



**WP 6 “Climate change impact on
ecosystems and biological diversity of the
Baltic Sea” in 2007**

Latvian Institute of Aquatic Ecology
Latvian Fish Resources Agency
UL Faculty of Biology
UL Institute of Biology



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WP6 tasks for 2007:

- The experimental studies – phytoplankton community response;
- The field work – data collection for estimation of variability and further forecasts of biotic parameters;
- Digitalization of fish species time-series;
- Long-term forecast of fish stock and production.



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Results

- The experimental part:
 - An impact of increased water temperature on autumn phytoplankton community structure in the Gulf of Riga;
 - An impact of increased temperature on **zooplankton egg production** in the Gulf of Riga.
 - An impact of increased temperature on **particular phytoplankton species** in the Gulf of Riga – started December 2007.
 - An impact of increased temperature on **winter phytoplankton community** structure in the Gulf of Riga – started January, 2008.

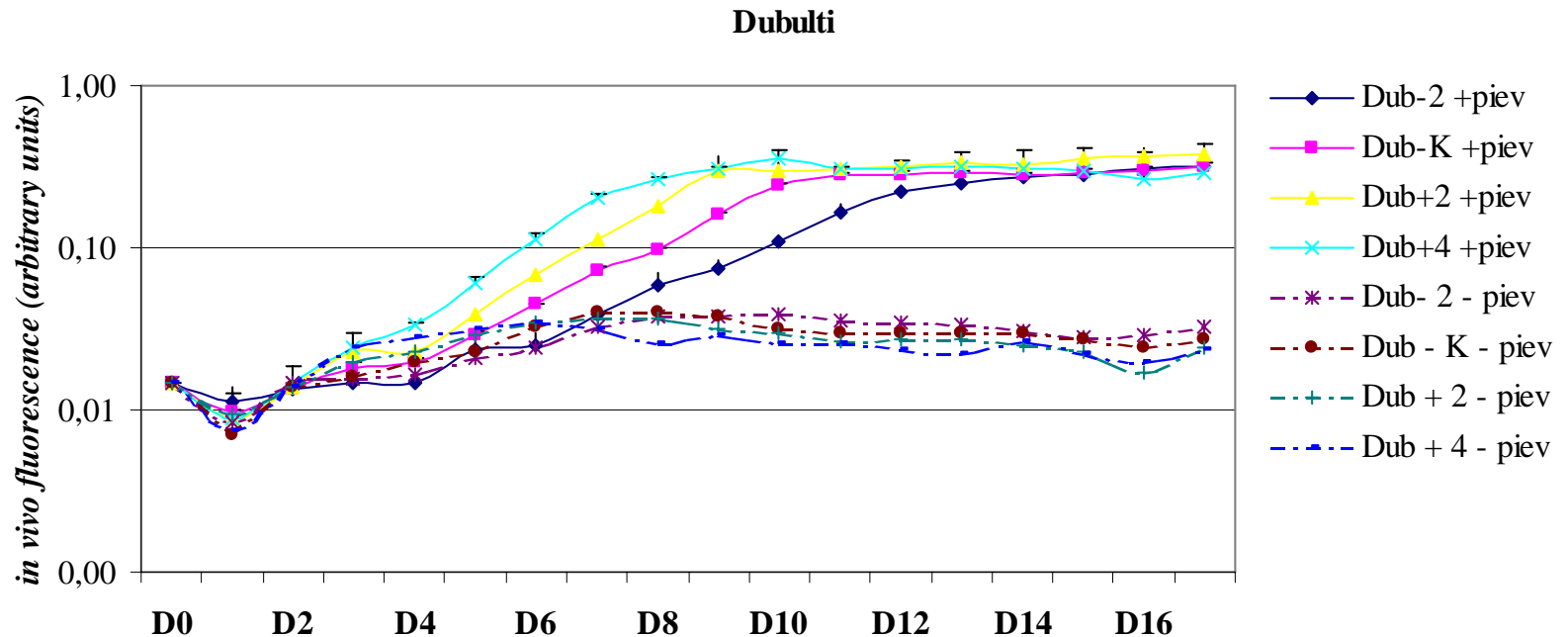


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Autumn phytoplankton response:

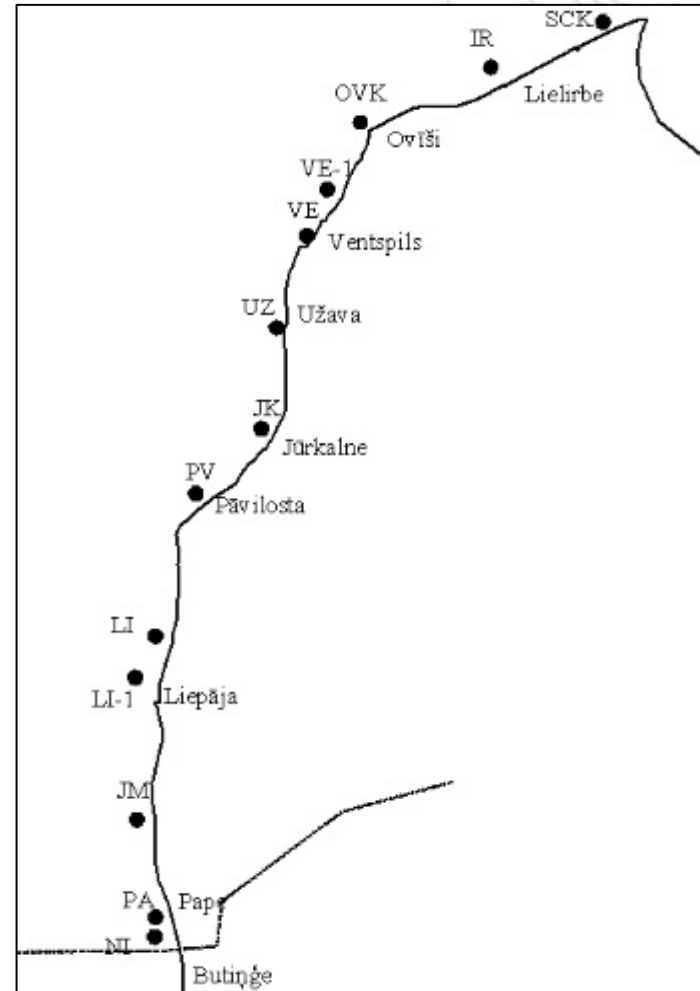
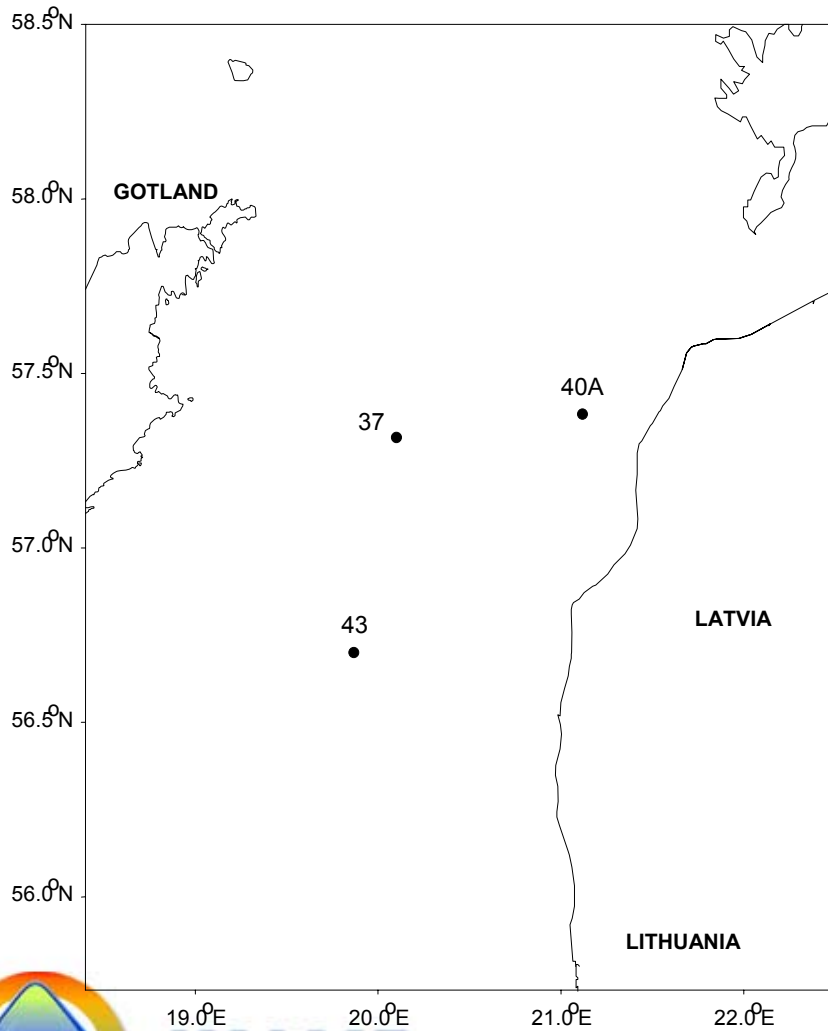
- If the water cooling in the autumn is delayed, phytoplankton autumn bloom can reach higher maximal values.



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Field work results



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Field work results

- 9 stations at the coastal zone, 3 – at the open part;
- Sampling monthly the coastal zone from April to November;
- 3 seasonal sampling occasions at the open part;
- Parameters - to cover the food web completely as possible.

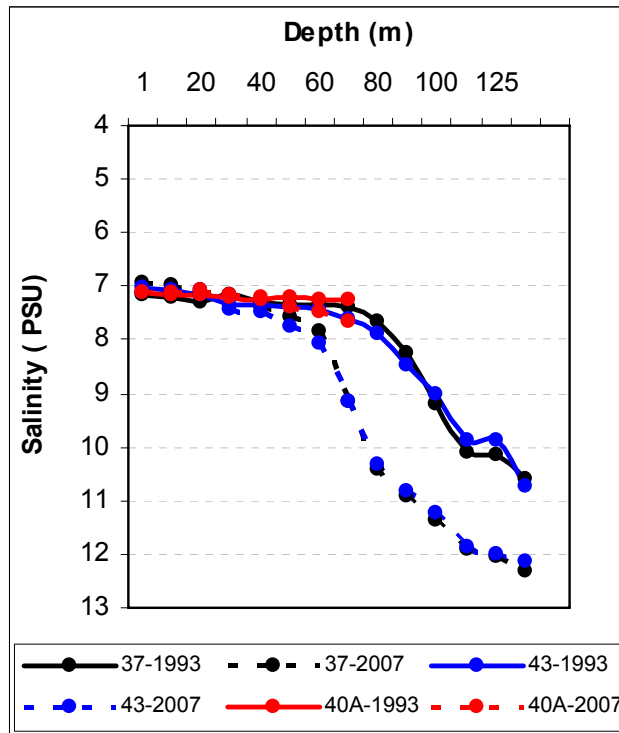


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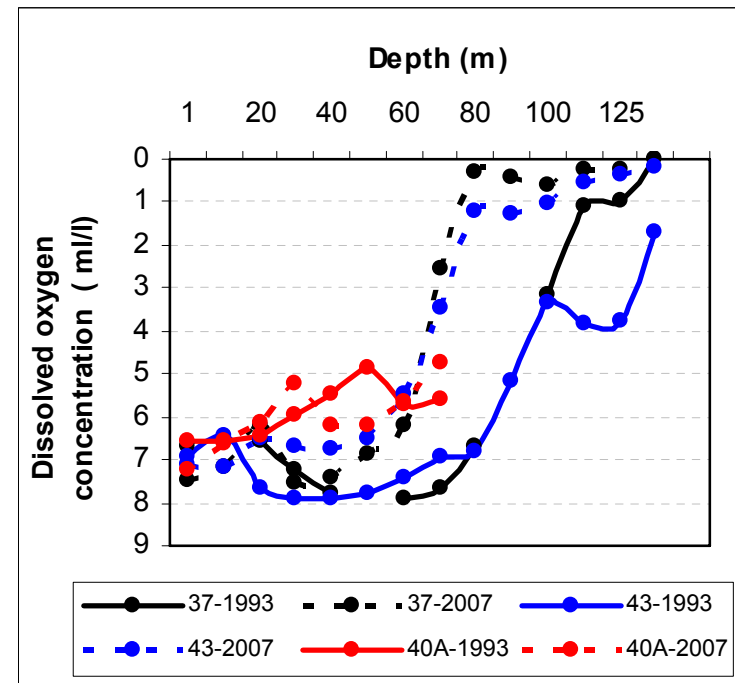
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Field work results

- The Baltic Proper
Salinity, summer



Dissolved oxygen concentration,
summer

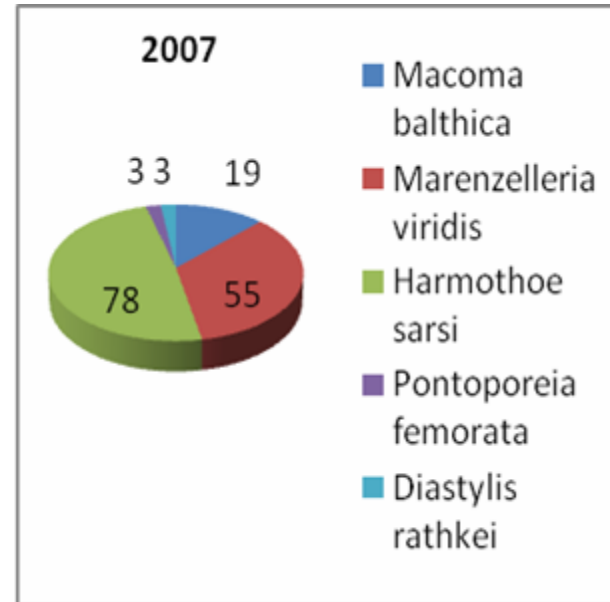
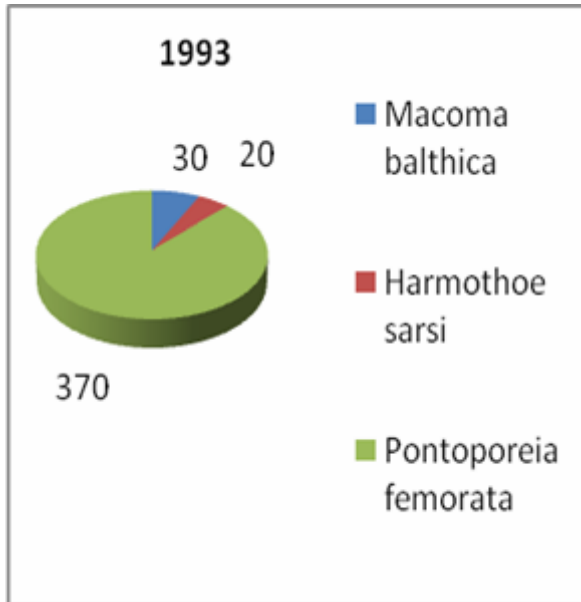


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Field work results

- The Baltic Proper - macrozoobenthos



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Fish data digitalization

- **Fish together important environmental variables:**
 - Gulf of Riga herring;
 - Baltic Proper herring;
 - Baltic Sea sprat;
 - Eastern Baltic cod;
 - Eastern Baltic flounder;
 - Coastal fish communities.



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Fish data digitalization – an example

Baltic Proper herring:

- a) the abundance of a year old herring at the beginning of the year from the stock assessment for 1974-2006;
- b) total spawning stock biomass and for separate age groups 1974-2006;
- c) mean body weight of the age groups in the spawning stock, 3 yrs old and older;
- d) zooplankton species abundance and biomass in the eastern part of the Baltic Sea, spring and summer 1974-2006;
- e) mean water temperature in the Baltic Sea, spring and summer, at 0-20 m layer, 1974-2006;
- f) mean salinity at the eastern part of the Baltic Sea, 0-20 m layer, 1974 -2006.

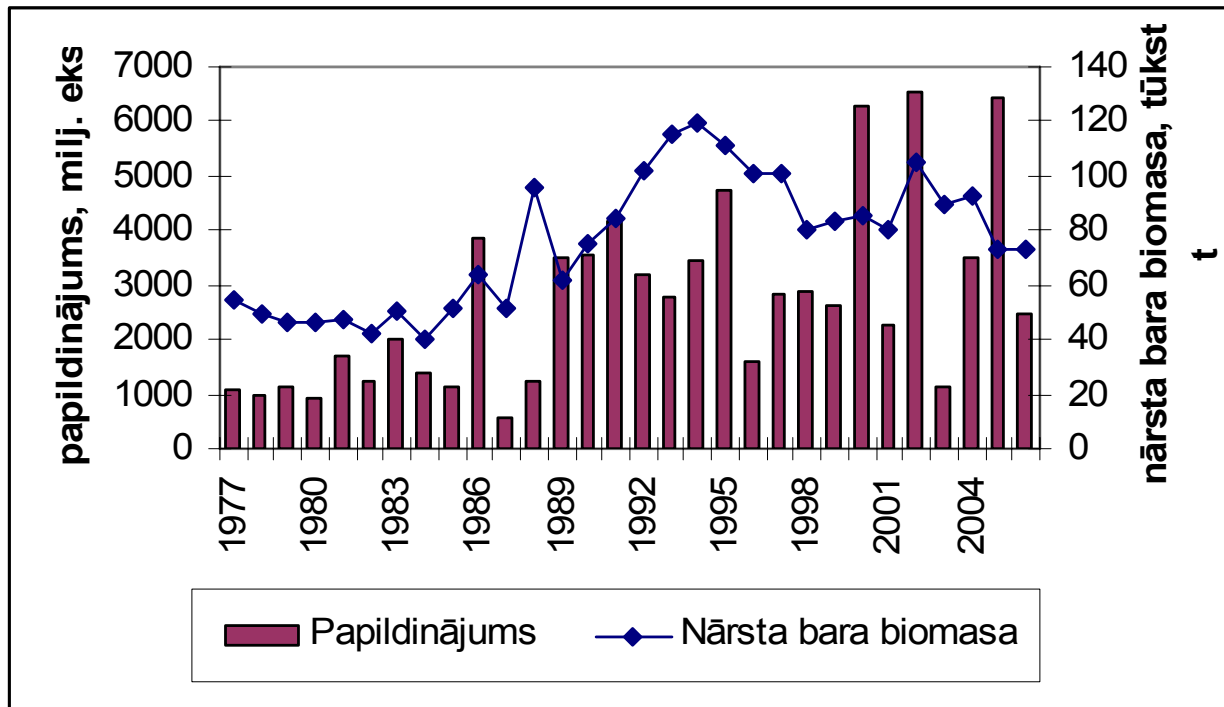


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Long-term forecasting of fish communities

- Gulf of Riga herring – spawning stock biomass and recruitment related vaguely

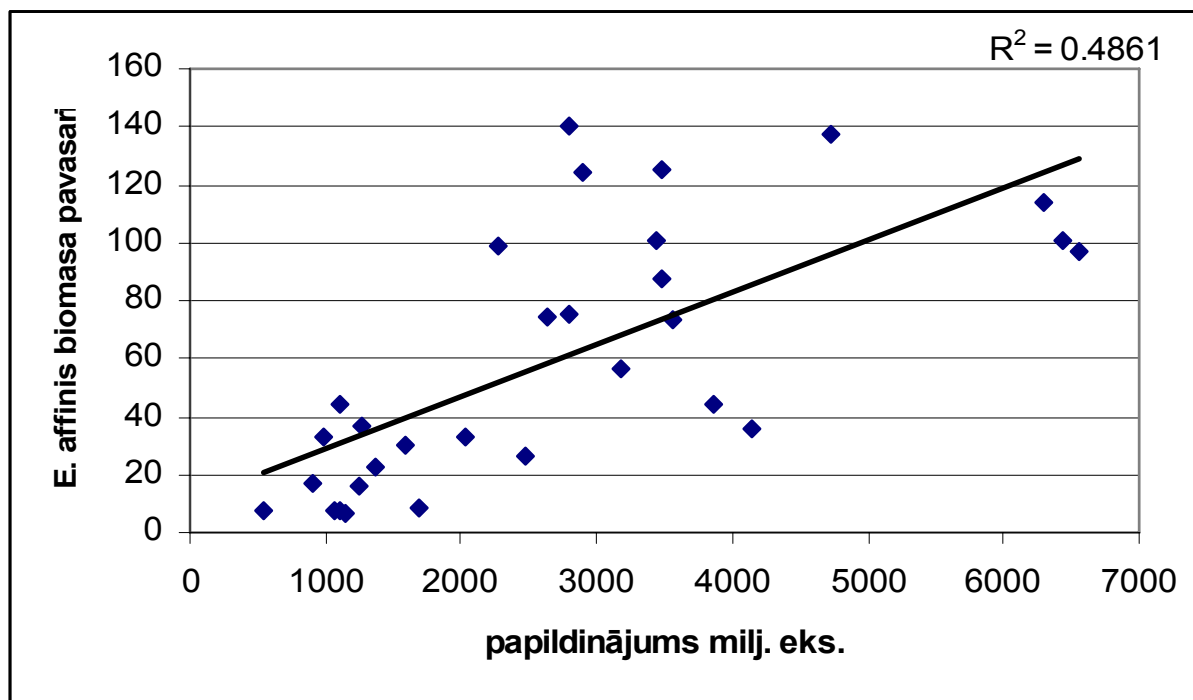


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Gulf of Riga herring

- Recruitment related to the water temperature and zooplankton biomass in spring

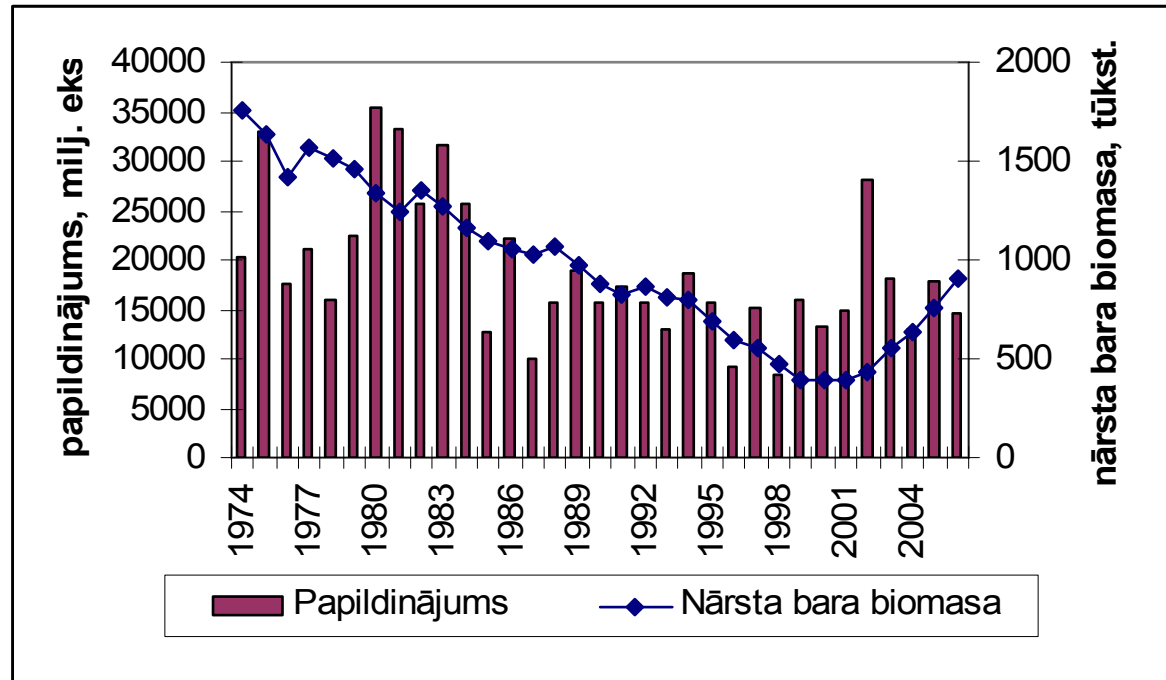


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Other fish species

- Baltic Sea herring – combination of more factors, affecting both recruitment and SS biomass

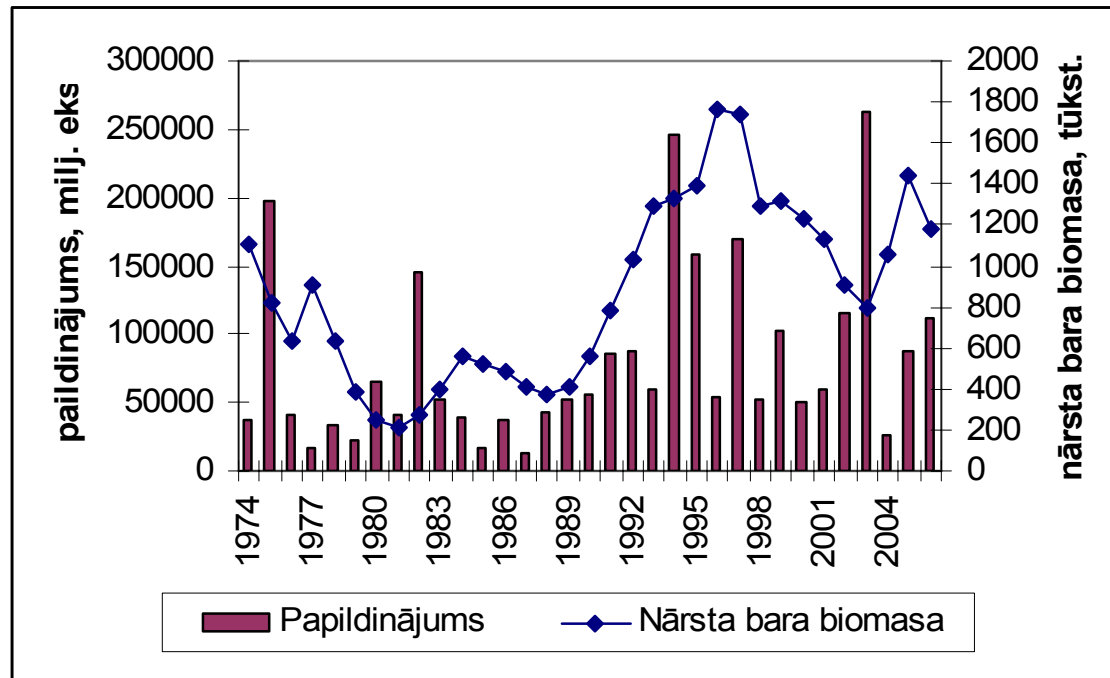


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Other fish species

- The Baltic sprat – more regulating factors without clear tendencies

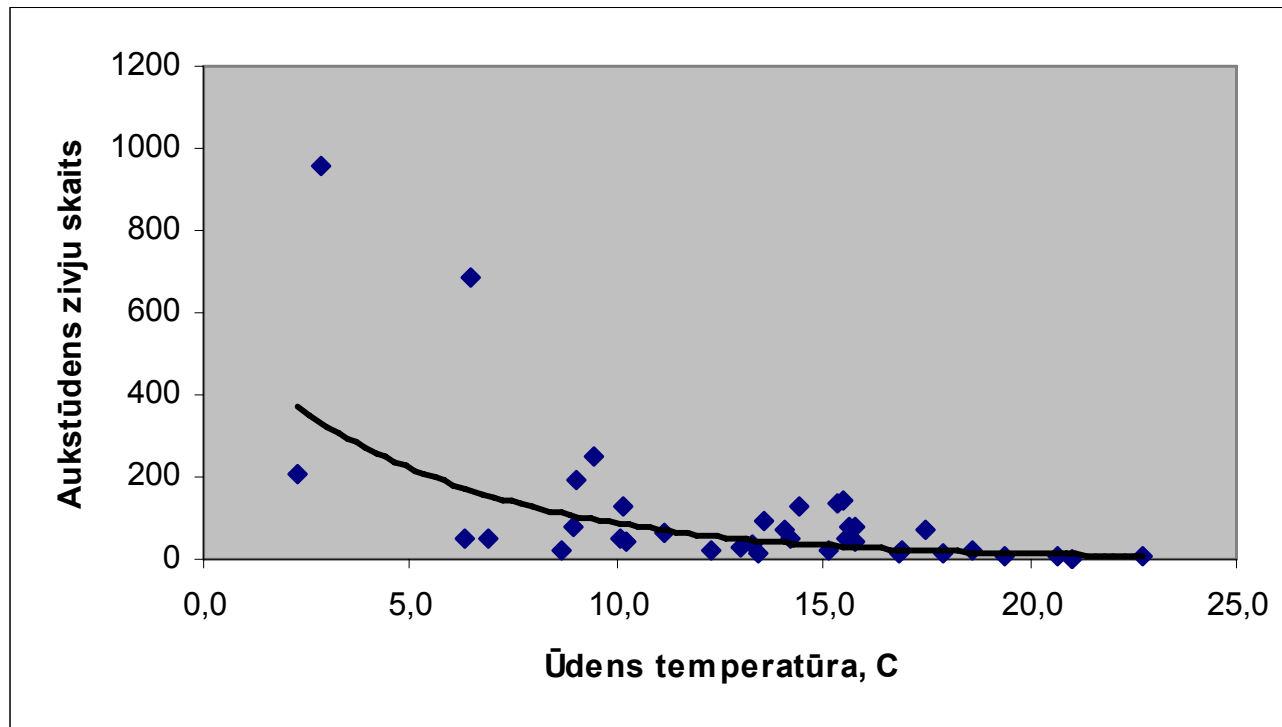


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Other fish species

- Coastal fish communities and the upwellings in the Gulf of Riga



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Tasks for 2008

- **Experimental work:**
 - spring and summer phytoplankton responses;
 - zooplankton production;
 - data analysis.

Output:

- presentation of the results in various fora,
- joint paper on theoretically possible ecosystem changes in the Latvian marine areas due to the climate change.



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Tasks for 2008

- **Field work:**
 - finalize sample analysis – **in May**;
 - data analysis for further assessments, forecasts and management recommendations.

Output:

- presentations and publications,
- joint paper ...



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Tasks for 2008

- **Finalization of fish community model - done**

Output: several publications (under preparation);

presentation of the results planned *inter alia* in ICES Annual Science Conferences.

- **Gradual creation of long-term forecasts for fish stocks.**

Cooperation with WPs 1, 4, 5, 7



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Thank you for the attention!

