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How to Use Pew's Protect High Seas Mapping Tool

Develop your ocean conservation plan with this step-by-step guide

Overview

As governments work to finalize a new treaty that would enable the creation of marine protected areas (MPAs) in the high seas, a key question looking forward is: In which high seas areas should protections be prioritized? The Pew Charitable Trusts built this tool to show different possibilities for safeguarding this massive portion of the global ocean to support healthy, productive ecosystems. Use this interactive resource to create a custom plan that protects the high seas and reflects your conservation goals.

Step 1: Choose whether your plan will conserve 30% or 50% of the high seas. The best available science suggests the need to protect *at least* 30% of the global ocean to help ensure its health.

Step 2: Familiarize yourself with the conservation features:

- **Biodiversity:** A measure of the variety and amount of organisms in an ecosystem and their vulnerability to extinction. This layer provides an aggregate of species concentration levels today and where they are forecast to move in an ocean altered by climate change, thus creating some opportunity to climate-proof your high seas conservation plan.

- **Productivity:** A measure of the amount of photosynthesis carried out by microscopic marine plants called phytoplankton. High productivity areas are the fertile crescents of the sea because elevated phytoplankton photosynthesis helps feed more ocean life throughout the rest of the food chain.

- **Seafloor diversity:** A measure of habitat diversity on the bottom of the ocean. This measure is determined by looking at factors such as depth, slope, sediment thickness, dissolved oxygen, and temperature. Seafloor diversity supports correspondingly diverse ecosystems.

- **Fisheries:** Satellites can now be used to track commercial fishing on the high seas. Prioritizing this feature as "high" will select areas for conservation that interfere the least with busy fishing grounds. Choosing "low" diminishes the consideration of fishing impact on your MPA.

- **Seamounts and vents:** Underwater mountains, volcanoes, and hydrothermal vents are home to many species, including some not found elsewhere, and are often ocean oases that attract large numbers of migrating fish, turtles, and whales. This layer represents the occurrence of different types of these special ocean habitats.

Step 3: Rank each conservation feature as either "low," "medium," or "high" priority by moving the sliders. Keep in mind that these priorities are relative to each other—if you choose "high" for every feature, they will be weighted equally (the same as if you choose "low" for every feature).

The map will then display which areas of the high seas should be prioritized for protection to meet your conservation goals.

Step 4: Click "See Your Plan" to learn more about the areas your plan protects—the fish, sea mammals, turtles, corals, and other life and features that could benefit from a conservation plan. An earlier Pew report identified 10 high seas places that would help safeguard biodiversity; your plan will highlight if one of those special areas is included in your conservation solution. You can learn more about those 10 places by hovering your cursor over each site on the map.

Step 5: Hit "Share Your Plan" to post your results on social media and show your colleagues, family, and friends that you care about protecting the ocean.

Step 6: Take action. Sign the linked petitions (if you are either a citizen or a scientist) to show your support for protecting the high seas.

Additional information about the process and data

To create this tool, researchers used a systematic conservation prioritization software called prioritizr R that identifies potential areas that meet conservation objectives while minimizing the opportunity cost. The algorithm tries to find a solution that maximizes those conservation features within the overall area target—either 30% or 50% of the high seas, depending on the user's selection.

Consistent with other studies focused on high seas areas, this analysis did not consider national waters, also known as a country's exclusive economic zone (EEZ), which extend 200 nautical miles from shore. The analysis included a total of 55 different data layers of conservation features, grouped into five broad categories, summarized in the table below:

Table 1

Layer(s)	Data source(s)
"Biodiversity" (48 data layers)	
Biodiversity now	AquaMaps (23 data layers, grouped by major taxonomic groups)
Biodiversity in a climate-changed future	AquaMaps 2100 model projections (23 data layers, grouped by major taxonomic groups)
Extinction risk now	IUCN Red List (categories assigned a numerical value)
Extinction risk in a climate-changed future	IUCN Red List (categories assigned a numerical value), mapped on AquaMaps 2100 model projections
"Productivity" (1 layer)	Oregon State University vertically generalized production model (VGPM)
"Seafloor diversity" (1 layer)	Data from Harris and Whiteway (2009) based on six biological and physical seafloor characteristics
"Fisheries" (1 layer)	Fishing effort (in kilowatt hours) described in Sala et al. (2018), based on data from Global Fishing Watch
"Seamounts + Vents" (4 data layers)	
Seamounts	Global seamount distribution data from Kim and Wessel (2011); depth categories identified by Clark et al. (2011) (3 layers)
Hydrothermal vents	InterRidge Vents Database

Note: You can read more details about our data and methodology at https://www.pewtrusts.org/-/media/data-visualizations/interactives/2022/highseas/methodology-statement-protect-high-seas-tool.pdf.

For further information, please visit: pewtrusts.org/highseas