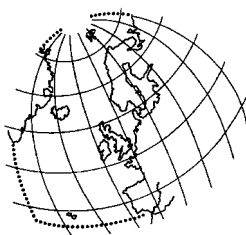


**Overview of the Results of the
Comprehensive Study on Riverine Inputs and
Direct Discharges (RID)
from 2000 to 2002**



OSPAR Commission
2004

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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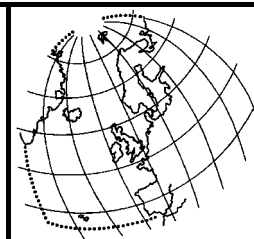
Part II

Overview of the Results of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID) in 2001

Part III

Overview of the Results of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID) in 2002

OSPAR Commission 2004



Part I

Overview of the Results of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID) in 2000¹

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¹ Extract from the “Data Report on the Comprehensive Study of Riverine Inputs and Direct Discharges (RID) in 2000”. This report is available from the Secretariat of the OSPAR Commission.

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 2000 COMPREHENSIVE STUDY

For the 2000 study, data sets on riverine inputs and direct discharges were provided by Denmark, Germany, Ireland, the Netherlands, Norway, Portugal, Sweden, Spain and the United Kingdom of Great Britain and Northern Ireland (UK). Only riverine inputs were reported by Belgium² and France (nutrients and suspended matter only). Iceland³ did not provide input data for 2000.

The geographical coverage for 2000 has improved compared to the coverage in previous years. Spain had increased the number of RID catchments for which data is reported. The additional input information produces an apparent increase in total inputs. This is, of course, not a "real" increase and should be discounted in assessing the data. Significant gaps still, however, occur in the data from several Contracting Parties. 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 still exist

The reporting of mandatory and voluntary determinands (cf. Table 1b) in 2000 was improved in comparison with 1999. However, several Contracting Parties did not report data for all mandatory parameters. All reporting Contracting Parties provided data on inputs of heavy metals with the exception of Denmark and France. There are a number of gaps as regards the reporting of data for inputs of γ -HCH and/or PCBs (Denmark, France, Ireland, Norway, Portugal and Sweden for all inputs, and the Netherlands for direct inputs) and suspended particulate matter (Denmark, Sweden for rivers). A number of additional parameters, not obligatory under the RID programme, and consequently not summarised in the overview Tables 3 and 4, were reported by Norway (cf. Table 1b). Norway had reported on inputs from fish-farming because in Norway this activity contributed a significant part of the inputs of nitrogen and phosphorus.

² Previously existing direct discharges no longer exist.

³ 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.

PRESENTATION OF THE 2000 DATA

Table 1a gives an overview of the information provided by Contracting Parties for 2000 and shows how the information was categorised:

- Direct inputs:
 - Sewage effluents
 - Industrial effluents
- 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 cases⁴ 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.

⁴ 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 2000

Country	Direct Discharges		Coastal Areas (1)	Riverine Inputs	
	Sewage Effluents	Industrial Effluents		Main Rivers	Tributary Rivers (2)
Belgium	NA	NA	(3)	+	+
Denmark					
- Kattegat	+	+	(4)	+	(5)
- Skagerrak	+	+	(4)	+	(5)
- North Sea	+	+	(4)	+	(5)
France					
- Channel/North Sea	NI	NI	NI	+	NI
- Atlantic	NI	NI	NI	+	NI
Germany	+	+	(6)	+	+
Iceland	No 2000 input data submitted (7)				
Ireland					
- Irish Sea	+ (8)	+ (8)	NI	+	+
- Celtic Sea	+ (8)	+ (8)	NI	+	+
- Atlantic	+ (8)	+ (8)	NI	+	+
Netherlands	+	+	(3)	+	+
Norway					
- Skagerrak	+	+	+ (9)	+	+
- North Sea	+	+	+ (9)	+	+
- Norwegian Sea	+	+	+ (9)	+	+
- Barents Sea	+	+	+ (9)	+	+
Portugal	Limited 2000 input data submitted				
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) 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.

(2) Tributary Rivers:

- 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.

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

(4) Included in the totals for Danish inputs to the North Sea, the Skagerrak and the Kattegat

(5) All 25 rivers are reported as main rivers

(6) Included in data on direct inputs

(7) 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

(8) 1990 data since the basis for calculation remained unchanged

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

Table 1b. Determinands Reported by Contracting Parties in 2000

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 - riverine inputs	NA R (4)	NA R (3)	NA R (3)	NA R (4)	NA R (3)	NA R (3)	NA R (4)	NA R (3)	NA R (3)	NA R (3)	NA R (3)	NA R (3)	NA R (3)	
Denmark - direct inputs - riverine inputs	NI NI	NI NI	NI NI	NI NI	NI NI	NI NI	NI NI	NI +	NI +	NI +	+	+	NI NI	
France - direct inputs - riverine inputs	NI NI	NI NI	NI NI	NI NI	NI NI	NI NI	NI NI	NI +	NI +	NI +	NI +	NI +	NI +	
Germany - direct inputs - riverine inputs* - riverine inputs** *) Elbe **) Other main rivers	R + (4) + (3)(4)	R + (3) + (3)	R + (3) + (3)	R + (3) + (3)	R + (3) + (3)	R + (4) + (3)(4)	R + (4) + (4)	+	+	+	+	+	+	
Iceland	No 2000 input data submitted (6)													
Ireland - direct inputs - main riv. inputs - tributary rivers	+(9) R (3)(4) R	NI NI NI	+(9) + (3) R	+(9) R (3)(4) R	+(9) + (3) +	NI NI NI	NI NI NI	NI R (3)(4) +	NI + (3) +	NI + (3) +	+(9)(10) NI NI	+(9) + (3) +	+(9) + (3) +	
Netherlands - direct inputs - main riv. inputs - tributary rivers	+	+	+	+	+	NI	NI	NI	+	NI	+	+	+	
	+ (3)(4) +	+ (3) +	+ (3) +	+ (3) +	+ (3)(4) +	+ (3) +	+ (3) +	+ (3) +	+ (3) +	+ (3) +	+ (3) +	+ (3) +	+ (3) +	
Norway - direct inputs - main riv. inputs - tributary rivers	+	+	+	+	+	NI	NI	+	+	+	+	+	+	Cr, Ni
	+ (3)(4) R	+ (3)(4) R	+ (3) +	+ (3) +	+ (3) +	+ (3)(4) +	NI NI NI	+ (3)(4) +(5)	+ (3) +(5)	+ (3)(4) +(5)	+ (3) +(5)	+ (3)(4) +(5)	+ (3)(4) +(5)	As, Cr, Ni, TOC As, Cr, Ni, TOC
Portugal - direct inputs - main riv. Inputs (7) - tributary rivers	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	
Spain - direct inputs - 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: - industrial effluents: - main riv. inputs	+	+	+	+	+	NI	NI	+	+	+	+	+	NI	
	+	+	+	+	+	NI	NI	NI	NI	NI	+	+	NI	
	+	+	+	+	+	NI	NI	+	+	+	+	+	NI	
United Kingdom - direct inputs - riverine inputs	R R	R R	R R	R R	R R	R R	R R	R R	R R	R R	R R	R(8) R(8)	R 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.

(10) Total oxidised nitrogen measured and not nitrate per se.

Table 2[^]. Direct Discharges to the Maritime Area of the OSPAR Convention in 2000 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 (lower estimate) (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 Skagerrak Kattegat	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	0,58 0,18 0,79	0,07 0,01 0,08	NI NI NI
France	Channel/North Sea Atlantic	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
Germany	North Sea	0,01 0,06	0,01 0,06	2,1 2,9	1,1 1,8	12 17	0,12 0,3	0,05 2,9	2,0 2,0	2,0 2,0	0,1 0,1	4,3 4,3	1,8 1,8	2,0 2,0
Iceland	Atlantic	no data submitted for 2000												
Ireland	Irish Sea Celtic Sea Atlantic	0,06 0,02 0,01	NI NI NI	7,50 3,20 0,83	3,30 4,40 0,39	63,00 21,50 7,70	NI NI NI	NI NI NI	NI NI NI	NI NI NI	NI NI NI	6,83 2,67 0,70	1,58 0,65 0,21	38,10 18,59 4,32
Netherlands	North Sea	0,1	0,03	3,3	1,1	25	NI	NI	NI	1,5	NI	6,4	0,4	8
Norway	Skagerrak North Sea Norwegian Sea Barents Sea	0,07 1,4 0,2 0,002	0,02 0,03 0,01 0,001	13 9,7 11,2 0,5	0,7 3,7 5,2 0,03	16 60 16 0,8			3,572 2,46 2,73 0,25	0,02 0,02 0,02 0,00	0,08 0,20 0,30 0,03	5,7 4,8 4,6 0,3	0,2 0,4 0,5 0,04	3,1 1602 1151 227
Portugal	Atlantic	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
Spain	Atlantic	3,6	41,5	12	15	24	2,61	2,101	8,5	0,2	1,3	300	20,8	104
Sweden	Kattegat Skagerrak	0,05 0,00	0,02 0,01	2,0 0,10	0,4 0,01	3,5 0,50	NI NI	NI NI	1,3 0,20	0,7 0,10	0,02 0,01	2,4 0,50	0,1 0,03	NI NI
United Kingdom	N Sea (East Coast) (lower estimate) (upper estimate) N Sea (Channel) (lower estimate) (upper estimate) Total North Sea (lower estimate) (upper estimate) Celtic Sea (lower estimate) (upper estimate) Irish Sea (lower estimate) (upper estimate) Atlantic (lower estimate) (upper estimate) Total Non-North Sea (lower estimate) (upper estimate)	0,7 0,9 0,1 0,1 0,8 1,0 1,3 1,3 0,3 0,6 0,06 0,5 1,6 2,4	0,2 0,2 0,00 0,00 0,2 0,2 0,01 0,01 0,3 0,4 0,04 0,07 0,4 0,5	84 84 17 17 100,9 100,9 6,3 6,3 10 10 24 25 39,5 41,5	35 35 4,8 4,9 39,5 39,9 10 10 23 24 4,8 6,5 37,1 40,2	317 317 28 28 345,3 345,4 124 124 35 35 21 21 180,0 180,3	28 37 2,7 3,8 30,3 40,9 0,8 3,3 0,2 6,3 1,7 10 2,7 19,2	1 92 0,00 5,1 1,4 96,6 6,5 11,6 0,000 0,6 0 16 6,6 28,2	19 19 5,9 5,9 25,0 25,0 6,5 6,5 7,5 7,5 2,3 2,3 16,3 16,3	11 11 2,2 2,2 13,4 13,4 1,8 1,8 3,2 3,2 1,9 2,0 6,9 7,0	7,4 7,4 1,7 1,7 9,1 9,1 1,3 1,3 2,5 2,5 1,0 1,0 4,7 4,7	37 37 8,3 8,3 44,9 44,9 8,5 8,5 13 13 6,1 6,1 27,9 27,9	8,4 8,4 1,7 1,7 10,1 10,1 1,3 1,3 2,5 2,5 1,3 1,3 5,1 5,1	300 301 7,0 7,0 307,0 308,0 30 30 36 36 29 29 95,0 95,0

[^] 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 2000 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)	0,8 8,3	0,52 0,7	58 67	84 113	277 316	96 107	0,8 108	6,1 6,8	37 42	2,0 2,3	51 57	4,0 5,3	286 324
Denmark	North Sea Skagerrak Kattegat									15,8 2,34 27,8	0,20 0,04 0,5	21,0 2,7 32,8	0,5 0,1 0,9	
France	Channel/North Sea Atlantic	NI NI	NI NI	NI NI	NI NI	NI NI	NI NI	NI NI	20,3 9,1	123,6 223,7	6,7 7,6	178,6 292	11,9 18,5	989 3255
Germany	North Sea (lower estimate) (upper estimate)	5,2 5,6	2,6 2,6	201 201	168 168	1224 1224	17 147	10,0 26	6,6 6,6	160 160	2,3 2,4	212 212	9,0 9,0	2005 2043
Iceland	Atlantic	no data submitted for 2000												
Ireland	Irish Sea (lower estimate) (upper estimate) Celtic Sea (lower estimate) (upper estimate) Atlantic (lower estimate) (upper estimate)	0,6 0,9 0,3 2,2 0,2 1,6	NI NI NI NI NI NI	27 27 53 53 32 36	18 20 15 30 3 17	177 177 267 267 157 157	NI NI NI NI NI NI	NI NI NI NI NI NI	0,8 0,8 2,0 2,1 0,4 0,5	20 20 55 55 13 13	0,4 0,4 1,4 1,4 0,6 0,6	NI NI NI NI NI NI	0,7 0,7 2,5 2,5 1,1 1,1	133 133 288 288 150 150
Netherlands	North Sea	6,0 7,1	1,7 1,7	327 327	220 220	1173 1173	166 183	121 123	15 15	267 267	10,0 10,0	357 357	20 20	2379 2379
Norway	Skagerrak North Sea Norwegian Sea Barents Sea	2,3 2,4 0,6 0,6 0,3 0,4 0,1 0,1	0,7 0,8 0,3 0,4 0,3 0,5 0,3 0,4	118 118 24 24 56 56 12 12	41 41 11 11 5,1 5,1 1,1 1,1	476 476 134 134 115 116 9,2 10,2	32,9 32,9 1,1 1,1 0,9 1,3 0,3 0,5		2,3 2,3 1,1 1,2 1,4 1,4 0,6 0,6	32 32 7 7 11 11 2,0 2,0	0,5 0,5 0,0 0,1 0,3 0,3 0,1 0,1	57 57 12 12 18 18 7,0 7,0	2,0 2,0 0,6 0,6 1,1 1,1 0,4 0,4	552 555 217 226 172 182 119 124
Portugal	Atlantic	0,0 1,0	0,8 0,8	20,7 20,7	0,3 4,7	123 123			1,0 1,0	9,4 9,4	1,7 1,7	44 44	2,2 2,2	176 176
Spain	Atlantic	0,7 5,7	0,0 9	20 96	7,4 39	314 324	18 31	4 5	3,7 4,1	33 33	1,0 1,1	23 23	2,6 2,7	231 231
Sweden	Kattegat Skagerrak	0,5 0,1	0,1 0,02	42 8,0	12 2,2	140 27	NI NI	NI NI	0,9 0,2	21 1,9	0,2 0,07	38 4,7	0,7 0,1	NI NI
United Kingdom	N Sea (East Coast) (lower estimate) (upper estimate) N Sea (Channel) (lower estimate) (upper estimate) Total North Sea (lower estimate) (upper estimate) Celtic Sea (lower estimate) (upper estimate) Irish Sea (lower estimate) (upper estimate) Atlantic (lower estimate) (upper estimate) Total non-North Sea (lower estimate) (upper estimate)	4,4 12,0 0,6 0,8 5,0 12,8 1,0 2,3 1,8 2,6 1,3 4,3 4,1 9,3	1,9 2,2 0,03 0,06 1,9 2,2 0,1 0,2 0,3 0,5 0,2 1,4 0,6 2,1	256 262 61 61 317,0 322,1 61 62 95 96 47 50 202,1 207,2	339 344 20 22 358,8 365,0 40 51 97 100 21 23 157,5 173,3	1190 1204 207 207 1397,0 1411,5 456 456 540 546 131 140 1125,9 1141,9	70 163 10,2 21 80,4 183,6 10 56 10,0 81 12 74 31,6 211,2	46,7 724 0,0 45,6 46,7 769,4 0,0 119 4 425 0,0 206 4,4 749,4	5,8 6,0 0,6 0,6 6,4 6,6 1,4 1,5 4 5 1,9 2,0 7,7 8,2	180 180 22 22 201,6 201,6 60 60 42 42 16 16 117,5 117,9	13 13 1,1 1,1 14,2 14,3 2,6 2,6 3,4 3,6 1,3 1,3 7,3 7,6	204 204 23 23 226,9 226,9 62 62 51 51 20 20 132,2 132,2	14 14 1,1 1,1 15,1 15,1 2,6 2,6 3,7 3,9 1,9 1,9 8,2 8,4	1404 1418 138 140 1542,0 1558,0 839 839 458 464 107 117 1404,0 1420,0

[^] 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 2000 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)	0,8	0,52	58	84	277	96	0,8	6,1	37	2,0	51	4,0	286
	(upper estimate)	8,3	0,7	67	113	316	107	108	6,8	42	2,3	57	5,3	324
Denmark	North Sea	NI	NI	NI	NI	NI	NI	NI	0,0	15,8	0,2	21,6	0,57	NI
	Skagerrak	NI	NI	NI	NI	NI	NI	NI	0,0	2,3	0,0	2,9	0,13	NI
	Kattegat	NI	NI	NI	NI	NI	NI	NI	0,0	28	0,5	33,6	0,97	NI
France	Channel/North Sea	NI	NI	NI	NI	NI	NI	NI	20,3	124	6,7	178,6	11,89	989
	Atlantic	NI	NI	NI	NI	NI	NI	NI	9,1	224	7,6	292,0	18,49	3255
Germany	North Sea (lower estimate)	5,2	2,6	203	169	1236	17	10,1	9	162	2,4	216	11	2007
	(upper estimate)	5,7	2,7	204	170	1241	147	29	9	162	2,5	216	11	2045
Iceland	Atlantic	no data submitted for 2000												
Ireland (2)	Irish Sea (lower estimate)	0,7	NI	35	21	240	NI	NI	0,8	20	0,4	6,8	2,3	171
	(upper estimate)	0,9	NI	35	23	240	NI	NI	0,8	20	0,4	6,8	2,3	171
	Celtic Sea (lower estimate)	0,3	NI	56	19	288	NI	NI	2,0	55	1,4	2,7	3,2	307
	(upper estimate)	2,2	NI	56	34	288	NI	NI	2,1	55	1,4	2,7	3,2	307
	Atlantic (lower estimate)	0,3	NI	33	4	164	NI	NI	0,4	13	0,6	0,7	1,3	154
	(upper estimate)	1,7	NI	36	17	164	NI	NI	0,5	13	0,6	0,7	1,3	154
Netherlands(3)	North Sea	6,1	1,7	331	221	1198	166	121	15	269	10,0	363	20	2386
		7,2	1,7	331	221	1199	183	123	15	269	10,0	364	20	2386
Norway	Skagerrak (lower estimate)	2,4	0,7	131	42	492	32,9	NI	4	32	0,6	63	2,2	555
	(upper estimate)	2,4	0,8	131	42	492	32,9	NI	5	32	0,6	63	2,2	558
	North Sea (lower estimate)	2,0	0,4	34	15	194	1,1	NI	3,6	7	0,2	17	1,0	1819
	(upper estimate)	2,0	0,4	34	15	194	1,1	NI	3,6	7	0,3	17	1,0	1828
	Norwegian Sea (lower estimate)	0,5	0,3	67	10	130	0,9	NI	4,1	11	0,6	22	1,6	1323
	(upper estimate)	0,5	0,5	67	10	132	1,3	NI	4,2	11	0,6	22	1,6	1333
	Barents Sea (lower estimate)	0,1	0,3	12	1,2	10,0	0,3	NI	0,8	2,0	0,2	7,3	0,4	346
	(upper estimate)	0,1	0,4	12	1,2	11,0	0,5	NI	0,6	2,0	0,2	7,3	0,4	350
Portugal	Atlantic	0,0	0,8	20,7	0,3	123,0	NI	NI	1,0	9,4	1,7	44	2,2	176
		1,0	0,8	20,7	4,7	123	NI	NI	1,0	9,4	1,7	44	2,2	176

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		4,3 9	41,5 51	31 108	23 54	338 348	18 31	4 5	12 13	33 33	2,3 2,4	323 323	23,4 23,5	335 335
Sweden	Kattegat Skagerrak		0,6 0,1	0,1 0,03	44 8,1	12 2,2	144 28	NI NI	NI NI	2,2 0,4	22 2,0	0,2 0,08	40 5,2	0,8 0,1	NI NI
United Kingdom	N Sea (East Coast)	(lower estimate)	5,1	2,0	340	374	1507	98	48	25	191	21	241	22	1704
		(upper estimate)	12,9	2,4	346	379	1521	200	815	25	191	21	241	22	1719
	N Sea (Channel)	(lower estimate)	0,7	0,03	78	24	235	12,9	0,0	6,5	24	2,8	31	2,8	145
		(upper estimate)	0,9	0,06	78	26	236	24	51	6,5	24	2,8	31	2,8	147
	North Sea	(lower estimate)	5,8	2,1	418	398	1742	111	48	31	215	23	272	25	1849
		(upper estimate)	13,8	2,4	423	405	1757	225	866	32	215	23	272	25	1866
	Celtic Sea	(lower estimate)	2,2	0,1	67	50	579	11	6,5	7,9	61	3,9	70	3,9	869
		(upper estimate)	3,6	0,2	68	61	580	60	131	8,0	61	3,9	70	3,9	869
	Irish Sea	(lower estimate)	2,1	0,6	104	119	575	10	4,4	12	45	5,9	64	6,3	494
		(upper estimate)	3,2	0,8	106	123	581	88	426	12	46	6,1	64	6,5	500
	Atlantic	(lower estimate)	1,4	0,3	70	25	152	14	0,1	4,2	18	2,3	26	3,2	136
		(upper estimate)	4,8	1,5	75	29	162	83	222	4,3	18	2,3	26	3,2	146
	non-North Sea	(lower estimate)	5,7	0,9	242	195	1306	34	11	24	124	12	160	13	1499
		(upper estimate)	12	2,5	249	214	1322	230	778	25	125	12	160	14	1515
Total reported:		(lower estimate)	35	51,8	1723	1217	7911	477	194	146	1405	73	2123	144	17458
		(upper estimate)	67	64	1825	1338	7998	958	1907	149	1411	74	2130	146	17593

(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

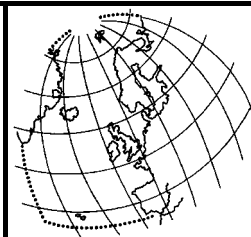
(3) Data provided comprise approx. 90% of the total pollution loads of the Netherlands into Convention Waters

Table 4b. Summary of Direct and Riverine Inputs to the Maritime Area of the OSPAR Convention in 2000 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	Arctic Ocean		0,1	0,27	12	1,2	10	0,3	NI	0,8	2,0	0,2	7,3	0,4	346
	Barents Sea		0,1	0,36	12	1,2	11	0,5	NI	0,6	2,0	0,2	7,3	0,4	350
North Sea	Atlantic Ocean (main body)		1,6 6,5	0,3 1,5	103 111	29 46	316 326	14 83	0,1 222	4,6 4,8	30 31	2,8 2,9	27 27	4,5 4,5	290 300
	Bay of Biscay and Iberian Coast		4,3 10,3	42,3 51,3	52 128	23 59	461 471	17,6 31	3,6 4,9	22,3 22,8	266 266	11,5 11,6	659 659	44,1 44,2	3766 3766
	Kattegat	(lower estimate)	0,6	0,12	44	12,4	144	NI	NI	2,2	50	0,7	74	1,8	0,0
		(upper estimate)	0,6	0,12	44	12,4	144	NI	NI	2,2	50	0,7	74	1,8	0,0
	Skagerrak	(lower estimate)	2,5	0,7	139	44	519	33	0	3,9	36	0,7	71	2,5	555
		(upper estimate)	2,5	0,8	139	44	519	33	0	5,1	36	0,7	71	2,5	558
	North Sea (main body)	(lower estimate)	19	7,2	966	863	4413	378	179	58	681	35	910	59	8202
		(upper estimate)	36	7,9	981	897	4471	638	1074	59	687	36	916	60	8302
	Channel	(lower estimate)	0,7	0,03	78	24	235	13	0	26,8	148	9,4	210	14,7	1134
		(upper estimate)	0,9	0,06	78	26	236	24	50,7	26,8	148	9,4	210	14,7	1136
Norwegian Sea	(lower estimate)		0,5	0,3	67	10	130	1	NI	4,1	11	0,6	22	1,6	1323
	(upper estimate)		0,5	0,5	67	10	132	1	NI	4,2	11	0,6	22	1,6	1333
Irish Sea	(lower estimate)		2,8	0,6	139	141	815	10	4	13	65	6,3	71	9	665
	(upper estimate)		4,2	0,8	141	146	821	88	426	13	66	6,5	71	9	671
Celtic Sea	(lower estimate)		2,6	0,1	123	69	868	11	6,5	10	117	5,3	73	7,1	1176
	(upper estimate)		5,8	0,2	124	95	868	60	131	10	117	5,3	73	7,1	1176

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.

OSPAR Commission 2004



Part II

Overview of the Results of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID) in 2001⁵

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⁵ Extract from the “Data Report on the Comprehensive Study of Riverine Inputs and Direct Discharges (RID) in 2001”. This report is available from the Secretariat of the OSPAR Commission.

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 2001 COMPREHENSIVE STUDY

For the 2001 study, data sets on riverine inputs and direct discharges were provided by Denmark, Germany, Ireland, the Netherlands, Norway, Portugal, Sweden, Spain and the United Kingdom of Great Britain and Northern Ireland (UK). Only riverine inputs were reported by Belgium⁶. France⁷ did not provide input data for 2001.

Iceland⁸ provided some information on monitoring results from 1998 – 2001: in a selection of rivers from North East and South Iceland (representing approximately 1/5 of Icelandic run-offs) inputs were found to be of the order of 0.14 tonnes cadmium, 0.845 tonnes lead and 0.076 tonnes mercury. The concentrations are in the range of background values and these inputs show that anthropogenic inputs from these substances are insignificant.

The geographical coverage for 2001 has again improved compared to the coverage in previous years. Spain had increased the number of RID catchments to 19 river catchment areas and therefore the total loads reported in 2001 could not be compared with previous years when fewer areas were reported. The additional input information was reflected in an apparent increase in total inputs which was not a “real” increase and should be accounted for in the data reports and assessments.

Belgium had applied a new method for calculating flow rates, and this change was directly responsible for a 6 % increase in calculated loads from the Scheldt river, which itself accounts for 80 % of total Belgian inputs. Movement restrictions in the UK in response to the foot and mouth outbreak meant the UK data set was not as comprehensive as in previous years.

Significant gaps occur in the data from several Contracting Parties. 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 still exist

The reporting of mandatory and voluntary determinands (cf. Table 1b) in 2001 was the same as in 2000. However, several Contracting Parties did not report data for all mandatory parameters. All reporting Contracting Parties provided data on inputs of heavy metals with the exception of

⁶ Previously existing direct discharges no longer exist.

⁷ France informed the Secretariat that it would submit its data by 31 October 2003.

⁸ 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.

Denmark. There are a number of gaps in the reporting of data for inputs of the mandatory parameter γ -HCH (Denmark, Ireland, Portugal and Sweden) and the voluntary parameter PCBs (Denmark, Ireland, Norway, Portugal and Sweden) and suspended particulate matter (Denmark, Sweden for rivers). A number of additional parameters, not summarised in the overview Tables 3 and 4, were reported again by Norway (cf. Table 1b). Norway had reported on inputs from fishfarming because in Norway this activity contributed a significant part of the inputs of nitrogen and phosphorus. A number of Contracting Parties reported overall downward trends in the inputs of the RID determinands over the period 1990 to 2001.

PRESENTATION OF THE 2001 DATA

Table 1a gives an overview of the information provided by Contracting Parties for 2001 and shows how the information was categorised:

- Direct inputs:
 - Sewage effluents
 - Industrial effluents
- 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 cases⁹ 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.

⁹ Secretariat note: Not all Contracting Parties wished to have their data rounded in accordance with this procedure.

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 2001 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 2001 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.

**Table 1a. Information Received on Inputs to the Maritime Area
of the OSPAR Convention in 2001**

Country	Direct Discharges		Coastal Areas (1)	Riverine Inputs	
	Sewage Effluents	Industrial Effluents		Main Rivers	Tributary Rivers (2)
Belgium	NA	NA	(3)	+	+
Denmark					
- Kattegat	+	+	(4)	+	(5)
- Skagerrak	+	+	(4)	+	(5)
- North Sea	+	+	(4)	+	(5)
France					
- Channel/North Sea					
- Atlantic					
Germany	+	+	(6)	+	+
Iceland	No 2001 input data submitted (7)				
Ireland					
- Irish Sea	+ (8)	+ (8)	NI	+	+
- Celtic Sea	+ (8)	+ (8)	NI	+	+
- Atlantic	+ (8)	+ (8)	NI	+	+
Netherlands	+	+	(3)	+	+
Norway					
- Skagerrak	+	+	+ (9)	+	+
- North Sea	+	+	+ (9)	+	+
- Norwegian Sea	+	+	+ (9)	+	+
- Barents Sea	+	+	+ (9)	+	+
Portugal	NI	NI	NI	+	NI
Spain	+	+	+	+	+
Sweden					
- Kattegat	+	+	(3)	+	+
- Skagerrak	+	+	(3)	+	+
United Kingdom					
- East Coast	+	+	NI	+	+ (10)
- Channel	+	+	NI	+	+ (10)
- Celtic Sea	+	+	NI	+	+ (10)
- Irish Sea	+	+	NI	+	+ (10)
- Atlantic	+	+	NI	+	+ (10)

+ = Information available

NI = No information

NA = Not applicable

- (1) 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.
- (2) Tributary Rivers: - 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.
- (3) Included in data on riverine inputs ("tributary rivers")
- (4) Included in the totals for Danish inputs to the North Sea, the Skagerrak and the Kattegat
- (5) All 25 rivers are reported as main rivers
- (6) Included in data on direct inputs
- (7) 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
- (8) 1990 data since the basis for calculation remained unchanged
- (9) cf. category "run-off" (i.e. estimated values for diffuse contributions) in Table 6b. for Norway
- (10) Reported as main rivers

Table 1b. Determinands Reported by Contracting Parties in 2001

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 - riverine inputs	NA R (4)	NA R (3)	NA R (3)	NA R (4)	NA R (3)	NA R (3)	NA R (4)	NA R (3)	NA R (3)	NA R (3)	NA R (3)	NA R (3)	NA R (3)	
Denmark - direct inputs - riverine inputs	NI NI	NI NI	NI NI	NI NI	NI NI	NI NI	NI NI	+	+	+	+	+	NI NI	
France - direct inputs - riverine inputs														
Germany - direct inputs - riverine inputs* - riverine inputs** (*) Elbe (**) Other main rivers	R + (4) + (3)(4)	R + (3) + (3)	R + (3) + (3)	R + (3) + (3)	R + (3) + (3)	R + (4) + (3)(4)	R + (4) + (4)	+	+	+	+	+	+	
Iceland	No 2001 input data submitted (6)													
Ireland - direct inputs - main riv. inputs - tributary rivers	+ (9) R (3)(4) R	NI NI NI	+ (9) R (3)(4) R	+ (9) R (3)(4) R	+ (9) R (3)(4) R	NI NI NI	NI NI NI	NI R (3)(4) R	NI +(3)(10) +	NI +(3) +	+ (9) NI NI	+ (9) NI +	+ (9) +(3) +	
Netherlands - direct inputs - main riv. inputs - tributary rivers	+	+	+	+	+	+ (12) + (3) +	+ (12) + (3) +	NI + (3) +	+	NI + (3) +	+	+	+	
Norway - direct inputs - main riv. inputs - tributary rivers	+	+	+	+	+	NI + (3)(4) E (11)	NI NI NI	+	+	+	+	+	+	Cr, Ni As, Cr, Ni, TOC As, Cr, Ni, TOC
Portugal - direct inputs - main riv. Inputs (7) - tributary rivers	NI +	NI +	NI +	NI +	NI +	NI NI NI	NI NI NI	NI +	NI +	NI +	NI +	NI +	NI +	
Spain - direct inputs - riverine inputs	+	+	+	+	+	+	+	+	+	+	+	+	+	
Sweden - sewage effluent - industrial effluent - main riv. inputs	+	+	+	+	+	NI NI NI	NI NI NI	+	+	+	+	+	NI NI NI	
United Kingdom - direct inputs - riverine inputs	R R	R R	R R	R R	R R	R R	R R	R R	R R	R R	R R	R(8) R(8)	R 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.

(10) Total oxidised nitrogen measured and not nitrate per se.

(11) Estimated values only

(12) estimate of the total national figure; lindane: 0-0.07 tonnes; PCBs: 0 - 0.0007 tonnes

Table 2[^]. Direct Discharges to the Maritime Area of the OSPAR Convention in 2001 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 (lower estimate) (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 Skagerrak Kattegat	NI NI NI	NI NI NI	NI NI NI	NI NI NI	NI NI NI	NI NI NI	NI NI NI	NI NI NI	0,188 0,063 0,661	0,017 0,007 0,062	0,21 0,07 0,73	0,02 0,01 0,07	NI NI NI
France	Channel/North Sea Atlantic													
Germany	North Sea	0,03 0,06	0,03 0,07	1,9 2,7	1,0 1,6	11 16	0,03 0,3	0,05 2,9	1,7 1,7	1,9 1,9	0,1 0,1	3,9 3,9	0,4 0,4	2,0 2,0
Iceland	Atlantic	no data submitted for 2001												
Ireland	Irish Sea Celtic Sea Atlantic	0,06 0,02 0,01	NI NI NI	7,50 3,20 0,83	3,30 4,40 0,39	63,00 21,50 7,70	NI NI NI	NI NI NI	NI NI NI	NI NI NI	NI NI NI	6,83 2,67 0,70	1,58 0,65 0,21	38,10 18,59 4,32
Netherlands	North Sea	0,2	0,1	2,8	1,8	25	NI	NI	NI	1,7	NI	6,1	0,4	5
Norway	Skagerrak North Sea Norwegian Sea Barents Sea	0,66 0,3 0,1 0,003	0,03 0,01 0,01 0,001	13 5,1 7,5 0,7	0,9 5,5 3,7 0,05	14 35 12 1,0			3,442 2,35 2,36 0,19	0,02 0,02 0,02 0,00	0,08 0,18 0,25 0,02	5,6 4,6 4,2 0,3	0,2 0,4 0,5 0,03	3,3 67 400 232
Portugal	Atlantic	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
Spain	Atlantic	3,7	0,2	14	35	57	30,34	29,165	6,4	0,3	0,7	15	3,5	104
Sweden	Kattegat (estimate) (precision in %) Skagerrak (estimate) (precision in %)	0,05 20 0,00 20	0,03 20 0,02 20	1,8 20 0,30 20	0,4 20 0,06 20	5,4 20 0,72 20	NI NI NI NI	NI NI NI NI	0,7 10 0,21 10	0,6 15 0,11 15	0,95 15 0,23 15	1,7 10 0,40 10	0,1 10 0,01 10	NI NI NI NI
United Kingdom	N Sea (East Coast) (lower estimate) (upper estimate) N Sea (Channel) (lower estimate) (upper estimate) <i>Total North Sea</i> (lower estimate) (upper estimate) Celtic Sea (lower estimate) (upper estimate) Irish Sea (lower estimate) (upper estimate) Atlantic (lower estimate) (upper estimate) <i>Total Non-North Sea</i> (lower estimate) (upper estimate)	0,4 0,6 0,1 0,1 0,5 0,7 1,0 1,0 0,3 0,7 0,05 0,3 1,3 1,9	0,4 0,4 0,01 0,01 0,4 0,4 0,00 0,00 0,2 0,3 0,03 0,07 0,2 0,4	64 64 12 12 76,0 76,2 4,8 4,8 7 9 21 22 32,6 35,5	29 29 6,1 6,3 34,6 35,1 9 9 12 13 2,6 3,4 23,2 25,5	195 195 26 26 221,7 221,7 98 98 22 23 21 21 141,6 142,0	10 27 1,8 7,7 12,1 34,4 0,2 2,2 0,7 4,5 10,2 17 11,1 23,6	42 81 0,00 7,9 42,3 88,8 4,1 8,4 0 1,5 0 0 4,1 9,9	19 19 7,6 7,6 26,5 26,6 4,3 4,4 6,1 6,2 5,5 5,5 15,9 16,1	13 13 2,2 2,2 14,7 14,7 0,9 0,9 1,9 2,0 2,4 2,4 5,2 5,3	6,8 6,8 1,7 1,7 8,5 8,5 0,9 0,9 1,7 1,7 1,3 1,3 3,9 3,9	37 37 11,1 11,1 47,6 47,6 5,2 5,2 8 8 10,9 10,9 24,4 24,4	7,4 7,4 1,7 1,7 9,1 9,1 0,9 0,9 1,9 1,9 2,0 2,0 4,8 4,8	560 560 3,0 3,0 563,0 563,0 27 27 25 25 34 34 86,0 86,0

[^] 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 2001 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)	1,1 4,9	0,3 0,3	58 67	36 43	170 185	32 49	0,0 76	3,8 6,3	31 33	1,4 1,5	40 46	1,2 2,8	147 164
Denmark	North Sea Skagerrak Kattegat									14,0 1,88 22,8	0,13 0,03 0,3	17,3 2,2 27,4	0,5 0,1 0,7	
France	Channel/North Sea Atlantic													
Germany	North Sea (lower estimate) (upper estimate)	4,9 5,2	2,5 2,5	195 195	158 158	1182 1182	71 71	2,0 26	7,2 7,3	147 147	2,6 2,6	196 196	9,0 9,0	2061 2101
Iceland	Atlantic	no data submitted for 2001												
Ireland	Irish Sea (lower estimate) (upper estimate)	0,3 0,7	NI NI	19 20	8 11	135 141	NI NI	NI NI	0,6 0,6	6 13	0,2 0,3	NI NI	0,2 0,4	48 48
	Celtic Sea (lower estimate) (upper estimate)	0,1 2,0	NI NI	31 35	15 28	130 132	NI NI	NI NI	1,0 1,0	35 40	0,8 0,9	NI NI	0,7 1,7	156 156
	Atlantic (lower estimate) (upper estimate)	0,0 1,4	NI NI	14 21	2 16	43 48	NI NI	NI NI	0,3 0,3	4 8	0,2 0,3	NI NI	0,3 0,5	32 50
Netherlands	North Sea (lower estimate) (upper estimate)	11,8 13,0	3,1 3,2	477 477	366 369	2065 2078	101 171	207 210	18 18	285 285	7,3 7,3	373 376	14 14	4002 4006
Norway	Skagerrak (lower estimate) (upper estimate)	1,2 1,5	1,2 1,3	70 71	16 16	258 258	26,5 26,5		2,1 2,1	17 17	0,3 0,3	30 30	1,7 1,8	310 312
	North Sea (lower estimate) (upper estimate)	0,2 0,5	0,2 0,3	15 15	3 4	77 83	0,5 0,5		0,5 0,5	7 7	0,1 0,1	10 10	0,6 0,6	55 60
	Norwegian Sea (lower estimate) (upper estimate)	0,1 0,8	0,3 0,3	59 59	1,7 2,3	127 136	0,8 0,8		0,7 0,8	7 7	0,1 0,1	15 15	0,8 0,8	165 180
	Barents Sea (lower estimate) (upper estimate)	0,0 0,3	0,1 0,1	23 23	0,5 0,8	82,4 84,0	0,4 0,6		0,3 0,3	0,3 0,3	0,1 0,1	5,0 5,0	0,2 0,2	29 32
Portugal	Atlantic (lower estimate) (upper estimate)	0,0 1,3	0,7 4,8	34,8 34,8	0,2 5,4	133 133	NI NI	NI NI	0,5 0,5	13,8 13,8	1,6 1,6	21 21	2,2 2,2	291 291
Spain	Atlantic (lower estimate) (upper estimate)	2,6 8,5	0,0 13	116 235	10,7 62	1237 1257	13 26	3 61	12,7 12,8	57 57	1,7 1,9	53 53	5,5 5,6	371 374
Sweden	Kattegat (estimate) (precision in %)	0,4 20	0,1 20	47 20	14 20	137 20	NI 20	NI	1,1 10	23 10	0,2 10	38 10	0,8 10	NI
	Skagerrak (estimate) (precision in %)	0,1 20	0,01 20	3,8 20	1,1 20	12 20	NI 20	NI	0,1 10	1,0 10	0,04 10	2,4 10	0,1 10	NI
United Kingdom	N Sea (East Coast) (lower estimate) (upper estimate)	3,8 7,3	0,6 0,8	224 225	215 223	934 945	30 114	36,9 284	6,7 6,9	182 182	12 12	202 203	12 12	1151 1160
	N Sea (Channel) (lower estimate) (upper estimate)	0,4 0,6	0,08 0,11	48 49	20 22	168 170	1,7 14	0,0 15,2	0,8 0,8	28 28	1,3 1,3	20 20	1,3 1,3	165 168
	Total North Sea (lower estimate) (upper estimate)	4,2 7,8	0,7 0,9	271,9 273,9	234,8 245,2	1101,3 1114,2	31,7 128,1	36,9 299,5	7,5 7,7	210,7 210,8	13,0 13,1	222,7 223,1	13,6 13,6	1316,0 1328,0
	Celtic Sea (lower estimate) (upper estimate)	1,2 2,1	0,2 0,3	93 94	68 78	407 407	18 37	2,9 37	2,0 2,0	48 48	3,3 3,3	51 51	3,3 3,3	1260 1260
	Irish Sea (lower estimate) (upper estimate)	1,4 2,0	0,2 0,3	75 76	83 86	403 414	0,2 31	3 78	4 5	34 35	3,2 3,3	41 41	3,2 3,4	489 499
	Atlantic (lower estimate) (upper estimate)	0,6 1,2	0,0 0,4	34 35	22 23	112 116	4 34	0,0 6	1,8 1,9	9 9	1,1 1,1	13 13	1,6 1,6	156 161
	Total non-North Sea (lower estimate) (upper estimate)	3,2 5,2	0,4 1,0	202,3 204,0	172,6 186,3	922,2 936,6	21,9 101,8	5,7 119,6	8,2 8,5	91,4 92,4	7,5 7,7	104,9 105,1	8,1 8,3	1905,0 1920,0

[^] 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. Sum of Direct (Table 2) and Riverine (Table 3) Inputs to the Maritime Area of the OSPAR Convention in 2001 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)	1,1	0,29	58	36	170	32	0,0	3,8	31	1,4	40	1,2	147
	(upper estimate)	4,9	0,3	67	43	185	49	76	6,3	33	1,5	46	2,8	164
Denmark	North Sea	NI	NI	NI	NI	NI	NI	NI	0,0	14,2	0,1	17,5	0,53	NI
	Skagerrak	NI	NI	NI	NI	NI	NI	NI	0,0	1,9	0,0	2,3	0,10	NI
	Kattegat	NI	NI	NI	NI	NI	NI	NI	0,0	23	0,4	28,1	0,81	NI
France	Channel/North Sea	NI	NI	NI	NI	NI	NI	NI	0,0	0	0,0	0,0	0,00	0
	Atlantic	NI	NI	NI	NI	NI	NI	NI	0,0	0	0,0	0,0	0,00	0
Germany	North Sea (lower estimate)	4,9	2,5	197	159	1193	71	2,1	8,9	149	2,7	200	9,4	2063
	(upper estimate)	5,3	2,6	198	160	1198	71	29	9,0	149	2,7	200	9,4	2103
Iceland	Atlantic	no data submitted for 2001												
Ireland (2)	Irish Sea (lower estimate)	0,4	NI	26	11	198	NI	NI	0,6	6	0,2	6,8	1,8	86
	(upper estimate)	0,8	NI	27	14	204	NI	NI	0,6	6	0,2	6,8	1,8	86
	Celtic Sea (lower estimate)	0,1	NI	35	19	151	NI	NI	1,0	35	0,8	2,7	1,3	175
	(upper estimate)	2,0	NI	39	32	153	NI	NI	1,0	35	0,8	2,7	1,3	175
	Atlantic (lower estimate)	0,0	NI	15	3	51	NI	NI	0,3	4	0,2	0,7	0,5	36
	(upper estimate)	1,4	NI	21	16	56	NI	NI	0,3	4	0,2	0,7	0,5	54
Netherlands(3)	North Sea	12,0	3,2	480	368	2090	101	207	18	287	7,3	379	14	4007
		13,2	3,3	480	371	2103	171	210	18	287	7,3	382	14	4011
Norway	Skagerrak (lower estimate)	1,9	1,2	83	17	272	26,5	NI	3	17	0,3	36	2,0	313
	(upper estimate)	2,1	1,4	84	17	272	26,5	NI	4	17	0,4	36	2,0	315
	North Sea (lower estimate)	0,5	0,2	20	9	112	0,5	NI	2,8	7	0,2	14	1,0	122
	(upper estimate)	0,8	0,3	20	9	119	0,5	NI	2,8	7	0,3	14	1,0	127
	Norwegian Sea (lower estimate)	0,2	0,3	66	5	139	0,8	NI	3,1	7	0,3	20	1,3	566
	(upper estimate)	0,9	0,3	66	6	148	0,8	NI	3,1	7	0,4	20	1,3	580
	Barents Sea (lower estimate)	0,0	0,1	24	0,5	83,4	0,4	NI	0,5	0,3	0,1	5,3	0,3	261
	(upper estimate)	0,3	0,1	24	0,9	85,0	0,6	NI	0,3	0,3	0,1	5,3	0,3	264
Portugal	Atlantic	0,0	0,7	34,8	0,2	133,0	NI	NI	0,5	13,8	1,6	21	2,2	291
		1,3	4,8	34,8	5,4	133	NI	NI	0,5	13,8	1,6	21	2,2	291

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		6,2 12	0,2 13	129 249	46 97	1294 1314	13 26	3 61	19 19	57 58	2,3 2,6	68 68	9,0 9,1	476 478
Sweden	Kattegat	(lower estimate)	0,5	0,2	49	14	143	NI	NI	1,9	23	1,2	40	0,9	NI
	Skagerrak	(lower estimate)	0,1	0,03	4,1	1,2	12	NI	NI	0,3	1,1	0,27	2,8	0,1	NI
United Kingdom	N Sea (East Coast)	(lower estimate)	4,2	1,0	288	244	1129	40	79	26	195	19	239	20	1711
		(upper estimate)	7,9	1,2	289	252	1140	141	365	26	195	19	239	20	1720
	N Sea (Channel)	(lower estimate)	0,5	0,09	60	26	194	3,5	0,0	8,4	31	3,0	31	3,0	168
		(upper estimate)	0,7	0,12	61	28	196	21	23	8,4	31	3,0	32	3,0	171
	North Sea	(lower estimate)	4,7	1,1	348	269	1323	44	79	34	225	21	270	23	1879
		(upper estimate)	8,5	1,3	350	280	1336	163	388	34	226	22	271	23	1891
	Celtic Sea	(lower estimate)	2,1	0,2	98	77	504	18	7,0	6,3	49	4,2	56	4,2	1287
		(upper estimate)	3,1	0,3	98	87	505	39	45	6,4	49	4,3	56	4,3	1287
	Irish Sea	(lower estimate)	1,7	0,3	82	95	426	1	2,8	11	36	4,8	49	5,1	514
		(upper estimate)	2,6	0,6	85	99	437	36	79	11	37	5,0	49	5,3	524
	Atlantic	(lower estimate)	0,7	0,1	55	24	134	14	0,0	7,3	11	2,4	24	3,6	190
		(upper estimate)	1,5	0,5	56	26	137	51	6	7,4	11	2,4	24	3,6	195
	non-North Sea	(lower estimate)	4,5	0,6	235	196	1064	33	10	24	97	11	129	13	1991
		(upper estimate)	7	1,3	240	212	1079	125	130	25	98	12	130	13	2006
Total reported:		(lower estimate)	37	10,6	1803	1154	8430	322	302	122	999	52	1282	82	12414
		(upper estimate)	61	29	1953	1279	8540	633	893	127	1003	53	1292	84	12546

(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

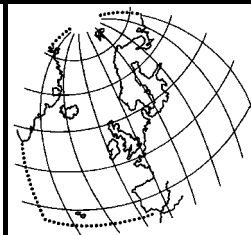
(3) Data provided comprise approx. 90% of the total pollution loads of the Netherlands into Convention Waters

Table 4b. Sum of Direct and Riverine Inputs to the Maritime Area of the OSPAR Convention in 2001 by Sea Area

Sea Area		Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs(1) [kg]	NH ₄ -N [kt]	NO ₃ -N [kt]	PO ₄ -P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
North-East Atlantic Ocean	<i>Arctic Ocean</i>	0,0	0,12	24	0,5	83	0,4	NI	0,5	0,3	0,1	5,3	0,3	261
	Barents Sea	0,3	0,13	24	0,9	85	0,6	NI	0,3	0,3	0,1	5,3	0,3	264
	<i>Atlantic Ocean</i> (main body)	0,7 2,9	0,1 0,5	70 78	27 42	184 193	14 51	0,0 6	7,6 7,7	15 15	2,5 2,6	25 25	4,1 4,1	226 249
	<i>Bay of Biscay and Iberian Coast</i>	6,3 13,5	0,9 18,0	164 284	46 102	1427 1447	13,1 26	3,2 60,9	19,6 19,7	71 71	3,9 4,2	89 89	11,2 11,3	767 769
North Sea	Kattegat (lower estimate)	0,5	0,16	49	14,0	143	NI	NI	1,9	47	1,6	68	1,7	0,0
	Kattegat (upper estimate)	0,5	0,2	49	14,0	143	NI	NI	1,9	47	1,6	68	1,7	0,0
	Skagerrak (lower estimate)	1,9	1,2	87,1	18,1	284,3	26,5	NI	3,8	19,9	0,6	40,6	2,2	313,5
	Skagerrak (upper estimate)	2,2	1,4	87,8	18,1	284,5	26,5	NI	4,7	19,9	0,7	40,6	2,2	315,0
	North Sea (lower estimate)	23	7,3	1043	816	4695	245	289	59	682	30	889	46	8051
	North Sea (upper estimate)	32	7,7	1054	835	4745	433	680	62	685	31	899	48	8126
	Channel (lower estimate)	0,5	0,09	60	26	194	4	0	8,4	31	3,0	31	3,0	168
	Channel (upper estimate)	0,7	0,12	61	28	196	21	23,1	8,4	31	3,0	32	3,0	171
Norwegian Sea	(lower estimate)	0,2	0,3	66	5	139	1	NI	3,1	7	0,3	20	1,3	566
	(upper estimate)	0,9	0,3	66	6	148	1	NI	3,1	7	0,4	20	1,3	580
Irish Sea	(lower estimate)	2,1	0,3	109	106	624	1	3	11	42	5,0	56	7	600
	(upper estimate)	3,4	0,6	112	113	641	36	79	11	43	5,2	56	7	610
Celtic Sea	(lower estimate)	2,2	0,2	132	96	656	18	7,0	7	85	5,0	59	5,5	1462
	(upper estimate)	5,0	0,3	137	119	658	39	45	7	85	5,0	59	5,6	1462

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.

OSPAR Commission 2004



Part III

Overview of the Results of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID) in 2002¹⁰

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¹⁰ Extract from the “Data Report on the Comprehensive Study of Riverine Inputs and Direct Discharges (RID) in 2002”. This report is available from the Secretariat of the OSPAR Commission.

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 2002 COMPREHENSIVE STUDY

For the 2002 study, data sets on riverine inputs and direct discharges were provided by Denmark, Germany, Ireland, the Netherlands, Norway, Spain, Sweden and the United Kingdom of Great Britain and Northern Ireland (UK). Belgium¹¹ only reported riverine inputs. Data from France¹² are delayed. Portugal¹³ did not provide input data for 2002.

Belgium had applied a new method for calculating flow rates, and this change was directly responsible for a 6 % increase in calculated loads from the Scheldt river, which itself accounts for 80 % of total Belgian inputs. A new numbering system for RID stations in Denmark has been incorporated into this report following a major revision to the Danish programme in 1998.

Germany report that river flow in 2002 was significantly higher than the long term average being dominated by three major flood events on the River Elbe. These led to a significant increase in inputs to the North Sea. However the annual loads of the River Elbe were less than 1987 which was a year with comparable run-off.

Norway have reported on the results from 10 main rivers and 126 tributaries. This is a reduction of 19 tributaries in the active monitoring programme compared to earlier years. Movement restrictions in the UK in response to the foot and mouth outbreak had continued to restrict the extent of data collection in the UK in 2002.

Significant gaps occur in the data from several Contracting Parties. 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 still exist.

The reporting of mandatory and voluntary determinands (cf. Table 1b) in 2002 was almost the same as in 2001 with the single difference being that Denmark did not report data for ammonia in direct discharges. Of those Contracting Parties reporting, several did not report data for all parameters, i.e.

- Denmark did not report data on inputs of heavy metals;

¹¹ Reporting of direct discharges has been discontinued.

¹² France informed the Secretariat that it would submit its data by 31 October 2004.

¹³ No flow rate data was available for Portugal. It was therefore not possible to calculate annual loads.

- Denmark, Ireland and Sweden did not report data for inputs of γ -HCH (the Netherlands and Norway did not report direct inputs of γ -HCH);
- Denmark and Sweden did not report on inputs of suspended particulate matter;
- Denmark, Ireland, Norway and Sweden did not report on the voluntary parameter PCBs. The Netherlands did not report direct inputs of PCBs.

A number of additional parameters, not summarised in the overview Tables 3 and 4, were reported again by Norway (cf. Table 1b). Norway had reported on inputs from fishfarming because in Norway this activity contributed a significant part of the inputs of nitrogen and phosphorus. A number of Contracting Parties reported overall downward trends in the inputs of the RID determinands over the period 1990 to 2001.

PRESENTATION OF THE 2002 DATA

Table 1a gives an overview of the information provided by Contracting Parties for 2002 and shows how the information was categorised:

- Direct inputs:
 - Sewage effluents
 - Industrial effluents
- 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 cases¹⁴ 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 2002 and summarises

¹⁴ Secretariat note: Not all Contracting Parties wished to have their data rounded in accordance with this procedure.

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 2002 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.

**Table 1a. Information Received on Inputs to the Maritime Area
of the OSPAR Convention in 2002**

Country	Direct Discharges		Coastal Areas (1)	Riverine Inputs	
	Sewage Effluents	Industrial Effluents		Main Rivers	Tributary Rivers (2)
Belgium	NA	NA	(3)	+	+
Denmark					
- Kattegat	+	+	(4)	+	(5)
- Skagerrak	+	+	(4)	+	(5)
- North Sea	+	+	(4)	+	(5)
France	No 2002 input data submitted				
- Channel/North Sea					
- Atlantic					
Germany	+	+	(6)	+	+
Iceland	No 2002 input data submitted (7)				
Ireland					
- Irish Sea	+ (8)	+ (8)	NI	+	+
- Celtic Sea	+ (8)	+ (8)	NI	+	+
- Atlantic	+ (8)	+ (8)	NI	+	+
Netherlands	+	+	(3)	+	+
Norway					
- Skagerrak	+	+	+ (9)	+	+
- North Sea	+	+	+ (9)	+	+
- Norwegian Sea	+	+	+ (9)	+	+
- Barents Sea	+	+	+ (9)	+	+
Portugal	No 2002 input data submitted (11)			+	NI
Spain	+	+	+	+	+
Sweden					
- Kattegat	+	+	(3)	+	+
- Skagerrak	+	+	(3)	+	+
United Kingdom					
- East Coast (12)	+	+	NI	+	+ (10)
- Channel	+	+	NI	+	+ (10)
- Celtic Sea	+	+	NI	+	+ (10)
- Irish Sea	+	+	NI	+	+ (10)
- Atlantic	+	+	NI	+	+ (10)

+ = Information available

NI = No information

NA = Not applicable

- (1) 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.
- (2) Tributary Rivers: - 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.
- (3) Included in data on riverine inputs ("tributary rivers")
- (4) Included in the totals for Danish inputs to the North Sea, the Skagerrak and the Kattegat
- (5) All 25 rivers are reported as main rivers
- (6) Included in data on direct inputs
- (7) 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
- (8) 1990 data since the basis for calculation remained unchanged. At ASMO 2004, Ireland stated that it planned to update its data on direct discharges in time for the next reporting cycle.
- (9) cf. category "run-off" (i.e. estimated values for diffuse contributions) in Table 6b. for Norway
- (10) Reported as main rivers
- (11) There are no flow rate data available for 2002. It is therefore not possible to calculate annual loads.
- (12) Split into East Coast (North) and East Coast (South)

Table 1b. Determinands Reported by Contracting Parties in 2002

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 - riverine inputs	NA R (4)	NA R (3)	NA R (3)	NA R (4)	NA R (3)	NA R (4)	NA R (4)	NA R (3)	NA R (3)	NA R (3)	NA R (3)	NA R (4)	NA R (3)	
Denmark - direct inputs - riverine inputs	NI NI	NI NI	NI NI	NI NI	NI NI	NI NI	NI NI	NI +	+	+	+	+	NI NI	
France - direct inputs - riverine inputs	No 2002 data submitted													
Germany - direct inputs - riverine inputs* - riverine inputs** (*) Elbe (**) Other main rivers	R + (4) + (3)(4)	R + (3) + (3)	R + (3) + (3)	R + (3) + (3)	R + (3) + (3)	R + (4) + (3)(4)	R + (4) + (4)	+	+	+	+	+	+	+
Iceland - direct inputs - main riv. inputs - tributary rivers	No 2002 input data submitted (6)													
Ireland - direct inputs - main riv. inputs - tributary rivers	+ (9) R (3)(4) R	NI NI NI	+ (9) R (3)(4) R	+ (9) R (3)(4) R	+ (9) R (3)(4) R	NI NI NI	NI NI NI	NI R (3)(4) R	NI +(3)(10) +	NI +(3) +	+ (9) + +	+ (9) + +	+ (9) +(3) +	
Netherlands - direct inputs - main riv. inputs - tributary rivers	+	+	+	+	+	+ (12) + (3) +	+ (12) + (3) +	NI + (3) +	+	NI + (3) +	+	+	+	
Norway - direct inputs - main riv. inputs - tributary rivers	+	+	+	+	+	NI + (3)(4) E (11)	NI NI NI	+	+	+	+	+	+	Cr, Ni As, Cr, Ni, TOC As, Cr, Ni, TOC
Portugal - direct inputs - riverine inputs	No 2002 input data submitted (13)													
Spain - direct inputs - riverine inputs	+	+	+	+	+	+	+	+	+	+	+	+	+	
Sweden - sewage effluent - industrial effluent - main riv. inputs	+ (3)(4) R(4) + (3)(4)	R(4) + (3)(4) + (3)(4)	+ (3)(4) + (3)(4) + (3)(4)	+ (3)(4) + (3)(4) + (3)(4)	+ (3)(4) + (3)(4) + (3)(4)	+ (3)(4) + (3)(4) + (3)(4)	R(4) + (3)(4) + (3)(4)	+ (3)(4) + (3)(4) + (3)(4)	+ (3)(4) + (3)(4) + (3)(4)	+ (3)(4) + (3)(4) + (3)(4)	+ (3)(4) + (3)(4) + (3)(4)	+ (3)(4) + (3)(4) + (3)(4)	+ (3)(4) + (3)(4) + (3)(4)	
United Kingdom - direct inputs - riverine inputs	+	+	+	+	+	NI NI NI	NI NI NI	+	+	+	+	+	NI NI NI	
	R R	R R	R R	R R	R R	R R	R R	R R	R R	R R	R R	R R	R 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-N and Total-P were not measured. To avoid anomalies, values equal to (i) the sum of the inorganic forms of N and (ii) orthophosphate-P respectively have been used.

(9) 1990 data since the basis for calculation remained unchanged. At ASMO 2004, Ireland stated that it planned to update its data on direct discharges in time for the next reporting cycle.

(10) Total oxidised nitrogen measured and not nitrate per se.

(11) Estimated values only

(12) estimate of the total national figure; lindane: 0-0.07 tonnes; PCBs: 0 - 0.0007 tonnes

(13) There are no flow rate data available for 2002. It is therefore not possible to calculate annual loads.

Table 2[^]. Direct Discharges to the Maritime Area of the OSPAR Convention in 2002 by Country

Country	Region	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH ₄ -N [kt]	NO ₃ -N [kt]	PO ₄ -P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Belgium	North Sea (lower estimate) (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 Skagerrak Kattegat	NI NI NI	NI NI NI	NI NI NI	NI NI NI	NI NI NI	NI NI NI	NI NI NI	NI NI NI	0,09 0,02 0,44	0,01 0,01 0,05	0,17 0,08 0,78	0,02 0,01 0,07	NI NI NI
France	Channel/North Sea Atlantic	no data submitted for 2002												
Germany	North Sea (lower estimate) (upper estimate)	0,02 0,06	0,02 0,06	2,1 2,8	0,89 1,5	10 15	0,02 0,30	0,04 2,9	1,8 1,8	1,9 1,9	0,08 0,08	3,8 3,8	0,40 0,40	2,0 2,0
Iceland	Atlantic	no data submitted for 2002												
Ireland	Irish Sea Celtic Sea Atlantic	0,06 0,02 0,01		7,50 3,20 0,83	3,30 4,40 0,39	63,00 21,50 7,70						6,83 2,67 0,70	1,58 0,65 0,21	38,13 18,59 4,32
Netherlands	North Sea	0,21	0,01	3,3	3,1	27	NI	NI	NI	1,2	NI	6,3	0,47	4
Norway	Skagerrak North Sea Norwegian Sea Barents Sea	0,06 0,14 0,05 0,00	0,02 0,01 0,01 0,00	12 5,2 9,3 0,67	0,72 4,5 1,5 0,05	17 26 13 1,0			2,9 1,8 2,4 0,18	0,02 0,01 0,02 0,00	0,07 0,16 0,25 0,02	4,9 3,4 4,3 0,24	0,19 0,32 0,48 0,03	2,6 49 470 211
Portugal	Atlantic	no data submitted for 2002												
Spain	Atlantic (lower estimate) (upper estimate)	1,7 9,1	0,87 1,4	9 17	10 59	79 88	1,9 17	59 70	10 10	4,1 4,2	1,5 1,5	22 22	3,4 3,3999	349 350
Sweden	Kattegat Skagerrak	0,02 0,00	0,02 0,01	1,7 0,44	0,2 0,02	5,9 0,50	NI NI	NI NI	1,2 0,10	0,2 0,00	0,02 0,00	2,0 0,39	0,1 0,01	NI NI
United Kingdom	North Sea North (lower estimate) (upper estimate)	0,13 0,18	0,08 0,22	30 30	6 6	89 89	2 7	0,00 7	11 11	4 4	2,3 2,4	18 18	3,2 3,3	114 114
	North Sea South (lower estimate) (upper estimate)	0,19 0,32	0,13 0,13	22 22	8 9	78 78	4 15	0,00 8	8 8	11 11	3,1 3,1	21 21	3,1 3,1	187 187
	North Sea (Channel) (lower estimate) (upper estimate)	0,02 0,03	0,01 0,01	9 9	2,7 2,7	18 18	2,3 5,0	0,00 6,7	6,6 6,7	2,2 2,2	1,2 1,3	9,2 9,2	1,2 1,3	22,8 22,8
	Total North Sea (lower estimate) (upper estimate)	0,34 0,53	0,22 0,36	60,5 60,8	17,2 17,6	184,6 184,6	8,5 26,1	0,00 21,4	26,0 26,1	16,8 16,8	6,6 6,7	47,9 47,9	7,5 7,6	323,9 324,0
	Celtic Sea (lower estimate) (upper estimate)	2,2 2,2	0,01 0,01	2,5 2,5	6 6	87 87	0,00 1,8	4,0 9,2	4,3 4,3	0,89 0,89	0,83 0,84	5,4 5,4	0,83 0,84	14 14
	Irish Sea (lower estimate) (upper estimate)	0,18 0,54	0,12 0,25	7 8	12 13	24 24	0,9 4,1	0,00 1,4	5,5 5,6	2,0 2,0	1,4 1,4	8 8	1,6 1,6	13 13
	Atlantic (lower estimate) (upper estimate)	0,03 0,11	0,08 0,12	8 8	1,3 1,4	21 23	0,11 6	0,00 0,00	4,4 4,4	2,0 2,0	0,87 0,87	8,2 8,2	1,0 1,0	31 31
	Total Non-North Sea (lower estimate) (upper estimate)	2,4 2,8	0,21 0,38	16,9 18,8	19,7 21,0	131,5 134,0	1,0 11,8	4,0 10,5	14,2 14,3	4,8 4,9	3,1 3,1	21,4 21,4	3,5 3,5	57,8 57,8

[^] 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 2002 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)	3,5 13,6	1,0 1,2	78 89	100 118	448 521	19 52	0,0 96	2,1 7,3	41 47	2,1 2,3	46 68	3,1 8,2	671 791
Denmark	North Sea Skagerrak Kattegat								NI NI NI	16 2,1 28	0,16 0,03 0,42	20 2,5 33	0,53 0,09 0,84	
France	Channel/North Sea Atlantic	no data submitted for 2002												
Germany	North Sea (lower estimate) (upper estimate)	8,9 9,1	4,4 4,4	286 286	219 220	2601 2601	109 109	7,0 42	9,9 9,9	241 241	4,4 4,5	304 304	13,0 13,0	1889 1933
Iceland	Atlantic	no data submitted for 2002												
Ireland	Irish Sea (lower estimate) (upper estimate) Celtic Sea (lower estimate) (upper estimate) Atlantic (lower estimate) (upper estimate)	0,3 0,8 0,2 3,1 0,0 2,3		28 29 57 59 41 45	17 21 24 49 6 28	87 87 241 241 312 313			0,5 0,5 1,2 1,3 0,3 0,5	27 27 73 73 13	0,4 0,4 1,2 1,2 0,4 0,5	27 27 84 84 24	0,5 0,5 1,6 1,6 0,9	119 119 175 175 145
Netherlands	North Sea (lower estimate) (upper estimate)	8,6 10	3,3	524	383	2132	41 55	217	16	308	10	423	29	3652
Norway	Skagerrak (lower estimate) (upper estimate) North Sea (lower estimate) (upper estimate) Norwegian Sea (lower estimate) (upper estimate) Barents Sea (lower estimate) (upper estimate)	1,2 1,3 0,37 0,53 0,49 0,80 0,01 0,22	0,87 0,92 0,12 0,15 0,44 0,49 0,13 0,13	70 71 14 14 48 48 20 20	20 20 7 7 8,9 8,9 0,65 0,93	244 245 63 66 84 95 71 72	25 25 0,83 0,83 0,40 0,73 0,36 0,45		1,2 1,2 0,22 0,24 1,2 1,3 0,21 0,21	16 16 5 5 3 3 0,25 0,25	0,31 0,31 0,16 0,17 0,26 0,28 0,06 0,07	26 26 9 9 10 10 4,1 4,1	1,6 1,6 0,66 0,66 1,2 1,2 0,19 0,19	196 197 63 71 284 294 26 28
Portugal	Atlantic (lower estimate) (upper estimate)	no data submitted for 2002												
Spain	Atlantic (lower estimate) (upper estimate)	1,3 9,2	0,1 12	10 117	5,4 68	850 855	9 25	20 35	10,9 11,1	109 109	1,6 2,3	57 57	3,4 3,4	228 230
Sweden	Kattegat Skagerrak (estimate) (estimate)	0,4 0,0	0,1 0,01	34 3,7	9 1,0	109 13	NI NI	NI NI	1,1 0,1	18 1,3	0,3 0,04	32 2,9	0,5 0,1	NI NI
United Kingdom	North Sea North (lower estimate) (upper estimate) North Sea South (lower estimate) (upper estimate) North Sea (Channel) (lower estimate) (upper estimate) Total North Sea (lower estimate) (upper estimate) Celtic Sea (lower estimate) (upper estimate) Irish Sea (lower estimate) (upper estimate) Atlantic (lower estimate) (upper estimate) Total non-North Sea (lower estimate) (upper estimate)	0,9 3,8 2,7 2,9 0,6 0,8 4,1 7,5 0,6 1,5 2,7 3,2 0,8 4,0 7,3	1,1 1,1 0,6 0,6 0,15 0,19 1,8 2,0 0,1 0,2 0,2 0,3 0,2 0,4 1,3	67 68 117 117 51 52 234,1 237,0 52 53 106 106 57 214,6 216,3	68 69 188 189 21 24 277,3 282,2 31 41 142 145 18 191,4 205,6	346 368 585 586 172 174 1103,3 1127,9 273 273 621 632 123 1016,5 1039,8	5 60 2 69 0,4 14 7,1 142,8 1 45 26 2 2,4 113,6	0,0 43 0 94 0,0 15,0 0,2 152,5 0,0 38 65 0,0 9 112,1	1,2 1,3 3,3 3,3 0,6 0,7 5,1 5,3 1,1 1,1 5 5 2,2 7,9 8,2	38 38 103 103 34 34 174,6 174,7 49 49 37 37 14 99,5 100,2	1 1 7 7 1,2 1,2 9,2 9,3 2,2 2,2 2,9 3,1 1,3 6,4 6,6	48 48 108 108 35 35 190,9 191,0 51 51 43 43 20 113,1 113,5	2 2 7 7 1,2 1,2 9,7 9,8 2,2 2,2 3,0 3,2 2,5 7,7 7,9	267 271 615 616 311 313 1192,9 1199,9 463 464 577 584 358 1393,8 1405,5

[^] 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. Sum of Direct (Table 2) and Riverine (Table 3) Inputs to the Maritime Area of the OSPAR Convention in 2002 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)	3,5	1,0	78	100	448	19	0,00	2,1	41	2,1	46	3,1	671
	(upper estimate)	14	1,2	89	118	521	52	96	7,3	47	2,3	68	8,2	791
Denmark	North Sea	NI	NI	NI	NI	NI	NI	NI	NI	16	0,17	20	0,55	NI
	Skagerrak	NI	NI	NI	NI	NI	NI	NI	NI	2,1	0,04	2,6	0,10	NI
	Kattegat	NI	NI	NI	NI	NI	NI	NI	NI	29	0,47	34	0,9	NI
France	Channel/North Sea	NI	NI	NI	NI	NI	NI	NI	0,0	0	0,0	0,0	0,00	0
	Atlantic	NI	NI	NI	NI	NI	NI	NI	0,0	0	0,0	0,0	0,00	0
Germany	North Sea (lower estimate)	8,9	4,4	288	220	2611	109	7,0	12	243	4,5	308	13	1891
	(upper estimate)	9,2	4,5	289	222	2616	109	45	12	243	4,6	308	13	1935
Iceland	Atlantic	no data submitted for 2002												
Ireland (2)	Irish Sea (lower estimate)	0,4	NI	36	21	150	NI	NI	0,5	0	0,4	6,8	1,6	38
	(upper estimate)	0,9	NI	36	24	150	NI	NI	0,5	27,4	0,4	33,9	2,1	157,5
	Celtic Sea (lower estimate)	0,2	NI	60	29	262	NI	NI	1,2	0	1,2	2,7	0,7	19
	(upper estimate)	3,1	NI	63	53	262	NI	NI	1,3	73,3	1,2	86,8	2,3	193,9
	Atlantic (lower estimate)	0,0	NI	41	7	319	NI	NI	0,3	0	0,4	0,7	0,2	4
	(upper estimate)	2,3	NI	45	28	321	NI	NI	0,5	12,8	0,5	24,9	1,1	149,1
Netherlands (3)	North Sea (lower estimate)	8,8					41							
	(upper estimate)	10	3,3	528	386	2159	55	217	16	309	10	429	29	3656
Norway	Skagerrak (lower estimate)	1,3	0,89	82	20	261	25	NI	3	16	0,38	31	1,8	199
	(upper estimate)	1,4	0,94	82	20	261	25	NI	3	16	0,38	31	1,8	200
	North Sea (lower estimate)	0,51	0,13	19	12	90	0,83	NI	2,0	5	0,32	12	1,0	112
	(upper estimate)	0,67	0,16	19	12	92	0,83	NI	2,1	5	0,33	12	1,0	120
	Norwegian Sea (lower estimate)	0,54	0,45	57	10	97	0,40	NI	3,7	3	0,51	14	1,7	754
	(upper estimate)	0,85	0,50	57	10	109	0,73	NI	3,7	3	0,53	14	1,7	764
	Barents Sea (lower estimate)	0,01	0,13	21	0,70	72	0,36	NI	0,39	0,25	0,08	4,4	0,22	238
	(upper estimate)	0,22	0,13	21	1,0	73	0,45	NI	0,21	0,25	0,09	4,4	0,22	239
Portugal	Atlantic	0,00	0,00	0	0,0	0	NI	NI	0,00	0	0,0	0	0,0	0
		0,0	0,0	0	0,0	0	NI	NI	0,00	0	0,0	0	0,0	0

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	3,0 18	1,0 13	19 134	15 127	928 943	11 42	79 105	21 21	113 113	3,1 3,8	79 79	6,7 6,8	577 580
Sweden	Kattegat (lower estimate) Skagerrak (lower estimate)	0,38 0,03	0,08 0,01	35 4,1	9 1,0	115 13	NI NI	NI NI	2,3 0,22	19 1,3	0,28 0,04	34 3,3	0,59 0,08	NI NI
United Kingdom	North Sea North (lower estimate)	1,0	1,1	97	74	435	6	0	13	42	3	66	5	381
	(upper estimate)	4,0	1,3	98	75	457	67	50	13	42	3	66	5	385
	North Sea South (lower estimate)	2,8	0,71	138	197	663	6,3	0,24	11	114	10	128	10	802,2
	(upper estimate)	3,3	0,77	138	198	664	83	102	11	114	10	128	10	803,4
	North Sea Channel (lower estimate)	0,57	0,16	60	24	190	2,7	0,00	7,3	36	2,5	44	2,5	333,8
	(upper estimate)	0,78	0,20	61	26	191	19	22	7,3	36	2,5	44	2,5	335,8
	North Sea (lower estimate)	4,4	2,0	295	294	1288	16	0,24	31	191	16	239	17	1517
	(upper estimate)	8,0	2,3	298	300	1313	169	174	31	192	16	239	17	1524
	Celtic Sea (lower estimate)	2,7	0,06	54	37	359	1	4,0	5,4	50	3,0	56	3,0	477
	(upper estimate)	3,7	0,17	55	47	359	47	47	5,4	50	3,0	56	3,0	477
	Irish Sea (lower estimate)	2,9	0,28	113	155	645	1	0,13	10	38	4,3	51	4,6	590
	(upper estimate)	3,7	0,53	115	158	656	30	67	10	39	4,5	51	4,9	597
Atlantic	(lower estimate)	0,79	0,30	64	19	144	2	0,00	6,6	16	2,2	28	3,5	384
	(upper estimate)	2,7	1,0	65	22	158	49	9	6,7	16	2,2	28	3,5	389
	non-North Sea (lower estimate)	6,4	0,64	231	211	1148	3	4	22	104	9	134	11	1452
	(upper estimate)	10	1,7	235	227	1174	125	123	22	105	10	135	11	1463
Total reported:		38	11	1208	926	7614	222	90	95	748	37	928	58	7137
		78	28	1875	1512	9932	560	737	117	1178	49	1515	96	11437

(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. Sum of Direct and Riverine Inputs to the Maritime Area of the OSPAR Convention in 2002 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>	0,01	0,13	21	0,70	72	0,36	NI	0,39	0,25	0,08	4,4	0,22	238
	Barents Sea	0,22	0,13	21	1,0	73	0,45	NI	0,21	0,25	0,09	4,4	0,22	239
North Sea	<i>Atlantic Ocean</i> (main body)	0,80 5,0	0,30 1,0	106 110	26 50	463 479	2 49	0,00 9	6,9 7,2	16 29	2,6 2,7	28 53	3,7 4,6	389 538
	<i>Bay of Biscay and Iberian Coast</i>	3,0 18	0,96 13	19 134	15 127	928 943	11 42	78,6 105	21 21	113 113	3,1 3,8	79 79	7 7	577 580
	Kattegat (lower estimate)	0,38	0,08	35	8,8	115	NI	NI	2,3	47	0,75	68	1,5	0,00
	(upper estimate)	0,38	0,08	35	8,8	115	NI	NI	2,3	47	0,75	68	1,5	0,00
	Skagerrak (lower estimate)	1,3	0,90	86	21	274	25	NI	3,2	20	0,45	37	1,9	199
	(upper estimate)	1,4	1,0	86	22	275	25	NI	3,2	20	0,45	37	1,9	200
	North Sea (lower estimate)	26	7	620	603	4247	182	7	40	460	20	581	33	3857
	(upper estimate)	41	11	1162	1011	6510	367	510	61	775	31	1032	67	7690
	Channel (lower estimate)	0,57	0,16	60	24	190	2,7	0,00	7,3	36	2,5	44	2,5	334
	(upper estimate)	0,78	0,20	61	26	191	19	22	7,3	36	2,5	44	2,5	336
Norwegian Sea	(lower estimate)	0,54	0,45	57	10	97	0,40	NI	3,7	3	0,51	14	1,7	754
	(upper estimate)	0,85	0,50	57	10	109	1	NI	3,7	3	0,53	14	1,7	764
Irish Sea	(lower estimate)	3,2	0,28	149	175	795	1	0,13	11	38	4,7	57	6	628
	(upper estimate)	4,6	0,53	151	182	807	30	67	11	67	4,9	85	7	754
Celtic Sea	(lower estimate)	2,9	0,06	114	66	621	1	4,0	7	50	4,2	59	3,7	495
	(upper estimate)	6,9	0,17	118	100	622	47	47	7	123	4,2	143	5,3	671

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.