

The Ocean Decade at COP26

of the United Nations Framework
Convention on Climate Change



The United Nations
Decade of Ocean Science
for Sustainable Development
2021-2030



2021 United Nations Decade
2030 of Ocean Science
for Sustainable Development

The Ocean-Climate Nexus

A healthy, resilient ocean holds extraordinary potential to address climate change and improve overall human health and well-being. However, the state of the ocean is declining as a result of human activity through greenhouse gas emissions and other anthropogenic stressors. Recent reports from the Intergovernmental Panel on Climate Change (IPCC) document the impacts of ocean acidification, deoxygenation, marine heat waves, ocean heat content, ice sheet and glacier mass lost driving rapid increases to sea level rise, changes in ocean currents, and the decline of Arctic sea ice. Multiple stressors on marine ecosystems are leading to detrimental impacts on important fisheries, habitats and aquaculture that will have destabilising effects aquaculture and throughout the marine food web. As a result, global food security, the economy, and valuable ecosystem services are at risk. Hundreds of millions of people are living in locations particularly vulnerable to climate change today, including low-lying coastal zones, small island developing states (SIDS) or in the Arctic. The ocean cannot be overlooked in our efforts to tackle climate change. Actions that will enhance our knowledge, technology, coordination and capabilities within this ocean-climate nexus are critical.

While the science has been rapidly advancing on these topics in recent years, there are still important knowledge gaps that are hampering the development of viable climate mitigation and adaptation solutions with the ocean playing a central role. For example, biological responses to changing environmental

conditions including ocean acidification, warming temperatures and declining sea ice require ongoing and enhanced ecological monitoring. Socio-economic considerations will need to be expanded in the use of blue carbon assets to combat climate change. The deep sea is still largely unexplored, and the ecosystem services it can provide are not yet fully realized. The ability of the ocean and its ecosystems to store carbon and contribute to mitigation efforts requires further research and the development of innovative solutions. Enhanced and coordinated global ocean observations are essential in improving the accuracy of climate models, weather forecasts and early warning systems and to better understand ocean acidification conditions. Continued efforts to build resilient ecosystems are necessary for providing stable food sources for the planet and promoting a strong blue economy. Additional knowledge, including indigenous and local knowledge, is needed to deliver equitable and just adaptation strategies for coastal communities facing threats from sea level rise and intensifying storms.

The United Nations Decade of Ocean Science for Sustainable Development which commenced on 1 January 2021 aims to meet these critical knowledge gaps by providing a framework to convene diverse actors around the world to co-design and co-deliver solutions-oriented research that will represent “the science we need for the ocean we want” under rapidly changing climatic conditions.

OCEAN-CLIMATE NEXUS Knowledge Gaps



OCEAN OBSERVATIONS

There is **insufficient baseline data provided by observations that are fundamental in the sustainable management of the ocean.**

Global ocean observations are key to improve accuracy of climate projections, weather forecasts, early warning systems, ocean acidification and deoxygenation monitoring, and biological responses.



MULTIPLE STRESSORS

The cumulative impacts of **ocean warming, deoxygenation and ocean acidification** on marine species are still largely unknown.

This knowledge is critical for ocean health, ecosystem functioning and commercially important species.



DEEP OCEAN

More than 80% of the ocean floor is unexplored. **Biodiversity of the deep sea is largely unknown.** These gaps limit adequate stock assessments and ability to monitor biological response to disturbances, including climate change.

Processes in the deep ocean are also critical drivers of ocean circulation and climate, requiring sustained observations.



COASTAL RESILIENCE

Nearly **1 billion people** live in low lying coastal zones vulnerable to climate change.

There is an urgent need to develop **equitable, co-designed and solutions-based adaptation strategies** to build resilient communities.



NATURE-BASED SOLUTIONS

Coastal habitats sequester 2-4x more carbon per area than terrestrial forests, yet coastal wetlands have reduced by **over 50%** since the Industrial Revolution.

More research is required to protect and restore these valuable blue carbon ecosystems

The Role of the Ocean Decade at COP26

What is the Ocean Decade?

On 5 December 2017, the United Nations (UN) declared that a Decade of Ocean Science for Sustainable Development ('Ocean Decade') would be held from 2021 to 2030. The Ocean Decade provides a common framework to ensure that ocean science can underpin the achievement of the 17 Sustainable Development Goals (SDGs) and complementary global and regional policy frameworks including the United Nations Framework Convention on Climate Change. The Ocean Decade provides a 'once-in-a-lifetime' opportunity to create a new foundation across the science-policy interface to strengthen the management of the ocean and coasts for the benefit of humanity and to mitigate the impacts of climate change. The Ocean Decade Implementation Plan outlines ten Decade Challenges, representing the most immediate and pressing needs of the Decade, which will guide stakeholders as they come together to co-design and co-deliver a wide range of Decade Actions that will be implemented the ocean-climate nexus is embodied in Challenge No. 5 and is reflected in a number of the other Challenges over the next ten years.

The Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO) has been mandated to coordinate implementation of the Ocean Decade. The Ocean Decade will provide the data, knowledge and capacity to address science and knowledge gaps needed to make informed policy decisions. The United Nations (UN) General Assembly clearly recognizes the societal benefits of a healthy ocean and the need to work across UN entities to achieve this goal. Working in coordination with the UN Framework Convention on Climate Change (UNFCCC), the Ocean Decade will contribute to addressing these societal challenges for example by providing the sound science needed to reflect ocean considerations in Nationally Determined Contributions (NDCs) of the Paris Agreement on Climate Change. In the Ocean and Climate Change Dialogue¹, the UNFCCC reaffirmed that science must be strengthened and central to this process. The complementary structure of the Ocean Decade Action Framework to the goals of COP26 will allow for meaningful contributions in achieving successful outcomes.

THE OCEAN DECADE ACTION FRAMEWORK



Source: from the IOC-UNESCO Decade Action Plan, 2020.

1 https://unfccc.int/sites/default/files/resource/SBSTA_Ocean_Dialogue_SummaryReport.pdf



© Lorenzo Mittiga / Ocean Image Bank (Volunteers working in the mangroves, Lac Bay, Bonaire).

The Ocean Decade Action Framework: Achieving the goals of COP26

MITIGATION I Unlocking the potential of the ocean to limit warming to 1.5 degrees

Assessments indicate that the NDCs announced in Paris in 2015 would result in warming well above 3 degrees by 2100 compared to pre-industrial levels. It is evident that limiting warming to even 2 degrees poses serious challenges to the health and sustainability of the ocean. At COP26, it is anticipated that countries will make commitments to keep warming to 1.5 degrees by 2050 but there is consensus that even more needs to be done. Cutting emissions alone towards achieving net zero is part of, but certainly not the entire, solution. The Ocean Decade complements the efforts of UNFCCC by filling the knowledge gaps required to meet the ambitious goals set forth in the Paris Agreement. With the ocean as an integral part of the climate system, the Ocean Decade will coordinate and sustain ocean observations, advance new technologies, improve ocean-climate literacy, and mobilise resources to bring about innovative solutions to achieve a sustainable ocean by 2030 and to mitigate the most severe impacts of climate change with potential actions that can limit warming to 1.5 degrees.

One of the 10 Ocean Decade Challenges, Challenge No. 5 is to unlock ocean-based solutions to climate change. There are numerous emerging services that the ocean can provide. The Ocean Decade will support programmes that lead to the development and application of renewable energy technologies, actions to maintain and strengthen ocean carbon uptake and low-emission ocean-based transport and food production that could reduce greenhouse gas emissions. In addition to the reduction of emissions, technologies will be needed to remove greenhouse gases from the atmosphere. Marine ecosystems such as seagrass meadows, kelp forests and mangroves, in addition to the deep ocean, naturally store carbon and would benefit from protection, restoration, and enhancement. There are other ocean-based greenhouse gas removal methods (e.g., ocean fertilisation and enhanced ocean alkalinity) that require further research but may

be powerful tools to combat climate change. However, these are processes that carry substantial ecological risks that must be well studied and executed in a manner that maintains a balanced ecosystem without causing further harm.

The presence of the Ocean Decade at COP26 aims to encourage countries to include ocean-based solutions in their national climate action strategies and NDCs. Currently, 25 countries have established National Decade Committees. These Committees will hold a wealth of knowledge that can be used to identify critical knowledge gaps in the development of NDCs.

ADAPTATION I Coastal resilience and adaptation to protect communities and natural habitats

The Ocean Decade will provide new knowledge and tools for nature-based solutions to increase climate resilience and increase the adaptive capacity of hundreds of millions of the most vulnerable people. There is vast potential in blue carbon assets, including marine protected areas and coastal habitats, that can be incorporated into national climate action plans. These natural habitats not only sequester carbon, but also offer other valuable ecosystem services that include shoreline protection from storms and erosion, enhancing biodiversity, and further support the blue economy through commercial fishing, tourism, renewable energy and aquaculture industries.

Improved observations of our ocean are critical to accurate and timely predictions that can be used for early warning services. These life-saving services are essential to building resilient coastal communities facing the threats of climate change. Ocean Decade Challenge No. 6 highlights the need to enhance multi-hazard early warning services for all geophysical, ecological, biological, weather-, climate- and anthropogenic-related ocean and coastal hazards, and mainstream community preparedness and resilience. With rising temperatures around the globe, the frequency of climate-related hazards is anticipated to increase. Such ocean-climate hazards include harmful algal blooms resulting in toxic fish/shellfish, increased tropical cyclone intensity and occurrence of extratropical cyclones, and coastal



© Martin Colognoli / Ocean Image Bank (Fisherman prepare traditional nets, Indonesia).

flooding tied to sea level rise and storm surges. Sustained ocean observations are critical to these efforts that require reliable, long-term funding sources and global coordination.

FINANCE I Mobilising resources to support the Ocean Decade

To stimulate the ambitious global ocean science agenda of the Ocean Decade, the Ocean Decade Alliance has been established to leverage and multiply financial and in-kind resource commitments to support Decade Actions. The Ocean Decade Alliance is a network of eminent partners of the Ocean Decade that are leading by example to catalyse support for the Ocean Decade through targeted resource mobilisation, networking, and influence. Exciting new partnerships have already been established in the first year of the Ocean Decade. As part of the second Call for Decade Actions No. 02/2021, the AXA Research Fund (<https://www.axa-research.org>) will be awarding 1M€ for projects led by early career researchers that address coastal resilience and adaptation to climate change. Additionally, the MeerWissen (<https://meerwissen.org/3rd-call-for-proposals>) Initiative for African-German marine partnerships, an in-kind contribution from the German government, will be funding collaborative projects that support nature-based solutions in Africa.

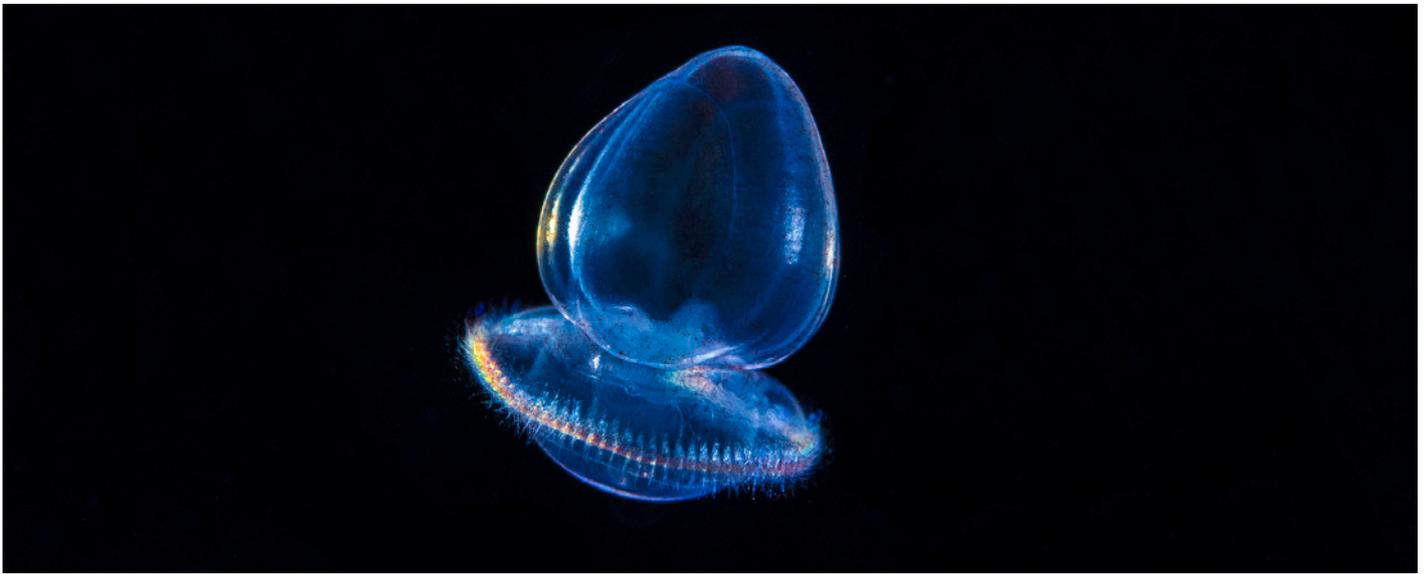
COLLABORATION I Inclusive, transdisciplinary, and transformative ocean-based climate solutions

The approach to tackling climate change must be holistic and inclusive. The Ocean Decade is designed to facilitate global communication and mutual learning across research and stakeholder communities. It works to meet the needs of scientists, policy and decision-makers, industry, civil society and the wider public. With the recent launch of the Global Stakeholder Forum (<forum.oceandecade.org>), partners and interested parties involved in Decade Actions from around the world will be able to engage and catalyse virtual and in-person collaborations surrounding common interests. The Global Stakeholder Forum will serve as the primary engagement

mechanism for the Ocean Decade, announcing opportunities for funding and partnerships, workshops and trainings, meetings, conferences, and input on calls for future Decade Actions. The Forum will also support Communities of Practice, where partners can optimise communication, collaboration and synergies across various themes and geographies.

Climate change touches on many aspects of the physical world and our everyday lives. Addressing these complex issues requires a transdisciplinary approach across the physical, natural and social sciences. Tackling climate change through the sustainable use of the ocean requires a revolution in how the science is produced, used and disseminated. Within the context of the Ocean Decade Action Framework, efforts to better understand the role of the ocean in adapting to and mitigating climate change will be incorporated throughout all of the Decade Challenges and supporting actions. Examples include actions that will enhance ocean-climate literacy, identifying sources of pollution that inhibit ocean processes that naturally mitigate climate change, and restoring coastal and marine ecosystems to be resilient in the face of climate change. Breaking the silos of knowledge generation will ensure that the solutions are inclusive and result in the benefit of society as a whole.

Transformative ocean science means implementing purposeful and solutions-based approaches. Co-designing this transformative science also requires working with all concerned stakeholders throughout the entire process, from conceptualisation to the application of data in user-friendly formats. The Ocean Decade is committed to the engagement of SIDS, least developing countries (LDCs), and landlocked developing countries (LLDCs). Stakeholders of Decade Actions will support capacity building initiatives that provide SIDS, LDCs and LLDCs with the resources required to lead and participate in the Ocean Decade. This includes inter alia, increasing access of data, information, capacity and technology transfer. There will also be an elevation of, and respect for, the inclusion of indigenous and local knowledge systems. A holistic and inclusive approach will build trust, improve responsiveness to the science, and enhance ocean-climate literacy.



© Richard Barnden / Ocean Image Bank [Jellyfish, blackwater].

What is already happening during the Ocean Decade?

Endorsed Decade Actions Addressing the Ocean-Climate Nexus

The first Call for Decade Actions No. 01/2020 of the Ocean Decade resulted in the endorsement of an impressive number and diversity of programmes and projects, as well as financial and in-kind contributions from around the world. Currently, 31 programmes, 84 projects and 10 Decade Actions from UN entities have been officially endorsed as part of the Ocean Decade. Communities of Practice have been established to allow different partners working on similar themes associated with the Decade Challenges or geographies to coordinate and collaborate in order to achieve the “ocean we want”. Highlighted below are a few examples of endorsed Decade programmes and contributions with a focus on the ocean-climate nexus:

Network programmes that have set ambitious goals to mobilise resources, develop new technologies, and tackle climate change:

Global Ecosystem for Ocean Solutions (GEOS)

GEOS will develop and deploy a series of equitable, durable, and scalable ocean-based solutions for addressing climate change and the other Decade Challenges. Initial projects will focus on ocean-based carbon dioxide removal, providing

adaptation tools to coastal communities, and improving ocean-based human health by working with GEOS’ vast network of partners. <https://oceanvisions.org/work/geos/>

Blue Climate Initiative - Solutions for People, Ocean, Planet

The Blue Climate Initiative (BCI) brings together scientists, communities, engineers, entrepreneurs, investors, global leaders and influencers harnessing innovation and traditional knowledge to reimagine, catalyse, and scale ocean-related strategies to combat climate change while protecting our ocean. BCI unlocks breakthrough solutions to urgent global challenges including improved human health, sustainable food supplies, renewable energy, flourishing biodiversity, stewardship of the ocean’s resources, and vibrant ocean economies. <https://www.blueclimateinitiative.org/>

Monitoring ocean stressors related to climate change

Ocean Acidification Research for Sustainability (OARS)

The ocean absorbs around 23% of the annual emissions of anthropogenic CO₂ to the atmosphere, the CO₂ reacts with seawater and changes the acidity of the ocean; this process is referred to as ocean acidification. OARS will foster the development of ocean acidification science addressing the impacts on marine life and sustainability of marine ecosystems. Key components include

regional collaboration, capacity building, co-design and joint implementation of ocean acidification observation and research, and communication and delivery of the outputs to policy makers and communities. <http://goa-on.org/oars/overview.php>

Global Ocean Oxygen Decade (GOOD)

Climate change is one of the main causes of oxygen loss in the ocean. GOOD is committed to raising global awareness about ocean deoxygenation, providing knowledge for action and developing mitigation and adaptation strategies and solutions through local, regional, and global efforts, including transdisciplinary research, innovative outreach, and ocean education and literacy. <https://en.unesco.org/go2ne> and <https://www.ocean-oxygen.org/>

Sustainably managing the deep ocean for climate solutions

Deep Ocean Observing Strategy (DOOS)

The deep ocean is the final frontier in ocean observing, holding the potential for scientific discoveries that will improve our understanding of the global climate system and provide solutions for mitigating climate change. DOOS is building a community of deep-sea observers and innovators to advance ocean and climate science and to address these important societal needs. <https://deepoceanobserving.org>

Achieving climate resilience in marine ecosystems

The Coral Reef Sentinels: A Mars Shot for Blue Planetary Health

The Coral Sentinels Programme is a transformative effort to deploy autonomous, low-cost robots to monitor the health of coral reefs around the world in near real-time. The actionable data delivered will enable rapid conservation interventions to protect these reefs from harm while ensuring local ecological, economic, and cultural health.

Fisheries Strategies for Changing Oceans and Resilient Ecosystems by 2030 (FishSCORE)

FishSCORE will aggregate climate resilience insights from fisheries

around the world and work closely with practitioners to identify tangible steps to secure a healthy future for our fisheries in the face of climate change. <https://www.gmri.org/projects/fisheries-strategies-changing-oceans-and-resilient-ecosystems-2030-fishscore2030/>

Sustainability, Predictability and Resilience of Marine Ecosystems (SUPREME)

The SUPREME programme seeks to globally implement an infrastructure to support robust climate- and ocean-related forecasts, predictions, and projections to guide marine ecosystem management and adaptation strategies that reduce risks and increase resilience of marine/coastal resources and the people who depend on them.

Regional programmes to enhance ecosystem resilience

Bertarelli Foundation Marine Science Programme

This programme will advance our understanding on the value of large marine protected areas, with a focus on the Indian Ocean, by using science to inform management and conservation in the region to preserve biodiversity and promote a healthy ocean. The programme features highly collaborative and interdisciplinary projects exploring innovative solutions and technology with an emphasis on enhanced communication, capacity building and increasing regional opportunities and access to marine science. <https://www.fondation-bertarelli.org/marine/marine-science/>

Reef Recovery 2030

Led by the Great Barrier Reef Foundation, in partnership with the world's leading coral reef scientists, Australian Government, reef managers, businesses, First Nations people and local communities, Reef Recovery 2030 will boost the resilience of these unique reef ecosystems and the people that rely on them. This is a decade long, one-billion-dollar collective effort to turn the tide on coral reef decline globally. <https://www.barrierreef.org/what-we-do/reef-recovery-2030>

Contributions supporting Early Career Ocean Professionals (ECOP) and SIDS

Norway-Pacific Ocean-Climate Scholarship Program (N-POC)

N-POC will support 24 fully funded PhD scholarships at the University of the South Pacific (USP) within ocean and climate research, ranging from the natural sciences to the social sciences, humanities, and law. A partnership between the USP and Norway's University of Bergen, N-POC will build new multidisciplinary Pacific research on the ocean-climate nexus and build an interdisciplinary Pacific cohort of researchers for regional and global policy impact. <https://www.uib.no/en/n-poc>

Many of the other endorsed programmes, projects, contributions and events of the Ocean Decade will contribute to the transformative and inclusive science we need for climate action. For more information, please visit www.oceandecade.org.



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The Road Ahead for the Ocean Decade

Second Call for Decade Actions No. 02/2021

The second Call for Decade Actions No. 02/2021 is open from 15 October 2021 until 31 January 2022. The ocean-climate nexus is a priority theme of the Call, along with themes related to multiple stressors on ecosystems and marine pollution. Submissions are encouraged for global or major regional programmes that will enhance understanding of the Ocean-Climate Nexus and generate knowledge and solutions to mitigate, adapt and build resilience to the effects of climate change across all geographies and at all scales. This can include

programmes that improve services and solutions, including predictions, for the ocean, climate and weather, or programmes that focus on nature-based solutions to climate change. The Call is also soliciting a diverse range of projects that will contribute to the Ocean Decade Challenges related to climate solutions and resilience. Decisions on endorsement of Decade Actions received through this Call will be made in 2022 and provide an opportunity to mobilise technology and innovation, capacity building, and financing to unlock solutions that the ocean can provide in mitigating and adapting to climate change.

HOW CAN YOU GET INVOLVED?

LEAD OR PARTICIPATE IN A DECADE ACTION

Decade Actions will be implemented by a wide range of proponents throughout the Decade. Regular Calls for Actions will be released twice per year. Visit www.oceandecade.org to learn more about the Call for Decade Actions No. 02/2021.

JOIN THE GLOBAL STAKEHOLDER FORUM

The Global Stakeholder Forum will serve as the primary engagement mechanism for the Ocean Decade, announcing opportunities for funding and partnerships, workshops and trainings, meetings, conferences, and input on calls for future Decade Actions. Sign up today to join the Global Stakeholder Forum at forum.oceandecade.org

BECOME A MEMBER OF THE OCEAN DECADE ALLIANCE

The Ocean Decade Alliance is a key mechanism for resource mobilisation during the Decade and will act as a matchmaker between resource providers and proponents of Decade Actions – in line with the priorities of the Decade. Visit <https://www.oceandecade.org/ocean-decade-alliance> to learn more

ESTABLISH OR JOIN A REGIONAL OR NATIONAL DECADE COMMITTEE

Coordination at the national and regional level will foster inclusion, engage national stakeholders and facilitate regional and national contributions to the Decade, as well as to promote awareness and interest. These voluntary and multi-stakeholder platforms will be key in linking national action to the international Ocean Decade framework. Learn more about national and regional groups on www.oceandecade.org

HOW TO ENGAGE?

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