

The Baltic Sea Drainage Basin

The Baltic Sea drainage basin covers an area of 2.1 million km², which is almost 20% of the European continent. About 85 million inhabitants live in the basin, where climate ranges from mild and humid mid-latitude conditions in the south to subarctic winter conditions in the north. It is partly a densely populated, heavily industrialised area, and intensive land use is common. The basin's net annual water discharge to the World Ocean is comparable to that of major river systems such as the Mississippi River.



The Baltic Sea drainage basin and BALTEx Conference locations

International BALTEx Study Conferences

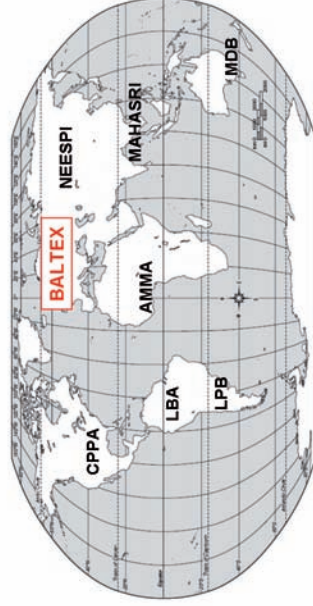
Every three years, the BALTEx research community gathers for an International BALTEx Study Conference, traditionally on an island in the Baltic Sea. The series of conferences started on Gotland in 1995, and the forthcoming is scheduled for 2010 on the island of Wolin, Poland.

Publications

BALTEx results are published in more than 350 peer-reviewed journal articles, particularly including 7 special BALTEx journal issues, as well as numerous reports and BALTEx Secretariat publications. A recent major achievement is the *BACC* book (BALTEx Assessment of Climate Change for the Baltic Sea Basin), which was published in early 2008.

International Cooperation

is a basic prerequisite for the success of BALTEx. BALTEx is closely interacting with other Regional Hydroclimate Projects within GEWEX/CEOP and is exchanging experience with thematically related projects and programmes in the region, such as the Land-Ocean Interactions in the Coastal Zone (LOICZ) and the Helsinki Commission (HELCOM).



GEWEX Regional Hydroclimate Projects



BALTEx
Baltic Sea Experiment

Phase II 2003 - 2012

A multi-disciplinary programme
for environmental research
in the Baltic Sea drainage basin



At present, more than 50 institutes and organisations in more than 15 countries have contributed to BALTEx. Scientists from 10 countries constitute major BALTEx bodies such as the BALTEx Science Steering Group (SSG) and BALTEx working groups.

BALTEx offers a common international platform for scientists from all environmental disciplines with the aim to provide an integrative description of the Baltic Sea drainage basin, including a retrospective analysis of past and the simulation of future climate conditions and their impact on the environment in this region.

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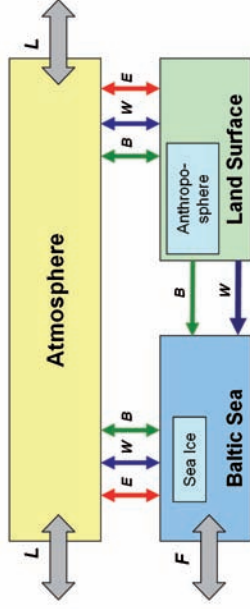
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A European contribution to the
Global Energy and Water Cycle Experiment
and World Climate Research Programme

Water, Energy and Biogeochemical Cycles in the Climate System

The hydrological cycle and the exchange of energy between the atmosphere and the surface of the Earth control and regulate the climate in a fundamental manner. This takes place directly as transport of latent heat over large distances and indirectly in the way vapour, clouds and snow on the ground affect the radiation balance. Precipitation returns water or snow back to the Earth's surface, where it enters other complex branches of the hydrological cycle, by e.g. accumulating snow, percolating into the ground and discharging into lakes, rivers and the sea. Water in all its three phases causes much of the complexity and variability of weather and climate.



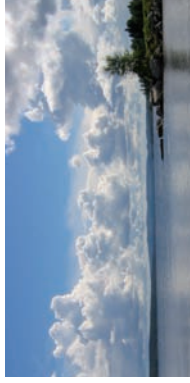
Sketch of the fluxes between the three major compartments of the Baltic Sea drainage basin. Lateral exchanges with the atmosphere outside the BALTEX region L, In- and outflows through the Danish Straits F, Water W, Energy E (heat) and Biogeochemical fluxes B.

Water as the Earth's ubiquitous solvent carries elements such as carbon, nitrogen, phosphorus, and sulphur, oxygen, as well as trace elements, and governs their fluxes and reservoirs on land, in the sea and the atmosphere. Biogeochemical cycles are thus closely interwoven with the hydrological cycle. These fluxes and reservoirs are expected to vary under climate change conditions with possible impacts on both marine and terrestrial ecosystems, as well as the socio-economy in the Baltic Sea drainage basin.

Objectives of BALTEX Phase II 2003-2012

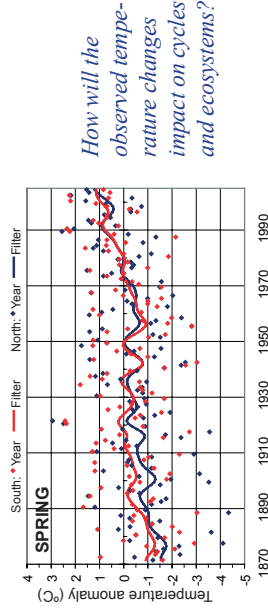
Better Understanding of Water and Energy Cycles

BALTEX improves our understanding of processes, related modelling capabilities, and the quantification of important energy and water cycle parameters such as clouds, solar and terrestrial radiation, precipitation, river runoff, Baltic Sea water transports and sea ice dynamics.



Climate Change and Variability

BALTEX research contributes to the detection of current regional climate change and to developing projections of future climate variability and change throughout the 21st century in the Baltic Sea drainage basin. The focus is on variables closely related to water, energy and biogeochemical fluxes. One aim is to discern between natural and anthropogenic causes, thus contributing to attribution studies.



Improved Tools for Water Management

BALTEX scientists develop numerical models which simulate effects of extreme weather and climate conditions on e.g. river runoff and coastal regions, helping to improve precautionary measures, and to efficiently manage water resources in the Baltic Sea drainage basin.

Objectives of BALTEX Phase II 2003-2012

Biogeochemical Cycles in the Sea and on Land

Mechanisms of how climate change interacts with biogeochemical cycles are poorly understood. BALTEX contributes to further developing Earth system models, capable to realistically model impacts on aquatic and terrestrial ecosystems.



A bloom of blue-green algae in the Baltic proper. Climate change may have impacts on biogeochemical fluxes and reservoirs.

Strengthened Interactions with Stakeholders and Decision Makers

The involvement of governmental agencies and intergovernmental organisations such as HELCOM will help to improve communication and knowledge transfer between scientists and decision makers.

Education and Outreach

BALTEX fosters scientific exchange through conferences, academic training through summer schools and courses, and involvement of the general public through publications and a dedicated web site.

