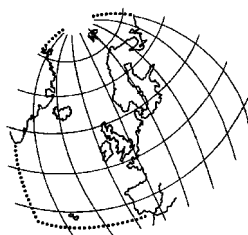


**Overview of the Results of the
Comprehensive Study on
Riverine Inputs and
Direct Discharges (RID) in 1999¹**



**OSPAR Commission
2002**

¹

Extract of:

Data Report on the Comprehensive Study on Riverine Inputs and Direct Discharges (RID) in 1999, available on request from the Secretariat of the OSPAR Commission.

The Convention for the Protection of the Marine Environment of the North-East Atlantic (the “OSPAR Convention”) was opened for signature at the Ministerial Meeting of the former Oslo and Paris Commissions in Paris on 22 September 1992. The Convention entered into force on 25 March 1998. It has been ratified by Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom and approved by the European Community and Spain.

La Convention pour la protection du milieu marin de l'Atlantique du Nord-Est, dite Convention OSPAR, a été ouverte à la signature à la réunion ministérielle des anciennes Commissions d'Oslo et de Paris, à Paris le 22 septembre 1992. La Convention est entrée en vigueur le 25 mars 1998. La Convention a été ratifiée par l'Allemagne, la Belgique, le Danemark, la Finlande, la France, l'Irlande, l'Islande, le Luxembourg, la Norvège, les Pays-Bas, le Portugal, le Royaume-Uni de Grande Bretagne et d'Irlande du Nord, la Suède et la Suisse et approuvée par la Communauté européenne et l'Espagne.

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INTRODUCTION

Good input data for substances carried to the maritime area of the Paris Convention by rivers and direct discharges are essential in order to allow an assessment of the effectiveness of the Paris Commission's policies. They are equally essential for the interpretation of monitoring data such as those collected under the Joint Assessment and Monitoring Programme (JAMP) of the Oslo and Paris Commissions, which replaced the former Joint Monitoring Programme in 1995.

The riverine discharges to the landward ends of estuaries and direct discharges to estuaries and coastal waters are combined to give estimates of the gross input of each substance to the maritime area. It is not feasible at the present time to estimate how much of these inputs are retained within estuaries and near-shore areas and how much passes into the open sea. Several major research projects are in hand to address this issue. The riverine loads reported also represent the loads coming from the whole of the river catchment areas. In the case of international rivers, loads from upstream countries are ascribed to the most downstream countries. No attempt has been made to identify the sources of these loads or whether these loads are of natural or anthropogenic origins. Again research aimed at differentiating between anthropogenic and natural contributions to riverine loads is needed to put the information into perspective for management purposes. As regards inputs to sea areas the considerable maritime fluxes across sea boundaries have not been taken into account.

RESULTS OF THE 1999 COMPREHENSIVE STUDY

For the 1999 study, data sets on riverine inputs and direct discharges were provided by Germany, the Netherlands, Norway, Portugal, Sweden, Spain and the United Kingdom of Great Britain and Northern Ireland (UK). Only riverine inputs were reported by Belgium², Denmark (nutrients only) and Ireland³. France and Iceland⁴ did not provide input data for 1999.

The geographical coverage for 1999 was similar to the coverage in previous years, with similar gaps. The part of the maritime area best covered remains the OSPAR Region II, the Greater North Sea, and especially the main body of the North Sea, although even here gaps exist.

The reporting of mandatory and voluntary determinands (cf. Table 1b) in 1999 was similar to 1998. Not all Contracting Parties reported data for all mandatory parameters. All reporting Contracting Parties provided data on inputs of heavy metals with the exception of Denmark (no metal data for 1999) and Spain (mainly riverine inputs). There are a number of gaps as regards the reporting of data for inputs of γ -HCH and PCBs (Denmark Ireland and Sweden for all inputs, Spain for most inputs, Norway for direct inputs) and suspended particulate matter (Denmark, Sweden for rivers). Some additional parameters, not summarised in the overview Tables 3 and 4, were reported by Norway (cf. Table 1b).

PRESENTATION OF THE 1999 DATA

Table 1a gives an overview of the information provided by Contracting Parties for 1999 and shows how the information was categorised:

- Direct inputs:
 - Sewage effluents
 - Industrial effluents

² Previously existing direct discharges no longer exist.

³ 1990 data for direct inputs are included, since the basis for the calculation remains unchanged.

⁴ Iceland stated in 1988 that it had no plans to monitor riverine inputs; however, Iceland announced in 1996 that it was setting up a monitoring plan which would also result in calculation of riverine inputs.

- Coastal areas: Data reported under "coastal areas" include discharges and run-off from coastal areas between rivers and also polder effluents. Depending on their nature, discharges from "coastal areas" are either counted under direct discharges or under riverine inputs.
- Riverine inputs:
 - Main rivers
 - Tributary rivers

Table 1b gives an overview of the determinands reported by Contracting Parties and shows where there are gaps in the reporting of mandatory determinands. Table 1b also indicates the precision of the estimate where the relevant information was provided by Contracting Parties. The last column of Table 1b informs on any additional determinands reported.

The data from Contracting Parties have in many cases⁵ been rounded to one significant number for data reported less than the unit in which they appear and to two significant numbers for data reported greater than one unit; the following examples illustrate this rounding convention:

Amount reported by Contracting Party	Figure reported in the tables
0,0011	0,001
0,011	0,01
0,11	0,1
1,11	1,1
11,1	11
111 and above	not rounded

Due to this procedure, there are sometimes slight differences between the calculated totals given in this report and those calculated by Contracting Parties.

Overviews of the input information by country and sea area are given in **Tables 2 to 4 a and b**. Table 2 gives an overview of direct inputs to OSPAR Convention Waters in 1998 and summarises the information which is set out in detail in Tables 5 on a country by country basis. Table 3 gives an overview of riverine inputs to OSPAR Convention waters in 1999 and summarises the information which is set out in detail in Tables 6 on a country by country basis. Table 4a summarises the information contained in Tables 2 and 3 and gives overall figures on inputs from land-based sources. Table 4b contains the same information as Table 4a but lists inputs by sea area. Please note that, due to major gaps in the reporting, no totals for the Convention area are given in Tables 2 to 4 a and b.

⁵ Secretariat note: Not all Contracting Parties wished to have their data rounded in accordance with this procedure.

Table 1a. Information Received on Inputs to the Maritime Area of the OSPAR Convention in 1999

Country	Direct Discharges		Coastal Areas (2)	Riverine Inputs	
	Sewage Effluents	Industrial Effluents		Main Rivers	Tributary Rivers (1)
Belgium	NA	NA	(3)	+	+
Denmark					
- Kattegat	NI	NI	NI	+	NI
- Skagerrak	NI	NI	NI	+	NI
- North Sea	NI	NI	NI	+	NI
France					
- North Sea	NI	NI	NI	NI	NI
- Channel	NI	NI	NI	NI	NI
- Atlantic	NI	NI	NI	NI	NI
Germany	+	+	(4)	+	+
Iceland	No 1999 input data available (5)				
Ireland					
- Irish Sea	+(7)	+(7)	NI	+	+
- Celtic Sea	+(7)	+(7)	NI	+	+
- Atlantic	+(7)	+(7)	NI	+	+
Netherlands	+	+	(3)	+	+
Norway					
- Skagerrak	+	+	+(6)	+	+
- North Sea	+	+	+(6)	+	+
- Norwegian Sea	+	+	+(6)	+	+
- Barents Sea	+	+	+(6)	+	+
Portugal	Limited 1999 input data available				
Spain	+	+	+	+	+
Sweden					
- Kattegat	+	+	(3)	+	+
- Skagerrak	+	+	(3)	+	+
United Kingdom					
- East Coast	+	+	NI	+	NI
- Channel	+	+	NI	+	NI
- Celtic Sea	+	+	NI	+	NI
- Irish Sea	+	+	NI	+	NI
- Atlantic	+	+	NI	+	NI

+ = Information available

NI = No information

NA = Not applicable

(1) Tributary Rive - any tributary river flowing into (the estuary of) a main river, downstream from the sampling point;
- any minor river which was not deemed to be a main river.

(2) Coastal areas: - 'downstream areas' of main and tributary rivers and rivers not monitored;
- areas discharging to the maritime area which, however, are located outside the catchment area of a river.

(3) Included in data on riverine inputs ("tributary rivers")

(4) Included in data on direct inputs

(5) Iceland stated in 1988 that it had no plans to monitor riverine inputs; however, Iceland announced in 1996 that it was setting up a monitoring plan which would also result in calculations of riverine inputs

(6) cf. category "run-off" (i.e. estimated values for diffuse contributions) in Table 6b. for Norway

(7) same 1990 data as in previous data reports.

Table 1b. Determinands Reported by Contracting Parties in 1999

Country	Determinands													
	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs (1) (voluntary)	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM (2)	Others
Belgium														
- direct inputs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
- riverine inputs	R (4)	R (4)	R (3)	R (3)	R (3)	R (3)	R (4)	R (3)	R (3)	R (3)	R (3)	R (3)	R (3)	
Denmark														
- direct inputs	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
- riverine inputs	NI	NI	NI	NI	NI	NI	NI	+	+	+	+	+	NI	
France	no data submitted for 1999													
- direct inputs														
- riverine inputs														
Germany														
- direct inputs	R	R	R	R	R	R	R	+	+	+	+	+	+	
- riverine inputs*	+ (4)	+ (3)	+ (3)	+ (3)	+ (3)	+ (4)	+ (4)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	
- riverine inputs**	+ (3)(4)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)(4)	+ (4)	+ (3)(4)	+ (3)	+ (3)(4)	+ (3)	+ (3)	+ (3)(4)	
*) Elbe **) Other main rivers														
Iceland	No 1999 input data available (6)													
Ireland														
- direct inputs	+(9)	NI	+(9)	+(9)	+(9)	NI	NI	NI	NI	NI	NI	NI	+(9)	+(9)
- main riv. inputs	R (3)(4)	NI	+ (3)	R (3)(4)	+ (3)	NI	NI	R (3)(4)	+ (3)	+ (3)	NI	NI	+ (3)	+ (3)
- tributary rivers	R	NI	R	R	+	NI	NI	+	+	+	NI	NI	+	+
Netherlands														
- direct inputs	+	+	+	+	+	NI	NI	NI	+	NI	+	+	+	+
- main riv. inputs	+ (3)(4)	+ (3)	+ (3)	+ (3)	+ (3)(4)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+
- tributary rivers	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Norway														
- direct inputs	+	+	+	+	+	NI	NI	NI	NI	NI	+	+	NI	
- main riv. inputs	+ (3)(4)	+ (3)(4)	+ (3)	+ (3)	+ (3)	+ (3)(4)	NI	+ (3)(4)	+ (3)	+ (3)(4)	+ (3)	+ (3)(4)	+ (3)(4)	
- tributary rivers	R	R	+	+	+	+	R	+ (5)	+ (5)	+ (5)	+ (5)	+ (5)	+ (5)	
Portugal														
- direct inputs	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
- main riv. Inputs (7)	+	+	+	+	+	NI	NI	+	+	+	+	+	+	
- tributary rivers	+	+	+	+	+	NI	NI	+	+	+	+	+	+	
Spain														
- direct inputs	+	+	+	+	+	NI	NI	+	+	+	+	+	+	
- riverine inputs	+ (3)(4)	R(4)	+ (3)(4)	+ (3)(4)	+ (3)(4)	R(4)	R(4)	R(3)(4)	R(3)	+ (3)(4)	R(3)	R(3)	R(3)	
Sweden														
- sewage effluent:	+	+	+	+	+	NI	NI	+	+	+	+	+	NI	
- industrial effluents:	+	+	+	+	+	NI	NI	NI	NI	NI	+	+	NI	
- main riv. inputs	+	+	+	+	+	NI	NI	NI	NI	NI	+	+	NI	
United Kingdom														
- direct inputs	R	R	R	R	R	R	R	R	R	R	R	R	R	
- riverine inputs	R	R	R	R	R	R	R	R	R	R	R	R(8)	R	

+ : Data provided

R: Estimate given as a range

NI: No information

NA: Not applicable; riverine inputs > 90% total inputs

DL: Detection limit

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180

(2) Suspended particulate matter

(3) 70 % of measurements above detection limit

(4) Less than 70 % of measurements above detection limit

(5) Includes 'run-off', i.e. estimated values for diffuse contributions.

(6) Iceland stated in 1988 that it had no plans to monitor riverine inputs; however, Iceland announced in 1996 that it was setting up a monitoring plan which would also result in calculations of riverine inputs

(7) River Tejo only

(8) In England and Wales Total-P was not measured. To avoid anomalies, a value equal to the orthophosphate-P has been used.

(9) 1990 data since basis for calculation remained unchanged.

Table 2[^]. Direct Discharges to the Maritime Area of the OSPAR Convention in 1999 by Country

Country	Region	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]	
Belgium	North Sea (upper estimate)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Denmark	North Sea	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
France	Channel/North Sea	no data submitted for 1999													
		no data submitted for 1999													
Germany	North Sea	0,01	0,01	2,1	1,1	11	0,02	0,05	3,3	2,0	0,1	4,3	2,0	2,0	
		0,06	0,06	2,9	1,7	16	0,3	2,9	3,3	2,0	0,1	4,3	2,0	2,0	
Iceland	Atlantic	no data submitted for 1999													
Ireland	Irish Sea	0,06	NI	7,5	3,3	63	NI	NI	NI	NI	NI	6,8	1,6	38	
		0,02	NI	3,2	4,4	22	NI	NI	NI	NI	NI	2,7	0,7	19	
		0,01	NI	0,8	0,4	7,7	NI	NI	NI	NI	NI	0,7	0,2	4,3	
Netherlands	North Sea	0,1	0,07	3,3	1,5	29	NI	NI	NI	1,8	NI	6,5	0,5	12	
		0,07	0,02	14	0,8	16	NI	NI	NI	NI	NI	5,9	0,2	2,9	
		1,0	0,04	6,9	7,6	56	NI	NI	NI	NI	NI	4,6	0,4	1504	
		0,4	0,01	11,5	1,3	15	NI	NI	NI	NI	NI	4,6	0,6	1388	
Portugal	Atlantic	0,002	0,001	0,5	0,03	0,8	NI	NI	NI	NI	NI	0,4	0,04	198	
		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
Spain	Atlantic	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
		9,5	0,1	25	24	57	NI	NI	9,6	0,2	0,3	18	2,9	88	
Sweden	Kattegat	0,05	0,02	2,4	0,4	5,9	NI	NI	1,2	0,6	0,02	2,1	0,1	NI	
		0,0008	0,0006	0,01	0,002	0,04	NI	NI	NI	NI	NI	0,4	0,01	NI	
United Kingdom	North Sea (East Coast)	(lower estimate)	0,3	0,2	87	32	306	43	72	23	11	7,6	39	8,6	514
		(upper estimate)	0,6	0,3	87	33	306	53	138	23	11	7,7	40	8,6	514
	North Sea (Channel)	(lower estimate)	0,3	0,00	28	5,8	35	4,5	0,15	6,9	1,6	1,7	8,6	1,7	6,7
		(upper estimate)	0,3	0,00	28	5,9	36	4,7	2,5	6,9	1,7	1,7	8,6	1,7	6,7
	Total North Sea	(lower estimate)	0,6	0,2	115	38	341	47	73	30	12	9,4	48	10	520
		(upper estimate)	0,9	0,3	115	39	341	58	141	30	12	9,4	48	10	521
	Celtic Sea	(lower estimate)	3,1	0,01	8,2	15	164	2,1	5,0	8,0	1,4	1,4	9,6	1,4	37
		(upper estimate)	3,1	0,01	8,2	15	164	4,8	10,6	8,0	1,4	1,4	9,7	1,4	37
	Irish Sea	(lower estimate)	0,6	0,4	12	28	51	0,1	0,000	8,4	2,3	2,9	11	3,1	20
		(upper estimate)	0,8	0,4	13	30	51	5,0	0,5	8,4	2,4	2,9	11	3,1	20
	Atlantic	(lower estimate)	0,07	0,03	18	5,4	27	1,3	0	4,0	2,2	0,8	6,8	1,2	41
		(upper estimate)	0,5	0,05	19	6,8	28	12	10	4,1	2,2	0,8	6,8	1,2	41
Total Non-North Sea	(lower estimate)	3,7	0,4	38	48	243	3,5	5,0	20	6,0	5,1	27	5,6	97	
	(upper estimate)	4,4	0,5	40	52	244	22	21	20	6,1	5,1	28	5,7	97	

[^] For explanation of data and reasons for lack of information, see Tables 1a and 1b

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180

(2) Suspended particulate matter

Table 3[^]. Riverine Inputs to the Maritime Area of the OSPAR Convention in 1999 by Country

Country	Sea area	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]	
Belgium	North Sea	(lower estimate)	1,8	0,03	52	52	368	73	0,0	7,8	34	1,5	50	2,9	297
		(upper estimate)	2,8	1,4	59	61	409	81	328	9,8	38	1,8	57	5,2	339
Denmark	North Sea	NI	NI	NI	NI	NI	NI	NI	0,3	4,5	0,06	9,9	0,4	NI	
		NI	NI	NI	NI	NI	NI	NI	0,00	0,00	0,00	0,005	0,00	NI	
		NI	NI	NI	NI	NI	NI	NI	0,2	5,0	0,1	6,5	0,3	NI	
France	Channel/North Sea Atlantic	no data submitted for 1999													
Germany	North Sea	(lower estimate)	4,6	2,3	184	124	1072	25	5,0	8,0	171	2,0	237	9,0	1483
		(upper estimate)	5,3	2,4	184	124	1072	110	239	8,2	171	2,0	237	9,0	1571
Iceland	Atlantic	no data submitted for 1999													
Ireland	Irish Sea	0,7	NI	23	32	156	NI	NI	1,5	20	0,5	NI	0,8	133	
		0,8	NI	23	32	156	NI	NI	1,5	20	0,5	NI	0,8	133	
	Celtic Sea	0,5	NI	58	57	379	NI	NI	0,9	75	1,3	NI	1,9	184	
		2,0	NI	58	59	379	NI	NI	1,0	75	1,3	NI	1,9	184	
Atlantic	0,2	NI	41	46	188	NI	NI	0,3	14	0,5	NI	0,9	147		
	1,5	NI	41	48	188	NI	NI	0,4	14	0,5	NI	0,9	147		
Netherlands	North Sea	11,6	2,2	405	324	1870	269	235	17	284	10,2	383	21	3088	
		12,0	2,3	405	325	1974	288	236	17	284	10,2	384	21	3090	
Norway	Skagerrak	1,3	0,4	87	22	312	8,6	NI	1,5	21	0,3	36	1,2	425	
		1,7	0,6	87	22	312	8,6	NI	1,6	21	0,3	36	1,2	428	
	North Sea	1,1	0,3	40	12	161	0,4	NI	1,1	14	0,2	22	0,7	100	
		1,1	0,4	40	12	160	0,4	NI	1,1	14	0,2	22	0,7	106	
	Norwegian Sea	0,4	0,2	92	9,0	133	0,3	NI	1,4	13	0,2	26	1,1	329	
Barents Sea	0,5	0,4	92	9,0	136	0,3	NI	1,4	13	0,2	26	1,1	335		
	0,02	0,2	22	0,8	2,5	0,0	NI	0,6	1,4	0,1	5,6	0,3	27		
Portugal	Atlantic	0,4	0,6	5,3	2,1	25	NI	NI	1,6	4,5	1,1	26	1,3	45	
		0,4	0,6	5,3	2,1	25	NI	NI	1,6	4,5	1,1	26	1,3	45	
Spain	Atlantic	0,9	0,0	20	4,7	181	46	157	11,4	45	1,4	26	2,0	345	
		5,8	17	182	62	277	195	159	11,6	45	1,6	26	2,2	345	
Sweden	Kattegat Skagerrak	0,7	0,1	28	13	226	NI	NI	1,9	32	0,3	53	1,0	NI	
		0,1	0,02	9,1	3,3	31	NI	NI	0,3	3,2	0,06	6,6	0,1	NI	
United Kingdom	N Sea (East Coast)	(lower estimate)	5,4	1,1	250	291	908	56	0,1	5,7	149	13	165	13	1587
		(upper estimate)	10,3	1,3	251	296	918	141	557	5,7	149	13	165	13	1599
	N Sea (Channel)	(lower estimate)	0,6	0,02	77	18	169	10,6	0,0	0,6	24	1,1	25	1,1	161
		(upper estimate)	0,7	0,04	78	21	171	20	23,6	0,6	24	1,1	25	1,1	162
	Total North Sea	(lower estimate)	6,0	1,1	327	309	1077	66	0,1	6,3	173	13,6	190	14,2	1747
		(upper estimate)	11,0	1,4	329	316	1089	161	580	6,3	173	13,7	190	14,2	1761
	Celtic Sea	(lower estimate)	1,3	0,1	59	61	441	16	0,0	1,3	55	2,8	57	2,8	825
		(upper estimate)	2,2	0,2	61	68	441	78	162	1,3	55	2,8	57	2,8	826
	Irish Sea	(lower estimate)	0,9	0,3	63	64	387	4,5	4	4	42	3,4	49	3,6	570
		(upper estimate)	1,8	1,0	64	67	389	118	600	4	43	3,9	49	4,1	578
Atlantic	(lower estimate)	0,6	0,2	54	13	94	15	0,1	2,5	14	1,4	19	2,3	125	
	(upper estimate)	2,5	1,0	55	16	104	57	83	2,5	14	1,5	19	2,3	127	
Total non-North Sea	(lower estimate)	2,8	0,6	176	138	922	36	4	7	111	7,6	125	8,7	1521	
	(upper estimate)	6,5	2,2	180	151	935	254	846	8	112	8,2	126	9,2	1531	

[^] For explanation of data and reasons for lack of information, see Tables 1a and 1b

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180

(2) Suspended particulate matter

Table 4a. Summary of Direct (Table 2) and Riverine (Table 3) Inputs to the Maritime Area of the OSPAR Convention in 1999 by Country

Country	Sea Area	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Belgium	North Sea (lower estimate) (upper estimate)	1,8	0,03	52	52	368	73	0,0	7,8	34	1,5	50	2,9	297
		2,8	1,4	59	61	409	81	328	9,8	38	1,8	57	5,2	339
Denmark	North Sea Skagerrak Kattegat	NI	NI	NI	NI	NI	NI	NI	0,3	4,5	0,1	10	0,4	NI
		NI	NI	NI	NI	NI	NI	NI	0,0	0,0	0,0	0,005	0,00	NI
		NI	NI	NI	NI	NI	NI	NI	0,2	5	0,1	6	0,3	NI
France	Channel/North Sea Atlantic	no data submitted for 1999												
Germany	North Sea (lower estimate) (upper estimate)	4,6	2,3	186	125	1083	25	5,1	11	173	2,1	241	11	1485
		5,4	2,5	187	126	1088	110	242	12	173	2,1	241	11	1573
Iceland	Atlantic	no data submitted for 1999												
Ireland (2)	Irish Sea (lower estimate) (upper estimate)	0,7	NI	31	36	219	NI	NI	1,5	20	0,5	6,8	2,4	171
		0,9	NI	31	36	219	NI	NI	1,5	20	0,5	6,8	2,4	171
	Celtic Sea (lower estimate) (upper estimate)	0,5	NI	61	61	400	NI	NI	0,9	75	1,3	2,7	2,6	203
		2,0	NI	61	63	400	NI	NI	1,0	75	1,3	2,7	2,6	203
Atlantic (lower estimate) (upper estimate)	0,3	NI	41	47	196	NI	NI	0,3	14	0,5	0,7	1,1	151,2	
	1,5	NI	41	48	196	NI	NI	0,4	14	0,5	0,7	1,1	151,2	
Netherlands(3)	North Sea	11,7	2,3	408	325	1899	269	235	17	286	10,2	390	21	3100
		12,1	2,3	408	326	2003	288	236	17	286	10,2	391	21	3102
Norway	Skagerrak (lower estimate) (upper estimate)	1,4	0,4	101	23	328	8,6	NI	1,5	21	0,3	41	1,4	428
		1,8	0,6	101	23	328	8,6	NI	1,6	21	0,3	41	1,4	431
	North Sea (lower estimate) (upper estimate)	2,1	0,3	47	20	217	0,4	NI	1,1	14	0,2	27	1,1	1604
		2,1	0,5	47	20	216	0,4	NI	1,1	14	0,2	27	1,1	1610
	Norwegian Sea (lower estimate) (upper estimate)	0,8	0,2	103	10	148	0,3	NI	1,4	13	0,2	30	1,7	1717
		0,9	0,4	103	10	151	0,3	NI	1,4	13	0,2	30	1,7	1723
Barents Sea (lower estimate) (upper estimate)	0,0	0,2	22	0,8	3,3	0,0	NI	0,6	1,4	0,1	6,0	0,4	225	
0,1	0,2	22	0,8	5,7	0,2	NI	0,6	1,5	0,1	6,0	0,4	229		
Portugal	Atlantic	0,4	0,6	5,3	2,1	24,6	NI	NI	1,6	4,5	1,1	26	1,3	45
		0,4	0,6	5,3	2,1	25	NI	NI	1,6	4,5	1,1	26	1,3	45

Table 4a Continued

Country	Sea Area	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]	
Spain	Atlantic	10,4	0,1	45	29	238	46	157	21	45	1,7	43	4,9	434	
		15	17	208	87	334	195	159	21	45	1,9	43	5,1	434	
Sweden	Kattegat Skagerrak	0,8	0,2	31	14	232	NI	NI	3,1	32	0,3	55	1,1	NI	
		0,1	0,03	9,1	3,3	31	NI	NI	0,3	3,2	0,06	7,0	0,1	NI	
United Kingdom	N Sea (East Coast)	(lower estimate)	5,7	1,3	337	323	1214	99	72	29	159	20	204	22	2101
		(upper estimate)	10,9	1,6	338	328	1224	194	695	29	160	20	205	22	2113
	N Sea (Channel)	(lower estimate)	0,9	0,02	105	24	205	15,2	0,1	7,5	26	2,8	34	2,8	167
		(upper estimate)	1,0	0,05	106	27	207	25	26	7,5	26	2,8	34	2,8	168
	North Sea	(lower estimate)	6,6	1,3	441	347	1419	114	73	36	185	23	238	24	2268
		(upper estimate)	11,9	1,7	444	355	1431	219	721	36	186	23	239	25	2281
	Celtic Sea	(lower estimate)	4,4	0,1	67	76	605	18	5,0	9,3	57	4,2	67	4,2	862
		(upper estimate)	5,3	0,2	69	83	605	83	173	9,3	57	4,2	67	4,2	862
	Irish Sea	(lower estimate)	1,5	0,6	75	92	438	5	4,3	12	44	6,3	60	6,6	590
		(upper estimate)	2,6	1,4	77	97	440	123	600	13	45	6,9	60	7,2	598
	Atlantic	(lower estimate)	0,7	0,2	72	19	122	17	0,1	6,4	16	2,2	26	3,5	166
		(upper estimate)	3,0	1,0	75	23	133	69	93	6,6	16	2,2	26	3,5	168
	non-North Sea	(lower estimate)	6,6	1,0	214	187	1165	39	9	28	117	13	153	14	1618
		(upper estimate)	11	2,6	220	203	1178	275	866	28	118	13	153	15	1628
Total reported:	(lower estimate)	49	9,0	1799	1282	7970	575	479	133	1048	56	1333	93	13745	
	(upper estimate)	69	30	1978	1377	8247	1179	2552	137	1054	57	1342	96	13920	

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180

(2) NH4-N, NO3-N, PO4-P: riverine inputs only; Total N: direct discharge only

(3) Data provided comprise approx. 90% of the total pollution loads of the Netherlands into Convention Waters

Table 4b. Summary of Direct and Riverine Inputs to the Maritime Area of the OSPAR Convention in 1999 by Sea Area

Sea Area		Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs(1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]	
North-East Atlantic Ocean	<i>Arctic Ocean</i>	0,0	0,21	22	0,8	3	0,0	NI	0,6	1,4	0,1	6,0	0,4	225	
	Barents Sea	0,1	0,24	22	0,8	6	0,2	NI	0,6	1,5	0,1	6,0	0,4	229	
	<i>Atlantic Ocean</i> (main body)	1,0	0,2	114	65	317	17	0,1	6,7	30	2,7	26	4,6	317	
		4,5	1,0	116	71	328	69	93	7,0	30	2,7	27	4,6	319	
	<i>Bay of Biscay and Iberian Coast</i>	10,8	0,7	51	31	263	45,9	157,0	22,6	50	2,8	69	6,2	478	
		15,7	17,7	213	89	358	195	158,8	22,8	50	3,0	69	6,4	478	
North Sea	Kattegat	(lower estimate)	0,8	0,15	31	13,6	232	NI	NI	3,3	37	0,4	61	1,4	0,0
		(upper estimate)	0,8	0,15	31	13,6	232	NI	NI	3,3	37	0,4	61	1,4	0,0
	Skagerrak	(lower estimate)	1,5	0,4	110	26	359	9	0,0	1,8	24	0,4	48	1,6	428
		(upper estimate)	1,9	0,6	110	26	359	9	0	1,8	24	0,4	48	1,6	431
	North Sea (main body)	(lower estimate)	26	6,3	1030	846	4781	466	313	66	671	34	921	58	8586
		(upper estimate)	33	8,3	1039	861	4941	674	1501	68	675	35	930	61	8737
	Channel	(lower estimate)	0,9	0,02	105	24	205	15	0,1	7,5	26	2,8	34	2,8	167
		(upper estimate)	1,0	0,05	106	27	207	25	26,1	7,5	26	2,8	34	2,8	168
Norwegian Sea	(lower estimate)	0,8	0,2	103	10	148	0	NI	1,4	13	0,2	30	1,7	1717	
	(upper estimate)	0,9	0,4	103	10	151	0	NI	1,4	13	0,2	30	1,7	1723	
Irish Sea	(lower estimate)	2,2	0,6	105	128	657	5	4	13	64	6,8	67	9	761	
	(upper estimate)	3,5	1,4	107	133	659	123	600	14	65	7,3	67	10	769	
Celtic Sea	(lower estimate)	4,9	0,1	129	137	1005	18	5,0	10	132	5,5	69	6,7	1065	
	(upper estimate)	7,3	0,2	130	146	1005	83	173	10	132	5,5	69	6,7	1066	

Note: Some Contracting Parties have not submitted information on direct inputs because under the current Principles of the Comprehensive Study, these inputs do not fall under the 90 % (of total inputs) monitoring requirement.