

New indicators for marine ecosystem protection developed

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Together with an international team, Senckenberg researchers have developed new monitoring indicators for the protection of marine and coastal areas. Credit: Octavio Aburto-Oropeza

Together with an international team, Senckenberg scientists have

developed new monitoring indicators for the protection of marine and coastal areas. In their study, published in the journal *Scientific Data*, they show that large gaps exist in the protection of marine ecosystems.

According to the research team, the high seas, for example, have a high conservation potential for biodiversity—but there are very few protected areas here. The data are meant to ensure a representative distribution of the expansion of protected areas to 30%, which is currently being discussed at the Conference of the Parties to the Convention on Biological Diversity.

Oceans and their coasts provide numerous services to humans—they sequester excess CO₂, supply oxygen, provide food, support livelihoods, and contribute to human well-being and culture. "But these ecosystems are subject to both global and local pressure imposed by humans.

Worldwide, one-third to one-half of endangered coastal and marine habitats have already been lost—accompanied by a decline in the services they provide to us humans," explains Dr. Aidin Niamir of the Senckenberg Biodiversity and Climate Research Center Frankfurt, and he continues, "Protected and conserved areas are one of the most common tools used to prevent these losses."

But where can these areas be established in the most effective way to protect biodiversity and, in the ideal case, even increase it again? To determine the current status of the protection of marine and coastal habitats, the team of scientists led by Senckenberg researchers Joy A. Kumagai and Aidin Niamir investigated in which countries the goals for protected and conserved areas have been achieved so far—and where they fell short.

For this purpose, they developed two indicators that provide information on what percentage of the six coastal and marine habitats (seamounts, [seagrass beds](#), cold-water coral reefs, warm-water coral reefs, [mangrove forests](#), and [salt marshes](#)) have [global data](#) available and are located

within protected and conserved areas, both in relation to [individual countries](#) and at the global level. "Currently, as part of the Conference of the Parties on Biological Diversity, governments are negotiating a goal to protect 30% of terrestrial and marine areas worldwide. We identified which countries do not have 30% of these [marine habitats](#) within protected or conserved areas—so that governments can prioritize these areas for protection," says Kumagai, explaining the approach.



The researchers' analysis revealed that more than 40 percent of the mangroves, coral reefs, and salt marshes are located in protected areas. In contrast, seamounts, for example, are often found in areas outside national jurisdiction and are therefore not as protected. Credit: Octavio Aburto-Oropeza

The researchers' analysis showed that more than 40% of the mangroves, coral reefs, and salt marshes are located in protected or conserved areas. In contrast, seamounts, for example, are often found in areas outside national jurisdiction and therefore have not been as protected with less than 10% of their area under protection. "The lack of protection on the [high seas](#) poses a major problem, since this area also offers the greatest opportunity for habitat conservation, in terms of area, if its protection were increased to 30%," said Niamir.

The distribution of protected areas also varies widely at the country level: in 11.6% of the countries, none of the marine and coastal habitats included in the study are located in a protected or conserved area.

"Collectively, our results not only reflect the current status of protection but also draw attention to the need for ecologically representative protected and conserved areas. We also need more freely available global habitat data here to understand and protect valuable marine and [coastal areas](#)," adds Kumagai in conclusion.

More information: Joy A. Kumagai et al, Habitat Protection Indexes—new monitoring measures for the conservation of coastal and marine habitats, *Scientific Data* (2022). [DOI: 10.1038/s41597-022-01296-4](#)

Provided by Senckenberg Research Institute and Natural History Museum

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