

# Baltic Earth: First meeting of the working group "Teleconnection between the North Atlantic and Northern Europe and the Baltic Sea region"

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## General information

Date	May 3, 2023
Location	online
Chair	Markus Meier, Florian Börgel
Minutes	Sven Karsten, Itzel Ruvalcaba Baroni

## Participants

Name	Initials	Institute
Florian Börgel	FB	Leibniz Institute for Baltic Sea Research Warnemünde (IOW)
Markus Meier	MM	IOW
Matthias Gröger	MG	IOW
Itzel Ruvalcaba Baroni	IRB	Swedish Meteorological and Hydrological Institute (SMHI)
Sebastian Brune	SB	University of Hamburg (UHH)
Bronwyn Cahill	BC	IOW
Malgorzata Falarz	MF	University of Katowice
Gabriele Messori	GM	University of Uppsala
Andreas Lehmann	AL	GEOMAR Kiel
Anna Ruttgerson	AR	University of Uppsala
Jari Hanninen	JH	University of Turk, Finland
Leonard Borchert	LB	UHH
Mati Kahru	MK	University of California, San Diego
Vytautes Akstinas	VA	Lithuanian Energy Institute (LEI)
Magnus Hieronimus	MH	SMHI
Suchithra Sundaram	SS	New York University Abu Dhabi
Arne Biastoch	AB	GEOMAR Kiel
Pasha Karami	PK	SMHI

Name	Initials	Institute
Xiaoli Guo Larsen	XGL	Technical University of Denmark (DTU)
Sven Karsten	SK	IOW
Taavi Liblik	TL	TalTech, Tallin
Cyril Dutheil	CD	IOW

## Introduction

- Markus Meier gives an overview on Baltic Earth (<https://baltic.earth/>)
- grand challenge No. 5 is related to "Regional variability of water and energy exchanges in the Baltic Sea region"
- Florian Börgel and Matthias Gröger formed the idea to have an extra working group that is focussed on "Teleconnection between the North Atlantic and Northern Europe and the Baltic Sea region"

## Formal part (election of speakers)

- Florian and Itzel volunteered to be the speakers of the formed WG

## Research topics/interests of participants

- Sebastian Brune
  - global modeling, ensemble simulations
  - the impact of the Baltic Sea climate on the European climate
- Bronwyn Cahill
  - Carbon pools and fluxes in the Baltic Sea - North Sea - Wadden Sea continuum
  - Exchanges between seas and North Atlantic,
  - Stability of biogeochemical pathways, hindcast (1993 - 2022) and sensitivity studies with biogeochemical-hydrological model GETM-ERGOM
- Malgorzata Falarz
  - impact on snow-cover changes in Poland from Northern Europe climate
- Gabriele Messori
  - climate extremes and their co-occurrence in different regions
- Andreas Lehmann
  - the changing impact of large-scale atmospheric circulations on the Baltic Sea region
- Anna Ruttgerson
  - atmospheric rivers
  - air-sea interaction
  - possible implication for extremes

- Florian Börgel
  - Impact of AMV on Northern Europe
- Jari Hanninen
  - interaction between the North Sea and Baltic Sea
  - Climate controlled ecosystems, eutrophication and nutrients (silica)
- Leonard Borchert
  - climate models, reanalysis
  - teleconnections and climate projections (predictions of extremes)
  - atmospheric modes on seasonal to decadal time-scales
- Mati Kahru
  - Baltic cyanobacteria and their teleconnections
  - inter-annual to decadal variations
  - biogeochemistry (e.g., nutrients) vs dynamics (e.g., NAO)
- Vytautes Akstinas
  - river intermittency
  - hydrological research
  - teleconnection patterns
- Magnus Hieronimus
  - climate indices and sea-level extremes
  - multivariate correlations
  - teleconnections
- Suchithra Sundaram
  - paleoclimate
  - teleconnection between the Indian summer monsoon, Arctic sea ice, and Baltic Sea
- Arne Biastoch
  - high-resolution simulations of the North Atlantic
  - oceanic teleconnections
  - large scale climate circulation
- Itzel Ruvalcaba Baroni
  - marine biogeochemical modeling (NEMO-SCOBI) (hindcast 1961-2017)
  - nutrients, eutrophication, deoxygenation
  - exchanges between North Sea and Baltic Sea
- Pasha Karami
  - global modeling with EC-Earth3 HR

- connections between sea-level extremes and large-scale circulations
- heat waves and their teleconnections
- Xiaoli Guo Larsen
  - modeling on a global scale to a microscale
  - using a coupled model that accounts for wakes, waves, and wind
  - detection of extreme wind conditions (accurate predictions)
- Sven Karsten
  - Development of a coupled model for the Baltic Sea region (CCLM + MOMS) (hindcast 1959-present)
- Taavi Liblik
  - physical oceanography related to temperature, salinity, oxygen, and nutrients
  - Contribution with data that is not necessarily available in large platforms
- Markus Meier
  - multidecadal salinity variability in the Baltic Sea linked to large-scale atmospheric circulation changes
- Matthias Gröger
  - skills of global models to describe extremes on regional scales (Baltic Sea)
- Cyril Dutheil
  - weather regimes and their influence on precipitation over Europe
- Kevin Bishop
  - hydrology at the European scale
  - Knowledge on available infrastructure
  - teleconnections
- Helena Filipsson
  - marine heatwaves
  - extreme weather
  - short term O2 events and the potential effects on the ecosystem of the Baltic Sea region

## General Discussion

- Florian idea next steps: write a review paper about WG focus
- Formation of subgroups may make work more efficient
- Markus Meier agrees and proposes a grand challenge for the WG after the review paper: decadal predictability
  - This might lead to a story-line paper
- Andreas Lehmann proposes to actively represent the WG at conferences (e.g., specific contributions or even sessions)

- Anna Ruttgerson also agrees to a review paper as the first step
- Florian Börgel poses the question if the focus may be mainly on the Baltic Sea
  - general agreement
- Itzel Baroni raises the question of whether fixed dates for meetings or on-demand dates are more appropriate
  - roughly fixed dates are preferred and more efficient
- Arne Biastoch asks whether the review paper should also contain new analysis results
  - for the review paper, there should be, at maximum, a "teaser" for new analysis results
- Markus reminds all that if participation to this groups is not desired, an email must be sent to Fabian.

## General ideas for the manuscript

- Long term variability, extremes, global scales down to wind farm
- Global models vs. regional models, decadal predictability for the Baltic Sea
- Bringing together global and regional modeling, as well as observations
- Quality of models involved

## Action point for next meeting

- next meeting should be at the beginning of September
- FB (or IRB) will send a doodle to set date
- FB should draft an outline for the review paper
- FB may think about reasonable subgroups
- others (e.g., AB, PK) who have ideas for some new analysis results should report their thoughts
- others (e.g., MG, MM, AR) should look for what is already published and what is missing about teleconnections between the North Atlantic and the Baltic Sea