

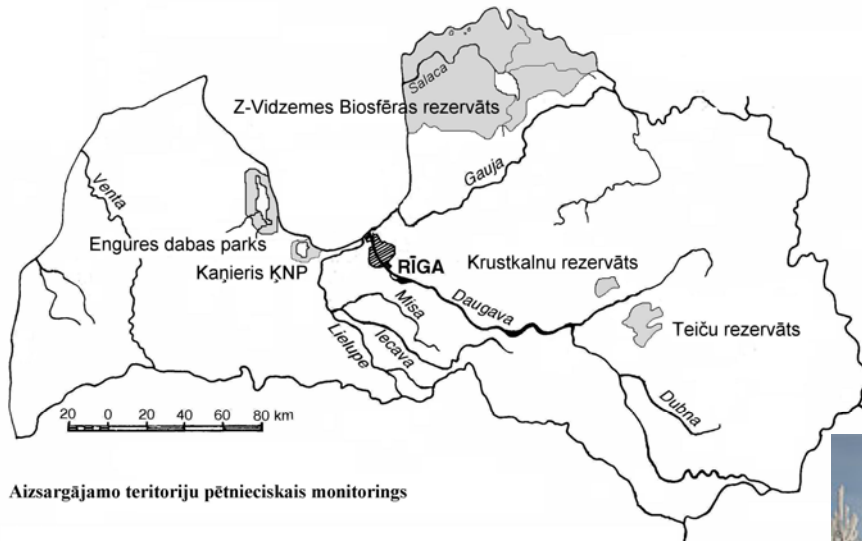


# **POTENTIAL CLIMATE IMPACT ON RIVER BIOCENOSIS: CASE STUDY OF THE RIVER SALACA**

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**Workshop**  
**14-17 February 2007**  
Pirkanmaa Regional Environment Centre, Tampere, Finland

# Study area



Aizsargājamo teritoriju pētnieciskais monitorings



29.01.2007. Temp:-24° Vecsalaca, photos<sup>2</sup>  
A.Soms



**Length 95 km, basin area 3 570 km<sup>2</sup>. The main salmon river of Latvia, internationally approved lotic system with high biological diversity.**

**North Vidzeme Biosphere Reserve since 1998**

**Regular chemical and biological surveys for the assessment of environmental quality of the River Salaca have been carried out since 1982 and are in progress until now.**

# Main tasks for the Salaca case study area:

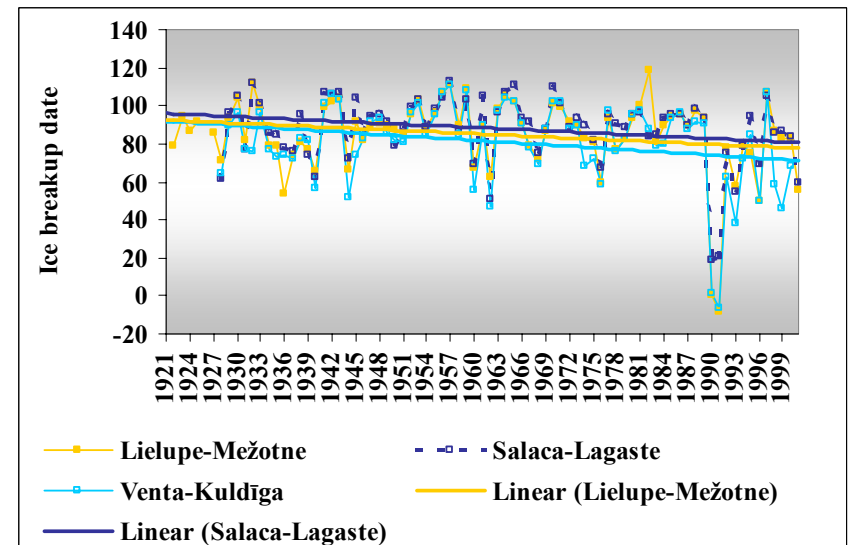
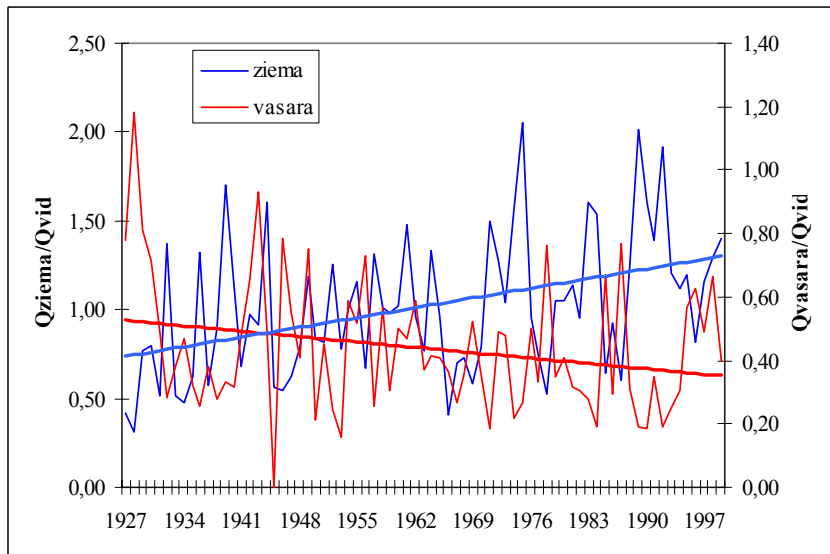


- to analyse changes of run-off (monthly, seasonal, annual discharge) and ice cover regime;
- to assess the chemical composition of water and sediment;
- to characterise water (bacterio-, phyto-, zooplankton) and sediment (bacterio-, zoobenthos) cenoses;
- River coastal processes analyses;
- analyses of the existing relevant social-economical and spatial and regional policies



**to determine the tendencies of development of waterbodies, their influencing factors and needs for climate change adaptation strategies for spatial planning and other regional measures in Biosphere Reserve.**

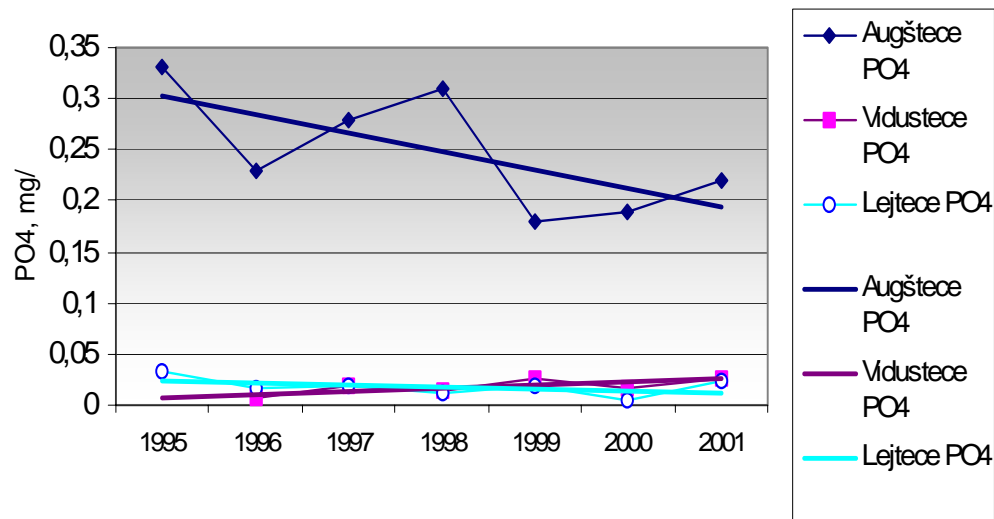
# Trends of river discharge and ice break in the River Salaca



# Hydrochemical peculiarities of the Salaca



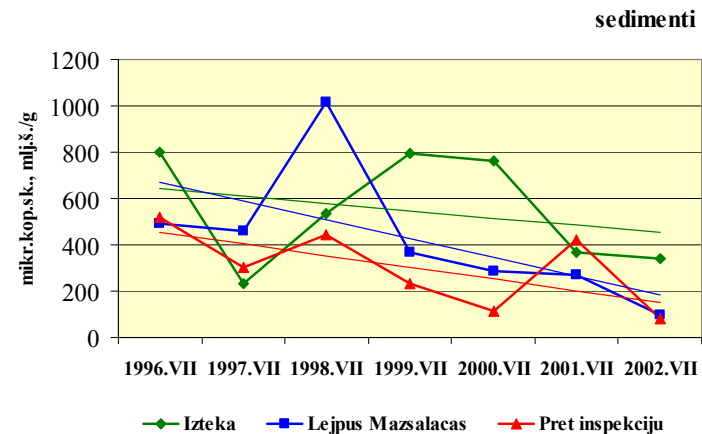
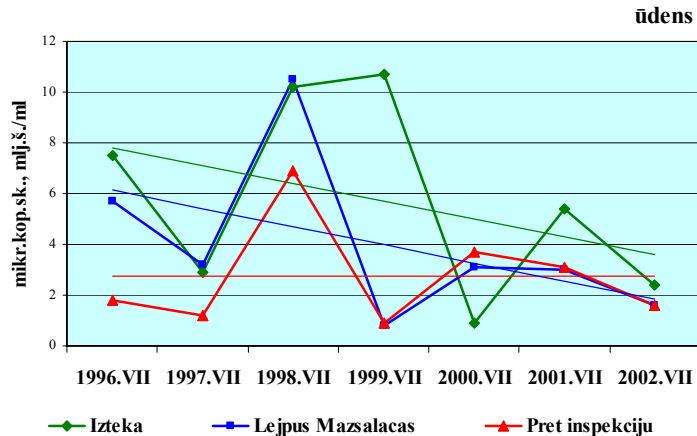
- ≡ Dominating ions: calcium and hydrocarbonates;
- ≡ Medium mineralisation of water (~300 mg/l);
- ≡ Concentration of O<sub>2</sub> ~7-11 mg/l;
- ≡ low BOD (0.6-2.0 mgO/l);
- ≡ low concentrations of biogenic elements (N<sub>inorg.</sub> - 1,20–1.65 mg/l; P<sub>inorg.</sub> - 0.001–0.05 mg/l).



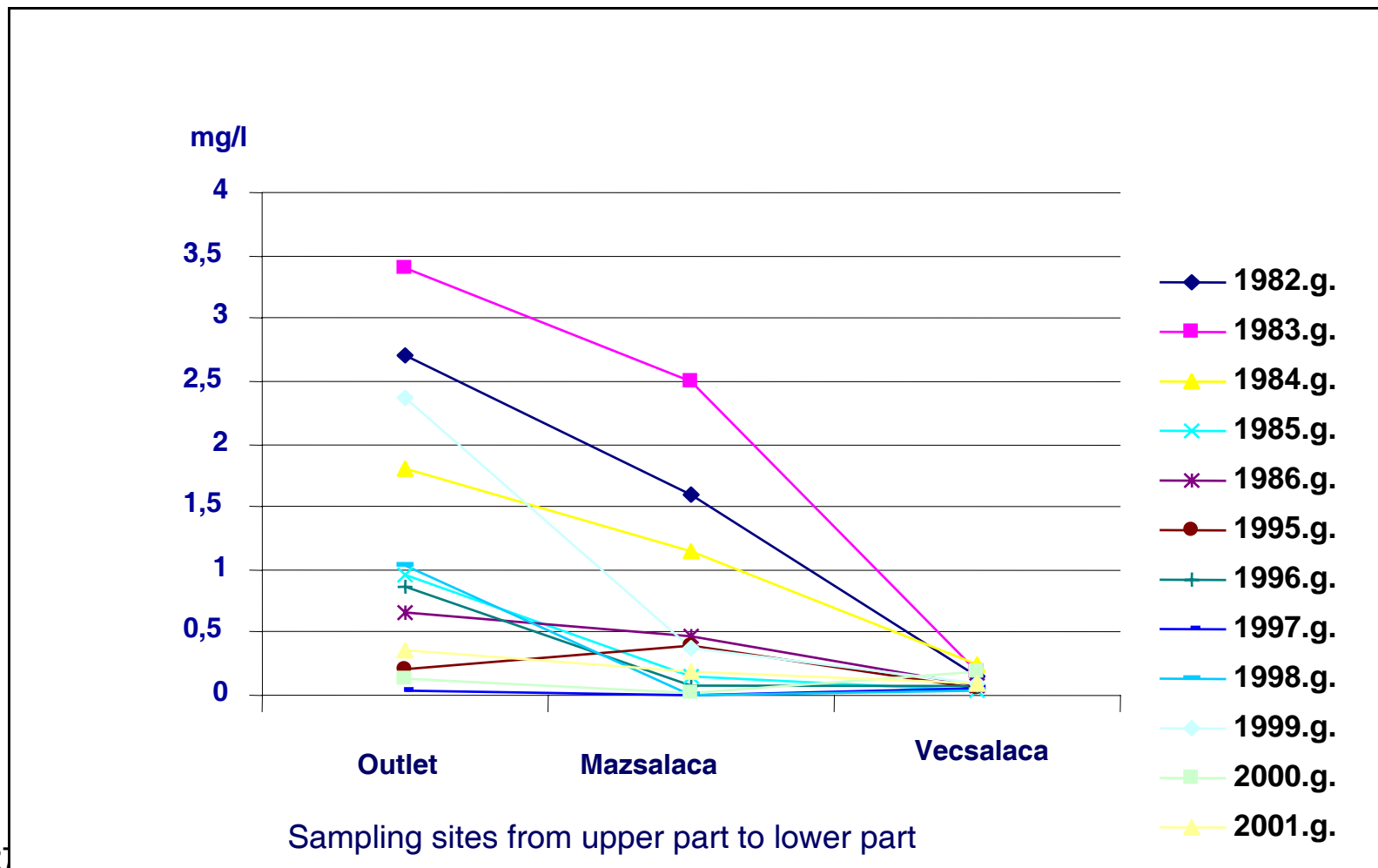
# Hydrobiological peculiarities of the Salaca:



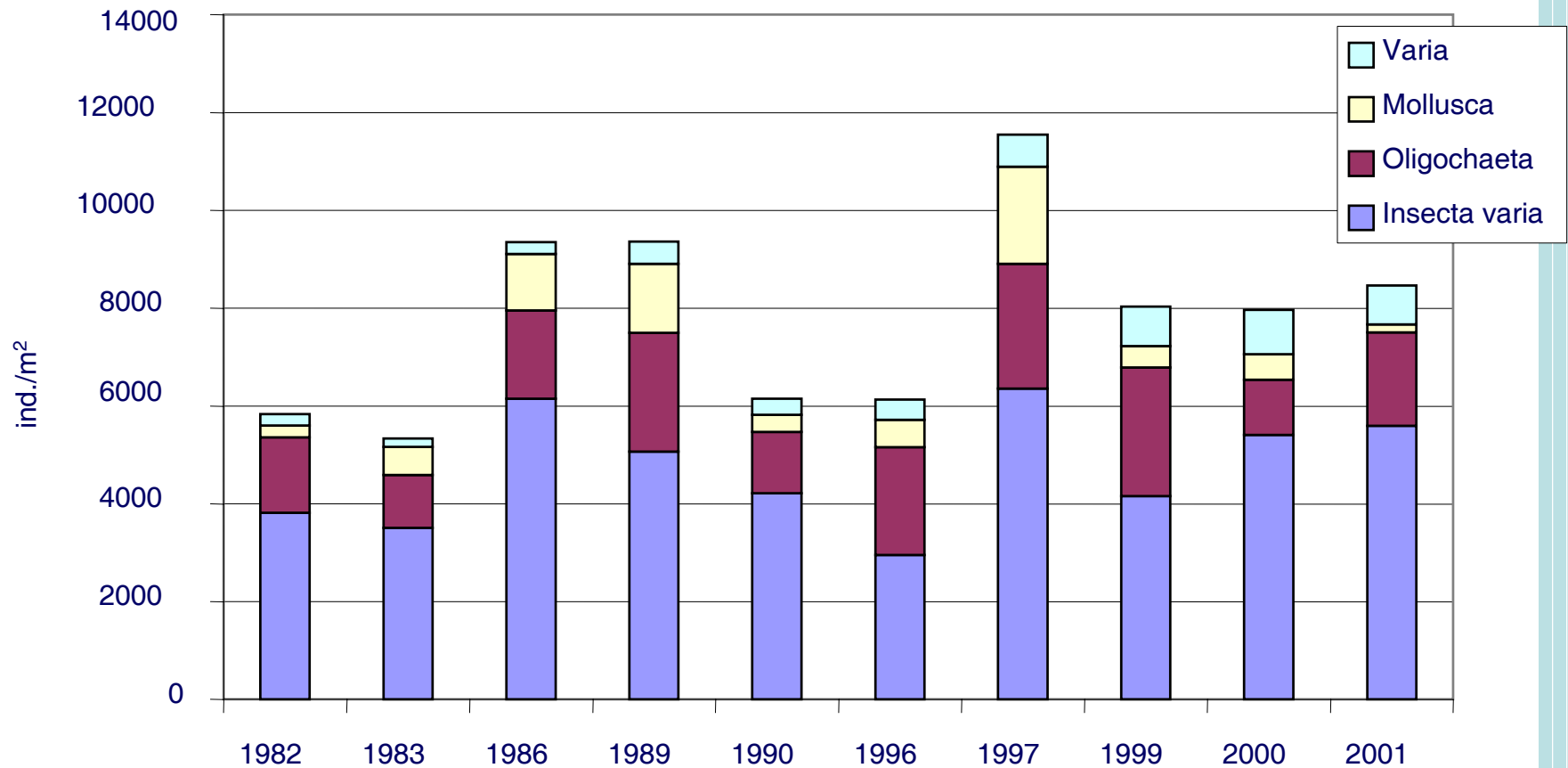
- ≡ Bacteriological parameters are typical for clean river;
- ≡ High number of algae species (296) and species diversity (Shannon index 2.65);
- ≡ High productivity and number of species (~300) of zoobenthos.



# Changes of phytoplankton distribution along the River Salaca



# Distribution of zoobenthos species in the River Salaca, Vecsalaca 1982-2001



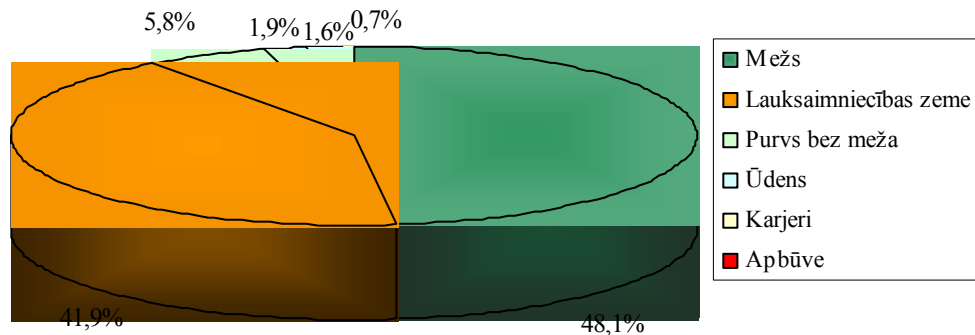
- ≡ **The River Salaca has high self-purification capacity, that is possible to confirm by the decreasing of microorganism number along the river.**
- ≡ **For the last 20 years the River Salaca shows stability and high species biodiversity, that in general corresponds to reference conditions**

# Overgrowing of the River Salaca

Salaca River at the mouth is overgrown more than 80 %, sediments are covered by *Potamogeton pectinatus*, *Myriophyllum spicatum* and *Cladophora* sp., typical for eutrophic waterbodies.



# Land use pattern in the River Salaca



In Latvia a very low level of fertilizers is typical in comparison with that in European countries. For example, in 2000, the use of fertilizers (N, P, K) was 9 – 36 kg/ha.

The presence of agricultural lands in river basin was not related to a diffuse pollution from the catchments areas.

# Possibility of the climate change effect to the River Salaca



**Above mentioned ice break regime, discharge trends land use pattern and simultaneously overgrowing lead to the conclusion of the potential climate change impact to the River Salaca ecosystem.**



**The lower part of the River Salaca after the removal of overgrown sediments, July 2006**

# Thank you!



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