

Water Quality monitoring and Water Quality Assessment methodologies

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Training Workshop

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SLOVENSKÝ HYDROMETEOROLOGICKÝ ÚSTAV

Main objectives of SW monitoring:

Since 2007 the quality of surface waters is in accordance with the requirements of the Water Framework Directive and it is monitored through “Surface Water Monitoring Program” also with the aim to assess the ecological and chemical status of surface water bodies.

Main objectives of SW monitoring:

- knowledge of the actual surface water quality status in SR (WFD),
- identification and quantification of the main water pollution problems,
- evaluation of meeting the water status with given criteria based on different water uses,
- assessment of the water quality trends,
- control of fitting the surface water quality imission criteria taken from the national legislation (Governmental Decree 269/2010 Z.z.),
- provision of information on water quality for decision making processes of water management authorities and other stakeholders,
- processing of the reports for EU,
- dissemination of information to international organizations e.g. ICPDR, EEA, EUROSTAT.

Monitoring Requirements - WFD

General Principles

- The individual water bodies selected may vary according to the objectives of the monitoring programme
- More water bodies might have to be monitored in a heterogeneous River Basin District in terms of water body types and pressures than in more homogeneous River Basin District
- Overview of water status should have acceptable level of confidence and precision

Types of Monitoring for Surface Waters :

- **Surveillance monitoring**
- **Operational monitoring**
- **Investigative monitoring**



Monitoring Requirements - WFD

Monitoring objectives

Surveillance monitoring:

- supplementing and validating the impact assessment procedure detailed in Annex II
- the efficient and effective design of future monitoring programmes
- the assessment of long term changes in natural conditions and those resulting from widespread anthropogenic activity
- undertaken for at least a period of one year during the period of a RBMP (ones per 6 year)

Operational monitoring:

- establish the status of those bodies identified as being at risk of failing to meet their environmental objectives
- assess any changes in the status of such bodies resulting from the programmes of measures

Investigative monitoring:

- to ascertain the causes of a water body or water bodies failing to achieve the environmental objectives; or
- to ascertain the magnitude and impacts of accidental pollution.



Monitoring Requirements - WFD

Surveillance

- Parameters indicative of all biological, hydromorphological and general physico-chemical quality elements
- All Priority List substances
- Other pollutants if discharged in significant quantities

Operational

- Parameters indicative of those biological and hydromorphological quality elements most sensitive to the pressures to which the body(ies) are subject
- Only priority substances and other pollutants that might cause failure of EOS

Selection based on
Pollution Reduction Programme



Surface Water Monitoring Program in the Slovak Republic

Characterization of surface waters in SR

Slovak territory = app. 49 000 sq. km

Belongs to 2 international river basins (Danube, Wisla)

Number of river basins: 6

111 natural lakes – all with the area less than 0.5 sq.km

Number of SW body types: 24

Number of identified SW bodies: 1351 (3RBMP)



Surface Water Monitoring Program in the Slovak Republic

The water management sector is regulated by the Ministry of Environment of the Slovak Republic through its strategic and conceptual documents. Surface water quality is monitored in accordance with the Surface Water Monitoring Program (for 5 years, additions for each year).

National cooperation:

- Water Research Institute (WRI) – coordination, water sampling and laboratory analysis, assessment in according to the WFD,
- Slovak Water Management Enterprise (SWME) - water sampling and laboratory analysis,
- Slovak Hydro-Meteorological Institute (SHMI) – data collection, processing, archiving into central database (Central Water Register), evaluated according to the national Regulation of the Slovak Government 269/2010 and data reporting into European Environmental Agency (EIONET) and EUROSTAT, ICPDR

Surface water quality in 2020 – in total 458:

Surveillance monitoring - 69 sites

Operational monitoring - 243 sites

Surveillance and operational monitoring - 57 sites

Protected areas drinking water- 89 sites



Basic set of determinants on all sites

Characteristics	Measured determinands
Temperature regime	temperature
Oxygen regime	dissolved oxygen (mg/l and %)
Total mineralization	conductivity, Ca, Mg, chlorides, sulphates
Acidification status	pH, acidity (AINC), alkalinity (AcNC), water hardness
Nutrients	P-total, N-total, dissolved reactive phosphorus, NO_3^- and NO_2^- , NH_4^+
Other	Suspended solids, Dissolved solids

Surface Water Monitoring Program in the Slovak Republic

Surveillance monitoring determinants

- Basic set of determinants
- Biological quality elements:
 - benthic diatoms, macrozoobenthos and fish
 - macrophytes on sites under 200 m above s.l. (lowland areas)
- Continuous measurement of water level and river discharges
- Hazardous substances and relevant substances
- Internationally agreed determinants on transboundary rivers, 77/795/EC

Operational monitoring determinants

- Basic set of determinants
- Sensitive biological quality elements
- Continuous measurement of water level and discharges
- Hazardous substances identified in risk analysis
- Relevant substances identified in Pollution reduction program

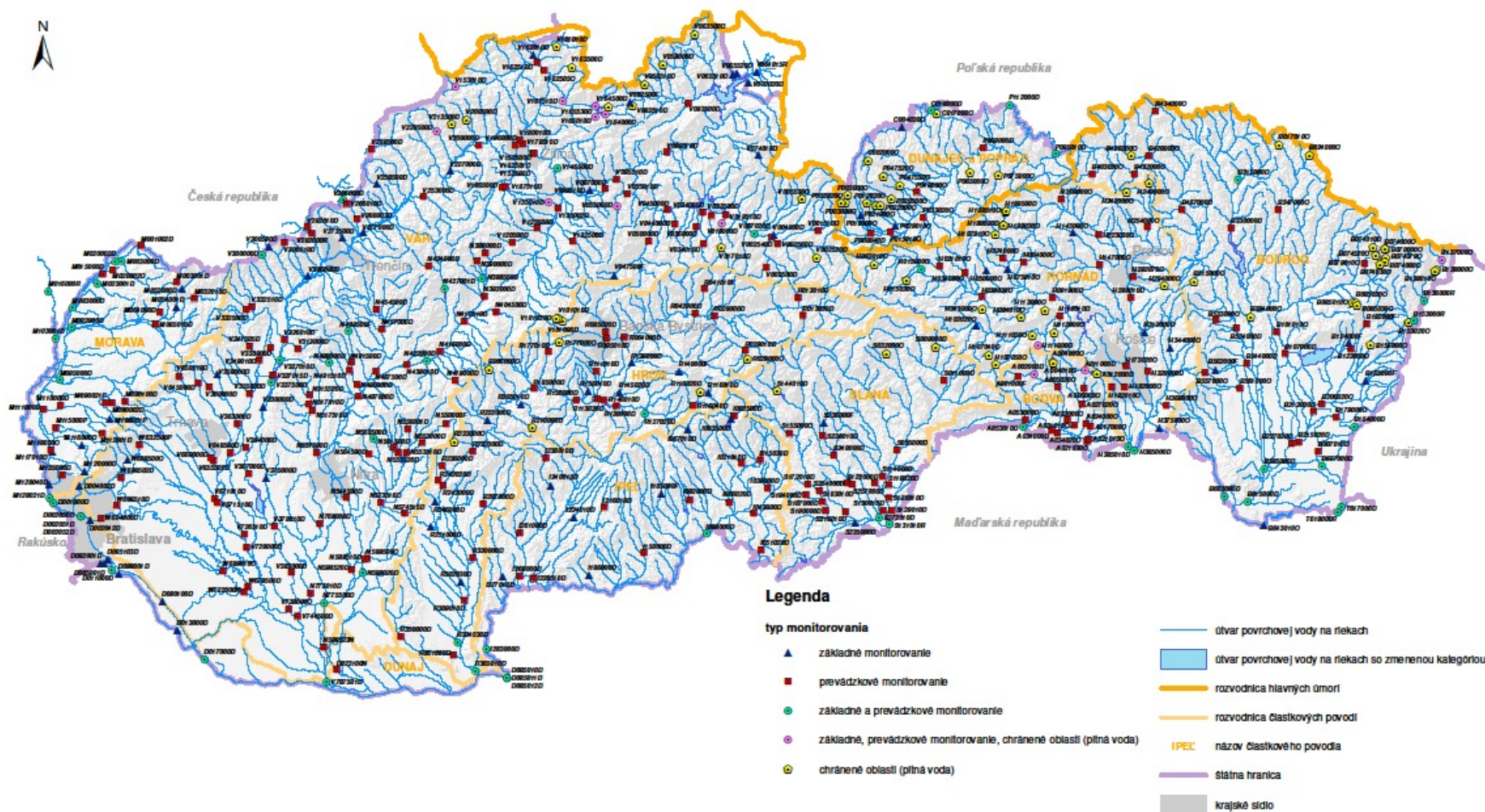
Surface Water Monitoring Program in the Slovak Republic

Frequency of sampling

- **Biological quality elements: 1-4/year**
- **Basic set of physico-chemical determinants: 4-12/year**
- **Priority hazardous substances: 12/year**
- **Hazardous substances and other relevant substances: 4/year**

Monitorované miesta kvality povrchovej vody na Slovensku v roku 2020

Mapa 1



Obchod zostavený podľa zákona č. 364/2004 Z. z. v znení neskorších predpisov

Podklad – digitálny terénny model SR (25 m) © 2000 CEI SAŽP v súlade so zákonom č. 205/2004 Z. z.

Mierka 1:1 000 000

1 cm = 10 km
0 2,5 10 30 40 60 km

Surface Water Quality Assessment

- **SURFACE WATER STATUS ASSESSMENT** (Water Framework Directive) –RBMP

<https://www.minzp.sk/voda/vodny-plan-slovenska/>

- **NATIONAL SURFACE WATER QUALITY ASSESSMENT** (Water Act)

<https://www.shmu.sk/sk/?%20page=1776>

- **THE TRANS-NATIONAL MONITORING NETWORK OF THE DANUBE RIVER BASIN**
(ICPDR) (TNMN Yearbook)

<https://www.icpdr.org/main/publications/tnmn-yearbooks>



Ecological Status

Biological quality elements

H	H	H	H
G	G	G	G
M	M	M	M
P	P	P	P
B	B	B	B

Lowest classed element

General chemical & physicochemical quality elements

H	H	H	H
G	G	G	G
M	M	M	M

Lowest classed element

Specific pollutants

G _H	G _H	G _H	G _H	G _H	G _H
M	M	M	M	M	M

Hydromorphological quality elements

H	H	H	H
G	G	G	G

Lowest classed element

H
G
M
P
B

Chemical Status

Priority substances & other EU-level dangerous substances

G	G	G	G	G	G
F	F	F	F	F	F

Lowest classed substance

G
F

G
F

G _H
M

Surface Water Status

Achieving
of
objectives

YES

NO



Surface Water Quality Assessment

NATIONAL SURFACE WATER QUALITY ASSESSMENT (WATER ACT) presents the comparison of the determined concentrations of individual quality parameters with the requested parameters and limit values for surface water quality are in *Slovak Government 269/2010 Coll.*

Requested parameters for surface water quality:

- *General physical-chemical parameters*
- *Non-synthetic pollutants*
- *Synthetic pollutants*
- *Indicators of radioactivity*
- *Biological and microbiological parameters*

GOOD LUCK!

