

JOINT FLOOD RISK MANAGEMENT PLANNING AND IMPLEMENTATION

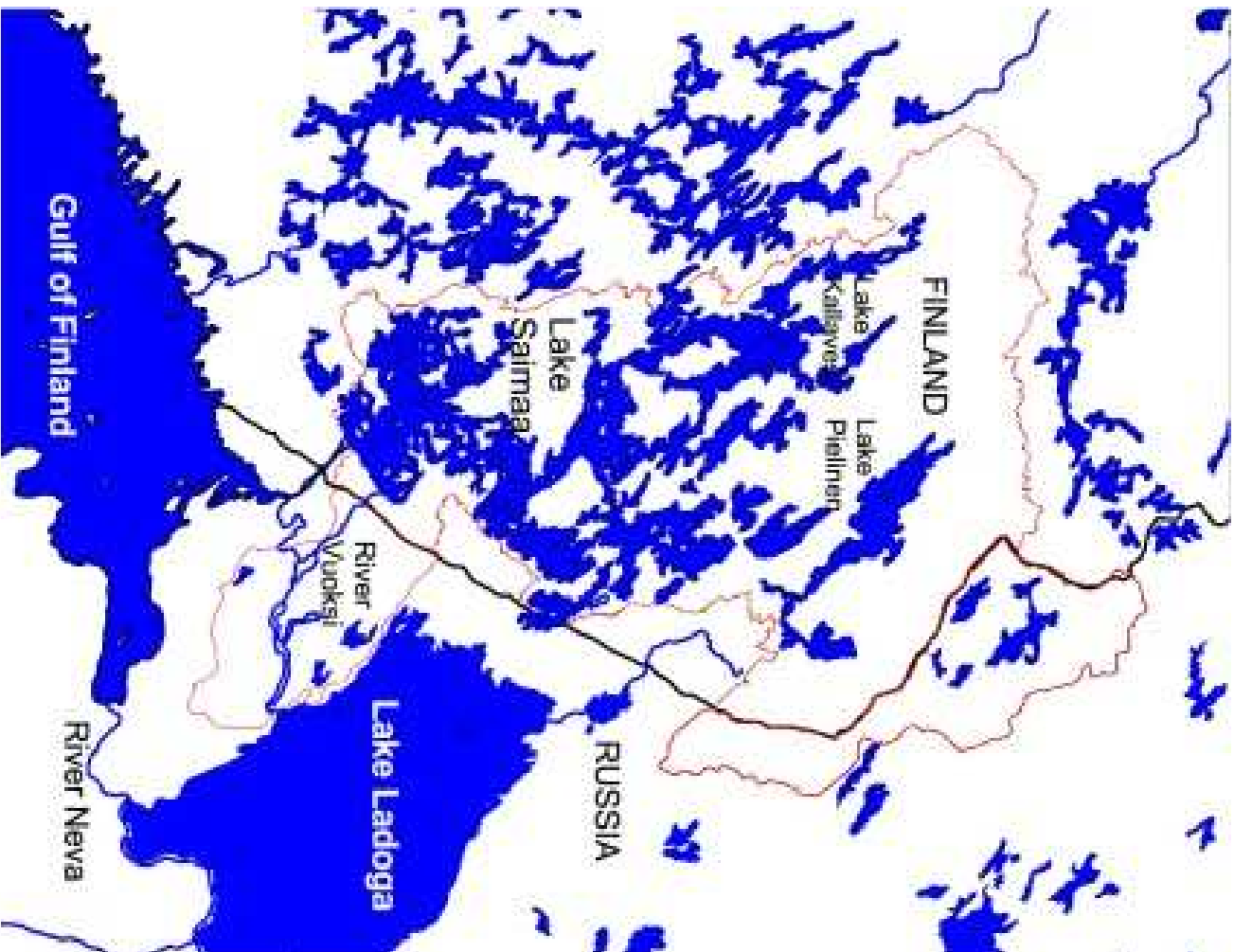
CASE STUDY: RIVER VUOKSI

Markku Ollila
Senior Engineer
Finnish Environment Institute SYKE

Workshop on Transboundary flood risk
management
Geneva, 22-23 April 2009



27.4.2009



S Y K E

BASIC INFORMATION

Lake Saimaa catchment area 69 500 km²
(77 % on the Finnish territory and
23 % on the Russian territory)

Precipitation annually 590 mm

Lake Saimaa area 4 460 km²

water level fluctuation

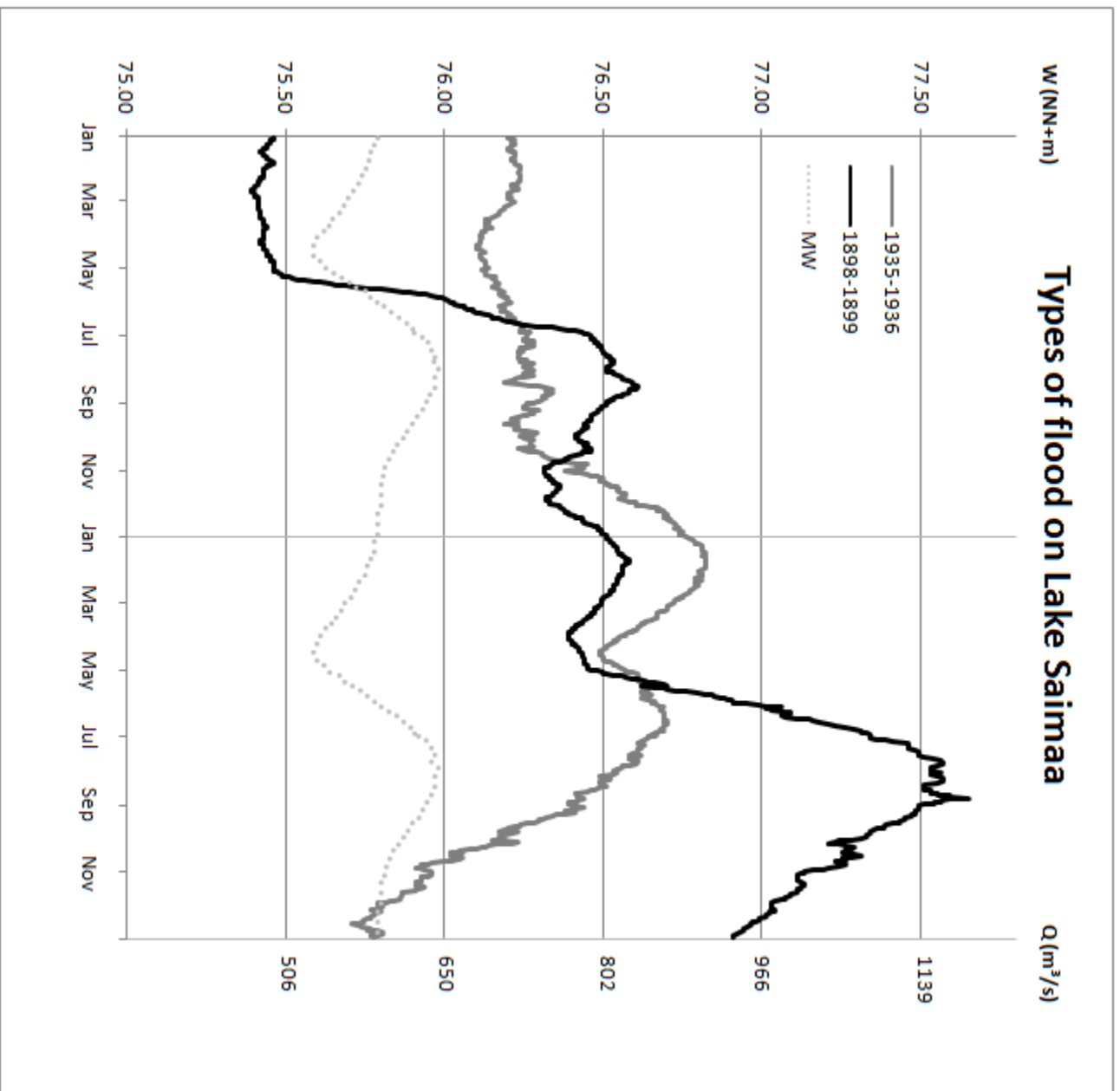
zone 3,3 m

mean annually 0,7 m

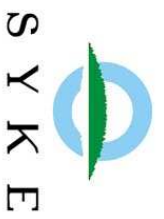
River Vuoksi natural discharge mean 600 m³/s

max 1170 m³/s

min 220 m³/s



27.4.2009

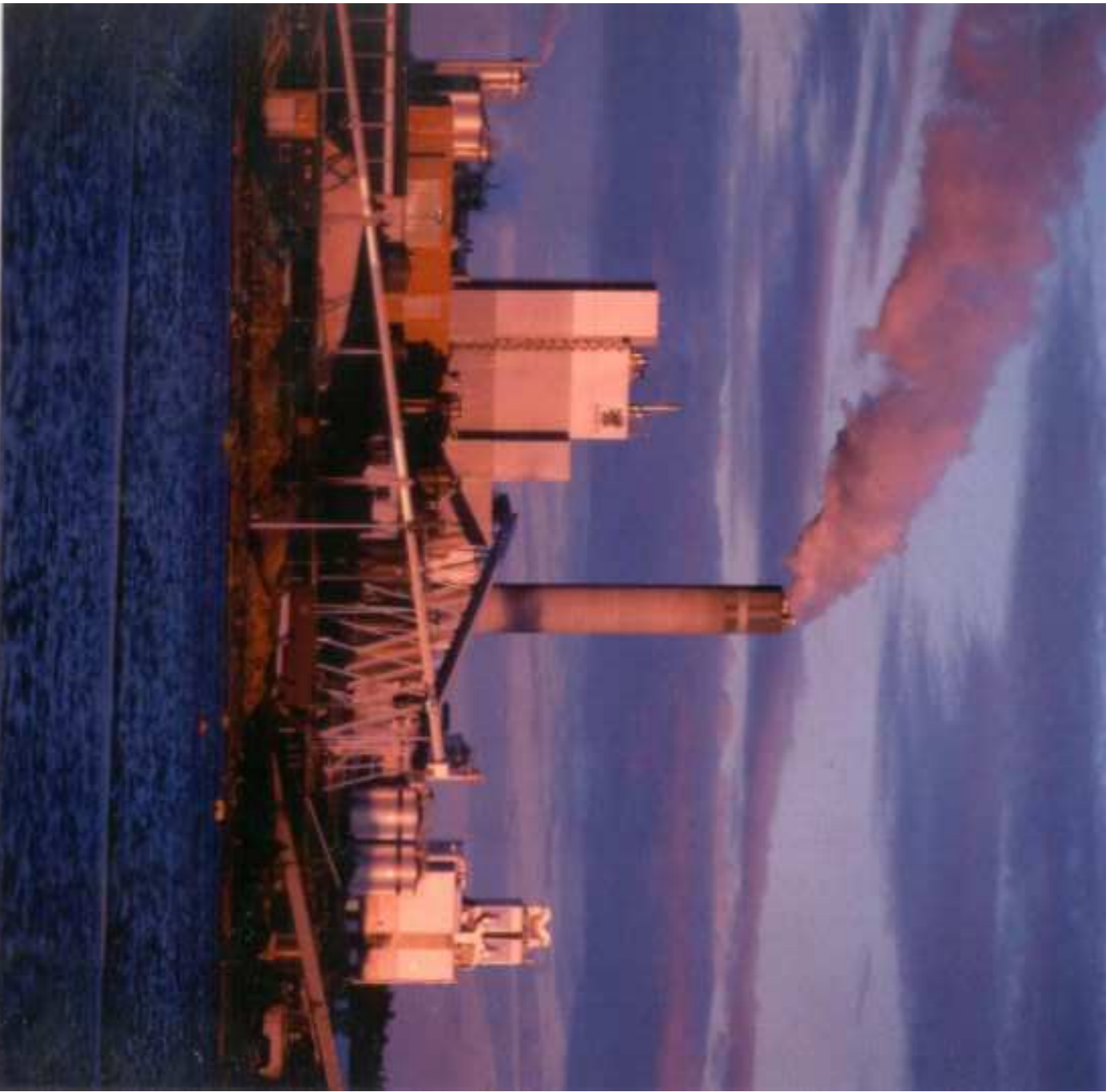




27.4.2009



S Y K E



27.4.2009

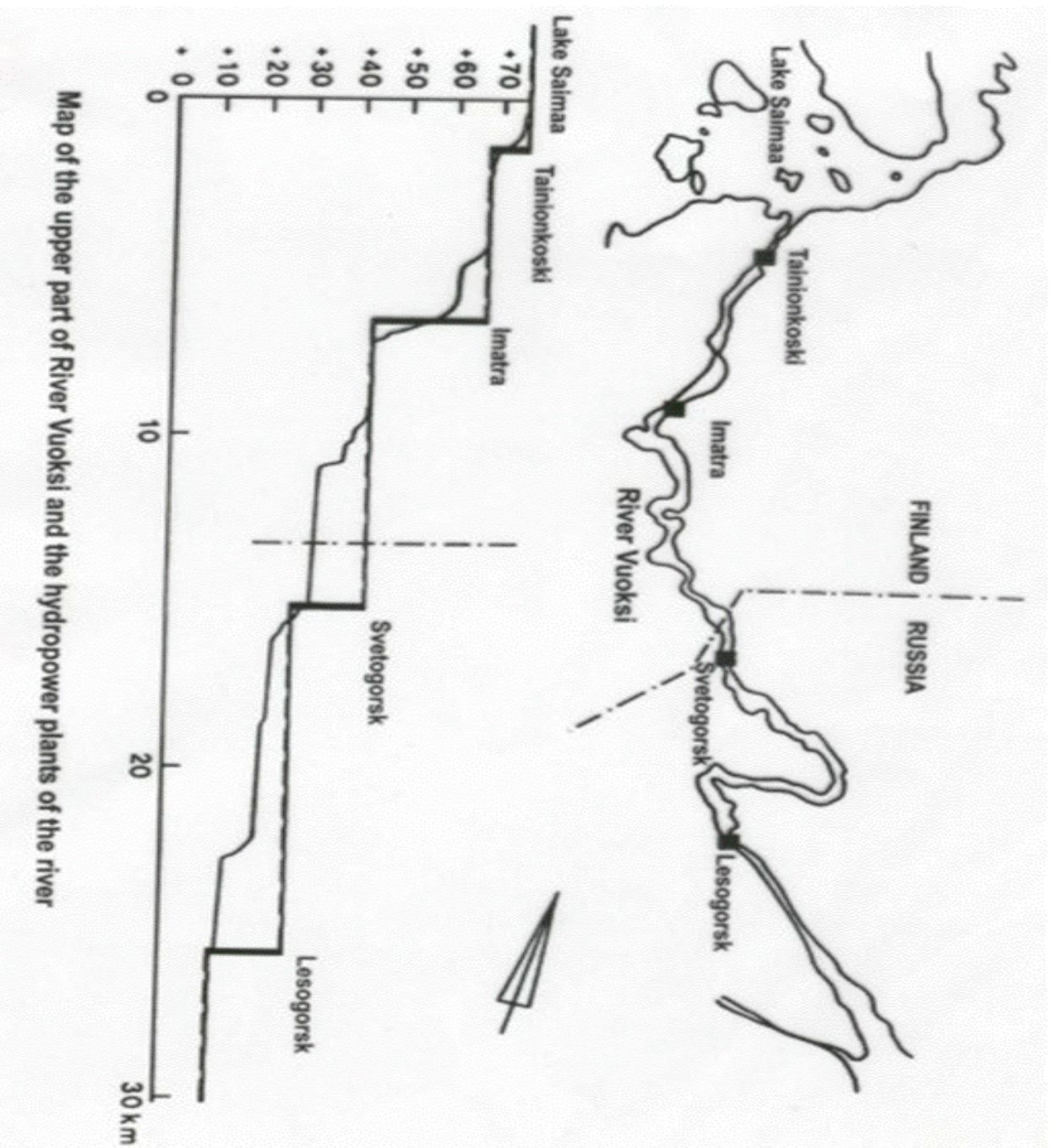


S Y K E



S Y K K E



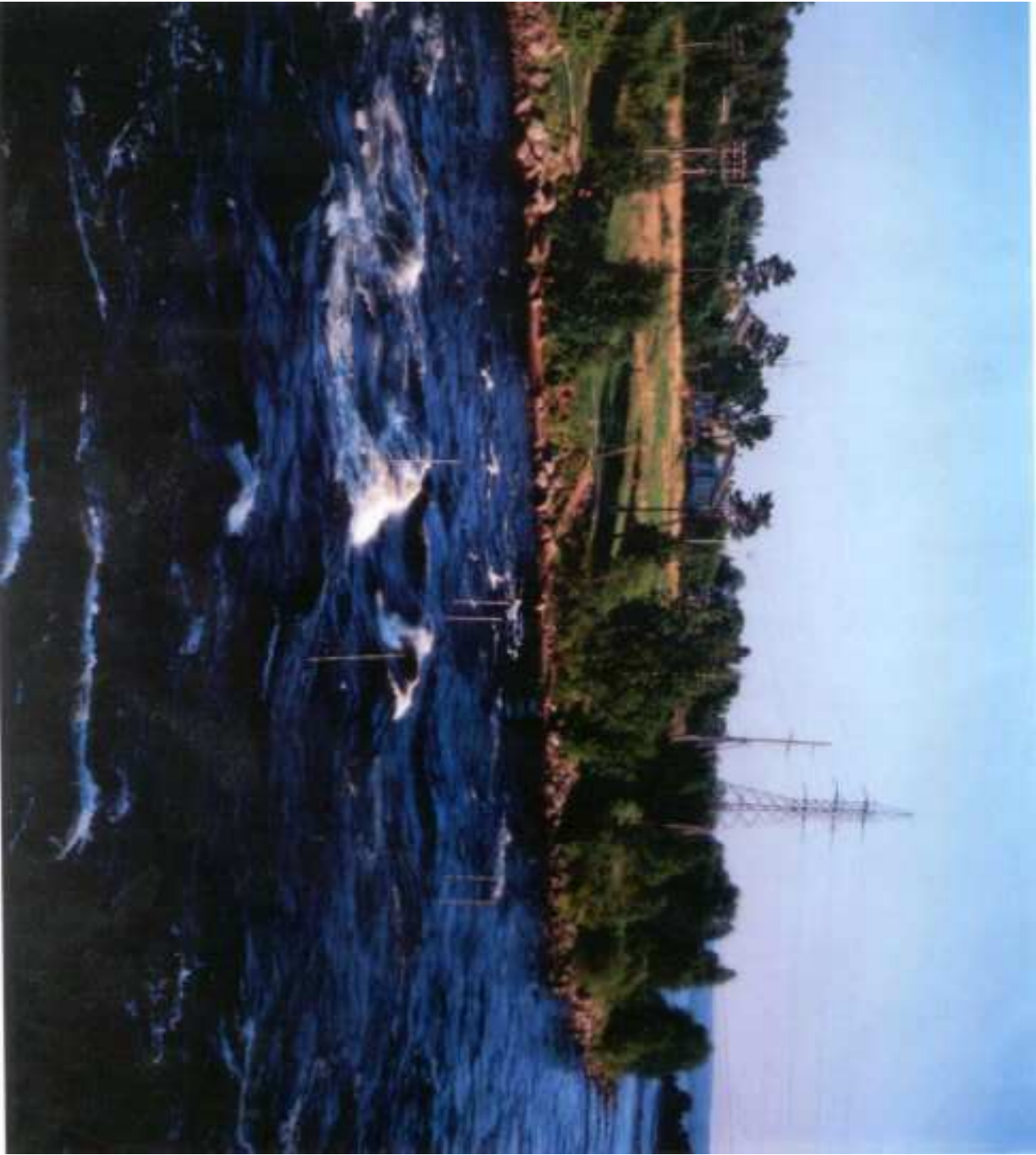


Map of the upper part of River Vuoksi and the hydropower plants of the river

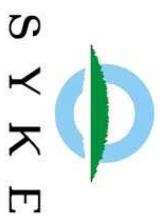
27.4.2009



S Y K K E



27.4.2009



27.4.2009



INSTITUTIONAL RESPONSIBILITIES AND COUNTERPARTS

STATE LEVEL:

The agreement between Finland and the USSR on frontier watercourses was signed in 1964

The joint Finnish-Russian Commission on the Utilization of Frontier watercourses was established in 1965

REGIONAL LEVEL:

The South-East Finland Regional Environment Centre

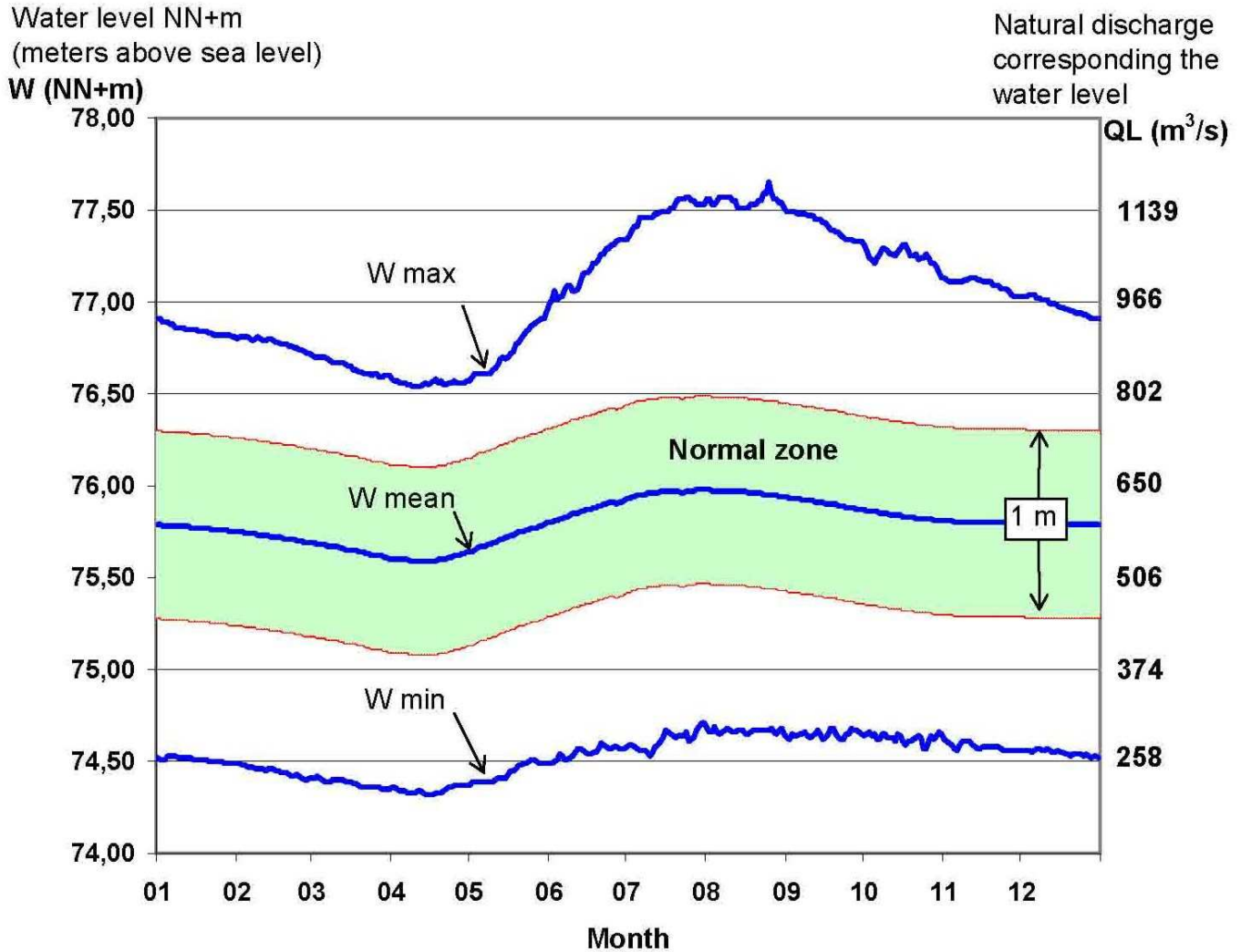
The Neva and Ladoga Water Basin Administration



THE DISCHARGE RULE

- Initiative made by the Russian part of the Commission in 1973
- Several alternatives, finally accepted in 1991
- The aim is to prevent damage caused by floods or low water levels
- Normally water level and discharge are kept in natural state
- Only in case the forecast predicts, that the water level will rise above the normal zone, discharge will be increased
- Correspondingly low water levels are prevented by reducing the discharge
- When there is no longer threat of flooding or drought, natural discharges will be resumed

The discharge rule of Lake Saimaa and River Vuoksi



The zone of normal water levels in Lake Saimaa and the highest, average and lowest water level recorded in 1847-2005



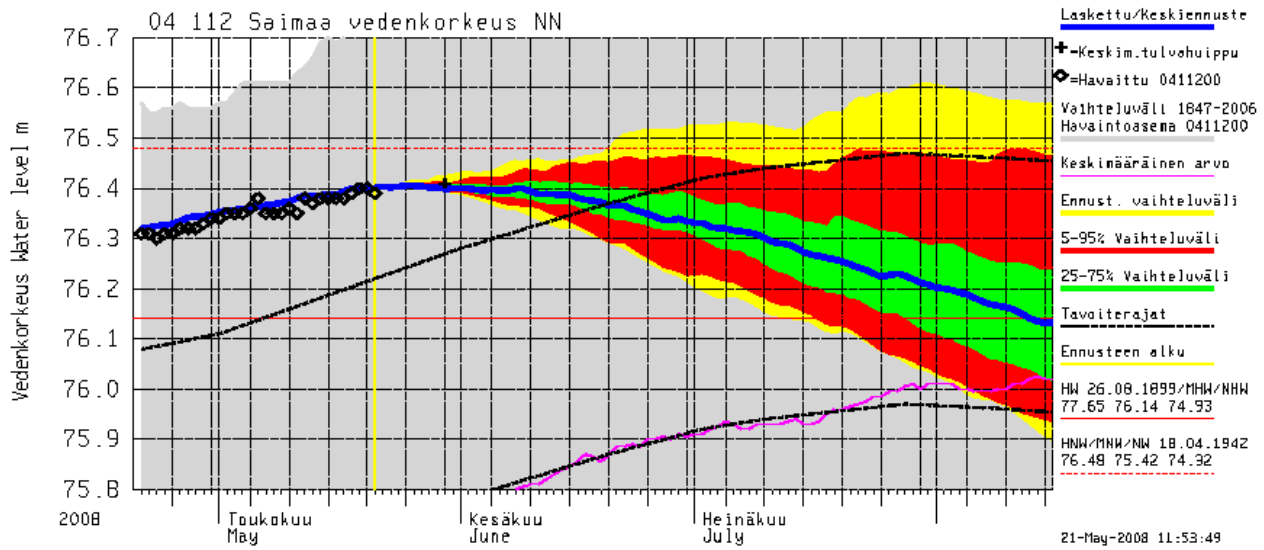
IMPLEMENTATION OF THE DISCHARGE RULE

- Throughout the year information on water level, precipitation, water equivalent of snow and water level forecast is sent to the Russian side.
- Real-time forecasts on water level and discharge from some measuring sites both in Finland and Russia are available in the Internet. This daily information is important for the Russian hydropower companies and the Russian water and environment authorities.
- Once a year the working group meeting is held for discussing the outcome of the implementation of the rule in the previous year and the perspective for the future.
- In case there will be a change in discharge, the Russian side and the power companies are informed.
- If the discharge is expected to cause damage, the amount of discharge will be agreed on in consultation between the Parties of the Commission.
- If damage is caused by the changes of discharge volumes it will be agreed on in the Commission and compensated by Finland.
- The target is to achieve as good result as possible from the point of view of both countries.

Forecast Sites in the internet



Forecast of water level of Lake Saimaa in the internet



27.4.2009



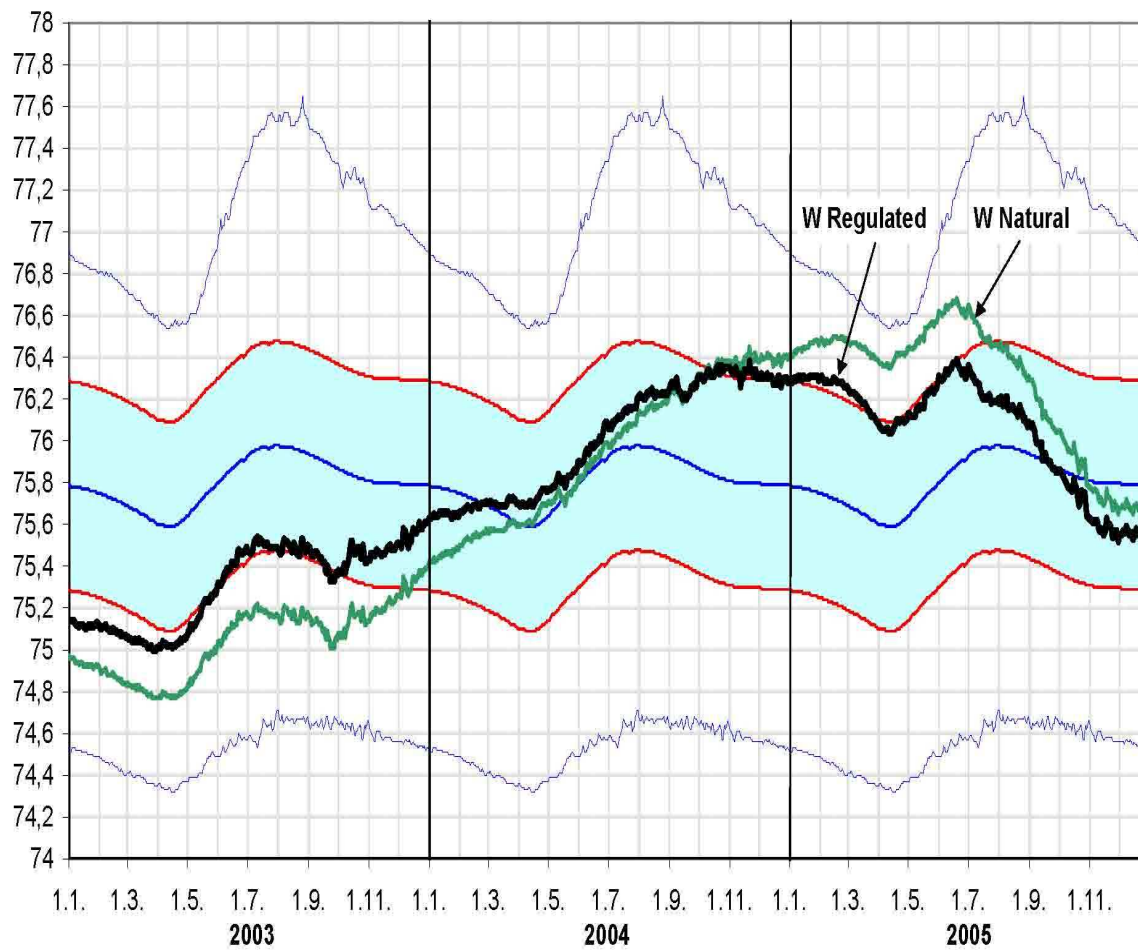
ACHIEVEMENTS IN THE IMPLEMENTATION OF THE RULE

- The Rule has been used 7 times for floods and 3 times for droughts
- These situations have not been very exceptional
- The maximum lowering of flood peak in Lake Saimaa has been 0,3 m and raising of low water level 0,2 m
- Prevented damage in Finland about 10 M€, while compensation of decreased electricity production in Russia about 1 M€
- No problems in the implementation
- Essential that the rule sets the principles and changing of discharges can be started rapidly
- Changing of discharges can be done flexibly taking into account the targets of both countries

An example of the use of the Discharge Rule in 2003-2005

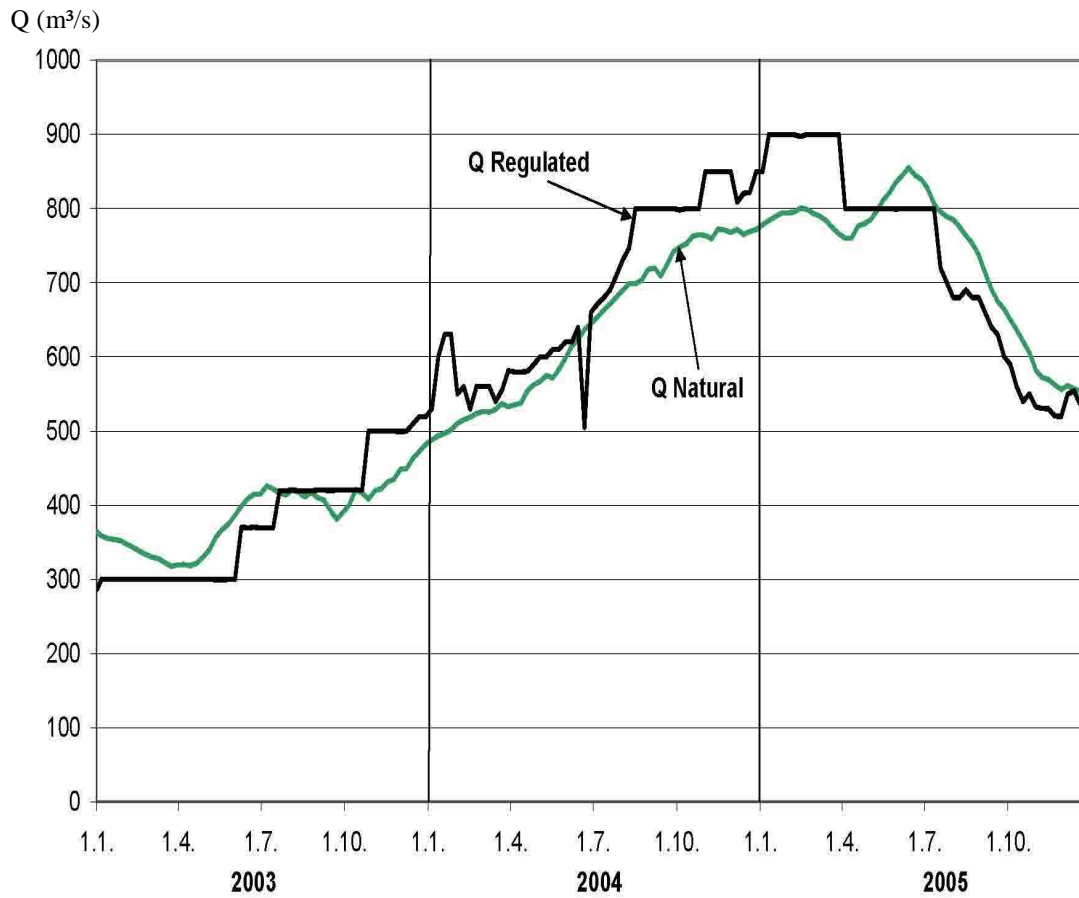
Lake Saimaa

W [NN + m]



An example of the use of the Discharge Rule in 2003-2005

River Vuoksi Tainionkoski



POTENTIAL IMPROVEMENTS

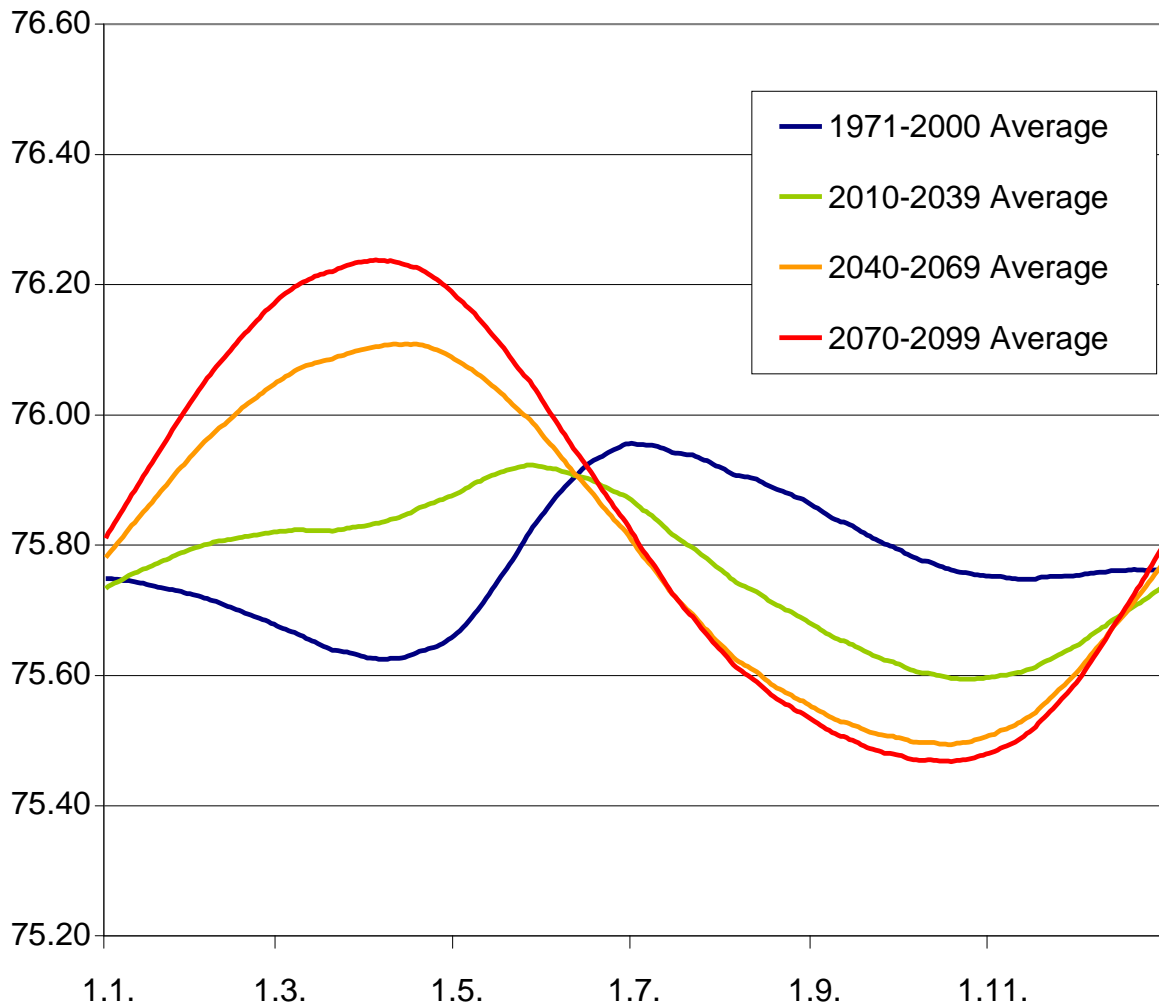
- More information needed on the dependence of flood damage on discharge on the Russian side of the River
- Raising of the maximum installed discharge capacity of the Russian hydropower plants to the same level as in the Finnish plants would improve the efficiency of flood protection
- More statistical and real time data on hydrology and meteorology on the northern part of the discharge area would improve the forecasts
- Studies should be made on the possible need of modifications in the Discharge Rule because of the anticipated effects of climate change



S Y K E

Average simulated water level of Lake Saimaa in different periods (Veijalainen, 2006)

Water level
(m, NN)



RELATION TO EU FLOOD RISK MANAGEMENT DIRECTIVE

- As the Vuoksi drainage area reaches beyond the boundaries of the EU, Finland should endeavour to create one flood risk management plan, or several coordinated ones
- The situation is quite good as there is lots of information concerning flood risks in the area, and the Discharge Rule is in force
- So far there have been some preliminary talks on the subject in the Joint Commission



S Y K E

CONCLUSIONS / CONTACTS

- The Joint Transboundary Commission has its regular meetings and contacts
- Regional water-environment organizations are developing emergency planning
- Members of the Commission have participated in a Tacis-project which studied flood problems in the Vuoksi River
- The Commission is preparing a programme to get more information for flood damage and flood protection in the River
- The power companies have close cooperation concerning information dissemination and emergency situations
- Real-time flood forecasts in the internet is a major asset



S Y K E

CONCLUSIONS / BENEFITS OF TRANSBOUNDARY APPROACH

- Information is delivered to the other party
- The Commission has been working for over 40 years and been successful
- Members of the Commission meet regularly and know each other for a long time
- The Discharge Rule was jointly created and approved and its use is jointly decided
- The principles for compensation have been decided in the Rule
- The amount of possible compensation is jointly approved in the Commission



CONCLUSIONS / CHALLENGES

- In case of a threat of a very large flood decision making on the amount of discharge can be difficult as there is not accurate information on the amount of flood damage along the River Vuoksi. In such a case decision making can also take quite a long time which lessens the lowering effect of the discharge on the flood peak of Lake Saimaa.

CONCLUSIONS / IMPROVEMENT OF FLOOD MANAGEMENT

- Flood protection situation in the Saimaa-Vuoksi –area is very good because of the Discharge Rule
- There are still some gaps in information
- The rise of the discharge capacity of the Russian hydropower plants to the capacity of the Finnish plants, about 900 m³/s, would improve the efficiency of the Discharge Rule to lower the flood peaks in Lake Saimaa



S Y K E

27.4.2009

