



INTERNATIONAL ALLIANCE TO
COMBAT OCEAN ACIDIFICATION

ADVANCING OCEAN & COASTAL ADAPTATION



Submission to the UNFCCC Ocean
and Climate Change Dialogue,
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Submitted by: OA Alliance

Endorsed by:



SUMMARY

Ocean acidification (OA) is a direct result of human-caused carbon dioxide (CO₂) emissions and is altering the chemical balance of seawater that marine life depends upon for proper functioning and survival.

Recent UN climate change conferences (COP23, COP25 and COP26) have called for the integration of ocean issues across the UN Framework Convention on Climate Change (UNFCCC) and other relevant UN frameworks.

Building on this momentum, the OA Alliance has suggested topics for the upcoming UNFCCC Ocean and Climate Dialogue which will address ocean mitigation and adaptation measures across climate frameworks.

Enhancing regional knowledge of ocean and coastal risks and impacts caused by climate change will help inform the most meaningful adaptation options. Guidance on ocean adaptation and increased climate finance are needed across international frameworks.

SPECIFICALLY, WE NEED TO:

- 1. Increase and ease access to climate financing** for ocean and coastal climate monitoring and research, risk assessments and remediation or adaptation measures. This should be explored through the Global Environment Facility, Green Climate Fund, Adaptation Fund, Standing Committee on Finance and other appropriate mechanisms.
- 2. Incorporate OA and other ocean-climate change indicators across a range of universally accepted adaptation strategies** like disaster risk management and recovery, cost-benefit frameworks, early warning systems, climate services and risk spreading.
- 3. Consider and evaluate the role of and Nature-Based Solutions** across freshwater, coastal and ocean ecosystems to mitigate and build resilience to climate change.
- 4. Expand guidance for incorporating ocean mitigation opportunities and adaptation needs across NDCs/ NAPs.**
- 5. Emphasize proper financing and implementation for UN Sustainable Development Goal (SDG) 14.3.1:** to minimize and address the impacts of ocean acidification and to establish a common methodology for reporting measurements.

SUBMISSION

OCEAN ACIDIFICATION IN CONTEXT OF THE UNFCCC

There are multiple impacts of climate change to our ocean including ocean warming, acidification, deoxygenation, sea-level rise, more frequent and intense storms, marine heat waves, loss of marine life and habitat, climate variability, and changing circulation. Together, these impacts are causing harm by displacing people, damaging coastal ecosystems, communities and property, decreasing food security and sovereignty, impacting jobs and livelihoods and threatening cultural practices and traditions. Over the 21st century the ocean is projected to transition to unprecedented conditions, and in some cases incur irreversible losses, driven by increased temperatures, greater upper ocean stratification, further acidification, oxygen decline and altered net primary production (IPCC, 2019).

Ocean acidification (OA) is a direct result of human-caused carbon dioxide (CO₂) emissions and is altering the chemical balance of seawater that marine life depends upon for proper functioning and survival. SBSTA has recognized OA as an emerging issue relevant to the UNFCCC and outlined OA research as a priority need under the Convention. Additionally, OA has been acknowledged as a slow-onset climate event by the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (Ellycia R. Harrould-Kolieb, 2016).

While increasing ambition to meet Convention goals and targets (and specifically, drastically reducing CO₂ emissions) is paramount for mitigating OA, there are actions that Parties and sub-national governments can and should be taking now that will allow for increased adaptation and resilience of vulnerable ecosystems and species, further bolstering the ability of human communities to cope with future change.

Enhancing regional knowledge of ocean and coastal risks and impacts caused by climate change—alongside understanding and engaging with coastal community priorities—will help inform the most meaningful adaptation options.



UNDERSTANDING CLIMATE-OCEAN IMPACTS, ADAPTATION AND VULNERABILITY:

In unprecedented terms, Climate Change 2022: Impacts, Adaptation and Vulnerability the Working Group II Contribution to the IPCC Sixth Assessment Report (IPCC, 2022) emphasizes climate impacts, adaptation and vulnerability to ecosystem and human communities.

The [OA Alliance submission to the Ocean and Climate Change Dialogue at SBSTA 52](#) called for increased emphasis on vulnerability assessments to illuminate impacts of OA and climate-driven ocean change and inform adaptation. The recent report indicates present and near-term risk and vulnerabilities, making clear the need to promote and strengthen adaptation measures.

Specifically, the report indicates that climate change has caused substantial damages—and increasingly irreversible losses—in terrestrial, freshwater, and coastal and open marine ecosystems (high confidence). The extent and magnitude of climate change impacts are larger than estimated in previous assessments (high confidence) (IPCC, 2022, page 8).

These impacts include species loss in the ocean driven by increases in extreme heat events (IPCC, 2022, p. 8); loss and degradation of coral reefs, low-lying coastal wetlands and kelp-forests (IPCC, 2022, p. 12). Ocean warming and OA have adversely affected food production including shellfish aquaculture and fisheries in some regions (high confidence). Additional risks to food security and safety caused by climate change include compounding health effects of seafood contamination from increased harmful algal blooms (IPCC, 2022, p. 19). A decrease in seafood production and availability is especially impactful for coastal communities with limited diet diversity who disproportionately rely on marine resources for primary protein (IPCC, 2022, p. 10).

That said, food security alone does not account for the full suite of socio-economic and socio-cultural vulnerabilities posed by climate change impacts to marine resources including economies, livelihoods, social and cultural practices and traditions. While vulnerability of ecosystems, species and human communities to climate change differs substantially across and with-in regions, the report finds that adaptation progress is unevenly distributed with prominent adaptation gaps (IPCC, 2022, p. 21).

It is also understood that climate change will have disproportionate impacts on some frontline and indigenous communities, whether due to geographic location or specific reliance on (or connection to) ecosystems and species that are most susceptible to impacts of climate-ocean change. Furthermore, limited availability of local data, information and evaluation of response strategies pose challenges to robust adaptation planning and current financial flows for adaptation are insufficient (IPCC, 2022, p. 27).

This means that express guidance on enabling conditions for ocean and coastal adaptation are needed across the UNFCCC and should reflect adaptation themes outlined in the IPCC, 2022 report: political commitment and follow-through, institutional frameworks, policies and instruments with clear goals and priorities, enhanced knowledge on impacts and solutions, mobilization of and access to adequate financial resources, monitoring and inclusive processes (IPCC, 2022, p. 29).

PROPOSED AREAS OF PRIORITY FOCUS FOR THE OCEAN AND CLIMATE CHANGE DIALOGUE AT SBSTA 56:

Outline a process for closing adaptation gaps by defining guidance on enabling conditions for ocean and coastal adaptation measures. Proposed guidance on enabling conditions should:

1. Emphasize the importance of regional risk and vulnerability assessments to identify the combined impacts of ocean warming, acidification and deoxygenation. This should include improving and diversifying knowledge of impacts (including biological impacts) to marine species and ecosystem functioning, alongside understanding socio-economic and socio-cultural significance.
2. Increase and ease access to climate financing for ocean and coastal climate monitoring and research, risk assessments and remediation or adaptation measures. This should be explored through the Global Environment Facility, Green Climate Fund, Adaptation Fund, Standing Committee on Finance and other appropriate mechanisms. Exploring pilot projects, cost-benefit frameworks, and more inclusive criteria for priority investments would be instructive.
3. Evaluate feasibility dimensions relative to ocean and coastal adaptation measures, defined by AR6 Working Group II as: economic, technical, institutional, social, environment and geophysical alongside synergies with mitigation (IPCC, 2022, p. 23).
4. Consider and evaluate the role of and Nature-Based Solutions across freshwater, coastal and ocean ecosystems to:
 - Sequester carbon through aquatic vegetation ecosystems like mangroves, salt marshes and some seagrasses that link with market mechanisms.
 - Remediate or ameliorate coastal acidification through aquatic ecosystems like mangroves, salt marshes, seagrass beds and kelp forest.
 - Improve water quality, limit coastal erosion and provide protection from extreme events.
 - Facilitate movement and protection of species (refugia).
 - Support adaptive management and promote resilience strategies for highly vulnerable species.
 - Reduce land-based/ terrestrial sources of pollution that exacerbate local OA conditions.
5. Incorporate OA and other ocean-climate change indicators across a range of universally accepted adaptation strategies like disaster risk management and recovery, cost-benefit frameworks, early warning systems, climate services and risk spreading.
6. Prioritize equity, justice, cooperation, and inclusive decision making with local communities and Indigenous People. This includes recognition of Tribal sovereigns and Treaty rights and inherent rights of Indigenous peoples across adaptation measures.
7. Draw from and highlight appropriate links to ocean-climate risk, vulnerability and adaptation work happening through the Nairobi Work Programme (NWP) expert group on oceans; Warsaw International Mechanism for Loss and Damage (WIM); FAO seafood adaptation programs; Local Communities and Indigenous Peoples Platform (LCIPP) (Summary Report, SBSTA, 2021).

Expand guidance for incorporating ocean mitigation opportunities and adaptation needs across NDCs/ NAPs.

Coastal states (Parties) should include consideration of climate-ocean risk assessment, mitigation and adaptation measures while emphasizing the role of information needs and nature-based solutions (values, functions, services). These considerations might also link to other regional policy instruments.

Expand Global Stocktake Indicators.

- Include global climate observing system and global climate indicators that relate to ocean and coastal change. Specifically, this should include ocean warming, acidification, sea level, Arctic and Antarctic sea ice extent as scientific measures of the Earth's energy imbalance.

Strengthen Coordination of OA Activities Across the UN.

- UN Decade of Ocean Science for Sustainability:
 - Support and utilize information arising from the Ocean Acidification Research for Sustainability Program and the Climate Change Multi-Stressor Program.
- Sustainable Development Goal 14:
 - Emphasize proper financing and implementation for UN Sustainable Development Goal (SDG) 14.3.1: to minimize and address the impacts of ocean acidification and to establish a common methodology for reporting measurements.
- Across the Ocean Climate Biodiversity Nexus:
 - OA actions, investments and programs have a unique role to play across the UN Environment Assembly, UNFCCC, UN Decade of Ocean Science for Sustainability and the UN Sustainable Development Agenda and Convention on Biological Diversity.



Rereferences:

Ellycia R. Harrould-Kolieb, Ocean Acidification and the UNFCCC: Finding Legal Clarity in the Twilight Zone, 6 WASH. J. ENVTL. L. & POL'Y 612 (2016). <https://digitalcommons.law.uw.edu/wjelp/vol6/iss2/13>

IPCC, 2022: Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Lösschke, V. Möller, A. Okem (eds.)]. In: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Lösschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. In Press.

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Subsidiary Body for Scientific and Technological Advice, SBSTA 2021: "Ocean and climate change dialogue to consider how to strengthen adaptation and mitigation action. Informal summary report by the Chair of the SBSTA." April 2021.



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