



Conserving the Ocean for Our Future

The science behind marine protected areas and the need to protect at least 30% of U.S. ocean and coastal waters by 2030

We all need the ocean for survival.

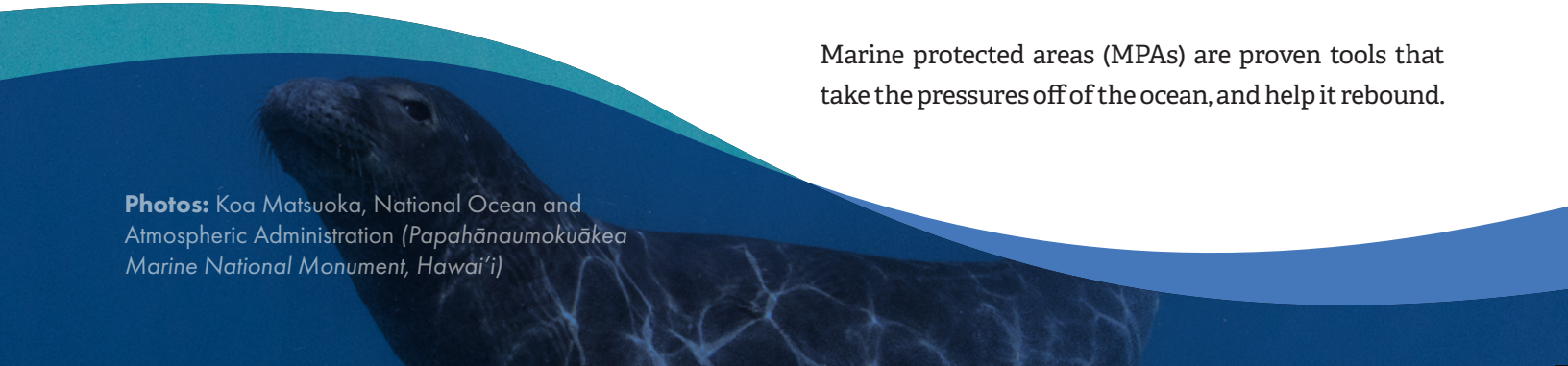
The ocean is essential to Americans everywhere. It stabilizes the climate, stores carbon, and generates the oxygen we breathe. It is a source of joy, wonder, and countless other spiritual and mental benefits for humanity. And it supplies food, jobs, and recreation for our communities. Ocean-based tourism and recreation contribute about \$124 billion to the U.S. economy each year and employ almost 2.4 million Americans. Commercial and recreational saltwater fishing in 2016 generated more than \$212 billion in sales, contributed \$100 billion to the nation's gross domestic product, and supported 1.7 million jobs across the country. These industries depend on a healthy ocean, clean beaches, and abundant fish and wildlife. A decline in ocean health would diminish their value to the U.S. economy.¹

The ocean was once thought to be limitless. But we now know that it's not.

We are in the midst of a global crisis. For decades, the world's ocean has literally been “taking the heat” for climate change, absorbing over 90% of the heat and nearly a third of the carbon dioxide from greenhouse gas emissions. The result is an ocean that is warmer, more acidic, and increasingly starved of oxygen—overall, an ocean that is becoming less habitable for fish and wildlife. At the same time, nearly every corner of the ocean has been touched by human impact or extraction, with over ⅔ of the ocean significantly altered by human activity. And the ocean's biodiversity is at risk, with almost 33% of reef forming corals and more than a third of all marine mammals threatened with extinction.

But we can solve this problem.

Marine protected areas (MPAs) are proven tools that take the pressures off of the ocean, and help it rebound.



Photos: Koa Matsuoka, National Ocean and Atmospheric Administration (*Papahānaumokuākea Marine National Monument, Hawai'i*)

MARINE PROTECTED AREAS

MPAs are areas of the ocean set aside primarily for the conservation of habitat and species.⁶ In a **fully protected MPA** no extractive or destructive activities are allowed, and all abatable impacts are minimized. In a **highly protected MPA** only very light extractive activities are allowed, such as subsistence or very small amounts of recreational fishing.⁷ Research has shown that these types of protected areas are more effective than other actions (like fisheries management or lightly protected MPAs) at restoring and preserving biodiversity, increasing yields in adjacent fisheries, and enhancing ecosystem resilience.⁸

When well-sited fully or highly protected MPAs are put in place...

FISH AND THEIR HABITATS BOUNCE BACK.

Fully and highly protected MPAs provide a refuge for exploited species and biological habitats such as kelp and coral to rebound. By halting all abatable extractive and destructive activities, these MPAs prevent the further degradation of ocean habitats and help them return to a healthy state.⁹ Fish populations recover as well—research has found the size and number of fish,¹⁰ as well as number of species¹¹ to be greater within these MPAs relative to unprotected areas. Scientists have

also found a significant increase in biomass outside of the boundaries in many places for many species, due to adult migration and larval export.¹² This “spillover” effect can help rebuild populations and lead to larger populations outside of the protected area—a result that benefits fishermen, coastal communities, and ocean animals alike.

THE OCEAN IS MORE RESILIENT IN THE FACE OF FUTURE CHANGES.

Fully and highly protected MPAs help take the pressure off an ocean area. They allow disturbed and degraded areas to recover, and also promote and retain complex, intact ecosystems that are better at resisting future

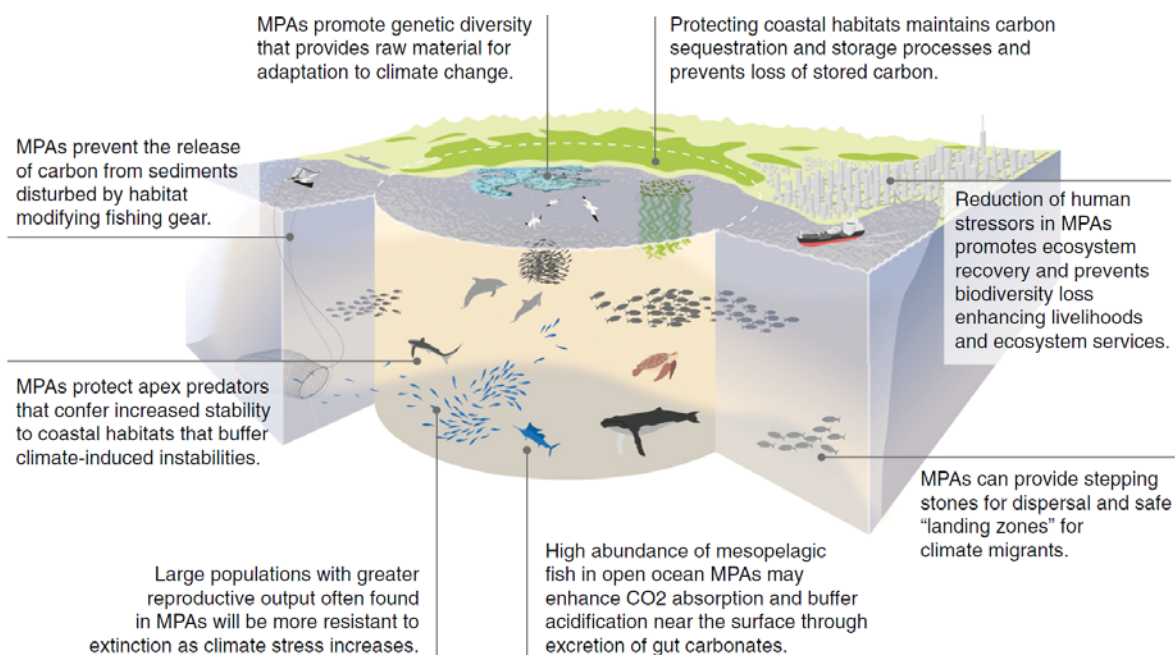


Figure 1: Eight illustrative pathways by which MPAs can mitigate and promote adaptation to the effects of climate change in the oceans. **Citation:** Roberts et al. 2017, Marine reserves can mitigate and promote adaptation to climate change. PNAS 114 (24) 6167-6175. <https://doi.org/10.1073/pnas.1701262114>

stresses.¹³ These MPAs protect a number of natural processes that help maintain the structure and functioning of ocean ecosystems in the face of climate change (see Figure 1), including:

- Protecting genetic diversity that provides raw materials for adaptation to climate change;
- Protecting the top predators that are needed for sustaining ecosystem structure and community composition;
- Protecting the coastal habitats that help buffer against climate change impacts;
- Providing stepping stones and safe “landing zones” for animal populations migrating, and for those shifting their ranges in response to warming waters;
- Protecting against extinctions by promoting larger populations of marine organisms with larger reproductive output; and
- Preventing carbon from being released from the sediments on the ocean floor by restricting habitat-modifying fishing gear.¹⁴

Fully and highly protected MPAs can also serve as climate refuges for climate-vulnerable species or ecosystems that are spatially isolated. And finally, when protecting “blue carbon” habitats like seagrass meadows, salt marshes and mangroves that can sequester more atmospheric carbon by area than tropical forests, these MPAs can help realize climate mitigation goals.¹⁵

PEOPLE BENEFIT.

Fully and highly protected MPAs also benefit Americans. They provide direct economic benefits by enhancing our fisheries,¹⁶ increasing tourism revenue, and generating jobs,¹⁷ and provide indirect economic benefits where nearshore habitats buffer communities from bacterial pathogens, storm damage, and provide long-term carbon storage.^{18,19} Other gains include scientific discoveries, such as new medicines, technologies, and genetic material that is used in products supporting health and well-being.^{20,21}

MPAs need not impact the bottom line for commercial fisheries. For example, research has shown no negative impacts of two large, highly protected MPAs on the lucrative Hawaiian longline fishery.²² The economic value of fully and highly protected MPAs can often exceed the area’s pre-protection value,²³ and the economic benefits have been shown to outweigh the costs by a ratio of at least five to one.²⁴ Further, human health and well-being tends to be higher in proximity to healthy natural ecosystems like those found in these MPAs.²⁵

Scientists have found that placing at least 30% of the world’s ocean in fully or highly protected MPAs is necessary to stem the extinction of ocean wildlife, stabilize our climate, and safeguard our future.^{26,27}

While the benefits of these MPAs are clear, today 23 percent of U.S. oceans are fully or highly protected—and nearly all of this area is located in two large protected areas in the remote Pacific Ocean.²⁸

The U.S. must adopt a goal to fully or highly protect at least 30% of our coastal and ocean waters by 2030. This should include:

- Areas that help address the impacts of climate change, including carbon storage areas and areas that provide adaptation and resilience benefits;
- Areas that protect a diversity of habitats, communities, and ecosystems with regional representation;
- Connected networks of areas important for preserving biodiversity and wildlife migration corridors;
- Areas with habitats important for fish and wildlife to thrive, including critical spawning, breeding, feeding, and growth to maturity;
- Areas that are relatively pristine, still intact, and least impacted by human activity;

- Areas that support coastal livelihoods and cultures, and provide access and enjoyment/recreational opportunities for Americans;
- Areas that help mitigate threats to America's most vulnerable coastal communities; and
- The natural resources that support the economy and health of communities that rely on clean oceans and water, in particular Indigenous and low-income communities at the front lines of climate change disaster.

It is in all of our interests to fully or highly protect at least 30% of our U.S. ocean by 2030.

In light of the ecological crisis our species and planet are facing, we are more in need of these effective conservation tools than ever.

**NATIONAL
OCEAN
PROTECTION
COALITION**



**New England
Aquarium**

Center for American Progress



**MYSTIC
AQUARIUM**



**AMERICAN NATURE
CAMPAIGN**

- [1] National Oceanic and Atmospheric Administration (NOAA) Office for Coastal Management. 2019. "NOAA Report on the U.S. Ocean and Great Lakes Economy." <https://coast.noaa.gov/data/digitalcoast/pdf/econ-report.pdf>
- [2] IPCC, 2019: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC) [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegria, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer (eds.)]. In press.
- [3] IPCC 2019
- [4] IPBES, 2019: Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany.
- [5] IPBES 2019
- [6] IUCN WCPA, 2018. Applying IUCN's Global Conservation Standards to Marine Protected Areas (MPA). Delivering effective conservation action through MPAs, to secure ocean health & sustainable development. Version 1.0. Gland, Switzerland. 4pp.
- [7] Oregon State University, IUCN World Commission on Protected Areas, Marine Conservation Institute, National Geographic Society, and UNEP World Conservation Monitoring Centre (2019) An Introduction to The MPA Guide. <https://www.protectedplanet.net/c/mpa-guide>
- [8] Sala & Giakoumi 2017, No-take marine reserves are the most effective protected areas in the ocean, ICES Journal of Marine Science, Volume 75, Issue 3, Pages 1166–1168, <https://doi.org/10.1093/icesjms/fsx059>
- [9] Sala & Giakoumi 2017
- [10] Sala & Giakoumi 2017
- [11] Lester SE, Halpern BS, Grorud-Colvert K, Lubchenco J and others (2009) Biological effects within no-take marine reserves: a global synthesis. *Mar Ecol Prog Ser* 384:33-46. <https://doi.org/10.3354/meps08029>
- [12] Lester et al. 2009
- [13] Roberts et al. 2017, Marine reserves can mitigate and promote adaptation to climate change. *PNAS* 114 (24) 6167-6175. <https://doi.org/10.1073/pnas.1701262114>
- [14] Roberts et al. 2017
- [15] Elizabeth Mcleod et al. 2011, A blueprint for blue carbon: Toward an improved understanding of the role of vegetated coastal habitats in sequestering CO2. *Frontiers in Ecology and the Environment* 9. <https://doi.org/10.1890/110004>
- [16] Lester et al. 2009
- [17] Sala E, Costello C, Dougherty D, Heal G, Kelleher K, Murray JH, et al. 2013, A general business model for marine reserves. *PLoS ONE* 8(4): e58799. <https://doi.org/10.1371/journal.pone.0058799>
- [18] Lamb et al. 2017, Seagrass ecosystems reduce exposure to bacterial pathogens of humans, fishes, and invertebrates. *Science*, Vol. 355, Issue 6326, pp. 731-733. DOI: <https://www.doi.org/10.1126/science.aal1956>
- [19] Brander et al. 2015, The benefits to people of expanding Marine Protected Areas. Amsterdam: Institute for Environmental Studies, available at https://www.issuelab.org/resources/25951/25951.pdf?download=true&_ga=2.227198557.1167454837.1558640107-1857028723.1558640107
- [20] Blasiak, R., Wynberg, R., Grorud-Colvert, K. et al. The ocean genome and future prospects for conservation and equity. *Nat Sustain* (2020). <https://doi.org/10.1038/s41893-020-0522-9>
- [21] Brander et al. 2015
- [22] Lynham et al. 2020, Impact of two of the world's largest protected areas on longline fishery catch rates. *Nature Communications*, Vol 11 (979). <https://www.nature.com/articles/s41467-020-14588-3>
- [23] Sala et al. 2013
- [24] Waldron et al. 2020, Protecting 30% of the planet for nature: costs, benefits and economic implications. https://www.conservation.cam.ac.uk/files/waldron_report_30_by_30_publish.pdf
- [25] Fisher et al. 2017, Effect of coastal marine protection on childhood health: an exploratory study. *The Lancet*, Vol 389 (2) [https://doi.org/10.1016/S0140-6736\(17\)31120-0](https://doi.org/10.1016/S0140-6736(17)31120-0)
- [26] O'Leary et al. 2016, Effective coverage targets for ocean protection. *Conservation Letters*, Vol 9 (6) p 398-404. <https://doi.org/10.1111/conl.12247>
- [27] Dinerstein et al. 2019, A Global Deal For Nature: Guiding principles, milestones, and targets. *Science Advances*, Vol. 5, no. 4. <https://doi.org/10.1126/sciadv.aaw2869>
- [28] "MPAtlas Country Summary: United States," Marine Conservation Institute, <http://mpatlas.org/region/country/USA/>

Photos: Kydd Pollock, United States Fish and Wildlife Association (Pacific Remote Islands Marine National Monument)