



5th European Coastal Lagoon Symposium, University of Aveiro, Portugal

Trans-boundary conservation issues in the Vistula Lagoon (southern Baltic Sea)

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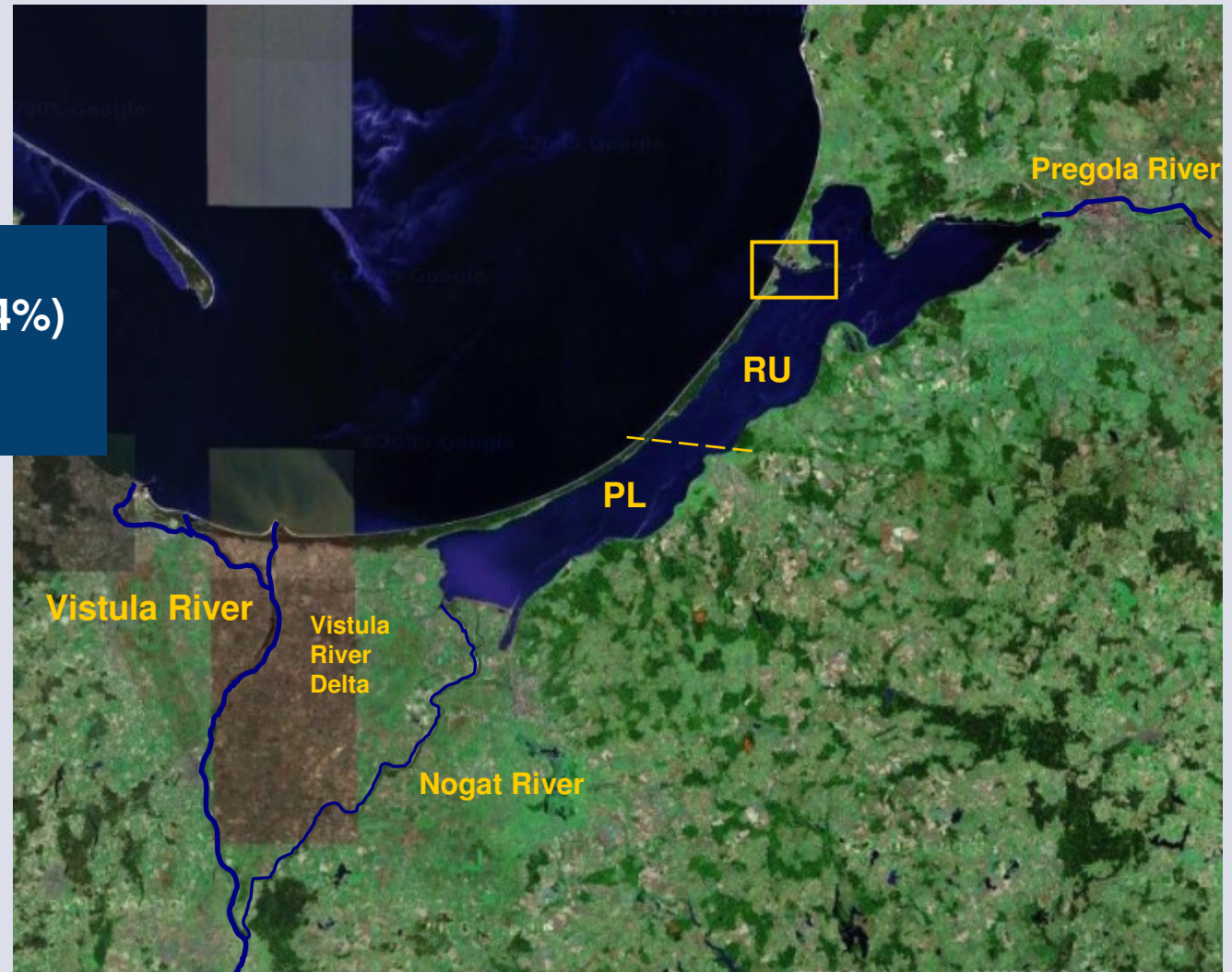
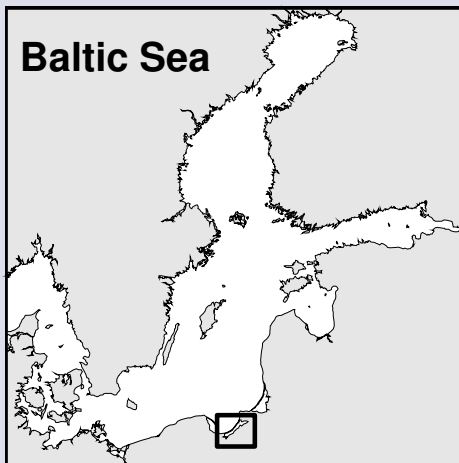
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- ✓ Area: 838 km²
(RUS – 56%, PL – 44%)
- ✓ Length: 90 km
- ✓ Width: 10-19 km



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✓ **Connection with the Gulf of Gdansk:
narrow, dredged channel
near Baltiysk (Russia)**

- width - 400 m
- depth - 10-12 m
- minimal vertical transect - 4200 m²



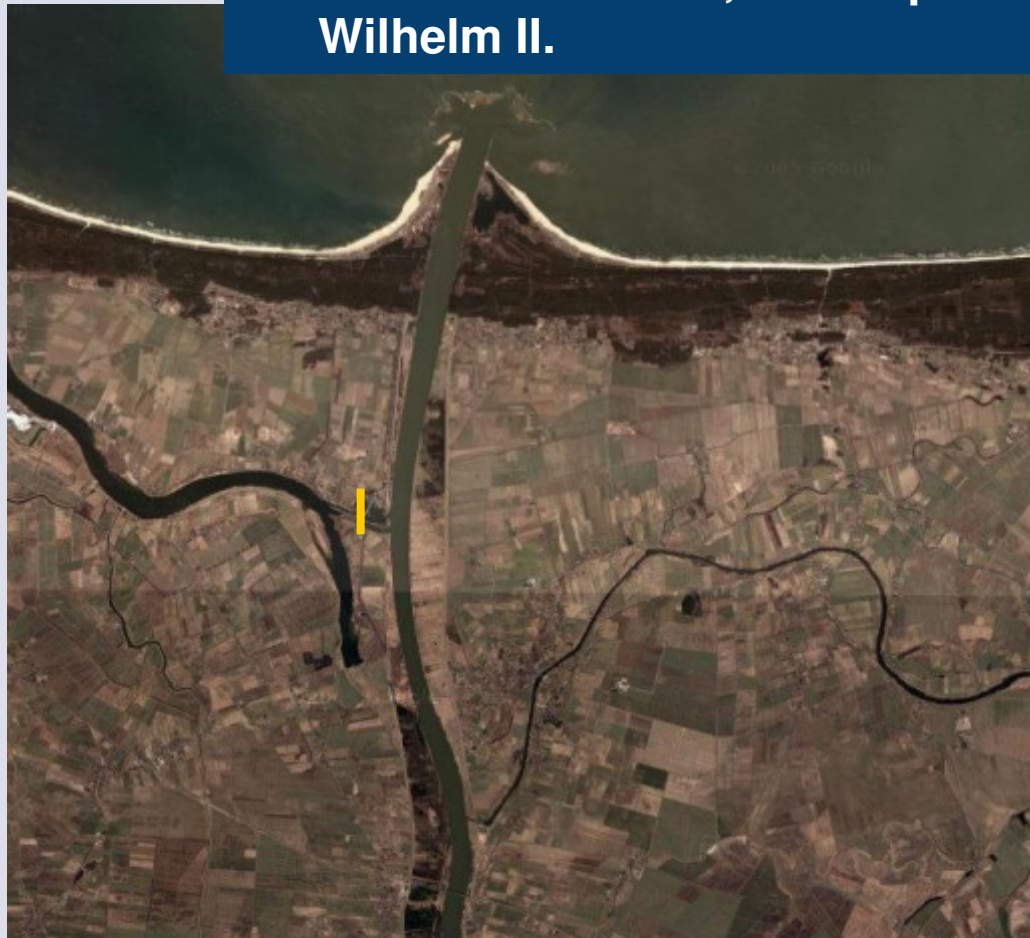
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- ✓ The new Vistula River mouth was artificially created between 1889 and 1895 and it was officially opened on 31 March 1895, on the personal order of Emperor Wilhelm II.



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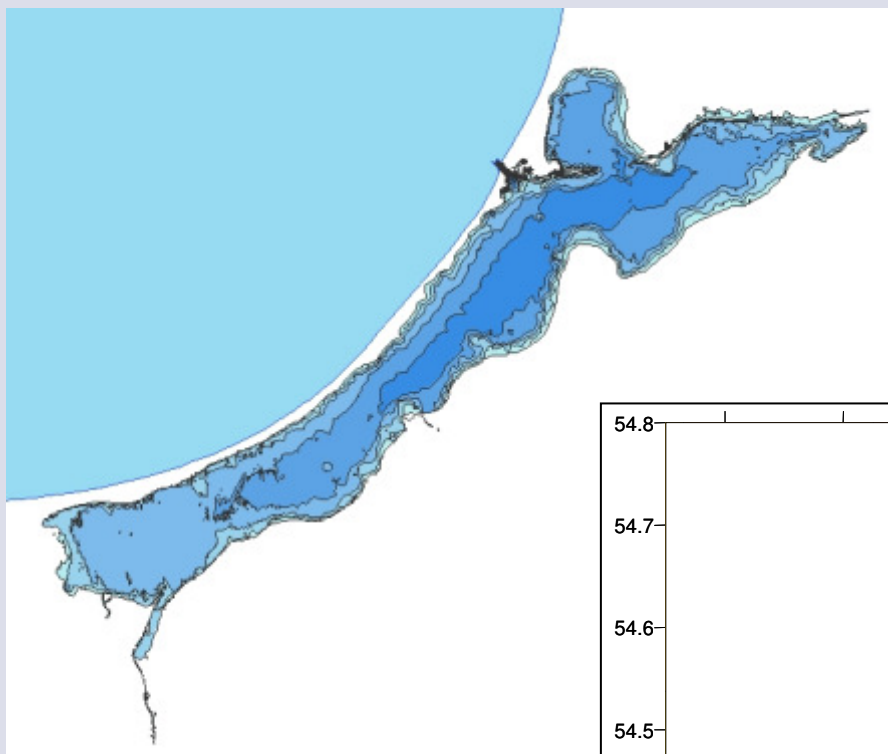
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✓ 'Biala Gora Lock' finished in 1915 cut off the Vistula Lagoon from the Vistula River. In 1550 about 85% of river runoff was reaching the sea through the Nogat River. Now it is reduced to less than 5%



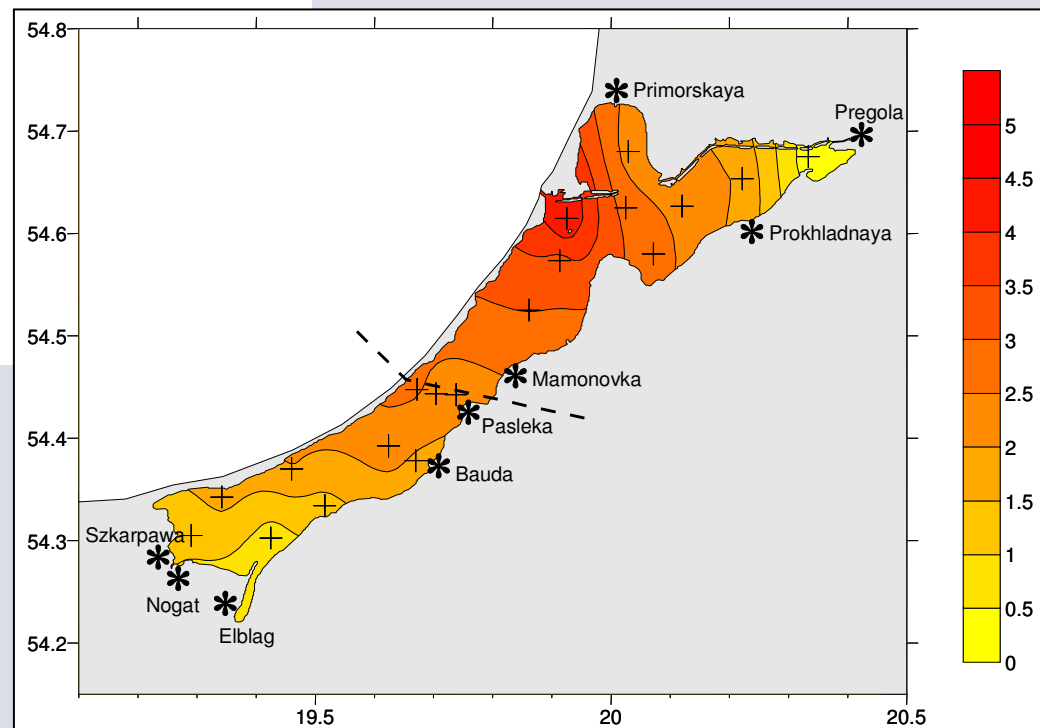
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- ✓ Average depth: 2.7 m
- ✓ Water volume: 2.3 km³

✓ Salinity: 0.1 - 4.5 PSU



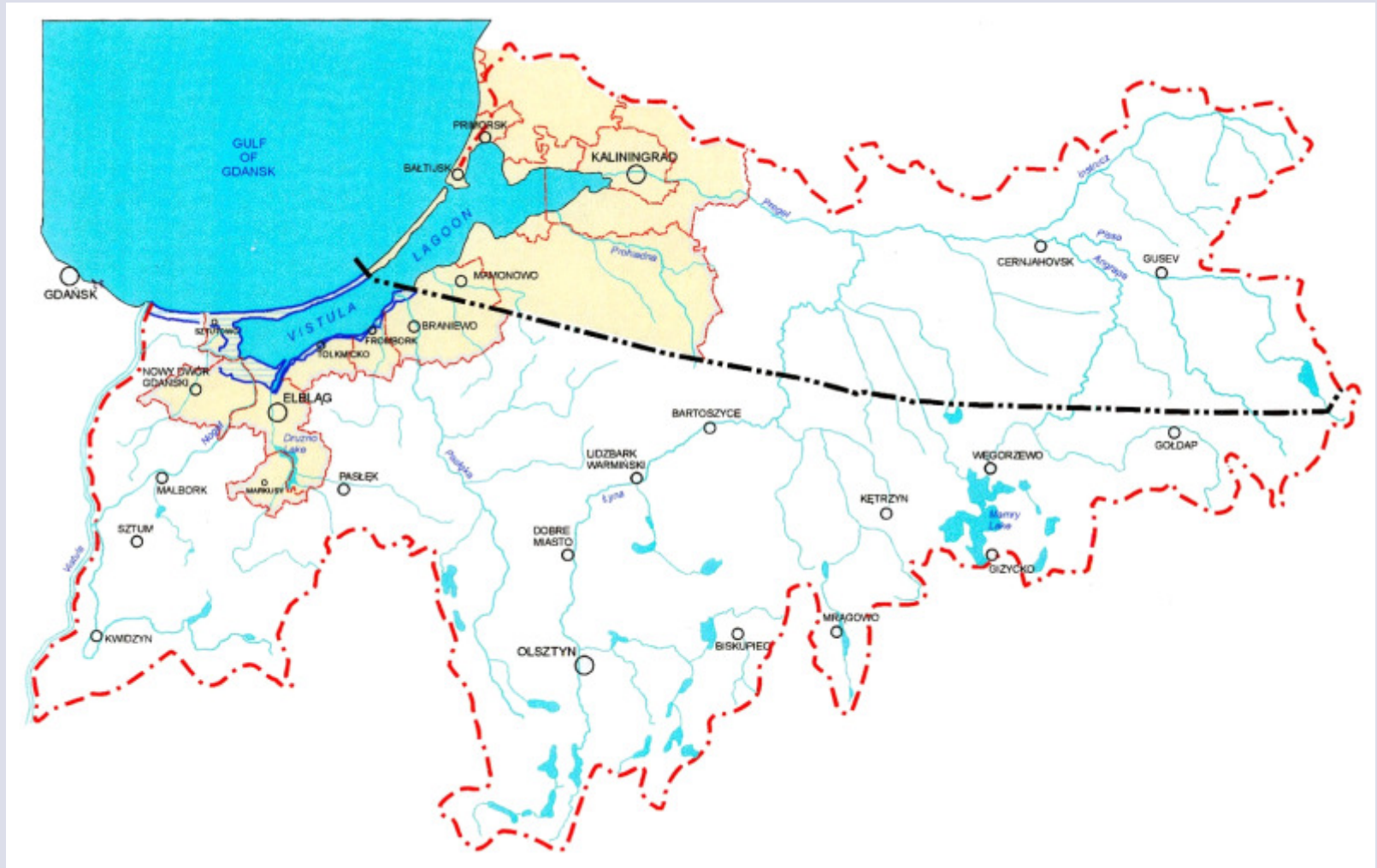
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✓ Drainage area: 23,871 km² within Poland and Russia



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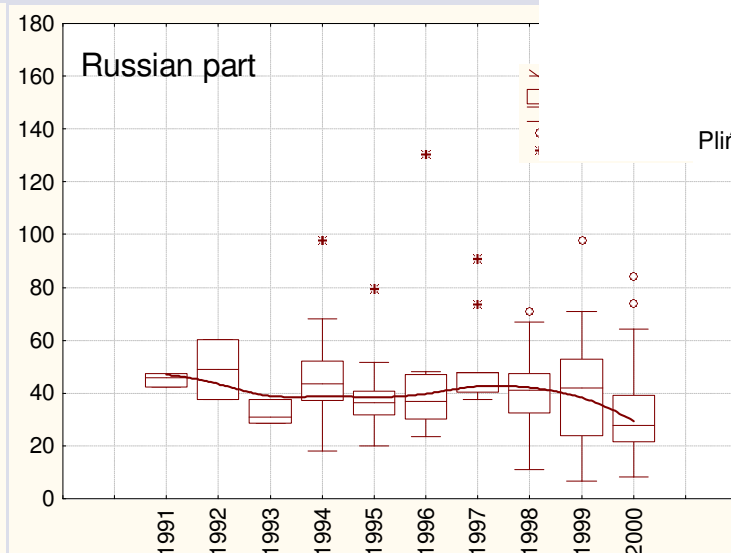
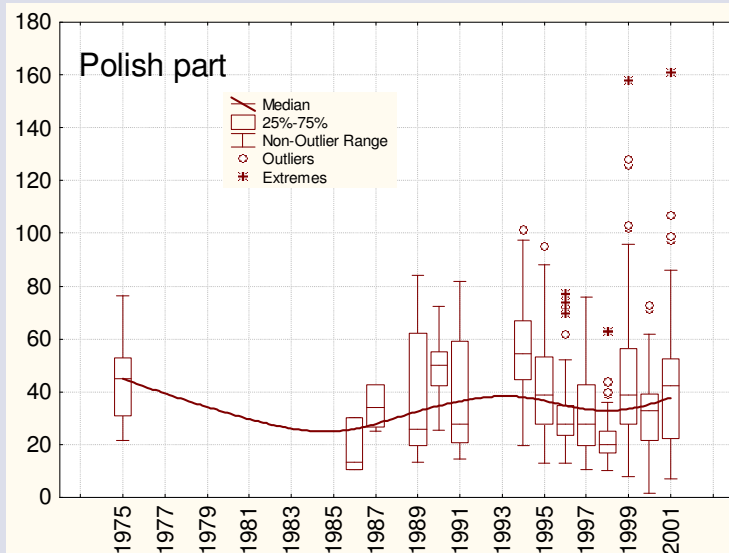
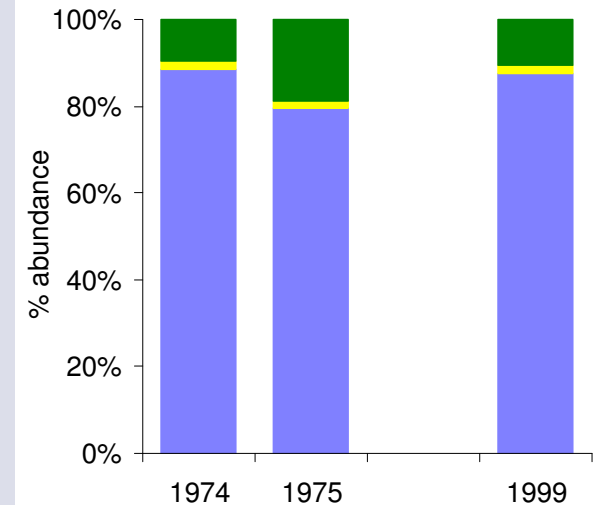


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Phytoplankton

Polish part example:

- no major changes in proportion of main group abundance between mid 1970s and late 1990s
- occurrence of blue-green algal blooms (*Anabaena* genus and *Aphanizomenon flos-aquae*)
- high level of chlorophyll *a* concentrations over the last 20 years,
- total phytoplankton biomass indicating eutrophic status



■ green algae
 ■ diatoms
 ■ blue-green algae

Pliński and Simm (1978)

median ~ 30-40 mg/m³

stable at ~ 40 mg/m³



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Zooplankton and macro-zoobenthos

There were apparent changes in abundance, biomass and taxonomic composition.

It seems that these changes might be explained by:

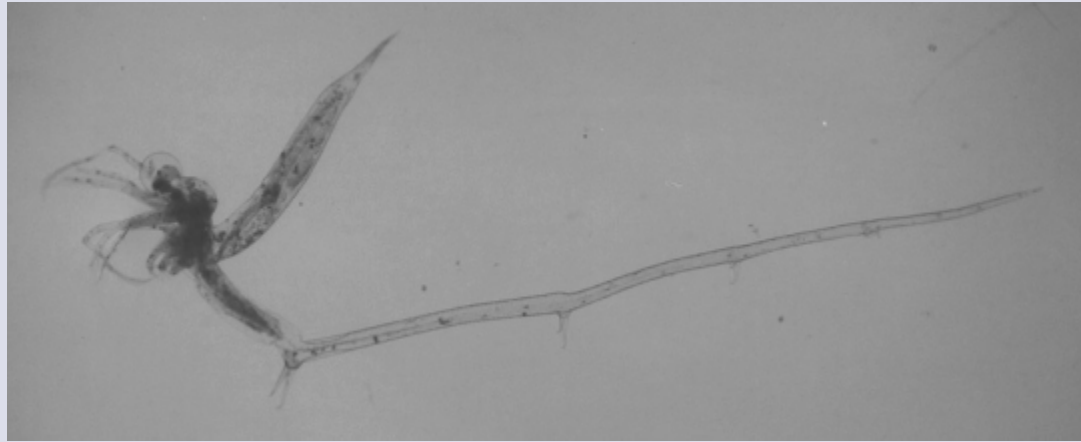
- **eutrophication**,
- **invasions of a new species**,
- **changes in salinity** caused by **hydro-meteorological processes** influencing the exchange of water masses between the Gulf of Gdańsk and the Lagoon, and partly by **human activities** (dredging the channel connecting the Lagoon with the Baltic Sea).



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Alien species



New predatory Cladocera species: *Cercopagis pengoi*:
first appearance in August 1999

Marenzelleria viridis appeared in the
Russian part in 1990



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Environmental issues

- eutrophication;
- during the last decade a numerous water treatment plants were constructed, but water quality did not improved much - this is most probably due to recycling from sediments;
- intensification of water-exchange with the Baltic Sea due to continuous dredging of the Baltiysk Strait (increase of salinity);
- overuse of the Polish part of the Vistula Spit for recreational purposes during the summer season beyond the carrying capacity of resources;
- fishing pressure;
- appearance of alien species;
- danger of flooding of low-laying areas due to poor technical condition of anti-flood and drainage infrastructure.



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Natura 2000

Special Protection Areas (SPAs) for birds

PLB280010

Special Areas of Conservation (SACs) to be designated for other species and for habitats

PLH280007



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Economic issues

- the area includes large population centres, scattered small cities and rural settlements, and extensive agricultural land;
- industry is not concentrated (except for Kaliningrad City);
- unused tourism potential of the Lagoon due to poor water quality;
- shrinkage of commercial fishing due to overexploitation;
- **... more details regarding the Polish part**
- farms are small when compared even to the eastern European conditions;
- agriculture has relatively low profit potential;
- high level of unemployment in the region due to disintegration of former economic structures (e.g. state farms);
- loss of historical role of Elblag city as a marine harbour;



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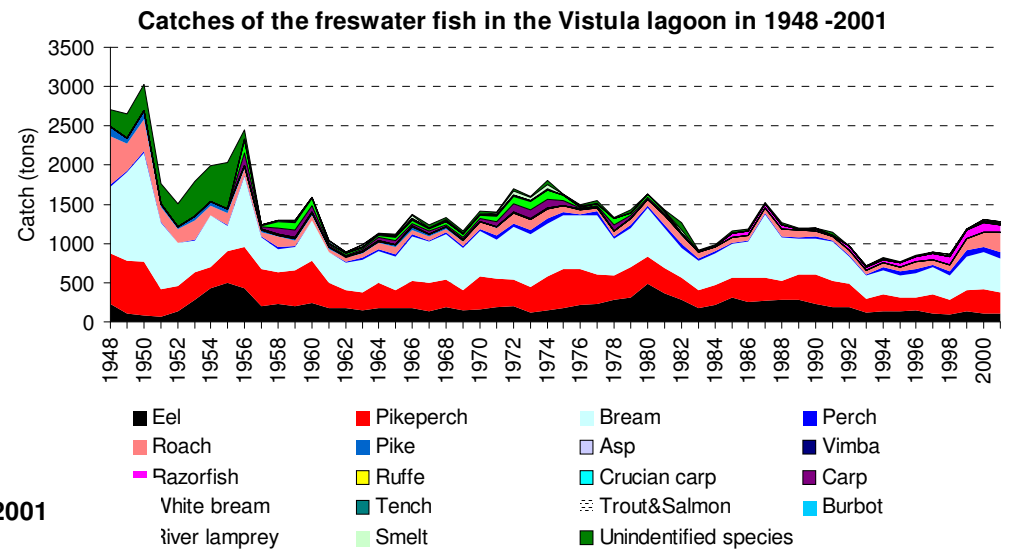




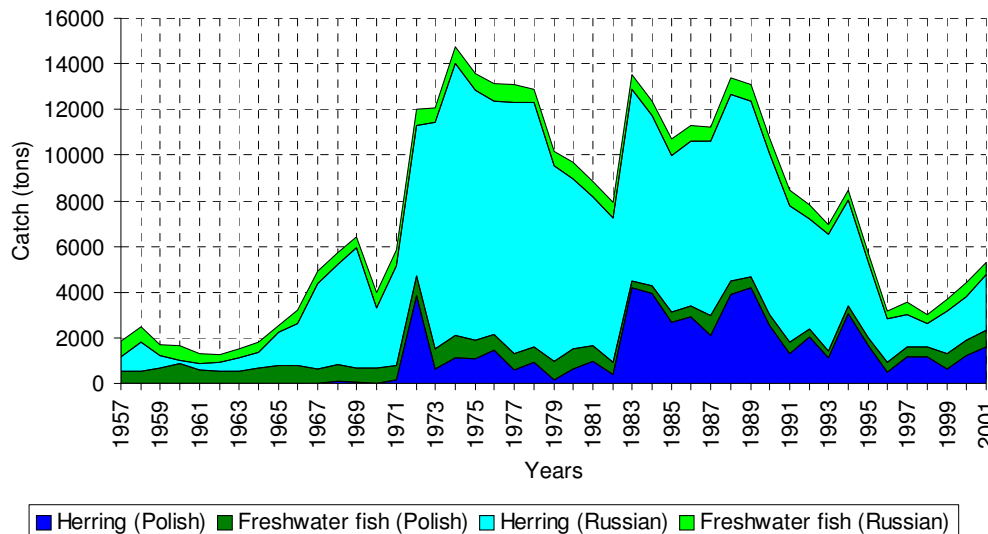
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Fisheries

- based on small fisheries harbours
- no fish processing
- limited stocking recently
- number of boats and fishermen (PL) dropped from 220/250 to 67/140



Polish and Russian catches in the Vistula lagoon in 1957 - 2001



Changes in level of exploitation depends mainly on **human activities:**

- international regulations (common bream, pikeperch)
- prices at the market (herring, partly)
- drainage of the wetlands (pike)
- low level or lack of stocking (eel)

and **natural conditions:**

- year-to-year changes in intensity of spawning migrations (herring)



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Transport

Major harbours:

RUS: Kaliningrad, Baltiysk

PL: Elblag, Tolkmicko, Frombork, Krynica Morska

Total average turnover is of 16,500,000 tons per year (Kaliningrad & Baltiysk) and 4,000 – 6,000 tons in Elblag.....



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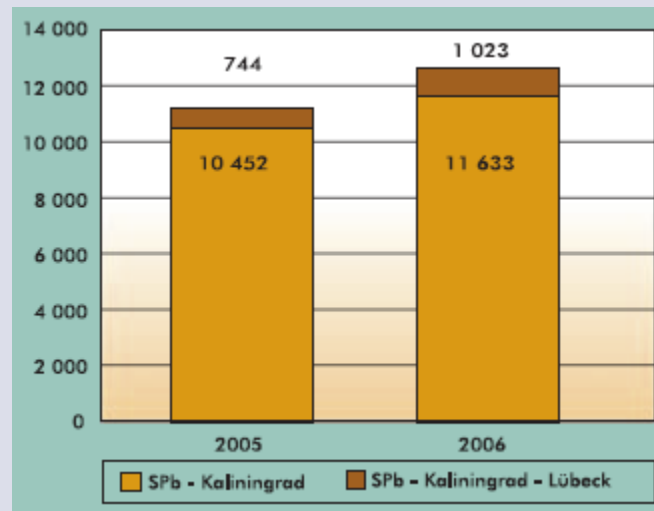
Tourism (Polish part):

- spatially and temporarily unbalanced: short season; much more intense use of the Vistula Spit;
- harbour capacity: ~ 300 yachts
- registered yachts: 70
- 130,000 – 160,000 passengers yearly



Tourism (Russian part):

passenger traffic from Marine Port Kaliningrad to St. Petersburg and Lübeck, 2005-2006



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Artificial channel 'Skowronki'

- direct access to Elblag Harbour
 - for ships with length of 100m, width of 20m and draught of 4m
 - growth of total cargo in Elblag Harbour to 3,500,000 tons per year
- but
- potential serious environmental problems



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Key cross-border issues for the Vistula Lagoon identified by ARTWEI project stakeholders

✓ WATER QUALITY PROBLEMS

- relatively shallow-water body with huge drainage basin
- restricted water exchange with the Baltic Sea
- high internal potential for eutrophication caused by significant sources of nutrients accumulated in the sediments

✓ HYDRO-TECHNICAL CONSTRUCTIONS AND THEIR POTENTIAL IMPACT ON LAGOON ENVIRONMENT

- future investments in the facilities of Kaliningrad Harbour
- idea of building a new artificial channel connecting lagoon with the Gulf of Gdansk near Skowronki village



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Key cross-border issues for the Vistula Lagoon identified by ARTWEI project stakeholders

✓ FISHERIES MANAGEMENT

- high productivity provides favourable conditions for many fish species
- high pressure and lack or limited stocking programme caused serious problems for the local fisherman community
- conflicts between fisheries and conservation measures



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