



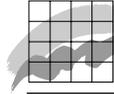
National Environmental Research Institute
Ministry of the Environment

Air Quality Monitoring Programme

Annual Summary 2000

NERI Technical Report No. 407

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Kåre Kemp

Finn Palmgren

Data sheet

Title:	Air Quality Monitoring Programme
Subtitle:	Annual Summary for 2000
Authors:	Kåre Kemp, Finn Palmgren
Department:	Department of Atmospheric Environment
Serial title and no.:	NERI Technical Report No. 407
Publisher:	Ministry of the Environment National Environmental Research Institute ©
URL:	http://www.dmu.dk
Date of publication:	November 2002
Referee:	Peter Wählin
Teknisk assistance:	Axel Egeløv, Lone Grundahl
Laboratorieassistance:	Axel Egeløv, Lone Grundahl, Bjarne Jensen, Christina F. Emborg, Hanne Langberg, Jens Tscherning Møller, Birgit Thomsen, Jane Søfting, Lizzi Stausgaard.
Financial support:	Ministry of the Environment
Please cite as:	Kemp, K., Palmgren, F., (2002): Air Quality Monitoring Programme. Annual Summary for 2000. National Environmental Research institute. 32pp. NERI Technical Report No. 407
	Reproduction is permitted, provided the source is explicitly acknowledged.
Abstract:	The air quality in Danish cities has been monitored continuously since 1982 within the Danish Air Quality (LMP) network. The aim has been to follow the concentration levels of toxic pollutants in the urban atmosphere and to provide the necessary knowledge to assess the trends, to perform source apportionment, and to evaluate the chemical reactions and the dispersion of the pollutants in the atmosphere. In 2000 the air quality was measured in three Danish cities and at two background sites. NO ₂ was found in concentrations close to the new EU limit values, which will be fully implemented in 2005. The trend for NO ₂ has been slowly decreasing since 1982. The concentration for most of the other measured pollutants (e.g. Total Suspended Particulates, SO ₂ and Pb) has been strongly decreasing in the same period.
Keywords:	Urban air quality, air pollution, nitrogen oxides, sulphur dioxide, particles, heavy metals, ozone, carbon monoxide, benzene, trends in air quality.
Layout:	Majbritt Pedersen-Ulrich
ISBN:	87-7772-686-3
ISSN electronic:	1600-0048
Number of pages:	32
Internet-version:	The report is only available as a PDF-file from NERI's homepage http://www.dmu.dk/1_viden/2_Publikationer/3_fagrappporter

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Summary

The Danish Air Quality Monitoring Programme (LMP IV) has been revised in accordance with the Framework Directive and the first three daughter directives of SO₂, NO_x/NO₂, PM₁₀, lead, benzene, CO and ozone. PM₁₀ samplers are under installation and the installation will be completed during 2002. The PM₁₀ results from 2000 are sparse, only TSP are thus included in this report. The data sets for year 2000 is complete for many stations. The monitoring programme consists of 10 stations plus 2 extra stations under the Municipality of Copenhagen.

The SO₂ and lead levels are still decreasing and far below the limit values. The limit values for benzene and CO are not exceeded and the levels are decreasing.

The ozone level is more or less the same at all rural and urban background stations and no clear trend is observed. The information threshold on 180 µg/m³ was not exceeded. The target values were not exceeded, but the long term objectives of max 8 hours on 120 µg/m³ and of AOT40 on 6000 µg/m³*hours were exceeded in a few cases.

The limit values for TSP are not exceeded in 2000. The trend of TSP has been decreasing the last 15 years.

The limit value for the annual average of NO₂ was exceeded at a few street stations and the decreasing trend continues.

Actual data, quarterly reports, annual summaries and summaries over many year are available at the homepage of NERI on "luft.dmu.dk".

1 Introduction

LMP IV

The fourth Danish Air Quality Monitoring Programme (LMP IV) was started in 2000. The programme comprises an urban monitoring network with stations in the four largest Danish cities, *Figure 2-1*. The results are used for assessment of the air pollution in urban areas. The programme is carried out in a co-operation between the National Environmental Research Institute (NERI), the Danish Environmental Protection Agency, the Environmental Protection Agency of the Municipality in Copenhagen, the Municipality of Århus, the County of Funen (for the city of Odense) and the Municipality of Aalborg. NERI is responsible for the practical programme. The results are currently published in quarterly reports in Danish and they are summarised in annual reports in English. Statistical parameters and actual data are accessible at the Web address: luft.dmu.dk. Selected actual data are also available at tele-text, Danish National Television (DR).

Other air quality networks in Denmark

Two other air quality monitoring networks are in operation in Denmark. The Environmental Protection Agency of the Municipality in Copenhagen is responsible for a network in the central part of Copenhagen. A number of pollutants are measured at two sites. The measurements are comparable with the LMP measurements and the two programmes are under the same quality control/quality assurance and supplement each other in Copenhagen. A network in rural areas (the Danish Background Monitoring Program) was established in 1978, *Figure 2-1*. NERI runs this programme. At present gas and aerosol measurements are performed at six stations, and various ions are determined in precipitation collected at 12 sites. The aim is i.a. to study acidification and eutrofication of the forests, farmland, Danish Sea and freshwater areas.

New limit values implemented by the EU Commission

The present Danish limit values are identical with the limit values laid down in the EU directives. The new EU legislation consists of the framework directive (EC 1996), giving general rules for network design and limit value strategies, and a number of daughter directives giving limit values, target values, alert thresholds, reference methods and monitoring strategies for specific pollutants. The limit values are close to the WHO's recommendations (WHO, 2000) based on the known health effects of the pollutants. The limit values shall in most cases be reached in 2005 or 2010. Until then a so-called margin of tolerance are added to the limit values. The margin of tolerance is gradually reduced to zero at the date of compliance. Daughter Directives for NO₂, SO₂, particulate matter (PM₁₀) and Pb (EC, 1999), CO and benzene (EC, 2000) and O₃ (EC 2002) are presently adopted. A Directive for Cr, As, Cd, Hg and PAH is under preparation. In the following chapters the measured results are compared to the limit values. Please refer to the Directives for a detailed description of the exact definitions of the limit values, margin of tolerance, target values and alert thresholds.

2 Measurements

Station locations

The measuring strategy is in short to place one or more pairs of stations in each city. One of stations is located close (at the side walk) to a street lane with a high traffic density. The other is located within a few hundred meters from the street station, and is representative for the urban background pollution; it is not influenced by a single or a few streets or other nearby sources. In most cases the background stations are placed on rooftops. Further two stations monitor the pollution outside the city areas. Further information about the program and results is found at the Web address: LUFT.DMU.DK.

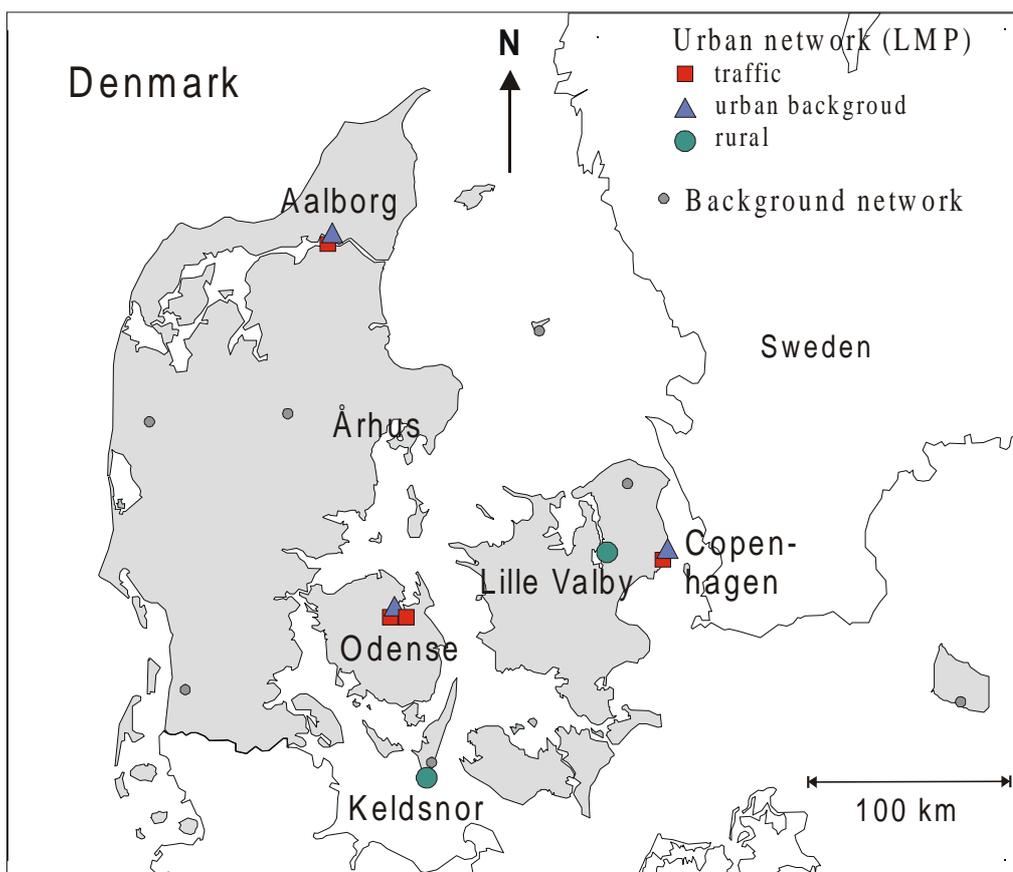


Figure 2-1 Monitoring stations in the two nation-wide air quality networks.

Table 2-1 Active stations in the LMP IV network in 2000.

Name	Street/location	type	Remarks
Copenhagen/1257	Jagtvej	Street	
Copenhagen/1259	H.C.Ørsted Institute	Urban background	
Århus/6153	Banegårdsgade	Street	Measurements starts medio 2001
Århus/6159	Valdemarsgade	Urban Background	Measurements starts medio 2001
Odense/9155	Albanigade	Street	
Odense/9154	Hunderupgade	Street	
Odense/9159	Town hall in Odense	Urban background	
Aalborg/8151	Vesterbro	Street	
Aalborg/8159	Dept. for Envir. and Urban Affairs	Urban background	
Lille Valby/2090	-	Rural	
Keldsnor/9055	-	Rural	

- NO and NO_x were measured at all stations, except Odense/9154
- O₃ was measured at all urban background stations and Copenhagen/1257
- CO was measured at all street stations and Copenhagen/1259
- Benzene and Toluene were measured at Copenhagen/1257 and Odense/9155
- Total Suspended Particulate matter was in the beginning of 2000 measured at all street stations and Lille Valby/2090; but was during the year replaced by PM₁₀ measurements. During 2001 and 2002 PM₁₀ will be implemented at all stations.
- The elemental compositions (including heavy metals) of the collected TSP and PM₁₀ are determined at all sites
- SO₂ was measured as 24 hours averages at the same stations as TSP. At Aalborg/8151 and at Copenhagen/1259 (DOAS) SO₂ was measured as ½-hour averages. The main purpose is to monitor episodic high concentration
- The meteorological parameters - temperature, wind speed and direction, relative humidity and global radiation - are measured at all urban background stations.

Averaging time

Apart from TSP and (in some cases) SO₂ all parameters were recorded as ½-hour averages. TSP and elements in TSP were measured as 24 hours averages.

Other information

Short descriptions of the measured pollutants are given in the appendix. The actually applied measurement methods are listed at the Web address: LUFT.DMU.DK

3 Nitrogen oxides

3.1 Yearly Statistics

Table 3-1 Nitrogen oxide (NO) 2000. All parameters are calculated with hourly averages.

Unit: $\mu\text{g}/\text{m}^3$	Number	Average	Median	98. percentile	19. highest
<i>Traffic:</i>					
Copenhagen/1257	8651	46	31	189	311
Odense/9155	7965	27	10	167	280
Aalborg/8151	8634	52	29	229	380
<i>Urban Background:</i>					
Copenhagen/1259	8564	4	2	30	81
Odense/9159	8566	4	1	24	85
Aalborg/8159	7034	6	2	44	145
<i>Rural:</i>					
Lille Valby/2090	8622	2	1	16	88
Keldsnor/9055	8568	2	1	9	17

Table 3-2 Nitrogen dioxide (NO₂) 2000. All parameters are calculated with hourly averages.

Unit: $\mu\text{g}/\text{m}^3$	Number	Average	Median	98. percentile	19. highest
<i>Traffic:</i>					
Copenhagen/1257	8651	42	40	92	117
Odense/9155	7965	31	26	86	110
Aalborg/8151	8634	35	31	87	108
<i>Urban Background:</i>					
Copenhagen/1259	8564	21	19	53	73
Odense/9159	8566	17	15	45	64
Aalborg/8159	7036	17	14	52	72
<i>Rural:</i>					
Lille Valby/2090	8620	12	9	36	51
Keldsnor/9055	8566	5	3	28	49
Limit values	>7884	40			200

The limit values are implemented through EU Council Directive (EC 1999).

3.2 Episodes

Table 3-3 Episodic results for Nitrogen oxide (NO) 2000. All parameters are calculated with hourly averages.

Unit: $\mu\text{g}/\text{m}^3$	Max. 3 hours	Date:hour	Max. hour	Date:hour
<i>Traffic:</i>				
Copenhagen/1257	439	001218: 8	506	001218: 10
Odense/9155	438	000217: 7	595	000217: 8
Aalborg/8151	399	000330: 6	509	000330: 6
<i>Urban Background:</i>				
Copenhagen/1259	121	001218: 8	159	001218: 9
Odense/9159	172	000124: 8	244	000124: 9
Aalborg/8159	181	001218: 6	210	001217: 19
<i>Rural:</i>				
Lille Valby/2090	123	001218: 8	215	001218: 18
Keldsnor/9055	22	000427: 9	33	000503: 10

Table 3-4 Episodic results for Nitrogen dioxide (NO₂) 2000. All parameters are calculated with hourly averages.

Unit: $\mu\text{g}/\text{m}^3$	Max. 3 hours	Date:hour	Max. hour	Date:hour
<i>Traffic:</i>				
Copenhagen/1257	161	000620:22	178	000620: 23
Odense/9155	118	000217: 7	175	000217: 8
Aalborg/8151	124	000516: 7	135	000621: 7
<i>Urban Background:</i>				
Copenhagen/1259	113	000620:22	146	000621: 0
Odense/9159	71	000124: 8	93	000510: 21
Aalborg/8159	76	000508: 5	120	001226: 20
<i>Rural:</i>				
Lille Valby/2090	51	000112: 5	63	000404: 7
Keldsnor/9055	50	000402:18	71	000418: 19
Alert threshold	400	-	-	-

The Alert threshold is given in EU Council Directive (EC, 1999). With reference to the definition of the alert threshold, the lowest one-hour values are calculated for all consecutive three-hour periods. The highest of these one-hour values are listed in the table in the column "Max. 3 hour".

3.3 Trends

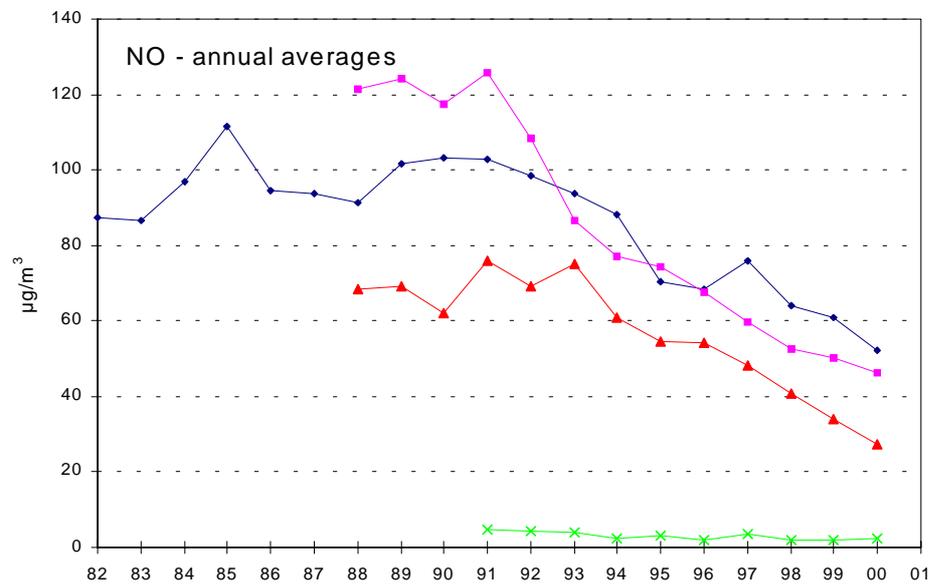
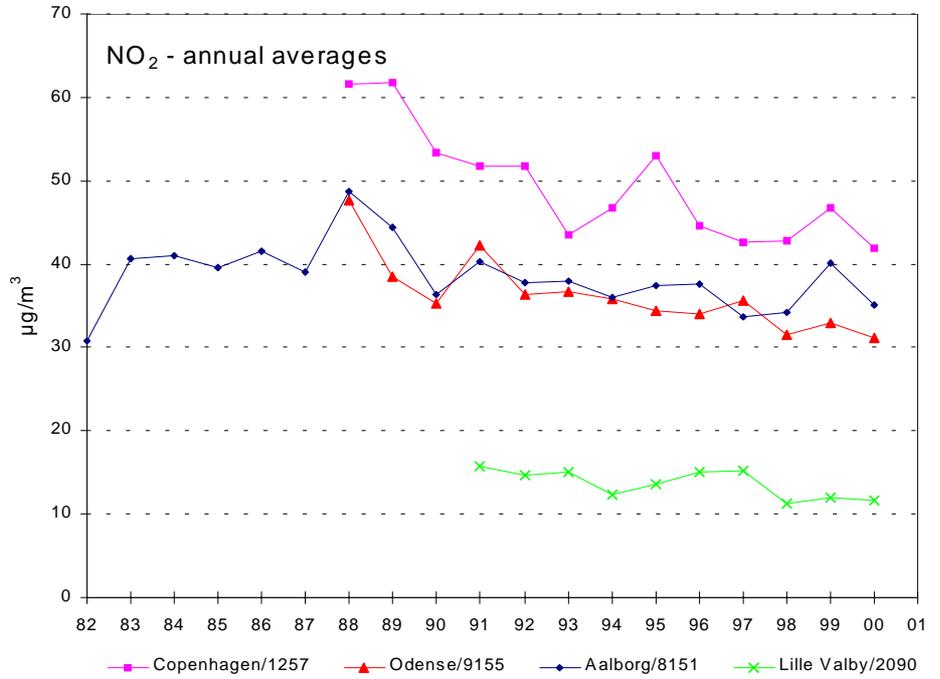


Figure 3-1 The graphs show the time series for the annual average values.

4 Ozone

4.1 Annual statistics

Table 4-1 Ozone (O₃) 2000. All parameters are calculated with one-hour average values. The eight hours values are calculated as a moving average based on hourly measurements. For the "26. highest 8 hour" value is used the highest daily 8 hour values calculated as described in the EU Directive 2002/3/EC.

Unit: µg/m ³	Number of results	Average	Median	Max. 8 hours	26. highest 8 hour	Max. 1 hour	AOT40 µg/m ³ .h
<i>Urban Background:</i>							
Copenhagen/1259	-	-	-	-	-	-	-
Odense/9159	8565	52	52	182	102	195	10006
Aalborg/8159	7877	50	52	153	93	181	5442
<i>Rural</i>							
Lille Valby/2090	8510	50	52	182	94	208	6365
Keldsnor/9055	8643	60	63	181	105	200	11880
Target value	>7884	-	-	-	120	-	18 000
Long term objective	>7884	-	-	120	-	-	6 000

AUT40 (expressed in µg/m³ hours) means the sum of the difference between hourly concentrations greater than 80 µg/m³ (= 40ppb) and 80 µg/m³ from may to july of hourly values measured between 8:00 and 20:00. Central European Time each day.

The target values and long time objectives are given in the EU Council Directive (EC, 2002).

Number of information to the public due to exceedance of the information threshold (180 µg/m³) in 2000: 0.

Number of information to the public due to exceedance of the alert threshold (240 µg/m³) in 2000: 0.

4.2 Trends

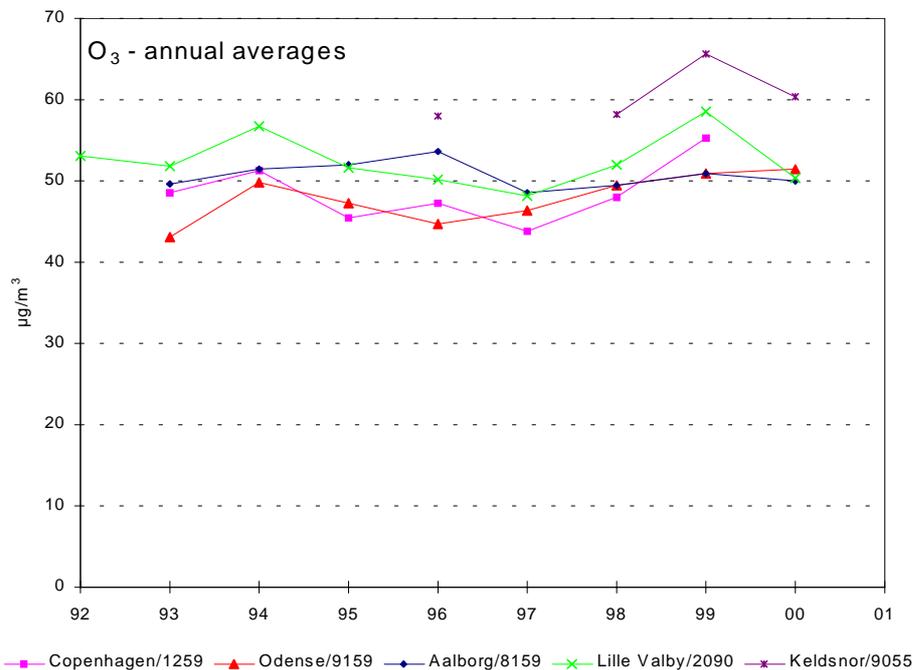


Figure 4-1 Annual average values

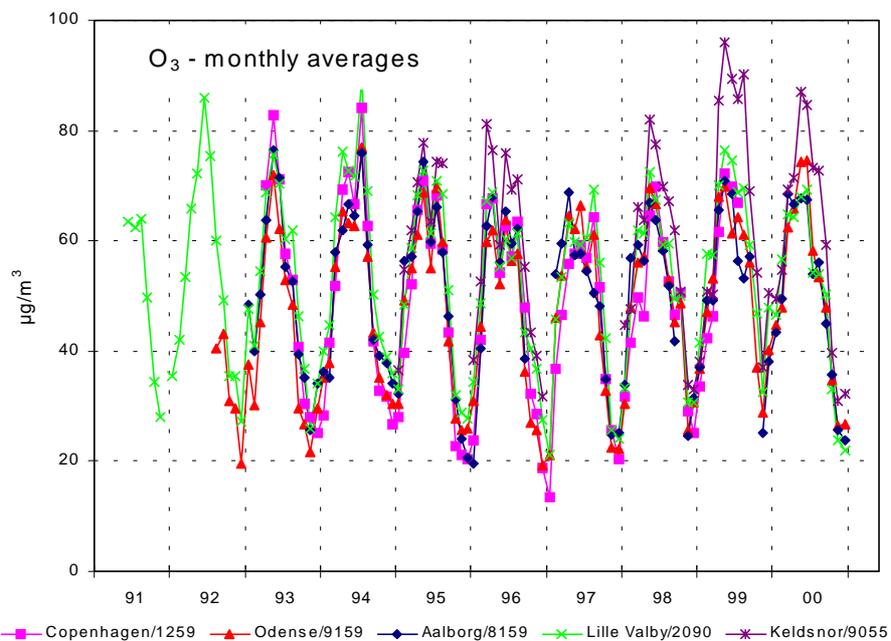


Figure 4-2 Monthly average values

5 Carbon monoxide

5.1 Annual statistics

Table 5-1 Annual statistics for carbon monoxide (CO) 2000. All parameters are calculated with hourly average. The 8-hour values are calculated as a moving average based on hourly results.

Unit: $\mu\text{g}/\text{m}^3$	Number	Average	Median	98- percentile	99.9- percentile	Max. 8- hours	Max. hour
<i>Traffic:</i>							
Copenhagen/1257	8610	1100	905	3120	5222	4162	6017
Odense/9155	8543	679	477	2387	4986	4890	7870
Aalborg/8151	8632	945	725	2901	4550	3696	6080
<i>Urban Background:</i>							
Copenhagen/1259	8559	328	297	754	1841	1813	2339
Limit value	-	-	-	-	-	10 000	-
Guideline values	-	-	-	-	-	10 000	30 000

The limit value is implemented through EU Council Directive (EC, 2000). The guideline values are proposed in WHO, 2000.

5.2 Trends

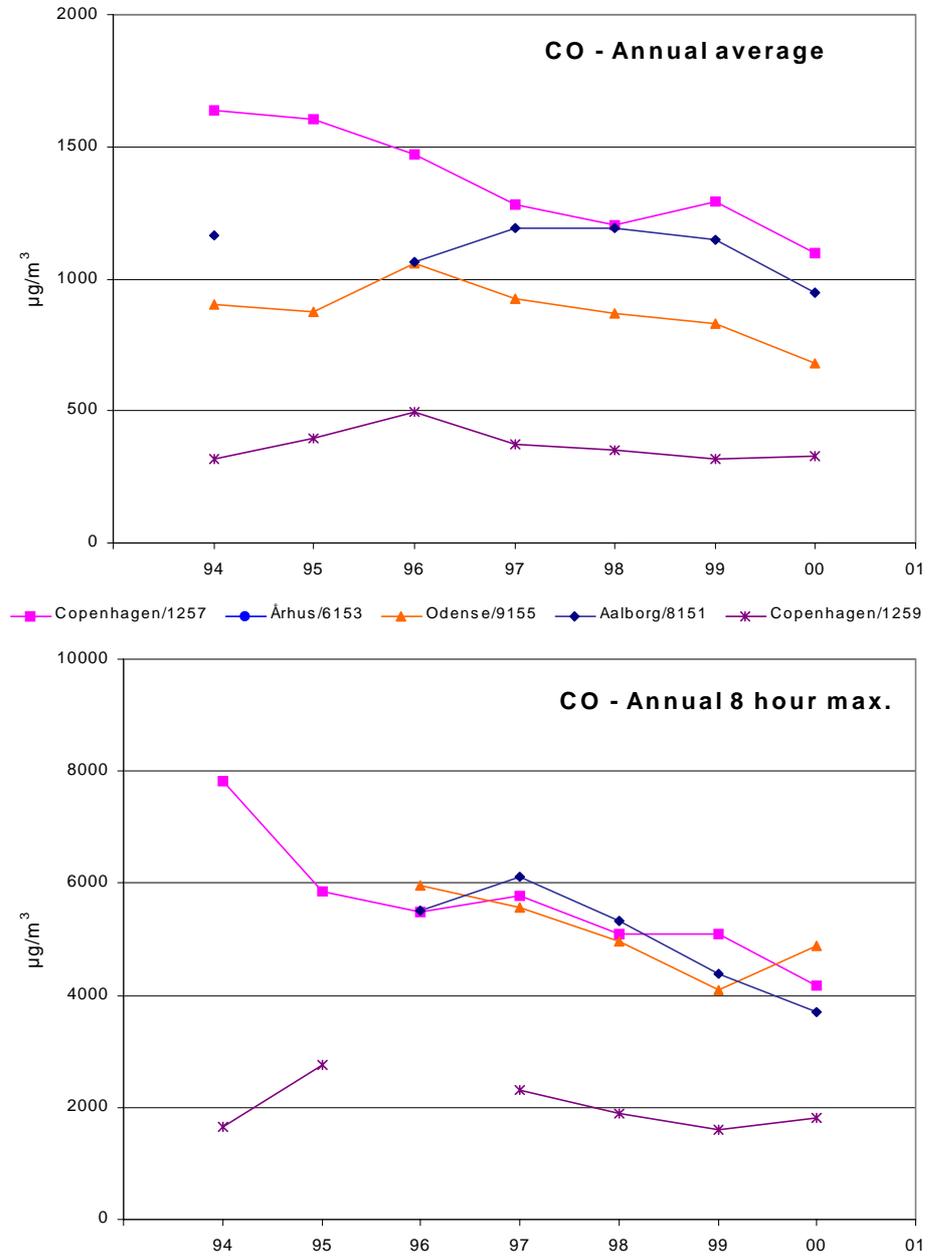


Figure 5-1 Annual average values and highest 8-hour average.

6 Benzene and Toluene

6.1 Annual statistics

Table 6-1 Annual statistics for Benzene 2000. All values are calculated as 1 hour averages. The 8 hours results are calculated as a moving average. The life time risk level is defined as the concentration that through a lifelong exposure is estimated to give an excess risk of $1:10^5$ for developing cancer.

$\mu\text{g}/\text{m}^3$	Number of results	Average	Max. 8 hours	Max. 1 hour
Copenhagen/1257	4925	3.6	14	20
Odense/9155	6256	2.2	21	119
Limit value	>7784	5	-	-
Life time risk level at $1:10^5$		1.7		

Table 6-2 Annual statistics for Toluene 2000. The 7 days results are calculated as a moving average based on daily averages.

$\mu\text{g}/\text{m}^3$	Number of results	Average	Max. 7 days	Max. 1 hour
Copenhagen/1257	4927	16.6	29	232
Odense/9155	6255	9.1	21	145
Guideline value	-	-	260	-

The limit value is implemented through EU Council Directive (EC, 2000).

The guideline and life time risk level are established by WHO (WHO, 2000).

7 Particles (TSP)

7.1 Annual statistics

Table 7-1 Annual statistics for TSP 2000. All parameters are calculated based on daily averages.

Unit $\mu\text{g}/\text{m}^3$	Number of results	Average	36.highest result	90 per-centile	95 per-centile	8.highest result	Max. day
<i>Traffic::</i>							
Copenhagen/1257	355	49	78	78	94	113	552
Odense/9155	363	44	71	71	87	107	144
Odense/9154	360	40	64	64	72	83	106
<i>Rural:</i>							
Lille Valby/2090	359	25	41	41	50	57	90
Limit values	>100	150	50	-	300	-	-

The limit values for TSP are implemented in Denmark by Regulation nr. 836 of 10. December 1986 issued by the ministry of Environment. These are the “old” values. New values will be implemented for PM_{10} .

7.2 Trends

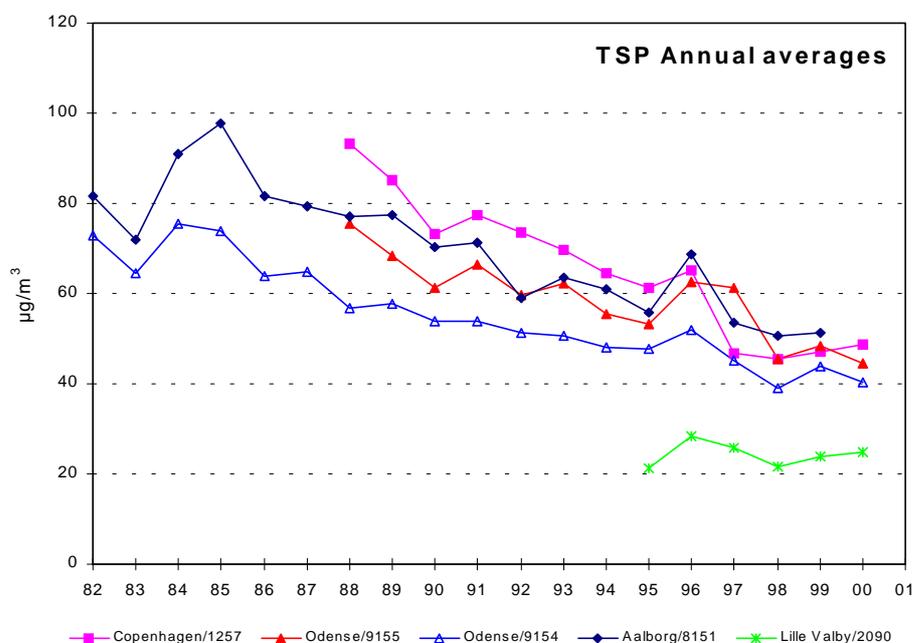


Figure 7-1 Annual averages for measurements of particulate matter

8 Heavy Metals

8.1 Annual statistics

Table 8-1 Annual statistics for Vanadium (V), Chromium (Cr), Manganese (Mn), Nickel (Ni), Copper (Cu), Zinc (Zn), Arsenic (As), Selenium (Se), Cadmium (Cd) and Lead (Pb) measured in TSP during 2000. The life time risk level is defined as the concentration that through a lifelong exposure is estimated to give a excess risk of $1:10^5$ for developing cancer.

Unit: ng/m ³	V	Cr	Mn	Ni	Cu	Zn	As	Se	Cd	Pb
<i>Traffic:</i>										
Copenhagen/1257	6.7	7.0	18.2	3.5	69.0	56.1	< 1.1	0.5	< 3.0	29.6
Odense/9155	4.3	5.6	20.8	2.3	31.0	51.8	0.9	0.6	< 2.4	13.0
Odense/9154	4.3	6.9	26.4	2.1	23.6	45.2	0.8	0.6	< 2.0	12.1
<i>Rural:</i>										
Lille Valby/2090	3.7	0.8	3.5	1.4	3.0	16.6	0.8	0.5	< 1.6	8.0
Limit values				*)			*)		*)	500
Guideline value	1000		150						5	
Life time risk level at $1:10^5$				25			6.6			

*) Limit values will be implemented within a few years.

The limit value for Pb is found in EU Council Directive (EC, 1999). A EU Council Directive including limit values for i.a. Ni, As and Cd is expected to be adapted in 2002 or 2003.

The guidelines and life time risk for the carcinogenic metals are established by WHO (WHO, 2000).

8.2 Trends

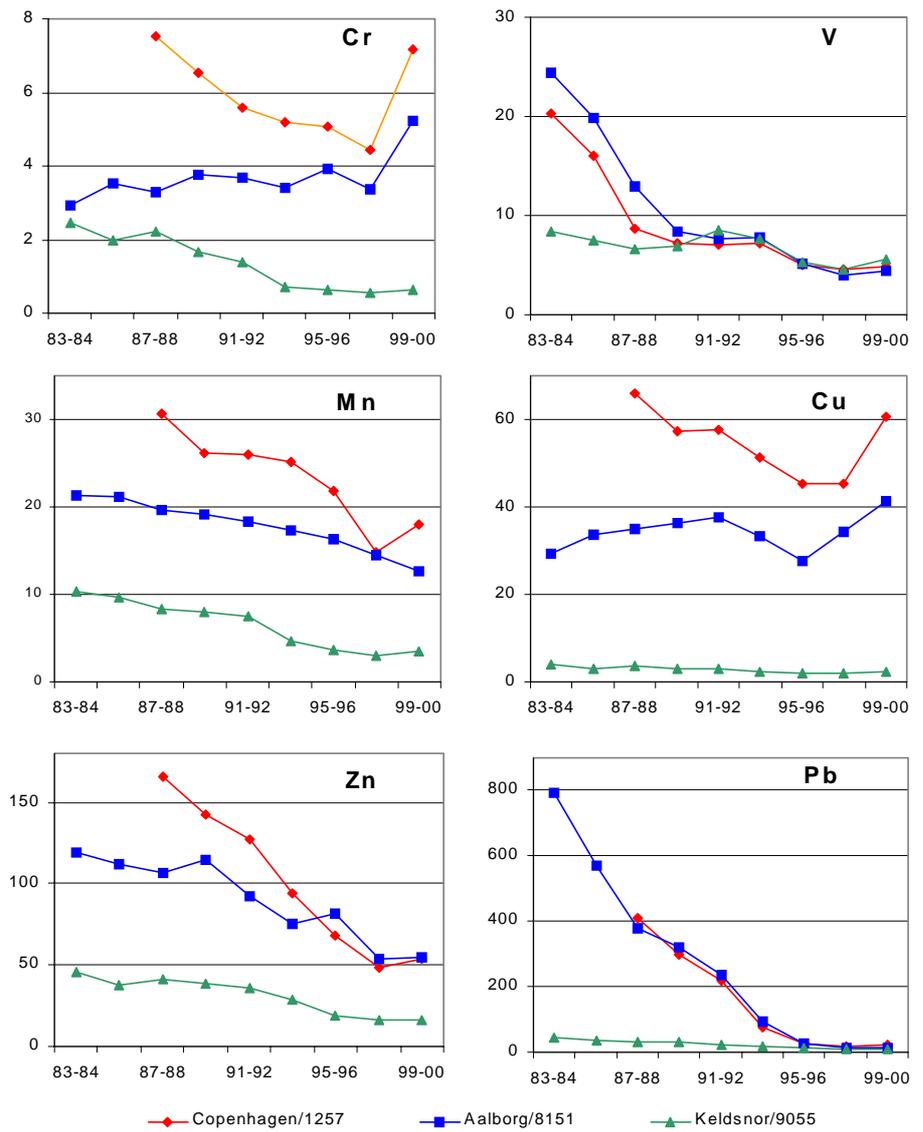


Figure 8-1 Biannual averages for Heavy Metals in particulate matter measured as TSP. y-axis units are ng/m^3

9 Sulphur Compounds

9.1 Annual statistics

Table 9-1 Annual statistics for SO₂ 2000. All parameters are calculated based on daily averages.

Unit: µg/m ³	Number of results	Average year	Average winter	Median	98-percentile	4. highest day
<i>Traffic:</i>						
Copenhagen/1257	355	3.3	3.3	3.0	7.8	8.4
Odense/9155	363	1.3	1.5	1.1	4.2	5.1
Odense/1954	360	1.3	1.5	1.1	4.2	5.2
<i>Rural:</i>						
Lille Valby/2090	362	1.4	1.5	1.1	5.5	5.6
Limit values	>329	20	20			25

The limit values are implemented through EU Council Directive (EC, 1999).

Table 9-2 Annual averages for particulate sulphur (S) measured in TSP 2000. Measurements are daily averages.

Unit: µg(S)/m ³	Number of results	Average
<i>Traffic:</i>		
Copenhagen/1257	356	1.31
Odense/9155	363	1.09
Odense/9154	361	1.08
<i>Rural:</i>		
Lille Valby/2090	363	0.89

9.2 Episodes

Table 9-3 Highest concentrations of SO₂ 2000.

Unit: µg/m ³	Number of results	Max. hour	Max. 3 hours
<i>Traffic:</i>			
Aalborg/8151	8603	53	32
Limit values	>7884	350	
Alert threshold			500

The Alert threshold is given in EU Council Directive (EC, 1999). With reference to the definition of the alert threshold, the lowest one-hour values are calculated for all consecutive three-hour periods. The highest of these one-hour values are listed in the table in the column "Max. 3 hours".

9.3 Trends



Figure 9-1 Annual averages for SO₂ and particulate sulphur.

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EC (1999). Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air. J. Europ. Commun. L163/41.

EC (2000). Directive of the European Parliament and of the council 2000/69/EC of 16 November 2000 on limit values for benzene and carbon monoxide in ambient air. J. Europ. Commun. L313/12.

EC (2002). Directive 2002/3/EC of the European Parliament and of the Council of 12 February 2002 relating to ozone in ambient air Official Journal L 067 /14

WHO (2000). Air Quality Guidelines for Europe, Second Edition, WHO Regional Publications, European Series, No. 91, Copenhagen 2000. See also(<http://www.who.int/peh/air/Airqualitygd.htm>)

Appendix

Pollutants measured in the LMP Network

Nitrogen oxides (NO and NO₂)

NO and partly NO₂ are formed by combustion at high temperatures. The main sources are power plants and traffic. At the street stations the traffic is the main source. The application of catalytic converter in the exhaust reduces the emission considerably. NO is relatively harmless, but NO₂ can cause respiratory problems.

Nitrogen dioxide (NO₂)

Most of the NO₂ in the urban atmosphere is produced by oxidation of nitrogen monoxide (NO) by ozone (O₃). The reaction will take place immediate, if sufficient O₃ is present. O₃ is often the limiting component for a complete oxidation in the street canyons, but practically all NO is oxidised at the urban background and rural stations. Within a few hours the NO₂ is further oxidised to nitrate and/or nitric acid, which may cause acid precipitation and eutrofication. NO₂ is a toxic gas, which may cause respiratory problems. There are limit values for the allowed concentration of NO₂ in the atmosphere.

Ozone (O₃)

O₃ is formed by photochemical reactions (i.e. by the influence of sunlight) between nitrogen oxides and volatile organic compounds (VOC's). The VOC's can be of natural and anthropogenic origin. The major part of the O₃ measured in Denmark originates from sources outside the country. Usually the highest concentrations are found at rural and urban background sites. O₃ is removed by NO at street level. O₃ is a toxic gas, which may cause respiratory problems and damage on crops and forests. There are so-called target values for the concentration of O₃ in the atmosphere.

Carbon monoxide (CO)

The main source of CO in the atmosphere is petrol-fuelled cars. The CO is formed due to incomplete combustion. The application of catalytic converter in the exhaust reduces the emission considerably. CO is only slowly removed from the atmosphere. CO is a toxic gas that may prevent the uptake of oxygen in the blood. There are limit values for the allowed concentration of CO in the atmosphere.

Benzene

Benzene is present in petrol. It may also be formed in engines due to incomplete combustion. Since 1994 the benzene content i petrol has been reduced by up to a factor of 5. The concentration in the atmosphere is reduced correspondingly. Benzene is a carcinogenic gas. There is a limit value for the average content in the atmosphere.

Other volatile organic compounds (VOC's)

Many different VOC's are present in the air. Several of these are emitted by incomplete combustion in e.g. engines and wood burning stoves. Several of the VOC's are carcinogenic. Limit values will be implemented for PAH (Polycyclic Aromatic Hydrocarbones). Of the VOC's only benzene, toluene and xylenes are measured routinely in LMP IV at present.

PM₁₀ and TSP

PM₁₀ is particles smaller than 10 µm, while TSP is all airborne particulate matter. In practice TSP are particles up to around 25 µm. The main sources for particulate matter are windblown dust, sea spray and combustion. Particles are also created in the atmosphere by oxidation of nitrogen dioxide and sulphur dioxide. The submicron particles, which are formed by combustion and chemical reactions in the atmosphere, are suspected to be the most harmful for the health. There are still a lack of knowledge about the connection between health effects and particle size distributions. Limit values for the PM₁₀ concentration in the atmosphere are implemented at present. The limit values will most likely be revised in a few years, when better knowledge about the adverse health effects of fine particles influence on health has been obtained.

Heavy metals (HM's)

There are a number of different HM's in the atmosphere. They are emitted from e.g. coal and oil fired power plants, waste incinerators and industries. HM's may also be emitted from traffic due to wear on engines, tires and brake pads. Several HM's are toxic even in low concentrations and a few also carcinogenic. A limit value is implemented for lead. In 2002 or 2003 limit values are expected to be implemented for arsenic, cadmium, nickel and mercury. WHO has proposed guideline values for the toxic non-carcinogenic and estimated life time risks for the carcinogenic HM's.

Sulphur compounds

Sulphur dioxide (SO₂) is formed by burning of fossil fuel and wood. In the atmosphere the SO₂ is oxidised to particulate sulphuric acid and sulphate. The conversion time depends strongly of the temperature and humidity in the air, but it is typically of the order of one day. Sulphuric acid contributes to "acid rain" and the deposition of sulphate causes damage to sensitive ecosystems. During the last 20 years the reduction of sulphur in fossil fuel and improved flue gas cleaning has reduced the concentration of SO₂ with one order of magnitude. SO₂ may cause respiratory problems. There are limit values for the allowed concentration of SO₂ in the atmosphere.

National Environmental Research Institute

The National Environmental Research Institute, NERI, is a research institute of the Ministry of the Environment. In Danish, NERI is called *Danmarks Miljøundersøgelser (DMU)*. NERI's tasks are primarily to conduct research, collect data, and give advice on problems related to the environment and nature.

Addresses:

URL: <http://www.dmu.dk>

National Environmental Research Institute
Frederiksborgvej 399
PO Box 358
DK-4000 Roskilde
Denmark
Tel: +45 46 30 12 00
Fax: +45 46 30 11 14

*Management
Personnel and Economy Secretariat
Research and Development Section
Department of Policy Analysis
Department of Atmospheric Environment
Department of Marine Ecology
Department of Environmental Chemistry and Microbiology
Department of Arctic Environment
Project Manager for Quality Management and Analyses*

National Environmental Research Institute
Vejlsovej 25
PO Box 314
DK-8600 Silkeborg
Denmark
Tel: +45 89 20 14 00
Fax: +45 89 20 14 14

*Environmental Monitoring Co-ordination Section
Department of Terrestrial Ecology
Department of Freshwater Ecology
Project Manager for Surface Waters*

National Environmental Research Institute
Grenåvej 12-14, Kalø
DK-8410 Rønne
Denmark
Tel: +45 89 20 17 00
Fax: +45 89 20 15 15

*Department of Landscape Ecology
Department of Coastal Zone Ecology*

Publications:

NERI publishes professional reports, technical instructions, and the annual report. A R&D projects' catalogue is available in an electronic version on the World Wide Web.

Included in the annual report is a list of the publications from the current year.

NERI Technical Reports

2001

- Nr. 374: Atmosfærisk deposition 2000. NOVA 2003. Af Ellermann, T. et al. 88 s. (elektronisk primo december 2001)
- Nr. 375: Marine områder 2000 – Miljøtilstand og udvikling. NOVA 2003. Af Henriksen, P. et al. (elektronisk primo december 2001)
- Nr. 376: Landovervågningsoplande 2000. NOVA 2003. Af Grant, R. et al. (elektronisk primo december 2001)
- Nr. 377: Søer 2000. NOVA 2003. Af Jensen, J.P. et al. (elektronisk primo december 2001)
- Nr. 378: Vandløb og kilder. NOVA 2000. Af Bøgestrand, J. (red.) (elektronisk primo december 2001)
- Nr. 379: Vandmiljø 2001. Tilstand og udvikling – faglig sammenfatning. Af Boutrup, S. et al. 62 s., 100,00 kr.
- Nr. 380: Fosfor i jord og vand – udvikling, status og perspektiver. Kronvang, B. (red.) 88 s., 100,00 kr.
- Nr. 381: Satellitsporing af kongeederfugl i Vestgrønland. Identifikation af raste- og overvintringsområder. Af Mosbech, A., Merkel, F., Flagstad, A. & Grøndahl, L. 42 s., 100,00 kr.
- Nr. 382: Bystruktur og transportadfærd. Hvad siger Transportvaneundersøgelsen? Af Christensen, L. 166 s. (elektronisk)
- Nr. 383: Pesticider 2 i overfladevand. Metodafprøvning. Af Nyeland, B. & Kvamm, B. 45 s. + Annex 1, 75,00 kr.
- Nr. 384: Natural Resources in the Nanortalik Area. An Interview Study on Fishing, Hunting and Tourism in the Area around the Nalunaq Gold Project. By Glahder, C.M. 81 pp., 125,00 kr.
- Nr. 385: Natur og Miljø 2001. Påvirkninger og tilstand. Af Bach, H., Christensen, N. & Kristensen, P. 368 s., 200,00 kr.
- Nr. 386: Pesticider 3 i overfladevand. Metodeafprøvning. Af Nyeland, B. & Kvamm, B. 94 s., 75,00 kr.
- Nr. 387: Improving Fuel Statistics for Danish Aviation. By Winther, M. 56 pp., 75,00 DKK

2002

- Nr. 388: Microorganisms as Indicators of Soil Health. By Nielsen, M.N. & Winding, A. 82 pp., 90,00 DKK
- Nr. 389: Naturnær skovrejsning – et bæredygtigt alternativ? Af Aude, E. et al. 47 s. (elektronisk)
- Nr. 390: Metoder til at vurdere referencetilstanden i kystvande – eksempel fra Randers Fjord. Vandrammedi- rektiv-projekt. Fase II. Af Nielsen, K. et al. 43 s. (elektronisk)
- Nr. 391: Biologiske effekter af råstofindvinding på epifauna. Af Lisbjerg, D. et al. 54 s. (elektronisk)
- Nr. 392: Næringssaltbegrænsning af makroalger i danske kystområder. Et samarbejdsprojekt mellem Ring- købing Amt, Nordjyllands Amt, Viborg Amt, Århus Amt, Ribe Amt, Sønderjyllands Amt, Fyns Amt, Roskilde Universitetscenter og Danmarks Miljøundersøgelser. Af Krause-Jensen, D. et al. 112 s. (elektronisk)
- Nr. 393: Vildtudbyttet i Danmark i jagtsæsonen 2000/2001. Af Asferg, T. 34 s., 40,00 kr.
- Nr. 394: Søerne i De Østlige Vejler. Af Jeppesen, E. et al. 90 s., 100,00 kr.
- Nr. 395: Menneskelig færdsels effekt på rastende vandfugle i saltvandssøen. Af Laursen, K. & Rasmussen, L.M. 36 s., 50,00 kr.
- Nr. 396: Miljøundersøgelser ved Maarmorilik 1999-2000. Af Møller, P. et al. 53 s. (elektronisk)
- Nr. 397: Effekt af lystfiskeri på overvintrende troldænder i Store Kattinge Sø. Af Madsen, J. 23 s. (elektronisk)
- Nr. 398: Danske duehøges populationsøkologi og forvandling. Af Drachmann, J. & Nielsen, J.T. 51 s., 75,00 kr.
- Nr. 399: NEXT 1998-2003, Pesticider 1 i drikkevand. Samlet rapport over 3 præstationsprøvningsrunder. Af Nyeland, B. & Kvamm, B.L. 43 s. (elektronisk)
- Nr. 400: Population Structure of West Greenland Narwhals. A Multidisciplinary Approach. By Riget, F. et al. 53 pp. (electronic)
- Nr. 401: Dansk tilpasning til et ændret klima. Af Fenger, J. & Frich, P. 36 s. (elektronisk)
- Nr. 404: Analytical Chemical Control of Phtalates in Toys. Analytical Chemical Control of Chemical Sub- stances and Products. By Rastogi, S.C., Jensen, G.H. & Worsøe, I.M. 25 pp. (electronic)
- Nr. 405: Indikatorer for Bæredygtig Transport – oplæg til indhold og strategi. Af Gudmundsen, H. 112 s., 100,00 kr.
- Nr. 408: Blykontaminering af havfugle i Grønland fra jagt med blyhagl. Af Johansen, P., Asmund, G. & Ri- get, F. 31 s. (elektronisk)
- Nr. 409: The State of the Environment in Denmark 2001. Bach, H., Christensen, N. & Kristensen, P. (eds). 368 pp., 200,00 DKK