

## REPORT

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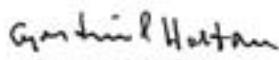
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## Abstract

Riverine inputs of nutrients, selected heavy metals and persistent organic pollutants to Norwegian coastal waters from 10 main and 145 tributary rivers have been monitored during 1998. 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. According to the results, total annual nutrient load to coastal waters from landbased sources, is approximately 3530 tonnes of phosphorus and 105.550 tonnes of nitrogen. About 41 per cent of the phosphorus and 62 per cent of the nitrogen are inputs from the monitored rivers and tributaries. Most inputs of heavy metals are low, especially the riverine inputs of Cd, Pb and Hg. A few values of Cd and Pb are below the detection limits of the specific analysis. For mercury, 58% of the total number of analyses were below the limit, whereas for the "Skagerrak-rivers" only, 79% of the values were above the detection limit. Most values of the different congeners of PCBs are below the detection limit. The pesticide lindane is detected in most analyses in small amounts. Total load of this compound is estimated to about 84 kg. The largest discharges from heavy metals comprise copper and zinc, with the input estimates of 308 and 1265 tonnes, respectively.

Retention in the fjords is not included in the above mentioned values, which in several cases would reduce the actual load to open marine waters considerably.

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The National Environmental  
Monitoring Programme

# OSPAR Commission

Annual report on direct and riverine inputs to  
Norwegian coastal waters during the year 1998

- A Principles, results and discussions
- B Data report

Oslo, November 1999

Project manager: Gjertrud Holtan  
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Terje Hopen

## Preface

The report presents the data from the 1998 monitoring of waterborne pollutants, both riverine and direct discharges, to the Norwegian coastal waters. The study is part of a joint monitoring programme under the "OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic". The Norwegian contribution is administered by the Norwegian Pollution Control Authority (SFT) which has contracted the Norwegian Institute for Water Research (NIVA) to perform the actual investigations.

The 1998-investigation lasted from January throughout December. This report is the Norwegian part of the 1998 study, divided into two parts:

- A: Principles - Results and Discussion
- B: Data Report.

The Programme Committee has consisted of Dag S. Rosland and John Rune Selvik (SFT) 1998 and 1999, respectively, Dag Berge and Gjertrud Holtan (NIVA). The practical investigation has been coordinated and performed by G. Holtan. Principal collaborator has been D. Berge. The calculations of all data has been performed by Terje Hopen (NIVA). The names of all participants are given in paragraph 5.

We would like to express our gratitude to all participants of the investigation, especially to the local fieldworkers for the collection and transport of the samples. The contact persons at the County Environmental Agencies and at the Municipalities of Oslo and Bærum are acknowledged for continuous support and goodwill. The contact persons at the Norwegian Water Resources and Energy Administration (NVE) and The Norwegian Meteorological Institute (DNMI), Per Lofberg and Stein Kristiansen, are acknowledged for their kind cooperation.

Oslo, 12. November 1999

*Gjertrud Holtan*

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## Summary and conclusions

In 1988, the Paris Commission decided to launch a comprehensive annual monitoring programme covering inputs of selected pollutants to Convention Waters, the "Comprehensive Study on Riverine Inputs and Direct Discharges (RID)". The programme was to commence in 1990, and continue the following years (Paris Commission, 1988, OSPAR, 1998).

The purposes of RID is:

- 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.
- To contribute to the implementation of the "Joint Assessment and Monitoring Programme (JAMP)" by providing data on inputs to Convention waters on a subregional and a regional level.

A national objective of RID is to contribute to assessment of the fulfillment of The Ministerial Declarations of the North Sea and the PARCOM Recommendation 88/2 on the 50% reduction target for nutrients.

In 1987 the ministers of the environment from 9 North Sea states agreed to "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 inputs of phosphorus and nitrogen to these areas between 1985 and 1995". At the following Ministerial Conferences, the latest in Esbjerg 1995, the Ministers decided to remain committed to the reduction target.

In Norway the OSPAR 50% reduction target applies to the coastal zone from the Norwegian-Swedish border to Lindesnes (the southernmost point of Norway). Further discharges of selected persistent organic pollutants to the whole North Sea area are to be reduced by 50-70% depending on the micropollutant in question.

In this report the results (1998) are given for riverine inputs of 10 main rivers and 145 tributaries. Thus the active monitoring programme covers drainage from 75 per cent of the main land areas. For discharges entering directly into marine recipients, i.e. sewage and industrial effluents, estimates are based on numbers from effluent control programmes. Diffuse loss of total phosphorus, total nitrogen, phosphates, nitrates and ammonia from these coastal zones are estimated by use of area specific runoff coefficients.

Greatest emphasis with regard to accuracy has been given to the input estimate of the Skagerrak region, as this is considered the most sensitive part of the North Sea. The Skagerrak reception of Norway's total loads are 25 per cent of the phosphorus and 38 per cent of the nitrogen discharges. In this region where 94 per cent of the area is river-monitored, about 67 per cent of the P- and 78 per cent of the N-loads, are found in the riverine inputs.

According to the results of the 1998 investigation total annual nutrient loads to coastal waters from landbased sources in Norway are approximately 3.530 tonnes of phosphorus and 105.550 tonnes of nitrogen. Respectively 41 and 62 per cent of the grand total inputs of phosphorus and nitrogen are monitored in the main and tributary rivers. Riverine inputs of metals and persistent organic pollutants are low. A few of the concentrations found for Cd and Pb are lower than the detection limit requested from PARCOM. Therefore, two quantities have been estimated: one assuming that the true concentration is zero and the other assuming that the true concentration is the limit of detection. This provides maximum and minimum concentrations between which lies the true estimate. When evaluating inputs these data provide a basis for upper and lower estimates.

Thus inputs of cadmium are measured/calculated to be between 7.3 and 8.2 tonnes, mercury between 2742 and 2839 kg. The "below detection limit problem" also applies for the inputs of PCBs which are measured to be between 0.38 and 44 kg. The pesticide lindane was found in all analyses, but in small amounts. Assumably, lindane contamination in Norwegian rivers is mostly due to long range air pollution. Total load is estimated to about 84 kg. The largest share of heavy metals comprise copper and zinc, with input estimates of 308 and 1265 tonnes, of which 81 and 89 % respectively, is river-monitored.

The relatively high load of Hg in 1998, is due to the large input from the river Glomma. Almost 90% of the total quantity is discharged with the river water. Twice in 1998 the measured concentrations of Hg were extremely high (915 and 730 ng/l, respectively) when compared to the maximum of 11 ng/l for the period 1990 – 1997. The samples were reanalysed with the same result. We have not found any error in sampling or analysis. A possible source for Hg in the lower part of Glomma should be investigated further.

Statistical trend analyses on annual basis in nutrients and heavy metals are carried out for the following rivers providing long time dataseries: River Glomma (1978-1998), Total-P and Total-N, River Otra (1980-1998) also Total-P and Total-N and River Orkla (1974-1998), Cu and Zn. The analyses show significant reductions in the yearly inputs of nutrients (Otra, P: 74%, N: 35%) and heavy metals (Orkla, Cu: 80%, Zn: 79%). As for Glomma there has also been detected a downward trend for Total-P (24%), but for Total-N an upward trend of 19%. Here the high floods especially in 1987 and 1995 were complicating the trend analyses.

The input-values vary to a great extent with the volume of the discharges. It is therefore difficult to say anything certain about altered pollution levels in the different rivers, even if there may be indications of an improved situation for most rivers/most parameters. To carry out trend analyses, especially for the rivers with long time series, would be an important tool in proving the case.

Retention of nutrients and persistent organic pollutants in the many threshold fjords of Norway is not included in the above given input figures. Estimates of retention of these substances will likely reduce the actual input to open marine waters.

For most Norwegian rivers the input to the sea show large annual variations due to differences in water discharge. In order to use the data as a control of the fulfillment of the Ministerial Declaration of the North Sea, the chemical data from 1998 are in addition "normalized", i.e. 1998 chemical concentrations in river water have been multiplied with normal annual runoff (LTA) in the period 1961-90 (main rivers) and 1931-60 (tributary rivers).

## 1. INTRODUCTION

At the eight meeting of the Paris Commission (Madrid, June 1986) it was decided to carry out a pilot project to test methods for estimating transport of pollutants from rivers to marine areas. The Norwegian part of the pilot study comprised the two rivers Glomma and Skienselva (Fig. 1). The project was carried out from August 1986 to August 1987, and reported in October 1987 (Lingsten, 1987).

At the Tenth Meeting of the Paris Commission (Lisbon, June 1988) the principles for the comprehensive study on riverine inputs were accepted. It was then decided to commence the study with measurements carried out in 1990, and 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.

1. Objectives of the Comprehensive Study
  - 1.1 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.
  - 1.2 To contribute to the implementation of the JAMP by providing data on inputs to Convention waters on a sub-regional and a regional level.
  - 1.3 To report these data annually to the OSPAR Commission and:
    - a. to review these data periodically with a view to determining temporal trends; and
    - 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.
  - 1.4 Each Contracting Party bordering the maritime area and, excluding the EC, 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 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 micropollutant in question.*

## 2. RIVERSYSTEMS INCLUDED IN THE STUDY

### 2.1 General aspects

The length of the Norwegian mainland coast line including fjords and bays is 21347 km, and the length of the islands' coast line is 35662 km. (Table 1). Because of the length of the coast line, the great numbers of rivers, and retention processes in the fjords, in- and out-washing areas, monitoring of riverborne pollutants in Norway faces quite a few problems with respect to assessing their impact on coastal waters. Further, to measure 90 % of the load from the Norwegian rivers, a great number of rivers would have to be included, which would be extremely expensive. It was therefore decided that 8 of the major load bearing rivers should be monitored in accordance with the objectives of the comprehensive study. Further it was decided that 2 "unpolluted" rivers should be monitored at a reduced, but appropriate frequency. In these 10 rivers a number of investigations have been carried out during many years, and they have all been included in the National Monitoring Programme of Watercourses (SFT, 1980 - 1998).

These investigations have mainly concentrated on nutrients. Hence data on the load of the nutrients are satisfactory, while the data on heavy metals and persistent organic pollutants are rather insufficient. In addition to the ten rivers it was decided to estimate the load of 145 other rivers (tributaries) based on other 1998-monitoring programmes, and existing knowledge of the river systems concerned, supplemented with random samples taken in 1998.

The total drainage area of these monitored rivers is 229152 km<sup>2</sup>, while the total area of mainland Norway is 323878 km<sup>2</sup> (Table 1). Totally 306747 km<sup>2</sup> of the drainage area is included in the investigation, of which 75 per cent is river monitored (Tables 4 and 5). It was of special importance to estimate the major loads to Skagerrak. In this region the monitored rivers and tributaries cover 94 per cent of the total area, whereof the main rivers alone 80 per cent.

The coastline is divided into subareas/-regions, comprising the drainage basins of the ten main rivers with tributaries, as shown in Fig. 1. Each subarea relates to one of the four discharge-/sub-regions (Fig. 1 and I.I-I.IV (Appendix I, Report B)) which are divided as follows (see also Table 4):

Barents Sea : From the Russian border (about 70°30'N, 70°30'E), to about 70°30'N, 21°E

Norwegian Sea: Southwards of 70°30'N, to about 62° N

North Sea : Southwards of 62° N, to the Swedish border

- Skagerrak : From Lindesnes (the southernmost point of Norway), about 57°44'N to Sweden about 58°58'N, 11°E.

Some key information about Norway and the adjacent oceans is given in Table 1.

**Table 1. Norway: Population, areas and length of coastline.**

<u>Population</u>	4.4 million
<u>Area:</u>	
- Mainland Norway	323878 km <sup>2</sup>
- The whole country incl. Svalbard and Jan Mayen	386958 km <sup>2</sup>
<u>Coastline:</u>	
- Length of the continental coastline	21347 km
- Not including fjords and bays	2650 km
- Length of the islands' coastline	35662 km

## 2.2 Riversystems monitored

The rivers chosen for the comprehensive study are the same as in 1990-1997 and presented in Table 2 and Fig. 1. The rivers marked 1 to 5, represent the major load bearing rivers in Norway. As mentioned in chapter 2.1, it was of special importance to estimate the major loads to Skagerrak (Fig. I.I, Appendix I, Report B) which is an important part of the North Sea, and considered to be most susceptible to pollutions. The five rivers (No 1 to 5) drain into the Skagerrak area. River Suldalslågen (No 7) and river Alta (No 10) are "unpolluted" riversystems where actual measurements have been carried out at a reduced frequency.

Orreelva (No 6) is draining the most intensive agriculture area in Norway especially concerning domestic animals (milk and meat production). Discharges from manure stores and silos together with area runoff from heavily manured fields are causing great problems (eutrophication, including toxic algal blooms) both in Orreelva and in the other water bodies in this area.

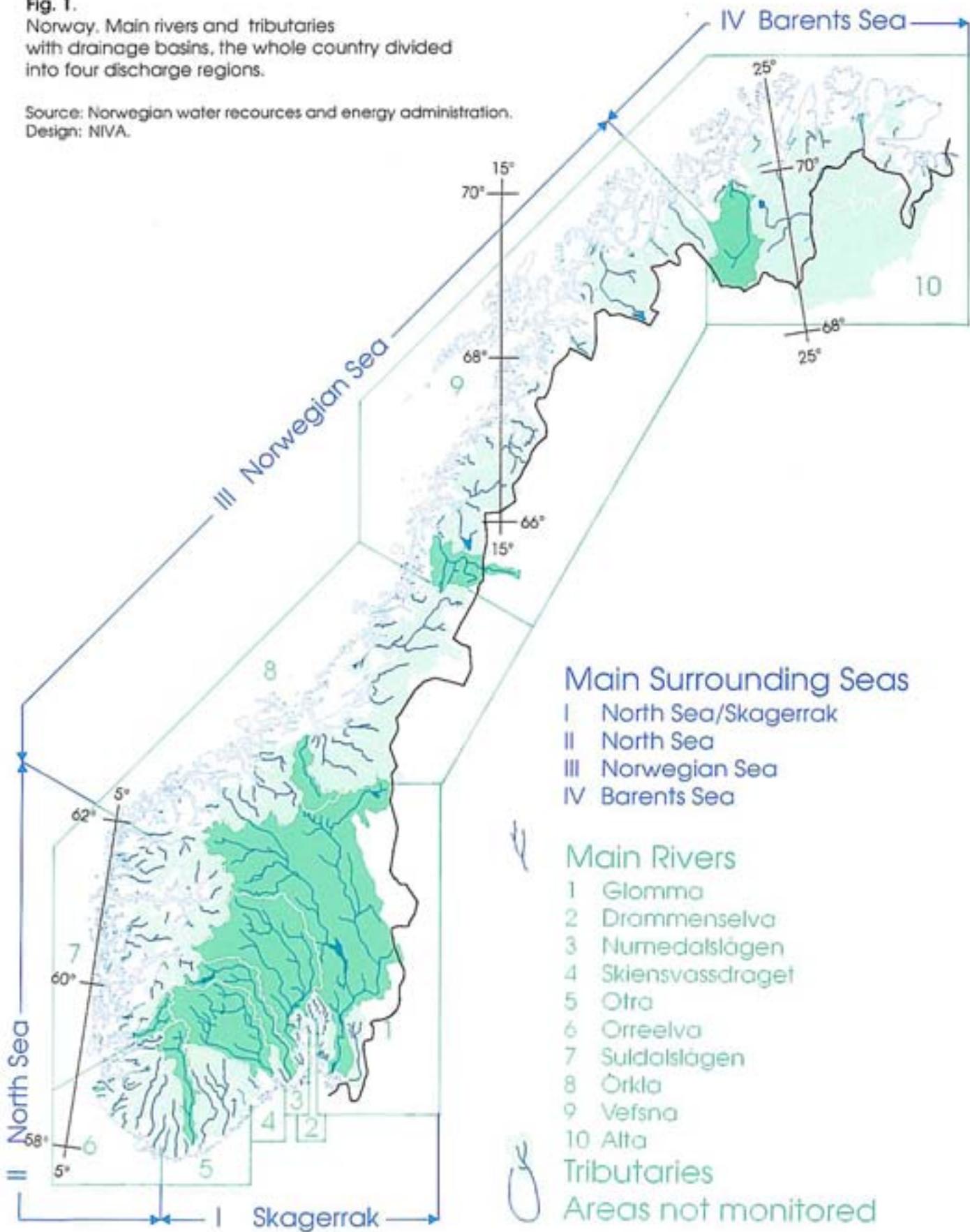
Orkla (No 8) is also draining agriculture area, but farming in this part of the country is rather extensive compared to the Orre area. More important in this area is the abandoned mines even if situated in the upper part of the watercourse. Several other rivers in this area also receive waste-water from abandoned mines (heavy metals).

Vefsna (No 9) is a watercourse where the runoff in periods is carrying quite a lot of suspended solids and as such is comparable with other rivers in this part of the country.

**Fig. 1.**

Norway. Main rivers and tributaries with drainage basins, the whole country divided into four discharge regions.

Source: Norwegian water resources and energy administration.  
Design: NIVA.



**Table 2. The main rivers with catchment areas and long term average flow (LTA) 1961-90.**

No	River	Catchment area, km <sup>2</sup>	LTA 1000 m <sup>3</sup> /day
		(at outlet)	(at outlet)
1	Glomma	41.918	61350
2	Drammenselva	17.034	28850
3	Numedalslågen	5.577	10200
4	Skienselva	10.772	23535
5	Otra	3.738	12870
6	Orreelva	105	335
8	Orkla	3.053	5710
9	Vefsna	4.122	15655
7	Suldalslågen	1.457	7420
10	Alta	7.373	7495
Total		95.149	

The ten water courses are all representing typical river systems in different parts of the country. As such they are very useful when estimating loads of comparable rivers, i.e corrections and adjustments in the estimates of loads of tributaries, which are based on fewer data than the main rivers.

All these watercourses except Orreelva are regulated for hydroelectric power production.

### 2.3 Other riversystems included (tributaries)

In addition to the ten main rivers, it was determined to assess inputs from the same 145 river systems as in 1990 - 1997 (Fig. 1) using "best estimates" of concentrations and flows. In total all Norwegian rivers with catchment areas larger than 500 km<sup>2</sup>, and several of the minor rivers (streams) also are included in the 1998 study. Some information about these rivers are shown in Tables 8.1-8.2 (Appendix VIII, Report B).

### 3. METHODOLOGY

#### 3.1 Methodology for assessment of riverine inputs

In carrying out the Survey, the methodology described in the Commissions Document "Principles of the Comprehensive Study on Riverine Inputs" (1988 and 1993) and in the 1990-Report from Norway (Holtan et al., 1991\*), was followed. \*In this document hereafter referred to as "The 1990-Report".

As for "Site selection" we refer to the abovementioned documents, but have chosen to repeat most of the text concerning "Sampling strategy and frequency", only with necessary adjustments.

The original programme of 1990-1992 was reduced in 1993.

In all main rivers, except Suldalslågen and Alta, 12 samples have been taken at regular monthly intervals during the sampling period from January to December 1998, as described in PARCOM 10/3/2.

For the "unpolluted" rivers Suldalslågen (No 7) and Alta (No 10), where, on the basis of existing knowledge, the concentration levels are very low, the requirement of 12 data sets per annum was found too stringent. These rivers were therefore sampled 4 times per annum. This sampling strategy should be sufficient enough to obtain a reliable estimate of the pollution load for these two rivers.

In 7 of the main rivers the parameters lindane and PCBs have been monitored twice in 1998, in the other 3, only once.

For the other rivers (tributaries), the concentrations are partly based on samples taken at the "standard" frequency (12, i.e. monthly, or more data sets per annum), which is the case for most rivers in the Skagerrak region. As for the rivers draining to the rest of the North Sea, all except one in the Orre area and two in the Suldalslågen area were sampled at least once in 1998. Two other rivers in this area (Laerdals- and Hornindalselva) were sampled and analysed for nutrients, particular suspended matter and conductivity. The concentrations are based on measurements of these samples and compared with samples from the last decade. With regard to the three rivers not sampled in 1998, most data are from samples gathered/analysed in 1997.

For the rivers draining to the Norwegian Sea, 15 of the 24 rivers in the Orkla area and all rivers in the Vefsna area were sampled and analysed at least once. Concerning rivers draining to the Barents Sea samples from all rivers except one (Mattusjákka) were gathered and analysed in 1998. These samples were analysed for all "OSPAR" parameters, except, PCBs and lindane. With regard to the rivers not sampled (13 altogether) and the parameters not analysed in 1998, most data are from samples gathered/analysed in 1997.

PCBs and lindane were only sampled/analysed in 2 of the Oslo rivers in 1998. As for Hg, this parameter was analysed at least once in all rivers mentioned above. For rivers not sampled/analysed for lindane and PCBs, the concentrations of these parameters are estimated on the basis of knowledge about the activity in the different drainage areas, the findings from the main rivers and samples/-analyses from these areas in 1990-1997 (paragraph 3.2.1).

The sample frequency for the main rivers is shown in Table 3.

**Table 3.** Sampling sites and frequency of the main rivers.

River/Location	J	F	M	A	M	J	J	A	S	O	N	D
Glomma at Sarpsfoss	x	x	x	x	x	x	x	x	x	x	x	x
Drammenselva upstream outlet	x	x	x	x	x	x	x	x	x	x	x	x
Numedalslågen at Bommestad	x	x	x	x	x	x	x	x	x	x	x	x
Skienelva at Klosterfoss	x	x	x	x	x	x	x	x	x	x	x	x
Otra upstream outlet	x	x	x	x	x	x	x	x	x	x	x	x
Orre upstream 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 upstream Mosjøen	x	x	x	x	x	x	x	x	x	x	x	x
Suldalslågen upstream outlet		x				x		x		x		
Alta upstream Alta			x			x		x		x		

In 1998 the water samples were taken by local persons as in 1990 - 1997. The persons were carefully instructed in advance. The samples were sent to the laboratory at NIVA immediately after sampling, usually arriving at NIVA within 24 to 36 hours later.

### 3.2 Parameters monitored and analytical methods

#### 3.2.1 Chemical parameters - detection limits and analytical methods

In 1998 the following parameters were monitored in accordance with the mandate: 5 nutrients (total phosphorus, orthophosphates, total nitrogen, ammonia and nitrates), 6 metals (copper, zinc, cadmium, lead, nickel and mercury), 1 pesticide (lindane) and a general parameter (suspended particulate matter, S.P.M.). PCBs were to be monitored on a voluntary basis for the 7 congeners (IUPAC numbers 28, 52, 101, 118, 138, 153 and 180).

As detailed information on methodology and obtainable limits of detection for all measured parameters were given in the 1990-Report, only new or improved methods will be described in this report.

As informed in the 1990-Report, the detection limits of the parameters Cd and Pb at the NIVA laboratory were above those requested from PARCOM. All Cd-, Pb- and also Cu- and Zn-samples from 1992 therefore have been analysed at the Norwegian Institute for Air Research (NILU) where metal determinations are performed on an ICP-MS-instrument (NILU, 1990). On this instrument the recommended detection limits from Parcom (Cd: 10 ng/l, Pb: 0.1 µg/l) are obtainable.

According to the document "Principles of the Comprehensive Study of Riverine Inputs and Direct Discharges" (Paris Commission, 1988), it is necessary to choose an analytical method which gives at least 70 % of positive findings (i.e. above the detection limit).

In 1998, there were six of the main rivers with more than 70 % positive Cd-findings in the samples (92-100%). For two of the other main rivers, the positive Cd- findings were 67 %, but were only 33 % in one and none at all in one river. As for Pb, all findings were positive in the main rivers (100 %). For the tributaries draining to the Skagerrak area, 92% of the Cd-samples were above the detection limit, and in the area draining to the rest of the North Sea, 58%. For the Pb-samples, all but two findings were above the detection limit. In the Norwegian Sea area, 21 % of the Cd-findings were positive, and in the Barents Sea area 31 %. More than 70% of the Pb-findings, however, were above the detection limit in both areas.

From 1993, the limit of detection has been lowered from 2 to 1 ng/l (mercury) and from 0.05 to 0.03 ng/l (PCBs). This is a result of refinement and optimisation of the methods. Even then, most Hg-findings in the 1998-samples from the main rivers were below the detection limit (17 to 92 % positive findings). Only in 2 rivers more than 70 % of the values were above the limit (Glomma, 92 % and Numedalslågen, 75 %). In the findings from the "Skagerrak" rivers, 17 out of 24 river samples were higher than the detection limit (70 %). As for the other main and tributary rivers, there were problems to obtain representative values for mercury, as they were below the detection limit during most of the investigation period. This was also the case for PCBs. For these parameters, most of the measured concentrations were extremely low, and certainly below the "PARCOM-detection limits" (Appendix VII - VIII, Report B).

We have not been able to explain why many of the findings regarding the Hg-values measured in 1997 and 1998 were lower than recent years findings/lower than the detection limit. This is either due to the use of a new instrument for analysing mercury ("FIMS-400") which is supposed to be more sensitive than the previously used instrument, or due to special weather conditions. The matter will be further studied.

However, we assume that these difficulties do not affect the main results and conclusions of the 1998-study. In those cases where the results recorded were lower than the limits of detection, two load quantities have been estimated, one assuming that the true concentration is zero and the other assuming that the true concentration is the limit of detection. This provides maximum and minimum concentrations within which the true estimate will fall. When used to evaluate inputs these data provide upper and lower boundaries for the estimate.

Occasionally on a voluntary basis, the metals arsenic, total chromium and vanadium have been determined in some of the samples from the main and tributary rivers and are stipulated for others (Report B). These parameters also were determined on ICP-MS at NILU.

### 3.2.2 Method used to estimate flow rate

For the period 1931-60 the annual specific runoff from the total area of Norway is estimated at 42.9 l/s km<sup>2</sup>. Expressed in volumetric units this amounts to 438 km<sup>3</sup> water, which distributed over the whole country equals a mean runoff of 1350 mm. Mean annual runoff in Norway and from the sub-regions to the main surrounding seas for the period 1931-60 are shown in Table 4. For the main rivers mean annual runoff for the last LTA-period (1961-90) have been estimated. These values are preliminary and will be adjusted when edited and published by NVE, probably next year. For the main rivers mean annual runoff (1931-60 and 1961-90) together with annual runoff for the years 1985, 1990-1998 are shown in Fig. 2, mean annual and annual precipitation for the same stations and periods in Fig. 3. As for precipitation, normals for Norway based on the LTA-period 1961-90 were published in 1993 (DNMI, 1993).

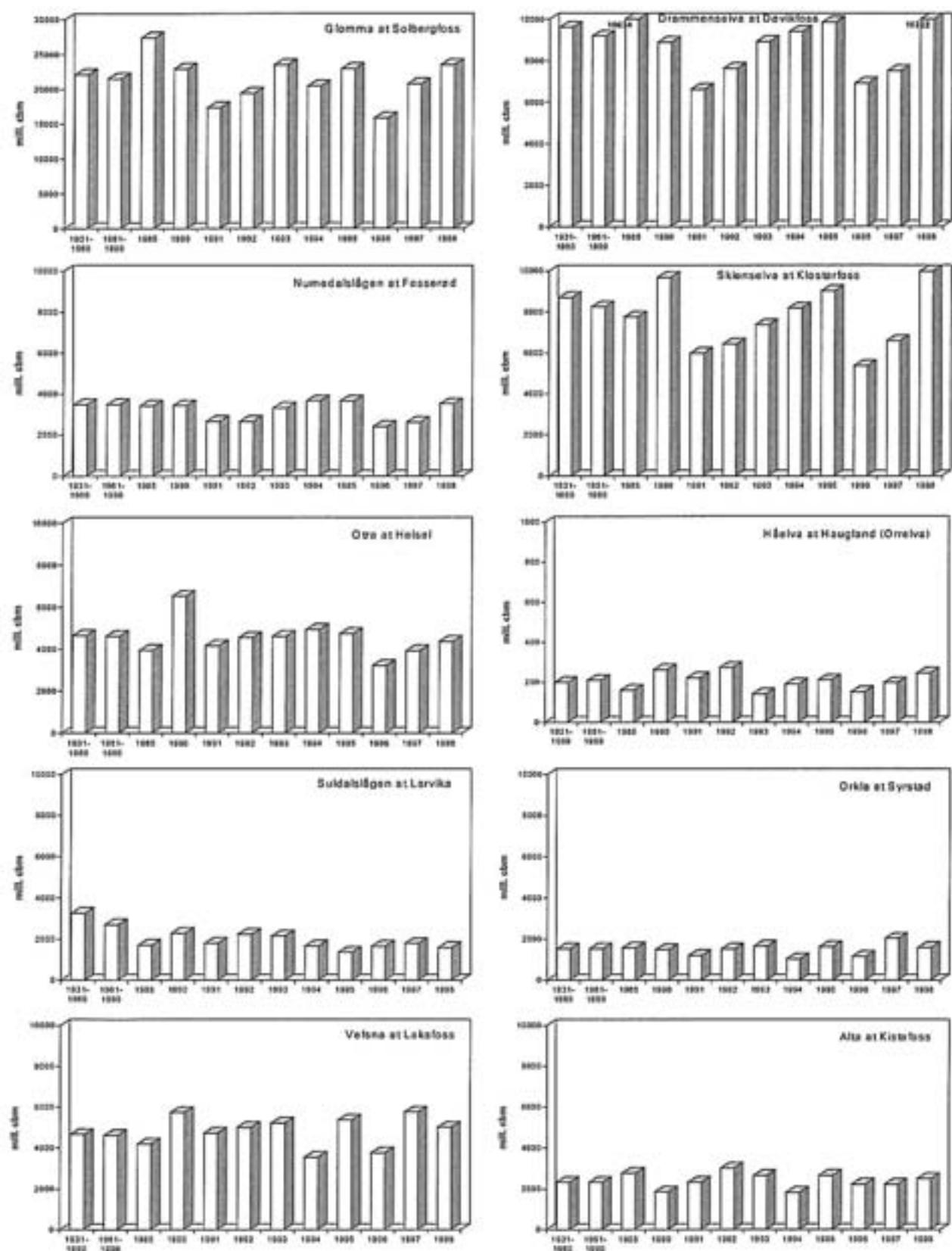


Fig. 2 Main Rivers. Mean Annual Runoff (1931-60 and 1961-90) and Annual Runoff for the Years 1985, 1990-1998 (mill. cbm.).

Source: Norwegian Water Resources and Energy Administration

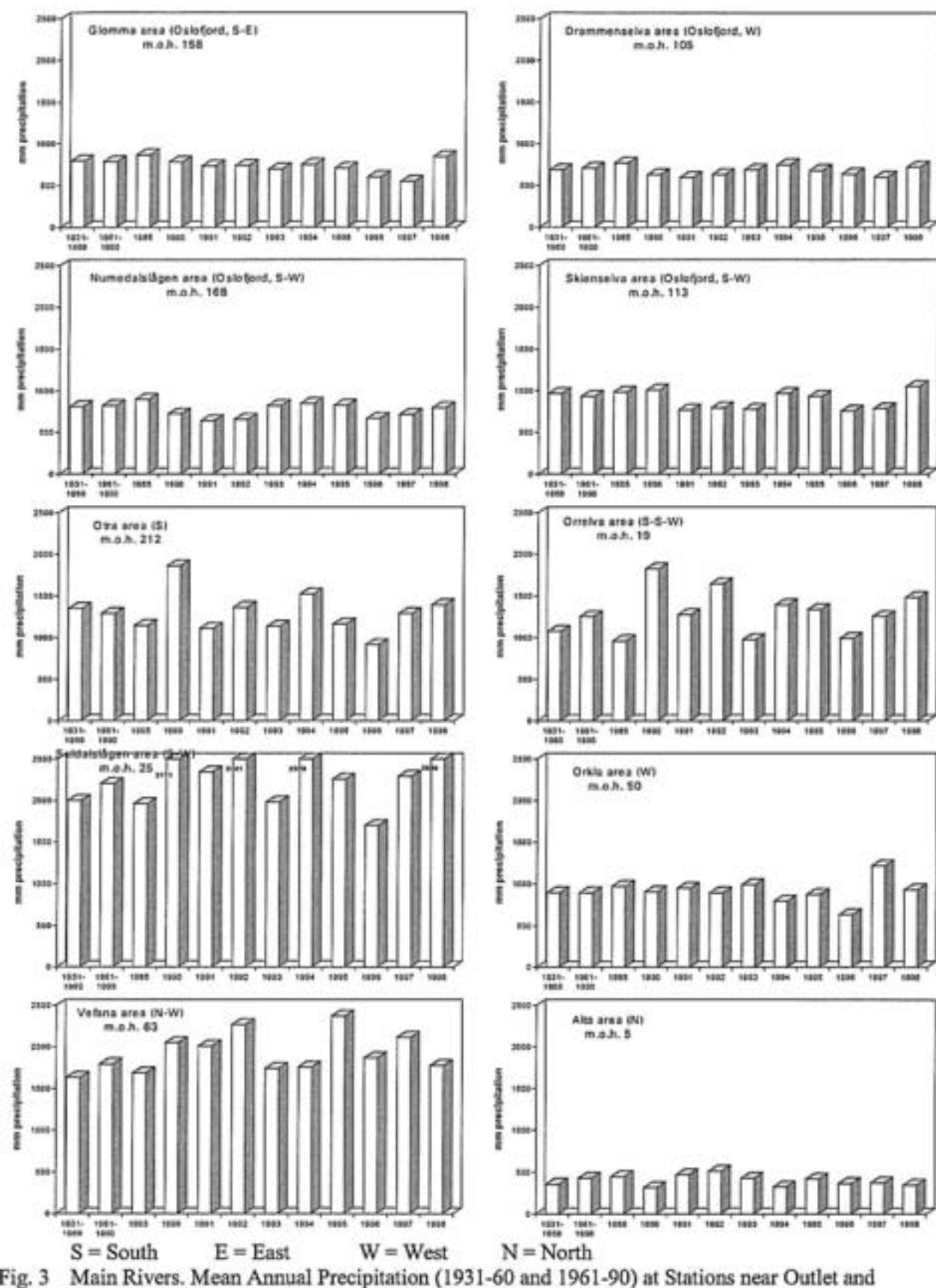


Fig. 3 Main Rivers. Mean Annual Precipitation (1931-60 and 1961-90) at Stations near Outlet and Annual Precipitation in the Years 1985, 1990 - 1997 (mm/year).  
Source: The Norwegian Meteorological Institute

**Table 4. Mean annual runoff (1931-60) from the subregions to the main surrounding seas.**  
 (Fig. 1 and Appendix I, Report B).

Subregions	Main Seas	Drainage area, km <sup>2</sup>	Runoff, mill. M <sup>3</sup>
The Swedish border - Lindesnes	Skagerrak	98699	57934.47
Lindesnes - Stad	North Sea	138902	164875.88
Stad - the border of Finnmark	Norwegian Sea	94704	231928.67
Finnmark - the border of Soviet	Barents Sea	73141	41462.90
Total		306747*	438267.45

At a given location the runoff will change from one year to another and throughout the year. In natural river basins the seasonal variations will depend mostly on the distance from the coast, the altitude and the latitude, and on variations in precipitation. The mean discharge is determined both by the precipitation and the catchment area. Along the coast of Southern and Western Norway the summer low flows are usually dominant together with high runoff in autumn and winter. Thus although Western Norway has much more precipitation than Eastern Norway, its smaller catchment areas lead to much less absolute discharge in western rivers. In the central part of Southern Norway and in the Northern part of the country low water flows are typical both in summer and winter, whereas periods of higher runoff will appear during the snow melting period (spring and early summer). In late summer and in autumn the flow depends on the precipitation and may therefore vary considerably.

In all main rivers continuous observations of the rate of flow are collected. For most rivers these stations are located upstream the sampling stations (NVE, 1998). The additional water supplied is estimated using measured rainfall data from the local catchment areas (DNMI, 1998).

With regard to the river Orkla the runoff station was changed from Vormstad to Syrstad in 1993 as we were recommended by NVE to do so. According to NVE this station is more reliable than Vormstad.

For all main rivers, seasonal changes in runoff in the period 1961-90, together with mean runoff in 1998, are shown in Fig. 4. In Fig. 5 monthly precipitation for the same period together with mean precipitation in 1998, are shown.

For the other rivers (tributaries) the runoff data partly are from continuous observations as the case is for most rivers in the Skagerrak area, and also for many of the rivers draining to the remaining North Sea. For the rest of the rivers mean runoff data (1931-60) and measured rainfall data (1998) are used for flow estimates.

\* The difference between the total area and the area given in Table 1 is due to rivers that drain into the neighbouring countries (Sweden, Russia and Finland).

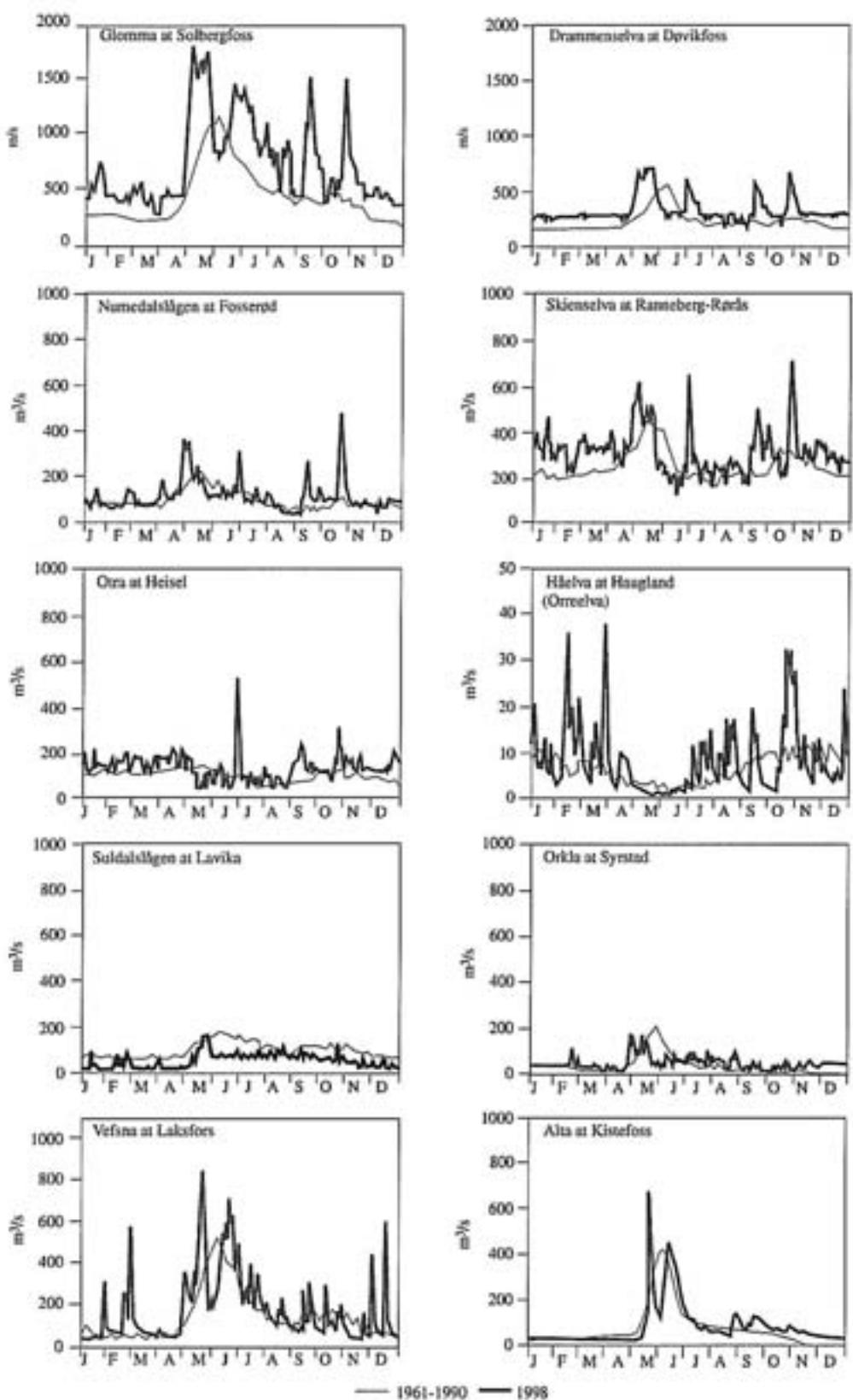


Fig. 4 Seasonal Changes in Daily Runoff (m³/s).  
Source: Norwegian Water Resources and Energy Administration

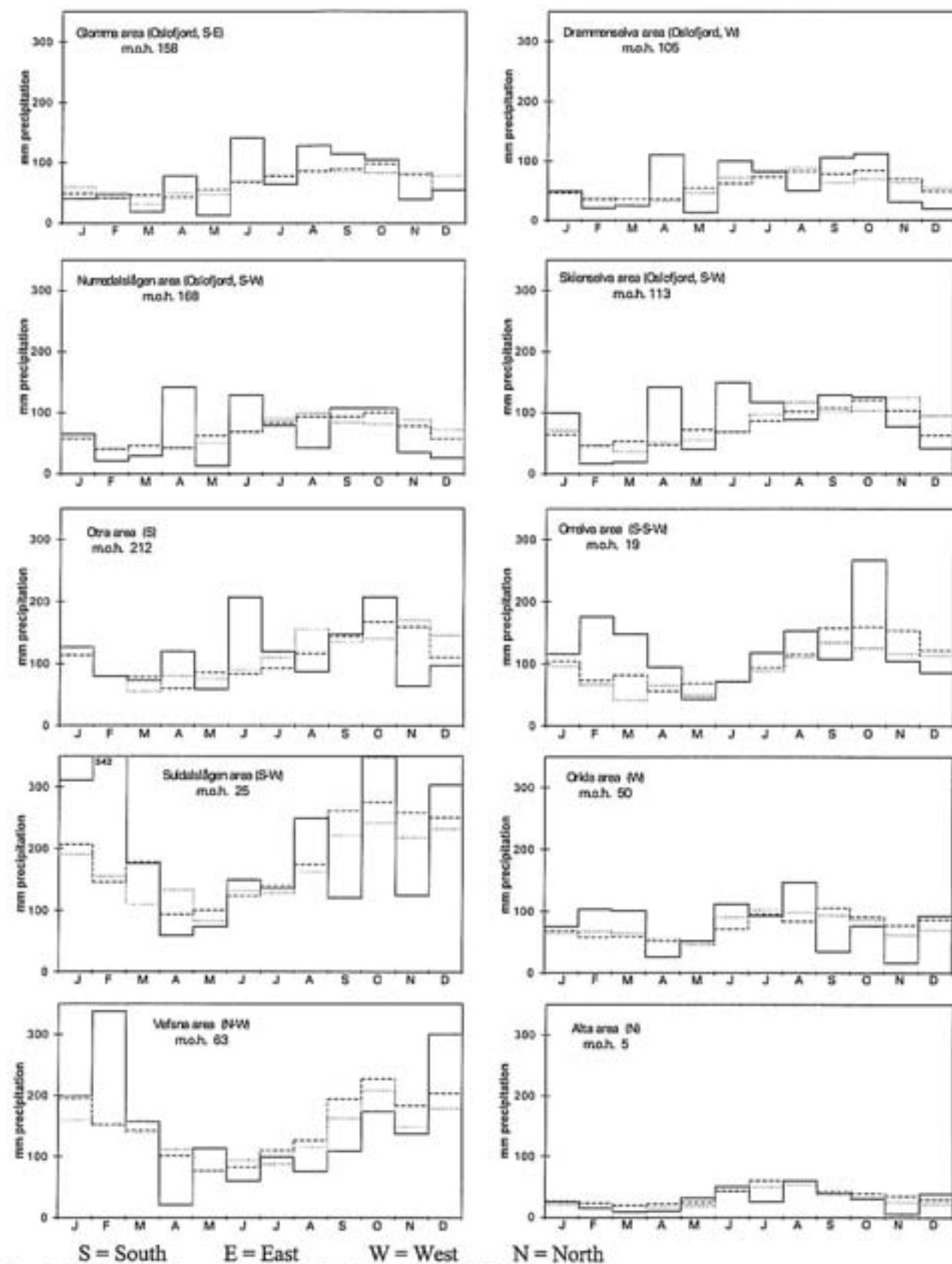


Fig. 5 Monthly Changes in Precipitation (mm/month).  
(m.o.h. = meters above sea level)  
Source: The Norwegian Meteorological Institute

### 3.2.3 Calculation of annual load

The first of the 2 formulas given in the Paris Commission document and the 1990-Report (Holtan et al., 1991) was used for calculating loads for all main rivers and most of the larger rivers.

This equation is a formula suited for estimating annual load when sampling dates are evenly spaced in time. Essentially it expresses the annual load (L) as the product of a flow weighted estimate of annual mean concentration and annual flow (Q<sub>a</sub>). Then the annual load estimate can be strongly biased if the sampling frequency increases during periods of high flow. Incidents with high flow will have a great influence on the estimate, and high concentrations during such periods will eventually lead to an overestimated annual load. A better method for estimating annual load when the sampling frequency increases with flow would be to use the above mentioned formula to make estimates of monthly loads and sum these to an estimate of annual load. 1995- and 1996-data from Glomma and Drammenselva areas were treated in this way.

The second formula was used where continuous records were not available.

For the other rivers, which have been monitored only once, the best available estimates of flow (catchment area multiplied by specific runoff adjusted for deviations from normal precipitation) and flow-weighted concentrations have been used to estimate contaminant loads.

Drainage basins to the different areas and regions ( $\text{km}^2$  and per cent) are shown in Table 5.

**Table 5. Drainage areas of monitored main and tributary rivers and downstream areas ( $\text{km}^2$  and per cent monitored/estimated in each subarea and subregion). (Fig. 1, Figs. I.I-I.V, Report B)**

Sub-regions	Sub-areas	Drainage area of monitored rivers $\text{km}^2$		Down Stream areas $\text{km}^2$	Total $\text{km}^2$	Monitored %
		Main	Tributary			
Skagerrak	No 1: Glomma	41218	2389	2416	45023	94.8
	* 1: Inner Oslofjord	859	342	1301	1301	73.7
	No 2: Drammenselva	17028	226	320	17614	98.2
	No 3: Numedalslågen	5513	1043	631	7187	91.2
	No 4: Skienselva	10348	1200	1203	12031	90.0
	No 5: Otra	3730	9169	904	13743	93.4
Total		77837	14965	5896	98699	94.0
The remaining North Sea	No 6: Orre	105	7233	2513	9851	74.5
	No 7: Suldalslågen	1466	16205	12681	30352	58.2
Total		1571	23438	15194	40203	62.2
The Norwegian Sea	No 8: Orkla	2880	28118	17036	47834	64.4
	No 9: Vefsn	4113	23907	18850	46870	59.8
Total		6793	52025	35886	94704	62.1
The Barents Sea	No 10: Alta	7367	45155	20619	73141	71.6
Total		93568	135584	77595	306747	74.7

### 3.3 Methodology for assessment of direct discharges to marine waters

As the methodology for assessing direct discharges to marine waters is outlined in the 1990-Report (Holtan et al., 1991), and the same procedure is applied for 1998, we refer to the above mentioned document for further information on this matter.

#### 3.3.1 Waste water treatment plants/sewage effluents

The Central Bureau of Statistics (SSB) and SFT have jointly initiated annual registration of data from all waste water treatment plants in the country with a capacity of more than 50 inhabitant equivalents (I.E.). The data are updated each year by the County Environmental Agencies. The computer program SSB-AVLØP has been installed at all county governors' environmental agencies, which are responsible for collecting effluent data from the municipalities. The county environmental agencies then send the data to SSB on disc. Since 1994 onwards, the reporting system SSB-AVLØP has been extended also to include data on scattered settlements. Discharge figures from SSB-AVLØP are reported to NIVA. NIVA uses these figures in the model "TEOTIL" to calculate the total discharges of phosphorus and nitrogen to Norwegian coastal waters. The figures take into account retention in watercourses.

In 1997, 2.260 municipal waste water treatment plants with a treatment capacity of at least 50 I.E. were registered in Norway. Their total treatment capacity was 5.4 million I.E. The 17 largest plants each had a capacity of 50.000 I.E. or more, and they treated almost half of all municipal waste water. Only 2 of these large plants are based on mechanical purification. In Eastern and Southern Norway a large proportion of the municipal waste water is purified in "high grade" plants. Such plants account for 94 per cent of total treatment capacity in this area. These areas as well as Sør Trøndelag, are also the areas with the highest hydraulic capacity per inhabitant. For example, the plants serving Oslo/Akershus have a capacity of more than 1.5 I.E. per inhabitant. Along the coast from Rogaland county and northwards, most waste water is only mechanically treated, and highgrade treatment plants account for only 24 per cent of total hydraulic capacity. Fjords are the recipients of the discharges from about 65 per cent of the total capacity of the plants (SSB, 1999).

Preferably, the annual loads from sewage effluents have been estimated as the product of annual flow and flow-weighted concentrations, which previously in particular has been the case for the sewage plants situated in the Skagerrak area i.e. the area involved in the North Sea Agreement, but from 1994 has come into force for most plants.

For the rest of the municipal wastewater, the loads were estimated by multiplying the number of people with the coefficients listed.

For crude (untreated) sewage discharges, the document "Principles of the Comprehensive Study of Riverine Inputs and Direct Discharges" (Paris Commission, 1988), recommends the following derived per capita loads to be used:

	PARCOM:			NORWAY:		
BOD	0.063	kg	O/person/day	0.046	kg	O/person/day
COD				0.094	kg	O/person/day
TOC				0.023	kg	/person/day
SPM	0.063	kg	/person/day	0.042	kg	/person/day
Total N	0.009	kg	N/person/day	0.012	kg	N/person/day
Total P	0.0027	kg	P/person/day	0.0016	kg	P/person/day

The Norwegian coefficients are based on recent studies of Norwegian sewerage districts. These data are also used to calculate pollutional loads from the different treatment plants, reduced by the removal efficiency of the treatment plants. Municipal sewage 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.

For metals in sewage discharges the calculated loads are based on measured concentrations and flows in larger treatment plants in the Oslo part of the Glomma area. Metal inputs from the rest of the country are estimated from local knowledge (\*) as follows:

Substance mg/person-equivalent/day (p.e.)	Cu	Zn	Cd	Pb	Cr-T	Ni	Hg
	30	35	0.2	1.0	2.9	5.0	0.10

The coefficients used in 1998 are the same as those used for calculations in 1992 - 1997. The coefficients are based on the results of an investigation on this topic launched by SFT (1993), i.e. monitoring at different types of treatment plants especially in the Oslo part of the Glomma area. Measured/estimated loads from sewage are shown in Appendix II, Report B.

\* Sources: Knutzen and Øren (1983), Myhrstad (1985), OVA (1999), SFT (1993), VEAS (1999).

### 3.3.2 Industrial effluents

Sampling frequency for industrial wastewater varies from weekly mixed samples to samples taken at random, but at least twice a year. Measured and estimated loads from industrial activities in the different areas are shown in Appendix III, Report B. According to SFT about 90 per cent of the industrial discharges (i.e. of the substances in question) are included in the total, and probably more for Total-P and Total-N.

### 3.3.3 Other inputs

(nutrients in area runoff from "Down Stream areas" of main and tributary rivers and rivers not monitored)

The pollution load model calculates the load from each pollution source by using area and activity specific load coefficients multiplied by areas (in square kilometres) of different categories and activity numbers, e.g. population (Holtan and Åstebøl, 1990). The coefficients used are prepared according to precipitation, climate, vegetation and soil in the different areas.

To estimate load from agricultural land area runoff, coefficients in the range of 50-200 kg Total-P and 2000-6500 kg Total-N km<sup>2</sup>/year are used depending on point sources, location of the agricultural land in relation to major tributaries, and agricultural production intensity. Load from upland (remote unpolluted) areas were estimated by using export coefficients in the range of 4-6 kg Total-P and 200-600 kg Total-N km<sup>2</sup>/year. The highest values were used in areas most affected by long range pollution (acid rain) along the Southern and Western coast. The coefficients are based on mean annual runoff for the period 1931-60.

Total direct nutrient discharges (Down stream areas) are shown in Table I (Appendix I, Report B), in the different subareas (1-10) in Appendix VI, Report B. Direct discharge areas (km<sup>2</sup>) are shown in Table 5.

## 4. RESULTS AND DISCUSSION

### 4.1 Pollutants

Norwegian watercourses, coastal fjords and sea areas are recipients for various substances discharged from many different sources. The discharges may have widely different impacts of varying severity.

In this investigation riverine and direct inputs of nutrients (P- and N-compounds), heavy metals, lindane and PCBs are measured or estimated. In addition to these contaminants the water is polluted by dissolved organic matter, especially from the pulp and paper industry and from municipal sewage, which also has been taken into account in this investigation.

The Norwegian Pollution Control Authority has given first priority to eliminate the effluents of 13 of the substances classified as micropollutants, which are in use in Norway, as quickly as possible. Most of the pollution is caused by industrial effluents, but other sources are municipal sewage, landfill leachate, and pesticide residues from agriculture.

Pollution by heavy metals is either due to discharges from industry, discharges from existing and abandoned mines, leaching from landfills or atmospheric fallout. The municipal sewage is the source of several heavy metals. Long range transboundary air pollution is another source of pollution both with respect to heavy metals and persistent organic pollutants.

Polychlorinated biphenyls (PCBs) are present in different industrial effluents and also released from discarded electrical equipment containing PCBs (e.g. transformer oil), when such equipment is unsatisfactorily stored or destroyed by incineration. No enterprises in Norway discharge PCBs regularly at present.

Municipal sewage and agriculture comprise the major sources of phosphorus and nitrogen pollution.

### 4.2 1998-results and discussion

The results given for riverine inputs (main rivers and tributaries) and discharges entering directly into marine recipients, are mainly based on direct measurements (paragraph 3.3).

Measured concentrations of the chemical parameters of the ten main rivers (1998), mean values, standard deviation and range are listed in Appendix VII, Report B. In the case of Cd, Pb, Hg and the different congeners of PCBs, where most of the rivers had concentrations below the respective detection limits, the concentrations are statistically treated as "limit-values". Total annual loads of the main rivers 1998 are shown in Appendix IV, Report B. Annual loads of nutrients and S.P.M. are also presented in Fig. 6. Total annual loads of the tributaries are shown in Appendix V, Report B. For the whole country, total annual loads (Direct discharges and Riverine inputs) are shown in Table I (Appendix I, Report B) and for the four subregions in Tables 1.1-1.4 (Appendix I, Report B), nutrients and S.P.M. also in Fig. 7.

As in 1990 -1997 the greatest emphasis with regard to accuracy has been given to the input estimate of the Skagerrak region, as this is considered the most sensitive part of the North Sea. In 1998, 25% of the P-load from the sources in Norway and 38% of the N-load were discharged into Skagerrak.

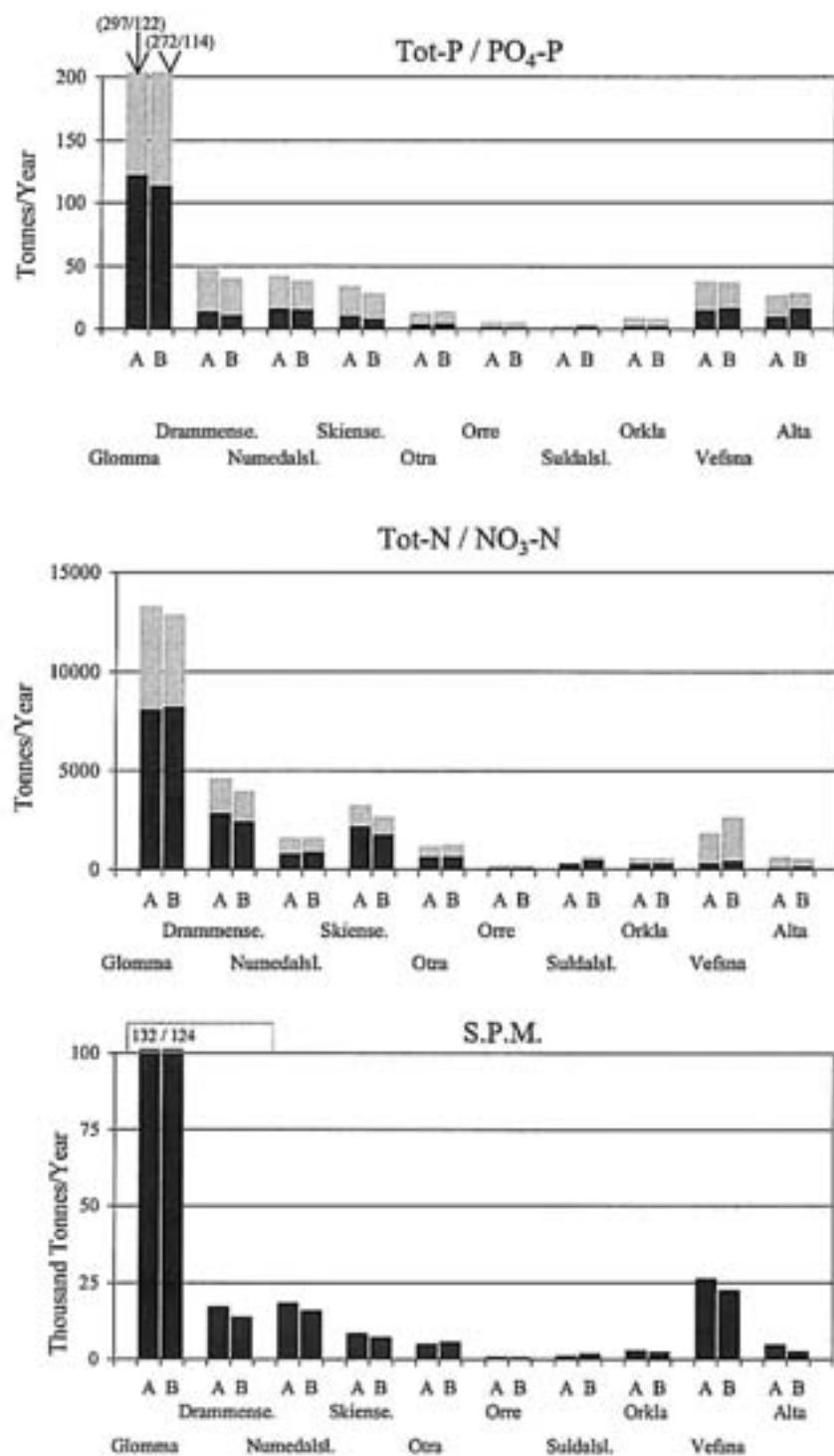


Fig. 6 Main rivers. Nutrients and S.P.M. Total loads 1998 (A) and Total normalized loads (B) in the different rivers.

Whole columns = Total P / N / S.P.M.  
Dark hatching = Phosphates / Nitrates

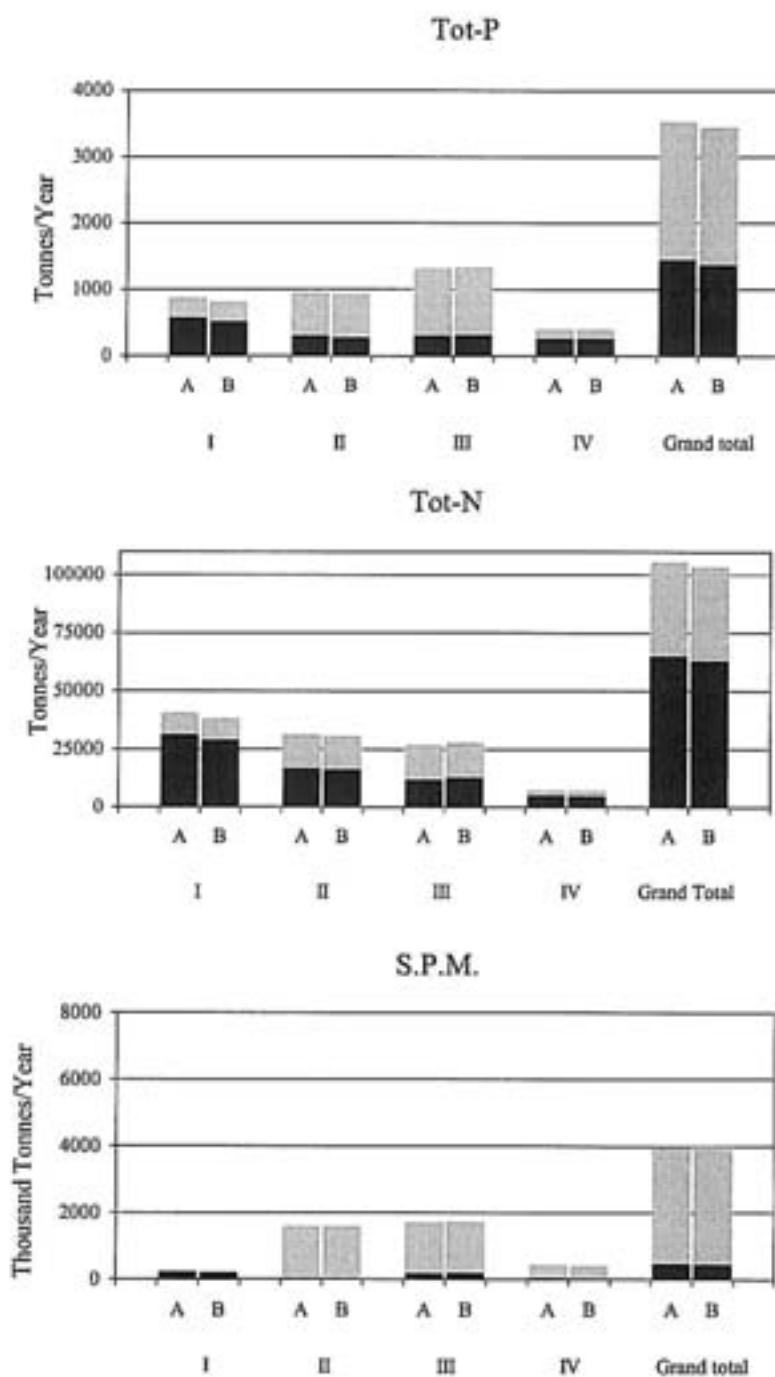


Fig. 7 Nutrients and S.P.M. Total and river discharges 1998 (A) and Total normalized loads (B) from mainland Norway to convention waters and the four subregions: I: Skagerrak, II: The remaining North Sea, III: The Norwegian Sea, IV: The Barents Sea.

Whole columns = Grand total  
 Light hatching = Direct discharges  
 Dark hatching = Main and tributary rivers

In this region where 94 per cent of the area is river-monitored, about 67 per cent of the P-load and 78 per cent of the N-load were found in the riverine inputs.

According to the results from the 1998 investigation, total annual nutrient load to coastal waters from landbased Norwegian sources, is approximately 3527 tonnes of phosphorus and 105.547 tonnes of nitrogen (Fig. 7). About 41 per cent of the phosphorus and 62 per cent of the nitrogen yield were inputs from the monitored rivers and tributaries. Copper and zinc comprised the largest inputs of heavy metals, which in 1998 amounted to about 308 and 1265 tonnes, of which 81 and 89 per cent respectively, were river monitored (Fig. 8).

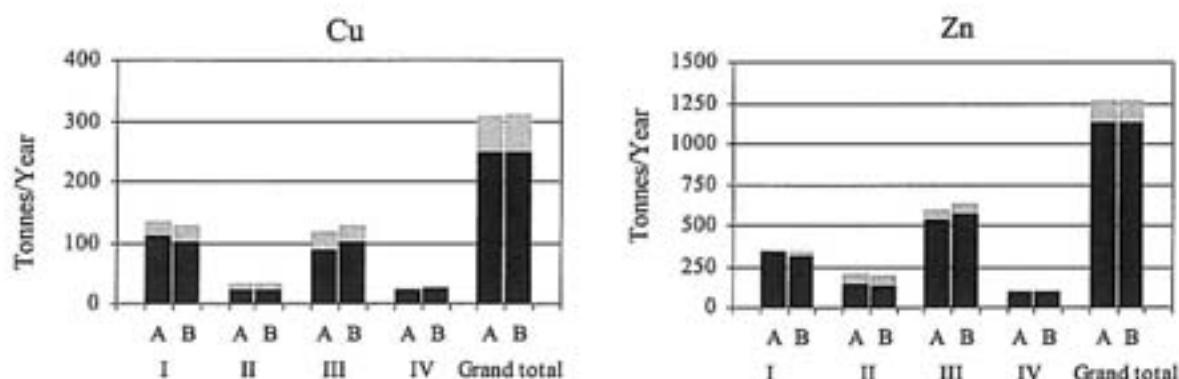


Fig. 8 Cu and Zn. Total- and river-discharges 1998 (A) and Total normalized loads (B) from mainland Norway to convention waters and the four subregions:

I: Skagerrak, II: The remaining, North Sea, III: The Norwegian Sea, IV: The Barents Sea  
 Whole columns = Grand total  
 Light hatching = Direct discharges  
 Dark hatching = Main and tributary rivers

Inputs of other metals and persistent organic pollutants were low. As the detection limits of the parameters Cd and Pb at the NIVA laboratory were above those requested from PARCOM, all analyses from 1992 and onwards of these substances are analysed on an ICP-MS-instrument at NILU (paragraph 3.2). Still, quite a few of the concentrations found for these parameters in 1998 were below the detection limits. Therefore two quantities have been estimated, one assuming that the true concentration was zero and the other assuming that the true concentration was the limit of detection. This provides maximum and minimum concentrations within which the true estimate will fall. When evaluating inputs these data provide upper and lower boundaries of the estimate.

Inputs of cadmium were measured/calculated to be between 7.3 and 8.2 tonnes, lead between 149.1 and 149.2 tonnes and mercury between 2742 and 2839 kg. The same "below detection limit problem" applies for the inputs of mercury, and also for PCBs which were measured to be between 0.38 and 44 kg. In Fig. 9 the lower and upper loads of these substances in the ten main rivers are presented. The pesticide lindane was found in most analyses, but in small amounts. The findings of this substance in Norwegian rivers are likely due to long range air pollution, as we often find lindane in runoff from areas where the compound has never been used (Olav Lodhe, State Plant Protection Agency, pers. comm.). Total load is estimated to about 84 kg.

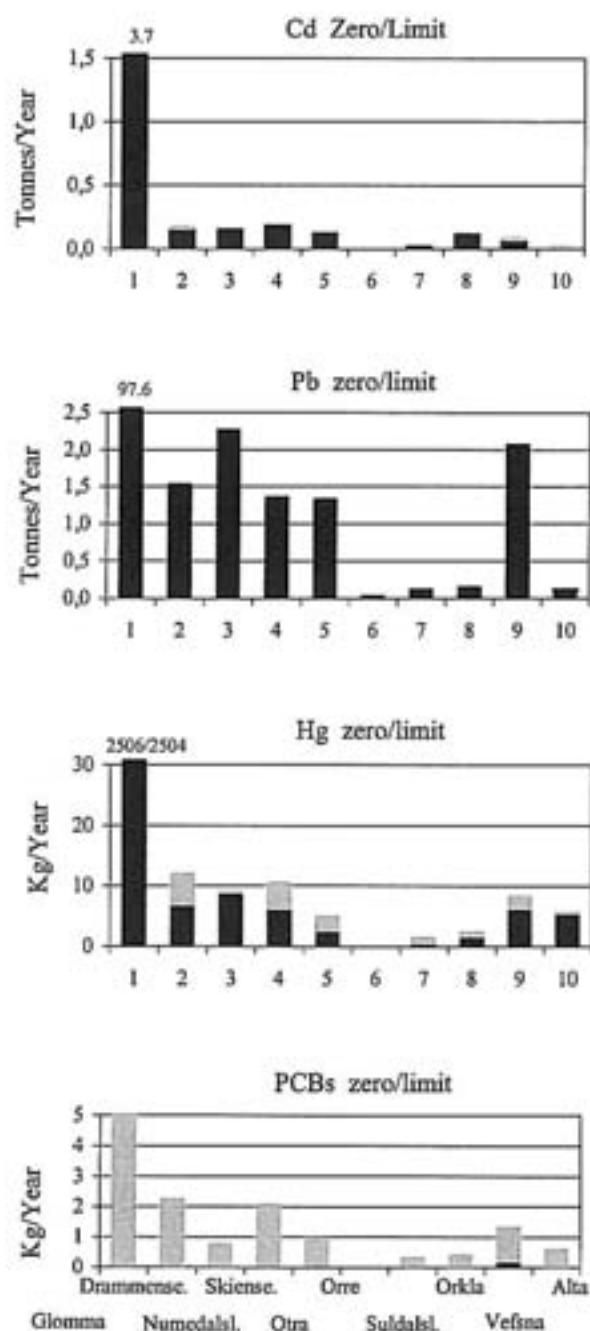


Fig. 9 Main rivers. Cd, Pb, Hg and PCBs. Total loads of the different rivers 1998 (lower and upper boundaries for the estimates).

Whole columns = upper boundary for the estimate  
 Dark hatching = lower boundary for the estimate

The relatively high load of Hg in 1998, is due to the large input from the river Glomma. Almost 90% of the total quantity is discharged with the river water. Twice in 1998 the measured concentrations of Hg were extremely high (915 and 730 ng/l, respectively) when compared to the maximum of 11 ng/l for the period 1990 – 1997 (Holtan et al., 1999). A finding of the study is that the largest quantities of mercury are usually transported in autumn and spring, i.e. during periods of high flow and when mercury levels in the water also reach their peak (see also SNV 1991). The highest values have often occurred at the same time as the peak values of suspended particulate matter. The water level is often high during spring and autumn which might lead to overbank flooding with erosion of soil, for instance from the fibre banks of former pulp and paper industry discharges which may contain mercury. This may be part of the explanation at least for one of the high mercury records. For the second and highest value we have not found any good explanation. The samples were reanalysed with the same result. We have not found any error in sampling or analysis. A possible source for Hg in the lower part of Glomma should be investigated further.

In most areas the riverine inputs of Total-P and S.P.M were slightly lower in 1998 compared to 1997, mainly due to differences in precipitation/runoff-conditions (paragraph 4.3). Up north, in the Alta area, runoff/precipitation were higher and therefore also the P-, N- and S.P.M.-loads.

The input-values vary to a great extent with the volume of the discharges (Fig. 10). It is therefore difficult to say anything certain about altered pollution level in the different rivers, even if there may be indications of an improved situation for most rivers/most parameters. Trend analyses would be important and facilitate the matter, especially for the rivers having long time series of data. The period from 1990 to 1998 may be too short to identify a real trend.

Statistical trend analyses (by the recommended tool "trend-y-tector") on annual basis in inputs of nutrients and heavy metals are presented in Fig. 11 for the following rivers with long time dataseries: River Glomma (1978-1998), Total-P and Total-N, river Otra (1980-1998) also Total-P and Total N and river Orkla (1974-1998), Cu and Zn. The analyses show significant reductions in the yearly inputs of nutrients (Otra, P: 74%, N: 35%) and heavy metals (Orkla, Cu: 80%, Zn: 79%). As for Glomma there has also been detected a downward trend for Total-P (24%), but for Total N an upward trend of 19%. Here the high floods, especially in 1987 and 1995, were complicating the trend analyses.

#### **4.3 Mean annual runoff (1931-60, 1961-90) and "mean load"**

Mean annual runoff for the last LTA-period (1961-90) has been estimated (Fig. 2). For most main rivers the mean runoff 1961-90 is lower or at the same level as the 1931-60-period. However, the 1961-90 values are preliminary and may be adjusted when edited and published by the Norwegian Water Resources and Energy Administration. As for precipitation, new normals were published in 1993.

Compared to Riverine Inputs to Marine Waters in 1990 - 1997, most calculated mean concentrations were of the same level in 1998. Total flow for most "Skagerrak" rivers, and accordingly the calculated loads for most of the substances were slightly higher in 1998 than in 1997. An exception is river Glomma with lower input of Total-P in spite of higher flow. This complies with the downward trend for Total-P which is presented in Fig. 11. As for the other main rivers (except Alta), total flow was lower, with lower calculated loads for most substances as a result.

Annual variations in precipitation/runoff, erosion and human activities in the drainage basins, strongly influence the mass transport in the watercourses. The transport values may vary considerably from one year to another. These variations are complicating the estimation of "normal transport values" i.e. mass transport in a "normal" year. Fig. 10 illustrates variations in annual runoff for the ten main rivers in 1985, 1990-1998, along with annual variations in total discharges of nutrients.

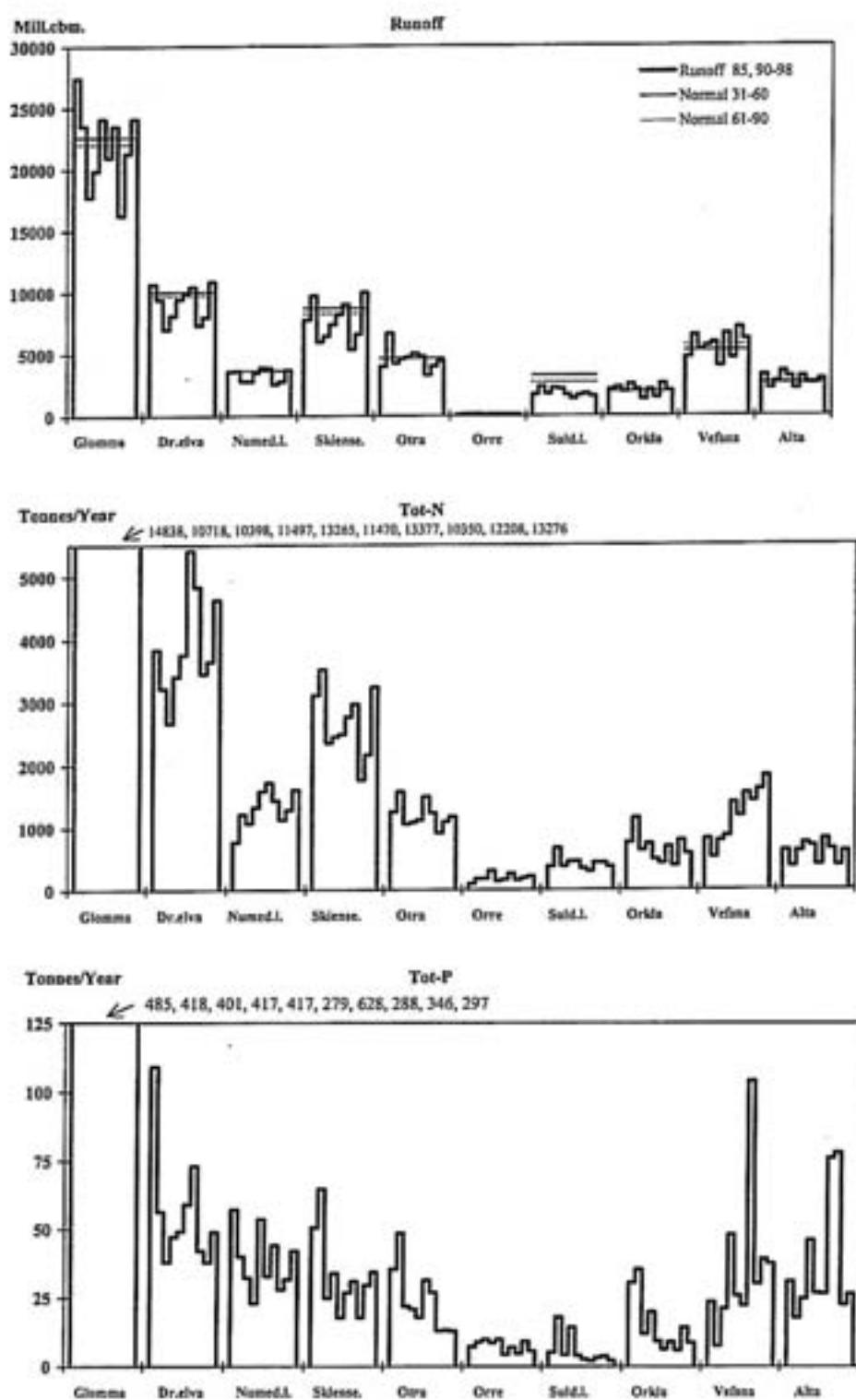
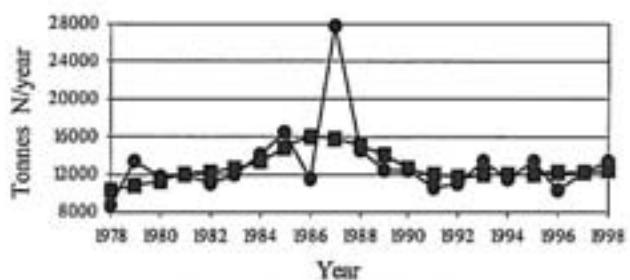
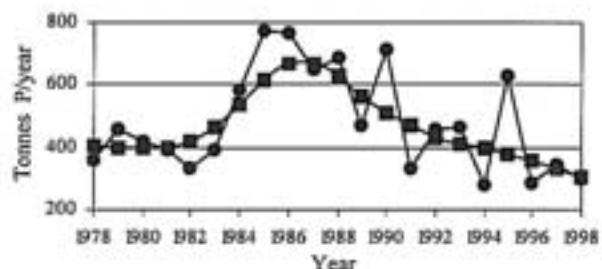
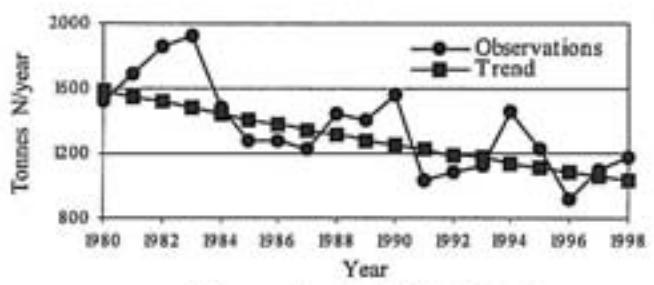
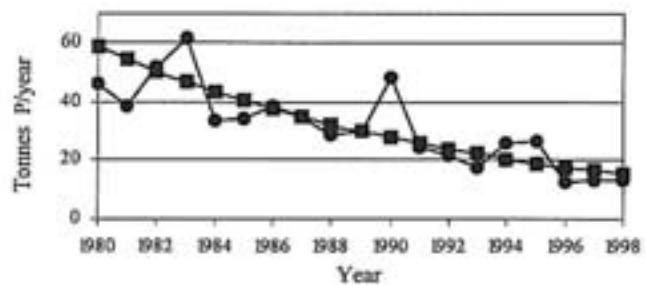


Fig. 10 Main rivers. Annual runoff and nutrient load in 1985, 1990-1998.

## Glomma at Sarpsfoss



## Otra at Skråstad



## Orkla at Vormstad

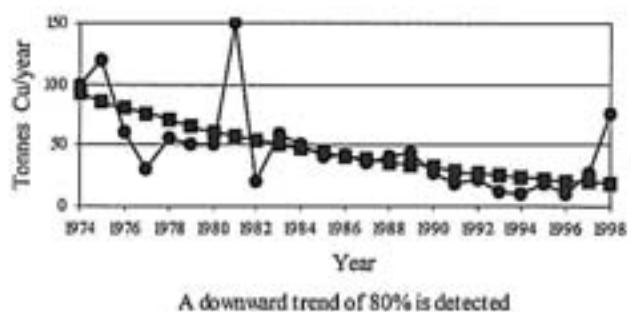
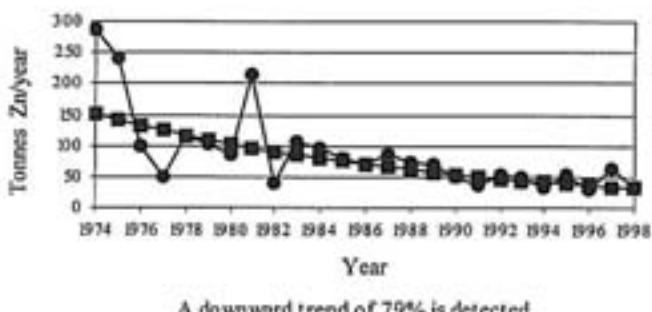


Fig. 11 Trends in inputs of Total P and Total N (Glomma, Otra), Cu and Zn (Orkla).

In order to adjust the 1998 transport values to a "normal year", approximations have been made by multiplying weighted mean concentrations by mean runoff (LTA, 1961-90). "Mean-values" (normals) for the ten main rivers and tributaries are given in Appendix X, Report B, where also total discharges to the sub regions are shown. In Fig. 6 - 7 the "normalized" nutrient transport values are compared with 1998-values.

During a normal winter the upland area of Norway together with the eastern part of the country show very little runoff. The frozen soil and snowcover protect vegetation and surface soil from erosion. But with the mild winters (1990-1993 and also 1995), soil especially in plowed field is exposed to more frequent and larger flood erosion also during the winter (eg. Glomma). As 1997 and 1998 were relatively mild winters compared to 1996, we suppose this is the main reason for somewhat higher concentrations/-loads in most rivers.

From experience we have learned that the product of weighted concentrations and mean runoff gives a relatively good estimate of the mass-transport in rivers, especially for the large rivers, and those not considerably exposed to erosion-material. In 1998 annual precipitation were about normal or a little higher (100 - 125 per cent) in most of the country (Fig 3). On an annual basis runoff also varied within a normal range in most of the country (Fig. 2). The river Suldalslågen is recently regulated (partly diverted to another catchment) and has now considerably less annual water discharge than in the normal period (1931-60).

#### 4.4 Nutrient retention in fjords

Both phosphorus and nitrogen retention in watercourses is taken into account in the calculation of the Norwegian contribution to marine pollution, but in a conservative way. However, no corrections are so far made for retention in fjords and other marine areas.

Considering the nutrient input to the open marine waters, one should also take into account retention in fjords, at least in well defined threshold fjords. As a result of high salinity compared to freshwater, marine waters have better conditions for sedimentation than lakes. For example clay settles very poorly in lakes, but more efficient in fjords. The watermasses are usually stratified, with light brackish water on top of heavier, saline waters. Thus the overall stratification in fjords is in most cases stronger than in lakes. This implies that particulate pollutants lost to deep waters by sedimentation have less chance to be brought back to the euphotic zone than in lakes.

In addition, stronger stratification implies greater chance for oxygen depletion in deep waters, which in fact is seen in many sheltered Norwegian fjords. Theoretically this will improve the conditions for denitrification. However, this greater stability is often reduced by rougher physical conditions in fjords compared to lakes.

Retention in Norwegian fjords is very poorly studied by direct budget measurements. In the Drammensfjord, Magnusson and Næss (1986) found that about 60% of the incoming phosphorus was retained in the fjord, while for nitrogen the retention was only about 15%. In the silled Inner Oslofjord preliminary calculations indicate that nitrogen retention is in the order of 30-50% (Baalsrud, K., and B. Bjerkeng, 1991).

Thus, nutrient retention in threshold fjords seems to be of the similar magnitude as we find in lakes, and it is likely to believe that retention can be estimated from the same type of models that applies for lakes. The general lack of calibration data on retention models in fjords implies that we find it to early, at this stage of knowledge, to include this correction in the Norwegian discharge budget. It should be kept in mind, however, that a significant part of the particulate pollutants, and pollutants with particle affinity, end up in fjord sediments and thus are prevented from reaching the coastal waters.

## 5. REFERENCES

### 5.1 Project Personnel

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- (10) ALTA: P. Nilsen. Finnmarksforskning. Alta.

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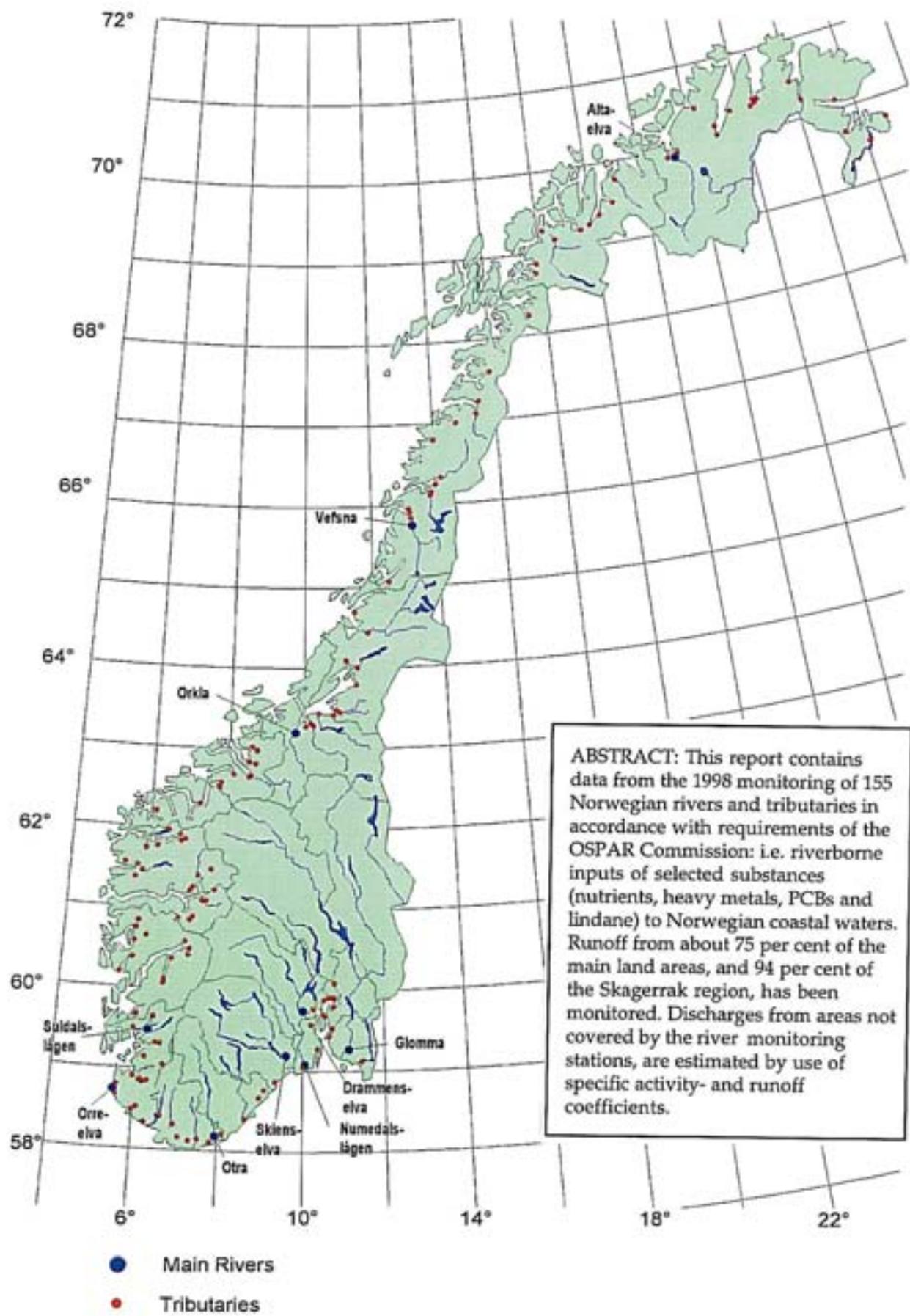
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**CONVENTION FOR THE PREVENTION OF MARINE POLLUTION FROM LANDBASED SOURCES  
QUESTIONNAIRE ACCORDING TO THE TENTH MEETING OF THE PARIS COMMISSION  
LISBON 15 - 17 JUNE 1988.**

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The purpose of this form is to provide the Commission, in accordance with Article 17(B) of the Paris convention, with an assessment of the waterborne inputs to Convention waters.

The form should be completed for each calendar year in retrospect and submitted to the Secretary by June following the year to which the data relate.

The information sought relates to inputs through direct discharges (questions 7 - 13) and riverine inputs (questions 14 - 19).

Some information on discharges other than those mentioned below are also attached (question 20).

Separate forms for the four single areas are filled in.

- (1) THE COUNTRY IS NORWAY
- (2) LENGTH OF COASTLINE INCLUDING FJORDS AND BAYS IS 21347 KM
- (3) NATURE OF THE RECEIVING WATER IS COASTAL

<b>APPENDIX I : TOTAL DISCHARGES 1998 (Paragraph 4 - 6)</b>		<b>Page:</b>
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**Paragraph 4: Direct Discharges**

**Paragraph 5: Riverine Discharges**

**Paragraph 6: Grand Total**

**Table I TOTAL DISCHARGES from MAINLAND NORWAY  
to convention waters 1998 ( Fig. I ).**

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		1.2	1.6 *	4.5 *	7.3	tonnes
Cadmium			2.4 **	4.6 **	8.2	tonnes
Mercury	115.5	86 *	2541 *	2742		kg
Mercury		162 **	2561 **	2839		kg
Copper	60.4	115	133	308		tonnes
Zinc	135.6	797	332	1265		tonnes
Lead	6.4	36.1 *	106.6 *	149.1		tonnes
Lead		36.2 **	106.7 **	149.2		tonnes
Arsenic	0.6	20.1 *	9.9 *	30.6		tonnes
Arsenic		25.6 **	11.3 **	37.5		tonnes
Cr-T	4.9	412.4 *	5.5 *	422.7		tonnes
Cr-T		469.2 **	33.0 **	507.1		tonnes
Ni	14.4	239.9 *	50.3 *	304.6		tonnes
Ni		246.2 **	51.1 **	311.7		tonnes
V			17.2 *	17.2		tonnes
V			19.4 **	19.4		tonnes
PCBs ***		0.22 *	0.16 *	0		kg
PCBs		29.8 **	13.9 **	44		kg
gamma-HCH		54	30	84		kg
NH4-N	1374	9925	2953 *	1187 *	15440	tonnes
NH4-N			2967 **	1187 **	15453	tonnes
NO3-N	15295	65	19152	15705	50216	tonnes
PO4-P	190	644	284 *	198 *	1316	tonnes
PO4-P			296 **	198 **	1328	tonnes
Total N	24066	16492	37463	27526	105547	tonnes
Total P	778	1300	934	516	3527	tonnes
SiO2			265813	165817	431629	tonnes
S.P.M.	3482987	251012	217044	3951043		tonnes
TOC		22320	242414	245700	510434	tonnes
COD	188709				188709	tonnes
BOD		44459			44459	tonnes

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

\*\*\* the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

**Table 1.1 TOTAL DISCHARGES to The Skagerrak Region 1998 ( Fig. I.I ).**

The Skagerrak Region with main rivers (1) Glomma, (2) Drammenselva, (3) Numedalslåger  
 (4) Skjenselva, (5) Otra

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.11	0.5	*	4.3	*
Cadmium			0.5	**	4.3	**
Mercury		54.50	14	*	2528	*
Mercury			18	**	2543	**
Copper		24.87	9		101	
Zinc		19.75	78		262	
Lead		0.71	6.8	*	104.1	*
Lead			6.8	**	104.1	**
Arsenic		0.20	3.31	*	7.7	*
Arsenic			3.31	**	8.7	**
Cr-T		2.60	6.3	*	5.4	*
Cr-T			12.7	**	26.5	**
Ni		5.22	5.8	*	43.8	*
Ni			6.6	**	44.2	**
V					17.1	*
V					17.1	**
PCBs ***			0.06	*	0.00	*
PCBs			3.0	**	11.2	**
gamma-HCH			10.4		28	
NH4-N	164	3907	386	*	1079	*
NH4-N			386	**	1079	**
NO3-N	1793	25	4316		14577	
PO4-P	18	84	43	*	167	*
PO4-P			43	**	167	**
Total N	2777	6280	7426		23918	
Total P	73	217	142		435	
SIO2			34685		136436	
S.P.M.		10016	40095		181271	
TOC		7398	60554		206205	
COD		114896				114896
BOD		15033				15033

Measurements below detection limits are treated in two ways :

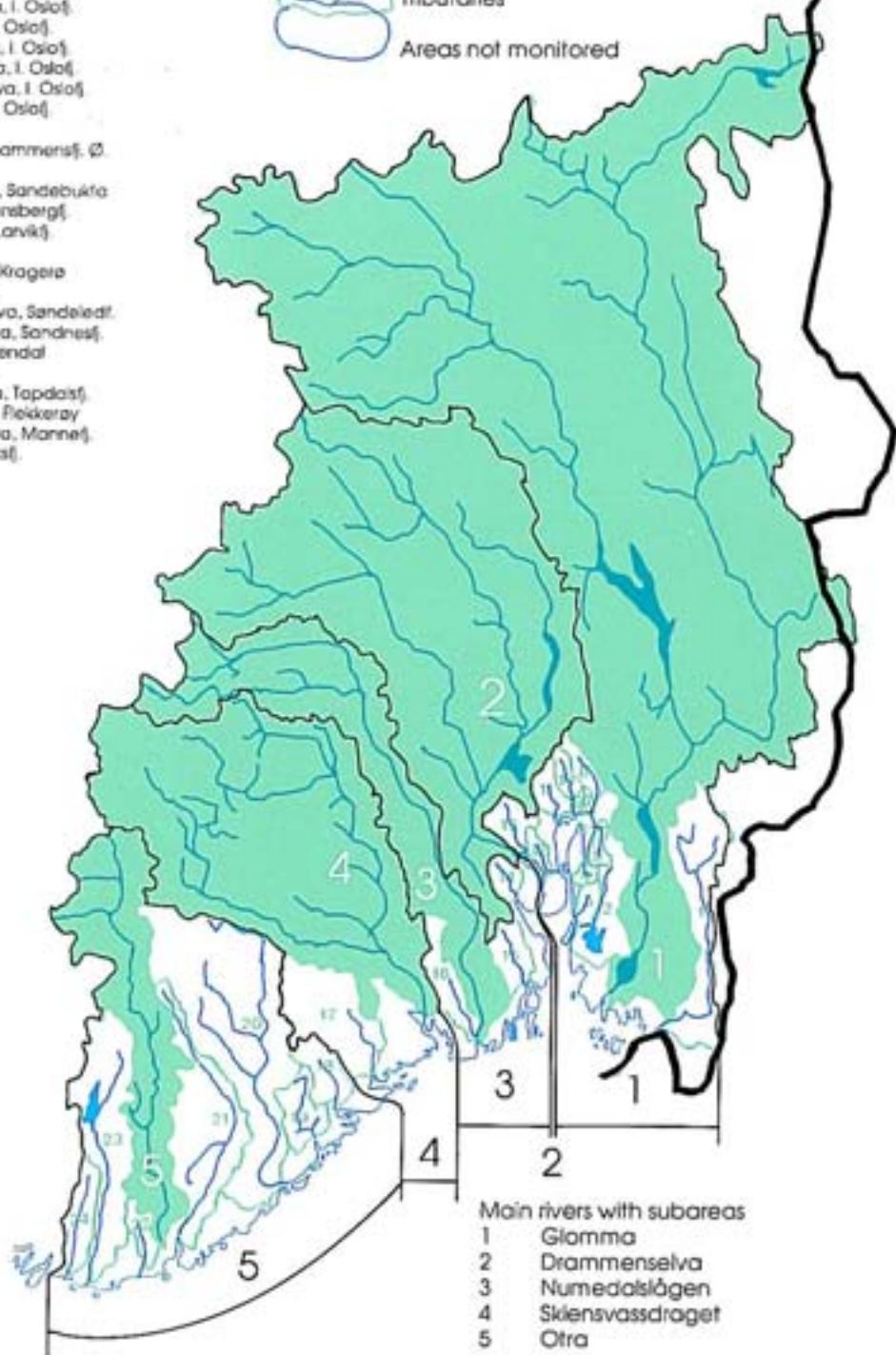
\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

\*\*\* the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

- 1 ØSTFOLD**  
 1 Tista, Iddelj.  
 2 Mosselva, Mossesundet Ø.  
**OSLO & AKERSHUS**  
 3 Heleneelva, Drøbakssundet Ø.  
 4 Årungelva, i. Oslo  
 5 Gjennælva, i. Oslo  
 6 Ljanselva, i. Oslo  
 7 Løelva/Aiha, i. Oslo  
 8 Akerselva, i. Oslo  
 9 Frognerelva, i. Oslo  
 10 Lysakerelva, i. Oslo  
 11 Sandvikselva, i. Oslo  
 12 Årælva, i. Oslo  
**2 BUSKERUD**  
**3 VESTFOLD**  
 13 Lierelva, Drammensfj. Ø  
**4 TELEMARK**  
 14 Sandeelva, Sandebukta  
 15 Aulavla, Tønsbergfj.  
 16 Farriselva, Larvikfj.  
**5 AUST-AGDER**  
 17 Tokkeelva, Kragerø  
**VEST-AGDER**  
 18 Gjerstadelva, Sandeledt  
 19 Vegårdselva, Sandnesfj.  
 20 Nidelva, Arendal  
**5**

**Fig. I.I**  
 Main Rivers and Tributaries draining to  
 The Skagerrak Region of The North Sea.



I North Sea/Skagerrak

**Table 1.2 TOTAL DISCHARGES to The Remaining North Sea  
1998 ( Fig. I.II ).**

The North Sea Region with main rivers : (6) Orreelva, (7) Suldalslägen

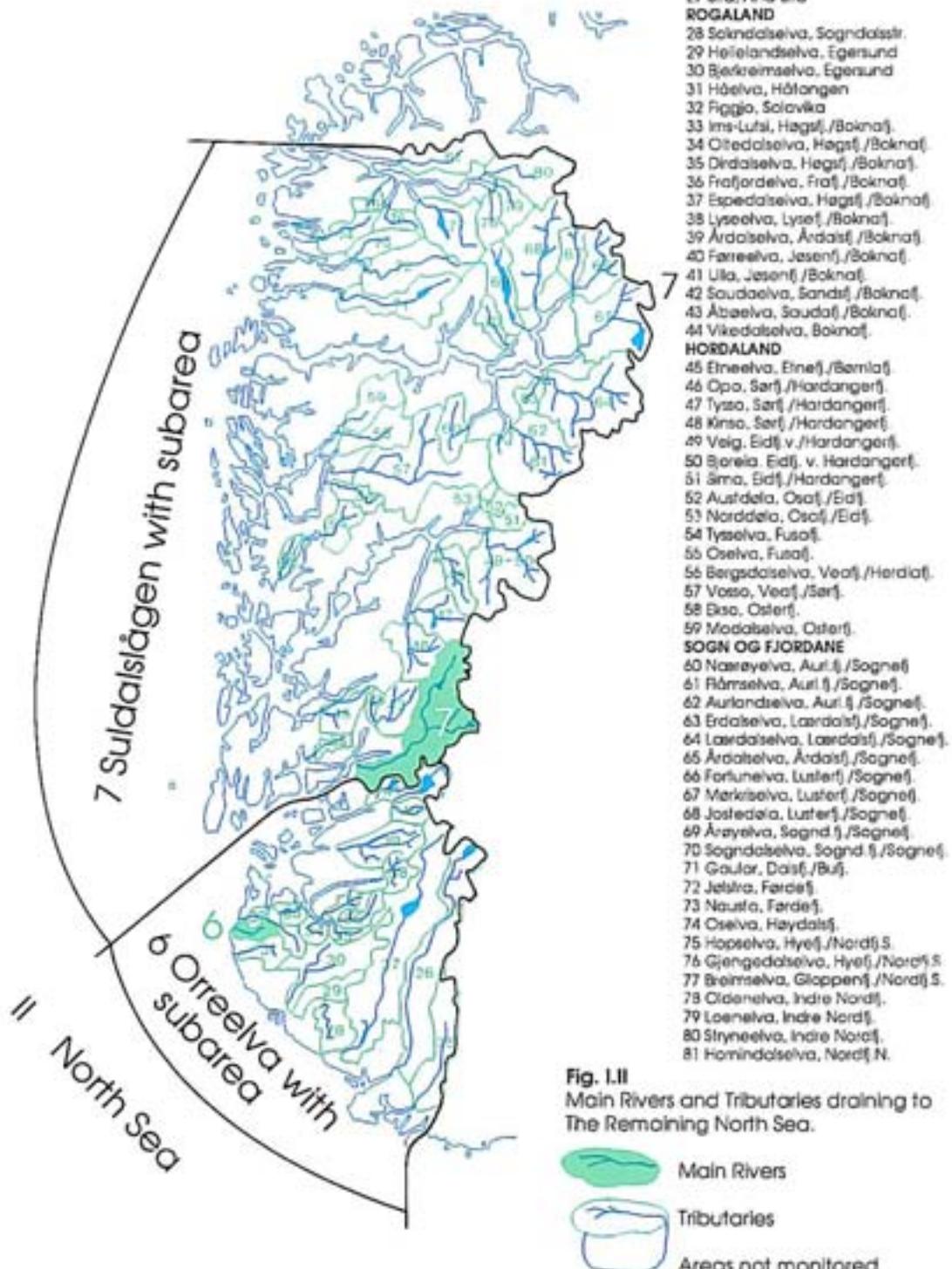
Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total		
Cadmium		0.99	0.7 *	0.0 *	1.7	tonnes	
Cadmium			0.9 **	0.0 **	1.9	tonnes	
Mercury	39.74	33	*	0.4 *	73	kg	
Mercury		56	**	1.8 **	97	kg	
Copper	8.51	22		1	31	tonnes	
Zinc	54.11	146		3	203	tonnes	
Lead	4.76	9.9	*	0.2 *	14.9	tonnes	
Lead		10.0	**	0.2 **	14.9	tonnes	
Arsenic	0.00	5.4	*	0.0 *	5.5	tonnes	
Arsenic		8.1	**	0.2 **	8.3	tonnes	
Cr-T	1.17	0.0	*	0.0 *	1.2	tonnes	
Cr-T		23.8	**	0.9 **	25.8	tonnes	
Ni	6.56	26.9	*	0.3 *	33.7	tonnes	
Ni		30.1	**	0.5 **	37.2	tonnes	
V				0.0 *	0.0	tonnes	
V				0.0 **	0.0	tonnes	
PCBs ***		0.2	*	0.00 *	0.2	kg	
PCBs		10.1	**	0.4 **	10.5	kg	
gamma-HCH		17.3		0	18	kg	
NH4-N	517	2736	719	*	11 *	3984	tonnes
NH4-N			719	**	11 **	3984	tonnes
NO3-N	5835	18	10677		396	16927	tonnes
PO4-P	51	223	57	*	3 *	335	tonnes
PO4-P			63	**	3 **	341	tonnes
Total N	9281	5059	16189		596	31126	tonnes
Total P	197	446	297		8	949	tonnes
SiO2			75432		1172	76604	tonnes
S.P.M.	1554425		38764		1665	1594854	tonnes
TOC		6938	80766		1459	89162	tonnes
COD		40832				40832	tonnes
BOD		13518				13518	tonnes

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

\*\*\* the following congeners: IUPAC Nos. 28,52,101,118,153,138,180



**Table 1.3 TOTAL DISCHARGES to The Norwegian Sea 1998 ( Fig. I.III ).**

The Norwegian Sea Region with main rivers (8) Orkla, (9) Vefsna

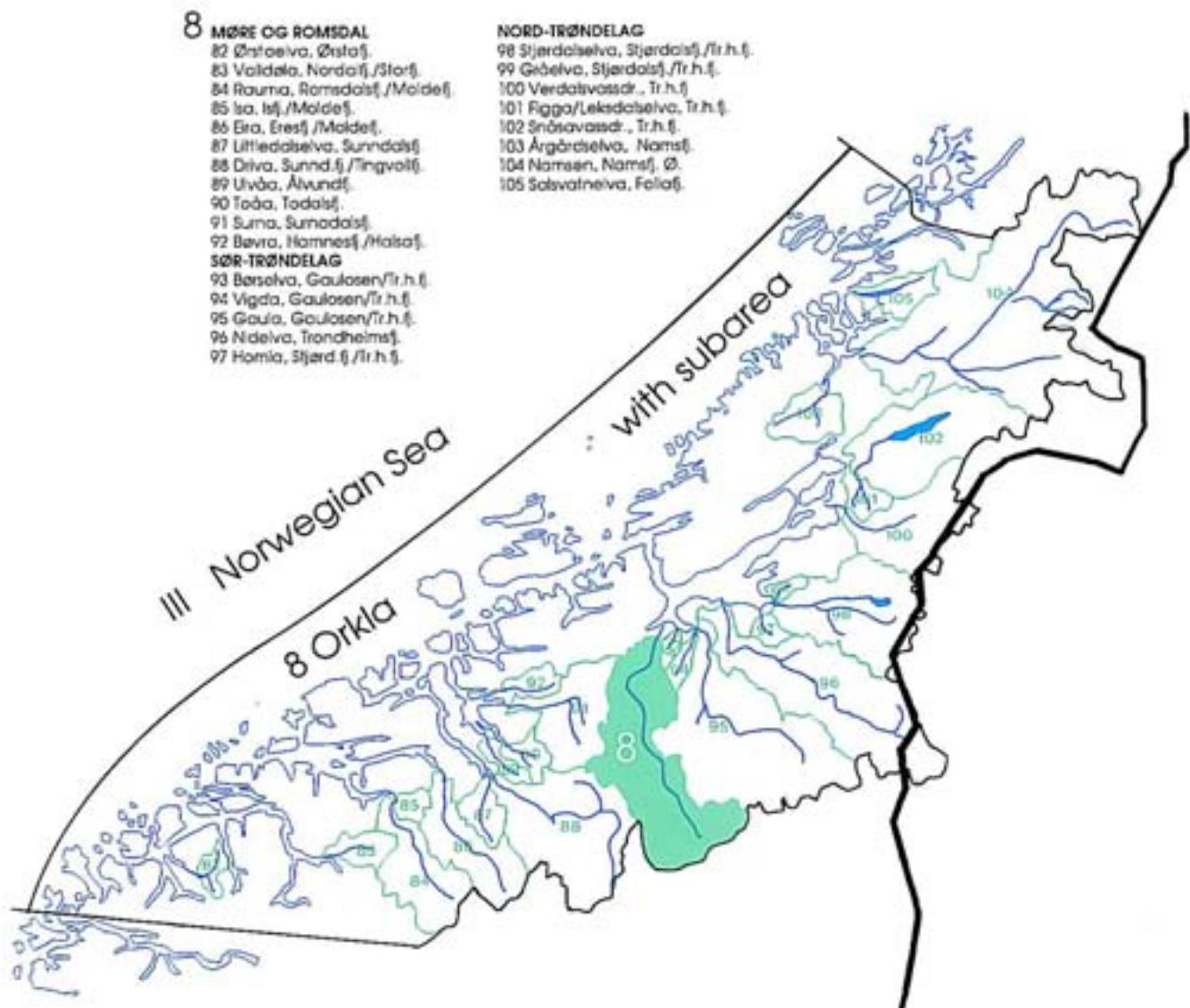
Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.10	0.1	*	0.2	*
Cadmium			0.7	**	0.2	**
Mercury		21.27	28	*	8	*
Mercury			70	**	11	**
Copper		26.65	62		28	
Zinc		61.30	476		66	
Lead		0.93	15.5	*	2.2	*
Lead				15.5	**	2.2
Arsenic		0.40	8.5	*	0.8	*
Arsenic			11.1	**	0.8	**
Cr-T		1.08	395.0	*	0.1	*
Cr-T			415.8	**	4.1	**
Ni		2.50	173.0	*	5.4	*
Ni			174.8	**	5.4	**
V					0.1	*
V					1.7	**
PCBs ***			0.0	*	0.2	*
PCBs			12.9	**	1.8	**
gamma-HCH			22.9		1	
NH4-N	607	3024	428	*	78	*
NH4-N			442	**	78	**
NO3-N	6652	20	3827		609	
PO4-P	103	310	74	*	18	*
PO4-P			77	**	18	**
Total N	10327	4807	9401		2403	
Total P	419	592	258		46	
SiO2			78119		14957	
S.P.M.		1539978	141331		29323	
TOC		7621	60797		27729	
COD		31751				31751
BOD		15181				15181

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

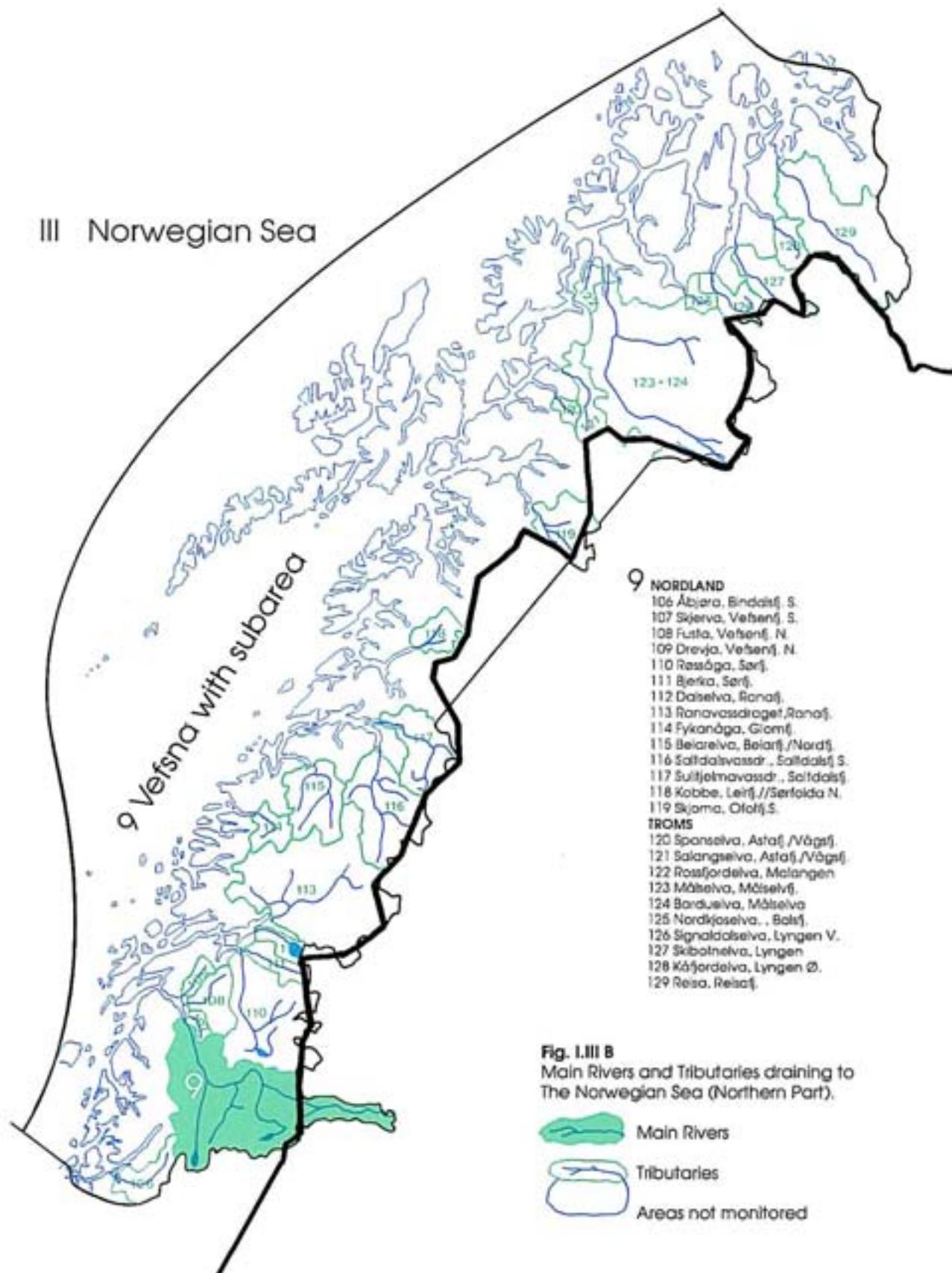
\*\* ) Detection limit = Limit

\*\*\* the following congeners: IUPAC Nos. 28,52,101,118,153,138,180



**Fig. I.III A**  
Main Rivers and Tributaries draining to  
The Norwegian Sea (Southern Part).





**Fig. I.III B**  
Main Rivers and Tributaries draining to  
The Norwegian Sea (Northern Part).

**Table 1.4 TOTAL DISCHARGES to The Barents Sea 1998 ( Fig. I.IV ).**

The Barents Sea Region with main river (10) Alta

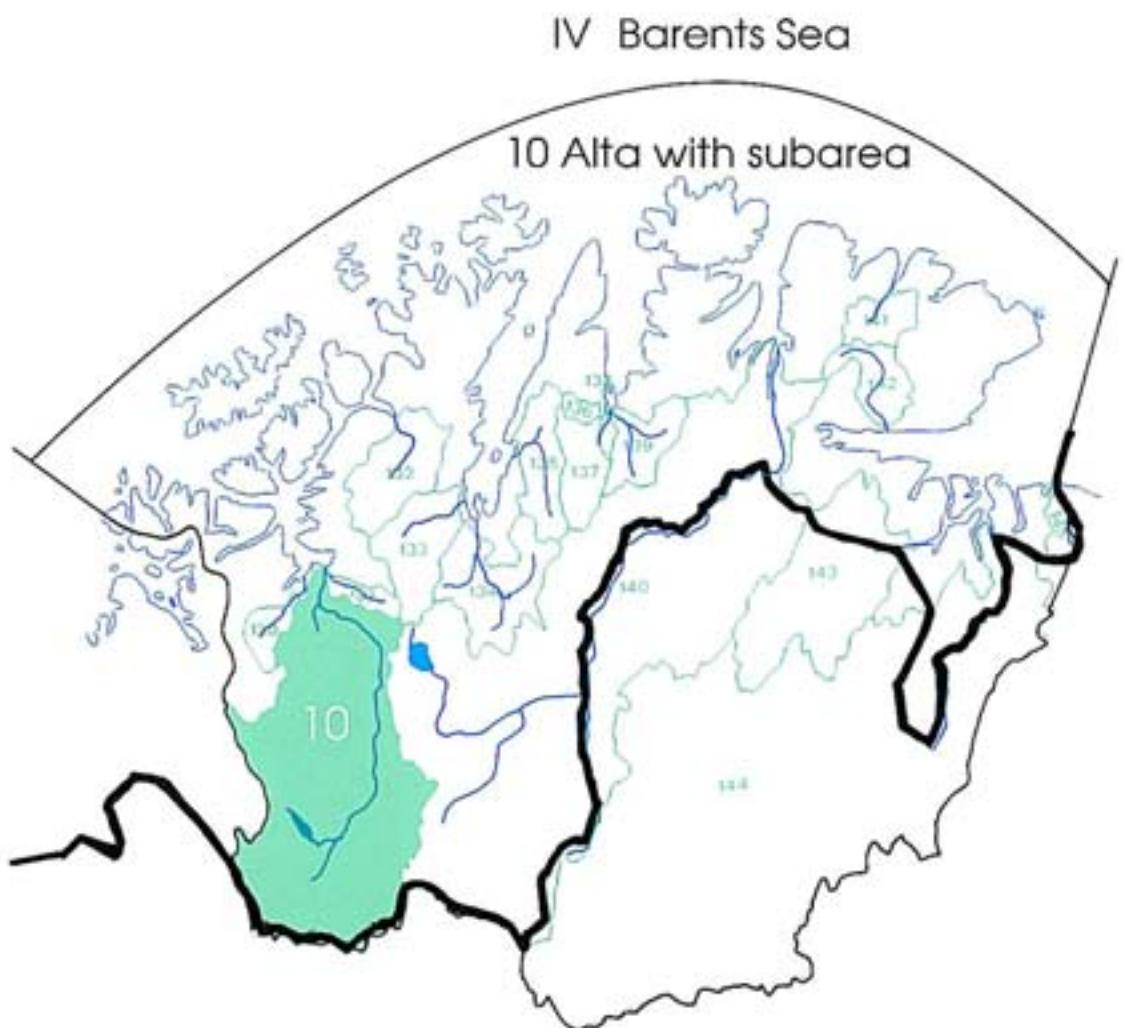
Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.00	0.3	*	0.00	*
Cadmium			0.4	**	0.03	**
Mercury		0.00	11	*	5.31	*
Mercury			18	**	5.79	**
Copper		0.37	22		2.65	
Zinc		0.43	97		1.35	
Lead		0.01	3.9	*	0.11	*
Lead			3.9	**	0.12	**
Arsenic		0.00	2.9	*	1.47	*
Arsenic			3.2	**	1.47	**
Cr-T		0.04	11.0	*	0.00	*
Cr-T			16.9	**	1.47	**
Ni		0.12	34.3	*	0.89	*
Ni			34.7	**	1.03	**
V					0.00	*
V					0.59	**
PCBs ***			0.0	*	0.00	*
PCBs			3.7	**	0.62	**
gamma-HCH			3.7		0.12	
NH4-N	85	258.00	1420	*	18.93	*
NH4-N			1420	**	18.93	**
NO3-N	1015	1.72	332		122.03	
PO4-P	18	26.51	111	*	9.53	*
PO4-P			113	**	9.53	**
Total N	1681	346	4447		609.01	
Total P	88	44.70	236		26.63	
SiO2			77577		13252	
S.P.M.		378568	30822		4786	
TOC		363	40298		10307	
COD		1230				1230
BOD		726				726

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

\*\*\* the following congeners: IUPAC Nos. 28,52,101,118,153,138,180



**Fig. I.IV**  
Main Rivers and Tributaries draining to  
The Barents Sea.



- 10 FINNMARK**
- 130 Matiselva, Kåfj./Altafj.
  - 131 Tverrelva, Altafj.
  - 132 Reppanfjordelva, Repparfj.
  - 133 Stabburselva, i. Porsangen V.
  - 134 Lakselva, i. Porsangen S.
  - 135 Barselva, i. Porsangen Ø.
  - 136 Mottusjökkia, i. Laksefj. V.
  - 137 Storelva, i. Laksefj. V.
  - 138 Soutsjökkia, i. Laksefj. V.
  - 139 Adamselva, i. Laksefj. Ø.
  - 140 Tanavassdø, Tanafj. S.
  - 141 Vesteralova, Syltefj.
  - 142 V. Jakobselv, Y. Varangerfj.
  - 143 Neiden Munkfj./Varangerfj.
  - 144 Passikelva, Bekfj./Varangerfj.
  - 145 Grense Jakobselv, Varangerfj.

**APPENDIX II : SEWAGE EFFLUENTS FROM DOWNSTREAM AREAS OF  
MAIN AND TRIBUTARY RIVERS AND RIVERS NOT  
MONITORED 1998 (Paragraph 7 - 8)**

Table II	Sewage effluents from down stream areas of mainland Norway to convention waters 1998	18
Table 2.1	Sewage effluents to the Skagerrak region	19
Table 2.2	Sewage effluents to the remaining North Sea	20
Table 2.3	Sewage effluents to the Norwegian Sea region	21
Table 2.4	Sewage effluents to the Barents Sea region	22

**Paragraph 7: Sewage effluents .**

**Paragraph 8: Measurements of calculation used - including information on the concentration upon which the measurement is based:**

Paragraph 3.3 (Report A, 1991, 1992 - 1999)

Municipal sewage includes a portion of industrial effluents

**Table II Sewage Effluents from down stream areas of mainland Norway to convention waters ( 1998 ).**

Total quantity of substance discharged per year:

Regions:	I	II	III	IV	Sum
	The Skagerrak	The North Sea	The Norwegian Sea	The Barents Sea	
Substance:	Region	Sea	Sea	Sea	
Cd	99	52	48	1	200 kg
Hg	45	33	21	0	99 kg
Cu	15.8	7.8	9.2	0.4	33.2 tonnes
Zn	18.9	12.1	10.7	0.4	42.2 tonnes
Pb	593	278	283	12	1166 kg
Cr-T	2.0	0.8	0.9	0.0	3.8 tonnes
Ni	3.3	1.5	1.8	0.1	6.8 tonnes
PCBs					kg
gamma-HCH					kg
NH4-N	3907	2736	3024	258	9925 tonnes
NO3-N	25	18	20	2	65 tonnes
PO4-P	84	223	310	27	644 tonnes
Tot-N	4957	3648	4033	344	12981 tonnes
Tot-P	140	372	517	44	1074 tonnes
S.P.M.	7089	10818	12492	663	31062 tonnes
TOC	7367	6759	7590	363	22079 tonnes
COD	30467	24099	25117	1230	80913 tonnes
BOD	15033	13518	15181	726	44459 tonnes

**Table 2.1 Sewage Effluents to The Skagerrak Region ( 1998 ).**

The Skagerrak region with sub-areas: ( 1 ) Glomma, ( 2 ) Drammenselva,  
 ( 3 ) Numedalslågen, ( 4 ) Skienselva, ( 5 ) Otra

Sub-areas :	Total quantity of substance discharged per year:					Precision of the estimate of the load	
	1	2	3	4	5		
<b>Substance:</b>							
Cd	44	11	18	6	20	kg	%
Hg	16	6	11	3	9	kg	%
Cu	8.22	1.75	1.80	0.92	3.16	tonnes	%
Zn	9.26	2.04	2.84	1.07	3.74	tonnes	%
Pb	320	57	78	30	108	kg	%
Cr-T	1.12	0.18	0.34	0.09	0.31	tonnes	%
Ni	1.90	0.29	0.47	0.15	0.53	tonnes	%
PCBs						kg	%
gamma-HCH						kg	%
NH4-N	2203	304	580	239	580	tonnes	
NO3-N	13	2	4	2	4	tonnes	%
PO4-P	28	7	19	5	25	tonnes	%
Tot-N	2685	406	773	319	774	tonnes	%
Tot-P	47	12	31	8	42	tonnes	%
S.P.M.	2651	396	1489	288	2265	tonnes	%
TOC	3579	533	1290	320	1645	tonnes	%
COD	15987	2131	4916	1175	6259	tonnes	%
BOD	7458	1066	2581	639	3289	tonnes	%

**Table 2.2 Sewage Effluents to The Remaining North Sea Region ( 1998 ).**

The remaining North Sea Region with sub-areas: ( 6 ) Orreelva, ( 7 ) Suldalslågen

Sub-areas :	Total quantity of substance discharged per year:		Precision of the estimate of the load
	6	7	
<b>Substance:</b>			
Cd	28	24	kg
Hg	22	11	kg
Cu	2.99	4.82	tonnes
Zn	6.48	5.62	tonnes
Pb	126	152	kg
Cr-T	0.35	0.48	tonnes
Ni	0.68	0.80	tonnes
PCBs			kg
gamma-HCH			kg
NH4-N	872	1864	tonnes
NO3-N	6	12	tonnes
PO4-P	46	178	tonnes
Tot-N	1162	2486	tonnes
Tot-P	77	296	tonnes
S.P.M.	3598	7220	tonnes
TOC	2573	4187	tonnes
COD	9827	14272	tonnes
BOD	5145	8373	tonnes

**Table 2.3 Sewage Effluents to The Norwegian Sea Region ( 1998 ).**

The Norwegian Sea Region with sub-areas: ( 8 ) Orkla, ( 9 ) Vefsna

Sub-areas :	Total quantity of substance discharged per year:		Precision of the estimate of the load
	8	9	
<b>Substance:</b>			
Cd	38	10	kg
Hg	14	7	kg
Cu	6.65	2.52	tonnes
Zn	7.76	2.94	tonnes
Pb	212	71	kg
Cr-T	0.66	0.25	tonnes
Ni	1.10	0.74	tonnes
PCBs			kg
gamma-HCH			kg
NH4-N	1817	1208	tonnes
NO3-N	12	8	tonnes
PO4-P	188	122	tonnes
Tot-N	2422	1611	tonnes
Tot-P	314	203	tonnes
S.P.M.	7511	4982	tonnes
TOC	4862	2728	tonnes
COD	16516	8601	tonnes
BOD	9724	5456	tonnes

**Table 2.4 Sewage Effluents to The Barents Sea Region ( 1998 ).**

The Barents Sea Region with sub-area: ( 10 ) Alta

Sub-area :	Total quantity of substance discharged per year:	Precision of the estimate of the load
Substance:		
Cd	1	kg
Hg	0	kg
Cu	0.37	tonnes
Zn	0.43	tonnes
Pb	12	kg
Cr-T	0.04	tonnes
Ni	0.12	tonnes
PCBs		kg
gamma-HCH		kg
NH4-N	258	tonnes
NO3-N	2	tonnes
PO4-P	27	tonnes
Tot-N	344	tonnes
Tot-P	44	tonnes
S.P.M.	663	tonnes
TOC	363	tonnes
COD	1230	tonnes
BOD	726	tonnes

**APPENDIX III : INDUSTRIAL EFFLUENTS FROM DOWN STREAM AREAS OF MAIN AND TRIBUTARY RIVERS AND RIVERS NOT MONITORED 1998 (Paragraph 11 - 13)**

Table III	Industrial effluents from down stream areas of mainland Norway to convention waters 1998	24
Table 3.1	Industrial effluents to the Skagerrak region	25
Table 3.2	Industrial effluents to the remaining North Sea	26
Table 3.3	Industrial effluents to the Norwegian Sea region	27
Table 3.4	Industrial effluents to the Barents Sea region	28

**Paragraph 11: Industrial effluents ./.**

**Paragraph 12: Measurements of calculation used - including information on the concentration upon which the measurement is based:**

Paragraph 3.3 (Report A, 1991, 1992 - 1999)

**Paragraph 13: Any other relevant information (e.g. proportion of substance discharged as insoluble material):**

A portion of industrial effluents is included in municipal sewage

**Table III Industrial Effluents from down stream areas of mainland Norway to convention waters ( 1998 ).**

Total quantity of substance discharged per year:

Regions:	I The Skagerrak	II The North Sea	III The Norwegian Sea	IV The Barents Sea	Sum
Substance:					
Cd	16	941	50		1007 kg
Hg	10	7	0		16 kg
Cu	9.03	0.70	17.48		27 tonnes
Zn	0.82	42.01	50.60		93 tonnes
Pb	121	4479	650		5249 kg
Arsenic	195	4	403	0	602 kg
Cr-T	0.56	0.34	0.17	0	1.07 tonnes
Ni	1.88	5.07	0.66		7.62 tonnes
PCBs					kg
gamma-HCH					kg
NO3-N					tonnes
PO4-P					tonnes
Tot-N	1324	1411	774	2	3511 tonnes
Tot-P	77	74	76	1	227 tonnes
S.P.M.	2927	1543607	1527486	377905	3451925 tonnes
TOC	32	178	31		241 tonnes
COD	84428	16733	6634		107796 tonnes

**Table 3.1 Industrial Effluents to The Skagerrak Region ( 1998 ).**

The Skagerrak Region with sub-areas: ( 1 ) Glomma, ( 2 ) Drammenselva,  
 ( 3 ) Numedalslågen, ( 4 ) Skienselva, ( 5 ) Otra

Sub-areas :	1	2	3	4	5	Precision of the estimate of the load
Total quantity of substance discharged per year:						
Substance:						
Cd	9.46		6.30		kg	%
Hg	9.52		0.08	0.00	kg	%
Cu	7486		15	94	1434 kg	%
Zn	547		112	4	157 kg	%
Pb	29.1		54.9	0.3	36.3 kg	%
Arsenic	0.0		0.0		195.0 kg	%
Cr-T	553.6		5.3		0.3 kg	%
Ni	344.2		234.8	126.5	1177 kg	%
PCBs					kg	%
gamma-HCH					kg	%
NO3-N					tonnes	%
PO4-P					tonnes	%
Tot-N	165.7	17.2	190.5	947.2	3.3 tonnes	%
Tot-P	31.7	0.7	20.2	22.4	1.9 tonnes	%
S.P.M.	765	137	1381	464	179 tonnes	%
TOC	0.0		22.3	9.2	tonnes	%
COD	52133	422	23277	2477	6121 tonnes	%

**Table 3.2 Industrial Effluents to The Remaining North Sea Region ( 1998).**

The remaining North Sea Region with sub-areas: ( 6 ) Orreelva, ( 7 ) Suldalslægen

Sub-areas :	6	7	Total quantity of substance discharged per year:	Precision of the estimate of the load
Cd		941	kg	%
Hg		6.54	kg	%
Cu	0	700	kg	%
Zn	22	41989	kg	%
Pb		4479	kg	%
Arsenic		3.6	kg	%
Cr-T	19.2	323.1	kg	%
Ni	5006.9	67	kg	%
PCBs			kg	%
gamma-HCH			kg	%
NO3-N			tonnes	%
PO4-P			tonnes	%
Tot-N	20.8	1390	tonnes	%
Tot-P	4.4	69.3	tonnes	%
S.P.M.	1531366	12241	tonnes	%
TOC	31.8	146.5	tonnes	%
COD	126	16607	tonnes	%

**Table 3.3 Industrial Effluents to The Norwegian Sea Region ( 1998 ).**

The Norwegian Sea Region with sub-areas: ( 8 ) Orkla, ( 9 ) Vefsna

Sub-areas :	Total quantity of substance discharged per year:		Precision of the estimate of the load
	8	9	
<b>Substance:</b>			
Cd	47.74	2.40	kg %
Hg	0.18	0.09	kg %
Cu	1579	15904	kg %
Zn	8218	42380	kg %
Pb	220.6	429.4	kg %
Arsenic	0.8	402.2	kg %
Cr-T	149.0	21.9	kg %
Ni	54.5	608.7	kg %
PCBs			kg %
gamma-HCH			kg %
NO3-N			tonnes %
PO4-P			tonnes %
Tot-N	228.6	545.3	tonnes %
Tot-P	26.5	49.0	tonnes %
S.P.M.	466787	1060699	tonnes %
TOC	26.1	4.9	tonnes %
COD	6484.3	150.1	tonnes %

**Table 3.4 Industrial Effluents toThe Barents Sea Region ( 1998 ).**

The Barents Sea Region with sub-area: ( 10 ) Alta

Sub-area :	Total quantity of substance discharged per year:	Precision of the estimate of the load
Cd		kg %
Hg		kg %
Cu		kg %
Zn		kg %
Pb		kg %
Arsenic	0.0	kg %
Cr-T	0.0	kg %
Ni		kg %
PCBs		kg %
gamma-HCH		kg %
NO3-N		tonnes %
PO4-P		tonnes %
Tot-N	2.0	tonnes %
Tot-P	0.5	tonnes %
S.P.M.	377905	tonnes %
TOC		tonnes %
COD		tonnes %

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**Paragraph 14: Main Rivers /.**

**Paragraph15: Measurements of calculation used - including information on the concentration upon which the measurement is based:**

Appendix VII (1-10) and Paragraph 3.2 (Report A, 1991, 1992 - 1999)

**Paragraph 16: Any other relevant information (e.g. proportion of substance discharged as insoluble material):**

**Table 4.1 MAIN RIVERINE INPUTS 1998 (1) Glomma**

Total volume: 65998 1000 m<sup>3</sup>/day Long term average flow (LTA) 60324 1000 m<sup>3</sup>/day  
 Minimum flow: 25229 1000 m<sup>3</sup>/day LTA period : 1961 to 1990  
 Maximum flow: 159408 1000 m<sup>3</sup>/day

	Mean	Number of meas.	minimum concentr.	Maximum concentr.	Total quantity of substance discharged each year	Were 70 % of measurements above limit of detection ?	Precision estimate of the load
Cadmium *	0.16	12	0.02	0.62	μg/l	3.70 tonnes	YES _____ %
Cadmium **	0.16	12	0.02	0.62	μg/l	3.70 tonnes	_____ %
Mercury *	141.75	12	0.0	915.0	ng/l	2504.2 kg	YES _____ %
Mercury **	141.83	12	1.0	915.0	ng/l	2505.9 kg	_____ %
Copper	3.20	12	1.2	16.9	μg/l	76.6 tonnes	YES _____ %
Zinc	6.9	12	1.9	43.8	μg/l	151 tonnes	YES _____ %
Lead *	3.68	12	0.19	37.40	μg/l	97.58 tonnes	YES _____ %
Lead **	3.68	12	0.19	37.40	μg/l	97.58 tonnes	_____ %
Arsenic *	0.19	1	0.19	0.19	μg/l	4.58 tonnes	YES _____ %
Arsenic **	0.19	1	0.19	0.19	μg/l	4.58 tonnes	_____ %
Total Cr-T *	0.00	1	0.0	0.0	μg/l	0.00 tonnes	NO _____ %
Total Cr-T **	0.50	1	0.5	0.5	μg/l	12.04 tonnes	_____ %
Ni *	1.53	12	0.5	9.9	μg/l	30.2 tonnes	YES _____ %
Ni **	1.53	12	0.5	9.9	μg/l	30.2 tonnes	_____ %
V *	0.30	1	0.3	0.3	μg/l	7.2 tonnes	YES _____ %
V **	0.30	1	0.3	0.3	μg/l	7.2 tonnes	_____ %
PCBs *		2			ng/l	0.00 kg	NO _____ %
PCBs **		2			ng/l	5.06 kg	_____ %
gamma-HCH (lindane)	0.51	2	0.50	0.51	ng/l	12.15 kg	YES _____ %
Ammonia (NH4-N)	31.92	12	13	113	μg/l	627 tonnes	YES _____ %
Ammonia (NH4-N)	31.92	12	13	113	μg/l	627 tonnes	_____ %
Nitrates (NO3-N)	383.8	12	91	705	μg/l	8102 tonnes	YES _____ %
Orthoph. (PO4-P)	5.25	12	2.0	11.0	μg/l	122.3 tonnes	YES _____ %
Orthoph. (PO4-P)	5.25	12	2.0	11.0	μg/l	122.3 tonnes	_____ %
Total N	598.8	12	390	930	μg/l	13276 tonnes	YES _____ %
Total P	12.67	12	7	25	μg/l	297 tonnes	YES _____ %
SiO2	3.07	12	2.3	3.7	mg/l	71208 tonnes	YES _____ %
Susp. Part. Matter	5.78	12	2.48	14.6	mg/l	132315 tonnes	YES _____ %
TOC	5.10	1	5.1	5.1	mg/l	122856 tonnes	YES _____ %

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 4.2 MAIN RIVERINE INPUTS 1998 (2) Drammenselva**

Total volume: 29767 1000 m<sup>3</sup>/day      Long term average flow (LTA) 26743 1000 m<sup>3</sup>/day  
 Minimum flow 16070 1000 m<sup>3</sup>/day      LTA period : 1961 to 1990  
 Maximum flow 64748 1000 m<sup>3</sup>/day

	Mean	Number of meas.	Minimum concentr. during the year	Maximum concentr. during the year	Total quantity of substance discharged each year	Were 70 % of measurements above limit of detection ?	Precision estimate of the load
Cadmium *	0.01	12	0.00	0.03	0.15 µg/l tonnes	NO	— %
Cadmium **	0.02	12	0.01	0.03	0.18 µg/l tonnes	—	%
Mercury *	0.54	12	0.00	1.50	6.66 ng/l kg	NO	— %
Mercury **	1.13	12	1.00	1.50	12.09 ng/l kg	—	%
Copper	0.83	12	0.60	1.20	9.23 µg/l tonnes	YES	— %
Zinc	3.01	12	2.20	4.20	32.83 µg/l tonnes	YES	— %
Lead *	0.13	12	0.06	0.28	1.54 µg/l tonnes	YES	— %
Lead **	0.13	12	0.06	0.28	1.54 µg/l tonnes	—	%
Arsenic *	0.00	1	0.00	0.00	0.00 µg/l tonnes	NO	— %
Arsenic **	0.10	1	0.10	0.10	1.09 µg/l tonnes	—	%
Total Cr-T *	0.50	1	0.50	0.50	5.43 µg/l tonnes	YES	— %
Total Cr-T **	0.50	1	0.50	0.50	5.43 µg/l tonnes	—	%
Ni *	0.51	12	0.40	0.80	5.56 µg/l tonnes	YES	— %
Ni **	0.51	12	0.40	0.80	5.56 µg/l tonnes	—	%
V *	0.40	1	0.40	0.40	4.35 µg/l tonnes	YES	— %
V **	0.40	1	0.40	0.40	4.35 µg/l tonnes	—	%
PCBs *		2		ng/l	0.00 kg	NO	— %
PCBs **		2		ng/l	2.28 kg	—	%
gamma-HCH (linds)	0.46	2	0.40	0.52	5.00 ng/l kg	YES	— %
Ammonia (NH4-N)	16.08	12	8.00	24.00	164.3 µg/l tonnes	YES	— %
Ammonia (NH4-N)	16.08	12	8.00	24.00	164.3 µg/l tonnes	—	%
Nitrates (NO3-N)	264.6	12	215	355	2850 µg/l tonnes	YES	— %
Orthoph. (PO4-P)	1.18	12	0.70	3.00	13.87 µg/l tonnes	YES	— %
Orthoph. (PO4-P)	1.18	12	0.70	3.00	13.87 µg/l tonnes	—	%
Total N	430.4	12	335	510	4624 µg/l tonnes	YES	— %
Total P	4.42	12	2.00	9.00	49 µg/l tonnes	YES	— %
SiO2	2.48	12	2.10	2.90	26935 mg/l tonnes	YES	— %
Susp. Part. Matter	1.51	12	0.67	3.04	17137 tonnes	YES	— %
TOC	3.40	1	3.40	3.40	36941 tonnes	YES	— %

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 4.3 MAIN RIVERINE INPUTS 1998 (3) Numedalslågen**

Total volume: 10203 1000 m<sup>3</sup>/day      Long term average flow (LTA) 10082 1000 m<sup>3</sup>/day  
 Minimum flow: 2601 1000 m<sup>3</sup>/day      LTA period : 1961 to 1990  
 Maximum flow: 43053 1000 m<sup>3</sup>/day

	Mean	Number of meas.	Minimum concentr. during the year	Maximum concentr. during the year	Total quantity of substance discharged each year	Were 70 % of measurements above limit of detection ?	Precision of the estimate of the load
Cadmium *	0.04	12	0.00	0.24	0.15 tonnes	YES	%
Cadmium **	0.04	12	0.01	0.24	0.15 tonnes		%
Mercury *	1.95	11	0.00	4.00	8.67 kg	YES	%
Mercury **	2.14	11	1.00	4.00	9.15 kg		%
Copper	2.51	12	1.00	12.30	7.02 tonnes	YES	%
Zinc	9.53	12	3.60	26.20	35.8 tonnes	YES	%
Lead *	0.53	12	0.20	2.03	2.28 tonnes	YES	%
Lead **	0.53	12	0.20	2.03	2.28 tonnes		%
Arsenic *	0.14	1	0.14	0.14	0.52 tonnes	YES	%
Arsenic **	0.14	1	0.14	0.14	0.52 tonnes		%
Total Cr-T *	0.00	1	0.00	0.00	0.00 tonnes	NO	%
Total Cr-T **	0.50	1	0.50	0.50	1.86 tonnes		%
Ni *	0.43	12	0.30	0.60	1.54 tonnes	YES	%
Ni **	0.43	12	0.30	0.60	1.54 tonnes		%
V *	0.70	1	0.70	0.70	2.61 tonnes	YES	%
V **	0.70	1	0.70	0.70	2.61 tonnes		%
PCBs *		2		ng/l	0.00 kg	NO	%
PCBs **		2		ng/l	0.78 kg		%
gamma-HCH (lindan)	0.41	2	0.36	0.45	1.51 kg	YES	%
Ammonia (NH4-N)	31.3	12	8.00	61.0	94.7 tonnes	YES	%
Ammonia (NH4-N)	31.3	12	8.00	61.0	94.7 tonnes		%
Nitrates (NO <sub>3</sub> -N)	238	12	86	485	812 tonnes	YES	%
Orthoph. (PO <sub>4</sub> -P)	4.17	12	1.00	11.0	16.41 tonnes	YES	%
Orthoph. (PO <sub>4</sub> -P)	4.17	12	1.00	11.0	16.41 tonnes		%
Total N	439	12	270	700	1607 tonnes	YES	%
Total P	10.25	12	6.00	21.0	42 tonnes	YES	%
SiO <sub>2</sub>	2.91	12	1.80	4.1	10811 tonnes	YES	%
Susp. Part. Matter	4.31	12	1.95	8.33	18337 tonnes	YES	%
TOC	3.40	1	3.40	3.40	12662 tonnes	YES	%

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 4.4 MAIN RIVERINE INPUTS 1998 (4) Skienselva**

Total volume:	27363	1000 m <sup>3</sup> /day	Long term average flow (LTA)	22611	1000 m <sup>3</sup> /day
Minimum flow:	10670	1000 m <sup>3</sup> /day	LTA period :	1961	to 1990
Maximum flow:	60981	1000 m <sup>3</sup> /day			

	Number of meas. Mean	Minimum concentr. during the year	Maximum concentr. during the year	Total quantity of substance discharged each year	Were 70 % of measurements above limit of detection ?	Precision of the estimate of the load			
Cadmium *	0.02	12	0.00	0.03	μg/l	0.18 tonnes	YES	_____	%
Cadmium **	0.02	12	0.01	0.03	μg/l	0.19 tonnes		_____	%
Mercury *	0.58	12	0.00	1.50	ng/l	6.04 kg	NO	_____	%
Mercury **	1.08	12	1.00	1.50	ng/l	10.65 kg		_____	%
Copper	0.68	12	0.30	1.30	μg/l	6.6 tonnes	YES	_____	%
Zinc	2.49	12	2.10	3.10	μg/l	24.9 tonnes	YES	_____	%
Lead *	0.19	12	0.05	1.46	μg/l	1.37 tonnes	YES	_____	%
Lead **	0.19	12	0.05	1.46	μg/l	1.37 tonnes		_____	%
Arsenic *	0.19	1	0.19	0.19	μg/l	1.90 tonnes	YES	_____	%
Arsenic **	0.19	1	0.19	0.19	μg/l	1.90 tonnes		_____	%
Total Cr-T *	0.00	1	0.00	0.00	μg/l	0.00 tonnes	NO	_____	%
Total Cr-T **	0.50	1	0.50	0.50	μg/l	4.99 tonnes		_____	%
Ni *	0.25	12	0.00	0.40	μg/l	2.32 tonnes	YES	_____	%
Ni **	0.28	12	0.20	0.40	μg/l	2.75 tonnes		_____	%
V *	0.20	1	0.20	0.20	μg/l	2.00 tonnes	YES	_____	%
V **	0.20	1	0.20	0.20	μg/l	2.00 tonnes		_____	%
PCBs *		2			ng/l	0.00 kg	NO	_____	%
PCBs **		2			ng/l	2.10 kg		_____	%
gamma-HCH (lindane)	0.75	2	0.70	0.80	ng/l	7.51 kg	YES	_____	%
Ammonia (NH4-N)	13.8	12	5.0	30.0	μg/l	131.2 tonnes	YES	_____	%
Ammonia (NH4-N)	13.8	12	5.0	30.0	μg/l	131.2 tonnes		_____	%
Nitrates (NO3-N)	213	12	160	270	μg/l	2181 tonnes	YES	_____	%
Orthoph. (PO4-P)	1.04	12	0.50	4.00	μg/l	10.81 tonnes	YES	_____	%
Orthoph. (PO4-P)	1.04	12	0.50	4.00	μg/l	10.81 tonnes		_____	%
Total N	323	12	295	345	μg/l	3235 tonnes	YES	_____	%
Total P	3.42	12	3	6	μg/l	34 tonnes	YES	_____	%
SiO2	1.97	12	1.70	2.10	mg/l	19848 tonnes	YES	_____	%
Susp. Part. Matter	0.86	12	0.55	1.26	mg/l	8478 tonnes	YES	_____	%
TOC	2.20	1	2.20	2.20	mg/l	21972 tonnes	YES	_____	%

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 4.5 MAIN RIVERINE INPUTS 1998 (5) Otra**

Total volume:	12146	1000 m <sup>3</sup> /day	Long term average flow (LTA)	12841	1000 m <sup>3</sup> /day
Minimum flow:	4303	1000 m <sup>3</sup> /day	LTA period :	1961	to 1990
Maximum flow:	46215	1000 m <sup>3</sup> /day			

	Number of meas. Mean	Minimum concentr. during the year	Maximum concentr. during the year	Total quantity of substance discharged each year	Were 70 % of measurements above limit of detection ?	Precision of the estimate of the load
Cadmium *	0.03	12	0.02	0.05 µg/l	0.12 tonnes	YES _____ %
Cadmium **	0.03	12	0.02	0.05 µg/l	0.12 tonnes	_____ %
Mercury *	0.58	12	0.00	2.00 ng/l	2.40 kg	NO _____ %
Mercury **	1.17	12	1.00	2.00 ng/l	5.09 kg	_____ %
Copper	0.46	12	0.30	0.70 µg/l	1.98 tonnes	YES _____ %
Zinc	3.79	12	2.90	5.10 µg/l	16.9 tonnes	YES _____ %
Lead *	0.30	12	0.17	0.51 µg/l	1.34 tonnes	YES _____ %
Lead **	0.30	12	0.17	0.51 µg/l	1.34 tonnes	_____ %
Arsenic *	0.15	1	0.15	0.15 µg/l	0.66 tonnes	YES _____ %
Arsenic **	0.15	1	0.15	0.15 µg/l	0.66 tonnes	_____ %
Total Cr-T *	0.00	1	0.00	0.00 µg/l	0.00 tonnes	NO _____ %
Total Cr-T **	0.50	1	0.50	0.50 µg/l	2.22 tonnes	_____ %
Ni *	0.95	12	0.50	2.00 µg/l	4.11 tonnes	YES _____ %
Ni **	0.95	12	0.50	2.00 µg/l	4.11 tonnes	_____ %
V *	0.20	1	0.20	0.20 µg/l	0.89 tonnes	YES _____ %
V **	0.20	1	0.20	0.20 µg/l	0.89 tonnes	_____ %
PCBs *		2		ng/l	0.00 kg	NO _____ %
PCBs **		2		ng/l	0.93 kg	_____ %
gamma-HCH (lindane)	0.43	2	0.24	0.62 ng/l	1.91 kg	YES _____ %
Ammonia (NH4-N)	13.3	12	4.0	24.0 µg/l	62.5 tonnes	YES _____ %
Ammonia (NH4-N)	13.3	12	4.0	24.0 µg/l	62.5 tonnes	_____ %
Nitrates (NO3-N)	140	11	97	195 µg/l	632 tonnes	YES _____ %
Orthoph. (PO4-P)	0.89	12	0.5	2.0 µg/l	3.78 tonnes	YES _____ %
Orthoph. (PO4-P)	0.89	12	0.5	2.0 µg/l	3.78 tonnes	_____ %
Total N	264	11	230	315 µg/l	1176 tonnes	YES _____ %
Total P	2.91	11	2.0	4.0 µg/l	13 tonnes	YES _____ %
SiO2	1.68	12	1.30	2.10 mg/l	7634 tonnes	YES _____ %
Susp. Part. Matter	1.18	12	0.50	2.34 mg/l	5005 tonnes	YES _____ %
TOC	2.65	11	1.90	3.50 mg/l	11773 tonnes	YES _____ %

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 4.6 MAIN RIVERINE INPUTS 1998 (6) Orreelva**

Total volume:	331	1000 m <sup>3</sup> /day	Long term average flow (LTA)	333	1000 m <sup>3</sup> /day
Minimum flow:	55	1000 m <sup>3</sup> /day	LTA period : 1961 to 1990		
Maximum flow:	1187	1000 m <sup>3</sup> /day			

	Mean	Number of meas.	Minimum concentr. during the year	Maximum concentr. during the year	Total quantity of substance discharged each year	Were 70 % of measurements above limit of detection ?	Precision of the estimate of the load
Cadmium *	0.01	12	0.00	0.02	μg/l	0.00 tonnes	NO _____ %
Cadmium **	0.01	12	0.01	0.02	μg/l	0.00 tonnes	_____ %
Mercury *	0.21	12	0.00	1.50	ng/l	0.05 kg	NO _____ %
Mercury **	1.04	12	1.00	1.50	ng/l	0.13 kg	_____ %
Copper	2.11	12	0.80	8.00	μg/l	0.37 tonnes	YES _____ %
Zinc	2.06	12	0.60	4.30	μg/l	0.33 tonnes	YES _____ %
Lead *	0.29	12	0.04	0.59	μg/l	0.04 tonnes	YES _____ %
Lead **	0.29	12	0.04	0.59	μg/l	0.04 tonnes	_____ %
Arsenic *	0.29	1	0.29	0.29	μg/l	0.04 tonnes	YES _____ %
Arsenic **	0.29	1	0.29	0.29	μg/l	0.04 tonnes	_____ %
Total Cr-T *	0.00	1	0.00	0.00	μg/l	0.00 tonnes	NO _____ %
Total Cr-T **	0.50	1	0.50	0.50	μg/l	0.06 tonnes	_____ %
Ni *	1.18	12	0.50	1.80	μg/l	0.14 tonnes	YES _____ %
Ni **	1.18	12	0.50	1.80	μg/l	0.14 tonnes	_____ %
V *	0.40	1	0.40	0.40	μg/l	0.05 tonnes	YES _____ %
V **	0.40	1	0.40	0.40	μg/l	0.05 tonnes	_____ %
PCBs *		2			ng/l	0.00 kg	NO _____ %
PCBs **		2			ng/l	0.03 kg	_____ %
gamma-HCH (lindane)	0.55	2	0.40	0.69	ng/l	0.06 kg	YES _____ %
Ammonia (NH4-N)	46.7	12	20	87	μg/l	6.18 tonnes	YES _____ %
Ammonia (NH4-N)	46.7	12	20	87	μg/l	6.18 tonnes	_____ %
Nitrates (NO <sub>3</sub> -N)	898	12	82	1975	μg/l	114 tonnes	YES _____ %
Orthoph. (PO <sub>4</sub> -P)	12.25	12	3	28	μg/l	1.99 tonnes	YES _____ %
Orthoph. (PO <sub>4</sub> -P)	12.25	12	3	28	μg/l	1.99 tonnes	_____ %
Total N	1565	12	640	2560	μg/l	223 tonnes	YES _____ %
Total P	40	12	24	80	μg/l	6 tonnes	YES _____ %
SiO <sub>2</sub>	0.50	1	0.50	0.50	mg/l	60 tonnes	YES _____ %
Susp. Part. Matter	4.42	12	0.53	10.20	mg/l	611 tonnes	YES _____ %
TOC	5.50	1	5.50	5.50	mg/l	665 tonnes	YES _____ %

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 4.7 MAIN RIVERINE INPUTS 1998 (7) Suldalslägen**

Total volume:	4350	1000 m <sup>3</sup> /day	Long term average flow (LTA)	7422	1000 m <sup>3</sup> /day
Minimum flow:	1192	1000 m <sup>3</sup> /day	LTA period :	1961	to 1990
Maximum flow:	13608	1000 m <sup>3</sup> /day			

	Mean	Number of meas.	Minimum concentr. during the year	Maximum concentr. during the year	Total quantity of substance discharged each year	Were 70 % of measurements above limit of detection ?	Precision of the estimate of the load
Cadmium *	0.01	4	0.01	0.01	0.02 tonnes	YES	%
Cadmium **	0.01	4	0.01	0.01	0.02 tonnes		%
Mercury *	0.38	4	0.00	1.50	0.34 kg	NO	%
Mercury **	1.13	4	1.00	1.50	1.70 kg		%
Copper	0.30	4	0.20	0.40	0.46 tonnes	YES	%
Zinc	1.58	4	1.20	1.90	2.37 tonnes	YES	%
Lead *	0.09	4	0.05	0.14	0.13 tonnes	YES	%
Lead **	0.09	4	0.05	0.14	0.13 tonnes		%
Arsenic *	0.00	1	0.00	0.00	0.00 tonnes	NO	%
Arsenic **	0.10	1	0.10	0.10	0.16 tonnes		%
Total Cr-T *	0.00	1	0.00	0.00	0.00 tonnes	NO	%
Total Cr-T **	0.50	1	0.50	0.50	0.79 tonnes		%
Ni *	0.13	4	0.00	0.30	0.14 tonnes	NO	%
Ni **	0.23	4	0.20	0.30	0.34 tonnes		%
V *	0.00	0	0.00	0.00	0.00 tonnes	0	%
V **	0.00	0	0.00	0.00	0.00 tonnes		%
PCBs *		1		ng/l	0.00 kg	NO	%
PCBs **		1		ng/l	0.33 kg		%
gamma-HCH (lindane)	0.12	1	0.12	0.12	0.19 kg	YES	%
Ammonia (NH4-N)	3.25	4	3	4	4.99 tonnes	YES	%
Ammonia (NH4-N)	3.25	4	3	4	4.99 tonnes		%
Nitrates (NO3-N)	183	4	148	205	282 tonnes	YES	%
Orthoph. (PO4-P)	0.75	4	0.5	1.0	1.26 tonnes	YES	%
Orthoph. (PO4-P)	0.75	4	0.5	1.0	1.26 tonnes		%
Total N	243	4	210	280	374 tonnes	YES	%
Total P	1.50	4	1	2	2 tonnes	YES	%
SiO2	0.70	1	0.70	0.70	1112 tonnes	YES	%
Susp. Part. Matter	0.70	4	0.51	0.83	1054 tonnes	YES	%
TOC	0.50	1	0.50	0.50	794 tonnes	YES	%

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 4.8 MAIN RIVERINE INPUTS 1998 (8) Orkla**

Total volume:	5538	1000 m <sup>3</sup> /day	Long term average flow (LTA)	5374	1000 m <sup>3</sup> /day
Minimum flow:	1702	1000 m <sup>3</sup> /day	LTA period :	1961	to 1990
Maximum flow:	19587	1000 m <sup>3</sup> /day			

	Number of meas. Mean	Minimum concentr. during the year	Maximum concentr. during the year	Total quantity of substance discharged each year	Were 70 % of measurements above limit of detection ?	Precision of the estimate of the load
Cadmium *	0.06	22	0.01	0.49 µg/l	0.11 tonnes	YES _____ %
Cadmium **	0.06	22	0.01	0.49 µg/l	0.11 tonnes	_____ %
Mercury *	0.55	11	0.00	2.00 ng/l	1.54 kg	NO _____ %
Mercury **	1.18	11	1.00	2.00 ng/l	2.56 kg	_____ %
Copper	6.44	22	2.60	13.70 µg/l	12.48 tonnes	YES _____ %
Zinc	17.5	22	7.20	38.50 µg/l	31.8 tonnes	YES _____ %
Lead *	0.08	22	0.02	0.30 µg/l	0.16 tonnes	YES _____ %
Lead **	0.08	22	0.02	0.30 µg/l	0.16 tonnes	_____ %
Arsenic *	0.07	11	0.00	0.20 µg/l	0.14 tonnes	NO _____ %
Arsenic **	0.12	11	0.10	0.20 µg/l	0.22 tonnes	_____ %
Total Cr-T *	0.05	11	0.00	0.50 µg/l	0.07 tonnes	NO _____ %
Total Cr-T **	0.50	11	0.50	0.50 µg/l	1.01 tonnes	_____ %
Ni *	0.86	22	0.50	1.50 µg/l	1.92 tonnes	YES _____ %
Ni **	0.86	22	0.50	1.50 µg/l	1.92 tonnes	_____ %
V *	0.05	11	0.00	0.30 µg/l	0.09 tonnes	NO _____ %
V **	0.22	11	0.20	0.30 µg/l	0.43 tonnes	_____ %
PCBs *		1		ng/l	0.00 kg	NO _____ %
PCBs **		1		ng/l	0.42 kg	_____ %
gamma-HCH (lindane)	0.15	1	0.15	0.15 ng/l	0.30 kg	YES _____ %
Ammonia (NH4-N)	6.82	11	3.0	15.0 µg/l	14.09 tonnes	YES _____ %
Ammonia (NH4-N)	6.82	11	3.0	15.0 µg/l	14.09 tonnes	_____ %
Nitrates (NO3-N)	160	11	73	280 µg/l	294 tonnes	YES _____ %
Orthoph. (PO4-P)	1.28	15	0.5	4.9 µg/l	2.55 tonnes	YES _____ %
Orthoph. (PO4-P)	1.28	15	0.5	4.9 µg/l	2.55 tonnes	_____ %
Total N	287	15	210	405 µg/l	581 tonnes	YES _____ %
Total P	4.11	15	2.0	10.0 µg/l	9 tonnes	YES _____ %
SiO2	2.80	1	2.80	2.80 mg/l	5660 tonnes	YES _____ %
Susp. Part. Matter	1.25	11	0.83	2.97 mg/l	2890 tonnes	YES _____ %
TOC	2.98	11	1.70	5.60 mg/l	6037 tonnes	YES _____ %

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 4.9 MAIN RIVERINE INPUTS 1998 (9) Vefsna**

Total volume:	16980	1000 m <sup>3</sup> /day	Long term average flow (LTA)	15620	1000 m <sup>3</sup> /day
Minimum flow:	3110	1000 m <sup>3</sup> /day	LTA period :	1961 to 1990	
Maximum flow:	89614	1000 m <sup>3</sup> /day			

	Number of meas. Mean	Minimum concentr. during the year	Maximum concentr. during the year	Total quantity of substance discharged each year	Were 70 % of measurements above limit of detection ?	Precision of the estimate of the load
Cadmium *	0.02	12	0.00	0.07 µg/l	0.06 tonnes	NO _____ %
Cadmium **	0.03	12	0.01	0.07 µg/l	0.09 tonnes	_____ %
Mercury *	0.71	12	0.0	3.0 ng/l	6.11 kg	NO _____ %
Mercury **	1.29	12	1.0	3.0 ng/l	8.45 kg	_____ %
Copper	4.18	12	0.3	15.3 µg/l	15.4 tonnes	YES _____ %
Zinc	11.83	12	0.4	50.2 µg/l	33.9 tonnes	YES _____ %
Lead *	0.67	12	0.03	4.4 µg/l	2.08 tonnes	YES _____ %
Lead **	0.67	12	0.03	4.4 µg/l	2.08 tonnes	_____ %
Arsenic *	0.10	1	0.10	0.10 µg/l	0.62 tonnes	YES _____ %
Arsenic **	0.10	1	0.10	0.10 µg/l	0.62 tonnes	_____ %
Total Cr-T *	0.00	1	0.00	0.00 µg/l	0.00 tonnes	NO _____ %
Total Cr-T **	0.50	1	0.50	0.50 µg/l	3.10 tonnes	_____ %
Ni *	0.61	12	0.00	1.80 µg/l	3.43 tonnes	YES _____ %
Ni **	0.63	12	0.20	1.80 µg/l	3.46 tonnes	_____ %
V *	0.00	1	0.00	0.00 µg/l	0.00 tonnes	NO _____ %
V **	0.20	1	0.20	0.20 µg/l	1.24 tonnes	_____ %
PCBs *		2		ng/l	0.16 kg	NO _____ %
PCBs **		2		ng/l	1.34 kg	_____ %
gamma-HCH (lindane)	0.12	2	0.12	0.12 ng/l	0.74 kg	YES _____ %
Ammonia (NH4-N)	16.8	12	3.0	45.0 µg/l	63.6 tonnes	YES _____ %
Ammonia (NH4-N)	16.8	12	3.0	45.0 µg/l	63.6 tonnes	_____ %
Nitrates (NO3-N)	81	12	28	137 µg/l	315 tonnes	YES _____ %
Orthoph. (PO4-P)	3.04	12	0.5	8.0 µg/l	15.2 tonnes	YES _____ %
Orthoph. (PO4-P)	3.04	12	0.5	8.0 µg/l	15.2 tonnes	_____ %
Total N	465	12	134	1300 µg/l	1822 tonnes	YES _____ %
Total P	6.50	12	2.00	10.00 µg/l	38 tonnes	YES _____ %
SiO2	1.50	1	1.50	1.50 mg/l	9297 tonnes	YES _____ %
Susp. Part. Matter	3.99	12	1.00	7.86 mg/l	26433 tonnes	YES _____ %
TOC	3.50	1	3.50	3.50 mg/l	21692 tonnes	YES _____ %

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 4.10 MAIN RIVERINE INPUTS 1998 (10) Altaelva**

Total volume:	8068	1000 m <sup>3</sup> /day	Long term average flow (LTA)	7487	1000 m <sup>3</sup> /day
Minimum flow:	2238	1000 m <sup>3</sup> /day	LTA period :	1961	to 1990
Maximum flow:	68135	1000 m <sup>3</sup> /day			

	Number of meas. Mean	Minimum concentr. during the year	Maximum concentr. during the year	Total quantity of substance discharged each year	Were 70 % of measurements above limit of detection ?	Precision of the estimate of the load
Cadmium *	0.00	4	0.00	0.00 µg/l	0.00 tonnes	NO _____ %
Cadmium **	0.01	4	0.01	0.01 µg/l	0.03 tonnes	_____ %
Mercury *	0.88	4	0.00	2.50 ng/l	5.31 kg	NO _____ %
Mercury **	1.38	4	1.00	2.50 ng/l	5.79 kg	_____ %
Copper	0.85	4	0.60	1.00 µg/l	2.65 tonnes	YES _____ %
Zinc	0.43	4	0.20	0.80 µg/l	1.35 tonnes	YES _____ %
Lead *	0.05	4	0.00	0.08 µg/l	0.11 tonnes	YES _____ %
Lead **	0.05	4	0.02	0.08 µg/l	0.12 tonnes	_____ %
Arsenic *	0.50	1	0.50	0.50 µg/l	1.47 tonnes	YES _____ %
Arsenic **	0.50	1	0.50	0.50 µg/l	1.47 tonnes	_____ %
Total Cr-T *	0.00	1	0.00	0.00 µg/l	0.00 tonnes	NO _____ %
Total Cr-T **	0.50	1	0.50	0.50 µg/l	1.47 tonnes	_____ %
Ni *	0.20	4	0.00	0.40 µg/l	0.89 tonnes	NO _____ %
Ni **	0.30	4	0.20	0.40 µg/l	1.03 tonnes	_____ %
V *	0.00	1	0.00	0.00 µg/l	0.00 tonnes	NO _____ %
V **	0.20	1	0.20	0.20 µg/l	0.59 tonnes	_____ %
PCBs *		1		ng/l	0.00 kg	NO _____ %
PCBs **		1		ng/l	0.62 kg	_____ %
gamma-HCH (lindane)	0.04	1	0.04	0.04 ng/l	0.12 kg	YES _____ %
Ammonia (NH4-N)	6.50	4	3	13 µg/l	18.93 tonnes	YES _____ %
Ammonia (NH4-N)	6.50	4	3	13 µg/l	18.93 tonnes	_____ %
Nitrates (NO3-N)	62.3	4	25	96 µg/l	122 tonnes	YES _____ %
Orthoph. (PO4-P)	6.00	4	1.00	9 µg/l	9.53 tonnes	YES _____ %
Orthoph. (PO4-P)	6.00	4	1.00	9 µg/l	9.53 tonnes	_____ %
Total N	194	4	175	215 µg/l	609 tonnes	YES _____ %
Total P	10.25	4	8	13 µg/l	27 tonnes	YES _____ %
SiO2	4.50	1	4.50	4.50 mg/l	13252 tonnes	YES _____ %
Susp. Part. Matter	0.94	4	0.32	2.22 mg/l	4786 tonnes	YES _____ %
TOC	3.50	1	3.50	3.50 mg/l	10307 tonnes	YES _____ %

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

APPENDIX V : INPUTS FROM TRIBUTARY RIVERS 1998 (Paragraph 17 - 19)			Page
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**Paragraph 17: Tributary rivers J.**

**Paragraph18: Measurements of calculation used - including information on the concentration upon which the measurement is based:**

Appendix VIII and IX (1-10) and Paragraph 3.2 (Report A, 1991, 1992 - 1999)

**Paragraph 19: Any other relevant information (e.g. proportion of substance discharged as insoluble material):**

**Table 5.1 The Skagerrak Region. Inputs from tributary rivers 1998  
in The Subareas ( 1-5 ).**

The Skagerrak Region with sub-areas: ( 1A ) Glomma, ( 1B ) Inner Oslofj., ( 2 ) Drammenselva,  
( 3 ) Numedalslågen, ( 4 ) Skienselva, ( 5 ) Otra

Sub-areas :	Total quantity of substance discharged per year:						Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
	1A	1B	2	3	4	5		
<b>Substance:</b>								
Cd *	0.03	0.02	0.01	0.03	0.03	0.33 tonnes	YES	%
Cd **	0.04	0.02	0.01	0.03	0.03	0.33 tonnes	_____	%
Hg *	0.85	0.96	0.59	0.74	1.14	9.43 kg	YES	%
Hg **	1.17	1.01	0.59	0.86	1.14	13.59 kg	_____	%
Cu	1.2	2.4	0.6	0.6	0.3	4.3 tonnes	YES	%
Zn	2.3	3.9	2.1	9.6	5.7	54.4 tonnes	YES	%
Pb *	0.19	0.33	0.31	0.40	0.31	5.25 tonnes	YES	%
Pb **	0.19	0.33	0.31	0.40	0.31	5.25 tonnes	_____	%
Arsenic *	0.38	0.14	0.17	0.16	0.20	2.27 tonnes	YES	%
Arsenic **	0.38	0.14	0.17	0.16	0.20	2.27 tonnes	_____	%
Cr-T *	1.18	3.64	0.47	1.01	0.00	0.00 tonnes	NO	%
Cr-T **	1.33	3.83	0.47	1.17	0.57	5.34 tonnes	_____	%
Ni *	0.80	1.17	0.44	0.36	0.34	2.66 tonnes	YES	%
Ni **	0.80	1.20	0.44	0.45	0.34	3.32 tonnes	_____	%
PCBs *	0.00	0.06	0.00	0.00	0.00	0.00 kg	NO	%
PCBs **	0.22	0.15	0.06	0.14	0.24	2.24 kg	_____	%
gamma-HCH	0.62	0.34	0.15	0.33	0.91	8.09 kg	YES	%
NH4-N *	39	19	2	34	27	264 tonnes	YES	%
NH4-N **	39	19	2	34	27	264 tonnes	_____	%
NO3-N	658	461	297	776	140	1984 tonnes	YES	%
PO4-P *	6	5	8	8	1	15 tonnes	YES	%
PO4-P **	6	5	8	8	1	15 tonnes	_____	%
Total N	1210	657	416	924	307	3913 tonnes	YES	%
Total P	20	19	12	33	5	54 tonnes	YES	%
SiO2	2243	2170	2126	4012	2838	21296 tonnes	YES	%
S.P.M.	2943	5053	5433	9047	1567	16052 tonnes	YES	%
TOC	7467	3086	1742	2730	6244	39284 tonnes	YES	%

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 5.2 The remaining North Sea Region. Inputs from tributary rivers 1998  
in The Subareas ( 6-7 ).**

The remaining North Sea Region with sub-areas: ( 6 ) Orreelva, ( 7 ) Suldalslågen

Sub-areas :	6	7		Were 70 % of measurements above the detection limit ?	Precision
					of the estimate of the load
<b>Substance:</b>					
Cd *	0.27	0.44	tonnes	NO	%
Cd **	0.30	0.57	tonnes		%
Hg *	19.68	13.04	kg	NO	%
Hg **	22.04	33.60	kg		%
Cu	5.8	16.2	tonnes	YES	%
Zn	52.3	94.1	tonnes	YES	%
Pb *	6.76	3.18	tonnes	YES	%
Pb **	6.76	3.21	tonnes		%
Arsenic *	2.30	3.12	tonnes	NO	%
Arsenic **	2.66	5.40	tonnes		%
Cr-T *	0.00	0.00	tonnes	NO	%
Cr-T **	7.94	15.88	tonnes		%
Ni *	18.46	8.41	tonnes	NO	%
Ni **	19.24	10.89	tonnes		%
PCBs *	0.00	0.16	kg	NO	%
PCBs **	3.33	6.81	kg		%
gamma-HCH	9.00	8.29	kg	YES	%
NH4-N *	219	500	tonnes	YES	%
NH4-N **	219	500	tonnes		%
NO3-N	4578	6099	tonnes	YES	%
PO4-P *	29	28	tonnes	NO	%
PO4-P **	29	34	tonnes		%
Total N	6975	9214	tonnes	YES	%
Total P	188	109	tonnes	YES	%
SiO2	29263	46169	tonnes	YES	%
S.P.M.	15069	23696	tonnes	YES	%
TOC	49268	31497	tonnes	YES	%

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 5.3 The Norwegian Sea Region. Inputs from tributary rivers 1998  
in The Subareas ( 8-9 ).**

The Norwegian Sea Region with sub-areas: ( 8 ) Orkla, ( 9 ) Vefsna

Sub-area:	8	9	Were 70 % of measurements above the detection limit ?		Precision of the estimate of the load
			tonnes	NO	%
<b>Substance:</b>					
Cd *	0.05	0.09	tonnes	NO	_____ %
Cd **	0.36	0.30	tonnes	NO	_____ %
Hg *	27.6	0.2	kg	NO	_____ %
Hg **	44.0	26.2	kg	NO	_____ %
Cu	33.8	28.1	tonnes	YES	_____ %
Zn	81.8	393.8	tonnes	YES	_____ %
Pb *	13.10	2.38	tonnes	YES	_____ %
Pb **	13.10	2.42	tonnes	NO	_____ %
Arsenic *	4.33	4.19	tonnes	NO	_____ %
Arsenic **	6.33	4.75	tonnes	NO	_____ %
Cr-T *	81.32	313.72	tonnes	NO	_____ %
Cr-T **	94.79	320.98	tonnes	NO	_____ %
Ni *	41.51	131.48	tonnes	YES	_____ %
Ni **	42.89	131.89	tonnes	NO	_____ %
PCBs *	0.00	0.00	kg	NO	_____ %
PCBs **	7.40	5.49	kg	NO	_____ %
gamma-HCH	14.38	8.51	kg	YES	_____ %
NH4-N *	241	187	tonnes	YES	_____ %
NH4-N **	255	187	tonnes	NO	_____ %
NO3-N	2844	983	tonnes	YES	_____ %
PO4-P *	47	27	tonnes	YES	_____ %
PO4-P **	47	30	tonnes	NO	_____ %
Total N	6913	2488	tonnes	YES	_____ %
Total P	163	95	tonnes	YES	_____ %
SiO2	51300	26819	tonnes	YES	_____ %
S.P.M.	71929	69402	tonnes	YES	_____ %
TOC	56863	3934	tonnes	YES	_____ %

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 5.4 The Barents Region. Inputs from tributary rivers 1998  
in The Subarea ( 10 ).**

The Barents Sea Region with sub-area: ( 10 ) Alta

Total quantity of substance discharged per year:		Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Sub-area :	10		
<b>Substance:</b>			
Cd *	0.34	tonnes NO	%
Cd **	0.40	tonnes	%
Hg *	11.36	kg NO	%
Hg **	17.81	kg	%
Cu	21.8	tonnes YES	%
Zn	97.4	tonnes YES	%
Pb *	3.85	tonnes YES	%
Pb **	3.89	tonnes	%
Arsenic *	2.86	tonnes NO	%
Arsenic **	3.20	tonnes	%
Cr-T *	11.01	tonnes NO	%
Cr-T **	16.88	tonnes	%
Ni *	34.30	tonnes YES	%
Ni **	34.73	tonnes	%
PCBs *	0.00	kg NO	%
PCBs **	3.70	kg	%
gamma-HCH	3.66	kg YES	%
NH4-N *	1420	tonnes YES	%
NH4-N **	1420	tonnes	%
NO3-N	332	tonnes YES	%
PO4-P *	111	tonnes NO	%
PO4-P **	113	tonnes	%
Total N	4447	tonnes YES	%
Total P	236	tonnes YES	%
SiO2	77577	tonnes YES	%
S.P.M.	30822	tonnes YES	%
TOC	40298	tonnes YES	%

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**APPENDIX VI : OTHER INPUTS 1998 (Paragraph 20)**

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Table 6.1	Nutrients from "Down Stream Areas" of main and tributary rivers and rivers not monitored	46
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**Paragraph 20: Any available information on discharge through urban run-off - storm water  
overflow - polder effluents etc.:**

"Background" is runoff from forested areas and highlands, including effect of acid precipitation

Agriculture runoff:

- "Area" is runoff from arable land
- "Point"-sources are drainage from silos, manures etc.

Paragraph 3.3 (Report A, 1991, 1992 - 1999)

**Table 6.1 Nutrients from "Down Stream Areas" of main and tributary rivers and rivers not monitored 1998.**

Direct runoff of P and N :

Sub-areas:		Back-ground tonnes	Agriculture Area tonnes	Sum tonnes
1 Glomma	P	18.4	10.4	28.8
	N	463.1	498.7	961.7
	PO4-P	3.7	3.1	6.8
	NO3-N	277.8	349.1	626.9
	NH4-N	23.2	34.9	58.1
1 Inner Oslofjord	P	3.4	2.2	5.6
	N	72.8	85.7	158.5
	PO4-P	0.7	0.6	1.3
	NO3-N	43.7	60.0	103.7
	NH4-N	3.6	6.0	9.6
2 Drammenselva	P	1.4	2.1	3.6
	N	64.0	68.3	132.3
	PO4-P	0.3	0.6	0.9
	NO3-N	38.4	47.8	86.2
	NH4-N	3.2	4.8	8.0
3 Numedalslågen	P	4.9	10.6	15.5
	N	184.7	427.6	612.3
	PO4-P	1.0	3.2	4.2
	NO3-N	110.8	299.3	410.2
	NH4-N	9.2	29.9	39.2
4 Skienselva	P	6.8	2.1	8.9
	N	331.3	89.5	420.7
	PO4-P	1.4	0.6	2.0
	NO3-N	198.8	62.6	261.4
	NH4-N	16.6	6.3	22.8
5 Otra	P	7.0	3.9	11.0
	N	391.8	99.5	491.3
	PO4-P	1.4	1.2	2.6
	NO3-N	235.1	69.7	304.7
	NH4-N	19.6	7.0	26.6
6 Orreelva	P	22.8	47.5	70.3
	N	1463.8	1307.0	2770.9
	PO4-P	4.6	14.3	18.8
	NO3-N	878.3	914.9	1793.2
	NH4-N	73.2	91.5	164.7
7 Suldalslågen	P	58.0	69.1	127.2
	N	5151.3	1359.0	6510.3
	PO4-P	11.6	20.7	32.3
	NO3-N	3090.8	951.3	4042.0
	NH4-N	257.6	95.1	352.7
8 Orkla	P	142.1	153.4	295.5
	N	3850.8	3626.9	7477.6
	PO4-P	28.4	46.0	74.4
	NO3-N	2310.5	2538.8	4849.3
	NH4-N	192.5	253.9	446.4
9 Vefsna	P	83.6	39.4	123.0
	N	1920.5	929.0	2849.5
	PO4-P	16.7	11.8	28.5
	NO3-N	1152.3	650.3	1802.6
	NH4-N	96.0	65.0	161.1
10 Altaelva	P	86.1	2.1	88.2
	N	1618.3	62.4	1680.7
	PO4-P	17.2	0.6	17.9
	NO3-N	971.0	43.7	1014.7
	NH4-N	80.9	4.4	85.3
		SUM	P	778 tonnes
		SUM	N	24066 tonnes
		SUM	PO4-P	190 tonnes
		SUM	NO3-N	15295 tonnes
		SUM	NH4-N	1374 tonnes

**APPENDIX VII : MAIN RIVERS 1 - 10. MEASURED CONCENTRATIONS  
1998**

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Table 7.1 Measured concentrations - 1998

Watercourse : Glomma

Annual flow . . . . . : 24089 mill. cbm

Drainage area . . . . . : 41218 sq.km

Date	Q m3/s	Cond µS/m	Tot-P µg/l	PO4-P µg/l	Tot-N µg/l	NO3-N µg/l	NH4-N µg/l	Cu µg/l	Zn µg/l	Cd µg/l	Pb µg/l	S.P.M. mg/l	SO2 ng/l	TOC mg/l	Hg ng/l	Gamm HCH ng/l	PCB (The following Congeners ) 28 ng/l	28 ng/l	Cr-T ng/l	Ni µg/l
980114	579	5.37	1.3	6	890	695	34	1.5	4.5	0.04	0.87	5.58	3.4	1.5	0.51	<0.03	<0.03	<0.03	0.8	
980223	461	5.45	2.5	11	930	705	40	1.6	4.6	0.06	0.50	14.6	3.7	1.5	0.51	<0.03	<0.03	<0.03	1.1	
980323	307	4.66	7	2	550	365	44	1.2	2.9	0.16	0.20	2.48	3.2	1.0					0.5	
980415	461	5.22	1.6	9	745	570	113	2.1	4.9	0.02	0.37	9.54	3.4	915					9.9	
980516	1584	3.12	1.3	5	390	195	15	2.6	4.6	0.12	0.33	6.12	3.0	3.5					0.8	
980615	1005	4.09	8	4	490	325	16	3.0	2.9	0.21	0.21	2.74	2.3	1.0					0.6	
980722	820	4.10	9	3	485	91	13	2.1	1.9	0.03	0.37	4.04	2.4	5.1					0.9	
980817	654	4.57	1.4	5	475	260	21	1.7	2.0	0.08	0.24	5.19	2.6	1.0					0.7	
980914	1086	4.01	1.1	5	440	260	16	2.8	3.8	0.17	0.27	4.43	2.7	2.5					0.7	
981020	615	4.74	1.6	6	655	430	20	1.4	2.7	0.06	0.28	5.74	3.2	<1.0					0.6	
981116	589	4.18	1.2	4	565	330	24	16.9	43.8	0.37	3.31	5.15	3.4	730	0.50	<0.03	<0.03	<0.03	0.9	
981214	487	4.64	8	3	570	380	27	1.5	3.7	0.62	0.19	3.80	3.5	2.0					0.9	
Min.:	307	3.12	7.0	2.0	390	91	13	1.2	1.9	0.02	0.19	2.48	2.3	5.1	1	0.5	0.03	0.03	0.5	
Max.:	1584	5.45	25.0	11.0	930	705	113	16.9	43.8	0.62	37.40	14.60	3.70	5.10	915.0	0.51	0.03	0.03	0.5	
Aver.:	721	4.51	12.7	5.3	599	384	32	3.2	6.9	0.16	3.68	5.78	3.07	5.10	141.8	0.51	0.03	0.03	0.5	
St.dev.:	355	0.66	4.9	2.6	174	190	27	4.4	11.7	0.18	10.65	3.33	0.46	320.6	0.01	0.00	0.00	0.00	2.6	
Numb.:	12	12	12	12	12	12	12	12	12	12	12	12	1	12	2	2	2	1	12	

**Table 7.2 Measured concentrations - 1998**

Watercourse : Drammenselva

Annual flow : 10865 mill. cbm

Drainage area : 17028 sq.km

Min : 186.0 cbm/s

Date	Q m <sup>3</sup> /s	Cond mS/m	Tot-P µg/l	PO4-P µg/l	Tot-N µg/l	NO3-N µg/l	NH4-N µg/l	Cu µg/l	Zn µg/l	Cd µg/l	Pb µg/l	S.P.M. mg/l	TOC mg/l	Hg ng/l	Gamm HCH ng/l	PCB ( The following Congeners ) IUPAC NOS 28 ng/l	PCB ( The following Congeners ) IUPAC NOS 52 ng/l	PCB ( The following Congeners ) IUPAC NOS 101 ng/l	PCB ( The following Congeners ) IUPAC NOS 118 ng/l	PCB ( The following Congeners ) IUPAC NOS 138 ng/l	PCB ( The following Congeners ) IUPAC NOS 153 ng/l	PCB ( The following Congeners ) IUPAC NOS 180 ng/l	As µg/l	V µg/l	Cr-T µg/l	Ni µg/l		
980116	300.8	4.36	2	0.8	335	245	12	1.2	4.2	<0.01	0.18	1.80	2.9	<1.0														0.5
980215	285.9	3.42	4	0.8	445	295	13	0.7	2.5	0.02	0.09	1.13	2.4	<1.0	0.40	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.4
980315	292.3	3.34	4	1.0	413	285	14	0.7	3.2	0.01	0.15	1.45	2.3	<1.0														0.4
980415	278.5	3.36	5	1.0	490	355	16	0.7	2.5	<0.01	0.09	1.65	2.6	<1.0														0.5
980516	744.0	2.88	5	2.0	390	245	8	1.0	2.9	0.02	0.19	1.97	2.4	1.0														0.5
980616	321.0	3.52	4	1.0	395	235	16	0.8	3.4	<0.01	0.11	1.81	2.3	<1.0														0.5
980715	345.4	1.38	5	1.0	425	230	16	0.8	2.9	0.02	0.15	1.57	2.3	3.4	1.0													0.8
980816	215.8	3.62	4	0.9	415	215	18	0.7	2.2	<0.01	0.07	0.98	2.1	<1.0														0.5
980915	305.1	3.36	9	3.0	500	260	22	0.9	3.8	0.01	0.28	3.04	2.7	1.5														0.4
981014	284.9	3.60	4	0.9	420	215	24	0.6	2.3	0.02	0.12	0.78	2.4	<1.0														0.4
981115	291.2	3.65	4	1.0	510	305	20	0.8	3.2	0.03	0.11	1.21	2.8	1.5	0.52	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.5	
981215	297.6	3.53	3	0.7	425	290	14	1.0	3.0	0.02	0.06	0.67	2.6	1.5														0.7
Min.:	216	1.38	2.0	0.7	335	215	8	0.6	2.2	0.01	0.06	0.67	2.10	3.40	1.00	0.40	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.10	0.4	0.5	
Max.:	744	4.36	9.0	3.0	510	355	24	1.2	4.2	0.03	0.28	3.04	3.40	1.5	0.52	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.10	0.4	0.4		
Aver.:	330	3.34	4.4	1.2	430	265	16	0.8	3.0	0.02	0.13	1.51	2.48	3.40	1.1	0.46	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.10	0.4	0.5		
Stdev.:	134	0.70	1.7	0.7	50	42	4	0.2	0.6	0.01	0.06	0.64	0.24	0.2	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1			
Numb.:	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	1	1			

Table 7.3 Measured concentrations - 1998  
 Watercourse : Numedalslågen  
 Annual flow : 3724 mill. cbm  
 Drainage area : 5513 sq.km

Date	Q m³/s	Cond µS/cm	Tot-P µg/l	PO4-P µg/l	Tot-N µg/l	NO3-N µg/l	NH4-N µg/l	Cu µg/l	Zn µg/l	Cd µg/l	Pb µg/l	S.P.M. mg/l	SiO2 mg/l	TOC mg/l	Hg ng/l	Gamma HCH ng/l	PCB (The following Congeners) IUPAC NOS							V µg/l	Cr-T µg/l	Ni µg/l
																	Max : 498.3 cbm/s									
980120	95.5	4.01	11	6	700	485	31	1.1	12.8	0.02	0.61	3.42	4.1	2.5	<1.0	0.36	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.5	0.4	
980219	89.4	3.04	7	4	440	275	42	2.0	4.5	0.02	0.21	2.86	3.0	<1.0	0.36	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.5	0.3		
980318	78.0	2.88	7	3	385	220	49	2.0	3.9	0.01	0.20	2.66	2.7	<1.0	0.36	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.5	0.3		
980415	111.5	3.49	13	6	590	425	48	2.5	6.6	0.04	0.48	6.38	3.2	3.4	1.0	0.48	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.5	0.4	
980519	192.9	1.75	10	3	270	99	8	1.2	9.2	0.03	0.37	4.51	2.1	3.0	0.01	0.48	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.3	0.3	
980623	128.1	2.20	21	11	310	86	16	1.5	26.2	0.03	2.03	5.65	1.8	4.0	0.02	0.48	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.5	0.5	
980715	95.0	0.96	6	2	285	105	11	1.1	4.6	0.02	0.24	2.53	2.1	2.0	0.01	0.48	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.5	0.5	
980817	53.5	2.98	7	1	350	155	31	2.9	3.6	<0.01	0.26	7.04	1.9	1.5	0.01	0.48	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.4	0.4	
980917	267.0	2.59	14	4	475	165	10	1.0	7.8	0.03	0.81	8.33	3.5	3.5	0.02	0.48	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.4	0.4	
981019	90.5	2.80	7	2	345	170	22	1.1	7.1	0.04	0.36	2.00	2.8	1.5	0.01	0.48	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.3	0.3	
981112	86.3	3.90	13	5	650	400	47	1.4	8.2	0.24	0.47	4.37	4.0	2.5	0.45	0.48	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.4	0.4	
981208	51.7	3.58	7	3	470	275	61	12.3	19.8	0.04	0.32	1.95	3.7	3.7	0.01	0.48	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.6	0.6	
Min.:	52	0.96	6.0	1.0	270	86	8	1.0	3.6	0.01	0.20	1.95	1.80	3.40	1.00	0.36	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.14	0.7	0.5
Max.:	267	4.01	21.0	11.0	700	485	61	12.3	26.2	0.24	2.03	8.33	4.10	3.40	4.00	0.45	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.14	0.7	0.3
Aver.:	112	2.85	10.3	4.2	439	238	31	2.5	9.5	0.04	0.53	4.31	2.91	3.40	2.14	0.41	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.14	0.7	0.6
St.dev.:	61	0.89	4.4	2.7	143	136	18	3.1	6.9	0.06	0.51	2.12	0.81	1.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1	0.4	0.4
Number:	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	1	11	2	2	2	2	2	2	1	1

**Table 7.4 Measured concentrations - 1998**  
**Watercourse : Skienselva**

Annual flow . . . . .			9987 mill. cbm			Max : 706 cbm/s			Min : 124 cbm/s																			
Drainage area . . . . .			10348 sq.km																									
Date	Q m <sup>3</sup> /s	Cond mS/m	Tot-P μg/l	PO4-P μg/l	Tot-N μg/l	NO3-N μg/l	NH4-N μg/l	Cu μg/l	Zn μg/l	Cd μg/l	Pb μg/l	S.P.M. mg/l	TOC mg/l	Hg ng/l	Gamm ng/l	PCB ( The following Congeners ) IUPAC NOS ng/l	28	52	101	118	138	153	180	As	V	Cr-T μg/l	Ni μg/l	
980113	357.3	2.20	6	4.0	330	255	9	0.5	2.4	0.02	0.06	0.57	2.0	<1.0	2.0											0.3		
980218	263.6	2.11	3	0.6	315	230	11	0.4	2.6	0.02	0.06	0.58	2.1	<1.0	0.7	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.2		
980318	332.4	2.05	3	0.5	315	260	8	1.3	2.4	0.01	0.05	0.69	2.0	<1.0												0.2		
980416	340.7	2.24	3	0.6	340	270	5	0.7	2.4	0.03	0.06	0.93	2.1	2.2	<1.0												0.3	
980513	503.4	2.04	3	0.5	315	235	11	0.5	2.4	0.02	0.09	0.69	2.0	1.0												0.3		
980615	166.0	1.96	3	0.9	295	190	8	0.4	2.1	0.02	0.05	0.55	1.9	<1.0												0.3		
980714	174.0	2.02	3	0.6	305	175	15	0.3	2.1	0.01	0.09	1.04	1.9	1.0												0.3		
980812	172.0	2.11	3	0.5	320	160	22	0.8	2.1	<0.01	1.46	0.97	1.7	1.5												0.4		
980917	492.8	2.06	3	0.7	323	175	18	0.3	2.3	0.02	0.08	1.04	2.0	1.0												0.3		
981019	204.4	2.00	4	0.6	335	175	30	0.9	3.1	0.03	0.11	1.03	1.9	<1.0												<0.5	0.3	
981120	286.9	2.13	4	2.0	330	205	17	1.0	3.0	0.01	0.08	1.26	2.0	1.0	0.8	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.19	0.2	<0.5	0.3		
981215	308.1	2.13	3	1.0	345	220	12	1.0	3.0	0.02	0.05	0.92	2.0	1.5												<0.2	0.4	
Min.:	166	1.96	3.0	0.5	295	160	5	0.3	2.1	0.01	0.05	0.55	1.70	2.20	1.00	0.70	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.19	0.2	0.5	0.2	
Max.:	503	2.24	6.0	4.0	345	270	30	1.3	3.1	0.03	1.46	1.26	2.10	2.20	1.50	0.80	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.19	0.2	0.5	0.4	
Aver.:	300	2.09	3.4	1.0	323	213	14	0.7	2.5	0.02	0.19	0.86	1.97	2.20	1.08	0.75	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.19	0.2	0.5	0.3	
St.dev.:	115	0.08	0.9	1.0	15	38	7	0.3	0.4	0.01	0.40	0.23	0.11	0.19	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1	0.1	0.3	0.1
Numb.:	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	1	12	2	2	2	2	2	2	1	1	1	12	

Table 7.5 Measured concentrations - 1998

Watercourse : Otra											Min : 4433 mill. cbm											Max: 534.9 cbm/s											IUPAC NOS										
Annual flow . . . . . : 3730 sq.km					IUPAC NOS					PCB ( The following Concentrations )					PCB ( The following Concentrations )					PCB ( The following Concentrations )					PCB ( The following Concentrations )					PCB ( The following Concentrations )													
Date	Q m³/s	Cond µS/m	Tot-P µg/l	PO4-P µg/l	Tot-N µg/l	NO3-N µg/l	NH4-N µg/l	Cu µg/l	Zn µg/l	Cd µg/l	Pb µg/l	S.P.M. mg/l	SD2 mg/l	TOC mg/l	Hg ng/l	HCH ng/l	Gamm ng/l	28 ng/l	52 ng/l	101 ng/l	118 ng/l	138 ng/l	153 ng/l	180 ng/l	As µg/l	V µg/l	Cr-T µg/l	Ni µg/l															
980114	141.9	1.86	3	0.7	315	175	20	0.6	5.1	0.05	0.35	0.95	2.1	3.4	<1.0																2.0												
980218	167.3	1.61	3	1.0	265	150	20	0.4	3.6	0.03	0.27	0.78	1.8	2.4	<1.0															1.0													
980318	163.1	1.63	2	0.5	250	155	14	0.3	3.3	0.02	0.19	0.63	1.7	1.9	<1.0	0.24	<0.03	<0.03	<0.03	<0.03										0.5													
980415	194.3	1.77	2	0.6	265	195	10	0.4	3.8	0.03	0.23	0.89	1.8	2.1	<1.0															0.8													
980513	120.1	1.49	2	0.6	245	143	5	0.4	3.1	0.02	0.22	0.93	1.5	2.1	<1.0															0.8													
980616	99.6	1.61	3	0.9	230	124	4	0.3	2.9	0.02	0.18	0.02	1.8	1.07	1.3	2.4	<1.0														0.5												
980714	112.8	1.76	4	1.0	295	110	5	0.6	3.6	0.03	0.32	0.32	2.34	1.4	3.5	1.0														1.0													
980812	53.3	1.0	1.0	0.9	250	97	17	0.5	4.4	0.02	0.44	1.66	1.3	1.5	2.1															1.6													
980916	187.3	1.51	4	0.9	250	97	17	0.5	4.2	0.03	0.51	1.66	1.8	3.5	1.5															1.0													
981019	102.1	1.48	3	2.0	235	109	13	0.4	4.0	0.04	0.39	1.45	1.8	2.5	<1.0															0.6													
981111	165.7	1.72	4	0.9	290	136	19	0.5	4.2	0.02	0.38	1.25	1.9	3.2	1.0	0.62	<0.03	<0.03	<0.03	<0.03	<0.03									0.8													
981214	120.7	1.53	2	0.6	265	146	24	0.4	3.3	0.02	0.17	0.50	1.7	2.1	2.0															0.8													
Min.:				53	1.48	2.0	0.5	230	97	4	0.3	2.9	0.02	0.17	0.50	1.30	1.90	1.00	0.24	0.03	0.03	0.03	0.03	0.03	0.15	0.2	0.5	0.5															
Max.:				194	1.86	4.0	2.0	315	195	24	0.7	5.1	0.05	0.51	2.34	2.10	3.50	2.00	0.62	0.03	0.03	0.03	0.03	0.03	0.15	0.2	0.5	0.5															
Aver.:				136	1.63	2.9	0.9	264	140	13	0.5	3.8	0.03	0.30	1.18	1.68	2.65	1.17	0.43	0.03	0.03	0.03	0.03	0.03	0.15	0.2	0.5	2.0															
St.dev.:				42	0.13	0.8	0.4	26	29	7	0.1	0.6	0.01	0.11	0.52	0.25	0.63	0.33	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.2	0.5	1.0															
Numb.:				12	11	11	12	11	11	12	12	12	12	12	12	11	12	12	12	2	2	2	2	2	2	1	1	12															

**Table 7.6 Measured concentrations - 1998**  
**Watercourse : Orreelva**

	Annual flow . . . . . : 120.8 mill. cbm							Drainage area . . . . . : 105 sq-km							Min : 0.637 cbm/s									
Date	Q m <sup>3</sup> /s	Cond mS/m	Tot-P µg/l	PO4-P µg/l	Tot-N µg/l	NO3-N µg/l	NH4-N µg/l	Cu µg/l	Zn µg/l	Cd µg/l	Pb µg/l	S.P.M. mg/l	SiO2 mg/l	TOC mg/l	Hg ng/l	Gamm-HCH ng/l	PCB ( The following Congeners ) IUPAC NOS ng/l	28 ng/l	52 ng/l	101 ng/l	118 ng/l	138 ng/l	153 ng/l	180 ng/l
980113	3.8	18.9	36	18	2240	1805	87	1.9	3.1	<0.01	0.39	3.26	<1.0										1.2	
980216	11.2	17.9	45	23	2560	420	67	8.0	4.3	0.01	0.30	3.07	1.0										1.2	
980323	4.4	17.0	41	12	2480	1975	20	2.1	3.5	0.01	0.27	7.02	<1.0	0.69	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03			1.3	
980414	4.8	17.0	47	16	2050	1715	44	2.0	2.4	0.02	0.28	5.65	<1.0										1.2	
980511	1.5	16.8	30	5	1680	1250	42	1.6	0.8	<0.01	0.19	1.83	<1.0										1.1	
980615	0.8	18.5	25	5	908	380	38	1.5	0.7	<0.01	0.12	2.41	<1.0										1.3	
980713	1.7	18.4	24	3	865	89	41	1.3	0.6	<0.01	0.14	4.40	<1.0										1.6	
980810	2.3	17.5	24	3	640	82	30	1.2	0.6	<0.01	0.04	0.53	<1.0										1.3	
980914	3.3	17.9	24	4	710	170	34	0.8	1.2	<0.01	0.25	2.14	0.5	5.5	<1.0								0.5	
981019	4.8	17.6	56	14	1040	420	38	0.9	1.5	<0.01	0.52	6.88	<1.0									0.7		
981110	6.8	16.4	80	28	1810	1205	55	1.8	3.3	0.02	0.59	10.2	1.5	0.40	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.0		
981207	3.2	18.0	51	16	1800	1270	64	2.2	2.7	<0.01	0.33	5.62	<1.0										1.8	
Min.:	0.80	16.40	24.0	3.0	640	82	20	0.8	0.6	0.01	0.04	0.53	0.50	5.50	1.00	0.40	0.03	0.03	0.03	0.03	0.29	0.4	0.5	
Max.:	11.20	18.90	80.0	28.0	2560	1975	87	8.0	4.3	0.02	0.59	10.20	0.50	5.50	1.50	0.69	0.03	0.03	0.03	0.03	0.29	0.4	0.5	
Aver.:	4.05	17.66	40.3	12.3	1565	898	47	2.1	2.1	0.01	0.29	4.42	0.50	5.50	1.04	0.55	0.03	0.03	0.03	0.03	0.29	0.4	0.5	
St.dev.:	2.81	0.75	16.9	8.4	703	712	19	1.9	1.3	0.00	0.16	2.75	0.14	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.3		
Numb.:	12	12	12	12	12	12	12	12	12	12	12	12	1	1	12	2	2	2	2	2	1	1		

**Table 7.7 Measured concentrations - 1998**  
**Watercourse : Suldalslägen**

**Annual flow . . . . . : 1588 mill. cbm**  
**Drainage area . . . . . : 1457 sq.km**

**Min : 13.8 cbm/s**  
**Max: 157.5 cbm/s**

Date	Q m <sup>3</sup> /s	Cond mS/m	Tot-P μg/l	PO4-P μg/l	Tot-N μg/l	NO3-N μg/l	NH4-N μg/l	Cu μg/l	Zn μg/l	Cd μg/l	Pb μg/l	S.P.M. mg/l	SiO <sub>2</sub> mg/l	TOC mg/l	Hg ng/l	Gamma HCH ng/l	IUPAC NOS					
																	28	52	101	118	138	153
980217	31.8	1.76	2	0.5	265	205	4	0.3	1.9	0.01	0.12	0.83				1.5	0.12	<0.03	<0.03	<0.03	<0.03	<0.03
980615	68.1	1.50	1	0.7	215	180	3	0.2	1.3	0.01	0.05	0.67				<1.0						
980810	71.7	1.40	1	1.0	210	148	3	0.3	1.2	0.01	0.06	0.51				<1.0						
981021	50.3	1.80	2	0.8	280	200	3	0.4	1.9	0.01	0.14	0.77	0.7	0.5	<1.0							
Min.:	32	1.40	1.0	0.5	210	148	3	0.2	1.2	0.01	0.05	0.51	0.70	0.50	1.00	0.12	0.03	0.03	0.03	0.03	0.03	0.5
Max.:	72	1.80	2.0	1.0	280	205	4	0.4	1.9	0.01	0.14	0.83	0.70	0.50	1.50	0.12	0.03	0.03	0.03	0.03	0.03	0.2
Aver.:	55	1.62	1.5	0.8	243	183	3	0.3	1.6	0.01	0.09	0.70	0.70	0.50	1.13	0.12	0.03	0.03	0.03	0.03	0.03	0.3
St.dev.:	18	0.20	0.6	0.2	35	26	1	0.1	0.4	0.00	0.04	0.14	0.14	0.25	1	4	1	1	1	1	1	0.5
Numb.:	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0.1

Table 7.8 Measured concentrations - 1998  
Watercourse : Orkla

Annual flow . . . . . : 2021 mill. cbm  
Drainage area . . . . . : 2872 sq.km

Date	Q m3/s	Cond mS/m	Tot-P μg/l	PO4-P μg/l	ToI-N μg/l	NO3-N μg/l	NH4-N μg/l	Cu μg/l	Zn μg/l	Cd μg/l	Pb μg/l	S.P.M. mg/l	SO2 mg/l	TOC mg/l	Hg ng/l	HCH ng/l	PCB ( The following Congeners ) ng/l	IUPAC NOS ng/l	118 ng/l	138 ng/l	153 ng/l	180 ng/l	As μg/l	V μg/l	Cr-T μg/l	Ni μg/l
																			Min :	Max :	19.7 cbm/s	226.7 cbm/s				
980105	52.9	4.97	2.0	1.0	230	150	10	4.3	7.2	0.03	0.03	0.98				<1.0						<0.1	<0.2	<0.5	0.6	
980113	52.9	5.40	2.0	0.5	240	146	8	5.1	9.0	0.01	0.04	0.95				2.0						0.1	<0.2	<0.5	0.6	
980202	51.5	5.22	2.0	0.5	240	146	8	5.1	13.0	0.03	0.04	0.95				<1.0						0.1	<0.2	<0.5	0.7	
980216	57.4	6.10						6.1	24.0	0.07	0.03	0.56				5.6						0.1	<0.2	<0.5	0.7	
980303	44.3	5.33	3.0	0.6	265	175	3	9.0	21.6	0.07	0.09	0.83				<1.0	0.15	<0.03	<0.03	<0.03	<0.03	<0.1	<0.2	<0.5	0.9	
980316	57.4	5.90	5.5	0.8	300			6.5	17.4	0.06	0.04	0.84				2.8						0.1	<0.2	<0.5	0.8	
980403	39.7	6.99	4.0	0.5	390	265	5	13.0	38.5	0.09	0.04	1.15				<1.0						0.1	<0.2	<0.5	0.9	
980420	25.6	9.70						13.7	26.8	0.07	0.08	0.98				3.6						0.2	<0.2	<0.5	0.9	
980504	113.2	4.02	7.0	2.0	310	117	7	9.0	18.2	0.04	0.26	2.97				2.0						0.1	<0.2	<0.5	1.0	
980518	139.9	3.20						6.2	10.1	0.03	0.08	0.98				2.9						0.1	<0.2	<0.5	1.4	
980603	36.3	3.45	4.0	1.0	210	73	5	4.4	8.4	0.02	0.03	1.50				2.0						0.2	<0.2	<0.5	0.8	
980615	54.6	4.70	10.0	4.9	250			6.9	13.2	0.02	0.10	4.9				4.9						<0.1	0.3	<0.5	1.1	
980714	79.3	4.50						4.5	8.9	0.02	0.05	2.6				2.6						0.1	<0.2	<0.5	1.5	
980802	78.6	4.72	4.0	0.7	265	78	5	6.0	17.7	0.05	0.04	1.05				1.0						0.1	<0.2	<0.5	1.0	
980817	40.5	6.40						8.2	23.9	0.05	0.05	1.7				1.7						0.2	<0.2	<0.5	0.8	
980904	38.2	5.53	5.0	3.0	295	165	3	4.3	17.7	0.04	0.30	0.83				1.0						0.1	<0.2	<0.5	1.1	
980914	45.4	7.30	4.4	0.8	340			6.8	18.8	0.04	0.06	1.8				1.8						0.1	<0.2	<0.5	0.5	
981002	25.1	8.09	3.0	1.0	350	210	5	5.5	16.8	0.49	0.09	1.62				<1.0						0.1	0.3	0.5	0.9	
981104	32.5	8.15	3.0	0.8	405	280	9	5.5	27.2	0.07	0.11	0.92				<1.0						0.1	<0.2	<0.5	0.6	
981116	47.3	8.70						6.8	24.6	0.05	0.05	2.5				2.5						<0.1	<0.2	<0.5	0.6	
981202	49.7	5.37	2.0	0.8	240	106	15	3.3	13.5	0.03	0.02	0.90				1.0						<0.1	<0.2	<0.5	1.1	
981215	60.5	6.00	2.7	0.8	210			2.6	7.8	0.02	0.02	2.8				2.4						<0.1	<0.2	<0.5	0.7	
Min.:	25.1	3.20	2.0	0.5	210	73	3	2.60	7.20	0.01	0.02	0.83				0.15	0.03	0.03	0.03	0.03		0.10	0.2	0.5	0.5	
Max.:	139.9	9.70	10.0	4.9	405	280	15	13.70	38.50	0.49	0.30	2.97				5.60	2.00	0.15	0.03	0.03		0.20	0.3	0.5	0.5	
Aver.:	55.6	5.90	4.1	1.3	287	160	7	6.44	17.47	0.06	0.08	1.25				2.80	2.98	1.18	0.15	0.03	0.03	0.12	0.2	0.5	1.5	
St.dev.:	27.1	1.68	2.2	1.2	62	69	4	2.80	7.91	0.10	0.07	0.63				1.25	0.40	1.11	0.11	0.04	0.04	0.03	0.2	0.5	0.9	
Numb.:	22	22	15	15	11	11	11	22	22	22	22	11				11	11	1	1	1	1	1	1	1	22	

**Table 7.9 Measured concentrations - 1998**  
**Watercourse : Vefsna**

Date	Drainage area . . . . .						Min : 6198 mill. cbm						Max: 1037 cbm/s														
	Q ml/s	Cond ms/m	Tot-P µg/l	PO4-P µg/l	Tot-N µg/l	NO3-N µg/l	NH4-N µg/l	Cu µg/l	Zn µg/l	Cd µg/l	Pb µg/l	S.P.M. mg/l	TOC mg/l	Hg ng/l	HCH ng/l	Gamm PCB (The following Congeners ) IUPAC NOS 28 ng/l	S2 ng/l	S2 ng/l	101 ng/l	118 ng/l	138 ng/l	153 ng/l	180 ng/l	As µg/l	V µg/l	Cr-T µg/l	Ni µg/l
980119	46.5	8.30	6	1.0	1010	137	45	10.1	7.2	0.03	0.03	1.82			3.0											0.8	
980217	67.8	7.43	8	1.0	1300	132	41	15.3	50.2	0.06	1.73	3.26			1.0											1.8	
980316	69.4	7.49	10	7.0	680	95	23	5.3	38.7	0.07	4.42	5.35			<1.0	0.12	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.6	
980414	49.1	11.2	8	8.0	215	123	5	1.6	1.0	0.02	0.18	7.86			<1.0											<0.2	
980511	440.9	4.77	6	3.0	135	40	3	0.8	0.9	<0.01	0.18	5.54			1.0											0.4	
980615	619.0	3.66	6	2.0	310	42	13	3.8	4.4	0.01	0.13	2.39			2.0											0.8	
980713	383.4	1.04	4	2.0	185	28	8	0.3	0.4	<0.01	0.08	4.10			<1.0											0.4	
980824	161.7	4.32	2	0.5	134	28	3	2.2	3.0	<0.01	0.14	4.20			1.5	3.5										0.6	
980914	326.6	3.24	9	2.0	215	28	4	0.6	1.9	<0.01	0.34	7.76			1.5											0.3	
981019	104.3	6.40	4	2.0	385	85	13	0.6	1.4	0.01	0.16	1.01			<1.0											0.2	
981116	38.3	7.57	6	3.0	655	107	31	6.0	18.9	0.04	0.51	1.00			<1.0	0.12	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.1	<0.2	<0.5	0.8	
981207	104.7	6.82	9	5.0	350	131	12	3.5	13.9	0.03	0.15	3.55			<1.0											0.6	
Min.:	38	1.04	2.0	0.5	134	28	3	0.3	0.4	0.01	0.03	1.00	1.50	3.50	1.00	0.12	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.10	0.2	0.5	0.2
Max.:	619	11.20	10.0	8.0	1300	137	45	15.3	50.2	0.07	4.42	7.86	1.50	3.50	3.00	0.12	0.03	0.03	0.03	0.03	0.03	0.03	0.10	0.2	0.5	1.8	
Aver.:	201	6.02	6.5	3.0	465	81	17	4.2	11.8	0.03	0.67	3.99	1.50	3.50	1.29	0.12	0.03	0.03	0.03	0.03	0.03	0.03	0.10	0.2	0.5	0.6	
St.dev.:	193	2.73	2.4	2.4	374	45	15	4.5	16.5	0.02	1.27	2.32			0.62	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.4		
Numb.:	12	12	12	12	12	12	12	12	12	12	12	12	1	1	12	2	2	2	2	2	2	2	1	1	12		

Table 7.10 Measured concentrations - 1998

Watercourse :	Alta										Min : 25.9 cbm/s										Max: 788.6 cbm/s									
	Annual flow . . . . .	Drainage area . . . . .	Q m3/s	Cond mS/m	Tot-P µg/l	PO4-P µg/l	Tot-N µg/l	NO3-N µg/l	NH4-N µg/l	Cu µg/l	Zn µg/l	Cd µg/l	Pb µg/l	S.P.M. mg/l	SiO2 mg/l	TOC mg/l	Hg ng/l	Gamm HCH ng/l	PCB ( The following Congeners ) IUPAC NOS 28 ng/l	PCB ( The following Congeners ) IUPAC NOS 52 ng/l	PCB ( The following Congeners ) IUPAC NOS 101 ng/l	PCB ( The following Congeners ) IUPAC NOS 118 ng/l	PCB ( The following Congeners ) IUPAC NOS 138 ng/l	PCB ( The following Congeners ) IUPAC NOS 153 ng/l	As µg/l	V µg/l	Cr-T µg/l	Ni µg/l		
980620	362.5	4.08	8	1	215	25	5	1.0	0.5	<0.01	0.04	2.22	2.5	3.5	2.5	2.5	28	52	101	118	138	153	180	As	V	Cr-T	Ni			
981102	107.8	12.1	10	7	205	75	13	0.6	0.2	<0.01	<0.02	0.53	4.5	3.5	1.0	<1.0	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	0.50	<0.2	<0.5	<0.2	0.4			
980316	29.7	16.8	10	9	180	96	3	1.0	0.2	<0.01	0.08	0.32	<1.0	<1.0	<1.0	<1.0	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.50	<0.2	<0.5	<0.2	0.4			
980812	62.3	20.3	13	7	175	53	5	0.8	0.8	<0.01	0.07	0.68	<1.0	<1.0	<1.0	<1.0	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.50	<0.2	<0.5	<0.2	0.4			
Min.:	30	4.08	8.0	1.0	175	25	3	0.6	0.2	0.01	0.02	0.32	4.50	3.50	1.00	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	
Max.:	363	20.30	13.0	9.0	215	96	13	1.0	0.8	0.01	0.08	2.22	4.50	3.50	2.50	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	
Aver.:	141	13.32	10.3	6.0	194	62	7	0.9	0.4	0.01	0.05	0.94	4.50	3.50	1.38	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	
St.dev.:	151	7.02	2.1	3.5	19	30	4	0.2	0.3	0.00	0.03	0.87	4	4	0.75	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Numb.:	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		

**APPENDIX VIII : TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1998**      **Page:**

Table 8.1	Cond., Nutrients, Heavy metals, Suspended part.matter	59-65
Table 8.2	Mercury, Lindane, PCBs	67-73

(1) Glomma	"tributaries"	: Tista	- Hølenelva
(1) Inner Oslo-fjord	"tributary"	: Årungelva	- Åroselva
(2) Drammenselva	"tributaries"	: Lierelva	
(3) Numedalslågen	"tributary"	: Sandeelva	- Farriselva
(4) Skienselva	"tributaries"	: Tokkeelva	
(5) Otra	"tributaries"	: Gjerstade.	- Audna
(6) Orreelva	"tributaries"	: Lygna	- Ulla
(7) Suldalslågen	"tributaries"	: Saudaelva	- Hornindalselva
(8) Orkla	"tributaries"	: Ørstaelva	- Salsvatnelva
(9) Vefsna	"tributaries"	: Åbjøra	- Reisa
(10) Alta	"tributaries"	: Mattiselva	- Grense Jacobse.

Table 8.1 TRIBUTARY RIVERS, MEAN CONCENTRATIONS 1998.

County	Watercourse	Runoff data										Parameters ( mean values )																			
		Discharge		Sampling station		Gauging station		Cond		Tot.P		PO4-P		Tot.N		NO3-N		NH4-N		Cu		Zn		Cd		Pb		S.P.M.		Hg	
		sq.km	sq.km	sq.km	sq.km	Normal	1998	sq.km	mS/m	Normal	1998	µg/l	µg/l	Normal	µg/l	1998	µg/l	Normal	µg/l	1998	µg/l	Normal	µg/l	1998	µg/l	Normal	µg/l	1998	µg/l		
Østfold ( 1. )	Tista, Iddefj., Mosselva, Mossesundet Ø	1588	1582	1582	14.4	13.3	14.4	13.3	6.00	10.4	2.0	923	670	6	0.9	2.5	0.05	0.15	1.52	1.0	4.38	<1.0	4.38	<1.0	10.30	3.5					
	Hulenelva, Drøbakskundet Ø	137	121	14.0	14.1	20.80	80.0	57.0	3460	2360	87	2.6	4.3	0.02	0.51	10.30	3.5	4.38	<1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0				
	Arungelva, I. Oslofj.	52	50	13.0	13.1	26.90	21.0	3.0	2990	2305	25	1.9	0.8	<0.01	0.08	4.77	1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0				
	Gjersjøelva, I. Oslofj.	86	85	85	14.0	14.1	19.10	8.0	0.8	1700	1445	5	1.7	1.8	0.02	0.09	4.08	1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0					
	Ljanselva, I. Oslofj.	42	41	13.0	10.2	28.00	82.0	32.0	1470	835	20	12.5	12.3	0.12	0.98	25.80	1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0						
	Loelva/Alna, I. Oslofj.	75	69	13.0	20.3	29.00	157.0	47.0	1727	1025	86	3.2	11.1	0.04	1.03	48.80	3.0	4.38	<1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0						
	Akerselva, I. Oslofj.	227	225	225	17.5	16.1	6.00	23.0	3.0	767	300	28	1.1	9.0	0.03	0.57	6.00	4.0	4.38	<1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0					
	Frognerelva, I. Oslofj.	23	20	15.0	25.1	22.00	62.0	31.0	1990	1180	133	15.8	11.2	0.02	0.39	10.40	1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0						
	Lysakerelva, I. Oslofj.	178	173	173	16.8	22.7	16.8	5.90	14.4	3.0	606	370	9	11.2	12.5	0.07	0.82	5.20	1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0						
	Sandvikselva, I. Oslofj.	223	187	187	18.4	24.4	18.4	24.4	12.90	15.0	6.0	880	700	15	0.8	1.7	0.01	0.27	0.89	1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0					
Buskerud ( 2. )	Aroselva, I. Oslofj.	113	109	109	17.0	18.9	17.0	18.30	36.1	11.0	1755	1590	93	1.6	3.0	0.04	0.79	10.50	1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0						
	Lierelva, Drammenselv, Ø	309	266	222	18.6	35.2	18.6	20.10	41.6	27.0	1410	1005	8	1.9	7.1	0.02	1.06	18.40	2.0	4.38	<1.0	4.38	<1.0	4.38	<1.0						
	Sandeelva, Sandebukta	193	190	17.0	19.6	16.00	16.0	6.0	1150	935	37	1.4	49.9	0.11	1.78	5.14	4.38	<1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0							
Vestfold ( 3. )	Aulielva, Tonsbergfj.	363	362	362	14.9	17.6	14.9	17.6	26.03	143.0	29.0	3078	2660	130	1.5	5.6	0.03	0.67	41.20	2.0	4.38	<1.0	4.38	<1.0							
	Farriselva, Larvikfj.	491	491	21.6	21.8	21.6	21.8	3.90	6.0	3.0	505	390	11	0.4	7.6	0.03	0.17	0.49	1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0						
Telemark ( 4. )	Tokkeelva, Kragerø	1238	1200	1200	26.7	30.0	1.59	4.0	0.6	270	123	24	0.3	5.0	0.03	0.27	1.38	1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0							
	Gjersdølva, Søndeledfj., Vegårdselva, Sandnesfj.	419	414	291	27.0	30.4	2.57	6.0	1.0	440	218	35	0.5	6.4	0.04	0.58	1.46	1.5	4.38	<1.0	4.38	<1.0	4.38	<1.0							
	Nidelva, Arendal	457	429	291	29.3	32.2	2.81	6.0	2.0	414	193	34	0.6	8.2	0.03	0.54	2.98	1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0							
	4025	4020	3956	29.8	32.8	1.80	4.0	0.8	334	169	17	0.5	5.0	0.03	0.34	1.08	1.0	4.38	<1.0	4.38	<1.0	4.38	<1.0								

Table 8.1 TRIBUTARY RIVERS, MEAN CONCENTRATIONS 1998.

County	Watercourse	Runoff data				Parameters (mean values)												Zn		Cd		Pb		S.P.M.		Hg	
		Discharge		gauging station		1998				NH4-N				Cu				mg/l		mg/l		mg/l		mg/l		mg/l	
		sq.km	sq.km	sq.km	sq.km	Normal	1998	mS/m	mg/l	Tot-P	PO4-P	Tot-N	NO3-N	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Vest-Agder (5.)	Tovdalselva, Topdalsfj.	1656	1854	1794	33.9	36.6	33.9	1.93	5.0	3.0	396	151	27	0.3	5.7	0.04	0.55	1.74	1.5								
	Sognelva, Flekkery	204	192	192	38.0	39.9	38.0	5.57	18.7	3.0	535	480	10	0.6	7.4	0.04	0.55	1.66	1.0								
	Mandalselva, Mannefj.	1803	1800	1740	46.0	47.4	47.6	49.1	1.70	4.5	1.0	312	143	32	0.3	3.7	0.02	0.62	1.63	1.5							
	Audna, Sniksfj.	450	400	59	45.0	48.2	51.8	3.92	9.0	1.0	590	335	30	0.3	5.9	0.04	0.64	1.93	1.5								
	Lynna, Lyngdalsfj.	664	660	266	49.0	51.9	57.9	62.1	2.50	5.0	1.0	393	221	8	0.3	4.6	0.04	0.46	1.48	1.5							
	Kvina, Fedafj.	1445	1140	1140	57.6	63.4	57.6	2.96	6.0	2.0	384	211	7	0.3	4.5	0.02	0.78	1.84	2.5								
Rogaland (6.)	Sira, Ana-Sira	1916	1872	1872	59.4	68.3	59.4	2.79	2.0	0.6	450	223	27	0.3	3.6	0.02	0.46	0.68	1.0								
	Sokndalselva, Sognlandsstr.	294	293	107	51.1	56.5	51.1	56.5	4.24	9.0	3.0	405	260	25	0.5	5.3	0.04	0.39	0.91	1.0							
	Hellandselva, Egersund	241	240	194	57.5	48.6	71.1	3.01	9.0	3.0	470	305	10	0.8	5.8	0.04	0.63	1.76	1.5								
	Bierkjemselva, Egersund	705	704	639	77.7	65.6	86.4	73.0	3.24	4.0	1.0	477	389	7	0.5	2.9	0.02	0.26	0.54	<1.0							
	Hælva, Håtangen	165	160	135	46.9	57.7	46.9	57.7	12.50	34.6	15.0	1777	1350	37	0.9	3.7	0.01	0.37	2.58	2.0							
	Figgjo, Solavika	229	218	135	50.0	60.0	50.0	46.5	14.20	285.0	23.0	1827	1705	34	1.3	6.1	0.02	0.63	3.38	1.5							
(7.)	Ims-Lutsi, Hogafj. Boknafj.	127	127	127	34.9	46.5	34.9	46.5	6.82	7.0	1.0	905	655	13	0.4	2.3	0.01	0.43	0.61	<1.0							
	Oltedalsse., Hogafj. Boknafj.	102	101	129	70.0	77.0	70.0	3.16	5.0	1.0	440	325	26	0.3	3.2	0.02	0.28	0.98	<1.0								
	Dirdalse., Hogafj. Boknafj.	158	158	95	83.0	91.3	83.0	1.75	2.5	0.6	315	243	20	0.7	3.1	<0.01	0.31	0.50	1.5								
	Frafjorde., Frafj. Boknafj.	178	178	124	94.4	103.4	94.4	1.89	3.0	0.8	250	144	5	0.3	1.8	<0.01	0.29	0.66	1.0								
	Espedalsse., Hogafj. Boknafj.	139	138	124	90.0	99.0	90.0	2.60	6.3	<0.5	316	235	3	0.2	1.3	<0.01	0.25	0.48	1.0								
	Lysefj. Boknafj.	182	182	46	74.0	81.4	74.0	2.00	1.0	0.8	150	100	3	0.2	1.7	<0.01	0.24	0.32	<1.0								
	Ardalsfj. Boknafj.	519	516	501	81.4	89.5	81.4	2.02	2.0	0.5	232	160	3	0.2	1.4	0.01	0.30	0.41	1.5								
	Førre., Jøsenfj. Boknafj.	163	163	163	65.8	94.4	85.8	2.30	3.0	0.5	250	240	7	0.3	0.9	0.01	0.20	0.20	1.0								
	Ulla., Jøsenfj. Boknafj.	393	393	385	83.4	91.7	83.4	2.09	2.0	0.5	250	138	3	0.2	2.1	<0.01	0.21	0.42	1.5								
	Saudafj. Boknafj.	353	353	85.0	102.0	85.0	2.86	2.0	<0.5	910	820	3	0.8	30.7	0.07	0.13	0.28	1.0									
	Abeelva, Saudafj. Boknafj.	82	82	85.0	102.0	85.0	1.14	2.0	1.0	200	144	3	0.2	1.8	<0.01	0.13	0.32	1.5									
	Vikedalsse., Boknafj.	118	117	115	80.0	99.8	80.0	99.8	1.78	3.0	0.8	218	149	3	0.5	3.3	0.03	0.24	1.35	1.0							

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1998.

County	Watercourse	Runoff data						Parameters (mean values)										Cu			Zn			Cd			Pb			S.P.M.			Hg										
		Discharge			gauging station			Cond			Tot-P			PO4-P			Tot-N			NO3-N			NH4-N			Cu			Zn			Cd			Pb			S.P.M.			Hg		
		sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km						
(7.)	Etnelva, Elnesfj, Bomsfj,	252	250	127	48.8	51.9	96.0	103.7	2.34	6.0	1.0	365	235	3	0.4	1.9	<0.01	0.19	1.69	1.0																							
	Opo, Sørfj. Hardangerfj.	482	480	464	79.3	81.0	79.3	81.0	1.71	3.8	2.1	653	124	195	0.5	2.9	0.02	0.37	1.92	1.5																							
	Tysso, Sørfj. Hardangerfj.	388	385	407	79.3	81.0	79.3	81.0	1.47	0.9	<0.5	155	114	5	0.3	2.9	0.02	0.06	0.25	<1.0																							
	Kinsø, Sørfj. Hardangerfj.	281	281	232	46.0	50.2	46.0	50.2	1.85	1.0	<0.5	116	79	3	0.2	0.9	<0.01	0.05	0.44	1.5																							
	Veig, Eldfjv. Hardangerfj.	496	496	386	41.8	39.2	41.8	39.2	1.38	2.0	<0.5	122	60	3	2.4	1.3	<0.01	0.55	0.55	<1.0																							
	Eijoreia, * Hardangerfj.	592	592	592	26.0	9.6	26.0	9.6	1.38	2.0	<0.5	122	60	3	2.4	1.3	<0.01	0.55	0.55	<1.0																							
	Simsa, Eldfj. Hardangerfj.	145	145	128	69.2	79.6	69.2	79.6	2.59	1.0	<0.5	175	145	3	0.2	0.7	<0.01	0.05	0.56	<1.0																							
	Austidøla, Øsafj. Eldfj.	131	130	89	74.6	85.8	74.6	74.6	7.90	0.8	<0.5	350	330	6	0.3	1.0	0.01	0.04	0.71	1.0																							
	Norddøla, Øsafj. Eldfj.	40	39	89	74.6	85.8	74.6	74.6	7.90	0.8	<0.5	350	330	6	0.3	1.0	0.01	0.04	0.71	1.0																							
	Tysesølva, Fusafj.	240	240	85.0	93.5	85.0	93.5	1.68	3.7	2.0	602	104	9	0.7	2.2	0.03	0.22	0.54	<1.0																								
	Oseleva, Fusafj.	109	108	50	91.7	106.0	91.7	106.0	3.71	12.0	3.0	410	245	11	1.1	3.9	0.02	0.16	1.32	1.0																							
	Bergsdalselv, Veafj. Herdlaflj.	198	198	80.0	68.0	80.0	68.0	1.45	2.0	<0.5	160	132	12	0.5	7.6	0.03	0.09	0.54	<1.0																								
	Væsso, Veafj. Sørflj.	1492	1465	1102	58.2	60.2	58.2	60.2	2.00	7.1	0.6	225	144	12	0.4	1.4	0.02	0.06	0.46	1.0																							
	Eksø, Østerflj.	414	400	342	86.2	90.5	86.2	90.5	1.41	3.0	0.5	167	98	5	0.3	1.7	0.03	0.17	0.60	<1.0																							
	Modalselva, Østerflj.	385	384	248	95.5	100.3	95.5	100.3	1.01	2.0	0.5	172	106	4	0.2	2.6	0.01	0.19	0.59	<1.0																							

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1998.

County	Watercourse	Runoff data						Parameters ( mean values )													
		Ge area	Outlet	Sampl. station	Disch. gaug. station	Sampling station		gauging station		Cond	Tot-P	PO4-P	Tot-N	NO3-N	NH4-N	Cu	Zn	Cd	Pb	S.P.M.	Hg mg/l
						1998	Normal	1998	Normal												
Sogn og Fjordane (7.)	Nærøyv., Aurl. f., Sognefj.	290	290	267	59.5	65.9	59.5	1.99	1.0	<0.5	320	255	11	0.6	6.7	0.02	0.08	0.22	<1.0		
	Fjåmse., Aurl. f., Sognefj.	280	275	275	52.4	57.1	52.4	1.43	0.8	<0.5	310	290	6	0.4	1.0	0.01	0.03	0.65	<1.0		
	Aurlandsv. Aurl. f., Sognefj.	600	799	762	48.6	51.0	48.6	1.43	2.0	<0.5	335	270	30	0.3	0.9	<0.01	0.04	1.43	<1.0		
	Erdalse., Lærd. f., Sognefj.	138	138	30.0	31.5	30.0	1.07	2.0	0.5	122	64	3	0.3	0.9	0.02	0.09	0.76	<1.0			
	Lærdalsv. Lærd. f., Sognefj.	1184	1172	30.0	21.8	30.0	1.65	3.7	1.0	206	158	4.5	0.7	1.0	0.09	0.09	1.04	<1.0			
	Ardalsv., Ardalsfj., Sognefj.	989	989	44.9	43.3	44.9	43.3	0.96	4.0	2.0	200	77	7	1.2	1.0	0.01	0.02	1.16	<1.0		
	Fortunv., Lusterfj., Sognefj.	508	508	367	51.0	49.9	51.0	49.9	2.08	2.0	1.0	280	230	9	0.8	1.0	<0.01	0.06	0.88	<1.0	
	Mørkrisv., Lusterfj., Sognefj.	282	282	203	54.7	52.0	54.7	2.04	0.9	0.7	305	275	6	0.4	1.0	<0.01	<0.02	0.26	<1.0		
	Jostedals., " Sognefj.	865	864	57.3	68.0	51.3	68.0	51.3	17.60	1.0	<0.5	400	325	12	0.8	1.2	<0.01	0.06	0.24	<1.0	
	Årøye., Sognd. f., Sognefj.	449	446	384	77.2	73.3	77.2	1.50	2.0	<0.5	170	149	6	0.3	0.9	<0.01	0.04	0.67	<1.0		
	Sogndalsse., " Sognefj.	175	172	111	65.1	64.8	66.1	2.11	4.0	2.0	360	320	6	0.4	4.3	<0.01	0.02	0.33	<1.0		
	Gaular., Dalsfj., Bufl.	627	625	505	79.3	84.5	79.3	84.5	0.95	5.0	2.0	158	79	12	0.3	1.4	<0.01	0.05	0.47	1.0	
	Jelstra., Ferdefj.	714	709	384	74.3	78.0	74.3	1.65	4.0	2.0	250	215	12	0.3	2.7	<0.01	0.03	0.48	<1.0		
	Nausta., Ferdefj.	277	273	232	61.7	85.8	61.7	1.21	10.0	6.0	140	60	6	0.1	3.1	<0.01	<0.02	0.74	1.0		
	Oseliva., Høydalsfj.	287	285	225	78.7	82.6	78.7	2.00	3.0	0.6	170	113	5	0.3	2.0	0.01	0.13	0.40	1.5		
	Hopse., Hyefj. Nordfj. S	73	73	161	75.0	78.8	75.0	1.43	2.0	<0.5	210	200	6	0.3	3.7	0.02	0.12	0.69	1.5		
	Gjengedalsse., " Nordfj. S	170	168	161	75.0	78.8	75.0	1.18	3.0	0.7	200	142	6	0.3	1.1	<0.01	0.09	0.52	2.0		
	Breimse., Gløppenfj. "	636	634	595	68.8	80.0	68.8	1.53	3.5	0.5	223	275	3	0.3	1.2	0.01	0.02	0.30	<1.0		
	Oldene., Indre Nordfj.	226	225	204	70.1	71.5	70.1	71.5	1.63	3.3	<0.5	243	250	9	0.4	1.0	<0.01	0.05	0.65	<1.0	
	Loenelva., Indre Nordfj.	261	260	234	65.0	66.2	65.0	66.2	2.05	2.8	1.0	169	205	3	0.4	0.5	<0.01	0.04	0.40	<1.0	
	Stryneee., Indre Nordfj.	532	530	493	60.2	56.8	60.2	56.8	1.78	2.8	<0.5	198	151	18	0.6	3.5	0.02	0.15	3.45	<1.0	
	Hornindalsse., Nordfj. N	428	424	378	58.1	55.8	58.1	55.8	2.58	5.0	0.6	315	115	3	0.4	1.1	<0.01	0.06	0.83	<1.0	

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1998.

County	Watercourse	Runoff data						Parameters (mean values)										1998			Normal				
		Discharge			gauging station			1998			Normal			Cond			mSiM			1998			Normal		
		sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km
(8.)	Ørstae-, Ørstafj. Værdiøla, Nordafj., Storfj. Rauma, Romsdalsfj., Moldefj. Ista, Istrf., Moldefj. Eira, Eresfj., Moldefj. Littledalselv, Sunndalsfj. Driva, Sunndfj., Tingvollf. Ulvia, Alvundfj. Teia, Todalsfj. Surna, Surnadalsfj. Bevra, Hamnesfj., Holsafj. Børse, Gaulosen Tr.h.fj. Vigda, Gaulosen Tr.h.fj.	160	155	70.0	73.5	70.0	3.55	17.0	6.0	565	280	37	1.1	5.8	0.01	0.20	2.95	1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Romsdal	359	357	60.0	63.0	60.0	3.0	1.20	3.0	0.6	107	57	3	0.4	1.0	<0.01	0.06	1.03	<1.0	<1.0	<1.0	<1.0	<1.0		
		1202	1190	1142	32.8	31.9	32.8	31.9	2.06	2.0	0.7	118	68	<3	0.4	1.1	<0.01	0.04	1.40	<1.0	<1.0	<1.0	<1.0		
		175	175	89	57.0	58.8	57.0	58.8	1.50	2.0	0.6	115	73	<3	0.3	1.6	0.01	0.07	0.64	<1.0	<1.0	<1.0	<1.0		
		1119	1119	1085	34.8	35.9	34.8	35.9	1.93	2.0	0.5	150	109	4	0.5	0.8	<0.01	0.08	0.56	<1.0	<1.0	<1.0	<1.0		
		359	330	41.0	47.9	41.0	47.9	0.99	1.0	0.5	68	21	4	0.3	0.4	<0.01	0.02	0.49	<1.0	<1.0	<1.0	<1.0			
		2487	2435	2435	27.9	32.1	27.9	32.1	2.94	2.0	0.5	225	135	<3	0.8	0.9	<0.01	0.08	0.62	<1.0	<1.0	<1.0	<1.0		
		199	199	207	57.0	34.3	60.7	36.5	3.46	7.0	2.0	690	510	6	1.3	1.7	<0.01	0.12	1.26	1.5	1.5	1.5	1.5		
		251	251	207	58.5	60.9	58.5	60.9	1.27	2.0	0.5	107	47	<3	0.3	0.4	0.02	0.04	0.58	<1.0	<1.0	<1.0	<1.0		
		1200	1125	48.0	51.8	49.3	49.3	1.83	3.0	0.9	175	84	5	0.4	1.6	0.01	0.24	0.99	<1.0	<1.0	<1.0	<1.0			
		243	243	196	55.0	57.6	55.0	57.6	2.30	3.0	0.7	165	51	6	0.6	1.0	0.01	0.23	1.10	1.0	1.0	1.0	1.0		
		110	100	30.0	28.9	30.0	28.9	30.0	9.33	12.0	5.0	490	255	14	1.4	0.6	<0.01	0.22	3.22	<1.0	<1.0	<1.0	<1.0		
		150	150	30.0	28.9	30.0	28.9	30.0	11.50	9.0	3.0	370	185	21	1.0	0.5	<0.01	0.15	4.67	<1.0	<1.0	<1.0	<1.0		
		3659	3650	3662	26.4	25.4	26.4	25.4	6.75	7.0	3.0	175	150	12	1.9	4.2	<0.01	2.26	6.70	<1.0	<1.0	<1.0	<1.0		
(8.)	Nidelva, Trondheimsfj. Homla, Stjerdafj., Tr.h.fj. Nord-Trondelag	3110	3100	3049	35.5	34.9	35.5	34.9	3.40	9.1	1.0	234	54	5	0.8	0.6	<0.01	0.06	2.01	<1.0	<1.0	<1.0	<1.0		
		157	157	30.0	29.5	30.0	29.5	30.0	4.97	5.0	0.9	240	41	16	2.1	3.6	<0.01	0.11	1.09	1.5	1.5	1.5	1.5		
		2117	2117	1863	38.5	38.1	38.5	38.1	2.95	4.0	2.0	185	55	5	3.3	4.0	<0.01	0.11	2.91	1.5	1.5	1.5	1.5		
		93	93	25.0	24.8	25.0	24.8	25.0	15.10	14.0	11.0	1110	1020	18	1.1	0.3	<0.01	0.13	1.07	<1.0	<1.0	<1.0	<1.0		
		1472	1472	898	40.0	39.9	44.5	44.5	5.04	4.0	1.0	225	90	8	0.9	4.5	<0.01	0.12	2.14	1.0	1.0	1.0	1.0		
		282	282	176	30.0	33.6	31.8	31.8	5.85	15.0	7.0	550	295	10	1.2	1.2	<0.01	0.25	8.84	1.5	1.5	1.5	1.5		
		2153	2125	2125	35.1	31.8	35.1	31.8	3.97	5.0	1.0	270	98	13	0.7	2.9	<0.01	0.05	1.39	1.5	1.5	1.5	1.5		
(8.)	Årgårdelva, Namnfj. Namsen, Namnfj. Ø Salsvatnøya, Follafl.	543	510	238	43.0	44.8	50.9	53.0	5.34	21.0	6.0	570	180	47	0.9	1.4	<0.01	0.28	7.72	2.5	2.5	2.5	2.5		
		6277	6276	5718	43.4	43.2	43.4	43.4	51.2	29.50	3.0	138	26	5	0.6	1.6	<0.01	0.41	1.23	1.5	1.5	1.5	1.5		
		432	432	422	59.7	63.5	47.3	47.3	0.9	<0.5	129	66	3	0.9	14.3	0.01	0.09	0.52	<1.0	<1.0	<1.0	<1.0			

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1998.

County	Watercourse	Runoff data				Parameters (mean values)																							
		Discharge		gauging station		Cond mS/cm				Tot-P µg/l		PO4-P µg/l		Tot-N µg/l		NH4-N µg/l		Cu µg/l		Zn µg/l		Cd µg/l		Pb µg/l		S.P.M. mg/l		Hg ng/l	
		Outlet sq.km	Samp. station sq.km	Disch. gaug. station Normal l/s sq.km	Sampling station Normal 1998 l/s sq.km																								
Nordland (9.)	Abjeira, Bindalstr. S	526	520	384	80.2	75.5	80.2	1.34	1.0	0.6	60	10	3	0.1	0.5	<0.01	0.06	0.48	<1.0										
	Skjervva, Vetsenfj. S	104	104	98	41.3	38.9	41.3	6.50	24.0	11.0	665	420	55	1.5	2.4	0.02	0.48	11.04	1.5										
	Fusta, Vetsenfj. N	544	543	520	63.4	59.7	63.4	59.7	2.38	3.0	0.9	89	15	10	0.3	1.6	<0.01	0.06	1.14	<1.0									
	Drevja, Vetsenfj. N	177	176	98	65.0	61.2	65.0	4.03	3.0	1.0	89	32	1	0.3	1.8	<0.01	0.09	1.95	<1.0										
	Rossøga, Sørkj.	2092	2087	1880	45.4	54.5	45.4	3.56	2.0	<0.5	69	32	9	0.5	5.4	<0.01	0.07	0.63	<1.0										
	Bjerkå, Sørkj.	385	385	273	55.4	49.9	55.4	2.92	1.0	<0.5	59	17	5	0.4	1.2	<0.01	0.05	0.40	<1.0										
	Dalselva, Ranafj. N	211	211	129	39.5	35.6	39.5	2.14	1.0	<0.5	46	9	4	0.3	0.7	<0.01	0.04	0.63	<1.0										
	Ranavassdraget, Ranafj. N	3847	3846	1892	44.9	40.4	44.9	1.99	2.0	1.0	63	30	5	0.2	1.3	<0.01	0.08	1.45	<1.0										
	Fykandøya, Glomfjord	297	297	243	103.7	98.3	103.7	4.44	1.0	0.5	126	77	12	0.5	10.4	<0.01	0.02	0.23	<1.0										
	Beiare, Beiarfj. Nordkj.	1064	875	797	45.1	45.1	7.14	5.0	3.0	53	48	5	0.5	4.8	<0.01	0.12	6.75	<1.0											
Saltdalsvassdr., Saltd. fj. S	1544	1543	1168	32.1	33.4	32.1	3.72	4.5	2.0	83	21	5	1.0	177.1	<0.01	<0.02	4.13	<1.0											
	Sultjelma vassdr., Saltd. fj	1028	800	791	44.0	46.2	44.0	19.60	1.0	<0.5	71	34	3	8.5	15.1	0.04	0.15	0.51	<1.0										
	Kobbie, Leirfj. Sandfj. N	405	405	386	66.9	64.8	66.9	1.54	1.0	<0.5	60	26	4	0.2	1.2	<0.01	0.05	0.70	<1.0										
	Skjoma, Olotfj. S	845	840	797	36.3	34.5	36.3	1.02	4.0	2.0	41	13	4	0.5	2.6	<0.01	0.19	3.11	<1.0										

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1998.

County	Watercourse	Runoff data						Parameters (mean values)														
		Discharge			Gauging station			1998			Normal			1998			Normal			1998		
		sq.km	sq.km	sq.km	Disch. station	Sampl. station	Gauging station	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	sq.km
Troms ( 9. )	Spanselva, Astafj. Vagsfj. Salangsæ, Astafj. Vagsfj. Rossfjorde, Malangen Mälse., Mälselfvifj. "	142	142	533	50.0	52.5	50.0	4.18	3.0	1.0	59	17	3	0.5	0.6	<0.01	0.07	2.79	<1.0			
	Bardue., Mälselfvifj.	539	539	533	40.9	42.9	40.9	6.04	2.0	0.7	65	27	4	0.3	0.2	<0.01	0.04	0.92	<1.0			
	Nordkjøselsva, Balsfj. Signaldelvæ, Lyngen V Skibotnsva, Lyngen Kåfjordelva, Lyngen Ø Reisa, Reisafj.	196	190	395	39.5	39.5	39.5	7.60	4.0	0.7	132	4	19	0.4	0.3	<0.01	0.05	0.98	<1.0			
		3239	3200	3118	28.7	21.7	21.7	7.30	13.0	2.6	219	78	19	2.1	9.0	0.01	0.19	7.86	<1.0			
		2906	2906	2049	28.3	21.4	28.3	7.55	7.1	0.5	169	71	5	2.1	9.0	0.01	0.19	7.86	<1.0			
		191	191	415	27.7	19.4	27.7	2.96	2.0	0.6	48	17	3	0.9	0.5	<0.01	0.06	1.46	<1.0			
		467	467	415	27.7	19.4	27.7	2.46	2.0	1.0	56	17	6	2.0	3.4	<0.01	0.11	2.37	<1.0			
		770	770	724	18.0	18.0	18.0	2.47	1.0	0.8	59	20	4	0.6	0.3	<0.01	<0.02	0.86	<1.0			
		358	358	348	20.0	14.0	20.0	3.20	1.0	0.5	120	79	5	1.1	0.7	<0.01	0.02	0.40	<1.0			
		2702	2702	16.0	12.0	16.0	5.26	2.0	0.7	74	16	5	0.8	0.6	<0.01	0.02	0.98	<1.0				
	Matiselva, Kåfj. Altafj. Tverrelva, Altafj.	325	325	319	26.5	26.5	26.5	2.31	3.0	<0.5	72	7	5	1.3	1.6	<0.01	0.24	0.67	<1.0			
Finnmark ( 10. )	Repparfjordv., Repparfj.	234	233	233	15.1	15.3	15.1	3.78	4.0	1.0	146	32	14	1.5	0.9	<0.01	0.09	0.80	<1.0			
	Stabburse., I. Porsangenv V Lakse., Indre Porsangenv S Borselva. Indre Porsangenv Ø Matusjåkka, I. Laksefj. V Storelv. Indre Laksefj. V Soussjåkka, I. Laksefj. V Adamselva, I. Laksefj. Ø Tanavassdrapet, Tanafj. S Vesterelva, Syltefj.	1090	1089	1089	25.0	22.5	25.0	2.89	1.0	<0.5	89	14	8	1.0	0.8	0.01	0.23	0.96	<1.0			
		1108	1102	870	18.3	16.5	18.3	4.41	3.0	<0.5	77	62	5	0.2	0.5	<0.01	0.03	0.55	<1.0			
		1533	1532	941	15.9	14.3	15.9	3.68	4.0	1.0	105	7	16	0.6	0.9	<0.01	0.03	1.79	<1.0			
		883	883	863	29.8	26.8	29.8	2.81	1.0	<0.5	65	6	21	0.3	1.2	<0.01	0.06	0.52	<1.0			
		101	101	101	22.8	21.7	22.8	7.32	1.0	0.5	59	2	3	0.2	0.2	0.01	0.02	0.31	4.0			
		690	690	760	21.9	20.8	19.9	2.64	1.0	<0.5	48	27	4	0.3	2.7	<0.01	<0.02	0.20	<1.0			
		92	92	102	25.3	23.9	22.8	4.20	0.9	<0.5	59	17	4	0.2	1.0	<0.01	0.03	0.32	<1.0			
		705	705	760	19.9	18.9	19.9	5.52	2.0	<0.5	89	9	17	0.3	1.5	<0.01	0.10	0.56	<1.0			
		16389	15713	14169	11.5	10.9	11.5	5.13	14.3	5.2	185	42	6	2.1	14.2	0.03	0.58	0.31	1.0			
		469	469	79	34.6	34.6	34.6	3.97	4.0	3.0	48	4	13	0.2	0.5	<0.01	0.06	0.62	<1.0			
		627	627	239	18.1	19.9	18.1	4.21	4.0	2.0	50	3	5	0.2	0.2	<0.01	0.02	0.76	<1.0			
		18404	18403	18175	9.3	9.8	9.3	3.59	25.0	14.0	500	3	231	1.3	2.6	0.03	0.05	3.10	1.0			
		2960	2960	2911	9.8	13.7	9.8	2.72	3.0	<0.5	160	4	10	0.2	<0.01	<0.02	5.84	<1.0				
		234	234	18.0	18.9	18.0	4.36	3.0	0.7	129	8	31	2.1	1.9	0.01	0.10	0.76	<1.0				



Table 8.2 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1998.

County	Watercourse	Runoff data							Parameters ( mean values )																	
		sq.km	sq.km	Disch. gauging station	Sampling station	Discharge			PCB ( The following Congeners ) IUPAC NOS							TOC			SiO <sub>2</sub>		Cr-T		Ni		As	
						Normal	1998	l/s sq.km	Normal	1998	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	mg/l	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		
Østfold ( 1. )	Tista, Iddefj., Mosselva, Mossesundet Ø	1588	1582	14.4	13.3	14.4	13.3	0.6	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	6.70	2.50	1.7	0.5	0.28	0.5	0.4				
	Hølenelva, Drøbak sundet Ø	137	121	14.0	14.1			0.6	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	9.90	9.10	0.9	2.8	0.59						
	Arungelva, l. Oslofj.	52	50	13.0	13.1			0.6	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	2.80	0.10	<0.5	1.6	0.36						
	Gjersjelva, l. Oslofj.	86	85	85	85	14.0	14.1	0.6	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	6.20	3.20	<0.5	2.2	0.18						
	Ljanselva, l. Oslofj.	42	41	13.0	10.2			0.6	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	6.50	6.70	0.7	4.0	0.46						
	Leirav/Alna, l. Oslofj.	75	69	13.0	20.3	0.28	0.17	0.08	0.18	0.05	0.11	0.11	0.05	0.05	0.05	6.00	7.10	0.6	0.4	0.28						
	Akerselva, l. Oslofj.	227	225	17.5	16.1	0.65	0.04	0.05	0.04	0.03	0.04	0.04	0.04	0.04	0.04	3.90	3.60	<0.5	0.3	0.25						
	Frognerelva, l. Oslofj.	23	20	20	25.1	0.6	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4.10	6.60	39.4	17.4	0.39						
	Lysakerelva, l. Oslofj.	178	173	173	22.7	16.8	22.7	16.8	0.6	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	5.50	4.70	24.1	5.1	0.21						
	Sandvikaelva, l. Oslofj.	223	187	187	18.4	18.4	24.4	18.4	0.6	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	5.90	1.00	<0.5	<0.2	0.18						
	Arosaiva, l. Oslofj.	113	109	109	17.0	18.9	17.0	17.0	0.6	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	6.20	6.20	<0.5	0.7	0.37						
Buskerud ( 2. )	Lierelva, Drammensfj. Ø	309	265	222	18.6	35.2	18.6	0.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	5.90	7.20	1.6	1.5	0.56						
	Sandeelva, Sandebukta	193	190	17.0	19.6			0.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	3.60	6.30	<0.5	<0.2	0.31						
Vestfold ( 3. )	Aulieelva, Tonsbergfj.	363	362	14.9	17.6	14.9	17.6	0.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	5.10	9.90	<0.5	1.8	0.37						
	Farriselva, Larvikfj.	491	491	21.6	21.6	21.6	21.6	0.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	3.80	3.80	3.0	<0.2	0.14						
Telemark ( 4. )	Tokkeelva, Kragerø	1238	1200	26.7	30.0	26.7	30.0	0.8	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	5.50	2.50	<0.5	0.3	0.18						
	Gjerstadelva, Søndeledfj.	419	414	291	27.0	30.4	27.0	0.8	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	5.50	2.50	<0.5	0.8	0.29						
	Vegårdselva, Sandnesfj.	457	429	291	29.3	32.2	29.3	0.8	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4.80	2.90	<0.5	0.7	0.24						
	Nidelva, Arendal	4025	4020	3956	29.8	32.8	29.8	0.8	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	3.00	2.20	<0.5	0.3	0.2						

Table 8.2 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1998.

County	Watercourse	Runoff data				Parameters ( mean values )															
		sq.km	sq.km	sq.km	sq.km	Discharge			PCB ( The following Congeners ) IUPAC NOS												
						Normal	1998	Normal	HCH	28	52	101	118	138	153	180	TOC	SiO2	Cr-T	Ni	
Vest-Agder ( 5. )	Tovdalselva, Topdalsfj.	1856	1854	1794	33.9	36.6	33.9	36.6	0.8	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4.50	1.90	<0.5	0.3	0.22
	Sognneiva, Flekkery	204	192	192	38.0	39.9	38.0	39.9	0.8	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	3.80	3.60	<0.5	0.6	0.27
	Mandalselva, Mannelj.	1809	1800	1740	46.0	47.4	47.6	49.1	0.7	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	3.80	1.30	<0.5	<0.2	0.2
	Audna, Sniksfj.	450	400	59	45.0	48.2	51.8	0.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	2.90	2.40	<0.5	<0.2	0.23
	Lygna, Lyngdalsfj.	684	660	266	48.0	51.5	57.9	62.1	0.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	3.90	2.00	<0.5	0.3	0.21
	Kvina, Fedafj.	1445	1140	1140	57.6	63.4	57.6	0.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4.10	1.80	<0.5	0.4	0.27
	Sira, Ana-Sira	1916	1872	1872	59.4	68.3	59.4	0.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4.50	1.20	<0.5	0.9	0.16
	Sokndalselva, Sogndalsstr.	294	293	107	51.1	56.5	51.1	56.5	0.9	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.60	1.70	<0.5	4.4	0.14
	Hellelandselva, Egersund	241	240	194	57.5	48.6	71.1	0.9	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.70	1.50	<0.5	4.3	0.19
	Eikerkreamselva, Egersund	705	704	639	77.7	65.6	86.4	73.0	0.9	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.70	1.20	<0.5	3.6	0.16
Rogaland ( 6. )	Hælvha, Hælvangen	165	160	135	46.9	57.7	46.9	57.7	0.8	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4.90	4.30	<0.5	0.5	0.34
	Figgjo, Solavikka	229	218	135	50.0	60.0	50.0	50.0	0.8	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	7.13	4.50	<0.5	0.8	0.28
	Ima-Lutsti, Høgsfj.Boknafj.	127	127	127	34.9	46.5	34.9	46.5	0.8	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	3.40	1.50	<0.5	<0.2	0.11
	Oltedalsø, Høgsfj.Boknafj.	102	101	129	70.0	77.0	70.0	0.8	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.40	1.30	<0.5	<0.2	<0.10
	Dirdalse, Høgsfj.Boknafj.	158	158	95	83.0	91.3	63.0	0.8	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.10	4.80	<0.5	6.0	<0.10
	Frafjorde, Frafj. Boknafj.	176	178	124	94.4	103.4	94.4	0.6	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.40	1.90	<0.5	<0.2	<0.10
	Espedalsø, Høgsfj.Boknafj.	138	138	124	90.0	99.0	90.0	0.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.30	<0.5	2.1	<0.10	
	Lyseø., Lysefj.Boknafj.	182	182	46	74.0	81.4	74.0	0.4	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.73	1.90	<0.5	<0.2	<0.10
	Ardalsø, Ardalsfj.Boknafj.	519	516	501	61.4	89.5	81.4	0.36	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.50	2.00	<0.5	<0.2	<0.10
	Førresø., Jøsenfj.Boknafj.	163	163	163	85.8	94.4	85.8	0.4	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.90	1.40	<0.5	0.1	0.11
( 7. )	Ulla, Jøsenfj.Boknafj.	393	393	385	83.4	91.7	83.4	0.4	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	3.90	2.00	<0.5	<0.2	0.13
	Saudaø., Saudafj.Boknafj.	353	353	82	82	85.0	102.0	85.0	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	2.40	2.00	<0.5	0.4	<0.10
	Alboøra, Alboøra, Saudafj.Boknafj.	82	82	82	85.0	102.0	85.0	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.90	2.20	<0.5	<0.2	<0.10
	Vikedalsø., Boknafj.	118	117	115	80.0	99.8	80.0	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.20	2.10	<0.5	0.4	0.25

**Table 8.2 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1998.**

County	Watercourse	Runoff data						Parameters ( mean values )													TOC		SiO2		Cr-T		Ni		As	
		sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	Discharge		Gamma			HCH		PCB ( The following Congeners )		IUPAC NOS			TOC		SiO2		Cr-T		Ni		As		
								Outlet	Sampi.	Disch.	Sampi.	gaug.	station	Normal	1998	Normal	1998	l/s sq.km	l/s sq.km	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	mg/l	mg/l	ug/l	ug/l	
( 7. )	Elneselva, Etnefj. Bomsfj.	252	250	127	48.8	51.9	96.0	103.7	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.90	1.00	<0.5	0.90	0.3	0.21					
	Opo, Sørkj. Hardangerfj.	482	480	464	79.3	81.0	79.3	81.0	0.4	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.10	0.60	<0.5	<0.5	<0.2	<0.10					
	Tysso, Sørkj. Hardangerfj.	388	385	407	79.3	81.0	79.3	81.0	0.4	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.20	1.30	<0.5	<0.5	<0.2	<0.10					
	Kinsø, Sørkj. Hardangerfj.	261	281	232	46.0	50.2	46.0	50.2	0.33	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.50	2.70	<0.5	<0.5	<0.2	<0.10					
	Veig, Eidsfj. Hardangerfj.	496	496	386	41.8	39.2	41.8	39.2	0.23	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.10	0.90	<0.5	<0.5	3.5	<0.10					
	Bjoreia, " Hardangerfj.	592	592	592	26.0	9.6	26.0	9.6	0.23	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.10	1.20	<0.5	<0.5	3.5	<0.10					
	Sima, Eidsfj. Hardangerfj.	145	145	128	69.2	79.6	69.2	79.6	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.30	1.00	<0.5	<0.5	<0.2	<0.10					
	Austdøla, Osafj. Eidsfj.	131	130	85	74.6	85.8	74.6	85.8	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.20	2.20	<0.5	<0.5	0.4	<0.10					
	Norddøla, Osafj. Eidsfj.	40	39	89	74.6	85.8	74.6	85.8	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.20	2.20	<0.5	<0.5	0.4	<0.10					
	Tysseelviva, Fusafj.	240	240	85.0	93.5	85.0	93.5	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.80	0.60	<0.5	<0.5	0.3	<0.10					
	Oseleva, Fusafj.	109	108	50	91.7	106.0	91.7	106.0	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.30	1.00	<0.5	<0.5	<0.2	<0.10					
	Bergsdalselv, Veafj. Herdla fj.	198	198	80.0	88.0	80.0	88.0	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.20	2.20	<0.5	<0.5	0.4	0.12					
	Vosso, Veafj. Sørkj.	1492	1465	1102	58.2	60.2	58.2	60.2	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.90	0.90	<0.5	<0.5	0.5	<0.10					
	Ekso, Østerfj.	414	400	342	86.2	90.5	86.2	90.5	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.20	1.00	<0.5	<0.5	<0.2	<0.10					
	Modalselviva, Østerfj.	385	384	248	95.5	100.3	95.5	100.3	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.80	0.90	<0.5	<0.5	<0.2	<0.10					

Table 8.2 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1998.

County	Watercourse	Runoff data				Parameters ( mean values )												
		sq.km	sq.km	Disch. station	Sampling station	Discharge			IUPAC NOS									
						Normal	1998	l/s sq.km	Gamma	PCB ( The following Congeners )	28	52	101	118	138	153	180	TOC
Sogn og Fjordane (7.)	Nærøy., Aurl.fj., Sognefj., Flåmse., Aurl.fj., Sognefj., Aurlandsv., Aurl.fj., Sognefj., Erdalsæ., Laerd.fj., Sognefj., Laardalsv., Laerd.fj., Sognefj., Ardalsv., Ardalstfj., Sognefj., Fortunv., Lusterfj., Sognefj., Mørkrisv., Lusterfj., Sognefj., Jostedals., " Sognefj., Aarøe., Sognd.fj., Sognefj., Sogndale, " Sognefj., Gaular, Dalsfj., Buflj., Jelstra, Fordefj., Nausta, Fordefj., Oselva, Høydalsfj., Hopse., Hyefj., Nordfj., S Gjengedalsse., " Nordfj., S Breimse., Gloppefj., " Oldene., Indre Nordfj., Loenelva, Indre Nordfj., Stryne., Indre Nordf., Hornindalsse., Nordfj., N	290	290	267	59.5	65.9	59.5	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.40	3.70
		280	275	275	52.4	57.1	52.4	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.30	<0.5
		800	795	762	48.6	51.0	48.6	0.12	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.40	1.70
		138	138	138	30.0	31.5	30.0	0.15	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.90	<0.5
		1184	1172	1172	30.0	21.8	30.0	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	2.10	<0.5
		989	989	989	44.9	43.3	44.9	0.25	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.88	2.20
		508	508	397	51.0	49.9	51.0	0.28	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.76	<0.5
		282	282	203	54.7	52.0	54.7	0.28	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.40	<0.5
		865	864	573	68.0	51.3	68.0	0.28	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4.20	<0.5
		449	446	384	77.2	73.3	77.2	0.28	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.60	<0.5
		175	172	111	66.1	64.8	66.1	0.28	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	3.00	1.60
		627	625	595	79.3	84.5	79.3	0.36	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.40	<0.5
		714	709	384	74.3	78.0	74.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.10	<0.5
		277	273	232	81.7	85.8	81.7	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.60	<0.5
		287	285	225	78.7	82.6	78.7	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	2.90	2.10
		73	73	161	75.0	78.8	75.0	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.30	<0.5
		170	168	161	75.0	78.8	75.0	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.10	<0.5
		635	634	585	68.8	60.0	68.8	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.49	<0.5
		226	225	204	70.1	71.5	70.1	71.5	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.70	<0.5
		261	260	234	65.0	66.2	65.0	66.2	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.80	1.40
		532	530	493	60.2	56.8	60.2	56.8	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.50	<0.5
		426	424	378	58.1	55.8	58.1	55.8	0.4	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.30	<0.5
																1.20	1.40	
																	<0.5	0.2
																		<0.10

**Table 8.2 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1998.**

County	Watercourse	Runoff data											Parameters (mean values)											
		sq.km	sq.km	sq.km	sq.km	sq.km	Discharge		HCH	Gamma	PCB (The following Congeners) IUPAC NOS	TOC	SiO <sub>2</sub>	Cr-T	Ni	As								
							Normal	1998																
<b>More og Romsdal (8.)</b>	Ørstaø., Ørstaflj., Valldøla, Nordalflj., Storfj. Rauma, Romsdalsflj., Moldefj. Isla, Isfj., Moldefj. Eira, Eresfj., Moldefj. Littledalise, Sunndalsflj., Driva, Sunnd. fl., Tingvollflj. Ulvåa, Alvdalsflj. Teia, Todalsflj. Surna, Surnadalstfj. Bovra, Hamnnesflj., Halsafj.	160	155	70.0	73.5	70.0	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.35	2.60	<0.5	0.7	<0.10						
		359	357	60.0	63.0	60.0	0.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.45	1.50	<0.5	0.7	<0.2						
		1202	1190	1142	32.8	31.9	32.8	31.9	0.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.45	<0.5	<0.5	<0.2	<0.10				
					57.0	58.8	57.0	58.8	0.4	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.65	1.80	<0.5	<0.5	<0.2	<0.10			
					1119	1085	34.8	35.9	0.31	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.50	1.50	<0.5	<0.5	<0.2	<0.10			
					359	330	41.0	47.9	0.4	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.60	0.60	<0.5	<0.5	<0.2	<0.10			
					2487	2435	27.9	32.1	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.25	1.25	<0.5	<0.5	<0.2	<0.10		
					199	199	207	34.3	60.7	36.5	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	1.40	4.00	<0.5	0.3	<0.2	<0.10		
					251	251	207	58.5	60.9	58.5	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	0.90	1.60	<0.5	<0.5	<0.2	<0.10		
					1200	1200	1125	48.0	51.8	49.3	0.5	<0.03	<0.03	<0.03	<0.03	<0.03	1.70	2.20	<0.5	0.2	<0.10			
					243	243	196	55.0	57.8	55.0	0.7	<0.03	<0.03	<0.03	<0.03	<0.03	1.75	1.10	<0.5	0.2	<0.10			
					110	100	30.0	28.9	30.0	0.9	<0.03	<0.03	<0.03	<0.03	<0.03	0.30	0.80	0.5	1.5	0.34				
					150	150	30.0	28.9	30.0	0.8	<0.03	<0.03	<0.03	<0.03	<0.03	0.30	1.00	<0.5	0.9	0.41				
					3659	3650	3062	26.4	26.4	25.4	0.7	<0.03	<0.03	<0.03	<0.03	<0.03	3.45	3.00	0.7	1.8	0.61			
					3110	3100	3049	35.5	34.9	35.5	0.57	<0.03	<0.03	<0.03	<0.03	<0.03	2.80	1.40	<0.5	0.8	0.12			
					157	157	30.0	29.5	30.0	0.55	<0.03	<0.03	<0.03	<0.03	<0.03	3.50	1.40	6.9	2.7	0.64				
<b>Nord- Trondelag (8.)</b>	Sjordalsv., " Tr.h.fl. Grise, " Tr.h.fl. Verdalvassdr., Tr.h.fl. Figgjelandsdale, Tr.h.fl. Snaasavassdr., Trondhf.fl. Argørdselva, Namsetf. Namsen, Namselv. Ø Salsvatnsva, Follafl.	2117	2117	1863	38.1	38.5	38.1	0.55	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	2.95	0.90	<0.5	0.6	0.16					
		93	93	25.0	24.8	25.0	0.55	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4.50	4.20	<0.5	0.7	0.26					
		1472	1472	898	40.0	39.9	44.5	44.8	0.55	<0.03	<0.03	<0.03	<0.03	<0.03	3.10	1.20	11.6	4.1	0.28					
					282	282	178	30.2	33.6	0.54	<0.03	<0.03	<0.03	<0.03	<0.03	4.60	1.40	0.7	0.9	0.38				
					2153	2125	35.1	31.8	35.1	0.5	<0.03	<0.03	<0.03	<0.03	<0.03	3.45	1.10	7.7	2.8	0.22				
					543	510	238	43.0	44.8	50.9	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	4.50	2.20	<0.5	0.6	0.27			
					6277	6276	5718	43.4	51.2	0.24	<0.03	<0.03	<0.03	<0.03	<0.03	0.80	<0.5	0.4	<0.10	0.4				
					432	432	422	59.7	63.5	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	1.00	45.4	14.1	0.28					

Table 8.2 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1998.

County	Watercourse	Runoff data												Parameters (mean values)												
		Discharge						PCB (The following Congeners) IUPAC NOS																		
		sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	Normal	1998	HCH	28	52	101	118	138	153	180	TOC	SiO2	Cr-T	Ni	As	ug/l	ug/l	ug/l	
Nordland ( 9. )	Abjøra, Bindalsfj. S	526	520	384	80.2	75.5	80.2	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.40	<0.5	<0.2	0.12	0.3	0.3	0.3	0.3	0.3	
	Skjerva, Vefsenvfj. S	104	104	98	41.3	38.9	41.3	0.4	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.30	0.7	1.4	0.2	0.3	0.2	0.2	0.2	0.2	
	Fusa, Vefsenvfj. N	544	543	520	63.4	59.7	63.4	59.7	0.4	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.40	<0.5	0.2	0.2	0.15	0.2	0.2	0.2	0.2
	Drevja, Vefsenvfj. N	177	176	98	65.0	61.2	65.0	0.4	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.40	<0.5	0.4	0.18	0.16	0.2	0.18	0.16	0.16	
	Rosaga, Sorfj.	2092	2087	1880	45.4	54.5	45.4	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.50	16.3	5.5	5.5	0.16	0.16	0.16	0.16	0.16	
	Bjerk, Sorfj.	385	385	273	55.4	49.9	55.4	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.50	<0.5	0.4	0.12	0.12	0.12	0.12	0.12	0.12	
	Dalselva, Ranafj. N	211	211	129	39.5	35.6	39.5	0.25	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.50	<0.5	0.3	0.13	0.13	0.13	0.13	0.13	0.13	
	Ranavassdraget, Ranafj. N	3847	3845	1892	44.9	40.4	44.9	0.25	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.60	<0.5	0.3	0.11	0.11	0.11	0.11	0.11	0.11	
	Fykanøga, Glomfjord	297	297	243	103.7	98.3	103.7	0.25	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.70	0.6	0.5	<0.10	0.10	0.10	0.10	0.10	0.10	
	Beiare, Beiarfj. Nordfj.	1064	875	797	45.1	45.1	45.1	0.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.60	4.40	<0.5	0.4	0.18	0.18	0.18	0.18	0.18	0.18
	Saaldalsvassdr., Saald. fj. S	1544	1543	1168	32.1	33.4	32.1	0.7	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.80	14.8	4.0	<0.10	0.10	0.10	0.10	0.10	0.10	
	Sultjelma vassdr., Salid. fj	1028	800	791	44.0	46.2	44.0	0.74	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.80	<0.5	0.5	<0.10	0.10	0.10	0.10	0.10	0.10	
	Kolle, Leirfj. Sarfjolda N	405	405	386	66.9	64.8	66.9	0.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.80	<0.5	<0.2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
	Skjøma, Olofsl. S	845	840	797	36.3	34.5	36.3	0.4	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.70	11.0	3.7	0.3	0.3	0.3	0.3	0.3	0.3	

Table 8.2 TRIBUTARY RIVERS, MEAN CONCENTRATIONS 1998.

County	Watercourse	Runoff data						Parameters (mean values)												
		sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	Discharge			PCB (The following Congeners) IUPAC NOS									
								Normal	1998	Normal	Normal	1998	Normal	1998	Normal	1998	Normal	1998	Normal	1998
Troms (9.)	Spanseleva, Astafj. Vågsfj. Salangsæ, Astafj. Vågsf. Rossfjordet, Malaangen Målse, Målselvfj. ” Bardue, Målselva Nordkjoselva, Balstfj. Signaldalselva, Lyngen V Skibotnelva, Lyngen Kalfjordelva, Lyngen Ø Reisa, Reisafj.	142	142	533	50.0	52.5	50.0	0.35	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.60	<0.5	0.5 <0.10
		539	539	533	40.9	42.9	40.9	0.35	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.60	<0.5	0.4 0.12
		196	190	39.5	39.5	39.5	21.7	0.33	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.40	<0.5	0.5 <0.10
		3239	3200	3118	28.7	28.7	21.7	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.00	52.7	23.1 0.44
		2906	2906	2049	28.3	21.4	28.3	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.00	52.7	23.1 0.44
		191	191	415	27.7	19.4	27.7	0.1	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.30	<0.5	0.5 0.15
		473	467	415	27.7	19.4	27.7	0.1	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.10	6.1	2.7 0.1
		770	770	724	18.0	18.0	18.0	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.20	<0.5	0.9 <0.10
		358	358	348	20.0	14.0	20.0	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.80	<0.5	0.5 <0.10
		2702	2702	16.0	12.0	16.0	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.90	4.60	<0.5 0.3 0.11
		325	325	319	26.5	26.5	0.1	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.80	<0.5	<0.2 0.12
		234	234	233	15.1	15.1	0.15	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.9	<0.5	0.4 0.14
		1069	1069	25.0	22.5	25.0	0.15	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.80	<0.5	0.3 <0.10
		1108	1102	870	18.3	16.5	18.3	0.15	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	2.40	4.20	<0.5 <0.10
		1533	1532	941	15.9	14.3	15.9	0.15	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	2.10	<0.5	0.5 <0.10
		883	883	863	29.8	26.8	29.8	0.15	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	2.10	<0.5	0.3 0.1
		101	101	101	22.8	21.7	22.8	0.15	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.40	<0.5	0.2 0.1
		690	690	760	21.9	20.8	19.9	0.15	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	2.30	11.2	3.7 <0.10
		92	92	102	25.3	23.9	22.8	0.15	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	2.60	<0.5	0.3 <0.10
		705	705	760	19.9	18.9	19.9	0.15	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	2.40	<0.5	0.3 <0.10
		16389	15713	14169	11.5	10.9	11.5	0.11	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	3.10	7.00	1.1 0.9 0.1
		469	469	459	79	34.6	34.6	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4.20	<0.5	0.2 0.31
		627	627	239	18.1	19.9	18.1	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	2.30	<0.5	0.2 <0.10
		18404	18400	16175	9.3	9.8	9.3	0.32	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	3.90	<0.5	4.5 0.29
		2960	2960	2911	9.8	13.7	9.8	0.35	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	2.10	<0.5	<0.2 0.27
		234	234	234	18.0	18.9	18.0	0.35	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	3.30	<0.5	7.1 0.24

## APPENDIX IX : TRIBUTARY RIVERS. ANNUAL LOAD 1998

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Table 9.1 Cond., Nutrients, Heavy metals, Suspended part.matter	75-81
Table 9.2 Mercury, Lindane, PCBs *(Detection limit = limit)	83-89

(1) Glomma	"tributaries"	: Tista	- Helenelva
(1) Inner Oslo-fjord		: Årungelva	- Åroselva
(2) Drammenselva	"tributary"	: Lierelva	
(3) Numedalslågen	"tributaries"	: Sandeelva	- Farriselva
(4) Skienselva	"tributary"	: Tokkeelva	
(5) Otra	"tributaries"	: Gjerstade.	- Audna
(6) Orreelva	"tributaries"	: Lygna	- Ulla
(7) Suldalslågen	"tributaries"	: Saudaelva	- Hornindalselva
(8) Orkla	"tributaries"	: Ørstaelva	- Salsvatnelva
(9) Vefsna	"tributaries"	: Åbjøra	- Reisa
(10) Alta	"tributaries"	: Mattiselva	- Grense Jacobse.

- \* Measurements below detection limits are treated in two ways:  
 "Detection limit = Zero", and "Detection limit = limit". This concerns the substances Cd, Pb, Hg and PCBs. In Tables 9.1-9.2 as well as in Tables 5.1-5.4 both "zero- and limit-values" are shown.

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1998.

County	Watercourse	Runoff data												Parameters (mean values)								
		Drainage area			Sampling station			Gauging station			Discharge			C d			P b			S.P.M.		
		sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	Normal	1997	Normal	1997	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	kg	
Østfold (1.)	Tista, Iddefj.	1598	1582	14.4	13.3	14.4	13.3	6.00	6.90	1.33	612.4	444.6	4.0	3.98	0.60	1.66	0.03	0.40	0.10	1.01	0.66	
	Mosselva, Mossesundet	690	689	14.5	14.5	14.5	14.5	10.60	8.60	1.58	411.2	86.6	29.9	29.93	0.47	0.41	0.00	0.00	0.07	0.07	1.38	
	Holenva, Drøbakssundet Ø	137	121	14.0	14.1	14.0	14.1	20.80	4.30	3.07	186.2	127.0	4.7	4.68	0.14	0.23	0.00	0.00	0.03	0.03	0.55	
	Årungelva, I. Oslofj.	52	50	13.0	13.1	26.90	0.43	0.06	61.8	47.6	0.5	0.52	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.10	0.02	
	Gjersjøelva, I. Oslofj.	86	85	14.0	14.1	19.10	0.30	0.03	64.3	54.6	0.2	0.19	0.06	0.07	0.00	0.00	0.00	0.00	0.00	0.15	0.00	
	Ljanselva, I. Oslofj.	42	41	13.0	10.2	28.00	1.08	0.42	19.4	11.0	0.3	0.26	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
	Leirvå/Alna, I. Oslofj.	75	69	13.0	20.3	29.00	6.94	2.08	76.3	45.3	3.8	3.80	0.14	0.49	0.00	0.00	0.05	0.05	0.05	2.16	0.13	
	Akerselva, I. Oslofj.	227	225	17.5	16.1	6.00	2.63	0.34	87.6	34.3	3.2	3.20	0.13	1.03	0.00	0.00	0.07	0.07	0.69	0.46	0.46	
	Frognerelva, I. Oslofj.	23	20	15.0	25.1	22.00	0.98	0.49	31.5	18.7	2.1	2.11	0.25	0.18	0.00	0.00	0.01	0.01	0.16	0.00	0.02	
	Lysakerelva, I. Oslofj.	178	173	16.8	22.7	16.8	5.90	0.37	75.1	45.6	1.1	1.11	1.39	1.55	0.01	0.01	0.10	0.10	0.64	0.12	0.12	
Akershus (1.)	Sandvikselva, I. Oslofj.	223	187	18.4	24.4	12.90	0.86	126.6	100.7	2.2	2.16	0.12	0.24	0.00	0.00	0.04	0.04	0.13	0.14	0.14	0.06	
	Aroselva, I. Oslofj.	113	109	17.0	18.9	18.30	2.35	0.71	114.0	103.3	6.0	6.04	0.10	0.19	0.00	0.00	0.05	0.05	0.68	0.06	0.06	
	Lierelva, Drammenselv Ø	309	222	18.6	35.2	18.6	35.2	20.10	12.28	7.97	416.3	296.8	2.4	2.36	0.56	2.10	0.01	0.31	0.31	5.43	0.59	
	Sandeelva, Sandebukta	193	190	17.0	19.6	16.00	1.88	0.70	135.1	109.8	4.3	4.35	0.16	5.86	0.01	0.01	0.21	0.21	0.60	0.00	0.12	
	Auliøya, Tensbergfj.	363	362	14.9	17.6	14.9	17.6	26.00	28.73	5.83	618.4	534.5	26.1	26.12	0.30	1.13	0.01	0.13	0.13	8.28	0.40	
	Farriselva, Larvikfj.	491	491	21.6	21.8	21.6	21.8	3.90	2.03	1.01	170.5	131.6	3.7	3.71	0.14	2.57	0.01	0.06	0.06	0.17	0.34	
	Tokkeelva, Kragerø	1238	1200	26.7	30.0	26.7	30.0	1.59	4.54	0.68	306.5	139.6	27.2	27.25	0.34	5.68	0.03	0.31	0.31	1.57	1.14	
	Aust-Agder (4.)	419	414	291	27.0	30.4	2.57	2.38	0.40	174.6	86.5	13.9	13.89	0.20	2.54	0.02	0.02	0.23	0.23	0.58	0.60	
	Vegårdselva, Sandnesfj.	457	429	291	29.3	32.2	29.3	2.81	2.61	0.87	180.4	84.1	14.8	14.81	0.26	3.57	0.01	0.01	0.24	0.24	1.30	0.44
	Nidelva, Arendal	4025	4020	3956	29.8	32.6	29.8	1.80	16.63	3.33	1388.8	785.9	70.7	70.69	2.08	20.79	0.12	0.12	1.41	4.49	0.00	
																				4.16		

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1998.

County	Watercourse	Runoff data												Parameters ( mean values )																							
		Drainage area			Discharge			gauging station			1997			Cond			NH4-N			Cu			Zn			Cd			P b			S.P.M.			Hg		
		Outlet sq.km	Sampi. station sq.km	Disch. gaug. station sq.km	Normal l/s sq.km	1997 l/s sq.km	Normal tonnes	Tot-P tonnes	PO4-P tonnes	Tot-N tonnes	NO3-N tonnes	zero tonnes	limit tonnes	zero tonnes	limit tonnes	zero tonnes	limit tonnes	zero tonnes	limit tonnes	zero tonnes	limit tonnes	zero tonnes	limit tonnes	zero tonnes	limit tonnes	zero tonnes	limit tonnes	zero tonnes	limit tonnes	zero tonnes	limit tonnes						
Vest-Agder ( 5. )	Tovdalselva, Tøvdalselv.	1856	1854	1794	33.9	36.6	1.93	10.70	6.42	847.4	323.1	57.8	57.78	12.20	0.09	0.09	1.18	1.18	3.72	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21							
	Segneelva, Flekketroy	204	192	38.0	39.9	38.0	5.57	4.52	0.72	129.3	116.0	2.4	2.42	0.14	1.79	0.01	0.01	0.13	0.13	0.40	0.40	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24					
	Mandalselva, Manneløv.	1809	1800	1740	46.0	47.4	49.1	1.70	12.11	2.69	839.5	384.8	86.1	86.10	0.81	9.96	0.05	0.05	1.67	1.67	4.39	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04						
	Audna, Snikstøl.	450	400	59	45.0	48.2	51.8	3.92	5.47	0.61	352.6	203.7	18.2	18.24	0.18	3.59	0.02	0.02	0.39	0.39	1.17	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91						
	Lygna, Lyngdalstøl.	664	660	266	48.0	51.5	57.9	62.1	2.50	5.36	1.07	421.3	236.9	8.6	8.58	0.32	4.93	0.04	0.04	0.49	0.49	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61					
	Kvina, Fedafj.	1445	1140	1140	57.6	63.4	57.6	2.96	13.66	4.56	875.2	480.9	16.0	15.95	0.68	10.26	0.05	0.05	1.78	1.78	4.19	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70						
	Sira, Ana-Sira	1916	1872	1872	59.4	68.3	59.4	2.79	8.06	2.42	1814.5	699.2	108.9	108.87	1.21	14.52	0.08	0.08	1.85	1.85	2.74	4.03	4.03	4.03	4.03	4.03	4.03	4.03	4.03	4.03	4.03						
Rogaland ( 6. )	Sekndalselva, Sogndalsstr.	294	293	107	51.1	56.5	51.1	56.5	4.24	4.70	1.57	211.4	135.7	13.1	13.05	0.26	2.77	0.02	0.02	0.20	0.20	0.46	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52					
	Hellelandselva, Egersund	241	240	194	57.5	48.6	71.1	3.01	3.31	1.10	172.9	112.2	3.7	3.68	0.29	2.13	0.01	0.01	0.23	0.23	0.65	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55						
	Bjerkreimselva, Egersund	705	704	633	77.7	65.6	86.4	73.0	3.24	5.83	1.46	694.7	566.5	10.2	10.19	0.73	4.22	0.03	0.03	0.38	0.38	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	Hælva, Hælangen	165	160	135	46.9	57.7	46.9	57.7	12.50	10.07	4.37	517.4	393.0	10.8	10.77	0.26	1.08	0.00	0.00	0.11	0.11	0.75	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58					
	Figgjo, Solavika	229	218	135	50.0	60.0	50.0	50.0	14.20	121.68	9.49	753.6	703.3	14.0	14.02	0.54	2.52	0.01	0.01	0.26	0.26	1.39	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62					
	Ims-Lutsi, Høgsfj. Boknafj.	127	127	127	34.9	46.5	34.9	46.5	6.82	1.30	0.19	168.5	122.0	2.4	2.42	0.07	0.43	0.00	0.00	0.08	0.08	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	Oltedalsse., Høgsfj. Boknafj.	102	101	129	70.0	77.0	70.0	77.0	3.16	1.23	0.25	107.9	79.7	5.9	5.89	0.07	0.78	0.00	0.00	0.07	0.07	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Viken ( 7. )	Dirdalse., Høgsfj. Boknafj.	159	158	95	83.0	91.3	83.0	91.3	1.75	1.14	0.27	143.3	110.5	9.1	9.10	0.32	1.41	0.00	0.00	0.14	0.14	0.23	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68					
	Frafjord., Frafj. Boknafj.	176	176	124	94.4	103.4	94.4	103.4	1.89	1.74	0.46	145.1	83.6	2.9	2.90	0.17	1.04	0.00	0.01	0.17	0.17	0.38	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58					
	Espedalsse., Høgsfj. Boknafj.	138	138	124	90.0	99.0	90.0	99.0	2.60	2.71	0.22	136.1	101.2	1.3	1.29	0.09	0.56	0.00	0.00	0.11	0.11	0.21	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43					
	Lysæs., Lysæfj. Boknafj.	182	182	46	74.0	81.4	74.0	81.4	2.00	0.47	0.37	70.1	46.7	1.4	1.40	0.09	0.79	0.00	0.00	0.11	0.11	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	Ardalsse., Ardalsfj. Boknafj.	519	516	501	81.4	89.5	81.4	89.5	2.02	2.91	0.73	337.9	233.0	4.4	4.37	0.29	2.04	0.01	0.01	0.44	0.44	0.60	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18					
	Førresse., Jøsenfj. Boknafj.	163	163	163	85.8	94.4	85.8	94.4	2.30	1.46	0.24	121.3	116.5	3.4	3.40	0.15	0.44	0.00	0.00	0.10	0.10	0.10	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49					
	Ulla., Jøsenfj. Boknafj.	393	393	385	83.4	91.7	83.4	91.7	2.09	2.27	0.57	284.1	156.8	3.4	3.41	0.23	2.39	0.01	0.01	0.24	0.24	0.48	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70					
( 7. )	Saudas., Saudafj. Boknafj.	353	353	82	85.0	102.0	85.0	102.0	2.86	2.27	0.57	1033.3	931.1	3.4	3.41	0.91	34.86	0.08	0.08	0.15	0.15	0.32	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14					
	Aboelva., Aboelva., Boknafj.	82	82	80.0	99.8	80.0	99.8	1.14	0.53	0.26	52.8	38.0	0.8	0.79	0.05	0.47	0.00	0.00	0.03	0.03	0.08	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40						
	Vikedalsse., Boknafj.	118	117	80.0	99.8	80.0	99.8	1.78	1.10	0.29	80.3	54.9	1.1	1.10	0.18	1.22	0.01	0.01	0.09	0.09	0.50	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37						

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1998.

County	Watercourse	Runoff data												Parameters (mean values)														
		Drainage area			Sampling station			Gauging station			Discharge			Cond	Tot-P	PO4-P	Tot-N	NO3-N	NH4-N	zero limit tonnes	Cu	Zn	Cd	zero limit tonnes	P b	S.P.M.	zero limit tonnes	Hg
		sq.km	sq.km	sq.km	sq.km	sq.km	sq.km	Normal	1997	Normal	1997	l/s sq.km	l/s sq.km	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	kg	
Hordaland (7.)	Eineelva, Etnefj. Bremefj. Opo, Sørfj. Hardangerfj. Tysso, Sørfj. Hardangerfj. Kinsø, Sørfj. Hardangerfj. Veig, Eldfjy. Hardangerfj. Bjoreia, " Hardangerfj. Sima, Eldfj. Hardangerfj. Austdøla, Osafj. Eldfj. Norddøla, Osafj. Eldfj. Tysseelva, Fusafj. Oseleva, Fusafj. Bergsdøla, Veafj. Herdlafl. Vosso, Veafj. Sunnfj. Ekso, Modalselva, Østerfj.	252	250	127	48.5	51.9	96.0	103.7	2.34	2.45	0.41	149.4	96.2	1.2	1.23	0.16	0.78	0.00	0.00	0.08	0.08	0.69	0.41	0.41	0.41			
		482	480	464	79.3	81.0	79.3	81.0	1.71	4.65	2.57	1045.9	152.0	240.3	240.32	0.61	3.56	0.02	0.02	0.45	0.45	2.35	1.84	1.84	1.84			
		388	385	407	79.3	81.0	79.3	81.0	1.47	0.89	0.49	152.4	112.1	4.9	4.92	0.30	2.85	0.02	0.02	0.06	0.06	0.25	0.00	0.00	0.00			
		281	281	232	46.0	50.2	46.0	50.2	1.85	0.44	0.22	51.6	35.1	1.3	1.33	0.09	0.40	0.00	0.00	0.02	0.02	0.20	0.67	0.67	0.67			
		496	496	386	41.8	39.2	41.8	39.2	1.38	1.23	0.31	74.6	36.8	1.8	1.84	1.47	0.80	0.00	0.01	0.34	0.34	0.00	0.61	0.61	0.61			
		592	592	26.0	9.6	26.0	9.6	1.38	0.35	0.09	21.9	10.8	0.5	0.54	0.43	0.23	0.00	0.00	0.10	0.10	0.10	0.00	0.00	0.18	0.18	0.18		
		145	145	128	69.2	79.6	69.2	79.6	2.59	0.26	0.16	63.7	52.8	1.1	1.09	0.07	0.25	0.00	0.00	0.02	0.02	0.20	0.00	0.00	0.35			
		131	130	89	74.6	85.8	74.6	85.8	7.90	0.23	0.18	123.1	116.1	2.1	2.11	0.11	0.35	0.00	0.00	0.01	0.01	0.25	0.35	0.35	0.35			
		40	39	89	74.6	85.8	74.6	85.8	7.90	0.03	0.05	36.9	34.8	0.6	0.63	0.03	0.11	0.00	0.00	0.00	0.00	0.07	0.11	0.11	0.11			
		240	240	85.0	93.5	85.0	93.5	1.68	2.62	1.42	567.5	73.6	6.4	6.37	0.50	1.56	0.02	0.02	0.16	0.16	0.38	0.00	0.00	0.71	0.71	0.71		
		109	108	50	91.7	106.0	91.7	106.0	3.71	4.33	1.08	148.0	88.5	4.0	3.97	0.40	1.41	0.01	0.01	0.06	0.06	0.48	0.36	0.36	0.36			
		198	198	80.0	88.0	80.0	88.0	1.45	1.10	0.27	87.9	72.5	6.6	6.59	0.27	4.18	0.02	0.02	0.05	0.05	0.30	0.00	0.00	0.55	0.55	0.55		
		1492	1465	1102	58.2	60.2	58.2	60.2	2.00	19.75	1.67	625.8	400.5	33.4	33.38	1.11	3.89	0.06	0.06	0.17	0.17	1.28	2.78	2.78	2.78			
		414	400	342	86.2	90.5	85.2	90.5	1.41	3.42	0.57	190.6	111.9	5.7	5.71	0.34	1.94	0.03	0.03	0.19	0.19	0.68	0.00	0.00	1.14			
		385	384	248	95.5	100.3	95.5	100.3	1.01	2.43	0.61	206.9	128.7	4.9	4.96	0.24	3.16	0.01	0.01	0.23	0.23	0.72	0.00	0.00	1.21			

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1998.

County	Watercourse	Runoff data										Parameters ( mean values )												
		Drainage area				Discharge						NH4-N			Cu		Zn		Cd					
		Outlet	Sampi. station	Disch. gaug. station	Sampling station	Normal	1997	Normal	1997	mS/m	Tot-P	PO4-P	NO3-N	tonnes tonnes	zero tonnes tonnes	zero tonnes tonnes	zero tonnes tonnes	Pb	S.P.M.	Hg				
Sogn og Fjordane (7.)	Nærøye, Aurl. f., Sognefj., Flåmselv., Aurl. f., Sognefj., Aurlandsv. Aurl. f., Sognefj., Erdalset., Lærd. f., Sognefj., Lærdalsv. Lærd. f., Sognefj., Ardalset., Ardalset., Sognefj., Fortunv., Lustefj., Sognefj., Markristv., Lustefj., Sognefj., Jostedøla, * Sognefj., Aroye, Sognsd. f., Sognefj., Sognsdøla, * Sognefj., Gaular, Dalsfj., Bufj., Joistra, Førdefj., Nausta, Førdefj., Oseleva, Høydalsfj., Hopse, Hyefj., Nordfj. S Gjengedalselv., Nordfj. S Breimset., Gløppenfj., Oldene, Indre Nordfj., Loenelva, Indre Nordfj., Strymne, Indre Nordfj., Hornindalselv., Nordfj. N	290	290	267	59.5	65.9	59.5	52.4	57.1	57.1	0.60	0.30	192.9	153.7	6.6	6.63	0.36	4.04	0.01	0.05	0.13	0.00	0.60	
		280	275	275	52.4	57.1	52.4	48.6	51.0	48.6	0.40	0.25	153.5	143.6	3.0	2.97	0.20	0.50	0.00	0.01	0.32	0.00	0.50	
		800	799	762	48.6	51.0	48.6	43.3	44.9	44.9	0.54	2.57	0.64	430.5	347.0	38.6	38.55	0.39	1.16	0.00	0.05	1.84	0.00	1.29
		138	138	138	30.0	31.5	30.0	30.0	30.0	30.0	1.07	0.27	0.07	16.7	8.8	0.4	0.41	0.04	0.12	0.00	0.01	0.10	0.00	0.14
		1184	1172	1172	30.0	21.8	30.0	21.8	21.8	21.8	1.65	2.98	0.81	166.0	127.3	3.6	3.63	0.56	0.81	0.07	0.07	0.07	0.00	0.81
		993	989	989	44.9	44.9	44.9	43.3	43.3	43.3	0.96	5.40	2.70	270.1	104.0	9.5	9.45	1.76	1.35	0.01	0.03	0.03	0.00	1.35
		508	508	367	51.0	49.9	51.0	49.9	49.9	49.9	2.08	1.60	0.80	223.8	183.9	7.2	7.19	0.64	0.80	0.00	0.01	0.05	0.00	0.80
		282	282	203	54.7	52.0	54.7	52.0	52.0	52.0	2.04	0.42	0.32	141.0	127.2	2.8	2.77	0.18	0.46	0.00	0.00	0.01	0.13	0.46
		855	854	573	68.0	51.3	68.0	68.0	68.0	68.0	51.3	17.60	1.40	559.1	454.3	16.8	16.77	1.12	1.68	0.00	0.01	0.06	0.00	1.40
		449	446	384	77.2	73.3	77.2	73.3	73.3	73.3	1.50	2.05	0.52	175.3	153.6	6.2	6.19	0.31	0.93	0.00	0.01	0.04	0.00	1.03
		175	172	111	66.1	64.8	66.1	66.1	66.1	66.1	2.11	1.41	0.70	126.5	112.5	2.1	2.11	0.14	1.51	0.00	0.00	0.05	0.00	0.80
		627	625	505	79.3	84.5	79.3	84.5	84.5	84.5	0.95	8.33	3.33	263.1	131.6	20.0	19.99	0.50	2.33	0.00	0.02	0.08	0.00	1.67
		714	709	384	74.3	78.0	74.3	78.0	78.0	78.0	1.65	6.98	3.49	426.0	375.0	20.9	20.93	0.52	4.71	0.00	0.02	0.05	0.00	1.74
		277	273	232	81.7	85.8	81.7	85.8	85.8	85.8	1.21	7.39	4.43	103.4	44.3	4.4	4.43	0.07	2.29	0.00	0.01	0.01	0.00	1.74
		287	285	225	78.7	82.6	78.7	82.6	82.6	82.6	2.00	2.23	0.45	126.2	83.9	3.7	3.74	0.22	1.48	0.01	0.01	0.12	0.00	0.35
		73	73	161	75.0	78.8	75.0	78.8	75.0	78.8	1.43	0.35	0.09	38.1	36.3	1.1	1.09	0.05	0.67	0.00	0.02	0.13	0.00	1.11
		170	168	161	75.0	78.8	75.0	78.8	75.0	78.8	1.18	1.25	0.29	63.5	59.3	2.5	2.50	0.13	0.46	0.00	0.00	0.04	0.00	0.27
		636	634	585	68.8	80.0	68.8	80.0	80.0	80.0	1.53	5.60	0.80	356.7	439.9	4.6	4.80	0.48	1.92	0.02	0.03	0.03	0.00	1.60
		226	225	214	70.1	71.5	70.1	71.5	71.5	71.5	1.63	1.67	0.25	123.3	126.8	4.6	4.57	0.20	0.51	0.00	0.01	0.33	0.00	0.51
		261	234	234	65.0	66.2	65.0	66.2	66.2	66.2	2.05	1.52	0.54	90.1	111.3	1.6	1.63	0.22	0.27	0.00	0.01	0.02	0.00	0.54
		532	530	493	60.2	56.8	60.2	56.8	56.8	56.8	1.78	2.66	0.47	188.0	143.4	17.1	17.09	0.57	3.32	0.02	0.14	0.14	0.00	3.28
		428	424	378	58.1	55.8	58.1	55.8	55.8	55.8	2.58	3.73	0.45	235.0	85.8	2.2	2.24	0.30	0.82	0.00	0.01	0.04	0.00	0.95

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1998.

County	Watercourse	Runoff data													Parameters (mean values)																
		Drainage area				Discharge				Gauging station				Cond. 1997				NH4-N		Cu		Zn		Cd		P b		S.P.M.		Hg	
		Outlet sq.km	Sampi. station sq.km	Disch. gaug. station sq.km	Normal 1997 l/s sq.km	Sampling station	Normal 1997 l/s sq.km	Disch. gaug. station	Normal 1997 l/s sq.km	Cond. mS/cm	Tot-P tonnes	PO4-P tonnes	Tot-N tonnes	NO3-N tonnes	NH4-N tonnes	zero limit tonnes	zero limit tonnes	zero limit tonnes	zero limit tonnes	Cu tonnes	Zn tonnes	Cd tonnes	Pb tonnes	S.P.M. tonnes	Hg zero limit kg						
Møre og Romsdal (8.)	Ørstafl.	160	155	70.0	73.5	70.0	3.59	6.11	2.16	203.0	100.6	13.3	13.29	0.40	2.08	0.00	0.00	0.07	1.06	0.07	1.06	0.00	0.36	0.36							
	Valldøla, Nordafl. Storfj.	359	357	60.0	63.0	60.0	1.20	2.13	0.43	75.9	40.4	2.1	2.13	0.28	0.71	0.00	0.01	0.04	0.04	0.73	0.00	0.05	0.71	0.00	0.71						
	Rauma, Romsdalsfj., Moldefj. Isa, (lef.), Moldefj.	1202	1190	1142	32.8	31.9	2.06	2.39	0.84	141.3	81.4	0.0	3.59	0.48	1.32	0.00	0.01	0.05	1.68	0.00	0.05	1.68	0.00	1.20							
	Eira, Erestfj., Moldefj.	175	175	89	57.0	58.8	1.50	0.65	0.19	37.3	23.7	0.0	0.97	0.10	0.52	0.00	0.00	0.02	0.21	0.00	0.02	0.21	0.00	0.32							
	Litledalselv., Sunndalsfj.	1119	1119	1085	34.8	35.9	1.93	2.53	0.63	190.0	138.1	5.1	5.07	0.63	1.01	0.00	0.01	0.10	0.10	0.71	0.00	0.10	0.71	0.00	1.27						
	Driva, Sunnd. f., Tingvollfj.	359	330	41.0	47.9	41.0	0.99	0.50	0.25	33.9	10.5	2.0	1.99	0.15	0.20	0.00	0.00	0.01	0.01	0.24	0.00	0.01	0.24	0.00	0.50						
	Ulvåa, Alvundsfj.	2487	2435	27.9	32.1	27.9	2.94	4.93	1.23	554.6	332.6	0.0	7.39	1.97	2.22	0.00	0.02	0.20	0.20	1.53	0.00	0.20	1.53	0.00	2.46						
	Toåa, Todalsfj.	199	199	207	57.0	34.3	60.7	36.5	3.46	1.51	0.43	148.5	109.8	1.3	1.29	0.28	0.37	0.00	0.00	0.03	0.03	0.27	0.00	0.03	0.27	0.00	0.32				
	Surna, Surnadalsfj.	251	251	207	58.5	60.9	58.5	1.27	0.96	0.24	51.6	22.7	0.0	1.45	0.14	0.19	0.01	0.01	0.02	0.02	0.26	0.00	0.02	0.26	0.00	0.48					
	Bøvra, Hamnesfj., Halsfj.	1200	1200	1125	48.0	51.8	49.3	1.83	5.88	1.76	343.0	164.7	9.8	9.80	0.78	3.14	0.02	0.02	0.47	0.47	1.94	0.00	0.01	1.94	0.00	1.96					
Sør-Trondelag (8.)	Børse, Gaulosen Tr.h.f.	110	100	30.0	28.9	30.0	9.33	1.09	0.46	44.7	23.2	1.3	1.28	0.13	0.05	0.00	0.00	0.02	0.02	0.29	0.00	0.02	0.29	0.00	0.09						
	Vigda, Gaulosen Tr.h.f.	150	150	30.0	28.9	30.0	11.50	1.23	0.41	50.6	25.3	2.9	2.87	0.14	0.07	0.00	0.00	0.02	0.02	0.64	0.00	0.05	0.64	0.00	0.14						
	Gaula, Gaulosen Tr.h.f.	3659	3650	3062	26.4	25.4	26.4	6.75	20.47	8.77	511.6	438.6	35.1	35.08	5.56	12.28	0.00	0.03	6.61	6.61	19.59	0.00	0.03	19.59	0.00	2.92					
	Niddeva, Trondheimsfj.	3110	3100	3049	35.5	34.9	35.5	34.9	31.05	3.41	798.4	184.2	17.1	17.06	2.73	2.05	0.00	0.03	0.20	0.20	6.86	0.00	0.03	6.86	0.00	3.41					
	Homla, Skjerd. f., Tr.h.f.	157	157	30.0	29.5	30.0	4.97	0.73	0.13	35.1	6.0	2.3	2.34	0.31	0.53	0.00	0.00	0.02	0.02	0.16	0.22	0.22	0.22	0.22	0.22						
	Sjordalsv., " Tr.h.f.	2117	2117	1663	38.5	38.1	2.95	10.17	5.09	470.6	139.9	12.7	12.72	8.39	10.17	0.00	0.03	0.28	0.28	7.40	0.00	0.03	7.40	0.00	3.82						
	Grae, " Tr.h.f.	93	93	25.0	24.8	25.0	15.10	1.02	0.80	80.7	74.2	1.3	1.31	0.08	0.02	0.00	0.01	0.01	0.01	0.08	0.00	0.01	0.08	0.00	0.07						
(8.)	Verdalvassdr., Tr.h.f.	1472	698	40.0	39.9	44.5	44.6	5.04	7.41	1.85	416.7	166.7	14.8	14.82	1.67	8.33	0.00	0.02	0.22	0.22	3.96	1.85	1.85	3.96	1.85	3.41					
	FiggjøLeksdalsæ., Tr.h.f.	282	178	30.0	33.6	5.85	4.03	1.88	147.7	79.2	2.7	2.69	0.32	0.32	0.00	0.01	0.07	0.07	2.37	0.40	0.40	2.37	0.40	4.40							
	Snisavassdr., Trondh. f.	2153	2125	35.1	31.8	35.1	3.97	10.66	2.13	575.4	208.8	27.7	27.70	1.49	6.18	0.00	0.02	0.11	0.11	2.96	3.20	3.20	2.96	3.20	3.20						
	Argårdselva, Namsfj.	543	510	43.0	44.8	50.9	53.0	5.34	15.13	4.32	410.7	129.7	33.9	33.87	0.65	1.01	0.00	0.01	0.20	0.20	5.56	1.80	1.80	5.56	1.80	1.80					
	Namsen, Namsfj. Ø	6277	6276	43.4	51.2	43.4	51.2	29.50	30.40	9.12	1398.4	263.5	50.7	50.67	6.08	16.21	0.00	0.10	4.15	4.15	12.46	15.20	15.20	12.46	15.20	15.20					
	Salevatnetv., Follafl.	432	422	59.7	63.5	59.7	4.73	0.43	111.5	57.1	2.6	2.60	0.76	12.37	0.01	0.01	0.08	0.45	0.08	0.08	0.45	0.08	0.08	0.07							

**Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1998.**

County	Watercourse	Runoff data													Parameters (mean values)									
		Drainage area				Discharge				Sampling station					gauging station			Cu	Zn	Cd	zero limit	Pb	S.P.M.	Hg zero limit
		Outlet sq.km	Sampi. station sq.km	Disch. gaug. station sq.km	Normal l/s sq.km	1997 Normal l/s sq.km	1997 mSim	Tot.P tonnes	PO4-P tonnes	Tot-N tonnes	NO3-N tonnes	NH4-N tonnes	zero limit tonnes	tonnes tonne/tonnes tonnes	tonnes tonne/tonnes tonnes	tonnes tonne/tonnes tonnes	tonnes tonne/tonnes tonnes							
Nordland (9.)	Abjora, Bindalsfj. S	526	520	384	80.2	75.5	80.2	1.34	1.24	74.3	12.4	3.7	3.71	0.12	0.62	0.00	0.01	0.07	0.07	0.59	0.00	1.24		
	Skjerva, Vefsandfj. S	104	104	98	41.3	38.9	41.3	6.50	3.06	1.40	84.8	53.6	7.0	7.02	0.19	0.31	0.00	0.00	0.06	0.06	1.41	0.19	0.19	
	Fusta, Vefsandfj. N	544	543	520	63.4	59.7	63.4	2.38	3.07	0.92	91.0	15.3	10.2	10.22	0.31	1.64	0.00	0.01	0.06	0.06	1.17	0.00	1.02	
	Drevja, Vefsandfj. N	177	176	98	65.0	61.2	65.0	4.03	1.02	0.34	30.2	10.9	0.3	0.34	0.10	0.61	0.00	0.00	0.03	0.03	0.66	0.00	0.34	
	Røssøya, Sørkj.	2092	2087	1880	45.4	54.5	45.4	3.56	7.17	1.79	319.2	114.8	32.3	32.28	1.79	19.37	0.00	0.04	0.25	0.25	2.26	0.00	3.59	
	Bjerkå, Sørkj.	385	385	273	55.4	49.9	55.4	2.92	0.61	0.30	35.7	10.3	3.0	3.03	0.24	0.73	0.00	0.01	0.03	0.03	0.24	0.00	0.61	
	Dalselva, Ranafj. N	211	211	129	39.5	35.6	39.5	2.14	0.24	0.12	11.4	2.1	0.9	0.95	0.07	0.17	0.00	0.00	0.01	0.01	0.15	0.00	0.24	
	Ranavassdraget, Ranafj. N	3847	3846	1692	44.9	40.4	44.9	1.99	9.80	4.90	308.7	147.0	24.5	24.50	0.98	6.37	0.00	0.05	0.39	0.39	7.11	0.00	4.90	
	Fykantiga, Glomfjord	297	297	243	103.7	98.3	103.7	4.44	0.92	0.46	116.0	70.9	11.0	11.05	0.46	9.58	0.00	0.01	0.02	0.02	0.21	0.00	0.92	
	Belare, Belarfj. Nordfj.	1064	875	797	45.1	45.1	7.14	6.22	3.73	66.0	59.7	6.2	6.22	0.62	5.97	0.00	0.01	0.15	0.15	0.40	0.00	1.24		
Sør-Trøndelag (24.)	Salidalsvassdr., Salid. fj.S	1544	1543	1168	32.1	33.4	32.1	3.72	7.31	3.25	134.9	34.1	8.1	8.13	1.63	257.83	0.00	0.02	0.03	0.03	6.71	0.00	1.63	
	Sulitjelmavassdr., Sulid. fj.	1028	800	791	44.0	45.2	44.0	19.60	1.17	0.58	82.8	39.6	3.5	3.50	9.91	17.60	0.05	0.05	0.17	0.17	0.59	0.00	1.17	
	Kobbe, Leirfj. Sørfolds N	405	405	386	66.9	64.8	66.9	1.54	0.83	0.41	49.7	21.5	3.3	3.31	0.17	0.99	0.00	0.01	0.04	0.04	0.58	0.00	0.83	
	Skjøma, Olofsl. S	845	840	797	36.3	34.5	36.3	1.02	3.66	1.83	37.5	11.9	3.7	3.66	0.46	2.38	0.00	0.01	0.17	0.17	2.84	0.00	0.91	



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**Table 9.2**

Table 9.2 TRIBUTARY RIVERS. ANNUAL LOAD 1998.

County	Watercourse	Parameters ( mean values )																
		PCB ( The following Congeners ) IUPAC NOS							PCB ( The following Congeners ) IUPAC NOS									
Gamma	HCH	28	52	101	118	138	153	160	Sum : PCB	TOC	SiO2	Cr-T	Ni	As				
		zero	limit	zero	limit	zero	limit	zero	kg	kg	kg	kg	kg	kg	tonnes/tonnes			
		kg	tons/tonnes															
Østfold ( 1. )	Tista, Iddefj. Mosselvå, Mossesundet	0.398 0.189	0.000 0.009	0.020 0.009	0.000 0.009	0.020 0.009	0.000 0.009	0.020 0.009	0.000 0.009	0.020 0.009	0.000 0.009	0.000 0.009	0.139 0.065	4.45 2.49	1.13 0.09	0.33 0.32	0.19 0.16	
Osl & Akershus ( 1. )	Hulenelva, Drøbak sundet Ø Arungelva, I. Oslofj. Gjersjøelva, I. Oslofj. Ljanselelv, I. Oslofj. Loelva/Alna, I. Oslofj. Akerselva, I. Oslofj. Frognerelva, I. Oslofj. Lysekkelva, I. Oslofj. Sandvikselva, I. Oslofj. Åreselva, I. Oslofj.	0.032 0.012 0.023 0.009 0.012 0.074 0.009 0.074 0.086 0.039	0.000 0.001 0.001 0.000 0.008 0.005 0.000 0.004 0.004 0.000	0.002 0.001 0.001 0.001 0.004 0.006 0.000 0.004 0.004 0.002	0.000 0.001 0.001 0.001 0.009 0.005 0.000 0.004 0.004 0.002	0.002 0.001 0.001 0.001 0.009 0.005 0.003 0.004 0.004 0.002	0.000 0.001 0.001 0.001 0.009 0.005 0.003 0.004 0.004 0.002	0.002 0.001 0.001 0.001 0.009 0.005 0.003 0.004 0.004 0.002	0.000 0.001 0.001 0.001 0.009 0.005 0.003 0.004 0.004 0.002	0.000 0.001 0.001 0.001 0.009 0.005 0.003 0.004 0.004 0.002	0.002 0.001 0.001 0.001 0.009 0.005 0.003 0.004 0.004 0.002	0.000 0.001 0.001 0.001 0.009 0.005 0.003 0.004 0.004 0.002	0.000 0.001 0.001 0.001 0.009 0.005 0.003 0.004 0.004 0.002	0.011 0.009 0.008 0.008 0.034 0.034 0.027 0.031 0.030 0.014	0.53 0.49 0.23 0.12 0.09 0.27 0.45 0.41 0.62 0.10	0.49 0.45 0.23 0.12 0.09 0.31 0.45 0.41 0.62 0.28	0.15 0.15 0.08 0.08 0.05 0.02 0.06 0.06 0.05 0.05	0.03 0.03 0.01 0.01 0.01 0.02 0.03 0.03 0.03 0.01
Buskerud ( 2. )	Lierelva, Drammenselv, Ø	0.148	0.000	0.009	0.000	0.009	0.000	0.009	0.000	0.009	0.000	0.009	0.062	1.74	2.13	0.47	0.44	0.17
Vestfold ( 3. )	Sandeeleva, Sandebukta Aulielva, Tonsbergf. Farriselva, Larvikf.	0.059 0.100 0.169	0.000 0.005 0.010	0.004 0.006 0.010	0.000 0.006 0.000	0.004 0.006 0.010	0.000 0.006 0.000	0.004 0.006 0.010	0.000 0.005 0.009	0.004 0.005 0.010	0.000 0.005 0.009	0.000 0.010 0.010	0.025 0.042 0.071	0.42 1.93 1.26	0.06 1.02 1.01	0.00 0.10 0.00	0.02 0.36 0.07	0.04 0.36 0.05
Telemark ( 4. )	Tokkeelva, Kragerø	0.908	0.000	0.034	0.000	0.034	0.000	0.034	0.000	0.034	0.000	0.034	0.238	6.24	2.84	0.00	0.57	0.34
Aust-Agder ( 5. )	Gjerstadelva, Søndeledsf. Vogårdelva, Sandnesfj. Nidelva, Arendal	0.318 0.349 3.327	0.000 0.000 0.000	0.012 0.013 0.125	0.000 0.000 0.000	0.012 0.013 0.125	0.000 0.000 0.000	0.012 0.013 0.125	0.000 0.000 0.000	0.012 0.013 0.125	0.000 0.000 0.000	0.000 0.000 0.000	0.083 0.091 0.073	2.16 2.09 12.5	0.99 1.26 9.15	0.00 0.00 0.00	0.20 0.22 2.08	0.32 0.30 1.25

Table 9.2 TRIBUTARY RIVERS. ANNUAL LOAD 1998.

County	Watercourse	Parameters ( mean values )																		
		PCB ( The following Congeners ) IUPAC NOS						Sum : PCB						Ni						
		Gamma	HCH	28	52	101	118	138	153	180	TOC	SiO2	Cr-T	zero	limit	zero	limit	zero	limit	
		kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	
( 5. )	Vest-Agder Tovdalselva, Topdalsfj.	1.712	0.000	0.064	0.000	0.064	0.000	0.064	0.000	0.064	0.000	0.0449	9.63	4.07	0.00	1.07	0.64	0.47	0.47	
	Søgneelva, Flekkery	0.193	0.000	0.007	0.000	0.007	0.000	0.007	0.000	0.007	0.000	0.007	0.051	0.92	0.87	0.00	0.12	0.14	0.14	0.07
	Mandalselva, Mannesfj.	1.863	0.000	0.081	0.000	0.081	0.000	0.081	0.000	0.081	0.000	0.081	0.055	10.22	3.50	0.00	1.35	0.00	0.54	0.54
	Audna, Sniksfj.	0.304	0.000	0.018	0.000	0.018	0.000	0.018	0.000	0.018	0.000	0.018	0.028	1.76	1.46	0.00	0.30	0.00	0.12	0.14
	Lygna, Lyngdalsfj.	0.536	0.000	0.032	0.000	0.032	0.000	0.032	0.000	0.032	0.000	0.032	0.0225	4.16	2.14	0.00	0.54	0.32	0.32	0.23
	Kvina, Fedafj.	1.140	0.000	0.068	0.000	0.068	0.000	0.068	0.000	0.068	0.000	0.068	0.029	9.35	4.10	0.00	1.14	0.91	0.91	0.62
( 6. )	Sira, Ara-Sira	2.016	0.000	0.121	0.000	0.121	0.000	0.121	0.000	0.121	0.000	0.121	0.000	0.121	0.000	0.000	4.84	0.00	2.02	3.63
	Rogaland Sokndalselva, Sognalselstr.	0.470	0.000	0.016	0.000	0.016	0.000	0.016	0.000	0.016	0.000	0.016	0.011	0.000	0.011	0.000	0.000	0.89	0.00	0.26
	Hellelandselva, Eggersund	0.331	0.000	0.011	0.000	0.011	0.000	0.011	0.000	0.011	0.000	0.011	0.000	0.077	0.63	0.55	0.00	0.18	1.58	1.58
	Bjørkremselva, Eggersund	1.311	0.000	0.044	0.000	0.044	0.000	0.044	0.000	0.044	0.000	0.044	0.000	0.044	0.000	0.000	0.306	1.75	2.62	0.00
	Hælva, Hålaengen	0.233	0.000	0.009	0.000	0.009	0.000	0.009	0.000	0.009	0.000	0.009	0.000	0.009	0.000	0.000	0.061	1.45	1.25	0.00
	Figgjo, Spalvika	0.330	0.000	0.012	0.000	0.012	0.000	0.012	0.000	0.012	0.000	0.012	0.000	0.012	0.000	0.000	0.087	2.94	1.86	0.00
( 7. )	Ims-Lutsi, Høgsfj.Boknafj.	0.149	0.000	0.006	0.000	0.006	0.000	0.006	0.000	0.006	0.000	0.006	0.000	0.039	0.63	0.28	0.00	0.09	0.00	0.04
	Oltedalsse., Høgsfj.Boknafj.	0.195	0.000	0.007	0.000	0.007	0.000	0.007	0.000	0.007	0.000	0.007	0.000	0.052	0.34	0.32	0.00	0.12	0.00	0.05
	Dirdalse., Høgsfj.Boknafj.	0.364	0.000	0.014	0.000	0.014	0.000	0.014	0.000	0.014	0.000	0.014	0.000	0.006	0.50	2.18	0.00	0.23	2.73	0.00
	Frafjordse., Frafj., Boknafj.	0.348	0.000	0.017	0.000	0.017	0.000	0.017	0.000	0.017	0.000	0.017	0.000	0.017	0.000	0.000	0.122	0.58	0.75	0.00
	Espedalsse., Høgsfj.Boknafj.	0.215	0.000	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.000	0.000	0.093	0.31	0.82	0.00
	Lysee., Lysefj.Boknafj.	0.187	0.000	0.014	0.000	0.014	0.000	0.014	0.000	0.014	0.000	0.014	0.000	0.014	0.000	0.000	0.098	0.23	0.93	0.00
	Ardalsse., Ardalafj.Boknafj.	0.524	0.000	0.044	0.000	0.044	0.000	0.044	0.000	0.044	0.000	0.044	0.000	0.044	0.000	0.000	0.306	2.04	2.77	0.00
	Forree., Josenfj.Boknafj.	0.194	0.000	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.000	0.000	0.102	0.92	0.68	0.00
	Ulla., Josenfj.Boknafj.	0.455	0.000	0.034	0.000	0.034	0.000	0.034	0.000	0.034	0.000	0.034	0.000	0.034	0.000	0.000	0.239	4.43	2.27	0.00
	Saudae., Saludafj.Boknafj.	0.227	0.000	0.034	0.000	0.034	0.000	0.034	0.000	0.034	0.000	0.034	0.000	0.034	0.000	0.000	0.238	2.73	2.27	0.00
	Abelia., Saudafj.Boknafj.	0.053	0.000	0.008	0.000	0.008	0.000	0.008	0.000	0.008	0.000	0.008	0.000	0.008	0.000	0.000	0.055	0.24	0.58	0.00
	Vikedalsse., Boknafj.	0.074	0.000	0.011	0.000	0.011	0.000	0.011	0.000	0.011	0.000	0.011	0.000	0.011	0.000	0.000	0.077	0.44	0.77	0.00

Table 9.2 TRIBUTARY RIVERS. ANNUAL LOAD 1998.

Country	Watercourse	Parameters ( mean values )													
		PCB ( The following Congeners ) IUPAC NDS				Sum : PCB				As					
Gamma	HCH	28	52	101	118	138	153	180	PCB	TOC	SiO2	Cr-T	Ni	As	As
		kg	t.kmnet tonnes	t.kmnet tonnes	zero	zero	zero	limit tons							
Hordaland ( 7. )	Eneelva, Etnefj. Bomiafj. Ops, Sørfj. Hardangerfj. Tyssø, Sørfj. Hardangerfj. Kinsø, Sørfj. Hardangerfj. Veig, Eidsfjv. Hardangerfj. Bjoreia, " Hardangerfj. Sima, Eidsfj. Hardangerfj. Austdalsla, Osafj. Eidsfj. Norddalsla, Osafj. Eidsfj. Tysseelva, Fusafj. Osleiva, Fusafj. Bergsdalselva, Veafj. Herdlaaf. Vosso, Veafj. Sørfj. Eksø, Modalselva, Østerfj.	0.123 0.490 0.393 0.147 0.141 0.041 0.011 0.070 0.021 0.142 0.072 0.110 0.556 0.228 0.243	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	0.012 0.037 0.030 0.013 0.018 0.005 0.011 0.011 0.003 0.021 0.011 0.016 0.083 0.034 0.036	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	0.012 0.037 0.030 0.013 0.018 0.005 0.014 0.011 0.003 0.021 0.011 0.016 0.083 0.034 0.036	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	0.012 0.037 0.030 0.013 0.018 0.005 0.014 0.011 0.003 0.021 0.011 0.016 0.083 0.034 0.036	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	0.086 0.257 0.037 0.000 0.018 0.005 0.012 0.011 0.003 0.021 0.011 0.016 0.083 0.034 0.036	0.37 1.35 1.25 0.22 1.18 0.67 0.55 0.67 0.22 1.20 0.49 0.22 0.31 2.15 0.57 0.97	0.20 0.61 0.49 0.00 1.25 0.31 0.55 0.67 0.22 1.20 0.49 0.22 0.31 2.15 0.57 0.97	0.12 0.25 0.20 0.00 0.20 0.00 0.22 0.09 0.00 0.20 0.00 0.20 0.00 0.21 2.15 0.63 0.97	0.09 0.12 0.12 0.00 0.12 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	

Table 9.2 TRIBUTARY RIVERS. ANNUAL LOAD 1998.

County	Watercourse	Parameters ( mean values )																	
		PCB ( The following Congeners ) IUPAC NOS						Sum : PCB						Cr. T					
		Gamma	HCH	28	52	101	118	138	153	180	PCB	TOC	SiO2	Ni	Cr. T	zero	limit	zero	limit
		kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	tonnes	tonnes	tonnes	tonnes
(7.)	Nærøye, Aurl. f., Sognefj.	0.121	0.000	0.018	0.000	0.018	0.000	0.018	0.000	0.018	0.000	0.127	0.24	2.23	0.00	0.16	0.18	0.00	0.06
	Fjordane, Aurl. f., Sognefj.	0.099	0.000	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.000	0.104	0.15	0.84	0.00	0.25	0.20	0.00	0.05
	Aurlandv. Aurl. f., Sognefj.	0.154	0.000	0.039	0.000	0.039	0.000	0.039	0.000	0.039	0.000	0.039	0.051	1.16	0.00	0.64	0.26	0.00	0.13
	Erdalsete, Lærd. f., Sognefj.	0.021	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.029	0.12	0.29	0.00	0.07	0.03	0.00
	Lærdalsv. Lærd. f., Sognefj.	0.161	0.000	0.024	0.000	0.024	0.000	0.024	0.000	0.024	0.000	0.024	0.050	1.71	0.00	0.40	0.24	0.00	0.01
	Årdalsv., Årdalsfj. Sognefj.	0.338	0.000	0.041	0.000	0.041	0.000	0.041	0.000	0.041	0.000	0.041	0.050	1.89	0.00	0.68	0.27	0.00	0.08
	Fortunv., Lusterfj. Sognefj.	0.224	0.000	0.024	0.000	0.024	0.000	0.024	0.000	0.024	0.000	0.024	0.050	1.03	1.89	0.00	0.68	0.27	0.00
	Markristv., Lusterfj. Sognefj.	0.129	0.000	0.014	0.000	0.014	0.000	0.014	0.000	0.014	0.000	0.014	0.050	1.18	0.97	0.00	0.23	0.18	0.00
	Jostedalsl. " Sognefj.	0.391	0.000	0.042	0.000	0.042	0.000	0.042	0.000	0.042	0.000	0.042	0.050	5.87	0.00	0.70	0.42	0.00	0.14
	Årøye, Sognd. f., Sognefj.	0.289	0.000	0.031	0.000	0.031	0.000	0.031	0.000	0.031	0.000	0.031	0.050	0.217	0.62	1.44	0.00	0.52	0.21
	Sogndalsl. " Sognefj.	0.098	0.000	0.011	0.000	0.011	0.000	0.011	0.000	0.011	0.000	0.011	0.050	1.02	1.74	0.00	0.40	0.24	0.00
	Gaular, Dalsfj. Bifj.	0.609	0.000	0.050	0.000	0.050	0.000	0.050	0.000	0.050	0.000	0.050	0.050	2.17	1.83	0.00	0.83	0.00	0.05
	Jelstra, Førdefj.	0.523	0.000	0.052	0.000	0.052	0.000	0.052	0.000	0.052	0.000	0.052	0.050	0.366	1.92	0.00	0.87	0.00	0.17
	Nauta, Førdefj.	0.222	0.000	0.022	0.000	0.022	0.000	0.022	0.000	0.022	0.000	0.022	0.050	0.155	1.18	0.00	0.37	0.00	0.10
	Osalva, Hoydalsfj.	0.223	0.000	0.022	0.000	0.022	0.000	0.022	0.000	0.022	0.000	0.022	0.050	0.156	1.86	0.37	0.00	0.22	0.00
	Hopse, Hylefj. Nordfj. S	0.054	0.000	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.050	0.13	0.15	0.00	0.09	0.00	0.04
	Glengedalsl. " Nordfj. S	0.125	0.000	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.050	0.088	0.62	0.46	0.00	0.21	0.00
	Breimse, Gløppenf. "	0.489	0.000	0.048	0.000	0.048	0.000	0.048	0.000	0.048	0.000	0.048	0.050	0.336	1.12	2.08	0.00	0.80	0.32
	Oldene, Indre Nordfj.	0.152	0.000	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.050	0.107	0.41	0.71	0.00	0.25	0.00
	Laerleva, Indre Nordfj.	0.163	0.163	0.000	0.016	0.000	0.016	0.000	0.016	0.000	0.016	0.000	0.163	0.261	0.27	0.00	0.11	0.06	0.08
	Shrynee, Indre Nordfj.	0.285	0.000	0.028	0.000	0.028	0.000	0.028	0.000	0.028	0.000	0.028	0.050	0.199	0.47	1.23	0.00	0.47	0.00
	Hornindalsl. Nordfj. N	0.293	0.000	0.022	0.000	0.022	0.000	0.022	0.000	0.022	0.000	0.022	0.050	0.157	1.04	0.00	0.37	0.15	0.00

Table 9.2 TRIBUTARY RIVERS. ANNUAL LOAD 1998.

Country	Watercourse	Parameters ( mean values )																	
		PCB ( The following Congeners ) IUPAC NOS								Sum : PCB									
Gamma	HCH	28	52	zero	limit	101	zero	118	zero	138	zero	153	zero	160	zero	kg	kg	kg	kg
More og Romsdal ( B. )	Ørstaflj.	0.016	0.000	0.011	0.000	0.011	0.000	0.011	0.000	0.011	0.000	0.011	0.000	0.075	0.49	0.93	0.00	0.18	0.25
	Valldøla, Nordalsfj., Storfj.	0.355	0.000	0.021	0.000	0.021	0.000	0.021	0.000	0.021	0.000	0.021	0.000	0.149	0.32	1.06	0.00	0.35	0.00
	Rauma, Romsdalsflj., Moldefj.	0.599	0.000	0.036	0.000	0.036	0.000	0.036	0.000	0.036	0.000	0.036	0.000	0.251	0.60	3.83	0.00	0.60	0.00
	Isla, Isfj., Moldefj.	0.130	0.000	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.000	0.068	0.21	0.53	0.00	0.16	0.00
	Eira, Eresfj., Moldefj.	0.393	0.000	0.038	0.000	0.038	0.000	0.038	0.000	0.038	0.000	0.038	0.000	0.266	0.63	1.90	0.00	0.63	0.00
	Littledalselv., Sunndalsflj.	0.199	0.000	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.000	0.105	0.30	0.50	0.00	0.25	0.00
	Driva, Sunnd. fl., Tingvollfj.	0.493	0.000	0.074	0.000	0.074	0.000	0.074	0.000	0.074	0.000	0.074	0.000	0.518	3.08	6.41	0.0	1.2	0.0
	Ulvia, Alvundsfj.	0.043	0.000	0.006	0.000	0.006	0.000	0.006	0.000	0.006	0.000	0.006	0.000	0.045	0.30	0.85	0.00	0.11	0.06
	Toia, Todalflj.	0.096	0.000	0.014	0.000	0.014	0.000	0.014	0.000	0.014	0.000	0.014	0.000	0.101	0.43	0.77	0.00	0.24	0.00
	Surna, Surnadalsflj.	0.980	0.000	0.059	0.000	0.059	0.000	0.059	0.000	0.059	0.000	0.059	0.000	0.412	3.33	2.35	0.00	0.98	0.39
Sør- Trondelag ( B. )	Bøvra, Hamnesflj., Halsafj.	0.310	0.000	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.000	0.093	0.78	0.49	0.00	0.22	0.09
	Børse, Gaulosen Tr.h.fj.	0.082	0.000	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000	0.019	0.32	0.07	0.05	0.05	0.00
	Vigda, Gaulosen Tr.h.fj.	0.109	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.029	0.52	0.14	0.00	0.07	0.12
	Gaula, Gaulosen Tr.h.fj.	2.047	0.000	0.088	0.000	0.088	0.000	0.088	0.000	0.088	0.000	0.088	0.000	0.614	10.1	8.77	2.05	5.26	5.26
	Nidelva, Trondheimsfj.	1.945	0.000	0.102	0.000	0.102	0.000	0.102	0.000	0.102	0.000	0.102	0.000	0.716	9.55	4.76	0.00	1.71	2.73
	Homla, Stjerd. fl., Tr.h.fj.	0.080	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.031	0.51	0.20	1.01	0.39	0.39
	Stjordalsflv., " Tr.h.fj.	1.399	0.000	0.076	0.000	0.076	0.000	0.076	0.000	0.076	0.000	0.076	0.000	0.534	7.5	2.29	0.00	1.27	1.53
	Grin., " Tr.h.fj.	0.040	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.015	0.33	0.31	0.00	0.04	0.05
	Verdalssvassdfl., Tr.h.fj.	1.019	0.000	0.056	0.000	0.056	0.000	0.056	0.000	0.056	0.000	0.056	0.000	0.399	5.74	2.22	21.49	7.59	7.59
Nord- Trondelag ( B. )	Figgjølæksdalsfl., Tr.h.fj.	0.145	0.000	0.008	0.000	0.008	0.000	0.008	0.000	0.008	0.000	0.008	0.000	0.056	1.24	0.38	0.19	0.19	0.24
	Snisavossdfl., Trondh.fj.	1.066	0.000	0.064	0.000	0.064	0.000	0.064	0.000	0.064	0.000	0.064	0.000	0.448	7.35	2.34	16.41	5.97	5.97
	Argårdseidva, Namnfj.	0.144	0.000	0.022	0.000	0.022	0.000	0.022	0.000	0.022	0.000	0.022	0.000	0.151	3.24	1.59	0.00	0.36	0.43
	Namsen, Namnfj. Ø	2.432	0.000	0.304	0.000	0.304	0.000	0.304	0.000	0.304	0.000	0.304	0.000	2.128	8.11	0.51	4.1	4.1	0.00
	Salsvatnøya, Fellsflj.	0.260	0.000	0.026	0.000	0.026	0.000	0.026	0.000	0.026	0.000	0.026	0.000	0.182	0.87	40.14	40.14	12.20	12.20

Table 9.2 TRIBUTARY RIVERS. ANNUAL LOAD 1998.

County	Watercourse	Parameters ( mean values )																		
		PCB ( The following Congeners ) IUPAC NOS								Sum : PCB										
Gamma	HCH	28	52	zero	limit	zero	limit	kg	kg	kg	kg	zero	limit	zero	limit	kg	kg	kg	kg	
( 9. )	Abjara, Bindalsfj. S	0.371	0.000	0.037	0.000	0.037	0.000	0.037	0.000	0.037	0.000	0.037	0.000	0.037	0.000	0.260	0.50	0.00	0.62	
	Skjerva, Vefsenvfj. S	0.051	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.027	0.17	0.09	0.09	0.18
	Fusta, Vefsenvfj. N	0.409	0.000	0.031	0.000	0.031	0.000	0.031	0.000	0.031	0.000	0.031	0.000	0.031	0.000	0.215	0.41	0.00	0.51	0.20
	Drevja, Vefsenvfj. N	0.136	0.000	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.000	0.071	0.14	0.00	0.17	0.14
	Rossåga, Sørkj.	1.076	0.000	0.108	0.000	0.108	0.000	0.108	0.000	0.108	0.000	0.108	0.000	0.108	0.000	0.753	1.79	0.47	58.47	19.73
	Bjerka, Sørkj.	0.162	0.000	0.018	0.000	0.018	0.000	0.018	0.000	0.018	0.000	0.018	0.000	0.018	0.000	0.127	0.30	0.00	0.30	0.24
	Dalselva, Ranafj. N	0.059	0.000	0.007	0.000	0.007	0.000	0.007	0.000	0.007	0.000	0.007	0.000	0.007	0.000	0.050	0.12	0.00	0.12	0.07
	Runavassdraget, Ranafj. N	1.225	0.000	1.147	0.000	1.147	0.000	1.147	0.000	1.147	0.000	1.147	0.000	1.147	0.000	1.029	2.94	0.00	2.45	1.47
	Fykanåga, Glomifjord	0.230	0.000	0.028	0.000	0.028	0.000	0.028	0.000	0.028	0.000	0.028	0.000	0.028	0.000	0.193	0.64	0.55	0.55	0.46
	Beiarelj. Nordfj.	0.622	0.000	0.037	0.000	0.037	0.000	0.037	0.000	0.037	0.000	0.037	0.000	0.037	0.000	0.261	1.99	5.48	0.00	0.62
S	Saldalsvassdr., Sald.fj.S	1.138	0.000	0.049	0.000	0.049	0.000	0.049	0.000	0.049	0.000	0.049	0.000	0.049	0.000	0.341	1.30	24.05	6.50	6.50
	Sulitjelmavassdr., Sulitd.fj	0.863	0.000	0.035	0.000	0.035	0.000	0.035	0.000	0.035	0.000	0.035	0.000	0.035	0.000	0.245	0.93	0.00	0.58	0.58
	Kobbe,, Leirfj. Sarfjorda N	0.414	0.000	0.025	0.000	0.025	0.000	0.025	0.000	0.025	0.000	0.025	0.000	0.025	0.000	0.174	0.65	0.00	0.41	0.00
	Skjema, Ofotfj. S	0.366	0.000	0.027	0.000	0.027	0.000	0.027	0.000	0.027	0.000	0.027	0.000	0.027	0.000	0.192	0.64	10.05	3.38	3.38
																			0.27	

Table 9.2 TRIBUTARY RIVERS. ANNUAL LOAD 1998.

County	Watercourse	Parameters ( mean values )															
		PCB ( The following Congeners ) IUPAC NOS								Sum : PCB							
Gamma HCH kg	28 zero kg	52 limit kg	101 zero kg	118 limit kg	135 zero kg	153 limit kg	160 zero kg	160 limit kg	PCB TOC tonne/tonnes	SO2 Cr-T zero tonne/tonnes	TOC Ni zero tonne/tonnes	Cr-T Ni zero tonne/tonnes	SO2 Ni zero tonne/tonnes	PCB Ni zero tonne/tonnes	As zero tonnes	As limit tonnes	
Troms ( 9. )	Spanselva, Astafj. Vågsfj. Salangs., Astafj. Vågsfj.- Rossfjorde., Målaengen Måse., Målselvflj. "	0.092	0.000	0.007	0.000	0.007	0.000	0.007	0.000	0.007	0.000	0.049	0.14	0.00	0.12	0.12	0.00
	Måse., Målselvflj. "	0.255	0.000	0.022	0.000	0.022	0.000	0.022	0.000	0.022	0.000	0.153	0.44	0.00	0.36	0.29	0.09
	Bardue., Målselvå.	0.078	0.000	0.007	0.000	0.007	0.000	0.007	0.000	0.007	0.000	0.050	0.09	0.00	0.12	0.12	0.00
	Nordkjøsøya, Balsfj.	0.438	0.000	0.066	0.000	0.066	0.000	0.066	0.000	0.066	0.000	0.460	2.19	115.41	115.41	50.59	0.96
	Signaldealsøya, Lyngen V	0.392	0.000	0.059	0.000	0.059	0.000	0.059	0.000	0.059	0.000	0.412	1.96	103.35	103.35	45.30	0.86
	Skibotnøya, Lyngen	0.012	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.034	0.00	0.025	0.15	0.00	0.06
	Kåfjordøya, Lyngen Ø	0.029	0.000	0.009	0.000	0.009	0.000	0.009	0.000	0.009	0.000	0.030	0.31	0.00	0.06	0.06	0.02
	Reisa, Reisafj.	0.022	0.000	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.52	0.00	0.22	0.39	0.00
		0.008	0.000	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.000	0.033	0.28	0.00	0.08	0.08	0.02
Finnmark ( 10. )	Mattiseleva, Kåfj. Altafj.	0.028	0.000	0.008	0.000	0.008	0.000	0.008	0.000	0.008	0.000	0.058	0.22	0.00	0.14	0.00	0.03
	Tverreleva, Altafj.	0.017	0.000	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000	0.024	0.11	0.00	0.06	0.04	0.02
	Repparfjordt., Repparfi.	0.116	0.000	0.023	0.000	0.023	0.000	0.023	0.000	0.023	0.000	0.162	0.62	0.00	0.39	0.23	0.09
	Stabburse, I. Porsangen V	0.086	0.000	0.017	0.000	0.017	0.000	0.017	0.000	0.017	0.000	0.120	1.38	2.41	0.00	0.29	0.00
	Lakse., Indre Porsangen S	0.104	0.000	0.021	0.000	0.021	0.000	0.021	0.000	0.021	0.000	0.145	1.45	0.00	0.35	0.35	0.07
	Berselva, Indre Porsangen Ø	0.112	0.000	0.022	0.000	0.022	0.000	0.022	0.000	0.022	0.000	0.157	1.57	0.00	0.37	0.22	0.07
	Mattusjåkka, I. Laksefj. V	0.010	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.015	0.10	0.00	0.03	0.01	0.01
	Storelva, Indre Laksefj. V	0.068	0.000	0.014	0.000	0.014	0.000	0.014	0.000	0.014	0.000	0.095	1.04	0.00	5.07	1.67	0.05
	Soussejåkka, I. Laksefj. V	0.010	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.015	0.18	0.00	0.03	0.02	0.01
	Adamselva, I. Laksefj. Ø	0.063	0.000	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.000	0.088	1.01	0.00	0.21	0.13	0.00
Norway	Tanavassdraget, Tanaflj. S	0.594	0.000	0.162	0.000	0.162	0.000	0.162	0.000	0.162	0.000	1.134	16.7	37.8	5.94	4.86	0.54
	Vesterelva, Sylteflj.	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.000	0.108	2.47	0.00	0.26	0.10	0.16
	V. Jakobse., Y. Varangerflj.	0.118	0.000	0.012	0.000	0.012	0.000	0.012	0.000	0.012	0.000	0.083	1.30	0.00	0.20	0.08	0.00
	Passevika, Bekkfj. Varangflj.	1.620	0.000	0.171	0.000	0.171	0.000	0.171	0.000	0.171	0.000	1.194	22.2	24.5	0.00	2.84	25.6
	Neiden, Munkfj. Varangflj.	0.448	0.000	0.038	0.000	0.038	0.000	0.038	0.000	0.038	0.000	0.269	2.69	0.00	0.64	0.00	0.35
	Grense Jakobse., Varangflj.	0.049	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.029	0.46	0.00	0.07	0.99	0.03

<b>APPENDIX X :</b>	<b>"MEAN" TOTAL DISCHARGES (Mean concentrations of main and tributary rivers multiplied with mean runoff 1961-90 (main rivers), 1931-60 (tributary rivers).</b>	<b>Page:</b>
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- \* Measurements below detection limits are treated in two ways:  
 "Detection limit = Zero", and "Detection limit = limit". This concerns the substances Cd, Pb, Hg and PCBs. In Table 10.5A the "limit-values" are shown, in Table 10.5B the "zero-values" are presented.

**Table X "MEAN" TOTAL DISCHARGES from MAINLAND NORWAY  
to convention waters ( Mean runoff 1961 - 90, main rivers,  
1931 - 60, tributary rivers ( Fig. I )).**

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		1.2	1.6	4.4	7.2	tonnes
Cadmium			2.3	**	4.4	tonnes
Mercury		116	80	*	3064	kg
Mercury			158	**	3084	kg
Copper		60	117	133	311	tonnes
Zinc		136	780	356	1272	tonnes
Lead		6.4	35.1	*	89.4	tonnes
Lead			35.1	**	89.4	tonnes
Arsenic		0.6	20.1	*	9.0	tonnes
Arsenic			25.5	**	10.2	tonnes
Cr-T		4.9	472.4	*	4.6	tonnes
Cr-T			527.5	**	30.2	tonnes
Ni		14.4	267.2	*	52.1	tonnes
Ni			273.1	**	52.1	tonnes
PCBs ***			0.2	*	0.2	kg
PCBs			29.3	**	12.7	kg
gamma-HCH			53		26	kg
NH4-N	1374	9925	2843	*	1268	tonnes
NH4-N			2856	**	1268	tonnes
NO3-N	15295	65	18337		15511	tonnes
PO4-P	190	644	273	*	192	tonnes
PO4-P			285	**	192	tonnes
Total N	24066	16492	36028		26909	tonnes
Total P	778	1300	897		475	tonnes
SiO2			263930		152023	tonnes
S.P.M.		3482987	251702		196531	tonnes
TOC		22320	233403		220876	tonnes
COD		188709			188709	tonnes
BOD		44459			44459	tonnes

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

\*\*\* the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

**Table 10.1 "MEAN" TOTAL DISCHARGES to The Skagerrak Region**  
 ( Mean runoff 1961 - 90, main rivers,  
 1931 - 60, tributary rivers ( Fig. I.I ) ).

The Skagerrak Region with main rivers (1) Glomma, (2) Drammenselva, (3) Numedalslågen  
 (4) Skienselva, (5) Otra

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.11	0.4 *	4.1 *	4.6	tonnes
Cadmium			0.4 **	4.1 **	4.6	tonnes
Mercury	54.50		13 *	3054 *	3121	kg
Mercury			17 **	3071 **	3143	kg
Copper	24.87		8	93	126	tonnes
Zinc	19.75		71	249	340	tonnes
Lead	0.71		6.2 *	85.0 *	91.9	tonnes
Lead			6.2 **	85.0 **	91.9	tonnes
Arsenic	0.20		3.0 *	6.9 *	10.1	tonnes
Arsenic			3.0 **	7.8 **	11.0	tonnes
Cr-T	2.60		5.1 *	4.6 *	12.3	tonnes
Cr-T			11.1 **	23.6 **	37.3	tonnes
Ni	5.22		5.0 *	45.4 *	55.6	tonnes
Ni			5.7 **	45.4 **	56.4	tonnes
PCBs ***			0.1 *	0.0 *	0.1	kg
PCBs			2.8 **	9.9 **	12.7	kg
gamma-HCH			10	25	35	kg
NH4-N	164	3907	356 *	1124 *	5551	tonnes
NH4-N	164	3907	356 **	1124 **	5551	tonnes
NO3-N	1793	25	3890	13960	19668	tonnes
PO4-P	18	84	36 *	153 *	290	tonnes
PO4-P			36 **	153 **	290	tonnes
Total N	2777	6280	6761	22316	38134	tonnes
Total P	73	217	125	392	807	tonnes
SIO2			31163	123683	154846	tonnes
S.P.M.	10016		34037	166343	210395	tonnes
TOC		7398	55950	183471	246820	tonnes
COD		114896			114896	tonnes
BOD		15033			15033	tonnes

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

\*\*\* the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

**Table 10.2 "MEAN" TOTAL DISCHARGES to The Remaining North Sea  
( Mean runoff 1961 - 90, main rivers,  
1931 - 60, tributary rivers ( Fig. I.II ) ).**

The North Sea Region with main rivers : (6) Orreelva, (7) Suldalslægen

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.99	0.7 *	0.0 *	1.7	tonnes
Cadmium			0.9 **	0.0 **	1.9	tonnes
Mercury	39.74		30 *	0 *	70	kg
Mercury			54 **	3 **	96	kg
Copper	8.5		23	1	32	tonnes
Zinc	54.1		135	5	194	tonnes
Lead	4.8		9.5 *	0.3 *	14.5	tonnes
Lead			9.5 **	0.3 **	14.6	tonnes
Arsenic	0.0		5.1 *	0.0 *	5.2	tonnes
Arsenic			7.8 **	0.3 **	8.1	tonnes
Cr-T	1.17		0.0 *	0.0 *	1.2	tonnes
Cr-T			23.1 **	1.4 **	25.7	tonnes
Ni	6.6		28.0 *	0.7 *	35.3	tonnes
Ni			31.1 **	0.7 **	38.4	tonnes
PCBs ***			0.2 *	0.0 *	0.2	kg
PCBs			9.9 **	0.6 **	10.4	kg
gamma-HCH			17	0	17	kg
NH4-N	517	2736	690 *	14 *	3957	tonnes
NH4-N			690 **	14 **	3957	tonnes
NO3-N	5835	18	10151	605	16610	tonnes
PO4-P	51	223	53 *	4 *	331	tonnes
PO4-P			59 **	4 **	337	tonnes
Total N	9281	5059	15395	849	30584	tonnes
Total P	197	446	269	9	922	tonnes
SIO2			74231	1958	76190	tonnes
S.P.M.		1554425	37539	2435	1593922	tonnes
TOC		6938	75041	2024	84003	tonnes
COD		40832			40832	tonnes
BOD		13518			13518	tonnes

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

\*\*\* the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

**Table 10.3 "MEAN" TOTAL DISCHARGES to The Norwegian Sea**  
 ( Mean runoff 1961 - 90, main rivers,  
 1931 - 60, tributary rivers ( Fig. I.III ) ).

The Norwegian Sea Region with main rivers (8) Orkla, (9) Vefsna

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.10	0.1 *	0.2 *	0.5	tonnes
Cadmium			0.7 **	0.2 **	1.0	tonnes
Mercury		21.27	26 *	8 *	55	kg
Mercury			70 **	8 **	99	kg
Copper		26.65	64	36	127	tonnes
Zinc		61.30	472	102	635	tonnes
Lead		0.93	15.4 *	4.0 *	20.3	tonnes
Lead			15.4 **	4.0 **	20.3	tonnes
Arsenic		0.40	9.3 *	0.8 *	10.5	tonnes
Arsenic			11.6 **	0.8 **	12.8	tonnes
Cr-T		1.08	455.7 *	0.0 *	456.7	tonnes
Cr-T			476.0 **	3.8 **	480.9	tonnes
Ni		2.50	200.8 *	5.2 *	208.5	tonnes
Ni			202.5 **	5.2 **	210.2	tonnes
PCBs ***			0.0 *	0.2 *	0.2	kg
PCBs			13.0 **	1.6 **	14.6	kg
gamma-HCH			23	1	24	kg
NH4-N	607	3024	442 *	111 *	4184	tonnes
NH4-N			454 **	111 **	4197	tonnes
NO3-N	6652	20	3947	776	11395	tonnes
PO4-P	103	310	76 *	20 *	509	tonnes
PO4-P			79 **	20 **	512	tonnes
Total N	10327	4807	9547	3212	27893	tonnes
Total P	419	592	270	45	1326	tonnes
SiO2			80260	14044	94304	tonnes
S.P.M.		1539978	151958	25176	1717112	tonnes
TOC		7621	62173	25786	95581	tonnes
COD		31751			31751	tonnes
BOD		15181			15181	tonnes

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

\*\*\* the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

**Table 10.4 "MEAN" TOTAL DISCHARGES to The Barents Sea**  
 ( Mean runoff 1961 - 90, main rivers,  
 1931 - 60, tributary rivers ( Fig. I.IV )).

The Barents Sea Region with main river (10) Alta

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.00	0.3 *	0.03 *	0.4	tonnes
Cadmium			0.4 **	0.03 **	0.4	tonnes
Mercury		0.00	11 *	2.74 *	14	kg
Mercury			18 **	2.74 **	21	kg
Copper		0.37	22	2.47	25	tonnes
Zinc		0.43	101	1.10	103	tonnes
Lead		0.01	4.0 *	0.14 *	4.2	tonnes
Lead			4.1 **	0.14 **	4.2	tonnes
Arsenic		0.00	2.7 *	1.37 *	4.1	tonnes
Arsenic			3.1 **	1.37 **	4.4	tonnes
Cr-T		0.04	11.6 *	0.00 *	11.6	tonnes
Cr-T			17.3 **	1.37 **	18.7	tonnes
Ni		0.12	33.4 *	0.82 *	34.3	tonnes
Ni			33.8 **	0.82 **	34.7	tonnes
PCBs ***			0.0 *	0.00 *	0.0	kg
PCBs			3.7 **	0.58 **	4.3	kg
gamma-HCH			4	0.11	4	kg
NH4-N	85	258	1355 *	19 *	1718	tonnes
NH4-N			1355 **	19 **	1718	tonnes
NO3-N	1015	1.7	349	170	1535	tonnes
PO4-P	18	27	108 *	16 *	169	tonnes
PO4-P			111 **	16 **	172	tonnes
Total N	1681	346	4325	532	6884	tonnes
Total P	88	45	232	28	394	tonnes
SiO2			78277	12336	90613	tonnes
S.P.M.		378568	28169	2577	409314	tonnes
TOC		363	40238	9595	50196	tonnes
COD		1230			1230	tonnes
BOD		726			726	tonnes

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

\*\*\* the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

**Table 10.5 A Main rivers. "Mean" load (Mean concentrations multiplied with mean runoff 1961-90) (Limit-values=limits).**

Watercourse	Runoff data						Parameters ( mean values )											
	Drainage area			Discharge			gauging station			Parameters ( mean values )								
	Outlet	Sampi. station	Disch. gaug. station	Sampling station	Normal	1997	Normal	1997	mS/m	Tot-P	PO4-P	Tot-N	NO3-N	Cu	Zn	Cd	Pb	S.P.M.
	sq.km	sq.km	sq.km	sq.km	l/s sq.km	l/s sq.km	l/s sq.km	l/s sq.km	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	t.tonnes
Glomma, Hvaler-Singofj.	41918	41218	40221	16.5	18.1	16.9	18.5	4.51	272.38	113.67	12847	8236	68.63	147.99	3.43	78.93	123.97	
Drammensvassdr, Dr.fj. V	17034	17028	16020	17.1	19.0	18.2	20.2	3.34	40.40	11.02	3949	2433	146.92	7.35	27.55	1.19	13.87	
Numedalslågen, Larvikfj.	5577	5513	5197	21.2	21.4	21.2	21.4	2.85	37.96	15.48	1618	877	114.26	9.21	35.01	0.15	1.95	
Skienstvassdr, Grønlandsfj.	10772	10348	10348	25.3	29.5	25.3	29.5	2.09	28.07	8.26	2667	1739	115.69	5.78	20.64	0.17	1.57	
Otra, Kr.Sandsfj.	3738	3730	3688	39.8	38.3	39.8	38.3	1.63	13.58	4.21	1238	655	60.86	2.34	17.79	0.14	1.40	
Orreleva, Orresanden	105	105	64	36.7	36.8	40.7	40.8	17.7	4.90	1.49	190	109	5.71	0.26	0.00	0.04	0.54	
Suldals-, Sandsfj.Boknafj.	1457	1457	1457	59.0	34.4	59.0	34.4	1.62	4.07	2.17	650	496	8.13	0.81	4.34	0.03	0.24	
Orkla, Ørkdalsfj.Tr.h.fj.	3053	2872	2247	21.7	22.3	21.7	22.3	5.90	8.06	2.56	564	314	13.76	12.58	34.39	0.12	1.16	
Vefsna, Vefsentfj. S	4122	4113	3323	43.9	43.7	43.9	43.7	6.02	37.01	17.08	2648	461	96.80	23.92	67.19	0.11	3.82	
Altaelva, Altafj.	7373	7367	6257	11.8	12.7	11.8	12.7	13.3	28.24	16.45	532	170	19.19	2.47	1.10	0.03	2.58	

Watercourse	Parameters ( mean values )												
	PCB ( The following Congeners ) IUPAC NOS												
	Hg limit kg	Gamma HCH kg	28 limit kg	52 limit kg	101 limit kg	116 limit kg	138 limit kg	153 limit kg	180 limit kg	SUM : TOC	Cr-T limit tonnes	Ni limit tonnes	As limit tonnes
Glomma, Hvaler-Singofj.	3041.26	10.94	0.64	0.64	0.64	0.64	0.64	0.64	0.64	4.504	109.38	10.72	32.17
Drammensvassdr, Dr.fj. V	9.18	4.22	0.28	0.28	0.28	0.28	0.28	0.28	0.28	31.22	4.59	4.59	0.92
Numedalslågen, Larvikfj.	7.74	1.51	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.774	12.53	1.84	1.47
Skienstvassdr, Grønlandsfj.	8.26	6.19	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1.734	18.16	4.13	1.57
Otra, Kr.Sandsfj.	4.68	2.01	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.983	12.17	2.34	4.68
Orreleva, Orresanden	0.12	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.026	0.67	0.05	0.04
Suldals-, Sandsfj.Boknafj.	2.71	0.33	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.669	1.36	1.36	0.54
Orkla, Ørkdalsfj.Tr.h.fj.	1.97	0.29	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.413	5.86	0.98	1.77
Vefsna, Vefsentfj. S	5.69	0.68	0.17	0.17	0.17	0.17	0.17	0.17	0.17	1.196	19.93	2.85	3.42
Altaelva, Altafj.	2.74	0.11	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.576	9.60	1.37	0.82

**Table 10.5B Main rivers. "Mean" load (Mean concentrations multiplied with mean runoff 1961-90) (Limit-values=Zero).**

Watercourse	Runoff data										Parameters ( mean values )																			
	Drainage area		Disch. gaug. station		Sampling station		Gauging station		Cond		Tot-P		PO4-P		Tot-N		NO3-N		NH4-N		Cu		Zn		Cd		Pb		S.P.M.	
	sq.km	sq.km	sq.km	sq.km	Normal	1997	Normal	1997	l/s sq.km	m3/s	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes			
Giomma, Hvaler-Singlefj.	41918	41218	40221	16.5	18.1	16.9	18.5	4.51	272.38	113.67	12847	8236	68.63	147.99	3.43	78.93	123.97													
Drammensvassdr, Dr.fj. V	17034	17028	16020	17.1	19.0	18.2	20.2	3.34	40.40	14.02	3949	2433	146.92	7.35	27.55	0.18	1.19	13.87												
Numedalslågen, Larvikfj.	5577	5613	5197	21.2	21.4	21.2	21.4	2.85	37.96	15.48	1618	877	114.26	9.21	35.01	0.15	1.95	15.89												
Skiensvassdr, Grenlandsfj.	10772	10348	10348	25.3	29.5	25.3	29.5	2.09	28.07	8.26	2667	1759	115.59	5.78	20.64	0.17	1.57	7.10												
Otra, Kr.Sandefj.	3738	3730	3668	39.8	38.3	39.8	38.3	1.63	13.58	4.21	1236	655	60.86	2.34	17.79	0.14	1.40	5.52												
Orreleva, Orresanden	105	105	54	36.7	36.8	40.7	40.8	17.7	4.90	1.49	190	109	5.71	0.26	0.00	0.00	0.04	0.54												
Suldalsl.,Sandsfj.Boknafj.	1457	1457	1457	59.0	59.0	59.0	59.0	34.4	1.62	4.07	2.17	659	496	8.13	0.81	4.34	0.03	0.24	1.90											
Orka, Orkdalsfj.Tr.h.fj.	3053	2872	2247	21.7	22.3	21.7	22.3	5.90	8.06	2.56	564	314	13.76	12.58	34.39	0.12	0.16	2.46												
Vefsna, Vefsenfj. S	4122	4113	3323	43.9	43.7	43.9	43.7	6.02	37.01	17.08	2648	461	96.80	23.92	67.19	0.11	3.52	22.72												
Altælva, Altafj.	7373	7367	6257	11.8	12.7	11.8	12.7	13.3	28.24	16.45	532	170	19.19	2.47	1.10	0.03	0.14	2.58												

Watercourse	Parameters ( mean values )										PCB ( The following Congeners ) IUPAC NOS										Parameters ( mean values )									
	Hg	Gamma	2B	52	101	118	138	153	180	SUM : zero	TOC	Cr-T	Ni	As	zero	zero	zero	zero	zero	zero	zero	zero								
	zero kg	HCH kg	zero kg	kg	kg	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes								
Giomma, Hvaler-Singlefj.	3041.26	10.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	109.38	0.00	32.17	4.08												
Drammensvassdr, Dr.fj. V	0.00	4.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	31.22	4.59	4.59	0.00												
Numedalslågen, Larvikfj.	7.74	1.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	12.53	0.00	1.47	0.52												
Skiensvassdr, Grenlandsfj.	0.00	6.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	16.16	0.00	2.48	1.57												
Otra, Kr.Sandefj.	4.68	2.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	12.17	0.00	4.68	0.70												
Orreleva, Orresanden	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.67	0.00	0.15	0.04												
Suldalsl.,Sandsfj.Boknafj.	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	1.36	0.00	0.54	0.00												
Orka, Orkdalsfj.Tr.h.fj.	1.97	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	5.86	0.00	1.77	0.20												
Vefsna, Vefsenfj. S	5.69	0.68	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	19.93	0.00	3.42	0.57												
Altælva, Altafj.	2.74	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	9.60	0.00	0.82	1.37												

**Table 10.6 The Skagerrak Region. "Mean" inputs from tributary rivers in  
The Sub-areas ( 1 - 5 )  
( Mean concentrations 1998 multiplied with mean runoff, 1931-60)**

The Skagerrak Region with sub-areas: ( 1A ) Glomma, ( 1B ) Inner Oslofj., ( 2 ) Drammenselva,  
( 3 ) Numedalslægen, ( 4 ) Skienselva, ( 5 ) Otra

Sub-areas :	Total quantity of substance discharged per year:						Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
	1A	1B	2	3	4	5		
<b>Substance:</b>								
Cd *	0.04	0.02	0.00	0.03	0.03	0.30 tonnes	YES	%
Cd **	0.04	0.02	0.00	0.03	0.03	0.30 tonnes		%
Hg *	0.91	0.88	0.31	0.67	1.01	8.90 kg	YES	%
Hg **	1.22	0.92	0.31	0.78	1.01	12.67 kg		%
Cu	1.3	1.9	0.3	0.5	0.3	4.0 tonnes	YES	%
Zn	2.4	3.3	1.1	8.6	5.1	50.4 tonnes	YES	%
Pb *	0.20	0.28	0.17	0.35	0.27	4.90 tonnes	YES	%
Pb **	0.20	0.28	0.17	0.35	0.27	4.90 tonnes		%
Arsenic *	0.39	0.12	0.09	0.14	0.18	2.10 tonnes	YES	%
Arsenic **	0.39	0.12	0.09	0.14	0.18	2.10 tonnes		%
Cr-T *	1.27	2.61	0.25	1.00	0.00	0.00 tonnes	NO	%
Cr-T **	1.43	2.78	0.25	1.14	0.51	4.96 tonnes		%
Ni *	0.82	0.90	0.23	0.31	0.30	2.43 tonnes	YES	%
Ni **	0.82	0.93	0.23	0.39	0.30	3.06 tonnes		%
PCBs *	0.00	0.05	0.00	0.00	0.00	0.00 kg	NO	%
PCBs **	0.23	0.13	0.03	0.13	0.21	2.08 kg		%
gamma-HCl	0.65	0.29	0.08	0.30	0.81	7.50 kg	YES	%
NH4-N *	38.9	16.1	1.2	29.6	24.2	246.4 tonnes	YES	%
NH4-N **	38.9	16.1	1.2	29.6	24.2	246.4 tonnes		%
NO3-N	694	396	157	678	124	1841 tonnes	YES	%
PO4-P *	6.1	4.2	4.2	6.5	0.6	14.0 tonnes	YES	%
PO4-P **	6.1	4.2	4.2	6.5	0.6	14.0 tonnes		%
Total N	1259	566	220	810	273	3633 tonnes	YES	%
Total P	20	15	6	28	4	51 tonnes	YES	%
SiO2	2377	1847	1123	3597	2526	19693 tonnes	YES	%
S.P.M.	3022	4095	2871	7696	1394	14959 tonnes	YES	%
TOC	7831	2599	921	2505	5557	36537 tonnes	YES	%

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 10.7 The remaining North Sea. "Mean" inputs from tributary rivers  
in The Subareas ( 6-7 ).  
( Mean concentrations 1998 multiplied with mean runoff, 1931-60)**

The remaining North Sea Region with sub-areas: ( 6 ) Orreelva, ( 7 ) Suldalslågen

Sub-areas :	Total quantity of substance discharged per year:		Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load	
	6	7		tonnes	NO
<b>Substance:</b>					
Cd *	0.26	0.44	tonnes	NO	_____ %
Cd **	0.28	0.58	tonnes	NO	_____ %
Hg *	17.82	12.15	kg	NO	_____ %
Hg **	20.33	33.27	kg	NO	_____ %
Cu	5.4	17.1	tonnes	YES	_____ %
Zn	48.5	87.0	tonnes	YES	_____ %
Pb *	6.21	3.29	tonnes	YES	_____ %
Pb **	6.21	3.32	tonnes	NO	_____ %
Arsenic *	2.13	2.99	tonnes	NO	_____ %
Arsenic **	2.46	5.30	tonnes	NO	_____ %
Cr-T *	0.00	0.00	tonnes	NO	_____ %
Cr-T **	7.36	15.76	tonnes	NO	_____ %
Ni *	18.47	9.56	tonnes	NO	_____ %
Ni **	19.18	11.93	tonnes	NO	_____ %
PCBs *	0.00	0.16	kg	NO	_____ %
PCBs **	3.09	6.76	kg	NO	_____ %
gamma-HCl	8.49	8.25	kg	YES	_____ %
NH4-N *	196.54	493.47	tonnes	YES	_____ %
NH4-N **	196.54	493.47	tonnes	NO	_____ %
NO3-N	4208	5944	tonnes	YES	_____ %
PO4-P *	25.9	27.2	tonnes	NO	_____ %
PO4-P **	26.1	33.0	tonnes	NO	_____ %
Total N	6384	9012	tonnes	YES	_____ %
Total P	163	107	tonnes	YES	_____ %
SiO2	27027	47204	tonnes	YES	_____ %
S.P.M.	13823	23716	tonnes	YES	_____ %
TOC	44355	30686	tonnes	YES	_____ %

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 10.8 The Norwegian Sea. "Mean" inputs from tributary rivers  
in The Subareas ( 8-9 ).**

( Mean concentrations 1998 multiplied with mean runoff, 1931-60)

The Norwegian Sea Region with sub-areas: ( 8 ) Orkla, ( 9 ) Vefsna

Sub-areas :	Total quantity of substance discharged per year:		Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load	
	8	9		tonnes	NO
<b>Substance:</b>					
Cd *	0.05	0.10	tonnes	NO	_____ %
Cd **	0.34	0.32	tonnes	NO	_____ %
Hg *	25.78	0.20	kg	NO	_____ %
Hg **	41.71	28.28	kg	NO	_____ %
Cu	33.1	31.0	tonnes	YES	_____ %
Zn	79.4	392.9	tonnes	YES	_____ %
Pb *	12.68	2.68	tonnes	YES	_____ %
Pb **	12.68	2.72	tonnes	NO	_____ %
Arsenic *	4.44	4.85	tonnes	NO	_____ %
Arsenic **	6.24	5.41	tonnes	NO	_____ %
Cr-T *	80.78	374.88	tonnes	NO	_____ %
Cr-T **	93.25	382.73	tonnes	NO	_____ %
Ni *	41.06	159.73	tonnes	YES	_____ %
Ni **	42.36	160.17	tonnes	NO	_____ %
PCBs *	0.00	0.00	kg	NO	_____ %
PCBs **	7.04	5.93	kg	NO	_____ %
gamma-HCl	14.07	8.80	kg	YES	_____ %
NH4-N *	235.73	206.02	tonnes	YES	_____ %
NH4-N **	248.18	206.02	tonnes	NO	_____ %
NO3-N	2845	1102	tonnes	YES	_____ %
PO4-P *	45.8	30.0	tonnes	YES	_____ %
PO4-P **	46.2	32.9	tonnes	NO	_____ %
Total N	6754	2793	tonnes	YES	_____ %
Total P	160	110	tonnes	YES	_____ %
SiO2	50096	30164	tonnes	YES	_____ %
S.P.M.	70788	81170	tonnes	YES	_____ %
TOC	57592	4582	tonnes	YES	_____ %

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit

**Table 10.9 The Barents Sea. "Mean" inputs from tributary rivers  
in The Sub-area (10).**  
**( Mean concentrations 1998 multiplied with mean runoff, 1931-60)**

The Barents Sea Region with sub-area: ( 10 ) Alta

Total quantity of substance discharged per year:		Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Sub-area :	10		
<b>Substance:</b>			
Cd *	0.34	tonnes	NO _____ %
Cd **	0.40	tonnes	_____ %
Hg *	11.39	kg	NO _____ %
Hg **	17.77	kg	_____ %
Cu	22.1	tonnes	YES _____ %
Zn	101.2	tonnes	YES _____ %
Pb *	4.04	tonnes	YES _____ %
Pb **	4.07	tonnes	_____ %
Arsenic *	2.71	tonnes	NO _____ %
Arsenic **	3.07	tonnes	_____ %
Cr-T *	11.61	tonnes	NO _____ %
Cr-T **	17.29	tonnes	_____ %
Ni *	33.40	tonnes	YES _____ %
Ni **	33.76	tonnes	_____ %
PCBs *	0.00	kg	NO _____ %
PCBs **	3.69	kg	_____ %
gamma-HCl	3.51	kg	YES _____ %
NH4-N *	1355.1	tonnes	_____ %
NH4-N **	1355.1	tonnes	_____ %
NO3-N	349	tonnes	YES _____ %
PO4-P *	108.4	tonnes	NO _____ %
PO4-P **	110.7	tonnes	_____ %
Total N	4325	tonnes	YES _____ %
Total P	232	tonnes	YES _____ %
SiO2	78277	tonnes	YES _____ %
S.P.M.	28169	tonnes	YES _____ %
TOC	40238	tonnes	YES _____ %

Measurements below detection limits are treated in two ways :

\* ) Detection limit = Zero

\*\* ) Detection limit = Limit