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European Topic Centre
Inland, coastal, marine waters

Comparison of Nitrate Reporting Under European Reporting Obligations

ETC/ICM Technical Report 1/2011

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Abbreviations

NiD	Nitrates Directive
SoE	State of Environment (Eionet)
WFD	Water Framework Directive
ETC/ICM	European Topic Centre on Inland, Coastal and Marine Waters
TCM	Transitional, Coastal and Marine Waters
GIS	Geographical Information System
GWB	Groundwater body
RBD	River Basin District

Introduction

- If Member States would like to "report once - use many times", then the streamlining of environmental data reporting is needed. Nitrate concentrations in water are being reported under three reporting obligations: the Nitrate Directive (NiD) reporting, State of Environment (SoE) reporting and Water Framework Directive (WFD) reporting. In order to develop a proposal for the streamlining of these three reporting obligations, the similarities and differences of the three reporting obligations have been compared by the ETC/ICM during the last 3 years. This report summarises the results and main findings and provides recommendations for potential streamlining. It provides a background for further discussions.

- Two main outputs were prepared in 2008 and 2009 by the ETC/ICM, these were: a) Comparison of the Nitrate Directive, State of Environment and Water Framework Directive reporting with respect to nitrate water quality; and b) Comparison of monitoring sites across the three reporting streams.

- The main conclusions were: 1) Reporting requirements differ in data aggregation and 2) Monitoring networks for SoE, NiD and WFD vary significantly in their degree of overlap (from 10 to 100 %). Precise quantification of the overlap was not possible in many countries due to site ID issues.

- The results were presented to countries at the Eionet workshop in the autumn of 2009. The ADG Environment consultants' report with a similar focus was produced at the same time.

- This report summarises the 2008 and 2009 outputs in Chapter 1 and adds a comparison of monitoring sites that includes newly reported WFD and SoE monitoring sites laid out in Chapter 2. The analysis in Chapter 3 is focused on the assessment of nitrates at water body level from data provided for the NiD, SoE and WFD. It is not a comparison of nitrate concentrations in monitoring sites, but a nitrate status assessment in water bodies based on threshold values and the 50 mg/l limit within pilot areas. The summary of received comments by countries is located in Annex 1.

- In the first half of 2010 the EC distributed a questionnaire about the comparison of the same three reporting streams. Detailed comments and explanations were provided by countries. The results of this survey are integrated into the internal report "Streamlining of Reporting Under WISE: Analysis of a Questionnaire" (Alterra Wageningen UR, Wageningen, 2010).

1. Comparison of monitoring sites of the Nitrates Directive, State of Environment and Water Framework Directive datasets

The ETC/ICM prepared in 2008/2009 a detailed comparison of monitoring sites reported under the Nitrates Directive, SoE – Eionet and Water Framework Directive. The comparison provides the first step towards the potential future streamlining of reporting with respect to nitrate data.

The entire work focused on a comparison of the monitoring stations of rivers, lakes, groundwaters and TCM waters for existing (NiD and Eionet-SoE) or expected (WFD, Art. 8) data for **Nitrates** (or $N\text{-}NO_3$).

There are three different sources of nitrate data:

1. Eionet (SoE) monitoring data
2. Nitrates Directive reporting and
3. Water Framework Directive (Article 8) reporting.

While Eionet and the Nitrates Directive data are reported after measurement (station information with nutrient concentrations), WFD Article 8 reporting was focused on planned monitoring (station information without nutrient concentration data and before measurement).

Available datasets:

- Water Framework Directive Art. 8 data was obtained from the database: http://eea.eionet.europa.eu/Members/irc/eionet-circle/eionet-telematics/library?l=/art8products/20090219&vm=detailed&sb=Title .
- Eionet (SoE) data for rivers, lakes and TCM was used from Waterbase (version 9 for rivers and lakes, version 6 for TCM) and groundwaters from the working database (status April 2009).

Links: GW: http://eea.eionet.europa.eu/Members/irc/eionet-circle/etcwater/library?l=/subvention_2009/activities_2009/151_wise_centre/1512_directives/1512_directives/directive_integration

SW: Waterbase_lakes_v9_mdb_selection.zip, Waterbase_rivers_v9__mdb_selection.zip

TCM: http://eea.eionet.europa.eu/Members/irc/eionet-circle/etcwater/library?l=/subvention_2009/activities_2009/151_wise_centre/1512_directives/1512_directives/directive_integration /

- Nitrates Directive data was used from the file: NiD_WQ_tabelsEU27_8juli.xls provided by DG ENV.

For the comparison it was possible to use all monitoring stations from Eionet and all or selected data from the WFD and NiD. We used all data without preliminary selection. Nitrates

Directive data is from the reporting period 2004– 2007. Eionet SoE data from the same period was used. Data regarding WFD monitoring programmes are officially from the end of 2006, but some of them were subsequently updated.

1.1. Methodology

The comparison was performed for each country separately. A comparable time period was used for NiD data and SoE data (2004–2007).

The comparison of the Nitrates Directive dataset with the Eionet SoE and Water Framework Directive datasets was performed in the following steps:

1. Selection of stations with nitrate data from all datasets
2. GIS analysis of the distance between NiDxSoE and NiDxWFD station positions
3. Database comparison of identifiers (ID) between NiDxSoE and NiDxWFD
4. Synthesis - comparison of GIS position and database (ID) results

Finally, an overview of the content analysis of NiD, SoE and WFD nitrate data was prepared. This was focused on a different type of data aggregation.

1.1.1. Spatial comparison of monitoring stations

GIS analysis was undertaken to enable a spatial comparison of monitoring stations. The aim was to identify 'identical' monitoring stations according to their geographical position. Station locations were compared between the NiD and SoE databases and between the NiD and WFD databases. Groundwaters and different categories of surface water monitoring stations were analysed separately. The surface water databases were divided into river, lake and transitional, coastal and marine categories. Analysis for each country was undertaken separately.

The selected databases were used as a basis for creating the GIS 'point' layers for the station locations for each of the three databases (SoE, NiD and WFD), using the attributes "longitude" and "latitude". Once completed, these were 'joined' with data available on nitrate concentration, resulting in stations with no information on nitrate concentration being discarded from any further analysis.

The data of the SoE - TCM was held in two databases, EIONET and MEDPOL (ICES). Both databases were used for the GIS analysis.

For each GIS layer the tool "Buffer" was used which selects a zone around a map feature (in our case the point – monitoring station) based on distance. The radius of the buffer was defined as 500 m from each monitoring station.

1.1.2. Attribute comparison of monitoring stations

Attribute analysis proceeded parallel to the spatial analysis. Each state and each water category (groundwaters, surface water - rivers, surface water - lakes and surface water – transitional, coastal, marine) was treated separately.

To get comparable results, relevant sites from all datasets had to be chosen. For the SoE and NiD this meant that only stations with information on nitrate concentration were chosen. In the case of the WFD, aggregated quality elements were used. The structure of the WFD

Art. 8 data allows the relating of quality elements both to monitoring station and monitoring programme. Information relative to stations was preferred. The WFD dataset also includes information that flags whether a site is also used for NiD reporting. Stations with this flag were added to the list of selected stations.

The following process was applied for selecting stations of interest:

Selection of surface water monitoring sites from the WFD dataset:

1. Stations which were assigned by Member States as measuring Quality Elements QE3-1-6 or QE3-1 or QE3.

2. For Member States which did not deliver information about QE in each station, programmes with the above mentioned QEs were selected and after that stations with these programmes were selected (DK,IT,IE,LV,PL).

3. Columns 'inter_networks' and 'other_networks' were analysed, but no station with NiD reporting which was not selected before was found.

Selection of groundwater monitoring sites from the WFD dataset:

1. Programmes with Quality Elements GE2 or GE2-4 were selected.

2. Stations with these programmes were selected.

3. Columns 'inter_networks' and 'other_networks' were analysed, stations with NiD reporting, which were not selected before, were added to the list.

After selection, monitoring stations with a matching identifier in the SoE and NiD or in the NiD and WFD datasets were searched for. Each of these three datasets gives more opportunities to identify a station. Initially the WFD codes, water base codes and national codes were compared manually. Then systematic error removal was done – mostly by using substrings of identifiers ("20.11.01.01" = "DK20.11.01.01" etc.). At the end, the combination of best results was used for ID comparison.

1.2. Synthesis of results

The results of the database analysis were compared with the results of the GIS analysis and divided according to their reliability. Monitoring stations with the same ID and positive GIS result are in the first category – '**best match**'. Monitoring stations with an identical ID but with a different localisation (or missing coordinates) are in the second category – '**moderate match**'. Sites with a different ID and positive GIS results are in the third category – '**possible match**'. Results of the comparison between the NiD and SoE datasets are displayed in the detailed Tables 1.1–1.4 for rivers, lakes, groundwaters and transitional/coastal and marine waters.

The second and third columns of the detailed Tables 1.1–1.4 show the number of pre-selected stations (stations with information on nitrate concentration) in each dataset, the fourth column contains the ratio of pre-selected (but not matching) NiD and SoE sites. The next four columns ('database analysis results') give results of the database comparison (common identifier or a relevant part of it) – according to the WFD code, SoE (Waterbase) code or national codes and, the final result as a combination of them both. The next two

columns (‘GIS analysis results’) show the results of the GIS analysis – number of sites with positive results (closer than 500 m). The last two columns (‘GIS and DB comparison’) illustrate the ‘best results‘ for both datasets – number of station from the Nitrates Directive in this category and the proportion of positive results on the NiD dataset.

The similar results for the comparison between the NiD and WFD are presented in Tables 1.5–1.8.

Detailed maps with monitoring stations were produced separately for each country together with accompanying notes. Individual files per country are available at:

http://eea.eionet.europa.eu/Public/irc/eionet-circle/water/library?l=/copenhagen_freshwater_3/comparison_directive&vm=detailed&sb=Title

Legend for Tables 1.1 – 1.8

4,2	< 25 % of matching stations
35,7	≥ 25 % and < 50 % of matching stations
61,1	≥ 50 % and < 75 % of matching stations
81,9	≥ 75 % of matching stations

	around the same number of sites
	significantly less WFD sites
	significantly less NiD sites

Table 1.1 - Detailed table of the comparison of NiD x SoE – Surface Water Rivers

Country	Number of sites			Database analysis results				GIS analysis results		GIS and DB comparison	
	NiD	SoE	Ratio NiDxSoE	WFD code	Waterbase code	national code	result	NiD_SoE	SoE_NiD	NiDxSoE - number of common sites	NiD - % of common sites
AT	271	290	0,93	72	0	0	249	228	225	225	83
BE	1142	63	18,13	0	0	0	4	28	26	4	0
BG	102	111	0,92	0	0	0	0	14	13	0	0
CY	10	23	0,43	1	0	0	4	4	4	4	40
CZ	940	73	12,88	44	0	64	64	53	2	50	5
DE	151	151	1,00	79	0	151	151	151	151	151	100
DK	127	42	3,02	0	0	28	28	27	27	27	21
EE	10	60	0,17	6	4	9	9	10	10	9	90
ES	2070	939	2,20	0	0	0	627	3	3	1	0
FI	84	227	0,37	19	23	0	30	30	30	30	36
FR	1744	1621	1,08	0	0	689	689	657	661	588	34
GR	81	14	5,79	0	0	0	0	77	87	0	0
HU	419	154	2,72	0	0	55	55	98	94	30	7
IE	148	153	0,97	0	0	124	124	148	150	124	84
IT	1855	1380	1,34	0	0	0	0	945	734	0	0
LT	53	99	0,54	51	0	53	53	53	55	53	100
LU	16	4	4,00	0	0	3	3	2	2	2	13
LV	170	117	1,45	0	0	58	58	78	86	58	34
MT	3	0									
NL	193	11	17,55	0	0	7	7	16	40	6	3
PL	3351	136	24,64	0	0	0	0	141	131	0	0
PT	71	56	1,27	0	0	13	13	14	14	13	18
RO	831	126	6,60	0	0	0	103	67	56	50	6
SE	193	126	1,53	0	0	0	0	114	118	0	0
SI	106	30	3,53	27	0	27	27	25	25	26	25
SK	224	90	2,49	39	0	89	89	93	91	86	38
UK	7915	204	38,80	0	0	0	169	216	174	140	2

Table 1.2 - Detailed table of the comparison of NiD x SoE – Surface Water Lakes

Country	Number of sites			Database analysis results				GIS analysis results		GIS and DB comparison	
	NiD	SoE	Ratio NiDxSoE	WFD code	Waterbase code	national code	result	NiD_SoE	SoE_NiD	NiDxSoE - number of common sites	NiD - % of common sites
AT	26	37	0,70	0	0	0	26	25	18	25	96
BE	12	5	2,40	0	0	0	0	0	0	0	0
BG	7	16	0,44	0	0	0	1	2	3	0	0
CY	0	9									
CZ	0	0									
DE	20	20	1,00	0	0	0	20	20	20	20	100
DK	93	20	4,65	0	0	0	0	0	0	0	0
EE	0	17									
ES	474	0									
FI	63	243	0,26	2	24	0	24	24	24	24	38
FR	2	0									
GR	26	0									
HU	116	23	5,04	0	0	0	6	14	12	0	0
IE	69	94	0,73	0	0	0	68	60	60	59	86
IT	256	298	0,86	0	0	0	0	87	78	0	0
LT	7	28	0,25	0	0	0	0	50	51	0	0
LU	0	0									
LV	155	41	3,78	0	0	0	21	29	33	19	12
MT	4	2	2,00	0	0	0	2	3	2	2	50
NL	309	6	51,50	0	0	0	5	2	0	0	0
PL	46	46	1,00	0	0	0	0	9	14	0	0
PT	56	30	1,87	21	0	0	21	22	22	21	38
RO	409	16	25,56	0	0	0	0	3	5	0	0
SE	1992	192	10,38	0	0	0	74	24	20	4	0
SI	11	11	1,00	5	0	0	5	6	6	2	18
SK	0	0									
GB	73	102	0,72	0	0	0	0	8	37	0	0

Table 1.3 - Detailed table of the comparison of NiD x SoE – Groundwaters

Country	Number of sites			Database analysis results				GIS analysis results		GIS and DB comparison	
	NiD	SoE	Ratio NiDxSoE	WFD code	Waterbase code	national code	result	NiD_SoE	SoE_NiD	NiDxSoE - number of common sites	NiD - % of common sites
AT	368	567	0,65	4	2	5	5	5	5	5	1
BE	3020	165	18,30	108	108	0	108	120	111	108	4
BG	128	83	1,54	0	0	0	46	38	41	37	29
CY	222	222	1,00	0	122	0	141	0	0	0	0
CZ	408	463	0,88	406	0	406	406	406	441	406	100
DE	170	856	0,20	0	0	59	81	56	60	37	22
DK	1478	65	22,74	0	0	0	65				
EE	564	294	1,92	0	0	0	7	59	58	7	1
ES	4078	251	16,25	0	0	152	152	258	240	152	4
FI	54	0									
FR	2664	1694	1,57	0	0	580	581	90	87	83	3
GR	415	303	1,37	0	0	0	181				
HU	1868	0									
IE	210	210	1,00	0	0	0	189	200	200	189	90
IT	5397	2741	1,97	0	0	0	0	1387	1037	0	0
LT	53	114	0,46	0	0	0	85	46	72	42	79
LU	20	0									
LV	164	192	0,85	0	0	0	105	163	188	105	64
MT	14	0									
NL	1244	0									
PL	1266	43	29,44	0	0	0	0	44	37	0	0
PT	494	320	1,54	210	0	211	211	0	319	211	43
RO	1371	0									
SE	163	22	7,41	0	0	22	22	22	22	22	13
SI	112	72	1,56	51	0	27	27	53	57	27	24
SK	560	466	1,20	14	0	188	188	220	192	188	34
UK	3061	5	612,20	0	0	0	0				

Table 1.4 - Detailed table of the comparison of NiD x SoE – TCM

Country	Number of sites			Database analysis results			GIS analysis results		GIS and DB comparison	
	NiD	SoE	Ratio NiDxSoE	Waterbase code	national code	result	NiD_SoE	SoE_NiD	NiDxSoE - number of common sites	NiD - % of common sites
AT	NR	NR	NR						NR	NR
BE	25	11	2,27	0	0	0	1	1	0	0
BG	6	28	0,21	0	0	6	14	6	0	0
CY	18	93	0,19	0	0	16	18	35	16	17
CZ	NR	NR	NR						NR	NR
DE	13	0								
DK	136	0								
EE	0	31								
ES	539	0								
FI	46	0								
FR	23	47	0,49	0	0	0	7	0	0	0
GR	11	81	0,14	0	0	0	10	0	0	0
HU	NR	NR	NR						NR	NR
IE	126	0								
IT	461	238	1,94	0	0	0	38	32	0	0
LT	19	20	0,95	0	14	14	13	13	10	50
LU	NR	NR	NR						NR	NR
LV	31	24	1,29	0	0	17	7	7	7	29
MT	29	120	0,24	0	27	27	27	81	26	22
NL	41	0								
PL	65	25	2,60	0	0	0	22	21	0	0
PT	42	0								
RO	60	72	0,83	0	0	7	11	7	1	1
SE	229	24	9,54	0	0	0	6	6	0	0
SI	5	0								
SK	NR	NR	NR						NR	NR
UK	841	0								

Table 1.5 - Detailed table of the comparison of NiD x WFD – Surface Water Rivers

Country	Number of sites			Database analysis results			GIS analysis results		GIS and DB comparison	
	NiD	WFD	Ratio NiDxWFD	national code	WFD code	result	NiDxWFD	WFDxNiD	NiDxWFD - number of common sites	NiD - % of common sites
AT	271	171	1,58	76	76	76	70	68	65	24
BE	1142	485	2,35	224	224	224	231	234	223	20
BG	102	338	0,30	20	0	93	91	100	91	89
CY	10	31	0,32	0	1	2	2	2	2	20
CZ	940	869	1,08	0	235	235	327	356	225	24
DE	151	3433	0,04	1	106	106	99	112	82	54
DK	127	748	0,17	125	0	125	126	129	124	98
EE	10	226	0,04	0	10	10	10	10	10	100
ES	2070	2995	0,69	1493	1493	1493	1483	1496	1394	67
FI	84	87	0,97	0	19	19	18	18	18	21
FR	1744	26	67,08	0	0	0	0	0	0	0
GR	81	0								
HU	419	13	32,23	0	0	0	2	2	0	0
IE	148	2762	0,05	148	0	148	148	174	148	100
IT	1855	4804	0,39	0	0	0	1653	1678	0	0
LT	53	1132	0,05	49	49	49	49	52	49	92
LU	16	17	0,94	15	0	15	13	13	12	75
LV	170	222	0,77	0	4	98	153	158	167	98
MT	3	0								
NL	193	131	1,47	0	0	11	62	63	11	6
PL	3351	0								
PT	71	617	0,12	0	26	26	27	28	26	37
RO	831	851	0,98	716	0	716	741	727	704	85
SE	193	463	0,42	0	0	0	122	126	0	0
SI	106	135	0,79	108	108	108	108	105	108	100
SK	224	260	0,86	68	67	68	61	60	57	25
UK	7915	4513	1,75	0	0	0	0	3264	0	0

Table 1.6 - Detailed table of the comparison of NiD x WFD – Surface Water Lakes

Number of sites				Database analysis results			GIS analysis results		GIS and DB comparison	
	NiD	WFD	Ratio NiDxWFD	national code	WFD code	result	NiDxWFD	WFDxNiD	NiDxWFD - number of common sites	NiD - % of common sites
AT	26	33	0,79	0	0	0	26	26	0	0
BE	12	16	0,75	0	0	0	0	0	0	0
BG	7	303	0,02	1	0	1	5	5	0	0
CY	0	9								
CZ	0	76								
DE	20	432	0,05	0	0	0	0	0	0	0
DK	93	265	0,35	0	0	0	62	62	0	0
EE	0	96		0	0	0	0	0	0	
ES	474	477	0,99	289	288	289	310	311	284	60
FI	63	103	0,61	0	2	2	2	2	2	3
FR	2	0								
GR	26	0								
HU	116	10	11,60	0	0	0	2	2	0	0
IE	69	198	0,35	58	0	58	57	57	57	83
IT	256	714	0,36	0	0	0	165	220	0	0
LT	7	324	0,02	7	7	7	42	42	3	43
LU	0	0								
LV	155	269	0,58	0	0	149	148	150	147	95
MT	4	0								
NL	309	191	1,62	0	0	6	52	49	6	2
PL	46	0								
PT	56	76	0,74	0	29	29	29	29	29	52
RO	409	443	0,92	289	0	289	42	39	38	9
SE	1992	911	2,19	0	0	0	65	68	0	0
SI	11	14	0,79	11	11	11	11	11	11	100
SK	0	31								
GB	73	209	0,35	0	0	0	2	2	0	0

Table 1.7 - Detailed table of the comparison of NiD x WFD – Groundwaters

Number of sites				Database analysis results			GIS analysis results		GIS and DB comparison	
	NiD	WFD	Ratio NiDxWFD	national code	WFD code	result	NiDxWFD	WFDxNiD	NiDxWFD - number of common sites	NiD - % of common sites
AT	368	2012	0,18	246	246	246	258	258	244	66
BE	3020	506	5,97	277	271	277	328	315	274	9
BG	128	201	0,64	27	0	64	66	65	47	37
CY	222	153	1,45	0	0	0	58	109	0	0
CZ	408	462	0,88	405	405	405	407	441	405	99
DE	170	12930	0,01	63	0	63	78	91	11	6
DK	1478	857	1,72	0	0	0	1453	844	0	0
EE	564	248	2,27	0	0	0	48	40	0	0
ES	4078	3266	1,25	1190	2513	2513	2740	2604	2314	57
FI	54	275	0,20	0	44	44	44	44	16	30
FR	2664	2274	1,17	564	0	564	421	403	271	10
GR	415	0								
HU	1868	1742	1,07	0	410	410	1795	1586	405	22
IE	210	300	0,70	0	0	197	210	216	196	93
IT	5397	5705	0,95	0	0	0	4730	3545	0	0
LT	53	237	0,22	0	0	113	45	87	42	79
LU	20	31	0,65	0	0	13	13	14	13	65
LV	164	70	2,34	0	0	112	152	68	109	66
MT	14	0								
NL	1244	1102	1,13	0	0	0	495	460	0	0
PL	1266	0								
PT	494	520	0,95	0	356	356	493	493	356	72
RO	1371	2500	0,55	583	0	583	1230	1272	520	38
SE	163	115	1,42	0	0	0	35	33	0	0
SI	112	104	1,08	101	101	101	104	104	101	90
SK	560	543	1,03	0	265	265	305	270	177	32
UK	3061	3762	0,81	0	0	2543	2423	2494	2049	67

Table 1.8 - Detailed table of the comparison of NiD x WFD – TCM

	Number of sites			Database analysis results			GIS analysis results		GIS and DB comparison	
	NiD	WFD	Ratio NiDxWFD	national code	WFD code	result	NiDxWFD	WFDxNiD	NiDxWFD - number of common sites	NiD - % of common sites
AT	NR	NR	NR						NR	NR
BE	25	17	1,47	0	0	4	4	4	3	12
BG	6	13	0,46	6	0	6	6	6	6	100
CY	18	8	2,25	0	1	1	0	0	0	0
CZ	NR	NR	NR						NR	NR
DE	13	82	0,16	0	0	0	0	0	0	0
DK	136	51	2,67	3	0	3	0	0	0	0
EE	0	55								
ES	539	1898	0,28	194	194	194	302	488	188	35
FI	46	67	0,69	0	9	9	8	8	8	17
FR	23	4	5,75	0	0	1	1	1	1	4
GR	0	0								
HU	NR	NR	NR						NR	NR
IE	126	105	1,20	0	0	0	4	4	0	0
IT	461	2793	0,17	0	0	226	430	488	215	47
LT	19	0								
LU	NR	NR	NR						NR	NR
LV	31	65	0,48	0	30	30	23	23	23	74
MT	29	0								
NL	41	16	2,56	0	0	12	7	7	7	17
PL	65	0								
PT	42	54	0,78	0	4	4	7	8	4	10
RO	60	57	1,05	30	0	30	53	47	23	38
SE	229	162	1,41	0	0	0	33	34	0	0
SI	5	5	1,00	5	4	5	5	5	5	100
SK	NR	NR	NR						NR	NR
UK	841	445	1,89	0	0	0	81	97	0	0

1.3. Conclusions on the comparison of the monitoring sites in NiD, SoE and WFD datasets

The best matching of monitoring sites was generally obtained for rivers and groundwaters, however only 5 countries have more than 75 % of the best matching river sites for NiDxSoE (AT, DE, EE, IE and LT), only 3 countries exceed 75 % for lakes (AT, DE and IE) and for groundwaters (CZ, IE, LT). 7 countries exceed 75 % for NiDxWFD rivers, 3 countries for lakes and 4 countries for groundwaters. Reasons for the low number of best matching monitoring stations are various but include: different monitoring networks for NiD, SoE and WFD, differences in the codes reported, mistakes in or missing coordinates and a low number of sites reported for SoE. Code problems could be an issue in terms of the future streamlining of reporting.

1.4. Conclusions on temporal and spatial aggregation scale of the reporting for NiD and Eionet-SoE; frequency and observation period

The analysis focused on the different types of spatial and temporal aggregation of NO_3 concentration data for the Nitrates Directive and SoE reporting and the frequency of sampling as well as the observation period for the Nitrates Directive, SoE reporting and WFD monitoring programmes.

The possibilities of future streamlining are determined by the different types of aggregation – spatial (aggregation of monitoring sites at water body level or sub-sites at one monitoring site) and temporal (aggregation of NO_3 results per year or observation period). While sub-sites aggregation is not so important, the other types of aggregation limit the use of data and future streamlining.

Spatial aggregation is applied for groundwater monitoring stations in the SoE database. Eight countries provided only data aggregated per groundwater body. A possible solution is to request only for spatially disaggregated data.

Temporal aggregation is applied for all data under the Nitrate Directive reporting. The reporting period is every 4th year but the time period actually reported differs per country – data can be aggregated over 2, 3 or 4 years, which makes any analysis unfeasible. A possible solution is to adapt the guidance with a reporting request annually for aggregated data.

The streamlining of data reporting would require changes to the reporting requirements.

1.5. Conclusions on reported parameters for eutrophication (Nitrate Directive)

Nitrate Directive reporting includes nitrates and also eutrophication parameters for all surface waters. Countries can choose a eutrophication determinand or parameters from code lists with 12 items (Table 1.9).

Table 1.9 - List of eutrophication parameters

BOD5	Five-day Biochemical Oxygen Demand
BOD7	Seven-day Biochemical Oxygen Demand
Chl-a	Chlorophyll a
DIN	Dissolved Inorganic Nitrogen
DIP	Dissolved Inorganic Phosphorus
DO	Dissolved Oxygen
NO2	Nitrite
NO3	Nitrate
N-tot	Total Nitrogen
P-PO4	Orthophosphate
P-tot	Total phosphorus
Secchi depth	Secchi Depth Transparency
TRIX	Trophical index for marine systems

Chlorophyll-a, Dissolved Oxygen, Total Nitrogen, Orthophosphate and Total Phosphorus are the most frequently reported eutrophication parameters for all surface waters. Secchi Depth Transparency is frequently used for lakes and Nitrite for transitional and coastal waters.

2. New comparison of monitoring sites for the Nitrate Directive and State of Environment reporting based on updated datasets

The entire work was focused on the updating of the comparison of monitoring sites of rivers, lakes and groundwaters for existing (NiD and SoE) or expected (WFD, Art. 8) data for **Nitrates** (or $N\text{-}NO_3$).

There are two different sources of nitrate data:

1. Eionet (SoE) monitoring data reporting and
2. Nitrate Directive reporting.

Only new data was used – 2009 SoE water quality data reporting and an updated version of the Nitrates Directive reporting dataset.

Available datasets:

- Eionet (SoE) data have been used from the 2009 reporting - Waterbase for rivers and lakes and the working database for groundwaters:
    - rivers: http://www.eea.europa.eu/data-and-maps/data/waterbase-rivers-6
    - lakes: http://www.eea.europa.eu/data-and-maps/data/waterbase-lakes-6
    - groundwaters: working database only (Waterbase includes only aggregated data per groundwater body level)
- NiD database – updated database from 2009, as provided by DG ENV

2.1. Methodology

The methodology is generally the same as it was in 2009 (see Chapter 1). The specific features are described below.

NiD – SoE sites comparison methodology:

In the first step, the number of sites in the new (2009) and old (2004 – 2007) datasets in both reporting periods were compared in order to determine which of the new data are actually new enough to enter into the analysis. For every country, each water category - groundwaters, surface water - rivers, and surface water - lakes was treated separately. (Transitional, coastal and marine monitoring sites were not taken into account because of the low number of identical sites last year and small changes this year.) Where the number of newly reported sites exceeded the number of old sites by 10 % or more, these data entered into a further comparison.

For several countries the number of SoE monitoring sites was smaller than the previous comparison due to the fact that monitoring sites with no NO_3 information were excluded. The comparison was then done only if the new number of monitoring sites was greater than 10 %.

In the second step, the actual comparison of sites was carried out: for codes (IDs) from monitoring sites and by location as GIS analysis. The results were then joined together and put into one table. In case the ID comparison showed much better results than the localisation (GIS) analysis, then a manual check of the sites with identical IDs was done.

The sites where both results come out positive were considered identical.

2.2. Results

There were significant changes found to the monitoring sites for both the NiD and SoE datasets. Tables 2.1 – 2.3 show a simple comparison of sites per country in the updated dataset (2009) and in the previous dataset (2004 - 2007). Changes in the number of sites exceeding 10 % are highlighted orange (increase) and blue (decrease). Tables 2.4 – 2.6 show the comparison of common monitoring sites for the 2009 analysis and for the current 2010 analysis. The comparison was carried out only for those countries where the difference in the new and old datasets was more than 10 % of the sites.

The last column in summary Tables 2.4 – 2.6 also shows the trend – improvement, stabilisation or deterioration of the matching for all types of monitoring sites. Where the results seemed to be deteriorating (worse match), a detailed manual check of the data was done to confirm them.

European scale maps are shown in Figures 2.1 – 2.3. As the density of monitoring sites is very high, some sites displayed in the bottom layers of the maps are barely visible (especially those SoE groundwater and river monitoring sites which could not be linked to their equivalents within the NiD database). Detailed maps with NiD, SoE and identical sites for newly compared countries were also prepared and are available at:

http://eea.eionet.europa.eu/Public/irc/eionet-circle/wwdr/library?l=/nitrate_directive&vm=detailed&sb=Title

Table 2.1 - Number of groundwater monitoring sites

country	NID - number of sites			country	SoE - number of sites		
	2009 dataset	2010 dataset	change (2010 - 2009)/2009		2004 - 2007 dataset	2004 - 2007 + 2009 dataset	change (2009 - 2004/2007)
AT	368	368	0%	AT	567	663	17%
BE	3020	3020	0%	BE	165	165	0%
BG	128	128	0%	BG	79	124	57%
CY	222	222	0%	CY	222	278	25%
CZ	408	408	0%	CZ	463	499	8%
DE	170	170	0%	DE	856	903	5%
DK	1478	1479	0%	DK	65	765	1077%
EE	564	620	10%	EE	294	304	3%
ES	4078	4078	0%	ES	251	251	0%
FI	54	54	0%	FI	aggregated only		0%
FR	2664	2666	0%	FR	1694	1957	16%
GR	415	418	1%	GR	303	303	0%
HU	1868	1868	0%	HU	no data	aggregated only	0%
IE	210	210	0%	IE	210	216	3%
IT	5397	5867	9%	IT	2741	2741	0%
LT	53	53	0%	LT	114	115	1%
LU	20	20	0%	LU	aggregated only		0%
LV	164	176	7%	LV	192	202	5%
MT	14	14	0%	MT	aggregated only		0%
NL	1244	1244	0%	NL	aggregated only		0%
PL	1266	1266	0%	PL	43	140	226%
PT	494	630	28%	PT	320	331	3%
RO	1371	1373	0%	RO	aggregated only		0%
SE	163	163	0%	SE	22	24	9%
SI	112	112	0%	SI	72	73	1%
SK	560	1775	217%	SK	466	472	1%
UK	3061	3061	0%	UK	5	291	5720%

Newly reported number of sites higher by 10 % than the previous dataset

Newly reported number of sites lower by 10 % than the previous dataset

No significant difference (> 10 %) between number of sites in previous and new datasets

Note: Some countries provide spatially aggregated data only under SoE GW reporting

Table 2.2 - Number of river monitoring sites

country	NID - number of sites			country	SoE - number of sites		
	2009 dataset	2010 dataset	change (2010 - 2009)/2009		2004 - 2007 dataset	2004 - 2007 + 2009 dataset	change (2009 - 2004/2007)
AT	271	271	0%	AT	290	290	0%
BE	1142	1142	0%	BE	63	66	5%
BG	102	102	0%	BG	111	111	0%
CY	10	10	0%	CY	23	22	-4%
CZ	949	949	0%	CZ	73	73	0%
DE	151	151	0%	DE	151	263	74%
DK	127	127	0%	DK	42	0	-100%
EE	10	57	470%	EE	60	60	0%
ES	2070	2070	0%	ES	939	2015	115%
FI	84	84	0%	FI	227	131	-42%
FR	1744	1744	0%	FR	1621	1824	13%
GR	81	81	0%	GR	14	85	507%
HU	419	419	0%	HU	154	150	-3%
IE	148	148	0%	IE	153	111	-27%
IT	1855	1856	0%	IT	1380	1193	-14%
LT	53	53	0%	LT	99	98	-1%
LU	16	16	0%	LU	4	4	0%
LV	170	170	0%	LV	117	117	0%
MT	3	3	0%	MT	no data	no data	
NL	193	193	0%	NL	11	31	182%
PL	3351	3351	0%	PL	136	136	0%
PT	71	71	0%	PT	56	54	-4%
RO	831	831	0%	RO	126	126	0%
SE	193	193	0%	SE	126	2	-98%
SI	106	106	0%	SI	30	30	0%
SK	224	224	0%	SK	90	122	36%
UK	7915	7915	0%	UK	204	206	1%

Newly reported number of sites higher by 10 % than the previous dataset

Newly reported number of sites lower by 10 % than the previous dataset

No significant difference (> 10 %) between number of sites in previous and new datasets

Note: The comparison of monitoring networks is based on monitoring sites as they were reported under the Nitrate Directive reporting. In Estonia's case the change in the reporting method took place between 2009 and 2010: in 2009 only sites within the Nitrate Vulnerable Zone (10 sites for river waters, 0 for lake waters) were reported, whereas in 2010 the whole monitoring network was reported (57 sites for RWs, 13 for LWs). The difference between 2009 and 2010, which was found by analysis (an increase of 470 % resp. 100 %), is therefore not caused by a real change, but by a different way of reporting.

Table 2.3 - Number of lake monitoring sites

country	NID - number of sites			country	SoE - number of sites		
	2009 dataset	2010 dataset	change (2010 - 2009)/2009		2004 - 2007 dataset	2004 - 2007 + 2009 dataset	change (2009 - 2004/2007)
AT	26	26	0%	AT	37	25	-32%
BE	12	12	0%	BE	5	5	0%
BG	7	7	0%	BG	16	15	-6%
CY	no data	no data		CY	9	9	0%
CZ	no data	no data		CZ	no data	no data	
DE	20	20	0%	DE	20	39	95%
DK	93	93	0%	DK	20	20	0%
EE	no data	13	100%	EE	17	17	0%
ES	474	474	0%	ES	0	278	100%
FI	63	63	0%	FI	243	166	-32%
FR	2	2	0%	FR	no data	25	100%
GR	26	26	0%	GR	no data	no data	
HU	116	116	0%	HU	23	18	-22%
IE	69	73	6%	IE	94		-100%
IT	256	256	0%	IT	298	291	-2%
LT	7	55	686%	LT	28	29	4%
LU	no data	no data		LU	no data	no data	
LV	155	155	0%	LV	41	44	7%
MT	4	4	0%	MT	2	2	0%
NL	309	309	0%	NL	6	22	267%
PL	46	46	0%	PL	46	47	2%
PT	56	56	0%	PT	30	30	0%
RO	409	410	0%	RO	16	16	0%
SE	1992	1992	0%	SE	192		-100%
SI	11	11	0%	SI	11	12	9%
SK	no data	no data		SK	no data	20	100%
UK	73	73	0%	UK	102	150	47%

Newly reported number of sites higher by 10 % than the previous dataset

Newly reported number of sites lower by 10 % than the previous dataset

No significant difference (> 10 %) between number of sites in previous and new datasets

Note: The comparison of monitoring networks is based on monitoring sites as they were reported under the Nitrate Directive reporting. In Estonia's case the change in the reporting method took place between 2009 and 2010: in 2009 only sites within the Nitrate Vulnerable Zone (10 sites for river waters, 0 for lake waters) were reported, whereas in 2010 the whole monitoring network was reported (57 sites for RWs, 13 for LWs). The difference between 2009 and 2010, which was found by analysis (an increase of 470 % resp. 100 %), is therefore not caused by a real change, but by a different way of reporting.

Table 2.4 - Comparison of common groundwater monitoring sites

country	Number of common sites 2009 analysis			Number of common sites 2010 analysis			change of 2010 to 2009 analysis
	ID comparison	**GIS comparison**	**ID and GIS comparison**	**ID comparison**	**GIS comparison**	**ID and GIS comparison**	
AT	5	5	5	45	45	45	↑
BE	108	120	108				
BG	46	38	37	34	19	19	↓
CY	141	0	0	122	173	121	↑
CZ	406	406	406				
DE	81	101	81				
DK	65	0	0	65	4	0	→
EE	7	59	7	18	111	13	↑
ES	152	258	151	152	259	152	
FI	NA	NA	NA				
FR	581	90	83	648	330	198	↑
GR	181						
HU	NA	NA	NA				
IE	189	200	189				
IT	0	1387	0				
LT	45	46	43				
LU	NA	NA	NA				
LV	105	163	104				
MT	NA	NA	NA				
NL	NA	NA	NA				
PL	0	44	0	0	154	0	→
PT	211	0	0	326	328	322	
RO	NA	NA	NA				
SE	22	22	22				
SI	27	53	27				
SK	188	220	133	258	322	212	↑
UK	0	0	0	0	185	0	→

2010 compared countries

↑	Improvement
→	Stabilisation
↓	Deterioration

Most of the newly compared countries show an improvement in the number of identical monitoring sites with both results positive (Austria, Cyprus, Estonia, France and Slovakia). The results are the same for Denmark (problems with coordinates), Poland (probably different IDs) and the UK (probably different IDs).

Because the Bulgarian coordinates of the NiD monitoring sites were damaged during the process, the number of matching sites decreased.

Table 2.5 - Comparison of common river monitoring sites

country	Number of common sites 2009 analysis			Number of common sites 2010 analysis			change of 2010 to 2009 analysis
	ID comparison	**GIS comparison**	**ID and GIS comparison**	**ID comparison**	**GIS comparison**	**ID and GIS comparison**	
AT	249	228	225				
BE	4	31	4				
BG	0	14	0				
CY	4	4	4				
CZ	64	53	50				
DE	151	151	151	151	117	116	↓
DK	28	27	27				
EE	9	10	9	56	56	56	↑
ES	627	3	1	641	981	455	↑
FI	30	30	30				
FR	689	657	587	749	646	603	↑
GR	0	77	0	0	72		
HU	55	98	30				
IE	124	148	123				
IT	0	945	0				
LT	53	53	53				
LU	3	2	2				
LV	58	78	0				
MT	NA	NA	NA				
NL	7	16	6	10	21	10	↑
PL	0	141	0				
PT	13	14	13				
RO	103	67	50				↑
SE	0	114	0				
SI	27	25	26				
SK	89	93	86	95	92	87	→
UK	169	216	140				

2010 compared countries

↑ Improvement

→ Stabilisation

↓ Deterioration

Note: The comparison of monitoring networks is based on monitoring sites as they were reported under the Nitrate Directive reporting. In Estonia's case the change in the reporting method took place between 2009 and 2010: in 2009 only sites within the Nitrate Vulnerable Zone (10 sites for river waters, 0 for lake waters) were reported, whereas in 2010 the whole monitoring network was reported (57 sites for RWs, 13 for LWs). The difference between 2009 and 2010, which was found by analysis (an increase of 470 % resp. 100 %), is therefore not caused by a real change, but by a different way of reporting.

Most of the newly compared countries have made an improvement in the number of identical monitoring sites with both results positive (Spain, France and The Netherlands). The results are the same for Slovakia.

Table 2.6 - Comparison of common lake monitoring sites

country	Number of common sites 2009 analysis			Number of common sites 2010 analysis			change of 2010 to 2009 analysis
	ID comparison	**GIS comparison**	**ID and GIS comparison**	**ID comparison**	**GIS comparison**	**ID and GIS comparison**	
AT	26	25	25				
BE	0	0	0				
BG	1	2	1				
CY	NA	NA	NA				
CZ	NA	NA	NA				
DE	20	20	20	20	20	18	→
DK	0	0	0				
EE	NA	NA	NA	13	12	12	↑
ES	NA	NA	NA	145	145	127	
FI	24	24	24				
FR	NA	NA	NA	0	0	0	→
GR	NA	NA	NA				
HU	6	14	2				
IE	68	60	59				
IT	0	87	0				
LT	0	50	0	0	28	0	→
LU	NA	NA	NA				
LV	21	29	19				
MT	2	3	2				
NL	5	2	0	10	16	10	↑
PL	0	9	0				
PT	21	22	21				
RO	0	9	0				
SE	74	24	4				
SI	5	6	2				
SK	NA	NA	NA	NA	NA	NA	→
UK	0	8	0	0	9	0	→

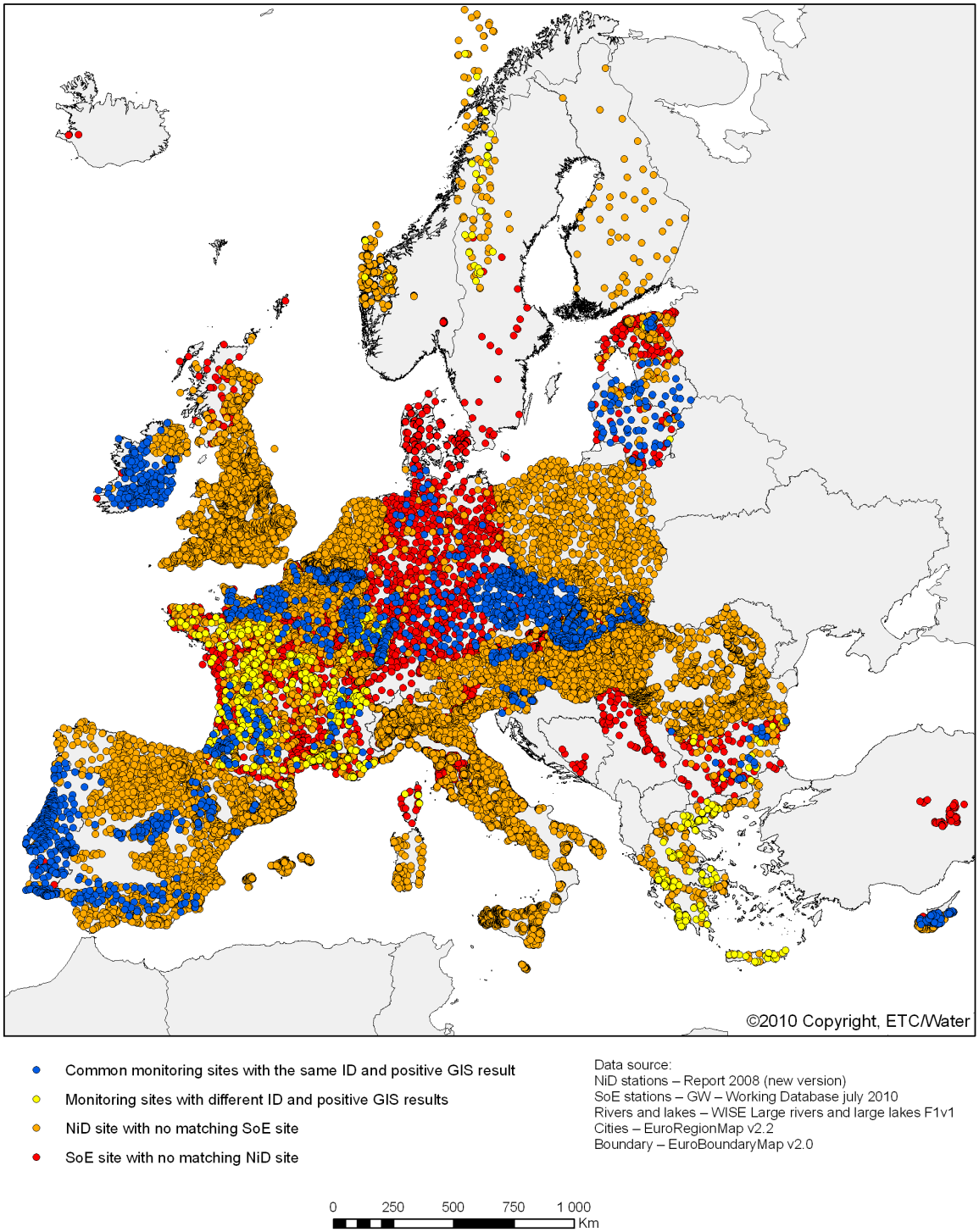
2010 compared countries

↑	Improvement
→	Stabilisation
↓	Deterioration

Note: The comparison of monitoring networks is based on monitoring sites as they were reported under the Nitrate Directive reporting. In Estonia's case the change in the reporting method took place between 2009 and 2010: in 2009 only sites within the Nitrate Vulnerable Zone (10 sites for river waters, 0 for lake waters) were reported, whereas in 2010 the whole monitoring network was reported (57 sites for RWs, 13 for LWs). The difference between 2009 and 2010, which was found by analysis (an increase of 470 % resp. 100 %), is therefore not caused by a real change, but by a different way of reporting.

Two of the newly compared countries have made an improvement in the number of identical monitoring sites with both results positive (The Netherlands). The results are the same for Denmark (problems with coordinates), France, Lithuania and the UK (probably different IDs). Slovakia could not be assessed because of a lack of NiD data.

Figure 2.1 - Comparison of common groundwater monitoring sites for SoE and NiD



Note: Denmark and Sweden provided NiD data in a different projection (not ETRS89).

Figure 2.2 - Comparison of common river monitoring sites for SoE and NiD

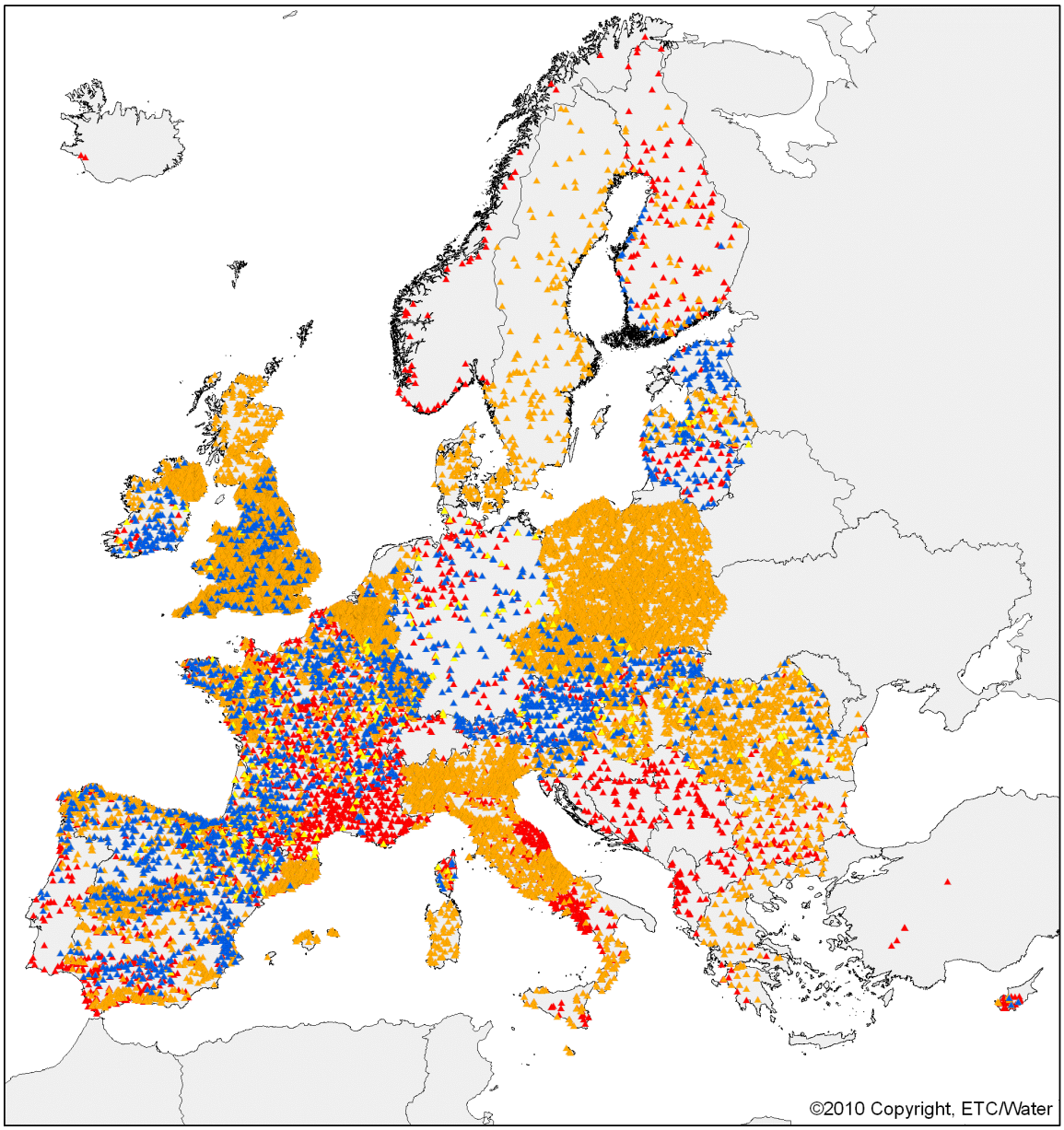
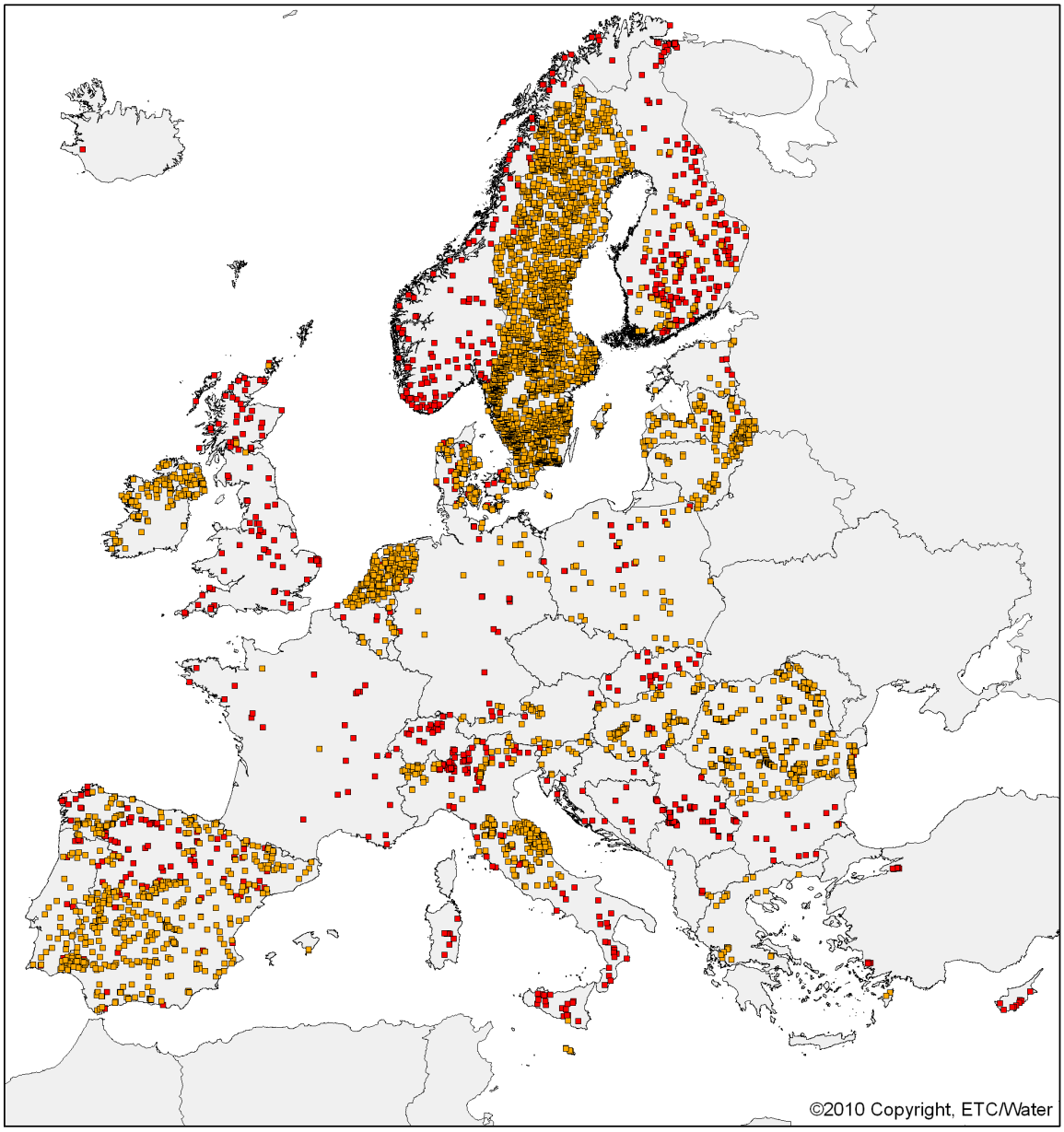


Figure 2.3 - Comparison of common lake monitoring sites for SoE and NiD



3. Nitrates pollution comparison of NiD/WFD/SoE quality data

3.1. Methodology

This part of the analysis is focused on the assessment of nitrates at water body level from data provided for the NiD, SoE and WFD. It is not a comparison of nitrate concentrations in monitoring sites, but a nitrate status or state assessment in water bodies.

While NiD and SoE data contain information about NO_3 concentration in monitoring sites, the Water Framework Directive is focused on water body status only. On the other hand, only the WFD provides information about all water bodies including their list.

The basis of the analysis was the status assessment according to the Water Framework Directive. Nitrates are part of the ecological status of surface waters (rivers, lakes, transitional and coastal waters) and they are included in general physico-chemical elements (groups of nutrients, temperature, oxygen conditions, acidification etc.). For groundwaters, nitrates are assessed as part of the chemical status which is based on all chemical substances and parameters put together.

When the WFD groundwater chemical status is not good, information about substances, the reasons for failure etc. are part of the electronic reporting process of the WFD (Table 3.1). Surface water ecological status has more detailed information on quality elements only (Table 3.2). We can therefore identify groundwater bodies with a bad status because of a high level of nitrate, but the same information for surface water bodies is not available.

Table 3.1 - Example of primary XML data on groundwater chemical status under WFD electronic reporting

Ground water body status	
ChemicalStatus	
Chemical status value:	3
Reasons for failure:	
exceedance	
water quality	
Pollutants causing failure:	
1 Nitrates	
3 Annex II pollutant	
Other relevant pollutant exceedance:	
Other Relevant Pollutant CAS Number	**Other Relevant Pollutant Name**
-	-

Table 3.2 - Example of primary XML data about elements for ecological status under WFD electronic reporting

Ecological Status or potential

TargetStatusOrPotential	P
ValueEcologicalStatusOrPotential	3
Confidence	3
CommentConfidence	Confidence of Less than Good
ValueQE1-1PhytoplanktonStatusOrPotential	U
ValueQE1-2OtherAquaticFloraStatusOrPotential	U
ValueQE1-2-1MacroalgaeStatusOrPotential	U
ValueQE1-2-2AngiospermsStatusOrPotential	U
ValueQE1-2-3MacropyhtesStatusOrPotential	U
ValueQE1-2-4PhytobenthosStatusOrPotential	U
ValueQE1-3MacroinvertabratesStatusOrPotential	5
ValueQE1-4FishStatusOrPotential	U
ValueQE1-5OtherBiologicalQEStatusOrPotential	U
ValueQE2HydromorphStatusOrPotential	2
ValueQE3-1GeneralPhysicoChemStatusOrPotential	3

Countries can use different limits (national threshold values for groundwaters) for good status according to the types of water bodies. This information is available separately for all types and categories of surface water bodies – natural, heavily modified and artificial; rivers, lakes, transitional and coastal waters (Table 3.3). For groundwaters only the range is provided (Table 3.4).

Table 3.3 - Example of primary XML river data on national limits (boundaries between high, good, moderate, poor and bad status) for surface water ecological status under WFD electronic reporting

QEParameterTypes	QEOtherParameterDescription	TypologyCode	MatrixType	Units	StatisticalExpression	ReferenceCondition	HighGoodBoundary	GoodModerateBoundary	ModeratePoorBoundary	PoorBadBoundary
QE3-1 Other	N-NO3	D2(P1V)	water	mg/l	90-percentile	<2	-7777	0.01	-7777	-7777
QE3-1 Other	N-NO3	M1(P1V)	water	mg/l	90-percentile	<2.5	-7777	9	-7777	-7777
QE3-1 Other	N-NO3	V3(P1V)	water	mg/l	90-percentile	<2	-7777	1.1	-7777	-7777
QE3-1 Other	N-NO3	R2(P1V)	water	mg/l	90-percentile	<2	-7777	7.8	-7777	-7777
QE3-1 Other	N-NO3	I1(P1V)	water	mg/l	90-percentile	<2	-7777	10	-7777	-7777
QE3-1 Other	N-NO3	B1(P1V)	water	mg/l	90-percentile	<1.5	-7777	48	-7777	-7777
QE3-1 Other	N-NO3	V2(K2V)	water	mg/l	90-percentile	<1.5	-7777	0.38	-7777	-7777

Table 3.4 - Example of primary XML data on national threshold values (boundaries between good and poor status) for groundwater chemical status under WFD electronic reporting

PollutantOrIndicator	Value	LowerThreshold	ReportingUnits	ThresholdValueScale
Arsenic	17.15	5.5	µg/l	Groundwater body
Cadmium	0.2222		µg/l	Groundwater body
Chloride	55.5	55.5	mg/l	Groundwater body
Conductivity	888	888	µS/cm	Groundwater body
Lead	8		µg/l	Groundwater body
Mercury	0.75		µg/l	Groundwater body
Nitrates	7.5	18.2	mg/l	Groundwater body
Tetrachloroethylene	7.5		µg/l	Groundwater body
Trichloroethylene	7.5		µg/l	Groundwater body

The NiD and SoE data contain monitored nitrate concentrations at monitoring sites including water body identification.

Regarding the structure of the WFD data, the nitrates status assessment was focused mainly on groundwater bodies. As the crucial WFD data had not been available in the database, all information had to be extracted manually from xml files.

National River Basin Districts were used for the analysis with all necessary information (groundwater status assessment, range of limits used and SoE and NiD data). The boundaries of groundwater bodies do not need to be the same as the boundaries of the RBD; however every groundwater body belongs to one RBD only.

Groundwater assessment was done for 4 national RBDs: Austria – Danube, France – Seine and Normandy coastal waters, Czech Republic – Elbe, and Ireland – South Eastern RBD. Surface water analysis was prepared for 1 RBD only: Ireland – South Eastern RBD.

WFD data:

An overview of groundwater body chemical status in the pilot area was prepared at first with information whether or not nitrates are the reason for the poor status. The information about the applied national threshold value of NO_3 (boundary between good and poor status) was used.

SoE and NiD data:

The assessment was done for every monitoring site – comparison of monitored NO_3 concentrations with 1) a 50 mg/l limit and 2) a different limit (national threshold) according to the WFD. Information about the number of existing monitoring sites and number of sites above and below the limit is included. The nitrates state was derived from the predominant results - equal or more than 50 % of monitoring sites above the limit (water body marked with red stripes on the map). Although the same limit and percentage of exceeded monitoring sites were used, the results cannot be fully comparable.

3.2. Results

Because the WFD data were prepared from primary (not quality assured) XML files, the final data could be different. Some information about the used national threshold values or about the boundaries between high, good, moderate, poor and bad status are missing or are not clear. The different horizons of groundwater bodies had to be taken into account as well. The summary tables (Tables 3.5 and 3.6) provide a short overview of all the results; detailed country results are shown further.

Table 3.5 - Summary of nitrate assessment according to the WFD, NiD and SoE data - groundwaters

Country		Austria	France	Czech Republic	Ireland
River Basin District		Danube	FRH	Elbe	SE
WFD classification	# GWBs	128	53	99	151
	# GWBs poor status	3	42	78	3
	# GWBs poor status - NO3	3	15	49	1
	% GWBs poor status NO3	2%	28%	49%	1%
NiD data assessment	# GWBs with monitoring site(s)	119	30	81	44
	# GWBs poor state - NO3 (national threshold)	8	7	15	6
	# GWBs poor state - NO3 (50 mg/l)	5	NR	NR	0
	# GWBs poor state (NO3) for WFD and NiD (national threshold)	3	5	15	1
	# GWBs poor state (NO3) for WFD and NiD (50 mg/l)	3	NR	NR	0
	%GWBs poor state - NO3 (national threshold)	6%	13%	15%	4%
	%GWBs poor state - NO3 (50 mg/l)	4%	NR	NR	0%
	% GWBs poor state (NO3) for WFD and NiD (national threshold)	2%	9%	15%	1%
	% GWBs poor state (NO3) for WFD and NiD (50 mg/l)	2%	NR	NR	0%
SoE data assessment	# GWBs with monitoring site(s)	14	53	81	45
	# GWBs poor state - NO3 (national threshold)	2	7	16	9
	# GWBs poor state - NO3 (50 mg/l)	2	NR	NR	2
	# GWBs poor state (NO3) for WFD and SoE (national threshold)	1	3	13	1
	# GWBs poor state (NO3) for WFD and SoE (50 mg/l)	1	NR	NR	1
	%GWBs poor state - NO3 (national threshold)	2%	13%	16%	6%
	%GWBs poor state - NO3 (50 mg/l)	2%	NR	NR	1%
	% GWBs poor state (NO3) for WFD and SoE (national threshold)	1%	6%	13%	1%
	% GWBs poor state (NO3) for WFD and SoE (50 mg/l)	1%	NR	NR	1%

NR - not relevant

Table 3.6 - Summary of nitrate assessment according to the WFD, NiD and SoE data – surface waters (South Eastern RBD in Ireland)

	WFD			NiD				
surface water type	# WBs	# WBs poor physico - chemical status	% WBs poor status	# WBs with monitoring site(s)	# WBs poor state - NO3	# WBs poor state for WFD and NiD	% WBs poor state	% WBs poor state for WFD and NiD
rivers	672	24	4%	50	0	0	0%	0%
lakes	12	5	42%	not relevant	not relevant	not relevant	not relevant	not relevant
transitional waters	21	12	57%	not relevant	not relevant	not relevant	not relevant	not relevant
coastal waters	9	3	33%	not relevant	not relevant	not relevant	not relevant	not relevant

	SoE				
surface water type	# WBs with monitoring site(s)	# WBs poor state - NO3	# WBs poor state for WFD and SoE	% WBs poor state	% WBs poor state for WFD and SoE
rivers	50	0	0	0%	0%
lakes	not relevant	not relevant	not relevant	not relevant	not relevant
transitional waters	not relevant	not relevant	not relevant	not relevant	not relevant
coastal waters	not relevant	not relevant	not relevant	not relevant	not relevant

3.2.1. Groundwaters: Example from Austria – Danube RBD

Groundwater bodies (GWBs) are layered out in three different horizons (Figure 3.1). Horizon 1 covers the entire area of the Danube RBD, so all maps were prepared for this horizon; however an assessment was prepared for each of the groundwater bodies.

There are 128 groundwater bodies in the Danube RBD according to the WFD reporting. All of them contain information about chemical status. Nitrates are a reason for the poor status of all 3 GWBs. The National Nitrates Threshold Value for all groundwater bodies was 45 mg/l (information from WFD electronic reporting) and the groundwater bodies were assessed as having a poor status if more than 50 % of the monitoring sites were above the limit. For better comparability, the National Nitrates Threshold Value and the same number of monitoring sites was then used also for the NiD and SoE data. Paralelly, the same analysis was carried out using the NiD 50 mg/l limit.

The NiD monitoring sites represent 119 groundwater bodies and 8 of them have a “poor state” classification regarding the national threshold (3 GWBs have the same results in WFD) – see Figure 3.3. Only 5 out of all of the groundwater bodies have the “poor state” classification when we used the 50 mg/l limit. The number of groundwater bodies with the same results in the WFD did not change (Figure 3.4).

8 GWBs in the SoE reporting do not exist in the WFD reporting – the inconsistency could be because of the different time periods for the NiD (2003 – 2007) and WFD (2009) reporting.

Austria provided SoE monitoring sites for 14 GWBs only (2006 and 2007). 2 of them have a "poor state" classification at least in one year, applying the National Threshold Value. The same results were obtained for 50 mg/l limit. However, only 1 GWB with an SoE "poor state" status is the same as the WFD (Figure 3.5 and 3.6).

GWBs with and without at least 1 NiD or SoE monitoring site are shown in Figure 3.2.

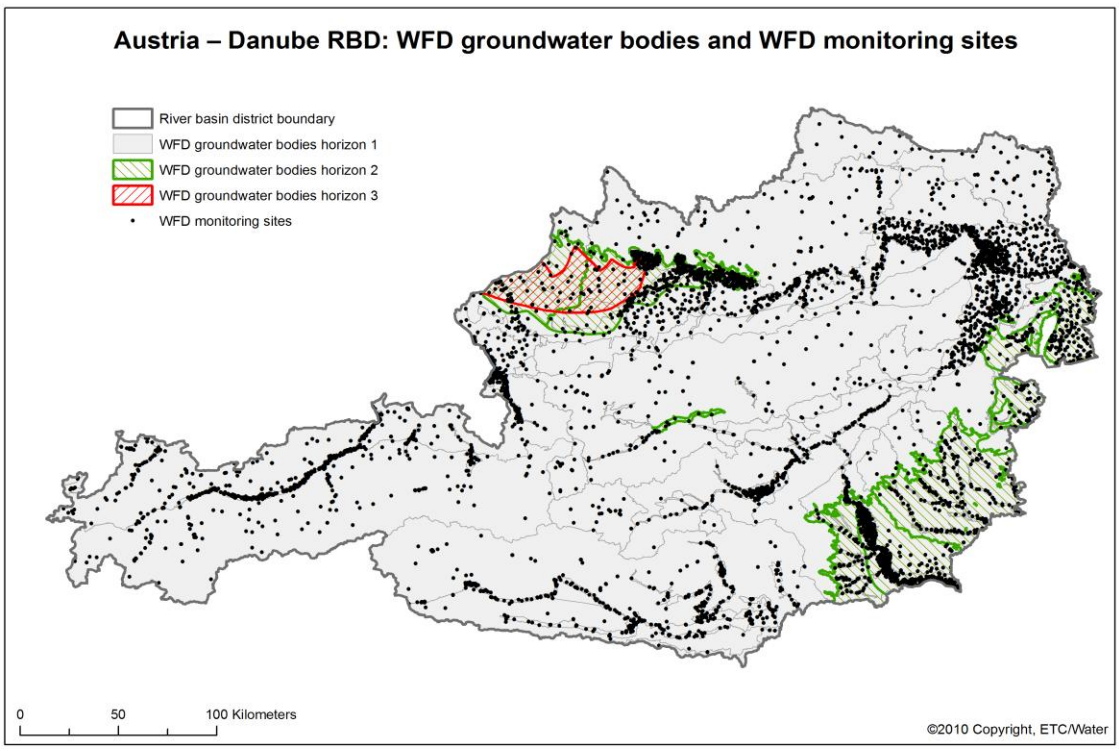
The proportion of identical monitoring sites NiD and SoE is very small - only 45 sites out of the 368 NiD sites or 663 SoE sites for the entire area of Austria.

Conclusions for Austria – Danube RBD:

The WFD assessment of groundwater body status identifies fewer water bodies with a poor status caused by nitrates than the assessment of groundwater bodies based on NiD or SoE data. The results were similar for National Threshold Value and for the 50 mg/l limit for nitrates. The main reason for this can be the different number of NiD monitoring sites used in the assessment. Austria probably used more sites for the WFD assessment.

SoE monitoring sites represent only 14 groundwater bodies out of 128 in total and therefore do not provide a comparable coverage of groundwater bodies.

Figure 3.1 - WFD groundwater bodies in the Danube RBD and WFD monitoring sites



Note: Monitoring sites were used from geographical layer only (without any attributes)

Figure 3.2 - NiD and SoE monitoring sites in the Danube RBD

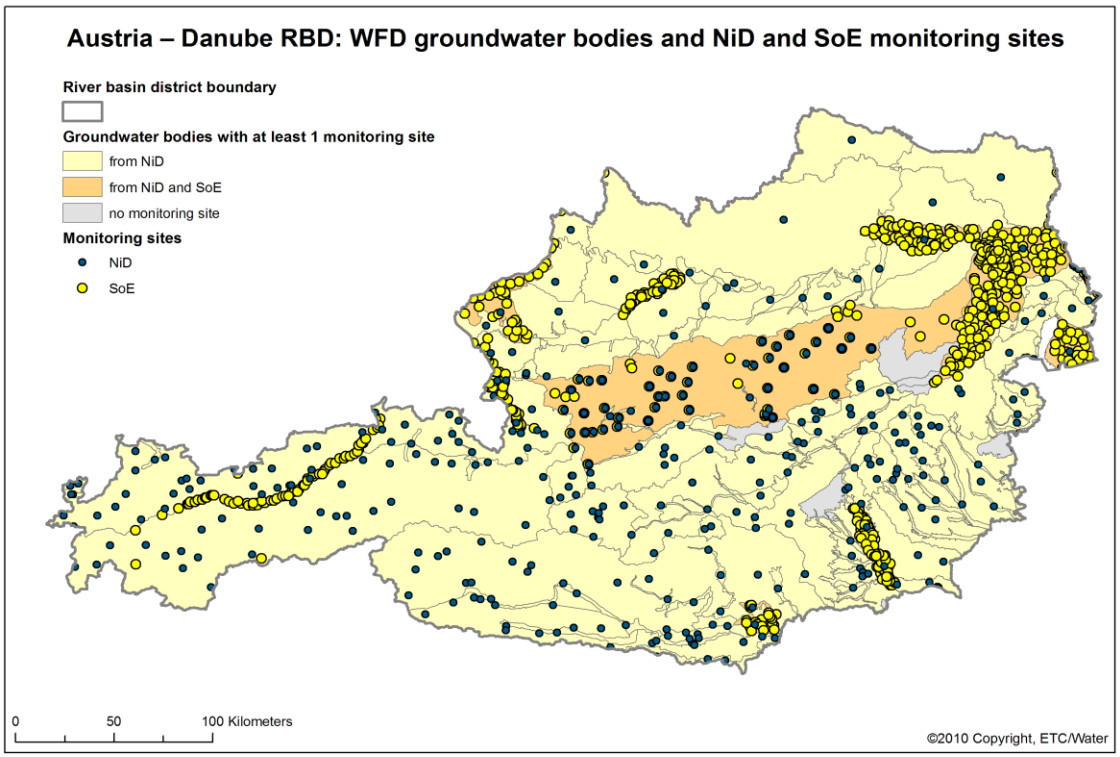


Figure 3.3 - Interpretation of NiD data (based on national threshold value), shown with quality of WFD groundwater bodies under WFD classification

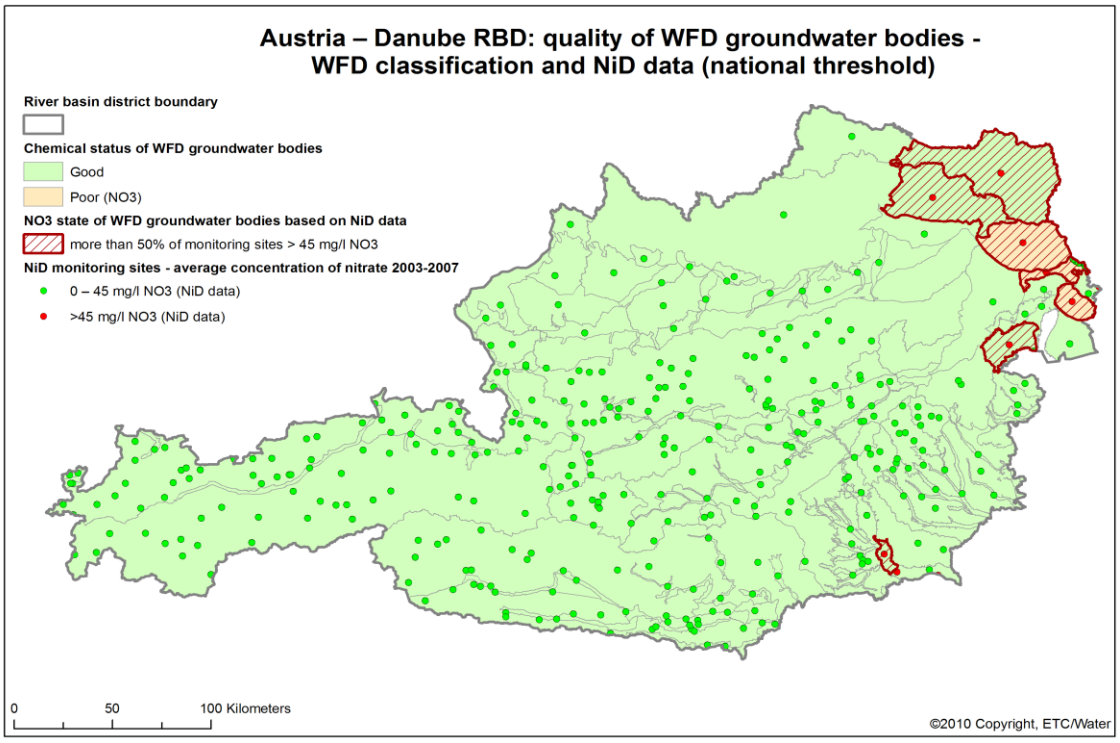


Figure 3.4 - Interpretation of NiD data (based on 50 mg/l limit), shown with quality of WFD groundwater bodies under WFD classification

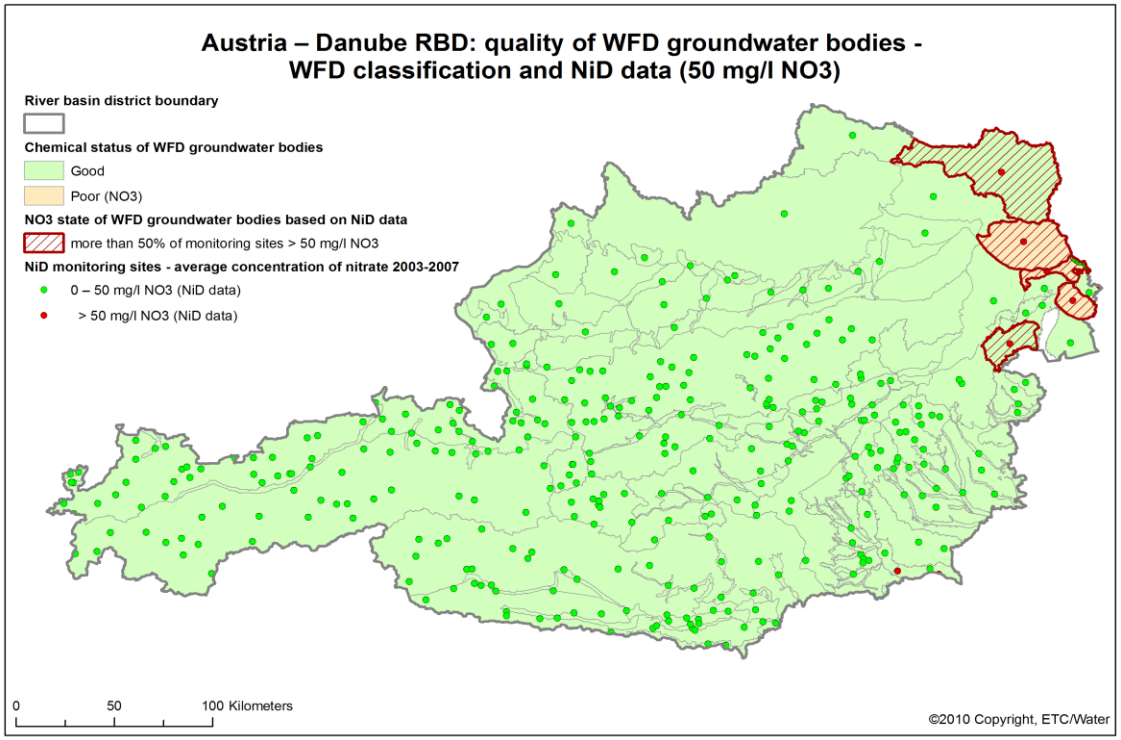


Figure 3.5 - Interpretation of SoE data (based on national threshold value), shown with quality of WFD groundwater bodies under WFD classification

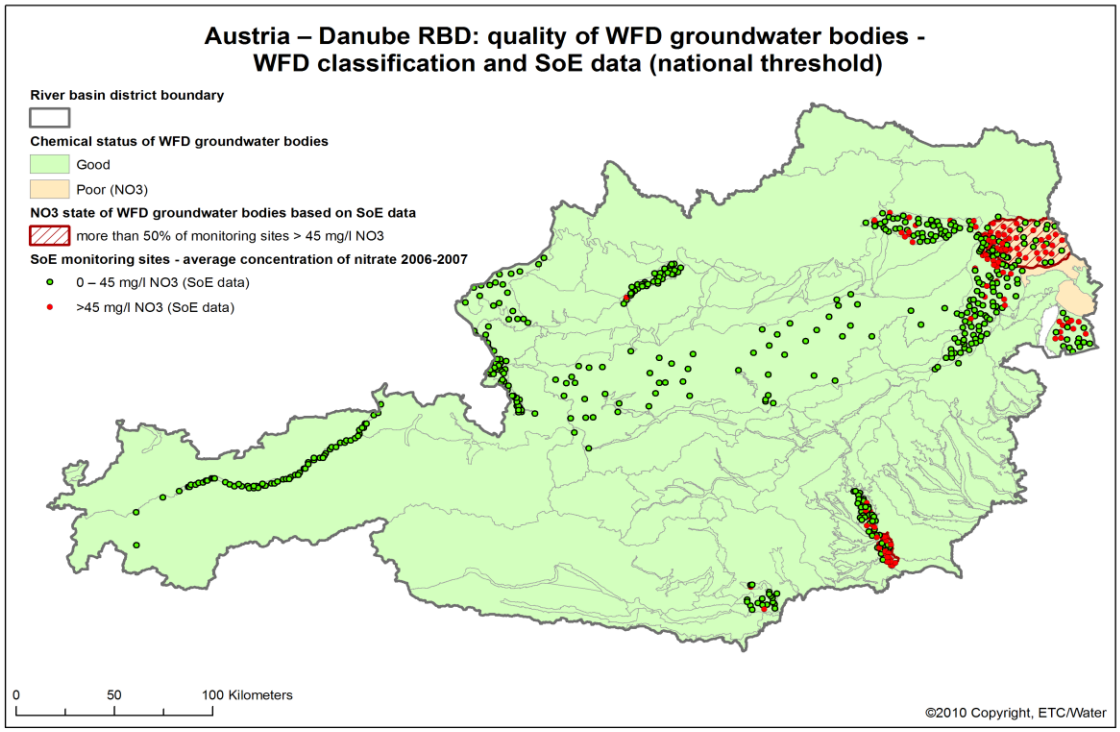
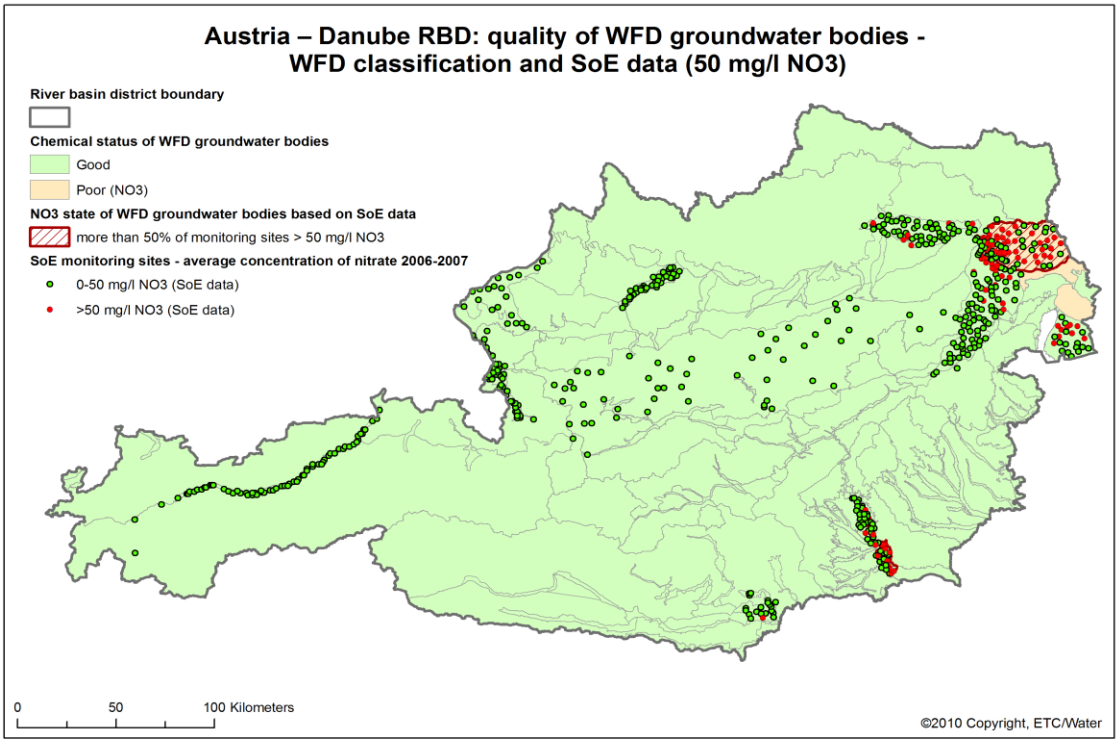


Figure 3.6 - Interpretation of SoE data (based on 50 mg/l limit), shown with quality of WFD groundwater bodies under WFD classification



3.2.2. Groundwaters: Example from France - Seine and Normandy coastal waters RBD

Groundwater bodies are shown in 4 different horizons (Figure 3.7). Horizons 1 and 2 cover the entire area of the FRH River Basin District, so all of the maps were prepared for the two horizons; however, an assessment was prepared for all groundwater bodies. IDs for some groundwater bodies within different horizons are the same.

There are 53 groundwater bodies in the FRH River Basin District according to the WFD reporting. All of them include information about chemical status. Nitrates are the reason for a poor status in 15 GWBs out of the 42 GWBs rated as “poor”. The nitrates threshold value for all groundwater bodies was not mentioned in the WFD electronic reporting, so the limit of 50 mg/l was used for the NiD and SoE data. Groundwater body state was evaluated as poor if 50 % or more of the monitoring sites were above the limit for nitrates.

Many NiD monitoring sites (628 out of 722) had no information about groundwater bodies. The sites were excluded from the assessment, so the results could be negatively affected because of this fact. NiD monitoring sites represent 30 groundwater bodies and 7 of them have a “poor state” rating (5 GWBs have the same results in WFD) – see Figure 3.9.

France provided SoE monitoring sites for all 53 GWBs (2006, 2007 and 2008) and 7 of them have a “poor state” rating at least in one year. However, only 3 GWBs with an SoE “poor

state" rating are the same as for WFD (Figure 3.10). 39 monitoring sites (out of 483) are without a groundwater body ID.

GWBs with and without at least 1 NiD or SoE monitoring site are shown in Figure 3.8.

The proportion of identical monitoring sites (NiD and SoE) is very small - only 198 sites out of 2666 NiD sites or 1957 SoE sites for the entire area of France.

Conclusions for France - Seine and Normandy coastal waters RBD:

The 50 mg/l limit for nitrates was used for the analysis. Only 2 water bodies are classified differently, within the NiD as "poor state" but within the WFD as "good status". The difference could be due to a different number of monitoring sites and/or different monitoring network.

The situation is similar for water bodies classified by SoE data compared to WFD water bodies. The higher number of groundwater bodies with a WFD "poor status" can be caused by the different origins of nitrate pollution or other aspects such as the impact of groundwater quality on surface water body status or dependent terrestrial ecosystems.

SoE data are reported from all groundwater bodies in the RBD, whereas NiD data are reported only for half of the groundwater bodies.

Figure 3.7 - WFD groundwater bodies in the FRH RBD

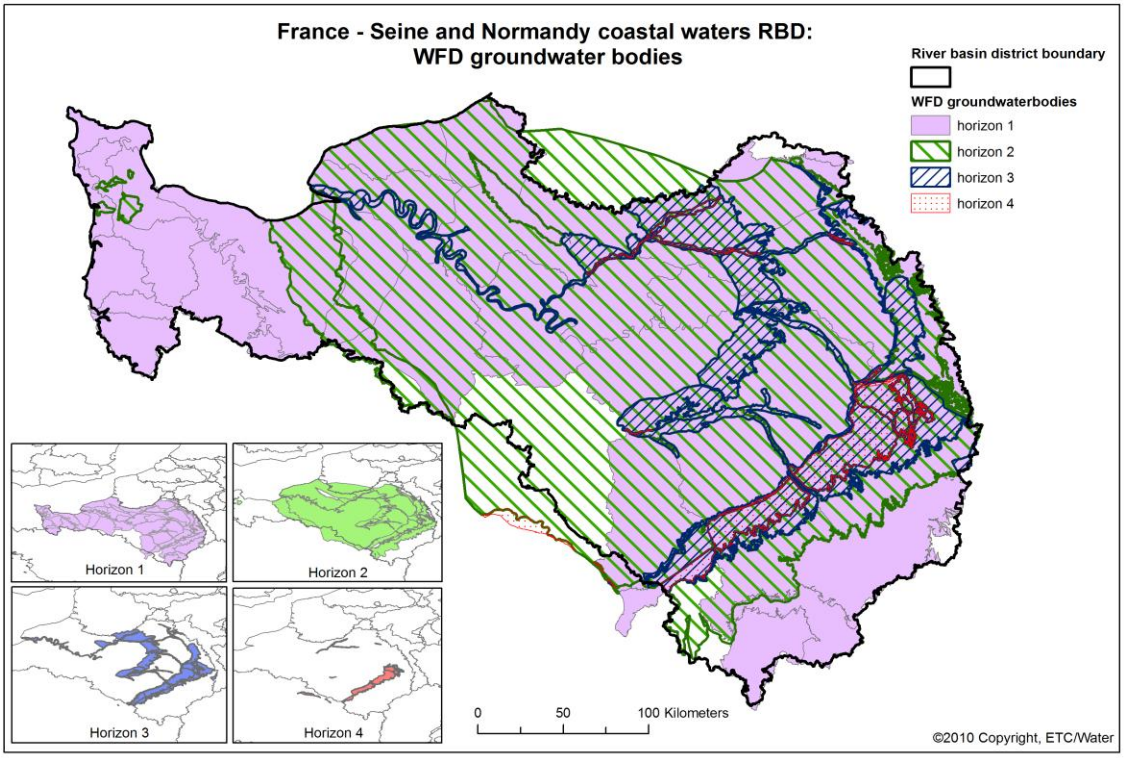


Figure 3.8 - NiD and SoE monitoring sites in the FRH RBD

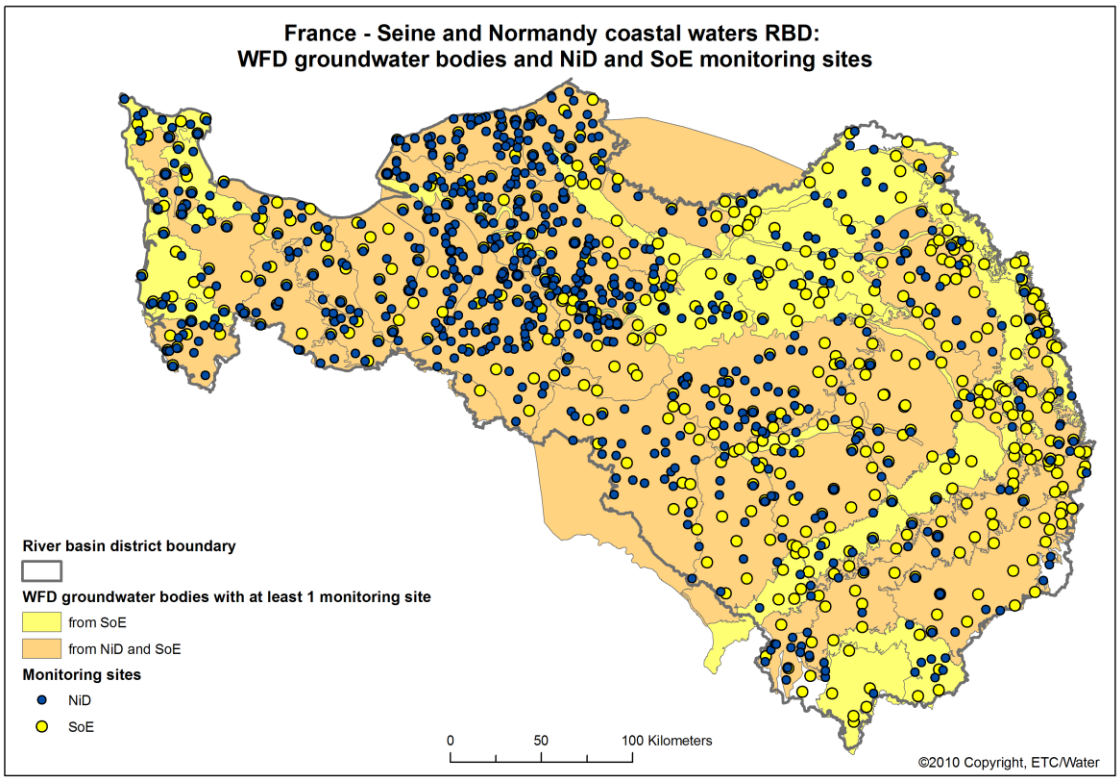


Figure 3.9 - Interpretation of NiD data (based on 50 mg/l limit), shown with quality of WFD groundwater bodies under WFD classification

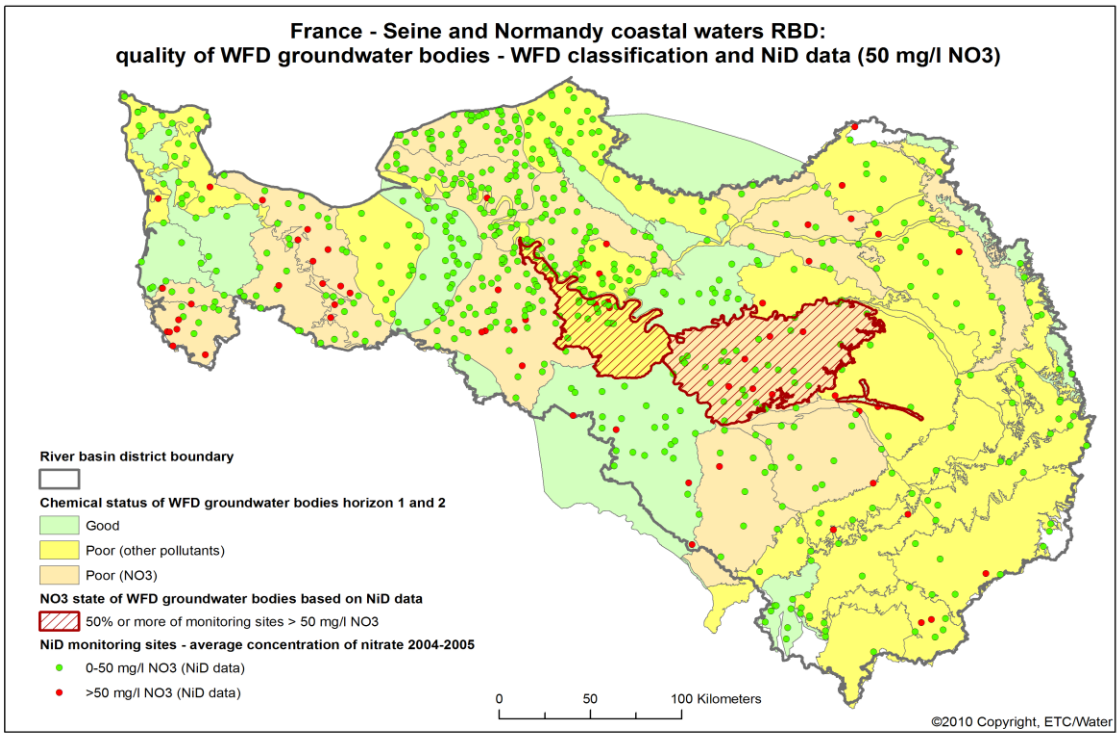
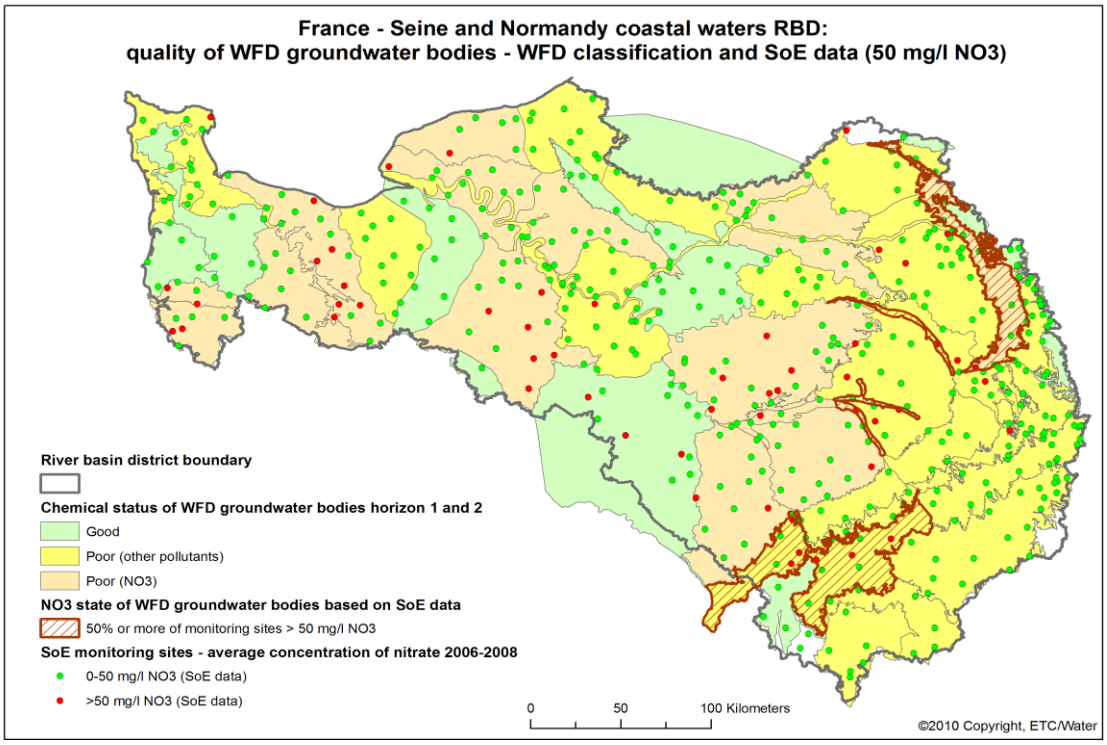


Figure 3.10 - Interpretation of SoE data (based on 50 mg/l limit), shown with quality of WFD groundwater bodies under WFD classification



3.2.3. Groundwaters: Example from the Czech Republic – Elbe RBD

Groundwater bodies are shown in 3 different horizons (see Figure 3.11). Horizon 2 covers the entire area of the Elbe RBD, so all of the maps were prepared for horizons 1 and 2. However, an assessment was prepared for each groundwater body.

There are 99 groundwater bodies in the Elbe RBD according to the WFD reporting. All of them contain information about chemical status. Nitrates are the reason for the poor status of 49 GWBs out of the 78 GWBs which have a poor status. The National Nitrates Threshold Value for all groundwater bodies was the same as in NiD - 50 mg/l. Groundwater bodies were assessed as having a poor status if equal or more than 50 % of the monitoring sites were above the limit (information from WFD electronic reporting). The same limit and number of monitoring sites was used for the NiD and SoE data.

NiD monitoring sites represent 81 of the groundwater bodies and 15 of them have a “poor state” rating (all GWBs have the same results under WFD) – see Figure 3.13. 14 monitoring sites (out of 289) are without a groundwater body ID.

The Czech Republic provided SoE monitoring sites for 81 GWBs (2004, 2005, 2006, 2007 and 2008) and 16 of them have a “poor state” rating at least in one year. 13 GWBs with the SoE “poor state” rating is the same as it is for WFD (Figure 3.14).

GWBs with and without at least 1 NiD or SoE monitoring site are shown in Figure 3.12.

A proportion of identical monitoring sites for the NiD and SoE is very high - 406 sites out of 408 NiD sites or 499 SoE sites for the entire area of the Czech Republic.

Conclusions for the Czech Republic – Elbe RBD:

All groundwater bodies under the NiD “poor state” rating are in the same status as they are under the WFD classification. However, many groundwater bodies with the WFD poor status are rated as having a “good state” classification under NiD or SoE. This can be caused by different origins of nitrate pollution or by other aspects such as the impact of groundwater quality to surface water body status or dependent terrestrial ecosystems.

SoE data and NiD data are reported from almost all groundwater bodies within the RBD.

Figure 3.11 - WFD Groundwater bodies in the Elbe RBD

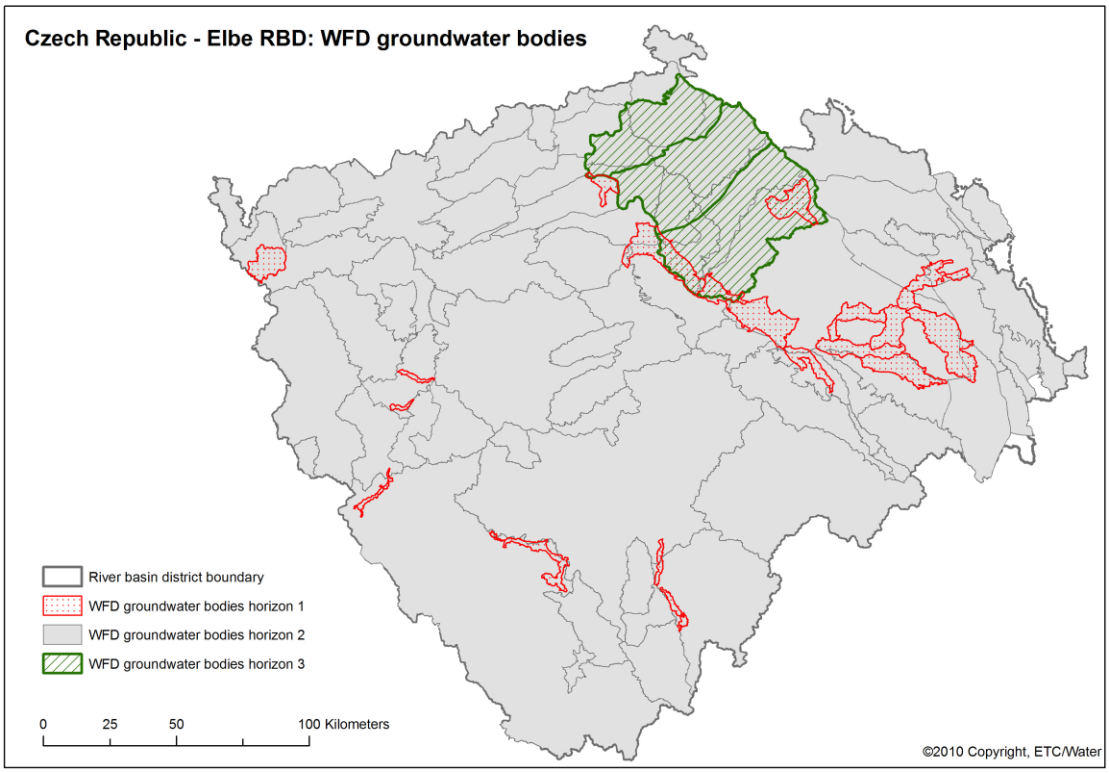


Figure 3.12 - NiD and SoE monitoring sites in the Elbe RBD

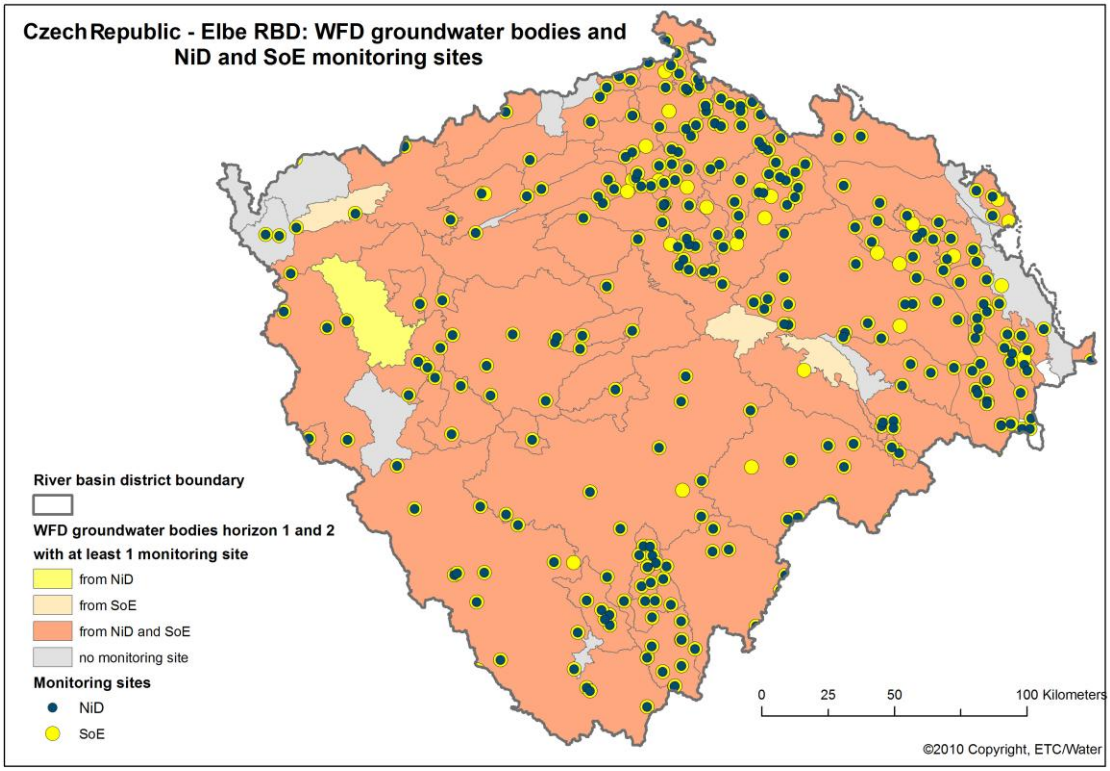


Figure 3.13 - Interpretation of NiD data (based on 50 mg/l limit), shown with quality of WFD groundwater bodies under WFD classification

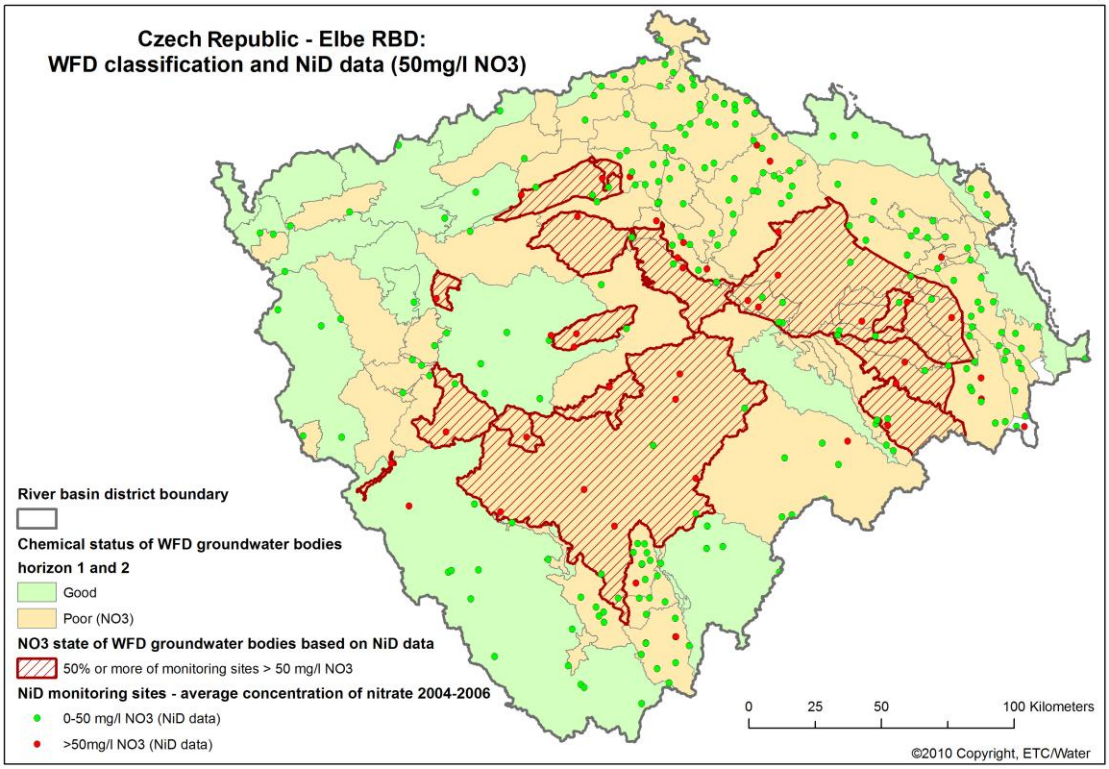
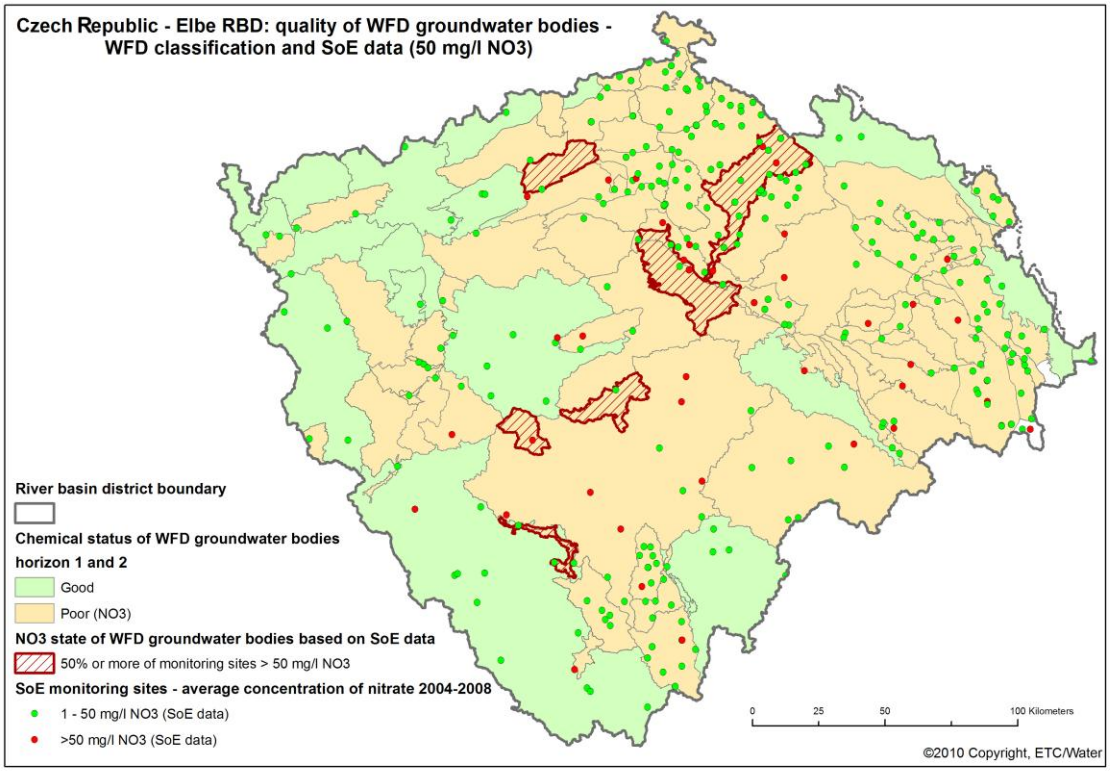


Figure 3.14 - Interpretation of SoE data (based on 50 mg/l limit), shown with quality of WFD groundwater bodies under WFD classification



3.2.4. Groundwaters: Example from Ireland - South Eastern RBD

Groundwater bodies are shown in one horizon only (Figure 3.15).

There are 151 groundwater bodies in the SE RBD according to WFD reporting. All of them contain information about chemical status. Nitrates are the reason for the poor status of 1 GWB out of the 3 GWBs with a “poor status” rating. The National Nitrates Threshold Value for all groundwater bodies was 37.5 mg/l (information from WFD electronic reporting). For better comparability, the National Nitrates Threshold Value and the same number of monitoring sites was then used also for the NiD and SoE data. Paralelly, the same analysis was carried out using the NiD 50 mg/l limit. Groundwater body state was evaluated as poor if 50 % or more of the monitoring sites were above the limit for nitrates.

NiD monitoring sites represent 44 groundwater bodies and 6 of them have a “poor state” rating with the national threshold (1 GWB has the same results as seen under the WFD) – see Figure 3.17. No groundwater body has a “poor state” rating when using the 50 mg/l limit (Figure 3.18).

Ireland provided SoE monitoring sites for 55 GWBs (2004, 2005, 2006, 2007 and 2008) 9 of which have a “poor state” rating at least in one year, regarding the national threshold (Figure 3.19). Only 2 groundwater bodies have a “poor state” rating regarding the 50 mg/l limit

(Figure 3.20).1 GWB with an SoE “poor state” rating is the same as under the WFD for both limits.

GWBs with and without at least 1 NiD or SoE monitoring site are shown in Figure 3.16.

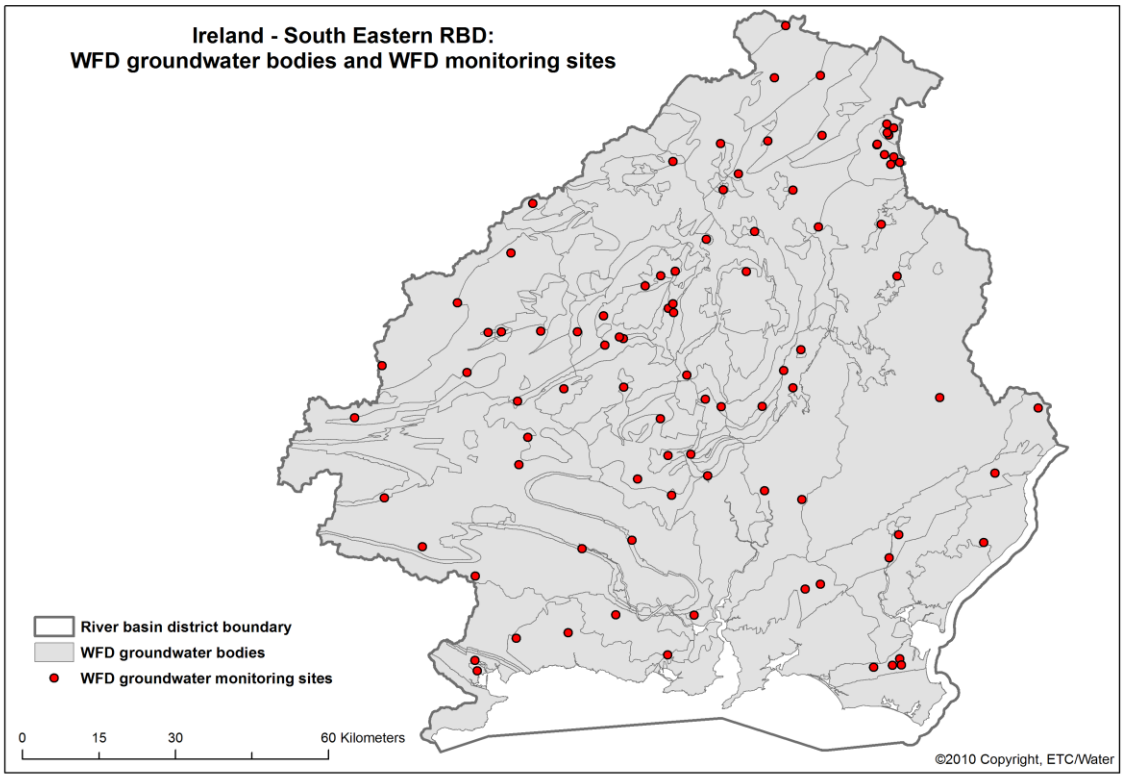
The proportion of identical monitoring sites NiD and SoE is very high - 189 sites out of 210 NiD sites or 216 SoE sites for the entire area of Ireland.

Conclusions for Ireland - South Eastern RBD:

Groundwater bodies are almost not affected by nitrates from all three of the reported streams.

SoE data and NiD data are reported from only 30 % of the groundwater bodies within the RBD.

Figure 3.15 - WFD groundwater bodies in the SE RBD and WFD monitoring sites



Note: Monitoring sites were used from geographical layer only (without any attributes)

Figure 3.16 - NiD and SoE monitoring sites in the SE RBD

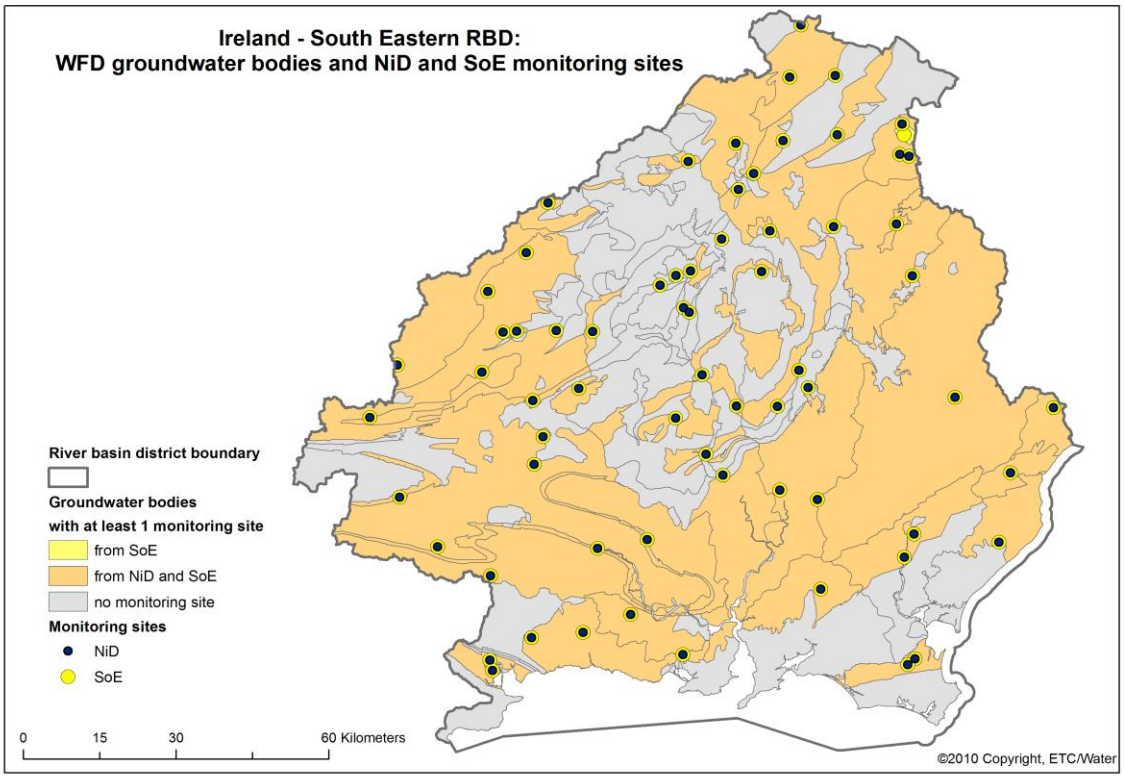


Figure 3.17 - Interpretation of NiD data (based on national threshold value), shown with quality of WFD groundwater bodies under WFD classification

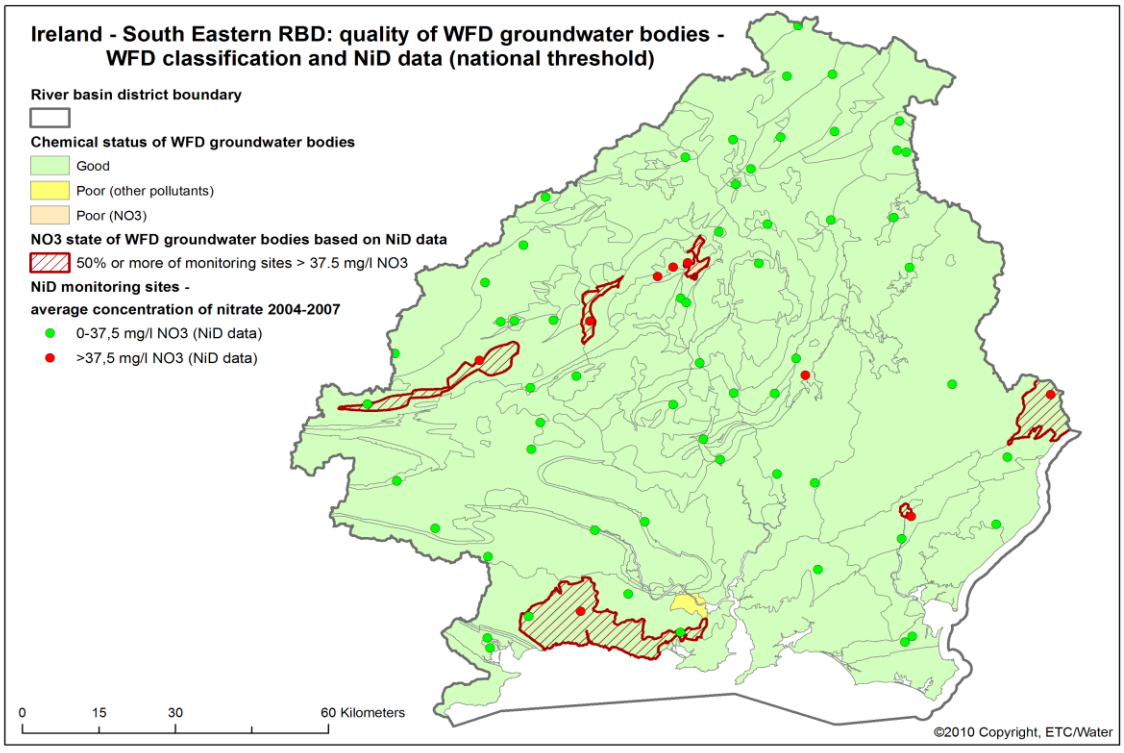


Figure 3.18 - Interpretation of NiD data (based on 50 mg/l limit), shown with quality of WFD groundwater bodies under WFD classification

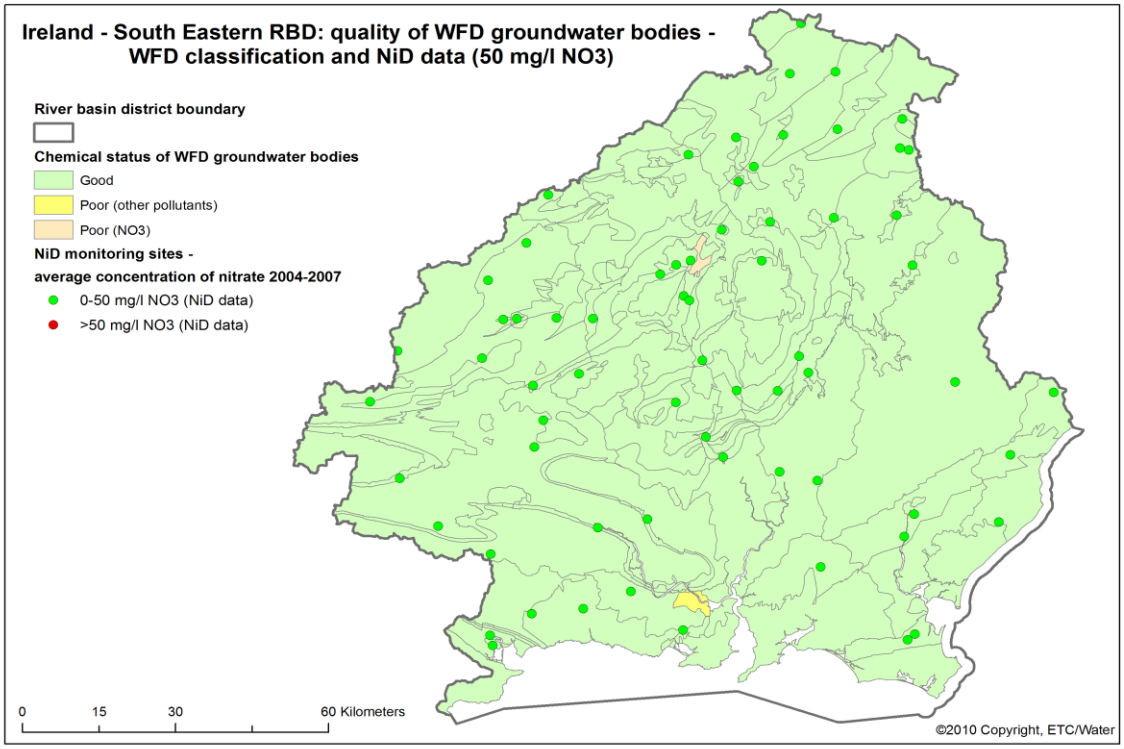


Figure 3.19 - Interpretation of SoE data (based on national threshold value), shown with quality of WFD groundwater bodies under WFD classification

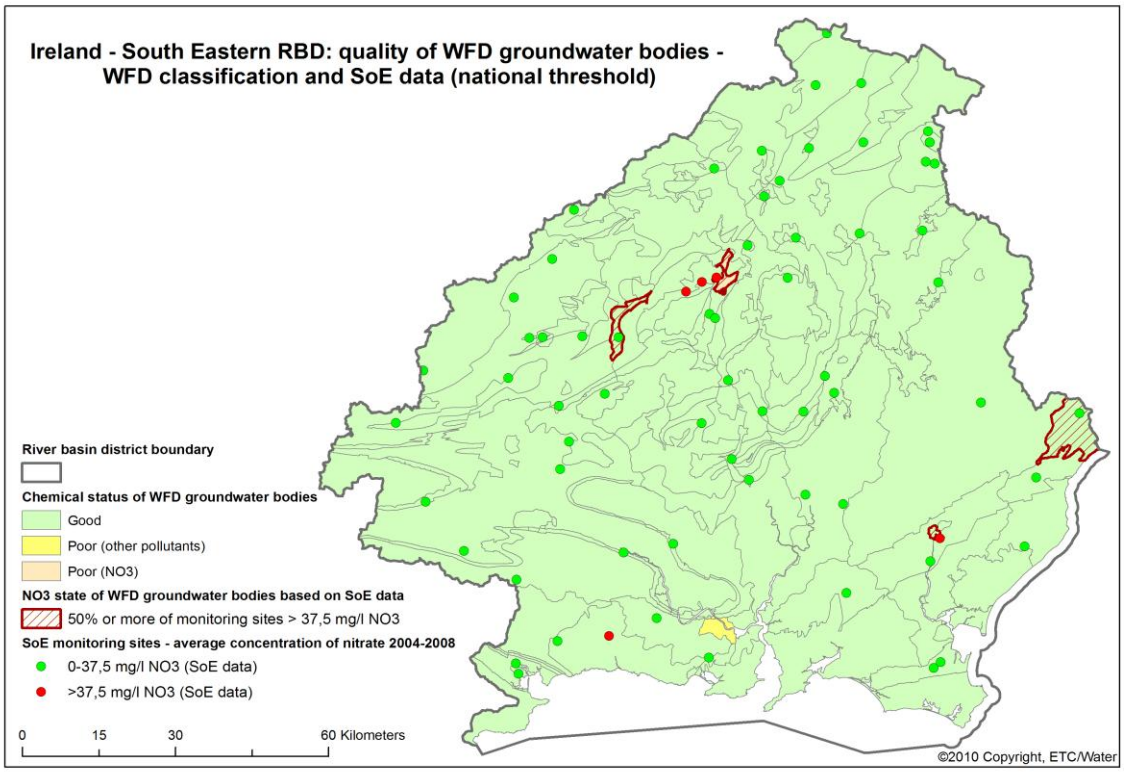
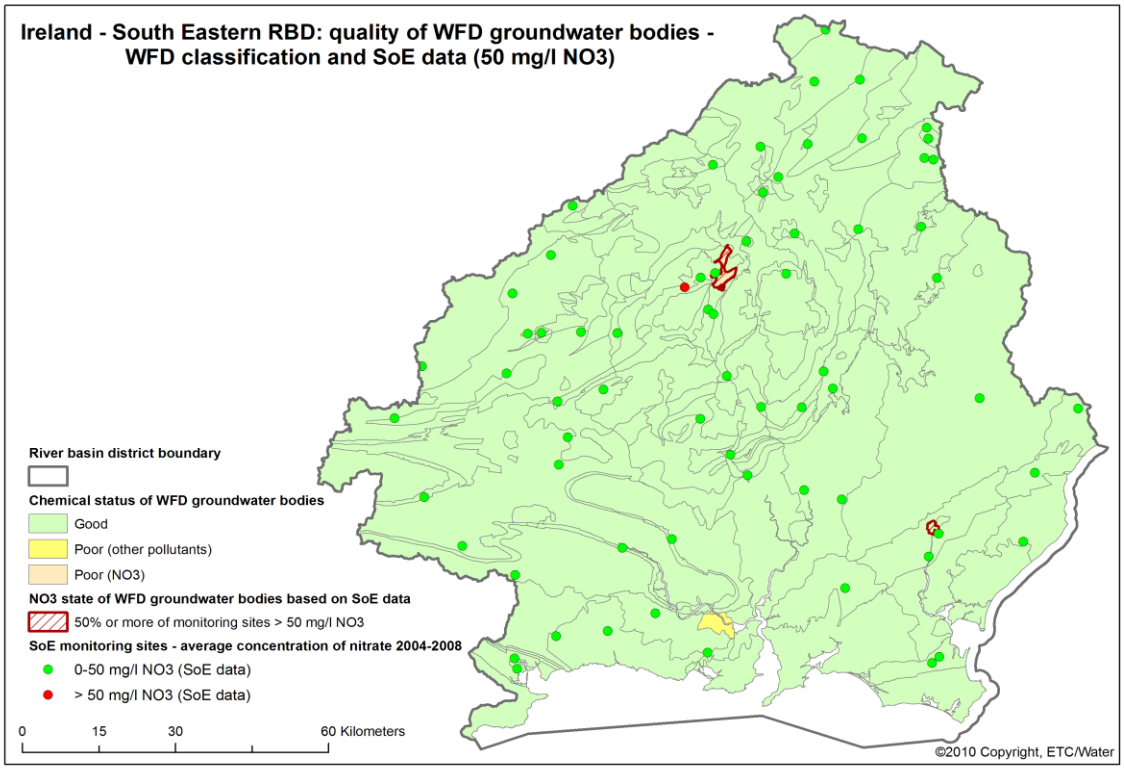


Figure 3.20 - Interpretation of SoE data (based on 50 mg/l limit), shown with quality of WFD groundwater bodies under WFD classification



3.2.5. Surface waters: Example from Ireland – South Eastern RBD

As mentioned above, a nitrates assessment can be part of the ecological status or ecological potential for surface water bodies. The Water Framework Directive requires the assessment of general chemical and physico-chemical elements supporting the biological elements. Nutrient conditions are part of them; however every country can select appropriate determinand for rivers, lakes, and transitional and coastal waters.

Ireland – South Eastern RBD applied the assessment of NO_3 for rivers only (from WFD electronic reporting). Lakes were evaluated according to ammonium and total phosphorus, coastal waters according to dissolved inorganic nitrogen and transitional waters according to molybdate reactive phosphorus (MRP). Boundaries of nitrates between high, good and moderate status for rivers were not found out, so a limit of 50 mg/l was used for the NiD and SoE assessment.

The SE RBD contains 714 water bodies – 672 rivers, 12 lakes, 21 transitional water bodies and 9 coastal water bodies (Figure 3.21). An assessment was completed for rivers only, because nitrates are not relevant for the ecological status assessment for lakes and transitional and coastal waters. 24 rivers have relevant lines in the geographical layer and are shown on the map with the assessment.

24 out of 672 rivers were classified as in a moderate status of general chemical and physico-chemical element; however 395 rivers had no information about their status. The moderate

status of the general chemical and physico-chemical element might not necessarily mean a nitrates value is responsible because the assessment was produced for BOD, total ammonia, ortho-phosphate and nitrate together.

NiD monitoring sites represent 50 surface water bodies (rivers) and none of them have a “poor state” rating (Figure 3.22).

Ireland provided SoE monitoring sites for 50 WBs – rivers (2004, 2005, 2006, 2007 and 2008) and none of them have a “poor state” rating (Figure 3.23).

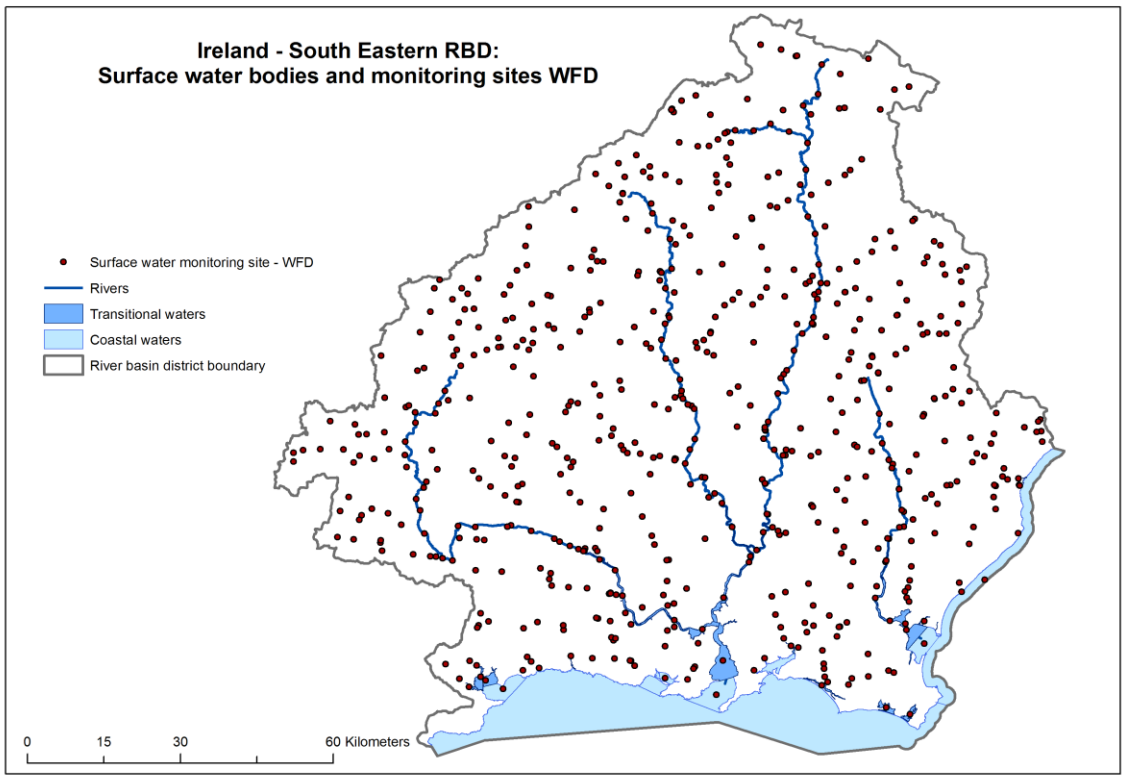
The proportion of identical monitoring sites NiD and SoE is very high - 123 sites out of 148 NiD sites or 153 SoE sites for the entire area of Ireland.

Conclusions for Ireland - South Eastern RBD:

WFD water body classification is comparable with neither NiD nor SoE nitrate concentration assessments. Nitrates are part of the WFD ecological status assessment for rivers only and no river water body is polluted by nitrates according to the NiD or SoE data. The moderate status of general physico-chemical elements could be caused by other determinands such as BOD, total ammonia or ortho-phosphate.

SoE data and NiD data are reported from only 7 % of the surface water bodies in the RBD.

Figure 3.21 - Surface water bodies in the SE RBD and WFD monitoring sites



Note: Monitoring sites were used from geographical layer only (without any attributes)

Figure 3.22 - Interpretation of NiD data, shown with quality of river SW bodies under WFD classification

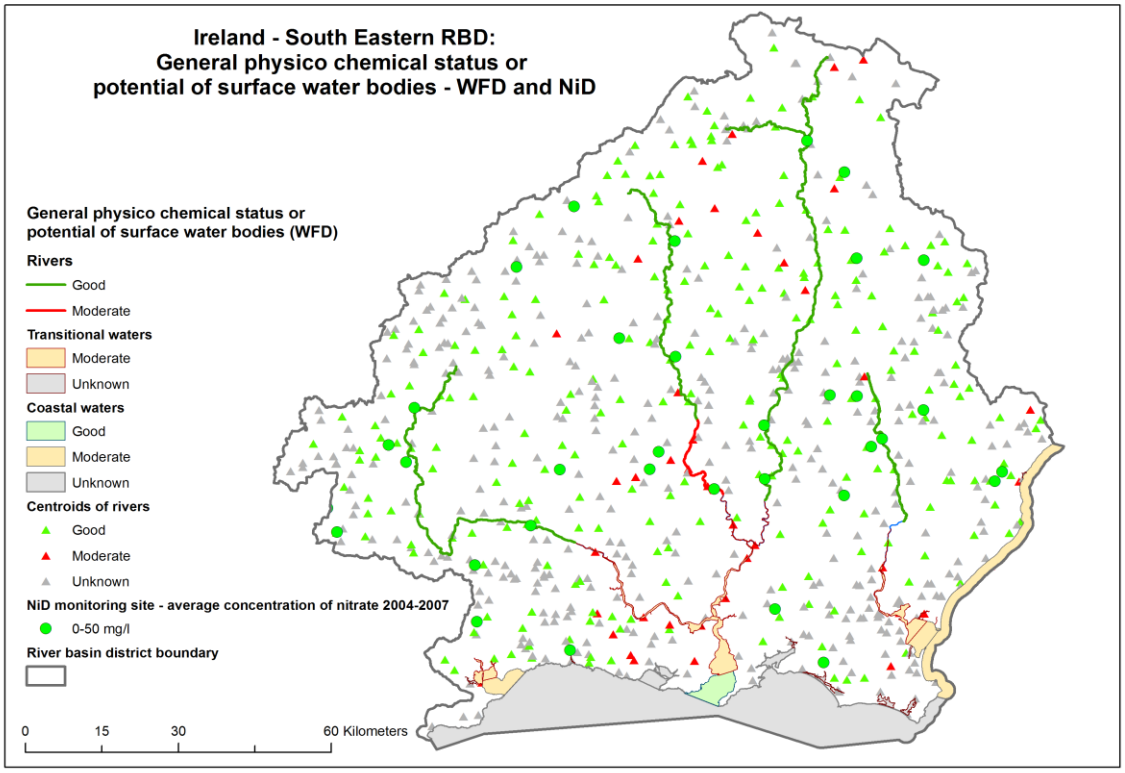
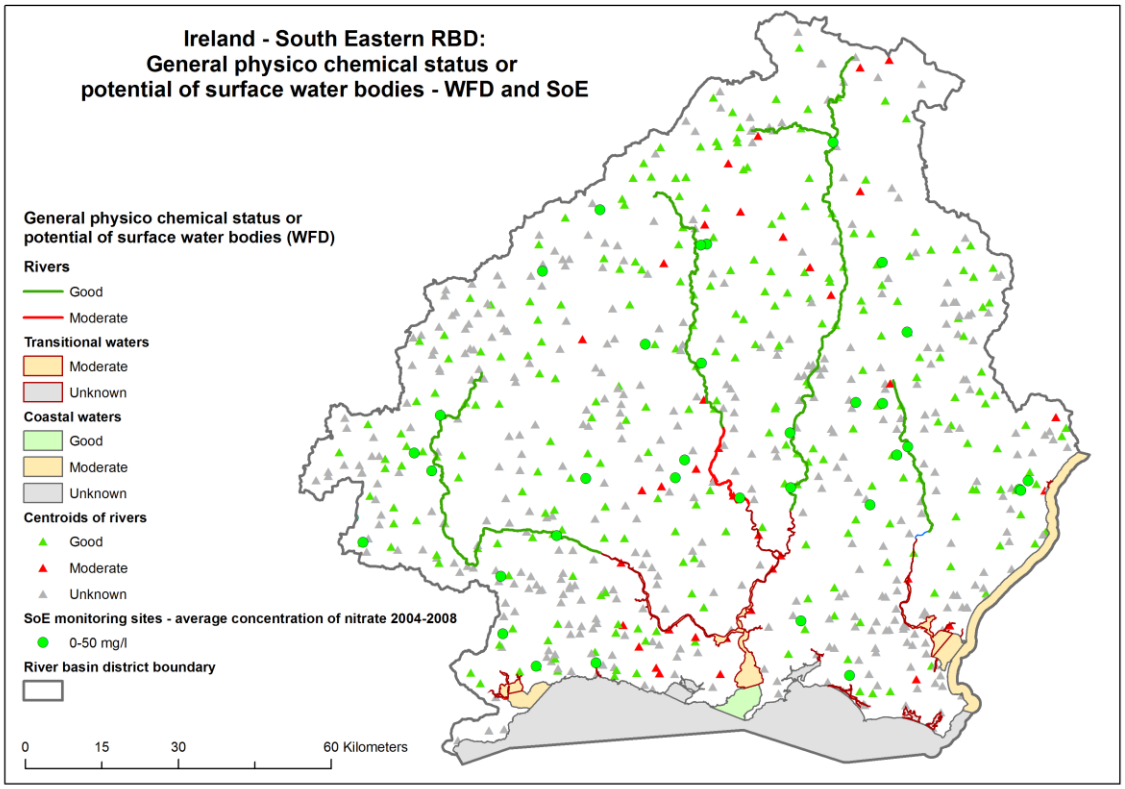


Figure 3.23 - Interpretation of SoE data, shown with quality of river SW bodies under WFD classification



4. Conclusions

The comparison of the Nitrates Directive, Water Framework Directive and State of Environment reporting was done for nitrogen or nitrates only. Other data (e.g. phosphorus, BOD, COD, chlorophyll-a) have not been compared in this report.

Data from the **WFD** reporting provides information on the status of water bodies and pollutants responsible for a poor status rating (for groundwaters only) or monitoring site characteristics, but no information about nitrates or other pollutant concentrations. Information regarding if the status of a water body was assessed from concentrations at monitoring site(s) or derived from other information is also missing. Data regarding water body status are provided every 6 years, the updating of monitoring sites can be done any time.

The **Nitrates Directive** data provides a nitrogen concentration value for every monitoring site. The reporting period is every 4 years when one characteristic nitrogen value (average) for the whole period is reported. The last reporting period was 2004 – 2007 and reporting was also done in 2008, therefore, some countries did not include data from 2007. Time period of characteristic nitrogen concentration value (mean, maximum of nitrates concentration) differs per country – e.g. Bulgaria provided means for rivers from 2004 -2007, Czech Republic from 2004 – 2006, Hungary from 2004 – 2005 and Malta from November 2007 to April 2008. The time period varies according to the water category (rivers, lakes, groundwaters, and TCM waters) and/or monitoring site.

The **SoE** data contains annually reported characteristic values for nitrates and other determinands (mean, median, maximum and minimum) for every monitoring site. Data is reported separately for rivers, lakes and TCM. Groundwater data is provided as disaggregated (individual measurements for monitoring sites) or aggregated at the water body level.

Only SoE reporting specifies the method of data aggregation (mainly replacement of concentrations below quantification limit with a value equivalent to half the limit of quantification). Aggregation is not relevant for WFD reporting.

Monitoring site comparison showed low overlap among SoE, NiD and WFD reported monitoring sites. This is partly because of different monitoring networks, the selection of monitoring sites for SoE, NiD and WFD and inconsistencies between IDs and coordinates (different projection). The new comparison of SoE and NiD monitoring sites was done for selected countries (with more than a 10 % greater number of reported monitoring sites). Changes in the 2010 analysis compared to the 2009 analysis documented improvement for groundwaters and rivers, but less for lakes.

Nitrates pollution comparison in groundwaters was done for 4 river basin districts (Austria – Danube, France – Seine and Normandy coastal waters, Czech Republic – Elbe and Ireland – South Eastern RBD).

The comparison was prepared at the water body level. Information about status assessment was used from the WFD. Nitrates state was assessed based on the NiD data as well as on

the SoE data. The same national threshold limit for “good” and “poor” statuses such as in the WFD national approach was used if available. In addition, the 50 mg/l NO_3 limit was applied for all river basin districts. Although the same limit and percentage of exceeded monitoring sites was used, results cannot be fully comparable. Results differ for the NiD, WFD and SoE data, with the main differences listed here:

- Two countries out of the four tested RBDs used the national threshold limit for nitrates in groundwaters lower than 50 mg/l – Austria (45 mg/l) and Ireland (37,5 mg/l). The Czech Republic and probably France (information was missing in the WFD reporting) used the 50 mg/l limit for groundwaters.

- Water bodies rated as “poor” in NiD/SoE but “good” in WFD: The reason is a different number of monitoring sites per same water body for the NiD, SoE and WFD reporting. Example: If a WFD groundwater body status is assessed from 30 monitoring sites and NiD or SoE reporting includes 5 sites only, the results could be different.

- Water bodies rated “good” in NiD/SoE but “poor” in WFD: the reason for this is the pollution of groundwater bodies which could be also from non-agricultural sources.

- The results of this European level nitrates pollution comparison differ from national assessments. Although national threshold values have been used and only the sites with values above the threshold got a “poor state” rating, the results at European and national levels are different.

Nitrates pollution comparison in surface waters was done for Ireland – South Eastern RBD only. The number of compared RBDs could not be higher because the data was not quality assured and not stored in a database yet. The comparison of the nitrate assessment for surface water bodies is not very reliable because of the following reasons:

- WFD reporting includes information about the quality element (e.g. fish, phytoplankton, macrophytes or general physico-chemical) status only, not pollutants such as NO_3.

- General physico-chemical elements are supporting the biological quality elements in the ecological status analysis and countries can choose determinands which they find relevant for the biological elements. For example, Ireland assessed nitrates in rivers only. Lakes were evaluated according to ammonium and total phosphorus values. Dissolved inorganic nitrogen was used in coastal waters and molybdate reactive phosphorus in transitional waters.

- WFD ecological status should be assessed at representative monitoring sites. NiD or SoE monitoring sites do not need to be representative for the whole water body.

The list of reasons above can be extended.

Another interesting result came up: The matching number of reported stations is not the only important information from the monitoring sites comparison. The number of water bodies with at least one reported monitoring sites is also important - if only some water bodies were

selected for the SoE monitoring sites reporting, it would be useful to know the reasons for these water bodies' selection.

Annex 1: Comments on this report by Member States

Member States of the EU27 and the EEA member countries were given the opportunity to comment on the results presented in this report. Since the comments represent the opinion of the countries and provide explanations of the results, we decided to compile the comments in this Annex as given by the countries.

The ETC/ICM received comments from 4 countries: Austria, France, Estonia and Slovakia. Slovakia had sent their comments only in the national language and did not provide an English version. Therefore, their comments are not presented here. Cited comments are displayed in *italic blue font*.

Comments by France

Thank you for having sent us this comparison between NiD, WFD and SoE nitrate reporting. For France, we would try to resolve problems with NiD – SoE groundwaters prefixes, for the next reports.

A study have also been carried out in France about the comparison of the networks implemented for WFD and NiD. So, we hope to improve soon the quality of reported data.

Otherwise we have some doubts with the method proposed to compare the status reported of water bodies for WFD with the status calculated.

The both status are not calculated over the same period of raw data. Consequently it is very difficult to compare the results but it is also indicated in the report.

Comments by Estonia

After having studied the document it seems, that when calculating the number of NiD stations (starting from table 1.1) or NiD stations for 2009 (starting from table 2.1), only monitoring stations within the Nitrate Vulnerable Zone have been taken into account. This can be the result of misunderstanding the reporting exercise from Estonian side. Estonia had an understanding, that only NVZ monitoring stations were needed to report station by station in excel tables. As the non-NVZ monitoring stations were reported in EIONET, Estonia did not provide this information to the current Nitrates directive report (but the information was used for characterizing the situation in Estonia as the whole and provided for the Commission later).

*In case of Estonian monitoring sites (Table 2.2, row EE): 2009 dataset contains **only** surface water monitoring sites within the Nitrate Vulnerable Zone (10 stations). 2010 dataset contains **total number** of Estonian surface water (river) monitoring sites (57), but still only 10 of them are situated within the NVZ territory. Therefore, Estonian monitoring network has remained the same in 2009 and 2010 and the increase of 470% is not true (should be 0% change in 2009-2010).*

Table 2.3, row EE: 2010 dataset (13 lakes) reflects total lake monitoring sites of Estonia, not NiD lake monitoring sites. Within NVZ (and NiD reporting) we do not have any lakes (as reflected in 2009 dataset: no data). Therefore no data (0 lakes) should be written also in the

NiD 2010 table-cell. Change 2009-2010 100% is in-correct, the monitoring network has remained the same in 2009-2010 (0%) also in NiD as it is in SoE columns.

Comments by Austria

Please find below the Austrian comments to the report: "Nitrate Reporting Comparison V1.3" which was produced by the ETC-Water and compares the reporting of nitrate information under WFD, the Nitrates Directive and SoE-WISE.

1. *For Austria, all three reporting streams (WFD, SoE and NiD) are **based on an identical data basis**. The sampling stations are identical as well as the station codes (WFD-code), the delineation of groundwater bodies and the measured values. Differences in the reporting are due to the following reasons:*

    - *With regard to WFD reporting **all data from the entire data network are used** as long as they meet the specific requirements.*
    - *With regards to NiD **all data from the entire data network are used** except the deep groundwater bodies (and their monitoring points) which are – due to their extreme low concentrations of nitrates - not relevant and therefore not covered under the NiD, in accordance with the Directive. Regarding to the number of reported groundwater monitoring stations an aggregation of the high number of monitoring stations in **porous aquifers** took place. This exercise was carried out in order to ensure **"readability of maps"** at a European scale.*
    - *SoE groundwater for Austria covers a selection of 14 representative groundwater bodies including all data from these bodies (as for WFD and NiD). The selection of groundwater bodies is in accordance with the criteria laid down in the respective EIONET Guidance [Guidance on Reporting required for assessing the state of, and trends in, the water environment at the European level", EEA 2009].*

In addition to the above mentioned reasons for a different number of monitoring sites this inventory was made in a transition period where changes due to the adaptation of the existing monitoring according to WFD requirements happened, hence causing changes in the monitoring networks. The presented NiD data are based on the monitoring stations observed between 2004 and 2007 and the amended WFD conform monitoring network is now in place since 2007 (considerable changes in the surface water network and monitoring strategy). Differences are therefore self-evident. Moreover, monitoring networks need to be regularly evaluated based on the monitoring results and – if necessary, adapted! Hence changes of the monitoring network usually happen regularly.

2. *Status assessment according to the WFD is based on national criteria; hence **any re-assessment** of **"status"** by a different than the national approach (different set of monitoring stations, different aggregation methodology, different aggregation period and different criteria) **is not admissible**. Any kind of assessments different to the national WFD approach must not be denoted "status assessment". **Therefore we strongly reject the respective statements and conclusions drawn in chapter 3.2.1 and the comparison made in Table 3.5 as they are misleading**. Most apparent discrepancies between the three different reporting streams are listed in the Addendum below.*

3. *In the first half of 2010 the EC distributed a questionnaire about the comparison of the same 3 reporting streams. Detailed comments and explanations were provided,*

explaining the national (AT) situation and the differences in the networks. The results of this survey should be integrated in this report.

4. *The overall conclusions of the report could emphasis the temporal harmonization in terms of the reporting frequency and the data aggregation period and it could mention the harmonization of aggregation methods e.g. streamlining the reporting periods for WFD and NiD considering aspects of quality assurance (see Commission Directive 2009/90/EC on technical specifications for chemical analysis and monitoring of water status).*

A very important step forward in the harmonization and streamlining process would be the promotion and application of a unique coding system for monitoring stations in each Member State subject to EU reporting (e.g. WFD coding).

5. ***We kindly ask you to insert the following summary as an introduction to chapter 3.2.1 "Austria-Danube RBD":***

For Austria, all three reporting streams (WFD, SOE and NiD) are based on an identical data basis. The selection of monitoring stations fully complies with the requirements and criteria given in the respective directives and guidelines. Differences in the number of monitoring stations are mainly due to the different requirements of the obligations, the different guidelines and the fact that the inventory was made in a transition period where major changes regarding WFD implementation happened and thus major changes in the monitoring networks.

Status assessment according to the WFD is based on national criteria and national methodologies; hence the re-assessment by a different data basis, a different methodology and different criteria is not admissible and shall not be denoted "status assessment".

Austria highly appreciates all efforts on streamlining of reporting on EU level and the "report once, use many" approach of the EC/EEA. At the moment a lot of parallel reporting is done, not at least because of completely different reporting frequencies (6 years for WFD, 4 years for NiD, annual basis for SOE) and the different aggregation methodologies. We encourage both, the EC and the EEA to look at the different reporting cycles and to harmonize them to those of the EU WFD in order to get maximum benefits out of the ongoing process.

Addendum

The addendum just focuses on groundwater aspects. Similar discrepancies/deviations are valid for surface waters as well.

1. ***Three different reporting streams – three different requirements and guidelines***

   Background and underlying documents and objectives:

   - *SOER: The underlying document is "Guidance on Reporting required for assessing the state of, and trends in, the water environment at the European level", EEA 2009. The key concepts are:*
     - *It compares like with like,*
     - *It has a statistically stratified design "tailor made" for specific issues and questions; and*
     - *It has a known power and precision*

For EIONET-Water data and information was requested from the monitoring of all relevant groundwater bodies (groundwater in porous media, karst groundwater and others) and including both shallow and deep aquifers. Relevant groundwater bodies were those that met at least one of three criteria. These were:

- *> 300 km² in area;*
- *of regional, socio-economic or environmental importance in terms of quantity and quality;*
- *exposed to severe or major impacts, representing different possible pressures.*

- *NiD monitoring and reporting: Monitoring requirements are laid down in Art. 6 of Directive 91/676 EWG – the requirements differ from EIONET-Water and WFD requirements.*
- *WFD monitoring: Monitoring requirements for groundwater are laid down in Art. 8 and Annex V of the WFD. Compared to EIONET-Water and NiD requirements, this is the most comprehensive approach.*

2. Most apparent discrepancies between the 3 different reporting streams:

- *Spatial aggregation should be identical (GWBs)*
- *Selection of monitoring stations: NiD focuses on nitrates from agriculture, SoE and WFD consider all kind of pollution.*
- *Temporal aggregation:*
  - *NiD: period mean values (4-year) (mean over the full period) – according to EU guidance*
  - *SoE: annual mean values,*
  - *WFD: period mean values (e.g. 3-annual in AT) (e.g. mean of annual means or mean over the full period), according to national approach.*
- *Reported elements:*
  - *NiD: mean values, max values, number of stations according to concentration classes, (based on EU guidance),*
  - *SoE: annual mean values per station,*
  - *WFD: "status" of GWB (based on national methodology).*
- *Standards:*
  - *NiD: 50 mg/l NO3 based on Directive,*
  - *SoE: 50 mg/l NO3 based on ETC/EEA decision,*
  - *WFD: 50 mg/l or national threshold value (< 50 mg/l, e.g.45 mg/l NO3 in AT)*

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