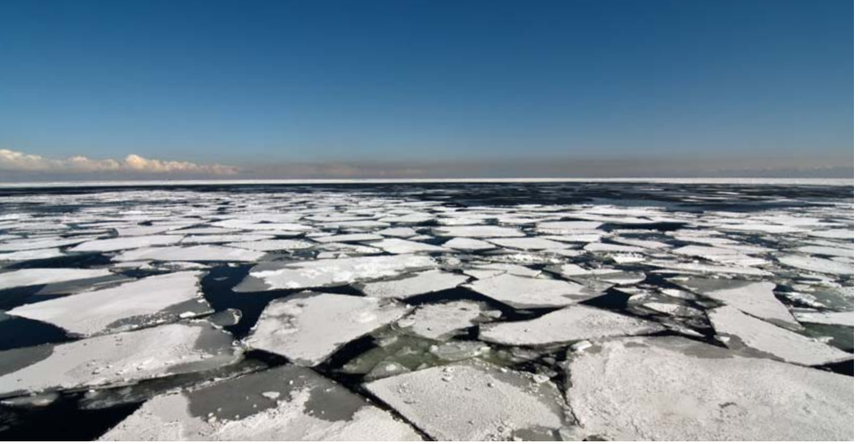

Baltic Sea related research and
expertise at other units of SYKE

- nutrient loads and water basin management
- hazardous substances
- environmental policy
- oil spill response
- environmental damages

For the latest information about the Baltic Sea:

www.balticseaportal.fi

- Up-to-date news and information on the state of the Baltic Sea and the related research, monitoring and conservation work.
- New data collected during the voyages of the marine research vessels Aranda and Muikku.
- Automatically updated daily marine information and forecasts.
- Maintained by the The Finnish Environment Institute, The Finnish Meteorological Institute and Ministry of the Environment.

Finnish Environment Institute SYKE

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SYKE

Marine Research Centre

of the Finnish Environment Institute SYKE

Investigating and improving the state of the Baltic Sea

SYKE's Marine Research Centre conducts wide-ranging research on the ecosystems, marine life and state of the open Baltic sea and the coastal waters around Finland, also assessing the factors that shape the marine environment. These issues are studied through three major research programmes. One key focus area is measuring the loads of substances entering the Baltic Sea, and examining their impacts. The Marine Research Centre was launched in January 2009, and employs about 80 scientists with wide expertise on marine research.

SYKE

Research Programme for the State of the Marine Environment

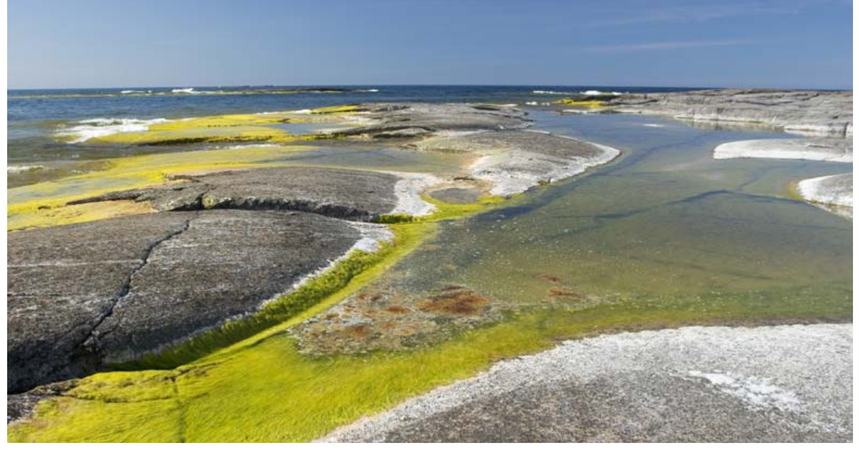
Information on the ecological state of the Baltic Sea

This programme produces up-to-date information on the state of the Baltic Sea marine environment. Observations are done all around the Baltic Sea, on the voyages of the research vessels Aranda and Muikku, on automatic monitoring devices fitted on board several commercial cargo and passenger vessels, and using satellite imagery.

Long-time series of observations are used to identify changes in the marine environment related to climatic trends, eutrophication and the impacts of hazardous pollutants. This information provides a basis for comprehensive evaluations of the state of the marine ecosystems, projections to the future, assessments of the effectiveness of earlier protection measures, and recommendations for new ones.

Information on the current state of the sea and forecasts for future trends are provided for policy-makers in Finland and internationally, particularly within the EU and HELCOM (The Baltic Marine Environment Protection Commission). The EU's Marine Strategy Directive and Water Framework Directive stress the importance of monitoring and assessing the environment of the Baltic Sea as part of their goal to improve the ecological state of Europe's marine and inland waters. On-line information is also provided for the Finnish public during the summer on phytplankton blooms.

The latest research subjects include studies of the impacts of hazardous substances and changing environmental conditions on fish, shellfish and crustaceans, by using of biomarkers at the level of cells and molecules. Such biomarkers can serve as warning signals of the impacts of pollution on marine life in the Baltic Sea.



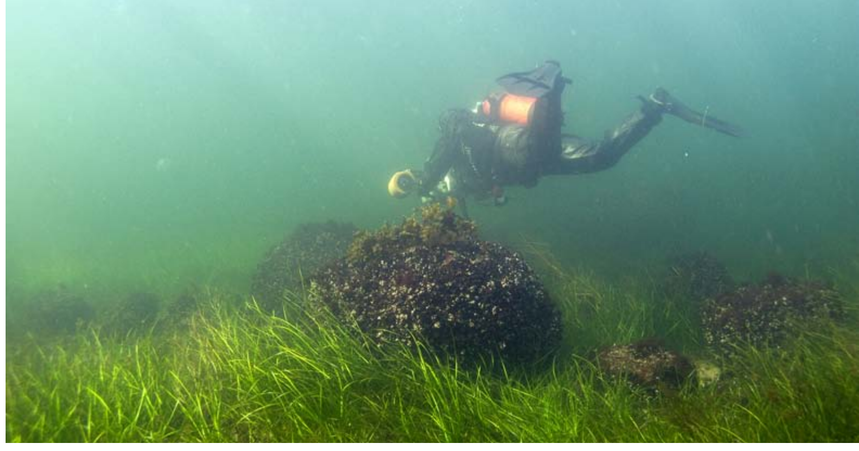
Research Programme for Marine Ecosystems

How and why is the Baltic Sea changing?

This programme examines the impacts of human activities on marine ecosystems today and in the future. Studies combine observations of internal marine processes and external factors such as nutrient loads. Focus areas include the impacts of nutrients in aquatic and benthic ecosystems as well as many aspects of complex nutrient cycles, from the role of bacteria and planktonic algae to the deposition and release of nutrients in sea-floor sediments. Such data can then be used to develop mathematical models of ecological processes.

The results of the programme's research will be applied in marine conservation and the planning of resource use. Models can be used to evaluate impacts on ecosystems, and to forecast ecological changes in the long and short term. New tools will also be devised to help assess the cost-effectiveness of conservation measures.

New research areas include the possible use of planktonic algae in biodiesel production, and opportunities to actively restore the state of marine environments through measures such as oxygenation. New studies will apply models of calculated flow fields within the Baltic Sea in the planning of shipping routes, aiming to limit the areas affected by spills in the event of accidents.



Research Programme for Marine Ecology and Biodiversity

Life beneath the waves of the Baltic

This programme focuses on marine life and biodiversity. Studies are designed to support the effective conservation and sustainable use of marine species and ecosystems. Key issues include algal blooms, toxic algae and other organic toxins, the ecology of the seabed, marine plankton communities and their predators. It is also important to study the characteristics and impacts of invasive species such as comb jellies and non-native benthic invertebrates. The Finnish inventory programme for the underwater marine environment (VELMU) is compiling vital new information on marine species and biotopes.

Analysis of long-term monitoring data can reveal how environmental factors have affected biodiversity and habitat conditions in the Baltic Sea. Field research and experiments are conducted to investigate the causes of such changes. Results can be applied to create wider summaries and models to explain and forecast changes in species' populations and habitats.

The state of the Baltic Sea shapes marine biodiversity, but biodiversity can also shape the state of the sea. Healthy communities of benthic organisms can maintain normal chemical processes of the benthic ecosystem, thus reducing excessive releases of deposited nutrients. New studies within the programme will assess how changes in oxygen conditions affect species diversity and functioning of the benthic ecosystem, and how these changes influence benthic nutrient dynamics and, hence, eutrophication.