

HIFMB NEWS #04/22

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The protection of biodiversity depends on small-scale decision making.



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TOP STORY

Faktencheck Artenvielfalt: A National Assessment of German Biodiversity and its Change

Global biodiversity is changing as a consequence of anthropogenic activities. This is by now an accepted fact and Germany has committed itself to a number of international agreements in order to halt further degradation of natural habitats, restore ecosystems where possible and better protect its biodiversity (UN Decade on Ecosystem Restoration, EU Green Deal, German Biodiversity Strategy). However, the current pace of biodiversity protection in Germany does not live up to their proclaimed and legally implemented commitments at national and international level.

As part of a Research Initiative for the Conservation of Biodiversity the German Federal Ministry of Education and Research has therefore launched a German biodiversity assessment ("Faktencheck Artenvielfalt") in order to synthesize the most recent scientific knowledge on biodiversity change, its drivers and best-practice conservation measures. The final assessment report is supposed to serve as evidence-based decision-support for policy makers and practitioners. The down-scaling from global assessments such as the

IPBES report from 2019 is necessary, as the mechanisms of biodiversity loss vary across countries and the protection of biodiversity is likewise dependent on smaller scale decision making, implementation as well as public acceptance. In order to foster societal awareness and transformation the final report and underlying literature database of the assessment will therefore be made available to the general public after finalizing the report at the end of 2023. To provide the aspired level of comprehensiveness in the synthesis of thousands of →

»Germany is lagging behind in the implementation of conservation measures. This urgently needs to be addressed, as warming temperatures, heat waves and the resulting oxygen depletion are adding further pressure on an already stressed ecosystem. «

Dorothee Hodapp, coordinator and lead author of the Faktencheck chapter on biodiversity change of the German coasts and coastal waters

→ scientific articles, grey literature and data sources the project involves 120 experts from natural and social science backgrounds as well as practitioners from federal and regional conservation authorities from all over Germany. The HIFMB was assigned to coordinate the chapter on biodiversity change of the German coasts and coastal waters. The marine chapter is one out of six ecosystem chapters including forest, freshwater, urban, soil, and agricultural and open landscape ecosystems. Although most of the information presented in the report is based on expert knowledge and a systematic literature review, it will also include quantitative results in form of a weighted vote-count and a meta-analysis summarizing the available data on current biodiversity trends. The preliminary results of the time series that have been analysed so far indicate a differentiated picture of changing biodiversity with varying trends (positive/ neutral/ negative) across organism groups and abundance/ biomass or diversity metrics (species richness/ effective number of species). It should be noted that these measures, despite commonly used in the literature, do not carry information on compositional changes in species communities and the amount of diversity loss as a consequence of habitat degradation and loss as such sites are usually not sampled in long-term monitoring campaigns. Yet, both these aspects have been and are contributing largely to biodiversity loss.

There are several more issues complicating the monitoring and assessment of biodiversity change, e.g. the limited accessibility of marine ecosystems, as well as the system inherent variability driven by their high connectivity and natural fluctuations. Although there have been great advances with regard to monitoring methodology in recent years, no comprehensive habitat type mapping exists for the German sea floor. In addition, long-term monitoring datasets are rare, often do not include measurements of relevant environmental parameters and are only available for a limited number of organism groups. These data limitations are accompanied by long processes of negotiation and harmonization for common descriptors and indicators of the status of marine ecosystems.

So far all big international environmental assessment frameworks (EU Marine Strategy Framework Directive (MSFD), the Convention for the Protection of the Marine Environment of the North-East Atlantic (Oslo-Paris Convention, OSPAR) or the Baltic Marine Environment Protection Commission (Helsinki Commission, HELCOM)) utilize key species and biomass measures instead of biodiversity metrics in order to inform the biodiversity descriptors they report on.

But also the development and implementation of conservation measures is facing big obstacles. Contrary to the common perception, space is an extremely sought after good in the marine environment. Conservation efforts, which require low levels of anthropogenic activities in order to allow for uninhibited natural processes, are competing with many other stakeholder groups and attached economic interests, e.g. fishing, shipping or offshore wind energy production, for space. Also, areas for tourism, sand and gravel extraction, coastal protection, military use, and numerous cables and pipelines need to be accounted for in marine spatial planning, which is a continuously increasing challenge, especially with regard to the recently decided extension of offshore wind energy production up to 70 GW by 2045. Intelligent planning, multi-use sites and compromises by all parties will likely be necessary to meet conservation aims as well as economic interests. Germany will have to increase the extent of strictly protected areas to 10% which means by a factor 10 until 2030 in order to meet one of the EU biodiversity strategy aims. Currently only less than 1% of the German waters are strictly protected (i.e. declared as no-take zone), despite the impressively sounding 40% of coastal waters that were designated as protected area. The remaining 30% also need to be managed more systematically including binding regulations on what types of activities are allowed. In general, Germany seems to be facing an implementation problem, which urgently needs to be addressed, as climate change, especially warming temperatures, heat waves and the resulting oxygen depletion are adding further pressure on an already stressed ecosystem.

BMBF Research Initiative for the Conservation of Biodiversity: www.feda.bio/en/

The Positive Impact of Seagrass Meadows on Adjacent Ecosystems

HIFMB, the Institute for Coastal and Marine Research (Nelson Mandela University in Gqeberha/ South Africa) and the Institute of Marine Sciences (University of Dar es Salaam Zanzibar, Tanzania) form together with decision-/ policy-makers, representatives from NGOs, farmers associations and governmental and national authorities the team of the new SOMWAT project (Nature based **S**OLutions for **M**itigation of **W**ATershed pollution: Cross-habitat facilitation by coastal seagrass meadows). SOMWAT develops local African research projects that are clearly linked to needs in the region of implementation and that are shaped together in a co-design process.



Photo © Peter Schupp

Seaweed farming in intertidal seagrass meadows at Jambiani, Zanzibar.

The project is facilitated by GIZ through the MeerWissen initiative of the German Federal Ministry for Economic Cooperation and Development (BMZ) and is endorsed as part of the UN Ocean Decade.

The overall goal of SOMWAT is to assess the role of tropical (Tanzania) and temperate (South Africa) seagrass meadows for reducing watershed pollution through nutrient, pollutant and pathogen removal for adjacent ecosystems (corals reefs, tidal flats) and aquacultures (sponge, algae and coral farms). Results aim to guide conservation and management efforts to establish sustainable and long-lasting use of the marine resources (e.g. estuary management plan). Field surveys and experiments will thereby help to unravel underlying mechanisms through which seagrasses can enhance water quality and may benefit local communities who rely on healthy ecosystems for food production, recreation and tourism.

SOMWAT has a total duration of 2.5 years and is currently in its 6 months co-design phase, which is designated to present the project to local stakeholders, iteratively integrate their knowledge and specific needs, and to design a joint project vision among all collaborating participants. To this end, Peter Schupp and Lukas Meysick from HIFMB have met with the project partners in Zanzibar and South Africa in the last months, conducting pilot samplings on point source pollutants and meeting with local stakeholders. Stakeholders in both countries have pinpointed major water quality hazards like coastal development and waste

water runoff in the areas. In Zanzibar, for instance, aquaculture farmers observed cyanobacterial infestation of sponge farms likely due to eutrophication. Interestingly, an emerging awareness for seagrass ecosystem services throughout the last years has caused a rethinking among many local farmers, who now started to deliberately build their farm plots within seagrass meadows to make use of their positive effects (e.g. sediment stabilisation, water purification) instead of clearing the area from seagrass. As a result from these meetings, one aspect of SOMWAT will now be to experimentally assess the relevance of seagrass meadows for small sponge and seaweed farms together with the local farmers.

New HORIZON Europe Projects

HIFMB is part of two EU projects at the science-policy interface, that are funded by HORIZON Europe, the key funding program for research and innovation.

Biodiversity Knowledge Agora: Developing the Science Service for European Research and Biodiversity Policymaking (BioAgora)

In 2021 the BDS2030 and the Farm to Fork strategy called for the establishment of a science-policy mechanism - the Science Service - aiming at "ratcheting up the implementation of biodiversity commitments" (European Union, 2021, Science at the Service of Biodiversity). BioAgora is designed to address this need. The overall aim of BioAgora is to connect research results to the needs of environmental policy in a targeted dialogue between science, other knowledge holders and policy actors.

Coordinator: Kati Vierikko (SYKE), see: bioagora.eu

User-oriented Solutions for Improved Monitoring and Management of Biodiversity and Ecosystem Services in Vulnerable European Seas (B-USEFUL)

B-USEFUL will contribute to achieve the ambitious policy goals by developing user-oriented tools and solutions to conserve and protect marine biodiversity, effectively building and improving upon existing European data infrastructures and governance frameworks. To that end, *B-USEFUL* will provide evidence-based guidance for ecosystem-based management (EBM) in general and marine spatial planning (MSP) in particular to ensure protection and recovery of biodiversity and the sustainable use of European marine resources.

Coordinator: Martin Lindegren (DTU Aqua)

Top Recent Publications

Milke F., Wagner-Doebler I., Wienhausen G., & **Simon M.** (2022). Selection, drift and community interactions shape microbial biogeographic patterns in the Pacific Ocean. *The ISME Journal*, 16(12), 2653-2665.
doi.org/10.1038/s41396-022-01318-4

Bondarev A., & **Upmann T.** (2022). Sliding modes in the management of renewable resources. *Automatica*, 144, 110487.
doi.org/10.1016/j.automatica.2022.110487

Teschke K., Konijnenberg R., Pehlke H., & **Brey T.** (2022). Exploring spatial similarity and performance among marine protected area planning scenarios: The case of the Weddell Sea, Antarctica. *Global Ecology and Conservation*, 38, e02238.
doi.org/10.1016/j.gecco.2022.e02238

Strack A., Jonkers L., C Rillo M., **Hillebrand H.**, & Kucera M. (2022). Plankton response to global warming is characterized by non-uniform shifts in assemblage composition since the last ice age. *Nature Ecology & Evolution*, 2022.
doi.org/10.1038/s41559-022-01888-8

McLaren J., Schmaljohann H., & **Blasius B.** (2022). Predicting performance of naïve migratory animals, from many wrongs to self-correction. *Communications Biology*, 5(1), 1058.
doi.org/10.1038/s42003-022-03995-5

+ More on Google Scholar:
scholar.google.de/citations?user=uCoLTyAAAAAJ&hl=en



VIEW FROM NORTHWEST #14

The Co-design of Co-design

Transformative science is based on the co-design of projects with stakeholders. By developing the question and approach together, scientists and stakeholders ensure that the science done meets the information needed to successfully implement management or other measures. Many funding agencies request this type of co-design, and relevant projects emerge at high rate. However, sometimes I wonder whether this co-design process actually has been co-designed.

In contrast to most scientists, who compared to other professional groups have rather high flexibility in structuring their work, those to be involved in this co-design process (for simplicity I will use the term stakeholders, but acknowledge that they are far from being a homogeneous group) have clear job duties or even make their stakes heard in their free time (NGOs, citizen scientists). It seems to be taken for granted that the stakes are so valuable that stakeholders commit themselves. I can imagine this being true for a company with commercial interests, here committing to the project and the company goals can be identical. However, this is already less true for an agency, which in the long run might profit from the project results, but now needs to finalize the assessment report, grant or deny approval for an activity, or answer urgent questions by politicians or the society.

Consequently, in direct conversations with stakeholders, I often get the feedback that the level of commitment needed for co-design is higher than can be delivered. This is just one aspect of stakeholder fatigue, but certainly a central one. If you didn't know it: Stakeholder fatigue is a huge topic, checking Google scholar you find >100 papers and reports published on this topic since early 2021. This is 5 papers a month. Part of the problem is that many stakeholders are not eligible to apply for own funds in these projects, thus they cannot employ personnel to actively participate.

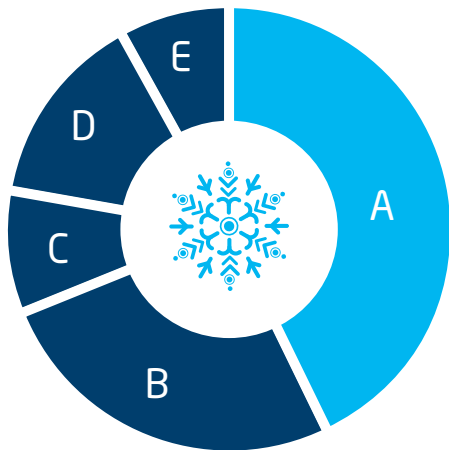
There are exceptions, the *MeerWissen* program featured in this Newsletter is a laudable one which separately funds a co-design phase before the actual project needs to be handed in. This overcomes the otherwise inevitable request to plan and establish the co-design for a project pro bono, knowing that applications have only a 5-20% chance of getting funded. Time is perhaps the single most-limiting resource in our business, so it is wise to handle it carefully both as researcher and as stakeholder.

Sincerely, Helmut Hillebrand
Director – Professor of Pelagic Ecology
helmut.hillebrand@hifmb.de

HIFMB TEAM

Fun Fact*

How are you going to get through this winter with skyrocketing gas prices?



- A 43 % Grandma's woolen socks and a winter coat should do the trick.
- B 26 % I'll sleep through this winter. Wake me up when temperatures reach 20°C again.
- C 9 % Still heating as usual - I'd rather be broke than cold.
- D 14 % I'm out of here. Find me in a warmer country!
- E 8 % My fireplace is a lifesaver.

* answered by HIFMB employees

Save the Date!

4th Symposium
on Functional Marine
Biodiversity
27 - 28 June 2023

hifmb.de/symposium23

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