

The Changing State of the Gulf of Finland Ecosystem – a trilateral Estonian–Finnish– Russian symposium held in Tallinn, 28–30 October 2002

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The Gulf of Finland is a unique water body, connecting the people of three countries: Estonia, Finland, and Russia. Among the five main sub-regions of the Baltic Sea, the Gulf of Finland receives the highest amount of river discharge and land-based nutrient load per total volume of water. Because of the open connection to the Baltic Proper, the water exchange is quite intensive, and the state of the Gulf of Finland ecosystem is also sensitive to the inflow and transformation of the North Sea water in the entire Baltic Sea. Both the oceanographic processes in the sea and hydrological processes in the drainage area depend on the climate and weather. In the recent period, since the end of the 1980s, summers have been generally warmer and winters have been milder than the long-term average, obviously due to the positive phase of the North Atlantic Oscillation index (Stenseth et al., 2002).

It was recognized more than 35 years ago that the environmental state of the Gulf of Finland is sensitive to the growing human activity. In order to circumvent increasing pollution and other man-caused threats, transnational cooperation was initiated, which included from the very beginning efforts of decision-makers, environmental experts, and scientists. A new dimension in the cooperation was established at the beginning of the 1990s. The Gulf of Finland Year '96 was an important milestone for the joint research.

The trilateral Estonian–Finnish–Russian expert group on the protection of the Gulf of Finland, working under the coordination of the ministries of the environment of the three countries, has planned and carried out a number of activities towards better conditions in the gulf. These include procedures of harmonized monitoring (e.g. measurements aboard ferries, remote sensing), cost-effective

measures for mitigation of eutrophication effects (e.g. scenario calculations based on ecosystem modelling, intercomparison of models), technical improvements for the environmental safety of shipping, and several other important undertakings.

In the Gulf of Finland the transportation of cargo has doubled in the last eight years and by the year 2010 the transported cargo will have doubled again (Hassink, 2001). Besides the well-known risk of oil pollution, a new threat to the Gulf of Finland ecosystem is invasion of alien species by ballast waters of ships (Leppäkoski et al., 2002).

Joint assessments have shown that in spite of about 30% reduction of phosphorus and nitrogen loads since the beginning of the 1990s, the wintertime nutrient concentrations in the seawater remain still high and eutrophication effects like oxygen deficiency and massive algal blooms continue to appear (HELCOM, 2002). This phenomenon is most probably caused by more effective release of accumulated nutrients from the sediments, triggered by poor near-bottom oxygen conditions that prevailed during the 1990s (Pitkänen et al., 2001).

Based on the recommendation of the trilateral expert group, a symposium “The Changing State of the Gulf of Finland Ecosystem” was held in Tallinn from 28 to 30 October 2002 with the support from the Estonian Ministry of the Environment in cooperation with several institutions from Finland, Russia, and Estonia. Advice was given by the Steering Committee consisting of Jüri Elken (Chairman), Tatyana Eremina, Sergey Golubkov, Urmas Lips, Georg Martin, Matti Perttilä, Heikki Pitkänen, and Valery Zaytsev. About 80 scientists attended the symposium. Altogether 35 scientific presentations were made within four sessions: (1) Critical processes for nutrient fluxes and ecosystem behaviour, (2) Processes and effects in the coastal environment, (3) Monitoring, modelling, and assessment, and (4) History, present state, and future consequences of alien species. The present special issue includes a selection of scientific findings that were reported at the symposium.

We as the scientific and administrative organizers of the symposium would like to thank the trilateral expert group, the Steering Committee, and Mr. Rene Reisner for doing excellent work. Additional funding for this special issue was kindly provided by the Estonian and Finnish ministries of the environment.

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