

ONE OCEAN HUB: Climate change research in a nutshell

Covering over 70% of the planet, the ocean is essential for controlling the earth's climate, supporting livelihoods and providing food for millions of people.

Changes in ocean conditions impact global climate patterns, local coastal environments, and our ways of life.

One Ocean Hub is an international programme of research for sustainable development that promotes fair and inclusive decision-making for a healthy ocean whereby people and the planet flourish.

Our research is particularly concerned with understanding the impacts of climate change on the ocean and the communities in South Africa, Namibia, Ghana, and the South Pacific.

Research on COMMUNITIES and climate change

Decisions for ocean-related climate action can only support social and environmental justice if they are equitable and inclusive.

Coastal communities most reliant upon the ocean - subsistence and small-scale fishers, local communities, indigenous peoples, women and youth - face significant barriers to participation in decision making about climate action, conservation, and 'blue economy' developments.

Yet these decisions directly impact livelihoods, cultural heritage, security, and health. Policies and practices often fail to include the knowledge and values of local people. There is an urgent need for participatory research and social learning.

One Ocean Hub collaborates with human rights-holders and decision makers to ensure climate action is contextualised, relevant and feasible. Our research helps understand vulnerabilities to climate change, including lived experience of climate-related impacts and damage to ecosystems that threatens food security and livelihoods. We work with communities to learn from, support and identify adaptation strategies that are incorporated into national planning agendas.

Our research adopts arts-based methodologies to privilege the knowledge and values of people living in precarious coastal environments most affected by climate change. Storytelling, music, art, film, and participatory theatre are vehicles to amplify under-represented voices in climate adaptation strategies.

Our approach to climate change:

- Our research with **coastal communities** who are reliant upon the ocean, looks at what barriers communities face in taking part in climate-action.
- Our research on **marine ecosystems** increases knowledge of deep-sea species and habitats to better understand their role in mitigating climate change and the impacts climate change may have upon them.
- Our research on **fisheries** examines the impacts of climate change, over-exploitation, pollution, and changing ocean conditions on fish that are essential to coastal community livelihoods.
- Our research on **human rights** highlights the needs of children and young people, women, indigenous peoples, small-scale fishers, and other communities dependent on a healthy ocean, amplifying their voices in global dialogue.



Research on MARINE ECOSYSTEMS and climate change

The ocean is the greatest defence against climate change impacts, absorbing over 93% of excess heat and over a quarter of excess carbon dioxide in the atmosphere.

Ocean circulation systems transport carbon dioxide rich surface water to the seafloor, locking this greenhouse gas at depth, and providing an essential service against climate change. Over time, this absorption and circulation is causing wide-spread changes in ocean conditions: warmer temperatures cause a decrease in oxygen, while increased carbon dioxide absorption leads to ocean acidification.

While the deep ocean is a key component of the climate system that supports climate mitigation and human wellbeing, these ecosystems are not well understood. It is estimated that there are 2.50 million undiscovered species. We have very little knowledge about how these species function, what services they provide, and how they may be affected by climate change.

One Ocean Hub researchers are investigating changing ocean conditions on key species such as cold-water corals, while mapping different marine habitats and the benefits they provide to society.

Our research produces maps of marine habitats and ecosystem services for the whole Atlantic to identify areas more vulnerable to potential climate change impacts. Together with studies on cold-water corals, this work is essential in predicting continued ocean change and how this may affect human wellbeing.



For more information, visit www.oneoceanhub.org and follow us on social media.

Research on HUMAN RIGHTS and climate change

Everyone's right to life, health, food, clean air, water and culture are reliant on a healthy ocean. The ocean supports the livelihoods of coastal communities and indigenous peoples who, given their geographic location, are particularly vulnerable to negative impacts on the ocean.

Marine biodiversity loss is accelerated by climate change, which increases risks of negative impacts on our human rights. The right to food is threatened when rising ocean temperatures cause fish stocks to decline. Seawalls, for example, can mitigate the impacts of sea level rise but undermine small-scale fishers' rights to food as accessing the sea becomes harder.

Climate action needs to respect human rights. One Ocean Hub undertakes focussed research on the unique role of the ocean in the effective protection of children's rights. Climate change has the potential to adversely affect nearly all the human rights which children hold. Action on the relationship between a healthy environment and climate change must consider the importance of the ocean for the protection of children's rights.

Research on FISHERIES and climate change

Fish provides an essential source of protein for millions of people, while fishing provides employment opportunities for many coastal communities. Decades of overexploitation of some fish stocks have reduced the abundance of available catch, which is further declining due to increased pollution, and habitat degradation among other factors. Rising sea surface temperatures resulting from climate change are influencing the distribution of fish, such as anchovies, which are sensitive to increasing temperatures.

As these stocks shift their distribution to find colder waters, many local fishers are at increased risk of poverty and food insecurity. One Ocean Hub research examines the combined impacts of climate change, over-exploitation, pollution, and other global change factors on fish that is essential to support the nutritional needs and livelihoods of coastal communities.

Ecosystem modelling is used to understand the relationship between human-induced climate change and fish abundance and distribution. These models can predict future catch potential under different climate scenarios. We analyse the environmental preferences of key species and project ideal environmental conditions. The Hub brings together scientific findings and local fisher knowledge to develop ecosystem-based management tools for sustainable, climate resilient fisheries management.

