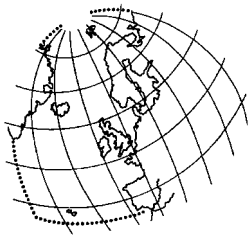
Assessment and Monitoring Series

Comprehensive Atmospheric Monitoring Programme (CAMP)

Observations from North-East Atlantic Coastal Stations in 2003



OSPAR Commission
2005

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.

ISBN 1-904426-76-X
Publication No. 2005/234

OR 15/2005b
APRIL 2005

COMPREHENSIVE ATMOSPHERIC MONITORING PROGRAMME

Pollutant deposits and air quality at coastal stations in 2003

OSPAR Commission
for the Protection of the Marine Environment
of the North-East Atlantic

Norwegian Institute for Air Research
P.O. Box 100, N-2027 Kjeller, Norway

NILU: OR 15/2005b

NILU: OR 15-2005b
REFERENCE: O-97146
DATE: APRIL 2005
ISBN:

Pollutant deposits and air quality at coastal stations in 2003

Kevin Barrett
Centre for Ecological Economics

contents

Executive Summary/Récapitulatif

This report presents the results of monitoring undertaken by OSPAR Contracting Parties for the Comprehensive Atmospheric Monitoring Programme (CAMP) during 2003. Under the CAMP, OSPAR Contracting Parties are committed to monitor on a mandatory basis the concentrations of a range of heavy metals, organic compounds and nutrients in precipitation and air, and their depositions. The CAMP encourages OSPAR Contracting Parties to monitor on a voluntary basis additional compounds (such as certain persistent organic pollutants). The report gives detailed information on atmospheric inputs of selected contaminants to the OSPAR maritime area and its regions.

Le présent rapport comporte les résultats de la surveillance continue effectuée par les Parties contractantes OSPAR, en 2003, dans le cadre du Programme exhaustif de surveillance continue de l'atmosphère (CAMP). Les Parties contractantes OSPAR sont tenues de surveiller obligatoirement les teneurs de toute une gamme de métaux lourds, de composés organiques et de nutriments dans les précipitations et l'atmosphère, ainsi que leurs retombées, ceci dans le cadre du CAMP. Celui-ci encourage les Parties contractantes OSPAR à surveiller de manière facultative des composés supplémentaires (tels que les polluants organiques persistants). Le rapport fournit des informations détaillées sur les apports atmosphériques de contaminants sélectionnés à la zone maritime OSPAR et à ses régions.

One third of the OSPAR Contracting Parties reported data for all components of the mandatory programme under the CAMP. The least reported of these components were γ-HCH (lindane) and mercury. In general, OSPAR Contracting Parties gave less attention to pollutants subject to voluntary monitoring. For example, three quarters of the Contracting Parties did not report data on atmospheric inputs of organic substances to waters off their coasts in 2003. Contracting Parties may wish to consider the status of implementation of the mandatory and voluntary monitoring programme. In the absence of reliable ground truth data from measurements, estimates of loads of pollutants and their potential impact on the OSPAR maritime area are purely based on assumptions.

Un tiers des Parties contractantes OSPAR notifient des données pour tous les contaminants obligatoires dans le cadre du CAMP. Le γ-HCH (lindane) et le mercure sont les contaminants les moins notifiés. De manière générale, les Parties contractantes OSPAR ont accordé moins d'importance aux polluants dont la surveillance est facultative. Les trois quarts des Parties contractantes, par exemple, n'ont pas notifié de données sur les apports atmosphériques de substances organiques dans les eaux au large de leurs côtes en 2003. Les Parties contractantes voudront, peut-être, étudier l'état de mise en oeuvre du programme de surveillance obligatoire et facultatif. En l'absence de données fiables provenant d'analyses, les estimations des charges de polluants et de leur impact potentiel sur la zone maritime OSPAR se basent uniquement sur des suppositions.

The quality control carried out by some Contracting Parties for their monitoring data falls short of what can be expected. In some cases, national data originators do not pick up relatively obvious errors. The current contract with the data manager (NILU) does not provide for quality assurance/quality control backstopping. Therefore, the validity of the results of OSPAR's monitoring of atmospheric inputs may be put at risk due to shortcomings in national data quality control.

Le contrôle de qualité, effectué par certaines Parties contractantes, et qui porte sur leurs données découlant de la surveillance continue, ne correspond pas à ce que l'on attendait. Dans certains cas, les responsables des données nationales ne relèvent pas des erreurs relativement évidentes. Le contrat actuel qu'OSPAR a avec le gérant des données (NILU) n'assure pas le soutien du point de vue de l'assurance/contrôle de qualité. La validité des résultats provenant de la surveillance OSPAR des apports atmosphériques risque donc d'être compromise à cause des insuffisances que présente le contrôle de qualité des données nationales.

It is a significant advantage of a centralised review of atmospheric inputs data that it allows the detection of inconsistencies in the spatial and temporal resolution of monitoring for various locations. This is illustrated by the example of one Contracting Party which, after such a recent review, chose to revise its monitoring programme. Thus, the CAMP with the centralised review of data can be seen to have been beneficial for monitoring practice. A similar review could possibly be undertaken for other locations in future. For example, reported concentrations of pollutants are sometimes notably above the levels monitored in neighbouring countries at neighbouring sites. Similarly, reported concentrations of heavy metals and organic substances can be below the detection limits, but with detection limits being unusually high. This might be sufficient to shed doubt upon data despite its validation by the national data suppliers.

Une étude centralisée des données sur les apports atmosphériques présente l'avantage important de permettre la détection de contradictions dans la résolution spatiale et temporelle de la surveillance dans divers emplacements. Une Partie contractante, par exemple, a décidé de revoir son programme de

surveillance à la suite d'une telle étude récente. Le CAMP, accompagné de l'étude centralisée des données, semble donc présenter des avantages en tant que pratique de surveillance. Il serait éventuellement judicieux, à l'avenir, d'entreprendre une telle étude pour d'autres emplacements. Par exemple, les teneurs notifiées en polluants se situent quelquefois nettement au dessus des teneurs surveillées dans les pays voisins dans des sites voisins. De même, les teneurs notifiées en métaux lourds et en substances organiques peuvent être inférieures aux limites de détection alors que celles-ci sont anormalement élevées. Il semblerait dont que les données ne soient pas assez fiables malgré leur validation par les responsables des données nationales.

1. Introduction

This report describes the results reported by coastal monitoring stations across the OSPAR Convention area (see Figure 2.1) under the Comprehensive Atmospheric Monitoring Programme (CAMP).

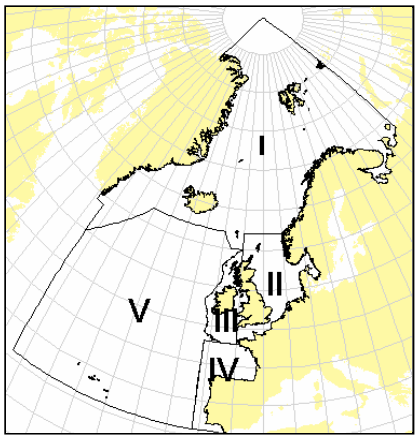


Figure 1.1 OSPAR maritime area and regions I: Arctic waters, II: Greater North Sea, III: Celtic Seas, IV: Bay of Biscay, V: Wider Atlantic

The Comprehensive Atmospheric Monitoring Programme forms one element within the wider Joint Assessment and Monitoring Programme of OSPAR. One objective of the CAMP is to monitor the concentrations of selected contaminants in precipitation and air, and their depositions, in order to assess, as accurately as appropriate, the atmospheric input of these contaminants to the OSPAR maritime area and its regions (Figure 1.1) on an annual basis. This is to be achieved through a monitoring regime with relevant substances, sampling methods, locations and frequency and analysis and assessment methodologies. This regime is set out in the CAMP Principles (OSPAR reference number: 2001-7).

The components of interest to the CAMP are divided into two groups, for measurement on a mandatory basis and for measurement on a voluntary basis. These are listed in table 1.1.

Table 1.1 Components to be measured under the CAMP

	Mandatory	**Voluntary**
Precipitation	As, Cd, Cr, Cu, Pb, Hg, Ni, Zn, γ-HCH, NH_4^+, NO_3^-	PCB 28,52,101,118,138,153,180 PAHs: Phenanthrene, anthracene, flouranthene, pyrene, benzo(*a*)anthracene, chrysene, benzo(*a*)pyrene, benzo(*ghi*)perylene, indeno(*1,2,3-cd*)pyrene
Airborne	NO_2, HNO_3, NH_3, NH_4^{+a}, NO_3^{-a}	As, Cd, Cr, Cu, Pb, Hg, Ni, Zn, γ-HCH, PCB 28,52,101,118,138,153,180, PAHs: Phenanthrene, anthracene, flouranthene, pyrene, benzo(*a*)anthracene, chrysene, benzo(*a*)pyrene, benzo(*ghi*)perylene, indeno(*1,2,3-cd*)pyrene, NO

[a]) total ammonium (NH_3 + NH_4^+) and total nitrate (HNO_3 +NO_3^-) is an alternative.

For quality assurance purposes, the reporting of pH, electrical conductivity, and concentrations in precipitation of all major irons (Na^+, K^+, Mg^{2+}, Ca^{2+}, SO_4^{2-}, Cl^-, NH_4^+, NO_3^-, HCO_3^-) is also encouraged.

The CAMP Principles call for each Contracting Party bordering the OSPAR maritime area (excluding the EU) to operate at least one monitoring station on the coast and/or offshore as part of the CAMP. Where Parties border more than one region (see Figure 1) at least one station should be operating in each. These stations should be so-called *background stations*, i.e. not directly influenced by local emission sources. The stations should be located not more than 10 km from the coastline.

The data assembled by monitoring stations are reported by Contracting Parties to the Norwegian Institute for Air Research (NILU) on a yearly basis, using a reporting format, and according to the time schedule set out in the CAMP Principles. Based on the data received, NILU prepares a CAMP data report on an annual basis for OSPAR subsidiary bodies to examine.

The present CAMP data report "Observations from North-East Atlantic Coastal Stations in 2003" gives in chapter 2 an overview of reported data and the implementation of the CAMP Principles in 2003. To this end, the geographical coverage, the contaminants covered which are subject to mandatory monitoring, and the timeliness of data submission are presented. In chapter 3, an overview is given of the 2003 annual average values of the components subject to mandatory monitoring for the North-East Atlantic. In chapter 4, temporal trends for the deposition of nitrogen to the Atlantic coastline and the North Sea in 2003 are shown, questions of detection limits are discussed, with lindane as an instance, and issues relating to data quality assurance are addressed. Chapter 5 summarises the report's observations on the reported CAMP data for 2003. The detailed data submitted by Contracting Parties are appended to this report (Annex 1).

2. The OSPAR CAMP Monitoring Programme in 2003

2.1 Geographical coverage

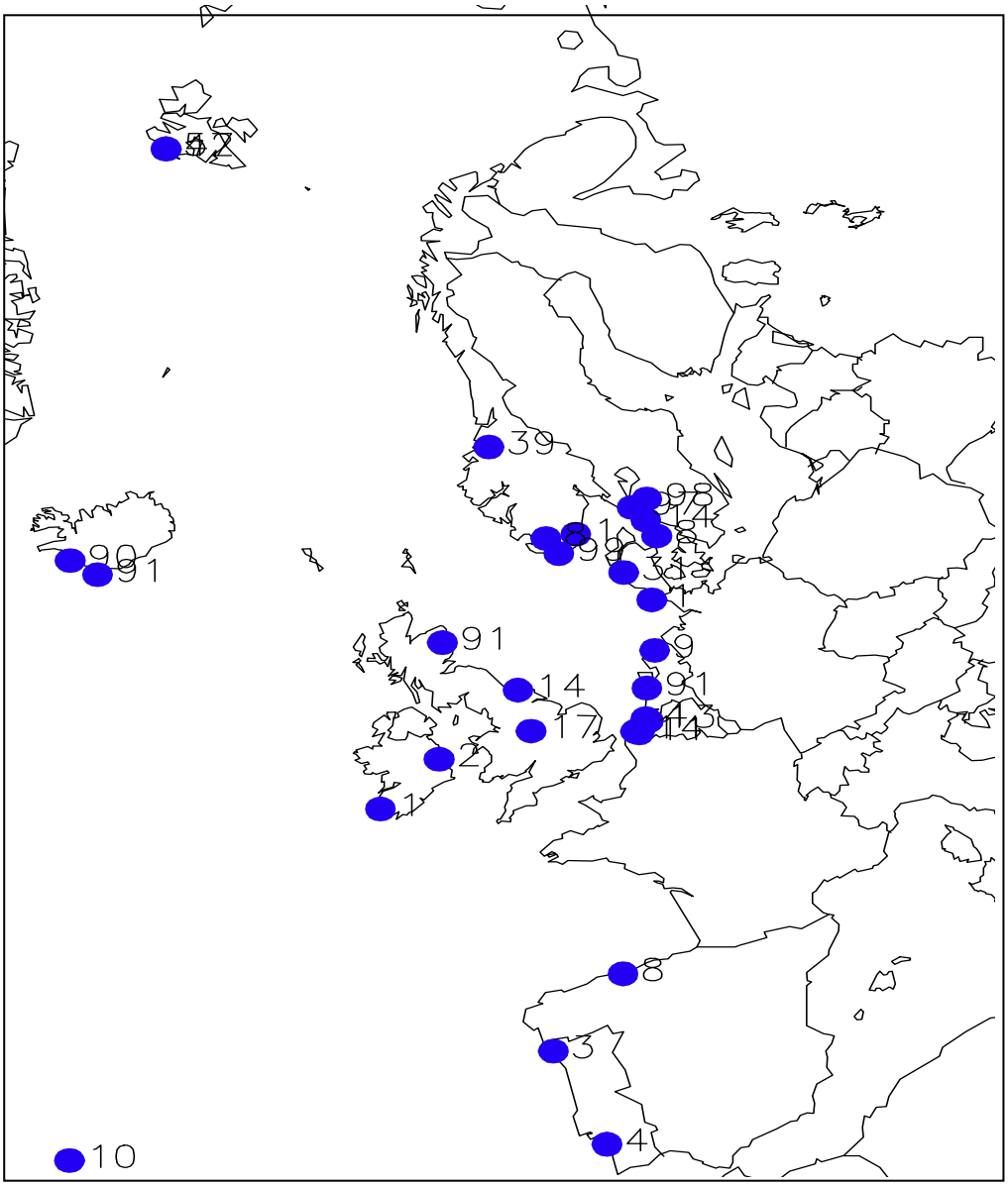


Figure 2.1 Monitoring sites reporting to OSPAR in 2003. Numbers refer to stations listed in table 2.1

The distribution of monitoring stations in the North-East Atlantic for reporting under the CAMP in 2003 remained unchanged from the previous year with the exception of those in the United Kingdom. It is important to note that France did not report any data for 2003. In general, the geographical coverage of the southern North Sea, the Skaggerak and the Kattegat by reporting monitoring stations was very good in 2003. Monitoring in the northern regions was more dispersed.

The geographical distribution of monitoring stations observing wet deposition of contaminants and of those reporting on ambient air quality in 2003 varies. Table 2.1 details the monitoring stations, and indicates the kind of monitoring undertaken: monitoring of airborne contaminants and/or measurement of contaminants in precipitation. Not all stations reported data for all components. This is also illustrated in the maps in chapter 4 showing the distribution of the deposition of selected contaminants.

Table 2.1 Stations reporting precipitation and air quality to OSPAR in 2003.

Country	Station number	Station name	Latitude	Longitude	Elevation/ Altitude (m)	Distance from sea (km)	Precipitation(p) airborne(a) monitoring
Belgium	BE0004r	Knokke	51°21' N	3°20' E	0	1	pa
	BE0011r	Moerkerke	51°01' N	2°35' E	0	9	a
	BE0013r	Houtem	51°15' N	3°21' E	10	12	a
	BE0014r	Koksijde	51°7' N	2°30' E	7	1.5	p
Denmark	DK0008r	Anholt	56°43' N	11°31' E	40	~0.5	pa
	DK0031r	Ulborg	56°17' N	8°26' E	40	20	pa
France	none						
Germany	DE0001r	Westerland	54°56' N	8°19' E	12	0.09	pa
Iceland	IS0090r	Irafoss	64°08' N	21°54' W	52	1	p
	IS0091r	Storhofdi	63°24' N	20°17' W	118	0.5	pa
Ireland	IE0001r	Valentia Island	51°56' N	10°15' W	9	0	p
	IE0002r	Turlough Hill	53°02' N	6°24' W	420	19	p
Netherlands	NL0009r	Kollumerwaard	53°20' N	6°17' E	1	7.5	pa
	NL0091r	De Zilk	52°18' N	4°31' E	4	2.5	pa
Norway	NO0001r	Birkenes	58°23' N	8°15' E	190	20	p
	NO0039r	Kaarvatn	62°47' N	8°53' E	210	70	p
	NO0042r	Zepellinfjell	78°54' N	11°53' E	474	2	a
	NO0057r	Ny Aalesund	78°55' N	11°55' E	8	0.3	pa
	NO0099r	Lista	58°06' N	6°34' E	13	0.1	p
Portugal	PT0003r	Viana do Castelo	41°42' N	8°48' W	16	4	p
	PT0004r	Monte Velho	38°05' N	8°48' W	43	1.5	p
	PT0010r	Angra do Heroismo	38°40' N	27°13' W	74	1	p
Spain	ES0008r	Niembro	43°27'N	4°51' W	134		p
Sweden	SE0014r	Rao	57°24' N	11°55' E			pa
	SE0097r	Gaardsjoen	58°03' N	12°01' E	113	12	p
	SE0098r	Svartedalen	57°59' N	12°06' E	120	16	p
United	GB0014r	High Muffles	54°20' N	0°48' W	267		pa
Kingdom	GB0017r	Heigham Holmes	52°45' N	1°38' W	0		pa
	GB0091r	Banchory	57°05' N	2°32' W	120		pa

2.2 Coverage of pollutants

The requirement of mandatory monitoring under the CAMP has not been fully complied with for all components concerned. Half of the Contracting Parties, however, reported concentrations of all mandatory components in precipitation. Two of twelve Contracting Parties reported concentrations in precipitation for less than half of the components of the mandatory programme. The least reported contaminants are the two toxic substances mercury and lindane. For air concentrations, reported data were, in general, fewer. One quarter of the Contracting Parties did not report air concentrations for any of the components subject to mandatory monitoring. Ground truth on the state of atmospheric pollution of OSPAR coastal waters was more sparse than for 2002.

Table 2.2 Reported data on concentrations of contaminants in precipitation for 2003 – mandatory monitoring

	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	γ-HCH	NH_4	NO_3
Belgium	•	•	•	•	•	•	•	•	•	•	•
Denmark	•	•	•	•	•		•	•		•	•
France											
Germany	•	•	•	•	•	•	•	•	•	•	•
Iceland	•	•	•	•	•		•	•	•	•	•
Ireland	•	•	•	•	•	•	•	•	•	•	•
Netherlands	•	•	•	•	•	•	•	•	•	•	•
Norway	•	•	•	•	•	•	•	•	•	•	•
Portugal		•		•	•		•	•		•	•
Spain										•	•
Sweden	•	•	•	•	•	•	•	•	•	•	•
United Kingdom	•	•	•	•	•		•	•		•	•

Grey boxes indicate contaminants for which no data were reported.

Table 2.3 Reported data on concentrations of contaminants in air for 2003 – mandatory monitoring

	NO_2	NO_3	NH_x
Belgium	•		
Denmark	•	•	•
France			
Germany	•	•	•
Iceland		•	
Ireland			
Netherlands	•	•	•
Norway	•	•	•
Portugal			
Spain	•	•	•
Sweden	•	•	•
United Kingdom	•	•	•

Grey boxes indicate contaminants for which no data were reported.

.

2.3 Timeliness of reporting

The reporting of data, in accordance with the time schedule of the CAMP Principles (see table 2.4), and in time for their consideration by INPUT, was poorer for 2003 data than for previous reporting years. Table 2.5 gives an overview of the actual receipt of national reports and the present status of reporting. More than half of the Contracting Parties submitted their reports within, or close to, the relevant deadlines. The latest submitted data to be included in this report were received on 1st April 2005.

Table 2.4 Timetable for data reporting according to the CAMP Principles

30th June	Call for metadata and data issued from NILU (regarding new data and metadata), with instructions and reference to supporting software (e.g. where to find tools on the NILU website).
30th September	Participants submit data and metadata via email or on diskette, in specified formats.
31st October	NILU returns data and metadata via email or on diskette in the form of a 'validation report' to data originators for verification and signing off by the data originators within **two weeks** of reception.

Table 2.5 History of reporting of 2003 CAMP data

Country	**Data/comment**
Portugal	√
Ireland	√
June 30, 2004 - Deadline for data request issue by NILU	
Denmark	Partial data
Iceland	√
Netherlands	√
Norway	√
Spain	√
Sweden	√
September 30, 2004 - Deadline for receipt of data	
Belgium	√
Germany	√
October 31, 2004 - Deadline for Validation Report issue by NILU	
France	Not reported
United Kingdom	Not reported
December 3, 2004 - Reporting to INPUT by NILU	
United Kingdom	Partial data
January 2005 – INPUT, London	
Denmark	Further data reported
France	No data available for 2003
United Kingdom	Further data reported
April 2005 – Final Report delivery	

3. Observed depositions of pollutants in 2003

This section gives an overview of atmospheric conditions around the North-East Atlantic in 2003. It lists and displays the annual average values of the concentrations of contaminants subject to mandatory monitoring, and their deposition to the OSPAR maritime area.

For heavy metals, the concentrations in precipitation measured in 2003 are presented in table 3.1, the corresponding estimated depositions and their distribution in the North-East Atlantic are illustrated in figures 3.1 – 3.7. Reported concentrations of mercury in precipitation and their estimated depositions are given separately in table 3.2; the distribution of mercury deposition is estimated depositions are given separately in table 3.2; the distribution of mercury deposition is illustrated in figure 3.8. Concentrations and deposition distribution patterns for lindane are given in table 3.3 and figure 3.9, respectively. Similarly, for nitrogen the concentrations in precipitation and the estimated depositions are set out in table 3.4, with the distribution of the depositions presented in figures 3.10 and 3.11. The deposition rates were calculated in accordance with the CAMP Principles and their interpretation of detection limits. This means that for data flagged as '780' (observation below detection limit, value is best estimate) the reported value was employed; for data flagged as '781' (observation below detection limit, value is detection limit), a value of half the detection limit was used.

3.1 Heavy metals (except mercury)

Table 3.1 Reported mean annual concentrations of heavy metals in precipitation (µg/l). These are precipitation-weighted values; precipitation amounts are given in mm.

		Cd	As	Cr	Cu	Ni	Pb	Zn	prec
		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mm
Belgium	**BE0004R**	1,25	0,24	1,49	2,54	2,33	2,58	33,39	942
Germany	**DE0001R**	0,04	0,14	0,14	0,79	0,24	1,17	7,20	622
Denmark	**DK0008R**	0,10	0,22	0,22	1,20	0,34	1,29	8,50	550
	DK0031R	0,05	0,19	0,18	1,68	0,30	1,09	9,21	715
UK	**GB0017R**	0,03	0,15	0,11	0,98	0,34	1,08	5,81	293
	GB0091R	0,04	0,55	0,29	0,75	0,41	1,18	8,82	393
Ireland	**IE0001R**	0,05	0,50	0,50	0,50	0,50	0,50	32,47	1507
	IE0002R	0,05	0,50	0,50	1,15	0,50	1,05	9,38	1516
Iceland	**IS0090R**	0,01	0,17	0,34	1,85	0,61	0,49	4,68	1097
	IS0091R	0,02		1,19	31,42	1,11	0,70	11,51	1770
Netherland	**NL0009R**	0,05	0,29	0,35	1,40	0,32	1,64	7,13	637
	NL0091R	0,06	0,14	0,28	2,00	0,31	2,39	7,41	614
Norway	**NO0001R**	0,04					1,57	3,93	1374
	NO0099R	0,06	1,01	0,31	1,30	0,50	1,92	7,54	1190
Portugal	**PT0003R**	0,43			0,97	0,93	0,65	16,09	250
	PT0004R	0,43			0,80	1,93	0,65	10,09	575
	PT0010R	0,43			1,07	7,70	2,62	100,42	856
Sweden	**SE0097R**	0,05	0,16	0,20	1,21	0,19	1,13	5,01	754

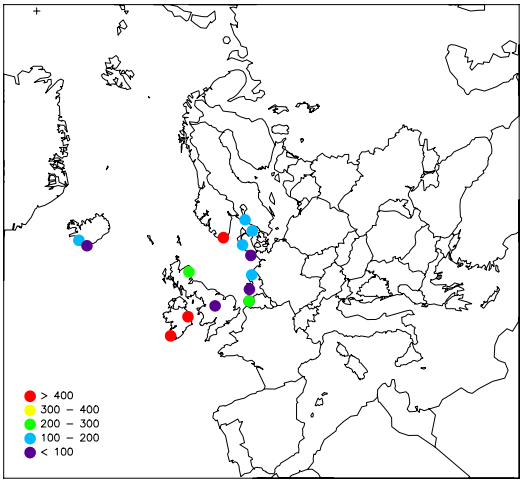


Figure 3.1 Arsenic depositions 2003, µg/m^2

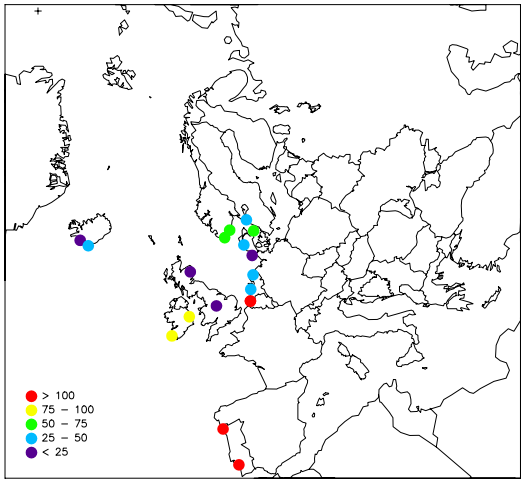


Figure 3.2 Cadmium depositions 2003, µg/m^2

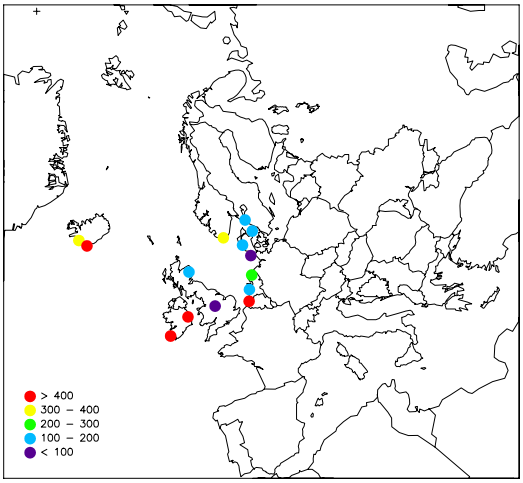


Figure 3.3 Chromium depositions 2003, µg/m^2

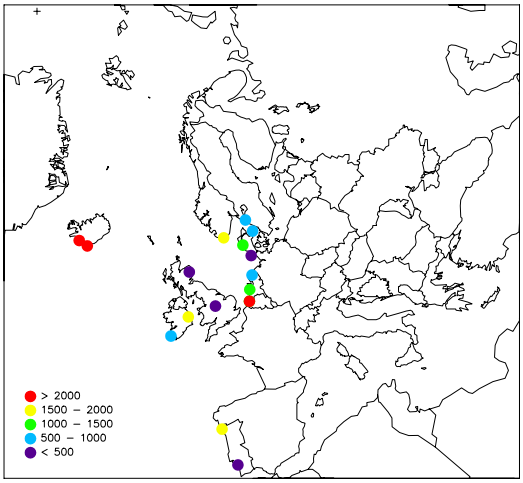


Figure 3.4 Copper depositions 2003, µg/m^2

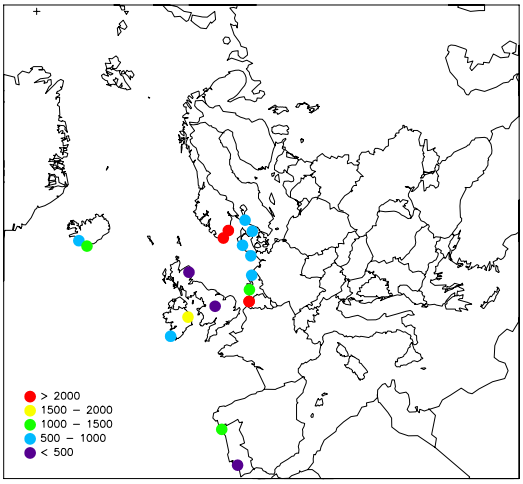


Figure 3.5 Lead depositions 2003, µg/m^2

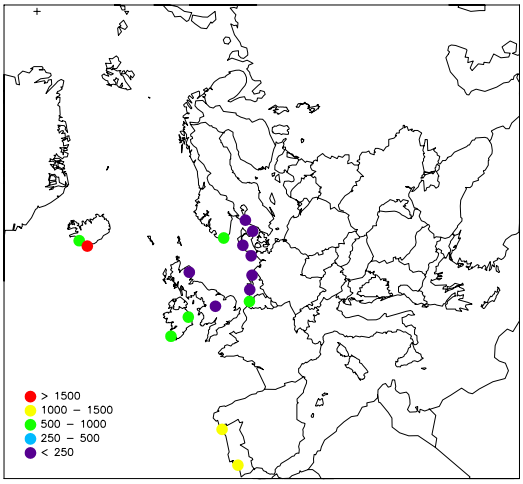


Figure 3.6 Nickel depositions 2003, µg/m^2

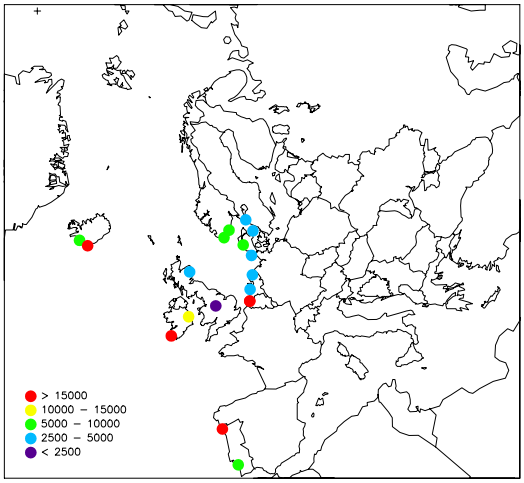


Figure 3.7 Zinc depositions 2003, µg/m^2

3.2 Mercury

Table 3.2 Reported concentrations of mercury in precipitation (ng/l) and its estimated deposition (ng/m^2)

		concentration	deposition	precipitation
		ng/l	ng/m^2	mm
Belgium	**BE0004R**	0,01	3,99	332,61
Germany	**DE0001R**	9,1	5356	589,5
Ireland	**IE0001R**	50,00	75267,75	1505,36
	IE0002R	50,00	75724,75	1514,50
Netherland	**NL0091R**	7,80	5413,51	693,70
Norway	**NO0099R**	7,84	3685,90	469,90
Sweden	**SE0014R**	9,04	4625,38	511,60

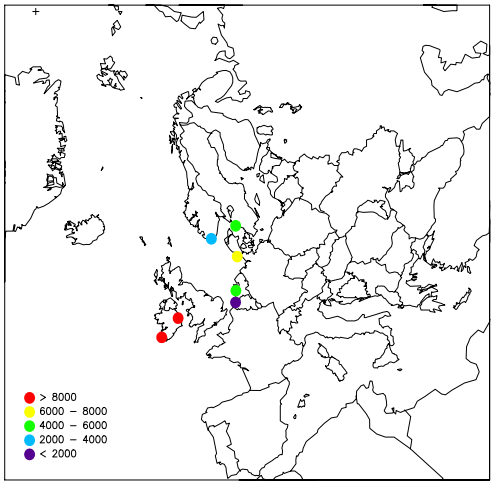


Figure 3.8 Mercury depositions 2003, ng/m^2

3.3 Lindane

Table 3.3 Reported annual concentrations of γ-HCH in precipitation (prec. wtd) and its deposition (ng/m^2) - in decreasing order of deposition quantities

		concentration	deposition	precipitation
		ng/l	ng/m2	mm
Netherland	**NL0091R**	7,58	5140,84	678,30
Belgium	**BE0004R**	7,02	2335,23	332,61
Germany	**DE0001R**	1,70	1020,71	585,60
Norway	**NO0099R**	0,91	881,77	974,62
Ireland	**IE0002R**	0,47	708,78	1514,50
Sweden	**SE0014R**	1,06a	356,88	
Iceland	**IS0091R**	0,07	52,65	737,19

[a] observation of precipitation plus dry deposition

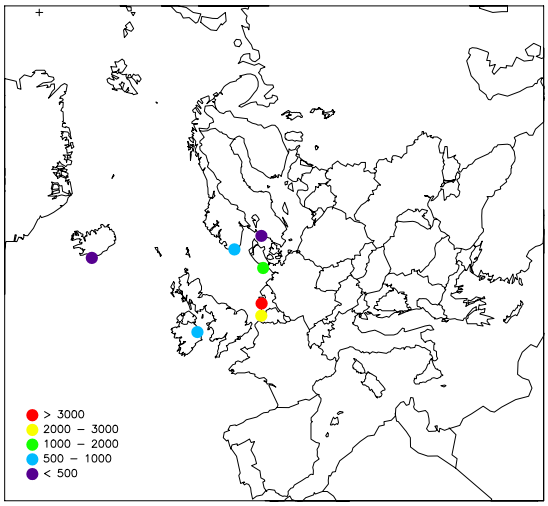


Figure 3.9 Lindane depositions 2003, ng/m^2

3.4 Nitrogen

Table 3.4 Reported mean annual concentrations (prec. wtd) of nitrogen in precipitation (mg/l) and its depositions (mg/m^2)

		nitrate	ammonium	precipitation	nitrate	ammonium
		mg/l	mg/l	mm	mg/m2	mg/m2
Belgium	**BE0014R**	0,41	0,61	528,60	215,14	322,97
Germany	**DE0001R**	0,62	0,73	578,70	356,20	422,00
Denmark	**DK0008R**	0,54	0,50	546,39	293,41	274,83
UK	**GB0014R**	0,49	0,57	628,60	309,12	358,12
	GB0017R	0,57	0,94	455,80	261,63	428,91
	GB0091R	0,46	0,41	486,30	225,64	196,95
Spain	**ES0008R**	0,68	0,56	673,00	458,31	376,21
Ireland	**IE0001R**	0,13	0,24	1505,36	188,17	364,30
Iceland	**IS0090R**	0,10	0,35	844,83	86,17	292,31
	IS0091R	0,09	0,34	1770,42	159,34	594,86
Netherlands	**NL0009R**	0,48	0,87	669,37	322,64	581,01
	NL0091R	0,45	0,66	681,29	306,58	446,25
Norway	**NO0001R**	0,50	0,47	1374,50	692,75	644,64
	NO0039R	0,08	0,12	1664,30	128,15	191,39
	NO0057R	0,11	0,12	206,50	22,92	24,57
	NO0099R	0,83	0,85	469,90	389,55	399,88
Portugal	**PT0003R**	0,24	0,14	1571,88	372,53	213,78
	PT0004R	0,16	0,08	575,50	94,38	46,04
	PT0010R	0,41	0,04	1117,50	462,65	45,82
Sweden	**SE0014R**	0,49	0,45	600,80	296,19	272,76
	SE0098R	0,60	0,49	1002,62	601,57	491,29

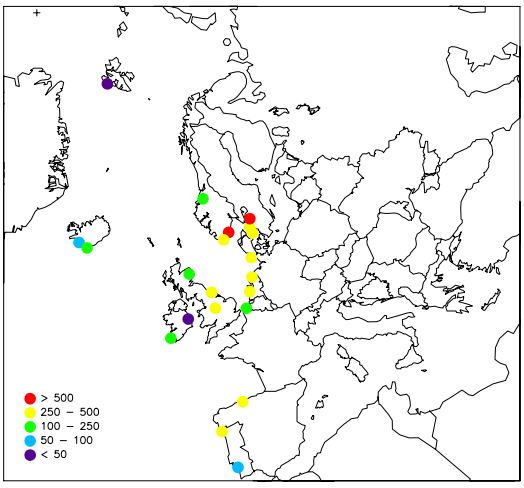


Figure 3.10 Nitrate depositions 2003, mg/m^2

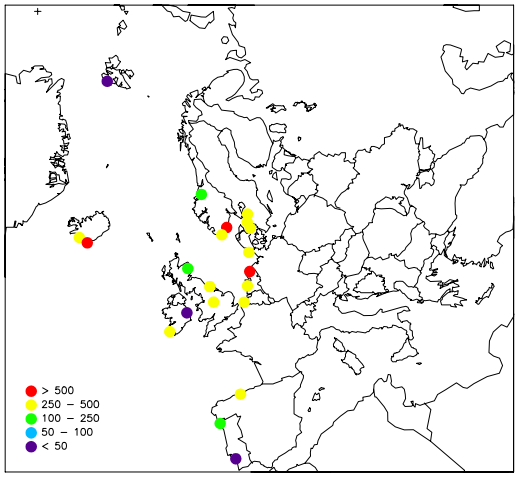


Figure 3.11 Ammonium depositions 2003, mg/m^2

4. Temporal trends and quality control

4.1 Seasonal patterns

Nitrogen has been selected here for displaying temporal trends. For heavy metals, temporal trends were given in the 2004 NILU CAMP data report based on 2002 data. An attempt was made to provide information of broad geographical coverage by means of averaging across stations. The potential impact of the absence of data from France must be taken into account when considering figures 4.1 and 4.2.

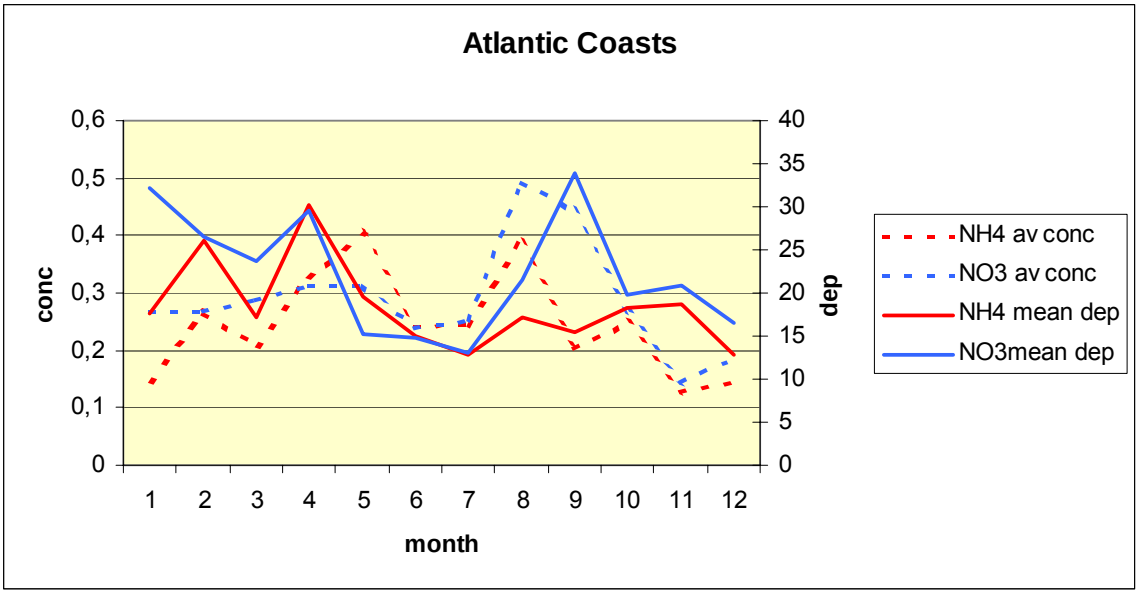


Figure 4.1 Seasonal pattern in the deposition of nitrogen to the Atlantic coastline during 2003, mg/l and mg/m^2/month.

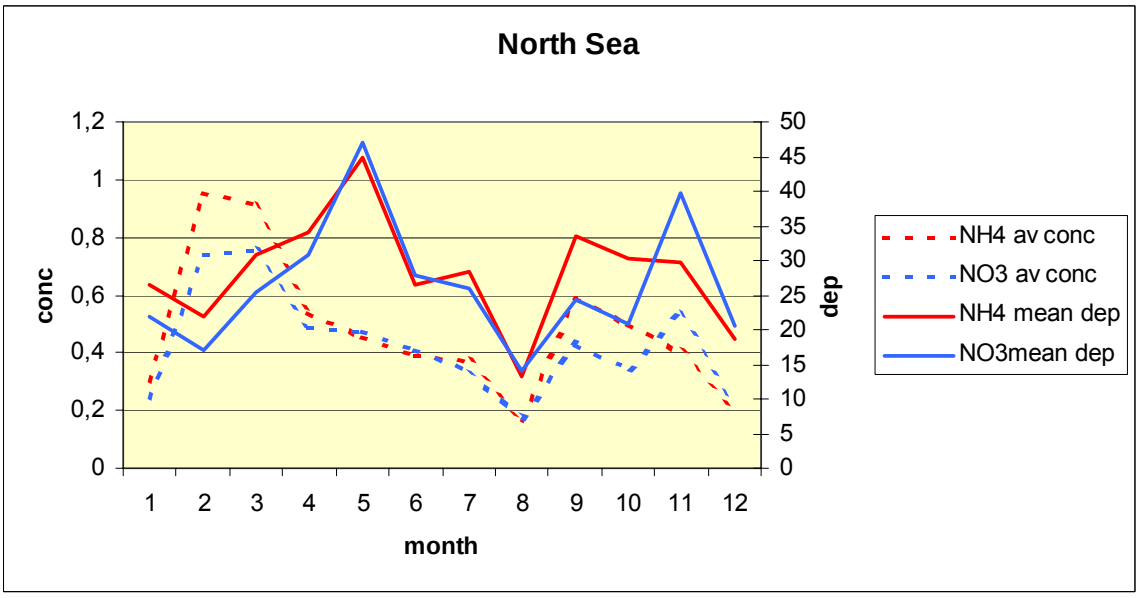


Figure 4.2 Seasonal pattern in the deposition of nitrogen to the North Sea coastline during 2003, mg/l and mg/m^2/month.

4.2 Quality Control

Quality control of data remains an important issue. It is foremost for the Contracting Parties to ensure that quality control is applied prior to their data submission. NILU is restricted to assembling and presenting reported data. However, there are important concerns. In this section, two issues will be indicated:

- Detection limits: the case of lindane
- Internal quality control

4.2.1 Detection limits: the case of lindane

The review of summary data for 2003 indicated that the values for deposition of lindane in the southern North Sea were elevated (see figures 4.3 and 4.4). At INPUT 2005, the majority of OSPAR Contracting Parties did not support a proposal to remove lindane from the list of CAMP components to be measured on a mandatory basis since lindane was still present in the marine environment. A subsequent close examination of the reported data for 2003 indicated that it is likely that values for deposition of lindane to the southern North Sea remain at elevated levels despite the phasing out of lindane some years ago and, therefore, underlines the usefulness of continued monitoring. However, the magnitude of lindane deposition may be notably smaller than has been suggested by the summary data. Following a first assessment, this appears to be due to uncertainties in monitoring, and poor detection limits applied by those Contracting Parties that report the highest levels of deposition (see table 4.1).

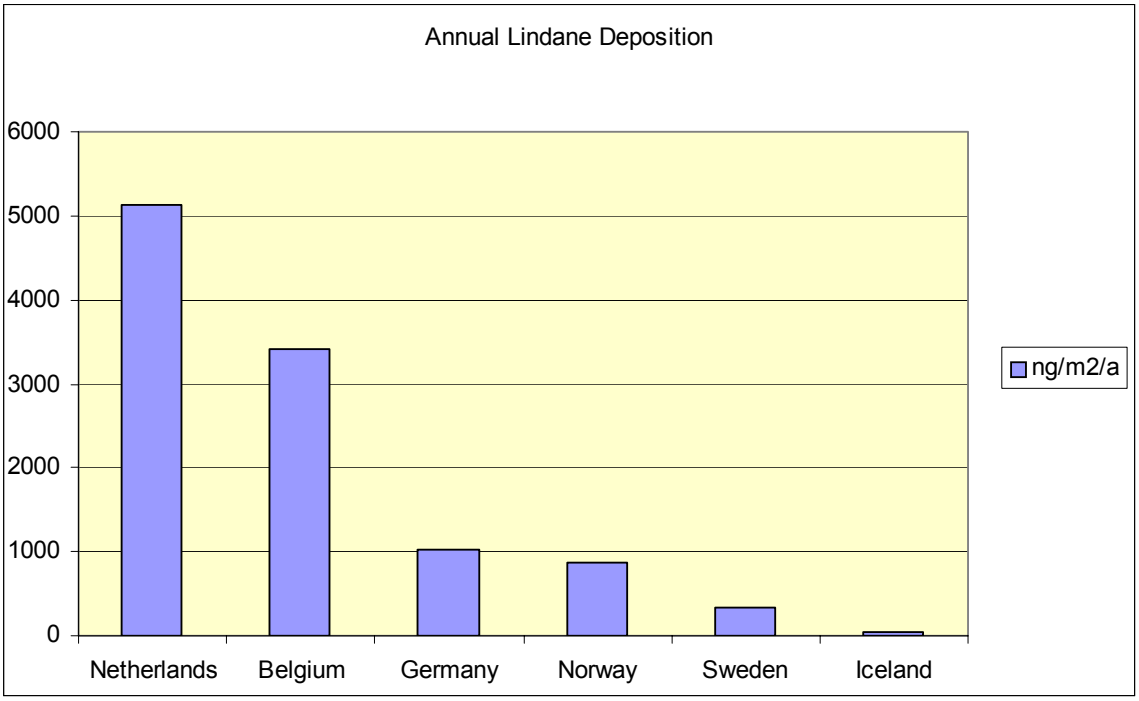


Figure 4.3 Summary annual data on the deposition of lindane, ng/m^2/a, during 2003. Calculated in accordance with the CAMP Principles. A further review indicates that the data for the Netherlands and Belgium are likely to overstate reality.

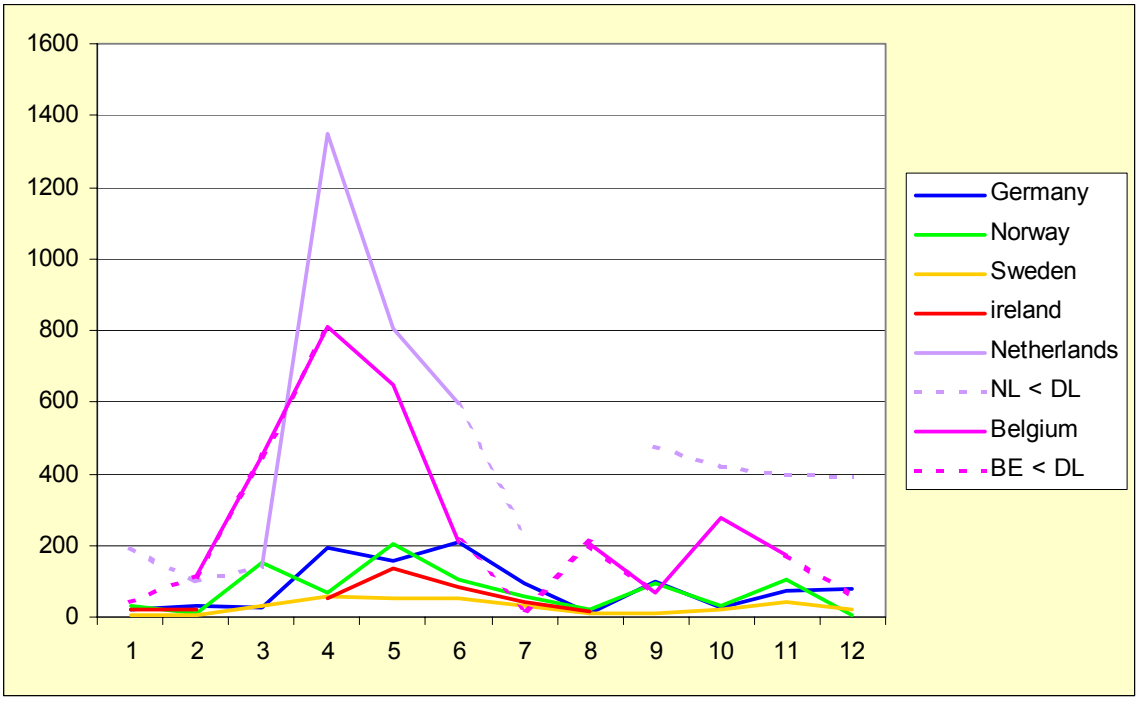


Figure 4.4 Monthly depositions of lindane (ng/m2/month). All values are above detection limit unless indicated otherwise. Calculated in accordance with the CAMP Principles (values below detection limit are presented as 50% of the reported detection limit).

Table 4.1 Summary analysis of low concentrations of lindane. The table shows the lowest concentrations that were successfully measured without reaching the detection limit (DL), and the highest reported detection limits. Each monitoring period is reported separately, hence detection limits vary.

Country	Lowest concentration analysed above detection limit	Highest reported detection limit
Belgium	6,000	2,000
Germany	0,150	*none below DL*
Iceland	0,030	*none below DL*
Ireland	*none above DL*	2,700
Netherlands	10,000	10,000
Norway	0,115	*none below DL*
Sweden	0,11	*none below DL*

The examination of the monthly reported data on deposition of lindane (see figure 4.4) showed that those Contracting Parties who reported the highest levels of deposition were able to successfully detect high concentrations only. During the low-input months, these countries typically find concentrations below the detection limit. However, a cross-comparison indicates that other Contracting Parties are quite able to detect lower concentrations throughout the whole year. The data from these countries, displayed on a suitable scale, indicate higher inputs in the period from March to June. In these peak months, the level of deposition of lindane amounts to 20% of the annual total at the monitoring site concerned. This is, however, still at a rate which is four to six times lower than the levels reported from monitoring stations with high concentrations. It is unclear why some of the detection limits are so high. Concentrations at nanogram level are not particularly low, and the very even step in monthly reported concentrations (above or below detection limit – see data tables in Annex 1) indicates uncertainty in data.

4.2.2 Internal quality control

The discussion concerning high detection limits for lindane is equally relevant under the heading of internal quality control. This cross-comparison of the national data from various relevant Contracting Parties highlights an issue which should have already been detected at data source.

Whilst allowing for comparison of data between Contracting Parties is a clear advantage of the CAMP, this section will provide an example of the benefits of cross-comparison of data at the national level of each Contracting Party. The CAMP Principles call for side-by-side sampling in order to check the results produced by bulk precipitation samplers. This provides the opportunity for in-country quality control of data prior to submission.

Table 4.2 gives the results from one Contracting Party of side-by-side wet-only and bulk samplers. These show higher depositions in the wet-only samplers than in the wet plus dry bulk samplers. There is also no consistent pattern in differences between metals and between sampler types. The precipitation values alone (not shown) also indicate the likelihood that the sampler is not opening sufficiently quickly.

Such errors can be noted by data originators, thus permitting in-house quality control prior to data submission. In response to the problems encountered with the data presented in table 4.2, the data originator in Belgium informed the CAMP data manager as follows:

"In 2003 we have performed background measurements with bulk sampling at 6 other sites in Flanders. Data from these locations have shown that the Knokke site is for some elements probably influenced by non-located local sources. Duplo measurements at this site have also shown in some cases an unexplainable big variability which indicates external influences.

<u>Action:</u> At the end of 2004 the measurements at the Knokke site have been stopped and new sampling equipment has been installed at a new location….."

Table 4.2 Comparison of wet only and bulk sampler results from one country**.**

		calculated deposition - µg/m^2/month											
		j	f	m	a	m	j	j	a	s	o	n	d
arsenic	bulk	26160,00	14640,00	10080,00	11760,00	19920,00	10080,00	11040,00	11280,00	30240,00	19680,00	25920,00	35280,00
	wet-only	10,62	4,66	2,02	10,22	15,53	8,29	4,68	0,00	15,99	0,00	0,00	15,13
cadmium	bulk	2943,00	1647,00	4620,00	7791,00	2241,00	1134,00	2898,00	9964,00	73206,00	2214,00	2916,00	3969,00
	wet-only	32,74	20,59	10,36	51,53	51,76	52,88	38,65	0,00	44,64	0,00	0,00	220,64
copper	bulk	227,81	127,49	87,78	208,45	173,47	87,78	96,14	98,23	566,50	171,38	225,72	307,23
	wet-only	399,35	40,59	136,14	89,01	135,22	72,23	40,80	0,00	139,24	0,00	0,00	131,75
lead	bulk	154,56	183,85	173,42	306,15	133,13	152,96	98,03	130,43	495,31	231,98	142,45	174,64
	wet-only	340,21	146,04	363,15	681,44	249,74	260,93	148,55	0,00	267,81	0,00	0,00	1296,10
zinc	bulk	1067,22	454,76	1052,94	1401,65	2273,62	838,07	1116,70	2460,26	14696,64	2532,73	1238,76	1451,92
	wet-only	8671,48	3722,43	2688,25	5331,42	4219,09	4665,60	4755,27	0,00	8132,30	0,00	0,00	3489,26

5. Final observations

- The reporting of 2003 CAMP data by OSPAR Contracting Parties was poorer than previous CAMP data reporting. One country did not deliver any data. Only one third of the Contracting Parties complied fully with the reporting requirements under the mandatory monitoring programme.
- Contracting Parties reported largely in accordance with the timetable agreed in the CAMP Principles. However, some data were delivered extremely late on 1 April 2005, four months after the draft data report had been delivered to INPUT.
- The review of reported data on lindane indicates that lindane is still deposited to the OSPAR maritime area, some years after the substance has been phased out by law and formal emissions have ceased. This underlines the usefulness of continued monitoring.
- However, there are issues of data quality to be answered. There is some evidence of occasional rather superficial data quality control, which undermines the validity of the monitoring results and the picture of air quality given. For example, national data originators validated and confirmed very high concentrations they had reported whilst monitoring in neighbouring Contracting Parties resulted in much lower concentrations. It would assist national data originators in identifying potential, less evident weaknesses in their national datasets if they considered such spatial features across national borders.
- The participation in international inter-comparison exercises is strongly advised. This has produced benefits during 2003, and can be taken further in future.

ANNEX 1
Reported monthly observations of Mandatory, Voluntary, and additional components

(major ions used solely for QA not listed)

Belgium

PRECIPITATION

mandatory		january	february	march	april	may	june	july	august	september	october	november	december	mean
BE0004R-Bulk sampler														
arsenic[a]	µg/l	240,00	240,00	240,00	240,00	240,00	240,00	240,00	240,00	240,00	240,00	240,00	240,00	240,00
cadmium	µg/l	27,00	27,00	110,00	159,00	27,00	27,00	63,00	212,00	581,00	27,00	27,00	27,00	122,66
copper	µg/l	2,09	2,09	2,09	4,25	2,09	2,09	2,09	2,09	4,50	2,09	2,09	2,09	2,52
lead	µg/l	1,42	3,01	4,13	6,25	1,60	3,64	2,13	2,78	3,93	2,83	1,32	1,19	2,52
zinc	µg/l	9,79	7,46	25,07	28,61	27,39	19,95	24,28	52,35	116,64	30,89	11,47	9,88	32,47
precipitation_amount	mm	109,00	61,00	42,00	49,00	83,00	42,00	46,00	47,00	126,00	82,00	108,00	147,00	942,00
BE0004R-Wet only sampler														
arsenic[a]	µg/l	0,24	0,24	0,24	0,24	0,24	0,24	0,24		0,24			0,24	0,24
cadmium	µg/l	0,74	1,06	1,23	1,21	0,80	1,53	1,98		0,67			3,50	1,44
chromium	µg/l	2,18	0,40	6,17	3,97	1,07	0,81	1,78		0,40			0,40	1,40
copper	µg/l	9,03	2,09	16,17	2,09	2,09	2,09	2,09		2,09			2,09	3,26
lead	µg/l	7,69	7,52	43,13	16,00	3,86	7,55	7,61		4,02			20,56	10,34
mercury	ng/l	0,01	0,01	0,01	0,04	0,01	0,01	0,01		0,01			0,03	0,01
nickel	µg/l	6,59	2,14	4,65	2,74	0,67	1,29	2,92		1,64			0,98	2,22
zinc	µg/l	196,01	191,68	319,27	125,18	65,21	135,00	243,61		122,07			55,35	125,79
gamma_HCH	ng/l	1,00	6,00		19,00	10,00	6,00	1,00		6,00			1,00	6,35
precipitation_amount	mm	44,24	19,42	8,42	42,59	64,70	34,56	19,52		66,62			63,04	363,11
BE0014R														
ammonium	mg/l	0,39	0,27	0,89	1,40	0,81	0,95	0,55	0,58	0,64	0,34	0,59	0,33	0,62
nitrate	mg/l	0,27	0,29	0,36	0,72	0,48	0,47	0,45	0,47	0,49	0,31	0,42	0,20	0,41
precipitation_amount	mm	29,70	15,60	21,00	31,30	66,10	41,40	44,10	64,60	21,30	58,10	74,80	62,90	530,90

[a] the wet only and bulk arsenic in precipitation values have both been reported as µg/l

voluntary	
not reported	
PCB_101	ng/l
PCB_118	ng/l
PCB_138	ng/l
PCB_153	ng/l
PCB_180	ng/l
PCB_28	ng/l
PCB_52	ng/l
phenanthrene	ng/l
anthracene	ng/l
flouranthene	ng/l
pyrene	ng/l
benzo(a)anthracene	ng/l
chrysene	ng/l
benzo(a)pyrene	ng/l
benzo(ghi)perylene	ng/l
indeno(1,2,3-cd)pyrene	ng/l

Extra reported non-CAMP components														
BE0004R														
aldrin	ng/l	0,50	0,50		0,50	0,50	0,50	0,50		0,50			0,50	0,50
alpha_HCH	ng/l	0,50	0,50		0,50	0,50	0,50	0,50		0,50			0,50	0,50
dieldrin	ng/l	1,00	1,00		1,00	1,00	1,00	1,00		1,00			1,00	1,00
endrin	ng/l	1,50	1,50		1,50	1,50	1,50	1,50		1,50			1,50	1,50
heptachlor	ng/l	1,00	1,00		1,00	1,00	1,00	1,00		1,00			1,00	1,00
pp_DDD	ng/l	0,50	0,50		0,50	0,50	0,50	0,50		0,50			0,50	0,50
pp_DDE	ng/l	1,00	1,00		1,00	1,00	1,00	1,00		1,00			1,00	1,00
pp_DDT	ng/l	0,50	0,50		0,50	0,50	0,50	0,50		0,50			0,50	0,50
precipitation_amount	mm	44,24	19,42		42,59	64,70	34,56	19,52		66,62			63,04	354,69

Airborne components

mandatory			january	february	march	april	may	june	july	august	september	october	november	december	mean
BE0011R															
	nitrogen_dioxide	µg/m^3	7,00	10,65	9,13	7,00	5,48	6,09	5,48	5,48	6,09	8,52	7,91	8,52	7,28
BE0013R															
	nitrogen_dioxide	µg/m^3	5,48	8,83	7,91	6,09	4,57	4,26	3,65	4,87	6,39	7,30	6,09	7,30	6,06
not reported															
	NH_3 + NH4	µg/m^3													
	HNO_3 + NO_3	µg/m^3													
voluntary															
BE0011R															
	NO	µg/m^3	1,40	6,53	2,80	1,40	0,93	0,93	0,93	0,93	1,87	2,80	4,67	9,33	2,88
BE0013R															
	NO	µg/m^3	0,93	4,67	3,27	0,93	0,93	0,47	0,47	0,93	1,40	2,33	2,33	5,13	1,98
not reported															
	PCB_118	pg/m3													
	PCB_138	pg/m3													
	PCB_153	pg/m3													
	PCB_180	pg/m3													
	PCB_28	pg/m3													
	PCB_52	pg/m3													
	anthracene	ng/m3													
	phenanthrene	ng/m3													
	benz_a_anthracene	ng/m3													
	benzo_a_pyrene	ng/m3													
	benzo_ghi_perylene	ng/m3													
	inden_123cd_pyrene	ng/m3													
	pyrene	ng/m3													
	mercury	ng/m3													
	γ-HCH	pg/m3													
	arsenic	ng/m3													
	cadmium	ng/m3													
	chromium	ng/m3													
	copper	ng/m3													
	lead	ng/m3													
	nickel	ng/m3													
	zinc	ng/m3													

Denmark

PRECIPITATION

mandatory			january	february	march	april	may	june	july	august	september	october	november	december	mean
DK0008R															
	ammonium	mg/l	0,312	0,796	1,384	0,492	0,582	0,312	0,563	0,483	0,912	0,475	0,333	0,268	0,50297
	nitrate	mg/l	0,542	1,037	1,409	0,386	0,531	0,449	0,485	0,646	0,701	0,586	0,496	0,438	0,537368
	precipitation	mm	31,559	9,02	9,361	57,656	65,048	49,808	79,072	27,123	55,435	32,366	72,283	57,66	546,391
	arsenic	µg/l	0,292	0,414	0,513	0,235	0,138	0,161	0,148	0,203	0,369	0,344	0,194	0,137	0,218
	cadmium	µg/l	0,055	0,086	0,118	0,062	0,046	0,037	0,029	0,062	0,576	0,05	0,036	0,031	0,098
	chromium	µg/l	0,204	0,3	0,653	0,449	0,15	0,166	0,117	0,274	0,378	0,232	0,089	0,114	0,216
	copper	µg/l	0,914	3,164	2,763	1,445	0,895	1,374	0,722	1,579	1,875	0,969	0,629	1,443	1,204
	lead	µg/l	2,4	4,493	3,971	1,939	0,975	1,437	1,024	1,316	0,7	1,577	1,207	0,087	1,286
	nickel	µg/l	0,254	0,621	0,822	0,492	0,244	0,354	0,257	0,434	0,516	0,316	0,192	0,248	0,335
	zinc	µg/l	8,193	20,531	25,8	8,599	4,896	9,41	6,66	10,246	14,373	12,242	4,637	5,618	8,501
	precipitation	mm	29,963	9,27	9,611	58,276	66,857	51,855	78,798	28,481	55,213	34,125	71,909	55,187	549,835
DK0031R															
	arsenic	µg/l	0,155	0,146	0,331	0,455	0,161	0,158	0,311	0,17	0,151	0,124	0,147	0,108	0,189
	cadmium	µg/l	0,058	0,046	0,102	0,068	0,046	0,036	0,112	0,043	0,034	0,021	0,031	0,03	0,047
	chromium	µg/l	0,159	0,149	0,47	0,563	0,153	0,158	0,298	0,181	0,126	0,073	0,076	0,065	0,182
	copper	µg/l	0,779	1,685	2,673	3,144	3,267	1,453	4,65	1,401	0,885	0,544	0,415	0,408	1,68
	lead	µg/l	0,8	1,089	3,265	2,16	1,099	0,946	2,186	0,492	0,934	0,666	0,754	0,411	1,09
	nickel	µg/l	0,256	0,357	0,837	0,604	0,333	0,293	0,357	0,209	0,301	0,173	0,168	0,188	0,303
	zinc	µg/l	10,178	10,031	58,789	14,591	9,81	6,24	10,635	6,18	5,801	5,408	5,34	5,508	9,205
	precipitation	mm	47,473	23,458	20,291	55,306	75,666	117,242	55,345	48,338	70,674	57,933	81,046	61,515	714,74
not reported															
	mercury	ng/l													
	γ-HCH	ng/l													

voluntary

not reported		
	PCB_101	ng/l
	PCB_118	ng/l
	PCB_138	ng/l
	PCB_153	ng/l
	PCB_180	ng/l
	PCB_28	ng/l
	PCB_52	ng/l
	phenanthrene	ng/l
	anthracene	ng/l
	flouranthene	ng/l
	pyrene	ng/l
	benzo(a)anthracene	ng/l
	chrysene	ng/l
	benzo(a)pyrene	ng/l
	benzo(ghi)perylene	ng/l
	indeno(1,2,3-cd)pyrene	ng/l

Airborne components

mandatory			january	february	march	april	may	june	july	august	september	october	november	december	mean
DK0008R															
	NO_2		2,36	3,24	2,70	1,60	1,35	1,18	1,57	0,99	1,18	1,24	3,07	2,26	1,89
	NH_3 + NH4		1,11	2,05	2,70	1,51	1,47	0,88	1,09	0,85	1,24	0,78	1,36	0,79	1,32
	$HNO_3 + NO_3$		0,77	1,30	1,66	0,89	0,98	0,56	0,67	0,50	0,84	0,62	0,91	0,55	0,85
voluntary															
DK0008R															
	arsenic	ng/m3	0,65	1,12	0,67	0,31	0,30	0,21	0,29	0,18	0,29	0,32	0,65	0,59	0,46
	cadmium	ng/m3	0,10	0,24	0,18	0,06	-0,01	-0,02	0,14	0,05	0,12	-0,02	0,25	0,15	0,10
	chromium	ng/m3	0,30	0,37	0,52	0,34	0,26	0,26	0,27	0,15	0,37	0,35	0,34	0,28	0,32
	copper	ng/m3	1,44	1,80	1,27	0,99	0,83	0,76	0,89	0,57	1,10	0,76	1,33	0,90	1,05
	lead	ng/m3	5,82	11,05	6,95	3,23	2,14	2,15	2,32	1,12	3,39	2,59	6,83	4,16	4,31
	nickel	ng/m3	1,60	2,20	2,89	2,02	1,92	1,96	1,94	1,14	1,48	0,76	1,70	1,01	1,72
	zinc	ng/m3	10,42	23,03	14,50	10,77	5,20	6,69	6,21	3,86	9,10	7,53	13,98	8,79	10,01
DK0031R	arsenic	ng/m3	0,31	0,30		0,51	0,18	0,18	0,20	0,11	0,28	0,25	0,46	0,32	0,28
	cadmium	ng/m3	0,15	0,03		0,14	-0,01	0,01	0,02	-0,03	0,03	0,02	0,18	0,16	0,06
	chromium	ng/m3	0,13	0,32		0,83	0,23	0,28	0,27	0,13	0,17	0,21	0,11	0,43	0,28
	copper	ng/m3	1,00	0,19		1,60	0,50	0,66	0,84	0,41	0,96	0,79	1,08	1,46	0,86
	lead	ng/m3	3,79	2,31		4,34	1,84	2,11	2,45	0,79	3,36	2,96	4,93	4,57	3,04
	nickel	ng/m3	0,88	0,17		1,45	1,10	1,07	1,23	0,62	0,96	0,47	1,04	0,85	0,89
	zinc	ng/m3	8,59	5,74		13,89	5,29	6,47	6,54	3,31	9,19	9,35	11,80	9,55	8,16

not reported		
	PCB_118	pg/m3
	PCB_138	pg/m3
	PCB_153	pg/m3
	PCB_180	pg/m3
	PCB_28	pg/m3
	PCB_52	pg/m3
	anthracene	ng/m3
	phenanthrene	ng/m3
	benz_a_anthracene	ng/m3
	benzo_a_pyrene	ng/m3
	benzo_ghi_perylene	ng/m3
	inden_123cd_pyrene	ng/m3
	pyrene	ng/m3
	mercury	ng/m3
	γ-HCH	pg/m3

France

PRECIPITATION

		january	february	march	april	may	june	july	august	september	october	november	december	mean
mandatory														
not reported														
ammonium	mg/l													
nitrate	mg/l													
arsenic	µg/l													
cadmium	µg/l													
chromium	µg/l													
copper	µg/l													
lead	µg/l													
mercury	ng/l													
nickel	µg/l													
zinc	µg/l													
γ-HCH	ng/l													
precipitation	mm													
voluntary														
not reported														
PCB_101	ng/l													
PCB_118	ng/l													
PCB_138	ng/l													
PCB_153	ng/l													
PCB_180	ng/l													
PCB_28	ng/l													
PCB_52	ng/l													
phenanthrene	ng/l													
anthracene	ng/l													
flouranthene	ng/l													
pyrene	ng/l													
benzo(a)anthracene	ng/l													
chrysene	ng/l													
benzo(a)pyrene	ng/l													
benzo(ghi)perylene	ng/l													
indeno(1,2,3-cd)pyrene	ng/l													

Airborne components

		january	february	march	april	may	june	july	august	september	october	november	december	mean
mandatory														
not reported														
NO_2	µg/m^3													
NH_3 + NH4	µg/m^3													
HNO_3 + NO_3	µg/m^3													
voluntary														
not reported														
PCB_118	pg/m3													
PCB_138	pg/m3													
PCB_153	pg/m3													
PCB_180	pg/m3													
PCB_28	pg/m3													
PCB_52	pg/m3													
anthracene	ng/m3													
phenanthrene	ng/m3													
benz_a_anthracene	ng/m3													
benzo_a_pyrene	ng/m3													
benzo_ghi_perylene	ng/m3													
inden_123cd_pyrene	ng/m3													
pyrene	ng/m3													
mercury	ng/m3													
γ-HCH	pg/m3													
arsenic	ng/m3													
cadmium	ng/m3													
chromium	ng/m3													
copper	ng/m3													
lead	ng/m3													
nickel	ng/m3													
zinc	ng/m3													
NO	µg/m^3													

Germany

Mandatory		january	february	march	april	may	june	july	august	september	october	november	december	mean
DE0001R														
ammonium	mg/l	0.60	2.01	2.34	0.75	0.57	1.25	0.88	0.36	0.86	0.36	0.54	0.29	0.73
nitrate	mg/l	0.64	0.68	1.41	0.47	0.59	0.77	0.64	0.38	0.67	0.32	0.92	0.66	0.61
precipitation	mm	40.20	4.70	10.50	35.50	75.80	80.20	61.20	38.10	81.80	74.70	25.20	50.80	578.70
arsenic	µg/l	0.16	0.28	0.37	0.11	0.10	0.15	0.18	0.09	0.15	0.11	0.13	0.13	0.14
cadmium	µg/l	0.04	0.05	0.09	0.03	0.02	0.04	0.06	0.01	0.05	0.03	0.04	0.03	0.04
chromium	µg/l	0.18	0.26	0.26	0.18	0.14	0.12	0.11	0.17	0.13	0.10	0.13	0.14	0.14
copper	µg/l	0.61	1.29	1.75	0.79	0.67	1.31	0.82	0.76	0.91	0.63	0.48	0.37	0.79
lead	µg/l	1.13	1.13	3.01	1.05	1.01	1.46	1.14	0.53	1.48	1.16	0.85	0.93	1.17
nickel	µg/l	0.26	0.73	0.39	0.21	0.21	0.25	0.28	0.19	0.25	0.20	0.31	0.19	0.24
zinc	µg/l	7.47	15.85	11.74	6.20	6.98	8.19	7.53	8.12	9.03	5.88	6.12	3.90	7.20
precipitation	mm	45.59	7.59	14.05	39.16	73.50	81.00	57.35	36.97	80.18	85.96	35.58	65.26	622.19
mercury	ng/l	5.16	38.76	12.18	6.92	10.12	13.23	14.34	10.88	7.17	4.05	7.70	6.28	9.09
precipitation	mm	42.93	6.82	11.24	38.30	69.56	78.19	58.54	37.47	81.32	80.79	30.46	53.94	589.55
γ-HCH	ng/l	0.90	1.16	2.18	4.94	2.29	2.68	2.62	0.15	1.75	0.51	1.40	1.22	1.81
precipitation	mm	24.00	26.00	12.00	39.00	68.00	78.00	36.00	73.20	58.00	56.20	52.00	63.20	585.60

voluntary														
anthracene	ng/l	0.30	0.30	0.70	0.20	0.10	0.10	0.20	0.40	0.10	0.10	0.20	0.50	0.25
flouranthene	ng/l	28.35	17.95	50.28	15.47	6.19	9.06	11.52	1.84	8.84	11.77	12.03	16.32	11.72
benzo(a)anthracene	ng/l	3.95	2.55	7.78	1.82	0.55	0.72	1.11	0.95	0.72	1.43	1.50	2.12	1.47
benzo(a)pyrene	ng/l	4.80	2.60	8.90	2.30	0.60	1.20	2.00	1.50	0.50	1.50	1.90	2.70	1.84
benzo(ghi)perylene	ng/l	8.30	3.60	12.30	2.00	0.50	1.30	2.30	1.30	0.90	2.30	2.50	3.90	2.37
chrysene	ng/l	13.20	7.00	20.00	5.40	1.70	2.50	3.30	1.80	2.50	4.30	4.70	6.60	4.36
indeno(123cd)pyrene	ng/l	10.70	3.70	14.80	2.10	0.30	1.30	2.90	1.60	0.30	2.60	2.40	3.90	2.56
phenanthrene	ng/l	21.40	16.00	35.10	9.70	5.30	7.60	12.50	5.60	7.30	9.90	12.00	15.60	10.46
pyrene	ng/l	19.50	12.00	34.40	10.60	4.20	7.20	7.90	3.00	5.30	8.20	7.90	10.30	8.18
PCB_101	ng/l	0.38	0.52	0.20	0.13	0.24	0.98	0.08	0.13	0.04	0.23	0.13	0.06	0.28
PCB_118	ng/l	0.17	0.25	0.08	0.08	0.10	0.20	0.07	0.04	0.03	0.07	0.05	0.03	0.09
PCB_138	ng/l	0.99	2.01	0.28	0.66	0.53	0.71	0.17	0.16	0.07	0.39	0.20	0.07	0.44
PCB_153	ng/l	0.41	0.79	0.17	0.23	0.25	0.63	0.09	0.08	0.04	0.18	0.11	0.04	0.23
PCB_180	ng/l	0.60	0.93	0.25	0.32	0.17	0.12	0.06	0.07	0.03	0.21	0.06	0.03	0.17
PCB_28	ng/l	0.04	0.04	0.08	0.03	0.03	0.05	0.03	0.01	0.02	0.04	0.02	0.02	0.03
PCB_52	ng/l	0.11	0.04	0.08	0.03	0.06	0.14	0.03	0.03	0.02	0.06	0.02	0.02	0.05
preciptation		24.00	26.00	12.00	39.00	68.00	78.00	36.00	73.20	58.00	56.20	52.00	63.20	585.60
benzo(a)anthracene	ng/l	3.95	2.55	7.78	1.82	0.55	0.72	1.11	0.95	0.72	1.43	1.50	2.12	1.47

Extra reported non-CAMP components														
benzo(b)fluoranthene	ng/L	14.75	6.56	21.48	4.81	1.14	2.03	3.73	2.06	1.97	5.04	4.47	6.72	4.35
benzo(k)fluoranthene	ng/L	5.51	2.55	8.71	1.85	0.43	0.80	1.54	0.95	0.72	1.88	1.72	2.45	1.68
dibenzo(ah)anthracene	ng/L	1.38	0.31	0.67	0.21	0.06	0.10	0.22	0.11	0.14	0.14	0.15	0.55	0.25
α–HCH	ng/L	0.18	0.28	0.45	0.31	0.18	0.25	0.52	0.05	0.24	0.31	0.24	0.23	0.24
HCB	ng/L	0.18	0.04	0.17	0.07	0.15	0.08	0.06	0.03	0.04	0.21	0.07	0.03	0.09
aldrin	ng/L	0.02	0.02	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
dieldrin	ng/L	0.02	0.11	0.25	0.17	0.12	0.04	0.21	0.05	0.08	0.15	0.15	0.34	0.13
endrin	ng/L	0.02	0.02	0.04	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
heptachlor	ng/L	0.01	0.01	0.02	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
o,p'-DDT	ng/L	0.02	0.02	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
p,p'-DDT	ng/L	0.10	0.25	0.08	0.15	0.08	0.01	0.03	0.01	0.02	0.09	0.02	0.02	0.05
o,p'-DDE	ng/L	0.01	0.01	0.02	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
p,p'-DDE	ng/L	0.19	0.32	0.02	0.01	0.13	0.07	0.01	0.00	0.05	0.09	0.00	0.00	0.06
o,p'-DDD	ng/L	0.02	0.02	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
p,p'-DDD	ng/L	0.02	0.02	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Airborne components

mandatory		january	february	march	april	may	june	july	august	september	october	november	december	mean
DE0001R														
NO_2	µg/m^3	3.7	4.4	3.2	2.2	1.5	1.2	1.2	0.9	1.7	3.3	4.5	4.3	2.68
NH_3 + NH4	µg/m^3	1.5	4.2	4.1	3.4	2.5	3	2.6						3.04
HNO_3 + NO_3	µg/m^3	1.1	2.5	2.6	1.8	1.3	1.1	1						1.63
voluntary														
arsenic	ng/m3	0.69	2.65	1.36	0.56	0.25	0.25	0.33	0.24	0.45	0.44	1.00	0.46	0.72
cadmium	ng/m3	0.14	0.49	0.36	0.20	0.06	0.05	0.05	0.09	0.11	0.10	0.26	0.22	0.18
copper	ng/m3	2.94	4.08	4.33	2.10	1.27	1.07	1.48	2.21	2.68	4.55	1.91	1.32	2.50
lead	ng/m3	7.19	18.65	12.99	4.84	2.71	1.88	2.46	2.04	4.73	3.76	8.53	5.65	6.29
nickel	ng/m3	1.34	1.81	2.43	1.83	1.96	1.17	1.28	0.61	1.15	0.75	0.92	0.50	1.31
not reported														
PCB_118	pg/m3													
PCB_138	pg/m3													
PCB_153	pg/m3													
PCB_180	pg/m3													
PCB_28	pg/m3													
PCB_52	pg/m3													
anthracene	ng/m3													
phenanthrene	ng/m3													
benz_a_anthracene	ng/m3													
benzo_a_pyrene	ng/m3													
benzo_ghi_perylene	ng/m3													
inden_123cd_pyrene	ng/m3													
pyrene	ng/m3													
mercury	ng/m3													
γ-HCH	pg/m3													
chromium	ng/m3													
zinc	ng/m3													
NO	µg/m^3													

Iceland

PRECIPITATION

Mandatory		january	february	march	april	may	june	july	august	september	october	november	december	mean
IS0090R														
ammonium	mg/l	0,72	0,53	0,44	0,43	0,20	0,25	0,24	0,16	0,24	0,46	0,23	0,35	0,35
nitrate	mg/l	0,16	0,18	0,08	0,10	0,10	0,12	0,06	0,06	0,04	0,13	0,14	0,06	0,10
precipitation	mm	25,70	126,40	87,60	55,20	44,30	85,20	67,80	75,80	74,40	43,50	63,80	95,10	844,80
arsenic	µg/l	0,09	0,11	0,27	0,20	0,09	0,04	0,04	0,07	0,08	0,29	0,41	0,26	0,17
cadmium	µg/l	0,01	0,02	0,02	0,03	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01
chromium	µg/l	0,27	0,19	0,07	0,34	0,67	0,99	0,22	0,36	0,29	0,33	0,42	0,29	0,34
copper	µg/l	4,37	1,26	1,27	1,44	2,93	3,25	1,60	1,84	1,61	2,11	2,00	1,57	1,84
lead	µg/l	1,06	0,52	0,29	0,82	0,61	0,49	0,47	0,34	0,34	0,47	0,44	0,23	0,49
nickel	µg/l	0,76	0,44	0,39	0,66	0,87	0,99	0,29	0,34	0,82	0,74	1,16	0,43	0,61
zinc	µg/l	9,38	2,44	3,19	4,09	9,05	8,42	7,41	4,38	3,97	7,55	4,09	2,22	4,69
precipitation	mm	37,21	145,32	108,60	165,53	51,25	82,13	71,54	92,89	87,45	52,42	67,94	134,74	1097,02
IS0091R														
ammonium	mg/l	0,23	0,13	0,14	0,18	0,54	0,12	0,47	3,06	0,08	0,17	0,27	0,01	0,34
nitrate	mg/l	0,04	0,12	0,16	0,27	0,06	0,08	0,05	0,11	0,02	0,10	0,10	0,01	0,09
precipitation	mm	133,67	318,15	152,33	110,80	29,69	78,80	182,13	95,16	182,49	147,10	146,63	193,47	1770,42
arsenic	µg/l	3,67	0,87	0,52	0,91	0,28	0,27	0,23	0,46	0,34	0,37	0,29	0,73	0,77
cadmium	µg/l	0,02	0,03	0,01	0,04	0,02	0,03	0,02	0,06	0,02	0,01	0,03	0,01	0,02
chromium	µg/l	0,42	1,08	0,58	0,27	1,50	2,37	2,90	1,78	1,46	1,05	0,83	0,62	1,19
copper	µg/l	1,26	7,36	268,45	52,87	2,79	3,67	6,37	3,88	2,72	15,88	9,38	1,29	31,42
lead	µg/l	2,68	0,81	1,02	0,87	0,68	0,30	0,37	0,32	0,23	0,59	0,46	0,17	0,70
nickel	µg/l	1,08	1,20	2,35	0,84	4,25	0,98	0,63	0,77	1,02	1,94	0,54	0,26	1,11
zinc	µg/l	16,26	13,75	13,98	14,28	12,56	7,62	10,39	8,66	7,83	9,20	11,34	10,23	11,51
precipitation	mm	133,67	318,15	152,33	110,80	29,69	78,80	182,13	95,16	182,49	147,10	146,63	193,47	1770,42
gamma_HCH	ng/l	0,06	0,06	0,07	0,07	0,20	0,19	0,04	0,05	0,05	0,08	0,07	0,03	0,07
precipitation	mm	59,00	89,00	75,00	56,00	21,50	61,00	61,00	43,00	62,00	37,00	77,00	103,00	744,50
not reported														
mercury	ng/l													

Voluntary														
IS0091R														
PCB_101	ng/l	0,01	0,01	0,01	0,01	0,03	0,01	0,01	0,01	0,01	0,01	0,00	0,00	0,01
PCB_118	ng/l	0,01	0,01	0,01	0,01	0,04	0,01	0,00	0,01	0,00	0,01	0,00	0,00	0,01
PCB_138	ng/l	0,01	0,01	0,01	0,01	0,06	0,01	0,01	0,01	0,01	0,01	0,00	0,00	0,01
PCB_153	ng/l	0,01	0,02	0,01	0,01	0,05	0,01	0,01	0,01	0,01	0,01	0,00	0,00	0,01
PCB_180	ng/l	0,01	0,01	0,00	0,00	0,04	0,01	0,00	0,01	0,00	0,01	0,00	0,00	0,00
PCB_28	ng/l	0,14	0,05	0,04	0,04	0,12	0,04	0,12	0,17	0,12	0,19	0,10	0,07	0,09
PCB_52	ng/l	0,04	0,02	0,02	0,02	0,05	0,02	0,03	0,05	0,03	0,05	0,03	0,02	0,03
precipitation	mm	58,52	85,70	69,64	63,24	23,36	57,82	63,33	43,09	60,90	37,47	77,52	97,13	737,71
not reported														
phenanthrene	ng/l													
anthracene	ng/l													
flouranthene	ng/l													
pyrene	ng/l													
benzo(a)anthracene	ng/l													
chrysene	ng/l													
benzo(a)pyrene	ng/l													
benzo(ghi)perylene	ng/l													
indeno(1,2,3-cd)pyrene	ng/l													
Extra reported non-CAMP components														
IS0091R														
alpha_HCH	ng/l	0,18	0,12	0,12	0,06	0,24	0,12	0,09	0,16	0,16	0,24	0,19	0,10	0,14
beta_HCH	ng/l	0,01	0,01	0,01	0,01	0,02	0,01	0,01	0,01	0,01	0,01	0,00	0,00	0,01
dieldrin	ng/l	0,03	0,03	0,04	0,03	0,03	0,02	0,01	0,01	0,03	0,03	0,05	0,02	0,03
pp_DDD	ng/l	0,01	0,01	0,01	0,01	0,02	0,01	0,00	0,01	0,00	0,01	0,01	0,01	0,01
pp_DDE	ng/l	0,01	0,01	0,00	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,00	0,00	0,01
pp_DDT	ng/l							0,01	0,01	0,02	0,01	0,01	0,01	0,01
op_DDT	ng/l					0,01	0,00	0,01	0,01	0,02	0,06	0,01	0,01	0,01
HCB	ng/l	0,04	0,01	0,01	0,01	0,02	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01
PCB_105	ng/l	0,01	0,00	0,00	0,00	0,02	0,01	0,00	0,01	0,00	0,01	0,00	0,00	0,00
PCB_156	ng/l	0,01	0,00	0,00	0,01	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00
PCB_31	ng/l	0,12	0,05	0,04	0,04	0,12	0,04	0,11	0,15	0,11	0,18	0,09	0,06	0,08
cis_CD	ng/l	0,01	0,00	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
trans_CD	ng/l	0,00	0,01	0,00	0,00	0,01	0,00	0,00	0,01	0,00	0,01	0,00	0,00	0,00
trans_NO	ng/l	0,01	0,00	0,00	0,00	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Toxaphene-26	ng/l	received from Icelandic data provider												
Toxaphene-26	ng/l	received from Icelandic data provider												
Toxaphene-26	ng/l	received from Icelandic data provider												
precipitation_amount	mm	59,00	89,00	75,00	56,00	21,50	61,00	61,00	43,00	62,00	37,00	77,00	103,00	744,50

Airborne components

Mandatory		january	february	march	april	may	june	july	august	september	october	november	december	mean
IS0091R														
NO_3	µg/m^3	0,05	0,08	0,11	0,12	0,05	0,05	0,06	0,05	0,03	0,08	0,04	0,02	0,06
not reported														
NO_2	µg/m^3													
HNO_3	µg/m^3													
NH_3	µg/m^3													
NH_4	µg/m^3													
voluntary														
IS0091R														
arsenic	ng/m3	0,19	0,23	0,21	0,16	0,12	0,11	0,08	0,08	0,14	0,13	0,20	0,13	0,15
cadmium	ng/m3	0,01	0,03	0,02	0,02	0,01	0,01	0,01	0,02	0,04	0,01	0,03	0,01	0,02
chromium	ng/m3	6,73	14,93	10,87	3,55	0,64	3,81	0,44	0,72	6,79	4,12	10,62	5,57	5,73
copper	ng/m3	0,84	0,56	0,66	0,85	1,53	0,62	0,37	0,22	0,56	0,51	0,65	0,35	0,64
lead	ng/m3	0,28	0,63	0,59	0,76	0,31	0,22	0,32	0,44	0,56	0,40	1,11	0,47	0,51
mercury	ng/m3	0,85	0,95	0,80	0,71	1,77	0,77	0,75	0,45	0,50	0,86	0,71	0,50	0,80
nickel	ng/m3	5,16	8,85	6,93	2,38	0,64	3,04	0,53	0,70	4,05	2,55	6,49	3,31	3,72
zinc	ng/m3	4,63	3,14	3,01	2,91	3,56	2,21	6,15	5,20	4,37	2,55	24,44	7,27	5,78
γ-HCH	pg/m3	3,97	6,96	7,02	9,10	7,28	7,55	8,77	8,16	7,87	8,40	8,89	6,28	7,52
PCB_28	pg/m3	1,36	1,56	1,74	2,09	2,11	2,07	6,05	6,03	6,08	5,62	11,89	5,81	4,37
PCB_52	pg/m3	0,58	0,66	0,73	0,88	0,89	0,87	1,67	1,65	1,67	1,54	3,07	1,59	1,32
PCB_101	pg/m3	0,21	0,24	0,27	0,32	0,49	0,32	1,09	1,11	1,03	0,63	1,18	0,24	0,59
PCB_118	pg/m3	0,21	0,24	0,27	0,32	0,33	0,32	0,17	0,17	0,17	0,15	0,58	0,16	0,26
PCB_138	pg/m3	0,26	0,30	0,33	0,40	0,41	0,40	0,26	0,25	0,25	0,23	0,26	0,24	0,30
PCB_153	pg/m3	0,26	0,30	0,33	0,40	0,41	0,40	0,26	0,25	0,25	0,23	0,59	0,24	0,33
PCB_180	pg/m3	0,16	0,18	0,20	0,24	0,25	0,24	0,17	0,17	0,17	0,15	0,17	0,16	0,19
not reported														
phenanthrene	ng/m3													
anthracene	ng/m3													
flouranthene	ng/m3													
pyrene	ng/m3													
benzo(a)anthracene	ng/m3													
chrysene	ng/m3													
benzo(a)pyrene	ng/m3													
benzo(ghi)perylene	ng/m3													
indeno(1,2,3-cd)pyrene	ng/m3													
NO	µg/m^3													
Extra reported non-CAMP components														
IS0091R														
alpha_HCH	pg/m3	7,20	5,30	7,92	8,09	8,53	8,83	6,78	7,35	10,92	6,39	6,43	4,85	7,38
dieldrin	pg/m3	0,67	0,68	0,65	0,85	1,16	1,26	0,82	0,77	0,85	0,79	0,80	0,52	0,82
pp_DDD	pg/m3	0,11	0,12	0,13	0,16	0,16	0,16	0,17	0,17	0,17	0,15	0,28	0,16	0,16
pp_DDE	pg/m3	0,39	0,35	0,33	0,38	0,30	0,48	0,25	0,38	0,55	0,22	0,43	0,24	0,36
pp_DDT	pg/m3	0,22	0,24	0,27	0,33	0,32	0,32	0,42	0,41	0,41	0,36	1,44	0,40	0,43

Ireland

PRECIPITATION

Mandatory		january	february	march	april	may	june	july	august	september	october	november	december	mean
IE0001R														
ammonium	mg/l	0,23	0,30	0,11	0,74	0,29	0,13	0,14	0,25	0,26	0,15	0,18	0,09	0,24
nitrate	mg/l	0,08	0,27	0,11	0,23	0,10	0,06	0,10	0,30	0,18	0,14	0,08	0,05	0,13
precipitation	mm	132,00	163,00	82,00	138,00	142,00	147,00	126,00	25,00	64,00	59,00	293,00	136,00	1507,00
arsenic	µg/l	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50
cadmium	µg/l	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05
chromium	µg/l	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50
copper	µg/l	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50
lead	µg/l	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50
mercury	ng/l	50,00	50,00	50,00	50,00	50,00	50,00	50,00	50,00	50,00	50,00	50,00	50,00	50,00
nickel	µg/l	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50
zinc	µg/l	56,00	25,00	59,00	21,00	24,00	12,00	21,00	69,00	30,00	55,00	41,00	22,00	32,46
precipitation	mm	132,00	163,00	82,00	138,00	142,00	147,00	126,00	25,00	64,00	59,00	293,00	136,00	1507,00
IE0002R														
ammonium	mg/l													0,00
nitrate	mg/l													0,00
precipitation	mm	144,10	131,60	90,50	107,80	161,50	154,50	89,80	12,60	71,60	186,10	217,00	149,20	1516,30
arsenic	µg/l	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50					0,50
cadmium	µg/l	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05					0,05
chromium	µg/l	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50					0,50
copper	µg/l	0,50	2,00	0,50	0,50	0,50	2,00	2,00	2,00					1,15
lead	µg/l	0,50	3,00	0,50	2,00	0,50	0,50	0,50	0,50					1,05
mercury	ng/l	50,00	50,00	50,00	50,00	50,00	50,00	50,00	50,00					50,00
nickel	µg/l	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50					0,50
zinc	µg/l	2,00	12,00	9,00	22,00	0,50	13,00	12,00	12,00					9,38
precipitation	mm	144,10	131,60	90,50	107,80	161,50	154,50	89,80	12,60	71,60	186,10	217,00	149,20	1516,30
γ-HCH	ng/l	0,15	0,15		0,50	0,85	0,55	0,45	1,35					0,25
precipitation	mm	144,10	131,60	90,50	107,80	161,50	154,50	89,80	12,60	71,60	186,10	217,00	149,20	1516,30
voluntary														
PCB_52	ng/l	0,05	0,05		0,20	0,35	0,20	0,20	0,55					0,17
PCB_101	ng/l	0,05	0,05		0,20	0,35	0,20	0,20	0,55					0,17
PCB_118	ng/l	0,05	0,05		0,10	0,15	0,10	0,10	0,25					0,09
PCB_138	ng/l	0,05	0,05		0,20	0,35	0,20	0,20	0,55					0,17
PCB_153	ng/l	0,05	0,05		0,20	0,35	0,20	0,20	0,55					0,17
precipitation	mm	144,10	131,60	90,50	107,80	161,50	154,50	89,80	12,60	71,60	186,10	217,00	149,20	1516,30
not reported														
PCB_180	ng/l													
PCB_28	ng/l													
phenanthrene	ng/l													
anthracene	ng/l													
flouranthene	ng/l													
pyrene	ng/l													
benzo(a)anthracene	ng/l													
chrysene	ng/l													
benzo(a)pyrene	ng/l													
benzo(ghi)perylene	ng/l													
indeno(1,2,3-cd)pyrene	ng/l													
Extra reported non-CAMP components														
IE0002R														
aldrin	ng/l	0,05	0,05		0,10	0,15	0,10	0,10	0,25					0,09
alpha_HCH	ng/l	0,15	0,15		0,50	0,85	0,55	0,45	1,35					0,42
dieldrin	ng/l	0,05	0,05		0,50	0,85	0,55	0,45	1,35					0,39
endrin	ng/l	0,35	0,35		0,50	0,85	0,55	0,45	1,35					0,48
heptachlor	ng/l	0,05	0,05		0,10	0,15	0,10	0,10	0,25					0,09
pp_DDD	ng/l													
pp_DDE	ng/l	0,05	0,05		0,10	0,15	0,10	0,10	0,25					0,09
pp_DDT	ng/l													
precipitation_amount	mm	144,10	131,60	90,50	107,80	161,50	154,50	89,80	12,60	71,60	186,10	217,00	149,20	1516,30

Airborne components

mandatory		january	february	march	april	may	june	july	august	september	october	november	december	mean
not reported														
NO_2	$\mu g/m^3$													
NH_3 + NH4	$\mu g/m^3$													
$HNO_3 + NO_3$	$\mu g/m^3$													
voluntary														
not reported														
PCB_118	pg/m3													
PCB_138	pg/m3													
PCB_153	pg/m3													
PCB_180	pg/m3													
PCB_28	pg/m3													
PCB_52	pg/m3													
anthracene	ng/m3													
phenanthrene	ng/m3													
benz_a_anthracene	ng/m3													
benzo_a_pyrene	ng/m3													
benzo_ghi_perylene	ng/m3													
inden_123cd_pyrene	ng/m3													
pyrene	ng/m3													
mercury	ng/m3													
γ-HCH	pg/m3													
arsenic	ng/m3													
cadmium	ng/m3													
chromium	ng/m3													
copper	ng/m3													
lead	ng/m3													
nickel	ng/m3													
zinc	ng/m3													
NO	$\mu g/m^3$													

Netherlands

PRECIPITATION

Mandatory			january	february	march	april	may	june	july	august	september	october	november	december	mean
NL0009R															
	ammonium	mg/l	0,77	0,77			1,22	1,62		3,29	0,77	0,45	0,63	0,55	0,81
	nitrate	mg/l	0,49	0,29			0,76	0,95		3,10	0,24	0,32	0,43	0,34	0,46
	precipitation	mm	145,80	25,90	12,10	1,90	95,90	70,10	26,60	1,80	132,10	82,10	40,20	83,93	718,43
	arsenic	µg/l	0,20	0,08		0,20		0,16	0,32	1,73	0,41	0,36	0,77	0,08	0,28
	cadmium	µg/l	0,09	0,04		0,06		0,08	0,09	0,34	0,02	0,02	0,10	0,04	0,06
	chromium	µg/l	0,26	0,26		0,26		0,26	0,26	2,10	0,26	0,53	0,94	0,26	0,34
	copper	µg/l	0,83	0,76		1,76		1,74	3,72	12,35	1,18	1,68	1,83	0,54	1,36
	lead	µg/l	1,54	0,49		2,22		2,04	1,98	8,61	1,52	1,63	3,15	0,62	1,64
	nickel	µg/l	0,21	0,21		0,52		0,21	0,49	2,55	0,21	0,44	0,77	0,21	0,31
	zinc	µg/l	6,49	5,00		7,70		7,60	10,90	34,80	7,30	5,80	12,00	4,71	7,10
	precipitation	mm	138,80	22,70		47,90		68,70	26,30	1,90	132,80	82,90	37,10	77,75	636,85
NL0091R															
	ammonium	mg/l	0,22	1,37	0,36	1,61	0,43	1,22	1,22		0,63	0,18	0,32	0,53	0,59
	nitrate	mg/l	0,24	0,59	0,31	0,80	0,48	0,53	0,81		0,46	0,21	0,41	0,34	0,42
	precipitation	mm	182,30	15,70	22,50	59,80	73,40	52,30	38,80		87,90	71,00	72,00	69,90	745,60
	arsenic	µg/l	0,08	0,15	0,18	0,16	0,22	0,23	0,23	1,72	0,08	0,08			0,13
	cadmium	µg/l	0,05	0,05	0,06	0,08	0,07	0,07	0,09	0,67	0,04	0,02			0,06
	chromium	µg/l	0,26	0,26	0,65	0,26	0,26	0,26	0,26	1,39	0,26	0,26			0,27
	copper	µg/l	0,96	1,40	2,89	1,65	1,74	4,24	5,42	51,26	1,43	0,96			1,87
	lead	µg/l	2,08	2,67	2,11	2,18	2,39	2,54	3,87	61,38	1,99	1,96			2,31
	nickel	µg/l	0,21	0,48	0,63	0,21	0,21	0,50	0,84	7,27	0,21	0,21			0,30
	zinc	µg/l	4,75	8,30	9,50	8,30	10,20	7,40	15,50	109,80	5,30	4,50			7,09
	precipitation	mm	186,50	16,40	20,60	57,40	81,60	53,10	39,70	0,30	87,80	70,10			613,50
	γ-HCH	ng/l	5,00	5,00	5,00	20,00	10,00	10,00	5,00	20,00	5,00	5,00	5,00	5,00	7,58
	precipitation	mm	38,60	19,40	28,60	67,50	80,70	59,40	44,50	2,40	95,60	83,20	80,00	78,40	678,30
	mercury	ng/l	5,40	7,00	9,74	12,30	12,06	12,44	18,80	13,00	9,31	4,16	5,18	4,46	8,60
	precipitation	mm	58,60	16,80	32,20	37,00	82,50	47,90	35,10	21,40	66,00	69,90	81,40	81,60	630,40

voluntary

not reported

PCB_101	ng/l
PCB_118	ng/l
PCB_138	ng/l
PCB_153	ng/l
PCB_180	ng/l
PCB_28	ng/l
PCB_52	ng/l
phenanthrene	ng/l
anthracene	ng/l
flouranthene	ng/l
pyrene	ng/l
benzo(a)anthracene	ng/l
chrysene	ng/l
benzo(a)pyrene	ng/l
benzo(ghi)perylene	ng/l
indeno(1,2,3-cd)pyrene	ng/l

Airborne components

mandatory			january	february	march	april	may	june	july	august	september	october	november	december	mean
NL0009R															
	nitrate	µg/m^3	0,51	1,38	1,18	0,76	0,55	0,59	0,49	0,5	1,04	0,74	0,96	0,66	0,78
	nitrogen_dioxide	µg/m^3	5,15	7,01	4,16	3,45	2,56	1,90	1,67	1,74	3,05	3,78	6,54	6,79	3,98
NL0091R															
	nitrate	µg/m^3	0,69	1,73	1,59	0,97	0,48	0,53	0,20	0,30	0,59	0,60	0,66	0,54	0,74
	nitrogen_dioxide	µg/m^3	7,71	12,93	7,90	5,84	4,36	4,80	4,04	3,52	6,61	6,92	9,33	9,06	6,92
	ammonium	µg/m^3	1,06	2,91	2,48	1,41	0,90	1,19	0,69	0,94	1,10	0,83	1,48	0,97	1,33
	ammonia	µg/m^3	0,17	6,81	2,87	2,11	0,90	1,44	1,28	0,99	1,29	0,82	0,87	1,00	1,71
voluntary															
NL0009R															
	arsenic	ng/m3	0,65	1,98	0,68	0,64	0,35	0,44	0,44	0,44	0,77	0,49	1,01	0,78	0,72
	cadmium	ng/m3	0,23	0,45	0,16	0,27	0,09	0,10	0,10	0,09	0,20	0,18	0,26	0,28	0,20
	lead	ng/m3	12,65	16,14	7,31	8,90	4,32	5,24	4,66	3,76	9,34	6,14	10,74	11,88	8,42
	zinc	ng/m3	24,37	43,88	18,92	24,07	11,54	16,85	14,54	14,40	27,72	18,04	27,15	32,61	22,84
	NO	µg/m^3	0,48	1,53	0,63	0,45	0,32	0,35	0,46	0,44	0,52	1,15	1,85	5,33	1,13
NL0091R															
	NO	µg/m^3	2,19	7,34	1,84	0,92	0,67	0,91	0,86	0,52	2,97	3,32	6,94	13,42	3,49
not reported															
	PCB_118	pg/m3													
	PCB_138	pg/m3													
	PCB_153	pg/m3													
	PCB_180	pg/m3													
	PCB_28	pg/m3													
	PCB_52	pg/m3													
	anthracene	ng/m3													
	phenanthrene	ng/m3													
	benz_a_anthracene	ng/m3													
	benzo_a_pyrene	ng/m3													
	benzo_ghi_perylene	ng/m3													
	inden_123cd_pyrene	ng/m3													
	pyrene	ng/m3													
	chromium	ng/m3													
	copper	ng/m3													
	nickel	ng/m3													
	mercury	ng/m3													
	γ-HCH	pg/m3													

Norway

PRECIPITATION

mandatory			january	february	march	april	may	june	july	august	september	october	november	december	mean
NO0001R															
	ammonium	mg/l	0,35	0,38	1,22	0,50	0,53	0,38	0,35	0,14	0,74	0,49	0,37	0,18	0,47
	nitrate	mg/l	0,54	0,52	0,91	0,51	0,51	0,28	0,33	0,22	0,67	0,75	0,55	0,28	0,50
	precipitation	mm	98,90	65,80	80,50	107,50	222,50	81,80	167,90	50,10	118,60	66,10	211,60	103,20	1374,50
	cadmium	µg/l	0,02	0,03	0,10	0,03	0,03	0,04	0,01	0,01	0,09	0,05	0,04	0,07	0,04
	lead	µg/l	1,75	2,01	4,50	1,28	0,99	0,65	0,64	0,73	2,58	1,46	1,33	1,76	1,57
	zinc	µg/l	3,27	3,54	9,83	2,85	2,55	5,33	2,85	2,59	5,51	4,89	2,76	5,50	3,93
	precipitation	mm	111,15	71,91	81,37	94,27	175,86	64,11	154,46	46,97	140,51	74,33	231,27	55,73	1301,94
NO0039R															
	ammonium	mg/l	0,05	0,31	0,57	0,17	0,17	0,13	0,20	0,09	0,15	0,06	0,14	0,04	0,12
	nitrate	mg/l	0,04	0,51	0,49	0,09	0,11	0,10	0,12	0,05	0,04	0,03	0,23	0,02	0,08
	precipitation	mm	239,90	2,40	79,80	56,80	90,30	122,40	87,70	386,80	133,90	152,70	13,80	297,80	1664,30
NO0057R															
	ammonium	mg/l	0,30	0,12	0,14	0,22	0,13	0,28	0,15	0,12	0,14	0,07	0,05	0,04	0,12
	nitrate	mg/l	0,25	0,08	0,08	0,19	0,11	0,50	0,12	0,23	0,09	0,04	0,09	0,06	0,11
	precipitation	mm	2,10	27,70	19,90	24,80	20,90	4,30	21,30	6,70	9,40	15,00	37,40	17,30	206,80
NO0099R															
	ammonium	mg/l	0,73	0,77	1,18	0,64	0,87	0,61							0,85
	nitrate	mg/l	0,54	1,10	1,03	0,77	1,06	0,51							0,83
	precipitation	mm	99,40	37,40	122,60	39,80	93,00	77,70							469,90
	arsenic	µg/l													
	cadmium	µg/l	0,06	0,08	0,05	0,12	0,13	0,03	0,25	0,01	0,04	0,03	0,05	0,01	0,06
	chromium	µg/l	0,65	0,22	0,16	0,47	0,43	0,27	0,55	0,48	0,16	0,10	0,10	0,10	0,31
	copper	µg/l	1,75	2,02	0,70	1,48	2,97	0,90	1,59	1,55	1,14	0,99	0,72	0,64	1,30
	lead	µg/l	1,55	3,82	2,27	3,00	2,57	1,35	1,90	4,77	2,21	1,46	1,39	0,67	1,95
	nickel	µg/l	0,79	0,24	0,31	0,43	0,87	0,37	1,16	0,43	0,33	0,47	0,29	0,19	0,50
	zinc	µg/l	10,21	7,34	5,54	7,88	13,87	4,16	11,72	4,40	10,86	6,01	3,99	3,12	7,76
	precipitation		212,20	38,89	114,08	38,12	85,61	73,47	77,01	50,80	170,64	80,73	135,02	114,32	1190,86
	γ-HCH	ng/l	0,34	0,30	1,15	1,94	2,19	1,32	0,76	0,41	0,64	0,41	0,78	0,24	0,91
	precipitation	mm	98,50	34,80	131,10	35,40	93,00	77,70	73,89	50,80	147,20	80,73	133,06	15,67	971,84
	mercury	ng/l													

voluntary		
not reported		
	PCB_101	ng/l
	PCB_118	ng/l
	PCB_138	ng/l
	PCB_153	ng/l
	PCB_180	ng/l
	PCB_28	ng/l
	PCB_52	ng/l
	phenanthrene	ng/l
	anthracene	ng/l
	flouranthene	ng/l
	pyrene	ng/l
	benzo(a)anthracene	ng/l
	chrysene	ng/l
	benzo(a)pyrene	ng/l
	benzo(ghi)perylene	ng/l
	indeno(1,2,3-cd)pyrene	ng/l

NO0099R															
	alpha_HCH	ng/l	0,37	0,43	0,36	0,66	0,38	0,33	0,28	0,49	0,39	0,37	0,41	0,28	0,39
	HCB	ng/l	0,14	0,30	0,13	1,05	0,36	0,39	0,12	1,09	0,73	0,16	0,35	0,11	0,39
	precipitation_amount	ng/l	98,50	34,80	131,10	35,40	93,00	77,70	73,89	50,80	147,20	80,73	133,06	15,67	971,84

Airborne components

mandatory			january	february	march	april	may	june	july	august	september	october	november	december	mean
NO0001R															
	NH_4	µg/m³	0,123	1,014	1,198	0,361	0,272	0,28	0,349	0,149	0,215	0,17	0,324	0,127	0,38
	NO_3	µg/m³	0,087	0,43	0,555	0,139	0,139	0,098	0,096	0,075	0,186	0,139	0,227	0,078	0,19
	NH_3	µg/m³	0,133	0,147	0,298	0,298	0,275	0,23	0,325	0,261	0,27	0,099	0,152	0,121	0,22
	NH_3 + NH4	µg/m³	0,255	1,162	1,497	0,658	0,549	0,51	0,675	0,41	0,485	0,271	0,476	0,248	0,60
	$HNO_3 + NO_3$	µg/m³	0,121	0,664	0,684	0,224	0,228	0,162	0,171	0,115	0,228	0,165	0,271	0,113	0,26
NO0008R	nitrate						0,169	0,094	0,092	0,089	0,2	0,075	0,109	0,074	0,11
NO0039R	NH_4	µg/m³	0,066	0,082	0,256	0,427	0,09	0,159	0,198	0,103	0,104	0,029	0,05	0,012	0,13
	NO_3	µg/m³	0,032	0,064	0,117	0,174	0,045	0,056	0,048	0,037	0,088	0,04	0,04	0,031	0,06
	NH_3	µg/m³	0,293	0,684	0,746	0,617	1,164	1,302	1,76	0,904	1,639	0,497	0,2	0,184	0,83
	NO_2	µg/m³	0,205	0,434	0,29	0,217	0,278	0,398	0,265	0,199	0,359	0,3	0,515	0,207	0,31
	NH_3 + NH4	µg/m³	0,361	0,746	0,998	1,046	1,253	1,462	1,957	1,005	1,717	0,524	0,249	0,196	0,96
	$HNO_3 + NO_3$	µg/m³	0,047	0,087	0,156	0,25	0,074	0,08	0,071	0,057	0,115	0,057	0,076	0,04	0,09
NO0042G	NH_4	µg/m³	0,074	0,046	0,085	0,068		0,024	0,013	0,015	0,012	0,009	0,029	0,061	0,04
	NO_3	µg/m³	0,025	0,016	0,021	0,029		0,015	0,016	0,015	0,018	0,016	0,015	0,023	0,02
	NH_3	µg/m³	0,18	0,218	0,189	0,266		0,246	0,246	0,318	0,256	0,25	0,228	0,124	0,23
	HNO_3	µg/m³	0,014	0,02	0,014	0,017		0,021	0,015	0,018	0,012	0,012	0,028	0,01	0,02
	NH_3 + NH4	µg/m³	0,254	0,264	0,274	0,336		0,27	0,259	0,333	0,269	0,257	0,258	0,184	0,27
	$HNO_3 + NO_3$	µg/m³	0,04	0,036	0,037	0,044		0,039	0,031	0,032	0,032	0,028	0,044	0,039	0,04
voluntary															
NO0001R	γ-HCH	pg/m3										2,54	15,545	5,94	8,01
NO0042G	PCB_28	pg/m3	1,643	1,524	1,681	1,724	3,208	1,962	2,585	2,035	1,972	1,758	1,621	1,244	1,91
	PCB_52	pg/m3	1,01	1,216	1,263	1,014	1,322	0,851	1,048	0,87	0,851	0,999	1,107	0,947	1,04
	PCB_101	pg/m3	0,643	0,718	0,551	0,459	0,621	0,327	0,377	0,371	0,337	0,57	0,632	0,382	0,50
	PCB_118	pg/m3	0,303	0,321	0,216	0,167	0,232	0,107	0,149	0,206	0,183	0,343	0,349	0,185	0,23
	PCB_138	pg/m3	0,384	0,319	0,192	0,148	0,303	0,13	0,146	0,252	0,222	0,265	0,273	0,14	0,23
	PCB_153	pg/m3	0,755	0,542	0,262	0,223	0,401	0,152	0,21	0,403	0,4	0,307	0,408	0,207	0,36
	PCB_180	pg/m3	0,198	0,129	0,011	0,026	0,079	0,054	0,07	0,093	0,076	0,062	0,095	0,05	0,08
	anthracene	ng/m3	0,005	0,004	0,002	0,001	0,012	0,008	0,001	0,001	0,004	0,172	0,001	0,003	0,02
	phenanthrene	ng/m3	0,215	0,142	0,102	0,024	0,084	0,062	0,036	0,029	0,085	1,748	0,053	0,107	0,22
	benz_a_anthracene	ng/m3	0,021	0,008	0,004	0,001	0,001	0,001	0,001	0,001	0,002	0,08	0,003	0,014	0,01
	benzo_a_pyrene	ng/m3	0,016	0,006	0,002	0,001	0,001	0,001	0,001	0,001	0,001	0,022	0,001	0,008	0,01
	benzo_ghi_perylene	ng/m3	0,024	0,011	0,009	0,001	0,001	0,001	0,001	0,001	0,001	0,212	0,004	0,013	0,02
	inden_123cd_pyrene	ng/m3	0,024	0,008	0,006	0,001	0,001	0,001	0,001	0,001	0,001	0,056	0,002	0,015	0,01
	pyrene	ng/m3	0,095	0,048	0,037	0,009	0,011	0,008	0,009	0,005	0,009	0,415	0,017	0,063	0,06
	γ-HCH	pg/m3	3,971	3,33	4,83	5,314	6,563	3,924	3,266	3,336	5,236	3,577	4,25	3,164	4,23
NO0099R	γ-HCH	pg/m3	3,094	4,86	9,09	6,377	11,39	11,57	21,6	11,34	11,345	5,59	8,953	3,847	9,09
not reported															
	arsenic	ng/m3													
	cadmium	ng/m3													
	chromium	ng/m3													
	copper	ng/m3													
	lead	ng/m3													
	mercury	ng/m3													
	nickel	ng/m3													
	zinc	ng/m3													
	NO	µg/m³													
Extra reported non-CAMP components															
NO0001R	alpha_HCH	pg/m3										6,22	12,17	7,36	8,58
NO0042G	alpha_HCH	pg/m3	18,10	13,12	15,48	17,35	21,42	19,21	19,82	26,11	25,84	16,75	16,60	15,22	18,75
	pp_DDD	pg/m3	0,06	0,17	0,02	0,09	0,04	0,01	0,05	0,07	0,04	0,07	0,13	0,12	0,07
	pp_DDE	pg/m3	1,53	2,02	0,64	0,56	0,41	0,15	0,44	0,72	0,71	0,62	1,85	1,08	0,90
	pp_DDT	pg/m3	0,17	0,23	0,11	0,09	0,08	0,03	0,08	0,13	0,13	0,16	0,34	0,21	0,15
NO0099R	alpha_HCH	pg/m3	7,98	8,20	7,62	11,72	10,96	13,73	21,95	16,70	15,38	12,86	10,35	8,45	12,16

Portugal

PRECIPITATION

Mandatory		january	february	march	april	may	june	july	august	september	october	november	december	mean
PT0003R														
ammonium	mg/l	0,07	0,14	0,25	0,13	0,67	0,10	0,28	0,17	1,04	0,11	0,04	0,10	0,14
nitrate	mg/l	0,27	0,27	0,40	0,31	1,01	0,24	0,32	0,24	0,28	0,12	0,10	0,22	0,24
precipitation	mm	294,90	132,20	142,40	176,90	20,10	76,90	60,70	36,10	31,00	193,10	290,50	121,80	1576,60
cadmium	µg/l	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43
copper	µg/l	0,60	2,43	0,74	0,59	2,60	0,65	1,85	4,81	2,64	0,62	0,51	1,05	1,91
lead	µg/l	0,65	0,65	0,65	0,65	1,12	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,73
nickel	µg/l	0,78	0,78	0,78	0,96	1,94	0,78	0,78	2,23	2,32	0,82	0,78	1,50	1,35
zinc	µg/l	4,65	15,23	21,03	15,83	43,53	21,28	25,34	30,45	20,00	17,52	16,96	17,81	249,62
PT0004R														
ammonium	mg/l	0,09	0,04	0,64	0,02					0,09	0,08	0,15	0,02	0,08
nitrate	mg/l	0,28	0,22	0,20	0,03					0,43	0,21	0,10	0,13	0,16
precipitation	mm	63,50	94,90	20,40	92,20	3,20	2,30	2,00	2,30	5,60	147,90	74,90	66,30	575,50
cadmium	µg/l	0,43	0,43	0,43	0,43					0,43	0,43	0,43	0,43	0,43
copper	µg/l	0,46	0,38	0,93	0,45					2,21	1,05	1,40	0,69	1,18
lead	µg/l	0,65	0,65	0,65	0,65					0,65	0,65	0,65	0,65	0,65
nickel	µg/l	0,78	0,78	0,78	1,77					2,50	3,40	2,04	1,24	1,94
zinc	µg/l	6,44	2,58	9,00	5,13					18,00	14,00	14,95	14,74	84,84
PT0010R														
ammonium	mg/l	0,11	0,06	0,06	0,04	0,08	0,05	0,02	0,03	0,02	0,07	0,02	0,02	0,04
nitrate	mg/l	0,37	0,33	0,42	0,41	0,91	0,65	1,88	0,37	0,60	0,31	0,23	0,18	0,42
precipitation	mm	119,80	89,40	143,30	158,40	14,40	12,60	9,30	55,60	244,10	25,70	115,40	129,50	1117,50
cadmium	µg/l	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43
copper	µg/l	3,73	0,33	1,66	0,33	0,65	0,33	0,33	0,48	0,66	2,94	0,87	0,40	1,04
lead	µg/l	0,65	0,65	0,65	1,03	3,65	0,65	7,13	0,65	7,30	4,20	3,49	0,65	4,09
nickel	µg/l	14,94	2,88	1,98	8,61	2,63	3,02	7,56	2,87	3,27	6,01	3,69	24,24	6,50
zinc	µg/l	42,35	15,82	52,39	12,81	29,00	46,00	73,00	89,99	300,36	99,00	11,80	83,50	856,02
not reported														
chromium	µg/l													
mercury	ng/l													
γ-HCH	ng/l													
voluntary														
not reported														
PCB_101	ng/l													
PCB_118	ng/l													
PCB_138	ng/l													
PCB_153	ng/l													
PCB_180	ng/l													
PCB_28	ng/l													
PCB_52	ng/l													
phenanthrene	ng/l													
anthracene	ng/l													
flouranthene	ng/l													
pyrene	ng/l													
benzo(a)anthracene	ng/l													
chrysene	ng/l													
benzo(a)pyrene	ng/l													
benzo(ghi)perylene	ng/l													
indeno(1,2,3-cd)pyrene	ng/l													

Airborne components

mandatory		january	february	march	april	may	june	july	august	september	october	november	december	mean
not reported														
NO_2	µg/m³													
NH_3 + NH4	µg/m³													
HNO_3 + NO_3	µg/m³													
voluntary														
not reported														
PCB_118	pg/m3													
PCB_138	pg/m3													
PCB_153	pg/m3													
PCB_180	pg/m3													
PCB_28	pg/m3													
PCB_52	pg/m3													
anthracene	ng/m3													
phenanthrene	ng/m3													
benz_a_anthracene	ng/m3													
benzo_a_pyrene	ng/m3													
benzo_ghi_perylene	ng/m3													
inden_123cd_pyrene	ng/m3													
pyrene	ng/m3													
mercury	ng/m3													
γ-HCH	pg/m3													
arsenic	ng/m3													
cadmium	ng/m3													
chromium	ng/m3													
copper	ng/m3													
lead	ng/m3													
nickel	ng/m3													
zinc	ng/m3													
NO	µg/m³													

Spain

PRECIPITATION

Mandatory			january	february	march	april	may	june	july	august	september	october	november	december	mean
ES0008R															
	ammonium	mg/l	0,15	0,26	0,47	1,81	1,04	0,91	0,84	1,21	0,56	0,54	0,36	0,45	0,56
	nitrate	mg/l	0,37	0,42	0,42	1,37	0,75	0,94	0,83	1,38	0,90	0,69	0,42	0,93	0,68
	precipitation	mm	141,80	57,60	20,40	11,40	48,60	43,20	26,40	62,40	36,40	107,20	79,60	38,00	673,00
not reported															
	arsenic	µg/l													
	cadmium	µg/l													
	chromium	µg/l													
	copper	µg/l													
	lead	µg/l													
	mercury	ng/l													
	nickel	µg/l													
	zinc	µg/l													
	γ-HCH	ng/l													

voluntary

not reported		
	PCB_101	ng/l
	PCB_118	ng/l
	PCB_138	ng/l
	PCB_153	ng/l
	PCB_180	ng/l
	PCB_28	ng/l
	PCB_52	ng/l
	phenanthrene	ng/l
	anthracene	ng/l
	flouranthene	ng/l
	pyrene	ng/l
	benzo(a)anthracene	ng/l
	chrysene	ng/l
	benzo(a)pyrene	ng/l
	benzo(ghi)perylene	ng/l
	indeno(1,2,3-cd)pyrene	ng/l

Airborne components

mandatory			january	february	march	april	may	june	july	august	september	october	november	december	mean
ES0008R															
	nitrate	µg/m3		0,41	1,34	0,72	0,50	0,35	0,32	0,37	0,55	0,38	0,40	0,23	0,51
	nitrogen_dioxide	µg/m3	0,87	0,81	0,95	1,60	1,71	1,66	1,11	1,40	2,05	2,25	2,50	2,17	1,59
	sum_ammonia_and_ammonium	µg/m3	0,29	0,35	0,75	0,66	0,51	0,72	0,77	0,97	0,67	0,35	0,23	0,24	0,54
	sum_nitric_acid_and_nitrate	µg/m3	0,28	0,39	0,83	0,66	0,48	0,46	0,46	0,66	0,64	0,57	0,70	0,25	0,53
	NH_3[a]	µg/m3						0,10						0,10	

[a] each one week campaigns. All observations BDL. Quoted value is 50% BDL as per CAMP Principles

voluntary

ES0008R															
	nitrogen monoxide		also received.												
	arsenic[b]	ng/m3							0,15					0,08	
	cadmium[b]	ng/m3							0,07					0,05	
	chromium[b]	ng/m3							0,98					0,72	
	copper[b]	ng/m3							19,54					10,07	
	lead[b]	ng/m3							2,66					4,71	
	nickel[b]	ng/m3							4,47					1,95	
	zinc[b]	ng/m3							19,32					29,28	

[b] each one week campaigns. Daily observations. Where daily value is BDL, 50% of BDL used as per CAMP Principles

not reported		
	PCB_118	
	PCB_138	
	PCB_153	
	PCB_180	
	PCB_28	
	PCB_52	
	anthracene	
	phenanthrene	
	benz_a_anthracene	
	benzo_a_pyrene	
	benzo_ghi_perylene	
	inden_123cd_pyrene	
	pyrene	
	mercury	ng/m3
	γ-HCH	

Extra reported non-CAMP components															
ES0008R															
	benzene[c]	µg/m3						0,24							
	toluene[c]	µg/m3						0,15							
	xylene[c]	µg/m3						0,45							

[c] each two week campaigns. 30-minute observations.

Sweden

PRECIPITATION

mandatory

			january	february	march	april	may	june	july	august	september	october	november	december	mean
SE0014R															
	ammonium	mg/l	0,38	0,76	1,13	0,62	0,48	1,05	0,25	0,12	1,38	0,33	0,26	0,26	0,45
	nitrate	mg/l	0,62	1,08	1,21	0,53	0,53	0,51	0,23	0,21	1,31	0,56	0,52	0,43	0,49
	precipitation	mm	37,30	17,60	10,60	90,90	59,10	53,70	84,10	48,00	10,20	44,50	61,80	83,00	600,80
	mercury	ng/l	11,50	22,00	24,00	7,40	7,20	24,00	7,10	9,70	13,00	8,30	6,60	5,20	9,04
	precipitation	mm	31,80	2,40	6,00	28,90	105,80	33,60	108,20	39,80	20,50	33,20	41,00	60,40	511,60
	γ-HCH	ng/m^2/d	0,11	0,23	1,13	2,01	1,80	1,78	1,09	0,32	0,46	0,71	1,45	0,81	0,99
SE0098R															
	ammonium	mg/l	0,65	0,57		0,41				0,19	0,93	0,31		0,18	0,40
	nitrate	mg/l	0,80	0,90		0,36				0,32	1,25	0,39		0,21	0,48
	precipitation	mm	419,00	36,00		84,00	101,00	80,00		38,00	19,00	75,00		176,00	1028,00
SE0097R															
	arsenic	µg/l	0,31	0,27	0,33	0,21	0,08	0,03	0,03	0,03	0,20	0,03	0,26	0,13	0,16
	cadmium	µg/l	0,06	0,06	0,09	0,06	0,04	0,04	0,03	0,03	0,09	0,02	0,08	0,03	0,05
	chromium	µg/l	0,81	1,16	0,30	0,05	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,20
	copper	µg/l	0,62	1,08	4,22	1,21	0,74	0,85	0,60	1,68	1,55	0,21	3,14	0,22	1,21
	lead	µg/l	1,46	2,27	2,35	1,32	0,99	0,81	0,83	0,48	1,67	0,33	1,41	0,60	1,13
	nickel	µg/l	0,02	0,09	0,55	0,20	0,18	0,20	0,15	0,26	0,36	0,13	0,21	0,21	0,19
	zinc	µg/l	6,86	6,65	15,57	5,49	3,88	4,49	1,62	2,29	8,75	0,49	5,28	2,60	5,00
	precipitation	mm	118,00	22,24	53,04	55,82	77,75	68,70	58,86	18,60	22,23	76,77	85,21	96,18	76,75

voluntary

SE0014R															
	PCB_101	ng/m^2/day	0,12	0,11	0,32	0,35		0,14	0,10	0,07	0,11		0,10	0,11	0,15
	PCB_118	ng/m^2/day	0,09	0,07	0,20	0,21		0,14	0,09	0,06	0,11		0,10	0,13	0,12
	PCB_138	ng/m^2/day	0,22	0,23	0,43	0,61		0,46	0,26	0,16	0,33		0,38	0,38	0,35
	PCB_153	ng/m^2/day	0,23	0,26	0,41	0,48		0,44	0,22	0,19	0,25		0,30	0,32	0,31
	PCB_180	ng/m^2/day	0,14	0,18	0,32	0,41		0,30	0,18	0,12	0,24		0,30	0,24	0,24
	PCB_28	ng/m^2/day	0,01	0,01	0,01	0,01		0,01	0,01	0,01	0,01		0,01	0,01	0,01
	PCB_52	ng/m^2/day	0,01	0,01	0,01	0,01		0,01	0,01	0,01	0,01		0,01	0,01	0,01
	alpha_HCH	ng/m^2/day	0,31	0,05	0,15	0,56		0,42	0,59	0,21	0,18		0,30	0,27	0,31
	anthracene	ng/m^2/day	1,00	1,00	1,00	1,00		0,00	0,00	0,00	1,00		2,00	2,00	0,90
	benz_a_anthracene	ng/m^2/day	5,05	4,00	4,00	4,00		2,00	1,00	1,00	0,00		10,00	14,00	4,52
	benzo_a_pyrene	ng/m^2/day	6,55	6,00	6,00	5,00		4,00	2,00	1,00	3,00		14,00	22,00	6,97
	benzo_b_fluoranthene	ng/m^2/day	14,13	14,00	11,00	8,00		6,00	4,00	2,00	4,00		36,00	36,00	13,51
	benzo_ghi_perylene	ng/m^2/day	6,55	8,00	5,00	5,00		4,00	3,00	2,00	3,00		15,00	26,00	7,77
	benzo_k_fluoranthene	ng/m^2/day	5,55	5,00	5,00	4,00		3,00	2,00	1,00	2,00		14,00	15,00	5,66
	chrysene_thriphenylene	ng/m^2/day	14,13	13,00	11,00	10,00		5,00	4,00	2,00	4,00		37,00	36,00	13,61
	fluoranthene	ng/m^2/day	24,24	34,00	30,00	33,00		13,00	9,00	4,00	9,00		50,00	73,00	27,89
	gamma_HCH	ng/m^2/day	1,25	0,11	0,79	2,10		1,80	1,20	0,31	0,35		1,50	0,81	1,03
	phenanthrene	ng/m^2/day	28,00	30,00	23,00	28,00		10,00	9,00	4,00	7,00		38,00	52,00	22,86
	pyrene	ng/m^2/day	16,65	19,00	18,00	18,00		9,00	6,00	3,00	5,00		34,00	55,00	18,38
Extra reported non-CAMP components															
SE0014R	alpha_HCH	precip+dry	0,31	0,05	0,15	0,56		0,42	0,59	0,21	0,18		0,30	0,27	0,31

NOTE: organic measurements at SE0014R are of combined dry and wet deposition

Airborne components

mandatory			january	february	march	april	may	june	july	august	september	october	november	december	mean
SE0014R															
	NO_2	µg/m^3	2,35	2,57	2,63	1,48	1,43	0,95	1,08	1,10	1,14	1,40	2,45	2,08	1,72
	NH_3 + NH4	µg/m^3	0,97	2,25	2,61	1,16	1,14	0,87	0,88	0,57	0,89	0,54	1,04	0,78	1,14
	HNO_3 + NO_3	µg/m^3	0,81	1,08	1,42	0,83	0,89	0,57	0,54	0,35	0,72	0,46	0,75	0,63	0,75
voluntary															
SE0014R															
	PCB_118	pg/m3	0,50	0,48	0,52	0,75	0,75	1,74	2,23	1,70	1,12	0,88	0,70	0,45	0,98
	PCB_138	pg/m3	1,09	1,11	0,94	1,55	1,40	3,79	5,14	3,67	2,23	1,88	1,71	0,97	2,12
	PCB_153	pg/m3	1,29	1,32	1,17	1,82	1,74	4,19	5,80	4,17	2,64	2,01	2,00	1,13	2,44
	PCB_180	pg/m3	0,63	0,68	0,46	0,59	0,48	1,36	1,93	1,23	0,77	0,75	0,85	0,39	0,84
	PCB_28	pg/m3	1,43	1,26	1,50	1,79	1,77	3,84	2,02	1,71	1,58	1,25	1,81	1,70	1,81
	PCB_52	pg/m3	1,90	1,88	2,17	2,71	3,05	8,73	6,13	4,51	3,70	2,34	2,19	1,63	3,41
	anthracene	ng/m3	0,06	0,07	0,02	0,01	0,00	0,01	0,00	0,01	0,01	0,05	0,06	0,02	0,03
	phenanthrene	ng/m3	2,88	3,93	1,85	0,99	0,53	0,47	0,44	0,43	0,48	2,02	3,33	1,77	1,59
	benz_a_anthracene	ng/m3	0,23	0,32	0,10	0,04	0,03	0,11	0,01	0,03	0,02	0,23	0,22	0,10	0,12
	benzo_a_pyrene	ng/m3	0,25	0,40	0,14	0,05	0,02	0,05	0,01	0,02	0,03	0,21	0,26	0,12	0,13
	benzo_ghi_perylene	ng/m3	0,26	0,40	0,17	0,06	0,02	0,01	0,01	0,01	0,03	0,19	0,36	0,15	0,14
	inden_123cd_pyrene	ng/m3	0,28	0,48	0,21	0,07	0,02	0,02	0,01	0,02	0,02	0,16	0,17	0,12	0,13
	pyrene	ng/m3	0,97	1,26	0,50	0,24	0,07	0,06	0,06	0,05	0,11	0,61	0,96	0,44	0,44
	mercury	ng/m3	12,34	20,41	11,31	8,33	7,31	7,13	7,45	4,51	5,54	5,43	13,46	10,60	9,48
	γ-HCH	pg/m3	4,12	3,93	6,07	7,40	12,87	10,11	14,45	9,32	8,50	4,81	7,07	6,00	7,89
not reported															
	arsenic	ng/m3													
	cadmium	ng/m3													
	chromium	ng/m3													
	copper	ng/m3													
	lead	ng/m3													
	nickel	ng/m3													
	zinc	ng/m3													
	NO	µg/m^3													

SE0014R												
	alpha_HCH	pg/m3	7.000	7.000	8.714	9.000	9.240	9.400	10.000	10.750	8.400	7.000	6.333
	pp_DDD	pg/m3	0.215	0.173	0.296	0.326	0.466	1.456	0.597	0.625	0.946	0.455	0.457
	pp_DDE	pg/m3	2.525	2.475	1.800	3.080	2.772	2.260	1.260	2.700	2.276	5.350	4.667
	pp_DDT	pg/m3	1.450	1.340	0.879	1.400	1.510	2.260	1.170	1.725	0.808	1.558	1.073

United Kingdom

PRECIPITATION

			january	february	march	april	may	june	july	august	september	october	november	december	mean
mandatory															
GB0014R	ammonium	mg/l	0,232	0,862	0,93	0,72	0,785	0,694	0,706	1,236	0,628	0,272	0,466	0,417	0,57
	nitrate	mg/l	0,237	0,623	0,51	0,41	0,542	0,622	0,663	1,096	0,546	0,491	0,507	0,369	0,492
	precipitatio	mm	103,586	33,429	26,086	29,886	86,457	41,679	44,693	17,364	48,821	48,829	83,486	64,286	628,6
GB0017R															
	ammonium	mg/l	1,54	5,179	0	0,41	0,322	0,184	0,226	0,28	2,55	2,55	1,998	0,917	0,941
	nitrate	mg/l	0,253	0,613	0	0,95	0,842	0,558	0,315	0,74	0,29	0,29	1,633	0,563	0,574
	precipitatio	mm	54,364	10,411	0,625	22	75,979	106,75	57,087	14,884	10,9	48,271	18,871	35,657	455,8
	arsenic	µg/l								0,19	0,19	0,173	0,112	0,13	0,147
	cadmium	µg/l								0,02	0,02	0,043	0,02	0,02	0,026
	chromium	µg/l								0,24	0,24	0,08	0,038	0,12	0,105
	copper	µg/l								1,85	1,85	1,096	0,626	0,58	0,975
	lead	µg/l								1,63	1,63	1,219	0,827	0,79	1,076
	nickel	µg/l								0,52	0,52	0,464	0,193	0,23	0,335
	zinc	µg/l								8,71	8,71	5,601	4,461	5,53	5,805
	precipitatio	mm								15,164	41,357	76,225	97,825	62,128	292,7
GB0091R															
	ammonium	mg/l	0,139	1,113	0,765	0,776	0,24	0,86	0,587	0,453	0,129	0,132	0,169	0,12	0,405
	nitrate	mg/l	0,164	1,229	0,858	0,686	0,306	1,194	0,549	0,56	0,156	0,326	0,296	0,137	0,464
	precipitatio	mm	63,333	22,824	30,093	75,964	95,4	20,986	20,286	16,486	19,829	30,286	58,014	32,8	486,3
	arsenic	µg/l			2,582	2,38	0,298	0,346	0,265	0,174	0,12	0,161	0,238	0,129	0,55
	cadmium	µg/l			0,022	0,063	0,016	0,094	0,119	0,099	0,033	0,026	0,047	0,021	0,043
	chromium	µg/l			1,53	0,487	0,238	0,401	0,25	0,228	0,211	0,254	0,199	0,095	0,291
	copper	µg/l			2,301	0,815	0,419	1,378	1,496	1,144	0,4	0,377	0,915	0,407	0,747
	lead	µg/l			0,887	1,814	0,615	1,67	1,189	0,62	0,33	0,359	2,495	0,612	1,175
	nickel	µg/l			0,163	0,234	0,146	1,284	0,631	2,101	0,442	0,199	0,504	0,093	0,412
	zinc	µg/l			7,344	10,28	4,879	17,113	24,134	12,179	5,981	6,002	9,41	6,697	8,817
	precipitatio	mm			10,1	44,529	106,791	36,722	25,358	10,4	25,929	20,057	65,3	48,114	393,3
not reported															
	mercury	ng/l													
	γ-HCH	ng/l													
voluntary															
not reported															
	PCB_101	ng/l													
	PCB_118	ng/l													
	PCB_138	ng/l													
	PCB_153	ng/l													
	PCB_180	ng/l													
	PCB_28	ng/l													
	PCB_52	ng/l													
	phenanthre	ng/l													
	anthracene	ng/l													
	flouranther	ng/l													
	pyrene	ng/l													
	benzo(a)ar	ng/l													
	chrysene	ng/l													
	benzo(a)py	ng/l													
	benzo(ghi)p	ng/l													
	indeno(1,2,	ng/l													

Airborne components

mandatory		january	february	march	april	may	june	july	august	september	october	november	december	mean
GB0014R														
NO_2	µg/m³										2,593	4,741	4,852	4,062
NH_3	µg/m³	0,11	0,22	0,36	0,45	0,21	0,34	0,32	0,33	0,4	0,16	0,15	0,11	0,263333
NH_4		0,18	0,95	1,17	0,87	0,21	0,46	0,3	0,29	0,43	0,21	0,42	0,27	0,48
HNO_3	µg/m³	0,26	0,41	0,47	0,38	0,17	0,38	0,26	0,27	0,19	0,42	0,42	0,45	0,34
NO_3		0,34	2,13	2,38	1,75	0,41	0,85	0,5	0,7	0,45	0,91	0,87	0,59	0,99
voluntary														
GB0017R														
arsenic	ng/m3								0,264	0,827	0,833	2,589		1,12825
cadmium	ng/m3								0	0,157	0,15	0,304		0,15275
chromium	ng/m3								1,023	1,624	1,286	4,017		1,9875
copper	ng/m3								0,791	2,8	2,404	4,033		2,507
lead	ng/m3								2,1	9,56	7,983	16,356		8,99975
nickel	ng/m3								0,756	2,684	1,814	1,994		1,812
zinc	ng/m3								18,382	29,31	20,142	42,826		27,665
GB0091R														
arsenic	ng/m3			0,883	0,587	0,235	0,253	0,294	0,223	0,393	0,397	0,89	0,618	0,4773
cadmium	ng/m3			0,139	0,163	0,029	0,003	0	0	0,023	0,006	0,087	0,064	0,0514
chromium	ng/m3			1,586	3,121	0,888	1,102	1,082	1,122	1,077	0,072	2,128	2,625	1,4803
copper	ng/m3			2,006	1,5	0,61	0,997	1,552	1,071	1,347	0,674	1,753	8,45	1,996
lead	ng/m3			9,15	7,5	1,871	1,783	2,081	2,752	2,29	1,639	7,71	6,218	4,2994
nickel	ng/m3			1,374	1,602	0,578	0,966	1,046	0,923	0,487	0,304	0,965	2,775	1,102
zinc	ng/m3			21,256	20,613	8,848	11,55	22,384	17,097	17,457	9,184	23,25	53,177	20,4816
not reported														
PCB_118	pg/m3													
PCB_138	pg/m3													
PCB_153	pg/m3													
PCB_180	pg/m3													
PCB_28	pg/m3													
PCB_52	pg/m3													
anthracene	ng/m3													
phenanthrene	ng/m3													
benz_a_anthracene	ng/m3													
benzo_a_pyrene	ng/m3													
benzo_ghi_perylene	ng/m3													
inden_123cd_pyrene	ng/m3													
pyrene	ng/m3													
mercury	ng/m3													
γ-HCH	pg/m3													
NO	µg/m³													

Norwegian Institute for Air Research (NILU)
P.O. Box 100, N-2027 Kjeller, Norway

REPORT SERIES SCIENTIFIC REPORT	REPORT NO. OR 15/2005b	ISBN ISSN 0807-7207	
DATE 28 April 2005	SIGN.	NO. OF PAGES 41	PRICE NOK 150,-

TITLE Pollutant deposits and air quality at coastal stations in 2003	PROJECT LEADER Kevin Barrett
	NILU PROJECT NO. O-97146
AUTHOR(S) Kevin Barrett Centre for Ecological Economics	CLASSIFICATION * C
	CONTRACT REF.
REPORT PREPARED FOR OSPAR Commission	

ABSTRACT

.

NORWEGIAN TITLE

KEYWORDS Marine	Atmospheric	Pollution

ABSTRACT (in Norwegian)

** Classification* *A* *Unclassified (can be ordered from NILU)*
B *Restricted distribution*
C *Classified (not to be distributed)*