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GKSS FORSCHUNGSZENTRUM in der HELMHOLTZ-GEMEINSCHAFT

PRESS RELEASE

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Climate change in the Baltic Sea basin – past, present and future

Scientists at GKSS have coordinated a regional climate survey, whose results are being presented today as a published book.

Titled *Assessment of Climate Change for the Baltic Sea Basin* (BACC), the book published by Springer-Verlag presents the first comprehensive survey of past and possible future climate change in the region, which extends over 13 countries around the Baltic Sea in northern and mid-Europe. One of the key findings is that air temperatures in the Baltic Sea basin could rise by up to five degrees Celsius from now to 2100. More than 80 scientists from 13 European countries were involved in this interdisciplinary project, which has been coordinated by the GKSS Research Centre in Geesthacht, Germany. “BACC is a regional assessment comparable to the IPCC report on global climate change,” says the coordinator of the project, Professor Hans von Storch, who heads the Institute for Coastal Research at GKSS.

Warming is already under way

The scientists conclude that air temperatures in the Baltic Sea basin have already risen over the past century, increasing by approximately 1°C in the northern areas of the Baltic Sea basin and by around 0.7 °C in the southern areas. Consequently, the warming is larger than the global mean temperature increase of 0.75 °C reported by the IPCC.

Scenarios for the end of this century

Meteorologists, hydrologists, biologists and oceanographers worked together to establish scenarios of climate development in the Baltic Sea basin for the period up to 2100. The results also include the possible impact of climate change on terrestrial, marine and freshwater ecosystems.

If adequate climate mitigation measures are not put in place by the global community, air temperatures could rise by 4-6 °C in northern areas such as Sweden, Finland and Western Russia, or by 3-5 °C in the southern areas such as Poland and Northern Germany. Water surface temperature in the Baltic Sea could increase by 2-4 °C. Higher water temperatures and decreased salinity would have a great impact on the Baltic Sea’s flora and fauna, affecting the entire ecosystem from bacteria and plankton all the way to commercially important fish species such as cod. Ecosystems on land – including managed forests – could benefit from an extended growing season, but may also become increasingly vulnerable to damage by insect and fungal pests as well as other stresses.

A milder climate could reduce the ice cover in the Baltic Sea by 50 to 80 %. While ice-free conditions would be beneficial for shipping in the Baltic Sea, they would threaten populations of animals such as the Baltic ringed seal, an endemic species that is dependent on ice surfaces in order to reproduce.

Precipitation may be expected to change as well, with possible increases of 25-75 % during winter and decreases of up to 45 % during the summer season in some areas. The combination of reduced rainfall and increased temperatures in summer could threaten water supplies, food production and forestry in countries along the southern coast of the Baltic Sea. Throughout this century, increased precipitation and freshwater inflow could lead to a decrease in the Baltic Sea's mean salinity and also to intensified eutrophication and algal blooms.

According to the IPCC, global sea levels are expected to rise by 20 to 60 cm by the end of the century. In the Baltic Sea, this increase will be accompanied by local land uplift and lowering. Whereas sea levels are expected to rise in the south, the rise in water levels will be partly compensated for by naturally occurring uplift of the land mass in the North.

BACC – Report recognized by HELCOM and taken as an example of other regional efforts

The project's findings have served as the basis of a report already published by the Baltic Marine Environment Protection Commission (HELCOM). "Climate scenarios are plausible but frequently also simplified descriptions of possible futures — they aren't clear-cut predictions," says Hans von Storch, in order to explain the need for further Baltic Sea research. Scientific findings would need to be treated with great care. The authors plan to update the Baltic Sea report in five years. "By then we'll know much more about future climate change and its consequences, which will allow us to make more reliable statements regarding response strategies," adds von Storch. The research will continue to be conducted as part of the Baltic Sea Experiment (BALTEX). The International BALTEX Secretariat is housed in the GKSS Research Centre in Geesthacht, Germany.

The Baltic Sea report has led to the launch of other, similar initiatives. One of these is a climate report for the greater Hamburg area, which is being prepared in cooperation between the University of Hamburg and GKSS-Research Centre as a contribution to the recently established "Cluster of Excellence in Climate Change" (CLISAP). Initial results are expected by the end of 2009.

Book title:

Assessment of Climate Change for the Baltic Sea Basin
The BACC Author Team, Springer 2008, Hardcover, ISBN: 978-3-540-72785-9, €181.85

For media downloads see:

http://www.gkss.de/pages.php?page=01_2008.html&language=e&version=g

Web links:

BACC:	www.baltex-research.eu/BACC
BALTEX:	www.baltex-research.eu
HELCOM:	www.helcom.fi
WCRP:	wcrp.wmo.int
CLISAP:	www.clisap.de

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