

What roles do oceans play in Climate Change Adaptation?

The most important way oceans contribute to adaptation is through coastal ecosystems such as mangroves, coral reefs, and seagrass beds. Coastal zones are very high energy areas (waves/tides) and to protect coastal communities, these forces must be managed. You can manage them by building grey infrastructure such as jetties or seawalls, or you can use green infrastructure such as mangroves, or a combination of both. Mangroves not only support fisheries and biodiversity, but they also strengthen the ability of coastal communities to withstand the impacts of climate change.

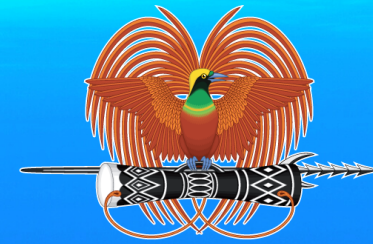


What roles do oceans play in Climate Change Mitigation?

Oceans are the largest heat sink on the planet. They absorb 90% of the excess heat caused by climate change. Oceans are also a very efficient carbon sink, absorbing 23% of human-caused CO₂ emissions. Ecosystems such as mangroves, which grow in coastal areas but with roots in sea water, as well as tidal marshes and seagrass meadows, all isolate and store more carbon than forests. We also know that some carbon particles have been isolated in seabed sediment over millions of years. But the role of oceans as a carbon sink is directly affected by the impacts of climate change on ocean health, creating a vicious cycle.

Fun Facts About the Ocean

- Whale sharks are the world's largest fish at 40 feet long.
- The male seahorse is the parent who gives birth to their offspring!
- The Pacific Ocean is the biggest ocean of the world and covers more than 30% of the Earth's surface.
- The largest coral reef in the world is located off the Australian coast and is called the Great Barrier Reef.
- The waters of the Indian Ocean provide the largest breeding grounds in the world for humpback whales.
- More than 2.6 billion people rely on the ocean as a source of protein.
- Half of the oxygen you breathe comes from the ocean.
- Papua New Guinea, island country in the southwestern Pacific Ocean.
- An octopus can change the colour and texture of its skin to match that of its surroundings. The mimic octopus can even pretend to be an entirely different animal!
- The biggest clownfish is always female. When she dies, the biggest male becomes a female!
- The lowest known point on earth is called Challenger Deep. It is located in the Pacific Ocean near Guam in the Philippine Sea at the end of the Mariana Trench. The depth recorded is 10,920m or 35,827ft.



CLIMATE CHANGE AND THE OCEAN

*It's a beautiful world down there.
Let's keep it safe.*

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There is so much yet to be explored in the deep blue sea.

What is an Ocean?

An ocean is a continuous body of salt water that is contained in an enormous basin on Earth's surface. The major oceans and their marginal seas cover nearly 71% of Earth's surface, with an average depth of 3,688m (12,100ft).

What are the 5 main Oceans?

The 5 major oceans are the Pacific Ocean, the Atlantic Ocean, the Indian Ocean, the Arctic Ocean and the Southern Ocean.

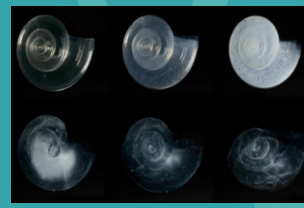


What is the largest Ocean?

The Pacific is the largest ocean in both surface area and volume. The Atlantic is the next largest, and the Arctic is the smallest.

How much of water found on Earth exists in Oceans?

By volume, 98% of the water on Earth exists as oceanic water and associated sea ice. Earth is unique in the solar system because its mean temperature allows water to exist on Earth in all three phases—solid, liquid, and gaseous—with the liquid phase predominating.



How does Climate Change affect the Ocean?

Climate change is a major threat to ocean health globally. Climate change is causing serious changes in oceans, including temperature increase, sea level rise, and acidification. Significant changes in ocean current patterns are also occurring. All these factors impact ocean health and marine species. For instance, coral reefs, which are critical marine ecosystems, are threatened by a trifecta of acidification, increasing sea temperatures and sea level rise. But acidification is also a much broader issue since it disrupts carbon sequestration by other species including mollusks and crustaceans. Changing ocean current patterns threaten recruitment of fish stocks – the number of fish born in a given time frame that reach the juvenile stage – with very real and direct impacts on coastal communities that depend on these resources.

Indicators of Climate Change in the Ocean?

- **Sea Surface Temperature** - is the water temperature close to the ocean's surface. It varies mainly with latitude, with the warmest waters generally near the equator and the coldest waters in the Arctic and Antarctic regions.
- **Sea Level** - Mean sea level is an average surface level of one or more among Earth's coastal bodies of water from which heights such as elevation may be measured.
- **Coastal Flooding** - normally occurs when dry and low-lying land is submerged by seawater.
- **Ocean Acidity** - refers to a reduction in the pH of the ocean over an extended period of time, caused primarily by uptake of carbon dioxide (CO₂) from the atmosphere.
- **Ocean Heat** - is the energy associated with the change in average ocean surface and bulk temperatures as a result of both natural and human activities. This heating comes as a result of increased greenhouse gas levels in the atmosphere, which are known to be attributed to human emissions.