

Groundwater status assessment in International Elbe River Basin District

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Groundwater status assessment in the International Elbe River Basin District

1. Chemical Status Assessment
 - Method
 - Results
2. Quantitative Status Assessment
 - Method and Results in an Overview
3. Exemptions
4. Main Significant Pressures

1.1 Chemical Status Assessment - Method

Step 1: Establish the national Threshold Value System (2006/118/EC)

naturall and/or anthropogenic substances	Arsenic	10,0 µg/l
	Cadmium	0,5 µg/l
	Lead	7 µg/l
	Mercury	0,2 µg/l
	Ammonium	*(0,5 mg/l)
	Chloride	250 mg/l
	Sulphate	240 mg/l
synthetic substances	Trichlorethylene	Σ: 10 µg/l
	Tetrachlorethylene	
Indicator of (saline) intrusions	Conductivity	-

Threshold values were modified for some GW-bodies on account of background concentrations.

+ EU-quality standards (nitrates, pesticides)

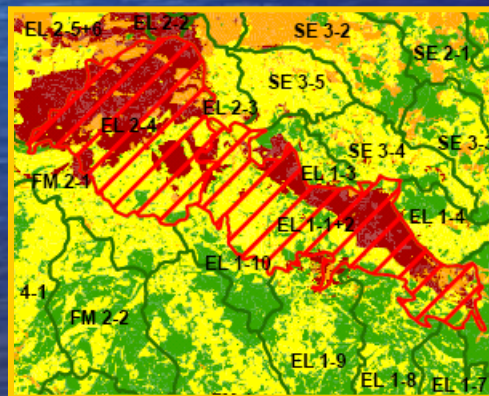
1.1 Chemical Status Assessment - Method

Step 1: Establish the Threshold Value System (2006/118/EC)

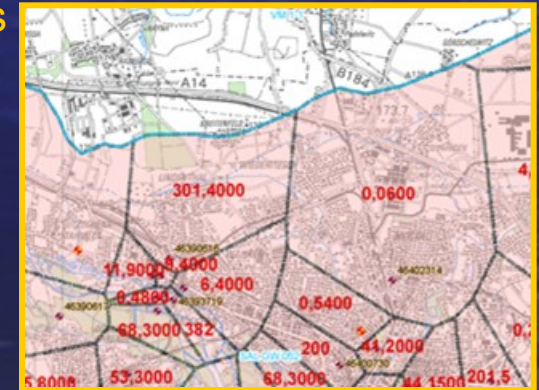
Step 2: Determine the extent of relevant pressures

- Assessment is based on monitoring results, additional information, conceptual model of the GW-body, expert knowledge.
- Determination of the extent of a relevant pressure varied with data availability and issue in question (e.g. dealing with point or diffuse sources)

example: Kriging in the case of diffuse sources



example: Thiessen-polygons in the case of point sources



1.1 Chemical Status Assessment - Method

Step 1: Establish the Threshold Value System (2006/118/EC)

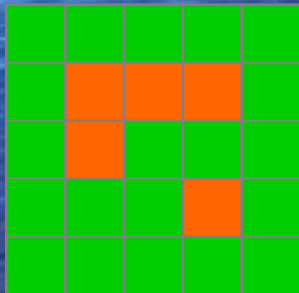
Step 2: Determine the extent of relevant pressures

Step 3: Assessment of the extent of the relevant pressure

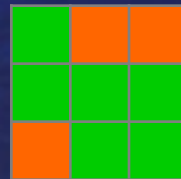
Poor chemical Status

area of exceedance of quality standards/threshold values exceeds an area of

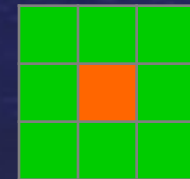
↙
 $\geq 25 \text{ km}^2$
in all cases



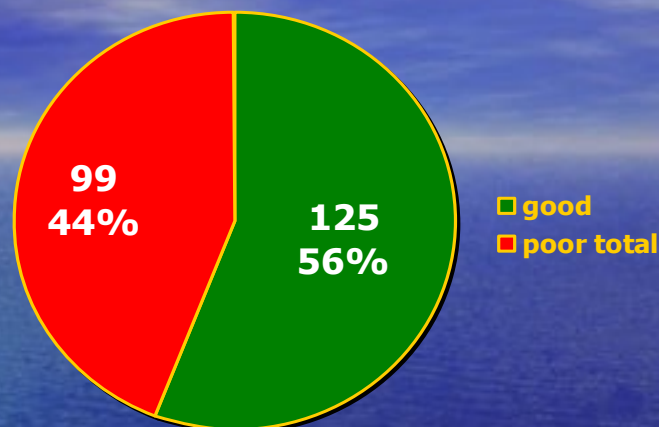
↓
 $\geq 1/3$ of a GW-body
in case of
diffuse sources
and GW-bodies $< 75 \text{ km}^2$



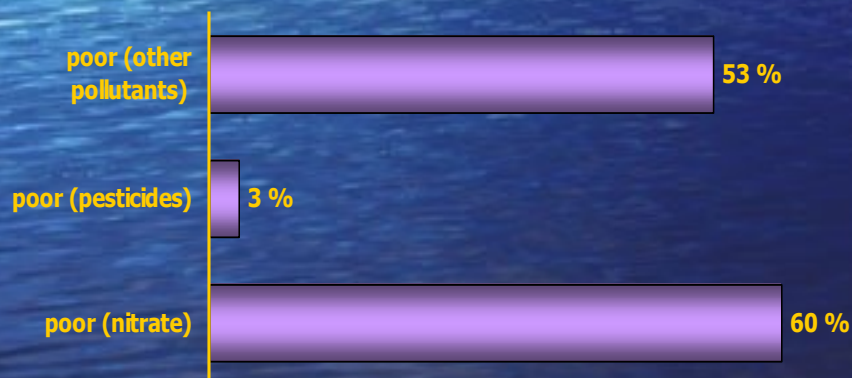
↘
 $\geq 1/10$ of a GW-body
in case of
point sources
and GW-bodies $< 250 \text{ km}^2$



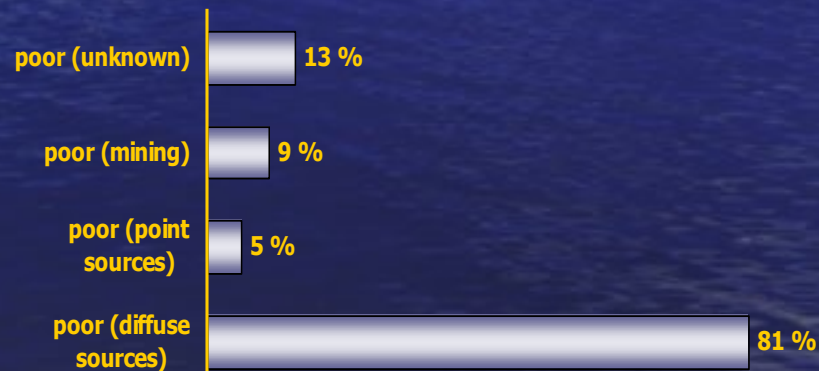
1.2 Chemical Status Assessment - Results



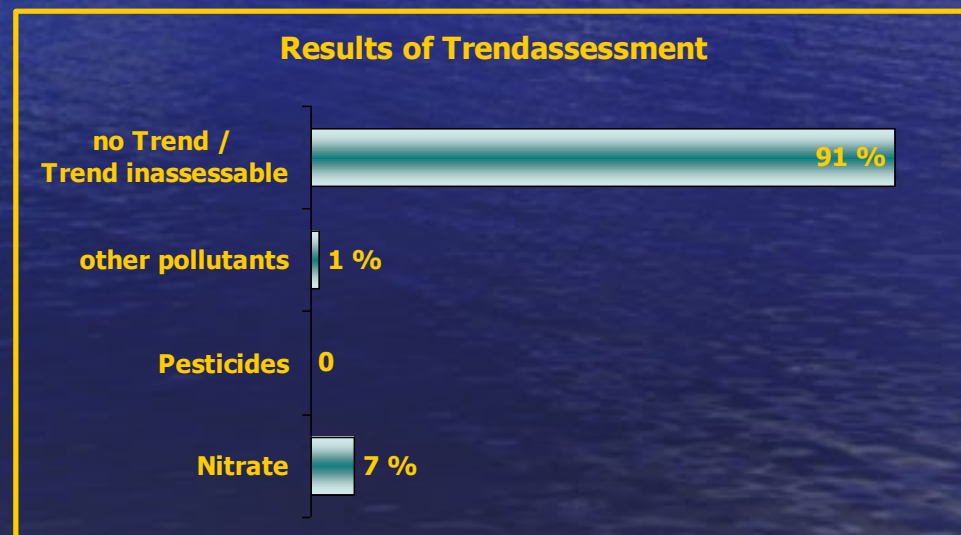
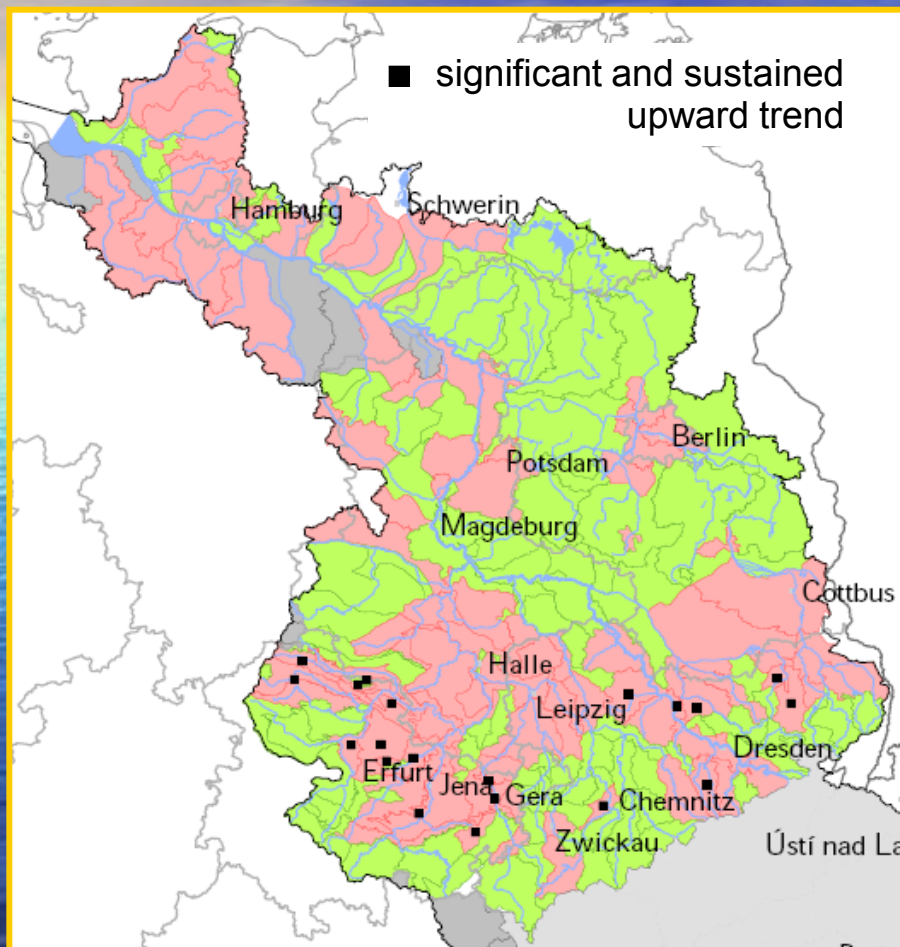
GW-status - Substances
(Percentage of GW-bodies in poor status)



GW-status - Pressures
(Percentage of GW-bodies in poor status)



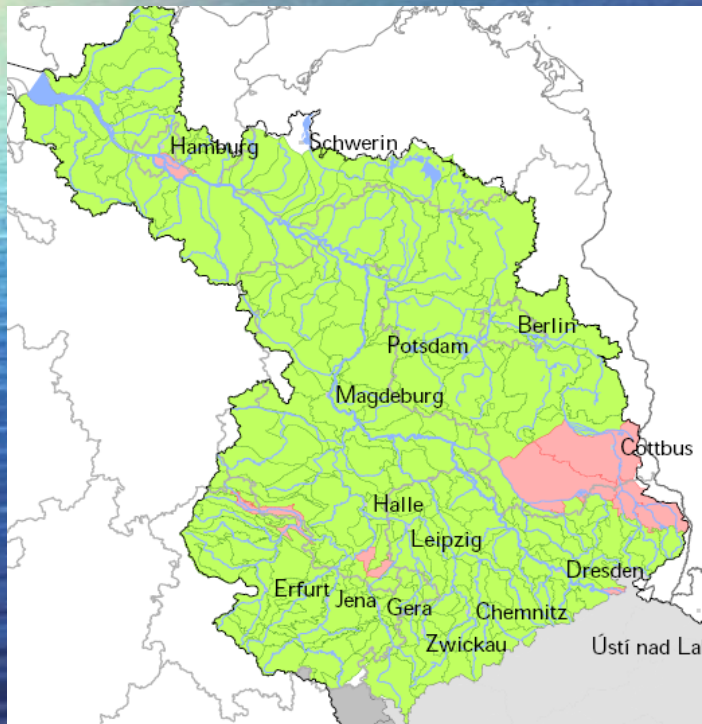
1.2 Chemical Status Assessment - Results



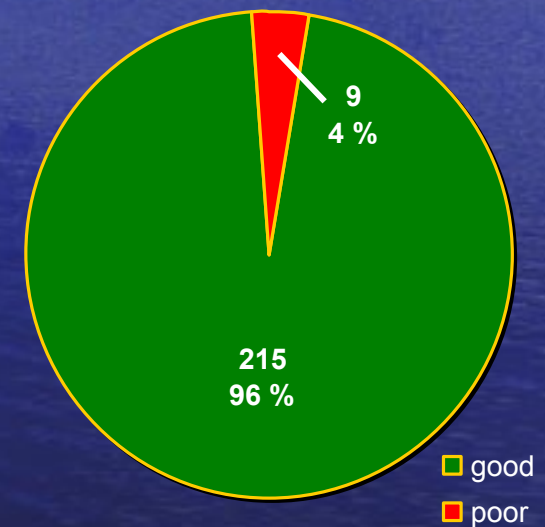
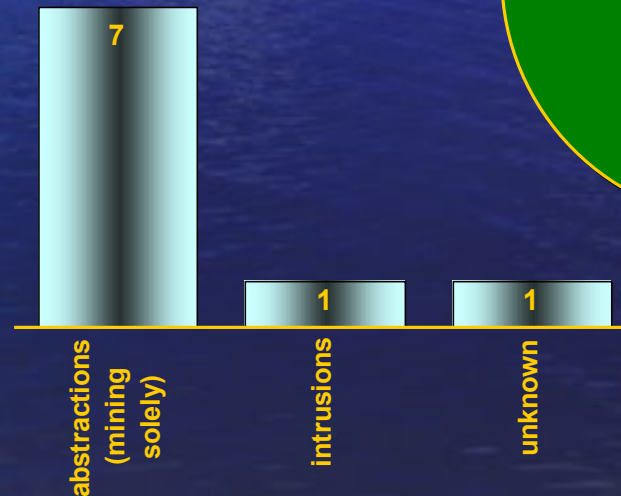
2. Quantitative Status Assessment

Criterion: Exceedance of the available groundwater resource by abstraction is diagnosed in the case of decreasing GW-level and/or intrusion of saline deep groundwater.

Results:

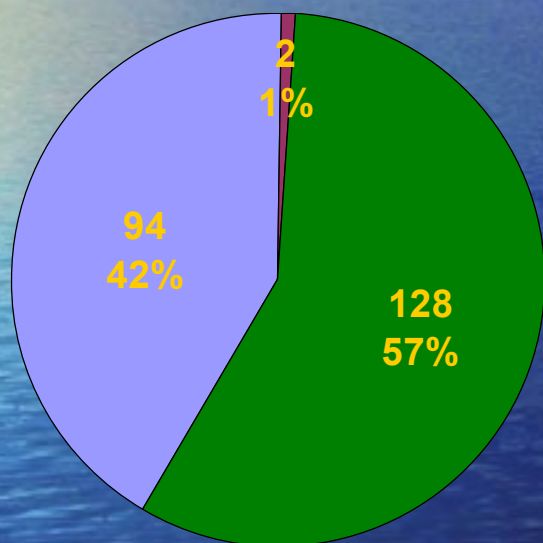


GW-Status - Quantity



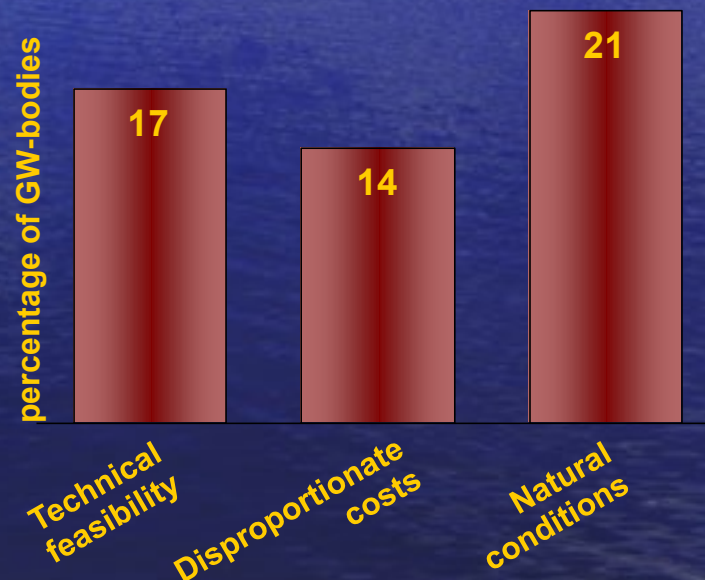
3. Environmental Objectives – Types and Justification

Environmental Objectives

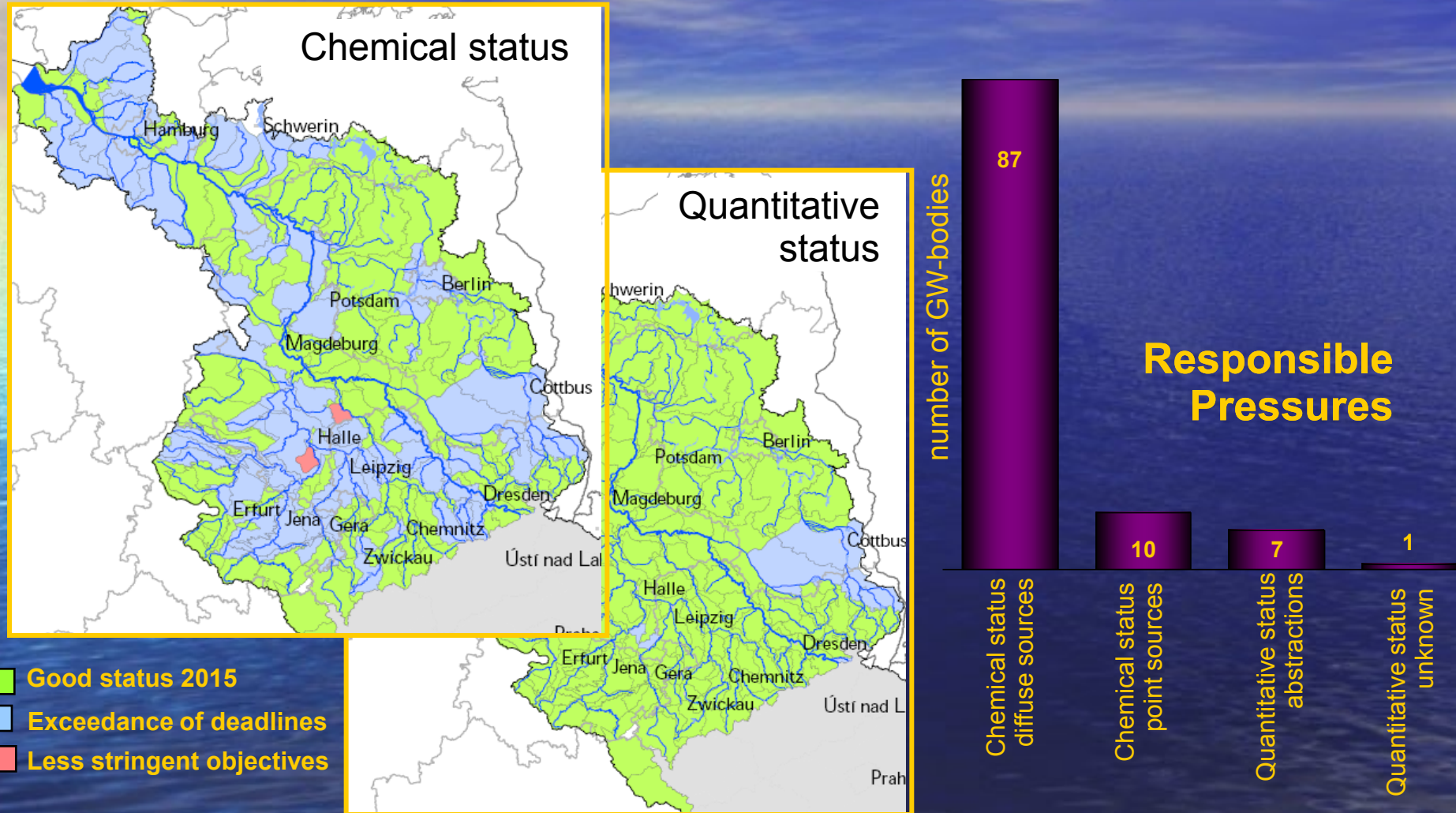


- Good status 2015
- Exceedance of deadlines
- Less stringent objectives

Justification of the Exemptions



3. Environmental Objectives - Pressures



1.1 Chemical Status Assessment - Method

Step 1: Establish the national Threshold Value System (2006/118/EC)

naturall and/or anthropogenic substances	Aluminium	0,2 mg/l
	Arsenic	10,0 µg/l
	Cadmium	0,5 µg/l
	Lead	5 µg/l
	Mercury	0,2 µg/l
	Ammonium	0,5 mg/l
	Chloride	200 mg/l
	Sulphate	400 mg/l
	Nitrites	0,5 mg/l
synthetic substances	Trichlorethylene	10 µg/l
	Tetrachlorethylene	10 µg/l

+ EU-quality standards (nitrates, pesticides)

1.1 Chemical Status Assessment - Method

Step 1: Establish the Threshold Value System (2006/118/EC)




Step 2: Comparision of average concentration with treshhold values

- Data from monitoring network (2004 – 2006)

Step 3: Risk assessment results (point sources, missing data)

Step 4: Assessment of working units

Three categories of results:

Chemical status	
Good	
Potentially poor	
Poor	

1.1 Chemical Status Assessment - Method

Step 5: Synthesis for the level of groundwater bodies

Poor chemical Status

area with poor status ≥ 30 %

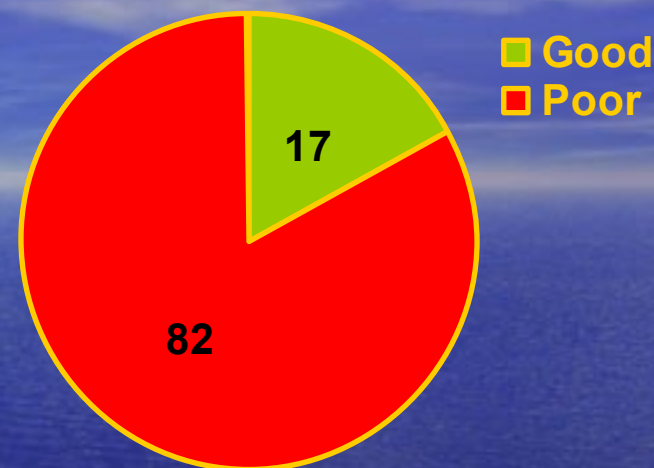
Potentially poor chemical Status

area with poor status < 30 % and area with potentially poor status ≥ 30 % and area of good status < 50 %

Good chemical Status

area with good status ≥ 50 %

1.2 Chemical Status Assessment - Results



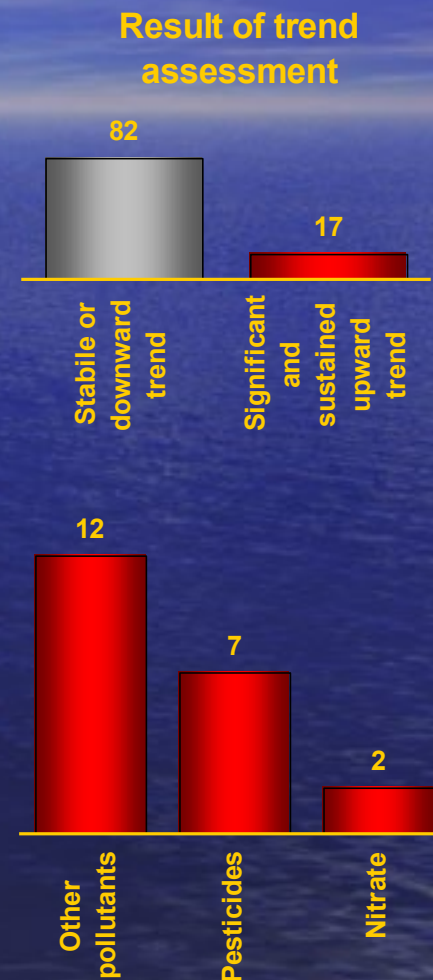
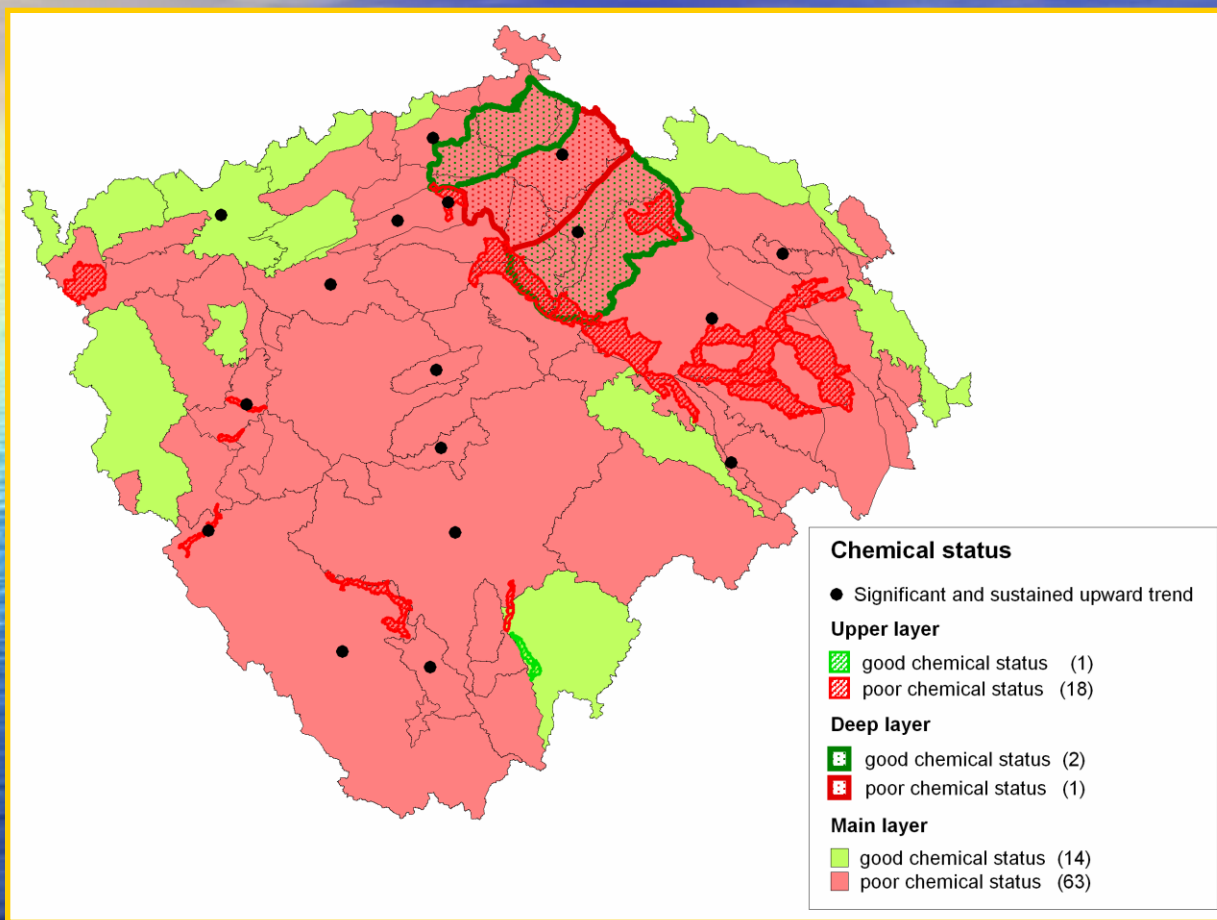
GW-status - Substances
(Percentage of GW-bodies in poor status)



GW-status - Pressures
(Percentage of GW-bodies in poor status)



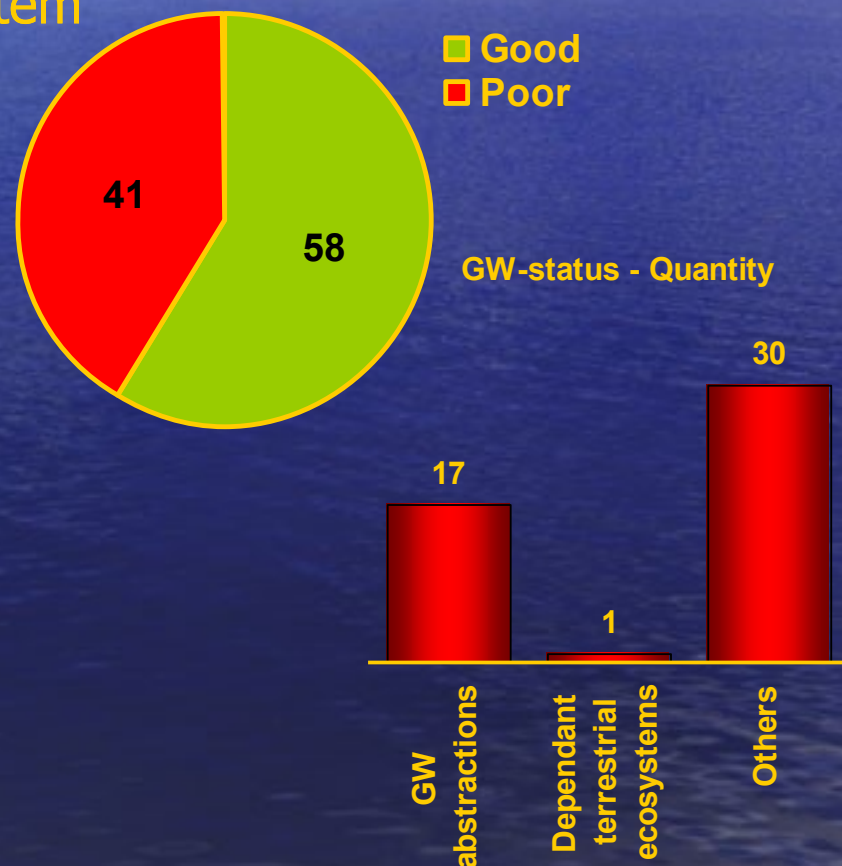
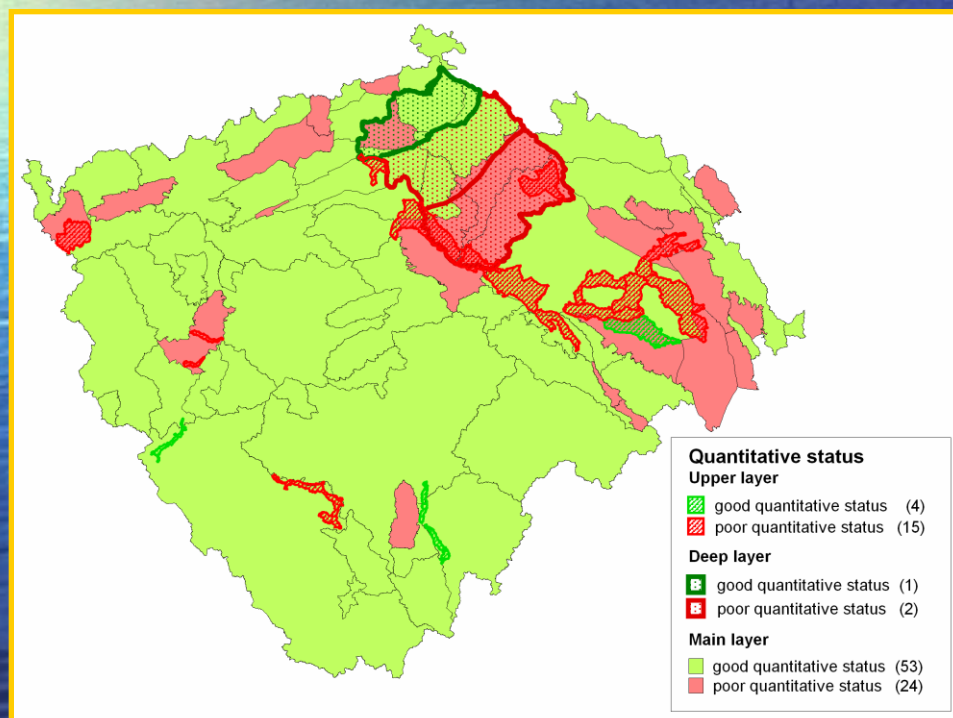
1.2 Chemical Status Assessment - Results



2. Quantitative Status Assessment

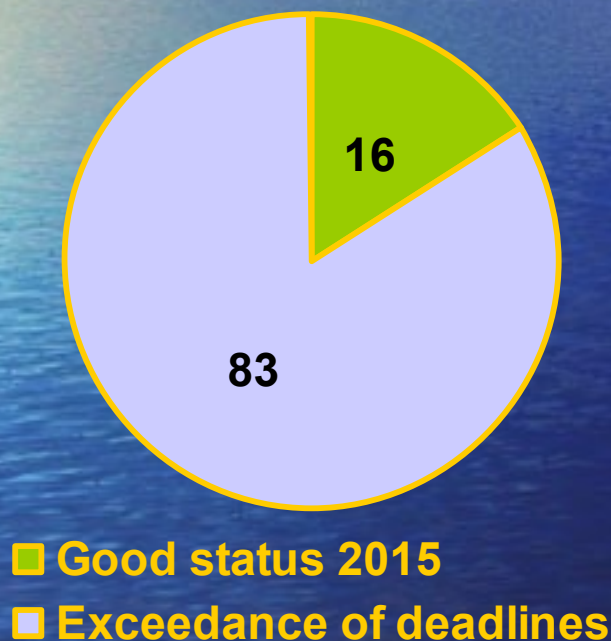
Criteria: Water balance in hydrogeological zones; ratio sum of abstraction to natural sources (base flow); mining, geothermal boreholes and influence on terrestrial ecosystem

Results:

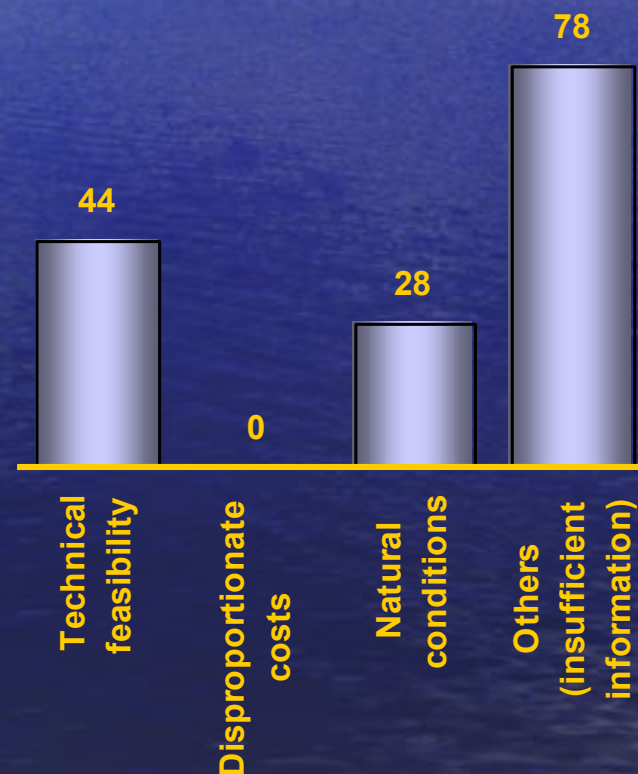


3. Environmental Objectives – Types and Justification

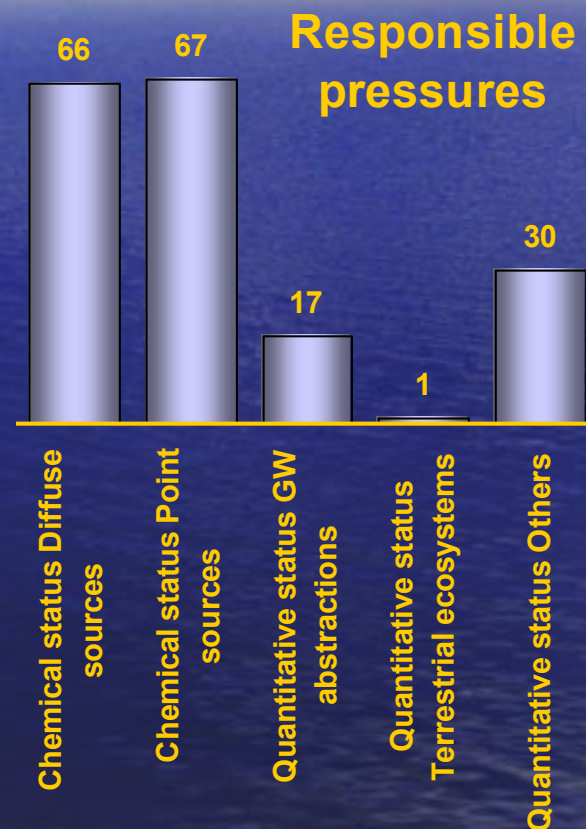
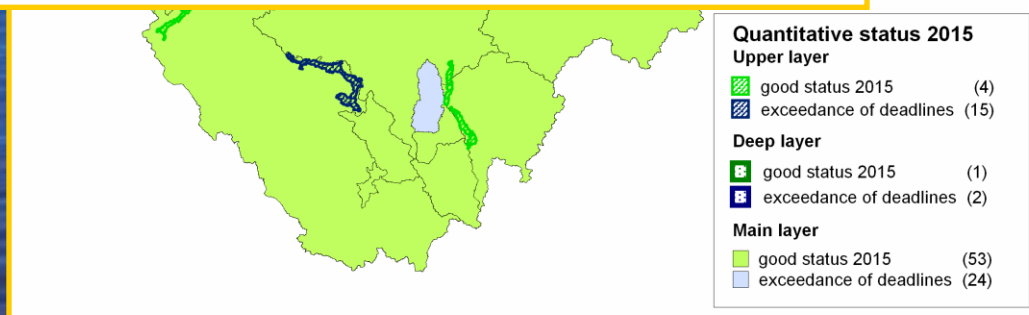
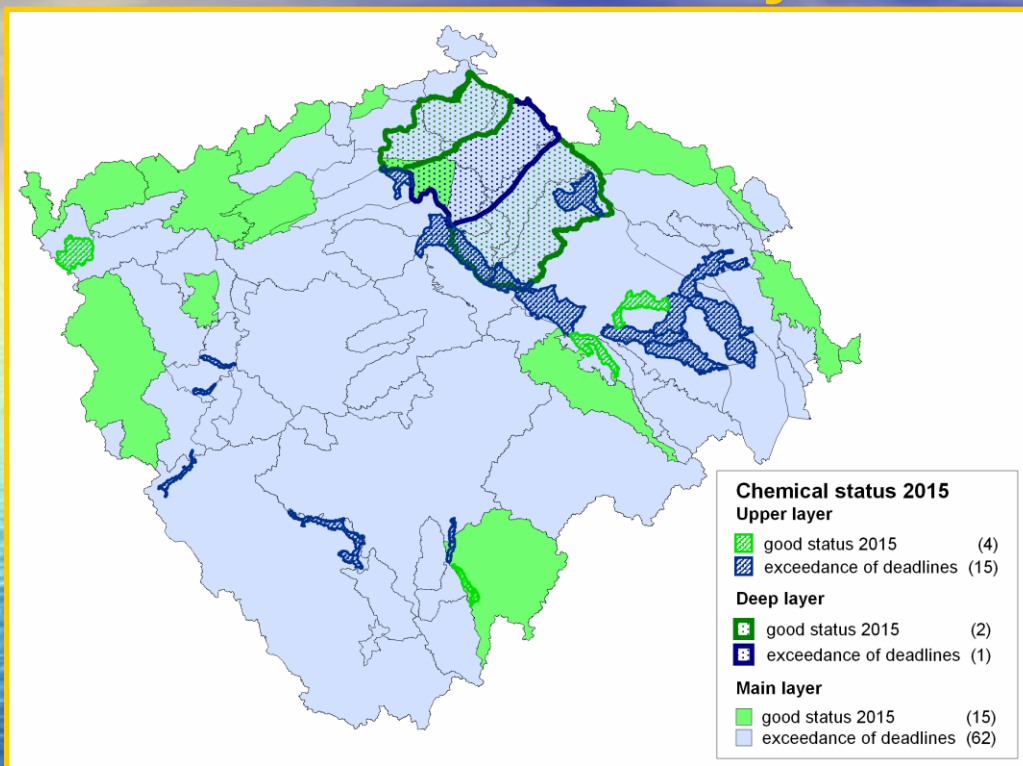
Environmental Objectives



Justification of the Exemptions



3. Environmental Objectives - Pressures



Main Significant Pressures

- Chemical Status Assessment
 - Diffuse sources – N (agriculture, atmospheric deposition – CR)
 - Point sources – CR – old contaminated sites
 - Mining
- Quantitative Status Assessment
 - Abstractions
 - Geothermal boreholes (CR)
 - Mining

Thank you for your attention