

WP3: Assessment of coastal climate change in the Lena Delta region of the Laptev Sea and in the North Sea (Hans von Storch, Karsten Reise, Paul Overduin)

Provide a balanced view of regional change

Objectives and challenges

The aim of this WP is to organize an international effort to collect and assess the published knowledge of recent, ongoing and possible future climate change and its impacts in two regions.

The two regions are the well-monitored North Sea and its catchment and the comparatively poorly observed Laptev Sea region. The effort will result in peer-reviewed assessment reports, comparable to the IPCC and BACC reports.

The climates of coastal systems change continuously; to a growing degree this is anthropogenically driven. The consequences are significant changes to weather risks and ecosystems. Regional climate and climate impact research is still rather fragmented by discipline, in particular oceanography, meteorology and ecology. The regional character of most climate impact research results in little international attention paid to globally relevant information. The knowledge conveyed to the public, media and stakeholders often does not present the state of the art but a blending of science with vested interests.

The goal of this work package is to prepare an assessment of recent, ongoing and possible future climate change in two selected regions, based on peer-reviewed and publicly accessible reports. The format used is that of the BACC report (BALTEX Assessment for Climate Change in the Baltic Sea Region, 2007). The report is prepared for the scientific community but also for governmental and supranational agencies.

The two regions are the Laptev Sea, with special emphasis on the Lena Delta, and the North Sea. Relatively small areas, as opposed to circumpolar or continental assessments are considered to allow for sufficient depths and regional detail, which are needed for building regional and local response strategies.

Work in the Laptev Sea region builds and draws upon the Arctic Coastal Dynamics (ACD) project of the International Arctic Science Committee, which is co-led by AWI. Building on existing geodata-bases and regional syntheses of coastal processes in the Laptev Sea, ACD links regional experts and an existing network of key coastal observatory sites to the assessment proposed here.

The work in the North Sea is based on long-term involvement of both AWI and GKSS in North Sea research and regional climate research, and in various regional scientific networks, such as ICES.

These two regions pose two different challenges

1. In the North Sea region many but often fragmented observations and modelling studies have been made on the changing climate and its impact, in particular on the marine ecosystem. The data often do not compare, are inhomogeneous in their informational content, and under the authority of different agencies and countries. The challenge consists in first getting access to this scattered knowledge, to render it comparable, and prepare an assessment of change based on the entire material
2. In the Laptev Sea and the Lena Delta, in particular, much of the historical data record lies in the purview of our Russian partners and coverage is poorer than for the North Sea region. Satellite data and re-analysis-type modelling studies are therefore of much greater importance. On the other hand, the number of institutions and persons holding data and knowledge is much smaller than in case of the North Sea region. The data mining and integration challenge is thus greater.

Implementation

Forming International Scientific Steering Groups

Following the example of BALTEX Assessment for Climate Change (BACC), international scientific steering groups (SSGs) will be formed for both regions. Scientists from scientific institutions and regional authorities serve on the SSGs. The effort will be pursued under the auspices of the Land-Ocean Interactions in the Coastal Zone project of the IGBP and IHSP, which is hosted by GKSS. The SSG for the North Sea will link with OSPAR Commission for the Protection of the Marine Environment of the North East Atlantic. The SSG for the Laptev Sea will link with ACD and integrate with the Sustained Arctic Observatory Network (SAON) effort of

the International Arctic Science Committee (IASC) and the Arctic Council. The task of the SSGs will be to agree on working group structures and to select and appoint writing teams for the report chapters and to organize the review process. WP3 cooperates with several WPs und Topic 1-3 (T1-WP2, T1-WP4, all WPs under Topic 2, and Topic 3-WP3).

Assessment report secretariats

For both considered regions, secretariats will be created: for the North Sea region at GKSS and for the Laptev Sea at AWI. The secretariats will be responsible for logistical tasks, such as to organize workshops, and to manage data collection, preservation, assessment and publication.

Time frame

The details of the time frames will be set by the SSGs. After the selection of lead authors, the assessment itself will require 2 years, including a series of workshops to discuss progress and limitations of the process. Another year will be required for the review process and the following revision of the chapters. After 3.5 years, public presentations of the findings will be possible. The reports, printed in book form, may be available after 4.5 years.

Deliverables

- Establishment of Scientific Steering Groups for the North Sea and Laptev Sea regions.
- Scenarios of coastal change caused by anthropogenic global climate change, regional developments and eutrophication effects.
- Publication of the two assessments reports during an international, open symposium.

2.4.3 Expected results, milestones

- Contributions to the 5th IPCC Assessment Report (2011).
- Assessing long-term climate variations in a coupled climate-biogeochemical-ecosystem model setup in combination with data analysis.
- Publication of assessments reports for the North Sea and the Lena Delta during an international, open symposium.

2.4.4 Cooperations

National Partners:

University of Bremen (including the excellence cluster "The Ocean in the Earth System")	Bremen
CLISAP, MPI, BSH, DWD	Hamburg
GFZ, PIK	Potsdam
DLR	Oberpfaffenhofen
TU München	Munich
University of Mainz	Mainz

International Partners:

Technical University of Delft Netherlands Institute for Sea Research (NIOZ)	Delft Den Burg	Netherlands
University of Alberta	Alberta	Canada
ACE-CRC Tasmania	Tasmania	Australia
University of Louvain La Neuve	Louvain	Belgium
Danish Meteorological Institute, ICES	Copenhagen	Denmark
University of Stockholm	Stockholm	Sweden
Naval Postgraduate School	Monterey	USA
University of Bristol, CEFAS	Bristol	UK
University of Bern	Bern	Switzerland
Lomonossov State University Arctic and Antarctic Research Institute	Moscow St. Petersburg	Russia

2.4.5 Contribution of centres

WP1 will essentially be an AWI project. WP2 will be dominated by AWI with a small complementary contribution from GKSS. In WP3 GKSS will mainly contribute to the assessment of climate change in the North Sea region with complementary contributions from AWI. AWI will contribute to the assessment of change in the coastal zone in the Laptev Sea. The assessment of ecosystem change in both areas will be guided by AWI and GKSS expertise.