Riverine inputs and direct discharges to Norwegian coastal waters – 2005

Norwegian Institute for Water Research

REPORT

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Abstract

The report presents results from the 2005 monitoring of 46 Norwegian rivers in accordance with the requirements of the OSPAR Commission. Riverborne inputs of nutrients, suspended particulate matter, total organic carbon, silicate, metals (Cd, Hg, Pb, Cu, Zn, As, Cr, Ni), PCB and the pesticide lindane to Norwegian coastal waters are quantified based on concentration and flow data. In addition, the inputs from rivers not monitored, as well as direct discharges to marine waters along the coast from Sweden to Russia, have been estimated. In general, most substances showed a decline, although varying in magnitude, in riverine loads from 2004 to 2005. This decline is most likely due to regional and intraregional differences in water discharges/regimes between the two years, and changed seasonal distribution in water discharge.

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1. Elvetilførsler	1. Riverine inputs
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4. Overvåking	4. Monitoring

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Preface

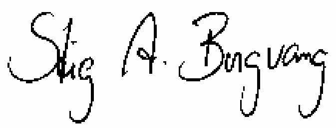
This report presents the results of the 2005 monitoring of riverine and direct discharges to Norwegian coastal waters. The monitoring is part of a joint monitoring programme under the "OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic".

The Norwegian contribution is administered by Jon L. Fuglestad, senior adviser at the Norwegian Pollution Control Authority (SFT). SFT commissioned the Norwegian Institute for Water Research (NIVA) to organise the monitoring, undertake the analyses and report the results.

At NIVA, the work has been co-ordinated by Stig A. Borgvang. The Norwegian Water Resources and Energy Administration (NVE) has been responsible for the water quality sampling and collation of water flow data.

I would like to thank all contributors to the programme for the efforts made in 2005-2006. A special thanks to Per G. Stålnacke, Stein W. Johansen and Eva Skarbøvik for their dedicated work.

Oslo, March 2007



Project co-ordinator

Content

Part A: Principles, Results and Discussions

Part A

Principles, Results and Discussions

Summary

Objectives
The main objectives of the monitoring programme on Riverine Inputs and Direct Discharges (RID Programme) are to carry out regular monitoring, analyse the water samples according to agreed methods, calculate the loads of the RID parameters, and assess the riverine and direct inputs of the selected pollutants to the Norwegian part of OSPAR's Maritime Area. Hence, the programme contributes to the Joint Assessment and Monitoring Programme (JAMP) by providing data on inputs to the Maritime Area on sub-regional and regional levels.

Coverage, methodology and data base
The sampling of the ten so-called "main rivers" has followed the strategy of earlier years, i.e. with one sample each month, and additional sampling in rivers Glomma and Drammenselva in May and June.

In 2004 the sampling metodology of the so-called "tributary rivers" was changed, from one sample per year in 145 rivers; to four samples a year in 36 rivers. This monitoring strategy was continued in 2005.

Loads of the RID parameters from the 10 main and 36 triburary rivers have been calculated by using the formula recommended by OSPAR. The loads from the remaining rivers have been calculated through modelling. For non-monitored coastal zones, diffuse losses of total phosphorus, total nitrogen, phosphates, nitrates and ammonia are estimated by using area specific runoff coefficients and the TEOTIL model. For discharges entering directly into marine waters or entering the rivers below the sampling sites for river water quality, i.e. municipal wastewater and industrial discharges, estimates are based on data from effluent control programmes.

The entire study area (i.e. main Norwegian land area) is divided into the following four major areas:

I. Skagerrak:	From the Swedish border to Lindesnes (the southernmost point of Norway), at about 57°44'N
II. North Sea:	From Lindesnes northwards to 62° N
III. Norwegian Sea:	From 62° N northwards to 70°30'N
IV. Barents Sea:	From 70°30'N to the Russian border.

The report also assesses the time trends in the development of water quality and loads during the period 1990-2005. For most Norwegian rivers, the inputs to the sea show large annual variations due to large seasonal differences in runoff (water flow) and in the contribution from various sources. Flow normalised loads of nutrients were estimated for the entire period for the main rivers, and trend analyses were performed on concentrations and loads.

The improved methodology for estimating water flow in tributaries, introduced in 2004, was continued in 2005. This involves applying the HBV-model to simulate the water discharge for the 36 rivers monitored quarterly, as well as for the 109 rivers that is no longer monitored regarding chemistry.

The year 2005

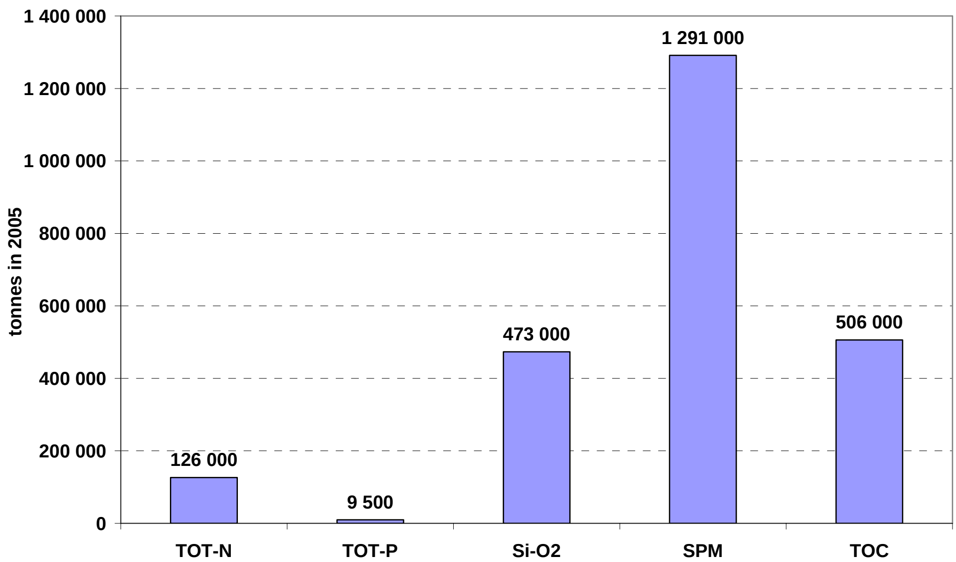
2005 was a relatively warm and humid year in Norway, with average annual air temperatures 1.5 °C higher than normal. This is the sixth highest mean temperature measured since the Norwegian Meteorological Institute started measurements in 1867, and 0.1 degree warmer than in 2004. 2005 also had 15% more rainfall than normal. The meteorological conditions resulted in snowmelt floods in Northern Norway in May and June, and in severe autumn rainfall floods in western Norway.

Major findings

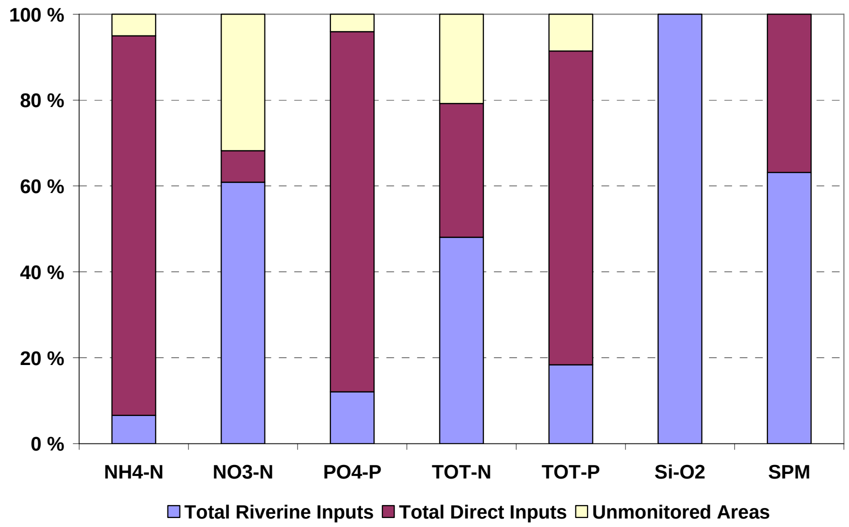
In general, most substances showed a decline, although varying in magnitude, in riverine loads when comparing the loads in 2004 and 2005. It is, however, important to remember that the water quality sampling is done once a month in the main rivers and four times a year in tributaries. This means that little or no account is taken of the water flow variations. With varying water regimes between years, regions, rivers, and seasons, the infrequent, regular sampling may imply that in some years and some rivers concentration peaks and flood events may be unaccounted for.

Nutrient inputs in 2005

The total nutrient input to coastal waters from land based sources in Norway in 2005 was estimated to 9 500 tonnes of phosphorus and 126 000 tonnes of nitrogen. The total inputs of nitrogen, phosphorus, silicate, suspended particulate matter and total organic carbon in 2005 are shown below:



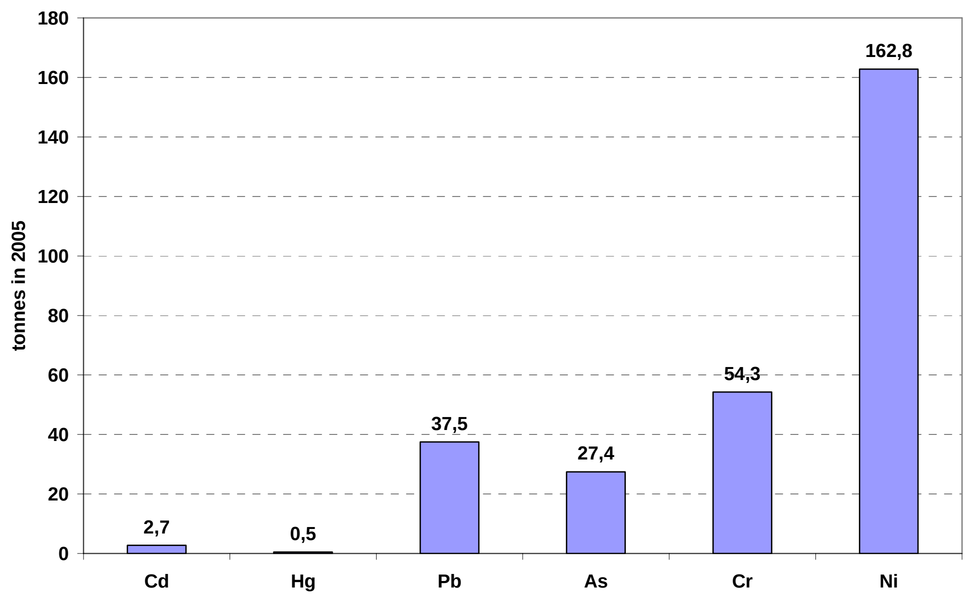
The inputs of nutrients, silicate and suspended particulate matter (SPM) in proportion of source (riverine, direct inputs and unmonitored areas; see illustration below) show that the main source for orthophosphate is the direct inputs, related to fish farming. Fish farming comprise the major single source of phosphorus input to the North Sea, Norwegian Sea and Barents Sea sub regions. Totally in Norway, the nutrient load from fish farming contributes to over 60 % of the total phosphorus loading and over 20 % of the total nitrogen load. Only about 20 % of the phosphorus and about 50 % of the nitrogen were inputs from the monitored rivers and tributaries. For SPM there are no estimates for fish farming or unmonitored areas.

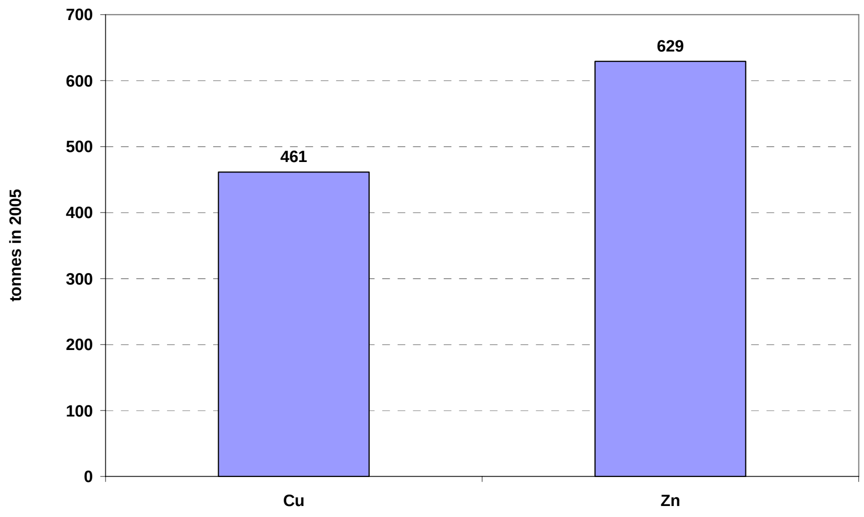


Compared to 2004, SPM loads have increased with almost 100 000 tonnes, mainly in the main rivers. Total-P also showed a general increase compared to 2004. This is very much related to increased particle transport due to the water regime in 2005, including flood events. On the other hand, we can also note a substantial decline in the SPM load, for example in the tributary rivers in the Barents Sea region. The total-N riverine load showed a slight decline from 2004 to 2005. There is, however, a general uncertainty in the load estimations for the tributary rivers given the low sampling frequency.

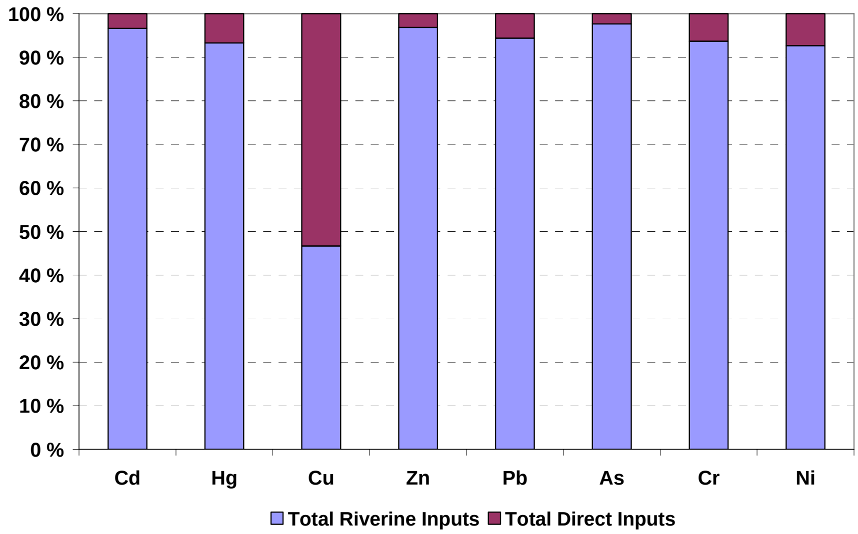
Metal inputs in 2005

For 2005, inputs of metals ranged from 0.49 tonnes for mercury to 629 tonnes for zinc. Inputs of cadmium were estimated to 2.4-2.7 tonnes, mercury to 0.4-0.5 tonnes, arsenic to 26-27 tonnes, and lead to about 37 tonnes. Copper and zinc comprised the largest inputs of heavy metals, which in 2005 amounted to 461 tonnes and 629 tonnes respectively, as shown in the figures below (note the different scales):





For all metals except copper (Cu) , the riverine loads accounted for at least 90% of the total input to Norwegian coastal waters. The relative share of the various pathways and sources of metals to the Norwegian coastal waters in 2005 is shown below :



There was a significant decline in loads from 2004 to 2005 for the five metals Cd, Cu, Pb, Zn and As in the 36 tributary rivers based on 4 samples a year, but this was not observed in the ten main rivers with monthly sampling frequency. It might indicate that the decline is due to climatic differences between the years or that quarterly sampling is insufficient in order to catch concentration peaks. However, as compared to 2004, Zn and Cu loads increased in some of the main rivers, due to high transport during flood conditions.

Estimates of copper discharges from fishfarming were made for the first time in 2005 in the RID context which explain the relative high Cu- direct loads in comparison with the riverine loads (see figure above). This also explains why the total load of Cu is significantly higher in 2005 compared to 2004. The direct discharges of Cd, Zn, Pb, As, Ni and the N and P fractions were only marginally different in 2005 compared to 2004, and within the level of uncertainty. The Hg inputs have declined and the Cr inputs increased, but the input data for the estimates represent a high level of uncertainty. These uncertainties are caused by the inconsistencies in point source data, since the number of industrial plants reporting losses varies considerably from year to year; and are also due to in incomplete reporting of discharges of especially heavy metals from wastewater treatment plants

Lindane and PCB in 2005

The pesticide lindane was detected in most samples in very low concentrations. Total riverine loads of lindane in the main rivers were estimated to 7.5-12.5 kg. The PCB riverine loads in the main rivers were in 2005 estimated to 0-71 kg. The figures are generated based on the detection limit of the analytical method used, i.e. the estimates of 71 kg are based on a detection limit of 0.2 PCB ng/L. PCB was not monitored in tributaries.

1. Introduction

The 2005 Study on Riverine Inputs and Direct Discharges to Norwegian coastal waters (RID) was successfully implemented by means of *inter alia*:

1. regular field work and sampling according to agreed sampling frequency, and according to NIVA's and NVE's (Norwegian Water Resources and Energy Directorate) QA system for Field and Sampling Procedures;
2. continuing the sampling strategy for tributaries that was introduced in 2004;
3. continuing to improve estimates of water flow in tributaries by applying the HBV-model to simulate the water discharge for the 36 rivers monitored quarterly, as well as for the now unmonitored 109 rivers
4. supplying land use information for the most important catchments as a mean to explain variations in concentrations and loads amongst rivers.

The general principles, background and reporting requirements as agreed by OSPAR are shown in **Annex I**.

This report shows the results for 2005 of the monitoring of ten main rivers and 36 tributary water courses in Norway, as well as the estimated loads from 109 unmonitored water courses and areas downstream of the RID sampling points. The parameters monitored and the loads estimated are as agreed within OSPAR, i.e. nutrient fractions, metals, PCB and lindane.

The work in 2005 has involved skilled personnel of NIVA and NVE, see information below on data sources and personnel involved.

Sub-contractors and personnel involved:

Norwegian Water Resources and Energy Directorate – NVE:	Water sampling, provision of water discharge data, water discharge modelling.
The TEOTIL-programme:	Calculations with the input-model TEOTIL2 of Input of nutrients to Norwegian coastal areas in non-monitored water courses
Norwegian Meteorological Institute (met.no):	Precipitation and temperature data
Statistics Norway (SSB):	Data on discharges of metals and lindane in outlets from wastewater treatment plants with more than 50 p.e. connected.
Norwegian Pollution Control Authority (SFT):	Data on discharges of metals and lindane in outlets from industrial plants

Project co-ordinator: Stig A. Borgvang, NIVA

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Stein W. Johansen (fieldwork co-ordination, status reporting, reporting)
Eva Skarbøvik (reporting)
John Rune Selvik (TEOTIL Modelling, GIS)
Bente Lauritzen (laboratory analyses)
Line Barkved (water flow issues, liaison with NVE modellers)
Tore Høgåsen (database, on-line data accessibility)
Torulv Tjomsland (TEOTIL Modelling)
Tor Traaen (quality assurance of laboratory data)
Erik Bjerknes (practical field work material liaison with NVE)

Project participants from NVE
Svein Harsten (main responsible, NVE)
Elisabeth Thøgersen (fieldwork co-ordination until 31.May)
Jarle Thorvaldsen (logistics, fieldwork co-ordination as from 1. June)
Stein Beldring (hydrological modelling)

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Personnel for water sampling in the 36 rivers with for times a year sampling:
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2. Norwegian Rivers and the Selection of Monitored Rivers

2.1 Norwegian Rivers Draining into Coastal Areas.

The coastline of Norway has been divided into the following four coastal areas/sub-regions:

I. Skagerrak:	From the Swedish border to Lindesnes (the southernmost point of Norway), at about 57°44'N
II. North Sea:	From Lindesnes northwards to 62° N
III. Norwegian Sea:	From 62° N northwards to 70°30'N
IV. Barents Sea:	From 70°30'N to the Russian border.

The total length of this coastline, including fjords and bays, is 21 347 km.

The river basin register system "REGINE", developed by the Norwegian Water Resources and Energy Directorate (NVE; www.nve.no), classifies the Norwegian river basins into 20.000 units, or 262 main catchment areas. According to this system, 247 of the 262 Norwegian rivers are draining into coastal areas. These range from *Haldenvassdraget* in the south east (River no. 001) to *Grense Jakobselv* in the north east (River no. 247).

In other words, there are 247 Norwegian rivers entering into the marine waters along a coastline of altogether 21 347 km. There has been an evident need of selecting a set of representative rivers. The Norwegian RID Programme comprises ten of these 247 rivers as "main rivers" reported to OSPAR, inasmuch as these ten rivers represent typical rivers for the four main coastal areas. This is illustrated in Figure 1.

In addition to these 10 main rivers, a set of 36 "tributary" rivers, or rivers monitored less frequently, were selected for the 2004 monitoring (c.f. paragraph 2.3 and Borgvang et al., 2006A).

2.2 Land use in Norwegian Catchments

Norway is a country with vast natural resources, and large parts of the country are covered by forests and mountainous areas. The land use in the drainage basins of the 10 main rivers are shown in Figure 3. The land cover of the mainland may be divided into areas covered by forest, agriculture and artificial surfaces, mountains and mountain plateaus, as well as lakes and wetlands, as shown in Figure 2.

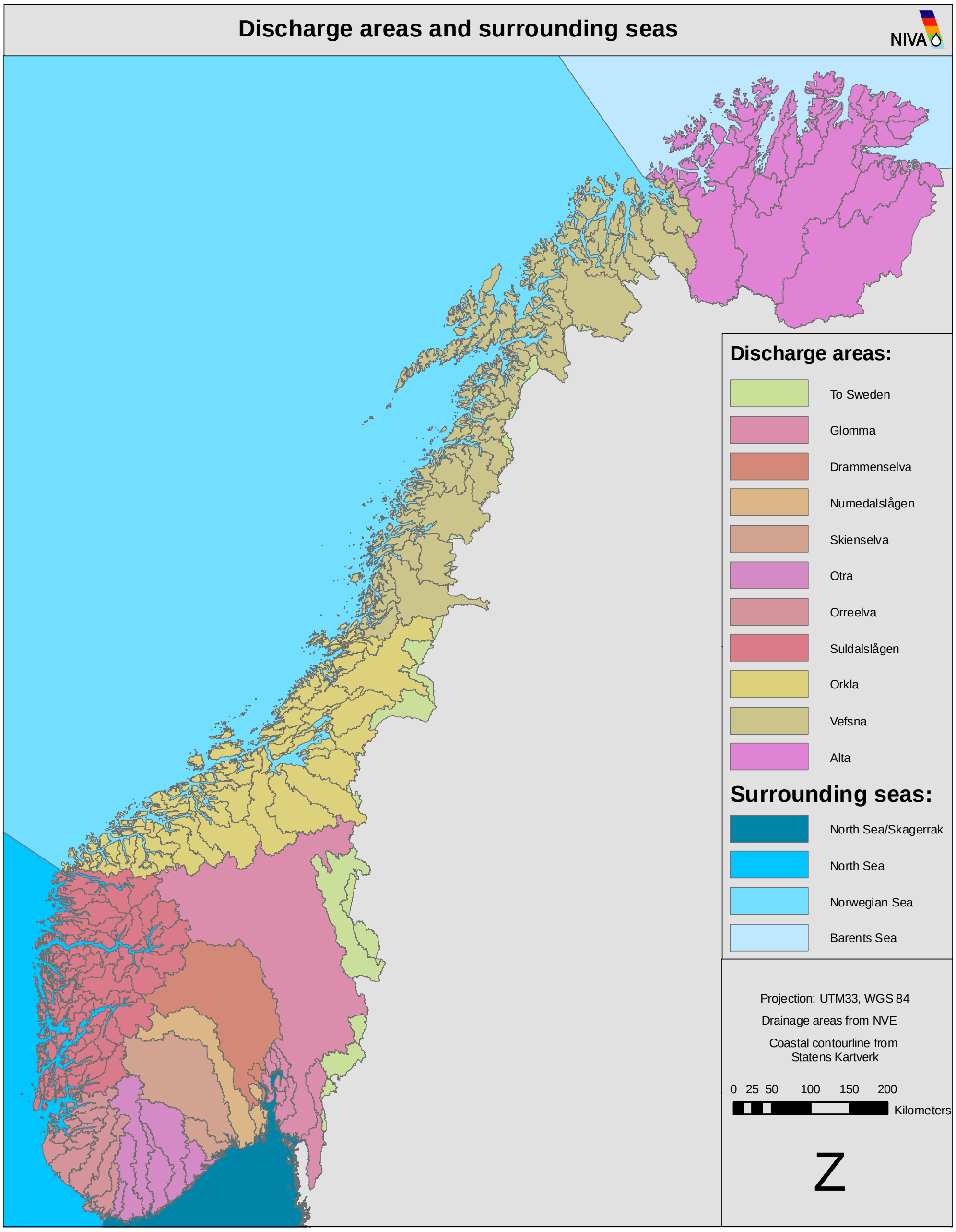


Figure 1. Norway divided into four Discharge Areas, i.e. Skagerrak, North Sea, Norwegian Sea and the Barents Sea.

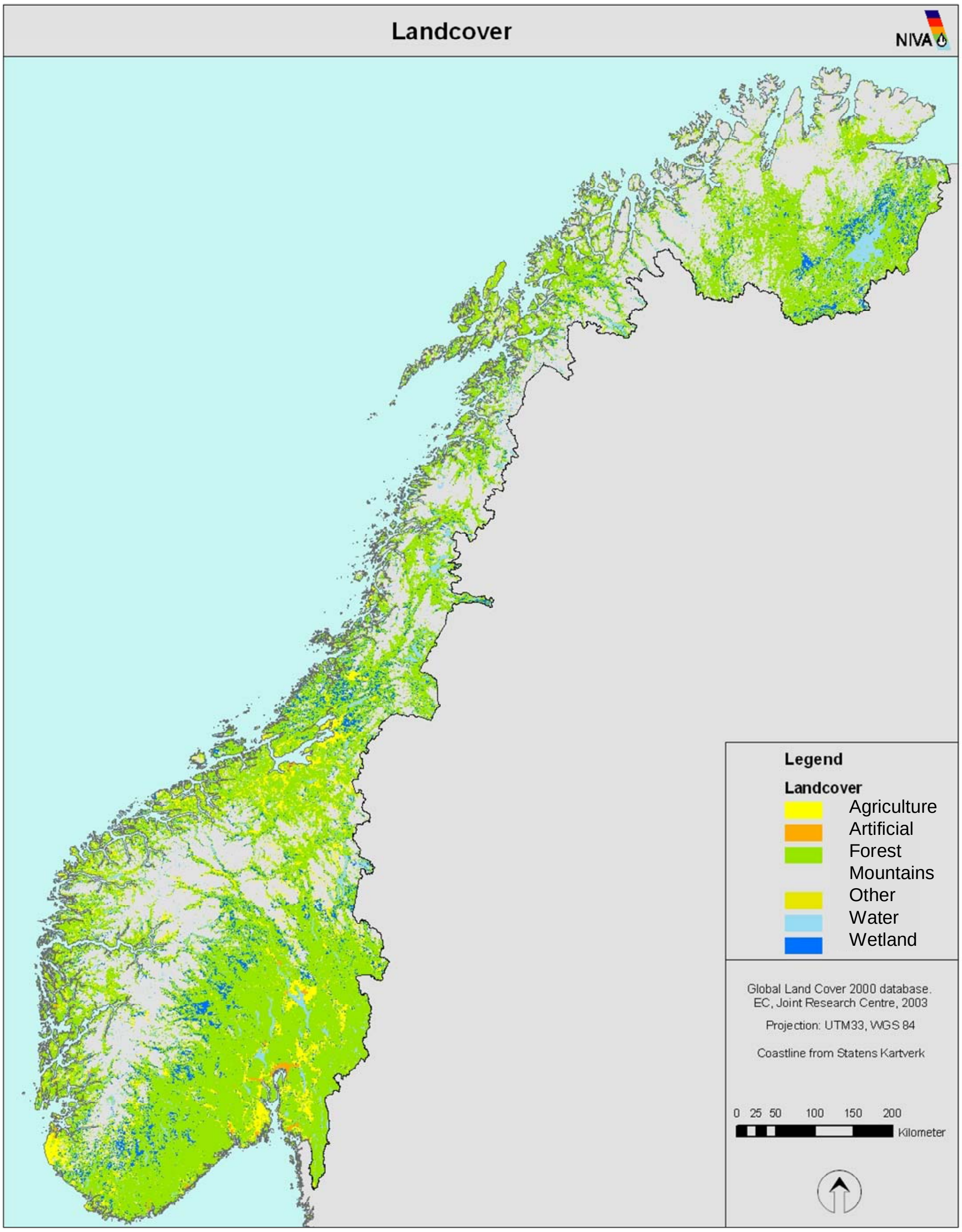


Figure 2. Land cover map of Norway. See also Figure 3 where the land use in the 10 main RID rivers is shown.

2.3 Selection of Rivers for Monitoring

As described in Section 2.1, a total of 247 rivers are entering into the coastal waters of Norway. Due to this large number of rivers, it became financially impossible to comply with the PARCOM requirements to measure 90 % of the load from Norwegian rivers to coastal areas. In order to reduce this challenge to a manageable and economically viable task, it was early on decided that 8 of the major load-bearing rivers should be monitored in accordance with the objectives of the comprehensive study. Furthermore, two relatively “unpolluted” rivers are monitored at the same frequency. In these 10 rivers (cf. Figure 1 and Table 2) a number of studies have been carried out since 1990, and they have all been included in the National Monitoring Programme of Watercourses (www.sft.no). These 10 rivers have been sampled 12-16 times in 2005.

In addition to the ten “main” rivers, within the RID Programme framework, the load from 126 to 145 so-called “tributary” rivers was estimated during the period 1990-2003. These estimates were based on random sampling, which generally consisted of only one sample per year. Since the transport of dissolved and particle associated material in rivers can vary considerably over time, an important and necessary change in the programme was introduced in 2004, maintaining the same ‘resource platform’: The number of “tributary rivers” was reduced to 36, and the sampling frequency for these 36 rivers was increased to 4 samples per year. The total drainage area for the original selection of 145 tributary rivers was 135 500 km^2, whereas the selected 36 rivers cover about 90 000 km^2. This constitutes 67% of the former tributary area, illustrating that the 36 tributaries were selected for their relatively large drainage areas. In addition, the selection focussed on finding rivers with representative water discharge data. Reliable data exist for 35 of the 36 selected rivers, although for four of the rivers water discharge is only monitored in tributaries and not in the main watercourse. Lyselva is the only river without water discharge monitoring stations.

Since it has been of special importance to estimate the major loads to one of the four ‘major areas’, i.e. Skagerrak, a proportionally higher number of rivers has been chosen for this part of the country. The load from the remaining rivers has been calculated through modelling (see Chapter 4 on Methodology). Table 1 gives an overview of Norwegian rivers draining into coastal areas, related to the rivers monitored by the RID Programme.

Table 1. Norwegian rivers draining into coastal areas, and the methods used to estimate loads from these rivers.

Type of river	**Number**	**Area km^2**	**% of Norwegian land area**
Total number of rivers draining into Norwegian coastal areas	247	310566	96
Main rivers, monitored monthly or more often in 2005	10	93751	29
Tributary rivers, monitored quarterly in 2005	36	90583	28
Tributary rivers, monitored once a year during 1990-2003 (loads modelled in 2005)	109	45285	14
Rivers that have never been monitored by the RID Programme (loads modelled)	92	80947	25
Rivers draining to other countries (transboundary rivers)	15	13544	4

2.4 Catchment Information for Rivers Monitored Monthly – Main Rivers

The rivers chosen for the comprehensive study (monthly or more frequent sampling) are the same as in 1990-2004 and are presented in Table 2 and Figure 1. Figure 3 shows the distribution of mountains and mountane plateaus; forests; agricultural areas; and lakes in these ten catchments.

The rivers *Glomma, Drammenselva, Numedalslaagen, Skienselva,* and *Otra* drain into the Skagerrak area, the part of the North Sea which is considered to be most susceptible to pollution. These five rivers also represent the major load bearing rivers in Norway. Of these, the River *Glomma* is the largest river in Norway, with a catchment area of about 42 000 km^2, or about 13 % of the total land area in Norway.

Orreelva and Suldalslågen are draining into the coastal area of the North Sea (Coastal area II). *Orreelva* is a relatively small river with a catchment area of only 105 km^2, and an average flow of 335 000 m^3/day or 3.9 m^3/s, but it is included in the RID Programme since it is draining one of the most intensive agricultural areas in Norway. More than 30% of its drainage area is covered by agricultural land, and discharges from manure stores and silos together with runoff from heavily manured fields are causing eutrophication and problems with toxic algal blooms both in this and adjacent water bodies. River *Suldalslågen*, with a drainage area of 1457 km^2 and population density of only 2.4 persons/ km^2 and no industrial units reporting discharges of nitrogen or phosphorus (cf. Figure 3 and Table 3), has been included in the study to represent a relatively non-polluted watercourse. The river is, however, heavily impacted by hydropower development.

Table 2. The 10 main rivers, their coastal area, catchment size and long term average flow.

Discharge area	Name of river	Catchment area (km^2)	Long term average flow (1000 m^3/day)	County with river outlet
I. Skagerrak	Glomma	41918	61350	Østfold
	Drammenselva	17034	28850	Buskerud
	Numedalslågen	5577	10200	Vestfold
	Skienselva	10772	23535	Telemark
	Otra	3738	12870	Vest-Agder
II. North Sea	Orreelva	105	335	Rogaland
	Suldalslågen	1457	7420	Rogaland
III. Norwegian Sea	Orkla	3053	5710	Sør Trøndelag
	Vefsna	4122	15655	Nordland
IV. Barents Sea	Alta	7373	7495	Finnmark

The *Orkla* and *Vefsna rivers* drain into the Norwegian Sea (Coastal area III). Agricultural land occupies 4 and 8 % of their catchment areas, respectively. Farming in this part of the country is less intensive as compared to the Orre area. More important are abandoned mines in the upper part of the *Orkla* watercourse. Several other rivers in this area also receive losses from abandoned mines (heavy metals). These two rivers have, however, no reported industrial activity discharging nitrogen or phosphorus (cf. Table 3).

The last of the main rivers, the River *Alta*, is, with its population density of only 0.3 persons per km^2 and no industrial plants reporting discharges, selected as the second of the two unpolluted river systems. The river drains into the Barents Sea.

The ten watercourses are representing typical river systems in different parts of the country. As such they are very useful when estimating loads of comparable rivers with less data than the main rivers. All of the rivers, except *Orreelva*, are to varying degrees regulated for hydropower production.

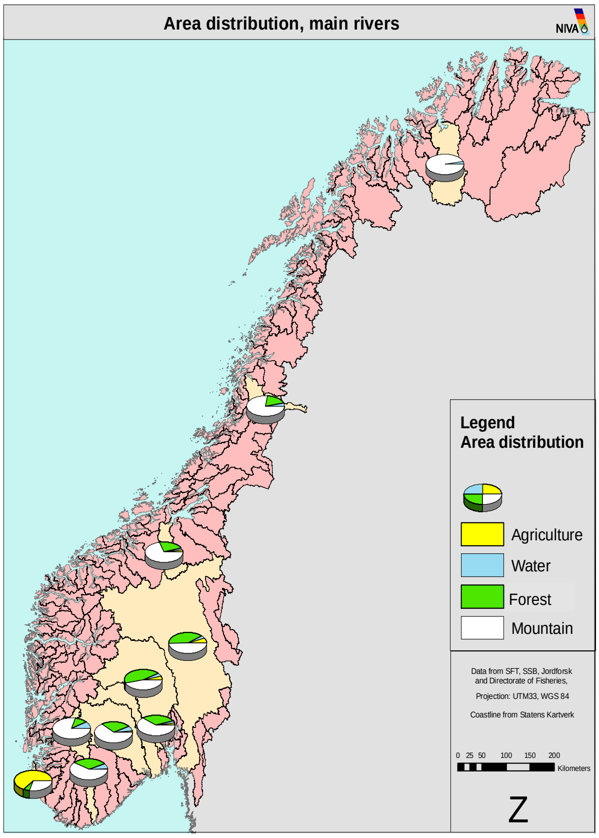


Figure 3. *Land use in the catchment areas of the 10 main rivers. "Water" signifies proportion of lakes in the catchment; "Mountains" include moors and mountain plateaus not covered by forest. Based on data from SFT, Statistics Norway, Jordforsk, Directorate of Fisheries, and Statens Kartverk.*

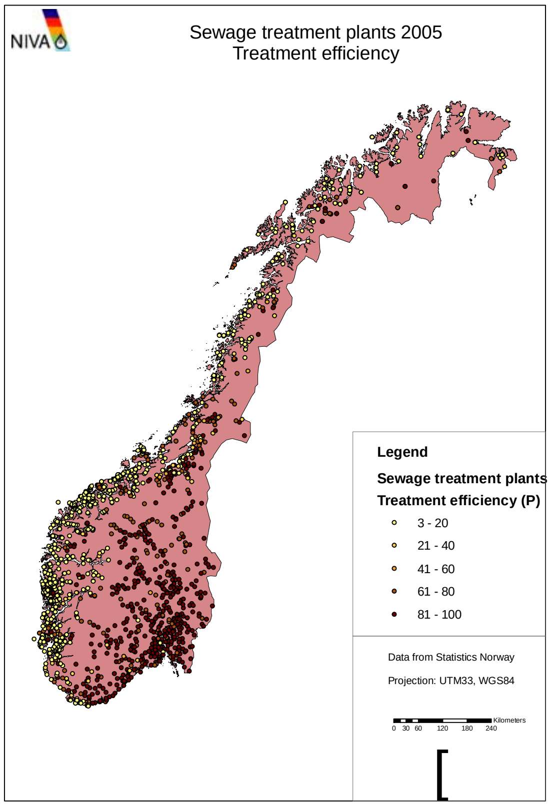
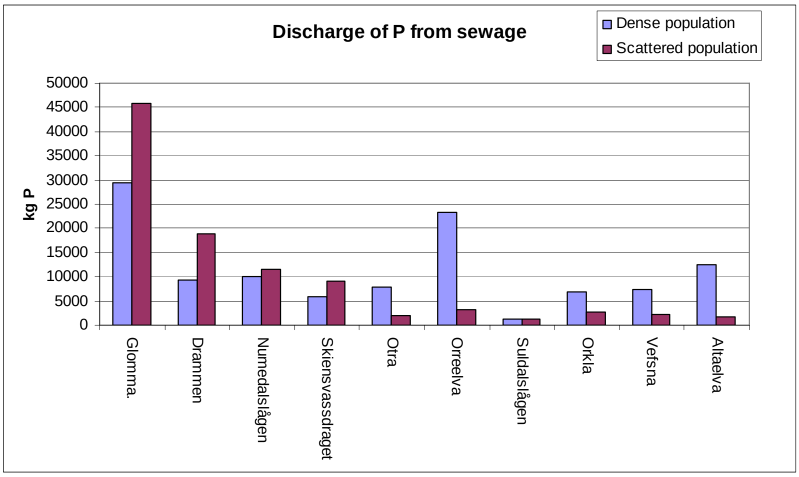


Figure 4. Sewage treatment plants in Norway. Co-ordinates from KOSTRA/SSB. Derived from Selvik et al. 2006.

Figure 4 shows a map of sewage treatment plants in Norway. The discharge of phosphorus and nitrogen from dense and scattered population is shown in Figure 5 for the river basins with monthly monitoring. To a large extent, these data reflects the size of the catchment area, such as the rivers *Glomma* and *Drammen*. The discharge of nutrients from sewage as measured in kg total phosphorus and total nitrogen is largest in *Glomma* and *Orreelva* (including *Figgjo*).



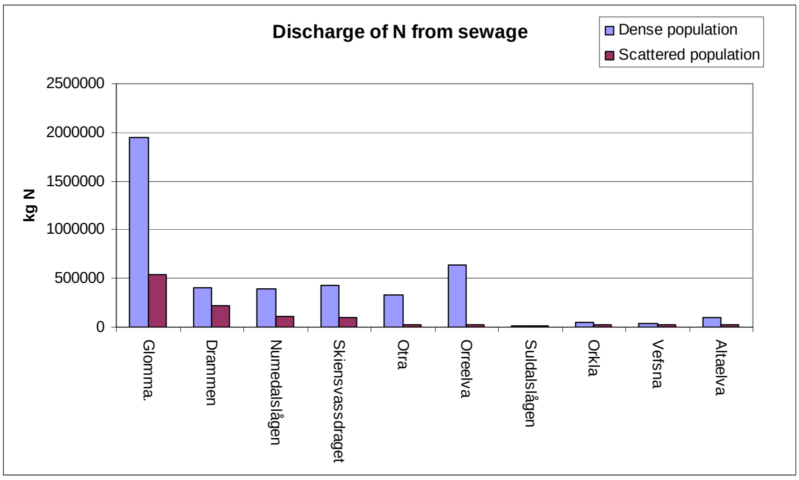


Figure 5. Discharge of phosphorus (top) and nitrogen (bottom) from sewage from dense and scattered population in rivers monitored monthly. Note that Orreelva also includes River Figgjo (cf. Figure 9).

Figures 6 and 7 show maps of fish farms and industrial units in Norway. Table 3 shows the discharges of phosphorus and nitrogen from the ten main rivers.

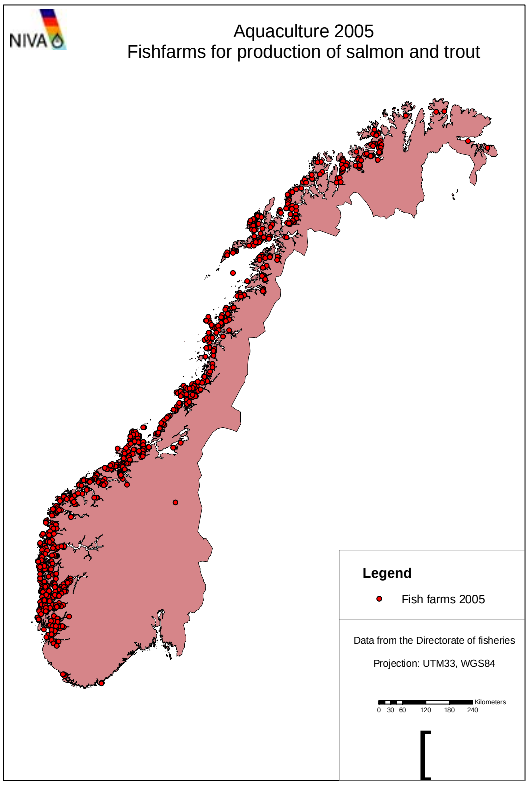


Figure 6 Fish farms in Norway. Based on data from the Directorate of Fisheries/Altinn. Derived from Selvik et al. 2006.

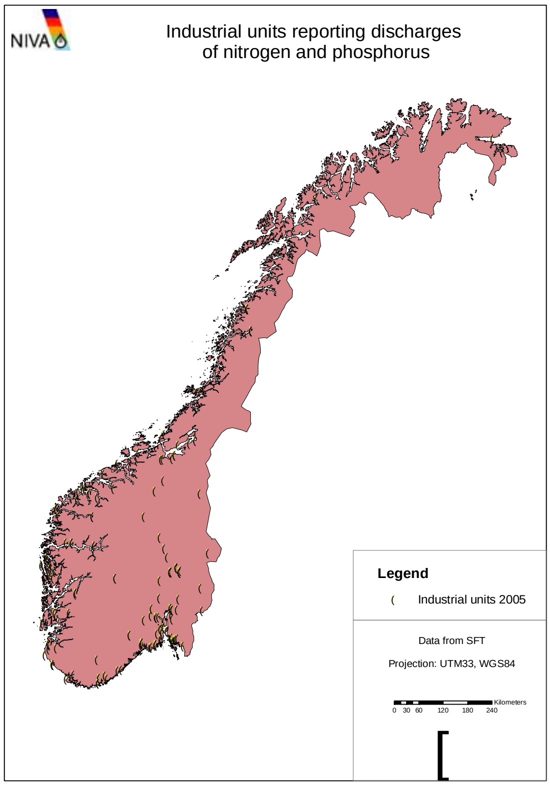


Figure 7 Industrial units reporting discharges of nitrogen and phosphorus to freshwater systems. Co-ordinates on industry from INKOSYS 2005; coast line from Statens Kartverk; Projection UTM33; WGS 84. Derived from Selvik et al 2006.

Table 3. Number of industrial units, and reported phosphorus and nitrogen discharge from industry in the 10 main rivers. The four northernmost rivers have no reported industrial activity in these catchment areas and are therefore omitted from the table.

Regine no.	River name (monthly sampling)	Number of industrial units	P discharge kg	N discharge kg
002	Glomma.	39	58919	223581
012	Drammen	7	6544	107800
015	Numedalslågen	7	8942	52280
016	Skiensvassdraget	6	10648	766740
021	Otra	2	2440	63880
028	Orreelva	1	0	309

2.5 Catchment Information for Rivers Monitored Quarterly – Tributary Rivers

As stated above, 36 rivers covering an area of altogether about 90 000 km^2 were monitored four times a year in 2005. The average size of their catchment areas is 2380 km^2, but the size varies from *Vikedalselva* with its 117 km^2, to the second largest drainage basin in Norway, *Pasvikelva* with a drainage basin of 18400 km^2. River basin characteristics (size and mean water discharge) are shown in Annex III, together with the name of the county of the river outlets. Land use varies considerable, as shown in Figure 8. As an example, the *Figgjo* and *Tista* Rivers have the highest coverage of agricultural land (31[1] and 12%, respectively), whereas some of the rivers have none or insignificant agricultural activities in their drainage basins (e.g. *Ulla*, *Røssåga*, *Målselv*, *Tana* and *Pasvik*). Some catchments, like *Lyseelv*, *Årdalselv* and *Ulla* in the west; and *Pasvik* in the north, are more or less entirely covered by mountains, moors, and mountain plateaus.

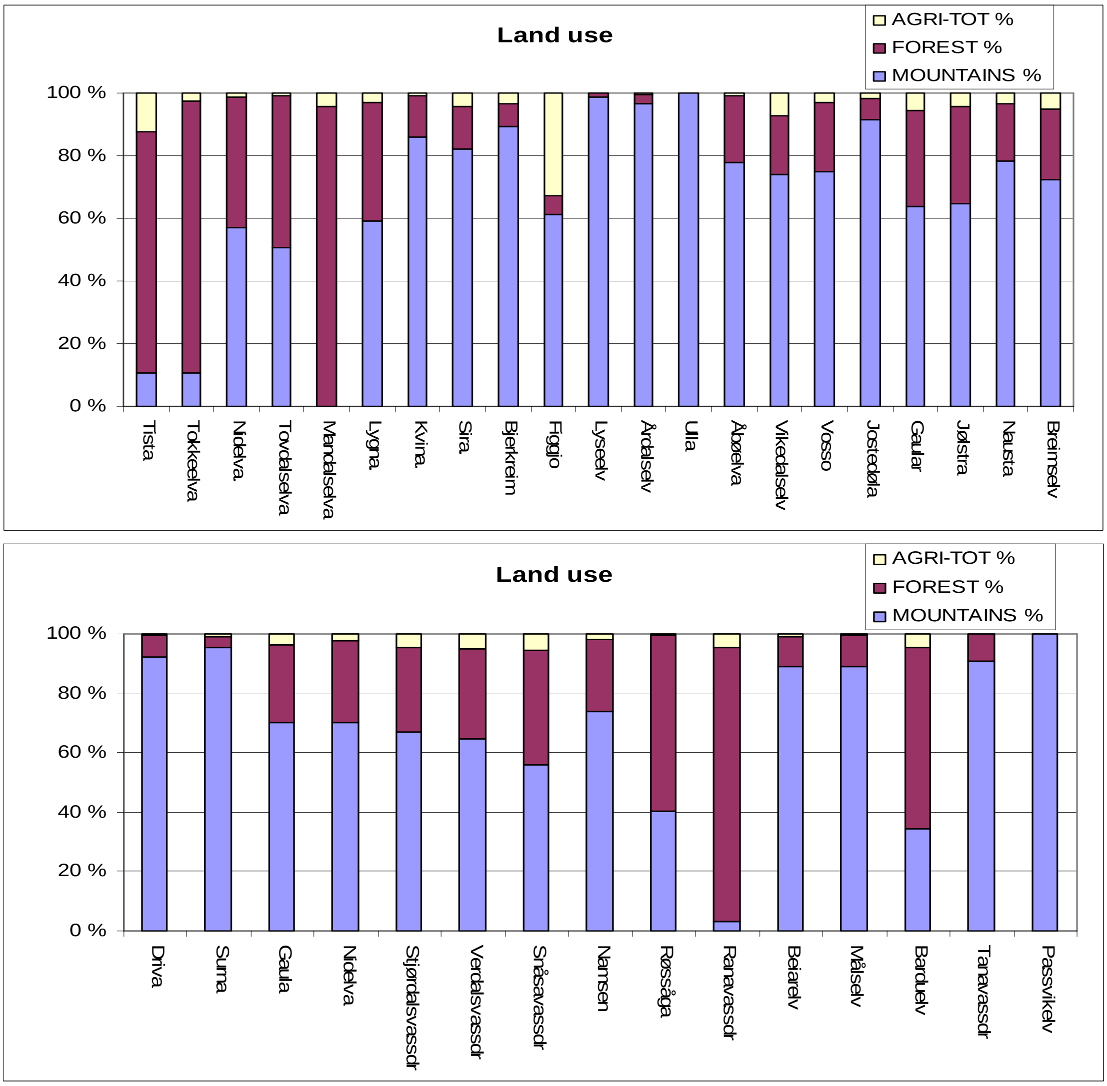
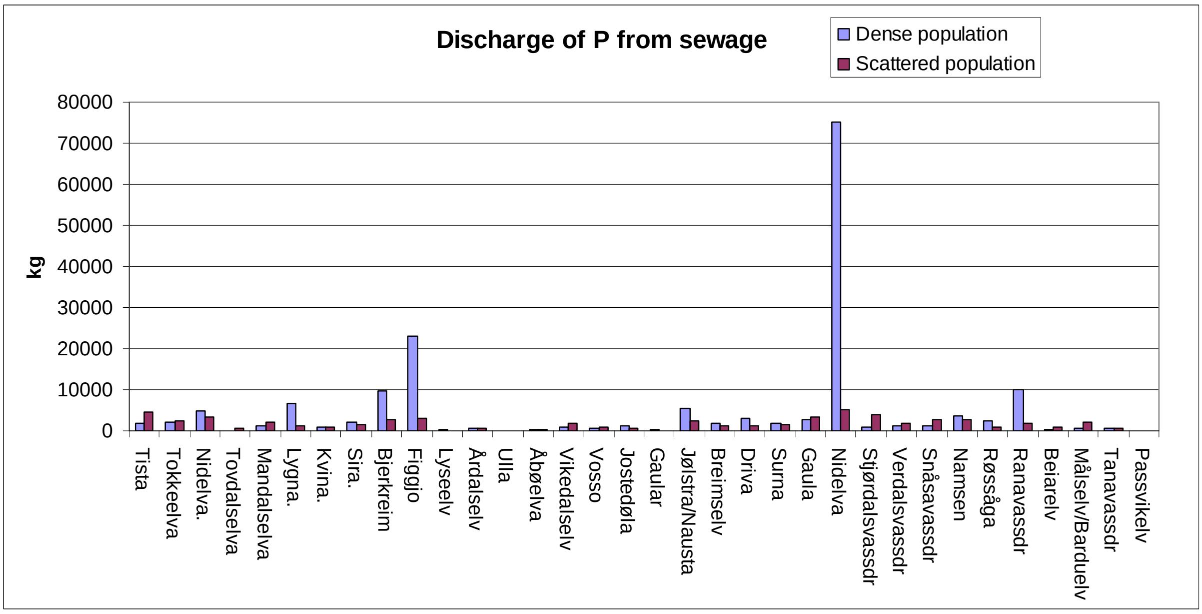


Figure 8. Land use distribution in the catchment areas of the 36 rivers monitored quarterly. "Agri-tot" means total agricultural land. "Mountains" include moors and mountain plateaus not covered by forest.

[1] Note that statistics for Figgjo also include values from Orre, as these rivers are adjacent.

There is also considerable variation in population density, from rivers in the west and north with fewer than one inhabitant per km^2, to rivers with larger towns and villages with up to 100 or more inhabitants per km^2. Population density decreases in general from south to north in Norway. On average, the population density of the 36 rivers amounts to about 14 inhabitants per square kilometre, whereas the average density in the main river catchments is about 20.

The amount of nitrogen and phosphorus discharged from sewage treatment plants and industrial units are shown in Figure 9. The figure reflects those units that are reporting discharges of nutrients. The variations observed depend partly on the population density, partly on the size of the catchment areas. The number of industrial plants discharging N and P are shown in Table 4; the data should be treated with some care, as this only reflects voluntary monitoring and reporting from the industrial plants.



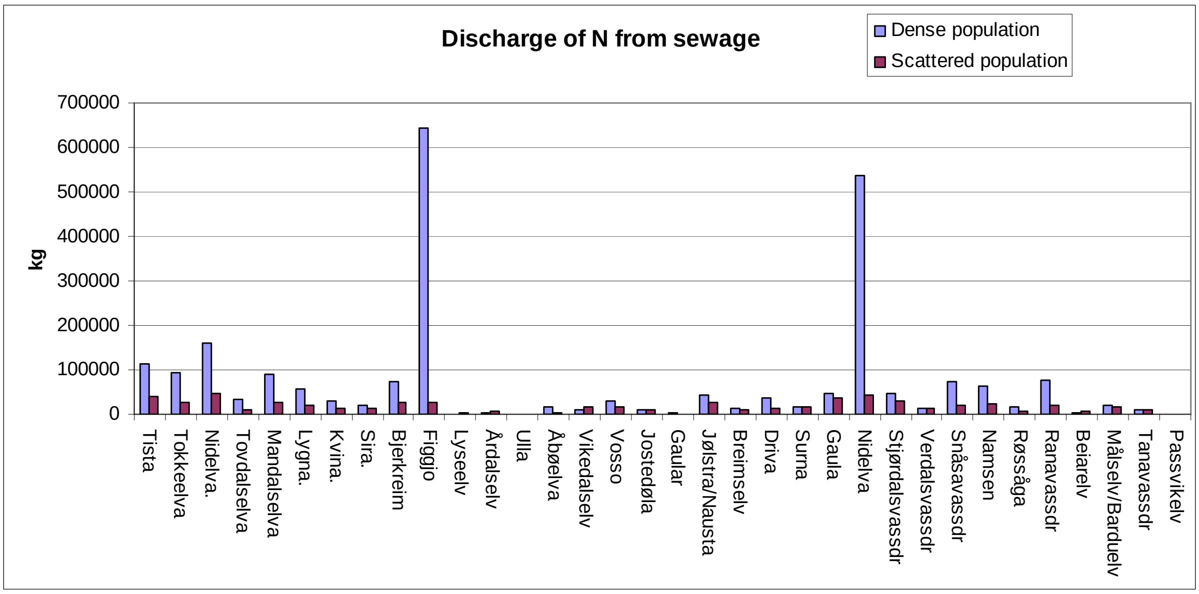


Figure 9. Discharge of phosphorus (top) and nitrogen (below) from sewage in dense and scattered population in rivers monitored quarterly. Note that River Figgjo also includes river Orreelva (cf. Figure 5).

Table 4. Number of industrial units, and reported phosphorus and nitrogen discharge from industry in the rivers monitored quarterly. Rivers with no reported discharge of N or P from industry are omitted from the table

Regine no.	**River name (quarterly sampling)**	**Number of industrial units**	**P discharge kg**	**N discharge kg**
001	Tista	3	5303	30500
017	Tokkeelva	1	520	190
025	Kvina.	2	1035	90100
026	Sira.	1	6850	44800
027	Bjerkreim	1	0	0
028	Figgjo	0	0	309
062	Vosso	1	150	0
087	Breimselv	1	2540	0
123	Nidelva	2	1122	10040
124	Stjørdalsvassdr	1	3	0
127	Verdalsvassdr	1	0	0

3. Climate conditions and water discharge in 2005

In general, 2005 was a relatively warm and humid year in Norway, with average annual air temperatures 1.5 ^{o}C higher than normal, and 15% more rainfall than normal. These meteorological conditions resulted in snowmelt floods in Northern Norway in May and June, and in severe autumn rainfall floods in western Norway.

3.1 Air temperature

In 2005, the mean annual temperature for Norway was 1.5 ^{o}C above normal (cf. Figure 10). This is the sixth highest mean temperature measured since the Norwegian Meteorological Institute started measurements in 1867, and 0.1 degree warmer than last year. Average temperature was higher than normal all over the country, but the highest discrepancies from normal values were found in the northernmost areas (Finnmark) and in the inner parts of Eastern Norway, where the mean annual temperature was 2-2.5 °C over normal.

The coastline from West Agder to Vestfold had the overall highest temperatures, whereas the coldest average temperatures are found in the mountains in Southern Norway as well as Finnmark (northern Norway). The warmest temperature measured was 32.1 °C in the innland township of Notodden, southern Norway; whereas the lowest temperature measured was minus 39,4 °C at the township of Røros. (Information derived from met.no.)

3.2 Precipitation

Precipitation in Norway in 2005 was, as a total for all monitoring stations, 15% higher than the normal values (Figure 11), which makes this year the fourth wettest since 1990. Large parts of Northern Norway and the west coast had significantly higher precipitation than normal, and in parts of these regions the precipitation was among the highest ever registered.

On November 15, in the southwest of Norway, a daily precipitation of 223 mm was measured – this is the second highest daily precipitation ever measured in Norway. The record of 229.6 mm dates back to 1944, and was measured in the same region. In Bergen, the major city on the west coast of Norway, the highest daily precipitation was measured to 156,5 mm in September.

3.3 Water discharge

Figure 12 shows the monthly mean water discharge in 2005 as compared to the average 30 year period of 1975-2004 for 8 of the 10 main rivers. Whereas the southern rivers had lower water discharge than normal during the summer, the two northern rivers, Vefsna and Alta, had significantly higher water discharges in June. This was mainly caused by snowmelt: Whereas the snowmelt proceeded relatively slowly in most of Southern Norway, the spring floods were severe in the North, with 10 year floods in the far north (Finnmark) and 30-year floods in Troms county. The upper parts of river *Vefsna* had a 10-year flood due to snowmelt in June.

Due to high autumn precipitation in the south and west (cf. section 3.2, above) the runoff in the rivers of these regions were higher than usual, especially in November. Both Glomma, Drammen, Numedalslågen, Skienselv, and Otra had significantly higher discharges in this month than normal. This also resulted in several extreme flood episodes during the autumn, including several 100 year floods in the western part of the country.

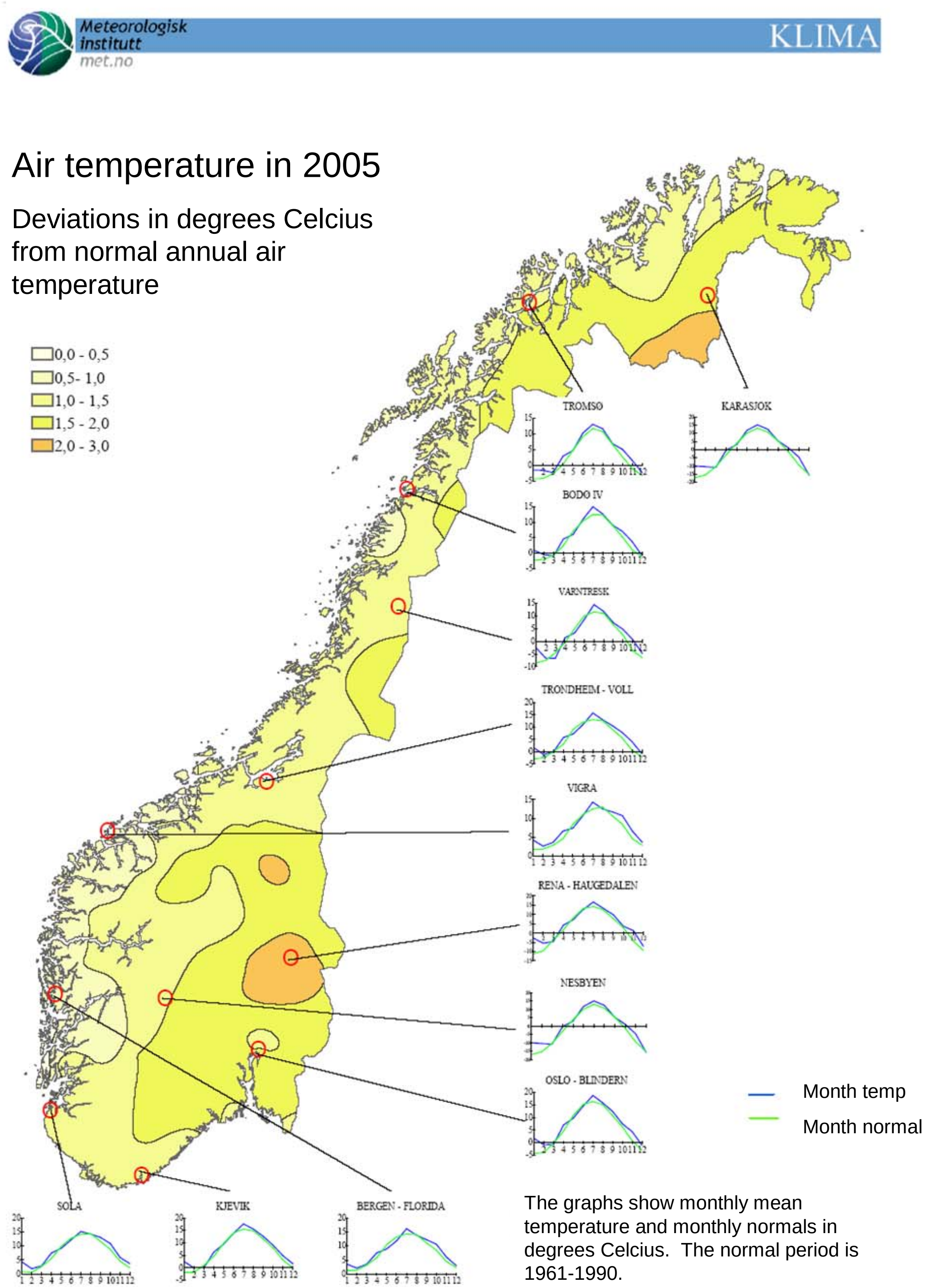


Figure 10. Air temperature in 2005 in Norway.
Source: Norwegian Meteorological Institute (met.no).

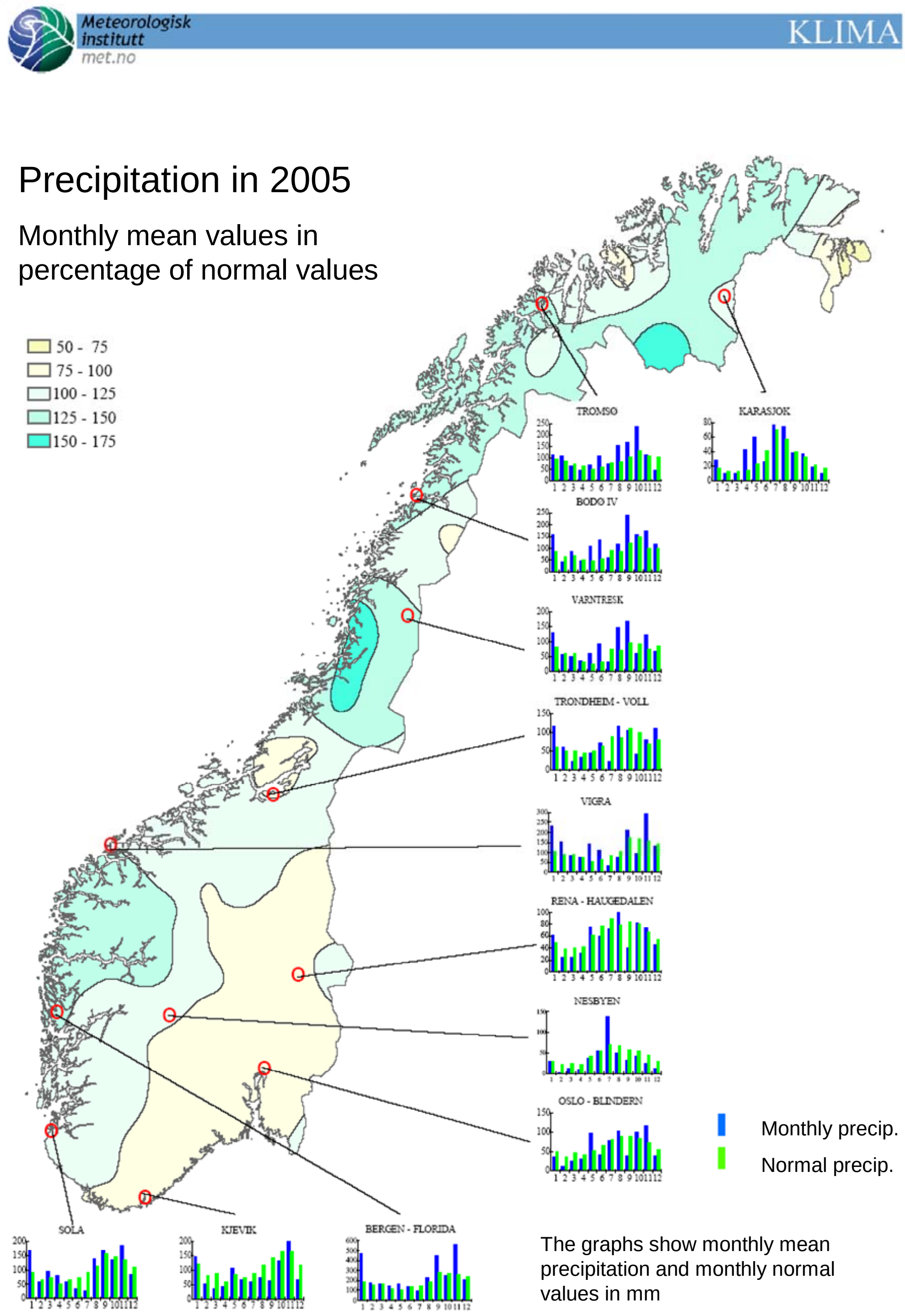


Figure 11. Precipitation in 2005 as compared with the period 1961-1990 (30-year normal). Source: Norwegian Meteorological Institute (met.no).

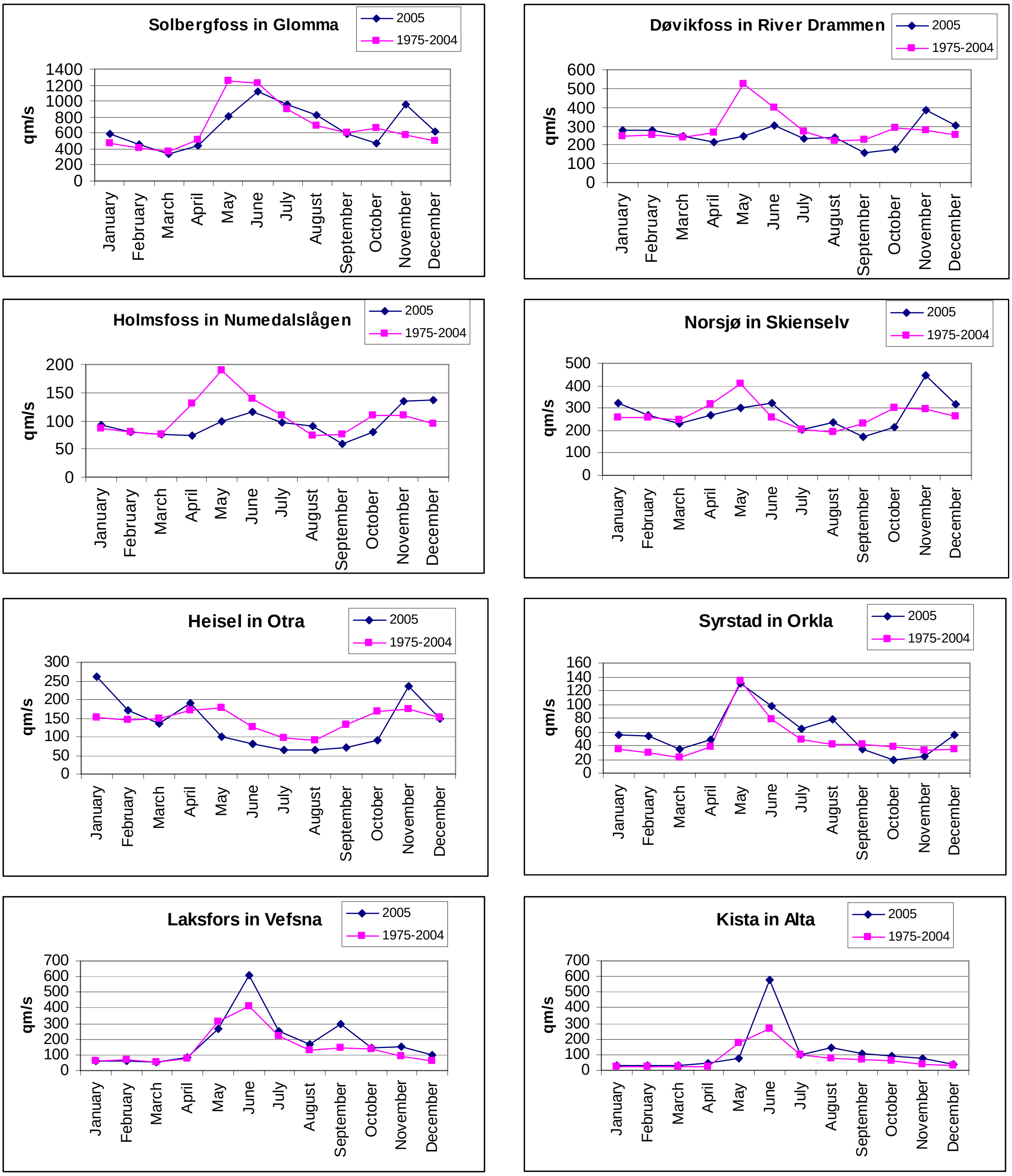


Figure 12. Monthly mean water discharge in 2005 and as an average of 30 years, derived from hydrological stations (named) in 8 of the rivers monitored monthly (data from NVE).

4. Methodology

4.1 Water Sampling Methodology

The methodology described in the Commissions Document “Principles of the Comprehensive Study on Riverine Inputs” (PARCOM, 1988, 1993) was followed.

A riverine input is a mass of a determinant carried to the maritime area by a watercourse (natural river or man-made watercourse) per unit of time. The objective of the water sampling is to obtain as accurate as possible an estimate of the input load to Norwegian coastal waters, and to obtain information on the long-term trends in inputs where such information might provide an additional or a better basis for a trend assessment.

Sampling Strategy
In 2005, water sampling for the RID Programme was carried out through a network of fieldworkers and professional staff administered by the Norwegian Water Resources and Energy Directorate (NVE). The sampling was done according to internationally agreed procedures. The personnel responsible for sampling had local knowledge of the rivers and watersheds. This ensured that unusual variations in the rivers were detected; and that samples were taken if any unforeseen events happened.

After sampling the samples were immediately stored in thermos bags and sent to NIVA for analysis.

Sampling Frequency
In general, the main rivers were samples 12 times a year, at regular monthly intervals during the sampling period from January to December 2005. Two of the main rivers (*Glomma* and *Drammenselva*) were sampled weekly or fortnightly in the period with the highest anticipated flow (May – June/July). In all the main rivers lindane and PCB have been sampled in designated bottles and analysed 4 times in 2005. The sampling frequency for the main rivers is shown in Table 5.

In the 36 rivers of quarterly sampling, the sampling was designed to cover four main meteorological and hydrological conditions in the Norwegian climate, viz. winter season with low temperatures, snowmelt during spring, summer low flow season, and autumn floods/high discharges. This change in sampling strategy that was introduced from 2004, has also come into line in 2005. With some exceptions the samples have been taken in February, May, August and October.

Table 5. Sampling frequency in main rivers (except Lindane and PCB which was sampled four times a year).

River/Location	J	F	M	A	M	J	J	A	S	O	N	D
Glomma at Sarpsfoss	x	X	x	x	Xxx	xxx	x	X	x	X	x	x
Drammen river upstream Mjøndalen Bridge	x	X	x	x	Xxx	xxx	x	X	x	X	x	x
Numedalslågen at Bommestad	x	X	x	x	X	x	x	X	x	X	x	x
Skien river at Klosterfoss	x	X	x	x	X	x	x	X	x	X	x	x
Otra at Skråstad	x	X	x	x	X	x	x	X	x	X	x	x
Orre near the outlet	x	X	x	x	X	x	x	X	x	X	x	x
Suldalslågen near the outlet	x	X	x	x	X	x	x	X	x	X	x	x
Orkla at Vormstad	x	x	x	x	X	x	x	x	x	X	x	x
Vefsna at Kvalfors	x	X	x	x	X	x	x	X	x	X	x	x
Alta river just upstream Alta	x	X	x	x	X	x	x	X	x	X	x	x

Site Selection

The sampling sites are indicated on the map of Figure 13. The sites are located in regions of unidirectional flow (no back eddies). In order to ensure as uniform water quality as possible, sites where the water is well mixed was chosen, such as at or immediately downstream a weir, in waterfalls, rapids or in channels in connection with hydroelectric power stations. Sampling sites were located as close to the freshwater limit as possible, without being influenced by seawater.

Several of the most significant discharges from the industry and the municipal wastewater system are located downstream the sampling sites. These supplies will not be included in the riverine inputs, but are included in the direct discharge estimates.

Figure 14 shows sampling sites in Rivers *Nidelva*, *Orkla*, *Vosso*, *Bjerkereim*, *Sira* and *Otra*. For quality assurance reasons, the sampling sites were documented by use of photographs in 2005. This will ensure continuity if staff needs to be changed.

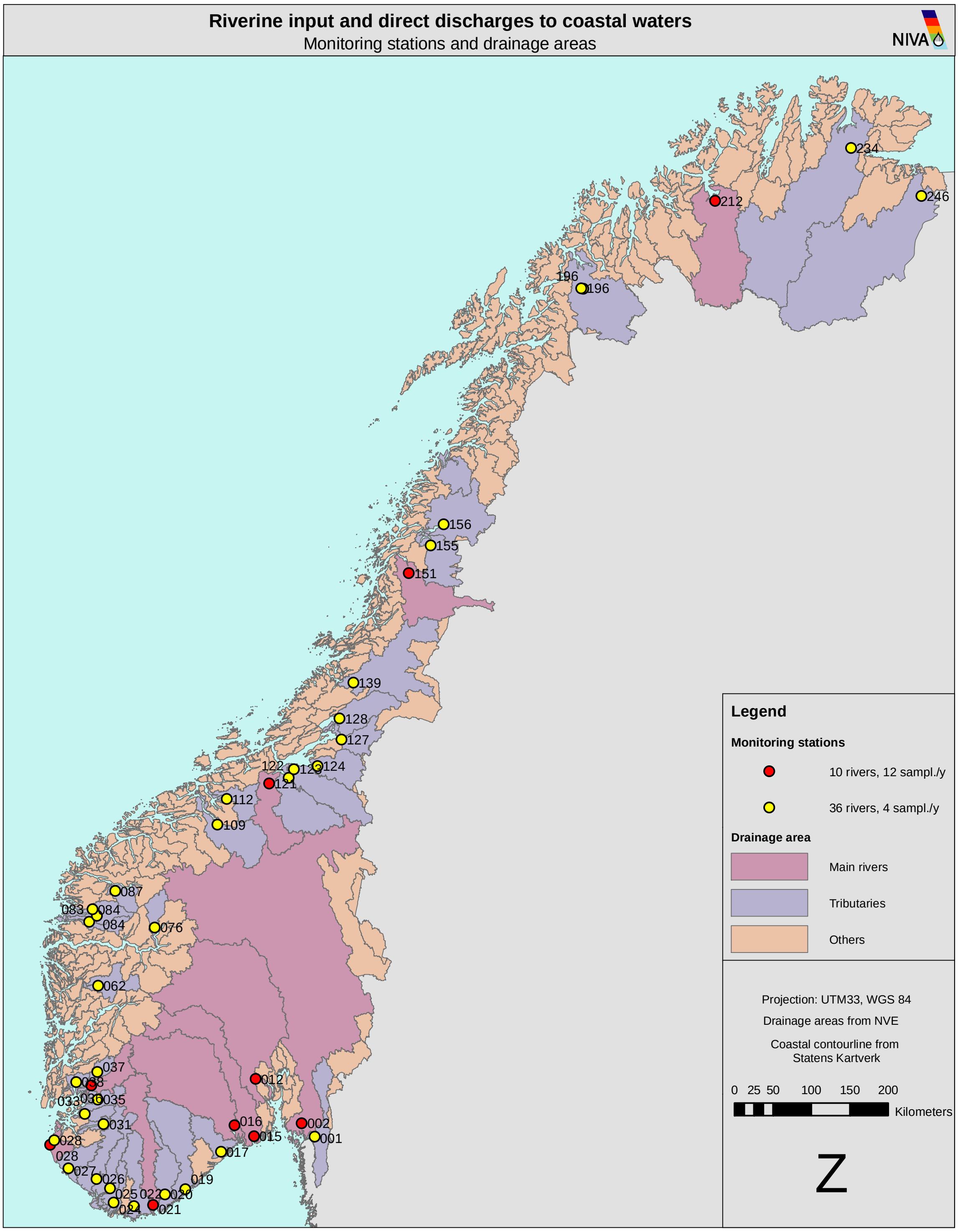


Figure 13. River sampling sites in the Norwegian RID programme. Red dots represent the 10 main rivers. Yellow dots represent the 36 'tributary' rivers. Numbers next to the dots refer to the national river register (REGINE; www.nve.no).

Figure 14. Water quality was monitored in 46 rivers in Norway in 2005. The pictures above show the monitoring sites in the Nidelva (top left), Orkla (top right), Vosso (middle left), Bjerkereim (middle right), Sira (lower left) and Otra (lower right) rivers. The sampling sites have been photographed for quality assurance reasons.

4.2 Chemical parameters – detection limits and analytical methods

In 2005, the following parameters were monitored:

- Six fractions of nutrients (total phosphorus, orthophosphates, total nitrogen, ammonia, nitrate + nitrite and silicate)
- Eight heavy metals (copper, zinc, cadmium, lead, chromium, nickel, mercury and arsenic)
- One pesticide (lindane)
- Seven PCB compounds (CB28, CB52, CB101, CB118, CB138, CB153, CB180)
- Four general parameters; suspended particulate matter (S.P.M.), pH, conductivity and total organic carbon (TOC).

Information on methodology and obtainable limits of detection for all parameters included in the sampling programme, are shown in Table 6.

Table 6. Analytical methods and obtainable detection limits for all parameters included in the sampling programme.

Parameter	**Detection limit**	**Analytical Methods (NS: Norwegian Standard)**
pH	0.01	NS 4720
Conductivity (mS/m)	0.05	NS-ISO 7888
Suspended particulate matter (S.P.M.) (mg/L)	0.1	NS 4733 modified
Total Organic Carbon (TOC) (mg C/L)	0.1	EPA number 415.1 and 9060A STD.
Total phosphorus (µg P/L)	1.0	NS 4725 – Peroxidisulphate oxidation method
Orthophosphate (PO_4-P) (µg P/L)	1.0	NS 4724 – Automated molybdate method
Total nitrogen (µg N/L)	10	NS 4743 – Peroxidisulphate oxidation method
Nitrate (µgN/L)	1	NS-EN ISO 10304-1
Ammonia (NH_4) (µg N/L)	5	NS-EN ISO 14911
Silicate (SiO_2) (Si/ICD; mg/L)	0.02	ICP-AES and ISO 11885 + NIVA's accredited method E9-5
Lead (Pb) (µg Pb/L)	0.005	ICP-MS; NIVA's accredited method E8-3
Cadmium (Cd) (µg Cd/L)	0.005	ICP-MS; NIVA's accredited method E8-3
Copper (Cu) (µg Cu/L)	0.01	ICP-MS; NIVA's accredited method E8-3
Zinc (Zn) (µg Zn/L)	0.05	ICP-MS; NIVA's accredited method E8-3
Arsenic (As) (µg As/L)	0.05	ICP-MS; NIVA's accredited method E8-3
Chromium (Cr) (µg Cr/L)	0.1	ICP-MS; NIVA's accredited method E8-3
Nickel (Ni) (µg Ni/L)	0.05	ICP-MS; NIVA's accredited method E8-3
Mercury (Hg) (ng Hg/L)	1.0	NS-EN 1483 and NIVA's accredited method E4-3
Lindane (g-HCH) (ng/L)	0.2	NIVA's accredited method H3-2 (PCB)
2,4,4'-trichlorobiphenyl (CB28) (ng/L)	0.2	NIVA's accredited method H3-2 (PCB)
2,2',5,5'-tetrachlorobiphenyl (CB52) (ng/L)	0.2	NIVA's accredited method H3-2 (PCB)
2,2',4,5,5'-pentachlorobiphenyl (CB101) (ng/L)	0.2	NIVA's accredited method H3-2 (PCB)
2,3',4,4',5-pentachlorobiphenyl (CB118) (ng/L)	0.2	NIVA's accredited method H3-2 (PCB)
2,2',3,4,4',5'-hexachlorobiphenyl (CB138) (ng/L)	0.2	NIVA's accredited method H3-2 (PCB)
2,2',4,4',5,5'-hexachlorobiphenyl (CB153) (ng/L)	0.2	NIVA's accredited method H3-2 (PCB)
2,2',3,4,4',5,5'-heptachlorobiphenyl (CB180) (ng/L)	0.2	NIVA's accredited method H3-2 (PCB)

According to the document "Principles of the Comprehensive Study of Riverine Inputs and Direct Discharges" (PARCOM, 1988), it is necessary to choose an analytical method, which gives at least 70 % of positive findings (i.e. no more than 30% of the samples below the detection limit). As shown in Table 7, thirteen parameters analysed in 2005 had more than 30% of the samples below the detection limit. Most of these parameters belong to the PCB compounds (seven) and Lindane. The rest of these parameters were 3 metals (Cd, Cr and Hg) and two nutrients (Orthophosphate and Ammonia). This reflects that the concentrations of these parameters were relatively low in river waters.

Table 7. Proportion of analyses below detection limit for all parameters included in the sampling programme.

Parameter	**% samples below detection limit**	**Total no. of samples**	**No. of samples below detection limit**
pH	0	272	0
Conductivity (mS/m)	0	271	0
Suspended particulate matter (S.P.M.) (mg/L)	<1	272	1
Total Organic Carbon (TOC) (mg C/L)	0	272	0
Total phosphorus (µg P/L)	2	272	5
Orthophosphate (PO_4-P) (µg P/L)	51	272	139
Total nitrogen (µg N/L)	0	272	0
Nitrate (µg N/L)	<1	272	2
Ammonia (NH_4) (µg N/L)	33	272	90
Silicate (SiO_2) (Si/ICD; mg/L)	0	272	0
Lead (Pb) (µg Pb/L)	3	272	7
Cadmium (Cd) (µg Cd/L)	31	272	83
Copper (Cu) (µg Cu/L)	0	272	0
Zinc (Zn) (µg Zn/L)	0	272	0
Arsenic (As) (µg As/L)	15	272	41
Mercury (Hg) (ng Hg/L)	71	272	193
Chromium (Cr) (µg Cr/L)	52	272	142
Nickel (Ni) (µg Ni/L)	2	272	4
Lindane (g-HCH) (ng/L)	73	40	29
PCB *(CB28)* (ng/L)	100	40	40
PCB *(CB52)* (ng/L)	100	30	30
PCB *(CB101)* (ng/L)	100	40	40
PCB *(CB118)* (ng/L)	100	39	39
PCB *(CB138)* (ng/L)	100	40	40
PCB *(CB153)* (ng/L)	100	40	40
PCB *(CB180)* (ng/L)	100	40	40

4.3 Quality assurance and direct on-line access to data

Data from the laboratory analyses were transferred to a database and quality checked against historical data by researchers with long experience in assessing water quality data. Whenever any anomalies were found, the samples were re-analysed. Following this quality assurance, the data were transferred to NIVA's web pages, where an on-line system was established early in 2004 (Figure 15). The system allows the authorised users to view values and graphs of each of the 46 monitored rivers. Data are uploaded continuously after each sampling.

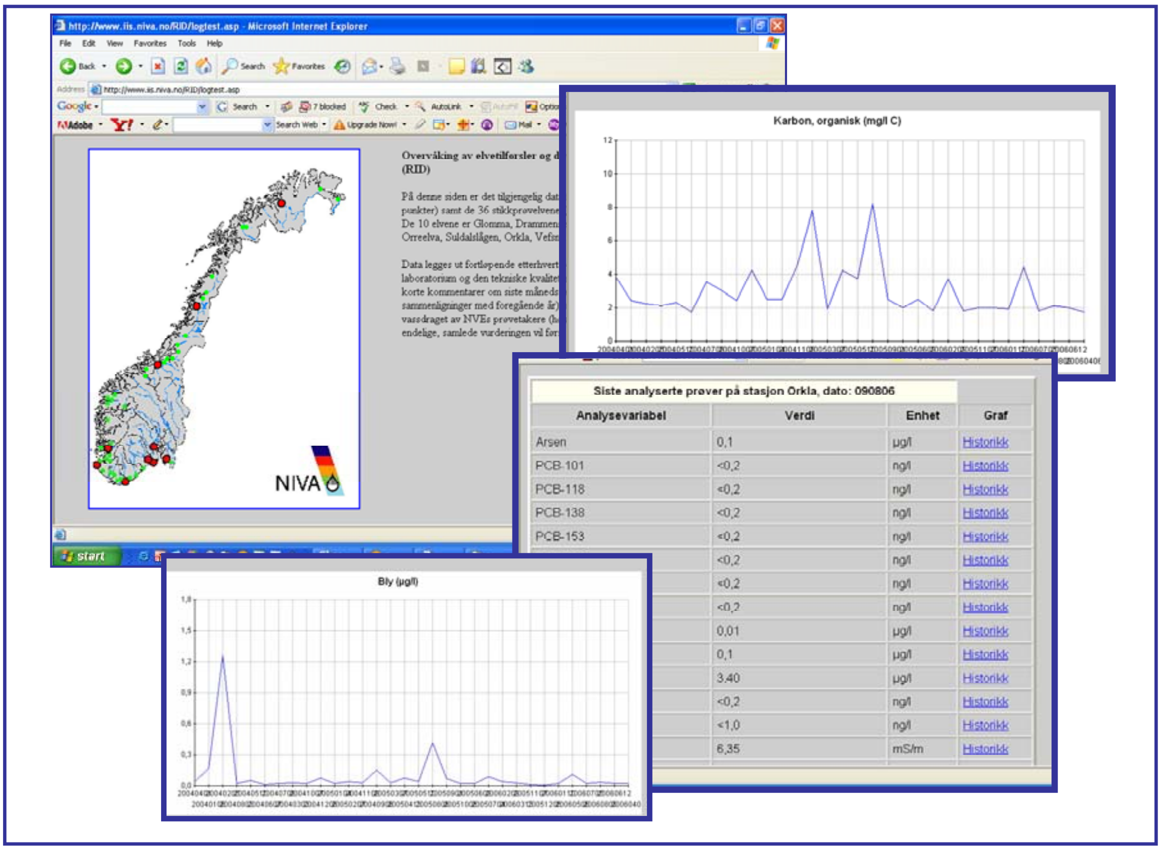


Figure 15. NIVA’s on-line web service for the RID Programme (AquaMonitor).

4.4 Water discharge and hydrological modelling

For the 10 main rivers, daily water discharge measurements were used for the calculation of loads. This is consistent with the practice of the RID programme.

For the 36 rivers monitored quarterly, as well as the remaining 109 rivers from the former RID studies, water discharge was simulated with a spatially distributed version of the HBV-model (Beldring *et al.* 2003). The use of this model was introduced in 2004. Earlier, the water discharge in the 145 rivers was calculated based on the 30 year average, and adjusted with precipitation data for the actual year. The introduction of more sophisticated hydrological modelling is done to improve the water discharge estimates in the tributary rivers.

The hydrological model performs water balance calculations for square grid cell landscape elements characterised by their altitude and land use. Each grid cell may be divided into two land use zones with different vegetations, a lake area and a glacier area. The model is run with daily time steps, using precipitation and air temperature data as input. It has components for accumulation, sub-grid scale distribution and ablation of snow, interception storage, sub-grid scale distribution of soil moisture storage, evapotranspiration, groundwater storage and runoff response, lake evaporation and glacier mass balance. Potential evapotranspiration is a function of air temperature, however, the effects of seasonally varying vegetation characteristics are considered. The algorithms of the model were described by Bergström (1995) and Sælthun (1996). The model is spatially distributed since every model element has unique characteristics that determine its parameters, input data are distributed, water balance computations are performed separately for each model element, and finally, only those parts of the model structure which are necessary are used for each element. When watershed boundaries are defined, runoff from the individual model grid cells is sent to the respective basin outlets.

The parameter values assigned to the computational elements of the precipitation-runoff model should reflect that hydrological processes are sensitive to spatial variations in topography, soil properties and vegetation. As the Norwegian landscape is dominated by shallow surface deposits overlying a relative impermeable bedrock, the capacity for subsurface storage of water is small (Beldring, 2002). Areas with low capacity for soil water storage will be depleted faster and reduced evapotranspiration caused by moisture stress shows up earlier than in areas with high capacity for soil water storage (Zhu and Mackay, 2001). Vegetation characteristics such as stand height and leaf area index influence the water balance at different time scales through their control on evapotranspiration, snow accumulation and snow melt (Matheussen *et al.*, 2000). The following land use classes were used for describing the properties of the 1 km^2 landscape elements of the model: (i) areas above the tree line with extremely sparse vegetation, mostly lichens, mosses and grass; (ii) areas above the tree line with grass, heather, shrubs or dwarfed trees; (iii) areas below the tree line with sub-alpine forests; (iv) lowland areas with coniferous or deciduous forests; and (v) non-forested areas below the tree line. The model was run with specific parameters for each land use class controlling snow processes, interception storage, evapotranspiration and subsurface moisture storage and runoff generation. Lake evaporation and glacier mass balance were controlled by parameters with global values.

A regionally applicable set of parameters was determined by calibrating the model with the restriction that the same parameter values are used for all computational elements of the model that fall into the same class for land surface properties. This calibration procedure rests on the hypothesis that model elements with identical landscape characteristics have similar hydrological behaviour, and should consequently be assigned the same parameter values. The grid cells should represent the significant and systematic variations in the properties of the land surface, and representative (typical) parameter values must be applied for different classes of soil and vegetation types, lakes and glaciers (Gottschalk et al., 2001). The model was calibrated using available information about climate and hydrological processes from all gauged basins in Norway with reliable observations, and parameter values were transferred to other basins based on the classification of landscape characteristics. Several automatic calibration procedures, which use an optimisation algorithm to find those values of model parameters that minimise or maximise, as appropriate, an objective function or statistic of the residuals between model simulated output and observed watershed output, have been developed. The nonlinear parameter estimation method PEST (Doherty et al., 1998) was used in this study. PEST adjusts the parameters of a model between specified lower and upper bounds until the sum of squares of residuals between selected model outputs and a complementary set of observed data are reduced to a minimum. A multi-criteria calibration strategy was applied, where the residuals between model simulated and observed monthly runoff from several basins located in areas with different runoff regimes and landscape characteristics were considered simultaneously.

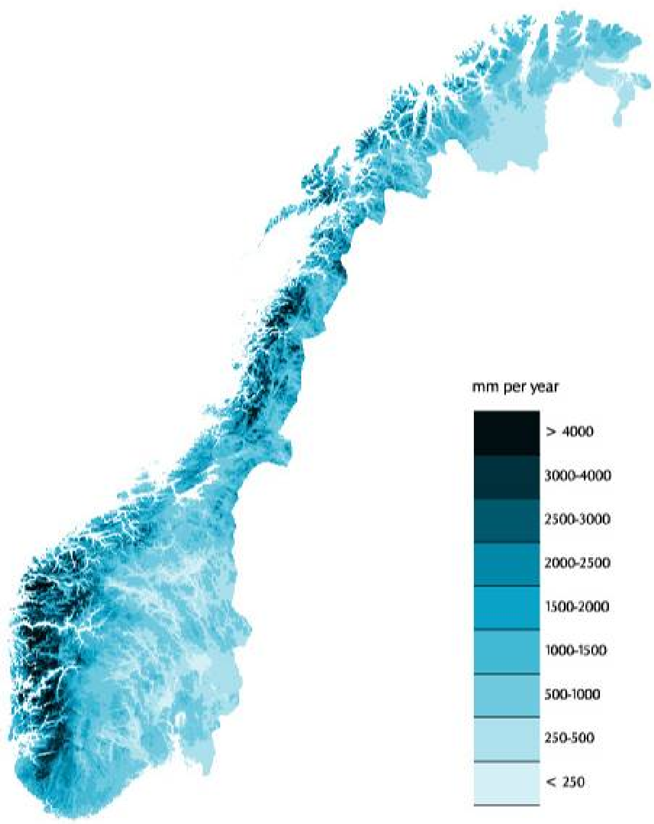


Figure 16. Annual average runoff (mm/year) for Norway for the period 1961-1990.

Precipitation and temperature values for the model grid cells were determined by inverse distance interpolation of observations from the closest precipitation stations and temperature stations. Differences in precipitation and temperature caused by elevation were corrected by precipitation-altitude gradients and temperature lapse rates determined by the Norwegian Meteorological Institute. There is considerable uncertainty with regard to the variations of precipitation with altitude in the mountainous terrain of Norway and this is probably the major source of uncertainty in the streamflow simulations. The precipitation-altitude gradients were reduced above the altitude of the coastal mountain ranges in western and northern Norway, as drying out of ascending air occurs in high mountain areas due to orographically induced precipitation (Daly et al., 1994). These mountain ranges release most of the precipitation associated with the eastward-migrating extratropical storm tracks that dominate the weather in Norway. Figure 16 shows the spatial distribution of mean annual runoff (mm/year) for Norway for the period 1961-1990.

In 2005, calibration of the model against an extended set of streamflow observations has been performed. This has resulted in a new parameter set for some rivers. Such alterations will also be done in the future, as new streamflow data are obtained.

4.5 Calculating Riverine Loads

The formula given by the Paris Commission was used for calculating loads for all of the 46 rivers:

$$Load = Q_r \frac{\sum_{i=1}^{n}(C_i \cdot Q_i)}{\sum_{i=1}^{n}(Q_i)}$$

C_i = measured concentration in sample *i*
Q_i = corresponding flow for sample *i*
Q_r = mean flow rate for each sampling period (i.e., annual flow)
N = number of samples taken in the sampling period

Essentially the formula expresses the annual load (L) as the product of a flow-weighted estimate of annual mean concentration and annual flow (Qa).

For the remaining 109 rivers (rivers monitored once a year in the period 1990-2003, but not in 2004 nor in 2005), the calculation of loads was done as follows:

- For nutrients, S.P.M, Silica and TOC, the modelled average water discharge in 2005 was multiplied with average concentration for the period 1990-2003.
- For metals, the modelled average water discharge in 2005 was multiplied with average concentration for the period 2000-2003 (earlier data were not used due to too high detection limits).

For the remaining area (includes those 92 remaining rivers that drain to the sea, but not included in either this or former RID studies; as well as areas downstream of the sampling points) the following approaches were used:

- diffuse nutrient loads were calculated by means of the TEOTIL model (see information below).
- all discharges (nutrients and metals) from industry and wastewater treatment plants in these areas were considered to be direct discharges to the sea.

It should be noted that no estimates for diffuse metals and SPM are performed for these areas.

4.6 Direct discharges to the sea

Data sources:

- Municipal wastewater and scattered dwellings (Statistics Norway- SSB / KOSTRA);
- Agriculture (BIOFORSK)- *nutrients only*
- Aquaculture (The Directorate of Fisheries / ALTINN (altinn.no))- *nutrients only*
- Industry (The Norwegian Pollution Control Authority - SFT/INKOSYS)

4.6.1 Wastewater

Statistics Norway (SSB) is responsible for the annual registration of data from all wastewater treatment plants in the country. The major parts of treatment plants with only primary treatment are serving smaller settlements, while the majority of advanced treatment plants (plants with chemical and/or biological treatment) are found near the larger cities, and therefore treat the main part of the produced wastewater. Of the total hydraulic capacity of 5.74 million p.e., chemical plants account for 37 %, primary treatment for 24 %, chemical/biological for 27 %, direct discharges for 8 %, biological for 2 % and others for 2 % (2002 data). In the North Sea area of Norway, most of the wastewater is treated in chemical or combined biological-chemical treatment plants, whereas the most common treatment methods along the coast from Hordaland county and northwards are primary treatment or no treatment.

The annual loads from municipal wastewater effluents have mostly been estimated as the product of annual flow and flow-weighted concentrations. For the rest of the municipal wastewater, the loads were estimated by multiplying the number of people with standard Norwegian per capita load figures. For raw (untreated) wastewater discharges, the document “Principles of the Comprehensive Study of Riverine Inputs and Direct Discharges” (PARCOM, 1988), recommends the derived per capita loads listed in Table 8 to be used. The Norwegian per capita loads are based on studies of Norwegian sewerage districts (Farestveit *et al.*, 1995). These data are also used to calculate pollution loads from the different treatment plants, reduced by the removal efficiency of the treatment plants. Municipal wastewater also includes a portion of industrial effluents. The fraction of the total person equivalents (p.e.) is proportioned between sewage and industrial wastewater according to the number of persons and the size of industrial effluents connected to each treatment plant.

Table 8. Per capita loads used for estimation of untreated sewage discharges.

Parameter	OSPAR	Norway
BOD (kg O/person/day)	0.063	0.046
COD (kg O/person/day)	-	0.094
TOC (kg TOC /person/day)	-	0.023
S.P.M. (kg S.P.M./person/day)	0.063	0.042
Tot-N (kg N/person/day)	0.009	0.012
Tot-P (kg P/person/day)	0.0027	0.0016

Metals from wastewater

The metal loads from wastewater treatment plant effluents were estimated based on measured data from SSB in 2001 and measured or calculated flows. The effluent metal concentrations used after treatment, based on Aquateam's study of metals in discharges from Norwegian municipal wastewater treatment plants in 1999, were used when analytical data were unavailable. The metal loads from industrial effluents were calculated based on data from SFT's database INKOSYS.

Nutrients from wastewater

Statistics Norway (SSB) and the Norwegian Pollution Control Authority (SFT) jointly initiated annual registration of data of nutrients from all wastewater treatment plants in the country with a capacity of more than 50 person equivalents (p.e.). The data are updated each year by the County Environmental Agencies. The electronic reporting system KOSTRA is used for the reporting of effluent data from the municipalities directly to SSB. Discharge figures from KOSTRA are used in the transport model "TEOTIL" to calculate the total discharges of total phosphorus, ammonia, nitrates, orthophosphates and total nitrogen from population (wastewater treatment plants and scattered dwellings not connected to wastewater treatment plants), industry, agriculture and aquaculture sources to Norwegian coastal waters. The Norwegian Institute for Water Research (NIVA) performs this modelling. The figures take account of retention in lakes.

4.6.2 Industrial effluents

Sampling frequency for industrial wastewater varies from weekly composite samples to random grab samples. Sampling is performed at least twice a year. Measured and estimated loads from industrial activities in the different areas are shown in Appendix III, Report B. NIVA has used TEOTIL for estimating the total nitrogen and total phosphorus loads from industry not connected to municipal treatment plants (Selvik *et al.*, 2006). The metal data were collected from SFT's data base INKOSYS.

4.6.3 Fish farming effluents

Fish farmers report monthly data about e.g. fish fodder, biomass, slaughtered fish and slaughter offal down to net cage level. The basis for the report from The Directorate of Fisheries is data available at altinn.no.

The sale statistics of SSB with regard to trout and salmon show the increase in fish farming activities since 1995 (see Figure 17), which has a bearing on the discharges from fish farming although there has been improvements in treatment yield and production procedures.

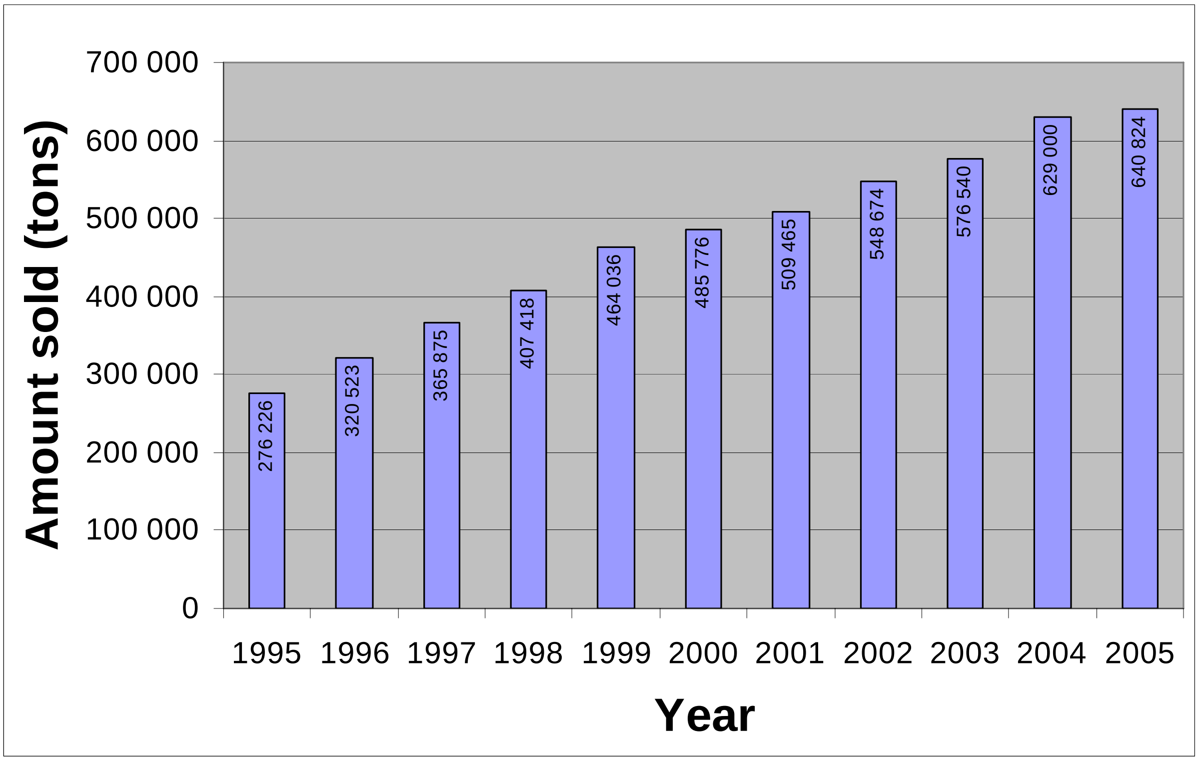


Figure 17. Quantities of sold trout and salmon for the period 1995-2005. The quantities for 2005 are preliminary (from Selvik et al., 2006, based on SSB data).

NIVA performs the estimates of discharges from fish farming of nitrogen and phosphorus according to HARP Guidelines (Borgvang and Selvik 2000). The basis for the estimates are mass balance equations, i.e. feed used (based on P or N content in feed), and fish production (based on P or N content in produced fish). The estimates do not distinguish between particulate and dissolved fractions of the nitrogen and phosphorus discharge/loss. This simple approach will therefore overestimate the nitrogen and phosphorus discharges/losses, as it does not take into account the burial of particulate nitrogen and phosphorus (especially phosphorus) in the sediments.

The produced volume has increased compared to previous years and the corresponding discharges of nitrogen and phosphorus will normally increase correspondingly. Some factors may influence sold volume, biomass produced and discharges of nitrogen and phosphorus, a few is listed here:

- Farmers may adapt slaughtering according to the market situation and sold volume and biomass produced may not correspond.
- Underreporting on the use of feed is possible, but was more likely when feed quata was in operation (before 2005)
- Diseases may lead to delayed sale or reduced production

For more information about details in data reporting and availability see Selvik *et al.*, 2006.

The loads from fish farming have been included in the grand total values as from 2000, i.e. these loads were not included in the input figures for the period 1990-1999.

The waste from aquaculture facilities is predominantly from feed (De Pauw and Joyce 1991: Pillay, 1992 and Handy and Poxton 1993), and includes uneaten feed (feed waste), undigested feed residues and excretion products (Cripps 1993). The main pollutants from an aquaculture source are organic matter, nitrogen and phosphorus (Cho and Bureau 1997). In marine fish farming the main excretory material is ammonium-N and urea which dissolve directly into the water. Approximately 70 % of the nitrogen fed to cultivated fish is released into the marine environment as soluble ammonium (Gowen and Bradbury 1987).

After deducting N and P harvested with the fish and the proportion of feed not consumed by fish, the remaining N and P is excreted in particulate (faecal) and soluble form. Results from Enell (1987), Ackefors and Enell (1990) and Ackefors and Enell (1991) have shown that about 78 % of the discharged N is in dissolved form and the rest (22 %) in particulate form.

4.6.4 All sources

With regard to nutrients Norway uses the TEOTIL model as a tool to assemble pollution load compilations of nitrogen and phosphorus in catchments or groups of catchments. The model estimates annual loads of phosphorus and nitrogen based on national statistical information on population, effluent treatment, industrial and agricultural point sources. Losses from agricultural fields and natural run-off from forest and mountain areas are based on an export coefficients approach.

TEOTIL was used for estimating the direct discharges of nitrogen and phosphorus to Norwegian coastal waters in 2005. With the Source Orientated Approach, Figures 18 and 19 show the inputs of nitrogen and phosphorus from 247 rivers to Norwegian coastal areas and the importance of the various sources. With regard to direct discharges both figures show the considerable inputs of nutrients from fish farming. The 247 rivers represent:

- the ten main Norwegian RID rivers
- the 36 rivers monitored four times a year
- the 109 rivers monitored once a year up to 2003, the load from which is now based on modelled water flow and the average concentration for the period 1999-2003 for metals, 1990-2003 for nutrients
- ninety-two rivers that never were part of the RID monitoring, but for which the inputs of nutrient were estimated using TEOTIL

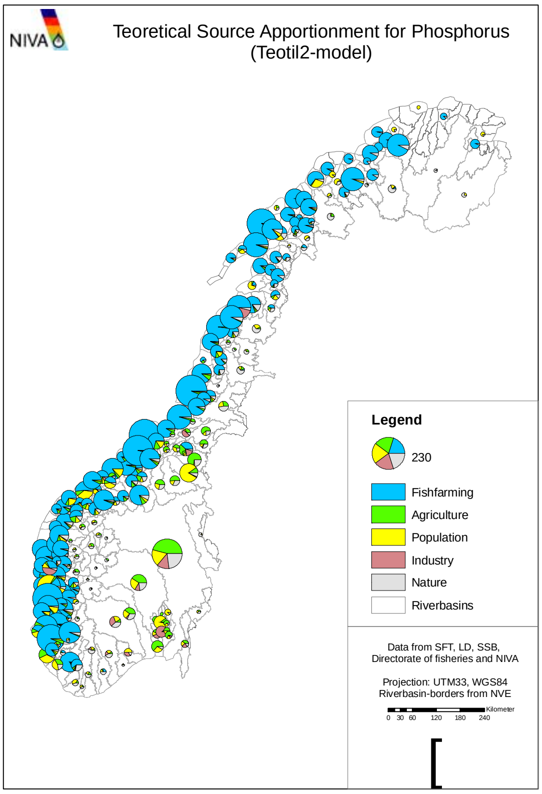


Figure 18
The relative importance of the five phosphorus sources taken account of when estimating the inputs to coastal areas from 247 rivers in 2004- Source Orientated Approach (from Selvik et al. 2006).

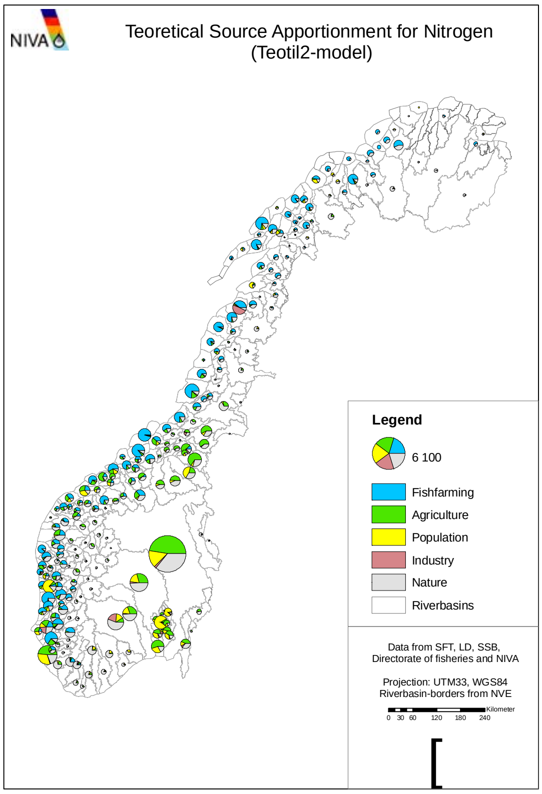


Figure 19
The relative importance of the five nitrogen sources taken account of when estimating the inputs to coastal areas from 247 rivers in 2004- Source Orientated Approach (from Selvik et al. 2006).

5. Total Inputs to Norwegian Coastal Waters 2005

Section 5.1-5.3 give an overview of the total inputs[2] in 2005 of various parameters. The underlying data for the figures is given in detail in Part B, the Data Report.

5.1 Total nutrient and particle input in 2005

The total nutrient input to coastal waters from land based sources in Norway in 2005 was estimated to 9 500 tonnes of phosphorus and 126 000 tonnes of nitrogen (Figure 20). The nutrient loads are lowest to the sub-region of the Barents Sea; 7 300 tonnes N per year and 520 tonnes P per year (Figure 21).

The total phosphorus loads are for all sub regions dominated by the dissolved inorganic fraction (PO_4-P) except for Skagerrak. This difference is due to the low number of fishfarms in Skagerrak. Fish farming comprise the major source of phosphorus input to the North Sea, Norwegian Sea and Barents Sea sub regions (Figure 21).

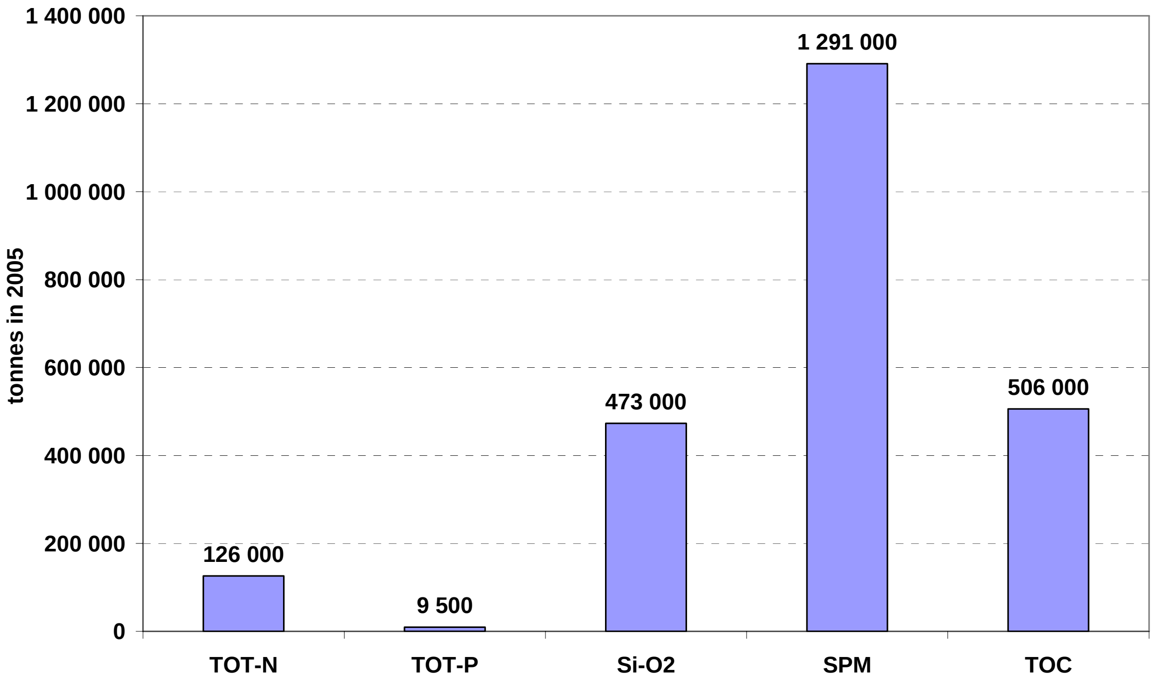
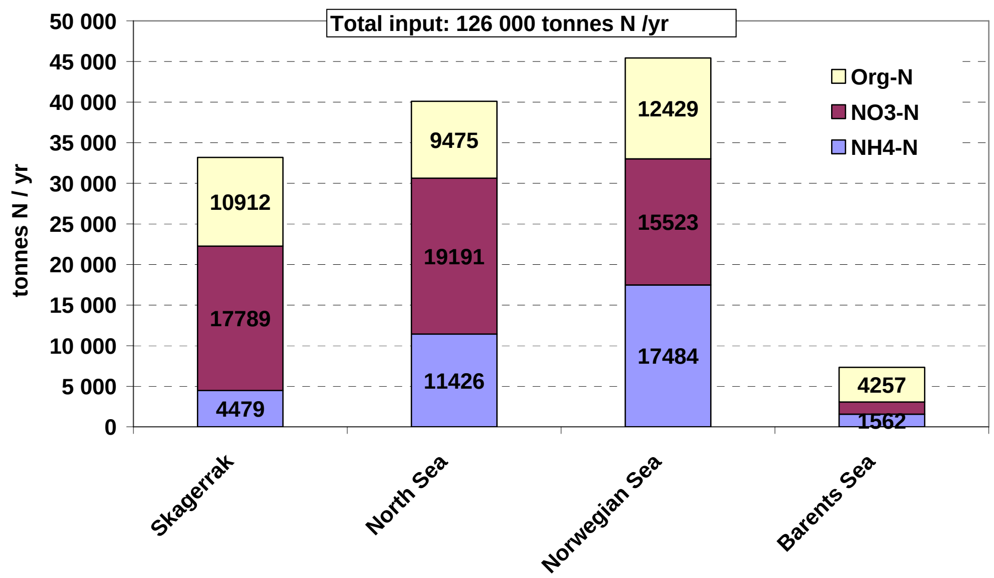


Figure 20. Total input of nitrogen, phosphorus, silicate, suspended particulate matter and total organic carbon in 2005.

[2] Sum to the four major coastal areas in Norway: Skagerrak, North Sea, Norwegian Sea, Barents Sea



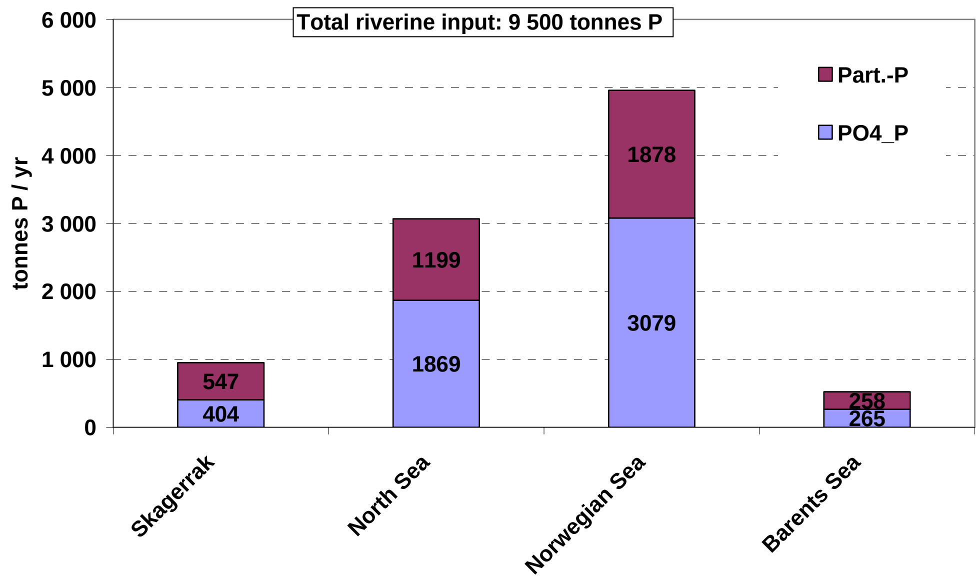


Figure 21. Loads of total-N (upper panel) and total-P (lower panel) divided into different fractions for the four Norwegian sub-regions in 2005.

Total inputs of suspended particulate matter (SPM) from Norway (Figure 22) are underestimated due to lack of monitoring data of discharges from sewage treatment plants and fish farming. Therefore the estimate of total loads was based only on riverine inputs and direct industrial discharges. The total inputs of SPM from these two sources were estimated to almost 1,3 million tonnes. The direct industrial discharges account for a high relative share especially to the Norwegian Sea. Here it should be noted that 2 industries alone account for almost 450,000 tonnes SPM of the total direct industrial discharges of 468,500 tonnes SPM. One additional industry is not accounted for since it is defined as a deep-water deposit.

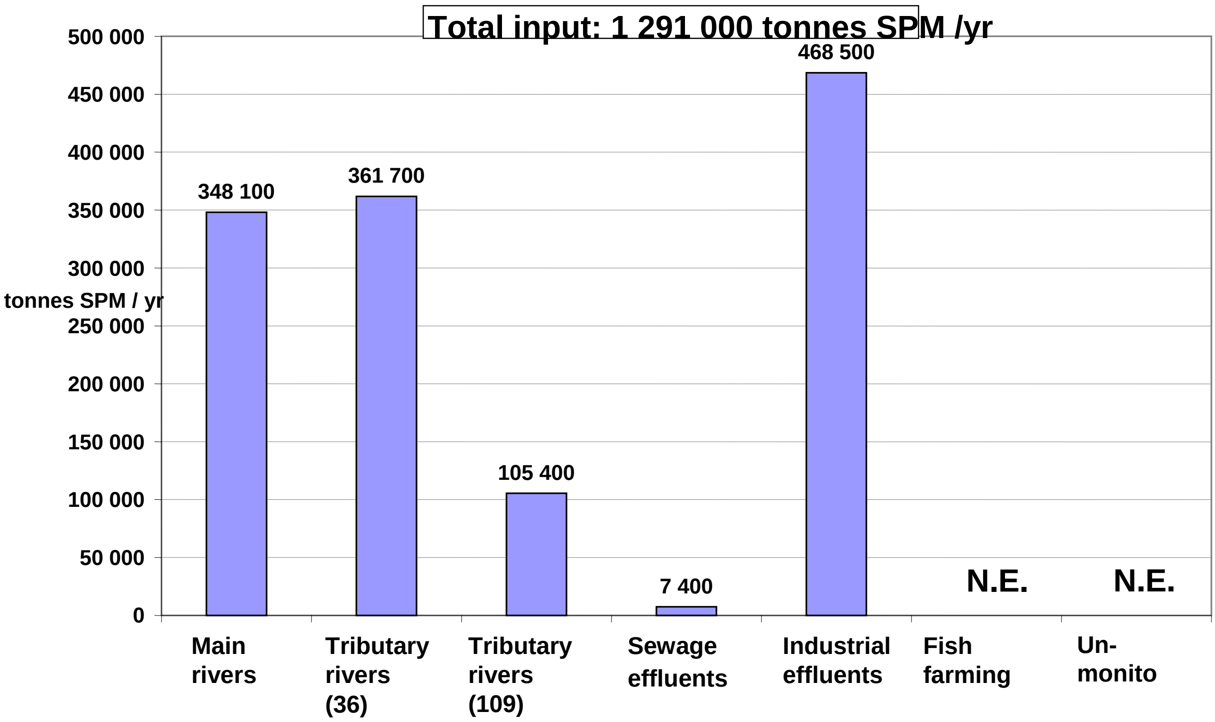


Figure 22. Inputs of particulate matter (SPM) from rivers and direct industrial discharges for in 2005.

In terms of sources, it is noteworthy that the 36 tributary rivers monitored quarterly in 2005 were estimated to transport more nutrients, silicate and particulate matter than the remaining 109 that were not monitored, but modelled this year (Figure 23). Furthermore, the nutrient loads from the 36 tributaries were equal to or larger than the loads from the ten main rivers.

Comparing riverine with direct sources (Figure 23, Lower panel) shows that the riverine sources are most important for loads of silicate and suspended particulate matter (SPM). However, estimates of SPM are not given for fish farming and unmonitored areas. For nutrients the total direct inputs are as important, or more important, than the riverine loads.

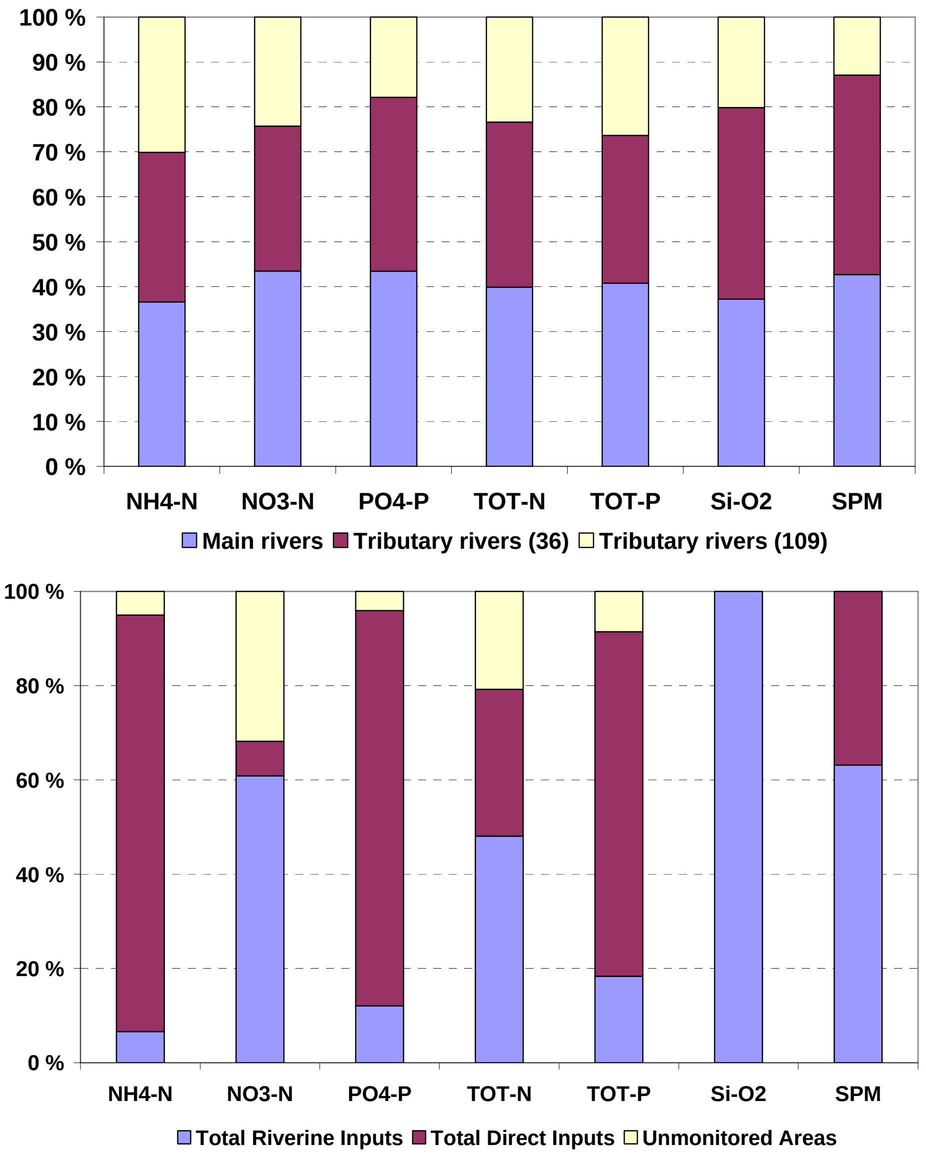


Figure 23. Main sources for nutrients, silicate and suspended particulate matter (SPM) divided into riverine contribution only (top panel) and the proportion between riverine, direct inputs and unmonitored areas (lower panel). Note that for SPM there are no estimates for fish farming and unmonitored areas.

In Figure 24, the relative share of fish farms to the total inputs of nutrients is shown for the four coastal areas. Due to few fish farms in the Skagerrak area, this area has significantly lower inputs from this source than the three other coastal areas, where aquaculture is responsible for a very high proportion of the total nutrient loads.

Totally in Norway, the nutrient loading from fish farming contributes to over 60 % of the total phosphorus loading and over 20 % of the total nitrogen loading. Only about 20 % of the phosphorus and about 50 % of the nitrogen were inputs from the monitored rivers and tributaries.

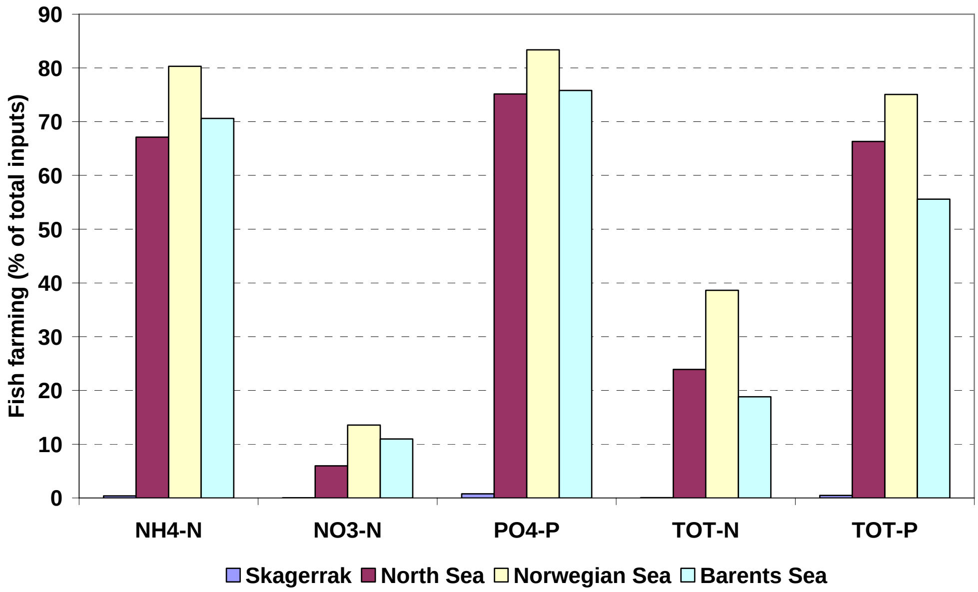


Figure 24. The relative share of nutrient inputs from fish-farming to the total inputs in 2005 for the 4 sub-regions.

The identification of long-term trends and the comparison with previous years was found to be not scientifically defensible due to uncertainties in the reporting by various industrial plants. Nevertheless, trends in riverine concentrations and loads are discussed in sections 6 and 7.

5.2 Total metal inputs

Inputs of cadmium were in 2005 estimated to 2.4-2.7 tonnes, mercury to 0.4-0.5 tonnes, arsenic to 26-27 tonnes[3], and lead to about 37 tonnes. Copper and zinc comprised the largest inputs of heavy metals, which in 2005 amounted to between 461 tonnes and 629 tonnes respectively.

[3] The variation is due to whether upper or lower estimates are used. In the upper estimates, samples with concentrations below the detection limits have been set to the detection limit; in the lower estimates, concentrations below the detection limit has been set to zero.

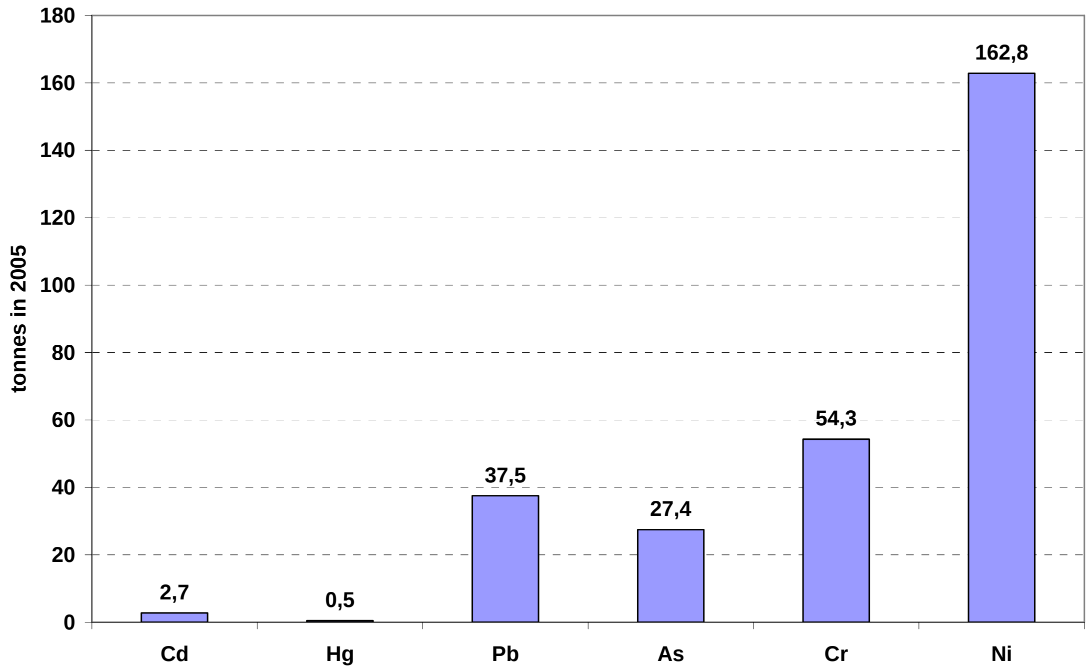


Figure 25 . Total input of cadmium, mercury, lead, arsenic, chromium and nickel in 2005.

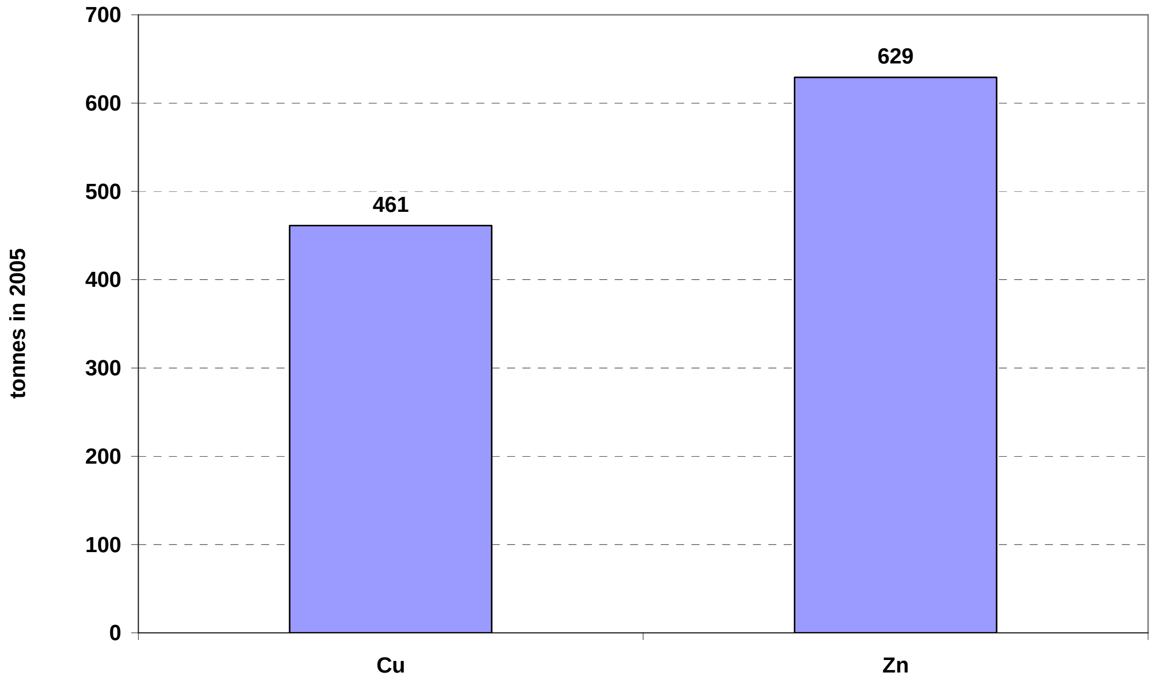


Figure 26. Total input of Copper and Zinc in 2005.

For all metals except copper (Cu), the riverine loads accounted for at least 90% of the total input to Norwegian coastal waters (Figure 27). Estimates of copper discharges from fishfarming were made for the first time in 2005 in the RID context which explain the relative high Cu- direct loads in comparison with the riverine loads (Figure 27).

Noteworthy were also the relatively high loadings from the tributary rivers (36 and 109) which for all metals exceeded the loadings from the ten main rivers (Figure 27). As for nutrients, the metal loads from the 36 tributaries monitored quarterly in 2005 were larger than the calculated loads from the remaining 109 tributaries, except for mercury.

The metal inputs per sub-region and other details are given in Part B.

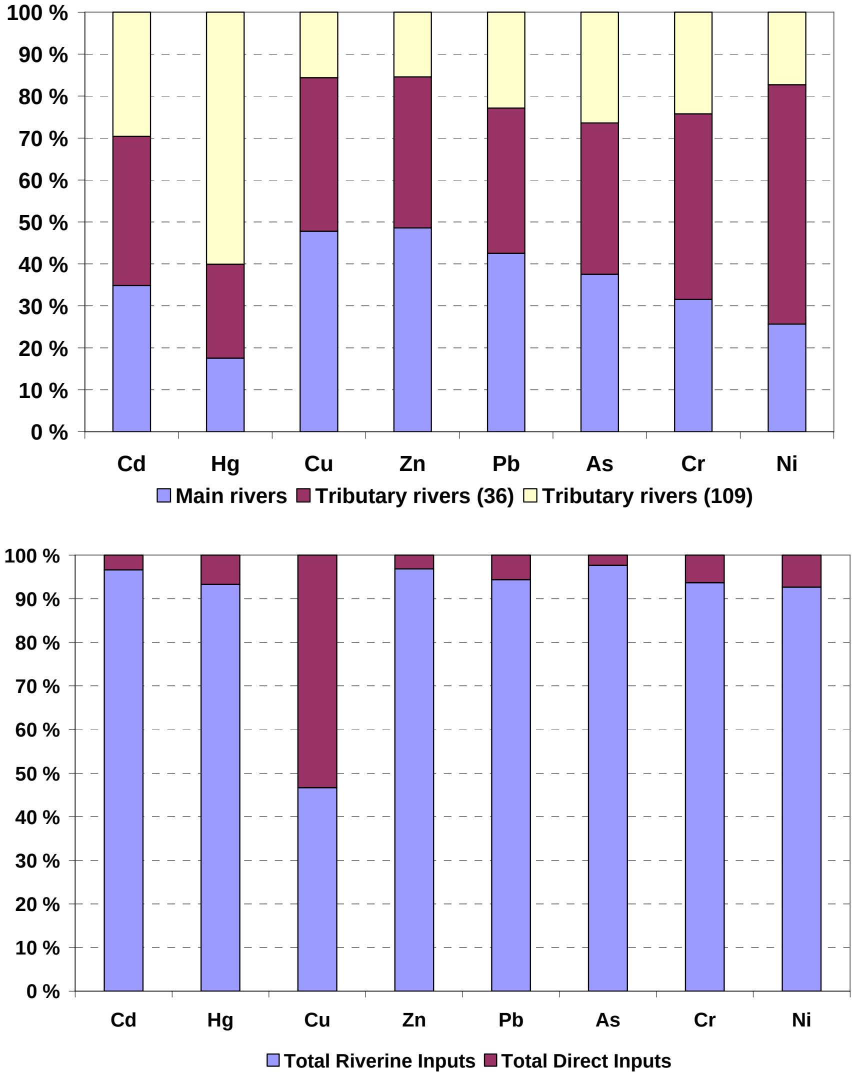


Figure 27. Relative share of the various pathways and sources of metals to the Norwegian coastal waters in 2005.

5.3 Total lindane and PCB inputs

The pesticide lindane was detected in most samples in very low concentrations (see Part B). Total riverine loads of lindane in the main rivers were estimated to 7,5-12,7 kg (Figure 28).

The PCB riverine loads in the main rivers were in 2005 calculated to 0-71 kg (Figure 28).

The figures are generated based on the detection limit of the analytical method used, i.e. the estimates of 71 kg are based on a detection limit of 0.2 PCB ng/L. PCB was not monitored in tributaries.

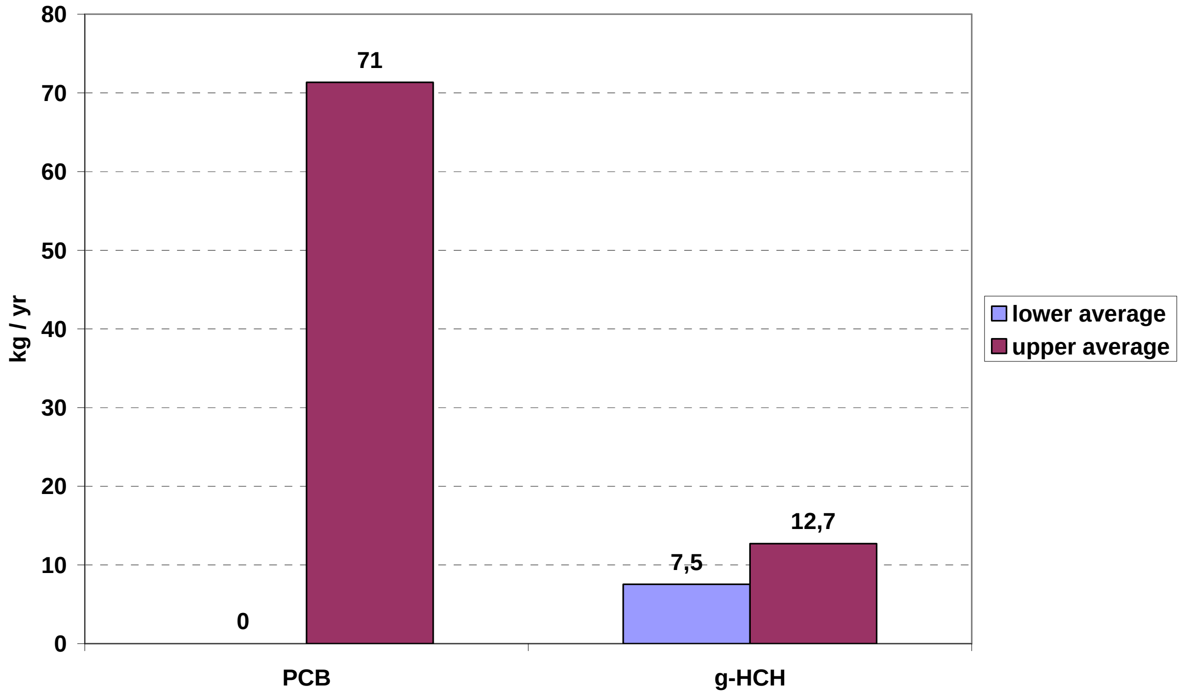


Figure 28. Riverine input (lower and upper average) in the main rivers (10) of PCB and lindane in 2005.

5.4 Load Comparison 2004 and 2005

Riverine loads

In general, most substances showed a decline in riverine loads from 2004 to 2005. This is mostly due to the regional and intraregional differences in water discharges/regimes between the two years and changed seasonal distribution. This is explained in more detail below. It is, however, important to remember that the water quality sampling is done once a month in the main rivers and four times a year in tributaries. This means that little or no account is taken of the water flow variations. With varying water regimes between years, regions, rivers, and seasons, the infrequent, regular sampling may imply that in some years and some rivers concentration peaks and flood events may be unaccounted for.

For Norway as a total, the water discharge was 4 % *higher* in 2005 compared to 2004. However, there were large regional differences (Table 9). For example, in the North Sea region (SW Norway) and the Barents Sea (N Norway), the water discharge was respectively 18 % and 20 % *higher* in 2005 than in 2004. On the other hand, in both Skagerrak and the Norwegian Sea region the water discharge was 4 % *lower* as compared to 2004.

Table 9. River water discharges (km^3/d) to the Norwegian coast in 2005 and 2004. The data is based on the main rivers (10), tributary rivers (36+109) and unmonitored areas.

	Total Norway	**Skagerrak**	**North Sea**	**Norwegian Sea**	**Barents Sea**
2005	869 596	169 272	268 036	338 147	94 142
2004	844 789	175 675	238 766	347 477	82 870

These regional differences are especially attributed to high autumn precipitation in the south and west (cf. section 3.2), which gave higher than usual runoff in the rivers of these regions, especially in November. Both Glomma, Drammen, Numedalslågen, Skienselv, and Otra had significantly higher discharges in this month than normal (see figure 12 in Chapter 3). This also resulted in several extreme flood episodes during the autumn, including several 100 year floods in the western part of the country. Whereas the southern rivers had lower water discharges than normal during the summer, the two northern rivers, Vefsna and Alta, as well as Orkla, had significantly higher water discharges in June. This was mainly caused by snowmelt: Whereas the snowmelt proceeded relatively slowly in most of Southern Norway, the spring floods were severe in the North, with 10 year floods in the far north (Finnmark) and 30-year floods in Troms county. The upper parts of river *Vefsna* had a 10-year flood due to snowmelt in June.

These rather complex differences in the water regime in 2004 and 2005, in combination with the 'mixture' with differences in concentration levels between the 155 rivers and its internal seasonal distribution, resulted in generally lower total riverine loads in 2005 compared to 2004.

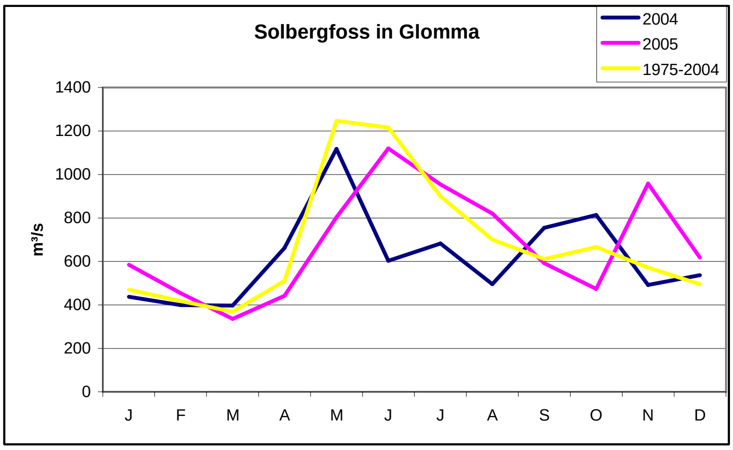


Figure 29. Monthly mean water discharge in 2004 and 2005 and as an average of 30 years (1975-2004), in the Glomma river, SE Norway (data from NVE).

Noteworthy for the metals was the relatively large decline in loads from 2004 to 2005 for five of the metals (Cd, Cu, Pb, Zn and As) in the 36 tributary rivers (4 samples a year) (Table 10). This was not observed in the ten major rivers. The decline in the tributary rivers is related to lower concentrations in the samples. This might indicate that the decline is explained by climatic differences between the years or that quarterly sampling has failed to catch concentration peaks.

Table 10. Riverine loads of various metals in 2004 and 2005. All values in tonnes yr^{-1}.

		Cd		**Cu**		**Zn**		**Pb**		**As**	
		2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
Major rivers (10)	Lower avg	0,81	0,86	98,7	102,9	226,5	296,0	14,7	15,1	9,8	10,0
	Upper avg	0,84	0,92	98,7	102,9	226,8	296,0	14,7	15,1	9,9	10,1
Tributary rivers (36)	Lower avg	1,57	0,70	130,1	78,8	273,3	219,4	21,0	12,3	13,6	8,7
	Upper avg	1,74	0,94	130,1	78,8	273,9	219,4	21,0	12,3	18,2	9,7
Tributary rivers (109)	Lower avg	0,82	0,78	37,4	33,6	98,7	93,8	8,5	8,1	8,2	7,1
	Upper avg	0,82	0,78	37,4	33,6	98,7	93,8	8,5	8,1	8,2	7,1
Total rivers	Lower avg	3,20	2,35	266,2	215,3	598	609	44,2	35,401	31,6	25,7
	Upper avg	3,40	2,65	266,2	215,3	599	609	44,2	35,407	36,3	26,8

However there were some substances that also showed *increased* riverine loads. More explicitly, the increased Zn and Cu loads for some of the main rivers are explained by increased concentrations, some during the flooding periods. For example in Glomma, the above-mentioned November rain-period increased the Cu and Zn concentrations slightly, but the load significantly and give raise to high annual total loads (Table 11).

Table 11. November sample concentrations of Cu and Zn in 2004 and 2005, respectively for the Glomma River.

	Nov. 2004	**Nov. 2005**
Cu	1,99	2,63
Zn	3,42	5,35

Otherwise, for the other metals in the major rivers, there were mainly marginal differences in loads between 2004 and 2005.

For SPM, the riverine loads totally from Norway have increased with almost 100 000 tonnes (Table 12). This is mainly explained by the increased loads in the major rivers. Total-P also showed a general increase compared to 2004. This is very much related to increased particle transport due to the water regime in 2005 in general and the above mentioned flood episodes in 2005 in particular.

On the other hand, we can also note a substantial decline in the SPM load. For example, the loads in tributary rivers in the Barents Sea region have declined from 35 500 tonnes SPM in 2004 compared to 13 500 tonnes in 2005.

However, this issue cannot be discussed without taking into account the general uncertainty in the load estimates for the tributary rivers, given the low sampling frequency (e.g. Borgvang 2006B). This further implies that any interpretation for single years should be made with great caution. It should also be pointed out that modelled water discharge was used for the tributary rivers in both 2004 and 2005. The model was improved in 2005, which makes the results not fully comparable between 2004 and 2005 since no re-calculation of the 2004 load-data was performed.

Table 12. Riverine load (in 1000 tonnes) of SPM in 2005 and 2004.

	Total Norway		**Skagerrak**		**North Sea**		**Norwegian Sea**		**Barents Sea**	
	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
Main rivers	240	348	208	265	5,0	40	25	19	1,2	24
Tributary rivers (36)	351	362	20	14	110	166	186	168	35	13
Tributary rivers (109)	127	105	27	14	31	35	62	49	6,8	7,6
Total Norway	717	815	255	293	146	241	273	236	43	45

The total-N riverine load showed a slight decline between 2004 and 2005 (Table 13); whereas there were only small differences in overall loads of total phosphorus in the two years.

Table 13. Total riverine load of total nitrogen and total phosphorus in 2005 and 2004.

	Nitrogen		**Phosphorus**	
	2004	2005	2004	2005
Major rivers (10)	23 338	24 143	489	710
Tributary rivers (36)	26 083	22 264	664	573
Tributary rivers (109)	16 196	14 165	519	459
Total Rivers	65 616	60 572	1 673	1 741

Direct discharges

The following differences in direct discharges from 2004 to 2005 have been found (Table 14):

- In 2005, estimates were made for the first time of copper discharges from aquaculture. This explains why the total loads of Cu is higher in 2005 compared to 2004, ie., inclusion of new source.
- The direct discharges for Cd, Zn, Pb, As, Ni and the N and P fractions were only marginally different between the years and within the level of uncertainty.
- The Hg inputs have declined from 140 kg to 30 kg, In year 2004, a high share of direct mercury discharges was almost solely explained by high discharges from three sewage treatment plants (all located in the Skagerrak sub-region) that contributed with inputs of 68, 27 and 26 kg. In 2005, the total emissions from these 3 plants were only 0,3 kg Hg.
- The increase in Cr may, as for Hg, be explained by uncertain data.

In any case, changes in discharges from industry and WWTPs are insignificant in magnitude compared to the riverine loads.

As a general point, it is important to bear in mind the two major uncertainties that presently make comparisons between years slightly doubtful for direct discharges:

- the inconsistencies in point source data, since the number of industrial plants reporting losses varies considerable from year to year.
- incomplete reporting of discharges of especially heavy metals from wastewater treatment plants.

Table 14. The total direct inputs to the Norwegian coast in 2004 and 2005. The direct discharges comprise of (i) sewage effluents, (ii) industrial effluents and (iii) fish farming. All values are given in tonnes.

	Cd	**Hg**	**Cu**	**Zn**	**Pb**	**As**	**Cr**	**Ni**	**NH_4-N**	**NO_3-N**	**PO_4-P**	**TOT-N**	**TOT-P**	**SPM**
2004	0,10	0,14	17,5	23,6	2,2	0,8	0,8	8,9	27232	3506	4266	36477	6300	365458
2005	0,09	0,03	246,0	19,8	2,1	0,6	3,4	11,9	30887	3961	4710	39280	6943	475932

6. Trend analyses - pollutant concentrations

6.1 Statistical method

A new type of data analysis method of reporting long-term changes in the concentration values for the 10 main Norwegian rivers was introduced in last years report (Borgvang et al. 2006A). This statistical procedure – with short name PMK – was used to test for monotone trends in the concentration time series (1990-2005) by simultaneously taking into account the correlation with (and time-trends in) water discharge.

The statistical properties of water quality data are usually not normally distributed, and they often exhibit a seasonal pattern because they are influenced by water discharge. In this report, a recently modified version of the seasonal Mann–Kendall test (Libiseller and Grimvall, 2002), referred to as the partial Mann–Kendall (PMK) test, which has been adapted to account for the influence of confounding (i.e. meteorological or hydrological) variables, was used with water discharge as such a variable.

It should be noted that the PMK-method tests for monotonic trends (including linear trends). Each season (i.e., month) is tested separately for trends before it is summed up to an overall test-statistics. The trends were regarded as statistically significant at the 5%-level (double-sided test). In addition to the formal statistical test, a visual inspection of all the time series was performed (cf. Figures 33-35 and complimentary figures in Annex II).

The time period analysed is 1990-2005, with monthly observations. In months with more than one sample, an arithmetic average was calculated. It should be noted that the sampling frequency was less than monthly during 1990-1998 for the rivers *Suldalslågen* and *Alta*.

Chemical variables analysed for trends includes conductivity (Cond), cadmium (Cd), copper (Cu), nickel (Ni), lead (Pb), zink (Zn), ammonium nitrogen (NH_4-N), nitrate nitrogen (NO_3-N), total nitrogen (TN), phosphate phosphorus (PO_4-P), total phosphorus (TP) and suspended particulate matter (SPM).

No trend analyses were performed for mercury (Hg) because of the general high analytical uncertainty of this parameter and change in analytical methods in 1999 (Weideborg et al., 2004). Other parameters not analysed for trends due to too short time series and/or gaps in the series include AOX, arsenic (As), cobolt (Co), chromium (Cr), total organic carbon (TOC), dissolved organic carbon (DOC), PCB and lindane (γ-HCH).

All trend analyses are performed on the upper estimates (i.e., if the concentration of the sample isbelow the detection limit, the concentration has been set equal to the value of the detection limit).

6.2 Results (Trends)

6.2.1 Water discharge

Trends in water discharge has only been analysed for the specific dates of sampling in the ten rivers. Based on this analysis, it can be concluded that water discharge during sampling dates has shown no significant upwards or downwards trends, thus indicating that sampling has occurred during relatively similar water discharges throughout the years.

The visual inspection of the time series showed elevated water flows during the autumn 2000 in all rivers discharging into Skagerrak except from the *Otra* river. Unusual high water flows during sampling dates were found in *Orreelva* in the end of 2004.

6.2.2 Nutrients and particulate matter

For total nitrogen, the PMK test revealed two statistically significant *downward* trends (p<0,05; Table 15), viz. in *Skienselva* and *Alta*. The reduction in *Skienselva* is confirmed by the fact that also nitrate is showing a downward trend in these rivers (Figure 30 and 33). The trend in *Alta* is explained by reductions in the organic nitrogen concentrations. Two other rivers, *Suldalslågen* and *Vefsna* showed tendencies of reduced TOT-N concentrations (0,1<p<0,05). Noteworthy were also some concentration reductions in the latter years (2000 onwards). These reductions were particulary visible in *Orreelva* and *Vefsna* in 2001-2005. These observations should not be over-interpreted, but might indicate a parabolic (curved) trend that is not captured by the trend test method (detects only monotonic trends). No statistically *increased* trends for tot-N were detected despite some tendencies of increased values in *Drammenselva* and *Numedalslågen*, mainly explained by the generally low concentrations during the first three years of the monitoring period (1990-1992).

The only tendencies to upward trends for nitrate were detected in the *Numedalslågen*, mainly due to relatively low concentrations in 1990 and 1991. Significant downward trends were detected in *Skienselva, Suldalslågen* and *Vefsna* (Figure 30). The latter river showed the only significant downward trend in ammonium nitrogen, despite a peak observation in August 2004. However, 12 missing observations during the 3-year period 2001-2003 reduces the significance of this finding, especially since the missing values are in months with normally high concentrations. The downward trend for nitrate-N in *Suldalslågen* is mainly explained by decreased concentrations in the autumn period (Aug-Oct) (Figure 31). This also exemplify the strength in using a seasonal test compared to a test on annual aggregated values.

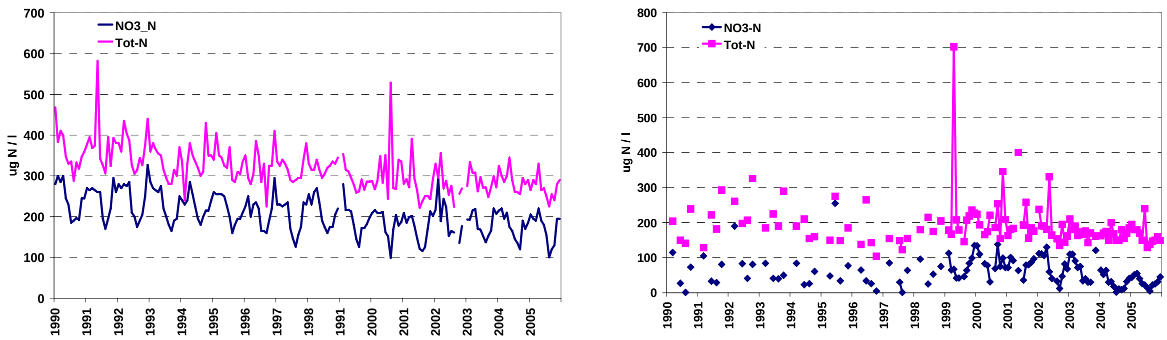


Figure 30. Monthly total-nitrogen and nitrate concentrations in Skienselva (left panel) and Vefsna (right panel).

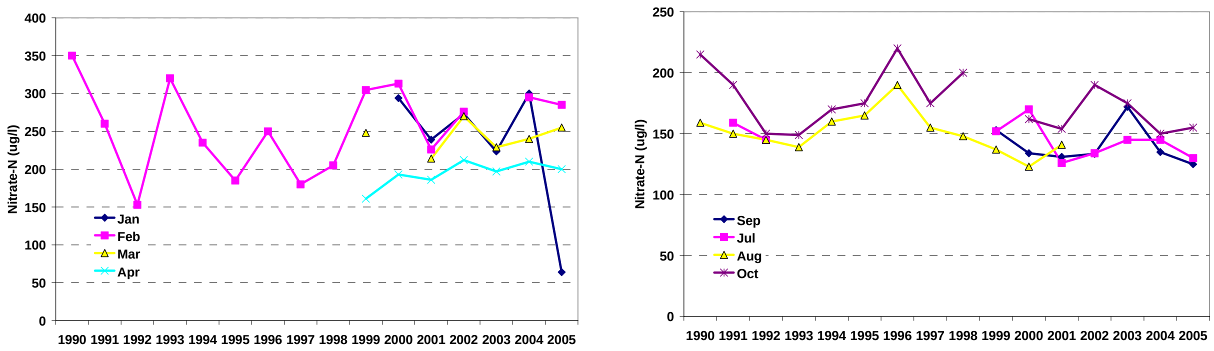


Figure 31. Monthly nitrate concentrations in Suldalslågen divided into winter values (left panel) and autumn values (right panel).

For total phosphorus, no statistically significant increasing trend was detected (Table 15), besides an increased tendency in the river *Numedalslågen* (p<0,09). The lack of significant trends in total phosphorus concentrations is somewhat surprising given the general improvement of municipal sewage treatment during the last 15-year period. An exploratory analysis of the time series showed surprisingly high concentration levels and peak values in many rivers during the period 1999-2002. This strange phenomenon is visible in all rivers except *Orreelva* and *Vefsna*.

In rivers where total phosphorus normally is dominated by erosion processes such as *Numedalslågen*, the normal relative good relationship between concentrations of total phosphorus and suspended particulate matter was almost non-existent during the period 1999-2002 (Figure 32). Particularly noteworthy was the many high total phosphorus concentration at low suspended particulate matter levels during this period compared to earlier and later periods (1990-1998 and 2003-2005).

In this connection it is worth mentioning that the year 2000 was extreme in terms of water discharge in the 5 rivers discharging into the coastal area of Skagerrak. More precisely, in *Glomma*, *Drammenselva*, *Numedalslågen*, *Skienselva,* and *Otra*, the annual water discharge was the highest ever reported during the study period. This was due to the intensive rainfall during the autumn 2000.

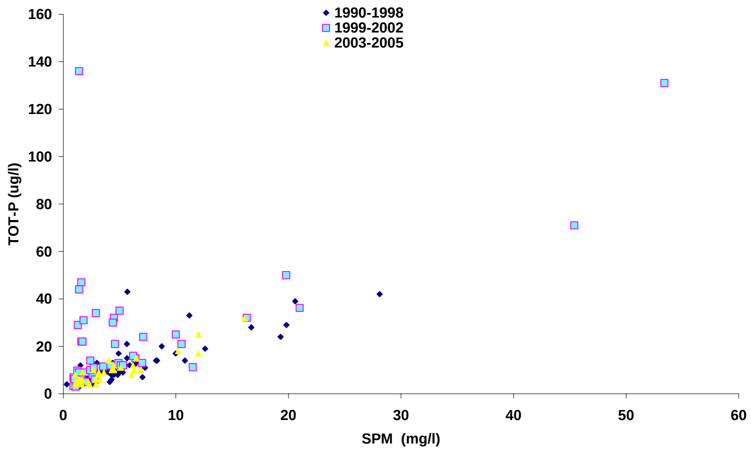


Figure 32. Scatter plot of the relationship between total phosphorus and suspended particulate matter concentrations in three time periods in Numedalslågen.

The same peculiar '1999-2002 pattern' as for total phosphorus is far less visible for orthophosphate, except for *Drammenselva, Suldalslågen* and *Alta,* and to some extent also the years 2000-2002 in *Orkla*. The formal statistical trend test for phosphate did not retrieve a single significant trend.

For suspended particulate matter, two downward trends were statistically detected; in *Otra* and *Orkla*. In *Glomma*, after the visible inspection of the suspended particulate matter series, it was observed that the peaks with values over 40 mg/l were totally absent after the beginning of year 2000. Particularly low SPM levels were observed in many of the rivers in 2002. High autumn values in 2000 was another characteristic in *Glomma, Drammenselva, Numedalslågen* and S*kienselva*, which corroborated well with the peaks in water discharge the corresponding period. In *Suldalslågen*, no high peak values were observed during 1990-1998, probably due to lower sampling frequency, but also possibly because of the effects of extensive hydropower regulations in this river.

Table 15 summarises long-term trends for nutrient concentrations in the 10 main rivers.

Table 15. Long-term trends for water discharge, nutrient and particle concentrations in the 10 Norwegian rivers 1990- 2005.

River	Q	NH_4-N	NO_3-N	Tot-N	PO_4-P	Tot-P	SPM
Glomma	0,8056	0,2075	0,7017	0,2201	0,9617	0,2272	0,4708
Drammenselva	0,2167	0,3690	0,5765	0,1692	0,6061	0,5694	0,4744
Numedalslågen	0,7510	0,7419	0,0738	0,1911	0,1997	0,0901	0,6081
Skienselva	0,1379	0,9479	0,0002	0,0003	0,1560	0,3852	0,3075
Otra	0,5800	0,4720	0,7132	0,4253	0,1125	0,2937	0,0037
Orrelva	0,4191	0,1752	0,2918	0,4750	0,0733	0,8585	0,9579
Suldalslågen	0,5872	0,4750	0,0456	0,0605	0,0724	0,7736	0,0488
Orkla	0,5758	0,8914	0,6761	0,9729	0,1840	0,3656	0,0068
Vefsna	0,5321	0,0123	0,0016	0,0813	0,7680	0,4947	0,3153
Alta	0,5351	0,1002	0,1952	0,0378	0,2501	0,1866	0,0931

Dark green	Significant downward ($p<0,05$)
Light green	Downward but not significant ($0,05<p<0,2$)
Red	Significant UPWARD ($p<0,05$)
Orange	Upward but not significant ($0,05<p<0,2$)

6.2.3 Metals and conductivity

Overall, a majority of the five analysed metals (Cd, Cu, Ni, Pb, Zn) showed a statistically downward trend in most of the ten studied rivers. More precisely, 44 of 50 metal trend tests revealed a statistically significant downward trend (Table 16). In addition, 4 additional tests showed an indication of decreased concentrations ($p<0.2$).

It should be kept in mind that the detection limits have decreased during the course of the monitoring programme between 1990 and 2005, but, nevertheless, there are still good arguments to believe that the observed trends also reflect trends due to emission reductions.

The conductivity measurements showed declined trends in *Skienselva, Otra, Suldalslågen* and *Alta*. Reduced point source emissions from industries and municipal sewage treatment plants combined with acid rain reductions (sulphate) may explain these trends. An upward trend was detected in *Drammenselva*, due to low values in 1990 and 1991 (see figure in Annex II).

Table 16. Long-term trends for conductivity and metals in the 10 Norwegian rivers 1990-2005.

River	Q	Cond	Cd	Cu	Ni	Pb	Zn
Glomma	0,8056	0,8731	0,0061	0,0350	0,0024	0,0034	0,0013
Drammenselva	0,2167	0,0155	0,0009	0,2186	0,0807	0,0272	0,0352
Numedalslågen	0,7510	0,9904	0,0024	0,0074	0,0021	0,0041	0,0109
Skienselva	0,1379	0,0027	0,0027	0,1302	0,0065	0,0069	0,0028
Otra	0,5800	0,0001	0,0161	0,3402	0,0898	0,0049	0,0003
Orrelva	0,4191	0,8321	0,0007	0,0489	0,0005	0,0092	0,2807
Suldalslågen	0,5872	0,0012	0,0017	0,0185	0,1192	0,0247	0,0012
Orkla	0,5758	0,4071	0,0493	0,0730	0,0033	0,0078	0,0140
Vefsna	0,5321	0,7034	0,0004	0,0041	0,0027	0,0006	0,0021
Alta	0,5351	0,0091	0,0015	0,0037	0,0043	0,0007	0,0033

Dark green	Significant downward ($p<0,05$)
Light green	Downward but not significant ($0,05<p<0,2$)
Red	Significant UPWARD ($p<0,05$)
Orange	Upward but not significant ($0,05<p<0,2$)

Figures 33-35 show monthly concentrations of total nitrogen, total phosphorus and cadmium, respectively, for the ten main rivers. Similar charts for the other RID parameters may be found in Annex II.

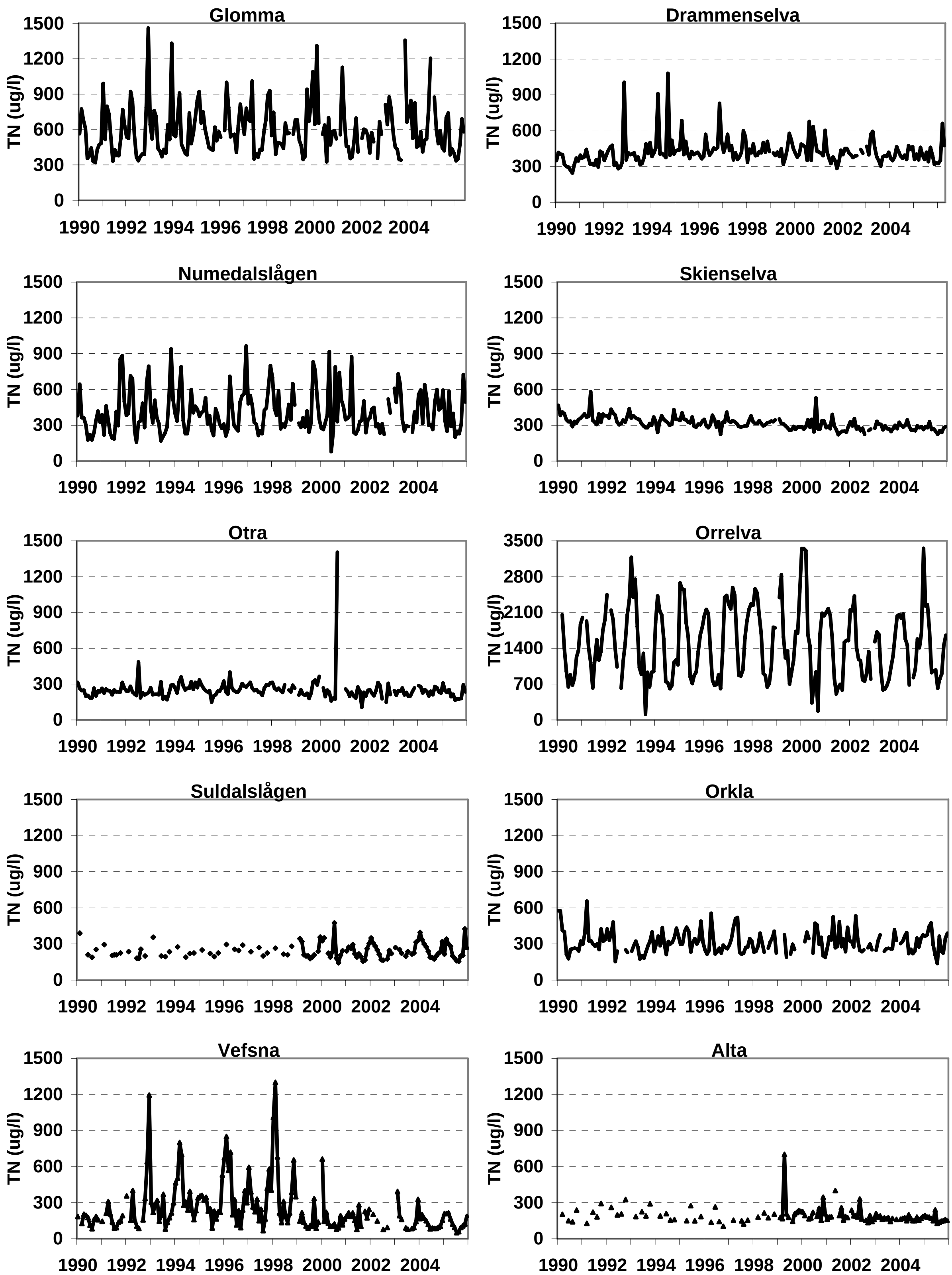


Figure 33. Monthly <u>total nitrogen</u> *concentrations in the 10 Norwegian main rivers besides data in 2005 for Glomma and Drammenselva that show all 16 sampled concentrations.*

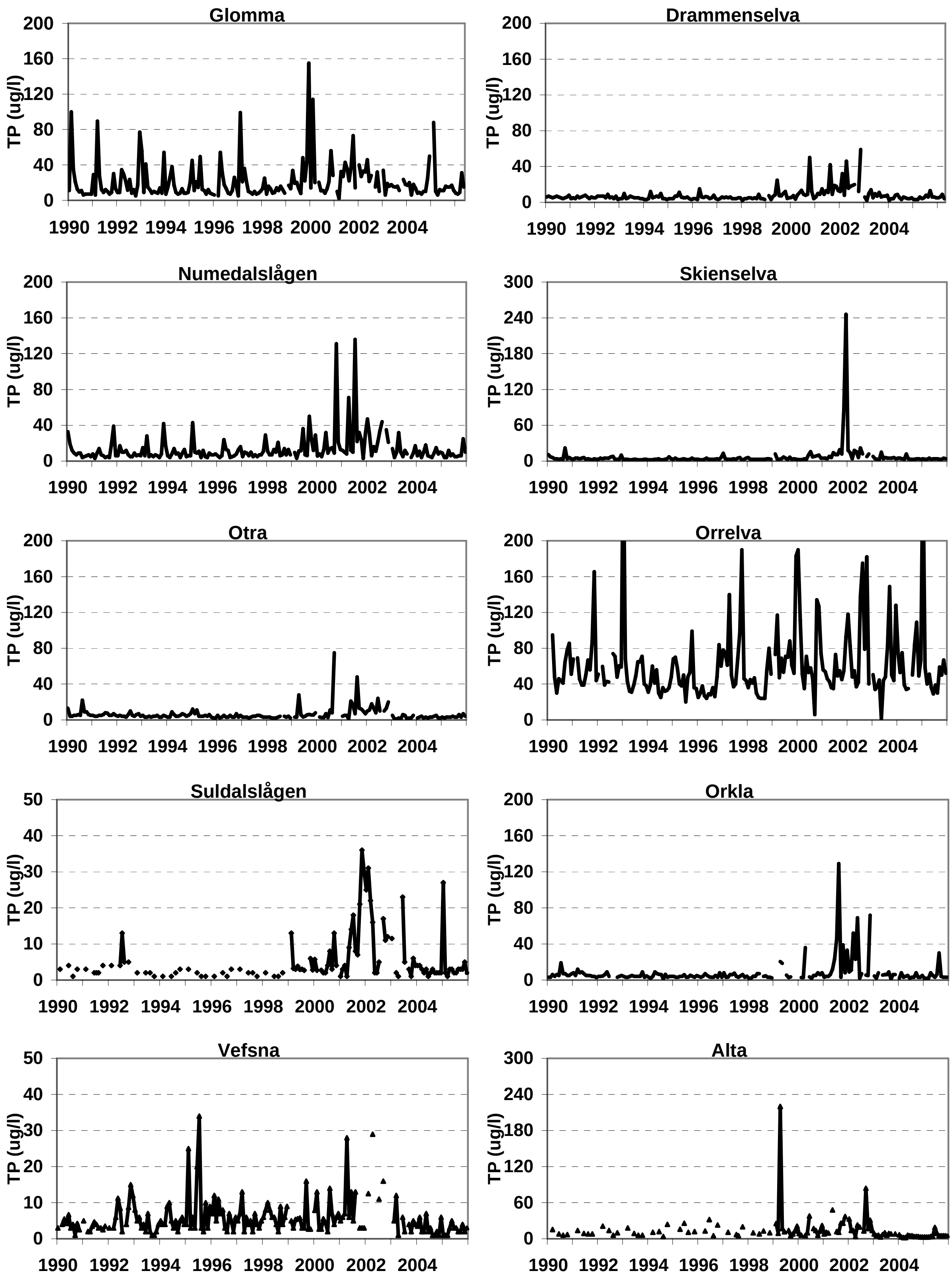


Figure 34. Monthly <u>total phosphorus</u> *concentrations in the 10 Norwegian main rivers besides data in 2005 for Glomma and Drammenselva that show all 16 sampled concentrations.*

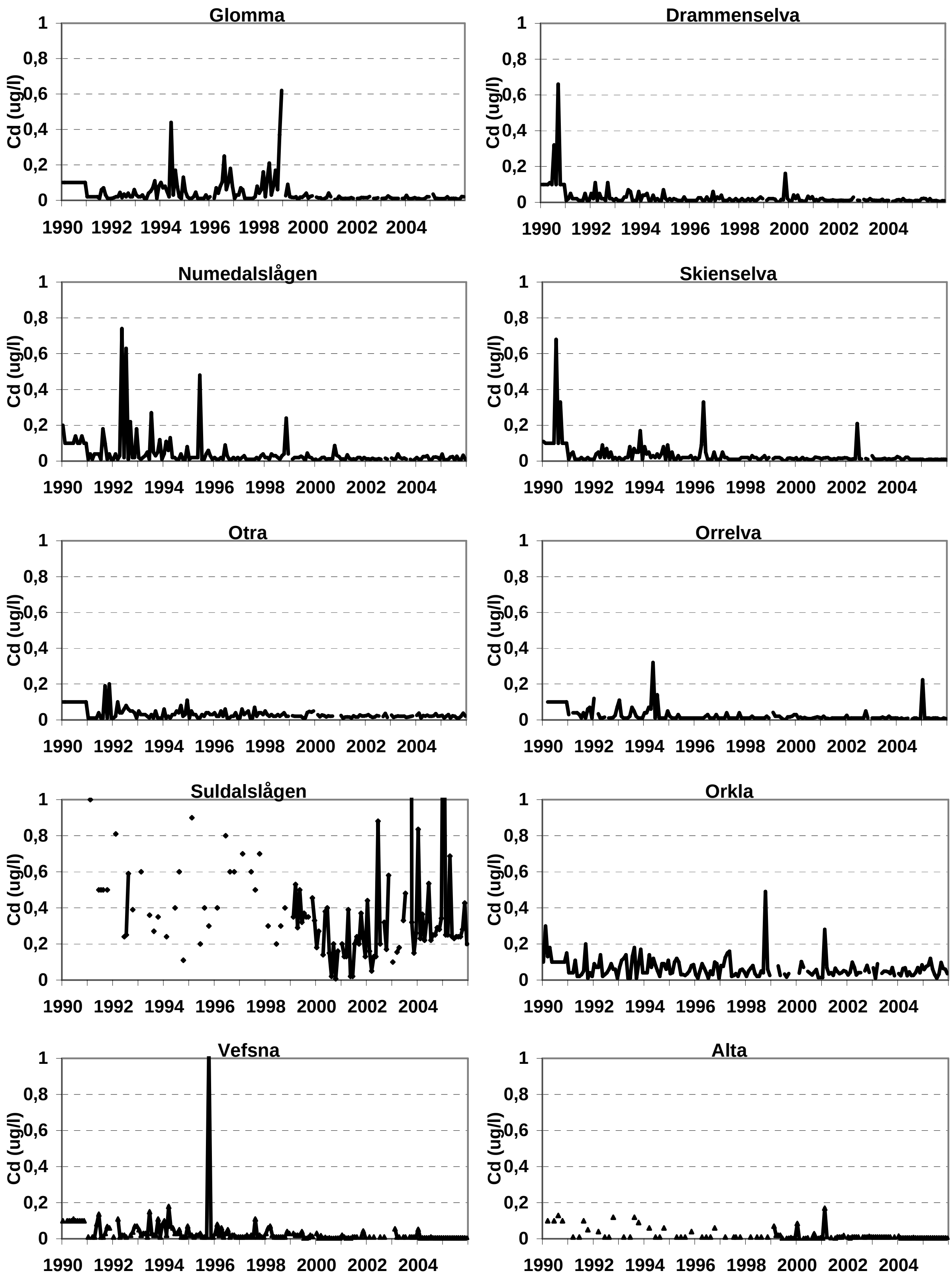


Figure 35. Monthly <u>Cadmium</u> *concentrations in the 10 Norwegian main rivers 1990-2005.*

7. Long-term trends in riverine loads of nutrients and particles

The riverine loads of nutrients and particles show a considerable interannual variability as e.g., shown in previous reporting of the Norwegian RID-programme. This is mainly due to interannual variability in runoff. In this chapter, an assessment is given of the long-term trends in riverine loads for nutrients and particulate matter by comparing the observed load with the flow-normalised load in the five Skagerrak rivers: *Glomma*, *Drammenselva*, *Numedalslågen*, *Skienselva*, and *Otra*.

Nitrogen
The observed total nitrogen loads were particularly high in 2000 and for many of the main Skagerrak rivers also in 1999 (see the dotted dark-blue lines in Figure 36). However, a substantial fraction of the interannual variation in nitrogen loads was removed when load data were flow normalised (solid lines in Figure 36). Flow normalisation also removed practically all signs of upward or downward trends in the annual riverine loads of total nitrogen to the sea. The only exception was the clear downward trend in *Skienselva*. This was also noted in the formal trend analysis on the concentrations (cf. Chapter 6). Noteworthy was also the relatively low flow-normalised loads in 2001 in all five rivers. This might be an effect of intensive leaching of nutrients and increased soil erosion during the precipitation-rich autumn of 2000, and thus, less available material for river transportation in 2001. The observed nitrogen loads were slightly higher in 2005 than in 2004 in four of the five rivers, but after flow normalisation the loads in 2004 and 2005 were practically similar, except perhaps for *Glomma*, which show a decline of more than 2000 tonnes. Noteworthy in *Otra* was that the ‘all-time low’ in observed load in 2005 became ‘normal’ after flow-normalisation.

Phosphorus
The flow-normalisation did not remove all the considerable interannual variations in the phosphorus loads (Figure 37). After flow-normalisation, there are still high loads in the period 1999-2002. As discussed in Chapter 6 on trends in concentrations, there are indications that the normally existing correlation between total phosphorus and particulate matter became absent in the period 1999-2002. Apart from some wetter periods with increased water flow, the high observed and flow-normalised loads can not be explained. When comparing the phosphorus loads in 2005 with 2004 it should be noted that there were only mariginal differences in loads after flow-normalisation. The only exception might be in *Glomma*, where the flow-normalised loads in 2005 where the lowest recored since 1998. In a 15-year perspective the loads in 2005 have been fairly normal in all the Skagerrak rivers, except for *Otra* and *Glomma* which showed in 2005 values below the 15-year-average.

Particulate matter
That the flow-normalised method was not capable of removing the interannual variability in observed load to any particular degree is due to a rather poor relationships between loads and water discharge (see Figures 38 and 39). This might indicate that the sampling method (regular monthly sampling) might underestimate the true loads as well as the un-predictability in the estimation like event-based substances like suspended particulate matter. The difference in load-discharge relationships also illustrate another feature in SPM loads namely that different rivers might exhibit different relationships.

Nonetheless, a common feature in the time-series was the high particle loads in the year 2000 for all five rivers. This was obviously explained by the water discharge. Both the observed and flow-normalised particle loads in 2005 showed both higher and lower loads compared to 2004 (cf. Figure 38). There were also high particle loads in the years 1994 and 1995 in *Otra*. This is due to single high particle concentrations in the end of 1994 and the beginning of 1995 despite of normal water discharges.

In a 15-year perspective, the suspended particulate matter loads in 2005 were fairly normal in all the Skagerrak rivers, if we disregard the exceptional period 1999-2002.

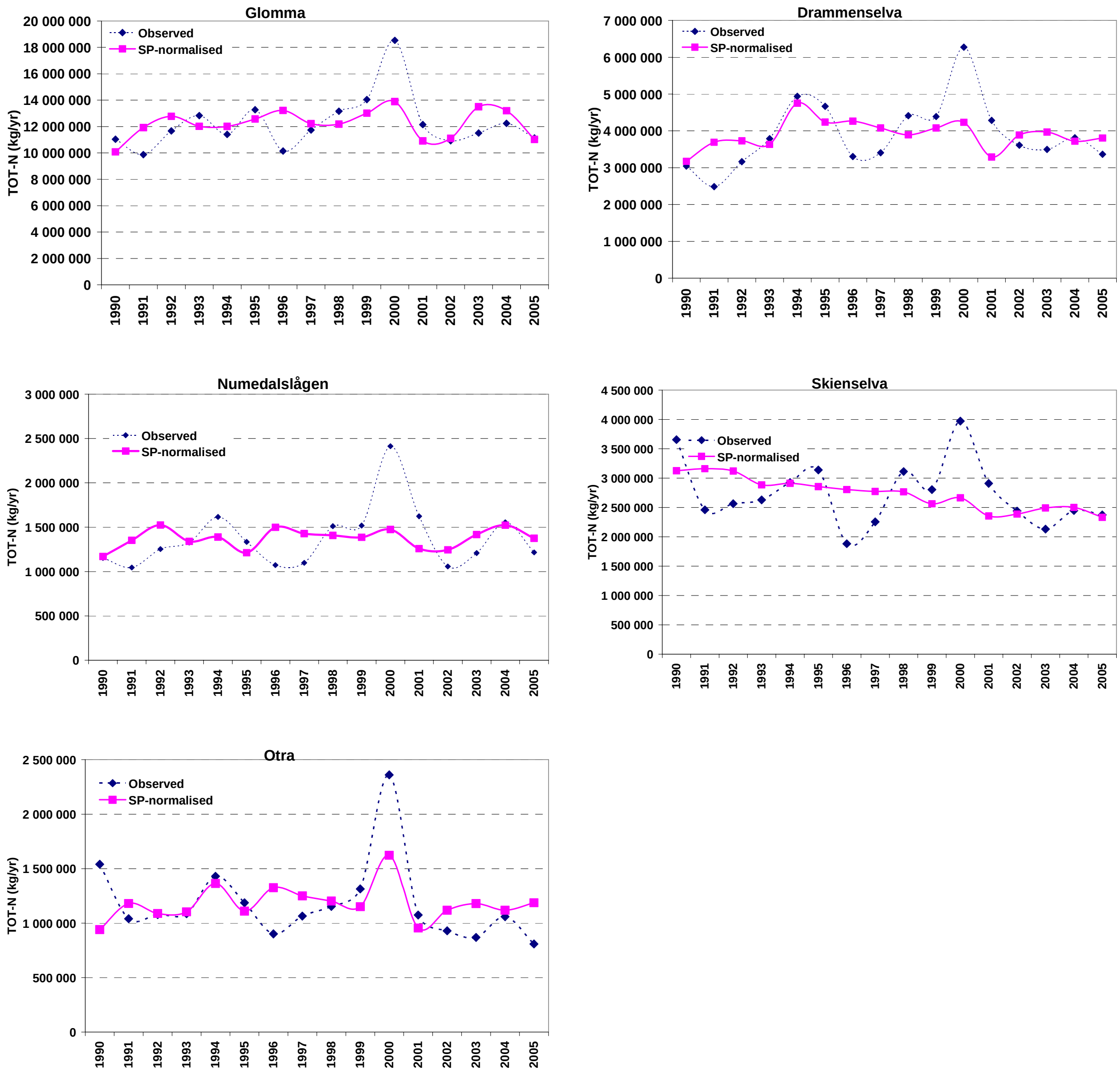


Figure 36. Observed and flow-normalised annual load of <u>total nitrogen</u> in 5 main rivers in Norway, 1990-2005. The flow-normalisation according to the method proposed by Stålnacke & Grimvall (2001).

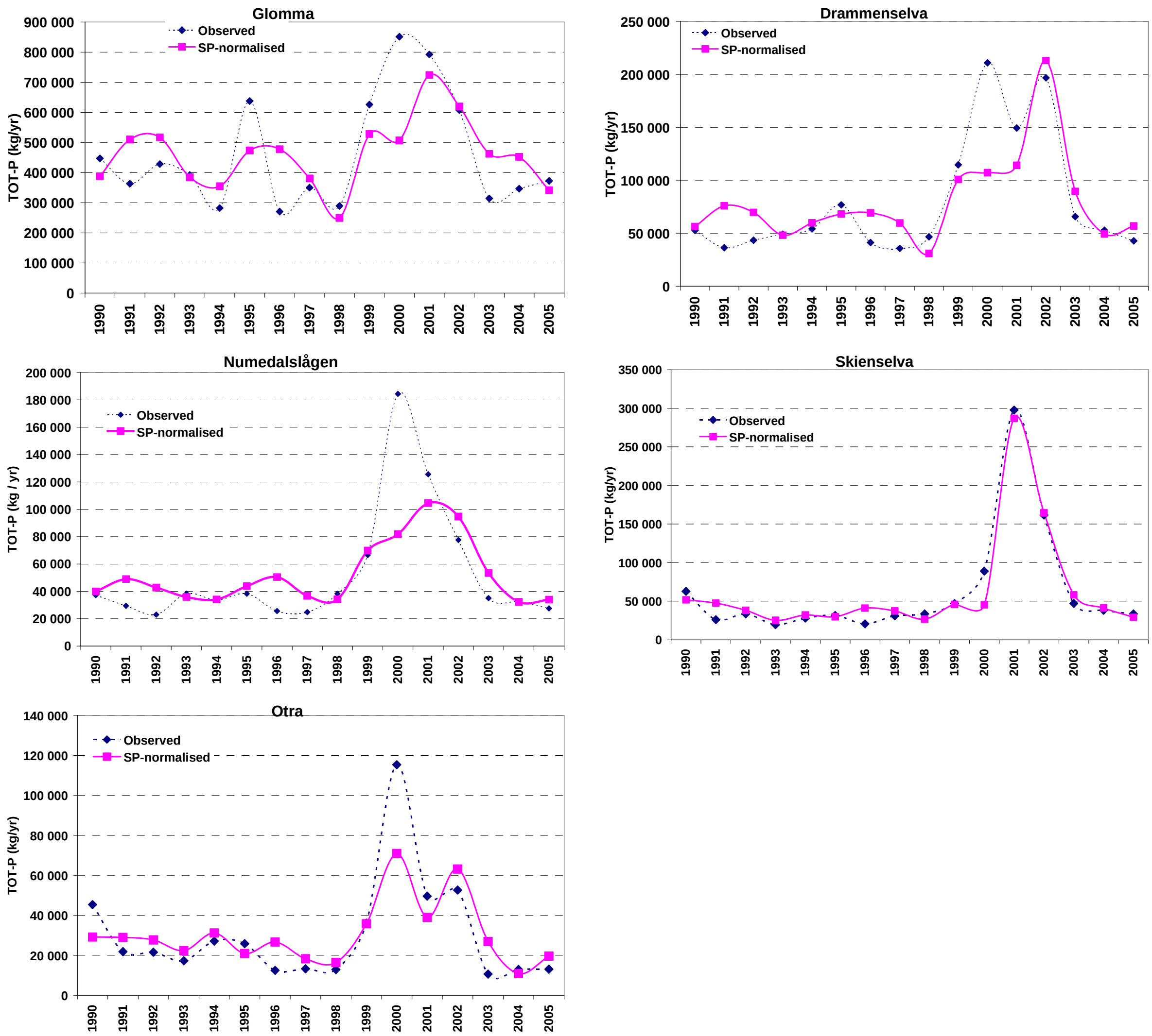


Figure 37. Observed and flow-normalised annual load of total phosphorus in five main rivers in Norway, 1990-2005. The flow-normalisation according to the method proposed by Stålnacke & Grimvall (2001).

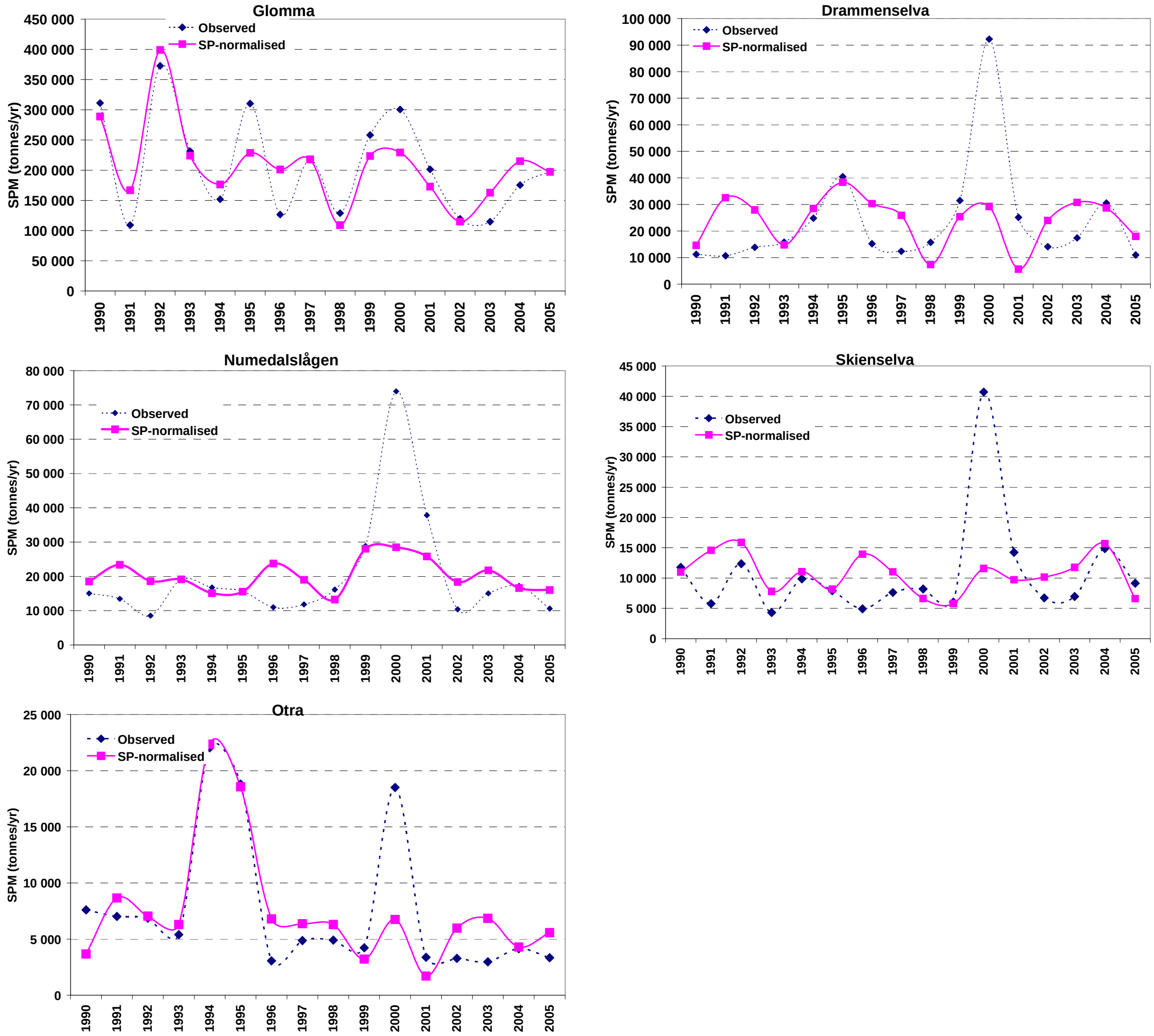


Figure 38. Observed and flow-normalised annual load of particulate matter (SPM) in five main rivers in Norway, 1990-2005. The flow-normalisation according to the method proposed by Stålnacke & Grimvall (2001).

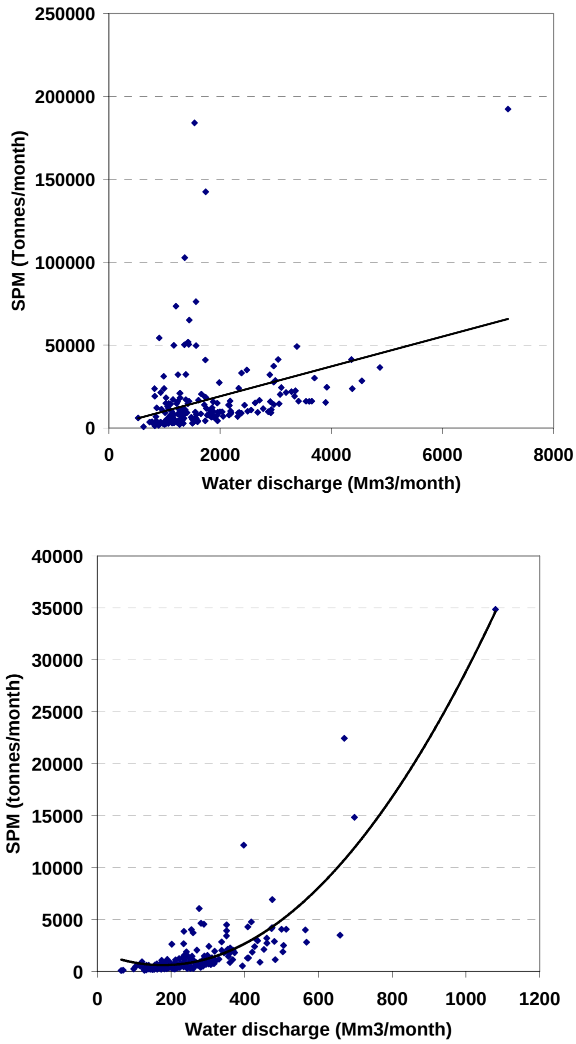


Figure 39. Scatterplot of the relationship between monthly load of suspended particulate matter and monthly water discharge in Glomma (upper panel) and Numedalslågen (lower panel), 1990-2005.

8. Concluding remarks

The objective of the water sampling, analyses and quantification process is to obtain as accurate as possible an estimate of the input load of the RID parameters to coastal waters, and to obtain information on the long-term trends in inputs by means of an adequate trend assessment.

Sources of errors in the quantification of loads to the sea are in particular related to the frequency of sampling, but also in the choice of interpolation methodology. In addition, 'upscaling' is a challenge when quantifying loads to the sea, i.e. related to monitoring one water body that is typical for several others, and thereby to find the right balance between number of monitoring sites (rivers and lakes), sampling frequency and resource allocation.

There are thousands of small rivers and creeks in Norway. Hence, it is impossible to monitor all rivers both from a financial and practical perspective. Our RID programme included 10 main rivers and 145 tributaries up to and including the year 2003. As from 2004 the number of tributaries has been reduced to 36 in order to increase the sampling frequency and thereby the accuracy of the estimated loads (change from one to four samples a year).

The issue of uncertainty in the calculated loads is a major challenge when reporting annual loads and also when comparing loads from one year to another, i.e. what is a significant increase or decrease in loads? The following questions may be asked:

- Why is an awareness of uncertainty essential in evaluating our state of knowledge about environmental variables/systems?
- How can information on uncertainty be obtained in the first place and what are the problems encountered?
- How can this information be organised and used in a way that is useful for answering practical questions about the sufficiency and accuracy of results? (Uncertainty at all levels of data gathering and 'data manipulation')
- What is 'acceptable' uncertainty?

In principal we should be able to quantify the uncertainty as a 'calculated load' ± %'. This means that each 'element' in the quantification process should have 'an uncertainty figure'. These elements include *inter alia*

- Number of samples per year
- Moment of sampling (timing)
- Representativeness of the samples, are flood events covered?
- Representativeness of sampling site (uniform water quality, site where the water is well mixed)
- Analytical method used
- Detection limit
- Load calculation method for riverine load
- Quantification of discharges/losses below RID sampling point
- Quantification by modelling of unmonitored catchments

Such figures have, as yet, not been produced neither at catchment scale, nor at national level. This is a problem for all OSPAR countries. This was clearly demonstrated when OSPAR countries tried to report according to the HARP Guidelines reporting forms (Borgvang and Selvik 2000), where no country indicated any uncertainty, as requested by the forms. It is therefore important to bear in mind that when there are indications in this report of an increase or decrease in load of a specific parameter between 2004 and 2005, this ‘indication’ is done bearing in mind that the uncertainty in the figures has not been quantified.

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Annexes to Part A

Annex I

At the Tenth Meeting of the Paris Commission (Lisbon, June 1988) the principles for the comprehensive study on riverine inputs were adopted. It was then decided to commence the study with measurements carried out in 1990, and to continue the work in the following years (PARCOM, 10/3/2). The purpose is to provide the Commission with an assessment of the waterborne inputs to Convention waters. Besides riverine inputs, the information sought also relates to direct discharges. The objectives of the Comprehensive Study are:

1. To assess, as accurately as possible, all riverborne and direct inputs of selected pollutants to Convention waters on an annual basis. Inputs from lakes, polders and storm overflows are to be included where information is available.
2. To contribute to the implementation of the JAMP by providing data on inputs to Convention waters on a sub-regional and a regional level.
3. To report these data annually to the OSPAR Commission and:
    a. to review these data periodically with a view to determining temporal trends;
    b. to review, on the basis of the data for 1990 to 1995 whether the Principles of the Comprehensive Study on Riverine Inputs require revision.
4. Each Contracting Party bordering the maritime area and, excluding the EU, should:
    a. aim to monitor on a regular basis at least 90 % of the inputs of each selected pollutant;
    b. provide, for a selection of their main rivers, information on the annual mean/-median concentrations of pollutants resulting from the monitoring according to paragraph 1.4a; and
    c. as far as is practicable, estimate inputs from diffuse sources, direct sources and minor rivers complementing the percentage monitored (cf. paragraph 1.4a) to 100 %.

PARCOM Recommendation 88/2 stipulates that Contracting Parties should take effective national steps in order to reduce nutrient inputs into areas where these inputs are likely, directly or indirectly, to cause pollution, and to achieve a substantial reduction (of the order of 50 %) in anthropogenic inputs of phosphorus and nitrogen to these areas between 1985 and 1995. At the Third International Conference on the Protection of the North Sea States in 1990, Ministers agreed that discharges of selected persistent organic pollutants to the whole North Sea area are to be reduced by 50-70 % depending on the pollutant in question.

Annex II

Trend analyses. Complimentary figures to chapter 6.

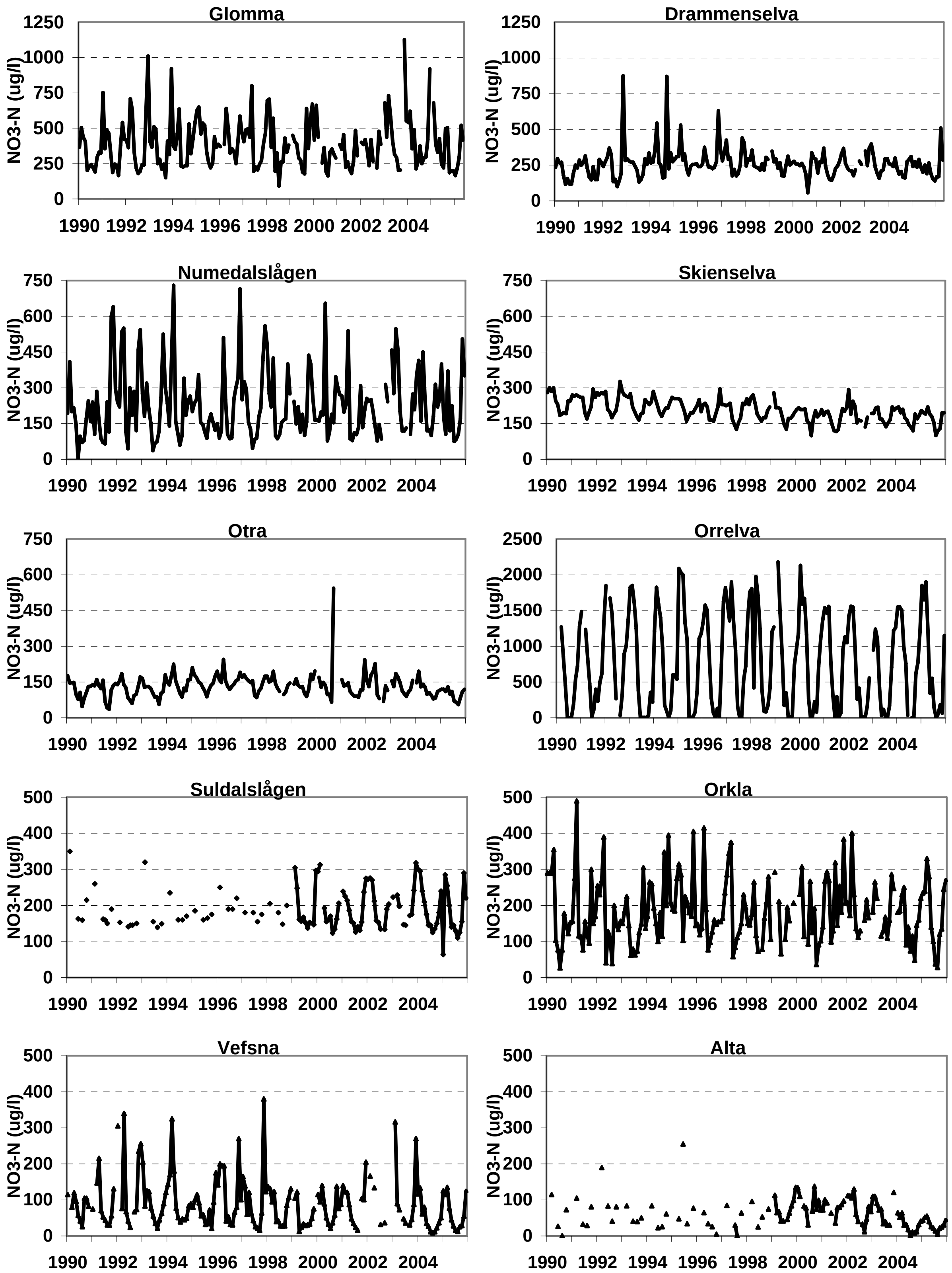

Figure A1. Monthly *nitrate nitrogen* concentrations in the 10 Norwegian main rivers 1990-2005.

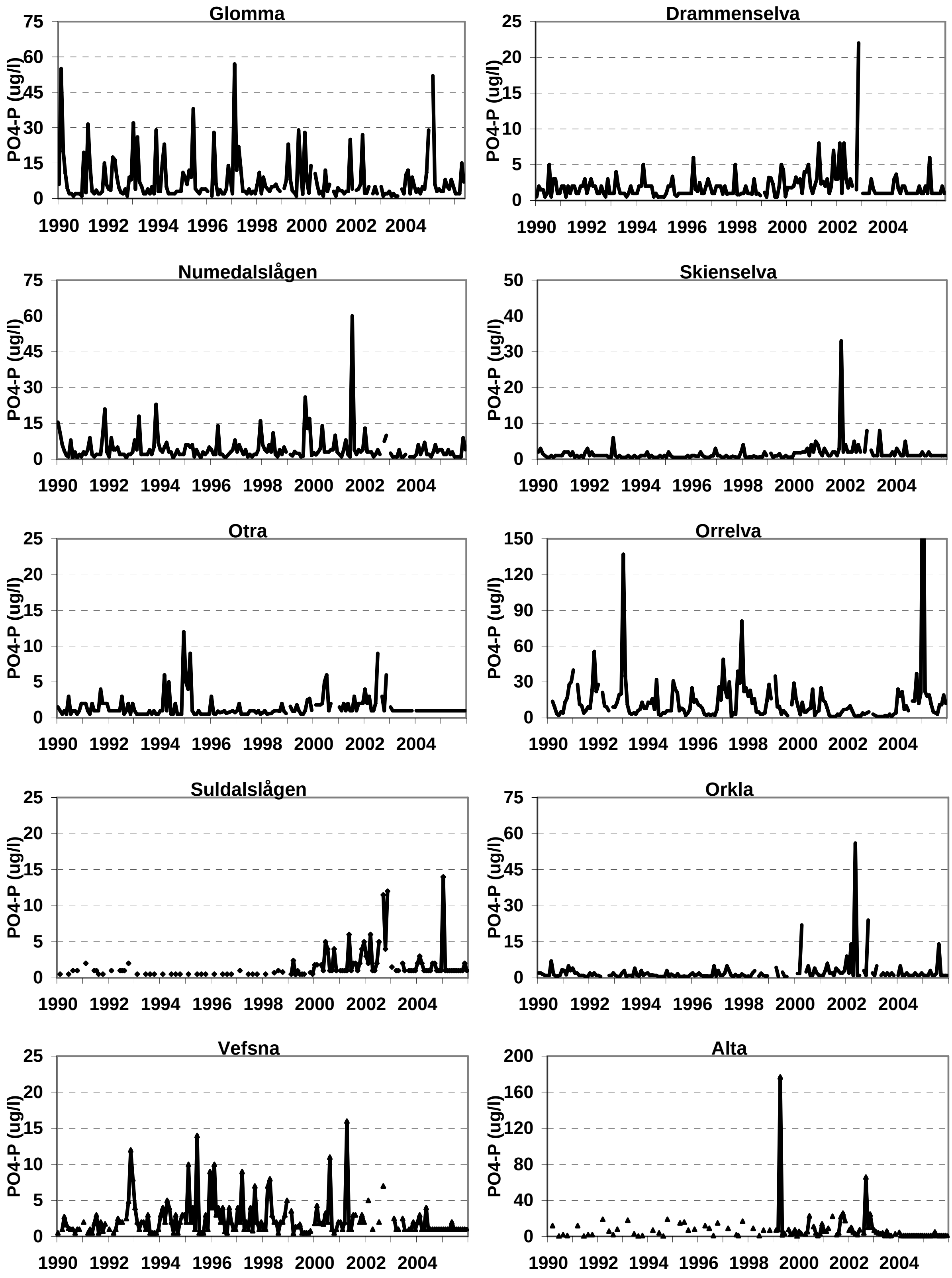

Figure A2. Monthly *phosphate-P* concentrations in the 10 Norwegian main rivers 1990-2005.

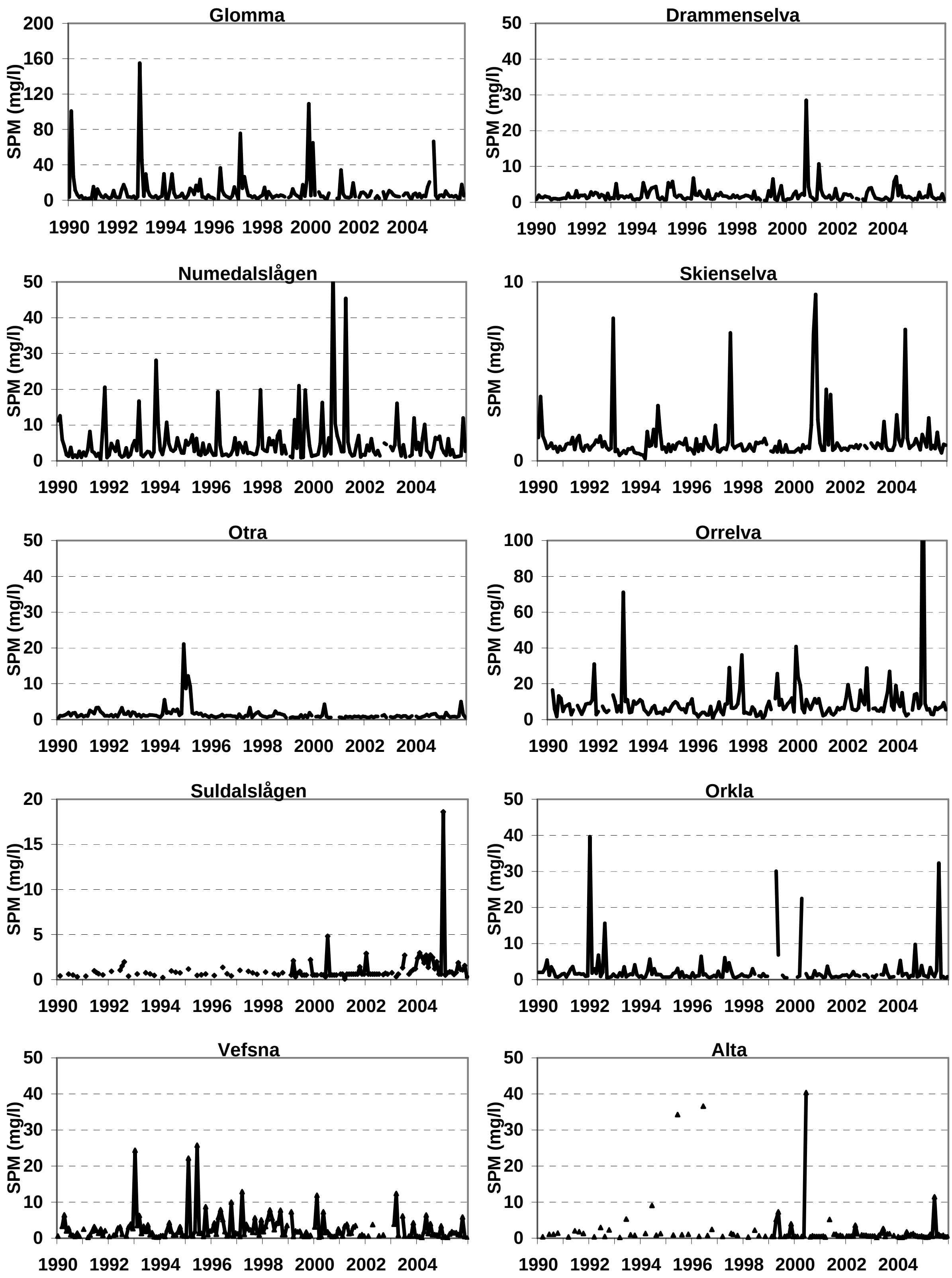

Figure A3. Monthly *SPM* concentrations in the 10 Norwegian main rivers 1990-2005.

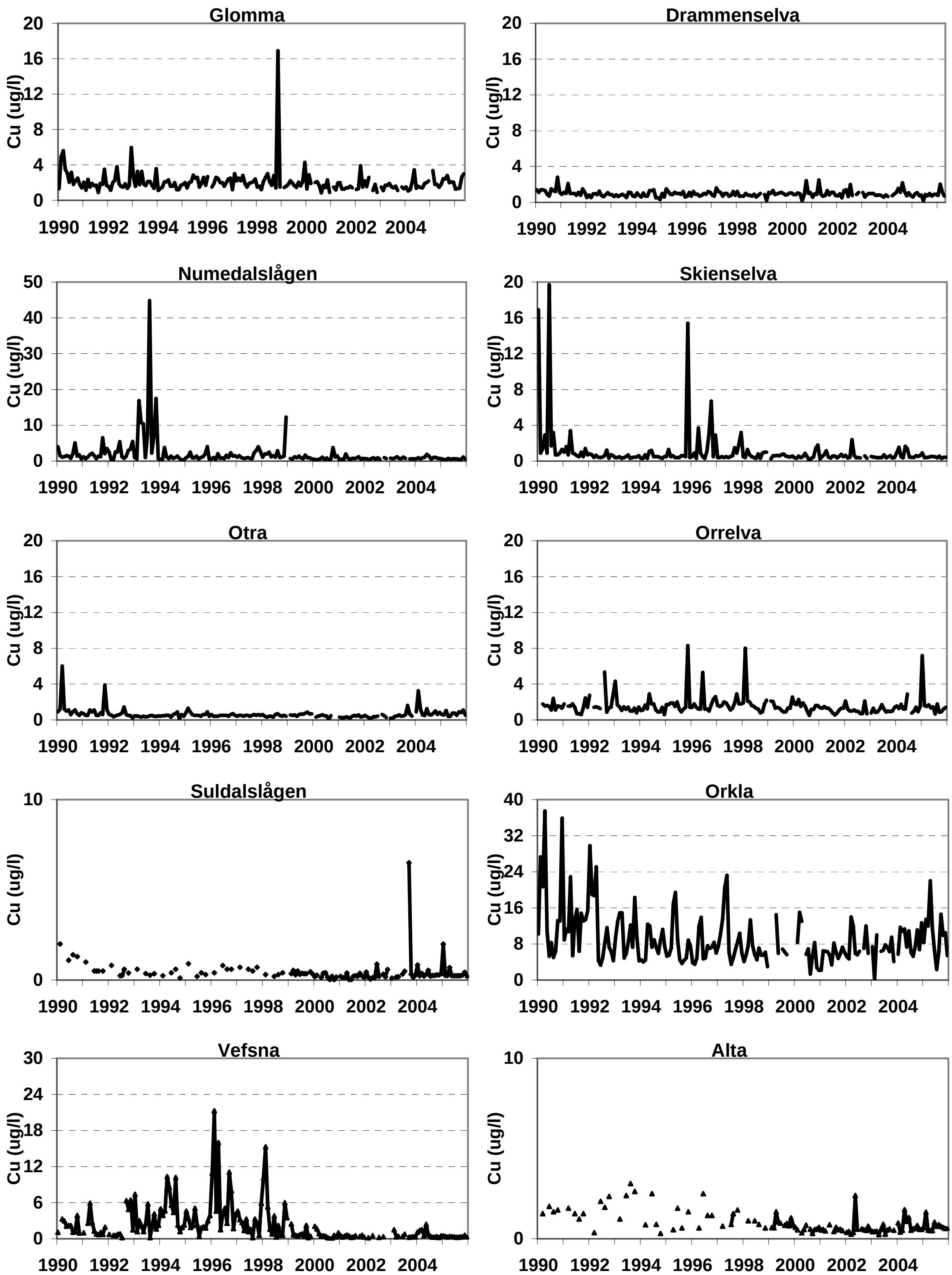

Figure A4. Monthly <u>*Copper*</u> concentrations in the 10 Norwegian main rivers 1990-2005.

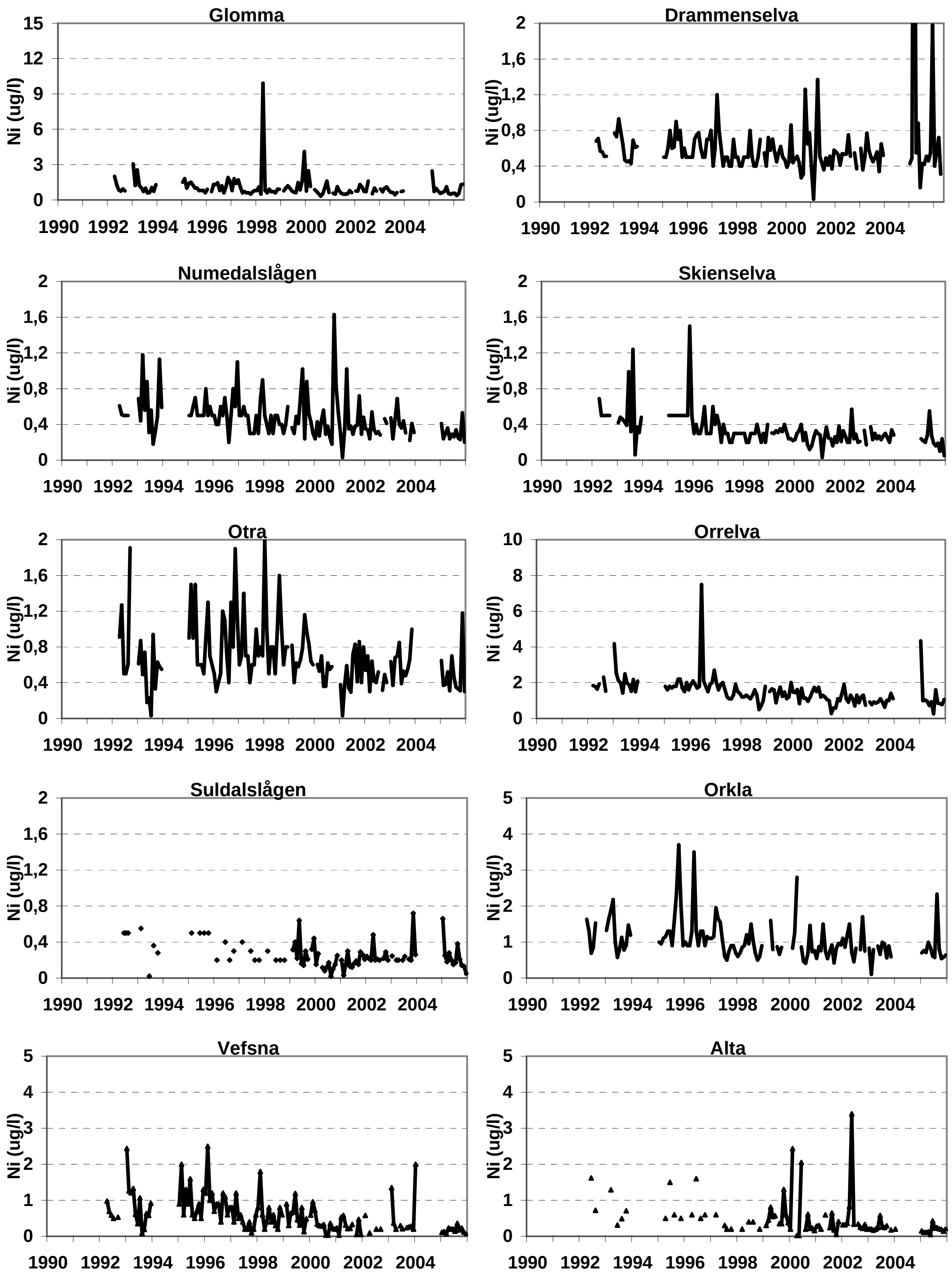

Figure A5. Monthly *Nickel* concentrations in the 10 Norwegian main rivers 1990-2005.

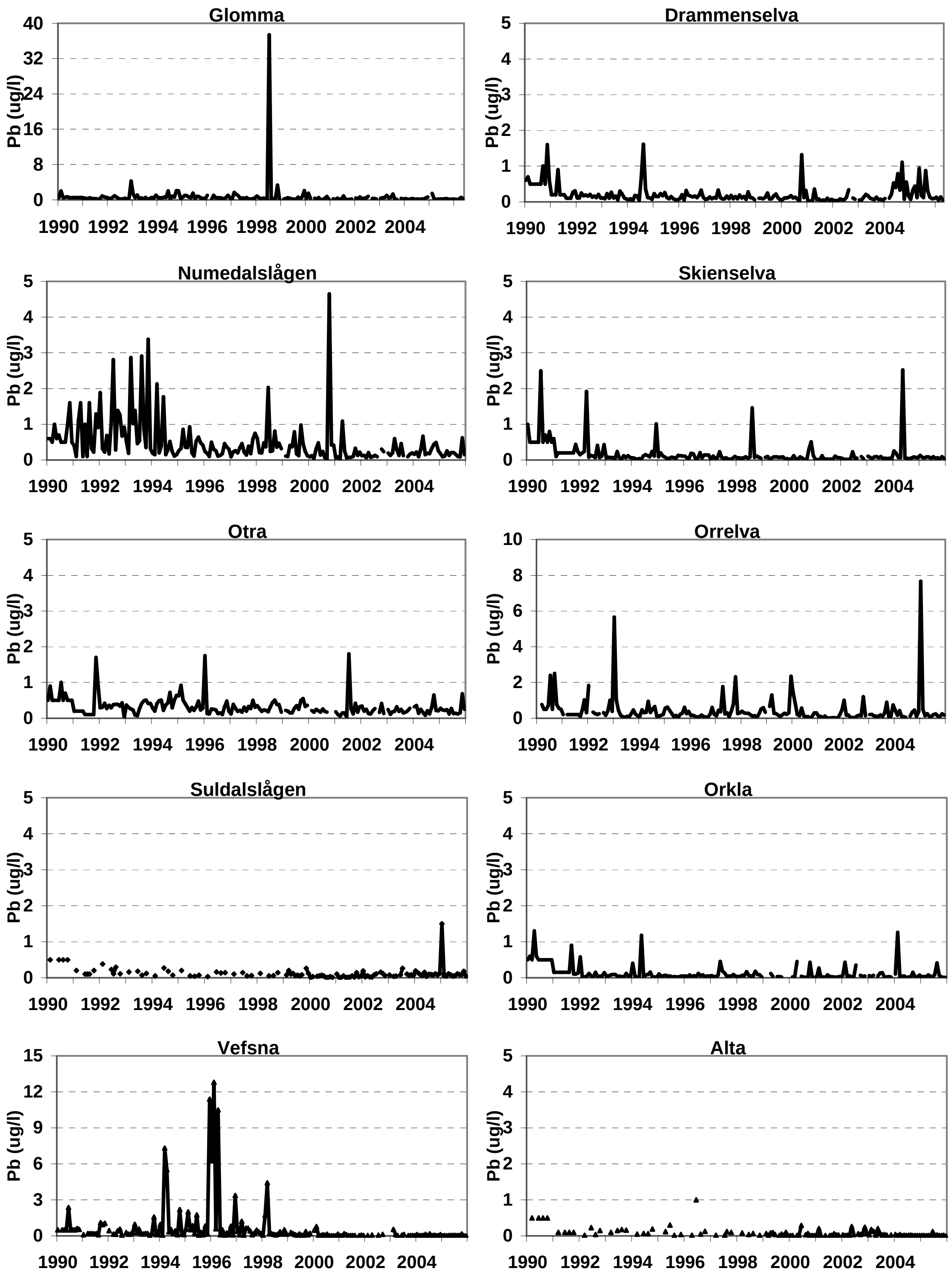

Figure A6. Monthly *Led* concentrations in the 10 Norwegian main rivers 1990-2005.

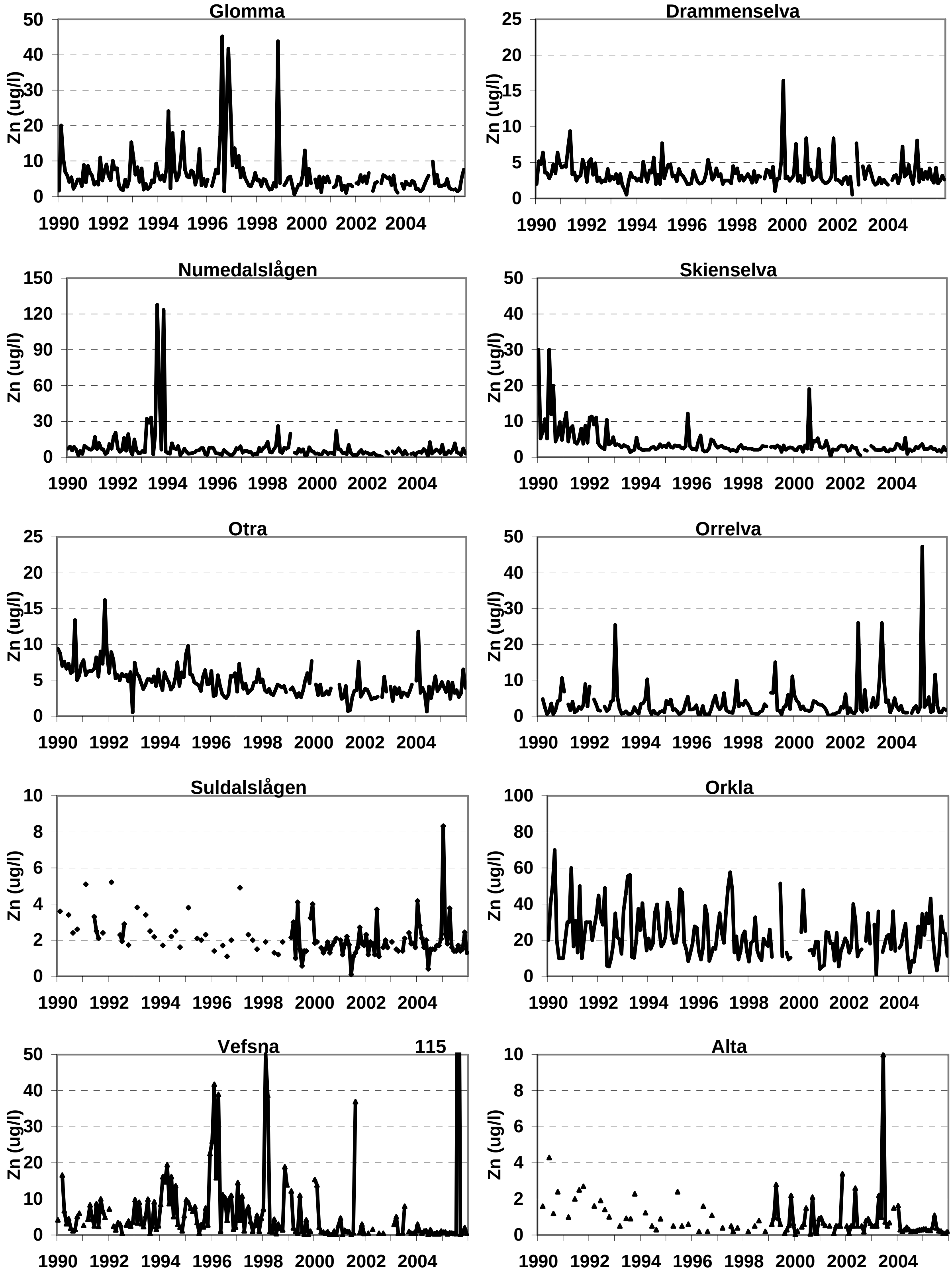

Figure A7. Monthly *Zink* concentrations in the 10 Norwegian main rivers 1990-2005.

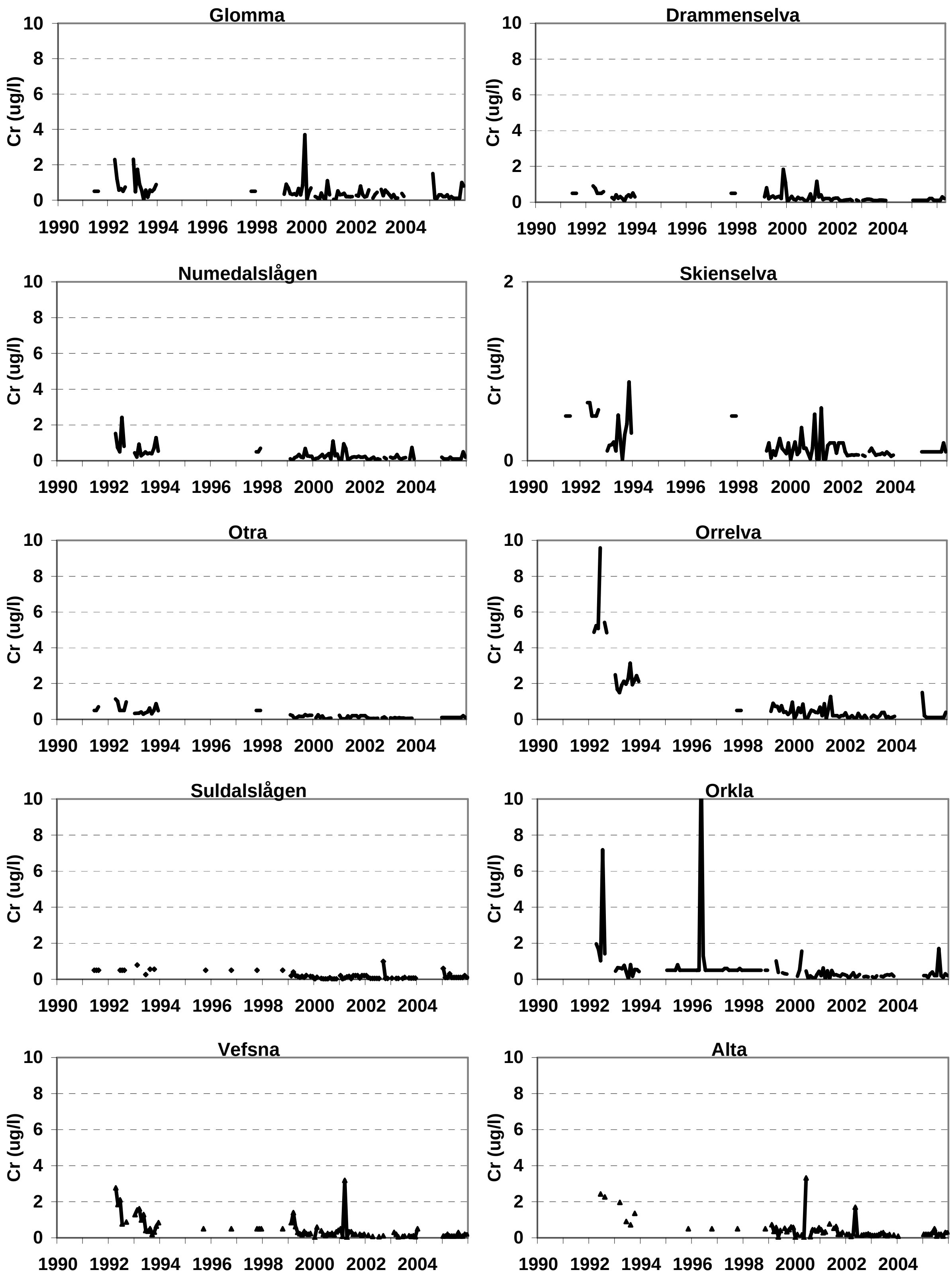

Figure A8. Monthly <u>*Chromium*</u> concentrations in the 10 Norwegian main rivers 1990-2005.

Annex III

10 main rivers with 12-16 samples per year

RID-ID	River and corresponding coastal water	Area upstream samplings site (km^2)	County with river outlet
2	Glomma, Hvaler-Singlefj.	41218	Østfold
15	Drammenselva, Dr.fj. V	17028	Buskerud
18	Numedalslågen, Larvikfj.	5513	Vestfold
20	Skienselva, Grenlandsfj.	10348	Telemark
26	Otra, Kr.Sandsfj.	3730	Vest-Agder
37	Orreelva, Orresanden	105	Rogaland
48	Suldalslågen, Sandsfj.Boknafj.	1457	Rogaland
100	Orkla, Orkdalsfj.Tr.h.fj.	2872	Sør Trøndelag
115	Vefsna, Vefsenfj. S	4113	Nordland
140	Altaelva, Altafj.	7367	Finnmark

36 rivers sampled four times a year

RID-ID	River and corresponding coastal water	Area upstream samplings site (km^2)	County with river outlet	Normal Q (10^6 m^3/yr)
1	Tista, Iddefj.	1582	Østfold	721
21	Tokkeelva, Kragerø	1200	Telemark	1042
24	Nidelva, Arendal	4020	Aust-Agder	3783
25	Tovdalselva, Topdalsfj.	1854	Vest-Agder	1984
28	Mandalselva, Mannefj.	1800	Vest-Agder	2624
30	Lygna, Lyngdalsfj.	660	Vest-Agder	1005
31	Kvina, Fedafj.	1140	Vest-Agder	2625
32	Sira, Åna-Sira	1872	Vest-Agder	3589
35	Bjerkreimselva, Egersund	704	Rogaland	1727
38	Figgjo, Solavika	218	Rogaland	361
44	Lyseelva, Lysefj.Boknafj.	182	Rogaland	425
45	Årdalselva., Årdalsfj.Boknafj.	516	Rogaland	1332
47	Ulla, Jøsenfj.Boknafj.	393	Rogaland	1034
49	Saudaelva, Saudafj.Boknafj.	353	Rogaland	946
51	Vikedalselva, Boknafj.	117	Rogaland	298
64	Vosso, Veafj. Sørfj.	1465	Hordaland	2738
75	Jostedøla, " Sognefj.	864	Sogn og Fjordane	1855
78	Gaular, Dalsfj. Bufj.	625	Sogn og Fjordane	1568
79	Jølstra, Førdefj.	709	Sogn og Fjordane	1673
80	Nausta, Førdefj.	273	Sogn og Fjordane	714
84	Breimselva, Gloppenfj. "	634	Sogn og Fjordane	1364
95	Driva, Sunnd.fj.Tingvollfj.	2435	Møre og Romsdal	2188
98	Surna, Surnadalsfj.	1200	Møre og Romsdal	1816
103	Gaula, Gaulosen Tr.h.fj.	3650	Sør Trøndelag	3046
104	Nidelva, Trondheimsfj.	3100	Sør Trøndelag	3482
106	Stjørdalsvassdraget, " Tr.h.fj.	2117	Nord Trøndelag	2570
108	Verdalsvassdraget, Tr.h.fj.	1472	Nord Trøndelag	1857

110	Snåsavassdraget, Trondh.fj.	2125	Nord Trøndelag	1376
112	Namsen, Namsfj. Ø	6276	Nord Trøndelag	1376
119	Røssåga, Sørfj.	2087	Nordland	2995
122	Ranavassdraget, Ranafj. N	3846	Nordland	5447
124	Beiarelva, Beiarfj. Nordfj.	875	Nordland	1513
132	Målselva, Målselvfj. "	3200	Troms	2932
133	Barduelva, Målselva	2906	Troms	2594
150	Tanavassdraget, Tanafj. S	15713	Finnmark	5944
153	Passvikelva, Bøkfj.Varang.fj.	18400	Finnmark	5398

109 rivers without sampling, but with modelled loads

RID-ID	River and corresponding coastal water	Area upstream samplings site (km^2)	County with river outlet
3	Mosselva, Mossesundet	689	Østfold
4	Hølenelva, Drøbaksundet Ø	121	Akershus
5	Årungelva, I. Oslofj.	50	Akershus
6	Gjersjøelva, I. Oslofj.	85	Akershus
7	Ljanselva, I. Oslofj.	41	Oslo
8	Loelva/Alna, I. Oslofj.	69	Oslo
9	Akerselva, I. Oslofj.	225	Oslo
10	Frognerelva, I. Oslofj.	20	Oslo
11	Lysakerelva, I. Oslofj.	173	Oslo
12	Sandvikselva, I. Oslofj.	187	Akershus
13	Åroselva, I. Oslofj.	109	Buskerud
14	Lierelva, Drammensfj. Ø	266	Buskerud
16	Sandeelva, Sandebukta	190	Vestfold
17	Aulielva, Tønsbergfj.	362	Vestfold
19	Farriselva, Larvikfj.	491	Vestfold
22	Gjerstadelva, Søndeledfj.	414	Aust-Agder
23	Vegårdselva, Sandnesfj.	429	Aust-Agder
27	Søgneelva, Flekkerøy	192	Vest-Agder
29	Audna, Sniksfj.	400	Vest-Agder
33	Sokndalselva, Sogndalsstr.	293	Rogaland
34	Hellelandselva, Egersund	240	Rogaland
36	Håelva, Håtangen	160	Rogaland
39	Ims-Lutsi. Høgsfj.Boknafj.	127	Rogaland
40	Oltedalselva, Høgsfj.Boknafj.	101	Rogaland
41	Dirdalselva, Høgsfj.Boknafj.	158	Rogaland
42	Frafjordelva, Frafj. Boknafj.	178	Rogaland
43	Espedalselva, Høgsfj.Boknafj.	138	Rogaland
46	Førreåna., Jøsenfj.Boknafj.	163	Rogaland
50	Åbøelva, Saudafj.Boknafj.	82	Rogaland
52	Etneelva, Etnefj. Bømlafj.	250	Hordaland
53	Opo, Sørfj. Hardangerfj.	480	Hordaland
54	Tysso, Sørfj. Hardangerfj.	385	Hordaland
55	Kinso, Sørfj. Hardangerfj.	281	Hordaland
56	Veig, Eidfjv. Hardangerfj.	496	Hordaland
57	Bjoreia, " , Hardangerfj.	592	Hordaland
58	Sima, Eidfj. Hardangerfj.	145	Hordaland

59	Austdøla, Osafj. Eidfj.	130	Hordaland
60	Norddøla, Osafj. Eidfj.	39	Hordaland
61	Tysseelva, Fusafj.	240	Hordaland
62	Oselva, Fusafj.	108	Hordaland
63	Bergsdalselva, Veafj.Herdlafj.	198	Hordaland
65	Ekso, Osterfj.	400	Hordaland
66	Modalselva, Osterfj.	384	Hordaland
67	Nærøyelva, Aurl.fj. Sognefj.	290	Sogn og Fjordane
68	Flåmselva, Aurl.fj. Sognefj.	275	Sogn og Fjordane
69	Aurlandvassdraget, Aurl.fj. Sognefj.	799	Sogn og Fjordane
70	Erdalselva, Lærd.fj. Sognefj.	138	Sogn og Fjordane
71	Lærdalsvassdraget, Lærd.fj. Sognefj.	1172	Sogn og Fjordane
72	Årdalsvassdraget, Årdalsfj.Sognefj.	989	Sogn og Fjordane
73	Fortunvassdraget, Lusterfj.Sognefj.	508	Sogn og Fjordane
74	Mørkrisvassdraget, Lusterfj.Sognefj.	282	Sogn og Fjordane
76	Årøyelva, Sognd.fj. Sognefj.	446	Sogn og Fjordane
77	Sogndalselva, " Sognefj.	172	Sogn og Fjordane
81	Oselva, Høydalsfj.	285	Sogn og Fjordane
82	Hopselva, Hyefj. Nordfj.S	73	Sogn og Fjordane
83	Gjengedalselva," Nordfj.S	168	Sogn og Fjordane
85	Oldenelva, Indre Nordfj.	225	Sogn og Fjordane
86	Loenelva, Indre Nordfj.	260	Sogn og Fjordane
87	Stryneelva, Indre Nordfj.	530	Sogn og Fjordane
88	Hornindalselva, Nordfj. N	424	Sogn og Fjordane
89	Ørstaeelva, Ørstafj.	155	Møre og Romsdal
90	Valldøla, Nordalfj.Storfj .	357	Møre og Romsdal
91	Rauma, Romsd.fj.Moldefj.	1190	Møre og Romsdal
92	Isa, Isfj. Moldefj.	175	Møre og Romsdal
93	Eira, Eresfj. Moldefj.	1119	Møre og Romsdal
94	Littledalselva, Sunndalsfj.	330	Møre og Romsdal
96	Ulvåa, Ålvundfj.	199	Møre og Romsdal
97	Toåa, Todalsfj.	251	Møre og Romsdal
99	Bøvra, Hamnesfj. Halsafj	243	Møre og Romsdal
101	Børselva,Gaulosen Tr.h.fj.	100	Sør Trøndelag
102	Vigda, Gaulosen Tr.h.fj.	150	Sør Trøndelag
105	Homla, Stjørd.fj.Tr.h.fj.	157	Sør Trøndelag
107	Gråelva, " Tr.h.fj.	93	Nord Trøndelag
109	Figga/Leksdalselva,Tr.h.fj.	282	Nord Trøndelag
111	Årgårdselva, Namsfj.	510	Nord Trøndelag
113	Salsvatnelva, Follafj.	432	Nord Trøndelag
114	Åbjøra, Bindalsfj. S	520	Nordland
116	Skjerva, Vefsenfj. S	104	Nordland
117	Fusta, Vefsenfj. N	543	Nordland
118	Drevja, Vefsenfj. N	176	Nordland
120	Bjerka, Sørfj.	385	Nordland
121	Dalselva, Ranafj. N	211	Nordland
123	Fykanåga, Glomfjord	297	Nordland
125	Saltdalsvassdraget, Saltd.fj.S	1543	Nordland
126	Sulitjelmavassdraget, Saltd.fj	800	Nordland
127	Kobbelva, Leirfj. Sørfolda N	405	Nordland

128	Skjoma, Ofotfj. S	840	Nordland
129	Spanselva, Astafj. Vågsfj.	142	Troms
130	Salangselva, Astafj. Vågsfj.	539	Troms
131	Rossfjordelva, Malangen	190	Troms
134	Nordkjoselva, Balsfj.	191	Troms
135	Signaldalselva, Lyngen V	467	Troms
136	Skibotnelva, Lyngen	770	Troms
137	Kåfjordelva, Lyngen Ø	358	Troms
138	Reisa, Reisafj.	2702	Troms
139	Mattiselva, Kåfj. Altafj.	325	Finnmark
141	Tverrelva, Altafj.	233	Finnmark
142	Repparfjordvassdraget, Repparfj.	1089	Finnmark
143	Stabburselva, I. Porsangen V	1102	Finnmark
144	Lakselva, Indre Porsangen S	1532	Finnmark
145	Børselva, Indre Porsangen Ø	883	Finnmark
146	Mattusjåkka, I. Laksefj. V	101	Finnmark
147	Storelva, Indre Laksefj. V	690	Finnmark
148	Soussjåkka, I. Laksefj. V	92	Finnmark
149	Adamselva, I. Laksefj. Ø	705	Finnmark
151	Vesterelva, Syltefj.	469	Finnmark
152	V. Jakobselv, Y.Varangerfj.	627	Finnmark
154	Neiden, Munkfj. Varang.fj.	2960	Finnmark
155	Grense Jakobselv, Varang.fj.	234	Finnmark

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Title – English and Norwegian Riverine inputs and direct discharges to Norwegian coastal waters – 2005. OSPAR Commission. Elvetilførsler og direkte tilførsler til norske kystområder – 2005. OSPAR Commission.
Summary The report contains results from the 2005 monitoring of 46 Norwegian rivers in accordance with the requirements of the Oslo and Paris Commission (OSPAR). Riverborne inputs of nutrients, suspended particulate matter, total organic carbon, silicate, metals (Cd, Hg, Pb, Cu, Zn, As, Cr, Ni), PCB and the pesticide lindane to Norwegian coastal waters are calculated based on concentration and flow data. In addition, the loads from rivers not monitored, as well as direct discharges to marine waters along the coast from Sweden to Russia have been estimated.

4 subject words Riverine inputs, Direct discharges, Norwegian coastal waters, Monitoring	4 emneord Elvetilførsler, Direkte tilførsler, Norske kystområder, Overvåking

Part B

Data Report

Overview of main parameters: Discharges/losses of RID parameters from mainland Norway in 2005.

In tonnes for all parameters, except PCB and Lindane which is in kg.

Parameter	Skagerrak	North Sea	Norwegian Sea	Barents Sea	Total Norwegian Coastal Waters
Cadmium	0.99	0.76	0.53	0.17	2.44
	1.00	0.82	0.71	0.22	2.74
Mercury	0.05	0.15	0.14	0.04	0.37
	0.08	0.18	0.18	0.05	0.49
Copper	88.0	118	208.1	47.1	461.3
	88.0	118	208.1	47.1	461.3
Zinc	237	164	208	20	629
	237	164	208	20	629
Lead	15.074	14.586	6.362	1.477	37.499
	15.074	14.586	6.367	1.478	37.505
Arsenic	11.2	5.8	6.5	2.9	26.4
	11.2	6.4	6.9	2.9	27.4
Chromium	13.5	13.7	15.0	4.7	47.0
	15.7	16.6	16.9	5.2	54.3
Nickel	42.6	27.3	44.6	48.2	162.7
	42.6	27.3	44.6	48.2	162.8
Ammonia	4 474	11 355	17 326	1528	34 684
	4 479	11 426	17 484	1562	34 950
Nitrate	17 789	19 191	15 523	1502	54 004
	17 789	19 191	15 523	1506	54 009
Phosphate	386	1844	3050	257	5537
	404	1869	3079	265	5616
Total Nitrogen	33 179	40 092	45 436	7326	126 033
	33 179	40 092	45 436	7326	126 033
Total Phosphorus	950	3067	4957	523	9497
	950	3067	4957	523	9498
Silicate	160 143	84 485	124 097	104 357	473 081
	160 143	84 485	124 097	104 357	473 081
Suspended Particulate Matter	296 716	256 384	693 080	44 898	1 291 078
	296 716	256 416	693 080	44 898	1 291 110
PCB[4]	0	0	0	0	0
	49	7	10	4.7	71
Lindane[5]	5.5	0	0	0	7.5
	10	1.4	1.7	0.8	12.7

[4] Main rivers only
[5] Main rivers only

Part B

Table 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Glomma ved Sarpsfoss

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg	g-HCH	PCBS
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[ng/l]
02.01.2005	547																		2		
10.01.2005	703	7,04	5,51	66,50	5	52	88	680	18	875	2,36	0,33	1,450	0,035	3,36	9,88	1,50	2,46	<1		
07.02.2005	469	6,79	4,84	5,25	4,3	6	10	385	27	595	1,91	0,20	0,222	0,010	1,82	3,58	<0,1	0,71	<1	0,20	<1,4
07.03.2005	365	6,98	4,78	1,64	3,1	3	6	330	24	480	1,66	0,20	0,110	0,010	1,77	6,09	<0,1	0,97	<1		
04.04.2005	339	6,89	5,29	5,41	3,6	4	12	425	10	590	1,90	0,20	0,160	0,009	1,48	2,90	0,30	0,73	2		
09.05.2005	808	6,99	4,40	5,81	4,3	3	11	245	12	445	1,60	0,20	0,170	0,009	1,77	2,88	0,30	0,56	1	<0,2	<1,4
20.05.2005	808	7,04	4,22	3,99	4,3	3	11	220	10	420	1,58	0,08	0,160	0,009	2,44	3,13	0,20	0,63	1,5		
30.05.2005	1199	6,99	4,65	10,40	4,3	8	16	495	13	700	1,80	0,20	0,235	0,010	2,41	3,23	0,20	0,72	2		
06.06.2005	1068	6,99	4,28	6,56	4,5	5	15	505	14	740	1,73	0,20	0,284	0,020	2,79	4,88	0,30	1,12	<1		
17.06.2005	1146	7,16	4,13	4,45	3,3	4	15	185	19	385	1,24	0,10	0,130	0,008	2	2,39	0,10	0,55	<1		
27.06.2005	1407	7,25	3,96	4,81	2,9	8	17	200	39	435	1,36	0,10	0,130	0,010	2,07	2	0,20	0,48	<1		
04.07.2005	938	7,20	4,18	3,77	2,7	5	11	200	16	395	1,03	0,10	0,160	0,010	2,04	1,90	<0,1	0,56	1		
08.08.2005	677	7,31	4,15	5,07	2,4	2	8	165	12	335	1,03	0,10	0,140	0,010	1,26	2	<0,1	0,56	1	<0,2	<1,4
05.09.2005	782	7,27	4,17	2,58	2,8	2	7	215	11	350	1,11	0,20	0,084	0,007	1,31	1,40	0,10	0,37	<1		
10.10.2005	391	7,30	4,69	2,37	2,9	2	9	295	22	475	1,24	0,10	0,130	0,007	1,37	1,90	<0,1	0,55	1	0,20	<1,4
07.11.2005	1615	7,12	5,09	17,80	4,7	15	31	520	14	690	2,54	0,28	0,528	0,021	2,63	5,35	1	1,28	<1		
05.12.2005	391	6,94	4,71	4,98	5,8	7	15	415	13	580	2,03	0,23	0,281	0,020	2,99	7,58	0,80	1,33	<1		
Lower avg.	803	7,08	4,57	9,46	3,8	8	18	343	17	531	1,63	0,18	0,273	0,013	2,09	3,82	0,31	0,85	0,68	0,10	0,0
Upper avg.	803	7,08	4,57	9,46	3,8	8	18	343	17	531	1,63	0,18	0,273	0,013	2,09	3,82	0,34	0,85	1,21	0,20	1,4
Minimum	339	6,79	3,96	1,64	2,4	2	6	165	10	335	1,03	0,08	0,084	0,007	1,26	1,40	0,10	0,37	1	0,20	<1,4
Maximum	1615	7,31	5,51	66,50	5,8	52	88	680	39	875	2,54	0,33	1,450	0,035	3,36	9,88	1,50	2,46	2	0,20	1,4
More than 70%>LOD	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no	no	no
n	17	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	17	4	4
Info																					
St.dev	382	0,16	0,46	15,68	1,0	12	20	153	8	157	0,45	0,07	0,331	0,008	0,63	2,37	0,40	0,52	0,4	0	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Drammenselva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg	g-HCH	PCBS
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[ng/l]
07.01.2005	287	6,91	3,24	0,65	2,7	<1	3	240	8	360	1,20	0,10	0,070	0,006	0,61	2,02	<0,1	0,43	1		
02.02.2005	302	6,87	3,87	1,04	2,5	<1	3	275	9	405	1,23	0,08	0,331	0,010	0,95	4,33	<0,1	0,49	<1	0,20	<1,4
02.03.2005	289	6,91	3,46	0,75	2,2	<1	3	235	8	355	1,14	0,10	0,440	0,010	1,08	8,08	0,10	5,47	<1		
06.04.2005	220	6,79	3,87	2,77	2,6	2	6	290	17	460	1,22	0,10	0,120	0,008	0,73	2,30	<0,1	0,55	1		
04.05.2005	233	6,86	3,67	1,30	2,9	<1	4	235	12	395	1,15	0,10	0,940	0,020	0,82	4,03	0,10	0,88	<1	0,21	<1,4
13.05.2005	236	6,86	3,50	1,30	2,8	1	5	200	7	360	1,06	<,05	0,180	0,022	0,17	2,66	0,10	0,16	<1		
24.05.2005	300	6,94	4,10	1,70	3,4	2	8	250	11	420	1,29	0,21	0,120	0,020	0,88	3,70	0,10	0,43	<1		
08.06.2005	259	7,05	3,31	1,42	3,5	<1	6	190	8	340	1,16	0,20	0,874	0,008	0,73	2,73	<0,1	0,42	<1		
14.06.2005	296	7,05	3,89	4,86	3,6	6	13	265	11	460	1,37	0,20	0,307	0,020	0,97	4,20	0,20	0,51	<1		
21.06.2005	390	7,09	3,65	1,63	4	1	6	190	8	395	1,18	0,20	0,130	0,008	0,70	2,62	0,20	0,46	<1		
05.07.2005	241	7,13	3,58	1,16	3,3	1	6	155	10	320	1,12	0,20	0,088	0,009	0,87	2,20	<0,1	0,55	<1		
10.08.2005	273	7,16	3,53	0,84	3,3	<1	5	140	8	330	1,04	0,24	0,094	0,010	0,90	4,28	0,10	1,98	1	<0,2	<1,4
01.09.2005	80	7,12	3,47	1,17	3,1	<1	5	170	15	325	1,03	0,20	0,130	0,007	0,75	2,07	0,10	0,40	<1		
05.10.2005	164	7,01	3,36	0,97	2,9	1	6	170	25	350	1,08	0,10	0,047	0,005	2,04	2,51	<0,1	0,56	<1	<0,2	<1,4
02.11.2005	333	7	4,23	2,34	3,9	2	9	510	15	660	1,51	0,21	0,140	0,009	1,16	3,18	0,30	0,72	<1		
06.12.2005	327	6,98	3,75	0,65	2,9	<1	4	285	20	475	1,29	0,20	0,053	0,009	0,71	2,61	0,20	0,31	1		
Lower avg.	264	6,98	3,66	1,53	3,1	1	6	238	12	401	1,19	0,15	0,254	0,011	0,88	3,35	0,09	0,90	0,25	0,10	0,0
Upper avg.	264	6,98	3,66	1,53	3,1	2	6	238	12	401	1,19	0,16	0,254	0,011	0,88	3,35	0,13	0,89	1	0,20	1,4
Minimum	80	6,79	3,24	0,65	2,2	1	3	140	7	320	1,03	0,05	0,047	0,005	0,17	2,02	0,10	0,16	1	0,20	<1,4
Maximum	390	7,16	4,23	4,86	4	6	13	510	25	660	1,51	0,24	0,940	0,022	2,04	8,08	0,30	5,47	1	0,21	1,4
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no	no	no
n	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	4	4
Info																					
St.dev	72	0,11	0,28	1,06	0,5	1	3	87	5	85	0,13	0,06	0,277	0,006	0,38	1,51	0,06	1,29	0	0,01	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Numedalslågen

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg	g-HCH	PCBS
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[ng/l]
04.01.2005	89	6,73	3,86	3,61	3,7	4	9	400	28	595	2,05	0,10	0,180	0,039	0,65	10,50	0,20	0,41	1,5		
08.02.2005	83	6,68	2,86	2,32	2,5	2	4	175	46	335	1,36	0,10	0,091	<,005	0,42	2,59	<0,1	0,24	<1	<0,2	<1,4
08.03.2005	86	6,77	2,56	1,55	2	2	4	105	27	250	1,15	0,20	0,110	0,007	0,40	2,61	<0,1	0,30	1		
11.04.2005	70	6,80	4,12	6,20	4,1	4	12	370	21	585	2,15	0,20	0,255	0,010	0,75	5,17	<0,1	0,36	2		
10.05.2005	74	6,86	2,73	1,66	3,4	2	6	120	21	290	1,20	0,10	0,130	0,022	0,55	3,62	0,20	0,24	1,5	<0,2	<1,4
07.06.2005	125	6,70	3,05	3,09	3,9	3	8	225	18	400	1,44	0,20	0,213	0,025	0,61	5,98	0,10	0,29	<1		
04.07.2005	84	6,92	2,46	1,10	3,1	1	5	75	15	200	1,10	0,20	0,211	<,005	0,64	11,70	<0,1	0,26	<1		
09.08.2005	106	6,94	2,60	1,16	3,1	1	5	84	10	250	1,13	0,29	0,160	0,027	0,62	3,95	0,10	0,34	1,5	<0,2	<1,4
06.09.2005	74	6,85	2,63	1,30	2,8	<1	6	105	18	230	0,97	0,10	0,100	0,008	0,48	3,29	<0,1	0,25	2,5		
10.10.2005	52	6,90	3,22	1,44	2,9	1	6	170	31	310	1,15	0,10	0,090	0,008	0,45	2,01	<0,1	0,23	<1	<0,2	<1,4
07.11.2005	203	6,78	4,05	12	7,4	9	25	505	16	725	2,27	0,31	0,622	0,033	1,15	7,36	0,50	0,53	<1		
13.12.2005	138	6,94	3,55	2,67	3,7	4	10	350	23	495	1,95	0,20	0,150	0,010	0,54	3,14	0,20	0,20	<1		
Lower avg.	99	6,82	3,14	3,18	3,6	3	8	224	23	389	1,49	0,18	0,193	0,016	0,60	5,16	0,11	0,30	0,83	0,0	0,0
Upper avg.	99	6,82	3,14	3,18	3,6	3	8	224	23	389	1,49	0,18	0,193	0,017	0,60	5,16	0,16	0,30	1,33	0,2	1,4
Minimum	52	6,68	2,46	1,10	2	1	4	75	10	200	0,97	0,10	0,090	0,005	0,40	2,01	0,10	0,20	1	<0,2	<1,4
Maximum	203	6,94	4,12	12	7,4	9	25	505	46	725	2,27	0,31	0,622	0,039	1,15	11,70	0,50	0,53	2,5	0,2	1,4
More than 70%>LOD	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no	no	no
n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4	4
Info																					
St.dev	41	0,09	0,61	3,13	1,4	2	6	146	9	172	0,47	0,08	0,145	0,012	0,20	3,18	0,12	0,09	0,49	0	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Skienselva-Skiensvassdraget

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg	g-HCH	PCBS
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[ng/l]
05.01.2005	316	6,59	2,08	1,47	2,4	2	4	205	10	265	1,06	0,08	0,130	0,010	0,91	3,67	0,10	0,24	1		
07.02.2005	280	6,54	2,04	1,14	2,5	1	3	195	9	290	1,03	0,22	0,077	<,005	0,41	2,23	0,10	0,22	<1	0,29	<1,4
03.03.2005	153	6,61	2	0,78	2,3	1	3	190	9	280	1,03	0,10	0,059	0,008	0,40	2,28	<0,1	0,20	<1		
08.04.2005	315	6,57	2,25	2,40	2,4	2	5	220	7	330	1,15	0,10	0,089	0,010	0,44	2,41	<0,1	0,28	1,5		
09.05.2005	315	6,64	2	0,67	2,3	1	3	190	8	265	0,99	0,09	0,084	0,010	0,52	2,96	<0,1	0,55	<1	0,30	<1,4
03.06.2005	288	6,70	2,01	0,85	2,2	<1	4	180	9	270	0,93	0,10	0,048	0,009	0,52	2,34	<0,1	0,27	<1		
04.07.2005	226	6,70	1,96	0,68	2,3	<1	4	155	10	250	0,87	0,10	0,091	0,010	0,50	2,29	<0,1	0,19	<1		
08.08.2005	236	6,83	1,83	1,60	2,2	<1	4	100	9	225	0,79	0,10	0,046	0,010	0,36	1,70	<0,1	0,16	1	0,26	<1,4
06.09.2005	199	6,68	1,89	0,74	1,9	<1	3	120	20	255	0,76	0,10	0,063	0,009	0,56	2	<0,1	0,19	<1		
06.10.2005	193	6,72	1,81	0,45	1,9	<1	3	130	31	240	0,80	0,10	0,028	0,010	0,30	1,50	<0,1	0,10	<1	0,28	<1,4
08.11.2005	592	6,79	2,09	0,93	2,4	1	5	195	11	280	1,02	0,10	0,095	0,010	0,43	2,92	0,20	0,24	<1		
06.12.2005	340	6,65	2,01	0,88	2,3	<1	4	195	10	290	0,95	0,10	0,046	0,010	0,43	1,90	0,10	<0,05	<1		
Lower avg.	288	6,67	2,00	1,05	2,3	1	4	173	12	270	0,95	0,11	0,071	0,009	0,48	2,35	0,04	0,22	0,29	0,28	0,0
Upper avg.	288	6,67	2,00	1,05	2,3	1	4	173	12	270	0,95	0,11	0,071	0,009	0,48	2,35	0,11	0,22	1,04	0,28	1,4
Minimum	153	6,54	1,81	0,45	1,9	1	3	100	7	225	0,76	0,08	0,028	0,005	0,30	1,50	0,10	0,05	1	0,26	<1,4
Maximum	592	6,83	2,25	2,40	2,5	2	5	220	31	330	1,15	0,22	0,130	0,010	0,91	3,67	0,20	0,55	1,5	0,30	1,4
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no	yes	no
n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4	4
Info																					
St.dev	113	0,09	0,12	0,54	0,2	0	1	38	7	27	0,12	0,04	0,028	0,001	0,15	0,60	0,03	0,12	0,14	0,02	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Otra

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg	g-HCH	PCBS
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[ng/l]
05.01.2005	211	5,89	1,81	0,74	3,3	<1	3	120	26	310	0,87	0,10	0,276	0,025	0,61	4,76	0,10	0,65	<1		
09.02.2005	190	6,02	1,46	0,54	2,2	<1	2	120	25	245	0,80	0,09	0,229	0,010	0,55	4,04	<0,1	0,37	1	<0,2	<1,4
03.03.2005	139	6,05	1,50	1,97	2,1	1	3	110	11	230	0,79	1,10	0,221	0,020	1,05	3,36	0,10	0,38	<1		
08.04.2005	225	5,97		1,10	2,3	<1	3	130	13	255	0,86	0,10	0,236	0,030	0,40	4,77	<0,1	0,52	<1		
08.05.2005	97	6,12	1,33	0,66	1,8	<1	3	99	8	195	0,67	0,08	0,120	0,010	0,40	2,40	<0,1	0,31	2	<0,2	<1,4
08.06.2005	89	5,87	1,74	0,83	2,5	<1	4	110	7	215	0,65	0,10	0,273	0,023	0,74	4,68	<0,1	0,70	<1		
06.07.2005	79	6,32	1,39	0,86	1,9	<1	3	70	5	165	0,50	0,10	0,130	0,020	0,75	3,24	<0,1	0,46	<1		
10.08.2005	59	6,16	1,33	0,68	1,9	<1	3	65	8	175	0,51	0,20	0,140	0,010	0,52	3,60	<0,1	0,35	1	<0,2	<1,4
07.09.2005	75	5,93	1,39	0,94	2,1	<1	6	55	12	175	0,49	0,10	0,120	0,010	0,90	2,66	<0,1	0,33	<1		
10.10.2005	61	5,93	1,56	4,98	2,3	<1	3	84	13	180	0,62	0,10	0,150	0,020	0,83	3,17	<0,1	0,31	<1	<0,2	<1,4
08.11.2005	269	5,66	2,09	1,45	5,5	1	7	110	10	295	1,04	0,20	0,686	0,037	1,10	6,50	0,20	1,18	<1		
08.12.2005	150	6,93	1,58	0,60	2,2	1	4	120	17	235	0,79	0,20	0,248	0,021	0,52	3,93	<0,1	0,30	<1		
Lower avg.	137	6,07	1,56	1,28	2,5	0	4	99	13	223	0,72	0,21	0,236	0,020	0,70	3,93	0,03	0,49	0,33	0,0	0,0
Upper avg.	137	6,07	1,56	1,28	2,5	1	4	99	13	223	0,72	0,21	0,236	0,020	0,70	3,93	0,11	0,49	1,08	0,2	1,4
Minimum	59	5,66	1,33	0,54	1,8	1	2	55	5	165	0,49	0,08	0,120	0,010	0,40	2,40	0,10	0,30	1	<0,2	<1,4
Maximum	269	6,93	2,09	4,98	5,5	1	7	130	26	310	1,04	1,10	0,686	0,037	1,10	6,50	0,20	1,18	2	0,2	1,4
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no	no	no
n	12	12	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4	4
Info																					
St.dev	72	0,32	0,24	1,23	1,0	0	1	25	7	48	0,17	0,29	0,154	0,009	0,24	1,13	0,03	0,26	0,29	0	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Orreelva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg	g-HCH	PCBS
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[ng/l]
12.01.2005	13	7,07	16,90	152	6,9	255	293	1850	22	3355	1,54	1	7,670	0,224	7,17	47,30	1,50	4,34	<1		
03.02.2005	4	7,15	17,40	9,03	5,4	22	58	1650	21	2225	0,74	0,26	0,478	<,005	1,61	2,57	0,20	0,99	1	<0,2	<1,4
01.03.2005	1	7,42	17,20	5,41	4,9	18	40	1900	32	2250	0,42	0,20	0,140	0,010	1,50	3,30	0,10	1,03	1,5		
07.04.2005	8	7,13	17,60	5,95	4,5	19	51	1200	60	1735	0,21	0,20	0,254	0,010	1,68	5,27	<0,1	0,96	1,5		
09.05.2005	2	7,72	19,10	2,95	4,6	11	36	345	35	925	0,18	0,20	0,100	0,007	1,34	1,10	<0,1	0,72	1	<0,2	<1,4
03.06.2005	1	7,57	17,80	2,83	4,6	5	29	550	69	955	0,06	0,29	0,092	0,010	1,46	1,40	<0,1	0,93	<1		
05.07.2005	1	7,42	20,10	6,81	5,8	4	39	140	120	975	0,80	0,20	0,203	0,010	0,66	11,60	<0,1	0,26	2		
02.08.2005	0	8,84	21,40	5,70	6,2	3	30	<1	26	620	0,80	0,33	0,238	0,010	1,77	2,86	<0,1	1,60	<1	<0,2	<1,4
05.09.2005	2	7,87	19,80	6,56	5,5	11	59	52	44	795	1,33	0,29	0,120	0,006	0,85	1	<0,1	0,86	<1		
06.10.2005	5	7,66	19,10	7,15	5,3	11	50	180	105	905	0,97	0,26	0,100	0,005	0,92	1,10	<0,1	0,82	<1	<0,2	<1,4
08.11.2005	18	7,40	19	9,48	5,7	19	67	65	<5	1455	0,72	0,21	0,248	0,010	1,24	2,10	<0,1	0,77	1,5		
08.12.2005	2	7,57	18,10	5,42	5,9	12	52	1150	24	1655	0,52	0,34	0,170	0,007	1,40	1,70	0,40	1,07	<1		
Lower avg.	5	7,57	18,63	18,27	5,4	33	67	757	47	1488	0,69	0,32	0,818	0,026	1,80	6,78	0,18	1,20	0,71	0,0	0,0
Upper avg.	5	7,57	18,63	18,27	5,4	33	67	757	47	1488	0,69	0,32	0,818	0,026	1,80	6,78	0,25	1,20	1,21	0,2	1,4
Minimum	0	7,07	16,90	2,83	4,5	3	29	1	5	620	0,06	0,20	0,092	0,005	0,66	1	0,10	0,26	1	<0,2	<1,4
Maximum	18	8,84	21,40	152	6,9	255	293	1900	120	3355	1,54	1	7,670	0,224	7,17	47,30	1,50	4,34	2	0,2	1,4
More than 70%>LOD	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no	no	no
n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4	4
Info																					
St.dev	6	0,47	1,36	42,16	0,7	70	72	746	35	806	0,45	0,22	2,161	0,062	1,73	13,10	0,40	1,04	0,33	0	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Suldalslågen

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg	g-HCH	PCBS
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[ng/l]
07.01.2005	826	5,89	2,42	18,60	1,8	14	27	64	9	215	0,51	0,20	1,500	0,031	1,99	8,32	0,60	0,66	3,5		
09.02.2005	42	6,40	2,57	0,49	0,9	1	2	285	<5	340	0,60	<,05	0,053	<,005	0,25	2,33	<0,1	0,25	<1	<0,2	<1,4
09.03.2005	15	6,43	1,98	0,74	0,6	<1	1	255	<5	300	0,52	0,08	0,046	0,008	0,25	1,80	<0,1	0,18	<1		
06.04.2005	59	6,41	2,18	0,85	1,6	<1	3	200	7	280	0,56	0,07	0,110	0,010	0,69	3,77	0,30	0,28	1,5		
04.05.2005	106	6,34	1,64	0,82	1,0	<1	3	140	7	200	0,42	0,07	0,082	0,009	0,24	1,60	<0,1	0,20	<1	<0,2	<1,4
08.06.2005	76	6,31	1,47	0,57	0,6	<1	2	145	<5	180	0,33	0,06	0,046	0,008	0,23	1,40	<0,1	0,15	<1		
06.07.2005	319	6,13	1,40	0,79	0,6	<1	2	130	<5	160	0,34	0,07	0,057	0,010	0,24	1,40	<0,1	0,17	<1		
03.08.2005	164	6,44	1,25	1,86	0,6	1	3	110	<5	155	0,38	0,10	0,110	0,010	0,24	1,70	<0,1	0,38	<1	<0,2	<1,4
07.09.2005	71	6,49	1,32	1,13	0,6	1	3	125	9	200	0,34	0,08	0,089	0,008	0,24	1,40	<0,1	0,21	<1		
05.10.2005	132	6,44	1,45	1,07	1,1	<1	3	155	<5	205	0,43	0,08	0,086	0,007	0,28	1,50	<0,1	0,14	<1	<0,2	<1,4
09.11.2005	505	6,41	1,70	1,55	2,2	2	5	290	<5	425	0,60	<,05	0,180	0,010	0,43	2,44	0,20	0,13	<1		
07.12.2005	27	6,51	1,60	0,31	0,8	<1	2	220	4	265	0,48	0,10	0,034	0,008	0,20	1,30	<0,1	<0,05	<1		
Lower avg.	195	6,35	1,75	2,40	1,0	2	5	177	3	244	0,46	0,08	0,199	0,010	0,44	2,41	0,09	0,23	0,42	0,0	0,0
Upper avg.	195	6,35	1,75	2,40	1,0	2	5	177	6	244	0,46	0,08	0,199	0,010	0,44	2,41	0,17	0,23	1,25	0,2	1,4
Minimum	15	5,89	1,25	0,31	0,6	1	1	64	4	155	0,33	0,05	0,034	0,005	0,20	1,30	0,10	0,05	1	<0,2	<1,4
Maximum	826	6,51	2,57	18,60	2,2	14	27	290	9	425	0,60	0,20	1,500	0,031	1,99	8,32	0,60	0,66	3,5	0,2	1,4
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	no	yes	no	no	no
n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4	4
Info																					
St.dev	244	0,18	0,44	5,12	0,6	4	7	73	2	81	0,10	0,04	0,412	0,007	0,51	1,99	0,15	0,16	0,73	0	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Orkla

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg	g-HCH	PCBS
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[ng/l]
04.01.2005	59	7,39	6,54	1,12	2,5	<1	2	235	11	365	1,33	0,08	0,022	0,058	8,29	22,90	0,20	0,70	<1		
07.02.2005	95	7,21	7,35	0,93	2,5	<1	2	240	9	375	1,47	0,10	0,036	0,075	13,50	34,80	0,20	0,76	<1	<0,2	<1,4
07.03.2005	21	7,43	8,57	0,65	1,9	<1	2	330	7	445	1,61	0,10	0,026	0,081	12	29,20	<0,1	0,71	<1		
13.04.2005	142	7,07	7,24	3,31	4,2	3	8	280	9	475	1,53	0,20	0,075	0,120	22	43,10	0,30	0,99	1,5		
10.05.2005	135	7,16	4,96	1,59	3,7	1	5	140	<5	290	1,24	0,09	0,041	0,061	11,60	22,60	0,40	0,84	1,5	<0,2	<1,4
09.06.2005	277	7,04	4,05	0,85	2,5	<1	3	100	7	205	0,98	0,09	0,020	0,031	6,53	10,50	0,20	0,61	1,5		
04.07.2005	273	7,26	3,47	2,52	1,8	2	6	38	7	137	0,89	0,10	0,087	0,010	2,32	3,13	0,20	0,57	<1		
08.08.2005	33	7	3,08	32,30	8,2	14	30	28	5	365	1,31	0,38	0,413	0,033	6,25	12	1,70	2,33	4	<0,2	<1,4
01.09.2005	32	7,41	6,51	0,59	2,5	<1	4	120	8	240	1,26	0,20	0,068	0,097	14,60	33,20	0,20	0,81	<1		
06.10.2005	28	7,41	5,83	0,84	2	<1	3	135	5	225	1,12	0,08	0,023	0,064	9,89	24,30	<0,1	0,54	<1	<0,2	<1,4
07.11.2005	31	7,64	8,33	0,19	2	<1	3	245	6	345	1,61	0,10	0,010	0,060	10,50	23,50	0,30	0,58	<1		
06.12.2005	19	7,40	6,30	0,80	2	<1	3	270	9	390	1,35	0,10	<,005	0,035	5,39	11,30	0,20	0,64	<1		
Lower avg.	96	7,29	6,02	3,81	3,0	2	6	180	7	321	1,31	0,14	0,068	0,060	10,24	22,54	0,33	0,84	0,71	0,0	0,0
Upper avg.	96	7,29	6,02	3,81	3,0	2	6	180	7	321	1,31	0,14	0,069	0,060	10,24	22,54	0,34	0,84	1,38	0,2	1,4
Minimum	19	7	3,08	0,19	1,8	1	2	28	5	137	0,89	0,08	0,005	0,010	2,32	3,13	0,10	0,54	1	<0,2	<1,4
Maximum	277	7,64	8,57	32,30	8,2	14	30	330	11	475	1,61	0,38	0,413	0,120	22	43,10	1,70	2,33	4	0,2	1,4
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	no
n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4	4
Info																					
St.dev	94	0,19	1,81	9,02	1,8	4	8	99	2	102	0,23	0,09	0,111	0,031	5,16	11,66	0,44	0,49	0,86	0	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Vefsna

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg	g-HCH	PCBS
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[ng/l]
03.01.2005	78	7,31	8,63	0,29	1,7	<1	<1	125	7	210	0,80	0,06	0,010	<,005	0,48	0,78	<0,1	0,11	<1		
06.02.2005	85	7,29	9,81	0,44	1,9	<1	1	115	7	210	0,86	0,10	0,024	<,005	0,40	0,86	<0,1	0,13	<1	<0,2	<1,4
03.03.2005	48	7,50	10,70	0,17	1,2	<1	<1	135	<5	215	1,00	0,10	<,005	<,005	0,30	0,34	0,20	0,07	<1		
07.04.2005	113	7,26	8,56	1,19	2	<1	3	77	<5	165	0,81	0,10	0,038	<,005	0,37	0,65	<0,1	0,23	<1		
18.05.2005	152	7,42	7,14	1,81	2	2	5	45	<5	123	0,64	0,22	0,044	<,005	0,36	0,54	0,10	0,20	1,5	<0,2	<1,4
06.06.2005	458	7,20	4,74	1,52	1,4	<1	3	28	<5	95	0,56	0,09	0,045	<,005	0,31	0,44	<0,1	0,20	<1		
04.07.2005	448	7,33	2,95	1,55	0,8	<1	3	16	<5	51	0,37	0,10	0,050	<,005	0,26	0,40	<0,1	0,14	<1		
15.08.2005	127	7,46	3,70	1,04	0,9	<1	2	13	<5	59	0,43	0,10	0,034	<,005	0,27	115	0,30	0,36	<1	<0,2	<1,4
05.09.2005	219	7,33	4,13	0,90	1,5	<1	2	26	<5	93	0,48	0,10	0,041	<,005	0,31	0,20	<0,1	0,18	1		
07.10.2005	281	7,34	3,69	5,86	1,5	1	4	29	6	107	0,57	0,10	0,160	<,005	0,33	0,61	<0,1	0,23	<1	<0,2	<1,4
07.11.2005	119	7,55	5,74	0,47	1,4	<1	2	55	<5	123	0,73	0,10	0,023	<,005	0,61	2,03	0,20	0,12	<1		
06.12.2005	70	7,49	7,70	0,23	1,5	<1	3	125	4	190	0,86	0,10	<,005	<,005	0,29	0,24	0,20	0,07	<1		
Lower avg.	183	7,37	6,46	1,29	1,5	0	2	66	2	137	0,67	0,11	0,039	0,000	0,36	10,17	0,08	0,17	0,21	0,0	0,0
Upper avg.	183	7,37	6,46	1,29	1,5	1	3	66	5	137	0,67	0,11	0,040	0,005	0,36	10,17	0,14	0,17	1,04	0,2	1,4
Minimum	48	7,20	2,95	0,17	0,8	1	1	13	4	51	0,37	0,06	0,005	0,005	0,26	0,20	0,10	0,07	1	<0,2	<1,4
Maximum	458	7,55	10,70	5,86	2	2	5	135	7	215	1,00	0,22	0,160	0,005	0,61	115	0,30	0,36	1,5	0,2	1,4
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	yes	yes	no	yes	yes	no	yes	no	no	no
n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4	4
Info																					
St.dev	142	0,11	2,64	1,55	0,4	0	1	47	1	59	0,20	0,04	0,041	0	0,10	33,02	0,07	0,08	0,14	0	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Altaelva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg	g-HCH	PCBS
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[ng/l]
03.01.2005	34	7,36	6,57	0,40	3,7	<1	3	44	6	195	2,48	0,10	0,010	<,005	0,62	0,33	0,20	0,15	<1		
03.02.2005	36	7,29	7,21	0,28	3,4	<1	3	52	7	180	2,70	0,10	0,010	<,005	1,48	0,33	0,20	0,11	<1	<0,2	<1,4
03.03.2005	34	7,39	7,64	0,33	3,2	1	3	55	<5	180	2,82	0,10	<,005	<,005	0,48	0,26	0,20	0,11	<1		
13.04.2005	66	7,38	8,33	1,10	3,2	1	4	40	<5	170	3,13	0,10	0,010	<,005	0,45	0,25	0,20	0,12	20		
09.05.2005	38	7,50	12,30	0,53	2,7	<1	4	26	<5	150	2,78	0,09	0,010	<,005	0,46	0,42	0,30	<0,05	1,5	<0,2	<1,4
06.06.2005	826	7,24	4,42	11,50	5,2	5	19	22	9	240	2,11	0,20	0,120	<,005	0,92	1,10	0,50	0,43	<1		
04.07.2005	179	7,31	3,87	0,83	3,5	<1	9	14	7	129	1,38	0,10	0,023	<,005	0,70	0,40	<0,1	0,23	<1		
02.08.2005	164	7,51	4,52	1,02	3,2	<1	5	5	<5	138	1,34	0,20	0,024	<,005	0,79	0,23	0,20	0,24	2,5	<0,2	<1,4
05.09.2005	151	7,51	4,97	0,66	3,4	<1	5	22	<5	147	1,55	0,10	0,010	<,005	0,69	0,22	0,20	0,21	<1		
11.10.2005	93	7,43	5,25	0,83	3,5	<1	5	25	<5	150	1,77	0,10	0,006	<,005	0,63	0,10	<0,1	0,19	<1	<0,2	<1,4
08.11.2005	122	7,55	5,61	0,41	3,5	<1	5	31	<5	160	2,15	0,10	0,020	<,005	0,58	0,10	0,30	0,14	<1		
12.12.2005	50	7,39	5,98	0,50	3,5	1	5	45	4	150	2,55	0,10	0,005	<,005	0,56	0,20	0,30	0,21	<1		
Lower avg.	149	7,41	6,39	1,53	3,5	1	6	32	3	166	2,23	0,12	0,021	0,000	0,70	0,33	0,22	0,18	2	0,0	0,0
Upper avg.	149	7,41	6,39	1,53	3,5	1	6	32	6	166	2,23	0,12	0,021	0,005	0,70	0,33	0,23	0,18	2,75	0,2	1,4
Minimum	34	7,24	3,87	0,28	2,7	1	3	5	4	129	1,34	0,09	0,005	0,005	0,45	0,10	0,10	0,05	1	<0,2	<1,4
Maximum	826	7,55	12,30	11,50	5,2	5	19	55	9	240	3,13	0,20	0,120	0,005	1,48	1,10	0,50	0,43	20	0,2	1,4
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	yes	yes	no	yes	yes	yes	yes	no	no	no
n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4	4
Info																					
St.dev	220	0,10	2,31	3,15	0,6	1	4	16	1	30	0,61	0,04	0,032	0	0,28	0,26	0,11	0,10	5,45	0	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Tista utløp Femsjøen

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
14.02.2005	18	6,74	5,57	5,08	7,9	6	14	640	5	900	1,81	0,33	0,373	0,022	2,77	8,07	0,40	1,08	<1
09.05.2005	15	6,73	5,56	3,51	7,8	3	5	595	<5	875	1,59	0,40	0,299	0,023	1,31	4,92	0,30	1,51	<1
08.08.2005	12	6,88	5,78	3,93	7,4	2	12	520	8	810	1,38	0,36	0,275	0,020	1,50	4,07	0,20	0,66	1,5
10.10.2005	10	6,94	5,85	1,61	7,1	2	11	605	6	840	1,42	0,30	0,180	0,010	1,37	2,97	0,20	0,76	<1
Lower avg.	14	6,82	5,69	3,53	7,6	3	11	590	5	856	1,55	0,35	0,282	0,019	1,74	5,01	0,28	1,00	0,38
Upper avg.	14	6,82	5,69	3,53	7,6	3	11	590	6	856	1,55	0,35	0,282	0,019	1,74	5,01	0,28	1,00	1,13
Minimum	10	6,73	5,56	1,61	7,1	2	5	520	5	810	1,38	0,30	0,180	0,010	1,31	2,97	0,20	0,66	1
Maximum	18	6,94	5,85	5,08	7,9	6	14	640	8	900	1,81	0,40	0,373	0,023	2,77	8,07	0,40	1,51	1,5
More than 70%>LOD	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	4	0,10	0,15	1,44	0,4	2	4	50	1	39	0,20	0,04	0,080	0,006	0,69	2,19	0,10	0,38	0,25

Tokkeelva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
08.03.2005	12	6,32	2,10	1,32	5,9	<1	4	200	<5	370	1,37	0,22	0,200	0,030	0,45	5,84	<0,1	0,37	<1
09.05.2005	14	6,39	2,97	6,97	8,9	3	24	26	<5	380	1,33	0,20	0,229	0,039	0,84	9,02	0,20	0,58	<1
08.08.2005	18	6,33	2,16	2,18	4,9	<1	8	105	<5	325	1,13	0,20	0,120	0,028	0,69	4,95	<0,1	0,49	<1
18.10.2005	9	6,23	2,17	2,82	5,4	<1	8	120	<5	350	1,17	0,21	0,096	0,030	0,52	4,86	0,20	0,39	<1
Lower avg.	13	6,32	2,35	3,32	6,3	1	11	113	0	356	1,25	0,21	0,161	0,032	0,63	6,17	0,10	0,46	0
Upper avg.	13	6,32	2,35	3,32	6,3	2	11	113	5	356	1,25	0,21	0,161	0,032	0,63	6,17	0,15	0,46	1
Minimum	9	6,23	2,10	1,32	4,9	1	4	26	5	325	1,13	0,20	0,096	0,028	0,45	4,86	0,10	0,37	1
Maximum	18	6,39	2,97	6,97	8,9	3	24	200	5	380	1,37	0,22	0,229	0,039	0,84	9,02	0,20	0,58	1
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	3	0,07	0,41	2,51	1,8	1	9	71	0	24	0,12	0,01	0,063	0,005	0,17	1,95	0,06	0,10	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Nidelva Arendal

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
08.03.2005	39	6,37	2,56	3,03	2,5	3	5	230	16	375	1,28	0,20	0,237	0,024	0,86	4,67	<0,1	0,22	<1
09.05.2005	64	6,45	2,42	1,94	2,7	1	5	170	12	330	0,90	0,20	0,170	0,024	0,76	4,37	<0,1	0,21	<1
08.08.2005	140	6,28	1,54	0,75	2,4	<1	3	110	6	255	0,66	0,10	0,120	0,022	0,83	3,25	<0,1	0,21	<1
18.10.2005	40	6,23	1,63	0,82	2,6	<1	3	145	11	250	0,85	0,20	0,110	0,026	0,79	4,31	0,10	0,36	1,5
Lower avg.	71	6,33	2,04	1,64	2,6	1	4	164	11	303	0,92	0,18	0,159	0,024	0,81	4,15	0,03	0,25	0,38
Upper avg.	71	6,33	2,04	1,64	2,6	2	4	164	11	303	0,92	0,18	0,159	0,024	0,81	4,15	0,10	0,25	1,13
Minimum	39	6,23	1,54	0,75	2,4	1	3	110	6	250	0,66	0,10	0,110	0,022	0,76	3,25	0,10	0,21	1
Maximum	140	6,45	2,56	3,03	2,7	3	5	230	16	375	1,28	0,20	0,237	0,026	0,86	4,67	0,10	0,36	1,5
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	48	0,10	0,53	1,08	0,1	1	1	51	4	61	0,26	0,05	0,058	0,002	0,04	0,62	0	0,07	0,25

Tovdalselva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
09.02.2005	30	5,93	2,35	1	4,1	<1	3	160	38	870	1,14	0,20	0,445	0,034	0,37	7,53	<0,1	0,39	<1
08.05.2005	28	6,31	2,26	1,65	3,1	<1	4	175	7	315	0,93	0,20	0,291	0,033	0,32	5,31	0,10	0,32	1
10.08.2005	30	6,51	2,21	1,57	3,7	<1	4	59	6	240	0,49	0,29	0,208	0,033	0,41	3,89	0,10	0,33	<1
18.10.2005	19	6,49	2,26	1,21	3,5	<1	3	100	48	270	0,62	0,24	0,214	0,027	0,86	4,51	0,20	0,34	<1
Lower avg.	27	6,31	2,27	1,36	3,6	0	4	124	25	424	0,79	0,23	0,290	0,032	0,49	5,31	0,10	0,35	0,25
Upper avg.	27	6,31	2,27	1,36	3,6	1	4	124	25	424	0,79	0,23	0,290	0,032	0,49	5,31	0,13	0,35	1
Minimum	19	5,93	2,21	1	3,1	1	3	59	6	240	0,49	0,20	0,208	0,027	0,32	3,89	0,10	0,32	1
Maximum	30	6,51	2,35	1,65	4,1	1	4	175	48	870	1,14	0,29	0,445	0,034	0,86	7,53	0,20	0,39	1
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	5	0,27	0,06	0,31	0,4	0	1	54	21	299	0,29	0,04	0,110	0,003	0,25	1,59	0,05	0,03	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Mandalselva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
08.02.2005	36	6,26	2,14	1,70	3,1	<1	4	110	15	280	0,61	0,10	0,408	0,020	0,36	4,91	<0,1	0,20	<1
08.05.2005	51	6,31	2,05	1,23	2,8	<1	5	115	10	245	0,67	0,20	0,371	0,024	0,58	6,18	0,10	0,38	1
21.08.2005	27	6,42	1,79	0,97	2,2	<1	4	115	9	190	0,40	0,10	0,255	0,020	0,36	2,65	<0,1	0,16	<1
18.10.2005	26	6,38	2,27	0,86	3,7	<1	4	140	13	310	0,65	0,20	0,372	0,027	0,72	3,82	0,10	0,22	<1
Lower avg.	35	6,34	2,06	1,19	3,0	0	4	120	12	256	0,58	0,15	0,352	0,023	0,50	4,39	0,05	0,24	0,25
Upper avg.	35	6,34	2,06	1,19	3,0	1	4	120	12	256	0,58	0,15	0,352	0,023	0,50	4,39	0,10	0,24	1
Minimum	26	6,26	1,79	0,86	2,2	1	4	110	9	190	0,40	0,10	0,255	0,020	0,36	2,65	0,10	0,16	1
Maximum	51	6,42	2,27	1,70	3,7	1	5	140	15	310	0,67	0,20	0,408	0,027	0,72	6,18	0,10	0,38	1
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	12	0,07	0,20	0,37	0,6	0	1	14	3	52	0,12	0,06	0,067	0,003	0,18	1,51	0	0,10	0

Lyngdalselva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
08.02.2005	15	5,96	3,32	0,63	2,8	<1	3	200	9	320	0,83	0,10	0,386	0,035	0,21	6,28	<0,1	0,16	<1
08.05.2005	16	6,57	2,91	0,85	3	1	13	165	<5	305	0,65	0,20	0,346	0,026	0,25	4,23	<0,1	0,09	1,5
21.08.2005	9	6,75	3,39	0,78	2,4	<1	5	230	15	325	0,71	0,20	0,201	0,020	0,25	2,34	<0,1	0,11	<1
18.10.2005	11	6,41	2,91	0,84	3,5	1	5	215	<5	380	0,72	0,25	0,271	0,028	0,59	4,25	0,20	0,16	<1
Lower avg.	13	6,42	3,13	0,78	2,9	1	7	203	6	333	0,73	0,19	0,301	0,027	0,33	4,28	0,05	0,13	0,38
Upper avg.	13	6,42	3,13	0,78	2,9	1	7	203	9	333	0,73	0,19	0,301	0,027	0,33	4,28	0,13	0,13	1,13
Minimum	9	5,96	2,91	0,63	2,4	1	3	165	5	305	0,65	0,10	0,201	0,020	0,21	2,34	0,10	0,09	1
Maximum	16	6,75	3,39	0,85	3,5	1	13	230	15	380	0,83	0,25	0,386	0,035	0,59	6,28	0,20	0,16	1,5
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	4	0,34	0,26	0,10	0,5	0	4	28	5	33	0,08	0,06	0,082	0,006	0,18	1,61	0,05	0,04	0,25

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Kvina

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
08.02.2005	30	5,94	4,72	0,79	2,3	<1	3	170	15	305	0,77	0,09	0,355	0,034	0,69	8,48	<0,1	0,25	<1
08.05.2005	38	6,37	2,84	0,77	2,5	<1	5	160	7	290	0,44	0,20	0,285	0,024	2,17	4,26	<0,1	0,18	1,5
21.08.2005	42	6,82	2,90	0,61	2,7	<1	6	94	16	230	0,31	0,20	0,321	0,020	1,79	2,15	<0,1	0,20	<1
18.10.2005	22	6,39	3,18	1,60	5,6	1	7	180	<5	360	0,83	0,28	0,485	0,033	0,91	4,84	0,20	0,18	<1
Lower avg.	33	6,38	3,41	0,94	3,3	0	5	151	10	296	0,59	0,19	0,362	0,028	1,39	4,93	0,05	0,20	0,38
Upper avg.	33	6,38	3,41	0,94	3,3	1	5	151	11	296	0,59	0,19	0,362	0,028	1,39	4,93	0,13	0,20	1,13
Minimum	22	5,94	2,84	0,61	2,3	1	3	94	5	230	0,31	0,09	0,285	0,020	0,69	2,15	0,10	0,18	1
Maximum	42	6,82	4,72	1,60	5,6	1	7	180	16	360	0,83	0,28	0,485	0,034	2,17	8,48	0,20	0,25	1,5
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	9	0,36	0,89	0,45	1,6	0	2	39	6	53	0,25	0,08	0,087	0,007	0,70	2,63	0,05	0,03	0,25

Sira

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
08.02.2005	69	5,19	1,76	0,40	1,9	<1	2	89	16	190	0,38	0,08	0,349	0,007	0,25	3,27	<0,1	0,14	1
08.05.2005	95	5,39	1,63	1,10	1,5	<1	5	105	15	205	0,44	0,10	0,290	0,010	0,26	4,32	<0,1	0,12	<1
21.08.2005	93	5,58	1,52	0,48	1,4	<1	4	99	12	160	0,35	0,08	0,214	0,010	1,36	2,67	<0,1	0,10	<1
18.10.2005	44	5,38	1,56	0,73	2,3	<1	3	93	16	195	0,40	0,10	0,327	0,010	0,55	2,48	0,10	0,12	1,5
Lower avg.	75	5,39	1,62	0,68	1,8	0	4	97	15	188	0,39	0,09	0,295	0,009	0,60	3,19	0,03	0,12	0,63
Upper avg.	75	5,39	1,62	0,68	1,8	1	4	97	15	188	0,39	0,09	0,295	0,009	0,60	3,19	0,10	0,12	1,13
Minimum	44	5,19	1,52	0,40	1,4	1	2	89	12	160	0,35	0,08	0,214	0,007	0,25	2,48	0,10	0,10	1
Maximum	95	5,58	1,76	1,10	2,3	1	5	105	16	205	0,44	0,10	0,349	0,010	1,36	4,32	0,10	0,14	1,5
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	24	0,16	0,11	0,31	0,4	0	1	7	2	19	0,04	0,01	0,059	0,002	0,52	0,83	0	0,02	0,25

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Bjerkreimselva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
11.02.2005	167	6,29	4,13	0,69	1,2	2	4	365	16	450	0,68	0,10	0,222	0,027	0,21	4,10	<0,1	0,19	<1
06.05.2005	47	6,36	3,06	0,36	1,1	<1	3	260	6	345	0,64	0,05	0,180	0,021	0,19	2,65	0,10	0,13	<1
04.08.2005	11	6,72	3,58	0,47	1,2	1	7	310	10	440	0,61	0,10	0,218	0,020	0,22	1,70	<0,1	0,16	1
07.10.2005	26	6,52	3,41	0,61	1,5	1	5	290	<5	400	0,58	0,10	0,190	0,022	0,22	2,87	<0,1	0,13	1
Lower avg.	63	6,47	3,55	0,53	1,3	1	5	306	8	409	0,63	0,09	0,203	0,023	0,21	2,83	0,03	0,15	0,5
Upper avg.	63	6,47	3,55	0,53	1,3	1	5	306	9	409	0,63	0,09	0,203	0,023	0,21	2,83	0,10	0,15	1
Minimum	11	6,29	3,06	0,36	1,1	1	3	260	5	345	0,58	0,05	0,180	0,020	0,19	1,70	0,10	0,13	1
Maximum	167	6,72	4,13	0,69	1,5	2	7	365	16	450	0,68	0,10	0,222	0,027	0,22	4,10	0,10	0,19	1
More than 70%>LOD	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	71	0,19	0,45	0,15	0,2	1	2	44	5	48	0,04	0,03	0,021	0,003	0,01	0,99	0	0,03	0

Figgjoelva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
03.02.2005	7	6,69	9,13	1,27	2,2	8	14	880	28	1090	1,42	0,10	0,319	0,009	0,81	6,04	0,10	0,30	1
09.05.2005	5	7,30	11,70	1,97	2,6	10	20	905	13	1200	0,92	0,10	0,244	0,010	0,82	3,35	0,20	0,28	<1
01.08.2005	2	7,42	10,20	1,59	2,4	9	19	470	11	745	0,72	0,20	0,347	0,010	0,97	3,37	<0,1	0,37	<1
06.10.2005	6	6,88	9,26	1,68	3,2	10	19	810	24	1190	1,01	0,10	0,269	0,020	0,95	4,50	<0,1	0,34	1
Lower avg.	5	7,07	10,07	1,63	2,6	9	18	766	19	1056	1,02	0,13	0,295	0,012	0,88	4,32	0,08	0,32	0,5
Upper avg.	5	7,07	10,07	1,63	2,6	9	18	766	19	1056	1,02	0,13	0,295	0,012	0,88	4,32	0,13	0,32	1
Minimum	2	6,69	9,13	1,27	2,2	8	14	470	11	745	0,72	0,10	0,244	0,009	0,81	3,35	0,10	0,28	1
Maximum	7	7,42	11,70	1,97	3,2	10	20	905	28	1200	1,42	0,20	0,347	0,020	0,97	6,04	0,20	0,37	1
More than 70%>LOD	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	2	0,34	1,19	0,29	0,4	1	3	202	8	213	0,30	0,05	0,047	0,005	0,08	1,27	0,05	0,04	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Lyseelva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
07.02.2005	9	6,17	3,02	0,12	0,6	<1	<1	110	7	150	0,81	<,05	0,070	<,005	0,19	2,66	<0,1	0,12	<1
08.05.2005	19	6,33	1,86	0,19	1	<1	2	72	<5	122	0,55	0,05	0,120	0,006	0,21	1,20	<0,1	0,07	<1
08.08.2005	14	6,57	1,54	0,16	1,3	<1	2	74	<5	149	0,69	0,08	0,140	<,005	0,22	0,85	<0,1	0,12	<1
17.10.2005	6	6,64	1,98	0,98	0,9	<1	2	125	<5	185	0,37	0,07	0,077	0,007	0,21	1,20	<0,1	<0,05	<1
Lower avg.	12	6,43	2,10	0,36	1,0	0	2	95	2	152	0,60	0,05	0,102	0,003	0,21	1,48	0,00	0,08	0
Upper avg.	12	6,43	2,10	0,36	1,0	1	2	95	6	152	0,60	0,06	0,102	0,006	0,21	1,48	0,10	0,09	1
Minimum	6	6,17	1,54	0,12	0,6	1	1	72	5	122	0,37	0,05	0,070	0,005	0,19	0,85	0,10	0,05	1
Maximum	19	6,64	3,02	0,98	1,3	1	2	125	7	185	0,81	0,08	0,140	0,007	0,22	2,66	0,10	0,12	1
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	yes	yes	no	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	6	0,22	0,64	0,41	0,3	0	1	26	1	26	0,19	0,02	0,034	0,001	0,01	0,81	0	0,04	0

Storåna (Årdalselva)

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
09.02.2005	22	6,59	7,04	0,14	1,1	1	2	1845	<5	1870	2,23	<,05	0,023	<,005	0,70	3,12	<0,1	0,23	<1
18.05.2005	25	6,52	3,76	0,51	0,9	<1	3	530	<5	605	0,76	<,05	0,098	0,007	0,24	1,40	<0,1	0,11	<1
17.08.2005	27	6,41	2,39	0,44	1,2	<1	3	205	<5	265	0,58	0,08	0,120	0,007	0,19	1,40	<0,1	0,23	1
21.10.2005	37	6,55	5,43	1,18	2,2	2	5	1400	<5	1390	1,33	0,09	0,204	0,008	0,45	1,80	0,20	0,15	1,5
Lower avg.	28	6,52	4,66	0,57	1,4	1	3	995	0	1033	1,22	0,04	0,111	0,006	0,39	1,93	0,05	0,18	0,63
Upper avg.	28	6,52	4,66	0,57	1,4	1	3	995	5	1033	1,22	0,07	0,111	0,007	0,39	1,93	0,13	0,18	1,13
Minimum	22	6,41	2,39	0,14	0,9	1	2	205	5	265	0,58	0,05	0,023	0,005	0,19	1,40	0,10	0,11	1
Maximum	37	6,59	7,04	1,18	2,2	2	5	1845	5	1870	2,23	0,09	0,204	0,008	0,70	3,12	0,20	0,23	1,5
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	no	yes	yes	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	6	0,08	2,02	0,44	0,6	1	1	759	0	731	0,74	0,02	0,074	0,001	0,23	0,82	0,05	0,06	0,25

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Ulladalsåna (Ulla)

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
09.02.2005	20	6,47	2,84	0,10	0,6	<1	<1	73	<5	116	0,71	<,05	0,024	<,005	0,09	1,60	<0,1	0,09	<1
18.05.2005	15	6,53	1,81	0,17	0,9	<1	2	38	<5	84	0,57	<,05	0,048	0,006	0,18	0,92	<0,1	0,10	<1
17.08.2005	29	6,91	2,24	0,78	0,8	<1	2	99	<5	155	0,92	0,06	0,052	0,007	0,24	1,10	<0,1	0,27	<1
21.10.2005	26	6,32	1,72	0,79	3,9	<1	4	100	<5	240	0,92	0,10	0,321	0,010	0,28	1,70	0,20	0,17	<1
Lower avg.	23	6,56	2,15	0,44	1,6	0	2	78	0	149	0,78	0,04	0,111	0,006	0,20	1,33	0,05	0,16	0
Upper avg.	23	6,56	2,15	0,46	1,6	1	2	78	5	149	0,78	0,07	0,111	0,007	0,20	1,33	0,13	0,16	1
Minimum	15	6,32	1,72	0,10	0,6	1	1	38	5	84	0,57	0,05	0,024	0,005	0,09	0,92	0,10	0,09	1
Maximum	29	6,91	2,84	0,79	3,9	1	4	100	5	240	0,92	0,10	0,321	0,010	0,28	1,70	0,20	0,27	1
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	no	yes	yes	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	6	0,25	0,51	0,38	1,6	0	1	29	0	67	0,17	0,02	0,140	0,002	0,08	0,38	0,05	0,08	0

Storelva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
09.02.2005	15	6,05	2,84	0,32	0,7	2	4	370	17	465	0,50	<,05	0,150	0,020	0,25	5,10	<0,1	0,27	<1
18.05.2005	14	6,10	1,81	0,36	0,6	<1	2	115	<5	170	0,40	<,05	0,180	0,010	0,23	2,16	<0,1	0,15	2,5
17.08.2005	43	6,30	0,93	0,19	0,5	<1	3	68	<5	117	0,27	0,07	0,059	0,006	0,21	0,76	<0,1	0,19	<1
21.10.2005	30	6,05	1,43	1,31	2	1	5	170	<5	260	0,46	0,10	0,239	0,010	0,35	2,57	<0,1	0,20	<1
Lower avg.	26	6,13	1,75	0,55	0,9	1	4	181	4	253	0,41	0,04	0,157	0,012	0,26	2,65	0,00	0,20	0,63
Upper avg.	26	6,13	1,75	0,55	0,9	1	4	181	8	253	0,41	0,07	0,157	0,012	0,26	2,65	0,10	0,20	1,38
Minimum	14	6,05	0,93	0,19	0,5	1	2	68	5	117	0,27	0,05	0,059	0,006	0,21	0,76	0,10	0,15	1
Maximum	43	6,30	2,84	1,31	2	2	5	370	17	465	0,50	0,10	0,239	0,020	0,35	5,10	0,10	0,27	2,5
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	no	yes	yes	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	14	0,12	0,81	0,52	0,7	1	1	133	6	153	0,10	0,02	0,075	0,006	0,06	1,81	0	0,05	0,75

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Vikedalselva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
09.02.2005	9	6,46	3,38	0,93	0,8	2	5	250	20	355	0,41	0,10	0,190	0,010	0,38	3,35	<0,1	0,44	<1
18.05.2005	5	6,47	2,62	0,60	0,8	<1	3	220	<5	300	0,40	0,09	0,120	0,010	0,38	2,87	<0,1	0,31	<1
17.08.2005	4	6,69	2,89	0,32	1,2	<1	5	215	9	305	0,43	0,35	0,078	0,009	0,36	1,40	<0,1	0,44	<1
21.10.2005	6	6,32	2,54	9,66	2,8	5	15	250	<5	400	0,64	0,50	0,849	0,020	1,35	3,53	0,30	0,81	2,5
Lower avg.	6	6,49	2,86	2,88	1,4	2	7	234	7	340	0,47	0,26	0,309	0,012	0,62	2,79	0,08	0,50	0,63
Upper avg.	6	6,49	2,86	2,88	1,4	2	7	234	10	340	0,47	0,26	0,309	0,012	0,62	2,79	0,15	0,50	1,38
Minimum	4	6,32	2,54	0,32	0,8	1	3	215	5	300	0,40	0,09	0,078	0,009	0,36	1,40	0,10	0,31	1
Maximum	9	6,69	3,38	9,66	2,8	5	15	250	20	400	0,64	0,50	0,849	0,020	1,35	3,53	0,30	0,81	2,5
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	2	0,15	0,38	4,53	0,9	2	5	19	7	47	0,11	0,20	0,363	0,005	0,49	0,97	0,10	0,22	0,75

Vosso Bolstadelvi

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
11.03.2005	13	6,45	1,65	0,35	0,7	<1	2	131	8	185	0,41	0,06	0,039	0,009	0,27	1,30	<0,1	0,28	<1
11.05.2005	92	5,87	2,21	0,57	1,2	<1	4	695	9	790	0,56	<,05	0,053	0,006	0,35	1,40	<0,1	0,35	<1
09.08.2005	190	6,29	0,79	0,68	0,8	<1	4	42	8	102	0,25	0,08	0,064	<,005	0,24	0,82	<0,1	0,25	<1
18.10.2005	46	6,33	1,09	0,75	1,2	<1	4	99	10	155	0,38	0,08	0,088	0,009	1,78	1,10	<0,1	0,30	<1
Lower avg.	85	6,24	1,44	0,59	1,0	0	4	242	9	308	0,40	0,06	0,061	0,006	0,66	1,16	0,00	0,30	0
Upper avg.	85	6,24	1,44	0,59	1,0	1	4	242	9	308	0,40	0,07	0,061	0,007	0,66	1,16	0,10	0,30	1
Minimum	13	5,87	0,79	0,35	0,7	1	2	42	8	102	0,25	0,05	0,039	0,005	0,24	0,82	0,10	0,25	1
Maximum	190	6,45	2,21	0,75	1,2	1	4	695	10	790	0,56	0,08	0,088	0,009	1,78	1,40	0,10	0,35	1
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	77	0,25	0,63	0,17	0,3	0	1	304	1	323	0,13	0,02	0,021	0,002	0,75	0,26	0	0,04	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Jostedøla

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
07.03.2005	5	6,62	4,26	0,29	0,7	<1	1	269	9	340	2,24	<,05	0,077	0,020	0,69	1,70	<0,1	0,08	<1
10.05.2005	27	6,59	2,59	0,84	1,3	<1	3	145	7	255	1,20	<,05	0,060	<,005	0,56	1	0,20	0,18	1
10.08.2005	145	6,15	0,51	91,50	0,2	53	57	8	6	50	2,59	0,06	0,816	<,005	2,34	10,30	3,20	2,40	2
21.10.2005	20	6,53	1,80	1,17	0,5	1	3	175	7	220	0,99	<,05	0,053	0,005	0,36	0,79	<0,1	0,12	<1
Lower avg.	49	6,47	2,29	23,45	0,7	14	16	149	7	216	1,76	0,02	0,252	0,006	0,98	3,45	0,85	0,70	0,75
Upper avg.	49	6,47	2,29	23,45	0,7	14	16	149	7	216	1,76	0,05	0,252	0,009	0,98	3,45	0,90	0,69	1,25
Minimum	5	6,15	0,51	0,29	0,2	1	1	8	6	50	0,99	0,05	0,053	0,005	0,36	0,79	0,10	0,08	1
Maximum	145	6,62	4,26	91,50	1,3	53	57	269	9	340	2,59	0,06	0,816	0,020	2,34	10,30	3,20	2,40	2
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	no	yes	no	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	65	0,22	1,57	45,37	0,5	26	27	108	1	122	0,78	0,01	0,376	0,008	0,91	4,58	1,53	1,14	0,5

Gaular

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
03.03.2005	11	6	1,89	0,27	1,1	1	3	170	<5	230	0,62	<0,05	0,025	<0,005	0,24	1,70	<0,1	0,11	1,5
02.06.2005	73	6,17	1,42	0,60	1,3	<1	4	96	8	185	0,43	<0,05	0,047	<0,005	0,22	1,20	<0,1	0,08	<1
10.08.2005	62	6,15	0,98	2,11	1	<1	5	45	<5	108	0,26	<0,05	0,044	<0,005	0,17	0,75	<0,1	0,09	<1
24.10.2005	24	6,11	1,30	0,54	1,9	3	7	100	<5	195	0,44	<0,05	0,068	0,005	0,29	1,40	<0,1	0,13	1,5
Lower avg.	43	6,11	1,40	0,88	1,3	1	5	103	2	180	0,44	0,00	0,046	0,001	0,23	1,26	0,00	0,10	0,75
Upper avg.	43	6,11	1,40	0,88	1,3	2	5	103	6	180	0,44	0,05	0,046	0,005	0,23	1,26	0,10	0,10	1,25
Minimum	11	6,00	0,98	0,27	1,0	1	3	45	5	108	0,26	0,05	0,025	0,005	0,17	0,75	0,10	0,08	1
Maximum	73	6,17	1,89	2,11	1,9	3	7	170	8	230	0,62	0,05	0,068	0,005	0,29	1,70	0,10	0,13	1,5
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	no	yes	no	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	30	0,08	0,38	0,83	0,4	1	2	51	2	51	0,15	0,00	0,018	0,000	0,05	0,40	0,00	0,02	0,29

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Jølstra

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
03.03.2005	13	6,14	1,82	0,37	0,8	1	3	185	<5	250	0,54	<,05	0,020	0,007	0,29	1,60	<0,1	0,10	<1
02.06.2005	80	6,24	1,57	0,58	1	<1	4	115	<5	195	0,41	<,05	0,029	<,005	0,23	1,30	<0,1	0,06	<1
10.08.2005	54	6,29	1,32	0,65	1,1	<1	5	69	6	143	0,32	<,05	0,033	<,005	0,19	0,97	<0,1	0,07	1
24.10.2005	23	6,24	1,47	0,57	1,3	1	5	145	<5	230	0,42	<,05	0,035	<,005	0,25	1,20	<0,1	0,12	<1
Lower avg.	43	6,23	1,55	0,54	1,0	1	4	129	2	205	0,42	0,00	0,029	0,002	0,24	1,27	0,00	0,09	0,25
Upper avg.	43	6,23	1,55	0,54	1,0	1	4	129	5	205	0,42	0,05	0,029	0,006	0,24	1,27	0,10	0,09	1
Minimum	13	6,14	1,32	0,37	0,8	1	3	69	5	143	0,32	0,05	0,020	0,005	0,19	0,97	0,10	0,06	1
Maximum	80	6,29	1,82	0,65	1,3	1	5	185	6	250	0,54	0,05	0,035	0,007	0,29	1,60	0,10	0,12	1
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	no	yes	no	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	31	0,06	0,21	0,12	0,2	0	1	49	1	47	0,09	0	0,007	0,001	0,04	0,26	0	0,03	0

Nausta

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
03.03.2005	5	6,13	2,32	0,33	1	1	4	145	<5	195	0,84	<,05	0,030	0,006	0,20	1,60	<0,1	0,11	1,5
02.06.2005	31	6,08	1,16	0,58	1,1	<1	4	36	<5	110	0,32	<,05	0,072	0,006	0,14	0,85	<0,1	0,05	2
05.08.2005	16	5,99	1,03	2,02	3,4	4	13	14	<5	230	0,33	0,06	0,200	0,009	0,31	1,50	<0,1	0,25	2
24.10.2005	9	6,35	1,38	0,69	1,5	1	5	135	<5	190	0,58	<,05	0,057	<,005	0,22	1,10	<0,1	0,14	<1
Lower avg.	15	6,14	1,47	0,91	1,8	2	7	83	0	181	0,52	0,02	0,090	0,005	0,22	1,26	0,00	0,14	1,38
Upper avg.	15	6,14	1,47	0,91	1,8	2	7	83	5	181	0,52	0,05	0,090	0,007	0,22	1,26	0,10	0,14	1,63
Minimum	5	5,99	1,03	0,33	1	1	4	14	5	110	0,32	0,05	0,030	0,005	0,14	0,85	0,10	0,05	1
Maximum	31	6,35	2,32	2,02	3,4	4	13	145	5	230	0,84	0,06	0,200	0,009	0,31	1,60	0,10	0,25	2
More than 70%>LOD	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	yes	yes	no	yes	yes
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	11	0,15	0,58	0,76	1,1	2	4	67	0	51	0,25	0,01	0,076	0,002	0,07	0,35	0	0,08	0,48

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Gloppenelva (Breimselva)

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
28.02.2005	7	6,59	1,96	0,23	0,8	<1	2	250	<5	300	0,73	<,05	<,005	<,005	0,25	0,94	<0,1	0,12	<1
03.05.2005	81	6,59	1,96	0,56	1	<1	3	240	7	305	0,69	0,05	0,032	<,005	0,41	0,89	<0,1	0,08	<1
08.09.2005	139	6,38	1,37	1,98	1	2	5	100	<5	180	0,54	<,05	0,058	<,005	0,28	0,70	<0,1	0,11	<1
05.11.2005	56	6,52	1,56	0,57	1	<1	4	175	<5	225	0,64	<,05	0,029	<,005	0,31	0,53	0,10	0,10	<1
Lower avg.	71	6,52	1,71	0,84	0,9	1	4	191	2	253	0,65	0,01	0,030	0,000	0,31	0,77	0,03	0,10	0
Upper avg.	71	6,52	1,71	0,84	0,9	1	4	191	6	253	0,65	0,05	0,031	0,005	0,31	0,77	0,10	0,10	1
Minimum	7	6,38	1,37	0,23	0,8	1	2	100	5	180	0,54	0,05	0,005	0,005	0,25	0,53	0,10	0,08	1
Maximum	139	6,59	1,96	1,98	1	2	5	250	7	305	0,73	0,05	0,058	0,005	0,41	0,94	0,10	0,12	1
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	no	yes	no	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	55	0,10	0,30	0,78	0,1	1	1	69	1	61	0,08	0	0,022	0	0,07	0,19	0	0,02	0

Driva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
25.02.2005	14	6,70	3,36	0,50	1,1	1	2	180	6	250	1,22	0,06	0,009	0,006	1,36	0,56	<0,1	0,15	1
12.05.2005	58	7,05	4,16	1,08	2,2	2	4	215	7	345	1,40	<,05	0,029	<,005	1,33	0,76	0,30	0,23	<1
29.08.2005	107	7,10	2,69	0,25	0,9	<1	3	70	9	117	1,13	0,10	0,076	<,005	0,56	0,82	0,20	0,14	<1
13.10.2005	39	7,10	3,05	0,45	0,9	<1	3	73	<5	141	0,63	0,05	<,005	<,005	0,45	0,10	<0,1	0,07	1
Lower avg.	55	6,99	3,32	0,57	1,3	1	3	135	6	213	1,10	0,05	0,029	0,002	0,93	0,56	0,13	0,15	0,5
Upper avg.	55	6,99	3,32	0,57	1,3	1	3	135	7	213	1,10	0,07	0,030	0,005	0,93	0,56	0,18	0,15	1
Minimum	14	6,70	2,69	0,25	0,9	1	2	70	5	117	0,63	0,05	0,005	0,005	0,45	0,10	0,10	0,07	1
Maximum	107	7,10	4,16	1,08	2,2	2	4	215	9	345	1,40	0,10	0,076	0,006	1,36	0,82	0,30	0,23	1
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	39	0,19	0,63	0,36	0,6	1	1	74	2	105	0,33	0,02	0,033	0,001	0,49	0,33	0,10	0,07	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Surna

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
15.02.2005	33	6,59	2,52	0,36	1,5	<1	2	82	7	155	0,79	<,05	0,010	<,005	0,35	0,47	<0,1	0,19	1
09.05.2005	63	6,81	3,29	0,99	2,5	<1	4	63	<5	175	0,67	<,05	0,020	<,005	0,59	0,48	0,20	0,40	2
01.08.2005	38	6,66	1,86	0,63	1,0	<1	3	28	<5	84	0,50	<,05	0,020	<,005	0,22	0,49	<0,1	0,34	1
17.10.2005	23	6,82	2,31	0,39	2	<1	3	93	<5	170	0,95	<,05	0,010	<,005	0,40	0,40	<0,1	0,22	<1
Lower avg.	40	6,72	2,50	0,59	1,7	0	3	67	2	146	0,73	0,00	0,015	0,000	0,39	0,46	0,05	0,29	1
Upper avg.	40	6,72	2,50	0,59	1,7	1	3	67	6	146	0,73	0,05	0,015	0,005	0,39	0,46	0,13	0,29	1,25
Minimum	23	6,59	1,86	0,36	1,0	1	2	28	5	84	0,50	0,05	0,010	0,005	0,22	0,40	0,10	0,19	1
Maximum	63	6,82	3,29	0,99	2,5	1	4	93	7	175	0,95	0,05	0,020	0,005	0,59	0,49	0,20	0,40	2
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	no	yes	no	yes	yes	no	yes	yes
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	17	0,11	0,60	0,29	0,7	0	1	29	1	42	0,19	0	0,006	0	0,16	0,04	0,05	0,10	0,5

Gaula

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
08.02.2005	95	7,14	12,30	14,80	3,3	5	8	350	24	545	2,27	0,20	0,215	<0,005	1,72	4,29	1,10	2,24	<1
24.05.2005	493	6,87	3,06	27,50	2,5	15	21	23	<5	129	1,36	0,10	0,222	0,010	1,91	4,50	1,20	1,97	1
11.08.2005	42	7,17	4,21	29,40	5,6	13	23	30	8	270	1,68	0,22	0,392	0,027	2,86	9,14	1,80	3,19	<1
01.12.2005	30	7,56	18,90	0,56	2,7	<1	4	390	5	545	1,94	0,20	0,051	0,010	1,44	3,64	0,50	0,97	<1
Lower avg.	165	7,19	9,62	18,07	3,5	8	14	198	9	372	1,81	0,18	0,220	0,012	1,98	5,39	1,15	2,09	0,25
Upper avg.	165	7,19	9,62	18,07	3,5	9	14	198	11	372	1,81	0,18	0,220	0,013	1,98	5,39	1,15	2,09	1
Minimum	30	6,87	3,06	0,56	2,5	1	4	23	5	129	1,36	0,10	0,051	0,005	1,44	3,64	0,50	0,97	1
Maximum	493	7,56	18,90	29,40	5,6	15	23	390	24	545	2,27	0,22	0,392	0,027	2,86	9,14	1,80	3,19	1
More than 70%>LOD	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	220	0,28	7,43	13,35	1,4	7	9	199	9	208	0,39	0,05	0,139	0,010	0,62	2,53	0,53	0,91	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Nidelva Trondheim

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
08.02.2005	85	6,93	3,57	1,93	2,6	1	3	110	9	210	0,88	0,07	0,036	<,005	0,73	1,40	0,20	0,76	<1
25.05.2005	354	6,98	3,17	1,54	2,7	1	4	85	<5	180	0,84	0,07	0,022	<,005	0,88	0,75	0,10	0,65	<1
11.08.2005	34	7,05	2,90	3,35	2,7	1	5	47	11	200	0,72	0,10	0,056	0,005	0,86	1,10	0,20	0,73	<1
01.12.2005	28	6,90	3,23	0,29	2,5	1	4	93	<5	205	0,84	0,10	0,094	0,010	1,02	5,61	0,30	0,69	<1
Lower avg.	125	6,97	3,22	1,78	2,6	1	4	84	5	199	0,82	0,09	0,052	0,004	0,87	2,22	0,20	0,71	0
Upper avg.	125	6,97	3,22	1,78	2,6	1	4	84	8	199	0,82	0,09	0,052	0,006	0,87	2,22	0,20	0,71	1
Minimum	28	6,90	2,90	0,29	2,5	1	3	47	5	180	0,72	0,07	0,022	0,005	0,73	0,75	0,10	0,65	1
Maximum	354	7,05	3,57	3,35	2,7	1	5	110	11	210	0,88	0,10	0,094	0,010	1,02	5,61	0,30	0,76	1
More than 70%>LOD	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	no	yes	yes	yes	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	155	0,07	0,28	1,26	0,1	0	1	27	3	13	0,07	0,02	0,031	0,003	0,12	2,28	0,08	0,05	0

Stjørdalselva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
08.02.2005	65	6,87	4,40	1,82	3	1	3	145	12	260	0,77	0,06	0,031	<,005	1,21	3	0,10	0,46	<1
25.05.2005	269	6,65	1,84	5,55	2,3	3	6	28	<5	140	0,45	0,07	0,100	0,009	1,92	3,97	0,20	0,56	<1
11.08.2005	23	6,82	2,52	12,70	8,2	6	14	22	6	270	0,61	0,20	0,246	0,010	2,54	5,62	0,50	1,17	<1
01.12.2005	26	7,02	3,78	1,28	2,7	<1	4	145	9	255	0,65	0,10	0,075	0,010	0,95	7,81	0,30	0,36	<1
Lower avg.	96	6,84	3,14	5,34	4,1	3	7	85	7	231	0,62	0,11	0,113	0,007	1,66	5,10	0,28	0,64	0
Upper avg.	96	6,84	3,14	5,34	4,1	3	7	85	8	231	0,62	0,11	0,113	0,009	1,66	5,10	0,28	0,64	1
Minimum	23	6,65	1,84	1,28	2,3	1	3	22	5	140	0,45	0,06	0,031	0,005	0,95	3	0,10	0,36	1
Maximum	269	7,02	4,40	12,70	8,2	6	14	145	12	270	0,77	0,20	0,246	0,010	2,54	7,81	0,50	1,17	1
More than 70%>LOD	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	117	0,15	1,16	5,26	2,8	2	5	69	3	61	0,13	0,06	0,093	0,002	0,72	2,11	0,17	0,36	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Verdalselva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
08.02.2005	39	7,18	11,30	1,31	3,3	2	4	670	8	800	1,36	0,10	0,036	<,005	0,79	1,10	0,10	0,51	<1
25.05.2005	229	6,78	2,25	11,20	2,6	7	10	32	<5	117	0,55	0,10	0,190	<,005	1,27	1,70	0,50	0,72	<1
11.08.2005	19	7,07	3,44	5,33	7,1	2	10	47	<5	300	0,60	0,24	0,180	0,007	0,95	1,30	0,30	0,79	<1
01.12.2005	22	7,28	5,60	0,90	3,4	<1	4	200	6	315	0,95	0,10	0,043	<,005	0,61	1,10	0,30	0,50	<1
Lower avg.	77	7,08	5,65	4,69	4,1	3	7	237	4	383	0,86	0,14	0,112	0,002	0,91	1,30	0,30	0,63	0
Upper avg.	77	7,08	5,65	4,69	4,1	3	7	237	6	383	0,86	0,14	0,112	0,006	0,91	1,30	0,30	0,63	1
Minimum	19	6,78	2,25	0,90	2,6	1	4	32	5	117	0,55	0,10	0,036	0,005	0,61	1,10	0,10	0,50	1
Maximum	229	7,28	11,30	11,20	7,1	7	10	670	8	800	1,36	0,24	0,190	0,007	1,27	1,70	0,50	0,79	1
More than 70%>LOD	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	no	yes	yes	yes	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	101	0,22	4,02	4,78	2,0	3	3	298	1	292	0,37	0,07	0,084	0,001	0,28	0,28	0,16	0,15	0

Snåsavassdraget

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
08.02.2005	33	6,98	5,46	1,73	3,8	2	5	220	7	365	0,73	0,08	0,069	<,005	0,67	2,12	0,20	0,46	<1
25.05.2005	125	7,04	4,46	0,89	3,8	1	5	155	<5	270	0,60	0,07	0,037	<,005	0,89	0,79	<0,1	0,38	<1
11.08.2005	11	7,21	4,41	0,92	3,7	<1	4	91	7	225	0,46	0,07	0,029	<,005	0,49	0,83	0,10	0,37	1,5
01.12.2005	17	7,04	5,07	1,05	4,2	1	5	200	<5	325	0,67	0,10	0,039	<,005	0,50	0,64	0,40	0,12	<1
Lower avg.	46	7,07	4,85	1,15	3,9	1	5	167	4	296	0,61	0,08	0,044	0,000	0,64	1,10	0,18	0,33	0,38
Upper avg.	46	7,07	4,85	1,15	3,9	1	5	167	6	296	0,61	0,08	0,044	0,005	0,64	1,10	0,20	0,33	1,13
Minimum	11	6,98	4,41	0,89	3,7	1	4	91	5	225	0,46	0,07	0,029	0,005	0,49	0,64	0,10	0,12	1
Maximum	125	7,21	5,46	1,73	4,2	2	5	220	7	365	0,73	0,10	0,069	0,005	0,89	2,12	0,40	0,46	1,5
More than 70%>LOD	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	no	yes	yes	yes	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	53	0,10	0,51	0,39	0,2	1	1	57	1	61	0,12	0,01	0,018	0	0,19	0,69	0,14	0,15	0,25

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Namsen

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
08.02.2005	22	6,72	5,62	1,51	2,7	2	3	165	10	270	1,13	0,10	0,160	<,005	0,99	3,18	0,40	0,95	<1
25.05.2005	191	6,63	2,55	13,40	2,5	8	12	35	<5	114	0,65	0,09	0,204	0,008	0,97	2,21	0,30	0,58	<1
11.08.2005	23	7,08	2,90	1,17	1,7	<1	5	32	7	123	0,35	0,10	0,055	0,063	0,91	2,30	<0,1	0,25	<1
01.12.2005	23	6,96	3,59	1,03	2,5	<1	4	115	<5	210	0,65	0,09	0,044	0,005	0,67	3,37	0,40	0,08	<1
Lower avg.	65	6,85	3,67	4,28	2,4	3	6	87	4	179	0,70	0,10	0,116	0,019	0,88	2,77	0,28	0,47	0
Upper avg.	65	6,85	3,67	4,28	2,4	3	6	87	7	179	0,70	0,10	0,116	0,020	0,88	2,77	0,30	0,46	1
Minimum	22	6,63	2,55	1,03	1,7	1	3	32	5	114	0,35	0,09	0,044	0,005	0,67	2,21	0,10	0,08	1
Maximum	191	7,08	5,62	13,40	2,7	8	12	165	10	270	1,13	0,10	0,204	0,063	0,99	3,37	0,40	0,95	1
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	84	0,21	1,37	6,09	0,4	3	4	65	2	74	0,32	0,01	0,079	0,029	0,15	0,60	0,14	0,38	0

Røssåga

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
06.02.2005	52	7,07	4,23	0,22	0,8	<1	1	69	8	125	0,37	0,08	0,020	<,005	0,37	5,91	<0,1	0,40	1
24.05.2005	202	7,30	4,94	0,29	1,1	<1	3	55	<5	122	0,39	0,07	0,062	0,009	0,37	7,29	<0,1	0,31	<1
15.08.2005	199	7,39	3,82	0,38	0,8	<1	3	21	6	81	0,28	0,10	0,120	0,006	0,31	5,45	<0,1	0,72	<1
17.10.2005	81	7,37	4,14	0,71	1,0	<1	3	52	<5	93	0,57	0,09	0,070	0,008	0,35	5,47	<0,1	0,43	<1
Lower avg.	134	7,28	4,28	0,40	0,9	0	3	49	4	105	0,40	0,09	0,068	0,006	0,35	6,03	0,00	0,47	0,25
Upper avg.	134	7,28	4,28	0,40	0,9	1	3	49	6	105	0,40	0,09	0,068	0,007	0,35	6,03	0,10	0,46	1
Minimum	52	7,07	3,82	0,22	0,8	1	1	21	5	81	0,28	0,07	0,020	0,005	0,31	5,45	0,10	0,31	1
Maximum	202	7,39	4,94	0,71	1,1	1	3	69	8	125	0,57	0,10	0,120	0,009	0,37	7,29	0,10	0,72	1
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	78	0,15	0,47	0,22	0,2	0	1	20	1	22	0,12	0,01	0,041	0,002	0,03	0,87	0	0,18	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Ranaelva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
06.02.2005	66	7,21	5,67	0,20	1	<1	1	73	8	134	0,60	0,07	0,020	<,005	0,34	0,68	<0,1	0,20	<1
24.05.2005	417	7,38	6,91	0,90	1,5	2	4	82	<5	210	0,63	0,09	0,092	<,005	0,44	1,60	0,10	0,22	1
15.08.2005	503	7,40	3,79	0,38	0,7	<1	3	17	9	430	0,46	0,10	0,034	<,005	0,31	0,98	0,20	2,34	<1
17.10.2005	142	7,49	5,04	0,57	1,0	<1	3	54	<5	102	0,58	0,07	0,010	0,006	0,36	0,48	<0,1	0,26	<1
Lower avg.	282	7,37	5,35	0,51	1,0	1	3	57	4	219	0,57	0,08	0,039	0,002	0,36	0,94	0,08	0,76	0,25
Upper avg.	282	7,37	5,35	0,51	1,0	1	3	57	7	219	0,57	0,08	0,039	0,005	0,36	0,94	0,13	0,75	1
Minimum	66	7,21	3,79	0,20	0,7	1	1	17	5	102	0,46	0,07	0,010	0,005	0,31	0,48	0,10	0,20	1
Maximum	503	7,49	6,91	0,90	1,5	2	4	82	9	430	0,63	0,10	0,092	0,006	0,44	1,60	0,20	2,34	1
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	yes	yes	no	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	211	0,12	1,30	0,30	0,4	1	1	29	2	148	0,07	0,02	0,037	0,001	0,06	0,49	0,05	1,06	0

Beiarelva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
04.04.2005	70	7	7,89	9,52	2,4	5	11	66	<5	205	1,81	0,20	0,190	0,005	1,12	4,53	0,80	1,55	2,5
10.05.2005	60	7,40	7,34	1,13	1,7	<1	3	27	<5	99	1,10	<,05	0,020	<,005	0,39	0,62	0,20	0,49	<1
08.08.2005	65	7,11	2,59	16	0,5	5	8	6	<5	57	0,84	0,21	0,160	<,005	0,64	1,50	0,40	0,65	1
12.11.2005	50	7,28	5,60	0,75	2,9	<1	4	65	<5	141	1,47	<,05	0,031	<,005	0,54	0,84	0,30	0,60	1,5
Lower avg.	61	7,20	5,86	6,85	1,9	3	7	41	0	126	1,31	0,10	0,100	0,001	0,67	1,87	0,43	0,82	1,25
Upper avg.	61	7,20	5,86	6,85	1,9	3	7	41	5	126	1,31	0,13	0,100	0,005	0,67	1,87	0,43	0,82	1,5
Minimum	50	7	2,59	0,75	0,5	1	3	6	5	57	0,84	0,05	0,020	0,005	0,39	0,62	0,20	0,49	1
Maximum	70	7,40	7,89	16	2,9	5	11	66	5	205	1,81	0,21	0,190	0,005	1,12	4,53	0,80	1,55	2,5
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	no	yes	no	yes	yes	yes	yes	yes
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	9	0,18	2,39	7,32	1,1	2	4	30	0	63	0,42	0,09	0,087	0	0,32	1,81	0,26	0,49	0,71

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Barduelva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
08.02.2005	11	7,70	10,80	1,04	1,2	<1	2	74	10	170	1,36	<,05	0,010	<,005	0,37	0,93	0,10	0,11	<1
08.05.2005	113	7,75	9,97	1,07	2,2	<1	5	79	7	195	1,20	<,05	0,077	<,005	0,72	0,70	0,40	0,27	<1
01.08.2005	104	7,86	8,76	1,32	0,8	1	3	29	<5	86	0,78	0,10	0,031	<,005	0,38	0,28	<0,1	0,37	<1
09.10.2005	153	7,72	9,32	1,39	1,5	<1	4	54	<5	114	1,06	<,05	0,023	<,005	0,45	0,34	<0,1	0,36	<1
Lower avg.	95	7,76	9,71	1,21	1,4	0	4	59	4	141	1,10	0,03	0,035	0,000	0,48	0,56	0,13	0,28	0
Upper avg.	95	7,76	9,71	1,21	1,4	1	4	59	7	141	1,10	0,06	0,035	0,005	0,48	0,56	0,18	0,28	1
Minimum	11	7,70	8,76	1,04	0,8	1	2	29	5	86	0,78	0,05	0,010	0,005	0,37	0,28	0,10	0,11	1
Maximum	153	7,86	10,80	1,39	2,2	1	5	79	10	195	1,36	0,10	0,077	0,005	0,72	0,93	0,40	0,37	1
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	no	yes	no	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	60	0,07	0,88	0,18	0,6	0	1	23	2	50	0,25	0,03	0,029	0	0,17	0,31	0,15	0,12	0

Målselv

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
08.02.2005	12	7,52	9,17	0,17	0,9	<1	<1	88	6	155	1,34	<,05	<,005	<,005	0,33	0,22	<0,1	0,17	<1
08.05.2005	125	7,56	8,60	0,63	2,5	<1	3	78	7	195	1,27	<,05	0,024	<,005	0,63	0,37	0,20	0,22	1
01.08.2005	114	7,64	6,97	0,61	0,8	<1	2	18	<5	74	0,85	0,20	0,010	<,005	0,33	0,22	<0,1	1,40	<1
09.10.2005	169	7,55	7,91	2,06	1,0	<1	2	39	<5	95	1,07	<,05	0,005	<,005	0,35	0,25	<0,1	0,21	<1
Lower avg.	105	7,57	8,16	0,87	1,3	0	2	56	3	130	1,13	0,05	0,010	0,000	0,41	0,27	0,05	0,50	0,25
Upper avg.	105	7,57	8,16	0,87	1,3	1	2	56	6	130	1,13	0,09	0,011	0,005	0,41	0,27	0,13	0,50	1
Minimum	12	7,52	6,97	0,17	0,8	1	1	18	5	74	0,85	0,05	0,005	0,005	0,33	0,22	0,10	0,17	1
Maximum	169	7,64	9,17	2,06	2,5	1	3	88	7	195	1,34	0,20	0,024	0,005	0,63	0,37	0,20	1,40	1
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	no	yes	no	yes	yes	no	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	66	0,05	0,95	0,82	0,8	0	1	33	1	55	0,22	0,08	0,009	0	0,15	0,07	0,05	0,60	0

TABLE 1. Rawdata and summary statistics for the 10 main and 36 tributary rivers in Norway in 2005

Tanaelva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
19.02.2005	14	6,96	7,33	0,69	1,8	3	7	77	23	225	4,85	0,10	0,492	0,081	1,35	2,39	0,30	0,27	<1
09.05.2005	22	7,22	6,70	1,86	1,7	1	8	18	13	235	3,72	0,08	0,666	0,049	1,70	4,11	0,40	0,40	2,5
03.08.2005	243	7,21	3,80	0,76	3,7	<1	5	1	<5	147	2,57	0,06	0,020	<,005	0,47	0,37	0,20	0,36	<1
10.10.2005	124	7,34	4,37	1,17	3,1	1	5	10	9	141	3,14	0,08	0,021	<,005	0,45	0,40	<0,1	0,28	<1
Lower avg.	101	7,18	5,55	1,12	2,6	1	6	27	11	187	3,57	0,08	0,300	0,033	0,99	1,82	0,23	0,33	0,63
Upper avg.	101	7,18	5,55	1,12	2,6	2	6	27	13	187	3,57	0,08	0,300	0,035	0,99	1,82	0,25	0,33	1,38
Minimum	14	6,96	3,80	0,69	1,7	1	5	1	5	141	2,57	0,06	0,020	0,005	0,45	0,37	0,10	0,27	1
Maximum	243	7,34	7,33	1,86	3,7	3	8	77	23	235	4,85	0,10	0,666	0,081	1,70	4,11	0,40	0,40	2,5
More than 70%>LOD	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	107	0,16	1,73	0,54	1,0	1	2	34	8	50	0,97	0,02	0,330	0,037	0,63	1,80	0,13	0,06	0,75

Pasvikelva

Date	Q	pH	Cond	SPM	TOC	PO4_P	Tot_P	NO3_N	NH4_N	Tot_N	Si	As	Pb	Cd	Cu	Zn	Cr	Ni	Hg
DD.MM.YY	[m3/s]		[mS/m]	[mg/l]	[mg/l C]	[µg/l P]	[µg/l P]	[µg/l N]	[µg/l N]	[µg/l N]	[mg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]
19.02.2005	28	6,89	3,41	0,64	2,9	<1	3	52	<5	190	2,52	0,10	0,042	0,006	1,26	1,70	0,10	1,08	<1
09.05.2005	23	6,90	3,57	1,94	3,2	12	25	37	7	255	2,37	0,41	0,382	0,025	10,80	5,41	0,40	9,80	2,5
02.08.2005	174	7,04	3,54	1,04	4,6	1	8	<1	14	233	1,72	0,20	0,045	0,010	2,56	0,79	0,10	8,20	<1
10.10.2005	80	7,16	3,34	1,68	3,5	<1	7	8	12	170	1,99	0,10	0,029	0,007	1,31	1,10	<0,1	4,65	<1
Lower avg.	76	7,00	3,47	1,33	3,6	3	11	24	8	212	2,15	0,20	0,125	0,012	3,98	2,25	0,15	5,93	0,63
Upper avg.	76	7,00	3,47	1,33	3,6	4	11	25	10	212	2,15	0,20	0,125	0,012	3,98	2,25	0,18	5,93	1,38
Minimum	23	6,89	3,34	0,64	2,9	1	3	1	5	170	1,72	0,10	0,029	0,006	1,26	0,79	0,10	1,08	1
Maximum	174	7,16	3,57	1,94	4,6	12	25	52	14	255	2,52	0,41	0,382	0,025	10,80	5,41	0,40	9,80	2,5
More than 70%>LOD	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Info																			
St.dev	70	0,13	0,11	0,59	0,7	6	10	24	4	39	0,36	0,15	0,172	0,009	4,58	2,14	0,15	3,89	0,75

Part B

Table 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities --->												
	Estimate	Flow rate (1000 m3/d)	Cd [tonnes]	Hg [kg]	Cu [tonnes]	Pb [tonnes]	Zn [tonnes]	g-HCH [kg]	PCBs [kg]	NH4-N [tonnes]	NO3-N [tonnes]	PO4-P [tonnes]	Total N [tonnes]	Total P [tonnes]	SPM [10^3 ton]
RIVERINE INPUTS: MAIN RIVERS (10)															
Glomma ved Sarpsfoss	lower avg.	61 414	0,29	13,38	48,62	6,34	81,49	1,63	0,00	392,02	7671,73	191,91	11990,81	421,18	223,77
	upper avg.	61 414	0,29	26,36	48,62	6,34	81,49	4,46	23,90	392,02	7671,73	191,91	11990,81	421,18	223,77
Drammenselva	lower avg.	23 373	0,10	2,23	7,36	2,15	29,38	0,96	0,00	98,19	2102,23	9,10	3501,87	49,82	13,39
	upper avg.	23 373	0,10	8,53	7,36	2,15	29,38	1,73	8,54	98,19	2102,23	13,23	3501,87	49,82	13,39
Numedalslågen	lower avg.	8 786	0,06	2,21	2,12	0,76	17,42	0,11	0,00	69,30	826,17	11,17	1373,25	32,32	12,97
	upper avg.	8 786	0,06	4,06	2,12	0,76	17,42	0,58	3,30	69,30	826,17	11,37	1373,25	32,32	12,97
Skienselva	lower avg.	24 657	0,08	2,67	4,38	0,68	22,10	2,56	0,00	100,66	1612,92	6,78	2460,50	35,40	9,72
	upper avg.	24 657	0,08	9,41	4,38	0,68	22,10	2,56	9,25	100,66	1612,92	10,64	2460,50	35,40	9,72
Otra	lower avg.	11 788	0,10	1,16	3,01	1,25	18,69	0,26	0,00	62,36	465,25	1,46	1047,71	16,40	4,91
	upper avg.	11 788	0,10	4,54	3,01	1,25	18,69	0,72	3,82	62,36	465,25	4,29	1047,71	16,40	4,91
Orreelva	lower avg.	424	0,01	0,13	0,42	0,31	2,04	0,00	0,00	4,74	133,73	11,29	296,75	17,40	6,45
	upper avg.	424	0,01	0,19	0,42	0,31	2,04	0,03	0,15	4,98	133,73	11,29	296,75	17,40	6,45
Suldalslågen.	lower avg.	12 598	0,08	5,85	4,18	2,76	19,21	0,04	0,00	18,32	682,52	25,22	1153,04	53,71	33,65
	upper avg.	12 598	0,08	8,71	4,18	2,76	19,21	1,38	7,24	30,63	682,52	26,66	1153,04	53,71	33,65
Orkla.	lower avg.	8 123	0,15	2,49	27,29	0,17	55,14	0,00	0,00	19,95	418,69	4,06	806,71	15,49	7,52
	upper avg.	8 123	0,15	3,94	27,29	0,18	55,14	0,50	2,96	21,69	418,69	5,52	806,71	15,49	7,52
Vefsna.	lower avg.	18 334	0,00	1,36	2,22	0,36	47,87	0,00	0,00	9,48	281,16	1,78	712,92	18,77	11,93
	upper avg.	18 334	0,03	6,92	2,22	0,36	47,87	1,25	7,50	35,10	281,16	7,15	712,92	19,16	11,93
Altaelva.	lower avg.	11 443	0,00	4,15	3,30	0,26	2,67	0,00	0,00	21,76	97,86	9,97	799,68	48,78	23,76
	upper avg.	11 443	0,02	7,70	3,30	0,27	2,67	0,79	4,70	29,55	97,86	11,88	799,68	48,78	23,76
RIVERINE INPUTS: TRIBUTARY RIVERS (36)															
Tista utløp Femsjøen	lower avg.	1 553	0,01	0,18	1,05	0,17	3,08			2,53	337,92	2,04	489,28	6,00	2,14
	upper avg.	1 553	0,01	0,63	1,05	0,17	3,08			3,30	337,92	2,04	489,28	6,00	2,14
Tokkeelva.	lower avg.	1 822	0,02	0,00	0,43	0,11	4,11			0,00	72,80	0,51	235,45	7,43	2,21
	upper avg.	1 822	0,02	0,67	0,43	0,11	4,11			3,33	72,80	1,01	235,45	7,43	2,21

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities --->												
	Estimate	Flow rate (1000 m3/d)	Cd [tonnes]	Hg [kg]	Cu [tonnes]	Pb [tonnes]	Zn [tonnes]	g-HCH [kg]	PCBs [kg]	NH4-N [tonnes]	NO3-N [tonnes]	PO4-P [tonnes]	Total N [tonnes]	Total P [tonnes]	SPM [10^3 ton]
Nidelva	lower avg.	8 802	0,07	0,68	2,61	0,47	12,37			30,33	465,99	2,05	924,56	11,98	4,31
	upper avg.	8 802	0,07	3,44	2,61	0,47	12,37			30,33	465,99	4,10	924,56	11,98	4,31
Tovdalselva	lower avg.	4 486	0,05	0,43	0,75	0,49	8,85			37,10	205,32	0,00	725,98	5,80	2,24
	upper avg.	4 486	0,05	1,64	0,75	0,49	8,85			37,10	205,32	1,64	725,98	5,80	2,24
Mandalselva	lower avg.	7 322	0,06	0,97	1,35	0,96	12,64			31,12	316,14	0,00	682,01	11,66	3,29
	upper avg.	7 322	0,06	2,67	1,35	0,96	12,64			31,12	316,14	2,67	682,01	11,66	3,29
Lyngdalselva	lower avg.	2 810	0,03	0,49	0,32	0,33	4,64			5,36	202,09	0,55	337,19	7,14	0,79
	upper avg.	2 810	0,03	1,19	0,32	0,33	4,64			8,09	202,09	1,03	337,19	7,14	0,79
Kvina	lower avg.	7 152	0,07	1,14	3,92	0,90	12,15			27,42	377,96	0,43	746,95	13,55	2,25
	upper avg.	7 152	0,07	2,99	3,92	0,90	12,15			29,59	377,96	2,61	746,95	13,55	2,25
Sira	lower avg.	14 548	0,05	2,38	3,40	1,51	17,52			76,70	518,96	0,00	988,45	19,71	3,68
	upper avg.	14 548	0,05	5,70	3,40	1,51	17,52			76,70	518,96	5,31	988,45	19,71	3,68
Bjerkreimselva	lower avg.	4 835	0,04	0,26	0,37	0,37	6,34			21,53	591,37	2,61	749,56	7,15	1,08
	upper avg.	4 835	0,04	1,76	0,37	0,37	6,34			22,45	591,37	2,94	749,56	7,15	1,08
Figgjoelva	lower avg.	655	0,00	0,16	0,21	0,07	1,11			5,11	197,99	2,20	266,75	4,18	0,38
	upper avg.	655	0,00	0,24	0,21	0,07	1,11			5,11	197,99	2,20	266,75	4,18	0,38
Lyseelva	lower avg.	1 752	0,00	0,00	0,13	0,07	0,87			0,83	54,84	0,00	91,16	1,04	0,17
	upper avg.	1 752	0,00	0,64	0,13	0,07	0,87			3,44	54,84	0,64	91,16	1,16	0,17
Storåna. (Årdalselva.)	lower avg.	5 139	0,01	1,38	0,73	0,23	3,53			0,00	1886,64	1,62	1948,90	6,49	1,20
	upper avg.	5 139	0,01	2,19	0,73	0,23	3,53			9,38	1886,64	2,50	1948,90	6,49	1,20
Ulladalsåna. (Ulla.)	lower avg.	3 889	0,01	0,00	0,29	0,17	1,92			0,00	118,15	0,00	224,96	3,00	0,72
	upper avg.	3 889	0,01	1,42	0,29	0,17	1,92			7,10	118,15	1,42	224,96	3,32	0,75
Storelva	lower avg.	3 981	0,01	0,50	0,38	0,21	3,10			3,70	217,33	0,86	317,18	5,23	0,81
	upper avg.	3 981	0,01	1,75	0,38	0,21	3,10			9,88	217,33	1,67	317,18	5,23	0,81
Vikedalselva	lower avg.	1 111	0,01	0,27	0,26	0,13	1,20			3,64	96,62	0,84	141,07	2,95	1,25
	upper avg.	1 111	0,01	0,57	0,26	0,13	1,20			4,56	96,62	0,99	141,07	2,95	1,25

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities --->												
	Estimate	Flow rate (1000 m3/d)	Cd [tonnes]	Hg [kg]	Cu [tonnes]	Pb [tonnes]	Zn [tonnes]	g-HCH [kg]	PCBs [kg]	NH4-N [tonnes]	NO3-N [tonnes]	PO4-P [tonnes]	Total N [tonnes]	Total P [tonnes]	SPM [10^3 ton]
Vosso.Bolstadelvi.	lower avg.	13 395	0,02	0,00	2,33	0,31	5,05			41,75	1120,87	0,00	1456,62	19,18	3,16
	upper avg.	13 395	0,03	4,89	2,33	0,31	5,05			41,75	1120,87	4,89	1456,62	19,18	3,16
Jostedøla	lower avg.	5 800	0,00	3,41	3,92	1,30	16,59			13,37	106,46	82,77	217,41	90,36	143,03
	upper avg.	5 800	0,01	3,67	3,92	1,30	16,59			13,37	106,46	83,11	217,41	90,36	143,03
Gaula	lower avg.	6 476	0,00	0,27	0,47	0,10	2,48			9,48	189,32	0,18	368,50	10,27	2,87
	upper avg.	6 476	0,01	2,45	0,47	0,10	2,48			15,37	189,32	2,36	368,50	10,27	2,87
Jølstra	lower avg.	6 900	0,00	0,80	0,57	0,08	3,03			4,82	275,94	0,53	471,54	11,04	1,47
	upper avg.	6 900	0,01	2,52	0,57	0,08	3,03			13,40	275,94	2,52	471,54	11,04	1,47
Nausta	lower avg.	2 657	0,01	1,62	0,20	0,10	1,09			0,00	51,65	1,26	155,78	6,36	0,93
	upper avg.	2 657	0,01	1,76	0,20	0,10	1,09			4,85	51,65	1,75	155,78	6,36	0,93
Gloppenelva.(Breimselva.)	lower avg.	5 239	0,00	0,00	0,62	0,08	1,39			3,82	303,30	1,88	435,33	7,94	2,39
	upper avg.	5 239	0,01	1,91	0,62	0,08	1,39			10,65	303,30	2,85	435,33	7,94	2,39
Driva.	lower avg.	8 974	0,00	0,79	2,61	0,15	2,16			21,87	381,17	1,96	624,65	10,48	1,71
	upper avg.	8 974	0,02	3,28	2,61	0,15	2,16			24,77	381,17	4,15	624,65	10,48	1,71
Surna.	lower avg.	5 133	0,00	2,35	0,79	0,03	0,88			2,78	118,13	0,00	277,70	5,98	1,28
	upper avg.	5 133	0,01	2,63	0,79	0,03	0,88			10,16	118,13	1,87	277,70	5,98	1,28
Gaula.	lower avg.	9 506	0,03	2,69	6,46	0,76	15,97			13,97	303,24	43,02	748,07	62,69	82,19
	upper avg.	9 506	0,04	3,53	6,46	0,76	15,97			27,10	303,24	43,17	748,07	62,69	82,19
Nidelva.	lower avg.	8 788	0,00	0,00	2,75	0,10	3,69			7,32	279,35	3,21	602,54	12,51	5,33
	upper avg.	8 788	0,02	3,21	2,75	0,10	3,69			19,54	279,35	3,21	602,54	12,51	5,33
Stjørdalselva.	lower avg.	6 658	0,02	0,00	4,31	0,23	10,12			7,29	134,48	6,42	427,50	14,19	12,30
	upper avg.	6 658	0,02	2,43	4,31	0,23	10,12			15,83	134,48	6,58	427,50	14,19	12,30
Verdalselva.	lower avg.	4 921	0,00	0,00	2,05	0,29	2,79			2,60	226,13	9,97	411,70	15,81	15,87
	upper avg.	4 921	0,01	1,80	2,05	0,29	2,79			9,79	226,13	10,10	411,70	15,81	15,87
Snåsavassdraget.	lower avg.	2 897	0,00	0,10	0,84	0,04	1,07			1,75	176,27	1,18	305,66	5,22	1,12
	upper avg.	2 897	0,01	1,09	0,84	0,04	1,07			5,79	176,27	1,24	305,66	5,22	1,12

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities -→												
	Estimate	Flow rate (1000 m3/d)	Cd [tonnes]	Hg [kg]	Cu [tonnes]	Pb [tonnes]	Zn [tonnes]	g-HCH [kg]	PCBs [kg]	NH4-N [tonnes]	NO3-N [tonnes]	PO4-P [tonnes]	Total N [tonnes]	Total P [tonnes]	SPM [10^3 ton]
Namsen.	lower avg.	4 701	0,02	0,00	1,61	0,30	4,12			2,52	90,66	10,39	234,28	16,98	17,48
	upper avg.	4 701	0,02	1,72	1,61	0,30	4,12			9,61	90,66	10,70	234,28	16,98	17,48
Røssåga.	lower avg.	11 494	0,03	0,41	1,45	0,34	25,99			12,62	181,38	0,00	430,44	11,78	1,60
	upper avg.	11 494	0,03	4,20	1,45	0,34	25,99			23,76	181,38	4,20	430,44	11,78	1,60
Ranaelva.	lower avg.	23 735	0,01	3,20	3,18	0,45	9,78			38,86	424,05	6,40	2513,91	28,18	5,07
	upper avg.	23 735	0,04	8,66	3,18	0,45	9,78			60,30	424,05	11,87	2513,91	28,18	5,07
Beiarelva.	lower avg.	5 417	0,00	2,55	1,38	0,21	4,00			0,00	79,75	5,47	250,72	13,50	14,66
	upper avg.	5 417	0,01	3,03	1,38	0,21	4,00			9,89	79,75	6,35	250,72	13,50	14,66
Barduelva.	lower avg.	9 789	0,00	0,00	1,82	0,15	1,60			8,47	197,26	0,97	471,90	14,17	4,52
	lower avg.	9 789	0,02	3,57	1,82	0,15	1,60			20,51	197,26	3,57	471,90	14,17	4,52
Målselv .	upper avg.	10 779	0,00	1,17	1,67	0,05	1,09			8,87	182,15	0,00	475,05	8,81	4,67
	upper avg.	10 779	0,02	3,93	1,67	0,05	1,09			22,12	182,15	3,93	475,05	8,92	4,67
Tanaelva.	lower avg.	20 283	0,04	1,00	4,14	0,53	4,84			31,82	54,90	3,48	1130,52	38,75	6,98
	upper avg.	20 283	0,07	8,00	4,14	0,53	4,84			54,11	54,90	7,93	1130,52	38,75	6,98
Pasvikelva.	lower avg.	16 508	0,07	1,53	19,47	0,47	8,28			69,42	62,19	11,98	1384,64	54,78	6,51
	upper avg.	16 508	0,07	6,94	19,47	0,47	8,28			73,23	66,84	12,75	1384,64	54,78	6,51
RIVERINE INPUTS: TRIBUTARY RIVERS (109)															
Mosselva	upper avg.	576	0,00	0,57	0,26	0,05	0,24			14,05	103,40	0,87	223,70	6,87	1,14
Hølenelva	upper avg.	90	0,00	0,13	0,08	0,01	0,09			3,71	113,90	1,47	138,97	2,64	0,37
Gjersjøelva.	upper avg.	65	0,00	0,13	0,04	0,00	0,02			0,59	26,54	0,06	36,65	0,51	0,06
Årungelva	upper avg.	38	0,00	0,10	0,03	0,00	0,01			0,57	26,75	0,15	40,04	0,71	0,10
Ljanselva	upper avg.	49	0,00	0,07	0,04	0,00	0,06			2,25	15,14	0,59	28,09	1,21	0,21
Loelva	upper avg.	82	0,00	0,21	0,23	0,08	0,68			6,08	37,80	1,62	64,02	4,84	0,88
Frognerelva	upper avg.	24	0,00	0,04	0,05	0,00	0,05			0,69	8,58	0,36	13,90	0,66	0,06
Akerselva	upper avg.	267	0,00	0,38	0,16	0,07	0,58			3,88	26,06	0,56	54,56	2,37	0,31
Lysakerelva	upper avg.	254	0,00	0,25	0,07	0,01	0,15			2,26	28,44	0,49	52,58	1,94	0,52

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities --->												
	Estimate	Flow rate (1000 m3/d)	Cd [tonnes]	Hg [kg]	Cu [tonnes]	Pb [tonnes]	Zn [tonnes]	g-HCH [kg]	PCBs [kg]	NH4-N [tonnes]	NO3-N [tonnes]	PO4-P [tonnes]	Total N [tonnes]	Total P [tonnes]	SPM [10^3 ton]
Sandvikselva	upper avg.	184	0,00	0,23	0,09	0,02	0,10			2,53	53,66	0,55	78,23	1,47	0,25
Åroselva	upper avg.	94	0,00	0,16	0,08	0,02	0,16			2,60	42,97	0,41	62,03	1,48	0,47
Lierelva	upper avg.	272	0,00	0,39	0,23	0,09	0,78			3,30	99,36	2,20	128,04	6,40	3,63
Sandeelva	upper avg.	185	0,01	0,49	0,68	0,03	0,84			4,93	64,07	0,64	97,01	2,27	0,66
Aulielva	upper avg.	424	0,00	1,35	1,15	0,04	0,32			27,55	261,08	4,22	398,13	10,32	3,07
Farriselva-Siljanvassdraget.	upper avg.	1 162	0,01	1,40	0,18	0,02	3,08			5,64	162,67	0,91	242,56	3,01	0,36
Gjerstadelva	upper avg.	704	0,01	0,73	0,16	0,09	1,35			8,92	52,91	0,40	104,79	2,95	0,32
Vegårdselva.	upper avg.	730	0,01	1,58	0,15	0,07	1,35			8,04	46,22	0,51	100,21	1,87	0,39
Søgneelva-Songdalselva.	upper avg.	781	0,02	0,99	0,17	0,12	1,80			8,70	164,55	0,66	211,00	3,43	0,45
Audnedalselva	upper avg.	1 453	0,03	1,99	0,17	0,24	3,35			13,70	160,54	0,70	253,27	4,29	0,73
Soknedalselva	upper avg.	2 277	0,03	2,35	0,45	0,25	3,84			17,84	218,53	1,90	312,94	10,61	0,85
Hellelandselva	upper avg.	1 648	0,02	2,84	0,25	0,26	2,38			7,75	192,73	1,46	275,94	6,77	0,56
Håelva	upper avg.	480	0,00	0,77	0,16	0,04	1,04			11,22	196,54	3,69	301,91	8,40	0,47
Imselva	upper avg.	461	0,00	0,41	0,10	0,02	0,36			3,16	93,91	0,22	131,71	1,64	0,21
Oltedalselva,utløp Ragsvatnet.	upper avg.	1 004	0,01	0,92	0,15	0,11	1,14			7,66	104,83	0,90	155,13	6,21	0,40
Dirdalsåna	upper avg.	1 571	0,01	1,62	0,17	0,14	0,89			4,69	135,93	1,89	185,10	5,14	0,37
Frafjordelva	upper avg.	1 770	0,01	1,81	0,19	0,17	0,87			6,86	133,56	0,80	182,15	3,51	0,30
Espedalselva	upper avg.	1 372	0,01	1,33	0,08	0,06	0,43			3,07	103,33	0,55	150,19	2,45	0,25
Førrelva	upper avg.	1 613	0,01	1,81	0,10	0,05	0,47			2,80	110,48	1,58	126,05	4,07	0,22
Åbøelva	upper avg.	925	0,00	1,05	0,07	0,04	0,43			1,69	52,12	0,38	70,74	1,07	0,15
Etneelva	upper avg.	2 181	0,01	5,85	0,34	0,09	1,49			15,74	240,51	1,00	322,10	4,65	0,74
Opo	upper avg.	4 491	0,03	6,29	0,55	0,69	5,20			39,03	195,13	2,43	435,00	15,95	2,58
Tysso	upper avg.	3 366	0,02	3,52	0,78	0,13	4,02			5,55	153,02	1,84	227,54	5,97	0,42
Kinso	upper avg.	1 792	0,01	1,56	0,13	0,09	0,42			3,44	43,75	1,18	76,26	4,45	0,43
Bjoreio	upper avg.	3 775	0,01	3,55	0,47	0,17	1,39			6,11	87,63	2,40	220,46	7,98	0,86

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities ->												
	Estimate	Flow rate (1000 m3/d)	Cd [tonnes]	Hg [kg]	Cu [tonnes]	Pb [tonnes]	Zn [tonnes]	g-HCH [kg]	PCBs [kg]	NH4-N [tonnes]	NO3-N [tonnes]	PO4-P [tonnes]	Total N [tonnes]	Total P [tonnes]	SPM [10^3 ton]
Veig	upper avg.	3 163	0,02	3,23	0,28	0,20	1,56			5,31	60,36	1,44	151,72	5,25	1,39
SIMA	upper avg.	925	0,00	1,45	0,07	0,07	0,30			1,49	36,55	0,36	54,29	1,06	0,29
Austdøla	upper avg.	885	0,00	0,82	0,06	0,03	0,32			1,65	40,34	0,58	52,56	5,04	0,13
Nordøla /Austdøla.	upper avg.	266	0,00	0,30	0,03	0,03	0,13			0,43	15,30	0,11	18,13	0,71	0,18
Tysselvi. Samnangervassdraget.	upper avg.	2 598	0,01	3,09	0,31	0,21	1,40			5,86	91,29	1,09	212,88	3,96	0,79
Oselva.	upper avg.	1 169	0,01	2,42	0,39	0,10	1,03			3,35	65,57	2,11	145,44	5,09	0,52
Daleelvi.Bergsdalsvassdraget.	upper avg.	2 361	0,01	2,53	0,34	0,18	1,70			5,84	77,27	0,75	141,77	4,29	0,52
Ekso –Storelvi.	upper avg.	5 087	0,02	4,66	0,34	0,23	1,97			13,50	161,99	2,75	305,10	8,12	1,18
Modalselva –Moelvi.	upper avg.	4 609	0,01	5,06	0,19	0,23	1,77			7,73	194,46	2,01	282,05	7,34	0,91
Nærøydalselvi.	upper avg.	2 141	0,01	2,68	0,15	0,04	0,55			3,98	96,31	0,82	131,85	5,01	0,44
Flåmselvi	upper avg.	1 594	0,01	1,54	0,11	0,05	0,48			4,13	69,15	0,48	88,32	1,80	0,61
Aurlandselvi	upper avg.	4 630	0,01	5,09	0,79	0,27	1,55			14,27	236,52	1,75	310,85	8,28	1,32
Erdalselvi.	upper avg.	620	0,00	0,60	0,03	0,01	0,11			0,85	15,73	0,23	26,03	0,75	0,12
Lærdalselva /Mjeldo.	upper avg.	5 265	0,01	4,95	0,73	0,12	1,22			9,08	210,88	1,81	313,16	11,49	1,82
Årdalselvi.	upper avg.	5 015	0,02	4,80	1,99	0,11	1,99			13,20	443,47	2,85	604,37	8,20	2,77
Mørkrisdalselvi	upper avg.	1 572	0,01	1,60	0,32	0,11	1,18			2,59	65,08	0,64	97,54	2,80	1,31
Fortundalselva.	upper avg.	2 831	0,01	5,04	0,90	0,18	1,66			5,44	106,43	1,04	146,49	4,76	2,06
Sogndalselva	upper avg.	1 160	0,00	1,45	0,07	0,04	4,68			2,62	50,96	0,97	79,40	2,38	0,48
Årøyelva	upper avg.	3 007	0,01	2,91	0,19	0,06	0,90			6,32	96,05	0,82	161,14	6,64	1,42
Oselva	upper avg.	3 425	0,01	5,65	0,52	0,14	2,19			14,62	66,69	0,97	237,16	12,00	0,81
Hopselva	upper avg.	960	0,00	1,69	0,03	0,04	0,28			1,87	34,39	0,32	47,29	1,08	0,21
Åelva (Gjengedalseva)	upper avg.	2 210	0,01	3,18	0,11	0,09	0,69			6,74	60,20	0,78	118,37	3,84	0,56
Oldenelva.	upper avg.	1 591	0,01	1,62	0,13	0,04	0,44			4,90	90,78	0,51	129,81	2,75	0,65
Loelvi.	upper avg.	1 839	0,01	1,44	0,22	0,06	0,46			4,60	80,53	1,38	110,77	4,20	0,84
Stryneelva.	upper avg.	3 749	0,01	3,23	1,05	0,08	0,82			12,69	147,69	1,50	245,80	5,56	3,96

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities --->												
	Estimate	Flow rate (1000 m3/d)	Cd [tonnes]	Hg [kg]	Cu [tonnes]	Pb [tonnes]	Zn [tonnes]	g-HCH [kg]	PCBs [kg]	NH4-N [tonnes]	NO3-N [tonnes]	PO4-P [tonnes]	Total N [tonnes]	Total P [tonnes]	SPM [10^3 ton]
Hornindalselva.(Horndøla.)	upper avg.	3 229	0,01	3,15	0,34	0,09	1,13			9,82	138,96	1,20	230,26	4,72	1,02
Ørstaelva.	upper avg.	1 229	0,00	1,02	0,13	0,02	0,31			7,61	69,10	1,70	126,83	5,19	0,75
Valldøla.	upper avg.	2 480	0,01	1,88	0,26	0,05	0,59			4,53	62,82	0,63	101,66	2,83	0,63
Isa.	upper avg.	874	0,00	0,64	0,13	0,02	0,18			2,48	24,30	0,34	40,78	1,12	0,29
Rauma.	upper avg.	5 942	0,02	5,75	0,59	0,12	1,41			13,77	141,82	1,54	220,41	6,56	1,60
Eira.	upper avg.	5 244	0,02	5,20	0,67	0,12	1,08			10,88	230,03	1,31	329,55	5,71	1,09
Litledalselva.	upper avg.	1 216	0,00	1,05	0,14	0,02	0,22			1,71	27,51	0,40	45,85	2,22	0,26
Ålvunda.	upper avg.	1 038	0,00	1,66	0,33	0,03	0,40			3,20	72,23	0,59	111,02	2,90	0,43
Toåa.	upper avg.	1 309	0,00	1,47	0,19	0,03	0,28			1,87	18,38	0,59	57,84	2,11	0,32
Bøvra.	upper avg.	1 039	0,00	0,87	0,13	0,01	0,20			2,82	53,51	0,30	95,52	1,81	0,33
Børselva.	upper avg.	260	0,00	0,41	0,13	0,01	0,08			1,45	33,37	0,43	59,31	2,10	0,34
Vigda	upper avg.	391	0,00	0,48	0,15	0,01	0,11			1,23	33,95	0,70	66,09	2,75	1,63
Homla.	upper avg.	445	0,00	0,59	0,13	0,01	0,11			3,23	8,19	0,30	44,07	1,67	0,19
Gråe.	upper avg.	292	0,00	0,46	0,12	0,01	0,07			1,52	58,46	0,71	88,61	1,55	0,32
Figga.	upper avg.	751	0,00	0,99	0,30	0,05	0,31			4,58	82,60	1,36	139,29	4,24	1,88
Årgårdselva.	upper avg.	1 725	0,01	3,09	0,41	0,06	0,59			15,26	87,59	3,85	248,64	11,60	2,21
Moelva.(Salsvatenelva.)	upper avg.	1 997	0,01	2,92	0,17	0,04	0,92			3,84	43,90	0,63	96,77	2,17	0,38
Åelva.(Åbjøra.)	upper avg.	3 155	0,01	4,82	0,31	0,12	0,80			7,41	33,65	1,44	113,57	11,51	1,41
Skjerva.	upper avg.	553	0,00	0,75	0,23	0,06	0,87			10,07	30,65	3,34	81,02	5,60	0,96
Fusta.	upper avg.	3 501	0,01	4,12	0,38	0,06	0,84			19,97	37,34	2,10	162,73	6,58	2,57
Drevja.	upper avg.	1 135	0,00	1,18	0,10	0,02	0,22			1,76	17,35	1,43	50,99	2,87	1,18
Bjerkaelva.	upper avg.	2 120	0,01	2,44	0,40	0,05	0,59			8,09	19,96	0,76	81,26	5,51	0,90
Dalselva.	upper avg.	1 302	0,00	1,19	0,18	0,03	0,25			5,63	9,80	0,82	55,76	2,42	0,64
Fykanåga.	upper avg.	1 777	0,01	24,49	0,11	0,04	0,31			4,98	29,36	1,07	58,22	3,00	0,85
Saltelva.	upper avg.	4 837	0,02	28,77	0,60	0,15	1,35			15,78	56,65	5,43	169,83	19,07	16,92

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities --->												
	Estimate	Flow rate (1000 m3/d)	Cd [tonnes]	Hg [kg]	Cu [tonnes]	Pb [tonnes]	Zn [tonnes]	g-HCH [kg]	PCBs [kg]	NH4-N [tonnes]	NO3-N [tonnes]	PO4-P [tonnes]	Total N [tonnes]	Total P [tonnes]	SPM [10^3 ton]
Sulitjelmavassdr.Utl. Øvrevt	upper avg.	3 604	0,02	3,82	1,05	0,05	0,84			9,57	36,65	1,37	107,23	6,54	1,46
Kobbelva.	upper avg.	2 579	0,01	3,10	0,09	0,04	0,68			5,91	31,49	1,32	87,78	3,95	1,09
Elvegårdselva.	upper avg.	4 060	0,02	3,98	0,71	0,16	1,60			13,62	17,94	2,23	94,88	5,62	1,67
Spanselva.	upper avg.	584	0,00	0,65	0,11	0,02	0,12			1,03	6,36	0,32	15,39	0,91	0,22
Salangselva.	upper avg.	2 168	0,01	2,13	0,21	0,04	0,41			4,77	20,35	1,05	60,21	2,97	0,83
Lakselva.(Rossfjordelva.)	upper avg.	640	0,00	0,92	0,04	0,02	0,10			2,08	2,24	0,41	28,26	1,29	0,17
Nordkjoselva.	upper avg.	526	0,00	0,60	0,06	0,01	0,09			0,86	3,57	0,38	13,16	0,80	0,23
Signaldalselva.	upper avg.	1 552	0,00	1,72	0,31	0,03	0,30			3,12	11,12	1,13	42,11	2,68	1,48
Skibotnelva.	upper avg.	2 096	0,01	2,22	0,37	0,02	0,42			3,90	19,29	0,90	62,52	2,96	0,59
Kåfjordelva.	upper avg.	976	0,00	2,01	0,43	0,02	0,47			1,37	23,05	0,44	45,21	2,25	0,30
Reisaelva.	upper avg.	5 362	0,02	6,66	1,61	0,24	2,41			12,59	75,98	2,31	204,67	9,74	2,49
Mattiselva.	upper avg.	422	0,00	0,49	0,11	0,00	0,09			1,21	2,60	0,17	16,08	0,48	0,09
Tverrelva.	upper avg.	303	0,00	0,23	0,08	0,00	0,07			0,86	6,54	0,19	21,59	0,62	0,09
Repparfjordelva.	upper avg.	3 507	0,01	4,26	2,34	0,02	0,56			9,62	41,17	1,84	158,07	5,19	0,82
Stabburselva.	upper avg.	2 098	0,01	2,03	0,25	0,01	0,61			5,57	20,02	0,83	74,11	2,09	0,49
Lakseelv.	upper avg.	2 002	0,01	1,89	0,51	0,04	0,50			5,28	6,81	0,97	75,88	4,62	2,75
Børselva.	upper avg.	1 658	0,00	10,93	0,09	0,01	0,45			6,02	5,42	0,69	41,79	1,54	0,42
Mattusjåkka.	upper avg.	179	0,00	0,26	0,02	0,02	0,23			0,44	1,77	0,07	4,88	0,18	0,04
Soussjåkka.	upper avg.	163	0,00	0,35	0,01	0,00	0,05			0,36	1,13	0,05	4,55	0,13	0,03
Stuorrajåkka.	upper avg.	1 221	0,00	1,32	0,03	0,01	0,41			3,73	17,43	0,40	34,91	1,26	0,18
Adamselva.	upper avg.	1 161	0,00	2,86	0,08	0,01	0,33			4,40	4,43	0,43	39,86	1,49	0,25
Syltefjordelva.(Vesterelva.)	upper avg.	1 483	0,00	1,24	0,06	0,01	0,21			4,61	8,45	0,83	56,32	4,03	0,28
Jakobselv.	upper avg.	1 187	0,00	1,34	0,09	0,01	0,18			3,59	4,25	0,75	51,50	2,25	0,28
Neidenelva.	upper avg.	3 255	0,01	2,72	0,74	0,04	0,54			16,18	15,66	1,29	222,61	6,63	1,82
Grense Jakobselv.	upper avg.	246	0,00	0,34	0,20	0,02	0,23			1,45	1,25	0,10	12,45	0,31	0,10

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities --->				
	Estimate	Flow rate (1000 m3/d)	As [tonnes]	TOC [10^3 tonnes]	Cr [tonnes]	Ni [tonnes]	Si [10^3 tonnes]
RIVERINE INPUTS: MAIN RIVERS (10)							
Glomma ved Sarpsfoss	lower avg.	61 414	3,91	85,04	7,69	18,69	36,79
	upper avg.	61 414	3,91	85,04	8,18	18,69	36,79
Drammenselva	lower avg.	23 373	1,33	26,81	0,89	7,91	10,33
	upper avg.	23 373	1,36	26,81	1,19	7,91	10,33
Numedalslågen	lower avg.	8 786	0,63	12,72	0,50	1,04	5,11
	upper avg.	8 786	0,63	12,72	0,62	1,04	5,11
Skienselva	lower avg.	24 657	0,96	20,62	0,55	2,05	8,69
	upper avg.	24 657	0,96	20,62	1,05	2,10	8,69
Otra	lower avg.	11 788	0,91	12,24	0,23	2,43	3,40
	upper avg.	11 788	0,91	12,24	0,50	2,43	3,40
Orreelva	lower avg.	424	0,06	0,88	0,06	0,26	0,13
	upper avg.	424	0,06	0,88	0,07	0,26	0,13
Suldalslågen.	lower avg.	12 598	0,47	6,63	1,21	1,62	2,21
	upper avg.	12 598	0,53	6,63	1,39	1,62	2,21
Orkla.	lower avg.	8 123	0,35	8,32	0,81	2,21	3,48
	upper avg.	8 123	0,35	8,32	0,82	2,21	3,48
Vefsna.	lower avg.	18 334	0,70	9,23	0,31	1,23	3,84
	upper avg.	18 334	0,70	9,23	0,82	1,23	3,84
Altaelva.	lower avg.	11 443	0,65	17,61	1,33	1,24	8,35
	upper avg.	11 443	0,65	17,61	1,40	1,25	8,35
RIVERINE INPUTS: TRIBUTARY RIVERS (36)							
Tista utløp Femsjøen	lower avg.	1 553	0,20	4,32	0,17	0,59	0,90
	upper avg.	1 553	0,20	4,32	0,17	0,59	0,90
Tokkeelva.	lower avg.	1 822	0,14	4,15	0,06	0,31	0,83
	upper avg.	1 822	0,14	4,15	0,10	0,31	0,83

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities --->				
	Estimate	Flow rate (1000 m3/d)	As [tonnes]	TOC [10^3 tonnes]	Cr [tonnes]	Ni [tonnes]	Si [10^3 tonnes]
Nidelva	lower avg.	8 802	0,48	8,06	0,05	0,75	2,65
	upper avg.	8 802	0,48	8,06	0,32	0,75	2,65
Tovdalselva	lower avg.	4 486	0,38	5,93	0,15	0,57	1,33
	upper avg.	4 486	0,38	5,93	0,19	0,57	1,33
Mandalselva	lower avg.	7 322	0,41	7,82	0,15	0,70	1,60
	upper avg.	7 322	0,41	7,82	0,27	0,70	1,60
Lyngdalselva	lower avg.	2 810	0,19	3,02	0,04	0,13	0,75
	upper avg.	2 810	0,19	3,02	0,12	0,13	0,75
Kvina	lower avg.	7 152	0,49	7,92	0,09	0,53	1,40
	upper avg.	7 152	0,49	7,92	0,30	0,53	1,40
Sira	lower avg.	14 548	0,47	8,91	0,08	0,63	2,08
	upper avg.	14 548	0,47	8,91	0,53	0,63	2,08
Bjerkreimselva	lower avg.	4 835	0,16	2,14	0,03	0,30	1,17
	upper avg.	4 835	0,16	2,14	0,18	0,30	1,17
Figgjoelva	lower avg.	655	0,03	0,62	0,02	0,07	0,26
	upper avg.	655	0,03	0,62	0,03	0,07	0,26
Lyseelva	lower avg.	1 752	0,03	0,64	0,00	0,06	0,40
	upper avg.	1 752	0,04	0,64	0,06	0,06	0,40
Storåna. (Årdalselva.)	lower avg.	5 139	0,09	2,72	0,12	0,33	2,25
	upper avg.	5 139	0,13	2,72	0,25	0,33	2,25
Ulladalsåna. (Ulla.)	lower avg.	3 889	0,07	2,37	0,08	0,25	1,16
	upper avg.	3 889	0,10	2,37	0,18	0,25	1,16
Storelva	lower avg.	3 981	0,09	1,41	0,00	0,29	0,55
	upper avg.	3 981	0,11	1,41	0,15	0,29	0,55
Vikedalselva	lower avg.	1 111	0,10	0,57	0,03	0,21	0,19
	upper avg.	1 111	0,10	0,57	0,06	0,21	0,19

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities --->				
	Estimate	Flow rate (1000 m3/d)	As [tonnes]	TOC [10^3 tonnes]	Cr [tonnes]	Ni [tonnes]	Si [10^3 tonnes]
Vosso.Bolstadelvi.	lower avg.	13 395	0,28	4,72	0,00	1,39	1,75
	upper avg.	13 395	0,35	4,72	0,49	1,39	1,75
Jostedøla	lower avg.	5 800	0,09	0,87	5,04	3,82	4,71
	upper avg.	5 800	0,12	0,87	5,07	3,82	4,71
Gaula	lower avg.	6 476	0,00	2,74	0,00	0,22	0,88
	upper avg.	6 476	0,12	2,74	0,24	0,22	0,88
Jølstra	lower avg.	6 900	0,00	2,66	0,00	0,19	0,99
	upper avg.	6 900	0,13	2,66	0,25	0,19	0,99
Nausta	lower avg.	2 657	0,02	1,71	0,00	0,12	0,39
	upper avg.	2 657	0,05	1,71	0,10	0,12	0,39
Gloppenelva.(Breimselva.)	lower avg.	5 239	0,03	1,90	0,04	0,19	1,16
	upper avg.	5 239	0,10	1,90	0,19	0,19	1,16
Driva.	lower avg.	8 974	0,20	4,20	0,58	0,50	3,67
	upper avg.	8 974	0,25	4,20	0,66	0,50	3,67
Surna.	lower avg.	5 133	0,00	3,47	0,15	0,59	1,30
	upper avg.	5 133	0,09	3,47	0,26	0,59	1,30
Gaula.	lower avg.	9 506	0,42	9,67	4,14	7,08	5,19
	upper avg.	9 506	0,43	9,67	4,14	7,08	5,19
Nidelva.	lower avg.	8 788	0,24	8,57	0,43	2,17	2,69
	upper avg.	8 788	0,24	8,57	0,43	2,17	2,69
Stjørdalselva.	lower avg.	6 658	0,19	6,81	0,51	1,38	1,28
	upper avg.	6 658	0,19	6,81	0,51	1,38	1,28
Verdalselva.	lower avg.	4 921	0,20	5,44	0,76	1,22	1,23
	upper avg.	4 921	0,20	5,44	0,76	1,22	1,23
Snåsavassdraget.	lower avg.	2 897	0,08	4,05	0,08	0,39	0,66
	upper avg.	2 897	0,08	4,05	0,15	0,39	0,66

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities --->				
	Estimate	Flow rate (1000 m3/d)	As [tonnes]	TOC [10^3 tonnes]	Cr [tonnes]	Ni [tonnes]	Si [10^3 tonnes]
Namsen.	lower avg.	4 701	0,16	4,20	0,50	0,92	1,14
	upper avg.	4 701	0,16	4,20	0,51	0,92	1,14
Røssåga.	lower avg.	11 494	0,36	3,90	0,00	2,05	1,57
	upper avg.	11 494	0,36	3,90	0,42	2,05	1,57
Ranaelva.	lower avg.	23 735	0,79	8,89	1,09	10,14	4,73
	upper avg.	23 735	0,79	8,89	1,25	10,14	4,73
Beiarelva.	lower avg.	5 417	0,22	3,59	0,88	1,70	2,59
	upper avg.	5 417	0,27	3,59	0,88	1,70	2,59
Barduelva.	lower avg.	9 789	0,10	5,41	0,44	1,17	3,69
	lower avg.	9 789	0,23	5,41	0,68	1,17	3,69
Målselv .	upper avg.	10 779	0,21	5,41	0,23	2,11	4,24
	upper avg.	10 779	0,36	5,41	0,51	2,11	4,24
Tanaelva.	lower avg.	20 283	0,51	24,72	1,13	2,47	21,39
	upper avg.	20 283	0,51	24,72	1,36	2,47	21,39
Pasvikelva.	lower avg.	16 508	1,26	25,57	0,58	40,54	11,37
	upper avg.	16 508	1,26	25,57	0,74	40,54	11,37
RIVERINE INPUTS: TRIBUTARY RIVERS (109)							
Mosselva	upper avg.	576	0,08	1,54	0,06	0,21	0,10
Hølenelva	upper avg.	90	0,02	0,33	0,02	0,11	0,08
Gjersjøelva.	upper avg.	65	0,01	0,14	0,01	0,05	0,04
Årungelva	upper avg.	38	0,01	0,06	0,01	0,02	0,01
Ljanselva	upper avg.	49	0,01	0,10	0,01	0,03	0,05
Loelva	upper avg.	82	0,02	0,17	0,03	0,05	0,11
Frognerelva	upper avg.	24	0,00	0,04	0,00	0,01	0,02
Akerselva	upper avg.	267	0,02	0,38	0,02	0,05	0,16
Lysakerelva	upper avg.	254	0,02	0,44	0,02	0,02	0,13

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities --->				
	Estimate	Flow rate (1000 m3/d)	As [tonnes]	TOC [10^3 tonnes]	Cr [tonnes]	Ni [tonnes]	Si [10^3 tonnes]
Sandvikselva	upper avg.	184	0,02	0,34	0,03	0,04	0,10
Åroselva	upper avg.	94	0,02	0,22	0,04	0,03	0,09
Lierelva	upper avg.	272	0,06	0,49	0,12	0,14	0,30
Sandeelva	upper avg.	185	0,06	0,28	0,25	0,09	0,11
Aulielva	upper avg.	424	0,54	0,88	0,38	0,68	0,18
Farriselva-Siljanvassdraget.	upper avg.	1 162	0,06	1,78	0,07	0,08	0,79
Gjerstadelva	upper avg.	704	0,06	1,26	0,04	0,15	0,23
Vegårdselva.	upper avg.	730	0,07	1,18	0,04	0,12	0,14
Søgneelva-Songdalselva.	upper avg.	781	0,07	1,24	0,02	0,17	0,21
Audnedalselva	upper avg.	1 453	0,13	1,90	0,05	0,14	0,33
Soknedalselva	upper avg.	2 277	0,13	1,55	0,07	2,82	0,48
Hellelandselva	upper avg.	1 648	0,09	1,28	0,06	0,19	0,30
Håelva	upper avg.	480	0,07	0,85	0,02	0,07	0,24
Imselva	upper avg.	461	0,03	0,57	0,04	0,07	0,03
Oltedalselva,utløp Ragsvatnet.	upper avg.	1 004	0,04	0,57	0,04	0,17	0,34
Dirdalsåna	upper avg.	1 571	0,06	0,79	0,05	0,11	0,31
Frafjordelva	upper avg.	1 770	0,07	0,88	0,06	0,13	0,29
Espedalselva	upper avg.	1 372	0,07	0,61	0,07	0,12	0,40
Førrelva	upper avg.	1 613	0,07	0,99	0,10	0,11	0,48
Åbøelva	upper avg.	925	0,04	0,31	0,05	0,07	0,08
Etneelva	upper avg.	2 181	0,15	0,74	0,12	0,38	0,27
Opo	upper avg.	4 491	0,18	1,36	0,37	0,41	0,77
Tysso	upper avg.	3 366	0,14	1,01	0,34	0,38	0,74
Kinso	upper avg.	1 792	0,05	0,40	0,20	0,10	0,11
Bjoreio	upper avg.	3 775	0,11	1,85	0,18	0,50	0,61
Veig	upper avg.	3 163	0,12	1,19	0,34	0,49	0,68

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities --->				
	Estimate	Flow rate (1000 m3/d)	As [tonnes]	TOC [10^3 tonnes]	Cr [tonnes]	Ni [tonnes]	Si [10^3 tonnes]
SIMA	upper avg.	925	0,02	0,19	0,06	0,09	0,28
Austdøla	upper avg.	885	0,02	0,13	0,04	0,03	0,08
Nordøla /Austdøla.	upper avg.	266	0,02	0,03	0,03	0,04	0,05
Tysselvi. Samnangervassdraget.	upper avg.	2 598	0,10	1,39	0,11	0,16	0,18
Oselva.	upper avg.	1 169	0,07	1,04	0,11	0,16	0,16
Daleelvi.Bergsdalsvassdraget.	upper avg.	2 361	0,06	1,15	0,14	0,19	0,27
Ekso -Storelvi.	upper avg.	5 087	0,11	2,54	0,18	0,27	0,38
Modalselva -Moelvi.	upper avg.	4 609	0,09	1,45	0,23	0,39	0,51
Nærøydalselvi.	upper avg.	2 141	0,04	0,43	0,10	0,10	0,72
Flåmselvi	upper avg.	1 594	0,03	0,25	0,06	0,15	0,19
Aurlandselvi	upper avg.	4 630	0,11	1,14	0,23	0,33	0,84
Erdalselvi.	upper avg.	620	0,01	0,20	0,02	0,03	0,10
Lærdalselva /Mjeldo.	upper avg.	5 265	0,09	1,70	0,17	0,32	1,34
Årdalselvi.	upper avg.	5 015	0,09	1,74	0,27	0,38	1,39
Mørkrisdalselvi	upper avg.	1 572	0,03	0,31	0,30	0,26	0,41
Fortundalselva.	upper avg.	2 831	0,07	0,54	0,22	0,27	0,59
Sogndalselva	upper avg.	1 160	0,05	0,86	0,07	0,05	0,13
Årøyelva	upper avg.	3 007	0,05	0,74	0,15	0,15	0,64
Oselva	upper avg.	3 425	0,14	3,34	0,27	0,31	0,19
Hopselva	upper avg.	960	0,03	0,28	0,06	0,05	0,06
Åelva (Gjengedalseva)	upper avg.	2 210	0,06	1,21	0,16	0,11	0,20
Oldenelva.	upper avg.	1 591	0,08	0,47	0,12	0,08	0,33
Loelvi.	upper avg.	1 839	0,06	0,43	0,18	0,09	0,45
Stryneelva.	upper avg.	3 749	0,09	0,89	0,29	0,20	0,75
Hornindalselva.(Horndøla.)	upper avg.	3 229	0,10	1,43	0,22	0,29	0,65
Ørstaelva.	upper avg.	1 229	0,03	0,61	0,09	0,11	0,34

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities --->				
	Estimate	Flow rate (1000 m3/d)	As [tonnes]	TOC [10^3 tonnes]	Cr [tonnes]	Ni [tonnes]	Si [10^3 tonnes]
Valldøla.	upper avg.	2 480	0,07	0,51	0,17	0,11	0,43
Isa.	upper avg.	874	0,02	0,23	0,13	0,07	0,24
Rauma.	upper avg.	5 942	0,17	1,42	0,33	0,31	1,40
Eira.	upper avg.	5 244	0,12	1,19	0,35	0,25	1,75
Litledalselva.	upper avg.	1 216	0,03	0,31	0,11	0,06	0,59
Ålvunda.	upper avg.	1 038	0,02	0,70	0,07	0,07	0,45
Toåa.	upper avg.	1 309	0,02	0,64	0,06	0,06	0,26
Bøvra.	upper avg.	1 039	0,02	0,97	0,05	0,07	0,22
Børselva.	upper avg.	260	0,02	0,47	0,03	0,13	0,06
Vigda	upper avg.	391	0,02	0,52	0,07	0,10	0,14
Homla.	upper avg.	445	0,07	0,96	0,04	0,08	0,12
Gråe.	upper avg.	292	0,04	0,57	0,04	0,06	0,08
Figga.	upper avg.	751	0,06	1,79	0,12	0,21	0,20
Årgårdselva.	upper avg.	1 725	0,07	4,85	0,17	0,20	0,40
Moelva.(Salsvatenelva.)	upper avg.	1 997	0,04	1,50	0,13	0,11	0,33
Åelva.(Åbjøra.)	upper avg.	3 155	0,07	2,17	0,23	0,35	0,26
Skjerva.	upper avg.	553	0,06	0,65	0,06	0,61	0,13
Fusta.	upper avg.	3 501	0,33	2,01	0,12	0,27	0,29
Drevja.	upper avg.	1 135	0,03	0,49	0,05	0,07	0,09
Bjerkaelva.	upper avg.	2 120	0,04	1,32	0,10	0,34	0,29
Dalselva.	upper avg.	1 302	0,02	0,88	0,04	0,21	0,18
Fykanåga.	upper avg.	1 777	0,03	0,42	0,05	0,10	0,16
Saltelva.	upper avg.	4 837	0,15	1,68	0,14	0,82	1,44
Sulitjelmavassdraget.Utl. Øvrevt	upper avg.	3 604	0,08	1,25	0,11	0,26	0,37
Kobbelva.	upper avg.	2 579	0,04	0,56	0,08	0,11	0,40
Elvegårdselva.	upper avg.	4 060	0,15	2,65	0,12	1,03	1,15

TABLE 2. Riverine inputs from the 10 main and 36+109 tributary rivers in Norway in 2005.

RIVERINE LOADS 2005			Quantities --->				
	Estimate	Flow rate (1000 m3/d)	As [tonnes]	TOC [10^3 tonnes]	Cr [tonnes]	Ni [tonnes]	Si [10^3 tonnes]
Spanselva.	upper avg.	584	0,01	0,22	0,04	0,18	0,12
Salangselva.	upper avg.	2 168	0,04	0,72	0,07	0,23	0,29
Lakselva.(Rossfjordelva.)	upper avg.	640	0,01	0,43	0,02	0,07	0,06
Nordkjoselva.	upper avg.	526	0,02	0,19	0,02	0,04	0,18
Signaldalselva.	upper avg.	1 552	0,05	2,08	0,07	0,20	0,51
Skibotnelva.	upper avg.	2 096	0,04	1,07	0,06	0,74	0,60
Kåfjordelva.	upper avg.	976	0,02	0,27	0,04	0,22	0,29
Reisaelva.	upper avg.	5 362	0,22	3,28	0,21	1,38	2,84
Mattiselva.	upper avg.	422	0,02	0,32	0,02	0,04	0,09
Tverrelva.	upper avg.	303	0,01	0,40	0,02	0,04	0,00
Repparfjordelva.	upper avg.	3 507	0,07	3,54	0,27	0,37	0,77
Stabburselva.	upper avg.	2 098	0,04	1,74	0,09	0,11	0,80
Lakseelv.	upper avg.	2 002	0,03	1,81	0,22	0,38	0,87
Børselva.	upper avg.	1 658	0,03	0,55	0,11	0,11	0,92
Mattusjåkka.	upper avg.	179	0,00	0,08	0,24	0,04	0,04
Soussjåkka.	upper avg.	163	0,00	0,07	0,01	0,01	0,09
Stuorrajåkka.	upper avg.	1 221	0,02	0,32	0,08	0,09	0,58
Adamselva.	upper avg.	1 161	0,02	0,75	0,08	0,03	0,55
Syltefjordelva.(Vesterelva.)	upper avg.	1 483	0,11	0,41	0,08	0,03	0,60
Jakobselv.	upper avg.	1 187	0,03	0,86	0,11	0,06	0,89
Neidenelva.	upper avg.	3 255	0,10	4,37	0,15	1,95	1,35
Grense Jakobselv.	upper avg.	246	0,02	0,23	0,19	0,70	0,10

Part B

Table 3. Total inputs from Norway 2005

TABLE 3. Total inputs from Norway 2005.

3A. TOTAL NORWAY

TOTAL INPUTS																			
Discharge region	**Estimate**	**Flow rate (km^3/d)**	**Cd [tonnes]**	**Hg [tonnes]**	**Cu [tonnes]**	**Zn [tonnes]**	**Pb [tonnes]**	**As [tonnes]**	**Cr [tonnes]**	**Ni [tonnes]**	**NH_4-N [tonnes]**	**NO_3-N [tonnes]**	**PO_4-P [tonnes]**	**TOT-N [tonnes]**	**TOT-P [tonnes]**	**Si-O_2 [tonnes]**	**SPM [tonnes]**	**TOC [tonnes]**	**PCB [kg]**	**g-HCH [kg]**
INPUTS TO OSPAR REGION: TOTAL NORWAY																				
RIVERINE INPUTS																				
	low avg.		0,86	0,04	102,9	296,0	15,1	10,0	13,6	38,7	797	14 292	273	24 143	709	176 203	348 067	200 098	0	7,5
Main Rivers	upp avg.	180 942	0,92	0,08	102,9	296,0	15,1	10,1	16,0	38,7	844	14 292	294	24 143	710	176 203	348 067	200 098	71	12,7
	low avg.		0,70	0,03	78,8	219,4	12,3	8,7	17,6	86,1	549	10 599	205	22 264	572	201 476	361 679	199 069		
Tributary Rivers (36)	upp avg.	259 908	0,94	0,10	78,8	219,4	12,3	9,7	22,5	86,1	767	10 603	262	22 264	573	201 476	361 711	199 069		
	low avg.		0,78	0,28	33,6	93,8	8,1	7,1	12,3	26,0	695	7 977	121	14 165	459	95 401	105 401	106 632		
Tributary Rivers (109)	upp avg.	189 703	0,78	0,28	33,6	93,8	8,1	7,1	12,3	26,0	695	7 977	121	14 165	459	95 401	105 401	106 632		
Total Riverine	**low avg.**		**2,35**	**0,34**	**215,3**	**609**	**35,401**	**25,7**	**43,6**	**150,8**	**2 041**	**32 868**	**599**	**60 572**	**1 740**	**473 081**	**815 146**	**505 798**		
Inputs	**upp avg.**	**630 553**	**2,65**	**0,46**	**215,3**	**609**	**35,407**	**26,8**	**50,9**	**150,9**	**2 307**	**32 873**	**677**	**60 572**	**1 741**	**473 081**	**815 179**	**505 798**		
DIRECT DISCHARGES																				
	low avg.		0,04	0,03	8,53	13,33	0,67	0,21	1,02	3,60	6783	452	424	9044	707		7414			
Sewage Effluents	upp avg.		0,04	0,03	8,53	13,33	0,67	0,21	1,02	3,60	6783	452	424	9044	707		7414			
	low avg.		0,06	0,01	9,66	6,48	1,43	0,44	2,40	8,34	1276	85	111	1701	186	0,02	468518			
Industrial Effluents	upp avg.		0,06	0,01	9,66	6,48	1,43	0,44	2,40	8,34	1276	85	111	1701	186	0,02	468518			
	low avg.				227,77						22828	3424	4175	28535	6050					
Fish Farming	upp avg.				227,77						22828	3424	4175	28535	6050					
	low avg.		**0,09**	**0,03**	**246,0**	**20**	**2,10**	**0,6**	**3,4**	**11,9**	**30 887**	**3 961**	**4 710**	**39 280**	**6 943**	**0,02**	**475 932**			
Total Direct Inputs	**upp avg.**		**0,09**	**0,03**	**246,0**	**20**	**2,10**	**0,6**	**3,4**	**11,9**	**30 887**	**3 961**	**4 710**	**39 280**	**6 943**	**0,02**	**475 932**			
UNMONITORED AREAS																				
	low avg.										1 757	17 175	228	26 181	813					
Unmonitored Areas	upp avg.	239 043									1 757	17 175	228	26 181	813					
	low avg.		**2,44**	**0,37**	**461,3**	**629**	**37,499**	**26,4**	**47,0**	**162,7**	**34 684**	**54 004**	**5 537**	**126 033**	**9 497**	**473 081**	**1291078**			
REGION TOTAL	**upp avg.**	**869 596**	**2,74**	**0,49**	**461,3**	**629**	**37,505**	**27,4**	**54,3**	**162,8**	**34 950**	**54 009**	**5 616**	**126 033**	**9 498**	**473 081**	**1291110**			

TABLE 3. Total inputs from Norway 2005.

3B. SKAGERRAK

Discharge region	Estimate	Flow rate (km^3/d)	Cd [tonnes]	Hg [tonnes]	Cu [tonnes]	Zn [tonnes]	Pb [tonnes]	As [tonnes]	Cr [tonnes]	Ni [tonnes]	NH_4-N [tonnes]	NO_3-N [tonnes]	PO_4-P [tonnes]	TOT-N [tonnes]	TOT-P [tonnes]	Si-O_2 [tonnes]	SPM [tonnes]	TOC [tonnes]	PCB [kg]	g-HCH [kg]
TOTAL INPUTS																				
INPUTS TO OSPAR REGION: Skagerrak																				
RIVERINE INPUTS																				
Main Rivers	low avg.		0,63	0,02	65,5	169	11,187	8	10	32	723	12 678	220	20 374	555	137 668	264 758	157 438	0	5,5
	upp avg.	130 019	0,63	0,05	65,5	169	11,187	8	12	32	723	12 678	231	20 374	555	137 668	264 758	157 438	49	10,0
Tributary Rivers (36)	low avg.		0,22	0,00	6,2	41	2,190	2	1	3	101	1 398	5	3 057	43	15 641	14 191	30 281		
	upp avg.	23 986	0,22	0,01	6,2	41	2,190	2	1	3	105	1 398	11	3 057	43	15 641	14 191	30 281		
Tributary Rivers (109)	low avg.		0,10	0,01	4,0	15	0,973	1	1	2	120	1 495	17	2 328	59	6 834	13 978	12 776		
	upp avg.	7 434	0,10	0,01	4,0	15	0,973	1	1	2	120	1 495	17	2 328	59	6 834	13 978	12 776		
Total Riverine Inputs	**low avg.**		**0,95**	**0,04**	**75,7**	**225**	**14,350**	**11**	**12**	**37**	**944**	**15 571**	**242**	**25 759**	**657**	**160 143**	**292 928**	**200 496**		
	upp avg.	**161 439**	**0,95**	**0,07**	**75,7**	**225**	**14,350**	**11**	**14**	**37**	**948**	**15 571**	**260**	**25 759**	**657**	**160 143**	**292 928**	**200 496**		
DIRECT DISCHARGES																				
Sewage Effluents	low avg.		0,03	0,01	2,7	7	0,267	0,1	0,5	1,3	2 516	167,7	56	3 354	93		2 159			
	upp avg.		0,03	0,01	2,7	7	0,267	0,1	0,5	1,3	2 516	167,7	56	3 354	93		2 159			
Industrial Effluents	low avg.		0,02	0,01	9,2	4	0,457	0,4	1,4	4,0	800	53,3	53	1 067	88		1 629			
	upp avg.		0,02	0,01	9,2	4	0,457	0,4	1,4	4,0	800	53,3	53	1 067	88		1 629			
Fish Farming	low avg.				0,3						17	2,5	3	21	4					
	upp avg.				0,3						17	2,5	3	21	4					
Total Direct Inputs	**low avg.**		**0,04**	**0,01**	**12,3**	**12**	**0,724**	**0,5**	**1,9**	**5,3**	**3 333**	**223,6**	**112**	**4 442**	**186**		**3 788**			
	upp avg.		**0,04**	**0,01**	**12,3**	**12**	**0,724**	**0,5**	**1,9**	**5,3**	**3 333**	**223,6**	**112**	**4 442**	**186**		**3 788**			
UNMONITORED AREAS																				
Unmonitored Areas	low avg.										198	1 994	31	2 978	107					
	upp avg.	7 833									198	1 994	31	2 978	107					
REGION TOTAL	**low avg.**		**0,99**	**0,05**	**88,0**	**237**	**15,074**	**11,2**	**13,5**	**42,6**	**4 474**	**17 789**	**386**	**33 179**	**950**	**160 143**	**296 716**			
	upp avg.	**169 272**	**1,00**	**0,08**	**88,0**	**237**	**15,074**	**11,2**	**15,7**	**42,6**	**4 479**	**17 789**	**404**	**33 179**	**950**	**160 143**	**296 716**			

TABLE 3. Total inputs from Norway 2005.

3C. NORTH SEA

Discharge region	Estimate	Flow rate (km^3/d)	Cd [tonnes]	Hg [tonnes]	Cu [tonnes]	Zn [tonnes]	Pb [tonnes]	As [tonnes]	Cr [tonnes]	Ni [tonnes]	NH_4-N [tonnes]	NO_3-N [tonnes]	PO_4-P [tonnes]	TOT-N [tonnes]	TOT-P [tonnes]	Si-O_2 [tonnes]	SPM [tonnes]	TOC [tonnes]	PCB [kg]	g-HCH [kg]
TOTAL INPUTS																				
INPUTS TO OSPAR REGION: North Sea																				
RIVERINE INPUTS																				
Main Rivers	low avg.		0,09	0,01	4,6	21	3,07	0,5	1	2	23	816	37	1 450	71	5 004	40 100	7 509	0	0,0
	upp avg.	13 022	0,09	0,01	4,6	21	3,07	0,6	1	2	36	816	38	1 450	71	5 004	40 100	7 509	7	1,4
Tributary Rivers (36)	low avg.		0,26	0,01	18,1	82	5,97	2,1	6	9	218	6 309	96	8 917	216	43 012	166 191	44 914		
	upp avg.	86 339	0,32	0,04	18,1	82	5,97	2,7	8	9	276	6 309	119	8 917	216	43 012	166 223	44 914		
Tributary Rivers (109)	low avg.		0,40	0,11	13,7	55	5,14	3,1	6	11	299	4 815	51	7 616	216	36 469	35 159	38 845		
	upp avg.	94 626	0,40	0,11	13,7	55	5,14	3,1	6	11	299	4 815	51	7 616	216	36 469	35 159	38 845		
Total Riverine Inputs	**low avg.**		**0,74**	**0,13**	**36,4**	**158**	**14,18**	**5,7**	**12,7**	**21,2**	**540**	**11 941**	**184**	**17 983**	**503**	**84 485**	**241 450**	**91 267**		
	upp avg.	**193 987**	**0,81**	**0,15**	**36,4**	**158**	**14,18**	**6,3**	**15,5**	**21,2**	**611**	**11 941**	**208**	**17 983**	**503**	**84 485**	**241 482**	**91 267**		
DIRECT DISCHARGES																				
Sewage Effluents	low avg.		0,01	0,02	5,81	5,35	0,40	0,09	0,55	2,21	2 208	147	161	2 944	269		4 131			
	upp avg.		0,01	0,02	5,81	5,35	0,40	0,09	0,55	2,21	2 208	147	161	2 944	269		4 131			
Industrial Effluents	low avg.		0,00		0,2	0,41	0,004	0,0	0,5	3,9	336	22	40	448	66		10 803			
	upp avg.		0,00		0,2	0,41	0,004	0,0	0,5	3,9	336	22	40	448	66		10 803			
Fish Farming	low avg.				75,6						7 669	1 150	1 404	9 586	2 035					
	upp avg.				75,6						7 669	1 150	1 404	9 586	2 035					
Total Direct Inputs	**low avg.**		**0,01**	**0,02**	**81,6**	**5,8**	**0,406**	**0,1**	**1,0**	**6,1**	**10 213**	**1 320**	**1 605**	**12 978**	**2 370**		**14 934**			
	upp avg.		**0,01**	**0,02**	**81,6**	**5,8**	**0,406**	**0,1**	**1,0**	**6,1**	**10 213**	**1 320**	**1 605**	**12 978**	**2 370**		**14 934**			
UNMONITORED AREAS																				
Unmonitored Areas	low avg.										602	5 930	55	9 131	195					
	upp avg.	74 049									602	5 930	55	9 131	195					
REGION TOTAL	**low avg.**		**0,76**	**0,15**	**118,0**	**164**	**14,586**	**5,8**	**13,7**	**27,3**	**11 355**	**19 191**	**1 844**	**40 092**	**3 067**	**84 485**	**256 384**			
	upp avg.	**268 036**	**0,82**	**0,18**	**118,0**	**164**	**14,586**	**6,4**	**16,6**	**27,3**	**11 426**	**19 191**	**1 869**	**40 092**	**3 067**	**84 485**	**256 416**			

TABLE 3. Total inputs from Norway 2005.

3D. NORWEGIAN SEA

TOTAL INPUTS																				
Discharge region	Estimate	Flow rate (km^3/d)	Cd [tonnes]	Hg [tonnes]	Cu [tonnes]	Zn [tonnes]	Pb [tonnes]	As [tonnes]	Cr [tonnes]	Ni [tonnes]	NH_4-N [tonnes]	NO_3-N [tonnes]	PO_4-P [tonnes]	TOT-N [tonnes]	TOT-P [tonnes]	Si-O_2 [tonnes]	SPM [tonnes]	TOC [tonnes]	PCB [kg]	g-HCH [kg]
INPUTS TO OSPAR REGION: Norwegian Sea																				
RIVERINE INPUTS																				
Main Rivers	low avg.		0,15	0,00	29,5	103	0,534	1,1	1	3	29	700	6	1 520	34	15 653	19 452	17 543	0	0,0
	upp avg.	26 458	0,18	0,01	29,5	103	0,536	1,1	2	3	57	700	13	1 520	35	15 653	19 452	17 543	10	1,7
Tributary Rivers (36)	low avg.		0,12	0,01	30,9	83	3,087	3,2	10	31	129	2 774	89	7 774	220	72 716	167 803	73 586		
	upp avg.	112 793	0,26	0,04	30,9	83	3,091	3,6	11	31	259	2 774	111	7 774	220	72 716	167 803	73 586		
Tributary Rivers (109)	low avg.		0,23	0,12	11,3	20	1,773	2,2	4	9	212	1 531	44	3 407	153	35 728	48 616	39 569		
	upp avg.	68 759	0,23	0,12	11,3	20	1,773	2,2	4	9	212	1 531	44	3 407	153	35 728	48 616	39 569		
Total Riverine Inputs	**low avg.**		**0,49**	**0,14**	**71,7**	**206**	**5,394**	**6,4**	**14,5**	**44,1**	**371**	**5 004**	**138**	**12 701**	**407**	**124 097**	**235 870**	**130 698**		
	upp avg.	**208 009**	**0,67**	**0,18**	**71,7**	**206**	**5,399**	**6,9**	**16,4**	**44,1**	**528**	**5 004**	**167**	**12 701**	**408**	**124 097**	**235 870**	**130 698**		
DIRECT DISCHARGES																				
Sewage Effluents	low avg.					0,5				0,04	1 903	127	191	2 537	318		1 123			
	upp avg.					0,5				0,04	1 903	127	191	2 537	318		1 123			
Industrial Effluents	low avg.		0,04		0,3	1,9	0,97	0,02	0,53	0,45	140	9	19	186	31	0,02	456 086			
	upp avg.		0,04		0,3	1,9	0,97	0,02	0,53	0,45	140	9	19	186	31	0,02	456 086			
Fish Farming	low avg.				136,2						14 040	2 106	2 567	17 550	3 720					
	upp avg.				136,2						14 040	2 106	2 567	17 550	3 720					
Total Direct Inputs	**low avg.**		**0,04**		**136,4**	**2,4**	**0,97**	**0,02**	**0,5**	**0,5**	**16 083**	**2 242**	**2 777**	**20 274**	**4 070**		**457 210**			
	upp avg.		**0,04**	**0,00**	**136,4**	**2,4**	**0,97**	**0,02**	**0,5**	**0,5**	**16 083**	**2 242**	**2 777**	**20 274**	**4 070**		**457 210**			
Unmonitored Areas	low avg.										873	8 276	135	12 461	479		0			
	upp avg.	130 138									873	8 276	135	12 461	479		0			
REGION TOTAL	**low avg.**		**0,53**	**0,14**	**208,1**	**208**	**6,362**	**6,5**	**15,0**	**44,6**	**17 326**	**15 523**	**3 050**	**45 436**	**4 957**	**124 097**	**693 080**			
	upp avg.	**338 147**	**0,71**	**0,18**	**208,1**	**208**	**6,367**	**6,9**	**16,9**	**44,6**	**17 484**	**15 523**	**3 079**	**45 436**	**4 957**	**124 097**	**693 080**			

TABLE 3. Total inputs from Norway 2005.

3E. BARENTS SEA

TOTAL INPUTS Discharge region	Estimate	Flow rate (km^3/s)	Cd [tonnes]	Hg [tonnes]	Cu [tonnes]	Zn [tonnes]	Pb [tonnes]	As [tonnes]	Cr [tonnes]	Ni [tonnes]	NH_4-N [tonnes]	NO_3-N [tonnes]	PO_4-P [tonnes]	TOT-N [tonnes]	TOT-P [tonnes]	Si-O_2 [tonnes]	SPM [tonnes]	TOC [tonnes]	PCB [kg]	g-HCH [kg]
INPUTS TO OSPAR REGION: Barents Sea																				
RIVERINE INPUTS																				
Main Rivers	low avg.		0,00	0,00	3,3	3	0,265	0,6	1	1	22	98	10	800	49	17 878	23 757	17 608	0,0	0,0
	upp avg.	11 443	0,02	0,01	3,3	3	0,265	0,6	1	1	30	98	12	800	49	17 878	23 757	17 608	4,7	0,8
Tributary Rivers (36)	low avg.		0,11	0,00	23,6	13	1,009	1,8	2	43	101	117	15	2 515	94	70 108	13 494	50 288		
	upp avg.	36 791	0,14	0,01	23,6	13	1,009	1,8	2	43	127	122	21	2 515	94	70 108	13 494	50 288		
Tributary Rivers (109)	low avg.		0,06	0,03	4,6	4	0,204	0,5	2	4	63	137	9	815	31	16 371	7 647	15 442		
	upp avg.	18 885	0,06	0,03	4,6	4	0,204	0,5	2	4	63	137	9	815	31	16 371	7 647	15 442		
Total Riverine Inputs	**low avg.**		**0,17**	**0,04**	**31,5**	**20**	**1,477**	**2,9**	**4,7**	**48,2**	**186**	**352**	**34**	**4 129**	**173**	**104 357**	**44 898**	**83 338**		
	upp avg.	**67 119**	**0,22**	**0,05**	**31,5**	**20**	**1,478**	**2,9**	**5,2**	**48,2**	**220**	**357**	**41**	**4 129**	**173**	**104 357**	**44 898**	**83 338**		
DIRECT DISCHARGES																				
Sewage Effluents	low avg.										156	10	16	207	27					
	upp avg.										156	10	16	207	27					
Industrial Effluents	low avg.																			
	upp avg.																			
Fish Farming	low avg.				15,6						1 103	165	201	1 379	291					
	upp avg.				15,6						1 103	165	201	1 379	291					
Total Direct Inputs	**low avg.**				**15,6**						**1 258**	**176**	**217**	**1 586**	**317**					
	upp avg.				**15,6**						**1 258**	**176**	**217**	**1 586**	**317**					
Unmonitored Areas	low avg.										84	974	7	1 611	32					
	upp avg.	27 023									84	974	7	1 611	32					
REGION TOTAL	**low avg.**		**0,17**	**0,04**	**47,1**	**20**	**1,477**	**2,9**	**4,7**	**48,2**	**1 528**	**1 502**	**257**	**7 326**	**523**	**104 357**	**44 898**			
	upp avg.	**94 142**	**0,22**	**0,05**	**47,1**	**20**	**1,478**	**2,9**	**5,2**	**48,2**	**1 562**	**1 506**	**265**	**7 326**	**523**	**104 357**	**44 898**			

Part B

Table 4. Rawdata (measured concentrations for Cr and Ni) for the 10 main and 36 tributary rivers in Norway in 2004.

TABLE 4. Rawdata (measured concentrations for Cr and Ni) for the 10 main and 36 tributary rivers in Norway in 2004.

TABLE 4. Rawdata (measured concentrations for Cr and Ni) for the 10 main and 36 tributary rivers in Norway in 2004.

River name	date DD.MM.YYYY	Cr µg/l	Ni µg/l
Glomma ved Solbergfoss	10.01.2004	0,4	0,94
Glomma ved Solbergfoss	09.02.2004	0,2	0,57
Glomma ved Solbergfoss	08.03.2004	0,9	0,64
Glomma ved Solbergfoss	13.04.2004	0,4	0,95
Glomma ved Solbergfoss	10.05.2004	0,3	0,94
Glomma ved Solbergfoss	18.05.2004	0,1	0,61
Glomma ved Solbergfoss	28.05.2004	0,2	0,53
Glomma ved Solbergfoss	07.06.2004	0,3	0,42
Glomma ved Solbergfoss	28.06.2004	0,1	1,53
Glomma ved Solbergfoss	05.07.2004	0,2	0,57
Glomma ved Solbergfoss	09.08.2004	< 0,1	0,48
Glomma ved Solbergfoss	06.09.2004	0,2	0,62
Glomma ved Solbergfoss	04.10.2004	0,2	1,47
Glomma ved Solbergfoss	08.11.2004	0,6	1,25
Glomma ved Solbergfoss	06.12.2004	0,7	1,48
Drammenselva	07.01.2004	< 0,1	0,39
Drammenselva	04.02.2004	< 0,1	< 0,05
Drammenselva	07.03.2004	1	0,5
Drammenselva	12.04.2004	< 0,1	0,6
Drammenselva	10.05.2004	0,2	0,5
Drammenselva	18.05.2004	< 0,1	0,47
Drammenselva	31.05.2004	0,2	0,57
Drammenselva	06.06.2004	< 0,1	1,02
Drammenselva	27.06.2004	0,2	0,49
Drammenselva	04.07.2004	0,1	0,48
Drammenselva	05.08.2004	0,2	0,61
Drammenselva	09.09.2004	0,2	0,48
Drammenselva	10.10.2004	0,1	0,42
Drammenselva	04.11.2004	0,1	0,55
Drammenselva	08.12.2004	0,2	0,52
Numedalslågen	06.01.2004	0,1	0,34
Numedalslågen	04.02.2004	0,1	0,37
Numedalslågen	08.03.2004	0,7	0,32
Numedalslågen	13.04.2004	0,2	0,42
Numedalslågen	11.05.2004	0,3	0,47
Numedalslågen	08.06.2004	< 0,1	0,79
Numedalslågen	06.07.2004	0,1	0,38
Numedalslågen	03.08.2004	0,1	0,29
Numedalslågen	07.09.2004	0,1	0,43
Numedalslågen	08.10.2004	0,2	0,49
Numedalslågen	09.11.2004	0,1	0,45
Numedalslågen	07.12.2004	0,2	0,47
Skienselva-Skiensvassdraget.	06.01.2004	< 0,1	0,35
Skienselva-Skiensvassdraget.	04.02.2004	< 0,1	0,22
Skienselva-Skiensvassdraget.	04.03.2004	0,9	0,32
Skienselva-Skiensvassdraget.	13.04.2004	< 0,1	0,27
Skienselva-Skiensvassdraget.	18.05.2004	< 0,1	0,31
Skienselva-Skiensvassdraget.	08.06.2004	< 0,1	0,58
Skienselva-Skiensvassdraget.	06.07.2004	< 0,1	0,21
Skienselva-Skiensvassdraget.	05.08.2004	< 0,1	0,25
Skienselva-Skiensvassdraget.	09.09.2004	< 0,1	0,2
Skienselva-Skiensvassdraget.	07.10.2004	< 0,1	0,25
Skienselva-Skiensvassdraget.	04.11.2004	< 0,1	0,26
Skienselva-Skiensvassdraget.	13.12.2004	< 0,1	0,28
Otra	06.01.2004	< 0,1	1,19
Otra	05.02.2004	< 0,1	0,75

TABLE 4. Rawdata (measured concentrations for Cr and Ni) for the 10 main and 36 tributary rivers in Norway in 2004.

River name	date DD.MM.YYYY	Cr µg/l	Ni µg/l
Otra	04.03.2004	0,9	0,38
Otra	13.04.2004	< 0,1	0,85
Otra	05.05.2004	< 0,1	0,53
Otra	09.06.2004	< 0,1	1,01
Otra	07.07.2004	< 0,1	0,68
Otra	11.08.2004	< 0,1	0,46
Otra	08.09.2004	< 0,1	1,31
Otra	11.10.2004	0,1	1,26
Otra	10.11.2004	< 0,1	0,54
Otra	08.12.2004	< 0,1	0,49
Orreelva	07.01.2004	0,2	1,15
Orreelva	04.02.2004	< 0,1	0,92
Orreelva	04.03.2004	1,2	1,37
Orreelva	13.04.2004	0,2	0,9
Orreelva	04.05.2004	0,1	0,9
Orreelva	08.06.2004	< 0,1	2,07
Orreelva	19.07.2004	< 0,1	1,09
Orreelva	03.08.2004	0,2	1,05
Orreelva	06.09.2004	0,3	0,9
Orreelva	08.10.2004	0,2	0,99
Orreelva	08.11.2004	< 0,1	0,94
Orreelva	07.12.2004	0,2	1,14
Suldalslågen.	07.01.2004	< 0,1	0,34
Suldalslågen.	09.02.2004	< 0,1	0,23
Suldalslågen.	03.03.2004	0,9	0,26
Suldalslågen.	13.04.2004	0,1	0,22
Suldalslågen.	05.05.2004	< 0,1	0,2
Suldalslågen.	09.06.2004	< 0,1	0,34
Suldalslågen.	07.07.2004	< 0,1	0,18
Suldalslågen.	04.08.2004	< 0,1	0,19
Suldalslågen.	08.09.2004	< 0,1	0,2
Suldalslågen.	06.10.2004	< 0,1	0,22
Suldalslågen.	10.11.2004	< 0,1	0,24
Suldalslågen.	08.12.2004	0,1	0,23
Orkla.	08.01.2004	0,2	0,81
Orkla.	05.02.2004	1,3	1,35
Orkla.	03.03.2004	1	1,01
Orkla.	01.04.2004	0,4	0,93
Orkla.	10.05.2004	0,2	0,87
Orkla.	07.06.2004	< 0,1	0,99
Orkla.	08.07.2004	0,3	0,79
Orkla.	03.08.2004	0,2	0,59
Orkla.	08.09.2004	0,6	1,3
Orkla.	07.10.2004	0,2	0,76
Orkla.	08.11.2004	0,2	0,75
Orkla.	08.12.2004	0,4	1,02
Vefsna.	06.01.2004	0,1	0,06
Vefsna.	05.02.2004	< 0,1	0,21
Vefsna.	08.03.2004	0,1	0,22
Vefsna.	13.04.2004	0,3	0,21
Vefsna.	10.05.2004	0,1	0,41
Vefsna.	07.06.2004	< 0,1	0,49
Vefsna.	05.07.2004	0,1	0,34
Vefsna.	03.08.2004	< 0,1	0,17
Vefsna.	06.09.2004	< 0,1	0,13
Vefsna.	06.10.2004	< 0,1	0,21
Vefsna.	09.11.2004	< 0,1	0,22
Vefsna.	08.12.2004	0,2	0,36

TABLE 4. Rawdata (measured concentrations for Cr and Ni) for the 10 main and 36 tributary rivers in Norway in 2004.

River name	date DD.MM.YYYY	Cr µg/l	Ni µg/l
Altaelva.	06.01.2004	0,7	0,16
Altaelva.	04.02.2004	1,9	0,1
Altaelva.	01.03.2004	0,8	0,16
Altaelva.	05.04.2004	0,1	0,13
Altaelva.	04.05.2004	0,2	0,19
Altaelva.	07.06.2004	< 0,1	0,49
Altaelva.	06.07.2004	0,2	0,13
Altaelva.	10.08.2004	0,1	0,2
Altaelva.	07.09.2004	0,2	0,2
Altaelva.	07.10.2004	0,2	0,21
Altaelva.	04.11.2004	0,2	0,26
Altaelva.	13.12.2004	0,2	0,23
Tista utløp Femsjøen	23.03.2004	0,4	0,65
Tista utløp Femsjøen	10.05.2004	0,2	0,64
Tista utløp Femsjøen	09.08.2004	0,3	0,92
Tista utløp Femsjøen	04.10.2004	0,2	0,66
Tokkeelva.	29.03.2004	0,1	0,44
Tokkeelva.	01.06.2004	0,1	0,38
Tokkeelva.	08.08.2004	0,1	0,42
Tokkeelva.	12.10.2004	0,2	0,51
Nidelva Arendal	29.03.2004	0,2	0,36
Nidelva Arendal	01.06.2004	<0,1	0,21
Nidelva Arendal	08.08.2004	<0,1	0,21
Nidelva Arendal	12.10.2004	0,2	0,33
Tovdalselva	30.03.2004	0,1	0,35
Tovdalselva	28.05.2004	<0,1	0,42
Tovdalselva	11.08.2004	<0,1	<0,05
Tovdalselva	11.10.2004	0,3	0,67
Mandalselva	30.03.2004	<0,1	0,2
Mandalselva	31.05.2004	<0,1	0,14
Mandalselva	19.08.2004	<0,1	0,19
Mandalselva	10.10.2004	0,2	0,29
Lyngdalselva	30.03.2004	<0,1	0,12
Lyngdalselva	31.05.2004	<0,1	0,26
Lyngdalselva	19.08.2004	0,1	0,27
Lyngdalselva	10.10.2004	<0,1	0,13
Kvina	30.03.2004	0,1	0,21
Kvina	31.05.2004	<0,1	0,21
Kvina	19.08.2004	0,1	0,25
Kvina	10.10.2004	0,2	0,18
Sira	30.03.2004	<0,1	0,12
Sira	31.05.2004	<0,1	0,12
Sira	19.08.2004	<0,1	0,14
Sira	10.10.2004	0,1	0,15
Bjerkreimselva	02.04.2004	<0,1	0,17
Bjerkreimselva	27.05.2004	0,1	0,12
Bjerkreimselva	04.08.2004	<0,1	0,16
Bjerkreimselva	12.10.2004	0,1	0,19
Figgjoelva	13.04.2004	0,3	0,41
Figgjoelva	24.05.2004	0,1	0,32
Figgjoelva	03.08.2004	0,2	0,32
Figgjoelva	06.10.2004	0,2	0,39
Lyseelva	31.03.2004	<0,1	0,08
Lyseelva	17.05.2004	<0,1	0,05
Lyseelva	15.08.2004	<0,1	<0,05
Lyseelva	05.10.2004	<0,1	0,07
Årdalselva	13.04.2004	<0,1	0,11
Årdalselva	13.05.2004	<0,1	0,1

TABLE 4. Rawdata (measured concentrations for Cr and Ni) for the 10 main and 36 tributary rivers in Norway in 2004.

River name	date DD.MM.YYYY	Cr µg/l	Ni µg/l
Årdalselva	10.08.2004	<0,1	0,1
Årdalselva	26.10.2004	0,2	0,16
Ulladalsåna. (Ulla.)	13.04.2004	<0,1	0,07
Ulladalsåna. (Ulla.)	13.05.2004	<0,1	<0,05
Ulladalsåna. (Ulla.)	10.08.2004	<0,1	<0,05
Ulladalsåna. (Ulla.)	26.10.2004	0,1	0,15
Saudaelva	13.04.2004	<0,1	0,14
Saudaelva	13.05.2004	<0,1	0,12
Saudaelva	10.08.2004	<0,1	0,11
Saudaelva	26.10.2004	<0,1	0,13
Vikedalselva	13.04.2004	0,4	0,35
Vikedalselva	13.05.2004	<0,1	0,3
Vikedalselva	10.08.2004	<0,1	0,25
Vikedalselva	26.10.2004	0,1	0,45
Vosso.Bolstadelvi.	23.03.2004	<0,1	0,37
Vosso.Bolstadelvi.	04.06.2004	0,2	0,21
Vosso.Bolstadelvi.	12.08.2004	<0,1	0,18
Vosso.Bolstadelvi.	07.11.2004	<0,1	0,25
Jostedøla	31.03.2004	<0,1	0,14
Jostedøla	18.06.2004	-	-
Jostedøla	10.08.2004	1,4	1,09
Jostedøla	05.10.2004	2,9	2,03
Gaular	23.03.2004	<0,1	0,14
Gaular	05.06.2004	0,2	0,09
Gaular	05.08.2004	0,2	0,09
Gaular	06.10.2004	<0,1	0,2
Jølstra	23.03.2004	<0,1	0,11
Jølstra	05.06.2004	0,2	0,07
Jølstra	05.08.2004	0,2	0,08
Jølstra	04.11.2004	<0,1	0,18
Nausta	23.03.2004	<0,1	0,13
Nausta	05.06.2004	0,1	0,07
Nausta	05.08.2004	<0,1	0,08
Nausta	04.11.2004	<0,1	0,19
Gloppenelva.(Breimselva.)	04.03.2004	0,7	0,15
Gloppenelva.(Breimselva.)	28.05.2004	<0,1	0,1
Gloppenelva.(Breimselva.)	11.08.2004	<0,1	0,09
Gloppenelva.(Breimselva.)	12.11.2004	<0,1	0,16
Driva.	23.03.2004	0,2	0,21
Driva.	11.05.2004	2,4	1,58
Driva.	24.08.2004	<0,1	0,08
Driva.	27.10.2004	0,1	0,12
Surna.	29.03.2004	0,2	0,43
Surna.	19.05.2004	0,2	0,44
Surna.	02.08.2004	<0,1	0,17
Surna.	18.10.2004	<0,1	0,17
Gaula.	01.04.2004	0,7	1,71
Gaula.	30.05.2004	0,3	1,12
Gaula.	11.08.2004	0,3	1,06
Gaula.	09.12.2004	1,4	3,14
Nidelva. Trondheim	01.04.2004	0,4	0,91
Nidelva. Trondheim	30.05.2004	0,1	0,6
Nidelva. Trondheim	11.08.2004	0,2	0,63
Nidelva. Trondheim	09.12.2004	0,7	1,4
Stjørdalselva.	01.04.2004	0,5	0,82
Stjørdalselva.	30.05.2004	0,1	0,53
Stjørdalselva.	11.08.2004	0,2	0,4

TABLE 4. Rawdata (measured concentrations for Cr and Ni) for the 10 main and 36 tributary rivers in Norway in 2004.

River name	date DD.MM.YYYY	Cr µg/l	Ni µg/l
Stjørdalselva.	09.12.2004	0,5	1,13
Verdalselva.	01.04.2004	0,5	0,86
Verdalselva.	30.05.2004	0,1	0,42
Verdalselva.	11.08.2004	0,4	0,25
Verdalselva.	09.12.2004	0,6	1,08
Snåsavassdraget.	01.04.2004	0,1	0,43
Snåsavassdraget.	30.05.2004	<0,1	0,33
Snåsavassdraget.	11.08.2004	0,1	0,42
Snåsavassdraget.	09.12.2004	0,2	0,55
Namsen.	01.04.2004	0,4	0,68
Namsen.	30.05.2004	0,1	0,31
Namsen.	11.08.2004	0,2	0,39
Namsen.	09.12.2004	0,7	1,01
Røssåga.	17.03.2004	<0,1	0,51
Røssåga.	18.05.2004	<0,1	0,36
Røssåga.	03.08.2004	<0,1	0,44
Røssåga.	11.10.2004	<0,1	2,48
Ranaelva.	25.03.2004	<0,1	0,22
Ranaelva.	18.05.2004	0,2	0,29
Ranaelva.	03.08.2004	<0,1	0,23
Ranaelva.	11.10.2004	<0,1	0,22
Beiarelva.	29.03.2004	0,2	0,4
Beiarelva.	01.06.2004	0,1	0,39
Beiarelva.	12.08.2004	0,3	0,48
Beiarelva.	01.11.2004	0,6	1,26
Målselv.	15.03.2004	<0,1	0,15
Målselv.	31.05.2004	0,1	0,2
Målselv.	09.08.2004	<0,1	0,22
Målselv.	10.10.2004	0,1	0,23
Barduelva.	15.03.2004	0,1	0,24
Barduelva.	31.05.2004	0,1	0,33
Barduelva.	09.08.2004	0,2	0,39
Barduelva.	10.10.2004	0,1	0,21
Tanaelva.	22.03.2004	0,2	0,25
Tanaelva.	25.05.2004	0,3	0,44
Tanaelva.	01.08.2004	0,2	0,32
Tanaelva.	20.10.2004	0,3	0,35
Pasvikelva.	21.03.2004	0,5	39,7
Pasvikelva.	25.05.2004	0,8	11
Pasvikelva.	01.08.2004	0,1	3,32
Pasvikelva.	20.10.2004	0,1	8,05