

Questionnaire: natural background – first results

- Objective: Harmonisation of natural background calculation methodologies (as far as possible)

- Questionnaire addresses methodologies and data used by CPs to calculate national natural background losses (loads) for TN and TP
 - Models
 - Measurements
 - Other methodologies

- The following CPs delivered by 14th of December: Poland, Estonia, Russia, Sweden, Denmark, Germany

- Missing: Finland, Latvia, Lithuania

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➤ Methods

Contracting Party	Models	Measurements	Other methods
Poland			(x)
Estonia	x		
Russia			(x)
Sweden	x (mostly)		
Denmark		x	
Germany	x		
Finland			
Latvia			
Lithuania			

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Example for „Other methods“

Poland

- used monitoring data (2012) from waterbodies with more than 70% forested area (areas close to natural conditions) taking into account different types of soils (permeability) and topography (slopes)
- different water body groups regarding soil permeability and slope were identified
- for each group average TN and TP concentrations (natural background) were allocated (range between 0.96 – 1.9 mgN/l and 0.04 – 0.12 mg P/l)

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Example for „Measurements“

Denmark

- Used monitoring data from 19 small catchments of differing land use patterns (distributed to whole country)
- Long-term measurement periods are taken into account; number of samples per year differ between 12 and 26
- Natural background values: 0.6 – 1.48 mg TN/l and 0.021 – 0.089 mg TP/l
- Values are transferred to the whole catchment area using a 5x5 km grid based on the dominating soil-type in each grid cell
- Values are not assigned to fortified areas

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Example for „Models“

Estonia

- Used an empirical pathway specific emission model on an annual time scale, spatially based on hydrological units (ESTMODEL)
- Used a pristine scenario defined by estimated natural concentrations of TN and TP as initial values
- Actual land use is considered but no management (forest and agricultural)
- Model results are validated using measurements

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➤ Atmospheric deposition onto water surfaces (used by CPs)

Contracting Party	Condition	Source	Values
Poland	Recent conditions	National monitoring data	Not taken into account yet for natural background calculations
Estonia	Recent conditions	long-term modelled average	TN: 440 kg/km ² /year TP: 8.1 kg/km ² /year
Russia	Recent conditions?		TN: zero (assumption: deposition is equal to removal by denitrification) TP: 3.2 kg/km ² /year
Sweden	Supposed to be pristine		TN: zero TP: 4 kg/km ² /year (mainly natural origin)
Denmark	Recent conditions		TN: 15 kg/ha/a (0.15 kg/km ² /year) TP: 0.1 kg/ha/a (0.001 kg/km ² /year)
Germany	Supposed to be pristine	Assumption	TN: 5 kg/ha/year (0.05 kg/km ² /year) TP: 4 kg/km ² /year

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➤ Retention

Contracting Party	Description
Poland	Calculated as the difference between the sum of loads from sources of pollution discharged to water and the load of pollutants discharged by rivers into the Baltic Sea
Estonia	Adjusted – calculated via flow velocity and distance (retention time)
Russia	Catchment surface retention is taking into account by concentrations in the runoff from natural areas (C_{nat} in the equation 1). Concentrations were measured during targeted studies in Russia and Finland.
Sweden	Adjusted - Calculated with the background loads but with the same parameter values as in the main calculations. The parameters have thus been calibrated for higher loads.
Denmark	Not considered separately (assumed to be part of measured load)
Germany	Considered under recent conditions (not adjusted to pristine conditions)

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Recommendations/Next steps

- Differences concerning used methodologies and data can be seen
- Prepare a more detailed evaluation for the next meeting
- Resume the discussion regarding harmonisation needs to prepare PLC 8

Thanks!

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