Marine Management Organisation

Climate Change Adaptation Report

(Fourth Round of the Climate Adaptation Reporting Power)

November 2024






...ambitious for our seas and coasts

Contents

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Marine Management Organisation
Lancaster House, Hampshire Court, Newcastle upon Tyne, NE4 7YH
www.gov.uk/marine-management-organisation
Contact: 0300 123 1032
Email: info@marinemanagement.org.uk

Executive Summary

Climate change is happening, and the effects are being seen and felt globally, including in marine environments. This report sets out how the Marine Management Organisation (MMO) and its services are likely to be impacted by climate change and details how MMO will address and reduce climate change risks over the next five years to 2030. This report contains:

- A summary of current and future impacts of climate change on the UK marine environment of relevance to MMO
- An assessment of the risks to MMO from climate change, under different climate scenarios
- Measures taken since publication of the previous MMO Adaptation Report (2022) to address the risks including policies and practices that are already being implemented
- Recommendations for short (<12 months), medium (12-24 months) and long-term (>24 months) actions to respond to climate change risks

In summary, this report concludes that:

- **Climate change is already impacting coastal and marine environments.** The speed and scale of this change is expected to increase in the coming decades. Marine ecosystems will change, offshore activity may become more hazardous and changes to species distribution will occur. Government responses to climate change, such as the focus on renewable energy will also impact MMO
- **Scientific evidence on the direct and indirect implications of climate change is continually emerging** and so our understanding continues to evolve. However, meaningful progress can still be made using a combination of robust current evidence, future climate projections, expert knowledge and judgement, and good risk management
- **The UK Climate Change Risk Assessment (CCRA) and MMO climate change risks** identified have the potential to impact on the quality and effectiveness of the MMO's services and operations, MMO's ability to support the UK Government policy objectives, and the value of MMO's contribution to the UK marine environment and broader environmental goals
- **MMO has already taken meaningful steps towards adapting to climate change.** Environmental integrity underlies the MMO's key functions of marine planning, licensing, conservation and fisheries management. Actions include climate considerations in marine plan policies; ensuring that relevant licensable projects consider the impact that they will have on climate and the vulnerability of the project to climate change; changes in fishing practices to reflect changes in the distribution of species; and considering climate change in the designation and functionality of Marine Protected Areas (MPAs) including Highly Protected Marine Areas (HPMAs)

At MMO we are dedicated to playing our part in achieving the UK Government's climate goals and net zero targets. MMO has unique expertise in the field of UK and global marine management and can make a major contribution to delivering UK Government policies. Continued close collaborative working with partners across the Defra Group and arms-length bodies (ALBs) will be essential to maximise this impact.

As England's manager and regulator for the marine environment, the MMO plays a key role in assurance, leadership and regulation of marine activities. In order to create the enabling conditions to allow other organisations and groups to deliver climate change adaptation responses, MMO has identified a need to influence and work closely with Defra to ensure the regulatory frameworks that

MMO are bound to do not prevent or hamper climate change adaptation efforts. An evolution of the regulatory frameworks and climate change adaptation guidance would allow MMO to be more effective as an enabler of marine adaptation action. This theme of providing an effective regulatory oversight of adaptation best practice and its implementation, and maximising MMO's influence is reflected in this report and the actions we will take going forwards.

MMO has an opportunity to become a leading and trusted national expert on climate change in the marine environment and can help the UK to achieve the 'triple win' for environment, economy and society in a complex and challenging situation.

To help realise this ambition, the MMO must:

- Ensure awareness and inclusion of climate change adaptation risks at a strategic level
- Provide assurance that the development of MMO activities within remit consider climate change adaptation evidence and risk
- Include climate change adaptation considerations as agenda items to relevant internal and external stakeholder interactions

Seagoing trip on Viking Sentinel. Taken by Aless Washbourn

Foreword – Who We Are

The Marine Management Organisation (MMO) was created by the Marine and Coastal Access Act 2009 to manage and regulate England's seas and coasts, and to ensure balance between economic development, societal needs, and the protection and enhancement of the marine environment.

The MMO's purpose is to protect and enhance our precious marine environment and support UK economic growth by enabling sustainable marine activities and development. We are driven by the government's aim for clean, healthy, safe, productive and biologically diverse oceans and seas. As England's marine manager, we protect and develop our seas, coasts and communities for the benefit of generations to come.

MMO is an executive non-departmental public body sponsored by the Department for Environment, Food & Rural Affairs (Defra) and governed by an independent board. We are a delivery body created to implement Defra and HMG policy objectives as set out in the Defra / MMO Framework document which outlines the obligations and expectations of both parties.

MMO works as part of Defra, with the rest of government (national and local), businesses, industry groups and local communities to implement the Defra 25 Year Environment Plan (and subsequent Environmental Improvement Plan 2023) which describe 10 environmental goals supported by six policies, two of which are of particular focus for MMO:

1. Securing clean, productive and biologically diverse seas and oceans.
2. Protecting and improving the global environment helping to create a more prosperous marine environment.

By delivering our six core services, MMO exists to protect and enhance the marine environment and support a sustainable, successful blue economy. As outlined in the MMO2030 Strategic Plan, the six core services of the MMO are:

- Enabling sustainable marine development
- Delivering sustainable fishing opportunities
- Protecting marine habitats and wildlife
- Administering marine support funds
- Providing regulatory support and assurance
- Supporting global marine protection

We will do everything within our remit to protect and enhance our seas, ensuring they are used wisely for the benefit of the environment, society and the economy. Through education and collaboration, we aim to do this by:

- Using our legal and licensing powers, as well as our enforcement powers when necessary
- Building on the strength of our expertise, experience and existing relationships
- Ensuring safe and sustainable marine development
- Supporting the prosperity and diversification of our marine environment
- Supporting the whole marine sector to reform and adapt including modernising fisheries management
- Sharing trusted expertise to support international improvements in ocean health and resilience
- Creating a resilient business that is fit for the future

As well as outlining MMO's core services, the MMO Strategic Plan also sets out the mission, vision, values and objectives for the organisation up to 2030. This is supported by the MMO Corporate plan 2022 – 2025 which describes MMO's delivery responsibilities for the three years from 2022 to 2025, as set out in the MMO Framework Agreement with Defra.

As set out in these plans, the MMO's main statutory deliverables are:

- **Marine Planning –** preparing marine plans, under the framework of the UK Government's Marine Policy Statement; monitoring, evaluating and reporting on marine plans; acting as a statutory consultee to decision-makers such as local planning authorities and the Planning Inspectorate (PINS)
- **Marine Licensing** – licensing of construction works, deposits, removals and other licensable activities below Mean High Water Springs, and monitoring and assuring compliance with licence conditions for licensable activities; providing pre-application advice to developers;

acting as a statutory consultee to PINS during the examination stage of Nationally Significant Infrastructure Project (NSIP) applications including offshore wind farms

- **Fisheries Management** – fisheries management and regulation of English waters from 0–200 nautical miles offshore, including quota rules and distribution, vessel licensing and associated compliance
- **Marine Conservation** – introducing and monitoring management measures in marine protected areas, including byelaws to meet the area's conservation objectives.

MMO delivers its responsibilities though a Chair, Chief Executive Officer (CEO) and Board. The Executive Leadership Team (ELT) is made up of the CEO and five Directors (each representing and leading a Directorate) and legal support. The Directorates in the MMO are:

- Finance and Resources
- Digital and Analysis
- Planning and Change Delivery
- Marine Development (Domestic and International)
- Operations

Minke whale swimming past Viking Sentinel. Taken by Annika Whitford

Report Context

The Climate Change Act 2008 is a legally binding, long-term framework for the UK to mitigate and adapt to the impact of climate change. In 2022 The Government published the latest UK Climate Change Risk Assessment (CCRA3) followed by the UK's third National Adaptation Programme (NAP3), published in 2023, which responds to the risks within the CCRA. Under the Climate Change Act, public bodies (including MMO) must report on the steps that they are taking to respond to climate change.

As the organisation was formed in 2010, MMO did not take part in the first round of climate change adaptation reporting which took place in 2011. MMO did take part in the second round of climate change adaptation reporting (2015), but it should be noted that MMO had only been operating for 5 years when the 2015 Climate Change Adaptation Report was published.

MMO took part in the third round of climate change adaptation reporting, the report for which was published in July 2023.
This is MMO's latest climate change adaptation report under the Climate Change Act 2008 and is submitted to the fourth round of statutory reporting. As advised in the round four reporting guidance provided by Defra's Adaptation Team, given the shorter time scale between the third and fourth reporting rounds, MMO's approach to this report has focussed on:

1) Reporting on adaptation progress since publication of the previous adaptation report
2) Updating risk areas and impacts using more recent and up-to-date evidence
3) Conducting a high-level review of climate change risks, and opportunities, to the organisation
4) Producing recommendations for future and ongoing adaptation actions
5) Reviewing and updating the MMO Climate Change Adaptation Action Plan

The MMO's approach to tackling climate change considers both mitigation and adaptation, however, the purpose of this report is to highlight the ways in which the MMO's work is at risk from a changing climate, and to set out action areas to help the organisation to adapt. Therefore, this report does not include in-depth details of mitigation activities (such as decarbonisation plans).

Adaptation Progress (Including Progress Since Previous Round)

MMO takes climate change and the impact this will have on the marine environment and our core functions seriously, which is why as an organisation we have:

- Taken steps to secure Executive level support for climate change adaptation
- Outlined the importance of climate change in the MMO's 10 Year Story, which sets out our ambition and pathway to 2030
- Highlighted climate change and environmental protection as one of our strategic principles in the MMO2030 Strategic Plan
- Aligned to ISO 14090:2019 principles, to ensure appropriate consideration is given to climate change adaptation in the design, implementation and review phases of policies, strategies, plans and activities
- Established the MMO's Climate & Sustainability Group which is the internal forum for communicating climate change activities across the organisation
- Internally promoted and adhered to the Defra Group Sustainability Strategy
- Contributed to the Greening Government Commitments (GGCs), whereby government departments and their agencies are required to develop strategies and actions plans in line with commitment F 'adapting to climate change'

MMO has made meaningful strides towards embedding climate change adaptation considerations into our operational, delivery and supporting services work. Figure 1 shows some case studies of recent MMO climate change adaptation activities undertaken by different parts of the organisation.

Case study 1: Diversifying Fisheries

Rising sea temperatures are resulting in shifts in species distribution, having positive and negative impacts on species of commercial and recreational value. In recent years, bluefin tuna have been increasingly recorded in UK waters, their recovery and return potentially aided by these higher water temperatures. This demonstrates an opportunity for UK fisheries to diversify and for fisheries management to explore a sustainable bluefin tuna fishery. As part of ongoing work into emerging fisheries, in 2024, MMO administered the second year of a trial commercial fishery, and the first year of a recreational fishery, providing opportunities for increased socio-economic benefits across the south west of England.

Case study 2: Improving and Sharing Evidence

Marine nature-based solutions (NBS) are actions that protect, enhance or restore biodiversity and deliver climate change mitigation and resilience to climate-related impacts, thus helping to tackle the biodiversity and climate emergencies. To develop better understanding of marine NBS and the barriers associated with NBS implementation, MMO delivered a Defra-funded project on 'Regulatory Decision Making to Enable Marine Nature-based Solutions', published in February 2024. This was achieved by undertaking an evidence review, mapping areas suitable for NBS implementation, and developing an NBS action plan for Defra Group.

Case study 3: Administering Fisheries Funding

MMO is responsible for administering Defra fisheries funding through the UK Seafood Fund (UKSF) and the Fisheries and Seafood Scheme (FaSS). A number of projects have been approved through these schemes because of their climate change and sustainability benefits, such as reducing engine emissions from vessels, reducing fuel usage and investigating hybrid engine options, supporting kelp restoration, and supporting ghost net recovery efforts. The MMO will continue to administer funds and grants on behalf of Defra to support the fishing industry to adapt to and mitigate climate change.

Case study 4: Embedding Climate Change Culture

MMO are continuing to strive for a culture of climate change awareness within all parts of the organisation. To help achieve this, MMO are encouraging staff enrolment onto the Defra Group Carbon and Climate Change Training course to help colleagues better understand the role they play in helping MMO and wider government to combat climate change. The first MMO cohort have completed the Defra Group Carbon & Climate Change training course and are now certified by the Carbon Literacy Trust as being 'Carbon Literate'.

Figure 1. Four case studies of climate change adaptation activities undertaken by different parts of the organisation since the previous MMO Adaptation Report.

For more detailed information on MMO progress made since the previous reporting round including specifical examples from across different parts of the organisation please see Appendix A.

Climate Change Impacts on the UK Marine Environment

Climate change is happening, and the effects are being seen and felt globally across terrestrial and marine environments. Some of the most notable changes occurring in the marine environment include sea level rise, higher sea temperatures, deoxygenation, acidification, and potential increased storm frequency and magnitude, all of which have the potential to impact MMO's ability to deliver our core services and activities. This section focuses on these key areas and summarises the current situation, future projections, and the expected impacts of each.

Sea Level Rise

What has happened and what can we expect in the future?

Since pre-industrial times, sea levels have risen and are continuing to rise at an accelerated rate. Since 1900, UK average sea levels have risen by 16cm[1] (taking in to account vertical land movements), and data from the tide gauge at Newlyn, one of the longest available records around the UK, shows sea level is rising, with 2023 being the highest year on record since 1916[2]. There is high certainty that the UK is 'locked-in' to experience further sea level rises over the coming decades[3]. It is estimated that by 2050, sea levels around the UK could be around 10–30 cm higher than the 1981–2000 average, and by 2100, UK sea levels could reach 55–80 cm above 1981–2000 levels, depending on the emissions scenario and location in the UK[4].

Taken from the UKCP18[5], Figure 2 shows the projected sea level rise in the UK under emissions scenarios RCP2.6, RCP4.5 and RCP8.5, and demonstrates the uneven effect of sea level rise across the UK's coastline. As shown in Figure 2, under all emissions scenarios, the greatest regional increases in sea level rise are predicted on the south coast, with smaller increases predicted in the north.

What are the impacts?

Continuing sea level rise around the UK is predicted to result in the inundation of low-lying coastal areas and an increase in flooding events, coastal erosion and damage from storm surges. As such, sea level rise increases the risk of flooding and damage to MMO occupied buildings and staff homes situated in coastal regions, reduces the ability of MMO coastal and enforcement officers to carry out their duties, and will also affect the operations of many MMO stakeholders and customers. These impacts will result in business disruption to MMO.

This demonstrates the importance of being able to prepare for and adapt to the impacts of sea-level rise in different regions, particularly in areas most vulnerable to sea level rise, in terms of planning, mapping, and engaging with communities.

[1] UK Climate Risk
[2] State of the UK Climate 2023 (wiley.com)
[3] UK Climate Risk
[4] Independent-Assessment-of-UK-Climate-Risk-Advice-to-Govt-for-CCRA3-CCC.pdf (theccc.org.uk)
[5] UKCP18-Marine-report.pdf (metoffice.gov.uk)

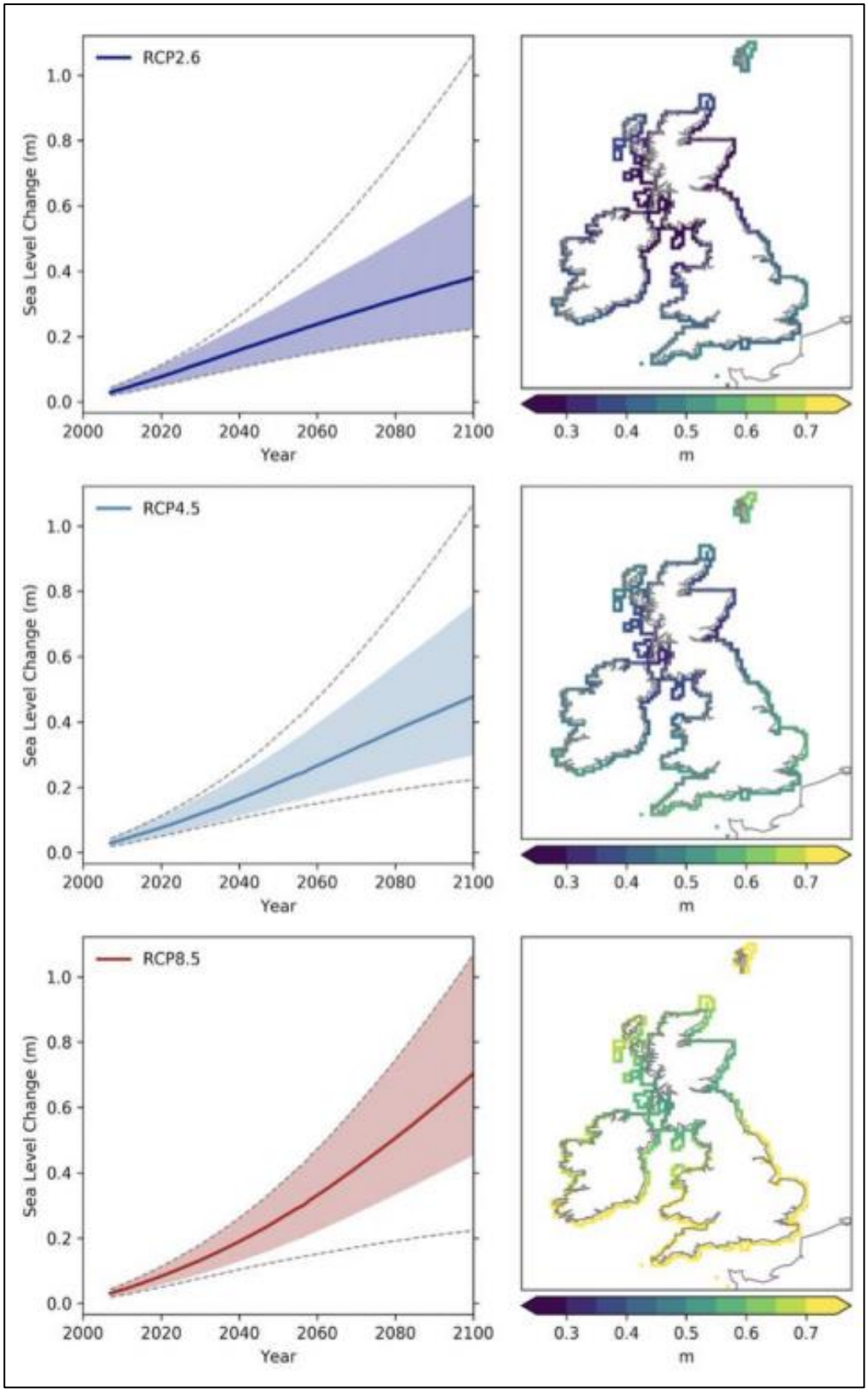

Figure 2. Model outputs showing UK average sea level projections under different emissions scenarios up to the year 2100 (*left)*; and spatial visualisation of the projected sea level change across the UK at 2100 for the three emissions scenarios (*right*) (Taken from MCCIP, originally from the UKCP18 Marine Report)

Rising Sea Temperatures and Deoxygenation

What has happened and what can we expect in the future?

Globally, temperatures have risen and are continuing to rise, both on land and at sea. Figure 3 shows the longer-term warming trend of UK coastal waters from 1870–2023. In recent decades, this warming has occurred at an accelerated rate, with UK sea surface temperatures (SST) generally show a warming trend of approximately 0.3°C per decade over the last 40 years[6]. As shown in Figure 3, 2023 was the UK's warmest year on record for SST in near-coastal waters, for the second consecutive year[7].

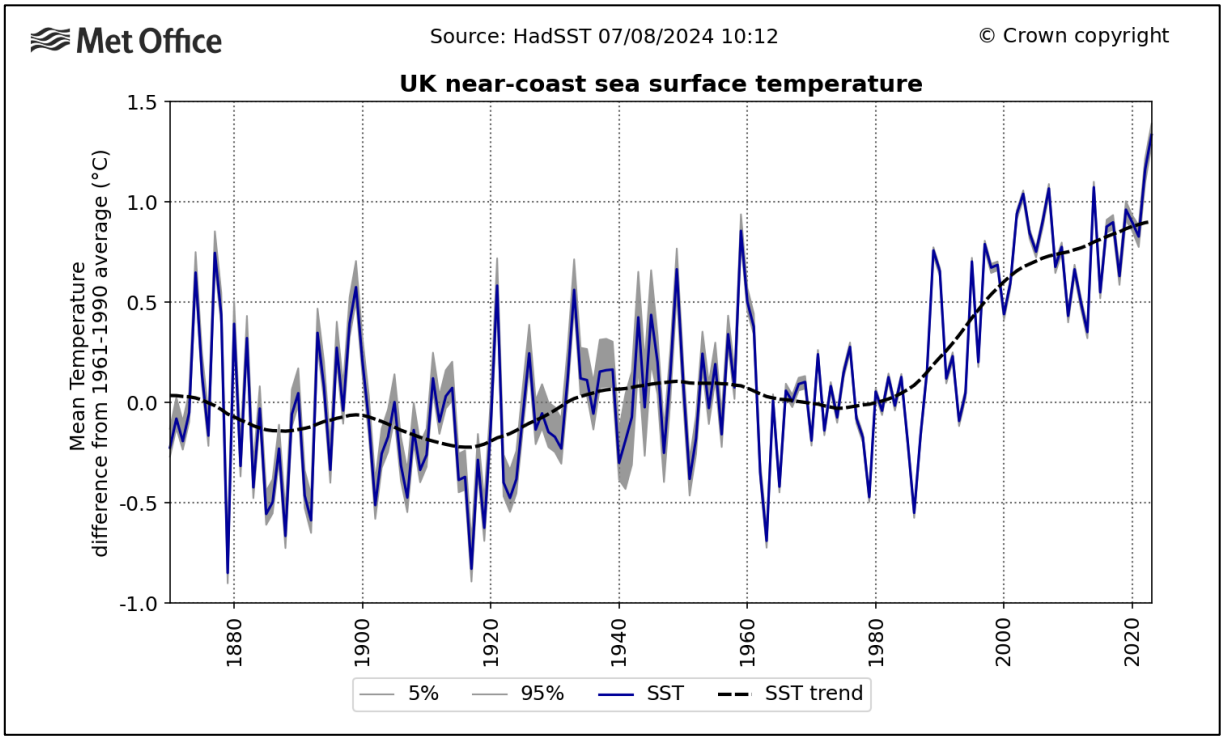

Figure 3: UK annual mean sea surface temperature (SST) in near-coastal waters from 1870-2023, (expressed as anomalies relative to the 1961-1990 long-term average) (Taken from the 'State of the UK Climate 2023' report (Kendon et al., 2024))

Marine heatwaves (periods of sustained, unusually warm SST) are also occurring more frequently[8]. Compared to 1982–1998, the annual number of marine heatwaves increased around the UK by an average of four events per year in the period 2000–2016, with more heatwave events recorded in northern waters than in southern waters[9]. 2023 was the hottest year on record globally[10], and in June 2023, the UK experienced its longest recorded category 2 (strong) marine heatwave, lasting 16 days, which was exacerbated by the warming trend observed in SST over the last 20 years[11]. Trends

[6] Temperature | Marine Climate Change Impacts Partnership (mccip.org.uk)
[7] State of the UK Climate 2023 (wiley.com)
[8] Marine Heatwaves | National Oceanography Centre (noc.ac.uk)
[9] The Impacts of Climate Change on Sea Temperature around the UK and Ireland_1.pdf (mccip.org.uk)
[10] 2023: The warmest year on record globally - Met Office
[11] Exceptional atmospheric conditions in June 2023 generated a northwest European marine heatwave which contributed to breaking land temperature records | Communications Earth & Environment (nature.com)

suggest that as a result of climate change, marine heatwave incidents globally are becoming more frequent, more intense and longer lasting[12], resulting in negative impacts on marine life and society.

What are the impacts?

Warmer seas dissolve less oxygen than colder ones, therefore higher sea temperatures can contribute to deoxygenation (the overall decline in the oxygen content of seawater), leading to areas of oxygen depletion and even hypoxia (oxygen 'dead zones'). Higher temperatures, especially when combined with reduced oxygen levels and other stressors, could result in a number of impacts on marine ecosystems including:

- Mass mortality of fish and other marine life
- Stress to marine life
- Harmful algal blooms
- Kelp and seagrass dieback
- Disease outbreaks
- Location shifts in species
- Increased threat of invasive non-native species (INNS)

These impacts can cause adverse effects for fisheries, habitat restoration efforts, coastal communities and tourism, and ultimately livelihoods, all of which will affect MMO's ability to carry out its duties.

Ocean Acidification

What has happened and what can we expect in the future?

Ocean acidification occurs when seawater absorbs carbon dioxide (CO_2) from the atmosphere, causing a reduction in the pH of the seawater (acidification). The ocean absorbs approximately a quarter of all anthropogenic CO_2 emissions annually[13], which has resulted in the global ocean becoming an estimated 26% more acidic since pre-industrial times[14]. Ocean acidification is occurring at various rates in surface waters, bottom waters and in coastal seas[15], demonstrating that a range of species and ecosystems have the potential to be affected by increasing ocean acidity. Around the UK, the rate of pH decline in coastal areas is projected to be faster in some areas (e.g. Bristol Channel) than others, such as the Celtic Sea[16].

As with sea level rise, we are 'locked in' to experience more ocean acidification in the coming decades and centuries. Future rates of ocean acidification and therefore the impact on species and ecosystems will depend on the emissions scenario and how successful we are in reducing global greenhouse gas emissions.

What are the impacts?

Marine life thought to be most directly at risk from ocean acidification are calcifying organisms which have calcium carbonate shells or exoskeletons, which include phytoplankton, crustaceans, echinoderms and molluscs, as more acidic conditions can impair their ability to form and maintain their shells, leading to knock-on impacts in the food web including on some commercial species.

[12] Climate change exacerbated June 2023 marine heatwave | Plymouth Marine Laboratory (pml.ac.uk)
[13] Ocean Acidification v2.pdf (mccip.org.uk)
[14] cbd-ts-75-en.pdf
[15] Ocean Acidification v2.pdf (mccip.org.uk)
[16] Ocean Acidification v2.pdf (mccip.org.uk)

There are still many unknowns in terms of predicted impacts on species, but it is thought that coastal species will be more likely to be able to adapt to increasing acidification than non-coastal species. Some species may even benefit from slightly more acidic conditions, potentially creating opportunities which should be explored to help the UK adapt to and benefit from these changes. For example, some studies suggest that seagrasses can tolerate more acidic conditions and can act as a buffer to ocean acidification by absorbing CO_2 from seawater, resulting in lower acidity (higher pH) in areas where seagrasses are present[17,18]. By locally mitigating ocean acidification, seagrass meadows can provide refuge for other species more sensitive to acidification, including crabs, seahorses, oysters and seaweeds, helping to boost overall ecosystem resilience. This, along with many other co-benefits, demonstrates the importance of habitat conservation and restoration efforts in helping to reduce the impacts of climate change.

Storms

What has happened and what can we expect in the future?

Changes to frequency in storms and winds are an important climatic factor, especially when coupled with rising sea levels. Since 1990, there has been an increase in the average annual number of storms[19], and there were 16 extreme storm-surge events recorded in 2023, of which 13 were associated with named storms[20]. However, there is currently insufficient evidence to show causation between climate change and increased wind velocity across the UK, and further evidence is needed to understand the interplay of climate change and such events. This research will be particularly important for coastal communities, marine developments and infrastructure.

What are the impacts?

Changes to storms, storm surges and winds could potentially impact the nation's net zero ambition, which relies on a considerable increase in offshore windfarms. As well as impacting the expansion and safe operation of offshore windfarms, increasing ferocity of storm events could potentially increase the need for marine licensing for activities such as coastal defence and emergency repairs. Storms can also impact offshore data collection, research and enforcement carried out by the MMO and partners. Increasing storminess has been raised as a concern by fishers, as more extreme weather events and storms can risk their personal safety, cause damage to fishing vessels, and contribute to fewer 'days at sea' due to poor weather conditions, resulting in a loss of income for fishers and increased risk of food insecurity. It can also risk the safety of offshore engineers and vessels carrying out offshore maintenance, and result in delays to their offshore maintenance checks and repairs. In addition, extreme weather could cause damage to MMO-occupied buildings (offices and staff homes), and port and harbour infrastructure, resulting in business disruption and additional marine licensing, marine planning and harbour order demands on MMO.

[17] Seagrass can mitigate negative ocean acidification effects on calcifying algae | Scientific Reports (nature.com)
[18] Seagrass can mitigate negative ocean acidification effects on calcifying algae | Scientific Reports (nature.com)
[19] Climate Change Impacts on Storms and Waves Relevant to the UK and Ireland .pdf (mccip.org.uk)
[20] State of the UK Climate 2023 (wiley.com)

Goynes at East Preston Beach, Rusington. Taken by Holly Protopapa

Climate Change Risks to MMO

MMO has reviewed the risks and opportunities outlined in the UK's latest Climate Change Risk Assessment (CCRA3) and identified the risks most relevant to MMO. These are summarised in Table 1.

Table 1. CCRA risks and opportunities relevant to MMO

Theme	CCRA Risk
Natural Environment and Assets	N5 - Risks and opportunities for natural carbon stores, carbon sequestration and GHG emissions from changing climatic conditions, including temperature change and water scarcity
Natural Environment and Assets	N14 - Risks to marine species, habitats and fisheries from changing climatic conditions, including ocean acidification and higher water temperatures
Natural Environment and Assets	N15 - Opportunities to marine species, habitats and fisheries from changing climatic conditions
Natural Environment and Assets	N16 - Risks to marine species and habitats from pests, pathogens and invasive species
Natural Environment and Assets	N17 - Risks and opportunities to coastal species and habitats due to coastal flooding, erosion and climate factors
Health, Communities and the Built Environment	H3 – Risks to people, communities and buildings from flooding
Health, Communities and the Built Environment	H4 - Risks to the viability of coastal communities from sea level rise
Health, Communities and the Built Environment	H9 – Risks to food safety and food security
Business and Industry	B1 - Risks to business sites from flooding
Business and Industry	B2 – Risks to businesses and infrastructure from coastal change from erosion, flooding and extreme weather events

Business and Industry	B5 – Risks to business from reduced employee productivity due to infrastructure disruption and higher temperatures in working environments
International Dimensions	ID1 – Risks to UK food availability, safety and quality from climate change overseas
International Dimensions	ID2 – Opportunities for UK food availability and exports from climate impacts overseas

Using information from the CCRA, current and predicted impacts on the marine environment, and in consultation with teams across the organisation, MMO has identified nine key climate change risks which, if not mitigated, could negatively impact the MMO's ability to fulfil its purpose and deliver its remit. These risks and the impact of these risks are outlined in Table 2.

Table 2. Identified climate change risks to MMO

Risk ID	Description	Impact of Risk
R1	There is a risk that inadequate consideration of the interlinkages between climate and nature, and low and high emissions scenarios in organisational planning decisions could negate the benefits of solutions that achieve net zero and nature positive goals, and that climate scenario plans will not be incorporated.	Planning is conducted that promotes climate change adaptation solutions that damage nature and undermine other policy goals, causing reputational damage and knock-on socio-economic impacts.
R2	There is a risk that if climate change adaptations in service delivery capacity are not clearly identified, prioritised, and managed by MMO or through government policy and legislation enablement, MMO could fail to meet wider policies and goals, manage emerging climate issues, and react to climate change impacts.	MMO does not deliver on government policy goals, statutory remit and service delivery leading to reputational damage and loss of public trust.
R3	There is a risk that insufficient collaboration, consultation and research on marine climate matters, and adaptation requirements within MMO and the wider stakeholder group, could result in maladaptation, adaptation opportunities being missed or misaligned, and leading practices not identified and shared.	Appropriate adaptation opportunities are missed, resulting in environmental, economic and social harm and reputational damage to MMO.
R4	There is a risk that if MMO colleagues, occupied buildings, staff homes, and surrounding areas are not resilient to extreme weather events, flooding, increased temperatures and other climate changes, there could be an increased risk of ill health, injury and loss of life, and of business disruption.	MMO colleagues are unable to work from these locations so MMO's ability to carry out some of its functions, may be compromised and/or delayed. The health and safety of colleagues may be jeopardised.
R5	There is a risk that coastal erosion, increased flooding, and terrestrial and recreational activities will cause negative impacts on marine and coastal areas, including a decline in water quality, increased pollution, and a risk of harm to MPA features.	Increasing pressures on habitats and species, including commercial species, which may reduce their ability to adapt to climate change. Failure to meet EIP23 MPA targets, High Level Marine Objectives, Good Environmental Status and water quality targets, leading to reputational risk to MMO and wider government.
R6	There is a risk that if extreme weather causes a rise in health and safety incidents and hazards in fishing fleets and offshore research, there could be an increased risk of loss of life, the	An increase in costs to the industry of insurance; consequent reduced recruitment into the industry and higher prices for consumers due to

	inability to conduct some types of research and a reduction in fishing fleet activity.	reduced supply and reduction in research into renewable energy sources and climate change impacts.
R7	There is a risk that if climate change places more pressure and complication on the marine and coastal environment, MMO could be unable to meet increased demand for marine planning, licensing activities, fisheries management, enforcement, and monitoring, and MPA/HPMA management.	Delivery of MMO's statutory duties, core functions, services and general objective is compromised, leading to wasted public funds and reputational damage to MMO.
R8	There is a risk that if incentives and funding mechanisms for fishing fleet adaptations do not gain the necessary support from the relevant key stakeholders, these adaptations may not be delivered.	Fleet and fishing practice adaptation measures are not adopted in sufficient volume and pace to be effective. Reputational damage with key stakeholders.
R9	There is a risk that if MMO's vision of its role in UK climate change adaptation is not clear to government, stakeholders, and the public, MMO may not be contributing effectively to a major national policy agenda, and that adaptations may not be supported and rolled out in a timely or effective manner.	MMO is unable to deliver its functions to support climate change adaptation leading to reputational damage.

The CCRA and MMO risks identified have the potential to impact on the quality and effectiveness of the MMO's services and operations; MMO's ability to support the UK Government policy objectives and the value of MMO's contribution to the UK marine environment and broader environmental goals.

MMO Climate Change Opportunities

Although the primary focus of this report is to identify risks and threats to the organisation from climate change, the CCRA3 and internal MMO risk review has also identified opportunity areas within MMO. These are presented in Table 3. These opportunities should be considered and pursued by the organisation to demonstrate a pro-active, innovative and positive approach to climate change action.

Table 3. MMO Climate Change Opportunities

Opportunity ID	Description	Benefit of Opportunity
OPP1	Demonstrate leadership on marine climate adaptation measures and meaningfully support the UK vision of leading climate change action in relation to marine and coastal environments	Improved organisational ambition around climate change action, and improved reputation across Government, ALBs and the wider public
OPP2	Adopt an innovative climate-focused leadership role in the new fisheries co-partnership structure and through the recently established Sustainable Fisheries Group within MMO	Utilising the MMO values of innovation and inclusion, MMO can evolve its leadership to promote sustainability and climate change adaptation measures for the fishing industry and improve MMO's reputation.
OPP3	Ensure appropriate and useable evidence is obtained for the areas critical to MMO to fill the gaps in existing knowledge.	The MMO can develop its current knowledge of climate change impacts across the organisation and with relevant stakeholders, both internal and external, building a culture of collective and co-ordinated planning, and evidence-based policy and decision-making

OPP4	Greater leverage and justification for climate change action through use of existing robust data and evidence	MMO can be more effective in the use and analysis of data, to strengthen support for climate-related policies and the implementation of activities, and optimise internal decision-making.
OPP5	Improve relationships with local communities and stakeholders on climate change issues	MMO can work on cascading a more effective understanding of region-specific issues throughout the organisation. This will improve MMO's reputation and its' ability to support local policies.

Adaptation Action Themes

Mitigating the risks and maximising the opportunities identified will require consideration within delivery functions, and a proactive approach to developing services and improving organisational practices. This approach reflects evolving evidence, policy priorities and changes to the marine environment and fishing industry and practices. It is also important that we play our part in enabling the conditions that allow other organisations and groups to deliver climate change adaptation responses. As such, MMO has identified a need to influence and work closely with Defra to ensure the regulatory frameworks that MMO are bound to do not prevent or hamper climate change adaptation efforts. An evolution of the regulatory frameworks and climate change adaptation guidance would allow MMO to be more effective as an enabler of marine adaptation action. This is reflected in the actions we will take going forwards.

In addition to reporting on the climate change adaptation actions undertaken since the previous report (see Appendix A), as part of the Round 4 reporting process MMO has taken the opportunity to refresh the internally-facing Climate Change Adaptation Plan which captures a number of planned or anticipated climate change adaptation actions. These actions have been grouped into the following adaptation action themes:

- Providing an effective regulatory oversight of adaptation best practice and its implementation, improving internal and external collaboration on climate change issues, and maximising MMO's influence
- Embedding a climate change culture within the organisation and in work planning processes
- Identifying climate change adaptation research areas/gaps, and maximising use of available evidence and projections
- Incorporate climate change adaptation in marine planning, licensing and conservation processes
- Resourcing and financial enablers

Many of the actions captured in the plan are ongoing workstreams and are intended to continue to develop over the coming years. A summary of MMO adaptation action themes is presented in Table 4, which also outlines the anticipated timescale for the actions: short-term (<12 months), medium-term (12-24 months), long-term (>24 months), or continuous.

Further detail on each adaptation action is presented in the internal MMO Climate Change Adaptation Plan, which includes an estimated time resource requirement and priority ranking (high, medium, low) for each action. This will allow the organisation to prioritise actions effectively and ensure sufficient time and staff resource is allocated to delivering the actions. Given the ever-evolving nature of climate change adaptation, the internal MMO Climate Change Adaptation Plan is not a static document, and new actions may be identified and undertaken before the next adaptation reporting cycle.

Table 4. Summary of MMO adaptation action themes

Climate change adaptation action theme	Adaptation actions	MMO Risks and Opportunities addressed	Timescale
Providing an effective regulatory oversight of adaptation best practice and its implementation, improving internal and external collaboration on climate change issues, and maximising MMO's influence	Work with Defra Group to increase climate resilience for MMO occupied buildings	R4	Continuous
	Improve MMO's visibility and role around climate change impacts on MMO customers and stakeholders	R3, R6, R7, R9 OPP1, OPP5	Short-term (<12 months)
	Communicate adaptation risks and mitigation advice through pre-application advice to developers	R3 OPP1, OPP3	Continuous
	Develop guidance for nature-based solutions, and work with Defra to update the marine licensing framework to better enable adaptive management	R3, R9 OPP1, OPP3, OPP5	Long-term (>24 months)
	In marine planning, improve stakeholder engagement to apply appropriate national adaptation measures to local circumstances, and identify longer term adaptation needs	R1, R2, R3, R6, R7 OPP1, OPP5	Long-term (>24 months)
	Work innovatively with industry, IFCAs and Government to incorporate and incentivise adaptation measures under the co-partnership approach introduced by the Fisheries Act	R2, R3, R6, R7, R8 OPP2	Continuous
	Explore scope for strategic alliances with partners to develop adaptation measures and industry advice across marine and coastal issues	R1, R2, R3, R5, R6, R7 OPP1, OPP5	Medium-term (12-24 months)
Embedding a climate change culture within the organisation and in work planning processes	Incorporate climate change considerations in project initiation and service design	R2, R3, R9 OPP3, OPP4	Continuous
	Consideration of climate change impacts in MMO business continuity plans and responses	R4 OPP3	Continuous
	Improve carbon literacy and understanding of climate change adaptation across the organisation	R2, R3, R9 OPP3	Continuous

Climate change adaptation action theme	Adaptation actions	MMO Risks and Opportunities addressed	Timescale
Identifying climate change adaptation research areas/gaps, and maximising use of available evidence and projections	Review available evidence and data across MMO relating to high and low emissions scenarios	R1, R2, R3, R7 OPP3, OPP4	Medium-term (12-24 months)
	Establish science collation / update of evidence relating to high and low emissions scenarios as new evidence becomes available	R1, R3 OPP3, OPP4	Medium-term (12-24 months)
	Build on existing Blue Carbon and Natural Capital projects in UKOTs	R1, R2, R3, R7 OPP4	Continuous
	Integrate climate issues and research needs into international programmes	R2, R3 OPP1, OPP4	Continuous
Incorporating climate change adaptation in marine planning, licensing and conservation processes	Make marine plans more climate smart	R1, R2, R7 OPP1, OPP3, OPP4, OPP5	Long-term (>24 months)
	Enable climate change resilience by developing measures for fisheries management and non-licensable activities	R1, R2, R5, R7, R9 OPP1, OPP2	Short-term (<12 months)
	Continue to support development of climate smart MPAs with appropriate management measures	R1, R3, R7 OPP1, OPP5	Continuous
Resourcing and financial enablers	Administer grant funds for improved sustainability and climate change adaptations to the fishing fleet	R3, R6, R8 OPP1, OPP5	Medium-term (12-24 months)
	Support MMO SR bids to identify and apply for climate change adaptation funding and resources	R2, R3, R7 OPP1, OPP3	Continuous - In line with SR cycles

Monitoring and Evaluation

Progress on MMO climate change adaptation actions will continue to be reported to the MMO Climate Change Adaptation Lead on a regular basis to establish where actions are on-target, completed (where applicable), or to identify where additional support / resource is required in order to achieve them. Progress updates will be shared by teams at the MMO Climate & Sustainability Group meetings. An internal adaptation action monitoring document has been created to track progress and act as a 'live' record of the status of actions. Progress updates and status will be collated and presented to ELT on a quarterly basis, as part of an agreed review cycle alongside the MMO's Corporate Plan and Business Continuity Plan.

Conclusion

In response to the Climate Change Act 2008, the UK Climate Change Risk Assessment (CCRA3) and in line with the Adaptation Reporting Power (ARP4) guidance, this report has set out how MMO and its services are likely to be impacted by climate change and how MMO are responding to the identified climate change risks through a number of adaptation action areas. The key points from this report are:

- **Climate change** is already significantly impacting coastal and marine environments, with more severe impacts predicted in the coming years and decades
- **Scientific evidence** on the physical, environmental and societal impacts of climate change is continually emerging, and MMO's approach is to review and use the best available evidence
- **MMO has** undertaken a climate change risk assessment which identified nine overarching climate change risks to the organisation's ability to deliver its key services and remit. The adaptation actions identified to mitigate and reduce these risks will aid MMO in supporting the UK's climate change ambitions
- **MMO has** already taken meaningful steps to adapt to climate change and will continue to strive to be leaders in climate change adaptation

Newlyn Harbour, Cornwall. Taken by Emma Martin

References

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- Defra 25 Year Environment Plan
- Environmental Improvement Plan 2023
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Appendix A: Progress made towards MMO adaptation actions since previous Climate Change Adaptation Report (2022)

Adaptation action	Risk(s) mitigated	Delivered by	Evidence of progress made to action
Develop a structured process for monitoring and evaluating climate change adaptation activities at corporate level	R1, R2, R3, R9	Planning & Performance	• Dedicated staff member recruited to lead monitoring of climate change adaptation activities across the organisation • MMO's Climate & Sustainability Group established as the cross-directorate collaboration mechanism for discussing climate change workstreams, and is the primary method of monitoring and reporting on progress on adaptations at working level • Internal monitoring and evaluation document created to record progress and evidence on how MMO are achieving the adaptation actions • Agreed that there will be a 'drumbeat' quarterly review of the Climate Change Adaptation (CCA) Plan (at same time as Corporate Plan review / Business Continuity Plan review) at ELT level to report on adaptation progress
Refresh climate-related sections of the Business Continuity Plan and continue discussions with Defra on climate resilience for buildings occupied by the MMO	R4, R6	Planning & Performance; Finance & Resources	• MMO Business Continuity Manager considering short, medium and long-term climate change risks based on latest evidence/ publications, and incorporating these into Business Continuity Plans (BCPs) and scenarios • MMO contributing to updates to the Defra Estates Strategy including sustainability elements • Climate resilient Defra-Group buildings discussed at Sustainability Leadership Group (SLG) meetings with MMO representation, covering mitigation and adaptation considerations
Identify existing climate change expertise and gaps across directorates, and champion MMO enrolment onto the Defra Group Carbon and Climate Change Training	R1, R2, R3, R7	Planning & Performance; Evidence & Evaluation	• Climate change specific roles have been identified within various teams and directorates, e.g. in Marine Planning, Evidence, Marine Licensing, Planning & Performance • Gaps can be addressed by increasing climate change awareness across the organisation, such as through the Defra Group Carbon & Climate Change training course • First MMO cohort have completed the Defra Group Carbon & Climate Change training and are now certified as being 'carbon literate' through the Carbon Literacy Trust. Training underway for others in the organisation • Examples of championing the Defra Group Carbon & Climate Change training include through the MMO New Starters Induction pack, inclusion in internal blog posts, and bespoke presentations/reflections delivered to the

Adaptation action	Risk(s) mitigated	Delivered by	Evidence of progress made to action
			Marine Planning Team, Marine Conservation Team, Climate & Sustainability Group, Planning & Change Directorate
Review available evidence and data across MMO relating to high and low emissions scenarios	R1, R2, R3, R7	Evidence & Evaluation; Marine Planning	• Use of MSPACE models which cover 2-4°C warming scenarios (correlating to medium-high emissions scenarios). The outputs of the MSPACE project are being used to inform various parts of MMO's work areas and remit, including national and regional marine plans, Fisheries Management Plans (FMPs)s, and the designation of protected sites • Gaps identified through MSPACE include assessment of economic and social implications of the climate-smart recommendations • MSPACE project identified a need for integrated spatial management of UK waters and better coordination between nations • Collation of other data sources used within MMO when considering high and low emissions scenarios including IPCC, UKCP18, UKCCRA, and Marine Climate Change Impacts Partnership (MCCIP) outputs
Build on existing digitisation and automation of marine activities licensing to manage increased workload due to more applications	R7	Marine Licensing	• Completion of the first year of the MMO Marine Planning and Licensing Programme (MPLP) Step Back programme which has successfully initiated a review of potential improvements across the directorate; instigated process and behavioural improvements for licensing and planning in Harbour Orders, Marine Case Management System (MCMS), and Marine Plan Assessments; improved integration between planning and licensing; and designed and planned a simpler, user-friendly interface to improve MMO customers' experience on Gov.uk. • Completion of the 'discovery phase' of automation workstream, looking into options to automate low-risk marine licensing check and routine tasks to reduce resourcing requirements and enable more resource for complex marine licensing cases • Working with Digital & Analysis and Planning & Change teams, the Marine Licensing team has alpha tested the automation technology and submitted the report to ELT. It is anticipated that an agreement will be in place to begin beta development in 2025.
Use MMO experience and existing research to inform potential adaptation risks and mitigation advice as a statutory consultee and	R3	Marine Licensing	• Marine Licensing team encourages and advertises pre-application advice to large-scale developers (e.g. offshore windfarm developers) and other applicants • MMO support Defra's contribution to 'Project Speed' by helping to reduce the time taken to

Adaptation action	Risk(s) mitigated	Delivered by	Evidence of progress made to action
through pre-application advice to proposers			develop, design and deliver vital infrastructure projects • MMO is contributing to delivering the National Infrastructure Strategy, in particular the aim to help decarbonise the economy and adapt to climate change by providing advice on offshore wind proposals; ports and manufacturing infrastructure; nuclear developments; opportunities for carbon capture; and flood protection required as a result of coastal erosion/climate change
Work innovatively with industry, IFCAs and government to incorporate and incentivise adaptation measures under the co-partnership approach introduced by the Fisheries Act	R2, R3, R6, R7, R8	Fisheries	• Investigation of emerging fisheries (due to climate change) to promote sustainable fishing e.g. octopus, razor clams, bluefin tuna • Future-proofing measures, where possible e.g. extend measures to the whole of International Council for the Exploration of the Sea (ICES) area 7 in anticipation that climate change may increase abundance of crawfish in Eastern Channel • Climate change adaptation is considered as part of the development of Fisheries Management Plans (FMPs) (for example Channel Demersal Non-Quota Species (NQS)) • FMP event held in June 2024 attended by colleagues from MMO, Defra, and Association of Inshore Fisheries Conservation Authorities (AIFCAs) involved in FMP implementation work to strengthen connections and cross-organisation working and discuss policy development, legal considerations, and stakeholder engagement. • Investigation into more selective gear types which have less destructive impact. E.g. 'disco pots' for catching scallops, reduced quota limit for catching sole with dredges in ICES area 7e. • MMO published the Atlantic Bluefin Tuna Fishing Plan which includes quotas for recreational fishing and a trial commercial fishery • Ongoing work including calls for evidence and consultations on byelaws prohibiting fishing within Marine Protected Areas (MPAs) and Highly Protected Marine Areas (HPMAs)
Administer grant funds for climate change adaptation to the fishing fleet	R6, R8	Finance & Resources	• A number of projects have been approved through the UK Seafood Fund (UKSF) which amounts to > £971k in grants. Examples of projects funded under this fund include those with key aims of reducing engine emissions from vessels and reducing fuel usage (including a hybrid engine project that runs on a mixture of diesel and cooking oil) • The Fisheries and Seafood Scheme (FaSS) funds (along with Seafish) have been

Adaptation action	Risk(s) mitigated	Delivered by	Evidence of progress made to action
			used to develop and launch the Seafood Carbon Emissions Profiling Tool[21] which aims to support the seafood sector's response to climate change by helping businesses measure the carbon footprint of their products and contribute to meeting net-zero targets
Share knowledge gained from international programmes within MMO	R1, R2, R3, R7	Global Marine Team	• Established relationship managers between Global Marine Team, Operations and Marine Development Teams to exchange information on workstreams and identify areas for join up, shared delivery and knowledge sharing, including areas for future collaboration and a bi-annual strategy meeting • Communication of workstreams and successes internally to colleagues through production of blogs, news stories and through dedicated slots on all-colleague calls • Presentation of climate-related international updates at Climate & Sustainability Group meetings
Support development of climate smart MPAs with appropriate management measures	R1	Global Marine Team	• Ongoing work with programme partners on climate-smart MPAs and climate-smart Marine Spatial Planning (MSP) • Global Marine Team joining up with MMO Marine Planning Team to help implement/ strengthen climate-smart work. Marine Planning climate change lead went on deployment to Turks and Caicos to support on-the-ground development of climate-smart MSP measures • Developing a National MPA Management framework for the Maldives in which climate change is a key management principle that feeds through to MPA design. • Management plans written with MMO assistance include climate change considerations
Integrate climate issues and research needs into international programmes	R2, R3	Global Marine Team	• Investigating future strategies for Ocean Country Partnership Programme (OCPP) and Blue Belt by linking climate resilience to wider HMG strategies and key performance indicators for International Climate Finance (ICF) Official Development Assistance (ODA) funding, such as energy security, food security, economic resilience and poverty alleviation • Paper submitted to Blue Belt board detailing work done since 2021 (with partners including CEFAS). This included the publication of a scientific paper on climate change impacts on the coral reefs and development of a reef resilience study in Pitcairn Islands, and

[21] page 6: fnw2273.pdf

Adaptation action	Risk(s) mitigated	Delivered by	Evidence of progress made to action
			research into the climate change vulnerability of kelp forests and monitoring kelp die-back in Tristan da Cunha • Current Blue Belt workstreams are integrating climate issues and bespoke research needs for various overseas territories including: understanding the potential impacts of climate change (through a literature review, horizon scanning to predict future impacts, vulnerability assessments) to inform development of adaptation and mitigation strategies in Anguilla; Further analysis of coral species (including genetic sampling to better understand resilience) and monitoring sea level rise in Pitcairn Islands; and evaluating climate change risks to Patagonian and Antarctic toothfish, and increasing monitoring of sea surface temperatures (SST) in the South Georgia and the South Sandwich Islands (SGSSI) • Proposal paper submitted to Blue Belt Programme Board to influence strategic direction to include climate change mitigations, adaptations and financing
Build on existing Blue Carbon and Natural Capital projects to further knowledge and research in partnership with CEFAS and explore linkages with other projects and initiatives	R1, R2, R3, R7	Global Marine Team	• Exploring sustainable financing workstreams including parametric insurance and climate finance with Finance Earth • Through MMO's role as delivery partners for the OCPP, the MMO are contributing to the Global Ocean Accounts Partnership (GOAP) work on Natural Capital and NDCs. In July 2024, MMO colleagues delivered a session at GOAP conference on links between marine planning and natural capital assets • Alongside Centre for Environment, Fisheries and Aquaculture Science (CEFAS), MMO co-published the Blue Carbon 'Insights into Blue Carbon Finance' report for UK Overseas Territories (OTs) through the Blue Belt programme
Ensure that marine plans, both extant, in development and in the future, are aligned to Governmental ambitions for greater spatial specificity and the outcomes of Defra's marine spatial prioritisation	R1, R2, R3, R7	Marine Planning; Evidence & Evaluation	• Publication of the East Marine Plan Spatial Assessment project demonstrates how MMO are taking into account different sectors and government policies and ensuring that the east marine plans are aligned with these. The project involved an assessment of national priorities and considerations for how these can be met in the east marine plan areas • Work ongoing for how the outputs of Marine Spatial Prioritisation (MSPri) can be incorporated in marine planning in terms of adaptation, and how this can best link to

Adaptation action	Risk(s) mitigated	Delivered by	Evidence of progress made to action
programme and Strategic Spatial Energy Plan in relation to adaptation			marine Local Nature Recovery Strategies (LNRS) and Strategic Spatial Energy Plan • Procurement underway for MMO Evidence project MMO1350 'Understanding the impacts of climate change that can be directly addressed by marine plans'
Evolve climate policies in marine plans, and begin trend analysis beyond the 20-year marine plan horizon to identify longer term adaptation needs	R2, R3, R7	Marine Planning	• Incorporating climate change into policies within marine plans, for example through discussions with marine planning sector leads, and external organisations • Work commenced in 2024 to update the east marine plan • Reviewing trend analysis beyond 20-year marine plan horizon for MSPACE project • Use of recent publications and modelling such as CEFAS' Fish distribution modelling publication, and CEFAS/Joint Nature Conservation Committee (JNCC) vulnerable marine species publication to inform marine planning and longer-term horizons
Through marine plans, improve stakeholder engagement to apply the most appropriate national adaptation measures to local circumstances	R1, R2, R6	Marine Planning	• Engaged with external stakeholders (including RSPB and WWF) regarding blue carbon habitat mapping and marine plans • Engagement with Restoring Meadows, Marsh and Reef (ReMeMaRe) project delivery partners (esp. Environment Agency and Defra) regarding enabling habitat restoration through marine licensing and planning • Working with local authorities and other bodies to incorporate marine habitats into LNRS
Explore scope for strategic alliances with partners to support and develop adaptation measures and industry advice across marine and coastal issues	R1, R2, R3, R5, R6, R7	Marine Planning; Marine Licensing; Global Marine Team; Planning & Performance	• MMO Strategic Compensation and Strategic Renewables workstreams working with external partners to align and develop industry advice • Global Marine Team are working with CEFAS, JNCC and academics to assist with ocean literacy programmes and provide climate change adaptation work packages to UKOTs and ODA eligible countries • MMO has a position on the MCCIP Overseas Working Group and contributed to an MCCIP session at the 2024 Blue Belt Symposium • As part of the assistance provided to Sri Lanka through the OCPP, MMO Global Marine Team and Strategic Renewables Unit (SRU) hosted a roundtable discussion on offshore wind with Sri Lankan Government officials in July 2024. Marine spatial planning workshops were also completed in August with Sri Lankan Ministries and key stakeholders explicitly linking to Sri Lanka's Offshore renewables roadmap. • An IPCC climate expert has presented at MMO's research seminar series and Global Marine Team meetings to share evidence and discuss potential application to our work

Adaptation action	Risk(s) mitigated	Delivered by	Evidence of progress made to action
			• MMO shared climate change adaptation planning approaches and advice with CEFAS, Environment Agency, Natural England and the Food Standards Agency

Appendix B: Glossary of Abbreviations

AIFCAs = Association of Inshore Fisheries and Conservation Authorities

CCA = Climate Change Adaptation

CCRA = Climate Change Risk Assessment

CEFAS = Centre for Environment, Fisheries and Aquaculture Science

DCO = Development Consent Order

EA = Environment Agency

ELT = Executive Leadership Team

FaSS = Fisheries and Seafood Scheme

FMPs = Fisheries Management Plans

FTE = Full-Time Equivalent (resourcing)

GOAP = Global Ocean Accounts Partnership

HLMOs = High Level Marine Objectives

HPMAs = Highly Protected Marine Areas

ICES = International Council for the Exploration of the Sea

ICF = International Climate Finance

IPCC = Intergovernmental Panel on Climate Change

JNCC = Joint Nature Conservation Committee

LNRS = Local Nature Recovery Strategies

MCCIP = Marine Climate Change Impacts Partnership

MCMS = Marine Case Management System

MPAs = Marine Protected Areas

MPLP = Marine Planning and Licensing Programme

MSP = Marine Spatial Planning

MSPACE = Marine Spatial Planning Addressing Climate Effects

MSPri = Marine Spatial Prioritisation

NBS = Nature-based Solutions

NDCs = Non-Determined Contributions

NQS = Non-Quota Species

NSIP = Nationally Significant Infrastructure Project

ODA = Official Development Assistance

OCPP = Ocean Country Partnership Programme

PINS = Planning Inspectorate

ReMeMaRe = Restoring Meadow, Marsh and Reef

RSPB = Royal Society for the Protection of Birds

SLG = Sustainability Leadership Group

SRU = Strategic Renewables Unit

SST = Sea Surface Temperature

UKCP18 = UK Climate Projections 2018

UKSF = UK Seafood Fund

WWF = World Wildlife Fund / Worldwide Fund for Nature