Transboundary water monitoring

Sari Mitikka, senior researcher
Finnish Environment Institute SYKE
Tajikistan ICI
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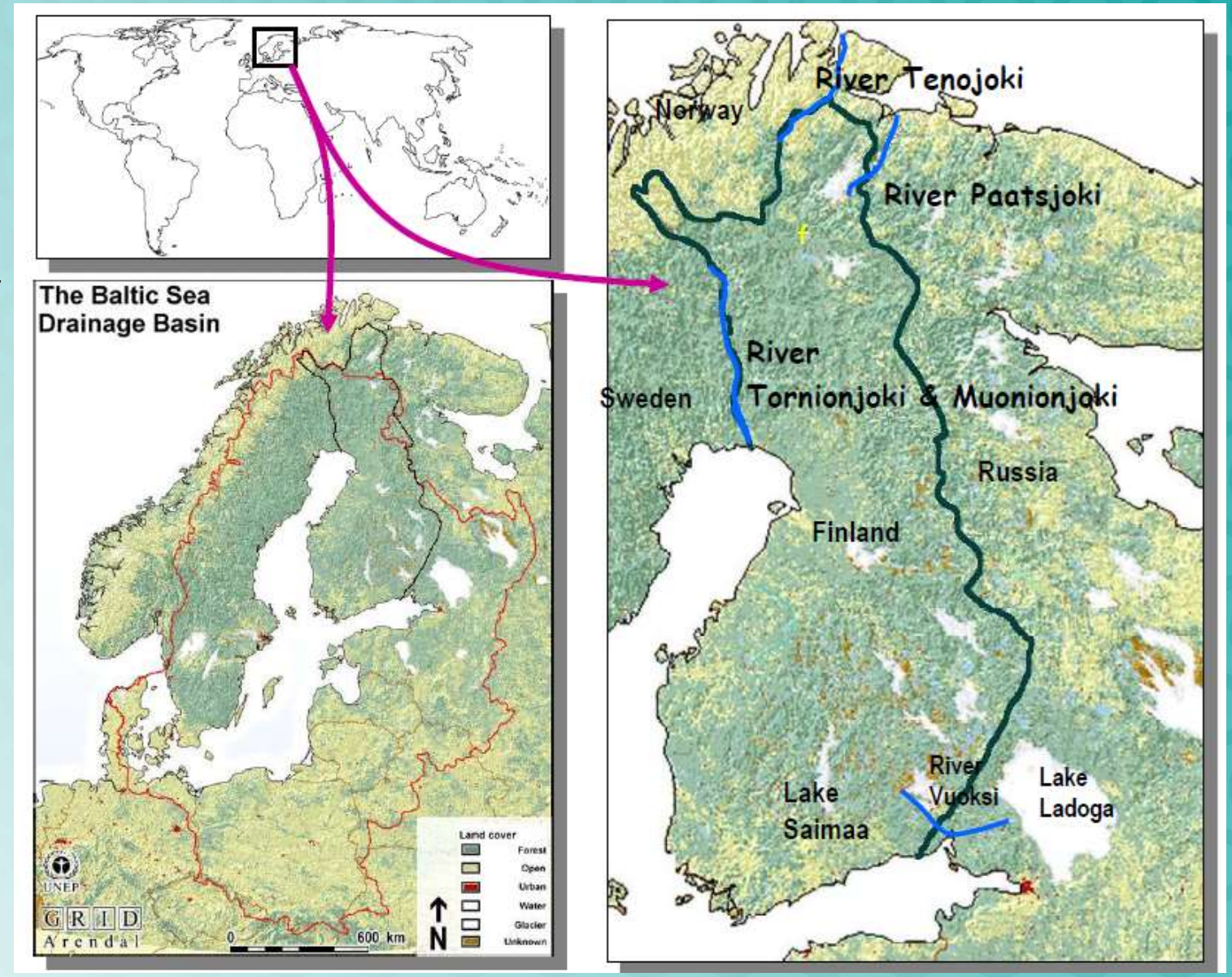
Finland and its transboundary waters



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Legal basis of transboundary water management and monitoring

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Basis agreements and commissions

- Bilateral agreements between bordering states included in the Finnish legislation
- Finland and Soviet Union 1964, now Russia
  - Finnish-Russian Commission on the Utilization of Frontier Watercourses
- Finland and Sweden, new agreement in 2010
  - the Finnish-Swedish Transboundary River Commission
- Finland and Norway, 1981
  - Finnish-Norwegian Transboundary Water Commission

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Commissions tasks

- Commissions promotes cooperation between the authorities of Finland and bordering states in
  - coordinating and reconciling programmes, plans and measures designed
  - to reach the objectives for the status of the aquatic environment and monitoring the status of waters.

- Key areas of interest

  Water management, Flooding protection, Water regulation, Fishing, Water quality status, Harmful substances, Biological status, Environmental impact assessment

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Some other agreements

- Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention, UN 1991)
  - If likely significant environmental impacts of a project, plan or programme cross national boundaries, the assessment is conducted in cooperation with the other country giving an opportunity for the authorities and the affected public to participate into the assessment procedure.

Ratified by Kyrgyzstan

Tajikistan has not ratified these

- Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention, UNECE 1996, opened to)
  - Legally binding instrument promoting the sustainable management of shared water resources, the implementation of the Sustainable Development Goals, the prevention of conflicts, and the promotion of peace and regional integration.
  - **Monitoring and assessment guidelines**

Ratified by Kyrgyzstan, Uzbekistan

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Annual meetings of the FI-RUS Commission

- Chairpersons of both country
- Members of the Commission
- Secretariat
- Interpreters

Chairwomen at present

Director Jaana Husu-Kallio, Ministry of Agriculture and Forestry, Finland

Director Bokova Tatjana Viktorovna, Federal Water Resources Agency, Russia

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Tasks of FI-RUS Commission

- The most important issue is to regulate the impacts in neighbouring country
- Regulation of water flow when there is a threat of floods or water scarcity
- Preventing pollution and monitor water quality
- Make sure that fish can freely migrate and prevent or minimize harms for fish stocks
- Common understanding of risks, benefits and costs in the broad sense

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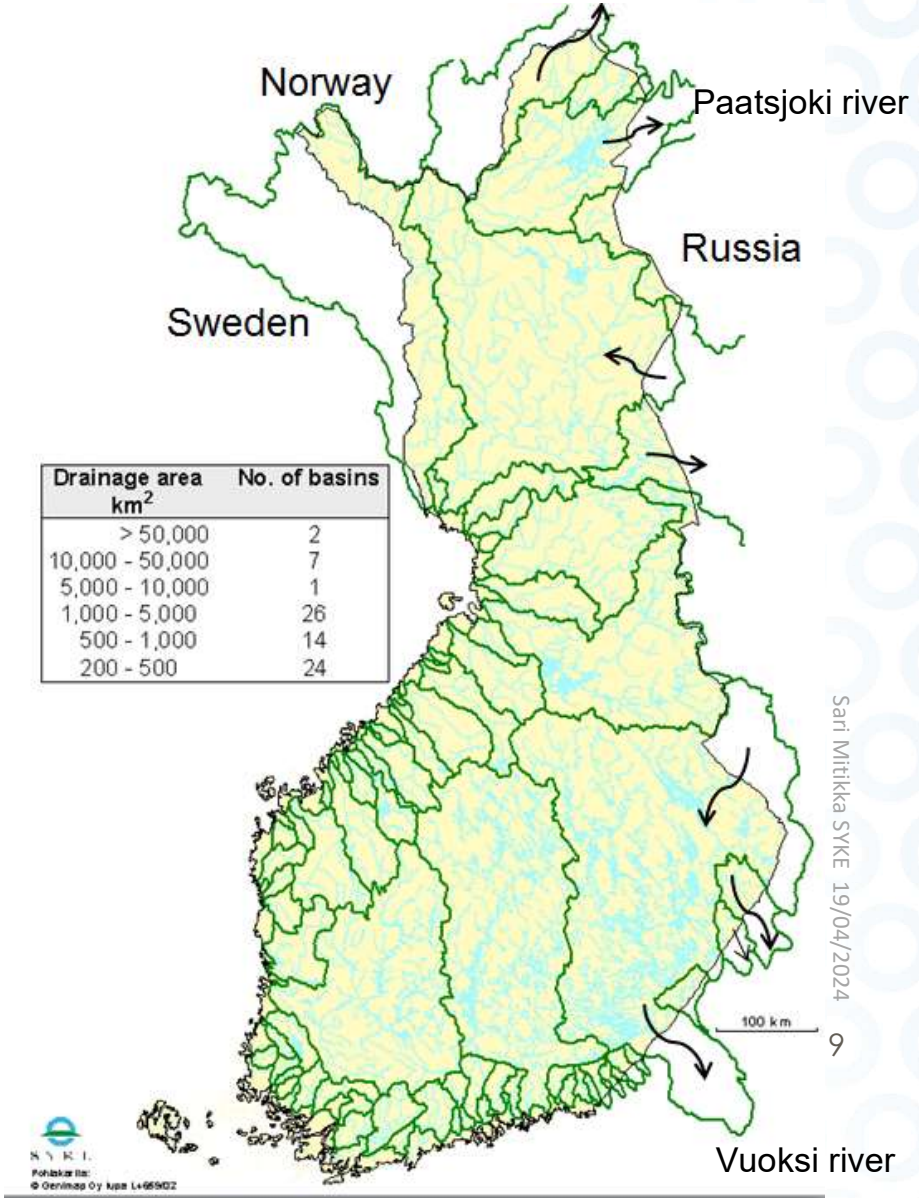
The main river basins

- Most waters flow from Finland to Russian
- The largest river basins along the common border are those of the rivers Vuoksi and Paatsjoki, both with several hydroelectric power plants



FI-RUS River basins

- The agreement covers most of eastern frontier (about 1000 km) with the exception of sea areas.
  - All transboundary inland waters
  - 19 river basins
  - Most of the rivers are in almost natural state near the border
  - Main interest has long been on watercourses in South-East Finland.

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Annual final protocol with attached reports prepared in working groups

- Annual reports
  - water quality trends
  - wastewater loads,
  - water protection measurements,
  - water regulation and rules,
  - actions done to protect fish populations
- Special reports e.g.
  - updated monitoring program,
  - flood risk management
  - developing joint hydrobiological monitoring

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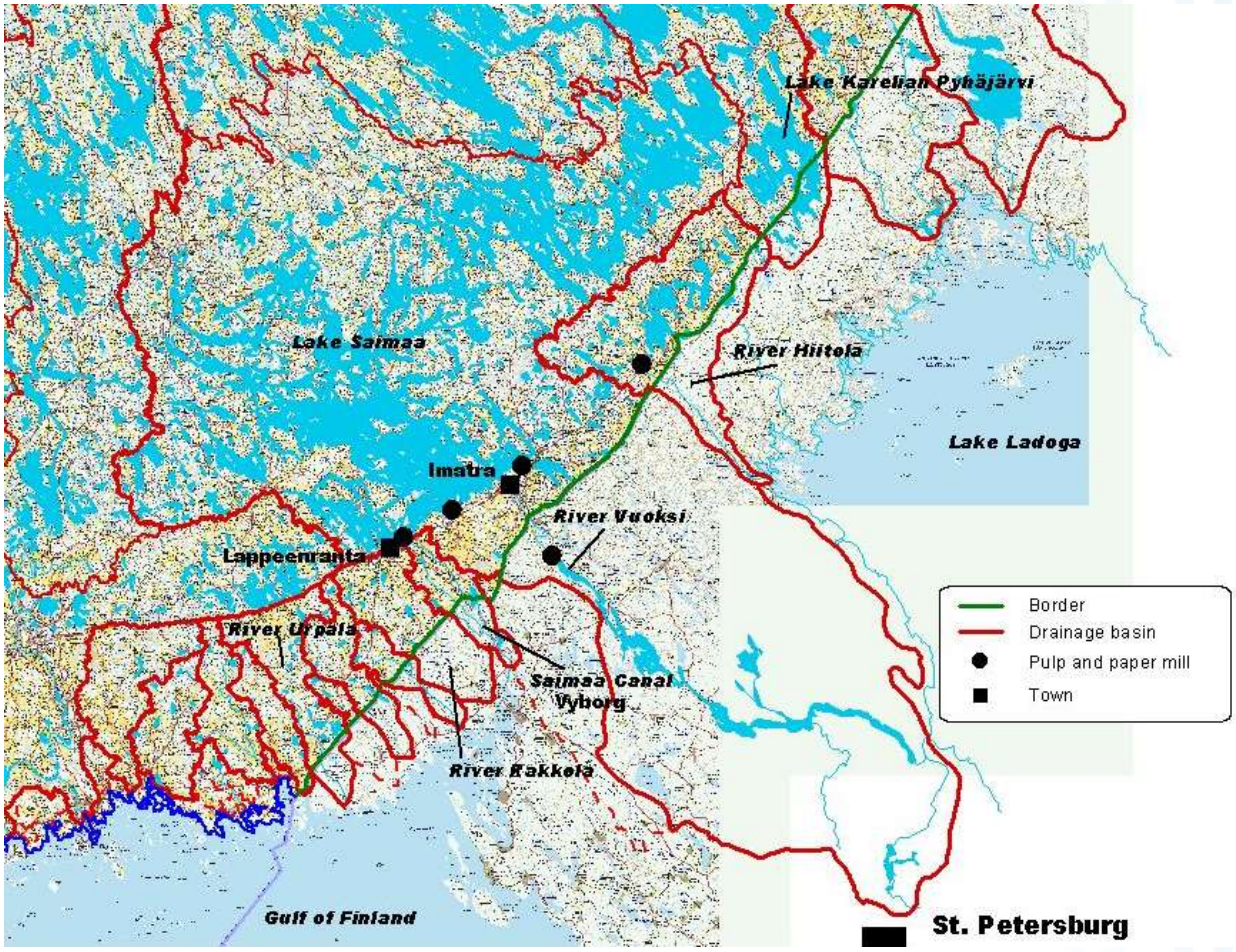
Working groups

- The practical work and preparing of issues in the commission is done in two main working groups:
  1) the integrated water management group
     - Experts for fisheries work in the sub-group of the integrated water management group.
  2) the water protection group
     - The frontier guards group helps experts in monitoring work.

Water protection group

- Main interest has long been on watercourses in the South-East Finland
- Pressures for watercourses are caused by
  - pulp and paper mills
  - hydropower
  - municipalities
  - agriculture



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Annual report of loading

Both parties report

- Point-source loading in reporting year
- How loading has changed in time
- Special occasions during a year e.g.
  - accidents,
  - difficulties in water purification in wastewater plants
- Water protection actions done in the latest year
  - New development in purification processes
  - Changes of environmental permits of industry and municipalities
  - Actions made to protect waters from diffuse pollution

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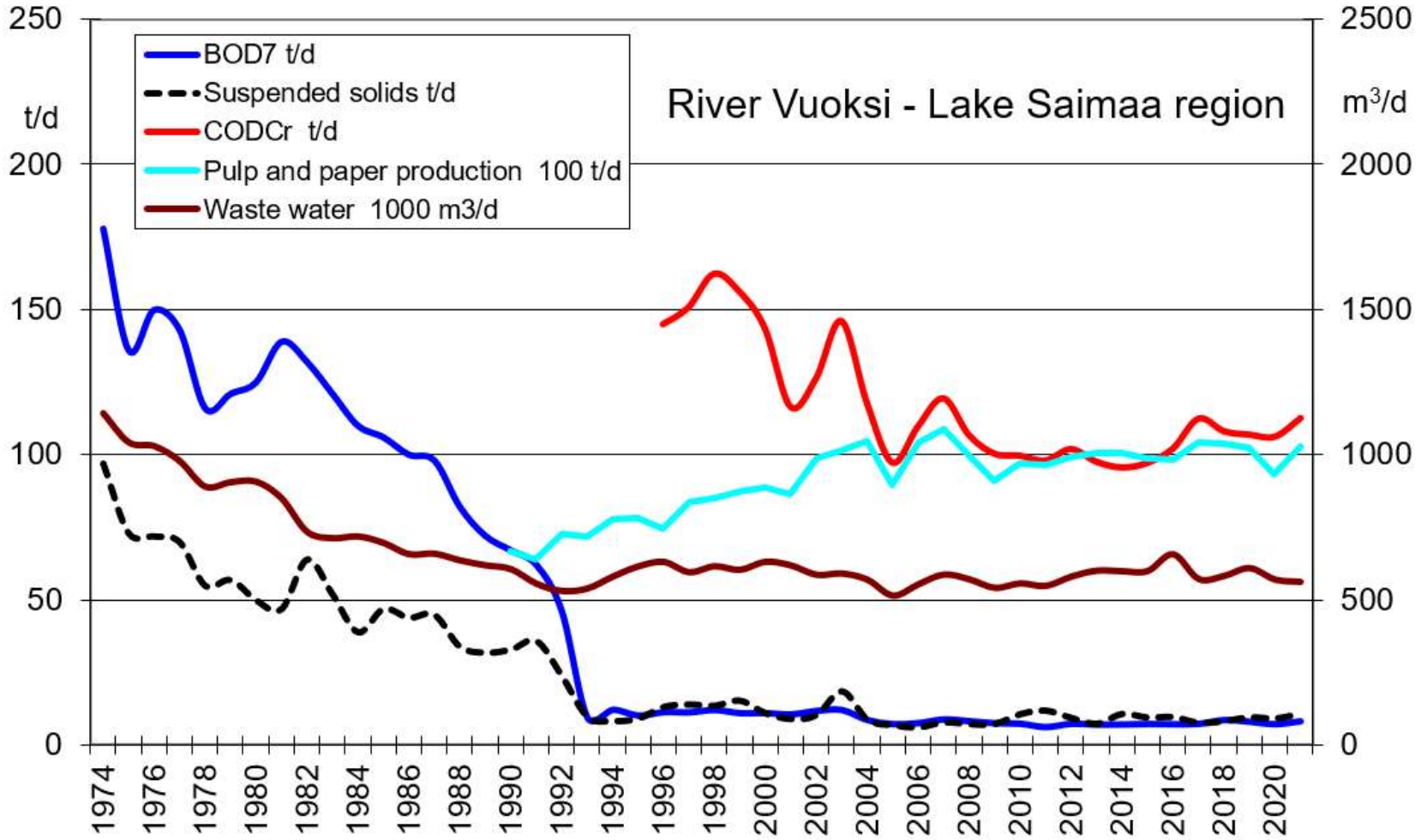
How loading has changed in time in River Vuoksi-Lake Saimaa region in Finland



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The development of the water quality

- The reduction of the load means an improvement in water quality in both Vuoksi and Hiitolanjoki rivers.
- Both the content of organic and phosphorus and nitrogen have reduced in these rivers significantly since 1970s.
- The water quality is good in the both rivers

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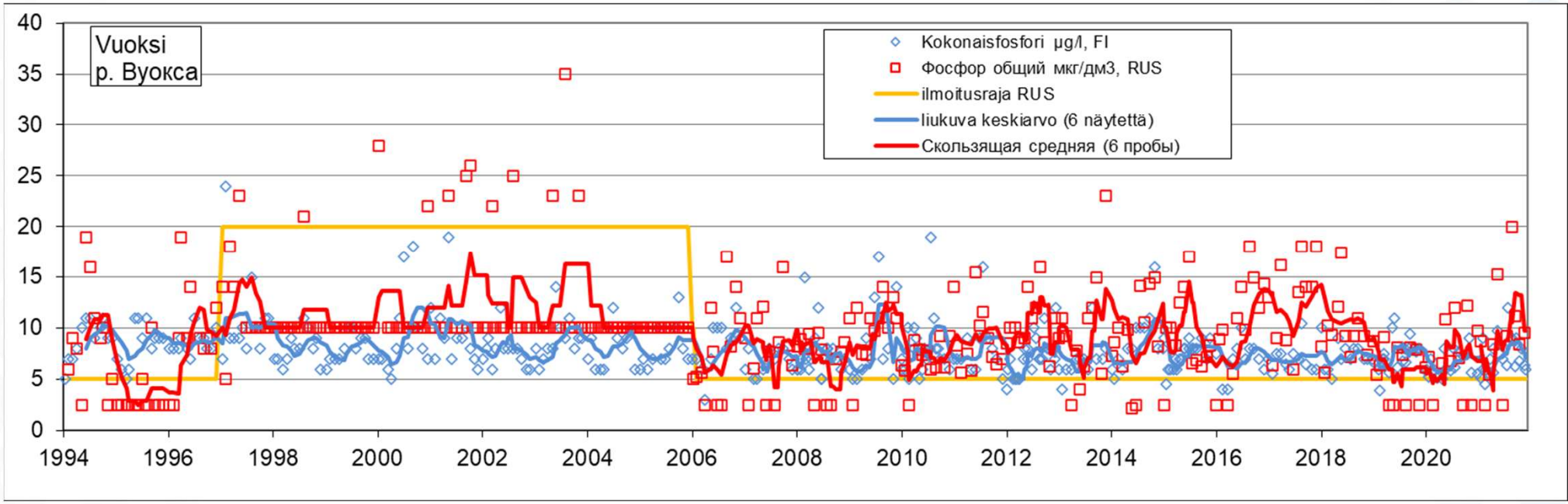
The development of the water quality

Data of both parties **FI** and **RUS** in a same time series.

- River Vuoksi, total phosphorus µg/l, each sample value and moving average of 6 samples, Russian limit of quantification (**LOQ**)



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Development in analytical methods

- In 1960s, 1970s, 1980, 1990s a lot of work was done to develop analytical methods together
- Used standards and practical laboratory work has been studied
- Intercalibration tests has been performed every 2-3 years
- Total nutrient (P and N) were added to monitoring programme not until early 1990s
- Detection limits are now low in both sides
- Data is now comparable

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Sampling

- Normal routine:

  Sampling every month in a same day in the Finnish side and in the Russian side

- Intercalibration:

  Joint sampling once in every 2 years, in March-April, only some water quality parameters and synthetic sample, analyzed by both parties

- On-line water quality monitoring

  Tested in a project with instruments for parameters: turbidity, total organic carbon, conductivity and chlorophyll *a*

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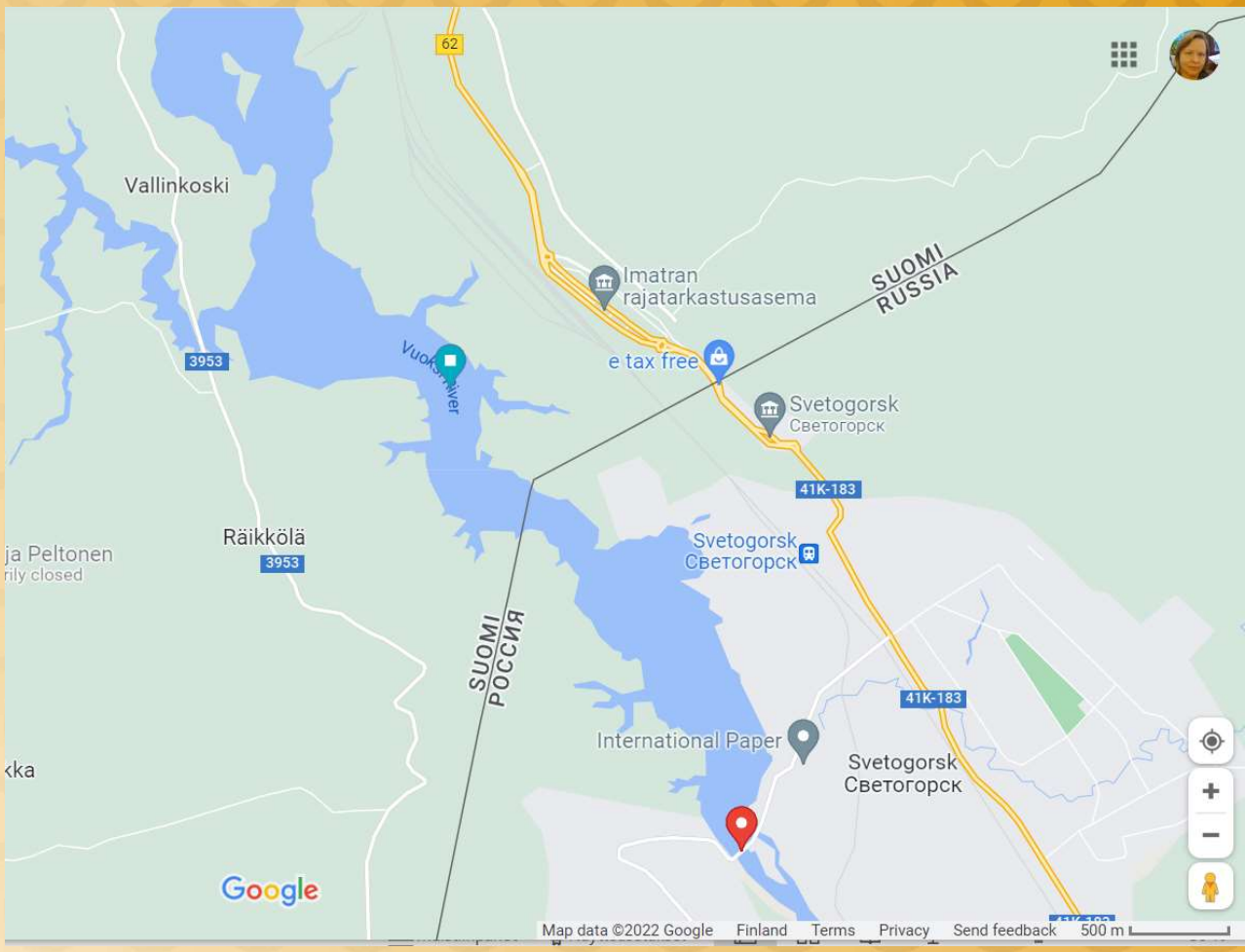
Joint monitoring program of bordering waters between Finland and Russia

- Updated in 2015
- History of FI-RUS monitoring
- Maps of sampling sites with co-ordinates
- Sampling depths and times
- Variables



River Vuoksi: Distance between sampling sites 2.9 km

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Monitoring program

- variables, units, sampling frequencies

Variable	Unit	Sampling frequency
Discharge	$m^3 s^{-1}$	
Secchi depth	m	12 times per year
Temperatute	^oC	
Ogygen	mg/l	
Oxygen saturation	%	
pH		
Conductivity	mS/m	
Suspended solids	mg/l	
Turbidity	FNU	
Colour	mg/l Pt	
COD_{Mn}	mg/l	
BOD_7	mg/l	
Total P	µg/l	
Total N	µg/l	
Fe	µg/l	
Mn	µg/l	
Na	mg/l	
Cu	µg/l	4 times per year
Zn	µg/l	
Hg	µg/l	
Ni	µg/l	4 times per year, every 3. year
Pb	µg/l	
Cr	µg/l	
Cd	µg/l	
As	µg/l	
Chlorophyll a	µg/l	7 times per year

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Experiences of Finland

- Joint transboundary integrated water resources management has been achievable even with two very different societies
- Survived cold war and collapse of Soviet Union
- Ukraine crisis → tension between Russia and EU
- **Pragmatic, clear focus on finding joint management interests**

Joint sampling by Russian and Finnish experts at the river Vuoksi