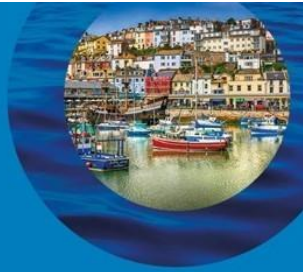




Marine
Management
Organisation

Climate Change Adaptation Report

December 2022



...ambitious for our seas and coasts

Contents

Foreword	3
Executive summary	4
Introduction	5
Organisational profile	5
Change is happening	6
Context for this report	7
Progress since last adaptation report (2015).....	7
The Climate Change risks we face.....	8
Climate Change and the marine environment.....	8
Our Climate Change Risk Areas	9
Sea Level Rise	9
Sea Water Temperature	9
Ocean Acidification	10
Storm Surge and Winds	10
MMO Climate Change Adaptation Risks.....	10
MMO Climate Change Adaptation Opportunities	12
Mitigations and Adaptations	13
Conclusion	14
References.....	15

Foreword

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

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 sets out 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](#) – this describes 10 strategic 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.

The UK's exit from the EU and new status as an independent coastal state, bringing new powers and reinvigorated policy ambition, has given MMO unprecedented opportunity to move towards our vision of a prosperous, sustainable and ambitious future for our seas, coasts, communities and marine environment for generations to come.

Ours seas will be protected, clean, healthy, safe, productive and biologically diverse allowing sustainable development and economic opportunities.

MMO exists to protect and enhance our precious marine environment and support a sustainable, successful blue economy, for the benefit of generations to come.

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. We aim to do this by:

- Using our legal powers, licensing, education and support, enforcing 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; and
- Creating a strong business that is fit for the future.

MMO Climate Change Adaptation Report December 2022 is published by:

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

This report sets out how MMO and its services are likely to be impacted by climate change, the key risks that arise from these changes, and details how MMO will address the risks over the next five years. The key points are:

- **Climate change** is significantly impacting coastal and marine environments. The speed and scale of this change is expected to increase in the next decades. Marine ecosystems will change, offshore activity may become more hazardous and species distribution will alter. Government responses to climate change, such as the focus on renewable energy will also impact MMO;
- **Scientific evidence** on the practical impact of climate change is still developing. However, meaningful progress can be made using a combination of current knowledge and good risk management, including the precautionary principle; and
- **MMO has** already taken meaningful steps to adapt 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 relevant licensable projects consider the impact they will have on climate and the vulnerability of the project to climate change, changes in fishing practices to reflect distribution of species and monitoring the condition of Marine Protected Areas.

As the marine environment is dynamic, MMO's services will need to continue to evolve to reflect changes and be flexible to adapt as more data and evidence emerges.

MMO is ready to take a greater role in delivering the UK government's climate goals and net zero target. MMO has unique expertise across UK and global marine management and can make a major contribution to the UK Government's policy agenda.

Continued close collaborative working with partners such as Defra Group and ALBs will be an essential part of this strategy to maximise its impact.

MMO has an opportunity to become a leading national expert on climate change in the marine environment, and on how best to achieve the 'triple win' of environment, economy and society in a complex and challenging situation. Doing so would enable a significant benefit to the UK and more widely.

Mitigations to the risks identified in section 5, can be summarised in 3 key points:

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

Introduction

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 2012 government published the [UK Climate Change Risk Assessment](#) (CCRA) (to be updated every five years) and a [National Adaptation Programme \(NAP\)](#) which responds to the risks within the CCRA. Under the Climate Change Act, public bodies (including the MMO) must report on the steps that they are taking to respond to climate change. Defra has also published its [Defra Group Sustainability Strategy](#), which also addresses Climate Change Adaption requirements.

This is MMO's second climate adaptation report under the Climate Change Act 2008 and is submitted to the third round of statutory reporting. MMO was only included as a reporting organisation for the second round in 2015 and so did not report in 2010, as MMO had only just been established.

The purpose of this report is to highlight the ways in which the MMO's work is at risk of being affected by a changing climate and to set out any actions to help the organisation adapt. It does not include activity to mitigate the impact of climate change (for example licensing renewable energy development). This report details:

- An assessment of the current and future adaptation risks to MMO presented by climate change (exclusive of mitigation actions, such as low carbon transition), under two, defined climate scenarios;
- The programme of measures to address the risks, including policies and practices that are already being implemented; and
- Recommendations for further action to respond to adaptation risks.

Organisational profile

MMO [2030 Strategic Plan](#) sets out the mission, vision, values and objectives for the organisation 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.

The MMO's main statutory deliverables in relation to MMO goals/services (listed in [MMO2030 Strategic Plan](#), [MMO Corporate plan 2022 – 2025](#) are:

- **Marine planning** – preparing marine spatial plans, under the framework of the 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;
- **Marine licensing** – licensing, and monitoring and assuring compliance with licence conditions, for licensable activities below Mean High Water Springs such as construction, dredging and deposits;
- **Fisheries management** – from 6–200 nautical miles offshore, including quota rules and distribution, vessel licensing and associated compliance; and
- **Marine conservation** – monitoring management measures in marine protected areas, including byelaws to protect the area's objectives.

MMO delivers its' responsibilities through a Chair, Chief Executive Officer (CEO) and Board. The Executive Leadership Team (ELT) is made up of the CEO and 5 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 Planning, Licensing and Global
- Marine Operations

Change is happening

Evidence from [UK Climate Projections 2009](#), the [Marine Climate Change Impacts Partnership \(MCCIP\) report cards](#), the [UK's Climate Change Risk Assessment](#) and other sources have been used along with expert judgement to assess the impacts that climate change might have on the marine environment.

The results show that evidence of a changing climate is already being seen around the UK. Sea levels have risen, and this continued rise appears to be accelerating. Sea surface temperatures have risen around the UK, whilst the ocean has become more acidic since pre-industrial times. Changes to wave height, water column stratification and salinity are expected in the future. The observed trends and predicted changes attributed to climate change described above will have wide ranging impacts for the marine and coastal environment and human socio-economic

systems that are dependent on it. There are several changes already being observed, and more predicted for the future with varying confidence levels.

Context for this report

The context of the report is:

- Assessing MMO’s current and future risks related to climate change adaptation based on progress since the last report, and recent (2022) risk reviews;
- Assessing how these risks can potentially impact the MMO’s ability to conduct its activities and overall business continuity, and
- Provide recommendations for a programme of measures to address these.

Progress since last adaptation report (2015)

MMO had only been operating for 5 years when the Climate Adaptation Report of 2015 was published. MMO has now taken significant steps to integrate climate change adaptation and mitigation into its core functions and its research programme. Where there is an absence of robust evidence, the best information available has been used to balance the interests of the environment with socio-economic factors; like enabling wind power generation and sustaining the UK fishing industry.

This section shows the actions undertaken by MMO since 2015 in relation to climate change adaptation. Many of these actions are ongoing and are intended to continue to develop over the coming years. Actions already in progress are:

Action	Descriptor	Update Dec 2022
01	The Marine Planning Team have appointed a climate change lead who is responsible for considering how plans can assist both climate change adaptation and mitigation	The Marine Planning Team have appointed a climate change lead who is responsible for considering how plans can assist both climate change adaptation and mitigation
02	Addition of resource to ensure that climate change adaptations are effectively managed at an organisational level	The recruitment process for a climate change resource for this activity has begun, anticipated in place for the start of FY 23/24
03	Climate change ambitions and impacts will be included as a key element of the MMO’s 10 year strategy review to 2030 (MMO2030 Strategic Plan) which will be reflected in the 3 year corporate plan commencing in 2023/24	As part of the development of the MMO Target Operating Model (see Action 05 of this table), the MMO Strategic Plan is proposed to be revised, with this as an inclusion. The MMO Corporate plan for 2023/24 is in draft and will include climate change ambitions and impacts
04	A member of the ELT has been appointed as climate change and sustainability sponsor to be responsible for giving focus to climate issues across MMO	Director Marine Planning, Licensing and Global has been appointed

Action	Descriptor	Update Dec 2022
05	The MMO Target Operating Model will be reviewed to ensure it is able to respond in an integrated way to future challenges and policy changes, including responding to the impact and consequences of climate change	A resource has been recruited to commence development of the MMO Target Operating Model. The proposal is in draft, and development anticipated to commence April 2023
06	Creation of a new performance framework to track changes in MMO's function's operational activities, such as on the sustainability of the fishing industry and coastal developments	The MMO performance framework is being created, and ongoing development is under review by ELT
07	Ensure there is robust resilience and compliant energy performance in MMO's premises; confirming the longevity of occupancy and the ongoing financial viability of premises use	Ongoing liaison with Defra as estates manager to achieve resilience and energy performance in MMO's buildings; considering expected use span and cost-effectiveness
08	The establishment in 2021 of the MMO Strategic Renewables Unit (SRU) to provide advice across the planning and licensing functions to meet the Government's policy for increasing renewable energy such as offshore fixed and floating wind and, in the future, tidal power in the marine space	The SRU is established, and is proving its' value and benefit with interactions and advice across the organisation
09	Establishment of an MMO Climate Ready Group (CRG) with the purpose to provide leadership and coordination of climate activity at MMO	The CRG is established, and meets with a regular drumbeat, reviewing adaptation risk, mitigations and adaptation activities

*Table 1.
Climate Change Adaptation Progress since 2015*

The Climate Change risks we face

Climate change is already a reality; bringing rapid and lasting changes to the atmosphere, oceans, glaciers, and the biosphere. The possible effects of climate change to rainfall and wind patterns, along with potential changes to North Atlantic currents and cyclonic activity could intensify the frequency and severity of surges, including coastal erosion and flooding, and damages to infrastructure both inland and offshore. Going forward, the likelihood, frequency, severity, and duration of extreme weather events will only be heightened by changes in the climate.

This climate adaptation report identifies climate adaptation risks considered to be material to MMO and the risks relevant to the MMO and its activities are discussed later in this section.

Climate Change and the marine environment

Climate change will result in higher global mean temperatures, which will have a wide variety of impacts; from an increase in the likelihood, duration, and severity of heatwaves across the nation and changes in precipitation patterns, to deviations in cyclonic activity and sea level rise. Amongst some of the most impactful changes to

the marine environment and MMO's activities include the increase in sea surface temperature, changes to ocean salinity, acidification, de-oxygenation, increased cyclonic activity, sea level rise and increased storm surge frequency and magnitude.

Our Climate Change Risk Areas

Associated with climate change are risks to the marine environment. From these 4 risk areas, described below, several organisational risks have been identified, and are addressed later in this document. These 4 risk areas are:

Sea Level Rise

As an island nation, sea level rise poses a territorial risk, including the inundation of low-lying coastal areas, an increase in coastal erosion and tidal locking in some rivers; which can potentially increase the damage of storm surges.

Since the beginning of the twentieth century, there has been an average of 1.4 ± 0.2 mm/year increase in sea levels after accounting for vertical land movements. Sea level rise in the UK is expected to continue to increase, depending on location; with the range from 0.11 to 1.15 m across the UK by 2100, depending on location and the emissions scenario with the greatest regional increases predicted on the UK south coast, and the lowest in the north. This behaviour demonstrates the importance of the capability to address and adapt to this impact differently in different regions of the nation, from planning, mapping, and engaging with communities at more risk to potential new construction and regulation measures.

Sea Water Temperature

As global mean temperature (GMT) continues to rise, its effects can also be measured in the seawater surface temperature (SST). Although there is not a direct correlation between GMT and SST, there are still strong similarities between the warming of both systems. From 2009 to 2018, the mean SST of UK coastal waters was on average 0.3°C higher than 1981-2010 UK coastal water mean SST. Like sea level rise, SST warming is not uniform across the nation, with greater SST increases occurring in southern waters than northern waters.

As warmer seas dissolve less oxygen than colder ones, this oxygen reduction could increase stress in marine environments and fish stocks in the UK, as oxygen-deficient waters result in hypoxia, changes in species distribution and abundance, and negative changes to the marine environment. An example is the proliferation of cyanobacteria that can cause sickness and death to sea life through reducing access to sunlight and producing toxic substances. Additionally, it can have an adverse effect in fisheries, local hospitality and tourism, and ultimately livelihoods.

Another possible negative effect of warming seas is the increased threat of invasive non-native species (INNSs) and pathogens, including virus, fungi, and bacteria, to native species, ecosystems, and protected sites such as marine protected areas (MPAs).

Ocean Acidification

The increasing levels of CO₂ released into the atmosphere also play a role in the marine environment. The ocean's pH is lowered (ocean acidification), as part of the CO₂ emitted does not end up in the atmosphere but is absorbed by the oceans. Global ocean water acidification has increased 26 percent compared to pre-industrial levels. In UK waters this situation is more pronounced than the North Atlantic average, indicating a pH reduction.

Storm Surge and Winds

Changes to frequency in storms and winds are an important climatic factor, especially when coupled with already rising sea levels. Currently there is 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 is particularly important for coastal communities, marine developments and infrastructure. Ultimately, changes to storm surge and winds can potentially impact the nation's net zero ambition, which will include an even higher implementation of offshore windfarms across our territorial waters. Besides impacting the expansion and safe operation of offshore installations, wind and surge could potentially increase the need for marine licensing for activities such as coastal defence and emergency repairs. It can also impact offshore data collection, research and enforcement carried out by the MMO and partners. It can also negatively impact the safety of fishers and vessels carrying out offshore maintenance work. In addition, extreme weather could cause damage to port and harbour infrastructure, resulting in additional, marine licensing, marine planning and harbour order demands on MMO.

MMO Climate Change Adaptation Risks

MMO has identified 9 Climate Change Adaptation Risks:

Risk ID	Descriptor	Impact of risk
R1	Inadequate consideration of the interlinkages between climate and nature, and low and high emissions scenarios in strategic planning, generates a risk that the benefits of promoting solutions that achieve net zero and nature positive goals will not be realised and that climate scenario plans will not be incorporated.	Planning is conducted that promote climate change adaptation solutions that damage nature and undermine other policy goals, cause reputational damage and knock-on socio-economic impacts.
R2	If climate change adaptations in service delivery capacity are not clearly identified prioritised and managed by MMO or through Government policy and legislation enablement, there is a risk of failure 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.

Risk ID	Descriptor	Impact of risk
R3	Where there is insufficient collaboration, consultation and research on marine climate matters, adaptation requirements, MMO functions, and evidence; within MMO and the wider stakeholder group, there is a risk that adaptation opportunities may be missed or misaligned, of unanticipated negative consequences from climate change adaptations and leading practices not identified and shared.	Appropriate adaptation opportunities are missed, resulting in environmental and social harm and reputational damage to MMO.
R4	If MMO occupied buildings and surrounding areas are not resilient to extreme weather events, flooding, increased temperatures and other climate changes, there is a risk of an increased risk to injury or loss of life, of business disruption including urgent advice on associated pollution incidents.	MMO staff are unable to work from these buildings, so MMO's ability to carry out some of its functions, may be compromised and/or delayed.
R5	If there is more terrestrial waste in the sea due to increased flooding on land, there is a risk of harm to MPAs and to marine species, and of habitat loss.	An increased need for marine activity licences and more pressure on the Marine Protection Team.
R6	If extreme weather causes a rise in health and safety incidents and hazards in fishing fleets, offshore research, there is a risk of and increased risk to loss of life and the inability to conduct some types of research.	An increased in costs to the industry of insurance; consequent reduced recruitment into the industry and higher prices for consumers due to reduced supply and reduction in research into renewable energy sources and climate change impacts.
R7	If climate change places more pressure and complication on a complex and evolving marine environment, there is a risk that MMO would be unable to meet increased demand for marine planning, licensing activities, fisheries management, enforcement and monitoring, and MPA 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	If incentives and funding mechanisms for fishing fleet adaptations do not gain necessary support from key stakeholders, there is a risk that these adaptations will 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	If MMO's vision of its role in UK climate adaptation is not clear to government, stakeholders, and the public, this creates the risk that MMO are not 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.

*Table 2.
MMO Climate Change Adaptation Risks*

These risks go beyond a narrow delivery role; taking a proactive and purposive approach to developing services. This approach reflects evolving evidence, policy priorities and changes to the marine environment and fishing industry and practices. Included therefore are adaptation-related risks that relate to the CCRA and NAP, and may impact on:

- The quality and effectiveness of the MMO's services and operations;
 - Risks R1, R2, R3, R4, R5, R8 and R9 are directly connected to this point (though not exclusively) and link to adaptation mitigations against Defra NAP risks N5, N14, N15, N16 and N17.
- MMO's ability to support the UK Government policy objectives;
 - Risks R1, R2, R7 and R9 are directly connected to this point (though not exclusively) and link to adaptation mitigations against Defra NAP risks N14, N16 and N17.
- The value of MMO's contribution to the UK marine environment and broader environmental goals.
 - Risks R1, R2, R3, R4, R6, R7 and R9 are directly connected to this point (though not exclusively) and link to adaptation mitigations against Defra NAP risks N5, N14 and N17.

The MMO Climate Change Adaptation Plan shows MMO adaptations as mitigations against MMO risks and the adaptation interactions with CCRA and NAP risks.

MMO Climate Change Adaptation Opportunities

The risk and adaptation review has identified several opportunities within MMO. These are:

- MMO has the opportunity to become a thought leader on marine climate adaptation measures both locally and internationally. Whilst ambitious, this is realistic in establishing MMO as a leading expert on marine climate adaptation measures. MMO would utilise the expertise of resources in supporting the UK vision of being a lead in climate change action. It is anticipated that this is not achievable short term and will require further stakeholder engagement and the building of relationships.
- Adopting an innovative climate-focused leadership role in the new fisheries co-management structure. Utilising the MMO values of innovation and inclusion, MMO can evolve its leadership to aid the improvement of sustainability for the fishing industry and give reputational benefit for MMO.
- 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 relevant stakeholders, both internal and external; building a culture of collective and co-ordinated planning, and evidence-based policy and decision-making.
- Better leverage existing robust data and evidence. MMO can be more effective in the use and analysis of all types of data, and so support policies and the enforcement of activities, and through this optimise internal decision-making.
- Continue improving relations with local communities and stakeholders. 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.

These are also summarised in the MMO Climate Change Adaptation Plan Dec 22.

Mitigations and Adaptations

From the risk assessment and interdependencies and interacting risks and opportunities, the mitigations MMO have identified against the 9 risks have resulted in 30 adaptations as mitigations to these risks, which allows MMO to:

- Create a strategic framework to integrate climate change adaptation needs to a 2080-time horizon based on high and low emissions scenarios, tailored to MMO’s climate ambition. This will be done through a clear hierarchy of strategic, operational and tactical plans, connected from EIP 23 and the Defra Group Sustainability Strategy, to the MMO 2030 Strategy, the MMO Corporate Plan and the MMO Target Operating Model;
- Contribute to the development and use of accessible climate-related evidence and research. This is achieved through collaboration and the sharing of practices, research and evidence, including the investigation of wider impacts;
- Ensure the MMO’s expertise is used effectively to influence and support government policy on marine adaptation measures. This is realised through the measured and recognised impacts of other activities and adaptations, raising MMO’s profile and reputation; and
- Identify future resource needs for the MMO’s climate change adaptation response. This is done through the formation of new roles and the evolution of current roles; identifying relevant areas and tasks that can be realigned.

Adaptations planned are summarised here in Table 2, in short (<9 months) medium (9 – 15 months) and long term (>15 months). Some adaptations listed as long term have already commenced and are long term as they may be ongoing and become business as usual.

Further detail on each adaptation is contained in the MMO Climate Change Adaptation Plan Dec 22.

Term	Adaptations	Risks mitigated
Short < 9 months (Jan – Sep 2023)	<ul style="list-style-type: none"> • Incorporate climate risks into MMO risk register • Set up Climate Ready group • Present climate scenario analysis and risks to ELT • Develop process for corporate level CCA activity monitoring • Refresh climate related sections of Business Continuity Plans • Conduct climate change skills audit • Develop strategy for addressing gaps in partnerships and external funding • Explore scope for strategic alliances with external partners • Develop a defined ambition for MMO in CCA 	R1, R2, R3, R4, R5, R6, R7, R8, R9

Term	Adaptations	Risks mitigated
Medium 9 – 15 months (Sep 2023 – Mar 2024)	<ul style="list-style-type: none"> • Directorates to review CCA risks and prioritise activities • Review high and low emission data scenarios • Establish high and low emission scenarios to 2025, 2050 and 2080 	R1, R2, R3, R4, R7, R9
Long > 15 months (Apr 2024 onwards)	<ul style="list-style-type: none"> • Forecast additional resource needs in preparation for SR 2025 • Develop inventory of existing data sets • Build on existing digitisation and automation • Ensure all climate related commissioning has practical application for MMO • Support other ALBs on CCA work • Exploit MMO experience and data to inform further CCA risks • Continue discussions with Defra on infrastructure climate resilience • Continue and identify higher value funding opportunities for research • Work innovatively with external stakeholders on incorporating and incentivising CCA measures • Continue to administer grant funds for CCA to the fishing fleet • Share knowledge of international CCA with MMO • Continue to support climate smart MPAs • Continue to integrate climate issues and research into international programmes • Ensure that all marine plans are aligned to Government ambitions • Continue to include and evolve climate policies in the marine plans • Improve stakeholder engagement to allow application of CCA measures • Build on existing Blue Carbon and Natural Capital projects • Consider the scope with other stakeholders to begin trend analysis beyond the 20-year marine plan horizon 	R1, R2, R3, R4, R5, R7, R8, R9

*Table 3.
Climate Change Adaptations Summary*

The MMO Climate Change Adaptation Plan Dec 22 shows how these adaptations are being planned and conducted.

Conclusion

In response to the [Climate Change Act 2008](#), the [UK Climate Change Risk Assessment](#) (CCRA) and the [National Adaptation Programme \(NAP\)](#) this report has set out how MMO and its services are likely to be impacted by climate change. The key points are:

- **Climate change** is significantly impacting coastal and marine environments;
- **Scientific evidence** on the practical impact of climate change is still developing; and

- **MMO has** already taken meaningful steps to adapt to climate change.

The key risks that arise from these changes have been discussed, and how MMO will address the risks, build on existing developments and optimise identified opportunities.

Assessment of the 4 risk impact areas of Sea Level Rise, Sea Water Temperature, Ocean Acidification and Storm Surge and Winds have led to the identification of 12 MMO risks. The mitigations to the 12 risks identified have led to 30 adaptations, which, as mitigations, will aid MMO in supporting the UK's Climate Change ambitions.

References

Marine and Coastal Access Act 2009

Department for Environment, Food, and Rural Affairs / Marine Management Organisation Framework Document

Department for Environment, Food, and Rural Affairs D25 Year Environment Plan Climate Change Act 2008

UK Climate Change Risk Assessment

National Adaptation Programme (NAP)

Defra Group Sustainability Strategy

Marine Management Organisation 2030 Strategic Plan

Marine Management Organisation Corporate plan 2022 – 2025

UK Climate Projections 2009

Marine Climate Change Impacts Partnership (MCCIP) report cards

UK's Climate Change Risk Assessment

Department for Environment, Food, and Rural Affairs Arm's Length Body Adaptation – Integrating Climate Change and Risk Management – Adaptation pathways to supporting NAP

Marine Management Organisation Climate Change Adaptation Plan