

5th Baltic Earth Conference

Jūrmala, Latvia

13 - 17 May 2024



Programme

Draft as of 25 April

Sunday, 12 May 2024

16:00 – 18:00 **Registration**

Monday, 13 May 2024

8:00 – 9:20 **Registration**

Opening Ceremony

09:30 **Welcome address on behalf of Baltic Earth**

H.E. Markus Meier

Leibniz Institute for Baltic Sea Research Warnemünde, Germany
Chair of the Baltic Earth Science Steering Group

9:40 **Welcome address on behalf of the Latvian Council of Science**

Lauma Muižniece

Director of the Latvian Council of Science

9:50 **Welcome address on behalf of the local host institute**

Juris Aigars

Director of the Latvian Institute of Aquatic Ecology

Opening Session - Keynote Speeches

Chair: Karol Kuliński

10:00 **Regime shifts as an archetypal phenomenon of climate and climate change**
Tarmo Soomere

Professor of Coastal Engineering, Tallinn University of Technology, Estonia

Short 10min Break

10:40 **Managing marine resources sustainably – but how do we know when marine management has been successful? (remote)**

Mike Elliott, Ángel Borja and Roland Cormier

Professor of Estuarine and Coastal Sciences, University of Hull, UK

11:10 **Understanding the what, the how and the why: the role of science in informed decision making - Cooperation between Baltic Earth and HELCOM, today and in the future (remote)**

Jannica Haldin

Deputy Executive Secretary at the HELCOM Secretariat, Finland

Short 10min Break

Session A: Biogeochemistry of the Baltic Sea – Linking observations and modelling

Chair: Juris Aigars

11:50 **Integrating Earth Observation and Modeling for Monitoring the Vernal Diatom–Dinoflagellate Bloom in Finnish coastal waterbodies (solicited)**

Väkevä S, Hoikkala L, Miettunen E, Attila J, Fleming V, Kuosa H

12:10 **Evidencing the Impact of Sea Ice on Eutrophication in the Baltic Sea using new Eutrophication Indicators**

Pärn O, Polimene L, Stips A

12:25 **Baltic Sea oxygen dynamics under reduced nutrient input scenarios**

Naumov L, Meier HEM, Neumann T

12:40 **Lunch**

13:50 **Acidification in the Baltic Sea: Science, monitoring perspectives, and future governance within HELCOM**

Rehder G, Carstensen J, Fleming V, Gustafsson E, Gustafsson B, Kuliński K

- 14:05 **Transport of total alkalinity from Vistula River to the Baltic Sea – seasonal and interannual variability (2016-2023)**
Koziorowska-Makuch K, Aguado Gonzalo F, Bromboszcz L, Malenga A, Winogradow A, Kuliński K
- 14:20 **Marked recent declines in boron in Baltic Sea cod otoliths – a bellwether of incipient acidification in a vast hypoxic system?**
Limburg K, Heimbrand K, Kuliński K
- 14:35 **Decoding Trends: Coastal Water Darkening in the Gulf of Riga with In-Situ, Model, and Remote Sensing Data Analysis**
Suhareva N, Aigars J, Cepite-Frisfelde D
- 14:50 **Topic A Open Discussion**
Chair: Karol Kuliński, Gregor Rehder and Juris Aigars
- 15:05 **Coffee Tea Break**

Session B: **Natural hazards and extreme events**

Chair: Martin Stendel

- 15:35 **Recent extreme water level events in the southwestern Baltic Sea in a climate perspective (solicited)**
Groll N, Gaslikova L, Weisse R
- 15:55 **Impact of atmospheric low pressure trajectories on extreme wind waves in the southern Baltic region**
Cupiał A, Cieślíkiewicz W
- 16:10 **Effects of extreme storms on coastal erosion in non-tidal seas (the Baltic, Black, and Azov Seas)**
Davydov O, Jarmalavičius D, Žilinskas G, Janušaitė R, Buynevich IV, Pupienis D
- 16:25 **The very strong storm surge of October 2023 in the southwestern Baltic from the perspective of an operational forecast and warning service**
Holfort J
- Short 15min Break*
- 16:55 **What causes the port of Klaipeda to be closed at every storm?**
Nesteckytė L, Kelpšaitė-Rimkienė L
- 17:10 **More frequent and longer marine heatwaves in the Baltic Sea**
Meier HEM, Safonova K, Gröger M

17:25 **Topic B Open Discussion**
Chair: Martin Stendel and Anna Rutgersson

17:40 End of Plenary Day 1

19:00 **Ice Breaker**

Tuesday, 14 May 2024

Session C: Sea level dynamics, sediment dynamics, coastal processes and impacts on coasts

Chair: Ralf Weisse

09:00 **Wave- and current-induced sediment resuspension in the Bothnian Sea**
(solicited)
Tuomi L, Kotilainen A, Attila J, Kanarik H

09:20 **The Impact of Baltic Sea Level Rise on Estonian Coastal Areas**
Kapsi I, Kall T, Liibus A

09:35 **Coastal vulnerability of the eastern Baltic Sea with respect to extreme minima of sea level**
Viigand K, Eelsalu M, Soomere T

09:50 **Coastal dynamics of the Daugavgriva Island beach in the Gulf of Riga, Latvia**
Viška M, Tõnisson H, Männikus R, Jankowski MZ

10:05 **Coastal erosion assessment for Latvia using Sentinel-2 data**
Zandersons V, Žeizis V

10:20 **Coffee Tea Break**

10:50 **Classification of soft cliff dynamics using remote sensing and data mining techniques**
Terefenko P, Śledziowski J, Giza A, Tanwari K

11:05 **Major changes to directional forcing of sediment transport along the eastern Baltic Sea coast**
Eelsalu M, Soomere T

11:20 **Modeling volumetric changes of sandy coast during various hydrodynamic conditions (case study Dziwnów Spit)**
Bugajny N

11:35 **Scour effect in Łeba, Poland – Impact of submerged breakwaters**
Bojan M

11:50 **Topic C Open Discussion**
Chair: Ralf Weisse and Kevin Parnell

12:05 Lunch

Session D: **Human impacts, interactions and management options**

Chair: Andris Andrusaitis

13:25 **Long-term observations and modelling of dissolved methane from Nord Stream leaks (solicited)**
Mohrmann M, Biddle LC, Rehder G, Bittig H, Queste B

13:45 **Changing Marine Lightscapes**
Zielinski O

14:00 **Monitoring seasonal maritime traffic from Sentinel-2 RGB imagery with YOLOv8**
Mäyrä J, Virtanen E, Jokinen A-P, Koskikala J, Väkevä S, Attila

14:15 **Good eutrophication status is a challenging goal for coastal waters**
Hyttiäinen K, Huttunen I, Kotamäki N, Kuosa H, Ropponen J

Short 15min Break

14:45 **Overview of alien species introduction pathways in the Baltic Sea**
Srèbaliénė G, Olenin S, Narščius A

15:00 **Distribution of pyrogenic organic matter in the southwestern Baltic Sea**
Serafim T, Schulz-Bull D, Waniek J, Osterholz H

15:15 **In search for suitable parameters quantifying the contribution of water level variations into coastal vulnerability index of microtidal seas**
Soomere T, Barzehkar M, Parnell K, Bagdanavičiūtė I

15:30 **Evaluating ecological connectivity in the Archipelago Sea**
Miettunen E, Virtanen E

15:45 End of Plenary Day 2

16:00 Excursion

Wednesday, 15 May 2024

Session D: **Human impacts, interactions and management options** *continued*

Chair: Kari Hyttiäinen

09:00 **A method for optimizing the location of measurement stations and its application to the Baltic Sea area**
Brodziński W, Kowalewski M, Ostrowska M

09:15 **Use of Artificial Neural Networks as a tool for port pollution control**
Šilas G, Rapalis P

09:30 **Topic D Open Discussion**
Chair: Kari Hyttiäinen and Andris Andrusaitis

Session E: **Modeling past and future climate changes and teleconnections**

Chair: Markus Meier

09:45 **Exceptional warming and intensified oxygen depletion due to warm saltwater inflows in the western Baltic Sea (*solicited*)**
Barghorn L, Meier HEM, Radtke H, Neumann T

10:05 **The impact of Atlantic Multidecadal Variability on Baltic Sea temperatures limited to winter**
Börgel F, Gröger M, Meier HEM, Dutheil C, Radtke H, Borchert L

10:20 **Coffee Tea Break**

10:50 **Future wind conditions over the South-Western Baltic Sea for the forcing of a high-resolution hydrodynamic numerical model chain**
Dreier N, Sone H, Nehlsen E, Fröhle P

11:05 **The dependence of the future climate of Estonia on the level of global warming**
Jakobson E, Jakobson L, Toll V, Keernik H, Luhamaa A, Post P

11:20 **Changing impact of large-scale atmospheric circulation variability on the water mass exchange and circulation of the Baltic Sea for the period 1950-2022**
Lehmann A, Post P

- 11:35 **Information flow and multivariate causality estimates between measured and modelled forcing and temperature time series**
Stips AK, Liang SX, Macias-Moy D
- 11:50 **ROPEWALK (Rescuing Old data with People's Efforts: Weather and climate Archives from Logbook records) - a digitization project for three centuries of weather observations on board of Danish ships**
Stendel M, Kronegh AJ, Skov EH
- 12:05 **Lunch**
- 13:25 **Topic E Open Discussion**
Chairs: Florian Börgel, Andreas Lehmann and Markus Meier
- Short 10min Break*
- 13:50 **Poster Speed Talks 1**
- 14:20 **Poster Session 1**
With Coffee Tea Break
- Session F: Small scale processes not yet resolved and their impact on the large-scale dynamics and patterns**
- Chair: Urmaz Lips*
- 16:00 **Deep mixing observed by Argo floats in the Gdansk Basin during the winter of 2023 (solicited)**
Walczowski W, Rak D, Merchel M, Bulczak A
- 16:20 **Central Baltic Sea Circulation Experiment – first results**
Liblik T, Rak D, Siht E, Väli G, Karstensen J, Tuomi L, Biddle L, Lilover M-J, Skudra M, Naumann M, Papirtis M, Petersson O, Lips U, Mohrholz V
- 16:35 **Seasonal Variability and Long-Term Winter Shoaling of the Upper Mixed Layer in the Southern Baltic Sea**
Bulczak A, Nowak K, Jakacki J, Muzyka M, Rak D, Walczowski W
- 16:50 **Detection of marine eddies based on high-resolution model data**
Dybowski D, Janecki M, Dzierzbicka-Głowacka L
- 17:05 **Baltic Sea Water Dynamics: The Role of the CSI-POM Project in Understanding Thermocline, Halocline, and Pycnocline**
Janecki M, Dybowski D, Dzierzbicka-Głowacka L

- 17:20 **Topic F Open Discussion**
Chair: Urmaz Lips and Lorenzo Minola
- 17:35 End of Plenary Day 3
- 18:30 Young Scientist's Event** *(by invitation only)*

Thursday, 16 May 2024

Session G: Comparing marginal seas worldwide

Chair: Joanna Dudzińska-Nowak

- 09:00 **Coastal processes and erosion with and without swell waves and tides in marginal seas** *(solicited)*
Parnell K, Soomere T
- 09:20 **Marginal Seas – Diversity and Comparison**
Harff J, Cawthra HC, Clift P, Greene HG, Reckermann M
- 09:35 **Comparing Baltic and North Sea coastline using remote sensing and machine learning**
Arlinghaus P, Pogorzelski D, Zhang W
- 09:50 **Compound events triggering coastal flooding: Results from the WAKOS project**
Weisse R, Heinrich P, Bormann H, Hagemann S, Gaslikova L
- 10:05 **E⁶ – A Short-Hand Expression for Six Key Elements to Characterize Urban Sea Systems**
Greene HG, Delaney JR
- 10:20 **Coffee Tea Break**

Chair: Jan Harff
- 10:50 **Human use of ancient and now-submerged coasts in South Africa**
Cawthra HC, Fisher EC (remote)
- 11:05 **The Ganges-Brahmaputra-Meghna delta systematics**
Ghatak S, Sen G, Ghatak M, Roychaudhuri S (remote)

- 11:20 **Comparative studies on the river mouth system development and sedimentary environment changes between Pearl River and Oder River**
Zhang Jinpeng, Pingyuan Li, Shiming Dong, Yufeng Wang (remote)
- 11:25 **Long term monitoring of the coastline changes, for future use in modeling (example from Southern Baltic Sea, Poland)**
Dudzińska-Nowak J, Jankowski R (remote)
- 11:50 **Topic G Open Discussion**
Chair: Joanna Dudzińska-Nowak and Jan Harff
- 12:05 **Lunch**
- 13:25 **Disko Bay – a uniquely complex environment in the West Greenland shelf area (remote)**
Krawczyk DW

Short 10min Break

Session H: **Philosophical aspects of Baltic Sea Earth system research**

Chair: Anders Omstedt

- 13:50 **Impactful Science Policy Dialogues (solicited)**
Heidenreich M, Sielemann K, Brunner A, Meyn A
- 14:10 **Mechanical energy balance in the Baltic Sea**
Elken J, Arneborg L, Omstedt A
- Short 10min Break*
- 14:35 **Poster Speed Talks 2**
- 15:05 **Poster Session 2**
With Coffee Tea Break
- 16:45 **General Open Discussion Part 1**
Chair: Markus Meier, Karol Kuliński and Andris Andrusaitis
- 17:50 End of Plenary Day 4
- 19:00 **Conference Dinner**

Friday, 17 May 2024

Session H: **Philosophical aspects of Baltic Sea Earth system research**

continued

Chair: Jüri Elken

- 09:00 **Philosophical Aspects of Marginal Seas**
Grønfeldt Winther R, Omstedt A
- 09:15 **Philosophical views on Baltic Basin climate and environmental sciences**
Omstedt A, Grønfeldt Winther R, von Storch H, Dailidiene I
- 09:30 **Topic G Open Discussion**
Chair: Anders Omstedt, Jüri Elken
- Short 10min Break*
- 09:55 **General Open Discussion Part 2**
Chair: Markus Meier, Karol Kuliński and Andris Andrusaitis
- 10:35 **Wrap-Up and Farewell**
- 10:50 End of Conference

Posters

Poster authors are requested to prepare a 1-min – 1-slide introduction to their poster. These speed talks will be held on Wednesday and Thursday afternoons.

There are two dedicated poster sessions after the two speed talk slots, respectively.

All posters are on display during the whole conference.
Poster sequence is first author alphabetically within topics.

Session A: Biogeochemistry of the Baltic Sea – Linking observations and modelling

- A-1 **Variability of the carbonate system in the coastal zone of the southern Baltic Sea**
Bromboszcz L, Koziarowska-Makuch K, Aguado Gonzalo F, Malenga A, Winogradow A, Kuliński K
- A-2 **Dissolved organic matter cycling in the southern and central Baltic Sea: results from sediment porewater sampling and incubations** *Withdrawn*
Loginova A, Wunsch U, Engel A, Kowalczyk P, Hoszek K, Zabłocka M, Szymczycha B, Kuliński K
- A-3 **Seasonal changes in chlorophyll a concentrations, phytoplankton biomass and primary production in the Baltic Sea based on monitoring and glider data**
Paczkowska J, Queste B, Monforte C, Biddle L
- A-4 **Seasonal investigation of nitrogen removal pathways in the Baltic Sea water column**
Sivasamy P, Diak M, Winogradow A, Prusiński P, Mackiewicz A, Makuch P, Koziarowska-Makuch K, Kuliński K, Szymczycha B

Session B: Natural hazards and extreme events

- B-1 **Characteristics of marine heatwaves in the SE Baltic Sea based on long-term in situ and satellite observations**
Dabuleviciene T, Servaite I
- B-2 **Compound late-spring frost and drought events in the eastern part of the Baltic Sea region**
Klimavičius L

- B-3 **Baltic Sea Surface Temperature Analysis 2022: A Study of Marine Heatwaves and Overall High Seasonal Temperatures**
Lindenthal A, Hinrichs C, Jandt-Scheelke S, Kruschke T, Lagemaa P, van der Lee E, Maljutenko I, Morrison H, Panteleit T, Raudsepp U
- B-4 **Flood risk assessment on the rivers of the Vistula basin within Ukraine *Withdrawn***
Ovcharuk V, Martyniuk M
- B-5 **Estimating frequency of extreme temperature events in Latvia based on skewed probability distribution**
Pogumirskis M, Sile T
- B-6 **Large Scale Atmospheric Conditions related to Storm Surges in the North and Baltic Seas and possible Future Changes using a CMIP6 GCM Ensemble**
Schade N, Jensen C, Schaffer L, Ditzinger GX, Kruschke T
- B-7 **The weather patterns favoring flash floods in southern Ukraine: A case study *Withdrawn***
Semenova I, Ovcharuk V
- B-8 **Negative emission technology carbon capture and storage**
Sunjay

Session C: Sea level dynamics, sediment dynamics, coastal processes and impacts on coasts

- C-1 **Reconstruction of post-glacial eustatic sea level in the south-eastern Baltic Sea**
Bitinas A, Damušytė A
- C-2 **Towards a user friendly coastal modeling tool for North Sea – Baltic Sea**
Frishfelds V, She J, Murawski J
- C-3 **Analysis of wave properties in the Baltic Sea: integrating findings from the Gulf of Finland, Gulf of Riga and Western Baltic Coasts**
Giudici A, Männikus R, Jankowski MZ, Soomere T
- C-4 **The BALTEX Hydrological dataset of GRDC – A unique archive for river discharge data of the Baltic Sea catchment**
Mischel S, Färber C, Plessow H
- C-5 **Sensitivity of wind forcing data to the wave energy in the Baltic Sea *Withdrawn***
Pham NT, Staneva J, Ricker M, Gramscianinov C
- C-6 **Diving marine birds as Baltic oceanographers: a novel method to collect data on water parameters**
Salvador P, Morkūnė R, Kelpšaitė-Rimkienė L, Kuzminskaitė U, Morkūnas J
- C-7 **Mapping Elevation and Elevation Changes in the North and Baltic Sea**
Schröder L, Liebsch G, Bauer T, Schwabe J, Gräwe U

- C-8 **Intriguing interannual variations of sediment transport in the Gulf of Riga**
Soomere T, Jankowski M, Parnell K
- C-9 **Hydrodynamic modeling of the intrusion of the transformed seawater from the Dniester Estuary to the mouth part of the Dniester** **Withdrawn**
Tuchkovenko Y, Loboda N, Ovcharuk V
- C-10 **Application of the probability of extreme sea levels at selected Baltic tide gauge stations**
Wolski T, Giza A, Wiśniewski B

Session D: Human impacts, interactions and management options

- D-1 **Air pollution and it's dispersion in the city of Klaipeda: the influence of meteorological conditions of the Baltic Sea Region**
Andriule A, Vasiliauskiene E, Rapalis P, Šaparnis L
- D-2 **Knowledge Transfer Platform FindFISH – Numerical Forecasting System for Fisheries for the Marine Environment of the Gulf of Gdańsk**
Dzierzbicka-Głowacka L, Janecki M, Dybowski D, Pieckiel P, Wójcik M, Wittbrodt J
- D-3 **A Prognostic Tool for Modeling the Optimal Environmental Conditions for Fish in the Gulf of Gdańsk – the Fish Module**
Janecki M, Dzierzbicka-Głowacka L, Pieckiel P, Wittbrodt J
- D-4 **Finnish-Estonian Collaborative Research Project: Utilizing Passive Samplers in Pharmaceutical Research in the Gulf of Finland** **Withdrawn**
Junttila V, Ahkola H, Mehtonen J, Äystö L, Vesikko L, Myrberg K
- D-5 **Implementing Nature-Based Solutions: Types of Actions, Addressed Challenges and Received Benefits**
Kapilovaitė J, Misiūnė I
- D-6 **Changes in water optical properties: Gulf of Riga and River Daugava use case (AqualNFRA project)**
Labuce A, Suhareva N, Jurgensone I, Armoskaite A, Andrushaitis A, Kutzer T, Laas A, Strake S
- D-7 **Macrophytes Identification Algorithm based on Žuvintas Lake Satellite data**
Levachou Y, Stonevičius E
- D-8 **The impact of meteorological conditions on diseases transmitted by tick in Lithuania**
Pipiraitė-Januškienė S, Rimkus E
- D-9 **Impact of River Catchments on Baltic Sea Heavy Metal Contamination and Natural-Based Solution Remediation Strategies: A Pilica River Case Study**
Piowarska D, Kiedrzyńska E, Kiedrzyński M

Session E: Modeling past and future climate changes and teleconnections

- E-1 Possible mechanisms of anthropocentric strengthening of the wintertime jet stream in the Atlantic sector: from the ocean to the stratosphere**
Piskożub J
- E-2 Analysing the occurrence and duration of periods with low wind speeds and high cloud cover in the Baltic Sea area: Insights from a renewable energy perspective**
Post P, Aun M, Keernik H, Toll V
- E-3 Innovative approaches to understanding ocean dynamics: Unveiling coherent variability and trends by data-driven methods and Koopman operator theory**
Slawinska J, Giannakis D
- E-4 Assessing bias correction approaches for analysis of climate extremes and hazards**
Syktus J, Chapman S, Trancoso R, Toombs N, Zhang H, Eccles R
- E-5 Projections for future drought in Australia using CMIP6 downscaled projections**
Syktus J, Eccles R, Trancoso R, Chapman S, Zhang H, Toombs N

Session F: Small scale processes not yet resolved and their impact on the large scale dynamics and patterns

- F-1 Unraveling Ocean Dynamics with Glider Profiling and ship-based Microstructure Observations in the Slupsk Furrow**
Bulczak A, Rak D, Salm K, Liblik T, Lips U
- F-2 Marine Organisms at Work: Biomixing in the Baltic Sea**
Bulczak A, Rak D, Schmidt B, Walczowski W
- F-3 Energy Fluxes and Vertical Heat Transfer in the Southern Baltic Sea**
Rak D, Przyborska A, Bulczak A, Dzierzbicka-Głowacka L
- F-4 On the coastal-offshore exchange in the Baltic Sea: a high-resolution modelling study**
Väli G, Hariri S, Radtke H, Meier HEM
- F-5 Continuous Baltic Sea Glider Observatories; two case studies**
Wranne Willstrand A, Biddle LC, Monforte C, Rollo C



Session G: **Comparing marginal seas worldwide**

G-1 Classification of the morphodynamics of the coast - a tool for comparison of the marginal seas

Dudzińska-Nowak J



Session H: **Philosophical aspects of Baltic Sea Earth system research**

H-1 The Geography of the Baltic Sea and the Philosophical approach to its interdisciplinary nature

Dailidienė I

H-2 The historical and cultural value of the Marine Protected areas: The island of Seili

Vuorinen I, Omstedt A