Sufficiency of the environmental data in pollution load evaluation of surface waters

The example of the audit "Effectiveness of the measures improving the status of Lake Peipus"

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Importance of the environmental data in auditing the environmental issues

- Environmental conservation and management decisions are based on the reliable knowledge about the environmental status and the changes in it.

- The main source of such knowledge is **environmental monitoring**, which should produce data in sufficient amount and quality.

- Important question in environmental auditing could be – are the environmental decisions base on sufficient and reliable data

Audit: "*Effectiveness of measures improving the status of Lake Peipus*"

The fifth largest lake in Europe, with area of 3555 km^2

The area of Lake Peipus basin is 47 814 km^2, of which 59% is Russian, 34% on the Estonian and 7% in Latvian territory.

The main ecological problems:

▪ Eutrophication due to the increased load of nutrients (phosphorous and nitrogen compounds) caused by human activities;

▪ Changes in ecosystems and fish communities

Sufficiency of the water monitoring data in pollution load evaluations

Audit: "*Effectiveness of measures improving the status of Lake Peipus*"

Audit (sub)questions:

– What are the ecological status and its dynamics of the Lake Peipus

– What are the pollution sources of the Lake Peipus

Audit criteria:

– The main pollution sources and proportion of the pollution load from different sources are identified (including natural and anthropogenic nutrient load from point and diffuse sources)

Audit methods

Analysis of the Lake Peipus environmental monitoring scheme and surface water monitoring scheme in Lake Peipus basin.

The water monitoring scheme has to follow the requirements and guidance of the EU Water Framework Directive

Analysis of the pollution load calculations (nitrogen and phosphorous), which is made for the evaluation of the Baltic Sea pollution load according to the HELCOM methodology. Pollution load from the rivers to the Baltic Sea (absolute amounts of N and P) has been modelled on the basis of water monitoring data, land use data and results of the different scientific investigations.

Water monitoring scheme of Lake Peipus and it's basin (Estonian part)
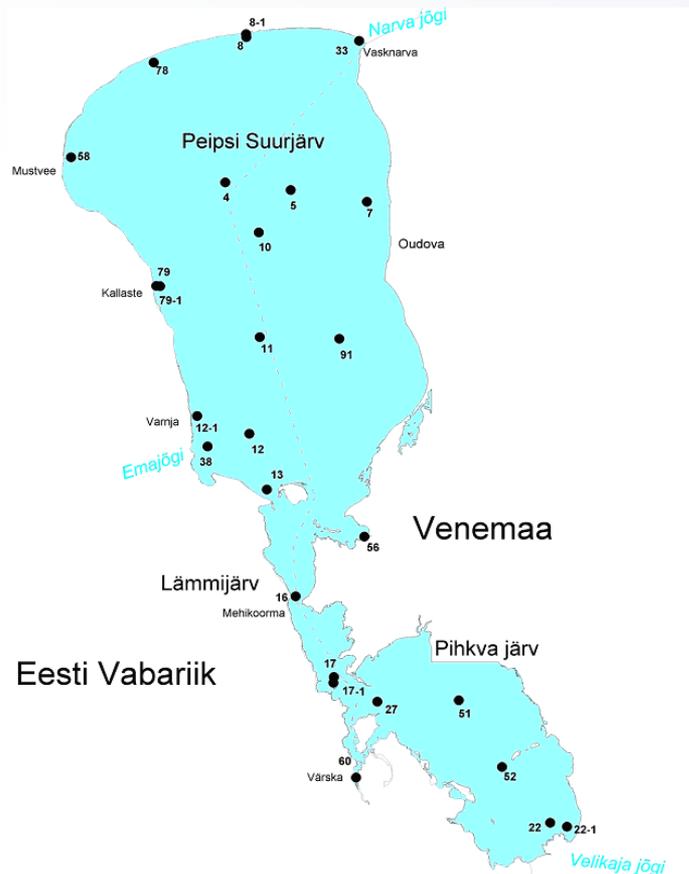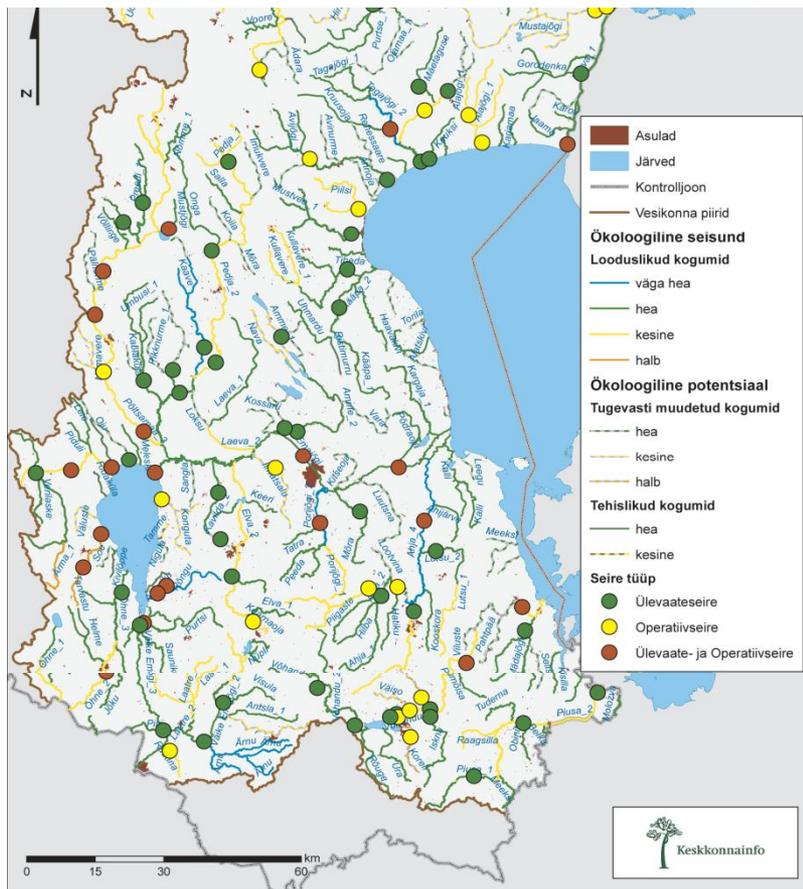
Findings

- National environmental monitoring enables to assess the status of Lake Peipus, changes in its condition and to calculate the pollution load

- There are not enough monitoring data to reliably determine the share of individual pollution sources, especially the share of different natural and anthropogenic diffuse sources (e.g. possible leaching of nutrients due to exploitation of arable and forest land)

- The internal phosphorous load from the sediments of the lake Peipus is not known, however in some environmental conditions this could be a remarkable part of the total phosphorous load

Conclusions

- The national water monitoring scheme is not yet developed entirely in compliance with the EU water framework directive (WFD foresee so-called three-level monitoring scheme consisting of individual sub-schemes for surveillance, operational and investigative monitoring, which serve different purposes).

- National monitoring program has the room of improvement for the investigative monitoring and the share of operational monitoring points in the monitoring network is very small. Thus, there are not enough monitoring data to reliably determine the share of various pollution sources.

- If we are not able clearly to distinguish the share of natural and anthropogenic diffuse nutrient load, it is difficult to plan efficient measures for the reduction of the pollution load, assess the performance of their implementation and impact on the status of the lake

More data, more expenses ...

However, it is always easy to say, that we need more data. This is most typical conclusion of scientists, who perform the monitoring and make the evaluations.

More reliable analysis means more data and more expensive monitoring scheme

There is always a questions: how much data do we need for reliable ecological analysis – what is an efficient amount of information?

Thank you!