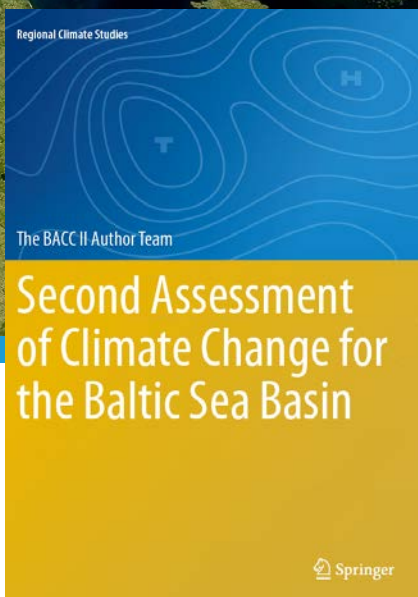
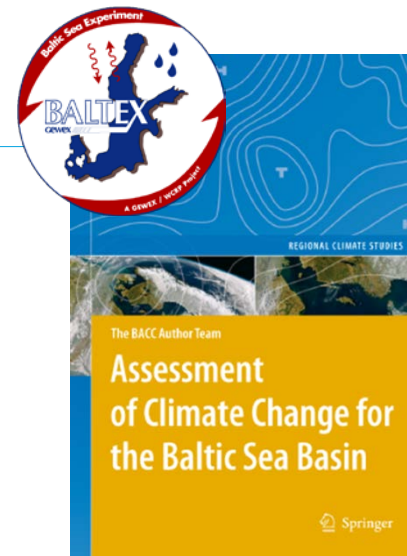


# Baltic Earth

## Earth System Science and Outreach for the Baltic Sea Region



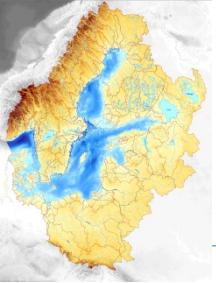
### Marcus Reckermann

Hans-Jörg Isemer and Silke Köppen

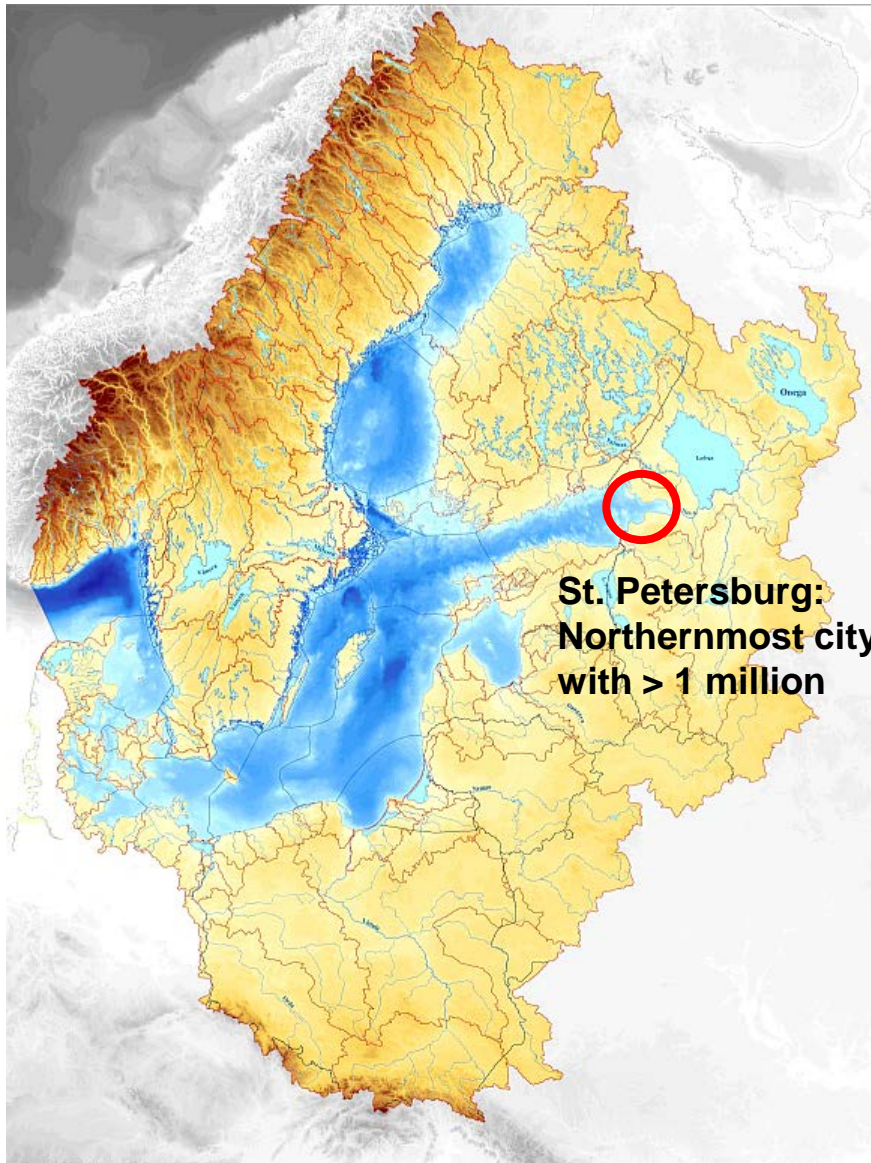
International Baltic Earth Secretariat  
Helmholtz-Zentrum Geesthacht, Germany

### Markus Meier, Anna Rutgersson

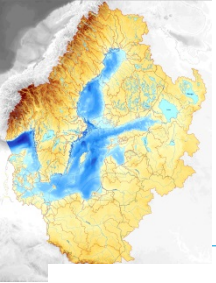
and the Baltic Earth Science Steering Group members



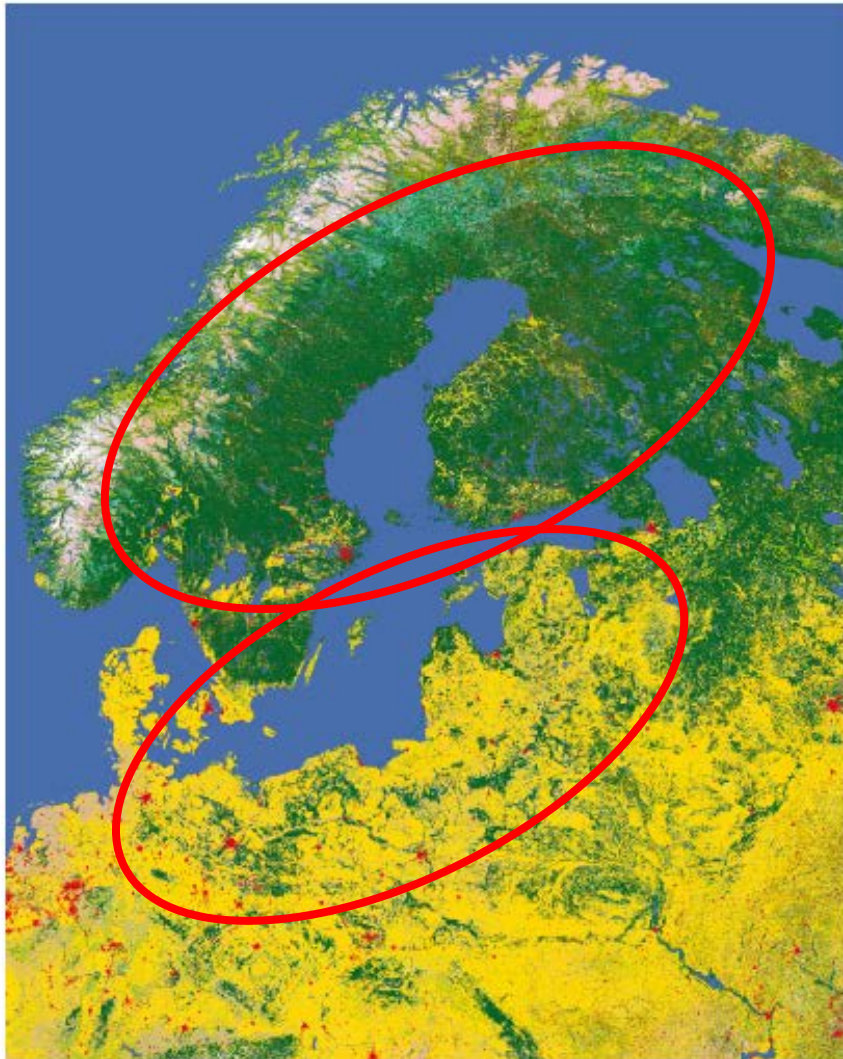
## The Baltic Sea region



- Drainage Basin: 2.13 Mill. km<sup>2</sup>  
(20% of the European continent)
- 85 million people in 14 countries
- Baltic Sea: 380 000 km<sup>2</sup>



# The Baltic Sea region



## The North ...

- extensive forests, mostly coniferous
- sparsely populated
- mostly rocky coasts
- subarctic climate in winter

## The South...

- intense agriculture
- densely populated
- mostly sandy coasts
- moderate climate in winter

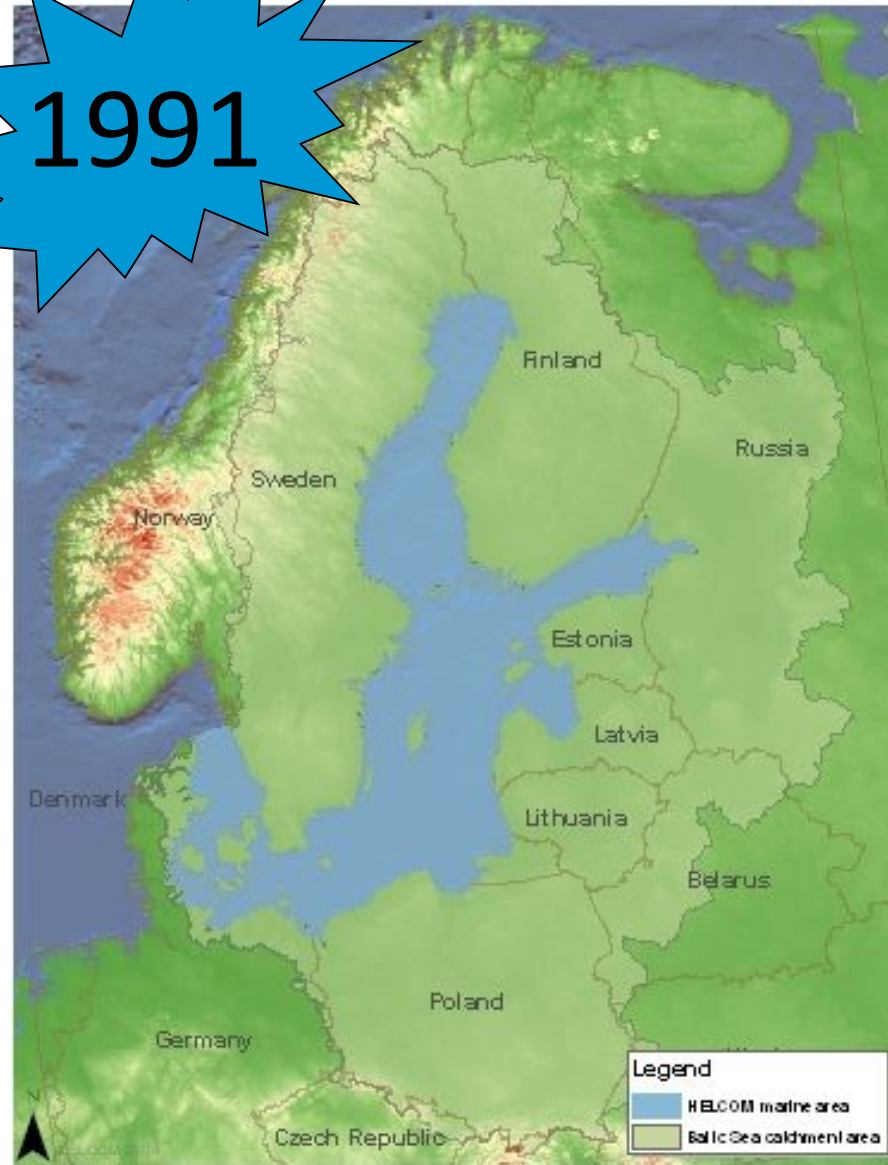
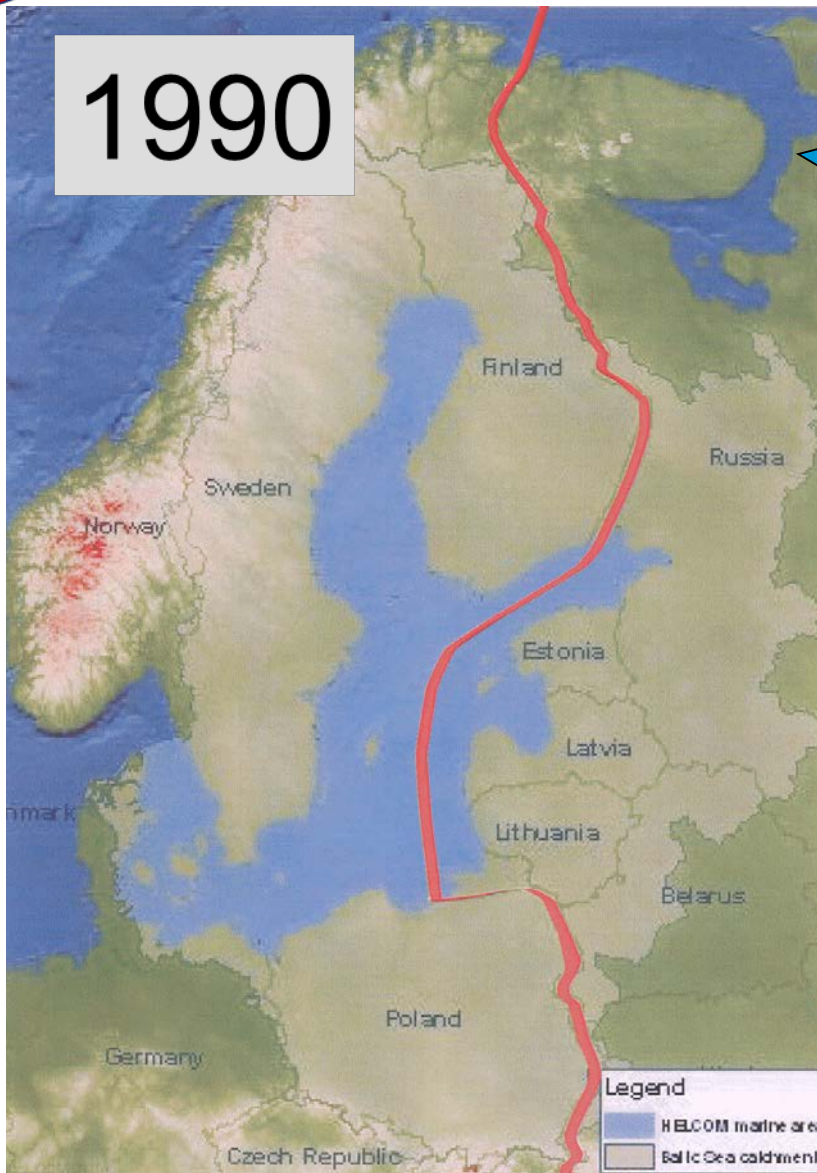




# Motivation for an international interdisciplinary research network



Helmholtz-Zentrum  
Geesthacht  
Centre for Materials and Coastal Research

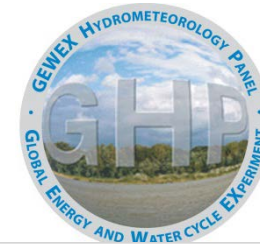




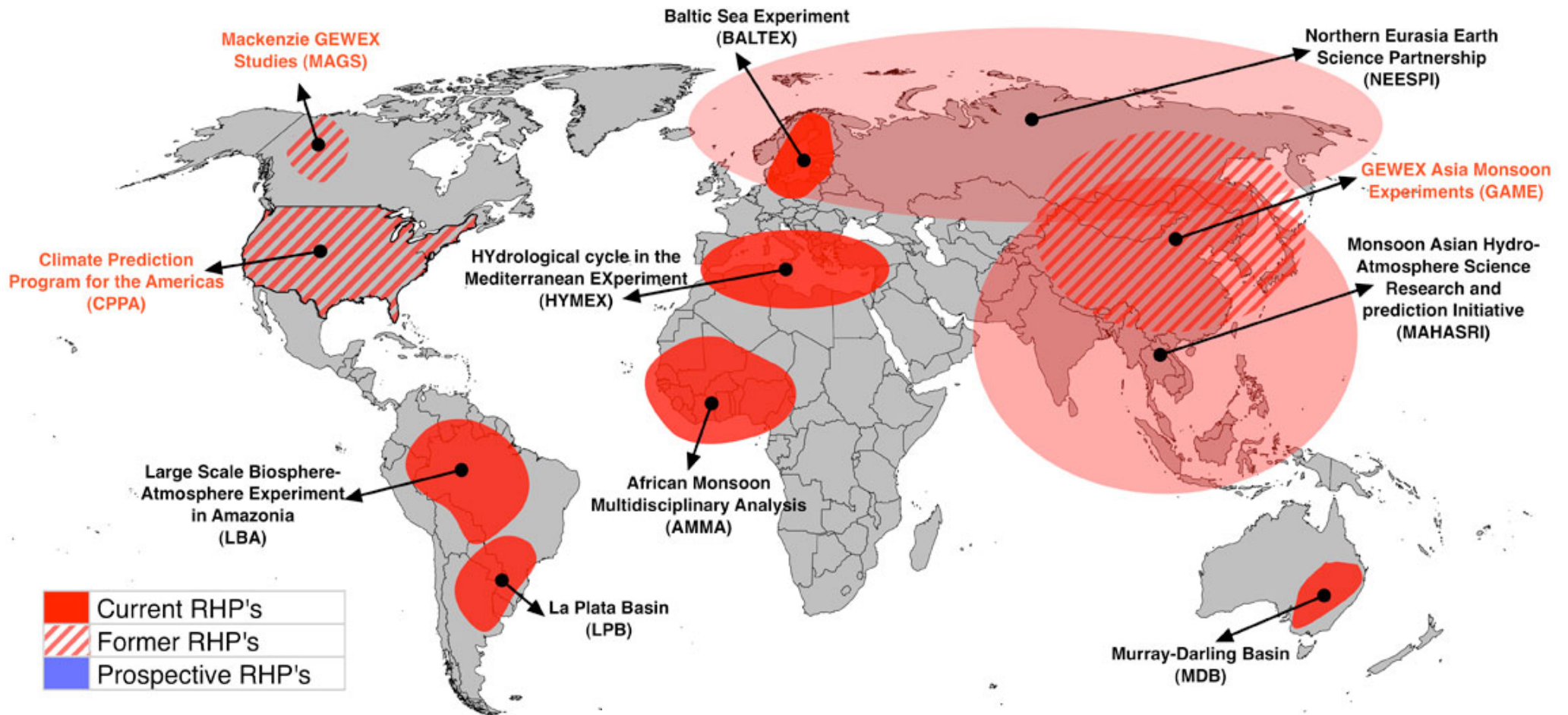
BALTEX was founded in 1992 as part of the GEWEX programme of WCRP



Helmholtz-Zentrum Geesthacht  
Centre for Materials and Coastal Research

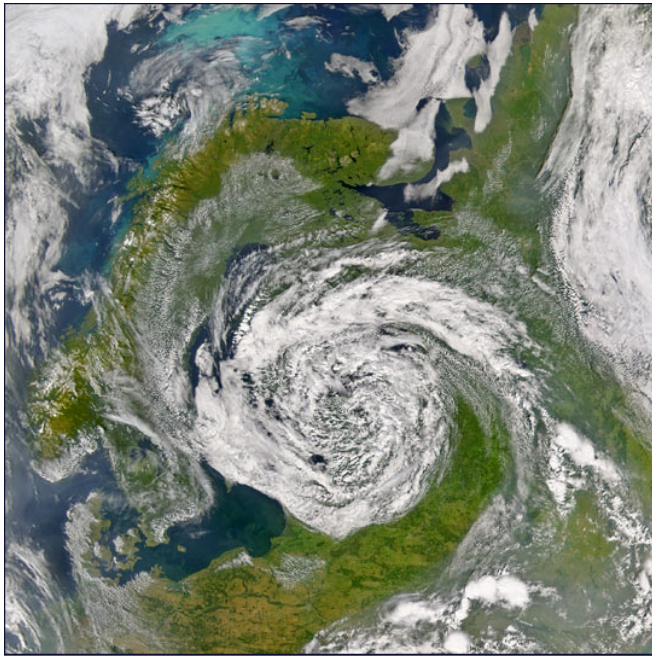


## GEWEX REGIONAL HYDROCLIMATE PROJECTS





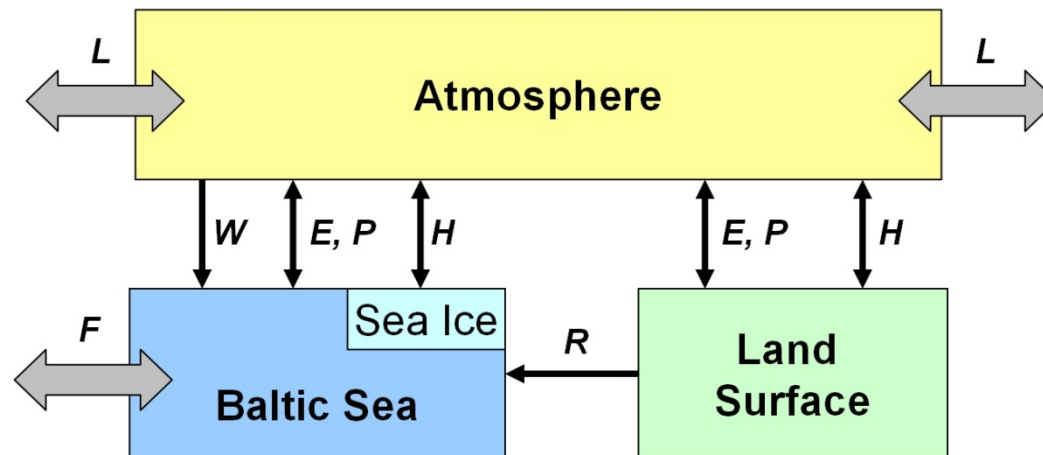
# BALTEX Phase I: 1992 – 2003: First 10 year Phase



BALTEX was founded in 1992 as part of the GEWEX programme of WCRP

The **hydrological cycle** and the **exchange of energy** between the atmosphere and the surface of the Earth (**physical part of the climate system**)

**Major disciplines:** Meteorology, Oceanography, Hydrology



**Major outcomes of BALTEX Phase I (1992-2003):**

Building of research and observation network; data exchange and availability, development of coupled regional atmosphere-land-ocean models

BALTEX Phase II has evolved into an **environmental research network** dealing with the **Earth system of the entire Baltic Sea catchment** including terrestrial and marine biogeochemical cycles

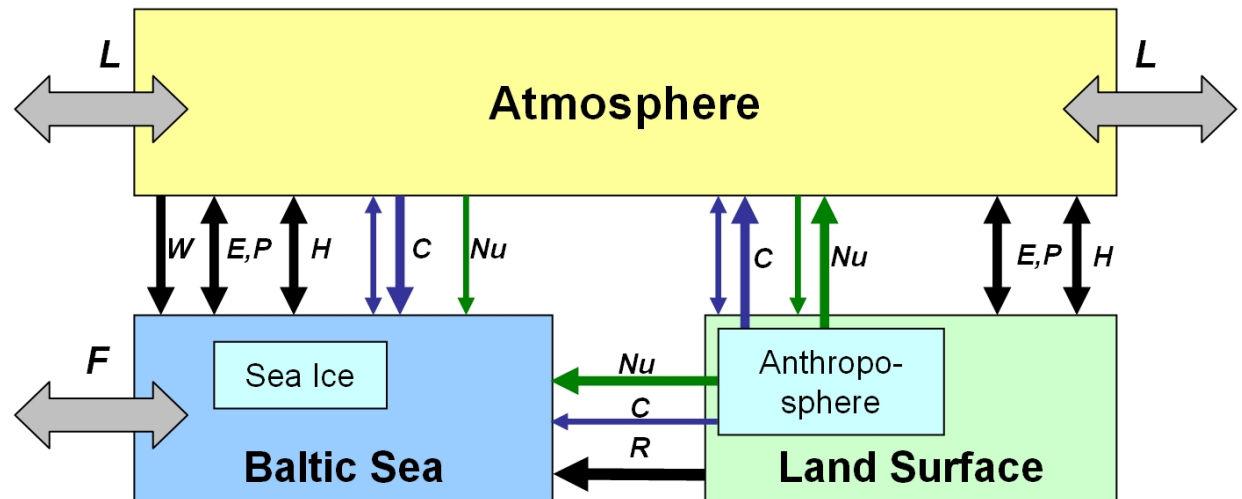
### Scientific disciplines (in Phase II):

- Meteorology
- Hydrology
- Climatology
- Oceanography
- Biogeochemistry

Important elements are

**Climate variability and change**

and related impacts on the environment and the human sphere



**BALTEX Assessment of Climate Change for the Baltic Sea basin (BACC)**

# Baltic Earth – Launch in June 2013



Helmholtz-Zentrum  
Geesthacht  
Centre for Materials and Coastal Research



Baltic Earth launched at the  
7<sup>th</sup> Study Conference on BALTEX in June 2013



this guy...



... in the presence of  
the King of Sweden





# Baltic Earth

Earth System Science for the Baltic Sea Region

## Vision of the new programme

*To achieve an improved Earth System understanding of the Baltic Sea region*

- **Interdisciplinary** and **international** collaboration (conferences, workshops, etc.)
- **Holistic view** on the Earth system of the Baltic Sea region, encompassing processes in the **atmosphere**, on **land** and in the **sea** and also in the **anthroposphere**
- “**Service to society**” in the respect that **thematic assessments** provide an overview over knowledge gaps which need to be filled (e.g. by funded projects)
- **Education** (summer schools)
- Inherits the BALTEX network of scientists and infrastructure



## Baltic Earth Infrastructure

- **International Baltic Earth Secretariat**  
at Helmholtz Zentrum Geesthacht
- **Baltic Earth Science Steering Group (BESSG)**  
Excellent, active “young” scientists; country balance, gender balance, discipline balance, institutional balance, currently 19 members; meetings biannually
- **Working Groups** installed for each GC plus
  - WG on Outreach and Communication
  - WG on Education
  - WG on the Utility of Regional Climate Models
  - WG on the Assessment of Scenario Simulations for the Baltic Sea 1960-2100
- **Senior Advisory Board**
- **Science Plan**
- **Website, social media**
- **Publication series, Newsletter**
- **Publication database**

## Baltic Earth Science Steering Group as of June 2014

### Chair

**Markus Meier**, Head of Physical Oceanography, Baltic Sea Research Institute, Germany

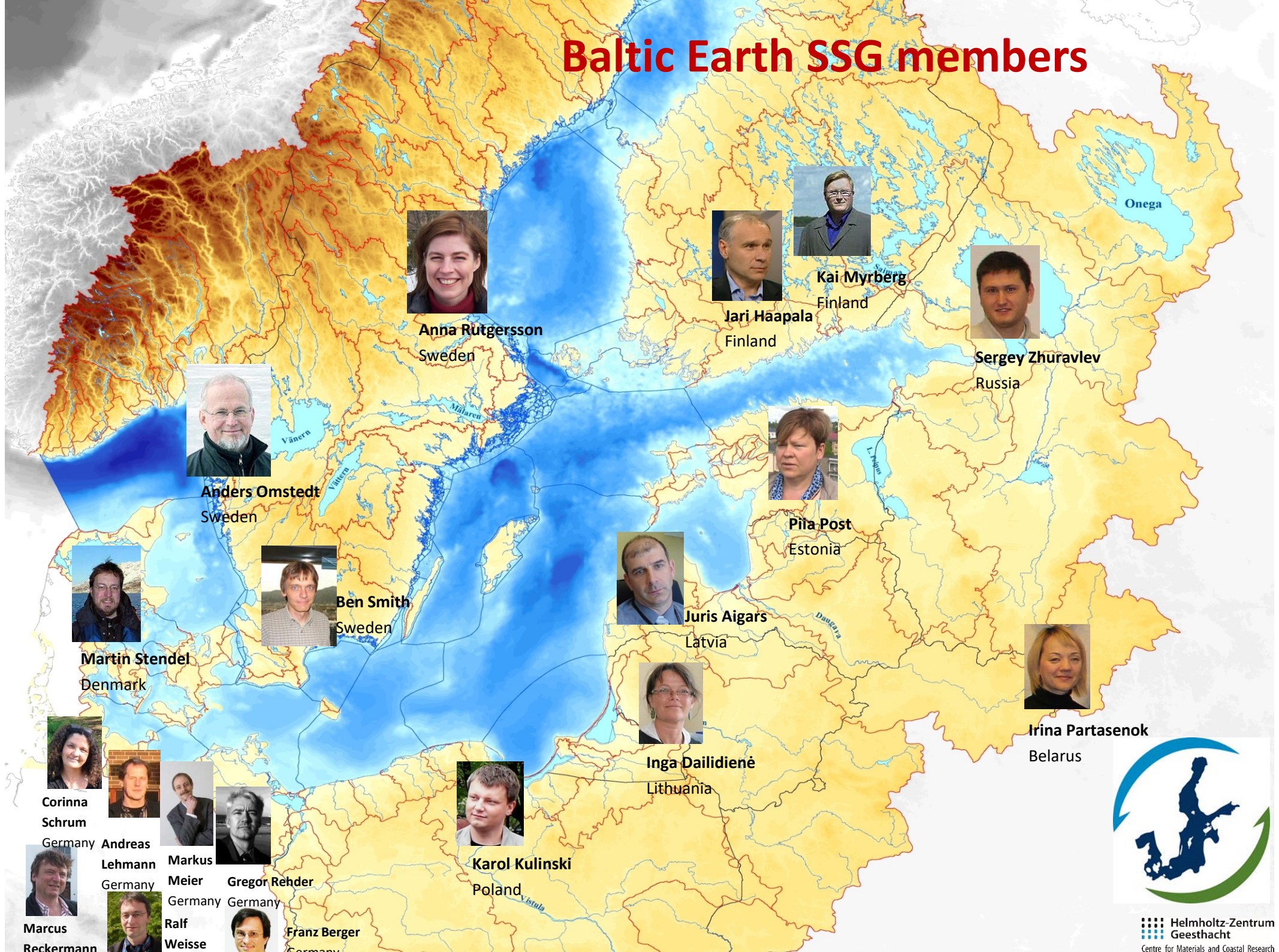


### Vice-Chair

**Anna Rutgersson**, Professor of Meteorology, Uppsala University, Sweden



# Baltic Earth SSG members



**Anna Rutgersson**  
Sweden



**Jari Haapala**  
Finland



**Kai Myrberg**  
Finland



**Sergey Zhuravlev**  
Russia



**Anders Omstedt**  
Sweden



**Pila Post**  
Estonia



**Ben Smith**  
Sweden



**Juris Aigars**  
Latvia



**Martin Stendel**  
Denmark



**Inga Dailidienė**  
Lithuania



**Irina Partasenok**  
Belarus



**Corinna Schrum**  
Germany



**Andreas Lehmann**  
Germany



**Markus Meier**  
Germany



**Gregor Rehder**  
Germany



**Karol Kulinski**  
Poland



**Marcus Reckermann**



**Ralf Weisse**



**Franz Berger**  
Germany



# Baltic Earth Senior Advisory Board



**Andris Andrusaitis**  
BONUS



**Ulla Li Zweifel**  
HELCOM



**Valery Vuglinsky**  
Russia



**Jüri Elken**  
Estonia



**Fritz Köster**  
Denmark



**Hans von Storch**  
Germany



**Kay Emeis**  
Germany



**Hans-Jörg Isemer**





## Baltic Earth Science Plan and Grand Challenges

- Flexible science plan with a continuously on-going definition of core research questions which are identified to be key scientific issues, so-called “**Grand Challenges**” (GCs)
- New Grand Challenges will be identified at conferences and by using **assessments of existing research** by dedicated working groups. Grand Challenges are envisaged to be research foci for periods of about 3-4 years (then terminated or updated)
- The new programme will **communicate** with **stakeholders** and research funding **agencies** to promote funding relevant for the Grand Challenges
- **International embedment** (GEWEX, Future Earth)

## Current Grand Challenges

- GC1: **Salinity dynamics** in the Baltic Sea
- GC2: **Land-Sea biogeochemical feedbacks** in the Baltic Sea region
- GC3: **Natural hazards and extreme events** in the Baltic Sea region
- GC4: Understanding **sea level dynamics** in the Baltic Sea
- GC5: Understanding **regional variability of water and energy exchanges**
- GC 6: **Multiple drivers of Earth system changes** in the Baltic Sea region
- The **human impact** will be assessed at all levels, wherever possible and meaningful
- Website: [www.baltic.earth](http://www.baltic.earth)

# Baltic Earth



## Earth System Science for the Baltic Sea Region

### Secretariat

#### International Baltic Earth Secretariat (IBES)

**Address:**

International Baltic Earth Secretariat  
Helmholtz-Zentrum Geesthacht  
Max-Planck-Straße 1  
D-21502 Geesthacht  
Tel: +49-4152-87-1693  
Germany  
E-mail: [balticearth\(at\)hzg.de](mailto:balticearth(at)hzg.de) (replace "(at)" with "@")



For details on IBES staff, [click here](#)

### Publications

### Website etc.

The International Baltic Earth Secretariat (IBES) as a focal support point for Baltic Earth is located at the [Helmholtz-Zentrum Geesthacht](#) (until 1 November 2010: GKSS Research Centre) in Geesthacht, Germany. The Baltic Earth Secretariat's tasks cover in particular:

- to support the Baltic Earth Science Steering Group, Working Groups and Panels in their activities, and to provide preliminary reviews of their work,
- to maintain connections with all participating research groups and with all operational data and numerical modelling centres for Baltic Earth,
- to prepare for international Baltic Earth meetings, workshops, seminars and conferences, and to provide assistance for reports by Baltic Earth scientists and to international research groups and the research and public community at large, and
- to inform participants about ongoing activities which may be of relevance to their work.

### Events

Since January 2002, GKSS (Helmholtz-Zentrum Geesthacht as of 1 November 2010) has been the only sponsor of the International BALTEX (now: Baltic Earth) Secretariat, covering salaries for the staff members, infrastructure and travel support.

# Infrastructure

# Secretariat

# Publications

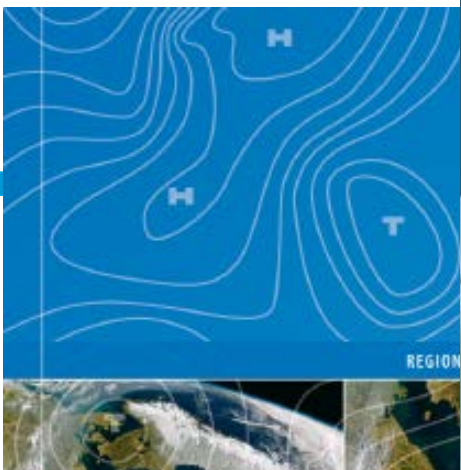
# Website etc.

# Events

Baltic Sea Environment Proceedings No. 111

## Climate Change in the Baltic Sea Area

HELCOM Thematic Assessment in 2007



### Ostseeküste im Klimawandel

Ein Handbuch zum Forschungsstand

Springer Earth System Sciences

Marcus Reckermann  
Heith Brander  
Brian R. MacKenzie  
Anders Omstedt Editors

## Climate Impacts in the Baltic from Science to Policy

**Helmholtz-Zentrum Geesthacht**  
Centre for Materials and Coastal Research



The BACC II Author Team

## Second Assessment of Climate Change in the Baltic Sea Basin

Baltic Sea Environment Proceedings No. 13

### Climate change in the Baltic Sea Area HELCOM thematic assessment in 2007



Helsinki Commission

Baltic Marine Environment Protection Commission



## An Earth System Science Program for the Baltic Sea Region

PAGES 109–110

From Russia in the east to Sweden, Denmark, and Germany in the west, reaching south to the tips of the Czech Republic, Slovakia, and Ukraine, the Baltic Sea watershed drains nearly 20% of Europe (see Figure 1). In the highly populated south, the temperate climate hosts intensive agriculture and industry. In the north, the landscape is boreal and rural. In the Baltic Sea itself, complex bathymetry and stratification patterns as well as extended hypoxic and anoxic deep waters add to the diversity. Yet in recent history, the differences across the Baltic Sea region have been more than physical: In the mid-20th century, the watershed was split in two.

The rise of the Iron Curtain in the wake of World War II had a tremendous effect on the exchange of scientific information in the region, driving a wedge through a mature research community and a strong scientific infrastructure. Building on this pre-Cold War history, soon after the Berlin Wall fell, the Baltic Sea Experiment (BALTEX) began, a project intended to promote research and outreach activities concerning the meteorology, hydrology, oceanography, regional climatology, and, in its latter phase, biogeochemistry of the Baltic Sea region. This project, in turn, helped reforge the connections between the research communities from the east and the west.

Now, after 20 years of successful research networking, BALTEX (1993–2013) has been succeeded by Baltic Earth, an expanded program with a revised focus on Earth system science. Relaunching in June 2013, Baltic Earth is inviting interested scientists to collaborate and contribute to its implementation.

*Baltic Earth and the Legacy of BALTEX*

By H. E. M. MEIER, A. RUTZGESSON, AND M. RECKERMANN

heriting the BALTEX network of people and institutions; its infrastructure, including the BALTEX secretariat, conferences, workshops, and publication series; and its scientific legacy [Reckermann et al., 2011, and references therein]. Like its progenitor, Baltic Earth aims to contribute to the understanding of regional energy, water, and matter fluxes and their effects on the regional climate. Thus, the vision of Baltic Earth is to achieve an improved Earth system understanding of the Baltic Sea region, with a more holistic view that encompasses processes in the atmosphere, land, sea, and anthroposphere.

From its very beginning, BALTEX had been part of and contributed to the Global Energy and Water Exchanges Project (GEWEX), within the World Climate Research Programme (WCRP), and Baltic Earth will continue this legacy.

In the coming years, the efforts of Baltic Earth will be guided by specific grand challenges defined by the program that pose major interdisciplinary research questions that studies of the Baltic Sea region can help answer. Thematic assessments of particular research topics compiled by expert groups, such as the BALTEX Assessment of Climate Change for the Baltic Sea Basin (BACC; <http://www.baltic-earth.eu/BACC/>) [see Reckermann et al., 2008] will help Baltic Earth scientists identify gaps in current knowledge and will guide the development plans to address these grand challenges.

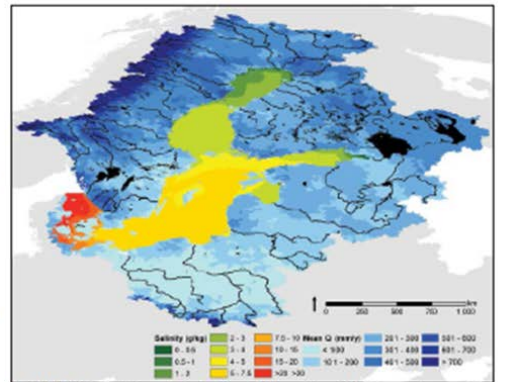


Fig. 1. The Baltic Sea drainage basin together with the spatial variability in annual mean water discharge (Q) calculated with the Hydrological Predictions for the Environment (HYPER) model [Arheimer et al., 2012] and with annual mean sea surface salinity in the Baltic Sea. This salinity diagram shows the gradient from high (red) to low (green) salinities, calculated with the Rossby Centre Ocean model [Meier et al., 2012]. Courtesy of René Copel, Swedish Meteorological and Hydrological Institute.



# Baltic Earth

Earth System Science for the Baltic Sea Region

Secretariat

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- [Grand Challenges](#)
- [Working Groups](#)
- [Projects](#)
- [Publications](#)
- [Organisation](#)
- [International Baltic Earth Secretariat](#)
- [Events](#)
- [Internal](#)
- [How to participate](#)

## The BALTEX/Baltic Earth Publication Library

### Compilation of BALTEX/Baltic Earth Publications

Welcome to the BALTEX/Baltic Earth

- [Enter the BALTEX/Baltic Earth Publication Library](#)
- [Login](#)

Publications

[1st Baltic Earth Multiple drivers system changes Baltic Sea region Nida\\_Curonian Sp Lithuania 13- 17 June 2016](#)

[BACC II](#)

 **Helmholtz-Zentrum Geesthacht**  
Centre for Materials and Coastal Research

- 14 books
- 722 peer-reviewed journal articles
- 65 reports
- 876 BALTEX/Baltic Earth Conference presentations
- 55 International BALTEX Secretariat Publications
- 9 International Baltic Earth Secretariat Publications
- Series issues
- Series issues

## Publications

- [International Baltic Earth Secretariat Publication Series](#)
- [New Baltic Earth Publications](#)
- [Baltic Earth Newsletter](#)
- [BALTEX/Baltic Earth Online Library](#)
- [BALTEX/Baltic Earth Publications Compilation](#)

earth programmes the objectives of programme are continuously "BALTEX" or

[Baltic Earth](#)

[Helmholtz-Zentrum Geesthacht](#)

[Secretariat](#)  
information:

[BACC II](#)

Website

Attention: To release, send an e-mail as well, if you wish to edit or delete an existing publication entry.

For any questions or suggestions, you may have, contact [Silke Köppen at the Baltic Earth Secretariat](#).

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### Secretariat

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- [Publications](#)
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- [Events](#)
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### Publications

[1<sup>st</sup> Baltic Earth Conference](#)  
[Multiple drivers for Earth system changes in the Baltic Sea region](#)  
[Nida, Curonian Spit, Lithuania](#)  
 13 - 17 June 2016

### Website etc.

[BACC II](#)



### Events

#### Announcements



[BALTEX Website...](#)



#### Extending the knowledge of the regional Earth system in the Baltic Sea

Baltic Earth stands for the vision to achieve an improved Earth system under the leadership of the research disciplines of BALTEX continue to be relevant, but a more holistic approach is needed. The atmosphere, on land and in the sea as well as in the anthroposphere. The grand research challenges represent interdisciplinary research. A major means will be scientific assessments of particular importance to identify gaps and inconsistencies in the current knowledge (publications) and the network (people and projects). The logo, but still distinctly different.

A science plan is currently being developed to a continuously on-going definition of core research questions which will be identified at conferences and by assessing the challenges for research. These will be identified at conferences and by assessing the challenges for research. These will be identified at conferences and by assessing the challenges for research. These will be identified at conferences and by assessing the challenges for research.

#### NEWS



**Baltic Earth Seminar at Fehmarnbelt Days 2016 "Exchanges between the North and Baltic Seas - A scientific overview".**  
 Presentations online [here...](#)



**North Sea Climate Change Assessment now online available as [Open Access!](#) Congratulations for this tremendous effort!**

**[Interview with students and lecturers about the Askö Summer School...](#)**  
 A [short note](#) by the Baltic Sea Centre of Stockholm University ...

#### Assessment Report of the Gulf of Finland published

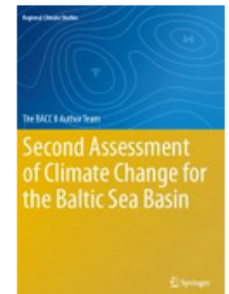


The Finnish Environment Institute SYKE has published an assessment of the Gulf of Finland, compiling the research results of over a hundred Finnish, Russian and Estonian researchers. The report includes recent information on issues such as eutrophication, hazardous substances, noise, maritime traffic, and plastic waste. The publication is the most important of Finland Year arranged by the countries. The publication includes for

#### Upcoming Events

For past events look [here...](#)

#### The BACC Blog



[BACC I \(2008\) download](#)



## The BACC Blog

Regional Climate Change in the Baltic Sea region and its impacts on marine and terrestrial environments

[www.baltic-earth.eu/BACC2/](http://www.baltic-earth.eu/BACC2/)

TUESDAY, 30 AUGUST 2016

### Baltic Earth Summer School on "Climate change in the Baltic Sea region"



20 students from 6 countries from around the Baltic Sea have gathered on the beautiful Swedish island of Askö for the third Baltic Earth summer school. After a rainy start, the sun is out and everybody is in good spirits for the days to come. Coming from an interdisciplinary mix of backgrounds (meteorology, oceanography, geography, social science, coastal engineering), the Master and PhD students will learn about the state of the art of climate and climate change research in the Baltic Sea region. Seven lecturers will cover all aspects of climate change in the Baltic Sea region. Course coordinators are Markus Møller from the Leibniz Institute for Baltic Sea Research Warnemünde and Marcus Reckermann from the International Baltic Earth Secretariat at Helmholtz-Zentrum Geesthacht. The summer school is also co-organized by the Universities of Rostock and Stockholm. More at: <http://www.baltic-earth.eu/summerschool2016/>



Posted by Marcus Reckermann at 17:22 No comments.

TUESDAY, 8 DECEMBER 2015

### 1st Baltic Earth Conference, Nida, Lithuania, 13-17 June 2016: Call for Papers open!

One important outcome of the BACC II book has been the understanding that the observed environmental changes are often caused by a mixture of interwoven factors, among them climate change and its associated impacts, eutrophication, pollution, fisheries, land cover change and others. Each of these factors has a scientific and a societal dimension, which are often interdependent, and which makes the identification of a single, or even dominant factor responsible for the change difficult.



The scope of this first Baltic Earth Conference is to attempt to describe the different factors for change, their impacts on the Earth system of the Baltic Sea region, and to demonstrate the capacity to model any of these factors in a single or a coupled approach. Are we able to simulate the observed changes in a realistic way? Are we able to produce credible scenarios for the future? Ultimately, this analysis should help to identify knowledge

#### THE BACC II BOOK (2015)



#### THE BACC BOOK (2008)



#### HOW TO USE THIS BLOG

BACC I and BACC II Lead Authors and SSC members have the right to submit postings, i.e. to begin new threads. Anyone can respond and comment. Just click on the comment line. Postings may also be sent to [Marcus Reckermann](mailto:Marcus.Reckermann@hzg.de) and [Hans von Storch](mailto:Hans.von.Storch@hzg.de) and will be posted with a short delay.

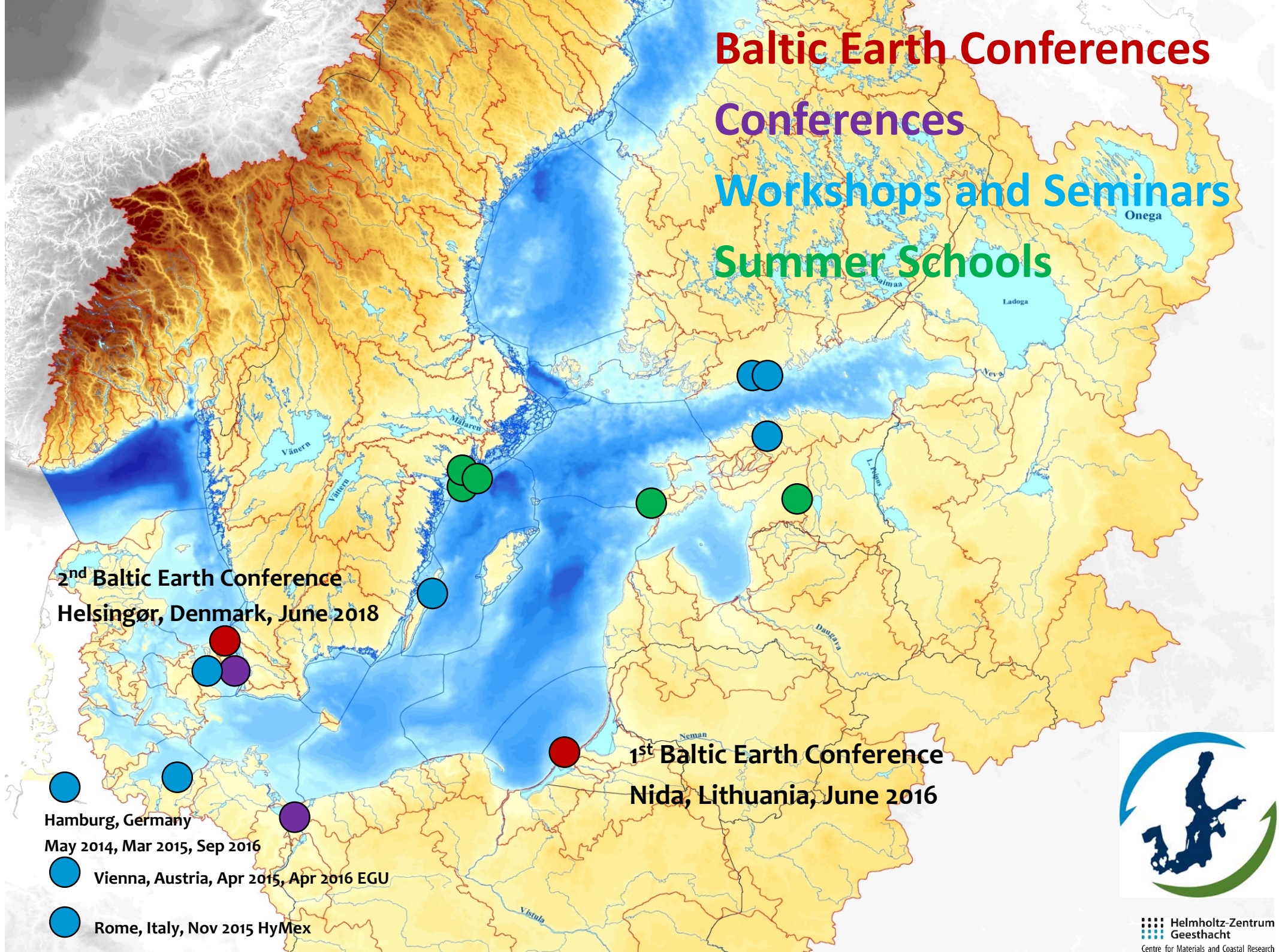
Please follow the common netiquette rules, i.e. refrain from insulting language, but be to the point. Please give your name or use an alias - comments from 'anonymous' should be avoided.

#### BACCGROUND

The BACC Blog is an open platform to exchange views and comments about the BACC project (BALTEX and Baltic Earth Assessment of Climate Change for the Baltic Sea Basin).

The regional climate change assessment report for the Baltic Sea basin was published in January 2008 (BACC Author Team, 2008). The assessment is an example for a type of urgently needed reports helping to put global climate change (as portrayed e.g. by the IPCC reports) into a regional perspective, which local stakeholders and politicians can relate to. The so called BACC (BALTEX Assessment of Climate Change for the Baltic Sea Basin) report was compiled by a consortium of 84 scientists from 13 countries around the Baltic Sea and covers various disciplines related to climate research and ecological impacts. The book is divided in chapters on past and current climate change, on projected future anthropogenic climate change, and on observed and projected impacts on terrestrial and marine ecosystems of the Baltic Sea basin. It aims to bring together consolidated (published)

# Baltic Earth Conferences Conferences Workshops and Seminars Summer Schools



**2<sup>nd</sup> Baltic Earth Conference**  
Helsingør, Denmark, June 2018

**1<sup>st</sup> Baltic Earth Conference**  
Nida, Lithuania, June 2016

● Hamburg, Germany  
May 2014, Mar 2015, Sep 2016

● Vienna, Austria, Apr 2015, Apr 2016 EGU

● Rome, Italy, Nov 2015 HyMex



# Events



**Woods Hole Oceanographic Institution**  
Marine and Coastal Research

## Summer Schools

International advanced PhD course on

**Impact of climate change  
on the marine environment  
with special focus  
on the role of changing extremes**

co-organized by the  
"Baltic Ecosystem Adaptive Management" (BEAM) and Baltic  
Earth programmes and funded by BEAM



**Askö Laboratory, Trosa, Sweden**

**24 - 30 August 2015**

A Doctoral Students Conference

**Challenges for Earth system science  
in the Baltic Sea region:  
From measurements to models**

co-organized by the  
the University of Tartu and Baltic Earth



**University of Tartu and Vilsandi Island  
Estonia**

**10 - 14 August 2015**



## Workshops and Seminars

## Topical Conferences

## Baltic Earth Conferences



Summer S

Workshop  
Seminars

Topical Co

Baltic Ea  
Conferen



new research ship "Electra" which is equipped with some of the newest technologies. A short "water crisis" was handled with ease and many buckets. A week to remember!

## Events

## Summer Schools

## Workshops and Seminars

## Topical Conferences

## Baltic Earth Conferences



FINNISH METEOROLOGICAL INSTITUTE



Baltic Earth

Baltic Earth Workshop on

### Natural hazards and extreme events in the Baltic Sea region

Finnish Meteorological Institute, Dynamicum, Helsinki

30-31 January 2014

Max Planck Gesellschaft  
Max-Planck-Zentrum  
für  
Materialien und Coastal Research



S Y K E



Baltic Earth  
Earth System Science for the Baltic Sea Region



Gulf of Finland  
Year 2014

Baltic Earth - Gulf of Finland Year 2014 Modelling Workshop on

### Using modelling as a tool to ensure sustainable development of the Gulf of Finland-Baltic Sea ecosystem

A scientific workshop in support of the Gulf of Finland Declaration

Finnish Environment Institute (SYKE), Helsinki 24-25 November 2014



Gulf of Finland  
Year 2014



Baltic Earth

An open Baltic Earth PhD seminar in connection to the Gulf of Finland Final Scientific Forum

### Exchange processes between the Gulf of Finland and other Baltic Sea basins

Tallinn, Estonia, 19 November 2015

## Events

### Summer Schools

### Workshops and Seminars

### Topical Conferences

### Baltic Earth Conferences



**Baltic Earth**  
Earth System Science for the Baltic Sea Region

**Climate modelling and impacts  
from the global to the regional  
to the urban scale**

An international scientific seminar

10 March 2015

Holcim Auditorium  
HafenCity Universität

Überseeallee 16, 20457 Hamburg, Germany

Scope of the seminar is to give an overview over the current state of research in the fields of global and regional climate modelling, and the impacts on the regional and urban scales.

Posters related to the seminar topic are invited to be presented. Poster abstract and registration deadline is 2 March 2015. There are no fees involved.

This open seminar is organised in connection with the 4<sup>th</sup> Baltic Earth Science Steering Group Meeting by the International Baltic Earth Secretariat at Helmholtz-Zentrum Geesthacht in cooperation with HafenCity Universität Hamburg (HCU) and the Cluster of Excellence CIISAP of Hamburg University, which stands for „Integrated Climate System Analysis and Prediction“.

Baltic Earth is the research network for Earth system science in the Baltic Sea region. [www.baltic-earth.eu](http://www.baltic-earth.eu)

HCU | HafenCity Universität  
Hamburg

U+H  
Universität Hamburg  
DER FORSCHUNG | DER LEHRE | DER BILDUNG

DKRZ  
DEUTSCHES  
KLIMARECHENZENTRUM

clisap<sup>o</sup>

Max-Planck-Institut  
für Meteorologie

Helmholtz-Zentrum  
Geesthacht  
Zentrum für Material- und Küstenforschung

A joint  
**HyMex-Baltic Earth**  
Workshop

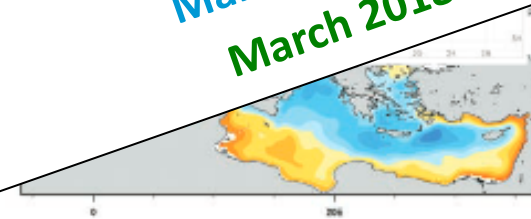
Helmholtz-Zentrum  
Geesthacht  
and Coastal Research

HyMeX



Joint regional climate system  
modelling for the  
European sea

**Baltic Earth-MedCORDEX Workshop on  
Regional Coupled Modelling**  
Mallorca, Spain  
March 2018



ENEA

Rome, Italy  
5-6 November 2015

Announcement  
and Call for Papers

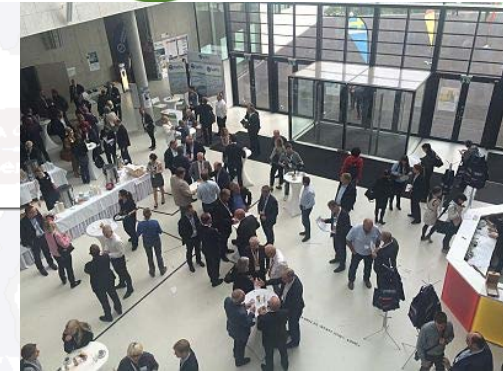


## Summer Schools



### Exchanges between the North and Baltic Seas – A scientific overview

HafenCity University Hamburg, Germany  
21 September, 9 – 12:30



## Workshops and Seminars



### Joint Baltic Earth-ESA Workshop on

### Remote Sensing applications in the Baltic Sea region

Helsinki, Finland

29-31 March 2017

## Topical Conferences

### Baltic Earth Conferences

Regularly organizing sessions at  
large international conferences





**Climate Change -  
The environmental and socio-  
economic response in the  
southern Baltic region**

**21<sup>st</sup> Century  
Challenges in Regional  
Climate Modelling**

Summer Schools

Workshops and  
Seminars

Topical Conferences

Baltic Earth  
Conferences



**Szczecin, Poland  
12 - 15 May 2014**

**Lund, Sweden  
16 - 19 June 2014**



Baltic Earth



First Announcement

First Announcement

# 1<sup>st</sup> Baltic Earth Conference

Nida, Curonian Spit, Lithuania

13 - 17 June 2016

Summer Schools

Workshops and  
Seminars

Topical Conferences

**Baltic Earth  
Conferences**



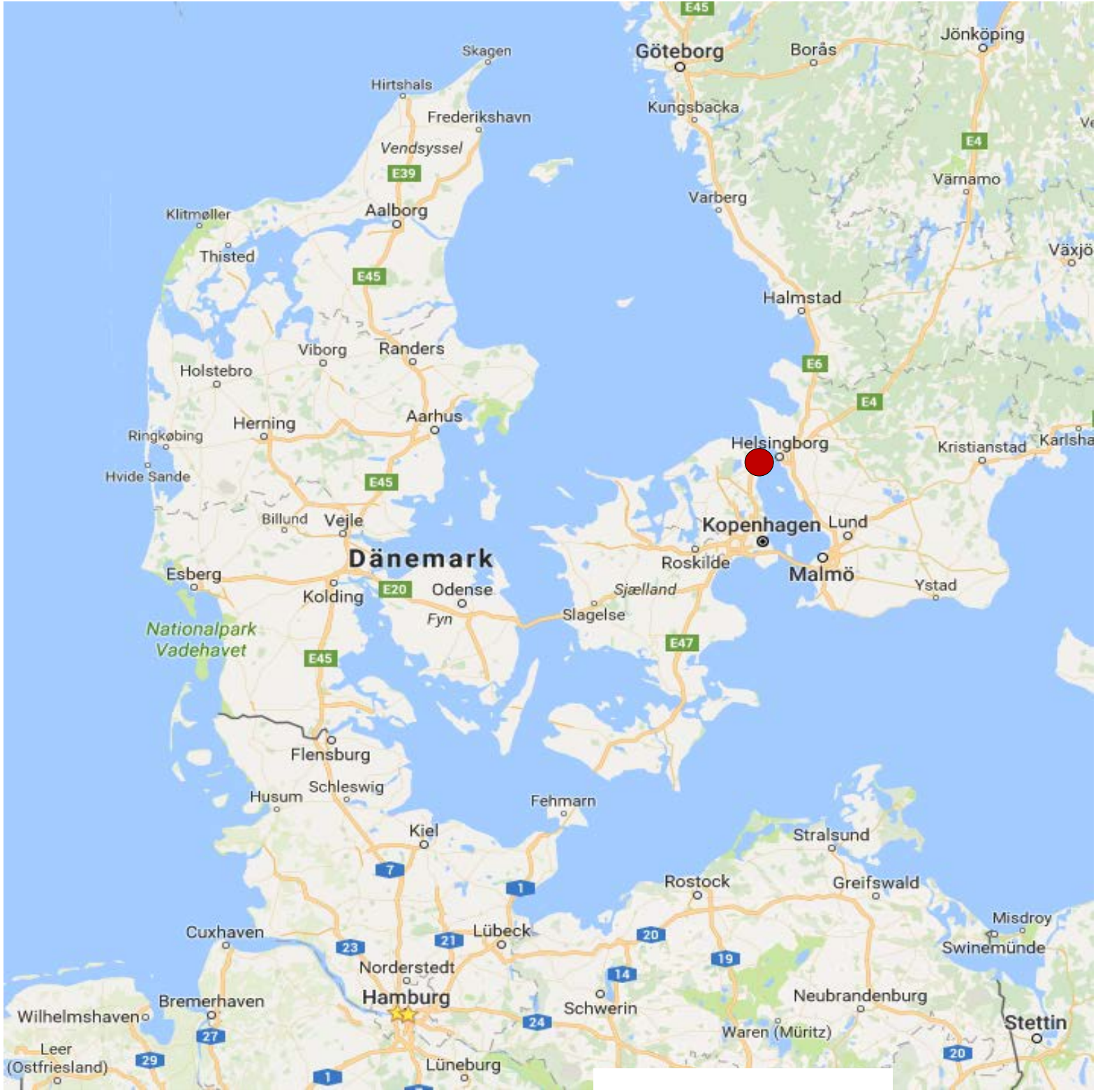
## Multiple drivers for Earth system changes in the Baltic Sea region



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**Second Announcement and Call for Papers**

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- Flexible science plan with a continuously on-going definition of core research questions which are identified to be key scientific issues, so-called “**Grand Challenges**” (GCs)
- New Grand Challenges will be identified at conferences and by using **assessments of existing research** by dedicated working groups. Grand Challenges are envisaged to be research foci for periods of about 3-4 years (then terminated or updated).
- The human impact will be assessed at all levels, wherever possible and senseful

# Currently: 6 Grand Challenges

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- GC1: Salinity dynamics
  - GC2: Land-Sea biogeochemical linkages
  - GC3: Natural hazards and extreme events
  - GC4: Sea level and coastal dynamics of the Baltic Sea
  - GC5: Regional variability of water and energy exchanges
  - GC6: Multiple drivers of regional Earth system changes
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# GC1: Salinity dynamics in the Baltic Sea

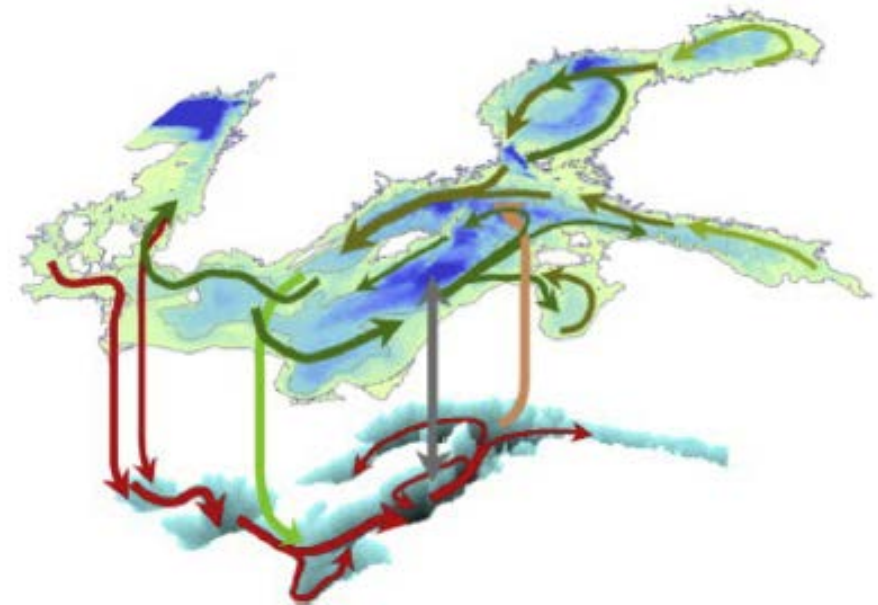


Andreas Lehman, GEOMAR

Kai Myrberg, FMI

Piia Post, University of Tartu

- Interrelation between decadal/climate variability and salinity
- Water mass exchange and major Baltic inflows
- Regional salinity distribution/variability and associated circulation patterns (including salinity fluxes between the coastal areas and the open sea and within the sub-basins)



Elken and Matthäus (2008)

# GC2: Land-Sea biogeochemical linkages

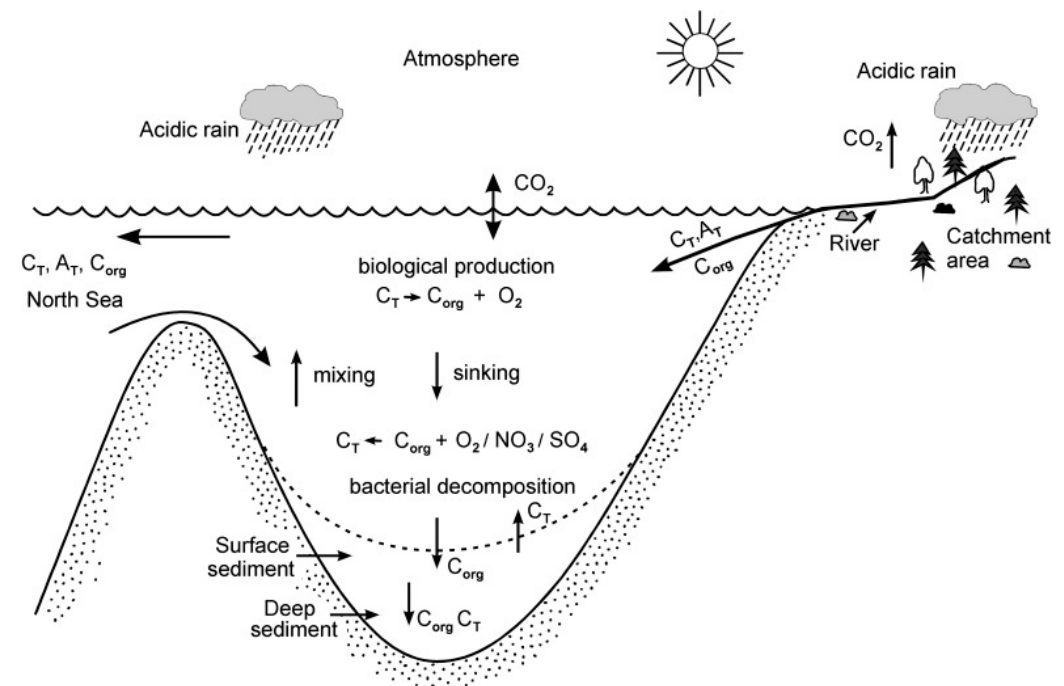


Gergor Rehder, IOW

Karol Kulinski, IO-PAN

Benjamin Smith, Lund University

- C, N, P cycles studies for the understanding primary production mechanism and organic matter transformations in the Baltic Sea
- Transformations and pathways of terrestrial organic matter, influence of the terrestrial input on the carbonate system
- Extension of the databases with the missing terrestrial loads data of the key chemical substances (e.g. Neva River)



# GC3: Natural hazards and extreme events in the Baltic Sea region



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Centre for Materials and Coastal Research

Jaari Haapala, FMI

Anna Rutgersson, Uppsala University

Martin Stendel, DMI,

- Society is very sensitive to extreme geophysical events that have severe implications for human life, generate economic losses and influence ecosystems
- A natural disaster links extreme geophysical events to ecosystems and society (in particular weaknesses in ecosystems and society)
- Understanding the underlying causes of natural disasters increases the ability to predict the occurrence and severity and may save human lives as well as mitigate economic losses



Photos: Martin Stendel and Finn Majlergaard



# GC4: Sea Level and Coastal Dynamics

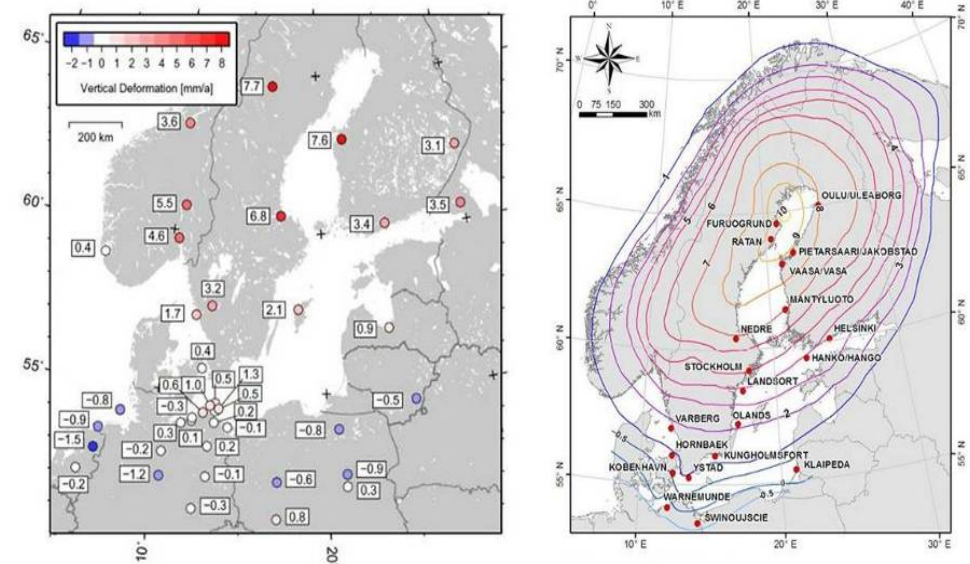


Ralf Weisse, HZG

Anders Omstedt University of Gothenburg

Birgit Hunicke, HZG

- Future sea level changes on time scales from seasons to decades (mean and extreme sea levels)
- A systematic comparison of tide-gauges and high resolution satellite products, more high-resolution ocean and atmosphere-ocean regional simulations of the Baltic Sea are becoming available
- Consistent analysis of all data sets is needed



Estimations of crustal deformation rates in the Baltic Sea Region derived by different methods. From Richter et al. (2011) and Harff et al. (2010).

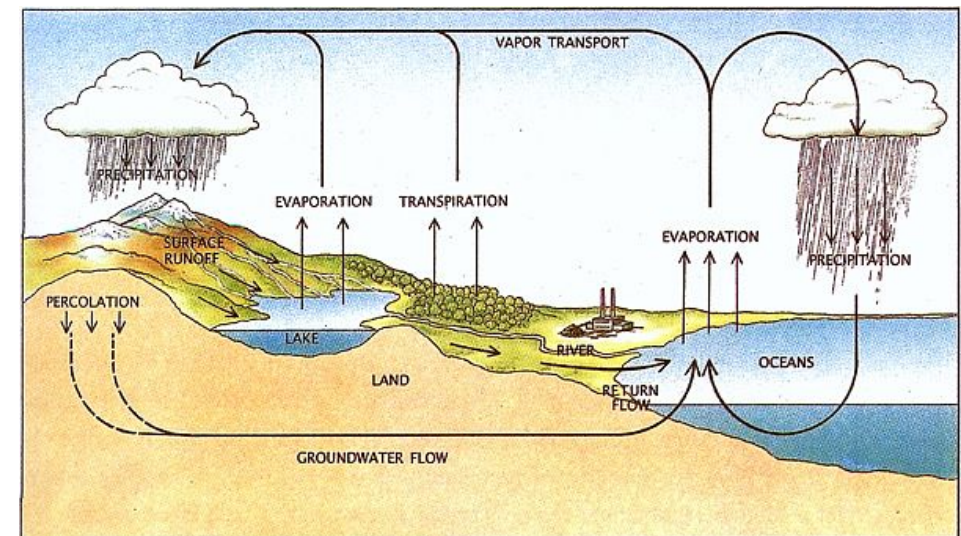
# GC5: Regional variability of water and energy exchanges in the Baltic Sea region



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Geesthacht  
Centre for Materials and Coastal Research

Sergej Zhuravlev, Saint-Petersburg State University  
Irina Partasenok, Centre for Hydrometeorology  
Franz Berger, DWD

- The observation of atmospheric processes
- The diagnosis of natural variability of energy and water components
- The improved description and modelling of atmospheric processes
- The extended and continuous evaluation of atmospheric processes with conventional meteorological/hydrological observations
- The modelling/prediction of short- and long-term water and energy exchanges



# GC6: Multiple drivers of regional Earth system changes

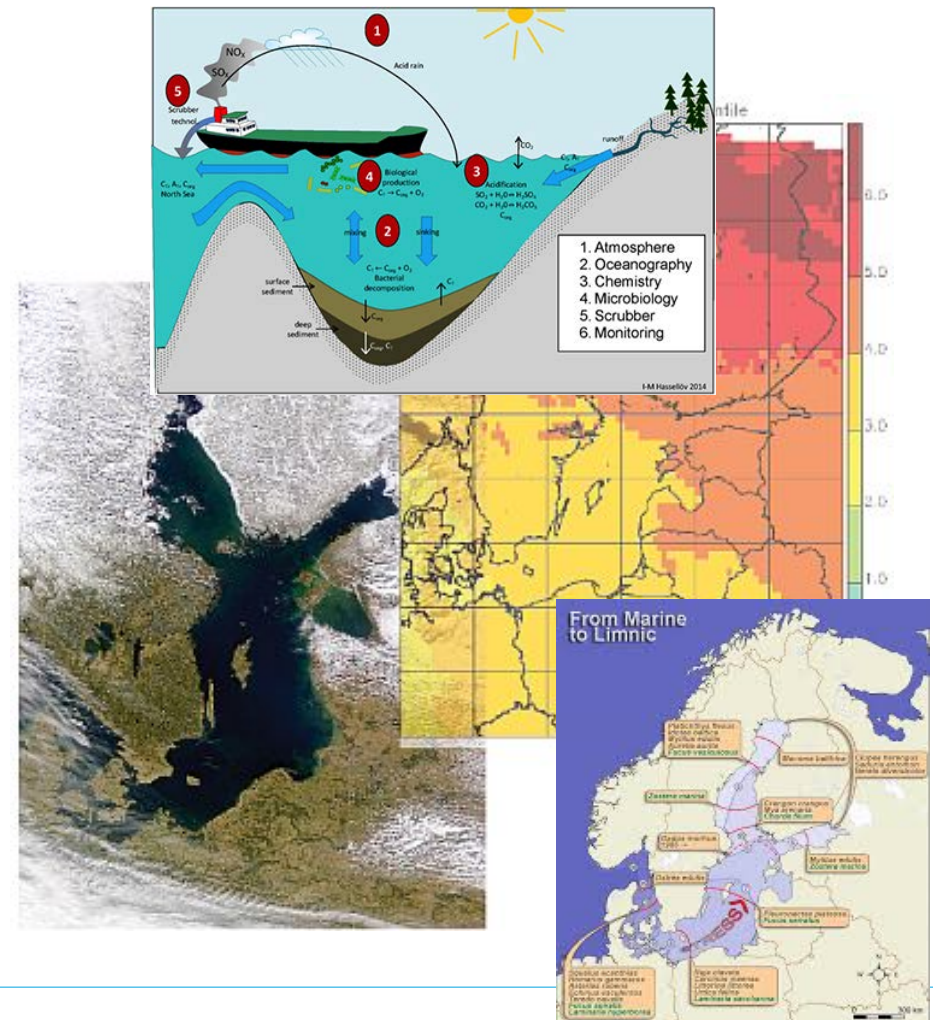


Juris Aigars, University of Latvia

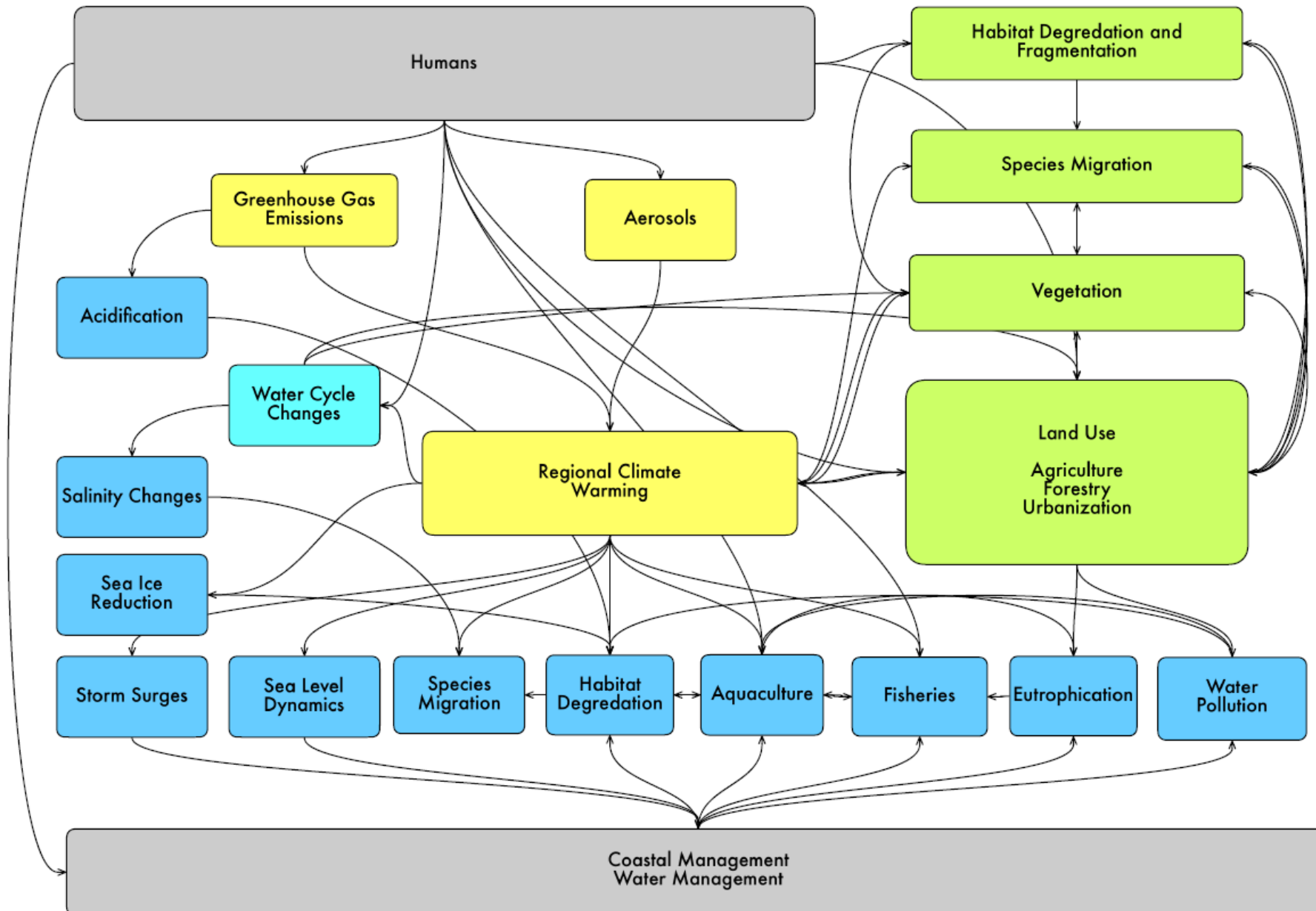
Anneli Poska, Lund University

Marcus Reckermann, Helmholtz-Zentrum Geesthacht

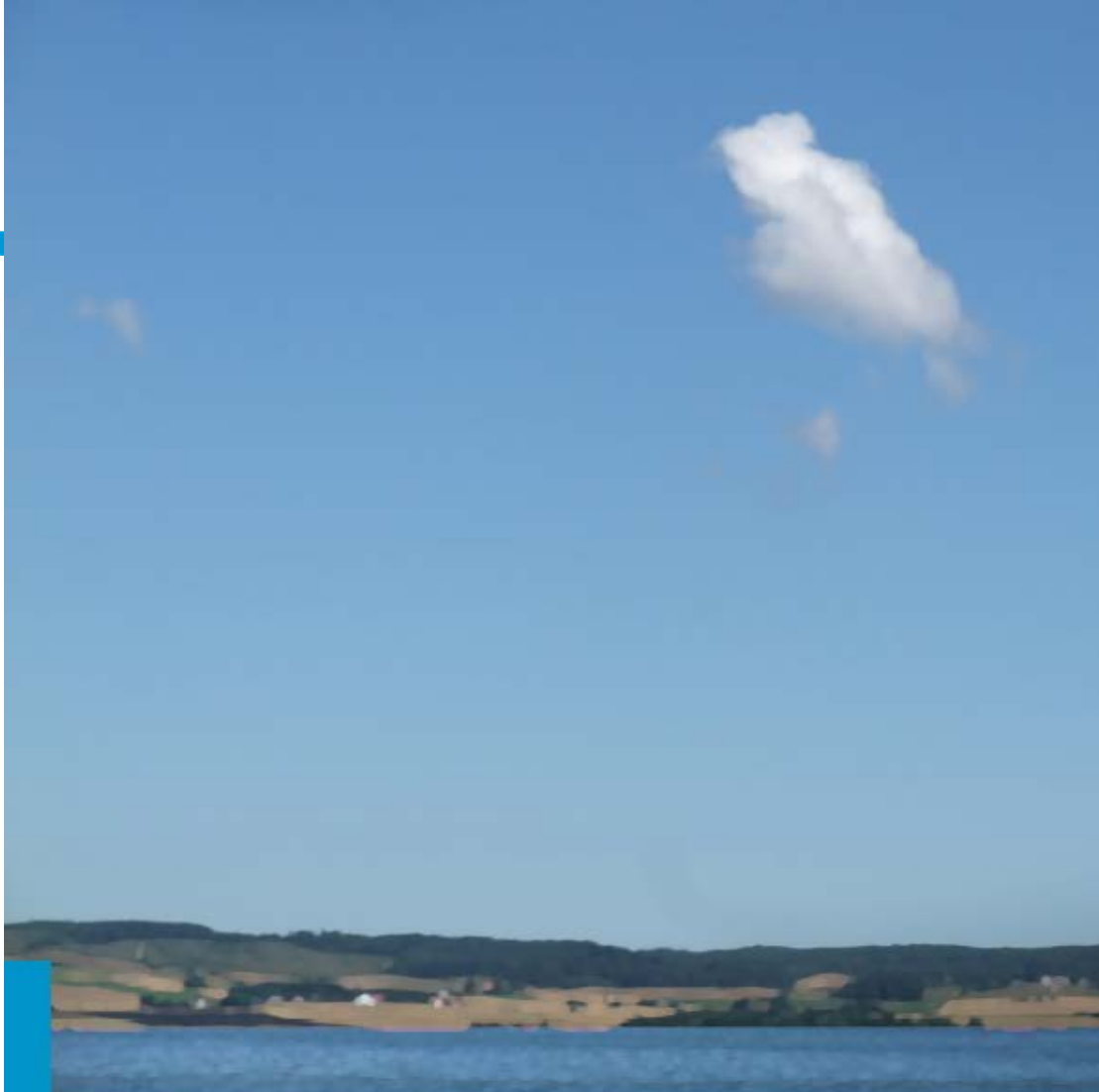
- A mixture of interwoven factors, such as regional climate change, eutrophication, pollution, fisheries, hydrographic engineering, agricultural and forestry practices and land cover change are responsible for the current situation and of potential importance as drivers of future changes.
- There is a need for increased cooperation among researchers having specialised knowledge of different components of the coupled biophysical-societal system.
- Key disciplines include meteorology and climate science, oceanography, hydrology, marine, terrestrial and freshwater ecology, microbiology and biogeochemistry, economists, human geographers, political scientists and engineers.



# GC6: Multiple drivers of regional Earth system changes



# Baltic Earth Science Plan 2017



International Baltic Earth Secretariat Publication No. 11, February 2017

## Baltic Earth Science Plan 2017



Download at  
[www.baltic.earth](http://www.baltic.earth)

Thank you for your attention!



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Geesthacht**  
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