CLIMATE AND POLLUTION AGENCY

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**Long-term monitoring of environmental quality in Norwegian coastal waters**

**Levels, trends and effects**

# Hazardous substances in fjords and coastal waters - 2009

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Abstract

This report is part of the Norwegian contribution to OSPAR's Coordinated Environmental Monitoring Programme (CEMP). CEMP 2009 included the monitoring of contaminants in blue mussel, dogwhelk, cod, and flatfish along the coast of Norway from the Oslofjord to the Varangerfjord. Time trend analyses were performed on a selection of representative contaminants of totalled 859 data series. Of the 538 time series evaluated for the 2009 investigations, 211 were statistically significant trends, 189 of these were downward trends and 22 were upwards. There were 186 of the 538 cases where concentrations in 2009 exceeded the upper limit to presumed background or the upper limit to Class I (insignificantly polluted). The dominance of downward trends indicates that contamination is decreasing.


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# *Foreword*

This report represents the Norwegian national comments on the 2009 investigations for the Coordinated Environmental Monitoring Programme (CEMP – a part of and referred to in earlier reports as the Joint Assessment and Monitoring Programme JAMP). CEMP is administered by the Oslo and Paris Commissions (OSPAR) in their effort to assess and remedy anthropogenic impact on the marine environment of the North East Atlantic. The current focus of the Norwegian contribution is on the levels, trends and effects of hazardous substances. CEMP-results from Norway and other OSPAR countries provide a basis for a paramount evaluation of the state of the marine environment. OSPAR receives guidance from the International Council for the Exploration of the Sea (ICES).

The Norwegian CEMP for 2009 was carried out by the Norwegian Institute for Water Research (NIVA) by contract from the The Climate and Pollution Agency, Klif (former Norwegian Pollution Control Authority, SFT). The project leader at Klif was Jon L. Fuglestad.

The Norwegian contribution to the CEMP was initiated by Klif in 1981 as part of the national monitoring programme. It now comprises three areas: the Oslofjord and adjacent areas (Hvaler-Singlefjord area and Grenlandsfjord, 1981-), Sørfjord/Hardangerfjord (1983-84, 1987-) and Orkdalsfjord area (1984-89, 1991-93, 1995-96, 2004-05), and stations in merely diffusely contaminated areas of Arendal, Lista and Bømlo-Sotra (1990-), areas from Bergen to Lofoten (1992-) and areas from Lofoten to the Norwegian-Russian border (1994-).

**Acknowledgments:** Thanks are due to many colleagues at NIVA, for fieldwork, sample preparations and data entry: Lise Tveiten, Merete Schøyen, Åse K. Gudmundson Rogne, Sigurd Øxnevad, Jarle Håvardstun, Janne Gitmark, Åse Bakketun, Marijana Brkljacic, Bjørnar Beylich, John Arthur Berge, Einar Kleiven, Torbjørn Johnsen, Arne Jørgen Kjøsnes and Mette Cecilie Lie. Thanks to our colleagues at Akvaplan-niva: Guttorm Christensen and Anita Evenset. For organic analyses: Kine Bæk, Alfhild Kringstad, Katherine Langford and their colleagues. For metal analyses: Bente Hiort Lauritzen, Marit Villø and their colleagues. For biological effects measurements: Oscar Fogelberg, Kenneth Macrae and their colleagues. For analytical quality assurance: Eva Hagebø and her colleagues. For data programme management and operation: Tore Høgåsen. To the other authors: Merete Schøyen, Sigurd Øxnevad and Anders Ruus (biological effects methods). For quality assurance: John Arthur Berge. Thanks go also to the numerous fishermen and their boat crews for which we have had the pleasure of working with.

Oslo, 26th November 2010.

Norman W. Green
Project co-ordinator
Norwegian Institute for Water Research

# Contents

# 1. Executive Summary/Sammendrag

The Norwegian contribution to OSPAR's Coordinated Environmental Monitoring Programme (CEMP) in 2009 included the monitoring of micropollutants (contaminants) in blue mussel (49 stations), dogwhelk (10 stations), cod (14 stations) and flatfish (dab, flounder, plaice, megrim; 11 stations) along the coast of Norway from the Oslofjord and Hvaler region in the southeast to the Varangerfjord in the northeast. The stations are located both in areas with known or presumed point sources of contaminants and in areas more remote, exposed to presumed diffuse contamination. The mussel sites include supplementary stations for the Norwegian Index Programme. There were totally 859 time series and 538 of these included results from 2009. Of these, 211 showed statistically significant trends; 189 were downwards and 22 were upwards. The dominance of downward trends indicates that contamination is decreasing. In 186 cases, concentrations were above what is expected in only diffusely contaminated areas (collectively termed over expected high background concentrations). The general situation for the two major impacted areas of CEMP is as follows:

**The Oslofjord/Hvaler/Grenlandsfjord area**
The Oslofjord was contaminated with PCBs (expressed the sum of seven PCB congeners), mercury and cadmium. Cod fillet from the Inner Oslofjord was moderately polluted by mercury, and had a significant upward trend for the period 1984-2009. Cod liver from the Inner Oslofjord had median concentrations of lead and cadmium higher that presumed high background, and there was a significant upward trend for cadmium in cod liver from the Inner Oslofjord for the same period. Cod liver from the Inner Oslofjord was markedly polluted with PCBs. Cod fillet from the Inner Oslofjord was also markedly polluted with PCBs in 2009. This was higher than the concentration in 2008 and there was a significant upward trend for the period 2000-2009. Cod from the outer part of the Oslofjord (Færder) were only insignificantly polluted by mercury, lead, cadmium and PCBs.

Blue mussel from Gressholmen, Akershuskaia and Ramtonholmen were moderately polluted by PCBs. There were significant downward trends for PCBs at these three stations for the whole monitoring period from 1987, 1992 and 1995, respectively, to 2009. The other blue mussel stations in the Oslofjord area were only insignificantly polluted by PCBs. Blue mussel from Damholmen in the Hvaler area were moderately polluted by mercury. The other blue mussel stations in the Oslofjord area were only insignificantly polluted by mercury. Blue mussel from Fugleskjær in the Hvaler area were moderately polluted by cadmium. Blue mussel from Gressholmen, Ramtonholmen, Solbergstrand and Mølen were insignificantly/slightly polluted by cadmium but had upward trends for the whole monitoring period from 1984, 1995, 1983 and 1983, respectively, to 2009. None of the blue mussel stations in the Oslofjord area were polluted by lead.

Blue mussel from stations in the Grenlandsfjord area were extremely polluted by dioxins. The concentrations of dioxins have increased every year in blue mussel at Gjemesholmen since 2005. There was a tendency towards an increase also at Bjørkøya and Strømtangen, but there were no significant trends for any of these stations.

**The Sørfjord/Hardangerfjord area**
The Sørfjord and Hardangerfjord were contaminated with DDE (p,p'DDE, a metabolite of DDT), cadmium, mercury and to a lesser degree PCBs. Cod fillet from the Inner Sørfjord was moderately polluted by mercury. Cod from Strandebarm in the Hardangerfjord was insignificantly polluted by mercury. There were concentrations over presumed high background levels and an upward trend for the period 1986-2009 for mercury in flounder fillet from the Inner Sørfjord.

Cod from the Inner Sørfjord showed concentrations of cadmium in the liver that exceeded presumed high background level. There was a significant upward trend for cadmium in cod liver for this station for the period 1986-2009. Cod from Strandebarm in the Hardangerfjord had a significant downward trend for the period 1987-2009 and median concentration of cadmium in 2009 was below presumed high background. Cod from the Inner Sørfjord had a median concentration of lead in the liver that exceeded presumed high background level. The median concentration of lead in cod liver from here had increased slightly compared to 2008, and there was a significant upward trend for the period 1990-2009. Inhibition of ALA-D in cod was commonly observed in the Sørfjord, also in 2009, as a result of the lead exposure. Cod liver from Strandebarm had a median concentration of lead below presumed high background level in 2009 and there was a significant downward trend for the same period.

Liver of cod from the Inner Sørfjord was insignificantly polluted by PCBs. The fillet of the same fish was however moderately polluted by PCBs. Liver and fillet of cod from Strandebarm in the Hardangerfjord were insignificantly polluted by PCBs. There was a significant downward trend for PCBs in cod liver from Strandebarm for the period 1990-2009. Cod liver and fillet from the Inner Sørfjord was moderately polluted by DDE. Both liver and fillet of cod from Strandebarm were insignificantly polluted by DDE, and showed significant downward trends for the same period.

Significant downward trends have been observed for cadmium in blue mussel in the Inner and Mid Sørfjord during the last two decades. In 2009 the blue mussel from the Inner and Mid Sørfjord were insignificantly to moderately polluted by mercury and lead. For three blue mussel stations in the Sørfjord, there were concentrations classified up to markedly polluted by DDE. The blue mussel at Kvalnes in the Mid Sørfjord has declined two classes in the classification system from extremely polluted in 2008 to markedly polluted in 2009.

**Biological effects**
Biological effects methods are included for in the monitoring programme to evaluate whether marine organisms are affected by contaminants in their environment, something that can not be assessed from concentrations of chemicals in tissues alone. Biological effects were investigated in cod from four areas: Inner Oslofjord, Lista, Bømlo-Sotra (Karihavet) and the Inner Sørfjord. The median amount of CYP1A protein in the liver of cod from the Inner Oslofjord in 2009 was lowest since investigations began in 2003; 50 % lower compared to 2008, however no significant trend could be detected. CYP1A protein levels were however higher in the Inner Oslofjord compared to the Inner Sørfjord and Karihavet, as was observed for the EROD activities. An explanation could be that the exposure to PCBs is higher in the Inner Oslofjord than in the Sørfjord and Karihavet.

In 2009, the median concentration of OH-pyrene metabolites in bile from cod was higher in the Inner Oslofjord compared to samples from the Inner Sørfjord, the Bømlo-Sotra area and Lista. Changes in concentrations of PAHs measured in blue mussel from the Inner Oslofjord correlate moderately well to alterations in OH-pyrene concentrations in the bile of cod from the same area. Since the year 2000 investigations have shown that EROD-activity in fish from the Inner Oslofjord is often higher than presumed cleaner stations. In the Inner Sørfjord EROD activities were often lower than at the reference Karihavet (although higher in 2009).

Of the time series investigated for biological effects (imposex) of TBT in dogwhelk, seven stations showed significant downward trends and two had no significant trends for the entire monitoring period, the first year of which varied from 1997 to 2002. The effects from TBT were low (VDSI<2) at eight of 10 stations investigated in 2009.

**Other observations**
Polybrominated diphenyl ethers (PBDEs) and perfluroalkyl compounds (PFCs) have been investigated in cod liver since 2005. In 2009, the concentration of sum PBDE and PFOS (the most abundant PFC) was highest in cod from the Inner Oslofjord. PBDDE was lowest in cod east of Bjørnerøya in Lofoten. BDE47 was the dominant PBDE in all samples. PFOS was lowest in the Sørfjord.

Blue mussel from two stations in the Kristiansandsfjord were markedly and moderately polluted by PAHs. Blue mussel from Ranfjord were extremely polluted by B[a]P, and blue mussel from the Kristiansandsfjord were up to severely polluted by benzo[a]pyrene.

Based on nine fjord areas, that are effected by point sources of contaminants, the Pollution Index for 2009 was 2.8, which was 0.2 lower than in 2008. A value between 2 and 3 would be termed by the Klif environmental system as “Marked” polluted. For the Reference Index based on four fjord areas that are presumably little polluted with contaminants, the Index value for 2009 was 1.2, which was 0.4 lower than the revised index 2008. A lower index in each of these cases indicates that contamination has decreased.

# Sammendrag

Det norske bidraget til OSPARs felles overvåkingsprogram CEMP 2009 inkluderer overvåking av miljøgifter i blåskjell (49 stasjoner inkludert stasjoner for beregning av forurensningsindeks), purpursnegl (10 stasjoner), torsk (14 stasjoner) og flatfisk (sandflyndre, skrubbe, rødspette, glassvar; 11 stasjoner) langs kysten fra Oslofjordområdet til Varangerfjorden. Stasjonene er lokalisert i områder med kjente eller antatte punktskilder av miljøgifter og i områder med antatt diffus belastning. Undersøkelsene omfatter totalt resultater fra 859 tidsserier hvorav 538 inkluderer resultater fra 2009. 257 av disse viste signifikante trender hvorav 189 viste en nedadgående trend og 22 viste en oppadgående trend. Dominans av nedadgående trender tyder på mindre forurensning av miljøgifter. Det var 186 tilfeller hvor resultatene viste konsentrasjoner over antatt høyt bakgrunnsnivå. Tilstand og utvikling i to områder som er påvirket av forurensninger er som følgende:

**Oslofjorden/Hvaler/Grenlandsfjorden**
Oslofjorden er forurenset med PCB (uttrykt som sum av syv PCB kongener), kvikksølv og kadmium. Filet av torsk fra Indre Oslofjord var moderat forurenset av kvikksølv, og det var en oppadgående trend for perioden 1984-2009. Torskelever fra Indre Oslofjord hadde nivåer av bly og kadmium som var over antatt høyt bakgrunnsnivå, og det var signifikant oppadgående trend for kadmium i torskelever for den samme perioden. Torskelever fra Indre Oslofjord var markert forurenset av PCB. Også filet av torsk fra Indre Oslofjord var markert forurenset av PCB i 2009. Dette var en økning siden 2008, og det var en signifikant oppadgående trend for perioden 2000 til 2009. Torsk fra Ytre Oslofjord var ikke forurenset av kvikksølv, bly, kadmium eller PCB.

Blåskjell fra Gressholmen, Akershuskaia og Ramtonholmen i Indre Oslofjord var moderat forurenset av PCB. Det var imidlertid en signifikant nedadgående trend for PCB i blåskjell for disse stasjonene for hele undersøkelsesperioden fra hhv. 1987, 1992, 1995 til 2009. De andre blåskjellstasjonene i Oslofjordområdet var ubetydelig forurenset av PCB. Blåskjell fra Damholmen på Hvaler var moderat forurenset av kvikksølv. De andre blåskjellstasjonene i Oslofjordområdet var ubetydelig forurenset av kvikksølv. Blåskjell fra Fugleskjær på Hvaler var moderat forurenset av kadmium. Blåskjell fra Gressholmen, Ramtonholmen, Solbergstrand og Mølen var ubetydelig forurenset av kadmium, men hadde oppadgående trender for hele perioden fra hhv. 1984, 1995, 1983, 1983 til 2009. Ingen av blåskjellstasjonene i Oslofjordområdet var forurenset av bly.

Blåskjell fra stasjonene i Grenlandsfjorden var meget sterkt forurenset av dioksiner. Konsentrasjonen av dioksiner i blåskjell fra Gjemesholmen har økt hvert år siden 2005. Også ved Bjørkøya og Strømtangen var det økende tendens for dioksiner i blåskjell. Økningen var imidlertid ikke signifikant.

**Sørfjorden/Hardangerfjorden**
Sørfjorden og Hardangerfjorden var forurenset med DDE (p,p'DDE, en metabolitt av DDT), kadmium, kvikksølv og i mindre grad PCB. Torskefilet fra Indre Sørfjorden var moderat forurenset av kvikksølv. Torskefilet fra Strandebarm i Hardangerfjorden var ubetydelig forurenset av kvikksølv. I skrubbefilet var det konsentrasjon av kvikksølv over antatt høyt bakgrunnsnivå, og stigende trend for perioden 1988-2009.

I torskelever fra Indre Sørfjorden var det nivåer av kadmium og bly høyere enn antatt høyt bakgrunnsnivå og oppadgående trend for perioden 1986-2009. Kadmium i torskelever fra Strandebarm i Hardangerfjorden avtok signifikant i perioden 1987-2009 og median konsentrasjon i 2009 var under antatt bakgrunn. Torsk fra Indre Sørfjorden hadde median konsentrasjon av bly over antatt høyt bakgrunnsnivå. Konsentrasjonen var litt høyere enn i 2008, og en signifikant oppadgående trend var registrert for perioden 1990-2009. Inhibering av ALA-D i torsk har vært ofte registrert i Sørfjorden, også i 2009, som et resultat av torskens eksponering for bly. Torskelever fra Strandebarm var lite forurenset av bly i 2009 og det ble registrert en signifikant nedadgående trend for samme periode.

Lever av torsk fra Indre Sørfjorden var ubetydelig forurenset av PCB, men fileten fra den samme torsken var moderat forurenset av PCB. Torskelever og -filet fra Strandebarm var ubetydelig forurenset av PCB. En signifikant nedadgående trend for PCB i torskelever her var registrert for perioden 1990-2009. Torskelever og -filet fra Indre Sørfjorden var også moderat forurenset av DDE. Torskelever og –filet fra Strandebarm var ubetydelig forurenset med DDE, og viste nedadgående trend for samme periode.

Det har vært signifikant nedadgående trender for kadmium i blåskjell fra den indre- og midtre Sørfjorden de siste 20 år. I 2009 var blåskjellene i den indre- og midtre delen av Sørfjorden ubetydelig til moderat forurenset av kvikksølv og bly. Lenger utover Sørfjorden og Hardangerfjorden var blåskjellene ubetydelig forurenset av kvikksølv og bly. Tre av blåskjellstasjonene i Sørfjorden var markert forurenset av DDE. Ved den ene av stasjonene (Kvalnes) var det en nedgang siden 2008, da blåskjellene var meget sterkt forurenset av DDE i 2009.

**Biologiske effekter**

Biologiske effekt-parametre er inkludert i overvåkingsprogrammet for å evaluere eventuell påvirking på organismer av forurensning, noe som kan ikke tilegnes kun fra konsentrasjoner av kjemikalier i vevsprøver alene. Biologiske effekt-parametre ble undersøkt i torsk fra fire stasjoner langs kysten: Indre Oslofjord, Lista, Bømlo–Sotra og Indre Sørfjorden. Effekt-parameterene er: OH-pyren (pyren metabolitt; markør for PAH-eksponering), δ-aminolevulinsyre dehydrase (ALA-D; markør for bly-eksponering), og mengde protein (CYP1A), samt aktivitet av cytokrom P4501A (EROD; markør for plane hydrokarboner, slik som PCB/PCN, PAH og dioksiner). Konsentrasjonen av CYP1A protein i torskelever fra Indre Oslofjord var i 2009 lavest siden undersøkelsen begynte i 2003; 50 % lavere enn i 2008. Nivået av CYP1A protein var imidlertid høyere i Indre Oslofjord enn i Indre Sørfjorden og Karihavet, noe som også ble funnet for EROD aktivitet. En mulig forklaring kan være at eksponering for PCB er høyere i Indre Oslofjord enn i Sørfjorden og Karihavet.

I 2009 var konsentrasjonen av OH-pyren metabolitter i galle fra torsk høyere i Indre Oslofjord enn i prøver fra Indre Sørfjorden, Karihavet og Lista. Endringer i PAH-konsentrasjoner i blåskjell fra Indre Oslofjord korrelerte bra med OH-pyren i torskegalle fra samme område. Siden 2000 har EROD-aktivitet i torsk fra dette området ofte vært noe høyere enn antatt mindre belastede steder. EROD i torsk fra Indre Sørfjord var ofte lavere (ikke i 2009) enn torsk fra Karihavet; et sted som antas å være mindre belastet med miljøgifter.

Biologiske effekter av TBT (imposex) ble undersøkt på purpursnegl. Sju av ti stasjoner hadde signifikant nedadgående trender, og for to av stasjonene var det ingen signifikant trend. Effektene av TBT var lave (VDSI<2) ved åtte av de ti undersøkte stasjonene i 2009.

**Andre observasjoner**

Polybrominerte difenyletere (PBDE) og perfluroalkyl stoffer (PFC) har vært undersøkt i torskelever siden 2005. I 2009, var median konsentrasjoner av sum-PBDE og PFOS, (det PFC-stoffet som det er mest av) høyest i Indre Oslofjord. PBDE var lavest i torsk øst for Bjørnerøya i Lofoten området. Av PBDE'ne var det mest av BDE47. PFOS var lavest i Indre Sørfjorden.

Blåskjell fra Kristiansandsfjorden var moderat til markert forurenset av PAH. Blåskjell fra Ranfjorden var meget sterkt forurenset av Benzo[a]Pyren, og blåskjell fra stasjonene i Kristiansandsfjorden var opptil sterkt forurenset av Benzo[a]Pyren.

På basis av forekomst av noen utvalgte miljøgifter i blåskjell har en siden 1995 beregnet en blåskjell-forurensningsindeks og en blåskjell-referanseindeks på basis av resultatene fra en gruppe forurensede og referansefjordområder. Basert på ni påvirkede fjordområder var forurensningsindeksen for 2009 på 2.8, som er 0.2 lavere enn i 2008. En verdi mellom 2 og 3 blir klassifisert som "markert" forurenset i henhold til Klifs klassifiseringssystem. Referanseindeksen er basert på fire antatt lite påvirkede fjordområder, og var i 2009 på 1.9, som er 0.4 lavere enn i 2008. At indeksene i hvert tilfelle har avtatt indikerer at områdene har blitt mindre forurenset med hensyn til miljøgifter.

# 2. Introduction

## 2.1. Background

Environmental concerns include the risks due to the pollution of air, soil and water. The Norwegian Pollution Monitoring Programme, administered by the Norwegian Climate and Pollution Agency (Klif), is designed to deal with these aspects. A part of this programme focuses on the levels, trends and effects of hazardous substances in fjords and coastal waters, which also represents the Norwegian contribution to the Coordinated Environmental Monitoring Programme (CEMP). CEMP is a common European monitoring programme under the auspices of Oslo and Paris Commissions (OSPAR). The Norwegian contribution to CEMP addresses several aspects of OSPAR's assessment hazardous substances. For this report the term CEMP only refers to the Norwegian contribution.

An overview of CEMP stations in Norway is shown in the tables in Appendix F and maps in Appendix G. It has included the monitoring of sediment, sea water and biota since 1981 with particular emphasis on three areas:

- Oslofjord-area (including the Hvaler area, Singlefjord and Grenland fjords area)
- Sørfjord/Hardangerfjord
- Orkdalsfjord area

During 1990-1995 and 2008-2009 Norway has also included

- Arendal and Lista areas

The previous investigations (cf. Appendix A) have shown that the Inner Oslofjord area has enhanced levels of PCBs in cod liver, mercury, lead and zinc in sediments and moderately elevated values of mercury in cod fillet. Investigations of the Sørfjord/Hardangerfjord have shown elevated levels of PCBs, DDT, cadmium, mercury and lead. The Norwegian Food Safety Authority (*Mattilsynet*) has issued warnings about the consumption of fish and/or mussel in the Oslofjord and Sørfjord partly based on these investigations. Investigations in Orkdalsfjord were discontinued during the period 1996 to 2003 and from 2006. Blue mussel from the Orkdalsfjord were monitored for the period 1984-1996, and then not again until 2004-2005 when bulk samples from three stations were investigated. The results from these investigations have been reported earlier (Green *et al.* 2007, Green & Ruus 2008).

In addition to the monitoring of Oslofjord area and Sørfjord/Hardangerfjord CEMP also includes the annual monitoring og selected stations in Lista and Bømlo areas on the south and west coast of Norway, respectively. CEMP includes sampling of blue mussel from reference areas along the coast from Lofoten to the Russian border, which were included in a 1993-1996 and 2006-2007 survey. The sampling also includes fish from four key areas north of Lofoten: Finnsnes-Skjervøy area, Hammerfest-Honningsvåg area, and Varanger Peninsula area. Fish from the Lofoten and Varanger Peninsula areas are sampled annually. The intention is to assess the level of contaminants in reference areas, areas that are considered to be little affected by contaminants, and to assess possible temporal trends.

Concentrations of metals, organochlorines (including pesticides), polycyclic aromatic hydrocarbons, polybrominated diphenyl ethers or perfluorinated compounds in blue mussel or fish were determined at the Norwegian Institute for Water Research (NIVA). Dioxins were analysed by the Norwegian Institute for Air Research (NILU). TBT analyses on blue mussel and dogwhelk were done at Eurofins.

Analytical methods have been described previously (Green *et al.* 2008a). Parameter abbreviations are given in Appendix C.

Biological effects methods, BEM or biomarkers were introduced in the Norwegian CEMP (former JAMP) in 1997. The purpose of these markers is, by investigations on molecular/cell/individual level, to give warning signals if ecosystems are affected by toxic compounds, i.e. contaminants, and to assist in establishing an understanding of the specific mechanisms involved. The reason to use biological effects methods within monitoring programmes is to evaluate whether marine organisms are affected by contaminant inputs. Such knowledge can not be derived from tissue levels of contaminants only. Just one reason is the vast number of chemicals (known and unknown) that organisms are exposed to, in combination, in the environment. In addition to enable conclusions on the health of marine organisms, some biomarkers assist in the interpretation of contaminant bioaccumulation. The biological effects component of the Norwegian CEMP is possibly the most extensive of its type in Europe and includes Imposex in gastropods as well as biomarkers in fish. The methods for fish were selected for specificity, for robustness and because they are among a limited set of methods proposed by international organisations, including OSPAR and ICES.

## 2.2. Purpose

The general purpose of CEMP is to assess the state of contamination in the marine environments in order to provide a basis for remedial action. The Norwegian contribution to CEMP is designed to address issues relevant to OSPAR (cf., OSPAR 2007, SIME 2004a) including OSPAR priority substances (SIME 2004b). And in this regard will be relevant to implementation of international initiatives such as The Water Framework Directive (WFD) (2000/60/EC) and the Marine Strategy Framework Directive (MSFD) (2008/56/EC). One of the goals of both of these EU directives is to achieve concentrations of hazardous substances in the marine environment near background values for naturally occurring substances and close to zero for manmade synthetic substances. OSPAR has also adopted this goal (OSPAR 1998b).

The state of contamination is divided into three issues of concern: levels, trends and effects. These are applied to the following regions:

- Oslofjord, Hvaler and Grenland area
- Sørfjord/Hardangerfjord
- Selected stations, remote from known point sources, along the entire coast of Norway
- Selected impacted blue mussel stations used for determination of Klif's pollution index

Different monitoring strategies are used, in particular with regard to the selection of indicator media (sediment, blue mussel, cod liver etc.) and sampling frequencies (generally every 5-10 years for sediment, annually for biota). The programme may be supplemented with long or short-term investigations of hazardous substances that are not routinely monitored.

Where possible CEMP is integrated with other national monitoring programmes to achieve a better practical and scientific solution to assessing the levels, trends and effects of micropollutants. In particular, this concerns Comprehensive Study on Riverine Inputs and Direct Discharges (RID) and The Norwegian Costal Monitoring Programme (*Kystovervåkingsprogrammet*, KYO). Both programmes are operated by NIVA on behalf of Klif.

# 3. Materials and methods

## 3.1. Sampling

The objective for the performed monitoring is to obtain updated information on levels and trends of selected hazardous substances, which are known to have a potential for causing detrimental biological effects on humans and wildlife that feed on marine organisms. In the marine environment, these substances may accumulate in the bottom sediment/porewater and in fish and shellfish. Because these fish and shellfish are a food source for marine wildlife and humans, the substances may be transferred to higher levels in the food chain. In humans, long-term exposure to or consumption of sea foods contaminated with these substances can cause severe health problems. The pathway of contamination is not always obvious. Although hot spots tend to be directly linked to particular human activities, the substances are also found in organisms that are collected far away from point sources because of transport by ocean currents, atmosphere or migration of prey species. The transport of these substances by these means can not be disregarded in this respect.

Concentrations of hazardous substances in sediment/porewater, mussel and fish constitute time-integrating state indicators for coastal water quality. With respect to organism, these substances have a tendency to accumulate in their tissues (bioaccumulation), and show higher concentrations relative to their surroundings (water and in some cases also sediment). Hence, it follows that the substances may be detected, which would otherwise be difficult when analysing water or sediment. Another advantage of using biota concentrations as indicators, as opposed to using water or sediment, is that they are of direct ecological importance as well as being important for human health considerations and quality assurance related to commercial interests involved in harvesting marine resources.

CEMP uses sediment monitored at about 10-year intervals and blue mussel, cod, and several flatfish species on a yearly basis. Mussels are attached to shallow-water surfaces, thus reflecting exposure at a fixed point (local pollution). Mussels are also abundant, robust and widely monitored in a comparable way. Mussels are, however, restricted to the coastal zone. Cod is a widely distributed and commercially important fish species. Fish are predators and, as such, will reflect contamination levels in their prey.

Samples were collected and analysed, where practical, according to OSPAR guidelines (more explicitly for 2009 sampling: OSPAR 2003b and OSPAR 2009)[1] and screened and submitted to ICES by agreed procedures (ICES 1996).

The sampling for 2009 involved blue mussel (49 stations), dogwhelk (10 stations), cod (14 stations), and flatfish (11 stations). (Figure 1, cf. Appendix F). This included three new cod-stations in the harbour areas of: Kristiansand (st.13BH), Trondheim (st.80BH) and Tromsø (st.43BH). The Norwegian CEMP has been expanded since 1989 to include monitoring in more diffusely polluted areas. Sufficient samples have not always been practical to obtain. When this applies to blue mussel, a new site in the vicinity is often chosen. As for fish, the quota of 25 individuals (±10 %), indicated in (Appendix F), as either 25 individuals or 5 bulked samples consisting of 5 fish per bulked sample, was not always met.

[1] See also www.ospar.org/eng/ > measures > list of other agreements

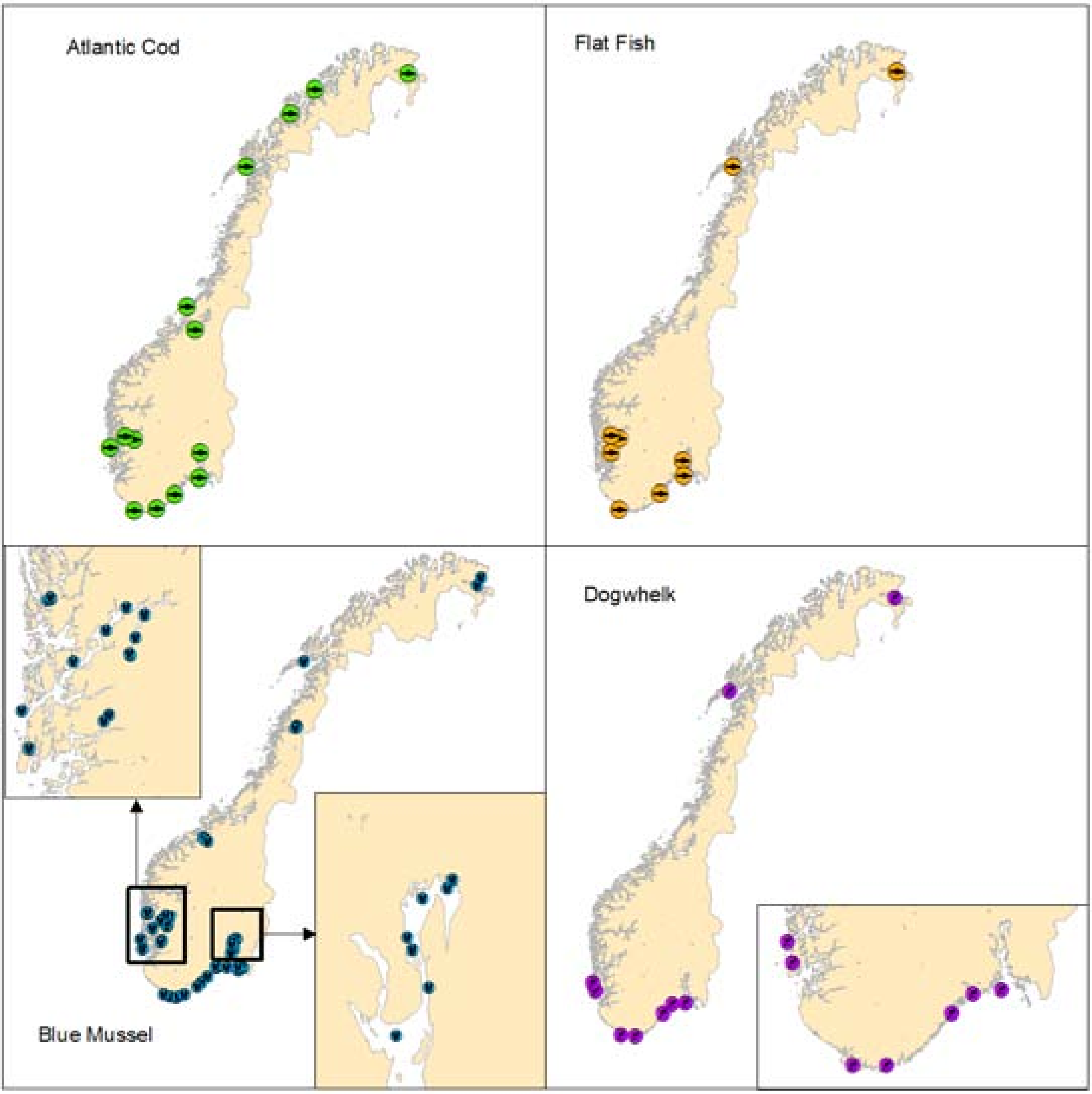


***Figure 1.*** *Stations samples where sampling of blue mussel, dogwhelk, cod and flatfish in 2009 is indicated. See also station information in Appendix F and detailed maps in Appendix G.*

**Blue mussel**

There is some evidence that the effect of shell length and difference in bulk sample size are of little or no significance (WGSAEM 1993; Bjerkeng & Green 1994). However, for historical reasons, three size groups of blue mussel (*Mytilus edulis*) have been sampled from most of the stations: 2-3 cm (100 individuals), 3-4 cm (50 individuals) and 4-5 cm (50 individuals). In order to obtain about 50 g wet weight, which is necessary for analyses and potential reanalyses of all variables, fifty to hundred individuals were sampled for each class. In 1992 a stricter approach (ICES 1992) was applied for new stations north of the Bømlo area at which 3 pooled samples of 20 individuals each were collected in the size range of 3-5 cm. Pending further investigation, all blue mussel samples from the new stations are collected according to this ICES method. Shell length was measured by slide callipers. The blue mussel were scraped clean on the outside by using knives or scalpels before taking out the tissue for the analysis.

To empty the intestinal canal (depuration) the mussel were kept alive for 12-24 hours in sea water (about 15 litres) collected in close proximity to the station. The shells were spread out on a perforated polyethylene platform and submerged in the sea water in a container and an aquarium pump pumped air to bottom of the aquarium which kept the water oxygenated. The container used was lined with polyethylene plastic bags and the bags were replaced for each station or sample. The temperature was kept at ambient conditions. Following depuration, the mussel were shucked and frozen (-20°C) to avoid excessive cutting of the soft tissue. The depuration was omitted if there was sufficient evidence that for a specific population/place the process has no significant influence on the body burden of the contaminants measured (cf. Green 1989a; Green *et al.* 1996). With one exception (st.227A2, Høgevarde in the Haugesund area) those samples that were not depurated were part of the Klif blue mussel pollution index (see Appendix M1).

The blue mussel samples were collected from August 25$^{th}$ to December 9$^{th}$, 2009. Generally, blue mussel are not abundant on the exposed coastline from Lista (southern Norway) to the north of Norway. A number of samples were collected from dock areas, buoys or anchor lines. All blue mussel were collected by NIVA except for the blue mussel collected in the Ranfjord, Lofoten and Varangerfjord which were collected by local contacts.

**Fish**

For fish, 25 individuals of Atlantic Cod (*Gadus morhua)* or one flatfish species have been sampled for each station. If possible, the same species as collected in previous years at the selected stations where used. The order of preference for flatfish species is according the OSPAR guidelines: dab (*Limanda limanda*), flounder (*Platichthys flesus*), plaice (*Pleuronectes platessa*), and megrim (*Lepidorhombus wiffiagonis*). For some areas the first preferred flatfish species have not been available. Then the same species collected in previous years at the selected stations have been collected to obtain best possible time series. Occasionally, ling (*Molva molva*) and/or tusk (*Brosme brosme*) are collected to investigate conditions in deeper waters.

If possible, the 25 individuals were sampled with five individuals within each of the five length classes (Table 1). The fish are either prepared in the field and the samples are stored frozen (-20°C) until analysis or the fish is frozen directly and later prepared at NIVA.

***Table 1.*** *Target length groups for sampling of cod and flatfish.*

| Size-class | Cod (mm) | Flatfish (mm) |
|---|---|---|
| **1** | 370-420 | 300-320 |
| **2** | 420-475 | 320-340 |
| **3** | 475-540 | 340-365 |
| **4** | 540-615 | 365-390 |
| **5** | 615-700 | 390-420 |

**Cod**
The cod were generally sampled from October 1st to December 20th 2009. All the cod were sampled by local fishermen except for the cod in the Inner Oslofjord (st. 30B) that was collected by NIVA on November 10th 2009 by trawling from the research vessel F/F *Trygve Braarud* owned by University of Oslo.

**Flatfish**
Dab, flounder, plaice and megrim were collected in the period from September 20th to December 1st 2009. All flatfish were sampled by local fishermen.

**Dogwhelk**
TBT-induced development of male sex-characters in females, known as Imposex. Imposex was quantified by the *Vas Deferens Sequence Index* (VDSI) analysed according to OSPAR-CEMP guidelines. The VDSI ranges from zero (no effect) to six (maximum effect) (Gibbs *et al.* 1987). Detailed information about the chemical analyses of the animals is given in Følsvik *et al.* (1999).

Effects (Imposex) and concentrations of organotin in dogwhelk (*Nucella lapillus*) were investigated using 50 individuals from each station. Individuals were kept alive in a refrigerator (at +4°C) until the effects (Imposex) were quantified. All dogwhelk were sampled by NIVA except for the dogwhelk collected in Lofoten and in the Varangerfjord. The dogwhelk samples were collected from September 11th to October 14th 2009.

## 3.2. Chemical variables

Hazardous substances have been analysed in different species tissues (Table 2).

**Table 2**. *Number of stations (see Appendix F) and indicator media with results for 2009. Indicator media include: selected tissues from blue mussel, dogwhelk, Atlantic cod and flatfish species. (See Appendix C for description of chemical codes.)*

| Description | Blue mussel, soft body | Dog-whelk, soft body | Atlantic cod bile | Atlantic cod blood | Atlantic cod liver | Atlantic cod fillet | Flatfish liver | Flatfish fillet |
|---|---|---|---|---|---|---|---|---|
| Cd, Cu, Pb, Zn, Ag, As, Co, Cr, Ni, Sn | 49 | | | | 12-14 | | 10-11 | |
| Hg | 46 | | | | | 13 | | 10 |
| TBT 1) | 14 | 10 | | | | | | |
| PCBs 2) | 41 | | | | 14 | 11 | 11 | 11 |
| HCB | 41 | | | | 11 | 11 | 11 | 9 |
| DDT, DDE, DDD | 41 | | | | 11 | 11 | 11 | 9 |
| α-, γ-HCH | 41 | | | | 14 | 11 | 11 | 11 |
| Dioxins 3) | 8 | | | | | | | |
| PBDE 4) | | | | | 10 7) | | | |
| PFC 5) | | | | | 10 7) | | | |
| PAHs 6) | 17 | | | | | | | |
| Biological effects methods 7) | | 10 Imposex | 4 OH-pyrene 7) | 3 ALA-D 7) | 3 EROD-activity, CYP1A 7) | | | |

1) Includes: DBTIN, DPTIN, MBTIN, MPTIN, TBTIN, TPTIN
2) Includes the congeners: CB-28,-52,-101,-105,-118,-138,-153,-156,-180, 209, 5-CB, OCS and, when dioxins are analysed, the non-orto-PCBs, i.e. CB-77, -81, -126, -169
3) Includes: CDD1N, CDD4X, CDD6P, CDD6X, CDD9X, CDDO, CDF2N, CDF2T, CDF4X, CDF6P, CDF6X, CDF9P, CDF9X, CDFDN, CDFDX, CDFO,TCDD
4) Polybrominated diphenyl ethers (PBDE), including brominated flame retardants and includes: BDE28, BDE47, BDE49, BDE66, BDE71, BDE77, BDE85, BDE99, BDE100, BDE119, BDE138, BDE153, BDE154, BDE183, BDE205 (and for some samples BDE196 and BDE209)
5) Includes: PFNA, PFOA, PFHpA, PFHxA, PFOS, PFBS, PFOSA
6) Includes (with NPDs): ACNE, ACNLE, ANT, BAP, BBJF, BEP, BGHIP, BKF. BAA. CHR, DBA3A, DBT, DBTC1, DBTC2, DBTC3, FLE, FLU, ICDP, NAP, NAPC1, NAPC2, NAPC3, PA, PAC1, PAC2, PAC3, PER, PYR.

***Table 3.*** *Overview of method of analyses (See Appendix C for description of chemical codes).*

| Medium analysed | Basis | Detection limit. | Methods | Sample description |
|---|---|---|---|---|
| **Biota** | w.w. | µg/kg | | |
| Mercury (Hg) | w.w. | 5 | NS-EN 1483 + NIVA's accredited method E4-3 | bulk or individual |
| Cadmium (Cd) | w.w. | 100 | NIVA's accredited method E10-4 and E8-3 | bulk or individual |
| Lead (Pb) | w.w. | 1000 | NIVA's accredited method E10-4 and E8-3 | bulk or individual |
| Copper (Cu) | w.w. | 200 | NIVA's accredited method E10-4 and E8-3 | bulk or individual |
| Zinc (Zn) | w.w. | 150 | NIVA's accredited method E10-4 and E8-3 | bulk or individual |
| Arsenic (As) | w.w. | 2000 | NIVA's accredited method E10-4 and E8-3 | bulk or individual |
| Barium (Ba) | w.w. | 100 | NIVA's accredited method E10-4 and E8-3 | bulk or individual |
| Cobalt (Co) | w.w. | 200 | NIVA's accredited method E10-4 and E8-3 | bulk or individual |
| Chromium (Cr) | w.w. | 200 | NIVA's accredited method E10-4 and E8-3 or E9-5 | bulk or individual |
| Nickel (Ni) | w.w. | 400 | NIVA's accredited method E10-4 and E8-3 | bulk or individual |
| Vanadium (V) | w.w. | 100 | NIVA's accredited method E10-4 and E8-3 | bulk or individual |
| Persistent organic pollutants 1) | w.w. | 0.05-0.1 | NIVA's accredited method H3-4 | bulk or individual |
| PAH 2) | w.w. | 0.2-0.5 | NIVA's accredited method H2-4 | bulk or individual |
| TBT and others 3) | w.w. | 0.2-2 | NIVA's method H14-2 | bulk |
| PBDE 4) | w.w. | 0.01-0.03 | | |
| HBCD (and BDE209) | w.w. | | | |
| PFCs: 5) | w.w. | | | |
| Dioxsins:6) | w.w. | 0.0001-0.00002 | NILU's method | bulk |
| OH-pyrene7) | | | NIVA's method | Ind. samples of cod bile |
| Dry matter | | | NIVA's accredited method B3 | bulk or individual |
| **Biological Effect Methods (BEM)** | | | | |
| EROD 7) | | | NIVA-internal method, after ICES (TIMES no. 13) | Ind. fish liver samples |
| CYP1A (when EROD is analysed)7) | | | NIVA-internal method, after ICES (TIMES no. 23) | Ind. fish liver samples |
| ALA-D7) | | | NIVA internal method, after ICES-TIMES (in press) | Ind. fish blood samples |
| **Other analyses** | | | | |
| Age determination | | | Otolith | Individual fish |
| IMPOSEX | | | NIVA-internal method, after ICES (TIMES no. 24) | One station with ca. 60 ind. |

1) Includes the congeners: CB-28,-52,-101,-105,-118,-138,-153,-156,-180, 209, 5-CB, OCS and, when dioxins are analysed, the non-orto-PCBs, i.e. CB-77, -81, -126, -169, see parameter group OC-CB, OC-DD, OC-CL, in Appendix C.
2) Polycyclic aromatic hydrocarbons and includes (with NPDs): ACNE, ACNLE, ANT, BAP, BBJF, BEP, BGHIP, BKF. BAA. CHR, DBA3A, DBT, DBTC1, DBTC2, DBTC3, FLE, FLU, ICDP, NAP, NAPC1, NAPC2, NAPC3, PA, PAC1, PAC2, PAC3, PER, PYR.
3) Includes the mono-, di- and tri forms of both butyltin and phenyltin, see parameter group O-MET in Appendix C.
4) Polybrominated diphenyl ethers (PBDE), and includes: BDE28, BDE47, BDE49, BDE66, BDE71, BDE77, BDE85, BDE99, BDE100, BDE119, BDE138, BDE153, BDE154, BDE183, BDE205 (and for some samples BDE196 and BDE209), see parameter group OC-BB in Appendix C.
5) Perfluorinated alkylated substances and includes PFOS, see parameter group PFAS in Appendix C.
6) Includes a number of dibenzodioxins and dibenzo furans, see parameter group OC-DX in Appendix C.
7) Cod only

An overview of the applied analytic methods method is presented in Table 3. Chemical analyses were performed on the of each cod liver and for mercury on the filet of each cod. Furthermore, Biological Effects Methods (BEM) were performed on individual cod. The remaining chemical analyses were performed on homogenates of each size class.

Several laboratories have been used in performing the chemical analysis since 1981 (cf. Green *et al.* 2008a). However, in general chemical analyses have been done at NIVA. One major exception has been the analyses of dioxins carried out by the Norwegian Institute for Air Research (NILU). A brief description of the analytical methods used follows (from Green *et al.* 2008a) below.

Metals were analysed at NIVA. Before 2002, these were done using Atomic Absorption Spectrometry (AAS). Biota samples were extracted using nitric acid. Sediment samples were extracted using 'Total' digestion with mineral acids including hydrofluoric acid (HF). Concentrations are determined either by Flame AAS (FAAS, for high concentrations) or Graphite furnace AAS (GAAS, for low concentrations). GAAS was always used for zinc and often for copper determinations. Since 2002, metals have been determined using Inductively Coupled Plasma Mass Spectrometry (ICP-MS), except for chromium, which was determined using GAAS or ICP-Atomic Emission Spectroscopy (ICP-AES). Mercury (total) has been analysed using Cold-Vapour AAS (CVAAS).

Polychlorinated biphenyls (PCBs) and other chlororganic hazardous substances in biota were analysed at Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology – SINTEF and at NIVA. Both laboratories have used gas chromatograph, with capillary column, (GC) and an electron capture detector (ECD). Fat content was extracted using a mixture of cyclohexane and acetone on the target tissue. Among the individual PCBs quantified, seven (ΣPCB-7) are commonly used for interpretation of the results[1] (Table 4).

***Table 4.*** *Suggested PCB-congeners which are to be quantified in biota (ICES 1986).*

| IUPAC/CB no. | Structure |
|---|---|
| 28 | 2 4 - 4' |
| 52 | 2 5 - 2'5' |
| 101 | 2 4 5 - 2'5' |
| 118 | 2 4 5 - 3'4' |
| 138 | 2 3 4 - 2'4'5' |
| 153 | 2 4 5 - 2'4'5' |
| 180 | 2 3 4 5 - 2'4'5' |

Polycyclic aromatic hydrocarbons (PAH) have been analysed at NIVA using a GC coupled to a Mass-selective detector (MSD). The individual PAHs are distinguished by the retention time and/or significant ions. All seven potentially carcinogen PAHs (IARC 1987) are included in the list of single components determined to constitute the total concentration of PAH.

Organic tin compounds have been analysed at NIVA except for the years 2001-2002 when GALAB (Germany) and Eurofins (Denmark) did the analyses. Analyses at NIVA were done using a GC-MSD in Selected Ion Monitoring mode (SIM). The other laboratories used a GC equipped with Atomic Emission Detector (AED), a method comparable to NIVA's.

Analyses of polybrominated diphenylether (PBDE) where done at NIVA. Determinations are made on the fat content of the target tissue using a GC-MSD-SIM. Some alterations were needed to analyse BDE196 and BDE209 *inter alia* with respect to the temperature programme and steps taken to reduce the samples exposure to light.

Perfluorinated compounds (PFC) are determined using liquid-chromatography coupled to tandem MS (LC/MS/MS) operated in negative electro-spray-ionisation (ESI) mode using multiple reaction monitoring.

For fish, the target tissues are; liver and fillet for hazardous substance and liver; blood and bile for the biological effects methods (BEM) (cf. Table 5). The fish fillet are analysed for the mercury and PCBs content. In addition, the age, sex, and visual pathological state for each individual are determined. Other measurements include: fish weight and length, weight of liver, liver dry weight and fat content (% total extractable fat), the fillet dry weight and its % fat content. These measurements are stored in the database and published periodically (e.g. Shi *et al.* 2008).

The mussel are analysed for all contaminants including organotin. The shell length of each mussel is measured. On a bulk basis the total shell weight, total soft tissue weight, dry weight and % fat content is measured. These measurements are stored in the database and published periodically.

The dogwhelk are analysed for all organotin compounds and biological effects (Imposex[2]).

[1] Several marine conventions (e.g. OSPAR and HELCOM[1]) use ΣPCB-7 to provide a common basis for PCB assessment.
[2] Vas Deferens Stage Index

## 3.3. Biological-effect analyses

There are currently five BEM applied on an annual basis. Each method is more or less specific for one or a group of contaminants. An overview of the methods, tissues sampled and contaminant specificity is shown in Table 5. One of the major benefits of biological effects methods (BEM) used at the individual level (biomarkers) is the feasibility of integrating biological and chemical methods, as both analyses are done on the same individual.

BEM-sampling requires that the target fish are kept alive until just prior to sampling. Sampling for BEM-analysis are performed by trained personnel, most often under field conditions. Immediately after the fish are inactivated by a blow to the head samples are collected and stored in liquid nitrogen. OH-pyrene analyses can also be done on bile samples stored at -20°C.

***Table 5.*** *The relevant contaminant-specific biological effects methods applied on an annual basis.*

| Code | Name | Tissue sampled | Specificity |
|---|---|---|---|
| OH-pyrene | Pyrene metabolite | fish bile | PAH |
| ALA-D | δ-aminolevulinic acid dehydrase inhibition | fish red blood cells | Pb |
| EROD-activity | Cytochrome P4501A-activity (CYP1A/P4501A1, EROD) | fish liver | planar PCB/PCNs, PAHs, dioxins |
| CYP1A | Relative amount of cytochrome P450 1A-protein | fish liver | Supporting parameter for EROD-activity |
| TBT | Imposex | snail soft tissue | organotin |

## 3.4. Information on Quality Assurance

NIVA has participated in all the QUASIMEME international intercalibration exercises relevant to chemical and Imposex analyses. For chemical analyses, these include Round 58 of July-October 2010 which would apply to the 2009 samples. These QUASIMEME exercises have included nearly all the contaminants as well as Imposex analysed in this programme. Quality assurance programme for NIVA is similar to the 2008 programme (cf. Green *et al.* 2010). In addition, NIVA was accredited in 1993 and since 2001 accredited in accordance with the NS-EN ISO/IEC 17025 standard by the Norwegian Accreditation (reference P009). A summary of the quality assurance programme at NIVA is given in Appendix B.

NIVA participated in the QUASIMEME Laboratory Performance Studies "Exercise 801-Round 53 Imposex in Marine Snails BE1" in June 2008. Measures were taken of shell height, penis-length-male, penis-length-female, average-shell-length and female-male-ratio. NIVA got the score satisfactory (which is the top score ranked after the following system: Satisfactory, Questionable, Unsatisfactory, Consistent, Inconsistent and Blanc). VDSI (Imposex stage values of all females sampled/number of females) was 1.545 compared to lab average 1.821. NIVA got satisfactory on all measured parameters in 2008.

In addition to these QUASIMEME exercises, certified reference materials (CRM) are also analysed routinely with the CEMP samples. It should be noted that for biota the type of tissue used in the CRMs do not always match the target tissue for analyses. Uncertain values identified by the analytical laboratory or the reporting institute are flagged in the database. The results are also "screened" during the import to the database at NIVA and ICES.

## 3.5. Norwegian blue mussel Pollution and Reference Indices (The Index Programme)

The Climate and Pollution Agency (Klif) is interested in obtaining a small group of indices to assess the united quality of the environment with respect to a selected group of contaminants and stations.

The target medium indices may vary depending on the purpose, though sediment, cod and mussel are considered to be the most likely choices. The blue mussel have been selected as the target medium since 1995.

The Index scale varies from 1 to 5, where 1 means that stations within an area are insignificantly polluted (Class I in Klif's classification system) with respect to contaminants measured. Index of 5 would mean that at least one station from any fjord or area is classified as "Extreme" (Class V in the Klif system) for at least one of the contaminants measured. More details concerning the methods and results for 2009 are shown in Appendix L.

## 3.6. Classification of environmental quality

Classifications used in earlier CEMP-reports are based on the Climate and Pollution agency environmental classification system (Molvær *et al.* 1997). The revised classification system (Bakke *et al.* 2007c) are used for sediments (not investigated in 2009). Focus is on the principle cases where median concentrations exceeded the upper limit to Class I in the Climate and Pollution Agency's (Klif's) environmental quality classification system (cf. Molvær *et al.* 1997). The relevant part of the system is shown in Appendix D, and includes unofficial conversion to other bases. The system has five classes from Class I, insignificantly polluted, to Class V, extremely polluted. However, the system does not cover all the contaminants in indicator species-tissues used in CEMP. To assess concentrations not included in the system provisional expected high background values were used (cf. Appendix D). The factor by which this limit or the Class I limit is exceeded is calculated (cf. Appendix J). High background concentration corresponds to the upper limit to Class I; insignificantly polluted, which in this context has no statistical implications.

The median concentration are assessed according to the Klif system, but where this is not possible, presumed high background levels are used. The term "significant" refers to the results of a statistical analysis of linear trends and can be found in the tables in Appendix J or figures in Appendix K. It should be noted that there is in general a need for periodic review and supplement of this list of limits in the light of results from reference localities and introduction of new analytical methods, and/or units. Because of changes in the limits, assessments of presumed high background levels over the years may not correspond.

Recommendations for changes to Class I (cf. Knutzen & Green 2001b, Green & Knutzen 2003) have been taken into account in this report. Revisions to corresponding Classes II-V have not been done, Klif is considering these recommendations in a current review of their classification system.

No attempt has been made to compensate for differences in size groups or number of individuals of blue mussel or fish. The exception was with mercury in fish fillet where six data sets in both cod and flatfish in this study showed significant differences between "small" and "large" fish (Appendix J). With respect to blue mussel, there is some evidence that concentrations do not vary significantly among the three size groups employed for this study (i.e. 2-3, 3-4 and 4-5 cm) (WGSAEM 1993).

With respect to Purpose A (health risk assessment), the Norwegian Food Safety Authority (*Mattilsynet*) is responsible for official commentary as to possible health risk due to consumption of seafood. Hence, the results of the CEMP pertaining to this purpose are presented only as a partial basis for evaluation.

The results can also be useful as part of the implementation of The Water Framework Directive (WFD) (2000/60/EC) ratified by Norway in 2009, and the Marine Strategy Directive (MSFD) (2008/56/EC), which by early 2010 has not yet been ratified by Norway. These two directives together concern all waters out to territorial borders. They are the main policies at the EU level designed to achieve good "ecological" (WFD) or "environmental" (MSFD) status, herein termed GES, in the European marine environment, by the year 2015 (2021 for Norway) and 2020 at the latest, respectively. The directives also set out to ensure the continued protection and preservation of the environment and the prevention of deterioration. The Norwegian framework regulation on water management (the Water Regulation) was adopted on December 15th 2006, and incorporates the WFD into Norwegian law. The Environmental Quality Standards (EQS) for 33 priority substances or groups of substances have been outlined in the EQS Directive (EQSD) (2008/105/EC). Several of these substances are monitored by CEMP. The EQS apply to concentrations in water, and for three substances (mercury, hexachlorobenzene (HCB) and hexachlorobutadiene (HCBD)) in "prey tissue" (Table 6). There is also a provision which allows a country to use other EQS in sediment and biota provided these offer the same level of protection as the EQS set for water. It should be noted that application of the EQS set for "prey tissue" is in conflict with the best class in the Climate and Pollution Agency system for classification of environmental quality; e.g. lower than the Class I for mercury and higher for Class V for HCB in blue mussel. This has not been resolved and for this report, only the Klif system will be used.

***Table 6.*** *The Water Framework Directive (WFD) Environmental Quality Standards for "prey tissue" (cf. Environmental Quality Standard Directive – 2008/105/EC) and the Class I and V (upper limit to insignificant and extreme degree of pollution, respectively) in the Klif environmental classification system (Molvær et al. 1997). Concentrations in µg/kg wet weight.*

| Media | Class | Mercury | Hexachlorobenzene (HCB) | Hexachlorobutadiene (HCBD) |
|---|---|---|---|---|
| "Prey tissue" | | 20 | 10 | 55 |
| Blue mussel | Class I 1) | 40 | 0.1 | - |
| | Class V 1) | 40000 | 5 | - |
| Cod liver | Class I | - | 20 | - |
| | Class V | - | 40 | - |
| Cod fillet | Class I | 100 | 0.2 | - |
| | Class V | 1000 | 5 | - |

1) Conversion assuming 20% dry weight

## 3.7. Statistical time trends analyses

A simple 3-model approach has been developed to study time trends for contaminants in biota based on median concentration (ASMO 1994). The results for this assessment are presented earlier (cf. ASMO 1994). The method has been applied to Norwegian data and results are shown in Appendix H. The results are presented in a type as shown in Figure 2.

A Loess smoother is based on a running seven-year interval, a non-parametric curve fitted to median log-concentration (Nicholson *et al.* 1991, 1994 and 1997 with revisions noted by Fryer & Nicholson 1999). For statistical tests based on a fitted smoother to be valid the contaminants indices should be independent to a constant level of variance and the residuals for the fitted model should be log-normally distributed (cf. Nicholson *et al.* 1998). No transformation was applied to the Imposex (VSDI) data.

The smoothed median for the last three sampling years is linearly projected for the next three years to assess the likelihood of presumed high background levels (not shown in figures).

An estimate of the power of the temporal trend series expressed as the number of years to detect a 10 % change per year with a 90% power (cf. Nicholson *et al.* 1997). The fewer the years the easier it is to detect a trend. The power is based on the percentage relative standard deviation (RLSD) estimated using the robust method described by ASMO (1994) and Nicholson *et al.* (1998). The estimate was made for series with at least 3 years of data and covers the entire period monitored. This fixed means of treating all the datasets may give misleading results especially where non-linear temporal changes are known to occur, such as for HCB in blue mussel from Grenland fjords area (Figure 2).

The statistical analysis was carried out on temporal trend data series for cadmium, mercury, lead, ΣPCB-7 (sum of congeners: 28, 52, 101, 118, 138, 153, 180), ppDDE (ICES code DDEPP), HCB, non-dicyclic PAHs, sum carcinogenic PAHs, B[a]P, TBT, and the biological effects parameters Imposex (VSDI), OH-pyrene, ALA-D and EROD-activity.

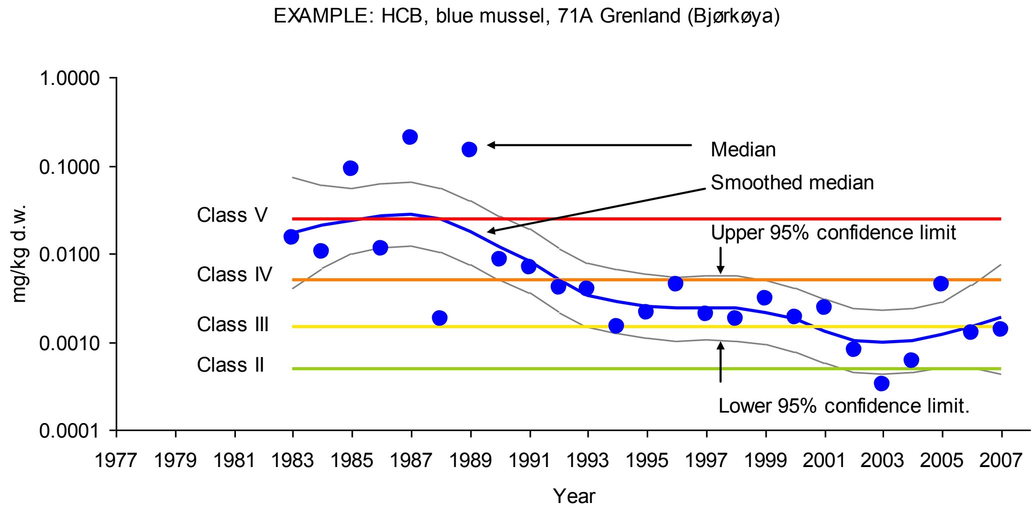


***Figure 2.*** *Example time trend that indicates the median concentration, running mean of median values (Loess smoother), 95 % confidence intervals. The horizontal lines indicate the lower boundaries to Klif classes of pollution: Class II (moderate=upper boundary to Class I (insignificant)), III (marked), IV (severe) and V (extreme), or alternatively the Class II boundary is replaced by the upper boundary to provisional "high background level" as in which case no class-boundaries are shown. (see text and refer to Appendix D).*

# 4. Results and discussion

## 4.1. General information on measurements

Samples along the Norwegian coast, from the border to Sweden in the south to the border to Russia in the north (cf. Appendix G, Figure 1), were collected. The stations and number of samples relevant for the 2009 investigations are noted in the tables in Appendix F. Time trend analyses were performed on a selection of representative contaminants and totalled 859 data series (cf. Appendix J), and 538 of these time series included results from 2009. In 186 of the 538 cases, concentrations were above what is expected in only diffusely contaminated areas (collectively termed: “over expected high background concentrations”). The focus of the overview presented below is based on these time series, of which 189 were downwards trends and 22 were upwards trends. The priorities of the results were systematized in order of concentrations over expected high background level (>Class I, insignificantly polluted, acceptable levels) in combination with significant upward trends, no trends or downward trends. Then results with concentrations below expected high background level (<Class I, insignificantly polluted) in combination with significant upward trends, no trends or downward trends were remarked. An overview of trends, classification and median concentrations is presented in Appendix I. The results are presented by classes and with results for observed trend analyses. For some stations there were insufficient data to do trend analyses.

## 4.2. National levels and trends

An overview of samples collected in 2009 with results is presented in Table 9 and Appendix I.

### Cod

Cod (*Gadus morhua*) were sampled at 14 stations along the Norwegian coast (Appendix F and maps in Appendix G). Cod have been collected in the port areas in Kristiansand (st. 13BH), Trondheim (Munkholmen st. 80BH) and Tromsø (st. 43BH) for the first time in 2009.

### Flatfish

Flatfish were collected at 11 stations along the Norwegian coast (Appendix F and maps in Appendix G). The flatfish species were dab (*Limanda limanda*), flounder (*Platichthys flesus*), plaice (*Pleuronectes platessa*) and megrim (*Lepidorhombus wiffiagonis*).

### Blue mussel

Blue mussel (*Mytilus edulis*) were sampled at 49 stations (including supplementary stations for Index and TBT) located along the coast of Norway (Appendix F and maps in Appendix G). The Index Programme in Norway started in 1995. It is a set of key contaminants monitored in blue mussel from selected fjords with historical discharges of contaminants. The indexes from the contaminated areas (“Pollution Index”) are related to corresponding measurements at reference sites (“Reference Index”). In total, the monitoring programme covers a number of 11 pollution and eight reference site stations in all five fjords.

Locations of stations are shown in Figure 1 and Appendix G. Trends and median concentrations for 2009 for a selection of the stations are shown from Figure 3 to Figure 23. The stations were chosen to show highly polluted stations and reference stations distributed along the Norwegian coast. A summary of the results for 2009 are shown in Table 9 and more details are given in Appendix I. The trend analyses for the entire monitored period are shown in Appendix J. Geographical distributions of contaminants are also shown in Appendix K.

### Dogwhelk

Concentrations and effects of organotin in dogwhelk (*Nucella lapillus*) were quantified at 10 stations located along the coast of Norway (Appendix F and maps in Appendix G).

## Mercury (Hg)

### Cod fillet

The median concentration of Hg in cod fillet exceeded Class I (insignificantly polluted) at 2 of 14 cod stations analysed (Figure 3). The two stations were the Inner Oslofjord (st. 30B) and the Inner Sørfjord (st. 53B), both classified to Class II (moderately polluted). A significant upward trend was found for cod from the Inner Oslofjord (st. 30B) for the sampling entire period (1984-2009), but no trend was found during the period 2000-2009. No significant trend was observed in the cod from the Inner Sørfjord (st. 53B). The cod from the Færder area (st. 36B), Borøy area (st. 77B), Ullerø area (st. 15B), Karihavet area (st. 23B), Stokken (st. 92B), Kvænangen/ Olderfjord (st. 43B) and Bjørnerøya (st. 98B1) showed low levels of Hg (Class I) and no significant trends. No trends could be calculated for cod from Kristiansand harbour (st. 13BH), Munkholmen (Trondheim harbour) (st. 80BH) and Tromsø harbour (st. 43BH) because of few years of measurements. Cod fillet from the Strandebarm area (st. 67B) and in the Varangerfjord (st. 10B) also showed acceptable low levels of Hg (Class I) and a significant downward trend.

### Flounder fillet

Three flounder stations were analysed for Hg in fillet and all stations showed median concentrations below expected high background levels. In addition, the flounder in the Inner Sørfjord (st. 53F) had a significant upward trend, while the two other stations at Sande (st. 33F) and in the Strandebarm area (st. 67F) showed a significant downward trend (Table 9).

### Dab fillet

Fish from four stations were analysed; Færder area (st. 36F), Borøy area (st. 77F), Ullerø area (st. 15F) and in the Åkrafjord (st. 21F) (see Table 9). The median concentrations observed in dab from the Færder area (st. 36F) and in the Åkrafjord (st. 21F) exceeded the acceptable level, but showed no significant trends. The dab at the Ullerø area (st. 15F) showed an acceptable level and a significant upward trend. The dab at Borøy area (st. 77F) had a median acceptable level of Hg, but no trend could be calculated because of few years of measurements.

### Plaice fillet

Fish from two stations were analysed. Plaice fillet from the Skogerøy area (st. 10F) in the Varangerfjord and from Husholmen area (st. 98F2) were not polluted by Hg nor had any significant trend.

### Megrim fillet

Megrim fillet from two stations on the west coast of Norway were analysed for Hg. The station in the Strandebarm area (st. 67F) in the Hardangerfjord showed a significant downward trend while the megrim in the Åkrafjord (st. 21F) had no significant trend.

### Blue mussel

The presence of Hg in blue mussel exceeded Class I (insignificantly polluted) at 7 of 46 blue mussel stations analysed (cf. Table 9). A graphical presentation of results from some of the stations is shown in Figure 4. No significant trends were found at Byrkjenes (st. 51A), Damholmen (st. I022) and Kirkøy (st. I024) (all Class II, moderately polluted). The combination of concentrations being over expected high background and a significant downward trend was found in mussels from Kvalnes (st. 56A) (Class II, moderately polluted). Blue mussel from Fugleskjær (st. 02A), Gjerdsvoldsøyen (st. 79A) and Høgevarde (st. 227A2) were also moderately polluted (Class II) by Hg, but no trends could be calculated because of insufficient data.

In blue mussel that were not polluted by Hg (Class I), significant upward trends were found at Akershuskaia (st. I301), Solbergstrand (st. 31A) and Espevær (st. 22A). Mussels from the majority of the stations did however revealed acceptable median level of Hg (Class I) in combination with no significant trend (Table 9). This was the case for Gressholmen (st. 30A), Gåsøya (st. I304), Ramtonholmen (st. I307), Håøya (st. I306) and Mølen (st. 35A) in the Oslofjord, Singlekalven (st. I023) in the Hvaler area, and Gjemesholmen (st. I712) and Strømtangen (st. I713) in the Grenlandsfjord area. This was also the result for Risøy (st. 76A), Gåsøy/ Ullerø (st. 15A) and Lastad (st. I131A) in the southern part of Norway. Further, no significant trends were found at Ekkjegrunn (st. I201) and Bølsnes (st. I205) in the inner part of the Saudafjord, and at Ranaskjær (st. 63A), Vikingneset (st. 65A) and Lille Terøy (st. 69A) in the Hardangerfjord. Blue mussel at Moholmen (st. I965), Toraneskaien (st. I964) and Bjørnbærviken (st. I969) in the Ranfjord, Husvaagen area (st. 98A2) in Lofoten and Brashavn (st. 11X) in the Varangerfjord showed all no significant trends. Significant downward trends were found at Bjørkøya/ Risøyodden (st. 71A), Eitrheimsneset (st. 52A), Krossanes (st. 57A) and Skallneset (st. 10A2).

**Concluding remarks**
Trend analyses of Hg showed concentrations higher than Class I and upward trends for cod fillet in the Inner Oslofjord, for flounder fillet in the Inner Sørfjord and for dab in the Ullerø area. The fillet of cod from the Inner Sørfjord was moderately polluted with Hg but no trend was observed. Blue mussel from Akershuskaia, Solbergstrand and Espevær showed significant upward trends but an acceptable level of Hg.

In 2008, concentrations of Hg were over expected high background level in combination with a significant upward trend in blue mussel at Bølsnes in the Saudafjord. In 2009 the blue mussel were not polluted by Hg and no significant trend was found. Øxnevad and Schøyen (2010) found that blue mussel at Bølsnes in 2009 were moderately polluted by Hg and insignificantly polluted at Ekkjegrunn in the Inner Saudafjord.

Bakke *et al.* (2010) showed that there has been a significant increase in Hg-concentrations in cod fillet from the Frierfjord the last 10 years, even though the samples from 2009 are classified as moderately polluted. Ruus *et al.* (2010) showed that the average concentration of Hg in cod fillet from the Sørfjord also corresponded to moderately polluted. Ruus *et al.* (2010) also showed that the concentrations of Hg in blue mussel in the Sørfjord was up to moderately polluted.

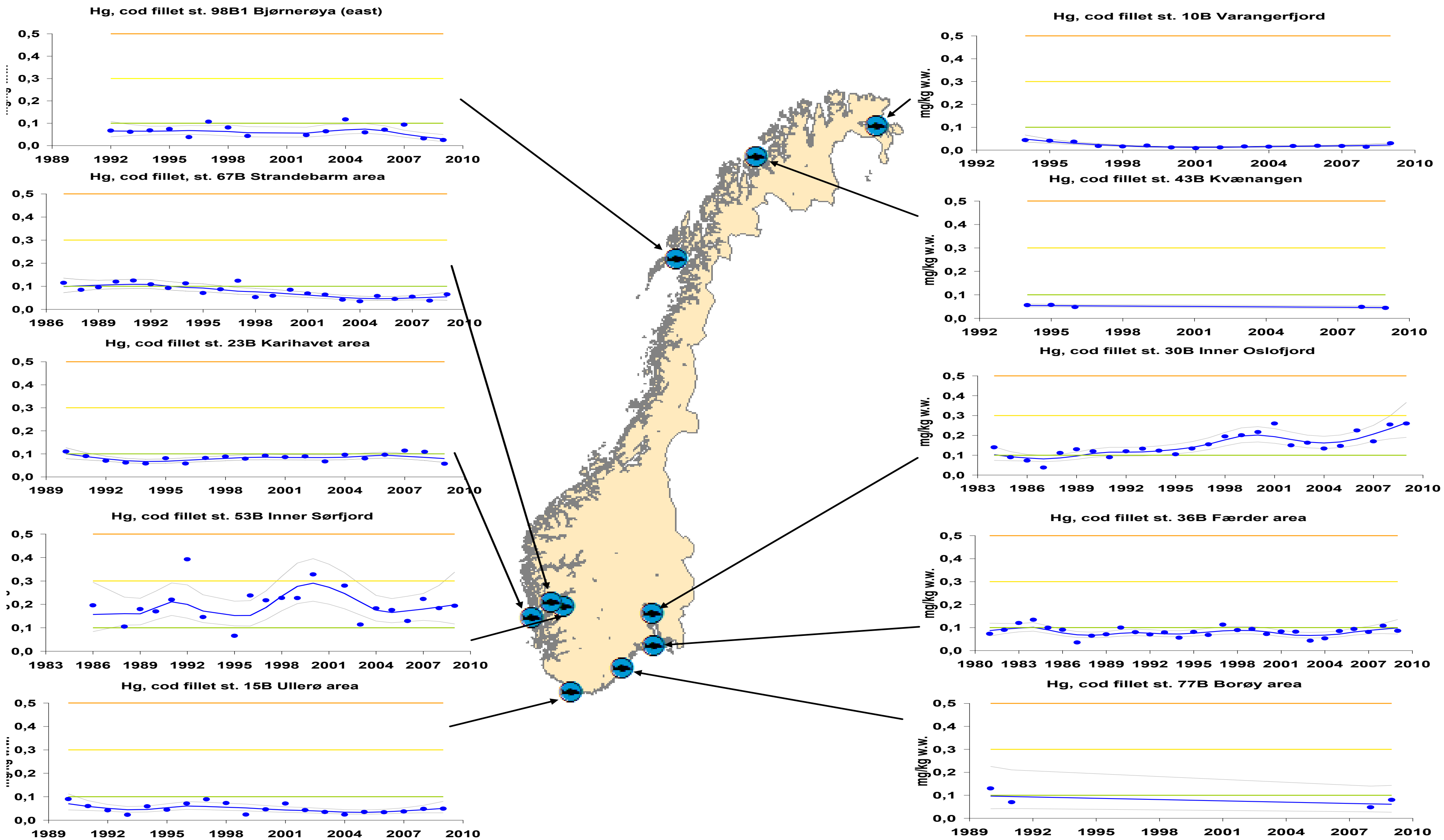


***Figure 3.*** *Trend and median concentration of Hg in cod fillet, mg/kg (mg Hg/kg) wet weight (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

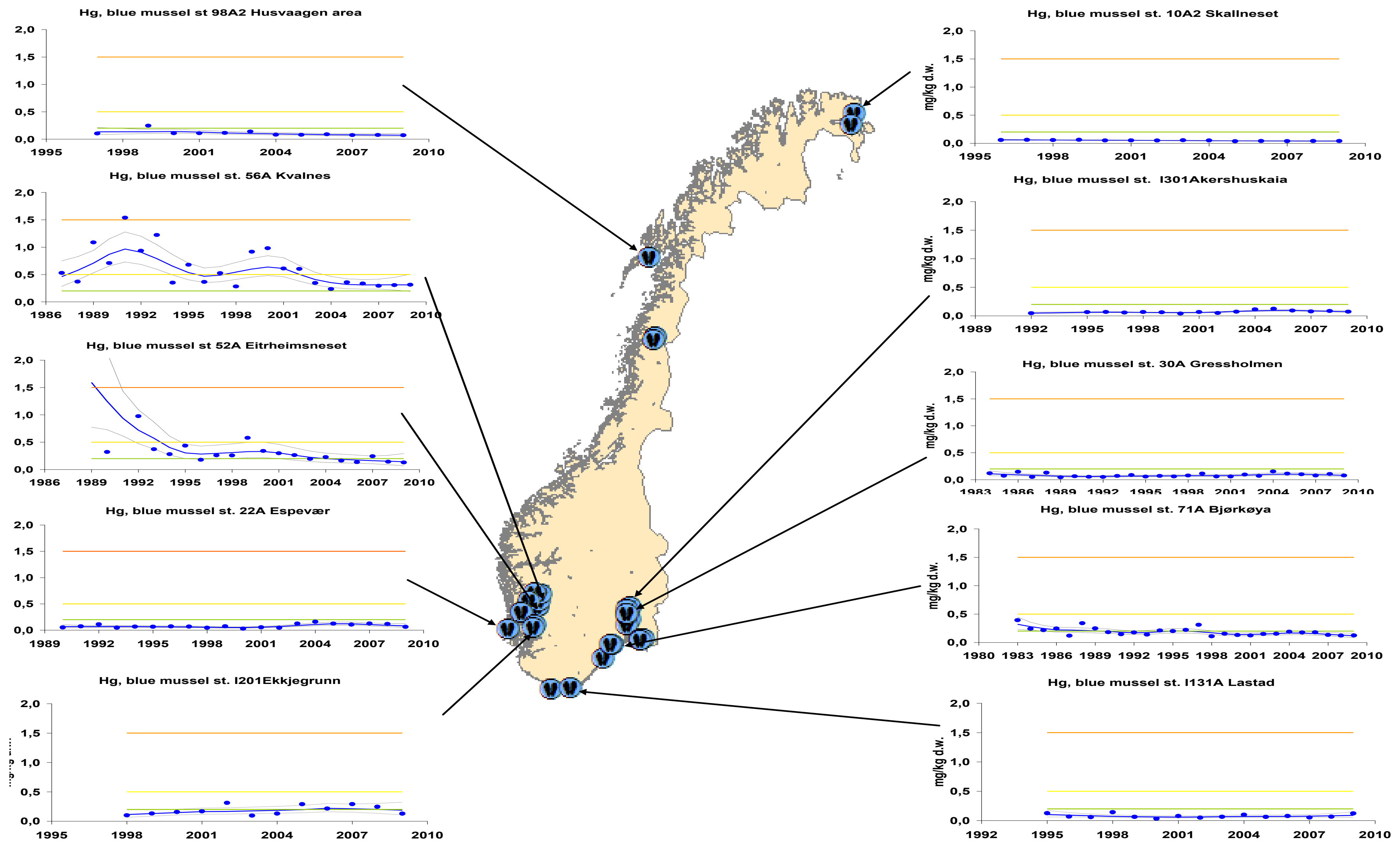


***Figure 4.*** *Trend and median concentration of Hg in blue mussel, mg/kg (mg Hg/kg) dry weight for selected stations (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

## Cadmium (Cd)

### Cod liver

The concentrations of Cd in cod liver exceeded expected high background levels at four out of 14 stations along the Norwegian coast (Table 9). A significant upward trend was also observed at two of the four stations, one in the Inner Oslofjord (st. 30B) and the second in the Inner Sørfjord (st. 53B). No significant trend was found for cod at Kvænangen/ Olderfjord (st. 43B). Results for Kristiansand harbour (st. 13BH), Munkholmen close to Trondheim harbour (st. 80BH) and Tromsø harbour (st. 43BH) were few to do a trend analysis. The cod from Børøy area (st. 77B), Ullerø area (st. 15B), Stokken (st. 92B), the Karihavet area (st. 23B) and from Bjørnerøya (st. 98B1) showed Cd-levels below an expected high background and no significant trends. Cod from three cod stations showed acceptable levels of Cd and a significant downward trend (Færder area (st. 36B), the Strandebarm area (st. 67B) in the Hardangerfjord and in the Varangerfjord (st. 10B)). No significant trend was found for cod in the Stokken area (st. 92B).

### Flounder liver

Flounder from three stations were analysed for Cd in liver and they were below expected high background level. The stations at Sande (st. 33F) and Strandebarm area (st. 67F) had significant downward trends while flounder in the Inner Sørfjord (st. 53F) showed no significant trend.

### Dab liver

Dab from four stations were analysed for Cd in liver; Færder area (st. 36F), Ullerø area (st. 15F) Borøy area (st. 77F) and Åkrafjord (st. 21F). All stations had an acceptable level of Cd and no significant trends were observed, except for Borøy area (st. 77F) where no trend could be calculated because of few years of measurements.

### Plaice liver

The concentrations of Cd in liver from plaice caught at Skogerøy (st. 10F) in the Varangerfjord showed concentrations over an acceptable level and no significant trend. The plaice from Husholmen (st. 98F2) contained an acceptable level of Cd in liver, but there was no value for trend analyses because of lack of data.

### Megrim liver

The megrim from Strandebarm (st. 67F) in Hardangerfjord showed a significant downward trend while the megrim in the Åkrafjord (st. 21F) showed no trend.

### Blue mussel

The presence of Cd exceeded Class I (insignificantly polluted) in mussel samples from six out of 46 stations. Results from some of the stations are presented in Figure 6. Significant downward trends were observed in mussels from Byrkjenes (st. 51A), Eitrheimsneset (st. 52A), Kvalnes (st. 56A) and Ranaskjær (st. 63A) and all were Class II (moderately polluted). Blue mussel from Fugleskjær (st. 02A) and Gjerdvoldsøyen (st. 94A) were moderately polluted (Class II) by Cd, but no trend analyses could be calculated because the data was insufficient for trend analyses.

In blue mussel that showed an acceptable level of Cd (Class I), significant upward trends were found at stations from the Inner Oslofjord and outward the fjord at Gressholmen (st. 30A), Ramtonholmen (st. I307), Solbergstrand (st. 31A) and Mølen (st. 35A), and significant downward trends were observed at Bjørkøya (st. 71A) in the Grenlandsfjord area, Krossanes (st. 57A) in the Sørfjord, Vikingneset (st. 65A) and Lille Terøy (st. 69A) in the Hardangerfjord, and at Husvaagen area (st. 98A2) in the Lofoten. Blue mussel stations that were classified as Class I and showed no trends were: Akershuskaia (st. I301), Gåsøya (st. I304) and Håøya (st. I306) in the Inner Oslofjord. This was also found at Damholmen (st. I022), Singlekalven (st. I023) and Kirkøy (st. I024) in the Hvaler area, and at Risøy (st. 76A), Lastad (st. 131A) and Gåsøy/ Ullerø (st. 15A) in the southern part of Norway. Further, this was also found at Ekkjegrunn (st. I201) and Bølsnes (st. I205) in the Saudafjord, at Espevær (st. 22A) on the west coast, at Moholmen (st. I965), Toraneskaien (st. I964) and Bjørnbærviken (st. I969) in the Ranfjord and at Skallneset (st. 10A2) and Brashavn (st. 11X) in the Varangerfjord.

**Concluding remarks**

Trend analyses of Cd showed concentrations over expected high background levels and upward trends for cod liver in the Inner Oslofjord and in the Inner Sørfjord. Significant downward trends have been observed for Cd in blue mussel in the Inner and Mid Sørfjord during the last two decades. Ruus *et al.* (2010) found that blue mussel at Kvalnes (st. 56A) in the Sørfjord was markedly polluted of Cd.

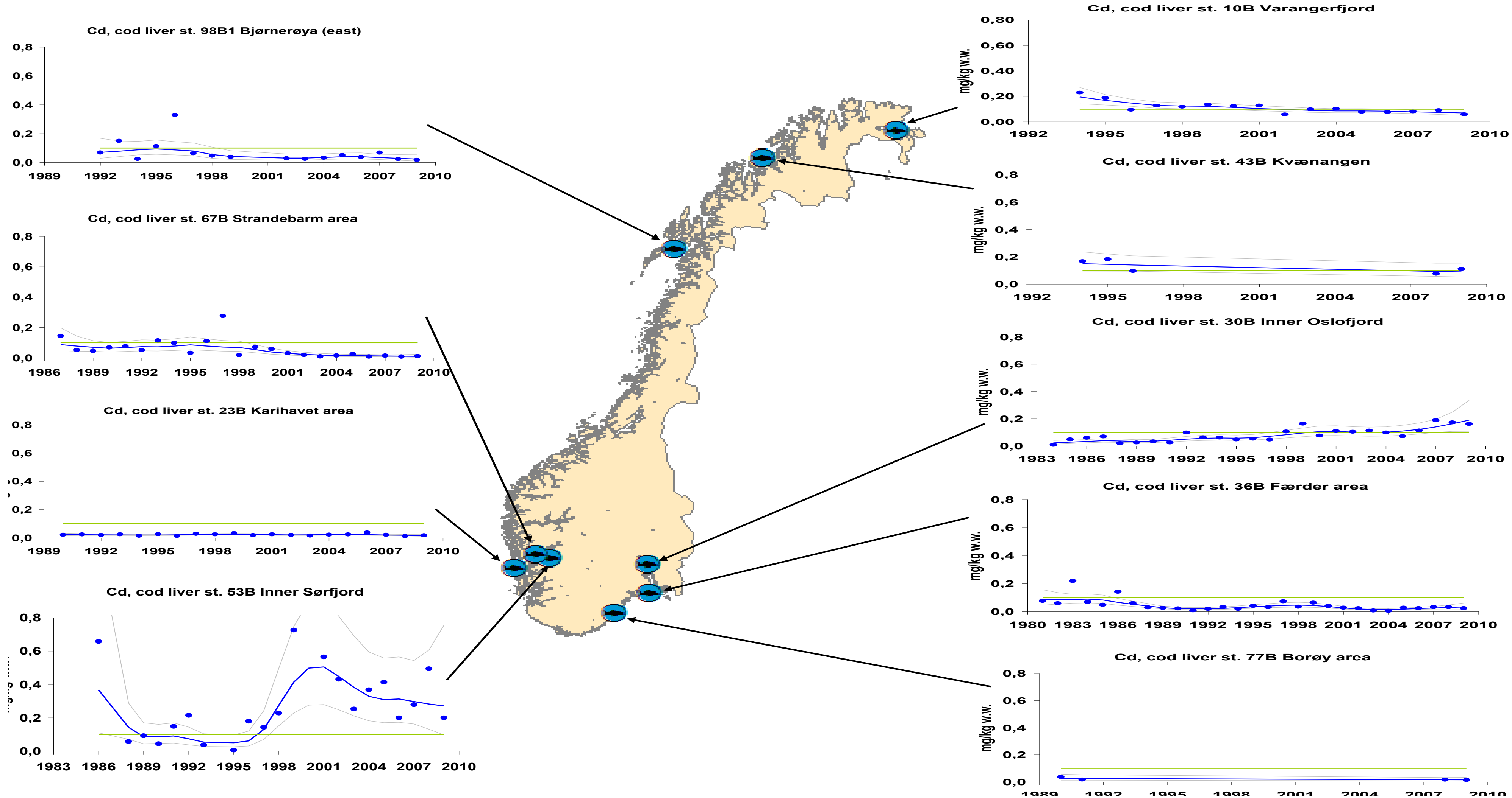


***Figure 5.*** *Trend and median concentration of Cd in cod liver, mg/kg (mg Cd/kg) wet weight (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

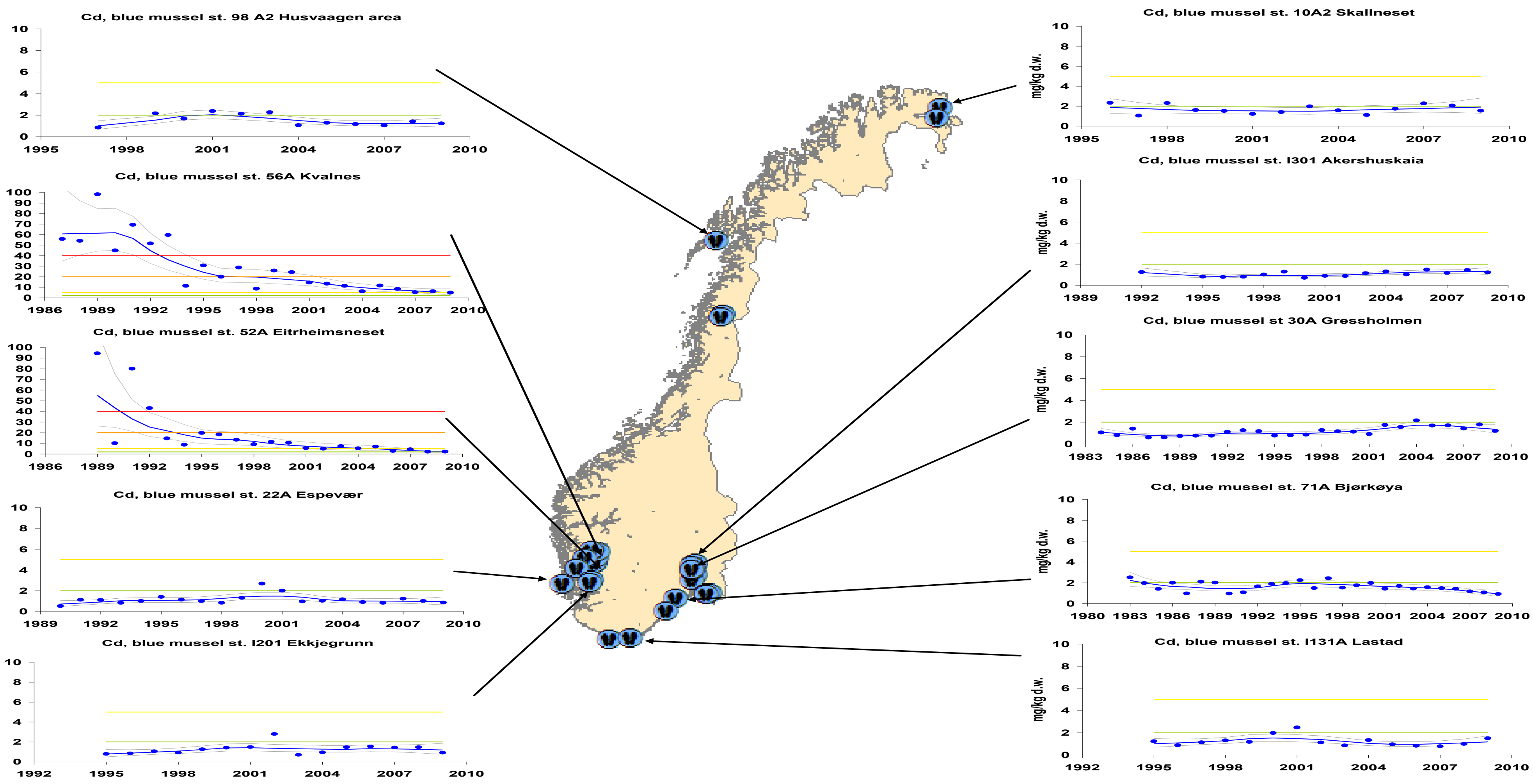


***Figure 6.*** *Trend and median concentration of Cd in blue mussel, mg/kg (mg Cd/kg) dry weight for selected stations (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

## Lead (Pb)

### Cod liver

The median concentration of Pb in cod liver exceeded expected high background levels at two of 14 cod stations (Inner Oslofjord st. 30B and Inner Sørfjord st. 53B). The station in the Inner Sørfjord (st. 53B) had a significant upward trend while the station in the Inner Oslofjord (st. 30B) showed no significant trend (see also Table 9). Most of the stations showed low levels of Pb (acceptable levels) and significant downward trends. This combination was observed in the Færder area (st. 36B), Borøy area (st. 77B), Strandebarm area (st. 67B), Karihavet area (st. 23B), Stokken area (st. 92B), Bjørnerøya (st. 98B1), Kvænangen/ Olderfjord (st. 43B) and in the Varangerfjord (st. 10B). The median concentration of Pb in cod liver had acceptable concentrations but no trends could be calculated at Ullerø area (st. 15B), Munkholmen close to Trondheim harbour (st. 80BH), Kristiansand harbour (st. 13BH) or Tromsø harbour (st. 43BH) because of lack of data.

### Flounder liver

Three flounder stations were analysed for Pb in liver and they all showed acceptable concentrations. The two stations, Sande (st. 33F) and Strandebarm (st. 67F), showed significant downward trends while the flounder in the Inner Sørfjord (st. 53F) showed no significant trend.

### Dab liver

There were observed acceptable levels of Pb in dab samples from the four stations analysed (Færder area st. 36F, Borøy area st.77F, Ullerø area st. 15F and Åkrafjord st. 21F, see also Table 9). Dab from the Åkrafjord (st. 21F) showed a significant upward trend while dab at Ullerø area (st. 15F) showed no significant trend. Dab from the Færder area (st. 36F) had a significant downward trend. Because of few years of sampling, no trend measurements were done for Pb in dab from the Borøy station (st. 77F).

### Plaice liver

An acceptable level and a significant downward trend was observed for Pb in plaice liver from Skogerøy (st. 10F) in the Varangerfjord. Plaice at Husholmen in the Lofoten (st. 98F2) had an acceptable level of Pb but no trend could be calculated because the data was insufficient for trend analysis.

### Megrim liver

Megrim from the Strandebarm area (st. 67F) in the Hardangerfjord showed a significant downward trend for Pb in liver. No significant trend was found for the megrim in the Åkrafjord (st. 21F).

### Blue mussel

The presence of Pb in blue mussel exceeded Class I (insignificantly polluted) at 15 of the 46 blue mussel stations analysed (some of the stations are presented in Figure 8 and an overview of all the results is found in Table 9). No significant trends were observed in mussel from Byrkjenes (st. 51A) and Kvalnes (st. 56A) in the Sørfjord or at Moholmen (st. I965) (all Class III, markedly polluted) and Toraneskaien (st. I964) (Class II, moderately polluted) in the Ranfjord. Blue mussel at Nordnes (st. I241) close to Bergen was markedly polluted (Class III) by Pb, but there was no values for trend analyses. Significant downward trends were found at Eitrheimsneset (st. 52A) and Krossanes (st. 57A) in the Sørfjord, and at Ranaskjær (st. 63A) and Vikingneset (st. 65A) (all Class II, moderately polluted) in the Hardangerfjord. Blue mussel from the six stations Svensholmen (st. I132) and Odderøy (st. I133) in the Kristiansandsfjord, Høgevarde (st. 227A2) close to Haugesund, Gravdalsneset (st. I242), Hegreneset (st. I243) and Gjemesholmen (st. I712) were moderately polluted (Class II) by Pb but no trend measurements could be done because the data was insufficient for trend analysis.

In blue mussel that were insignificantly polluted (Class I) of Pb, no significant trends were found in the Oslofjord at Akershuskaia (st. I301), Gressholmen (st. 30A), Gåsøya (st. I304), Ramtonholmen (st. I307), Håøya (st. I306) and Solbergstrand (st. 31A). This was also found in the Hvaler area in the outer Oslofjord at Damholmen (st. I022), Singlekalven (st. I023) and at Kirkøy (st. I024), as well as at Risøy (st. 76A) and Gåsøy/ Ullerø (st. 15A) in the southern part of Norway. Further, this was also found at Ekkjegrunn (st. I201) and Bølsnes (st. I205) in the Saudafjord, at Espevær (st. 22A) on the west coast at Bjørnbærviken (st. I969) in the Ranfjord and at Skallneset (st. 10A2) and Brashavn (st. 11X) in the Varangerfjord. In blue mussel that were insignificantly polluted (Class I) of Pb, a significant downward trend was found at the stations Mølen (st. 35A), Bjørkøya/ Risøyodden (st. 71A), Lille Terøy (st. 69A) and Husvaagen area (st. 98A2).

**Concluding remarks**
Only two upward trends of Pb were found; cod liver at Inner Sørfjord (st. 53B) and dab liver at the Åkrafjord (st. 21F). Concentrations over expected high background levels of Pb were found in cod liver from the Inner Oslofjord (st. 30B) and the Inner Sørfjord (st. 53B). Blue mussel at Byrkjenes (st. 51A), Kvalnes (st. 56A), Nordnes (st. I241) and Moholmen (st. I965) were markedly polluted with Pb.

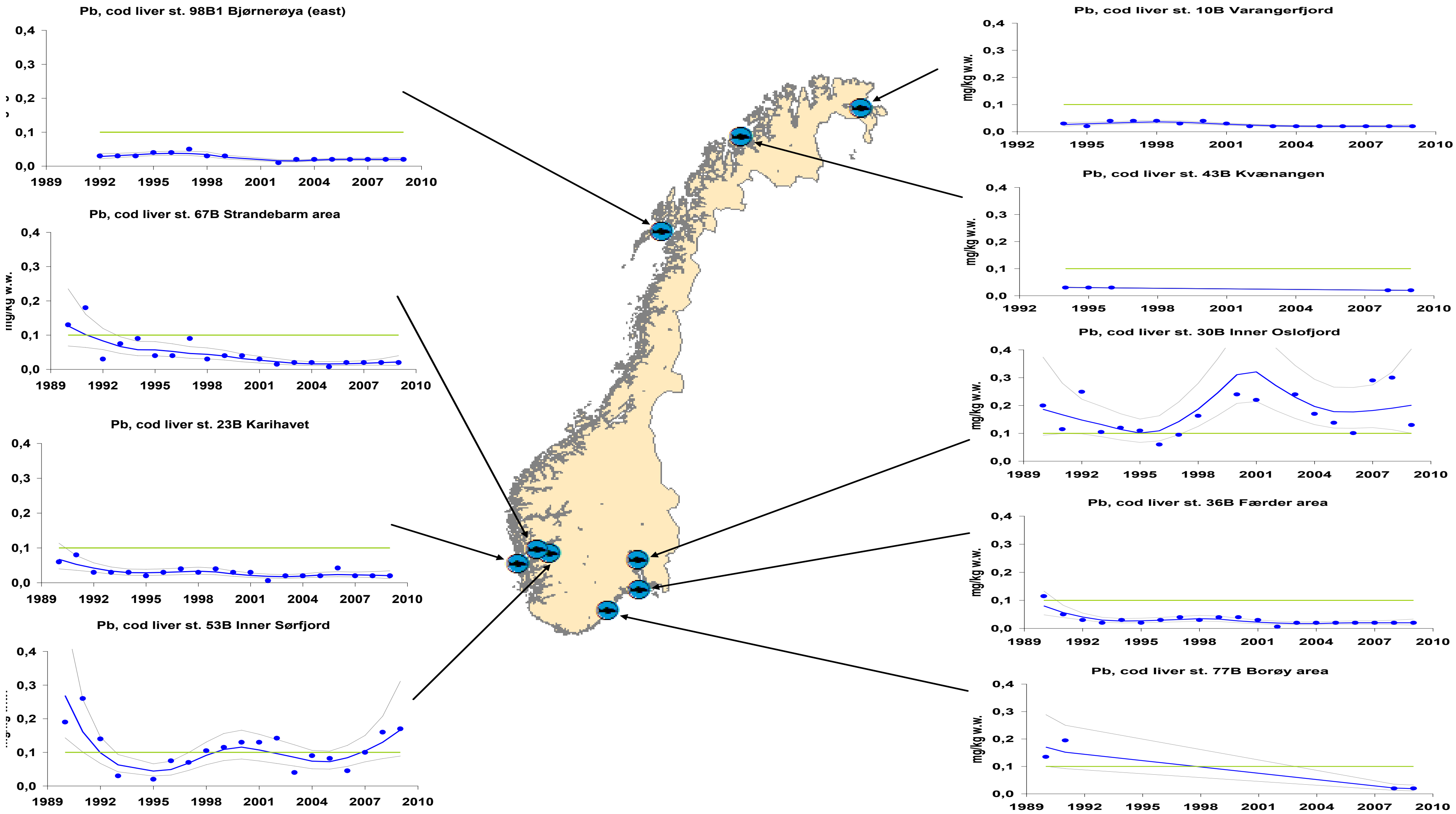


***Figure 7.*** *Trend and median concentration of Pb in cod liver, mg/kg (mg Pb/kg) wet weight (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

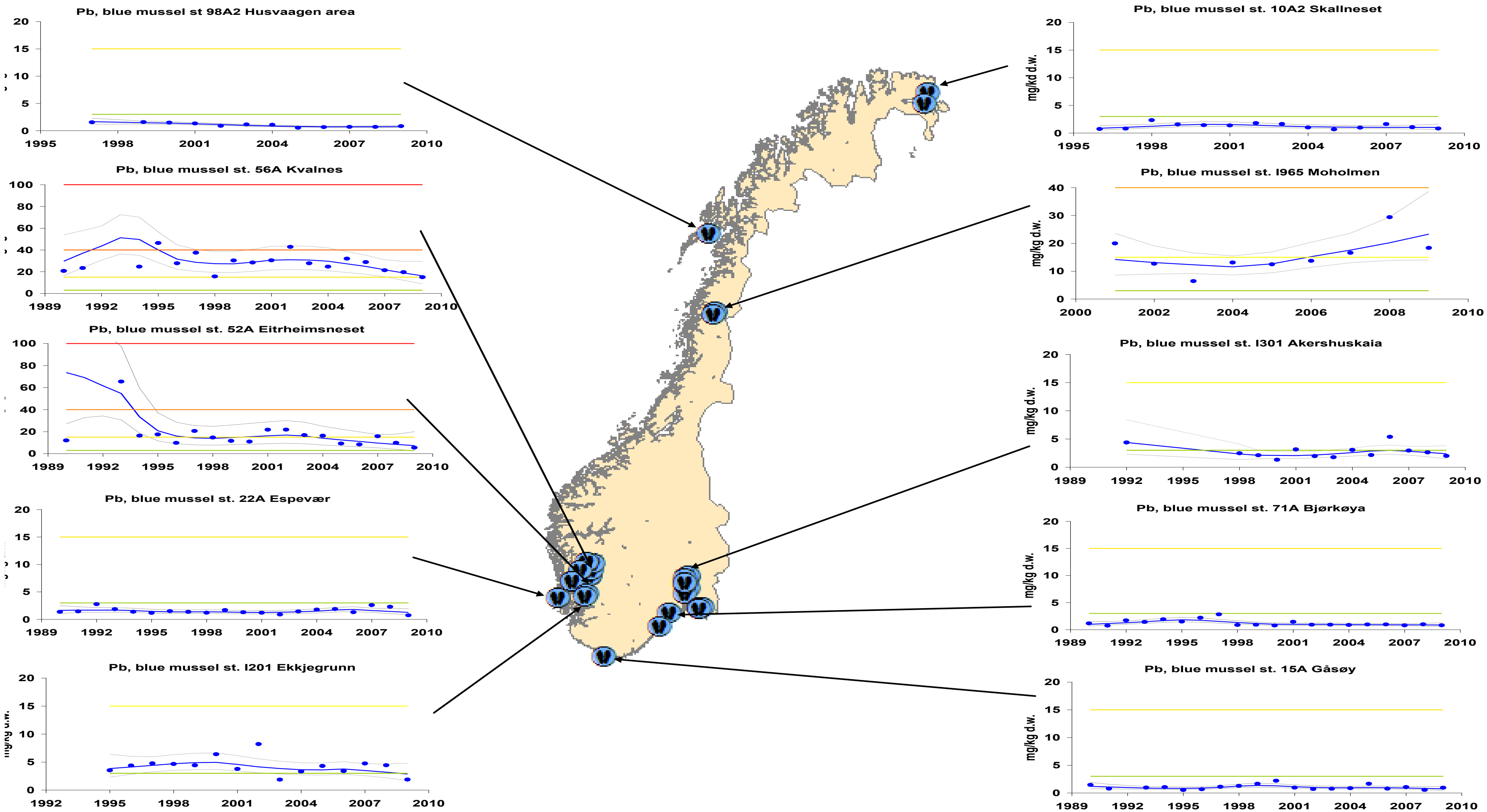


***Figure 8.*** *Trend and median concentration of Pb in blue mussel, mg/kg (mg Pb/kg) dry weight for selected stations (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

## Copper (Cu)

Results for Cu are presented in Table 9 and Appendix I. Trend analyses are only presented for some blue mussel stations (cf. Appendix J).

**Cod liver**
All 14 cod stations that were analysed for Cu in liver had acceptable levels.

**Flounder liver**
Flounder at all three stations at Sande (st. 33F), in the Inner Sørfjord (st. 53F) and in the Strandebarm area (st. 67F) had acceptable levels of Cu in liver.

**Dab liver**
Dab at Færder (st. 36F), Borøy (st. 77F), Ullerø area (st. 15F) and Åkrafjord (st. 21F) were analysed for Cu in liver and all four stations showed acceptable concentrations.

**Plaice liver**
Plaice at the two stations Husholmen (st. 98F2) in Lofoten and at Skogerøy (st. 10F) in the Varangerfjord had acceptable levels of Cu-concentrations in the liver.

**Megrim liver**
Two megrim stations were analysed for Cu in liver. No trend could be calculated for megrim at the Strandebarm area (st. 67F) in the Hardangerfjord because of lack of data. Relevant values for median expected high background levels were not available.

**Blue mussel**
The presence of Cu in blue mussel exceeded Class I (insignificantly polluted) at six of 46 stations. The blue mussel were moderately polluted (Class II) at Gjerdsvoldsøyen (st. 79A), Svensholmen (st. I132), Odderøy (st. I133), Kirkøy (st. I024), Toraneskaien (st. I964) and Moholmen (st. I965).

Blue mussel were insignificantly polluted (Class I) and showed no significant trends at most stations in the Oslofjord at Gressholmen (st. 30A), Solbergstrand (st. 31A), Mølen (st. 35A), and in the southern part at Bjørkøya/ Risodden (st. 71A), Risøy (st. 76A) and Gåsøy/ Ullerø (st. 15A). This were also the results in the Sørfjord at Byrkjenes (st. 51A), Eitrheimsneset (st. 52A), Kvalnes (st. 56A) and Krossanes (st. 57A), and outwards the Hardangerfjord at Ranaskjær (st. 63A), Vikingneset (st. 65A) and Lille Terøy (st. 69A). This was also found at Espevær (st. 22A) on the west coast, in the Husvaagen area (st. 98A2) in Lofoten and in Skallneset (st. 10A2) and Brashavn (st. 11X) in the northern part of Norway.

**Concluding remarks**
Blue mussel were up to moderately polluted by Cu and no upward trends were found. The median concentration of Cu has decreased the recent years at Espevær were the blue mussel was severely polluted in 2007 and insignificantly polluted in 2008 and 2009.

## Zinc (Zn)

Results for Zn are presented in Table 9 and Appendix I. Trend analyses are only presented for some blue mussel stations (cf. Appendix J).

### Cod liver

Samples from the Inner Oslofjord (st. 30B) were the only samples from the 14 stations that exceeded expected high background level for Zn. Cod from Færder area (st. 36B), Borøy area (st. 77B), Ullerø area (st. 15B), Kristiansand harbour (st. 13 BH), Inner Sørfjord (st. 53B), Strandebarm area (st. 67B), Karihavet area (st. 23B), Munkholmen (st. 80BH), Kvænangen/ Olderfjord (st. 43B), Tromsø harbour (st. 43BH), Stokken (st. 92B), Bjørnerøya east (st. 98B1) and the Varangerfjord (st. 10B) had all concentrations below background levels.

### Flounder liver

Flounder from the east side of Sande (st. 33F), Inner Sørfjord (st. 53F) and Strandebarm area (st. 67F) had acceptable levels of Zn in liver.

### Dab liver

Dab at Færder (st. 36F), Borøy (st. 77F), Ullerø area (st. 15F) and Åkrafjord (st. 21F) showed acceptable levels of Zn in the liver.

### Plaice liver

Plaice at the two stations Husholmen (st. 98F2) in Lofoten and at Skogerøy (st. 10F) in the Varangerfjord had acceptable levels of Zn-concentrations in the liver.

### Megrim liver

Two megrim stations were analysed for Zn in liver in the Åkrafjord (st. 21F) on the west coast and in the Strandebarm area (st. 67F) in the Hardangerfjord. Values for median concentration over expected high background levels were not given.

### Blue mussel

Blue mussel at 46 locations were analysed for Zn. Blue mussel at Toraneskaien (st. I964) and Moholmen (st. I965) were moderately polluted (Class II) by Zn.

All the 17 blue mussel stations that had values for trend analyses were insignificantly polluted (Class I). Significant upward trend was only found at Mølen (st. 35A). No trends were observed in the Oslofjord at Gressholmen (st. 30A) and Solbergstrand (st. 31A) or at Risøy (st. 76A) and Gåsøy/ Ullerø (st. 15A) in the southern part of Norway. Further, no trends were found at Byrkjenes (st. 51A) in the Sørfjord, at Espevær (st. 22A) on the west coast, at Husvaagen area (st. 98A2) in the Lofoten or at Skallneset (st. 10A2) and Brashavn (st. 11X) in the Varangerfjord. Significant downward trends were observed in mussel from Bjørkøya/ Risøyodden (st. 71A) and stations in the Sørfjord and Hardangerfjord; Eitrheimsneset (st. 52A), Kvalnes (st. 56A), Krossanes (st. 57A), Ranaskjær (st. 63A), Vikingneset (st. 65A) and Lille Terøy (st. 69A).

### Concluding remarks

The two blue mussel stations with highest concentrations (moderately polluted) were found in the Ranfjord. The only upward trend for Zn was observed in blue mussel from Mølen.

## Silver (Ag)

Results for Ag are presented in Table 9 and Appendix I. Relevant values for median expected high background levels of Ag are not available for any of the analysed fish samples. No trends for Ag in fish or blue mussel were measured because the data was insufficient for trend analysis.

**Cod liver**
Cod liver from 12 stations were analysed for Ag with a range of median concentrations of 0.07 – 10.70 mg/kg w.wt. The three highes conentrations were from Inner Oslofjord (st. 30B), Karihavet area (st. 23B) and Kristiansand harbour (st. 13BH) with 10.7, 3.77 and 2.11 mg/kg w.wt., respectively (cf. Appendix I).

**Flounder liver**
Flounder from Sande (st. 33F), the Inner Sørfjord (st. 53F) and the Strandebarm area (st. 67F) were analysed for Ag in liver with a range in median concentrations of 0.01 – 0.09 mg/kg w.wt.

**Dab liver**
Dab liver at the four stations Færder area (st. 36F), Ullerø area (st. 15F), Borøy area (st. 77F) and Åkrafjord (st. 21F) were analysed for Ag with a range of median concentrations of 0.01 – 0.06 mg/kg w.wt.

**Plaice liver**
Ag in plaice liver was analysed at the two stations Husholmen (st. 98F2) in Lofoten and at Skogerøy (st. 10F) in the Varangerfjord with median concentrations of 0.05 and 0.18 mg/kg w.wt., respectively.

**Megrim liver**
Two megrim stations were analysed for Ag in liver; the Åkrafjord (st. 21F) on the west coast and the in the Strandebarm area (st. 67F) in the Hardangerfjord with median concentrations of 0.08 and 0.06 mg/kg w.wt., respectively.

**Blue mussel**
Blue mussel was insignificantly polluted (Class I) at all 46 stations that were analysed in 2009 (see Appendix I). There were no values for trend analyses.

**Concluding remarks**
All blue mussel were classified as insignificantly polluted by Ag.

## Arsenic (As)

Results for As is presented in Table 9 and Appendix I. No trends for As in fish and blue mussel were measured because the data was insufficient for trend analysis. Relevant values for median expected high background levels of As are not available for any of the analysed fish samples.

**Cod liver**
Cod at 13 stations were analysed for As and median concentrations varied between 2 and 10 mg/kg w.wt. with two exceptions; 43.5 mg/kg w.wt. in the Inner Oslofjord (st. 30B) and 48.5 mg/kg w.wt. in the Karihavet area (st. 23B). The reason for these maxima has not yet been determined.

**Dab liver**
Dab liver at the four stations Færder area (st. 36F), Ullerø area (st. 15F), Borøy area (st. 77F) and Åkrafjord (st. 21F) were analysed for As and median concentration range was 5-24 mg/kg w.wt.

**Plaice liver**
Liver in the two plaice stations at Husholmen (st. 98F2) in Lofoten and at Skogerøy (st. 10F) in the Varangerfjord were analysed for As with median concentrations of 3.75 and 11.40 mg/kg w.wt., respectively.

**Megrim liver**
Liver samples from the two stations Åkrafjord (st. 21F) on the west coast and the Strandebarm area (st. 67F) in the Hardangerfjord were analysed for As with median concentrations of 9.91 and 3.52 mg/kg w.wt., respectively.

**Blue mussel**
Blue mussel at 46 stations were analysed for As. At the two stations Høgevarde (st. 227A2) in the Karmsund close to Haugesund and Nordstrand (st. 77A) close to Arendal blue mussel were markedly polluted (Class III) by As. Blue mussel was moderately polluted (Class II) at 39 stations and insignificantly polluted (Class I) at five stations analysed for As (see Appendix I).

**Concluding remarks**
Most of the blue mussel were moderately polluted by As but Høgevarde close to Haugesund and Nordstrand close to Arendal were markedly polluted by As.

## Nickel (Ni)

Results for Ni are presented in Table 9 and Appendix I. No trends for Ni in fish and blue mussel were measured because the data was insufficient for trend analysis. Relevant values for median expected high background levels of Ni are not available for any of the analysed fish samples.

**Cod liver**
Cod at 13 stations were analysed for Ni with a range of median concentrations of 0.03 – 0.50 mg/kg w.wt. The highest concentration was found in Karihavet area (st. 23B) and the next highest was found in Kristiansand harbour (st. 13BH) with a median concentration of 0.39 mg/kg w.wt.

**Dab liver**
Dab liver at the four stations Færder area (st. 36F), Ullerø area (st. 15F), Borøy area (st. 77F) and Åkrafjord (st. 21F) were analysed for Ni with a range of median concentrations of 0.09 – 0.23 mg/kg w.wt.

**Plaice liver**
No trends were measured in liver samples from the station at Husholmen (st. 98F2) in Lofoten and at Skogerøy (st. 10F) in the Varangerfjord with median concentrations of 0.05 and 0.10 mg/kg w.wt., respectively.

**Megrim liver**
Samples from the two stations that were analysed for Ni in liver were Åkrafjord (st. 21F) on the west coast and the Strandebarm area (st. 67F) in the Hardangerfjord with median concentrations of 0.02 mg/kg w.wt. in both cases.

**Blue mussel**
Blue mussel at 46 stations were analysed for Ni. Blue mussel at the two stations Toraneskaien (st. I964) and Moholmen (st. I965) in the Ranfjord were markedly polluted (Class III) by Ni. Blue mussel was moderately polluted (Class II) at the three stations Svendsholmen (st. I132), Odderøy (st. I133) and Kirkøy (st. I024). Blue mussel were insignificantly polluted (Class I) at 41 stations analysed for Ni (see Appendix I). There were no values for trend analyses for any of the blue mussel locations.

**Concluding remarks**
Two blue mussel stations in the Ranfjord were markedly polluted by Ni and the two blue mussel stations in the Kristiansandsfjord were moderately polluted by Ni.

## Chromium (Cr)

Results for Cr are presented in Table 9 and Appendix I. No trends for Cr in fish and blue mussel were measured because the data was insufficient for trend analysis. Relevant values for median expected high background levels of Cr are not available for any of the analysed fish samples.

**Cod liver**

Cod at 12 stations were analysed for Cr with a range of median concentrations of <0.1 – 0.4 mg/kg w.wt., respectively.

**Dab liver**

Dab liver at the four stations Færder area (st. 36F), Ullerø area (st. 15F), Borøy area (st. 77F) and Åkrafjord (st. 21F) were analysed for Cr with median concentrations of <0.2 mg/kg w.wt., respectively.

**Plaice liver**

Liver samples from the two plaice stations at Husholmen (st. 98F2) in Lofoten and at Skogerøy (st. 10F) in the Varangerfjord were analysed with median concentrations of <0.2 mg/kg w.wt.

**Megrim liver**

Megrim liver from the Åkrafjord (st. 21F) on the west coast and the Strandebarm area (st. 67F) in the Hardangerfjord were analysed for Cr with median concentrations of <0.2 mg/kg w.wt.

**Blue mussel**

Blue mussel at 46 stations were analysed for Cr. Blue mussel at the two stations Toraneskaien (st. I964) and Moholmen (st. I965) in the Ranfjord were severely polluted (Class IV) by Cr. Blue mussel was moderately polluted (Class II) at three stations Odderøy (st. I133), Gjemesholmen (st. I712) and Kirkøy (st. I024). Blue mussel were insignificantly polluted (Class I) at 41 stations analysed for Cr (see Appendix I).

**Concluding remarks**

Two blue mussel stations in the Ranfjord were severely polluted by Cr; the reason for this is not yet determined.

## Polychlorinated biphenyls (ΣPCB-7)

**Cod liver**

The median concentration of ΣPCB-7 in cod liver exceeded Class I (insignificantly polluted) in only diffusely contaminated areas at three of the 14 stations (Figure 9). The observations from the station in Inner Oslofjord (st. 30B) (Class III, markedly polluted) revealed no significant trend. Cod liver at Kristiansand harbour (st. 13 BH) and Munkholmen in Trondheim (st. 80BH) were moderately polluted (Class II) by PCBs, but no trend measurements could be done because of insufficient data. Cod liver that were insignificantly polluted of ΣPCB-7 and had a significant downward trend, were found at the six stations; Færder area (st. 36B), Ullerø area (15B), Strandebarm area (st. 67B), Karihavet area (st. 23B), Bjørnerøya east (st. 98B1) and in the Varangerfjord (st. 10B). There was no significant trend and the cod liver was insignificantly polluted by ΣPCB-7 in the inner Sørfjord (st. 53B) and Stokken area (st. 92B). Due to insufficient data, no trend could be calculated for the cod from Borøy area (st. 77B), Kvænangen/ Olderfjord (st. 43B) and Tromsø harbour (st. 43BH).

**Cod fillet**

The median concentration of ΣPCB-7 in cod fillet exceeded Class I (insignificantly polluted) at four of the 12 cod stations (Figure 10). The station in Inner Oslofjord (st. 30B) was classified in Class III (markedly polluted), and revealed no significant trend for the entire monitoring period (1990-2009), but for the period 2000-2009 an upward trend was detected (cf. Appendix J). The cod in Inner Sørfjord (st. 53B) was moderately polluted (Class II) and showed no significant trend. The cod fillet in samples from Kristiansand harbour (st. 13BH) and at Munkholmen (st. 80BH) in the Trondheimsfjord were moderately polluted (Class II) by PCBs, but no trend could be calculated. The cod in the Færder area (st. 36B), Borøy area (st. 77B), Ullerø area (st. 15B), the Strandebarm area (st. 67B), the Karihavet area (st. 23B) and Bjørnerøya east (st. 98B1) and the Varangerfjord (st. 10B) had acceptable levels of ΣPCB-7 (Class I) and showed no significant trends. No trend could be calculated for the cod in Tromsø harbour (st. 43BH) because the data were insufficient for trend analyses.

**Flounder liver**

Results from liver samples from the three stations that were analysed for ΣPCB-7 (Sande east side (st. 33F), the Inner Sørfjord (st. 53F), and Strandebarm area (st. 67F)) showed levels below the expected high background level. The ΣPCB-7 concentration in flounder from the Inner Sørfjord and in Strandebarm revealed a significant downward trend, while the flounder in Sande showed no significant trend.

**Flounder fillet**

Observations of ΣPCB-7 in fillet from flounder caught at Sande (st. 33F), in the Inner Sørfjord (st. 53F), and in the Strandebarm area (st. 67F) showed concentrations below expected high background level. The flounder in Inner Sørfjord and in Strandebarm showed a significant downward trend, and the flounder in Sande revealed no significant trend.

**Dab liver**

Results from analysis for ΣPCB-7 in liver of dab showed acceptable concentrations in samples from the Færder area (st. 36F), Borøy area (st. 77F), Ullerø area (st. 15F) and Åkrafjord (st. 21F). In addition, the data from dab at Færder and Ullerø showed no significant trend while dab from the Åkrafjord showed a downward trend.

**Dab fillet**

Results from analysis for ΣPCB-7 in fillet of dab showed concentrations over acceptable level at the Færder area (st. 36F), but acceptable levels at Ullerø area (st. 15F), Åkrafjord (st. 21F) and Borøy area (st. 77F). In addition, the data from dab at Færder showed an upward trend while dab at Ullerø and the Åkrafjord showed no trend. No trend could be calculated for dab at Borøy area (st. 77F) because the data were insufficient for trend analyses.

**Plaice liver**

The presence of ΣPCB-7 in liver showed value below expected high background level at Husholmen (st. 98F2) in the Lofoten area and Skogerøy (st. 10F) in the Varangerfjord. Skogerøy showed no significant trend whereas a significant downward trend was found at Husholmen.

**Plaice fillet**
The value in fillet from fish from Husholmen (st. 98F2) and Skogerøy (st. 10F) was below expected high background level of ΣPCB-7 and no significant trend was observed.

**Megrim liver**
Megrim liver from fish caught at two stations on the west coast of Norway (Åkrafjord (st. 21F) and Strandebarm area (st. 67F) in the Hardangerfjord) were analysed for ΣPCB-7. The results from megrim in Strandebarm showed a significant downward trend while the results from megrim in the Åkrafjord showed no significant trend. Values for background concentrations for ΣPCB-7 in liver from megrim are not given.

**Megrim fillet**
The results from megrim fillet from the Strandebarm area (st. 67F) and Åkrafjord (st. 21F) showed no trend. Values for background concentrations for ΣPCB-7 in fillet from megrim are not available.

**Blue mussel**
Blue mussel at 41 stations were analysed for ΣPCB-7. The presence of ΣPCB-7 in blue mussel exceeded Class I (insignificantly polluted) at 12 blue mussel stations (some of the stations are presented in Figure 11). No significant trends were found at Gåsøya (st. I304), Svensholmen (st. I132), Nordnes (st. I241), Gravdalsneset (st. I242) and Hegreneset (st. I243) (all Class II, moderately polluted). Significant downward trends were found at Gressholmen (st. 30A), Akershuskaia (st. I301) and Ramtonholmen (st. I307) (all Class II, moderately polluted). Blue mussel at Sponvika (st. 01A), Nordstrand (st. 77A), Odderøy (st. I133) and Høgevarde (st. 227A2) were moderately polluted (Class II) by PCBs but no trends could be measured because the data were insufficient to do trend analyses.

Blue mussel were insignificant polluted (Class I) and no trends were found at Håøya (st. I306) in the inner Oslofjord, at Strømtangen (st. I713) in the Frierfjord and at Lastad (st. I131A) in the southern part of Norway. This was also found at Byrkjenes (st. 51A), Eitrheimsneset (st. 52A), Kvalnes (st. 56A) and Krossanes (st. 57A) in the Sørfjord and at Lille Terøy (st. 69A) in the Hardangerfjord. This was also the case at Espevær (st. 22A) on the west coast, at Husvaagen area (st. 98A2) in Lofoten, and at Brashavn (st. 11X) in the Varangerfjord. Significant downward trends were observed at the nine stations Solbergstrand (st. 31A), Mølen (st. 35A), Singlekalven (st. I023), Kirkøy (st. I024), Bjørkøya/ Risøyodden (st. 71A), Risøy (st. 76A), Gåsøy/ Ullerø (st. 15A), Gjemesholmen (st. I712) and Skallneset (st. 10A2).

## Concluding remarks
Both cod liver and fillet were markedly polluted by ΣPCB-7 in Inner Oslofjord (st. 30B), but no significant trends were observed. The ΣPCB-7 in the cod liver in Inner Oslofjord was markedly polluted while the cod fillet was moderately polluted in 2009. There was no significant trend and the cod liver was insignificantly polluted by ΣPCB-7 in the inner Sørfjord. The cod fillet in Inner Sørfjord (st. 53B) was moderately polluted and showed no significant trend.

Concentrations above expected high background levels of ΣPCB-7 were found in blue mussel at 12 stations but no significant upward trends were observed. All the four blue mussel stations in the Inner Oslofjord were moderately polluted by ΣPCB-7. All four blue mussel stations in the Sørfjord were insignificantly polluted by ΣPCB-7. Ruus *et al.* (2010) also found that blue mussel from all stations in the Sørfjord were insignificantly polluted Class I with ∑PCB-7 in 2009.

It can be noted that the Norwegian Food Safety Authority (*Mattilsynet*) has issued consumption advice for some areas along the coast due to concern about PCBs in cod liver (Økland 2005, cf. Appendix E).

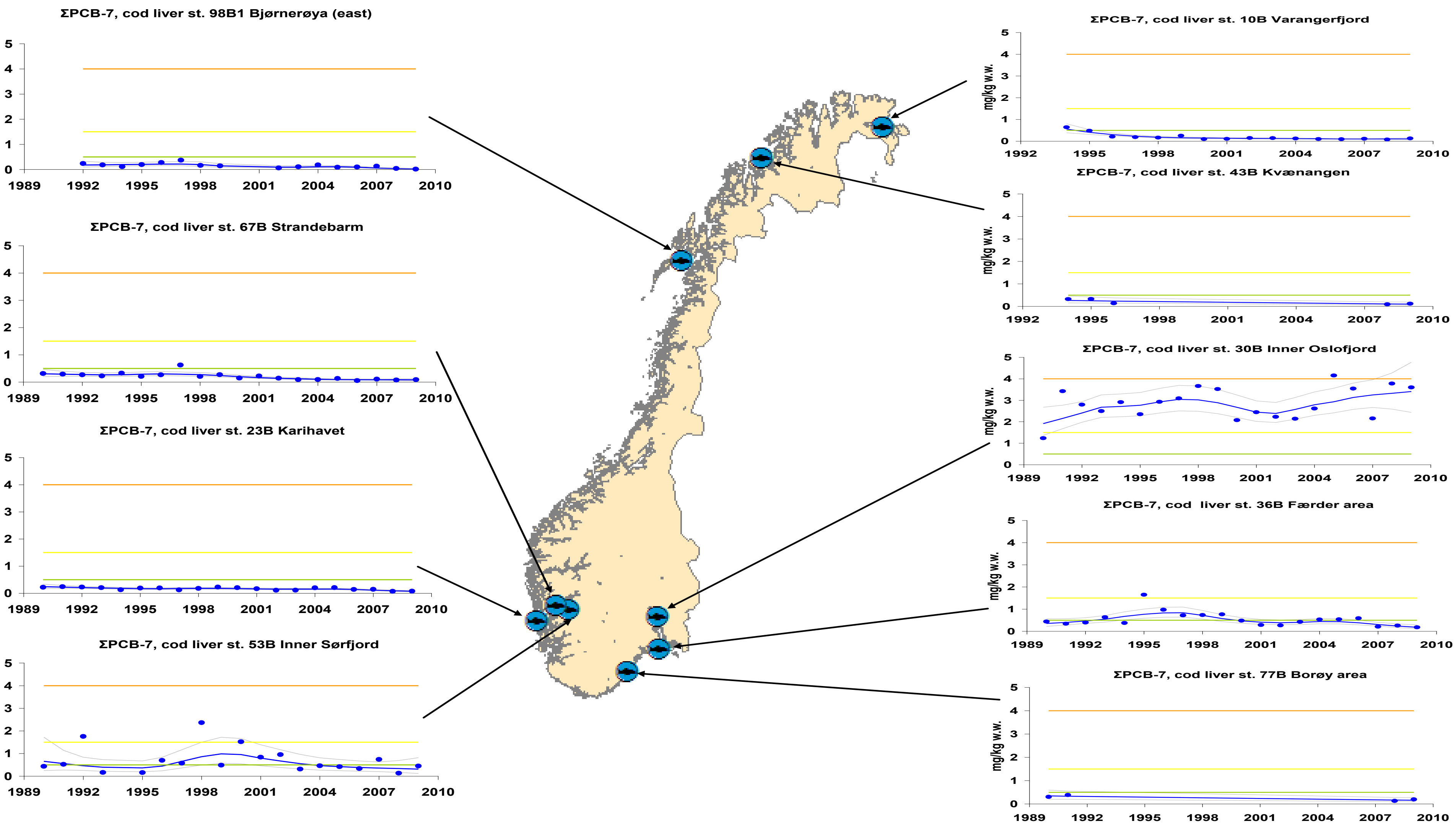


***Figure 9.*** *Trend and median concentration of ΣPCB-7 in cod liver, mg/kg (mg ΣPCB-7/kg) wet weight (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

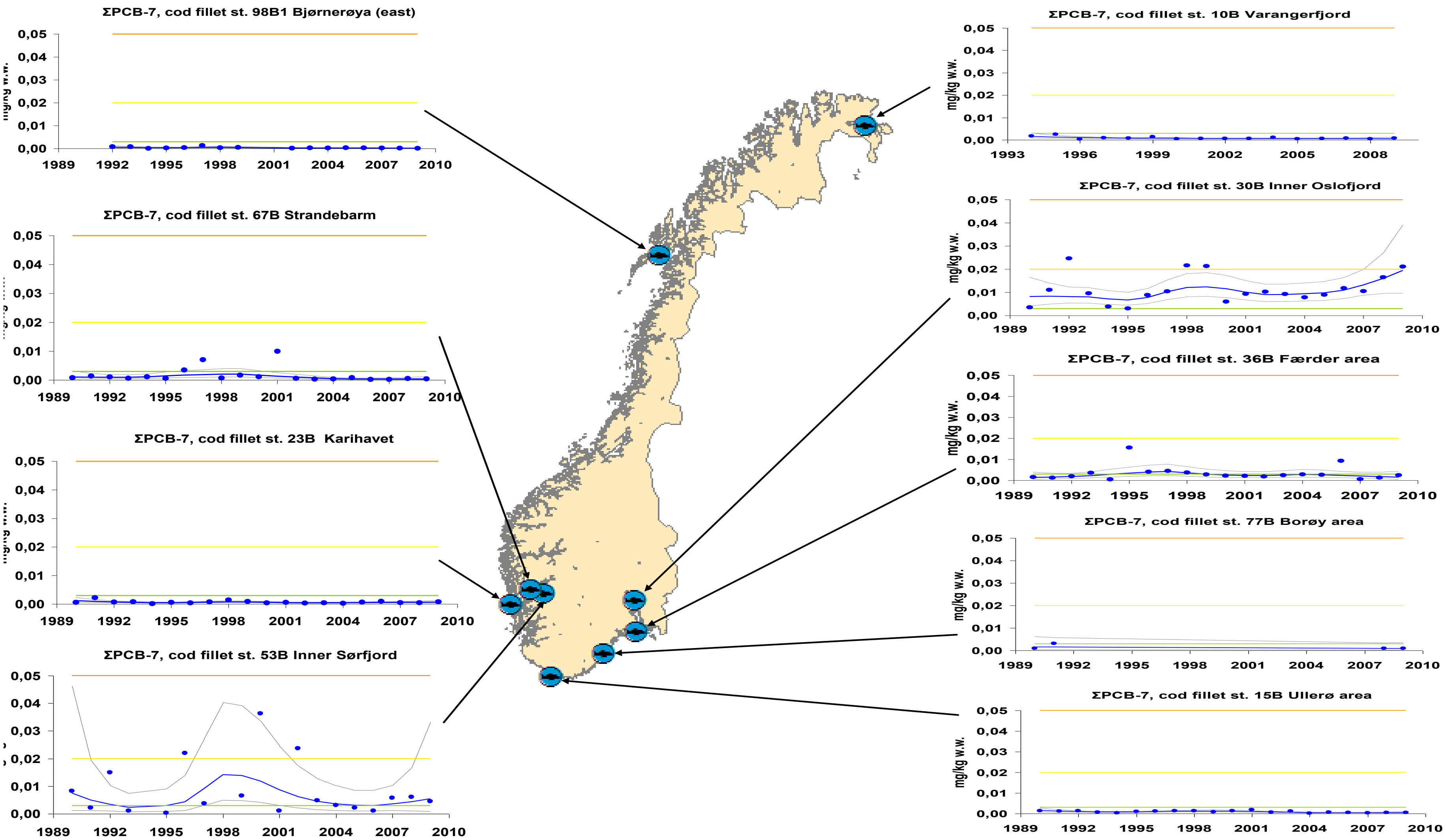


***Figure 10.*** *Trend and median concentration of ΣPCB-7 in cod fillet, mg/kg (mg ΣPCB-7 /kg) wet weight (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

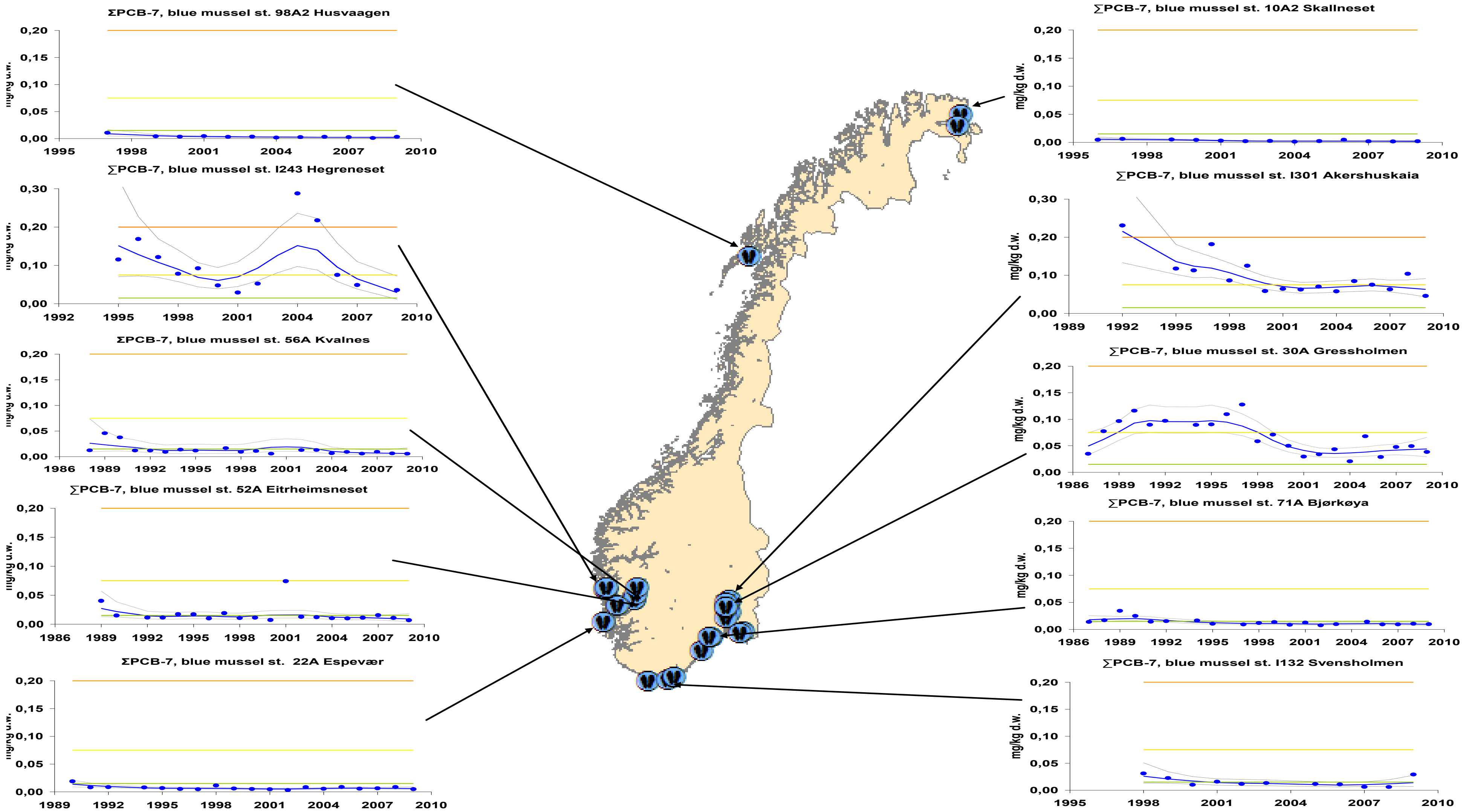


***Figure 11.*** *Trend and median concentration of ΣPCB-7 in blue mussel mg/kg (mg ΣPCB-7/kg) dry weight for selected stations (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

## Polycyclic aromatic hydrocarbons (PAHs)

**Blue mussel**

The presence of PAHs in blue mussel exceeded Class I (insignificantly polluted) at 6 of the 17 blue mussel stations (results from 10 of the stations are presented in Figure 12). No significant trends were observed in mussel from Odderø (st. I133) in the Kristiansandsfjord, Toraneskaien (st. I964) and Moholmen (st. I965) in the Ranfjord (all Class III, markedly polluted) and Akershuskaia (st. I301), Svensholmen (st. I132) and Bjørnebærviken (st. I969) (all Class II, moderately polluted). No upward or downward trends for PAHs were observed in blue mussel with concentrations exceeding background levels in only diffusely contaminated area.

Blue mussel from Gressholmen (st. 30A), Gåsøya (st. I304), Ramtonholmen (st. I307), Håøya (st. I306) and Lastad (I131A) were insignificantly polluted (Class I) of PAHs and revealed no significant trends. The blue mussel from Ekkjegrunn (st. I201) and Bølsnes (st. I205) in the Saudafjord, and Honnhammer (st. I912) and Fjøseid (st. I913) in the Sunndalsfjord were also insignificantly polluted by PAHs, but for these stations significant downward trends were also observed. Similarly, the blue mussel at Mølen (st. 35A) and Flåøya (st. I915) were insignificantly polluted by PAHs, but no trend analysis could be performed for these stations due to insufficient data. No upward trends for PAHs were observed in blue mussel from stations with concentrations below background levels in only diffusely contaminated areas.

**Concluding remarks**

No upward trends for PAHs in blue mussel were observed. Mussels from Ranfjord were markedly polluted by PAHs (Class III), but no significant trends was observed. Norwegian Food Safety Authority (*Mattilsynet*) has issued recommendations regarding consumption of seafood from the Ranfjord area due to the high levels of PAHs in blue mussel from the fjord (Appendix E).

PAHs in blue mussel at Odderø were also markedly polluted while the mussel was moderately polluted at Svensholmen in the Kristiansandsfjord.

There was a significant downward trend in concentrations of PAHs in the Sunndalsfjord. Norwegian Food Safety Authority issued recommendations/restrictions regarding consumption and trade of seafood in 2005 from the area due to concern about PAHs in blue mussel and fish liver from the Sunndalsfjord (Appendix E). Changes in the production process at the aluminium plant in Sunndalsfjord in 2002-2003 (from Søderberg plant to 100 % Prebake) have resulted in a reduction in dissolved PAHs in seawater around the outlet from the treatment plant during summer 2003 (Bakke and Uriansrud 2004). Measurements outside the industrial land fill and in the seawater intake at The Norwegian Institute of Food, Fisheries and Aquaculture Research (former Akvaforsk) also indicated a reduction in the concentrations of dissolved PAHs in the inner part of the fjord. The concentrations of dissolved PAHs components in the seawater outside Hydro Aluminium Sunndal AS were expected to be high compared to other harbour areas, but much lower then from areas with analogous industrial activity. The PAHs accumulated from the seawater intake at The Norwegian Institute of Food, Fisheries and Aquaculture Research was 2-20 times higher than has been found with the same methodology in assumed clean fjord areas.

The two blue mussel stations in the Saudafjord were insignificantly polluted by PAHs and Øxnevad and Schøyen (2010) found the same result at the same stations in 2009.

Ruus *et al.* (2010) found that concentrations of ΣPAH in blue mussel were insignificantly polluted at all stations in the Sørfjord in 2009.

## Sum carcinogenic polycyclic aromatic hydrocarbons (KPAHs)

### Blue mussel

The presence of the potentially carcinogenic PAHs (KPAHs) in blue mussel exceeded Class I (insignificantly polluted) at six of 17 stations. A significant trend downward trend was observed in mussels from Ekkjegrunn (st. I201) in the Saudafjord. Toraneskaien (st. I964) in the Ranfjord was extremely polluted (Class V) by KPAHs. At Odderø (st. I133) in the Kristiansandsfjord and Moholmen (st. I965) in the Ranfjord, the blue mussel were severely polluted (Class IV) by KPAHs. At Svensholmen (st. I132), the blue mussel were markedly polluted (Class III) and the blue mussel from Ekkjegrunn (st. I201) in the Saudafjord and Bjørnebærviken (st. I969) in the Ranfjord were classified in Class II (moderately polluted).

The combination of insignificantly polluted (Class I) blue mussel of KPAHs and no significant trend were found in blue mussel from Akershuskaia (st. I301), Gressholmen (st. 30A), Gåsøya (st. I304), Ramtonholmen (st. I307) and Håøya (st. I306) in the Inner Oslofjord, and Lastad (I131A) close to Mandal and Bølsnes (st. I205) in the Saudafjord. Blue mussel were insignificantly polluted (Class I) of KPAHs and significant downward trends were observed in blue mussel from Honnhammer (st. I912) and Fjøseid (st. I913) in the Sunndalsfjord. The blue mussel at Mølen (st. 35A) and Flåøya (st. I915) were insignificantly polluted by KPAHs, but there were no values for trend analyses because the data were insufficient for trend analysis.

### Concluding remarks

No upward trends for KPAHs was observed in blue mussel from any of the analysed stations. The results from the analyses showed concentrations over expected high background levels at six of 17 stations. The highest concentrations were observed in mussels from the Ranfjord (extremely polluted) and no trends were observed in the mussels form this area.

The blue mussel from the Kristiansandsfjord was up to severely polluted. No trends were observed in mussels form the Kristiansandsfjord. Acceptable levels of KPAHs were observed in mussels from the Sunndalsfjord and a significant downward trend for KPAHs was observed.

The blue mussel in the Inner Sørfjord were moderately polluted by KPAHs. Øxnevad and Schøyen (2010) found that blue mussel at four stations in the Saudafjord were insignificantly polluted in 2009.

## Benzo[a]pyrene B[a]P

**Blue mussel**

The presence of B[a]P in blue mussel exceeded Class I (insignificantly polluted) at six of the 15 stations (some of the stations are presented in Figure 13). Toraneskaien (st. I964) and Moholmen (st. I965) in the Ranfjord were extremely polluted (Class V) and no significant trend were found. No significant trends were observed in blue mussel from Odderøy (st. I133) (Class IV, severely polluted) and Svensholmen (st. I132) (Class III, markedly polluted) in the Kristiansandsfjord, and Bjørnbærviken (st. I969) (Class II, moderately polluted) in the Ranfjord. A significant downward trend was found at Ekkjegrunn (st. I201) in the Inner Saudafjord (Class II, moderately polluted).

Blue mussel at Ramtonholmen (st. I307) and Håøya (st. I306) in the Inner Oslofjord were insignificantly polluted (Class I) and a significant upward trend was observed. Similar levels of B[a]P (Class I, insignificantly polluted) was observed in mussels from Akershuskaia (st. I301), Gressholmen (st. 30A) and Gåsøya (st. I304) in the Inner Oslofjord, but no significant trend were detected. Low levels of B[a]P (Class I) and lack of observed trends was also observed in mussels from Lastad (st. I131A) close to Mandal, Bølsnes (st. I205) in the Saudafjord, and Honnhammer (st. I912) and Fjøseid (st. I913) in the Sunndalsfjord. No stations revealed low levels of B[a]P (Class I) in combination with a downward trend.

**Concluding remarks**

Blue mussel in the Ranfjord were extremely polluted with B[a]P, and blue mussel in the Kristiansandsfjord were up to severely polluted. The monitoring results from these stations did not reveal any trends because of lack of data. A downward trend was found at Ekkjegrunn in Inner Saudafjord where the mussel was moderately polluted by B[a]P. Øxnevad and Schøyen (2010) found, however, that blue mussel at four stations in the Saudafjord were insignificantly polluted by B[a]P in 2009. Upward trends of B[a]P were observed at the two stations Ramtonholmen and Håøya in the Inner Oslofjord, even though the pollution was insignificantly. Other stations in the Inner Oslofjord (Akershuskaia, Gressholmen, Gåsøya) revealed no trend and the blue mussel were insignificantly polluted by B[a]P.

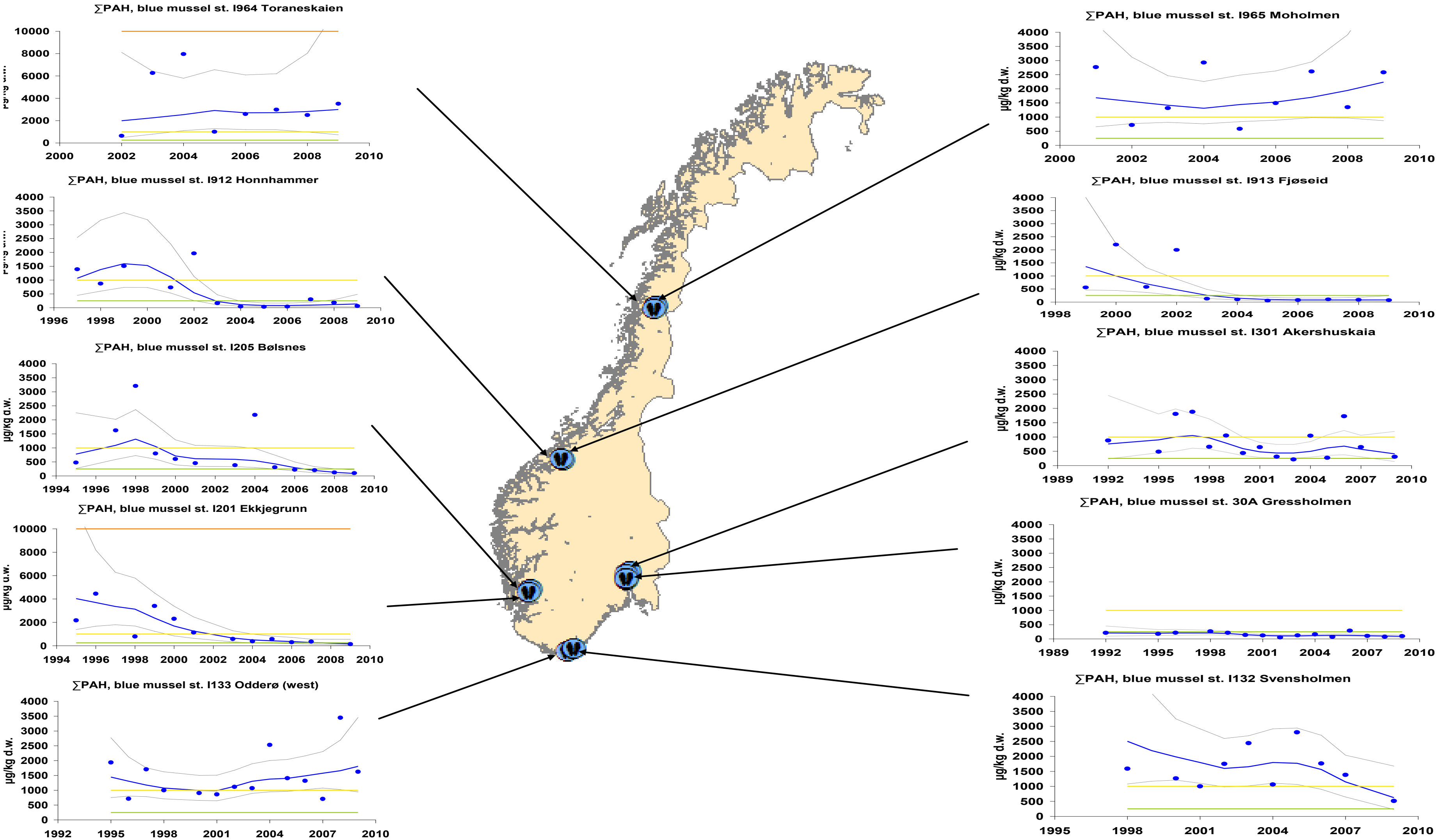


***Figure 12.*** *Trend and median concentration of PAH in blue mussel, µg/kg (µg PAH/kg) dry weight for selected stations (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

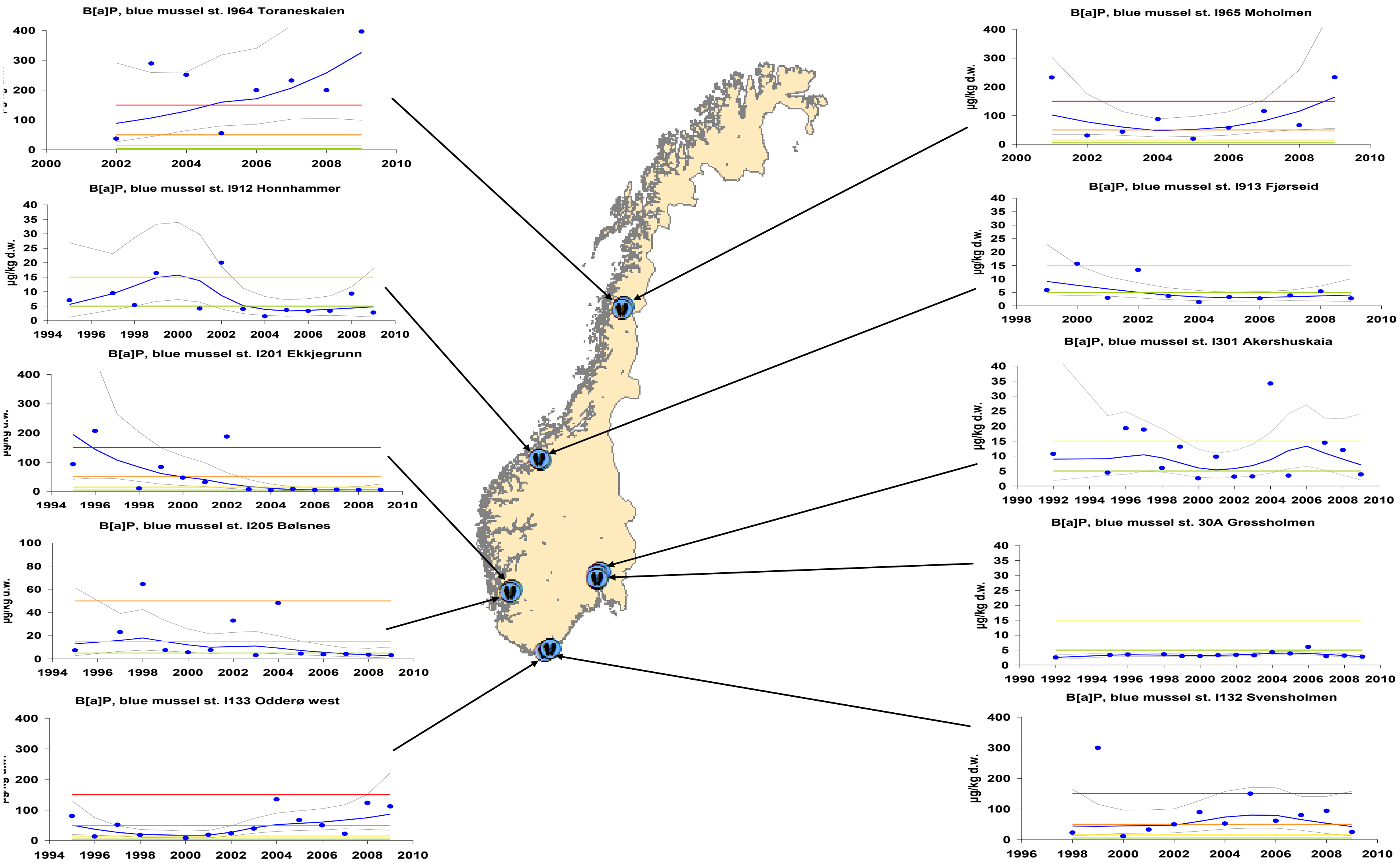


***Figure 13.*** *Trend and median concentration of B[a]P in blue mussel, µg/kg (µg B[a]P /kg) dry weight for selected stations (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

## Dichlorodiphenyldichloroethylene (ppDDE)

The concentrations of ppDDE are compared with Class limits for ΣDDT.

**Cod liver**

The concentrations of ppDDE in cod liver exceeded Class I (insignificantly polluted) in one of the 14 stations investigated (Figure 14). This station was located in the inner Sørfjord (st. 53B) and the concentration level in cod liver from fish caught there in 2009 was classified to Class II (moderately polluted). Cod in the Inner Oslofjord (st. 30B), Borøy (st. 77B), Ullerø area (st. 15B), Stokken (st. 92B), and Kvænangen/ Olderfjord (st. 43B) contained ppDDE-levels equivalent to Class I (Class limits for ΣDDT) and no significant trends were found. A significant downward trend was observed in the ppDDE levels at five stations: Færder area (st. 36B), Strandebarm area (st. 67B), Karihavet area (st. 23B), Bjørnerøya in the Lofoten (st. 98B1) and in the Varangerfjord (st. 10B). Trends for cod from Kristiansand harbour (st. 13BH), Munkholmen (st. 80BH), and Tromsø harbour (st. 43BH) could not be calculated due to insufficient data.

**Cod fillet**

Concentrations of ppDDE exceeding background levels in only diffusely contaminated areas were only observed in cod fillet from the inner Oslofjord (st. 30B) and in the Inner Sørfjord (st. 53B) (Class II, moderately polluted). No significant trends were found at these stations.
Cod at the other stations contained ppDDE -levels equivalent to Class I (insignificantly polluted). A downward trend was observed at the station in the Strandebarm area (st. 67B) in the Hardangerfjord. The stations in the Færder area (st. 36B), at Borøy (st. 77B), in the Ullerø area (15B), in the Karihavet area (st. 23B) and in Bjørnerøya in the Lofoten (st. 98B1) had no significant trends. For the stations Kristiansand harbour (st. 13BH), Munkholmen (st. 80BH), Tromsø harbour (st. 43BH) and Varangerfjord (st. 10B) there were no values for trend analyses due to insufficient data.

**Flounder liver**

Flounder liver from three stations were analysed for ppDDE. The results from the station in Sande (st. 33F), the Inner Sørfjord (st. 53F) and in the Strandebarm area (st. 67F) revealed concentrations of ppDDE below background levels in only diffusely contaminated area. No significant trends were observed.

**Flounder fillet**

There observed concentrations of ppDDE were below background levels in only diffusely contaminated area in flounder from Sande (st. 33F), Strandebarm area (st. 67F) in the Hardangerfjord and in the Inner Sørfjord (st. 53F). The data revealed no significant trend in Sande and significant downward trends for the stations in the Hardangerfjord and Sørfjord.

**Dab liver**

All of the four stations analysed for ppDDE in dab liver revealed concentrations of ppDDE below background levels in only diffusely contaminated area (Class I). Dab from the Færder area (st. 36F), Borøy area (st. 77F) and the Ullerø area (st. 15F) showed no significant trends. Dab from the Åkrafjord (st. 21F) showed a downward trend.

**Dab fillet**

Dab fillet from Færder area (st. 36F), Ullerø area (st. 15F) and the Åkrafjord (st. 21F) were analysed for ppDDE. The results from all three areas revealed concentrations of ppDDE below background levels in only diffusely contaminated area and no significant trends were detected.

**Plaice liver**

There were an acceptable background level and a significant downward trend of ppDDE in plaice liver from Skogerøy (st. 10F) in the Varangerfjord. Plaice at Husholmen (st. 98F2) had acceptable concentrations of ppDDE but no trend could be calculated.

**Plaice fillet**
The results revealed concentrations of ppDDE below background levels in only diffusely contaminated area and a significant downward trend in plaice fillet from Skogerøy (st. 10F) in the Varangerfjord. The ppDDE-concentrations was also low in plaice fillet from Husholmen (st. 98F2), and no significant trend was found.

**Megrim liver**
Fish from two stations on the west coast were analysed for ppDDE, the Åkrafjord (st. 21F) and the Strandebarm area (st. 67F). The results from the station in Strandebarm showed a significant downward trend while the megrim in the Åkrafjord had no significant trend.

**Megrim fillet**
Fish from the Åkrafjord (st. 21F) and the Strandebarm area (st. 67F) were analysed for ppDDE. The results from the station in Strandebarm showed a significant downward trend while the megrim in the Åkrafjord revealed no significant trend. Both had acceptable levels of ppDDE in the fillet.

**Blue mussel**
The presence of ppDDE in blue mussel exceeded Class I (insignificantly polluted) in mussel from three out of 41 blue stations, (results from some of the stations are presented in Figure 15). These three stations in the Sørfjord at Kvalnes (st. 56A) and Krossanes (st. 57A) (both markedly polluted, Class III) and Byrkjenes (st. 51A) (moderately polluted, Class II), showed no significant trends.

Concentrations of ppDDE below background level in only diffusely contaminated area (Class I) and no significant trends were observed in most of the data. This was the case for Akershuskaia (st. I301), Gåsøya (st. I304), Ramtonholmen (st. I307), Håøya (st. I306), Solbergstrand (st. 31A) and Mølen (st. 35A) in the Oslofjord. Similar results were also observed in mussels from Gjemesholmen (st. I712), Strømtangen (st. I713) and Bjørkøya (Risøyodden) (st. 71A) in the Frierfjord, Risøy (st. 76A) close to Risør, Odderø (st. I133) and Svensholmen (st. I132) in the Kristiansandsfjord, Lastad (st. I131A) in the southern part of Norway and Gåsøy/ Ullerø (st. 15A) close to Farsund. Further, this was also the result in Eitrheimsneset (st. 52A) in the Sørfjord, Ranaskjær (st. 63A), Vikingneset (st. 65A) and Lille Terøy (st. 69A) in the Hardangerfjord, Espevær (st. 22A) on the west coast, Nordnes (st. I241), Gravdalsneset (st. I242) and Hegreneset (st. I243) close to Bergen. Acceptable levels of ppDDE and no significant trends were also observed at Husvaagen area (st. 98A2) in the Lofoten, and Skallneset (st. 10A2) and Brashavn (st. 11X) in the Varangerfjord.

A significant downward trend and insignificantly polluted blue mussel were observed in samples from the Inner Oslofjord at Gressholmen (st. 30A) and in the Hvaler area; Damholmen (st. I022), Singlekalven (st. I023) and Kirkøy (st. I024). For the period 2000-2009, no trend was detected at Gressholmen (cf. Appendix J).

**Concluding remarks**
No upward trends for ppDDE were observed. Blue mussel from three stations in the Sørfjord were classified up to markedly polluted with ppDDE. The concentrations in blue mussel at Kvalnes in the mid Sørfjord have declined from extremely polluted in 2008 to markedly polluted in 2009. Ruus *et al.* (2010) found that concentrations of ∑DDT in blue mussel were classified up to extremely polluted at Utne (Outer Sørfjord) and at Måge (in the mid Sørfjord). At the other stations, concentrations in mussel corresponded to be classified as insignificantly polluted to severely polluted. Downward trends were found in blue mussel from Gressholmen in Inner Oslofjord and the three locations in the Hvaler area.

Both cod liver and fillet from the Inner Sørfjord were moderately polluted by ppDDE. Ruus *et al.* (2010) found that the average ∑DDT-concentrations in both cod liver and fillet from the Sørfjord were moderately polluted. Cod fillet from the Inner Oslofjord was also moderately polluted by ppDDE.

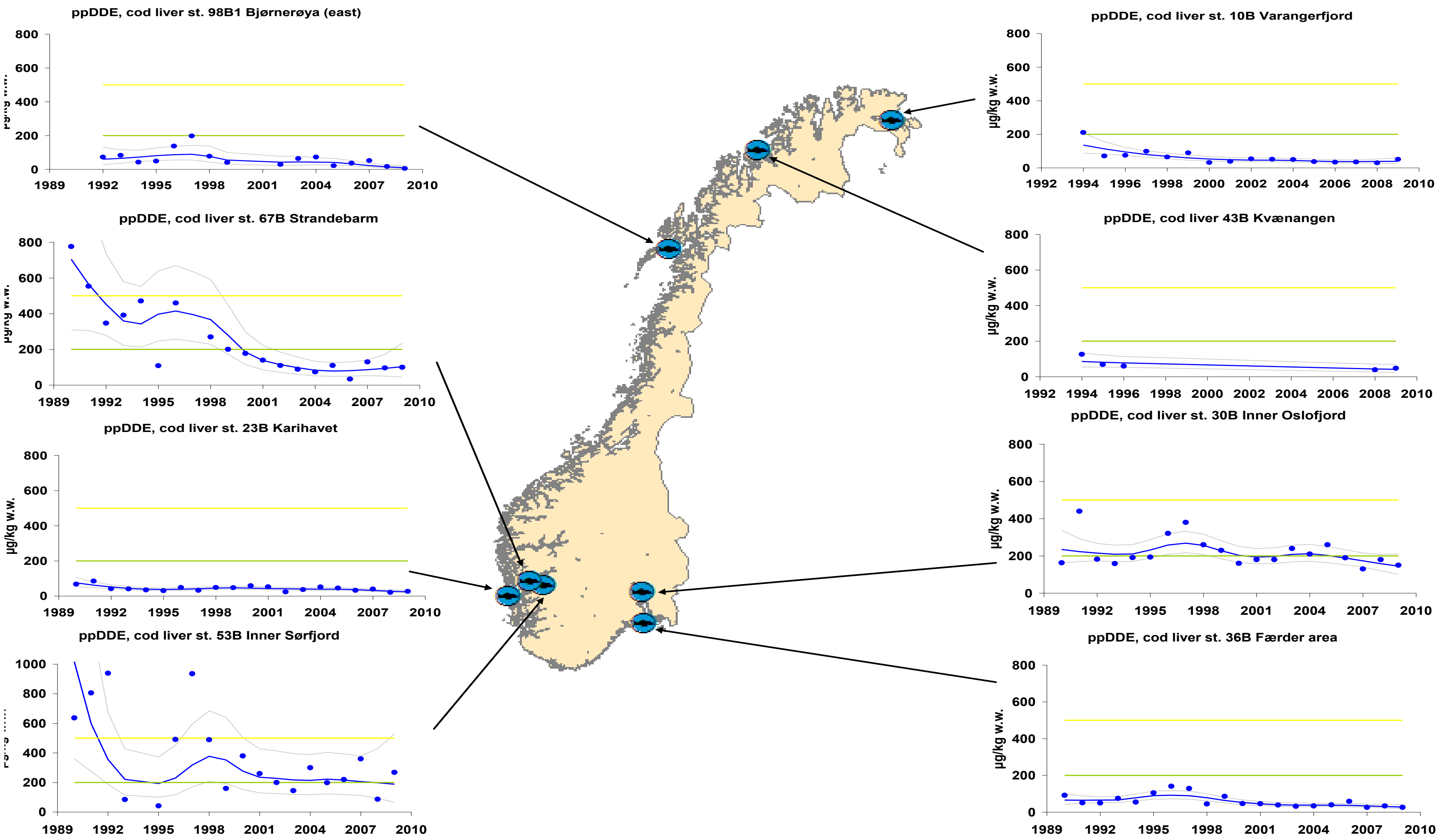


***Figure 14.*** *Trend and median concentration of ppDDE in cod liver, µg/kg (µg ppDDE/kg) wet weight (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2). Note: Class limits for ΣDDT used.*

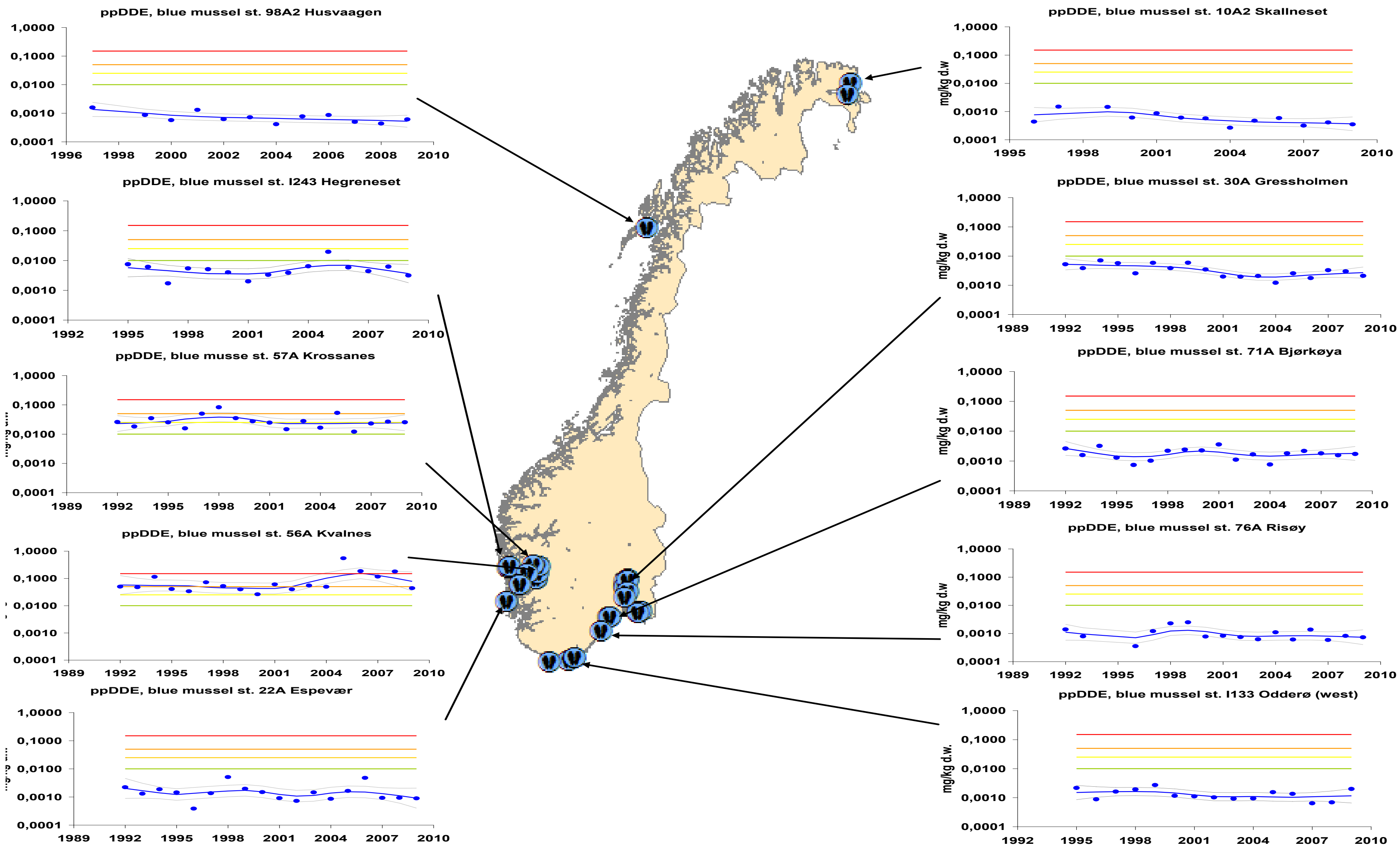


***Figure 15.*** *Trend and median concentration of ppDDE in blue mussel, mg/kg (mg ppDDE/kg) dry weight for selected stations (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).* ***Note: Log-scale and Class limits for ΣDDT used.***

## Hexachlorobenzene (HCB)

### Cod liver

Observed concentrations of HCB in cod liver exceeded Class I (insignificantly polluted) in samples from 12 of the 14 cod stations investigated (Figure 16). Cod liver in the Kristiansand harbour (st. 13BH) was classified as markedly polluted (Class III) by HCB, and cod from Munkholmen in the Trondheimsfjord (st. 80BH) as moderately polluted (Class II). No trend measurements were done for these two locations, due to insufficient data. There were observed low levels of HCB (Class I) and downward trends for data from six stations: Inner Oslofjord (st. 30B), Færder area (st. 36B), Borøy area (st. 77B), Strandebarm area (st. 67B), Bjørnerøya in the Lofoten (st. 98B1) and in the Varangerfjord (st. 10B). Similar low levels of HCB and no significant trend were observed for data from the Inner Sørfjord (st. 53B), Karihavet (st. 23B), Stokken area (92B), and Kvænangen/ Olderfjord (st. 43B). Data on HCB in cod from and Tromsø harbour (st. 43BH) also revealed HBC concentrations below the background level (Class I), but the data was insufficient for trend analyses.

### Cod fillet

There were acceptable levels (Class I, insignificantly polluted) of HCB in cod fillet in 11 out of 12 stations investigated (some of the result are shown in Figure 16), the exception being cod from the Kristiansand harbour (st. 13BH). The fish from the Kristiansand harbour was classified as markedly polluted (Class III) by HCB and no trend could be detected due to insufficient data.

A significant downward trends was observed in the data from the five stations; Inner Oslofjord (st. 30B), Færder area (st. 36B), Ullerø area (st. 15B), Strandebarm area (st. 67B) and Bjørnerøya in Lofoten (st. 98B1). No significant trend was observed in the data from the Inner Sørfjord (st. 53B), Karihavet (st. 23B) and in the Varangerfjord (st. 10B). There were insufficient data to evaluate trends in cod Munkholmen (st. 80BH) and Tromsø harbour (st. 43BH).

### Flounder liver

Flounder liver from three stations were analysed for HCB. None of the results from the samples from stations in Sande (st. 33F), the Inner Sørfjord (st. 53F) and the Strandebarm area (st. 67F) revealed concentrations of HCB over expected high background. A significant downward trend was found in the data from the Inner Sørfjord, while there were no significant trends for the data from Sande or Strandebarm.

### Flounder fillet

Flounder fillet from three stations were analysed for HCB. Only the station in the Strandebarm area (st. 67F) showed concentrations over high background level, but no significant trend was found in the data from this station. The results from stations in Sande (st. 33F) and Inner Sørfjord (st. 53F) showed concentrations below a high background level for HCB. The station in the Inner Sørfjord showed a significant downward trend, while the flounder fillet from Sande had no significant trend.

### Dab liver

Concentrations below expected high background levels of HCB were observed in dab liver from four investigated stations. There was not observed any significant trend for the data from the Borøy area (st. 77F), Ullerø area (st. 15F) or Åkrafjord (st. 21F). The results from dab from the Færder area (st. 36F) revealed a significant downward trend.

### Dab fillet

Concentrations below expected high background levels were observed in dab fillet from all four investigated stations. There was not observed any significant trend in the data from the Ullerø area (st. 15F) and Åkrafjord (st. 21F). The data for dab from the Færder area (st. 36F) did show a significant downward trend. There was insufficient data for a trend analyse for dab from the Borøy area (st. 77F).

**Plaice liver**
The results from Husholmen (st. 98F2) in the Lofoten area and Skogerøy (st. 10F) in the Varangerfjord revealed concentrations below expected high background levels. The results for Skogerøy showed a significant downward trend.

**Plaice fillet**
The data from plaice fillet from Husholmen (st. 98F2) in the Lofoten area and Skogerøy (st. 10F) in the Varangerfjord showed HCB concentrations below the expected high background level. A downward significant trend was found at Skogerøy.

**Megrim liver**
The two stations Åkrafjord (st. 21F) and the Strandebarm area (st. 67F) in the mid Hardangerfjord were analysed for HCB in megrim liver. The data from the station in Strandebarm showed a significant downward trend while the data for megrim in the Åkrafjord showed no significant trend.

**Megrim fillet**
The same two stations Åkrafjord (st. 21F) and Strandebarm (st. 67F) were used for analysis of megrim fillet. The data for megrim in Strandebarm showed a significant downward trend and the data from Åkrafjord showed no significant trend.

**Blue mussel**
The presence of HCB in blue mussel exceeded Class I (insignificantly polluted) in samples from 24 out of 41 stations investigated (some of the stations are presented in Figure 17). Blue mussel were markedly polluted (Class III) at Strømtangen (st. I713) and at Odderø (st. I133). The data from Strømtangen showed no significant trend whereas a significant downward trend was observed in the data from Odderø (st. I133). Blue mussel from Lastad (st. I131A) and Nordnes (st. I241) were moderately polluted (Class II) and the data showed a significant upward trend. The combination of concentrations classified as moderately polluted (Class II) and no significant trends were observed in mussel from Byrkjenes (st. 51A) and Krossanes (st. 57A) in the Sørfjord, and at Ranaskjær (st. 63A), Vikingneset (st. 65A) and Lille Terøy (st. 69A) in the Hardangerfjord. Similar results were also observed in mussels from Akershuskaia (st. I301), Damholmen (st. I022), Kirkøy (st. I024), Gjemesholmen (st. I712), Svensholmen (st. I132), Hegreneset (st. I243) and Brashavn (st. 11X). The combination of concentrations classified as moderately polluted (Class II) and significant downward trends were observed in data from Solbergstrand (st. 31A), Bjørkøya/ Risøyodden (st. 71A) and Gravdalsneset (st. I242). Blue mussel from Sponvika (st. 01A, Langøsund (st. 13A), Aavigen (st. 14A), Nordstrand (st. 77A) and Gjerdsvoldsøyen (st. 79A) were also classified as moderately polluted (Class II), but the data from these stations were insufficient to calculate trends.

Acceptable levels of HCB (Class I) and no significant trends were observed in the data from Gåsøya (st. I304), Ramtonholmen (st. I307) and Håøya (st. I306) in the inner Oslofjord and at Singlekalven (st. I023) in the Hvaler area. Similar observations were also made based on the data from Risøy (st. 76A) and Gåsøy/ Ullerøy (st. 15A), at Eitrheimsneset (st. 52A) and Kvalnes (st. 56A) in the Inner Sørfjord, and at Husvaagen (st. 98A2) and Skallneset (st. 10A2) northern part of Norway. There were acceptable levels of HCB (Class I) and significant downward trends in the data from Gressholmen (st. 30A), Mølen (st. 35A) and Espevær (st. 22A).

**Concluding remarks**
Both cod liver and fillet in the Kristiansand harbour (st. 13 BH) were markedly polluted by HCB. Cod liver in Munkholmen in the Trondheimsfjord was moderately polluted by HCB. For all other stations, HCB in cod liver and fillet were at background level and no upward trends were observed. Blue mussel in the Frierfjord and the Kristiansandsfjord in 2009 were up to markedly polluted with HCB as in 2008. Only two significant upward trends were found in blue mussel, Lastad and Nordnes, which were moderately polluted.

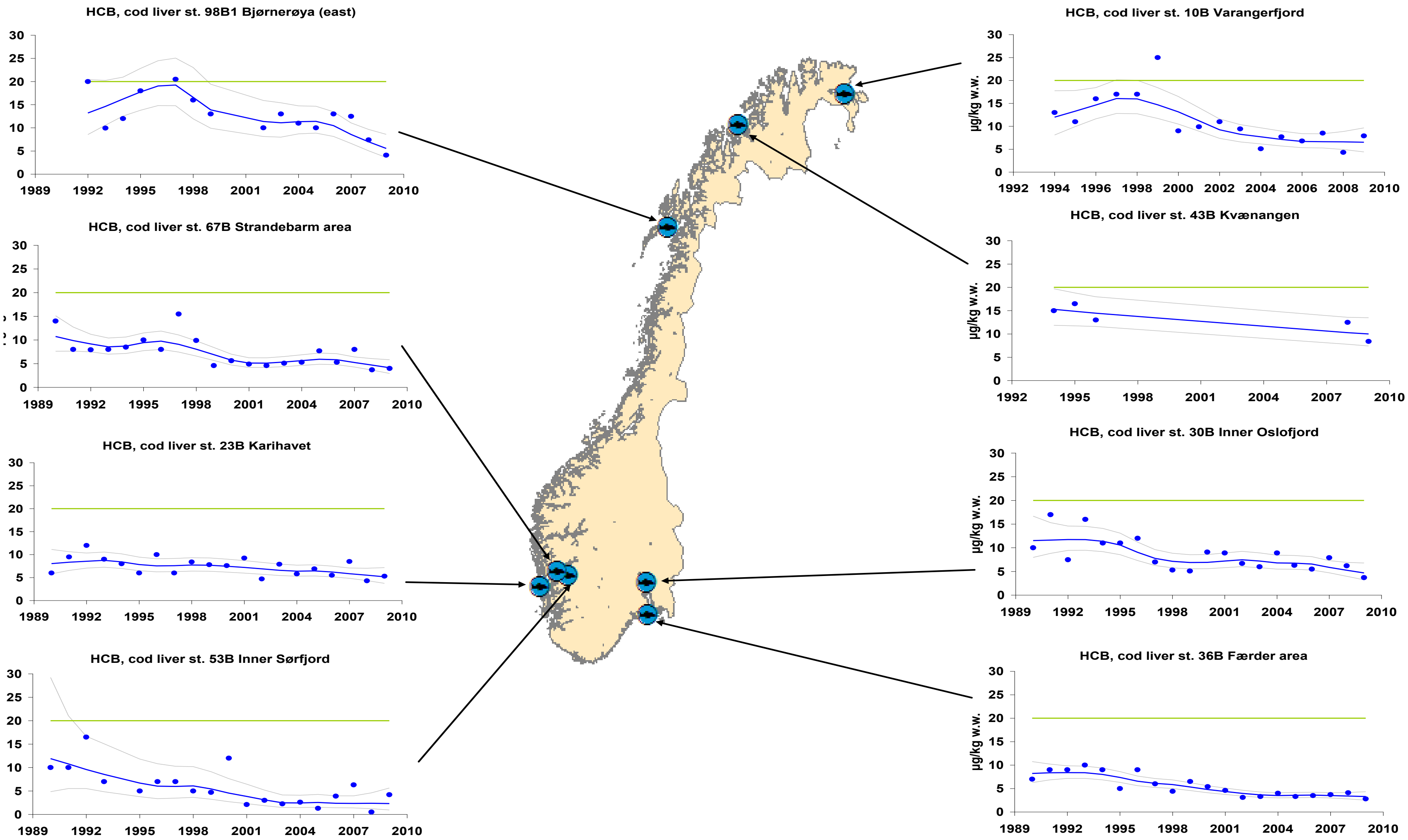


***Figure 16.*** *Trend and median concentration of HCB in cod liver, µg/kg (µg HCB/kg) wet weight (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

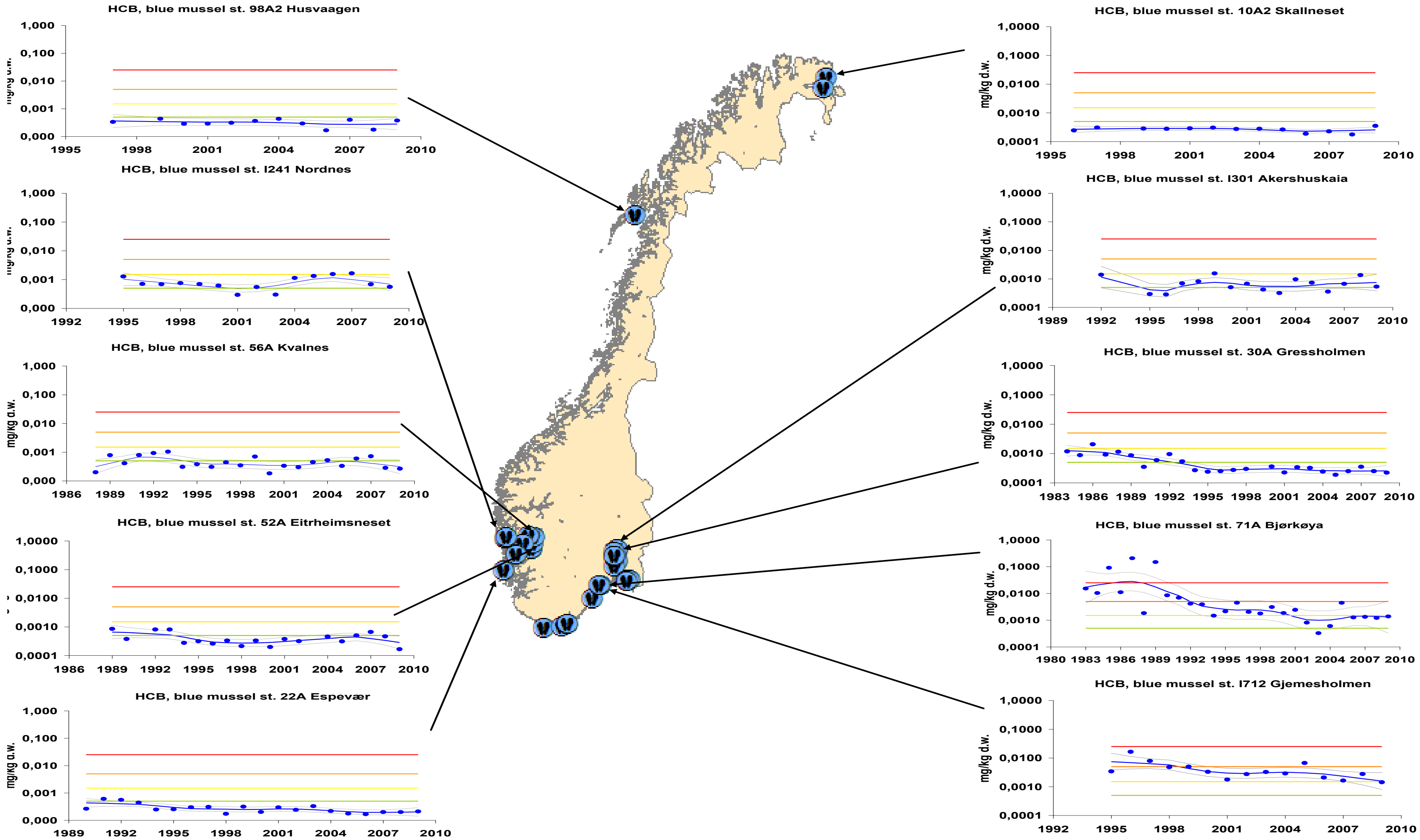


***Figure 17.*** *Trend and median concentration of HCB in blue mussel, mg/kg (mgHCB/kg) dry weight for selected stations (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).* ***NB: log-scale.***

## Dioxins (dioxin toxicity equivalents – Nordic model, TCDDN)

**Blue mussel**

The classifications are based on analysis of TCDD/F and subsequent calculation of dioxin toxicity equivalents (TCDDN) after the Nordic model (Ahlborg 1989).

Mussels from eight stations were investigated; in the Oslofjord (Gressholmen st. 30A, Mølen st. 35A), the Grenlandsfjord area (Bjørkøya/ Risøyodden st. 71A, Risøy st. 76A, Gjemesholmen st. I712 and Strømtangen st. I713), and in the Kristiansandsfjord at Svensholmen (st. I132) and Odderø (st. I133) (Figure 18). No significant trends were observed for dioxins. Trend analysis for Mølen could not be done because of insufficient data.

Blue mussel in the Grenland area at Bjørkøya/Risodden (st. 71A), Gjemesholmen (st. I712) and Strømtangen (st. I713) were extremely polluted (Class V) by dioxins. In the Kristiansandsfjord, blue mussel samples were markedly polluted (Class III) at Odderøy (st. I133), and moderately polluted (Class II) at Svensholmen (st. I132). At Mølen (st. 35A), the blue mussel were markedly polluted (Class III) by dioxins. Blue mussel at Gressholmen (st. 30A) and Risøy (st. 76A) were insignificantly polluted (Class I) by dioxins.

**Concluding remarks**

Dioxins have been included in Klif's Pollution Index for blue mussel since 2002 (cf. chapter 4.4). No significant trends were observed for dioxins in blue mussel. Blue mussel from three stations in the Grenlandsfjord were extremely polluted with dioxins both in 2008 and 2009. Consumption advice has been issued for fish and shellfish in the Grenlandsfjord area due to the high concentrations of organochlorines including dioxins. It can be noted that environmental status is classified according to environmental quality criteria (based on ecotoxicological marginal values or presumed background levels) and must not be confused with limit values for human consumption and associated advices issued by the Norwegian Food Safety Authorities (*Mattilsynet*). Monitoring of contaminants in organisms from Grenland showed that the dioxins content in blue mussel is far over expected high background level, and this has not changed systematically since 1995 (Bakke *et al.* 2010). Results presented by Bakke *et al.* (2010) also indicated that dioxin concentrations have shown a tendency to increase outside the Frierfjord during the period 2002 to 2009 (examples dioxins in the Langesundfjord (Croftholmen), Helgeroa and Klokkartangen). A similar trend was also shown for CEMP data (cf. st. 71A and I712) but the trend was not significant.

In the Kristiansandsfjord, blue mussel were markedly polluted at Odderøy in 2009 and insignificant polluted in 2008. The blue mussel at Svensholmen were moderately polluted in 2009 and markedly polluted in 2008.

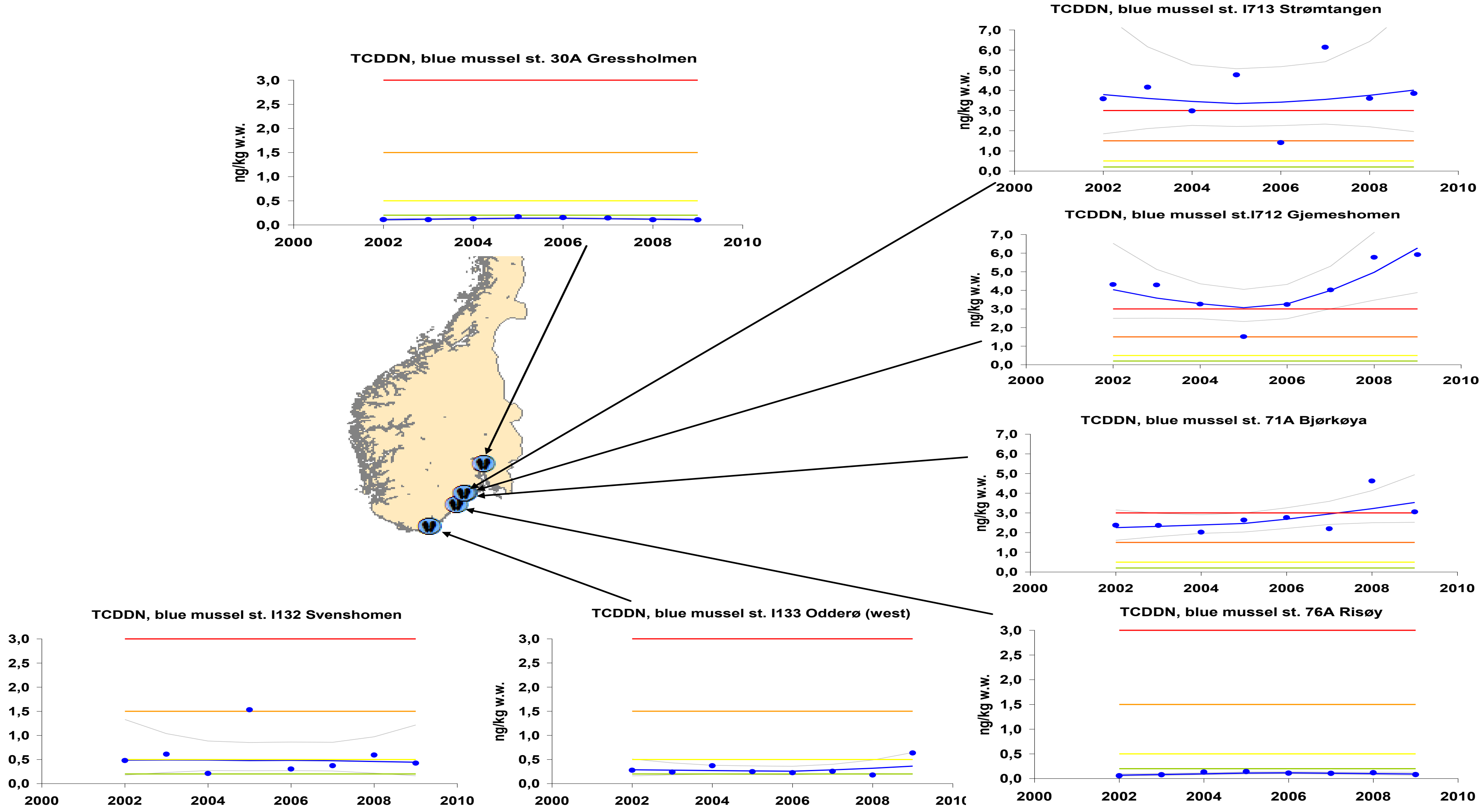


***Figure 18.*** *Trend and median concentration of dioxins TCDD-toxicity equivalents after Nordic model (TCDDN cf. Appendix C) in blue mussel, ng/kg TCDDN/kg) (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

## Polybrominated diphenyl ethers (PBDE)

### Cod liver

Polybrominated diphenyl ethers (PBDEs) have been investigated in cod liver since 2005. PBDEs were analysed in cod from 10 stations (see Table 7 and Figure 19). In 2009, the median concentration of sum PBDE was highest in cod from the Inner Oslofjord (61 µg/kg w.w.) and lowest in samples east of Bjørnerøya in Lofoten (2.7 µg/kg w.w.) (Table 7). No significant trends were observed. The tetrabromodiphenyl ether BDE47 was the most dominant PBDE, whereas the pentabromodiphenyl ether BDE100 and the tetrabromodiphenyl ether BDE49 were either the second or third most dominant. The median concentration of decabromodiphenyl ether BDE209 was below the detection limit at all stations.

***Table 7**. Concentrations of PBDE analysed in cod liver (*Gadus morhua*) 2009.*

| Station | SUM PBDE (µg/kg w.w.) |
|---|---|
| Inner Oslofjord (st. 30B) | 61 |
| Færder (st. 36B) | 2.9 |
| Kristiansand harbour (st. 13BH) | 19.8 |
| Inner Sørfjord (st. 53B) | 33.2 |
| Karihavet area (st. 23B) | 9.5 |
| Munkholmen (st. 80BH) | 38.7 |
| Stokken (st. 92B) | 5.5 |
| Bjørnerøya (st. 98B1) | 2.7 |
| Kvænangen/ Olderfjord (st. 43B) | 11 |
| Tromsø harbour (st. 43BH) | 36.13 |

### Concluding remarks

The concentrations of PBDE was highest in cod liver from the Inner Oslofjord. The values of the median concentration of PBDE in Inner Oslofjord and Karihavet were lower in 2009 than in 2008.

Median concentration found at presumed reference stations like Svolvær, Færder, Utsira and Bømlo-Sotra indicate that a high background level in diffusely contaminated areas might be 30 µg/kg w.w. for cod liver (Fjeld *et al.* 2005). This is higher than the median found in Færder, Kristiansand, Kvænangen, Karihavet, Stokken and Lofoten. It can not be disregarded that this high background concentration might be too high. The median found in the inner Osloford was 60 µg/kg w.w. and in the interval of 37-112 µg/kg w.w. found in other contaminated areas (Fjeld *et al.* 2005; Berge *et al.* 2006). Bakke (*et al.* 2008) found a range of mean concentrations in remote areas to be 3.4 – 29.0 µg/kg w.w.

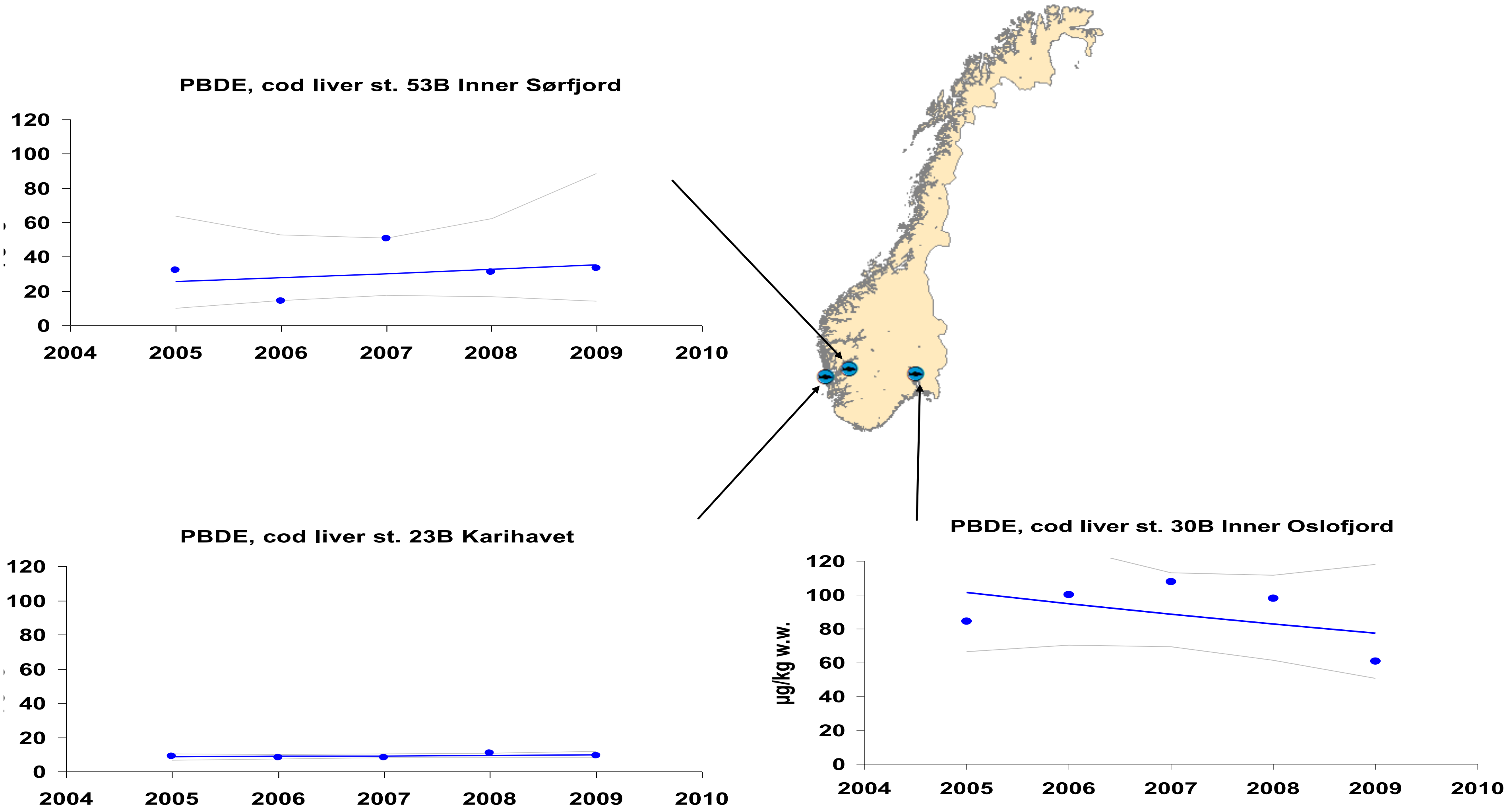


***Figure 19.*** *Trend (not significant) and median concentration of PBDE in cod liver from Karihavet (st. 23B), Inner Sørfjord (st. 53B) and Inner Oslofjord (st. 30B), µg/kg (µg PBDE/kg) wet weight (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2). There is no limit to classify the results from 2009.*

## Perfluoroctanoic sulphonate (PFOS)

### Cod liver

Perfluroalkyl compounds (PFC[1]) have been analysed in cod liver since 2005. PFOS were in 2009 analysed in cod from 10 stations (see Table 8 and Figure 20). The median concentration of the indicator PFC compound perfluoroctonoic sulphonate (PFOS), the most abundant PFC, was highest in Inner Oslofjord (48 µg/kg w.w.). The lowest median concentration was found in the inner Sørfjord (3.2 µg/kg w.w.). The second most abundant PFC was perfluoroctanesulfonic acid (PFOSA) with a median concentration of 41.5 µg/kg w.w. in the Inner Oslofjord and 2.2 µg/kg w.w. in Kristiansand harbour. The median concentrations of the remaining PFCs were below the limit of detection.

***Table 8***. *Concentrations of PFOS analysed in cod liver (*Gadus morhua*) 2009.*

| Stations | PFOS (µg/kg w.w.) |
|---|---|
| Inner Oslofjord (st. 30B) | 48 |
| Færder (st. 36B) | 29 |
| Kristiansand harbour (st. 13BH) | 9 |
| Inner Sørfjord (st. 53B) | 3.2 |
| Karihavet area (st. 23B) | 8.9 |
| Munkholmen (st. 80BH) | 4.3 |
| Stokken (st. 92B) | 9.1 |
| Bjørnerøya (st. 98B1) | 6.8 |
| Kvænangen/ Olderfjord (st. 43B) | 5.5 |
| Tromsø harbour (st. 43BH) | 6.3 |

### Concluding remarks

PFOS was the most dominant PFC found in cod liver. Concentrations of PFOS in the Inner Oslofjord was clearly higher than for the other stations. There were higher values of PFOS in the Inner Oslofjord and in Karihavet in 2009 (respectively 48 µg/kg w.w. and 8.9 µg/kg w.w.) was higher than in 2008 (respectively 42 µg/kg w.w. and 6.9 µg/kg w.w.). The values in the Inner Sørfjord in 2009 (3.2 µg/kg w.w.) were lower than in the previous year (10 µg/kg w.w.).

Median concentration observed in cod from presumed reference stations like Svolvær, Kvænangen/ Olderfjord north of Skjervøy and the Varangerfjord indicated that a high background concentrations in only diffusely contaminated areas might be around 10 µg/kg w.w. (Bakke *et al.* 2007a). The concentrations observed in the Inner Oslofjord and Færder were higher. The other eight stations were quite near this level or lower. No significant trends were observed.

[1] PFCs included PFBS, PFHpA, PFHxA, PFNA, PFOA, PFOS, and PFOSA

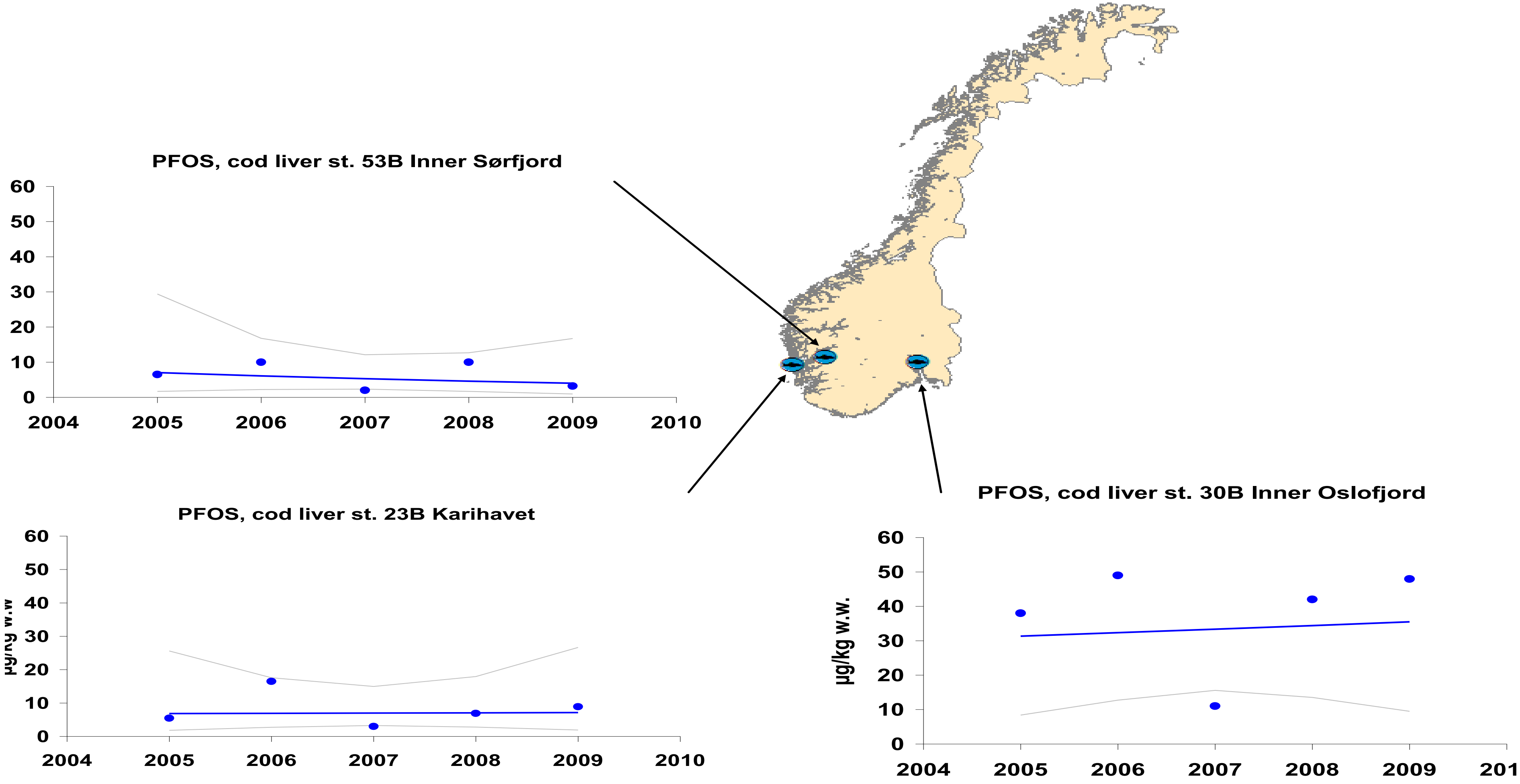


***Figure 20.*** *Trend (not significant) and median concentration of PFOS in cod liver from Karihavet (st. 23B), Inner Sørfjord (st. 53B) and Inner Oslofjord (st. 30B), µg/kg (µg PFOS/kg) wet weight (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2). There is no limit to classify the results from 2009.*

## Gamma-hexachlorocyclohexane (HCHG)

There are class limits for ΣHCH, which is the sum of alpha-, beta- and gamma isomers; (Molvær *et al.* 1997). However, not all isomers are analysed and hence, the system was applied to HCHG, the results are shown in Appendix J and Appendix K.

**Cod liver**
Samples of cod liver from all 14 cod stations that were analysed were insignificantly polluted by HCHG (Class I). Significant downward trends were detected at all stations except for Borøy (st. 77B) where no trend was detected and Kristiansand harbour (st. 13BH), Munkholmen in the Trondheimsfjord (st. 80BH) and Tromsø harbour (st. 43BH), where there was insufficient data to do trend analysis.

**Cod fillet**
Samples of cod fillet from all 12 cod stations that were analysed were insignificantly polluted by HCHG (Class I). Significant downward trends were found at Færder (st. 36B) and Borøy (st. 77B). No trends were found at the remaining stations in part due to insufficient data (i.e. Kristiansand harbour (st. 13BH), Munkholmen in the Trondheimsfjord (st. 80BH) and Tromsø harbour (st. 43BH)).

**Flounder liver**
The sample from the three flounder stations in Sande (st. 33F), Inner Sørfjord (st. 53F) and Strandebarm (st. 67F) showed levels of HCHG in liver which where below a high background level. The results from the Inner Sørfjord and Strandebarm also showed a significant downward trend.

**Flounder fillet**
The same three flounder stations showed levels of HCHG in fillet which where below a high background level and showed a significant downward trend.

**Dab liver**
Dab samples from all the four stations Færder (st. 36F), Borøy (st. 77F), Ullerø (st. 15F) and Åkrafjord (st. 21F) showed levels of HCHG which where below a high background level for liver. The results from Færder, Ullerø and Åkrafjord also showed a significant downward trend.

**Dab fillet**
Dab from the same four stations showed levels of HCHG which where below a high background level for fillet. The results from Færder and Ullerø also showed a significant downward trend.

**Plaice liver**
Plaice from Husholmen (st. 98F2) in Lofoten and Skogerøy (st. 10F) in the Varangerfjord showed both levels of HCHG which where below a high background level for plaice liver. No significant trends were detected.

**Plaice fillet**
Plaice from Husholmen (st. 98F2) in Lofoten and Skogerøy (st. 10F) in the Varangerfjord showed both levels of HCHG which where below a high background level for fillet in plaice. No significant trends were detected.

**Megrim liver**
Megrim from Strandebarm (st. 67F) in the Hardangerfjord and Åkrafjord (st.21F) on the west coast showed both levels of HCHG which where below a high background level for liver in megrim. There was insufficient data to do a trend analysis.

**Megrim fillet**
Megrim from Strandebarm (st. 67F) in the Hardangerfjord and Åkrafjord (st.21F) on the west coast showed both levels of HCHG which where below a high background level for fillet in megrim. There was insufficient data to do a trend analysis.

**Blue mussel**
All 41 blue mussel stations that were analysed for HCHG were insignificantly polluted (Class I), and all significant trends were downward.

**Concluding remarks**
All cod liver and fillet, and blue mussel that were analysed for HCHG were insignificantly polluted. All dab, flounder and megrim liver and fillet had acceptable levels of HCHG.

## Tributyltin (TBT)

### Blue mussel

Concentrations of organotin (TBT) in blue mussel were quantified at 14 stations (results from some of the stations are presented in Figure 21). The presence of TBT exceeded Class I (insignificantly polluted) at six blue mussel stations. No significant downward trends were observed at Akershuskaia (st. I301), Gressholmen (st. 30A), Gjemesholmen (st. I712) and Høgevarde (st. 227A2) (all Class II, moderately polluted). Blue mussel at Svensholmen (st. I132) and Odderøy (st. I133) in the Kristiansandsfjord were also moderately polluted (Class II) by TBT, but no significant trend measurements were done due to insufficient data.

Blue mussel at Espevær (st. 22A) were insignificantly polluted (Class I) by TBT but no significant trend was observed. Significant downward trends were found in mussel at Bjørkøya/ Risøyodden (st. 71A), Strømtangen (st. I713), Risøy (st. 76A), Gåsøy/ Ullerø (st. 15A), Husvaagen area (st. 98A2) and Brashavn (st. 11X) (all Class I). Blue mussel from Mølen (st. 35A) showed also concentrations below background, but no significant trend measurements could be done for this station.

### Concentrations of TBT in dogwhelk

The concentrations of TBT in dogwhelk from the 10 stations investigated in 2009 were relatively low. As in 2003, 2004, 2005, 2007 and 2008 the highest organotin level was found at Melandsholmen close to Haugesund (st. 227G1, Figure 22) (<0.0323 mg/kg d.w.) on the west coast of Norway. Significant downward trends were found on the data from Færder (st. 36G), Lista at Gåsøy/ Ullerø (st. 15G), Lastad (st. 131G), Svolvær (st. 98G) and Brashavn (st. 11G).

There were no significant trends in the data on dogwhelk from Fugløyskjær (st. 71G), Risøy (st. 76G), Espevær (st. 22G) or Melandholmen (st. 227G1). The lowest organotin levels (0.00225 mg/kg d.w.) were found at Brashavn (st. 11G) in the Varangerfjord.

TBT-concentrations were 0.018103 mg/kg d.w. at Langholmane (st. 74G) and since this station is new in 2009, there were no values for trend analysis.

### Biological effects of TBT (Imposex/VDSI) in dogwhelk

The effects from TBT were low (VDSI<2) at eight of 10 stations investigated in 2009. A pronounced effect of TBT was however observed in dogwhelks from the Svolvær area (st. 98G) where VDSI was 3.03 and at Melandholmen (st. 227G1) where VDSI was 2.32 (Figure 23). No effects (VDSI = 0) were found at Risøy (st. 76G), Lastad (st. 131G), Gåsøy/ Ullerø (st. 15G) and Brashavn (st. 11G) (Figure 23). There were significant downward trends at all the stations except for at Svolvær (st. 98G) and Brashavn (st. 11G) (Figure 23). At Langholmane (st. 74G) the VDSI was 0.033 but since this station is new in 2009, there were no values for significant trend analysis.

### Concluding remarks

No significant upward trends were found in either blue mussel or snails. The presence of organotin (as TBT) in Norwegian waters Class I (insignificantly polluted) at six of the 14 blue mussel stations monitored in 2009. This was observed in harbour areas like Akershuskaia (st. I301) and Gressholmen (st. 30A) in the Oslofjord, Gjemesholmen (st. I712) in the Frierfjord, Svensholmen (st. I132) and Odderøy (st. I133) in the Kristiansandsfjord, and Høgevarde (st. 227A2) in the Karmsund close to Haugesund. However, of the time series investigated, 10 stations showed significant downward trends for TBT in blue mussel, and one stations (Espevær st. 22A) showed no significant trend. The TBT-concentrations have decreased in blue mussel at Gressholmen (st. 30A) and Gjemesholmen (st. I712) from markedly polluted in 2008 to moderately polluted in 2009, and at Akershuskaia (st. I301) from severely polluted in 2008 to moderately polluted in 2009.

Of the time series investigated for biological effects (Imposex) of TBT in dogwhelk, seven showed significant downward trends and two had no significant trend. Significant downward trends for TBT concentrations in gastropods were found at Færder (st. 36G), Lista at Gåsøy/ Ullerø (st. 15G), Lastad (st. 131G), Svolvær (st. 98G) and Brashavn (st. 11G). The effects from TBT were low (VDSI<2) at eight of 10 stations investigated in 2009. Dogwhelks from the Svolvær area (st. 98G) showed a VDSI of 3.03 in 2009 which was higher than in 2008. There was no trend at this station in 2009 but a downward trend in 2008.

The results show that the restrictions introduced in Norway banning the use of organotins on ships shorter than 25 meters in 1990 and longer than 25 meters in 2003 have been effective in reducing Imposex in dogwhelk populations and some of the gastropod populations have re-established. The international convention that was initiated by the International Maritime Organization (IMO) has also resulted in a ban on the presence of organotin-based antifouling paints on the hulls of large ships from 2008.

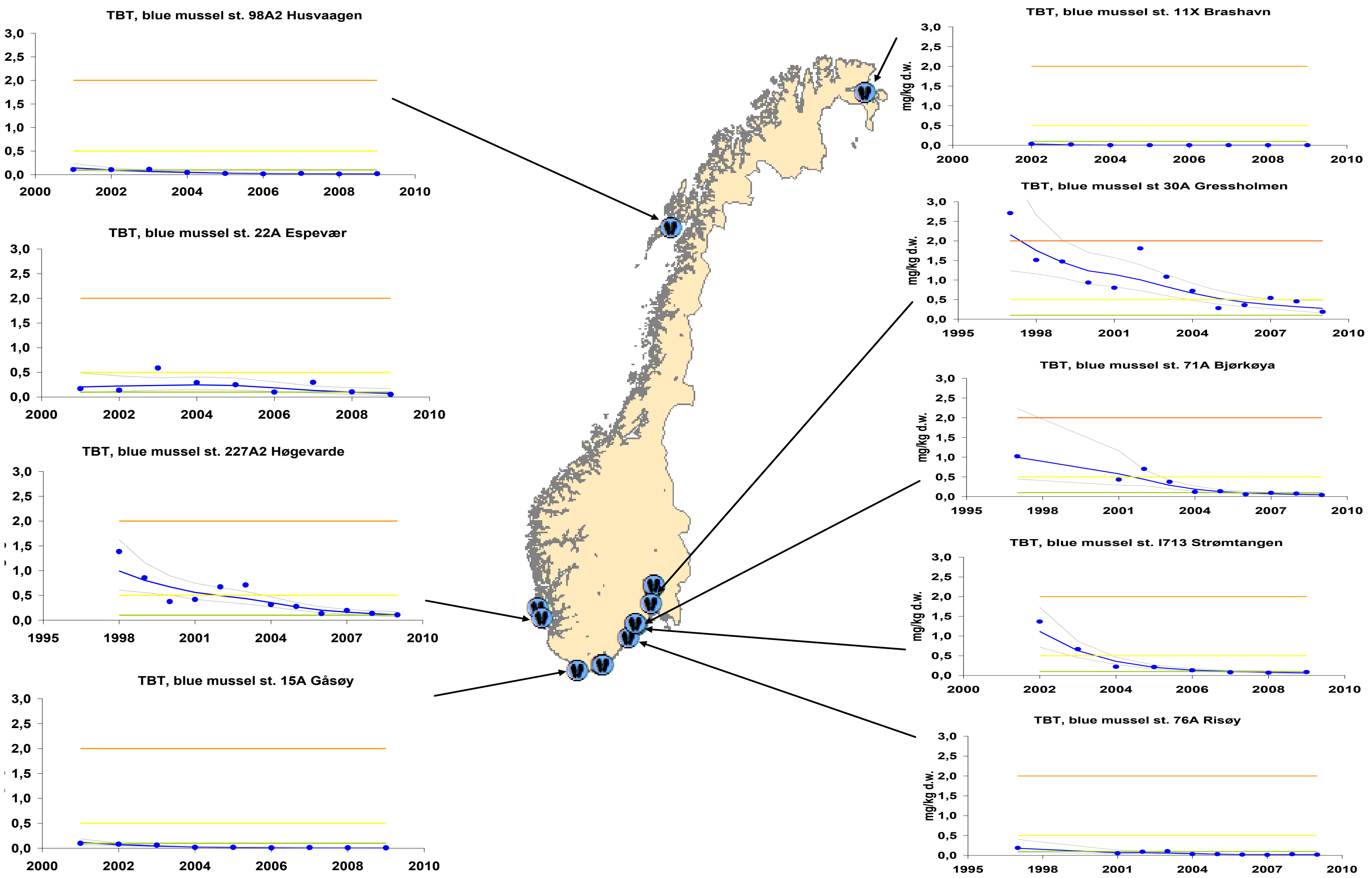


***Figure 21.*** *Trend and median concentration of TBT (on a formulation basis) in blue mussel, mg/kg (mg TBT/kg) dry weight (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

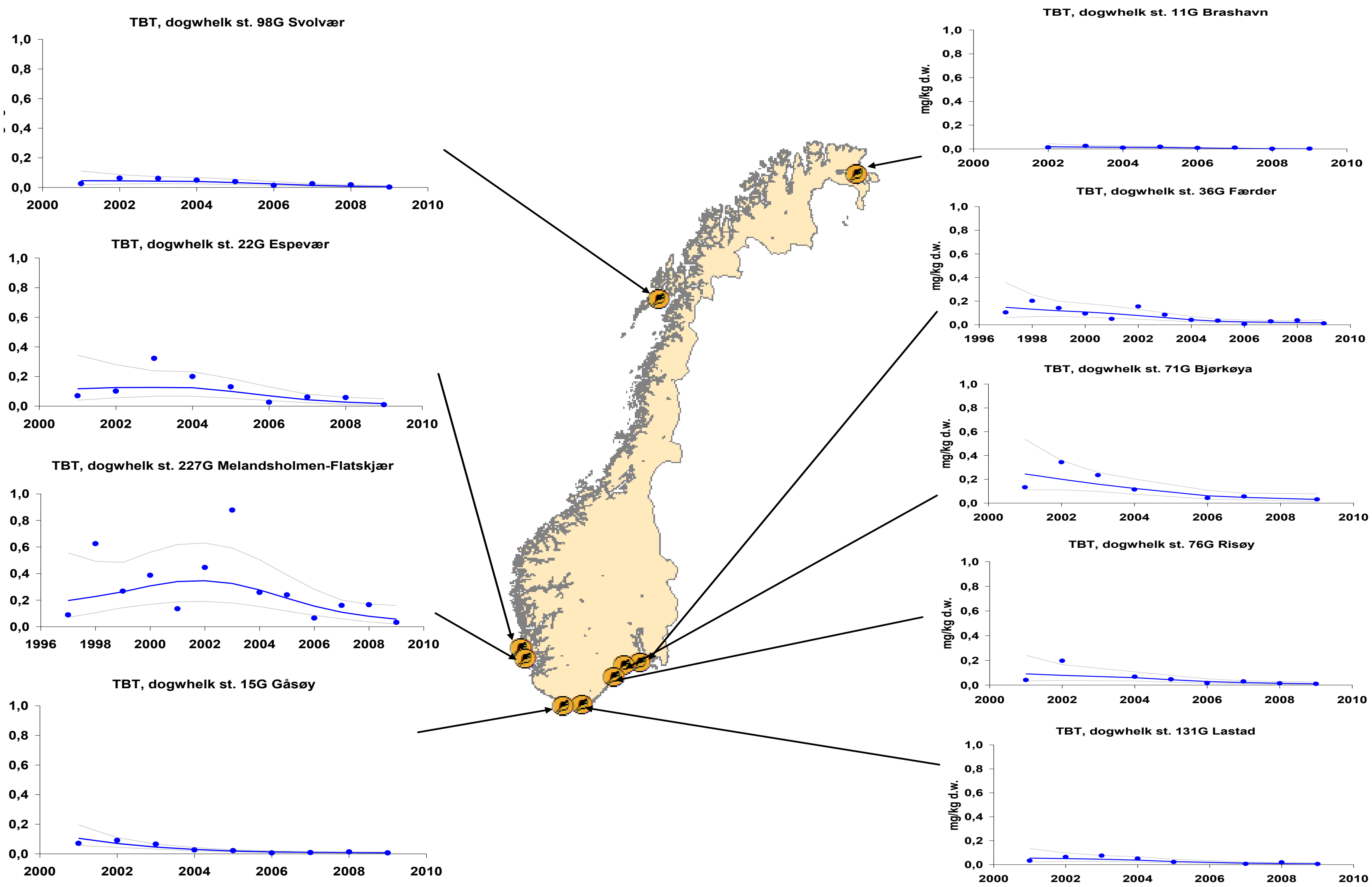


***Figure 22.*** *Trend and median concentration of TBT (on a formulation basis) in dogwhelk at 9 stations, mg/kg (mg TBT/kg) dry weight (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2). There is no limit to classify the results from 2009.*

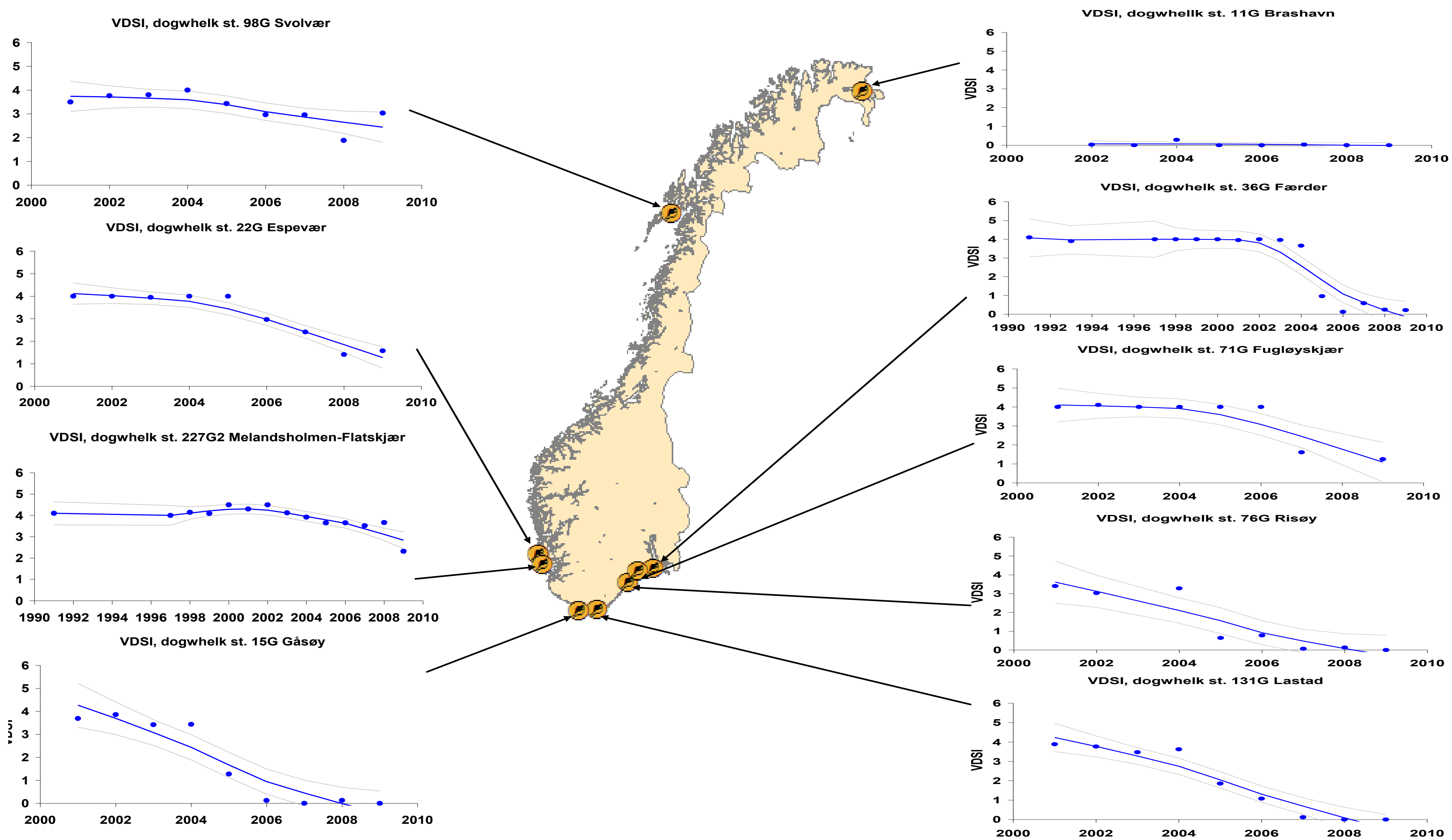


***Figure 23.*** *Trends in Imposex (VDSI) in dogwhelk at 8 stations. Data from 1991 (Harding et al. 1992) and 1993 (Walday et al. 1997) (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2). There is no limit to classify the results from 2009.*

***Table 9.*** *Overview of samples collected in 2009 with indication of levels and trends in concentrations of contaminants monitored. Classification is based on observed concentrations in cod, flatfish and blue mussel. Tissues: soft body (SB), muscle (MU), liver (LI), whole organism (WO), fish bile (BI) and fish blood (BL). Klif Classification system is used for biota (Molvær et al. 1997: Classes: I (blue), II (green), III (yellow), IV (orange) and V (red) (see Appendix D). For biota, trend analyses were done on time series with three or more years and the results are indicated by an upward or downward arrow where significant trends were found, or a zero if no trend was detected. A small filled square (▪) indicates that chemical analysis has been performed, but either data were insufficient to do a trend analysis or was not presented. Dark grey indicates concentrations higher than estimated high background levels. Light grey indicates concentrations lower than high background levels.* ***Note: Class limits for ΣDDT are used for ppDDE. Class limits for ΣHCH are used for HCHG.***

| Station | Station | Medium | Tissue | VDSI | Ag | ALAD | As | BA | B[a]P | BDE | ΣPCB-7 | Cd | Co | Cr | Cu | CYP1A | ppDDE | EROD | HCHG | HCB | Hg | KPAH | Mo | Ni | OCS | PAH | Pb | PFOS | PYR1O | QCB | Sn | TBT | TCDDN | V | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01A | Sponvika | Blue mussel | SB | | ▪ | | ▪ | | | | ▪ | ▪ | ▪ | ▪ | ▪ | | ▪ | | ▪ | ▪ | ▪ | | | ▪ | ▪ | | ▪ | | | ▪ | ▪ | | | | ▪ |
| 02A | Fugleskjær | Blue mussel | SB | | ▪ | | ▪ | | | | ▪ | ▪ | ▪ | ▪ | ▪ | | ▪ | | ▪ | ▪ | ▪ | | | ▪ | ▪ | | ▪ | | | ▪ | ▪ | | | | ▪ |
| 03A | Tisler | Blue mussel | SB | | ▪ | | ▪ | | | | ▪ | ▪ | ▪ | ▪ | ▪ | | ▪ | | ▪ | ▪ | ▪ | | | ▪ | ▪ | | ▪ | | | ▪ | ▪ | | | | ▪ |
| 10A2 | Skallneset | Blue mussel | SB | | ▪ | | ▪ | | | | ↓ | o | ▪ | ▪ | o | | o | | ↓ | o | ↓ | | | ▪ | ▪ | | o | | | ▪ | ▪ | | | | o |
| 11X | Brashavn | Blue mussel | SB | | ▪ | | ▪ | | | | o | o | ▪ | ▪ | o | | o | | ↓ | o | o | | | ▪ | ▪ | | o | | | ▪ | ▪ | ↓ | | | o |
| 13A | Langøsund | Blue mussel | SB | | ▪ | | ▪ | | | | ▪ | ▪ | ▪ | ▪ | ▪ | | ▪ | | ▪ | ▪ | ▪ | | | ▪ | ▪ | | ▪ | | | ▪ | ▪ | | | | ▪ |
| 14A | Aavigen | Blue mussel | SB | | ▪ | | ▪ | | | | ▪ | ▪ | ▪ | ▪ | ▪ | | ▪ | | ▪ | ▪ | ▪ | | | ▪ | ▪ | | ▪ | | | ▪ | ▪ | | | | ▪ |
| 15A | Gåsøy (Ullerø) | Blue mussel | SB | | ▪ | | ▪ | | | | ↓ | o | ▪ | ▪ | o | | oo | | ↓ | o | o | | | ▪ | ▪ | | o | | | ▪ | ▪ | ↓ | | | o |
| 227A2 | Høgevarde | Blue mussel | SB | | ▪ | | ▪ | | | | ▪ | ▪ | ▪ | ▪ | ▪ | | ▪ | | ▪ | ▪ | ▪ | | | ▪ | ▪ | | ▪ | | | ▪ | ▪ | ↓ | | | ▪ |
| 22A | Espevær | Blue mussel | SB | | ▪ | | ▪ | | | | o | o | ▪ | ▪ | o | | o | | ↓ | ↓ | ↑ | | | ▪ | ▪ | | o | | | ▪ | ▪ | o | | | o |
| 30A | Gressholmen | Blue mussel | SB | | ▪ | | ▪ | | o | | ↓ | ↑ | ▪ | ▪ | o | | ↓ | | ↓ | ↓ | o | o | | ▪ | ▪ | o | o | | | ▪ | ▪ | ↓ | o | | o |
| 31A | Solbergstrand | Blue mussel | SB | | ▪ | | ▪ | | | | ↓ | ↑ | ▪ | ▪ | o | | o | | ↓ | ↓ | ↑ | | | ▪ | ▪ | | o | | | ▪ | ▪ | | | | o |
| 35A | Mølen | Blue mussel | SB | | ▪ | | ▪ | ▪ | | | ↓ | ↑ | ▪ | ▪ | o | | o | | ↓ | ↓ | o | ▪ | ▪ | ▪ | ▪ | ▪ | ↓ | | | ▪ | ▪ | ▪ | ▪ | ▪ | ↑ |
| 51A | Byrkjenes | Blue mussel | SB | | ▪ | | ▪ | | | | o | ↓ | ▪ | ▪ | o | | o | | ↓ | o | o | | | ▪ | ▪ | | o | | | ▪ | ▪ | | | | o |
| 52A | Eitrheimsneset | Blue mussel | SB | | ▪ | | ▪ | | | | o | ↓ | ▪ | ▪ | o | | o | | ↓ | o | ↓ | | | ▪ | ▪ | | ↓ | | | ▪ | ▪ | | | | ↓ |
| 56A | Kvalnes | Blue mussel | SB | | ▪ | | ▪ | | | | o | ↓ | ▪ | ▪ | o | | o | | ↓ | o | ↓ | | | ▪ | ▪ | | o | | | ▪ | ▪ | | | | ↓ |
| 57A | Krossanes | Blue mussel | SB | | ▪ | | ▪ | | | | o | ↓ | ▪ | ▪ | o | | o | | ↓ | o | ↓ | | | ▪ | ▪ | | ↓ | | | ▪ | ▪ | | | | ↓ |
| 63A | Ranaskjær | Blue mussel | SB | | ▪ | | ▪ | | | | ▪ | ↓ | ▪ | ▪ | o | | o | | ↓ | o | o | | | ▪ | ▪ | | ↓ | | | ▪ | ▪ | | | | ↓ |
| 65A | Vikingneset | Blue mussel | SB | | ▪ | | ▪ | | | | ▪ | ↓ | ▪ | ▪ | o | | o | | ↓ | o | o | | | ▪ | ▪ | | ↓ | | | ▪ | ▪ | | | | ↓ |
| 69A | Lille Terøy | Blue mussel | SB | | ▪ | | ▪ | | | | o | ↓ | ▪ | ▪ | o | | o | | ↓ | o | o | | | ▪ | ▪ | | ↓ | | | ▪ | ▪ | | | | ↓ |
| 71A | Bjørkøya | Blue mussel | SB | | ▪ | | ▪ | | | | ↓ | ↓ | ▪ | ▪ | o | | o | | o | ↓ | ↓ | | | ▪ | ▪ | | ↓ | | | ▪ | ▪ | ↓ | o | | ↓ |
| 73A | Lyngholmen | Blue mussel | SB | | ▪ | | ▪ | | | | ▪ | ▪ | ▪ | ▪ | ▪ | | ▪ | | ▪ | ▪ | ▪ | | | ▪ | ▪ | | ▪ | | | ▪ | ▪ | | | | ▪ |
| 76A | Risøy | Blue mussel | SB | | ▪ | | ▪ | | | | ↓ | o | ▪ | ▪ | o | | o | | ↓ | o | o | | | ▪ | ▪ | | o | | | ▪ | ▪ | ↓ | o | | o |
| 77A | Nordstrand | Blue mussel | SB | | ▪ | | ▪ | | | | ▪ | ▪ | ▪ | ▪ | ▪ | | ▪ | | ▪ | ▪ | ▪ | | | ▪ | ▪ | | ▪ | | | ▪ | ▪ | | | | ▪ |
| 79A | Gjerdsvoldsøyen | Blue mussel | SB | | ▪ | | ▪ | | | | ▪ | ▪ | ▪ | ▪ | ▪ | | ▪ | | ▪ | ▪ | ▪ | | | ▪ | ▪ | | ▪ | | | ▪ | ▪ | | | | ▪ |

| Station | Station | Medium | Tissue | VDSI | Ag | ALAD | As | BA | B[a]P | BDE | ∑PCB-7 | Cd | Co | Cr | Cu | CYP1A | ppDDE | EROD | HCHG | HCB | Hg | KPAH | Mo | Ni | OCS | PAH | Pb | PFOS | PYR1O | QCB | Sn | TBT | TCDDN | V | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 98A2 | Husvaagen area | Blue mussel | SB | | ▪ | | ▪ | | | | o | ↓ | ▪ | ▪ | o | | o | | ↓ | o | o | | | ▪ | ▪ | | ↓ | | | ▪ | ▪ | ↓ | | | o |
| I022 | West Damholmen | Blue mussel | SB | | ▪ | | ▪ | | | | ▪ | o | ▪ | ▪ | ▪ | | ↓ | | ▪ | o | o | | | ▪ | ▪ | | o | | | ▪ | ▪ | | | | ▪ |
| I023 | Singlekalven | Blue mussel | SB | | ▪ | | ▪ | | | | ↓ | o | ▪ | ▪ | ▪ | | ↓ | | ▪ | o | o | | | ▪ | ▪ | | o | | | ▪ | ▪ | | | | ▪ |
| I024 | Kirkøy | Blue mussel | SB | | ▪ | | ▪ | | | | ↓ | o | ▪ | ▪ | ▪ | | ↓ | | ▪ | o | o | | | ▪ | ▪ | | o | | | ▪ | ▪ | | | | ▪ |
| I131A | Lastad | Blue mussel | SB | | ▪ | | ▪ | | o | | o | o | ▪ | ▪ | ▪ | | o | | ▪ | ↑ | o | o | | ▪ | ▪ | o | ▪ | | | ▪ | ▪ | | | | ▪ |
| I132 | Svensholmen | Blue mussel | SB | | ▪ | | ▪ | | o | | o | ▪ | ▪ | ▪ | ▪ | | o | | ▪ | o | ▪ | o | | ▪ | ▪ | o | ▪ | | | ▪ | ▪ | o▪ | o | | ▪ |
| I133 | Odderø (west) | Blue mussel | SB | | ▪ | | ▪ | | o | | ▪ | ▪ | ▪ | ▪ | ▪ | | o | | ▪ | ↓ | ▪ | o | | ▪ | ▪ | o | ▪ | | | ▪ | ▪ | o▪ | o | | ▪ |
| I201 | Ekkjegrunn (G1) | Blue mussel | SB | | ▪ | | ▪ | | ↓ | | | o | ▪ | ▪ | ▪ | | | | | | o | ↓ | | ▪ | | ↓ | o | | | | ▪ | | | | ▪ |
| I205 | Bølsnes (G5) | Blue mussel | SB | | ▪ | | ▪ | | o | | | o | ▪ | ▪ | ▪ | | | | | | o | o | | ▪ | | ↓ | o | | | | ▪ | | | | ▪ |
| I241 | Nordnes | Blue mussel | SB | | ▪ | | ▪ | | | | o | ▪ | ▪ | ▪ | ▪ | | o | | ▪ | ↑ | ▪ | | | ▪ | ▪ | | ▪ | | | ▪ | ▪ | | | | ▪ |
| I242 | Gravdalsneset | Blue mussel | SB | | ▪ | | ▪ | | | | o | ▪ | ▪ | ▪ | ▪ | | o | | ▪ | ↓ | ▪ | | | ▪ | ▪ | | ▪ | | | ▪ | ▪ | | | | ▪ |
| I243 | Hegreneset | Blue mussel | SB | | ▪ | | ▪ | | | | o | ▪ | ▪ | ▪ | ▪ | | o | | ▪ | o | ▪ | | | ▪ | | | ▪ | | | ▪ | ▪ | | | | ▪ |
| I301 | Akershuskaia | Blue mussel | SB | | ▪ | | ▪ | | o | | ↓ | o | ▪ | ▪ | ▪ | | o | | ▪ | o | ↑ | o | | ▪ | ▪ | o | o | | | ▪ | ▪ | ↓ | | | ▪ |
| I304 | Gåsøya | Blue mussel | SB | | ▪ | | ▪ | | o | | o | o | ▪ | ▪ | ▪ | | o | | ▪ | o | o | o | | ▪ | ▪ | o | o | | | ▪ | ▪ | | | | ▪ |
| I306 | Håøya | Blue mussel | SB | | ▪ | | ▪ | | ↑ | | o | o | ▪ | ▪ | ▪ | | o | | ▪ | o | o | o | | ▪ | ▪ | o | o | | | ▪ | ▪ | | | | ▪ |
| I307 | Ramtonholmen | Blue mussel | SB | | ▪ | | ▪ | | ↑ | | ↓ | ↑ | ▪ | ▪ | ▪ | | o | | ▪ | o | o | o | | ▪ | ▪ | o | o | | | ▪ | ▪ | | | | ▪ |
| I712 | Gjemesholmen | Blue mussel | SB | | ▪ | | ▪ | | | | ↓ | ▪ | ▪ | ▪ | ▪ | | o | | ▪ | o | o | | | ▪ | ▪ | | ▪ | | | ▪ | ▪ | ↓ | o | | ▪ |
| I713 | Strømtangen | Blue mussel | SB | | ▪ | | ▪ | | | | o | ▪ | ▪ | ▪ | ▪ | | o | | ▪ | o | o | | | ▪ | ▪ | | ▪ | | | ▪ | ▪ | ↓ | o | | ▪ |
| I912 | Honnhammer | Blue mussel | SB | | | | | | o | | | | | | | | | | | | | ↓ | | | | ↓ | | | | | | | | | |
| I913 | Fjøseid | Blue mussel | SB | | | | | | o | | | | | | | | | | | | | ↓ | | | | ↓ | | | | | | | | | |
| I915 | Flåøya | Blue mussel | SB | | | | | | | | | | | | | | | | | | | ▪ | | | | ▪ | | | | | | | | | |
| I964 | Toraneskaien (B4) | Blue mussel | SB | | ▪ | | ▪ | | o | | | o | ▪ | ▪ | ▪ | | | | | | o | o | | ▪ | | o | o | | | | ▪ | | | | ▪ |
| I965 | Moholmen (B5) | Blue mussel | SB | | ▪ | | ▪ | | o | | | o | ▪ | ▪ | ▪ | | | | | | o | o | | ▪ | | o | o | | | | ▪ | | | | ▪ |
| I969 | Bjørnbærviken (B9) | Blue mussel | SB | | ▪ | | ▪ | | o | | | o | ▪ | ▪ | ▪ | | | | | | o | o | | ▪ | | o | o | | | | ▪ | | | | ▪ |
| 10B | Varangerfjorden | Cod | LI | | ▪ | | ▪ | | | | ↓ | ↓ | ▪ | ▪ | ▪ | | ↓ | | ↓ | ↓ | | | | ▪ | ▪ | | ↓ | | | ▪ | ▪ | | | | ▪ |
| 10B | Varangerfjorden | Cod | MU | | | | | | | | o | | | | | | ▪ | | o | ▪ | ↓ | | | | ▪ | | | | | ▪ | | | | | |
| 13BH | Kristiansand harbour | Cod | LI | | ▪ | | ▪ | | | ▪ | ▪ | ▪ | ▪ | ▪ | ▪ | | ▪ | | ▪ | ▪ | | | | ▪ | ▪ | | ▪ | ▪ | | ▪ | ▪ | | | | ▪ |
| 13BH | Kristiansand harbour | Cod | MU | | | | | | | | ▪ | | | | | | ▪ | | ▪ | ▪ | ▪ | | | | ▪ | | | | | ▪ | | | | | |
| 15B | Ullerø area | Cod | BI | | | | | | | | | | | | | | | | | | | | | | | | | | o | | | | | | |
| 15B | Ullerø area | Cod | LI | | ▪ | | ▪ | | | | ↓▪ | o▪ | ▪ | ▪ | ▪ | | o▪ | | ↓ | ▪ | | | | ▪ | ▪ | | ↓▪ | | | ▪ | ▪ | | | | ▪ |
| 15B | Ullerø area | Cod | MU | | | | | | | | o | | | | | | ▪ | | o | ▪ | o | | | | ▪ | | | | | ▪ | | | | | |
| 23B | Karihavet area | Cod | BI | | | | | | | | | | | | | | | | | | | | | | | | | | o | | | | | | |
| 23B | Karihavet area | Cod | BL | | | o | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Station | Station | Medium | Tissue | VDSI | Ag | ALAD | As | BA | B[a]P | BDE | ΣPCB-7 | Cd | Co | Cr | Cu | CYP1A | ppDDE | EROD | HCHG | HCB | Hg | KPAH | Mo | Ni | OCS | PAH | Pb | PFOS | PYR1O | QCB | Sn | TBT | TCDDN | V | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23B | Karihavet area | Cod | LI | | ■ | | ■ | | | ■ | ↓ | o | ■ | ■ | ■ | ■ | ↓ | o | ↓ | o | | | | ■ | ■ | | ↓ | ■ | | ■ | ■ | | | | ■ |
| 23B | Karihavet area | Cod | MU | | | | | | | | o | | | | | | o | | o | o | o | | | | ■ | | | | | ■ | | | | | |
| 30B | Oslo City area | Cod | BI | | | | | | | | | | | | | | | | | | | | | | | | | | o | | | | | | |
| 30B | Oslo City area | Cod | BL | | | o | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30B | Oslo City area | Cod | LI | | ■ | | ■ | | | ■ | o | ↑ | ■ | ■ | ■ | o | o | o | ↓ | ↓ | | | | ■ | ■ | | o | ■ | | ■ | ■ | | | | ■ |
| 30B | Oslo City area | Cod | MU | | | | | | | | o | | | | | | o | | o | ↓ | ↑ | | | | ■ | | | | | ■ | | | | | |
| 36B | Færder area | Cod | LI | | ■ | | ■ | | | ■ | ↓ | ↓ | ■ | ■ | ■ | | ↓ | | ↓ | ↓ | | | | ■ | ■ | | ↓ | ■ | | ■ | ■ | | | | ■ |
| 36B | Færder area | Cod | MU | | | | | | | | o | | | | | | o | | ↓ | ↓ | o | | | | ■ | | | | | ■ | | | | | |
| 43B | Kvænangen | Cod | LI | | | | ■ | | | ■ | ■ | ■ | | | ■ | | ■ | | ↓ | ■ | | | | ■ | ■ | | ↓ | ■ | | ■ | | | | | ■ |
| 43B | Kvænangen | Cod | MU | | | | | | | | | | | | | | | | | | ■ | | | | | | | | | | | | | | |
| 43BH | Tromsø harbour | Cod | LI | | ■ | | ■ | | | ■ | ■ | ■ | ■ | ■ | ■ | | ■ | | ■ | ■ | | | | ■ | ■ | | ■ | ■ | | ■ | ■ | | | | ■ |
| 43BH | Tromsø harbour | Cod | MU | | | | | | | | ■ | | | | | | ■ | | ■ | ■ | ■ | | | | ■ | | | | | ■ | | | | | |
| 53B | Inner Sørfjord | Cod | BI | | | | | | | | | | | | | | | | | | | | | | | | | | o | | | | | | |
| 53B | Inner Sørfjord | Cod | BL | | | o | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53B | Inner Sørfjord | Cod | LI | | ■ | | ■ | | | ■ | o | ↑ | ■ | ■ | ■ | o | o | o | ↓ | o | | | | ■ | ■ | | ↑ | ■ | | | ■ | | | | ■ |
| 53B | Inner Sørfjord | Cod | MU | | | | | | | | o | | | | | | o | | o | o | o | | | | ■ | | | | | ■ | | | | | |
| 67B | Strandebarm area | Cod | LI | | ■ | | ■ | | | | ↓ | ↓ | ■ | ■ | ■ | | ↓ | | ↓ | ↓ | | | | ■ | ■ | | ↓ | | | ■ | ■ | | | | ■ |
| 67B | Strandebarm area | Cod | MU | | | | | | | | o | | | | | | ↓ | | o | ↓ | ↓ | | | | ■ | | | | | ■ | | | | | |
| 77B | Borøy area | Cod | LI | | ■ | | ■ | | | | ■ | ■ | ■ | ■ | ■ | | ■ | | o | ■ | | | | ■ | ■ | | ↓ | | | ■ | ■ | | | | ■ |
| 77B | Borøy area | Cod | MU | | | | | | | | ■ | | | | | | ■ | | ↓ | ■ | ■ | | | | ■ | | | | | ■ | | | | | |
| 80BH | Munkholmen | Cod | LI | | ■ | | ■ | | | ■ | ■ | ■ | ■ | ■ | ■ | | ■ | | ■ | ■ | | | | ■ | ■ | | ■ | ■ | | ■ | ■ | | | | ■ |
| 80BH | Munkholmen | Cod | MU | | | | | | | | ■ | | | | | | ■ | | ■ | ■ | ■ | | | | ■ | | | | | ■ | | | | | |
| 92B | Stokken area | Cod | LI | | | | | | | ■ | ■ | ■ | | | ■ | | ■ | | ↓ | ■ | | | | | ■ | | ■ | ■ | | ■ | | | | | ■ |
| 92B | Stokken area | Cod | MU | | | | | | | | | | | | | | | | | | ■ | | | | | | | | | | | | | | |
| 98B1 | Bjørnerøya | Cod | LI | | ■ | | ■ | | | ■ | ↓ | o | ■ | ■ | ■ | | ↓ | | ↓ | ↓ | | | | ■ | ■ | | ↓ | ■ | | ■ | ■ | | | | ■ |
| 98B1 | Bjørnerøya | Cod | MU | | | | | | | | o | | | | | | o | | o | ↓ | o | | | | ■ | | | | | ■ | | | | | |
| 15F | Ullerø area | Dab | LI | | ■ | | ■ | | | | o | o | ■ | ■ | ■ | | o | | ■ | o | | | | ■ | ■ | | o | | | ■ | ■ | | | | ■ |
| 15F | Ullerø area | Dab | MU | | | | | | | | o | | | | | | ■ | | ■ | ■ | ↑ | | | | ■ | | | | | ■ | | | | | |
| 21F | Åkrafjord | Dab | LI | | ■ | | ■ | | | | ↓ | o | ■ | ■ | ■ | | ↓ | | ■ | o | | | | ■ | ■ | | ↑ | | | ■ | ■ | | | | ■ |
| 21F | Åkrafjord | Dab | MU | | | | | | | | o | | | | | | o | | ■ | o | o | | | | ■ | | | | | ■ | | | | | |
| 36F | Færder area | Dab | LI | | ■ | | ■ | | | | o | o | ■ | ■ | ■ | | o | | ■ | ↓ | | | | ■ | ■ | | ↓ | | | ■ | ■ | | | | ■ |
| 36F | Færder area | Dab | MU | | | | | | | | ↑ | | | | | | o | | ■ | ↓ | o | | | | ■ | | | | | ■ | | | | | |
| 77F | Borøy area | Dab | LI | | ■ | | ■ | | | | ■ | ■ | ■ | ■ | ■ | | ■ | | ■ | ■ | | | | ■ | ■ | | ■ | | | ■ | ■ | | | | ■ |

| Station | Station | Medium | Tissue | VDSI | Ag | ALAD | As | BA | B[a]P | BDE | ∑PCB-7 | Cd | Co | Cr | Cu | CYP1A | ppDDE | EROD | HCHG | HCB | Hg | KPAH | Mo | Ni | OCS | PAH | Pb | PFOS | PYR1O | QCB | Sn | TBT | TCDDN | V | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 77F | Borøy area | Dab | MU | | | | | | | | ■ | | | | | | ■ | | ■ | ■ | ■ | | | | ■ | | | | | ■ | | | | | |
| 11G | Brashavn | Dogwhelk | SB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ↓ | | | |
| 11G | Brashavn | Dogwhelk | WO | o | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 131G | Lastad | Dogwhelk | SB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ↓ | | | |
| 131G | Lastad | Dogwhelk | WO | ↓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15G | Gåsøy (Ullerø) | Dogwhelk | SB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ↓ | | | |
| 15G | Gåsøy (Ullerø) | Dogwhelk | WO | ↓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 227G1 | Melandholmen | Dogwhelk | SB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | o | | | |
| 227G1 | Melandholmen | Dogwhelk | WO | ↓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22G | Espevær | Dogwhelk | SB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | o | | | |
| 22G | Espevær | Dogwhelk | WO | ↓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36G | Færder | Dogwhelk | SB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ↓ | | | |
| 36G | Færder | Dogwhelk | WO | ↓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 71G | Fugløyskjær | Dogwhelk | SB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | o | | | |
| 71G | Fugløyskjær | Dogwhelk | WO | ↓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 74G | Langholmane | Dogwhelk | SB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 74G | Langholmane | Dogwhelk | WO | ■ | | | | | | | | | | | | | | | | | | | | | | | | | | | | ■ | | | |
| 76G | Risøy | Dogwhelk | SB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | o | | | |
| 76G | Risøy | Dogwhelk | WO | ↓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 98G | Svolvær area | Dogwhelk | SB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ↓ | | | |
| 98G | Svolvær area | Dogwhelk | WO | o | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33F | Sande | Flounder | LI | | ■ | | ■ | | | | o | ↓ | ■ | ■ | ■ | | o | | o | o | | | | ■ | ■ | | ↓ | | | ■ | ■ | | | | ■ |
| 33F | Sande | Flounder | MU | | | | | | | | o | | | | | | o | | ↓ | o | ↓ | | | | ■ | | | | | ■ | | | | | |
| 53F | Inner Sørfjord | Flounder | LI | | ■ | | ■ | | | | ↓ | o | ■ | ■ | ■ | | o | | ↓ | ↓ | | | | ■ | ■ | | o | | | ■ | ■ | | | | ■ |
| 53F | Inner Sørfjord | Flounder | MU | | | | | | | | ↓ | | | | | | ↓ | | ↓ | ↓ | ↑ | | | | ■ | | | | | ■ | | | | | |
| 67F | Strandebarm area | Flounder | LI | | ■ | | ■ | | | | ↓ | ↓ | ■ | ■ | ■ | | o | | ■ | o | | | | ■ | ■ | | ↓ | | | ■ | ■ | | | | ■ |
| 67F | Strandebarm area | Flounder | MU | | | | | | | | ↓ | | | | | | ↓ | | ↓ | o | ↓ | | | | ■ | | | | | ■ | | | | | |
| 21F | Åkrafjord | Megrim | LI | | ■ | | ■ | | | | o | o | ■ | ■ | o | | o | | o | o | | | | ■ | ■ | | ■ | | | ■ | ■ | | | | ■ |
| 21F | Åkrafjord | Megrim | MU | | | | | | | | ■ | | | | | | o | | o | o | o | | | | ■ | | | | | ■ | | | | | |
| 67F | Strandebarm area | Megrim | LI | | ■ | | ■ | | | | ↓ | ↓ | ■ | ■ | ■ | | ↓ | | ↓ | ↓ | | | | ■ | ■ | | ↓ | | | ■ | ■ | | | | ■ |
| 67F | Strandebarm area | Megrim | MU | | | | | | | | o | | | | | | ↓ | | ■ | ↓ | ↓ | | | | ■ | | | | | ■ | | | | | |
| 10F | Skogerøy | Plaice | LI | | ■ | | ■ | | | | o | o | ■ | ■ | ■ | | ↓ | | ■ | ↓ | | | | ■ | ■ | | ↓ | | | ■ | ■ | | | | ■ |
| 10F | Skogerøy | Plaice | MU | | | | | | | | o | | | | | | ↓ | | ■ | ↓ | o | | | | ■ | | | | | ■ | | | | | |

| Station | Station | Medium | Tissue | VDSI | Ag | ALAD | As | BA | B[a]P | BDE | ∑PCB-7 | Cd | Co | Cr | Cu | CYP1A | ppDDE | EROD | HCHG | HCB | Hg | KPAH | Mo | Ni | OCS | PAH | Pb | PFOS | PYR1O | QCB | Sn | TBT | TCDDN | V | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 98F2 | Husholmen | Plaice | LI | | ▪ | | ▪ | | | | ↓▪ | ○▪ | ▪ | ▪ | ▪ | | ↓▪ | | ○ | ○▪ | | | | ▪ | ▪ | | ○▪ | | | ▪ | ▪ | | | | ▪ |
| 98F2 | Husholmen | Plaice | MU | | | | | | | | ○▪ | | | | | | ○▪ | | ○ | ○▪ | ○▪ | | | | ▪ | | | | | ▪ | | | | | |

## 4.3. Areas of special concern (Impacted)

### Oslofjord/Hvaler/Grenlandsfjord area and Sørfjord/Hardangerfjord area

This report focus on two main areas of special concern; the Oslofjord/Hvaler/Grenlandsfjord area, and the Sørfjord/Hardangerfjord area. 170 time series concerned the Oslofjord area, including the Hvaler area and Grenlandsfjord area. In 2009, 144 of these had a concentrations that could be classified as insignificantly polluted (Class I), or did not exceed provisional "high background". There were 69 significant trends, and 57 of these were downwards. 169 time series had data from the Sørfjord and Hardangerfjord area in 2009. Of these time series, 69 were downwards and six were upwards.

### Oslofjord/Hvaler/Grenlandsfjord area

The investigations for the Oslofjord/Hvaler/Grenlandsfjord area in 2009 included 17 blue mussel stations one flounder station, two cod stations and one dogwhelk station. Points of concern are described below.

**Mercury (Hg)**
There was significant upward trend for Hg in cod fillet from the Inner Oslofjord (st. 30B) for the entire sampling period (1984-2009) but no trend was found recently, for the period 2000-2009. Cod fillet from the Inner Oslofjord was moderately polluted (Class II) by Hg (Figure 24). Cod from the outer part of the Oslofjord, (Færder, st. 36B), was insignificantly polluted by Hg.

Blue mussel from Damholmen (st. I022) was moderately polluted by Hg, but had no significant trend. Two upward trends were found in blue mussel from the mid Oslofjord at Solbergstrand (st. 31A) and the Inner Oslofjord at Akershuskaia (st. I301), however concentrations in 2009 were low (Class I). The other blue mussel stations in the Oslofjord area were insignificantly polluted by Hg.

The concentrations of mercury in fillet of cod from Inner Oslofjord (st. 30B) is similar to the concentrations found in Bekkelagsbassenget and Frognerkilen in 2006, inner basin and Bekkelagsbassenget (1997 and 1998), and Hvervenbukta and Breivold/Bunnefjorden in 1997 and 1998 (Berge 2009). The discharge of mercury in Norway has been reduced by 60 % from 1995 to 2005. From 2008 products containing mercury was prohibited in Norway. In 2009 a survey of contaminants in freshwater fish in Norway revealed very high concentrations of mercury (Fjeld and Rognerud 2009). This increase was unexpected as the atmospheric mercury depositions most likely have decreased in southeast Norway since the beginning of the 1990s. Mercury in fish exists mainly as methyl mercury, and factors stimulating the mercury methylation, such as warmer and wetter climate and also forestry lumbering, may have contributed to the observed increase. This might also be the case for the contamination of cod in the Oslofjord. The mechanism for the increase of Hg in fish in Norway is not fully understood. An alternative explanation might be the increasing trends in dissolved organic carbon (DOC) that have been shown in surface waters in Norway (De Wit *et al.* 2007) and boreal areas elsewhere in North America and Europe (Monteith *et al.* 2007) which were attributed to a decline in sulphate deposition. The DOC is derived from soil organic material and may act as a carrier for organic pollutants (Ding and Wu 1997). Thus, the increase in DOC would contribute to increased transport of Hg sorbed to dissolved humic substances and wash-out to the fjord.

**Cadmium (Cd)**
There was a significant upward trend for Cd in cod liver from the Inner Oslofjord (st. 30B). The concentrations were above presumed high background level (Figure 25). Cod from the Færder area (st. 36B) had concentrations of Cd that were below presumed high background level, and showed a downward trend. Blue mussel from Fugleskjær (st. 02A) in the Hvaler area were moderately polluted by Cd. Blue mussel from Gressholmen (st. 30A), Ramtonholmen (st. I307), Solbergstrand (st. 31A) and Mølen (st. 35A) were insignificantly/slightly polluted (Class I) by Cd but had upward trends. Blue mussel from Bjørkøya (st. 71A) was insignificantly polluted by Cd and had a significant downward trend.

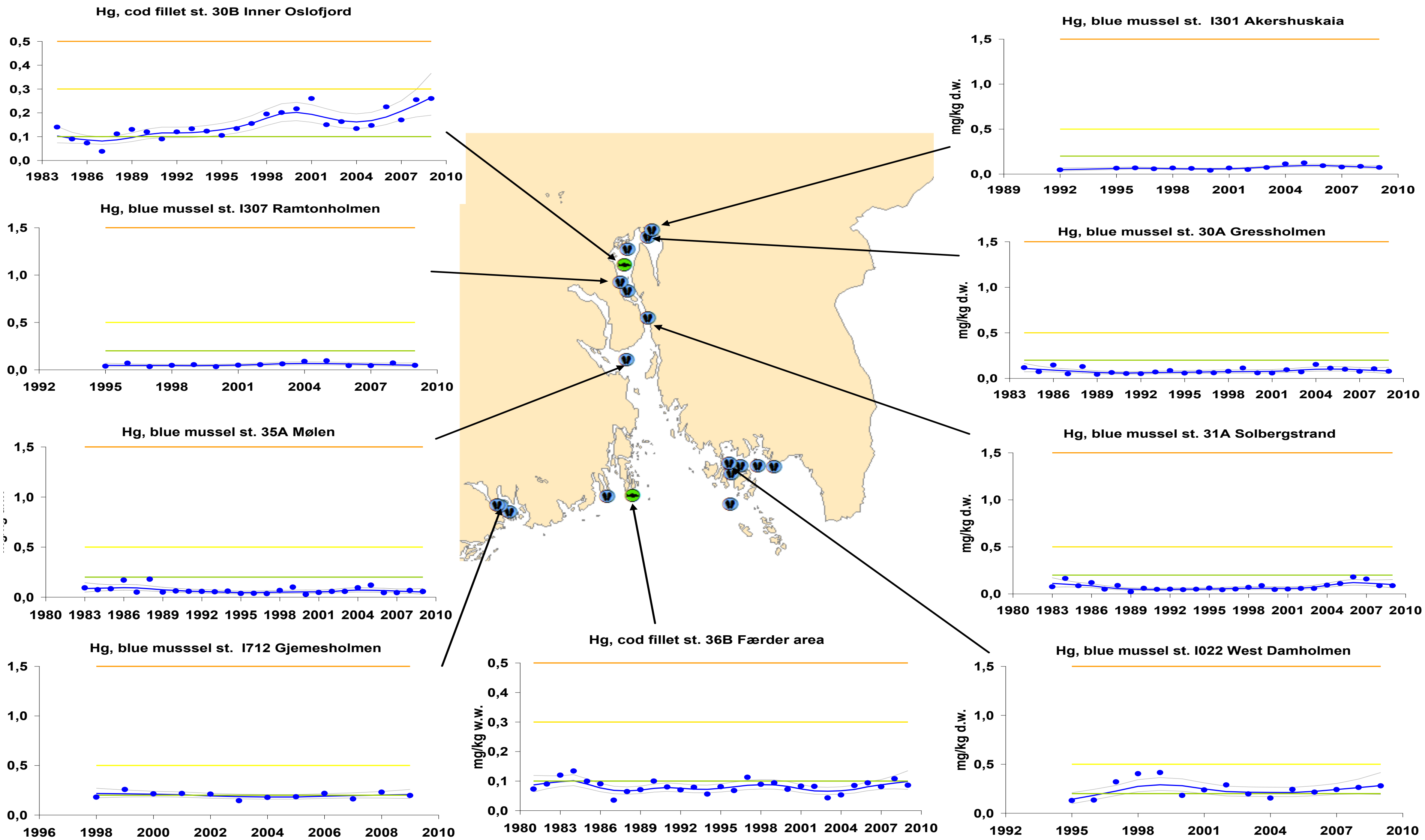


**Figure 24.** *Trend for median Hg concentrations in cod and blue mussel from the Oslofjord area (cf. Appendix J and Appendix I, see otherwise key to detail in Figure 2).*

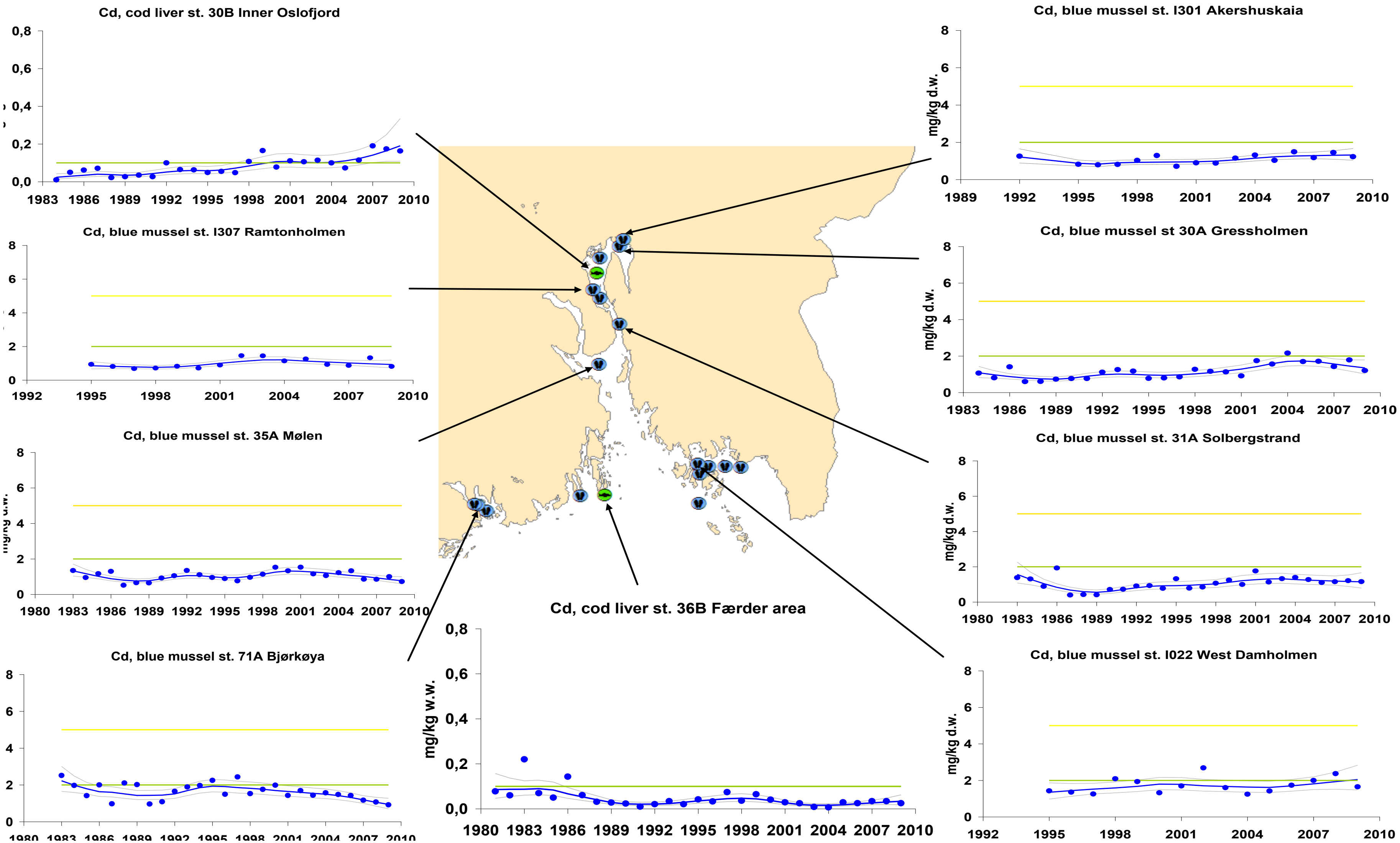


***Figure 25.*** *Trend for median Cd concentrations in cod and blue mussel from the Oslofjord area (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

**Lead (Pb)**
The concentrations of Pb in cod liver exceeded presumed high background level in the Inner Oslofjord (st. 30B). The concentrations of Pb in cod liver from the Inner Oslofjord has been high most of the years since 1989 (Figure 26). Cod from the Færder area (st. 36B) did not have elevated concentrations of Pb in the liver. The concentrations of Pb in blue mussel from Gressholmen (st. 30A) were slightly lower than in 2008, and was in Class I. The other blue mussel stations in the Oslofjord area were insignificantly polluted by Pb (Class I).

**Polychlorinated biphenyls (ΣPCB-7)**
Cod liver from the Inner Oslofjord was markedly polluted by PCBs, as it has been for many years (Figure 27). The concentrations of ΣPCB-7 in cod fillet had increased since 2008, and was in 2009 markedly polluted (Class III). Though no trend was detected in cod filet, either on a wet weight (standard for this investigation) or a lipid weight basis (results not shown) for the entire sampling period (1990-2009), a significant upward trend for the period 2000-2009 was found (on a wet weight basis, cf. Appendix J). Cod from the Færder area (st. 36B) was not polluted by PCBs. Blue mussel from Akershuskaia (st. I301), Gressholmen (st. 30A) and Ramtonholmen (st. I307) was moderately polluted (Class II) by ΣPCB-7. There were significant downward trends for ΣPCB-7 at these three stations. However, no trend was detected at Gressholmen for the period 2000-2009. The other blue mussel stations in the Oslofjord area were insignificantly/slightly polluted (Class I) by PCBs.

The Norwegian Food Safety Authority (*Mattilsynet*) has issued advice against consumption of eel and fish liver from the Inner Oslofjord due to high concentrations of PCBs. Blue mussel are found in shallow water, and are filter-feeders. Cod are found in the whole water body, and feed on fish, prawns and benthic fauna. Cod will therefore bioaccumulate contaminants like PCBs from sediments to a higher extent than blue mussel. This might be the reason for the observed differences in trends for ΣPCB-7 in blue mussel and cod. An alternative explanation might be the increasing trends in dissolved DOC that would contribute to increased transport of organochlorines sorbed to dissolved humic substances, like explained for Hg.

From 2006 to 2008 approximately 440 000 $m^3$ polluted sediment was dredged from the harbour area in the Inner Oslofjord. Monitoring of contaminants in blue mussel in this period showed relatively high levels of PCBs (Class II-III) but no significant increase. Berge *et al.* (2009) concluded that the dredging activity probably was not the most important explanation for the observed elevated concentrations of contaminants in blue mussel in the harbour area. Berge (in prep. 2010) noted the concentrations of HCB and, to a lesser degree PCBs, in cod liver from Frognerkilden and Bekkelaget was lower in 2009 compared to 2006. For the CEMP results, this was evident for HCB but not so for PCBs, which was higher in 2009 compared to 2006. Frognerkilden and Bekkelaget are closer to the Oslo harbour areas than the CEMP station (st. 30B) and differences in contaminant exposure may partly account for why HCB correlates well but not PCBs. It is surprising to find an increase of PCBs in cod liver and fillet from the Inner Oslofjord since polluted sediment has been removed from the harbour area and capped with clean sediments.

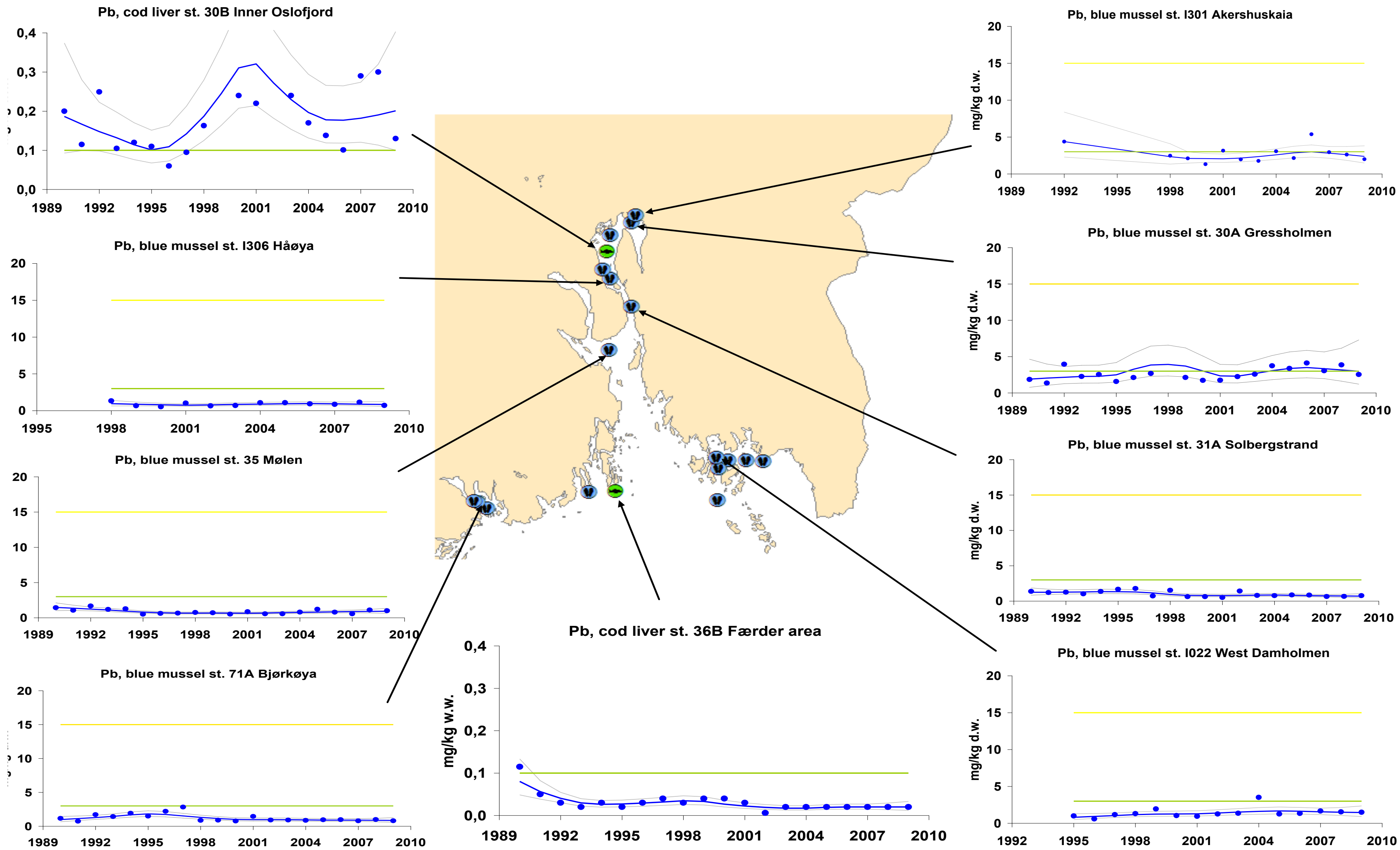


***Figure 26.*** *Trend for median Pb concentrations in cod liver and blue mussel from the Oslofjord area (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

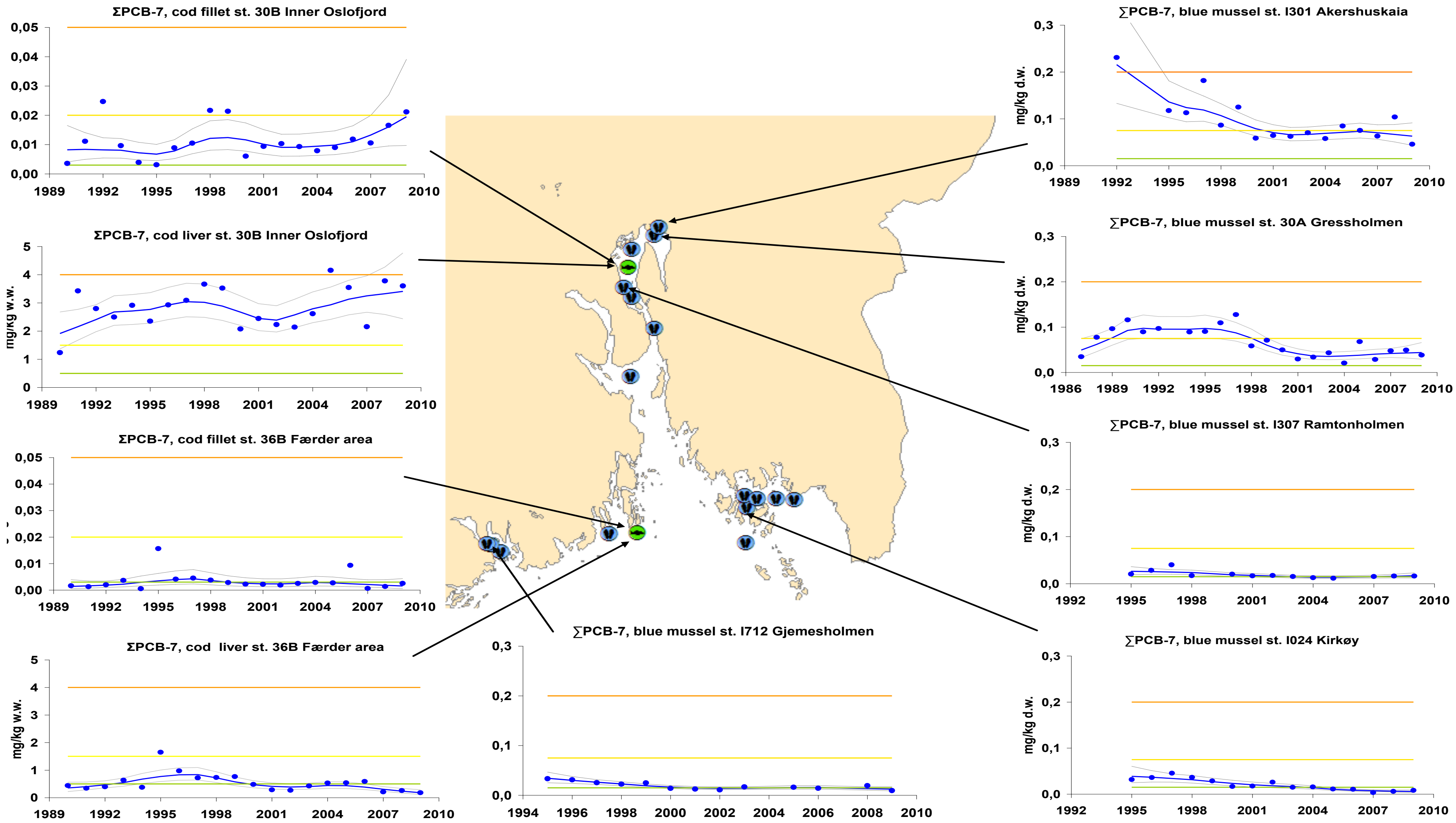


***Figure 27.*** *Trend for median ΣPCB-7 concentrations in cod and blue mussel from the Oslofjord area (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

**Hexachlorobenzene (HCB)**
Cod from both the Inner Oslofjord (st. 30B) and the Færder area (st. 36B) showed concentrations of HCB in the liver that was below presumed high background level (Figure 28). Blue mussel from Strømtangen (st. I713) in the Grenlandsfjord were markedly polluted (Class III) by HCB. Blue mussel from Gjemesholmen (st. I712), Bjørkøya (st. 71A), Akershuskaia (st. I301) and Solbergstrand (st. 31A) was moderately polluted (Class II) by HCB. There were significant downward trends for HCB in blue mussel at Solbergstrand and Bjørkøya. Blue mussel from the other stations in the Oslofjord area were insignificantly/ slightly polluted (Class I) by HCB.

**Dioxins (dioxin toxicity equivalents – Nordic model, TCDDN)**
Blue mussel from Bjørkøya (st. 71A), Gjemesholmen (st. I712) and Strømtangen (st. I713) in the Grenlandsfjord area were extremely polluted (Class V) by dioxins (Figure 29). The concentrations of dioxins have increased every year in blue mussel at Gjemesholmen (st. I712) since 2005. There was a tendency towards an increase also at Bjørkøya and Strømtangen, but there were no significant trends for any of these stations. Blue mussel from Gressholmen (st. 30A) and Risøy (st. 76A) were not polluted by dioxins.

Large reductions in the industrial effluents resulted in a strong decline in contaminant levels in fish and shellfish around 1990, but still the dioxin concentrations in seafood from the Grenlandsfjord is too high. Concentrations of dioxins in blue mussel showed no reduction in the Grenlandsfjord area from 1997 to 2007 (Bakke *et al.* 2009).

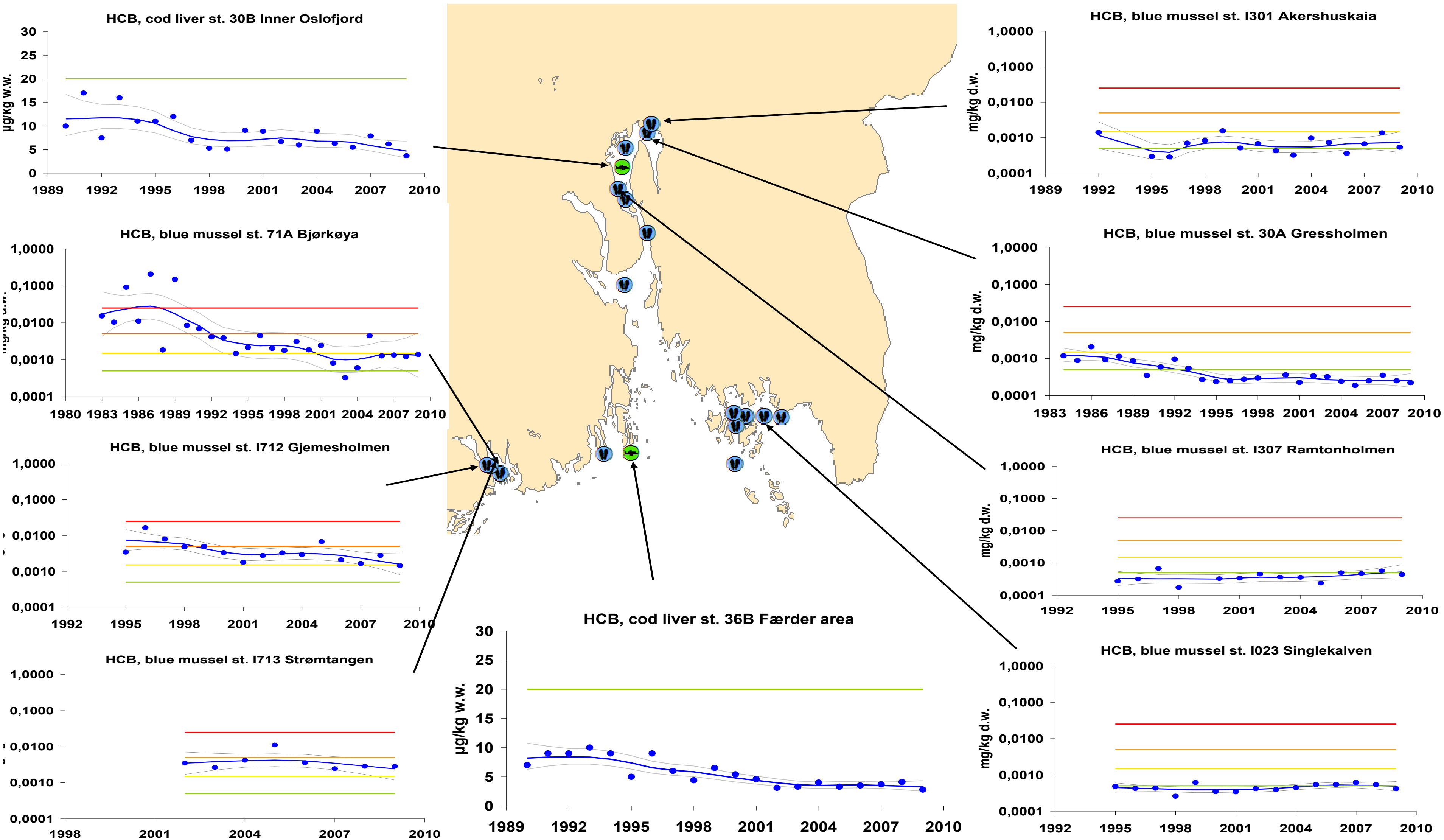


***Figure 28.*** *Trend for median HCB concentrations in cod and blue mussel from the Oslofjord area (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

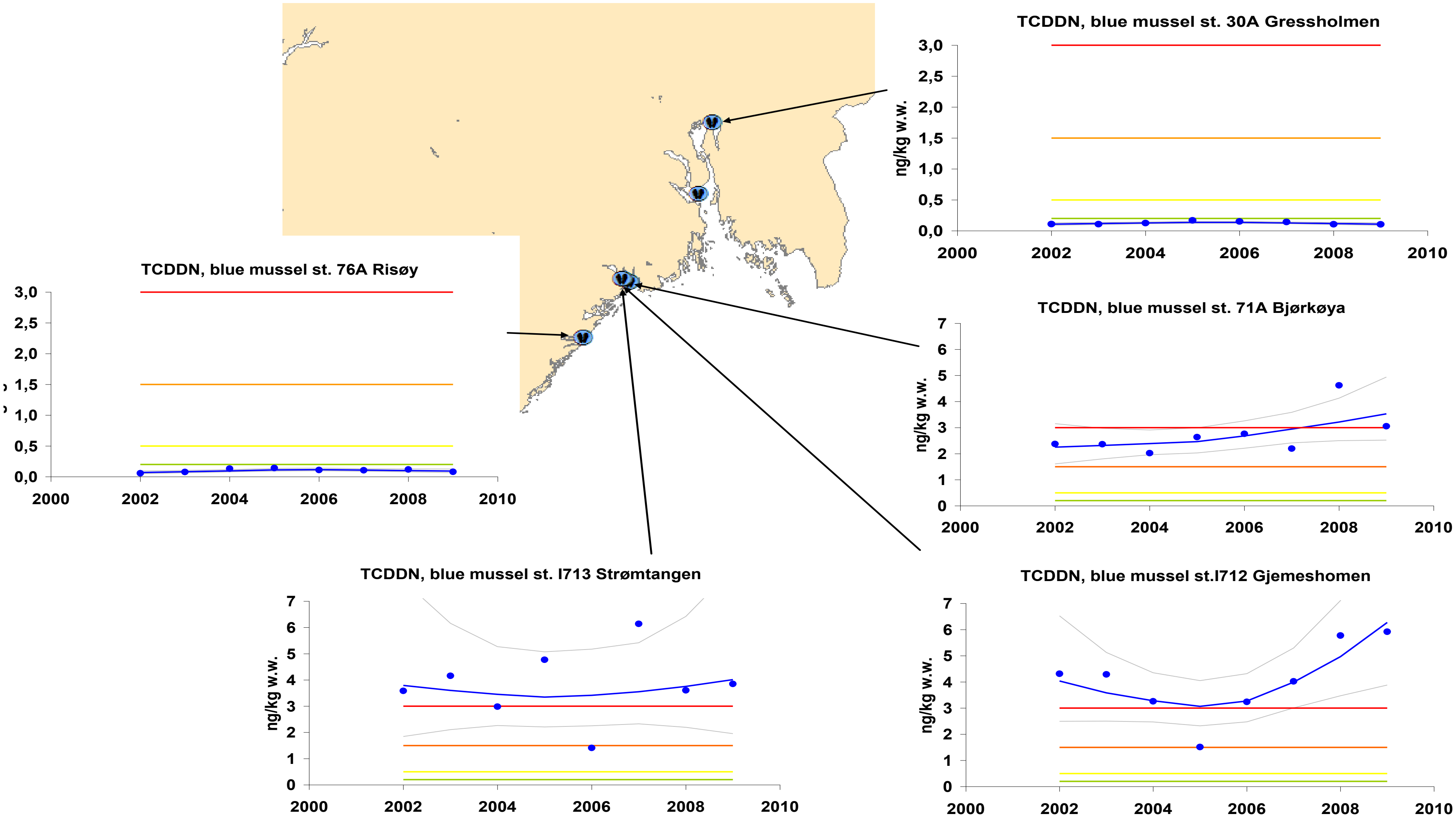


***Figure 29.*** *Trends and median concentrations for dioxins TCDDN-toxicity equivalents after Nordic model (TCDDN) in blue mussel, ng/kg TCDDN/kg from the Oslofjord area (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

## The Sørfjord and Hardangerfjord area

Investigations for 2009 in this area included seven blue mussel stations, two cod and three flatfish stations in the Sørfjord and Hardangerfjord area. Flounder were collected from Inner Sørfjord and both flounder and megrim were collected from the Hardangerfjord. Points of concern are described below.

**Mercury (Hg)**
Cod from the Inner Sørfjord (st. 53B) was moderately polluted (Class II) by Hg in the fillet (Figure 30). The median concentration of Hg in the fillet was approximately the same as in 2008 and there was no significant trend. Cod from Strandebarm (st. 67B) in the Hardangerfjord was insignificantly polluted by Hg.

Blue mussel from Kvalnes (st. 56A) in the mid part of the Sørfjord was moderately polluted by Hg, and showed a significant downward trend. Blue mussel from Byrkjenes was also moderately polluted by Hg. Blue mussel from Byrkjenes (st. 51A), Eitrheimsneset (st. 52A) and Krossanes (st. 57A) showed significant downward trends for 2000 to 2009. The other blue mussel stations in this area were only insignificantly/ slightly polluted (Class I) by Hg.

**Cadmium (Cd)**
Cod from the Inner Sørfjord (st. 53B) showed concentrations of Cd in the liver that exceeded presumed high background level (Figure 31). There was a significant upward trend for Cd in cod liver for this station. Cod from Strandebarm (st. 67B) in the Hardangerfjord had a significant downward trend and median concentration of Cd that was below presumed high background level.

Significant downward trends were found for Cd in blue mussel from Byrkjenes (st. 51A), Eitrheimsneset (st. 52A), Kvalnes (st. 56A) and Ranaskjær (st. 63A). These stations had blue mussel that were moderately polluted (Class II) by Cd. Blue mussel from Krossanes (st. 57A), Vikingneset (st. 65A) and Lille Terøy (st. 69A) were not polluted by Cd (Class I), and showed significant downward trends.

**Lead (Pb)**
Cod from the Inner Sørfjord (st. 53B) had concentrations of Pb in the liver that exceeded presumed high background level (Figure 32). The median concentration of Pb in cod liver had increased slightly compared to 2008, and there was a significant upward trend. Inhibition of ALA-D in cod is commonly observed in the Sørfjord as a result of the Pb exposure (c.f. chapter 4.5). Cod liver from Strandebarm (st. 67B) was not contaminated by Pb, the concentrations were below presumed high background level and there was a significant downward trend.

Blue mussel from Byrkjenes (st. 51A) and Kvalnes (st. 56A) were markedly polluted (Class III) by Pb. At both stations, the concentrations of Pb were slightly lower in 2009 than in 2008, and for Kvalnes it was a significant downward trend from 2000 to 2009. At the stations Eitrheimsneset (st. 52A), Krossanes (st. 57A), Ranaskjær (st. 63A) and Vikingneset (st. 65A) the blue mussel were moderately contaminated (Class II) by Pb and showed significant downward trends. Blue mussel from Lille Terøy (st. 69A) was insignificantly polluted (Class I) by Pb and had a significant downward trend.

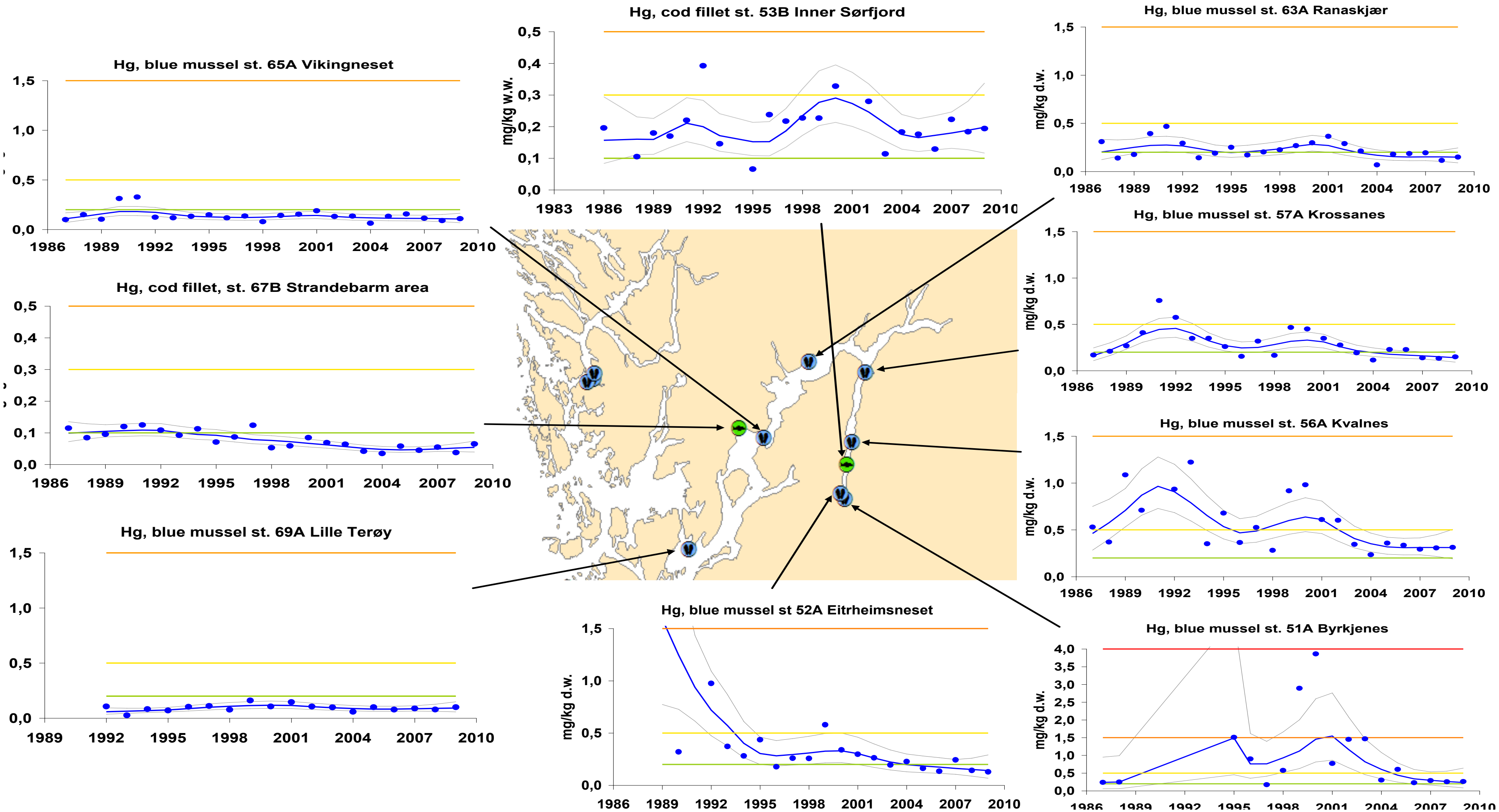


***Figure 30.*** *Trends and median concentrations for Hg in cod and blue mussel from the Sørfjord and Hardangerfjord area (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

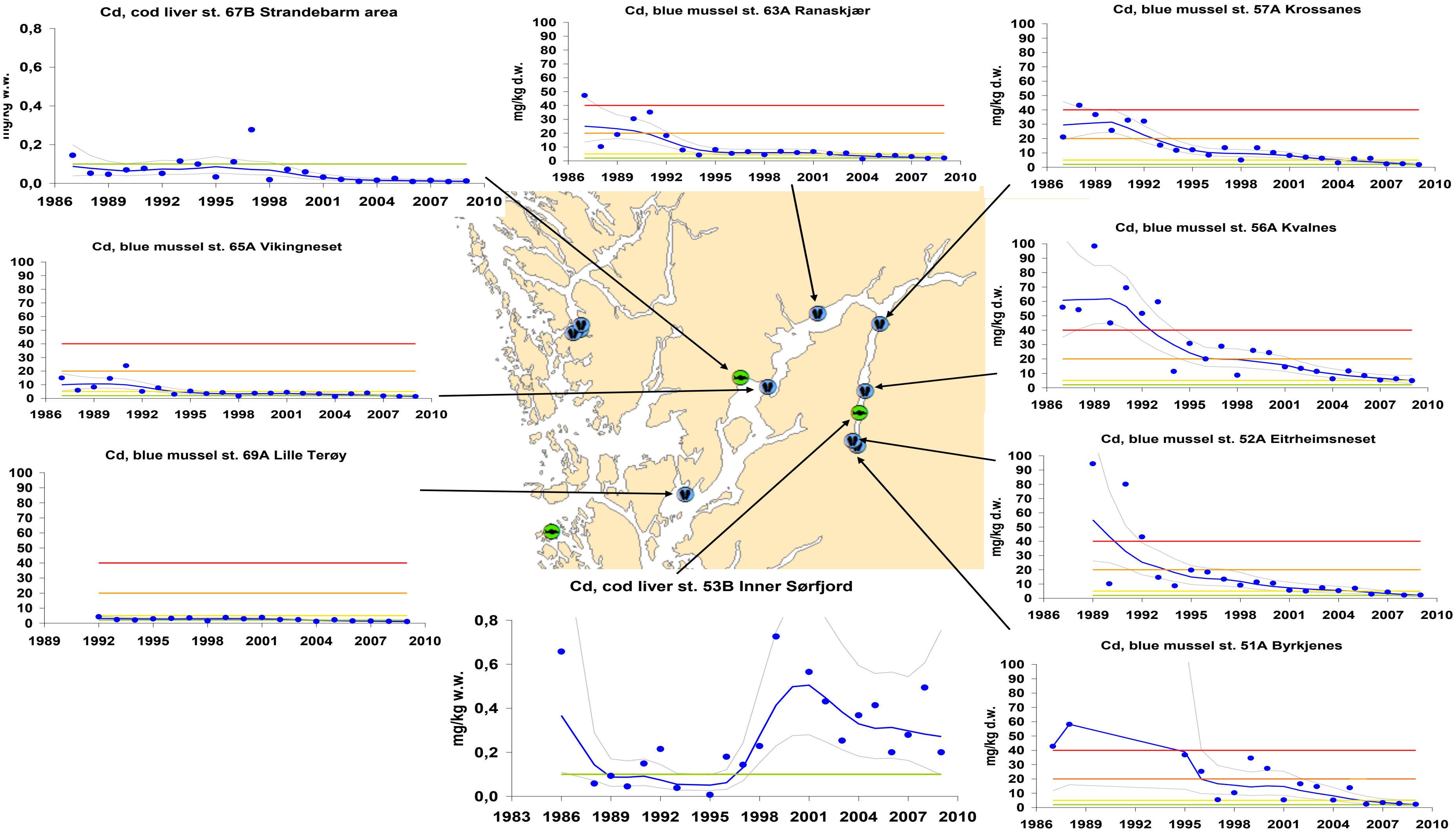


*__Figure 31.__ Trends and median concentrations of Cd in cod and blue mussel from the Sørfjord and Hardangerfjord area (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

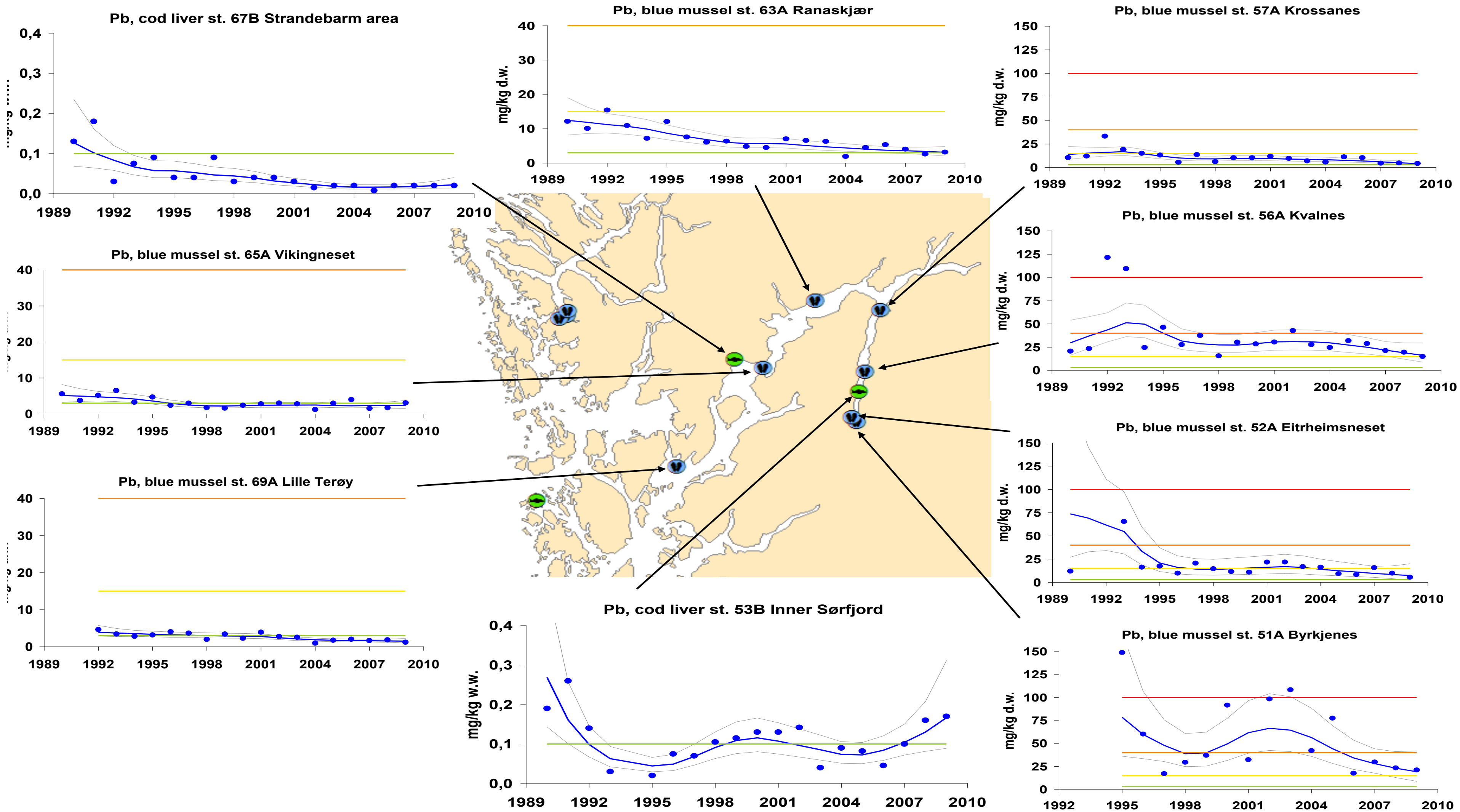


***Figure 32.*** *Median concentrations of Pb in cod and blue mussel from the Sørfjord and Hardangerfjord  area (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

**Polychlorinated biphenyls (ΣPCB-7)**
Liver of cod from the Inner Sørfjord (st. 53B) was insignificantly polluted (Class I) by ΣPCB-7 (Figure 33). The fillet of the same fish was however moderately polluted (Class II) by ΣPCB-7. Liver and fillet of cod from Strandebarm (st. 67B) in the Hardangerfjord were insignificantly polluted (Class I) by ΣPCB-7. There was a significant downward trend for ΣPCB-7 in cod liver from Strandebarm.

**Dichlorodiphenyldichloroethylene (ppDDE)**
Cod liver from the Inner Sørfjord (st. 53B) was moderately polluted (Class II, limits for ΣDDT) by ppDDE (Figure 34). Cod fillet from the Inner Sørfjord was also moderately polluted (Class II) by ppDDE. Both liver and fillet of cod from Strandebarm (st. 67B) in the Hardangerfjord were insignificantly polluted (Class I) by ppDDE, and showed significant downward trends.

Blue mussel from Kvalnes (st. 56A) and Krossanes (st. 57A) were markedly polluted (Class III) by ppDDE. Blue mussel from Kvalnes were less polluted by ppDDE in 2009 than in 2008, when they were classified as extremely polluted (Class V) by ppDDE. Blue mussel from Byrkjenes (st. 51A) was moderately polluted (Class II) by ppDDE. Farther out in the Hardangerfjord, at Vikingneset (st. 65A) and Lille Terøy (st. 69A), the blue mussel were insignificantly polluted (Class I) by ppDDE.

The Sørfjord area has a considerable number of fruit orchards and earlier use and persistence of DDT and leaching from contaminated soil is probably the main reason for the observed high concentrations of ppDDE in the Sørfjord area. It must however be noted that the use of DDT products have been prohibited in Norway since 1970. Green *et al.* (2004) concluded that the source of ppDDE was uncertain. Analyses of supplementary stations between Kvalnes (st. 56A) and Krossanes (st. 57A) in 1999 indicated that there could be several sources (Green *et al.* 2001). A more intensive investigation in 2002 with seven sampling stations confirmed that there were two main areas with high concentrations north of Kvalnes and near Urdheim south of Krossanes (Green *et al.* 2004). Skei *et al.* (2005) concluded that the variations in concentrations of ΣDDT and the ratio between p,p'-DDT/p,p'DDE (insecticide vs. metabolite) in blue mussel from Byrkjenes and Krossanes corresponds with periods with much precipitation and is most likely a result of wash-out from sources on shore. Botnen and Johansen (2006) set out passive samplers (SPMD- and PCC-18 samplers) at 12 locations along the Sørfjord to sample for DDT and its derivates in sea water. Blue mussel and sediments were also taken at fewer stations. The results indicated that further and more detailed surveys should be undertaken along the west side of the Sørfjord between Måge and Jåstad, and that replanting of old orchards might release DDT through erosion. Concentrations of ΣDDT in blue mussel in the Sørfjord in 2008 showed up to Class V (extremely polluted) at Utne and at Kvalnes (Ruus *et al.* 2009). There was high variability in the concentrations of ΣDDT in replicate samples from Utne, indicating that the station is affected by DDT-compounds in varying degree, dependent on local conditions. Increased ΣDDT-concentrations in blue mussel from the Sørfjord were discussed by Ruus *et al.* (2010). Possible explanations that were discussed were that an increase in DOC would contribute to increased transport of DDT sorbed to dissolved humic substances and wash-out to the fjord.

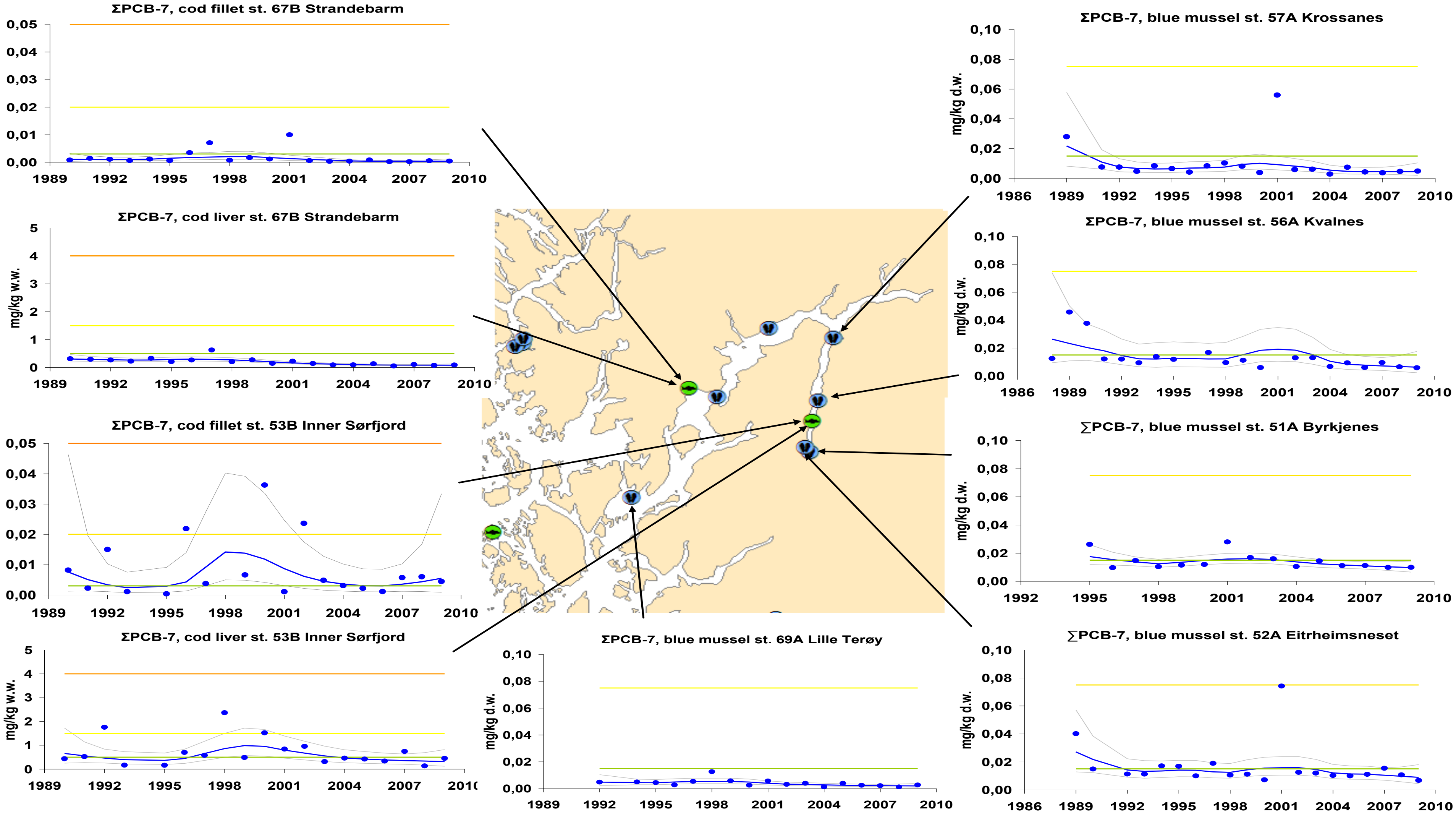


***Figure 33.*** *Median concentrations of ΣPCB-7 in cod and blue mussel from the Sørfjord and Hardangerfjord area (cf. Appendix I and Appendix J, see otherwise key to detail in Figure 2).*

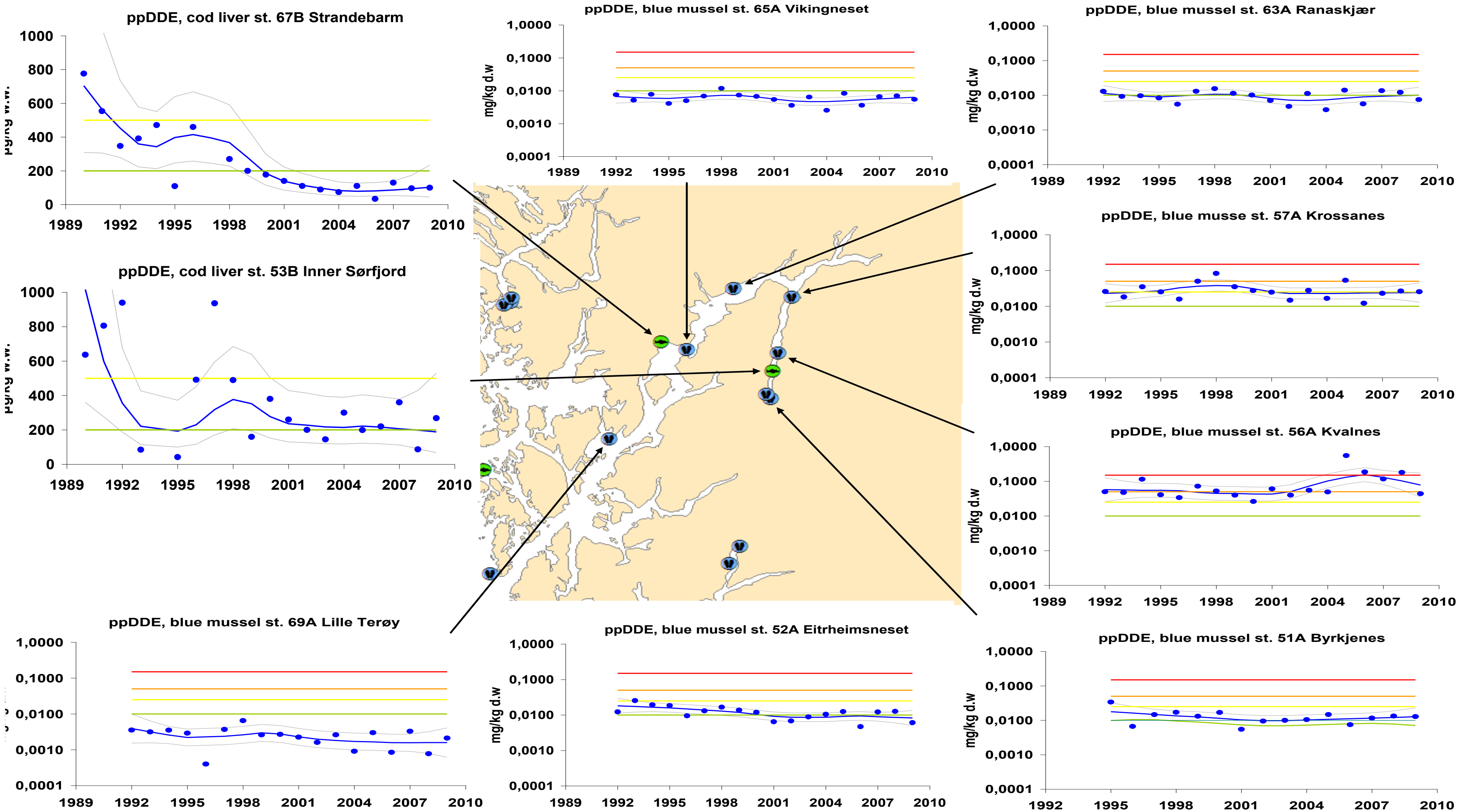


**Figure 34.** *Median concentrations of ppDDE in cod and blue mussel from the Sørfjord and Hardangerfjord area (cf. Appendix I and Appendix J and see otherwise key to map and detail in* Figure 2*).*

## Cod from harbour areas of Kristiansand, Trondheim and Tromsø

In 2009, CEMP included for the first time investigations of cod in Kristiansand, Trondheim and Tromsø harbours. Nineteen contaminants were analysed including 11 metals, organochlorines, PBDEs and PFCs (represented here by PFOS, perfluoroctonoic sulfonate). The classification systems applied in the study has not been developed to include arsenic, nickel, chromium, cobalt, tin, octachlorostyrene, pentachlorobenzene, PBDEs and PFCs. Points of concern are described below.

**Kristiansand harbour**
Both the liver and muscle of cod from Kristiansand harbour (st. 13BH)were markedly polluted with HCB (Klif's Class III). Both tissues were moderately polluted with ΣPCB-7 (Klif's Class II). The classification systems applied did not reveal any other elevated concentrations. Median concentrations of octachlorostyrene was 70 µg/kg w.w. and over 26 times higher than that found in the four other harbour areas. The reason for this has not been determined. PBDE was in the range found in the inner Oslofjord and the inner Sørfjord areas. The median concentration of PFOS was 9.0 mg/kg w.w. and about one fifth the concentrations found in the inner Oslofjord (48 µg/kg w.w.). The second most abundant PFC was perfluoroctanesulfonic acid (PFOSA) with a median concentration of 2.2 µg/kg w.w. The median concentrations of the remaining PFCs were below the limit of detection.

The Norwegian Food Safety Authority (*Mattilsynet*) has issued advice against consumption of fish from the Kristiansand harbour area due to high concentrations of organochlorines including dioxins (Appendix E).

**Trondheim harbour**
The liver of cod from Trondheim harbour (st. 80BH) were moderately polluted with HCB (Klif's Class II), however both tissues were moderately polluted with ΣPCB-7. The classification systems applied did not indicate any other elevated concentrations. PBDE and PFOS were in the range found in the inner Oslofjord and the inner Sørfjord areas. The median concentrations of the remaining PFCs were below the limit of detection.

The Norwegian Food Safety Authority (*Mattilsynet*) has issued advice against consumption of fish and mussels from the Trondheim harbour area due to high concentrations of PCBs and PAHs (Appendix E).

**Tromsø harbour**
The median concentration of cadmium in cod liver Tromsø harbour (st. 43BH)was over expected high background, and with in the range found in the Inner Oslofjord and Sørfjord areas (0.16 – 0.20 mg/kg w.w.). The classification systems applied did not reveal any other elevated concentrations. PBDE and PFOS were in the range found in the inner Oslofjord and the inner Sørfjord areas. The median concentrations of the remaining PFCs were below the limit of detection.

The Norwegian Food Safety Authority (*Mattilsynet*) has issued advice against consumption of fish and mussels from the Tromsø harbour area due to high concentrations of PAHs and PCBs (Appendix E).

***Table 10.*** *Median concentrations of contaminants in cod (*Gadus *morhua) from the harbour areas of Kristiansand, Trondheim, Tromsø and (for comparison) Oslo and the Inner Sørfjord. Klif Classification system is used for sediment (Bakke et al. 2007c) and biota (Molvær et al. 1997) for Classes: I (blue), II (green), III (yellow), IV (orange) and V (red) (see Appendix D). Dark grey indicates concentrations higher than estimated high background levels. Light grey indicates concentrations lower than high background levels. Note: Class limits for ΣDDT are used for ppDDE. Class limits for ΣHCH are used for HCHG.*

| | | Kristiansand | | Trondheim (Munkholmen) | | Tromsø | | Oslo City area | | Inner Sørfjord | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 13BH | | 80BH | | 43BH | | 30B | | 53B | |
| **Contaminant** | **Unit & basis** | **Liver** | **Fillet** | **Liver** | **Fillet** | **Liver** | **Fillet** | **Liver** | **Fillet** | **Liver** | **Fillet** |
| Mercury | mg/kg w.w. | | 0.073 | | 0.060 | | 0.028 | | 0.260 | | 0.194 |
| Cadmium | mg/kg w.w. | 0.04 | | 0.02 | | 0.17 | | 0.16 | | 0.20 | |
| Lead | mg/kg w.w. | 0.04 | | 0.03 | | 0.02 | | 0.13 | | 0.17 | |
| Copper | mg/kg w.w. | 7.44 | | 4.45 | | 3.59 | | 6.54 | | 7.94 | |
| Zinc | mg/kg w.w. | 29.6 | | 23.0 | | 23.8 | | 30.6 | | 28.7 | |
| Silver | mg/kg w.w. | 2.11 | | 0.19 | | 0.19 | | 10.70 | | 0.24 | |
| Arsenic | mg/kg w.w. | 5.10 | | 2.40 | | 6.17 | | 43.50 | | 4.21 | |
| Nickel | mg/kg w.w. | 0.39 | | 0.10 | | 0.06 | | 0.17 | | 0.15 | |
| Chromium | mg/kg w.w. | 0.4 | | 0.3 | | 0.1 | | 0.2 | | 0.2 | |
| Cobalt | mg/kg w.w. | 0.08 | | 0.03 | | 0.01 | | 0.10 | | 0.06 | |
| Tin | mg/kg w.w. | 0.3 | | 0.3 | | 0.3 | | 0.3 | | 0.3 | |
| ΣPCB-7 | µg/kg w.w. | 1299.8 | 6.06 | 1252.7 | 4.46 | 290.1 | 1.44 | 3600.0 | 21.20 | 449.0 | 4.44 |
| DDT | µg/kg w.w. | 58.0 | 0.31 | 60.0 | 0.21 | 33.0 | 0.14 | 150.0 | 1.10 | 268.0 | 1.30 |
| HCB | µg/kg w.w. | 110.0 | 1.40 | 22.0 | 0.16 | 7.7 | 0.08 | 3.7 | 0.06 | 4.2 | 0.04 |
| Lindane | µg/kg w.w. | 1.0 | 0.05 | 1.0 | 0.05 | 1.0 | 0.05 | 0.6 | 0.05 | 1.0 | 0.05 |
| Octachlorostyrene | µg/kg w.w. | 70.0 | 0.46 | 1.0 | 0.05 | 1.0 | 0.05 | 2.6 | 0.05 | 1.0 | 0.05 |
| Pentachlorobenzene | µg/kg w.w. | 5.5 | 0.08 | 1.2 | 0.03 | 1.0 | 0.03 | 1.1 | 0.03 | | 0.03 |
| PBDE | µg/kg w.w. | 19.8 | | 38.7 | | 36.1 | | 61.0 | | 33.2 | |
| PFOS | µg/kg w.w. | 9.0 | | 4.3 | | 6.3 | | 48.0 | | 3.2 | |

## 4.4. Norwegian blue mussel Pollution and Reference Indices (The Index Programme)

Stations involved in 2009 are shown in Figure 35. More details on the methods and results for 2009 can be found in Appendix L.

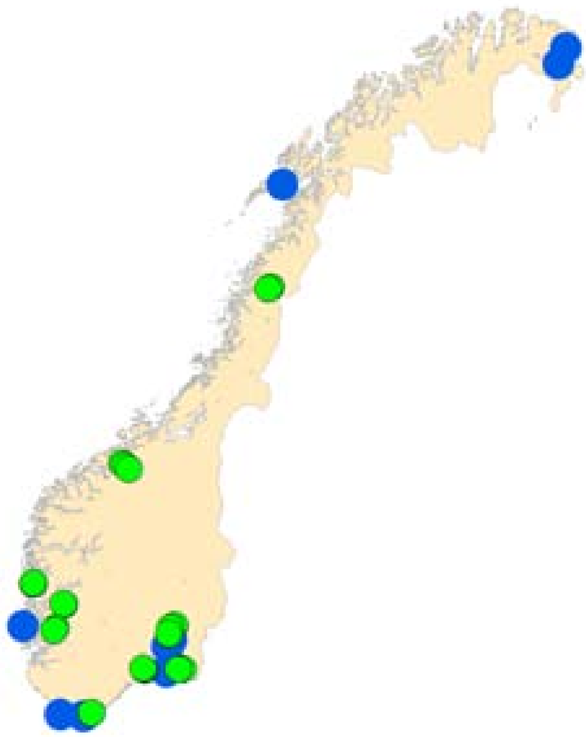

***Figure 35.*** *Blue mussel Index stations sampled in 2009; pollution (green circles), reference (blue circles).*

Based on nine fjord areas the Pollution Index for 2009 was 2.8, 0.2 lower than in 2008 (Appendix M4, Green *et al.* 2010). A value between 2 and 3 would be termed by the Klif system as “Marked” and between 3 and 4 "Severe".

For the Reference Index based on four fjord areas, the Index for 2009 was 1.2, 0.4 lower than the revised index 2008 (see Appendix L). An index value between 1 and 2 would be termed by the Klif system as “Moderate”.

A decrease in each of the indices indicates that the respective fjord areas are less contaminated.

It is not the intent of the application of the indices to give a station by station account. However, time trend analyses for the entire period (1995-2009) have been calculated and show both significant upward and downward trends in blue mussel (cf. Appendix J). Some cases for downward and upward trends are worth noting (2009 median Class, maps refer to Appendix G):

Downward trends

- Inner Oslofjord, Akershuskaia (st. I301) Gressholmen (st.30A) (Map 1) - TBT, ΣPCB-7, Class II
- Inner Oslofjord, Ramtonholmen (st. I307, Map 1) - ΣPCB-7, Class II
- Mid Oslofjord, Solbergstrand (st. 31A, Map 1) - TBT, Class II
- Frierfjord area, Bjørkøya (Risøyodden) (st. 71A, Map 3) - HCB, Class II
- Frierfjord area, Gjemesholmen (st. I712) (Map 3) - TBT, Class II
- Kristiansand harbour, Odderø (west) (st. I133) – HCB, Class II
- Saudafjord, Ekjegrunn (st. I201, Map 5) - B[a]P, sum carcinogen-PAHs, Class II
- Sørfjord, Bykjenes (st. 51A, Map 6) - Cd, Class II
- Sørfjord, Eitrheimsneset (st. 52A), Hardangerfjorden, Ranaskjær (st.63A) (Map 6) - Cd, Pb, Class II
- Sørfjord, Eitrheimsneset (st. 56A, Map 6) - Cd, Hg, Class II
- Hardangerfjord, Vikingneset (st. 65A, Map 6) - Pb, Class II
- Byfjorden (Bergen), Gravdalsneset (st. I242) in Bergen harbour (Map 7) - HCB, Class II

Upward trends

- Kristiansand - Mandal area, Lastad (st. I131A, Map 4) - HCB, Class II
- Byfjorden (Bergen), Nordnes (st. I241) in Bergen harbour (Map 7) - HCB, Class II

## 4.5. Biological effects methods for cod

### Rationale and overview

The rationale to use biological effects methods (BEM) within monitoring programmes is to evaluate whether marine organisms are affected by contaminant inputs. Such knowledge can not be derived from tissue levels of contaminants only. Just one reason is the vast number of chemicals (known and unknown) that organisms are exposed to, in combination, in the environment. In addition to enable conclusions on the health of marine organisms, some biomarkers assist in the interpretation of contaminant exposure and bioaccumulation. The biological effects component of the Norwegian CEMP is possibly the most extensive of its type in Europe and includes Imposex in gastropods as well as biomarkers in fish. The four chosen methods for fish were selected for specificity, for robustness and because they are among a limited set of methods proposed by international organisations, including OSPAR and ICES (see Table 3 for parameter list with method specificity and Figure 1 for map of stations).

A thorough analysis and review of BEM-results has been performed twice since their inclusion in 1997 (Ruus *et al.* 2003; Hylland *et al.* 2009). Clear relationships were shown between tissue contaminants, physiological status, and responses in BEM parameters in cod (Hylland *et al.* 2009). Although metals contributed substantially to the models for ALA-D and metallothionein (MT; included in the programme 1997-2001) and organochlorines in the model for CYP1A activity, other factors were also shown to be important. Liver lipid and liver somatic index (LSI) contributed for all three BEM-parameters, presumably reflecting the general health of the fish. Size or age of the fish also exerted significant contributions to the regression models. It was concluded that the biological effect methods clearly reflected relevant processes in the fish even if they may not be used singly to indicate pollution status for specific locations at given times. Furthermore, the study showed that it is important to integrate a range of biological and chemical methods in any assessment of contaminant impacts. Through continuous monitoring within CEMP, a unique BEM time series / dataset is generated, that will also be of high value as a basis of comparison for future environmental surveys.

Biological effect methods were first included in the programme in 1997, after which some modifications have been done. In 2002, reductions were made in parameters and species analysed. There have also been improvements in the methods, such as discontinuation of single wavelength fluorescence and use of HPLC in the analysis of bile metabolites (2000).

The CEMP-programme for 2009 included four biological effects methods (BEM) (cf. Table 5). For the 2009 investigations OH-pyrene, ALA-D, EROD-activity and CYP1A were measured in Atlantic cod from the Inner Oslofjord (st. 30B), the Inner Sørfjord (st. 53B) and Karihavet (st, 23B). OH-pyrene was also analysed in cod from Lista (st. 15B).

Under controlled conditions the measures derived from OH-pyrene, EROD-activity and CYP1A increase with increased exposure to their respective inducing contaminants. The activity of ALA-D on the other hand is inhibited by contamination (i.e., lead), thus lower activity means a response to higher exposure.

As in most previous years, 25 individual cod were sampled for biological effects measurements. Since 2002 three stations (four for OH-pyrene) have been sampled, instead of eight stations as in previous years. No samples for BEM have taken from flatfish since 2002. All fish were collected by local fishermen and kept alive until sampling by NIVA staff within 5 days.

## OH-pyrene metabolites in bile

Detection methods for OH-pyrene have been improved two times since the initiation of these analyses in the CEMP programme. In 1998, the wavelength for measurement of light absorbance of the support/normalisation parameter biliverdine was changed to 380 nm. In 2000, the use of single-wavelength fluorescence for quantification of OH-pyrene was replaced with HPLC separation proceeding fluorescence detection. The single wavelength fluorescence method is much less specific than the HPLC method. Although there is a good correlation between results from the two methods, they can not be compared directly.

PAH compounds are effectively metabolized in vertebrates. As such, when fish are exposed to and take up PAHs, the compounds are biotransformed into polar metabolites which enhances the efficiency of excretion. It is therefore not suitable to analyse fish tissues for PAH parent compounds as a measure of exposure. However, since the bile is a dominant excretion route of PAH metabolites, and since the metabolites are stored for some time in the gall bladder, the bile is regarded as a suitable matrix for analyses of PAH metabolites as a measure of PAH exposure.

In 2009, as it has been since 2002, the median concentration of OH-pyrene metabolites in bile from cod were higher in the Inner Oslofjord (st. 30B) compared to samples from the Inner Sørfjord (st. 53B), the Bømlo-Sotra area (reference, st. 23B) and Lista (st. 15B). No significant trends for the period 2000-2009 were detected (cf. Appendix J). In other words, the concentrations have fluctuated around the same levels, with a trend towards an apparent reduction at Lista (st. 15B) towards the last few years (not significant; Figure 37, and Appendix J).

PAHs are measured in blue mussel from the Inner Oslofjord (st. 30A). The changes in concentrations correlate moderately well to the changes in OH-pyrene in cod from the same area (st. 30B). These results indicate general changes in PAH exposure in this fjord area, since cod and blue mussel apparently experience similar alterations in PAH exposure, despite biological differences. Blue mussel is a sessile, filtering organism, while cod is mobile and exposed to PAHs both through food and through direct partitioning from water (over respiratory surfaces).

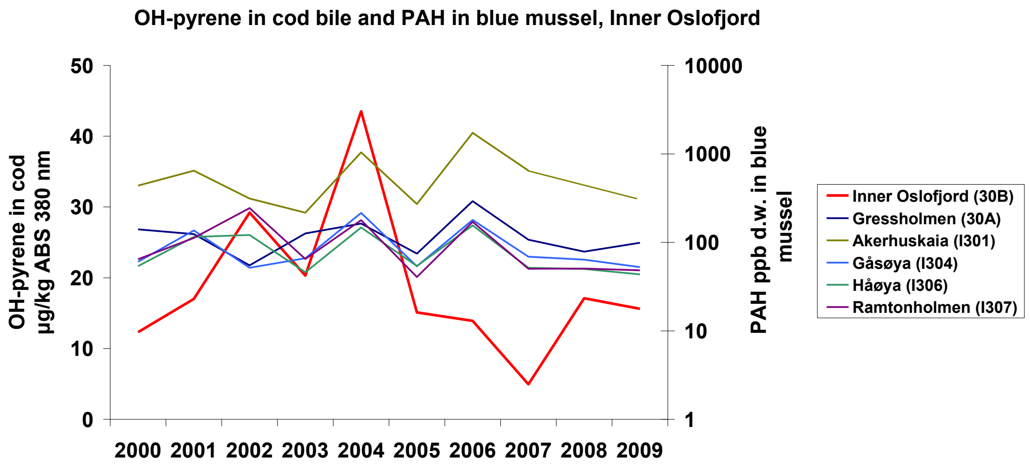


***Figure 36.*** *Changes in median concentration of OH-pyrene (µg/kg ABS 380 nm) in bile from Atlantic cod collected from the Inner Oslofjord (st. 30B Inner Oslofjord; thick red line) and total PAH in blue mussel from the same area.* ***NB: concentrations of PAHs are on a log scale.***

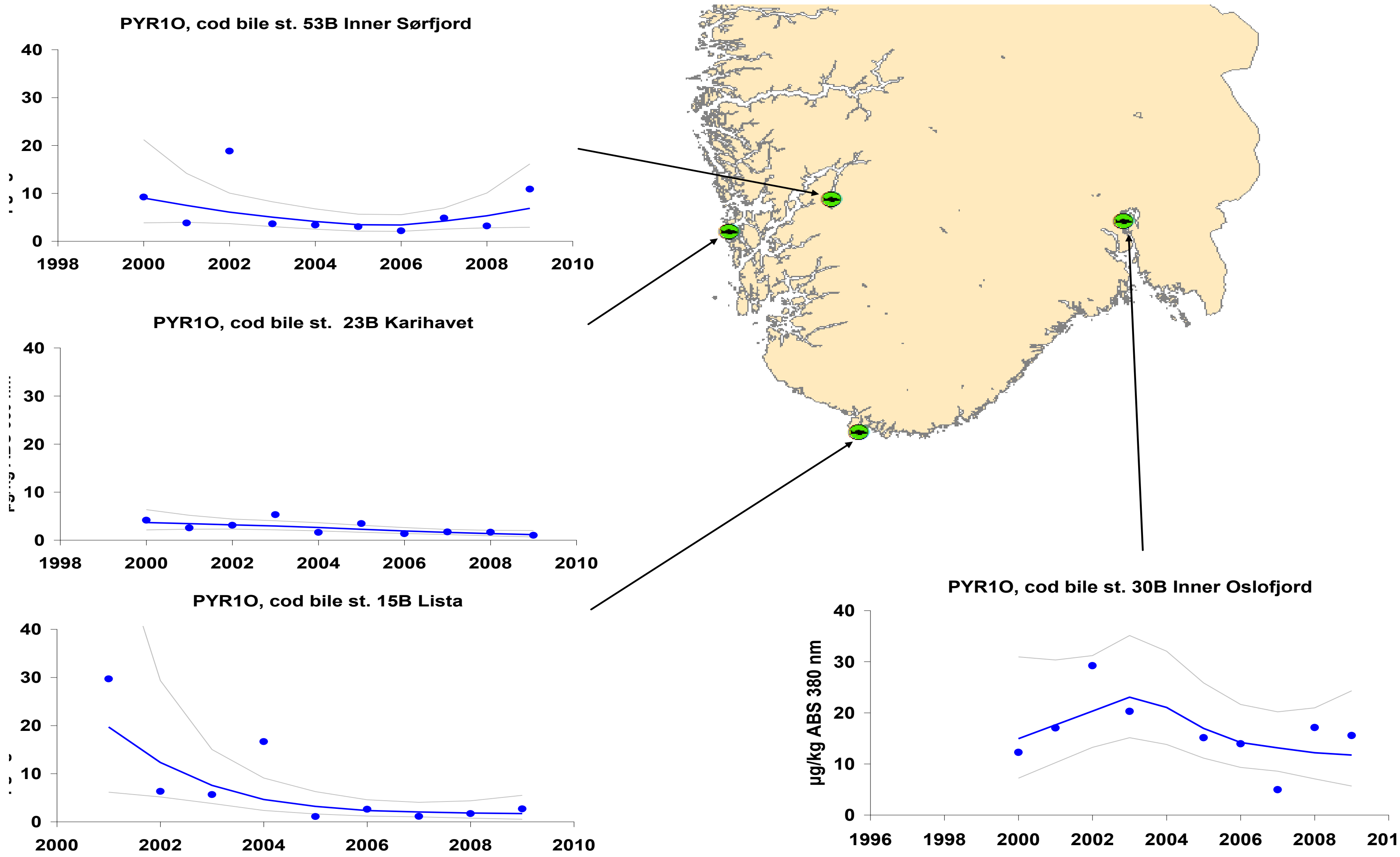


***Figure 37.*** *Trend and median concentration of OH-pyrene (µg/kg ABS 380 nm) in bile from Atlantic cod collected from southern Norway (cf. Appendix I and Appendix J and see otherwise key to detail in Figure 2). There is no limit to classify the result from 2009.*

### ALA-D in blood cells

Inhibited activity of ALA-D indicates the influence of lead contamination. Although ALA-D inhibition is lead-specific, it is not possible to rule out interference by other metals or organic contaminants. Previous studies indicate that zinc may ameliorate the effect of lead to some extent, but the effect is variable and weak. Other studies have also shown ALA-D to be a remarkably robust biomarker and factors such as sex, age or season does not appear to affect the response.

Most years the activity of ALA-D in cod was somewhat inhibited in the Inner Oslofjord (st. 30B) and Inner Sørfjord (st. 53B), compared to reference stations, i.e. outer Oslofjord (st. 36B; only data to 2001), Karihavet in the Bømlo-Sotra area (st. 23B), and Varangerfjord (st. 10B; only data to 2001, not shown) (Appendix I and Appendix J). For the years 1997-2006 and 2009 the median activity of the enzyme in cod from Inner Sørfjord (st. 53B) was generally lower than on the open coast (Karihavet, st. 23B), about 130 km to the west. As mentioned (chapter 3.3), the lower activities of ALA-D in cod from the Sørfjord compared to the reference station (basis for comparison prior to 2007 and in 2009) indicate the contamination of lead in the Sørfjord.

In 2009 ALA-D levels were over twice as high in the blood of cod from the Inner Oslofjord (st. 30B) as compared to 2008. ALA-D levels were also higher in the Inner Oslofjord than in the Inner Sørfjord (st. 53A). However, no trend could be shown for the period 1997-2009 (Appendix J), indicating fluctuations in the enzyme activity around a similar level for the whole period.

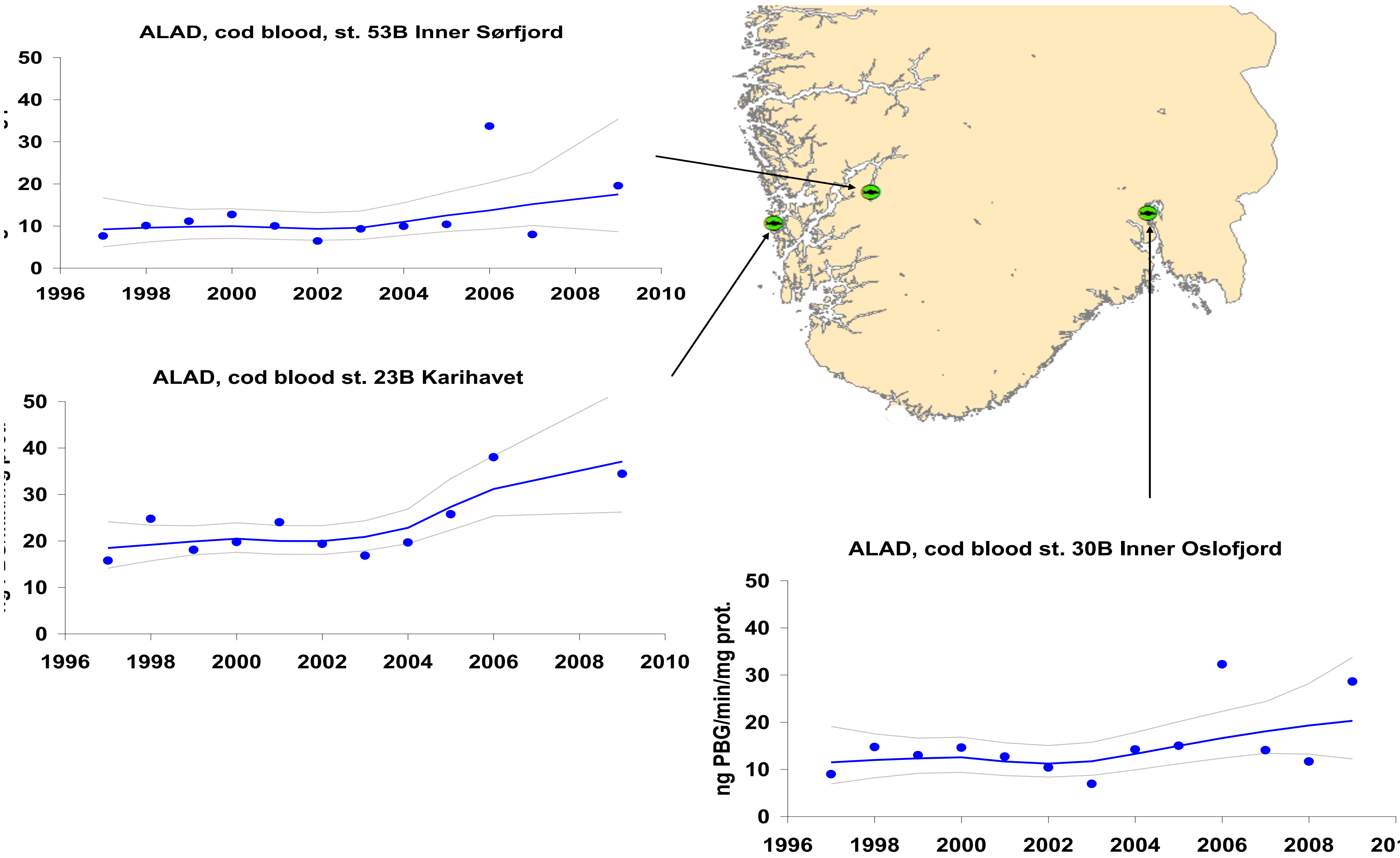


***Figure 38.*** *Trend and median activity of δ-aminolevulinic acid dehydrase (ALA-D, ng PBG/min/mg protein) in red blood cells from Atlantic cod collected from southern Norway (cf. Appendix I and Appendix J and see otherwise key to detail in Figure 2). There is no limit to classify the results from 2009. Note that lower activity means higher exposure and vice versa.*

## EROD-activity and amount of CYP1A protein in liver

*EROD-activity*

High activity of hepatic cytochrome P4501A activity (EROD-activity) normally occurs as a response to the contaminants indicated in Table 5. It was expected that higher activity would be found at the stations that were presumed to be most impacted by planar PCBs, PCNs, PAHs or dioxins, i.e. Inner Oslofjord (st. 30B) and Inner Sørfjord (st. 53B/F). Since 2000 the median EROD-activity has been higher in the Inner Oslofjord compared to the reference station on the west coast (Karihavet, st. 23B). However, in the Inner Sørfjord EROD activities were not consistently higher than at the reference Karihavet. No significant downward trends for EROD in cod liver in the Inner Oslofjord, Inner Sørfjord (st. 53B) or Karihavet (st. 23B) could be shown for the period 1997-2009 (st. 30B, Figure 39 and Appendix J).

No adjustment for water temperature has been made. Fish are sampled at the same time of year (September-November) when differences between the sexes should be at a minimum. Statistical analyses indicate no clear difference in activity between the sexes (Ruus *et al.* 2003). It has been shown that generally higher activity occurs at more contaminated stations (Ruus *et al.* 2003). However, the response is inconsistent (cf. Appendix J), perhaps due to sampling of populations with variable exposure history. Besides, there is evidence from other fish species that continuous exposure to e.g. PCBs may cause adaptation, i.e. decreased EROD-activity response.

The median amount of CYP1A protein in the liver of cod from the Inner Oslofjord (st. 30B) in 2009 was lowest since investigations began in 2003; 50 % lower compared to 2008, however no significant trend could be detected (Figure 40). CYP1A protein levels were however higher in the Inner Oslofjord compared to the Inner Sørfjord (st. 53B) and Karihavet (st. 23B), as was observed for the EROD activities. An explanation could be that the exposure to PCBs is higher in the inner Oslofjord than in the Sørfjord and Karihavet. It was earlier observed, however, that EROD activities apparently were not significantly influenced by a substantial increase in cod liver PCB content (Ruus *et al.* 2006). An explanation (besides the adaptation hypothesis, mentioned above) may be that the inducing effect of specific contaminants may be inhibited by other contaminants present. The significant reduction in EROD activity for the period 1997-2008 was not supported in 2009 where the activity was nearly 10 times higher than in 2008. The variability in 2009 was however high (Figure 58, appendix J).

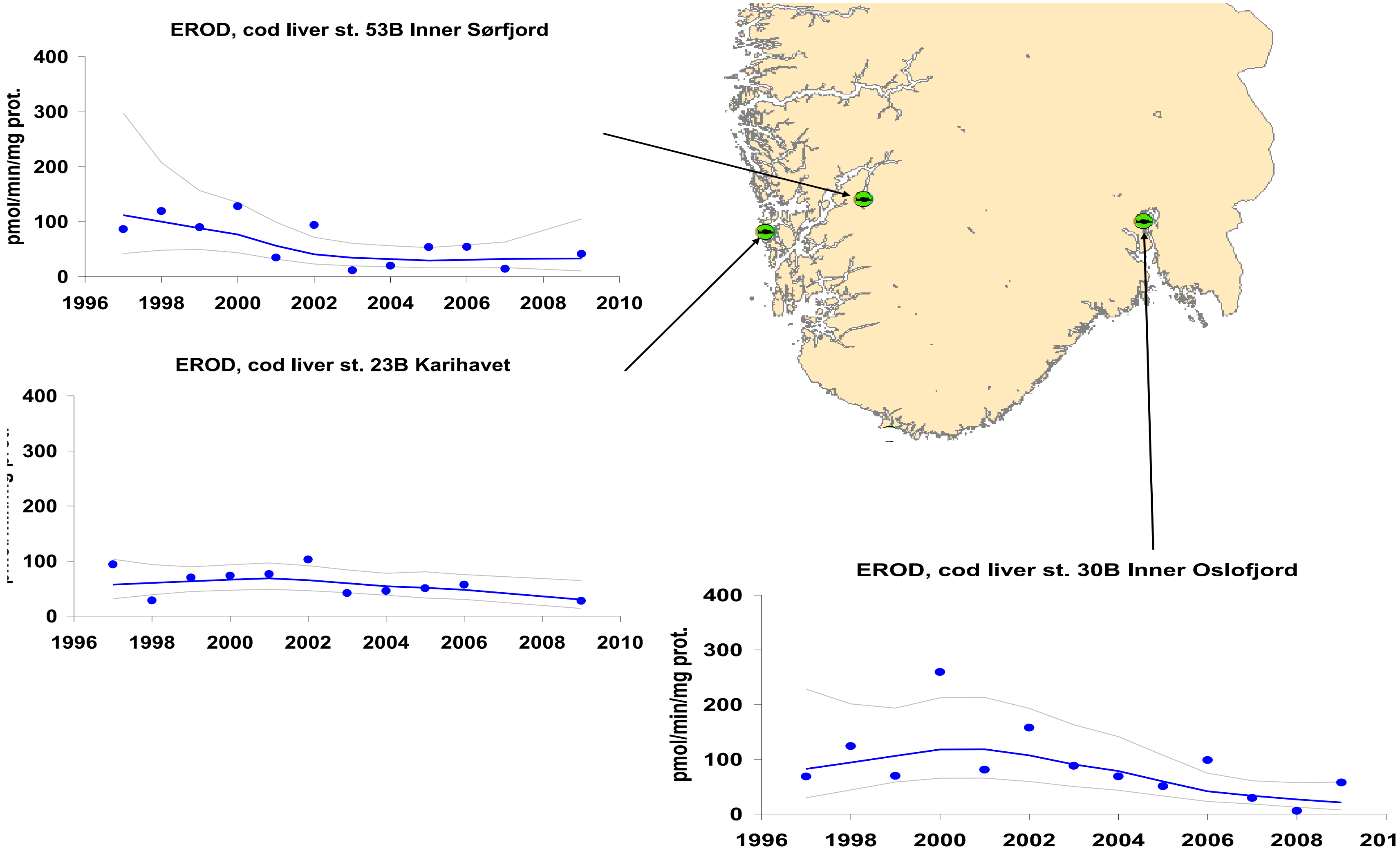


***Figure 39.*** *Trend and median activity of cytochrome P4501A (EROD-activity, pmol/min/mg protein) in liver from Atlantic cod collected from southern Norway (cf. Appendix I and Appendix J and see otherwise key to map and detail in Figure 2). There is no limit to classify the results from 2009.*

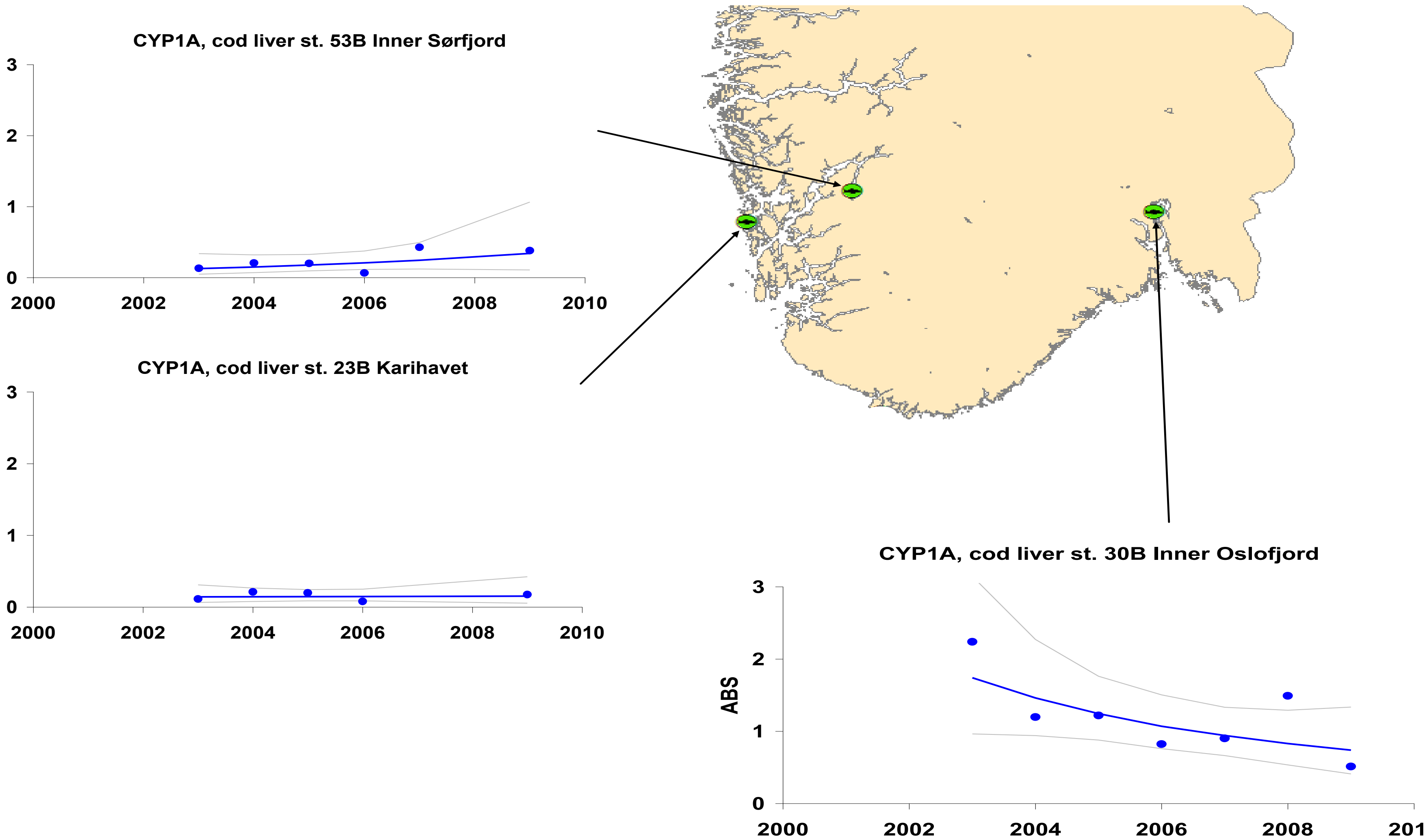


***Figure 40.*** *Trend and median activity of cytochrome CYP1A (relative amount of cytochrome P4501A-protein) in liver from Atlantic cod collected from southern Norway (cf. Appendix I and Appendix J and see otherwise key to map and detail in Figure 2). There is no limit to classify the results from 2009.*

## Concluding remarks

The application of BEM methods within CEMP through the years 1997-2001 indicated that the location Lista (st. 15B), which was previously regarded as only diffusely polluted, had an input of PAH which was sufficient to affect fish in the area. However, in 2002 and 2003 the median concentrations of OH-pyrene in cod from Lista were lower than those from the Inner Oslofjord (st. 30B) and Inner Sørfjord (st. 53B). Since 2005, the OH-pyrene concentrations in cod from Lista have been low (the same level as the reference). No significant time-trends could be detected for the period 2000-2009 at any stations. In other words, the concentrations have fluctuated around the same levels, with a trend towards an apparent reduction at Lista towards the last few years. In 2009, the median concentration of OH-pyrene metabolites in bile from cod was higher in the Inner Oslofjord (st. 30B) compared to samples from the Inner Sørfjord (st. 53B), the Bømlo-Sotra area (st. 23B) and Lista (st. 15B). Changes in concentrations of PAH measured in blue mussel from the Inner Oslofjord correlate moderately well to alterations in OH-pyrene concentrations in the bile of cod from the same area.

Results for the period 1997-2005 and 2009 indicated that there are lead effects, shown by decreased activity of the enzyme ALA-D in the two most contaminated areas, i.e. cod from the Inner Oslofjord (st. 30B) and cod from the Inner Sørfjord (st. 53B). This indication was less evident in 2006. No trend could be shown for the period 1997-2009.

Since 2000 investigations have shown that EROD-activity in fish from the Inner Oslofjord is often higher than presumed cleaner stations, however this trend is not consistent. In the Inner Sørfjord EROD activities were often lower than at the reference Karihavet (st. 23B; although higher in 2009). An explanation may be that the inducing effect of specific contaminants may be inhibited by other contaminants present. The median amount of CYP1A protein in the liver of cod from the Inner Oslofjord (st. 30B) in 2009 was 50 % lower as in 2008 (despite the increase in EROD activity). No significant time-trend could be observed for CYP1A.

# 5. Conclusions

The Norwegian contribution to OSPAR's Coordinated Environmental Monitoring Programme (CEMP) in 2009 included the monitoring of micropollutants (contaminants) in blue mussel (49 stations), dogwhelk (10 stations), cod (14 stations) and flatfish (dab, flounder, plaice, megrim; 11 stations) along the coast of Norway from the Oslofjord and Hvaler region in the southeast to the Varangerfjord in the northeast. The stations are located both in areas with known or presumed point sources of contaminants and in areas more remote, exposed to presumed diffuse contamination. The mussel sites include supplementary stations for the Norwegian Index Programme. There were totally 859 time series and 538 of these included results from 2009. Of these, 211 showed statistically significant trends; 189 were downwards and 22 were upwards. The dominance of downward trends indicates that contamination is decreasing. In 186 cases, concentrations were above what is expected in only diffusely contaminated areas (collectively termed over expected high background concentrations). The general situation for the two major impacted areas of CEMP is as follows:

**The Oslofjord/Hvaler/Grenlandsfjord area**
The Oslofjord was contaminated with PCBs (expressed the sum of seven PCB congeners), mercury and cadmium. Cod fillet from the Inner Oslofjord was moderately polluted by mercury, and had a significant upward trend for the period 1984-2009. Cod liver from the Inner Oslofjord had median concentrations of lead and cadmium higher that presumed high background, and there was a significant upward trend for cadmium in cod liver from the Inner Oslofjord for the same period. Cod liver from the Inner Oslofjord was markedly polluted with PCBs. Cod fillet from the Inner Oslofjord was also markedly polluted with PCBs in 2009. This was higher than the concentration in 2008 and there was a significant upward trend for the period 2000-2009. Cod from the outer part of the Oslofjord (Færder) were only insignificantly polluted by mercury, lead, cadmium and PCBs.

Blue mussel from Gressholmen, Akershuskaia and Ramtonholmen were moderately polluted by PCBs. There were significant downward trends for PCBs at these three stations for the whole monitoring period from 1987, 1992 and 1995, respectively, to 2009. The other blue mussel stations in the Oslofjord area were only insignificantly polluted by PCBs. Blue mussel from Damholmen in the Hvaler area were moderately polluted by mercury. The other blue mussel stations in the Oslofjord area were only insignificantly polluted by mercury. Blue mussel from Fugleskjær in the Hvaler area were moderately polluted by cadmium. Blue mussel from Gressholmen, Ramtonholmen, Solbergstrand and Mølen were insignificantly/slightly polluted by cadmium but had upward trends for the whole monitoring period from 1984, 1995, 1983 and 1983, respectively, to 2009. None of the blue mussel stations in the Oslofjord area were polluted by lead.

Blue mussel from stations in the Grenlandsfjord area were extremely polluted by dioxins. The concentrations of dioxins have increased every year in blue mussel at Gjemesholmen since 2005. There was a tendency towards an increase also at Bjørkøya and Strømtangen, but there were no significant trends for any of these stations.

**The Sørfjord/Hardangerfjord area**
The Sørfjord and Hardangerfjord were contaminated with DDE (p,p'DDE, a metabolite of DDT), cadmium, mercury and to a lesser degree PCBs. Cod fillet from the Inner Sørfjord was moderately polluted by mercury. Cod from Strandebarm in the Hardangerfjord was insignificantly polluted by mercury. There were concentrations over presumed high background levels and an upward trend for the period 1986-2009 for mercury in flounder fillet from the Inner Sørfjord.

Cod from the Inner Sørfjord showed concentrations of cadmium in the liver that exceeded presumed high background level. There was a significant upward trend for cadmium in cod liver for this station for the period 1986-2009. Cod from Strandebarm in the Hardangerfjord had a significant downward trend for the period 1987-2009 and median concentration of cadmium in 2009 was below presumed high background. Cod from the Inner Sørfjord had a median concentration of lead in the liver that exceeded presumed high background level. The median concentration of lead in cod liver from here had increased slightly compared to 2008, and there was a significant upward trend for the period 1990-2009. Inhibition of ALA-D in cod was commonly observed in the Sørfjord, also in 2009, as a result of the lead exposure. Cod liver from Strandebarm had a median concentration of lead below presumed high background level in 2009 and there was a significant downward trend for the same period.

Liver of cod from the Inner Sørfjord was insignificantly polluted by PCBs. The fillet of the same fish was however moderately polluted by PCBs. Liver and fillet of cod from Strandebarm in the Hardangerfjord were insignificantly polluted by PCBs. There was a significant downward trend for PCBs in cod liver from Strandebarm for the period 1990-2009. Cod liver and fillet from the Inner Sørfjord was moderately polluted by DDE. Both liver and fillet of cod from Strandebarm were insignificantly polluted by DDE, and showed significant downward trends for the same period.

Significant downward trends have been observed for cadmium in blue mussel in the Inner and Mid Sørfjord during the last two decades. In 2009 the blue mussel from the Inner and Mid Sørfjord were insignificantly to moderately polluted by mercury and lead. For three blue mussel stations in the Sørfjord, there were concentrations classified up to markedly polluted by DDE. The blue mussel at Kvalnes in the Mid Sørfjord has declined two classes in the classification system from extremely polluted in 2008 to markedly polluted in 2009.

**Biological effects**
Biological effects methods are included for in the monitoring programme to evaluate whether marine organisms are affected by contaminants in their environment, something that can not be assessed from concentrations of chemicals in tissues alone. Biological effects were investigated in cod from four areas: Inner Oslofjord, Lista, Bømlo-Sotra (Karihavet) and the Inner Sørfjord. The median amount of CYP1A protein in the liver of cod from the Inner Oslofjord in 2009 was lowest since investigations began in 2003; 50 % lower compared to 2008, however no significant trend could be detected. CYP1A protein levels were however higher in the Inner Oslofjord compared to the Inner Sørfjord and Karihavet, as was observed for the EROD activities. An explanation could be that the exposure to PCBs is higher in the Inner Oslofjord than in the Sørfjord and Karihavet.

In 2009, the median concentration of OH-pyrene metabolites in bile from cod was higher in the Inner Oslofjord compared to samples from the Inner Sørfjord, the Bømlo-Sotra area and Lista. Changes in concentrations of PAHs measured in blue mussel from the Inner Oslofjord correlate moderately well to alterations in OH-pyrene concentrations in the bile of cod from the same area. Since the year 2000 investigations have shown that EROD-activity in fish from the Inner Oslofjord is often higher than presumed cleaner stations. In the Inner Sørfjord EROD activities were often lower than at the reference Karihavet (although higher in 2009).

Of the time series investigated for biological effects (imposex) of TBT in dogwhelk, seven stations showed significant downward trends and two had no significant trends for the entire monitoring period, the first year of which varied from 1997 to 2002. The effects from TBT were low (VDSI<2) at eight of 10 stations investigated in 2009.

**Other observations**
Polybrominated diphenyl ethers (PBDEs) and perfluroalkyl compounds (PFCs) have been investigated in cod liver since 2005. In 2009, the concentration of sum PBDE and PFOS (the most abundant PFC) was highest in cod from the Inner Oslofjord. PBDE was lowest in cod east of Bjørnerøya in Lofoten. BDE47 was the dominant PBDE in all samples. PFOS was lowest in the Sørfjord.

Blue mussel from two stations in the Kristiansandsfjord were markedly and moderately polluted by PAHs. Blue mussel from Ranfjord were extremely polluted by B[a]P, and blue mussel from the Kristiansandsfjord were up to severely polluted by benzo[a]pyrene.

Based on nine fjord areas, that are effected by point sources of contaminants, the Pollution Index for 2009 was 2.8, which was 0.2 lower than in 2008. A value between 2 and 3 would be termed by the Klif environmental system as “Marked” polluted. For the Reference Index based on four fjord areas that are presumably little polluted with contaminants, the Index value for 2009 was 1.2, which was 0.4 lower than the revised index 2008. A lower index in each of these cases indicates that contamination has decreased.

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# Appendix A
# Overview of previous CEMP investigations

**Previous investigations**

The results for CEMP have previously been presented for:

- 1981-1983 (only Oslofjord; Enger *et al.* 1984, 1985)
- 1984-1985 (Green 1988)
- 1986 (Green 1987; SFT 1987)
- 1987 (SFT 1988)
- 1988 (Green 1989b; SFT 1989)
- 1989 (Green 1991a, SFT 1990)
- 1990 (Green 1992, JMG 1994)
- 1991 (Green 1993a)
- 1992 (Green 1994, Green & Knutzen 1994)
- 1993 (Green 1995a)
- 1994 (Green 1995b)
- 1995 (Green 1997a)
- 1996 (Green 1997b)
- 1997 (Green *et al.* 1999)
- 1998 (Green *et al.* 2000)
- 1999 (Green *et al.* 2001a)
- 2000 (Green *et al.* 2002a)
- 2001 (Green, *et al.* 2003)
- 2002 (Green, *et al.* 2004a)
- 2003 (Green, *et al.* 2004b)
- 2004 (Green, *et al.* 2005)
- 2005 (Green, *et al.* 2007)
- 2006 (Green, *et al.* 2008b)
- 2007 (Green, *et al.* 2009)
- 2008 (Green, *et al.* 2010)

The results have been incorporated in OSPAR's European regional assessments of sediment (JMG 1993) and biota (ICES 1988, JMG 1992) and temporal trends in biota (ICES 1989; 1991; ASMO 1994).

An overview of the analytical methods (1981-2000) has been presented in Green 1993b; Green *et al.* 2001b, Green *et al.* 2008a.

The raw data or statistical summaries have been presented for:

- sediment 1986-1997 (Green & Klungsøyr 1994; Green *et al.* 2002b)
- biota 1981-1992 (Green & Rønningen 1994)
- biota 1993-1997 (Green & Severinsen 1999a, b)
- biota 1998-2001 (Green *et al.* 2002c, d) and
- sediment and biota 1981-2006 (cf. Shi *et al.* 2008)

Summary assessments have been made for the periods:

- 1981-1992 (Green *et al.* 1995)
- 1981-1999 (Green *et al.* 2002c)
- 1981-2006 (Green & Ruus 2008)

An evaluation of "background" levels of contaminants in biota based on CEMP data has been done by Knutzen & Green (1995, 2001a) and Green & Knutzen (2003). Application of pollution and reference indices using the blue mussel and coordinated with CEMP has also been assessed (Green & Knutzen 2001). Results from biological effects methods 1997-2001 have been assessed as well (Ruus *et al.* 2003).

# Appendix B
# Quality assurance programme

# Information on Quality Assurance

NIVA has participated in all the QUASIMEME international intercalibration exercises relevant to chemical and Imposex analyses. For chemical analyses, these include Round 58 of July-October 2009 and round 60, which would apply to the 2009 samples. These QUASIMEME exercises have included nearly all the contaminants as well as Imposex analysed in this programme. In addition, NIVA was accredited in 1993 and since 2001 accredited in accordance with the NS-EN ISO/IEC 17025 standard by the Norwegian Accreditation (reference P009).

In addition to these QUASIMEME exercises, Standard Reference Materials (SRM) are also analyzed routinely with the CEMP samples. It should be noted that for biota the type of tissue used in the SRMs do not always match the target tissue for analyses. Uncertain values identified by the analytical laboratory or the reporting institute are flagged in the database. The results are also “screened” when submitted to the database at NIVA and ICES.

**Accreditation**
The laboratories at NIVA, both the chemical, microbiological and the ecotoxicological laboratories, were accredited in 1993 for quality assurance system by the National Measurement Service - Norwegian Accreditation and based on European Standard EN45000/ISO71EC Guide 25. NIVA has reference number P009. The chemical laboratory has satisfied the requirements in NS-EN ISO/IEC 17025 since 2001.

**Summary of quality control results**
Standard Reference Materials (SRM) were analysed regularly (Table 11). Fish protein (DORM-3) or dogfish liver (DOLT-4) was used as SRM for the control of the determination of metals. Cod liver oil (1588) and mussel tissue (2977) was used as SRM for controls of PCBs and PAHs, respectively. NIES 11 was used for tin organic compounds. Cyprinid fish (EDF2525) at NILU was used as SRM for control of determination of dioxins.

Following results for round QUASIMEME –Round 58, January-April 2009, were used. This round would apply to the 2009 samples. All samples have been analysed but for an unknown reason not reported to QUASIMEME. However, it can be noted that all the results are within the uncertainty limits of 20% deviation from the true value with few exceptions.

- QTM083BT (no.1) and QTM084BT (no.2) for metals in biota.
  The results were all very good with the exception of the results for cadmium (Cd in no.1), but the uncertainty in the true value here is relatively large.
- QOR100BT (no.1) and QOR101BT (no.2) for organochlorines in biota.
  The results were all acceptable. All the true values of the samples were very low and close to the detection limits. Therefore the results are in percent deviation.
- QPH055BT (no.1) and QPH056BT (no.2) for PAH in biota.
  The results were acceptable except for benzo(a)flouranthene where the result is too high. The reason for this is that NIVA determine the j-isomere in the same measurement. The result for phenanthrene (no. 2) the result also was too high, but acceptable. Over all very good results.

***Table 11.** Summary of the quality control of results for the 2009 biota samples analysed in 2009-2010. The Standard Reference Materials (SRM) were DORM-3* (fish protein) for blue mussel and fish fillet, DOLT-4* (dogfish liver) for fish liver, 1588** (cod liver oil) for blue mussel and fish liver and 2977** (mussel tissue) for blue mussel. SRM was analysed in series with the CEMP-samples for analyses of metals (mg/kg d.w.), NIES 11 for organochlorines or PAH (μg/kg d.w.) and EDF2525**** for fish (cyprinid) was analysed for dioxin (ng/kg) by NILU (Norwegian Institute for Air Research – results for 2009 material are shown here; cf. Green et al.2010). Tissue types were: mussel softbody (SB), fish liver (LI) and fish fillet (MU). SRMs were measured several times (N) over a number of weeks (W).*

| Code | Contaminant | Tissue type | SRM type | SRM value confidence interval | N | W | Mean value | Standard deviation |
|---|---|---|---|---|---|---|---|---|
| **As** | **Arsenic** | LI | DOLT-4 | 9.66 ± 0.62 | 16 | 23 | 11.29 | 0.394 |
| **Cd** | **Cadmium** | LI | DOLT-4 | 24.3 ± 0.8 | 16 | 23 | 24.45 | 0.818 |
| **Cr** | **Chromium** | LI | DOLT-4 | Missing | 16 | 23 | 1.30 | 0.092 |
| **Cu** | **Copper** | LI | DOLT-4 | 31.2 ±1.1 | 16 | 23 | 33.46 | 1.366 |
| **Ni** | **Nickel** | LI | DOLT-4 | 0.97 ± 0.11 | 16 | 23 | 1.046 | 0.156 |
| **Pb** | **Lead** | LI | DOLT-4 | 0.16 | 13 | 23 | 0.154 | 0.018 |
| **Zn** | **Zinc** | LI | DOLT-4 | 116 ± 6 | 16 | 23 | 124.81 | 2.762 |
| **As** | **Arsenic** | SB | DORM-3 | 6.88±0.30 | 12 | 22 | 8.24 | 0.38 |
| **Cd** | **Cadmium** | SB | DORM-3 | 0.290 ± 0.020 | 12 | 22 | 0.317 | 0.008 |
| **Co** | **Cobalt** | SB | DORM-3 | missing | 11 | 22 | 0.261 | 0.008 |
| **Cr** | **Chromium** | SB | DORM-3 | 1.89 ± 5.5 | 12 | 22 | 1.79 | 0.13 |
| **Cu** | **Copper** | SB | DORM-3 | 15.5 ± 0.63 | 12 | 22 | 15.2 | 0.36 |
| **Hg** | **Mercury** | MU | DORM-3 | 0.409 ± 0.027 | 38 | 23 | 0.408 | 0.03 |
| **Hg** | **Mercury** | SB | DORM-3 | 0.409 ± 0.027 | 38 | 23 | 0.408 | 0.03 |
| **Ni** | **Nickel** | SB | DORM-3 | 1.28± 0.24 | 12 | 22 | 1.28 | 0.11 |
| **Pb** | **Lead** | SB | DORM-3 | 0.395 ± 0.050 | 12 | 22 | 0.415 | 0.013 |
| **Zn** | **Zinc** | SB | DORM-3 | 51.3 ± 3.1 | 12 | 22 | 53.1 | 2.16 |
| **BDE100** | **2,2',4,4',6-Pentabromidiphenylether** | LI | SRM1588b | 1.89 ± 0.45 | 13 | 18 | 2.08 | 0.459 |
| **BDE154** | **2,2',4,4',5,6'-Hexabromidiphenylether** | LI | SRM1588b | 0.495 ± 0.069 | 13 | 18 | 0.36 | 0.21 |
| **BDE28** | **2,2,4'-Tribromodiphenylether** | LI | SRM1588b | 1.08 ± 0.23 | 13 | 18 | 0.914 | 0.577 |
| **BDE47** | **2,2',4,4',-Tetrabromidiphenylether** | LI | SRM1588b | 17.8 ± 2.0 | 13 | 18 | 19.09 | 5.98 |
| **BDE49** | **2,2',4,5'-Tetrabromidiphenylether** | LI | SRM1588b | 2.25 ± 0.24 | 13 | 18 | 2.25 | 0.78 |
| **BDE99** | **2,2',4,4',5-Pentabromidiphenylether** | LI | SRM1588b | 0.56 ± 0.20 | 12 | 18 | 0.56 | 0.18 |
| **CB101** | **PCB congener CB-101** | LI | SRM1588b | 127 ± 9 | 16 | 21 | 131.25 | 15.86 |
| **CB105** | **PCB congener CB-105** | LI | SRM1588b | 59.2 ± 1.2 | 16 | 21 | 64.3 | 5.72 |
| **CB118** | **PCB congener CB-118** | LI | SRM1588b | 172 ± 7 | 16 | 21 | 175.6 | 9.63 |
| **CB138** | **PCB congener CB-138** | LI | SRM1588b | 212 ± 29 | 16 | 21 | 206.25 | 13.1 |
| **CB153** | **PCB congener CB-153** | LI | SRM1588b | 275 ± 4 | 16 | 21 | 278.12 | 26.63 |
| **CB156** | **PCB congener CB-156** | LI | SRM1588b | 18.0 ± 2.1 | 16 | 21 | 19.18 | 1.64 |
| **CB180** | **PCB congener CB-180** | LI | SRM1588b | 98.5 ± 6.3 | 16 | 21 | 101.4 | 7.62 |
| **CB209** | **PCB congener CB-209** | LI | SRM1588b | 3.2 ± 0.26 | 16 | 21 | 3.48 | 1.05 |
| **CB28** | **PCB congener CB-28** | LI | SRM1588b | 27.8 ± 1.4 | 16 | 21 | 23.3 | 1.49 |
| **CB52** | **PCB congener CB-52** | LI | SRM1588b | 82.4 ± 1.7 | 16 | 21 | 75.4 | 8.43 |
| **DDEPP** | **4.4'-DDE** | LI | SRM1588b | 676 ± 36 | 16 | 21 | 596.9 | 53.0 |
| **DDTPP** | **4.4'-DDT** | LI | SRM1588b | 570 ± 27 | 16 | 21 | 430 | 212 |
| **HCB** | **Hexachlorobenzene** | LI | SRM1588b | 163 ± 16 | 16 | 21 | 150 | 13.7 |
| **HCHA** | **α -hexachlorohexene** | LI | SRM1588b | 99 ± 15 | 16 | 21 | 93.5 | 8.83 |
| **HCHG** | **γ -hexachlorohexene** | LI | SRM1588b | 23.3 ± 1.7 | 16 | 21 | 20 | 2.68 |
| **OCS** | **Octachlorostyrene** | LI | SRM1588b | 9.14 ± 0.74 | 16 | 21 | 14.8 | 1.08 |
| **QCB** | **Pentachlorobenzene** | LI | SRM1588b | 16.1 ± 0.6 | 16 | 21 | 19.75 | 2.74 |
| **TDEPP** | **4.4'-DDD** | LI | SRM1588b | 285 ± 37 | 16 | 21 | 263.12 | 48.95 |
| **ACNE** | **Acenaphthene** | SB | SRM2977 | 4.2 ± 0.4 | 2 | 1 | 2.9 | 0.70 |
| **ACNLE** | **Acenaphthylene** | SB | SRM2977 | m | 2 | 1 | 2.86 | 0.79 |
| **ANT** | **Anthracene** | SB | SRM2977 | 8 ± 4 | 2 | 1 | 3.55 | 0.49 |
| **BAP** | **benzo[a]pyrene**[1)] | SB | SRM2977 | 8.35 ± 0.72 | 2 | 1 | 5.55 | 0.21 |
| **BBJF** | **Benzo(b+j)flouranthene**[2)] | SB | SRM2977 | m | 2 | 1 | 17.5 | 0.70 |
| **BEP** | **benzo[e]pyrene** | SB | SRM2977 | 13.1 ± 1.1 | 2 | 1 | 20 | 0 |
| **BGHIP** | **benzo[ghi]perylene** | SB | SRM2977 | 9.53 ± 0.43 | 2 | 1 | 11.5 | 0.71 |
| **BKF** | **benzo[k]fluoranthene** | SB | SRM2977 | 4 ± 1 | 2 | 1 | 6.05 | 0.212 |
| **BAA** | **benzo[a]anthracene**[1)] | SB | SRM2977 | 20.34 ± 0.78 | 2 | 1 | 19 | 0 |

| Code | Contaminant | Tis-sue type | SRM type | SRM value confidence interval | N | W | Mean value | Standard deviation |
|---|---|---|---|---|---|---|---|---|
| **CHR** | **Chrysene** | SB | SRM2977 | 49 ± 2 | 2 | 1 | 52 | 2.8 |
| **DBA3A** | **Dibenz[a,h]anthracene/ Dibenz[a,c]anthracene**[3)] | SB | SRM2977 | 2.0 ± 0.2 | 2 | 1 | 1.55 | 0.21 |
| **FLE** | **Fluorene** | SB | SRM2977 | 10.24 ± 0.43 | 2 | 1 | 7.65 | 1.62 |
| **FLU** | **fluoranthene** | SB | SRM2977 | 38.7 ± 1.0 | 2 | 1 | 29.5 | 7.78 |
| **ICDP** | **indeno[1,2,3-cd]pyrene** | SB | SRM2977 | 4.84 ± 0.81 | 2 | 1 | 4.45 | 0.212 |
| **NAP** | **Naphthalene** | SB | SRM2977 | 19 ± 5 | 2 | 1 | 8.45 | 0.92 |
| **PA** | **Phenanthrene** | SB | SRM2977 | 35.1 ± 3.8 | 2 | 1 | 38 | 2.82 |
| **PER** | **perylene** | SB | SRM2977 | 3.50 ± 0.76 | 2 | 1 | 1.8 | 0.42 |
| **PYR** | **pyrene** | SB | SRM2977 | 78.9 ± 3.5 | 2 | 1 | 62 | 18.38 |
| **CB126** | **3,3',4,4',5-PeCB** | SB | EDF2525 | 647 ± 211 | 4 | 30 | 675 | Missing |
| **CB169** | **3,3',4,4',5,5'-HxCB** | SB | EDF2525 | 55.8 ± 12.6 | 4 | 30 | 57.5 | Missing |
| **CB77** | **3,3',4,4'-TeCB** | SB | EDF2525 | 1980 ± 659 | 4 | 30 | 1986 | Missing |
| **CB81** | **3,4,4',5-TeCB** | SB | EDF2525 | 179 ± 35.1 | 4 | 30 | 178 | Missing |
| **CDD1N** | **1,2,3,7,8-PeCDD** | SB | EDF2525 | 3.88 ± 1.22 | 4 | 30 | 4.65 | Missing |
| **CDD4X** | **1,2,3,4,7,8-HxCDD** | SB | EDF2525 | 0.31 ± 0.14 | 4 | 30 | 0.51 | Missing |
| **CDD6X** | **1,2,3,6,7,8-HxCDD** | SB | EDF2525 | 2.19 ± 0.76 | 4 | 30 | 2.29 | Missing |
| **CDD9X** | **1,2,3,7,8,9-HxCDD** | SB | EDF2525 | 0.32 ± 0.11 | 4 | 30 | 0.26 | Missing |
| **CDDO** | **OCDD** | SB | EDF2525 | 2.57 ± 2.59 | 4 | 30 | 2.02 | Missing |
| **CDF2N** | **2,3,4,7,8-PeCDF** | SB | EDF2525 | 14.5 ± 2.41 | 4 | 30 | 16 | Missing |
| **CDF2T** | **2,3,7,8-TCDF** | SB | EDF2525 | 24.5 ± 5.52 | 4 | 30 | 25.2 | Missing |
| **CDF4X** | **2,3,4,6,7,8-HxCDF** | SB | EDF2525 | 1.09 ± 0.55 | 4 | 30 | 1.05 | Missing |
| **CDF6P** | **1,2,3,4,6,7,8-HpCDF** | SB | EDF2525 | 0.59 ± 0.61 | 4 | 30 | 0.55 | Missing |
| **CDF6X** | **1,2,3,6,7,8-HxCDF** | SB | EDF2525 | 1.65 ± 0.56 | 4 | 30 | 1.87 | Missing |
| **CDF9P** | **1,2,3,4,7,8,9-HpCDF** | SB | EDF2525 | 0.08 ± 0.11 | 4 | 30 | 0.18 | Missing |
| **CDFDN** | **1,2,3,7,8/1,2,3,4,8-PeCDF** | SB | EDF2525 | 4.88 ± 1.46 | 4 | 30 | 4.84 | Missing |
| **CDFDX** | **1,2,3,4,7,8/1,2,3,4,7,9-HxCDF** | SB | EDF2525 | 5.8 ± 0.99 | 4 | 30 | 6.39 | Missing |
| **CDFO** | **OCDF** | SB | EDF2525 | 0.78 ± 1 | 4 | 30 | 0.33 | Missing |
| **TCDD** | **2,3,7,8-tetrachl-DiBpD (TCDD)** | SB | EDF2525 | 17.3 ± 2.58 | 4 | 30 | 19.7 | Missing |

*) National Research Council Canada, Division of Chemistry, Marine Analytical Chemistry Standards

**) BCR, Community Bureau of Reference, Commission of the European Communities

***) National Institute of Standards & Technology (NIST)

****) CIL, US

1) Not certified (see NIST certificate)

2) Calculated from separate values for **Benzo(b)fluoranthene** and **Benzo(j)fluoranthene**

3) Calculated from separate values for **Dibenz(a,c)anthracene and Dibenz(a,h)anthracene**

# Appendix C
# Abbreviations

| **Abbreviation**[1] | English | *Norwegian* | Param. group |
|---|---|---|---|
| **ELEMENTS** | | | |
| **Al** | aluminium | *aluminium* | I-MET |
| **As** | arsenic | *arsen* | I-MET |
| **Cd** | cadmium | *kadmium* | I-MET |
| **Co** | cobalt | *kobolt* | I-MET |
| **Cr** | chromium | *krom* | I-MET |
| **Cu** | copper | *kobber* | I-MET |
| **Fe** | iron | *jern* | I-MET |
| **Hg** | mercury | *kvikksølv* | I-MET |
| **Li** | lithium | *litium* | I-MET |
| **Mn** | manganese | *mangan* | I-MET |
| **Ni** | nickel | *nikkel* | I-MET |
| **Pb** | lead | *bly* | I-MET |
| **Pb210** | lead-210 | *bly-210* | I-RNC |
| **Se** | selenium | *selen* | I-MET |
| **Ti** | titanium | *titan* | I-MET |
| **Zn** | zinc | *sink* | I-MET |
| | | | |
| **METAL COMPOUNDS** | | | |
| **TBT** | tributyltin | *tributyltinn* | O-MET |
| **MBTIN** | monobutyltin | *monobutyltinn* | O-MET |
| **DBTIN** | dibutyltin | *dibutyltinn* | O-MET |
| **TBTIN** | tributyltin | *tributyltinn* | O-MET |
| **MPTIN** | monophenyltin | *monofenyltinn* | O-MET |
| **DPTIN** | diphenyltin | *difenyltinn* | O-MET |
| **TPTIN** | triphenyltin | *trifenyltinn* | O-MET |
| | | | |
| **PAHs** | | | |
| **PAH** | polycyclic aromatic hydrocarbons | *polysykliske aromatiske hydrokarboner* | |
| | | | |
| **ACNE** [3] | acenaphthene | *acenaften* | PAH |
| **ACNLE** [3] | acenaphthylene | *acenaftylen* | PAH |
| **ANT** [3] | anthracene | *antracen* | PAH |
| **BAA** [3, 4] | benzo[*a*]anthracene | *benzo[a]antracen* | PAH |
| **BAP** [3, 4] | benzo[*a*]pyrene | *benzo[a]pyren* | PAH |
| **BBF** [3, 4] | benzo[*b*]fluoranthene | *benzo[b]fluoranten* | PAH |
| **BBJKF** [3, 4] | benzo[*b,j,k*]fluoranthene | *benzo[b,j,k]fluoranten* | PAH |
| **BBJKF** [3, 4] | benzo[b+j,k]fluoranthene | *benzo[b+j,k]fluoranten* | PAH |
| **BBKF** [3, 4] | benzo[*b+k*]fluoranthene | *benzo[b+k]fluoranten* | PAH |
| **BEP** | benzo[e]pyrene | *benzo[e]pyren* | PAH |
| **BGHIP** [3] | benzo[*ghi*]perylene | *benzo[ghi]perylen* | PAH |
| **BIPN** [2] | biphenyl | *bifenyl* | PAH |
| **BJKF** [3, 4] | benzo[*j,k*]fluoranthene | *benzo[j,k]fluorantren* | PAH |
| **BKF** [3, 4] | benzo[*k*]fluoranthene | *benzo[k]fluorantren* | PAH |
| **CHR** [3, 4] | chrysene | *chrysen* | PAH |
| **CHRTR** [3, 4] | chrysene+triphenylene | *chrysen+trifenylen* | PAH |
| **COR** | coronene | *coronen* | PAH |
| **DBAHA** [3, 4] | dibenz[*a,h*]anthracene | *dibenz[a,h]anthracen* | PAH |
| **DBA3A** [3, 4] | dibenz[*a,c/a,h*]anthracene | *dibenz[a,c/a,h]antracen* | PAH |
| **DBP** [4] | dibenzopyrenes | *dibenzopyren* | PAH |
| **DBT** | dibenzothiophene | *dibenzothiofen* | PAH |
| **DBTC1** | $C_1$-dibenzothiophenes | *$C_1$-dibenzotiofen* | PAH |
| **DBTC2** | $C_2$-dibenzothiophenes | *$C_2$-dibenzotiofen* | PAH |
| **DBTC3** | $C_3$-dibenzothiophenes | *$C_3$-dibenzotiofen* | PAH |
| **FLE** [3] | fluorene | *fluoren* | PAH |
| **FLU** [3] | fluoranthene | *fluoranten* | PAH |
| **ICDP** [3, 4] | indeno[*1,2,3-cd*]pyrene | *indeno[1,2,3-cd]pyren* | PAH |
| **NAP** [2] | naphthalene | *naftalen* | PAH |
| **NAPC1** [2] | $C_1$-naphthalenes | *$C_1$-naftalen* | PAH |
| **NAPC2** [2] | $C_2$-naphthalenes | *$C_2$-naftalen* | PAH |
| **NAPC3** [2] | $C_3$-naphthalenes | *$C_3$-naftalen* | PAH |
| **NAP1M** [2] | 1-methylnaphthalene | *1-metylnaftalen* | PAH |
| **NAP2M** [2] | 2-methylnaphthalene | *2-metylnaftalen* | PAH |
| **NAPD2** [2] | 1,6-dimethylnaphthalene | *1,6-dimetylnaftalen* | PAH |
| **NAPD3** [2] | 1,5-dimethylnaphthalene | *1,5-dimetylnaftalen* | PAH |

| Abbreviation[1] | English | Norwegian | Param. group |
|---|---|---|---|
| **NAPDI** [2] | 2,6-dimethylnaphthalene | *2,6-dimetylnaftalen* | PAH |
| **NAPT2** [2] | 2,3,6-trimethylnaphthalene | *2,3,6-trimetylnaftalen* | PAH |
| **NAPT3** [2] | 1,2,4-trimethylnaphthalene | *1,2,4-trimetylnaftalen* | PAH |
| **NAPT4** [2] | 1,2,3-trimethylnaphthalene | *1,2,3-trimetylnaftalen* | PAH |
| **NAPTM** [2] | 2,3,5-trimethylnaphthalene | *2,3,5-trimetylnaftalen* | PAH |
| **NPD** | Collective term for naphthalenes, phenanthrenes and dibenzothiophenes | *Sammebetegnelse for naftalen, fenantren og dibenzotiofens* | PAH |
| **PA** [3] | phenanthrene | *fenantren* | PAH |
| **PAC1** | $C_1$-phenanthrenes | *$C_1$-fenantren* | PAH |
| **PAC2** | $C_2$-phenanthrenes | *$C_2$-fenantren* | PAH |
| **PAC3** | $C_3$-phenanthrenes | *$C_3$-fenantren* | PAH |
| **PAM1** | 1-methylphenanthrene | *1-metylfenantren* | PAH |
| **PAM2** | 2-methylphenanthrene | *2-metylfenantren* | PAH |
| **PADM1** | 3,6-dimethylphenanthrene | *3,6-dimetylfenantren* | PAH |
| **PADM2** | 9,10-dimethylphenanthrene | *9,10-dimetylfenantren* | PAH |
| **PER** | perylene | *perylen* | PAH |
| **PYR** [3] | pyrene | *pyren* | PAH |
| **DI-Σn** | sum of "n" dicyclic "PAH"s (footnote 2) | *sum "n" disykliske "PAH" (fotnote 2)* | |
| **P-Σn / P_S** | sum "n" PAH (DI-Σn not included, footnote 3) | *sum "n" PAH (DI-Σn ikke inkludert, fotnot 3)* | |
| **PK-Σn / PK_S** | sum carcinogen PAHs (footnote 4) | *sum kreftfremkallende PAH (fotnote 4)* | |
| **PAHΣΣ** | DI-Σn + P-Σn etc. | *DI-Σn + P-Σn mm.* | |
| **SPAH** | "total" PAH, specific compounds not quantified (outdated analytical method) | *"total" PAH, spesifikk forbindelser ikke kvantifisert (foreldret metode)* | |
| **BAP_P** | % BAP of PAHΣΣ | *% BAP av PAHΣΣ* | |
| **BAPPP** | % BAP of P-Σn | *% BAP av P-Σn* | |
| **BPK_P** | % BAP of PK_Sn | *% BAP av PK_Sn* | |
| **PKn_P** | % PK_Sn of PAHΣΣ | *% PK_Sn av PAHΣΣ* | |
| **PKnPP** | % PK_Sn of P-Σn | *% PK_Sn av P-Σn* | |
| | | | |
| **PCBs** | | | |
| **PCB** | polychlorinated biphenyls | *polyklorerte bifenyler* | |
| **CB** | individual chlorobiphenyls (CB) | *enkelte klorobifenyl* | |
| **CB28** | CB28 (IUPAC) | *CB28 (IUPAC)* | OC-CB |
| **CB31** | CB31 (IUPAC) | *CB31 (IUPAC)* | OC-CB |
| **CB44** | CB44 (IUPAC) | *CB44 (IUPAC)* | OC-CB |
| **CB52** | CB52 (IUPAC) | *CB52 (IUPAC)* | OC-CB |
| **CB77** [5] | CB77 (IUPAC) | *CB77 (IUPAC)* | OC-CB |
| **CB81** [5] | CB81 (IUPAC) | *CB81 (IUPAC)* | OC-CB |
| **CB95** | CB95 (IUPAC) | *CB95 (IUPAC)* | OC-CB |
| **CB101** | CB101 (IUPAC) | *CB101 (IUPAC)* | OC-CB |
| **CB105** | CB105 (IUPAC) | *CB105 (IUPAC)* | OC-CB |
| **CB110** | CB110 (IUPAC) | *CB110 (IUPAC)* | OC-CB |
| **CB118** | CB118 (IUPAC) | *CB118 (IUPAC)* | OC-CB |
| **CB126** [5] | CB126 (IUPAC) | *CB126 (IUPAC)* | OC-CB |
| **CB128** | CB128 (IUPAC) | *CB128 (IUPAC)* | OC-CB |
| **CB138** | CB138 (IUPAC) | *CB138 (IUPAC)* | OC-CB |
| **CB149** | CB149 (IUPAC) | *CB149 (IUPAC)* | OC-CB |
| **CB153** | CB153 (IUPAC) | *CB153 (IUPAC)* | OC-CB |
| **CB156** | CB156 (IUPAC) | *CB156 (IUPAC)* | OC-CB |
| **CB169** [5] | CB169 (IUPAC) | *CB169 (IUPAC)* | OC-CB |
| **CB170** | CB170 (IUPAC) | *CB170 (IUPAC)* | OC-CB |
| **CB180** | CB180 (IUPAC) | *CB180 (IUPAC)* | OC-CB |
| **CB194** | CB194 (IUPAC) | *CB194 (IUPAC)* | OC-CB |
| **CB209** | CB209 (IUPAC) | *CB209 (IUPAC)* | OC-CB |
| **CB-Σ7** | CB: 28+52+101+118+138+153+180 | *CB: 28+52+101+118+138+153+180* | |
| **CB-ΣΣ** | sum of CBs, includes CB-Σ7 | *sum CBer, inkluderer CB-Σ7* | |
| **TECBW** | Sum of CB-toxicity equivalents after WHO model, see **TEQ** | *Sum CB- toksitets ekvivalenter etter WHO modell, se **TEQ*** | |
| **TECBS** | Sum of CB-toxicity equivalents after SAFE model, see **TEQ** | *Sum CB-toksitets ekvivalenter etter SAFE modell, se **TEQ*** | |

| **Abbreviation**[1] | English | *Norwegian* | Param. group |
|---|---|---|---|
| **DIOXINs** | | | |
| **TCDD** | 2, 3, 7, 8-tetrachloro-dibenzo dioxin | *2, 3, 7, 8-tetrakloro-dibenzo dioksin* | OC-DX |
| **CDDST** | Sum of tetrachloro-dibenzo dioxins | *Sum tetrakloro-dibenzo dioksiner* | |
| **CDD1N** | 1, 2, 3, 7, 8-pentachloro-dibenzo dioxin | *1, 2, 3, 7, 8-pentakloro-dibenzo dioksin* | OC-DX |
| **CDDSN** | Sum of pentachloro-dibenzo dioxins | *Sum pentakloro-dibenzo dioksiner* | |
| **CDD4X** | 1, 2, 3, 4, 7, 8-hexachloro-dibenzo dioxin | *1, 2, 3, 4, 7, 8-heksakloro-dibenzo dioksin* | OC-DX |
| **CDD6X** | 1, 2, 3, 6, 7, 8-hexachloro-dibenzo dioxin | *1, 2, 3, 6, 7, 8-heksakloro-dibenzo dioksin* | OC-DX |
| **CDD9X** | 1, 2, 3, 7, 8, 9-hexachloro-dibenzo dioxin | *1, 2, 3, 7, 8, 9-heksakloro-dibenzo dioksin* | OC-DX |
| **CDDSX** | Sum of hexachloro-dibenzo dioxins | *Sum heksakloro-dibenzo dioksiner* | |
| **CDD6P** | 1, 2, 3, 4, 6, 7, 8-heptachloro-dibenzo dioxin | *1, 2, 3, 4, 6, 7, 8-heptakloro-dibenzo dioksin* | OC-DX |
| **CDDSP** | Sum of heptachloro-dibenzo dioxins | *Sum heptakloro-dibenzo dioksiner* | |
| **CDDO** | Octachloro-dibenzo dioxin | *Oktakloro-dibenzo dioksin* | OC-DX |
| **PCDD** | Sum of polychlorinated dibenzo-p-dioxins | *Sum polyklorinaterte-dibenzo-p-dioksiner* | |
| **CDF2T** | 2, 3, 7, 8-tetrachloro-dibenzofuran | *2, 3, 7, 8-tetrakloro-dibenzofuran* | OC-DX |
| **CDFST** | Sum of tetrachloro-dibenzofurans | *Sum tetrakloro-dibenzofuraner* | |
| **CDFDN** | 1, 2, 3, 7, 8/1, 2, 3, 4, 8-pentachloro-dibenzofuran | *1, 2, 3, 7, 8/1, 2, 3, 4, 8-pentakloro-dibenzofuran* | OC-DX |
| **CDF2N** | 2, 3, 4, 7, 8-pentachloro-dibenzofuran | *2, 3, 4, 7, 8-pentakloro-dibenzofuran* | OC-DX |
| **CDFSN** | Sum of pentachloro-dibenzofurans | *Sum pentakloro-dibenzofuraner* | |
| **CDFDX** | 1, 2, 3, 4, 7, 8/1, 2, 3, 4, 7, 9-hexachloro-dibenzofuran | *1, 2, 3, 4, 7, 8/1, 2, 3, 4, 7, 9-heksakloro-dibenzofuran* | OC-DX |
| **CDF6X** | 1, 2, 3, 6, 7, 8-hexachloro-dibenzofuran | *1, 2, 3, 6, 7, 8-heksakloro-dibenzofuran* | OC-DX |
| **CDF9X** | 1, 2, 3, 7, 8, 9-hexachloro-dibenzofuran | *1, 2, 3, 7, 8, 9-heksakloro-dibenzofuran* | OC-DX |
| **CDF4X** | 2, 3, 4, 6, 7, 8-hexachloro-dibenzofuran | *2, 3, 4, 6, 7, 8-heksakloro-dibenzofuran* | OC-DX |
| **CDFSX** | Sum of hexachloro-dibenzofurans | *Sum heksakloro-dibenzofuraner* | |
| **CDF6P** | 1, 2, 3, 4, 6, 7, 8-heptachloro-dibenzofuran | *1, 2, 3, 4, 6, 7, 8-heptakloro-dibenzofuran* | OC-DX |
| **CDF9P** | 1, 2, 3, 4, 7, 8, 9-heptachloro-dibenzofuran | *1, 2, 3, 4, 7, 8, 9-heptakloro-dibenzofuran* | OC-DX |
| **CDFSP** | Sum of heptachloro-dibenzofurans | *Sum heptakloro-dibenzofuraner* | OC-DX |
| **CDFO** | Octachloro-dibenzofurans | *Octakloro-dibenzofuran* | OC-DX |
| **PCDF** | Sum of polychlorinated dibenzo-furans | *Sum polyklorinated dibenzo-furaner* | |
| **CDDFS** | Sum of PCDD and PCDF | *Sum PCDD og PCDF* | |
| **TCDNN** | Sum of TCDD-toxicity equivalents after Nordic model, see **TEQ** | *Sum TCDD- toksitets ekvivalenter etter Nordisk modell, se **TEQ*** | |
| **TCDDI** | Sum of TCDD-toxicity equivalents after international model, see **TEQ** | *Sum TCDD-toksitets ekvivalenter etter internasjonale modell, se **TEQ*** | |
| | | | |
| **PESTICIDES** | | | |
| **ALD** | aldrin | *aldrin* | OC-DN |
| **DIELD** | dieldrin | *dieldrin* | OC-DN |
| **ENDA** | endrin | *endrin* | OC-DN |
| **CCDAN** | cis-chlordane (=α-chlordane) | *cis-klordan (=α-klordan)* | OC-DN |
| **TCDAN** | trans-chlordane (=γ-chlordane) | *trans-klordan (=γ-klordan)* | OC-DN |
| **OCDAN** | oxy-chlordane | *oksy-klordan* | OC-DN |
| **TNONC** | trans-nonachlor | *trans-nonaklor* | OC-DN |
| **TCDAN** | trans-chlordane | *trans-klordan* | OC-DN |
| **OCS** | octachlorostyrene | *oktaklorstyren* | OC-CL |
| **QCB** | pentachlorobenzene | *pentaklorbenzen* | OC-CL |
| **DDD** | dichlorodiphenyldichloroethane 1,1-dichloro-2,2-bis-(4-chlorophenyl)ethane | *diklordifenyldikloretan 1,1-dikloro-2,2-bis-(4-klorofenyl)etan* | OC-DD |

| **Abbreviation[1]** | English | *Norwegian* | Param. group |
|---|---|---|---|
| **DDE** | dichlorodiphenyldichloroethylene (principle metabolite of DDT) 1,1-dichloro-2,2-bis-(4-chlorophenyl)ethylene* | *diklordifenyldikloretylen (hovedmetabolitt av DDT) 1,1-dikloro-2,2-bis-(4-klorofenyl)etylen* | OC-DD |
| **DDT** | dichlorodiphenyltrichloroethane 1,1,1-trichloro-2,2-bis-(4-chlorophenyl)ethane | *diklordifenyltrikloretan 1,1,1-trikloro-2,2-bis-(4-klorofenyl)etan* | OC-DD |
| **DDEOP** | o,p'-DDE | *o,p'-DDE* | OC-DD |
| **DDEPP** | p,p'-DDE | *p,p'-DDE* | OC-DD |
| **DDTOP** | o,p'-DDT | *o,p'-DDT* | OC-DD |
| **DDTPP** | p,p'-DDT | *p,p'-DDT* | OC-DD |
| **TDEPP** | p,p'-DDD | *p,p'-DDD* | OC-DD |
| **DDTEP** | p,p'-DDE + p,p'-DDT | *p,p'-DDE + p,p'-DDT* | OC-DD |
| **DD-nΣ** | sum of DDT and metabolites, n = number of compounds | *sum DDT og metabolitter, n = antall forbindelser* | OC-DD |
| **HCB** | hexachlorobenzene | *heksaklorbenzen* | OC-CL |
| **HCHG** | Lindane γ HCH = gamma hexachlorocyclohexane (γ BHC = gamma benzenehexachloride, outdated synonym) | *Lindan γ HCH = gamma heksaklorsykloheksan (γ BHC = gamma benzenheksaklorid, foreldret betegnelse)* | OC-HC |
| **HCHA** | α HCH = alpha HCH | *α HCH = alpha HCH* | OC-HC |
| **HCHB** | β HCH = beta HCH | *β HCH = beta HCH* | OC-HC |
| **HC-nΣ** | sum of HCHs, n = count | *sum av HCHs, n = antall* | |
| **EOCl** | extractable organically bound chlorine | *ekstraherbart organisk bundet klor* | OC-CL |
| **EPOCl** | extractable persistent organically bound chlorine | *ekstraherbart persistent organisk bundet klor* | OC-CL |
| **PBDEs** | | | |
| **PBDE** | polybrominated diphenyl ethers | *polybromerte difenyletere* | OC-BB |
| **BDE** | brominated diphenyl ethers | | OC-BB |
| **BDE-28** | 2,4,4'-tribromodiphenyl ether | *2,4,4'-tribromdifenyleter* | OC-BB |
| **BDE-47** | 2,2',4,4'-tetrabromodiphenyl ether | *2,2',4,4'-tetrabromdifenyleter* | OC-BB |
| **BDE-49*** | 2,2',4,5'- tetrabromodiphenyl ether | *2,2',4,5'- tetrabromdifenyleter* | OC-BB |
| **BDE-66*** | 2,3',4',6- tetrabromodiphenyl ether | *2,3',4',6- tetrabromdifenyleter* | OC-BB |
| **BDE-71*** | 2,3',4',6- tetrabromodiphenyl ether | *2,3',4',6- tetrabromdifenyleter* | OC-BB |
| **BDE-77** | 3,3',4,4'-tetrabromodiphenyl ether | *3,3',4,4'-tetrabromdifenyleter* | OC-BB |
| **BDE-85** | 2,2',3,4,4'-pentabromodiphenyl ether | 2,2',3,4,4'-pentabromdifenyleter | OC-BB |
| **BDE-99** | 2,2',4,4',5-pentabromodiphenyl ether | *2,2',4,4',5-pentabromdifenyleter* | OC-BB |
| **BDE-100** | 2,2',4,4',6-pentabromodiphenyl ether | *2,2',4,4',6-pentabromdifenyleter* | OC-BB |
| **BDE-119** | 2,3',4,4',6-pentabromodiphenyl ether | *2,3',4,4',6-pentabromdifenyleter* | OC-BB |
| **BDE-138** | 2,2',3,4,4',5'-hexabromodiphenyl ether | *2,2',3,4,4',5'-heksabromdifenyleter* | OC-BB |
| **BDE-153** | 2,2',4,4',5,5'-hexabromodiphenyl ether | *2,2',4,4',5,5'-heksabromdifenyleter* | OC-BB |
| **BDE-154** | 2,2',4,4',5,6'-hexabromodiphenyl ether | *2,2',4,4',5,6'-heksabromdifenyleter* | OC-BB |
| **BDE-183** | 2,2',3,4,4',5',6-heptabromodiphenyl ether | *2,2',3,4,4',5',6-heptabromdifenyleter* | OC-BB |
| **BDE-196** | 2,2',3,3',4,4',5',6-octabromodiphenyl ether | *2,2',3,3',4,4',5',6-octabromdifenyleter* | OC-BB |
| **BDE-205** | 2,2',3,3',4,4',5,5',6'-nonabromodiphenyl ether | *2,2',3,3',4,4',5,5',6'-nonabromdifenyleter* | OC-BB |
| **BDE-209** | Decabromodiphenyl ether | *Dekabromdifenyleter* | OC-BB |
| **PFAS** | perfluorinated alkylated substances | perfluoralkylertestoffer | |
| **PFBS** | perfluorobutane sulfonate | perfluorbutan sulfonat | PFAS |
| **PFHxA** | perfluorohexanoic acid | perfluorhexansyre | PFAS |
| **PFHpA** | perfluoroheptanoic acid | perfluorheptansyre | PFAS |

| **Abbreviation**[1] | English | *Norwegian* | Param. group |
|---|---|---|---|
| **PFOA** | perfluorooctanoic acid | perfluoroktansyre | PFAS |
| **PFNA** | perfluorononanoic acid | perfluornonansyre | PFAS |
| **PFOS** | perfluoroctanoic sulfonate | perfluoroktansulfonat | PFAS |
| **PFOSA** | perfluoroctanesulfonic acid | perfluoroktansulfon syre | PFAS |
| | | | |
| **NTOT** | total organic nitrogen | *total organisk nitrogen* | I-NUT |
| **CTOT** | total organic carbon | *total organisk karbon* | O-MAJ |
| **CORG** | organic carbon | *organisk karbon* | O-MAJ |
| **GSAMT** | grain size | *kornfordeling* | P-PHY |
| **MOCON** | moisture content | *vanninnhold* | P-PHY |
| | | | |
| **INSTITUTES** | | | |
| **EFDH** | Eurofins [DK] | *Eurofins [DK]* | |
| **FIER** | Institute for Nutrition, Fisheries Directorate | *Fiskeridirektoratets Ernæringsinstitutt* | |
| **FORC** | FORCE Institutes, Div. for Isotope Technique and Analysis [DK] | *FORCE Institutterne, Div. for Isotopteknik og Analyse [DK]* | |
| **GALG** | GALAB Laboratories Gmbh [D] | *GALAB Laboratories Gmbh [D]* | |
| **IFEN** | Institute for Energy Technology | *Institutt for energiteknikk* | |
| **IMRN** | Institute of Marine Research (IMR) | *Havforskningsinstituttet* | |
| **NACE** | Nordic Analytical Center | *Nordisk Analyse Center* | |
| **NILU** | Norwegian Institute for Air Research | *Norsk institutt forluftforskning* | |
| **NIVA** | Norwegian Institute for Water Research | *Norsk institutt for vannforskning* | |
| **SERI** | Swedish Environmental Research Institute | *Institutionen för vatten- och luftvårdsforskning* | |
| **SIIF** | Fondation for Scientific and Industrial Research at the Norwegian Institute of Technology - SINTEF (a division, previously: Center for Industrial Research SI) | *Stiftelsen for industriell og teknisk forskning ved Norges tekniske høgskole- SINTEF (en avdeling, tidligere: Senter for industriforskning SI)* | |
| **VETN** | Norwegian Veterinary Institute | *Veterinærinstituttet* | |
| **VKID** | Water Quality Institute [DK] | *Vannkvalitetsintitutt [DK]* | |

1) After: ICES Environmental Data Reporting Formats. International Council for the Exploration of the Sea. July 1996 and supplementary codes related to non-ortho and mono-ortho PCBs and “dioxins” (ICES pers. comm.)

2) Indicates "PAH" compounds that are dicyclic and not truly PAHs typically identified during the analyses of PAH, include naphthalenes and "biphenyls".

3) Indicates the sum of tri- to hexacyclic PAH compounds named in EPA protocol 8310 minus naphthalene (dicyclic), so that the SFT classification system can be applied

4) Indicates PAH compounds potentially cancerogenic for humans according to IARC (1987, updated 14.August 2007 at http://monographs.iarc.fr/ENG/Classification/crthgr01.php), i.e., categories 1, 2A, and 2B (are, possibly and probably carcinogenic). NB.: the update inlcludes Chrysene as cancerogenic and hence, KPAH with Chrysene should not be used in Klif’s classification system for this sum-variable (Molvær *et al.* 1997).

5) Indicates non ortho- co-planer PCB compounds i.e., those that lack Cl in positions 1, 1', 5, and 5'

*) The Pesticide Index, second edition. The Royal Society of Chemistry, 1991.

**Other abbreviations** *andre forkortelser*

| | English | *Norwegian* |
|---|---|---|
| **TEQ** | "Toxicity equivalency factors" for the most toxic compounds within the following groups:<br>• polychlorinated dibenzo-p-dioxins and dibenzofurans (**PCDD/PCDFs**). Equivalents calculated after Nordic model (Ahlborg 1989) [1] or international model (Int./EPA, cf. Van den Berg *et al.* 1998) [2]<br>• non-ortho and mono-ortho substituted chlorobiphenyls after WHO model (Ahlborg *et al.* 1994) [3] or Safe (1994, cf. NILU pers. comm.) | *"Toxisitetsekvivalentfaktorer" for de giftigste forbindelsene innen følgende grupper.*<br>• *polyklorerte dibenzo-p-dioksiner og dibenzofuraner (**PCDD/PCDF**). Ekvivalentberegning etter nordisk modell (Ahlborg 1989) [1] eller etter internasjonal modell (Int./EPA, cf. Van den Berg* et al. *1998) [2]*<br>• *non-orto og mono-orto substituerte klorobifenyler etter WHO modell (Ahlborg* et al. *1994) [3] eller Safe (1994, cf. NILU pers. medd.)* |
| **ppm** | parts per million, mg/kg | *deler pr. milliondeler, mg/kg* |
| **ppb** | parts per billion, µg/kg | *deler pr. milliarddeler, µg/kg* |
| **ppp** | parts per trillion, ng/kg | *deler pr. tusen-milliarddeler, ng/kg* |
| **d.w.** | dry weight basis | *tørrvekt basis* |
| **w.w.** | wet weight or fresh weight basis | *våtvekt eller friskvekt basis* |

[1]) Ahlborg, U.G., 1989. Nordic risk assessment of PCDDs and PCDFs. Chemosphere 19:603-608.

[2]) Van den Berg, Birnbaum, L, Bosveld, A. T. C. and co-workers, 1998. Toxic equivalency factors (TEFs) for PCBs, PCDDs, PCDFs for humans and wildlife. Environ Hlth. Perspect. 106:775-792.

[3]) Ahlborg, U.G., Becking G.B., Birnbaum, L.S., Brouwer, A, Derks, H.J.G.M., Feely, M., Golor, G., Hanberg, A., Larsen, J.C., J.C., Liem, A.K.G., Safe, S.H., Schlatter, C., Wärn, F., Younes, M., Yrjänheikki, E., 1994. Toxic equivalency factors for dioxin-like PCBs. Report on a WHO-ECEH and IPSC consultation , December 1993. Chemosphere 28:1049-1067.

# Appendix D
# Classification of environmental quality

***Table 12.*** *Climate and Pollution Agency environmental classification system of contaminants in blue mussel and fish (Molvær et al. 1997) and proposed revisions (shaded) for Class I concentrations (Knutzen & Green 2001b) used in this report.*

| **Contaminant** | | | **Classification (upper limit for Classes I-IV)** *Degree of pollution* | | | | |
|---|---|---|---|---|---|---|---|
| | | | **I** ***Insignificant*** | **II** ***Moderate*** | **III** ***Marked*** | **IV** ***Severe*** | **V** ***Extreme*** |
| **Blue mussel** | | | | | | | |
| **Lead (Pb)** | mg/kg | w.w. [2)] | 0.6 | 3 | 8 | 20 | >20 |
| | mg/kg | d.w. | 3 | 15 | 40 | 100 | >100 |
| **Cadmium (Cd)** | mg/kg | w.w. [2)] | 0.4 | 1 | 4 | 8 | >8 |
| | mg/kg | d.w. | 2 | 5 | 20 | 40 | >40 |
| **Copper (Cu)** | mg/kg | w.w. [2)] | 2 | 6 | 20 | 40 | >40 |
| | mg/kg | d.w. | 10 | 30 | 100 | 200 | >200 |
| **Mercury (Hg)** | mg/kg | w.w. [2)] | 0.04 | 0.1 | 0.3 | 0.8 | >0.8 |
| | mg/kg | d.w. | 0.2 | 0.5 | 1.5 | 4 | >4 |
| **Zinc (Zn)** | mg/kg | w.w. [2)] | 40 | 80 | 200 | 500 | >500 |
| | mg/kg | d.w. | 200 | 400 | 1000 | 2500 | >2500 |
| **TBT** [1)] | mg/kg | d.w. | 0.1 | 0.5 | 2 | 5 | >5 |
| **∑PCB-7** | µg/kg | w.w. | 3 [5)] | 15 | 40 | 100 | >100 |
| | | d.w. [2)] | 15 [2)] | 75 | 200 | 500 | >500 |
| **∑DDT** | µg/kg | w.w. | 2 | 5 | 10 | 30 | >30 |
| | | d.w. [2)] | 10 | 25 | 50 | 150 | >150 |
| **∑HCH** | µg/kg | w.w. | 1 | 3 | 10 | 30 | >30 |
| | | d.w. [2)] | 5 | 15 | 50 | 150 | >150 |
| **HCB** | µg/kg | w.w. | 0.1 | 0.3 | 1 | 5 | >5 |
| | | d.w. [2)] | 0.5 | 1.5 | 5 | 25 | >25 |
| **∑PAH** | µg/kg | w.w. | 50 | 200 | 2000 | 5000 | >5000 |
| | | d.w. [2)] | 250 | 1000 | 10000 | 25000 | >25000 |
| **∑KPAH** | µg/kg | w.w. | 10 | 30 | 100 | 300 | >300 |
| | | d.w. [2)] | 50 | 150 | 500 | 1500 | >1500 |
| **B[*a*]P** | µg/kg | w.w. | 1 | 3 | 10 | 30 | >30 |
| | | d.w. [2)] | 5 | 15 | 50 | 150 | >150 |
| **$TE_{PCDF/D}$** [3)] | µg/t [4)] | w.w. | 0.2 | 0.5 | 1.5 | 3 | >3 |
| **Cod, fillet** | | | | | | | |
| **Mercury (Hg)** | mg/kg | w.w. | 0.1 | 0.3 | 0.5 | 1 | >1 |
| **∑PCB-7** | µg/kg | w.w. | 3 [6)] | 20 | 50 | 150 | >150 |
| **∑DDT** | µg/kg | w.w. | 1 | 3 | 10 | 25 | >25 |
| **∑HCH** | µg/kg | w.w. | 0.3 [7)] | 2 | 5 | 15 | >15 |
| **HCB** | µg/kg | w.w. | 0.2 | 0.5 | 2 | 5 | >5 |
| **$TE_{PCDF/D}$** | ng/kg | w.w. | < 0.1 | 0.3 | 1 | 2 | > 2 |
| **Cod, liver** | | | | | | | |
| **∑PCB-7** | µg/kg | w.w. | 500 | 1500 | 4000 | 10000 | >10000 |
| **∑DDT** | µg/kg | w.w. | 200 [8)] | 500 | 1500 | 3000 | >3000 |
| **∑HCH** | µg/kg | w.w. | 30 [9)] | 200 | 500 | 1000 | >1000 |
| **HCB** | µg/kg | w.w. | 20 | 50 | 200 | 400 | >400 |
| **$TE_{PCDF/D}$** [3)] | µg/t [4)] | w.w. | 10 [10)] | 40 | 100 | 300 | >300 |
| **Flounder, fillet** | | | | | | | |
| **∑PCB-7** | µg/kg | w.w. | <5 | 20 | 50 | 150 | >150 |
| **∑DDT** | µg/kg | w.w. | <2 | 4 | 15 | 40 | >40 |
| **∑HCH** | µg/kg | w.w. | <1 | 3 | 10 | 30 | >30 |
| **HCB** | µg/kg | w.w. | <0.2 | 0.5 | 2 | 5 | >5 |
| **$TE_{PCDF/D}$** | ng/kg | w.w. | <0.1 | 0.3 | 1 | 3 | >3 |

[1]) Tributyltin on a formula basis

[2]) Conversion assuming 20% dry weight

[3]) TCDDN (Appendix C)

[4]) µg/1000 kg (Appendix C)

[5]) Blue mussel - ΣPCB7: Decrease limit from 4 to 3

[6]) Cod fillet - ΣPCB7: Decrease limit from 5 to 3

[7]) Cod fillet - ΣHCH: Decrease limit from 0.5 to 0.3

[8]) Cod liver - ΣDDT: Proposal to either increase limit from 200 to 300 or, preferably, replace ΣDDT with p,p'-DDE and keep the limit (Knutzen & Green 2001b)

[9]) Cod liver - ΣHCH: Decrease limit from 50 to 30

[10]) Cod liver: TEPCDD/PCDF: Decrease limit from 0.015 to 0.010

***Table 13.*** *Provisional "high background levels" of selected contaminants, in* ***mg/kg dry weight*** *(blue mussel) and* ***mg/kg wet weight*** *(blue mussel and fish) used in this report. The respective "high background" limits are from Knutzen & Skei (1990) with mostly minor adjustments (Knutzen & Green 1995, 2001b; Molvær et al. 1997), except for dab where the suggested limit is based on CEMP-data (Knutzen & Green 1995). Especially uncertain values are marked with "?".*

| **Cont.** | **Blue mussel** [1] | | **Cod** [1] | | **Flounder** [1] | | **Dab** [1] | | **Plaice** [1] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | **liver** | **fillet** | **liver** | **fillet** | **liver** | **fillet** | **liver** | **fillet** |
| | mg/kg d.w. | mg/kg w.w. | mg/kg w.w. | mg/kg w.w. | mg/kg w.w. | mg/kg w.w. | mg/kg w.w. | mg/kg w.w. | mg/kg w.w. | mg/kg w.w. |
| **Lead** | 3.0 2) | 0.6 3) | 0.1 | | 0.3 ? | | 0.3 ? | | 0.2 ? | |
| **Cadmium** | 2.0 2) | 0.4 3) | 0.3 | | 0.3 ? | | 0.3 ? | | 0.2 ? | |
| **Copper** | 10 2) | 2 3) | 20 | | 10 ? | | 30 ? | | 10 ? | |
| **Mercury** | 0.2 2) | 0.04 3) | | 0.1 2) | | 0.1 | | 0.1 | | 0.1 |
| **Zinc** | 200 2) | 40 3) | 30 | | 50 ? | | 60 ? | | 50 ? | |
| **∑PCB-7 8)** | 0.015 3,9) | 0.003 2 9) | 0.50 2) | 0.003 9) | 0.1 | 0.003 9) | 0.5 | 0.005 9) | 0.05 ? | 0.004 9) |
| **ppDDE** | 0.010 3) | 0.002 6) | 0.2 9) | | 0.03 | 0.001 9) | 0.1 | 0.002 9) | 0.01 ? 6) | 0.001 9) |
| **γ HCH** | 0.005 3) | 0.001 6) | 0.03 9) | 0.0003 9) | 0.01 | 0.0003 9) | 0.03 | 0.0005 9) | 0.005 ? 6) | 0.0003 9) |
| **HCB** | 0.0005 3) | 0.0001 2) | 0.02 2) | | 0.005 | 0.0001 9) | 0.01 | 0.0002 9) | 0.005 ? | 0.0002 9) |
| **TCDDN** | 0.000001 3)<br>0.0000002 2) | | 0.00001 9) | | | | | | | |

[1] ) Respectively: *Mytilus edulis, Gadus morhua, Platichthys flesus* and *Limanda limanda*

[2] ) From the Norwegian Pollution Control Authority Environmental Class I ("good") (Molvær *et al.* 1997)

[3] ) Conversion assuming 20% dry weight

[4] ) Approximately 25% of ΣPCB-7 (Knutzen & Green 1995)

[5] ) 1.5-2 times 75% quartile (cf. Annex B in Knutzen & Green 1995)

[6] ) Assumed equal to limit for ΣDDT or ΣHCH, respectively, from the Norwegian Pollution Control Authority Environmental Class I ("good") (Molvær *et al.* 1997). Hence, limits for ppDDE and γHCH are probably too high (lacking sufficient and reliable reference values)

[7] ) Mean plus 2 times standard deviation (cf. Annex B in Knutzen & Green 1995)

[8] ) Estimated as sum of 7 individual PCB compounds (CB-28, -52, -101, -118, -138, -153 and -180) and assumed to be ca. 50% and 70% of total PCB for blue mussel and cod/flatfish, respectively

[9] ) Flounder liver: Decrease limit from 5 to 3 and from 2 to 1 for ΣPCB7 and p,p-DDE, respectively, with regard to revisions suggested by Knutzen & Green (2001b) and Green & Knutzen (2003)

# Appendix E
# Summary of action taken by Norwegian Food Safety Authority

***Table 14.** Summary of action taken by the Norwegian Food Safety Authority (Mattilsynet) concerning the consumption and sale of fish products along the Norwegian Coast (see www.miljostatus.no > tema/Hav-og-vann/pavikninger-pa-livet-i-vann > miljøgifter_vann > miljøgifter_marint > kostholdsråd and review by Økland 2005). Restrictions on sale vary and may concern the whole or part of fish product.*

| **Area of concern ($km^2$)** | **Main parameters of concern** | **Last year of issue/ adjustment** | **Main fish/shellfish product of concerned** | **Recommendations or restrictions of concern:** |
|---|---|---|---|---|
| Mid [1] and Inner Oslofjord (498.9) (includes Drammensfj.) | PCB | 2002 | fish liver, eel | Consumption |
| Tønsberg area (23.7) (includes (Vrengen) | PCB | 2003 | fish liver, eel, mussels | Consumption |
| Inner Sandefjordfjord (1.5) | PCB | 1999 | fish liver | Consumption |
| Grenland fjords, Langesundsfjord (90.3) | Chl.org [2]/ Dioxins | 2004 | fish, shellfish | Consumption |
| Kragerø (3.2) | PAH Dioxins | 2002 | eel, mussels | Consumption |
| Tvedestrand (2.3) | PCB | 2000 | fish liver | Consumption |
| Arendal (8.0) | PCB | 2000 | fish liver | Consumption |
| Inner Kristiansandsfjord (33.3) | Chl.org [2]/ Dioxins/PCB | 2000 | fish, shellfish | Consumption |
| Farsund area (42.0) | PCB PAH | 2000 | fish liver, mussels | Consumption |
| Fedafjord (11.2) | PAH | 2002 | mussels | Consumption |
| Fedje | Hg | 2010 | fish, shellfish | Consumption |
| Flekkefjord (4.2) | PCB | 2000 | fish liver | Consumption |
| Stavanger (4.0) | PCB PAH | 2001 | fish liver, mussels | Consumption |
| Sandnes (1.7) | PAH | 2001 | mussels | Consumption |
| Karmsund-Eidsbotn, Vedavågen (24.1 [6]) | PCB, PAH | 2005 | fish liver [3], shellfish | Consumption |
| Saudafjord (16.6 [7]) | PAH | 2007 | fish liver, mussels | Consumption |
| Sørfjord (62.2) | Cd Pb Hg PCB | 2005 | fish, shellfish | Consumption |
| Bergen area (169.9) | PCB Hg | 2008 | fish, shellfish | Consumption |
| Høyangerfjorden (10.2 [7]) | Cd Pb | 2008 | fish liver, shellfish | Consumption |
| Årdalsfjord (30.4) | PAH | 2002 | mussels | Consumption |
| Åsefjorden/Ellingsøyfjorden (8 [7]) | HBCDD [4] Hg | 2006/2007 | fish, shellfish | Consumption |
| Sunndalsfjord (100.1) | PAH | 2005 | fish liver, mussels | Consumption |
| Hommelvik (2.6) | PAH | 1985 | mussels | Consumption |
| Inner Trondheimfjorden (1.2) | PAH PCB | 2002 | fish liver, mussels | Consumption |
| Brønnøysund (7.0) | PAH | 2003 | mussels | Consumption |
| Vefsnfjord (76.4) [5] | | | | |
| Sandnessjøen (0.4) | PAH | 2005 | mussels | Consumption |
| Inner Ranfjord (16.6) | PAH | 2005 | mussels | Consumption |
| Ramsund (5.4) | PCB | 2000 | fish, shellfish | Consumption |
| Harstad (2.9) | PCB Pb Cd | 2003 | fish liver, mussels | Consumption |
| Narvik (11.6) | PCB PAH | 2005 | fish liver, mussels | Consumption |
| Tromsø (17.7) | PAH | 2006 | fish liver, mussels | Consumption |
| Hammerfest (4.1) | PAH | 2003 | mussels | Consumption |
| Honningsvåg (3.3) | PAH | 2000 | mussels | Consumption |

[1] Includes, Hvitsten, Moss, Horten og Holmenstrand
[2] Organochlorine compounds
[3] Concerns only Eidsbotn
[4] A brominated flame retardant
[5] Grounds for concern were cleared in 2005
[6] Exclusive Vedavågen
[7] Estimated from map shown in www.miljostatus.no

# Appendix F
# Overview of localities and sample count for biota
# 1981-2009

**Nominal station positions are shown on maps in Appendix G**

jmpco:CEMP area code (J99 = unclassified)
jmpst: station code
stnam: station name
nom_lon: Longitude (nominal)
nom_lat: Latitude (nominal)
speci: species code (English, Norwegian (Latin))
MYTI EDU - blue mussel, blåskjell (*Mytilus edulis*)
NUCE LAP - dogwhelk, purpursnegl (*Nucella lapillus*)
BROS BRO - tusk, brosme (*Brosme brosme)*
CHIM MON - rat fish, havmus (*Chimaera monstrosa*)
GADU MOR - Atlantic cod, torsk (*Gadus morhua*)
LEPI WHI - megrim, glassvar (*Lepidorhombus whiff-iagonis*)
LIMA LIM - dab, sandflyndre (*Limanda limanda*)
MICR KIT - lemon sole, lomre (*Microstomus kitt*)
MOLV MOL - ling, lange (*Molva molva*)
PAND BOR - shrimp, reker (*Pandalus borealis)*
PLAT FLE - flounder, skrubbe (*Platichthys flesus*)
PLEU PLA - plaice, rødspette (*Pleuronectes platessa*)
tissu: tissue:
SB - soft body
LI - liver
MU - fillet
TM - tail muscle

# STATIONS AND SAMPLE COUNT FOR BIOTA

| jmpst | Station_Name | Latitude | Longitude | speci | tissu | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01A | Sponvika | 59.088 | 11.226 | MYTI EDU | SB | | 3 | | | 3 | | | | | 3 | | | | | | | | | | | | | | | | | | 3 | 3 |
| 02A | Fugleskjær | 59.115 | 10.983 | MYTI EDU | SB | | 3 | | | 3 | | | | | 3 | | | | | | | | | | | | | | | | | | 2 | 3 |
| 03A | Tisler | 58.980 | 10.958 | MYTI EDU | SB | | 2 | | | 3 | | | | | 3 | | | | | | | | | | | | | | | | | | 3 | 3 |
| 10A1 | Skagodden | 70.104 | 30.262 | MYTI EDU | SB | | | | | | | | | | | | | | 3 | 3 | | | | | | | | | | | | | | |
| 10A2 | Skallneset | 70.104 | 30.262 | MYTI EDU | SB | | | | | | | | | | | | | | | | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 10B | Varangerfjorden | 69.933 | 29.667 | BROS BRO | LI | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | |
| 10B | Varangerfjorden | 69.933 | 29.667 | BROS BRO | MU | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | |
| 10B | Varangerfjorden | 69.933 | 29.667 | GADU MOR | BI | | | | | | | | | | | | | | | | | | | | 22 | 21 | | | | | | | | |
| 10B | Varangerfjorden | 69.933 | 29.667 | GADU MOR | BL | | | | | | | | | | | | | | | | | | | | 25 | 25 | | | | | | | | |
| 10B | Varangerfjorden | 69.933 | 29.667 | GADU MOR | LI | | | | | | | | | | | | | | 21 | 25 | 25 | 23 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 10 | 25 | 25 | 25 |
| 10B | Varangerfjorden | 69.933 | 29.667 | GADU MOR | MU | | | | | | | | | | | | | | 25 | 30 | 30 | 27 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 12 | 30 | 30 | 30 |
| 10F | Skogerøy | 69.917 | 29.850 | PLEU PLA | BI | | | | | | | | | | | | | | | | | | | | 15 | 25 | | | | | | | | |
| 10F | Skogerøy | 69.917 | 29.850 | PLEU PLA | BL | | | | | | | | | | | | | | | | | | | | 11 | 24 | | | | | | | | |
| 10F | Skogerøy | 69.917 | 29.850 | PLEU PLA | LI | | | | | | | | | | | | | | | | | 5 | | 4 | 18 | 30 | 30 | 22 | 24 | 30 | | 24 | 12 | 18 |
| 10F | Skogerøy | 69.917 | 29.850 | PLEU PLA | MU | | | | | | | | | | | | | | | | | 5 | | 4 | 18 | 30 | 30 | 22 | 24 | 30 | | 24 | 12 | 17 |
| 10G3 | Vardø | 70.378 | 31.108 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | |
| 10G4 | Vadsø | 70.075 | 29.715 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | |
| 11A1 | Sildkrokneset (south) | 69.785 | 30.185 | MYTI EDU | SB | | | | | | | | | | | | | | 3 | 3 | | | | | | | | | | | | | | |
| 11A2 | Sildkrokneset (north) | 69.785 | 30.185 | MYTI EDU | SB | | | | | | | | | | | | | | | | 4 | 3 | | | | | | | | | | | | |
| 11G | Brashavn | 69.899 | 29.744 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 11X | Brashavn | 69.899 | 29.744 | MYTI EDU | SB | | | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 131G | Lastad | 58.056 | 7.709 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 2 |
| 13A | Langøsund | 57.998 | 7.577 | MYTI EDU | SB | | | | | | | | | | 1 | 4 | | | | | | | | | | | | | | | | | 4 | 3 |
| 13BH | Kristiansand harbour | 58.135 | 7.988 | GADU MOR | LI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 25 |
| 13BH | Kristiansand harbour | 58.135 | 7.988 | GADU MOR | MU | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 30 |
| 145B | Andøya | 69.254 | 16.170 | GADU MOR | LI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 11 |
| 145B | Andøya | 69.254 | 16.170 | GADU MOR | MU | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 11 |
| 146B | Bjørnøya | 73.830 | 19.920 | GADU MOR | LI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 25 |
| 146B | Bjørnøya | 73.830 | 19.920 | GADU MOR | MU | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 25 |
| 147B | Svalbard | 78.170 | 13.457 | GADU MOR | LI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 25 |
| 147B | Svalbard | 78.170 | 13.457 | GADU MOR | MU | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 25 |
| 14A | Aavigen | 58.033 | 7.216 | MYTI EDU | SB | | | | | | | | | | 3 | 4 | | | | | | | | | | | | | | | | | 3 | 3 |
| 15A | Gåsøy (Ullerø) | 58.048 | 6.895 | MYTI EDU | SB | | | | | | | | | | 4 | 4 | | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 15B | Ullerø area | 58.050 | 6.717 | GADU MOR | BI | | | | | | | | | | | | | | | | | 10 | 25 | 25 | | 24 | 25 | 24 | 22 | 25 | 25 | 25 | 22 | 25 |
| 15B | Ullerø area | 58.050 | 6.717 | GADU MOR | BL | | | | | | | | | | | | | | | | | 24 | 25 | 25 | | 23 | | | | | | | | |
| 15B | Ullerø area | 58.050 | 6.717 | GADU MOR | LI | | | | | | | | | | 25 | 24 | 23 | 30 | 23 | 25 | 26 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| 15B | Ullerø area | 58.050 | 6.717 | GADU MOR | MU | | | | | | | | | | 30 | 29 | 27 | 30 | 28 | 29 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| 15C | Gåsøy (Ullerø) | 57.988 | 7.244 | PAND BOR | TM | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | |
| 15F | Ullerø area | 58.050 | 6.717 | LIMA LIM | BI | | | | | | | | | | | | | | | | | | | 20 | | 22 | | | | | | | | |
| 15F | Ullerø area | 58.050 | 6.717 | LIMA LIM | BL | | | | | | | | | | | | | | | | | | | 25 | | 25 | | | | | | | | |
| 15F | Ullerø area | 58.050 | 6.717 | LIMA LIM | LI | | | | | | | | | | | 3 | | 2 | 4 | 5 | 5 | 5 | 5 | 30 | 5 | 30 | 30 | 30 | 30 | 30 | 27 | 30 | 30 | 30 |
| 15F | Ullerø area | 58.050 | 6.717 | LIMA LIM | MU | | | | | | | | | | | 3 | | 2 | 4 | 5 | 5 | 5 | 5 | 30 | 5 | 30 | 30 | 30 | 30 | 30 | 27 | 30 | 30 | 30 |
| 15F | Ullerø area | 58.050 | 6.717 | MICR KIT | LI | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | |
| 15F | Ullerø area | 58.050 | 6.717 | MICR KIT | MU | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | |
| 15F | Ullerø area | 58.050 | 6.717 | PLEU PLA | LI | | | | | | | | | | | | 3 | 2 | | | | | | | | | | | | | | | | |
| 15F | Ullerø area | 58.050 | 6.717 | PLEU PLA | MU | | | | | | | | | | | | 3 | 2 | | | | | | | | | | | | | | | | |
| 15G | Gåsøy (Ullerø) | 58.050 | 6.896 | NUCE LAP | MU | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| 15G | Gåsøy (Ullerø) | 58.050 | 6.896 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 |
| 21D | Åkrafjord | 59.800 | 6.183 | BROS BRO | LI | | | | | | | | | | | | | | | | | | | 1 | | 24 | | | | | | | | |
| 21D | Åkrafjord | 59.800 | 6.183 | BROS BRO | MU | | | | | | | | | | | | | | | | | | | 1 | | 24 | | | | | | | | |
| 21D | Åkrafjord | 59.800 | 6.183 | CHIM MON | LI | | | | | | | | | | | | | | | | | | | 1 | | 12 | | | | | | | | |
| 21D | Åkrafjord | 59.800 | 6.183 | CHIM MON | MU | | | | | | | | | | | | | | | | | | | 1 | | 12 | | | | | | | | |
| 21D | Åkrafjord | 59.800 | 6.183 | MOLV MOL | LI | | | | | | | | | | | | | | | | | | | 1 | | 24 | | | | | | | | |
| 21D | Åkrafjord | 59.800 | 6.183 | MOLV MOL | MU | | | | | | | | | | | | | | | | | | | 1 | | 24 | | | | | | | | |
| 21F | Åkrafjord | 59.750 | 6.117 | LEPI WHI | LI | | | | | | | | | | | | | | | | | | | 5 | | | | 30 | 30 | 30 | 18 | 30 | 30 | 30 |
| 21F | Åkrafjord | 59.750 | 6.117 | LEPI WHI | MU | | | | | | | | | | | | | | | | | | | 5 | | | | 30 | 30 | 30 | 18 | 30 | 30 | 30 |
| 21F | Åkrafjord | 59.750 | 6.117 | LIMA LIM | LI | | | | | | | | | | | | | | | | | | | | | | 30 | 30 | 30 | 29 | | 28 | | 18 |
| 21F | Åkrafjord | 59.750 | 6.117 | LIMA LIM | MU | | | | | | | | | | | | | | | | | | | | | | 30 | 30 | 30 | 30 | | 28 | | 18 |
| 21F | Åkrafjord | 59.750 | 6.117 | PLAT FLE | BI | | | | | | | | | | | | | | | | | | | 11 | | | | | | | | | | |
| 21F | Åkrafjord | 59.750 | 6.117 | PLAT FLE | BL | | | | | | | | | | | | | | | | | | | 11 | 25 | | | | | | | | | |
| 21F | Åkrafjord | 59.750 | 6.117 | PLAT FLE | LI | | | | | | | | | | | | | | | | | | | 14 | 30 | 30 | 30 | | 6 | 30 | 30 | | | |
| 21F | Åkrafjord | 59.750 | 6.117 | PLAT FLE | MU | | | | | | | | | | | | | | | | | | | 14 | 30 | 30 | 30 | | 6 | 30 | 30 | | | |
| 220G | Smørstakk | 59.252 | 5.352 | NUCE LAP | SB | | | | | | | | | | | | | | | | | 1 | 1 | 1 | | | | | 2 | | | | | |
| 221A | Stangeland | 59.277 | 5.328 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | 3 | 3 | | | | | | | | | | |
| 221G | Stangeland | 59.270 | 5.330 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | |
| 222A | Kopervik harbour | 59.283 | 5.316 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | | | |
| 224G | Heggjelen | 59.416 | 5.232 | NUCE LAP | SB | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 1 | | | | | | | | | |
| 226G | Karmsund bridge (east) | 59.378 | 5.298 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | 1 | 1 | 1 | | | | | | | | | |
| 226H | Karmsund bridge (west) | 59.378 | 5.292 | NUCE LAP | SB | | | | | | | | | | | | | | | | | 1 | | | 1 | | | | | | | | | |
| 226X | Karmsund bridge (east) | 59.378 | 5.298 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | 1 | 3 | 3 | | | | | | | | | |
| 227A2 | Høgevarde | 59.326 | 5.318 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 2 | 3 | 1 | 1 | 1 |
| 227G1 | Melandholmen | 59.337 | 5.312 | NUCE LAP | SB | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | |
| 227G2 | Flatskjær | 59.337 | 5.312 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| 22A | Espevær (west) | 59.584 | 5.144 | MYTI EDU | SB | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 22C | Bømlofjord | 59.567 | 5.183 | PAND BOR | TM | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | | |

| jmpst | Station_Name | Latitude | Longitude | speci | tissu | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22F | Borøyfjorden | 59.710 | 5.330 | LIMA LIM | LI | | | | | | | | | | 5 | 5 | 4 | | 5 | 2 | | | | | | | | | | | | | | |
| 22F | Borøyfjorden | 59.710 | 5.330 | LIMA LIM | MU | | | | | | | | | | 5 | 5 | 4 | | 5 | 2 | | | | | | | | | | | | | | |
| 22F | Borøyfjorden | 59.710 | 5.330 | MICR KIT | LI | | | | | | | | | | | | | 5 | | | | | | | | | | | | | | | | |
| 22F | Borøyfjorden | 59.710 | 5.330 | MICR KIT | MU | | | | | | | | | | | | | 5 | | | | | | | | | | | | | | | | |
| 22F | Borøyfjorden | 59.710 | 5.330 | PLEU PLA | LI | | | | | | | | | | | | | | | | 5 | 5 | 5 | | | | | | | | | | | |
| 22F | Borøyfjorden | 59.710 | 5.330 | PLEU PLA | MU | | | | | | | | | | | | | | | | 5 | 5 | 5 | | | | | | | | | | | |
| 22G | Espevær (west) | 59.584 | 5.144 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 23A | Austvik | 59.870 | 5.108 | MYTI EDU | SB | | | | | | | | | | 3 | 3 | | | | | | | | | | | | | 3 | 3 | | | | |
| 23B | Karihavet area | 59.900 | 5.133 | GADU MOR | BI | | | | | | | | | | | | | | | | | 22 | 23 | 24 | 23 | 25 | 25 | 25 | 24 | 25 | 25 | 23 | 25 | 25 |
| 23B | Karihavet area | 59.900 | 5.133 | GADU MOR | BL | | | | | | | | | | | | | | | | | 25 | 25 | 25 | 24 | 25 | 25 | 25 | 25 | 25 | 25 | | | |
| 23B | Karihavet area | 59.900 | 5.133 | GADU MOR | LI | | | | | | | | | | 25 | 25 | 25 | 25 | 26 | 25 | 26 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| 23B | Karihavet area | 59.900 | 5.133 | GADU MOR | MU | | | | | | | | | | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| 23F | Karihavet area | 59.900 | 5.133 | MICR KIT | LI | | | | | | | | | | | | | | 1 | 4 | | | | | | | | | | | | | | |
| 23F | Karihavet area | 59.900 | 5.133 | MICR KIT | MU | | | | | | | | | | | | | | 1 | 4 | | | | | | | | | | | | | | |
| 23F | Karihavet area | 59.900 | 5.133 | PLAT FLE | LI | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | |
| 23F | Karihavet area | 59.900 | 5.133 | PLAT FLE | MU | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | |
| 23F | Karihavet area | 59.900 | 5.133 | PLEU PLA | LI | | | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | |
| 23F | Karihavet area | 59.900 | 5.133 | PLEU PLA | MU | | | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | |
| 24A | Vardøy | 60.171 | 5.010 | MYTI EDU | SB | | | | | | | | | | 3 | 3 | | | | | | | | | | | | | 3 | 3 | | | | |
| 24G | Vardøy | 60.171 | 5.010 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| 25A | Hinnøy | 61.370 | 4.879 | MYTI EDU | SB | | | | | | | | | | | | 3 | 3 | | | | | | | | | | | 3 | 3 | | | | |
| 25G | Hinnøy | 61.370 | 4.879 | NUCE LAP | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | 2 | | | | | |
| 26A | Hamnen | 61.876 | 5.222 | MYTI EDU | SB | | | | | | | | | | | | 6 | 3 | | | | | | | | | | | 3 | 3 | | | | |
| 26G | Hamnen | 61.875 | 5.222 | NUCE LAP | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | 1 | | | | | |
| 27A | Grinden | 62.202 | 5.421 | MYTI EDU | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | 3 | 3 | | | | |
| 27G | Røydeskjær | 62.183 | 5.740 | NUCE LAP | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | 2 | | | | | |
| 27H | Storholmen | 62.190 | 5.393 | NUCE LAP | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | |
| 28A | Eiksundet | 62.252 | 5.864 | MYTI EDU | SB | | | | | | | | | | | | 6 | 3 | | | | | | | | | | | 3 | 3 | | | | |
| 28G | Grønevikholmen (Eiksundet) | 62.247 | 5.883 | NUCE LAP | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | 2 | | | | | |
| 28H | Øveråneset (Hareid) | 62.362 | 6.078 | NUCE LAP | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | |
| 302 | Ormøya | 59.878 | 10.758 | MYTI EDU | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | |
| 303 | Malmøya | 59.863 | 10.766 | MYTI EDU | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | |
| 304 | Gåsøya | 59.851 | 10.589 | MYTI EDU | SB | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | | |
| 305 | Lysaker | 59.906 | 10.643 | MYTI EDU | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | |
| 306 | Håøya | 59.713 | 10.555 | MYTI EDU | SB | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | | |
| 30A | Gressholmen | 59.882 | 10.712 | MYTI EDU | SB | | | | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 30B | Oslo City area | 59.799 | 10.560 | GADU MOR | BI | | | | | | | | | | | | | | | | | | 27 | 23 | 23 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| 30B | Oslo City area | 59.799 | 10.560 | GADU MOR | BL | | | | | | | | | | | | | | | | | 20 | 30 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | | |
| 30B | Oslo City area | 59.799 | 10.560 | GADU MOR | LI | | | | 29 | 25 | 25 | 25 | 25 | 25 | 25 | 24 | 21 | 24 | 25 | 25 | 50 | 50 | 50 | 25 | 25 | 28 | 30 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| 30B | Oslo City area | 59.799 | 10.560 | GADU MOR | MU | | | | 29 | 25 | 25 | 25 | 26 | 26 | 30 | 30 | 21 | 29 | 30 | 30 | 60 | 60 | 60 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| 30C | Oslo City area | 59.817 | 10.550 | PAND BOR | TM | | | | 1 | | | | | | | | 2 | | | | | | | | | | | | | | | | 2 | |
| 30F | Oslo City area | 59.783 | 10.567 | PLEU PLA | LI | | | | | | | | | | | | 2 | | 5 | 5 | | | | | | | | | | | | | | |
| 30F | Oslo City area | 59.783 | 10.567 | PLEU PLA | MU | | | | | | | | | | | | 2 | | 5 | 5 | | | | | | | | | | | | | | |
| 30J | Spro | 59.799 | 10.560 | PAND BOR | TM | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | |
| 30K | Storegrunn | 59.799 | 10.560 | PAND BOR | TM | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | |
| 30X | West of Nesodden | 59.808 | 10.600 | GADU MOR | LI | | | | | | | | | | | | 22 | | | | | | | | | | | | | | | | | |
| 30X | West of Nesodden | 59.808 | 10.600 | GADU MOR | MU | | | | | | | | | | | | 22 | | | | | | | | | | | | | | | | | |
| 31A | Solbergstrand | 59.619 | 10.650 | MYTI EDU | SB | 2 | | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 31B | Solbergstrand | 59.615 | 10.640 | GADU MOR | LI | 10 | 27 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31B | Solbergstrand | 59.615 | 10.640 | GADU MOR | MU | 10 | 27 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31C | Solbergstrand | 59.615 | 10.640 | PAND BOR | TM | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31F | Solbergstrand | 59.615 | 10.640 | PLAT FLE | LI | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31F | Solbergstrand | 59.615 | 10.640 | PLAT FLE | MU | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32A | Rødtangen | 59.525 | 10.427 | MYTI EDU | SB | 1 | 3 | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 33C | Sande | 59.528 | 10.350 | PAND BOR | TM | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| 33F | Sande (east side) | 59.528 | 10.350 | PLAT FLE | LI | | | 25 | | 1 | 23 | 1 | 26 | 1 | 5 | 5 | 5 | 5 | 5 | 5 | 15 | 15 | 13 | 5 | 5 | 30 | 30 | 30 | 30 | 30 | 30 | 18 | 30 | 30 |
| 33F | Sande (east side) | 59.528 | 10.350 | PLAT FLE | MU | | | 25 | | 25 | 1 | 1 | 26 | 1 | 5 | 5 | 5 | 5 | 5 | 5 | 15 | 15 | 13 | 5 | 5 | 30 | 30 | 30 | 30 | 30 | 30 | 18 | 30 | 30 |
| 33X | Sande (west side) | 59.528 | 10.340 | PLAT FLE | LI | | | | | | | | | | 3 | | | | | | | | | | | | | | | | | | | |
| 33X | Sande (west side) | 59.528 | 10.340 | PLAT FLE | MU | | | | | | | | | | 3 | | | | | | | | | | | | | | | | | | | |
| 35A | Mølen | 59.488 | 10.498 | MYTI EDU | SB | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 35C | Mølen-Moss | 59.483 | 10.529 | PAND BOR | TM | | 1 | | | | | | 1 | | 2 | | | | | | | | | | | | | | | | | | 2 | |
| 35C | Mølen-Moss | 59.483 | 10.529 | PAND BOR | XX | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 36A | Færder | 59.027 | 10.526 | MYTI EDU | SB | 1 | | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| 36B | Færder area | 59.040 | 10.436 | GADU MOR | BI | | | | | | | | | | | | | | | | | 21 | 25 | 25 | 23 | 25 | | | | | | | | |
| 36B | Færder area | 59.040 | 10.436 | GADU MOR | BL | | | | | | | | | | | | | | | | | 20 | 25 | 25 | 23 | 25 | | | | | | | | |
| 36B | Færder area | 59.040 | 10.436 | GADU MOR | LI | 10 | 27 | 23 | 24 | 14 | 25 | 25 | 25 | 25 | 24 | 25 | 25 | 25 | 25 | 25 | 26 | 25 | 25 | 25 | 23 | 28 | 30 | 25 | 25 | 25 | 25 | 25 | 25 | 21 |
| 36B | Færder area | 59.040 | 10.436 | GADU MOR | MU | 10 | 27 | 23 | 24 | 14 | 25 | 25 | 26 | 26 | 29 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 27 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 25 |
| 36C | Færder area | 59.040 | 10.436 | PAND BOR | TM | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | |
| 36F | Færder area | 59.067 | 10.383 | LIMA LIM | BI | | | | | | | | | | | | | | | | | | | 11 | 9 | 20 | | | | | | | | |
| 36F | Færder area | 59.067 | 10.383 | LIMA LIM | BL | | | | | | | | | | | | | | | | | | | 20 | 9 | 20 | | | | | | | | |
| 36F | Færder area | 59.067 | 10.383 | LIMA LIM | LI | | | | | | | | | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 30 | 30 | 30 | 30 | 30 | 30 | 29 | 30 | 30 | 30 | 30 |
| 36F | Færder area | 59.067 | 10.383 | LIMA LIM | MU | | | | | | | | | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 30 | 30 | 30 | 30 | 30 | 30 | 29 | 30 | 30 | 30 | 30 |
| 36G | Færder | 59.027 | 10.526 | NUCE LAP | SB | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 41A | Fensneset (Grytøya) | 68.935 | 16.641 | MYTI EDU | SB | | | | | | | | | | | | | | 3 | 3 | 4 | 3 | | | | | | | | | 3 | 3 | | |
| 41G | Harstad (Trondenes) | 68.822 | 16.565 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | 1 | | | | | | 2 | | | |
| 41G1 | Feneset | 68.935 | 16.641 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | |
| 42A | Tennskjær (Malangen) | 69.478 | 18.302 | MYTI EDU | SB | | | | | | | | | | | | | | 3 | 3 | | | | | | | | | | | 3 | 3 | | |
| 42G | Finnsnes | 69.226 | 17.975 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |

| jmpst | Station_Name | Latitude | Longitude | speci | tissu | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43A | Lyngneset (Langfjord) | 70.100 | 20.546 | MYTI EDU | SB | | | | | | | | | | | | | | 3 | 3 | | 3 | | | | | | | | | 3 | 3 | | |
| 43B | Kvænangen (Olderfjord) | 70.226 | 21.397 | GADU MOR | LI | | | | | | | | | | | | | | 25 | 25 | 25 | | | | | | | | | | | | 20 | 21 |
| 43B | Kvænangen (Olderfjord) | 70.226 | 21.397 | GADU MOR | MU | | | | | | | | | | | | | | 30 | 30 | 30 | | | | | | | | | | | | 24 | 21 |
| 43B1 | Leisundet | 70.226 | 21.397 | GADU MOR | LI | | | | | | | | | | | | | | | | | | | | | | | | | | 25 | 25 | | |
| 43B1 | Leisundet | 70.226 | 21.397 | GADU MOR | MU | | | | | | | | | | | | | | | | | | | | | | | | | | 30 | 30 | | |
| 43BH | Tromsø harbour | 69.653 | 18.974 | GADU MOR | LI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 25 |
| 43BH | Tromsø harbour | 69.653 | 18.974 | GADU MOR | MU | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 30 |
| 43F | Kvænangen (Olderfjord) | 70.224 | 21.397 | LIMA LIM | LI | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | | |
| 43F | Kvænangen (Olderfjord) | 70.224 | 21.397 | LIMA LIM | MU | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | | |
| 43F | Kvænangen (Olderfjord) | 70.224 | 21.397 | MICR KIT | LI | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| 43F | Kvænangen (Olderfjord) | 70.224 | 21.397 | MICR KIT | MU | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| 43F1 | Leisundet | 70.224 | 21.397 | PLEU PLA | LI | | | | | | | | | | | | | | | | | | | | | | | | | | 24 | 30 | | |
| 43F1 | Leisundet | 70.224 | 21.397 | PLEU PLA | MU | | | | | | | | | | | | | | | | | | | | | | | | | | 24 | 30 | | |
| 43G | Skjervøy | 70.036 | 20.996 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | 1 | | | | | | 2 | | | |
| 43G1 | Lyngneset (Langfjord) | 70.101 | 20.546 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | |
| 44A | Elenheimsundet | 70.516 | 22.246 | MYTI EDU | SB | | | | | | | | | | | | | | 3 | 3 | 4 | 3 | | | | | | | | | 3 | 3 | | |
| 44G | Alta | 69.990 | 23.306 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| 44G1 | Elenheimsundet | 70.516 | 22.246 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | |
| 45A | Sauhamneset | 70.764 | 24.320 | MYTI EDU | SB | | | | | | | | | | | | | | 3 | 3 | | | | | | | | | | | 3 | 3 | | |
| 45B | Hammerfest area | 70.767 | 24.108 | GADU MOR | LI | | | | | | | | | | | | | | 24 | 25 | | | | | | | | | | | | | | |
| 45B | Hammerfest area | 70.767 | 24.108 | GADU MOR | MU | | | | | | | | | | | | | | 29 | 30 | | | | | | | | | | | | | | |
| 45B1 | Revsbotn | 70.767 | 24.108 | GADU MOR | LI | | | | | | | | | | | | | | | | | | | | | | | | | | 25 | 25 | | |
| 45B1 | Revsbotn | 70.767 | 24.108 | GADU MOR | MU | | | | | | | | | | | | | | | | | | | | | | | | | | 30 | 30 | | |
| 45F | Hammerfest area | 70.667 | 24.667 | PLEU PLA | LI | | | | | | | | | | | | | | | | | | | | | | | | | | 30 | 30 | | |
| 45F | Hammerfest area | 70.667 | 24.667 | PLEU PLA | MU | | | | | | | | | | | | | | | | | | | | | | | | | | 30 | 30 | | |
| 45G | Sauhamneset | 70.764 | 24.320 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | 1 | | | | | | 2 | | | |
| 46A | Smines (Altesula) | 70.973 | 25.802 | MYTI EDU | SB | | | | | | | | | | | | | | 3 | 3 | 5 | | | | | | | | | | 3 | 3 | | |
| 46H | Honningsvåg | 70.985 | 25.966 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | | |
| 46H | Honningsvåg | 70.985 | 25.966 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | 1 | | | | | | 2 | | | |
| 47A | Kifjordneset | 70.881 | 27.370 | MYTI EDU | SB | | | | | | | | | | | | | | 3 | 3 | | | | | | | | | | | 2 | 3 | | |
| 47G | Kifjordneset | 70.881 | 27.370 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | 1 | | | | | | 2 | | | |
| 48A | Trollfjorden (Tanafjord) | 70.694 | 28.555 | MYTI EDU | SB | | | | | | | | | | | | | | 3 | 3 | 3 | | | | | | | | | | 3 | 3 | | |
| 48G | Mehamn | 71.042 | 27.839 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| 48G1 | Trollfjorden (Tanafjord) | 70.694 | 28.555 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | |
| 49A | Nordfjorden (Syltefjord) | 70.550 | 30.086 | MYTI EDU | SB | | | | | | | | | | | | | | 3 | 3 | | | | | | | | | | | 3 | 3 | | |
| 49G | Syltefjorden | 70.550 | 30.086 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | |
| 51A | Byrkjenes | 60.084 | 6.550 | MYTI EDU | SB | | | | | | | 3 | 3 | | | | | | | 1 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 52A | Eitrheimsneset | 60.097 | 6.533 | MYTI EDU | SB | | | | | | | | | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 52E | Eitrheimsneset | 60.097 | 6.537 | ANGU ANG | MU | | | | | | | | | | | | | | | | | | | 5 | | | | | | | | | | |
| 53B | Inner Sørfjord | 60.167 | 6.567 | GADU MOR | BI | | | | | | | | | | | | | | | | | 15 | 28 | 24 | 25 | 25 | 25 | 24 | 25 | 25 | 25 | 25 | 24 | 19 |
| 53B | Inner Sørfjord | 60.167 | 6.567 | GADU MOR | BL | | | | | | | | | | | | | | | | | 15 | 30 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | | |
| 53B | Inner Sørfjord | 60.167 | 6.567 | GADU MOR | LI | | | | | | | 13 | 26 | 12 | 25 | 25 | 22 | 25 | 25 | 25 | 50 | 30 | 30 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 19 |
| 53B | Inner Sørfjord | 60.167 | 6.567 | GADU MOR | MU | | | | | | | 12 | 26 | 15 | 30 | 30 | 26 | 30 | 30 | 30 | 56 | 36 | 36 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 23 |
| 53B | Inner Sørfjord | 60.167 | 6.567 | SALM TRU | LI | | | | | | | | | | 12 | | | | | | | | | | | | | | | | | | | |
| 53B | Inner Sørfjord | 60.167 | 6.567 | SALM TRU | MU | | | | | | | | | | 12 | | | | | | | | | | | | | | | | | | | |
| 53D | Digraneset | 60.183 | 6.575 | BROS BRO | LI | | | | | | | | | | | | | | | | | | | | | 24 | | | | | | | | |
| 53D | Digraneset | 60.183 | 6.575 | BROS BRO | MU | | | | | | | | | | | | | | | | | | | | | 24 | | | | | | | | |
| 53D | Digraneset | 60.183 | 6.575 | CHIM MON | LI | | | | | | | | | | | | | | | | | | | | | 12 | | | | | | | | |
| 53D | Digraneset | 60.183 | 6.575 | CHIM MON | MU | | | | | | | | | | | | | | | | | | | | | 12 | | | | | | | | |
| 53D | Digraneset | 60.183 | 6.575 | MOLV MOL | LI | | | | | | | | | | | | | | | | | | | | | 30 | | | | | | | 25 | |
| 53D | Digraneset | 60.183 | 6.575 | MOLV MOL | MU | | | | | | | | | | | | | | | | | | | | | 30 | | | | | | | 30 | |
| 53E | Inner Sørfjord | 60.167 | 6.567 | ANGU ANG | MU | | | | | | | | | | | | | | | | | | | 5 | | | | | | | | | | |
| 53F | Inner Sørfjord | 60.167 | 6.567 | GLYP CYN | LI | | | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | |
| 53F | Inner Sørfjord | 60.167 | 6.567 | GLYP CYN | MU | | | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | |
| 53F | Inner Sørfjord | 60.167 | 6.567 | PLAT FLE | BI | | | | | | | | | | | | | | | | | | | 25 | 11 | 12 | | | | | | | | |
| 53F | Inner Sørfjord | 60.167 | 6.567 | PLAT FLE | BL | | | | | | | | | | | | | | | | | | | 23 | 11 | 12 | | | | | | | | |
| 53F | Inner Sørfjord | 60.167 | 6.567 | PLAT FLE | LI | | | | 22 | | | | 22 | 30 | 5 | 5 | 5 | 5 | 4 | 4 | 11 | 15 | 11 | 30 | 13 | 30 | 30 | 30 | 30 | 30 | | 30 | 30 | 9 |
| 53F | Inner Sørfjord | 60.167 | 6.567 | PLAT FLE | MU | | | | 22 | | | | 22 | 30 | 5 | 5 | 5 | 5 | 4 | 4 | 11 | 15 | 11 | 30 | 13 | 30 | 30 | 30 | 30 | 30 | | 30 | 30 | 9 |
| 56A | Kvalnes | 60.220 | 6.602 | MYTI EDU | SB | | | | | | | 3 | 15 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 56A1 | Kvalnes (north) | 60.225 | 6.604 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | 3 | | | 3 | | | | | | | |
| 56A2 | Kjeken | 60.339 | 6.655 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | 3 | | | 3 | | | | | | | |
| 56A3 | Sekse | 60.261 | 6.623 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | |
| 56A4 | Rosstadnes | 60.287 | 6.624 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | |
| 56A5 | Lofthus (south) | 60.322 | 6.652 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | |
| 56D | Kvalnes | 60.250 | 6.600 | BROS BRO | LI | | | | | | | | | | | | | | | | | | | 3 | | | | | | | | | | |
| 56D | Kvalnes | 60.250 | 6.600 | BROS BRO | MU | | | | | | | | | | | | | | | | | | | 3 | | | | | | | | | | |
| 56D | Kvalnes | 60.250 | 6.600 | CHIM MON | LI | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| 56D | Kvalnes | 60.250 | 6.600 | CHIM MON | MU | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| 56D | Kvalnes | 60.250 | 6.600 | MOLV MOL | LI | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| 56D | Kvalnes | 60.250 | 6.600 | MOLV MOL | MU | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| 57A | Krossanes | 60.387 | 6.689 | MYTI EDU | SB | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 57A1 | Urdheim | 60.372 | 6.678 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | 3 | | | 3 | | | | | | | |
| 57A2 | Ernes | 60.353 | 6.662 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | |
| 63A | Ranaskjær | 60.421 | 6.405 | MYTI EDU | SB | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 65A | Vikingneset | 60.242 | 6.153 | MYTI EDU | SB | | | | | | | 3 | 15 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 67B | Strandebarm area | 60.267 | 6.033 | GADU MOR | BI | | | | | | | | | | | | | | | | | 25 | 24 | 25 | 15 | 25 | | | | | | | | |
| 67B | Strandebarm area | 60.267 | 6.033 | GADU MOR | BL | | | | | | | | | | | | | | | | | 25 | 25 | 25 | 13 | 24 | | | | | | | | |
| 67B | Strandebarm area | 60.267 | 6.033 | GADU MOR | LI | | | | | | | 22 | 26 | 22 | 16 | 19 | 8 | 12 | 18 | 25 | 35 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 20 | 25 |

| jmpst | Station_Name | Latitude | Longitude | speci | tissu | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67B | Strandebarm area | 60.267 | 6.033 | GADU MOR | MU | | | | | | | 22 | 26 | 23 | 16 | 24 | 9 | 14 | 22 | 30 | 40 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 24 | 30 |
| 67D | Strandebarm area | 60.267 | 6.033 | MOLV MOL | LI | | | | | | | | | | | | | | | | | | | | | | | | | | | | 17 | |
| 67D | Strandebarm area | 60.267 | 6.033 | MOLV MOL | MU | | | | | | | | | | | | | | | | | | | | | | | | | | | | 21 | |
| 67E | Strandebarm area | 60.267 | 6.033 | ANGU ANG | MU | | | | | | | | | | | | | | | | | | | 5 | | | | | | | | | | |
| 67F | Strandebarm area | 60.267 | 6.033 | LEPI WHI | LI | | | | 19 | | | 1 | 26 | 30 | 5 | 5 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 30 | 30 | 28 | 12 | 29 | 21 | 30 | 28 | 29 |
| 67F | Strandebarm area | 60.267 | 6.033 | LEPI WHI | MU | | | | 19 | | | 1 | 26 | 30 | 5 | 5 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 30 | 30 | 28 | 12 | 30 | 23 | 30 | 30 | 29 |
| 67F | Strandebarm area | 60.267 | 6.033 | LIMA LIM | LI | | | | | | | | | | | | | | | | | | 5 | | | | | | | | | | | |
| 67F | Strandebarm area | 60.267 | 6.033 | LIMA LIM | MU | | | | | | | | | | | | | | | | | | 5 | | | | | | | | | | | |
| 67F | Strandebarm area | 60.267 | 6.033 | PLAT FLE | BI | | | | | | | | | | | | | | | | | | | 25 | 22 | 25 | | | | | | | | |
| 67F | Strandebarm area | 60.267 | 6.033 | PLAT FLE | BL | | | | | | | | | | | | | | | | | | | 25 | 23 | 23 | | | | | | | | |
| 67F | Strandebarm area | 60.267 | 6.033 | PLAT FLE | LI | | | | | | | | | | | | | | | | 3 | | 4 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| 67F | Strandebarm area | 60.267 | 6.033 | PLAT FLE | MU | | | | | | | | | | | | | | | | 3 | | 4 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 29 | 30 |
| 69A | Lille Terøy | 59.982 | 5.752 | MYTI EDU | SB | | | | | | | | | | | | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 71A | Bjørkøya (Risøyodden) | 59.023 | 9.754 | MYTI EDU | SB | 1 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 |
| 71G | Fugløyskjær | 58.981 | 9.808 | LITT LIT | SB | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 |
| 71G | Fugløyskjær | 58.981 | 9.808 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 2 | 1 | 1 | 2 | | 2 |
| 73A | Lyngholmen | 59.045 | 10.295 | MYTI EDU | SB | | | | | | | | | | 3 | | | | | | | | | | | | | | | | | | 3 | 5 |
| 74A | Langholmane | 58.955 | 9.868 | MYTI EDU | SB | | | | | | | | | | 3 | | | | | | | | | | | | | | | | | | 3 | |
| 74G | Langholmane | 58.955 | 9.868 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| 76A | Risøy | 58.731 | 9.272 | MYTI EDU | SB | | | | | | | | | | 3 | 3 | 3 | 3 | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 |
| 76A | Risøy | 58.731 | 9.272 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| 76G | Risøy | 58.728 | 9.276 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | 1 | 1 | | 2 | 2 | 2 | 2 | 2 | 2 |
| 77A | Nordstrand | 58.524 | 8.942 | MYTI EDU | SB | | | | | | | | | | 3 | 3 | | | | | | | | | | | | | | | | | 3 | 5 |
| 77B | Borøy area | 58.550 | 9.017 | GADU MOR | LI | | | | | | | | | | 14 | 25 | | | | | | | | | | | | | | | | | 25 | 25 |
| 77B | Borøy area | 58.550 | 9.017 | GADU MOR | MU | | | | | | | | | | 17 | 30 | | | | | | | | | | | | | | | | | 30 | 30 |
| 77C | Borøy area | 58.483 | 9.167 | PAND BOR | TM | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | 2 | |
| 77F | Borøy area | 58.550 | 9.017 | LIMA LIM | LI | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | | 30 | 30 |
| 77F | Borøy area | 58.550 | 9.017 | LIMA LIM | MU | | | | | | | | | | | | | | | | | | | | | | | | | | | | 30 | 30 |
| 79A | Gjerdsvoldsøyen (east) | 58.413 | 8.742 | MYTI EDU | SB | | | | | | | | | | 3 | 3 | | | | | | | | | | | | | | | | | 3 | 3 |
| 80A | Østmarknes | 63.457 | 10.450 | MYTI EDU | SB | | | | 1 | 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 80BH | Munkholmen | 63.442 | 10.392 | GADU MOR | LI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 21 |
| 80BH | Munkholmen | 63.442 | 10.392 | GADU MOR | MU | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 25 |
| 81A | Biologisk Stasjon | 63.442 | 10.349 | MYTI EDU | SB | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 82A | Flakk | 63.450 | 10.206 | MYTI EDU | SB | | | | 1 | 2 | 2 | 3 | 1 | 2 | | 3 | 2 | 2 | | 3 | 3 | | | | | | | | 3 | 3 | | | | |
| 82G | Flakk | 63.451 | 10.202 | NUCE LAP | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | 2 | | | | | |
| 83A | Frøsetskjær | 63.428 | 10.107 | MYTI EDU | SB | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 84A | Tråsåvika | 63.346 | 9.957 | MYTI EDU | SB | | | | 2 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 | 3 | | 3 | 3 | | | | | | | | 3 | 3 | | | | |
| 84B | Tråsåvika | 63.349 | 9.961 | GADU MOR | LI | | | | 13 | 1 | 1 | 1 | 5 | | | | | | | | | | | | | | | | | | | | | |
| 84B | Tråsåvika | 63.349 | 9.961 | GADU MOR | MU | | | | 13 | 10 | 1 | 1 | 5 | | | | | | | | | | | | | | | | | | | | | |
| 84B | Tråsåvika | 63.349 | 9.961 | MELA AEG | LI | | | | | | 14 | 1 | 4 | | | | | | | | | | | | | | | | | | | | | |
| 84B | Tråsåvika | 63.349 | 9.961 | MELA AEG | MU | | | | | | 1 | 1 | 5 | | | | | | | | | | | | | | | | | | | | | |
| 84B | Tråsåvika | 63.349 | 9.961 | MERL MNG | LI | | | | | | | 1 | 7 | | | | | | | | | | | | | | | | | | | | | |
| 84B | Tråsåvika | 63.349 | 9.961 | MERL MNG | MU | | | | | | | 1 | 7 | | | | | | | | | | | | | | | | | | | | | |
| 84B | Tråsåvika | 63.349 | 9.961 | POLL POL | LI | | | | | 1 | 1 | | 8 | | | | | | | | | | | | | | | | | | | | | |
| 84B | Tråsåvika | 63.349 | 9.961 | POLL POL | MU | | | | | 16 | 1 | | 8 | | | | | | | | | | | | | | | | | | | | | |
| 84B | Tråsåvika | 63.349 | 9.961 | POLL VIR | LI | | | | | | | | 4 | | | | | | | | | | | | | | | | | | | | | |
| 84B | Tråsåvika | 63.349 | 9.961 | POLL VIR | MU | | | | | | | | 4 | | | | | | | | | | | | | | | | | | | | | |
| 84F | Tråsåvika | 63.349 | 9.961 | MICR KIT | LI | | | | | | | | 3 | | | | | | | | | | | | | | | | | | | | | |
| 84F | Tråsåvika | 63.349 | 9.961 | MICR KIT | MU | | | | | | | | 3 | | | | | | | | | | | | | | | | | | | | | |
| 84G | Tråsåvika | 63.346 | 9.957 | NUCE LAP | SB | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| 85A | Geitstrand | 63.364 | 9.928 | MYTI EDU | SB | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 86A | Geitnes | 63.443 | 9.978 | MYTI EDU | SB | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 87A | Ingdalsbukt | 63.462 | 9.907 | MYTI EDU | SB | | | | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 2 | 1 | | 2 | 2 | | | | | | | | 1 | 3 | | | | |
| 87G | Ingdalsbukt | 63.462 | 9.907 | NUCE LAP | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | 2 | | | | | |
| 88A | Rødberg | 63.487 | 10.000 | MYTI EDU | SB | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 91A | Nerdvika | 63.353 | 8.157 | MYTI EDU | SB | | | | | | | | | | | | 4 | 3 | 3 | | | | | | | | | | | 3 | | | | |
| 92A1 | Krokholmen | 64.054 | 10.030 | MYTI EDU | SB | | | | | | | | | | | | 7 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | | | |
| 92A2 | Nygården | 64.054 | 10.030 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | | | |
| 92B | Stokken area | 64.171 | 9.887 | GADU MOR | LI | | | | | | | | | | | | | 25 | 24 | 25 | 25 | | | | | | | | 25 | 25 | | | 25 | 25 |
| 92B | Stokken area | 64.171 | 9.887 | GADU MOR | MU | | | | | | | | | | | | | 30 | 29 | 30 | 30 | | | | | | | | 30 | 30 | | | 30 | 25 |
| 92F | Stokken area | 64.171 | 9.887 | LIMA LIM | LI | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | |
| 92F | Stokken area | 64.171 | 9.887 | LIMA LIM | MU | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | |
| 92F | Stokken area | 64.171 | 9.887 | PLEU PLA | LI | | | | | | | | | | | | | | | 1 | | | | | | | | | | 30 | | | | |
| 92F | Stokken area | 64.171 | 9.887 | PLEU PLA | MU | | | | | | | | | | | | | | | 1 | | | | | | | | | | 30 | | | | |
| 93A | Sætervik | 64.395 | 10.483 | MYTI EDU | SB | | | | | | | | | | | | 7 | 3 | | | | | | | | | | | 3 | 3 | | | | |
| 93G | Sætervika (Stadsvikskjæret) | 64.395 | 10.500 | NUCE LAP | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | |
| 94A | Landfast | 65.644 | 12.006 | MYTI EDU | SB | | | | | | | | | | | | 3 | 3 | | | | | | | | | | | 3 | 3 | | | | |
| 94G | Steinskjær (Landfast) | 65.641 | 11.998 | NUCE LAP | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | 2 | | | | | |
| 95A | Sleipnesodden (south) | 66.710 | 13.253 | MYTI EDU | SB | | | | | | | | | | | | 3 | 3 | | | | | | | | | | | 3 | 3 | | | | |
| 95G | Sleipnesodden (south) | 66.707 | 13.238 | NUCE LAP | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | 2 | | | | | |
| 96A | Breiviken | 66.296 | 12.834 | MYTI EDU | SB | | | | | | | | | | | | 6 | 3 | | | | | | | | | | | 3 | 3 | | | | |
| 97A | Klokkholmen | 67.665 | 14.743 | MYTI EDU | SB | | | | | | | | | | | | 4 | 3 | | | | | | | | | | | 3 | 3 | | | | |
| 97G | Varnesodden | 67.801 | 14.750 | NUCE LAP | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | 2 | | | | | |
| 97H | Småfloholmene | 67.891 | 14.818 | NUCE LAP | SB | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | |
| 98A1 | Yitj-Skarvsundet | 68.158 | 14.653 | MYTI EDU | SB | | | | | | | | | | | | 4 | 3 | | | | | | | | | | | | | | | | |
| 98A2 | Husvaagen area | 68.258 | 14.664 | MYTI EDU | SB | | | | | | | | | | | | | | | | | 3 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 98A3 | Vatterfjord | 68.258 | 14.664 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | |
| 98B1 | Bjørnerøya (east) | 68.247 | 14.803 | GADU MOR | LI | | | | | | | | | | | | 25 | 29 | 25 | 24 | 26 | 25 | 25 | 25 | | | 25 | 21 | 25 | 25 | 25 | 8 | 25 | 25 |

| jmpst | Station_Name | Latitude | Longitude | speci | tissu | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 98B1 | Bjørnerøya (east) | 68.247 | 14.803 | GADU MOR | MU | | | | | | | | | | | | 30 | 29 | 30 | 29 | 30 | 30 | 30 | 30 | | | 30 | 25 | 30 | 30 | 30 | 10 | 30 | 30 |
| 98B2 | Austnesfjorden | 68.247 | 14.803 | GADU MOR | BI | | | | | | | | | | | | | | | | | | | | 14 | 22 | | | | | | | | |
| 98B2 | Austnesfjorden | 68.247 | 14.803 | GADU MOR | BL | | | | | | | | | | | | | | | | | | | | 5 | 25 | | | | | | | | |
| 98B2 | Austnesfjorden | 68.247 | 14.803 | GADU MOR | LI | | | | | | | | | | | | | | | | | | | | 25 | 25 | | | | | | | | |
| 98B2 | Austnesfjorden | 68.247 | 14.803 | GADU MOR | MU | | | | | | | | | | | | | | | | | | | | 30 | 30 | | | | | | | | |
| 98F1 | Bjørnerøya (east) | 68.219 | 14.808 | GLYP CYN | LI | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | |
| 98F1 | Bjørnerøya (east) | 68.219 | 14.808 | GLYP CYN | MU | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | |
| 98F1 | Bjørnerøya (east) | 68.219 | 14.808 | LIMA LIM | LI | | | | | | | | | | | | | 4 | 1 | 1 | 5 | | | | | | | | | | | | | |
| 98F1 | Bjørnerøya (east) | 68.219 | 14.808 | LIMA LIM | MU | | | | | | | | | | | | | 4 | 1 | 1 | 5 | | | | | | | | | | | | | |
| 98F1 | Bjørnerøya (east) | 68.219 | 14.808 | MICR KIT | LI | | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | |
| 98F1 | Bjørnerøya (east) | 68.219 | 14.808 | MICR KIT | MU | | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | |
| 98F1 | Bjørnerøya (east) | 68.219 | 14.808 | PLEU PLA | LI | | | | | | | | | | | | | 3 | | 5 | | 4 | 5 | 1 | | | | | | | | | | |
| 98F1 | Bjørnerøya (east) | 68.219 | 14.808 | PLEU PLA | MU | | | | | | | | | | | | | 3 | | 5 | | 4 | 5 | 1 | | | | | | | | | | |
| 98F2 | Husholmen | 68.219 | 14.808 | PLEU PLA | BI | | | | | | | | | | | | | | | | | | | | 18 | 24 | | | | | | | | |
| 98F2 | Husholmen | 68.219 | 14.808 | PLEU PLA | BL | | | | | | | | | | | | | | | | | | | | 13 | 19 | | | | | | | | |
| 98F2 | Husholmen | 68.219 | 14.808 | PLEU PLA | LI | | | | | | | | | | | | | | | | | | | | 25 | 30 | 24 | 18 | 28 | 12 | 28 | 30 | 30 | 30 |
| 98F2 | Husholmen | 68.219 | 14.808 | PLEU PLA | MU | | | | | | | | | | | | | | | | | | | | 25 | 30 | 24 | 18 | 28 | 12 | 28 | 30 | 30 | 30 |
| 98G | Svolvær area | 68.249 | 14.663 | NUCE LAP | SB | | | | | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 98X | Skrova harbour | 68.165 | 14.659 | MYTI EDU | SB | | | | | | | | | | | | | | 3 | 4 | 4 | | | | | | | | | | | | | |
| 99A | Brunvær | 68.005 | 15.093 | MYTI EDU | SB | | | | | | | | | | | | 7 | 3 | | | | | | | | | | | 3 | 3 | | | | |
| I001 | Sponvikskansen | 59.090 | 11.210 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | | | | | | | | | | | | | |
| I011 | Kråkenebbet | 59.101 | 11.289 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | | | | | | | | | | | | | |
| I021 | Kjøkø (south) | 59.130 | 10.952 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | | 3 | 3 | 3 | | | | | | | |
| I022 | West Damholmen | 59.102 | 11.045 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I023 | Singlekalven (south) | 59.095 | 11.137 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I024 | Kirkøy (north west) | 59.080 | 10.986 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I080 | Østmerknes | 63.457 | 10.450 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | | | | | | | | | | | | | |
| I131A | Lastad | 58.056 | 7.709 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I132 | Svensholmen | 58.125 | 7.989 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 |
| I1321 | Fiskåtangen | 58.128 | 7.977 | MYTI EDU | SB | | | | | | | | | | | | | | | 4 | 4 | 3 | | | | | | | | | | | | |
| I133 | Odderø (west) | 58.132 | 8.002 | MYTI EDU | SB | | | | | | | | | | | | | | | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I201 | Ekkjegrunn (G1) | 59.643 | 6.357 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I205 | Bølsnes (G5) | 59.592 | 6.300 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I241 | Nordnes | 60.401 | 5.302 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I242 | Gravdalsneset | 60.395 | 5.267 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I243 | Hegreneset | 60.415 | 5.305 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I301 | Akershuskaia | 59.905 | 10.736 | MYTI EDU | SB | | | | | | | | | | | | 2 | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I304 | Gåsøya | 59.851 | 10.589 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I306 | Håøya | 59.713 | 10.555 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I307 | Ramtonholmen | 59.744 | 10.523 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I711 | Steinholmen | 59.052 | 9.677 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 4 | 3 | 3 | 3 | 3 | | 3 | | | | | | | |
| I712 | Gjemesholmen | 59.045 | 9.707 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 |
| I713 | Strømtangen | 59.050 | 9.692 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I911 | Horvika | 62.735 | 8.523 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | | | | | | | | | | | | | |
| I912 | Honnhammer | 62.853 | 8.162 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I913 | Fjøseid | 62.810 | 8.275 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I914 | Flåøya (southeast) | 62.756 | 8.445 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | |
| I915 | Flåøya (northwest) | 62.758 | 8.440 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| I916 | Sundalsfjord (Hydro kai) | 62.684 | 8.552 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | | | 3 | 3 | | | | |
| I962 | Koksverktomta (B2) | 66.326 | 14.140 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 2 | 3 | | | | | | | | | | | |
| I964 | Toraneskaien (B4) | 66.319 | 14.128 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 |
| I965 | Moholmen (B5) | 66.312 | 14.126 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 |
| I969 | Bjørnbærviken (B9) | 66.280 | 14.035 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| R096 | Breiviken (Tomma) | 66.294 | 12.841 | MYTI EDU | SB | | | | | | | | | | | | | | | 3 | 3 | | | | | | | | | | | | | |

# Appendix G
# Map of stations

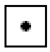
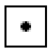
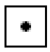
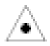
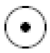
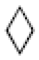
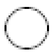
**Nominel station positions 1981-2009**
**(cf. Appendix H and Appendix L)**

# Appendix G (cont.) Map of stations

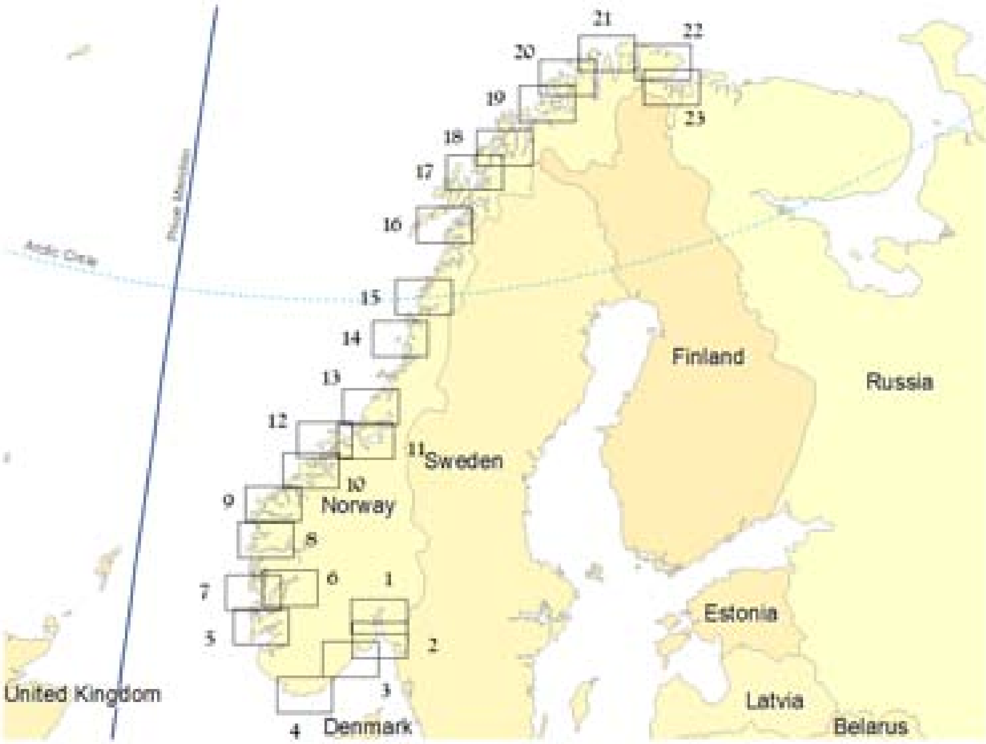
## NOTES

The station's nominal position is plotted, and not the specific positions that may have differed from one year to another. The maps are generated using ArcGIS version 9.1.

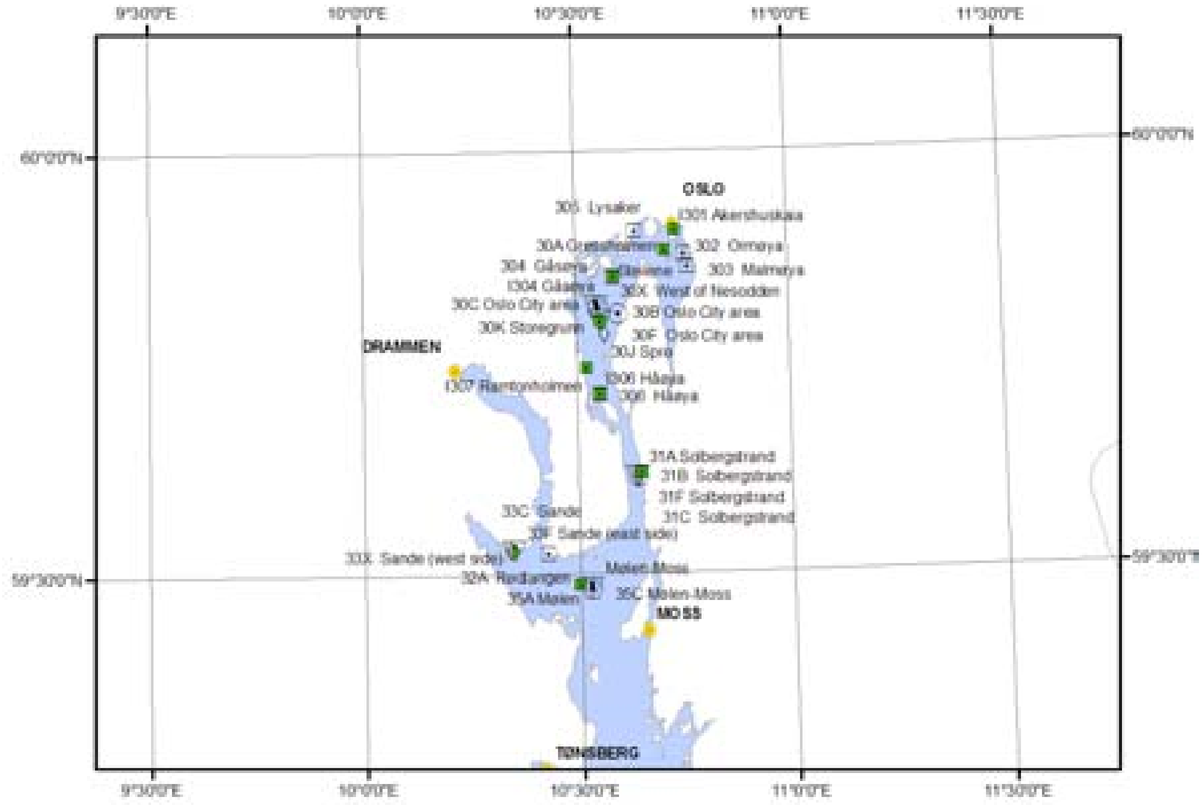
The following symbols and codes apply:

| All years | 2009 | Explanation | Station code |
|---|---|---|---|
|  |  | Sediment | <number>S |
|  |  | Blue mussel | <number>A |
|  |  | Blue mussel | I<number/letter> 1) |
|  |  | Blue mussel | R<number/letter> 1) |
|  |  | Dogwhelk | <number>F |
|  |  | Prawn | <number>C |
|  |  | Atlantic cod | <number>A |
|  |  | Flatfish | <number>D/E |
|  |  | Other round fish | |
|  | | Town or city | |

1) Supplementary station used in Klif blue mussel pollution (I) or reference (R) index (cf. Appendix L).

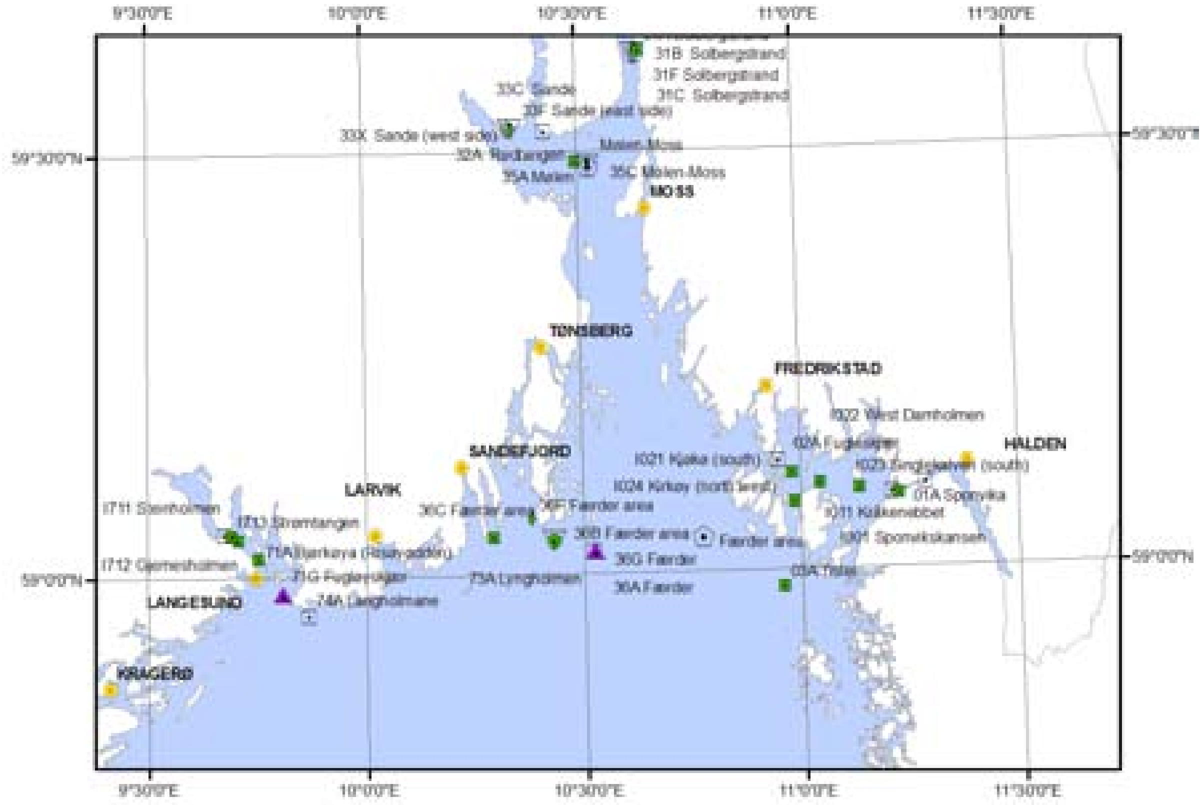



CEMP stations Norway. Numbers indicate map reference that follow.
Note: distance between two lines of latitude is 15 nautical miles (= 27.8 km).



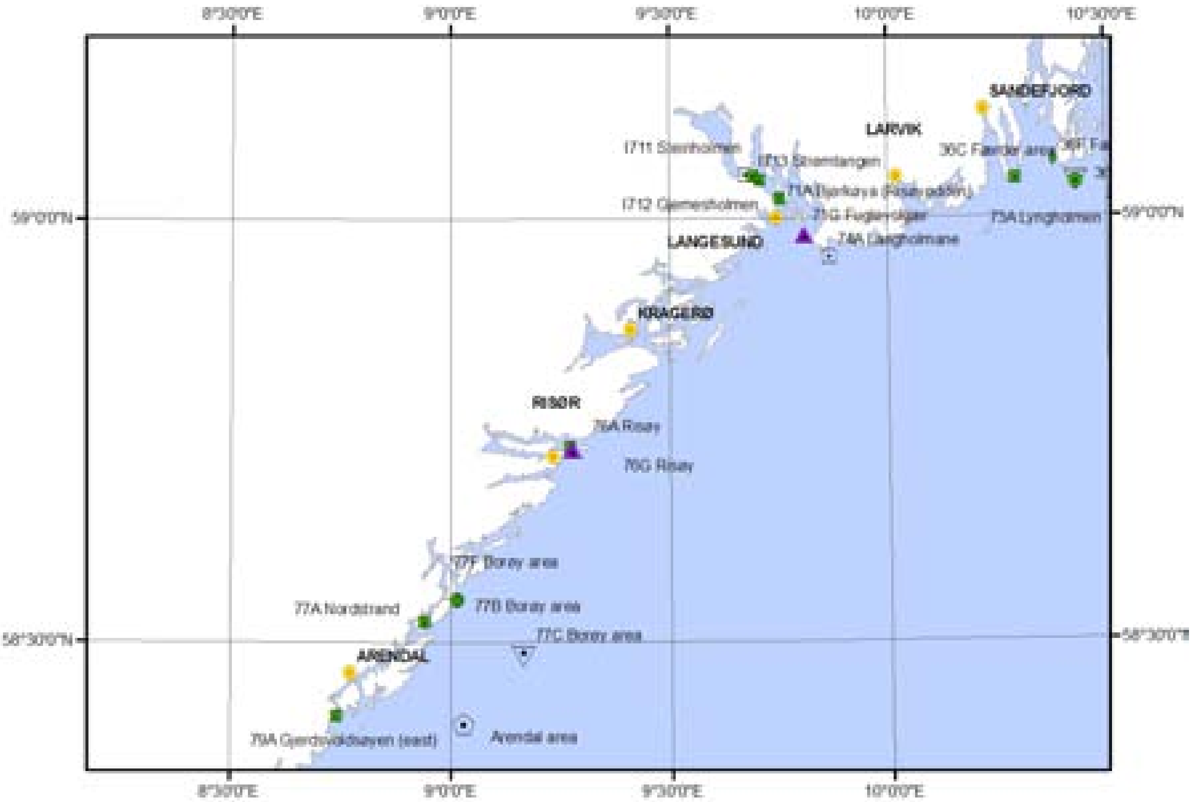
OSLO
DRAMMEN
MOSS
TØNSBERG
305 Lysaker
I301 Akershuskaia
302 Ormøya
303 Malmøya
30X West of Nesodden
30B Oslo City area
30F Oslo City area
30J Spro
30K Storegrunn
30C Oslo City area
I306 Håøya
306 Håøya
I307 Ramtonholmen
31A Solbergstrand
31B Solbergstrand
31F Solbergstrand
31C Solbergstrand
33C Sande
33F Sande (east side)
33X Sande (west side)
32A Rødtangen
35A Mølen
35C Mølen-Moss
Mølen-Moss


**MAP 1**



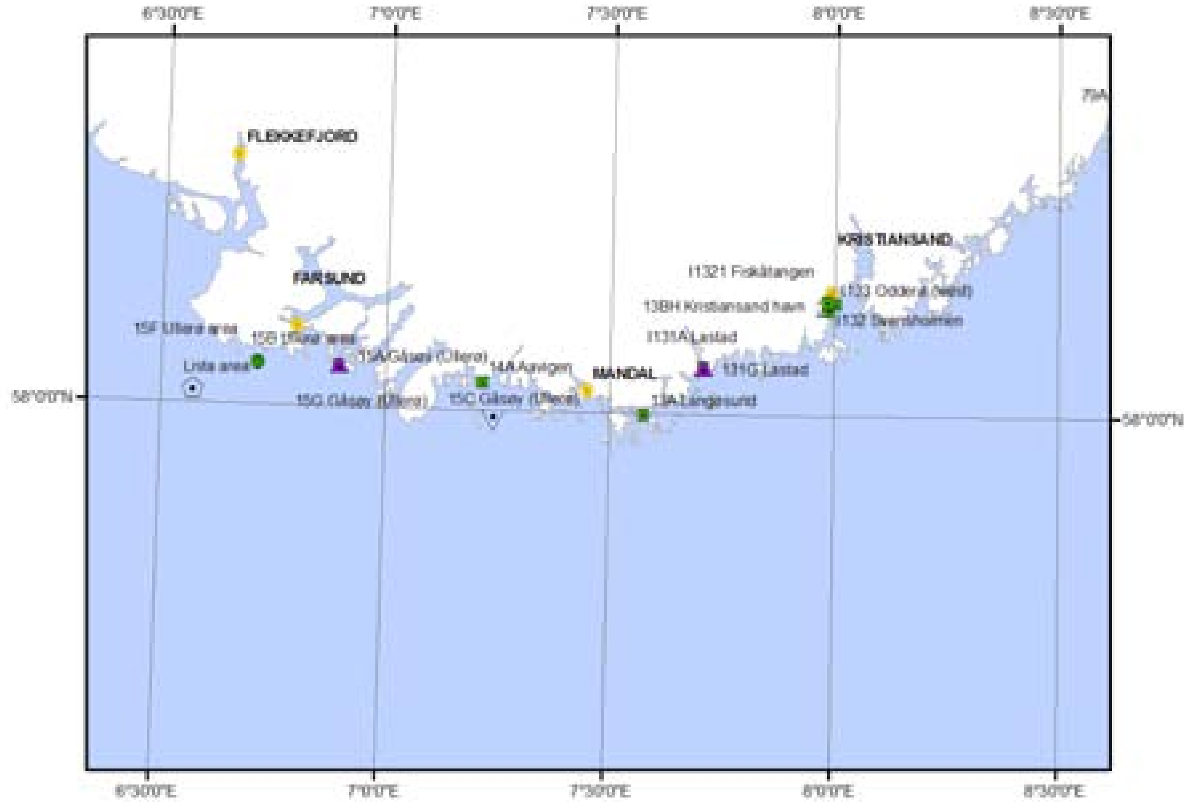
31B Solbergstrand
31F Solbergstrand
31C Solbergstrand
33C Sande
33F Sande (east side)
33X Sande (west side)
32A Rødtangen
35A Mølen
Mølen-Moss
35C Mølen-Moss
MOSS
TØNSBERG
FREDRIKSTAD
HALDEN
SANDEFJORD
LARVIK
LANGESUND
KRAGERØ
I022 West Damholmen
I021 Kjøkø (south)
I024 Kirkøy (north west)
I023 Singlekalven (south)
01A Sponvika
I011 Kollkenabbet
I001 Sponekskansen
03A Tisler
36C Færder area
36F Færder area
36B Færder area
Færder area
36G Færder
36A Færder
73A Lyngholmen
I711 Steinholmen
I713 Stromtangen
I712 Gjemesholmen
71A Bjørkøya (Risøy-Sodden)
71G Fugleskjær
74A Langholmane


**MAP 2**



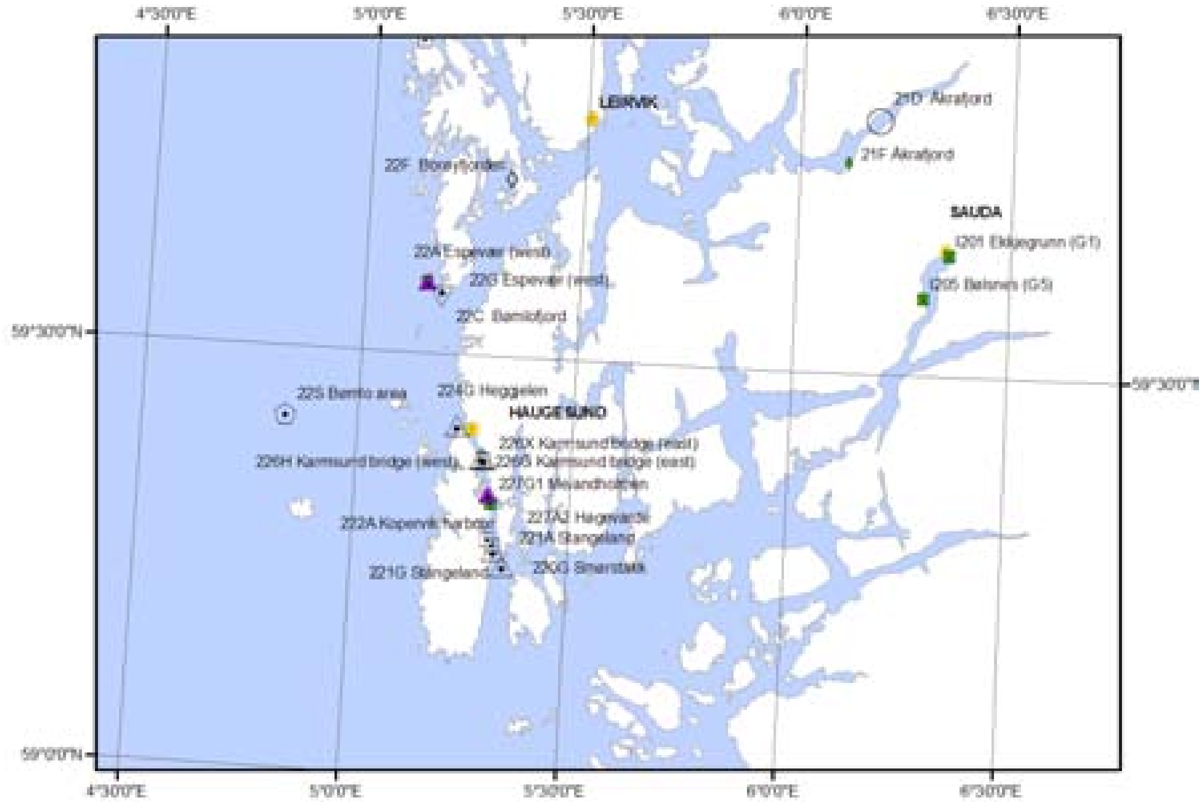
SANDEFJORD
LARVIK
LANGESUND
KRAGERØ
RISØR
ARENDAL
I712 Gjemesholmen
I713 Strømtangen
36C Færder area
71A Bjørkøya
71G Fugleskjær
74A Langholmane
76A Risøy
76G Risøy
77F Borøy area
77B Borøy area
77A Nordstrand
77C Borøy area
79A Gjerdsvoldsøyen (east)
Arendal area
59°0'0"N
58°30'0"N
8°30'0"E
9°0'0"E
9°30'0"E
10°0'0"E
10°30'0"E


**MAP 3**

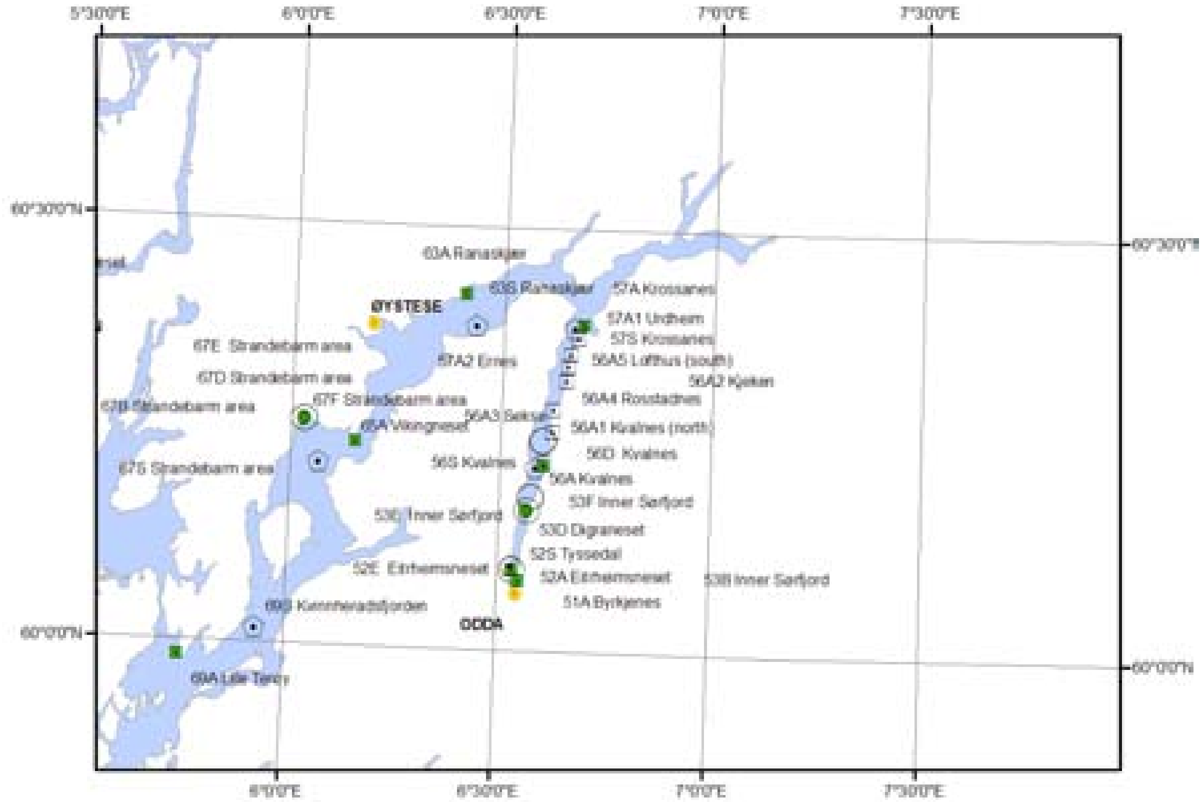


FLEKKEFJORD
FARSUND
MANDAL
KRISTIANSAND
I1321 Fiskåtangen
13BH Kristiansand havn
I133 Odderøya (west)
I132 Svensholmen
I131A Lastad
131G Lastad
13A Langesund
14A Ånvigen
15A Gåsøy (Ullerø)
15G Gåsøy (Ullerø)
15C Gåsøy (Ullerø)
15F Ullerø area
15B Ullerø area
Lista area
58°0'0"N
6°30'0"E
7°0'0"E
7°30'0"E
8°0'0"E
8°30'0"E

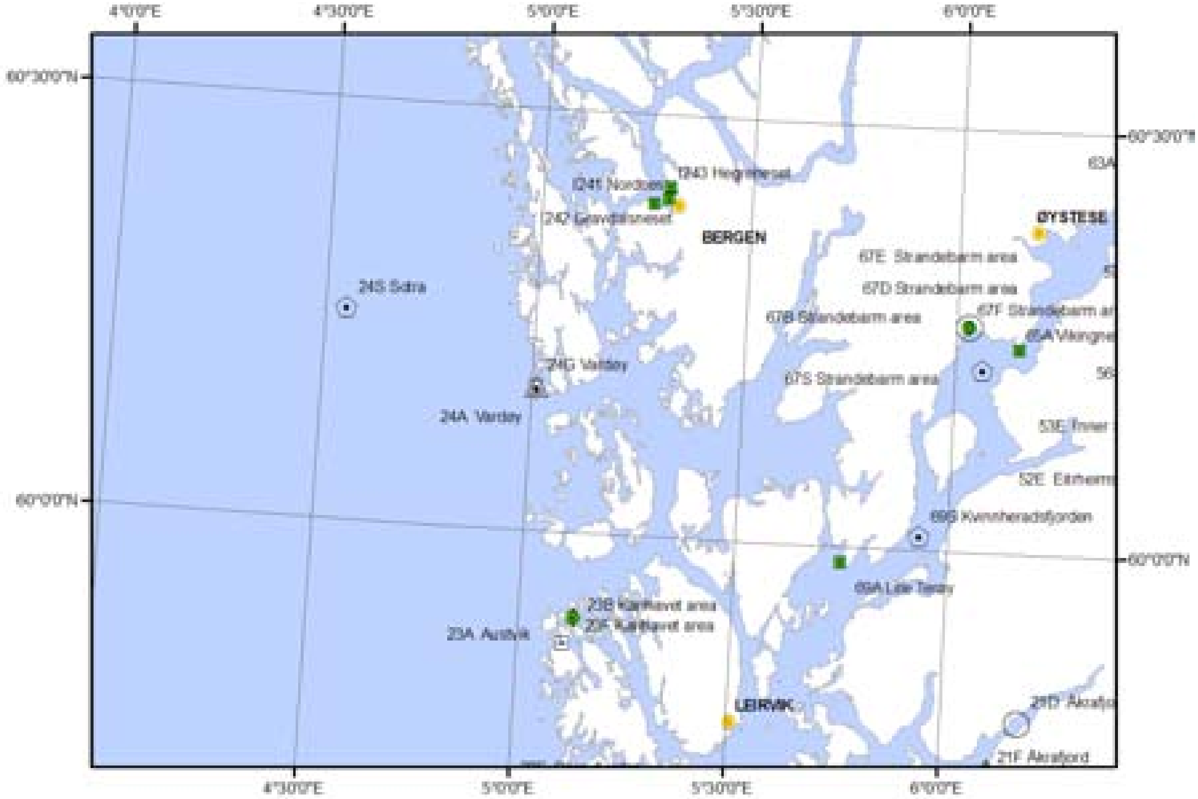

**MAP 4**


LEIRVIK
SAUDA
HAUGESUND
21F Åkrafjord
22F Bømlafjorden
22A Espevær (west)
22G Espevær (west)
22C Bømlafjord
22S Bømlo area
22G Heggelen
226X Karmsund bridge (east)
226H Karmsund bridge (west)
227G1 Melandholmen
222A Kopervik harbour
221A Stangeland
221G Stangeland
4°30'0"E
5°0'0"E
5°30'0"E
6°0'0"E
6°30'0"E
59°30'0"N
59°0'0"N

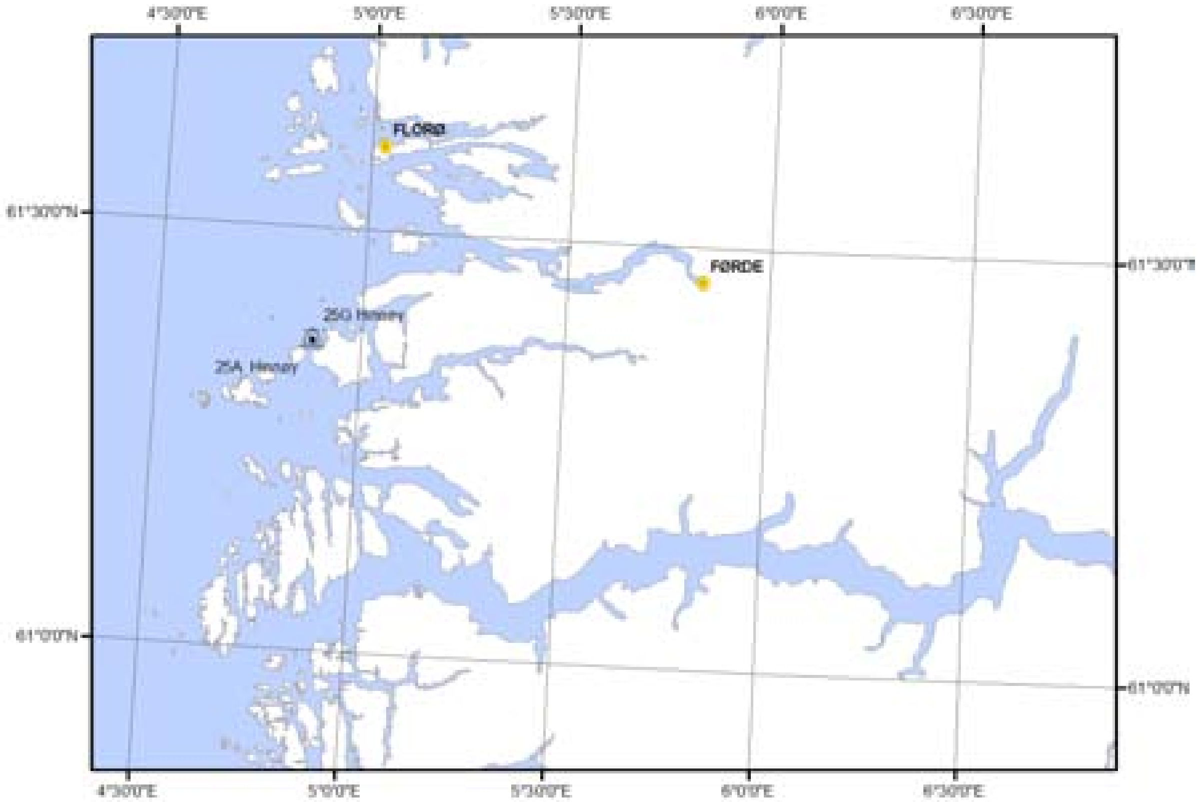
**MAP 5**


ØYSTESE
ODDA
63A Ranaskjær
63S Ranaskjær
57A Krossanes
57A1 Urdheim
57S Krossanes
56A5 Lofthus (south)
56A2 Kjeken
67E Strandebarm area
67D Strandebarm area
67F Strandebarm area
67B Strandebarm area
67S Strandebarm area
56A4 Rosstadnes
56A1 Kvalnes (north)
56D Kvalnes
56S Kvalnes
56A Kvalnes
53F Inner Sørfjord
53D Digraneset
52S Tyssedal
52E Eitrheimsneset
52A Eitrheimsneset
53B Inner Sørfjord
51A Byrkjenes
69A Lille Terøy
5°30'0"E
6°0'0"E
6°30'0"E
7°0'0"E
7°30'0"E
60°30'0"N
60°0'0"N

**MAP 6**


BERGEN
ØYSTESE
LEIRVIK
24S Sotra
24G Vardøy
24A Vardøy
23A Austvik
23B Karihavet area
23F Karihavet area
67E Strandebarm area
67D Strandebarm area
67B Strandebarm area
67S Strandebarm area
69S Kvinnheradsfjorden
69A Lille Terøy
21F Åkrafjord

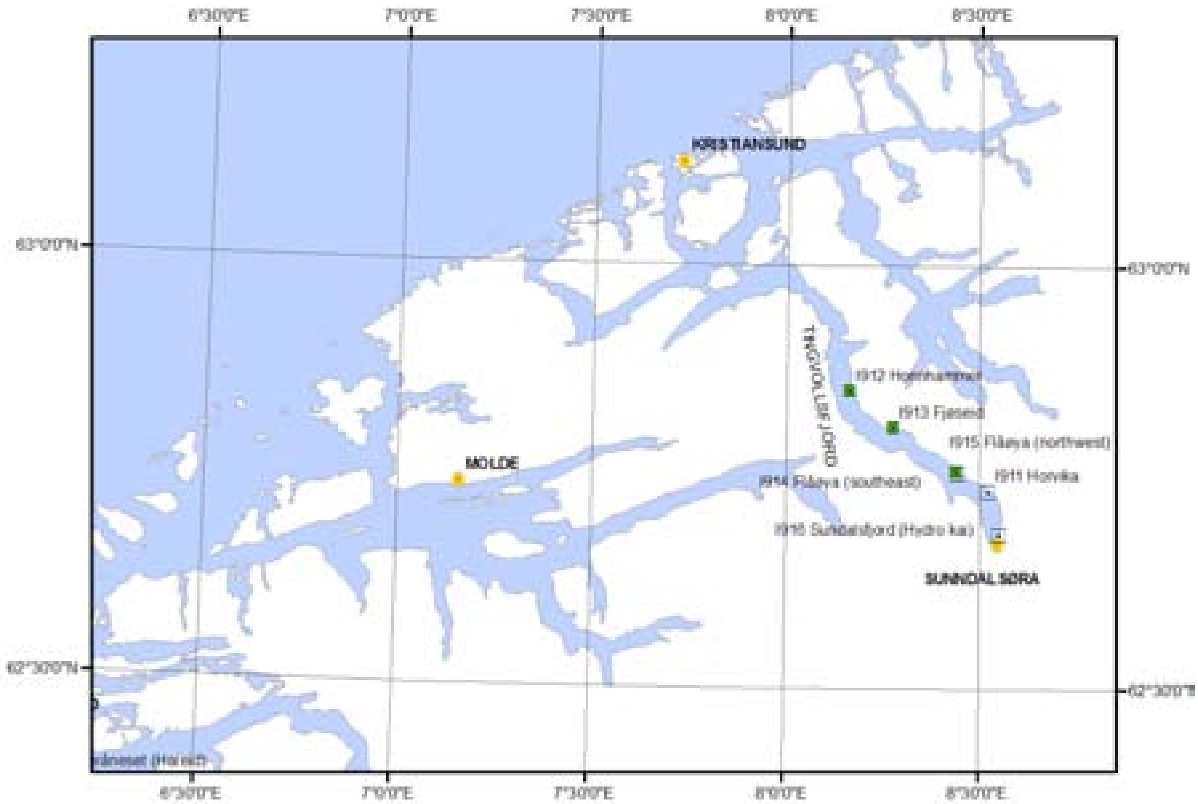
MAP 7


FLORØ
FØRDE
25G Hissøy
25A Hissøy

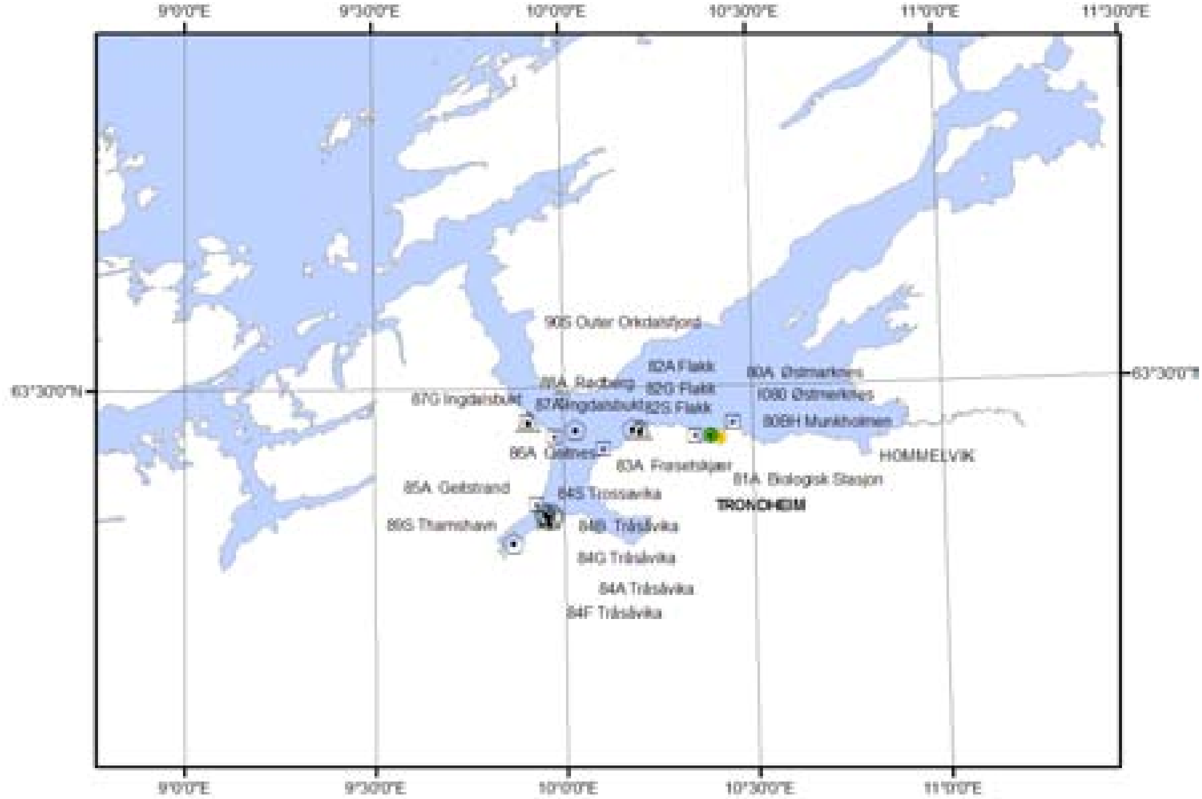
MAP 8


ÅLESUND
ULSTEINVIK
28A Eiksundet
STADTLANDET
MÅLØY

**MAP 9**


KRISTIANSUND
MOLDE
TINGVOLLSFJORD
I913 Fjøseid
I915 Flåøya (northwest)
I911 Hovika
I914 Flåøya (southeast)
I916 Sunndalsfjord (Hydro kai)
SUNNDALSØRA

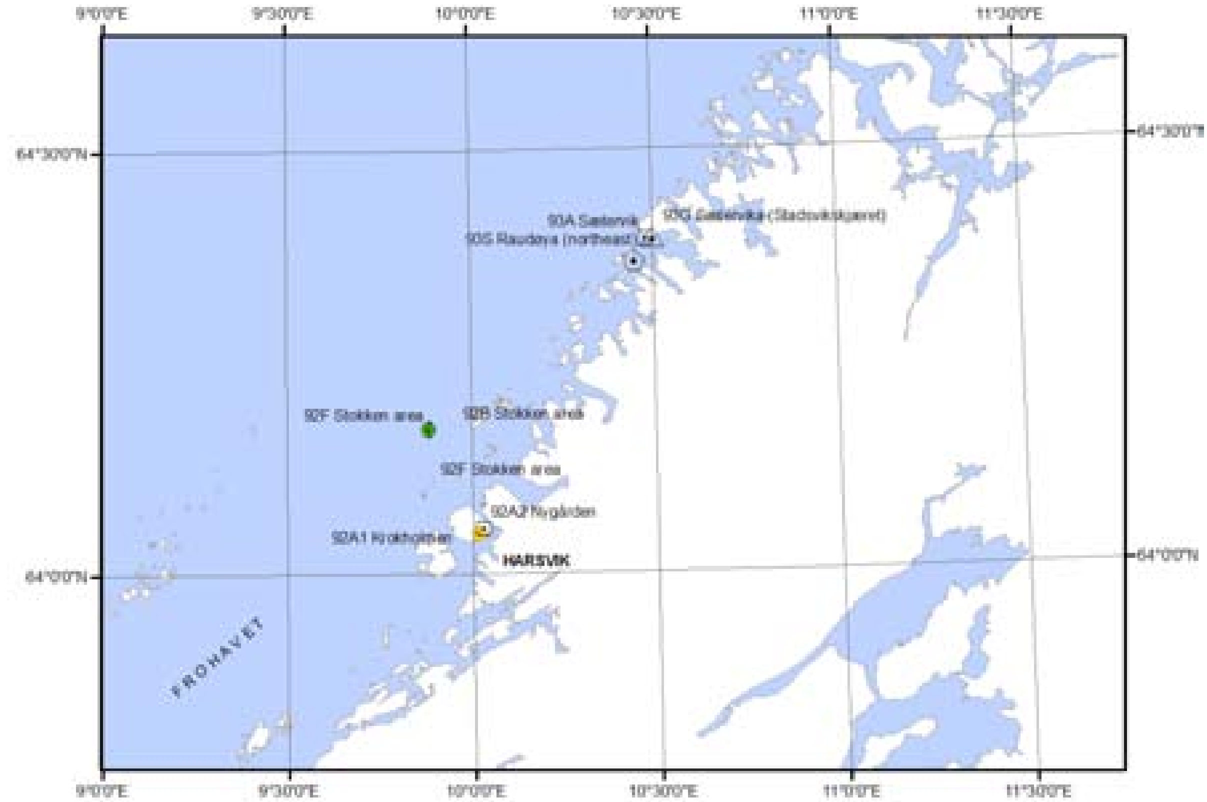
**MAP 10**


9°0'0"E
9°30'0"E
10°0'0"E
10°30'0"E
11°0'0"E
11°30'0"E
63°30'0"N
90S Outer Orkdalsfjord
82A Flakk
82G Flakk
82S Flakk
87G Ingdalsbukt
80BH Munkholmen
HOMMELVIK
81A Biologisk Stasjon
TRONDHEIM
85A Geitstrand
84S Trossavika
89S Thamshavn
84G Tråsåvika
84A Tråsåvika
84F Tråsåvika

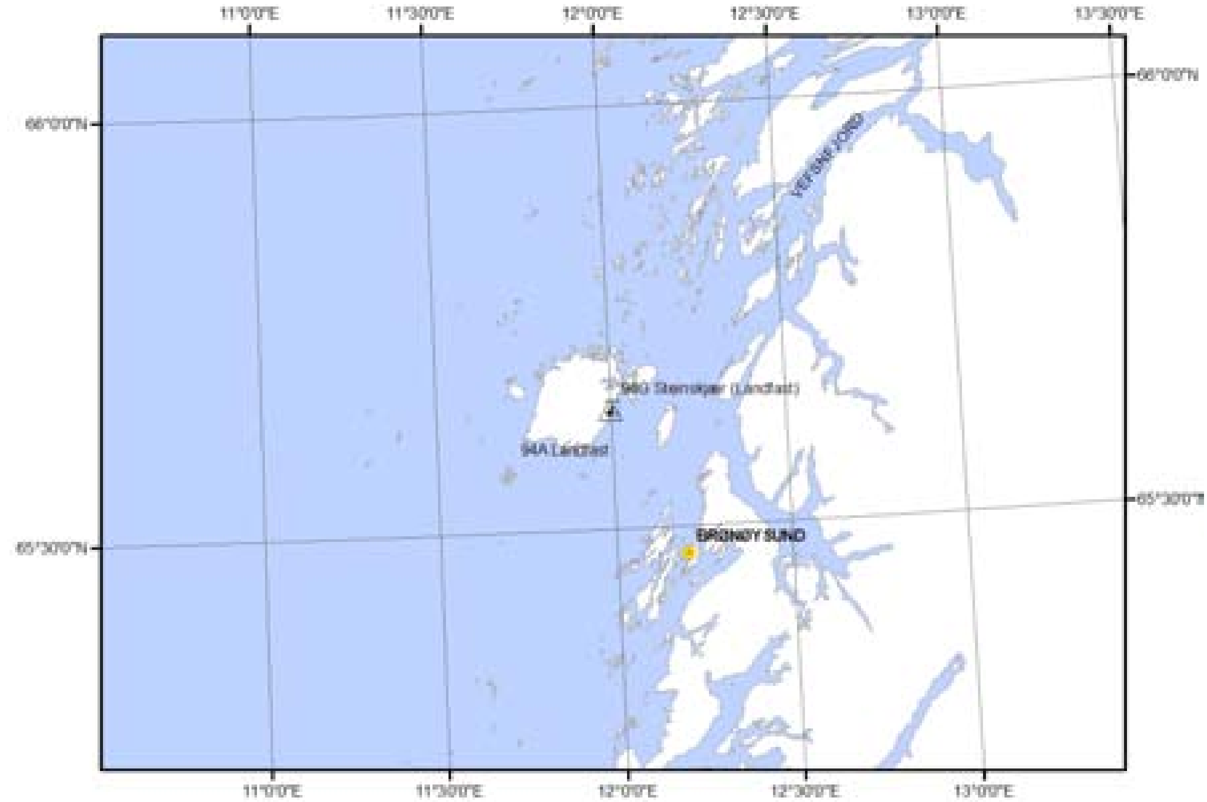
**MAP 11**


7°0'0"E
7°30'0"E
8°0'0"E
8°30'0"E
9°0'0"E
9°30'0"E
63°30'0"N
HITRA
TRONDHEIMSLEIA
SMØLA
91A Nordvika
KRISTIANSUND

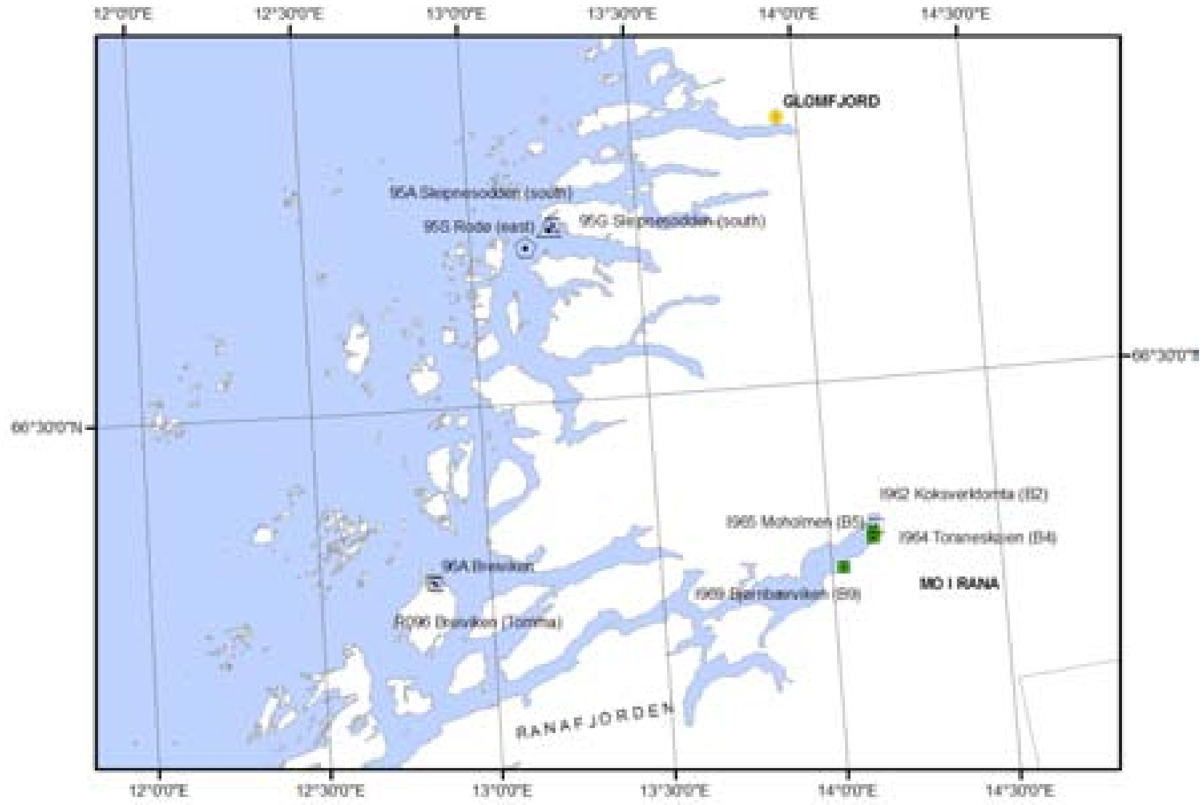
**MAP 12**


9°0'0"E
9°30'0"E
10°0'0"E
10°30'0"E
11°0'0"E
11°30'0"E
64°30'0"N
64°0'0"N
92F Stokken area
92B Stokken area
92F Stokken area
92A2 Nygården
HARSVIK
FROHAVET

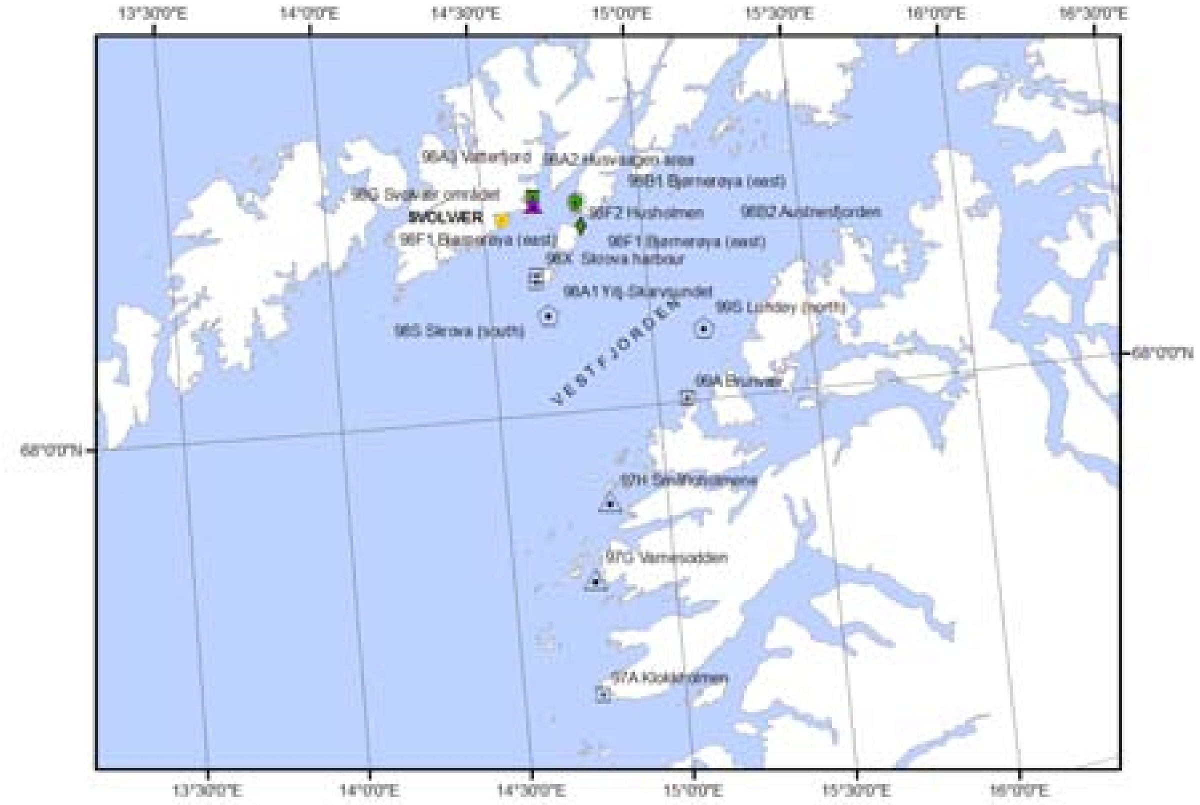
**MAP 13**


11°0'0"E
11°30'0"E
12°0'0"E
12°30'0"E
13°0'0"E
13°30'0"E
66°0'0"N
65°30'0"N

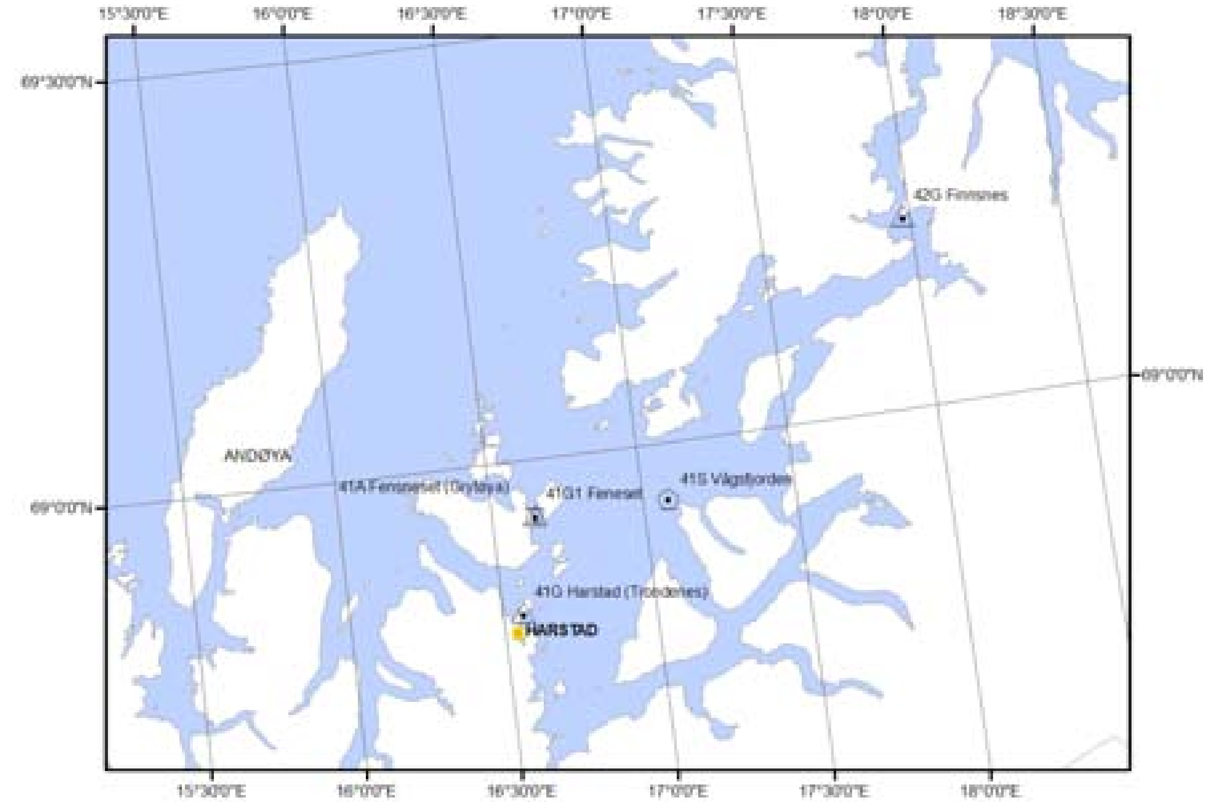
**MAP 14**


12°0'0"E
12°30'0"E
13°0'0"E
13°30'0"E
14°0'0"E
14°30'0"E
GLOMFJORD
MO I RANA
RANAFJORDEN
66°30'0"N

**MAP 15**


13°30'0"E
14°0'0"E
14°30'0"E
15°0'0"E
15°30'0"E
16°0'0"E
16°30'0"E
98F2 Husholmen
98X Skrova harbour
98S Skrova (south)
VESTFJORDEN
97G Vamesodden
68°0'0"N

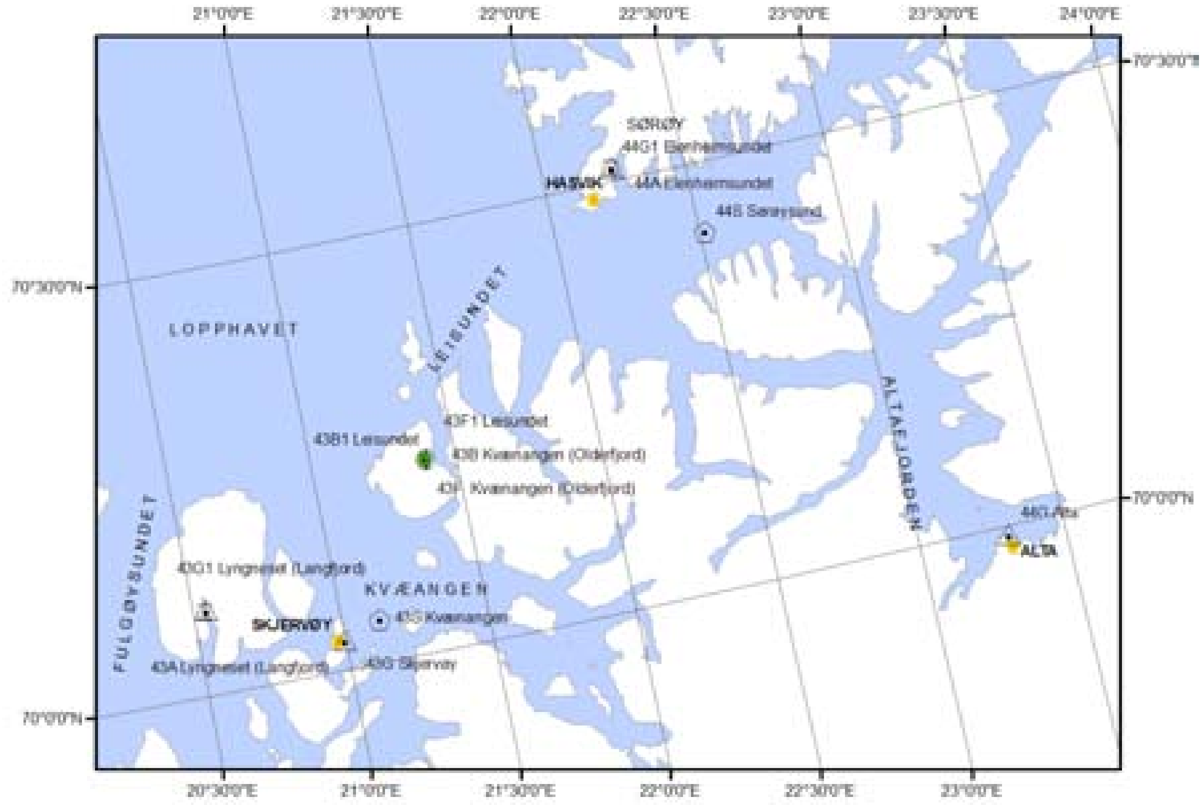
**MAP 16**


ANDØYA
41G1 Feneset
41S Vågsfjorden
41G Harstad (Trondenes)
HARSTAD
42G Finnsnes

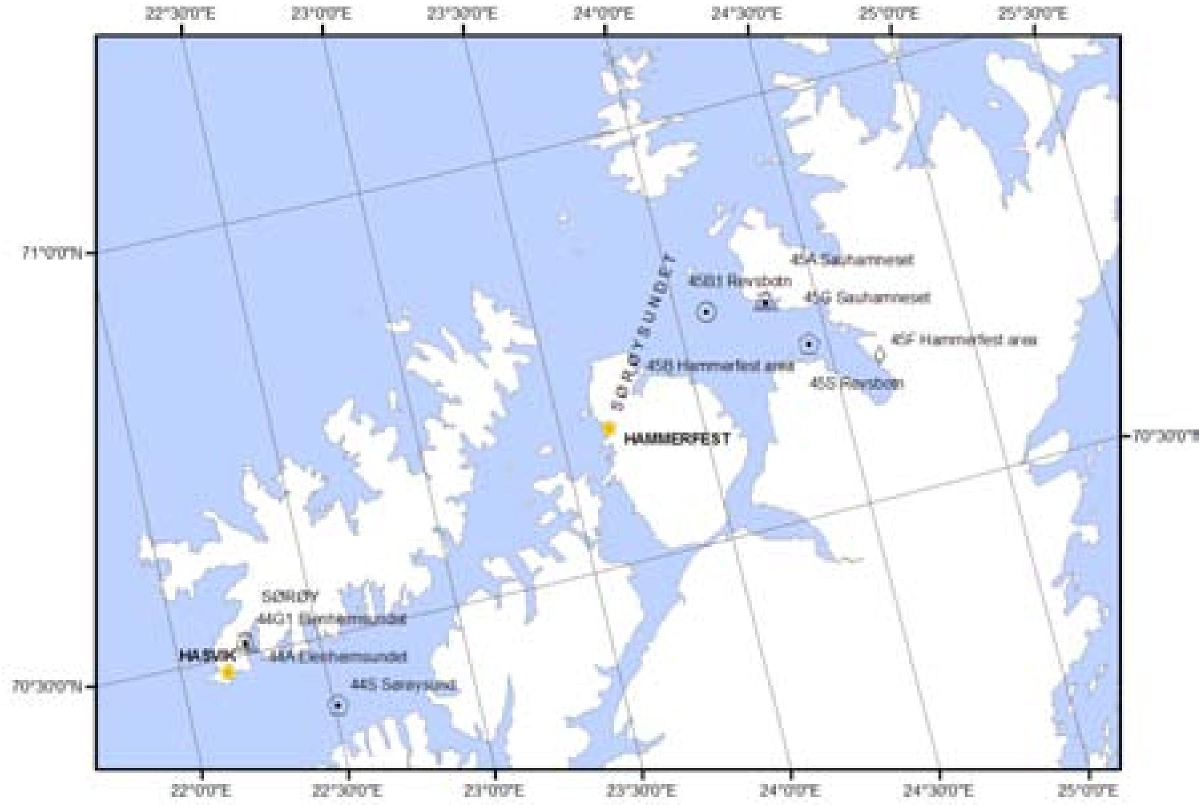
**MAP 17**


TROMSØ
43BH Tromsø havn
KVALØY
MALANGEN
42A Tennskjær (Malangen)
42G Finnsnes

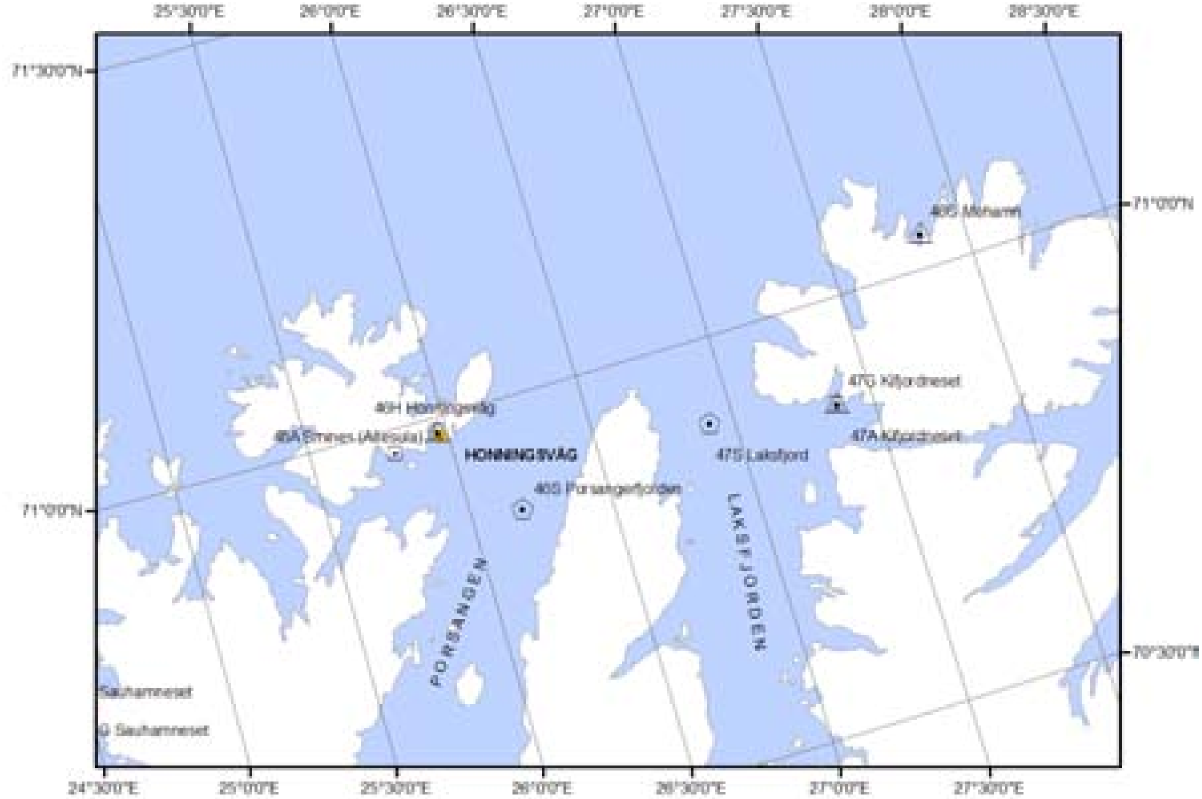
**MAP 18**


SØRØY
44G1 Bjørnhamsundet
HASVIK
44A Elenhamsundet
44S Sørøysund
LOPPHAVET
LEISUNDET
43F1 Leisundet
43B1 Leisundet
43B Kvænangen (Olderfjord)
43F Kvænangen (Olderfjord)
ALTAFJORDEN
44G Alta
ALTA
FULGØYSUNDET
43G1 Lyngneset (Langfjord)
KVÆNANGEN
SKJERVØY
45G Kvænangen
43A Lyngneset (Langfjord)
43G Skjervøy

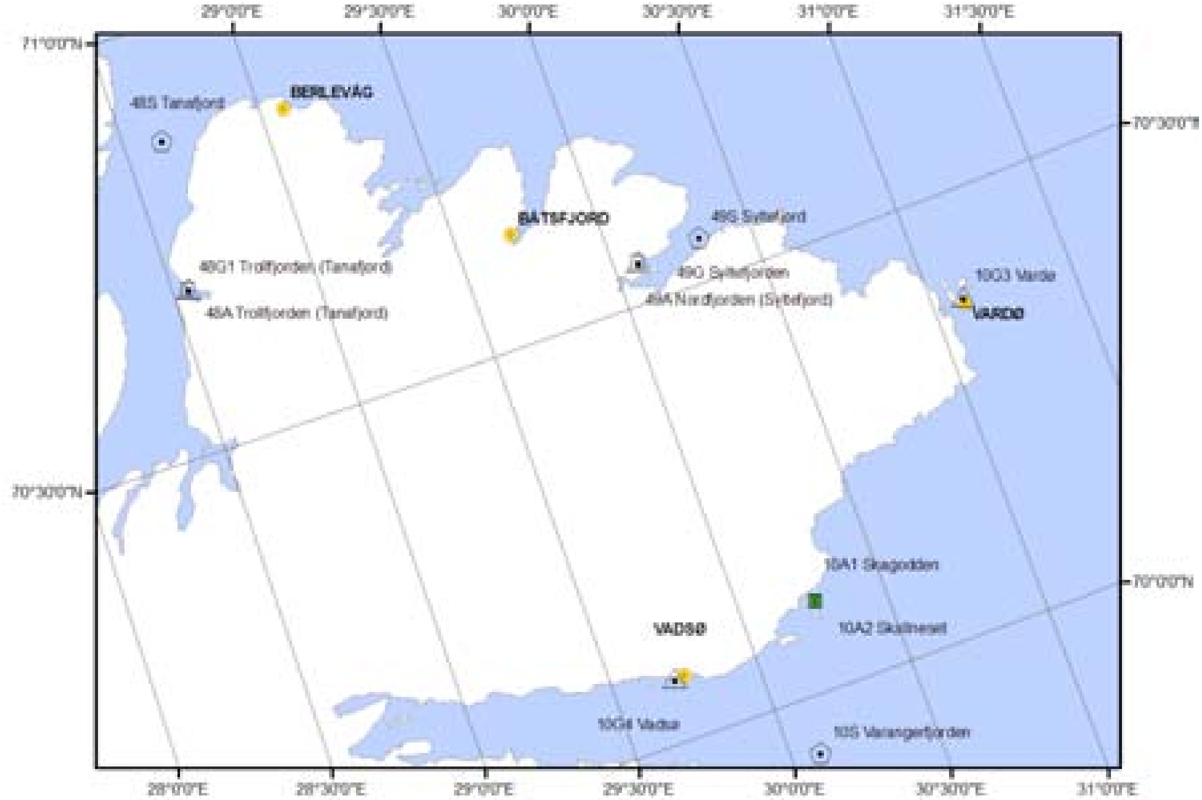
**MAP 19**


45A Sauhamneset
45B1 Revsbotn
45G Sauhamneset
SØRØYSUNDET
45F Hammerfest area
45B Hammerfest area
45S Revsbotn
HAMMERFEST
SØRØY
44G1 Bjørnhamsundet
HASVIK
44A Elenhamsundet
44S Sørøysund

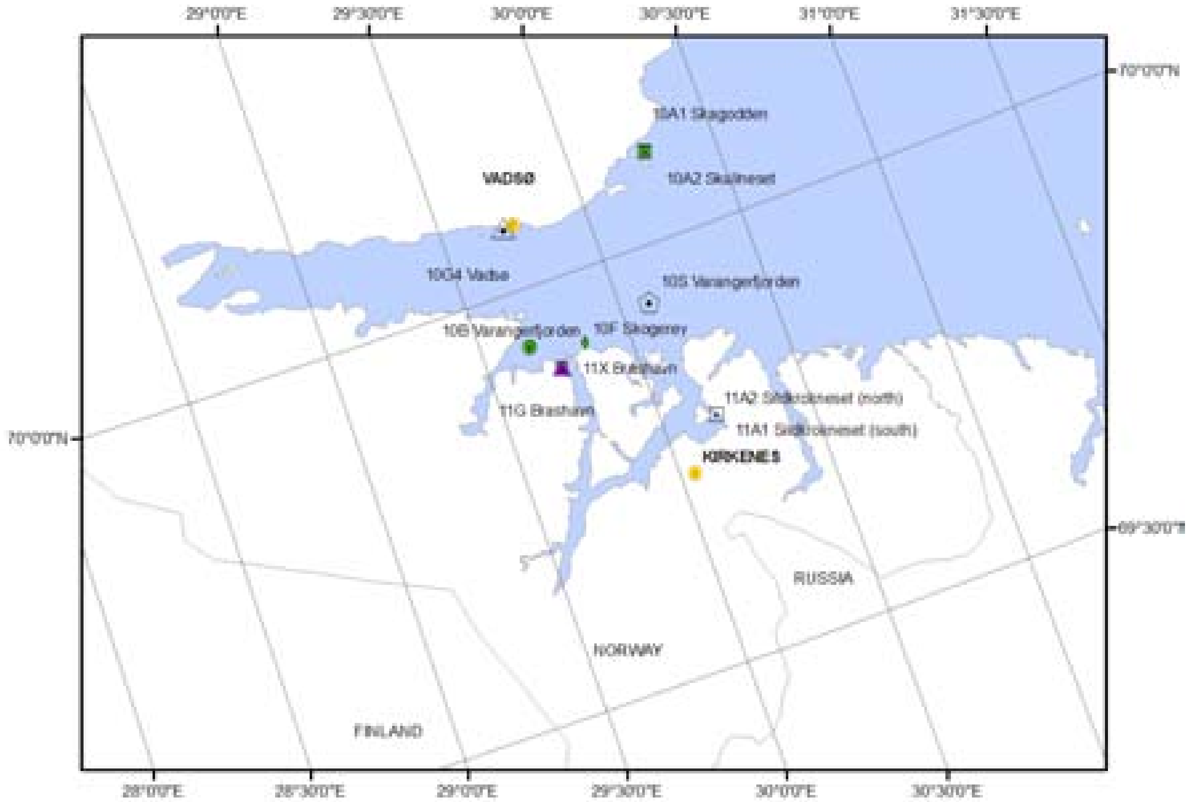
**MAP 20**


HONNINGSVÅG
46S Porsangerfjorden
47S Laksfjord
47G Kifjordneset
PORSANGEN
LAKSFJORDEN
Sauhamneset

**MAP 21**


48S Tanafjord
BERLEVÅG
BÅTSFJORD
49S Syltefjord
48G1 Trollfjorden (Tanafjord)
48A Trollfjorden (Tanafjord)
49G Syltefjorden
49A Nordfjorden (Syltefjord)
10G3 Vardø
VARDØ
10A1 Skagodden
10A2 Skallneset
VADSØ
10S Varangerfjorden

**MAP 22**


VADSØ
10A1 Skagodden
10S Varangerfjorden
10B Varangerfjorden
11G Brashavn
KIRKENES
RUSSIA
NORWAY
FINLAND

**MAP 23**

# Appendix H
# Overview of materials and analyses 2009

**Nominal station positions are shown on maps in Appendix G**

**Me - Blue Mussel (*Mytilus edulis*)**
**Nl – Dog whelk (*Nucella lapillus*)**
**Gm - Atlantic cod (*Gadus morhua*)**
**Fl – flat fish:**
**Megrim (*Lepidorhombus whiff-iagonis*)**
**Dab (*Limanda limanda*)**
**Flounder (*Platichthys flesus*)**

**Tissue:**
**SB - Soft body tissue**
**LI - Liver tissue, in fish**
**MU - Muscle tissue, in fish**
**BL – Blood, in fish**
**BI – Bile, fish**

**ICES-parameter-group codes** (See Appendix C for descriptions of codes):

| ICES code | Description | Me-SB | NI-SB | Gm-BI | Gm-BL | Gm/Ff-LI | Gm/Ff-MU |
|---|---|---|---|---|---|---|---|
| I-MET | Cd, Cu, Pb, Zn | x | | | | x | |
| I-MET | Hg | x | | | | | x |
| O-MET | TBT 1) | x | x | | | x 3) | |
| OC-CB | PCBs 2) | x | | | | x | x |
| OC-CL | HCB | x | | | | x | x |
| OC-DD | DDT, DDE, DDD | x | | | | x | x |
| OC-HC | $\alpha$-, $\gamma$-HCH | x | | | | x | x |
| OC-DX | Dioxins 3) | x | | | | | |
| OC-BB | PBDE 4) | | | | | x 3) | |
| OC-PF | PFC 5) | | | | | x 3) | |
| PAH | PAHs 6) | x | | | | | |
| BEM 7) | Biological effects met. | | Impo-sex | OH-pyrene | ALA-D | EROD-activity, CYP1A 8) | |

1) Includes: DBTIN, DPTIN, MBTIN, MPTIN, TBTIN, TPTIN
2) Includes the congeners: CB-28,-52,-101,-105,-118,-138,-153,-156,-180, 209, 5-CB, OCS and, when dioxins are analysed, the non-orto-PCBs, i.e. CB-77, -81, -126, -169
3) Includes: CDD1N, CDD4X, CDD6P, CDD6X, CDD9X, CDDO, CDF2N, CDF2T, CDF4X, CDF6P, CDF6X, CDF9P, CDF9X, CDFDN, CDFDX, CDFO,TCDD
4) Polybrominated diphenyl ethers (PBDE), including brominated flame retardants and includes: BDE28, BDE47, BDE49, BDE66, BDE71, BDE77, BDE85, BDE99, BDE100, BDE119, BDE138, BDE153, BDE154, BDE183, BDE205
5) Includes: PFNA, PFOA, PFHpA, PFHxA, PFOS, PFBS, PFOSA
6) Includes (with NPDs): ACNE, ACNLE, ANT, BAP, BBJF, BEP, BGHIP, BKF. BAA. CHR, DBA3A, DBT, DBTC1, DBTC2, DBTC3, FLE, FLU, ICDP, NAP, NAPC1, NAPC2, NAPC3, PA, PAC1, PAC2, PAC3, PER, PYR.
7) Biological effects methods
8) Cod only

# Appendix H. Sampling and analyses for 2009 –biota.

| jmpst | station | nom_lon | nom_lat | speci | tissu | N | I-MET | O-BR | OC-CB | OC-CL | OC-DD | OC-DX | OC-HC | O-FL | O-MET | O-PAH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01A | Sponvika | 11.226 | 59.088 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 02A | Fugleskjær | 10.983 | 59.115 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 03A | Tisler | 10.958 | 58.98 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 10A2 | Skallneset | 30.262 | 70.104 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 10B | Varangerfjorden | 29.667 | 69.933 | GADU MOR | LI | 25 | 25 | | 25 | 25 | 25 | | 25 | | | |
| 10B | Varangerfjorden | 29.667 | 69.933 | GADU MOR | MU | 30 | 25 | | 5 | 5 | 5 | | 5 | | | |
| 10F | Skogerøy | 29.85 | 69.917 | PLEU PLA | LI | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 10F | Skogerøy | 29.85 | 69.917 | PLEU PLA | MU | 2 | 2 | | 2 | 2 | 2 | | 2 | | | |
| 11G | Brashavn | 29.744 | 69.899 | NUCE LAP | SB | 1 | | | | | | | | | 1 | |
| 11X | Brashavn | 29.744 | 69.899 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | 2 | |
| 131G | Lastad | 7.709 | 58.056 | NUCE LAP | SB | 1 | | | | | | | | | 1 | |
| 13A | Langøsund | 7.577 | 57.998 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 13BH | Kristiansand harbour | 7.988 | 58.135 | GADU MOR | LI | 25 | 25 | 25 | 25 | 25 | 25 | | 25 | 25 | | |
| 13BH | Kristiansand harbour | 7.988 | 58.135 | GADU MOR | MU | 30 | 25 | | 5 | 5 | 5 | | 5 | | | |
| 14A | Aavigen | 7.216 | 58.033 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 15A | Gåsøy (Ullerø) | 6.895 | 58.048 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | 2 | |
| 15B | Ullerø area | 6.717 | 58.05 | GADU MOR | LI | 25 | 19 | | 25 | 25 | 25 | | 25 | | | |
| 15B | Ullerø area | 6.717 | 58.05 | GADU MOR | MU | 30 | 25 | | 5 | 5 | 5 | | 5 | | | |
| 15F | Ullerø area | 6.717 | 58.05 | LIMA LIM | LI | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 15F | Ullerø area | 6.717 | 58.05 | LIMA LIM | MU | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 15G | Gåsøy (Ullerø) | 6.896 | 58.05 | NUCE LAP | SB | 1 | | | | | | | | | 1 | |
| 21F | Åkrafjord | 6.117 | 59.75 | LEPI WHI | LI | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 21F | Åkrafjord | 6.117 | 59.75 | LIMA LIM | LI | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 21F | Åkrafjord | 6.117 | 59.75 | LEPI WHI | MU | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 21F | Åkrafjord | 6.117 | 59.75 | LIMA LIM | MU | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 227A2 | Høgevarde | 5.318 | 59.326 | MYTI EDU | SB | 1 | 1 | | 1 | 1 | 1 | | 1 | | 1 | |
| 227G2 | Flatskjær | 5.312 | 59.337 | NUCE LAP | SB | 1 | | | | | | | | | 1 | |
| 22A | Espevær (west) | 5.144 | 59.584 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | 2 | |
| 22G | Espevær (west) | 5.144 | 59.584 | NUCE LAP | SB | 1 | | | | | | | | | 1 | |
| 23B | Karihavet area | 5.133 | 59.9 | GADU MOR | LI | 25 | 25 | 25 | 25 | 25 | 25 | | 25 | 25 | | |
| 23B | Karihavet area | 5.133 | 59.9 | GADU MOR | MU | 30 | 25 | | 5 | 5 | 5 | | 5 | | | |
| 30A | Gressholmen | 10.712 | 59.882 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | 2 | 3 | | 2 | 3 |
| 30B | Oslo City area | 10.56 | 59.799 | GADU MOR | LI | 25 | 25 | 25 | 25 | 25 | 25 | | 25 | 25 | | |
| 30B | Oslo City area | 10.56 | 59.799 | GADU MOR | MU | 30 | 25 | | 5 | 5 | 5 | | 5 | | | |
| 31A | Solbergstrand | 10.65 | 59.619 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 33F | Sande (east side) | 10.35 | 59.528 | PLAT FLE | LI | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 33F | Sande (east side) | 10.35 | 59.528 | PLAT FLE | MU | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 35A | Mølen | 10.498 | 59.488 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | 1 | 3 | | 1 | 1 |
| 36B | Færder area | 10.436 | 59.04 | GADU MOR | LI | 21 | 21 | 21 | 21 | 21 | 21 | | 21 | 21 | | |
| 36B | Færder area | 10.436 | 59.04 | GADU MOR | MU | 25 | 21 | | 4 | 4 | 4 | | 4 | | | |
| 36F | Færder area | 10.383 | 59.067 | LIMA LIM | LI | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 36F | Færder area | 10.383 | 59.067 | LIMA LIM | MU | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 36G | Færder | 10.526 | 59.027 | NUCE LAP | SB | 1 | | | | | | | | | 1 | |
| 43B | Kvænangen (Olderfjord) | 21.397 | 70.226 | GADU MOR | LI | 21 | 21 | 21 | 21 | 21 | 21 | | 21 | 21 | | |
| 43B | Kvænangen (Olderfjord) | 21.397 | 70.226 | GADU MOR | MU | 21 | 21 | | | | | | | | | |
| 43BH | Tromsø harbour | 18.974 | 69.653 | GADU MOR | LI | 25 | 25 | 25 | 25 | 25 | 25 | | 25 | 25 | | |
| 43BH | Tromsø harbour | 18.974 | 69.653 | GADU MOR | MU | 30 | 25 | | 5 | 5 | 5 | | 5 | | | |
| 51A | Byrkjenes | 6.55 | 60.084 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 52A | Eitrheimsneset | 6.533 | 60.097 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 53B | Inner Sørfjord | 6.567 | 60.167 | GADU MOR | LI | 19 | 19 | 19 | 19 | 19 | 19 | | 19 | 19 | | |
| 53B | Inner Sørfjord | 6.567 | 60.167 | GADU MOR | MU | 23 | 19 | | 4 | 4 | 4 | | 4 | | | |
| 53F | Inner Sørfjord | 6.567 | 60.167 | PLAT FLE | LI | 2 | 2 | | 2 | 2 | 2 | | 2 | | | |
| 53F | Inner Sørfjord | 6.567 | 60.167 | PLAT FLE | MU | 2 | 2 | | 2 | 2 | 2 | | 2 | | | |
| 56A | Kvalnes | 6.602 | 60.22 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 57A | Krossanes | 6.689 | 60.387 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 63A | Ranaskjær | 6.405 | 60.421 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 65A | Vikingneset | 6.153 | 60.242 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 67B | Strandebarm area | 6.033 | 60.267 | GADU MOR | LI | 29 | 25 | | 25 | 25 | 25 | | 25 | | | |
| 67B | Strandebarm area | 6.033 | 60.267 | GADU MOR | MU | 30 | 25 | | 5 | 5 | 5 | | 5 | | | |
| 67F | Strandebarm area | 6.033 | 60.267 | LEPI WHI | LI | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 67F | Strandebarm area | 6.033 | 60.267 | PLAT FLE | LI | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 67F | Strandebarm area | 6.033 | 60.267 | LEPI WHI | MU | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 67F | Strandebarm area | 6.033 | 60.267 | PLAT FLE | MU | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 69A | Lille Terøy | 5.752 | 59.982 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 71A | Bjørkøya (Risøyodden) | 9.754 | 59.023 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | 2 | 3 | | 1 | |
| 71g | Fugløyskjær | 9.808 | 58.981 | LITT LIT | SB | 1 | | | | | | | | | 1 | |
| 71G | Fugløyskjær | 9.808 | 58.981 | NUCE LAP | SB | 1 | | | | | | | | | 1 | |
| 73A | Lyngholmen | 10.295 | 59.045 | MYTI EDU | SB | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 74G | Langholmane | 9.868 | 58.955 | NUCE LAP | SB | 1 | | | | | | | | | 1 | |
| 76A | Risøy | 9.272 | 58.731 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | 2 | 3 | | 1 | |
| 76G | Risøy | 9.276 | 58.728 | NUCE LAP | SB | 1 | | | | | | | | | 1 | |
| 77A | Nordstrand | 8.942 | 58.524 | MYTI EDU | SB | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 77B | Borøy area | 9.017 | 58.55 | GADU MOR | LI | 25 | 25 | | 25 | 25 | 25 | | 25 | | | |
| 77B | Borøy area | 9.017 | 58.55 | GADU MOR | MU | 30 | 25 | | 5 | 5 | 5 | | 5 | | | |
| 77F | Borøy area | 9.017 | 58.55 | LIMA LIM | LI | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 77F | Borøy area | 9.017 | 58.55 | LIMA LIM | MU | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 79A | Gjerdsvoldsøyen (east) | 8.742 | 58.413 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| 80BH | Munkholmen | 10.392 | 63.442 | GADU MOR | LI | 21 | 21 | 21 | 21 | 21 | 21 | | 21 | 21 | | |
| 80BH | Munkholmen | 10.392 | 63.442 | GADU MOR | MU | 25 | 21 | | 4 | 4 | 4 | | 4 | | | |
| 92B | Stokken area | 9.887 | 64.171 | GADU MOR | LI | 25 | 25 | 25 | 25 | 25 | 25 | | 25 | 25 | | |
| 92B | Stokken area | 9.887 | 64.171 | GADU MOR | MU | 25 | 25 | | | | | | | | | |
| 98A2 | Husvaagen area | 14.664 | 68.258 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | 2 | |
| 98B1 | Bjørnerøya (east) | 14.803 | 68.247 | GADU MOR | LI | 25 | 25 | 25 | 25 | 25 | 25 | | 25 | 25 | | |
| 98B1 | Bjørnerøya (east) | 14.803 | 68.247 | GADU MOR | MU | 30 | 25 | | 5 | 5 | 5 | | 5 | | | |
| 98F2 | Husholmen | 14.808 | 68.219 | PLEU PLA | LI | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 98F2 | Husholmen | 14.808 | 68.219 | PLEU PLA | MU | 5 | 5 | | 5 | 5 | 5 | | 5 | | | |
| 98G | Svolvær area | 14.663 | 68.249 | NUCE LAP | SB | 1 | | | | | | | | | 1 | |
| I022 | West Damholmen | 11.045 | 59.102 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| I023 | Singlekalven (south) | 11.137 | 59.095 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| I024 | Kirkøy (north west) | 10.986 | 59.08 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| I131A | Lastad | 7.709 | 58.056 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | 3 |
| I132 | Svensholmen | 7.989 | 58.125 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | 1 | 3 | | 1 | 3 |
| I133 | Odderø (west) | 8.002 | 58.132 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | 1 | 3 | | 2 | 3 |
| I201 | Ekkjegrunn (G1) | 6.357 | 59.643 | MYTI EDU | SB | 3 | 3 | | | | | | | | | 3 |
| I205 | Bølsnes (G5) | 6.3 | 59.592 | MYTI EDU | SB | 3 | 3 | | | | | | | | | 3 |
| I241 | Nordnes | 5.302 | 60.401 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| I242 | Gravdalsneset | 5.267 | 60.395 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| I243 | Hegreneset | 5.305 | 60.415 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | |
| I301 | Akershuskaia | 10.736 | 59.905 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | 2 | 3 |
| I304 | Gåsøya | 10.589 | 59.851 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | 3 |
| I306 | Håøya | 10.555 | 59.713 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | 3 |
| I307 | Ramtonholmen | 10.523 | 59.744 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | | 3 | | | 3 |
| I712 | Gjemesholmen | 9.707 | 59.045 | MYTI EDU | SB | 4 | 4 | | 4 | 4 | 4 | 2 | 4 | | 3 | |
| I713 | Strømtangen | 9.692 | 59.05 | MYTI EDU | SB | 3 | 3 | | 3 | 3 | 3 | 1 | 3 | | 2 | |
| I912 | Honnhammer | 8.162 | 62.853 | MYTI EDU | SB | 3 | | | | | | | | | | 3 |
| I913 | Fjøseid | 8.275 | 62.81 | MYTI EDU | SB | 3 | | | | | | | | | | 3 |
| I915 | Flåøya (northwest) | 8.44 | 62.758 | MYTI EDU | SB | 3 | | | | | | | | | | 3 |
| I964 | Toraneskaien (B4) | 14.128 | 66.319 | MYTI EDU | SB | 3 | 3 | | | | | | | | | 3 |
| I965 | Moholmen (B5) | 14.126 | 66.312 | MYTI EDU | SB | 3 | 3 | | | | | | | | | 3 |
| I969 | Bjørnbærviken (B9) | 14.035 | 66.28 | MYTI EDU | SB | 3 | 3 | | | | | | | | | 3 |

# Appendix I
# Concentrations and temporal trend analyses of contaminants and biomarkers in biota 2009

### Sorted by contaminant, species and area/station:

**Ag - silver**
**ALA-D** (δ-amino levulinic acid dehydrase inhibition)
**As - arsenic**
**Ba - barium**
**BAP** (benzo[*a*]pyrene)
**BDESS** (Sum brominated flame retardants)
**CB_S7** (CB: 28+52+101+118+138+153+180)
**Cd - cadmium**
**Co - cobalt**
**Cr - chromium**
**Cu - copper**
**CYP1A** (relative amount of Cytochrome P4501A protein)
**DD_S4** (sum of pp'DDE, pp'DDD, and pp'DDT)
**EROD-activity** (Cytochrome P4501A-activity)
**HCB**
**Hg - mercury**
**HCHG** (gamma-hexachlorocyclohexane)
**Mo - molybdenum**
**Ni - nickel**
**PAH** (sum of PAHs, excluding the dicyclic forms, cf. Appendix B)
**PK_S** (sum carcinogen PAHs, cf. Appendix B)
**Pb – lead**
**PFOS**
**PYR10** (Pyrene metabolite)
**QCB**
**Sn - tin**
**TBT** (Tributyltin)
**TCDDN** (Dioxin toxicity equivalents – Nordic model)
**Vanadium (V)**
**VDSI** (measurement of Imposex)
**Zinc (Zn)**

**CEMP-stations**
**"Index"-stations**
**MYTI EDU - Blue Mussel (*Mytilus edulis*)**
**NUCE LAP – Dog whelk (*Nucella lapillus*)**
**GADU MOR - Atlantic cod (*Gadus morhua*)**
**LEPI WHI - Megrim (*Lepidorhombus whiff-iagonis*)**
**LIMA LIM - Dab (*Limanda limanda*)**
**PLAT FLE - Flounder (*Platichthys flesus*)**

**Tissue:**
**SB - Soft body tissue**
**LI - Liver tissue**
**MU - Muscle tissue**
**BL - Blood**
**BI - Bile**

**Unit:**
**M –** mg/kg
**U -** µg/kg
**N –** ng/kg
**ng –** ng/min/mg protein (for ALAD)
**pm –** pmol/min/mg protein (for EROD)
**380 –** µg/kg/ABS 380 nm (for PYR10)
**ABS –** ABS (for CYP1A)

**Base:**
**W –** wet weight
**D –** dry weight

**OC** Overconcentration expressed as quotient of median of last year and upper limit to presumed "high background" ("m" missing background value)

**Class** Classification system is used for sediment (Bakke *et al.* 2007c) and biota (Molvær *et al.* 1997) for Classes: I (blue), II (green), III (yellow), IV (orange) and V (red). Dark grey indicates concentration higher than estimated high background levels. Light grey indicates concentration lower than high background levels. Note: Class limits for ΣDDT are used for ppDDE. Class limits for ΣHCH are used for HCHG.

**TRND** trend for all time series with 3 or more years data.

| | |
|---|---|
| D- | Significant linear trend, downward |
| U- | Significant linear trend, upward |
| -- | No significant trend |
| -? | No significant linear trend, systematic non-linear trend can not be tested because of insufficient data (<7 years) |
| -Y | No significant linear trend, but a systematic non-linear trend |
| DY or UY | Significant linear trend (downward or upward) and a significant non-linear trend. This is considered the same as "-Y" |

**Note on detection limit: for values designated below detection limit, half of this limit is used.**

**Symbol** trend analyses were done on time series with three or more years and the results are indicated by an upward or downward arrow where significant trends were found, or a zero if no trend was detected. A small filled square (□) indicates that chemical analysis has been performed, but the data were insufficient to do a trend analysis.

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10B | Varangerfjorden | GADU MOR | Cod | Ag | LI | M | W | 0.15 | | | | ▪ |
| 13BH | Kristiansand havn | GADU MOR | Cod | Ag | LI | M | W | 2.11 | | | | ▪ |
| 15B | Ullerø area | GADU MOR | Cod | Ag | LI | M | W | 0.33 | | | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | Ag | LI | M | W | 3.77 | | | | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | Ag | LI | M | W | 10.70 | | | | ▪ |
| 36B | Færder area | GADU MOR | Cod | Ag | LI | M | W | 0.61 | | | | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | Ag | LI | M | W | 0.19 | | | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | Ag | LI | M | W | 0.24 | | | | ▪ |
| 67B | Strandebarm area | GADU MOR | Cod | Ag | LI | M | W | 0.11 | | | | ▪ |
| 77B | Borøy area | GADU MOR | Cod | Ag | LI | M | W | 0.40 | | | | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | Ag | LI | M | W | 0.19 | | | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | Ag | LI | M | W | 0.07 | | | | ▪ |
| 21F | Åkrafjord | LEPI WHI | Megrim | Ag | LI | M | W | 0.08 | | | | ▪ |
| 67F | Strandebarm area | LEPI WHI | Megrim | Ag | LI | M | W | 0.06 | | | | ▪ |
| 15F | Ullerø area | LIMA LIM | Dab | Ag | LI | M | W | 0.06 | | | | ▪ |
| 21F | Åkrafjord | LIMA LIM | Dab | Ag | LI | M | W | 0.04 | | | | ▪ |
| 36F | Færder area | LIMA LIM | Dab | Ag | LI | M | W | 0.03 | | | | ▪ |
| 77F | Borøy area | LIMA LIM | Dab | Ag | LI | M | W | 0.01 | | | | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.04 | | I | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.12 | | I | | ▪ |
| 11X | Brashavn | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.14 | | I | | ▪ |
| 13A | Langøsund | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.04 | | I | | ▪ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.06 | | I | | ▪ |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.02 | | I | | ▪ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.16 | | I | | ▪ |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.06 | | I | | ▪ |
| 35A | Mølen | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.06 | | I | | ▪ |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.04 | | I | | ▪ |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.05 | | I | | ▪ |
| 56A | Kvalnes | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.04 | | I | | ▪ |
| 57A | Krossanes | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| 63A | Ranaskjær | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65A | Vikingneset | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.04 | | I | | ▪ |
| 73A | Lyngholmen | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.02 | | I | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| 77A | Nordstrand | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.05 | | I | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.04 | | I | | ▪ |
| I022 | West Damholmen | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.05 | | I | | ▪ |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.04 | | I | | ▪ |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.05 | | I | | ▪ |
| I131A | Lastad | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.04 | | I | | ▪ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.06 | | I | | ▪ |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.04 | | I | | ▪ |
| I201 | Ekkjegrunn (G1) | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| I205 | Bølsnes (G5) | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| I241 | Nordnes | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.04 | | I | | ▪ |
| I243 | Hegreneset | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| I304 | Gåsøya | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.04 | | I | | ▪ |
| I306 | Håøya | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.05 | | I | | ▪ |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| I713 | Strømtangen | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.04 | | I | | ▪ |
| I964 | Toraneskaien (B4) | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.05 | | I | | ▪ |
| I965 | Moholmen (B5) | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.04 | | I | | ▪ |
| I969 | Bjørnbærviken (B9) | MYTI EDU | Blue mussel | Ag | SB | M | D | 0.03 | | I | | ▪ |
| 33F | Sande (east side) | PLAT FLE | Flounder | Ag | LI | M | W | 0.09 | | | | ▪ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | Ag | LI | M | W | 0.02 | | | | ▪ |
| 67F | Strandebarm area | PLAT FLE | Flounder | Ag | LI | M | W | 0.01 | | | | ▪ |
| 10F | Skogerøy | PLEU PLA | Plaice | Ag | LI | M | W | 0.18 | | | | ▪ |
| 98F2 | Husholmen | PLEU PLA | Plaice | Ag | LI | M | W | 0.05 | | | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | ALAD | BL | np | W | 34.4 | m | | -- | ○ |
| 30B | Oslo City area | GADU MOR | Cod | ALAD | BL | np | W | 28.6 | m | | -- | ○ |
| 53B | Inner Sørfjord | GADU MOR | Cod | ALAD | BL | np | W | 19.6 | m | | -- | ○ |
| 10B | Varangerfjorden | GADU MOR | Cod | As | LI | M | W | 4.64 | | | | ▪ |
| 13BH | Kristiansand havn | GADU MOR | Cod | As | LI | M | W | 5.10 | | | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15B | Ullerø area | GADU MOR | Cod | As | LI | M | W | 4.69 | | | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | As | LI | M | W | 48.50 | | | | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | As | LI | M | W | 43.50 | | | | ▪ |
| 36B | Færder area | GADU MOR | Cod | As | LI | M | W | 4.18 | | | | ▪ |
| 43B | Kvænangen (Olderfjord) | GADU MOR | Cod | As | LI | M | W | 5.03 | | | | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | As | LI | M | W | 6.17 | | | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | As | LI | M | W | 4.21 | | | | ▪ |
| 67B | Strandebarm area | GADU MOR | Cod | As | LI | M | W | 3.04 | | | | ▪ |
| 77B | Borøy area | GADU MOR | Cod | As | LI | M | W | 4.44 | | | | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | As | LI | M | W | 2.40 | | | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | As | LI | M | W | 3.49 | | | | ▪ |
| 21F | Åkrafjord | LEPI WHI | Megrim | As | LI | M | W | 9.91 | | | | ▪ |
| 67F | Strandebarm area | LEPI WHI | Megrim | As | LI | M | W | 3.52 | | | | ▪ |
| 15F | Ullerø area | LIMA LIM | Dab | As | LI | M | W | 5.81 | | | | ▪ |
| 21F | Åkrafjord | LIMA LIM | Dab | As | LI | M | W | 24.00 | | | | ▪ |
| 36F | Færder area | LIMA LIM | Dab | As | LI | M | W | 9.61 | | | | ▪ |
| 77F | Borøy area | LIMA LIM | Dab | As | LI | M | W | 13.50 | | | | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | As | SB | M | D | 8.58 | | I | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | As | SB | M | D | 13.31 | | II | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | As | SB | M | D | 17.00 | | II | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | As | SB | M | D | 14.76 | | II | | ▪ |
| 11X | Brashavn | MYTI EDU | Blue mussel | As | SB | M | D | 10.57 | | II | | ▪ |
| 13A | Langøsund | MYTI EDU | Blue mussel | As | SB | M | D | 20.63 | | II | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | As | SB | M | D | 22.94 | | II | | ▪ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | As | SB | M | D | 20.24 | | II | | ▪ |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | As | SB | M | D | 31.60 | | III | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | As | SB | M | D | 16.76 | | II | | ▪ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | As | SB | M | D | 13.39 | | II | | ▪ |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | As | SB | M | D | 15.73 | | II | | ▪ |
| 35A | Mølen | MYTI EDU | Blue mussel | As | SB | M | D | 14.87 | | II | | ▪ |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | As | SB | M | D | 13.29 | | II | | ▪ |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | As | SB | M | D | 18.24 | | II | | ▪ |
| 56A | Kvalnes | MYTI EDU | Blue mussel | As | SB | M | D | 25.00 | | II | | ▪ |
| 57A | Krossanes | MYTI EDU | Blue mussel | As | SB | M | D | 19.10 | | II | | ▪ |
| 63A | Ranaskjær | MYTI EDU | Blue mussel | As | SB | M | D | 21.47 | | II | | ▪ |
| 65A | Vikingneset | MYTI EDU | Blue mussel | As | SB | M | D | 21.55 | | II | | ▪ |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | As | SB | M | D | 17.65 | | II | | ▪ |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | As | SB | M | D | 10.41 | | II | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73A | Lyngholmen | MYTI EDU | Blue mussel | As | SB | M | D | 12.60 | | II | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | As | SB | M | D | 23.65 | | II | | ▪ |
| 77A | Nordstrand | MYTI EDU | Blue mussel | As | SB | M | D | 33.89 | | III | | ▪ |
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | As | SB | M | D | 17.80 | | II | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | As | SB | M | D | 15.68 | | II | | ▪ |
| I022 | West Damholmen | MYTI EDU | Blue mussel | As | SB | M | D | 12.30 | | II | | ▪ |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | As | SB | M | D | 8.54 | | I | | ▪ |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | As | SB | M | D | 12.90 | | II | | ▪ |
| I131A | Lastad | MYTI EDU | Blue mussel | As | SB | M | D | 14.77 | | II | | ▪ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | As | SB | M | D | 18.40 | | II | | ▪ |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | As | SB | M | D | 15.87 | | II | | ▪ |
| I201 | Ekkjegrunn (G1) | MYTI EDU | Blue mussel | As | SB | M | D | 6.35 | | I | | ▪ |
| I205 | Bølsnes (G5) | MYTI EDU | Blue mussel | As | SB | M | D | 8.38 | | I | | ▪ |
| I241 | Nordnes | MYTI EDU | Blue mussel | As | SB | M | D | 12.39 | | II | | ▪ |
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | As | SB | M | D | 13.86 | | II | | ▪ |
| I243 | Hegreneset | MYTI EDU | Blue mussel | As | SB | M | D | 11.50 | | II | | ▪ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | As | SB | M | D | 10.27 | | II | | ▪ |
| I304 | Gåsøya | MYTI EDU | Blue mussel | As | SB | M | D | 13.14 | | II | | ▪ |
| I306 | Håøya | MYTI EDU | Blue mussel | As | SB | M | D | 14.71 | | II | | ▪ |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | As | SB | M | D | 13.63 | | II | | ▪ |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | As | SB | M | D | 12.29 | | II | | ▪ |
| I713 | Strømtangen | MYTI EDU | Blue mussel | As | SB | M | D | 15.23 | | II | | ▪ |
| I964 | Toraneskaien (B4) | MYTI EDU | Blue mussel | As | SB | M | D | 13.80 | | II | | ▪ |
| I965 | Moholmen (B5) | MYTI EDU | Blue mussel | As | SB | M | D | 13.83 | | II | | ▪ |
| I969 | Bjørnbærviken (B9) | MYTI EDU | Blue mussel | As | SB | M | D | 9.17 | | I | | ▪ |
| 33F | Sande (east side) | PLAT FLE | Flounder | As | LI | M | W | 15.70 | | | | ▪ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | As | LI | M | W | 9.56 | | | | ▪ |
| 67F | Strandebarm area | PLAT FLE | Flounder | As | LI | M | W | 1.10 | | | | ▪ |
| 10F | Skogerøy | PLEU PLA | Plaice | As | LI | M | W | 11.40 | | | | ▪ |
| 98F2 | Husholmen | PLEU PLA | Plaice | As | LI | M | W | 3.75 | | | | ▪ |
| 35A | Mølen | MYTI EDU | Blue mussel | Ba | SB | M | D | 1.64 | | | | ▪ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | BaP | SB | U | D | 2.78 | no | I | -- | o |
| I131A | Lastad | MYTI EDU | Blue mussel | BaP | SB | U | D | 3.85 | no | I | -- | o |
| I132 | Svensholmen | MYTI EDU | Blue mussel | BaP | SB | U | D | 24.70 | 4.9 | III | -- | o |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | BaP | SB | U | D | 112.00 | 22.4 | IV | -- | o |
| I201 | Ekkjegrunn (G1) | MYTI EDU | Blue mussel | BaP | SB | U | D | 5.41 | 1.1 | II | D- | ↓ |
| I205 | Bølsnes (G5) | MYTI EDU | Blue mussel | BaP | SB | U | D | 3.13 | no | I | -- | o |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | BaP | SB | U | D | 3.86 | no | I | -- | o |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I304 | Gåsøya | MYTI EDU | Blue mussel | BaP | SB | U | D | 3.57 | no | I | -- | o |
| I306 | Håøya | MYTI EDU | Blue mussel | BaP | SB | U | D | 3.33 | no | I | U- | ↑ |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | BaP | SB | U | D | 2.94 | no | I | UY | ↑ |
| I912 | Honnhammer | MYTI EDU | Blue mussel | BaP | SB | U | D | 2.78 | no | I | -- | o |
| I913 | Fjøseid | MYTI EDU | Blue mussel | BaP | SB | U | D | 2.78 | no | I | -- | o |
| I964 | Toraneskaien (B4) | MYTI EDU | Blue mussel | BaP | SB | U | D | 397.00 | 79.3 | V | -- | o |
| I965 | Moholmen (B5) | MYTI EDU | Blue mussel | BaP | SB | U | D | 233.00 | 46.7 | V | -- | o |
| I969 | Bjørnbærviken (B9) | MYTI EDU | Blue mussel | BaP | SB | U | D | 14.90 | 3 | II | -- | o |
| 13BH | Kristiansand havn | GADU MOR | Cod | BDESS | LI | U | W | 573 | | | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | BDESS | LI | U | W | 10 | m | | -? | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | BDESS | LI | U | W | 61 | m | | -? | ▪ |
| 36B | Færder area | GADU MOR | Cod | BDESS | LI | U | W | 68 | | | | ▪ |
| 43B | Kvænangen (Olderfjord) | GADU MOR | Cod | BDESS | LI | U | W | 222 | | | | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | BDESS | LI | U | W | 897 | | | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | BDESS | LI | U | W | 33 | m | | -? | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | BDESS | LI | U | W | 867 | | | | ▪ |
| 92B | Stokken area | GADU MOR | Cod | BDESS | LI | U | W | 148 | | | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | BDESS | LI | U | W | 92 | | | | ▪ |
| 10B | Varangerfjorden | GADU MOR | Cod | CB_S7 | LI | U | W | 131 | no | I | DY | ↓ |
| 13BH | Kristiansand havn | GADU MOR | Cod | CB_S7 | LI | U | W | 34340.90 | | V | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | CB_S7 | LI | U | W | 78 | no | I | D- | ↓ |
| 30B | Oslo City area | GADU MOR | Cod | CB_S7 | LI | U | W | 3600 | 3.6 | III | -- | o |
| 36B | Færder area | GADU MOR | Cod | CB_S7 | LI | U | W | 181 | no | I | DY | ↓ |
| 43B | Kvænangen (Olderfjord) | GADU MOR | Cod | CB_S7 | LI | U | W | 121 | no | I | -? | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | CB_S7 | LI | U | W | 8515.40 | | IV | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | CB_S7 | LI | U | W | 449 | no | I | -- | o |
| 67B | Strandebarm area | GADU MOR | Cod | CB_S7 | LI | U | W | 89 | no | I | D- | ↓ |
| 77B | Borøy area | GADU MOR | Cod | CB_S7 | LI | U | W | 197 | no | I | -? | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | CB_S7 | LI | U | W | 27540.80 | | V | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | CB_S7 | LI | U | W | 15 | no | I | D- | ↓ |
| 10B | Varangerfjorden | GADU MOR | Cod | CB_S7 | MU | U | W | 0.71 | no | I | -- | o |
| 13BH | Kristiansand havn | GADU MOR | Cod | CB_S7 | MU | U | W | 33.86 | | III | | ▪ |
| 15B | Ullerø area | GADU MOR | Cod | CB_S7 | MU | U | W | 0.48 | no | I | -- | o |
| 23B | Karihavet area | GADU MOR | Cod | CB_S7 | MU | U | W | 0.84 | no | I | -- | o |
| 30B | Oslo City area | GADU MOR | Cod | CB_S7 | MU | U | W | 21.20 | 7.1 | III | -- | o |
| 36B | Færder area | GADU MOR | Cod | CB_S7 | MU | U | W | 2.53 | no | I | -- | o |
| 43BH | Tromsø havn | GADU MOR | Cod | CB_S7 | MU | U | W | 7.84 | | II | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | CB_S7 | MU | U | W | 4.44 | 1.5 | II | -- | o |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67B | Strandebarm area | GADU MOR | Cod | CB_S7 | MU | U | W | 0.43 | no | I | -- | o |
| 77B | Borøy area | GADU MOR | Cod | CB_S7 | MU | U | W | 0.98 | no | I | -? | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | CB_S7 | MU | U | W | 19.84 | | II | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | CB_S7 | MU | U | W | 0.18 | no | I | -- | o |
| 21F | Åkrafjord | LEPI WHI | Megrim | CB_S7 | LI | U | W | 66 | m | | -- | o |
| 67F | Strandebarm area | LEPI WHI | Megrim | CB_S7 | LI | U | W | 27 | m | | DY | ↓ |
| 21F | Åkrafjord | LEPI WHI | Megrim | CB_S7 | MU | U | W | 2.81 | | | | ▪ |
| 67F | Strandebarm area | LEPI WHI | Megrim | CB_S7 | MU | U | W | 0.52 | m | | -- | o |
| 15F | Ullerø area | LIMA LIM | Dab | CB_S7 | LI | U | W | 48 | no | B.B. | -- | o |
| 21F | Åkrafjord | LIMA LIM | Dab | CB_S7 | LI | U | W | 34 | no | B.B. | Dm | ↓ |
| 36F | Færder area | LIMA LIM | Dab | CB_S7 | LI | U | W | 313 | no | B.B. | -- | o |
| 77F | Borøy area | LIMA LIM | Dab | CB_S7 | LI | U | W | 80 | no | B.B. | -? | ▪ |
| 15F | Ullerø area | LIMA LIM | Dab | CB_S7 | MU | U | W | 0.66 | no | B.B. | -- | o |
| 21F | Åkrafjord | LIMA LIM | Dab | CB_S7 | MU | U | W | 1.20 | no | B.B. | -- | o |
| 36F | Færder area | LIMA LIM | Dab | CB_S7 | MU | U | W | 10.10 | 2 | O.B. | UY | ↑ |
| 77F | Borøy area | LIMA LIM | Dab | CB_S7 | MU | U | W | 6.33 | | O.B. | | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 32.68 | | II | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 26.54 | | II | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 12.18 | | I | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 2.06 | no | I | D- | ↓ |
| 11X | Brashavn | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 2.64 | no | I | -- | o |
| 13A | Langøsund | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 13.93 | | I | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 35.68 | | II | | ▪ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 4.50 | no | I | DY | ↓ |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 25.57 | | II | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 4.84 | no | I | -- | o |
| 30A | Gressholmen | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 38.30 | 1.5 | II | D- | ↓ |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 11.00 | no | I | DY | ↓ |
| 35A | Mølen | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 6.96 | no | I | D- | ↓ |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 9.93 | no | I | -- | o |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 6.78 | no | I | -- | o |
| 56A | Kvalnes | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 5.81 | no | I | -- | o |
| 57A | Krossanes | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 4.88 | no | I | -- | o |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 2.73 | no | I | -- | o |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 9.71 | no | I | D- | ↓ |
| 73A | Lyngholmen | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 31.10 | | II | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 5.24 | no | I | DY | ↓ |
| 77A | Nordstrand | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 151.13 | | III | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 19.44 | | II | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 3.25 | no | I | -- | o |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 9.62 | no | I | D- | ↓ |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 8.36 | no | I | D- | ↓ |
| I131A | Lastad | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 8.18 | no | I | -- | o |
| I132 | Svensholmen | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 29.10 | 1.2 | II | -- | o |
| I241 | Nordnes | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 51.50 | 2.1 | II | -- | o |
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 35.10 | 1.4 | II | -- | o |
| I243 | Hegreneset | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 35.90 | 1.4 | II | -- | o |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 45.90 | 1.8 | II | D- | ↓ |
| I304 | Gåsøya | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 17.70 | no | II | -- | o |
| I306 | Håøya | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 12.30 | no | I | -- | o |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 16.50 | no | II | D- | ↓ |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 9.47 | no | I | D- | ↓ |
| I713 | Strømtangen | MYTI EDU | Blue mussel | CB_S7 | SB | U | D | 13.10 | no | I | -- | o |
| 33F | Sande (east side) | PLAT FLE | Flounder | CB_S7 | LI | U | W | 75 | no | B.B. | -- | o |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | CB_S7 | LI | U | W | 19 | no | B.B. | DY | ↓ |
| 67F | Strandebarm area | PLAT FLE | Flounder | CB_S7 | LI | U | W | 23 | no | B.B. | D- | ↓ |
| 33F | Sande (east side) | PLAT FLE | Flounder | CB_S7 | MU | U | W | 1.28 | no | B.B. | -- | o |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | CB_S7 | MU | U | W | 0.59 | no | B.B. | DY | ↓ |
| 67F | Strandebarm area | PLAT FLE | Flounder | CB_S7 | MU | U | W | 1.13 | no | B.B. | DY | ↓ |
| 10F | Skogerøy | PLEU PLA | Plaice | CB_S7 | LI | U | W | 11 | no | B.B. | -- | o |
| 10F | Skogerøy | PLEU PLA | Plaice | CB_S7 | MU | U | W | 0.33 | no | B.B. | -- | o |
| 10B | Varangerfjorden | GADU MOR | Cod | Cd | LI | M | W | 0.06 | no | B.B. | D- | ↓ |
| 13BH | Kristiansand havn | GADU MOR | Cod | Cd | LI | M | W | 0.04 | | B.B. | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | Cd | LI | M | W | 0.02 | no | B.B. | -- | o |
| 30B | Oslo City area | GADU MOR | Cod | Cd | LI | M | W | 0.16 | 1.6 | O.B. | U- | ↑ |
| 36B | Færder area | GADU MOR | Cod | Cd | LI | M | W | 0.03 | no | B.B. | DY | ↓ |
| 43B | Kvænangen (Olderfjord) | GADU MOR | Cod | Cd | LI | M | W | 0.11 | 1.1 | O.B. | -? | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | Cd | LI | M | W | 0.17 | | O.B. | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | Cd | LI | M | W | 0.20 | 2 | O.B. | UY | ↑ |
| 67B | Strandebarm area | GADU MOR | Cod | Cd | LI | M | W | 0.01 | no | B.B. | D- | ↓ |
| 77B | Borøy area | GADU MOR | Cod | Cd | LI | M | W | 0.02 | no | B.B. | -? | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | Cd | LI | M | W | 0.02 | | B.B. | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | Cd | LI | M | W | 0.02 | no | B.B. | -- | o |
| 21F | Åkrafjord | LEPI WHI | Megrim | Cd | LI | M | W | 0.11 | m | | -- | o |
| 67F | Strandebarm area | LEPI WHI | Megrim | Cd | LI | M | W | 0.02 | m | | DY | ↓ |
| 15F | Ullerø area | LIMA LIM | Dab | Cd | LI | M | W | 0.18 | no | B.B. | -- | o |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21F | Åkrafjord | LIMA LIM | Dab | Cd | LI | M | W | 0.17 | no | B.B. | -- | ○ |
| 36F | Færder area | LIMA LIM | Dab | Cd | LI | M | W | 0.15 | no | B.B. | -- | ○ |
| 77F | Borøy area | LIMA LIM | Dab | Cd | LI | M | W | 0.08 | no | B.B. | -? | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | Cd | SB | M | D | 0.87 | | I | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | Cd | SB | M | D | 3.23 | | II | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.28 | | I | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.55 | no | I | -- | ○ |
| 11X | Brashavn | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.02 | no | I | -- | ○ |
| 13A | Langøsund | MYTI EDU | Blue mussel | Cd | SB | M | D | 0.75 | | I | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.16 | | I | | ▪ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | Cd | SB | M | D | 0.84 | no | I | -- | ○ |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | Cd | SB | M | D | 0.85 | | I | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | Cd | SB | M | D | 0.87 | no | I | -- | ○ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.21 | no | I | UY | ↑ |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.16 | no | I | UY | ↑ |
| 35A | Mølen | MYTI EDU | Blue mussel | Cd | SB | M | D | 0.73 | no | I | UY | ↑ |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | Cd | SB | M | D | 2.29 | 1.1 | II | D- | ↓ |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | Cd | SB | M | D | 2.25 | 1.1 | II | D- | ↓ |
| 56A | Kvalnes | MYTI EDU | Blue mussel | Cd | SB | M | D | 4.89 | 2.4 | II | D- | ↓ |
| 57A | Krossanes | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.83 | no | I | D- | ↓ |
| 63A | Ranaskjær | MYTI EDU | Blue mussel | Cd | SB | M | D | 2.04 | 1 | II | D- | ↓ |
| 65A | Vikingneset | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.43 | no | I | D- | ↓ |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.09 | no | I | D- | ↓ |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | Cd | SB | M | D | 0.92 | no | I | D- | ↓ |
| 73A | Lyngholmen | MYTI EDU | Blue mussel | Cd | SB | M | D | 0.74 | | I | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.01 | no | I | -- | ○ |
| 77A | Nordstrand | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.33 | | I | | ▪ |
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | Cd | SB | M | D | 2.03 | | II | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.24 | no | I | DY | ↓ |
| I022 | West Damholmen | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.65 | no | I | -- | ○ |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | Cd | SB | M | D | 0.98 | no | I | -- | ○ |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.91 | no | I | -- | ○ |
| I131A | Lastad | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.51 | no | I | -- | ○ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.22 | | I | | ▪ |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.85 | | I | | ▪ |
| I201 | Ekkjegrunn (G1) | MYTI EDU | Blue mussel | Cd | SB | M | D | 0.92 | no | I | -- | ○ |
| I205 | Bølsnes (G5) | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.14 | no | I | -- | ○ |
| I241 | Nordnes | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.33 | | I | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.17 | | I | | ▪ |
| I243 | Hegreneset | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.24 | | I | | ▪ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.23 | no | I | -- | o |
| I304 | Gåsøya | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.16 | no | I | -- | o |
| I306 | Håøya | MYTI EDU | Blue mussel | Cd | SB | M | D | 0.77 | no | I | -- | o |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | Cd | SB | M | D | 0.82 | no | I | UY | ↑ |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.44 | | I | | ▪ |
| I713 | Strømtangen | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.03 | | I | | ▪ |
| I964 | Toraneskaien (B4) | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.55 | no | I | -- | o |
| I965 | Moholmen (B5) | MYTI EDU | Blue mussel | Cd | SB | M | D | 1.74 | no | I | -- | o |
| I969 | Bjørnbærviken (B9) | MYTI EDU | Blue mussel | Cd | SB | M | D | 0.50 | no | I | -- | o |
| 33F | Sande (east side) | PLAT FLE | Flounder | Cd | LI | M | W | 0.06 | no | B.B. | D- | ↓ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | Cd | LI | M | W | 0.15 | no | B.B. | -- | o |
| 67F | Strandebarm area | PLAT FLE | Flounder | Cd | LI | M | W | 0.13 | no | B.B. | DY | ↓ |
| 10F | Skogerøy | PLEU PLA | Plaice | Cd | LI | M | W | 0.62 | 3.1 | O.B. | -- | o |
| 10B | Varangerfjorden | GADU MOR | Cod | Co | LI | M | W | 0.02 | | | | ▪ |
| 13BH | Kristiansand havn | GADU MOR | Cod | Co | LI | M | W | 0.08 | | | | ▪ |
| 15B | Ullerø area | GADU MOR | Cod | Co | LI | M | W | 0.04 | | | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | Co | LI | M | W | 0.29 | | | | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | Co | LI | M | W | 0.10 | | | | ▪ |
| 36B | Færder area | GADU MOR | Cod | Co | LI | M | W | 0.05 | | | | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | Co | LI | M | W | 0.01 | | | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | Co | LI | M | W | 0.06 | | | | ▪ |
| 67B | Strandebarm area | GADU MOR | Cod | Co | LI | M | W | 0.03 | | | | ▪ |
| 77B | Borøy area | GADU MOR | Cod | Co | LI | M | W | 0.04 | | | | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | Co | LI | M | W | 0.03 | | | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | Co | LI | M | W | 0.02 | | | | ▪ |
| 21F | Åkrafjord | LEPI WHI | Megrim | Co | LI | M | W | 0.08 | | | | ▪ |
| 67F | Strandebarm area | LEPI WHI | Megrim | Co | LI | M | W | 0.06 | | | | ▪ |
| 15F | Ullerø area | LIMA LIM | Dab | Co | LI | M | W | 0.21 | | | | ▪ |
| 21F | Åkrafjord | LIMA LIM | Dab | Co | LI | M | W | 0.53 | | | | ▪ |
| 36F | Færder area | LIMA LIM | Dab | Co | LI | M | W | 0.21 | | | | ▪ |
| 77F | Borøy area | LIMA LIM | Dab | Co | LI | M | W | 0.42 | | | | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | Co | SB | M | D | 0.28 | | | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | Co | SB | M | D | 1.02 | | | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | Co | SB | M | D | 0.55 | | | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | Co | SB | M | D | 0.28 | | | | ▪ |
| 11X | Brashavn | MYTI EDU | Blue mussel | Co | SB | M | D | 0.30 | | | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13A | Langøsund | MYTI EDU | Blue mussel | Co | SB | M | D | 0.40 | | | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | Co | SB | M | D | 0.51 | | | | ▪ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | Co | SB | M | D | 0.56 | | | | ▪ |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | Co | SB | M | D | 0.62 | | | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | Co | SB | M | D | 0.44 | | | | ▪ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | Co | SB | M | D | 0.38 | | | | ▪ |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | Co | SB | M | D | 0.41 | | | | ▪ |
| 35A | Mølen | MYTI EDU | Blue mussel | Co | SB | M | D | 0.26 | | | | ▪ |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | Co | SB | M | D | 0.46 | | | | ▪ |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | Co | SB | M | D | 0.35 | | | | ▪ |
| 56A | Kvalnes | MYTI EDU | Blue mussel | Co | SB | M | D | 0.55 | | | | ▪ |
| 57A | Krossanes | MYTI EDU | Blue mussel | Co | SB | M | D | 0.36 | | | | ▪ |
| 63A | Ranaskjær | MYTI EDU | Blue mussel | Co | SB | M | D | 0.47 | | | | ▪ |
| 65A | Vikingneset | MYTI EDU | Blue mussel | Co | SB | M | D | 0.40 | | | | ▪ |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | Co | SB | M | D | 0.46 | | | | ▪ |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | Co | SB | M | D | 0.35 | | | | ▪ |
| 73A | Lyngholmen | MYTI EDU | Blue mussel | Co | SB | M | D | 0.48 | | | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | Co | SB | M | D | 0.56 | | | | ▪ |
| 77A | Nordstrand | MYTI EDU | Blue mussel | Co | SB | M | D | 0.57 | | | | ▪ |
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | Co | SB | M | D | 0.70 | | | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | Co | SB | M | D | 0.35 | | | | ▪ |
| I022 | West Damholmen | MYTI EDU | Blue mussel | Co | SB | M | D | 0.89 | | | | ▪ |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | Co | SB | M | D | 0.51 | | | | ▪ |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | Co | SB | M | D | 1.09 | | | | ▪ |
| I131A | Lastad | MYTI EDU | Blue mussel | Co | SB | M | D | 0.63 | | | | ▪ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | Co | SB | M | D | 1.01 | | | | ▪ |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | Co | SB | M | D | 1.50 | | | | ▪ |
| I201 | Ekkjegrunn (G1) | MYTI EDU | Blue mussel | Co | SB | M | D | 0.32 | | | | ▪ |
| I205 | Bølsnes (G5) | MYTI EDU | Blue mussel | Co | SB | M | D | 0.30 | | | | ▪ |
| I241 | Nordnes | MYTI EDU | Blue mussel | Co | SB | M | D | 0.47 | | | | ▪ |
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | Co | SB | M | D | 0.46 | | | | ▪ |
| I243 | Hegreneset | MYTI EDU | Blue mussel | Co | SB | M | D | 0.36 | | | | ▪ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | Co | SB | M | D | 0.38 | | | | ▪ |
| I304 | Gåsøya | MYTI EDU | Blue mussel | Co | SB | M | D | 0.47 | | | | ▪ |
| I306 | Håøya | MYTI EDU | Blue mussel | Co | SB | M | D | 0.37 | | | | ▪ |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | Co | SB | M | D | 0.54 | | | | ▪ |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | Co | SB | M | D | 0.51 | | | | ▪ |
| I713 | Strømtangen | MYTI EDU | Blue mussel | Co | SB | M | D | 0.68 | | | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I964 | Toraneskaien (B4) | MYTI EDU | Blue mussel | Co | SB | M | D | 1.12 | | | | ▪ |
| I965 | Moholmen (B5) | MYTI EDU | Blue mussel | Co | SB | M | D | 1.11 | | | | ▪ |
| I969 | Bjørnbærviken (B9) | MYTI EDU | Blue mussel | Co | SB | M | D | 0.35 | | | | ▪ |
| 33F | Sande (east side) | PLAT FLE | Flounder | Co | LI | M | W | 0.83 | | | | ▪ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | Co | LI | M | W | 0.19 | | | | ▪ |
| 67F | Strandebarm area | PLAT FLE | Flounder | Co | LI | M | W | 0.02 | | | | ▪ |
| 10F | Skogerøy | PLEU PLA | Plaice | Co | LI | M | W | 0.27 | | | | ▪ |
| 98F2 | Husholmen | PLEU PLA | Plaice | Co | LI | M | W | 0.07 | | | | ▪ |
| 10B | Varangerfjorden | GADU MOR | Cod | Cr | LI | M | W | 0.20 | | | | ▪ |
| 13BH | Kristiansand havn | GADU MOR | Cod | Cr | LI | M | W | 0.40 | | | | ▪ |
| 15B | Ullerø area | GADU MOR | Cod | Cr | LI | M | W | 0.20 | | | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | Cr | LI | M | W | 0.20 | | | | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | Cr | LI | M | W | 0.20 | | | | ▪ |
| 36B | Færder area | GADU MOR | Cod | Cr | LI | M | W | 0.20 | | | | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | Cr | LI | M | W | 0.10 | | | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | Cr | LI | M | W | 0.20 | | | | ▪ |
| 67B | Strandebarm area | GADU MOR | Cod | Cr | LI | M | W | 0.20 | | | | ▪ |
| 77B | Borøy area | GADU MOR | Cod | Cr | LI | M | W | 0.20 | | | | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | Cr | LI | M | W | 0.30 | | | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | Cr | LI | M | W | 0.20 | | | | ▪ |
| 21F | Åkrafjord | LEPI WHI | Megrim | Cr | LI | M | W | 0.20 | | | | ▪ |
| 67F | Strandebarm area | LEPI WHI | Megrim | Cr | LI | M | W | 0.20 | | | | ▪ |
| 15F | Ullerø area | LIMA LIM | Dab | Cr | LI | M | W | 0.20 | | | | ▪ |
| 21F | Åkrafjord | LIMA LIM | Dab | Cr | LI | M | W | 0.20 | | | | ▪ |
| 36F | Færder area | LIMA LIM | Dab | Cr | LI | M | W | 0.20 | | | | ▪ |
| 77F | Borøy area | LIMA LIM | Dab | Cr | LI | M | W | 0.20 | | | | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.28 | | I | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | Cr | SB | M | D | 2.23 | | I | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.13 | | I | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.00 | | I | | ▪ |
| 11X | Brashavn | MYTI EDU | Blue mussel | Cr | SB | M | D | 0.67 | | I | | ▪ |
| 13A | Langøsund | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.00 | | I | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | Cr | SB | M | D | 0.92 | | I | | ▪ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | Cr | SB | M | D | 0.47 | | I | | ▪ |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.33 | | I | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | Cr | SB | M | D | 0.57 | | I | | ▪ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | Cr | SB | M | D | 0.82 | | I | | ▪ |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.53 | | I | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35A | Mølen | MYTI EDU | Blue mussel | Cr | SB | M | D | 0.96 | | I | | ▪ |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.50 | | I | | ▪ |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | Cr | SB | M | D | 0.41 | | I | | ▪ |
| 56A | Kvalnes | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.50 | | I | | ▪ |
| 57A | Krossanes | MYTI EDU | Blue mussel | Cr | SB | M | D | 0.95 | | I | | ▪ |
| 63A | Ranaskjær | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.76 | | I | | ▪ |
| 65A | Vikingneset | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.00 | | I | | ▪ |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | Cr | SB | M | D | 0.67 | | I | | ▪ |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | Cr | SB | M | D | 0.67 | | I | | ▪ |
| 73A | Lyngholmen | MYTI EDU | Blue mussel | Cr | SB | M | D | 0.40 | | I | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | Cr | SB | M | D | 0.82 | | I | | ▪ |
| 77A | Nordstrand | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.07 | | I | | ▪ |
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.62 | | I | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.13 | | I | | ▪ |
| I022 | West Damholmen | MYTI EDU | Blue mussel | Cr | SB | M | D | 2.20 | | I | | ▪ |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | Cr | SB | M | D | 2.08 | | I | | ▪ |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | Cr | SB | M | D | 5.36 | | II | | ▪ |
| I131A | Lastad | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.18 | | I | | ▪ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | Cr | SB | M | D | 2.06 | | I | | ▪ |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | Cr | SB | M | D | 3.02 | | II | | ▪ |
| I201 | Ekkjegrunn (G1) | MYTI EDU | Blue mussel | Cr | SB | M | D | 0.82 | | I | | ▪ |
| I205 | Bølsnes (G5) | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.20 | | I | | ▪ |
| I241 | Nordnes | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.73 | | I | | ▪ |
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.64 | | I | | ▪ |
| I243 | Hegreneset | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.89 | | I | | ▪ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.40 | | I | | ▪ |
| I304 | Gåsøya | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.07 | | I | | ▪ |
| I306 | Håøya | MYTI EDU | Blue mussel | Cr | SB | M | D | 0.93 | | I | | ▪ |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.24 | | I | | ▪ |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | Cr | SB | M | D | 3.52 | | II | | ▪ |
| I713 | Strømtangen | MYTI EDU | Blue mussel | Cr | SB | M | D | 1.69 | | I | | ▪ |
| I964 | Toraneskaien (B4) | MYTI EDU | Blue mussel | Cr | SB | M | D | 47.29 | | IV | | ▪ |
| I965 | Moholmen (B5) | MYTI EDU | Blue mussel | Cr | SB | M | D | 36.73 | | IV | | ▪ |
| I969 | Bjørnbærviken (B9) | MYTI EDU | Blue mussel | Cr | SB | M | D | 2.30 | | I | | ▪ |
| 33F | Sande (east side) | PLAT FLE | Flounder | Cr | LI | M | W | 0.20 | | | | ▪ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | Cr | LI | M | W | 0.20 | | | | ▪ |
| 67F | Strandebarm area | PLAT FLE | Flounder | Cr | LI | M | W | 0.20 | | | | ▪ |
| 10F | Skogerøy | PLEU PLA | Plaice | Cr | LI | M | W | 0.20 | | | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 98F2 | Husholmen | PLEU PLA | Plaice | Cr | LI | M | W | 0.20 | | | | ▪ |
| 10B | Varangerfjorden | GADU MOR | Cod | Cu | LI | M | W | 3.66 | | B.B. | | ▪ |
| 13BH | Kristiansand havn | GADU MOR | Cod | Cu | LI | M | W | 7.44 | | B.B. | | ▪ |
| 15B | Ullerø area | GADU MOR | Cod | Cu | LI | M | W | 5.04 | | B.B. | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | Cu | LI | M | W | 7.46 | | B.B. | | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | Cu | LI | M | W | 6.54 | | B.B. | | ▪ |
| 36B | Færder area | GADU MOR | Cod | Cu | LI | M | W | 6.14 | | B.B. | | ▪ |
| 43B | Kvænangen (Olderfjord) | GADU MOR | Cod | Cu | LI | M | W | 8.09 | | B.B. | | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | Cu | LI | M | W | 3.59 | | B.B. | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | Cu | LI | M | W | 7.94 | | B.B. | | ▪ |
| 67B | Strandebarm area | GADU MOR | Cod | Cu | LI | M | W | 7.80 | | B.B. | | ▪ |
| 77B | Borøy area | GADU MOR | Cod | Cu | LI | M | W | 6.46 | | B.B. | | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | Cu | LI | M | W | 4.45 | | B.B. | | ▪ |
| 92B | Stokken area | GADU MOR | Cod | Cu | LI | M | W | 5.77 | | B.B. | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | Cu | LI | M | W | 1.94 | | B.B. | | ▪ |
| 21F | Åkrafjord | LEPI WHI | Megrim | Cu | LI | M | W | 0.02 | m | | -- | O |
| 67F | Strandebarm area | LEPI WHI | Megrim | Cu | LI | M | W | 7.46 | | | | ▪ |
| 15F | Ullerø area | LIMA LIM | Dab | Cu | LI | M | W | 9.82 | | B.B. | | ▪ |
| 21F | Åkrafjord | LIMA LIM | Dab | Cu | LI | M | W | 9.94 | | B.B. | | ▪ |
| 36F | Færder area | LIMA LIM | Dab | Cu | LI | M | W | 7.23 | | B.B. | | ▪ |
| 77F | Borøy area | LIMA LIM | Dab | Cu | LI | M | W | 3.25 | | B.B. | | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | Cu | SB | M | D | 8.01 | | I | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | Cu | SB | M | D | 8.46 | | I | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | Cu | SB | M | D | 7.07 | | I | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.24 | no | I | -- | O |
| 11X | Brashavn | MYTI EDU | Blue mussel | Cu | SB | M | D | 5.90 | no | I | -- | O |
| 13A | Langøsund | MYTI EDU | Blue mussel | Cu | SB | M | D | 5.93 | | I | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | Cu | SB | M | D | 8.71 | | I | | ▪ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.24 | no | I | -- | O |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.93 | | I | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.39 | no | I | -- | O |
| 30A | Gressholmen | MYTI EDU | Blue mussel | Cu | SB | M | D | 8.44 | no | I | -- | O |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.23 | no | I | -- | O |
| 35A | Mølen | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.48 | no | I | -- | O |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | Cu | SB | M | D | 4.86 | no | I | -- | O |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.94 | no | I | -- | O |
| 56A | Kvalnes | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.56 | no | I | -- | O |
| 57A | Krossanes | MYTI EDU | Blue mussel | Cu | SB | M | D | 4.75 | no | I | -- | O |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63A | Ranaskjær | MYTI EDU | Blue mussel | Cu | SB | M | D | 5.82 | no | I | -- | o |
| 65A | Vikingneset | MYTI EDU | Blue mussel | Cu | SB | M | D | 5.37 | no | I | -- | o |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | Cu | SB | M | D | 5.61 | no | I | -- | o |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.22 | no | I | -- | o |
| 73A | Lyngholmen | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.88 | | I | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.76 | no | I | -- | o |
| 77A | Nordstrand | MYTI EDU | Blue mussel | Cu | SB | M | D | 7.53 | | I | | ▪ |
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | Cu | SB | M | D | 10.00 | | II | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.68 | no | I | -- | o |
| I022 | West Damholmen | MYTI EDU | Blue mussel | Cu | SB | M | D | 7.70 | | I | | ▪ |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.77 | | I | | ▪ |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | Cu | SB | M | D | 10.10 | | II | | ▪ |
| I131A | Lastad | MYTI EDU | Blue mussel | Cu | SB | M | D | 8.23 | | I | | ▪ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | Cu | SB | M | D | 12.20 | | II | | ▪ |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | Cu | SB | M | D | 10.99 | | II | | ▪ |
| I201 | Ekkjegrunn (G1) | MYTI EDU | Blue mussel | Cu | SB | M | D | 4.41 | | I | | ▪ |
| I205 | Bølsnes (G5) | MYTI EDU | Blue mussel | Cu | SB | M | D | 3.93 | | I | | ▪ |
| I241 | Nordnes | MYTI EDU | Blue mussel | Cu | SB | M | D | 8.40 | | I | | ▪ |
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | Cu | SB | M | D | 7.14 | | I | | ▪ |
| I243 | Hegreneset | MYTI EDU | Blue mussel | Cu | SB | M | D | 7.21 | | I | | ▪ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | Cu | SB | M | D | 7.53 | | I | | ▪ |
| I304 | Gåsøya | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.57 | | I | | ▪ |
| I306 | Håøya | MYTI EDU | Blue mussel | Cu | SB | M | D | 5.73 | | I | | ▪ |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.47 | | I | | ▪ |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | Cu | SB | M | D | 5.62 | | I | | ▪ |
| I713 | Strømtangen | MYTI EDU | Blue mussel | Cu | SB | M | D | 6.85 | | I | | ▪ |
| I964 | Toraneskaien (B4) | MYTI EDU | Blue mussel | Cu | SB | M | D | 11.22 | | II | | ▪ |
| I965 | Moholmen (B5) | MYTI EDU | Blue mussel | Cu | SB | M | D | 10.20 | | II | | ▪ |
| I969 | Bjørnbærviken (B9) | MYTI EDU | Blue mussel | Cu | SB | M | D | 5.45 | | I | | ▪ |
| 33F | Sande (east side) | PLAT FLE | Flounder | Cu | LI | M | W | 15.00 | | O.B. | | ▪ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | Cu | LI | M | W | 11.62 | | O.B. | | ▪ |
| 67F | Strandebarm area | PLAT FLE | Flounder | Cu | LI | M | W | 11.20 | | O.B. | | ▪ |
| 10F | Skogerøy | PLEU PLA | Plaice | Cu | LI | M | W | 4.22 | | B.B. | | ▪ |
| 98F2 | Husholmen | PLEU PLA | Plaice | Cu | LI | M | W | 2.15 | | B.B. | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | CYP1A | LI | ABS | W | 0.175 | m | | -? | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | CYP1A | LI | ABS | W | 0.513 | m | | -- | o |
| 53B | Inner Sørfjord | GADU MOR | Cod | CYP1A | LI | ABS | W | 0.380 | m | | -- | o |
| 10B | Varangerfjorden | GADU MOR | Cod | DD_S4 | LI | U | W | 51 | no | I | D- | ↓ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13BH | Kristiansand havn | GADU MOR | Cod | DD_S4 | LI | U | W | 58.00 | | I | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | DD_S4 | LI | U | W | 27 | no | I | D- | ↓ |
| 30B | Oslo City area | GADU MOR | Cod | DD_S4 | LI | U | W | 150 | no | I | -- | ○ |
| 36B | Færder area | GADU MOR | Cod | DD_S4 | LI | U | W | 26 | no | I | D- | ↓ |
| 43B | Kvænangen (Olderfjord) | GADU MOR | Cod | DD_S4 | LI | U | W | 48 | no | I | -? | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | DD_S4 | LI | U | W | 33.00 | | I | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | DD_S4 | LI | U | W | 268 | 1.3 | II | -- | ○ |
| 67B | Strandebarm area | GADU MOR | Cod | DD_S4 | LI | U | W | 100 | no | I | D- | ↓ |
| 80BH | Munkholmen | GADU MOR | Cod | DD_S4 | LI | U | W | 60.00 | | I | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | DD_S4 | LI | U | W | 6 | no | I | D- | ↓ |
| 13BH | Kristiansand havn | GADU MOR | Cod | DD_S4 | MU | U | W | 0.31 | | I | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | DD_S4 | MU | U | W | 0.09 | no | I | -- | ○ |
| 30B | Oslo City area | GADU MOR | Cod | DD_S4 | MU | U | W | 1.10 | 1.1 | II | -- | ○ |
| 36B | Færder area | GADU MOR | Cod | DD_S4 | MU | U | W | 0.22 | no | I | -- | ○ |
| 43BH | Tromsø havn | GADU MOR | Cod | DD_S4 | MU | U | W | 0.14 | | I | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | DD_S4 | MU | U | W | 1.30 | 1.3 | II | -- | ○ |
| 67B | Strandebarm area | GADU MOR | Cod | DD_S4 | MU | U | W | 0.47 | no | I | D- | ↓ |
| 77B | Borøy area | GADU MOR | Cod | DD_S4 | MU | U | W | 0.14 | no | I | -? | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | DD_S4 | MU | U | W | 0.21 | | I | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | DD_S4 | MU | U | W | 0.05 | no | I | -- | ○ |
| 21F | Åkrafjord | LEPI WHI | Megrim | DD_S4 | LI | U | W | 43 | m | | -- | ○ |
| 67F | Strandebarm area | LEPI WHI | Megrim | DD_S4 | LI | U | W | 46 | m | | D- | ↓ |
| 21F | Åkrafjord | LEPI WHI | Megrim | DD_S4 | MU | U | W | 0.59 | m | | -- | ○ |
| 67F | Strandebarm area | LEPI WHI | Megrim | DD_S4 | MU | U | W | 0.66 | m | | D- | ↓ |
| 15F | Ullerø area | LIMA LIM | Dab | DD_S4 | LI | U | W | 16 | no | B.B. | -- | ○ |
| 21F | Åkrafjord | LIMA LIM | Dab | DD_S4 | LI | U | W | 18 | no | B.B. | Dm | ↓ |
| 36F | Færder area | LIMA LIM | Dab | DD_S4 | LI | U | W | 18 | no | B.B. | -- | ○ |
| 77F | Borøy area | LIMA LIM | Dab | DD_S4 | LI | U | W | 20 | no | B.B. | -? | ▪ |
| 21F | Åkrafjord | LIMA LIM | Dab | DD_S4 | MU | U | W | 0.69 | no | B.B. | -- | ○ |
| 36F | Færder area | LIMA LIM | Dab | DD_S4 | MU | U | W | 0.41 | no | B.B. | -- | ○ |
| 77F | Borøy area | LIMA LIM | Dab | DD_S4 | MU | U | W | 0.29 | | B.B. | | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 2.37 | | I | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 1.83 | | I | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 0.67 | | I | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 0.35 | no | I | -- | ○ |
| 11X | Brashavn | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 0.45 | no | I | -- | ○ |
| 13A | Langøsund | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 1.29 | | I | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 2.15 | | I | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 0.77 | no | I | -- | o |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 0.93 | | I | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 0.90 | no | I | -- | o |
| 30A | Gressholmen | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 2.11 | no | I | D- | ↓ |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 2.94 | no | I | -- | o |
| 35A | Mølen | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 3.13 | no | I | -- | o |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 12.90 | 1.3 | II | -- | o |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 6.11 | no | I | -- | o |
| 56A | Kvalnes | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 44.00 | 4.4 | III | -- | o |
| 57A | Krossanes | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 25.50 | 2.6 | III | -- | o |
| 63A | Ranaskjær | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 7.50 | no | I | -- | o |
| 65A | Vikingneset | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 5.50 | no | I | -- | o |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 2.12 | no | I | -- | o |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 1.71 | no | I | -- | o |
| 73A | Lyngholmen | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 1.52 | | I | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 0.73 | no | I | -- | o |
| 77A | Nordstrand | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 1.40 | | I | | ▪ |
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 3.27 | | I | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 0.61 | no | I | -- | o |
| I022 | West Damholmen | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 1.40 | no | I | DY | ↓ |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 1.77 | no | I | D- | ↓ |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 1.20 | no | I | DY | ↓ |
| I131A | Lastad | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 1.46 | no | I | -- | o |
| I132 | Svensholmen | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 1.87 | no | I | -- | o |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 2.00 | no | I | -- | o |
| I241 | Nordnes | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 5.56 | no | I | -- | o |
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 2.71 | no | I | -- | o |
| I243 | Hegreneset | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 3.16 | no | I | -- | o |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 3.00 | no | I | -- | o |
| I304 | Gåsøya | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 1.93 | no | I | -- | o |
| I306 | Håøya | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 1.71 | no | I | -- | o |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 2.31 | no | I | -- | o |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 1.05 | no | I | -- | o |
| I713 | Strømtangen | MYTI EDU | Blue mussel | DD_S4 | SB | U | D | 1.62 | no | I | -- | o |
| 33F | Sande (east side) | PLAT FLE | Flounder | DD_S4 | LI | U | W | 24 | no | B.B. | -- | o |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | DD_S4 | LI | U | W | 9 | no | B.B. | -- | o |
| 67F | Strandebarm area | PLAT FLE | Flounder | DD_S4 | LI | U | W | 19 | no | B.B. | -- | o |
| 33F | Sande (east side) | PLAT FLE | Flounder | DD_S4 | MU | U | W | 0.39 | no | B.B. | -- | o |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53F | Inner Sørfjord | PLAT FLE | Flounder | DD_S4 | MU | U | W | 0.27 | no | B.B. | D- | ↓ |
| 67F | Strandebarm area | PLAT FLE | Flounder | DD_S4 | MU | U | W | 0.87 | no | B.B. | DY | ↓ |
| 10F | Skogerøy | PLEU PLA | Plaice | DD_S4 | LI | U | W | 4 | no | B.B. | D- | ↓ |
| 10F | Skogerøy | PLEU PLA | Plaice | DD_S4 | MU | U | W | 0.11 | no | B.B. | D- | ↓ |
| 23B | Karihavet area | GADU MOR | Cod | EROD | LI | pm | W | 27.8 | m | | -- | o |
| 30B | Oslo City area | GADU MOR | Cod | EROD | LI | pm | W | 57.8 | m | | -- | o |
| 53B | Inner Sørfjord | GADU MOR | Cod | EROD | LI | pm | W | 41.4 | m | | -- | o |
| 10B | Varangerfjorden | GADU MOR | Cod | HCB | LI | U | W | 8 | no | I | D- | ↓ |
| 13BH | Kristiansand havn | GADU MOR | Cod | HCB | LI | U | W | 110.00 | | III | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | HCB | LI | U | W | 5 | no | I | -- | o |
| 30B | Oslo City area | GADU MOR | Cod | HCB | LI | U | W | 4 | no | I | D- | ↓ |
| 36B | Færder area | GADU MOR | Cod | HCB | LI | U | W | 3 | no | I | D- | ↓ |
| 43B | Kvænangen (Olderfjord) | GADU MOR | Cod | HCB | LI | U | W | 8 | no | I | -? | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | HCB | LI | U | W | 7.70 | | I | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | HCB | LI | U | W | 4 | no | I | -- | o |
| 67B | Strandebarm area | GADU MOR | Cod | HCB | LI | U | W | 4 | no | I | D- | ↓ |
| 80BH | Munkholmen | GADU MOR | Cod | HCB | LI | U | W | 22.00 | | II | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | HCB | LI | U | W | 4 | no | I | D- | ↓ |
| 13BH | Kristiansand havn | GADU MOR | Cod | HCB | MU | U | W | 1.40 | | III | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | HCB | MU | U | W | 0.17 | no | I | -- | o |
| 30B | Oslo City area | GADU MOR | Cod | HCB | MU | U | W | 0.06 | no | I | DY | ↓ |
| 36B | Færder area | GADU MOR | Cod | HCB | MU | U | W | 0.04 | no | I | D- | ↓ |
| 43BH | Tromsø havn | GADU MOR | Cod | HCB | MU | U | W | 0.08 | | I | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | HCB | MU | U | W | 0.04 | no | I | -- | o |
| 67B | Strandebarm area | GADU MOR | Cod | HCB | MU | U | W | 0.05 | no | I | D- | ↓ |
| 77B | Borøy area | GADU MOR | Cod | HCB | MU | U | W | 0.05 | no | I | -? | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | HCB | MU | U | W | 0.16 | | I | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | HCB | MU | U | W | 0.05 | no | I | D- | ↓ |
| 21F | Åkrafjord | LEPI WHI | Megrim | HCB | LI | U | W | 4 | m | | -- | o |
| 67F | Strandebarm area | LEPI WHI | Megrim | HCB | LI | U | W | 2 | m | | D- | ↓ |
| 21F | Åkrafjord | LEPI WHI | Megrim | HCB | MU | U | W | 0.32 | m | | -- | o |
| 67F | Strandebarm area | LEPI WHI | Megrim | HCB | MU | U | W | 0.06 | m | | D- | ↓ |
| 15F | Ullerø area | LIMA LIM | Dab | HCB | LI | U | W | 3 | no | B.B. | -- | o |
| 21F | Åkrafjord | LIMA LIM | Dab | HCB | LI | U | W | 1 | no | B.B. | -- | o |
| 36F | Færder area | LIMA LIM | Dab | HCB | LI | U | W | 1 | no | B.B. | D- | ↓ |
| 77F | Borøy area | LIMA LIM | Dab | HCB | LI | U | W | 3 | no | B.B. | -? | ▪ |
| 21F | Åkrafjord | LIMA LIM | Dab | HCB | MU | U | W | 0.06 | no | B.B. | -- | o |
| 36F | Færder area | LIMA LIM | Dab | HCB | MU | U | W | 0.07 | no | B.B. | DY | ↓ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 77F | Borøy area | LIMA LIM | Dab | HCB | MU | U | W | 0.07 | | B.B. | | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.61 | | II | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.23 | | I | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.18 | | I | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.35 | no | I | -- | o |
| 11X | Brashavn | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.91 | 1.8 | II | -- | o |
| 13A | Langøsund | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.94 | | II | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | HCB | SB | U | D | 1.07 | | II | | ▪ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.18 | no | I | -- | o |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.27 | | I | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.21 | no | I | D- | ↓ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.22 | no | I | D- | ↓ |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.94 | 1.9 | II | DY | ↓ |
| 35A | Mølen | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.26 | no | I | DY | ↓ |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.58 | 1.2 | II | -- | o |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.17 | no | I | -- | o |
| 56A | Kvalnes | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.27 | no | I | -- | o |
| 57A | Krossanes | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.75 | 1.5 | II | -- | o |
| 63A | Ranaskjær | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.63 | 1.3 | II | -- | o |
| 65A | Vikingneset | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.95 | 1.9 | II | -- | o |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.67 | 1.3 | II | -- | o |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | HCB | SB | U | D | 1.38 | 2.8 | II | D- | ↓ |
| 73A | Lyngholmen | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.16 | | I | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.18 | no | I | -- | o |
| 77A | Nordstrand | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.88 | | II | | ▪ |
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | HCB | SB | U | D | 1.25 | | II | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.38 | no | I | -- | o |
| I022 | West Damholmen | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.50 | 1 | II | -- | o |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.42 | no | I | -- | o |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.50 | 1 | II | -- | o |
| I131A | Lastad | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.77 | 1.5 | II | U- | ↑ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.67 | 1.3 | II | -- | o |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | HCB | SB | U | D | 1.87 | 3.7 | III | D- | ↓ |
| I241 | Nordnes | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.56 | 1.1 | II | UY | ↑ |
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.77 | 1.5 | II | DY | ↓ |
| I243 | Hegreneset | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.53 | 1.1 | II | -- | o |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.53 | 1.1 | II | -- | o |
| I304 | Gåsøya | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.36 | no | I | -- | o |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I306 | Håøya | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.36 | no | I | -- | o |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | HCB | SB | U | D | 0.44 | no | I | -- | o |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | HCB | SB | U | D | 1.43 | 2.9 | II | -- | o |
| I713 | Strømtangen | MYTI EDU | Blue mussel | HCB | SB | U | D | 2.83 | 5.7 | III | -- | o |
| 33F | Sande (east side) | PLAT FLE | Flounder | HCB | LI | U | W | 2 | no | B.B. | -- | o |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | HCB | LI | U | W | 1 | no | B.B. | D- | ↓ |
| 67F | Strandebarm area | PLAT FLE | Flounder | HCB | LI | U | W | 3 | no | B.B. | -- | o |
| 33F | Sande (east side) | PLAT FLE | Flounder | HCB | MU | U | W | 0.05 | no | B.B. | -- | o |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | HCB | MU | U | W | 0.05 | no | B.B. | DY | ↓ |
| 67F | Strandebarm area | PLAT FLE | Flounder | HCB | MU | U | W | 0.15 | 1.5 | O.B. | -- | o |
| 10F | Skogerøy | PLEU PLA | Plaice | HCB | LI | U | W | 2 | no | B.B. | D- | ↓ |
| 10F | Skogerøy | PLEU PLA | Plaice | HCB | MU | U | W | 0.07 | no | B.B. | D- | ↓ |
| 10B | Varangerfjorden | GADU MOR | Cod | Hg | MU | M | W | 0.030 | no | I | DY | ↓ |
| 13BH | Kristiansand havn | GADU MOR | Cod | Hg | MU | M | W | 0.073 | | I | | ▪ |
| 15B | Ullerø area | GADU MOR | Cod | Hg | MU | M | W | 0.049 | no | I | -- | o |
| 23B | Karihavet area | GADU MOR | Cod | Hg | MU | M | W | 0.057 | no | I | -- | o |
| 30B | Oslo City area | GADU MOR | Cod | Hg | MU | M | W | 0.260 | 2.6 | II | U- | ↑ |
| 36B | Færder area | GADU MOR | Cod | Hg | MU | M | W | 0.086 | no | I | -- | o |
| 43B | Kvænangen (Olderfjord) | GADU MOR | Cod | Hg | MU | M | W | 0.044 | no | I | -? | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | Hg | MU | M | W | 0.028 | | I | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | Hg | MU | M | W | 0.194 | 1.9 | II | -- | o |
| 67B | Strandebarm area | GADU MOR | Cod | Hg | MU | M | W | 0.065 | no | I | D- | ↓ |
| 77B | Borøy area | GADU MOR | Cod | Hg | MU | M | W | 0.080 | no | I | -? | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | Hg | MU | M | W | 0.060 | | I | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | Hg | MU | M | W | 0.025 | no | I | -- | o |
| 21F | Åkrafjord | LEPI WHI | Megrim | Hg | MU | M | W | 0.173 | m | | -- | o |
| 67F | Strandebarm area | LEPI WHI | Megrim | Hg | MU | M | W | 0.090 | m | | D- | ↓ |
| 15F | Ullerø area | LIMA LIM | Dab | Hg | MU | M | W | 0.068 | no | B.B. | U- | ↑ |
| 21F | Åkrafjord | LIMA LIM | Dab | Hg | MU | M | W | 0.139 | 1.4 | O.B. | -- | o |
| 36F | Færder area | LIMA LIM | Dab | Hg | MU | M | W | 0.118 | 1.2 | O.B. | -- | o |
| 77F | Borøy area | LIMA LIM | Dab | Hg | MU | M | W | 0.050 | | B.B. | | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.143 | | I | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.308 | | II | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.094 | | I | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.041 | no | I | D- | ↓ |
| 11X | Brashavn | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.043 | no | I | -- | o |
| 13A | Langøsund | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.081 | | I | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.143 | | I | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.077 | no | I | -- | o |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.200 | | II | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.063 | no | I | UY | ↑ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.078 | no | I | -- | o |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.088 | no | I | UY | ↑ |
| 35A | Mølen | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.057 | no | I | -- | o |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.264 | 1.3 | II | -- | o |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.129 | no | I | D- | ↓ |
| 56A | Kvalnes | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.313 | 1.6 | II | D- | ↓ |
| 57A | Krossanes | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.150 | no | I | DY | ↓ |
| 63A | Ranaskjær | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.150 | no | I | -- | o |
| 65A | Vikingneset | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.110 | no | I | -- | o |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.100 | no | I | -- | o |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.124 | no | I | D- | ↓ |
| 73A | Lyngholmen | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.038 | | I | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.100 | no | I | -- | o |
| 77A | Nordstrand | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.139 | | I | | ▪ |
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.318 | | II | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.072 | no | I | -- | o |
| I022 | West Damholmen | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.280 | 1.4 | II | -- | o |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.131 | no | I | -- | o |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.240 | 1.2 | II | -- | o |
| I131A | Lastad | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.123 | no | I | -- | o |
| I132 | Svensholmen | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.143 | | I | | ▪ |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.177 | | I | | ▪ |
| I201 | Ekkjegrunn (G1) | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.129 | no | I | -- | o |
| I205 | Bølsnes (G5) | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.180 | no | I | -- | o |
| I241 | Nordnes | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.178 | | I | | ▪ |
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.129 | | I | | ▪ |
| I243 | Hegreneset | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.116 | | I | | ▪ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.073 | no | I | U- | ↑ |
| I304 | Gåsøya | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.057 | no | I | -- | o |
| I306 | Håøya | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.053 | no | I | -- | o |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.047 | no | I | -- | o |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.197 | no | I | -- | o |
| I713 | Strømtangen | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.131 | no | I | -- | o |
| I964 | Toraneskaien (B4) | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.116 | no | I | -- | o |
| I965 | Moholmen (B5) | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.086 | no | I | -- | o |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I969 | Bjørnbærviken (B9) | MYTI EDU | Blue mussel | Hg | SB | M | D | 0.040 | no | I | -- | ○ |
| 33F | Sande (east side) | PLAT FLE | Flounder | Hg | MU | M | W | 0.049 | no | B.B. | DY | ↓ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | Hg | MU | M | W | 0.074 | no | B.B. | UY | ↑ |
| 67F | Strandebarm area | PLAT FLE | Flounder | Hg | MU | M | W | 0.065 | no | B.B. | DY | ↓ |
| 10F | Skogerøy | PLEU PLA | Plaice | Hg | MU | M | W | 0.017 | no | B.B. | -- | ○ |
| 10B | Varangerfjorden | GADU MOR | Cod | HS_S2 | LI | U | W | 0.50 | | | | ▪ |
| 13BH | Kristiansand havn | GADU MOR | Cod | HS_S2 | LI | U | W | 1.00 | | | | ▪ |
| 15B | Ullerø area | GADU MOR | Cod | HS_S2 | LI | U | W | 1.00 | | | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | HS_S2 | LI | U | W | 0.50 | | | | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | HS_S2 | LI | U | W | 0.60 | | | | ▪ |
| 36B | Færder area | GADU MOR | Cod | HS_S2 | LI | U | W | 0.50 | | | | ▪ |
| 43B | Kvænangen (Olderfjord) | GADU MOR | Cod | HS_S2 | LI | U | W | 1.00 | | | | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | HS_S2 | LI | U | W | 1.00 | | | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | HS_S2 | LI | U | W | 1.00 | | | | ▪ |
| 67B | Strandebarm area | GADU MOR | Cod | HS_S2 | LI | U | W | 1.00 | | | | ▪ |
| 77B | Borøy area | GADU MOR | Cod | HS_S2 | LI | U | W | 1.00 | | | | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | HS_S2 | LI | U | W | 1.00 | | | | ▪ |
| 92B | Stokken area | GADU MOR | Cod | HS_S2 | LI | U | W | 1.00 | | | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | HS_S2 | LI | U | W | 2.00 | | | | ▪ |
| 10B | Varangerfjorden | GADU MOR | Cod | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 13BH | Kristiansand havn | GADU MOR | Cod | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 15B | Ullerø area | GADU MOR | Cod | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 36B | Færder area | GADU MOR | Cod | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 67B | Strandebarm area | GADU MOR | Cod | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 77B | Borøy area | GADU MOR | Cod | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 21F | Åkrafjord | LEPI WHI | Megrim | HS_S2 | LI | U | W | 1.00 | | | | ▪ |
| 67F | Strandebarm area | LEPI WHI | Megrim | HS_S2 | LI | U | W | 0.50 | | | | ▪ |
| 21F | Åkrafjord | LEPI WHI | Megrim | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 67F | Strandebarm area | LEPI WHI | Megrim | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 15F | Ullerø area | LIMA LIM | Dab | HS_S2 | LI | U | W | 1.00 | | | | ▪ |
| 21F | Åkrafjord | LIMA LIM | Dab | HS_S2 | LI | U | W | 0.20 | | | | ▪ |
| 36F | Færder area | LIMA LIM | Dab | HS_S2 | LI | U | W | 0.50 | | | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 77F | Borøy area | LIMA LIM | Dab | HS_S2 | LI | U | W | 0.50 | | | | ▪ |
| 15F | Ullerø area | LIMA LIM | Dab | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 21F | Åkrafjord | LIMA LIM | Dab | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 36F | Færder area | LIMA LIM | Dab | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 77F | Borøy area | LIMA LIM | Dab | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.30 | | | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.38 | | | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.29 | | | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.29 | | | | ▪ |
| 11X | Brashavn | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.24 | | | | ▪ |
| 13A | Langøsund | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.31 | | | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.36 | | | | ▪ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.29 | | | | ▪ |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.33 | | | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.24 | | | | ▪ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.28 | | | | ▪ |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.31 | | | | ▪ |
| 35A | Mølen | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.23 | | | | ▪ |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.71 | | | | ▪ |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.28 | | | | ▪ |
| 56A | Kvalnes | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.33 | | | | ▪ |
| 57A | Krossanes | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.25 | | | | ▪ |
| 63A | Ranaskjær | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.31 | | | | ▪ |
| 65A | Vikingneset | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.25 | | | | ▪ |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.28 | | | | ▪ |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.24 | | | | ▪ |
| 73A | Lyngholmen | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.21 | | | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.29 | | | | ▪ |
| 77A | Nordstrand | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.29 | | | | ▪ |
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.42 | | | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.28 | | | | ▪ |
| I022 | West Damholmen | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 1.00 | | | | ▪ |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.77 | | | | ▪ |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 1.00 | | | | ▪ |
| I131A | Lastad | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.38 | | | | ▪ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.33 | | | | ▪ |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.40 | | | | ▪ |
| I241 | Nordnes | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.28 | | | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.36 | | | | ▪ |
| I243 | Hegreneset | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.26 | | | | ▪ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.67 | | | | ▪ |
| I304 | Gåsøya | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.71 | | | | ▪ |
| I306 | Håøya | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.67 | | | | ▪ |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.59 | | | | ▪ |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.35 | | | | ▪ |
| I713 | Strømtangen | MYTI EDU | Blue mussel | HS_S2 | SB | U | D | 0.38 | | | | ▪ |
| 33F | Sande (east side) | PLAT FLE | Flounder | HS_S2 | LI | U | W | 1.00 | | | | ▪ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | HS_S2 | LI | U | W | 0.71 | | | | ▪ |
| 67F | Strandebarm area | PLAT FLE | Flounder | HS_S2 | LI | U | W | 1.00 | | | | ▪ |
| 33F | Sande (east side) | PLAT FLE | Flounder | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 67F | Strandebarm area | PLAT FLE | Flounder | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 10F | Skogerøy | PLEU PLA | Plaice | HS_S2 | LI | U | W | 0.20 | | | | ▪ |
| 98F2 | Husholmen | PLEU PLA | Plaice | HS_S2 | LI | U | W | 0.10 | | | | ▪ |
| 10F | Skogerøy | PLEU PLA | Plaice | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 98F2 | Husholmen | PLEU PLA | Plaice | HS_S2 | MU | U | W | 0.05 | | | | ▪ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | PK_S | SB | U | D | 11.1 | no | I | -- | o |
| 35A | Mølen | MYTI EDU | Blue mussel | PK_S | SB | U | D | 8.0 | | I | | ▪ |
| I131A | Lastad | MYTI EDU | Blue mussel | PK_S | SB | U | D | 9.6 | no | I | -- | o |
| I132 | Svensholmen | MYTI EDU | Blue mussel | PK_S | SB | U | D | 162.0 | 3.2 | III | -- | o |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | PK_S | SB | U | D | 568.0 | 11.4 | IV | -- | o |
| I201 | Ekkjegrunn (G1) | MYTI EDU | Blue mussel | PK_S | SB | U | D | 52.6 | 1.1 | II | D- | ↓ |
| I205 | Bølsnes (G5) | MYTI EDU | Blue mussel | PK_S | SB | U | D | 27.9 | no | I | -- | o |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | PK_S | SB | U | D | 35.9 | no | I | -- | o |
| I304 | Gåsøya | MYTI EDU | Blue mussel | PK_S | SB | U | D | 8.9 | no | I | -- | o |
| I306 | Håøya | MYTI EDU | Blue mussel | PK_S | SB | U | D | 8.9 | no | I | -- | o |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | PK_S | SB | U | D | 7.4 | no | I | -- | o |
| I912 | Honnhammer | MYTI EDU | Blue mussel | PK_S | SB | U | D | 8.9 | no | I | D- | ↓ |
| I913 | Fjøseid | MYTI EDU | Blue mussel | PK_S | SB | U | D | 11.6 | no | I | D- | ↓ |
| I915 | Flåøya (northwest) | MYTI EDU | Blue mussel | PK_S | SB | U | D | 112.6 | | II | | ▪ |
| I964 | Toraneskaien (B4) | MYTI EDU | Blue mussel | PK_S | SB | U | D | 1610.0 | 32.1 | V | -- | o |
| I965 | Moholmen (B5) | MYTI EDU | Blue mussel | PK_S | SB | U | D | 990.0 | 19.8 | IV | -- | o |
| I969 | Bjørnbærviken (B9) | MYTI EDU | Blue mussel | PK_S | SB | U | D | 90.0 | 1.8 | II | -- | o |
| 35A | Mølen | MYTI EDU | Blue mussel | MO | SB | M | D | 0.76 | | | | ▪ |
| 10B | Varangerfjorden | GADU MOR | Cod | Ni | LI | M | W | 0.11 | | | | ▪ |
| 13BH | Kristiansand havn | GADU MOR | Cod | Ni | LI | M | W | 0.39 | | | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15B | Ullerø area | GADU MOR | Cod | Ni | LI | M | W | 0.06 | | | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | Ni | LI | M | W | 0.50 | | | | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | Ni | LI | M | W | 0.17 | | | | ▪ |
| 36B | Færder area | GADU MOR | Cod | Ni | LI | M | W | 0.07 | | | | ▪ |
| 43B | Kvænangen (Olderfjord) | GADU MOR | Cod | Ni | LI | M | W | 0.04 | | | | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | Ni | LI | M | W | 0.06 | | | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | Ni | LI | M | W | 0.15 | | | | ▪ |
| 67B | Strandebarm area | GADU MOR | Cod | Ni | LI | M | W | 0.04 | | | | ▪ |
| 77B | Borøy area | GADU MOR | Cod | Ni | LI | M | W | 0.04 | | | | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | Ni | LI | M | W | 0.10 | | | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | Ni | LI | M | W | 0.03 | | | | ▪ |
| 21F | Åkrafjord | LEPI WHI | Megrim | Ni | LI | M | W | 0.02 | | | | ▪ |
| 67F | Strandebarm area | LEPI WHI | Megrim | Ni | LI | M | W | 0.02 | | | | ▪ |
| 15F | Ullerø area | LIMA LIM | Dab | Ni | LI | M | W | 0.11 | | | | ▪ |
| 21F | Åkrafjord | LIMA LIM | Dab | Ni | LI | M | W | 0.20 | | | | ▪ |
| 36F | Færder area | LIMA LIM | Dab | Ni | LI | M | W | 0.09 | | | | ▪ |
| 77F | Borøy area | LIMA LIM | Dab | Ni | LI | M | W | 0.23 | | | | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | Ni | SB | M | D | 0.78 | | I | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | Ni | SB | M | D | 2.58 | | I | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.94 | | I | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.29 | | I | | ▪ |
| 11X | Brashavn | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.14 | | I | | ▪ |
| 13A | Langøsund | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.14 | | I | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.38 | | I | | ▪ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.29 | | I | | ▪ |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | Ni | SB | M | D | 2.53 | | I | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.00 | | I | | ▪ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.00 | | I | | ▪ |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.67 | | I | | ▪ |
| 35A | Mølen | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.13 | | I | | ▪ |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.29 | | I | | ▪ |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | Ni | SB | M | D | 0.94 | | I | | ▪ |
| 56A | Kvalnes | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.38 | | I | | ▪ |
| 57A | Krossanes | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.00 | | I | | ▪ |
| 63A | Ranaskjær | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.53 | | I | | ▪ |
| 65A | Vikingneset | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.25 | | I | | ▪ |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.00 | | I | | ▪ |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | Ni | SB | M | D | 0.86 | | I | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73A | Lyngholmen | MYTI EDU | Blue mussel | Ni | SB | M | D | 0.80 | | I | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.80 | | I | | ▪ |
| 77A | Nordstrand | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.83 | | I | | ▪ |
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | Ni | SB | M | D | 2.08 | | I | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.19 | | I | | ▪ |
| I022 | West Damholmen | MYTI EDU | Blue mussel | Ni | SB | M | D | 2.50 | | I | | ▪ |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | Ni | SB | M | D | 2.25 | | I | | ▪ |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | Ni | SB | M | D | 5.20 | | II | | ▪ |
| I131A | Lastad | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.69 | | I | | ▪ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | Ni | SB | M | D | 6.63 | | II | | ▪ |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | Ni | SB | M | D | 5.18 | | II | | ▪ |
| I201 | Ekkjegrunn (G1) | MYTI EDU | Blue mussel | Ni | SB | M | D | 0.71 | | I | | ▪ |
| I205 | Bølsnes (G5) | MYTI EDU | Blue mussel | Ni | SB | M | D | 0.73 | | I | | ▪ |
| I241 | Nordnes | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.40 | | I | | ▪ |
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.21 | | I | | ▪ |
| I243 | Hegreneset | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.40 | | I | | ▪ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.13 | | I | | ▪ |
| I304 | Gåsøya | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.36 | | I | | ▪ |
| I306 | Håøya | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.40 | | I | | ▪ |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.53 | | I | | ▪ |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | Ni | SB | M | D | 2.72 | | I | | ▪ |
| I713 | Strømtangen | MYTI EDU | Blue mussel | Ni | SB | M | D | 2.08 | | I | | ▪ |
| I964 | Toraneskaien (B4) | MYTI EDU | Blue mussel | Ni | SB | M | D | 28.33 | | III | | ▪ |
| I965 | Moholmen (B5) | MYTI EDU | Blue mussel | Ni | SB | M | D | 22.56 | | III | | ▪ |
| I969 | Bjørnbærviken (B9) | MYTI EDU | Blue mussel | Ni | SB | M | D | 1.75 | | I | | ▪ |
| 33F | Sande (east side) | PLAT FLE | Flounder | Ni | LI | M | W | 0.44 | | | | ▪ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | Ni | LI | M | W | 0.06 | | | | ▪ |
| 67F | Strandebarm area | PLAT FLE | Flounder | Ni | LI | M | W | 0.03 | | | | ▪ |
| 10F | Skogerøy | PLEU PLA | Plaice | Ni | LI | M | W | 0.10 | | | | ▪ |
| 98F2 | Husholmen | PLEU PLA | Plaice | Ni | LI | M | W | 0.05 | | | | ▪ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | PAH | SB | U | D | 98.9 | no | I | -- | ○ |
| 35A | Mølen | MYTI EDU | Blue mussel | PAH | SB | U | D | 120.1 | | I | | ▪ |
| I131A | Lastad | MYTI EDU | Blue mussel | PAH | SB | U | D | 43.8 | no | I | -- | ○ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | PAH | SB | U | D | 513.0 | 2.1 | II | -- | ○ |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | PAH | SB | U | D | 1630.0 | 6.5 | III | -- | ○ |
| I201 | Ekkjegrunn (G1) | MYTI EDU | Blue mussel | PAH | SB | U | D | 137.0 | no | I | D- | ↓ |
| I205 | Bølsnes (G5) | MYTI EDU | Blue mussel | PAH | SB | U | D | 101.0 | no | I | D- | ↓ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | PAH | SB | U | D | 308.0 | 1.2 | II | -- | ○ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I304 | Gåsøya | MYTI EDU | Blue mussel | PAH | SB | U | D | 52.5 | no | I | -- | ○ |
| I306 | Håøya | MYTI EDU | Blue mussel | PAH | SB | U | D | 43.5 | no | I | -- | ○ |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | PAH | SB | U | D | 48.3 | no | I | -- | ○ |
| I912 | Honnhammer | MYTI EDU | Blue mussel | PAH | SB | U | D | 61.7 | no | I | DY | ↓ |
| I913 | Fjøseid | MYTI EDU | Blue mussel | PAH | SB | U | D | 73.6 | no | I | D- | ↓ |
| I915 | Flåøya (northwest) | MYTI EDU | Blue mussel | PAH | SB | U | D | 731.0 | | II | | ▪ |
| I964 | Toraneskaien (B4) | MYTI EDU | Blue mussel | PAH | SB | U | D | 3510.0 | 14.1 | III | -- | ○ |
| I965 | Moholmen (B5) | MYTI EDU | Blue mussel | PAH | SB | U | D | 2580.0 | 10.3 | III | -- | ○ |
| I969 | Bjørnbærviken (B9) | MYTI EDU | Blue mussel | PAH | SB | U | D | 641.0 | 2.6 | II | -- | ○ |
| 10B | Varangerfjorden | GADU MOR | Cod | Pb | LI | M | W | 0.02 | no | B.B. | DY | ↓ |
| 13BH | Kristiansand havn | GADU MOR | Cod | Pb | LI | M | W | 0.04 | | B.B. | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | Pb | LI | M | W | 0.02 | no | B.B. | D- | ↓ |
| 30B | Oslo City area | GADU MOR | Cod | Pb | LI | M | W | 0.13 | 1.3 | O.B. | -- | ○ |
| 36B | Færder area | GADU MOR | Cod | Pb | LI | M | W | 0.02 | no | B.B. | D- | ↓ |
| 43B | Kvænangen (Olderfjord) | GADU MOR | Cod | Pb | LI | M | W | 0.02 | no | B.B. | D? | ↓ |
| 43BH | Tromsø havn | GADU MOR | Cod | Pb | LI | M | W | 0.02 | | B.B. | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | Pb | LI | M | W | 0.17 | 1.7 | O.B. | UY | ↑ |
| 67B | Strandebarm area | GADU MOR | Cod | Pb | LI | M | W | 0.02 | no | B.B. | D- | ↓ |
| 77B | Borøy area | GADU MOR | Cod | Pb | LI | M | W | 0.02 | no | B.B. | D? | ↓ |
| 80BH | Munkholmen | GADU MOR | Cod | Pb | LI | M | W | 0.03 | | B.B. | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | Pb | LI | M | W | 0.02 | no | B.B. | DY | ↓ |
| 21F | Åkrafjord | LEPI WHI | Megrim | Pb | LI | M | W | 0.02 | | | | ▪ |
| 67F | Strandebarm area | LEPI WHI | Megrim | Pb | LI | M | W | 0.02 | m | | D- | ↓ |
| 15F | Ullerø area | LIMA LIM | Dab | Pb | LI | M | W | 0.02 | no | B.B. | -- | ○ |
| 21F | Åkrafjord | LIMA LIM | Dab | Pb | LI | M | W | 0.24 | no | B.B. | Um | ↑ |
| 36F | Færder area | LIMA LIM | Dab | Pb | LI | M | W | 0.04 | no | B.B. | DY | ↓ |
| 77F | Borøy area | LIMA LIM | Dab | Pb | LI | M | W | 0.09 | no | B.B. | -? | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | Pb | SB | M | D | 1.43 | | I | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | Pb | SB | M | D | 1.00 | | I | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | Pb | SB | M | D | 0.35 | | I | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | Pb | SB | M | D | 0.82 | no | I | -- | ○ |
| 11X | Brashavn | MYTI EDU | Blue mussel | Pb | SB | M | D | 0.30 | no | I | -- | ○ |
| 13A | Langøsund | MYTI EDU | Blue mussel | Pb | SB | M | D | 1.25 | | I | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | Pb | SB | M | D | 1.93 | | I | | ▪ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | Pb | SB | M | D | 0.94 | no | I | -- | ○ |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | Pb | SB | M | D | 3.53 | | II | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | Pb | SB | M | D | 0.74 | no | I | -- | ○ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | Pb | SB | M | D | 2.54 | no | I | -- | ○ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31A | Solbergstrand | MYTI EDU | Blue mussel | Pb | SB | M | D | 0.78 | no | I | -- | ○ |
| 35A | Mølen | MYTI EDU | Blue mussel | Pb | SB | M | D | 1.00 | no | I | DY | ↓ |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | Pb | SB | M | D | 21.20 | 7.1 | III | -- | ○ |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | Pb | SB | M | D | 5.50 | 1.8 | II | D- | ↓ |
| 56A | Kvalnes | MYTI EDU | Blue mussel | Pb | SB | M | D | 15.00 | 5 | III | -- | ○ |
| 57A | Krossanes | MYTI EDU | Blue mussel | Pb | SB | M | D | 4.28 | 1.4 | II | D- | ↓ |
| 63A | Ranaskjær | MYTI EDU | Blue mussel | Pb | SB | M | D | 3.19 | 1.1 | II | D- | ↓ |
| 65A | Vikingneset | MYTI EDU | Blue mussel | Pb | SB | M | D | 3.10 | 1 | II | D- | ↓ |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | Pb | SB | M | D | 1.20 | no | I | D- | ↓ |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | Pb | SB | M | D | 0.81 | no | I | D- | ↓ |
| 73A | Lyngholmen | MYTI EDU | Blue mussel | Pb | SB | M | D | 0.54 | | I | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | Pb | SB | M | D | 1.35 | no | I | -- | ○ |
| 77A | Nordstrand | MYTI EDU | Blue mussel | Pb | SB | M | D | 2.20 | | I | | ▪ |
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | Pb | SB | M | D | 2.73 | | I | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | Pb | SB | M | D | 0.83 | no | I | D- | ↓ |
| I022 | West Damholmen | MYTI EDU | Blue mussel | Pb | SB | M | D | 1.50 | no | I | -- | ○ |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | Pb | SB | M | D | 0.77 | no | I | -- | ○ |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | Pb | SB | M | D | 1.40 | no | I | -- | ○ |
| I131A | Lastad | MYTI EDU | Blue mussel | Pb | SB | M | D | 1.54 | | I | | ▪ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | Pb | SB | M | D | 3.83 | | II | | ▪ |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | Pb | SB | M | D | 12.80 | | II | | ▪ |
| I201 | Ekkjegrunn (G1) | MYTI EDU | Blue mussel | Pb | SB | M | D | 1.88 | no | I | -- | ○ |
| I205 | Bølsnes (G5) | MYTI EDU | Blue mussel | Pb | SB | M | D | 2.80 | no | I | -- | ○ |
| I241 | Nordnes | MYTI EDU | Blue mussel | Pb | SB | M | D | 18.67 | | III | | ▪ |
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | Pb | SB | M | D | 5.21 | | II | | ▪ |
| I243 | Hegreneset | MYTI EDU | Blue mussel | Pb | SB | M | D | 8.89 | | II | | ▪ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | Pb | SB | M | D | 2.00 | no | I | -- | ○ |
| I304 | Gåsøya | MYTI EDU | Blue mussel | Pb | SB | M | D | 1.50 | no | I | -- | ○ |
| I306 | Håøya | MYTI EDU | Blue mussel | Pb | SB | M | D | 0.71 | no | I | -- | ○ |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | Pb | SB | M | D | 0.88 | no | I | -- | ○ |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | Pb | SB | M | D | 3.29 | | II | | ▪ |
| I713 | Strømtangen | MYTI EDU | Blue mussel | Pb | SB | M | D | 1.83 | | I | | ▪ |
| I964 | Toraneskaien (B4) | MYTI EDU | Blue mussel | Pb | SB | M | D | 10.70 | 3.6 | II | -- | ○ |
| I965 | Moholmen (B5) | MYTI EDU | Blue mussel | Pb | SB | M | D | 18.40 | 6.1 | III | -- | ○ |
| I969 | Bjørnbærviken (B9) | MYTI EDU | Blue mussel | Pb | SB | M | D | 2.13 | no | I | -- | ○ |
| 33F | Sande (east side) | PLAT FLE | Flounder | Pb | LI | M | W | 0.03 | no | B.B. | DY | ↓ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | Pb | LI | M | W | 0.04 | no | B.B. | -- | ○ |
| 67F | Strandebarm area | PLAT FLE | Flounder | Pb | LI | M | W | 0.02 | no | B.B. | DY | ↓ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10F | Skogerøy | PLEU PLA | Plaice | Pb | LI | M | W | 0.03 | no | B.B. | D- | ↓ |
| 13BH | Kristiansand havn | GADU MOR | Cod | PFOS | LI | U | W | 9 | | | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | PFOS | LI | U | W | 9 | m | | -? | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | PFOS | LI | U | W | 48 | m | | -? | ▪ |
| 36B | Færder area | GADU MOR | Cod | PFOS | LI | U | W | 29 | | | | ▪ |
| 43B | Kvænangen (Olderfjord) | GADU MOR | Cod | PFOS | LI | U | W | 5.5 | | | | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | PFOS | LI | U | W | 6.3 | | | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | PFOS | LI | U | W | 3 | m | | -? | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | PFOS | LI | U | W | 4.3 | | | | ▪ |
| 92B | Stokken area | GADU MOR | Cod | PFOS | LI | U | W | 9.1 | | | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | PFOS | LI | U | W | 6.8 | | | | ▪ |
| 15B | Ullerø area | GADU MOR | Cod | PYR1O | BI | 380 | W | 2.69 | m | | -- | ○ |
| 23B | Karihavet area | GADU MOR | Cod | PYR1O | BI | 380 | W | 1.02 | m | | -- | ○ |
| 30B | Oslo City area | GADU MOR | Cod | PYR1O | BI | 380 | W | 15.60 | m | | -- | ○ |
| 53B | Inner Sørfjord | GADU MOR | Cod | PYR1O | BI | 380 | W | 10.90 | m | | -- | ○ |
| 10B | Varangerfjorden | GADU MOR | Cod | QCB | LI | U | W | 1.90 | | | | ▪ |
| 13BH | Kristiansand havn | GADU MOR | Cod | QCB | LI | U | W | 5.50 | | | | ▪ |
| 15B | Ullerø area | GADU MOR | Cod | QCB | LI | U | W | 1.60 | | | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | QCB | LI | U | W | 0.89 | | | | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | QCB | LI | U | W | 1.10 | | | | ▪ |
| 36B | Færder area | GADU MOR | Cod | QCB | LI | U | W | 0.50 | | | | ▪ |
| 43B | Kvænangen (Olderfjord) | GADU MOR | Cod | QCB | LI | U | W | 2.00 | | | | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | QCB | LI | U | W | 1.00 | | | | ▪ |
| 67B | Strandebarm area | GADU MOR | Cod | QCB | LI | U | W | 1.10 | | | | ▪ |
| 77B | Borøy area | GADU MOR | Cod | QCB | LI | U | W | 5.50 | | | | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | QCB | LI | U | W | 1.20 | | | | ▪ |
| 92B | Stokken area | GADU MOR | Cod | QCB | LI | U | W | 0.53 | | | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | QCB | LI | U | W | 1.60 | | | | ▪ |
| 10B | Varangerfjorden | GADU MOR | Cod | QCB | MU | U | W | 0.03 | | | | ▪ |
| 13BH | Kristiansand havn | GADU MOR | Cod | QCB | MU | U | W | 0.08 | | | | ▪ |
| 15B | Ullerø area | GADU MOR | Cod | QCB | MU | U | W | 0.03 | | | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | QCB | MU | U | W | 0.03 | | | | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | QCB | MU | U | W | 0.03 | | | | ▪ |
| 36B | Færder area | GADU MOR | Cod | QCB | MU | U | W | 0.03 | | | | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | QCB | MU | U | W | 0.03 | | | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | QCB | MU | U | W | 0.03 | | | | ▪ |
| 67B | Strandebarm area | GADU MOR | Cod | QCB | MU | U | W | 0.03 | | | | ▪ |
| 77B | Borøy area | GADU MOR | Cod | QCB | MU | U | W | 0.03 | | | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 80BH | Munkholmen | GADU MOR | Cod | QCB | MU | U | W | 0.03 | | | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | QCB | MU | U | W | 0.03 | | | | ▪ |
| 21F | Åkrafjord | LEPI WHI | Megrim | QCB | LI | U | W | 1.90 | | | | ▪ |
| 67F | Strandebarm area | LEPI WHI | Megrim | QCB | LI | U | W | 0.93 | | | | ▪ |
| 21F | Åkrafjord | LEPI WHI | Megrim | QCB | MU | U | W | 0.03 | | | | ▪ |
| 67F | Strandebarm area | LEPI WHI | Megrim | QCB | MU | U | W | 0.03 | | | | ▪ |
| 15F | Ullerø area | LIMA LIM | Dab | QCB | LI | U | W | 0.79 | | | | ▪ |
| 21F | Åkrafjord | LIMA LIM | Dab | QCB | LI | U | W | 0.30 | | | | ▪ |
| 36F | Færder area | LIMA LIM | Dab | QCB | LI | U | W | 0.30 | | | | ▪ |
| 77F | Borøy area | LIMA LIM | Dab | QCB | LI | U | W | 0.46 | | | | ▪ |
| 15F | Ullerø area | LIMA LIM | Dab | QCB | MU | U | W | 0.03 | | | | ▪ |
| 21F | Åkrafjord | LIMA LIM | Dab | QCB | MU | U | W | 0.03 | | | | ▪ |
| 36F | Færder area | LIMA LIM | Dab | QCB | MU | U | W | 0.03 | | | | ▪ |
| 77F | Borøy area | LIMA LIM | Dab | QCB | MU | U | W | 0.03 | | | | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.18 | | | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.23 | | | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.18 | | | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.18 | | | | ▪ |
| 11X | Brashavn | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.14 | | | | ▪ |
| 13A | Langøsund | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.19 | | | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.21 | | | | ▪ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.59 | | | | ▪ |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.20 | | | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.14 | | | | ▪ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.17 | | | | ▪ |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.19 | | | | ▪ |
| 35A | Mølen | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.13 | | | | ▪ |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.43 | | | | ▪ |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.17 | | | | ▪ |
| 56A | Kvalnes | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.20 | | | | ▪ |
| 57A | Krossanes | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.15 | | | | ▪ |
| 63A | Ranaskjær | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.19 | | | | ▪ |
| 65A | Vikingneset | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.24 | | | | ▪ |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.18 | | | | ▪ |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.33 | | | | ▪ |
| 73A | Lyngholmen | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.13 | | | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.18 | | | | ▪ |
| 77A | Nordstrand | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.18 | | | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.25 | | | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.17 | | | | ▪ |
| I022 | West Damholmen | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.50 | | | | ▪ |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.38 | | | | ▪ |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.50 | | | | ▪ |
| I131A | Lastad | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.23 | | | | ▪ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.20 | | | | ▪ |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.24 | | | | ▪ |
| I241 | Nordnes | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.17 | | | | ▪ |
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.21 | | | | ▪ |
| I243 | Hegreneset | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.16 | | | | ▪ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.33 | | | | ▪ |
| I304 | Gåsøya | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.36 | | | | ▪ |
| I306 | Håøya | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.33 | | | | ▪ |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.29 | | | | ▪ |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.33 | | | | ▪ |
| I713 | Strømtangen | MYTI EDU | Blue mussel | QCB | SB | U | D | 0.75 | | | | ▪ |
| 33F | Sande (east side) | PLAT FLE | Flounder | QCB | LI | U | W | 0.50 | | | | ▪ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | QCB | LI | U | W | 0.49 | | | | ▪ |
| 67F | Strandebarm area | PLAT FLE | Flounder | QCB | LI | U | W | 0.64 | | | | ▪ |
| 33F | Sande (east side) | PLAT FLE | Flounder | QCB | MU | U | W | 0.03 | | | | ▪ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | QCB | MU | U | W | 0.03 | | | | ▪ |
| 67F | Strandebarm area | PLAT FLE | Flounder | QCB | MU | U | W | 0.03 | | | | ▪ |
| 10F | Skogerøy | PLEU PLA | Plaice | QCB | LI | U | W | 0.37 | | | | ▪ |
| 98F2 | Husholmen | PLEU PLA | Plaice | QCB | LI | U | W | 0.25 | | | | ▪ |
| 10F | Skogerøy | PLEU PLA | Plaice | QCB | MU | U | W | 0.03 | | | | ▪ |
| 98F2 | Husholmen | PLEU PLA | Plaice | QCB | MU | U | W | 0.03 | | | | ▪ |
| 10B | Varangerfjorden | GADU MOR | Cod | Sn | LI | M | W | 0.30 | | | | ▪ |
| 13BH | Kristiansand havn | GADU MOR | Cod | Sn | LI | M | W | 0.30 | | | | ▪ |
| 15B | Ullerø area | GADU MOR | Cod | Sn | LI | M | W | 0.30 | | | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | Sn | LI | M | W | 0.30 | | | | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | Sn | LI | M | W | 0.30 | | | | ▪ |
| 36B | Færder area | GADU MOR | Cod | Sn | LI | M | W | 0.30 | | | | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | Sn | LI | M | W | 0.30 | | | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | Sn | LI | M | W | 0.30 | | | | ▪ |
| 67B | Strandebarm area | GADU MOR | Cod | Sn | LI | M | W | 0.30 | | | | ▪ |
| 77B | Borøy area | GADU MOR | Cod | Sn | LI | M | W | 0.30 | | | | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | Sn | LI | M | W | 0.30 | | | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | Sn | LI | M | W | 0.30 | | | | ▪ |
| 21F | Åkrafjord | LEPI WHI | Megrim | Sn | LI | M | W | 0.30 | | | | ▪ |
| 67F | Strandebarm area | LEPI WHI | Megrim | Sn | LI | M | W | 0.30 | | | | ▪ |
| 15F | Ullerø area | LIMA LIM | Dab | Sn | LI | M | W | 0.30 | | | | ▪ |
| 21F | Åkrafjord | LIMA LIM | Dab | Sn | LI | M | W | 0.30 | | | | ▪ |
| 36F | Færder area | LIMA LIM | Dab | Sn | LI | M | W | 0.30 | | | | ▪ |
| 77F | Borøy area | LIMA LIM | Dab | Sn | LI | M | W | 0.30 | | | | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.83 | | | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.31 | | | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.76 | | | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.76 | | | | ▪ |
| 11X | Brashavn | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.43 | | | | ▪ |
| 13A | Langøsund | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.88 | | | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.14 | | | | ▪ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.76 | | | | ▪ |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.00 | | | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.43 | | | | ▪ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.67 | | | | ▪ |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.88 | | | | ▪ |
| 35A | Mølen | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.30 | | | | ▪ |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.14 | | | | ▪ |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.67 | | | | ▪ |
| 56A | Kvalnes | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.00 | | | | ▪ |
| 57A | Krossanes | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.50 | | | | ▪ |
| 63A | Ranaskjær | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.88 | | | | ▪ |
| 65A | Vikingneset | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.50 | | | | ▪ |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.67 | | | | ▪ |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.43 | | | | ▪ |
| 73A | Lyngholmen | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.25 | | | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.76 | | | | ▪ |
| 77A | Nordstrand | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.76 | | | | ▪ |
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.50 | | | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.67 | | | | ▪ |
| I022 | West Damholmen | MYTI EDU | Blue mussel | Sn | SB | M | D | 3.00 | | | | ▪ |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.31 | | | | ▪ |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | Sn | SB | M | D | 3.00 | | | | ▪ |
| I131A | Lastad | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.31 | | | | ▪ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.00 | | | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I133 | Odderø (west) | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.60 | | | | ▪ |
| I201 | Ekkjegrunn (G1) | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.76 | | | | ▪ |
| I205 | Bølsnes (G5) | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.88 | | | | ▪ |
| I241 | Nordnes | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.67 | | | | ▪ |
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.14 | | | | ▪ |
| I243 | Hegreneset | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.58 | | | | ▪ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.00 | | | | ▪ |
| I304 | Gåsøya | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.14 | | | | ▪ |
| I306 | Håøya | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.00 | | | | ▪ |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.76 | | | | ▪ |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.07 | | | | ▪ |
| I713 | Strømtangen | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.31 | | | | ▪ |
| I964 | Toraneskaien (B4) | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.90 | | | | ▪ |
| I965 | Moholmen (B5) | MYTI EDU | Blue mussel | Sn | SB | M | D | 2.59 | | | | ▪ |
| I969 | Bjørnbærviken (B9) | MYTI EDU | Blue mussel | Sn | SB | M | D | 1.54 | | | | ▪ |
| 33F | Sande (east side) | PLAT FLE | Flounder | Sn | LI | M | W | 0.10 | | | | ▪ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | Sn | LI | M | W | 0.30 | | | | ▪ |
| 67F | Strandebarm area | PLAT FLE | Flounder | Sn | LI | M | W | 0.30 | | | | ▪ |
| 10F | Skogerøy | PLEU PLA | Plaice | Sn | LI | M | W | 0.30 | | | | ▪ |
| 98F2 | Husholmen | PLEU PLA | Plaice | Sn | LI | M | W | 0.30 | | | | ▪ |
| 11X | Brashavn | MYTI EDU | Blue mussel | TBT | SB | U | D | 0.003 | no | I | DY | ↓ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | TBT | SB | U | D | 0.007 | no | I | D- | ↓ |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | TBT | SB | U | D | 0.106 | 1.1 | II | D- | ↓ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | TBT | SB | U | D | 0.053 | no | I | -- | ○ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | TBT | SB | U | D | 0.187 | 1.9 | II | D- | ↓ |
| 35A | Mølen | MYTI EDU | Blue mussel | TBT | SB | U | D | 13.636 | | V | | ▪ |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | TBT | SB | U | D | 0.039 | no | I | D- | ↓ |
| 76A | Risøy | MYTI EDU | Blue mussel | TBT | SB | U | D | 0.020 | no | I | D- | ↓ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | TBT | SB | U | D | 0.021 | no | I | D- | ↓ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | TBT | SB | U | D | 84.667 | | V | | ▪ |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | TBT | SB | U | D | 85.976 | | V | | ▪ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | TBT | SB | U | D | 0.364 | 3.6 | II | DY | ↓ |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | TBT | SB | U | D | 0.148 | 1.5 | II | DY | ↓ |
| I713 | Strømtangen | MYTI EDU | Blue mussel | TBT | SB | U | D | 0.085 | no | I | DY | ↓ |
| 11G | Brashavn | NUCE LAP | Dogwhelk | TBT | SB | U | D | 0.002 | m | | D- | ↓ |
| 131G | Lastad | NUCE LAP | Dogwhelk | TBT | SB | U | D | 0.005 | m | | D- | ↓ |
| 15G | Gåsøy (Ullerø) | NUCE LAP | Dogwhelk | TBT | SB | U | D | 0.007 | m | | D- | ↓ |
| 227G1 | Melandholmen | NUCE LAP | Dogwhelk | TBT | SB | U | D | 0.032 | m | | -- | ○ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22G | Espevær (west) | NUCE LAP | Dogwhelk | TBT | SB | U | D | 0.010 | m | | -- | o |
| 36G | Færder | NUCE LAP | Dogwhelk | TBT | SB | U | D | 0.012 | m | | D- | ↓ |
| 71G | Fugløyskjær | NUCE LAP | Dogwhelk | TBT | SB | U | D | 0.032 | m | | -- | o |
| 74G | Langholmane | NUCE LAP | Dogwhelk | TBT | SB | U | W | 2.300 | | | | ▪ |
| 76G | Risøy | NUCE LAP | Dogwhelk | TBT | SB | U | D | 0.009 | m | | -- | o |
| 98G | Svolvær området | NUCE LAP | Dogwhelk | TBT | SB | U | D | 0.002 | m | | D- | ↓ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | TCdDN | SB | N | W | 0.106 | m | I | -- | o |
| 35A | Mølen | MYTI EDU | Blue mussel | TCdDN | SB | N | W | 0.745 | | III | | ▪ |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | TCdDN | SB | N | W | 3.050 | m | V | -- | o |
| 76A | Risøy | MYTI EDU | Blue mussel | TCdDN | SB | N | W | 0.081 | m | I | -- | o |
| I132 | Svensholmen | MYTI EDU | Blue mussel | TCdDN | SB | N | W | 0.425 | m | II | -- | o |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | TCdDN | SB | N | W | 0.635 | m | III | -- | o |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | TCdDN | SB | N | W | 5.920 | m | V | -- | o |
| I713 | Strømtangen | MYTI EDU | Blue mussel | TCdDN | SB | N | W | 3.850 | m | V | -- | o |
| 35A | Mølen | MYTI EDU | Blue mussel | V | SB | M | D | 2.60 | | | | ▪ |
| 227G1 | Melandholmen | NUCE LAP | Dogwhelk | VDSI | WO | | W | 2.32 | m | | DY | ↓ |
| 22G | Espevær (west) | NUCE LAP | Dogwhelk | VDSI | WO | | W | 1.58 | m | | DY | ↓ |
| 36G | Færder | NUCE LAP | Dogwhelk | VDSI | WO | | W | 0.22 | m | | DY | ↓ |
| 71G | Fugløyskjær | NUCE LAP | Dogwhelk | VDSI | WO | | W | 1.25 | m | | D- | ↓ |
| 98G | Svolvær området | NUCE LAP | Dogwhelk | VDSI | WO | | W | 3.03 | m | | -- | o |
| 10B | Varangerfjorden | GADU MOR | Cod | Zn | LI | M | W | 13.9 | | B.B. | | ▪ |
| 13BH | Kristiansand havn | GADU MOR | Cod | Zn | LI | M | W | 29.6 | | B.B. | | ▪ |
| 15B | Ullerø area | GADU MOR | Cod | Zn | LI | M | W | 20.4 | | B.B. | | ▪ |
| 23B | Karihavet area | GADU MOR | Cod | Zn | LI | M | W | 25.5 | | B.B. | | ▪ |
| 30B | Oslo City area | GADU MOR | Cod | Zn | LI | M | W | 30.6 | | O.B. | | ▪ |
| 36B | Færder area | GADU MOR | Cod | Zn | LI | M | W | 27.2 | | B.B. | | ▪ |
| 43B | Kvænangen (Olderfjord) | GADU MOR | Cod | Zn | LI | M | W | 21.4 | | B.B. | | ▪ |
| 43BH | Tromsø havn | GADU MOR | Cod | Zn | LI | M | W | 23.8 | | B.B. | | ▪ |
| 53B | Inner Sørfjord | GADU MOR | Cod | Zn | LI | M | W | 28.7 | | B.B. | | ▪ |
| 67B | Strandebarm area | GADU MOR | Cod | Zn | LI | M | W | 21.3 | | B.B. | | ▪ |
| 77B | Borøy area | GADU MOR | Cod | Zn | LI | M | W | 23.1 | | B.B. | | ▪ |
| 80BH | Munkholmen | GADU MOR | Cod | Zn | LI | M | W | 23.0 | | B.B. | | ▪ |
| 92B | Stokken area | GADU MOR | Cod | Zn | LI | M | W | 23.1 | | B.B. | | ▪ |
| 98B1 | Bjørnerøya (east) | GADU MOR | Cod | Zn | LI | M | W | 13.0 | | B.B. | | ▪ |
| 21F | Åkrafjord | LEPI WHI | Megrim | Zn | LI | M | W | 86.2 | | | | ▪ |
| 67F | Strandebarm area | LEPI WHI | Megrim | Zn | LI | M | W | 38.6 | | | | ▪ |
| 15F | Ullerø area | LIMA LIM | Dab | Zn | LI | M | W | 38.8 | | B.B. | | ▪ |
| 21F | Åkrafjord | LIMA LIM | Dab | Zn | LI | M | W | 39.9 | | B.B. | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36F | Færder area | LIMA LIM | Dab | Zn | LI | M | W | 27.1 | | B.B. | | ▪ |
| 77F | Borøy area | LIMA LIM | Dab | Zn | LI | M | W | 20.8 | | B.B. | | ▪ |
| 01A | Sponvika | MYTI EDU | Blue mussel | Zn | SB | M | D | 99.5 | | I | | ▪ |
| 02A | Fugleskjær | MYTI EDU | Blue mussel | Zn | SB | M | D | 169.2 | | I | | ▪ |
| 03A | Tisler | MYTI EDU | Blue mussel | Zn | SB | M | D | 100.0 | | I | | ▪ |
| 10A2 | Skallneset | MYTI EDU | Blue mussel | Zn | SB | M | D | 111.0 | no | I | -- | ○ |
| 11X | Brashavn | MYTI EDU | Blue mussel | Zn | SB | M | D | 73.0 | no | I | -- | ○ |
| 13A | Langøsund | MYTI EDU | Blue mussel | Zn | SB | M | D | 108.8 | | I | | ▪ |
| 14A | Aavigen | MYTI EDU | Blue mussel | Zn | SB | M | D | 135.7 | | I | | ▪ |
| 15A | Gåsøy (Ullerø) | MYTI EDU | Blue mussel | Zn | SB | M | D | 107.0 | no | I | -- | ○ |
| 227A2 | Høgevarde | MYTI EDU | Blue mussel | Zn | SB | M | D | 139.3 | | I | | ▪ |
| 22A | Espevær (west) | MYTI EDU | Blue mussel | Zn | SB | M | D | 103.0 | no | I | -- | ○ |
| 30A | Gressholmen | MYTI EDU | Blue mussel | Zn | SB | M | D | 117.0 | no | I | -- | ○ |
| 31A | Solbergstrand | MYTI EDU | Blue mussel | Zn | SB | M | D | 110.0 | no | I | -- | ○ |
| 35A | Mølen | MYTI EDU | Blue mussel | Zn | SB | M | D | 80.4 | no | I | UY | ↑ |
| 51A | Byrkjenes | MYTI EDU | Blue mussel | Zn | SB | M | D | 83.3 | no | I | -- | ○ |
| 52A | Eitrheimsneset | MYTI EDU | Blue mussel | Zn | SB | M | D | 94.1 | no | I | D- | ↓ |
| 56A | Kvalnes | MYTI EDU | Blue mussel | Zn | SB | M | D | 101.0 | no | I | D- | ↓ |
| 57A | Krossanes | MYTI EDU | Blue mussel | Zn | SB | M | D | 67.0 | no | I | D- | ↓ |
| 63A | Ranaskjær | MYTI EDU | Blue mussel | Zn | SB | M | D | 82.5 | no | I | D- | ↓ |
| 65A | Vikingneset | MYTI EDU | Blue mussel | Zn | SB | M | D | 92.9 | no | I | D- | ↓ |
| 69A | Lille Terøy | MYTI EDU | Blue mussel | Zn | SB | M | D | 98.0 | no | I | DY | ↓ |
| 71A | Bjørkøya (Risøyodden) | MYTI EDU | Blue mussel | Zn | SB | M | D | 86.1 | no | I | DY | ↓ |
| 73A | Lyngholmen | MYTI EDU | Blue mussel | Zn | SB | M | D | 80.4 | | I | | ▪ |
| 76A | Risøy | MYTI EDU | Blue mussel | Zn | SB | M | D | 114.0 | no | I | -- | ○ |
| 77A | Nordstrand | MYTI EDU | Blue mussel | Zn | SB | M | D | 124.0 | | I | | ▪ |
| 79A | Gjerdsvoldsøyen (east) | MYTI EDU | Blue mussel | Zn | SB | M | D | 153.6 | | I | | ▪ |
| 98A2 | Husvaagen area | MYTI EDU | Blue mussel | Zn | SB | M | D | 92.6 | no | I | -- | ○ |
| I022 | West Damholmen | MYTI EDU | Blue mussel | Zn | SB | M | D | 171.0 | | I | | ▪ |
| I023 | Singlekalven (south) | MYTI EDU | Blue mussel | Zn | SB | M | D | 105.4 | | I | | ▪ |
| I024 | Kirkøy (north west) | MYTI EDU | Blue mussel | Zn | SB | M | D | 181.0 | | I | | ▪ |
| I131A | Lastad | MYTI EDU | Blue mussel | Zn | SB | M | D | 123.8 | | I | | ▪ |
| I132 | Svensholmen | MYTI EDU | Blue mussel | Zn | SB | M | D | 102.4 | | I | | ▪ |
| I133 | Odderø (west) | MYTI EDU | Blue mussel | Zn | SB | M | D | 151.8 | | I | | ▪ |
| I201 | Ekkjegrunn (G1) | MYTI EDU | Blue mussel | Zn | SB | M | D | 118.2 | | I | | ▪ |
| I205 | Bølsnes (G5) | MYTI EDU | Blue mussel | Zn | SB | M | D | 106.7 | | I | | ▪ |
| I241 | Nordnes | MYTI EDU | Blue mussel | Zn | SB | M | D | 134.0 | | I | | ▪ |
| I242 | Gravdalsneset | MYTI EDU | Blue mussel | Zn | SB | M | D | 175.7 | | I | | ▪ |

| St | Station_Name | Species code | Common name | Contaminant | Tissue | Unit | Base | Concentration | OC | Class | TRND | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I243 | Hegreneset | MYTI EDU | Blue mussel | Zn | SB | M | D | 130.0 | | I | | ▪ |
| I301 | Akershuskaia | MYTI EDU | Blue mussel | Zn | SB | M | D | 145.0 | | I | | ▪ |
| I304 | Gåsøya | MYTI EDU | Blue mussel | Zn | SB | M | D | 130.0 | | I | | ▪ |
| I306 | Håøya | MYTI EDU | Blue mussel | Zn | SB | M | D | 94.7 | | I | | ▪ |
| I307 | Ramtonholmen | MYTI EDU | Blue mussel | Zn | SB | M | D | 95.9 | | I | | ▪ |
| I712 | Gjemesholmen | MYTI EDU | Blue mussel | Zn | SB | M | D | 118.3 | | I | | ▪ |
| I713 | Strømtangen | MYTI EDU | Blue mussel | Zn | SB | M | D | 96.2 | | I | | ▪ |
| I964 | Toraneskaien (B4) | MYTI EDU | Blue mussel | Zn | SB | M | D | 233.1 | | II | | ▪ |
| I965 | Moholmen (B5) | MYTI EDU | Blue mussel | Zn | SB | M | D | 377.7 | | II | | ▪ |
| I969 | Bjørnbærviken (B9) | MYTI EDU | Blue mussel | Zn | SB | M | D | 90.9 | | I | | ▪ |
| 33F | Sande (east side) | PLAT FLE | Flounder | Zn | LI | M | W | 45.2 | | B.B. | | ▪ |
| 53F | Inner Sørfjord | PLAT FLE | Flounder | Zn | LI | M | W | 38.1 | | B.B. | | ▪ |
| 67F | Strandebarm area | PLAT FLE | Flounder | Zn | LI | M | W | 43.8 | | B.B. | | ▪ |
| 10F | Skogerøy | PLEU PLA | Plaice | Zn | LI | M | W | 38.6 | | B.B. | | ▪ |
| 98F2 | Husholmen | PLEU PLA | Plaice | Zn | LI | M | W | 25.3 | | B.B. | | ▪ |

# Appendix J
# Temporal trend analyses of contaminants and biomarkers in biota 1981-2009

**Sorted by contaminant, species and area/station:**

**Cadmium (Cd)**
**Mercury (Hg)**
**Lead (Pb)**
**Copper (Cu)**
**Zinc (Zn)**
**Silver (Ag)**
**Arsenic (As)**
**Nickel (Ni)**
**Sum PCB-7** or **CB_S7** (CB: 28+52+101+118+138+153+180)
**DDEPP (ppDDE)**
**HCB**
**HCHG** (gamma-hexachlorocyclohexane)
**BAP** (benzo[*a*]pyrene)
**PK_Sn or PK_S** (sum carcinogen PAHs, cf. Appendix B)
**P-Σn or P_S** (sum of PAHs, dicyclic “PAHs” not included, cf. Appendix B)
**PFOS (**perfluoroctanoic sulphonate**)**
**TBT** (Tributyltin)
**TCDDN** (Dioxin toxicity equivalents – Nordic model)
**BDESS** (Sum brominated flame retardants)
**ALA-D** (δ-amino levulinic acid dehydrase inhibition)
**EROD-activity** (Cytochrome P4501A-activity)
**CYP1A** (relative amount of Cytochrome P4501A protein)
**OH-pyrene or PYR10** (Pyrene metabolite)
**VDSI** (measurement of Imposex)

**CEMP-stations**
**"Index"-stations**
**MYTI EDU - Blue Mussel (***Mytilus edulis***)**
**NUCE LAP – Dog whelk (***Nucella lapillus***)**
**GADU MOR - Atlantic cod (***Gadus morhua***)**
**LEPI WHI - Megrim (***Lepidorhombus whiff-iagonis***)**
**LIMA LIM - Dab (***Limanda limanda***)**
**PLAT FLE - Flounder (***Platichthys flesus***)**
**(s) - Small fish**
**(l) - Large fish**

**Tsu -tissue:**
**SB - Soft body tissue**
**LI - Liver tissue**
**MU - Muscle tissue**
**BL - Blood**
**BI - Bile**

**OC** Overconcentration expressed as quotient of median of last year and upper limit to presumed “high background” ("m" missing background value)

**TRD** trend for all time series with 3 or more years data. **NB**. The result shown in parentheses, e.g. “(D-)” for selected time series refers to trend analysis for the last 10-year period.

| | |
|---|---|
| D- | Significant linear trend, downward |
| U- | Significant linear trend, upward |
| -- | No significant trend |
| -? | No significant linear trend, systematic non-linear trend can not be tested because of insufficient data (<7 years) |
| -Y | No significant linear trend, but a systematic non-linear trend |
| DY or UY | Significant linear trend (downward or upward) and a significant non-linear trend. This is considered the same as "-Y" |

SIZE length effect (mercury in fillet)

| | |
|---|---|
| L | Significant difference in concentration levels but pattern of variation same |
| D | As "L" but pattern of variation significantly different |
| - | No significant difference between “small” and “large” fish |

| | |
|---|---|
| **SM3** | Projected smoothed median for three years expressed as quotient of value and "high background" ("?" if missing background or if number of years is less than seven) |
| **PWR** | POWER; estimated number of years to detect a hypothetical situation of 10% trend a year with a 90% power |

**Note on detection limit: for values designated below detection limit, half of this limit is used.**

Annual median concentration of Cd (mg/kg d. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | 1.07 | 0.81 | 1.41 | 0.6 | 0.61 | 0.736 | 0.769 | 0.769 | 1.12 | 1.26 | 1.17 | 0.776 | 0.8 | 0.857 | 1.27 | 1.16 | 1.13 | 0.914 | 1.75 | 1.56 | 2.16 | 1.7 | 1.72 | 1.42 | 1.79 | 1.21 | no | UY | no | 10 |
| 31A | MYTI EDU | SB | 1.39 | 1.31 | 0.89 | 1.93 | 0.4 | 0.43 | 0.412 | 0.719 | 0.727 | 0.914 | 0.933 | 0.781 | 1.32 | 0.789 | 0.854 | 1.07 | 1.25 | 1 | 1.76 | 1.14 | 1.33 | 1.4 | 1.28 | 1.11 | 1.16 | 1.21 | 1.16 | no | UY | no | 12 |
| 35A | MYTI EDU | SB | 1.35 | 0.952 | 1.17 | 1.3 | 0.52 | 0.66 | 0.647 | 0.926 | 1.05 | 1.35 | 1.11 | 0.958 | 0.894 | 0.766 | 0.965 | 1.14 | 1.53 | 1.33 | 1.53 | 1.16 | 1.06 | 1.23 | 1.33 | 0.86 | 0.855 | 1.01 | 0.726 | no | UY | no | 9 |
| 36A | MYTI EDU | SB | 0.845 | 1.19 | 0.84 | 1.38 | 0.59 | 0.56 | 0.502 | 0.407 | 1.22 | 1.06 | 0.899 | 1.22 | 1.17 | 1.6 | 1.84 | 0.965 | 1.01 | 1.65 | 2.59 | 1 | 0.848 | 0.956 | 0.9 | 0.586 | 0.633 | 0.735 | | no | UY | no | 12 |
| 71A | MYTI EDU | SB | 2.52 | 1.98 | 1.42 | 2 | 0.98 | 2.11 | 2.02 | 0.968 | 1.09 | 1.66 | 1.89 | 1.97 | 2.25 | 1.5 | 2.44 | 1.53 | 1.76 | 1.99 | 1.43 | 1.69 | 1.44 | 1.57 | 1.48 | 1.43 | 1.17 | 1.07 | 0.924 | no | D-(D-) | no | 10 |
| 76A | MYTI EDU | SB | | | | | | | | 0.638 | 0.86 | 0.957 | 1.1 | | | 1.17 | 1.19 | 1.2 | 1.28 | 0.823 | 1.82 | 1.45 | 1.05 | 1.01 | 0.829 | 0.816 | 1.03 | 0.953 | 1.01 | no | -- | no | 9 |
| 15A | MYTI EDU | SB | | | | | | | | 0.505 | 0.831 | | 1.18 | 0.794 | 1.44 | 1.22 | 1.07 | 1.03 | 0.841 | 1.44 | 4.4 | 1.31 | 0.737 | 0.926 | 0.788 | 1.01 | 0.718 | 0.622 | 0.835 | no | -- | no | 14 |
| 51A | MYTI EDU | SB | | | | | 42.8 | 58.2 | | | | | | | 36.8 | 25.3 | 5.45 | 10.3 | 34.6 | 27.3 | 5.35 | 16.6 | 14.7 | 5.21 | 13.8 | 2.35 | 3.42 | 2.84 | 2.29 | 1.1 | D-(--) | no | 20 |
| 52A | MYTI EDU | SB | | | | | | | 94.4 | 10.2 | 80.1 | 43.1 | 14.7 | 8.71 | 19.8 | 18.4 | 13.4 | 9.14 | 11.4 | 10.5 | 5.59 | 5 | 7.38 | 5.37 | 7 | 2.88 | 4.41 | 2.22 | 2.25 | 1.1 | D-(D-) | no | 18 |
| 56A | MYTI EDU | SB | | | | | 55.9 | 54.2 | 98.4 | 45 | 69.4 | 51.7 | 59.7 | 11.4 | 30.8 | 20 | 28.8 | 8.71 | 25.9 | 24.4 | 14.5 | 13.4 | 11.4 | 6.18 | 11.7 | 8.4 | 5.29 | 6.21 | 4.89 | 2.4 | D-(D-) | 1.3 | 15 |
| 57A | MYTI EDU | SB | | | | | 21.1 | 43.2 | 36.7 | 25.7 | 32.8 | 32.1 | 15.4 | 11.8 | 12.2 | 8.48 | 13.6 | 5.02 | 13.6 | 10.3 | 8.19 | 6.96 | 6.32 | 3.12 | 5.94 | 6.21 | 2.34 | 2.43 | 1.83 | no | D-(D-) | no | 13 |
| 63A | MYTI EDU | SB | | | | | 47.2 | 10.3 | 19 | 30.4 | 35.1 | 18.2 | 7.81 | 4.23 | 8.16 | 5.4 | 6.62 | 4.43 | 6.87 | 5.97 | 6.73 | 5.38 | 5.69 | 1.3 | 4 | 3.98 | 3.07 | 1.81 | 2.04 | 1.0 | D-(--) | no | 16 |
| 65A | MYTI EDU | SB | | | | | 15 | 5.96 | 8.29 | 14.6 | 24 | 5.09 | 7.73 | 3.01 | 5.37 | 3.53 | 4.28 | 1.72 | 3.82 | 3.85 | 4.5 | 3.74 | 3.4 | 1.31 | 3.42 | 3.98 | 1.87 | 1.47 | 1.43 | no | D-(--) | no | 15 |
| 69A | MYTI EDU | SB | | | | | | | | | | 4.26 | 2.37 | 2.08 | 2.91 | 3.2 | 3.53 | 1.58 | 3.76 | 2.87 | 3.8 | 2.41 | 2.36 | 1.19 | 2.26 | 1.51 | 1.41 | 1.23 | 1.09 | no | D- | no | 12 |
| 22A | MYTI EDU | SB | | | | | | | | 0.532 | 1.14 | 1.12 | 0.844 | 1.02 | 1.41 | 1.14 | 1.01 | 0.851 | 1.32 | 2.69 | 2.01 | 0.976 | 1.04 | 1.18 | 0.912 | 0.844 | 1.24 | 1.02 | 0.874 | no | -- | no | 12 |
| 23A | MYTI EDU | SB | | | | | | | | 0.406 | 0.994 | | | | | | | | | | | | | 0.832 | 1.11 | | | | | no | -? | ? | 15 |
| 24A | MYTI EDU | SB | | | | | | | | 0.52 | 0.816 | | | | | | | | | | | | | 0.958 | 0.944 | | | | | no | -? | ? | 10 |
| 82A | MYTI EDU | SB | | 1.41 | 1.15 | 2.31 | 0.99 | 0.4 | 1.26 | | 1.2 | 1.21 | 1.15 | | 0.981 | 1.22 | | | | | | | | 0.944 | 1.51 | | | | | no | -- | no | 15 |
| 84A | MYTI EDU | SB | | 1.39 | 1.86 | 2.38 | 2.1 | 0.96 | 1.19 | | 1.82 | 2.11 | 1.6 | | 1.64 | 1.29 | | | | | | | | 1.54 | 2.05 | | | | | 1.0 | -- | 1.5 | 11 |
| 87A | MYTI EDU | SB | | 0.968 | 1.02 | 1.93 | 0.77 | 0.69 | 0.756 | | 0.872 | 0.978 | 0.927 | | 1.15 | 1.27 | | | | | | | | 1 | 1.08 | | | | | no | -- | no | 11 |
| 25A | MYTI EDU | SB | | | | | | | | | | 1.38 | 1.05 | | | | | | | | | | | 1.25 | 1.46 | | | | | no | -? | ? | 8 |
| 26A | MYTI EDU | SB | | | | | | | | | | 1.07 | 1 | | | | | | | | | | | 1.24 | 1.13 | | | | | no | -? | ? | <=5 |
| 27A | MYTI EDU | SB | | | | | | | | | | 1.1 | | | | | | | | | | | | 0.856 | 0.894 | | | | | no | -? | ? | <=5 |
| 28A | MYTI EDU | SB | | | | | | | | | | 1.12 | 0.841 | | | | | | | | | | | 0.947 | 1.04 | | | | | no | -? | ? | 8 |
| 91A | MYTI EDU | SB | | | | | | | | | | 1.68 | 1.27 | 1.82 | | | | | | | | | | | 1.16 | | | | | no | -? | ? | 9 |
| 92A1 | MYTI EDU | SB | | | | | | | | | | 1.08 | 0.544 | 0.939 | 0.743 | 0.691 | 0.716 | | | | | | | | | | | | | no | -- | no | 11 |
| 93A | MYTI EDU | SB | | | | | | | | | | 1.23 | 0.645 | | | | | | | | | | | 0.888 | 0.68 | | | | | no | -? | ? | 13 |
| 94A | MYTI EDU | SB | | | | | | | | | | 0.87 | 0.846 | | | | | | | | | | | 1.13 | 1.2 | | | | | no | U? | ? | <=5 |
| 95A | MYTI EDU | SB | | | | | | | | | | 1.21 | 1.47 | | | | | | | | | | | 1 | 1.11 | | | | | no | -? | ? | 7 |
| 96A | MYTI EDU | SB | | | | | | | | | | 0.963 | 0.782 | | | | | | | | | | | 0.718 | 1.03 | | | | | no | -? | ? | 10 |
| 97A | MYTI EDU | SB | | | | | | | | | | 1.31 | 1.55 | | | | | | | | | | | 1.44 | 1.44 | | | | | no | -? | ? | 6 |
| 98A2 | MYTI EDU | SB | | | | | | | | | | | | | | | 0.854 | | 2.17 | 1.68 | 2.38 | 2.13 | 2.27 | 1.07 | 1.29 | 1.18 | 1.05 | 1.42 | 1.24 | no | DY | no | 10 |
| 98X | MYTI EDU | SB | | | | | | | | | | | | 0.712 | 0.688 | 0.781 | | | | | | | | | | | | | | no | -? | ? | 6 |
| 99A | MYTI EDU | SB | | | | | | | | | | 1.43 | 1.28 | | | | | | | | | | | 1.35 | 1.27 | | | | | no | -? | ? | <=5 |
| 41A | MYTI EDU | SB | | | | | | | | | | | | 1.89 | 2.95 | 1.63 | 1.88 | | | | | | | | | 2.67 | 1.68 | | | no | -- | 1.0 | 11 |
| 42A | MYTI EDU | SB | | | | | | | | | | | | 1.05 | 1.59 | | | | | | | | | | | 0.952 | 1.2 | | | no | -? | ? | 11 |
| 43A | MYTI EDU | SB | | | | | | | | | | | | 3.47 | 4.32 | | 3.85 | | | | | | | | | 2.53 | 3.26 | | | 1.6 | -? | ? | 8 |
| 44A | MYTI EDU | SB | | | | | | | | | | | | 1.69 | 2.74 | 1.95 | 1.51 | | | | | | | | | 1.86 | 1.15 | | | no | -- | no | 11 |
| 45A | MYTI EDU | SB | | | | | | | | | | | | 1.81 | 1.61 | | | | | | | | | | | 1.88 | 2.02 | | | 1.0 | -? | ? | 6 |
| 46A | MYTI EDU | SB | | | | | | | | | | | | 2.7 | 2.06 | 2.72 | | | | | | | | | | 2.53 | 1.63 | | | no | -? | ? | 10 |
| 47A | MYTI EDU | SB | | | | | | | | | | | | 4.55 | 3.01 | | | | | | | | | | | 2.29 | 2.51 | | | 1.3 | -? | ? | 9 |
| 48A | MYTI EDU | SB | | | | | | | | | | | | 1.35 | 1.31 | 1.38 | | | | | | | | | | 2.64 | 1.97 | | | no | U? | ? | 8 |
| 49A | MYTI EDU | SB | | | | | | | | | | | | 1.57 | 1.16 | | | | | | | | | | | 4.07 | 2.33 | | | 1.2 | -? | ? | 13 |
| 10A2 | MYTI EDU | SB | | | | | | | | | | | | | | 2.34 | 1.06 | 2.32 | 1.61 | 1.53 | 1.23 | 1.41 | 1.98 | 1.59 | 1.12 | 1.74 | 2.28 | 2.07 | 1.55 | no | -- | 1.1 | 12 |
| 11X | MYTI EDU | SB | | | | | | | | | | | | | | | 1.65 | 0.67 | 1.13 | 1.07 | 1.32 | 1.36 | 1.36 | 0.911 | 0.981 | 0.933 | 1.16 | 1.14 | 1.02 | no | -- | no | 10 |

Annual median concentration of Cd (mg/kg d. wt.)

| St | Species | Tissue | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | ANALYSIS TRND | SM+3 | POWER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30A | MYTI EDU | SB | | 1.07 | 0.81 | 1.41 | 0.6 | 0.61 | 0.736 | 0.769 | 0.769 | 1.12 | 1.26 | 1.17 | 0.776 | 0.8 | 0.857 | 1.27 | 1.16 | 1.13 | 0.914 | 1.75 | 1.56 | 2.16 | 1.7 | 1.72 | 1.42 | 1.79 | 1.21 | no | UY | no | 10 |
| 71A | MYTI EDU | SB | 2.52 | 1.98 | 1.42 | 2 | 0.98 | 2.11 | 2.02 | 0.968 | 1.09 | 1.66 | 1.89 | 1.97 | 2.25 | 1.5 | 2.44 | 1.53 | 1.76 | 1.99 | 1.43 | 1.69 | 1.44 | 1.57 | 1.48 | 1.43 | 1.17 | 1.07 | 0.924 | no | D- | no | 10 |
| 51A | MYTI EDU | SB | | | | | 42.8 | 58.2 | | | | | | | 36.8 | 25.3 | 5.45 | 10.3 | 34.6 | 27.3 | 5.35 | 16.6 | 14.7 | 5.21 | 13.8 | 2.35 | 3.42 | 2.84 | 2.29 | 1.1 | D-(--) | no | 20 |
| 52A | MYTI EDU | SB | | | | | | | 94.4 | 10.2 | 80.1 | 43.1 | 14.7 | 8.71 | 19.8 | 18.4 | 13.4 | 9.14 | 11.4 | 10.5 | 5.59 | 5 | 7.38 | 5.37 | 7 | 2.88 | 4.41 | 2.22 | 2.25 | 1.1 | D-(D-) | no | 18 |
| 10A2 | MYTI EDU | SB | | | | | | | | | | | | | | 2.34 | 1.06 | 2.32 | 1.61 | 1.53 | 1.23 | 1.41 | 1.98 | 1.59 | 1.12 | 1.74 | 2.28 | 2.07 | 1.55 | no | -- | 1.1 | 12 |
| I021 | MYTI EDU | SB | | | | | | | | | | | | | 1.73 | 2.26 | 2.48 | 3.31 | | 1.83 | 2.53 | 2.41 | | | | | | | | 1.2 | -- | 1.0 | 10 |
| I022 | MYTI EDU | SB | | | | | | | | | | | | | 1.43 | 1.36 | 1.26 | 2.09 | 1.94 | 1.33 | 1.7 | 2.69 | 1.61 | 1.25 | 1.42 | 1.74 | 2 | 2.37 | 1.65 | no | -- | 1.2 | 11 |
| I023 | MYTI EDU | SB | | | | | | | | | | | | | 1.61 | 1.4 | 1.77 | 2.04 | 1.45 | 0.948 | 0.873 | 1.55 | 1.48 | 1.03 | 1.39 | 1.79 | 1.15 | 1.28 | 0.983 | no | -- | no | 11 |
| I024 | MYTI EDU | SB | | | | | | | | | | | | | 1.31 | 1.63 | 2.04 | 2.56 | 2.45 | 1.83 | 2.53 | 2.7 | 2.03 | 1.57 | 1.46 | 1.97 | 1.39 | 2.04 | 1.91 | no | -- | 1.1 | 9 |
| I301 | MYTI EDU | SB | | | | | | | | | | 1.26 | | | 0.824 | 0.795 | 0.817 | 1.03 | 1.29 | 0.716 | 0.902 | 0.888 | 1.15 | 1.32 | 1.03 | 1.49 | 1.18 | 1.45 | 1.23 | no | -- | no | 9 |
| I304 | MYTI EDU | SB | | | | | | | | | | | | | 1.33 | 0.719 | 0.784 | 1.05 | 0.994 | 0.921 | 1.16 | 1.3 | 1.37 | 1.1 | 1.34 | 1.35 | 0.889 | 1.11 | 1.16 | no | -- | no | 9 |
| I306 | MYTI EDU | SB | | | | | | | | | | | | | 0.81 | 0.779 | 0.646 | 0.707 | 0.842 | 0.592 | 0.734 | 0.872 | 1.28 | 0.992 | 1.11 | 0.806 | 0.65 | 1.16 | 0.773 | no | -- | no | 9 |
| I307 | MYTI EDU | SB | | | | | | | | | | | | | 0.94 | 0.815 | 0.687 | 0.72 | 0.826 | 0.719 | 0.899 | 1.46 | 1.44 | 1.14 | 1.26 | 0.933 | 0.876 | 1.33 | 0.818 | no | UY | no | 9 |
| I131A | MYTI EDU | SB | | | | | | | | | | | | | 1.24 | 0.875 | 1.14 | 1.31 | 1.18 | 1.98 | 2.48 | 1.13 | 0.862 | 1.34 | 0.965 | 0.831 | 0.787 | 1 | 1.51 | no | -- | no | 11 |
| I201 | MYTI EDU | SB | | | | | | | | | | | | | 0.801 | 0.856 | 1.06 | 0.927 | 1.27 | 1.42 | 1.49 | 2.8 | 0.707 | 0.957 | 1.47 | 1.55 | 1.44 | 1.48 | 0.924 | no | -- | no | 13 |
| I205 | MYTI EDU | SB | | | | | | | | | | | | | 0.819 | | 1.37 | 0.858 | 1.49 | 1.99 | 1.42 | 2.43 | 1.25 | 1.02 | 2.02 | 1.91 | 1.28 | 2.41 | 1.14 | no | -- | no | 13 |
| I965 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | 2.02 | 2.15 | 0.813 | 1.9 | 1.8 | 1.78 | 2.08 | 2.91 | 1.74 | no | -- | 1.3 | 13 |
| I962 | MYTI EDU | SB | | | | | | | | | | | | | 0.746 | 0.606 | 0.645 | 0.518 | | | | | | | | | | | | no | -? | ? | 6 |
| I964 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | 1.57 | 0.652 | 0.92 | 2.15 | 2.11 | 2.04 | 2.06 | 1.55 | no | -- | 1.0 | 14 |
| I969 | MYTI EDU | SB | | | | | | | | | | | | | 0.502 | 0.599 | 0.318 | 0.611 | 0.588 | 0.827 | 0.76 | 0.8 | 0.557 | 0.615 | 1.19 | 0.432 | 0.461 | 0.564 | 0.503 | no | -- | no | 12 |

Annual median concentration of Cd (mg/kg w. wt.)

| St | Species | Tissue | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | ANALYSIS TRND | SM+3 | POWER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30B | GADU MOR | LI | | | | 0.01 | 0.05 | 0.0619 | 0.0711 | 0.0218 | 0.0267 | 0.035 | 0.027 | 0.1 | 0.0645 | 0.063 | 0.049 | 0.055 | 0.0485 | 0.107 | 0.165 | 0.078 | 0.111 | 0.106 | 0.114 | 0.1 | 0.0734 | 0.115 | 0.19 | 0.174 | 0.163 | 1.6 | U- | 2.6 | 15 |
| 36B | GADU MOR | LI | 0.078 | 0.06 | 0.22 | 0.07 | 0.05 | 0.143 | 0.0611 | 0.0314 | 0.028 | 0.0235 | 0.01 | 0.021 | 0.034 | 0.021 | 0.042 | 0.033 | 0.0741 | 0.036 | 0.065 | 0.041 | 0.029 | 0.0247 | 0.0088 | 0.0067 | 0.029 | 0.025 | 0.034 | 0.034 | 0.025 | no | DY | no | 16 |
| 77B | GADU MOR | LI | | | | | | | | | | 0.0375 | 0.018 | | | | | | | | | | | | | | | | | 0.017 | 0.015 | no | -? | ? | 13 |
| 15B | GADU MOR | LI | | | | | | | | | | 0.026 | 0.009 | 0.025 | 0.016 | 0.014 | 0.016 | 0.024 | 0.031 | 0.03 | 0.026 | 0.033 | 0.026 | 0.0183 | 0.0374 | 0.0097 | 0.019 | 0.0058 | 0.023 | 0.018 | 0.02 | no | -- | no | 16 |
| 53B | GADU MOR | LI | | | | | | 0.658 | | 0.058 | 0.0929 | 0.045 | 0.149 | 0.215 | 0.038 | | 0.007 | 0.18 | 0.143 | 0.228 | 0.726 | 0.829 | 0.565 | 0.431 | 0.253 | 0.368 | 0.414 | 0.2 | 0.279 | 0.494 | 0.2 | 2.0 | UY(--) | 2.3 | 21 |
| 67B | GADU MOR | LI | | | | | | | 0.145 | 0.0519 | 0.0467 | 0.069 | 0.077 | 0.0514 | 0.115 | 0.0989 | 0.033 | 0.111 | 0.277 | 0.0185 | 0.0715 | 0.059 | 0.032 | 0.0203 | 0.01 | 0.016 | 0.0252 | 0.0092 | 0.015 | 0.009 | 0.012 | no | D- | no | 19 |
| 23B | GADU MOR | LI | | | | | | | | | | 0.022 | 0.024 | 0.02 | 0.025 | 0.015 | 0.026 | 0.014 | 0.029 | 0.025 | 0.033 | 0.019 | 0.025 | 0.0206 | 0.0163 | 0.0228 | 0.024 | 0.0379 | 0.022 | 0.012 | 0.018 | no | -- | no | 11 |
| 84B | GADU MOR | LI | | | | 0.13 | 0.1 | 0.0688 | | 0.0291 | | | | | | | | | | | | | | | | | | | | | | no | D? | ? | 6 |
| 92B | GADU MOR | LI | | | | | | | | | | | | | 0.036 | 0.029 | 0.022 | 0.066 | | | | | | | | 0.0229 | 0.024 | | | 0.031 | 0.049 | no | -- | no | 14 |
| 98B1 | GADU MOR | LI | | | | | | | | | | | | 0.069 | 0.15 | 0.025 | 0.113 | 0.33 | 0.064 | 0.047 | 0.039 | | | 0.0291 | 0.0254 | 0.0332 | 0.051 | 0.0379 | 0.0686 | 0.024 | 0.018 | no | -- | no | 19 |
| 43B | GADU MOR | LI | | | | | | | | | | | | | | 0.168 | 0.183 | 0.097 | | | | | | | | | | | | 0.0765 | 0.112 | 1.1 | -? | ? | 12 |
| 10B | GADU MOR | LI | | | | | | | | | | | | | | 0.23 | 0.188 | 0.095 | 0.128 | 0.119 | 0.137 | 0.125 | 0.129 | 0.059 | 0.099 | 0.103 | 0.079 | 0.0779 | 0.0815 | 0.092 | 0.06 | no | D- | no | 11 |

Annual median concentration of Cd (mg/kg w. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 33F | PLAT FLE | LI | | | 0.19 | | 0.2 | 0.176 | 0.257 | 0.061 | 0.106 | 0.234 | 0.196 | 0.16 | 0.184 | 0.087 | 0.091 | 0.114 | 0.119 | 0.0952 | 0.126 | 0.071 | 0.091 | 0.0569 | 0.0627 | 0.0313 | 0.025 | 0.0677 | 0.039 | 0.067 | 0.064 | no | D- | no | 13 |
| 53F | PLAT FLE | LI | | | | | | | | 2.24 | 1.53 | 1.54 | 1.72 | 1.79 | 0.789 | | 0.135 | 2.53 | 0.892 | 1.47 | 2.55 | 1.77 | 2.74 | 2.74 | 4.56 | 1.46 | 1.31 | | 0.765 | 1.34 | 0.152 | no | -- | no | 20 |
| 67F | PLAT FLE | LI | | | | | | | | | | | | | | | | 2.48 | | 0.187 | 0.185 | 0.148 | 0.059 | 0.065 | 0.0802 | 0.0605 | 0.124 | 0.14 | 0.093 | 0.126 | 0.13 | no | DY | no | 14 |
| 21F | PLAT FLE | LI | | | | | | | | | | | | | | | | | | | 0.052 | 0.0979 | 0.141 | 0.22 | | 0.0473 | 0.125 | 0.129 | | | | no | -- | no | 18 |
| 36F | LIMA LIM | LI | | | | | | | | | | 0.106 | 0.112 | 0.23 | 0.295 | 0.135 | 0.147 | 0.139 | 0.123 | 0.202 | 0.227 | 0.139 | 0.232 | 0.127 | 0.142 | 0.188 | 0.144 | 0.128 | 0.208 | 0.139 | 0.151 | no | -- | no | 11 |
| 77F | LIMA LIM | LI | | | | | | | | | | | 0.181 | | | | | | | | | | | | | | | | | 0.226 | 0.083 | no | -? | ? | 20 |
| 15F | LIMA LIM | LI | | | | | | | | | | | | | 0.0992 | 0.136 | 0.125 | 0.153 | 0.076 | 0.181 | 0.167 | | 0.313 | 0.129 | 0.11 | 0.189 | 0.225 | 0.377 | 0.153 | 0.284 | 0.176 | no | -- | no | 14 |
| 22F | LIMA LIM | LI | | | | | | | | | | 0.095 | 0.091 | 0.128 | | 0.169 | 0.125 | | | | | | | | | | | | | | | no | -? | ? | 9 |
| 21F | LIMA LIM | LI | | | | | | | | | | | | | | | | | | | | | | 0.0166 | 0.0085 | 0.0747 | 0.014 | | 0.029 | | 0.17 | no | -- | no | 23 |
| 30F | PLEU PLA | LI | | | | | | | | | | | | 0.11 | | 0.101 | 0.222 | | | | | | | | | | | | | | | 1.1 | -? | ? | 15 |
| 22F | PLEU PLA | LI | | | | | | | | | | | | | | | | 0.23 | 0.231 | 0.244 | | | | | | | | | | | | 1.2 | -? | ? | <=5 |
| 98F2 | PLEU PLA | LI | | | | | | | | | | | | | | | | | | | | 0.821 | 0.521 | 0.217 | 0.218 | 0.0726 | 1.01 | 0.593 | 0.287 | 0.205 | 0.051 | no | -- | no | 22 |
| 10F | PLEU PLA | LI | | | | | | | | | | | | | | | | | 0.571 | | 0.141 | 0.248 | 0.302 | 0.204 | 0.316 | 0.307 | 0.271 | | 0.627 | 0.409 | 0.617 | 3.1 | -- | 4.1 | 14 |
| 67F | LEPI WHI | LI | | | 0.181 | | | | 0.18 | 0.109 | 0.066 | 0.197 | 0.085 | 0.1 | 0.12 | 0.304 | 0.259 | 0.2 | 0.097 | 0.033 | 0.051 | 0.037 | 0.049 | 0.0342 | 0.0543 | 0.0485 | 0.0609 | 0.0449 | 0.028 | 0.026 | 0.023 | m | DY | m | 13 |
| 21F | LEPI WHI | LI | | | | | | | | | | | | | | | | | | | | | | | 0.0592 | 0.0812 | 0.112 | 0.186 | 0.049 | 0.041 | 0.108 | m | -- | m | 18 |

Annual median concentration of Hg (mg/kg d. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | 0.118 | 0.073 | 0.147 | 0.05 | 0.13 | 0.0437 | 0.0641 | 0.0533 | 0.0508 | 0.0703 | 0.0865 | 0.0574 | 0.07 | 0.0604 | 0.0778 | 0.114 | 0.0599 | 0.0586 | 0.0952 | 0.071 | 0.153 | 0.113 | 0.1 | 0.0765 | 0.106 | 0.0778 | no | -- | no | 12 |
| 31A | MYTI EDU | SB | 0.0757 | 0.164 | 0.086 | 0.12 | 0.05 | 0.09 | 0.0225 | 0.0599 | 0.0485 | 0.0508 | 0.0446 | 0.0502 | 0.0623 | 0.0435 | 0.0515 | 0.0699 | 0.0881 | 0.0464 | 0.051 | 0.0577 | 0.0577 | 0.0935 | 0.11 | 0.18 | 0.159 | 0.0867 | 0.0875 | no | UY | no | 13 |
| 35A | MYTI EDU | SB | 0.0933 | 0.0741 | 0.084 | 0.17 | 0.05 | 0.18 | 0.05 | 0.0617 | 0.0585 | 0.0578 | 0.0537 | 0.0607 | 0.0369 | 0.0383 | 0.0354 | 0.0667 | 0.101 | 0.028 | 0.0472 | 0.0575 | 0.0574 | 0.0938 | 0.12 | 0.045 | 0.045 | 0.0667 | 0.0565 | no | -- | no | 14 |
| 36A | MYTI EDU | SB | 0.0516 | 0.0427 | 0.084 | 0.14 | 0.05 | 0.14 | 0.034 | 0.0452 | 0.0476 | 0.0394 | 0.0321 | 0.0481 | 0.0333 | 0.0442 | 0.0743 | 0.0299 | 0.0455 | 0.0377 | 0.0245 | 0.0342 | 0.0526 | 0.108 | 0.05 | 0.0364 | 0.0267 | 0.0353 | | no | -- | no | 14 |
| 71A | MYTI EDU | SB | 0.393 | 0.242 | 0.218 | 0.247 | 0.12 | 0.34 | 0.249 | 0.182 | 0.145 | 0.178 | 0.14 | 0.212 | 0.201 | 0.222 | 0.312 | 0.11 | 0.155 | 0.132 | 0.123 | 0.15 | 0.154 | 0.189 | 0.177 | 0.18 | 0.133 | 0.122 | 0.124 | no | D- | no | 11 |
| 76A | MYTI EDU | SB | | | | | | | | 0.0709 | 0.0682 | 0.0498 | 0.0205 | | | 0.057 | 0.0824 | 0.0632 | 0.101 | 0.0328 | 0.0634 | 0.0585 | 0.0843 | 0.101 | 0.0824 | 0.0579 | 0.0824 | 0.0933 | 0.1 | no | -- | no | 12 |
| 15A | MYTI EDU | SB | | | | | | | | 0.0561 | 0.0522 | | 0.0244 | 0.0503 | 0.0217 | 0.0488 | 0.0558 | 0.0529 | 0.0437 | 0.163 | 0.0354 | 0.0452 | 0.0596 | 0.0946 | 0.075 | 0.0632 | 0.0471 | 0.0526 | 0.0765 | no | -- | no | 15 |
| 51A | MYTI EDU | SB | | | | | 0.24 | 0.25 | | | | | | | 1.51 | 0.901 | 0.175 | 0.577 | 2.89 | 3.86 | 0.774 | 1.45 | 1.47 | 0.304 | 0.607 | 0.231 | 0.292 | 0.257 | 0.264 | 1.3 | --(D-) | no | 21 |
| 52A | MYTI EDU | SB | | | | | | | 2.35 | 0.321 | 3.01 | 0.976 | 0.372 | 0.282 | 0.437 | 0.178 | 0.26 | 0.258 | 0.58 | 0.34 | 0.298 | 0.264 | 0.195 | 0.228 | 0.163 | 0.135 | 0.244 | 0.143 | 0.129 | no | D-(D-) | no | 17 |
| 56A | MYTI EDU | SB | | | | | 0.53 | 0.37 | 1.09 | 0.71 | 1.54 | 0.935 | 1.22 | 0.352 | 0.679 | 0.365 | 0.526 | 0.282 | 0.917 | 0.982 | 0.611 | 0.602 | 0.346 | 0.235 | 0.358 | 0.336 | 0.294 | 0.307 | 0.313 | 1.6 | D-(DY) | 1.5 | 14 |
| 57A | MYTI EDU | SB | | | | | 0.17 | 0.21 | 0.269 | 0.411 | 0.758 | 0.576 | 0.349 | 0.35 | 0.26 | 0.155 | 0.319 | 0.166 | 0.467 | 0.451 | 0.349 | 0.277 | 0.193 | 0.115 | 0.229 | 0.229 | 0.139 | 0.133 | 0.15 | no | DY(D-) | no | 12 |
| 63A | MYTI EDU | SB | | | | | 0.31 | 0.14 | 0.177 | 0.394 | 0.468 | 0.294 | 0.143 | 0.19 | 0.252 | 0.172 | 0.203 | 0.226 | 0.268 | 0.299 | 0.365 | 0.289 | 0.213 | 0.0695 | 0.18 | 0.187 | 0.194 | 0.116 | 0.15 | no | -- | no | 14 |
| 65A | MYTI EDU | SB | | | | | 0.1 | 0.15 | 0.104 | 0.312 | 0.328 | 0.124 | 0.119 | 0.134 | 0.148 | 0.118 | 0.136 | 0.0792 | 0.142 | 0.155 | 0.189 | 0.132 | 0.135 | 0.0638 | 0.133 | 0.156 | 0.114 | 0.09 | 0.11 | no | -- | no | 13 |
| 69A | MYTI EDU | SB | | | | | | | | | | 0.106 | 0.0263 | 0.0829 | 0.0704 | 0.104 | 0.111 | 0.0773 | 0.161 | 0.107 | 0.146 | 0.106 | 0.0989 | 0.0586 | 0.1 | 0.0778 | 0.0882 | 0.0789 | 0.1 | no | -- | no | 13 |
| 22A | MYTI EDU | SB | | | | | | | | 0.0529 | 0.0732 | 0.112 | 0.0476 | 0.0673 | 0.0657 | 0.0723 | 0.0683 | 0.046 | 0.0736 | 0.0288 | 0.0545 | 0.0461 | 0.126 | 0.161 | 0.125 | 0.106 | 0.127 | 0.119 | 0.0632 | no | UY | no | 13 |
| 23A | MYTI EDU | SB | | | | | | | | 0.0543 | 0.0759 | | | | | | | | | | | | | 0.0855 | 0.107 | | | | | no | -? | ? | 9 |
| 24A | MYTI EDU | SB | | | | | | | | 0.0578 | 0.0748 | | | | | | | | | | | | | 0.0903 | 0.075 | | | | | no | -? | ? | 8 |
| 82A | MYTI EDU | SB | | 0.0508 | 0.11 | 0.17 | 0.08 | 0.12 | 0.0668 | | 0.0743 | 0.0519 | 0.0787 | | 0.0493 | 0.0691 | | | | | | | | 0.0508 | 0.0941 | | | | | no | -- | no | 13 |
| 84A | MYTI EDU | SB | | 0.0766 | 0.112 | 0.15 | 0.08 | 0.24 | 0.0571 | | 0.0657 | 0.0902 | 0.0568 | | 0.0542 | 0.0433 | | | | | | | | 0.0511 | 0.0824 | | | | | no | -- | no | 15 |
| 87A | MYTI EDU | SB | | 0.178 | | 0.15 | 0.05 | 0.26 | 0.0462 | | 0.0564 | 0.0543 | 0.0488 | | 0.0439 | 0.0623 | | | | | | | | 0.0467 | 0.045 | | | | | no | -- | no | 18 |
| 25A | MYTI EDU | SB | | | | | | | | | | 0.141 | 0.0368 | | | | | | | | | | | 0.0952 | 0.0727 | | | | | no | -? | ? | 19 |
| 26A | MYTI EDU | SB | | | | | | | | | | 0.0959 | 0.0459 | | | | | | | | | | | 0.0843 | 0.0789 | | | | | no | -? | ? | 14 |
| 27A | MYTI EDU | SB | | | | | | | | | | 0.107 | | | | | | | | | | | | 0.0824 | 0.0722 | | | | | no | -? | ? | 6 |
| 28A | MYTI EDU | SB | | | | | | | | | | 0.0765 | 0.0619 | | | | | | | | | | | 0.0851 | 0.125 | | | | | no | -? | ? | 10 |
| 91A | MYTI EDU | SB | | | | | | | | | | 0.0539 | 0.0758 | 0.0943 | | | | | | | | | | | 0.0647 | | | | | no | -? | ? | 12 |
| 92A1 | MYTI EDU | SB | | | | | | | | | | 0.0548 | 0.0335 | 0.0521 | 0.0407 | 0.0234 | 0.067 | | | | | | | | | | | | | no | -- | no | 14 |
| 93A | MYTI EDU | SB | | | | | | | | | | 0.0679 | 0.118 | | | | | | | | | | | 0.202 | 0.126 | | | | | no | -? | ? | 13 |
| 94A | MYTI EDU | SB | | | | | | | | | | 0.082 | 0.0631 | | | | | | | | | | | 0.0508 | 0.0591 | | | | | no | -? | ? | 8 |
| 95A | MYTI EDU | SB | | | | | | | | | | 0.0765 | 0.0598 | | | | | | | | | | | 0.0526 | 0.0667 | | | | | no | -? | ? | 9 |
| 96A | MYTI EDU | SB | | | | | | | | | | 0.0481 | 0.0304 | | | | | | | | | | | 0.039 | 0.04 | | | | | no | -? | ? | 10 |
| 97A | MYTI EDU | SB | | | | | | | | | | 0.0765 | 0.0703 | | | | | | | | | | | 0.0594 | 0.0619 | | | | | no | -? | ? | <=5 |
| 98A2 | MYTI EDU | SB | | | | | | | | | | | | | | | 0.104 | | 0.246 | 0.109 | 0.109 | 0.115 | 0.14 | 0.0817 | 0.08 | 0.0889 | 0.075 | 0.0765 | 0.0722 | no | -- | no | 12 |
| 98X | MYTI EDU | SB | | | | | | | | | | | | 0.335 | 0.34 | 0.328 | | | | | | | | | | | | | | 1.6 | -? | ? | <=5 |
| 99A | MYTI EDU | SB | | | | | | | | | | 0.0881 | 0.0487 | | | | | | | | | | | 0.0552 | 0.0588 | | | | | no | -? | ? | 12 |
| 41A | MYTI EDU | SB | | | | | | | | | | | | 0.0686 | 0.0635 | 0.064 | 0.0848 | | | | | | | | | 0.05 | 0.0471 | | | no | -- | no | 8 |
| 42A | MYTI EDU | SB | | | | | | | | | | | | 0.0449 | 0.0492 | | | | | | | | | | | 0.0348 | 0.0333 | | | no | D? | ? | <=5 |
| 43A | MYTI EDU | SB | | | | | | | | | | | | 0.0844 | 0.0946 | | 0.104 | | | | | | | | | 0.075 | 0.0733 | | | no | -? | ? | 7 |
| 44A | MYTI EDU | SB | | | | | | | | | | | | 0.0552 | 0.05 | 0.0517 | 0.0592 | | | | | | | | | 0.0444 | 0.045 | | | no | -- | no | 6 |
| 45A | MYTI EDU | SB | | | | | | | | | | | | 0.0819 | 0.0667 | | | | | | | | | | | 0.0474 | 0.05 | | | no | D? | ? | 7 |
| 46A | MYTI EDU | SB | | | | | | | | | | | | 0.0387 | 0.0618 | 0.0564 | | | | | | | | | | 0.04 | 0.0227 | | | no | -? | ? | 12 |
| 47A | MYTI EDU | SB | | | | | | | | | | | | 0.064 | 0.0425 | | | | | | | | | | | 0.0579 | 0.0368 | | | no | -? | ? | 12 |
| 48A | MYTI EDU | SB | | | | | | | | | | | | 0.0726 | 0.0599 | 0.0524 | | | | | | | | | | 0.125 | 0.1 | | | no | -? | ? | 10 |
| 49A | MYTI EDU | SB | | | | | | | | | | | | 0.0651 | 0.0543 | | | | | | | | | | | 0.0474 | 0.0389 | | | no | -? | ? | 7 |
| 10A2 | MYTI EDU | SB | | | | | | | | | | | | | | 0.0588 | 0.0617 | 0.0581 | 0.0625 | 0.0503 | 0.052 | 0.0494 | 0.0549 | 0.0503 | 0.0368 | 0.0412 | 0.0391 | 0.0412 | 0.0412 | no | D- | no | 6 |
| 11X | MYTI EDU | SB | | | | | | | | | | | | | | | 0.0811 | 0.0366 | 0.0564 | 0.0667 | 0.065 | 0.0372 | 0.0372 | 0.037 | 0.0429 | 0.0389 | 0.0421 | 0.0471 | 0.0429 | no | -- | no | 10 |

## Annual median concentration of Hg (mg/kg d. wt.)

| St | Species | Tissue | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND (ANALYSIS) | SM+3 | POWER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30A | MYTI EDU | SB | | | | 0.118 | 0.073 | 0.147 | 0.05 | 0.13 | 0.0437 | 0.0641 | 0.0533 | 0.0508 | 0.0703 | 0.0865 | 0.0574 | 0.07 | 0.0604 | 0.0778 | 0.114 | 0.0599 | 0.0586 | 0.0952 | 0.071 | 0.153 | 0.113 | 0.1 | 0.0765 | 0.106 | 0.0778 | no | -- | no | 12 |
| 71A | MYTI EDU | SB | | | 0.393 | 0.242 | 0.218 | 0.247 | 0.12 | 0.34 | 0.249 | 0.182 | 0.145 | 0.178 | 0.14 | 0.212 | 0.201 | 0.222 | 0.312 | 0.11 | 0.155 | 0.132 | 0.123 | 0.15 | 0.154 | 0.189 | 0.177 | 0.18 | 0.133 | 0.122 | 0.124 | no | D- | no | 11 |
| 51A | MYTI EDU | SB | | | | | | | 0.24 | 0.25 | | | | | | | 1.51 | 0.901 | 0.175 | 0.577 | 2.89 | 3.86 | 0.774 | 1.45 | 1.47 | 0.304 | 0.607 | 0.231 | 0.292 | 0.257 | 0.264 | 1.3 | --(D-) | no | 21 |
| 52A | MYTI EDU | SB | | | | | | | | | 2.35 | 0.321 | 3.01 | 0.976 | 0.372 | 0.282 | 0.437 | 0.178 | 0.26 | 0.258 | 0.58 | 0.34 | 0.298 | 0.264 | 0.195 | 0.228 | 0.163 | 0.135 | 0.244 | 0.143 | 0.129 | no | D-(D-) | no | 17 |
| 10A2 | MYTI EDU | SB | | | | | | | | | | | | | | | | 0.0588 | 0.0617 | 0.0581 | 0.0625 | 0.0503 | 0.052 | 0.0494 | 0.0549 | 0.0503 | 0.0368 | 0.0412 | 0.0391 | 0.0412 | 0.0412 | no | D- | no | 6 |
| I021 | MYTI EDU | SB | | | | | | | | | | | | | | | 0.212 | 0.397 | 0.496 | 0.859 | | 0.356 | 0.436 | 0.319 | | | | | | | | 1.6 | -- | no | 13 |
| I022 | MYTI EDU | SB | | | | | | | | | | | | | | | 0.13 | 0.134 | 0.321 | 0.404 | 0.415 | 0.182 | 0.238 | 0.289 | 0.197 | 0.155 | 0.243 | 0.215 | 0.242 | 0.264 | 0.28 | 1.4 | -- | 1.7 | 12 |
| I023 | MYTI EDU | SB | | | | | | | | | | | | | | | 0.14 | 0.143 | 0.295 | 0.31 | 0.263 | 0.0944 | 0.0959 | 0.15 | 0.142 | 0.129 | 0.164 | 0.177 | 0.138 | 0.131 | 0.131 | no | -- | no | 12 |
| I024 | MYTI EDU | SB | | | | | | | | | | | | | | | 0.107 | 0.18 | 0.45 | 0.543 | 0.425 | 0.12 | 0.295 | 0.238 | 0.233 | 0.21 | 0.291 | 0.275 | 0.225 | 0.245 | 0.24 | 1.2 | -- | 1.1 | 14 |
| I301 | MYTI EDU | SB | | | | | | | | | | | | 0.0466 | | | 0.0656 | 0.0682 | 0.0582 | 0.0675 | 0.0625 | 0.0408 | 0.0677 | 0.05 | 0.0732 | 0.114 | 0.125 | 0.0929 | 0.0778 | 0.0857 | 0.0733 | no | U- | no | 9 |
| I304 | MYTI EDU | SB | | | | | | | | | | | | | | | 0.047 | 0.0694 | 0.0395 | 0.0541 | 0.0503 | 0.0294 | 0.0513 | 0.0462 | 0.0491 | 0.063 | 0.0702 | 0.0615 | 0.0471 | 0.0467 | 0.0571 | no | -- | no | 10 |
| I306 | MYTI EDU | SB | | | | | | | | | | | | | | | 0.0447 | 0.0617 | 0.0387 | 0.061 | 0.0508 | 0.0355 | 0.0353 | 0.0403 | 0.0507 | 0.0744 | 0.069 | 0.05 | 0.05 | 0.0692 | 0.0533 | no | -- | no | 10 |
| I307 | MYTI EDU | SB | | | | | | | | | | | | | | | 0.0383 | 0.0705 | 0.0337 | 0.0465 | 0.0542 | 0.0327 | 0.0488 | 0.0541 | 0.062 | 0.0893 | 0.0952 | 0.0438 | 0.0438 | 0.0714 | 0.0471 | no | -- | no | 12 |
| I711 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | 0.382 | 0.287 | 0.198 | | 0.2 | | | | | | | | no | -? | ? | 9 |
| I712 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | 0.181 | 0.257 | 0.214 | 0.218 | 0.211 | 0.145 | 0.178 | 0.184 | 0.218 | 0.163 | 0.231 | 0.197 | no | -- | 1.1 | 8 |
| I713 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | 0.111 | 0.177 | 0.157 | 0.108 | 0.164 | 0.117 | 0.192 | 0.131 | no | -- | no | 11 |
| I131A | MYTI EDU | SB | | | | | | | | | | | | | | | 0.127 | 0.0691 | 0.0601 | 0.144 | 0.0635 | 0.0337 | 0.0784 | 0.0503 | 0.0652 | 0.1 | 0.0634 | 0.0786 | 0.0533 | 0.0667 | 0.123 | no | -- | no | 14 |
| I201 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | 0.101 | 0.132 | 0.157 | 0.169 | 0.313 | 0.0964 | 0.13 | 0.291 | 0.215 | 0.292 | 0.247 | 0.129 | no | -- | no | 14 |
| I205 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | 0.0974 | 0.171 | 0.205 | 0.167 | 0.218 | 0.151 | 0.142 | 0.306 | 0.285 | 0.267 | 0.314 | 0.18 | no | -- | 1.1 | 11 |
| I965 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | 0.2 | 0.0904 | 0.168 | 0.124 | 0.107 | 0.123 | 0.15 | 0.0864 | no | -- | no | 12 |
| I964 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | 0.136 | 0.0592 | 0.0494 | 0.155 | 0.17 | 0.163 | 0.157 | 0.116 | no | -- | no | 16 |
| I969 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | | 0.0632 | 0.0419 | 0.0359 | 0.103 | 0.0421 | 0.0667 | 0.0467 | 0.04 | no | -- | no | 14 |

## Annual median concentration of Hg (mg/kg w. wt.)

| St | Species | Tissue | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND (ANALYSIS) | SM+3 | POWER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30B | GADU MOR | MU | | | | 0.14 | 0.09 | 0.0732 | 0.0382 | 0.112 | 0.13 | 0.12 | 0.09 | 0.12 | 0.133 | 0.123 | 0.105 | 0.134 | 0.155 | 0.195 | 0.201 | 0.217 | 0.26 | 0.15 | 0.163 | 0.134 | 0.147 | 0.225 | 0.17 | 0.255 | 0.26 | 2.6 | U-(--) | 3.5 | 11 |
| 36B | GADU MOR | MU | 0.0729 | 0.09 | 0.12 | 0.134 | 0.0995 | 0.0905 | 0.0352 | 0.0644 | 0.0708 | 0.1 | 0.08 | 0.07 | 0.079 | 0.056 | 0.081 | 0.068 | 0.113 | 0.089 | 0.094 | 0.072 | 0.083 | 0.082 | 0.043 | 0.053 | 0.085 | 0.094 | 0.081 | 0.108 | 0.086 | no | -- | 1.2 | 11 |
| 77B | GADU MOR | MU | | | | | | | | | | 0.13 | 0.07 | | | | | | | | | | | | | | | | | 0.048 | 0.08 | no | -? | ? | 14 |
| 15B | GADU MOR | MU | | | | | | | | | | 0.09 | 0.06 | 0.042 | 0.023 | 0.059 | 0.0445 | 0.071 | 0.089 | 0.073 | 0.024 | 0.046 | 0.071 | 0.043 | 0.035 | 0.024 | 0.035 | 0.034 | 0.037 | 0.048 | 0.049 | no | -- | no | 13 |
| 53B | GADU MOR | MU | | | | | | 0.196 | | 0.105 | 0.18 | 0.17 | 0.22 | 0.392 | 0.146 | | 0.066 | 0.238 | 0.217 | 0.227 | 0.227 | 0.328 | 0.51 | 0.28 | 0.114 | 0.183 | 0.176 | 0.129 | 0.223 | 0.184 | 0.194 | 1.9 | --(--) | 2.3 | 14 |
| 67B | GADU MOR | MU | | | | | | | 0.115 | 0.0847 | 0.0957 | 0.12 | 0.125 | 0.109 | 0.0925 | 0.113 | 0.071 | 0.087 | 0.124 | 0.053 | 0.059 | 0.085 | 0.069 | 0.064 | 0.042 | 0.035 | 0.058 | 0.045 | 0.055 | 0.038 | 0.065 | no | D- | no | 11 |
| 23B | GADU MOR | MU | | | | | | | | | | 0.11 | 0.09 | 0.07 | 0.062 | 0.058 | 0.081 | 0.058 | 0.082 | 0.088 | 0.079 | 0.092 | 0.086 | 0.089 | 0.067 | 0.096 | 0.08 | 0.096 | 0.114 | 0.109 | 0.057 | no | -- | no | 9 |
| 84B | GADU MOR | MU | | | | 0.05 | 0.04 | 0.0246 | | 0.0439 | | | | | | | | | | | | | | | | | | | | | | no | -? | ? | 13 |
| 92B | GADU MOR | MU | | | | | | | | | | | | | 0.057 | 0.087 | 0.077 | 0.093 | | | | | | | | 0.058 | 0.054 | | | 0.071 | 0.072 | no | -- | no | 8 |
| 98B1 | GADU MOR | MU | | | | | | | | | | | | 0.067 | 0.0615 | 0.068 | 0.074 | 0.038 | 0.107 | 0.081 | 0.043 | | | 0.047 | 0.064 | 0.117 | 0.059 | 0.071 | 0.0938 | 0.032 | 0.025 | no | -- | no | 14 |
| 43B | GADU MOR | MU | | | | | | | | | | | | | | 0.056 | 0.057 | 0.048 | | | | | | | | | | | | 0.0485 | 0.044 | no | -? | ? | 6 |
| 10B | GADU MOR | MU | | | | | | | | | | | | | | 0.044 | 0.041 | 0.037 | 0.018 | 0.016 | 0.02 | 0.012 | 0.009 | 0.012 | 0.016 | 0.015 | 0.018 | 0.019 | 0.018 | 0.014 | 0.03 | no | DY | no | 10 |

Annual median concentration of Hg (mg/kg w. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 33F | PLAT FLE | MU | | | 0.12 | | 0.09 | 0.0769 | 0.019 | 0.0694 | | 0.18 | 0.11 | 0.126 | 0.081 | 0.074 | 0.051 | 0.052 | 0.0795 | 0.049 | 0.078 | 0.05 | 0.049 | 0.042 | 0.038 | 0.036 | 0.045 | 0.031 | 0.071 | 0.04 | 0.049 | no | DY | no | 13 |
| 53F | PLAT FLE | MU | | | | | | | | 0.111 | 0.107 | 0.12 | 0.14 | 0.124 | 0.104 | | 0.0352 | 0.207 | 0.185 | 0.201 | 0.159 | 0.259 | 0.338 | 0.625 | 0.5 | 0.328 | 0.845 | | 0.231 | 0.224 | 0.0741 | no | UY | no | 15 |
| 67F | PLAT FLE | MU | | | | | | | | | | | | | | | | 0.18 | | 0.0555 | 0.037 | 0.069 | 0.05 | 0.057 | 0.066 | 0.064 | 0.061 | 0.041 | 0.045 | 0.071 | 0.065 | no | DY | no | 11 |
| 21F | PLAT FLE | MU | | | | | | | | | | | | | | | | | | | 0.075 | 0.078 | 0.04 | 0.042 | | 0.021 | 0.046 | 0.043 | | | | no | -- | no | 13 |
| 36F | LIMA LIM | MU | | | | | | | | | | 0.07 | 0.06 | 0.086 | 0.078 | 0.056 | 0.058 | 0.073 | 0.038 | 0.09 | 0.054 | 0.066 | 0.053 | 0.068 | 0.061 | 0.074 | 0.12 | 0.1 | 0.111 | 0.054 | 0.118 | 1.2 | -- | no | 11 |
| 15F | LIMA LIM | MU | | | | | | | | | | | 0.09 | | 0.0359 | 0.036 | 0.034 | 0.056 | 0.055 | 0.049 | 0.0459 | | 0.064 | 0.07 | 0.045 | 0.082 | 0.115 | 0.074 | 0.076 | 0.13 | 0.068 | no | U- | no | 11 |
| 22F | LIMA LIM | MU | | | | | | | | | | 0.13 | 0.08 | 0.257 | | 0.082 | 0.153 | | | | | | | | | | | | | | | 1.5 | -? | ? | 17 |
| 21F | LIMA LIM | MU | | | | | | | | | | | | | | | | | | | | | | 0.021 | 0.006 | 0.084 | 0.009 | | 0.137 | | 0.139 | 1.4 | -- | 3.2 | >25 |
| 30F | PLEU PLA | MU | | | | | | | | | | | | 0.0451 | | 0.038 | 0.039 | | | | | | | | | | | | | | | no | -? | ? | <=5 |
| 22F | PLEU PLA | MU | | | | | | | | | | | | | | | | 0.045 | 0.051 | 0.074 | | | | | | | | | | | | no | -? | ? | 7 |
| 98F2 | PLEU PLA | MU | | | | | | | | | | | | | | | | | | | | 0.115 | 0.072 | 0.032 | 0.041 | 0.016 | 0.0732 | 0.045 | 0.044 | 0.02 | 0.019 | no | -- | no | 16 |
| 10F | PLEU PLA | MU | | | | | | | | | | | | | | | | | 0.038 | | 0.0216 | 0.029 | 0.023 | 0.023 | 0.0155 | 0.0273 | 0.024 | | 0.0364 | 0.0272 | 0.017 | no | -- | no | 11 |
| 67F | LEPI WHI | MU | | | 0.39 | | | | 0.35 | 0.329 | 0.253 | 0.52 | 0.07 | 0.174 | 0.205 | 0.477 | 0.379 | 0.418 | 0.284 | 0.11 | 0.154 | 0.114 | 0.111 | 0.123 | 0.131 | 0.199 | 0.096 | 0.108 | 0.09 | 0.098 | 0.09 | m | D- | m | 14 |
| 21F | LEPI WHI | MU | | | | | | | | | | | | | | | | | | | | | | | 0.122 | 0.19 | 0.192 | 0.215 | 0.203 | 0.13 | 0.173 | m | -- | m | 10 |

Annual median concentration of Pb (mg/kg d. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | 1.86 | 1.36 | 3.95 | 2.27 | 2.54 | 1.58 | 2.12 | 2.69 | 36.7 | 2.13 | 1.74 | 1.76 | 2.24 | 2.58 | 3.74 | 3.38 | 4.12 | 3.06 | 3.87 | 2.54 | no | -- | no | 20 |
| 31A | MYTI EDU | SB | | 1.38 | 1.21 | 1.26 | 1.03 | 1.37 | 1.68 | 1.79 | 0.732 | 1.54 | 0.629 | 0.629 | 0.51 | 1.43 | 0.805 | 0.781 | 0.869 | 0.855 | 0.647 | 0.667 | 0.778 | no | -- | no | 12 |
| 35A | MYTI EDU | SB | | 1.44 | 1.07 | 1.68 | 1.2 | 1.28 | 0.507 | 0.628 | 0.664 | 0.759 | 0.714 | 0.522 | 0.866 | 0.571 | 0.574 | 0.813 | 1.21 | 0.805 | 0.571 | 1.11 | 1 | no | DY | no | 11 |
| 36A | MYTI EDU | SB | | 1.01 | 0.847 | 0.787 | 1.12 | 1.39 | 1.24 | 2.04 | 2.17 | 1.57 | 0.995 | 0.943 | 0.618 | 0.449 | 0.585 | 0.956 | 0.578 | 0.559 | 1.13 | 0.471 | | no | DY | no | 12 |
| 71A | MYTI EDU | SB | | 1.16 | 0.745 | 1.72 | 1.42 | 1.92 | 1.49 | 2.21 | 2.83 | 0.867 | 0.903 | 0.774 | 1.45 | 0.919 | 0.915 | 0.866 | 0.962 | 0.98 | 0.797 | 1 | 0.81 | no | D- | no | 12 |
| 76A | MYTI EDU | SB | | 1.77 | 0.968 | 1.5 | 0.913 | | | 0.796 | 1.84 | 1.23 | 1.99 | 0.602 | 0.829 | 0.766 | 0.938 | 1.48 | 0.778 | 1.19 | 1.06 | 1.76 | 1.35 | no | -- | no | 13 |
| 15A | MYTI EDU | SB | | 1.46 | 0.777 | | 0.976 | 1.05 | 0.522 | 0.671 | 1.12 | 1.28 | 1.66 | 2.2 | 0.96 | 0.714 | 0.76 | 0.857 | 1.66 | 0.781 | 1.06 | 0.545 | 0.941 | no | -- | no | 13 |
| 51A | MYTI EDU | SB | | | | | | | 149 | 60.3 | 17.2 | 29.6 | 37.1 | 91.7 | 32.4 | 98.4 | 108 | 42.2 | 77.5 | 17.6 | 29.8 | 23.4 | 21.2 | 7.1 | --(--) | 2.0 | 18 |
| 52A | MYTI EDU | SB | | 12.1 | 313 | 189 | 65.5 | 16.4 | 17.5 | 9.84 | 20.6 | 14.7 | 11.6 | 11 | 21.8 | 21.8 | 16.9 | 16.3 | 9.27 | 8.44 | 15.8 | 9.86 | 5.5 | 1.8 | D-(--) | 1.3 | 21 |
| 56A | MYTI EDU | SB | | 20.7 | 23.4 | 121 | 109 | 24.7 | 46.4 | 27.8 | 37.5 | 15.7 | 30.3 | 28.5 | 30.5 | 42.9 | 27.8 | 24.7 | 32 | 28.9 | 21.4 | 19.6 | 15 | 5.0 | --(D-) | 2.6 | 15 |
| 57A | MYTI EDU | SB | | 10.5 | 12.1 | 33.3 | 19.2 | 15.1 | 13.2 | 5.6 | 13.7 | 6.15 | 10.4 | 10.3 | 11.9 | 9.59 | 7.02 | 5.79 | 11.3 | 10.4 | 4.57 | 4.78 | 4.28 | 1.4 | D-(--) | no | 13 |
| 63A | MYTI EDU | SB | | 12.1 | 10.1 | 15.4 | 10.9 | 7.22 | 12.1 | 7.6 | 6.1 | 6.39 | 4.84 | 4.52 | 7.05 | 6.57 | 6.3 | 1.92 | 4.53 | 5.36 | 4.05 | 2.63 | 3.19 | 1.1 | D-(--) | no | 12 |
| 65A | MYTI EDU | SB | | 5.61 | 3.78 | 5.19 | 6.53 | 3.28 | 4.73 | 2.41 | 3 | 1.77 | 1.63 | 2.45 | 2.84 | 3.05 | 2.82 | 1.25 | 3 | 4.01 | 1.56 | 1.75 | 3.1 | 1.0 | D-(--) | no | 13 |
| 69A | MYTI EDU | SB | | | | 4.62 | 3.42 | 2.8 | 3.17 | 4.02 | 3.66 | 1.98 | 3.4 | 2.27 | 3.91 | 2.76 | 2.53 | 0.957 | 1.74 | 2.01 | 1.65 | 1.84 | 1.2 | no | D- | no | 12 |
| 22A | MYTI EDU | SB | | 1.37 | 1.46 | 2.78 | 1.87 | 1.39 | 1.18 | 1.51 | 1.37 | 1.21 | 1.7 | 1.3 | 1.21 | 0.884 | 1.46 | 1.79 | 1.88 | 1.31 | 2.6 | 2.29 | 0.739 | no | -- | no | 12 |
| 23A | MYTI EDU | SB | | 1.42 | 1.47 | | | | | | | | | | | | | 0.878 | 2.13 | | | | | no | -? | ? | 15 |
| 24A | MYTI EDU | SB | | 1.42 | 1.21 | | | | | | | | | | | | | 2.01 | 1.44 | | | | | no | -? | ? | 9 |
| 82A | MYTI EDU | SB | | | 1.28 | 0.933 | 0.916 | | 0.622 | 0.674 | | | | | | | | 0.558 | 0.529 | | | | | no | -- | no | 7 |
| 84A | MYTI EDU | SB | | | 1.01 | 1.15 | 1.38 | | 1.38 | 0.833 | | | | | | | | 1.11 | 1 | | | | | no | -- | no | 9 |
| 87A | MYTI EDU | SB | | | 0.974 | 0.87 | 0.634 | | 1.4 | 2.47 | | | | | | | | 0.421 | 0.3 | | | | | no | -- | no | 13 |
| 25A | MYTI EDU | SB | | | | 2.68 | 1.77 | | | | | | | | | | | 2.01 | 1.09 | | | | | no | -? | ? | 13 |
| 26A | MYTI EDU | SB | | | | 1.42 | 1.38 | | | | | | | | | | | 1.87 | 1.4 | | | | | no | -? | ? | 8 |
| 27A | MYTI EDU | SB | | | | 1.83 | | | | | | | | | | | | 0.941 | 0.833 | | | | | no | D? | ? | <=5 |
| 28A | MYTI EDU | SB | | | | 1.39 | 1.87 | | | | | | | | | | | 0.957 | 1.29 | | | | | no | -? | ? | 10 |
| 91A | MYTI EDU | SB | | | | 0.898 | 1.46 | 2.01 | | | | | | | | | | | 0.778 | | | | | no | -? | ? | 15 |
| 92A1 | MYTI EDU | SB | | | | 0.933 | 0.628 | 1.09 | 0.664 | 0.654 | 2.18 | | | | | | | | | | | | | no | -- | no | 16 |
| 93A | MYTI EDU | SB | | | | 1.14 | 1.62 | | | | | | | | | | | 2.13 | 1.05 | | | | | no | -? | ? | 14 |
| 94A | MYTI EDU | SB | | | | 0.765 | 1.18 | | | | | | | | | | | 0.305 | 0.482 | | | | | no | -? | ? | 13 |
| 95A | MYTI EDU | SB | | | | 1.04 | 2.16 | | | | | | | | | | | 0.585 | 0.463 | | | | | no | -? | ? | 14 |
| 96A | MYTI EDU | SB | | | | 1.13 | 0.988 | | | | | | | | | | | 0.488 | 0.835 | | | | | no | -? | ? | 12 |
| 97A | MYTI EDU | SB | | | | 1.37 | 1.26 | | | | | | | | | | | 0.495 | 0.47 | | | | | no | D? | ? | <=5 |
| 98A2 | MYTI EDU | SB | | | | | | | | | 1.54 | | 1.59 | 1.49 | 1.34 | 0.892 | 1.16 | 1.09 | 0.54 | 0.667 | 0.699 | 0.706 | 0.833 | no | D- | no | 9 |
| 98X | MYTI EDU | SB | | | | | | 4.34 | 3.12 | 4.11 | | | | | | | | | | | | | | 1.4 | -? | ? | 11 |
| 99A | MYTI EDU | SB | | | | 1.2 | 0.752 | | | | | | | | | | | 0.697 | 0.529 | | | | | no | -? | ? | 11 |
| 41A | MYTI EDU | SB | | | | | | 1.29 | 0.9 | 0.793 | 0.651 | | | | | | | | | 0.63 | 0.356 | | | no | Dm | no | 11 |
| 42A | MYTI EDU | SB | | | | | | 1.54 | 0.761 | | | | | | | | | | | 0.557 | 0.384 | | | no | -? | ? | 13 |
| 43A | MYTI EDU | SB | | | | | | 1.56 | 1.51 | | 0.855 | | | | | | | | | 0.713 | 0.572 | | | no | D? | ? | 10 |
| 44A | MYTI EDU | SB | | | | | | 2.81 | 2.57 | 1.66 | 1.15 | | | | | | | | | 0.82 | 1.81 | | | no | -- | no | 14 |
| 45A | MYTI EDU | SB | | | | | | 1.1 | 1.99 | | | | | | | | | | | 0.69 | 0.639 | | | no | -? | ? | 12 |
| 46A | MYTI EDU | SB | | | | | | 1.26 | 1.57 | 1.38 | | | | | | | | | | 0.87 | 0.681 | | | no | D? | ? | 8 |
| 47A | MYTI EDU | SB | | | | | | 1.09 | 1.18 | | | | | | | | | | | 0.603 | 0.675 | | | no | D? | ? | 7 |
| 48A | MYTI EDU | SB | | | | | | 0.682 | 1.08 | 0.333 | | | | | | | | | | 0.451 | 0.448 | | | no | -? | ? | 15 |
| 49A | MYTI EDU | SB | | | | | | 2.38 | 7.65 | | | | | | | | | | | 2.73 | 1.87 | | | no | -? | ? | 18 |
| 10A2 | MYTI EDU | SB | | | | | | | | 0.735 | 0.807 | 2.34 | 1.57 | 1.44 | 1.39 | 1.8 | 1.65 | 1.02 | 0.674 | 0.988 | 1.63 | 1.06 | 0.824 | no | -- | no | 13 |
| 11X | MYTI EDU | SB | | | | | | | | | 0.743 | 0.521 | 0.314 | 1.09 | 2.32 | 0.74 | 0.279 | 0.37 | 0.323 | 0.539 | 0.331 | 0.389 | 0.3 | no | -- | no | 17 |

Annual median concentration of Pb (mg/kg d. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | 1.86 | 1.36 | 3.95 | 2.27 | 2.54 | 1.58 | 2.12 | 2.69 | 36.7 | 2.13 | 1.74 | 1.76 | 2.24 | 2.58 | 3.74 | 3.38 | 4.12 | 3.06 | 3.87 | 2.54 | no | -- | no | 20 |
| 71A | MYTI EDU | SB | | 1.16 | 0.745 | 1.72 | 1.42 | 1.92 | 1.49 | 2.21 | 2.83 | 0.867 | 0.903 | 0.774 | 1.45 | 0.919 | 0.915 | 0.866 | 0.962 | 0.98 | 0.797 | 1 | 0.81 | no | D- | no | 12 |
| 51A | MYTI EDU | SB | | | | | | | 149 | 60.3 | 17.2 | 29.6 | 37.1 | 91.7 | 32.4 | 98.4 | 108 | 42.2 | 77.5 | 17.6 | 29.8 | 23.4 | 21.2 | 7.1 | --(--) | 2.0 | 18 |
| 52A | MYTI EDU | SB | | 12.1 | 313 | 189 | 65.5 | 16.4 | 17.5 | 9.84 | 20.6 | 14.7 | 11.6 | 11 | 21.8 | 21.8 | 16.9 | 16.3 | 9.27 | 8.44 | 15.8 | 9.86 | 5.5 | 1.8 | D-(--) | 1.3 | 21 |
| 10A2 | MYTI EDU | SB | | | | | | | | 0.735 | 0.807 | 2.34 | 1.57 | 1.44 | 1.39 | 1.8 | 1.65 | 1.02 | 0.674 | 0.988 | 1.63 | 1.06 | 0.824 | no | -- | no | 13 |
| I021 | MYTI EDU | SB | | | | | | | 1.06 | 2.29 | 1.65 | 2.12 | | 0.99 | 1.65 | 1.19 | | | | | | | | no | -- | no | 13 |
| I022 | MYTI EDU | SB | | | | | | | 1 | 0.599 | 1.18 | 1.31 | 1.94 | 1.05 | 0.952 | 1.27 | 1.36 | 3.51 | 1.26 | 1.34 | 1.67 | 1.55 | 1.5 | no | -- | no | 13 |
| I023 | MYTI EDU | SB | | | | | | | 0.774 | 1.27 | 1.38 | 1.7 | 1.38 | 0.636 | 0.616 | 0.754 | 1.28 | 2.34 | 0.901 | 1.05 | 0.846 | 0.769 | 0.769 | no | -- | no | 13 |
| I024 | MYTI EDU | SB | | | | | | | 0.971 | 1.1 | 1.16 | 1.7 | 1.79 | 0.617 | 1.33 | 1.1 | 1.73 | 2.68 | 1.06 | 1.18 | 0.917 | 1.45 | 1.4 | no | -- | no | 13 |
| I301 | MYTI EDU | SB | | | | 4.38 | | | | | | 2.47 | 2.11 | 1.32 | 3.16 | 1.98 | 1.77 | 3.07 | 2.15 | 5.38 | 2.94 | 2.63 | 2 | no | -- | no | 13 |
| I304 | MYTI EDU | SB | | | | | | | | | | 2.23 | 1.19 | 0.765 | 1.88 | 1.3 | 1.16 | 1.73 | 1.95 | 2.16 | 1.59 | 1.47 | 1.5 | no | -- | no | 12 |
| I306 | MYTI EDU | SB | | | | | | | | | | 1.34 | 0.678 | 0.542 | 1.03 | 0.658 | 0.704 | 1.08 | 1.09 | 0.938 | 0.867 | 1.15 | 0.714 | no | -- | no | 11 |
| I307 | MYTI EDU | SB | | | | | | | | | | 1.05 | 0.798 | 0.513 | 1.01 | 1.26 | 1.01 | 1.07 | 1.39 | 1.04 | 0.875 | 1.21 | 0.875 | no | -- | no | 11 |
| I201 | MYTI EDU | SB | | | | | | | 3.54 | 4.39 | 4.77 | 4.67 | 4.43 | 6.41 | 3.78 | 8.21 | 1.87 | 3.33 | 4.31 | 3.41 | 4.75 | 4.44 | 1.88 | no | -- | no | 14 |
| I205 | MYTI EDU | SB | | | | | | | 4.77 | | 6.96 | 4 | 5.97 | 7.09 | 6.15 | 9.27 | 3.4 | 2.76 | 6.3 | 5.26 | 3.33 | 7.29 | 2.8 | no | -- | 1.1 | 14 |
| I965 | MYTI EDU | SB | | | | | | | | | | | | | 20 | 12.7 | 6.45 | 13.1 | 12.5 | 13.7 | 16.6 | 29.4 | 18.4 | 6.1 | -- | 10.6 | 13 |
| I962 | MYTI EDU | SB | | | | | | | 4.44 | 5.34 | 3.55 | 2.99 | | | | | | | | | | | | no | -? | ? | 9 |
| I964 | MYTI EDU | SB | | | | | | | | | | | | | | 8.75 | 3.49 | 6.57 | 13 | 13.3 | 13.7 | 15.4 | 10.7 | 3.6 | -- | 5.3 | 14 |
| I969 | MYTI EDU | SB | | | | | | | 2.47 | 2.08 | 1.62 | 2.91 | 5.13 | 3 | 2.57 | 2.58 | 1.85 | 1.59 | 3.92 | 2.11 | 1.94 | 1.93 | 2.13 | no | -- | no | 12 |

Annual median concentration of Pb (mg/kg w. wt.)

| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | ANALYSIS TRND | SM+3 | POWER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30B | GADU MOR | LI | | 0.2 | 0.115 | 0.249 | 0.105 | 0.12 | 0.11 | 0.06 | 0.0949 | 0.163 | 0.85 | 0.24 | 0.22 | 0.513 | 0.24 | 0.17 | 0.138 | 0.101 | 0.29 | 0.3 | 0.13 | 1.3 | -- | 2.3 | 17 |
| 36B | GADU MOR | LI | | 0.115 | 0.05 | 0.03 | 0.02 | 0.03 | 0.02 | 0.03 | 0.04 | 0.03 | 0.04 | 0.04 | 0.03 | 0.0061 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | no | D- | no | 14 |
| 77B | GADU MOR | LI | | 0.135 | 0.195 | | | | | | | | | | | | | | | | | 0.02 | 0.02 | no | D? | ? | 11 |
| 15B | GADU MOR | LI | | 0.17 | 0.06 | 0.03 | 0.03 | 0.03 | 0.02 | 0.03 | 0.04 | 0.03 | 0.03 | 0.04 | 0.03 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | no | DY | no | 12 |
| 53B | GADU MOR | LI | | 0.19 | 0.26 | 0.14 | 0.03 | | 0.02 | 0.0748 | 0.07 | 0.105 | 0.115 | 0.13 | 0.13 | 0.142 | 0.04 | 0.09 | 0.082 | 0.0453 | 0.1 | 0.16 | 0.17 | 1.7 | UY(--) | 2.6 | 16 |
| 67B | GADU MOR | LI | | 0.13 | 0.18 | 0.03 | 0.0748 | 0.09 | 0.04 | 0.04 | 0.09 | 0.03 | 0.04 | 0.04 | 0.03 | 0.0149 | 0.02 | 0.02 | 0.0075 | 0.02 | 0.02 | 0.02 | 0.02 | no | D-(--) | no | 16 |
| 23B | GADU MOR | LI | | 0.06 | 0.08 | 0.03 | 0.03 | 0.03 | 0.02 | 0.03 | 0.04 | 0.03 | 0.04 | 0.03 | 0.03 | 0.0061 | 0.02 | 0.02 | 0.02 | 0.0423 | 0.02 | 0.02 | 0.02 | no | D- | no | 14 |
| 92B | GADU MOR | LI | | | | | 0.02 | 0.03 | 0.03 | 0.04 | | | | | | | | 0.02 | 0.02 | | | 0.02 | 0.02 | no | -- | no | 6 |
| 98B1 | GADU MOR | LI | | | | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 | 0.05 | 0.03 | 0.03 | | | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | no | DY | no | 10 |
| 43B | GADU MOR | LI | | | | | | 0.03 | 0.03 | 0.03 | | | | | | | | | | | | 0.02 | 0.02 | no | D? | ? | <=5 |
| 10B | GADU MOR | LI | | | | | | 0.03 | 0.02 | 0.04 | 0.04 | 0.04 | 0.03 | 0.04 | 0.03 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | no | DY | no | 9 |

Annual median concentration of Pb (mg/kg w. wt.)

| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | ANALYSIS TRND | SM+3 | POWER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33F | PLAT FLE | LI | | 0.24 | 0.35 | 0.06 | 0.03 | 0.03 | 0.02 | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.03 | 0.0295 | 0.03 | 0.02 | 0.03 | 0.0439 | 0.02 | 0.03 | 0.03 | no | DY | no | 13 |
| 53F | PLAT FLE | LI | | 0.71 | 0.81 | 0.41 | 0.23 | | 0.0245 | 0.46 | 0.35 | 0.52 | 0.46 | 0.357 | 0.57 | 1.29 | 0.73 | 0.44 | 1.35 | | 0.56 | 0.7 | 0.0447 | no | -- | no | 22 |
| 67F | PLAT FLE | LI | | | | | | | | 0.35 | | 0.03 | 0.03 | 0.03 | 0.03 | 0.0078 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | no | DY | no | 15 |
| 21F | PLAT FLE | LI | | | | | | | | | | | 0.04 | 0.0447 | 0.06 | 0.0461 | | 0.04 | 0.1 | 0.11 | | | | no | -- | no | 12 |
| 36F | LIMA LIM | LI | | 0.6 | 0.07 | 0.04 | 0.07 | 0.03 | 0.02 | 0.03 | 0.05 | 0.05 | 0.05 | 0.06 | 0.04 | 0.0477 | 0.03 | 0.05 | 0.05 | 0.0473 | 0.05 | 0.06 | 0.04 | no | DY | no | 15 |
| 77F | LIMA LIM | LI | | | 0.23 | | | | | | | | | | | | | | | | | 0.06 | 0.09 | no | -? | ? | 13 |
| 15F | LIMA LIM | LI | | | 0.07 | | 0.0408 | 0.03 | 0.02 | 0.03 | 0.05 | 0.04 | 0.0346 | | 0.05 | 0.0212 | 0.02 | 0.03 | 0.03 | 0.037 | 0.02 | 0.03 | 0.02 | no | -- | no | 12 |
| 22F | LIMA LIM | LI | | 0.25 | 0.16 | 0.0424 | | 0.06 | 0.07 | | | | | | | | | | | | | | | no | -? | ? | 18 |
| 21F | LIMA LIM | LI | | | | | | | | | | | | | | 0.0293 | 0.02 | 0.05 | 0.02 | | 0.08 | | 0.24 | no | Um | 1.1 | 17 |
| 30F | PLEU PLA | LI | | | | 0.739 | | 0.54 | 0.57 | | | | | | | | | | | | | | | 2.9 | -? | ? | 7 |
| 22F | PLEU PLA | LI | | | | | | | | 0.28 | 0.28 | 0.46 | | | | | | | | | | | | 2.3 | -? | ? | 9 |
| 98F2 | PLEU PLA | LI | | | | | | | | | | | | 0.104 | 0.04 | 0.0682 | 0.04 | 0.02 | 0.204 | 0.15 | 0.06 | 0.02 | 0.02 | no | -- | no | 21 |
| 10F | PLEU PLA | LI | | | | | | | | | 0.15 | | 0.0648 | 0.08 | 0.05 | 0.0583 | 0.0447 | 0.0447 | 0.03 | | 0.0346 | 0.0592 | 0.03 | no | D- | no | 11 |
| 67F | LEPI WHI | LI | | 0.19 | 0.07 | 0.06 | 0.07 | 0.04 | 0.07 | 0.03 | 0.04 | 0.04 | 0.03 | 0.03 | 0.04 | 0.0312 | 0.02 | 0.0245 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | m | D- | m | 11 |
| 21F | LEPI WHI | LI | | | | | | | | | | | | | | | 0.02 | 0.02 | 0.02 | 0.031 | 0.02 | 0.02 | 0.02 | m | -- | m | 9 |

Annual median concentration of Cu (mg/kg d. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | | 4.57 | | 7.45 | 4.96 | 5.48 | 5.97 | 10.3 | 10.5 | 5.84 | 6.67 | 8.56 | 6.94 | 7.69 | 9.47 | 7.72 | 8.01 | 6.49 | 5.81 | 6.29 | 7.68 | 8.55 | 9.31 | 8.2 | 7.35 | 7.44 | 8.44 | no | -- | no | 9 |
| 31A | MYTI EDU | SB | | 7.03 | 6.57 | | | 4.44 | 4.52 | 4.51 | 9.04 | 11 | 5.49 | 5.67 | 6.21 | 7.26 | 6.61 | 6.08 | 8.08 | 7.55 | 5.54 | 5.82 | 5.47 | 6.31 | 6.73 | 6.86 | 8.4 | 6.38 | 5.87 | 6.23 | no | -- | no | 9 |
| 35A | MYTI EDU | SB | | 6.32 | 3.62 | | 8.06 | 4.89 | 4.58 | 5.26 | 8.02 | 10.1 | 6.56 | 6.34 | 6.61 | 6.41 | 6.94 | 6.81 | 7.23 | 7.14 | 5.49 | 6.19 | 6.51 | 7.38 | 8.31 | 7.94 | 6.55 | 5.57 | 6.58 | 6.48 | no | -- | no | 9 |
| 36A | MYTI EDU | SB | | 6.29 | 3.57 | | 6.08 | 4.47 | 4.87 | 4.3 | 5.5 | 9.23 | 5.16 | 5.51 | 5.63 | 7.67 | 9.06 | 6.86 | 6.83 | 6.2 | 5.52 | 5.83 | 5.21 | 6.32 | 6.96 | 6.24 | 6.27 | 6.19 | 6.29 | | no | -- | no | 9 |
| 71A | MYTI EDU | SB | | 8.47 | 5.24 | | | 6.08 | 8.43 | 6.99 | 8.33 | 10.3 | 7.4 | 7.88 | 7.18 | 8.11 | 7.66 | 9.44 | 7.5 | 7.57 | 8.81 | 7.53 | 7.12 | 11.2 | 8.81 | 8.93 | 10.1 | 8.13 | 7.72 | 6.22 | no | -- | no | 8 |
| 76A | MYTI EDU | SB | | | | | | | | | 8.51 | 10.8 | 5.65 | 5.57 | | | 6.65 | 7.8 | 9.14 | 10.2 | 6.93 | 7.67 | 6.39 | 9.76 | 7.99 | 7.76 | 7 | 6.29 | 6.86 | 6.76 | no | -- | no | 9 |
| 15A | MYTI EDU | SB | | | | | | | | | 5.72 | 7.21 | | 5.5 | 5.25 | 5.26 | 7.32 | 6.14 | 7.62 | 7.34 | 7.62 | 9.47 | 5.68 | 8.07 | 6.47 | 6.81 | 6.81 | 7.59 | 5.89 | 6.24 | no | -- | no | 8 |
| 51A | MYTI EDU | SB | | | | | | 7.14 | 6.14 | | | | | | | 10.2 | 10.2 | 7.44 | | 8.21 | | | | | | | | | | 4.86 | no | -- | no | 8 |
| 52A | MYTI EDU | SB | | | | | | | | 8.4 | 7.49 | 72.1 | 9.35 | 8.45 | 6.98 | 7.03 | 6.28 | 7.73 | 6.47 | 5.53 | 6.97 | 5.88 | 7.45 | 9.19 | 6.21 | 7.47 | 5.56 | 8.11 | 5.27 | 6.94 | no | -- | no | 16 |
| 56A | MYTI EDU | SB | | | | | | 8.07 | 7.87 | 8.82 | 5.37 | 7.54 | 7.4 | 9.15 | 6.36 | 7.71 | 6.59 | 7.79 | 7.18 | 8.17 | 8.72 | 5.77 | 6 | 9.1 | 5.36 | 8 | 7.47 | 5.61 | 7 | 6.56 | no | -- | no | 9 |
| 57A | MYTI EDU | SB | | | | | | 8.21 | 6.33 | 6.01 | 6.16 | 7.27 | 6.59 | 6.77 | 6.43 | 5.62 | 5.54 | 6.98 | 6.91 | 6.39 | 5.13 | 5.81 | 7.21 | 5.98 | 3.26 | 6.88 | 8.29 | 4.33 | 5.22 | 4.75 | no | -- | no | 10 |
| 63A | MYTI EDU | SB | | | | | | 9.84 | 6.16 | 5.11 | 6.84 | 11.1 | 6.32 | 6.11 | 6.71 | 6.84 | 6.56 | 6.12 | 5.61 | 5.13 | 5.69 | 5.46 | 6.67 | 7.95 | 2.39 | 6.27 | 7 | 5.57 | 4.11 | 5.82 | no | -- | no | 12 |
| 65A | MYTI EDU | SB | | | | | | 7.98 | 4.94 | 5.19 | 12.2 | 8.14 | 5.51 | 6 | 5.12 | 5.66 | 5.82 | 5.59 | 5.14 | 5.05 | 5.27 | 5.93 | 6.54 | 7.71 | 2.81 | 6.94 | 6.76 | 4.62 | 6.75 | 5.37 | no | -- | no | 12 |
| 69A | MYTI EDU | SB | | | | | | | | | | | 6.19 | 5.32 | 5.41 | 6.26 | 7.28 | 5.56 | 5.22 | 7.22 | 8.51 | 6.82 | 5.81 | 12.6 | 3.06 | 5.84 | 5.55 | 6.06 | 6.39 | 5.61 | no | -- | no | 12 |
| 22A | MYTI EDU | SB | | | | | | | | | 6.35 | 6.69 | 5.38 | 5.76 | 6.28 | 6.81 | 9.29 | 4.16 | 8.56 | 7.47 | 8.54 | 5.27 | 5.86 | 7.81 | 14.9 | 6.82 | 8.72 | 145 | 9.82 | 6.39 | no | -- | 1.1 | 20 |
| 23A | MYTI EDU | SB | | | | | | | | | 5.58 | 6.52 | | | | | | | | | | | | | 6.64 | 6.93 | | | | | no | -? | ? | 6 |
| 24A | MYTI EDU | SB | | | | | | | | | 5.78 | 7.01 | | | | | | | | | | | | | 6.78 | 5.91 | | | | | no | -? | ? | 7 |
| 82A | MYTI EDU | SB | | | 6.38 | | | 4.69 | 5.77 | 7.49 | | 11.8 | 6.87 | 9.61 | | 7.44 | 7.93 | | | | | | | | 5.52 | 6.94 | | | | | no | -- | no | 10 |
| 84A | MYTI EDU | SB | | | 10.3 | | 96.8 | 56.8 | 39.3 | 26.8 | | 17.1 | 22.2 | 24 | | 9.51 | 7.21 | | | | | | | | 8.07 | 8.39 | | | | | no | -- | 1.1 | 17 |
| 87A | MYTI EDU | SB | | | 4.57 | | | 20.1 | 8.35 | 5.88 | | 7.28 | 6.3 | 6.88 | | 7.63 | 7.52 | | | | | | | | 6.92 | 5.95 | | | | | no | -- | no | 13 |
| 25A | MYTI EDU | SB | | | | | | | | | | | 6.48 | 5.77 | | | | | | | | | | | 6.48 | 6.05 | | | | | no | -? | ? | 6 |
| 26A | MYTI EDU | SB | | | | | | | | | | | 6.98 | 6.28 | | | | | | | | | | | 6.41 | 6.75 | | | | | no | -? | ? | <=5 |
| 27A | MYTI EDU | SB | | | | | | | | | | | 6.92 | | | | | | | | | | | | 5.89 | 5.52 | | | | | no | -? | ? | <=5 |
| 28A | MYTI EDU | SB | | | | | | | | | | | 5.36 | 5.18 | | | | | | | | | | | 5.69 | 8.12 | | | | | no | -? | ? | 9 |
| 91A | MYTI EDU | SB | | | | | | | | | | | 6.59 | 6.36 | 8.36 | | | | | | | | | | | 7.33 | | | | | no | -? | ? | 8 |
| 92A1 | MYTI EDU | SB | | | | | | | | | | | 6.65 | 6.03 | 7.56 | 6.26 | 7.48 | 6.4 | | | | | | | | | | | | | no | -- | no | 7 |
| 93A | MYTI EDU | SB | | | | | | | | | | | 6.46 | 6.79 | | | | | | | | | | | 7.93 | 8.11 | | | | | no | U? | ? | <=5 |
| 94A | MYTI EDU | SB | | | | | | | | | | | 6.81 | 6.72 | | | | | | | | | | | 6.72 | 5.77 | | | | | no | -? | ? | 6 |
| 95A | MYTI EDU | SB | | | | | | | | | | | 7.84 | 6.44 | | | | | | | | | | | 7.95 | 7.28 | | | | | no | -? | ? | 7 |
| 96A | MYTI EDU | SB | | | | | | | | | | | 7.22 | 6.2 | | | | | | | | | | | 6.46 | 6.68 | | | | | no | -? | ? | 6 |
| 97A | MYTI EDU | SB | | | | | | | | | | | 8.12 | 7.01 | | | | | | | | | | | 6.77 | 7.35 | | | | | no | -? | ? | 6 |
| 98A2 | MYTI EDU | SB | | | | | | | | | | | | | | | | 5.5 | | 5.94 | 6.84 | 6.1 | 6.58 | 7.22 | 8.34 | 7.13 | 8.2 | 5.94 | 7.12 | 6.68 | no | -- | no | 7 |
| 98X | MYTI EDU | SB | | | | | | | | | | | | | 8.99 | 8.91 | 7.74 | | | | | | | | | | | | | | no | -? | ? | <=5 |
| 99A | MYTI EDU | SB | | | | | | | | | | | 8.65 | 7.29 | | | | | | | | | | | 6.72 | 7.11 | | | | | no | -? | ? | 6 |
| 41A | MYTI EDU | SB | | | | | | | | | | | | | 6.83 | 8.16 | 7.64 | 4.76 | | | | | | | | | 7.5 | 7.29 | | | no | -- | no | 10 |
| 42A | MYTI EDU | SB | | | | | | | | | | | | | 7.4 | 7.61 | | | | | | | | | | | 7.09 | 6.33 | | | no | -? | ? | <=5 |
| 43A | MYTI EDU | SB | | | | | | | | | | | | | 7.79 | 9.32 | | 6.32 | | | | | | | | | 9.38 | 5.84 | | | no | -? | ? | 11 |
| 44A | MYTI EDU | SB | | | | | | | | | | | | | 6.56 | 9.56 | 7.78 | 6.86 | | | | | | | | | 9.1 | 5.81 | | | no | -- | no | 10 |
| 45A | MYTI EDU | SB | | | | | | | | | | | | | 6.22 | 7.39 | | | | | | | | | | | 5.95 | 5.89 | | | no | -? | ? | 6 |
| 46A | MYTI EDU | SB | | | | | | | | | | | | | 6.63 | 7.43 | 8 | | | | | | | | | | 8.15 | 6.61 | | | no | -? | ? | 7 |
| 47A | MYTI EDU | SB | | | | | | | | | | | | | 5.7 | 5.84 | | | | | | | | | | | 6.5 | 6.32 | | | no | U? | ? | <=5 |
| 48A | MYTI EDU | SB | | | | | | | | | | | | | 6.57 | 7.74 | 7.1 | | | | | | | | | | 5.76 | 5.26 | | | no | D? | ? | 6 |
| 49A | MYTI EDU | SB | | | | | | | | | | | | | 7.36 | 9.68 | | | | | | | | | | | 8 | 6.17 | | | no | -? | ? | 9 |
| 10A2 | MYTI EDU | SB | | | | | | | | | | | | | | | 7.84 | 5.71 | 7.9 | 6.93 | 6.17 | 5.43 | 6.4 | 7.42 | 6.95 | 6.79 | 8 | 6.26 | 6.41 | 6.24 | no | -- | no | 7 |
| 11X | MYTI EDU | SB | | | | | | | | | | | | | | | | 5.51 | 5.45 | 6.49 | 5.27 | 5.45 | 6.51 | 7.07 | 6.54 | 6.1 | 8.61 | 5.9 | 5.82 | 5.9 | no | -- | no | 7 |

Annual median concentration of Zn (mg/kg d. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | | 138 | 90.5 | 140 | 120 | 93.1 | 76.2 | 161 | 116 | 147 | 104 | 117 | 109 | 114 | 126 | 173 | 106 | 93.4 | 92.3 | 116 | 123 | 141 | 118 | 125 | 106 | 134 | 117 | no | -- | no | 9 |
| 31A | MYTI EDU | SB | | 88.1 | 132 | 76.9 | 106 | 66.3 | 67.7 | 58.1 | 181 | 128 | 125 | 96.4 | 96.8 | 151 | 103 | 128 | 120 | 112 | 84 | 83.1 | 92.9 | 127 | 128 | 116 | 108 | 100 | 104 | 110 | no | -- | no | 10 |
| 35A | MYTI EDU | SB | | 91.9 | 79.6 | 75.9 | 89.8 | 68.4 | 81.5 | 83.2 | 166 | 139 | 131 | 119 | 97.6 | 82.9 | 94.3 | 103 | 112 | 111 | 66.1 | 72.3 | 84.6 | 106 | 131 | 118 | 80.5 | 83.5 | 92.6 | 80.4 | no | UY | no | 9 |
| 36A | MYTI EDU | SB | | 66.5 | 85.8 | 66.1 | 57.7 | 61.5 | 73.6 | 65.3 | 126 | 127 | 104 | 84 | 121 | 115 | 137 | 145 | 105 | 95.5 | 125 | 100 | 102 | 125 | 98.6 | 90.6 | 83.6 | 91.9 | 90.6 | | no | UY | no | 9 |
| 71A | MYTI EDU | SB | | 124 | 125 | 77 | 115 | 101 | 169 | 128 | 162 | 143 | 166 | 120 | 157 | 150 | 122 | 192 | 114 | 114 | 99.4 | 97.9 | 134 | 121 | 117 | 105 | 95.3 | 85.6 | 104 | 86.1 | no | DY | no | 9 |
| 76A | MYTI EDU | SB | | | | | | | | | 158 | 127 | 124 | 57.6 | | | 112 | 135 | 137 | 132 | 83.1 | 116 | 123 | 127 | 128 | 107 | 92.6 | 121 | 116 | 114 | no | -- | no | 9 |
| 15A | MYTI EDU | SB | | | | | | | | | 157 | 144 | | 71.4 | 88.9 | 62.6 | 232 | 107 | 127 | 105 | 127 | 83.3 | 110 | 101 | 114 | 103 | 112 | 102 | 92.6 | 107 | no | -- | no | 11 |
| 51A | MYTI EDU | SB | | | | | | 378 | 253 | | | | | | | 386 | 223 | 120 | | 170 | | | | | | | | | | 83.3 | no | -- | no | 13 |
| 52A | MYTI EDU | SB | | | | | | | | 824 | 272 | 453 | 408 | 218 | 141 | 196 | 183 | 247 | 160 | 143 | 134 | 180 | 90.6 | 137 | 106 | 104 | 90.6 | 106 | 95 | 94.1 | no | D- | no | 11 |
| 56A | MYTI EDU | SB | | | | | | 869 | 410 | 1170 | 572 | 479 | 418 | 388 | 211 | 290 | 246 | 377 | 143 | 271 | 225 | 158 | 146 | 151 | 178 | 171 | 140 | 99.3 | 125 | 101 | no | D- | no | 12 |
| 57A | MYTI EDU | SB | | | | | | 378 | 263 | 441 | 520 | 292 | 256 | 147 | 173 | 182 | 115 | 223 | 121 | 207 | 167 | 124 | 108 | 98.8 | 84.4 | 112 | 105 | 63.8 | 78.9 | 67 | no | D- | no | 11 |
| 63A | MYTI EDU | SB | | | | | | 579 | 216 | 241 | 509 | 392 | 207 | 122 | 122 | 189 | 147 | 170 | 129 | 115 | 115 | 127 | 106 | 119 | 54.6 | 110 | 113 | 98.2 | 77.9 | 82.5 | no | D- | no | 12 |
| 65A | MYTI EDU | SB | | | | | | 191 | 156 | 199 | 424 | 308 | 131 | 139 | 118 | 166 | 147 | 184 | 121 | 152 | 154 | 155 | 145 | 151 | 69.6 | 139 | 147 | 94.8 | 128 | 92.9 | no | D- | no | 12 |
| 69A | MYTI EDU | SB | | | | | | | | | | | 135 | 102 | 135 | 163 | 161 | 218 | 144 | 201 | 133 | 190 | 136 | 177 | 84 | 123 | 92.5 | 106 | 114 | 98 | no | DY | no | 10 |
| 22A | MYTI EDU | SB | | | | | | | | | 172 | 162 | 135 | 116 | 98 | 144 | 221 | 110 | 128 | 122 | 72.1 | 117 | 90.3 | 134 | 142 | 121 | 88.8 | 147 | 118 | 103 | no | -- | no | 10 |
| 23A | MYTI EDU | SB | | | | | | | | | 136 | 133 | | | | | | | | | | | | | 105 | 113 | | | | | no | D? | ? | <=5 |
| 24A | MYTI EDU | SB | | | | | | | | | 175 | 133 | | | | | | | | | | | | | 130 | 99.4 | | | | | no | -? | ? | 9 |
| 82A | MYTI EDU | SB | | | 127 | 106 | 132 | 109 | 76.1 | 129 | | 145 | 123 | 112 | | 109 | 87.6 | | | | | | | | 81.2 | 88.2 | | | | | no | -- | no | 9 |
| 84A | MYTI EDU | SB | | | 118 | 160 | 163 | 133 | 132 | 142 | | 185 | 180 | 113 | | 121 | 85.8 | | | | | | | | 93 | 108 | | | | | no | -- | no | 9 |
| 87A | MYTI EDU | SB | | | 100 | 92.8 | 97.7 | 102 | 105 | 96.6 | | 117 | 114 | 90.2 | | 109 | 97.2 | | | | | | | | 72.4 | 75.7 | | | | | no | -- | no | 6 |
| 25A | MYTI EDU | SB | | | | | | | | | | | 184 | 117 | | | | | | | | | | | 119 | 111 | | | | | no | -? | ? | 10 |
| 26A | MYTI EDU | SB | | | | | | | | | | | 125 | 118 | | | | | | | | | | | 146 | 110 | | | | | no | -? | ? | 8 |
| 27A | MYTI EDU | SB | | | | | | | | | | | 164 | | | | | | | | | | | | 128 | 131 | | | | | no | -? | ? | <=5 |
| 28A | MYTI EDU | SB | | | | | | | | | | | 141 | 96.1 | | | | | | | | | | | 103 | 174 | | | | | no | -? | ? | 12 |
| 91A | MYTI EDU | SB | | | | | | | | | | | 96.2 | 102 | 116 | | | | | | | | | | | 99.4 | | | | | no | -? | ? | 7 |
| 92A1 | MYTI EDU | SB | | | | | | | | | | | 88.7 | 61.1 | 90.2 | 77.5 | 59.2 | 97.8 | | | | | | | | | | | | | no | -- | no | 10 |
| 93A | MYTI EDU | SB | | | | | | | | | | | 94.4 | 95.9 | | | | | | | | | | | 103 | 89.5 | | | | | no | -? | ? | 6 |
| 94A | MYTI EDU | SB | | | | | | | | | | | 74.3 | 81.3 | | | | | | | | | | | 65.9 | 59.5 | | | | | no | -? | ? | 6 |
| 95A | MYTI EDU | SB | | | | | | | | | | | 94.7 | 81 | | | | | | | | | | | 76.6 | 71.7 | | | | | no | -? | ? | 6 |
| 96A | MYTI EDU | SB | | | | | | | | | | | 102 | 71.6 | | | | | | | | | | | 68.3 | 82 | | | | | no | -? | ? | 9 |
| 97A | MYTI EDU | SB | | | | | | | | | | | 91.7 | 91.6 | | | | | | | | | | | 89.6 | 79 | | | | | no | -? | ? | <=5 |
| 98A2 | MYTI EDU | SB | | | | | | | | | | | | | | | | 89.9 | | 82.1 | 96 | 100 | 84.5 | 87 | 88 | 91.7 | 81.7 | 97.9 | 108 | 92.6 | no | -- | no | 6 |
| 98X | MYTI EDU | SB | | | | | | | | | | | | | 187 | 182 | 146 | | | | | | | | | | | | | | no | -? | ? | 6 |
| 99A | MYTI EDU | SB | | | | | | | | | | | 107 | 70.3 | | | | | | | | | | | 84 | 77.6 | | | | | no | -? | ? | 10 |
| 41A | MYTI EDU | SB | | | | | | | | | | | | | 85.1 | 89 | 94.8 | 90.9 | | | | | | | | | 81 | 83.9 | | | no | -- | no | <=5 |
| 42A | MYTI EDU | SB | | | | | | | | | | | | | 87.1 | 80.9 | | | | | | | | | | | 64.3 | 68.1 | | | no | D? | ? | <=5 |
| 43A | MYTI EDU | SB | | | | | | | | | | | | | 98.7 | 96.6 | | 89.2 | | | | | | | | | 75 | 82.1 | | | no | D? | ? | <=5 |
| 44A | MYTI EDU | SB | | | | | | | | | | | | | 67.2 | 91.3 | 81 | 78.8 | | | | | | | | | 71.9 | 85 | | | no | -- | no | 7 |
| 45A | MYTI EDU | SB | | | | | | | | | | | | | 115 | 117 | | | | | | | | | | | 97.9 | 102 | | | no | D? | ? | <=5 |
| 46A | MYTI EDU | SB | | | | | | | | | | | | | 88.4 | 112 | 93.3 | | | | | | | | | | 85 | 73.3 | | | no | -? | ? | 7 |
| 47A | MYTI EDU | SB | | | | | | | | | | | | | 122 | 88.2 | | | | | | | | | | | 121 | 109 | | | no | -? | ? | 9 |
| 48A | MYTI EDU | SB | | | | | | | | | | | | | 74.9 | 87 | 68.8 | | | | | | | | | | 69.4 | 73.1 | | | no | -? | ? | 7 |
| 49A | MYTI EDU | SB | | | | | | | | | | | | | 95.7 | 101 | | | | | | | | | | | 64.8 | 66.5 | | | no | D? | ? | <=5 |
| 10A2 | MYTI EDU | SB | | | | | | | | | | | | | | | 94.6 | 114 | 102 | 103 | 125 | 114 | 134 | 100 | 149 | 87.4 | 87.5 | 100 | 108 | 111 | no | -- | no | 8 |
| 11X | MYTI EDU | SB | | | | | | | | | | | | | | | | 104 | 70.2 | 81 | 101 | 121 | 89.6 | 72.4 | 78.2 | 80.5 | 85.6 | 59.5 | 85 | 73 | no | -- | no | 9 |

Annual median concentration of ∑PCB-7 (mg/kg d. wt)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | 77.5 | 96.5 | 116 | 89.6 | 97 | | 89.3 | 90.4 | 110 | 128 | 58.5 | 71.1 | 49.9 | 29.6 | 33.9 | 43.4 | 20.7 | 67.9 | 28.8 | 47.7 | 49.4 | 38.3 | 2.6 | D-(--) | 3.2 | 12 |
| 31A | MYTI EDU | SB | | 21.7 | 24.9 | 37.1 | 24.7 | 34.6 | | 52.2 | 49 | 63.8 | 24.6 | 12.9 | 18 | 6.49 | 8.87 | 8.97 | 7.58 | 3.79 | 13.8 | 9.3 | 5.83 | 11.5 | 11 | no | DY | no | 13 |
| 35A | MYTI EDU | SB | | 21.5 | 33.6 | 27.5 | 14.2 | 22.1 | | 13.4 | 13.6 | 10.7 | 16.5 | 12.5 | 14.6 | 5.52 | 7.32 | 6.97 | 8.2 | | 12.3 | 4.91 | 5.06 | 9.45 | 6.96 | no | D- | no | 12 |
| 36A | MYTI EDU | SB | | 11 | 17.9 | 19.3 | 7.94 | 11.2 | | 5.69 | 10.5 | 12.3 | 12.7 | 8.62 | 12.1 | 5.28 | 5.54 | 6.03 | 5.75 | 5.58 | 6.92 | 3.61 | 2.94 | 5.56 | | no | D- | no | 12 |
| 71A | MYTI EDU | SB | | 17 | 34.4 | 25 | 14.2 | 15.3 | | 16.5 | 10.5 | | 9.27 | 11.8 | 13.6 | 8.52 | 12.7 | 7.55 | 9.74 | | 14.3 | 9.33 | 9.3 | 10.5 | 9.71 | no | D- | no | 11 |
| 76A | MYTI EDU | SB | | | | 16.6 | 6.49 | 7.21 | | | | 16.3 | 19.1 | 14.4 | 16.4 | 6.34 | 6.78 | 5.12 | 5.06 | | 3.29 | 4.59 | 4.68 | 5.91 | 5.24 | no | DY | no | 11 |
| 15A | MYTI EDU | SB | | | | 11.8 | | | | 6.29 | 3.06 | 2.41 | 3.88 | 4.72 | 5.28 | 2.56 | 4.19 | 3.15 | 2.73 | 2.74 | 3.34 | 2.56 | 4.38 | 4.18 | 4.5 | no | DY | no | 11 |
| 51A | MYTI EDU | SB | | | | | | | | | 26.2 | 9.69 | 14.7 | 10.5 | 11.5 | 12 | 28 | 16.9 | 16 | 10.6 | 14.5 | 11.2 | 11.2 | 9.89 | 9.93 | no | -- | no | 12 |
| 52A | MYTI EDU | SB | | | 40.2 | 14.9 | | 11.3 | 11.3 | 17.1 | 16.9 | 10 | 19 | 10.6 | 11.2 | 7.19 | 74.2 | 12.5 | 12 | 10.3 | 9.97 | 11.1 | 15.4 | 10.7 | 6.78 | no | -- | no | 17 |
| 56A | MYTI EDU | SB | | 12.5 | 45.8 | 37.7 | 12.1 | 12 | 9.41 | 13.8 | 11.9 | | 16.8 | 9.55 | 11.2 | 5.98 | 216 | 13 | 13.1 | 6.73 | 9.33 | 6.04 | 9.53 | 6.5 | 5.81 | no | -- | no | 21 |
| 57A | MYTI EDU | SB | | | 28 | | 7.63 | 7.55 | 4.74 | 8.38 | 6.54 | 4.18 | 8.41 | 10.3 | 8.16 | 3.89 | 55.9 | 5.89 | 6.16 | 2.89 | 7.47 | 4.28 | 3.74 | 4.65 | 4.88 | no | -- | no | 19 |
| 63A | MYTI EDU | SB | | | 21.8 | | 9.71 | 6.45 | 3.68 | 5.7 | 5.72 | | 4.15 | 7.95 | 7.26 | 4.09 | 13.8 | 3.54 | 6.05 | 1.25 | 5.3 | 4.09 | 5.07 | 3.3 | | no | -- | no | 16 |
| 65A | MYTI EDU | SB | | 6.05 | 11.1 | 33.4 | 9.29 | 5.59 | 3.69 | 5.55 | 3.37 | 5.19 | 3.76 | 7.62 | 6.44 | 3 | 8.31 | 2.73 | 3.73 | 1.24 | 4.75 | 3.28 | 3.9 | 1.73 | | no | D- | no | 17 |
| 69A | MYTI EDU | SB | | | | | | 4.82 | | 4.97 | 4.51 | 2.77 | 5.41 | 12.6 | 5.83 | 2.53 | 5.7 | 3.18 | 4.01 | 1.27 | 4.03 | 2.48 | 2.18 | 1.28 | 2.73 | no | -- | no | 16 |
| 22A | MYTI EDU | SB | | | | 18.9 | 8.23 | 8.61 | | 7.97 | 6.84 | 5.19 | 4.69 | 11.5 | 6.01 | 5.14 | 4.69 | 3.24 | 8.5 | 5.51 | 8.74 | 5.76 | 6.43 | 8.68 | 4.84 | no | -- | no | 12 |
| 82A | MYTI EDU | SB | | 8.4 | 15.6 | | | | | | | | | | | | | | | 2.39 | 3.09 | | | | | no | -? | ? | 14 |
| 84A | MYTI EDU | SB | | 5.25 | 20.5 | | 5.05 | 8.44 | | | 3.6 | 6.37 | | | | | | | | 0.852 | 5.11 | | | | | no | -- | no | 21 |
| 87A | MYTI EDU | SB | | 3.9 | 12.8 | | | | | | | | | | | | | | | | 3.38 | | | | | no | -? | ? | 23 |
| 91A | MYTI EDU | SB | | | | | | 2.81 | | 7.64 | | | | | | | | | | | 3.14 | | | | | no | -? | ? | 20 |
| 92A1 | MYTI EDU | SB | | | | | | 4.46 | 2.49 | 5.83 | 4.05 | 2.89 | 7.74 | | | | | | | | | | | | | no | -- | no | 15 |
| 96A | MYTI EDU | SB | | | | | | 3.35 | 1.52 | | | | | | | | | | | 0.785 | 2.83 | | | | | no | -? | ? | 21 |
| 98A2 | MYTI EDU | SB | | | | | | | | | | | 10.7 | | 4.14 | 3.54 | 4.56 | 3.23 | 3.62 | 1.85 | 2.72 | 3.27 | 2.7 | 1.09 | 3.25 | no | -- | no | 14 |
| 98X | MYTI EDU | SB | | | | | | | | 87.3 | 78.4 | 46.4 | | | | | | | | | | | | | | 3.1 | -? | ? | 9 |
| 99A | MYTI EDU | SB | | | | | | 3.42 | 1.97 | | | | | | | | | | | 0.871 | 1.29 | | | | | no | -? | ? | 13 |
| 41A | MYTI EDU | SB | | | | | | | | 3.49 | 4.26 | 2.39 | 2.58 | | | | | | | | | 2.35 | 1.78 | | | no | -- | no | 10 |
| 43A | MYTI EDU | SB | | | | | | | | 2.92 | 3.1 | | 3.02 | | | | | | | | | 2.5 | 1.57 | | | no | -? | ? | 9 |
| 44A | MYTI EDU | SB | | | | | | | | | 7.31 | 8.46 | 29.4 | | | | | | | | | 15.7 | 11.1 | | | no | -? | ? | 18 |
| 45A | MYTI EDU | SB | | | | | | | | 6.45 | 5.31 | | | | | | | | | | | 4.25 | 2.7 | | | no | -? | ? | 10 |
| 46A | MYTI EDU | SB | | | | | | | | 5.74 | 4.16 | 3.11 | | | | | | | | | | 5.53 | 2.86 | | | no | -? | ? | 13 |
| 48A | MYTI EDU | SB | | | | | | | | 6.22 | 4.04 | 3.1 | | | | | | | | | | 5.16 | 2.21 | | | no | -? | ? | 15 |
| 10A2 | MYTI EDU | SB | | | | | | | | | | 4.66 | 6.29 | | 5.11 | 4.33 | 3.03 | 2.13 | 2.58 | 1.28 | 2.29 | 4.59 | 1.89 | 1.65 | 2.06 | no | D- | no | 13 |
| 11X | MYTI EDU | SB | | | | | | | | | | | 3.34 | 3.56 | 4.48 | 2.79 | 3.1 | 1.93 | 1.93 | 1.28 | 3.02 | 2.11 | 1.9 | 2.25 | 2.64 | no | -- | no | 11 |

Annual median concentration of ∑PCB-7 (mg/kg d. wt)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | 34.9 | 77.5 | 96.5 | 116 | 89.6 | 97 | | 89.3 | 90.4 | 110 | 128 | 58.5 | 71.1 | 49.9 | 29.6 | 33.9 | 43.4 | 20.7 | 67.9 | 28.8 | 47.7 | 49.4 | 38.3 | 2.6 | DY(--) | 3.2 | 12 |
| 71A | MYTI EDU | SB | | 13.9 | 17 | 34.4 | 25 | 14.2 | 15.3 | | 16.5 | 10.5 | | 9.27 | 11.8 | 13.6 | 8.52 | 12.7 | 7.55 | 9.74 | | 14.3 | 9.33 | 9.3 | 10.5 | 9.71 | no | D- | no | 11 |
| 51A | MYTI EDU | SB | | | | | | | | | | 26.2 | 9.69 | 14.7 | 10.5 | 11.5 | 12 | 28 | 16.9 | 16 | 10.6 | 14.5 | 11.2 | 11.2 | 9.89 | 9.93 | no | -- | no | 12 |
| 52A | MYTI EDU | SB | | | | 40.2 | 14.9 | | 11.3 | 11.3 | 17.1 | 16.9 | 10 | 19 | 10.6 | 11.2 | 7.19 | 74.2 | 12.5 | 12 | 10.3 | 9.97 | 11.1 | 15.4 | 10.7 | 6.78 | no | -- | no | 17 |
| 10A2 | MYTI EDU | SB | | | | | | | | | | | 4.66 | 6.29 | | 5.11 | 4.33 | 3.03 | 2.13 | 2.58 | 1.28 | 2.29 | 4.59 | 1.89 | 1.65 | 2.06 | no | D- | no | 13 |
| I021 | MYTI EDU | SB | | | | | | | | | | 43.1 | 31.8 | 32.2 | 24.1 | | 22.2 | 20 | 25.1 | | | | | | | | 1.7 | D- | 1.3 | 7 |
| I022 | MYTI EDU | SB | | | | | | | | | | 32.1 | 25.9 | 41.2 | 22.4 | 28.9 | 19.2 | 22.4 | 20.8 | 15.2 | 17.1 | 11 | 11.1 | 5.79 | 8.13 | | no | D- | no | 10 |
| I023 | MYTI EDU | SB | | | | | | | | | | 19.6 | 20.9 | 26 | 15 | 22.2 | 10.8 | 17.4 | 15.9 | 12.3 | 12.6 | 9.73 | 8.91 | | 5.04 | 9.62 | no | D- | no | 11 |
| I024 | MYTI EDU | SB | | | | | | | | | | 31.8 | 36.1 | 45.6 | 36.6 | 28.7 | 16.8 | 17.7 | 26 | 15 | 15.8 | 11.3 | 10.6 | 3.54 | 6.14 | 8.36 | no | D- | no | 13 |
| I301 | MYTI EDU | SB | | | | | | | 231 | | | 118 | 113 | 182 | 86.5 | 125 | 58.7 | 64.6 | 62.6 | 70.4 | 57.9 | 84.7 | 75.4 | 63.2 | 104 | 45.9 | 3.1 | D-(--) | 3.5 | 11 |
| I304 | MYTI EDU | SB | | | | | | | | | | 35.2 | 23.8 | 44.4 | 35.9 | | 19.9 | 25 | 24.4 | 27.5 | 30 | 21.4 | 23.4 | 23.9 | 33.1 | 17.7 | 1.2 | -- | 1.3 | 11 |
| I306 | MYTI EDU | SB | | | | | | | | | | 16.4 | 15.7 | 54.2 | 26.1 | | 21.8 | 17.2 | 15.7 | 15.4 | 17.9 | 12.9 | 20.1 | 20.7 | | 12.3 | no | -- | no | 13 |
| I307 | MYTI EDU | SB | | | | | | | | | | 20.6 | 28.5 | 40.2 | 17.3 | | 20.3 | 16.9 | 17.5 | 15.4 | 13 | 11.7 | | 15.4 | 16.5 | 16.5 | 1.1 | D- | 1.3 | 10 |
| I711 | MYTI EDU | SB | | | | | | | | | | 24.8 | 13.3 | 13.3 | 20.6 | 21.6 | 18.4 | | 13.4 | | | | | | | | no | -- | no | 11 |
| I712 | MYTI EDU | SB | | | | | | | | | | 33.3 | 31.2 | 25.3 | 22.4 | 24.9 | 13.9 | 12.5 | 10.9 | 16.9 | | 16.2 | 14.2 | | 19.4 | 9.47 | no | D- | no | 10 |
| I713 | MYTI EDU | SB | | | | | | | | | | | | | | | | | 12.5 | 15 | 21.4 | 18.1 | 15.7 | | 13.7 | 13.1 | no | -- | no | 8 |
| I131A | MYTI EDU | SB | | | | | | | | | | 7.94 | 11.7 | 13.1 | 22.4 | 12.7 | 10.1 | 14 | 29.4 | 8.13 | 3.98 | 9.65 | 4.65 | 3.53 | 12.3 | 8.18 | no | -- | no | 16 |
| I132 | MYTI EDU | SB | | | | | | | | | | | | | 31.1 | 22.5 | 10.2 | 15.8 | 11.8 | 13.3 | | 11.5 | 10.9 | 6.19 | 5.92 | 29.1 | 1.9 | -- | 1.3 | 16 |
| I133 | MYTI EDU | SB | | | | | | | | | | 22.8 | 22.3 | 21.5 | 24.7 | 23 | 10.4 | 11.7 | 9.24 | 9.23 | 12.5 | 10 | 9.68 | 9.58 | 6.42 | | no | D- | no | 9 |
| I241 | MYTI EDU | SB | | | | | | | | | | 54.3 | 78.9 | 47.2 | 55.2 | 80.8 | 55.5 | 36.3 | 96.4 | 125 | 118 | 61.8 | 48.5 | 46.4 | 55 | 51.5 | 3.4 | --(--) | 2.2 | 13 |
| I242 | MYTI EDU | SB | | | | | | | | | | 63 | 81.6 | 29.6 | 45.6 | 59.5 | 36.6 | 26.2 | 44.6 | 81.9 | 55.9 | 36.8 | 31.7 | 29.4 | | 35.1 | 2.3 | -- | 1.6 | 13 |
| I243 | MYTI EDU | SB | | | | | | | | | | 115 | 169 | 122 | 78.2 | 92.4 | 47.9 | 29.3 | 52.5 | 326 | 288 | 217 | 75.2 | 48.9 | | 35.9 | 2.4 | -- | no | 17 |

Annual median concentration of ∑PCB-7 (mg/kg w. wt)

| | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30B | GADU MOR | LI | | 1240 | 3430 | 2800 | 2500 | 2910 | 2350 | 2930 | 3090 | 3660 | 3520 | 2080 | 2440 | 2230 | 2140 | 2620 | 4160 | 3550 | 2160 | 3780 | 3600 | 3.6 | --(--) | 3.6 | 11 |
| 36B | GADU MOR | LI | | 441 | 344 | 396 | 636 | 376 | 1650 | 974 | 720 | 736 | 766 | 482 | 288 | 269 | 425 | 535 | 542 | 591 | 210 | 261 | 181 | no | DY | no | 13 |
| 77B | GADU MOR | LI | | 305 | 386 | | | | | | | | | | | | | | | | | 134 | 197 | no | -? | ? | 11 |
| 15B | GADU MOR | LI | | 182 | 349 | 266 | 182 | 295 | 307 | 274 | 399 | 279 | 257 | 153 | 377 | 244 | 213 | 154 | 186 | 131 | 166 | 135 | 121 | no | D- | no | 11 |
| 53B | GADU MOR | LI | | 435 | 524 | 1760 | 166 | | 162 | 701 | 576 | 2370 | 487 | 1520 | 842 | 956 | 317 | 463 | 422 | 340 | 742 | 136 | 449 | no | --(--) | no | 20 |
| 67B | GADU MOR | LI | | 316 | 293 | 268 | 226 | 329 | 210 | 269 | 627 | 206 | 273 | 148 | 225 | 145 | 92.6 | 94.4 | 134 | 56.1 | 109 | 77.1 | 89.3 | no | D- | no | 13 |
| 23B | GADU MOR | LI | | 222 | 244 | 228 | 208 | 128 | 193 | 196 | 125 | 179 | 229 | 207 | 167 | 111 | 114 | 202 | 210 | 141 | 146 | 72.9 | 78.1 | no | D- | no | 11 |
| 92B | GADU MOR | LI | | | | | 135 | 152 | 311 | 369 | | | | | | | | 119 | 42.8 | | | 78 | 82.7 | no | -- | no | 13 |
| 98B1 | GADU MOR | LI | | | | 239 | 183 | 114 | 197 | 278 | 372 | 165 | 147 | | | 62.6 | 110 | 183 | 91.6 | 102 | 132 | 41.2 | 14.9 | no | D- | no | 12 |
| 43B | GADU MOR | LI | | | | | | 325 | 329 | 140 | | | | | | | | | | | | 94.1 | 121 | no | -? | ? | 13 |
| 10B | GADU MOR | LI | | | | | | 645 | 485 | 210 | 189 | 168 | 255 | 99.4 | 109 | 151 | 146 | 127 | 104 | 96.6 | 116 | 82.4 | 131 | no | DY | no | 11 |

Annual median concentration of ∑PCB-7 (mg/kg w. wt)

| | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30B | GADU MOR | MU | | 3.58 | 11.1 | 24.7 | 9.65 | 3.94 | 3.12 | 8.9 | 10.5 | 21.7 | 21.4 | 6.06 | 9.4 | 10.3 | 9.31 | 7.91 | 9.01 | 11.9 | 10.6 | 16.6 | 21.2 | 7.1 | --(U-) | 9.6 | 17 |
| 36B | GADU MOR | MU | | 1.62 | 1.29 | 2 | 3.65 | 0.525 | 15.6 | 4.14 | 4.54 | 3.78 | 2.86 | 2.26 | 2.19 | 1.9 | 2.52 | 2.88 | 2.71 | 9.34 | 0.63 | 1.36 | 2.53 | no | -- | no | 21 |
| 77B | GADU MOR | MU | | 0.88 | 3.05 | | | | | | | | | | | | | | | | | 0.9 | 0.98 | no | -? | ? | 19 |
| 15B | GADU MOR | MU | | 1.35 | 1.22 | 1.38 | 0.65 | 0.38 | 1.03 | 1.14 | 1.44 | 1.41 | 0.81 | 1.42 | 1.88 | 0.655 | 1.23 | 0.2 | 0.675 | 0.575 | 0.421 | 0.575 | 0.475 | no | -- | no | 15 |
| 53B | GADU MOR | MU | | 8.2 | 2.23 | 15 | 1.1 | | 0.37 | 21.9 | 3.76 | 138 | 6.61 | 36.3 | 1.08 | 23.6 | 4.84 | 3.09 | 2.2 | 1.12 | 5.72 | 6.02 | 4.44 | 1.5 | --(--) | 2.8 | >25 |
| 67B | GADU MOR | MU | | 0.835 | 1.43 | 1.1 | 0.624 | 1.15 | 0.605 | 3.5 | 7.07 | 0.73 | 1.72 | 1.18 | 9.98 | 0.61 | 0.35 | 0.407 | 0.865 | 0.235 | 0.255 | 0.557 | 0.43 | no | -- | no | 23 |
| 23B | GADU MOR | MU | | 0.64 | 2.26 | 0.75 | 0.85 | 0.18 | 0.625 | 0.46 | 0.81 | 1.49 | 0.95 | 0.45 | 0.62 | 0.38 | 0.495 | 0.325 | 0.7 | 1.01 | 0.53 | 0.515 | 0.835 | no | -- | no | 16 |
| 92B | GADU MOR | MU | | | | | 0.55 | 0.225 | 0.36 | 0.905 | | | | | | | | 0.225 | 0.255 | | | 0.365 | | no | -- | no | 17 |
| 98B1 | GADU MOR | MU | | | | 0.9 | 0.9 | 0.135 | 0.34 | 0.475 | 1.4 | 0.44 | 0.585 | | | 0.24 | 0.385 | 0.32 | 0.435 | 0.385 | 0.307 | 0.25 | 0.175 | no | -- | no | 17 |
| 43B | GADU MOR | MU | | | | | | 0.515 | 0.815 | 0.39 | | | | | | | | | | | | 0.362 | | no | -? | ? | 13 |
| 10B | GADU MOR | MU | | | | | | 1.77 | 2.49 | 0.367 | 0.9 | 0.79 | 1.39 | 0.5 | 0.55 | 0.635 | 0.555 | 1.15 | 0.535 | 0.609 | 0.804 | 0.495 | 0.71 | no | -- | no | 16 |

Annual median concentration of ∑PCB-7 (mg/kg w. wt)

| | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 33F | PLAT FLE | LI | | 36 | 31.1 | 97.5 | 69 | 57 | 86 | 54.9 | 30.3 | 35.3 | 47.2 | 90.7 | 158 | 53 | 60.1 | 62.8 | 63.4 | 68.9 | 67.3 | 72.8 | 74.6 | no | -- | no | 13 |
| 53F | PLAT FLE | LI | | 509 | 517 | 309 | 36 | | 22.8 | 115 | 113 | 111 | 156 | 95.8 | 95.1 | 158 | 165 | 108 | 363 | | 119 | 80.7 | 19.4 | no | DY | no | 18 |
| 67F | PLAT FLE | LI | | | | | | | | 70 | | 96.9 | 45.8 | 44 | 36.3 | 32 | 27.6 | 33.1 | 39 | 42.7 | 42.5 | 34.4 | 23.3 | no | D- | no | 10 |
| 21F | PLAT FLE | LI | | | | | | | | | | | 22.9 | 6.97 | 33.6 | 48.9 | | 121 | 15.5 | 20.1 | | | | no | -- | no | 23 |
| 33F | PLAT FLE | MU | | 2.04 | 3.96 | 1.8 | 0.95 | 0.51 | 1.37 | 1.91 | 0.935 | 1.14 | 5.32 | 1.14 | 1.76 | 1.53 | 1.25 | 0.675 | 0.48 | 0.805 | 0.675 | 1.38 | 1.28 | no | -- | no | 16 |
| 53F | PLAT FLE | MU | | 27.4 | 33.2 | 14.2 | 1.45 | | 0.757 | 3.19 | 2.74 | 2.19 | 2.73 | 3 | 2.67 | 2.02 | 1.13 | 1.96 | 6.73 | | 1.76 | 2.19 | 0.588 | no | DY | no | 19 |
| 67F | PLAT FLE | MU | | | | | | | | 0.775 | | 1.8 | 1.66 | 1.48 | 0.95 | 0.845 | 0.82 | 0.295 | 0.565 | 0.47 | 1.1 | 1.56 | 1.13 | no | DY | no | 13 |
| 21F | PLAT FLE | MU | | | | | | | | | | | 0.76 | 0.2 | 0.61 | 1.33 | | 1.56 | 0.957 | 1.19 | | | | no | -- | no | 18 |
| 36F | LIMA LIM | LI | | 301 | 217 | 339 | 418 | 404 | 433 | 386 | 387 | 236 | 412 | 838 | 527 | 297 | 272 | 538 | 511 | 620 | 650 | 721 | 313 | no | -- | no | 13 |
| 77F | LIMA LIM | LI | | | 75 | | | | | | | | | | | | | | | | | 31.3 | 79.7 | no | -? | ? | 19 |
| 15F | LIMA LIM | LI | | | 124 | | 58.2 | 77 | 74 | 62.5 | 64.5 | 51.1 | 69.6 | | 106 | 50.2 | 49.8 | 66.8 | 105 | 47.1 | 55.5 | 74.9 | 47.7 | no | -- | no | 12 |
| 22F | LIMA LIM | LI | | 170 | 127 | 140 | | 60 | 88.7 | | | | | | | | | | | | | | | no | -? | ? | 11 |
| 21F | LIMA LIM | LI | | | | | | | | | | | | | | 149 | 115 | 136 | 123 | | 115 | | 34.1 | no | Dm | no | 13 |
| 36F | LIMA LIM | MU | | 2.76 | 7.05 | 5.6 | 7.8 | 5.9 | 8.18 | 9.62 | 5.19 | 9.41 | 3.88 | 8.38 | 7.73 | 6.56 | 3.73 | 4.34 | 4.47 | 7.18 | 10.4 | 12.1 | 10.1 | 2.0 | UY | 3.8 | 12 |
| 15F | LIMA LIM | MU | | | 3.72 | | 0.806 | 0.369 | 1.14 | 1.81 | 1.28 | 1.42 | 0.959 | | 1.21 | 0.665 | 0.94 | 0.349 | 1.25 | 0.695 | 0.575 | 0.98 | 0.66 | no | -- | no | 16 |
| 22F | LIMA LIM | MU | | 1.97 | 5 | 3.82 | | 1.24 | 5.14 | | | | | | | | | | | | | | | 1.0 | -? | ? | 20 |
| 21F | LIMA LIM | MU | | | | | | | | | | | | | | 1.54 | 1.12 | 1.12 | 1.62 | | 1.82 | | 1.2 | no | -- | no | 10 |
| 30F | PLEU PLA | LI | | | | 313 | | 207 | 216 | | | | | | | | | | | | | | | 4.3 | -? | ? | 8 |
| 22F | PLEU PLA | LI | | | | | | | | 21 | 20.1 | 14.5 | | | | | | | | | | | | no | -? | ? | 7 |
| 98F2 | PLEU PLA | LI | | | | | | | | | | | | 40.8 | 25.5 | 10.3 | 10.5 | 8.4 | 24.1 | 13.8 | 5.53 | 3.49 | 2.56 | no | D- | no | 15 |
| 10F | PLEU PLA | LI | | | | | | | | | 42.1 | | 62.8 | 45 | 24.9 | 86.2 | 16.6 | 22.3 | 25.7 | | 14.9 | 23.8 | 10.5 | no | -- | no | 16 |
| 30F | PLEU PLA | MU | | | | 6.82 | | 3.01 | 1.46 | | | | | | | | | | | | | | | no | -? | ? | 9 |
| 22F | PLEU PLA | MU | | | | | | | | 1.39 | 0.95 | 3.33 | | | | | | | | | | | | 1.7 | -? | ? | 19 |
| 98F2 | PLEU PLA | MU | | | | | | | | | | | | 1.54 | 0.6 | 0.291 | 0.25 | 0.175 | 0.862 | 0.74 | 0.285 | 0.225 | 0.175 | no | -- | no | 18 |
| 10F | PLEU PLA | MU | | | | | | | | | 0.97 | | 2.58 | 1.78 | 1.12 | 1 | 0.457 | 0.175 | 0.435 | | | 0.986 | 0.333 | no | -- | no | 17 |
| 67F | LEPI WHI | LI | | 111 | 100 | 143 | 101 | 172 | 166 | 97.2 | 91.5 | 118 | 82.3 | 83.9 | 63.8 | 105 | 85.2 | 73.3 | 58 | 52.5 | 50.4 | 40.4 | 27.3 | m | DY | m | 9 |
| 21F | LEPI WHI | LI | | | | | | | | | | | | | | | 101 | 78.5 | 101 | 112 | 87.6 | 59.7 | 65.9 | m | -- | m | 9 |
| 67F | LEPI WHI | MU | | 0.84 | 0.935 | 1.4 | 0.55 | 0.48 | 1.46 | 0.445 | 0.68 | 0.42 | 1.03 | 0.82 | 0.673 | 0.37 | 0.43 | 0.464 | 0.639 | 0.428 | 0.22 | 0.64 | 0.52 | m | -- | m | 15 |
| 21F | LEPI WHI | MU | | | | | | | | | | | | | | | 0.45 | 0.345 | 1.11 | 0.93 | 0.855 | 0.63 | 0.59 | m | -- | m | 13 |

Annual median concentration of ppDDE (mg/kg d. wt.)

| | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | 5.24 | 3.86 | 7.08 | 5.7 | 2.56 | 5.88 | 3.87 | 5.91 | 3.47 | 1.99 | 1.97 | 2.08 | 1.22 | 2.56 | 1.77 | 3.29 | 3 | 2.11 | no | D-(--) | no | 13 |
| 31A | MYTI EDU | SB | | 3.3 | 1.89 | 3.45 | 1.84 | 0.505 | 3.37 | 3.49 | 5.47 | 1.19 | 2.1 | 1.79 | 1.01 | 1.25 | 3.17 | 6.32 | 3.94 | 3.47 | 2.94 | no | -- | no | 18 |
| 35A | MYTI EDU | SB | | 4.91 | 2.08 | 3.13 | 2.84 | 0.57 | 3.91 | 3.73 | 5.93 | 1.61 | 3.29 | 2.17 | 1.8 | 2.94 | 5.47 | 2.4 | 2.86 | 3.95 | 3.13 | no | -- | no | 17 |
| 36A | MYTI EDU | SB | | 2.76 | 1.06 | 1.03 | 1.76 | 0.442 | 2.11 | 1.79 | 2.98 | 1.48 | 1.51 | 1.34 | 0.76 | 1.47 | 1.56 | 1.41 | 0.733 | 1.24 | | no | -- | no | 15 |
| 71A | MYTI EDU | SB | | 2.61 | 1.58 | 3.21 | 1.29 | 0.736 | 1.02 | 2.2 | 2.41 | 2.26 | 3.58 | 1.1 | 1.67 | 0.763 | 1.8 | 2.17 | 1.8 | 1.56 | 1.71 | no | -- | no | 14 |
| 76A | MYTI EDU | SB | | 1.4 | 0.794 | | | 0.355 | 1.21 | 2.29 | 2.49 | 0.779 | 0.829 | 0.746 | 0.621 | 1.1 | 0.611 | 1.38 | 0.588 | 0.824 | 0.733 | no | -- | no | 15 |
| 15A | MYTI EDU | SB | | | 0.976 | 1.72 | 0.735 | 0.294 | 1.02 | 1.41 | 2.05 | 0.536 | 0.622 | 0.854 | 0.667 | 0.857 | 0.688 | 0.722 | 0.706 | 1.17 | 0.765 | no | -- | no | 16 |
| 51A | MYTI EDU | SB | | | | | 33.9 | 6.67 | 14.7 | 17.1 | 13.2 | 16.9 | 5.48 | 9.52 | 10 | 10.5 | 14.7 | 7.5 | 11.7 | 13.3 | 12.9 | 1.3 | -- | 1.4 | 15 |
| 52A | MYTI EDU | SB | | 12.3 | 25.5 | 19.4 | 18.5 | 9.53 | 13.1 | 16.7 | 13.7 | 11.9 | 6.47 | 6.82 | 8.86 | 10.5 | 12.5 | 4.71 | 12.2 | 12.7 | 6.11 | no | -- | no | 13 |
| 56A | MYTI EDU | SB | | 50 | 47.5 | 115 | 40.8 | 33.9 | 72.3 | 52.6 | 39.8 | 26.2 | 60.6 | 40 | 55.1 | 49.3 | 550 | 186 | 117 | 180 | 44 | 4.4 | -- | no | 18 |
| 57A | MYTI EDU | SB | | 25.9 | 18.3 | 35 | 25.3 | 15.8 | 50 | 82.9 | 35.2 | 27.5 | 24.7 | 14.7 | 27.8 | 16.6 | 53.3 | 12.1 | 23 | 26.7 | 25.5 | 2.6 | -- | 2.5 | 16 |
| 63A | MYTI EDU | SB | | 12.9 | 9.29 | 9.68 | 8.36 | 5.53 | 13 | 15.5 | 11.4 | 10.2 | 7.09 | 4.76 | 11.3 | 3.82 | 14 | 5.67 | 13.6 | 12.1 | 7.5 | no | -- | 1.1 | 14 |
| 65A | MYTI EDU | SB | | 7.6 | 5.19 | 7.79 | 4.12 | 5 | 6.9 | 11.9 | 7.38 | 6.76 | 5.43 | 3.61 | 6.47 | 2.55 | 8.33 | 3.63 | 6.67 | 7 | 5.5 | no | -- | no | 13 |
| 69A | MYTI EDU | SB | | 3.55 | 3.16 | 3.54 | 2.91 | 0.4 | 3.69 | 6.52 | 2.61 | 2.7 | 2.25 | 1.61 | 2.62 | 0.909 | 3 | 0.85 | 3.29 | 0.778 | 2.12 | no | -- | no | 20 |
| 22A | MYTI EDU | SB | | 2.22 | 1.31 | 1.88 | 1.45 | 0.387 | 1.37 | 5.11 | 1.96 | 1.49 | 0.909 | 0.725 | 1.46 | 0.861 | 1.65 | 4.78 | 0.933 | 0.938 | 0.895 | no | -- | no | 18 |
| 84A | MYTI EDU | SB | | 3.13 | 2.23 | | 0.985 | 0.736 | | | | | | | | 0.509 | 0.889 | | | | | no | -- | no | 16 |
| 25A | MYTI EDU | SB | | 1.29 | 1.03 | | | | | | | | | | | 0.879 | 1.05 | | | | | no | -? | ? | 8 |
| 26A | MYTI EDU | SB | | 2.74 | | | | | | | | | | | | 1.35 | 1.84 | | | | | no | -? | ? | 11 |
| 27A | MYTI EDU | SB | | 1.8 | | | | | | | | | | | | 0.442 | 0.833 | | | | | no | -? | ? | 16 |
| 28A | MYTI EDU | SB | | 1.11 | 0.858 | | | | | | | | | | | 0.378 | 0.765 | | | | | no | -? | ? | 14 |
| 91A | MYTI EDU | SB | | 0.625 | | 1.32 | | | | | | | | | | | 0.667 | | | | | no | -? | ? | 17 |
| 92A1 | MYTI EDU | SB | | 0.68 | 2.09 | 1.41 | 0.766 | 0.275 | 1.93 | | | | | | | | | | | | | no | -- | no | 22 |
| 96A | MYTI EDU | SB | | 1.03 | 0.435 | | | | | | | | | | | 0.262 | 0.7 | | | | | no | -? | ? | 19 |
| 98A2 | MYTI EDU | SB | | | | | | | 1.59 | | 0.87 | 0.575 | 1.31 | 0.625 | 0.725 | 0.415 | 0.778 | 0.867 | 0.5 | 0.438 | 0.611 | no | -- | no | 13 |
| 98X | MYTI EDU | SB | | | | 31.6 | 22.9 | 5.16 | | | | | | | | | | | | | | no | -? | ? | 15 |
| 99A | MYTI EDU | SB | | 0.621 | 0.873 | | | | | | | | | | | 0.254 | 0.294 | | | | | no | -? | ? | 10 |
| 41A | MYTI EDU | SB | | | | 0.621 | 0.423 | 0.291 | 0.61 | | | | | | | | | 0.35 | 0.333 | | | no | -- | no | 12 |
| 43A | MYTI EDU | SB | | | | | 0.608 | | 0.855 | | | | | | | | | 0.313 | 0.357 | | | no | -? | ? | 11 |
| 44A | MYTI EDU | SB | | | | | 0.486 | 0.343 | 1.41 | | | | | | | | | 3.3 | 1.35 | | | no | -? | ? | 19 |
| 45A | MYTI EDU | SB | | | | 1.74 | 2 | | | | | | | | | | | 0.8 | 0.889 | | | no | D? | ? | 8 |
| 46A | MYTI EDU | SB | | | | 1.05 | 0.756 | 0.273 | | | | | | | | | | 0.6 | 0.524 | | | no | -? | ? | 17 |
| 48A | MYTI EDU | SB | | | | 1.71 | 1.13 | 0.286 | | | | | | | | | | 1.24 | 0.438 | | | no | -? | ? | 22 |
| 10A2 | MYTI EDU | SB | | | | | | 0.439 | 1.49 | | 1.45 | 0.611 | 0.867 | 0.61 | 0.576 | 0.267 | 0.474 | 0.588 | 0.318 | 0.412 | 0.353 | no | -- | no | 14 |
| 11X | MYTI EDU | SB | | | | | | | 0.811 | 1.04 | 1.04 | 0.769 | 0.758 | 0.472 | 0.465 | 0.317 | 0.524 | 0.389 | 0.286 | 1.17 | 0.45 | no | -- | no | 14 |

Annual median concentration of ppDDE (mg/kg d. wt.)

| | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | 5.24 | 3.86 | 7.08 | 5.7 | 2.56 | 5.88 | 3.87 | 5.91 | 3.47 | 1.99 | 1.97 | 2.08 | 1.22 | 2.56 | 1.77 | 3.29 | 3 | 2.11 | no | D-(--) | no | 13 |
| 71A | MYTI EDU | SB | | 2.61 | 1.58 | 3.21 | 1.29 | 0.736 | 1.02 | 2.2 | 2.41 | 2.26 | 3.58 | 1.1 | 1.67 | 0.763 | 1.8 | 2.17 | 1.8 | 1.56 | 1.71 | no | -- | no | 14 |
| 51A | MYTI EDU | SB | | | | | 33.9 | 6.67 | 14.7 | 17.1 | 13.2 | 16.9 | 5.48 | 9.52 | 10 | 10.5 | 14.7 | 7.5 | 11.7 | 13.3 | 12.9 | 1.3 | -- | 1.4 | 15 |
| 52A | MYTI EDU | SB | | 12.3 | 25.5 | 19.4 | 18.5 | 9.53 | 13.1 | 16.7 | 13.7 | 11.9 | 6.47 | 6.82 | 8.86 | 10.5 | 12.5 | 4.71 | 12.2 | 12.7 | 6.11 | no | -- | no | 13 |
| 10A2 | MYTI EDU | SB | | | | | | 0.439 | 1.49 | | 1.45 | 0.611 | 0.867 | 0.61 | 0.576 | 0.267 | 0.474 | 0.588 | 0.318 | 0.412 | 0.353 | no | -- | no | 14 |
| I021 | MYTI EDU | SB | | | | | 4.6 | 1.45 | 4.8 | 3.25 | | 5.19 | 2.73 | 4.73 | | | | | | | | no | -- | no | 16 |
| I022 | MYTI EDU | SB | | | | | 3.95 | 1.38 | 7.13 | 4.58 | 7.96 | 4.92 | 3.73 | 4.51 | 2.54 | 2.7 | 1.43 | 1.31 | 0.75 | 1.09 | 1.4 | no | DY(D-) | no | 15 |
| I023 | MYTI EDU | SB | | | | | 1.81 | 1.32 | 3.79 | 2.32 | 6.1 | 2.39 | 2.91 | 3.31 | 1.42 | 1.29 | 1.47 | 1.45 | 0.923 | 1 | 1.77 | no | D-(--) | no | 14 |
| I024 | MYTI EDU | SB | | | | | 3.5 | 3.52 | 8.91 | 7.17 | 8.96 | 4.94 | 2.52 | 5.15 | 2.4 | 2.32 | 1.7 | 1.33 | 0.615 | 1.09 | 1.2 | no | DY(D-) | no | 13 |
| I301 | MYTI EDU | SB | | 6.76 | | | 2.59 | 3.75 | 17.8 | 5.96 | 7.45 | 5.58 | 4.51 | 5.06 | 3.54 | 4.47 | 5.17 | 3.57 | 4.06 | 6.53 | 3 | no | -- | no | 15 |
| I304 | MYTI EDU | SB | | | | | 2.14 | 0.751 | 3.42 | 3.89 | | 1.95 | 2.71 | 2.62 | 1.73 | 2.71 | 1.43 | 1.85 | 3.17 | 3.07 | 1.93 | no | -- | no | 15 |
| I306 | MYTI EDU | SB | | | | | 1.84 | 0.455 | 4.25 | 3.31 | | 2.37 | 1.88 | 1.92 | 1.12 | 1.74 | 1.09 | 2.47 | 1.86 | 2.46 | 1.71 | no | -- | no | 17 |
| I307 | MYTI EDU | SB | | | | | 2.18 | 1.03 | 3.42 | 2.74 | | 2.12 | 4.13 | 2.28 | 1.09 | 1.34 | 0.873 | 2.5 | 2.31 | 2.07 | 2.31 | no | -- | no | 15 |
| I711 | MYTI EDU | SB | | | | | 3.46 | 0.719 | 1.49 | 2.19 | 2.18 | 3.85 | | 1.26 | | | | | | | | no | -- | no | 19 |
| I712 | MYTI EDU | SB | | | | | 2.43 | 1.34 | 3.14 | 3.09 | 3.49 | 3.46 | 2.48 | 1.6 | 2.65 | 2.94 | 1.36 | 2.36 | 1.75 | 2.38 | 1.05 | no | -- | no | 13 |
| I713 | MYTI EDU | SB | | | | | | | | | | | | 1.61 | 2.26 | 2.96 | 0.676 | 2.19 | 2.17 | 1.69 | 1.62 | no | -- | no | 16 |
| I131A | MYTI EDU | SB | | | | | 1.46 | 0.691 | 1.89 | 2.06 | 1.67 | 1.11 | 0.915 | 1.11 | 0.942 | 1.37 | 2.39 | 0.846 | 0.733 | 2.07 | 1.46 | no | -- | no | 15 |
| I132 | MYTI EDU | SB | | | | | | | | 2.02 | 2.06 | 1.19 | 1.15 | 1.26 | 1.17 | 0.917 | 1.83 | 1.13 | 0.5 | 0.548 | 1.87 | no | -- | no | 15 |
| I133 | MYTI EDU | SB | | | | | 2.16 | 0.879 | 1.62 | 1.93 | 2.73 | 1.16 | 1.11 | 1.03 | 0.925 | 0.94 | 1.55 | 1.35 | 0.643 | 0.692 | 2 | no | -- | no | 15 |
| I241 | MYTI EDU | SB | | | | | 6.4 | 6.21 | 2.3 | 6.49 | 5.59 | 4.45 | 2.93 | 4.4 | 4.37 | 5.49 | 6.17 | 3 | 3.88 | 11.9 | 5.56 | no | -- | no | 15 |
| I242 | MYTI EDU | SB | | | | | 6.52 | 9.74 | 1.58 | 3.53 | 9.47 | 3.52 | 2.22 | 2.88 | 3.38 | 4.41 | 2.57 | 1.93 | 3.06 | 2.43 | 2.71 | no | -- | no | 17 |
| I243 | MYTI EDU | SB | | | | | 7.47 | 6.12 | 1.72 | 5.43 | 5.11 | 4.01 | 1.99 | 3.32 | 3.88 | 6.41 | 19.5 | 5.88 | 4.41 | 6.23 | 3.16 | no | -- | no | 17 |

Annual median concentration of ppDDE (µg/kg w. wt.)

| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | ANALYSIS TRND | SM+3 | POWER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30B | GADU MOR | LI | | 163 | 440 | 182 | 159 | 191 | 194 | 321 | 380 | 260 | 230 | 160 | 180 | 180 | 240 | 210 | 260 | 190 | 130 | 180 | 150 | no | --(--) | no | 11 |
| 36B | GADU MOR | LI | | 91.9 | 51 | 50 | 75 | 55 | 105 | 141 | 129 | 45 | 86 | 47 | 46 | 39 | 32 | 34 | 40 | 59 | 26 | 34 | 26 | no | D- | no | 12 |
| 77B | GADU MOR | LI | | 46 | 63.4 | | | | | | | | | | | | | | | | | 20 | 30 | no | -? | ? | 12 |
| 15B | GADU MOR | LI | | 50 | 136 | 48 | 57 | 86 | 33.5 | 75 | 140 | 72.5 | 76 | 46 | 60 | 78 | 74 | 50 | 58 | 51 | 55 | 48 | 37 | no | -- | no | 13 |
| 53B | GADU MOR | LI | | 637 | 806 | 939 | 85 | | 42 | 491 | 936 | 490 | 160 | 380 | 260 | 200 | 145 | 300 | 199 | 220 | 360 | 87 | 268 | 1.3 | --(--) | no | 21 |
| 67B | GADU MOR | LI | | 776 | 554 | 347 | 392 | 471 | 109 | 460 | 2060 | 270 | 200 | 177 | 140 | 110 | 89 | 74 | 110 | 34 | 130 | 96.5 | 100 | no | D-(--) | no | 19 |
| 23B | GADU MOR | LI | | 68 | 85.4 | 42 | 41 | 35 | 31 | 49 | 33 | 49 | 48 | 59 | 52.9 | 24 | 37 | 52 | 46 | 33 | 40 | 21.4 | 26 | no | D- | no | 11 |
| 92B | GADU MOR | LI | | | | | 53 | 50.5 | 50 | 196 | | | | | | | | 50 | 22 | | | 38 | 34 | no | -- | no | 15 |
| 98B1 | GADU MOR | LI | | | | 73 | 83.4 | 43 | 49 | 138 | 198 | 78 | 41 | | | 29 | 64 | 73 | 22 | 37 | 52.2 | 17 | 5.6 | no | D- | no | 18 |
| 43B | GADU MOR | LI | | | | | | 126 | 69 | 60 | | | | | | | | | | | | 39.5 | 48 | no | -? | ? | 12 |
| 10B | GADU MOR | LI | | | | | | 211 | 71 | 75 | 99 | 65 | 90 | 32 | 38.5 | 54 | 51.5 | 50 | 37 | 34 | 35 | 30 | 51 | no | D- | no | 12 |

Annual median concentration of ppDDE (µg/kg w. wt.)

| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | ANALYSIS TRND | SM+3 | POWER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30B | GADU MOR | MU | | 0.45 | 1.21 | 2 | 1 | 0.32 | 0.29 | 1.01 | 0.989 | 1.5 | 1.5 | 0.44 | 0.67 | 0.73 | 0.7 | 0.66 | 0.73 | 0.65 | 0.58 | 0.82 | 1.1 | 1.1 | -- | 1.2 | 16 |
| 36B | GADU MOR | MU | | 0.34 | 0.29 | 0.2 | 0.5 | 0.09 | 0.93 | 0.58 | 0.88 | 0.31 | 0.32 | 0.171 | 0.24 | 0.22 | 0.21 | 0.26 | 0.41 | 0.38 | 0.08 | 0.22 | 0.221 | no | -- | no | 18 |
| 77B | GADU MOR | MU | | 0.14 | 0.7 | | | | | | | | | | | | | | | | | 0.13 | 0.14 | no | -? | ? | 22 |
| 15B | GADU MOR | MU | | 0.47 | 0.36 | 0.346 | 0.2 | 0.12 | 0.26 | 0.35 | 0.514 | 0.23 | 0.32 | 0.31 | 0.19 | 0.22 | 0.39 | 0.07 | 0.21 | 0.18 | 0.15 | 0.15 | 0.12 | no | -- | no | 14 |
| 53B | GADU MOR | MU | | 2.36 | 2.16 | 6.75 | 1.8 | | 0.08 | 4.09 | 4.59 | 4.64 | 3.2 | 2.5 | 0.6 | 1.79 | 2.4 | 1.9 | 4.2 | 0.63 | 1.9 | 1.8 | 1.3 | 1.3 | -- | 1.0 | 25 |
| 67B | GADU MOR | MU | | 2.25 | 3.03 | 1.4 | 1 | 2.46 | 1.08 | 6.96 | 19 | 1 | 1.1 | 1.1 | 1.8 | 0.44 | 0.24 | 0.31 | 0.66 | 0.12 | 0.34 | 0.554 | 0.47 | no | D- | no | 22 |
| 23B | GADU MOR | MU | | 0.21 | 0.59 | 0.1 | 0.2 | 0.04 | 0.16 | 0.14 | 0.18 | 0.14 | 0.18 | 0.12 | 0.16 | 0.1 | 0.13 | 0.08 | 0.17 | 0.29 | 0.15 | 0.07 | 0.09 | no | -- | no | 17 |
| 92B | GADU MOR | MU | | | | | 0.1 | 0.09 | 0.17 | 0.49 | | | | | | | | 0.11 | 0.1 | | | 0.14 | | no | -- | no | 13 |
| 98B1 | GADU MOR | MU | | | | 0.4 | 0.4 | 0.06 | 0.05 | 0.24 | 0.6 | 0.18 | 0.15 | | | 0.09 | 0.12 | 0.21 | 0.14 | 0.09 | 0.148 | 0.05 | 0.05 | no | -- | no | 20 |
| 43B | GADU MOR | MU | | | | | | 0.23 | 0.23 | 0.14 | | | | | | | | | | | | 0.0949 | | no | -? | ? | 10 |
| 10B | GADU MOR | MU | | | | | | 0.74 | 0.68 | 0.12 | 0.4 | 0.26 | 0.41 | 0.15 | 0.18 | 0.23 | 0.18 | 0.41 | 0.17 | 0.175 | 0.26 | 0.19 | 0.27 | no | -- | no | 16 |

Annual median concentration of ppDDE (µg/kg w. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 33F | PLAT FLE | LI | | 13 | 9.1 | 24 | 14 | 13 | 7 | 12.7 | 9.29 | 8.99 | 6.8 | 27 | 27 | 17 | 22 | 19 | 16 | 20 | 16 | 18 | 24 | no | -- | no | 13 |
| 53F | PLAT FLE | LI | | 94 | 70.1 | 32 | 41 | | 8 | 25 | 45 | 38 | 44 | 17.5 | 39 | 42 | 40 | 29 | 45 | | 51 | 30 | 9.44 | no | -- | no | 16 |
| 67F | PLAT FLE | LI | | | | | | | | 27 | | 84.5 | 40 | 35 | 25 | 24 | 20 | 21 | 22 | 26 | 26 | 33 | 19 | no | -- | no | 12 |
| 21F | PLAT FLE | LI | | | | | | | | | | | 11 | 2.6 | 16 | 7.4 | | 90 | 7.7 | 4.8 | | | | no | -- | no | >25 |
| 33F | PLAT FLE | MU | | 0.9 | 1.93 | 0.6 | 0.2 | 0.15 | 0.25 | 0.495 | 0.299 | 0.26 | 1.5 | 0.3 | 0.56 | 0.43 | 0.53 | 0.25 | 0.16 | 0.25 | 0.22 | 0.29 | 0.39 | no | -- | no | 17 |
| 53F | PLAT FLE | MU | | 4.67 | 5.3 | 3.8 | 1.3 | | 0.373 | 1.79 | 1.36 | 0.96 | 0.93 | 0.61 | 0.88 | 0.66 | 0.81 | 0.57 | 1.3 | | 0.67 | 0.73 | 0.273 | no | D- | no | 15 |
| 67F | PLAT FLE | MU | | | | | | | | 0.85 | | 1.31 | 1.4 | 1.2 | 0.54 | 0.63 | 0.68 | 0.11 | 0.33 | 0.26 | 0.7 | 1 | 0.87 | no | DY | 1.9 | 16 |
| 21F | PLAT FLE | MU | | | | | | | | | | | 0.32 | 0.1 | 0.43 | 0.16 | | 1.2 | 0.61 | 0.3 | | | | no | -- | no | 22 |
| 36F | LIMA LIM | LI | | 28 | 34.4 | 28 | 21 | 50 | 40 | 40 | 22 | 18 | 52 | 45 | 27 | 31 | 36 | 17 | 21 | 35 | 19 | 22 | 18 | no | -- | no | 13 |
| 77F | LIMA LIM | LI | | | 17 | | | | | | | | | | | | | | | | | 7.3 | 20 | no | -? | ? | 20 |
| 15F | LIMA LIM | LI | | | 39 | | 13.4 | 23.5 | 9 | 20.7 | 20 | 13 | 32 | | 41 | 15 | 17 | 23 | 26 | 15 | 16 | 22 | 16 | no | -- | no | 14 |
| 22F | LIMA LIM | LI | | 68.9 | 48 | 39.9 | | 21 | 9.17 | | | | | | | | | | | | | | | no | D? | ? | 10 |
| 21F | LIMA LIM | LI | | | | | | | | | | | | | | 74 | 82 | 56 | 69 | | 40 | | 18 | no | Dm | no | 11 |
| 36F | LIMA LIM | MU | | 0.41 | 1.15 | 0.7 | 0.5 | 0.96 | 0.91 | 0.91 | 0.46 | 0.67 | 0.49 | 0.52 | 0.51 | 0.61 | 0.53 | 0.13 | 0.31 | 0.38 | 0.46 | 0.35 | 0.41 | no | -- | no | 14 |
| 15F | LIMA LIM | MU | | | 1.21 | | 0.173 | 0.143 | 0.3 | 0.55 | 0.42 | 0.38 | 0.324 | | 0.55 | 0.18 | 0.28 | 0.1 | 0.46 | 0.24 | 0.16 | 0.35 | 0.23 | no | -- | no | 17 |
| 22F | LIMA LIM | MU | | 1.1 | 2 | 1.18 | | 0.56 | 0.83 | | | | | | | | | | | | | | | no | -? | ? | 14 |
| 21F | LIMA LIM | MU | | | | | | | | | | | | | | 1.4 | 0.82 | 0.51 | 1.1 | | 0.79 | | 0.69 | no | -- | no | 13 |
| 30F | PLEU PLA | LI | | | | 21.2 | | 13 | 12 | | | | | | | | | | | | | | | 1.2 | -? | ? | 6 |
| 22F | PLEU PLA | LI | | | | | | | | 7.8 | 12 | 2.8 | | | | | | | | | | | | no | -? | ? | 21 |
| 98F2 | PLEU PLA | LI | | | | | | | | | | | | 10.8 | 8 | 5.1 | 3.6 | 2.8 | 9.19 | 4.6 | 1.7 | 1.2 | 1.2 | no | D- | no | 15 |
| 10F | PLEU PLA | LI | | | | | | | | | 15 | | 34.7 | 28 | 8.9 | 19 | 4.74 | 5.79 | 10 | | 3.9 | 5.02 | 3.7 | no | D- | no | 16 |
| 30F | PLEU PLA | MU | | | | 0.693 | | 0.32 | 0.17 | | | | | | | | | | | | | | | no | -? | ? | 8 |
| 22F | PLEU PLA | MU | | | | | | | | 0.47 | 0.34 | 0.76 | | | | | | | | | | | | no | -? | ? | 15 |
| 98F2 | PLEU PLA | MU | | | | | | | | | | | | 0.465 | 0.24 | 0.135 | 0.09 | 0.05 | 0.434 | 0.34 | 0.08 | 0.05 | 0.05 | no | -- | no | 21 |
| 10F | PLEU PLA | MU | | | | | | | | | 0.4 | | 0.859 | 1.1 | 0.3 | 0.4 | 0.134 | 0.0671 | 0.18 | | 0.2 | 0.139 | 0.11 | no | D- | no | 16 |
| 67F | LEPI WHI | LI | | 294 | 240 | 183 | 163 | 250 | 145 | 143 | 167 | 160 | 160 | 130 | 58 | 64 | 73 | 71.1 | 55 | 61.6 | 48 | 61 | 46 | m | D- | m | 10 |
| 21F | LEPI WHI | LI | | | | | | | | | | | | | | | 44 | 27.9 | 48 | 45 | 36 | 38 | 43 | m | -- | m | 10 |
| 67F | LEPI WHI | MU | | 2.56 | 1.51 | 2.5 | 0.8 | 0.8 | 3.04 | 0.78 | 1.27 | 0.56 | 1.4 | 1.1 | 0.54 | 0.39 | 0.59 | 0.483 | 0.57 | 0.37 | 0.28 | 0.76 | 0.66 | m | D- | m | 16 |
| 21F | LEPI WHI | MU | | | | | | | | | | | | | | | 0.27 | 0.15 | 0.6 | 0.38 | 0.46 | 0.43 | 0.35 | m | -- | m | 15 |

Annual median concentration of HCB (mg/kg d. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | | 1.18 | 0.877 | 2.06 | 0.917 | 1.15 | 0.866 | 0.35 | 0.592 | 0.952 | 0.541 | 0.27 | 0.239 | 0.251 | 0.275 | 0.298 | | 0.361 | 0.225 | 0.34 | 0.323 | 0.242 | 0.188 | 0.25 | 0.353 | 0.25 | 0.222 | no | D- | no | 13 |
| 31A | MYTI EDU | SB | | 13.4 | 1.38 | 3.83 | 1.89 | 0.93 | 0.893 | 0.361 | 0.317 | 0.606 | 0.549 | 0.446 | 0.243 | 0.312 | 0.219 | 0.258 | 0.21 | | 0.226 | 0.265 | 0.321 | 0.327 | 0.216 | 0.207 | 0.421 | 0.5 | 0.2 | 0.938 | 1.9 | DY | 1.7 | 15 |
| 35A | MYTI EDU | SB | | 12.8 | 0.952 | 3.33 | 0.793 | 0.976 | 1.12 | 0.474 | 0.42 | 0.585 | 0.578 | 0.505 | 0.234 | 0.276 | 0.219 | 0.522 | 0.2 | 0.336 | 0.36 | 0.3 | 0.287 | 0.273 | 0.313 | 0.533 | 0.35 | 0.381 | 0.333 | 0.261 | no | DY | no | 15 |
| 36A | MYTI EDU | SB | | 15 | 0.948 | 3.83 | 2.9 | 2.37 | 0.957 | 0.426 | 0.33 | 0.546 | 0.394 | 0.529 | 0.24 | 0.333 | 0.276 | 0.311 | 0.149 | | 0.252 | 0.197 | 0.214 | 0.292 | 0.216 | 0.353 | 0.182 | 0.2 | 0.294 | | no | DY | no | 16 |
| 71A | MYTI EDU | SB | | 15.3 | 10.4 | 91.4 | 11.1 | 207 | 1.83 | 149 | 8.48 | 6.91 | 4.14 | 3.91 | 1.47 | 2.13 | 4.48 | 2.04 | 1.78 | 3.1 | 1.85 | 2.42 | 0.809 | 0.327 | 0.606 | 4.47 | 1.27 | 1.33 | 1.21 | 1.38 | 2.8 | D-(--) | 2.3 | >25 |
| 76A | MYTI EDU | SB | | | | | | | | | 0.378 | 0.568 | 0.498 | 0.794 | | | 0.254 | 0.289 | 0.4 | 0.256 | 0.216 | 0.244 | 0.299 | 0.311 | 0.974 | 0.294 | 0.188 | 0.235 | 0.353 | 0.176 | no | -- | no | 14 |
| 15A | MYTI EDU | SB | | | | | | | | | 0.203 | | | 0.488 | 0.253 | 0.217 | 0.294 | 0.254 | 0.159 | 0.224 | 0.179 | 0.253 | 0.296 | 0.331 | 0.291 | 0.313 | 0.167 | 0.353 | 0.222 | 0.176 | no | -- | no | 11 |
| 51A | MYTI EDU | SB | | | | | | | | | | | | | | 0.612 | 0.333 | 0.313 | 0.4 | 0.4 | 0.385 | 0.196 | 0.476 | 0.403 | 0.49 | 0.575 | 0.5 | 0.769 | 0.467 | 0.583 | 1.2 | -- | 1.2 | 11 |
| 52A | MYTI EDU | SB | | | | | | | | 0.855 | 0.378 | | 0.813 | 0.811 | 0.276 | 0.316 | 0.262 | 0.333 | 0.214 | 0.334 | 0.199 | 0.376 | 0.318 | | 0.458 | 0.313 | 0.5 | 0.667 | 0.467 | 0.167 | no | -- | no | 14 |
| 56A | MYTI EDU | SB | | | | | | | 0.2 | 0.787 | 0.413 | 0.794 | 0.935 | 1.04 | 0.309 | 0.382 | 0.309 | 0.442 | 0.348 | 0.704 | 0.183 | 0.336 | 0.301 | 0.451 | 0.526 | 0.333 | 0.6 | 0.722 | 0.286 | 0.267 | no | -- | no | 15 |
| 57A | MYTI EDU | SB | | | | | | | | 0.769 | | 0.763 | 0.719 | 0.794 | 0.357 | 0.301 | 0.262 | 0.431 | 0.576 | 0.625 | 0.262 | 0.361 | 0.254 | 0.397 | 0.237 | 0.533 | 0.538 | 0.696 | 0.278 | 0.75 | 1.5 | -- | 1.4 | 13 |
| 63A | MYTI EDU | SB | | | | | | | | 1.05 | | 0.971 | 0.74 | 0.625 | 0.316 | 0.329 | 0.333 | 0.407 | 0.452 | 0.51 | 0.23 | 0.321 | 0.329 | 0.352 | 0.154 | 0.533 | 0.235 | 0.882 | 0.263 | 0.625 | 1.3 | -- | 1.4 | 14 |
| 65A | MYTI EDU | SB | | | | | | | 0.2 | 0.427 | 0.516 | 0.862 | 0.621 | 0.667 | 0.284 | 0.296 | 0.294 | 0.345 | 0.377 | 0.524 | 0.15 | 0.272 | 0.258 | 0.294 | 0.179 | 0.556 | 0.188 | 1.1 | 0.2 | 0.947 | 1.9 | -- | 1.8 | 16 |
| 69A | MYTI EDU | SB | | | | | | | | | | | 0.532 | 0.526 | 0.286 | 0.251 | 0.286 | 0.5 | 0.483 | 0.361 | 0.207 | 0.331 | 0.311 | 0.266 | 0.247 | 0.368 | 0.158 | 1.3 | 0.167 | 0.667 | 1.3 | -- | 1.3 | 17 |
| 22A | MYTI EDU | SB | | | | | | | | | 0.265 | 0.61 | 0.559 | 0.444 | 0.248 | 0.253 | 0.301 | 0.311 | 0.172 | 0.316 | 0.202 | 0.298 | 0.242 | 0.329 | 0.219 | 0.176 | 0.167 | 0.2 | 0.2 | 0.211 | no | D- | no | 11 |
| 82A | MYTI EDU | SB | | | 2.26 | 10.7 | 0.656 | 0.617 | 0.8 | 0.535 | | | | | | | | | | | | | | | 0.181 | 0.235 | | | | | no | -- | no | 25 |
| 84A | MYTI EDU | SB | | | 3.41 | 8.79 | 3.33 | 2.04 | 1.23 | 0.476 | | 0.505 | 0.625 | 0.532 | | 0.246 | 0.215 | | | | | | | | 0.292 | 0.188 | | | | | no | DY | no | 15 |
| 87A | MYTI EDU | SB | | | | | | | 0.917 | 0.42 | | | | | | | | | | | | | | | 0.14 | 0.19 | | | | | no | -? | ? | 14 |
| 25A | MYTI EDU | SB | | | | | | | | | | | 0.704 | 0.513 | | | | | | | | | | | 0.35 | 0.364 | | | | | no | -? | ? | 8 |
| 26A | MYTI EDU | SB | | | | | | | | | | | 0.614 | | | | | | | | | | | | 0.318 | 0.474 | | | | | no | -? | ? | 12 |
| 27A | MYTI EDU | SB | | | | | | | | | | | 0.599 | | | | | | | | | | | | 0.188 | 0.222 | | | | | no | -? | ? | 9 |
| 28A | MYTI EDU | SB | | | | | | | | | | | 0.556 | 0.429 | | | | | | | | | | | 0.16 | 0.353 | | | | | no | -? | ? | 15 |
| 91A | MYTI EDU | SB | | | | | | | | | | | 0.625 | | 0.314 | | | | | | | | | | | 0.278 | | | | | no | -? | ? | 14 |
| 92A1 | MYTI EDU | SB | | | | | | | | | | | 0.68 | 0.418 | 0.244 | 0.225 | 0.23 | 0.254 | | | | | | | | | | | | | no | Dm | no | 12 |
| 96A | MYTI EDU | SB | | | | | | | | | | | 0.525 | 0.422 | | | | | | | | | | | 0.146 | 0.3 | | | | | no | -? | ? | 14 |
| 98A2 | MYTI EDU | SB | | | | | | | | | | | | | | | | 0.336 | | 0.435 | 0.286 | 0.291 | 0.313 | 0.362 | 0.433 | 0.294 | 0.167 | 0.4 | 0.176 | 0.375 | no | -- | no | 13 |
| 98X | MYTI EDU | SB | | | | | | | | | | | | | 0.559 | 0.318 | 0.26 | | | | | | | | | | | | | | no | -? | ? | 8 |
| 99A | MYTI EDU | SB | | | | | | | | | | | 0.621 | 0.442 | | | | | | | | | | | 0.152 | 0.176 | | | | | no | D? | ? | 9 |
| 41A | MYTI EDU | SB | | | | | | | | | | | | | 0.292 | 0.263 | 0.291 | 0.303 | | | | | | | | | 0.15 | 0.444 | | | no | -- | no | 14 |
| 43A | MYTI EDU | SB | | | | | | | | | | | | | 0.325 | 0.338 | | 0.45 | | | | | | | | | 0.188 | 0.286 | | | no | -? | ? | 11 |
| 44A | MYTI EDU | SB | | | | | | | | | | | | | | 0.273 | 0.286 | 0.329 | | | | | | | | | 0.25 | 0.381 | | | no | -? | ? | 9 |
| 45A | MYTI EDU | SB | | | | | | | | | | | | | 0.292 | 0.278 | | | | | | | | | | | 0.263 | 0.222 | | | no | -? | ? | 6 |
| 46A | MYTI EDU | SB | | | | | | | | | | | | | 0.263 | 0.291 | 0.273 | | | | | | | | | | 0.15 | 0.391 | | | no | -? | ? | 14 |
| 48A | MYTI EDU | SB | | | | | | | | | | | | | 0.279 | 0.294 | 0.238 | | | | | | | | | | 0.188 | 0.25 | | | no | -? | ? | 8 |
| 10A2 | MYTI EDU | SB | | | | | | | | | | | | | | | 0.245 | 0.309 | | 0.284 | 0.278 | 0.289 | 0.305 | 0.275 | 0.279 | 0.263 | 0.188 | 0.227 | 0.176 | 0.353 | no | -- | no | 9 |
| 11X | MYTI EDU | SB | | | | | | | | | | | | | | | | 0.34 | 0.208 | 0.249 | 0.242 | 0.253 | 0.236 | | 0.279 | 0.381 | 0.167 | 0.571 | 0.176 | 0.905 | 1.8 | -- | 1.5 | 16 |

Annual median concentration of HCB (mg/kg d. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | | 1.18 | 0.877 | 2.06 | 0.917 | 1.15 | 0.866 | 0.35 | 0.592 | 0.952 | 0.541 | 0.27 | 0.239 | 0.251 | 0.275 | 0.298 | | 0.361 | 0.225 | 0.34 | 0.323 | 0.242 | 0.188 | 0.25 | 0.353 | 0.25 | 0.222 | no | D- | no | 13 |
| 71A | MYTI EDU | SB | | 15.3 | 10.4 | 91.4 | 11.1 | 207 | 1.83 | 149 | 8.48 | 6.91 | 4.14 | 3.91 | 1.47 | 2.13 | 4.48 | 2.04 | 1.78 | 3.1 | 1.85 | 2.42 | 0.809 | 0.327 | 0.606 | 4.47 | 1.27 | 1.33 | 1.21 | 1.38 | 2.8 | D- | 2.3 | >25 |
| 51A | MYTI EDU | SB | | | | | | | | | | | | | | 0.612 | 0.333 | 0.313 | 0.4 | 0.4 | 0.385 | 0.196 | 0.476 | 0.403 | 0.49 | 0.575 | 0.5 | 0.769 | 0.467 | 0.583 | 1.2 | -- | 1.2 | 11 |
| 52A | MYTI EDU | SB | | | | | | | | 0.855 | 0.378 | | 0.813 | 0.811 | 0.276 | 0.316 | 0.262 | 0.333 | 0.214 | 0.334 | 0.199 | 0.376 | 0.318 | | 0.458 | 0.313 | 0.5 | 0.667 | 0.467 | 0.167 | no | -- | no | 14 |
| 10A2 | MYTI EDU | SB | | | | | | | | | | | | | | | 0.245 | 0.309 | | 0.284 | 0.278 | 0.289 | 0.305 | 0.275 | 0.279 | 0.263 | 0.188 | 0.227 | 0.176 | 0.353 | no | -- | no | 9 |
| I021 | MYTI EDU | SB | | | | | | | | | | | | | | 0.833 | 0.916 | 0.48 | 0.375 | | 0.481 | 0.636 | 0.549 | | | | | | | | 1.1 | -- | 1.3 | 10 |
| I022 | MYTI EDU | SB | | | | | | | | | | | | | | 0.421 | 0.479 | 0.97 | 0.312 | 0.783 | 0.455 | 0.543 | 0.549 | 0.379 | 0.513 | 0.476 | 0.692 | 0.667 | 0.545 | 0.5 | 1.0 | -- | 1.1 | 12 |
| I023 | MYTI EDU | SB | | | | | | | | | | | | | | 0.482 | 0.424 | 0.431 | 0.259 | 0.615 | 0.347 | 0.342 | 0.417 | 0.394 | 0.446 | 0.541 | 0.545 | 0.615 | 0.538 | 0.417 | no | -- | no | 10 |
| I024 | MYTI EDU | SB | | | | | | | | | | | | | | 0.488 | 0.602 | 1.16 | 0.426 | 0.66 | 0.556 | 0.536 | 0.495 | 0.388 | 0.404 | 0.532 | 0.615 | 0.308 | 0.636 | 0.5 | 1.0 | -- | 1.1 | 12 |
| I301 | MYTI EDU | SB | | | | | | | | | | | 1.4 | | | 0.294 | 0.284 | 0.695 | 0.818 | 1.55 | 0.508 | 0.677 | 0.423 | 0.318 | 0.965 | 0.735 | 0.357 | 0.667 | 1.36 | 0.533 | 1.1 | -- | 1.7 | 16 |
| I304 | MYTI EDU | SB | | | | | | | | | | | | | | 0.336 | 0.281 | 0.719 | 0.486 | | 0.294 | 0.526 | 0.385 | 0.307 | 0.5 | 0.439 | 0.286 | 0.333 | 0.733 | 0.357 | no | -- | no | 13 |
| I306 | MYTI EDU | SB | | | | | | | | | | | | | | 0.299 | 0.307 | 0.774 | 0.253 | | 0.296 | 0.294 | 0.336 | 0.352 | 0.462 | 0.431 | 0.438 | 0.357 | 0.462 | 0.357 | no | -- | no | 12 |
| I307 | MYTI EDU | SB | | | | | | | | | | | | | | 0.273 | 0.318 | 0.674 | 0.174 | | 0.327 | 0.336 | 0.45 | 0.365 | 0.357 | 0.238 | 0.5 | 0.471 | 0.571 | 0.438 | no | -- | 1.3 | 13 |
| I711 | MYTI EDU | SB | | | | | | | | | | | | | | 4.45 | 5.54 | 0.575 | 4.46 | 6.96 | 2.56 | | 4 | | | | | | | | 8.0 | -- | 11.2 | 24 |
| I712 | MYTI EDU | SB | | | | | | | | | | | | | | 3.43 | 16.4 | 7.9 | 4.83 | 5 | 3.31 | 1.78 | 2.75 | 3.27 | 2.9 | 6.72 | 2.09 | 1.64 | 2.77 | 1.43 | 2.9 | -- | no | 16 |
| I713 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | | | | 3.49 | 2.64 | 4.17 | 11.1 | 3.56 | 2.44 | 2.83 | 2.83 | 5.7 | -- | 1.7 | 16 |
| I131A | MYTI EDU | SB | | | | | | | | | | | | | | 0.316 | 0.298 | 0.273 | 0.196 | 0.582 | 0.288 | 0.327 | 0.292 | 0.373 | 1.4 | 0.724 | 0.643 | 0.625 | 0.643 | 0.769 | 1.5 | U- | 1.2 | 14 |
| I132 | MYTI EDU | SB | | | | | | | | | | | | | | | | | 44.2 | 1.89 | 4.73 | 3.11 | 2.36 | 1.56 | 1.94 | 6.42 | 4.93 | 0.625 | 3.55 | 0.667 | 1.3 | -- | no | 24 |
| I133 | MYTI EDU | SB | | | | | | | | | | | | | | 18.1 | 43.5 | 8.12 | 28 | 1.7 | 6.18 | 2.3 | 1.62 | 2.45 | 3.76 | 7.18 | 4.09 | 0.615 | 4.31 | 1.87 | 3.7 | D- | 1.3 | 22 |
| I241 | MYTI EDU | SB | | | | | | | | | | | | | | 1.28 | 0.706 | 0.69 | 0.753 | 0.698 | 0.618 | 0.293 | 0.55 | 0.299 | 1.14 | 1.33 | 1.55 | 1.65 | 0.688 | 0.556 | 1.1 | UY | no | 14 |
| I242 | MYTI EDU | SB | | | | | | | | | | | | | | 1.2 | 0.923 | 0.562 | 0.604 | 0.651 | 0.552 | 0.241 | 0.5 | 0.463 | 0.593 | 0.857 | 1.07 | 0.778 | 0.571 | 0.769 | 1.5 | DY | 1.3 | 11 |
| I243 | MYTI EDU | SB | | | | | | | | | | | | | | 1.03 | 0.663 | 0.516 | 1.24 | 0.662 | 0.67 | 0.262 | 0.444 | 0.34 | 0.611 | 0.92 | 1.19 | 0.889 | 0.5 | 0.526 | 1.1 | -- | no | 13 |

Annual median concentration of HCB (µg/kg w. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30B | GADU MOR | LI | | 10 | 17 | 7.48 | 16 | 11 | 11 | 12 | 7 | 5.3 | 5.1 | 9.1 | 8.9 | 6.7 | 6 | 8.9 | 6.3 | 5.5 | 7.9 | 6.2 | 3.7 | no | D- | no | 12 |
| 36B | GADU MOR | LI | | 7 | 9 | 9 | 10 | 9 | 5 | 9 | 6 | 4.4 | 6.5 | 5.4 | 4.6 | 3.1 | 3.3 | 4 | 3.3 | 3.5 | 3.7 | 4.1 | 2.8 | no | D- | no | 10 |
| 77B | GADU MOR | LI | | 9.49 | 8 | | | | | | | | | | | | | | | | | 3.7 | 4.5 | no | D? | ? | 8 |
| 15B | GADU MOR | LI | | 5 | 20.5 | 10 | 14 | 14 | 9 | 11 | 13 | 11.5 | 11 | 6.2 | 6.6 | 8.2 | 6.4 | 9.7 | 9.1 | 13 | 9.9 | 6.2 | 6.0 | no | -- | no | 12 |
| 53B | GADU MOR | LI | | 10 | 10 | 16.5 | 7 | | 5 | 7 | 7 | 5 | 4.7 | 12 | 2.1 | 3 | 2.25 | 2.6 | 1.3 | 3.9 | 6.3 | 0.5 | 4.2 | no | -- | no | 20 |
| 67B | GADU MOR | LI | | 14 | 8 | 7.94 | 8 | 8.49 | 10 | 8 | 15.5 | 9.9 | 4.6 | 5.63 | 4.9 | 4.6 | 5.1 | 5.3 | 7.7 | 5.3 | 8 | 3.7 | 4 | no | D- | no | 11 |
| 23B | GADU MOR | LI | | 6 | 9.49 | 12 | 9 | 8 | 6 | 10 | 6 | 8.4 | 7.8 | 7.6 | 9.25 | 4.7 | 7.9 | 5.8 | 6.9 | 5.5 | 8.5 | 4.3 | 5.1 | no | -- | no | 11 |
| 92B | GADU MOR | LI | | | | | 17 | 11 | 14 | 13 | | | | | | | | 9.8 | 6 | | | 7.3 | | no | -- | no | 10 |
| 98B1 | GADU MOR | LI | | | | 20 | 9.95 | 12 | 18 | 35 | 20.5 | 16 | 13 | | | 10 | 13 | 11 | 10 | 13 | 12.5 | 7.4 | 4.1 | no | D-(--) | no | 12 |
| 43B | GADU MOR | LI | | | | | | 15 | 16.5 | 13 | | | | | | | | | | | | 12.5 | 8.4 | no | -? | ? | 9 |
| 10B | GADU MOR | LI | | | | | | 13 | 11 | 16 | 17 | 17 | 25 | 9 | 9.9 | 11 | 9.43 | 5.1 | 7.7 | 6.8 | 8.5 | 4.3 | 7.9 | no | D- | no | 12 |

Annual median concentration of HCB (µg/kg w. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30B | GADU MOR | MU | | 0.09 | 0.09 | 0.1 | 0.1 | 0.04 | 0.03 | 0.05 | 0.05 | 0.06 | 0.06 | 0.06 | 0.05 | 0.06 | 0.05 | 0.06 | 0.06 | 0.05 | 0.04 | 0.05 | 0.06 | no | DY | no | 10 |
| 36B | GADU MOR | MU | | 0.11 | 0.07 | 0.1 | 0.1 | 0.04 | 0.05 | 0.06 | 0.06 | 0.05 | 0.06 | 0.04 | 0.05 | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 | 0.03 | 0.04 | 0.0447 | no | D- | no | 10 |
| 77B | GADU MOR | MU | | 0.12 | 0.1 | | | | | | | | | | | | | | | | | 0.03 | 0.05 | no | -? | ? | 12 |
| 15B | GADU MOR | MU | | 0.11 | 0.11 | 0.1 | 0.1 | 0.06 | 0.07 | 0.08 | 0.0748 | 0.1 | 0.06 | 0.1 | 0.04 | 0.06 | 0.07 | 0.05 | 0.06 | 0.07 | 0.06 | 0.06 | 0.05 | no | D- | no | 10 |
| 53B | GADU MOR | MU | | 0.1 | 0.03 | 0.1 | 0.1 | | 0.03 | 0.0648 | 0.06 | 0.05 | 0.05 | 0.09 | 0.04 | 0.05 | 0.08 | 0.03 | 0.04 | 0.03 | 0.04 | 0.03 | 0.04 | no | -- | no | 15 |
| 67B | GADU MOR | MU | | 0.1 | 0.0849 | 0.1 | 0.1 | 0.0748 | 0.06 | 0.05 | 0.07 | 0.06 | 0.05 | 0.05 | 0.04 | 0.05 | 0.05 | 0.04 | 0.07 | 0.04 | 0.05 | 0.05 | 0.05 | no | D- | no | 9 |
| 23B | GADU MOR | MU | | 0.08 | 0.08 | 0.1 | 0.1 | 0.04 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.04 | 0.05 | 0.03 | 0.07 | 0.08 | 0.05 | 0.04 | 0.17 | no | -- | no | 13 |
| 92B | GADU MOR | MU | | | | | 0.1 | 0.07 | 0.05 | 0.09 | | | | | | | | 0.07 | 0.07 | | | 0.08 | | no | -- | no | 12 |
| 98B1 | GADU MOR | MU | | | | 0.2 | 0.2 | 0.07 | 0.1 | 0.11 | 0.1 | 0.1 | 0.08 | | | 0.07 | 0.09 | 0.08 | 0.11 | 0.08 | 0.0949 | 0.07 | 0.05 | no | D- | no | 11 |
| 43B | GADU MOR | MU | | | | | | 0.09 | 0.13 | 0.06 | | | | | | | | | | | | 0.124 | | no | -? | ? | 14 |
| 10B | GADU MOR | MU | | | | | | 0.16 | 0.11 | 0.09 | 0.2 | 0.17 | 0.26 | 0.09 | 0.11 | 0.13 | 0.09 | 0.09 | 0.1 | 0.0849 | 0.09 | 0.08 | 0.1 | no | -- | no | 12 |

Annual median concentration of HCB (µg/kg w. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 33F | PLAT FLE | LI | | 1 | 0.5 | 5 | 2 | 1 | 1 | 0.648 | 0.693 | 0.643 | 0.54 | 1.6 | 1.6 | 1.6 | 1.9 | 1.2 | 1.3 | 1.8 | 1.7 | 1.5 | 1.8 | no | -- | no | 16 |
| 53F | PLAT FLE | LI | | 6 | 4.47 | 5 | 2 | | 1 | 2 | 3 | 1.8 | 2.5 | 2.39 | 2 | 2.9 | 1.4 | 1 | 1.2 | | 1.6 | 1.1 | 1.32 | no | D- | no | 12 |
| 67F | PLAT FLE | LI | | | | | | | | 3 | | 6.39 | 3.6 | 4.2 | 4.3 | 3.5 | 3.7 | 3.1 | 4.3 | 3.8 | 4.5 | 2.9 | 2.8 | no | -- | no | 10 |
| 21F | PLAT FLE | LI | | | | | | | | | | | 3.1 | 1.1 | 2.4 | 0.9 | | 3.6 | 2.1 | 1.2 | | | | no | -- | no | 18 |
| 33F | PLAT FLE | MU | | 0.06 | 0.07 | 0.1 | 0.1 | 0.03 | 0.03 | 0.03 | 0.05 | 0.03 | 0.06 | 0.04 | 0.04 | 0.05 | 0.06 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.05 | no | -- | no | 12 |
| 53F | PLAT FLE | MU | | 0.45 | 0.3 | 0.2 | 0.1 | | 0.0837 | 0.05 | 0.1 | 0.06 | 0.06 | 0.09 | 0.06 | 0.05 | 0.13 | 0.03 | 0.07 | | 0.04 | 0.08 | 0.049 | no | DY | no | 14 |
| 67F | PLAT FLE | MU | | | | | | | | 0.05 | | 0.098 | 0.19 | 0.16 | 0.12 | 0.14 | 0.12 | 0.03 | 0.08 | 0.07 | 0.07 | 0.11 | 0.15 | 1.5 | -- | 2.0 | 14 |
| 21F | PLAT FLE | MU | | | | | | | | | | | 0.1 | 0.03 | 0.06 | 0.04 | | 0.09 | 0.08 | 0.06 | | | | no | -- | no | 15 |
| 36F | LIMA LIM | LI | | 5.48 | 3 | 5 | 2 | 3 | 2 | 2.3 | 3 | 1.1 | 2.5 | 3 | 2.6 | 2 | 2.5 | 1.8 | 1.6 | 2.2 | 1.5 | 1.6 | 1.4 | no | D- | no | 12 |
| 77F | LIMA LIM | LI | | | 1 | | | | | | | | | | | | | | | | | 0.9 | 2.9 | no | -? | ? | 21 |
| 15F | LIMA LIM | LI | | | 4 | | 4 | 4 | 2 | 3 | 3.2 | 3 | 3.64 | | 5.9 | 2.5 | 4.3 | 3.1 | 4 | 2.6 | 3.7 | 2.5 | 3.3 | no | -- | no | 11 |
| 22F | LIMA LIM | LI | | 6 | 3 | 5 | | 1 | 1.41 | | | | | | | | | | | | | | | no | -? | ? | 15 |
| 21F | LIMA LIM | LI | | | | | | | | | | | | | | 4.8 | 9.1 | 3.1 | 8 | | 2.6 | | 0.93 | no | -- | no | 17 |
| 36F | LIMA LIM | MU | | 0.1 | 0.09 | 0.1 | 0.1 | 0.06 | 0.06 | 0.07 | 0.05 | 0.05 | 0.05 | 0.05 | 0.06 | 0.06 | 0.05 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.07 | no | DY | no | 9 |
| 15F | LIMA LIM | MU | | | 0.2 | | 0.1 | 0.0447 | 0.07 | 0.09 | 0.07 | 0.09 | 0.08 | | 0.15 | 0.04 | 0.09 | 0.03 | 0.09 | 0.05 | 0.06 | 0.07 | 0.06 | no | -- | no | 14 |
| 22F | LIMA LIM | MU | | 0.12 | 0.2 | 0.1 | | 0.05 | 0.0742 | | | | | | | | | | | | | | | no | -? | ? | 14 |
| 21F | LIMA LIM | MU | | | | | | | | | | | | | | 0.13 | 0.13 | 0.06 | 0.15 | | 0.08 | | 0.06 | no | -- | no | 13 |
| 30F | PLEU PLA | LI | | | | 5 | | 2 | 2 | | | | | | | | | | | | | | | no | -? | ? | 11 |
| 22F | PLEU PLA | LI | | | | | | | | 0.5 | 0.9 | 0.3 | | | | | | | | | | | | no | -? | ? | 19 |
| 98F2 | PLEU PLA | LI | | | | | | | | | | | | 1.3 | 1.8 | 0.955 | 0.68 | 1.2 | 1.09 | 0.45 | 0.43 | 0.48 | 0.61 | no | -- | no | 13 |
| 10F | PLEU PLA | LI | | | | | | | | | 6.1 | | 8.77 | 6.4 | 2.4 | 1.6 | 2.15 | 1.99 | 2.9 | | 1.35 | 1.59 | 1.7 | no | D- | no | 13 |
| 30F | PLEU PLA | MU | | | | 0.141 | | 0.05 | 0.03 | | | | | | | | | | | | | | | no | D? | ? | <=5 |
| 22F | PLEU PLA | MU | | | | | | | | 0.03 | 0.03 | 0.04 | | | | | | | | | | | | no | -? | ? | 7 |
| 98F2 | PLEU PLA | MU | | | | | | | | | | | | 0.07 | 0.04 | 0.0447 | 0.04 | 0.03 | 0.0648 | 0.04 | 0.04 | 0.04 | 0.03 | no | -- | no | 11 |
| 10F | PLEU PLA | MU | | | | | | | | | 0.22 | | 0.303 | 0.49 | 0.15 | 0.43 | 0.0648 | 0.0346 | 0.07 | | 0.06 | 0.0648 | 0.07 | no | D- | no | 17 |
| 67F | LEPI WHI | LI | | 9 | 4 | 5 | 4 | 5 | 2 | 4.6 | 4 | 5 | 2.8 | 4.8 | 3.4 | 3.8 | 3.9 | 3.45 | 2 | 2.2 | 2.3 | 2 | 1.9 | m | D- | m | 11 |
| 21F | LEPI WHI | LI | | | | | | | | | | | | | | | 4.8 | 1 | 2.9 | 4.2 | 3.2 | 2.7 | 4.4 | m | -- | m | 18 |
| 67F | LEPI WHI | MU | | 0.09 | 0.07 | 0.1 | 0.1 | 0.03 | 0.04 | 0.03 | 0.07 | 0.03 | 0.04 | 0.05 | 0.03 | 0.04 | 0.04 | 0.0346 | 0.04 | 0.03 | 0.03 | 0.05 | 0.06 | m | D- | m | 12 |
| 21F | LEPI WHI | MU | | | | | | | | | | | | | | | 0.04 | 0.03 | 0.07 | 0.06 | 0.03 | 0.04 | 0.04 | m | -- | m | 13 |

Annual median concentration of HCHG (mg/kg d.wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | 15.5 | 23.5 | | 216 | 2.05 | 3.55 | 1.52 | 1.62 | 1.73 | 1.48 | 0.653 | 1.6 | 1.79 | 1.2 | 0.838 | 0.676 | 0.68 | 0.645 | 0.403 | 0.313 | 0.333 | 0.294 | 0.313 | 0.278 | no | D- | no | 20 |
| 31A | MYTI EDU | SB | | 16.4 | 23.3 | | 181 | 2.04 | 3.66 | 2.2 | 1.42 | 1.37 | 0.779 | 0.658 | 2.73 | 1.23 | 0.938 | 0.686 | 0.769 | 0.753 | 0.654 | 0.36 | 0.338 | 0.263 | 0.313 | 0.333 | 0.313 | no | D- | no | 20 |
| 35A | MYTI EDU | SB | | 16.8 | 24.4 | | 227 | 2.65 | 4.09 | 2.31 | 1.52 | 1.61 | 1.13 | 0.837 | 4.51 | 1 | 0.671 | 1.3 | 0.687 | 0.575 | 0.515 | 0.305 | 0.333 | 0.238 | 0.25 | 0.263 | 0.227 | no | D- | no | 21 |
| 36A | MYTI EDU | SB | | 12.4 | 23.7 | | 209 | 3.63 | 5.46 | 2.76 | 1.59 | 0.769 | 1.25 | 0.556 | 2.88 | 2 | 1.74 | 0.909 | 0.656 | 0.651 | 0.585 | 0.36 | 0.278 | 0.227 | 0.333 | 0.294 | | no | D- | no | 19 |
| 71A | MYTI EDU | SB | | 15.9 | 28.7 | | 276 | 2.08 | 4.85 | 1.96 | 2.11 | 0.964 | 0.793 | 0.478 | 1.02 | 1.91 | 1.08 | 0.943 | 0.926 | 479 | 0.641 | 0.394 | 0.357 | 0.333 | 0.333 | 0.278 | 0.238 | no | -- | no | >25 |
| 76A | MYTI EDU | SB | | | | | | 1.59 | 2.15 | 1.4 | 2.35 | | | 0.609 | 1.68 | 2.4 | 1.19 | 0.943 | 0.732 | 1.19 | 0.621 | 0.336 | 0.294 | 0.313 | 0.294 | 0.333 | 0.294 | no | D- | no | 14 |
| 15A | MYTI EDU | SB | | | | | | 1.68 | | | 1.95 | 1.11 | 1.06 | 0.366 | 1.99 | 2.32 | 1.38 | 0.595 | 0.758 | 0.591 | 0.662 | 0.338 | 0.294 | 0.278 | 0.294 | 0.263 | 0.294 | no | D- | no | 15 |
| 51A | MYTI EDU | SB | | | | | | | | | | | 1.73 | 1.13 | 1.22 | 2.29 | 1.1 | 0.923 | 0.347 | 0.787 | 0.806 | 0.345 | 0.562 | 0.313 | 0.417 | 0.333 | 0.714 | no | D- | no | 14 |
| 52A | MYTI EDU | SB | | | | | 400 | 1.04 | | 0.943 | 1.15 | 1.3 | 1.27 | 2.57 | 1.22 | 2.2 | 1.08 | 0.995 | 1.13 | 0.5 | 0.671 | 0.327 | 0.313 | 0.313 | 0.313 | 1.07 | 0.278 | no | D- | no | 25 |
| 56A | MYTI EDU | SB | | | | | 394 | 1.75 | 2.38 | 0.935 | 1.04 | 1.21 | 1.22 | 1.74 | 1.25 | 2.29 | 1.04 | 0.732 | 1.01 | 0.602 | 0.746 | 0.329 | 0.417 | 0.357 | 0.313 | 0.357 | 0.333 | no | DY | no | 22 |
| 57A | MYTI EDU | SB | | | | | 350 | | 2.29 | 1.44 | 0.794 | 0.857 | 1.01 | 2.46 | 1.03 | 3.56 | 1.04 | 0.733 | 0.938 | 0.508 | 0.592 | 0.237 | 0.333 | 0.357 | 0.217 | 0.278 | 0.25 | no | DY | no | 18 |
| 63A | MYTI EDU | SB | | | | | 276 | | 2.91 | 1.48 | 0.714 | 0.982 | 0.859 | 1.27 | 0.776 | 2.84 | 1.11 | 0.773 | 0.962 | 0.658 | 0.787 | 0.166 | 0.357 | 0.313 | 0.357 | 0.263 | 0.313 | no | DY | no | 17 |
| 65A | MYTI EDU | SB | | | | | 214 | 2.16 | 2.59 | 1.27 | 0.741 | 1.22 | 0.651 | 2.88 | 1 | 2.92 | 1.14 | 0.821 | 0.815 | 0.515 | 0.588 | 0.128 | 0.333 | 0.313 | 0.238 | 0.25 | 0.25 | no | DY | no | 21 |
| 69A | MYTI EDU | SB | | | | | | | | 1.6 | 1.05 | 0.939 | 0.653 | 0.355 | 1.31 | 3.1 | 0.794 | 0.889 | 0.993 | 0.57 | 0.532 | 0.154 | 0.316 | 0.263 | 0.294 | 0.278 | 0.278 | no | D- | no | 16 |
| 22A | MYTI EDU | SB | | | | | | 0.798 | 1.9 | 1.67 | 1.33 | 1.07 | 1.03 | 0.581 | 1.19 | 2.33 | 0.798 | 1.06 | 0.893 | 0.483 | 0.658 | 0.365 | 0.294 | 0.278 | 0.333 | 0.313 | 0.238 | no | D- | no | 13 |
| 82A | MYTI EDU | SB | | 19.7 | 30.9 | | 267 | | | | | | | | | | | | | | | 0.254 | 0.313 | | | | | no | -? | ? | >25 |
| 84A | MYTI EDU | SB | | 20 | 43.1 | | 238 | | 1.52 | 0.625 | 1.06 | | 0.788 | 0.519 | | | | | | | | 0.284 | 0.294 | | | | | no | -- | no | >25 |
| 87A | MYTI EDU | SB | | | 27.8 | | 210 | | | | | | | | | | | | | | | 0.234 | 0.25 | | | | | no | -? | ? | >25 |
| 25A | MYTI EDU | SB | | | | | | | | 1.45 | 1.03 | | | | | | | | | | | 0.265 | 0.273 | | | | | no | D? | ? | 8 |
| 26A | MYTI EDU | SB | | | | | | | | 1.5 | | | | | | | | | | | | 0.318 | 0.263 | | | | | no | D? | ? | <=5 |
| 27A | MYTI EDU | SB | | | | | | | | 0.599 | | | | | | | | | | | | 0.294 | 0.278 | | | | | no | D? | ? | <=5 |
| 28A | MYTI EDU | SB | | | | | | | | 1.64 | 1.29 | | | | | | | | | | | 0.266 | 0.294 | | | | | no | D? | ? | 8 |
| 91A | MYTI EDU | SB | | | | | | | | 0.884 | | 0.818 | | | | | | | | | | | 0.278 | | | | | no | -? | ? | 6 |
| 92A1 | MYTI EDU | SB | | | | | | | | 0.68 | 0.837 | 0.99 | 0.769 | 0.413 | 0.861 | | | | | | | | | | | | | no | -- | no | 13 |
| 96A | MYTI EDU | SB | | | | | | | | 0.535 | 0.844 | | | | | | | | | | | 0.244 | 0.294 | | | | | no | -? | ? | 12 |
| 98A2 | MYTI EDU | SB | | | | | | | | | | | | | 0.596 | | 0.746 | 0.575 | 0.872 | 0.625 | 0.725 | 0.256 | 0.294 | 0.278 | 0.333 | 0.294 | 0.278 | no | D- | no | 11 |
| 98X | MYTI EDU | SB | | | | | | | | | | 1.45 | 0.637 | 0.417 | | | | | | | | | | | | | | no | -? | ? | 8 |
| 99A | MYTI EDU | SB | | | | | | | | 0.621 | 0.442 | | | | | | | | | | | 0.254 | 0.263 | | | | | no | D? | ? | 8 |
| 41A | MYTI EDU | SB | | | | | | | | | | 0.683 | 0.526 | 0.291 | 0.427 | | | | | | | | | 0.25 | 0.278 | | | no | -- | no | 11 |
| 43A | MYTI EDU | SB | | | | | | | | | | 0.519 | 0.405 | | 0.45 | | | | | | | | | 0.313 | 0.357 | | | no | -? | ? | 7 |
| 44A | MYTI EDU | SB | | | | | | | | | | | 0.541 | 0.286 | 0.641 | | | | | | | | | 0.25 | 0.25 | | | no | -? | ? | 13 |
| 45A | MYTI EDU | SB | | | | | | | | | | 0.409 | 0.524 | | | | | | | | | | | 0.263 | 0.278 | | | no | -? | ? | 8 |
| 46A | MYTI EDU | SB | | | | | | | | | | 0.442 | 0.465 | 0.328 | | | | | | | | | | 0.25 | 0.227 | | | no | D? | ? | 7 |
| 48A | MYTI EDU | SB | | | | | | | | | | 0.335 | 0.479 | 0.333 | | | | | | | | | | 0.313 | 0.313 | | | no | -? | ? | 9 |
| 10A2 | MYTI EDU | SB | | | | | | | | | | | | 0.439 | 0.402 | | 1.08 | 0.503 | 0.867 | 0.61 | 0.549 | 0.267 | 0.263 | 0.313 | 0.227 | 0.294 | 0.294 | no | DY | no | 12 |
| 11X | MYTI EDU | SB | | | | | | | | | | | | | 0.34 | 0.99 | 1.15 | 0.727 | 0.758 | 0.472 | 0.465 | 0.265 | 0.238 | 0.278 | 0.238 | 0.278 | 0.238 | no | D- | no | 12 |

Annual median concentration of HCHG (mg/kg d.wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | 15.5 | 23.5 | | 216 | 2.05 | 3.55 | 1.52 | 1.62 | 1.73 | 1.48 | 0.653 | 1.6 | 1.79 | 1.2 | 0.838 | 0.676 | 0.68 | 0.645 | 0.403 | 0.313 | 0.333 | 0.294 | 0.313 | 0.278 | no | D- | no | 22 |
| 71A | MYTI EDU | SB | | 15.9 | 28.7 | | 276 | 2.08 | 4.85 | 1.96 | 2.11 | 0.964 | 0.793 | 0.478 | 1.02 | 1.91 | 1.08 | 0.943 | 0.926 | 479 | 0.641 | 0.394 | 0.357 | 0.333 | 0.333 | 0.278 | 0.238 | no | D- | no | >25 |
| 51A | MYTI EDU | SB | | | | | | | | | | | 1.73 | 1.13 | 1.22 | 2.29 | 1.1 | 0.923 | 0.347 | 0.787 | 0.806 | 0.345 | 0.562 | 0.313 | 0.417 | 0.333 | 0.714 | no | D- | no | 14 |
| 52A | MYTI EDU | SB | | | | | 400 | 1.04 | | 0.943 | 1.15 | 1.3 | 1.27 | 2.57 | 1.22 | 2.2 | 1.08 | 0.995 | 1.13 | 0.5 | 0.671 | 0.327 | 0.313 | 0.313 | 0.313 | 1.07 | 0.278 | no | D- | no | 25 |
| 10A2 | MYTI EDU | SB | | | | | | | | | | | | 0.439 | 0.402 | | 1.08 | 0.503 | 0.867 | 0.61 | 0.549 | 0.267 | 0.263 | 0.313 | 0.227 | 0.294 | 0.294 | no | DY | no | 12 |
| I021 | MYTI EDU | SB | | | | | | | | | | | 1.47 | 0.916 | 1.12 | 1.22 | | 0.962 | 1.36 | 1.1 | | | | | | | | no | -- | no | 9 |
| I022 | MYTI EDU | SB | | | | | | | | | | | 1.58 | 1.05 | 2.28 | 1.04 | 0.932 | 0.873 | 1.17 | 1.1 | 0.758 | 0.455 | 0.467 | 0.385 | 0.417 | 0.455 | 1 | no | D- | no | 12 |
| I023 | MYTI EDU | SB | | | | | | | | | | | 1.2 | 0.956 | 2.33 | 0.862 | 1.27 | 1.22 | 1.03 | 0.833 | 0.787 | 0.431 | 0.431 | 0.385 | 0.385 | 0.385 | 0.769 | no | D- | no | 12 |
| I024 | MYTI EDU | SB | | | | | | | | | | | 1.66 | 1.38 | 1.88 | 1.08 | 0.943 | 0.926 | 0.893 | 0.99 | 0.775 | 0.505 | 0.485 | 0.583 | 0.417 | 0.455 | 1 | no | D- | no | 10 |
| I301 | MYTI EDU | SB | | | | | | | | 1.86 | | | 0.984 | 1.25 | 2.42 | 2.58 | 1.86 | 1.07 | 0.827 | 0.625 | 0.637 | 0.439 | 0.347 | 0.357 | 0.278 | 0.333 | 0.667 | no | DY | no | 11 |
| I304 | MYTI EDU | SB | | | | | | | | | | | 1.14 | 0.867 | 2.48 | 2.5 | | 0.941 | 0.752 | 0.769 | 0.613 | 0.394 | 0.439 | 0.385 | 0.294 | 0.333 | 0.714 | no | D- | no | 13 |
| I306 | MYTI EDU | SB | | | | | | | | | | | 1.44 | 0.679 | 3.27 | 2.28 | | 0.888 | 0.747 | 0.671 | 0.704 | 0.391 | 0.431 | 0.313 | 0.643 | 0.385 | 0.667 | no | D- | no | 15 |
| I307 | MYTI EDU | SB | | | | | | | | | | | 1.61 | 1.02 | 2.83 | 2.2 | | 0.85 | 0.872 | 0.901 | 0.73 | 0.42 | 0.397 | 0.333 | 0.313 | 0.357 | 0.588 | no | D- | no | 12 |
| I711 | MYTI EDU | SB | | | | | | | | | | | 1.46 | 0.719 | 0.879 | 1.04 | 1.15 | 1.03 | | 0.976 | | | | | | | | no | -- | no | 11 |
| I712 | MYTI EDU | SB | | | | | | | | | | | 1 | 1.04 | 1.81 | 1.73 | 1.13 | 0.846 | 0.99 | 0.813 | 0.68 | 0.459 | 0.4 | 0.455 | 0.313 | 0.357 | 0.345 | no | D- | no | 10 |
| I713 | MYTI EDU | SB | | | | | | | | | | | | | | | | | | 0.738 | 0.787 | 0.435 | 0.352 | 0.685 | 0.278 | 0.385 | 0.385 | no | -- | no | 12 |
| I131A | MYTI EDU | SB | | | | | | | | | | | 0.909 | 1.12 | 2.3 | 2.19 | 0.729 | 1.06 | 0.654 | 0.559 | 0.725 | 0.333 | 0.34 | 0.385 | 0.333 | 0.333 | 0.385 | no | D- | no | 13 |
| I132 | MYTI EDU | SB | | | | | | | | | | | | | | 3.44 | 1.02 | 0.852 | 0.676 | 0.764 | 0.69 | 0.485 | 2.33 | 0.333 | 0.333 | 0.323 | 0.333 | no | -- | no | 17 |
| I133 | MYTI EDU | SB | | | | | | | | | | | 2.9 | 4.4 | 1.45 | 1.86 | 1.02 | 1.01 | 0.794 | 0.791 | 0.845 | 0.431 | 0.455 | 0.521 | 0.385 | 0.385 | 0.404 | no | D- | no | 11 |
| I241 | MYTI EDU | SB | | | | | | | | | | | 2.73 | 3.16 | 1.15 | 1.19 | 1.05 | 0.879 | 0.323 | 0.667 | 0.599 | 0.439 | 0.583 | 0.385 | 0.313 | 0.313 | 0.278 | no | D- | no | 12 |
| I242 | MYTI EDU | SB | | | | | | | | | | | 2.23 | 2.41 | 1.12 | 1.47 | 0.947 | 0.852 | 0.359 | 0.611 | 0.704 | 0.413 | 0.357 | 0.357 | 0.294 | 0.357 | 0.357 | no | D- | no | 11 |
| I243 | MYTI EDU | SB | | | | | | | | | | | 2.18 | 2.03 | 0.882 | 1.65 | 0.882 | 0.92 | 0.369 | 0.588 | 0.637 | 0.382 | 0.92 | 0.313 | 0.294 | 0.385 | 0.263 | no | D- | no | 13 |

Annual median concentration of HCHG (µg/kg w. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30B | GADU MOR | LI | | 3 | 15 | 5 | 5 | 10 | 7 | 11 | 12 | 4 | 2.55 | 4 | 2.8 | 2 | 1.5 | 2 | 2 | 1 | 0.47 | 0.56 | 0.6 | no | D- | no | 15 |
| 36B | GADU MOR | LI | | 6.48 | 14 | 9 | 9 | 17 | 3 | 11 | 6 | 8.1 | 6.9 | 6.4 | 2.8 | 1.5 | 2 | 1.3 | 0.92 | 1 | 0.6 | 0.8 | 0.5 | no | D- | no | 14 |
| 77B | GADU MOR | LI | | 28 | 6 | | | | | | | | | | | | | | | | | 1 | 1 | no | -? | ? | 20 |
| 15B | GADU MOR | LI | | 11 | 37.5 | 7 | 9 | 10 | 6 | 13 | 10 | 8.15 | 6.5 | 3.4 | 2.7 | 1.7 | 1 | 1.5 | 1.5 | 2 | 1 | 0.8 | 1 | no | D- | no | 14 |
| 53B | GADU MOR | LI | | 12 | 8.49 | 5 | 6 | | 6 | 7 | 8 | 10 | 3.5 | 3.1 | 1.1 | 0.64 | 1 | 1 | 1 | 0.77 | 0.5 | 0.2 | 1 | no | DY | no | 15 |
| 67B | GADU MOR | LI | | 12 | 7 | 10 | 7 | 6.32 | 5 | 10 | 11 | 21 | 4.8 | 4 | 2.6 | 2.3 | 3 | 2 | 1.5 | 2 | 1 | 1 | 1 | no | DY | no | 13 |
| 23B | GADU MOR | LI | | 13 | 5.92 | 11 | 5 | 8 | 5 | 13 | 8 | 9.4 | 5.5 | 5 | 2.88 | 2.6 | 3 | 2 | 1.5 | 1 | 2 | 1 | 0.5 | no | DY | no | 13 |
| 92B | GADU MOR | LI | | | | | 6 | 6 | 4 | 6 | | | | | | | | 2 | 0.8 | | | 1 | 1 | no | D- | no | 11 |
| 98B1 | GADU MOR | LI | | | | 5 | | 8 | 3 | 6 | 3 | 8 | 5 | | | 2.2 | 3 | 3 | 1.5 | 2 | 1 | 1 | 2 | no | D- | no | 14 |
| 43B | GADU MOR | LI | | | | | | 3 | 3 | 4 | | | | | | | | | | | | 1 | 1 | no | D? | ? | 9 |
| 10B | GADU MOR | LI | | | | | | 3 | 3 | 4 | 3 | 8 | 4.2 | 3 | 2.85 | 1.6 | 2 | 1 | 1 | 2 | 0.6 | 1 | 0.5 | no | D- | no | 13 |

Annual median concentration of HCHG (µg/kg w. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30B | GADU MOR | MU | | 0.08 | 0.05 | 0.1 | | 0.06 | 0.04 | 0.05 | 0.05 | 0.07 | 0.06 | 0.05 | 0.04 | 0.05 | 0.1 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | no | -- | no | 11 |
| 36B | GADU MOR | MU | | 0.15 | 0.1 | 0.1 | 0.1 | 0.08 | 0.19 | 0.09 | 0.06 | 0.1 | 0.06 | 0.03 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | no | D- | no | 12 |
| 77B | GADU MOR | MU | | 0.08 | 0.1 | | | | | | | | | | | | | | | | | 0.05 | 0.05 | no | D? | ? | 7 |
| 15B | GADU MOR | MU | | 0.09 | 0.06 | 0.1 | | 0.04 | 0.06 | 0.09 | 0.06 | 0.09 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | no | -- | no | 10 |
| 53B | GADU MOR | MU | | 0.12 | 0.02 | 0.1 | 0.1 | | 0.03 | 0.0812 | 0.05 | 0.07 | 0.06 | 0.05 | 0.04 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | no | -- | no | 16 |
| 67B | GADU MOR | MU | | 0.11 | 0.07 | 0.1 | | 0.0447 | 0.22 | 0.16 | 0.06 | 0.09 | 0.06 | 0.04 | 0.04 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | no | -- | no | 14 |
| 23B | GADU MOR | MU | | 0.11 | 0.09 | 0.1 | 0.1 | 0.03 | 0.06 | 0.08 | 0.07 | 0.07 | 0.06 | 0.03 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | no | -- | no | 12 |
| 92B | GADU MOR | MU | | | | | | 0.03 | 0.03 | 0.05 | | | | | | | | 0.05 | 0.05 | | | 0.05 | | no | -- | no | 9 |
| 98B1 | GADU MOR | MU | | | | 0.1 | 0.1 | 0.05 | 0.03 | 0.03 | 0.1 | 0.04 | 0.05 | | | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | no | -- | no | 13 |
| 43B | GADU MOR | MU | | | | | | 0.03 | | 0.06 | | | | | | | | | | | | 0.05 | | no | -? | ? | 15 |
| 10B | GADU MOR | MU | | | | | | 0.03 | 0.15 | 0.03 | 0.1 | 0.04 | 0.03 | 0.04 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | no | -- | no | 15 |

Annual median concentration of HCHG (µg/kg w. wt.)

| | | | | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 33F | PLAT FLE | LI | | 2 | 0.5 | 5 | 2 | 2 | 1 | 2.45 | 1.74 | 1.15 | 0.69 | 1.9 | 1.4 | 1.2 | 1.1 | 1 | 1 | 1 | 0.5 | 0.5 | 1 | no | -- | no | 17 |
| 53F | PLAT FLE | LI | | 3 | 2 | 5 | 2 | | 1.41 | 2 | 3 | 2 | 2.4 | 0.941 | 0.86 | 1 | 0.5 | 1 | 0.21 | | 0.5 | 0.5 | 0.707 | no | D- | no | 15 |
| 67F | PLAT FLE | LI | | | | | | | | 2 | | 6.19 | 3.3 | 3.1 | 1.7 | 1.1 | 2 | 2 | 1.2 | 1.2 | 0.5 | 0.5 | 1 | no | D- | no | 15 |
| 21F | PLAT FLE | LI | | | | | | | | | | | 3.3 | 0.85 | 0.78 | 0.6 | | 1 | 0.2 | 0.2 | | | | no | -- | no | 18 |
| 33F | PLAT FLE | MU | | 0.19 | 0.05 | 0.1 | 0.1 | 0.05 | 0.13 | 0.155 | 0.0949 | 0.09 | 0.1 | 0.06 | 0.06 | 0.05 | 0.05 | 0.05 | 0.08 | 0.05 | 0.05 | 0.05 | 0.05 | no | D- | no | 13 |
| 53F | PLAT FLE | MU | | 0.2 | 0.2 | 0.1 | 0.1 | | 0.125 | 0.0837 | 0.1 | 0.13 | 0.1 | 0.05 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | | 0.05 | 0.05 | 0.05 | no | D- | no | 10 |
| 67F | PLAT FLE | MU | | | | | | | | 0.06 | | 0.122 | 0.19 | 0.13 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | no | DY | no | 11 |
| 21F | PLAT FLE | MU | | | | | | | | | | | 0.11 | 0.04 | 0.06 | 0.05 | | 0.05 | 0.05 | 0.05 | | | | no | -- | no | 12 |
| 36F | LIMA LIM | LI | | 8.94 | 3 | 5 | 1 | 4 | 3 | 8 | 5 | 2 | 3.8 | 4 | 1.8 | 1.6 | 2 | 1 | 1 | 0.5 | 0.6 | 0.5 | 0.5 | no | D- | no | 16 |
| 77F | LIMA LIM | LI | | | 2 | | | | | | | | | | | | | | | | | 0.4 | 0.5 | no | -? | ? | 10 |
| 15F | LIMA LIM | LI | | | 3 | | 4 | 3.46 | 3 | 5.1 | 5.6 | 4.1 | 3.25 | | 2.6 | 1 | 1 | 1 | 1 | 1 | 0.5 | 0.5 | 1 | no | DY | no | 12 |
| 22F | LIMA LIM | LI | | 6.93 | 3 | 5 | | 1 | 1 | | | | | | | | | | | | | | | no | D? | ? | 14 |
| 21F | LIMA LIM | LI | | | | | | | | | | | | | | 1.6 | 2 | 2 | 0.6 | | 0.5 | | 0.2 | no | Dm | no | 14 |
| 36F | LIMA LIM | MU | | 0.24 | 0.07 | 0.1 | 0.1 | 0.16 | 0.21 | 0.33 | 0.15 | 0.15 | 0.09 | 0.07 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | no | DY | no | 12 |
| 15F | LIMA LIM | MU | | | 0.14 | | 0.1 | 0.0548 | 0.26 | 0.29 | 0.14 | 0.15 | 0.06 | | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | no | D- | no | 14 |
| 22F | LIMA LIM | MU | | 0.25 | 0.2 | 0.2 | | 0.08 | 0.0458 | | | | | | | | | | | | | | | no | D? | ? | 10 |
| 21F | LIMA LIM | MU | | | | | | | | | | | | | | 0.05 | 0.05 | 0.05 | 0.05 | | 0.05 | | 0.05 | no | -- | no | ? |
| 30F | PLEU PLA | LI | | | | 5 | | 1 | 1 | | | | | | | | | | | | | | | no | -? | ? | 15 |
| 22F | PLEU PLA | LI | | | | | | | | 0.9 | 0.7 | 0.6 | | | | | | | | | | | | no | -? | ? | <=5 |
| 98F2 | PLEU PLA | LI | | | | | | | | | | | | 0.71 | 0.67 | 0.219 | 0.22 | 1 | 0.2 | 0.2 | 0.1 | 0.6 | 0.1 | no | -- | no | 22 |
| 10F | PLEU PLA | LI | | | | | | | | | 0.8 | | 1.1 | 1.3 | 0.6 | 1.2 | 0.5 | 0.5 | 1 | | 0.3 | 0.224 | 0.2 | no | D- | no | 14 |
| 30F | PLEU PLA | MU | | | | 0.1 | | 0.06 | 0.0346 | | | | | | | | | | | | | | | no | -? | ? | 8 |
| 22F | PLEU PLA | MU | | | | | | | | 0.0995 | 0.06 | 0.07 | | | | | | | | | | | | no | -? | ? | 11 |
| 98F2 | PLEU PLA | MU | | | | | | | | | | | | 0.0548 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.1 | 0.05 | no | -- | no | 10 |
| 10F | PLEU PLA | MU | | | | | | | | | 0.05 | | 0.06 | 0.07 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | | 0.05 | 0.1 | 0.05 | no | -- | no | 10 |

Annual median concentration of PBDE ((µg/kg w. wt.)

| | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30B | GADU MOR | LI | | | | | | | 84.6 | 100 | 108 | 98.2 | 61 | m | -? | m | 10 |
| 53B | GADU MOR | LI | | | | | | | 32.3 | 14.4 | 50.5 | 31.2 | 33.2 | m | -? | m | 16 |
| 23B | GADU MOR | LI | | | | | | | 9.06 | 8.22 | 8.31 | 10.9 | 9.52 | m | -? | m | 7 |

Annual median concentration of PFOS (µg/kg w. wt.)

| | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30B | GADU MOR | LI | | | | | | | 38 | 49 | 11 | 42 | 48 | m | -? | m | 20 |
| 53B | GADU MOR | LI | | | | | | | 6.48 | 10 | 2 | 10 | 3.2 | m | -? | m | 21 |
| 23B | GADU MOR | LI | | | | | | | 5.48 | 16.5 | 3 | 6.9 | 8.9 | m | -? | m | 20 |

Annual median concentration of B[a]P (µg/kg d. wt.)

| | | | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | 3.35 | 3.52 | | 3.57 | 2.99 | 2.99 | 3.29 | 3.4 | 3.23 | 4.26 | 3.85 | 6.07 | 2.94 | 3.13 | 2.78 | no | -- | no | 9 |
| I301 | MYTI EDU | SB | | 4.44 | 19.3 | 18.8 | 6.02 | 13.1 | 2.55 | 9.77 | 3.13 | 3.18 | 34.2 | 3.47 | 42.1 | 14.4 | 12 | 3.86 | no | -- | no | 23 |
| I304 | MYTI EDU | SB | | 3.36 | 2.81 | 3.29 | 3.38 | 2.76 | 2.94 | 3.76 | 3.85 | 3.07 | 5.33 | 4.39 | 3.85 | 2.94 | 3.33 | 3.57 | no | -- | no | 8 |
| I306 | MYTI EDU | SB | | 2.99 | 3.07 | 2.87 | 3.05 | 3.07 | 2.96 | 2.94 | 3.36 | 3.52 | 4.79 | 4.31 | 3.13 | 3.57 | 3.85 | 3.33 | no | U- | no | 7 |
| I307 | MYTI EDU | SB | | 2.73 | 3.21 | 2.75 | 2.91 | 3.01 | 3.27 | 3.36 | 4.5 | 3.65 | 5.27 | 3.97 | 3.13 | 3.13 | 3.57 | 2.94 | no | UY | no | 8 |
| I131A | MYTI EDU | SB | | 3.25 | 2.66 | 2.73 | 3.6 | 5.02 | 2.4 | 3.27 | 2.79 | 3.73 | 8 | 3.4 | 3.85 | 3.33 | 3.33 | 3.85 | no | -- | no | 12 |
| I132 | MYTI EDU | SB | | | | | 22.6 | 300 | 10.8 | 32.7 | 49.6 | 89.7 | 52.4 | 150 | 61.3 | 80 | 93.8 | 24.7 | 4.9 | -- | 1.6 | 24 |
| I133 | MYTI EDU | SB | | 80.6 | 13.7 | 51.7 | 18.6 | | 8.47 | 19 | 23.7 | 39.3 | 135 | 67.3 | 50 | 22.3 | 123 | 112 | 22.4 | --(U-) | 22.9 | 20 |
| I201 | MYTI EDU | SB | | 93.2 | 207 | 679 | 10.5 | 83.8 | 47.4 | 31.7 | 188 | 7.23 | 3.79 | 8.55 | 5 | 6.08 | 5.2 | 5.41 | 1.1 | D-(--) | no | >25 |
| I205 | MYTI EDU | SB | | 7.39 | | 23.1 | 64.5 | 7.51 | 5.59 | 7.55 | 33 | 3.16 | 48.2 | 4.5 | 3.85 | 4.17 | 3.57 | 3.13 | no | -- | no | 24 |
| I913 | MYTI EDU | SB | | | | | | 5.85 | 15.6 | 2.96 | 13.3 | 3.65 | 1.36 | 3.29 | 2.78 | 3.85 | 5.42 | 2.78 | no | -- | no | 19 |
| I912 | MYTI EDU | SB | | 7.02 | | 9.46 | 5.35 | 16.4 | 135 | 4.17 | 20 | 3.97 | 1.46 | 3.65 | 3.33 | 3.38 | 9.29 | 2.78 | no | -- | 1.2 | 25 |
| I965 | MYTI EDU | SB | | | | | | | | 233 | 30.8 | 43.6 | 87.7 | 19.3 | 58 | 115 | 66.5 | 233 | 46.7 | -- | 56.9 | 21 |
| I962 | MYTI EDU | SB | | 246 | 33.5 | | 87 | | | | | | | | | | | | 17.4 | -? | ? | >25 |
| I964 | MYTI EDU | SB | | | | | | | | | 37.3 | 289 | 251 | 55.4 | 200 | 232 | 200 | 397 | 79.3 | -- | 100.6 | 22 |
| I969 | MYTI EDU | SB | | 14.2 | 10.7 | 17.6 | 8.42 | 10.3 | 17.1 | 23.5 | 3.68 | 46.7 | 34.7 | 7.27 | 24.2 | 23.9 | 25 | 14.9 | 3.0 | -- | 3.8 | 20 |

Annual median concentration of ∑PK_S (µg/kg d. wt.)

| | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | 38.1 | | | 27.5 | 28.3 | | 38.5 | 20.4 | 16.5 | 38.3 | 11.6 | 17.6 | 45.7 | 14.2 | 45.1 | 18.2 | 14.7 | 11.1 | no | -- | no | 16 |
| I301 | MYTI EDU | SB | | 118 | | | 73 | 257 | 197 | 100 | 175 | 32.4 | 112 | 43.7 | 38.4 | 313 | 40.9 | 269 | 109 | | 35.9 | no | -- | no | 22 |
| I304 | MYTI EDU | SB | | | | | 14.4 | 16.7 | 13.7 | 36.8 | 33.2 | 7.62 | 21.4 | 9.62 | 8.01 | 69.9 | 15.5 | 27.7 | 10.1 | 10.5 | 8.93 | no | -- | no | 19 |
| I306 | MYTI EDU | SB | | | | | 12.8 | 15.1 | 34.8 | 31.3 | 27.9 | 7.4 | 28.2 | 12.1 | 8.8 | 52.7 | 12.6 | 18.2 | 10.1 | 11.9 | 8.93 | no | -- | no | 18 |
| I307 | MYTI EDU | SB | | | | | 11.8 | 18.9 | 19.9 | 27.7 | 41.7 | 11.6 | 27.2 | 29.3 | 9.69 | 74 | 13.6 | 16.8 | 9.65 | 11.4 | 7.35 | no | -- | no | 18 |
| I131A | MYTI EDU | SB | | | | | 48.4 | 17.9 | 35.4 | 61.4 | 57.1 | 26.9 | 28 | 15.5 | 26.6 | 127 | 20.1 | 9.62 | 8.33 | 14.5 | 9.62 | no | -- | no | 19 |
| I132 | MYTI EDU | SB | | | | | | | | 581 | 2730 | 243 | 389 | 783 | 1520 | 570 | 813 | 401 | 405 | | 162 | 3.2 | -- | no | 21 |
| I133 | MYTI EDU | SB | | | | | 602 | 121 | 647 | 287 | | 150 | 339 | 476 | 580 | 1200 | 451 | 345 | 197 | 646 | 568 | 11.4 | -- | 9.5 | 19 |
| I201 | MYTI EDU | SB | | | | | 705 | 1590 | 7970 | 281 | 999 | 903 | 638 | | 189 | 111 | 212 | 119 | 149 | | 52.6 | 1.1 | D- | no | 23 |
| I205 | MYTI EDU | SB | | | | | 96.4 | | 470 | 1380 | 197 | 187 | 189 | 1650 | 97.5 | 808 | 98.2 | 57.2 | 56.3 | 34.5 | 27.9 | no | -- | no | 24 |
| I913 | MYTI EDU | SB | | | | | | | | | 107 | 604 | 76.7 | 405 | 28.8 | 20.9 | 8.22 | 8.67 | 14.3 | 20.6 | 11.6 | no | D- | no | 23 |
| I912 | MYTI EDU | SB | | | | | 109 | | 342 | 195 | 187 | 1560 | 58.9 | 412 | 27.9 | 10.6 | 9.12 | 8.33 | 30.1 | 36.3 | 8.94 | no | D- | no | 25 |
| I965 | MYTI EDU | SB | | | | | | | | | | | 1330 | 431 | 468 | 854 | 181 | 357 | 612 | 398 | 990 | 19.8 | -- | 21.2 | 17 |
| I962 | MYTI EDU | SB | | | | | 1450 | 265 | | 665 | | | | | | | | | | | | 13.3 | -? | ? | >25 |
| I964 | MYTI EDU | SB | | | | | | | | | | | | 368 | 2370 | 2090 | 501 | 915 | 1070 | 993 | 1610 | 32.1 | -- | 32.0 | 20 |
| I969 | MYTI EDU | SB | | | | | 139 | 108 | 230 | 131 | 285 | 192 | 169 | 39.7 | 625 | 361 | 73.6 | 188 | 170 | | 90 | 1.8 | -- | no | 21 |

Annual median concentration of ∑PAH (µg/kg d. wt.)

| | | | | | | | | | | | | | | | | | | | | | ANALYSIS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | 215 | | | 179 | 219 | | 268 | 216 | 140 | 124 | 54.9 | 126 | 163 | 74.6 | 292 | 107 | 78.4 | 98.9 | no | -- | no | 15 |
| I301 | MYTI EDU | SB | | 878 | | | 486 | 1810 | 1880 | 657 | 1050 | 438 | 645 | 312 | 216 | 1040 | 271 | 1730 | 647 | | 308 | 1.2 | -- | no | 19 |
| I304 | MYTI EDU | SB | | | | | 75.5 | 111 | 182 | 228 | 326 | 60.4 | 136 | 51.5 | 66.1 | 215 | 53.6 | 179 | 68.8 | 63.7 | 52.5 | no | -- | no | 17 |
| I306 | MYTI EDU | SB | | | | | 73.7 | 87 | 188 | 172 | 225 | 53.8 | 115 | 121 | 45.9 | 147 | 53.9 | 155 | 51.5 | 49.9 | 43.5 | no | -- | no | 16 |
| I307 | MYTI EDU | SB | | | | | 59.6 | 90.4 | 153 | 155 | 325 | 64.4 | 112 | 244 | 64.8 | 178 | 40.6 | 170 | 50.3 | 50.5 | 48.3 | no | -- | no | 18 |
| I131A | MYTI EDU | SB | | | | | 120 | 98.4 | 140 | 213 | 240 | 181 | 91.8 | 95 | 133 | 344 | 109 | 80.6 | 70 | | 43.8 | no | -- | no | 14 |
| I132 | MYTI EDU | SB | | | | | | | | 1590 | 6470 | 1270 | 1000 | 1750 | 2440 | 1060 | 2800 | 1760 | 1380 | | 513 | 2.1 | -- | no | 18 |
| I133 | MYTI EDU | SB | | | | | 1940 | 715 | 1710 | 1000 | | 908 | 863 | 1120 | 1070 | 2530 | 1410 | 1320 | 709 | 3450 | 1630 | 6.5 | -- | 8.6 | 16 |
| I201 | MYTI EDU | SB | | | | | 2170 | 4450 | 15500 | 793 | 3400 | 2300 | 1130 | | 579 | 381 | 569 | 303 | 358 | | 137 | no | D- | no | 21 |
| I205 | MYTI EDU | SB | | | | | 476 | | 1630 | 3210 | 801 | 603 | 457 | | 384 | 2170 | 309 | 221 | 204 | 124 | 101 | no | D- | no | 19 |
| I913 | MYTI EDU | SB | | | | | | | | | 559 | 2200 | 578 | 2000 | 128 | 98.1 | 55.1 | 75.7 | 103 | 84.9 | 73.6 | no | D- | no | 21 |
| I912 | MYTI EDU | SB | | | | | 648 | | 1390 | 873 | 1510 | 5990 | 735 | 1970 | 164 | 42.3 | 32.9 | 42.9 | 305 | 185 | 61.7 | no | DY | no | 24 |
| I965 | MYTI EDU | SB | | | | | | | | | | | 2770 | 720 | 1320 | 2930 | 587 | 1500 | 2620 | 1350 | 2580 | 10.3 | --(--) | 12.1 | 19 |
| I962 | MYTI EDU | SB | | | | | 3400 | 982 | | 1600 | | | | | | | | | | | | 6.4 | -? | ? | 21 |
| I964 | MYTI EDU | SB | | | | | | | | | | | | 643 | 6270 | 7960 | 1010 | 2590 | 2990 | 2500 | 3510 | 14.1 | -- | 13.7 | 24 |
| I969 | MYTI EDU | SB | | | | | 695 | 803 | 673 | 551 | 807 | 988 | 675 | 136 | 2340 | 1540 | 283 | 660 | 832 | | 641 | 2.6 | -- | 2.5 | 22 |

Annual median concentration of TBT (mg/kg d. wt.)

| | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | 2.71 | 1.51 | 1.47 | 0.935 | 0.802 | 1.81 | 1.08 | 0.723 | 0.282 | 0.36 | 0.543 | 0.455 | 0.187 | 1.9 | D- | 1.4 | 14 |
| 36A | MYTI EDU | SB | | 0.0336 | 0.179 | 0.217 | 0.0831 | 0.0591 | 0.0792 | 0.103 | 0.0603 | 0.0224 | 0.0172 | 0.0283 | 0.0257 | | no | -- | no | 18 |
| 71A | MYTI EDU | SB | | 1.02 | | | | 0.431 | 0.702 | 0.375 | 0.119 | 0.136 | 0.0567 | 0.0934 | 0.0765 | 0.0393 | no | D- | no | 14 |
| 76A | MYTI EDU | SB | | 0.188 | | | | 0.0529 | 0.092 | 0.106 | 0.034 | 0.0318 | 0.0206 | 0.0135 | 0.03 | 0.0195 | no | D- | no | 14 |
| 15A | MYTI EDU | SB | | | | | | 0.098 | 0.0811 | 0.0622 | 0.0179 | 0.0179 | 0.0078 | 0.0137 | 0.00853 | 0.00681 | no | D- | no | 13 |
| 22A | MYTI EDU | SB | | | | | | 0.17 | 0.138 | 0.587 | 0.291 | 0.249 | 0.1 | 0.297 | 0.103 | 0.053 | no | -- | no | 18 |
| 226X | MYTI EDU | SB | | | 1.61 | 0.854 | 0.555 | | | | | | | | | | 5.6 | -? | ? | 6 |
| 227A2 | MYTI EDU | SB | | | 1.38 | 0.854 | 0.375 | 0.417 | 0.672 | 0.709 | 0.314 | 0.277 | 0.134 | 0.193 | 0.135 | 0.106 | 1.1 | D- | no | 13 |
| 98A2 | MYTI EDU | SB | | | | | | 0.108 | 0.105 | 0.114 | 0.0468 | 0.0252 | 0.0165 | 0.0268 | 0.0153 | 0.0208 | no | D- | no | 13 |
| 10A2 | MYTI EDU | SB | | | | | | 0.0224 | 0.0123 | 0.0067 | | | | | | | no | D? | ? | <=5 |
| 11X | MYTI EDU | SB | | | | | | | 0.0348 | 0.0201 | 0.00401 | 0.00233 | 0.00278 | 0.00238 | 0.00286 | 0.0029 | no | DY | no | 15 |
| I301 | MYTI EDU | SB | | | | | | | 2.59 | 2.11 | 2.83 | 2.94 | 1.27 | 1.42 | 0.561 | 0.364 | 3.6 | DY | no | 12 |
| I712 | MYTI EDU | SB | | | | | | | 1.2 | 0.912 | 0.3 | 0.268 | 0.219 | 0.18 | 0.204 | 0.148 | 1.5 | DY | no | 11 |
| I713 | MYTI EDU | SB | | | | | | | 1.37 | 0.668 | 0.22 | 0.213 | 0.13 | 0.0795 | 0.0686 | 0.0852 | no | DY | no | 12 |
| I132 | MYTI EDU | SB | | | | | | | 0.474 | | 0.458 | 0.128 | 0.21 | 0.0807 | 0.184 | 0.207 | 2.1 | -- | 1.5 | 16 |
| I133 | MYTI EDU | SB | | | | | | | | 0.885 | 0.232 | 0.222 | 0.286 | 0.124 | 0.25 | 0.21 | 2.1 | -- | 1.7 | 16 |
| 36G | NUCE LAP | SB | | 0.105 | 0.203 | 0.142 | 0.0951 | 0.0496 | 0.155 | 0.0846 | 0.0412 | 0.0344 | 0.00625 | 0.0293 | 0.0377 | 0.0118 | m | D- | m | 19 |
| 71G | NUCE LAP | SB | | | | | | 0.133 | 0.344 | 0.235 | 0.115 | | 0.0429 | 0.0563 | | 0.0315 | m | -- | m | 16 |
| 76G | NUCE LAP | SB | | | | | | 0.0409 | 0.196 | | 0.0679 | 0.0467 | 0.0165 | 0.0294 | 0.0139 | 0.00945 | m | -- | m | 18 |
| 131G | NUCE LAP | SB | | | | | | 0.0326 | 0.064 | 0.075 | 0.0507 | 0.022 | | 0.00629 | 0.0189 | 0.00534 | m | D- | m | 18 |
| 15G | NUCE LAP | SB | | | | | | 0.0706 | 0.091 | 0.0652 | 0.0264 | 0.0215 | 0.00641 | 0.00897 | 0.0132 | 0.00651 | m | D- | m | 15 |
| 224G | NUCE LAP | SB | | 0.0769 | 0.295 | | 0.12 | | | | | | | | | | m | -? | m | 24 |
| 22G | NUCE LAP | SB | | | | | | 0.0699 | 0.101 | 0.322 | 0.2 | 0.13 | 0.0262 | 0.0611 | 0.0581 | 0.00976 | m | -- | m | 21 |
| 220G | NUCE LAP | SB | | 0.0815 | 0.1 | 0.0851 | | | | | 0.113 | | | | | | m | -? | m | 7 |
| 226G | NUCE LAP | SB | | | 0.844 | 0.225 | 0.21 | | | | | | | | | | m | -? | m | 16 |
| 227G1 | NUCE LAP | SB | | 0.0891 | 0.625 | 0.267 | 0.387 | 0.135 | 0.446 | 0.878 | 0.258 | 0.239 | 0.065 | 0.16 | 0.165 | 0.0323 | m | -- | m | 21 |
| 98G | NUCE LAP | SB | | | | | | 0.026 | 0.0629 | 0.0612 | 0.0492 | 0.0394 | 0.014 | 0.0253 | 0.0178 | 0.00231 | m | D- | m | 18 |
| 11G | NUCE LAP | SB | | | | | | | 0.0133 | 0.0261 | 0.0103 | 0.0184 | 0.00862 | 0.0111 | 0.00145 | 0.00225 | m | D- | m | 18 |

Annual median concentration of TCDDN (ng/kg w. wt.)

| | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30A | MYTI EDU | SB | | | 0.11 | 0.108 | 0.127 | 0.169 | 0.153 | 0.143 | 0.107 | 0.106 | m | -- | m | 7 |
| 71A | MYTI EDU | SB | | | 2.37 | 2.36 | 2.02 | 2.64 | 2.76 | 2.2 | 4.62 | 3.05 | m | -- | m | 10 |
| 76A | MYTI EDU | SB | | | 0.0566 | 0.078 | 0.133 | 0.142 | 0.111 | 0.106 | 0.119 | 0.0812 | m | -- | m | 10 |
| I712 | MYTI EDU | SB | | | 4.31 | 4.29 | 3.26 | 1.51 | 3.24 | 4.02 | 5.77 | 5.92 | m | -- | m | 12 |
| I713 | MYTI EDU | SB | | | 3.59 | 4.16 | 2.98 | 4.77 | 1.41 | 6.14 | 3.61 | 3.85 | m | -- | m | 16 |
| I132 | MYTI EDU | SB | | | 0.479 | 0.611 | 0.211 | 1.53 | 0.303 | 0.373 | 0.593 | 0.425 | m | -- | m | 19 |
| I133 | MYTI EDU | SB | | | 0.277 | 0.24 | 0.371 | 0.249 | 0.227 | 0.256 | 0.178 | 0.635 | m | -- | m | 14 |

Annual median concentration of CYP1A (ABS)

| | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1995 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30B | GADU MOR | LI | | | | | | | 2.24 | 1.2 | 1.22 | 0.822 | 0.902 | 1.49 | 0.513 | m | -- | m | 14 |
| 53B | GADU MOR | LI | | | | | | | 0.132 | 0.207 | 0.201 | 0.0655 | 0.428 | | 0.38 | m | -- | m | 19 |
| 23B | GADU MOR | LI | | | | | | | 0.113 | 0.212 | 0.199 | 0.0795 | | | 0.175 | m | -? | m | 16 |

Annual median concentration of ALAD (ng/min/mg protein)

| | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30B | GADU MOR | BL | | 8.98 | 14.7 | 13 | 14.6 | 12.7 | 10.4 | 6.91 | 14.2 | 15 | 32.3 | 14.1 | 11.7 | 28.6 | m | -- | m | 14 |
| 36B | GADU MOR | BL | | 13 | 26.2 | 9.93 | 22 | 19.4 | | | | | | | | | m | -? | m | 15 |
| 15B | GADU MOR | BL | | 17.2 | 23.4 | 8.45 | | 18.9 | | | | | | | | | m | -? | m | 17 |
| 53B | GADU MOR | BL | | 7.64 | 10.1 | 11.1 | 12.7 | 10 | 6.44 | 9.32 | 9.95 | 10.4 | 33.7 | 7.98 | | 19.6 | m | -- | m | 15 |
| 67B | GADU MOR | BL | | 7.17 | 28.2 | 16.9 | 22.4 | 19 | | | | | | | | | m | -? | m | 16 |
| 23B | GADU MOR | BL | | 15.8 | 24.8 | 18.1 | 19.8 | 24 | 19.4 | 16.8 | 19.7 | 25.8 | 38 | | | 34.4 | m | -- | m | 9 |

Annual median concentration of EROD (pmol/min/mg protein)

| | | | | | | | | | | | | | | | | | ANALYSIS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St | Species | Tissue | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | OC | TRND | SM+3 | POWER |
| 30B | GADU MOR | LI | | 68.8 | 124 | 70 | 260 | 81.2 | 158 | 88.3 | 69 | 50.9 | 98.7 | 29.7 | 6.12 | 57.8 | m | -- | m | 21 |
| 36B | GADU MOR | LI | | 95.1 | 11.4 | 60.2 | 64.9 | 76.2 | | | | | | | | | m | -? | m | 24 |
| 15B | GADU MOR | LI | | 49.9 | 52.3 | 184 | | 61 | | | | | | | | | m | -? | m | 20 |
| 53B | GADU MOR | LI | | 86.5 | 119 | 90.1 | 128 | 34.7 | 93.9 | 11.7 | 20 | 53.9 | 54.2 | 14.3 | | 41.4 | m | -- | m | 20 |
| 67B | GADU MOR | LI | | 103 | 76.2 | 84.6 | 103 | 72.9 | | | | | | | | | m | -? | m | 9 |
| 23B | GADU MOR | LI | | 94.1 | 28.6 | 70.1 | 73.5 | 76.5 | 103 | 41.9 | 45.9 | 50.8 | 57.2 | | | 27.8 | m | -- | m | 15 |

Annual median concentration of PYR1O (µg/kg/ABS 380 nm)

| St | Species | Tissue | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | ANALYSIS OC | TRND | SM+3 | POWER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30B | GADU MOR | BI | | | | | 12.3 | 17 | 29.2 | 20.3 | 43.5 | 15.1 | 13.9 | 4.95 | 17.1 | 15.6 | m | -- | m | 17 |
| 15B | GADU MOR | BI | | | | | | 29.7 | 6.32 | 5.66 | 16.7 | 1.1 | 2.61 | 1.14 | 1.7 | 2.69 | m | -- | m | 22 |
| 53B | GADU MOR | BI | | | | | 9.23 | 3.81 | 18.8 | 3.65 | 3.39 | 3.04 | 2.18 | 4.84 | 3.19 | 10.9 | m | -- | m | 18 |
| 23B | GADU MOR | BI | | | | | 4.15 | 2.55 | 3.1 | 5.32 | 1.62 | 3.46 | 1.34 | 1.72 | 1.67 | 1.02 | m | -- | m | 14 |

Annual median VDSI

| St | Species | Tissue | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | ANALYSIS OC | TRND | SM+3 | POWER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36G | NUCE LAP | WO | | 4.1 | | 3.9 | | | | 4 | 4 | 4 | 4 | 3.95 | 4 | 3.96 | 3.65 | 0.96 | 0.125 | 0.583 | 0.24 | 0.217 | m | DY | m | 18 |
| 71G | NUCE LAP | WO | | | | | | | | | | | | 4 | 4.1 | 4 | 4 | 4 | 4 | 1.61 | | 1.25 | m | D- | m | 18 |
| 76G | NUCE LAP | WO | | | | | | | | | | | | 3.41 | 3.03 | | 3.28 | 0.643 | 0.778 | 0.0667 | 0.13 | 0 | m | D- | m | 20 |
| 131G | NUCE LAP | WO | | | | | | | | | | | | 3.89 | 3.77 | 3.47 | 3.63 | 1.86 | 1.08 | 0.118 | 0 | 0 | m | D- | m | 16 |
| 15G | NUCE LAP | WO | | | | | | | | | | | | 3.69 | 3.86 | 3.42 | 3.43 | 1.28 | 0.125 | 0 | 0.129 | 0 | m | D- | m | 19 |
| 22G | NUCE LAP | WO | | | | | | | | | | | | 4 | 4 | 3.95 | 4 | 4 | 2.96 | 2.41 | 1.41 | 1.58 | m | DY | m | 13 |
| 220G | NUCE LAP | WO | | | | | | | | 4.05 | 4 | 4 | | | | | 4 | | | | | | m | -? | m | <=5 |
| 227G1 | NUCE LAP | WO | | 4.1 | | | | | | 4 | 4.15 | 4.09 | 4.5 | 4.3 | 4.5 | 4.13 | 3.92 | 3.65 | 3.66 | 3.52 | 3.67 | 2.32 | m | DY | m | 12 |
| 98G | NUCE LAP | WO | | | | | | | | | | | | 3.5 | 3.76 | 3.8 | 4 | 3.43 | 2.97 | 2.95 | 1.88 | 3.03 | m | -- | m | 15 |
| 11G | NUCE LAP | WO | | | | | | | | | | | | | 0.0333 | 0 | 0.289 | 0 | 0 | 0.0345 | 0 | 0 | m | -- | m | 7 |

# Appendix K
# Geographical distribution of contaminants and biomarkers in biota 1990-2009

**Sorted by contaminant and species:**

**Cadmium (Cd)**
**Mercury (Hg)**
**Lead (Pb)**
**Sum of 7 CBs (CB-28, -52, 101, -118, -138, -153 and -180)**
**DDEPP (ppDDE)**
**HCB**
**TCDDN**
**PBDE**
**OH-pyrene**
**ALA-D** (δ-amino levulinic acid dehydrase inhibition)
**EROD-activity** (Cytochrome P4501A-activity)
**CYP1A** (relative amount of cytochrome P4501A-protein)
**TBT**
**VDSI**

**MYTI EDU - Blue Mussel (*Mytilus edulis*)**
**GADU MOR - Atlantic cod (*Gadus morhua*)**
**PLAT FLE - Flounder (*Platichthys flesus*)**
**LIMA LIM - Dab (*Limanda limanda*)**
**PLEU PLA - Plaice (*Pleuronectes platessa*)**
**MICR KIT - Lemon sole (*Microstomus kitt*)**
**LEPI WHI - Megrim (*Lepidorhombus whiff-iagonis*)**

**Station positions are shown on maps in Appendix G**

**Results are presented for three periods as noted in figure text**
**The average of the median concentrations was used for each period.**
**Cf. Appendix F. sample overview**

# Appendix K
# Geographical distribution of contaminants and biomarkers in biota 1990-2009
# (cont.)

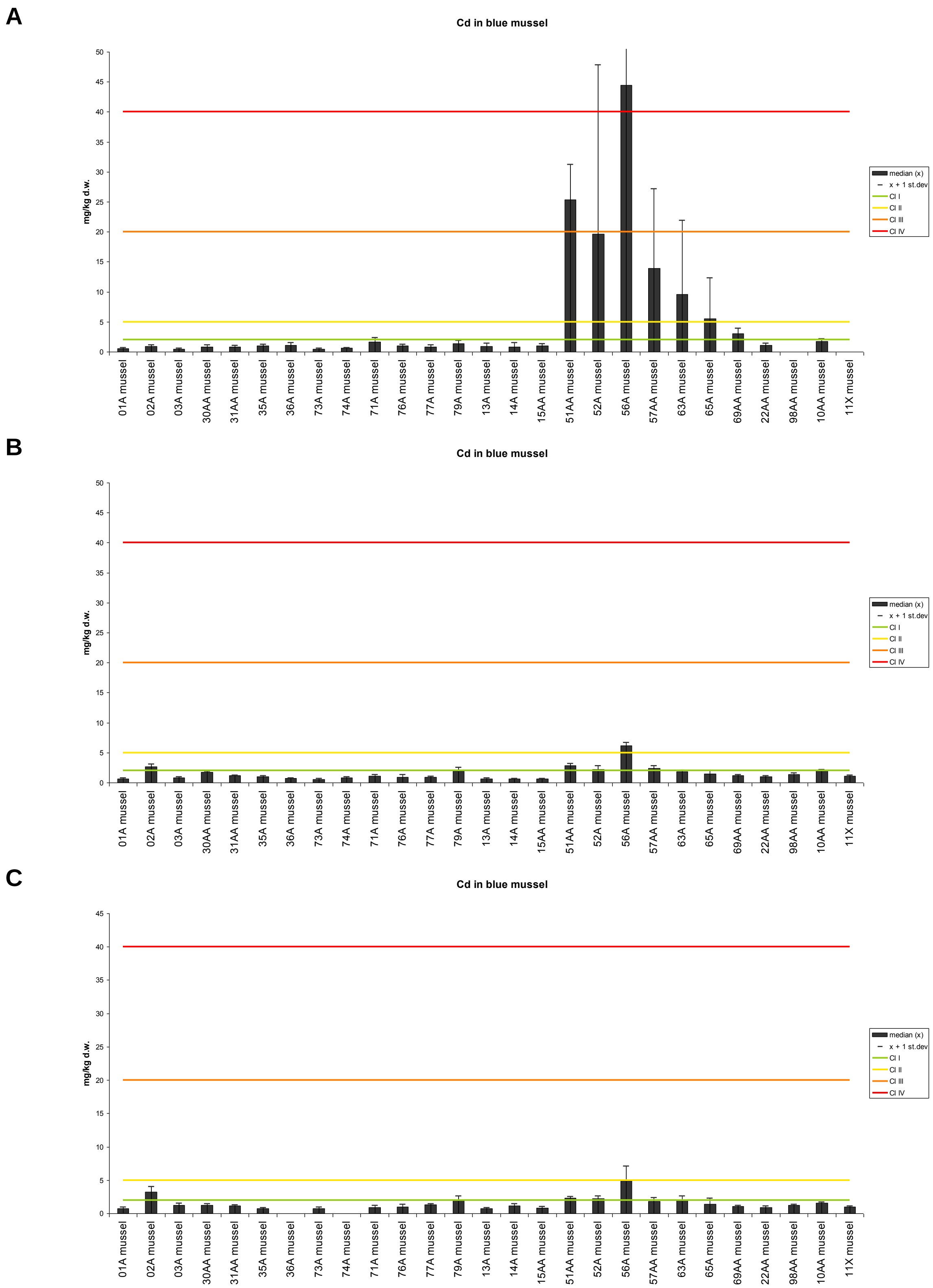



***Figure 41.*** *Median, standard deviation and upper limit to Klif Classes or provisional "high background" concentration for cadmium in blue mussel 1990-1996 (**A**), 2008 (**B**) and 2009 (**C**), ppm (mg/kg) dry weight (see maps in Appendix G).* ***Note: for one station, the standard deviation is off-scale in figure A.***

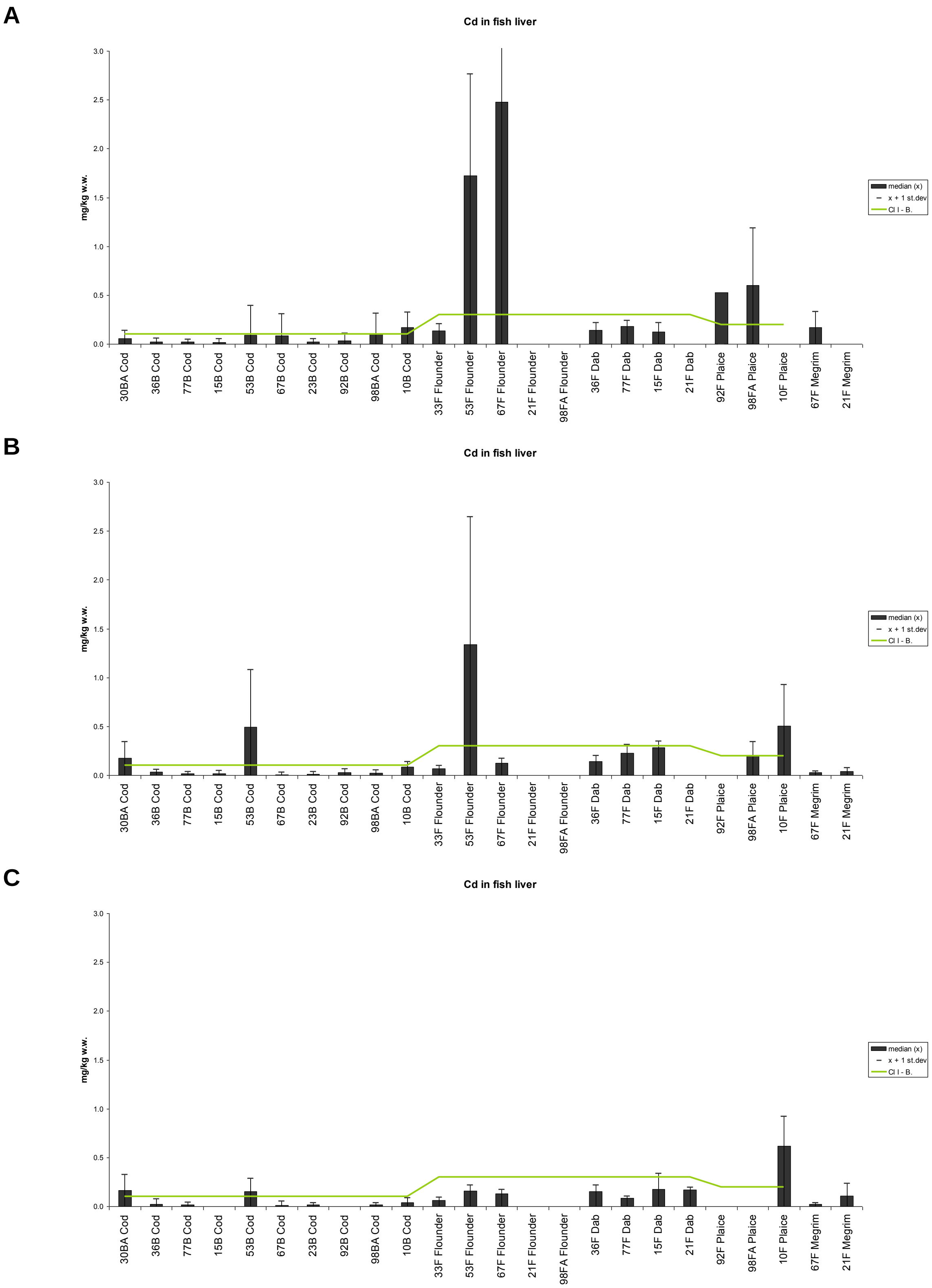



***Figure 42.*** *Median, standard deviation and upper limit to Klif Classes or provisional "high background" concentration for cadmium in fish liver 1990-1996* ***(A),*** *2008 (**B**) and 2009 (**C**), ppm (mg/kg) wet weight. “Cl. – B” indicates that only upper limit to Klif Classes or provisional high background concentration is indicated for all fish, (see maps in Appendix G).* ***Note: for one station, the standard deviation is off-scale in figure A.***

A

B

C

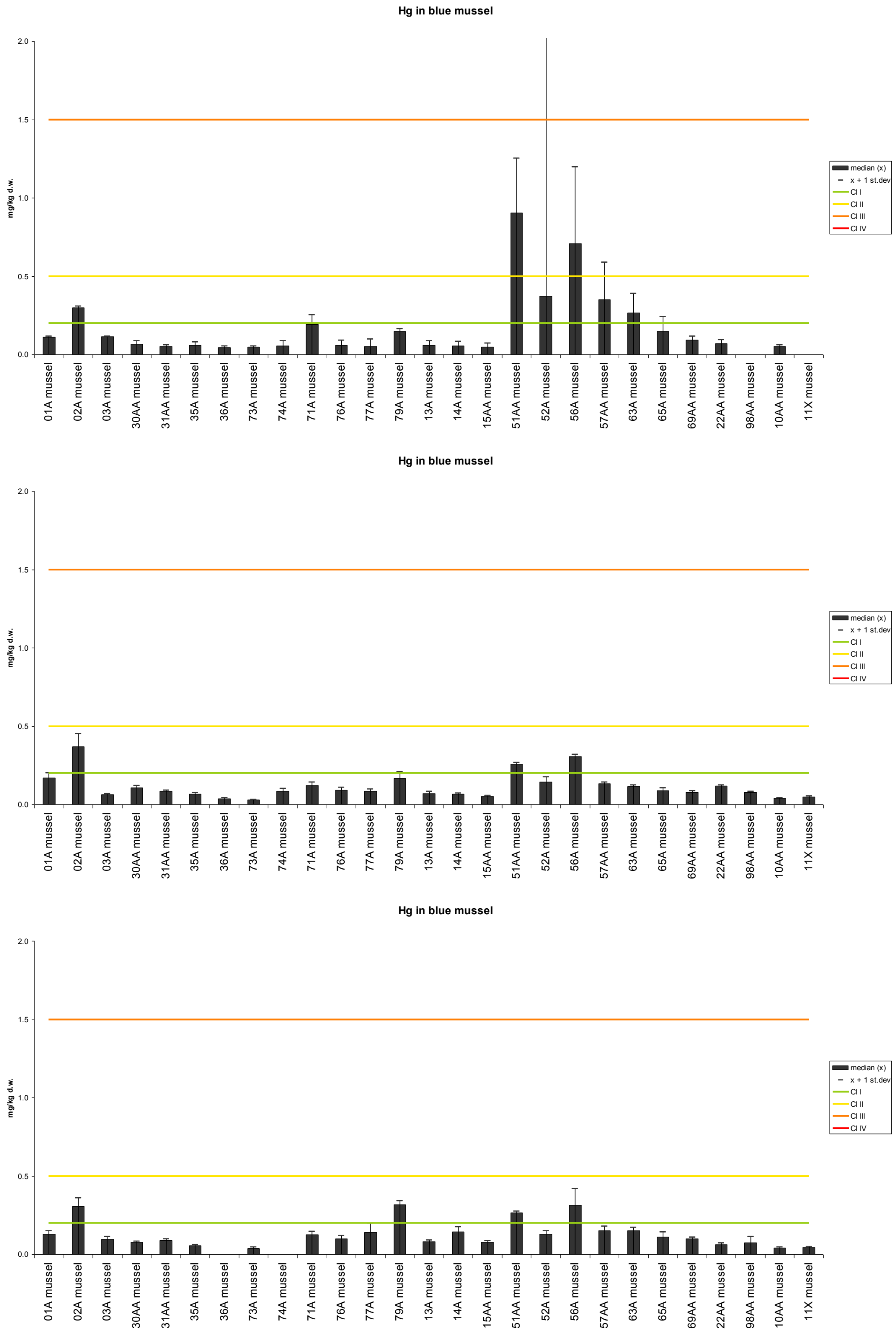
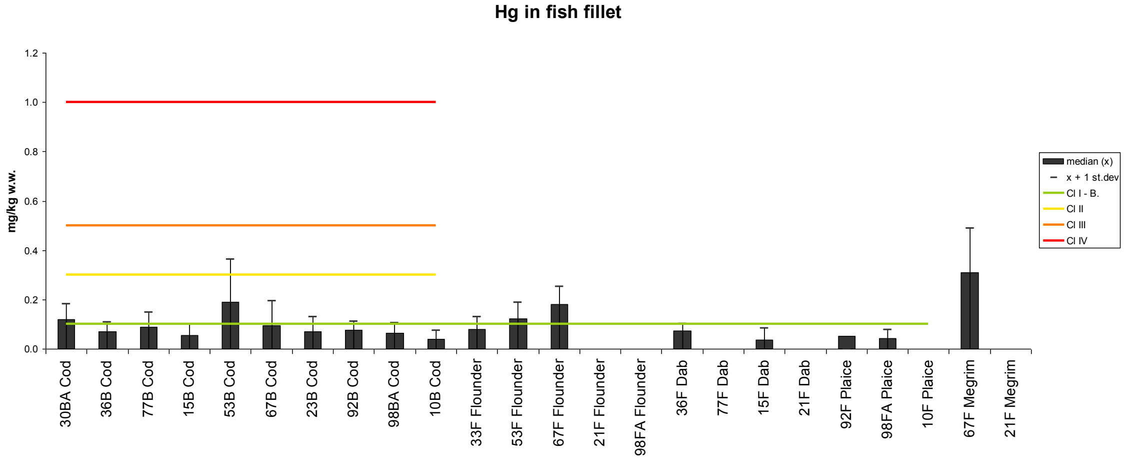
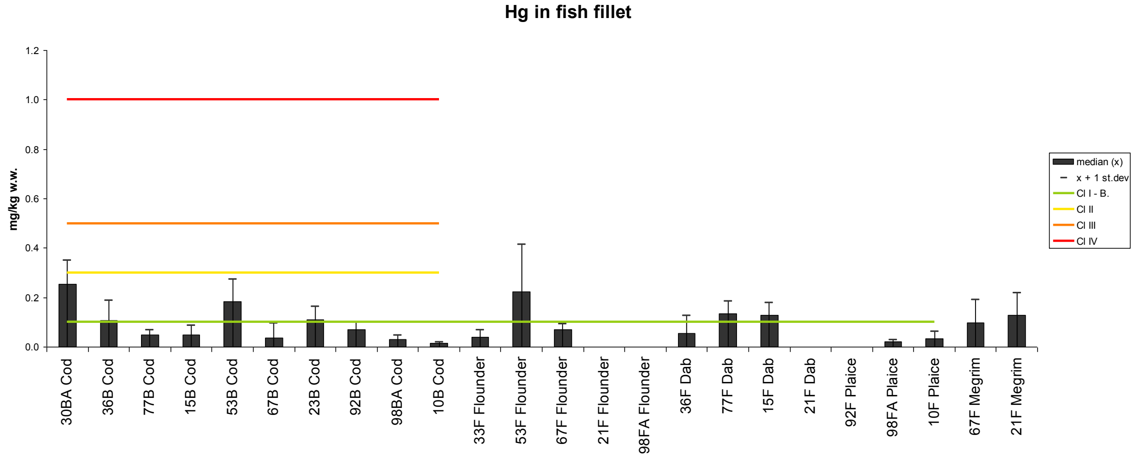



***Figure 43.*** *Median, standard deviation and upper limit to Klif Classes or provisional "high background" concentration for mercury in blue mussel 1990-1996 (**A**), 2008 (**B**) and 2009 (**C**), ppm (mg/kg) dry weight (see maps in Appendix G).* ***Note: for one station, the standard deviation is off-scale in figure A.***

**A**




**B**




**C**

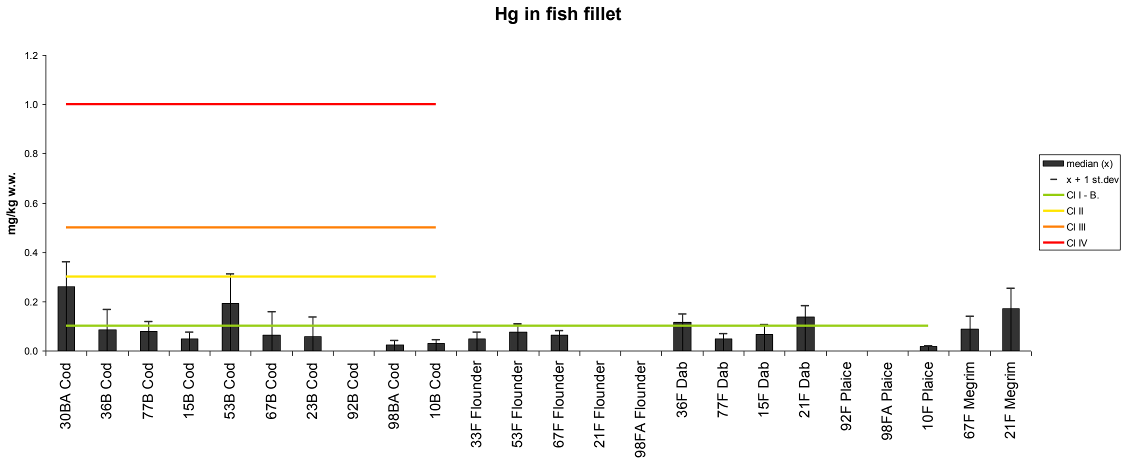



***Figure 44.*** *Median, standard deviation and upper limit to Klif Classes or provisional "high background" concentration for mercury in fish fillet 1990-1996 (**A**), 2008 (**B**) and 2009 (**C**), ppm (mg/kg) wet weight, "Cl. – B" indicates that only upper limit to Klif Classes or provisional high background concentration is indicated for flatfish, (see maps in Appendix G).*

A

B

C

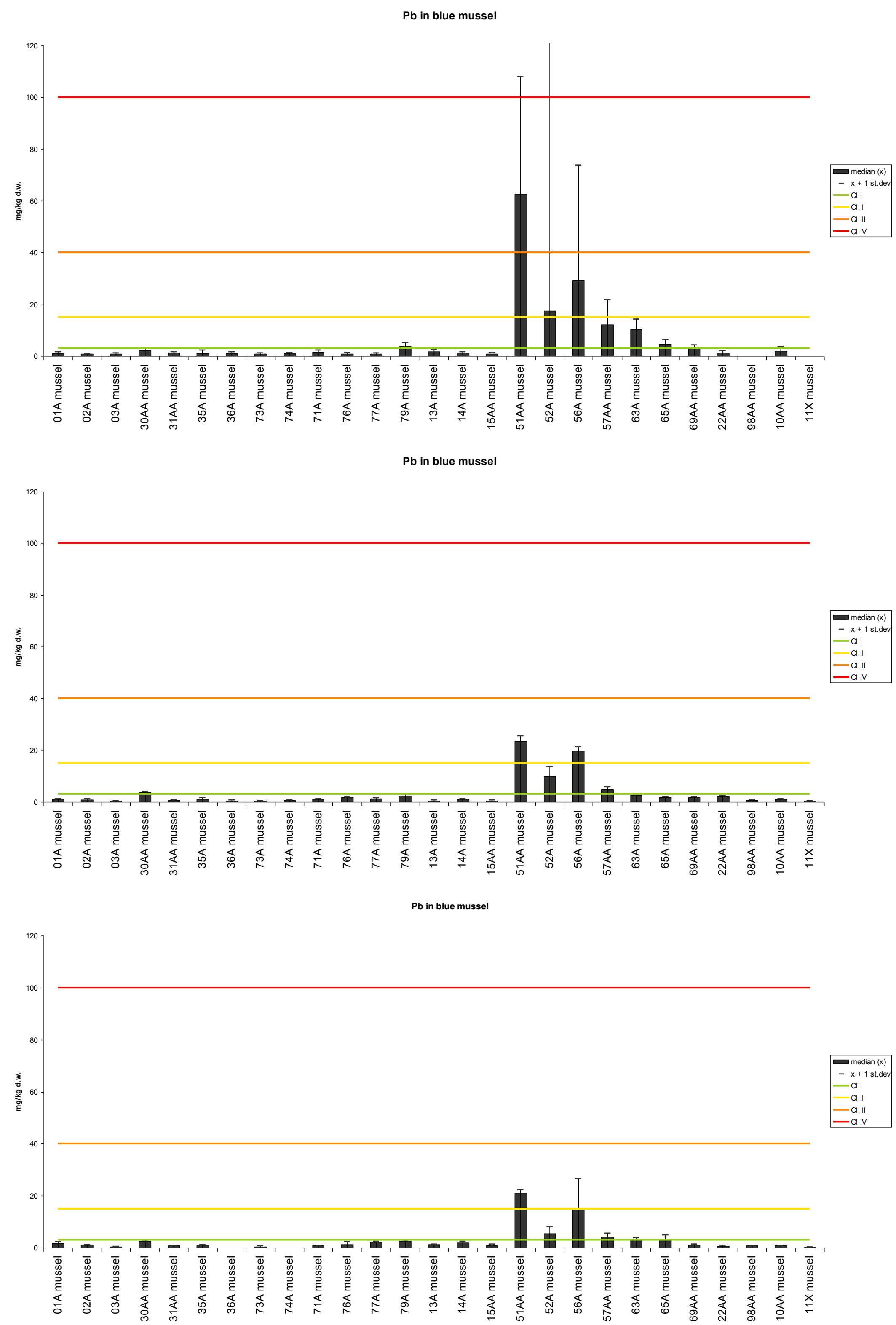



***Figure 45.*** *Median, standard deviation and upper limit to Klif Classes or provisional "high background" concentration for lead in blue mussel 1990-1996 (**A**), 2008 (**B**) and 2009 (**C**), ppm (mg/kg) dry weight (see maps in Appendix G).* ***Note: for one station, the standard deviation is off-scale in figure A.***

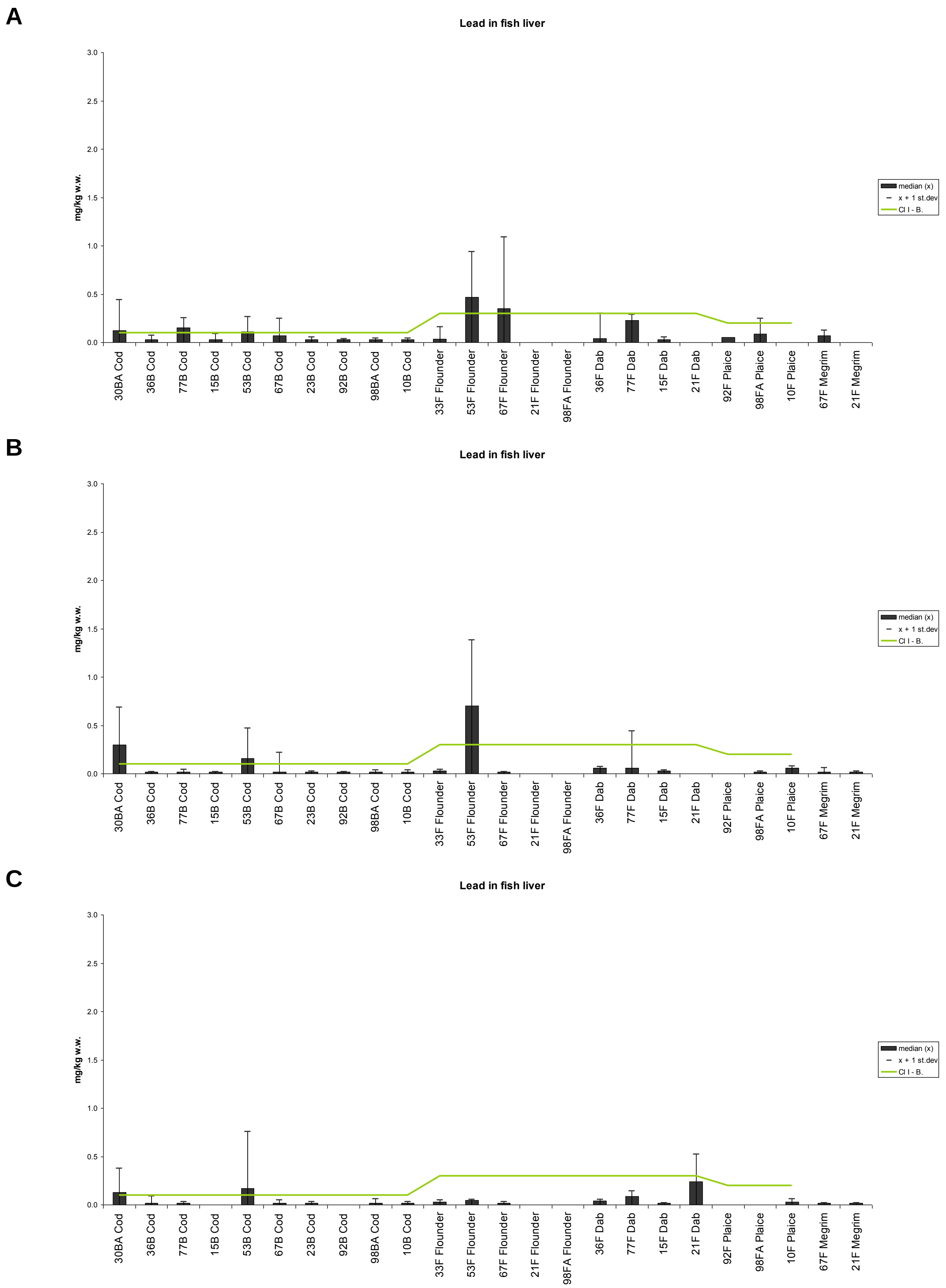
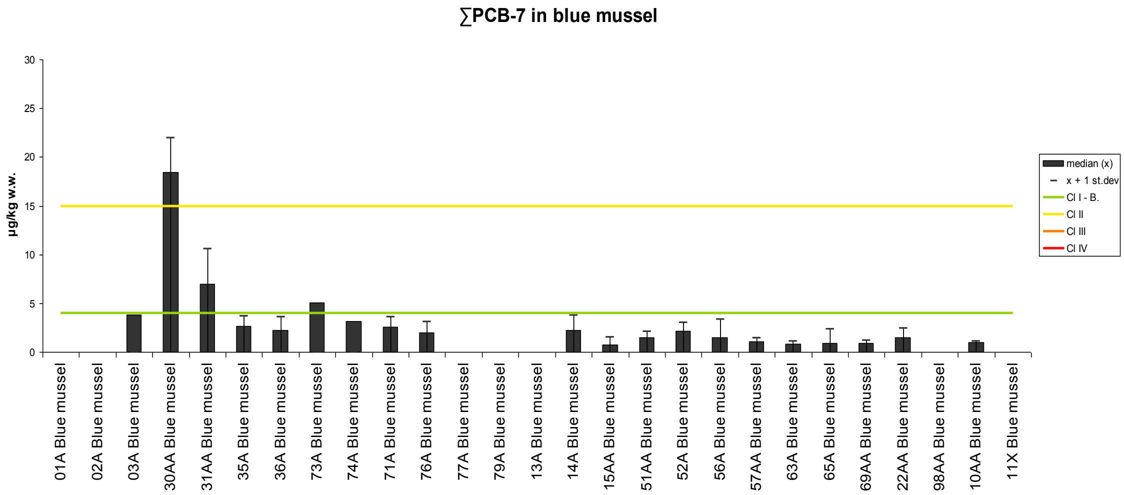
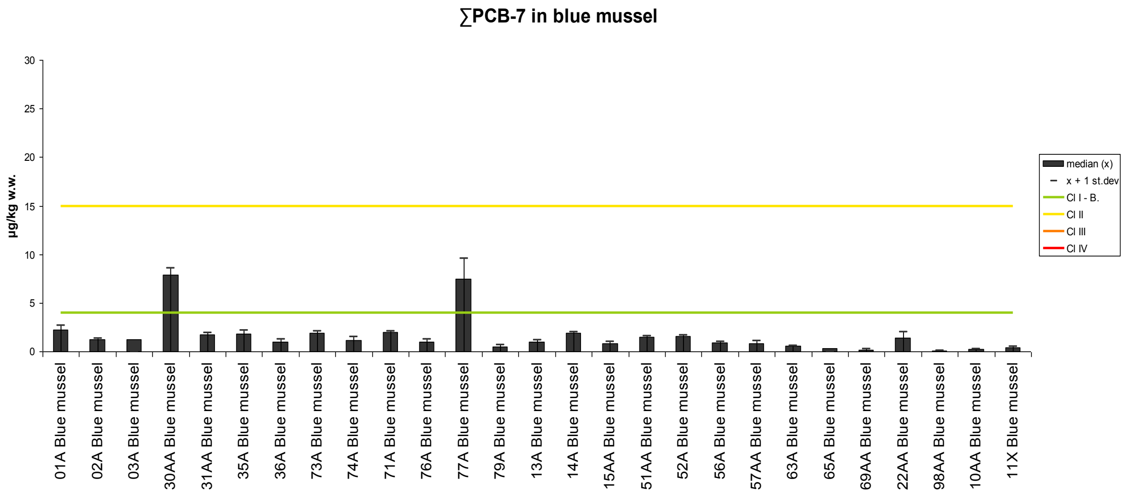



***Figure 46.*** *Median, standard deviation and upper limit to Klif Classes or provisional "high background" concentration for lead in fish liver 1990-1996 (**A**), 2008 (**B**) and 2009 (**C**), ppm (mg/kg) wet weight, "Cl. – B" indicates that only upper limit to Klif Classes or provisional high background concentration is indicated for all fish, (see maps in Appendix G).*

**A**




**B**




**C**

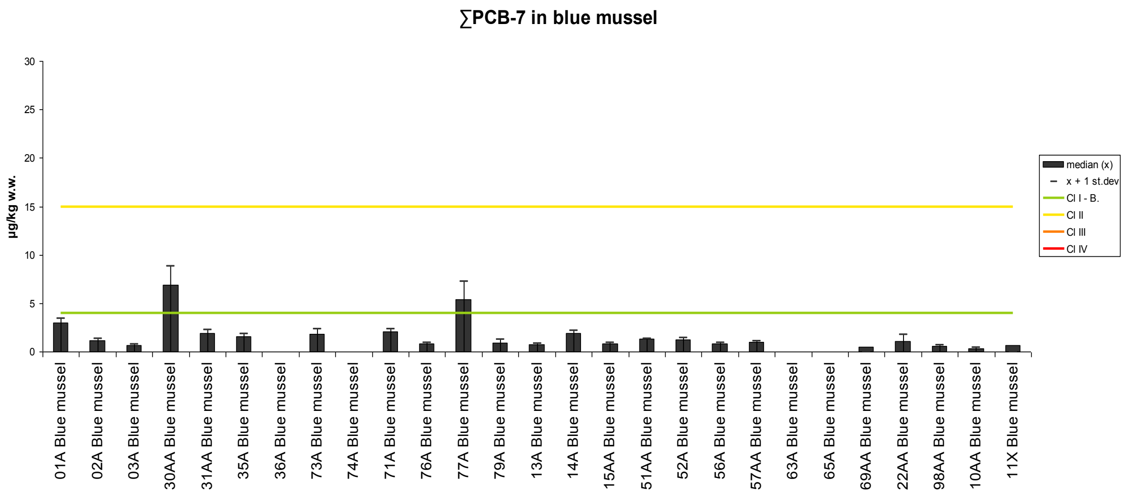



***Figure 47.*** *Median, standard deviation and upper limit to Klif Classes or provisional "high background" concentration for sum of 7 PCBs (CB-28, -52, 101, -118, -138, -153 and -180) in blue mussel 1990-1996 (**A**), 2008 (**B**) and 2009 (**C**), ppb (µg/kg) wet weight (see maps in Appendix G).*

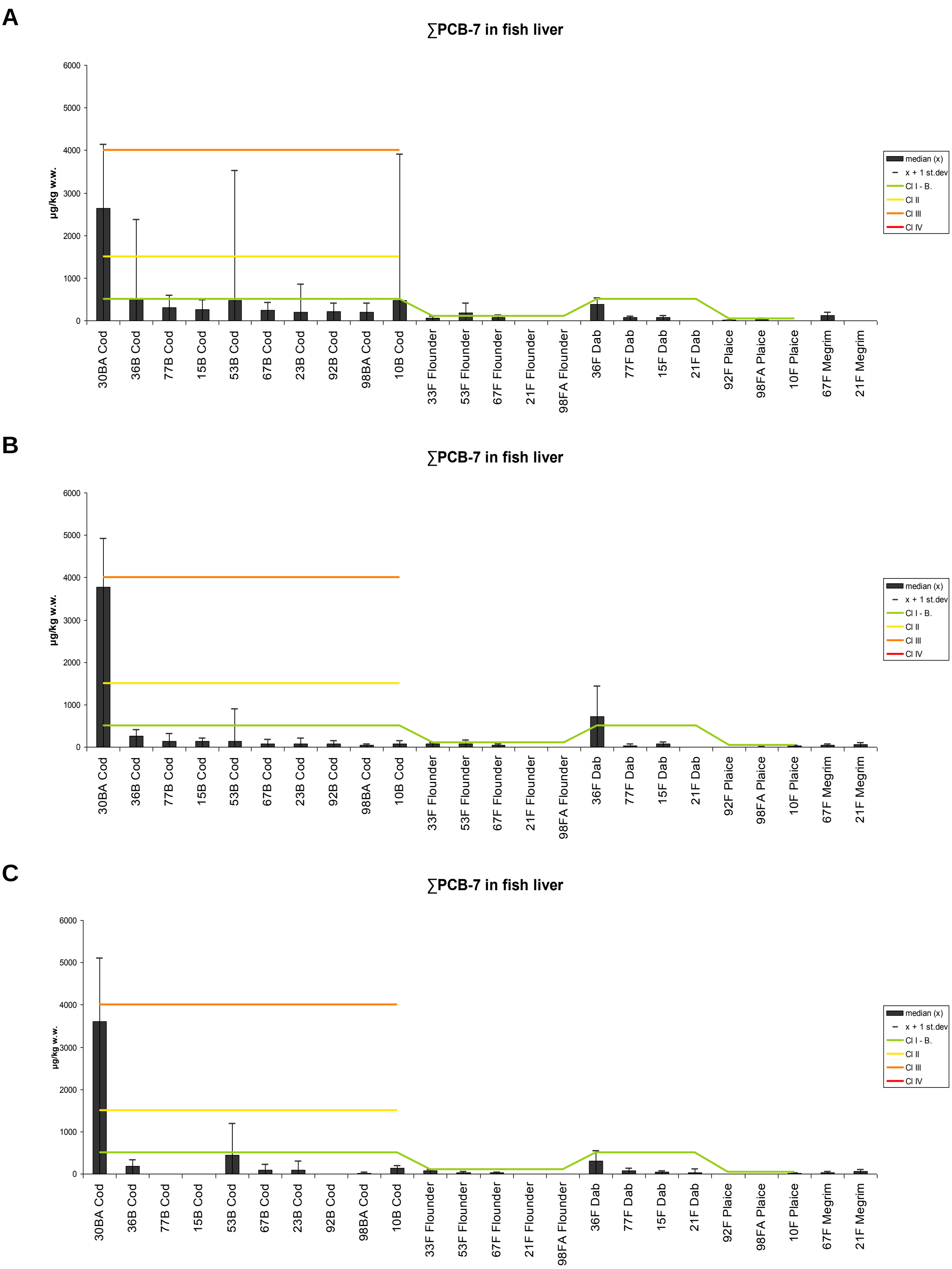



***Figure 48.*** *Median, standard deviation and upper limit to Klif Classes or provisional "high background" concentration for sum of 7 PCBs (CB-28, -52, 101, -118, -138, -153 and -180) in fish liver 1990-1996 (**A**), 2008 (**B**) and 2009 (**C**), ppb (µg/kg) wet weight, "Cl. I – B" indicates that only upper limit to Klif Classes or provisional high background concentration is indicated for flatfish, (see maps in Appendix G).*

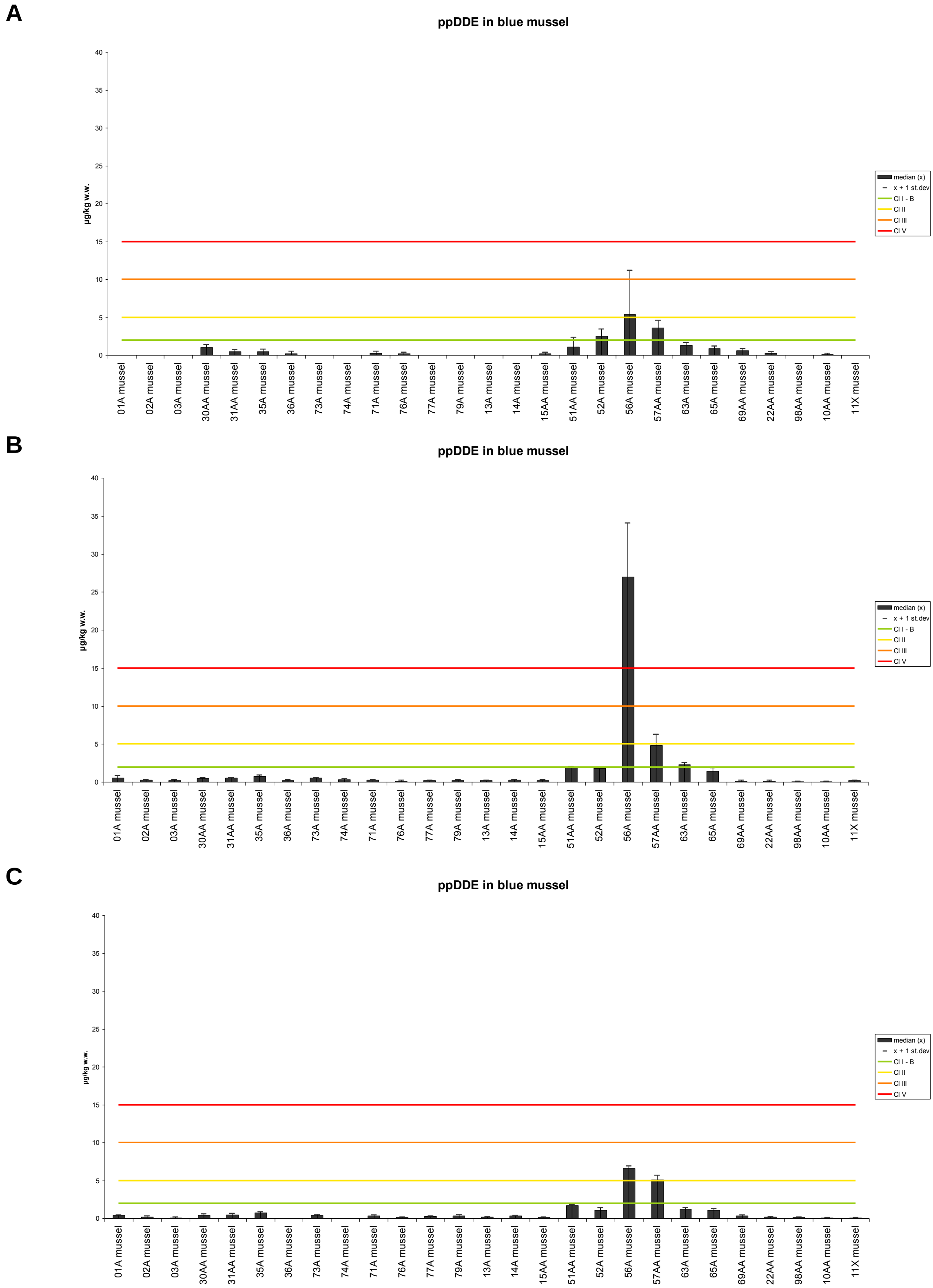



***Figure 49.*** *Median, standard deviation and upper limit to Klif Classes or provisional "high background" concentration for ppDDE (DDEPP) in blue mussel 1990-1996 (**A**), 2008 (**B**) and 2009 (**C**), ppb (µg/kg) wet weight (see maps in Appendix G). (See also footnote in Table 13).* ***Note: Class limits for ΣDDT used.***

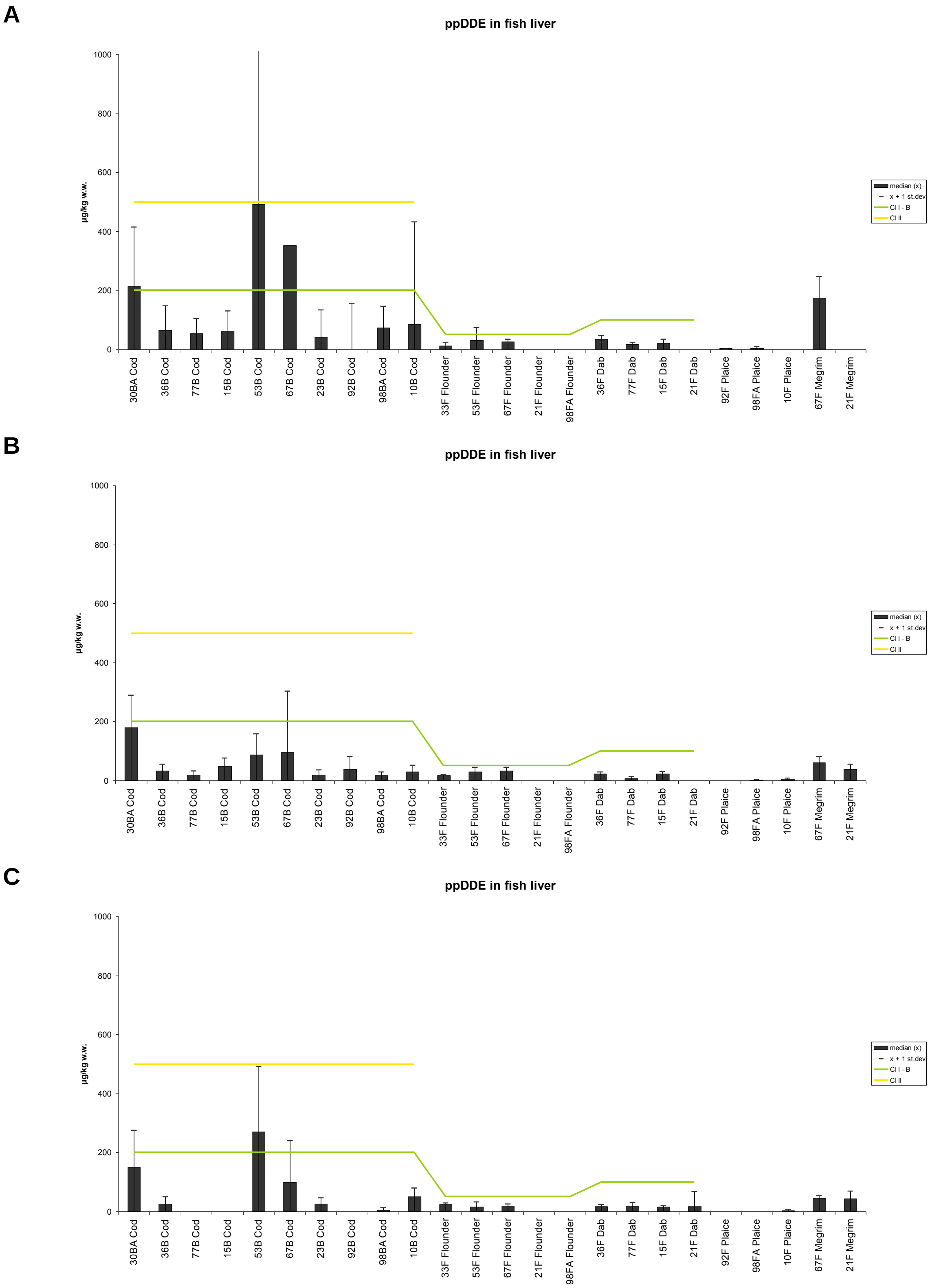
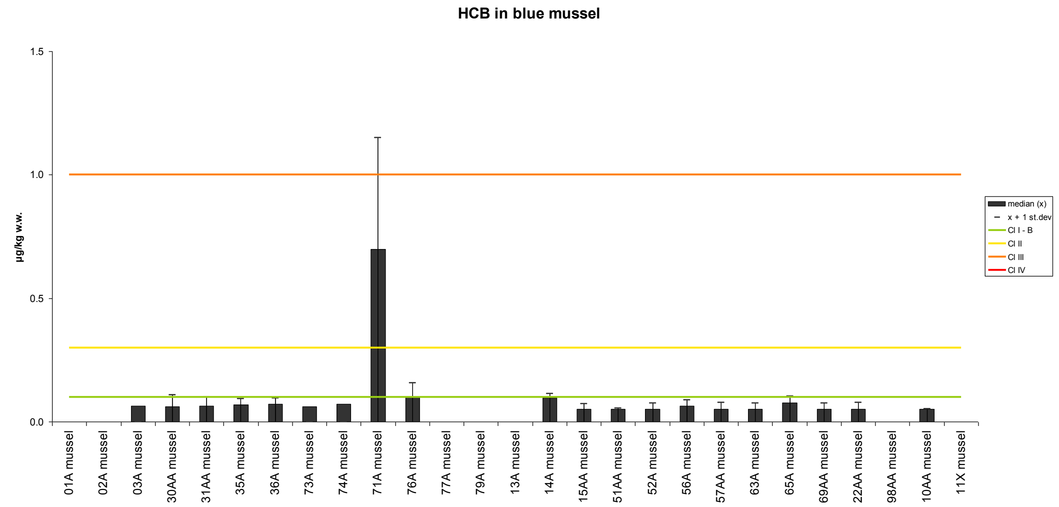
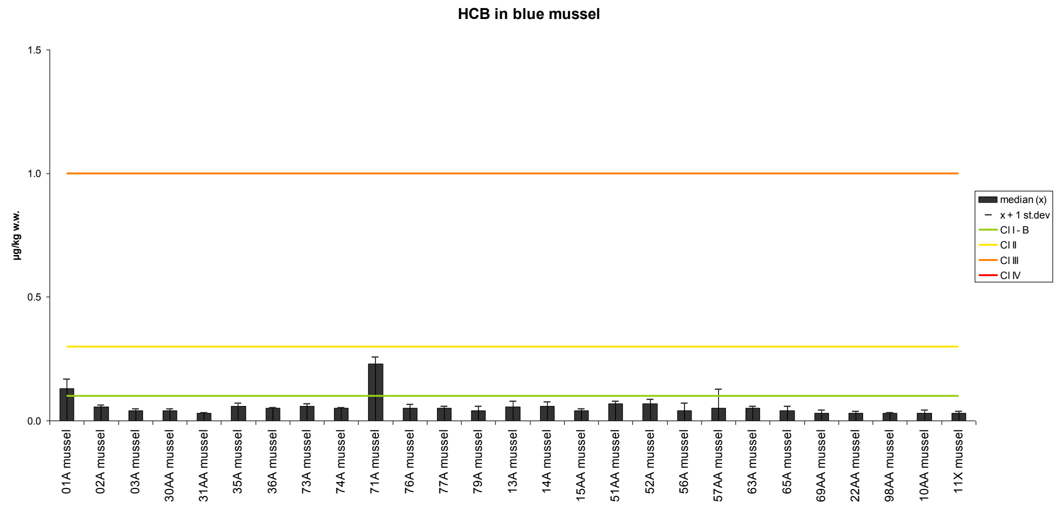



***Figure 50.*** *Median, standard deviation and upper limit to Klif Classes or provisional "high background" concentration for ppDDE (DDEPP) in fish liver 1990-1996 (**A**), 2008 (**B**) and 2009 (**C**), ppb ($\mu$g/kg) wet weight, "Cl. – B" indicates that only upper limit to Klif Classes or provisional high background concentration is indicated for flatfish, (see maps in Appendix G). (See also footnote in Table 13).* ***Note: Class limits for ΣDDT used.***

A




B




C

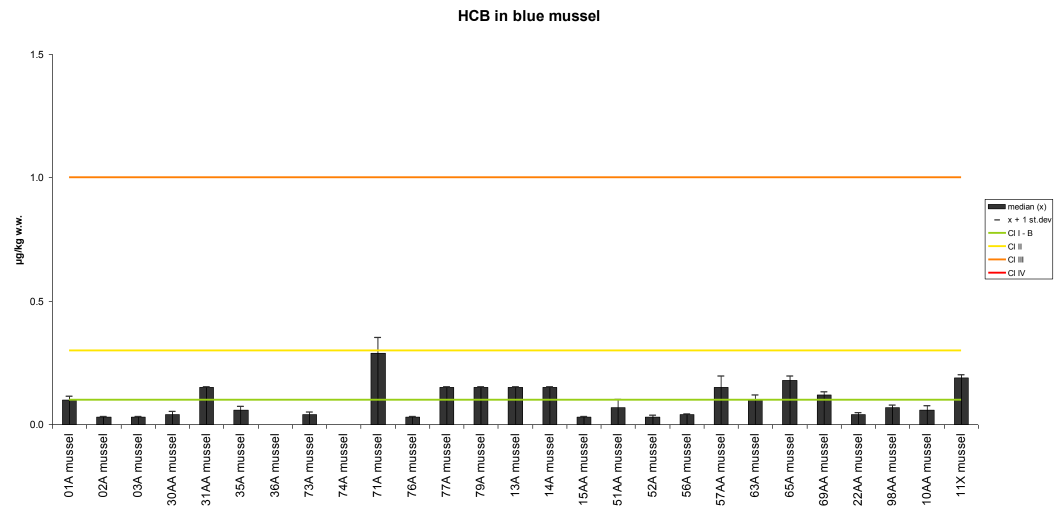



***Figure 51.*** *Median, standard deviation and upper limit to Klif Classes or provisional "high background" concentration for HCB in blue mussel 1990-1996 (**A**), 2008 (**B**) and 2009 (**C**), ppb (µg/kg) wet weight (see maps in Appendix G).*

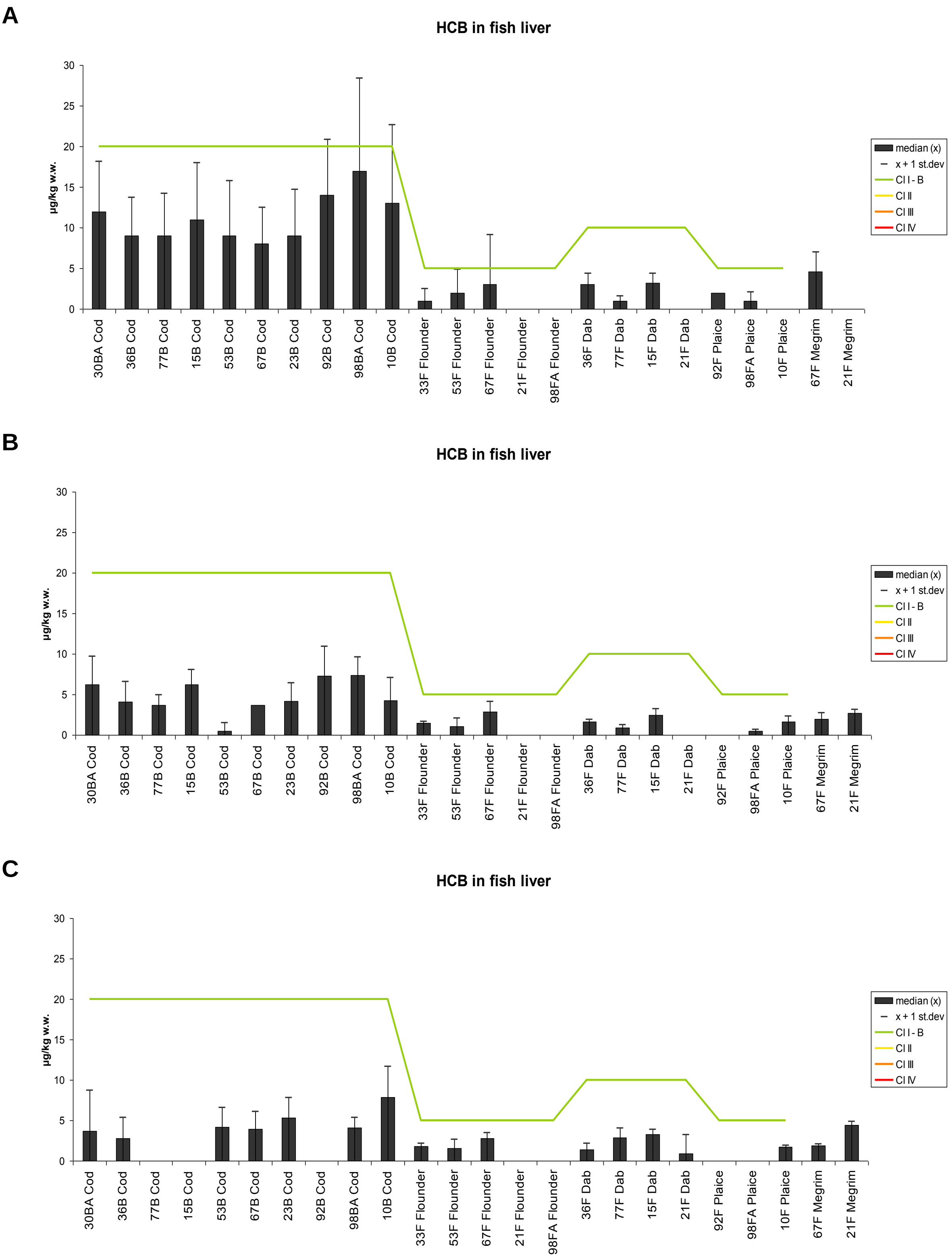
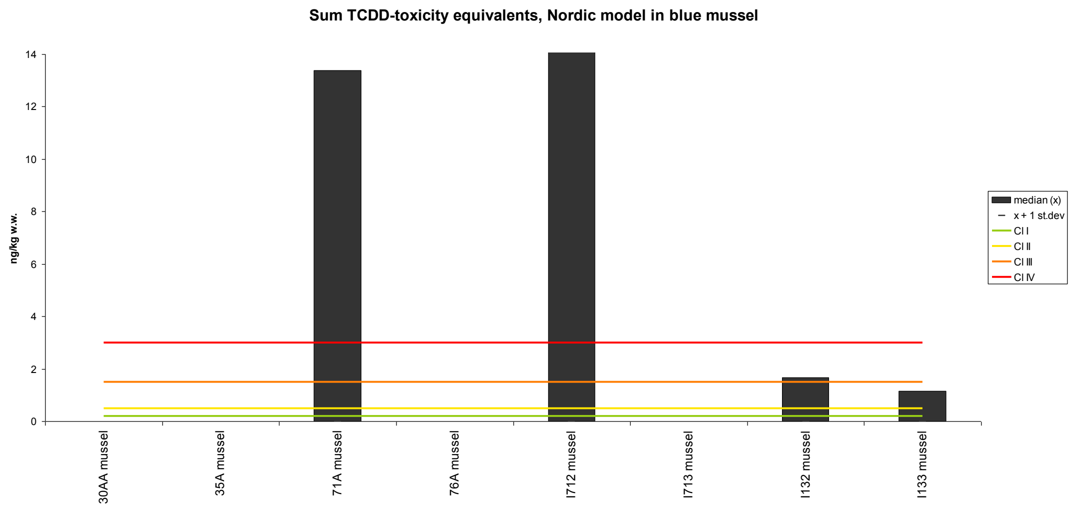
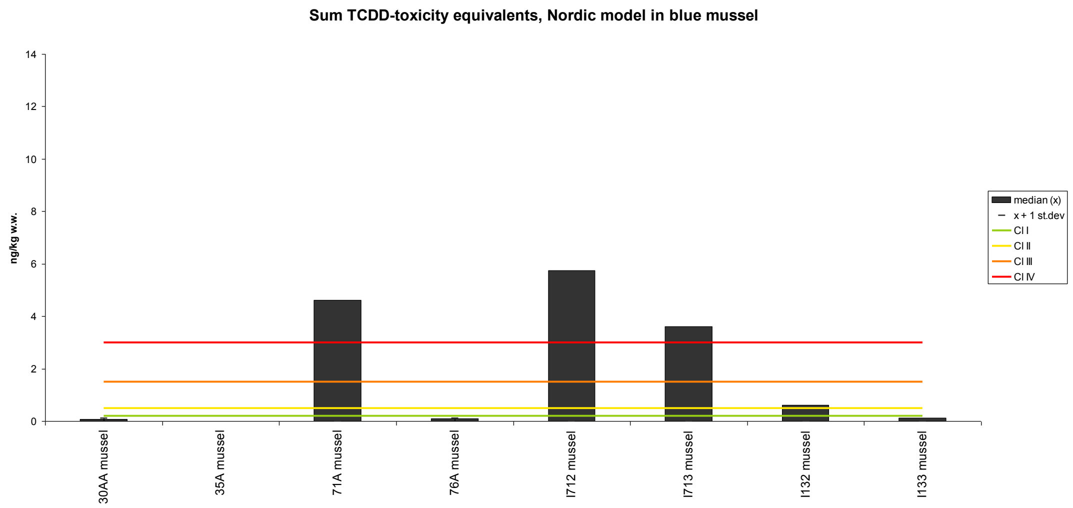



***Figure 52.*** *Median, standard deviation and upper limit to Klif Classes or provisional "high background" concentration for HCB in fish liver 1990-1996 (**A**), 2008 (**B**) and 2009 (**C**), ppb ($\mu$g/kg) wet weight, "Cl. – B" indicates that only upper limit to Klif Classes or provisional high background concentration is indicated for all fish, (see maps in Appendix G).*

A




B




C

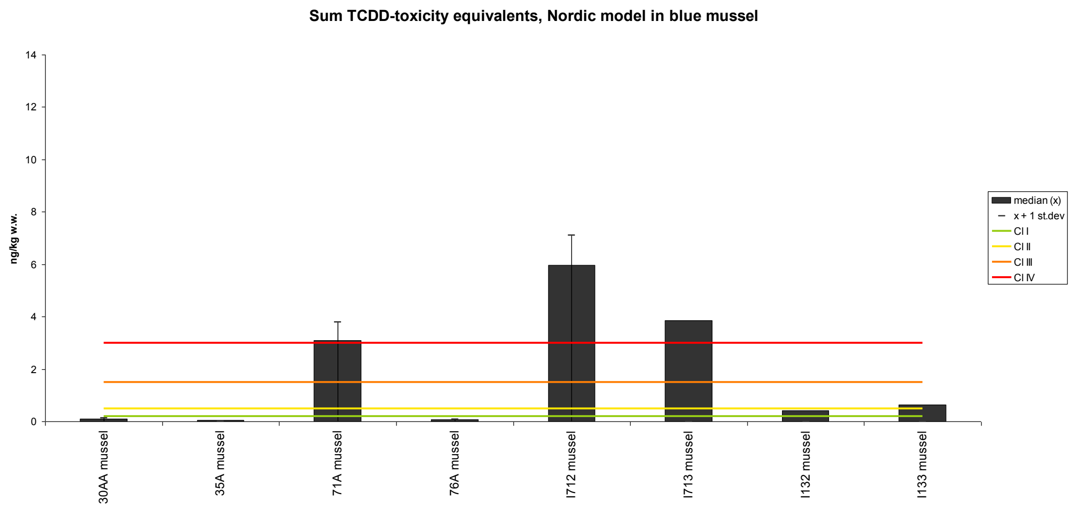



***Figure 53.** Median, standard deviation and upper limit to Klif Classes or provisional "high background" concentration for dioxin TCDD-toxicity equivalents after nordic model (TCDDN) in blue mussel 1990-1996 (**A**), 2008 (**B**) and 2009 (**C**), ppp (ng/kg) wet weight (see maps in Appendix G). NB: TCDDN is a sum of specific dioxin compounds of which may include compounds of uncertain quantification.*

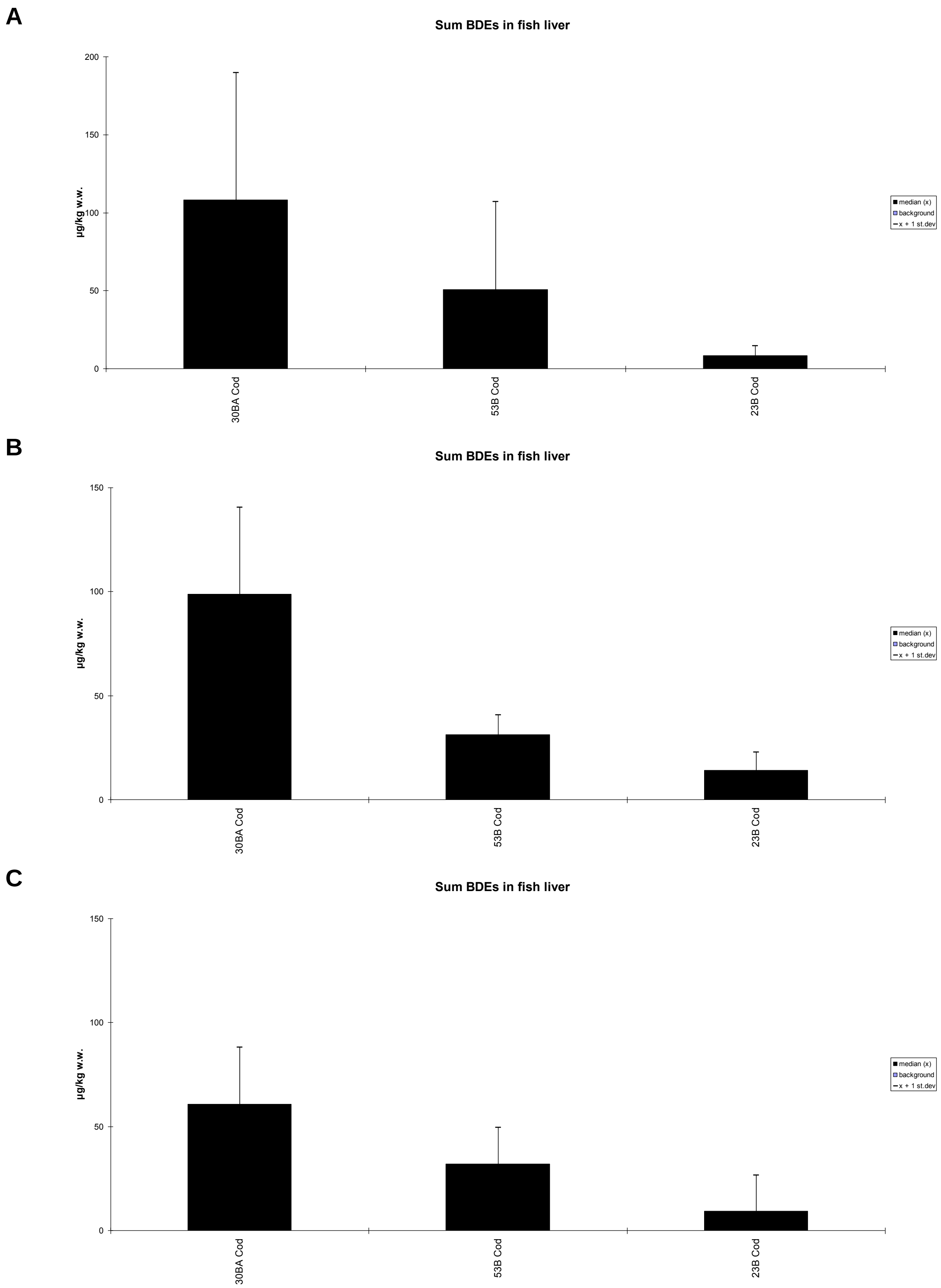



***Figure 54.*** *Median concentration for brominated flame retardant in cod liver 2007 (**A**), 2008 (**B**) and 2009 (**C**) ppb (µg/kg) wet weight for three CEMP stations (Inner Oslofjord - st. 30B, Inner Sørfjord - st. 53B and Karihavet - st. 23B) (see maps in Appendix G), and from two other investigations (see text).*

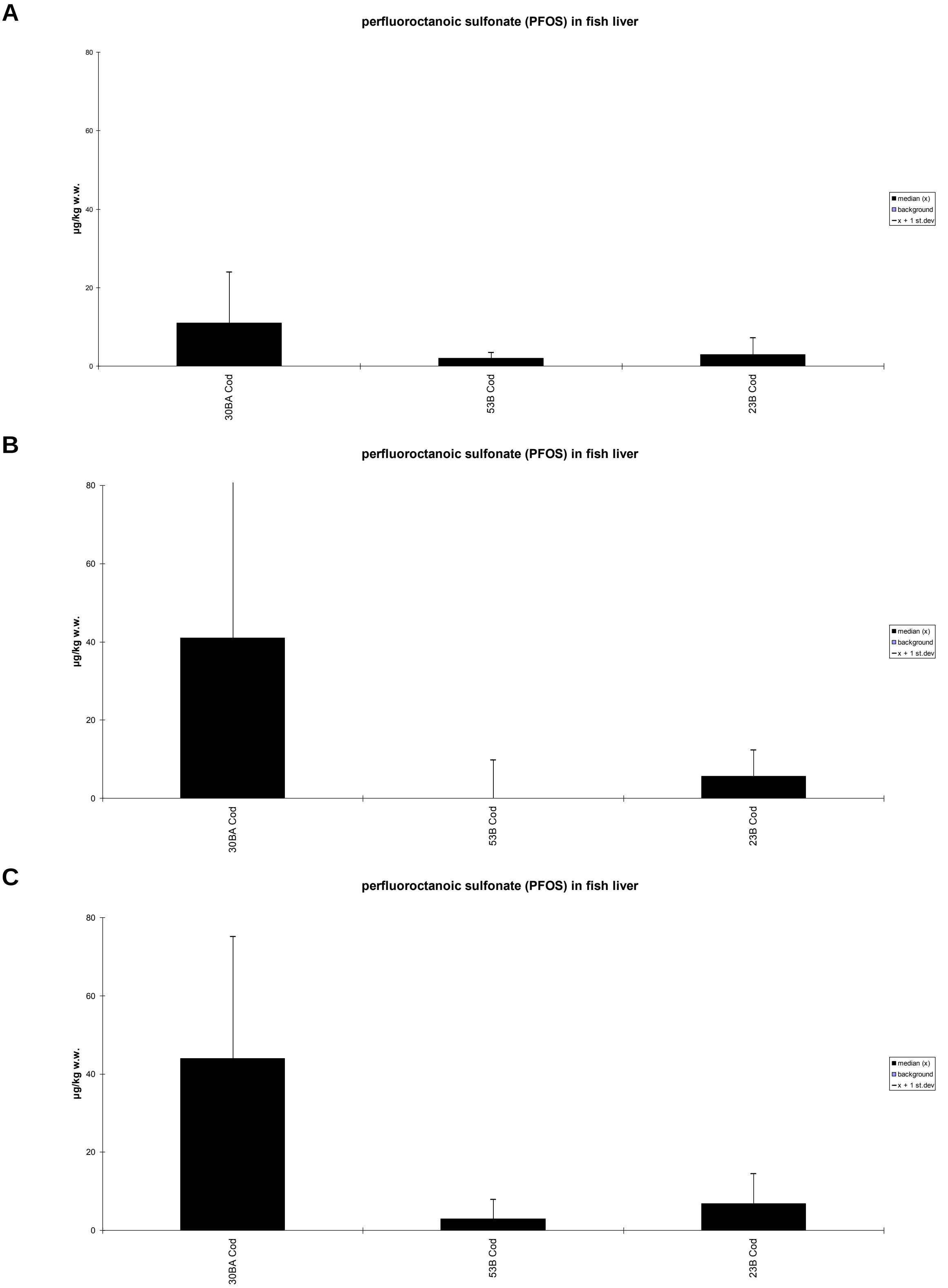



***Figure 55.*** *Median concentration for perfluoroctanoic sulfonate (PFOS) in cod liver 2007 (**A**), 2008 (**B**) and 2009 (**C**) ppb (µg/kg) wet weight for three CEMP stations (Inner Oslofjord - st. 30B, Inner Sørfjord - st. 53B and Karihavet - st. 23B) (see maps in Appendix G), and from two other investigations (see text).*

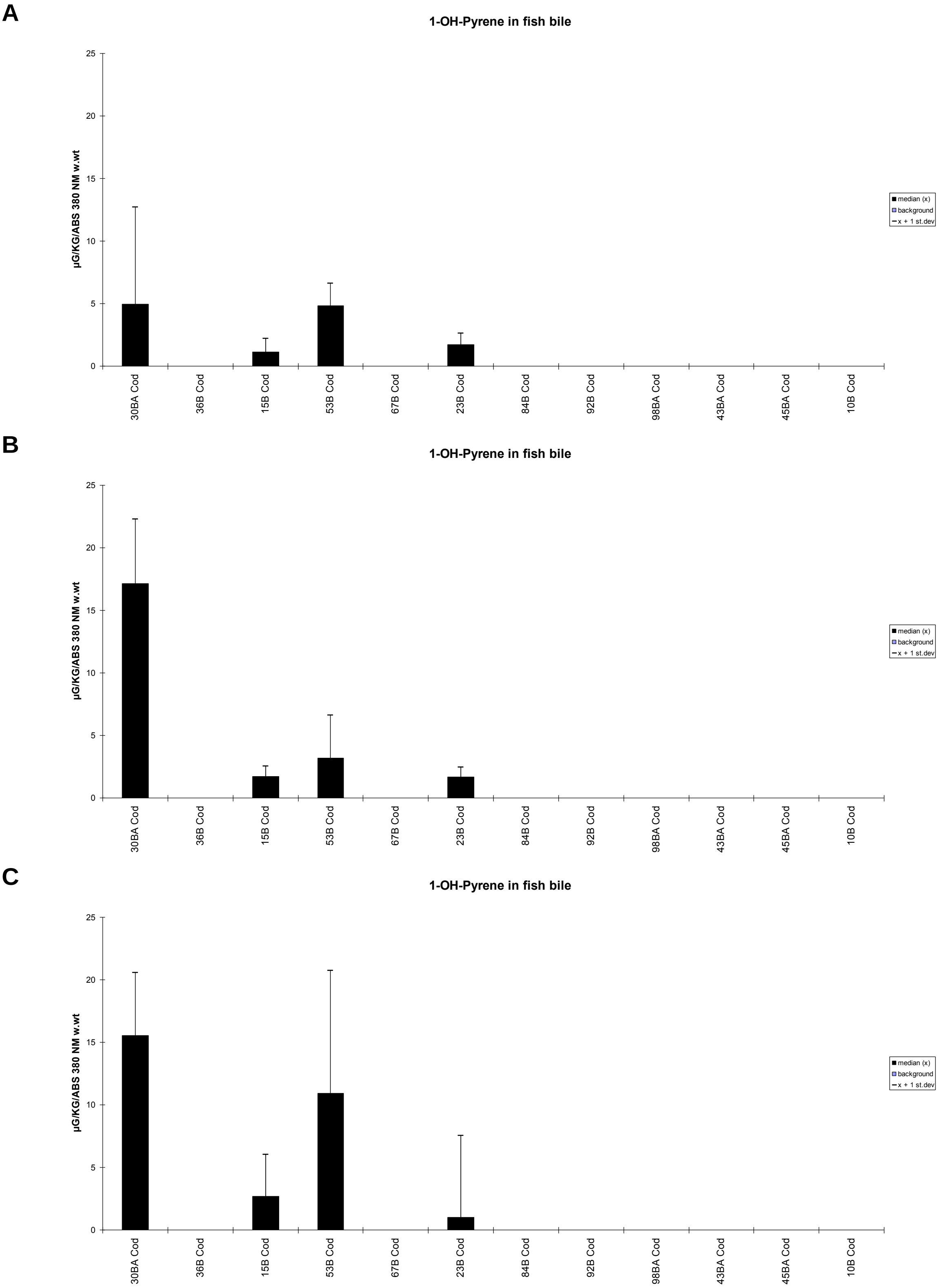



***Figure 56.*** *Median and standard deviation concentration for OH-pyrene (Pyrene metabolite) in fish bile 2007 (**A**), 2008 (**B**) and 2009 (**C**), µg/kg/ABS (absorbance) 380 nm (see maps in Appendix G).*

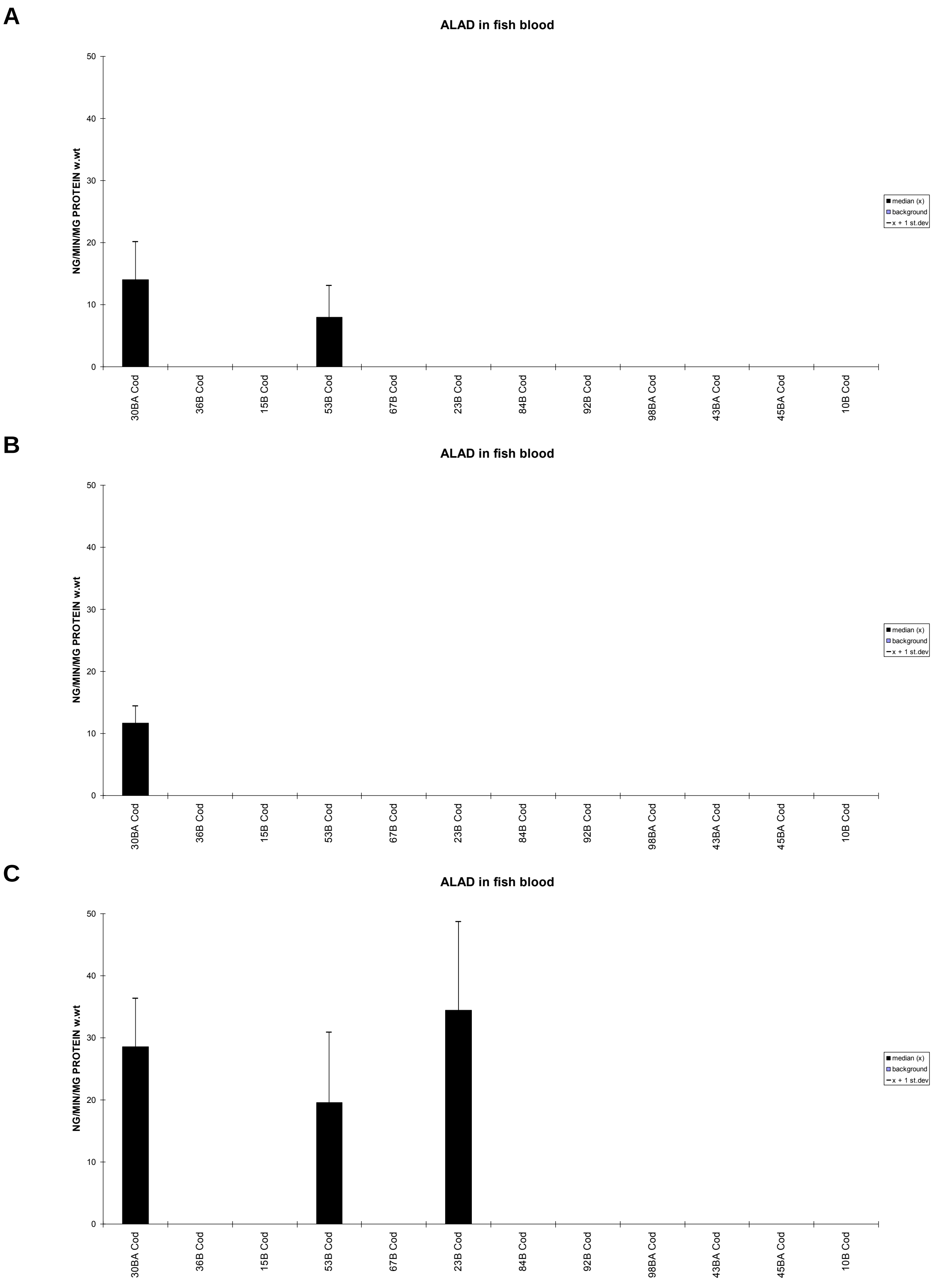



***Figure 57.*** *Median and standard deviation activity for ALA-D (δ-amino levulinic acid dehydrase inhibition) in fish blood 2007 (**A**), 2008 (**B**) and 2009 (**C**), ng PBG (porphobilinogen)/min/mg protein (see maps in Appendix G).*

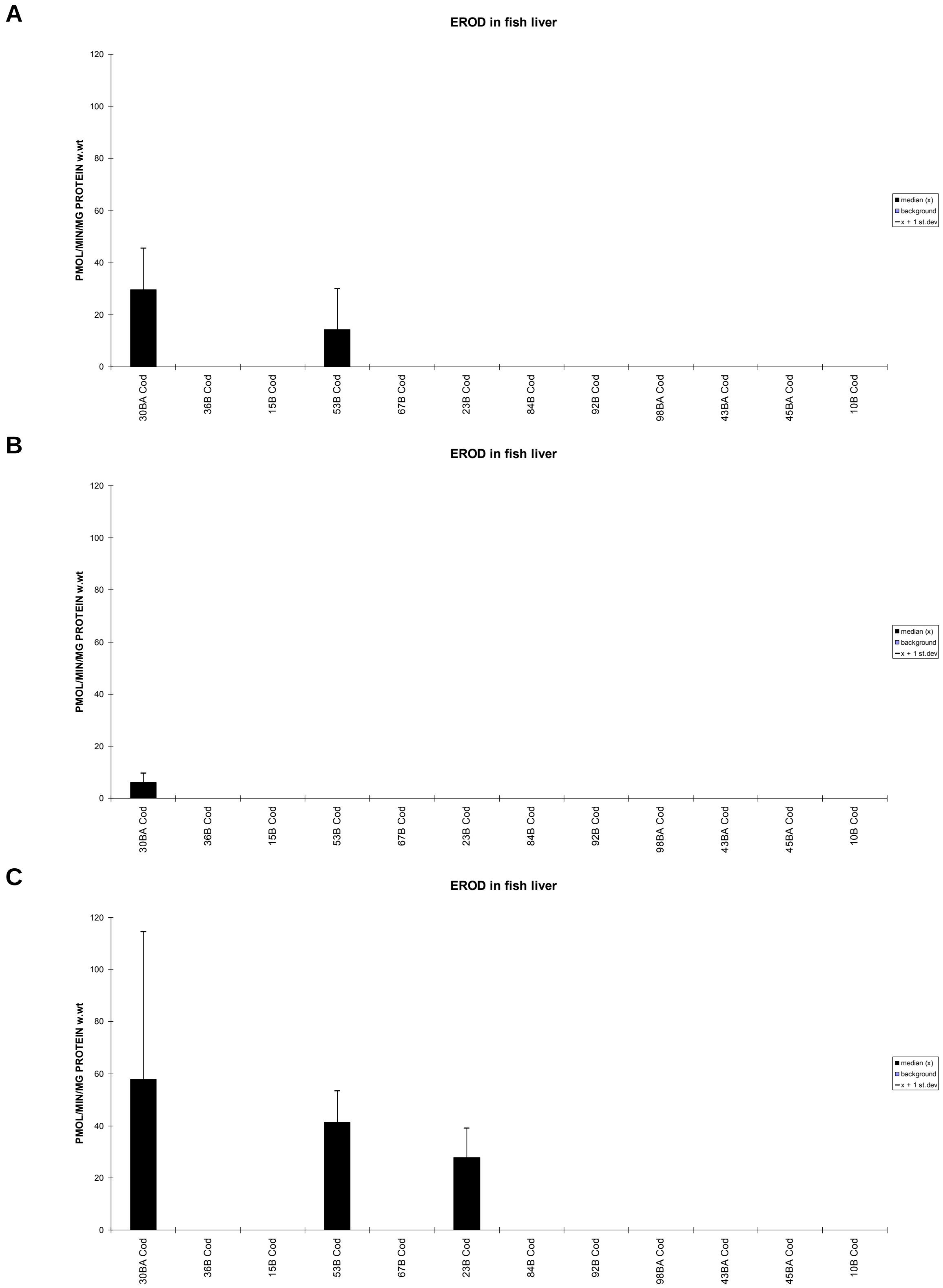



***Figure 58.*** *Median and standard deviation activity for EROD (Cytochrome P4501A-activity) in fish liver 2007 (**A**), 2008 (**B**) and 2009 (**C**), pmol/min/mg protein (see maps in Appendix G).*

A
B
C

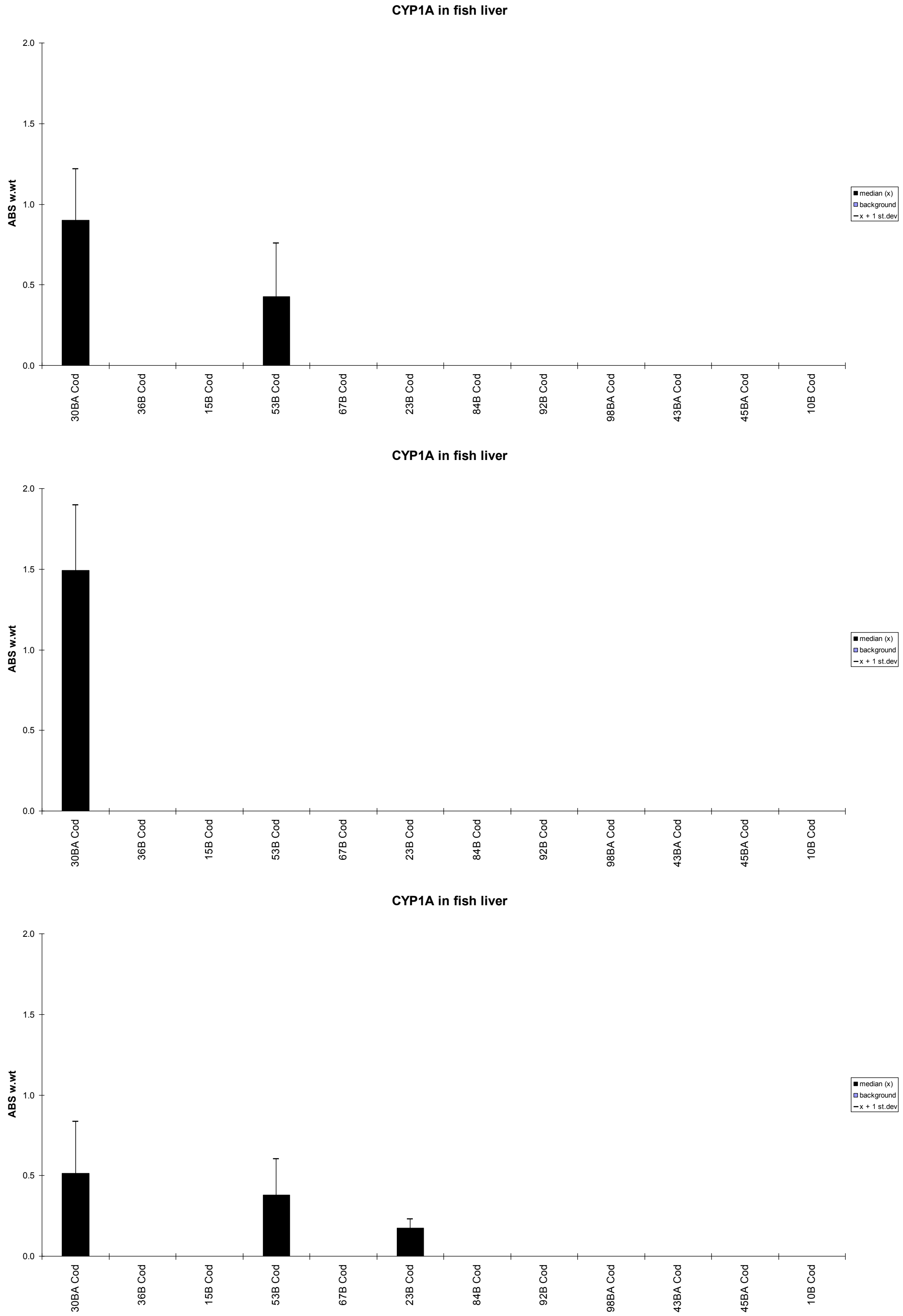
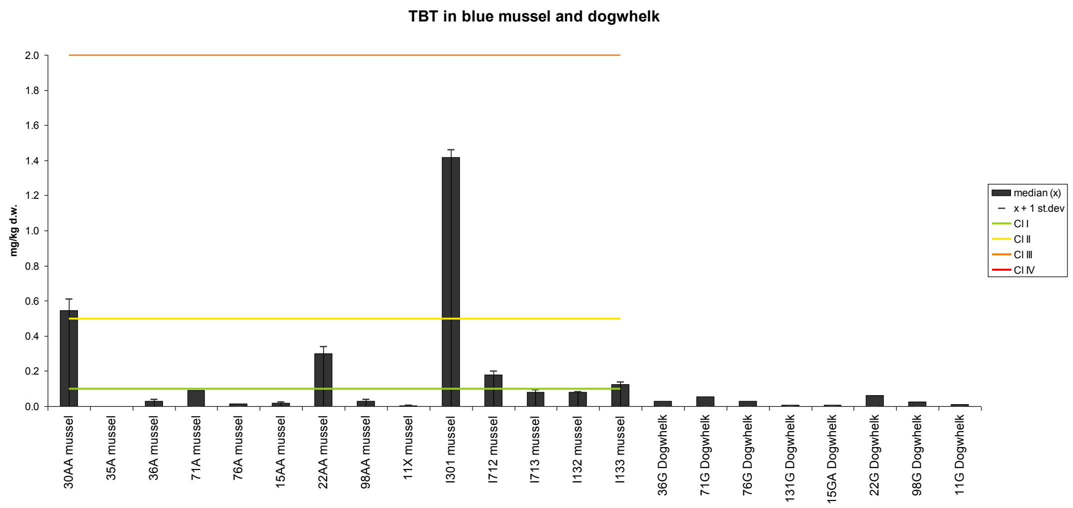
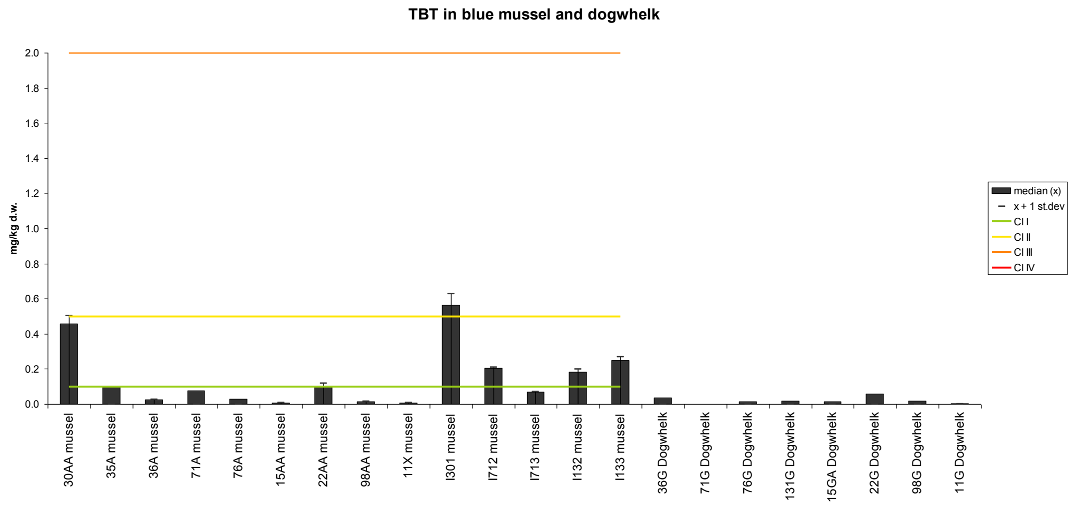



***Figure 59.*** *Median and standard deviation activity for CYP1A (relative amount of Cytochrome P4501A-protein) in fish liver 2007 (**A**), 2008 (**B**) and 2009 (**C**), pmol/min/mg protein (see maps in Appendix G).*

A




B




C

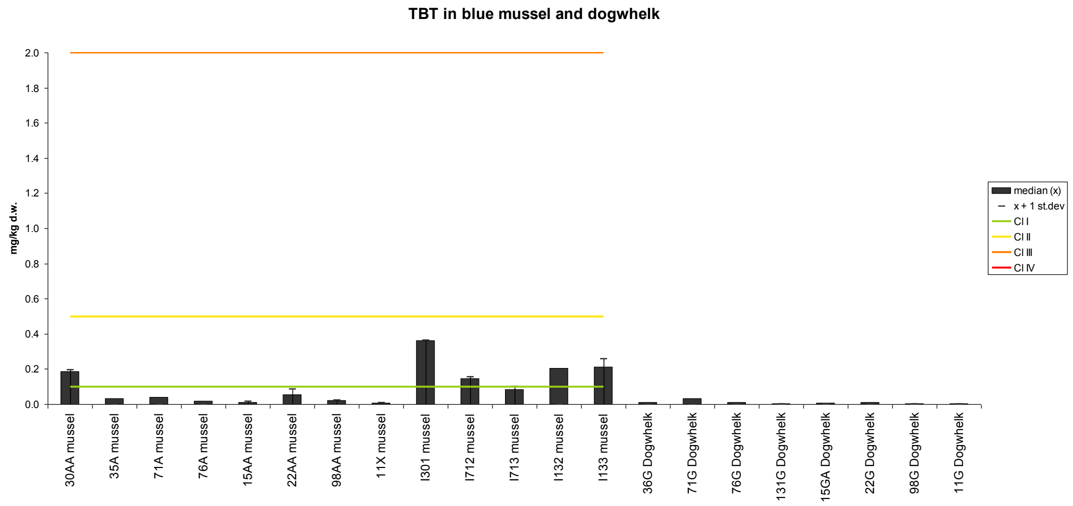



***Figure 60.*** *Median, standard deviation and upper limit to Klif Classes or provisional "high background" concentration for tributyltin (TBT-concentration on a formulation basis) in blue mussel and dogwhelk 2007 (**A**), 2008 (**B**) and 2009 (**C**), ppm (2.44* mg Sn/kg) dry weight (see maps in Appendix G).*

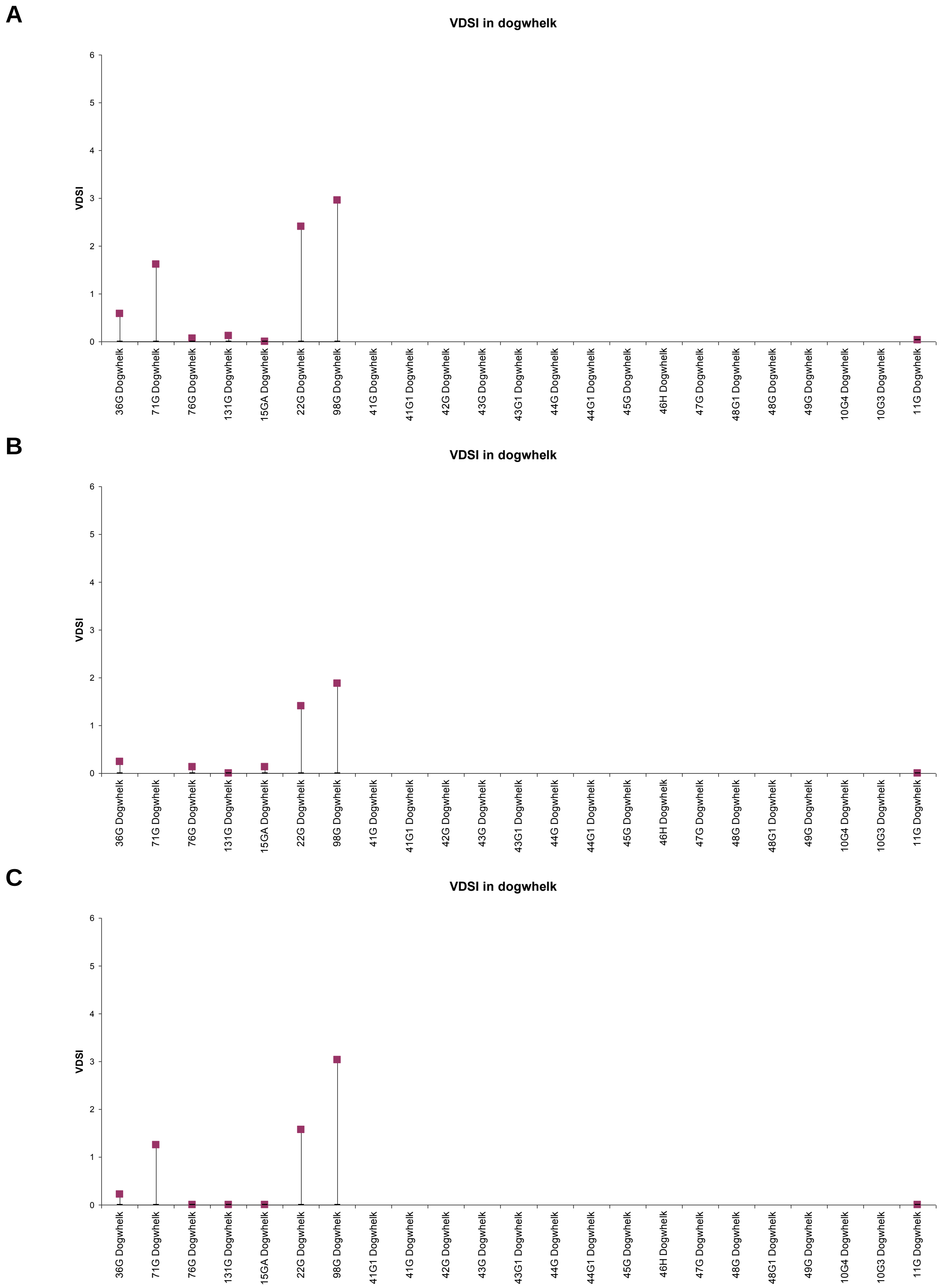



***Figure 61.*** *Average VDSI in dogwhelk 2007 (**A**), 2008 (**B**) and 2009 (**C**) (see maps in Appendix G).*

# Appendix L
# Results from INDEX determinations 1995-2009

# Introduction

The blue mussel pollution and reference indices are two indices used to evaluate levels of certain hazardous substances in blue mussel from a selection of fjord areas in Norway (Figure 62). The pollution index is based on 26 stations from nine fjord areas regarded as polluted. The reference index is based on results from 8 stations remote from point sources of pollution in five fjord areas.

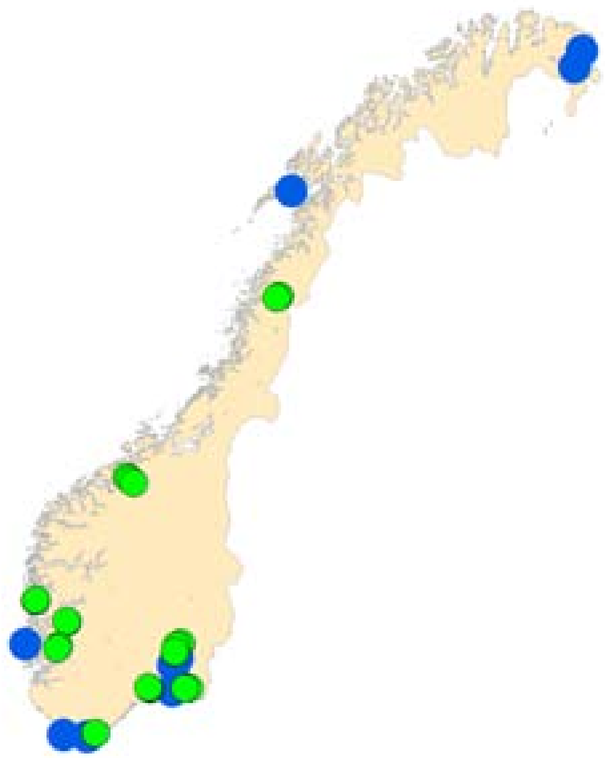


***Figure 62.*** *Blue mussel Index stations sampled in 2009; pollution (green circles), reference (blue circles).*

The index scale varies from 1 to 5. Based on the analyses each station is classified according to Klif's classification system. Each area or fjord is given a class according to the highest classification registered, e.g. if one station within an area is classified as Class IV, the area is would designated with Maximum Environmental Class (Max.E.C.) of IV, provided that this is the highest classification found for all the stations in that area. A Max.E.C. of 1 means that all stations within an area are insignificantly polluted (Class I in Klif's classification system). There is one Max. E.C. determined for each fjord or fjord area and the average of these is the index. An index of 5 would mean that all the fjords or fjord areas have a Max.E.C. of V or "Extreme" in Klif's classification system.

The indices have been used since 1995 based on contaminant concentrations in blue mussel from 14-19 areas (cf. Green *et al.* 2004). An assessment of their application suggested that the pollution index needed mainly two improvements (Green & Knutzen 2001): 1) more stations to avoid the consequences of insufficient sample size and 2) inclusion of more relevant contaminant analyses with respect to the pollution load expected and in relation to the Klif classification system for environmental quality (Molvær *et al.* 1997). Klif provided funds to improve the index in 2002. Three additional stations have since been established: one in the Frierfjord area (I713 Strømtangen, about 800 m east of I711 Steinsholmen), one in the inner Ranfjord (I964 Toraneskaien, about 500 m north of I965 Moholmen) and one in the Sunndalsfjord area (I915 Flåøya, northwest, about halfway between I913 and the inner most part of the fjord). Dioxin and TBT analyses were added to the programme for samples collected in the Frierfjord area, inner Oslofjord and the inner Kristiansandsfjord TBT-analyses were also included for some of the reference stations (see Annex). These changes affect the outcome of the index and comparison to previous years should be cautioned. For results up to and including 2001 Klif has presented only the results using the old method of calculation, for 2002 the results for both the old and new methods are presented, and for 2003 and since then only the results for the new method are presented. Comparison of the two methods for 2002 and 2003 has been done earlier (Green *et al.*, 2004 a, b).

The Klif Classes are based on the provisional "high background" levels. This system has been revised (Molvær *et al.* 1997); where among other changes the sum of CB-28, -52, -101, -118, -138, -153, and -180 (CBΣ7) is now a distinct parameter for classification. The sum of all PAHs excluding the dicyclic PAHs (PAH_Σ) was compared to the system's "sum-PAH". Previously this was the calculation of sum-PAH that included the dicyclic PAHs. As analytical methods improved through the years more non-dicyclic PAHs could be quantified, and included the C1-, C2-, and C3-dibenzpthiophenes, and C1-, C2-, C3- and methylated phenathrenes. These were included in the sum of all non-dicyclic PAHs, and comparison between years could be misleading. For the *National Comments* 2006 (Green *et al.,* 2008a), PAH_Σ was re-calculated, also for previous years, using only the 15 non-dycyclic PAH listed in the EPA protocol 8310[1]. The recalculation revealed only one difference from previously reported index values, and that was for the Reference Index 2006 reported to Klif as 1.6 in June of 2007, but the recalculation was 1.4 because PAH_Σ at Lista dropped into Cl.I from Cl.II.

It should also be noted that the Klif classification system is under revision and may affect calculations of the indices in the future. One likely change will be the lowering of limits to the classes for PCBs taking into consideration a lower background from 4 to 3 ppb wet weight suggested by Green & Knutzen (2003).

No special considerations were made when one but not all the stations within an area were sampled. The lack of sufficient samples has occurred several times for the Pollution Index: (st. I205 Bølsnes from Saudafjord 1996, st. I911 Horvika in the Sunndalsfjord since 1999, st. I021 in the Hvaler area 1999, st.I962 in the Inner Ranfjord since 1999, and st. I711 Steinholmen in the Frierfjord 2001).

Because insufficient amount of blue mussel were found at station Horvika in the Sunndalsfjord, two new stations were introduced; Fjøseid (I913) in 1999 and Flåøya, northwest (I915), in 2003, about 15 and 5 km farther out the fjord from Horvika, respectively. It can be noted that inclusion of supplementary analyse of blue mussel from the "Hydro kai" (I916), innermost in Sunndalsfjord, would have increased the index. Because sufficient amount of blue mussel was not found at station I962 Koksverktomta in the Ranfjord since 1999, a new station (I965 - Moholmen) was introduced in 2001 about 2 km south of Koksverktomta.

The Index scale varies from 1 to 5. Index 1 means that all areas or fjords are insignificantly polluted (Class I in Klif's classification system), Index 5 means that at least one sample from each area or fjord is extremely polluted or Class V in Klif's system. A value between 3 and 4 would be between "Marked" and "Severe" (Class III and IV) in the Klif system. A value between 2 and 3 would be between "Moderate" and "Marked" (Class II and III). A value between 1 and 2 would be between "Slight" and "Moderate" (Class I and II).

[1] Acenaphthene, acenaphthylene, anthracene, benzo[*a*]anthracene, benzo[*a*]pyrene, benzo[b]fluoranthene, benzo[ghi]perlyene, benzo[*k*]fluoranthene, chrysene, dibenzo[*a,h*]anthracene, fluoranthene, indeno[*1,2,3-cd*]pyrene, phenanthrene and pyrene. NB. for NIVA's PAH_Σ, a where these cannot be distinguished but included in a group, such as benzo[*b*]fluoranthene benzo[*b,b,f*]fluoranthene, the value for the group is used. A single compound can not be included in more than one group.

Based on nine fjord areas and on the new calculation with the mentioned supplementary stations and supplementary analyses of dioxin and TBT, the Pollution Index for 2009 was 2.8, 0.2 lower than in 2008 (Table 15, Appendix M4, Green *et al.* 2010). A value between 2 and 3 would be termed by the Klif system as “Marked” and between 3 and 4 "Severe".

Only 5 fjords/areas were monitored for the Reference Index for 1998-2009 compared to 7 for 1997 and 8 for 1995-1996 (Table 2, Annex). However, only four of these provided a common basis (cf., Table 16). Similar to the application Pollution Index, the Reference Index made no special considerations when one but not all the stations within an area were sampled. For the four common areas, this has occurred several times, all in the Varangerfjord area (st.48A since 1997 and st.11A since 1998). With Lofoten and the supplementary analyses of TBT included, the Reference Index for 2009 was 1.2, 0.4 lower than in 2008 (Table 2, Annex. Note that 1.4 was erroneously reported for 2008 earlier). Four of the fjords/areas included the TBT analyses. The index decreased one class for the Bømlo-Sotra area because of lower concentration of TBT, and also decreased one class for the Varanger peninsula area because of lower concentration of cadmium. An index value between 1 and 2 would be termed by the Klif system as “Moderate”.

***Table 15.*** Maximum environmental classification for fjords selected for Pollution Index. (See text).

| Index Area [1] | 1995 | 1996 | 1997 [2] | 1998 | 1999 | 2000 | 2001 | 2002 | 2002 new [7] | 2003 | 2003 new [7] | 2004 new [7] | 2005 new [7] | 2006 new [7] | 2007 new [7] | 2008 new [7] | 2009 new [7] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hvaler/Singlefjord | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Iddefjord | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Inner Oslofjord | 3 | 3 | 4 | 2 | 3 | 2 | 2 | 2 | 4 | 2 | 4 | 4 | 4 | 3 | 3 | 3 | 2 |
| Frierfjord, Grenlandsfjords | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 5 [6] | 5 | 3 [6] | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Inner Kristiansandsfjord | 5 | 5 | 5 | 5 | 5 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 |
| Saudafjord | 4 | 5 | 5 | 3 | 4 | 3 | 3 | 4 | 4 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 1 |
| Sørfjord | 5 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | 5 | 5 | 4 | 4 | 3 | 3 | 3 | 3 |
| Byfjorden, Bergen [3] | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 2 | 2 | 2 |
| Sunndalsfjord | 3 | 3 | 3 [4] | 2 | 3 | 4 | 2 | 3 | 3 | 1 [6] | 1 | 1 | 1 | 1 | 2 | 2 | 1 |
| Orkdalsfjord | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Inner Ranfjord | 5 | 3 | 3 [5] | 4 | 2 | 2 | 3 | 3 [6] | 3 | 3 [8] | 5 | 5 | 3 | 4 | 4 | 4 | 5 |
| **AVERAGE (Pollution INDEX)** | **3.7** | **3.6** | **3.4** | **3.0** | **3.1** | **2.9** | **2.7** | **3.2** | **3.4** | **2.9** | **3.6** | **3.4** | **3.1** | **2.9** | **3.0** | **3.0** | **2.8** |

[1] Iddefjord and Orkdalsfjord not sampled since 1997, hence the indices 1995-96 do not include the local indices from these fjords

[2] Copper, zinc and TCDDN excluded since 1997, hence indices for 1995-96 excludes these contaminants

[3] PCB (DDTΣ, HCB, HCHΣΣ and CBΣΣ) analysed in stored samples for 1995-1996

[4] Change in classification (cf. Green *et al.* 1999) due to recalculation of PAHs that excluded the dicyclic compounds

[5] Change in classification (cf. Green *et al.* 1999) due to calculation error

[6] Results from supplementary station would not influence the outcome of classification

[7] Inclusion of supplementary a station in Frierfjord, Inner Ranfjord, and Sunndalsfjord (2003), and supplementary dioxin and TBT analyses for Inner Oslofjord, Frierfjord, and Inner Kristiansandsfjord.

[8] Results from supplementary station would influence the outcome of classification.

***Table 16.*** Maximum environmental classification for fjords selected for Reference Index. (See text).

| Index Area | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2002 new 5) | 2003 | 2003 new 5) | 2004 new 5) | 2005 new 5) | 2006 new 5) | 2007 new 5) | 2008 new 5) | 2009 new 5) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mid and outer Oslofjord 1) | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 2 |
| Lista | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 |
| Bømlo-Sotra | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| Outer Ranfjord, Helgeland 2) | (1) | (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Lofoten 3) | (2) | (2) | (1) | (2) | (2) | (1) | (2) | (2) | 2 | (2) | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| Finnsnes-Skjervøy 2) | (2) | (1) | (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hammerfest-Honningsvåg 2) | (2) | (3) 4) | (2) | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Varanger Peninsula | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 |
| **AVERAGE (Reference INDEX)** | **1.3** | **1.5** | **1.3** | **1.3** | **1.3** | **1.5** | **1.8** | **1.3** | **1.6** | **1.2** | **1.8** | **1.4** | **1.4** | **1.4** | **1.4** | **1.6** 6) | **1.2** |

1) Inclusion of results for arsenic, nickel and silver in 1996 did not affect the classification

2) Outer Ranfjord, Finnsnes-Skjervøy and Hammerfest-Honningsvåg stations were not sampled in 1998, hence, the index for 1995-97 did not take these results into account. See cf., Green *et al.* 2000 for more details for outer Ranfjord.

3) Inconsistency in sampling site, st.98X in 1995-96 and st.98A in 1997, hence, results from Lofoten excluded. See cf., Green *et al.* 2000 for more details for st 98X.

4) Change in classification (cf. Green *et al.* 1999) due to recalculation of PAHs that excluded the dicyclic compounds.

5) Inclusion of supplementary TBT analyses for Mid and outer Oslofjord, Lista, Bømlo-Sotra, Lofoten and Varangerfjord Peninsula.

6) 1.4 reported earlier.

# Appendix L1
# INDEX - Sampling and analyses for 1995-2009

**Appendix L1.** Blue mussel samples planned or used in INDEX and other purposes besides CEMP 1995-2006, where P = “Pollution Index” and R = “Reference Index” (contaminated and assumed “background” stations, respectively). + indicates CEMP sampling and analyses (i.e. equivalent to analysis code A). The number indicates the number samples analysed. Codes for analysis (A, B etc.) are defined in Appendix L2. See Walday *et al.* (1995) for discussion of selection of stations and analyses.

| | **STATION** | **INDEX** | | | | | | **ANALYSIS CODE** | | | | | | | **CM** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| st. | | | + | A | B | C | D | E | F | G | H | I | J | K | |
| | **HVALER/SINGLEFJORD AREA** | | | | | | | | | | | | | | |
| I021 | Kjøkø, south | P | . | 3 | . | . | . | . | . | . | . | . | . | . | |
| I024 | Kirøy, north west | P | . | 3 | . | . | . | . | . | . | . | . | . | . | |
| I022 | West Damholmen | P | . | 3 | . | . | . | . | . | . | . | . | . | . | |
| I023 | Singlekalven, south | P | . | 3 | . | . | . | . | . | . | . | . | . | . | |
| | **IDDEFJORD** | | | | | | | | | | | | | | |
| I001 | Sponvikskansen | P | . | . | 3 | . | . | . | . | . | . | . | . | . | |
| I011 | Kråkenebbet | P | . | . | 3 | . | . | . | . | . | . | . | . | . | |
| | **OSLOFJORD**, inner | | | | | | | | | | | | | | |
| 30A | Gressholmen | P | + | 3 | . | . | . | . | . | . | 3 | . | 2 | 2 | |
| I301 | Akershuskaia | P | . | . | . | 3 | . | . | . | . | . | . | . | 2 | |
| I304 | Gåsøya | P | . | . | . | 3 | . | . | . | . | . | . | . | . | |
| I307 | Ramtonholmen | P | . | . | . | 3 | . | . | . | . | . | . | . | . | |
| I306 | Håøya | P | . | . | . | 3 | . | . | . | . | . | . | . | . | |
| | **OSLOFJORD**, mid and outer | | | | | | | | | | | | | | |
| 31A | Solbergstrand | R | + | 3 | . | . | . | . | . | . | . | . | . | . | |
| 35A | Mølen | R | + | 3 | . | . | . | . | . | . | . | . | . | . | |
| 36A | Færder | R | + | 3 | . | . | . | . | . | . | . | . | . | 2 | |
| | **FRIERFJORD AREA**, west of outer Oslofjord | | | | | | | | | | | | | | |
| I712 | Gjermundsholmen | P | . | . | . | . | 3 | . | . | . | . | . | 2 | 2 | |
| I713 | Strømtangen | P | . | . | . | . | 3 | . | . | . | . | . | 1 | 2 | |
| 71A | Bjørkøya | P | + | 3 | . | . | . | . | . | . | . | . | 2 | 1 | |
| 76A | Risøy | R | + | 3 | . | . | . | . | . | . | . | . | 2 | 1 | |
| | **INNER KRISTRIANSANDSFJORD** | | | | | | | | | | | | | | |
| I1321 | Fiskåtangen | P | . | . | . | . | . | 3 | . | . | . | . | 2 | 2 | |
| I133 | Odderø, west | P | . | . | . | . | . | 3 | . | . | . | . | 1 | 2 | |
| | **LISTA AREA** | | | | | | | | | | | | | | |
| 15A | Gåsøya | R | + | 3 | . | . | . | . | . | . | . | . | . | 2 | |
| I131A | Lastad | R | . | . | . | 3. | . | . | . | . | . | . | . | . | g |
| | **SAUDAFJORD** | | | | | | | | | | | | | | |
| I201 | Ekkjegrunn (G1) | P | . | . | . | . | . | . | 3 | . | . | . | . | . | |
| ** I205 | Bølsnes (G5) | P | . | . | . | . | . | . | 3 | . | . | . | . | . | |
| | **[HAUGESUND AREA not related to INDEX investigation]** | | | | | | | | | | | | | | |
| 227A1 | Melandsholmen | O | . | 3 | . | . | . | . | . | . | . | . | . | 1 | |
| | **BØMLO-SOTRA AREA** | | | | | | | | | | | | | | |
| 22A | Espevær, west | R | + | 3 | . | . | . | . | . | . | . | . | . | 2 | c,a |
| | **SØRFJORD** | | | | | | | | | | | | | | |
| * 51A | Byrkjeneset | P | . | 3 | . | . | . | . | . | . | . | . | . | . | |
| 52A | Eirtrheimsneset | P | + | 3 | . | . | . | . | . | . | . | . | . | . | c |

**Appendix L1 (cont'd)**

| | st. | STATION | INDEX | | + | A | B | C | D | E | F | G | H | I | J | K | CM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ---------------- ANALYSIS CODE | | | | | | | | | | | | |
| | | **BYFJORDEN, BERGEN** | | | | | | | | | | | | | | | |
| | I242 | Valheimsneset | P | . . . . | . | . | . | . | . | . | . | 3 | . | . | . | . | |
| | I241 | Nordnes | P | . . . . | . | . | . | . | . | . | . | 3 | . | . | . | . | |
| | I243 | Hagreneset | P | . . . . | . | . | . | . | . | . | . | 3 | . | . | . | . | |
| | | **SUNNDALSFJORD** | | | | | | | | | | | | | | | |
| | I912 | Honnhammer | P | . . . . | . | . | . | . | . | . | . | . | 3 | . | . | . | |
| | I913 | Fjøseid | P | . . . . | . | . | . | . | . | . | . | . | 3 | . | . | . | |
| | I914 | Flåøya, southeast | P | . . . . | . | . | . | . | . | . | . | . | 3 | . | . | . | |
| | I915 | Flåøya, northwest | P | . . . . | . | . | . | . | . | . | . | . | 3 | . | . | . | |
| | | **[TRONDHEIM AREA - not related to index investigation]** | | | | | | | | | | | | | | | |
| * | 80A | Østmarknes | - | . . . . | . | . | . | . | . | . | . | . | . | 3 | . | . | |
| | | **ORKDALSFJORD AREA (not suggested in Walday *et al.* 1995)** | | | | | | | | | | | | | | | |
| | 82A | Flakk | P | . . . . | + | 3 | . | . | . | . | . | . | . | . | . | . | |
| | 84A | Trossavika | P | . . . . | + | 3 | . | . | . | . | . | . | . | . | . | . | |
| | 87A | Ingdalsbukta | P | . . . . | + | 3 | . | . | . | . | . | . | . | . | . | . | |
| | | **INNER RANFJORD** | | | | | | | | | | | | | | | |
| | I962 | Koksverkkaien (B2) | P | . . . . | . | . | . | . | . | . | . | . | . | 3 | . | . | c |
| | I964 | Toraneskaien | P | . . . . | . | . | . | . | . | . | . | . | . | 3 | . | . | |
| | I965 | Moholmen (B5) | P | . . . . | . | . | . | . | . | . | . | . | . | 3 | . | . | |
| | I969 | Bjørnbærviken (B9) | P | . . . . | . | . | . | . | . | . | . | . | . | 3 | . | . | |
| | | **OUTER RANFJORD, HELGELAND AREA** | | | | | | | | | | | | | | | |
| * | R096 | Breivika, Tomma | R | . . . . | . | 3 | . | . | . | . | . | . | . | . | . | . | a |
| | 96A | Breivika, Tomma | R | . . . . | . | 3 | . | . | . | . | . | . | . | . | . | . | a |
| | | **LOFOTEN AREA** | | | | | | | | | | | | | | | |
| | 98A | Husvågen | R | . . . . | + | 3 | . | . | . | . | . | . | . | . | . | 2 | e |
| | | **FINNSNES-SKJERVØY AREA** | | | | | | | | | | | | | | | |
| | 41A | Fensneset, Grytøya | R | . . . . | . | 3 | . | . | . | . | . | . | . | . | . | . | c |
| | | **HAMMERFEST-HONNINGSVÅG AREA** | | | | | | | | | | | | | | | |
| | 44A | Elenheimsundet | R | . . . . | . | 3 | . | . | . | . | . | . | . | . | . | . | a,f |
| | 46A | Smineset in Altesula | R | . . . . | . | 3 | . | . | . | . | . | . | . | . | . | . | c,f |
| | | **VARANGER PENINSULA AREA** | | | | | | | | | | | | | | | |
| | 48A | Trollfjorden i Tanafjord | R | . . . . | . | 3 | . | . | . | . | . | . | . | . | . | . | |
| | 10A1 | Skagoodden | R | . . . . | + | 3 | . | . | . | . | . | . | . | . | . | . | b |
| | 11X | Brashavn | R | . . . . | + | 3 | . | . | . | . | . | . | . | . | . | 2 | |

* - CEMP station but not sampled in accordance to CEMP guidelines, see Appendix text.
** - Sufficient mussel-sample not found in 1996.

Notes (CM):
- a - blue mussel collected from buoy and/or buoy anchor lines
- b - blue mussel collected from sand/gravel bottom
- c - blue mussel collected from iron/cement pilings
- d - blue mussel collected from metal navigation buoys
- e - blue mussel collected from floating dock
- f - blue mussel collected from wooden docks
- g - blue mussel collected from tire on jetty

# Appendix L2
# INDEX - Key to analysis codes and sample counts
(Used in Appendix L1)

**ANALYSIS CODES**[1)] See Walday *et al.* (1995) for discussion of selection of analyses.

| | Analysis code | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Contaminant** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** |
| Lead . . . . . . | x | x | . | . | . | x | . | . | x | . | . |
| Cadmium . . . . . . | x | x | x | . | . | x | . | . | x | . | . |
| Copper [2]) . . . . . . | x | x | x | . | . | . | . | . | . | . | . |
| Mercury . . . . . . | x | x | x | . | . | . | . | . | . | . | . |
| Zinc [2]) . . . . . . | x | x | x | . | . | . | x | . | x | . | . |
| EPOCl . . . . . . | . | . | . | . | x | . | . | . | . | . | . |
| PAHs . . . . . . | . | . | x | . | x | x | . | x | x | . | . |
| PCBs . . . . . . | x | . | x | x | x | . | x | . | . | . | . |
| "Dioxin" [3]) . . . . . . | . | . | . | . | . | . | . | . | . | x | . |
| TBT [4]) . . . . . . | . | . | . | . | . | . | . | . | . | . | x |

[1] ) Concerns MUSSEL - 1 size group (3-5 cm), 3 replicate samples each a bulk of 20 individuals (see text)
[2] ) Concerns MUSSEL - discontinued since 1996
[3] ) Concerns MUSSEL - discontinued since 1995, but reinstated 2002 for st.30A, 71A, I711, I712, I713, 76A, I132 and I133
[4] ) Concerns MUSSEL – not included in Walday *et al.* (1995).

# Appendix L3
# INDEX - Klif Environmental quality classes

(Molvær *et al.* 1997)

| | |
|---|---|
| **As** | Arsenic |
| **Pb** | Lead |
| **F** | Fluoride |
| **Cd** | Cadmium |
| **Cu** | Copper |
| **Cr** | Chromium |
| **Hg** | Mercury |
| **Ni** | Nickel |
| **Zn** | Zinc |
| **Ag** | Silver |
| **TBT** | Tributyltin |
| **PAH_S** | total PAH excluding dicyclic (=PAH_Σ)* |
| **BAP** | benzo[*a*]pyrene |
| **DDTSS** | DDTPP+DDEPP+TDEPP (=DDTΣΣ)* |
| **HCB** | hexachlorobenzene |
| **HCHSS** | HCHG+HCHA+HCHB (=HCHΣΣ)* |
| **CBSSe** | sum of CB: 28+52+101+118+138+153+180 * |
| **TCDDN** | Sum of TCDD-toxicity equivalents * |

* ) See also **Appendix C** for definitions.

Basis: D = dry weight, W = wet weight
Units: M = ppm (mg/kg), U = ppb (µg/kg), P = ppp (ng/kg)

## Klif's Environmental quality classes for blue mussel (Molvær *et al.* 1997).

| Contaminant | basis | unit | Class I | Class II | Class III | Class IV | Class V |
|---|---|---|---|---|---|---|---|
| As | D | M | <10 | 10-30 | 30-100 | 100-200 | >200 |
| Pb | D | M | <3 | 3-15 | 15-40 | 40-100 | >100 |
| F | D | M | <15 | 15-50 | 50-150 | 150-300 | >300 |
| Cd | D | M | <2 | 2-5 | 5-20 | 20-40 | >40 |
| Cu | D | M | <10 | 10-30 | 30-100 | 100-200 | >200 |
| Cr | D | M | <3 | 3-10 | 10-30 | 30-60 | >60 |
| Hg | D | M | <0.2 | 0.2-0.5 | 0.5-1.5 | 1.5-4 | >4 |
| Ni | D | M | <5 | 5-20 | 20-50 | 50-100 | >100 |
| Zn | D | M | <200 | 200-400 | 400-1000 | 1000-2500 | >2500 |
| Ag | D | M | <0.3 | 0.3-1 | 1-2 | 2-5 | >5 |
| TBT | D | M | <0.1 | 0.1-0.5 | 0.5-2 | 2-5 | >5 |
| PAH_S | W | U | <50 | 50-200 | 200-2000 | 2000-5000 | >5000 |
| BAP | W | U | <1 | 1-3 | 3-10 | 10-30 | >30 |
| DDTSS | W | U | <2 | 2-5 | 5-10 | 10-30 | >30 |
| HCB | W | U | <0.1 | 0.1-0.3 | 0.3-1 | 1-5 | >5 |
| HCHSS | W | U | <1 | 1-3 | 3-10 | 10-30 | >30 |
| CBSSe | W | U | <4 | 4-15 | 15-40 | 40-100 | >100 |
| TCDDN | W | P | <0.2 | 0.2-0.5 | 0.5-1.5 | 1.5-3 | >3 |

# Appendix L4
# INDEX - Summary table "Pollution index" 2008-2009

## Pollution index 2008-new (with supplementary analyses and stations)

Max(median). Statistics for all areas: (n = Index-station measured, N = Station programmed for index, "i" = not investigated)

### Average of Max E.C is 3.0

| Index area name (Pollution area) 2008 | n | N | Pb ppm d.wt | F ppm d.wt | Cd ppm d.wt | Cu ppm d.wt | Cr ppm d.wt | Hg ppm d.wt | Ni ppm d.wt | Zn ppm d.wt | Ag ppm d.wt | PAH_S ppb w.wt | BAP ppb w.wt | DDTSS ppb w.wt | HCB ppb w.wt | HCHSS ppb w.wt | CBSSe ppb w.wt | TCDDN ppp w.wt | TBT ppm d.wt | Max E.C I:V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hvaler/Singlefjorden | 3 | 4 | 1.55 | i | 2.37 | i | i | 0.26 | i | i | i | i | i | <0.33 | 0.07 | <0.05 | <1.00 | i | i | II |
| Iddefjord | 0 | 2 | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | miss |
| Inner Oslofjord | 5 | 5 | i | i | 1.79 | i | i | 0.11 | i | i | i | <10.20 | 1.8 | 2.49 | 0.19 | <0.05 | 15.57 | <0.08 | 0.56 | III |
| Frierfjorden | 3 | 4 | i | i | i | i | i | i | i | i | i | i | i | 1.49 | 0.36 | <0.10 | <2.65 | 5.76 | 0.2 | V |
| Inner Kristiansandsfjord | 2 | 3 | i | i | i | i | i | i | i | i | i | <466.00 | 16 | <0.30 | 0.56 | <0.15 | <0.95 | <0.61 | 0.25 | IV |
| Saudafjord | 2 | 2 | 7.29 | i | 2.41 | i | i | i | i | i | i | <16.07 | 0.8 | i | i | i | i | i | i | II |
| Sørfjord | 2 | 2 | 23.43 | i | 2.84 | i | i | 0.26 | i | i | i | i | i | 3.56 | 0.07 | <0.21 | <1.59 | i | i | III |
| Byfjorden | 3 | 3 | i | i | i | i | i | i | i | i | i | i | i | 2.91 | 0.11 | <0.05 | 8.8 | i | i | II |
| Sunndalsfjord | 3 | 4 | i | i | i | i | i | i | i | i | i | <21.23 | 1.8 | i | i | i | i | i | i | II |
| Orkdalsfjord area | 0 | 3 | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | miss |
| Inner Ranfjord | 3 | 4 | 24.57 | i | 2.8 | i | i | i | i | i | i | <215.50 | 16 | i | i | i | i | i | i | IV |

## Pollution index 2009-new (with supplementary analyses and stations)

Max(median). Statistics for all areas: (n = Index-station measured, N = Station programmed for index, ”i” = not investigated)

### Average of Max E.C is 2.8

| Index area name (Pollution area) 2009 | n | N | Pb ppm d.wt | F ppm d.wt | Cd ppm d.wt | Cu ppm d.wt | Cr ppm d.wt | Hg ppm d.wt | Ni ppm d.wt | Zn ppm d.wt | Ag ppm d.wt | PAH_S ppb w.wt | BAP ppb w.wt | DDTSS ppb w.wt | HCB ppb w.wt | HCHSS ppb w.wt | CBSSe ppb w.wt | TCDDN ppp w.wt | TBT ppm d.wt | Max E.C I:V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hvaler/Singlefjorden | 3 | 4 | 1.5 | i | 1.91 | i | i | 0.28 | i | i | i | i | i | <0.62 | <0.05 | <0.10 | <1.40 | i | i | II |
| Iddefjord | 0 | 2 | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | miss |
| Inner Oslofjord | 5 | 5 | i | i | 1.23 | i | i | 0.08 | i | i | i | <46.26 | 0.54 | 1.53 | 0.08 | <0.10 | 6.9 | <0.11 | 0.36 | II |
| Frierfjorden | 3 | 4 | i | i | i | i | i | i | i | i | i | i | i | <0.58 | 0.34 | <0.05 | 2.04 | 5.97 | 0.15 | V |
| Inner Kristiansandsfjord | 2 | 3 | i | i | i | i | i | i | i | i | i | <191.00 | 13 | <0.58 | 0.2 | <0.05 | 3.81 | <0.64 | 0.21 | IV |
| Saudafjord | 2 | 2 | 2.8 | i | 1.14 | i | i | i | i | i | i | <22.83 | 0.83 | i | i | i | i | i | i | I |
| Sørfjord | 2 | 2 | 21.21 | i | 2.29 | i | i | 0.26 | i | i | i | i | i | 2.94 | 0.07 | <0.10 | <1.34 | i | i | III |
| Byfjorden | 3 | 3 | i | i | i | i | i | i | i | i | i | i | i | 1.79 | <0.10 | <0.05 | 8.31 | i | i | II |
| Sunndalsfjord | 3 | 4 | i | i | i | i | i | i | i | i | i | <16.84 | 0.71 | i | i | i | i | i | i | I |
| Orkdalsfjord area | 0 | 3 | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | miss |
| Inner Ranfjord | 3 | 4 | 18.38 | i | 1.74 | i | i | i | i | i | i | <363.50 | 41 | i | i | i | i | i | i | V |

# Appendix L5
# INDEX - Summary table “Reference Index”
# 2008-2009

**Reference index 2008-new (with supplementary analyses and stations)**

Max(median). Statistics for all areas: (n = Index-station measured, N = Station programmed for index, "i" = not investigated)

**Average of Max E.C is 1.6**

| Index area name (Reference area) 2008 | n | N | Pb ppm d.wt | F ppm d.wt | Cd ppm d.wt | Cu ppm d.wt | Cr ppm d.wt | Hg ppm d.wt | Ni ppm d.wt | Zn ppm d.wt | Ag ppm d.wt | PAH_S ppb w.wt | BAP ppb w.wt | DDTSS ppb w.wt | HCB ppb w.wt | HCHSS ppb w.wt | CBSSe ppb w.wt | TCDDN ppp w.wt | TBT ppm d.wt | Max E.C I:V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mid and outer Oslofjord | 2 | 3 | 1.11 | i | 1.21 | i | 1.58 | 0.09 | 0.89 | i | 0.04 | i | 0.96 | <1.11 | 0.06 | <0.05 | <1.82 | i | 0.1 | II |
| Lista area | 1 | 3 | 0.55 | i | 1 | i | i | 0.07 | i | i | i | i | <0.50 | 0.58 | 0.09 | <0.05 | <1.80 | i | 0.01 | I |
| Bømlo-Sotra area | 2 | 1 | 2.29 | i | 1.02 | i | 0.71 | 0.12 | 1.06 | i | 0.02 | i | i | <0.53 | <0.03 | <0.05 | <1.45 | i | 0.1 | II |
| Outer Ranfjord, Helgeland area | 0 | 2 | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | I |
| Lofoten area | 1 | 3 | 0.71 | i | 1.42 | i | 0.71 | 0.08 | 0.76 | i | 0.05 | i | i | <0.27 | <0.03 | <0.05 | <0.05 | i | 0.02 | I |
| Finnsnes- Skjervøy area | 0 | 1 | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | I |
| Hammerfest-Honningsvåg area | 0 | 2 | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | I |
| Varanger peninsula area | 2 | 5 | 1.06 | i | 2.07 | i | 2.76 | 0.04 | 1.88 | i | 0.11 | i | i | <0.27 | <0.03 | <0.05 | <0.22 | i | i | II |

## Reference index 2009-new (with supplementary analyses and stations)

Max(median). Statistics for all areas: (n = Index-station measured, N = Station programmed for index, "i" = not investigated)

### Average of Max E.C is 1.2

| Index area name (Reference area) 2009 | n | N | Pb ppm d.wt | F ppm d.wt | Cd ppm d.wt | Cu ppm d.wt | Cr ppm d.wt | Hg ppm d.wt | Ni ppm d.wt | Zn ppm d.wt | Ag ppm d.wt | PAH_S ppb w.wt | BAP ppb w.wt | DDTSS ppb w.wt | HCB ppb w.wt | HCHSS ppb w.wt | CBSSe ppb w.wt | TCDDN ppp w.wt | TBT ppm d.wt | Max E.C I:V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mid and outer Oslofjord | 2 | 3 | 1 | i | 1.2 | i | 1.5 | 0.09 | 1.67 | i | 0.1 | <6.67 | <0.50 | 1.1 | <0.15 | <0.05 | <1.89 | <0.04 | 0.03 | II |
| Lista area | 2 | 3 | 2 | i | 1.5 | i | 0.5 | 0.12 | 1.69 | i | 0.1 | <4.72 | <0.50 | <0.55 | <0.10 | <0.05 | <1.11 | i | 0.01 | I |
| Bømlo-Sotra area | 1 | 1 | 1 | i | 0.9 | i | 0.6 | 0.06 | 1 | i | <0.02 | i | i | <1.02 | 0.04 | <0.05 | <1.06 | i | 0.06 | I |
| Outer Ranfjord, Helgeland area | 0 | 2 | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | I |
| Lofoten area | 1 | 3 | 1 | i | 1.2 | i | 1.1 | 0.07 | 1.19 | i | 0 | i | i | <0.31 | 0.07 | <0.05 | <0.58 | i | 0.02 | I |
| Finnsnes- Skjervøy area | 0 | 1 | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | I |
| Hammerfest-Honningsvåg area | 0 | 2 | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | i | I |
| Varanger peninsula area | 1 | 5 | 1 | i | 1.6 | i | 1 | 0.04 | 1.29 | i | 0.1 | i | i | <0.26 | 0.06 | <0.05 | <0.35 | i | i | I |

**Long-term monitoring of environmental quality in Norwegian coastal waters**

**Coordinated Environmental Monitoring Programme (CEMP)**

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Hazardous substances in fjords and coastal waters-2009. Levels, trends and effects.
Long-term monitoring of environmental quality in Norwegian coastal waters.

Summary

This report is part of the Norwegian contribution to OSPAR's Coordinated Environmental Monitoring Programme (CEMP). CEMP 2009 included the monitoring of contaminants in blue mussel, dogwhelk, cod, and flatfish along the coast of Norway from the Oslofjord to the Varangerfjord. Time trend analyses were performed on a selection of representative contaminants of totalled 859 data series. Of the 538 time series evaluated for the 2009 investigations, 211 were statistically significant trends, 189 of these were downward trends and 22 were upwards. There were 186 of the 538 cases where concentrations in 2009 exceeded the upper limit to presumed background or the upper limit to Class I (insignificantly polluted). The dominance of downward trends indicates that contamination is decreasing.

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Statlig program for forurensningsovervåking omfatter overvåking av forurensningsforholdene i luft og nedbør, skog, vassdrag, fjorder og havområder.
Overvåkingsprogrammet dekker langsiktige undersøkelser av:

- overgjødsling
- forsuring (sur nedbør)
- ozon (ved bakken og i stratosfæren)
- klimagasser
- miljøgifter

Overvåkingsprogrammmet skal gi informasjon om tilstanden og utviklingen av forurensningssituasjonen, og påvise eventuell uheldig utvikling på et tidlig tidspunkt. Programmet skal dekke myndighetenes informasjonsbehov om forurensningsforholdene, registrere virkningen av iverksatte tiltak for å redusere forurensningen, og danne grunnlag for vurdering av nye tiltak. Klif er ansvarlig for gjennomføringen av overvåkningsprogrammet.

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