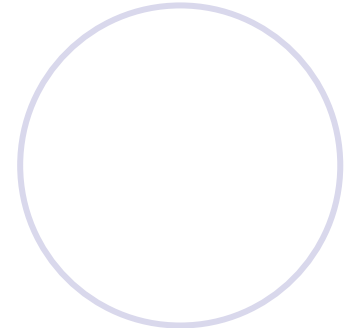
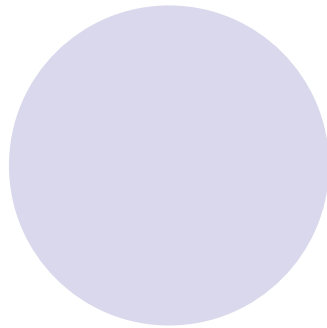
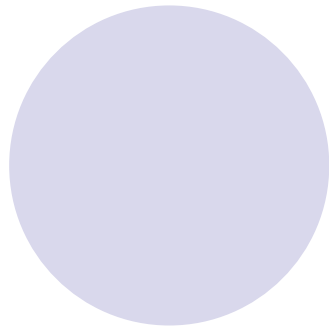


**Report on the activities of
Russian organization in
relation to the BALTEX Phase
II Implementation**

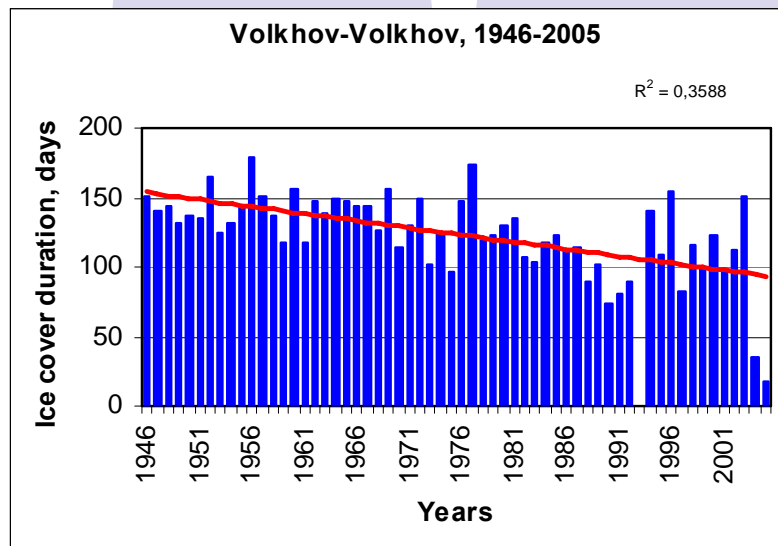
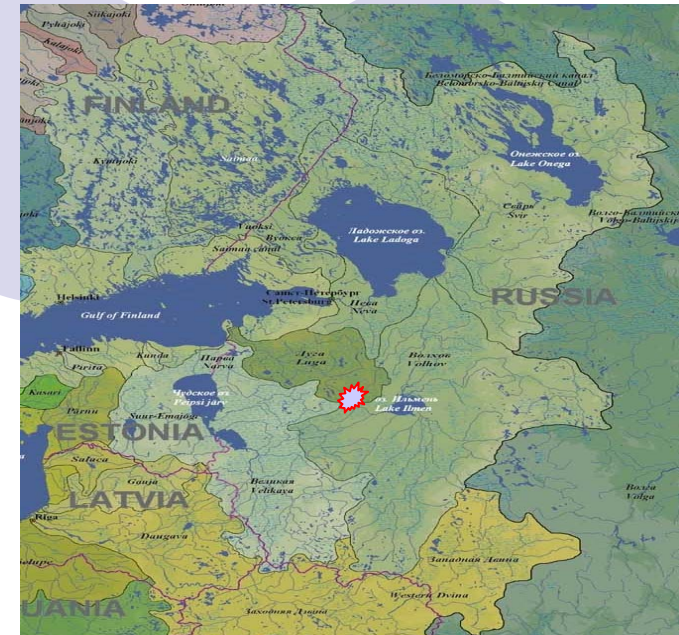


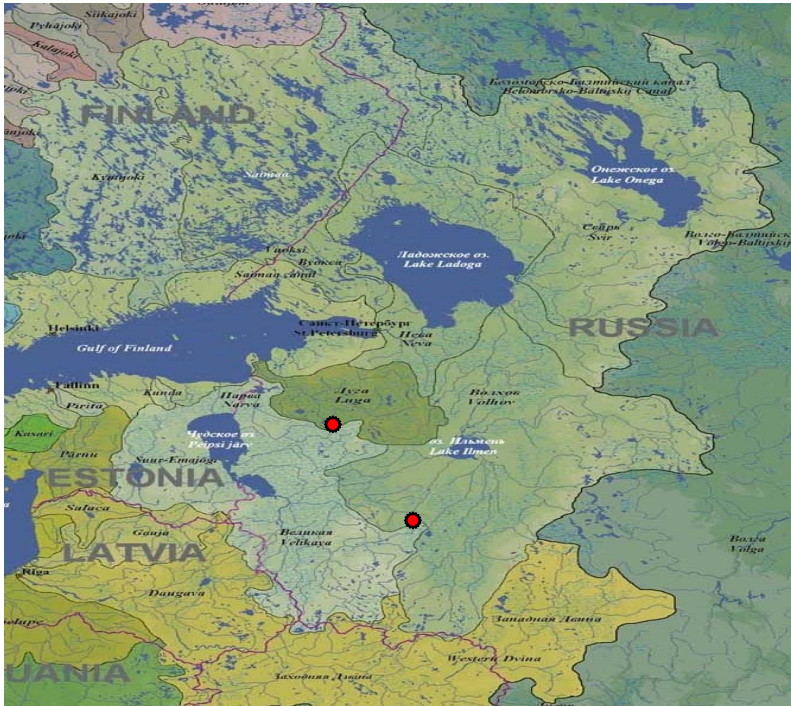
1. Better understanding of the energy and water cycles over the Baltic Sea basin

Long-term studies of lakes and rivers ice regime formation in the Russian part of the Baltic Sea basin are being carried out at the State Hydrological Institute. The changes of ice cover duration and maximal ice cover thickness for the last 50 years has been estimated on the basis of statistical methods.

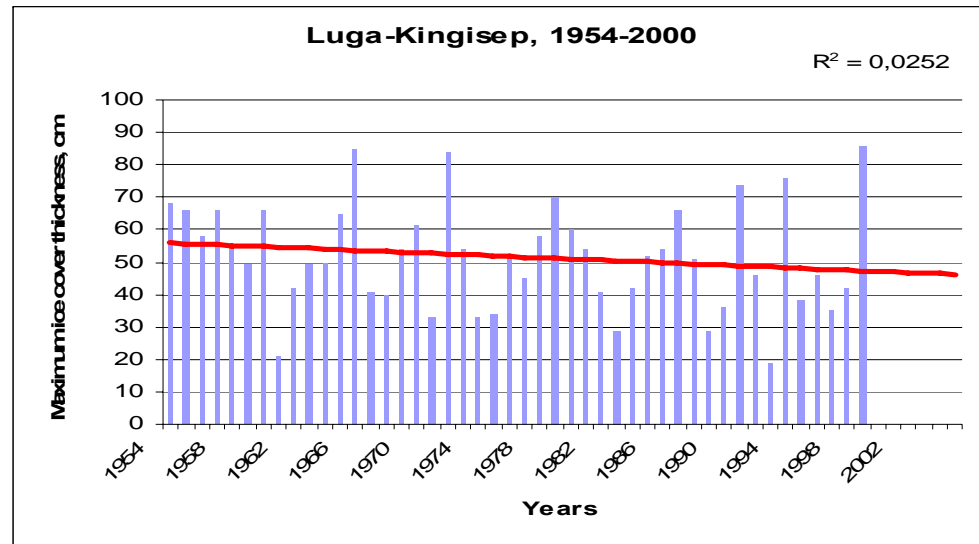
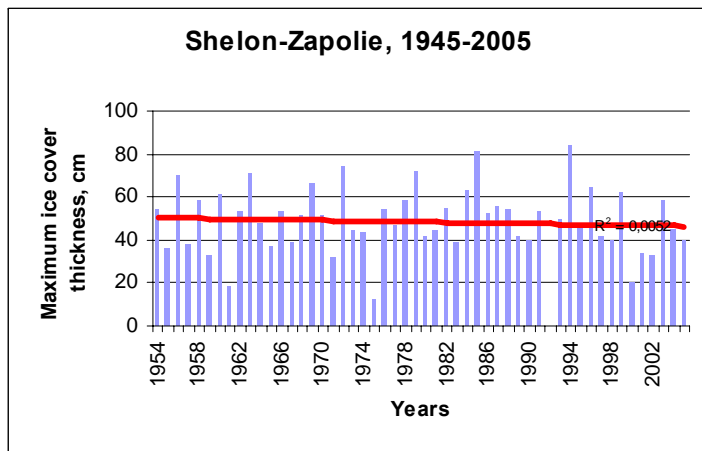
The ice cover duration in mid-size rivers within the Russian part of Baltic drainage basin became shorter because of later ice-on and earlier ice-off:

- for the period of observation (from 1945 to 2005) became shorter by 30-40 days on the average
- during the last 20-25 years became shorter by 3-7 days on the average





In all rivers under consideration within the Russian part of Baltic drainage basin a tendency towards decrease of the maximum ice cover thickness was established for the second part of the XXth century. A thinning of the maximum ice cover thickness was -5-10 cm for the period



Possible features of bottom flow from the Stolp Channel into the Central Baltic were investigated by numerical simulation at the Russian State Hydrometeorological University (RSHU). The accounts were carried out for rectangular area located in the central part of the Baltic sea , including the Gotland and Gdansk Deeps.

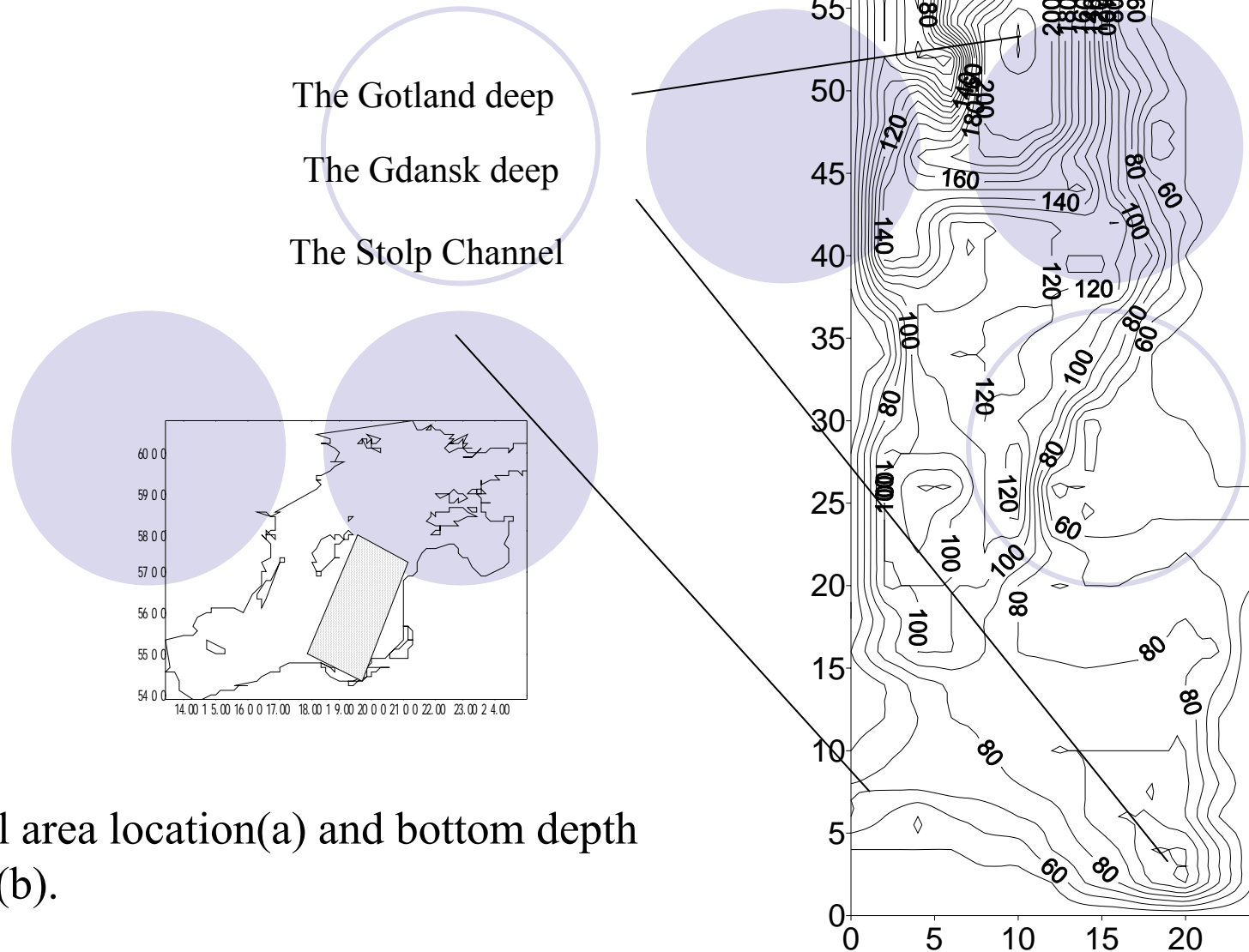


Fig.1 Model area location(a) and bottom depth distribution(b).

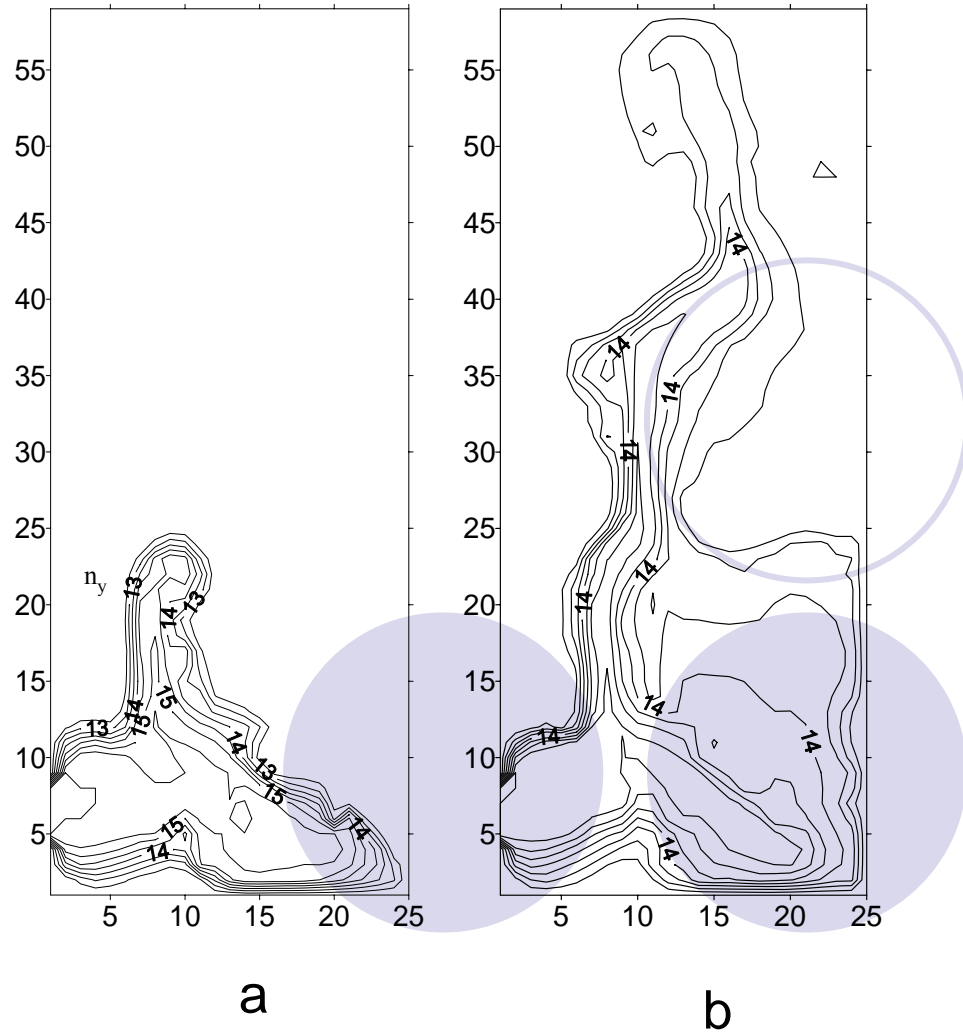


Fig.2. Bottom salinity distribution calculated in 10 (a) and 70 (b) days.

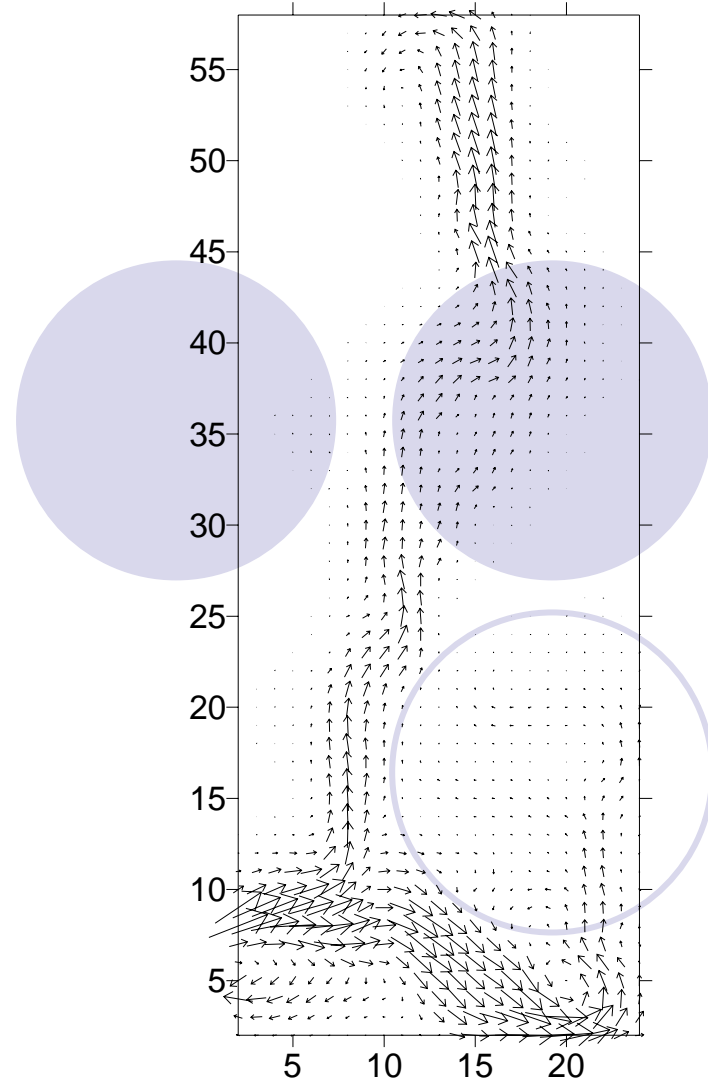


Fig.3. Calculated in 70 days bottom currents velocity distribution

3. Provision of improved tools for water management, with an emphasis on more accurate forecasts of extreme events and long-term changes

Methodological approaches have been developed and assessments of maximal ice cover thickness on rivers and lakes for the last 20 years as compared with the previous 30 years have been made at the State Hydrological Institute. Assessments have also been made of possible changes in maximal ice cover thickness for the nearest 15-20 years on the basis of winter air temperature rise scenarios. Recommendations have been developed on adaptation of water resources utilization system to expected changes in ice regime of rivers and lakes.

Assessment of possible ice regime changes for the period 2010-2015

	Changes in ice cover duration for the period 2010-2015, days (prognostic values)	Changes in maximum ice cover thickness for the period 2010-2015, (prognostic values)	
		cm	%%
Region (mean values)	-4-7		
Volkhov river	-5-10	-2-4	--5-10
Luga river	-3-5	-2-5	-4-11
Shelon river	-3-5	-1-3	-2-6
Msta river	-4-6	-2-4	-4-8

4. Gradual extension of BALTEX methodologies to air and water quality studies

Studies of flow of organic matter along the river Neva and its tributaries within St. Petersburg area and the organic outflow into the Neva Bay making use of the hydrochemical and ecological analyses as well as the analysis of the dynamics of the Neva basin contamination by organic matter have been carried out at the Russian State Hydrometeorological University.

The RSHU in collaboration with its Finnish colleagues is currently studying to assess contamination of bed load in the Okhta channel and Okhta reservoir (the Neva basin) within the framework of the Russian-Finnish project “Collaboration for development of ecological feasibility of channel dredging for the river Okhta” financed by EU. The final aim of the study is to develop recommendations on ecological feasibility of channel dredging for small rivers in large cities and industrial zones.

Neva river pollution by biogenic substances (in relation to mean MPC*)

River-station	Nitrogen Na	Nitrogen Nna	Nitrogen Nnt	Phosphorus Pmin
Neva-Shlisselburg	0,3	0,2	0,03	0,02
Neva-Kirovsk	0,5	0,1	0,03	0,04
Neva-Tosna m.	0,3	0,2	0,03	0,08
Neva-Izhora m.	0,5	0,5	0,05	0,12
Neva-Novosaratovka	0,5	0,5	0,05	0,25
Neva-Okhta m.	0,7	1,0	0,03	0,10
Neva-Liteyny br.	0,4	0,1	0,03	0,05
Neva-mouth	0,4	0,3	0,03	0,07

*maximum permissible concentration

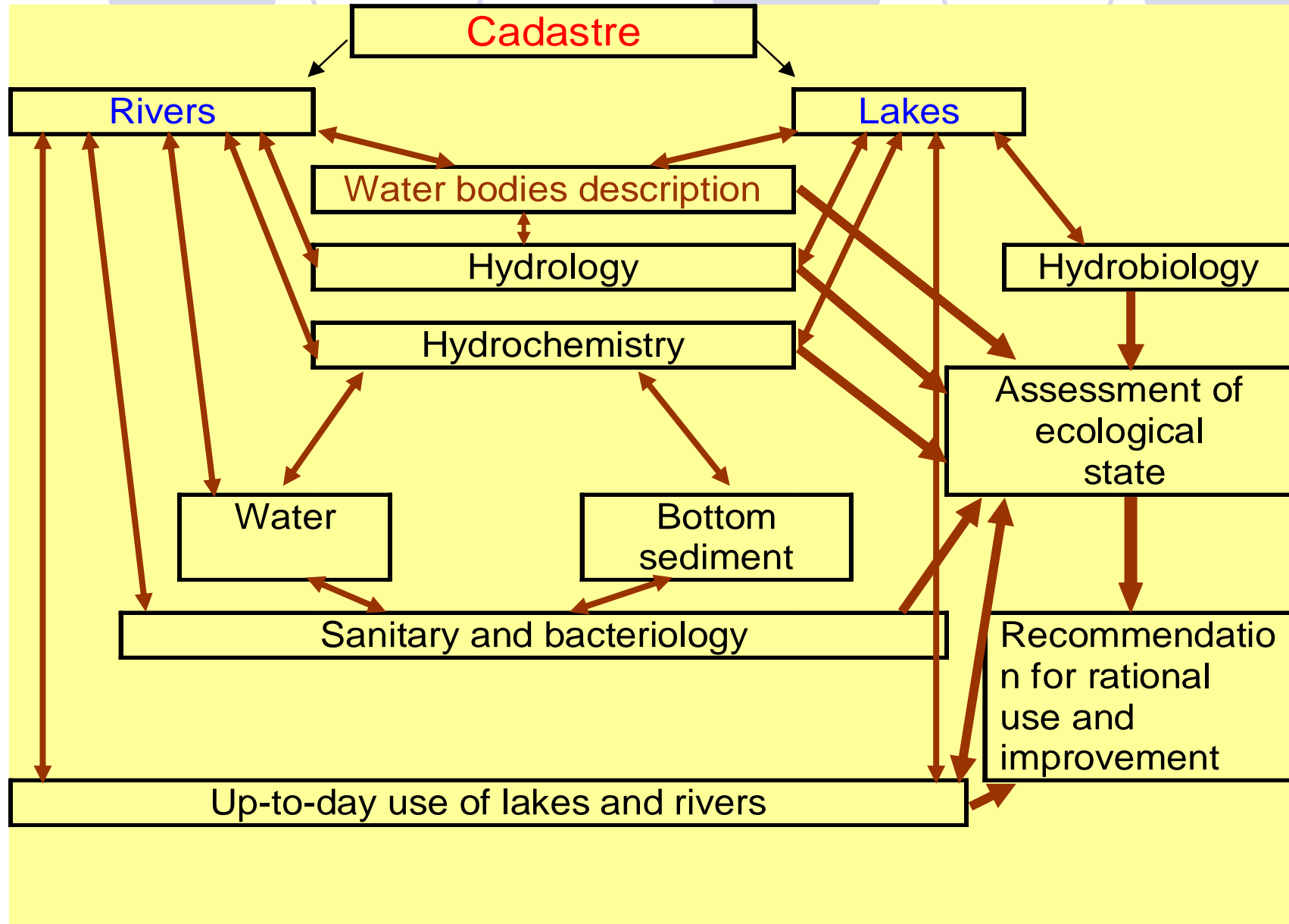
The 5 years investigations on the inventory of rivers and lakes within the St.Petersburg city area and the assessment of their hydroecological status have been finished at the State Hydrological Institute . The manual “Rivers and lakes of St.Petersburg” has been prepared for publication during 2008.

The main objectives of the research

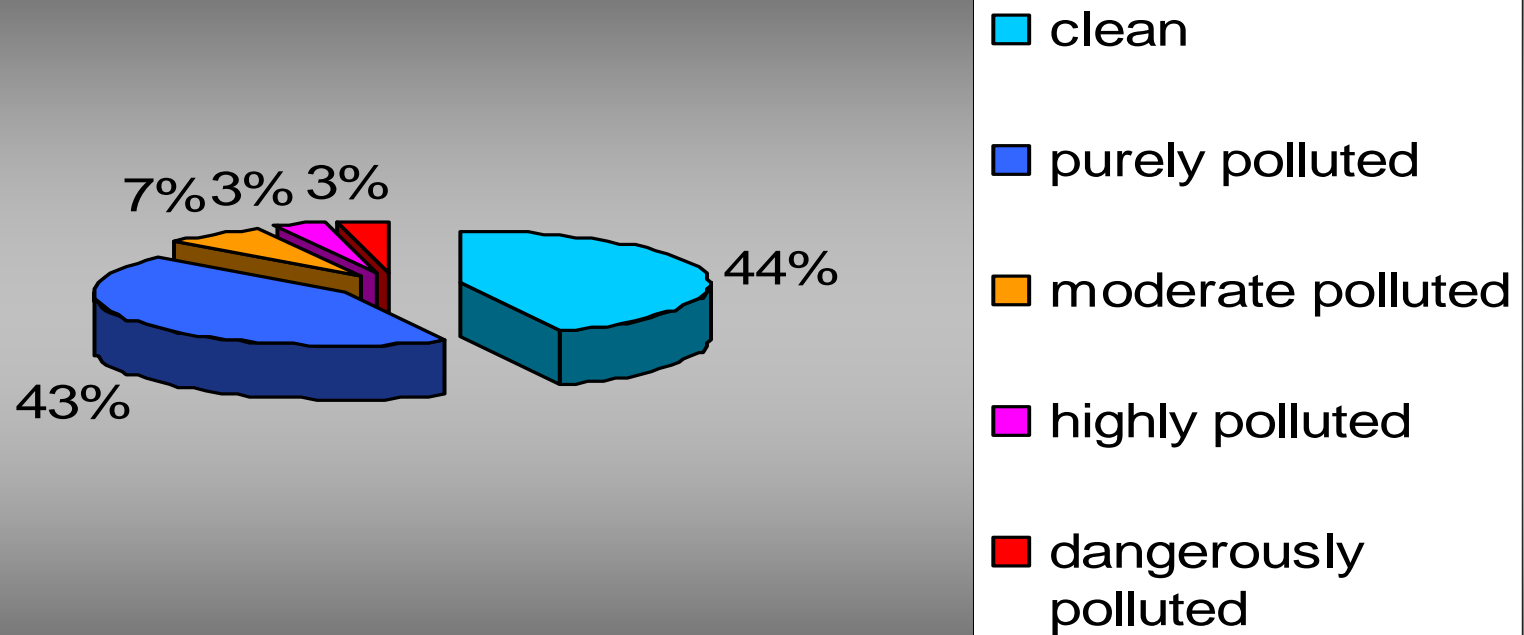
- inventory of water bodies in the city (rivers, canals, lakes, ponds, reservoirs);
- assessment of present ecology of water bodies;
- development of scientifically validated recommendations on the rational use and improvement of urban water bodies;
- development of hydroecological monitoring system in urban environment.



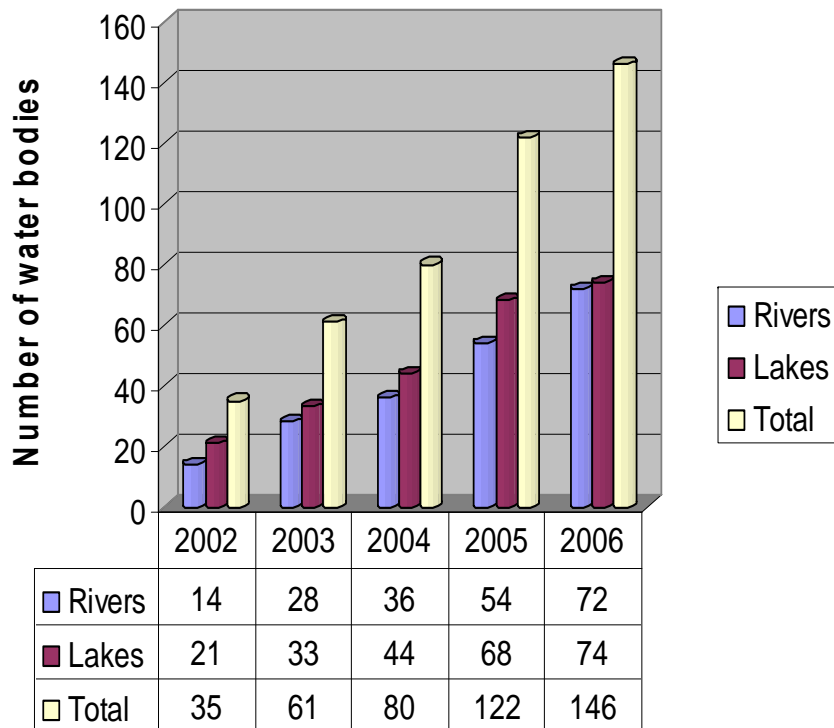
Structure of the St. Petersburg water bodies Cadastre



Distribution of the studied water bodies by the pollution of bottom sediments



Dynamics of the water bodies monitoring in 2002-2006



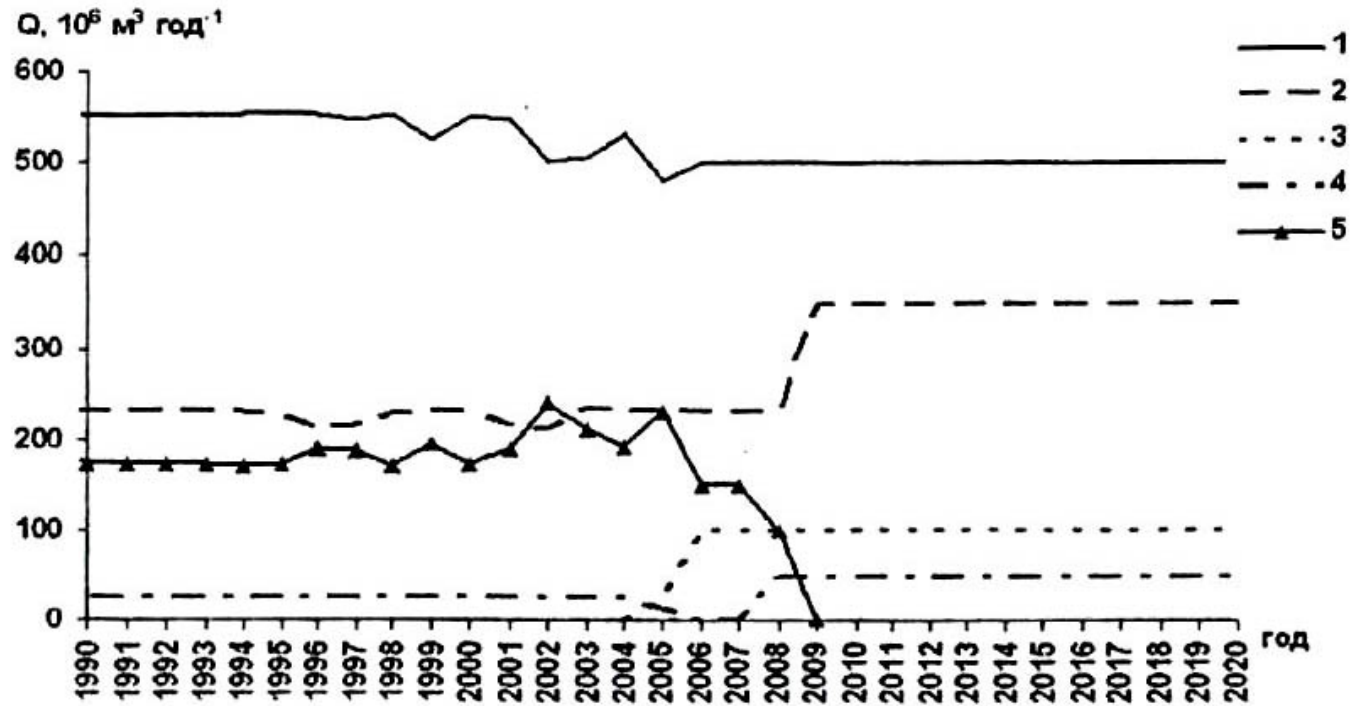
5. Strengthened interaction with decision makers, with emphasis on global change impact assessments

Problems of restoration of lakes (including Lake Ladoga), impacted by human activity, situated in the Russian part of the Baltic Sea basin, were discussed at the scientific conference “Theory and practice of lake restoration” held in St. Petersburg, 15-18 October 2007. This conference was organized by the Institute of Limnology of Russian Academy of Sciences. Representatives of local authorities of St. Petersburg as well as of “Vodokanal” organization participated actively in the conference. Proceedings of the conference were published in “Theory and Practice of Inner Water Bodies Restoration”, St. Petersburg, 2007 (in Russian).

Concentration Pt and some heavy metals (mg/ l -1) in sewage of St.Petersburg

	NAS	CAS	SWAS	KAS	Others CS	Without cleaning
<i>Pt_{mg}</i>	<i>0.9</i>	<i>1.2</i>	<i>1.5</i>	<i>2.2 (before 2005 г.)</i> <i>1.5 (after 2008 г.)</i>	<i>1.9</i>	<i>3.2</i>
Cu	0.0034	0.002	0.0025	0.0032	0.005	0.5
Fe	0.39	0.17	0.21	0.19	0.5	5.0

Dynamics of sewage inflow to the Neva Bay



1- NAS, 2- CAS, 3- SWAS, 4- KAS, 5- Without cleaning

6. Education and outreach at the international level

Various courses for students are now being organized within the framework of the “Baltic University” project at the Russian State University. Major themes are: “Sustainable development of the Baltic Region”, “Baltic environment” and “Sustainable water management”.

Students from more than 30 universities of St. Petersburg (mainly 2-5 year students) are taking part in these courses. Every year 4-5 students of the Geography and Geoecology department take part in various “Summer schools” dealing with ecology and sustainable development of the Baltic Region within the framework of this programme.