Baltic Earth

Working Group “Marginal Seas – Humans and Environment”

Minutes of Kick-Off Meeting (online: TEAMS)

Oct 24, 2024, 15:15 CEST

Participants:

Cátia Milene Ehlert von Ahn (CvA), Germany; Peter Arlinghaus (PA), Germany (temporary); Hayley Cawthra (HC), South Africa; Peter Clift (PC), UK; Joanna Dudzińska-Nowak (JDN), Poland; Matthias Gröger (MG), Germany Jan Harff (JH), Poland (protocol); Katarzyna Koziorowska-Makuch (KKM), Poland; Karol Kuliński (KK), Poland; Markus Meier (MM), Germany (temporary); Kevin Parnell (KP), Estonia; Marcus Reckermann (MR), Germany; Jinpeng Zhang (JZ), China

Preface:

In 2020, Baltic Earth joined an international initiative to specifically study marginal seas in order to support the development of general sustainable management strategies. As part of this initiative, joint topical sessions were organized at international conferences (online and hybrid) and research papers were published in Special Issues of scientific Journals (such as Reckermann et al., 2023). This successful initiative led to a discussion in 2023 of establishing a separate marginal seas working group within Baltic Earth. But it was the promising course and the committed discussions of Session G "Comparing marginal seas worldwide" at the 5th Baltic Earth Conference, held at Jurmala, Latvia, May 13-17, 2024, that ultimately led to the decision to set up such a Baltic Earth working group "Marginal Seas - Humans and Environment". The kick-off meeting of this working group, which currently includes 19 members from European and overseas countries, took place online on October 24, 2024 along with the first seminar in the series of "Szczecin Marginal Seas Webinars" of the Winter Semester 2024/25 at the University of Szczecin (http://nms.usz.edu.pl/instytut/aktualnosci/).

Agenda:

1. Introduction
2. Marginal Seas’ diversity
3. Goal and Road map
4. Next steps
5. Discussion
6. Conclusion

Results:

On topics 1 to 4, JH gave an overview of the activities and discussions carried out prior to the founding of the working group, as well as of the status of the working group's establishment. The statements are open to be debated by the WG.

Ad 1) As an **introduction** JH reported about the development of the marginal seas initiative in Baltic Earth in co-operation with partner institutes and scientific organization.

Members of the Working Group (status of Oct 1, 2024):

Cátia Milene Ehlert von Ahn, Leibniz Institute for Tropical Marine Research, Bremen, Germany
Peter Arlinghaus, Helmholtz-Zentrum Hereon Geesthacht, Germany
Helge Arz, Leibniz Institute for Baltic Sea Research Warnemünde, Germany
Hayley Cawthra, Council for Geoscience, Cape Town & Nelson Mandela University Cape Town, South Africa
Peter Clift, University College London, UK
Joanna Dudzińska-Nowak, University of Szczecin, Poland
Erich Fisher, Universidade do Algarve, Faro, Portugal
Gary Greene, San Jose State University, Orcas Island & University of Washington, Seattle, USA
Matthias Gröger, Leibniz Institute for Baltic Sea Research Warnemünde, Germany
Jan Harff, University of Szczecin, Poland
Katarzyna Koziorowska-Makuch, Institute of Oceanology PAN, Sopot, Poland
Karol Kuliński, Institute of Oceanology PAN, Sopot, Poland
Markus Meier, Leibniz Institute for Baltic Sea Research Warnemünde, Germany
Kai Myrberg, SYKE Finnish Environment Institute Helsinki, Finland
Kevin Parnell, Tallinn University of Technology, Estonia
Marcus Reckermann, Helmholtz-Zentrum Hereon Geesthacht, Germany
Hans von Storch, Helmholtz-Zentrum Hereon Geesthacht, Germany
Ralf Weisse, Helmholtz-Zentrum Hereon Geesthacht, Germany
Jinpeng Zhang, Guangzhou Marine Geological Suvey – China Geological Suryey, China

Ad 2) One base of the initiative is the fact that marginal seas worldwide are exposed to high pressures by climate change and human activities and require holistic sustainable management strategies.

To master the **diversity** by generalization, marginal seas have to be described by data of a comparable spatial, temporal and state parameters (variables). Spatially, marginal seas can be described as to varying degree enclosed marine areas clearly influenced by the adjacent mainland (drainage areas). The time frame of processes to be considered spans 120 ky BP – 2100 AD covering the last glacial cycle including Holocene and Anthropocene. The state parameters describe spatial and temporal environmental changes in terms of geosystem, ecosystem, climate and

socioeconomic system. For management aspects the variables have to be linked by a cause-effect network (Reckermann et al. 2022).

Data ranges from local and regional monitoring programs (sometimes as real-time data registrations) to global satellite observations. For long-term environmental changes (trends) proxy data from natural archives are to be deciphered by transfer-functions. For future prospection modeling procedures replace measurements.

Ad 3, 4) Goal: “Contributions to the taxonomy of Marginal Seas considering natural drivers and anthropogenic impacts to support generalized sustainable management exemplified by selected key areas”.

For comparison analogue studies of potential key areas from different climatic zones and geological settings were mentioned as examples: Baltic Sea, North Sea, Salish Sea, Svalbard Archipelago, South China Sea and Bays of the South African Shelf.

Roadmap (2 years):

Oct 2024: Kick Off

Phase 1
Task: Setting the framework and feasibility study

Jan 2025: online (evtl: online/insite) WG Meeting (Workshop),

Deliverables D1.1:
- Conceptual taxonomy model for marginal seas
- Selection of variables
- Selection of key areas (minimum: 2) for an analogue study

May 2025: Baltic Sea Science Congress

Deliverable D1.2:
- Joint presentation of the concept and first results of an analogue study

Oct 2025: Reporting to Baltic Earth Steering Group

Deliverable D1.3:
- Results of a first analogue study
- Work program Phase 2 (positive decision about continuation provided)

Phase 2
Task: Elaboration of a Marginal Seas White Paper

May 2026: 6th Baltic Earth Conference

Deliverable D2.1:
- Marginal Seas Topical Session
  with presentations of WGs members and invited speakers

Sept 2026: Final WG meeting
Deliverable D2.2:
WG report (summarizing results and draft of a joint white paper)

Ad 5) Discussion

The following topics were addressed during the kick-off meeting and in continuation by email conversation between KP and JH:

- Scientific definition of “marginal seas” (KP, MM, JH)
- Specification of tasks and work program (KP, JH)
- Role of key areas (KP, MR, JH)
- Analogue studies: Role of drivers (MR)
- Hierarchy of Variables: Climate parameters, Carbon Cycle, anoxia (KK, MM, MR)
- Proxy vaiables (JH)
- Data: Remote sensing (MG)
- Relation of working group to international research programs such as IGCP (JZ)

Ad 6) Conclusion

The Baltic Earth working group plans to contribute to marginal seas comparison studies considering natural drivers and anthropogenic impacts to pave the road for generalized sustainable management concepts.

In the work program spatial/temporal settings and the selection of variables linked by a cause-effect network must be prioritized for the methodology to compare marginal seas worldwide. These topics will be highlighted on a WG meeting to be organized as the next step at the beginning of 2025.

The conceptual model together with the selection of key areas shall be presented and discussed at the Baltic Sea Science Congress to be held at Sopot, Poland, May 2025.

After the first year the working group will present first results and specify the planning for the second work year to the Baltic Earth Steering Group.

Positive decision about a continuation provided, during the second year the working group will organize a marginal seas topical session at the 6th Baltic Earth Conference 2026.

A marginal seas white paper is suggested to be drafted by the end of the second work year for publication in an international scientific journal.

protocol: J. Harff, Nov 15, 2024

References

Reckermann, M., Harff, J., Meier, H.E.M., Kuliński, K., v.Storch, H., (eds.), 2023. Earth System Changes in Marginal Seas. Oceanologia, vol. 61, no. 1, 1-296, https://DOI: 10.1016/j.oceano.2023.01.001

Reckermann, M., Omstedt, A., Soomere, T. et al., 2022. Human impacts and their interactions in the Baltic Sea region, Earth Syst. Dynam., 13, 1–80, https://doi.org/10.5194/esd-13-1-2022, 2022.