Statlig program for forurensningsovervåking

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

Joint Assessment and Monitoring Programme (JAMP).

CONTAMINANT AND EFFECTS DATA FOR SEDIMENTS, SHELLFISH AND FISH 1981-2006

1015

2015

NIVA
Norwegian Institute for Water Research

Long-term monitoring of environmental quality in Norwegian coastal waters

Joint Assessment and Monitoring Programme (JAMP)

SPFO-report: 1015/2008
TA-2369/2008
ISBN 978-82-577-5297-2

Client: Norwegian Pollution Control Authority (SFT)
Contractor: Norwegian Institute for Water Research (NIVA)

: Contaminant and effects data for sediments, shellfish and fish 1981-2006

Report 1015/2008

Authors:
Ling Shi, Norman Green, Åse Kristine Rogne

NIVA report no. 5562-2008

O-80106, O-25106, O-26106, O-27106

JOINT ASSESSMENT AND MONITORING PROGRAMME (JAMP)

CONTAMINANT and EFFECTS DATA FOR SEDIMENTS, SHELLFISH and FISH 1981-2006

Foreword

This report presents the Norwegian data for contaminants in sediment and organisms, as well as the results from biological effects methods compiled for the Joint Assessment and Monitoring Programme (JAMP). JAMP is administered by the Oslo and Paris Commissions (OSPAR) and their Environmental Assessment and Monitoring Committee (ASMO). JAMP receives guidance from the International Council for the Exploration of the Sea (ICES). ASMO has delegated implementation of part of the programme to the Working Group on Concentrations, Trends and Effects of Substances in the Marine Environment (SIME). The Norwegian 2006 investigations are directed to particular JAMP issues relating to contaminants and implemented by SIME. JAMP replaced Joint Monitoring Programme (JMP) in 1995 and has been an integral part of OSPAR's Coordinated Environmental Monitoring Programme (CEMP) since 1998.

The Norwegian JAMP was carried out by the Norwegian Institute for Water Research (NIVA) by contract from the Norwegian Pollution Control Authority (SFT, NIVA contract 80106, 25106, 26106, and 27106).

The Norwegian contribution to the JAMP was initiated by SFT in 1981 as part of the national monitoring programme. Three main areas have been investigated: the Oslofjord and adjacent areas (Hvaler-Singlefjord area and Langesundsfjord, 1981-), Sørfjord/Hardangerfjord (1983-84, 1987-) and Orkdalsfjord area (1984-89, 1991-93, 1995-96, 2004-05).

Since the North Sea Task Force Monitoring Master Plan was implemented in 1990, additional areas have also been monitored. These include: Arendal, Lista and Bømlo-Sotra areas. On the initiative of SFT and NIVA "reference" or merely diffusely contaminated areas from Bergen to Lofoten have been monitored since 1992 and from Lofoten to the Norwegian-Russian border from 1994.

***Reader's guide**. Due to the size of this report (approximately 2000 pp.) it is impractical to produce as a hard copy in it's entirety. Following the SIME meeting in Edinburgh, 11-13 February, 2008, the full report in PDF-format can be downloaded from either of two websites: the SFT's website and using SFT's TA-number at http://www.sft.no/publikasjonerforside 10990.aspx or from NIVA's website at http://www.niva.no/symfoni/infoportal/portenglish.nsf and doing a search on the "løpenr", which is the NIVA-report number for this report.*

Thanks are due to my colleagues at NIVA, and the following institutes that have contributed to JAMP since its start in 1981:

Eurofins [DK]
Institute for Nutrition, Fisheries Directorate
FORCE Institutes, Div. for Isotope Technique and Analysis [DK]
GALAB Laboratories Gmbh [D]
Institute for Energy Technology
Institute of Marine Research (IMR)
Nordic Analytical Center
Norwegian Institute for Air Research
Swedish Environmental Research Institute
Fondation for Scientific and Industrial Research at the Norwegian Institute of Technology - SINTEF (a division, previously: Center for Industrial Research SI)
Norwegian Veterinary Institute
Water Quality Institute [DK]

Oslo, 22 May 2008

Norman W. Green
Project manager

Contents

NB: Full content of Appendices E-L are located via links identified under each appendix

1. Background and aims

The Oslo and Paris commissions were established in the seventies with the aim to protect the marine environment against anthropogenic contamination. The Oslo commission focuses on problems relating to dumping at sea in the Northeast Atlantic and Baltic areas. The Paris commission focuses on discharges from land based sources. Together, the commission (Oslo and Paris Commission - OSPAR), govern the "Joint Assessment and Monitoring Programme" (JAMP). JAMP commenced in 1995 as a continuation of the "Joint Monitoring Programme" (JMP). Since 1998, parts of JAMP have formed and integral part of OSPAR's Coordinated Environmental Monitoring Programme (CEMP). JAMP receives guidance from the "International Council for the Exploration of the Sea" (ICES). Norway and other European countries, which are members of OSPAR have committed themselves to protection of the marine environment of the North East Atlantic for preventing and eliminating pollution, protecting human health and ensuring sound and healthy marine ecosystems (OSPAR 1998).

The Norwegian contribution to JAMP focuses on two JAMP areas: Oslofjord-area (including the Hvaler area, Singlefjord and Langesundsfjord) and the Sørfjord/Hardangerfjord area. Orkdalsfjord, a third JAMP area, has only been investigated once since 1996. During 1990-95 Norway has also included other areas, mostly remote from point sources of pollution, along the coast from the Swedish border in the South to the Russian border in the North. This was in connection with the Norwegian contribution to the investigation of the North Sea (*North Sea Task Force* (NSTF) *Monitoring Master Plan* (MMP)) in 1990 when JAMP expanded to cover the area from Oslofjorden og Bergen. The programme has since also included areas farther north. In 1992 and 1994 contaminants in marine sediments were investigated from Bergen to Varangerfjorden.

An overview of the analytical methods (1981-2007) has been presented (Green *et al.* 2008b). The results 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 1989; 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), and 2006 (Green, *et al*., 2008a). The results have been incorporated in European JMG regional assessments of sediment (JMG 1993) and biota (ICES 1988, JMG 1992) and temporal trends in biota (ICES 1989; 1991; ASMO 1994, OSPAR 2005). An overview of the analytical methods (1981-2000) has been presented (Green 1993b; Green *et al.* 2001b). The raw data has been presented for sediment 1986-1997 (Green & Klungsøyr 1994; Green & Rønningen 1995, Green *et al.* 2002b), biota 1981-1992 (Green & Rønningen 1994), 1993-1997 (Green & Severinsen 1999a, b), 1998-2001 (Green *et al.* 2002c, d) and summary statistics 1981-2001 (Green *et al.* 2002e). The results for 1981-1992 have been assessed by Green *et al.* (1995). The results for 1981-1999 have been assessed by Green *et al.* (2001c). An evaluation of "background" levels of contaminants in biota based on JMP data has been done by Knutzen & Green (1995, 2001) and Green & Knutzen (2003). Application of pollution and reference indicies using the blue mussel and coordinated with JAMP has also been assessed (Green & Knutzen 2001). Results from biological effects methods 1997-2001 have been assessed as well (Ruus *et al.* 2003). The results have also been incorporated in OSPAR assessments (e.g. OSPAR 2005.).

2. Sampling

The JAMP stations monitored 1981-2006 by Norway are spread from the Swedish border to Varangerfjorden (Appendix D. , Appendix C. and Appendix D.).

The sampling of biota follows as closely as possible the OSPAR guidelines (1997, see also www.ospar.org/eng/ > *measures* > *list of other agreements*). These have replaced relevant portions of earlier guidelines (ICES 1986, 1992 including revisions up to 1999).

The results presented are for the total fraction of the **sediment** (<2000µm) and are not normalised because agreement on this issue within OSPAR has not been reached.

For historical reasons three sizes of **mussels** (*Mytilus edulis*) have been sampled from most of the stations. The size classes were: 2-3, 3-4 and 4-5cm. In 1992 a stricter ICES approach was applied for new stations (north of the Bømlo area). For these stations 3 pooled samples of 20 individuals each are collected (ICES 1992) in the size range of 3-4 or 4-5 cm. These samples were depurated. Samples collected for SFT pollution index (station codes prefixed with "I") were not.

Cod (*Gadus morhua)* and one flatfish species are sampled; 25 individuals of each species. If possible, the same species collected in previous years at the selected stations are to be collected in 1999. The order of preference for flatfish species is: **dab** (*Limanda limanda*), **flounder** (*Platichthys flesus*), **plaice** (*Pleuronectes platessa*) and **lemon sole** (*Microstomus kitt*). If possible, the fish samples are sampled with five individuals within each of the five length classes roughly geometrically distributed, viz.:

size-class	cod	flatfish
1	370-420mm	300-320mm
2	420-475mm	320-340mm
3	475-540mm	340-365mm
4	540-615mm	365-390mm
5	615-700mm	390-420mm

3. Analyses

OSPAR agreed that the concentration of at least cadmium, mercury, lead and polychlorinated hydrocarbons should be monitored in sediment (OSPAR 2007). The Norwegian JAMP has included many other contaminants as well, many of which are relevant to the CEMP. A complete list of variables and abbreviations is given in Appendix A.

An overview of the contaminants and associated analytical method codes, as well as a brief description of the analytical methods is given by Shi *et al.* (2007a). Nearly all the metal analyses and most of the organic analyses were performed at the Norwegian Institute for Water Research (NIVA), however the following institutes have contributed with analyses:

Eurofins [DK]
Institute for Nutrition, Fisheries Directorate
FORCE Institutes, Div. for Isotope Technique and Analysis [DK]
GALAB Laboratories Gmbh [D]
Institute for Energy Technology
Institute of Marine Research (IMR)
Nordic Analytical Center
Norwegian Institute for Air Research
Swedish Environmental Research Institute
Fondation for Scientific and Industrial Research at the Norwegian Institute of Technology - SINTEF (a division, previously: Center for Industrial Research SI)
Norwegian Veterinary Institute
Water Quality Institute [DK]

The analytical laboratories involved for each analyses are noted in the "Raw data" tables of the appendices, i.e. Appendix E. (sediment), Appendix G. (shellfish), Appendix H. (fish), and Appendix I. (biological effects methods).

The **mussels** are analysed for all contaminants. The shell length of each mussel is measured. On a bulk basis the total shell weight, total soft tissue weight, dry weight and %

For **fish,** two types of tissue are analysed. The fish fillet is analysed for mercury and PCB content and the liver for all mentioned contaminants except mercury. In addition, the age, sex and pathological state for each individual is 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.

The results of the analyses are presented in Appendix E. to Appendix L.

4. Comment on quality assurance and detection limit

Analytical labs have been routinely involved in international and national intercalibration exercises for quality assurance (QA), including QUASIMEME since 1994 (cf. Green *et al.*2008a). In addition the laboratories have (more regularly in recent years) analysed standard reference material in connection with analyses of the samples used in monitoring. The results of intercalibration exercises and analyses of the standard reference material are discussed in part in the annual National Comments (cf. Green *et al.*2008a).

The detection limits are approximations based on 3 times the standard deviation of the 'blank' or near zero concentration of a solution. Day-to-day variations in the analytical instrument may lead to minor variation in detection limits.

5. Comment on presentation of results

An overview of the samples collected is shown in Appendix B. and Appendix E. . Special attention should be paid to notes and comments preceeding each set of tables in the Appendices.

The data is stored in MS ACCESS 2003. The tables are generated using MS ACCESS 2003 and MS EXCEL 2003.

6. References

Titles translated to English in square brackets [ ] are not official.

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

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.

ASMO, 1994. Draft assessment of temporal trends monitoring data for 1983-91: Trace metals and organic contaminants in biota. Environmental Assessment and Monitoring Committee (ASMO). Document ASMO(2) 94/6/1.

Berg, V. Polder, A., Skaare, J.U., 1998. Organochlorines in deep-sea fish from the Nordfjord. Chemosphere 38: 275-282.

Enger, B., Frøslie, A., Kirkerud, L., Knutzen, J., Madsen, L., Martinsen, K., Norheim, G., 1984. Overvåking av PCB, kvikksølv og kadmium i sjøvannsmiljø. Oslofjordområdet 1981-82. [Investigations of PCB, mercury and cadmium in the marine environment. Oslofjord area 1981-82.] Norwegian Pollution Control Authority, Monitoring report no. 119/84. Norwegian Institute for Water Research project 80106, report number 1583, 24 pp.. ISBN number 82-577-0736-8.

Enger, B., Håstein, T., Kirkerud, L., Martinsen, K., Norheim, G., 1985. Overvåking av PCB, kvikksølv og kadmium i sjøvannsmiljø. Oslofjordområdet 1982-83. SFT overvåkingsrapport nr. 183/85. NIVA O-80106 (løpenummer 1717), 24 sider. [Investigations of PCB, mercury and cadmium in the marine environment. Oslofjord area 1982-83.] Norwegian Pollution Control Authority, Monitoring report no. 183/85. Norwegian Institute for Water Research project 80106, report number 1717, 24 pp.. ISBN number 82-577-0905-0.

Fjeld, E., Schlabach, M., Berge J.A., Eggen, T., Snilsberg, P., Källberg, G., Rognerud, S., Enge, E.K., Borgen, A., Gundersen, H., 2004. Screening of selected new organic contaminants—brominated flame retardants, chlorinated parafins, bisphenol-A and triclosan. Norwegian Pollution Control Authority, Monitoring report no. 895/2004. Norwegian Institute for Water Research project 23338, report number 4809-2004, 115pp. ISBN number 82-577-4488-3.

Green, N.W., 1987. Joint Monitoring Programme (JMP). National comments to the Norwegian data for 1986. NIVA-project 80106, report 30.8.87, 40 pp.. (Also in documents MON 6/3/1-E and MON 6/3/1 Corr.1-E of the sixth meeting of JMG's Ad Hoc Working Group on Monitoring (MON).)

Green, N.W., 1988. Felles europeisk overvåkingsprogram (JMP) i Norge. Overvåking av miljøgifter i sjøvannsmiljø. Oslofjord- området, Sørfjorden, Hardangerfjorden og Orkdalsfjord- området 1984-1985. NIVA project 80106, report number 2139. 76 pp..

Green, N.W., 1989b. Joint Monitoring Programme (JMP). National Comments to the Norwegian Data for 1988. NIVA project 80106, report 27.10.89. 32pp.. (Also as document JMG 15/3/8-E.)

Green, N.W., 1991a. Joint Monitoring Programme (JMP). National Comments to the Norwegian Data for 1989. NIVA project 80106, report 25.01.91. 27pp.. (Also as document JMG 16 info 13.)

Green, N.W., 1991b. "Joint Monitoring Group" (JMG) and "North Sea Task Force" (NSTF) subproject. Joint Monitoring Programme in Norway. Oslofjord-area, Arendal, Lista, Sørfjorden, Hardangerfjorden, Bømlo-Sotra and Orkdalsfjorden. Programme proposal for 1991. NIVA project 80106, 24.06.1991. 21pp..

Green, N.W., 1992. Joint Monitoring Programme (JMP) and North Sea Task Force - Master Monitoring Plan (NSTF/MMP) (contaminants only) National comments to the Norwegian Data for 1990, with special emphasis on contaminants in biota. NIVA project 80106, report 18.01.92 65pp. (Also as document JMG 17/3/18.).

Green, N.W., 1993a. Joint Monitoring Programme (JMP) National comments to the Norwegian Data for 1991. NIVA project 80106, report 22.01.93 74. (Also as document JMG 18/3/8-E(L).).

Green, N.W., 1993b. Joint Monitoring Programme - JMP. Overview of analytical methods employed by JMP in Norway 1981-1992. Norwegian Institute for Water Research. Project O-80106 report number 2971, 41 pp.. ISBN number 82-577-2390-8.

Green, N.W., 1994. Joint Monitoring Programme (JMP) National comments to the Norwegian Data for 1992. NIVA project 80106, report 18.01.94 85s.. (Also as document JMG 19/7/4-E(L).).

Green, N.W., 1995a. Joint Monitoring Programme (JMP) National comments to the Norwegian Data for 1993. NIVA project 80106, report 5.01.95 123s.. (Also as document SIME 95/6/1).

Green, N.W., 1995b. Joint Monitoring Programme (JMP) National comments to the Norwegian Data for 1994. NIVA project 80106, report 25.12.95 109.. (Also as document SIME 96/19/1).

Green, N.W., 1997a. Joint Assessment and Monitoring Programme (JAMP) National Comments to the Norwegian Data for 1995. Norwegian Pollution Control Authority, Monitoring report no. 685/97 TA no. 1405/1997. Norwegian Institute for Water Research project 80106, report number 3597-97, 124 pp.. ISBN number 82-577-3152-8. (Also as document SIME 97/5/5).

Green, N.W., 1997b. Joint Assessment and Monitoring Programme (JAMP) National Comments to the Norwegian Data for 1996. Norwegian Pollution Control Authority, Monitoring report no. 716/97 TA no. 1489/1997. Norwegian Institute for Water Research project 80106, report number 3730-97, 129 pp.. ISBN number 82-577-3299-0. (Also as document SIME (2) 97/3/16 Add.1).

Green, N.W., Klungsøyr, J., 1994. Norwegian 1990 sediment data for the North Sea Task Force (NSTF) and the Joint Monitoring Group (JMG). A joint report by Norwegian Institute for Water Research (NIVA) and Institute of Marine Research (IMR). NIVA project O-80106 (report number 3110), 17 pp + Annexes. ISBN-82-577-2585-4

Green, N.W., Knutzen, J., 1994. Miljøgiftsundersøkelse i indre Oslofjord. Delrapport nr. 2. Miljøgifter i organismer 1992 [Contaminants in the inner Oslofjord. Sub-report no.2. Contaminants in organisms 1992]. Norwegian Pollution Control Authority, Monitoring report no. 541/93 TA no. 1002/1994. Norwegian Institute for Water Research project 921315, report number 2972, 54 pp.. ISBN number 82-577-2401-7.

Green, N.W., Knutzen, J., 2001. Joint Assessment and Monitoring Programme (JAMP). Forurensnings- og referanseindeks basert på observasjoner av miljøgifter i blåskjell fra utvalgte områder 1995-1999.[Joint Assessment and Monitoring Programme (JAMP). Pollution and reference indecies based on contaminants in blue mussels 1995-1999]. Norwegian Pollution Control Authority, Monitoring report no. 821/01 TA no. 1799/2001. NIVA project O-80106, (report number 4342-2001) 35 pp.. ISBN number 82-577-3977-4.

Green, N.W., Knutzen, J., 2003. Organohalogens and metals in marine fish and mussels and some relationships to biological variables at reference localities in Norway. Marine Pollution Bulletin 46(3):362-374.

Green, N.W., Rønningen, A., 1994. Contaminants in shellfish and fish. 1981-92. Joint Monitoring Programme (JMP) Norwegian biota data. Norwegian Pollution Control Authority, Monitoring report no. 585/94 TA no. 1156/1994. NIVA project O-80106/, (report number 3175), 351 pp.. ISBN number 82-577-2656-7.

Green, N.W., Rønningen, A., 1995. Contaminants in sediment 1986-92. The Joint Monitoring Programme (JMP) NIVA samples. Norwegian biota data. Norwegian Pollution Control Authority, Monitoring report no. 599/95 TA no. 1180/1995. NIVA project O-80106/, (report number 3192), 97 pp.. ISBN number 82-577-2679-6.

Green, N.W., Severinsen, G., 1999a. Joint Monitoring and Assessment Programme (JAMP). Contaminants in shellfish. 1993-1997. Norwegian biota data. Norwegian Pollution Control Authority, Monitoring report no. 775/99 TA no. 1667/1999. NIVA project O-80106, (report number 4083-99), 206 pp.. ISBN number 82-577-3689-9.

Green, N.W., Severinsen, G., 1999b. Joint Monitoring and Assessment Programme (JAMP). Contaminants in fish. 1993-1997. Norwegian biota data. Norwegian Pollution Control Authority, Monitoring report no. 776/99 TA no. 1668/1999. NIVA project O-80106, (report number 4084-99), 393 pp.. ISBN number 82-577-3690-2.

Green, N.W., Knutzen, J., Helland, A., Brevik, E.M., 1995. Overvåking av miljøgifter i sedimenter og organismer 1981-92. "Joint Monitoring Programme (JMP)". Statlig program for forurensningsovervåking rapport nr. 593/95 TA nr. 1172/1995 NIVA-rapport O-80106 (l.nr. 3184), 195 s. ISBN-82-577-2676-1.

Green, N.W., Berge, J.A, Helland, A., Hylland, K., Knutzen, J., Walday, M., 1999. Joint Assessment and Monitoring Programme (JAMP) National Comments regarding the Norwegian Data for 1997. Norwegian Pollution Control Authority, Monitoring report no. 752/99 TA no. 1611/1999. Norwegian Institute for Water Research project 80106, report number 3980-99, 129 pp.. ISBN number 82-577-3576-0. (Also presented as SIME document (1999)).

Green, N.W., Bjerkeng, B, Helland, A., Hylland, K., Knutzen, J., Walday, M., 2000. Joint Assessment and Monitoring Programme (JAMP) National Comments regarding the Norwegian Data for 1998 and supplementary investigations on cod (1996) and sediment (1996-1997). Norwegian Pollution Control Authority, Monitoring report no. 788/00 TA no. 1702/2000. Norwegian Institute for Water Research project 80106, report number 4171-2000, 206 pp.. ISBN number 82-577-3787-9. (Also presented as SIME 2000 document 00/3/6).

Green, N.W., Hylland, K., Walday, M., 2001a. Joint Assessment and Monitoring Programme (JAMP). National Comments regarding the Norwegian Data for 1999. Norwegian Pollution Control Authority, Monitoring report no. 812/01 TA no. 1780/2001. Norwegian Institute for Water Research project 80106, report number 4335-2001, 181 pp.. ISBN number 82-577-3969-3. (Also presented as SIME 2001 document 01/3/info. 4).

Green, N.W., Følsvik, N., Øredalen, T.J., Prestbakmo, G., 2001b. Joint Assessment and Monitoring Programme (JAMP). Overview of analytical methods 1981-2000. Norwegian Pollution Control Authority, Monitoring report no.822/01 TA no. 1800/2001. Norwegian Institute for Water Research project 80106, report number 4353-2001, 68 pp.. ISBN number 82-577-3989-8.

Green, N.W., Helland, A., Hylland, K., Knutzen, J., Walday, M., 2001c. Joint Assessment and Monitoring Programme (JAMP). Overvåking av miljøgifter i marine sedimenter og organismer 1981-1999 [Joint Assessment and Monitoring Programme (JAMP). Investigations in marine sediment and organisms 1981-1999. Norwegian Pollution Control Authority, Monitoring report no. 819/01 TA no. 1797/2001. NIVA project O-80106, (report number 4358) 191 pp.. ISBN number 82-577-3995-2.

Green, N.W., Hylland, K., Ruus, A., Walday, M., 2002a. Joint Assessment and Monitoring Programme (JAMP). National Comments regarding the Norwegian Data for 2000. Norwegian Pollution Control Authority, Monitoring report no. 842/02 TA no. 1854/2002. Norwegian Institute for Water Research project 80106, report number 4468-2002, 197 pp.. ISBN number 82-577-4115-9. (Also presented as SIME 2002 document 02/2/info. 2).

Green, N.W., Severinsen G., Rogne, Å.K., 2002b. Joint Assessment and Monitoring Programme (JAMP). Contaminant data for sediments 1986-1997. Norwegian Pollution Control Authority, Monitoring report no. 861/02 TA no. 1918/2002. Norwegian Institute for Water Research project 80106, report number 4599-2002, 230 pp.. ISBN number 82-577-4259-7.

Green, N.W., Severinsen G., Rogne, Å.K., 2002c. Joint Assessment and Monitoring Programme (JAMP). Contaminant data for shellfish 1998-2001. Norwegian Pollution Control Authority, Monitoring report no. 862/02 TA no. 1919/2002. Norwegian Institute for Water Research project 80106, report number 4600-2002, 269 pp.. ISBN number 82-577-4260-0.

Green, N.W., Severinsen G., Rogne, Å.K., 2002d. Joint Assessment and Monitoring Programme (JAMP). Contaminant data for fish 1998-2001. Norwegian Pollution Control Authority, Monitoring report no. 863/02 TA no. 1920/2002. Norwegian Institute for Water Research project 80106, report number 4601-2002, 336 pp.. ISBN number 82-577-4261-9.

Green, N.W., Severinsen G., Rogne, Å.K., 2002e. Joint Assessment and Monitoring Programme (JAMP). Summary statistics for contaminants in shellfish and fish 1981-2001. Norwegian Pollution Control Authority, Monitoring report no. 864/02 TA no. 1921/2002. Norwegian Institute for Water Research project 80106, report number 4602-2002, 422 pp.. ISBN number 82-577-4262-7.

Green, N.W., Hylland, K., Ruus, A., Walday, M., 2003. Joint Assessment and Monitoring Programme (JAMP). National Comments regarding the Norwegian Data for 2001. Norwegian Pollution Control Authority, Monitoring report no. 867/02 TA no. 1926/2002. Norwegian Institute for Water Research project 80106, report number 4618-2002, 217 pp.. ISBN number 82-577-4279-1.

Green, N.W., Hylland, K., Ruus, A., Walday, M., 2004a. Joint Assessment and Monitoring Programme (JAMP). National Comments regarding the Norwegian Data for 2002. Norwegian Pollution Control Authority, Monitoring report no. 894/2003 TA no. 2003/2003. Norwegian Institute for Water Research project 80106, report number 4778-2004, 223 pp.. ISBN number 82-577-4454-9. Also as Trends and Effects of Substances in the Marine Environment (SIME) London (Secretariat) 24-26 February 2004. SIME 04/02/info. 4 -E

Green, N.W., Ruus, A., Walday, M., 2004b. Joint Assessment and Monitoring Programme (JAMP). National Comments regarding the Norwegian Data for 2003. Norwegian Pollution Control Authority, Monitoring report no. 921/2004 TA no. 2072/2004. Norwegian Institute for Water Research project 80106, report number 4927-2004, 219 pp.. ISBN number 82-577-4618-5. Also as Trends and Effects of Substances in the Marine Environment (SIME) Vigo (Spain) 15-17 Mars 2005. SIME 05/02/info. 7 -E

Green, N.W., Ruus, A., Schøyen, M., Tveiten, L., Walday, M., 2005. Joint Assessment and Monitoring Programme (JAMP). National Comments regarding the Norwegian Data for 2004. Norwegian Pollution Control Authority, Monitoring report no. 944/2005 TA no. 2141/2005. Norwegian Institute for Water Research projects 80106 and 25106 report number 5112-2005, 235 pp.. ISBN number 82-577-4822-6. Also as Trends and Effects of Substances in the Marine Environment (SIME) London (UK) 21-23 February 2006. SIME 06/02/07 –E.

Green, N.W., Ruus, A., Bakketun, Å., Håvardstun, J., Rogne, Å.G., Schøyen, M., Tveiten, L., Øxenvad, S., 2007. Joint Assessment and Monitoring Programme (JAMP). National Comments regarding the Norwegian Data for 2005. Norwegian Pollution Control Authority, Monitoring report no. 974/2006 TA no. 2214/2006. Norwegian Institute for Water Research projects 80106, 25106, and 26106 and report number 5315-2006, 191 pp.. ISBN number 82-577-5047-6. Also as Trends and Effects of Substances in the Marine Environment (SIME), Hamburg 6-8 March 2007. SIME 07/02/Info.3-E

Green, N.W., Ruus, A., Bakketun, Å., Håvardstun, J., Rogne, Å.G., Schøyen, M., Tveiten, L., Øxenvad, S., 2008a. Joint Assessment and Monitoring Programme (JAMP). National Comments regarding the Norwegian Data for 2006. Norwegian Pollution Control Authority, Monitoring report no. 1017/2008 TA no. 2371/2008. Norwegian Institute for Water Research projects 80106, 26106, and 27106 and report number 5564-2008, 225 pp.. ISBN number 82-577-5299-6.

Green, N.W., Dahl, I.., Kringstad, A., og Schlabach, 2008b. Joint Assessment and Monitoring Programme (JAMP). Overview of analytical methods 1981-2007. Norwegian Pollution Control Authority, Monitoring report no.1016/2008 TA no. 2370/2008. NIVA-rapport 5563-2008, 96 pp. ISBN number 978-82-577-5298-9..

IARC (International Agency for Reseach on Cancer), 1987. Monographs on the evaluation of carcinogenic risks to humans. Overall evaluation of carcinogenity: An updating of IARC Monographs volumes 1 to 42. Suppl. 7. Lyons, 440 pp.

ICES, 1986. Interim reporting format for contaminants in fish and shellfish, JMP-version. ICES, May 1986.

ICES, 1988. Results of 1985 baseline study of contaminants in fish and shellfish. ICES Cooperative Research Report no. 151, 366 pp..

ICES, 1989. Statistical analysis of the ICES Cooperative Monitoring Programme data on contaminants in fish muscle tissue (1978.1985) for determination of temporal trends. ICES Cooperative Research Report no. 162, 147 pp..

ICES, 1991. Statistical analysis of the ICES Cooperative Monitoring Programme data on contaminants in fish liver tissue and Mytilus edulis (1978.1988) for determination of temporal trends. ICES Cooperative Research Report no. 176, 189 pp..

ICES, 1992. ICES Environmental data reporting formats, Version 2.1 - January 1992.

JMG, 1992. Results of the 1990 supplementary baseline study of contaminants in fish and shellfish.. Seventeenth Meeting of the Joint Monitoring Group. Uppsala: 20-24 January 1992. JMG 17/3/13-E. 25pp. plus appendices.

JMG, 1993. Oslo and Paris Conventions for the Prevention of Marine Pollution,. Eighteenth Meeting of the Joint Monitoring Group. The Hague: 25-29 January 1993. Draft report on the results of the 1990/1991 baseline study of contaminants in sediments JMG 18/3/7-E. 33pp. plus tables, figures and appendices.

JMG, 1994. Oslo and Paris Conventions for the Prevention of Marine Pollution,. Eighteenth Meeting of the Joint Monitoring Group. The Hague: 25-29 January 1994. Draft report on the results of the 1990/1991 baseline study of contaminants in sediments JMG 18/3/7-E. 33pp. plus tables, figures and appendices.

Knutzen, J., Green, N.W., 1995. Bakgrunnsnivåer av en del miljøgifter i fisk, blåskjell og reker. Data fra utvalgte norske prøvesteder innen den felles overvåking under Oslo-/Paris-kommisjonene 1990-1993. [Background levels of some micropollutants in fish, the blue mussel and shrimps. Data from selected Norwegian sampling sites within the joint monitoring of the Oslo-/Paris Commissions 1990-1993]. Norwegian Pollution Control Authority, Monitoring report no. 594/95 TA no. 1173/1995. NIVA project O-80106/E-91412, (report number 3302) 105 pp.. ISBN number 82-577-2678-8.

Knutzen, J., Green, N.W., 2001. Joint Assessment and Monitoring Programme (JAMP). "Bakgrunnsnivåer" av miljøgifter i fisk og blåskjell basert på datamateriale fra 1990-1998.[Joint Assessment and Monitoring Programme (JAMP). Background levels of some contaminants in fish and blue mussel based on data from 1990-1998]. Norwegian Pollution Control Authority, Monitoring report no. 820/01 TA no. 1798/2001. NIVA project O-80106, (report number 4339) 145 pp.. ISBN number 82-577-3973-1.

Molvær, J., Knutzen, J., Magnusson, J., Rygg, B., Skei J., Sørensen, J., 1997. Klassifisering av miljøkvalitet i fjorder og kystfarvann. Veiledning. Classification of environmental quality in fjords and coastal waters. A guide. Norwegian Pollution Control Authority. TA no. TA-1467/1997. 36 pp.

OSPAR, 1998. OSPAR OSPAR Strategy with regard to Hazardous Substances. OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic. Meeting of the OSPAR Commission (OSPAR). Sintra, 23-27 June, 1998. Summary Record Annex 34 (Reference number 1998-16). 22 pp.

OSPAR, 2005 Assessment of data collected under the Co-ordinated Environmental Monitoring Programme (CEMP), OSPAR publication 2005/235. 115 pp. + appendices.

OSPAR, 2007. OSPAR Coordinated Environmental Monitoring Programme (CEMP). OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic. OSPAR Commission. Reference number: 2007-1. 25pp..

Ruus, A., Hylland, K., Green, N., 2003. Joint Assessment and Monitoring Programme (JAMP). Biological Effects Methods, Norwegian Monitoring 1997-2001. Norwegian Pollution Control Authority, Monitoring report no. 869/03 TA no. 1948/2003. Norwegian Institute for Water Research project 80106, report number 4649-2003, 139 pp.. ISBN number 82-577-4313-5.

SFT, 1987. Overvåkingsresultater 1986. (Chapter) 8. Felles europeisk overvåkingsprogram (JMP) i Norge: Overvåking av PCB, DDT- derivater, kadmium, kvikksølv, kobber, bly og sink. Norwegian Pollution Control Authority (SFT) Report 288/87:84- 85.

SFT, 1988. Overvåkingsresutater 1987. (Chapter) 8. Felles europeisk overvåkingsprogram (JMP) i Norge: Overvåking av PCB, DDT- derivater, kadmium, kvikksølv, kobber, bly og sink. Norwegian Pollution Control Authority (SFT) Report 330/88:96- 97.

SFT, 1989. Overvåkingsresultater 1988. (Chapter) 8. Overvåking av miljøgifter: Joint Monitoring Programme (JMP). Norwegian Pollution Control Authority (SFT) Report 379/89:98-101.

SFT, 1990. Overvåkingsresultater 1989. (Chapter) 8 Overvåking av miljøgifter - Joint Monitoring Programme (JMP). Norwegian Pollution Control Authority (SFT) Report 433/90:116-119.

Shi, L., Green, N., Rogne, Å., 2008. Joint Assessment and Monitoring Programme (JAMP). Contaminant and effects data for sediments, shellfish and fish 1981-2006. Norwegian Pollution Control Authority, Monitoring report no. 1016/2008 TA no. 2370/2008. NIVA projects 80106, 25106, 26106, 27106, report number 5563-2008, 96 pp.. ISBN number 978-82-577-5298-9

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.

Appendix A. 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
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-Σn	*% BAP av PK-Σn*	
PKn_P	% PK-Σn of PAHΣΣ	*% PK-Σn av PAHΣΣ*	
PKnPP	% PK-Σn of P-Σn	*% PK-Σn 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***	

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

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	*Lindan*	OC-HC
	γ HCH = gamma hexachlorocyclohexane	*γ HCH = gamma heksaklorsykloheksan*	
	(γ BHC = gamma benzenehexachloride, outdated synonym)	*(γ BHC = gamma benzenheksaklorid, foreldret betegnelse)*	
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-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 aubstances	perfluoralkylertestoffer	
PFBS	perfluorobutane sulfonate	perfluorbutan sulfonat	PFAS
PFHxA	perfluorohexanoic acid	perfluorhexansyre	PFAS
PFHpA	perfluoroheptanoic acid	perfluorheptansyre	PFAS
PFOA	perfluorooctanoic acid	perfluoroktansyre	PFAS
PFNA	perfluorononanoic acid	perfluornonansyre	PFAS
PFOS	perfluoroctanoic sulfonate	perfluoroktansulfonat	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 SFT’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:	*"Toxisitetsekvivalentfaktorer" for de giftigste forbindelsene innen følgende grupper.*
	• 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]	• *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]*
	• non-ortho and mono-ortho substituted chlorobiphenyls after WHO model (Ahlborg *et al.*, 1994) [3] or Safe (1994, cf. NILU pers. comm.)	• *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 B.
Overview of localities and sample count for sediment
1981-2006

Nominel station positions are shown on maps in Appendix D.

jmpco: JAMP area code (J99 = unclassified)
jmpst: station code
stnam: station name
nom_lon: Longitude (nominel)
nom_lat: Latitude (nominel)

STATIONS AND SAMPLE COUNT FOR SEDIMENT

jmpco	jmpst	stnam	lat	lon	1986	1987	1990	1992	1994	1996	1997	2004	2006
J26	30S	Steilene	59° 49.1	10° 33.8	8		34			5			
J26	35S	Mølen-Moss	59° 28.96	10° 31.74	6					5			
J26	35S	Mølen-Moss	59° 30	10° 35.7	2		3						
J26	36S	Færder area	59° 0.4	10° 41.6	2		40						
J26	36S	Færder area	59° 1.55	10° 32.99	6								
J26	36S	Færder area	59° 2.5	10° 46.6						56			
J99	77S	Arendal area	58° 24.2	9° 1.8			43				29		
J99	15S	Lista area	58° 1	6° 34.3			32				5		
J63	52S	Tyssedal	60° 6.9	6° 32.9			3				5		
J63	52S	Tyssedal	60° 6.92	6° 32.6								3	
J63	56S	Kvalnes	60° 13.7	6° 35.6			29				5		
J63	56S	Kvalnes	60° 13.72	6° 35.6								3	
J63	57S	Krossanes	60° 23.1	6° 40.7			3				5	3	
J62	63S	Ranaskjær	60° 23.34	6° 26.7								3	
J62	63S	Ranaskjær	60° 23.6	6° 27.1			3				5		
J62	67S	Strandebarm area	60° 13.12	6° 4.6								3	
J62	67S	Strandebarm area	60° 13.5	6° 5.1			28				28		
J62	69S	Kvinnheradsfjorden	60° 1.3	5° 56.1			3				5	3	
J99	22S	Bømlo area	59° 25.9	4° 50.2			29				5	3	
J99	24S	Sotra	60° 15.1	4° 33.3			3					3	
J65	82S	Flakk	63° 27.5	10° 11.8		8						3	
J65	89S	Thamshavn	63° 19.7	9° 52.5								3	
J65	89S	Thamshavn	63° 19.8	9° 52.5		4		3					
J65	84S	Trossavika	63° 21.7	9° 57.4		8		3				3	
J65	90S	Outer Orkdalsfjord	63° 27.3	10° 2.6								3	
J65	90S	Outer Orkdalsfjord	63° 27.4	10° 2.6		8		30					
J99	27S	Stadtlandet (east)	62° 9.3	5° 21.3				30				3	
J99	93S	Raudøya (northeast)	64° 22.7	10° 27.8				30				3	
J99	95S	Rodø (east)	66° 41.8	13° 10								3	
J99	95S	Rodø (east)	66° 41.8	13° 9.9				31					
J99	98S	Skrova (south)	68° 7	14° 41				30				3	
J99	99S	Lundøy (north)	68° 5.8	15° 10.1				30				3	
J99	41S	Vågsfjorden	68° 56.025	17° 5.024									2
J99	41S	Vågsfjorden	68° 56.25	17° 5.24					34				1
J99	42S	Malangen	69° 30.038	18° 6.077									3
J99	42S	Malangen	69° 30.38	18° 6.77					3				
J99	43S	Kvænangen	70° 3.031	21° 7.094									3
J99	43S	Kvænangen	70° 3.31	21° 7.94					34				
J99	44S	Sørøysund	70° 25.091	22° 31.083									3
J99	44S	Sørøysund	70° 25.91	22° 31.83					3				
J99	45S	Revsbotn	70° 42.086	24° 26.065									3
J99	45S	Revsbotn	70° 42.86	24° 26.65					34				
J99	46S	Porsangerfjorden	70° 52.093	26° 11.089									3
J99	46S	Porsangerfjorden	70° 52.93	26° 11.89					28				
J99	47S	Laksfjord	70° 54.096	26° 55.011									3
J99	47S	Laksfjord	70° 54.96	26° 55.11					3				
J99	48S	Tanafjord	70° 52.054	28° 38.053									3
J99	48S	Tanafjord	70° 52.54	28° 38.53					33				
J99	49S	Syltefjord	70° 33.094	30° 19.091									3
J99	49S	Syltefjord	70° 33.94	30° 19.91					3				
J99	10S	Varangerfjorden	69° 56.01	30° 6.07									3
J99	10S	Varangerfjorden	69° 56.07	30° 6.7					29				

Appendix C.
Overview of localities and sample count for biota 1981-2006

Nominel station positions are shown on maps in Appendix D.

jmpco: JAMP area code (J99 = unclassified)
jmpst: station code
stnam: station name
nom_lon: Longitude (nominel)
nom_lat: Latitude (nominel)
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

jmpco	jmpst	stnam	nomlat	nomlon	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
J26	01A	Sponvika	59° 5.31	11° 13.57	MYTI EDU	SB		3			3					3																
J26	02A	Fugleskjær	59° 6.9	10° 59	MYTI EDU	SB		3			3					3																
J26	03A	Tisler	58° 58.8	10° 57.5	MYTI EDU	SB		2			3					3																
J26	301	Akershuskaia	59° 54.32	10° 44.18	MYTI EDU	SB												2														
J26	302	Ormøya	59° 52.69	10° 45.46	MYTI EDU	SB												2														
J26	303	Malmøya	59° 51.78	10° 45.95	MYTI EDU	SB												1														
J26	304	Gåsøya	59° 51.08	10° 35.32	MYTI EDU	SB												3														
J26	305	Lysaker	59° 54.36	10° 38.6	MYTI EDU	SB												2														
J26	306	Håøya	59° 42.8	10° 33.31	MYTI EDU	SB												3														
J26	30A	Gressholmen	59° 52.89	10° 42.71	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
J26	30B	Oslo City area	59° 47.96	10° 33.6	GADU MOR	BI																			23	23	25	24	25	25	23	24
J26	30B	Oslo City area	59° 47.96	10° 33.6	GADU MOR	BL																			25	25	25	25	25	25		
J26	30B	Oslo City area	59° 47.96	10° 33.6	GADU MOR	LI				29	25	25	25	25	25	25	24	21	24	25	25	40	40	50	25	25	28	25	25	25	25	25
J26	30B	Oslo City area	59° 47.96	10° 33.6	GADU MOR	MU				29	25	25	25	26	26	30	30	21	29	30	30	48	48	60	30	30	30	30	30	30	30	30
J26	30C	Oslo City area	59° 49	10° 33	PAND BOR	TM				1								2														
J26	30F	Oslo City area	59° 47	10° 34	PLEU PLA	LI												2		5	5											
J26	30F	Oslo City area	59° 47	10° 34	PLEU PLA	MU												2		5	5											
J26	30J	Spro	59° 47.96	10° 33.6	PAND BOR	TM															1											
J26	30K	Storegrunn	59° 47.96	10° 33.6	PAND BOR	TM															1											
J26	30X	West of Nesodden	59° 48.5	10° 36	GADU MOR	LI												22														
J26	30X	West of Nesodden	59° 48.5	10° 36	GADU MOR	MU												22														
J26	31A	Solbergstrand	59° 37.13	10° 38.99	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
J26	31B	Solbergstrand	59° 36.9	10° 38.4	GADU MOR	LI	10	27																								
J26	31B	Solbergstrand	59° 36.9	10° 38.4	GADU MOR	MU	10	27																								
J26	31F	Solbergstrand	59° 36.9	10° 38.4	PLAT FLE	LI	8																									
J26	31F	Solbergstrand	59° 36.9	10° 38.4	PLAT FLE	MU	8																									
J26	31C	Solbergstrand	59° 36.9	10° 38.4	PAND BOR	TM				1																						
J26	32A	Rødtangen	59° 31.5	10° 25.6	MYTI EDU	SB	1	3			3																					
J26	33F	Sande (east side)	59° 31.7	10° 21	PLAT FLE	LI			25		1	1	1	1	1	5	5	5	5	5	5	10	10	8	5	5	5	5	5	5	5	5
J26	33F	Sande (east side)	59° 31.7	10° 21	PLAT FLE	MU			25		25	1	1	1	1	5	5	5	5	5	5	10	10	8	5	5	5	5	5	5	5	5
J26	33C	Sande	59° 31.7	10° 21	PAND BOR	TM						1																				
J26	33X	Sande (west side)	59° 31.7	10° 20.4	PLAT FLE	LI										3																
J26	33X	Sande (west side)	59° 31.7	10° 20.4	PLAT FLE	MU										3																
J26	35A	Mølen	59° 29.29	10° 29.88	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
J26	35C	Mølen-Moss	59° 28.96	10° 31.74	PAND BOR	TM		1						1		2																
J26	35C	Mølen-Moss	59° 28.96	10° 31.74	PAND BOR	XX								1																		
J26	36A	Færder	59° 1.63	10° 31.53	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
J26	36G	Færder	59° 1.63	10° 31.53	NUCE LAP	SB																	1	1	1	1	1	1	1	2	2	2
J26	36B	Færder area	59° 2.43	10° 26.15	GADU MOR	BI																	21	25	25	23	25					
J26	36B	Færder area	59° 2.43	10° 26.15	GADU MOR	BL																	20	25	25	23	25					
J26	36B	Færder area	59° 2.43	10° 26.15	GADU MOR	LI	10	27	23	24	14	25	25	25	25	24	25	25	25	25	25	26	25	25	25	23	28	25	25	25	25	25
J26	36B	Færder area	59° 2.43	10° 26.15	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
J26	36F	Færder area	59° 4	10° 23	LIMA LIM	BI																			11	9	20					
J26	36F	Færder area	59° 4	10° 23	LIMA LIM	BL																			20	9	20					
J26	36F	Færder area	59° 4	10° 23	LIMA LIM	LI										5	5	5	5	5	5	5	5	5	25	14	24	5	5	5	5	5
J26	36F	Færder area	59° 4	10° 23	LIMA LIM	MU										5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
J26	73A	Lyngholmen	59° 2.68	10° 17.72	MYTI EDU	SB										3																
J26	74A	Langholmane	58° 57.3	9° 52.1	MYTI EDU	SB										3																
J26	71A	Bjørkøya (Risøyodden)	59° 1.4	9° 45.22	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
J26	71G	Fugløyskjær	58° 58.85	9° 48.46	NUCE LAP	SB																					1	1	1	1	1	1

jmpco	jmpst	stnam	nomlat	nomlon	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
J99	76A	Risøy	58° 43.85	9° 16.32	MYTI EDU	SB										3	3	3	3			3	3	3	3	3	3	3	3	3	3	3
J99	76A	Risøy	58° 43.85	9° 16.32	NUCE LAP	SB																							1				
J99	76G	Risøy	58° 43.68	9° 16.53	NUCE LAP	SB																					1	1		1	2	2
J99	77A	Nordstrand	58° 31.42	8° 56.51	MYTI EDU	SB										3	3															
J99	77B	Borøy area	58° 33	9° 1	GADU MOR	LI										14	25															
J99	77B	Borøy area	58° 33	9° 1	GADU MOR	MU										17	30															
J99	77F	Borøy area	58° 33	9° 1	LIMA LIM	LI											3															
J99	77C	Borøy area	58° 29	9° 10	PAND BOR	TM										2																
J99	79A	Gjerdsvoldsøyen (east)	58° 24.8	8° 44.5	MYTI EDU	SB										3	3															
J99	13A	Langøsund	57° 59.87	7° 34.6	MYTI EDU	SB										1	4															
J99	131G	Lastad	58° 3.33	7° 42.52	NUCE LAP	SB																					1	1	1	1	2	2
J99	14A	Aavigen	58° 1.96	7° 12.97	MYTI EDU	SB										3	4															
J99	15A	Gåsøy (Ullerø)	58° 2.87	6° 53.72	MYTI EDU	SB										4	4		3	3	4	4	3	3	3	3	3	3	3	3	3	3	3
J99	15G	Gåsøy (Ullerø)	58° 2.98	6° 53.74	NUCE LAP	SB																					1	1	1	2	2	2
J99	15B	Ullerø area	58° 3	6° 43	GADU MOR	BI																	10	25	25		24	18	24	22	24	24
J99	15B	Ullerø area	58° 3	6° 43	GADU MOR	BL																	24	25	25		23					
J99	15B	Ullerø area	58° 3	6° 43	GADU MOR	LI										25	24	23	25	23	24	26	25	25	25	25	25	25	25	25	25	25
J99	15B	Ullerø area	58° 3	6° 43	GADU MOR	MU										30	29	27	30	28	29	30	30	30	30	30	30	30	30	30	30	30
J99	15F	Ullerø area	58° 3	6° 43	LIMA LIM	BI																			20		22					
J99	15F	Ullerø area	58° 3	6° 43	LIMA LIM	BL																			25		25					
J99	15F	Ullerø area	58° 3	6° 43	LIMA LIM	LI											3		2	4	5	5	5	5	30	5	30	5	5	5	5	5
J99	15F	Ullerø area	58° 3	6° 43	LIMA LIM	MU											3		2	4	5	5	5	5	5	5	5	5	5	5	5	5
J99	15F	Ullerø area	58° 3	6° 43	PLEU PLA	LI												3	2													
J99	15F	Ullerø area	58° 3	6° 43	PLEU PLA	MU												3	2													
J99	15F	Ullerø area	58° 3	6° 43	MICR KIT	LI														1												
J99	15F	Ullerø area	58° 3	6° 43	MICR KIT	MU														1												
J63	51A	Byrkjenes	60° 5.03	6° 33.03	MYTI EDU	SB							3	3							1	3	3	3	6	3	3	3	3	3	3	3
J63	52A	Eitrheimsneset	60° 5.8	6° 31.97	MYTI EDU	SB									3	3	3	3	2	3	3	3	3	3	6	3	3	3	3	3	3	3
J63	53B	Inner Sørfjord	60° 10	6° 34	GADU MOR	BI																			24	25	25	24	24	25	24	24
J63	53B	Inner Sørfjord	60° 10	6° 34	GADU MOR	BL																			25	25	25	25	25	25		
J63	53B	Inner Sørfjord	60° 10	6° 34	GADU MOR	LI							13	1	12	25	25	22	25	25	25	50	30	30	25	25	25	25	25	25	25	25
J63	53B	Inner Sørfjord	60° 10	6° 34	GADU MOR	MU							12	1	15	30	30	26	30	30	30	56	36	36	30	30	30	30	30	30	30	30
J63	53F	Inner Sørfjord	60° 10	6° 34	PLAT FLE	BI																			25	11	12					
J63	53F	Inner Sørfjord	60° 10	6° 34	PLAT FLE	BL																			23	11	12					
J63	53F	Inner Sørfjord	60° 10	6° 34	PLAT FLE	LI				22				1	30	5	5	5	5	4	4	11	15	11	30	13	17	5	5	5	5	
J63	53F	Inner Sørfjord	60° 10	6° 34	PLAT FLE	MU				22				1	30	5	5	5	5	4	4	11	15	11	5	2	5	5	5	5	5	
J63	53F	Inner Sørfjord	60° 10	6° 34	GLYP CYN	LI							3																			
J63	53F	Inner Sørfjord	60° 10	6° 34	GLYP CYN	MU							3																			
J63	53B	Inner Sørfjord	60° 10	6° 34	SALM TRU	LI										12																
J63	53B	Inner Sørfjord	60° 10	6° 34	SALM TRU	MU										12																
J63	53D	Digraneset	60° 11	6° 34.5	BROS BRO	LI																					4					
J63	53D	Digraneset	60° 11	6° 34.5	BROS BRO	MU																					4					
J63	53D	Digraneset	60° 11	6° 34.5	MOLV MOL	LI																					5					
J63	53D	Digraneset	60° 11	6° 34.5	MOLV MOL	MU																					5					
J63	53D	Digraneset	60° 11	6° 34.5	CHIM MON	LI																					2					
J63	53D	Digraneset	60° 11	6° 34.5	CHIM MON	MU																					2					
J63	56A	Kvalnes	60° 13.23	6° 36.12	MYTI EDU	SB							3	15	3	3	3	3	3	3	3	3	3	3	6	3	3	3	3	3	3	3
J63	56A1	Kvalnes (north)	60° 13.51	6° 36.26	MYTI EDU	SB																			3			2				
J63	56A2	Kjeken	60° 20.33	6° 39.27	MYTI EDU	SB																			3			2				
J63	56A3	Sekse	60° 15.68	6° 37.4	MYTI EDU	SB																						2				
J63	56A4	Rosstadnes	60° 17.22	6° 37.43	MYTI EDU	SB																						2				
J63	56A5	Lofthus (south)	60° 19.35	6° 39.12	MYTI EDU	SB																						2				
J63	56D	Kvalnes	60° 15	6° 36	BROS BRO	LI																			3							
J63	56D	Kvalnes	60° 15	6° 36	BROS BRO	MU																			3							

jmpco	jmpst	stnam	nomlat	nomlon	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
J63	56D	Kvalnes	60° 15	6° 36	MOLV MOL	LI																			1							
J63	56D	Kvalnes	60° 15	6° 36	MOLV MOL	MU																			1							
J63	56D	Kvalnes	60° 15	6° 36	CHIM MON	LI																			1							
J63	56D	Kvalnes	60° 15	6° 36	CHIM MON	MU																			1							
J63	57A	Krossanes	60° 23.23	6° 41.34	MYTI EDU	SB							3	3	3	3	3	3	3	3	3	3	3	3	6	3	3	3	3	3	3	3
J63	57A1	Urdheim	60° 22.35	6° 40.69	MYTI EDU	SB																			3			2				
J63	57A2	Ernes	60° 21.19	6° 39.74	MYTI EDU	SB																						2				
J62	63A	Ranaskjær	60° 25.25	6° 25.32	MYTI EDU	SB							3	3	3	3	3	3	3	3	3	3	3	3	6	3	3	3	3	3	3	3
J62	65A	Vikingneset	60° 14.54	6° 9.16	MYTI EDU	SB							3	15	3	3	3	3	3	3	3	3	3	3	6	3	3	3	3	3	3	3
J62	67B	Strandebarm area	60° 16	6° 2	GADU MOR	BI																	25	24	25	15	25					
J62	67B	Strandebarm area	60° 16	6° 2	GADU MOR	BL																	25	25	25	13	24					
J62	67B	Strandebarm area	60° 16	6° 2	GADU MOR	LI							22	1	22	16	19	8	12	18	25	35	25	25	25	25	25	25	25	25	25	25
J62	67B	Strandebarm area	60° 16	6° 2	GADU MOR	MU							22	1	23	16	24	9	14	22	30	40	30	30	30	30	30	30	30	30	30	30
J62	67F	Strandebarm area	60° 16	6° 2	PLAT FLE	BI																			25	22	25					
J62	67F	Strandebarm area	60° 16	6° 2	PLAT FLE	BL																			25	23	23					
J62	67F	Strandebarm area	60° 16	6° 2	PLAT FLE	LI																3		4	30	28	30	5	5	5	5	5
J62	67F	Strandebarm area	60° 16	6° 2	PLAT FLE	MU																3		4	5	5	5	5	5	5	5	5
J62	67F	Strandebarm area	60° 16	6° 2	LIMA LIM	LI																		5								
J62	67F	Strandebarm area	60° 16	6° 2	LIMA LIM	MU																		5								
J62	67F	Strandebarm area	60° 16	6° 2	LEPI WHI	LI				19			1	1	30	5	5	3	5	5	5	5	5	5	5	5	5	5	5	2	5	4
J62	67F	Strandebarm area	60° 16	6° 2	LEPI WHI	MU				19			1	1	30	5	5	3	5	5	5	5	5	5	5	5	5	5	5	2	5	4
J62	69A	Lille Terøy	59° 58.91	5° 45.15	MYTI EDU	SB												3	1	3	3	3	3	3	6	3	3	3	3	3	3	3
J99	22A	Espevær (west)	59° 35.05	5° 8.63	MYTI EDU	SB										3	3	3	3	3	3	5	3	3	3	3	3	3	3	3	3	3
J99	224G	Heggjelen	59° 24.96	5° 13.9	NUCE LAP	SB																	1	1	1	1						
J99	22G	Espevær vest	59° 35.02	5° 8.67	NUCE LAP	SB																					1	1	1	2	2	2
J99	220G	Smørstakk	59° 15.15	5° 21.11	NUCE LAP	SB																	1	1	1					2		
J99	22C	Bømlofjord	59° 34	5° 11	PAND BOR	TM										2																
J99	221A	Stangeland	59° 16.62	5° 19.7	MYTI EDU	SB																		2	3							
J99	221G	Stangeland	59° 16.21	5° 19.8	NUCE LAP	SB																		1	1							
J99	21F	Åkrafjord	59° 45	6° 7	PLAT FLE	BI																			11							
J99	21F	Åkrafjord	59° 45	6° 7	PLAT FLE	BL																			11	25						
J99	21F	Åkrafjord	59° 45	6° 7	PLAT FLE	LI																			14	11	5	5		1	5	5
J99	21F	Åkrafjord	59° 45	6° 7	PLAT FLE	MU																			3	5	5	5		1	5	5
J99	21F	Åkrafjord	59° 45	6° 7	LIMA LIM	LI																						5	5	5	5	
J99	22F	Borøyfjorden	59° 42.6	5° 19.8	LIMA LIM	LI										5	5	4		5	2											
J99	21F	Åkrafjord	59° 45	6° 7	LIMA LIM	MU																						5	5	5	5	
J99	22F	Borøyfjorden	59° 42.6	5° 19.8	LIMA LIM	MU										5	5	4		5	2											
J99	22F	Borøyfjorden	59° 42.6	5° 19.8	PLEU PLA	LI																5	5	5								
J99	22F	Borøyfjorden	59° 42.6	5° 19.8	PLEU PLA	MU																5	5	5								
J99	21F	Åkrafjord	59° 45	6° 7	LEPI WHI	LI																			5				5	5	5	3
J99	21F	Åkrafjord	59° 45	6° 7	LEPI WHI	MU																			5				5	5	5	3
J99	22F	Borøyfjorden	59° 42.6	5° 19.8	MICR KIT	LI													5													
J99	22F	Borøyfjorden	59° 42.6	5° 19.8	MICR KIT	MU													5													
J99	21D	Åkrafjord	59° 48	6° 11	BROS BRO	LI																			1		4					
J99	21D	Åkrafjord	59° 48	6° 11	BROS BRO	MU																			1		4					
J99	21D	Åkrafjord	59° 48	6° 11	MOLV MOL	LI																			1		4					
J99	21D	Åkrafjord	59° 48	6° 11	MOLV MOL	MU																			1		4					
J99	21D	Åkrafjord	59° 48	6° 11	CHIM MON	LI																			1		2					
J99	21D	Åkrafjord	59° 48	6° 11	CHIM MON	MU																			1		2					
J99	222A	Kopervik harbour	59° 16.98	5° 18.94	MYTI EDU	SB																				3						
J99	226X	Karmsund bridge (east)	59° 22.68	5° 17.91	MYTI EDU	SB																		1	3	3						
J99	226G	Karmsund bridge (east)	59° 22.68	5° 17.91	NUCE LAP	SB																		1	1	1						
J99	226H	Karmsund bridge (west)	59° 22.66	5° 17.55	NUCE LAP	SB																	1			1						
J99	227A1	Melandholmen	59° 19.56	5° 19.05	MYTI EDU	SB																		2	3							

jmpco	jmpst	stnam	nomlat	nomlon	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
J99	227A2	Høgevarde	59° 19.56	5° 19.05	MYTI EDU	SB																				3	3	3	3	1	2	2
J99	227G1	Melandholmen	59° 20.24	5° 18.75	NUCE LAP	SB																	1	1	1	1	1	1				
J99	227G2	Flatskjær	59° 20.24	5° 18.75	NUCE LAP	SB																							1	1	2	2
J99	23A	Austvik	59° 52.22	5° 6.47	MYTI EDU	SB										3	3													3	3	
J99	23B	Karihavet area	59° 54	5° 8	GADU MOR	BI																	22	23	24	23	25	25	25	24	25	25
J99	23B	Karihavet area	59° 54	5° 8	GADU MOR	BL																	25	25	25	24	25	25	25	25		
J99	23B	Karihavet area	59° 54	5° 8	GADU MOR	LI										25	25	25	25	25	25	26	25	25	25	25	25	25	25	25	25	25
J99	23B	Karihavet area	59° 54	5° 8	GADU MOR	MU										30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
J99	23F	Karihavet area	59° 54	5° 8	PLAT FLE	LI														1												
J99	23F	Karihavet area	59° 54	5° 8	PLAT FLE	MU														1												
J99	23F	Karihavet area	59° 54	5° 8	PLEU PLA	LI														3												
J99	23F	Karihavet area	59° 54	5° 8	PLEU PLA	MU														3												
J99	23F	Karihavet area	59° 54	5° 8	MICR KIT	LI														1	4											
J99	23F	Karihavet area	59° 54	5° 8	MICR KIT	MU														1	4											
J99	24A	Vardøy	60° 10.27	5° 0.62	MYTI EDU	SB										3	3													3	3	
J99	24G	Vardøy	60° 10.27	5° 0.62	NUCE LAP	SB																								1		
J65	80A	Østmarknes	63° 27.44	10° 26.97	MYTI EDU	SB				1	2																					
J65	81A	Biologisk Stasjon	63° 26.5	10° 20.95	MYTI EDU	SB				1																						
J65	82A	Flakk	63° 27.02	10° 12.38	MYTI EDU	SB				1	2	2	3	1	2		3	2	2		3	3								3	3	
J99	82G	Flakk	63° 27.04	10° 12.15	NUCE LAP	SB												1												1		
J65	83A	Frøsetskjær	63° 25.69	10° 6.4	MYTI EDU	SB				1																						
J65	84A	Tråsåvika	63° 20.79	9° 57.43	MYTI EDU	SB				2	3	3	3	3	3		3	3	3		3	3								3	3	
J99	84G	Tråsåvika	63° 20.79	9° 57.43	NUCE LAP	SB												1														
J65	84B	Tråsåvika	63° 20.92	9° 57.68	GADU MOR	LI				13	1	1	1	1																		
J65	84B	Tråsåvika	63° 20.92	9° 57.68	GADU MOR	MU				13	10	1	1	1																		
J65	84F	Tråsåvika	63° 20.92	9° 57.68	MICR KIT	LI								1																		
J65	84F	Tråsåvika	63° 20.92	9° 57.68	MICR KIT	MU								1																		
J65	84B	Tråsåvika	63° 20.92	9° 57.68	MELA AEG	LI						1	1	1																		
J65	84B	Tråsåvika	63° 20.92	9° 57.68	MELA AEG	MU						1	1	1																		
J65	84B	Tråsåvika	63° 20.92	9° 57.68	MERL MNG	LI							1	1																		
J65	84B	Tråsåvika	63° 20.92	9° 57.68	MERL MNG	MU							1	1																		
J65	84B	Tråsåvika	63° 20.92	9° 57.68	POLL POL	LI					1	1		1																		
J65	84B	Tråsåvika	63° 20.92	9° 57.68	POLL POL	MU					16	1		1																		
J65	84B	Tråsåvika	63° 20.92	9° 57.68	POLL VIR	LI								1																		
J65	84B	Tråsåvika	63° 20.92	9° 57.68	POLL VIR	MU								1																		
J65	85A	Geitstrand	63° 21.84	9° 55.65	MYTI EDU	SB				1																						
J65	86A	Geitnes	63° 26.57	9° 58.66	MYTI EDU	SB				1																						
J65	87A	Ingdalsbukt	63° 27.71	9° 54.43	MYTI EDU	SB				1	1	1	1	1	1		1	1	1		2	2								1	3	
J99	87G	Ingdalsbukt	63° 27.71	9° 54.43	NUCE LAP	SB												1												1		
J65	88A	Rødberg	63° 29.2	10° 0	MYTI EDU	SB				1	1																					
J99	25A	Hinnøy	61° 22.17	4° 52.74	MYTI EDU	SB												3	3											3	3	
J99	25G	Hinnøy	61° 22.17	4° 52.74	NUCE LAP	SB												1												1		
J99	26A	Hamnen	61° 52.56	5° 13.3	MYTI EDU	SB												6	3											3	3	
J99	26G	Hamnen	61° 52.52	5° 13.3	NUCE LAP	SB												1												1		
J99	27A	Grinden	62° 12.11	5° 25.27	MYTI EDU	SB												2												3	3	
J99	27G	Røydeskjær	62° 11	5° 44.42	NUCE LAP	SB												1												1		
J99	27H	Storholmen	62° 11.38	5° 23.59	NUCE LAP	SB												1														
J99	28A	Eiksundet	62° 15.1	5° 51.84	MYTI EDU	SB												5	3											3	3	
J99	28G	Grønevikholmen (Eiksundet)	62° 14.8	5° 53	NUCE LAP	SB												1												1		
J99	28H	Øveråneset (Hareid)	62° 21.69	6° 4.67	NUCE LAP	SB												1														
J99	91A	Nerdvika	63° 21.16	8° 9.43	MYTI EDU	SB												3	3	3											3	
J99	92A1	Krokholmen	64° 3.21	10° 1.79	MYTI EDU	SB												6	3	3	3	3	3									
J99	92A2	Nygården	64° 3.21	10° 1.79	MYTI EDU	SB																									3	
J99	92B	Stokken area	64° 10.28	9° 53.24	GADU MOR	LI													25	24	25	25								25	25	

jmpco	jmpst	stnam	nomlat	nomlon	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
J99	92B	Stokken area	64° 10.28	9° 53.24	GADU MOR	MU													30	29	30	30								30	30	
J99	92F	Stokken area	64° 10.28	9° 53.24	LIMA LIM	LI															1											
J99	92F	Stokken area	64° 10.28	9° 53.24	LIMA LIM	MU															1											
J99	92F	Stokken area	64° 10.28	9° 53.24	PLEU PLA	LI															1										5	
J99	92F	Stokken area	64° 10.28	9° 53.24	PLEU PLA	MU															1										5	
J99	93A	Sætervik	64° 23.68	10° 29	MYTI EDU	SB												3	3											3	3	
J99	93G	Sætervika (Stadsvikskjæret)	64° 23.69	10° 30	NUCE LAP	SB												1														
J99	94A	Landfast	65° 38.62	12° 0.36	MYTI EDU	SB												3	3											3	3	
J99	94G	Steinskjær (Landfast)	65° 38.44	11° 59.89	NUCE LAP	SB												1												1		
J99	95A	Sleipnesodden (south)	66° 42.61	13° 15.17	MYTI EDU	SB												3	3											3	3	
J99	95G	Sleipnesodden (south)	66° 42.4	13° 14.3	NUCE LAP	SB												1												1		
J99	96A	Breiviken	66° 17.77	12° 50.02	MYTI EDU	SB												6	3											3	3	
J99	97A	Klokkholmen	67° 39.88	14° 44.57	MYTI EDU	SB												3	3											3	3	
J99	97G	Varnesodden	67° 48.08	14° 45.02	NUCE LAP	SB												1												1		
J99	97H	Småfloholmene	67° 53.45	14° 49.1	NUCE LAP	SB												1														
J99	98A1	Yitj-Skarvsundet	68° 9.45	14° 39.2	MYTI EDU	SB												3	3													
J99	98A2	Husvaagen area	68° 15.46	14° 39.83	MYTI EDU	SB																	3		3	3	3	3	3	3	3	3
J99	98A3	Vatterfjord	68° 15.46	14° 39.83	MYTI EDU	SB																		3								
J99	98G	Svolvær området	68° 14.92	14° 39.8	NUCE LAP	SB																					1	1	1	2	2	2
J99	98B2	Austnesfjorden	68° 14.8	14° 48.2	GADU MOR	BI																				14	22					
J99	98B2	Austnesfjorden	68° 14.8	14° 48.2	GADU MOR	BL																				5	25					
J99	98B1	Bjørnerøya (east)	68° 14.8	14° 48.2	GADU MOR	LI												25	24	25	24	26	25	25	25			25	21	25	25	25
J99	98B2	Austnesfjorden	68° 14.8	14° 48.2	GADU MOR	LI																				25	25					
J99	98B1	Bjørnerøya (east)	68° 14.8	14° 48.2	GADU MOR	MU												30	29	30	29	30	30	30	30			30	25	30	30	30
J99	98B2	Austnesfjorden	68° 14.8	14° 48.2	GADU MOR	MU																				30	30					
J99	98F1	Bjørnerøya (east)	68° 13.13	14° 48.48	LIMA LIM	LI													4	1	1	5										
J99	98F1	Bjørnerøya (east)	68° 13.13	14° 48.48	LIMA LIM	MU													4	1	1	5										
J99	98F2	Husholmen	68° 13.13	14° 48.48	PLEU PLA	BI																				18	24					
J99	98F2	Husholmen	68° 13.13	14° 48.48	PLEU PLA	BL																				13	19					
J99	98F1	Bjørnerøya (east)	68° 13.13	14° 48.48	PLEU PLA	LI													3		5		4	5	1							
J99	98F2	Husholmen	68° 13.13	14° 48.48	PLEU PLA	LI																				22	30	4	3	5	2	5
J99	98F1	Bjørnerøya (east)	68° 13.13	14° 48.48	PLEU PLA	MU													3		5		4	5	1							
J99	98F2	Husholmen	68° 13.13	14° 48.48	PLEU PLA	MU																				4	5	4	3	5	2	5
J99	98F1	Bjørnerøya (east)	68° 13.13	14° 48.48	MICR KIT	LI														1	1											
J99	98F1	Bjørnerøya (east)	68° 13.13	14° 48.48	MICR KIT	MU														1	1											
J99	98F1	Bjørnerøya (east)	68° 13.13	14° 48.48	GLYP CYN	LI															1											
J99	98F1	Bjørnerøya (east)	68° 13.13	14° 48.48	GLYP CYN	MU															1											
J99	98X	Skrova harbour	68° 9.91	14° 39.53	MYTI EDU	SB														3	4	4										
J99	99A	Brunvær	68° 0.3	15° 5.6	MYTI EDU	SB												6	3											3	3	
J99	41A	Fensneset (Grytøya)	68° 56.1	16° 38.47	MYTI EDU	SB														3	3	4	3									3
J99	41G	Harstad (Trondenes)	68° 49.3	16° 33.92	NUCE LAP	SB																				1						2
J99	41G1	Feneset	68° 56.1	16° 38.46	NUCE LAP	SB																										2
J99	42A	Tennskjær (Malangen)	69° 28.65	18° 18.12	MYTI EDU	SB														3	3											3
J99	42G	Finnsnes	69° 13.55	17° 58.5	NUCE LAP	SB																				1						
J99	43A	Lyngneset (Langfjord)	70° 6.03	20° 32.79	MYTI EDU	SB														3	3		3									3
J99	43G1	Lyngneset (Langfjord)	70° 6.04	20° 32.79	NUCE LAP	SB																										2
J99	43B1	Leisundet	70° 13.56	21° 23.81	GADU MOR	LI																										25
J99	43B1	Leisundet	70° 13.56	21° 23.81	GADU MOR	MU																										30
J99	43F1	Leisundet	70° 13.43	21° 23.84	PLEU PLA	LI																										4
J99	43F1	Leisundet	70° 13.43	21° 23.84	PLEU PLA	MU																										4
J99	43B	Kvænangen (Olderfjord)	70° 13.56	21° 23.81	GADU MOR	LI															25	25	25									
J99	43B	Kvænangen (Olderfjord)	70° 13.56	21° 23.81	GADU MOR	MU															30	30	30									
J99	43G	Skjervøy	70° 2.17	20° 59.76	NUCE LAP	SB																				1						2
J99	43F	Kvænangen (Olderfjord)	70° 13.43	21° 23.84	LIMA LIM	LI																3										

jmpco	jmpst	stnam	nomlat	nomlon	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
J99	43F	Kvænangen (Olderfjord)	70° 13.43	21° 23.84	LIMA LIM	MU																3										
J99	43F	Kvænangen (Olderfjord)	70° 13.43	21° 23.84	MICR KIT	LI																1										
J99	43F	Kvænangen (Olderfjord)	70° 13.43	21° 23.84	MICR KIT	MU																1										
J99	44A	Elenheimsundet	70° 30.97	22° 14.76	MYTI EDU	SB														3	3	4	3									3
J99	44G	Alta	69° 59.4	23° 18.35	NUCE LAP	SB																				1						
J99	44G1	Elenheimsundet	70° 30.97	22° 14.73	NUCE LAP	SB																										2
J99	45A	Sauhamneset	70° 45.82	24° 19.2	MYTI EDU	SB														3	3											3
J99	45G	Sauhamneset	70° 45.82	24° 19.2	NUCE LAP	SB																				1						2
J99	45B	Hammerfest area	70° 46	24° 6.5	GADU MOR	LI														24	25											
J99	45B1	Revsbotn	70° 46	24° 6.5	GADU MOR	LI																										25
J99	45B	Hammerfest area	70° 46	24° 6.5	GADU MOR	MU														29	30											
J99	45B1	Revsbotn	70° 46	24° 6.5	GADU MOR	MU																										30
J99	45F	Hammerfest area	70° 40	24° 40	PLEU PLA	LI																										5
J99	45F	Hammerfest area	70° 40	24° 40	PLEU PLA	MU																										5
J99	46A	Smines (Altesula)	70° 58.37	25° 48.1	MYTI EDU	SB														3	3	5										3
J99	46H	Honningsvåg	70° 59.11	25° 57.96	MYTI EDU	SB																										3
J99	46H	Honningsvåg	70° 59.11	25° 57.96	NUCE LAP	SB																				1						2
J99	47A	Kifjordneset	70° 52.87	27° 22.19	MYTI EDU	SB														3	3											2
J99	47G	Kifjordneset	70° 52.87	27° 22.19	NUCE LAP	SB																				1						2
J99	48A	Trollfjorden (Tanafjord)	70° 41.61	28° 33.28	MYTI EDU	SB														3	3	3										3
J99	48G	Mehamn	71° 2.55	27° 50.35	NUCE LAP	SB																				1						
J99	48G1	Trollfjorden (Tanafjord)	70° 41.61	28° 33.28	NUCE LAP	SB																										2
J99	49G	Syltefjorden	70° 33.01	30° 5.17	NUCE LAP	SB																										2
J99	49A	Nordfjorden (Syltefjord)	70° 33.01	30° 5.17	MYTI EDU	SB														3	3											3
J99	10A1	Skagodden	70° 6.21	30° 15.75	MYTI EDU	SB														3	3											
J99	10A2	Skallneset	70° 6.21	30° 15.75	MYTI EDU	SB																4	3	3	3	3	3	3	3	3	3	3
J99	10G3	Vardø	70° 22.65	31° 6.5	NUCE LAP	SB																										2
J99	10G4	Vadsø	70° 4.48	29° 42.9	NUCE LAP	SB																										2
J99	10B	Varangerfjorden	69° 56	29° 40	GADU MOR	BI																				22	21					
J99	10B	Varangerfjorden	69° 56	29° 40	GADU MOR	BL																				25	25					
J99	10B	Varangerfjorden	69° 56	29° 40	GADU MOR	LI														21	25	25	23	25	25	25	25	25	25	25	25	10
J99	10B	Varangerfjorden	69° 56	29° 40	GADU MOR	MU														25	30	30	27	30	30	30	30	30	30	30	30	12
J99	10B	Varangerfjorden	69° 56	29° 40	BROS BRO	LI														1												
J99	10B	Varangerfjorden	69° 56	29° 40	BROS BRO	MU														1												
J99	10F	Skogerøy	69° 55	29° 51	PLEU PLA	BI																				15	25					
J99	10F	Skogerøy	69° 55	29° 51	PLEU PLA	BL																				11	24					
J99	10F	Skogerøy	69° 55	29° 51	PLEU PLA	LI																	5		4	18	30	5	4	4	5	
J99	10F	Skogerøy	69° 55	29° 51	PLEU PLA	MU																	5		4	3	5	5	4	4	5	
J99	11A1	Sildkrokneset (south)	69° 47.11	30° 11.1	MYTI EDU	SB														3	3											
J99	11A2	Sildkrokneset (north)	69° 47.11	30° 11.1	MYTI EDU	SB																4	3									
J99	11G	Brashavn	69° 53.92	29° 44.65	NUCE LAP	SB																						1	1	2	2	2
J99	11X	Brashavn	69° 53.92	29° 44.65	MYTI EDU	SB																	3	3	3	3	3	3	3	3	3	3
J26	I001	Sponvikskansen	59° 5.41	11° 12.61	MYTI EDU	SB															3	3										
J26	I011	Kråkenebbet	59° 6.05	11° 17.33	MYTI EDU	SB															3	3										
J26	I021	Kjøkø (south)	59° 7.79	10° 57.11	MYTI EDU	SB															3	3	3	3		3	3	3				
J26	I022	West Damholmen	59° 6.11	11° 2.69	MYTI EDU	SB															3	3	3	3	3	3	3	3	3	3	3	3
J26	I023	Singlekalven (south)	59° 5.7	11° 8.2	MYTI EDU	SB															3	3	3	3	3	3	3	3	3	3	3	3
J26	I024	Kirkøy (north west)	59° 4.8	10° 59.18	MYTI EDU	SB															3	3	3	3	3	3	3	3	3	3	3	3
J26	I301	Akershuskaia	59° 54.32	10° 44.18	MYTI EDU	SB															3	3	3	3	3	3	3	3	3	3	3	3
J26	I304	Gåsøya	59° 51.08	10° 35.34	MYTI EDU	SB															3	3	3	3	3	3	3	3	3	3	3	3
J26	I306	Håøya	59° 42.8	10° 33.31	MYTI EDU	SB															3	3	3	3	3	3	3	3	3	3	3	3
J26	I307	Ramtonholmen	59° 44.67	10° 31.37	MYTI EDU	SB															3	3	3	3	3	3	3	3	3	3	3	3
J99	I711	Steinholmen	59° 3.11	9° 40.62	MYTI EDU	SB															3	4	3	3	3	3		3				
J99	I712	Gjemesholmen	59° 2.72	9° 42.41	MYTI EDU	SB															3	4	3	3	3	3	3	3	3	3	3	3

jmpco	jmpst	stnam	nomlat	nomlon	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
J99	I713	Strømtangen	59° 3.02	9° 41.5	MYTI EDU	SB																						3	3	3	3	3
J99	I131A	Lastad	58° 3.33	7° 42.52	MYTI EDU	SB															3	3	3	3	3	3	3	3	3	3	3	3
J99	I132	Svensholmen	58° 7.5	7° 59.33	MYTI EDU	SB																		3	3	3	3	3	3	3	3	3
J99	I1321	Fiskåtangen	58° 7.7	7° 58.6	MYTI EDU	SB															4	4	3									
J99	I133	Odderø (west)	58° 7.9	8° 0.1	MYTI EDU	SB															4	4	3	3	3	3	3	3	3	3	3	3
J99	I201	Ekkjegrunn (G1)	59° 38.6	6° 21.44	MYTI EDU	SB															3	3	3	3	3	3	3	3	3	3	3	3
J99	I205	Bølsnes (G5)	59° 35.5	6° 18.01	MYTI EDU	SB															3		3	3	3	3	3	3	3	3	3	3
J99	I241	Nordnes	60° 24.04	5° 18.1	MYTI EDU	SB															3	3	3	3	3	3	3	3	3	3	3	3
J99	I242	Gravdalsneset	60° 23.69	5° 16.01	MYTI EDU	SB															3	3	3	3	3	3	3	3	3	3	3	3
J99	I916	Sundalsfjord (Hydro kai)	62° 41.05	8° 33.11	MYTI EDU	SB																								3	3	
J99	I243	Hegreneset	60° 24.92	5° 18.29	MYTI EDU	SB															3	3	3	3	3	3	3	3	3	3	3	3
J99	I914	Flåøya (southeast)	62° 45.35	8° 26.7	MYTI EDU	SB																								3		
J99	I915	Flåøya (northwest)	62° 45.48	8° 26.39	MYTI EDU	SB																								3	3	3	3
J99	I911	Horvika	62° 44.1	8° 31.4	MYTI EDU	SB															3	3										
J99	I913	Fjøseid	62° 48.59	8° 16.48	MYTI EDU	SB																			3	3	3	3	3	3	3	3
J99	I912	Honnhammer	62° 51.2	8° 9.7	MYTI EDU	SB															3	3	3	3	3	3	3	3	3	3	3	3
J65	I080	Østmerknes	63° 27.44	10° 26.97	MYTI EDU	SB															3	3										
J99	I965	Moholmen (B5)	66° 18.72	14° 7.55	MYTI EDU	SB																						3	3	3	3	3	3
J99	I962	Koksverktomta (B2)	66° 19.57	14° 8.38	MYTI EDU	SB															3	3	2	3								
J99	I964	Toraneskaien	66° 19.3	14° 7.97	MYTI EDU	SB																						3	3	3	3	3
J99	I969	Bjørnbærviken (B9)	66° 16.81	14° 2.08	MYTI EDU	SB															3	3	3	3	3	3	3	3	3	3	3	3
J99	R096	Breiviken (Tomma)	66° 17.65	12° 50.48	MYTI EDU	SB															3	3										
J26	A3*	Svartskjær	°	°	MYTI EDU	SB	1																									

Appendix D.
Map of stations

Nominel station positions 1981-2006

Appendix D. (cont.) Map of stations

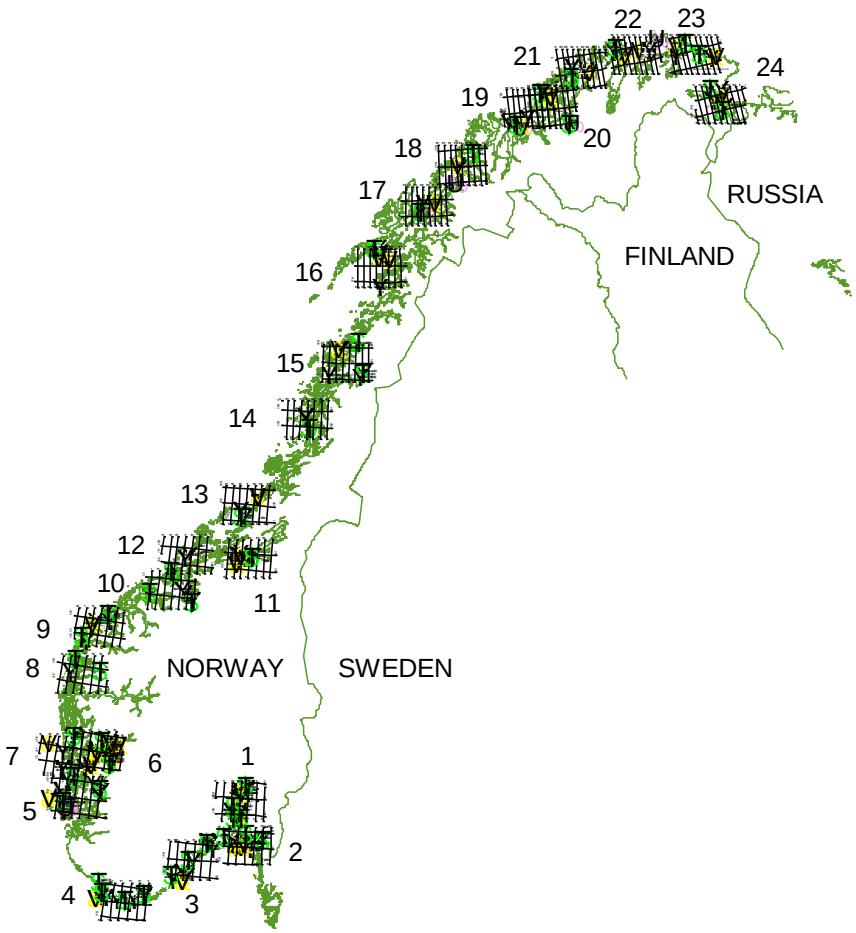
NOTES

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.

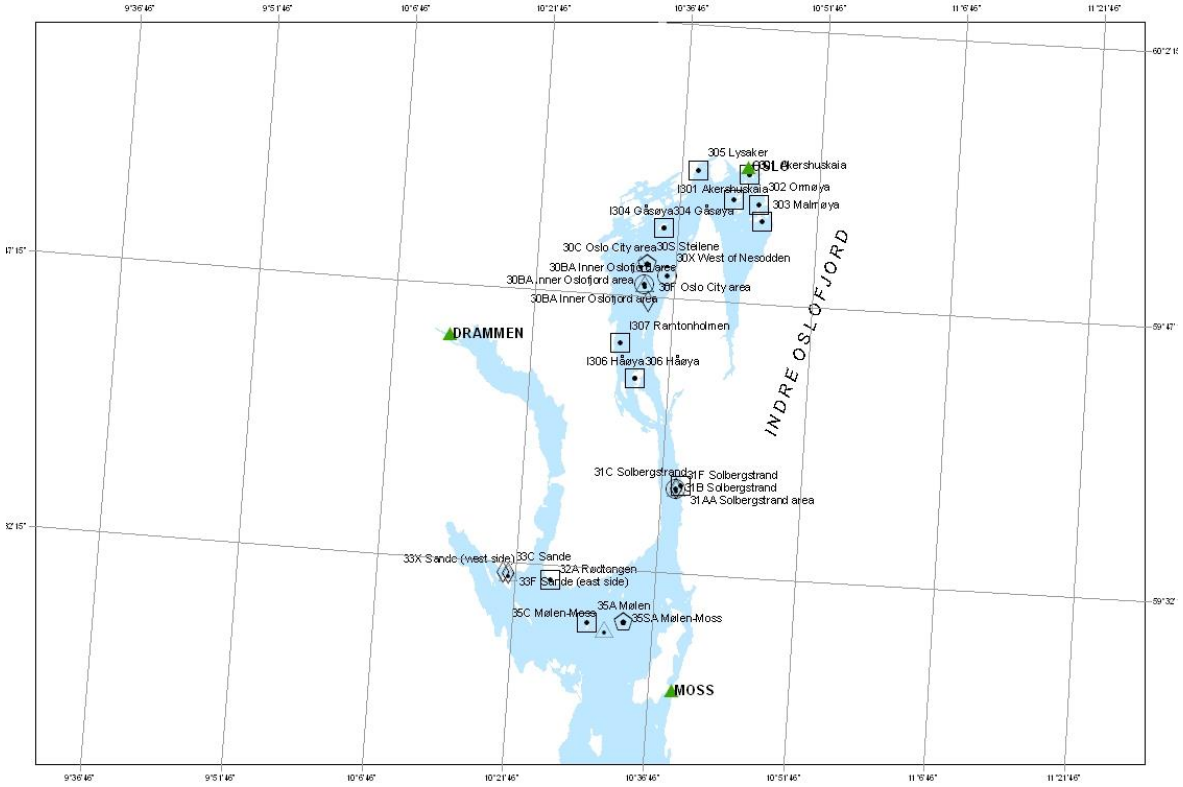
The following symbols and codes apply:

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

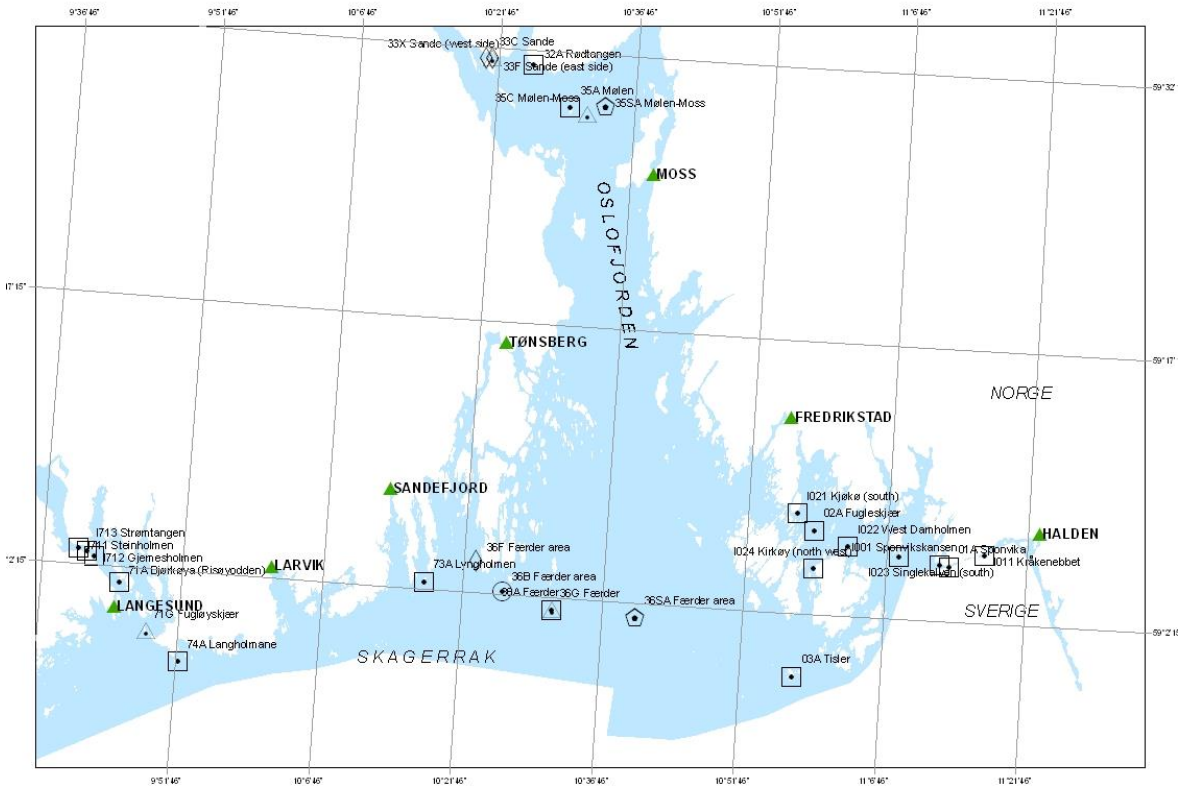
1) Supplementary station used in SFT bluemussel pollution (I) or reference (R) index



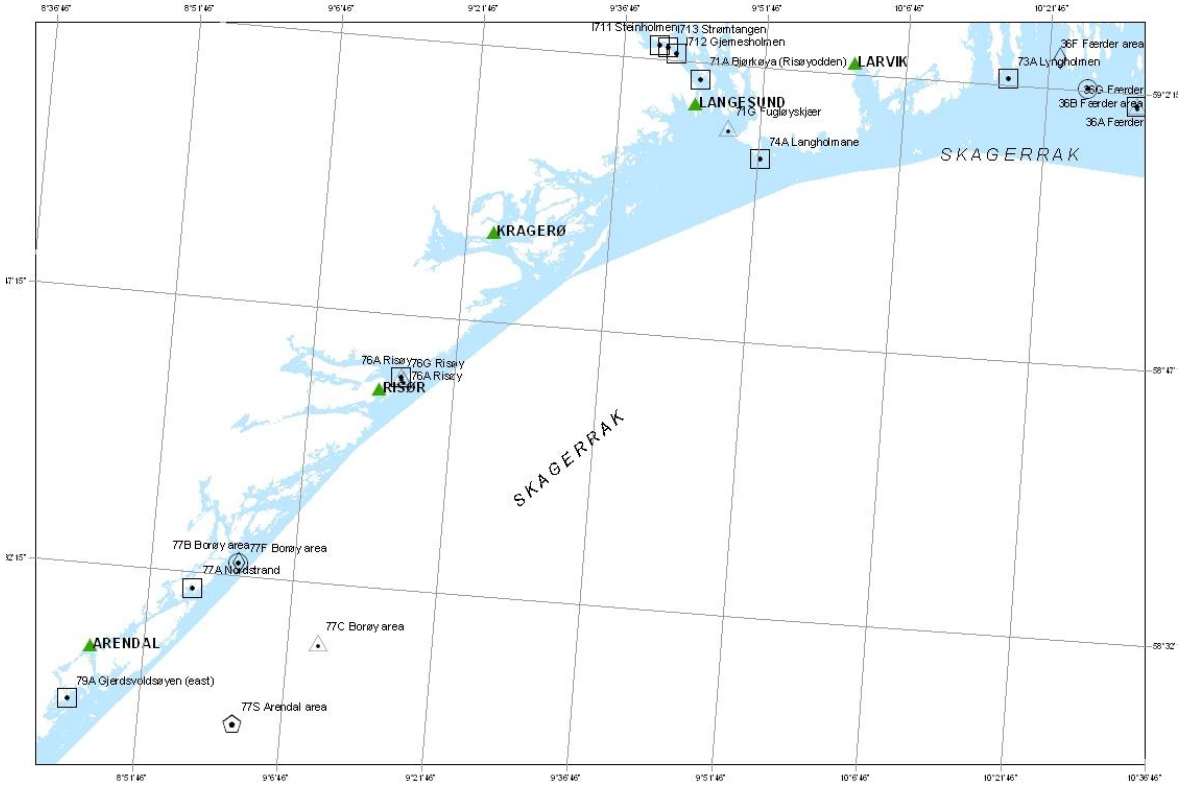
JAMP stations Norway. Numbers indicate map reference that follow.
Note: distance between two lines of latitude is 15 nautical miles (= 27.8 km).


305 Lysaker
I301 Akershuskaia
302 Ormøya
303 Malmøya
I304 Gåsøya
304 Gåsøya
30C Oslo City area
30S Steilene
30X West of Nesodden
30BA Inner Oslofjord area
30F Oslo City area
I307 Rambtonholmen
DRAMMEN
I306 Håøya
306 Håøya
INDRE OSLOFJORD
31C Solbergstrand
31F Solbergstrand
31B Solbergstrand
31AA Solbergstrand area
33X Sandø (west side)
33C Sande
32A Rødtangen
33F Sande (east side)
35C Mølen-Moss
35A Mølen
35SA Mølen-Moss
MOSS

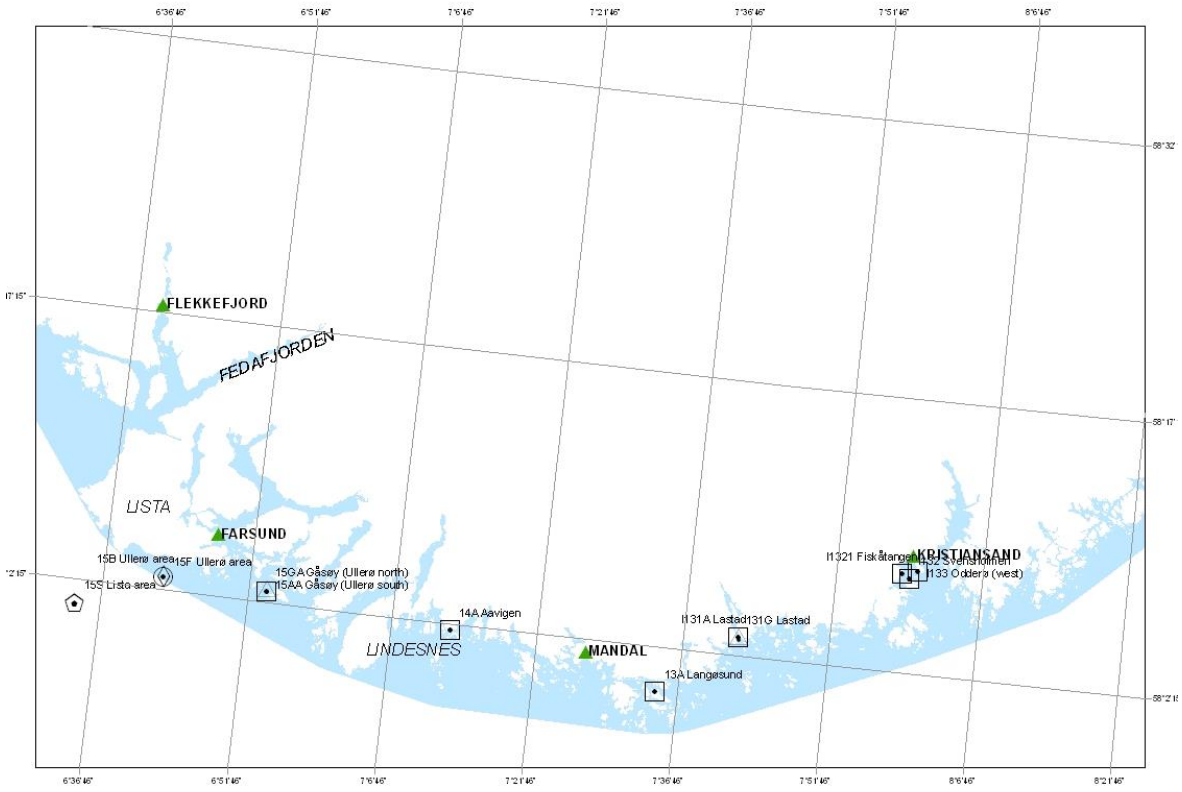
MAP 1


33X Sandø (west side)
33C Sande
32A Rødtangen
33F Sande (east side)
35C Mølen-Moss
35A Mølen
35SA Mølen-Moss
MOSS
OSLOFJORDEN
TØNSBERG
NORGE
FREDRIKSTAD
SANDEFJORD
I021 Kjøkø (south)
02A Fugleskjær
I022 West Damholmen
I024 Kirkøy (north west)
I001 Spjærvikskansen
01A Spjærvika
I011 Kråkenebbet
I023 Singlekalven (south)
HALDEN
I713 Strømtangen
I711 Steinholmen
I712 Gjemesholmen
71A Bjørkøya (Risøyodden)
LARVIK
73A Lyngholmen
36F Færder area
36B Færder area
36A Færder
36G Færder
36SA Færder area
LANGESUND
71G Fugløyskjær
74A Langholmane
SKAGERRAK
SVERIGE
03A Tisler

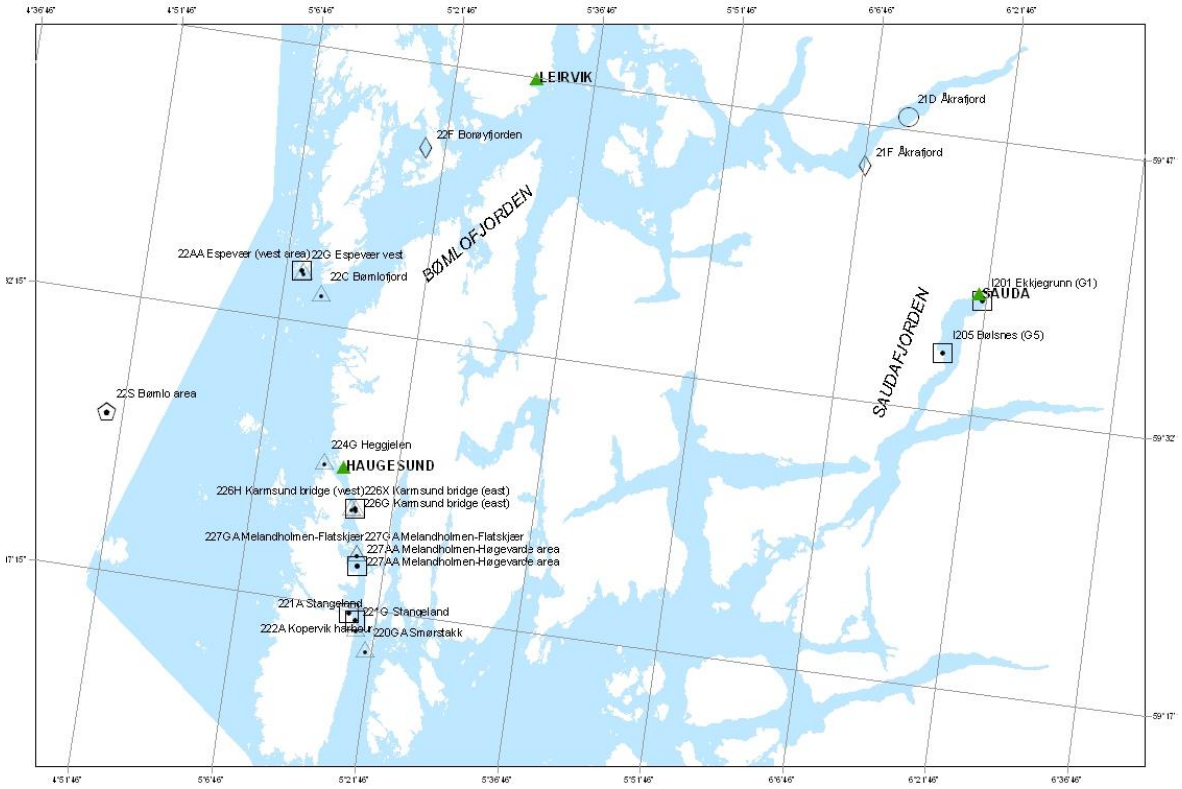
MAP 2


I711 Steinholmen
I713 Strømtangen
I712 Gjemesholmen
71A Bjørkøya (Risøyodden)
LARVIK
73A Lyngholmen
36F Feerder area
36G Feerder
36B Feerder area
36A Feerder
LANGESUND
71G Ugløyskjær
74A Langholmane
SKAGERRAK
KRAGERØ
76A Risøy
76G Risøy
76A Risøy
RISØR
SKAGERRAK
77B Borøy area
77F Borøy area
77A Nordstrand
77C Borøy area
ARENDAL
79A Gjerdsvoldsøyen (east)
77S Arendal area

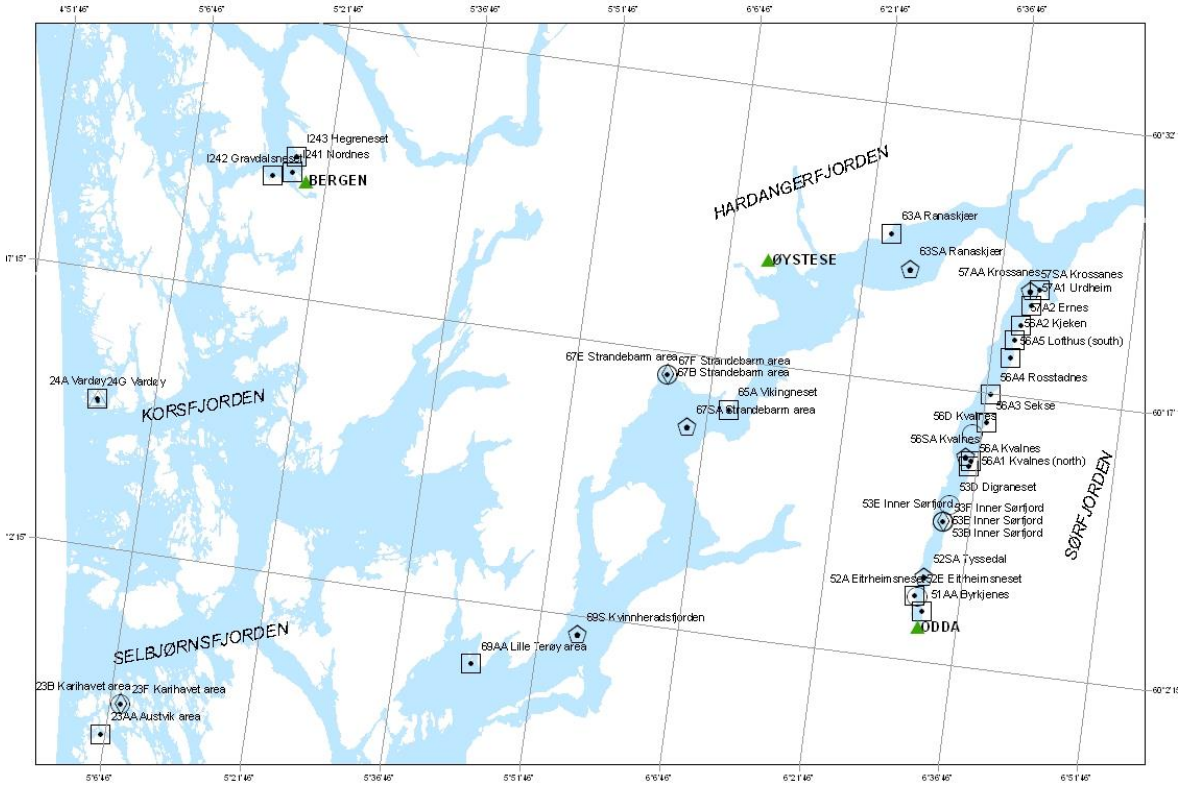
MAP 3


FLEKKEFJORD
FEDAFJORDEN
LISTA
FARSUND
15B Ullerø area
15F Ullerø area
15S Lista area
15GA Gåsøy (Ullerø north)
15AA Gåsøy (Ullerø south)
14A Aavigen
UNDESNES
MANDAL
13A Langesund
I131A Lastad
131G Lastad
I321 Fiskåtangen
KRISTIANSAND
I32 Svenskholmen
I33 Oddera (west)

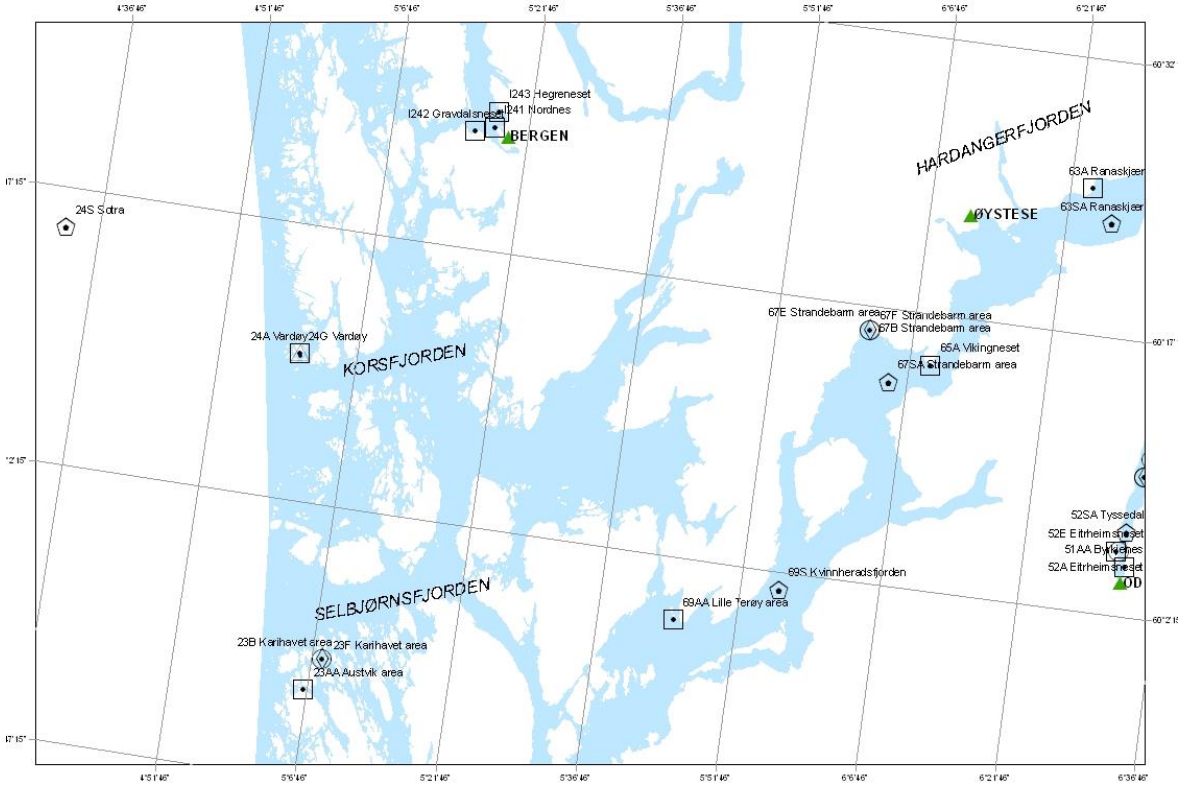
MAP 4


LEIRVIK
21D Åkrafjord
22F Børøyfjorden
21F Åkrafjord
BØMLOFJORDEN
22AA Espevær (west area)
22G Espevær vest
22C Bømlofjord
I201 Ekkjegrunn (G1)
SAUDA
SAUDAFJORDEN
I205 Bølsnes (G5)
22S Bømlo area
224G Heggjelen
HAUGESUND
226H Karmsund bridge (west)
226X Karmsund bridge (east)
226G Karmsund bridge (east)
227GA Melandholmen-Flatskjær
227AA Melandholmen-Høgevarde area
221A Stangeland
221G Stangeland
222A Kopervik harbour
220GA Smørstakk

MAP 5


I243 Hegreneset
I241 Nordnes
I242 Gravdalsneset
BERGEN
HARDANGERFJORDEN
63A Ranaskjær
ØYSTESE
63SA Ranaskjær
57AA Krossanes
57SA Krossanes
57A1 Urdheim
57A2 Ernes
56A2 Kjeken
56A5 Lothus (south)
56A4 Rosstadnes
67E Strandebarm area
67F Strandebarm area
67B Strandebarm area
24A Vardøy
24G Vardøy
KORSFJORDEN
65A Vikingneset
67SA Strandebarm area
56A3 Sekse
56D Kvalnes
56SA Kvalnes
56A Kvalnes
56A1 Kvalnes (north)
53D Digraneset
53E Inner Sørfjord
53F Inner Sørfjord
53E Inner Sørfjord
53B Inner Sørfjord
SØRFJORDEN
52SA Tyssedal
52A Eitrheimsneset
52E Eitrheimsneset
51AA Byrkjenes
ODDA
69S Kvinnheradsfjorden
SELBJØRNSFJORDEN
69AA Lille Terøy area
23B Karihavet area
23F Karihavet area
23AA Austvik area

MAP 6


I243 Hegreneset
I242 Gravdalsneset
I241 Nordnes
BERGEN
HARDANGERFJORDEN
63A Ranaskjær
63SA Ranaskjær
ØYSTESE
24S Sotra
67E Strandebarm area
67F Strandebarm area
67B Strandebarm area
24A Vardøy
24G Vardøy
KORSFJORDEN
65A Vikingneset
67SA Strandebarm area
52SA Tysseda
52E Eitrheim
51AA Bykle
52A Eitrheim
OD
69S Kvinnherad sfjorden
SELBJØRNSFJORDEN
69AA Lille Terøy area
23B Karihavet area
23F Karihavet area
23AA Austvik area

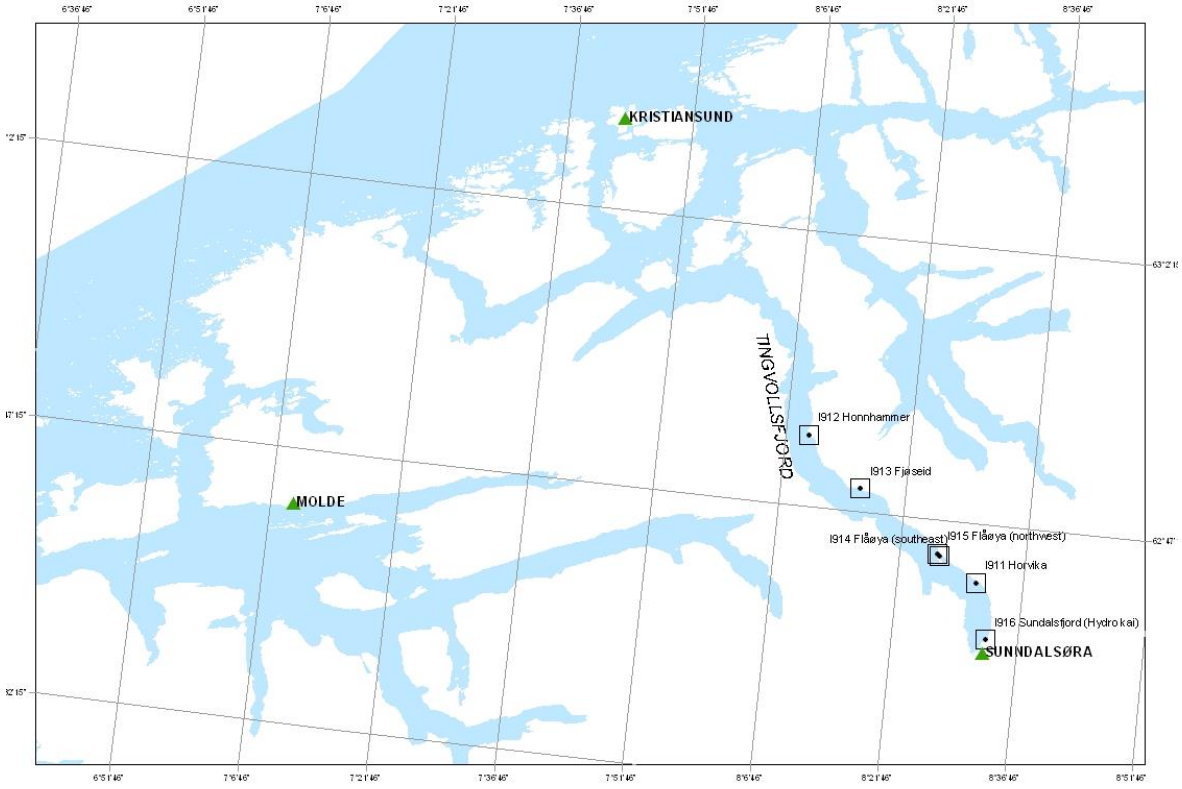
MAP 7


FLORØ
STAVFJORDEN
FØRDE
25AA Hinnøy area
25GA Hinnøy area
VILNESFJORDEN
SOGNEFJORDEN

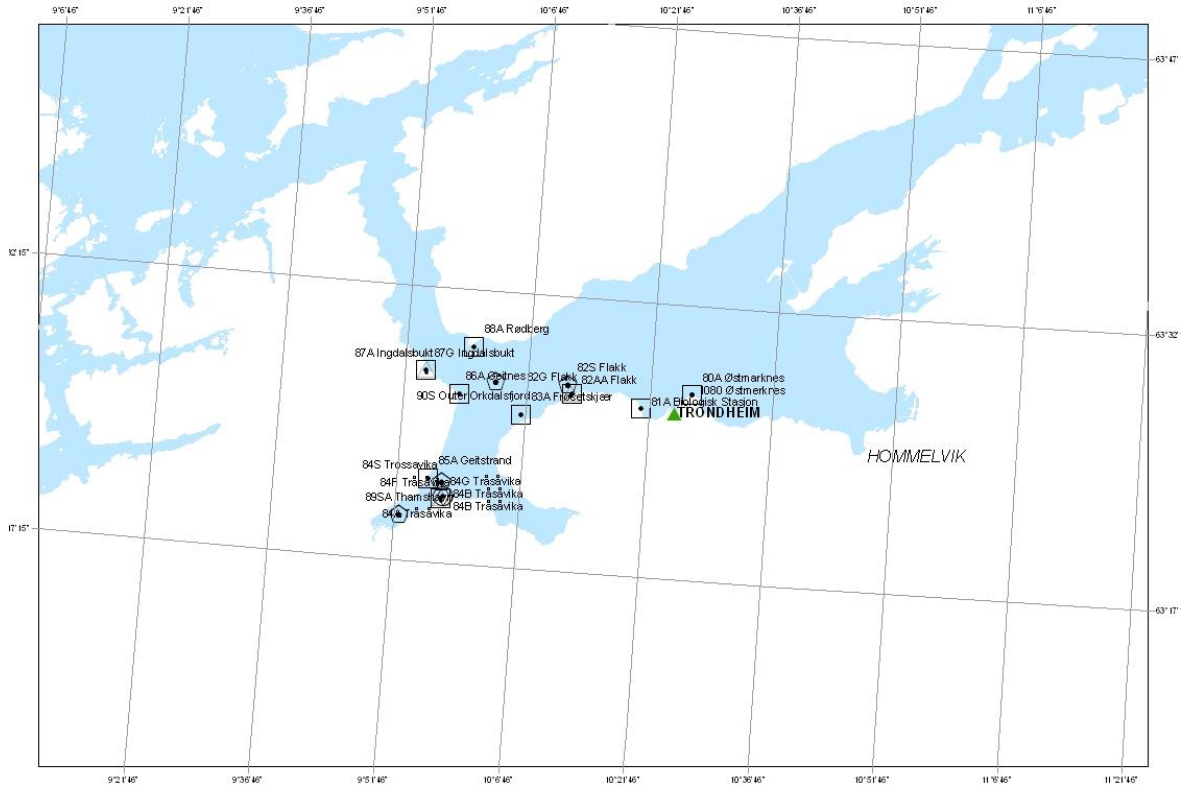
MAP 8


ÅLESUND
ULSTEINVIK
28H Øveråneset (Hareid)
28G Grønevikholmen (Eiksundet)
28AA Eiksundet area
27AA Grinden area
27F Storholmen
27S Stadtlandet (east)
27GA Røydeskjær area
STADTLANDET
MÅLØY
26AA Hamnen area
26G Hamnen

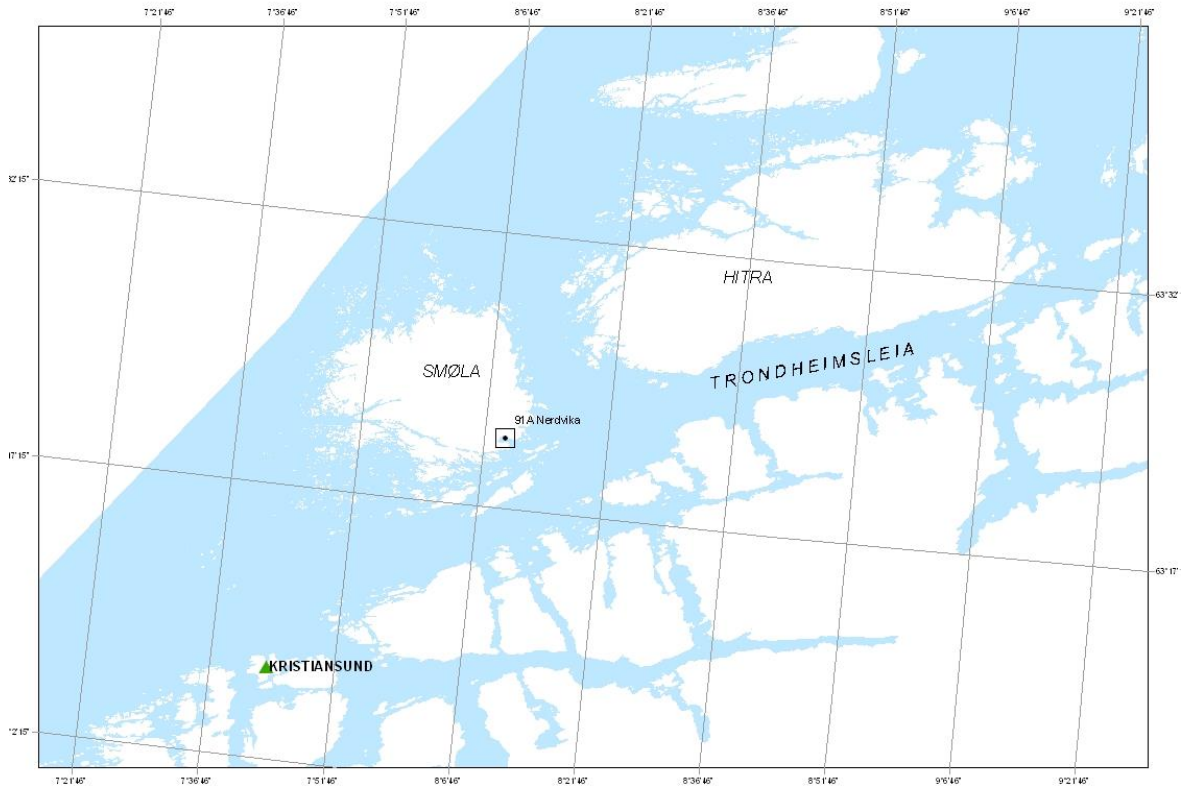
MAP 9


KRISTIANSUND
TINGVOLLSFJORD
I912 Honnhammer
I913 Fjøseid
MOLDE
I914 Flåøya (southeast)
I915 Flåøya (northwest)
I911 Horvika
I916 Sundalsfjord (Hydro kai)
SUNNDALSØRA

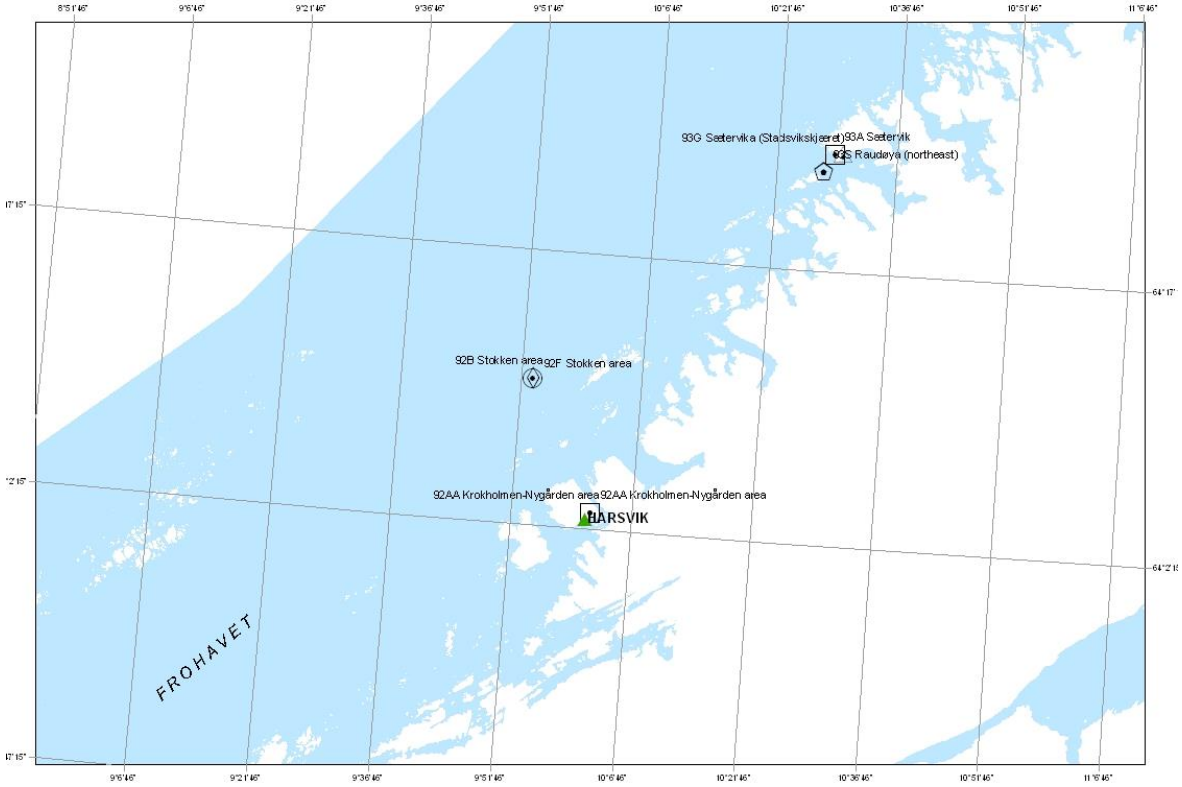
MAP 10


88A Rødberg
87A Ingdalsbukt
87G Ingdalsbukt
86A Agdenes
82G Flakk
82S Flakk
82AA Flakk
80A Østmarknes
080 Østmarknes
90S Outer Orkdalsfjord
83A Frøsetskjær
81A Biologisk Stasjon
TRONDHEIM
HOMMELVIK
84S Trossavika
85A Geitstrand
84F Trossavika
84G Trossavika
89SA Thamshavn
84B Trossavika
84 Trossavika

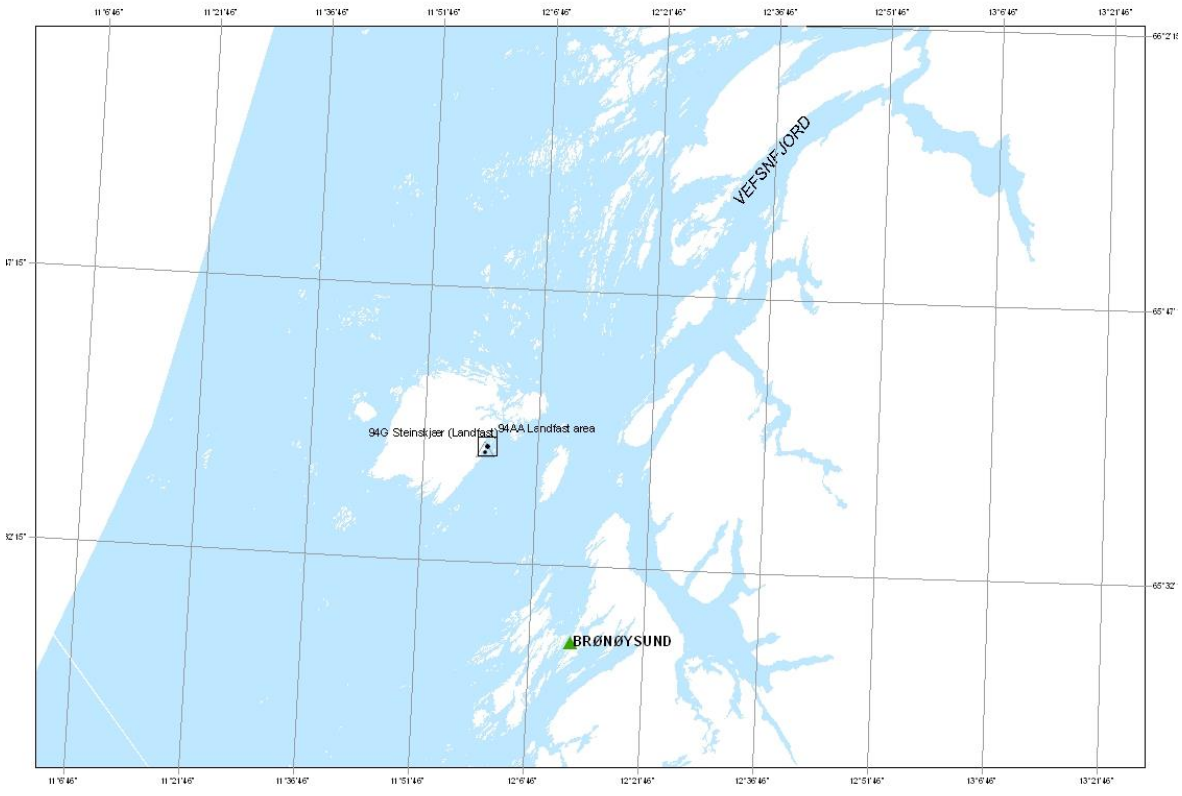
MAP 11


HITRA
TRONDHEIMSLEIA
SMØLA
91A Nerdvika
KRISTIANSUND

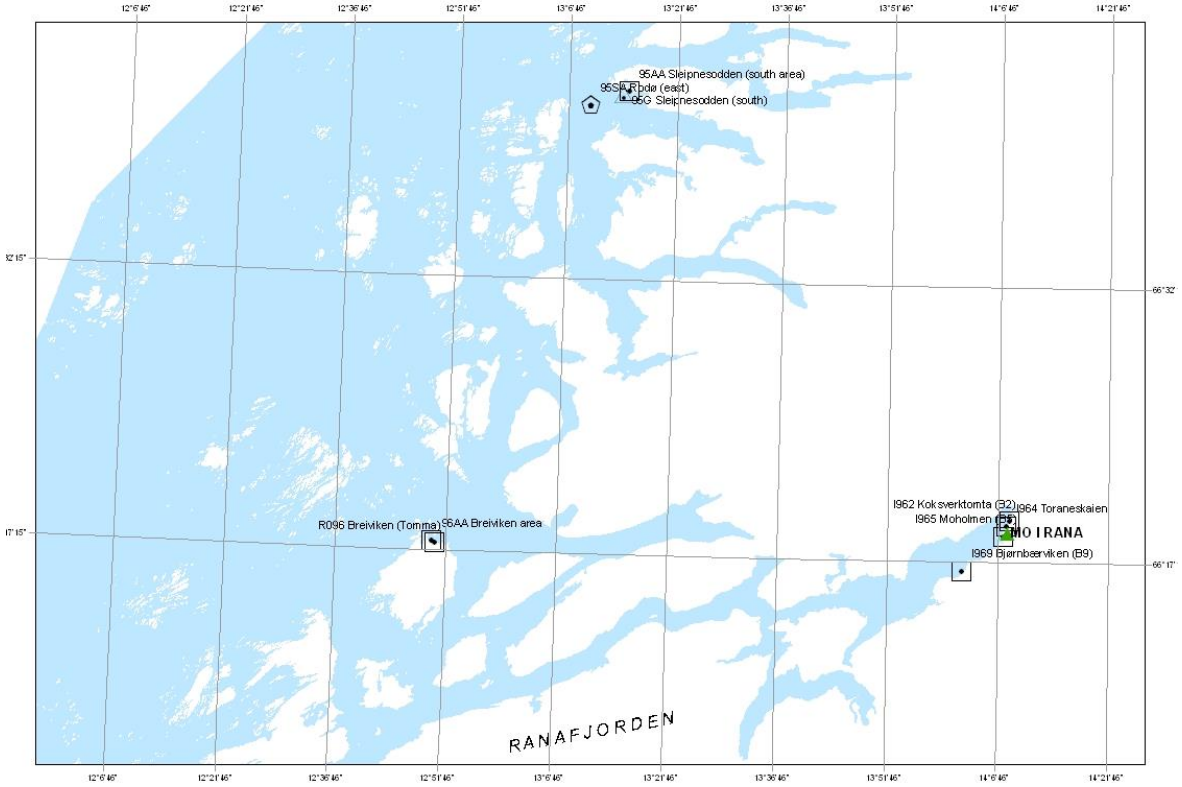
MAP 12


93G Sætervika (Statsvikskjæret)
93A Sætervik
93S Raudøya (northeast)
92B Stokken area
92F Stokken area
92AA Krokholmen-Nygården area
92AA Krokholmen-Nygården area
HARSVIK
FROHAVET

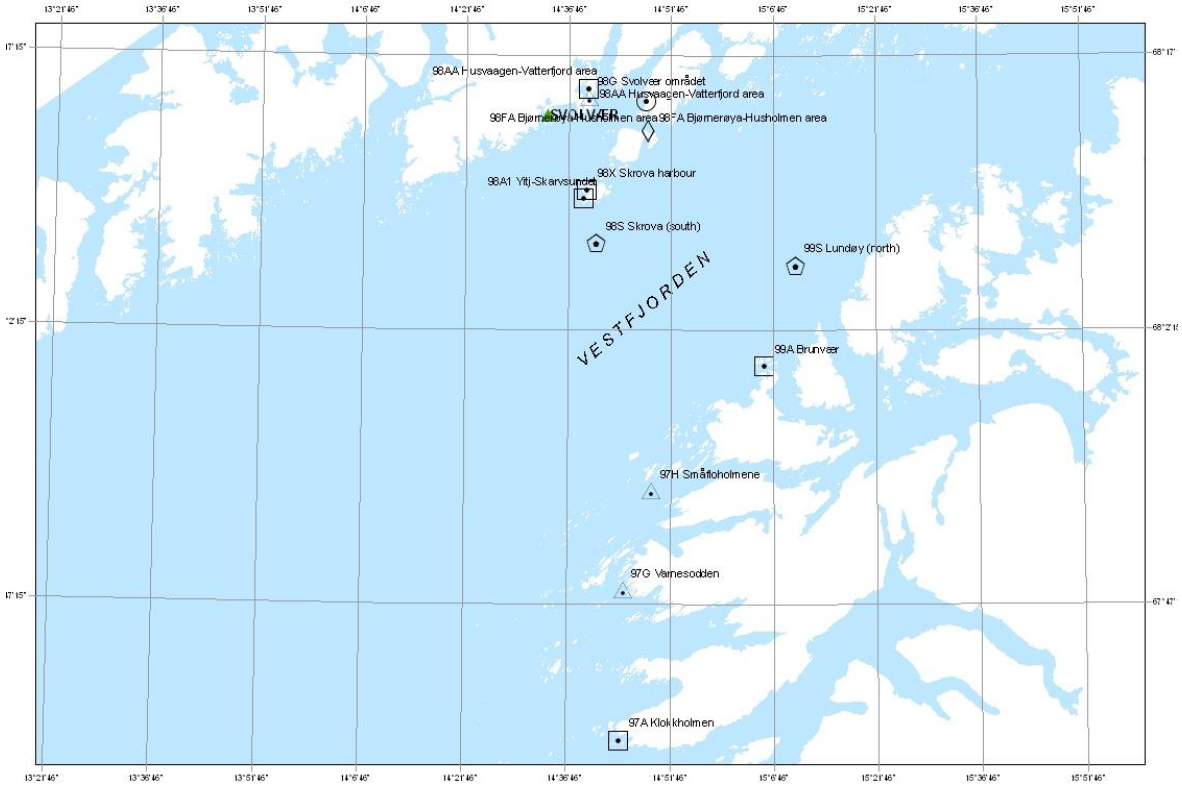
MAP 13


VEFSNFJORD
94G Steinskjær (Landfast)
94AA Landfast area
BRØNØYSUND

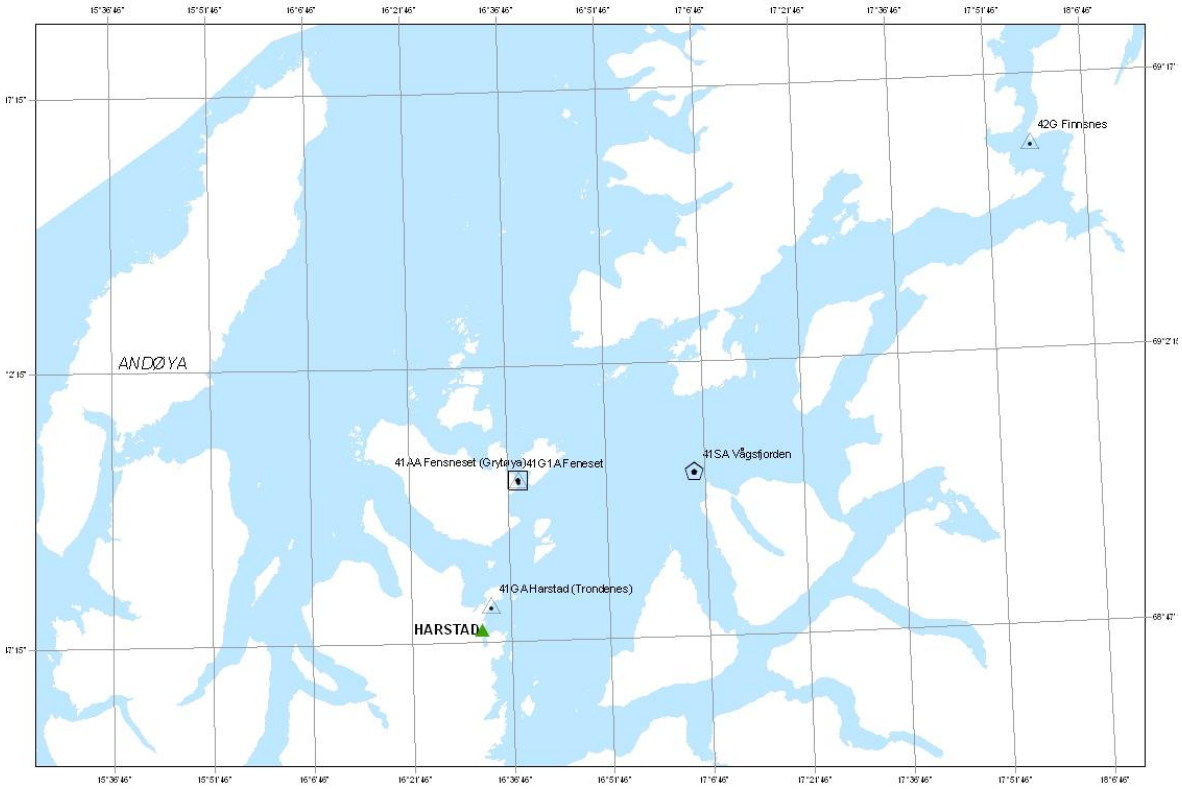
MAP 14


95AA Sleipnesodden (south area)
95SA Rbdø (east)
95G Sleipnesodden (south)
R096 Breiviken (Tomma)
96AA Breiviken area
I962 Koksverktomta (B2)
I964 Toraneskaien
I965 Moholmen (B6)
MO I RANA
I969 Bjørnbærviken (B9)
RANAFJORDEN

MAP 15


98AA Husvaagen-Vatterfjord area
98G Svolvær området
98AA Husvaagen-Vatterfjord area
SVOLVÆR
98FA Bjørnerøya-Husholmen area
98FA Bjørnerøya-Husholmen area
98A1 Ytti-Skarvsundet
98X Skrova harbour
98S Skrova (south)
99S Lundøy (north)
VESTFJORDEN
99A Brunvær
97H Småfloholmene
97G Vamesodden
97A Klokkholmen

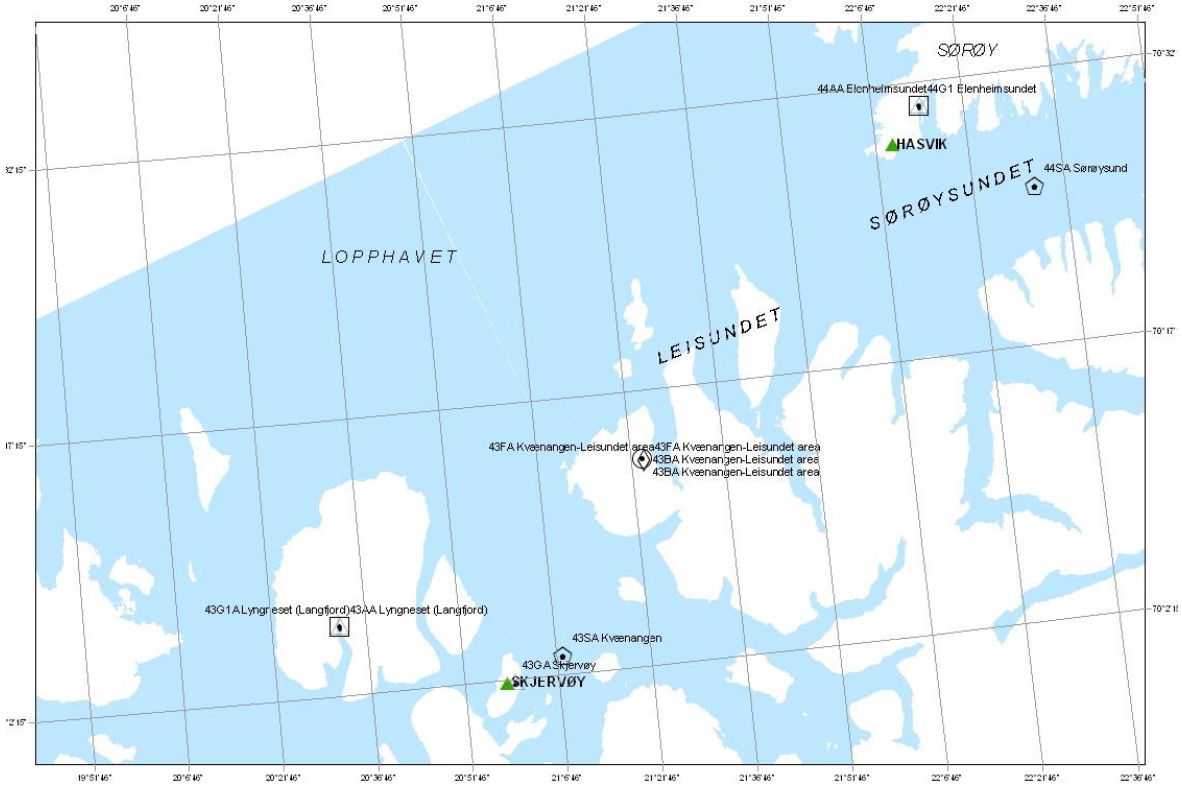
MAP 16


42G Finnsnes
ANDØYA
41AA Fensneset (Grytøya)
41G1A Feneset
41SA Vågsfjorden
41GA Harstad (Trondenes)
HARSTAD

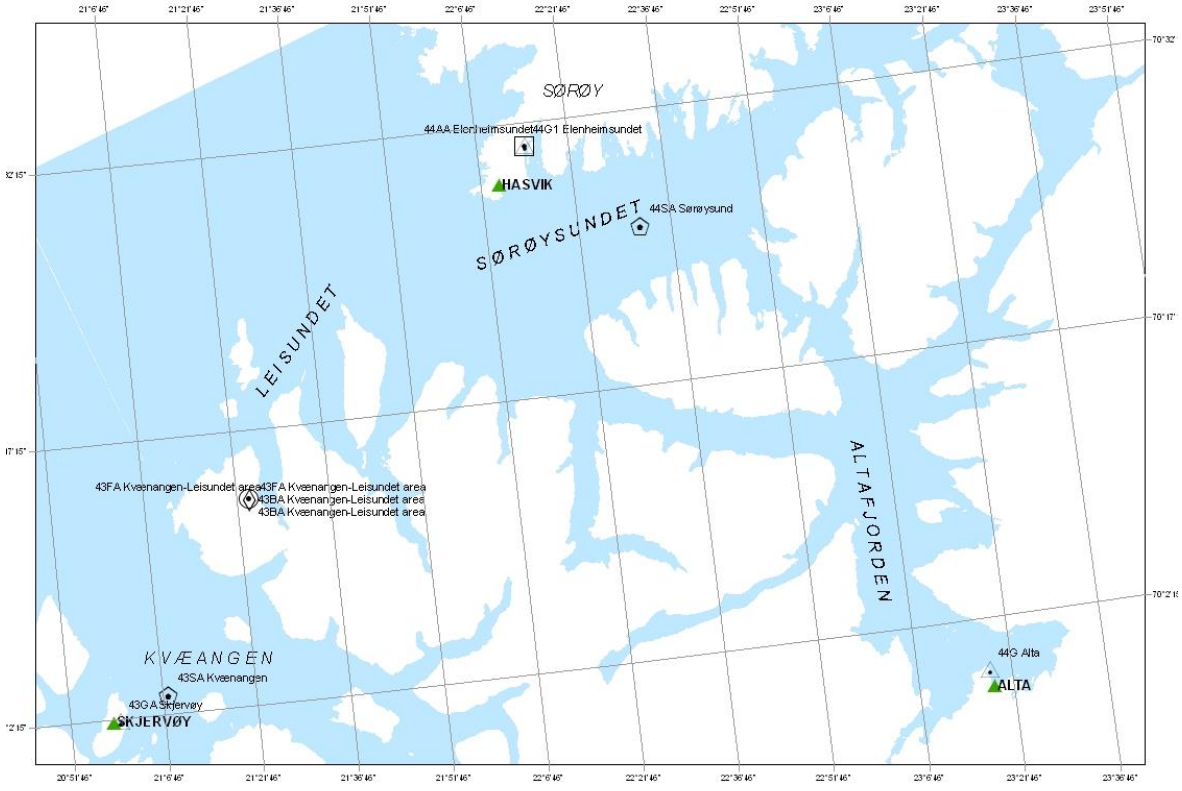
MAP 17


TROMSØ
KVALØY
MALANGEN
42SA Malangen
42AA Tennskjær (Malangen)
42G Finnsnes

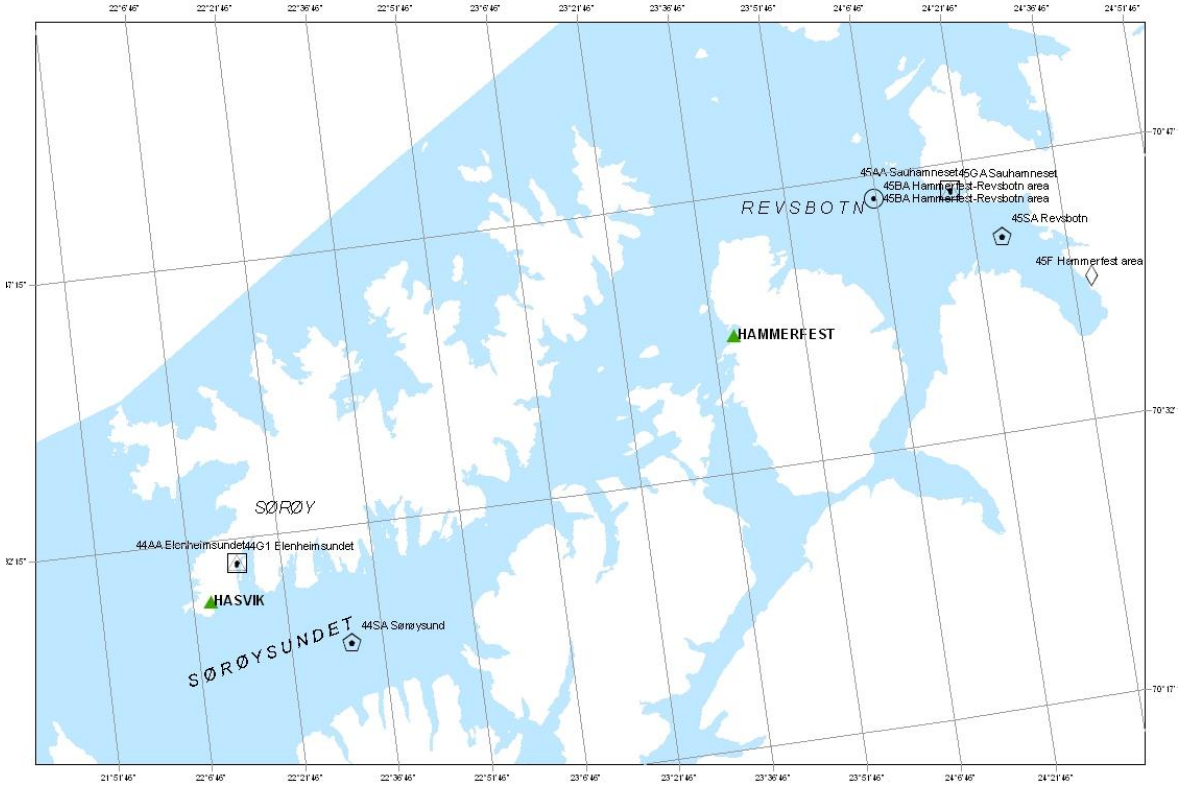
MAP 18


SØRØY
44AA Elenheimsundet44G1 Elenheimsundet
HASVIK
44SA Sørøysund
SØRØYSUNDET
LOPPHAVET
LEISUNDET
43FA Kvænangen-Leisundet area43FA Kvænangen-Leisundet area
43BA Kvænangen-Leisundet area
43BA Kvænangen-Leisundet area
43G1A Lyngneset (Langfjord)43AA Lyngneset (Langfjord)
43SA Kvænangen
43GA Skjervøy
SKJERVØY

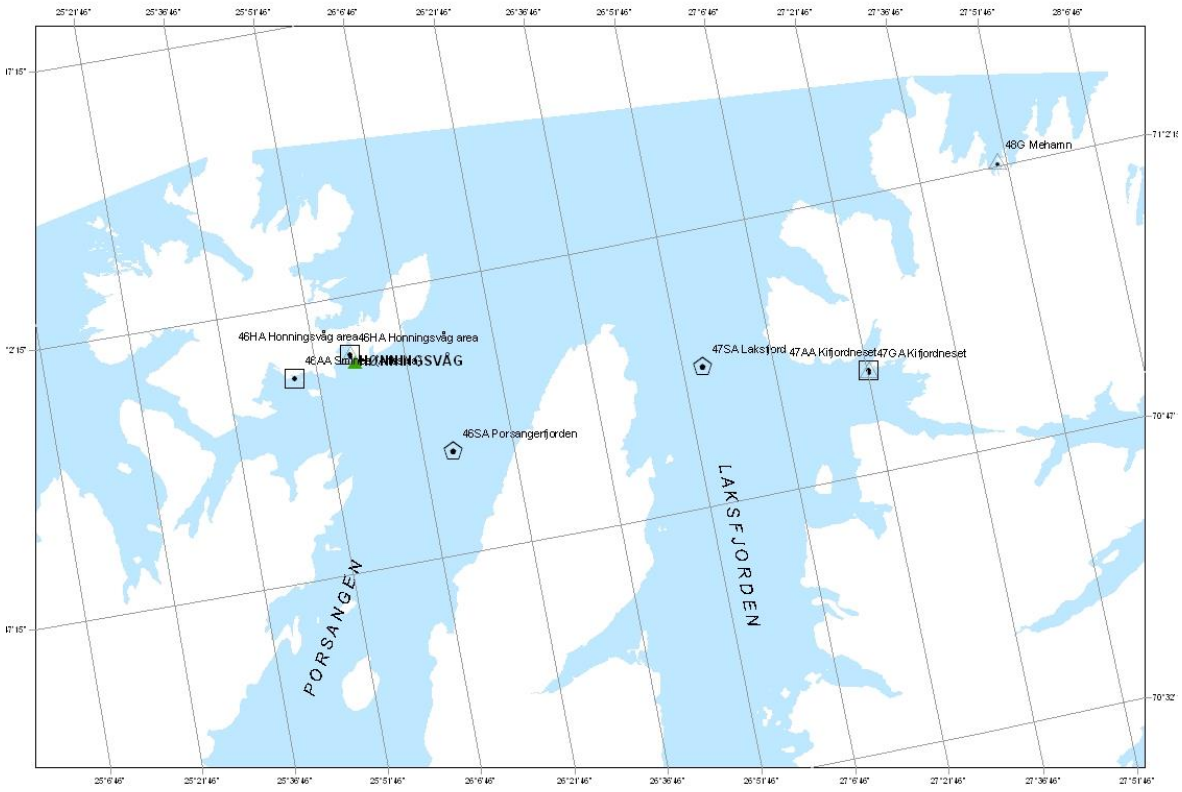
MAP 19


SØRØY
44AA Elenheimsundet44G1 Elenheimsundet
HASVIK
SØRØYSUNDET
44SA Sørøysund
LEISUNDET
ALTAFJORDEN
43FA Kvænangen-Leisundet area43FA Kvænangen-Leisundet area
43BA Kvænangen-Leisundet area
43BA Kvænangen-Leisundet area
KVÆANGEN
43SA Kvænangen
43GA Skjervøy
SKJERVØY
44G Alta
ALTA

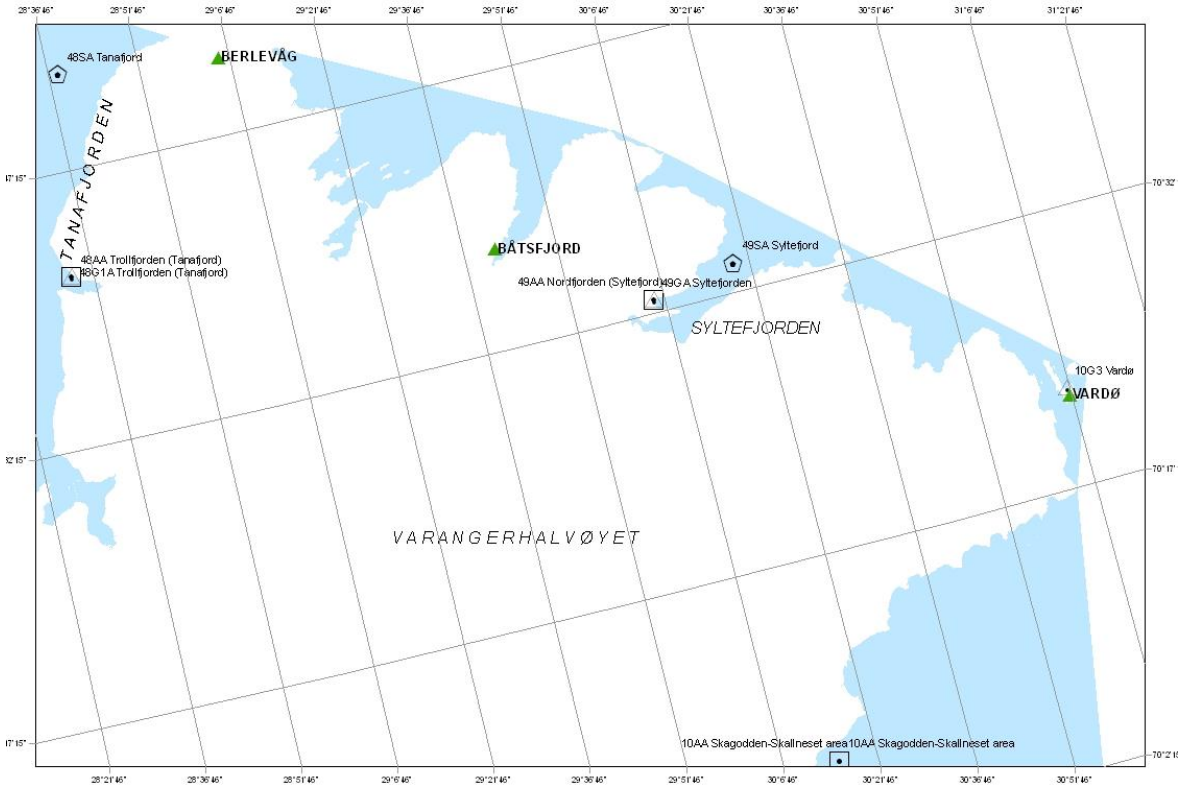
MAP 20


45AA Sauhamneset
45GA Sauhamneset
45BA Hammerfest-Revsbotn area
45BA Hammerfest-Revsbotn area
REVSBOTN
45SA Revsbotn
45F Hammerfest area
HAMMERFEST
SØRØY
44AA Elenheimsundet
44G1 Elenheimsundet
HASVIK
44SA Sørøysund
SØRØYSUNDET

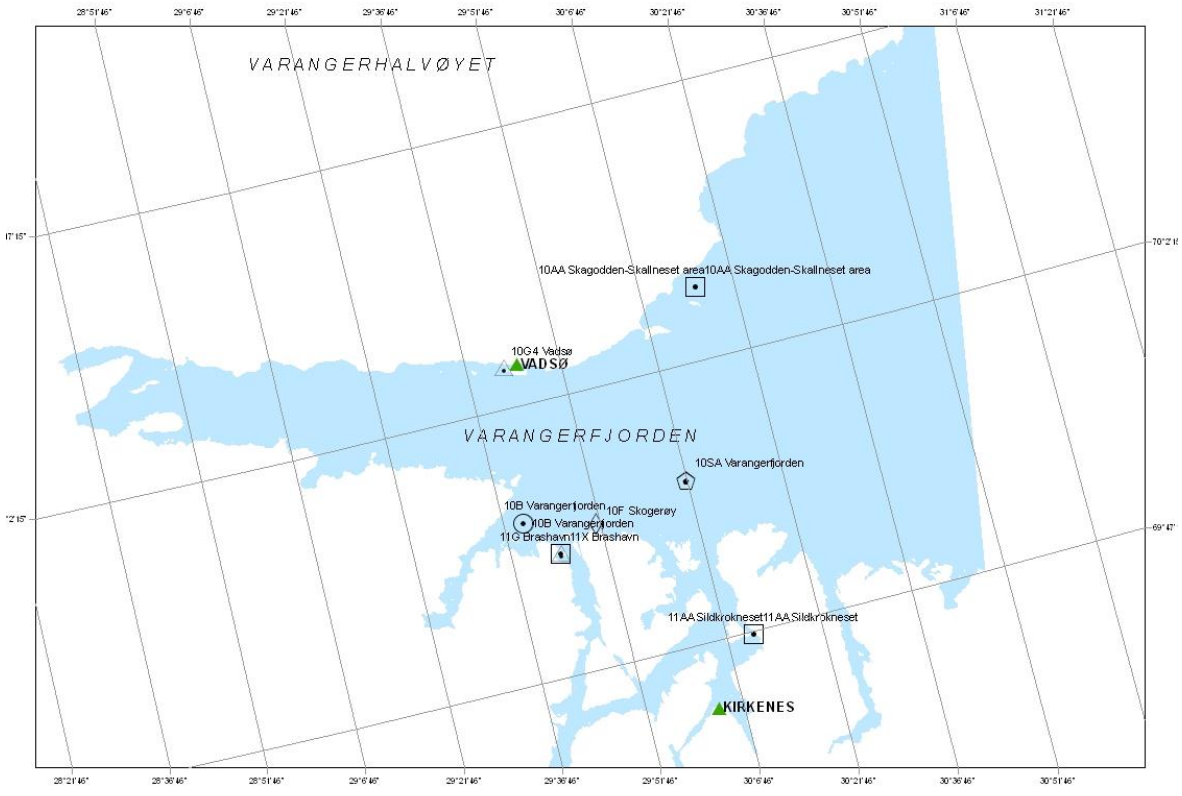
MAP 21


48G Mehamn
46HA Honningsvåg area
46HA Honningsvåg area
47SA Lakselord
47AA Kjelfordneset
47GA Kjelfordneset
46SA Porsangerfjorden
PORSANGEN
LAKSFJORDEN

MAP 22


48SA Tanafjord
BERLEVÅG
TANAFJORDEN
48AA Trollfjorden (Tanafjord)
48G1A Trollfjorden (Tanafjord)
BÅTSFJORD
49SA Syltefjord
49AA Nordfjorden (Syltefjord)
49GA Syltefjorden
SYLTEFJORDEN
10G3 Vardø
VARDØ
VARANGERHALVØYET
10AA Skagodden-Skallneset area
10AA Skagodden-Skallneset area

MAP 23


VARANGERHALVØYET
10AA Skagodden-Skallneset area
10AA Skagodden-Skallneset area
10G4 Vadsø
VADSØ
VARANGERFJORDEN
10SA Varangerfjorden
10B Varangerfjorden
10F Skogerøy
10B Varangerfjorden
11G Brashavn
11X Brashavn
11AA Sildkrokneset
11AA Sildkrokneset
KIRKENES

MAP 24

Appendix E.
SEDIMENT 1986-2006
RAW DATA

NOTES

This appendix presents mean concentrations of the contaminants found in sediment. All data are on a dry weight basis. Three units of measure are used: **ppt** (parts per thousand), **ppm** (parts per million, mg/kg), and **ppb** (parts per billion, µg/kg). The numeric values shown have been printed with a fixed number of digits and do not necessarily indicate analytical precision. Refer also to the comments preceding the table.

The sample area code refers to the official JAMP designation and for some areas this may be undefined (J99).

Sample area	Geographically beginning with those stations near the Swedish border and continuing around the coast to the Russian border (cf., maps (Appendix D.). The sample area code refers to the official JAMP designation and for some areas this may be undefined (J99).
Locality	Station name and postion.The data are sorted geographically along the coast from the Swedish border in the south to the Russian border in the north (cf., maps (Appendix D.) and Appendix B.)
Type	refers to sample method: where GC=gravity corer (used by NIVA).
Diameter	refers to inner diameter (mm) of GC

The abbreviations for analytical laboratory and variable name are explained in Appendix A. An overview of variables, analysis code, detection limits and data count has been described Green *et al.*(2008b).

Appendix_E_Sediment_1986-2006_raw_data (86 pp)

Appendix F.
SEDIMENT 1986-2006
MEAN CONCENTRATIONS

NOTES

This appendix presents mean concentrations of the contaminants found in sediment. All data are on a dry weight basis and include count, mean and standard deviation for parallel samples, if relevant. Three units of measure are used: **ppt** (parts per thousand), **ppm** (parts per million, mg/kg), and **ppb** (parts per billion, µg/kg). The numeric values shown have been printed with a fixed number of digits and do not necessarily indicate analytical precision. Refer also to the comments preceding the table.

The sample area code refers to the official JAMP designation and for some areas this may be undefined (J99).

Sample area Geographically beginning with those stations near the Swedish border and continuing around the coast to the Russian border (cf., maps, Appendix D.). The sample area code refers to the official JAMP designation and for some areas this may be undefined (J99).

Locality Station name and postion. The data are sorted geographically along the coast from the Swedish border in the south to the Russian border in the north (cf., maps (Appendix D.) and Appendix B.).

Type refers to sample method: where GC=gravity corer (used by NIVA).

Diameter refers to inner diameter (mm) of GC

The abbreviations for analytical laboratory and variable name are explained in Appendix A. An overview of variables, analysis code, detection limits and data count has been described Green *et al.*(2008b).

Appendix_F_Sediment_1986-2006_mean_concentrationsl (188pp)

Appendix G.
SHELLFISH 2002-2006
RAW DATA

NOTES

This appendix presents concentrations of the contaminants found in shellfish. All data are on a original basis; that is, the basis on which the sample was analysed. Three units of measure are used: **ppm** (parts per million, mg/kg), **ppb** (parts per billion, µg/kg) and **ppp** (parts per trillion, ng/kg). The numeric values shown have been printed with a fixed number of digits and do not necessarily indicate analytical precision. Refer also to the comments preceding the table.

The data is sorted in the order of:

Species	Alphabetically by ICES code.
Tissue	Softbody, tail muscle.
Sample area	Geographically beginning with those stations near the Swedish border and continuing around the coast to the Russian border (cf., maps (Appendix D. , and order shown in Appendix C.). The sample area code refers to the official JAMP designation and for some areas this may be undefined (J99).

Note that the results from bulked samples and individuals are treated separately.

The abbreviations for analytical laboratory and variable name are explained in Appendix A. An overview of variables, analysis code, detection limits and data count has been described Green *et al.*(2008b).

Appendix_G_Shellfish_2002-2006_raw_data. (437 pp)

Appendix H.
FISH 2002-2006
RAW DATA

NOTES

This appendix presents concentrations of the contaminants found in shellfish. All data are on a original basis; that is, the basis on which the sample was analysed. Three units of measure are used: **ppm** (parts per million, mg/kg), **ppb** (parts per billion, µg/kg) and **ppp** (parts per trillion, ng/kg). The numeric values shown have been printed with a fixed number of digits and do not necessarily indicate analytical precision. Refer also to the comments preceding the table.

The data is sorted in the order of:

Species	Alphabetically by ICES code; Latin, English and Norwegian name follow.
Tissue	Softbody, tail muscle
Sample area	Geographically beginning with those stations near the Swedish border and continuing around the coast to the Russian border (cf., maps (Appendix D. , and order shown in Appendix C.). The sample area code refers to the official JAMP designation and for some areas this may be undefined (J99).

Note that the results from bulked samples and individuals are treated separately.

The abbreviations for analytical laboratory and variable name are explained in Appendix A. An overview of variables, analysis code, detection limits and data count has been described Green *et al.*(2008b).

Appendix_H_Fish_2002-2006_raw_data (508 pp)

Appendix I.
BIOLOGICAL EFFECTS RESULTS 2002-2006
RAW DATA

NOTES

This appendix presents concentrations of the contaminants found in shellfish. All data are on a original basis; that is, the basis on which the sample was analysed. Three units of measure are used: **ppm** (parts per million, mg/kg), **ppb** (parts per billion, µg/kg) and **ppp** (parts per trillion, ng/kg). The numeric values shown have been printed with a fixed number of digits and do not necessarily indicate analytical precision. Refer also to the comments preceding the table.

The data is sorted in the order of:

Species	Alphabetically by ICES code; Latin, English and Norwegian name follow.
Tissue	Softbody, tail muscle
Sample area	Geographically beginning with those stations near the Swedish border and continuing around the coast to the Russian border (cf., maps (Appendix D. , and order shown in Appendix C.). The sample area code refers to the official JAMP designation and for some areas this may be undefined (J99).

Note that the results from bulked samples and individuals are treated separately.

The abbreviations for analytical laboratory and variable name are explained in Appendix A. An overview of variables, analysis code, detection limits and data count has been described Green *et al.*(2008b).

Appendix_I_Biological_effects_results_2002-2006_raw_data (106 pp)

Appendix J.
SHELLFISH 1981-2006
MEAN CONCENTRATIONS

This appendix presents mean concentrations of the contaminants found in shellfish. All data are on a wet weight basis. Three units of measure are used: **ppm** (parts per million, mg/kg), **ppb** (parts per billion, µg/kg) and **ppp** (parts per trillion, ng/kg). The numeric values shown have been printed with a fixed number of digits and do not necessarily indicate analytical precision. Refer also to the comments preceding the table.

The data is sorted in the order of:

Species	Alphabetically by ICES code; Latin, English and Norwegian name follow.
Tissue	Softbody, tail muscle.
Sample area	Geographically beginning with those stations near the Swedish border and continuing around the coast to the Russian border (cf., maps (Appendix D. , and order shown in Appendix C.). The sample area code refers to the official JAMP designation and for some areas this may be undefined (J99).

Note that the results from bulked samples and individuals are treated separately.

The abbreviations for analytical laboratory and variable name are explained in Appendix A. An overview of variables, analysis code, detection limits and data count has been described Green *et al.*(2008b).

Appendix_J_Shellfish_1981_2006_mean_concentrations (249 pp)

Appendix K.
FISH 1981-2006
MEAN CONCENTRATIONS

This appendix presents mean concentrations of the contaminants found in shellfish. All data are on a wet weight basis. Three units of measure are used: **ppm** (parts per million, mg/kg), **ppb** (parts per billion, µg/kg) and **ppp** (parts per trillion, ng/kg). The numeric values shown have been printed with a fixed number of digits and do not necessarily indicate analytical precision. Refer also to the comments preceding the table.

The data is sorted in the order of:

Species	Alphabetically by ICES code; Latin, English and Norwegian name follow.
Tissue	Softbody, tail muscle.
Sample area	Geographically beginning with those stations near the Swedish border and continuing around the coast to the Russian border (cf., maps (Appendix D. , and order shown in Appendix C.). The sample area code refers to the official JAMP designation and for some areas this may be undefined (J99).

Note that the results from bulked samples and individuals are treated separately.

The abbreviations for analytical laboratory and variable name are explained in Appendix A. An overview of variables, analysis code, detection limits and data count has been described Green *et al.*(2008b).

Appendix_K_Fish_1981-2006_mean_concentrations (219 pp)

Appendix L.
BIOLOGICAL EFFECTS RESULTS 1997-2006
MEAN CONCENTRATIONS

This appendix presents mean concentrations of the contaminants found in shellfish. All data are on a wet weight basis. Three units of measure are used: **ppm** (parts per million, mg/kg), **ppb** (parts per billion, µg/kg) and **ppp** (parts per trillion, ng/kg). The numeric values shown have been printed with a fixed number of digits and do not necessarily indicate analytical precision. Refer also to the comments preceding the table.

The data is sorted in the order of:

Species	Alphabetically by ICES code; Latin, English and Norwegian name follow.
Tissue	Softbody, tail muscle.
Sample area	Geographically beginning with those stations near the Swedish border and continuing around the coast to the Russian border (cf., maps (Appendix D. and order shown in Appendix C.). The sample area code refers to the official JAMP designation and for some areas this may be undefined (J99).

Note that the results from bulked samples and individuals are treated separately.

The abbreviations for analytical laboratory and variable name are explained in Appendix A. An overview of variables, analysis code, detection limits and data count has been described Green *et al.*(2008b).

Appendix_L_Biological_effects_results_1997-2006_mean concentrations_shellfish (121 pp)

Appendix_L_Biological_effects_results_1997-2006_mean concentrations_fish (110 pp)

Long-term monitoring of environmental quality in Norwegian coastal waters

Joint Assesment and Monitoring Programme (JAMP)

Norwegian Pollution Control Authority (SFT)
Postboks 8100 Dep, 0032 Oslo – Street address: Strømsveien 96
Telephone: 22 57 34 00 - Telefaxs: 22 67 67 06
E-mail: postmottak@sft.no – Internet: www.sft.no

Contractor	ISBN-number
Norwegian Institute for Water Research	978-82-577-5297-2

Contracting project manager	SFT project manager	TA-number
Norman Green	Jon L. Fuglestad	2369/2008

	Year	Pages	SFT's contract number
	2008	8 + 12 appendices (ca. 2000 pp.)	5007040

Publisher	Project financed by
Norwegian Institute for Water Research (NIVA) NIVA-report 5562-2008	Norwegian Pollution Control Authority *Statens forurensningstilsyn* (SFT)

Author(s)
Ling Shi
Norman Green
Åse Kristine Rogne

Title
Joint Assessment and Monitoring Programme (JAMP)

Contaminant and effects data for sediments, shellfish and fish 1981-2006

Summary
This report is a compilation of data on contaminant concentrations in sediment and organisms, as well as results from biological effects methods used in the Norwegian contribution to the Joint Assessment and Monitoring Programme (JAMP). It concerns mainly selected metals, organochlorines and polycyclic aromatic hydrocarbons that were collected during the period 1981-2006

4 *emneord*	4 subject words
Miljøgifter	Contaminants
Biologisk effekter	Biological effects
Marin	Marine
Norge	Norway

Statens forurensningstilsyn
Postboks 8100 Dep,
0032 Oslo
Besøksadresse: Strømsveien 96

Telefon: 22 57 34 00
Telefaks: 22 67 67 06
E-post: postmottak@sft.no
www.sft.no

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. SFT er ansvarlig for gjennomføringen av overvåkningsprogrammet.

TA-2369/2008
ISBN 978-82-577-5297-2