

Country fiche: Germany

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1. Introduction

The European Environment Agency (EEA) manages water data and information reported either voluntarily by EEA member countries (water quality in groundwater, rivers, lakes; emissions of pollutants and water quantity); and data reported via REPORTNET under EU water directives: Water Framework Directive (WFD); Bathing Water Directives (BWD) and Urban Waste Water Treatment Directive (UWWTD), Nitrate Directive (NiD) and Drinking water Directive (DWD). Reported data are processed at EEA and stored in water data center. They can be also accessible on EEA home page. Data reported under Nitrate Directive (NiD) and Drinking water Directive (DWD) are not yet available at EEA water data center home page.

The aim of the country fiches is both to clean-up and correcting errors in the data member countries now have reported for 15-20 years. Some errors have been introduced by the EEA and its Topic Centres handling of the reported data; others is due to errors introduced in member countries reporting.

Another aspect is to improve the spatial and temporal coverage and to ensure that the relevant determinands are reported.

- In some cases member countries will be asked for more stations to increase the spatial coverage or density of stations; or questions on why data have not been reported from some of the RBDs.
- EEA water quality indicators are for trend assessments based on consistent time series with some gap filling. For a single country consistent time series are established for the defined period (e.g. 1992-2012; or 2000-2012) with some gap filling (e.g. up to 3 years) and only stations with values for all years in the defined period are used. This ensure that any trend is because of change in the observations and not in the stations included.
- In the current data set the reporting of some high priority determinands has stopped or there has been change in the determinands in the database e.g. cadmium changed to dissolved cadmium. EEA wants to clarify if these changes are real changes or it has been errors/misinterpretations introduced in compiling the databases. In addition, the aim is to ensure that the high priority determinands (e.g. nitrate or orthophosphate) have as complete coverage as possible.

The last part is on ensuring linkage between the different Waterbases by having a common coding system (Water Body ID) and linked to different reference layers such as the RBDcodes.

2. Reporting obligations from European Water Directives

Germany reporting of data in relation to EU water directives have in the last years been uploaded to the [Reportnet](#) Central Data Repository (CDR [Germany](#)) and below is listed an overview of Germany's reporting in relation to water directives (Remark this is an overview of what is available in CDR and Germany may have reported by other format directly to the European Commission).

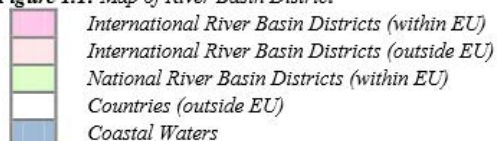
- [Bathing Water Directive \(2006/7/EC\)](#) [Link](#) – Germany's reporting under the Bathing Water Directive is further described in the annual national report published by EEA available at [link](#) and the data is available here [Link](#)
- [Drinking Water Directive Report \(98/83/EC\)](#) - [Link](#). Data related to two “3 yearly report on quality of water for human consumption” are available for the period 2005-2005 and 2008-2010.
- [Floods Directive](#) Preliminary flood risk assessment
 - Floods Directive Unit of Management and Competent Authorities. [Link](#), German Competent

- Authority and Units of Management,
 - Preliminary flood risk assessment [Link](#).
- Nitrates Directive (91/676/EEC) - [Link](#). Report/data related to the Nitrate Directive reporting period 2004-2007 and 2008-2011.
- Urban Waste Water Treatment Directive
 - Monitoring (91/271/EEC) [Art 15] - [Link](#). 2011 UWWT data plus archive over previous reporting.
 - Article 16 - Situation report – [Link](#). *No data in CDR yet.*
 - Article 17 - National Implementation Programme – [Link](#). *No data in CDR yet.*
- Water Framework Directive
 - Art. 3 reporting (River Basin Districts and Competent Authorities) – [Link](#).
 - Art. 5 reporting – [Link](#).
 - Art. 8 (Monitoring programmes) – [Link](#).
 - Art. 13 (River Basin Management Plans) – [Link](#).
 - Art. 15.3 Progress on implementation of programmes of measures – [Link](#).

3. Overview on WFD reporting in Germany



Figure 1.1: Map of River Basin District



Source: WISE, Eurostat (country borders)

Source: Germany's WFD implementation report

http://ec.europa.eu/environment/water/water-framework/pdf/CWD-2012-379_EN-Vol3_DE.pdf

RBD	Name	Size ¹ (km ²)	% share of total basin in DE	Countries sharing RBD
DE1000	Danube	801000 (56259 in DE)	7	AT, BA, BG, CH, CZ, HR, HU, IT, MD, ME, MK, PL, RO, RS, SI, SK, UA, AL
DE2000	Rhine	197177 (105775 in DE)	54	AT, BE, CH, FR, IT, LI, LU, NL
DE3000	Ems	20246 (17117 in DE)	84	NL
DE4000	Weser	49063	100	-
DE5000	Elbe	150558 (99506 in DE)	65.5	AT, CZ, PL
DE6000	Odra	124000 (9600 in DE)	7.7	CZ, PL
DE7000	Meuse	34364 (3984 in DE)	11.6	BE, FR, LU, NL
DE9500	Eider	9202 (DE only ²)	-	DK
DE9610	Schlei/Trave	9218 (DE only ²)	99.95	DK
DE9650	Warnow/Peene	21088	100	-

Table 1.1: Overview of Germany's River Basin Districts

Source: River Basin Management Plans reported to WISE⁴: <http://cdr.eionet.europa.eu/de/eu/wfdart13>

The WISE-WFD database contains data from River Basin Management Plans reported by EU Members States according to article 13 of the Water Framework Directive. A number of aggregation queries provide an overview on number and statistics of water bodies, on status assessments and pressures and impacts for both surface water bodies and groundwater bodies.

The following queries are available:

- Numbers and statistics of surface water bodies
- Ecological and chemical status of surface water bodies
- Significant pressures affecting surface water bodies
- Impacts on surface water bodies
- Numbers and statistics of groundwater bodies
- Chemical and quantitative status of groundwater bodies

The information is aggregated at country, river basin district (RBD) or in some cases even RBD-subunit level and can be downloaded [here](#).

4. Eionet priority data flows – SoE data (Waterbase)

The EEA Eionet priority data flows identify a set of agreed, stable, well-defined objectives to provide a focus for countries when they are putting procedures in place for regular reporting. Germany has in the period 2000-2014 reported river, lake (reservoir) and groundwater water quality data, while there have been no reporting of data on emissions (data have been inserted from E-PRTR) and limited reporting on water quantity.

Germany– performance of EEA priority inland data flows

Data flow name	Progress 2000	Progress 2001	Progress 2002	Progress 2003	Progress 2004	Progress 2005	Progress 2006	Progress 2007	Progress 2008	Progress 2009	Progress 2010	Progress 2011	Progress 2012
EWN1: River quality													
EWN2: Lake quality													
EWN3: Groundwater quality													
EWN4: Water quantity	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A		
WISE1: Water emission quality	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			N/A	

DR

Data flow name	Status	Progress 2012-2013	Progress 2013-2014	Remark
EWN1: River quality	2014-02-25			Data delivered on time and in the requested format. Feedback to reported issues provided. Monitoring stations with coordinates provided. Data on 5 preferred SoE nutrient delivered. Hazardous substances data delivered. Proxy pressures data not provided for all stations. Some long time series on preferred SoE nutrients available. Biology data delivered.
EWN2: Lake quality	2014-02-27			Data delivered on time and in the requested format. No reply to critical QA issues on previously reported data. Monitoring stations with coordinates provided. Data on 4 preferred SoE nutrient delivered. Hazardous substances data delivered. Proxy pressures data not provided for all stations. Long time series on preferred SoE nutrients available. Biology data delivered.
EWN3: Groundwater quality	2014-02-04			Data delivered on time and in the requested format but with many formal errors. Data for all 5 requested chemical substances provided, all in disaggregated form. Monitoring sites with coordinates and links to GW bodies provided. GIS data for GW bodies and list of GW bodies with most important attributes and pressure data provided.
EWN4: Water quantity ⁽¹⁾	2014-02-07			Late delivery (5 Feb 2014) of groundwater data not in the requested format. Reported data relevant to Water Quantity in EUROSTAT/OECD JQ 2012.
WISE1: Emissions to water ⁽¹⁾	2014-02-03			No data delivery under WISE-SoE data collection 2013, data from E-PRTR inserted.

Note: Further information and scoring criteria is available here:

http://www.eionet.europa.eu/dataflows/pdf2013/country_summary?country=DE

<http://www.eionet.europa.eu/dataflows/pdf2013/history?country=DE>

4.1 Rivers and Lakes

Note: all queries (which are still under development) and outcomes on rivers and lakes can be found here: http://www.tcvoe.si/wise_so_e_country_fiche/#

In Chapters 2.1.1 and 2.1.4 reporting on nutrients, organic matter and general physico-chemical determinands is illustrated. For simplification only the term nutrients is used in the descriptions.

Rivers – Nutrients, Organic Matter and General Physico-Chemical Determinands

Issues to be clarified:

- Have data for all SoE nutrients of highest priority¹ been reported consistent over the years?
- Are stations with monitoring of highest priority nutrients covering all RBDs?
- Are longer time series (since 1992) for preferred nutrients available?
- Are stations codes consistent and is it possible to link the stations with WFD water bodies?
- Member State specific issues, if such occur

Germany reports data on nutrients in rivers since 1981. Table 1 below provides an overview by determinands (highest priority nutrients) of the number of river stations per year for the period

¹ Determinands of highest priority in terms of EEA's needs are determinands which are or will be used in EEA assessments (e.g. CSI).

1992 to 2012. For the year 2007 no data have been submitted. Total ammonium was changed to ammonia after 2007. BOD₅ has been reported only from 2005 on.

Table 1: Number of river stations per determinand/year (nutrients of highest EEA priority)

Determinand_Nutrients	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Nitrate	121	121	124	148	148	148	147	148	148	148	151	151	151	151	151	0	253	244	255	257	226
Total nitrogen	50	56	74	84	88	92	104	104	104	106	109	109	107	98	121	0	216	210	217	226	182
Orthophosphates	120	129	129	143	147	148	147	143	141	148	150	151	146	150	126	0	245	232	210	213	185
Total phosphorus	119	114	114	140	138	137	136	143	145	147	149	149	150	151	132	0	209	244	255	255	226
BOD5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	164	156	147	160	130
Total organic carbon (TOC)	58	63	79	101	121	127	138	144	144	147	115	124	124	150	131	0	253	254	251	256	224
Dissolved organic carbon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	155	0	0
Ammonium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	253	195	181	180	165
Total ammonium	124	132	138	148	148	148	148	140	144	148	149	151	151	151	133	0	0	49	74	77	61

Note: In the current data set the reporting of some high priority determinands has stopped or there has been a change in the determinands in the database. EEA wants to clarify if these changes are real changes or it has been errors/misinterpretations introduced in compiling the databases. In addition, the aim is to ensure that the high priority determinands (e.g. nitrate or orthophosphate) have as complete coverage as possible.

Table 2 shows the number of river stations by River Basin Districts which reported on nutrients for the period from 1992 – 2012. Germany reported data from 265 river stations for nutrients in all 10 German RBDs in this period. In 2007 there was no reporting of nutrients in Germany. The number of river stations has been increased significantly since 2008.

Table 2: Number of river stations for nutrients by River Basin Districts for the period 1992 - 2012

RBDcode	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DE1000	17	17	18	18	18	18	18	18	18	18	18	18	18	18	18	0	37	37	37	37	35
DE2000	51	51	52	54	54	54	54	54	54	54	54	54	54	54	54	0	76	79	79	80	70
DE3000	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	10	10	10	10	10
DE4000	15	16	16	16	16	16	16	16	16	16	17	17	17	17	17	0	44	44	44	44	43
DE5000	39	39	39	40	40	40	40	40	40	40	42	42	42	42	42	0	54	54	54	54	48
DE6000	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	0	7	7	7	7	3
DE7000	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	3	2	2	3	1
DE9500	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	4	4	4	4	3
DE9610	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	9	9	9	9	5
DE9650	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	7	7	7	7	7
Total	142	143	145	148	148	148	148	148	148	148	151	151	151	151	151	0	251	253	253	255	225

Note: One aspect of the country fiches is to improve the spatial coverage and ensure that stations are reported for all RBDs.

The figure below illustrates the river stations with nutrient reporting in 2013 (covering the year 2012) in Germany. From this it can be seen that all RBDs in Germany are covered with reporting in 2012, but the density of stations is rather low.

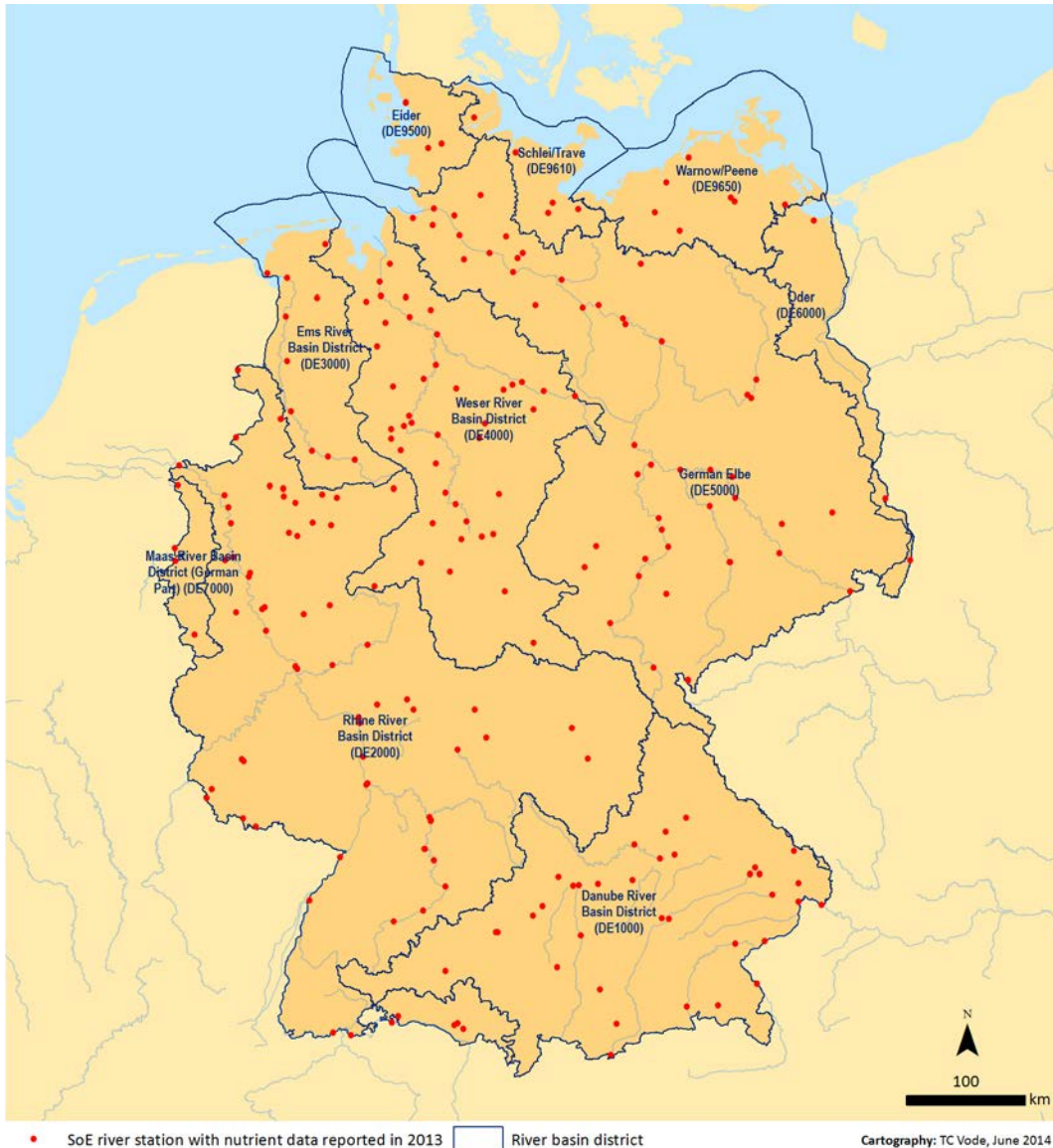


Figure 1: SoE river stations with nutrient data reported in 2013 in Germany's RBDs

For the period 1992 to 2012 Germany has reported around 265 river stations with monitoring of nitrate, just under the half of the stations have 15 years of observation, around 120 stations have 5 years of observation or less (Table 3). This may be explained with the new stations which have been reported after 2007. If gaps in reporting are filled, many time series of 20 years length are available.

Table 3: Length of nitrate time series in Germany for period 1992 – 2012 (value in the table fields is number of stations with x years' time series)

RBDcode	1 yr	2 yr	3 yr	4 yr	5 yr	6 yr	7 yr	8 yr	9 yr	10 yr	11 yr	12 yr	13 yr	14 yr	15 yr	16 yr	17 yr	18 yr	19 yr	20 yr	21 yr
No of stations with time series with x years length	1	0	2	18	96	0	0	1	0	0	0	24	3	2	118	0	0	0	0	0	0

No of stations with time series with x years length, if one year of interruption is filled	1	0	0	20	93	0	0	0	0	3	0	1	0	0	9	4	22	4	23	85	0
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Note: EEA water quality indicators are used for trend assessments based on consistent time series with some gap filling. For a single country consistent time series are established for the defined period (e.g. 1992-2012; or 2000-2012) with some gap filling (e.g. up to 3 years) and only stations with values for all years in the defined period are used. This ensures that any trend is because of change in the observations and not in the stations included.

Questions to Germany regarding the reporting on nutrients in rivers:

- Does data exist for determinands to fill the gaps in reporting? All priority determinands in 2007, DOC, BOD₅ before 2005.
- Can the data be resubmitted for stations / years / which have not been reported so far?
- Ammonium/total ammonium - why was there a change from 2008 on, is ammonium/total ammonium the same parameter?
- Are there more stations with time series for the listed determinands (in particular the priority ones) available that have so far not been reported?
- Can more stations be reported to increase spatial coverage?

Rivers – hazardous substances

Issues to be clarified:

- Have data for all SoE preferred² hazardous substances which are monitored in the Member State been reported and consistent for the years in which data are available?
- Are stations with monitoring of SoE preferred hazardous substances covering all RBDs?

Germany reports data on hazardous substances in rivers since 1999. In Table 4 there is an overview on the reporting of some preferred hazardous substances (heavy metals, PAHs and some pesticides) only as example. In general many data have been reported on pesticides, PAH and metals. For many substances data in some years have not been reported (2004, 2007) or reporting stopped for some substances. Another issue is that until 2009 there was no distinction between total and dissolved forms of metals in the data dictionary code list for rivers and lakes. After 2009 it could be distinguished between the forms of metals. In the first rows of Table 4 reporting on heavy metals is included. From this can be seen that there were some changes in reporting of metals in Germany.

² The lists of preferred substances are based on legislation, spatial and temporal availability. Preferred substances are also covered by Hazardous substances report regularly.

Table 4: Hazardous substances (examples for preferred substances) in rivers by number of stations and year

Determinand_HazSubs	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Cadmium	139	138	134	136	136	0	129	97	0	196	0	0	0	0
Cadmium dissolved	0	0	0	0	0	0	0	0	0	0	0	131	135	178
Lead	136	135	126	134	134	0	0	0	0	0	0	0	86	66
Lead dissolved	0	0	0	0	0	0	0	0	0	0	131	135	140	122
Mercury	132	135	131	134	136	0	128	90	0	167	0	0	0	0
Mercury dissolved	0	0	0	0	0	0	0	0	0	0	89	77	129	79
Nickel	135	136	126	134	134	0	0	0	0	0	0	0	86	66
Nickel dissolved	0	0	0	0	0	0	0	0	0	0	131	135	137	113
Benzo(k)fluoranthene	33	41	104	43	25	0	31	45	0	0	103	89	116	67
Benzo(a)pyrene	34	38	104	34	32	0	30	46	0	0	100	89	116	67
Fluoranthene	34	44	104	33	29	0	30	40	0	0	105	91	83	70
Naphthalene	31	43	102	60	38	0	54	52	0	0	117	105	102	85
Benzo(g,h,i)perylene	27	41	101	33	26	0	32	46	0	0	103	95	128	76
Anthracene	27	34	104	48	31	0	33	39	0	78	104	89	83	70
Indeno(1,2,3-cd)pyrene	33	46	104	35	25	0	33	46	0	0	103	95	127	76
Benzo(b)fluoranthene	33	44	104	34	26	0	30	46	0	0	103	89	117	68
DDE, p,p'	39	24	49	31	31	0	46	37	0	0	73	52	55	44
Ametryn	70	74	89	69	48	0	61	48	0	104	96	86	98	89
Aldrin	41	42	77	46	25	0	42	34	0	0	67	59	75	50
Propazine	87	85	100	84	73	0	62	0	0	0	0	0	0	0
Chlorpyrifos	0	0	0	0	0	0	0	0	0	0	0	94	80	87
4-nonylphenol, branched	0	0	0	0	0	0	0	0	0	0	0	9	0	0
Hexazinone	65	64	80	62	43	0	78	61	0	0	104	80	92	84
Heptachloroepoxide	0	0	22	9	1	0	27	16	0	0	50	28	22	20
Parathion-methyl	62	64	81	66	42	0	50	59	0	101	83	78	70	72
Chlordane	6	23	89	31	10	0	22	24	0	25	41	30	22	16
Bromoxynil	0	0	0	0	0	0	0	0	0	0	0	90	140	82
Diuron	73	79	104	90	81	0	77	72	0	0	144	124	123	101

Note: In the current data set the reporting of some high priority determinands has stopped or there has been change in the determinands in the database e.g. lead changed to dissolved lead. EEA wants to clarify if these changes are real changes or it has been errors/misinterpretations introduced in compiling the databases. In addition, the aim is to ensure that the high priority determinands (e.g. priority substances) have as complete coverage as possible.

- An overview of reporting on supportive determinands will be added in final versions of country fiches -

Table 5 shows the number of river stations by River Basin Districts which reported on preferred hazardous substances for the period from 1999 – 2012. In this period Germany reported data from around 250 river stations for all 10 German RBDs. In 2004 and 2007 no data on hazardous substances were reported

Table 5: Number of stations by River Basin Districts for preferred hazardous substances

RBDcode	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
---------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

DE1000	14	14	15	12	12	0	12	9	0	21	22	20	20	21
DE2000	52	52	52	52	52	0	52	37	0	72	74	77	71	66
DE3000	3	3	3	3	3	0	3	3	0	6	6	4	10	5
DE4000	16	17	17	17	16	0	16	17	0	32	20	17	40	24
DE5000	41	41	41	41	41	0	40	41	0	50	43	41	50	38
DE6000	5	5	5	5	5	0	4	5	0	7	6	6	7	3
DE7000	4	4	4	4	4	0	4	4	0	3	2	2	3	1
DE9500	2	2	2	2	2	0	2	2	0	4	2	4	4	2
DE9610	1	1	1	1	1	0	2	2	0	9	6	2	9	4
DE9650	3	3	4	3	3	0	0	4	0	7	7	5	4	5
Total	141	142	144	140	139	0	135	124	0	211	188	178	218	169

Questions to Germany regarding the reporting on hazardous substances in rivers:

- Does data exist for determinands to fill the gaps in reporting?
- Can reporting for metals be clarified?
- Are data from 1992 to 1998 available?
- Are there more stations for the preferred determinands available that have so far not been reported?
- Can the data be resubmitted for stations / years which have not been reported so far?

Rivers – Biology

Issues to be clarified:

- Are status classes reported? If not, why not?
- Are EQR values reported? If not, why not?
- Can reported EQR values be normalised? If not, why not?

In general care should be taken to ensure that the stations reported are geographically representative, as well as representative in terms of the whole range of ecological status classes, and that all major river types are included.

Germany reported river biology data (both phytobenthos and macroinvertebrates) for 2011 and 2012 (Table 6). The number of stations is low, and dropped further for 2012. 12.5% of the stations were reported for two or more years.

Table 6: Number of river biology records per determinand, aggregation period and year.

BQE	DeterminandBiology	AggregationPeriod	2011	2012
PB	PhytobenthosEQR_E	Annual	8	3
PB	PhytobenthosEQR_H	Annual	3	3
MI	InvertebrateEQR_G	Annual	6	2

The reporting is not representative for Germany as a whole (see Table 7).

Table 7: Number of river biology records per BQE, RBD and year.

BQE	RBDcode	2011	2012
PB	DE4000	3	2
PB	DE5000	8	4
MI	DE4000	1	
MI	DE5000	5	2

Questions to Germany regarding the reporting on biology in rivers:

- Status classes are reported in Germany, but nor EQR values are reported. Could these data be reported or be explained, why data are not reported?
- Could the number of stations reported be increased?

Some more comments on different QA issues:

- Only status classed are reported, no EQR values. Germany is encouraged to report EQR values, or to provide an explanation why this is not done.
- Minor quality issues (spelling etc.) corrected for all years.
- Classification system is reported, although this information cannot be used without EQR values.
- Germany has two sets of class boundaries for phytobenthos: for diatoms and macrophytes, respectively. This information is more complex than the Waterbase structure allows for, and must be handled specifically by ETC.
- The data provider has not replied to feedback with questions about the classification system (posted in CDR 10.03.2014:
<http://cdr.eionet.europa.eu/de/eeg/ewn1/envumo1xa/feedback1394459564>).

Lakes – Nutrients, Organic Matter and General Physico-Chemical Determinands

Issues to be clarified:

- Have data for all SoE nutrients of highest priority³ been reported consistent over the years?
- Are stations with monitoring of highest priority nutrients covering all RBDs of the Member States?
- Are longer time series (since 1992) for preferred nutrients available?
- Are stations codes consistent and is it possible to link the stations with WFD water bodies?
- Member State specific issues, if such occur

Germany reports data from nutrients in lakes from 1981 on. The table below provides an overview by determinands of the number of lake stations per year for the period 1992 to 2012. Germany didn't report nutrients in 2007, in general very few stations are reported for BOD5, CODMn, and there are big gaps in reporting on TOC. There was a change in reporting Total ammonium or Ammonium after 2007.

³ Determinands of highest priority in terms of EEA's needs are determinands which are or will be used in EEA assessments (e.g. CSI).

Table 8: Number of lake stations per determinand/year (nutrients of highest priority)

Determinand_Nutrients	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Nitrate	5	6	7	8	10	15	18	20	20	20	20	20	20	17	3	0	35	36	34	37	29	58
Orthophosphates	3	5	6	7	9	13	16	18	18	18	18	18	18	15	6	0	24	30	28	36	26	52
Total phosphorus	5	5	7	8	10	15	18	19	20	20	20	20	20	17	0	0	33	40	25	28	17	60
BOD5	0	0	0	0	0	1	1	1	2	2	2	2	1	0	0	0	0	2	1	0	0	5
Total organic carbon (TOC)	0	0	0	0	0	3	4	6	6	6	6	8	1	0	0	0	0	22	27	21	20	39
CODMn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Dissolved oxygen	5	6	7	8	10	15	18	20	20	20	20	20	20	17	0	0	32	40	39	42	35	63
Ammonium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	35	37	29	54
Total ammonium	5	6	7	8	10	15	18	20	20	20	20	20	20	17	12	0	0	0	0	0	0	20

Note: In the current data set the reporting of some high priority determinands has stopped or there has been a change in the determinands in the database. EEA wants to clarify if these changes are real changes or it has been errors/misinterpretations introduced in compiling the databases. In addition, the aim is to ensure that the high priority determinands (e.g. nitrate or orthophosphate) have as complete coverage as possible.

Table 9 shows the number of lake stations by River Basin Districts which reported on nutrients for the period from 1992 – 2012. Data are reported from 63 stations in this period for 8 German RBDs. In some RBDs there are gaps in reporting or only less stations reported. The number of stations reported for lakes was increasing from 2008 on.

Table 9: Number of lake stations for nutrients by River Basin Districts

RBDcode	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
DE1000	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	0	8	3	4	5	3	
DE2000	1	2	2	2	2	3	3	3	3	3	3	3	3	1	2	0	2	2	4	3	3	
DE4000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	2	2	2	2	
DE5000	0	0	1	2	4	8	9	10	10	10	10	10	10	9	9	0	19	25	21	21	16	
DE6000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	1	
DE7000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	
DE9610	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	2	0	4	3	3	2	6
DE9650	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	1	3	4	8	4	
Total	5	6	7	8	10	15	18	20	20	20	20	20	20	17	14	0	36	40	39	42	35	

Note: One aspect of the country fiches is to improve the spatial coverage and ensure that stations are reported for all RBDs.

Questions to Germany regarding the reporting on nutrients in lakes:

- Does data exist for determinands to fill the gaps in reporting? All priority determinands in 2007, DOC, BOD₅ before 2005.
- Can the data be resubmitted for stations / years / which have not been reported so far?
- Ammonium/total ammonium - why was there a change from 2008 on, is ammonium/total ammonium the same parameter?

- Are there more stations with time series for the listed determinands (in particular the priority ones) available that have so far not been reported?
- Can more stations be reported to increase spatial coverage?

Lakes – Hazardous Substances

Issues to be clarified:

- Have data for all SoE preferred⁴ hazardous substances which are monitored in the Member State been reported and consistent for the years in which data are available?
- Are stations with monitoring of SoE preferred hazardous substances covering all RBDs?

Germany reports data on hazardous substances in lakes since 2008. In Table 10 there is an overview on the reporting of some preferred hazardous substances to illustrate (heavy metals, some pesticides and PAH). For most substances data have been reported only for some years and stations.

Table 10: SoE preferred hazardous substances (examples) in lakes by number of stations and year

Determinand_HazSubs	2008	2009	2010	2011	2012
Mercury	1	0	1	2	0
Nickel	1	0	3	4	0
Cadmium	1	0	0	0	0
Lead	1	0	4	0	0
Chlorfenvinphos	0	0	0	0	2
MCPA	0	0	0	2	0
Terbutryn	0	0	1	0	0
Dichlorvos	0	0	0	0	2
Benzo(g,h,i)perylene	0	0	2	4	0
Benzo(a)pyrene	0	0	2	4	2
Dibenzo(a,h)anthracene	0	0	0	4	2
Anthracene	0	0	0	0	2
Naphthalene	0	0	1	3	2
Benzo(k)fluoranthene	0	0	2	3	2
Indeno(1,2,3-cd)pyrene	0	0	2	4	0
Benzo(b)fluoranthene	0	0	0	4	2
Fluoranthene	0	0	1	4	2

Note: In the current data set the reporting of some high priority determinands has stopped or there has been change in the determinands in the database. EEA wants to clarify if these changes are real changes or it has been errors/misinterpretations introduced in compiling the databases. In addition, the aim is to ensure that the high priority determinands (e.g. priority substances) have as complete coverage as

⁴ The lists of preferred substances are based on legislation, spatial and temporal availability. Preferred substances are also covered by Hazardous substances report regularly.

possible.

Table 10 shows the number of river stations by River Basin Districts which reported on preferred hazardous substances for the period from 2008 – 2012. In this period Germany reported data from 11 lake stations in only 3 RBDs. In Germany there are 67 monitoring stations for surveillance monitoring on lakes, so maybe more stations could be reported.

Table 11: Number of lake stations by River Basin Districts for preferred hazardous substances

RBDcode	2008	2009	2010	2011	2012
DE5000	0	0	3	5	4
DE7000	1	0	1	0	0
DE9610	2	0	2	2	0

Note: One aspect of the country fiches is to improve the spatial coverage and ensure that stations are reported for all RBDs.

Questions to Germany regarding the reporting on hazardous substances in lakes:

- Does data exist for determinands to fill the gaps in reporting?
- Are older data than what has been reported available (from 1992 – 2007)?
- Are there more stations for the determinands available that have so far not been reported?
- Can the data be resubmitted for stations / years which have not been reported so far?

Lakes – Biology

Issues to be clarified:

- Are status classes reported? If not, why not?
- Are EQR values reported? If not, why not?
- Can reported EQR values be normalised? If not, why not?
- Are stations with monitoring covering all RBDs of the Member States?

In general care should be taken to ensure that the stations reported are geographically representative, as well as representative in terms of the whole range of ecological status classes, and that all major lake types are included.

Germany reported lakes biology data (phytoplankton and macrophytes) for 2010-2012. The number of stations reporting on phytoplankton is low, and dropped further in 2012. Germany is strongly encouraged to increase the number of stations reported. 73% of the stations were reported for two or more years. Phytoplankton impact type changed from General degradation (2010) to Eutrophication (2011-2012). Only one station for reporting on Macrophytes; not reported in 2010. The station was not the same in the two years. Additional metrics (phytoplankton) were reported only in 2010.

Table 12: Number of lake biology records per determinand, aggregation period and year. (a) EQR values and/or status class. (b) Additional metrics in original scale.

- a)

BQE	CountryCode	DeterminandBiology	ImpactType	AggregationPeriod	2010	2011	2012
PP	DE	PhytoplanktonEQR_E	E	Annual		8	4
PP	DE	PhytoplanktonEQR_G	G	Annual	11		
MP	DE	MacrophyteEQR_E	E	Annual		1	1

- b)

BQE	CountryCode	DeterminandBiology	2010	2011	2012
PP	DE	Chlorophyll_a	29		
PP	DE	TotalPhytoplanktonBiomass	17		

The reporting is clearly not representative for Germany as a whole. Only some RBDs report biology records (Table 13).

Table 13: Number of lake biology records per BQE, RBD and year. (a) EQR values and/or status class. (b) Additional metrics in original scale.

- a)

BQE	CountryCode	RBDcode	2010	2011	2012
PP	DE	DE5000	11	8	4
MP	DE	DE5000		1	1

- b)

BQE	CountryCode	RBDcode	2010	2011	2012
PP	DE	DE1000	3		
PP	DE	DE2000	3		
PP	DE	DE4000	2		
PP	DE	DE5000	30		
PP	DE	DE9650	8		

Questions to Germany regarding the reporting on biology in lakes:

- Status classes are reported, but no EQR values, without an explanation. Can EQR values be reported?
- Phytoplankton impact type changed from General degradation (2010) to Eutrophication (2011-2012). Are these truly different metrics, or can both be reported as the same impact type?
- Germany is encouraged to continue the reporting of additional metrics for phytoplankton (as well as for macrophytes). The data can be used to link with the nutrients data, which would improve European assessments of pressures and impacts/status.

4.2 Groundwater quality

Issues to be clarified:

- Have data for all SoE nutrients of highest priority (in terms of EEA's needs) in groundwater been reported consistent over the years?
- Have disaggregated data for all highest priority SoE nutrients in groundwater been reported consistent over the years?
- Are all RBDs in the MS covered with reporting on highest priority SoE nutrients in groundwater?
- Have data on preferred hazardous substances, if monitored by Member State, in groundwater been reported for all years in which they are available?
- Are all RBDs in the MS covered with reporting on preferred SoE hazardous substances in groundwater?

Groundwater - Nutrients, Organic Matter and General Physico-Chemical Determinands

Germany reports disaggregated⁵ data on groundwater nutrients. In 2002 there was less reporting. In 2006 and 2007 no data for dissolved oxygen have been delivered.

Table 14: (Highest priority) nutrients in groundwater disaggregated (value = number of stations per country in which given determinand was reported)

DeterminandName	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Nitrate	301	321	5	577	476	590	704	470	612	622	681	507	605
Ammonium	124	98	3	566	476	578	604	469	605	625	594	465	604
Nitrite	46	60	0	562	468	581	596	404	573	570	578	487	603
Dissolved Oxygen	180	263	1	608	559	644	0	0	525	629	625	447	556

Note: In the current data set the reporting of high priority determinands has stopped or nutrients have been reported as aggregated data only. The aim is to ensure that the high priority determinands (preferably disaggregated data) have as complete coverage as possible.

Data for all RBDs were reported up to now. In 2002 there was less reporting in all RBDs, only 9 groundwater stations have been reported at all. In some German RBDs no data were reported in some years.

Table 15: Number of groundwater stations for highest priority nutrients (disaggregated) by River Basin Districts

RBDcode	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DE1000	0	0	0	0	95	116	116	90	92	92	92	21	91
DE2000	88	92	0	83	135	194	216	176	215	203	209	172	184
DE3000	6	31	0	6	6	35	42	5	36	42	41	43	41

⁵ For Eionet-Water data are reported at different levels of aggregation:

- Disaggregated: concentrations in each sample and date of sample taken at each monitoring site in the groundwater body;
- Aggregated: annual average concentrations for the groundwater body.

DE4000	31	85	2	25	19	88	89	26	90	96	99	97	91
DE5000	159	166	7	164	122	147	172	78	171	190	174	158	155
DE6000	24	26	0	24	22	22	24	22	17	24	24	17	16
DE7000	0	0	0	0	0	0	9	0	10	8	10	11	10
DE9500	12	12	0	11	12	12	12	12	12	12	10	12	9
DE9610	10	10	0	10	9	10	10	10	10	11	11	9	8
DE9650	15	15	0	16	14	14	14	13	0	21	18	0	0
total	345	437	9	339	434	638	704	432	653	699	688	540	605

Note: One aspect of the country fiches is to improve the spatial coverage and ensure that stations are reported for all RBDs.

- An overview of reporting time series will be added in final versions of country fiches -

Groundwater - Hazardous substances

In Table 16 there is an overview on the reporting of the preferred hazardous substances (only metals and some pesticides as example) in groundwater in Germany. For many stations data in some years have not been reported. Another issue is that until 2009 there was no distinction between total and dissolved forms of metals in the data dictionary code list. After 2009 it could be distinguished between the forms of metals, so there was some change in reporting, as can be seen in the first rows of Table 16.

Table 16: Number of groundwater stations per determinand (examples for preferred hazardous substances)/year

DeterminandName	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Arsenic	0	0	0	0	0	0	0	0	444	409	450	0	0
Arsenic dissolved	0	0	0	0	0	0	0	0	0	0	0	479	275
Cadmium	0	0	0	319	195	370	425	286	445	0	0	0	0
Cadmium dissolved	0	0	0	0	0	0	0	0	0	416	452	458	273
Copper	0	0	0	335	232	370	0	0	431	0	0	0	0
Copper dissolved	0	0	0	0	0	0	0	0	0	405	415	415	268
Chromium	0	0	0	0	0	0	0	0	431	397	443	0	0
Chromium dissolved	0	0	0	0	0	0	0	0	0	0	0	412	255
Lead	0	0	0	242	187	293	0	0	0	0	0	0	0
Lead dissolved	0	0	0	0	0	0	0	0	0	382	416	451	230
Mercury	0	0	0	0	0	0	57	53	162	103	141	145	0
Mercury dissolved	0	0	0	0	0	0	0	0	0	0	0	0	0
Nickel	0	0	0	341	233	370	432	230	446	0	0	0	0
Nickel dissolved	0	0	0	0	0	0	0	0	0	409	450	417	268
Zinc	0	0	0	378	265	408	469	267	468	0	0	0	0
Zinc dissolved	0	0	0	0	0	0	0	0	0	433	483	461	348
Aldrin	0	0	0	0	0	0	0	0	0	22	0	0	0
Endrin	0	0	0	0	0	0	0	0	0	22	0	0	0
Alpha-HCH	0	0	0	0	0	0	0	1	36	50	0	0	0
Beta-HCH	0	0	0	0	0	0	0	1	36	50	0	0	0

Propazine	0	0	0	0	0	0	0	343	226	250	287	217	304	157
MCPA	0	0	0	0	0	0	0	7	119	23	118	43	149	4

Note: In the current data set the reporting of preferred substances has stopped or data have not been reported. The aim is to ensure that the high priority determinands (e.g. priority substances) have as complete coverage as possible.

Data for all RBDs were reported up to now. From 2000 to 2002 there was only less reporting in all RBDs. In some German RBDs no data were reported in some years.

Table 17: Number of groundwater stations for preferred hazardous substances by River Basin Districts

RBDcode	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DE1000	0	0	0	0	95	113	116	68	70	85	83	86	12
DE2000	1	0	1	83	134	193	213	116	151	155	167	186	110
DE3000	0	0	0	6	6	35	33	0	21	37	19	30	24
DE4000	0	0	0	31	18	91	65	28	69	85	63	67	64
DE5000	1	0	0	157	70	140	145	114	162	167	134	135	132
DE6000	0	0	0	24	22	22	24	22	17	20	16	17	16
DE7000	0	0	0	0	0	0	9	0	9	7	0	9	0
DE9500	0	0	0	5	12	10	6	2	6	4	9	7	4
DE9610	0	0	0	7	9	9	5	0	0	4	10	1	2
DE9650	0	0	0	12	11	11	11	13	0	11	0	0	0
total	2	0	1	325	377	624	627	363	505	575	501	538	364

Note: One aspect of the country fiches is to improve the spatial coverage and ensure that stations are reported for all RBDs.

Questions to Germany regarding the reporting on groundwater

- Data for some RBDs are missing in some years (e.g. DE9650 nutrients in 2011 and 2012, hazardous substances in 2010 – 2012). Could they be resubmitted?
- In general very few data have been submitted in 2002 (nutrients) and 2000 – 2002 (hazardous substances) and in DE7000. Could they be resubmitted?

Comment from ETC data manager:

In the last delivery, ca 400 disaggregated data records of nutrients (out of reported 7150 records) and 5250 disaggregated records of hazardous substances (out of 17100 records) could not be processed due to many formal errors in the reported data (mostly due to missing stations). A discussion on how data reporting can be improved in the future between data manager of SoE database and national data reporter has been started.

DRAFT

4.3 Emissions

Issues to be clarified:

- Does Member State report data on emissions or are the tables prefilled from E-PRTR reporting?
- What type of source apportionment has been reported?
- Which determinands have been reported for the different emissions categories (nutrients from point and diffuse sources, hazardous substances from point and diffuse sources)
- Have data been reported from all RBDs (if relevant)?

For Germany only records from E-PRTR and UWWTD databases are present. Germany has never reported emissions under SoE. In the following tables there is an overview on reporting nutrients and hazardous substances from point sources and the groups of emission sources which have been used. The value in the table fields is the number of RBDs in which the determinands were reported.

The E-PRTR are limited to point sources of pollution and to specific types of facilities. Although to each facility the main activity is assigned, which allows to distinguish between industrial and urban waste water emissions, this apportionment is very rough (there could be more than one activity assigned to each facility). The table shows also that there might be some gaps in the spatial coverage of the country. From E-PRTR those pollutants were selected which were available and could be unambiguously linked to the determinands in SoE data dictionary. The UWWTP database contains the information on nutrients, but doesn't cover the hazardous substances.

Table 18: Nutrients emissions from point sources (value means the number of spatial units in which the determinand was reported for that year)

Determinand_Nutrients	2006	2007	2008	2009	2010	2011	2012
Total Nitrogen					10	9	
Total Organic Carbon (TOC)					10	9	
Total Phosphorus					10	9	

Sources of emissions reported:

- I Industrial Waste Water Discharges total
- U2 Urban Waste Water Treated Discharges total

Table 19: Hazardous substances emissions from point sources (value means the number of spatial units in which the determinand was reported for that year)

Determinand_HazSubs	CASNumber	2003	2008	2009	2010	2011	2012
Arsenic	7440-38-2				7	7	
Cadmium	7440-43-9				7	6	
Copper	7440-50-8				9	9	
Chromium	7440-47-3				5	5	
Lead	7439-92-1				7	7	
Mercury	7439-97-6				7	6	
Nickel	7440-02-0				10	10	

Zinc	7440-66-6				10	10	
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Sources of emissions reported:

I	Industrial Waste Water Discharges total
U2	Urban Waste Water Treated Discharges total

Questions to Germany regarding the reporting on emissions:

- Are other data than E-PRTR or UWWTD available for point sources?
- Are any data available for diffuse sources?

4.4 Waterbase WaterQuantity

In the last years Germany has submitted through the WISE SoE Water Quantity dataflow only data measuring groundwater level. The submitted files were not in the requested format (XML) and coordinate system (ETRS89 or WGS84). No other point or areal data have been received from Germany through this dataflow.

In 2011 Germany has participated in an effort of the EEA to complement and enhance the water quantity data flow to support the development of Water Asset Accounts in Europe by providing long daily stream flow data of major German rivers. The location of these stations is shown in Figure 2.



Figure 2: Location of streamflow stations on major rivers in Germany

Germany submits regularly through the OECD/ EUROSTAT Joint Questionnaire on Inland Waters areal data relevant to water quantity i.e. water abstraction, water balance and water use. Submitting water quantity relevant data also through the WISE-SoE dataflow would improve the ability of European bodies to estimate indicators (e.g. WEI+) and trends on a Pan-European level.

5. Matching of stations/water bodies

For the integrated assessment with the Water Framework Directive as well as other Water Directives it is a prerequisite that SoE stations can be linked to stations or water bodies from the other reporting streams. That was often not possible in former assessments and should be improved in the future, especially with regards to the next assessment of WFD reporting.

All the datasets reported to WISE have different fields to identify the stations or water bodies. The WISE-WFD database with data reported for the first RBMPs has the **water body code** (Surface or Groundwater) as one of the main codes. The WISE-SoE Groundwater, Rivers and Lake databases have a field with the **water body codes** (WaterBodyID/ GWBcode_WFD).

Database	Water Body Code
WISE-WFD database	<i>Surface water bodies</i> EUSurfaceWaterBodyCode SWB_MS_Code SWB_NAME
WISE_SoE rivers	WaterBodyID WaterBodyName
WISE_SoE lakes	WaterBodyID WaterBodyName
WISE-WFD database	<i>Groundwater bodies</i> EUGroundWaterBodyCode SWB_MS_Code SWB_NAME
WISE_SoE groundwater bodies Groundwater stations	GWBcode_WFD GWBcode_WFD

The following overview shows some statistics of the availability of WaterBodyID for SoE surface water stations or WaterBodyCode for SoE groundwater stations and groundwaterbodies and their matching with WFD EUSurfaceWaterBodyCode and WFD SWB_MS_CD.

WISE-SoE rivers

Germany has reported WaterBodyID for most of its WISE-SOE river stations (261 of 268); there is a high match between 255 of 268 river stations and the WFD water bodies EUSurfaceWaterbody CODE, as well if SWB_MS_CD is used (see Table 20).

Table 20 WISE SoE rivers water quality dataset - statistics of the availability of rivers monitoring stations and their attributes (waterbody ID) and the results of the matching of the SoE rivers waterbody ID with WFD EUSURFACEWATERBODYCODE and SWB_MS_CD

SOE_STATIONS_TOTAL	SOE_WATERBODYID_EXISTS	MATCH_EUSURFACEWATERBODY_CODE	MATCH_SWB_MS_CD
268	261	255	255

WISE-SoE lakes

Germany has reported WaterBodyID for most of its lakes (62 of 64); there is a high match again between 62 of 64 lake stations and the WFD water bodies (Table 3).

Table 21: WISE SoE lakes water quality dataset - statistics of the availability of lakes monitoring stations and their attributes (water body ID) and the results of the matching of the SoE lakes waterbodyID with WFD EUSURFACEWATERBODYCODE and SWB_MS_CD

SOE_STATIONS_TOTAL	SOE_WATERBODYID_EXISTS	MATCH_EUSURFACEWATERBODYCODE	MATCH_SWB_MS_CD
64	64	62	62

WISE-SoE groundwater

The majority of Germans WISE-SoE groundwater bodies (1173 of 1183) and most WISE-SoE groundwater stations (867 of 1181) have GWB codes. However there are match again of 317 groundwater bodies with WFD water bodies only and no match groundwater stations with WFD water bodies (Table 22; Table 23).

Table 22: WISE SoE groundwater quality dataset - statistics of the availability of groundwaterbodies and their SOE_GWBCODE_WFD and the results of the matching of the SoE groundwater SOE_GWBCODE_WFD with WFD EUGROUNDWATERBODYCODE and GWB_MS_CD

COUNTRYCODE	SOE_GWB_TOTAL	SOE_GWBCODE_WFD_EXISTS	MATCH_EUGROUNDWATERBODYCODE	MATCH_GWB_MS_CD
DE	1183	1173	317	0

Table 23: WISE SoE groundwater quality dataset - statistics of the availability of groundwater monitoring stations and their attributes (SOE_GWBCODE_WFD) and the results of the matching of the SoE groundwater SOE_GWBCODE_WFD with WFD EUGROUNDWATERBODYCODE and GWB_MS_CD

COUNTRYCODE	SOE_GW_STATIONS_TOTAL	SOE_GWBCODE_WFD_EXISTS	MATCH_EUGROUNDWATERBODYCODE	MATCH_GWB_MS_CD
DE	1181	867	0	0

Questions to Germany:

- Can the waterbody code as defined in the WFD guidance (EUSurfaceWaterBodyCode) be reported for all stations and water bodies, especially groundwater?
- Could stations that are not active and where the station information is from before 2007 (if this is the case) be updated with WBCode?

- Other statistics on matching (see example Spain) will be included in the country fiche in a next version -