

# Adapting to Climate Change: Marine Ecosystems

Climate change will impact marine ecosystems and coastal communities. Effective adaptation must address both marine ecosystems and coastal communities, and the connections between them. Immediate and substantial adaptation action is needed for people and marine ecosystems to survive and prosper. Even if greenhouse gas emissions are stabilized today, major physical and biological changes to the ocean will continue for centuries.

**The Earth's oceans have absorbed 30 percent of global anthropogenic carbon dioxide emissions – 50 percent more than terrestrial systems.** The oceans have also absorbed 80 percent of the excess heat caused by climate change. As a result, the oceans are experiencing large impacts with serious and irreversible consequences for essential marine ecosystem services and the people that depend on them.

The impacts of climate change on the oceans – including warming ocean temperatures, sea level rise, ocean acidification and changing ocean currents – will lead to major shifts in the diversity and abundance of life in the ocean. Globally, millions of people are already being impacted by these physical and biological changes through shifts to major fisheries, increased coastal flooding, erosion from storms and loss of livelihoods. Critically, coastal and small island communities harbor many of the world's most vulnerable people and these populations are being impacted first and most severely.

- Worldwide, approximately one billion people are dependent on fish as their principal source of protein and half a billion people depend on fisheries and aquaculture for their livelihoods, particularly in developing countries. **Climate change is predicted to drive large-scale redistribution of commercial fisheries including a drop of up to 40 percent in catch in tropical seas.**
- An estimated 10 million people are impacted by coastal flooding each year due to storm surges, hurricanes and typhoons. Coral reefs and mangroves play an important role in coastal protection for people and ecosystems globally. **Despite their vital importance, 35 percent of the world's mangroves are gone and some 30 percent of coral reefs are already seriously damaged.**



## The Way Forward:

- **Immediate adaptation action** at a scale commensurate to the threat is needed to allow people and marine ecosystems to survive climate change-driven changes to the oceans.
- **Large scale funding must be mobilized** quickly to assist developing countries in adapting to the impacts of climate change on the oceans. Developing countries are particularly vulnerable to the coastal impacts of climate change and to impacts of climate change on marine resources. Considering ecosystems and their services is an essential part of the response.
- **Significant technical and institutional capacity building** is needed to support adaptation action in developing countries. Support is necessary for short term action, technology transfer and building long-term capacity.
- **The best available science must be applied to manage the uncertainty of climate change.** This must include: accounting for climate change-driven shifts in fisheries management; coastal zone planning; conservation of important habitats such as sea grasses, mangroves and coral reefs that protect against erosion and storm flooding, and maintain important fisheries and coral reefs.
- **Local capacity must be built to support** local practices **and incorporate traditional knowledge** to respond to and manage climate change impacts to marine resources.

## FIELD DEMONSTRATIONS: Ecosystem approaches to adaptation

- In the Galapagos Islands of Ecuador, Conservation International (CI) and partners have conducted a vulnerability assessment of the impacts of climate change on the communities and biodiversity of the region. CI is now working with the Ecuadorian government to develop an adaptation plan for the islands and is implementing priority adaptation actions for critical ecosystems including corals, and mangroves.
- In the Raja Ampat region of Eastern Indonesia, CI researchers have found coral populations that appear to be resistant to the impacts of warming ocean temperatures. CI is now working with the local communities to protect these corals and is working to identify the source of this natural resilience in order to develop adaptation approaches for other coral populations.
- The communities of the Verde Island Passage, Philippines, are acutely dependant on the ocean ecosystems of the passage for protection from storms and for food. CI is working with local governments to identify the climate change vulnerability of the region and ensure adaptation is integrated into management of the marine resources and ecosystems. CI is also working to protect particularly important marine ecosystems in the passage, including mangroves, seagrasses and corals.

### OUR VISION

We imagine a healthy, prosperous world in which societies are forever committed to caring for and valuing nature, our global biodiversity, for the long-term benefit of people and all life on Earth.

### OUR MISSION

Building upon a strong foundation of science, partnership and field demonstration, CI empowers societies to responsibly and sustainably care for nature, our global biodiversity, for the well-being of humanity.

CONSERVATION  
INTERNATIONAL



[conservation.org](http://conservation.org)

2011 Crystal Drive  
Suite 500  
Arlington, VA 22202 USA  
+1.703.341.2400

Contact:

**Hannah Campbell**

Climate Adaptation &  
Communities

+1.703.341.2698

[hcampbell@conservation.org](mailto:hcampbell@conservation.org)

PHOTO CREDITS:  
© CI/photo by Sterling Zumbunn  
Raja Ampat, Indonesia