



Global workshop on exchange of data and information in transboundary basins
4-5 December 2019
Geneva, Switzerland

From physical-chemical to hydrobiological monitoring and data exchange and assessment of water body status: challenges of comparability of monitoring data and information with different and changing approaches of riparian countries – Case study from the Belarus-Lithuanian cooperation on the Neman river basin

Mr. Vladimir Korneev

Head of Monitoring and State Water Cadastre Department,
Central Research Institute for Complex Use of Water Resources
Minsk, Republic of Belarus

v_korn@rambler.ru

Belarus and Lithuania expressed their readiness to strengthen cooperation in the Neman river transboundary basin
Belarus and Lithuania expressed their readiness to strengthen cooperation in the transboundary Neman river basin, including for the implementation of the results of the UNECE pilot project “River basin management and climate change adaptation in the Neman river basin”.



The cooperation could aim at developing and implementing the joint Neman River Basin Management Plan.

In particular, this can be achieved by reviewing and agreeing on the Neman/Nemunas River Basin Management Plans prepared by both parties in the areas, where there are some common interests (e.g. improving the water quality) and readiness for gradual progress towards coordinated and, ultimately, joint river basin management.

Specific activities to elaborate the priority components of the Transboundary Neman/Nemunas River Basin Management Plan were conducted since 2017 with support of UNECE.

Main activities

1. An overview of the Neman River basin on the territory of Belarus was prepared in line with the recommendations of the Water Framework Directive.
2. Bodies of surface water and their homogeneous parts (“water bodies”) were identified taking into account the key point pollution sources within the Belarusian part of the Neman river basin take into account Lithuanian experience.
3. The systems of monitoring and assessment of the ecological status of water bodies of Belarus and Lithuania were compared in terms of physicochemical, hazardous pollutant, and biological (hydrobiological) parameters.
4. The status of bodies of surface water and their homogeneous parts (“water bodies”) within the Belarusian part of the Neman River basin was assessed—in line with the assessment systems of Belarus and Lithuania—in terms of physicochemical, hazardous pollutant, and biological (hydrobiological) parameters. The overall ecological status of surface water bodies and their homogeneous parts (“water bodies”) was identified, with a comparative analysis of the assessments prepared and their results mapped.
5. The factors and sources of heavy impact on the surface water bodies and groundwater bodies within the Neman River basin were identified, including point and non-point (diffuse) pollution sources.

0 25 50 75 100 км

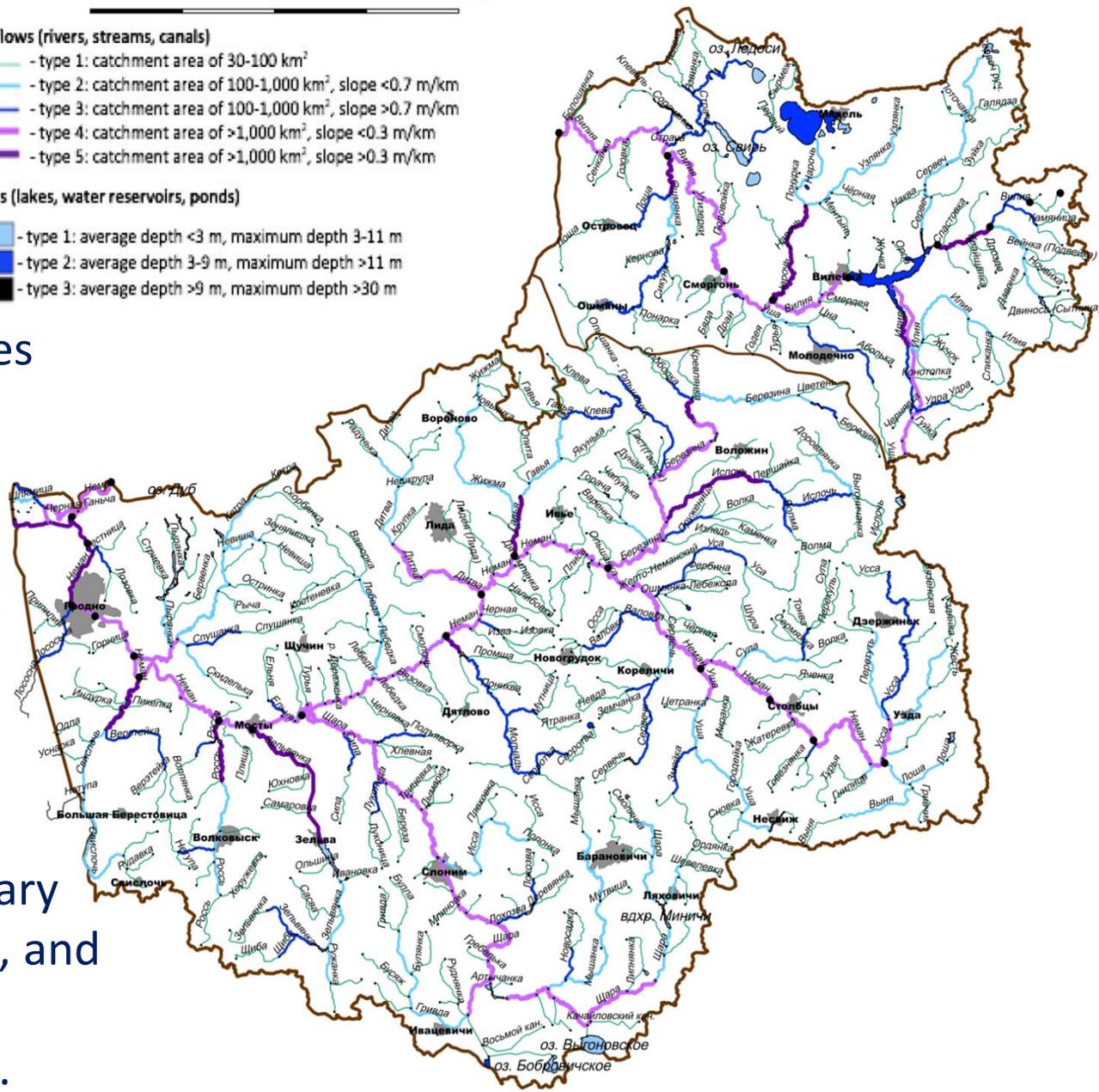
Stream flows (rivers, streams, canals)

- type 1: catchment area of 30-100 km²
- type 2: catchment area of 100-1,000 km², slope <0.7 m/km
- type 3: catchment area of 100-1,000 km², slope >0.7 m/km
- type 4: catchment area of >1,000 km², slope <0.3 m/km
- type 5: catchment area of >1,000 km², slope >0.3 m/km

Reservoirs (lakes, water reservoirs, ponds)

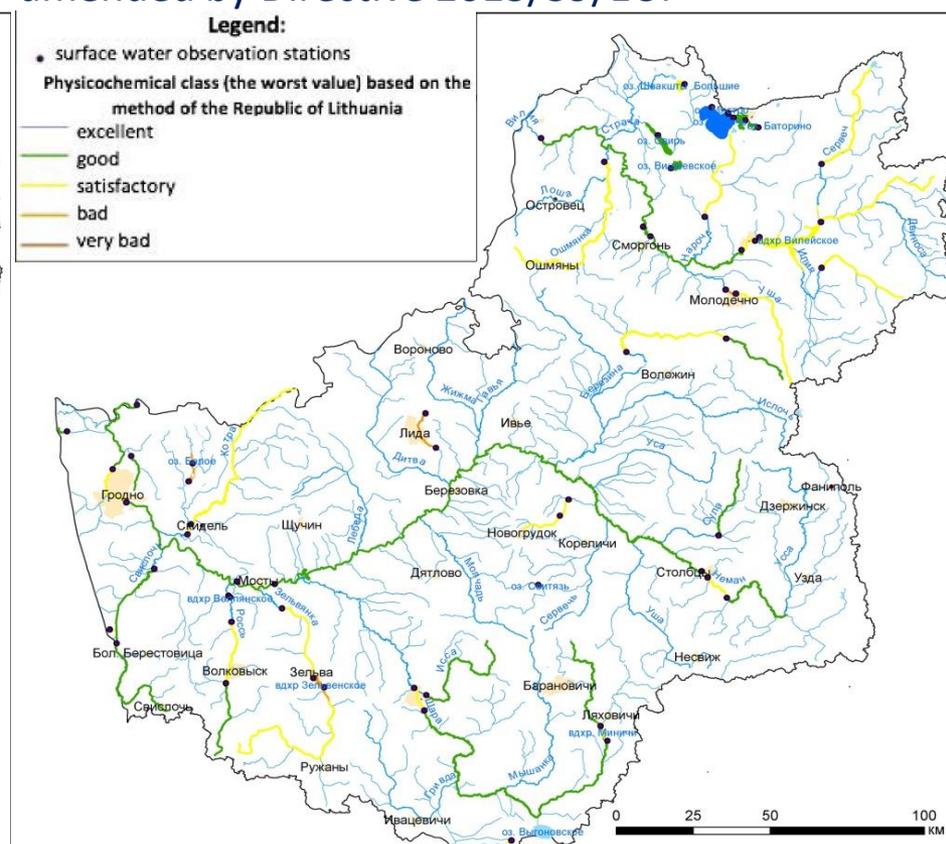
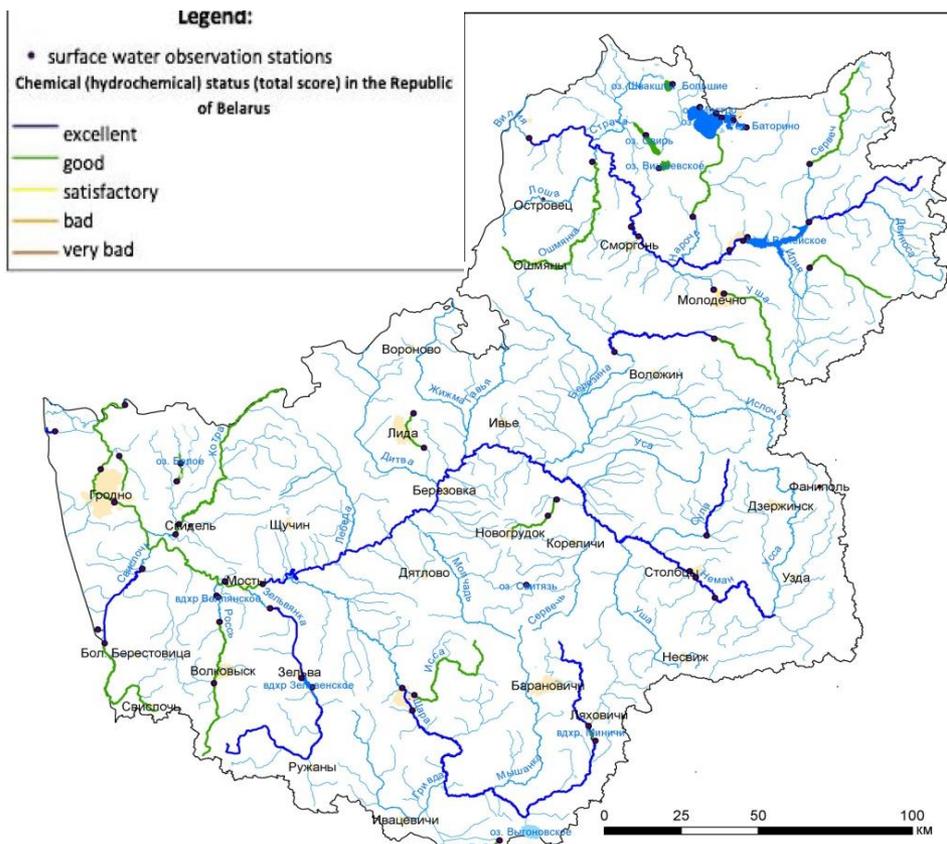
- type 1: average depth <3 m, maximum depth 3-11 m
- type 2: average depth 3-9 m, maximum depth >11 m
- type 3: average depth >9 m, maximum depth >30 m

587 surface water bodies were delineated in the Neman RB in Belarus including 496 stream flows and 91 reservoirs. 13 groundwater bodies were identified in the Neman river basin in Belarus: five in quaternary aquifers and complexes, and eight in pre-quaternary aquifers and complexes.



Belarus: chemical (hydrochemical) status is determined using key hydrochemical parameters. The differences are explained by the different ranges of concentrations used for hydrochemical parameters for the 5 classes of quality, primarily for nitrogen- and phosphorus-containing substances. In the Republic of Lithuania, the upper limit of concentrations set for good class is much lower, i.e. the criteria are more stringent than in Belarus.

Lithuania: status (class) for physicochemical parameters (the worst value) are taken into account along with hydromorphological, hydrobiological, and biological elements to assess the ecological status of water bodies. Chemical status is made based on the list of priority hazardous substances and the environmental quality standards set for these purposes by the Environmental Quality Standards Directive (2008/105/EC) in the field of water policies, as amended by Directive 2013/39/EU.

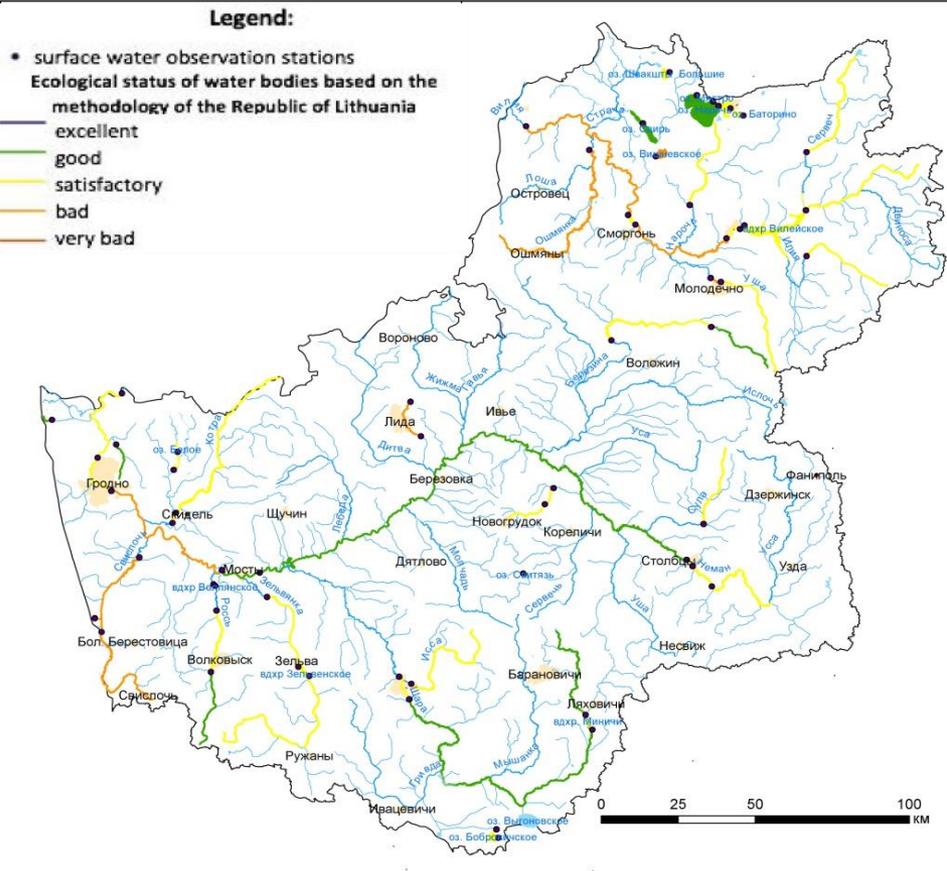
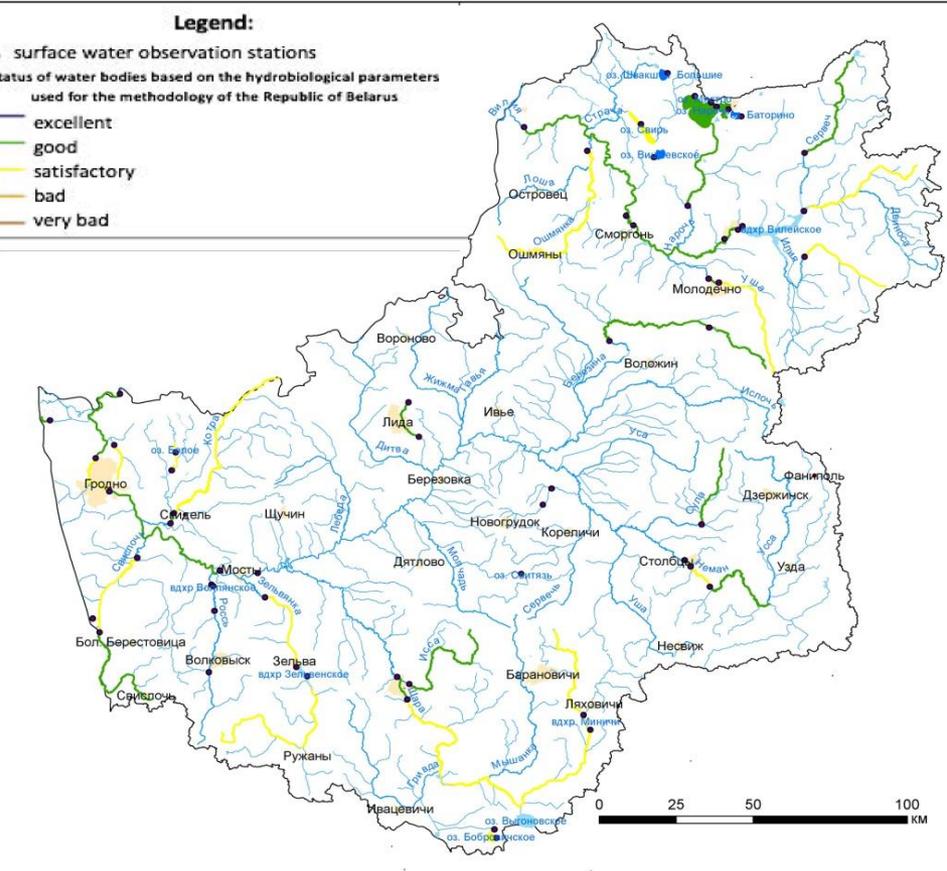


Belarus: classes of surface water bodies for biological (hydrobiological) parameters.

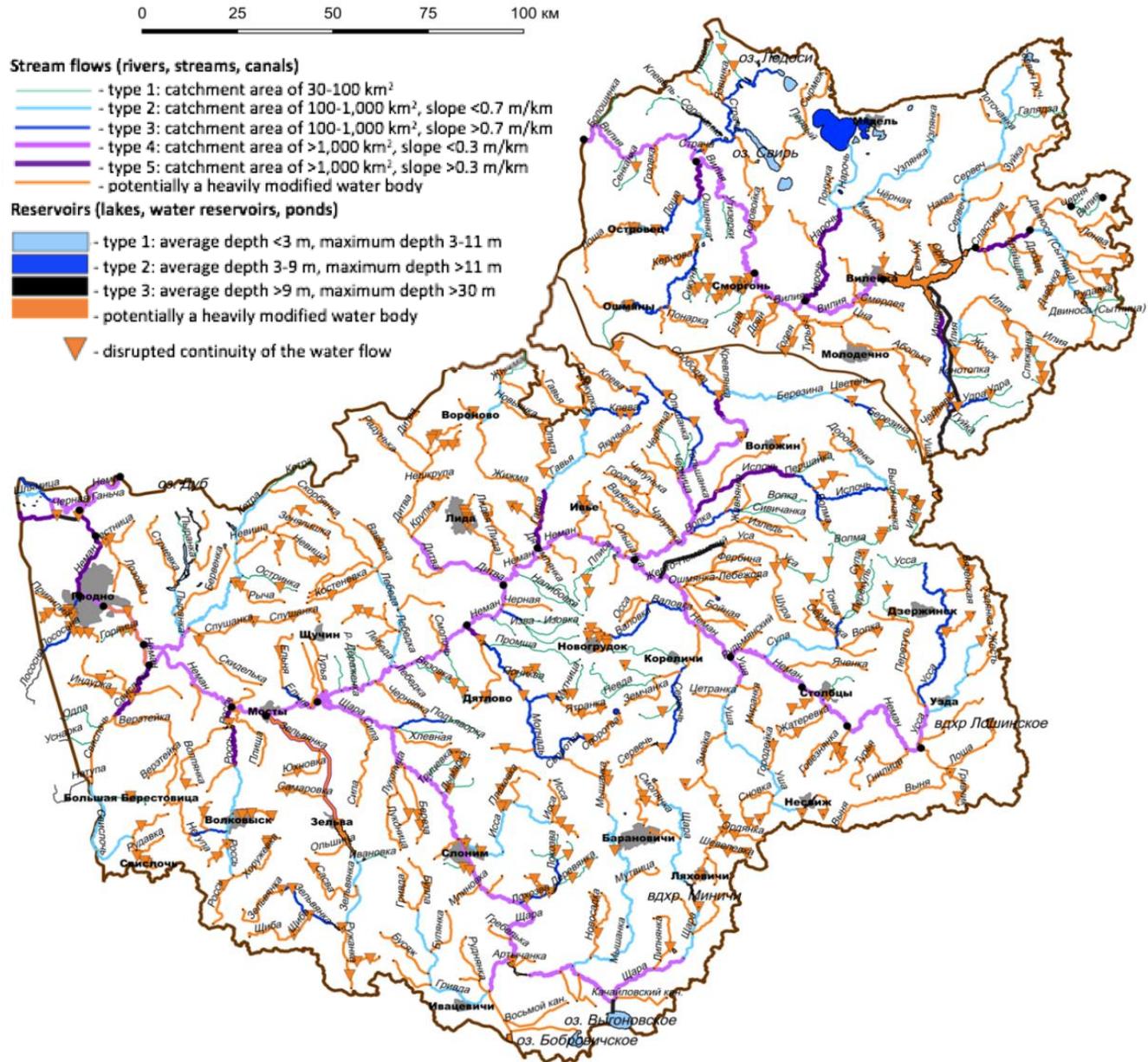
Determination of hydrobiological parameters based on the structural characteristics of phytoplankton and macrozoobenthos communities by calculating the saprobity index using the Pantle-Bucca saprobiological analysis method in Sladeczek's modification.

Lithuania: ecological status of water bodies.

Key biological parameters used for the ecological status assessment are the zoobenthos index (UMI) and phytobenthos index (FBI) for rivers and chlorophyll for lakes.

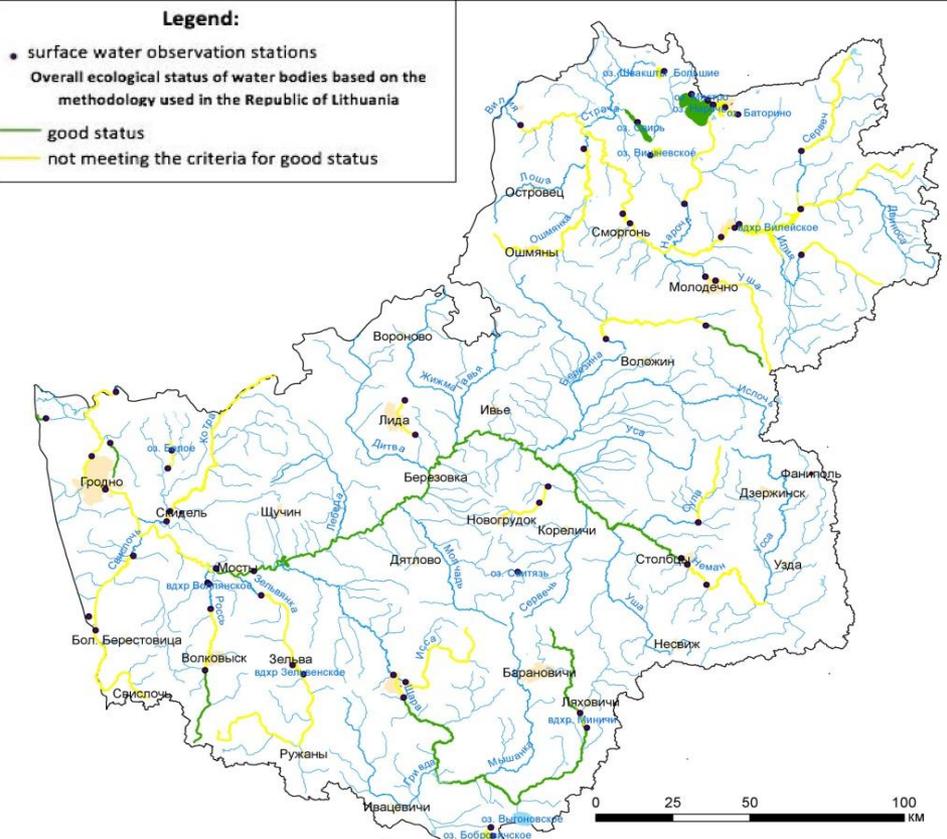
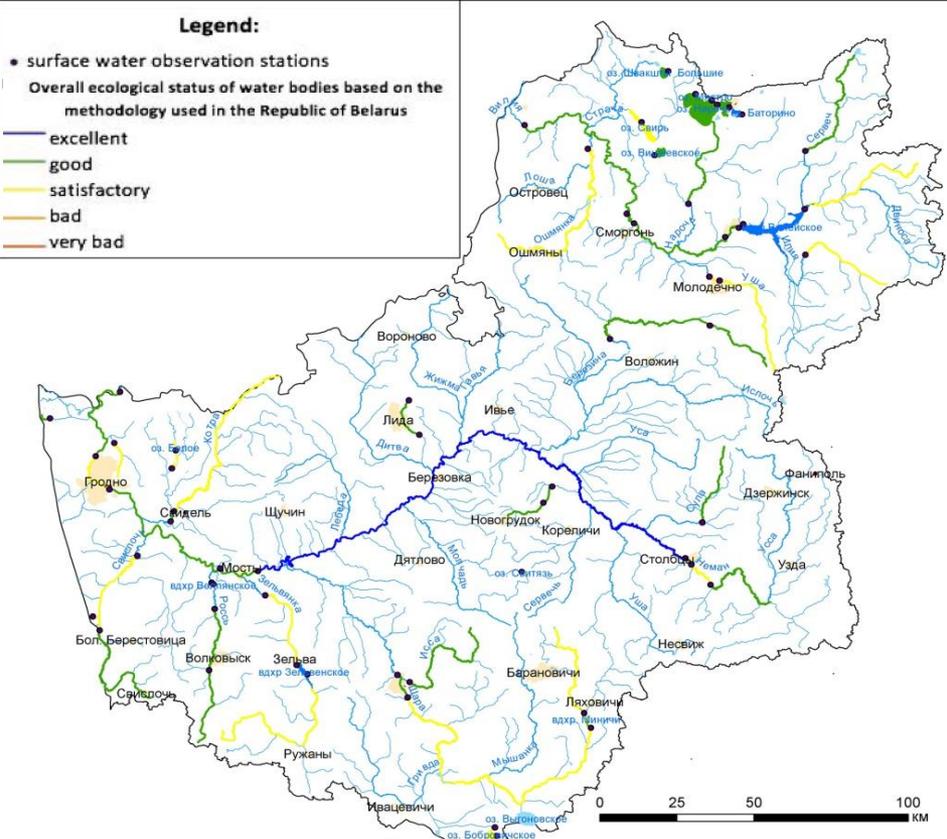


Hydromorphological modifications of surface water bodies in the Neman river basin on the territory of Belarus



Belarus: overall ecological status of surface water bodies is determined using a five-grade scale based on the hydrobiological parameters (ecological / hydrobiological ecological status) combined with hydrochemical parameters (chemical / hydrochemical status) and hydromorphological parameters (the degree of their modification).

Lithuania: overall ecological status of surface water bodies is defined as the overall condition of a water body that meets or fails to meet the criteria for 'good status'.



Important lessons learnt

The most comprehensive identification of water bodies under a heavy anthropogenic impact and risk of not reaching at least 'good ecological status' with using:

- ✓ Combination of Belarusian and Lithuanian approaches for the water bodies assessment ;
- ✓ Lithuanian approaches to identify water bodies under heavy impact resulting from the economic activity (anthropogenic pressure);
- ✓ Belarusian approaches to identify water bodies under diffuse sources of pollution.

Assessment of the ecological status based on the Belarusian methodology

- - excellent
- - good
- - satisfactory
- - bad
- - very bad

Assessment of the ecological status based on the Lithuanian methodology

- - meeting the criteria for at least 'good status'
- - not meeting the criteria for at least 'good status'

Point pollution sources

- ★ - not affecting the ecological status
- ★ - able to affect the ecological status

— - surface water bodies and parts thereof ("water bodies") under the risk of not reaching at least 'good ecological status'

65 surface water bodies and parts thereof ("water bodies") under a heavy anthropogenic impact and risk of not reaching at least 'good ecological status'



Future planned activities

- ✓ Continued collaboration and data exchange under Technical protocol "On cooperation in the field of monitoring and data exchange on transboundary surface waters" between the Ministry of Environment of the Republic of Lithuania and the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus (signed in 2008).
- ✓ Realization of the UNDP-GEF Project “Fostering multi-country cooperation over conjunctive surface and groundwater management in the Bug and Neman Transboundary River Basins and the underlying aquifer systems” with Transboundary Diagnostic Analyses (TDA) and RBMPs (Belarus, Ukraine) development with using main results and lessons learned reached for the Neman river basin in the frame of Belarusian-Lithuanian cooperation with UNECE support.

Thank you for attention



Transboundary district of the river Neman (Belarus – Lithuania)