



**General Assembly of the ECOSUPPORT  
project, SMHI, Norrköping, 15, October 2009**

**Julia Gorbunova<sup>1</sup> & Sergey Aleksandrov<sup>2</sup>**

**Nutrient loads to the Vistula Lagoon of the Baltic Sea**

*<sup>1</sup>Atlantic Branch of P.P.Shirshov Institute of Oceanology Russian Academy of Sciences*

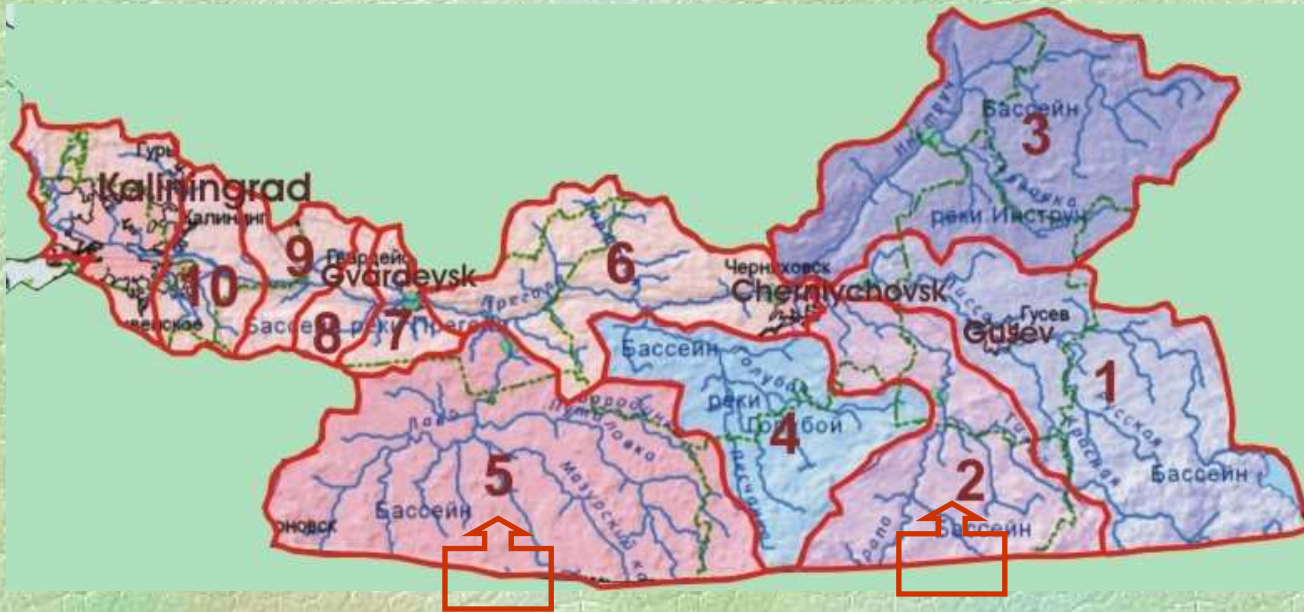
*<sup>2</sup>Atlantic Research Institute of Marine Fisheries and Oceanography*

# The catchment area of the Vistula Lagoon



Gorbunova J., Alexandrov S. Nutrient loads to the Vistula Lagoon of the Baltic Sea. / Abstract book of the 7th Baltic Sea Science Congress, Tallin, August 17-21, 2009. Tallinn University of Technology, 2009. p. 41.

# Pregolia River Basin (Kaliningrad Oblast, Russia) delineation of sub-catchments for FyrisNP model installation



- 1) Pissa River Sub-basin; 2) Angrapa River Sub-basin; 3) Instruch River Sub-basin; 4) Golubaya River Sub-basin; 5) Lava River Sub-basin; Pregolia River Sub-basins: 6) 16,5 - 33 km from the mouth; 7) 33-44 km from the mouth; 8) 44-56 km from the mouth; 9) 56-60 km from the mouth; 10) 60-123 km from the mouth.



External load – nutrients (N, P) input from upstream parts (Poland)

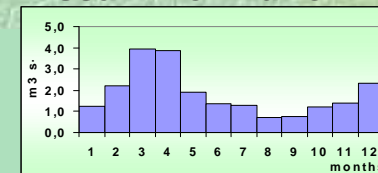
<u>Data sources</u>	
Map material and analysis	Domnin D., Chubarenko B., 2007 Atlas of transboundary river basins of the Kaliningrad Oblast
Arable and Pasture lands areas	Data of agricultural census, 2006 ( <i>Federal State Statistics Service</i> )
Mire area	Map of swamp complexes, 1:500000 (Kucheriaviy P., 2002 // Geographic atlas of Kaliningrad oblast)
Forested land and clearcuts areas	Vegetation map, 1:500000 (Suchova A., 2002 // Geographic atlas of Kaliningrad oblast)
Temperature (surface air)	<a href="http://meteo.infospace.ru/">http://meteo.infospace.ru/</a>
<u>Point and Diffuse Sources of Nitrogen and Phosphorus</u>	
Wastewaters	Analytic review, 2008 ( <i>Federal State Statistics Service</i> )
Housholds emission (number of habitats and gross emission)	Statistical bulletin, 2006 ( <i>Federal State Statistics Service</i> ); Swedish Environmental Protection Agency, 1995
External load of nutrients (N, P) from upstream parts (Poland)	ECE/MP.WAT/WG.2/2007/8 (Estimation of the transboundary water resources in the ECE UN region)
<u>Type-specific nutrients concentrations in runoff from different land use</u>	
Soil types	Soil map, 1:500000 (Lazareva N., 2002 // Geographic atlas of Kaliningrad oblast)
Crops	Data of agricultural census, 2006 ( <i>Federal State Statistics Service</i> )
Relationship between type-specific nutrients concentrations and soil types and crops	Data of Swedish Agricultural University

# Time series data

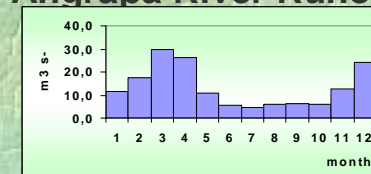


● sampling stations (N total, P total) summer-autumn 2001-2005

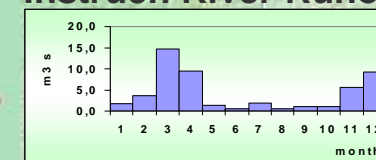
Pissa River Runoff



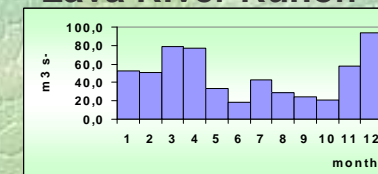
Angrapa River Runoff



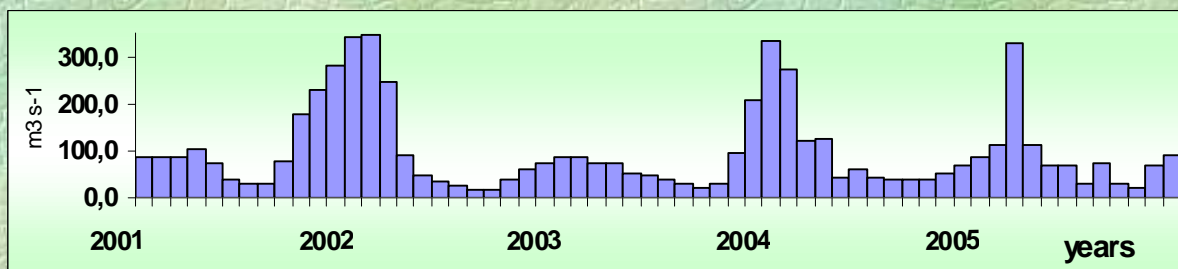
Instruch River Runoff



Lava River Runoff



Pregolia River Runoff



Estimation time period	Nutrients input to the Vistula lagoon	Total N Ton N/year	Total P Ton P/year	References
Estimation 1992	Pregelia river + Sewage collector, Kaliningrad	20680	1710	Krugen Consalt, 1995. Kaliningrad Urban and Industrial Wastewater Project, Draft Interim Report
Estimation 1994-1995	Pregelia river upstream Kaliningrad	7300	875	Prioritizing hot spot Remediations in the Vistula Lagoon catchment. Environmental Assessment and Planning for the Polish and Kaliningrad Parts of the Lagoon – 1997
	Pregelia river downstream Kaliningrad	8962	1228	
	Pregelia river + Sewage collector, Kaliningrad	10705	1850	
Estimation 1998-2000	Pregelia river upstream Kaliningrad	3950	310	Kaliningrad Oblast in Number, Kaliningrad, 2002
	Pregelia river + Sewage collector, Kaliningrad	6028	490	
Modelling of geosystem conditions (1980s-1990s)	Pregelia river	4250	540	Zotov S., 2001 Modelling of geosystem conditions
Modelling (FyrisNP) 2001 – 2005	Pregelia river upstream Kaliningrad	2300	120 - 440	Gorbunova Julia (ABIORAS) & Alexandrov Sergey (AtlantNIRO) data estimations
	Pregelia river + Sewage collector, Kaliningrad	3700	420 - 740	

Gorbunova J., Alexandrov S. Nutrient loads to the Vistula Lagoon of the Baltic Sea. / Abstract book of the 7th Baltic Sea Science Congress, Tallin, August 17-21, 2009. Tallinn University of Technology, 2009. p. 41.