

## **Mapping biodiversity indicators to balance European policy requirements: a practical perspective**

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Spatial information of ecosystem state, the distribution of human pressures and the effects of current and future spatial management measures is essential to link policy instruments such as marine spatial planning and the Marine Strategy Framework Directive (MSFD). To practically align both instruments, we looked at the German maritime spatial plan as a case study and identified the conservation of biodiversity as main thematic overlap. We present a methodological comparison of mapping biodiversity indicators to fulfil high mapping standards needed in evidence-based decision-making. We compared the indirect approach which consists of modeling individual species distributions before computing a diversity index with the direct approach in which diversity indices are directly modelled. We applied both approaches to a suite of indicators spanning from species specific metrics to biodiversity indices reflecting functional traits and sensitivity to fishing using geostatistics. We further tested indicator sensitivity to highly abundant species and assessed spatial overlaps of indices with fishing pressure from two beam trawl fleets and offshore wind parks in the German EEZ. While the direct mapping approach is a good way of depicting general patterns in a time-efficient manner, mapping individual species produced more detailed maps. We conclude that more research effort needs to go into technical developments in making composite indicators more robust and responsive to human uses in particular fishing pressure to properly assess pressure-state-relationships.

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