

ANNUAL REPORT 2024

MISSION & VISION

“Our mission is to understand the coastal seas with a holistic approach, and through scientific knowledge, innovative methods and the dialogue with society to contribute to solve regional and global societal challenges”

FROM THE IOW'S
MISSION STATEMENT



FOREWORD

DEAR READERS,

I am pleased to present this annual report, which provides a concise overview of the work carried out by the Leibniz Institute for Baltic Sea Research Warnemünde (IOW) in 2024. After a period of biennial reports, we are now returning to an annual format in order to provide more up-to-date, continuous and detailed coverage of developments.

The reporting year 2024 began with the new IOW research programme “Perspectives of Coastal Seas”, set to run for ten years. It ties together scientific work in three interdisciplinary areas: research of Key Processes Across Scales and Boundaries, Coastal Seas in Transition, and the development and application of Emerging Technologies in Coastal Research. This allows us to create a clear thematic focus and link basic research with issues that are equally relevant to society, the economy and the environment. In 2024, we introduced the Baltic Challenges as a new flexible instrument. These enable us to quickly and coordinately address arising topics of high importance for the Baltic Sea within the research areas.

A particular focus lies on the so called “Sondertatbestand” Shallow Water Processes (S2B – shore to basin), which has been funded since 2023. In 2024, seminars, research trips and workshops were held on this topic, first publications were released and qualification work was started. The first results confirm the central role of dynamic, land-influenced processes in understanding the Baltic Sea.

Our long-term observation and monitoring on behalf of the Federal Maritime and Hydrographic Agency (BSH) has also been restructured. This will improve the coordination of work within the framework of the Helsinki Convention (HELCOM). During the EMB 340 expedition with our research vessel Elisabeth Mann Borgese, we were able to expand the observation area to the Gulf of Bothnia.

In 2024, the IOW managed to raise funds for numerous new projects – ranging from baseline studies to international collaborative projects. A selection of projects can be found in the chapter “New Projects” and a complete list of all projects worked on in 2024 can be found in the appendix. A total of 166 articles were published in peer-reviewed journals, including highly acclaimed interdisciplinary studies such as the discovery of suspected hunting structures in the Baltic Sea region, published in the Proceedings of the National Academy of Sciences (PNAS). For more details on this, please refer to the chapter “Research Highlights”. In addition, our scientists received several awards and prizes.

International networking was further expanded through workshops with partners from Germany and abroad and through active participation in conferences, such as the Baltic Earth Conference in Jurmala (Latvia). Dialogue with the public, practitioners and policy makers is of importance for us. For this reason,

several events for the public were held or resumed in 2024. Particularly noteworthy are the Open Ship event on the two research vessels Maria S. Merian and Elisabeth Mann Borgese, our participation in the Long Night of Science, and the resumption of the “Warnemünder Abende”.

The IOW can thus look back on a strong and successful year in terms of content– with scientific advances, new collaborations, and intensive exchange far beyond the research community. I invite you to discover for yourself on the following pages what moved us in 2024.

Sincerely,



OLIVER ZIELINSKI
DIRECTOR



© Gohlke

CONTENTS

08 RESEARCH HIGHLIGHTS

Research Programme:	
Perspectives of Coastal Seas (2024-2033)	9
RA1: Key Processes across Scales and Boundaries	10
RA2: Coastal Seas in Transition	14
RA3: Emerging Technologies in Coastal Research	18
Research Focus: Shallow Water Processes	21
Long-term Observations	23
Research Data Management	25

41 AWARDS, HONOURS, NOMINATIONS



55 IOW WITHIN THE LEIBNIZ ASSOCIATION



64 APPENDIX

Projects	66
Sea Cruises	73
Publications	74
Committees	84
Academic Qualifications	86



26 NEW PROJECTS

38 NEW FACES

46 COOPERATIONS

48 TRANSFER

58 EQUAL OPPORTUNITIES

60 REVIEW 2024

87 KEY DATA

88 ORGANISATIONAL CHART

89 IMPRINT



RESEARCH HIGHLIGHTS

At the IOW, the four departments “Marine Geology”, “Marine Chemistry”, “Biological Oceanography” and “Physical Oceanography” and the newly formed research unit “Marine Observation” are working on an interdisciplinary basis on the 10-year research programme “Perspectives of Coastal Seas” (2024–2033). Their research activities are grouped into three research areas (RAs): RA 1 focuses on key processes across scales and boundaries, RA 2 on coastal seas in transition and RA 3 on emerging technologies in coastal research.

RP

RESEARCH PROGRAMME: “PERSPECTIVES OF COASTAL SEAS” (2024–2033)

Our new research programme “Perspectives of Coastal Seas” (2024–2033) is organized into three research areas (RAs) (see figure), which address open questions in the areas of “Key Processes across Scales and Boundaries” (RA 1), “Coastal Seas in Transition” (RA 2) and “Emerging Technologies in Coastal Research” (RA 3). An important innovation compared to the previous programme is the additional focus on shallow water processes between the coastline and a water depth of approximately 10–20 m. All scientific and technical staff involved in the development of the measurement strategies and technological equipment required for coastal ocean observation are grouped

together in the newly established research unit “Marine Observations” (OBS). The overall structure of the 10-year IOW research programme follows the well-proven matrix concept, in which all departments and the new OBS research unit contribute to the three research areas. As a new instrument for addressing specific topics in an agile manner and within shorter time frames, we are introducing the so-called Baltic Challenges. They bring together research activities within the three research areas that facilitate progress on emerging and socially relevant topics of importance to the Baltic Sea.

RESEARCH AREAS

KEY PROCESSES ACROSS SCALES AND BOUNDARIES

COASTAL SEAS IN TRANSITION

EMERGING TECHNOLOGIES IN COASTAL RESEARCH

SUBAREAS

Hydrodynamic Impact

The Present State of the Baltic Sea System

New technologies for marine observation

Biogeochemical Cycles

Reconstruction of Past Ecosystems

Model development

Dynamics of Biological Processes

Shaping the Coastal Sea's Future

Data integration

Future Projections under Changing Climate and Human impact

SEKTIONEN

MARINE GEOLOGY (GEO)

MARINE CHEMISTRY (CHE)

BIOLOGICAL OCEANOGRAPHY (BIO)

PHYSICAL OCEANOGRAPHY (PHY)

RESEARCH UNITS

COASTAL SEA: MANAGEMENT AND PLANNING

MARINE OBSERVATIONS (OBS)

FULLY INTEGRATED S2B* “SHALLOW WATER PROCESSES AND TRANSITIONS TO THE BALTIC SCALE”

STATUS: 16.10.2024

*Shore to Basin

RESEARCH AREA 1 – “KEY PROCESSES ACROSS SCALES AND BOUNDARIES”

Understanding how marine systems such as the Baltic Sea function – and how to preserve their ecosystems – requires precise observations and a detailed understanding of processes operating across different spatial and temporal scales. Processes that span system boundaries and several orders of magnitude are particularly challenging, necessitating cross-disciplinary expertise and collaborative research to address current scientific questions.

ENERGY CRISIS FOR COD AND CO.: HOW OVER-FERTILISATION AND CLIMATE CHANGE ARE CHANGING THE FOOD WEB IN THE BALTIC SEA

Cod stocks in the Baltic Sea have been in crisis for years. Despite historically low fishing pressure the stock is not recovering. Until now, there has been no conclusive explanation for this. Researchers at the IOW and the Thünen Institute of Baltic Sea Fisheries have now been able to prove for the first time that in Baltic Sea areas with large-scale blooms of filamentous blue-green algae, increasingly common due to eutrophication and climate change, the food web for cod has lengthened. As a result, significantly less energy is available to the cod population than in areas without blue-green algae blooms. Unless the nutrient regime improves, cod in the Baltic Sea will not be able to recover.

Marine phytoplankton is the energy supplier for all marine ecosystems: these tiny plants floating in seawater use photosynthesis to bind energy in the form of biomass, which is then passed on step by step in the marine food webs to different species of fish and fish-eating species. The amount of energy that reaches the different organisms depends on the position they occupy in the food web. It is known that around 90 per cent of the energy is lost as heat from one level to the next. The more levels a food web has, the less energy reaches the organisms at the top, such as predatory fish.

In the Baltic Sea, excess nutrients entering through surface runoff and rivers (86) of which originate from agriculture promote cyanobacteria blooms that would not occur naturally at such levels. Other microalgae species are displaced by them. Due to their shape and size, filamentous blue-green algae cannot be eaten by small crustaceans, which are an important food source in marine food webs. Instead of eating a vegetarian diet, the small crustaceans eat microbes/bacteria that feed on excrement or decomposition products from bluegreen algae.

This creates a whole additional level in the food web, which inevitably leads to high energy loss in animals further down the food chain.

“This type of food web extension in fish has been discussed theoretically for some time. We can now measure it directly for

“This type of food web extension in fish has been discussed theoretically for some time. We can now measure it directly for the first time and clearly assign it to the blue-green algae-dominated food web.”

DR. NATALIE LOICK-WILDE

the first time and clearly attribute it to the blue-green algae-dominated food web,” says Natalie Loick-Wilde. She has established one of the few marine research laboratories in the world at the IOW, where stable isotopes of nitrogen in 13 different amino acids are measured for this purpose. For cod from the central Baltic Sea, her former PhD student Markus Steinkopf determined trophic positions between 4.8 and 5.2, instead of 4.1 as in healthy food webs. This indicates an energy loss of 60 to 99 per cent, because zooplankton is supposed to feed small organisms and fish in large numbers, but is very depleted due to poor nutrition. This also limits the food available for cod – formerly the most important fish in the Baltic Sea from a fisheries perspective. This energy crisis affecting Baltic Sea cod shows that restrictions on fishing are no longer sufficient for stock recovery alone. Rather, the food web itself must be restored. However, this can only be achieved if all possibilities are exploited across border get the overfertilization under control. Nutrient input from agriculture has led to this situation. Natalie Loick-Wilde sums it up: “People usually only notice that something fundamental has changed in the ecosystem when 90 per cent of the energy no longer reaches the end of the food chain, but only ten per cent. Then entire fisheries, such as cod fishing in the Baltic Sea

or smelt fishing in the tidal Elbe, collapse. The trophic position of key species offers a new gold standard for determining the health of food webs in aquatic ecosystems.” The study was funded by the Federal Ministry of Research, Technology and Space (BMFTR) as part of the BluEs project (short for: Blue_Estuarines – Sustainable Estuary Development under Climate Change and Other Stressors).

CONTCAT PERSON

Dr. Natalie Loick-Wilde

PUBLICATION

 Steinkopf, M., U. Krumme, D. Schulz-Bull, D. Wodarg and N. Loick-Wilde (2024): Trophic lengthening triggered by filamentous, N₂-fixing cyanobacteria disrupts pelagic but not benthic food webs in a large estuarine ecosystem, Ecology and Evolution. doi.org/10.1002/ece3.11048



Algae street in the Baltic Sea crossed by the research vessel “Meteor”
© Raeke, DWD



To ensure that computer simulations adequately reflect reality, comparative measurements are necessary on site, such as here near the mouth of the Elbe in the German Bight. © Holtermann, IOW

SALT, BRACKISH, FRESH: HOW CIRCULATION AND MIXING DETERMINE THE EXCHANGE BETWEEN THE SEA AND THE COAST

Estuaries, i.e. bodies of water such as river mouths, where fresh water from the land meets salt water from the sea, play an important role in the coastal habitat. They serve, for example, as nurseries for fish, transport sediments from the land to the coast and can regulate the influx of nutrients and pollutants like a filter. Their dynamics are determined by the differences in density between fresh and salt water: the denser salt water from the sea flows upstream at the bottom, i.e. towards the land. Above it, less dense fresh water flows seaward, gradually mixing with the salt water below and thus leading to a brackish outflow into the sea. In the Warnow, which flows into the tide-free Baltic Sea, we can observe this so-called estuarine circulation directly, whereas in waters influenced by tides, such as the Elbe estuary or the Chinese Pearl River estuary, it only becomes visible after an averaging about the tides.

Whether with or without tides, it is estuarine circulation that regulates transport processes in estuaries. In order to understand how sediments, nutrients and pollutants, but also fish larvae and plankton are distributed in estuaries, we must therefore understand

estuarine beeinflussen. Circulation and understanding the factors that influence it. The time, place and mechanics of the mixing of fresh and salt water to form brackish water play a key role here, because if the two water masses do not mix, there is no circulation and no exchange between the estuary and the sea.

In order to investigate the relationship between mixing and estuarine circulation, variables such as salinity, currents and turbulence – which causes mixing – must be known in high temporal and spatial resolution. Since measurements alone cannot meet this requirement, researchers from the “Processes in Estuaries and Coastal Seas” working group at the IOW used high-resolution computer simulations of the Warnow, Elbe and Pearl River to create maps showing where water exchange with the sea takes place in the estuary. It was found that this has a two-layer structure: on each area of constant salinity (i.e. “isohaline”), there is an inflow towards land near the bottom, in the upstream part of this area. At the other end, i.e. seaward near the surface, water flows through the iso-haline towards the sea.

The water exchange through individual iso-halines, which is closely related to mixing, thus has the same structure as the estuarine circulation described above, which covers the entire body of water, and could now be directly related to it by deriving a mathematical equation. However, the maps also show that the water exchange is not equally strong everywhere. There are regions where it is increased, which is directly related to topographical features. In the Elbe, for example, these are the turbulent edges of the shipping channel, which mix particularly effectively.

The Baltic Sea, with its many freshwater sources and salty inflows from the North Sea, can also be understood as an estuary, for which the spatial structure of water exchange has also been demonstrated. Here, hotspots were found along the boundaries of the individual basins and around islands.

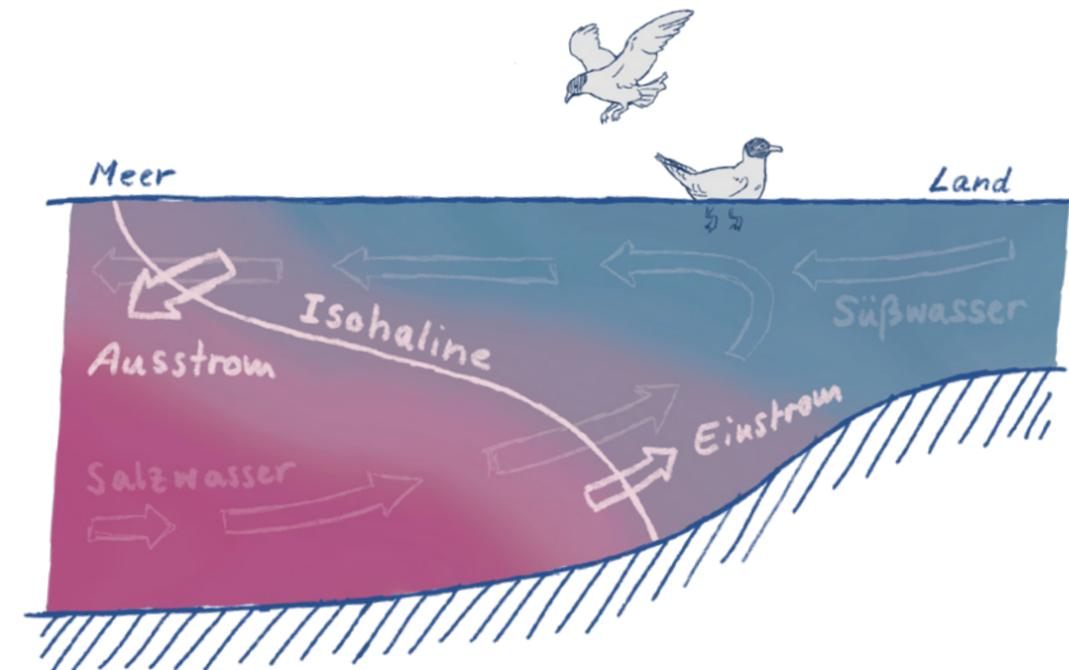
Current work by the research group is now using the knowledge gained to identify individual processes of local mixing underlying estuarine circulation, such as the specific mechanisms along the Elbe shipping channel.

CONTACT PERSON

Dr. Lloyd Reese

PUBLICATION

 Reese, L., U. Gräwe, K. Klingbeil, X. Li, M. Lorenz and H. Burchard (2024). Local mixing determines spatial structure of diahaline exchange flow in a mesotidal estuary: A study of extreme runoff conditions. *J. Phys. Oceanogr.* 54: 3-27, doi: 10.1175/JPO-D-23-0052.1



Longitudinal section through an estuary (sea on the left, river on the right). The arrows represent the estuarine circulation, in which the inflowing salt water (magenta) mixes with the fresh water (blue) and leads to a brackish outflow.

© Reese, IOW

RESEARCH AREA 2 – “COASTAL SEAS IN TRANSITION”

Only when we understand the natural variability of our coastal seas and all its implications can we identify the changes caused by humans. We conduct interdisciplinary research to understand the current state of the Baltic Sea and reconstruct past ecosystem conditions, and we make projections for the future under changing climate conditions and human influence. As actors with the tools to restore a good ecological status, humans must shape the future of the coastal sea.

TRACES OF ICE AGE HUNTERS DISCOVERED IN THE BALTIC SEA

The research team actually wanted to investigate manganese crusts on a marl ridge about 10 km before Rerik at the bottom of the Bay of Mecklenburg. They noticed a 970 m long, regular stone structure. It consists of up to 1,500 tennis ball to football-sized stones, which connect several large boulders to form a wall up to 1 m high. The Baltic Sea is now 21 metres deep at the site of the discovery. The stone wall must therefore have been erected before the water level rose sharply after the end of the last ice age. This last happened around 8,500 years ago. Scientists from the IOW, the interdisciplinary Kiel Marine Science at Kiel University,

the University of Rostock, the Centre for Baltic and Scandinavian Archaeology in Schleswig at the Leibniz Centre for Archaeology (LEIZA-ZSBA), the German Aerospace Centre (DLR), the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI) and the State Office for Culture and Monument Preservation (LAKD) Mecklenburg-Western Pomerania have used modern geophysical methods to create a detailed 3D model of the wall and reconstructed the structure of the surrounding subsoil. Sediment samples from the basin to the south provided evidence of the possible age of the linear structure. “The investigations have confirmed that a natural origin is just as unlikely as a deliberate construction in modern times, for example through construction work

to lay submarine cables or stone fishing. The stones are too methodically and regularly arranged for that,” explains Dr. Jacob Geersen.

“The investigations have confirmed that a natural origin is just as unlikely as a construction in modern times[...].”

DR. JACOB GEERSEN

3D model of a section of the stone wall (scale, bottom edge of image: 50 cm). The tennis ball to football-sized stones that form the approximately 1 km long wall are clearly visible.

@ Auer, LAKD M-V

Graphical reconstruction of the stone wall discovered at the bottom of the Baltic Sea as a drive hunting structure, based on bathymetric data and an underwater 3D model © Grabowski

If we rule out natural or modern origins, the only possible time for the construction of the stone wall is after the end of the last ice age (about 12,000 years ago), when the landscape was not yet flooded by the Baltic Sea. “The wall probably served to corner the reindeer at the edge of a lake so that they could be killed by Stone Age hunters with hunting weapons”, explains Dr. Marcel Bradtmöller from the University of Rostock. Around 11,000 years ago, as the climate warmed and forests spread, the last reindeer and the last migratory. As herd animals disappeared from our latitudes, the stone wall cannot have been erected after this date. This would make the stone wall the oldest human structure ever discovered in the Baltic Sea.

The stone row discovered in 2021 is now the starting point for further research. Based on the site in Mecklenburg Bay, geophysical, geological and underwater archaeological logical investigations reconstructed the environmental conditions of that time and addressed the question of human origin and cultural function. This facility will help to clarify these questions. However, potential megastructures in the Flensburg Fjord and Fehmarn Sound, which have hardly been

scientifically explored to date, will also be analysed in detail using high-resolution mapping. The aim is to reconstruct a more comprehensive picture of the formerly terrestrial cultural landscapes at the bottom of today’s Baltic Sea, thereby gaining new insights into the way of life of early Stone Age hunters and gatherers and opening up new perspectives on the early historical development of Northern Europe.

CONTACT PERSON

Dr. Jacob Geersen

PUBLICATION

 Geersen, J., M. Bradtmöller, J. Schneider von Deimling, P. Feldens, J. Auer, P. Held, A. Lohrberg, R. Supka, J. J. L. Hoffmann, B. V. Eriksen, W. Rabbel, H.-J. Karlsen, S. Krastel, D. Brandt, D. Heuskin and H. Lübke (2024): A submerged Stone Age hunting architecture from the Western Baltic Sea Proceedings of the National Academy of Sciences: doi.org/10.1073/pnas.2312008121

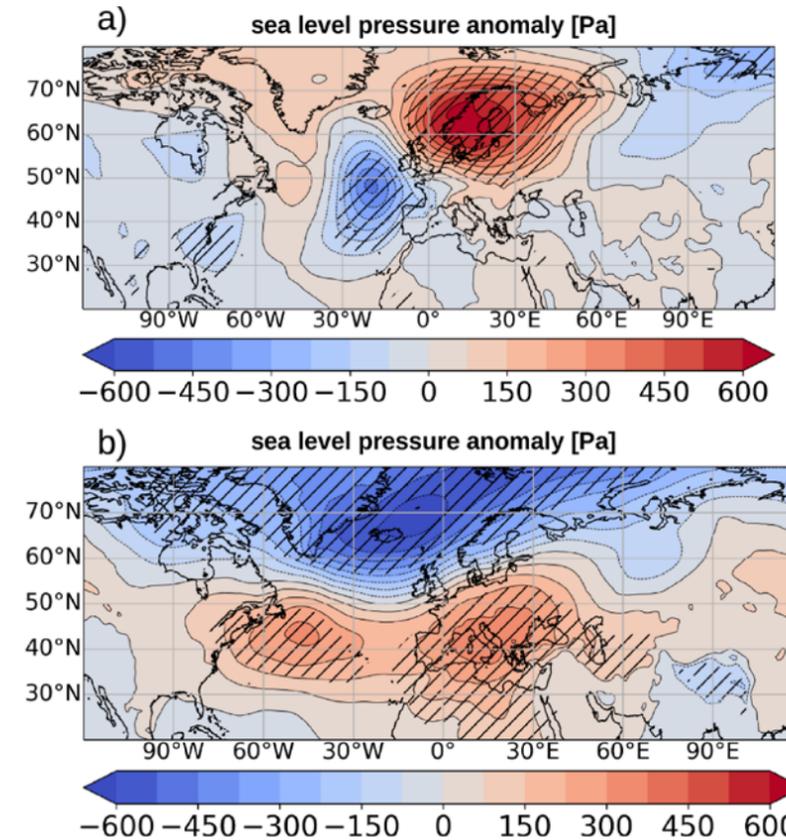
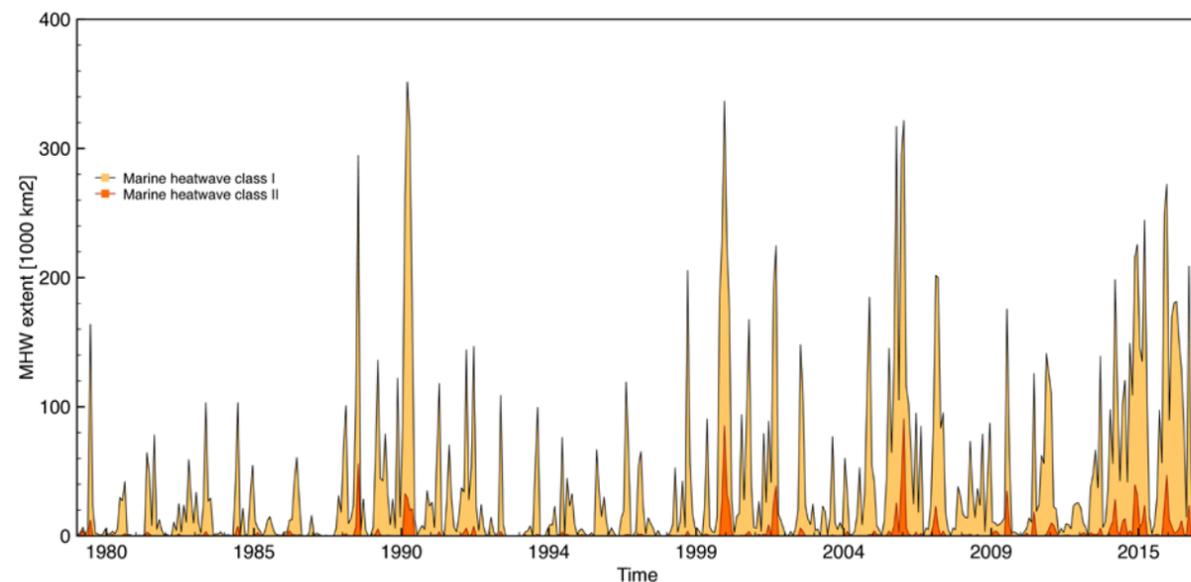
MARINE HEAT WAVES IN THE BALTIC SEA: CAUSES AND EFFECTS

It is becoming clearer than ever that the climate is continuing to heat up. Global warming is affecting the oceans, and the Baltic Sea in particular, with a warming of more than 1 °C over the last three and a half decades, is one of the fastest warming marine regions in the world. In addition to general ocean warming, marine heatwaves are causing problems for marine ecosystems. These are temporary periods during which the temperature of the upper layers of seawater exceeds a threshold typical for the respective region and season for at least five days. Over the last century, such heatwaves have been recorded more frequently worldwide: an international study shows that they have been occurring more often and lasting longer since 1925, leading to over 50 per cent more marine heatwave days per year in some areas.

In order to understand the occurrence of heat waves in marginal and inland seas in general, and in the Baltic Sea in particular, an IOW research team led by Baltic Sea climate experts Matthias Gröger and Markus Meier evaluated enormous meteorological data sets spanning more than three decades. In doing so, they identi-

fied anomalies in the large-scale air pressure patterns and wind systems over the North Atlantic and Europe that lead to heat waves in the Baltic Sea. During the summer months, it is the stable high-pressure systems over Scandinavia that cause the heat waves – not only due to strong solar radiation and high air temperatures, but above all due to the exceptionally weak winds under such conditions. The latter prevents the increasingly warm surface water from mixing with cold water from the depths, causing the heat to accumulate in the upper water layers. But heat waves are also possible in the Baltic Sea in winter. They occur whenever prolonged strong westerly winds transport warm, moist air masses from the Atlantic to Europe, causing the Baltic Sea to cool less than usual for this time of year. The data evaluated in the study between 1980 and 2016 also show that both summer and winter heat waves in the Baltic Sea are becoming more frequent, lasting longer and affecting increasingly larger areas.

Average annual surface extent of marine heatwaves in the Baltic Sea. Yellow: moderate heatwaves. Red: severe heatwaves. @ IOW



a) air pressure anomaly during marine heat waves during the summer months (June-October) @ IOW

b) air pressure anomaly during marine heat waves during the winter months (December-March) @ IOW

Another study by the IOW shows that heat waves can have a concrete impact on vital environmental parameters. To this end, researchers analysed model data from five decades (1970 to 2020). For the first time, they also investigated the extent to which summer heat waves spread into the depths, with a particular focus on the shallow coastal areas of the Baltic Sea, which are actually considered to be permanently well “aerated” and therefore robust against oxygen deficits. The results of this study were surprising and alarming. They show that summer heat waves often penetrate to a water depth of about 20 metres to the sea floor, where they locally reduce the oxygen content of the water. Summer oxygen concentrations can generally be very low at the sea floor in coastal areas and now sometimes fall below 2 ml/litre, a critical threshold below which life is no longer possible for many higher organisms such as mussels, worms, crabs and fish. As the Baltic Sea is one of the fastest warming regions of the world’s oceans, there is a high risk that marine heat waves, together with further climate warming, will

increasingly cause critical oxygen deficits for bottom fauna, with farreaching consequences for the entire ecosystem.

CONTACT PERSONS

Prof. Dr. Markus Meier, Dr. Matthias Gröger

PUBLICATIONS

 Gröger, M., C. Dutheil, F. Börgel and H. E. M. Meier (2024): Drivers of marine heatwaves in a stratified marginal sea. *Climate Dynamics* 7062, DOI:10.1007/s00382-023-07062-5

 Safonova, K., H. E. M. Meier and M. Gröger (2024): Summer heatwaves on the Baltic Sea seabed contribute to oxygen deficiency in shallow areas. *Commun Earth Environ* 5, 106. doi.org/10.1038/s43247-024-01268-z

RESEARCH AREA 3 – “EMERGING TECHNOLOGIES IN COASTAL RESEARCH”

Innovative technologies are a driving force for future-oriented science. New ways of linking diverse research data, increasing computing power, new molecular biology approaches, and the use of machine learning and artificial intelligence to analyse big data all confirm the importance of methodological research for environmental and marine sciences. With the potential of new technologies to enable cutting-edge research, the IOW strives to drive social change towards sustainability. In this context, two new working groups, “Bioinformatics and omics data science” and “Integrated Optical Remote Sensing,” were established in 2024.

REDUCING ALGAL BLOOMS LEADS TO A DECREASE IN PATHOGENIC VIBRIO IN THE BALTIC SEA

Climate change is leading to increased proliferation of the pathogenic bacterium *Vibrio vulnificus* on brackish water coasts. *V. vulnificus* infections are often fatal, posing a serious threat to public health and offshore aquaculture and potentially damaging tourism. As part of the project led by Prof. Dr. Matthias Labrenz (head of the working group Environmental Microbiology at the IOW) the EU project “Pathogenic Vibrio bacteria in the current and future waters of the Baltic Sea: Mitigating the Problem” (BaltVib) investigated whether previously proposed regulatory measures to reduce the occurrence of *V. vulnificus*, such as the renaturation of seagrass beds, could also be applied to the Baltic Sea. The research team consisted of experts from various research institutions in the Baltic Sea coastal states of Germany, Denmark, Sweden, Finland, Estonia, Lithuania and Poland, who jointly developed strategies to reduce health risks and protect marine ecosystems.

In the summer of 2021, a team of researchers led by Prof. Dr. Matthias Labrenz and his doctoral student David Riedinger took field samples inside and outside seagrass beds, along the salinity and nutrient gradients of the Baltic Sea, one of the largest brackish water areas in the world. Physical, biological and hydrochemical parameters were measured. Machine learning was then used to identify the variables that explain the occurrence of *V. vulnificus*. The best predictive variables for *V. vulnificus* were eutrophication-related characteristics such as particulate organic carbon and nitrogen, as well as the occurrence of potential algal blooms and associated species. Surprisingly, the occurrence of *V. vulnificus* did not vary significantly between seagrass beds and seagrass-free areas. These results suggest that further reduction of nutrient inputs into the Baltic Sea is an effective method of controlling the *V. vulnificus* populations on nutrient-rich brackish water coasts. This study (Riedinger et al. 2024) thus

provided a scientific basis for future regulatory strategies (see figure) that not only protect public health but also minimise ecological and economic consequences.

The BaltVib project was funded by the European Union as part of the BiodivERSA funding programme for three years until spring 2024 and aimed to investigate the spread and control of the pathogenic bacterium *Vibrio vulnificus* in the Baltic Sea.

Schematic overview of the ways in which eutrophication affects the proliferation of *V. vulnificus*. The inflow of inorganic nutrients from land induces algal blooms, which provide the organic material needed for the reproduction of *V. vulnificus* and also offer protection from bacterivorous plankton. Organisms that are thought to play a key role in this process are named and potential interactions are indicated by arrows.

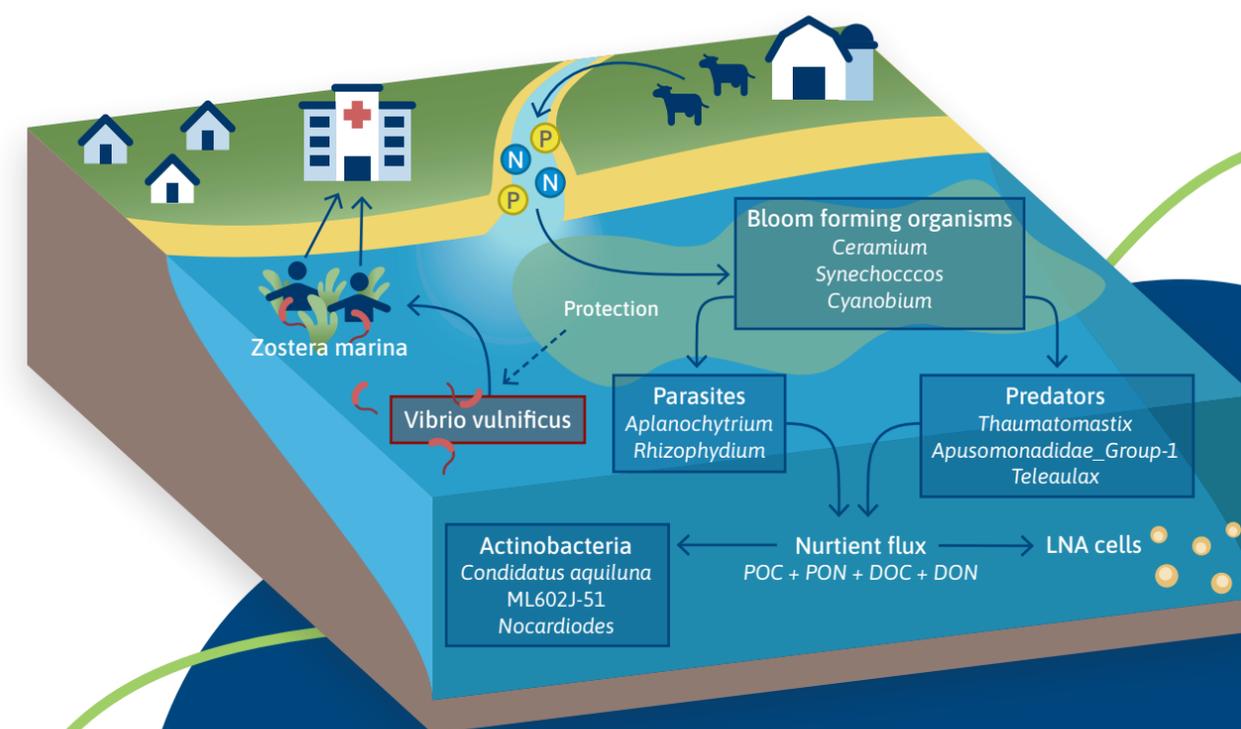
© Riedinger, IOW

CONTACT PERSON

Prof. Dr. Matthias Labrenz

PUBLICATION

 Riedinger, D. J., V. Fernández-Juárez, L. F. Delgado, T. Sperlea, C. Hassenrück, D. P. R. Herlemann, C. Pansch, M. Kataržytė, F. Bruck, A. Ahrens, M. Rakowski, K. Piwosz, A. Stevenson, T. B. H. Reusch, G. Gyraitė, D. Schulz-Bull, H. Benterbusch-Brockmüller, S. Kube, S. Dupke, A. F. Andersson, L. Riemann and M. Labrenz (2024). Control of *Vibrio vulnificus* proliferation in the Baltic Sea through eutrophication and algal bloom management. *Commun. Earth Environ.* 5: 246, doi: 10.1038/s43247-024-01410-x



PROGRESS IN NUMERICAL MODELLING ENABLES MORE ACCURATE PROJECTIONS

With the continuous development of internationally used models for ocean turbulence (GOTM, gotm.net), ecosystems (ERGOM, ergom.net) and hydrodynamics (GETM, getm.eu), the IOW is laying the foundation for its expertise in regional ocean modelling and for a large number of publications based on this expertise. Model development is not only a service for research and society, but also represents an independent scientific discipline. In 2024, the IOW successfully completed decisive development work and published it in renowned scientific journals.

Developed for regional climate studies Dr. Sven Karsten from the working group “Dynamics of Regional Climate Systems” and colleagues have developed a coupled Earth system model, the core of which is a novel component for the modular coupling of models for the ocean, sea ice, waves and atmosphere (Karsten et al. 2024). The coupling component enables the consistent calculation of mass, momentum and heat fluxes between the ocean and atmosphere on a high-resolution exchange grid, thus providing more realistic regional climate projections (see grid figure).

Furthermore, as part of the DFG Collaborative Research Centre TRR 181 on energy transfer in the atmosphere and ocean, the IOW is leading several sub-projects aimed at improving the energetic consistency of ocean models. In particular, the IOW shares its expertise in the development of numerical methods for hydrodynamic model cores. In this field of research, Dr. Knut Klingbeil from the working group “Processes in Estuaries and Coastal Seas”, together with

colleagues from the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI), significantly improve the national climate model FESOM. A new solution algorithm with higher accuracy and better performance (Banerjee et al. 2024, GMD) and a new analysis method for quantifying false mixing and water mass transformation in ocean models (Banerjee et al. 2024, OCEMOD) were implemented.

CONTACT PERSONS

Dr. Sven Karsten, Dr. Knut Klingbeil

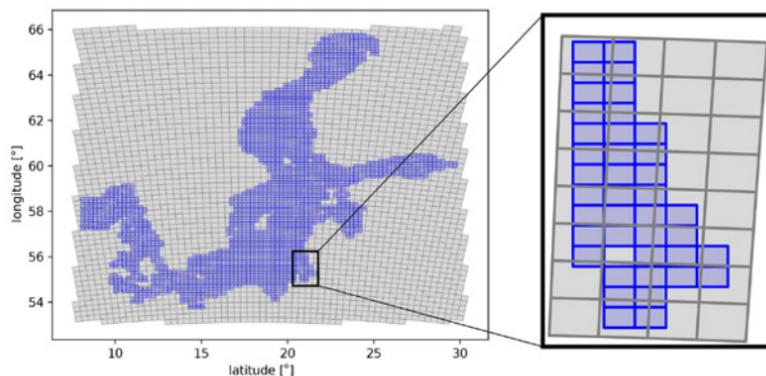
PUBLICATIONS

 Karsten, S., H. Radtke, M. Gröger, H. T. M. Ho-Hagemann, H. Mashayekh, T. Neumann and H. E. M. Meier (2024). Flux coupling approach on an exchange grid for the IOW Earth System Model (version 1.04.00) of the Baltic Sea region. *Geosci. Model Dev.* 17: 1689-1708, doi: 10.5194/gmd-17-1689-2024.

 Banerjee, T., S. Danilov, K. Klingbeil and J.-M. Campin (2024). Discrete variance decay analysis of spurious mixing. *Ocean Model.* 192: 102460, doi: 10.1016/j.ocemod.2024.102460

 Banerjee, T., P. Scholz, S. Danilov, K. Klingbeil and D. Sidorenko (2024). Split-explicit external mode solver in the finite volume sea ice-ocean model FESOM2. *Geosci. Model Dev.* 17: 7051-7065, doi: 10.5194/gmd-17-7051-2024

A fundamental problem with regional Earth system models is the different grid resolutions of the model components (atmosphere, ocean, land, ice, etc.), which must be coupled in order to communicate their respective states with each other and calculate flows realistically. © Source: <https://gmd.copernicus.org/articles/17/1689/2024/>.



S2B

RESEARCH FOCUS – “SHALLOW WATER PROCESSES”

With the research focus established in 2023 as a “small institute expansion”, the IOW’s research portfolio will be expanded to include shallow water processes and their relevance for the entire Baltic Sea. The research work, summarised under the title “Shallow Water Processes and Transitions to the Baltic Scale” (S2B = “shore to basin” for short), will be integrated into all three research areas of the IOW research programme and focuses on the hitherto little-studied area of the interface between land and sea.

TECHNOLOGY DEVELOPMENT AND SAMPLING IN SHALLOW WATER AREAS

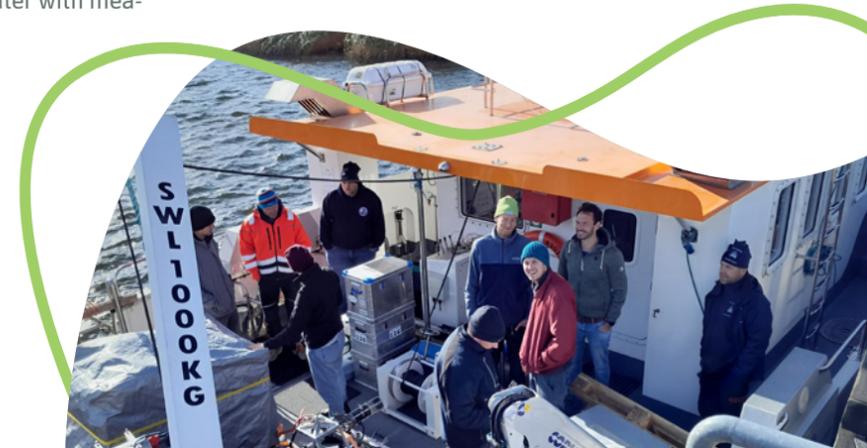
The launch of the new research focus into its first full year of operation has been successful and multifaceted. Seminars, excursions, workshops and extensive planning have been carried out. The new employees have successfully acquired projects, and master’s and doctoral theses have been started. Initial results confirm the expectation of dynamic and land-influenced processes.

The new research focus started with an official kick-off meeting at the IOW on 22 January 2024. A new series of lectures organised by S2B was established, taking place on the first Monday of every month with guest speakers or internal reports from employees. In addition, there were monthly sampling trips to the Nienhagen reef off the coast of the Baltic Sea resort of Nienhagen near Rostock, as well as numerous discussions on the development of suitable technology for shallow water areas: for example, an anchorage for shallow water with mea-

suring probes at very close intervals of 3-4 metres and tests and commissioning of the complex systems of the imaging flow cytometer for phytoplankton detection (Imaging Flow Cytobot, IFC) and the Edna sampler for automated sampling genetic material were implemented. Regular support from the diving group was instrumental in obtaining sediment samples and deploying the landers at the Nienhagen reef.

At the same time, the biogeochemical modelling group began setting up initial sensitivity experiments on the role of coasts in a coarser resolution ocean model and developing the ROBOELF model infrastructure, which will make it possible for the first time to carry out parameter studies of complex biogeochemical models in large numbers using graphical processing units (GPUs).

Limanda research catamaran from the University of Rostock in the port of Rostock-Marienehe, shortly before departure for the measurement campaign in October 2024. The newly developed STB lander (left) and the chamber lander can be seen. © Holtermann, IOW



Participants in the stakeholder workshop on 13 November 2024 in the IOW hall.
© von Thenen, IOW



STAKEHOLDER-WORKSHOP

One of the goals of S2B is to make the results usable in practice. For this reason, stakeholder workshops have been held from the outset. The first took place on 13 November 2024 on the topic of “Challenges in shallow coastal waters”. Representatives from state offices and authorities, the scientific community and civil society interest groups were invited. The workshop, organised by Miriam von Thenen (Deputy Head of the “Coastal Seas and Society” working group at the IOW), was structured into three working blocks: “Recording” and “Understanding” the shallow water zone and “Extrapolating” model applications to larger areas of the Baltic Sea.

INITIAL SCIENTIFIC WORK

Four scientific areas of work are being pursued in The following are representative of the S2B:

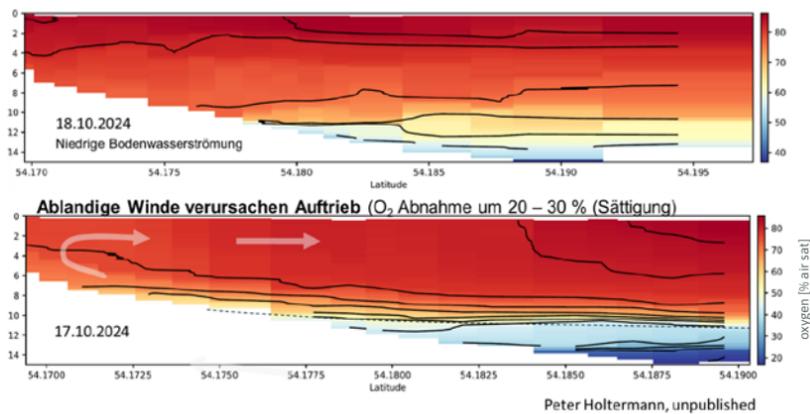
(1) In spring 2024, Ingrid Sassenhagen, Daniel Herlemann and Jörg Dutz designed and conducted a laboratory experiment to investigate the effects of sediment resuspension in shallow waters on the recruitment of microorganisms from resting stages into the water column and the changes in the plankton commu-

nity. This complex experiment showed significant changes in several organisms and biochemical conditions in response to the experimental treatment.

(2) Natural organic matter (NOM) is an important carbon sink that Jann Müller and Helena Osterholz are investigating. Samples were taken weekly for a year and characterised using optical methods. The influence of terrestrial and marine NOM on the photodegradation of new pollutants is also to be clarified.

(3) A year-long study of nitrogen turnover in coastal waters was continued, and initial preliminary results indicate both denitrification and dissimilatory reduction of nitrate to Ammonium (DNRA) as important sales, whereby DNRA has hardly been recorded regularly to date.

(4) A measurement campaign with the research catamaran “Limanda” from the University of Rostock was able to measure a sudden occurrence of oxygen-depleted water at the bottom near Nienhagen on two consecutive days (see figure). This phenomenon, as well as all other work that is the focus of the S2B investigations, will be studied intensively in the coming years.



Data on oxygen saturation along a transect at the Nienhagen reef (west of Warnemünde off the Baltic resort of Nienhagen) on two consecutive days, showing high dynamics in bottom oxygen © Holtermann, IOW

LTO

LONG-TERM OBSERVATIONS

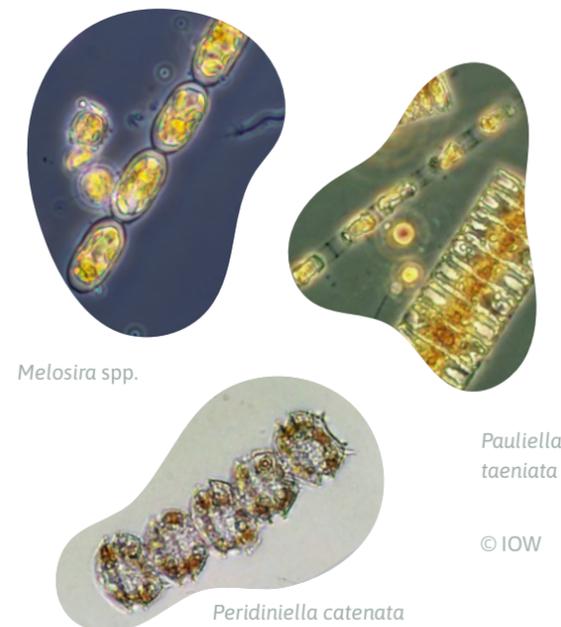
Long-term data are an important basis for identifying and forecasting developments, trends and processes in the past, present and future. For decades, the IOW has been collecting various biological, chemical, physical and geological data from the seabed and water column, from the western to the central Baltic Sea and, more recently, also in the north. In the western Baltic Sea, the IOW’s long-term observation programme is mainly carried out on behalf of the Federal Maritime and Hydrographic Agency (BSH) as part of Germany’s contribution to monitoring the marine environment of the Baltic Sea under the Helsinki Convention (HELCOM). The data is freely available in the institute’s own database and is also posted on the relevant national database portals. This gives the IOW a unique archive with high spatial and temporal resolution of the Baltic Sea.

THE OCCURRENCE OF COLD-WATER ALGAE IN THE BALTIC SEA – INCREASINGLY INFLUENCED BY CLIMATE CHANGE?

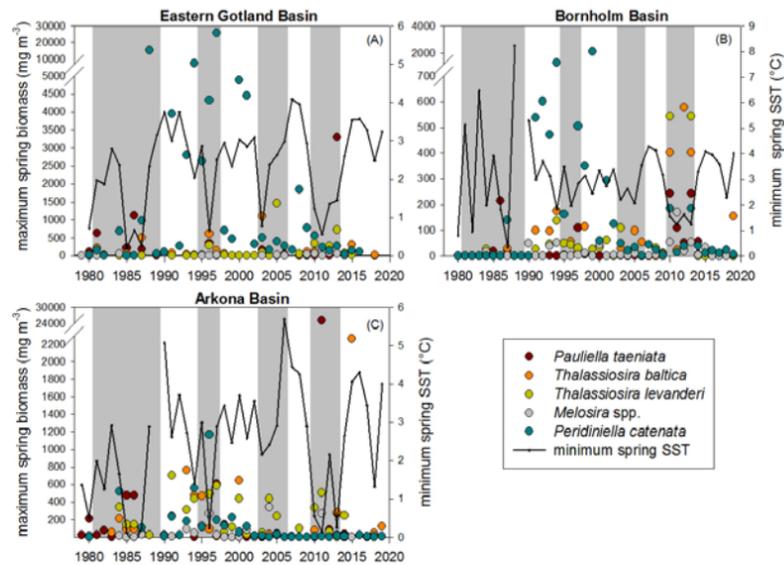
Backwater and ice-associated diatoms and dinoflagellates dominate the phytoplankton (microalgae community) during spring blooms in the northern and eastern basins of the Baltic Sea. As in polar regions, some of these species can already form large blooms in and under the sea ice. The diatom *Pauliella taeniata* even occurs only at water temperatures around freezing point. Ice cover and the surface temperature of the water therefore play a decisive role for these species

data collections of the IOW and ICES (HELCOM) as well as the BED database (Baltic Environmental Database) were used for this purpose.

In the central and southern Baltic Sea, cold-water algae occur less frequently and with irregular dynamics. in the biomass. The increase in surface water temperature of up to 1.5 °C in spring over the last few decades and an increasing decline in ice cover in winter due to climate change suggest that the occurrence of many cold-water algae has already changed significantly. To answer this question, a DFG project used long-term monitoring data from the last 20 and 40 years from the southern and central Baltic Sea for five typical cold-water algae to analyse: the diatoms *Pauliella taeniata*, *Thalassiosira baltica*, *Thalassiosira levanderi*, *Melosira* spp. and the dinoflagellate *Peridiniella catenata*. The



© IOW



Maximum biomass (mg m⁻³) of cold-water algae per year during the spring bloom and the corresponding minimum sea surface temperature (SST). Grey areas in the background symbolise identified periods with high biomasses of cold-water algae in the southern and central Baltic Sea. © Paul, IOW

It has been shown that in the 1980s and in periods from 1995 to 1997, 2003 to 2006 and 2010 to 2013, diatoms occurred in high biomass concentrations in all areas, as can be seen in the adjacent figure. These periods correlated with prolonged ice cover throughout the Baltic Sea and low water temperatures in winter and spring. Since 2013, the biomass of coldwater diatoms in particular has declined sharply in all areas studied, and larger blooms have ceased to occur altogether, correlating with the significant increase in water temperature. The results suggest that these species may soon disappear completely from the southern basins. The decline of the dinoflagellate *Peridiniella catenata*, however, remains a mystery, as its dynamics appear to be less strongly linked to these environmental factors. Further research is needed to elucidate the presumably complex causes.

But how are larger blooms of cold-water algae actually formed in the central Baltic Sea? Similar to plants, many phytoplankton species form resting stages that sink into the sediment after blooming and germinate again under favourable environmental conditions. However, the central Baltic Sea is too deep to form blooms in this way and is also rarely covered by ice, except in coastal areas. The model analyses were able to prove for the first time that the origin of coldwater algae blooms in the central Baltic Sea lies in the Gulf of Finland and the Gulf of Riga. After cold, ice-rich winters, a significant proportion of the meltwater and thus also large quantities of cold-water algae are trans-

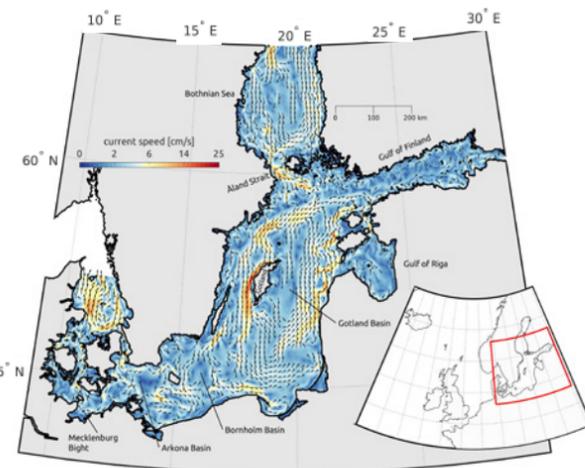
ported for south by surface currents. This then forms the origin of the blooms in the eastern Gotland Basin and in some years even influences the blooms in the Bornholm Basin and Arkona Basin.

CONTACT PERSON

Dr. Carolin Paul

PUBLICATION

 Paul, C., U. Gräwe and A. Kremp (2023). Long-term changes in bloom dynamics of Southern and Central Baltic cold-water phytoplankton. *Front. Mar. Sci.* 10: 1212412, doi: 10.3389/fmars.2023.1212412



Surface currents in the Baltic Sea. © Gräwe, IOW

RDM

RESEARCH DATA MANAGEMENT

Research data form the basis of scientific work. At the IOW, they are based on measurements or observations taken from the air, at sea or in the laboratory, as well as on model simulations. Careful research data management is essential in this context, as it ensures the validation of data, secure storage and long-term archiving, public accessibility and citability, as well as the accurate use of data in terms of content and context.

The IOW works closely with stakeholders from the fields of IT & data management, science and the library support researchers in their data management. Information events are held to explain the basics of handling research data in accordance with the internationally applicable FAIR principles, to present options for storing, long-term archiving or sharing data in collaborations, and to provide tips on publishing data with persistent identifiers (such as DOI). Particular attention is paid to in-house infrastructures, such as the oceanographic database IOWDB, the database search tool ODIN and the metadata catalogue IOWMETA.

The IOW data management team attends national and international conferences and meetings. Currently, the IOW is also organising and coordinating the central data management for the CDRmare research mission of the German Alliance for Marine Research (DAM). This involves lively, productive exchanges with all parties involved, in particular the DAM core area “Data Management and Digitisation”, the other DAM research missions sustainMare and mareXtreme, and the PAN-GAEA data repository.

In addition, in September 2024, the IOW successfully applied for membership in NFDI4Earth, the consortium for Earth system research of the National Research Data Infrastructure (NFDI). Specifically, this activity is supported by the “User SupportNetwork” of NFDI4Earth, through which user enquiries about aspects of FAIR handling of research data and related infrastructures

be answered. Here, the IOW can contribute its expertise in oceanographic databases, data curation and model data server solutions. The IOW has also applied for a second funding phase of NFDI4Bio-diversity, the NFDI consortium for the shared use of biodiversity and environmental data. There, it will contribute to improving the availability and FAIRness of data on marine biodiversity in the future.

CONTACT PERSONS

Dr. Susanne Feistel, Dr. Manja Placke

PUBLICATION

 Höring, F., Boxhammer, T., Feistel, S., Felden, J., Heins, A., Hoppe, K., Krüger, M., Mehrrens, H., Placke, M., Terzijska, D., Wiemer, G. & Wittmann, A. C. (2025). Empfehlungen zum Forschungsdatenmanagement für DAM-Forschungsemissionen und Verbünde (Version 3). Zenodo. <https://doi.org/10.5281/zenodo.15430225>

MARINE DATA

NFDI 4 BIODIVERSITY

PANGAEA
Data Publisher for Earth & Environmental Science

NFDI4Earth



The floating offshore wind turbine (DemosATH) is located off the coast of Bilbao and, together with the "Life Boosting Units" (top right, opposite page), represents one of four hybrid blue-grey infrastructures used in TRANSEATION. © saitec

NEW PROJECTS

In 2024, 33 third-party funded projects began (some of which in a coordinating role). The funding bodies include the European Union (particularly as part of the EU research framework programme Horizon Europe), the German Research Foundation (DFG), the Federal Ministry of Research, Technology and Space (BMFTR) and other federal ministries. Selected projects are presented in the following chapter. A complete list of all projects worked on in 2024 can be found in the appendix.

TRANSEATION

Advancing Ecosystem-Based Management through Hybrid Blue-Grey Infrastructures in Marine and Coastal Areas

In the EU project TRANSEATION, the IOW is working with partners from eight countries to investigate how technical coastal infrastructures such as breakwaters, offshore wind farms and aquaculture facilities can be ecologically enhanced and integrated into marine ecosystems. The aim is to develop a management approach that combines nature-based solutions with technology and digitalisation to protect biodiversity and ecosystem services. Four case studies in Spain, France and Israel examine hybrid systems, evaluating their effectiveness and assessing their transferability. The IOW is contributing the System Approach Framework (SAF) – a structured, participatory approach to planning, implementation and evaluation of ecosystem-based solutions.

FUNDING PERIOD

01/2024 – 06/2027

FUNDING

EU – Horizon Europe

PROJECT MANAGEMENT AT IOW

Dr. Johanna Schuhmacher, Dr. Ibrahim Boubekri

WEBSITE

<https://transeation-europeanproject.eu/>



Moorklimaschutz

Model project for climate protection through peatland restoration

In this project, 12 degraded coastal polders (totalling 1400 ha) on the Baltic Sea coast of Vorpommern are being ecologically restored through rewetting in order to investigate their function as carbon sinks. Researchers at the IOW led by Prof. Dr. Maren Voß and Dr. Sophie Kache, in cooperation with the University of Greifswald and the Baltic Sea Foundation (coordination), are investigating material and gas flows – especially nitrogen compounds – using long-term monitoring data. Four selected polders along the coast are being sampled, which are being renaturalised in different ways and connected to the adjacent coast. The ten-year project duration allows for observations before, during and after renaturation, thus offering a unique opportunity to analyse emissions and material conversion processes. The results will be used to develop sound strategies for renaturation measures with low nutrient and greenhouse gas emissions. The model project is part of the national "Natural Climate Protection Action Programme" (ANK).

Project kick-off (from left): Maren Voß (IOW), Georg Nikelski (OST-SEE-STIFTUNG), Steffi Lemke (Federal Minister for the Environment), Balázs Baranyai (OSTSEESTIFTUNG), Till Backhaus (Minister for the Environment of Mecklenburg-Western Pomerania), Gerald Jurasinski (University of Greifswald) © Krone, OSTSEESTIFTUNG



FUNDING PERIOD

03/2024 – 03/2034

FUNDING

Federal Agency for Nature Conservation (Natural Climate Protection Action Programme)

PRINCIPAL INVESTIGATOR (PI) AT IOW

Prof. Dr. Maren Voß

WEBSITE

<https://www.iow.de/project/338/moorklimaschutz.html>



TRR 181

Energy transfer in atmosphere and ocean

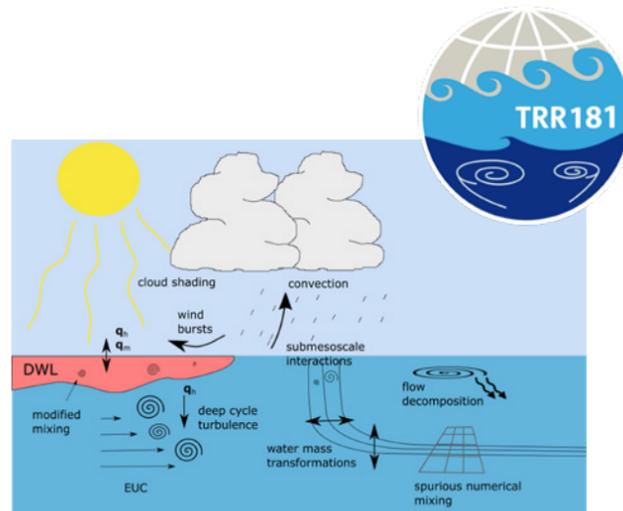
TRR 181 “Energy transfer in atmosphere and ocean” is a special programme funded by the DFG, coordinated by the University of Hamburg, which has been investigating energy transport between the ocean and the atmosphere since 2016 – a key aspect for the further development of climate-relevant models. In the third funding phase, the IOW is contributing its many years of expertise, particularly in the field of physical oceanography. It examines how internal waves, currents and eddies affect mixing processes and how these processes influence the energy balance in the ocean. The Baltic Sea serves as a model system for purposive measurements and simulations. The aim is to improve the physical consistency of climate models in order to better represent the smallest energy imbalances – because these in particular can have far-reaching global consequences.

FUNDING PERIOD

07/2024 – 06/2028

FUNDING

German Research Foundation



Graphic representation of the IOW's research in the third funding phase of TRR 188 “Energy transfer in the atmosphere and the ocean” (DWL: Diurnal Warm Layer; EUC: Equatorial Undercurrent; q_h : Heat flux through the surface; q_m : Impulse flux through the surface)
© Umlauf, IOW

PRINCIPAL INVESTIGATOR (PI) AT IOW

Prof. Dr. Hans Burchard

WEBSITE

<https://www.trr-energytransfers.de>



STATUS

Status of the functions of biogenic reefs in the Baltic Sea with a focus on carbon fixation

This project investigates sublittoral mussel beds and biogenic reefs in the German Baltic Sea with regard to their blue-carbon potential – that is, their capacity to permanently sequester carbon in marine habitats. The aim is to systematically map these structures, quantify their contribution to CO₂ storage and represent this in current and future balance models. Field studies, remote sensing, laboratory and mesocosm experiments are used to record material flows and calcification. The results help to close key knowledge gaps on nature-based climate protection in marine ecosystems and support the Federal Agency for Nature Conservation (BfN) in developing effective protection and management strategies for reef structures relevant to biodiversity.

FUNDING PERIOD

10/2024 – 09/2027

FUNDING

Federal Agency for Nature Conservation

PRINCIPAL INVESTIGATOR (PI) AT IOW

Dr. Michael L. Zettler

WEBSITE

<https://www.iow.de/project/350/status.html>



SEADITO

Social-Ecological analysis and models for the digital twin ocean

In this European joint project, analysis methods and tools are being developed in cooperation with end users to support the expansion of the European Digital Ocean Twin (EU DTO) into a comprehensive platform by 2030. The project integrates ecological and socio-economic data into models to provide practical support to decision-makers in coastal and inland waters. Participatory processes generate “what-if” scenarios and indicators for environmental changes, policy alternatives and management decisions. The IOW contributes by facilitating co-design workshops with stakeholders in the case study area, developing integrated models, and leading the work package on case studies, with a particular focus on the Greifswald Bodden water-quality case study. SEADITO is producing FAIR-compliant decision support systems and learning materials for researchers, authorities and the public until 2027.



FUNDING PERIOD

09/2024 – 08/2027

FUNDING

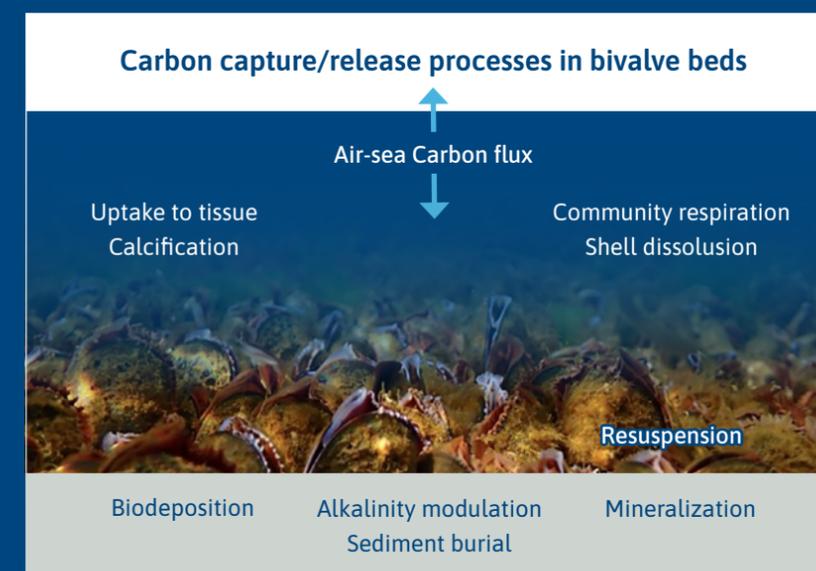
EU – Horizon Europe

PRINCIPAL INVESTIGATOR (PI) AT IOW

Dr. Miriam von Thenen

WEBSITE

<https://seadito.eu>

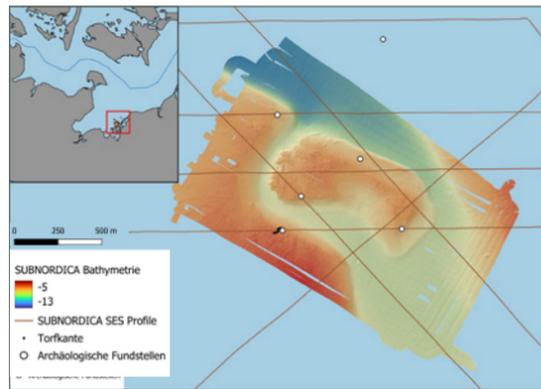


Schematic representation of the carbon budget of biogenic mussel reefs (*Mytilus* sp.) in the Baltic Sea based on studies by Kent et al. (2017), Jansen and van den Boogart (2020), Lee et al. (2020) and Sea et al. (2022). © IOW

SUBNORDICA

On the trail of submerged landscapes

The IOW contribution to the ERC Synergy Grant aims to develop new methods for reconstructing submerged landscapes and human settlements. The focus is on how post-glacial sea level rises changed the coastal regions of the North Sea and Baltic Sea and what consequences this had for prehistoric societies. To this end, researchers are combining geophysical measurements, sediment analyses, dendrochronology and AI-based modelling. Holocene coastal landscapes are being systematically examined in four selected regions. The aim is to develop an integrative methodological approach that combines archaeological, geoscientific and ecological findings. SUBNORDICA strives to redefine our view of human prehistory, develop a world-lea-



ding model for the investigation of submerged landscapes and strengthen policy guidelines for managing underwater cultural heritage

FUNDING PERIOD

10/2024 – 03/2030

FUNDING

EU – ERC Synergy Grant

PRINCIPAL INVESTIGATOR (PI) AT IOW

Dr. Jacob Geersen

WEBSITE

 <https://projects.au.dk/subnordica/about>

Sediment echo sounder profiles and bathymetry as well as mapped peat edges (recording data March/May 2025) and archaeological sites from earlier projects (SINCOS project 2002 – 2009)
© Geersen/Feldens, IOW



DAM MISSIONEN

The IOW in the joint projects of the research missions of the German Marine Research Alliance (DAM)

The IOW is actively involved in projects covering all three research missions of the German Marine Research Alliance. Selected projects are presented on the following pages.



In early 2024, the *mareXtreme* research mission “Ways to improve risk management in the field of marine extreme events and natural hazards” commenced, along with the following two projects involving the IOW:

ElbeXtremeHydro

Effects of physical oceanographic extreme events on ecosystem services in the Elbe estuary coastal system; Project: Scenario studies as a basis for ecosystem risks

The project aims to develop a high-resolution, hydrodynamic-ecological model for the Elbe estuary to enable better predictions and assessments of the effects of extreme events such as storm surges, heat waves and floods. The existing model with curvilinear coordinates is being significantly refined and implemented using the General Estuarine Transport Model (GETM). By linking it to modular ecosystem components via MOSSCO, ecological extreme events such as oxygen depletion or algal blooms can be simulated realistically. Scenario analyses help to map both historical and possible future extreme events and to analyse their risks to the sensitive estuarine ecosystem on a scientific basis.

FUNDING PERIOD

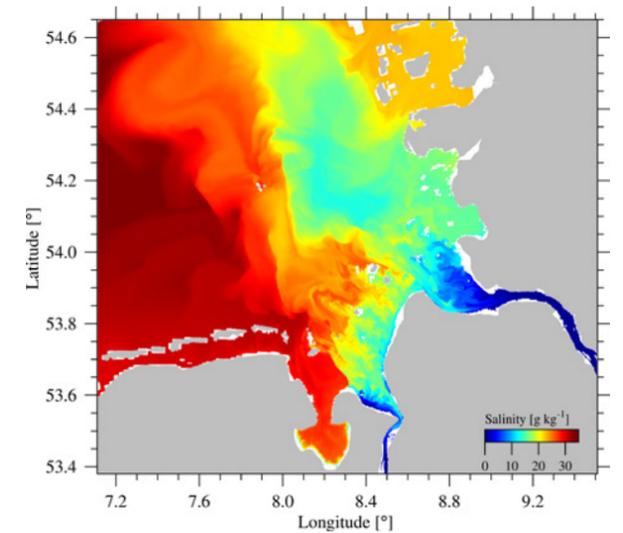
01/2024 – 12/2026

FUNDING

Federal Ministry of Research, Technology and Space

PRINCIPAL INVESTIGATOR (PI) AT IOW

Prof. Dr. Hans Burchard



2011 at 0:00 h, estimated using a high-resolution numerical simulation with GETM (General Estuarine Transport Model). It is easy to see how the fresh water (blue) from the Weser (west) and the Elbe (east) mixes with each other and with the salt water of the North Sea (red) to form a common river plume (light blue-yellow) that flows northwards.

© Li, IOW

WEBSITE

 <https://www.iow.de/project/331/elbextreme-hydro.html>

© Hentzsch, IOW



PrimePrevention

Prediction of marine biological hazards to prevent socio-economic impacts; project: Monitoring, modelling and assessment of extreme weather events on marine biological hazards in the western Baltic Sea

Increasing marine hazards such as pathogenic vibrios, potentially toxic cyanobacteria and oxygen depletion pose a growing threat to public health, fisheries, tourism and biodiversity in the western Baltic Sea. PrimePrevention is developing innovative early warning systems based on linked modular measurement systems and high-resolution models. The aim is ensure that risks can be detected at an early stage and preventive measures can be taken. The IOW analyses past extreme events and possible cascade effects under rising temperatures. This is incorporated into studies on the effects of extreme events on ecosystem services. The results of the DAM joint project will ultimately lead to improved early warning systems and practical strategies for sustainable risk management and monitoring.

Summery, potentially toxic blue-green algae bloom in the inner coastal waters of the Baltic Sea (Curonian Spit), resulting in bathing bans and restricted tourism development © Schwernewski, IOW

FUNDING PERIOD

01/2024 – 12/2026

FUNDING

Federal Ministry of Research, Technology and Space

PRINCIPAL INVESTIGATOR (PI) AT IOW

Dr. René Friedland

WEBSITE



https://www.iow.de/project/332/dam_prime-prevention.html

In the second funding phase of the CDRmare research mission “Marine carbon sinks as a path to decarbonisation”, the IOW continues to be active in the following projects:

MGF Baltic Sea II

Effects of bottom contact fishing exclusion in marine protected areas (Natura 2000) of the German EEZ in the Baltic Sea; Development scenarios of benthic communities and sediment functions

The MGF-Baltic Sea II project investigates how the exclusion of mobile bottom contact fishing affects benthic communities and sediment functions in marine protected areas in the Baltic Sea. Building on Phase I, time series sampling is used to record changes in biodiversity, biomass and seabed function. In addition, a targeted experiment analyses the direct impact of bottom trawling on benthic communities. The aim is to establish a robust scientific basis for the effective management of marine protected areas.

FUNDING PERIOD

03/2023 – 02/2026

FUNDING

Federal Ministry of Research, Technology and Space

PRINCIPAL INVESTIGATOR (PI) AT IOW

Prof. Dr. Klaus Jürgens

WEBSITE



https://www.iow.de/project/318/mgf-ostsee_ii.html

RETAKE II

CO₂ removal by alkalinity enhancement: Potential benefits and risks; Subproject: Potential effects of benthic carbonate dissolution on the Baltic Sea ecosystem

In the second funding phase of RETAKE, the potential of CO₂ removal through alkalinity increase in the Baltic Sea will be further researched. The IOW is using modeling and field measurements to investigate the effects of lime addition on CO₂ uptake, biogeochemical processes and marine ecology. The aim is to reduce uncertainties from phase I and to better assess the ecological compatibility of large-scale applications.

FUNDING PERIOD

08/2024 – 07/2027

FUNDING

Federal Ministry of Research, Technology and Space

PRINCIPAL INVESTIGATOR (PI) AT IOW

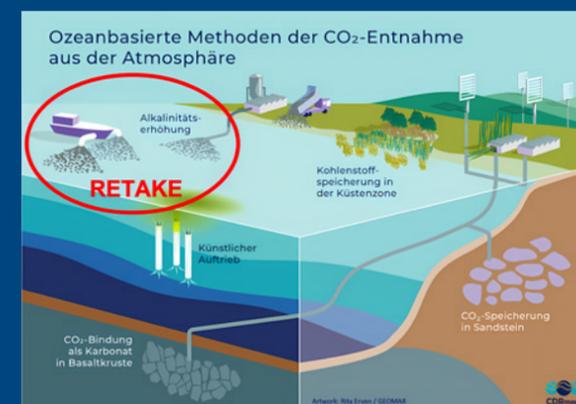
Dr. Hagen Radtke

WEBSITE



https://www.iow.de/project/345/retake_2.html

Presentation of the methods investigated in the CDRmare project consortium with emphasis on the focus of RETAKE © Erven, GEOMAR



Coordinated deployment of the research vessels EMB (foreground), Alkor (right), Clupea (left), Limanda (not pictured) during the 2024 trawl experiment. © Meeske, IOW



In the *sustainMare* research mission “Protecting and sustainably using the oceans”, the IOW is again actively involved in the following projects in the second funding phase:

CREATE II

Concepts for Reducing the Effects of Anthropogenic pressures and uses on marine Ecosystems and on Biodiversity: Creation of a Baltic Sea bioarchive

With this project, the IOW is establishing harmonised long-term archiving of environmental DNA (Edna) for the German Baltic Sea. The aim is to build up a comprehensive digital database and a physical sample collection. These will be used for research, biodiversity conservation and to provide information for authorities and the public. In addition, a fact sheet with standards for sampling, storage and analysis is being created to support the uniform archiving of Ednasamples.

FUNDING PERIOD
12/2024 – 11/2027

FUNDING
Federal Ministry of Research, Technology and Space

PRINCIPAL INVESTIGATOR (PI) AT IOW
Prof. Dr. Matthias Labrenz

WEBSITE
 https://www.iow.de/project/352/dam_create-2.html



The project team at the kick-off meeting © Halbach, HIFMB

CONMAR II

Concepts for conventional Marine munition Remediation in the German North Sea and Baltic Sea; Project: Modelling the drift of explosive-type compounds (STV) in coastal oceans and investigating clearance strategies

The project investigates the distribution, condition and environmental impact of around 1.6 million tonnes of sunken munitions in the North Sea and Baltic Sea. The aim is to integrate existing and new data sets on contaminated sites containing explosive ordnance in order to gain a comprehensive understanding of the release, spread and ecological impact of explosive-type compounds. Using modelling and measurement data, the IOW analyses the drift of these substances in coastal waters and assesses various clearance strategies.

Photo mosaic of dumped ammunition in the Bay of Lübeck. © Greinert, GEOMAR

FUNDING PERIOD
12/2024 – 11/2027

FUNDING
Federal Ministry of Research, Technology and Space

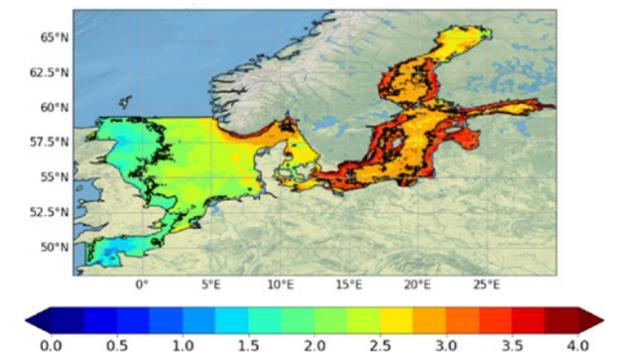
PRINCIPAL INVESTIGATOR (PI) AT IOW
Dr. Ulf Gräwe

WEBSITE
 <https://conmar-munition.eu/>

CoastalFutures II

Future scenarios for promoting the sustainable use of marine areas

The project is developing a model system for the North Sea and Baltic Sea that analyses the effects of climate change and human use on marine ecosystems. This virtual environment is used to evaluate management measures in the sectors of offshore energy, fisheries, coastal protection/sand management, and nutrient and pollutant inputs. The IOW contributes its expertise in physical-biogeochemical modelling and investigates possible future scenarios with regard to ecosystem services, resilience and conflicts of use. The aim is to provide scientifically sound, practical recommendations for action for the sustainable, integrated management of marine areas.



Maximum temperature anomaly during a heatwave © Gröger, IOW

FUNDING PERIOD
12/2024 – 11/2027

FUNDING
Federal Ministry of Research, Technology and Space

PRINCIPAL INVESTIGATOR (PI) AT IOW
Prof. Dr. Markus Meier

WEBSITE
 <https://www.coastalfutures.de/>

OCEAN TECHNOLOGY CAMPUS

The second funding phase of the Ocean Technology Campus (OTC), which is funded by the BMFTR as part of the Clusters4Future funding line, was approved in 2024. Three OTC II projects began at the IOW in the reporting year. A fourth project will start in 2025.



DaTA2Model-E

Living Probabilistic Twins

The DaTA2Model-E project is optimising the measuring instruments used to survey a marine area: by creating a digitally, spatially and temporally high-resolution “true state” using a model it examines which sensor strategies and placements best support the reconstruction of this state, taking measurement uncertainties into account.

FUNDING PERIOD

10/2024 – 09/2027

FUNDING

Federal Ministry of Research, Technology and Space

PROJECT MANAGEMENT AT IOW

Dr. Ralf Prien

WEBSITE

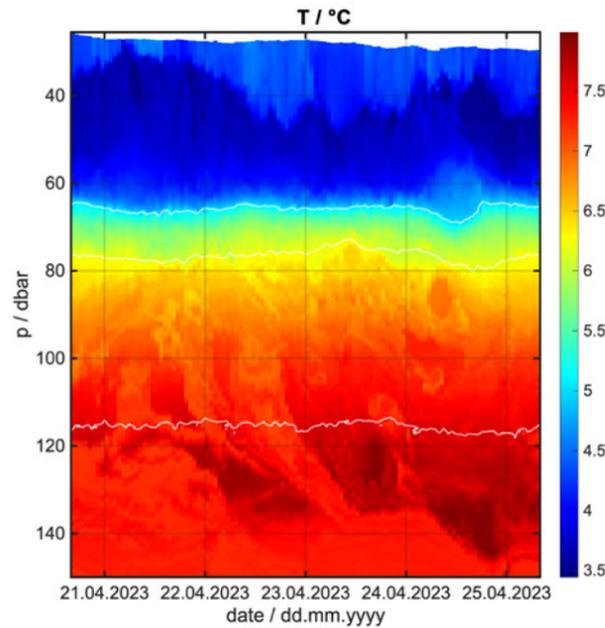


<https://www.iow.de/project/356/otc-data-2model-e.html>

Genomics II

Method development for environmental monitoring of aquatic habitats using eDNA

The project is developing new methods for monitoring aquatic life using environmental DNA (Edna). This involves analysing tiny traces of genetic material in the water and evaluating them using modern computer technology and artificial intelligence. The goal is to detect pollution or other environmental changes at an early stage and to develop an easy-to-use tool with clear standards that start-ups can use and authorities can begin testing from 2027 onwards.



Measurement of temperature dynamics in the Gotland Basin over five days with high temporal resolution. Which combination of instruments is sufficient to resolve these dynamics? The white lines represent isopycnals. © Prien, IOW

FUNDING PERIOD

11/2024 – 10/2027

FUNDING

Federal Ministry of Research, Technology and Space

PROJECT MANAGEMENT AT IOW

Prof. Dr. Matthias Labrenz

WEBSITE



<https://www.iow.de/project/293/otc-genomics.html>

Doktorand Conor Glackin bei der Wasserprobenahme am Ostseestrand © Nietz, IOW

PromOcean

Diversity, recruiting skilled workers and promoting young talents in ocean technology

PromOcean combines the recruitment of skilled workers and equal opportunities in the maritime sector at the Ocean Technology Campus Rostock. It relies on innovative formats such as camps, summer schools and mentoring programmes to inspire young talent across all educational backgrounds, nationalities and genders. The aim is to break down structural barriers, strengthen the international campus and promote female and international talent in particular.

FUNDING PERIOD

10/2024 – 09/2027

FUNDING

Federal Ministry of Research, Technology and Space



Collaboration on deck is fun © Kastell, IOW

PRINCIPAL INVESTIGATOR (PI) AT IOW

Dr. Regine Labrenz

WEBSITE



<https://www.iow.de/project/353/otc-promo-ocean.html>

OTC-SMART

Smart marine data analysis in real time

The OTC-SMART project is developing AI-supported assistance software that controls autonomous hydro-acoustic sensor platforms in real time and evaluates data. This allows large areas of the seabed to be surveyed in a cost-efficient manner. The system improves data quality directly in the field. It is scheduled for use in unmanned vehicles from 2027 onwards.

FUNDING PERIOD

01/2025 – 12/2027

FUNDING

Federal Ministry of Research, Technology and Space

PRINCIPAL INVESTIGATOR (PI) AT IOW

Dr. Svenja Papenmeier

WEBSITE



<https://www.iow.de/project/354/otc-smart.html>



NEW FACES



DR. VOLKER MOHRHOLZ, PROF. DR. HANS BURCHARD

Deputy Head of the "Physical Oceanography and Measurement Technology department"

In June Dr. Volker Mohrholz, an expert in coastal and ocean observation, took over as Deputy Head of the Physical Oceanography and Measurement Technology department. His predecessor, Prof. Dr. Hans Burchard, stepped down as Deputy Head of the department in order to devote more time to research in his working group.



Dr. Volker Mohrholz © Beck, IOW



Dr. Hans Burchard © Burchard

NEW FACES OF THE SCIENTIFIC COUNCIL

The Scientific Council (WR) advises the Director and Board of Trustees on important scientific matters, such as the appointment of members of the Scientific Advisory Board or the creation of the research programme. The committee consists of the heads of department, their deputies and four elected scientific staff members from the respective departments. In 2024 Dr. Isabell Klawonn, Dr. Henry Bittig, Jacob Geersen und Dr. Florian Bögel were elected by the scientific staff for a three-year term.



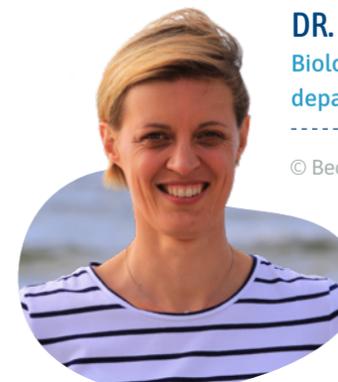
DR. HENRY BITTIG
Marine Chemistry department
(Spokesperson for the
Scientific Council)

© Jessin, LOV



DR. FLORIAN BÖGEL
Physical Oceanography &
Instrumentation department

© Amm, IOW



DR. ISABELL KLAWONN
Biological Oceanography
department

© Beck, IOW



DR. JACOB GEERSEN
Marine Geology
department

© Beck, IOW

SPOKESPERSONS FOR THE RESEARCH AREAS

The new IOW research programme 2024–2033, “Perspectives of Coastal Seas”, is divided into three research areas (see chapter Research Highlights). These strengthen interdisciplinary and cross-sectional scientific cooperation. In October, the spokespersons were elected by the IOW scientists. We are delighted that six people have stepped forward to take on these roles.

RESEARCH AREA 1: KEY PROCESSES ACROSS SCALES AND BOUNDARIES



DR. NATALIE LOICK-WILDE
Biological Oceanography
department



DR. VOLKER MOHRHOLZ
Physical Oceanography &
Measurement Technology
department



DR. JÉRÔME KAISER
Marine Geology department

DR. HELENA OSTERHOLZ
Marine Chemistry department

RESEARCH AREA 3: EMERGING TECHNOLOGIES



DR. BRONWYN CAHILL
Marine Observation Research Unit



DR. CHRISTIANE HASSENRÜCK
Biological Oceanography
department

PROF. DR. KATJA FENNEL
Chair of the Advisory Board

Prof. Dr. Katja Fennel from Dalhousie University, Halifax (Canada) has been the new chair of the IOW's nine-member Scientific Advisory Board since the beginning of 2024. The renowned oceanographer brings international expertise to the table and provides strategic support to the institute in the further development of its research.



AWARDS, HONOURS & NOMINATIONS





© Burchard

CHAIR OF THE GERMAN NATIONAL COMMITTEE OF THE SCIENTIFIC COMMITTEE ON OCEAN RESEARCH (SCOR)

Since the beginning of 2024, the Future Forum Oceanography (ZFO) has been the official German National Committee of the Scientific Committee on Ocean Research (SCOR), an international network for ocean research. As spokesperson for the ZFO's executive committee, **Prof. Dr. Hans Burchard** also chairs the committee. The committee evaluates SCOR applications from around the world and makes funding recommendations.

LINK



<https://www.deutsche-meeresforschung.de/en/the-ocean-future-forum-elects-a-new-spokesperson/>

PROFESSOR KAZIMIERZ DEMEL MEDAL

For his outstanding achievements in the field of physical oceanography and modelling, as well as his calculations of the effects of climate change on the protection of the Baltic Sea, **Prof. Dr. Markus Meier** was awarded the prestigious Professor Kazimierz Demel Medal from the Polish Academy of Sciences in 2024. The award recognises his many years of scientific commitment.

LINK



<https://www.io-warnemuende.de/short-news-archiv-details/items/markus-meier-erhaelt-kazimierz-demel-medaille.html>



Prof. Mariusz Sapota (Institute of Oceanography at the University of Gdansk), Prof. Dr. Markus Meier (IOW) and Dr. Piotr Margoński (National Marine Fisheries Research Institute) at the award ceremony in Gdynia, Poland (from right to left). © Meier

GIBBS AWARD FOR OUTSTANDING RESEARCH ON WATER, STEAM AND AQUEOUS SOLUTIONS

Dr. Rainer Feistel (retired) was honoured in 2024 with the prestigious Gibbs Award from the international Association for the Properties of Water and Steam (IAPWS) for his leading role in the development of the international seawater standard TEOS-10. The award recognises his significant contribution to the thermodynamic description of seawater.

LINK



<https://www.io-warnemuende.de/short-news-archiv-details/items/gibbs-award-2024-fuer-rainer-feistel.html>

Dr. Rainer Feistel with the Gibbs Award from the IAPWS
© Feistel



© Beck, IOW

DFG REVIEW BOARD FOR GEOLOGY/PALAEONTOLOGY

Prof. Dr. Helge Arz was elected to the DFG Review Board for Geology/Palaeontology. For four years, he will review funding applications and contribute to quality assurance in the DFG evaluation process – a commitment that represents an important contribution to the scientific community.

LINK



<https://www.io-warnemuende.de/short-news-archiv-details/items/helge-arz-in-dfg-fachkollegium-gewaehlt.html>

RECOGNITION AWARD AT THE NORTH GERMAN SCIENCE AWARD



The SEASCAPES team at the award ceremony © SEASCAPES

For the SEASCAPES project, the IOW and its partners received a recognition award worth German Science Award. The project team from Mecklenburg-Western Pomerania and Schleswig-Holstein was thus honoured for its research on Stone Age underwater structures in the western Baltic Sea.

LINK

 <https://www.io-warnemuende.de/short-news-archiv-details/items/norddeutscher-wissenschaftspreis-2024-erkennung-fuer-seascapes.html>

INTERNATIONAL HONORARY POSITIONS FOR TRACE GAS RESEARCH

Since October 2024, **Prof. Dr. Gregor Rehder** has been representing the trace gas component in two international committees: as chair of the Ocean Marine Station Assembly in the Integrated Carbon Observation System (ICOS), he coordinates quality standards and technical exchange. On the steering board of the International Ocean Carbon Coordination Project (IOCCP), he is committed to establishing N₂O and CH₄ as global measurement standards alongside CO₂.

LINK

 <https://www.icos-cp.eu>

 <https://www.ioccp.org>



Prof. Dr. Gregor Rehder
© Rehder

APPOINTMENTS OF PROF. DR. OLIVER ZIELINSKI

The director of the IOW was appointed to four advisory boards and executive boards in the reporting year.

CHAIR OF THE SCIENTIFIC ADVISORY BOARD OF THE WUPPERTAL INSTITUTE

Prof. Dr. Oliver Zielinski was appointed chair of the Scientific Advisory Board of the Wuppertal Institute for Climate, Environment and Energy in 2024. The advisory board supports the strategic research focus of the renowned sustainability institute.

LINK

 <https://wupperinst.org/en/the-institute/organisation/international-advisory-board>

MEMBER OF THE ADVISORY BOARD OF THE LEIBNIZ ACADEMY FOR EXECUTIVES

In 2024 **Prof. Dr. Oliver Zielinski** was appointed to the advisory board of the Leibniz Academy for Executives. The academy supports executives at Leibniz institutes through practical programmes and strategic skill development.

LINK

 https://www.leibniz-fuehrungskraefte.de/fileadmin/user_upload/Akademie/3_Programme/Beirat_Leibniz-Akademie_-f%C3%BCr_F%C3%BChrungskr%C3%A4fte_2025.pdf

BALTIC EARTH SENIOR ADVISORY BOARD (BESAB)

As a new member of the Baltic Earth Senior Advisory Board (BESAB) **Prof. Dr. Oliver Zielinski** advises the international research network on climate processes in the Baltic Sea region. Baltic Earth promotes interdisciplinary research on sustainable development in the region.

LINK

 https://baltic.earth/organisation/advisory_board



© Gohlke

EXTENDED BOARD OF THE GERMAN MARINE RESEARCH CONSORTIUM

Prof. Dr. Oliver Zielinski has been a member of the extended board of the German Marine Research Consortium (KDM) since 2024. The KDM pools Germany's marine science expertise and coordinates research strategies at the national level.

LINK

 <https://www.deutsche-meeresforschung.de/en/new-board-of-kdm-takes-up-its-work/>



COOPERATION

Science thrives through cooperation with national and international partners and networks. The IOW is a member of various national networks, most notably the German Alliance for Marine Research (DAM) and the German Marine Research Consortium (KDM). On the international stage, the IOW works in the Baltic Sea region under the umbrella of the Baltic Earth Network, a network of earth system science institutes in the countries bordering the Baltic Sea. Additionally, the IOW maintains numerous structural collaborations with marine science research institutes and universities abroad, such as Dalhousie University in Halifax, Canada. The IOW continues to expand its collaborations with strategically important partners.

MEMORANDUM OF UNDERSTANDING WITH DALHOUSIE UNIVERSITY, HALIFAX, CANADA

In January 2024 the IOW, the University of Rostock and the Dalhousie University in Halifax, Canada, signed a memorandum of understanding. This will deepen the already close contacts between the two institutions. The aim is to develop the broadest possible academic relations and, through the joint agreement, establish a framework for expanding further collaborative activities between the institutions. The focus lies on fields of marine sciences and marine technology. To kick things off, an initial trilateral online workshop was held in February 2024.



Heide Schulz-Vogt, Deputy Director of the IOW, Matthew Hebb, Vice-President of Dalhousie University in Halifax, Canada, and Elizabeth Prommer, Rector of the University of Rostock, at the signing of the Memorandum of Understanding.
© Universität Rostock

MEMORANDUM OF UNDERSTANDING WITH THE UNIVERSITY OF KLAIPĖDA



Oliver Zielinski, Director of the IOW, signed a Memorandum of Understanding with the Lithuanian University of Klaipėda in April 2024. This opens up further perspectives for the existing cooperation. The focus is on strengthening collaborative coastal sea research, including in the field of remote sensing, as well as on the efficient use of existing research infrastructure and innovative marine research technology. An important existing joint research area is a research group established by the IOW in Klaipėda on the topic of coastal and marine management.

Oliver Zielinski, Director of the IOW (left), and Artūras Razbadauskas (right), Rector of Klaipėda University, signing the memorandum of understanding in Klaipėda.
© IOW

WORKSHOP ON COOPERATION WITH THE UNIVERSITY OF GREIFSWALD

There is a long-standing collaboration with the University of Greifswald, including joint professoral appointments. In addition, there are close project-based collaborations. In November, a delegation of scientists from various departments at the University of Greifswald visited the IOW to participate in a workshop focused on cooperation. With strategically important partners. The collaboration is set to be strengthened in several areas, such as in marine microbiology.



Colleagues from the University of Greifswald visiting the IOW as part of a cooperation workshop.
© Premke-Kraus, IOW



TRANSFER

For the IOW, transfer means preparing and communicating science-based facts for society, policy makers and practitioners. This chapter uses selected examples to show how research results are communicated to various target groups – from events such as Open Ship, the Warnemünder Abende and the Hanse Sail to action days. Young people gain insights into marine research through camps and volunteer services. Patents and funding applications for spin-offs show that the IOW is strengthening its innovative power and expanding its exchange with partners from industry. This makes knowledge tangible, understandable and effective.

RESEARCH UP CLOSE

Open Ship 2024

The IOW invited visitors to a double “Open Ship” event in May. The two research vessels MARIA S. MERIAN and ELISABETH MANN BORGESSE were moored in Warnemünde, ready to welcome curious visitors. Exciting tours allowed visitors to explore the bridge, laboratories and living quarters. At ten information stands, researchers presented topics such as climate change in the Baltic Sea, plastic waste, coastal protection, sediment research, biodiversity, pollutants, oxygen depletion, modern measurement technology, digitisation of marine research and sustainable shipping. In addition, nine lectures offered fascinating insights into current research work. Several hundred guests took advantage of the rare opportunity to experience both vessels in their home port at the same time. This made the sea on our doorstep tangible for young and old alike and brought science to life.

CONTACT PERSON

Dr. Matthias Premke-Kraus



Demonstration of measuring instruments on board the research vessel Elisabeth Mann Borgese during Open Ship 2024 © Beck, IOW

HANDS-ON SCIENCE

Long Night of Science 2024

The IOW attracted large crowds at the Long Night of Science in April. Together with the Leibniz Institute for Atmospheric Physics in Kühlungsborn (IAP), the institute presented itself in the Technikum of the Leibniz Institute for Catalysis (LIKAT). There was plenty of technology to try out at the stand: simulating currents on the touch table, examining the device buoy used in shallow water research, marvelling at a drone or discovering the Baltic Sea model. The small research

boat “Klaashahn” outside the hall also attracted a lot of attention. The response was consistently positive, and the joint presentation by three Leibniz Institutes became the ideal place for exciting discussions with a curious audience.

CONTACT PERSON

Dr. Sven Hille

IOW scientists present marine technology © IOW



FULL SPEED AHEAD! MOVING THE FUTURE WITH SCIENCE

The IOW at the Hanse Sail

In August, the IOW presented itself at the Science@Sail Campus in Rostock's city harbour. At the information stand, visitors were able to access live data from the Baltic Sea and the Warnow River and talk to researchers. Among other things, measuring instruments used for monitoring the Baltic Sea and the "Warnow probe" developed by the IOW were on display. With lectures on unusually warm bottom temperatures in the Baltic Sea and participation in discussion panels such as "Future in flux?!" the IOW brought current research topics into the public debate. Science came to life – right by the water and in the midst of the Hanse Sail hustle and bustle.

CONTACT PERSON

Dr. Sven Hille



The IOW team was delighted with the enthusiastic response from Science@Sail visitors at the information stand.
© Labrenz, IOW

THE IOW AT THE HEART OF THE CELEBRATIONS

Unification celebrations in Schwerin

On the occasion of the nationwide celebration of German Unity Day in October, the IOW presented itself at the Mecklenburg-Vorpommern Mile at Schweriner Pfaffenteich. For three days, colleagues manned the stand together with other Leibniz Institutes from the federal state. The touch table, which allows visitors to experience phenomena in the Baltic Sea in a playful way, attracted many visitors and provided an ideal conversation starter. Numerous interested parties learned about current IOW research, including the warming of the Baltic Sea due to climate change and nutrient pollution. Science Minister Bettina Martin from Mecklenburg-Western Pomerania also took the opportunity to learn more about the institute's work.

CONTACT PERSON

Dr. Matthias Premke-Kraus



Bettina Martin, Minister for Science, Culture, Federal and European Affairs, in conversation at the IOW stand © Dahlhaus, INP

BALTIC SEA RESEARCH IN DIALOGUE

Warnemünder Abende 2024

The "Warnemünder Abende" are a series of lectures organised by the IOW that open up current research topics to a broad audience. After a five-year hiatus, they were relaunched in 2024 with great success. Around 500 guests attended in total, many of them more than once. In the fully packed IOW hall, the focus was on topics concerning the Baltic Sea and beyond: the history of marine research in Warnemünde, the darkening of oceans, climate change and its consequences, microplastics, vibrios and World War II munitions in the sea, and eight million years of climate history revealed by deep drilling in the South Pacific. This made knowledge tangible and aroused curiosity about research taking place on our doorstep.

CONTACT PERSON

Dr. Matthias Premke-Kraus



The packed hall of the IOW during one night of the lectures at the Warnemünde Evenings © Premke-Kraus, IOW

SAVE THE BALTIC SEA

"StrandVision" action day at the IOW

The "Save the Baltic Sea" expedition made a stop-over at the IOW in April 2024. A group of ten Lithuanian environmental activists circled the entire Baltic Sea on foot to draw attention to pressing issues such as climate change, eutrophication, munitions contamination and microplastics. In collaboration with the Mecklenburg-Western Pomeranian Agency for the Environment, Nature Conservation and Geology (LUNG) and the Coastal Union Germany e.V. (EUCC-D), the IOW invited to the "StrandVision" action day to mark the occasion. Around 90 schoolchildren, citizens and experts from the tourism industry, administration and science discussed climate adaptation strategies for coastal regions in workshops and took part in a beach litter survey in

Sorting the approximately 1,000 pieces of plastic found in the IOW hall © Beck, IOW

Warnemünde. Despite the rain, 40 volunteers collected over 1,000 pieces of plastic waste in just 45 minutes. The event thus combined science, commitment and practical action.

CONTACT PERSON

Dr. Sven Hille



MARINE PROTECTION MEETS HIGH TECH

Inventors' Camp 2024

Twelve schoolgirls from Rostock, Berlin and Hannover immersed themselves in the world of marine research in July 2024. At the Inventors' Camp, part of the Ocean Technology Campus (OTC) project "Ocean Gender", they experienced how high-tech and marine conservation go hand in hand. They investigated salinity, wind and currents, discovered biodiversity in a landing net, steered an underwater robot and built their own measuring station. In the process, they learned about current research topics at OTC Rostock and the challenges of working underwater. The camp sparked a noticeable curiosity about the marine sector in all participants. This way, forward-looking thinking was combined with a spirit of exploration, and science was made tangible in a unique way.



The students steering an underwater robot © Kastell, IOW

CONTACT PERSON

Dr. Kirstin Kastell

FRESH ENERGY AT THE IOW

Volunteers and trainees 2024/25

For many years, the IOW has been hosting young people for a voluntary ecological year (FÖJ) or a voluntary social year in science, technology and sustainability (FJN). In September 2024, seven new volunteers and trainees started at the institute. They work in almost all departments, from biological oceanography and marine chemistry to marine geology, physical oceanography and science management. Through their service, they gain insights into scientific practice and gain

valuable guidance for their study or career decisions. At the same time, the IOW benefits from their personal commitment: the volunteers support projects, offer new perspectives and help to bring research to life – a real win-win situation.

CONTACT PERSON

Dr. Sven Hille



The volunteers of the 2024/25 cohort © Labrenz, IOW

SUCCESS IN TECHNOLOGY TRANSFER

New patents for the IOW

In winter 2024, the IOW achieved two successful patents grants. At the end of February, a patent was issued for the SPR sensor unit, which enables the measurement, the refractive index and density for precise investigations in the marine environment. In the addition, the IOW supported a funding application as part of the EXIST research transfer programme. These developments further strengthen the cooperation between science and industry.

CONTACT PERSON

Dr. Regine Labrenz

DECISION-MAKING TOOL FOR STAKEHOLDERS FROM ADMINISTRATION, POLITICS AND SOCIETY

Assessment framework for marine CO₂ removal

As part of the German Marine Research Alliance's mission "Marine Carbon Storage as a Pathway to Decarbonisation" (CDRmare), an assessment framework for marine CO₂ removal methods was developed with the involvement of scientists from the IOW. This framework integrates technical, ecological, legal, economic, political, ethical and justice-related considerations. While previous assessment approaches often focused on individual aspects (e.g. biodiversity) or mainly considered technical feasibility, the newly developed assessment framework emphasises the relevance of all dimensions – including justice and ethical issues. As a result, the assessment framework provides a basis for evaluating which marine CO₂ removal methods are technically feasible and under which conditions they could be socially desirable. This represents an important contribution to informed decision-making in climate protection.

CONTACT PERSON

Prof. Dr. Gregor Rehder

WEBSITE

 <https://oceanrep.geomar.de/id/eprint/60681/>



The cover page of the publication

UPDATED FACT SHEET ON CLIMATE CHANGE IN THE BALTIC SEAE

Climate Change in the Baltic Sea 2024 Fact Sheet

How is climate change affecting the Baltic Sea? Answers can be found in the updated “Climate Change in the Baltic Sea 2024 Fact Sheet” published by Baltic Earth and HELCOM. Around 90 researchers, including experts from the IOW, contributed to the fact sheet. It brings together the latest findings on 38 parameters – from temperature, sea level and nutrient cycles to biodiversity, ecosystem services and human activities. New additions include acidification, harmful algal blooms and marine litter. What becomes clear: The Baltic Sea is warming, sea levels are rising and ice-free winters are becoming more likely – with far-reaching consequences for nature and coastal residents.

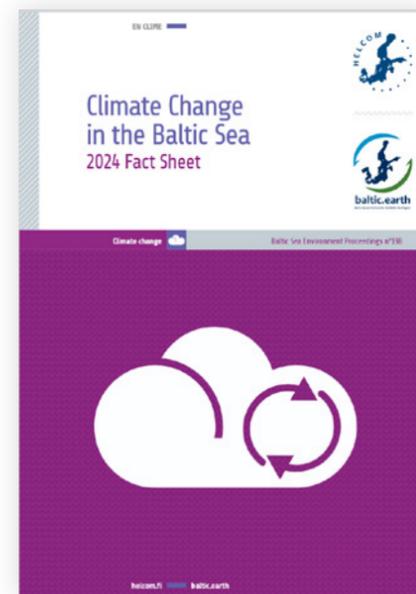
CONTACT PERSON

Prof. Dr. Markus Meier

WEBSITE



https://helcom.fi/wp-content/uploads/2024/10/Baltic-Sea-Climate-Change-Fact-Sheet_2024.pdf



The cover page of the publication

© Prien, IOW

THE IOW WITHIN THE LEIBNIZ ASSOCIATION

SECTION E

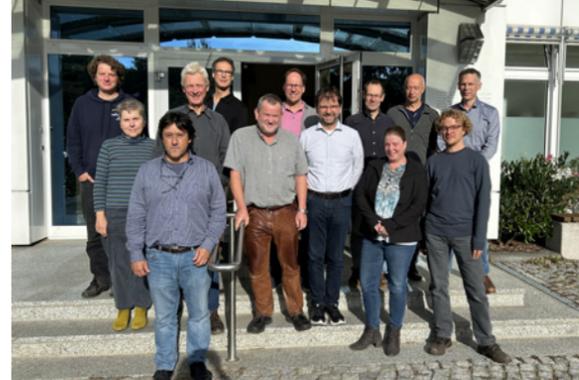


<https://zenodo.org/records/10794362>

The IOW is a member of Section E (Environmental Sciences) of the Leibniz Association and actively participates in many committees, initiatives and joint events, either by contributing or in a coordinating role. Networking within the community is of strategic importance to the IOW. Selected examples are presented below.

PARTNERS IN THE LEIBNIZ LAB "SYSTEMIC SUSTAINABILITY"

The rapid loss of biodiversity and ongoing climate change are both consequences of intensive agriculture and at the same time, they threaten agriculture and food security. The Leibniz Lab "Systemic Sustainability" brings together relevant knowledge from science and society to address this fundamental challenge and to advance the development and implementation of systemic solutions. It does so by systematically integrating scientific findings on biodiversity, climate, agriculture and food, while also identifying innovative approaches. By pooling the expertise of 41 research institutions and 11 research clusters of the Leibniz Association, including the IOW as a contributing partner, the Lab serves as a central hub for sharing knowledge and providing advice in this field.



The participants of the strategy workshop
"Coast & Sea at Leibniz" © Premke-Kraus, IOW

HOST OF THE STRATEGY WORKSHOP "COAST & SEA @ LEIBNIZ"

The Leibniz Association has several institutes and research groups that deal with topics related to marine and coastal research. In October 2024, the IOW invited them to the first strategy workshop under the title "Coast & Sea at Leibniz". The invitation was accepted by representatives from Senckenberg am Meer of the Senckenberg Society for Nature Research (SGN), the Leibniz Centre for Tropical Marine Research (ZMT), the Leibniz Institute for Tropospheric Research (TROPOS) and the Potsdam Institute for Climate Impact Research (PIK). The aim of the joint initiative is to strengthen networking among Leibniz Institutes with a research profile in marine and coastal research, for example on strategic and technical topics.

IOW EXPERTISE IN "10 MUST-KNOWS FROM BIODIVERSITY RESEARCH 2024" BY THE LEIBNIZ RESEARCH NETWORK „BIODIVERSITY"

The IOW is a member of the Leibniz Research Networks "Biodiversity", "Earth & Society" and "Mathematical Modelling and Simulation". In March 2024, the Leibniz Research Network Biodiversity published the "10 Must-Knows from Biodiversity Research 2024". It is a policy advisory paper with evidence-based recommendations for action as a contribution to the socio-ecological transformation of society. Christiane Hassenrück and Klaus Jürgens from the IOW were involved in two recommendations for action.



Cover page of the publication
© Alexandra Koch, Public6

WEBSITE

 <https://zenodo.org/records/10794362>

COMMITMENT TO THE EQUAL OPPORTUNITIES AND DIVERSITY WORKING GROUP

The Leibniz Association's Working Group on Equal Opportunities and Diversity (AKCD) brings together the equal opportunities officers of the Leibniz Association's institutions and those responsible for diversity matters. Hendrikje Wehnert from the IOW has been the elected spokesperson for diversity of the AKCD since 2020.

At the networking meeting of Leibniz institution personnel responsible for diversity
© Herbot-von-Loeper, Leibniz-Gemeinschaft



Members of the Communications Working Group visit the IOW
© Premke-Kraus, IOW

THE COMMUNICATION WORKING GROUP VISITS THE IOW

The Communication Working Group serves to exchange experiences on issues relating to press and public relations. It develops concepts and measures for the internal and external communication of the Leibniz Association. In June 2024, around 60 participants from various Leibniz institutes met in Warnemünde for the spring meeting at the invitation of the IOW. Topics such as the opportunities and limitations of artificial intelligence, as well as the exchange on new developments in media work, were the focus.

WORKING GROUP ON SUSTAINABILITY MANAGEMENT

The aim of the Leibniz Working Group on Sustainability Management is to promote networking among sustainability actors within the Leibniz Association by providing information and facilitating the exchange of experiences, and to support members in developing and implementing sustainability management. Matthias Premke-Kraus is a member of the working group's spokesperson committee. In 2024, the IOW expanded its vehicle fleet to include two electric cars and a cargo bike.

The IOW's cargo bike
© Premke-Kraus, IOW





EQUAL OPPORTUNITIES

The IOW promotes equal opportunities – in other words, truly equal chances for success for all employees. A key focus is gender equality, for example through initiatives supporting women. One of the goals is to increase the proportion of women in all positions/salary levels where they have been underrepresented, as well as raising the share of women in leadership roles. In addition, during the reporting year, the IOW was active in supporting graduates and international staff. Within the Leibniz Association, the IOW is involved in the Equal Opportunities and Diversity Working Group.

CONTACT PERSONS

Equal Opportunities Officer
Dr. Marion Kanwischer
Dr. Svenja Papenmeier

Diversity Officer
Hendrikje Wehnert

CONFIRMED IN OFFICE

The IOW's Diversity Officer has once again been elected as spokesperson for diversity for the Leibniz Association.

In November 2024, Hendrikje Wehnert was re-elected as spokesperson for diversity for the Leibniz Association's Working Group on Equal Opportunities and Diversity. In this role, she is committed to further strengthening the framework conditions for equal chances for success in all Leibniz institutions and to continuously developing diversity work within the association.



© Rövensthal

IN COMPARISON

Implementation of the Leibniz Association's equality standards

The Leibniz Association has established standards for gender equality. These cover, among other things, the promotion of women in leadership positions, the compatibility of work and family life, and the integration of equal opportunities as a guiding principle. In 2024, the Leibniz Association surveyed its 96 member institutions on the implementation of these standards. The IOW exemplifies the high level of equal opportunities within

the Leibniz Association. Above-average ratings were given for the embedding of equality and familyfriendly policies. However, the head office noted there is still potential for improvement in the proportion of women in leadership roles. The IOW aims to improve in this area. One measure is to increase visibility and support of the third management level (working group leaders), starting in 2025.

LANGUAGE CONNECTS

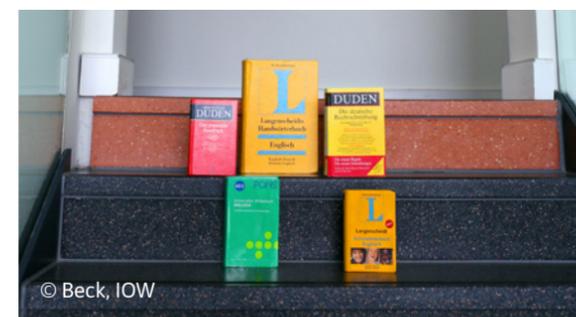
German courses for international staff

English is the language of science. However, to enable staff to participate in non-technical conversations, the IOW offers free German courses for international employees at the IOW. This allows them to improve their language skills at work and to exchange with other international employees across departments. The language courses are part of the IOW's welcoming culture.

LEADERSHIP IN FOCUS

Postdocs in the "Developing Leadership" programme

In 2024, one senior female researcher and one senior male researcher were successfully nominated by the IOW to participate in the "Developing Leadership" programme of the Leibniz Academy for Executives. Participation in this programme encourages reflection on leadership roles in science. In doing so, the IOW actively supports the next generation of researchers, creates perspectives for future leadership positions and strengthens diversity in leadership roles.



© Beck, IOW

**LEIBNIZ
FÜHRUNGSKRÄFTE
AKADEMIE**

REVIEW 2024

JANUARY

KICK-OFF FOR THE STB

In January, colleagues involved in the new interdisciplinary research focus “Shallow Water Processes and Transitions to the Baltic Scale (STB),” scheduled to begin in 2023, came together for a kick-off meeting. The new team members, project objectives and work packages were introduced. The focus of the kick-off meeting was getting to know one another and discussing the scientific measures needed to implement the work packages in the coming years.



© IOW

MARCH

METEOR EXPEDITION M200

During this expedition, the IOW and partners from Aarhus, Bremen and the USA, carried out first detailed investigation of how manganese, nitrogen, carbon and iodine cycles interact in the oxygen-depleted Baltic Sea basins. New elements of the research included high-resolution depth profiles and complex onboard incubation experiments.



© Prien, IOW

APRIL

LONG NIGHT OF SCIENCE

At the Long Night of Science in April, the IOW presented itself once again on the Southern Campus in Rostock alongside other Leibniz Institutes. At the IOW booth in the Technikum of the Leibniz Institute for Catalysis (LIKAT), models, measuring instruments and the research boat “Klaashahn” attracted numerous visitors and sparked many lively discussions.



© Hille, IOW

MAY

OPEN SHIP 2024

In May, the IOW welcomed visitors on board of two research vessels: the MARIA S. MERIAN and the ELISABETH MANN BORGESSE. Several hundred guests explored the bridge, laboratories and cabins. At ten information booths and in nine lectures, researchers presented topics such as climate change, plastic waste, coastal protection and sustainable shipping – offering hands-on science for everyone.



© Beck, IOW

FEBRUARY

OVERWHELMING MEDIA RESPONSE TO PRESS RELEASE

In mid-February, the publication of the IOW press release “Traces of Ice Age hunters discovered in the Baltic Sea” generated significant international attention for the IOW and its partners, with coverage appearing for over a month in print, online, radio and TV. Around 700 media reports appeared in 30 countries, including CNN, The Guardian, Science, New Scientist and La Stampa.



© Grabowski

“STRANDVISION” ACTION DAY

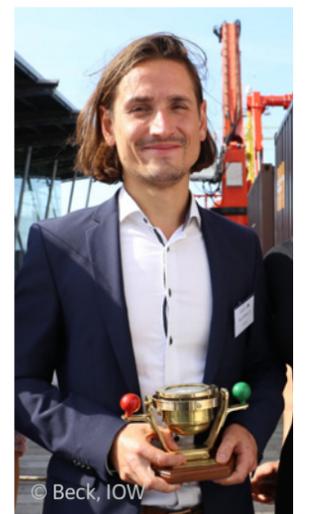
In April, the Lithuanian environmental initiative “Save the Baltic Sea” visited the IOW. Around 90 people took part in the “StrandVision” action day. A key activity was a systematic beach litter survey: within one hour, participants collected 1,025 pieces of litter, almost half of which originated from beach tourism.



© Beck, IOW

BRIESE AWARD FOR MARINE RESEARCH

In May 2024, the BRIESE Award 2023 was presented to Dr. Hagen Buck-Wiese of the Max Planck Institute for Marine Microbiology in Bremen. The jury honoured his pioneering discovery that brown algae release long-lived sugar polymers, that are hardly degradable, that function as carbon sinks in the sea.



© Beck, IOW

CONTINUATION REVIEW 2024

JUNE

ROSTOCK COMPANIES RUN

Once again, the IOW took part in the Rostock Company Run. Three four-person teams represented the institute and were cheered on by colleagues along the 3.5-kilometre course.



AUGUST

SCIENCE@SAIL

In August, the IOW exhibited at the Science@Sail campus during the Hanse Sail event. Visitors to the IOW booth learned about current research topics related to the Baltic Sea. Under the motto “Shaping the future with science”, the event offered a wide range of insights into current marine research.



JULY

THE WARNEMÜNDER ABENDE

After a pause, the IOW once again hosted the “Warnemünde Abende” in 2024 – welcoming around 500 guests. These popular summer events feature accessible lectures by IOW scientists and encourage guests to engage in discussion. Topics ranged from climate change and microplastics to deep-sea drilling in the South Pacific.



INVENTORS' CAMP

At this year's Ocean Technology Campus Inventors' Camp in July, twelve schoolgirls with a passion for STEM subjects dived into the world of marine research. Through hands-on experiments, workshops and excursions, they operated underwater robots, built their own measuring stations and learned how ocean technology can advance marine conservation.



SEPTEMBER

COHORT 2024/25: NEW VOLUNTEERS AND TRAINEES

For many years, the IOW has welcomed young people for a Voluntary Ecological Year (FÖJ) and a Voluntary Year in Science, Technology and Sustainability (FJN). In September 2024, six volunteers and one trainee started their year at the IOW. They work in nearly all departments of the institute, bringing new perspectives to everyday research.



DECEMBER

THE IOW LONG-TERM MONITORING PROGRAMME IN THE UN DECADE

This reporting year, the IOW's long-term monitoring programme was recognised as a project of the UN Decade of Ocean Science for Sustainable Development (2021–2030), honouring its decades of data collection on the state of the Baltic Sea.



OCTOBER

NATIONWIDE CELEBRATION OF GERMAN UNITY DAY

At the celebration in Schwerin in October, the IOW exhibited at the Leibniz Institutes' joint booths. For three days, researchers provided information about current Baltic Sea research. The touch table on marine phenomena attracted many visitors, including Minister of Science Bettina Martin.



APPENDIX

Current Projects	66
Sea Cruises	73
Publications	74
Committees	84
Academic Qualifications	86
Key Data	87
Organisational Chart	88



CURRENT PROJECTS

Research Area 1 – Key Processes Across Scales and Boundaries

PROJECT NAME	FUNDING AGENCY	FUNDING PERIOD	PRINCIPAL INVESTIGATOR AT THE IOW
SFB-TRR 181: Energy transfers in atmosphere and ocean	DFG ¹	01.07.2016 – 30.06.2024	Hans Burchard
LEGRA: Live along the gradient: Analysis of the impact of environmental parameters on the distribution, diversity and function of benthic communities and their habitats in the southern Baltic Sea and its implications within the European marine conservation directive	BfN ²	01.01.2019 – 31.12.2024	Michael L. Zettler
NOTION: Nitrogen fixers structuring phytoplankton biodiversity in the ocean under climate change	Fondation BNP Paribas	15.04.2020 – 31.12.2025	Maren Voß
FunPhy: Fungal infections on phytoplankton – Cryptic perturbation of phytoplankton growth, recycling and sedimentation	DFG Emmy Noether Gruppe	01.08.2020 – 31.07.2026	Isabell Klawonn
MeN-ARP: Metabolism of nitrogen in the Amazon river plume and western tropical North Atlantic	DFG	01.11.2024 – 31.01.2024	Natalie Loick-Wilde
CoTrans: KüNO Umbrella project – Coordination and transfer, lead proposal; Project: Coordination	BMFTR ³	01.11.2020 – 29.02.2024	Ulrich Bathmann
BluEs: Blue_Estuarines – Developing estuaries as habitable sustainable ecosystem despite climate change and stress, lead proposal, Subproject: Functional diversity and network analysis Oder and Elbe estuary	BMFTR	01.11.2020 – 29.02.2024	Maren Voß
CYA-REMO: Cyanobakterien im Klimawandel: Ein Blick in die Vergangenheit – Prognosen für die Zukunft	DFG	01.05.2021 – 31.03.2025	Anke Kremp
FINO II 2021-2024: Operation of the FINO database, oceanographic measures at the FINO2 platform	BSH ⁴	01.09.2021 – 30.11.2024	Erik Stohr
NArrFix: Nitrogen argon measures for the quantification of surface water nitrogen fixation in the Baltic Sea	DFG	01.10.2021 – 30.09.2024	Oliver Schmale
CREATE: Concepts for reducing the effects of anthropogenic pressures and uses on marine ecosystems and on biodiversity; Subproject: Habitat variability and bioarchives as a measure of habitat integrity using the example of the living lab Eckernförde Bay	BMFTR/DAM ⁵	01.12.2021 – 30.11.2024	Svenja Papenmeier
CONMAR: Concepts for conventional marine munition remediation in the German North Sea and Baltic Sea	BMFTR/DAM	01.12.2021 – 30.11.2024	Ulf Gräwe

¹German Research Foundation

²Federal Agency for Nature Conservation

³Federal Ministry of Research, Technology and Space

⁴Federal Maritime and Hydrographic Agency

⁵German Marine Research Alliance

PROJECT NAME	FUNDING AGENCY	FUNDING PERIOD	PRINCIPAL INVESTIGATOR AT THE IOW
SESPOD: Subantarctic Eastern South Pacific surface Ocean Dynamics since the Late Miocene (IODP Expedition 383)	DFG	01.01.2022 – 31.07.2024	Jerome Kaiser Helge Arz
MicroMeth: Methane production by microphytobenthos and its contribution to the benthic methane flux from the coastal zone of the Baltic Sea	DFG	01.10.2022 – 31.12.2028	Oliver Schmale
BaltChron: Placing the deep Baltic Sea sediment stratigraphy in a precise chronological framework: Improved paleoenvironmental studies and 14C reservoir age calibration	DFG	05.12.2022 – 04.09.2025	Markus Czymzik
SALINE: Salt intrusion in the tidal Weser as scientific support for the planned Weser adjustment	BAW ⁶	01.01.2023 – 30.04.2026	Hans Burchard
FunSeq: Cryptic cross-kingdom interactions: The impact of fungal parasitism on phytoplankton-bacteria interactions revealed via genome and transcriptome profiling	DFG	01.01.2023 – 31.12.2024	Isabell Klawonn
OCEAN CITIZEN: Marine forest coastal restoration: an underwater gardening socio-ecological plan	EU – Horizon Europe	01.01.2023 – 31.12.2026	Peter Feldens
CofEs: Coastal filter function under Environmental stress	Björn Carlson Preis	01.02.2023 – 31.01.2026	Maren Voß
Hurri: Lake system response to Caribbean hurricane activity – a calibration study of ostracode (paleo-)biology and geochemistry (Lago Enriquillo, Dominican Republic)	DFG	13.03.2023 – 30.11.2024	Michael E. Böttcher
Pelagische Hab II: innovative monitoring of pelagic habitats	UBA ⁷	01.09.2023 – 31.01.2026	Carolin Paul
ArKoBi: Investigation of the contribution of <i>Arctica islandica</i> to the carbon storage and biodiversity in the Baltic Sea	BfN	01.12.2023 – 30.09.2026	Michael L. Zettler
DUAL-CLUMP: Das duale Karbonat-,clumped-isotope-Thermometer. Differenzierung zwischen Temperatur, kinetischen und diagenetischen Effekten zur genauen Rekonstruktion von Erdoberflächentemperaturen	DFG	01.01.2024 – 31.12.2025	Michael E. Böttcher
MnION: Examination of the link between manganese (Mn) cycling and other elemental redox cycles in the Baltic Sea's oxygen-depleted basins	DFG	01.02.2024 – 30.06.2025	Volker Mohrholz
SEA-Quester: Blue Carbon production, export and sequestration in emerging polar ecosystems	EU – Horizon Europe	01.02.2024 – 31.01.2028	Jörg Dutz
Moorklimaschutz: Model project for climate protection through peatland restoration; Subproject 1: Reduction of nitrogen emissions from coastal peatlands	BfN	15.03.2024 – 14.03.2034	Maren Voß

⁶Federal Waterways Engineering and Research Institute

⁷German Environment Agency

PROJECT NAME	FUNDING AGENCY	FUNDING PERIOD	PRINCIPAL INVESTIGATOR AT THE IOW
SeaStore II: Protection and restoration of seagrass meadows in the southern Baltic Sea: Integrative consideration of the greenhouse gas balance in the restoration of seagrass meadows	BMFTR	01.08.2024 – 31.07.2027	Gregor Rehder
PICASSO: Process insights into the sources and sinks of methane in the upwelling region of Concepción	DFG	01.09.2024 – 28.02.2026	Lars Umlauf Oliver Schmale Klaus Jürgens
BALTIMAGX: Ecological impact of magnetotactic bacteria across redox gradients in the Baltic Sea	DFG	01.12.2024 – 30.11.2027	Heide Schulz-Vogt

Research Area 2 – Coastal Seas in Transition

PROJECT NAME	FUNDING AGENCY	FUNDING PERIOD	PRINCIPAL INVESTIGATOR AT THE IOW
Baltic Transcoast: Research Training School “The German Baltic Sea Coast as Terrestrial-Marine Interface of Water and Matter Fluxes”	DFG	01.01.2016 – 31.12.2024	Maren Voß
Baltic Proper spring bloom: Can micro- or mesozooplankton control phytoplankton spring blooms in the Baltic Proper under climate warming?	DFG	01.09.2019 – 31.05.2025	Carolin Paul
JERICO-S3: Joint European Research Infrastructure of Coastal Observatories: Science, Service, Sustainability	EU – Horizon 2020	01.02.2020 – 31.07.2024	Gregor Rehder
MeN-ARP: Metabolism of nitrogen in the Amazon river plume and western tropical North Atlantic	DFG	01.11.2020 – 31.01.2024	Maren Voß
COOLSTYLE: Oceans under stress: CARBOSTORE – Carbon storage in German Coastal Seas – Stability, vulnerability and perspectives for manageability	BMFTR	01.04.2021 – 31.07.2024	Michael E. Böttcher
BaltVib: Collaborative project BiodivERsA: Pathogenic Vibrio bacteria in the current and future Baltic Sea waters. Subproject 1: coordination, data management, problem-solving concepts	BMFTR EU BiodivERsA	01.04.2021 – 31.03.2024	Matthias Labrenz
PaintSed: Paint Particles in Marine Sediment: Interactions with Microbiota and Effects on Sediment Processes	DFG	01.05.2021 – 31.07.2024	Alexander Tagg
PHYTOARK: Predicting the future from signatures of the past: using living sediment archives and ancient DNA to understand responses of marine primary producers to environmental changes	Leibniz-Wettbewerbsverfahren (SAW)	01.05.2021 – 30.04.2025	Anke Kremp
LABPLAS: Land-Based Solutions for Plastics in the Sea; Plastics in the environment: understanding the sources, transport, distribution and impacts of plastics pollution	EU – Horizon 2020	01.06.2021 – 31.05.2025	Juliana Assuncao Ivar do Sul

PROJECT NAME	FUNDING AGENCY	FUNDING PERIOD	PRINCIPAL INVESTIGATOR AT THE IOW
HyFiFive: Hydrography on Fishing Vessels – joint research project to develop an innovative sensor system used at fishing vessels for autonomous hydrographic measurements, data transfer and analysis	BLE ⁸	01.07.2021 – 30.09.2024	Michael Naumann
AMMOTRACe: Marine AMMunitiOn dump exploration by surface- and underwater-based laser mass spectrometric TRACing technology	BMWE ⁹	01.09.2021 – 31.08.2024	Detlef Schulz-Bull
DynaDeep: Forschungsgruppe Spurenelemente und Metallisotope: Transformation und Fraktionierung	DFG	01.09.2021 – 31.08.2025	Michael E. Böttcher
NArrFix: Nitrogen Argon Measurements for the Quantification of Surface Water Nitrogen Fixation in the Baltic Sea	DFG	01.10.2021 – 30.09.2025	Oliver Schmale
OTC DaTA: Ocean Technology Campus Rostock: Digital Twin & analytics-embedding semantic visual analytics methods in multisensor data evaluation for functional assistance systems in an industrial context	BMFTR	01.10.2021 – 30.09.2024	Martin Kolbe
OTC Stone: Ocean Technology Campus Rostock: Automatic localization and measurement of boulders in acoustic datasets based on neural networks	BMFTR	01.10.2021 – 30.09.2024	Svenja Papenmeier
GESIFUS II: The Genetic Structure of Microbial Communities as a Signature of their Functional Stability	DFG	01.11.2021 – 15.11.2025	Sara Beier
OTC-Genomics: Innovative analytical methods for environmental monitoring of aquatic habitats based on nucleic acid sequencing	BMFTR	01.11.2021 – 31.01.2025	Matthias Labrenz
Coastal Futures I+II: Ecosystem-supporting Coastal Adaptation Strategies for the German Baltic Sea Coast: Model Studies on the variability and changes of storm surges in the western Baltic Sea	BMFTR/ DAM	01.12.2021 – 30.11.2027	Markus Meier
BacDMS: Bacterial transformations of dimethylsulfoniopropionate in the Weddell Sea	DFG	01.08.2022 – 30.06.2025	Judith Piontek
MAPUCHE: Impact of pelagic anoxia in the upwelling area off Concepción and in a pristine anoxic fjord, and the postglacial development of the Patagonian Fjord Region of Chile	BMFTR	01.08.2022 – 31.10.2024	Heide Schulz-Vogt
PlumeBaSe: Tracing of ship plumes and impact to seawater	DFG	01.09.2022 – 31.05.2026	Helena Osterholz
MGF-Ostsee II: Effects of bottom contact fishing exclusion in marine protected areas (Natura 2000) of the German EEZ in the Baltic Sea; Development scenarios of benthic communities and sediment functions	BMFTR/ DAM	01.03.2023 – 28.02.2026	Klaus Jürgens

⁸Federal Ministry of Food and Agriculture

⁹Federal Ministry for Economic Affairs and Energy

PROJECT NAME	FUNDING AGENCY	FUNDING PERIOD	PRINCIPAL INVESTIGATOR AT THE IOW
EFFECTIVE: Enhancing social well-being and economic prosperity by reinforcing the effectiveness of protection and restoration management in Mediterranean MPAs	EU – Horizon Europe	01.06.2023 – 31.05.2027	Ibrahim Boubekri
UBA-MoSEA: Model Simulations for an improved Eutrophication Assessment in the Baltic Sea	UBA	01.08.2023 – 31.12.2025	Sarah Piehl
COP: Circular Ocean-bound Plastic	EU – Interreg South Baltic	01.09.2023 – 31.08.2026	Mirco Haseler
ICEstuaries: Exchange flow and mixing in ice-covered estuaries	DFG	01.11.2023 – 30.11.2026	Hans Burchard
TRANSEATION: Advancing ecosystem-based management through hybrid blue-grey infrastructures in marine and coastal areas	EU – Horizon Europe	01.01.2024 – 30.06.2027	Ibrahim Boubekri
ElbeXtremeHydro: Extreme hydrodynamic events in the Elbe estuary: scenario studies as basis for ecosystem risk assessment	BMFTR/DAM	01.01.2024 – 31.12.2026	Hans Burchard
PrimePrevention: Prediction of marine biological hazards to prevent socio-economic impacts; Project: Monitoring, modelling and assessment of extreme weather events on marine biological hazards in the western Baltic Sea	BMFTR/DAM	01.01.2024 – 31.12.2026	René Friedland
E-POLIO: Emerging Pollutants and Microplastic Abundance in Surface Waters of Indian Ocean	BMFTR	15.03.2024 – 31.07.2026	Joanna J. Waniek
RETAKE II: CO ₂ -removal by alkalinity enhancement: Potential, benefits and risks: Subproject: Potential effects of benthic carbonate dissolution on the Baltic Sea ecosystem	BMFTR/DAM	01.08.2024 – 31.07.2027	Hagen Radtke
Pockmarks: Quantitative morphologic analysis of pockmarks around Barkley Canyon (north-east Pacific): spatial and temporal evolution and formation mechanisms	DFG	01.08.2024 – 30.04.2026	Jacob Geersen
SEADITO: Social-Ecological Analysis and Models for the Digital Twin Ocean	EU – Horizon Europe	01.09.2024 – 31.08.2027	Miriam von Thenen
KomSO: Storage capacity for organic carbon in marine sediments of the German Baltic Sea	BfN	15.09.2024 – 14.11.2027	Peter Feldens
NAPOLY: Temporal and spatial distribution of microplastics in the deep North Atlantic (2000 m) in relation to environmental factors and concentrations of persistent organic pollutants (POPs)	DFG	01.10.2024 – 30.09.2027	Joanna J. Waniek
STATUS: STATUS of the functions of biogenic reefs in the Baltic Sea with a focus on carbon fixation	BfN	01.10.2024 – 30.09.2027	Michael L. Zettler
SUBNORDICA: Beyond submerged landscapes – defining human response to postglacial sea-level rise and climate change	EU – Horizon Europe, Part of ERC-Synergy Grant	01.10.2024 – 31.03.2030	Jacob Geersen

PROJECT NAME	FUNDING AGENCY	FUNDING PERIOD	PRINCIPAL INVESTIGATOR AT THE IOW
South Pacific: Orbital and millennial-scale upper ocean dynamics in the Pacific Southern Ocean since the Mid-Pleistocene Transition (IODP 383)	DFG	01.11.2024 – 31.10.2026	Helge Arz
CONMAR II: KCONcepts for conventional MARine Munition Remediation in the German North and Baltic Sea, project: Modelling the drift of explosive-type compounds (STV) in coastal oceans and investigating clearance strategies	BMFTR/DAM	01.12.2024 – 31.10.2027	Ulf Gräwe

Research Area 3 – Emerging Technologies in Coastal Research

PROJECT NAME	FUNDING AGENCY	FUNDING PERIOD	PRINCIPAL INVESTIGATOR AT THE IOW
CRASSOBIOM: The role of host-microbiome interactions in physiological performance of the Pacific oyster <i>Crassostrea gigas</i> in extreme habitats	DFG	01.10.2020 – 31.12.2024	Matthias Labrenz
ECAS-BALTIC: Ecosystem-supporting Coastal Adaptation Strategies for the German Baltic Sea Coast: Model Studies on the variability and changes of storm surges in the western Baltic Sea	BMFTR	01.11.2020 – 29.02.2024	Ulf Gräwe
C-SCOPE: C-SCOPE: Analyse der CO ₂ -uptake and dynamics under the impact of eutrophication by expanding the CO ₂ observation network in the Baltic Sea	BMFTR	01.01.2021 – 31.12.2024	Henry Bittig
TouMaLi: Marine litter and sustainable waste management in North-African coastal tourism regions	BMUKN ¹⁰	01.05.2021 – 31.12.2025	Gerald Schernewski
ASMASYS: BUUnified ASsessment framework for proposed methods of MARine CDR and interim knowledge SYnthesis	BMFTR/DAM	01.08.2021 – 31.07.2024	Gregor Rehder
RETAKE I: CO ₂ -removal by alkalinity enhancement: potential, benefits and risks, Subproject: Possible direct and indirect consequences of hypothetical near-bottom alkalinity enhancement in the Baltic Sea	BMFTR/DAM	01.08.2021 – 31.07.2024	Hagen Radtke
CTD_II: Underway data: Development of a CTD-Frame-work	BMFTR/DAM	01.01.2023 – 31.12.2025	Martin Kolbe
GEORGE: Next generation multiplatform Ocean observing technologies for research infrastructures	EU – Horizon Europe	01.01.2023 – 30.06.2027	Henry Bittig
ATMO-SHIP: Shipborne measurement of CO ₂ and CH ₄ concentrations in the atmospheric boundary layer (ITMS Module Q&S II)	BMFTR	01.07.2024 – 30.06.2027	Gregor Rehder

¹⁰ Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety

PROJECT NAME	FUNDING AGENCY	FUNDING PERIOD	PRINCIPAL INVESTIGATOR AT THE IOW
BALTWRECK: Preventing massive marine waters chemical pollution from the leaking wrecks and munition/ weapon dumps in the South Baltic	EU – Interreg South Baltic	01.07.2024 – 30.06.2027	Ralf Prien
HABBAL: BiodivGesundheit2: Assessment of the effect of novel Harmful Algal Bloom (HAB) species in the Baltic Sea	BMFTR	01.08.2024 – 31.07.2027	Ingrid Sassenhagen
O₂-MCA: The Effect of the Medieval Climate Anomaly on Hypoxia in the Baltic Sea: A Coupled Benthic-Pelagic Modeling Approach	DFG	01.09.2024 – 31.08.2027	Jurjen Rooze
OTC-DaTA2Model-E: Ocean Technology Campus Rostock: Living Probabilistic Twins	BMFTR	01.10.2024 – 30.09.2027	Ralf Prien
OTC-Genomics II: Ocean Technology Campus Rostock: Method development for environmental monitoring of aquatic habitats using eDNA	BMFTR	01.11.2024 – 31.10.2027	Matthias Labrenz
CREATE II: Concepts for Reducing the Effects of Anthropogenic pressures and uses on marine Ecosystems and on Biodiversity: creation of a Baltic Sea bioarchive	BMFTR/DAM	01.12.2024 – 30.11.2027	Matthias Labrenz
FINO II: Operation of the FINO database, oceanographic measures at the FINO2 platform	BSH	01.12.2024 – 30.11.2026	Franz Jendersie

Transfer projects

PROJECT NAME	FUNDING AGENCY	FUNDING PERIOD	PRINCIPAL INVESTIGATOR AT THE IOW
OTC-Gender: Ocean Technology Campus Rostock: Promotion of gender equality in underwater professions	BMFTR	01.10.2021 – 30.09.2024	Oliver Zielinski
OTC Ocean Talents: Ocean Technology Campus Rostock: Talent promotion along different educational pathways	BMFTR	01.10.2021 – 30.09.2024	Regine Labrenz
OTC-PromOcean: Ocean Technology Campus Rostock: Diversity, recruiting skilled workers and promoting young talent in ocean technology	BMFTR	01.10.2024 – 30.09.2027	Regine Labrenz

SEA CRUISES

CRUISE NO.	MISSION	PERIOD	AREA	CRUISE LEADER	SECTION
EMB356	BLMP + Long-term monitoring	06.02. – 21.02.2024	Baltic Sea	Mohrholz	Physics
EMB335	MARNET	26.02. – 01.03.2024	Western Baltic Sea	Mars	Instrumentation
EMB336	Geo-Praktikum	12.03. – 15.03.2024	Western Baltic Sea	Arz	Geology
EMB337	BLMP + Long-term monitoring	19.03. – 03.04.2024	Baltic Sea	Kuss	Chemistry
M200	MnION	22.03. – 09.04.2024	Baltic Sea	Mohrholz	Physics
EMB338	MARNET	06.04. – 10.04.2024	Western Baltic Sea	Mars	Instrumentation
EMB339	OTC-Stone	13.04. – 22.04.2024	Western Baltic Sea	Papenmeier	Geology
EMB340	BLMP + Long-term monitoring	25.04. – 15.05.2024	Baltic Sea	Naumann	Physics
EMB341	MARNET	27.05. – 01.06.2024	Western Baltic Sea	Mars	Instrumentation
EMB342	MFG II	10.06. – 17.10.2024	German EEZ	Gogina	Biology
EMB343	LEGRA24	21.06. – 02.07.2024	German EEZ	Romoth	Biology
EMB344	MARNET	04.07. – 09.07.2024	Western Baltic Sea	Mars	Instrumentation
EMB345	MFG II TE	16.07. – 03.08.2024	German EEZ	Jürgens	Biology
SO305/2	E-POLIO	16.07. – 05.08.2024	Indian Ocean	Waniek	Chemistry
EMB346	BLMP + Long-term monitoring	06.08. – 20.08.2024	Baltic Sea	Dutz	Geology
EMB347	Plume	24.08. – 31.08.2024	South western Baltic Sea, Kattegat	Osterholz	Chemistry
EMB351	MARNET	01.11. – 05.11.2024	Western Baltic Sea	Mars	Instrumentation
EMB353	BLMP + Long-term monitoring	07.11. – 22.11.2024	Baltic Sea	Kube	Biology
EMB354	PaleoScapes	26.11. – 03.12.2024	Western Baltic Sea	Geersen	Geology
EMB355	MARNET	09.12. – 14.12.2024	Western Baltic Sea	Mars	Instrumentation

research vessels: EMB – Elisabeth Mann Borgese | SO – Sonne | M – Meteor
BLMP – Federal and State Measurement Programme

PUBLICATIONS 2024

AS OF 31 JULY 2025

Articles in Peer-Reviewed Journals

Ahmerkamp, S., C. O. Pacherres, M. Mosshammer, M. Godefroid, M. Wind-Hansen, M. Kuypers, L. Behrendt, K. Koren and M. Kühl (2024). Novel Approach for Lifetime-Proportional Luminescence Imaging Using Frame Straddling. *ACS Sensors* 9: 5531–5540, doi: 10.1021/acssensors.4c01828

Andrews, A. H., J. P. Eveson, C. Welte, K. Okamoto, K. Satoh, K. Krusic-Golub, **B. C. Lougheed**, J. I. Macdonald, F. Rounsard and J. H. Farley (2024). Age validation of yellowfin and bigeye tuna using post-peak bomb radiocarbon dating confirms long lifespans in the western and central Pacific Ocean. *ICES J. Mar. Sci.* 81: 1137–1149, doi: 10.1093/icesjms/fsae074

Anschütz, A.-A., M. Maselli, C. Traboni, A. R. Boon and W. Stolte (2024). Importance of integrating mixoplankton into marine ecosystem policy and management – Examples from the Marine Strategy Framework Directive. *Integr. Environ. Assess. Manag.* 20: 1366–1383, doi: 10.1002/ieam.4914

Banerjee, T., P. Scholz, S. Danilov, **K. Klingbeil** and D. Sidorenko (2024). Split-explicit external mode solver in the finite volume sea ice–ocean model FESOM2. *Geosci. Model Dev.* 17: 7051–7065, doi: 10.5194/gmd-17-7051-2024

Banerjee, T., S. Danilov, **K. Klingbeil** and J.-M. Campin (2024). Discrete variance decay analysis of spurious mixing. *Ocean Model.* 192: 102460, doi: 10.1016/j.ocemod.2024.102460

Bange, H. W., P. Mongwe, J. D. Shutler, D. L. Arévalo-Martínez, D. Bianchi, S. K. Lausset, C. Liu, C. R. Löscher, H. Martins, J. A. Rosentreter, **O. Schmale**, T. Steinhoff, R. C. Upstill-Goddard, R. Wanninkhof, S. T. Wilson and H. Xie (2024). Advances in understanding of air-sea exchange and cycling of greenhouse gases in the upper ocean. *Elem. Sci. Anth.* 12: 1, doi: 10.1525/elementa.2023.00044

Bellon, G., H. Middel, C. Chicco and J. N. Rempel (2024). Changes in cetacean occurrence in Faxaflói Bay, Iceland, as observed from whale watching vessels. *NAMMCO Scientific Publications* 13, doi: 10.7557/3.7386

Bergman, I., E. S. Lindström and **I. Sassenhagen** (2024). Ciliate Grazing on the bloom-forming microalga *Gonyostomum* semen. *Microb. Ecol.* 87: 33, doi: 10.1007/s00248-024-02344-9

Bick, A. and **M. L. Zettler** (2024). Description of three new species of Amphitritides Augener, 1922 (Terebellida, Annelida) from the coast of Namibia (South West Africa). *Zootaxa* 5446: 42–64, doi: 10.11646/zootaxa.5446.1.2

Bittig, H. C., **E. Jacobs**, **T. Neumann** and **G. Rehder** (2024). A regional pCO₂ climatology of the Baltic Sea from in situ pCO₂ observations and a model-based extrapolation approach. *Earth Syst. Sci. Data* 16: 753–773, doi: 10.5194/essd-16-753-2024

Bordbar, M. H., A. Nasrolahi, **M. Lorenz**, S. Moghaddam and **H. Burchard** (2024). The Persian Gulf and Oman Sea: Climate variability and trends inferred from satellite observations. *Estuar. Coast. Shelf Sci.* 296: 108588, doi: 10.1016/j.ecss.2023.108588

Botterell, Z. L. R., F. Ribeiro, D. Alarcón-Ruales, E. Alfaro, J. Alfaro-Shigueto, N. Allan, N. Becerra, L. Braunholtz, S. Cardenas-Diaz, D. de Veer, **G. Escobar-Sanchez**, M. V. Gabela-Flores, B. J. Godley, I. Grønneberg, J. A. Howard, D. Honorato-Zimmer, J. S. Jones, C. Lewis, J. C. Mangel, M. Martin, J. P. M. Pérez, S. E. Nelms, C. Ortiz-Alvarez, A. Porter, M. Thiel and T. S. Galloway (2024). Plastic pollution transcends marine protected area boundaries in the eastern tropical and south-eastern Pacific. *Mar. Poll. Bull.* 201: 116271, doi: 10.1016/j.marpolbul.2024.116271

Böttner, C., C. J. Stevenson, R. Englert, **M. Schönke**, B. T. Pandolpho, **J. Geersen**, **P. Feldens** and S. Krastel (2024). Extreme erosion and bulking in a giant submarine gravity flow. *Sci. Adv.* 10: eadp2584, doi: 10.1126/sciadv.adp2584

Böttner, C., J. J. L. Hoffmann, D. Unverricht, M. Schmidt, T. Spiegel, **J. Geersen**, T. H. Müller, J. Karstens, K. J. Andresen, L. Sander, J. Schneider von Deimling and C. Schmidt (2024). The Enigmatic Pockmarks of the Sandy Southeastern North Sea. *Geochem., Geophys., Geosyst.* 25: e2024GC011837, doi: 10.1029/2024GC011837

Boukheloua, R., I. Mukherjee, H. Park, K. Šimek, V. Kasalický, M. Ngochera, H.-P. Grossart, A. Picazo-Mozo, A. Camacho, P. J. Cabello-Yeves, F. Rodriguez-Valera, C. Callieri, A.-S. Andrei, J. Pernthaler, T. Posch, A. Alfreider, R. Sommaruga, M. W. Hahn, B. Sonntag, P. Lopez-García, D. Moreira, L. Jardillier, C. Lepère, C. Biderre-Petit, A. Bednarska, M. Ślusarczyk, V. R. Tóth, H. L. Banciu, K. Kormas, S. Orlic, D. Šantić, G. Muyzer, **D. P. R. Herlemann**, H. Tammert, S. Bertilsson, S. Langenheder, T. Zechmeister, N. Salmaso, N. Storelli, C. Capelli, F. Lepori, V. Lanta, H. Henriques Vieira, F. Kostanjšek, K. Kabeláčová, M.-C. Chiriac, M. Haber, T. Shabarova, C. Fernandes, P. Rychtecký, P. Znachor, T. Szőke-Nagy, P. Layoun, H. L. Wong, V. S. Kavagutti, P.-A. Bulzu, M. M. Salcher, K. Piwosz and R. Ghai (2024). Global freshwater distribution of *Telonemia* protists. *ISME J.* 18: wrae177, doi: 10.1093/ismejo/wrae177

Breznikar, A., D. L. Pönisch, **M. Lorenz**, G. Jurasinski, **G. Rehder** and **M. Voss** (2024). Rewetting effects on nitrogen cycling and nutrient export from coastal peatlands to the Baltic Sea. *Biogeochemistry* 167: 967–987, doi: 10.1007/s10533-024-01149-9

Brink, A. M., **A. Kremp** and E. Gorokhova (2024). Quantitative real-time PCR assays for species-specific detection and quantification of Baltic Sea spring bloom dinoflagellates. *Front. Microbiol.* 15, doi: 10.3389/fmicb.2024.1421101

Bruhns, T., C. Sánchez-Girón Barba, L. König, S. Timm, **K. Fisch** and I. M. Sokolova (2024). Combined effects of organic and mineral UV-filters on the lugworm *Arenicola marina*. *Chemosphere* 358: 142184, doi: 10.1016/j.chemosphere.2024.142184

Burchard, H., M. Alford, **M. Chouksey**, G. Dematteis, C. Eden, I. Giddy, **K. Klingbeil**, A. Le Boyer, D. Olbers, J. Pietrzak, F. Pollmann,

K. Polzin, F. Roquet, P. S. Saez, S. Swart, L. Umlauf, G. Voet and B. Wynne-Cattanach (2024). Linking ocean mixing and overturning circulation. *Bull. Amer. Meteorol. Soc.* 105: E1265–E1274, doi: 10.1175/BAMS-D-24-0082.1

Cabral, A., G. M. S. Reithmaier, Y. Y. Y. Yau, **L. C. Cotovicz Jr.**, J. Barreira, B. Viana, J. Hayden, S. Bouillon, N. Brandini, V. Hatje, C. E. de Rezende, A. L. Fonseca and I. R. Santos (2024). Large Porewater – Derived Carbon Outwelling Across Mangrove Seascapes Revealed by Radium Isotopes. *Journal of Geophysical Research – Oceans* 129: e2024JC021319, doi: 10.1029/2024JC021319

Cabral, A., Y. Y. Y. Yau, G. M. S. Reithmaier, **L. C. Cotovicz**, J. Barreira, G. Broström, B. Viana, A. L. Fonseca and I. R. Santos (2024). Tidally driven porewater exchange and diel cycles control CO₂ fluxes in mangroves on local and global scales. *Geochim. Cosmochim. Acta* 374: 121-135, doi: 10.1016/j.gca.2024.04.020

Cahill, B., **E. Chrysaği**, R. Vortmeyer-Kley and **U. Gräwe** (2024). Deconstructing co-occurring marine heatwave and phytoplankton bloom events in the Arkona Sea in 2018. *Front. Mar. Sci.* 11: 1323271, doi: 10.3389/fmars.2024.1323271

Chang, Y., X. Li, Y. P. Wang, **K. Klingbeil**, W. Li, F. Zhang and **H. Burchard** (2024). Salinity mixing in a tidal multi-branched estuary with huge and variable runoff. *J. Hydrol.* 634: 131094, doi: 10.1016/j.jhydrol.2024.131094

Chielle, R. S. A., R. V. Marins, M. S. Cavalcante and **L. C. Cotovicz Jr.** (2024). Seasonal and spatial variability of CO₂ emissions in a large tropical mangrove-dominated delta. *Limnol. Oceanogr.*: online, doi: 10.1002/lno.12471

Chielle, R., T. Meziane, C. E. Rezende, **L. C. Cotovicz Jr.**, G. Abril and R. V. Marins (2024). Fatty acids and stable isotopes distribution in the mangrove dominated Parnaíba River Delta. *Estuar. Coast. Shelf Sci.* 308: 108934, doi: 10.1016/j.ecss.2024.108934

Choisnard, N., **J. Umbricht**, M. Araujo, **M. E. Böttcher**, **C. Burmeister**, **I. Liskow**, **I. Schmie-dinger** and **M. Voss** (2024). Nitrogen assimilation and nitrification in surface waters of the Amazon and Pará estuaries. *J. Geophys. Res. Oceans* 129: e2024JC021004, doi: 10.1029/2024JC021004

Choisnard, N., N. N. Duprey, T. Wald, M. Thibault, F. Houlbrèque, A. D. Foreman, P. Cuet, M. M. M. Guillaume, H. Vonhof, D. M. Sigman, G. H. Haug, J.-F. Maguer, S. L’Helguen, A. Martínez-García and A. Lorrain (2024). Tracing the fate of seabird-derived nitrogen in a coral reef using nitrate and coral skeleton nitrogen isotopes. *Limnol. Oceanogr.* 69: 309–324, doi: 10.1002/lno.12485

Choisnard, N., **T. Sperlea**, **I. Liskow** and **M. Voss** (2024). Nitrification in the Amazon River plume. *Mar. Ecol. Prog. Ser.* 730: 1–14, doi: 10.3354/meps14530

Cosme De Esteban, M., **P. Feldens**, R. Haroun, F. Tuya, A. Gil and F. Otero Ferrer (2024). Habitat mapping of the Vila Franca do Campo marine reserve (Azores) and recommendations for its improvement. *Estuar. Coast. Shelf Sci.* 303: 108809, doi: 10.1016/j.ecss.2024.108809

Cotovicz Jr., L. C., **B. Cahill**, **B. Sabbaghzadeh**, **J. M. Lencina-Avila** and **G. Rehder** (2024). Increase in marginal sea alkalinity may impact air–sea carbon dioxide exchange and buffer acidification. *Limnol. Oceanogr.* 69: 2332-2347, doi: 10.1002/lno.12672

Cotovicz Jr., L. C., G. Abril, C. J. Sanders, D. R. Tait, D. T. Maher, J. Z. Sippo, C. Holloway, Y. Y. Y. Yau and I. R. Santos (2024). Methane oxidation minimizes emissions and offsets to carbon burial in mangroves. *Nat. Clim. Chang.* 14: 275-281, doi: 10.1038/s41558-024-01927-1

Czymzik, M., M. Christl, **O. Dellwig**, R. Mutscheler, D. Müller, **J. Kaiser**, M. J. Schwab, C. K. M. Nantke, A. Brauer and **H. W. Arz** (2024). Synchronizing the Western Gotland Basin (Baltic Sea) and Lake Kälksjön (central Sweden) sediment records using common cosmogenic radionuclide production variations. *Holocene* 34: 1128-1137, doi: 10.1177/09596836241247311

Das, S. K., N. Mahanta, B. Sahoo, R. K. Singh, C. A. Alvarez Zarkian, M. Tiwari, N. Vats, Nihal, F. Lamy, G. Winckler, J. L. Middleton, **H. W. Arz**, J. Gottschalk, C. Basak, A. Brombacher, O. M. Esper, J. R. Farmer, L. C. Herbert, S. Iwasaki, L. Lembke-Jene, V. J. Lawson, L. Lo, E. Malinverno, E. Michel, S. Moretti, C. M. Moy, A. C. Ravelo, C. R. Riesselman, M. Saavedra-Pellitero, I. Seo, R. A. Smith, A. L. Souza, J. S. Stoner, I. V. M. P. de Oliveira, S. Wan and X. Zhao (2024). Late Miocene to Early Pliocene paleocean-

ographic evolution of the Central South Pacific: A deep-sea benthic foraminiferal perspective. *Palaeogeogr., Palaeoclimatol., Palaeoecol.* 647: 112252, doi: 10.1016/j.palaeo.2024.112252

Das, S. K., R. K. Singh, M. Saavedra-Pellitero, J. Gottschalk, C. A. Alvarez Zarkian, L. Lembke-Jene, F. Lamy, G. Winckler, J. L. Middleton, **H. W. Arz**, C. Basak, A. Brombacher, O. M. Esper, J. R. Farmer, L. C. Herbert, S. Iwasaki, V. J. Lawson, L. Lo, E. Malinverno, E. Michel, S. Moretti, C. M. Moy, A. C. Ravelo, C. R. Riesselman, I. Seo, R. A. Smith, A. L. Souza, J. S. Stoner, I. M. Venancio, S. Wan and X. Zhao (2024). Recent deep-sea nematodes and agglutinated foraminifera select specific grains and bioclasts from their environments: Ecological implications. *Mar. Micropaleontol.* 192: 102409, doi: 10.1016/j.marmicro.2024.102409

Davies, J., K. Fahl, **M. Moros**, A. Carter-Champion, H. Detlef, R. Stein, C. Pearce and M.-S. Seidenkrantz (2024). Sea-ice conditions from 1880 to 2017 on the Northeast Greenland continental shelf: a biomarker and observational record comparison. *The Cryosphere* 18: 3415-3431, doi: 10.5194/tc-18-3415-2024

Dieterich, C. and **H. Radtke** (2024). Higher quantiles of sea levels rise faster in Baltic Sea Climate projections. *Clim. Dyn.* 62: 3709–3719, doi: 10.1007/s00382-023-07094-x

Dippner, J. W., J. P. Montoya, A. Subramaniam, **J. Umbricht** and **M. Voss** (2024). The Amazon River plume – a Lagrangian view. *Limnol. Oceanogr. Meth.* 22: 572–589, doi: 10.1002/lom3.10626

Dusch, N., V. Avsarkisov, M. Gerding, C. Stolle and **J. Faber** (2024). Analysis of coupled energy and helicity spectra in stratified turbulence: Theory and balloon measurements. *Phys. Rev. Fluids* 9: 033801, doi: 10.1103/PhysRevFluids.9.033801

Dutheil, C., S. Lal, M. Lengaigne, S. Cravatte, C. Menkès, A. Receveur, **F. Börgel**, **M. Gröger**, F. Houlbrequer, R. Le Gendre, I. Mangolte, A. Peltier and **H. E. M. Meier** (2024). The massive 2016 marine heatwave in the Southwest Pacific: An “El Niño-Madden-Julian Oscillation” compound event. *Sci. Adv.* 10: eadp2948, doi: 10.1126/sciadv.adp2948

- Ehler von Ahn, C. M., O. Dellwig, B. Szymczycha, L. Kotwicki, J. Rooze, R. Endler, P. Escher, I. Schmiedinger, J. Sültenfuß, M. Diak, M. Gehre, U. Struck, S. Vogler and M. E. Böttcher (2024). Submarine groundwater discharge into a semi-enclosed coastal bay of the southern Baltic Sea: A multi-method approach. *Oceanologia* 66: 111–138, doi: 10.1016/j.oceano.2024.01.001
- Ehrmann, W., P. A. Wilson, H. W. Arz, H. Schulz and G. Schmiedl (2024). Monsoon-driven changes in aeolian and fluvial sediment input to the central Red Sea recorded throughout the last 200 000 years. *Clim. Past* 20: 37–52, doi: 10.5194/cp-20-37-2024
- Estelmann, A., R. Prien, W. Marz, M. Elbing, P. Harz and G. Rehder (2024). An SPR-Based In Situ Methane Sensor for the Aqueous and Gas Phase. *Anal. Chem.* 96: 16203–16214, doi: 10.1021/acs.analchem.4c02875
- Fajardo-Urbina, J. M., Y. Liu, S. Georgievska, U. Gräwe, H. J. H. Clercx, T. Gerkema and M. Duran-Matute (2024). Efficient deep learning surrogate method for predicting the transport of particle patches in coastal environments. *Mar. Poll. Bull.* 209: 117251, doi: <https://doi.org/10.1016/j.marpolbul.2024.117251>
- Falfushynska, H., O. Dellwig, A. Köhler and I. M. Sokolova (2024). Adverse outcome pathways as a tool for optimization of the biomarker-based assessment of pollutant toxicity: A case study of cadmium in the blue mussels *Mytilus edulis*. *Ecol. Indic.* 158: 111431, doi: 10.1016/j.ecolind.2023.111431
- Feistel, R. (2024). Origin of Life: A Symmetry-Breaking Physical Phase Transition. *Symmetry* 16: 1611, doi: 10.3390/sym16121611
- Feistel, R. (2024). TEOS-10 and the climatic relevance of ocean–atmosphere interaction. *Ocean Sci.* 20: 1367–1402, doi: 10.5194/os-20-1367-2024
- Feistel, R. and O. Hellmuth (2024). Irreversible thermodynamics of seawater evaporation. *J. Mar. Sci. Eng.* 12: 166, doi: 10.3390/jmse12010166
- Feistel, R. and O. Hellmuth (2024). TEOS-10 Equations for determining the lifted condensation level (LCL) and climatic feedback of marine clouds. *Oceans* 5: 312–351, doi: 10.3390/oceans5020020
- Fer, I., M. Dengler, P. Holtermann, A. Le Boyer and R. Lueck (2024). ATOMIX benchmark datasets for dissipation rate measurements using shear probes. *Sci. Data* 11: 518, doi: 10.1038/s41597-024-03323-y
- Fernández-Juárez, V., D. J. Riedinger, J. B. Gusmao, L. F. Delgado-Zambrano, G. Coll-García, V. Papazachariou, D. P. R. Herlemann, C. Pansch, A. F. Andersson, M. Labrenz and L. Riemann (2024). Temperature, sediment resuspension, and salinity drive the prevalence of *Vibrio vulnificus* in the coastal Baltic Sea. *mBio* 15: e01569-24, doi: 10.1128/mbio.01569-24
- Filella, A., J. Umbricht, A. Klett, A. Vogts, T. Vannier, O. Grosso, M. Voss, L. Riemann and M. Benavides (2024). Dissolved organic matter offsets the detrimental effects of climate change in the nitrogen-fixing cyanobacterium *Crocospaera*. *Limnol. Oceanogr. Lett.* 9, 296-306, doi: 10.1002/lo12.10380
- Gande, D., C. Hassenrück, M. Žure, T. Richter-Heitmann, E. Willerslev and M. W. Friedrich (2024). Recovering short DNA fragments from minerals and marine sediments: A comparative study evaluating lysis and isolation approaches. *Environ. DNA* 6: e547, doi: 10.1002/edn3.547
- Gaye, B., N. Lahajnar, H. C. Frazão, M. Metzke, C. Perkuhn, R. Prien, S. Tian and J. J. Waniek (2024). Amino Acids as Indicators of Organic Matter Sources and Degradation in Suspended Matter off the Pearl River: Indications for Resuspension in the Northern South China Sea. *J. Geophys. Res. Oceans* 129: e2024JC021519, doi: 10.1029/2024JC021519
- Geersen, J., M. Bradtmöller, J. Schneider von Deimling, P. Feldens, J. Auer, P. Held, A. Lohrberg, R. Supka, J. J. L. Hoffmann, B. V. Eriksen, W. Rabbel, H.-J. Karlsen, S. Krastel, D. Brandt, D. Heuskin and H. Lübke (2024). A submerged Stone Age hunting architecture from the Western Baltic Sea. *Proc. Nat. Acad. Sci. U.S.A.* 121: e2312008121, doi: 10.1073/pnas.2312008121
- Glackin, C. C., S. Dupke, T. S. Chandra, D. Riedinger and M. Labrenz (2024). Combined TCBS and CHROMagar analyses allow for basic identification of *Vibrio vulnificus* within a 48 h incubation period in the coastal Baltic Sea. *Microorganisms* 12: 614, doi: 10.3390/microorganisms12030614
- Gogina, M., S. J. Hahn, R. Ohde, A. Brandt, S. Forster, I. Kröncke, M. Powilleit, K. Romoth, M. Sonnewald and M. L. Zettler (2024). Baseline inventory of benthic macrofauna in German marine protected areas (2020–2022) before closure for bottom-contact fishing. *Biology* 13: 389, doi: 10.3390/biology13060389
- Greenwood, P. F., H. Grotheer, M. E. Böttcher and K. Grice (2024). The stable sulfur isotope and abundance fluxes of reduced inorganic sulfur and organic sulfur phases recorded in the Permian-Triassic transition of the Meishan type section. *Org. Geochem.* 196: 104808, doi: 10.1016/j.orggeochem.2024.104808
- Gröger, M., C. Dutheil, F. Börgel and H. E. M. Meier (2024). Drivers of marine heatwaves in a stratified marginal sea. *Clim. Dyn.* 62: 3231–3243, doi: 10.1007/s00382-023-07062-5
- Gröger, M., F. Börgel, S. Karsten, H. E. M. Meier, K. Safonova, C. Dutheil, A. Receveur and P. Polte (2024). Future climate change and marine heatwaves – Projected impact on key habitats for herring reproduction. *Sci. Total Environ.* 951: 175756, doi: 10.1016/j.scitotenv.2024.175756
- Gustafsson, M., Å. Strand, A. T. Laugen, J. Albretsen, C. André, G. Broström, P. E. Jorde, H. Knutsen, O. Ortega-Martinez, M. Sodeland, M. Waern, A.-L. Wrangé and P. De Wit (2024). Unlocking the secret life of blue mussels: Exploring connectivity in the Skagerrak through biophysical modeling and population genomics. *Evol. Appl.* 17: e13704, doi: 10.1111/eva.13704
- Gyrate, G., M. Katarzyte, M. Bucas, G. Kalvaitiene, S. Kube, D. P. R. Herlemann, C. Pansch, A. F. Andersson, T. Pitkanen, A.-M. Hokajarvi, A. Annus-Urmet, G. Hauk, M. Hippelein, E. Lastauskiene and M. Labrenz (2024). Epidemiological and environmental investigation of the ‘big four’ *Vibrio* species, 1994 to 2021: a Baltic Sea retrospective study. *Euro Surveill.* 29: 32, doi: 10.2807/1560-7917.ES.2024.29.32.2400075
- Hagemann, J. R., F. Lamy, H. W. Arz, L. Lembke-Jene, A. Auderset, N. Harada, S. L. Ho, S. Iwasaki, J. Kaiser, C. B. Lange, M. Murayama, K. Nagashima, N. Nowaczyk, A. Martínez-García and R. Tiedemann (2024). A marine record of Patagonian ice sheet changes over the past 140,000 years. *Proc. Nat. Acad. Sci. U.S.A.* 121: e2302983121, doi: 10.1073/pnas.2302983121
- Hariri, S., H. E. M. Meier and G. Väli (2024). Investigating the influence of sub-mesoscale current structures on Baltic Sea connectivity through a Lagrangian analysis. *Front. Mar. Sci.* 11: 1340291, doi: 10.3389/fmars.2024.1340291
- Heise, S. and I. Stresius (2024). Application of qualitative modelling to improve system understanding of the stressed elbe estuary. *Estuar. Coast. Shelf Sci.* 307: 108908, doi: doi.org/10.1016/j.ecss.2024.108908
- Heller, T., D. P. R. Herlemann, A. Plieth, J.-C. Kröger, M.-A. Weber, J. Reiner, R. Jaster, B. Kreikemeyer, G. Lamprecht and H. Schäffler (2024). Liver cirrhosis and antibiotic therapy but not TIPS application leads to a shift of the intestinal bacterial communities: A controlled, prospective study. *J. Digest. Dis.* 25: 200-208, doi: 10.1111/1751-2980.13262
- Hepach, H., J. Piontek, H. W. Bange, T. Barthelmeß, A. von Jackowski and A. Engel (2024). Enhanced warming and bacterial biomass production as key factors for coastal hypoxia in the southwestern Baltic Sea. *Sci. Rep.* 14: 29442, doi: 10.1038/s41598-024-80451-w
- Herlemann, D. P. R., H. Tammert, C. Kivistik, K. Käiro and V. Kisand (2024). Distinct biogeographical patterns in snail gastrointestinal tract bacterial communities compared with sediment and water. *MicrobiologyOpen* 13: e13, doi: 10.1002/mbo3.1413
- Hermann, A., F. Furkert, M. Björner, M. Naumann, D. Stepputtis, M. Gag and S. Klein (2024). HyFiVe: hydrography on fishing vessels; A new monitoring system enables cost effective and scalable ocean monitoring. *J. Applied Hydrography* 129: 12–18, doi: 10.23784/HN129-02
- Hieronimus, J., M. Hieronimus, M. Gröger, J. Schwinger, R. Bernadello, E. Tourigny, V. Sicardi, I. Ruvalcaba Baroni and K. Wyser (2024). Net primary production annual maxima in the North Atlantic projected to shift in the 21st century. *Biogeosciences* 21: 2189–2206, doi: 10.5194/bg-21-2189-2024
- Hoffman, L. and M. L. Zettler (2024). Galeommatoidea (Bivalvia) from Namibia (Part 2). *Iberus* 42: 155–164
- Hoffman, L. and M. L. Zettler (2024). Neoleptonidae (Bivalvia) from Namibia. *Iberus* 42: 165–173
- Hoffman, L., C. Wienberg, M. Lisher and M. L. Zettler (2024). Occurrence of *Adacnarca* (Bivalvia: Philobryidae) of Late Pleistocene age from the continental shelf off Namibia and notes on species from South Africa. *Basteria* 88: 264–270
- Honorato-Zimmer, D., G. Escobar-Sánchez, K. Deakin, D. De Veer, T. Galloway, V. Guevara-Torrejón, J. Howard, J. Jones, C. Lewis, F. Ribeiro, G. Savage and M. Thiel (2024). Macrolitter and microplastics along the East Pacific coasts – A homemade problem needing local solutions. *Mar. Poll. Bull.* 203: 116440, doi: 10.1016/j.marpolbul.2024.116440
- Hu, Z., W. Li, S. V. Hohl, P. Meister, S. Yang, B. Zhang, Z. Xia and C. Liu (2024). Evaporite sequences as archives for Mg isotope compositions of seawater – Evidence from a Tethys marginal shelf basin in the Anisian. *Chem. Geol.* 668: 122346, doi: 10.1016/j.chemgeo.2024.122346
- Hubert-Huard, R., N. Andersen, H. W. Arz, W. Ehrmann and G. Schmiedl (2024). Changes in the Red Sea overturning circulation during Marine Isotope Stage 3. *Clim. Past* 20: 267–280, doi: 10.5194/cp-20-267-2024
- Jiménez, J. A., G. Winter, A. Bonaduce, M. Depuydt, G. Galluccio, B. van den Hurk, H. E. M. Meier, N. Pinardi, L. G. Pomarico and N. Vazquez Riveiros (2024). Sea Level Rise in Europe: Knowledge gaps identified through a participatory approach. *Sea Level Rise in Europe: 1st Assessment Report of the Knowledge Hub on Sea Level Rise (SLRE1)* 3-slre1: 3, doi: 10.5194/sp-3-slre1-3-2024
- Kaiser, J., E. Schefuß, J. Collins, R. Garreaud, J.-B. W. Stuut, N. Ruggieri, R. De Pol-Holz and F. Lamy (2024). Orbital modulation of subtropical versus subantarctic moisture sources in the southeast Pacific mid-latitudes. *Nat. Commun.* 15: 7512, doi: 10.1038/s41467-024-51985-4
- Kaiser, J., M. Tomczak, O. Dellwig and H. W. Arz (2024). Mediterranean-like “fall dump” events in the Baltic Sea. *Holocene* 34: 415–419, doi: 10.1177/09596836231219479
- Karsten, S., H. Radtke, M. Gröger, H. T. M. Ho-Hagemann, H. Mashayekh, T. Neumann and H. E. M. Meier (2024). Flux coupling approach on an exchange grid for the IOW Earth System Model (version 1.04.00) of the Baltic Sea region. *Geosci. Model Dev.* 17: 1689–1708, doi: 10.5194/gmd-17-1689-2024
- Kasuya, T., Y. Okazaki, S. Iwasaki, K. Nagashima, K. Kimoto, F. Lamy, J. R. Hagemann, L. Lembke-Jene, H. W. Arz, M. Murayama, C. B. Lange and N. Harada (2024). Orbital timescale CaCO₃ burial and dissolution changes off the Chilean margin in the subantarctic Pacific over the past 140 kyr. *Progress in Earth and Planetary Science* 11: 56, doi: 10.1186/s40645-024-00657-4
- Kiesel, J., C. Wolff and M. Lorenz (2024). Brief communication: From modelling to reality – flood modelling gaps highlighted by a recent severe storm surge event along the German Baltic Sea coast. *Nat. Hazards Earth Syst. Sci.* 24, 11: 3841–3849, doi: 10.5194/nhess-24-3841-2024
- Knoke, M., T. Dittmar, O. Zielinski, M. Kida, N. E. Asp, C. E. de Rezende, B. Schnetger and M. Seidel (2024). Outwelling of reduced porewater drives the biogeochemistry of dissolved organic matter and trace metals in a major mangrove-fringed estuary in Amazonia. *Limnol. Oceanogr.* 69: 262–278, doi: 10.1002/lno.12473
- Kuznetsov, I., B. Rabe, A. Androsov, Y. C. Fang, M. Hoppmann, A. Quintanilla-Zurita, S. Harig, S. Tippenhauer, K. Schulz, V. Mohrholz, I. Fer, V. Fofonova and M. Janout (2024). Dynamical reconstruction of the upper-ocean state in the central Arctic during the winter period of the MOSAIC expedition. *Ocean Sci.* 20: 759–777, doi: 10.5194/os-20-759-2024
- Lainela, S., E. Jacobs, S.-T. Luik, G. Rehder and U. Lips (2024). Seasonal dynamics and regional distribution patterns of CO₂ and CH₄ in the north-eastern Baltic Sea. *Biogeosciences* 21: 4495–4519, doi: 10.5194/bg-21-4495-2024
- Lamy, F., G. Winckler, H. W. Arz, J. R. Farmer, J. Gottschalk, L. Lembke-Jene, J. L. Midleton, M. van der Does, R. Tiedemann, C. Alvarez Zarikian, C. Basak, A. Brombacher, L. Dumm, O. M. Esper, L. C. Herbert,

S. Iwasaki, G. Kreps, V. J. Lawson, L. Lo, E. Malinverno, A. Martinez-Garcia, E. Michel, S. Moretti, C. M. Moy, A. C. Ravelo, C. R. Riesselman, M. Saavedra-Pellitero, H. Sadatzki, I. Seo, R. K. Singh, R. A. Smith, A. L. Souza, J. S. Stoner, M. Toyos, I. M. V. P. de Oliveira, S. Wan, S. Wu and X. Zhao (2024). Five million years of Antarctic Circumpolar Current strength variability. *Nature* 627: 789–796, doi: 10.1038/s41586-024-07143-3

Lapham, L. L., K. G. Lloyd, H. Fossing, S. Flury, J. B. Jensen, M. J. Alperin, **G. Rehder**, W. Holzhueter, T. Ferdelman and B. B. Jørgensen (2024). Methane leakage through the sulfate–methane transition zone of the Baltic seabed. *Nat. Geosci.* 17: 1277–1283, doi: 10.1038/s41561-024-01594-z

Lauvset, S. K., N. Lange, T. Tanhua, **H. C. Bittig**, A. Olsen, A. Kozyr, M. Álvarez, K. Azetsu-Scott, P. J. Brown, B. R. Carter, L. Cotrim da Cunha, M. Hoppema, M. P. Humphreys, M. Ishii, E. Jeansson, A. Murata, J. D. Müller, F. F. Pérez, C. Schirnack, R. Steinfeldt, T. Suzuki, A. Ulfsbo, A. Velo, R. J. Woosley and R. M. Key (2024). The annual update GLODAPv2.2023: the global interior ocean biogeochemical data product. *Earth Syst. Sci. Data* 16: 2047–2072, doi: 10.5194/essd-16-2047-2024

Lenz, R., K. Enders, E. C. Vizsolyi, M. Schumacher, J. Lötsch, M. G. J. Löder, G. Eder, Y. Voronko, J. M. Andrade-Garda, S. Muniategui-Lorenzo, C. Laforsch, D. Fischer and **M. Labrenz** (2024). What Goes Around Should Not Move Around: Immobilizing Microplastics as a New Approach for Analytical Ring Trials. *Environ. Sci. Technol.* 58: 22224–22234, doi: 10.1021/acs.est.4c09427

Li, X., E. Chrysagi, K. Klingbeil and **H. Burchard** (2024). Impact of Islands on Tidally Dominated River Plumes: A High-Resolution Modeling Study. *J. Geophys. Res. Oceans* 129: e2023JC020272, doi: 10.1029/2023JC020272

Lueck, R., I. Fer, C. Bluteau, M. Dengler, **P. Holtermann**, R. Inoue, A. LeBoyer, S.-A. Nicholson, K. Schulz and C. Stevens (2024). Best practices recommendations for estimating dissipation rates from shear probes. *Front. Mar. Sci.* 11: 1334327, doi: 10.3389/fmars.2024.1334327

Lønborg, C., C. Carreira, G. Abril, S. Agustí, V. Amaral, A. Andersson, J. Aristegui, P. Bhadury, M. B. Bif, A. V. Borges, S. Bouillon, M. L. Calleja, **L. C. Cotovicz Jr.**, S. Cozzi, M. Doval, C. M. Duarte, B. Eyre, C. G. Ficht,

E. E. García-Martín, A. Garzon-Garcia, M. Giani, R. Gonçalves-Araujo, R. Gruber, D. A. Hansell, F. Hashihama, D. He, J. M. Holding, W. R. Hunter, J. S. P. Ibánhez, V. Ibello, S. Ji-ang, G. Kim, K. Klun, P. Kowalczyk, A. Kubo, C.-W. Lee, C. B. Lopes, F. Maggioni, P. Magni, C. Marrase, P. Martin, S. L. McCallister, R. McCallum, P. M. Medeiros, X. A. G. Morán, F. E. Muller-Karger, A. Myers-Pigg, M. Norli, J. M. Oakes, **H. Osterholz**, H. Park, M. Lund Paulsen, J. A. Rosentreter, J. D. Ross, D. Rueda-Roa, C. Santinelli, Y. Shen, E. Teira, T. Tinta, G. Uher, M. Wakita, N. Ward, K. Watanabe, Y. Xin, Y. Yamashita, L. Yang, J. Yeo, H. Yuan, Q. Zheng and X. A. Álvarez-Salgado (2024). A global database of dissolved organic matter (DOM) concentration measurements in coastal waters (CoastDOM v1). *Earth Syst. Sci. Data* 16: 1107–1119, doi: 10.5194/essd-16-1107-2024

Marx, D., A. Feldens, S. Papenmeier, P. Feldens, A. Darr, **M. L. Zettler** and K. Heinicke (2024). Habitats and biotopes in the German Baltic Sea. *Biology* 13: 6, doi: 10.3390/biology13010006

Medwed, C., U. Karsten, J. Romahn, J. Kaiser, O. Dellwig, H. W. Arz and **A. Kremp** (2024). Archives of cyanobacterial traits: insights from resurrected *Nodularia spumigena* from Baltic Sea sediments reveal a shift in temperature optima. *ISME Communications* 4: ycae140, doi: 10.1093/ismeco/ycae140

Medwed, C., U. Karsten, J. Romahn, J. Kaiser, O. Dellwig, H. W. Arz and **A. Kremp** (2024). Archives of cyanobacterial traits: insights from resurrected *Nodularia spumigena* from Baltic Sea sediments reveal a shift in temperature optima. *ISME Communications* 4: ycae140, doi: 10.1093/ismeco/ycae140

Melet, A., R. van de Wal, A. Amores, A. Arns, A. A. Chaigneau, I. Dinu, I. D. Haigh, T. H. J. Hermans, P. Lionello, M. Marcos, **H. E. M. Meier**, B. Meyssignac, M. D. Palmer, R. Reese, M. J. R. Simpson and A. B. A. Slangen (2024). Sea Level Rise in Europe: Observations and projections. *Sea Level Rise in Europe: 1st Assessment Report of the Knowledge Hub on Sea Level Rise (SLRE1)* 3-slre1: 4, doi: 10.5194/sp-3-slre1-4-2024

Meng, S., J. Strahl, A. Börner, K. Krienke, **M. L. Zettler** and C. Wroczynna (2024). The bay barnacle *Amphibalanus improvisus* (Darwin, 1854) in the Pleistocene of Europe? A review of Pleistocene *Balanidae* of northern Central Europe. *J. Quat. Sci.* 39: 547–565, doi: 10.1002/jqs.3603

Miedtank, A., J. Schneider, C. Manss and **O. Zielinski** (2024). Marine digital twins for enhanced ocean understanding. *Remote Sens. Appl.-Soc. Environ.* 36: 101268, doi: https://doi.org/10.1016/j.rsase.2024.101268

Moll, D., H. Asmus, A. Blöcker, U. Böttcher, J. Conradt, L. Färber, N. Funk, S. Funk, G. Helene, H.-H. Hinrichsen, P. Kotterba, U. Krumme, F. Madiraca, **H. E. M. Meier**, S. Meyer, T. Moritz, S. A. Otto, M. Parr, G. Pinto, P. Polte, M.-C. Riekhof, V. Sarrazin, M. Scotti, R. Voss, H. Winkler and C. Möllmann (2024). A climate vulnerability assessment of the fish community in the Western Baltic Sea. *Sci. Rep.* 14: 16184, doi: 10.1038/s41598-024-67029-2

Morard, R., K. F. Darling, A. K. M. Weiner, **C. Hassenrück**, C. Vanni, T. Cordier, N. Henry, M. Greco, N. M. Vollmar, T. Milivojevic, S. N. Rahman, M. Siccha, J. Meilland, L. Jonkers, F. Quillévére, G. Escarguel, C. J. Douady, T. de Garidel-Thoron, C. de Vargas and M. Kucera (2024). The global genetic diversity of planktonic foraminifera reveals the structure of cryptic speciation in plankton. *Biol. Rev.* 99: 1218-1241, doi: 10.1111/brv.13065

Moros, M., A. T. Kotilainen, I. Snowball, T. Neumann, K. Perner, **H. E. M. Meier**, S. Papenmeier, H. Kolling, T. Leipe, J. S. Sinninghe Damsté and R. Schneider (2024). Giant saltwater inflow in AD 1951 triggered Baltic Sea hypoxia. *Boreas* 53: 125–138, doi: 10.1111/bor.12643

Mredul, M. M. H., **E. P. Sokolov**, H. Kong and I. M. Sokolova (2024). Spawning acts as a metabolic stressor enhanced by hypoxia and independent of sex in a broadcast marine spawner. *Sci. Total Environ.* 909: 168419, doi: 10.1016/j.scitotenv.2023.168419

Oggerin, M., T. Viver, J. Brüwer, D. Voß, M. Garcia-Llorca, **O. Zielinski**, L. H. Orellana and B. M. Fuchs (2024). Niche differentiation within bacterial key-taxa in stratified surface waters in the Southern Pacific Gyre. *ISME J.* 18: wrae155, doi: 10.1093/ismejo/wrae155

Ostrander, C. M., Y. Shu, S. G. Nielsen, **O. Dellwig**, J. Blusztajn, **H. N. Schulz-Vogt**, V. Hübner and C. M. Hansel (2024). Anthropogenic forcing of the Baltic Sea thallium cycle. *Environ. Sci. Technol.* 58: 8510–8517, doi: 10.1021/acs.est.4c01487

Owensworth, E., **M. Moros**, J. Lloyd, O. Bennike, J. B. Jensen, T. Blanz and D. Selby (2024). Multi-proxy palaeoenvironmental reconstruction of the Skagerrak from the Lateglacial to Middle Holocene. *Boreas* 53: 360–375, doi: 10.1111/bor.12652

Pagli, B., M. Duphil, S. Jullien, **C. Dutheil**, A. Peltier and C. Menkes (2024). Wave climate around New Caledonia. *Clim. Dyn.* 62: 8865–8887, doi: 10.1007/s00382-024-07365-1

Pham, A. H., **N. Choisnard, A. Fernández-Carrera**, A. Subramaniam, E. K. Strobe, E. J. Carpenter, **M. Voss** and J. P. Montoya (2024). Planktonic habitats in the Amazon plume region of the Western Tropical North Atlantic. *Front. Mar. Sci.* 11: 1287497, doi: 10.3389/fmars.2024.1287497

Pham, D. N., A. Ruhl, K. Fisch, S. El Toum, S. Heise and I. M. Sokolova (2024). Effects of contamination and warming on ragworms *Hediste diversicolor*: A laboratory experiment with Oder estuary sediments. *Estuar. Coast. Shelf Sci.* 299: 108702, doi: 10.1016/j.ecss.2024.108702

Piontek, J., C. Hassenrück, B. Zäncker and **K. Jürgens** (2024). Environmental control and metabolic strategies of organic-matter-responsive bacterioplankton in the Weddell Sea (Antarctica). *Environ. Microbiol.* 26: e16675, doi: 10.1111/1462-2920.16675

Piret, L., S. Bertrand, C. Moffat, **P. Feldens, S. Papenmeier** and **H. W. Arz** (2024). Recent ice-contact delta formation in front of Pio XI glacier controls sedimentary processes in Eyre Fjord, Patagonia. *Earth Surface Processes and Landforms* 49: 5054–5068, doi: 10.1002/esp.6012

Premaratne, K. M., R. Chandrajith, N. P. Ratnayake, S.-L. Li, K. Gayantha and J. Routh (2024). North Atlantic forcing of Indian Winter Monsoon intensification: Evidence from Holocene sediments from the tropical Indian Ocean Island of Sri Lanka. *Holocene* 34: 274–282, doi: 10.1177/09596836231211875

Rain-Franco, A., H. Peter, G. Pavan de Moraes and **S. Beier** (2024). The cost of adaptability: resource availability constrains functional stability under pulsed disturbances. *mSphere* 9: e00727, doi: 10.1128/msphere.00727-23

Receveur, A., C. Menkes, M. Lengaigne, A. Ariza, A. Bertrand, **C. Dutheil**, S. Cravatte, V. Allain, L. Barbin, A. Lebourges-Dhaussy, P. Lehodey and S. Nicol (2024). A rare oasis effect for forage fauna in oceanic eddies at the global scale. *Nat. Commun.* 15: 4834, doi: 10.1038/s41467-024-49113-3

Reckhardt, A., R. Meyer, S. L. Seibert, J. Gresskowiak, M. Roberts, S. Brick, G. Abarike,

K. Amoako, H. Waska, K. Schwalfenberg, **I. Schmiedinger**, O. Wurl, **M. E. Böttcher**, G. Massmann and K. Pahnke (2024). Spatial and temporal dynamics of groundwater biogeochemistry in the deep subsurface of a high-energy beach. *Mar. Chem.* 267: 104461, doi: 10.1016/j.marchem.2024.104461

Reese, L., U. Gräwe, K. Klingbeil, X. Li, M. Lorenz and **H. Burchard** (2024). Local mixing determines spatial structure of diahaline exchange flow in a mesotidal estuary: A study of extreme runoff conditions. *J. Phys. Oceanogr.* 54: 3–27, doi: 10.1175/JPO-D-23-0052.1

Reineccius, J. and J. J. Waniek (2024). Critical reassessment of microplastic abundances in the marine environment. *Sci. Total Environ.* 954: 176449, doi: 10.1016/j.scitotenv.2024.176449

Reineccius, J., M. Heck and **J. J. Waniek** (2024). Microplastic Particles and Fibers in Seasonal Ice of the Northern Baltic Sea. *Toxics* 12: 542, doi: 10.3390/toxics12080542

Rengefors, K., N. Annenkova, J. Wallenius, M. Svensson, **A. Kremp** and D. Ahrén (2024). Population genomic analyses reveal that salinity and geographic isolation drive diversification in a free-living protist. *Sci. Rep.* 14: 4986, doi: 10.1038/s41598-024-55362-5

Riedinger, D. J., V. Fernández-Juárez, L. F. Delgado, T. Sperlea, C. Hassenrück, D. P. R. Herlemann, C. Pansch, M. Kataržytė, F. Bruck, A. Ahrens, M. Rakowski, K. Piwosz, A. Stevenson, T. B. H. Reusch, G. Gyraitė, **D. Schulz-Bull, H. Benterbusch-Brockmöller, S. Kube**, S. Dupke, A. F. Andersson, L. Riemann and **M. Labrenz** (2024). Control of *Vibrio vulnificus* proliferation in the Baltic Sea through eutrophication and algal bloom management. *Commun. Earth Environ.* 5: 246, doi: 10.1038/s43247-024-01410-x

Rita, D., A. Borrell, **D. Wodarg**, G. Vikingsson, R. García-Vernet, A. Aguilar and N. Loick-Wilde (2024). Amino acid-specific nitrogen stable isotope analysis reveals the trophic behavior of Icelandic fin whales in winter and suggests variable feeding strategies. *Mar. Mamm. Sci.* 40: e13097, doi: 10.1111/mms.13097

Robbe, E., L. B. Abdallah, L. El Fels, N. E. H. Chaher, M. Haseler, F. Mhiri and **G. Scher-**

newski (2024). Towards solving the beach litter problem: Ecosystem service assessments at North African coasts. *Sustainability* 16: 5911, doi: 10.3390/su16145911

Robbe, E., L. Rogge, J. Lesutienė, M. Bučas and **G. Schernewski** (2024). Assessment of Ecosystem Services Provided by Macrophytes in Southern Baltic and Southern Mediterranean Coastal Lagoons. *Environ. Manage.* 74: 206–229, doi: 10.1007/s00267-024-01955-9

Rodrigues, J. V., **L. C. Cotovicz Jr., N. Beloto, M. R. Gmach** and L. E. A. Bezerra (2024). Historical land use changes lead to massive loss of soil carbon stocks in a recovering, semiarid mangrove. *Mar. Poll. Bull.* 208: 116980, doi: 10.1016/j.marpolbul.2024.116980

Rodríguez-Marconi, S., B. Krock, U. Tillmann, A. Tillmann, D. Voss, **O. Zielinski, M. Vásquez** and N. Trefault (2024). Diversity of eukaryote plankton and phycotoxins along the West Kalaallit Nunaat (Greenland) coast. *Front. Mar. Sci.* 11: 1443389, doi: 10.3389/fmars.2024.1443389

Rollwage, L., O. Sánchez-Guillamón, C. Sippl, R. León, J. T. Vázquez, M. Urlaub, F. Gross, C. Böttner, S. Krastel and **J. Geersen** (2024). Geomorphological evidence for volcano-tectonic deformation along the unstable western flank of Cumbre Vieja Volcano (La Palma). *Geomorphology* 465: 109401, doi: 10.1016/j.geomorph.2024.109401

Romahn, J., D. Baranski, A. Schmidt, **J. Kaiser, H. W. Arz**, L. S. Epp, A. Kremp and M. Bálint (2024). Glimpse of past dynamics: A new set of phytoplankton primers for sedaDNA. *Environ. DNA* 6: e577, doi: 10.1002/edn3.577

Roos, J., M. A. Zeller, M. Gogina, P. Roeser, J. Kallmeyer, M. Schönke, H. Radtke and **M. E. Böttcher** (2024). Bottom-trawling signals lost in sediment: A combined biogeochemical and modeling approach to early diagenesis in a perturbed coastal area of the southern Baltic Sea. *Sci. Total Environ.* 906: 167551, doi: 10.1016/j.scitotenv.2023.167551

Rostami, M., L. Severino, S. Petri and **S. Harriri** (2024). Dynamics of localized extreme heatwaves in the mid-latitude atmosphere: A conceptual examination. *Atmos. Sci. Lett.* 25: e1188, doi: 10.1002/asl.1188

Ruvalcaba Baroni, I., E. Almroth-Rosell, L. Axell, S. T. Fredriksson, J. Hieronymus, M. Hieronymus, S.-E. Brunnabend, **M. Gröger**, I. Kuznetsov, F. Fransner, R. Hordoir, S. Falahat and L. Arneborg (2024). Validation of the coupled physical-biogeochemical ocean model NEMO-SCOBI for the North Sea-Baltic Sea system. *Biogeosciences* 21: 2087–2132, doi: 10.5194/bg-21-2087-2024

Sabbaghzadeh, B., G. Uher and R. Upstill-Goddard (2024). “Dynamics of chromophoric dissolved organic matter in the Atlantic Ocean: unravelling province-dependent relationships, optical complexity, and environmental influences”. *Front. Mar. Sci.* 11: 1432133, doi: 10.3389/fmars.2024.1432133

Saez, P. S., C. Eden and **M. Chouksey** (2024). Evolution of internal gravity waves in a mesoscale eddy simulated using a novel model. *J. Phys. Oceanogr.* 54: 985–1002, doi: 10.1175/JPO-D-23-0095.1

Safonova, K., H. E. M. Meier and **M. Gröger** (2024). Summer heatwaves on the Baltic Sea seabed contribute to oxygen deficiency in shallow areas. *Commun. Earth Environ.* 5: 106, doi: 10.1038/s43247-024-01268-z

Saghravani, S. R., **M. E. Böttcher**, W. L. Hong, K. Kuliński, A. Lepland, A. Sen and B. Szymczycha (2024). Distributions of in situ parameters, dissolved (in)organic carbon, and nutrients in the water column and pore waters of Arctic fjords (western Spitsbergen) during a melting season. *Earth Syst. Sci. Data* 16: 3419–3431, doi: 10.5194/essd-16-3419-2024

Scales, B. S., C. Hassenrück, L. Moldaenke, J. Hassa, C. Rückert-Reed, C. Rummel, C. Völkner, R. Rynek, T. Busche, J. Kalinowski, A. Jahnke, M. Schmitt-Jansen, K. Wendt-Potthoff and S. Oberbeckmann (2024). Hunting for pigments in bacterial settlers of the Great Pacific Garbage Patch. *Environ. Microbiol.* 26: e16639, doi: 10.1111/1462-2920.16639

Schaub, I., R. Friedland and **M. L. Zettler** (2024). Good-Moderate boundary setting for the environmental status assessment of the macrozoobenthos communities with the Benthic Quality Index (BQI) in the south-western Baltic Sea. *Mar. Poll. Bull.* 201: 116150, doi: 10.1016/j.marpolbul.2024.116150

Schernewski, G., G. Escobar Sánchez, S. Felsing, M. Gatel Rebours, **M. Haseler**, R. Hauk, **X. Lange** and **S. Piehl** (2024). Emission, transport and retention of floating marine macro-litter (plastics): The Role of Baltic harbor and sailing festivals. *Sustainability* 16: 1220, doi: 10.3390/su16031220

Schernewski, G., M. Jekat, F. Kösters, **T. Neumann**, S. Steffen and **M. von Thenen** (2024). Ecosystem Services Supporting Environmental Impact Assessments (EIAs): Assessments of Navigation Waterways Deepening Based on Data, Experts, and a 3D Ecosystem Model. *Land* 13: 1653, doi: 10.3390/land13101653

Schernewski, G., T. Neumann, M. Bučas and **M. v. Thenen** (2024). Ecosystem Services of the Baltic Sea – State and Changes during the Last 150 Years. *Environments* 11, doi: 10.3390/environments11090200

Schmidt, A., J. Romahn, E. Andren, **A. Kremp**, **J. Kaiser**, **H. W. Arz**, **O. Dellwig**, M. Balint and L. S. Epp (2024). Decoding the Baltic Sea’s past and present: A simple molecular index for ecosystem assessment. *Ecol. Indic.* 166: 112494, doi: 10.1016/j.ecolind.2024.112494

Schmitt, M., H. T. Pham, S. Sarkar, **K. Klingbeil** and **L. Umlauf** (2024). Diurnal Warm Layers in the ocean: Energetics, non-dimensional scaling, and parameterization. *J. Phys. Oceanogr.* 54: 1037–1055, doi: 10.1175/JPO-D-23-0129.1

Senckenberg Ocean Species Alliance (SOSA), A. Brandt, C. Chen, L. Engel, P. Esquete, T. Horton, A. M. Jazdzewska, N. Johannsen, S. Kaiser, T. C. Kihara, H. Knauber, **K. Kniesz**, J. Landschoff, A. N. Lorz, F. M. Machado, C. A. Martinez-Munoz, T. Riehl, A. Serpell-Stevens, J. D. Sigwart, A. H. S. Tandberg, R. Tato, M. Tsuda, K. Voncina, H. K. Watanabe, C. Wenz and J. D. Williams (2024). Ocean Species Discoveries 1-12 – A primer for accelerating marine invertebrate taxonomy. *Biodivers Data J* 12: e128431, doi: 10.3897/BDJ.12.e128431

Skogen, M. D., J. M. Aarflot, L. M. García-García, R. Ji, M. Ruiz-Villarreal, E. Almroth-Rosell, A. Belgrano, **R. Friedland**, S. Gao, M. Hill-Cruz, S. S. Hjøllø, M. Huret, J. B. Kellner, S. van Leeuwen, A. Lopez de Gamiz-Zearra, M. Maar, E. A. Mousing, M. A. Peck, A. Pastor Rollan, S. F. Sailley, S. Saraiva, C. Speakman, T. Troost and V. Ç. Yumruktepe (2024). Bridging the gap:

integrating models and observations for better ecosystem understanding. *Mar. Ecol. Prog. Ser.* 739: 257–268, doi: 10.3354/meps14616

Smrzka, D., J. Zwicker, **H. N. Schulz-Vogt**, C. T. S. Little, M. Rieder, P. Meister, S. Gier and J. Peckmann (2024). Fossilized giant sulfide-oxidizing bacteria from the Devonian Hollard Mound seep deposit, Morocco. *Geobiology* 22: e12581, doi: 10.1111/gbi.12581

Socrate, J., E. Verón and G. García (2024). Contributions to the planning of argentine maritime spaces: The Northern Patagonian socioecological system as a case study. *Mar. Policy* 168: 106322, doi: 10.1016/j.marpol.2024.106322

Socrate, J., E. Verón and M. Chaparro (2024). Public perception of offshore hydrocarbon activities in the North Argentine Basin: a study in Buenos Aires Province, Argentina. *J. Coast. Conserv.* 28: 77, doi: 10.1007/s11852-024-01078-7

Speidel, L. G., R. Carvalho da Silva, M. Beck, **O. Dellwig**, J. Wollschläger, T. Dittmar and M. Seidel (2024). Rivers and tidal flats as sources of dissolved organic matter and trace metals in the German Bight (North Sea). *Biogeochemistry* 167: 225–250, doi: 10.1007/s10533-024-01117-3

Steinkopf, M., U. Krumme, **D. Schulz-Bull**, **D. Wodarg** and **N. Loick-Wilde** (2024). Trophic lengthening triggered by filamentous, N₂-fixing cyanobacteria disrupts pelagic but not benthic food webs in a large estuarine ecosystem. *Ecol. Evol.* 14: e11048, doi: 10.1002/ece3.11048

Svennevig, K., M. J. Owen, M. Citterio, T. Nielsen, S. Rosing, **J. Harff**, **R. Endler**, M. Morlighem and E. Rignot (2024). Holocene gigascale rock avalanches in Vaigat strait, West Greenland—Implications for geohazard. *Geology* 52: 147–152, doi: 10.1130/g51234.1

Taenzer, L., W. Pardis, S. D. Wankel, **M. Kolbe**, **M. Voss**, **H. N. Schulz-Vogt**, **C. Burmeister**, D. S. Hardisty and C. M. Hansel (2024). Subsurface Superoxide Spans the Baltic Sea. *J. Geophys. Res. Oceans* 129: e2024JC021438, doi: 10.1029/2024JC021438

Tagg, A. S., T. Sperlea, **C. Hassenrück**, B. Kreikemeyer, D. Fischer and **M. Labrenz**

(2024). Microplastic-antifouling paint particle contamination alters microbial communities in surrounding marine sediment. *Sci. Total Environ.* 926: 171863, doi: 10.1016/j.scitotenv.2024.171863

Umbricht, J., A. Filella, **A. Klett**, **A. Vogts**, M. Benavides and **M. Voss** (2024). Uptake of dissolved inorganic nitrogen and N₂ fixation by *Crocospaera watsonii* under climate change scenarios. *Front. Mar. Sci.* 11, doi: 10.3389/fmars.2024.1388214

Umbricht, J., C. Burmeister, J. W. Dippner, I. Liskow, J. P. Montoya, A. Subramaniam and **M. Voss** (2024). Nitrate uptake and primary production along the Amazon River plume continuum. *J. Geophys. Res. Biogeosciences* 129: e2023JG007662, doi: 10.1029/2023JG007662

Vajedsamiei, J., N. Warlo, **H. E. M. Meier** and F. Melzner (2024). Predicting key ectotherm population mortality in response to dynamic marine heatwaves: A Bayesian-enhanced Thermal Tolerance Landscape approach. *Functional Ecology* 38: 1875–1887, doi: 10.1111/1365-2435.14620

Väli, G., **H. E. M. Meier**, T. Liblik, **H. Radtke**, **K. Klingbeil**, **U. Gräwe** and U. Lips (2024). Submesoscale processes in the surface layer of the central Baltic Sea: A high-resolution modelling study. *Oceanologia* 66: 78–90, doi: 10.1016/j.oceano.2023.11.002

Vanharanta, M., **M. Santoro**, C. Villena-Aleman, J. Piiparinen, K. Piwosz, H.-P. Grosart, **M. Labrenz** and K. Spilling (2024). Microbial remineralization processes during post-spring-bloom with excess phosphate available in the northern Baltic Sea. *FEMS Microbiol. Ecol.*: online, fiae103, doi: 10.1093/femsec/fiae103

Vedenin, A. A., I. Kröncke, A. J. Beck, A. Bodenbinder, **E. Chrysagi**, **U. Gräwe**, M. Kampmeier and J. Greinert (2024). Spatial structure and biodiversity of macrofauna around marine munition dumpsites - A case study from the Baltic Sea. *Mar. Poll. Bull.* 198: 115865, doi: 10.1016/j.marpolbul.2023.115865

Veeningen, R., A. Fall, **M. E. Böttcher**, P. Eichhubl, K. Decker and B. Grasemann (2024). Deformation and fluid flow history of a fractured basement hydrocarbon reservoir below the Sab’atayn Basin, Habban Field, Yemen. *Mar. Pet. Geol.* 169, doi: doi.org/10.1016/j.marpetgeo.2024.107082

Wählström, I., E. Almroth-Rosell, M. Edman, M. Olofsson, K. Eilola, V. Fleming, **M. Gröger**, L. Arneborg and **H. E. M. Meier** (2024). Increased nutrient retention and cyanobacterial blooms in a future coastal zone. *Estuar. Coast. Shelf Sci.* 301: 108728, doi: 10.1016/j.ecss.2024.108728

Wilson, S. J., A. Moody, T. McKenzie, M. B. Cardenas, E. Luijendijk, A. H. Sawyer, A. Wilson, H. A. Michael, B. Xu, K. L. Knee, H.-M. Cho, Y. Weinstein, A. Paytan, N. Moosdorf, C.-T. A. Chen, M. Beck, C. Lopez, D. Murgulet, G. Kim, M. A. Charette, H. Waska, J. S. P. Ibánhez, G. Chaillou, T. Oehler, S.-i. Onodera, M. Saito, V. Rodellas, N. Dimova, D. Montiel, H. Dulai, C. Richardson, J. Du, E. Petermann, X. Chen, K. L. Davis, S. Lamontagne, R. Sugimoto, G. Wang, H. Li, A. I. Torres, C. Demir, E. Bristol, C. T. Connolly, J. W. McClelland, B. J. Silva, D. Tait, B. Kumar, R. Viswanadham, V. Sarma, E. Silva-Filho, A. Shiller, A. Lecher, J. Tamborski, H. Bokuniewicz, C. Rocha, A. Reckhardt, **M. E. Böttcher**, S. Jiang, T. Stieglitz, H. G. V. Gbewezoun, C. Charbonnier, P. Anschutz, L. M. Hernández-Terrones, S. Babu, B. Szymczycha, M. Sadat-Noori, F. Niencheski, K. Null, C. Tobias, B. Song, I. C. Anderson and I. R. Santos (2024). Global subterranean estuaries modify groundwater nutrient loading to the ocean. *Limnol. Oceanogr. Lett.* 9: 411–422, doi: 10.1002/lo12.10390

Wimart-Rousseau, C., T. Steinhoff, B. Klein, **H. C. Bittig** and A. Körtzinger (2024). Technical note: Assessment of float pH data quality control methods – a case study in the subpolar northwest Atlantic Ocean. *Biogeosciences* 21: 1191–1211, doi: 10.5194/bg-21-1191-2024

Xie, R., L. Lin, C. Shi, P. Zhang, P. Rao, J. Li and D. Izabel-Shen (2024). Elucidating the links between N₂O dynamics and changes in microbial communities following saltwater intrusions. *Environ. Res.* 245: 118021, doi: 10.1016/j.envres.2023.118021

Yau, Y. Y. Y., A. Cabral, G. Reithmaier, **L. C. Cotovicz Jr.**, J. Barreira, G. Abril, C. Morana, A. V. Borges, W. Machado, J. M. Godoy, S. Bonaglia and I. R. Santos (2024). Efficient oxidation attenuates porewater-derived methane fluxes in mangrove waters. *Limnol. Oceanogr.* 69: 1997–2014, doi: 10.1002/lno.12639

Zalasiewicz, J., M. J. Head, C. N. Waters, S. D. Turner, P. K. Haff, C. Summerhayes, M. Williams, A. Cearreta, M. Wägrich, I.

Fairchild, N. L. Rose, Y. Saito, R. Leinfelder, B. Fiałkiewicz-Kozioł, Z. An, J. Svytski, A. Gałuszka, F. M. G. McCarthy, **J. I. d. Sul**, A. Barnosky, A. B. Cundy, J. R. McNeill and J. Zinke (2024). The Anthropocene within the Geological Time Scale: a response to fundamental questions. *International Union of Geological Sciences* 47: 65–83, doi: 10.18814/epiugs/2023/023025

Zarghamipour, M., H. Malakooti and **M. H. Bordbar** (2024). Air-Sea CO₂ exchange over the Mediterranean Sea, the Red Sea and the Arabian Sea. *Int. J. Environ. Res.* 18: 36, doi: 10.1007/s41742-024-00586-6

Zarghamipour, M., H. Malakooti and **M. H. Bordbar** (2024). Spatio-temporal analysis of the factors affecting NO_x concentration during the evaluation cycle of high pollution episodes in Tehran metropolitan. *Atmos. Pollut. Res.* 15: 102177, doi: 10.1016/j.apr.2024.102177

Zeller, M. A., B. R. Van Dam, C. Lopes, A. M. McKenna, C. L. Osburn, J. W. Fourqurean, J. S. Kominoski and **M. E. Böttcher** (2024). The unique biogeochemical role of carbonate-associated organic matter in a subtropical seagrass meadow. *Commun. Earth Environ.* 5: 681, doi: 10.1038/s43247-024-01832-7

Zettler, M. L. (2024). Re-establishment of *Malletia sorror* (Soot-Ryen, 1957), an endemic bathyal bivalve off Chile (Mollusca: Bivalvia: Nuculanoidea). *Gayana* 88(2): 320–326

Zilius, M., R. Barisevičiūtė, S. Bonaglia, **I. Klawonn**, E. Lorre, T. Politi, I. Vybernaitė-Lubienė, **M. Voss**, D. Overlingé and P. A. Bukaveckas (2024). The effects of variable riverine inputs and seasonal shifts in phytoplankton communities on nitrate cycling in a coastal lagoon. *Front. Mar. Sci.* 11, doi: 10.3389/fmars.2024.1497246

Articles in Other Journals

Hinz, M., P. Westfeld, **P. Feldens**, **A. Feldens**, S. Themann and **S. Papenmeier** (2024). AI-based boulder detection in sonar data – bridging the gap from experimentation to application. *Int. Hyd. Rev.* 30: 78–98, doi: 10.58440/ihr-30-1-a08

Tagg, A. S. and **M. Labrenz** (2024). Impacts of Climate Change on Microbial Communities in the Baltic Sea. *Oxford Research*

Encyclopedia of Climate Science, doi: 10.1093/acrefore/9780190228620.013.892

Zettler, M. L. (2024). Bericht über das 42. Kartierungstreffen der Arbeitsgruppe Malakologie Mecklenburg-Vorpommern vom 3. bis 5. Mai 2024 in Kamminke (Landkreis Vorpommern-Greifswald). Mitt. Dtsch. Malakozool. Ges. 111: 63-71, http://www.dmg.mollusca.de/images/mitteilungen_dmg/mitteilungen111/mitt_dmg_111_063-071_zettler.pdf

Individual Contributions to Edited Journals

Böttcher, M. E., U. Mallast, G. Massmann, N. Moosdorf, M. Müller-Petke and H. Waska (2024). Coastal-Groundwater Interfaces (Submarine Groundwater Discharge). In: Ecohydrological Interfaces. Ed. by S. Krause, D. M. Hannah and N. B. Grimm. 1st ed. Newark: John Wiley & Sons, Incorporated: 123 – 147, 978-1-119-48966-5

Brandt, P., M. **H. Bordbar**, P. Coelho, R. A. I. Koungue, M. Körner, T. Lamont, J. F. Lübbecke, V. **Mohrholz**, A. Prigent, M. Roch, **M. Schmidt**, A. K. van der Plas and J. Veitch (2024). Physical drivers of southwest African coastal upwelling and its response to climate variability and change. In: Sustainability of Southern African Ecosystems under Global Change: Science for Management and Policy Interventions. Ed. by G. P. von Maltitz, G. F. Midgley, J. Veitch, C. Brümmer, R. P. Rötter, F. A. Viehberg and M. Veste. Cham: Springer International Publishing: 221 – 257, 978-3-031-10948-5, doi: 10.1007/978-3-031-10948-5_9

Gogina, M., I. Kröncke, **D. Marx** and **M. L. Zettler** (2024). Status und Trends der biologischen Vielfalt an Küsten und in Küstengewässern. Zoobenthos. In: Faktencheck Artenvielfalt: Bestandsaufnahme und Perspektiven für den Erhalt der biologischen Vielfalt in Deutschland. Ed. by C. Wirth, H. Bruelheide, N. Farwig, J. M. Marx and J. Settele. München: oekom 681 – 684, 978-3-98726-095-7, doi: 10.14512/9783987263361

ICES, J. Beermann, S. Birchenough, M. Blomqvist, R. Boschen-Rose, L. Buhl Mortensen, J. Craeymeersch, J. Dannheim, S. Degraer, N. Desroy, A. Donnay, E. Farrell, L. Guérin, S. Glorius, L. Healy, H. Hillewaert,

M. Gogina, Y. Griffiths, W. Hunter, U. Janas, C. Labruno, P. Magni, H. Nygård, E. Oug, S. Parra, H. Reiss, H. C. Trannum, J. Vanaverbeke, G. Van Hoey, J. Warzocha, A. Wrede and **M. L. Zettler** (2024). Benthos Ecology Working Group (BEWG; outputs from 2023 meeting) (BEWG). In: ICES Scientific Reports. Ed. by J. Craeymeersch and P. Magni. International Council for the Exploration of the Sea (ICES) – Conseil International pour l’Exploration de la Mer (CIEM) 06: 26, doi: 10.17895/ices.pub.27257232.v1

Oschlies, A., N. Mengis, **G. Rehder**, E. Schill, H. Thomas, K. Wallmann and M. Zimmer (2024). Mögliche Beiträge geologischer und mariner Kohlenstoffspeicher zur Dekarbonisierung. In: Klimawandel in Deutschland: Entwicklung, Folgen, Risiken und Perspektiven. Ed. by G. P. Brasseur, D. Jacob and S. Schuck-Zöller. Berlin, Heidelberg: Springer Berlin Heidelberg: 449 – 458, doi: 10.1007/978-3-662-66696-8_35

Zielinski, O. (2024). Geleitwort. In: Regenerative Zukünfte und künstliche Intelligenz. Ed. by K. Gondlach, B. Brinkmann, M. Brinkmann and J. Plath. Wiesbaden: Springer 1: XIII-XV, 978-3-658-43585-1, doi: 10.1007/978-3-658-43586-8

Monographs

Kremp, A., J. Dutz and **M. L. Zettler** (2024). Biological assessment of the Baltic Sea 2021. Rostock: Leibniz Institute for Baltic Sea Research Warnemünde. 89 S. (Meeresswissenschaftliche Berichte = Marine Science Reports; 124), doi: 10.12754/msr-2024-0124

Marx, D., K. Romoth, S. Papenmeier, J. Valerius, S. Eisenbarth and K. Heinicke (2024). Die Biotope des Meeresbodens im Naturschutzgebiet “Kadetrinne”. Bonn: Bundesamt für Naturschutz. (BfN-Schriften; 690), doi: 10.19217/skr690

Matthäus, W. (2024). Die Forschungsschiffe und autonomen Messsysteme des Instituts für Meereskunde Warnemünde – ihre Geschichte und ihr Verbleib. Rostock: Leibniz Institute for Baltic Sea Research Warnemünde. 111 S. (Meeresswissenschaftliche Berichte = Marine Science Reports; 126), doi: 10.12754/msr-2024-0126

Naumann, M., U. Gräwe, L. Umlauf, H. Burchard, V. Mohrholz, J. Kuss, M. Kanwischer, H. Osterholz, S. Feistel, I. Hand, J. J. Waniek and **D. E. Schulz-Bull** (2024). Hydrograph-

ic-hydrochemical assessment of the Baltic Sea 2022. Warnemünde: Leibniz Institute for Baltic Sea Research. (Meeresswissenschaftliche Berichte), doi: 10.12754/msr-2024-0127

Naumann, M., U. Gräwe, V. Mohrholz, J. Kuss, M. Kanwischer, H. Osterholz, S. Feistel, I. Hand and **J. J. Waniek** (2024). Hydrographic-hydrochemical assessment of the Baltic Sea 2023. Warnemünde: Leibniz Institute for Baltic Sea Research. (Meeresswissenschaftliche Berichte), doi: 10.12754/msr-2024-128.

Tagg, A. and **M. Labrenz** (2024). The Microplastic Pollution Problem and the sea. “Mum, can we play in the sand?” A child-centric microbiology education framework. 12 S., http://www.imili-eah.com/api/profile/upload/2024/02/22/The%20microplastic%20pollution%20problem_20240222101604A314.pdf

Thonicke, K., E. Rahner, A. Arneith, A. Bonn, N. Borchard, A. Chaudhary, M. Darbi, T. Dutta, U. Eberle, N. Eisenhauer, N. Farwig, C. G. Flocco, J. Freitag, P. Grobe, R. Grosch, H. P. Grossart, A. Grosse, K. Grützmacher, N. Hagemann, B. Hansjürgens, A. Hartman Scholz, **C. Hassenrück**, C. Häuser, T. Hickler, F. Hölker, U. Jacob, S. Jähnig, **K. Jürgens**, S. Kramer-Schadt, C. Kretsch, C. Krug, J. P. Lindner, L. Loft, C. Mann, B. Matzdorf, M. Mehring, R. Meier, K. Meusemann, D. Müller, M. Nieberg, J. Overmann, R. S. Peters, L. Pörtner, P. Pradhan, A. Prochnow, V. Rduch, C. Reyer, C. Roos, C. Scherber, N. Scheunemann, S. Schroer, A. Schuck, G. B. Sioen, S. Sommer, N. Sommerwerk, F. Tanneberger, K. Tockner, H. van der Voort, T. Veenstra, P. Verburg, M. Voss, B. Warner, W. Wende and K. Wesche (2024). 10 Must-Knows aus der Biodiversitätsforschung 2024. Potsdam: Leibniz-Forschungsnetzwerk Biodiversität. 72 S. doi: 10.5281/zenodo.10794361

Zettler, M. L., A. Kremp and **J. Dutz** (2024). Biological assessment of the Baltic Sea 2022. Rostock: Leibniz-Institut für Ostseeforschung Warnemünde. 86 S. (Meeresswissenschaftliche Berichte = Marine Science Reports; 125), doi: 10.12754/msr-2024-0125

Working and Discussion Papers

Ahola, M., L. Bergström, M. Blomqvist, D. Boedeker, **F. Börgel**, I. Carlén, T. Carlund, J. Carstensen, J. P. A. Christensen, J. De La Cueva, M. Futter, E. Gaget, O. Glibko, **M. Gröger**, V. Dierschke, C. Dieterich, M. Frederiksen, A. Galatius, B. Gustafsson, C. Frauen, A. Halkka, C. Halling, N. Heibeck, J. Holfort, M. Huss, K. Hyttiäinen, **K. Jürgens**, M. Jüssi, M. Kallasvuo, M. Kankainen, B. Karlson, A. M. Karlsson, M. Karlsson, A. Kiessling, E. Kjellström, A. Kontautas, D. Krause-Jensen, **A. Kremp**, K. Kuliński, S. Kuningas, J. Käyhkö, J. Laht, A. Laine, **M. Labrenz**, G. Lange, A. Lappalainen, T. Laurila, M. Lehtiniemi, K.-O. Lerche, U. Lips, G. Martin, M. McCrackin, **H. E. M. Meier**, N. Mustamäki, B. Müller-Karulis, R. Naddafi, L. Niskanen, A. Nyström Sandman, J. Olsson, O. Outinen, D. Pavón-Jordán, J. Pålsson, M. Rantanen, A. Razinkovas-Baziukas, **G. Rehder**, J. H. Reißmann, M. Reutgård, S. Ross, A. Rutgersson, J. Saarinen, L. Saks, O. Savchuk, **G. Schernewski, J. Schumacher**, M. Sofiev, K. Spich, G. Srébaliené, S. Suikkanen, J. Särkkä, M. Viitasalo, J. Vielma, J. Virtasalo, I. Wallin, R. Weisse, J. Wikner, W. Zhang, E. Zorita and Ö. Östman (2024). Climate Change in the Baltic Sea 2024 Fact Sheet. HELCOM Baltic Marine Environment Protection Commission - Helsinki Commission. https://helcom.fi/wp-content/uploads/2024/10/Baltic-Sea-Climate-Change-Fact-Sheet_2024.pdf

Auge, T., **S. Feistel**, F. J. Ekaputra, M. Klettke, **S. Jürgensmann**, E. Michels and L. Waltersdorfer (2024). Towards an Integrated Provenance Framework: A Scenario for Marine Data. 2024 IEEE European Symposium on Security and Privacy Workshops, Vienna, Institute of Electrical and Electronics Engineers: 597-601

Bathmann, U., P. Braun and I. Meinke (2024). Abschlussbericht des KüNO III Dachprojektes – Koordination und Transfer (CoTrans).

Björner, M., F. Furkert, A. Hermann, R. Wagner, S. Neubert and **M. Naumann** (2024). Evaluation of Low-Cost Hydrographic Sensors for Increased Monitoring Density in Coastal Oceans. 2024 IEEE Sensors Applications Symposium (SAS), Naples, Italy: 1–5 doi: 10.1109/SAS60918.2024.10636439

Estelmann, A. and **R. D. Prien** (2024). Cryptophane A-Based Methane Sensing in the Aqueous and Gas Phase. OCEANS 2024 –

Halifax, Halifax, Institute of Electrical and Electronics Engineers: 01-08 doi: 10.1109/OCEANS55160.2024.10754500

Feistel, R. (2024). Thermodynamics of Water in the “Steam Engine” Climate. Gibbs Award Lecture, 18th International Conference on the Properties of Water and Steam, 24 June 2024, Boulder, USA doi: 10.13140/RG.2.2.22056.75522

Gebbe, R., **K. Kesý**, D. Hallier, A. Brauer, S. Bertilsson, **M. Labrenz** and M. M. Bengtsson (2024). The ecology of potentially pathogenic *Vibrio* spp. in a seagrass meadow ecosystem. bioRxiv: 2024.06.15.599152, doi: 10.1101/2024.06.15.599152

Kreuzburg, M., C. Baatz, L. Bednarz, M. Böttcher, C. Merk, T. Morganti, L. Tank, W. B. Yao, **H. Wehnert** and **G. Rehder** (2024). Unified Assessment framework for proposed methods of Marine CDR and interim knowledge Synthesis (ASMASYS). Rostock: 1 – 38 S. doi: 10.3289/CDRmare.37

Krüger, F., D. Waltemath, R. Ludwig, M. Schröder, U. Henny-Krahmer, S. Spors, S. Scheel, R. Schneider, J. Novak, S. Schmidt, S. Schick, K. Yordanova, S. Al-Suadi, M. Becker, H. Beelich, D. Bläsing, C. Brock, I. Bruder, K. Budde-Sagert, C. Cap, H. Dieckmann, A. Dorhoi, M. Dörr, A. Eggert, T. Fennel, H. Fischer, W. Flügge, L.-A. Garbe, P. Gröber, K.-M. Henkel, R. Henkel, K. Hoff, F. Jansen, **S. Jürgensmann**, H. Jürß, R. Kammerer, D. Kautnaite, L. Kennes, M. Kerntopf, J. Kiesendahl, S. Klinger, U. Kragl, S. Kroll, K. Kubisch, R. Köhling, K. Labahn, H. Lebert, M. Manzke, J. Matela, P. Mattern, F. Meinel, J. Michael, H. Murua Escobar, **M. Premke-Kraus**, I. Rusch, C. Schmidt, C. Schmidt, F. Schmitt, S. Schnell, D. Schwerdt, J. Sender, A. Stahl, M. Stanke, G. Szepannek, A. Theise, M.-A. Weber, F. Winkelmann, C. Winterhalter, J. Wodke, F. Woitzel, N. Wrage-Mönnig and **O. Zielinski** (2024). Bedarfsermittlung für die FDM-Landesinitiative in Mecklenburg-Vorpommern: Ergebnisse des Vernetzungstreffens Forschungsdatenmanagement vom 04.12.2023. Zenodo. doi: 10.5281/zenodo.10798387

Lindmark, M., F. Maioli, S. C. Anderson, **M. Gogina**, V. Bartolino, M. Sköld, M. Ohlsson, A. Eklöf and M. Casini (2024). Quantifying competition between two demersal fish species from spatiotemporal stomach content data. bioRxiv, doi: 10.1101/2024.04.22.590538

Löschke, S., M. Kreuzburg, G. Rehder, M. Böttcher, L. Tank, C. Baatz and ASMASYS-Konsortium (2024). CDRmare Insights: Neuer Leitfaden: Marine CO2-Entnahmemethoden und -projekte einheitlich und wissenschaftlich bewerten. 1 – 8 S. doi: 10.3289/CDRmare.40

Markfort, G., H. Schröder and **O. Zielinski** (2024). Digitalization and Augmentation of ROV Operations. OCEANS 2024 – Halifax, Halifax, IEEE: 1-5 doi: 10.1109/OCEANS55160.2024.10754227

Meier, M. and K. Kulinski (2024). Scientific cooperation under changing geopolitics. Baltic Rim Economies 4/2024 – Germany. https://www.centrumbalticum.org/en/publications/baltic_rim_economies/baltic_rim_economies_4_2024_-_germany/markus_meier_karo_kulinski_scientific_cooperation_under_changing_geopolitics

Prien, R. D. and **M. Floth-Peterson** (2024). Oxygen Optode Profiles – A Closer Look on Facts and Artefacts. OCEANS 2024 – Halifax, Halifax, NS, Canada, IEEE: 1-6

Rodiouchkina, K., S. Goderis, O. Karatekin, P. Claeys, **M. E. Böttcher**, F. Vanhaecke, C. Senel, I. Rodushkin, O. Temel, J. Vellekoop and P. Kaskes (2024). Reduced contribution of sulfur to the mass extinction associated with the Chicxulub impact event. EarthArXiv Preprints, doi: 10.31223/X5M99H

Saghavani, S. R., **M. E. Böttcher**, W. L. Hong, K. Kuliński, A. Lepland, A. Sen and B. Szymczycha (2024). Distributions of in situ parameters, dissolved (in)organic carbon, and nutrients in the water column and pore waters of Arctic fjords (western Spitsbergen) during a melting season. Earth Syst. Sci. Data Discuss. 2024: 3419-3431, doi: 10.5194/essd-16-3419-2024

Spilling, K., M. Vanharanta, M. Santoro, C. Villena-Alemaný, **M. Labrenz**, H.-P. Grossart and K. Piwosz (2024). Effects of excess phosphate on a coastal plankton community. bioRxiv: 2024.02.05.576994, doi: 10.1101/2024.02.05.576994

Vanharanta, M., M. Santoro, C. Villena-Alemaný, J. Piiparinen, K. Piwosz, H.-P. Grossart, **M. Labrenz** and K. Spilling (2024). Microbial remineralization processes during post-spring-bloom excess phosphate in the northern Baltic Sea. bioRxiv: 2024.02.02.577174, doi: 10.1101/2024.02.02.577174

COMMITTEES OF IOW

AS OF 31 DECEMBER 2024

Board of Govenors

Woldemar Venohr (Chair)

Ministry for Science, Culture, Federal and European Affairs Mecklenburg-Western Pomerania, Head of department 3

Dr. Zage Kaculewski (Deputy Chair)

Federal Ministry of Research, Technology and Space (BMFTR), Head of department 724

Peter Grönwoldt

Federal Ministry of Research, Technology and Space (BMFTR), Department 724

Holger Wandsleb

Ministry for Science, Culture, Federal and European Affairs Western Pomerania, Head of department 340

Prof. Helge Heegewaldt

President of the Federal Maritime and Hydrographic Agency

Prof. Dr. Elizabeth Prommer

Rector of the University of Rostock

Prof. Dr. Katja Fennel

(Chair of the Scientific Advisory Board)
Dalhousie University, Kanada

Sabine Müller

Managing Director Innomar Technology Rostock

Scientific Advisory Board

Prof. Dr. Katja Fennel (Chair)

Dalhousie University, Kanada

Prof. Dr. Heinz Wilkes (Deputy Chair)

University of Oldenburg, Institute for Chemistry and Biology of the Marine Environment

Prof. Dr. Katarina Abrahamsson

University of Gothenborg, Schweden

Prof. Dr. Gerhard Herndl

University Wien, Österreich

Prof. Dr. Christian Hübscher

University Hamburg, Marine Seismics and Hydroakustics, Germany

Prof. Dr. Jack Middelburg

University of Utrecht, Netherlands

Dr. Uta Passow

Memorial University of Newfoundland, Kanada

Prof. Dr. Niels Peter Revsbech

Aarhus University, Denmark

Prof. Dr. Anna Rutgersson

Uppsala University, Sweden

Scientific Council

PERMANENT MEMBERS

Prof. Dr. Helge W. Arz

Head of department Marine Geology

Prof. Dr. Michael E. Böttcher

Deputy Head of department Marine Geology

Prof. Dr. Klaus Jürgens

Deputy Head of department Biological Oceanography

Prof. Dr. Markus Meier

Head of department Physical Oceanography and Instrumentation

Dr. Volker Mohrholz

Deputy Head of department Physical Oceanography and Instrumentation

Prof. Dr. Gregor Rehder

Head of department Marine Chemistry

Prof. Dr. Heide Schulz-Vogt

Head of department Biological Oceanography

Prof. Dr. Joanna Waniek

Deputy Head of department Marine Chemistry

ELECTED MEMBER OF THE DEPARTMENTS

Dr. Henry Bittig (Spokesperson)

Department Marine Chemistry

Dr. Florian Börgel

Department Physical Oceanography und Instrumentation

Dr. Jacob Geersen

Department Marine Geology

Dr. Isabell Klawonn

Department Biological Oceanography

ACADEMIC QUALIFICATIONS

Finished bachelor's and master's theses are not listed here

Doctorates 2024

Noémie Joseph dit Choisnard

Aspects of the N-cycle of the Amazon River plume.
University of Rostock
Supervisor: Prof. Dr. Maren Voß

Gabriela Dangl

Microbial community dynamics and nitrous oxide production in the Benguela Upwelling System.
University of Rostock
Supervisor: Prof. Dr. Klaus Jürgens

Sophie Kache

Bentho-pelagic transport of methanotrophs at methane gas seep sites.
University of Rostock
Supervisor: Prof. Dr. Maren Voß

Lev Naumov

Hypoxia in various coastal seas:
Modelling and comparison.
University of Rostock
Supervisor: Prof. Dr. Markus Meier

David Riedinger

Predictors of *Vibrio vulnificus* occurrence:
A machine learning approach.
University of Rostock
Supervisor: Prof. Dr. Matthias Labrenz

Esther Robbe

Ecosystem service assessments of the coastal zone:
Case studies and management implications.
University of Klaipeda
Supervisor: Prof. Dr. Gerald Schernewski

Jacqueline Umbricht

Nitrogen assimilation and phytoplankton communities in changing environments.
University of Rostock
Supervisor: Prof. Dr. Maren Voß

Anna Katharina Wittenborn

A comprehensive study for the application of proxies based on glycerol dialkyl glycerol tetraethers in the Baltic Sea.
University of Greifswald
Supervisor: Prof. Dr. Helge Arz

Mo Zhou

Analysis and tracking chlorinated hydrocarbons: PCB, DDT and HCB in Baltic Sea sediments.
University of Rostock
Supervisor: Prof. Dr. Joanna Waniek

KEY DATA

AS OF 31 DECEMBER 2024

PERSONNEL*

● WOMEN
● MEN



225

Employees

Apprentices**
Science service staff
PhD students
Researchers***
Personnel (total)****

* Heads
** as of 15.10. of the year
*** without phd students
**** without students/research assistants

PUBLICATIONS

Total **201**



PROMOTIONS

9

Doctorates completed, thereof 7 women

44

Ongoing doctorates, thereof 27 women

FINANCES*

19,9

Mio. EUR INSTITUTIONAL FUNDING

8,2

Mio EUR THIRD-PARTY FUNDS



1,0

Mio. EUR REVENUE AND OTHER OPERATING INCOME

5,8 Mio. EUR Bund, (federal ministries), thereof 2,7 Mio. EUR BSH-Monitoring**
0,2 Mio. EUR SAW***

1,7 Mio. EUR DFG
0,4 Mio. EUR EU
0,2 Mio. EUR others

* financial data based on the profit and loss statement (P&L) of IOW
** Federal Maritime and Hydrographic Agency
*** Leibniz Competition

ORGANISATIONAL CHART

AS OF 31. DECEMBER 2024

BOARD OF TRUSTEES

Woldemar Venohr (Ministry of Science, Culture, Federal and European Affairs of Mecklenburg-Western Pomerania) (Chair)
Dr Zage Kaculevski (Federal Ministry of Research, Technology and Space) (Deputy)

SCIENTIFIC COUNCIL

Dr. Henry Bittig
(Spokesperson)

DIRECTOR

Prof. Dr. Oliver Zielinski

DEPUTY DIRECTOR

Prof. Dr. Heide Schulz Vogt

SCIENTIFIC ADVISORY BOARD

Prof. Dr. Katja Fennel
(Dalhousie University, Halifax, Nova Scotia, Kanada)

ADMINISTRATION

Beatrix Blabusch
Finance/Human Resources/
Facility Management

SCIENCE MANAGEMENT

Dr. Matthias Premke-Kraus
Communications/Library

COASTAL SEAS & SOCIETY

Prof. Dr. Gerald Schernewski
Miriam von Thenen
(Deputy)

DEPARTMENTS

BIOLOGICAL OCEANOGRAPHY

Prof. Dr. Heide Schulz-Vogt
Prof. Dr. Klaus Jürgens
(Deputy)

MARINE GEOLOGY

Prof. Dr. Helge Arz
Prof. Dr. Michael Böttcher
(Deputy)

PHYSICAL OCEANOGRAPHY & INSTRUMENTATION

Prof. Dr. Markus Meier
Dr. Volker Mohrholz
(Deputy)

MARINE CHEMISTRY

Prof. Dr. Gregor Rehder
Prof. Dr. Joanna Waniek
(Deputy)

RESEARCH AREAS

RA 1: KEY PROCESSES ACROSS SCALES AND BOUNDARIES

RA 2: COASTAL SEAS IN TRANSITION

RA 3: EMERGING TECHNOLOGIES IN COASTAL RESEARCH

CENTRAL SERVICES

ANALYTICS GROUP

Dr. Marion Kanwischer
Una Reck

NANOSIMS

Dr. Angela Vogts

IT & DATAMANAGEMENT

Dr. Steffen Bock

OFFICERS AND REPRESENTATIVES

EQUAL OPPORTUNITIES OFFICER

Dr. Marion Kanwischer
Dr. Svenja Papenmeier (Deputy)

STAFF COUNCIL

Christian Burmeister

OMBUDSPERSON

Dr. Peter Holtermann
Prof. Dr. Maren Voß

DIVERSITY OFFICER

Hendrikje Wehnert

WORK SAFETY

Una Reck

IMPRINT

PUBLISHER

Leibniz Institute for
Baltic Sea Research
Warnemünde (IOW)

Seestraße 15
18119 Rostock
info@leibniz-iow.de
www.leibniz-iow.de

EDITOR

Dr. Matthias Premke-Kraus,
Hendrikje Wehnert

TRANSLATION

Elisabeth Harris

This publication was created using AI-based tools, including text generation and research tools. The editorial team was responsible for the editorial content and final quality control.

The publication is available for download on the IOW website:
<https://www.iow.de/annual-reports.html>

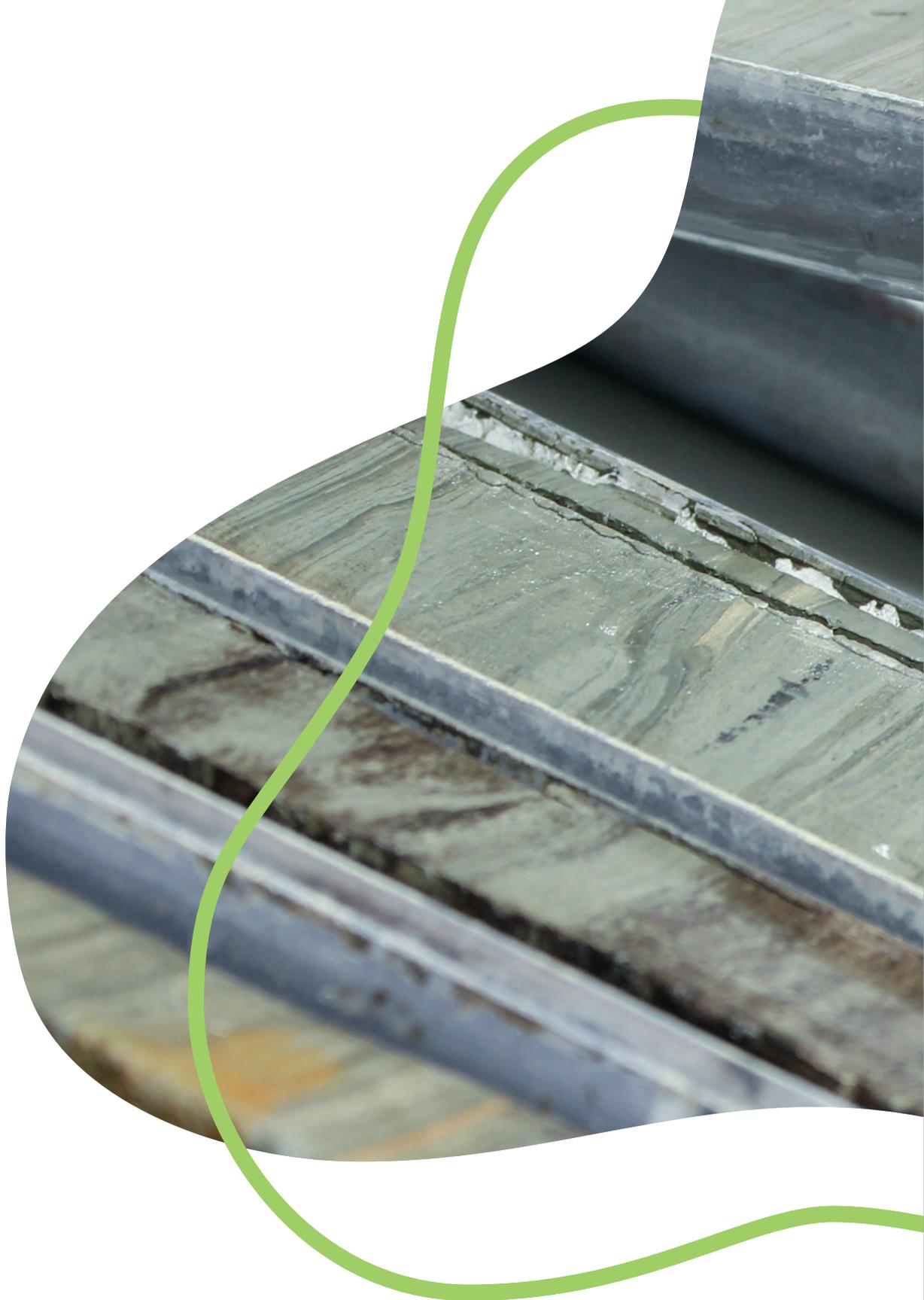
DESIGN

JAKOTA Design Group GmbH

IMAGE CREDITS (UNLESS OTHERWISE STATED)

Prien, IOW: pp. 2/3, 58
Schmale, IOW: p. 4
Holtermann, IOW: p. 6
saitec: p.6
Nietz, IOW: p.7
Raeke, DWD: p.7
Meeske: p. 8
Premke-Kraus, IOW: p. 38, 46
WERK3: p. 41
Cwierz, IOW: p. 48
Giovanazzi, Leibniz-Gemeinschaft: p. 55
Wehnert, IOW: pp. 64/65
IOW: p. 87, 89
Gohlke: Cover

As of December 2025



**LEIBNIZ INSTITUTE FOR
BALTIC SEA RESEARCH
WARNEMÜNDE (IOW)**

Seestraße 15
18119 Rostock
info@leibniz-iow.de
www.leibniz-iow.de