

Climate Impacts on the Baltic Sea: From Science to Policy

School of Environmental Research - Organized by the Helmholtz-Zentrum Geesthacht

Bearbeitet von
Marcus Reckermann, Keith Brander, Brian R. MacKenzie, Anders Omstedt

1. Auflage 2012. Buch. xiv, 218 S. Hardcover

ISBN 978 3 642 25727 8

Format (B x L): 15,5 x 23,5 cm

Gewicht: 514 g

[Weitere Fachgebiete > Geologie, Geographie, Klima, Umwelt > Geologie > Marine
Geologie, Ozeanographie](#)

schnell und portofrei erhältlich bei

The logo for beck-shop.de features the text 'beck-shop.de' in a bold, red, sans-serif font. Above the 'i' in 'shop' are three red dots of increasing size. Below the main text, 'DIE FACHBUCHHANDLUNG' is written in a smaller, red, all-caps, sans-serif font.

beck-shop.de
DIE FACHBUCHHANDLUNG

Die Online-Fachbuchhandlung beck-shop.de ist spezialisiert auf Fachbücher, insbesondere Recht, Steuern und Wirtschaft. Im Sortiment finden Sie alle Medien (Bücher, Zeitschriften, CDs, eBooks, etc.) aller Verlage. Ergänzt wird das Programm durch Services wie Neuerscheinungsdienst oder Zusammenstellungen von Büchern zu Sonderpreisen. Der Shop führt mehr als 8 Millionen Produkte.

Preface

The Baltic Sea area is an old cultural landscape with a well developed international framework for monitoring, assessing and managing its marine ecosystems. It provides a good case study for other regions where such management is being set up. One of our main aims is to introduce this example of management in action to a wider community. The existing Baltic Sea Action Plan, which is a major component of the management framework, has not yet been extended to include climate change impacts, so another aim is to supply some of the background needed to do this.

With a catchment basin covering almost 20% of the European continent, the Baltic Sea is one of the largest brackish seas in the world. It spans different climate and population zones, from the temperate, highly populated and industrialized south with intensive agriculture, to the boreal and rural north. The Baltic Sea features some natural peculiarities which make its ecosystems especially vulnerable to external stresses due to pollution, eutrophication and climate change. Water exchange with the North Sea and world oceans is limited; the deep basins are separated by sills, and there is a steep salinity gradient from south to north. In the past decades, the Baltic Sea has demonstrated its sensitivity to various human pressures and to climate change.

This book is the outcome of a Summer School titled “Climate Impacts on the Baltic Sea: From Science to Policy”, which took place in Nexø on the Danish Baltic Sea island of Bornholm, 27 July to 5 August 2009. The purpose of the summer school was to provide an introduction to the entire range of climate change impacts on the Baltic Sea, including its catchment basin, from the physical and biological to the societal and political impacts. An interdisciplinary approach was followed: students from different natural science disciplines coming together to develop skills in observing, modelling, projecting and interpreting physical and biological changes in the Baltic Sea. An important goal of the course was to demonstrate how discipline-specific scientific knowledge can be combined in order to contribute to real management solutions at the ecosystem level, and how scientific assessments of climate change impacts can be communicated to policy makers and the general public. Such interdisciplinary assessments are increasingly required as part of the

management of societal pressure on marine ecosystems and to deal with the additional pressure from climate change.

Twenty students from all across the Baltic Sea came together in the “Møbelfabrikken”, a former furniture factory, which proved to be a perfect venue for the course. Sunny, warm weather and occasional recreational swims at the nearby rocky beaches contributed to the good spirit. The facilities are close to ‘Bornholms lakseklækkeri’ (Bornholm Salmon Hatchery, owned by DTU-Aqua and used as an experimental cod hatchery and release facility for stock enhancement) which was also visited during the course.



Students and lecturers in front of the *Møbelfabrikken*

Students were assigned activities to develop their discipline-specific knowledge, learn how the knowledge could be translated to management and policy actions, and improve general scientific skills (e.g. oral and written presentation of scientific results; organisation and structuring of group work; collaboration with colleagues from different nations and disciplines). The course contained lectures, individual exercises, discussion tutorials and group exercises. One type of group exercise was discipline-specific (e.g. related to modelling oceanographic or fish population responses to climate change), while the second was course-long, interdisciplinary and oriented to management objectives for the Baltic Sea ecosystem. This overarching task was the preparation and presentation by four student groups of a “climate change action plan” that would supplement the existing HELCOM Baltic Sea Action Plan. The task inspired some long evening and night sessions among

students and lecturers. At the end of the course, students were asked to give an oral presentation of their visions. The outcomes of this exercise (one page summaries and presentations) are available at the course website: www.baltex-research.eu/baltic2009.

The chapters in this book are based on lectures given at the course. They cover a range of topics, spanning from detailed descriptions of political agreements that protect the marine environment, to basic modelling instructions, to an assessment of the possible impacts of climate change on the marine ecosystem, to a reflection on the role of climate scientists and their responsibility in society.

Chris Hopkins presents an extensive overview over international environmental agreements and conventions and demonstrates their role, importance and effectiveness for the environmental recovery of the Baltic Sea. This chapter represents an unprecedented summary of these activities in the Baltic Sea region and Europe in general (Chap. 1). **Minna Pyhälä** focuses on a recent and important activity: the HELCOM Baltic Sea Action Plan (BSAP) as the prominent international agreement aiming at a fundamental recovery of the Baltic Sea (Chap. 2). **Anders Omstedt** discusses basic oceanographic features of the Baltic Sea, and gives a basic introduction how these processes, including important aspects of the carbon cycle, can be modelled (Chap. 3). **Eduardo Zorita** provides a basic introduction to the principles of climate modelling with a special emphasis on the related uncertainties (Chap. 4). **Keith Brander** and **Jon Havenhand** give a short overview of the observed and possible future impacts of climate change on the marine ecosystems, including acidification (Chap. 5), and **Rabea Diekmann** and co-authors present some background on ecosystem theory related to abrupt ecosystem changes referred to as regime shifts, including a description of statistical techniques which can be used to analyze such regime shifts (Chap. 6). Sustainability is a central term in the protection and management of ecosystems, but it is also essential that scientists themselves act in a responsible and sustainable way, as explained by **Hans von Storch** (Chap. 7).

This interdisciplinary book is primarily directed at students and lecturers of the environmental disciplines to provide an overview of the possible impacts of climate change on the Baltic Sea. We also intend it to serve as a good background reference for scientists and policy makers, both for the Baltic Sea area and more generally.

Marcus Reckermann
Keith Brander
Brian MacKenzie
Anders Omstedt

