



Państwowe
Gospodarstwo Wodne
Wody Polskie

State Water Holding Polish Waters
National Water Management Authority

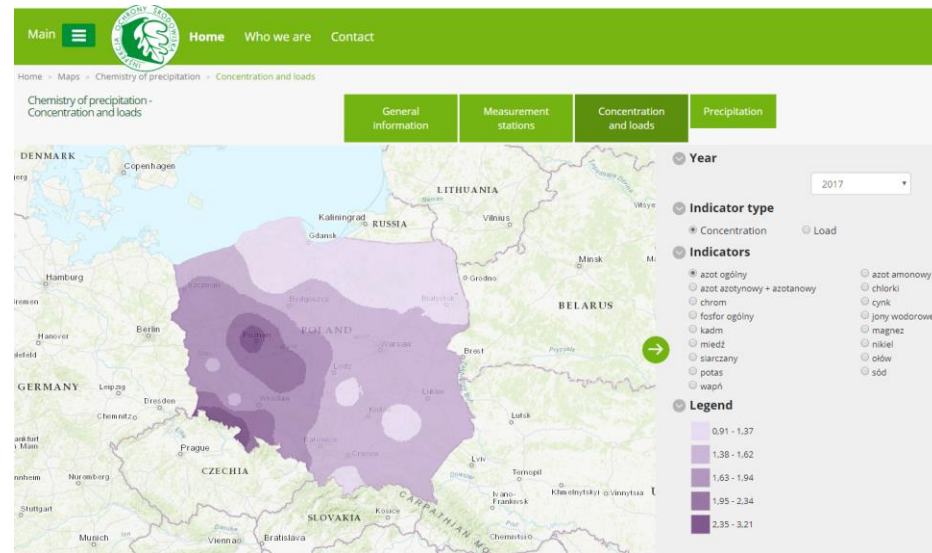
09.09.2020



Quantifying emissions from diffuse sources

- In the 3rd cycle of WFD RMBPs quantification of emissions from DS was conducted in the project "Identification of pressures in water regions and river basins districts. Part II: Development of database of anthropogenic pressures."
- This work compiles all available data on emissions from point and diffuse sources basing on classification from WFD Guidances.
- The main result of this task was compilation of data from various sources

- Source of loads from atmospheric deposition was monitoring data.
- Measurements from 23 monitoring stations was interpolated on the area of whole country and calculated in 2,5 km grid.
- Load in each water body catchment was summarized using this data.



- The calculation of this source was based on the statistics of population which uses septic tanks, population which uses individual treatment plants and number of individual treatment plants.
- The total loads were estimated basing on individual loads from untreated sewage and was calculated separately for area of agglomerations under UWTP Directive and outside of this areas.

- Loads from urban runoff was calculated basing on measured runoff and concentration values of pollutants from publications about pollutants from rainwater in Polish urban areas.
- Concentration values were specific for each pollutant in particular areas (f.e. different for continuous urban, dis continuous urban, seminatural).

- Data on industrial polluted areas were collected from registry of historical environment pollution.
- This resource may be useful as identification of pressure in case when specific markers were identified in water body as it do not have information about loads from certain sites.

- Data on road and rail transport is based on spatial distribution of spatial distribution of these roads.
- Data on loads from roads was estimated using data of atmospheric deposition.
- Data on railroads do not contain data on loads.

- Data on landfills was collected from all available data including regional reports, permissions, surveys etc.
- Data was hierarchized according to its reliability and the most reliable source was used in case when objects was included in more than one source.

- Data on usage of sewage sludge was collected from Voivodeship marshal's offices.
- Data includes sewage sludge management areas and sum of its mass in each area.

- Data was collected basing on surveys from regional administrative districts. Data do not include data on loads.
- The reliability of this resource highly depends on the level of the return of surveys.

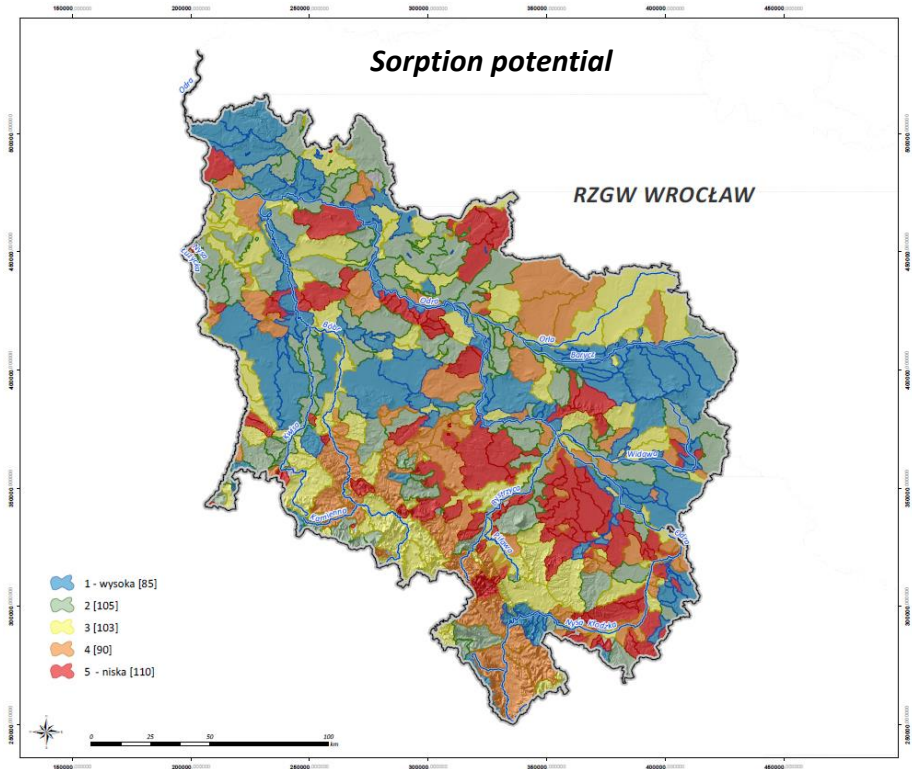
- Data about fish production was collected from statistical reports which was aggregated to Voivodeships.
- Data on fishery contain the amount (mass) of produced fish with division on carp and trout farms. It shows an intensity of activity but not directly a load.

- Data on number of animals (cattle, pigs, sheep, goats, chicken, turkeys, geoses) was collected from national registry of farm animals.
- Data on fur animals was collected from permissions.
- Data do not have information about loads from farms.

- Doses of fertilizers was estimated basing on national statistics on usage of fertilizers.
- Data aggregated in administrative divisions was calculated to catchments of water bodies with taking into account the spatial distribution of agricultural areas (CLC 2012).
- Data gaps was estimated using trend analysis basing on historical data on fertilizers usage.

Analysis of pressures and impacts

- Data collected in previous steps was used to evaluate the pressures on each water body.
- The main methodological assumptions were to use markers (pressure – specific pollutant) in order to identify the pressure and a parameter which was called “Sorption potential” (retention capacity and sensitivity to anthropogenic pressure within the WB catchment area).



- In case of diffuse pollution, a coefficient defined for each water body on the basis of our experience with the SWAT model is used to estimate the proportion of pollutant load that actually reaches the river.
- In order to use collected data it was necessary to process the data to assumed parameters which described the sorption potential. The result was database which compiles the data on pressures identified in all water bodies including indication of significant anthropogenic pressures.
- One of the results of the analysis was database which presents “virtuals loads” of nutrients in end-point of water body segment. These loads were calculated using monitoring data, emissions and hydrological data (measurements and model).
- The most complete analysis was done for the nutrients (P total, N total), and to a lesser extent to some heavy metals (Cr, Zn, Cu) and BOD. For other pollutants the sources of pressures is identified by the markers, so on the basis of monitoring.

- Data about pressures was collected on various levels and methodologies.
- Data availability and reliability was the main problem in the compilation of data. An additional effort to eliminate the errors had to be done.
- Estimations and approximations were encountered on different levels of analysis.
- Not all available data are suitable for quantification of loads.



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