

photo: Alexander Antsulevich

DATA:
MONITORING



MONITORING

Data obtained through monitoring is valuable in order to follow progress towards goals and targets agreed upon by all members of HELCOM. Monitoring is the basis for the formulation of policies, and the setting of priorities for cost-efficient actions designed to protect the marine environment, and ensure it is used sustainably.

The aim of the activities in BASE is to contribute to the harmonisation of assessment methods in the whole Baltic Sea region in order to have compara-

ble and reliable results for the assessments and evaluation of sources for hazardous substances and nutrients. The incompleteness of nutrient load data from the Russian part of the Gulf of Finland catchment prevents measuring Russian progress in achieving the nutrient reduction targets in the HELCOM Baltic Sea Action Plan. Moreover, the lack of input data from different sources in the Russian part of the Baltic Sea catchment area hinders the development of the cost-effective measures required to achieve HELCOM's reduction targets.

BASE Project has carried out monitoring in Russia as two case studies: **1)** Assessment and quantification of nutrient

loads to the Baltic Sea from Leningrad Region including a desk study assessment of nutrient loads transboundary rivers, **2)** Previously unmonitored tributaries of the Pregolya in Kaliningrad Region including a desk study assessment of nutrient loads transboundary rivers. The analysis of the loads from Kaliningrad Region includes also a screening activity to determine **3)** Hazardous substances loads.

Results from this project have regularly been reported to HELCOM expert groups and projects (e.g. HELCOM LAND, HELCOM PLC). Russia will continue to report monitoring results to HELCOM and is encouraged to develop its state monitoring programmes.

photo: Balttechmordirectsiya, Kaliningrad department



MONITORING OF NUTRIENTS IN LENINGRAD REGION

NUTRIENTS IN NEVA, ITS TRIBUTARIES AND TRANSBOUNDARY RIVERS IN LENINGRAD REGION

Assessment and quantification of nutrient loads to the Baltic Sea from Leningrad Region and transboundary rivers, and the evaluation of their sources

Implemented by ECOGLOBUS Ltd.
(Main Consultant)

Support provided by Pöyry Finland Oy
(EU Expert)

To obtain complete nutrient load data from the Russian part of the Gulf of Finland catchment, data from previously unmonitored tributaries of the Neva is needed in addition to data obtained through regular state monitoring in the Neva catchment. Furthermore, point sources discharging directly into the Gulf of Finland and the share of Russian transboundary load of the River Narva need to be estimated.

OBJECTIVES

The objective of the study was to quantify and assess the total annual nutrient load from the River Neva to the Baltic Sea, including the share of Lake Ladoga,



photo: Balttecmordirectsiya, Kaliningrad department

the unmonitored or partly monitored 17 tributaries and watercourses as well as the city of St Petersburg. The study was based on four rounds of hydrological and hydrochemical monitoring activities in most water objects within Neva River catchment situated downstream of the Lake Ladoga outlet. The aim was also to assess transboundary nutrient loads from the Leningrad Re-

gion, flowing to the Gulf of Finland via the River Narva, and make proposals for common methodology on how to quantify the transboundary loads. As a final result, an assessment of the total nutrient load from Leningrad Region - based on a compilation of the results of several on-going activities on monitoring - was produced, along with recommendations for the improvement of the monitoring system for future HELCOM reporting.

MAIN OUTCOMES

NEVA AND ITS REGULARLY MONITORED AND PREVIOUSLY UNMONITORED TRIBUTARIES

The total load with River Neva to the Gulf of Finland is 2,700 t/a for P_{tot} and 63,000 t/a for N_{tot} , of which app. 75% (73% for P_{tot} and 85% for N_{tot}) originated from the Lake Ladoga outlet and the rest with tributaries, partly as unspecified loads most likely caused by direct point sources of inputs to the River Neva. The main part of the nutrient load comes with major monitored tributaries (Ohta, Izhora, Mga, Tosna) while the nutrient load from the unmonitored tributaries not yet covered by the state monitoring programme is small (around 1% of total nutrient load), except for the Novoladozskiy Canal.

Continue >>

TRANSBOUNDARY NUTRIENT LOADS THROUGH THE RIVER NARVA

The assessment of the transboundary nutrient loads from Leningrad Region through the River Narva, has been implemented through modelling. According to the results of the modelling, the Russian part of the nutrient load via the River Narva to the Gulf of Finland is approximately 7,687 tonnes of total nitrogen (N_{tot}) and 339 tonnes of total phosphorous (P_{tot}), with the natural background load constituting of 3459 and 122 tonnes of total nitrogen and total phosphorus, correspondingly. The main part (more than 80 %) of this calculated total Russian load originates from diffuse sources, namely the agriculture sector such as run-off from arable lands and emissions from organic and mineral fertilizers.

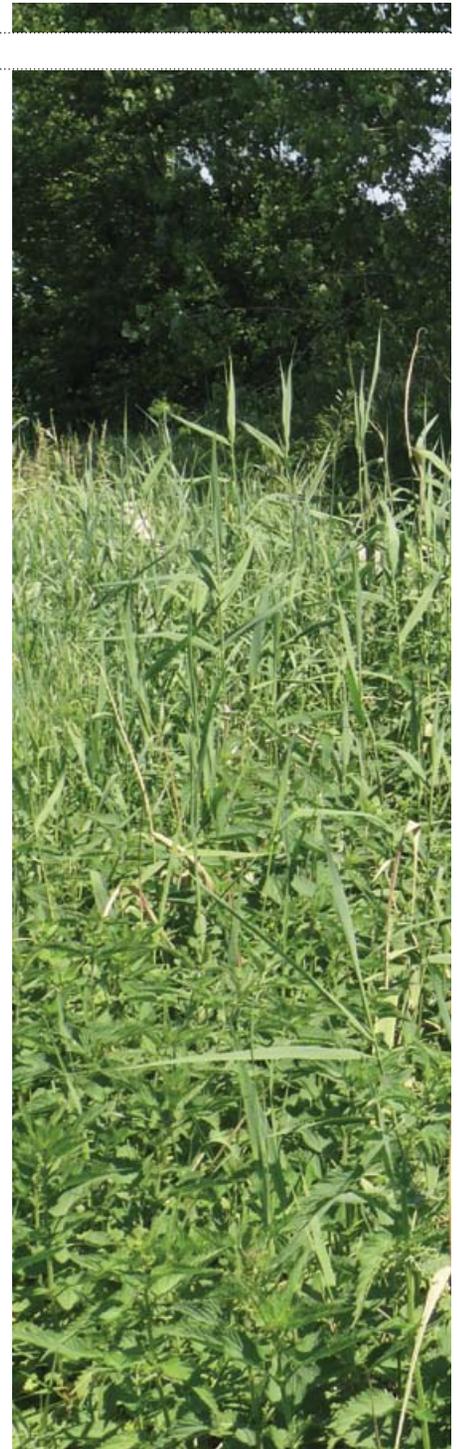
Based on a compilation of results from several on-going activities, the Russian contribution to the nutrient load to the Gulf of Finland in 2013 was 3,700 t/a for P_{tot} and 87,000 t/a for N_{tot}. The approximate Russian share of nutrient input from the River Daugava to the Gulf of Riga was 100 t/a for P_{tot} and 2,000 t/a for N_{tot}.

RECOMMENDATIONS

In order to ensure more accurate assessments in the future, the following activities are recommended:

- Take into account the transboundary load from Finland, e.g. by establishing agreement with in bilateral cooperation or/and HELCOM process.
- Develop the data collection to improve modelling activities and model verification in the River Narva catchment.
- Collect the most recent information on the nutrient load in the River Daugava on the border between Russia and Belorussia, using Russian state monitoring capacity and/or data from the Belorussian side obtained within the existing bilateral agreement in order to assess Russia's share of the nutrient input of the transboundary rivers
- Improve data collection concerning the actual nutrient load from point sources within the Russian catchment area
- Further develop the state monitoring programme of the Russian Federation

Full report available at
www.helcom.fi





MONITORING OF NUTRIENTS IN KALININGRAD REGION

NUTRIENTS IN PREGOLYA, ITS TRIBUTARIES AND TRANSBOUNDARY RIVERS IN KALININGRAD REGION

Assessment and quantification of nutrient loads to the Baltic Sea from Kaliningrad Region and transboundary rivers, and the evaluation of their sources.

Implemented by ECOGLOBUS Ltd., Baltic Institute for Ecology of Hydrosphere (BIEH) (Main Consultant)

Support provided by Pöyry Finland Oy (EU Expert)

To obtain the complete data of the nutrient load from the unmonitored areas of Kaliningrad Region as well as the Russian input to the watersheds to the Vistula and Curonian Lagoons, including transboundary share, should be estimated. Moreover, lack of data concerning inputs of different sources in the Russian part of the catchment area hinders the identification of cost-



photo: Jaakko Saukkoriipi

effective measures required to achieve HELCOM's reduction targets.

OBJECTIVES

The objective of the study was to quantify and assess the total annual load of nutrients to the Baltic Sea from the Kaliningrad Region. The work was conducted through four sampling rounds in the River Pregolya and its 12 tributaries as well as in a number of rivers of the Curonian and Vistula lagoons. Additionally, the assessment of the transboundary nutrients inputs from Kaliningrad Region (with a specific focus on River Neman and the Matrosovka Canal) and proposals for common methodology on how to quantify the transboundary loads are elaborated and described.

MAIN OUTCOMES

According to the hydrological and hydrochemical surveys, namely sampling

and analysis of the River Pregolya and its 12 tributaries, the Matrosovka Canal, and the Kaliningrad waste water discharge canal as well as the quantification of the transboundary nutrient load from Kaliningrad Region (the River Neman and the Matrosovka Canal), the following conclusions can be drawn:

1. The following big tributaries are mainly employed in the Pregolya water stream formation: the In-struch, the Angrapa, the Golubaya, the Stream Glubokij, and the Lava River. According to the measurements conducted in 2013 – 2014 all these rivers in total bring 8111 tons of total nitrogen and 369 tons of phosphorus a year. Near Gvardejsk the Dejma arm flows out of the River Pregolya. Before this branching total nutrient load of the Pregolya is 5595 tons of total nitrogen and 221 tons of total phosphorus a year.

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2. The main tributary of the River Pregolya is the cross-border River Lava, of which more than half of the water basin is located in Poland. Thus, the greatest part of the nutrient input comes to Kaliningrad Region from this transboundary territory. The amount of nutrients that come from Polish territory is less than half of the total amount, which is later carried out to the Pregolya and further to the Baltic Sea. Moreover, immediately after the national Russian-Polish border is the Pravdinsk reservoir, which according to autumn and winter monitoring rounds, keeps half of the upstream nutrient input.
3. The total annual nutrient inputs to the Vistula Lagoon are 5,384 tonnes nitrogen and 529 tonnes phosphorus. Of this amount, 69% of nitrogen comes from the Pregolya River and 26% from the Kaliningrad waste canal and for phosphorus 48% and 46% respectively.
4. The total annual input to the Curonian Lagoon in 2013-2014 was 9,459 tonnes total nitrogen and 332 tonnes total phosphorus.
5. Retention by the Matrosov Canal in Kaliningrad Region is 25% of total nitrogen and 37% of total phospho-

rus. Nutrient retention by the River Sheshupe in the Kaliningrad Region is 1% of total nitrogen and 13% of total phosphorus.

6. For quantification of the transboundary nutrient input into Kaliningrad Region (the River Neman and the Matrosovka Canal) the Institute of Limnology Load Model (ILLM) is effective. The results obtained in applying this model have shown good comparability with other similar assessments.
7. The average annual input in the period 2010-2013 from the Russian part of the catchment to the Baltic Sea via the River Neman and the Matrosovka Canal constitutes 700 tonnes of total nitrogen and 200 tonnes of total phosphorus, where the natural background load constitutes 290 and 2.1 tonnes of total nitrogen and total phosphorus, correspondingly. These figures tentatively constitute 1.6% for total nitrogen load and 12% for total phosphorous load coming with the River Neman to the Baltic Sea.
8. The main part of this total Russian input coming with the River Neman to the Baltic Sea originates from diffuse sources (more than 70%) - namely the agriculture sector such as run-off

from arable lands and emissions of organic and mineral runoff from agricultural lands as well as emissions of organic and mineral fertilizers.

9. The approximate total nutrient input from the Kaliningrad Region to the Baltic Sea - coming with the main rivers investigated in the BASE Project as well as the Russian share of the total input via the River Neman - constitutes 10,667 t/a for total nitrogen and 927 t/a for total phosphorus.

RECOMMENDATIONS

Accordingly, for a more detailed analysis of the water bodies in Kaliningrad Region it would be sensible to elaborate a monthly monitoring scheme on total nitrogen and phosphorus concentrations in the existing monitoring points as well as in the previously unmonitored rivers.

Moreover, in order to quantify transboundary nutrient loads through modelling on a regular basis, input data should be improved. This includes statistical data on the amount of nitrogen and phosphorous resulting from the use of fertilizers, the number of animals, and other relevant factors. ●

Full report available at
www.helcom.fi

SCREENING OF HAZARDOUS SUBSTANCES IN KALININGRAD REGION

Implemented by ECOGLOBUS Ltd.
(Main Consultant)

Support provided by Pöyry Finland Oy
(EU Expert)

OBJECTIVES

To measure the concentrations of heavy metals (Hg, Cd, Zn, Cu and Pb) in the River Pregolya and qualitatively assess potential pollution sources of the river, the samples should be taken from the river sediment and the river water. The analysis of water samples shall include both soluble and total concentrations.

To measure the concentrations of the HELCOM Priority Hazardous Substances in the sediments of Kaliningrad Bay and qualitatively assess potential pollution sources of the bay.

Main outcomes and further information are available on the HELCOM website www.helcom.fi. The report includes the results of a sediment analysis, a map of major industries in the region and recommendations by the project.

photo: Jaakko Saukkoriipi





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