



## PRIORITISING MARINE CLIMATE CHANGE ISSUES IN THE UK OVERSEAS TERRITORIES

In this article, the UK Marine Climate Change Impacts Partnership outlines some of its work in the UK Overseas Territories which are the location of some of the most vulnerable marine climates in the world.

### Overview

The 14 UK Overseas Territories (UKOTs) collectively represent the 5<sup>th</sup> largest marine estate in the world, and almost 90% of the sea area for which the UK is responsible. The UKOTs contain 94% of the UK's unique biodiversity, much of it in their seas. Given the extent and richness of their marine and coastal environments, it is little wonder the territories are key for delivering the UK government's targets and ambitions for the ocean. This includes the Global Ocean Alliance 30by30 initiative, which is being led by the UK. Its aim is to protect at least 30% of the global ocean as Marine Protected Areas (MPAs) and Other Effective area-based Conservation Measures (OECMs) by 2030.

These unique territories, and their associated communities, are under threat from climate change. The UK Marine Climate Change Impacts Partnership (MCCIP), working closely with the UK Overseas Territories Association (UKOTA), the UK's Department for Environment, Food and Rural Affairs (DEFRA) and the Foreign, Commonwealth and Development Office (FCDO), and Great British Oceans, has carried out the first ever comprehensive assessment of climate change impacts across all UK Overseas Territories. Adopting MCCIP core principles of community engagement and scientific integrity, the key climate change issues facing the UKOTs have been identified, independently reviewed, and summarised for a policy audience.

Around 100 scientific experts and UKOT representatives across six geographic regions (Polar, Pacific, South Atlantic, Mediterranean, Caribbean and Mid Atlantic, and Indian Ocean) were brought together to identify key climate change issues for the 14 UKOTs.

### UKOT REGIONS: PRIORITY CLIMATE CHANGE ISSUES

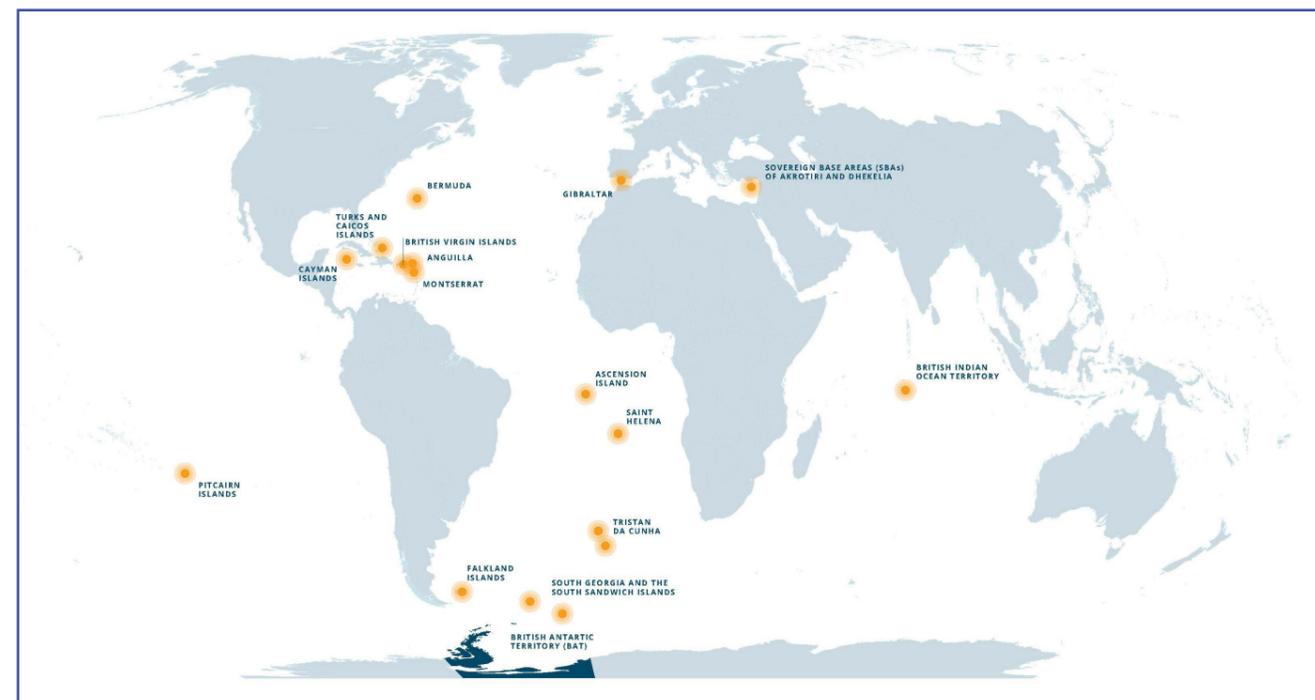
#### PACIFIC (PITCAIRN ISLANDS)

For the Pitcairn Island group, coral reefs and the intricate food webs they support, including commercial fish species, are increasingly at risk from the combined effects of warming and ocean acidification. Offshore, decreasing dissolved oxygen could make Pitcairn's waters less suitable for some tuna species.

Pitcairn Island relies heavily on imports for food, fuel, clothing, medicines and most other goods and materials, which could become more disrupted by extreme weather. Island shorelines may be affected by accelerating sea level rise.

#### INDIAN OCEAN (BRITISH INDIAN OCEAN TERRITORY (BIOT))

Severe warming is already having a significant effect on shallow reef habitats, and the communities they support, including fish. The effects of warming on BIOT's corals, with an increase in heat stress and bleaching events, are being exacerbated by ocean acidification. Coral reefs also supply sediment to BIOT's sandy beaches and provide coastal protection to the islands. Coastal change could threaten internationally important nesting sites for seabirds and turtles.



Above: A map showing the 14 UK Overseas Territories across the world.

#### SOUTH ATLANTIC (ASCENSION ISLAND, FALKLAND ISLANDS, ST HELENA AND TRISTAN DA CUNHA)

Marine food webs are at risk from changes in the growth and productivity of marine plants, including plankton, which form the basis of the food web, and help which provides critical habitat for many species.

Many iconic species could be affected by climate change including the Green Turtles on Ascension or Rock lobster in Tristan da Cunha, the latter having important economic value as a major fishery. Climate change is impacting on other commercially exploited species such as tuna and squid, with implications for food security and GDP in the Falkland Islands and Tristan da Cunha.

Sea-level rise and changes in storms and waves could increase coastal flooding and erosion, threaten the 'islander' way of life, and disrupt the flow of essential imports to these remote islands.

#### CARIBBEAN AND MID ATLANTIC (ANGUILLA, BERMUDA, THE BRITISH VIRGIN ISLANDS, THE CAYMAN ISLANDS, MONTSERRAT, AND THE TURKS AND CAICOS)

Sea-level rise and changes in extreme weather events (heatwaves, heavy rainfall, tropical cyclones and storm surges) constitute the biggest climate change risks to these UKOTs. Hurricanes Irma and Maria in 2017 (two of the most intense storms to hit the Caribbean), caused widespread devastation in Anguilla, the British Virgin Islands and the Turks and Caicos Islands. Climate change impacts on food security, fish, fishing communities, infrastructure, and operations, are highlighted as a priority issue, with important consequences for the livelihoods of local communities. Sea temperature rise is a major threat to habitats, most notably when marine heatwaves hit coral reefs and their associated communities. These impacts affect ecosystem health and marine food webs, as well as the reefs' appeal for tourism and recreation.



**Dr Matt Frost** is the Chair of the UK Marine Climate Change Impacts Partnership (MCCIP) and its Overseas Work Group. He is Deputy Director at the Marine Biological Association and Head of Policy and Engagement and chairs and contributes to a wide range of national and international science-policy projects and Committees.



**Paul Buckley** is the UK Marine Climate Change Impacts Partnership (MCCIP) Programme Manager and a principal scientist at the Centre for Environment, Fisheries and Aquaculture Science (an Executive Agency of the UK's Department for Environment, Food and Rural Affairs), specialising in communicating climate change science to policy makers.



**POLAR (SOUTH GEORGIA AND SOUTH SANDWICH ISLANDS (SGSSI) AND THE BRITISH ANTARCTIC TERRITORY (BAT))**

Sea surface temperatures at South Georgia and across the British Antarctic Territory are amongst the fastest warming in the Southern Hemisphere. These changes are having a major effect on how food webs and ecosystems function, impacting on globally important fisheries. A further issue is the loss of sea-ice, which provides critical habitat for charismatic species such as Adélie penguins and Weddell seals.

In the Southern Ocean, both the sea and marine organisms play a critical role in removing excess CO2 from the atmosphere. Its capacity to absorb CO2 might be reduced as seas warm. Warming waters may reduce the availability of oxygen for marine species, some of which will also be increasingly stressed by ocean acidification. The West Antarctic Ice Sheet in the British Antarctic Territory is one of the world's most vulnerable ice sheets. Both its size and the rate of ice loss will have significant implications for global sea-level rise.

**MEDITERRANEAN (GIBRALTAR AND SOVEREIGN BASE AREAS (SBAS) OF AKROTIRI AND DHEKELIA)**

For the Mediterranean UKOTs, which are geographically well spread, large-scale ecosystem and food web impacts are a key issue, with critically endangered species and regionally important habitats under pressure, such as seagrass meadows. These ecosystem-scale effects are being exacerbated by the spread of alien invasive species.

At the local scale, human health, coastal communities and infrastructure could be at risk. This is related to both an increase in flood risk, and increased presence of jellyfish and some algal species that present a risk to human health and that may clog industrial intakes or accumulate on beaches.



Image credit: Crown copyright/MPC/South Georgia

**Common challenges**

Although some of the climate change issues described here are specific to territories or regions, some common themes emerged across all the UKOTs, particularly when it comes to having an adequate knowledge base and supporting scientific infrastructure to better understand and address climate change impacts. For example, whilst there is strong evidence for climate change impacts in the regional seas and oceans around the UKOTs, a lack of local data often makes it difficult to measure changes and identify trends in the territories.

For many, resources for long-term monitoring programmes are limited and future climate projections do not realistically represent local land and sea areas, leading to much uncertainty when formulating action plans to address the impacts from climate change.

Part of the ethos of MCCIP is that it is just as important to state what we do not know as it is to report on what we do know. This enables funding bodies from local to national government to UK wide research councils to direct funding to the most urgent priorities. A range of knowledge gaps were therefore identified across the UKOTs ranging from specific needs such as better fish catch data in the Pitcairn Islands to more general requirements such as the need for more research and data collection in the South Atlantic UKOTs in order to better measure the impacts of climate change in relation to other human activities such as fishing.

Not all the gaps relate to the biological or physical ocean components (e.g. Sea Surface Temperature, SST). For the Mediterranean, for example, there is also a real need to map stakeholder perspectives and gain a better understanding of

the economic value and other benefits of protecting the marine environment in order to support an adaptive management approach to limit socioeconomic losses.

Some of these gaps are already being addressed. It is hoped for example that innovations in technology (e.g. autonomous vehicles, remote monitoring stations, improvements in satellite remote sensing) will increase the ability of scientists to sample inaccessible regions such as the Polar region, leading to a better understanding of change in polar ecosystems and the services they provide. In other areas there is still much work to be done such as the OTs in the Caribbean and Mid-Atlantic region, which still suffer from a lack of data on which to develop sector-specific policies or assessments required to inform climate action to reduce vulnerability and exposure.



Image credit: Susie Green/British Antarctic Survey

**Identifying solutions: Working with nature to build resilience**

Across the UKOTs, efforts are already underway to work with nature to build resilience to climate change. 'Nature based solutions' are being seen by governments and scientists as a crucial element in meeting the challenges of climate change and the UKOTs are already utilising this approach widely across the different regions. The establishment of some of the world's largest MPAs in the UKOTs is key to increasing resilience to climate change, such as those established around South Georgia and the South Sandwich Islands and BIOT. At a local level, Pitcairn has developed a community action plan that includes limiting erosion, better management of fisheries resources, and controlling invasive species. Research in BIOT has shown the importance of restoring seabird populations to increase transport of nutrients from the open ocean to islands. Regional Caribbean frameworks that embed nature-based solutions, habitat restoration and water management in the South Atlantic, and seagrass restoration in the Mediterranean provide further examples.

**Forward look: what next for the UKOT marine climate network?**

With COP26 on the horizon, this work shines a light on the UKOTs and the challenges they face from climate change.

The MCCIP launched its latest report on 21 July 2021 with an opening address from UK Minister for Pacific and the Environment at the FCDO and DEFRA, Lord Goldsmith who said: "The impacts of climate change pose a serious threat to the vital marine ecosystems of the UK Overseas Territories and the coastal communities that depend directly on them. By undertaking research, such as the reports published today, we can close gaps in our understanding and gain

valuable insights that will help us to meet the global challenge of protecting and restoring the health of our ocean."

Focusing on six key regions (Polar, Pacific, South Atlantic, Mediterranean, Caribbean and North Atlantic, and Indian Ocean), more than 100 leading experts from all 14 UKOTs prioritised and highlighted their most important ecological and societal climate challenges in the latest report.

The launch event, eagerly attended across UKOT time zones, also included regional presentations from the six regions, a live debate, and an inspiring call to action from Professor John Cortez, Minister for the Environment, Sustainability, Climate Change, Heritage and Culture for the Government of Gibraltar and Chair of the Overseas Territories and Crown Dependencies Environment Ministers Council.

Supported by a strong social media campaign, the information and key messages are now being actively promoted in the UK and across the territories. A joint event with UKOTA is confirmed for UNFCCC COP26 to further promote these messages. This work has been vital in highlighting the key climate change issues for the UKOTs as well as looking forward to address the challenges.

Capacity building and science diplomacy have also been key aspects in delivering this work, which provides a benchmark for future climate action, supported by the strong civil service and UKOT networks established through this project.

Further info: The detailed peer-reviewed regional reports, summary cards and infographic are available at [www.mccip.org.uk/uk-overseas-territories](http://www.mccip.org.uk/uk-overseas-territories). The MCCIP Secretariat is based at the Centre for Environment, Fisheries and Aquaculture (CEFAS) and can be contacted at [office@mccip.org.uk](mailto:office@mccip.org.uk).