



UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

**COMMITTEE ON ENVIRONMENTAL POLICY
CONFERENCE OF EUROPEAN STATISTICIANS**

Joint Intersectoral Task Force on Environmental Indicators

Third session
11-13 July 2011, Geneva

NATIONAL REVIEW OF THE APPLICATION OF ENVIRONMENTAL INDICATORS

Submitted by Republic of Macedonia
Prepared by Katerina Nikolovska, Ministry of Environment and Physical Planning,
the former Yugoslav Republic of Macedonia

EVALUATION OF FURTHER SIX INDICATORS FROM THE UNECE INDICATOR GUIDELINES

Indicator	A. Effective inter-agency cooperation mechanisms to produce the indicator	B. Data quality assurance and control procedures for the production of the indicator	C. Publication of the indicator in statistical compendiums and state-of-the-environment reports
<p style="text-align: center;">BOD and concentration of ammonium in rivers</p>	<p>There is cooperation between Ministry of agriculture-Agency for hydro-meteorological affairs and Ministry of Environment and Physical Planning (MOEPP). The MOEPP is responsible for establishing the national list of environmental indicators following national demands</p>	<p>Institutions that make measure, calculate and publish the same should guarantee data quality</p>	<p>1. title: Environmental statistic, 2007 names of the publishing houses: State Statistical Office, "Dame Gruev"- 4 cities and years of the publications: Republic of Macedonia, Skopje, 2007 languages: Macedonian, English number of copies published:1000 Internet addresses: http://www.moep.gov.mk/WBStorage/Files/Zivotna%20sredina_Environmental%20statistics.pdf time-series data: 1988-2004</p> <p>2. title: Environmental statistic, 2009 names of the publishing houses: State Statistical Office, "Dame Gruev"- 4 cities and years of the publications: Republic of Macedonia, Skopje, 2009 languages: Macedonian, English number of copies published:300 Internet addresses: http://www.stat.gov.mk/Publikacii/ZivotnaSredina2009.pdf time-series data: 1999-2008</p> <p>3. title: Environmental indicators 2008 names of the publishing houses: Ministry of Environment and Physical Planning, "Goce Delcev", bb cities and years of the publications: Republic of Macedonia, Skopje, 2008 languages: Macedonian, English number of copies published:1000 Internet addresses: http://www.moep.gov.mk/WBStorage/Files/Indikator%202008%20-%20Air%20pollution.pdf time-series data: 1988 - 2006</p> <p>4. title: Environmental indicators 2010 names of the publishing houses: Ministry of Environment and Physical Planning, "Goce Delcev", bb cities and years of the publications: Republic of Macedonia, Skopje, 2011 languages: Macedonian number of copies published:500 Internet addresses: http://www.moep.gov.mk/WBStorage/Files/1%20Indikator%202010%20-%20Vozduh.pdf time-series data: 2000 - 2009</p>
<p style="text-align: center;">Nutrients in fresh water</p>	<p>There is cooperation between Ministry of agriculture-Agency for hydro-meteorological affairs and Ministry of Environment and Physical Planning (MOEPP). The MOEPP is responsible for establishing the national list of environmental indicators following national demands</p>	<p>Institutions that make measure, calculate and publish the same should guarantee data quality</p>	<p>1. title: Environmental statistic, 2007 names of the publishing houses: State Statistical Office, "Dame Gruev"- 4 cities and years of the publications: Republic of Macedonia, Skopje, 2007 languages: Macedonian, English number of copies published:1000 Internet addresses: http://www.moep.gov.mk/WBStorage/Files/Zivotna%20sredina_Environmental%20statistics.pdf time-series data: 1988-2004</p> <p>2. title: Environmental statistic, 2009 names of the publishing houses: State Statistical Office, "Dame Gruev"- 4 cities and years of the publications: Republic of Macedonia, Skopje, 2009 languages: Macedonian, English number of copies published:300 Internet addresses: http://www.stat.gov.mk/Publikacii/ZivotnaSredina2009.pdf time-series data: 1999-2008</p> <p>3. title: Environmental indicators 2008 names of the publishing houses: Ministry of Environment and Physical Planning, "Goce Delcev", bb cities and years of the publications: Republic of Macedonia, Skopje, 2008 languages: Macedonian, English number of copies published:1000 Internet addresses: http://www.moep.gov.mk/WBStorage/Files/Indikator%202008%20-%20Air%20pollution.pdf time-series data: 1988 - 2006</p> <p>4. title: Environmental indicators 2010 names of the publishing houses: Ministry of Environment and Physical Planning, "Goce Delcev", bb cities and years of the publications: Republic of Macedonia, Skopje, 2011 languages: Macedonian number of copies published:500 Internet addresses: http://www.moep.gov.mk/WBStorage/Files/1%20Indikator%202010%20-%20Vozduh.pdf time-series data: 2000 - 2009</p>

Nutrients in coastal seawaters	Not relevant for Republic of Macedonia	Not relevant for Republic of Macedonia	Not relevant for Republic of Macedonia
Area affected by soil erosion	----	----	<p>1. title: Environmental statistic, 2007 names of the publishing houses: State Statistical Office, "Dame Gruev"- 4 cities and years of the publications: Republic of Macedonia, Skopje, 2007 languages: Macedonian, English number of copies published:1000 Internet addresses: http://www.moep.gov.mk/WBStorage/Files/Zivotna%20sredina_Environmental%20statistics.pdf time-series data: 1995</p> <p>2. title: Environmental statistic, 2009 names of the publishing houses: State Statistical Office, "Dame Gruev"- 4 cities and years of the publications: Republic of Macedonia, Skopje, 2009 languages: Macedonian, English number of copies published:300 Internet addresses: http://www.stat.gov.mk/Publikacii/ZivotnaSredina2009.pdf time-series data: 1995</p>
Pesticide use	There is cooperation between the State Statistical Office and Ministry of Environment and Physical Planning (MOEPP). The MOEPP is responsible for establishing the national list of environmental indicators following national demands	Institutions that make measure, calculate and publish the same should guarantee data quality	<p>1. title: Environmental statistic, 2007 names of the publishing houses: State Statistical Office, "Dame Gruev"- 4 cities and years of the publications: Republic of Macedonia, Skopje, 2007 languages: Macedonian, English number of copies published:1000 Internet addresses: http://www.moep.gov.mk/WBStorage/Files/Zivotna%20sredina_Environmental%20statistics.pdf time-series data: 1995</p> <p>2. title: Environmental statistic, 2009 names of the publishing houses: State Statistical Office, "Dame Gruev"- 4 cities and years of the publications: Republic of Macedonia, Skopje, 2009 languages: Macedonian, English number of copies published:300 Internet addresses: http://www.stat.gov.mk/Publikacii/ZivotnaSredina2009.pdf time-series data: 1995</p>
Consumption of ozone-depleting substances	Indicator is produced by the Ozone Unit within MOEPP, that is owner of the data	Institutions that make measure, calculate and publish the same should guarantee data quality	<p>1. title: Environmental statistic, 2007 names of the publishing houses: State Statistical Office, "Dame Gruev"- 4 cities and years of the publications: Republic of Macedonia, Skopje, 2007 languages: Macedonian, English number of copies published:1000 Internet addresses: http://www.moep.gov.mk/WBStorage/Files/Zivotna%20sredina_Environmental%20statistics.pdf time-series data: 1995-2005</p> <p>2. title: Environmental statistic, 2009 names of the publishing houses: State Statistical Office, "Dame Gruev"- 4 cities and years of the publications: Republic of Macedonia, Skopje, 2009 languages: Macedonian, English number of copies published:300 Internet addresses: http://www.stat.gov.mk/Publikacii/ZivotnaSredina2009.pdf time-series data: 1995-2008</p> <p>3. title: Environmental indicators 2008 names of the publishing houses: Ministry of Environment and Physical Planning, "Goce Delcev", bb cities and years of the publications: Republic of Macedonia, Skopje, 2008 languages: Macedonian, English number of copies published:1000 Internet addresses: http://www.moep.gov.mk/WBStorage/Files/Indikator%202008%20-%20Air%20pollution.pdf time-series data: 1995 - 2006</p> <p>4. title: Environmental indicators 2010 names of the publishing houses: Ministry of Environment and Physical Planning, "Goce Delcev", bb cities and years of the publications: Republic of Macedonia, Skopje, 2010 languages: Macedonian number of copies published:500 Internet addresses: http://www.moep.gov.mk/WBStorage/Files/1%20Indikator%202010%20-%20Vozduh.pdf time-series data: 2000 - 2010</p>

Question A. Effective inter-agency cooperation mechanisms to produce the indicator
Please describe cooperation arrangements, if any, which have been established in your country to collect the necessary data for the indicator. These may involve statistical agencies, ministries of water management, agriculture, transport, interior,

Question B. Data quality assurance and control procedures for the production of the indicator
Please describe data quality assurance and control procedures for the production of the indicator. The description should cover problems met, solutions found and possible further steps envisaged or needed. References should be made to any international

Question C. Publication of the indicator in statistical compendiums and state-of-the-environment reports
Please present the evidence of the indicator publication in statistical compendiums and state-of-the-environment reports (titles, names of the publishing houses, cities and years of the publications, languages, number of copies published, Internet addresses,

The description of the indicators is available online at: www.unec.org/env/documents/2007/ece/ece.belgrade.conf.2007.inf.6.c.pdf.

Time series data on the indicators for 1990-2010, Table 1. Biochemical oxygen demand (BOD₅) and concentration of ammonium in rivers: (the FYR of Macedonia)

Name of river	Vardar													
Distance to mouth or downstream frontier (km)	The river length 301 km													
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sampling frequency - average	Per sampling period			monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	
BOD ₅	Mg of O ₂ /liter			5.85	11.35	13.3	7.18	10.3	7.46	6.52	7.55	9.27	5.88	
Ammonium	µg of N/liter			670	690	420	430	400	270	380	201	319	264	

Notes: Analytical method that is used for determining of BOD₅ is EN 25813:1992, while for determining of ammonia is being used standard Methods 20th edition 1998

Average values of concentrations for sampling period should be filled in. Please specify if the sampling period concerns the whole year or the seasonal period.
 Countries are asked to report on at least three large rivers in order to have a balanced representation of water quality. Data for more rivers can be filled if the country decides to do so. Data should represent the main rivers draining the large watersheds. Please fill in one sheet for each selected river. For each river, at least three sampling points should be filled in: One for the first sampling point downstream the well or downstream of the frontier (if the river enters the country from neighboring country), the second for the first sampling point upstream the mouth or upstream the e frontier where the river leaves the territory of the country and the third sampling point in between. Data for more sampling points can be filled if the country decides to do so.
 If available, the map showing the location of sampling points should be added.
 Analytical method for determining of BOD₅ should be compliant with ISO 5815-1: 2003 and ISO 5815-2:2003; if different method is used, specify, please. Analytical method for determining ammonia ion should be compliant with ISO 7150: 1984 and ISO 6778: 1984; if different method is used, specify, please.

Glossary:

BOD₅: Biochemical oxygen demand – amount of dissolved oxygen required by organisms for the aerobic decomposition of organic matter present in water. This is measured at 20 degree Celsius for the period of five days.

Ammonium: Ion NH₄⁺.

Time series data on the indicators for 1990-2010, Table 1. Biochemical oxygen demand (BOD₅) and concentration of ammonium in rivers: (the FYR of Macedonia)

Name of river	Bregalnica													
Distance to mouth or downstream frontier (km)	The river length is 225 km													
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sampling frequency - average	Per sampling period			monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	
BOD ₅	Mg of O ₂ /liter			3.61	6.1	7.35	4.71	8.99	8.55	7.44	5.79	8.09	5.41	
Ammonium	µg of N/liter			220	270	190	200	170	140	200	129	126	120	

Notes: Analytical method that is used for determining of BOD₅ is EN 25813:1992, while for determining of ammonia is beening used stand.Methods 20th edition 1998

Average values of concentrations for sampling period should be filled in. Please specify if the sampling period concerns the whole year or the seasonal period.

Countries are asked to report on at least three large rivers in order to have a balanced representation of water quality. Data for more rivers can be filled if the country decides to do so. Data should represent the main rivers draining the large watersheds. Please fill in one sheet for each selected river. For each river, at least three sampling points should be filled in: One for the first sampling point downstream the well or downstream or the frontier (if the river enters the country from neighboring country), the second for the first sampling point upstream the mouth or upstream the e frontier where the river leaves the territory of the country and the third sampling point in between. Data for more sampling points can be filled if the country decides to do so.

If available, the map showing the location of sampling points should be added.

Analytical method for determining of BOD₅ should be compliant with ISO 5815-1: 2003 and ISO 5815-2:2003; if different method is used, specify, please. Analytical method for determining ammonia ion should be compliant with ISO 7150: 1984 and ISO 6778: 1984; if different method is used, specify, please.

Glossary:

BOD₅: Biochemical oxygen demand – amount of dissolved oxygen required by organisms for the aerobic decomposition of organic matter present in water. This is measured at 20 degree Celsius for the period of five days.

Ammonium: Ion NH₄⁺.

Time series data on the indicators for 1990-2010, Table 1. Biochemical oxygen demand (BOD₅) and concentration of ammonium in rivers:(the FYR of Macedonia)

Name of river	Crna Reka													
Distance to mouth or downstream frontier (km)	The river length 228 km													
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sampling frequency - average	Per sampling period			monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	
BOD ₅	Mg of O ₂ /liter			12.1	19.76	18.94	18.4	12.82	10.08	9.41	10.91	10.51	6.16	
Ammonium	µg of N/liter			1390	2890	1200	820	670	700	700	1006	1042	666	

Notes: Analytical method that is used for determining of BOD₅ is EN 25813:1992, while for determining of ammonia is beeing used stand.Methods 20th edition

Average values of concentrations for sampling period should be filled in. Please specify if the sampling period concerns the whole year or the seasonal period.

Countries are asked to report on at least three large rivers in order to have a balanced representation of water quality. Data for more rives can be filled if the country decides to do so. Data should represent the main rivers draining the large watersheds. Please fill in one sheet for each selected river. For each river, at least three sampling points should be filled in: One for the first sampling point downstream the well or downstream or the frontier (if the river enters the country from neighboring country), the second for the first sampling point upstream the mouth or upstream the e frontier where the river leaves the territory of the country and the third sampling point in between. Data for more sampling points can be filled if the country decides to do so.

If available, the map showing the location of sampling points should be added.

Analytical method for determining of BOD₅ should be compliant with ISO 5815-1: 2003 and ISO 5815-2:2003; if different method is used, specify, please. Analytical method for determining ammonia ion should be compliant with ISO 7150: 1984 and ISO 6778: 1984; if different method is used, specify, please.

Glossary:

BOD₅: Biochemical oxygen demand – amount of dissolved oxygen required by organisms for the aerobic decomposition of organic matter present in water. This is measured at 20 degree Celsius for the period of five days.

Ammonium: Ion NH₄⁺.

Time series data on the indicators for 1990-2010, Table 2a. Nutrients in freshwater - rivers: (the FYR of Macedonia)

Name of river	Vardar													
Distance to mouth or downstream frontier (km)	The river length is 301 km													
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sampling frequency - average	Per sampling period			monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	
Phosphates as P	µg/liter			1438	514	850	710	1050	310	270	250	265	254	
Nitrates (NO3)	µg/liter			1460	2120	1730	1760	1820	2170	2370	1742	1739	1953	

Note: The analytical method used for determining nitrates is ISO7890, while the analytical method that is used for determining phosphates is EN ISO 6878:2004.

Average values of concentrations for sampling period should be filled in. Please specify if the sampling period concerns the whole year or the seasonal period.

Countries are asked to report on at least three large rivers in order to have a balanced representation of water quality. Data for more rivers can be filled if the country decides to do so. Data should represent the main rivers draining the large watersheds. Please fill in one sheet for each selected river. For each river, at least three sampling points should be filled in: One for the first sampling point downstream the well or downstream or the frontier (if the river enters the country from neighboring country), the second for the first sampling point upstream the mouth or upstream the frontier where the river leaves the territory of the country and the third sampling point in between. Data for more sampling points can be filled if the country decides to do so.

If available, the map showing the location of sampling points should be added.

Methods of measurement should be specified. It is recommended that analytical method for determining nitrates is compliant with ISO 7890-3: 1988 and analytical method for determining phosphates is compliant with ISO 6878: 2004.

Glossary:

Total phosphorus: Sum of phosphorus compounds measured in terms of phosphorus.

Time series data on the indicators for 1990-2010, Table 2b. Nutrients in fresh water - lakes: (Republic of Macedonia)

Name of lake	Ohrid Lake													
Name of measuring station														
Surface area (km ²)	249 km ²													
Maximum depth (m)	288,7 m													
Mean depth (m)	163,7 m													
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sampling frequency - average	Per sampling period													
Total phosphorus as P	µg/liter			0	10	10	10	5	7	0	29.40	10.23	7.13	
Nitrates (NO3)	µg/liter			280	380	50	551	428						

Note: The frequency of lake monitoring depends on available finances, obtained through project support and other financial aid.

Average values of concentrations for sampling period should be filled in. Please specify if the sampling period concerns the whole year or the seasonal period.

Countries are asked to report on at least two large lakes in order to have a balanced representation of water quality. Data for more lakes can be filled if the country decides to do so. Please fill in one sheet for each selected lake. For each lake, data from at least one sampling point should be filled in. Data for more sampling points can be filled if the country decides to do so.

Methods of measurement should be specified. It is recommended that analytical method for determining nitrates is compliant with ISO 7890-3: 1988 and analytical method for determining phosphates is compliant with ISO 6878: 2004.

If available, the map showing the location of sampling points should be added.

Glossary:

Total phosphorus: Sum of phosphorus compounds measured in terms of phosphorus.

Time series data on the indicators for 1990-2010, Table 2c. Nutrients in fresh water - groundwater: (country name)

Name of water object														
Type of measuring station (shallow well, deep well, spring)														
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sampling frequency - average	Per sampling period													
Nitrates (NO3)	µg/liter													

Note: For the moment there is only monitoring of water level and temperature of groundwaters, for which data is available. The monitoring of groundwater quality is not yet performed, due to lack of finances, technical equipment and capacities.

Note:

Average values of concentrations for sampling period should be filled in. Please specify if the sampling period concerns the whole year or the seasonal period.

Countries are asked to report on at least two aquifers in order to have a balanced representation of ground water quality. Data for more aquifers can be filled if the country decides to do so. Please fill in one sheet for each selected aquifer. For each aquifer, data from at least one measuring station should be filled in. Data for more measuring stations can be filled if the country decides to do so.

If available, the map showing the location of measuring stations should be added.

Type of measuring station should be presented in compliance with national legislation (including explanation)

Analytical method for determining nitrates should be compliant with ISO 7890-3: 1988; if different method is used, please specify.

Time series data on the indicators for 1990-2010, Table 2a. Nutrients in freshwater - rivers: (the FYR of Macedonia)

Name of river	Bregalnica													
Distance to mouth or downstream frontier (km)	The river length is 225 km													
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sampling frequency - average	Per sampling period			monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	
Phosphates as P	µg/liter			420	260	520	620	800	200	150	430	415	290	
Nitrates (NO3)	µg/liter			1050	1540	1600	6280	1530	1760	1740	1509	1630	1400	

Note: The analytical method used for determining nitrates is ISO 7890, while the analytical method that is used for determining phosphates is EN ISO 6878:2004.

Average values of concentrations for sampling period should be filled in. Please specify if the sampling period concerns the whole year or the seasonal period.

Countries are asked to report on at least three large rivers in order to have a balanced representation of water quality. Data for more rivers can be filled if the country decides to do so. Data should represent the main rivers draining the large watersheds. Please fill in one sheet for each selected river. For each river, at least three sampling points should be filled in: One for the first sampling point downstream the well or downstream or the frontier (if the river enters the country from neighboring country), the second for the first sampling point upstream the mouth or upstream the e frontier where the river leaves the territory of the country and the third sampling point in between. Data for more sampling points can be filled if the country decides to do so.

If available, the map showing the location of sampling points should be added.

Methods of measurement should be specified. It is recommended that analytical method for determining nitrates is compliant with ISO 7890-3: 1988 and analytical method for determining phosphates is compliant with ISO 6878: 2004.

Glossary:

Total phosphorus: Sum of phosphorus compounds measured in terms of phosphorus.

Time series data on the indicators for 1990-2010, Table 2b. Nutrients in fresh water - lakes: (Republic of Macedonia)

Name of lake	Prespa Lake													
Name of measuring station														
Surface area (km ²)	176 km ²													
Maximum depth (m)	47 m													
Mean depth (m)	16 m													
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sampling frequency - average	Per sampling period													
Total phosphorus as P	µg/liter			20	40	30	50	34	59	44	45.24	50.64	89.15	
Nitrates (NO3)	µg/liter			570	800	850	580	665	449					

Note: The frequency of lake monitoring depends on available finances, obtained through project support and other financial aid.

Average values of concentrations for sampling period should be filled in. Please specify if the sampling period concerns the whole year or the seasonal period.

Countries are asked to report on at least two large lakes in order to have a balanced representation of water quality. Data for more lakes can be filled if the country decides to do so. Please fill in one sheet for each selected lake. For each lake, data from at least one sampling point should be filled in. Data for more sampling points can be filled if the country decides to do so.

Methods of measurement should be specified. It is recommended that analytical method for determining nitrates is compliant with ISO 7890-3: 1988 and analytical method for determining phosphates is compliant with ISO 6878: 2004.

If available, the map showing the location of sampling points should be added.

Glossary:

Total phosphorus: Sum of phosphorus compounds measured in terms of phosphorus.

Time series data on the indicators for 1990-2010, Table 2c. Nutrients in fresh water - groundwater: (country name)

Name of water object														
Type of measuring station (shallow well, deep well, spring)														
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sampling frequency - average	Per sampling period													
Nitrates (NO3)	µg/liter													

Note: For the moment there is only monitoring of water level and temperature of groundwaters; for which data is available. The monitoring of groundwater quality is not yet performed, due to lack of finances, technical equipment and capacities.

Note:

Average values of concentrations for sampling period should be filled in. Please specify if the sampling period concerns the whole year or the seasonal period.

Countries are asked to report on at least two aquifers in order to have a balanced representation of ground water quality. Data for more aquifers can be filled if the country decides to do so. Please fill in one sheet for each selected aquifer. For each aquifer, data from at least one measuring station should be filled in. Data for more measuring stations can be filled if the country decides to do so.

If available, the map showing the location of measuring stations should be added.

Type of measuring station should be presented in compliance with national legislation (including explanation)

Analytical method for determining nitrates should be compliant with ISO 7890-3: 1988; if different method is used, please specify.

Time series data on the indicators for 1990-2010, Table 2a. Nutrients in freshwater - rivers: (the FYR of Macedonia)

Name of river	Crna Reka													
Distance to mouth or downstream frontier (km)	The river length 228 km													
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sampling frequency - average	Per sampling period			monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	monthly	
Phosphates as P	µg/liter			600	260	460	460	640	220	160	400	389	383	
Nitrates (NO3)	µg/liter			1110	1050	1570	970	1630	1270	1570	1066	1418	1331	

Note: The analytical method used for determining nitrates is ISO 7890, while the analytical method that is used for determining phosphates is EN ISO 6878:2004.

Average values of concentrations for sampling period should be filled in. Please specify if the sampling period concerns the whole year or the seasonal period.

Countries are asked to report on at least three large rivers in order to have a balanced representation of water quality. Data for more rivers can be filled if the country decides to do so. Data should represent the main rivers draining the large watersheds. Please fill in one sheet for each selected river. For each river, at least three sampling points should be filled in: One for the first sampling point downstream the well or downstream of the frontier (if the river enters the country from neighboring country), the second for the first sampling point upstream the mouth or upstream the e frontier where the river leaves the territory of the country and the third sampling point in between. Data for more sampling points can be filled if the country decides to do so.

If available, the map showing the location of sampling points should be added.

Methods of measurement should be specified. It is recommended that analytical method for determining nitrates is compliant with ISO 7890-3: 1988 and analytical method for determining phosphates is compliant with ISO 6878: 2004.

Glossary:

Total phosphorus: Sum of phosphorus compounds measured in terms of phosphorus.

Time series data on the indicators for 1990-2010, Table 2b. Nutrients in fresh water - lakes: (country name)

Name of lake														
Name of measuring station														
Surface area (km ²)														
Maximum depth (m)														
Mean depth (m)														
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sampling frequency - average	Per sampling period													
Total phosphorus as P	µg/liter													
Nitrates (NO3)	µg/liter													

Note:

Average values of concentrations for sampling period should be filled in. Please specify if the sampling period concerns the whole year or the seasonal period.

Countries are asked to report on at least two large lakes in order to have a balanced representation of water quality. Data for more lakes can be filled if the country decides to do so. Please fill in one sheet for each selected lake. For each lake, data from at least one sampling point should be filled in. Data for more sampling points can be filled if the country decides to do so.

Methods of measurement should be specified. It is recommended that analytical method for determining nitrates is compliant with ISO 7890-3: 1988 and analytical method for determining phosphates is compliant with ISO 6878: 2004.

If available, the map showing the location of sampling points should be added.

Glossary:

Total phosphorus: Sum of phosphorus compounds measured in terms of phosphorus.

Time series data on the indicators for 1990-2010, Table 2c. Nutrients in fresh water - groundwater: (country name)

Name of water object														
Type of measuring station (shallow well, deep well, spring)														
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sampling frequency - average	Per sampling period													
Nitrates (NO3)	µg/liter													

Note: For the moment there is only monitoring of water level and temperature of groundwaters; for which data is available. The monitoring of groundwater quality is not yet performed, due to lack of finances, technical equipment and capacities.

Note:

Average values of concentrations for sampling period should be filled in. Please specify if the sampling period concerns the whole year or the seasonal period.

Countries are asked to report on at least two aquifers in order to have a balanced representation of ground water quality. Data for more aquifers can be filled if the country decides to do so. Please fill in one sheet for each selected aquifer. For each aquifer, data from at least one measuring station should be filled in. Data for more measuring stations can be filled if the country decides to do so.

If available, the map showing the location of measuring stations should be added.

Type of measuring station should be presented in compliance with national legislation (including explanation)

Analytical method for determining nitrates should be compliant with ISO 7890-3: 1988; if different method is used, please specify.

Time series data on the indicators for 1990-2010, Table 3. Nutrients in coastal seawaters: (NOT RELEVANT)

Name of coastal zone	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of selected sampling points (from which average concentrations are calculated)														
Sampling frequency – mean	Per year													
Number of analyses - average	Per year													
Total phosphorus as P – Summer	µg/liter													
Total nitrogen as N - Summer	µg/liter													
Total phosphorus as P – Autumn	µg/liter													
Total nitrogen as N - Autumn	µg/liter													
Total phosphorus as P – Winter	µg/liter													
Total nitrogen as N - Winter	µg/liter													
Total phosphorus as P – Spring	µg/liter													
Total nitrogen as N - Spring	µg/liter													

Notes:

Average values of concentrations from all selected sampling points for summer, winter, autumn and spring period should be filled in. In the case of high number of sampling points on the coastal zone, the countries should select at least five representative points for the calculation of average concentrations to have a balanced representation of water quality. Data for more sampling points can be used for the calculation of average concentrations if the country decides to do so. Please fill in one sheet for each coastal zone. If available, the map showing the location of sampling points should be added. Methods of measurement should be specified. It is recommended that analytical method for determining nitrates should be compliant with ISO 7890-3: 1988 and analytical method for determining phosphates should be compliant with ISO 6878: 2004. Preferably, reference methods as agreed upon in the Joint monitoring program established within the framework of the OSPAR Convention (<http://www.ospar.org>).

Time series data on the indicators for 1990-2010, Table 4. Area affected by erosion: (the FYR of Macedonia)

Areas affected by water erosion														
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total agricultural land	Km ²													
No affect (tolerable)	Km ²													
<i>Share in total agricultural land</i>	%													
Light affect	Km ²													
<i>Share in total agricultural land</i>	%													
Moderate affect	Km ²													
<i>Share in total agricultural land</i>	%													
Strong affect	Km ²													
<i>Share in total agricultural land</i>	%													
Extreme affect	Km ²													
<i>Share in total agricultural land</i>	%													
Total affect	Km ²													
<i>Share in total agricultural land</i>	%													
Areas affected by wind erosion														
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total agricultural land	Km ²													
No affect (tolerable)	Km ²													
<i>Share in total agricultural land</i>	%													
Light affect	Km ²													
<i>Share in total agricultural land</i>	%													
Moderate affect	Km ²													
<i>Share in total agricultural land</i>	%													
Strong affect	Km ²													
<i>Share in total agricultural land</i>	%													
Extreme affect	Km ²													
<i>Share in total agricultural land</i>	%													
Total affect	Km ²													
<i>Share in total agricultural land</i>	%													
Total areas affected by erosion (water and wind)														
	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total agricultural land	Km ²	n.a.	25'713.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
No affect (tolerable)	Km ²	n.a.	900.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<i>Share in total agricultural land</i>	%	n.a.	3.5	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Light affect	Km ²	n.a.	15'399.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<i>Share in total agricultural land</i>	%	n.a.	62.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Moderate affect	Km ²	n.a.	6'893.3	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<i>Share in total agricultural land</i>	%	n.a.	27.8	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Strong affect	Km ²	n.a.	1'832.4	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<i>Share in total agricultural land</i>	%	n.a.	7.4	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Extreme affect	Km ²	n.a.	688.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Share in total agricultural land	%	n.a.	2.8	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total affect	Km ²	n.a.	24'813.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Share in total agricultural land	%	n.a.	96.5	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Glossary:	
Erosion: Water and wind erosion is measured as net loss of soil (in tons per hectare per year).	
Erosion – Classification (the same for both water and wind erosion):	
No affect (tolerable):	Net loss lower than 6 tons/hectare/year
Light affect:	Net loss 6.0 – 10.9 tons/hectare/year
Moderate affect:	Net loss 11.0 – 21.9 tons/hectare/year
Strong affect:	Net loss 22.0 – 32.9 tons/hectare/year
Extreme affect:	Net loss higher than 33 tons/hectare/year
Note: If your country applies classification for the severity of erosion different from that presented above, provide the data according to the national classification and give the detailed explanation of the national system. If data for 1990 or other year is not available, fill in "n.a.".	

More information: Erosion values are given in m3/km2/year. Calculation has been performed on the basis of Erosion map of the Republic of Macedonia (Gjorgjevik et al., 1993) which use the classification of erosion according to (Gavrilovic, 1965). The values refer to the hole territory of the country not only for the agricultural land.

Assessment and Reporting on Soil Erosion, Technical Report 94/2003, European Environment Agency 2003, http://www.eea.europa.eu/publications/technical_report_2003_94

Time series data on the indicators for 1990-2010, Table 5. Pesticide use: (the FYR of Macedonia)

Substance	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Insecticides – consumption	ton	n.a.	n.a.	57	66	54	42	51	17	20	22	16	n.a.	n.a.
Herbicides and desiccants – consumption	ton	n.a.	n.a.	50*	59*	73*	52*	32*	33*	16*	17*	7*	n.a.	n.a.
Fungicides and bactericides – consumption	ton	n.a.	n.a.	189**	200**	113**	116**	179**	99**	291**	80**	68**	n.a.	n.a.
Plant regulators – consumption	ton	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Rodenticides – consumption	ton	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Others (e.g. mineral oils) – consumption	ton	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total consumption (all pesticides)	ton	n.a.	n.a.	308	333	245	222	273	159	336	122	91	n.a.	n.a.
Total arable and permanent cropland	1000 hectare	n.a.	n.a.	598	612	577	569	560	546	537	526	521	n.a.	n.a.
Pesticide use per unit of land	Kg/hectare	n.a.	n.a.	0.51	0.54	0.42	0.39	0.48	0.29	0.62	0.23	0.17	n.a.	n.a.

Note:

Data should relate to pesticide consumption in agriculture, forestry and gardening. Otherwise, kindly indicate if data refer to sales, distribution or imports for use in particular sectors. If data for 1990 or other year is not available, fill in "n.a.". Data should be expressed in active ingredients (A.I.). Therefore, calculate the volume of A.I. contained in individual products and then include it in the relevant group in table 3. Alternatively, the data may be reported by: consumption in commercial products; sales; distribution or imports for use in the agricultural sector.

Glossary:

Insecticide: Pesticide used against insects

Herbicide: Pesticide against unwanted plants (weed)

Desiccant: Hygroscopic substance that induces or sustains a state of dryness

Fungicide: Pesticide for the control of fungi and oomycetes

Bactericide: Pesticide for the control of bacteria

Plant regulator: Pesticide that retards the growth of plants

Rodenticide: Pesticide for the control of rodents

Active Ingredients: A pesticide product has two main components: the Active Ingredient(s) and the inert (other) ingredient(s). The active ingredient is the specific compound designed to adversely effect a pest. Pesticide active ingredients are generally not applied in their pure form, but are usually included in formulations with inert ingredients that improve their storage, handling, application, effectiveness, or safety. Content of active ingredient is obviously presented either in pesticide product documentation or on the pesticide product packaging.

More information: * data only for herbicides ; ** data only for fungicides:

Comprehensive information on pesticides can be found at the FAO page <http://www.fao.org/agriculture/crops/core-themes/theme/pests/en>.

The detailed list of pesticides including chemical substances and example of trade names of commercial products can be found at <http://www.fao.org/economic/ess/ess-agri/ess-resource-meth/en> (Questionnaires, Pesticides, 2010, Annex I)

Time series data on the indicators for 1990-2010, Table 6a. Consumption of ozone-depleting substances (calculated levels in tons of substances): (the FYR of Macedonia)

Substance	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CFCs	ton	n.a.	558	51.27	51.42	34.14	49.33	8,77	11.83	6.99	0	0	0	0
Halons		n.a.	3	0	0	0	0	0	0	0	0	0	0	0
Other fully halogenated CFCs		n.a.	0	0	0	0	0	0	0	0	0	0	0	0
Carbon tetrachloride		n.a.	0	0.04	0	0.01	0	0	0.01	0	0	0	0	0
Methyl chloroform		n.a.	0	0	0	0	0	0	0	0	0	0	0	0
HCFCs		n.a.	28	90.18	188.34	70.32	108.38	4.76	33.87	42.98	22.73	36.86	57.33	24
HBFCs		n.a.	0	0	0	0	0	0	0	0	0	0	0	0
Bromochloromethane		n.a.	0	0	0	0	0	0	0	0	0	0	0	0
Methyl bromide		n.a.	0	33.39	28.46	7.6	0	0	0	0	0	0	0	0

Note:

Calculated levels of consumption mean production plus imports minus export of controlled substances. However, any export of controlled substances to non-Parties (to the Montreal Protocol) is not to be subtracted in calculating the consumption level of the exporting Party. If data for 1990 or other year is not available, fill in "n.a.". Consumption is not to be multiplied by ODP.

Glossary:

CFCs: Chlorofluorocarbons (CFC-11, CFC-12, CFC-113, CFC-114 and CFC-115)

Halons: halon 1211, halon 1301 and halon 2402

Other fully halogenated CFCs: CFC-13, CFC-111, CFC-112, CFC-211, CFC-212, CFC-213, CFC-214, CFC-215, CFC-216, CFC-217

HCFCs: Hydrochlorofluorocarbons

HBFCs: Hydrobromofluorocarbons

ODP: Ozone depleting potential

Time series data on the indicators for 1990-2010, Table 6b. Consumption of ozone-depleting substances (calculated levels in tons of ODP):
(the FYR of Macedonia)

Substance	Unit	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CFCs	Ton of ODP	n.a.	558	49.46	46.68	34.11	49.33	8.77	11.83	6.99	0	0	0	0
Halons		n.a.	30	0	0	0	0	0	0	0	0	0	0	0
Other fully halogenated CFCs		n.a.	0	0	0	0	0	0	0	0	0	0	0	0
Carbon tetrachloride		n.a.	0	0.04	0	0.01	0	0	0.012	0	0	0	0	0
Methyl chloroform		n.a.	0	0	0	0	0	0	0	0	0	0	0	0
HCFCs		n.a.	1.54	4.98	10.36	3.92	5.96	4.76	1.86	2.36	1.25	2.03	4.02	1.32
HBFCs		n.a.	0	0	0	0	0	0	0	0	0	0	0	0
Bromochloromethane		n.a.	0	0	0	0	0	0	0	0	0	0	0	0
Methyl bromide		n.a.	0	23.37	19.92	5.32	0	0	0	0	0	0	0	0
Total		n.a.	589.54	77.85	76.96	43.36	55.29	13.53	13.702	9.35	1.25	2.03	4.02	1.32

Note: Values presented in Table 6a should be multiplied by appropriate values of ODP, as presented in the next sheet.

ODP Values of the Most Important ODS

Note: Only the ODP values of the most important ODS are listed below. Other ODS are rarely used and thus of little significance for reporting and assessing compliance. For a complete list of ODP values of controlled substances refer to the Annexes of the Montreal Protocol.

Group of substances	Substance	ODP
Annex A, Group I	CFC-11	1.0
	CFC-12	1.0
	CFC-113	0.8
	CFC-114	1.0
	CFC-115	0.6
Annex A, Group II	Halon-1211	3.0
	Halon-1301	10.juin
	Halon-2402	06.juin
Annex B, Group I	CFC-13	1.0
	CFC-111	1.0
	CFC-112	1.0
	CFC- 211 – CFC-217	1.0
Annex B, Group II	Carbon tetrachloride	01.janv
Annex B, Group III	Methyl chloroform	0.1
Annex C, Group I	HCFC-21	0.04
	HCFC-22	0.055
	HCFC-31	0.02
	HCFC-123	0.02
	HCFC-124	0.022
	HCFC-133	0.06
	HCFC-141b	0.11
	HCFC-142b	0.065
	HCFC-225	0.07
	HCFC-225ca	0.025
HCFC-225cb	0.033	
Annex E, Group I	Methyl bromide	0.6

Source: 1997 Update of the Handbook for the International Treaties for the Protection of the Ozone Layer, Montreal Protocol, Annexes A, B, C and E

More information:
Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer, Eighth edition, UNEP 2009 (in English), http://ozone.unep.org/Publications
Handbook on Data Reporting under the Montreal Protocol, UNEP 1999 (in English and Russian); http://ozone.unep.org/Data_Reporting/Data_Reporting_Tools .