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Dynamics of the catch of herring and sprat in the Baltic Sea and Gulf of Finland: assessment of climate impact

A. Pedchenko (VNIRO) 2018

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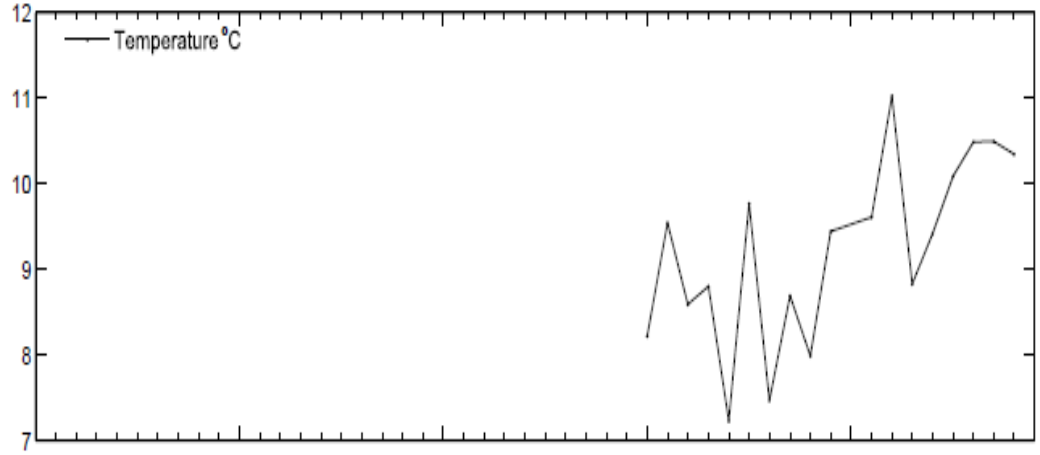
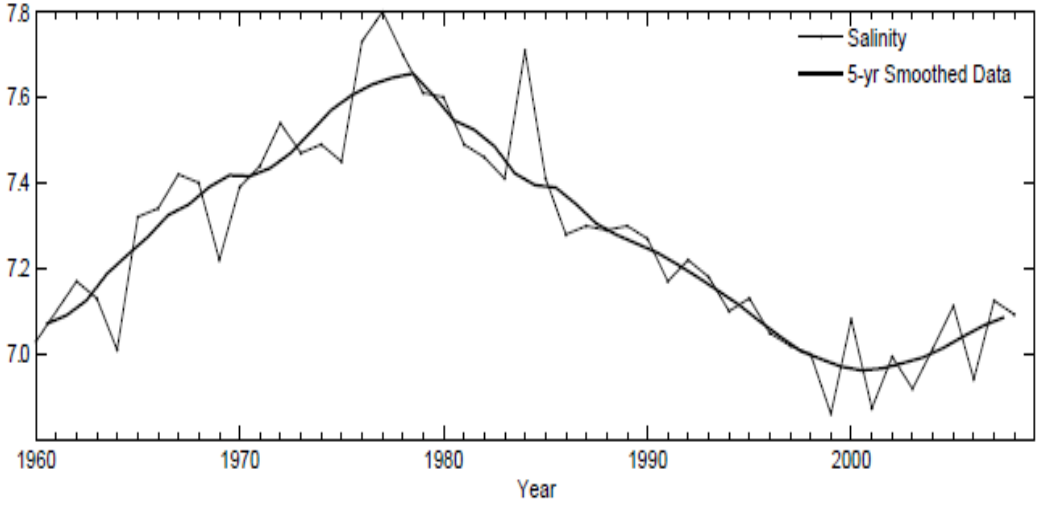
Changes in temperature and salinity* on the surface of the Baltic sea in 1960-2008

Изменения температуры и солености* на поверхности в Балтийском море в 1960-2008 гг.



Data Provider: SMHI - Swedish Meteorological and Hydrological Institute
Ref: ICES Report on Ocean Climate 2008



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*** - the salinity point #15 to the West of the island of Gotland // соленость в точке #15 к западу от о. Готланд//**

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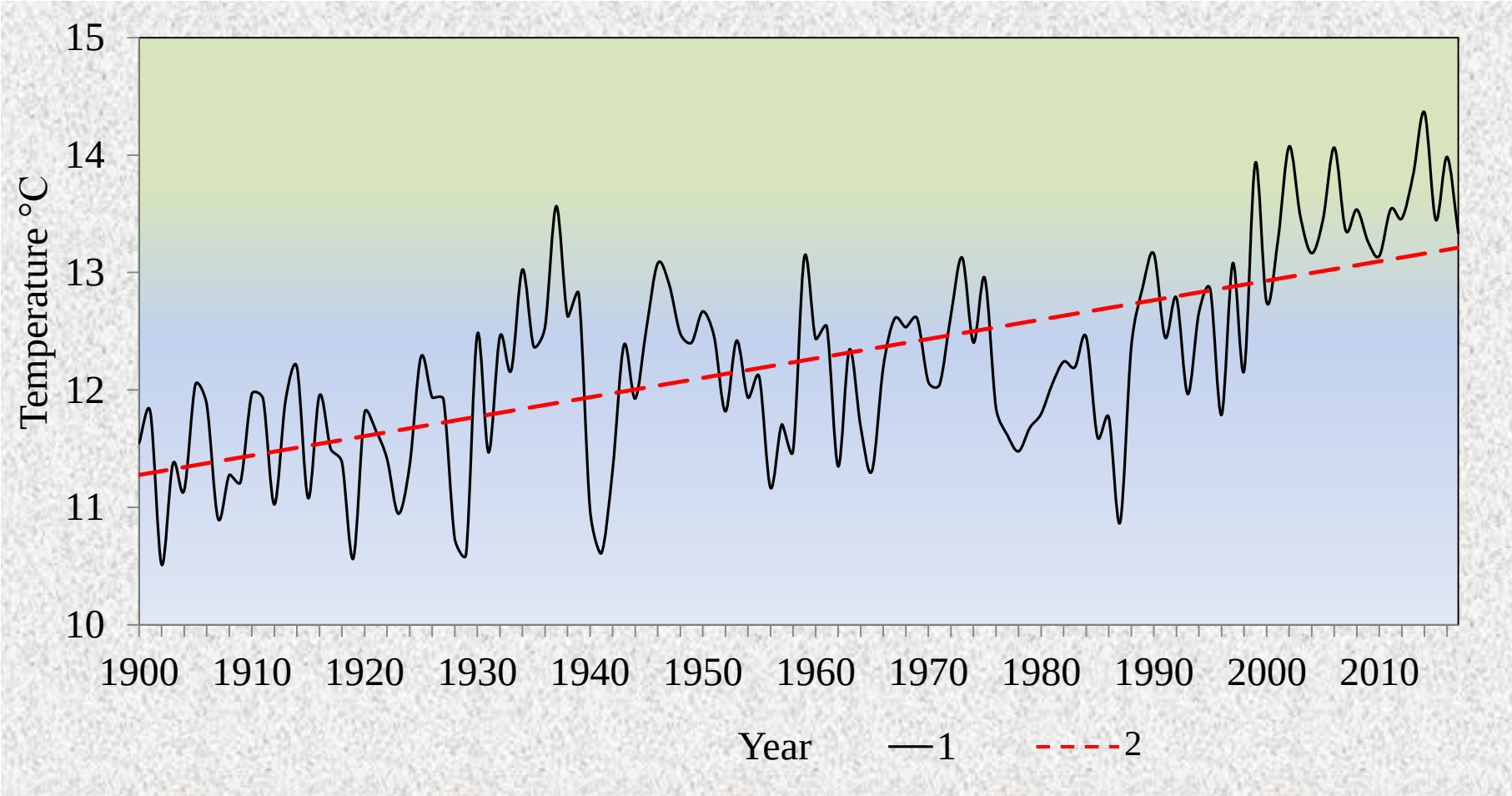
The interannual fluctuations of the surface temperature of the Baltic Sea in 1900-2017



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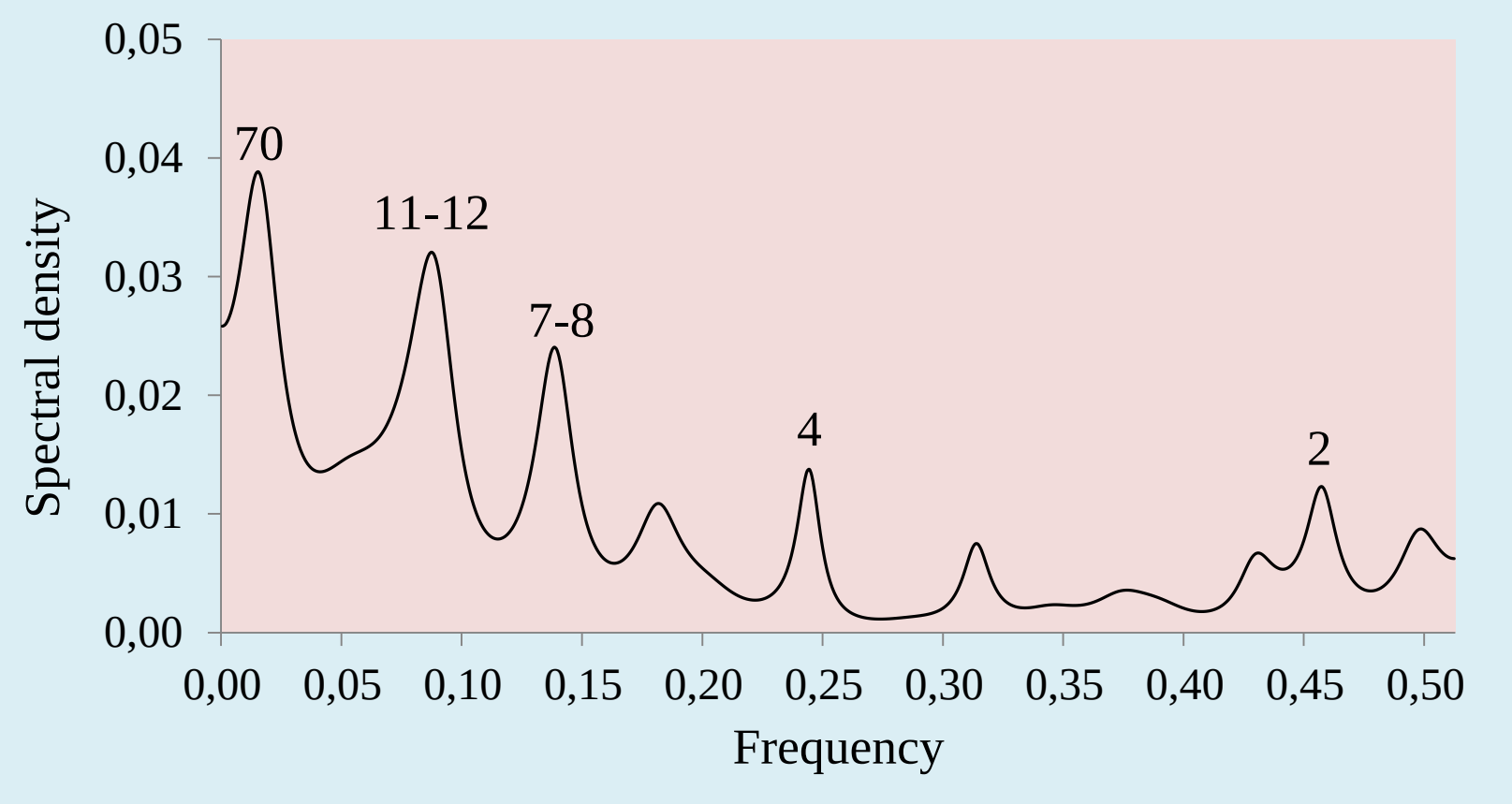
The spectral composition of the interannual variability of the surface temperature



The spectrum fluctuations of the surface temperature of the Baltic Sea 1900-2017. The period (years) is indicated above the significant peaks of the spectral density . (The software package AutoSignal (USA) was used.)

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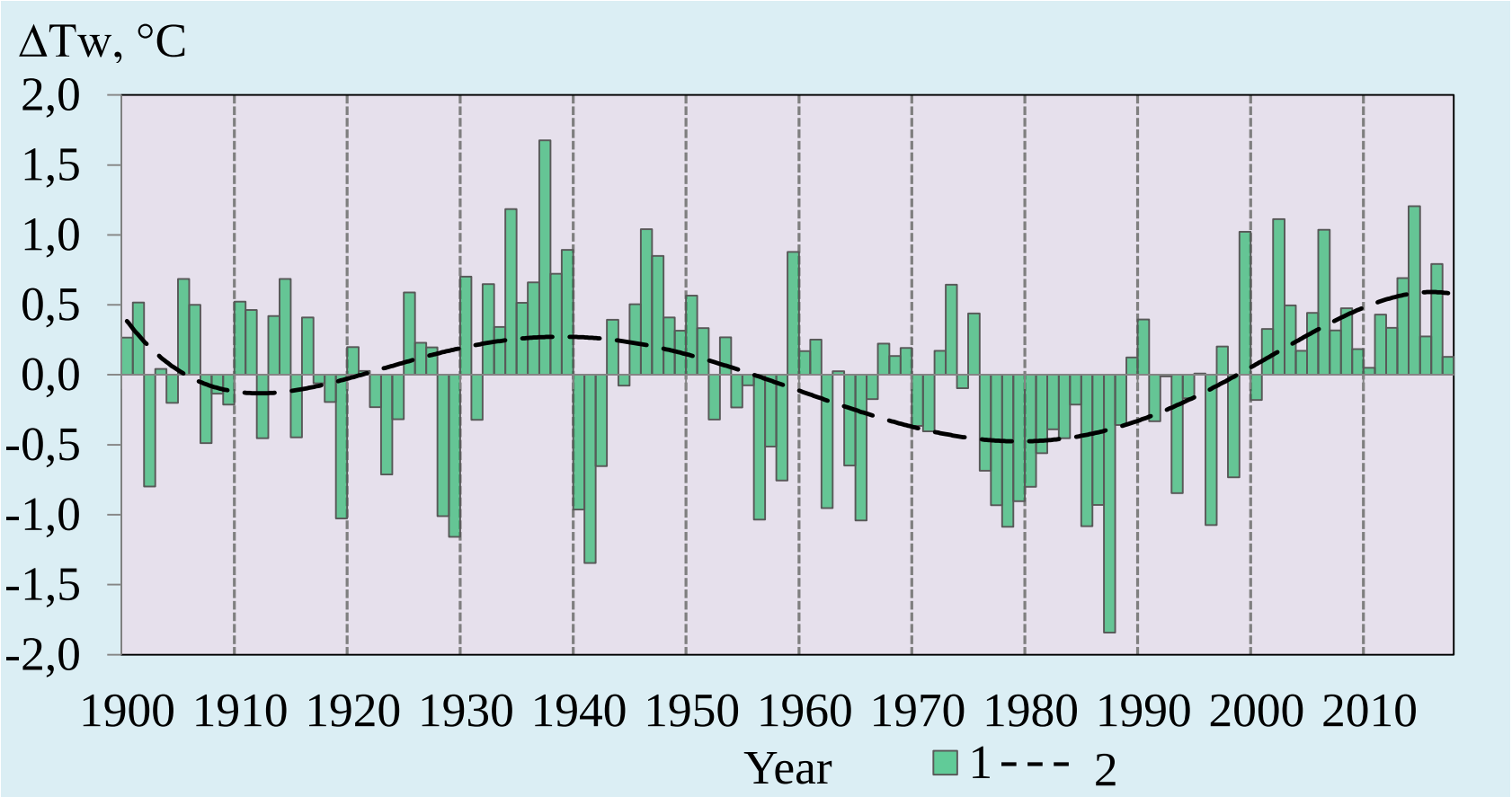
Long-term variability of surface temperature anomalies in the Baltic sea in 1900-2017



Changing the difference between the original surface temperature of the Baltic Sea and their values of linear trend (1), 70-year cyclic component (2)

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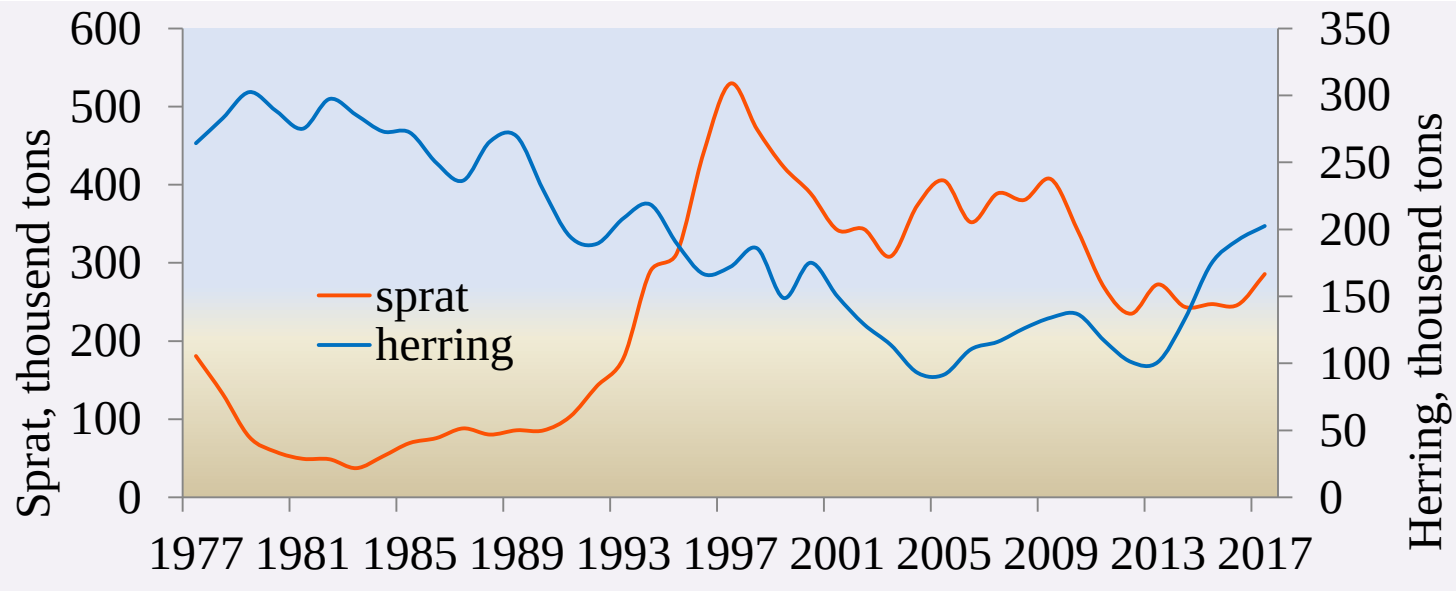
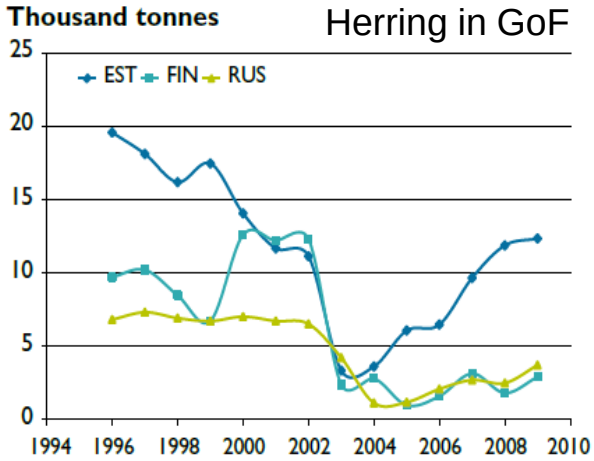
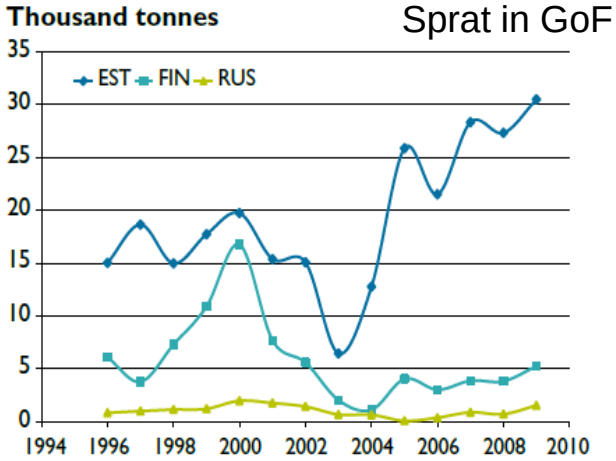
Dynamics of the herring and sprat annual catches in the Baltic Sea and GoF in 1977-2017







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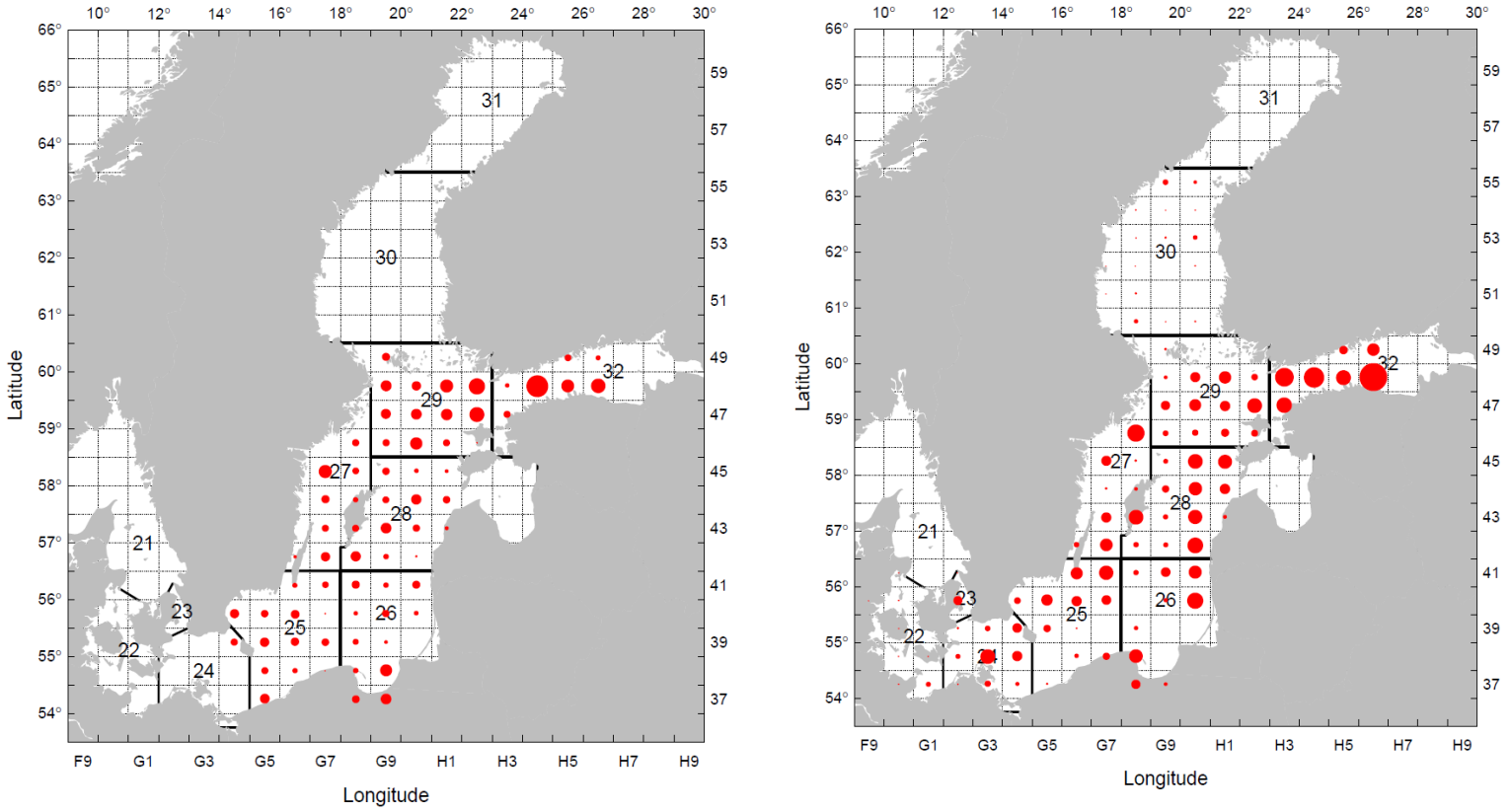

Distribution of herring (left panel) and Baltic sprat (right panel) in Sub-divisions 25 to 29 and 32, excluding the Gulf of Riga, from the acoustic survey (BIAS) in the 4th quarter 2013.

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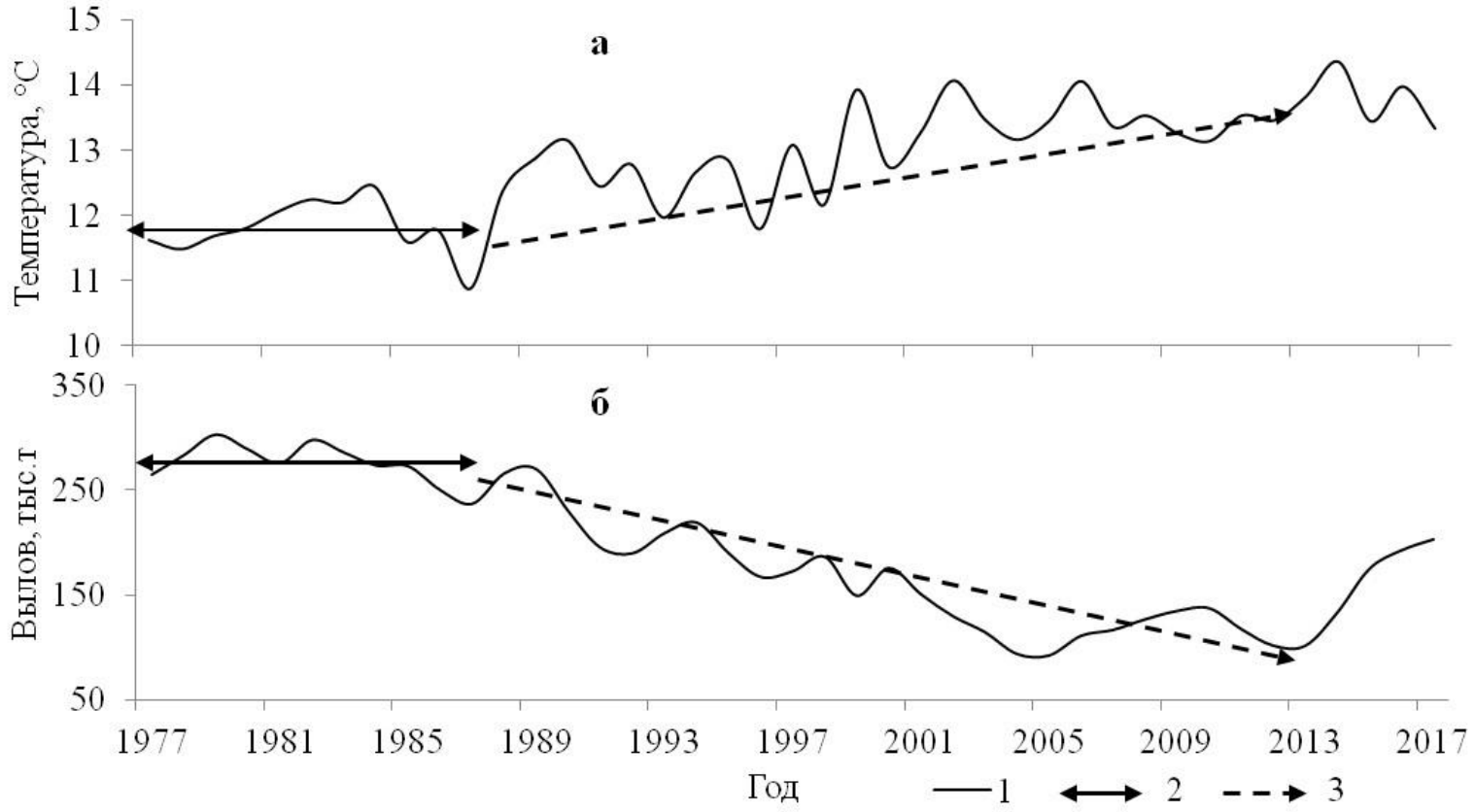

The interannual variations of the surface temperature (a) and the total catch of herring (b) in the Baltic Sea in 1977-2017, their average values in 1977-1988 (2) and linear trends in 1989-2013 (3)

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Summary

- The obtained results allow us to speak about the possibility of using the identified fluctuations of the Baltic Sea water temperature and their relationship with the catch of commercial fish for the development of long-term forecasts of herring and sprat fishing in the Gulf of Finland.

- However, the assessment of the climate impact on the dynamics of catch of commercial fish is noisy by various types of anthropogenic impact.

- The development of the hydrotechnical works in the GoF requires further detailed study of the impact of climate and anthropogenic factors on its ecosystem, taking into account the activities of Marine Spatial Planning.

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Thank you for attention !