International Partnership on MPAs, Biodiversity and Climate Change

FAQs

How does the ocean regulate the global climate?

The ocean controls the circulation of heat and moisture throughout the global climate system. Ocean water evaporates into the surrounding air and can be transported far distances to support life all over the planet, making the ocean the largest source of rainfall in the world. Societies and agricultural practices depend on this rainfall, even landlocked areas thousands of miles from the coast depend on the ocean for rainfall.

The ocean is also responsible for heat capture and carbon uptake from the atmosphere, acting as a buffer for climate change effects. Increased ocean temperatures have led to increased frequency and intensity of extreme events, such as temperature, precipitation, drought, or flooding. Extreme events affect all people on this planet whether they are coastal or inland.

How are all nation's reliant on a healthy ocean?

The ocean produces rainfall that is needed all over the world for agriculture and as a source of drinking water. The hydrologic cycle starts with the ocean, storms come from high pressure systems offshore, which carry large amounts of precipitation to inland and mountainous regions, producing snow and rainfall which fill rivers and support downstream populations. In addition, the heat and carbon dioxide that the ocean absorbs has shielded terrestrial areas from taking on that burden, historically reducing heatwaves and droughts that we are now experiencing due to increased intensity and frequency of extreme events.

What are the vision and goals of this Partnership?

Our vision is for global decision makers to implement Marine Protected Area networks as nature-based solutions for biodiversity conservation and climate change mitigation, adaptation, and resilience. The Partnership's goals are:

- Decision makers understand the link between the ocean, MPAs, and climate change and have the support needed to implement MPAs as a nature-based solution.
- Decision-makers link MPAs, biodiversity and climate change as a contribution to national and international commitments.
- Countries globally have the evidence and tools they need to implement effective MPA networks that mitigate climate change, conserve biodiversity, and increase resilience.

How is climate change harming natural and agricultural resources?

Warmer temperatures, rising sea levels, and other climate-related changes are stressing countless species of plants and animals. The ability of ecosystems to provide culturally and economically important services, such as timber, water supply, recreation and fisheries, are likely to decline as a result of human-caused climate change due to increased disturbance from water stress, invasive species, heat stress, ocean acidification, and drought. Food and forage production will decline in

agricultural regions experiencing increased frequency and duration of drought. Shifts in precipitation are likely to increase incidence of pests and disease for crops and livestock.

How will climate change harm human health and well-being?

The major public health organizations of the world have said that climate change is a critical public health problem. More frequent heavy rain events will likely increase exposure to water-borne illnesses, including those linked to sewage contamination of drinking water. Recreational waters are likely to experience more outbreaks of aquatic pathogens, including Vibrio bacteria and harmful algal blooms.

Human-caused climate change also threatens food safety in multiple ways including causing greater accumulation of mercury and other toxins in seafood.

What are marine protected areas (MPAs)?

A marine protected area is a defined geographical area of coastal or open ocean habitat that is legally safeguarded and managed as a means to conserve and preserve ecological resources, ecosystem services, and culturally significant areas.

The IUCN defines a protected area as "...a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values." (IUCN Definition 2008)

Why should nations establish MPAs?

Marine protected areas are a relatively low-cost and highly effective way to increase marine ecosystem resilience and mitigate climate change by limiting stressors that we can control that are not related to climate change, including habitat degradation, overfishing, and other consumptive or destructive human caused disturbances. Establishing MPAs and MPA networks can increase eco-tourism, have positive impacts on surrounding fisheries, and provide areas of refuge for biodiversity and biomass to flourish.

What is a nature-based solution to climate change?

Nature-based Solutions are actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits. The goal of Nature Based Solutions is to support the achievement of society's development goals and safeguard human well-being in ways that reflect cultural and societal values and enhance the resilience of ecosystems, their capacity for renewal and the provision of services. Nature-based Solutions are designed to address major societal challenges, such as food security, climate change, water security, human health, disaster risk, social and economic development.

How are MPAs an effective nature-based solution for climate change adaptation?

MPA's are an effective nature-based solution to climate change impacts through the protection they provide from non-climate related anthropogenic stressors. MPAs reduce the potential for ecosystems to be negatively impacted by human caused disturbances such as overfishing and degradation. While we cannot control climatic stressors, we can limit the amount of negative human impacts that occur, giving ecosystems and species a chance to adapt to climate and other stressors.

"Ecosystem-based Approaches to Climate Change Adaptation, or Ecosystem-based Adaptation (EbA) involves a wide range of ecosystem management activities to increase the resilience and reduce the vulnerability of people and the environment to climate change." (IUCN)

"Ecosystem-based adaptation is the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change." CBD (2009)

How are MPAs an effective nature-based solution for climate mitigation?

MPAs conserve ecosystems that sequester carbon (such as seagrass beds, mangroves, kelp forests, salt marshes), carbon reservoirs (lagoons, deep sea sediment), and important species (whales, plankton). MPAs also provide nurseries and habitats for marine species in order to increase biodiversity within an MPA. Protecting blue carbon habitats within MPAs allows ecosystems to keep carbon stored for long periods of time and to continue to sequester atmospheric carbon, making sure those carbon sinks remain intact. Restoration of blue carbon habitats within MPAs allows for increased carbon sequestration into these ecosystems, further mitigating carbon emissions that contribute to climate change.

How are MPA networks effective at conserving biodiversity?

Effectively managed MPAs across a bioregion create a network of habitats for marine organisms to utilize across space and life stages, while also benefiting the surrounding unprotected areas for human use through spillover effects. Establishing MPA networks increases connectivity between the protected areas, establishing more areas of refuge and resources for biomass and biodiversity to proliferate.

"Protecting and connecting features and habitats that support the ability of species to be resilient to, or adapt to, climate change (e.g. sea ice areas with forecasted persistence) by providing biodiversity reservoirs that can help species repopulate after extreme events and areas that are protected from other stressors that deplete resilience." (PAME, 2015)
https://www.iucn.org/sites/dev/files/import/downloads/mpanetworksmakingithappen_en.pdf

What is "Blue Carbon"?

Blue carbon is carbon captured and stored in our coastal and marine ecosystems. Coastal habitats such as mangroves, salt marshes, sea grasses are blue carbon habitats. They capture carbon in their

roots, stems, leaves, fronds, and sediment. In the case of kelp, carbon is captured in the kelp forest habitat but stored in offshore sediments as pieces of kelp sink to the deep sea after breaking off and floating offshore. In the open ocean, carbon is captured by bacteria, algae and phytoplankton, and stored by animals in the food chain.

What is blue carbon storage?

Reserves of blue carbon within the marine ecosystems that stay stored for many years like carbon stored in sediment. Threats and disturbances to these resources can cause that carbon to be released into the atmosphere.

What is blue carbon sequestration?

Blue carbon sequestration refers to the active uptake of carbon dioxide from the atmosphere or surrounding ocean water by marine and coastal habitats and organisms, where it can be stored for long periods of time.

Why is it important to effectively manage MPAs for blue carbon?

When coastal and marine ecosystems containing reservoirs of carbon are degraded, that carbon is released into the surrounding ocean water or atmosphere as greenhouse gas emissions. Effectively managed MPAs result in longer periods of carbon storage and undisturbed carbon reservoirs because of the protections it provides from human degradation. The amount of carbon that these ecosystems can sequester per unit area is often more than that of terrestrial forests (Baxter et al., 2016). The preservation and restoration of these habitats through effectively managed MPA's is becoming increasingly recognized as a means of climate change mitigation.

How do MPAs benefit people and their livelihoods?

MPAs can increase marine biodiversity and overall biomass within their protected boundaries by managing the take of species and preventing overfishing. This can lead to species spilling over into surrounding waters which benefit fisheries, increases cultural resources, increases tourism attraction which helps the local economy, and preserves indigenous values and resources.

How do MPAs increase marine ecosystem resilience?

MPAs and MPA networks create buffer zones where the fauna and flora are able to grow and reproduce in an undisturbed or minimally disturbed area with reduced anthropogenic stressors. This results in increased biodiversity, biomass, and healthy habitats, which can help prevent the collapse of entire ecosystems or species and allows for easier recovery in the wake of ecological or climatic disturbances (extreme events). In addition to increased ability to rebound after disturbances, MPAs also increase marine ecosystem resilience by allowing species to adapt to climate change impacts such as increased ocean temperatures and acidification without having to deal with impacts from human activities such as overfishing and pollution.

What do we mean by resilient?

When we talk about resilience, we are referring to the ability for marine ecosystems and the species within them to be able to adapt to climate change impacts, such as sea level rise, warming ocean temperatures, more extreme climatic patterns (extreme events), and rebound from ecological and biological disturbances. The resilience of an ecosystem relates to the ability of a community to either remain or return to its original state after being impacted or changed by an external force. Some climate change impacts are now inevitable, and we want to make sure that these areas can survive, and even thrive, during and after these impacts.

“The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change.” (IPCC 2008)

What do we mean by adaptation?

Adaptation refers to increasing resilience and reducing vulnerability of marine organisms, ecosystems, and coastal communities to better persist under the inevitable effects of climate change including increased ocean temperatures, extreme climatic patterns, and sea level rise.

Why is biodiversity important?

Biodiversity is critical to a healthy planet and promotes ecosystem resilience. A diversity of species within an area can prevent the collapse of an ecosystem or food web in the wake of an ecological or climatic disturbance. Having a low diversity of species in an area poses a risk in the event that one species faces a sudden and dramatic population decline, resulting in an out of balance ecosystem. Biodiversity increases the resilience and ability of an ecosystem to recover or remain in a state of equilibrium between the habitat and all the species that exist within it.

How will climate change impact biodiversity?

Species that depend on particular habitats, for example polar species and coral reefs, are vulnerable to climate changes as are the communities that depend on them culturally and economically. Species, including many iconic species, may disappear from regions where they have been prevalent or become extinct, altering some regions so much that their mix of flora and fauna will become almost unrecognizable.

What is ocean acidification?

As carbon dioxide is emitted into the atmosphere from greenhouse gas emissions, the ocean absorbs much of that carbon dioxide. Through a series of chemical reactions, an increase in concentration of hydrogen ions creates more acidic conditions and results in a reduction of carbonate ions in seawater. This has adverse effects on many marine species, in particular calcifying organisms (shellfish, corals, pteropods, etc) that rely on carbonate ions to form and maintain their shells. (NOAA 2020)

What is deoxygenation?

As the water becomes warmer, its ability to hold oxygen and stratification, which further exacerbates deoxygenation by reducing mixing, increases. In addition, as waters keep warming, the demand for oxygen from marine species increases even while the supply steadily decreases. This negative feedback loop is creating unfavorable conditions in the ocean for a wide range of marine species and communities.

How will the Partnership advance actions to address biodiversity loss and climate change?

The Partners will provide evidence at international forums and to country decision-makers and negotiators on the role MPAs can play in mitigating and adapting to climate change and conserving biodiversity to inform key decisions throughout the Decade of the Ocean with the goal for countries to include nature-based solutions into nationally determined contributions to mitigating climate change.

The Partners will share information and expertise on the role MPAs can play in mitigation and adaptation to climate change; identify and address common knowledge gaps; and work to increase the application of best practices in the designation and management of MPAs globally.

Who can become a member and how do I join the Partnership?

Organisations actively working in the field of climate change, biodiversity or MPAs are welcome to join the Partnership. Joining the Partnership is simple and the benefits are ample. To become a Partner, you can indicate your interest by contacting us on our website here, or by emailing offshorempas@jncc.gov.uk. We can then arrange a focused discussion to find out more about your priorities and agree on next steps.

What is expected of me if I join?

Your participation can be targeted in a number of ways, to make best use of the resource that you have available, but as a minimum you would be expected to actively participate in the twice-yearly All Partners Group (see Governance).

You would be welcome to participate in our technical groups working on growing the evidence base and developing tools, case studies and approaches to climate change in the context of MPA implementation and management, drawing in scientific and policy expertise as you require from your respective country/organisations.

See here for more detailed information about what the partnership entails.

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