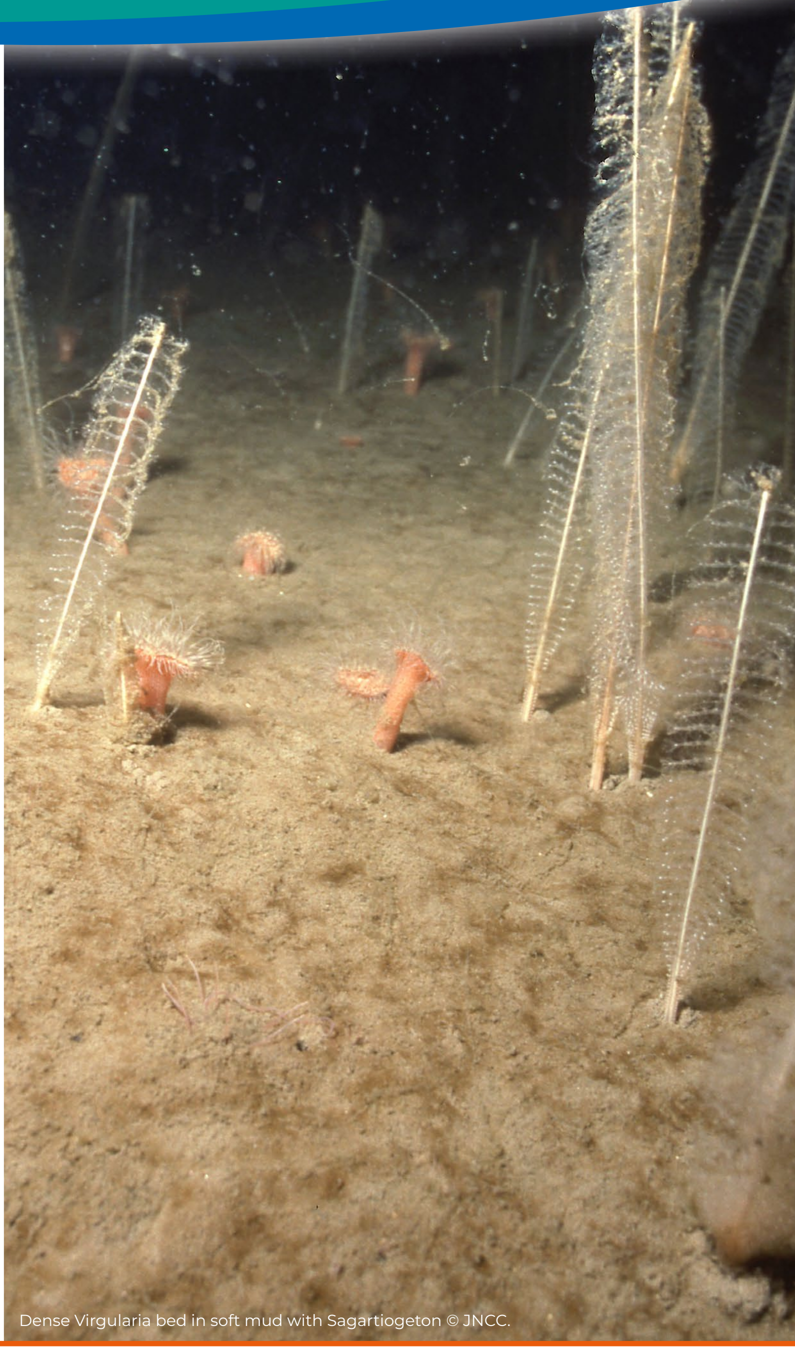
International Partnership on MPAs, Biodiversity and Climate Change

Climate-smart MPAs

CASE STUDY

A case study from UK waters



Dense Virgularia bed in soft mud with Sagartiogeton © JNCC.

The International Partnership on MPAs, Biodiversity and Climate Change is an alliance of government agencies and organisations from across the world, working together to progress the evidence base around the role of Marine Protected Areas (MPAs) and biodiversity in tackling climate change.

Our vision is for global decision-makers to implement MPA networks as nature-based solutions for biodiversity conservation and climate change mitigation, adaptation, and resilience.

For further information about the Partnership please visit **www.mpabioclimate.org**

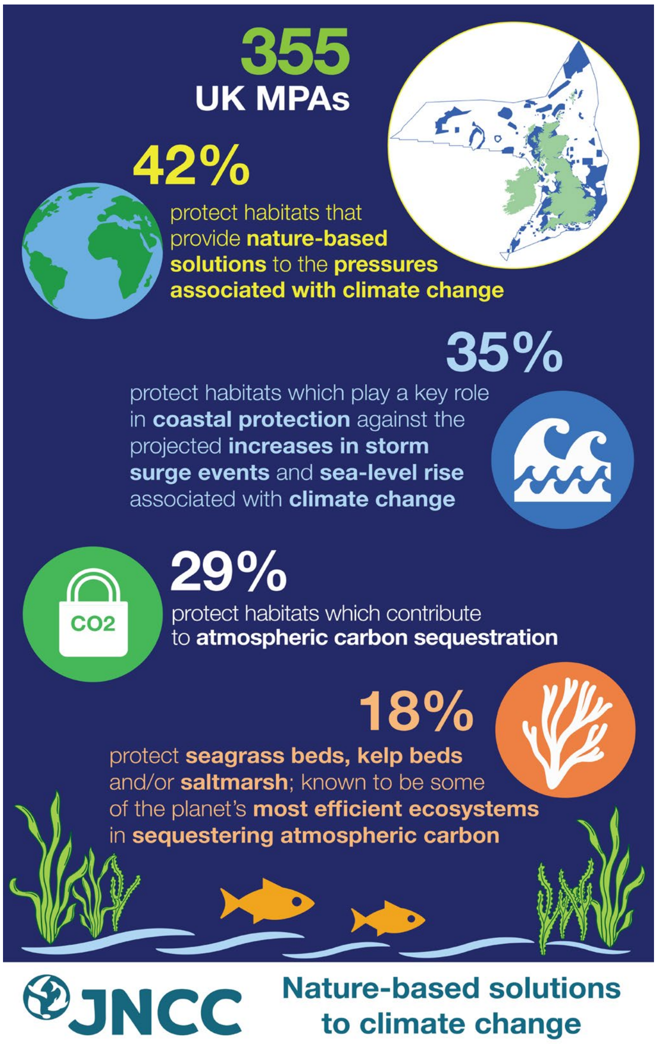
CASE STUDY

Climate-smart MPAs: a case study from UK waters

In the UK evidence projects have been undertaken to improve our understanding of the role of MPAs as Nature-based Solutions in the face of a changing climate. This has involved: (i) Understanding the role of marine biodiversity in supporting climate change adaptation and mitigation; (ii) Quantifying the protection of blue carbon habitats within the UK's existing MPA network; (iii) Understanding how MPA protected features may be impacted by climate change; and (iv) Establishing the relative importance of areas of the English seabed for blue carbon.

Outcomes

The Joint Nature Conservation Committee (JNCC) Climate Smart MPAs project focused on improving understanding of the role of marine biodiversity in climate change mitigation and adaptation. The project undertook a literature assessment to investigate the provision of two climate related ecosystem services (carbon sequestration and coastal protection), by MPA protected features and developed statistics on the provision of these services by the MPA network within English inshore and offshore and Northern Irish offshore waters.



The study found that of the MPA features investigated, nine habitat types played a role in carbon sequestration. These habitat types included coastal vegetated habitats, such as saltmarsh and seagrass beds, and sedimentary habitats, such as subtidal mud and deep-sea mud. 43% of MPAs protect habitats that play a key role in coastal protection and 29% protect habitats that trap and store carbon long-term.

A next step in developing the evidence-base was to understand the extent to which blue carbon habitats are already protected within the existing UK MPA network. JNCC developed methodologies to examine existing data for protected features of MPAs across the UK and presented statistics on the area extent of blue carbon habitats protected and not protected within MPAs. The study found that four blue carbon habitats have most of their known extents protected within MPAs (coastal saltmarsh and saline reedbeds, seagrass, kelp beds and littoral mud), but the majority of the known extent of three other important habitats (sublittoral mud, deep-sea mud, and maerl beds) are not protected within existing MPAs.

An essential element in the planning of Climate Smart MPAs is to understand the extent to which MPA protected features may be impacted by the effects of climate change. The JNCC project considered how MPA features may respond to four pressures associated with climate change: ocean acidification, ocean warming, marine heatwaves and sea-level rise.

Evidence developed through this project was used to create climate profiles for two case study MPAs: The Canyons and Studland Bay Marine Conservation Zones. The climate profiles tested an approach for presenting the developing evidence base on climate pressures, feature sensitivity and climate change mitigation and adaptation services at a MPA site level. This work highlighted the complexity of assimilating and presenting climate pressure and sensitivity information at a site level in a way that is accessible to a wide range of stakeholders.

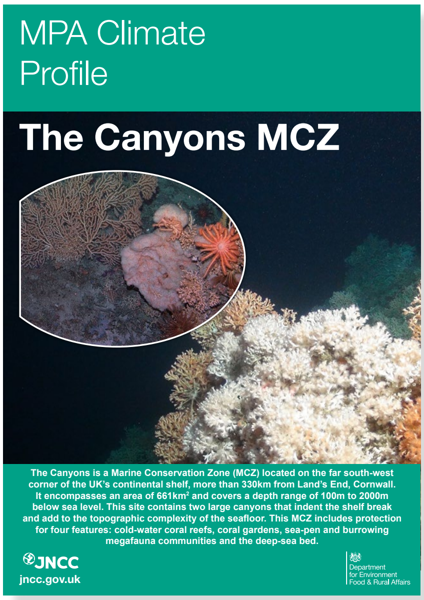
Although UK MPAs have been designated primarily for the protection of biodiversity and not climate change mitigation and adaptation, understanding the extent to which blue carbon habitats are already protected within the existing UK MPA network has helped understand existing protection and potential gaps.

For further information on this case study, please visit:
www.jncc.gov.uk/our-work/climate-smart-mpas

CASE STUDY

Climate-smart MPAs: a case study from UK waters

Due to their extensive area, seabed sediments represent a large and globally important carbon store and long-term sink. However, the amount of carbon stored in seabed sediments, and therefore the contribution to climate change mitigation, varies depending on habitat type and many other factors. On-going work by the Centre for Environment, Fisheries and Aquaculture Science (Cefas) is assessing the relative important of the seabed in English waters for carbon storage and burial, using a range of mapping and computational modelling techniques. The initial outputs of this study have been used to inform the process of identifying areas for stricter protection in English waters as part of the Highly Protected Marine Areas Project, which is including carbon storage as one of the selection criteria.



MPA Climate Profile

The Canyons MCZ

The Canyons is a Marine Conservation Zone (MCZ) located on the far south-west corner of the UK's continental shelf, more than 330km from Land's End, Cornwall. It encompasses an area of 661km² and covers a depth range of 100m to 2000m below sea level. This site contains two large canyons that indent the shelf break and add to the topographic complexity of the seafloor. This MCZ includes protection for four features: cold-water coral reefs, coral gardens, sea-pen and burrowing megafauna communities and the deep-sea bed.

JNCC
jncc.gov.uk

Department for Environment Food & Rural Affairs

Future Desired Outcomes

To continue to develop the evidence base on MPAs as Nature-based solutions for climate change and biodiversity loss, both in the UK and collectively across the International Partnership on MPAs, Biodiversity and Climate Change. This in turn would support a new approach in climate smart decision making for current and future choices on MPA designation and management.

How do these outcomes address climate change adaptation strategies, climate change mitigation, and conserving biodiversity?

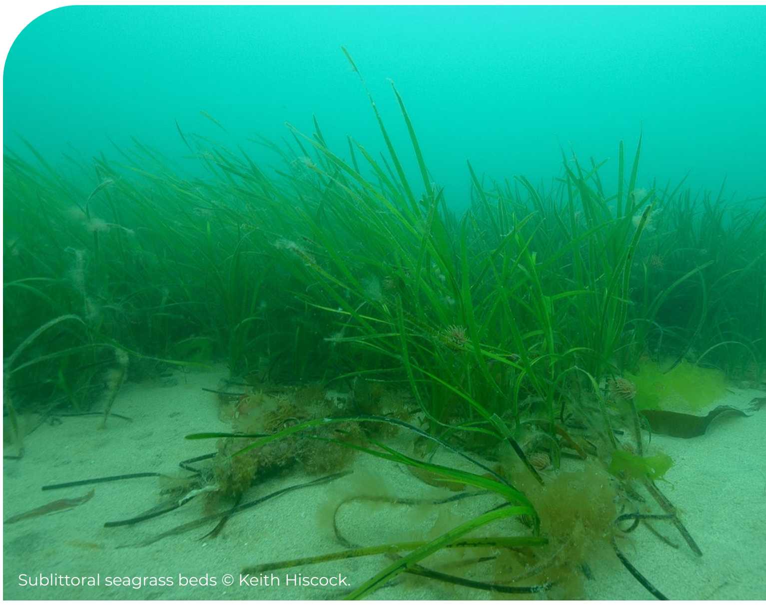
Understanding the role of marine biodiversity in supporting climate change adaptation and mitigation will in turn help support management decisions. For example, habitats with a role in coastal protection could be managed in a way that ensures they retain those qualities and the condition which allows it to deliver this ecosystem service at optimal levels. Knowledge of where blue carbon habitats are protected within the existing MPA network could help inform place-based management decisions to ensure carbon stays locked up within these habitats and damage and degradation of these habitats no longer contribute to carbon emissions. Understanding how MPA protected features may be impacted by climate change, such as sea-level rise or ocean warming, could help identify where elevated levels of management are needed to ensure there is resilience to these stressors within ecosystems. Finally, establishing the relative importance of areas of the English seabed for blue carbon will help better understand where these carbon stores are location and inform management of MPAs and appropriate implementation of wider management approaches across the wider marine system.

How is this case study and lessons learned transferable to other MPAs globally?

Although the evidence developed through these projects is mainly focused on UK MPAs, information on ecosystem services related to climate change mitigation and adaptation is transferable to other countries, as is information on habitat sensitivity and sediment carbon stores, where similar habitats occur. Methodologies developed for the assessments are also transferable to other countries. For example, the US Office of National Marine Sanctuaries Blue Carbon in MPAs series built upon the UK's seabed assessments.

Next Steps

Future work priorities include developing the evidence base on the impacts of human activities on blue carbon stores and improving our understanding of the role of deep-sea marine ecosystems in supporting climate change mitigation. Marine monitoring survey programmes are evolving to include the collection of direct evidence on blue carbon stocks and fluxes on the UK seabed, which will be used to improve the accuracy of computer modelling. Moreover, early detection systems around the impact of climate change on marine biodiversity are being trialed.



Sublittoral seagrass beds © Keith Hiscock.