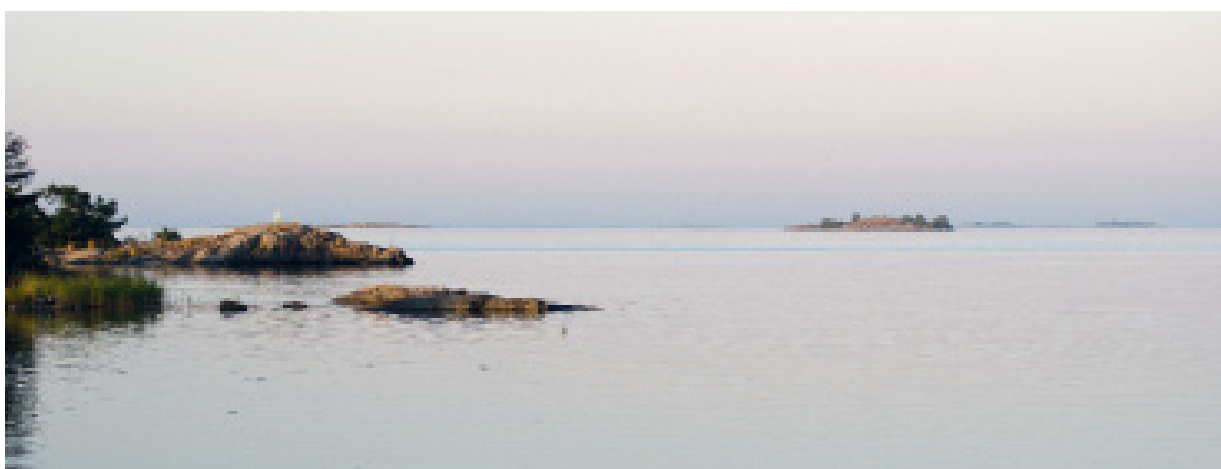


OCEANOGRAPHIC RESEARCH FOR DECISION SUPPORT

The oceanographic research unit at SMHI conducts research and development in physical oceanography and marine biogeochemistry using field observations, remote sensing, data assimilation and numerical modelling.



RESEARCH AREAS

Our research spans time scales: from short-term forecasts for temperature, salinity, currents, waves, sea level, ice cover and oil-spill drifts, to climate change impacts on the sea and the marine ecosystem on decadal to millennial time scales. Our main geographical focus areas are the Baltic Sea, the North Sea and the Arctic Ocean and the subject areas are ocean climate, marine environment and operational oceanography using both open ocean and coastal models. The research is conducted in cooperation with a large number of national and international partners. The research has been possible due to support from the EU Horizon 2020 and BONUS programs, as well as from international and national research councils.

The researchers strive to improve the scientific understanding of processes in the sea, the sea ice and in the ocean floor sediments and of atmosphere–ocean–land interaction. Recently, the variability of hypoxic and anoxic areas, major salt-water inflows to the Baltic Sea, dynamics of harmful algal blooms, including the life cycle of cyanobacteria in the Baltic Sea, biogeochemical processes and freshwater dynamics in the Arctic Ocean, are examples of research topics of the SMHI research unit in oceanography.

DECISION SUPPORT

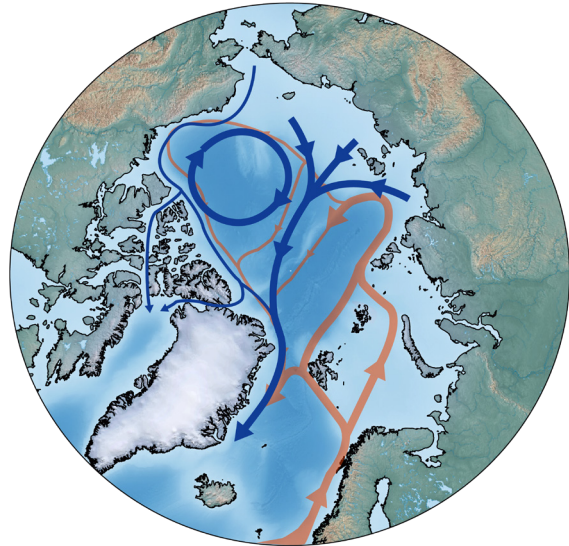
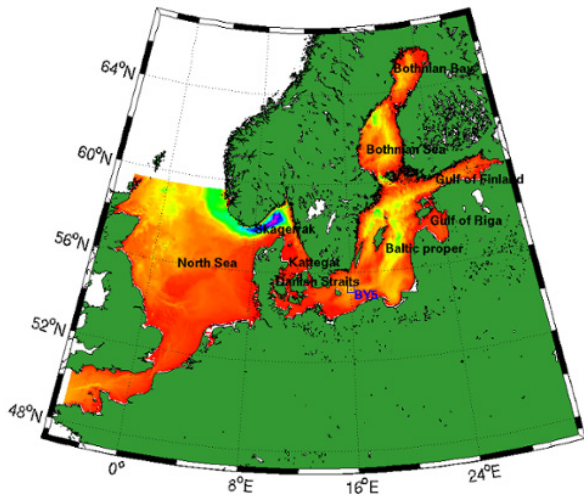
The SMHI oceanographic research unit is actively building arenas to provide accessible and comprehensible, scientifically sound information for stakeholder decision support and playing a major role at the science-policy interface.

By high-technology tools that enable the comparison of management scenarios for combating eutrophication problems of the Baltic Sea under the impact of climate change, are developed and operated. The scenarios use the latest available, regionally downscaled, climate projections and ensemble modelling for assessment of uncertainty ranges, together with nutrient load scenarios for land, point sources and atmosphere. Decision support development also includes model-based simulations for rescue actions (oil drift, man over board), flooding risks and information on economically and environmentally beneficial shipping routes.

For more information contact:

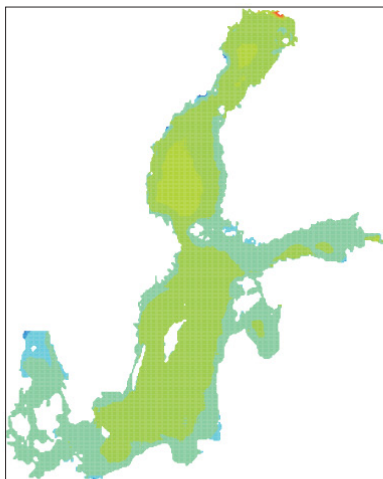
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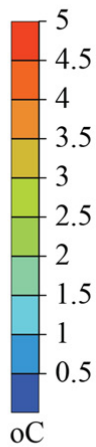
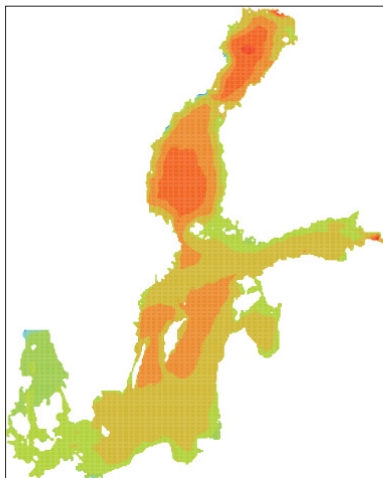


The main focus areas at the oceanographic research unit at SMHI; the Baltic Sea and the North Sea (left) and the Arctic Ocean (right).

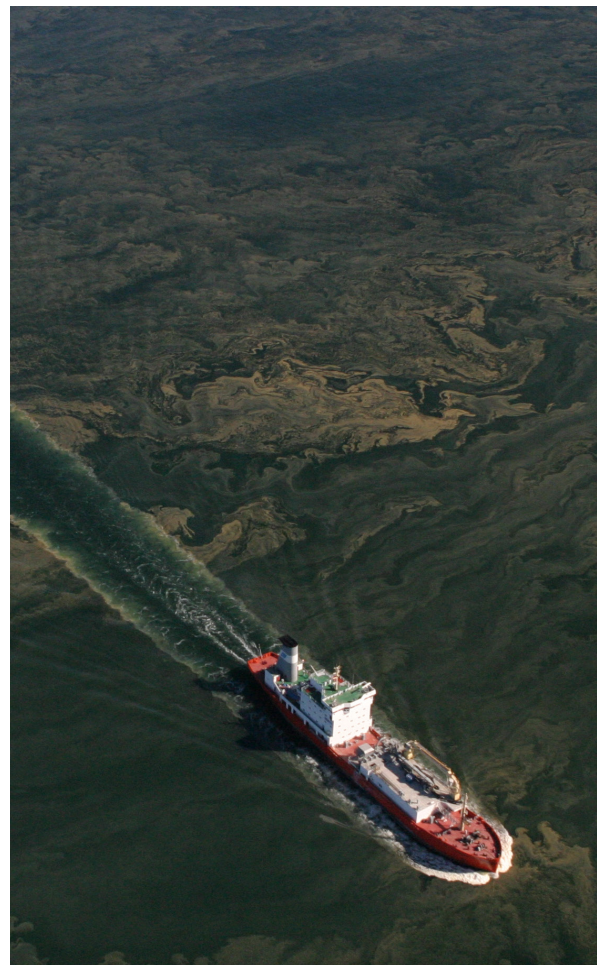
RCP 4.5



RCP 8.5



Projected changes in ensemble average summer sea surface temperatures (°C) between future (2069–2098) and historical (1976–2005) condition according to RCP 4.5 (upper) and RCP 8.5 (lower). Result from our modelled future climate projections for the Baltic Sea.



Algal bloom in the Baltic Sea - a sign of eutrophication. The improvement of scientific knowledge about the marine environment, e.g. the Baltic Sea, as a support for decision-makers is one of our research areas.