



Department for
Science, Innovation
& Technology



Customer Supplier Agreement

For the provision of the UK Public Weather Service

2023-28

Date agreement comes into effect: 1st April 2023

Met Office Ref No: L5590

CUSTOMER – SUPPLIER AGREEMENT

For the provision of the UK Public Weather Service

Date Agreement comes into effect: 1st April 2023

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SECTION 2: PWS PERFORMANCE MEASURES, DELIVERABLES, SERVICES AND REPORTING FOR 2023-28

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Foreword

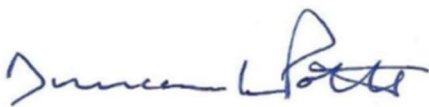
Welcome to the Customer Supplier Agreement 2023-2028. You will notice that for this year and going forward we have decided to move away from a fixed term CSA, updated each year, to a rolling 5-year CSA. The key rationale behind the original 5-year CSA remains, namely, to look far enough ahead to plan on change, development and the sequencing of new requirements. However, after 2 years it seems more sensible to keep a constant 5-year horizon to ensure we can capitalise on developments in science, technology and new capabilities that need to be brought to operational delivery. What won't change is that the PWSCG intends to remain in lock step with the Met Office Strategy, and the CSA and Met Office Strategy will remain mutually supportive. Also, key themes around **Stay Safe, Thrive, Authoritative Voice, National Capabilities** and **International Commitments** remain the bedrock around which plans and deliverables are built.



The main changes you will see in this year's CSA are in Theme 3 – Authoritative Voice. Throughout the last year the Met Office has developed a new Citizens Engagement Strategy (CES), which focusses on how the Met Office can best ensure that the authoritative weather narrative reaches UK citizens and enables them to plan their lives and make informed decisions. The role the Met Office should play in a competitive weather forecast market is now much clearer.

Whilst this year has not been dominated by as many named storms as typical, the past winter has seen extremes of cold, mild, dry and wet periods. Perhaps most significantly, last summer saw unparalleled periods of hot weather with multiple new temperature records being broken. This certainly vindicated the new Heat Warning System introduced in 2022 and the value of the Met Office not simply producing the weather forecast but also providing advice on staying safe – lives have been saved.

Whilst there is much to be positive about, UK and International challenges remain, with inflation, supply chain and broader budgetary constraints that may require prioritisation of work streams within the CSA. The focus of the Customer Group will be to ensure that the services delivered by the Met Office will continue to enhance the reach and decision making by the public to make the best use of this world leading weather service.

A handwritten signature in blue ink that reads "Duncan L Potts". The signature is fluid and cursive.

Duncan L Potts CB

Chair of the Public Weather Service Customer Group

1. Introduction

The UK Government through the Department for Science, Innovation and Technology (DSIT) funds the Met Office to provide a public weather service for all citizens of the United Kingdom. The Public Weather Service (PWS) exists to provide a trustworthy and reliable public forecast for UK citizens, including the provision of a National Severe Weather Warning Service.

As a DSIT Partner Organisation, the Met Office is an Executive Agency of the Department with Trading Fund Status. The Met Office is the delivery body for the PWS with the owning Department, DSIT, setting the organisation's Public Task through the PWS.

To ensure the PWS is delivered in a way that meets the needs of all users of these services, an independently Chaired Public Weather Service Customer Group (PWSCG) provides a crucial role in representing the interests of the wider public sector and government, including the interest of the general public. Further details on the role of the PWSCG can be found [here](#) and in Annex D.

1.1. Public Weather Service (PWS) Scope

The PWS must equip the UK public, responder organisations and other users of the outputs of the Met Office National Capability with information that enables them to take appropriate decisions and actions to stay safe and thrive. It will provide advice and support learning to enable the effective use of weather, climate, and climate change information.

On behalf of UK citizens at home and abroad, the PWSCG requires the Met Office to provide accurate warnings of severe weather and seamless, timely and accurate weather forecasts for all time periods from nowcasting up to 6 months. Forecasts will cover the whole of the UK, including mountains, islands, and coastal areas.

The products and services are defined by the Customer Supplier Agreement (CSA) and must be delivered to agreed performance standards.

1.2. Public Weather Service (PWS) Principles

The following additional principles will guide development and delivery of PWS services:

- **Value for money** – all PWS services, products and the underlying capability should provide value for money to the taxpayer and deliver social and economic benefits to the UK;
- **User insight** – the development of services and products will be based on a sound understanding of user needs, informed by user engagement, user testing and research together with usage statistics and digital channel analytics;
- **Partnerships and collaboration** – requirements will be developed and delivered working with or collaborating with partners where relevant;
- **Consistency** – products and messages across all delivery channels will be as consistent as possible. User feedback shows that consistency between products and channels is critical for gaining trust in forecasts;
- **Integrity** – all products will be based on sound scientific principles and provide demonstrable value;
- **Resilience** – operational services will be delivered with a high level of resilience and with appropriate levels of support;
- **Verification** – where possible all forecasts will be verified against observations;
- **Compliance** – PWS services and products will comply with all relevant legislation.

1.3. What the Public Weather Service is not

The Public Weather Service provides products and services that are within the scope of PWS and follow the principles laid out above. It does not provide **specialist** products and services; specialist forecasts should be paid for under a commercial contract with the Met Office. The final decision for including a service within the PWS CSA rests with the PWSCG after consideration of the PWS scope and principles.

1.4. What is National Capability?

National Capability comprises the essential observations, common forecast capabilities and infrastructure that underpin all Met Office weather services for PWS and wider UK Governments.

1.5. The Customer Supplier Agreement (CSA)

The CSA is the agreement that is in place between the Secretary of State at the Department for Science, Innovation and Strategy and the Met Office to set out the detailed outcomes that the Met Office must deliver as part of the Public Weather Service. The CSA is signed by three parties; the Senior Civil Servant with policy responsibility for the PWS at DSIT on behalf of the Secretary of State, the Chief Executive Officer at the Met Office and the Chair of the Public Weather Service Customer Group.

During the 2023 refresh, which covers the halfway mark of the 2021-2026 agreement, the CSA has been adjusted to be termed as a rolling 5-year agreement – therefore extended to fulfil 2023-2028. This enables the CSA to support PWS science and services planning across Spending Review periods and identify horizon scanning opportunities. The CSA will therefore be able to support and guide with alignment to the Met Office Strategy as defined in Section 1.6. Funding of PWS will remain aligned to the Finance statement in Section 1 – page 10.

The CSA describes the full range of expectations of capability and services that the PWSCG require from the Met Office. It outlines what products and services are required and is focussed on outcomes and outputs, with a series of associated metrics (performance measures) by which the Met Office will be assessed. Deliverables are also defined detailing PWSCG requirements for pieces of work designed to improve PWS services. The products and services described in the CSA cover a 5-year period, however the CSA is designed to be flexible in the face of evolving circumstances, for example to digital developments, forecasting capability and financial settlements. Therefore, metrics and deliverables will be assessed annually to ensure that they continue to be appropriate, with new deliverables developed as required.

It is recognised that over the timescale of this 5-year rolling agreement, there is potential for some external factors to impact and influence the priorities within the CSA and may impact upon the Met Office's ability to deliver the full ambition described in this Customer Supplier Agreement (CSA). The PWSCG will monitor progress throughout and prioritise delivery as appropriate. These factors include;

- o Global inflationary pressures*
 - o The implementation of a new supercomputer and adjacent supporting technologies*
-

The CSA is written and owned by the PWSCG, with support from the Met Office. The Met Office will write and maintain a service delivery plan to describe how the performance measures and deliverables will be met.

1.6. How does this Customer Supplier Agreement link to the 2019-2024 Met Office strategy

The Met Office strategy is *'helping you make better decisions to stay safe and thrive'* (Figure 1). The PWSCG CSA has been developed to help ensure the Met Office delivers this strategy.

The Met Office vision is to be *'recognised as global leaders in weather and climate science and services in a changing world'*, always striving to be among the world's best national weather and climate services. The PWSCG CSA aims to give the Met Office a framework to deliver services that are focused on what people, organisations and responders want and need, provide good value for money to the UK population, and deliver extraordinary impact and benefit.

The CSA also links to the Met Office values as shown in Figure 1, in the way that PWSCG requires the Met Office to deliver weather forecasts.



Figure 1: Met Office strategy and values (<https://www.metoffice.gov.uk/about-us/who>)

1.7. How does the Public Weather Service tie in with broader UK aims?

The PWS provides direct and indirect benefits to the UK that go beyond the well-known forecast and warning services. Investing in a public weather service and all the underpinning UK infrastructure, science and expertise needed to produce and communicate weather forecasts nationally and internationally provides the UK with an enviable scientific meteorological infrastructure. This infrastructure, which includes world leading supercomputing capability, allows the UK to remain at the forefront of weather and climate science. The services that are provided help to reduce the impact that severe weather has on our lives, not only to stay safe but to mitigate against disruption that would otherwise hit the nation's productivity.

The PWS supports the Met Office to work closely across the UK's 4 Nations, ensuring that the service captures an alignment in needs, ideas and recommendations to drive improvements, ensuring the UK can use weather information to stay safe and thrive.

The PWS supports jobs in the Science, technology, engineering, and mathematics (STEM) sector both in regions of the UK where these opportunities are less prevalent such as the South-West but also in many other regions with a dispersed workforce across the UK, including operational capability in Aberdeen.

The underpinning national capability that the PWS pays for supports the Hadley Centre for Climate Change to carry out its world leading science and research which is key to putting the UK on a path to Net Zero by 2050.

The Met Office has been confirmed as a Category 2 Responder which recognises and formalises the role that it plays in times of severe weather across the UK.

Including the Met Office as a Category 2 Responder was recommended as part of a review of the Civil Contingencies Act in 2021 and recognises the pivotal role it has to play in providing crucial advice and support when it comes to saving lives, protecting property and the economy during times of extreme weather.

Weather and climate advice is becoming increasingly important to national resilience particularly given the increasing frequency and severity of extreme weather. This change in status is an important acknowledgement of the UK's National Weather Service, working in partnership with government and the UK resilience community in the planning and response to emergencies and incidents across the country.

A dedicated team of Civil Contingency Advisors already work closely with Local Resilience Forums and emergency responders across the UK, and this change will allow them to work with in a more consistent and structured way, not only as emergencies unfold but also during emergency planning and multi-agency training exercises helping to highlight potential risks.

The types of incidents that the Met Office is commonly involved in supporting and planning for include impacts from severe storms, periods of extreme heat or cold, plume predictions (such as fires and chemical incidents), events where weather could have a significant impact, as well as offering support to the agencies responsible for forecasting and responding to flooding.

Met Office expertise was recognised during the unprecedented July heatwave in the summer of 2022, where teams across the Met Office played a pivotal role in the run up to and during the event. Support through the Government, the NHS, local authorities', and emergency responders with briefings and guidance showing how in times of exceptional weather, Met Office values come into their own.

PWS funding enables the Met Office to represent UK national interests within several important international organisations. The UK leverages influence on the back of this expertise and reputation forged over many years as a leading player in the field of meteorology. This gives the UK a strong voice in organisations such as EUMETSAT, ensuring the financial contribution from the UK delivers value for money for UK taxpayers. The PWS provides the means for the Met Office to enhance the UK's reputation overseas both amongst its allies but also to develop relationships that are of strategic benefit of the nation. Maintaining diplomatic relations within organisations such as the World Meteorological Organization (WMO), all play their part in ensuring the UK can use its 'soft power' influence to achieve consensus to the benefit of national interest.

Public Sector Information made available for reuse as part of the Met Office's Public Task helps to stimulate a competitive market for weather products and services. This aligns with wider Government objectives to ensure an innovative sector that supports job creation in the fields of artificial intelligence and geospatial data.

1.8. Partnership working

The Met Office should develop services and products, collaborating and working with partners. Where possible it should use groups which are already established such as the Natural Hazards Partnership (<http://www.naturalhazardspartnership.org.uk/>).

The Natural Hazards Partnership (NHP) is a consortium of 19 public bodies (mainly government departments and agencies, trading funds and public sector research establishments) which aims to build on partners' existing natural hazard science, expertise and services to deliver fully coordinated impact-based natural hazard advice for civil contingencies and responder communities and governments across the UK. PWS funds the production of the Daily Hazard Assessment which brings together information in an 'at a glance' overview of potential natural hazards and health implications that could affect the UK over the next 5 days. (<http://www.naturalhazardspartnership.org.uk/products/dha/>) It provides a hazards summary to help increase UK's ability to respond to, and be prepared for multi-hazard events. The Met Office should build upon relationships within NHP where appropriate as it develops services and products within this CSA.

2. Summary

2.1. Executive summary

This CSA was updated in 2023 to cover a rolling period of 5 years (2023-28), with metrics being assessed each year to ensure that they continue to be appropriate, and new deliverables developed each year. Requirements are based on consultations with customers and research and are outlined in detail in this document which describes what the PWSCG require from the Met Office. Four overarching themes are shown in Figure 2.

In summary, the PWSCG requires the Met Office to improve the accuracy of the warning and forecasts that people see and use, get the information to people when and where they need it and ensure the science and collaborations needed to do this are improved. Met Office products and services should be: **Discoverable Accurate, Consistent, Timely and Useful.**



Figure 2: A summary of the CSA themes which define the requirements of the CSA.

In the preceding CSA covering years '21-'22, the Met Office delivered against performance measures and provided regular reports for Theme 4 of the CSA which provides assurance on the national capability and international commitments of the Met Office.

In the CSA for years '22-'23, the Met Office delivered a substantive focus on the Citizens Engagement Strategy – laying out the approach to reaching all members of the UK population, to deliver trusted weather and climate services. '23-'24 will see the implementation of this strategy. The specific deliverables from the CES have been integrated into Themes 1 to 3 where appropriate, and a summary of the CES can be found in Figure 3.

The purpose of the Citizen Engagement Strategy is to:

- Set out the Met Office’s approach to reaching all members of the UK population with *trusted weather and climate services*. This includes harder to reach and vulnerable groups.
- Position the Met Office as *‘the engine’*, driving the UK weather market and an essential component of all weather services. The “engine” means that the Met Office we will aim to make high quality, compelling content and trusted services available either directly or indirectly to all UK citizens.
- By enhancing Met Office direct channels and working with partners to build reach indirectly, the Met Office will be able to provide citizens with *trusted, consistent, useful, accurate and timely information*, when and where they need it, to help them to *make better decisions to stay safe and thrive*.

The results of this work will be carried forward into future years of the CSA, with ongoing performance measures and deliverables tailored to reflect the outcome of this work.

Citizen Engagement Strategy

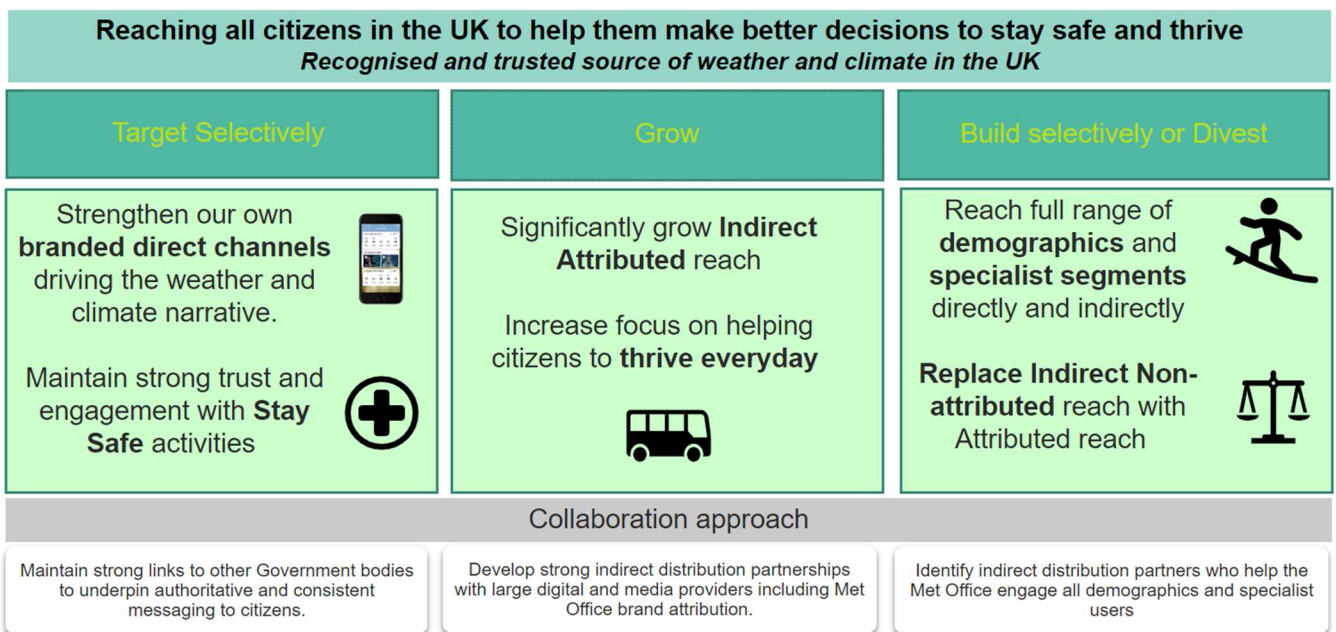


Figure 3: Met Office Citizens Engagement Strategy Summary

3. Themes

The following themes have been developed based on the consultations and research, and to tie in with the Met Office Purpose.

Performance metrics and deliverables have been developed using evidence and information that has been gathered from surveys and research undertaken by the PWSCG, the Met Office and other independent research organisations. These surveys include the Public Perception Survey, Trust Tracker, Consumer Accuracy Index and ad-hoc warning surveys.

3.1 Theme 1: Weather forecasts and warnings when it matters – stay safe:

Accurate weather forecasts and warnings that help people make decisions and change their behaviour.

The Met Office should deliver authoritative, trusted, timely and useful forecasts and warnings when it matters. Warnings for high impact weather should be made available to all users – this includes the public, communities, responders, the media, and government through its responsibilities as a CAT2 responder - in a timely way through the National Severe Weather Warnings Service (NSWWS), Civil Contingency Services, and direct and indirect channels. These warnings and their supporting services should provide information and advice to help mitigate the impacts of the weather that may pose an immediate risk to life and property, such as that shown in Figure 4.

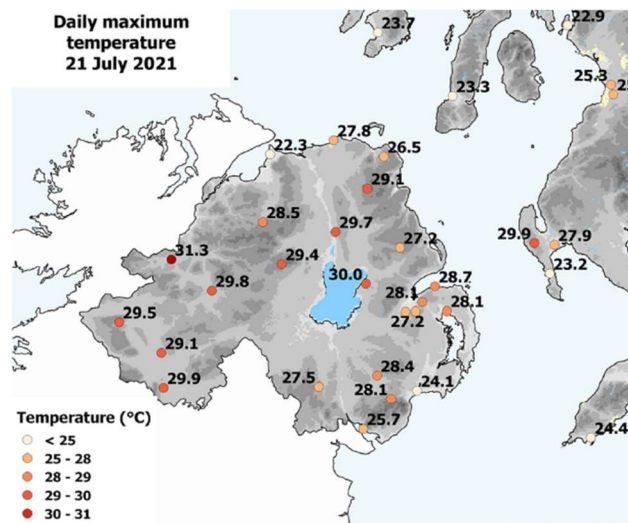


Figure 4: Record breaking temperatures in Northern Ireland during the first Extreme Heat warning issued by the Met Office in 2022.

To meet this aim, there are a range of improvements that the Met Office should seek to make. These improvements are described in full in the following sections, but include improving the accuracy of warnings, including advice on impacts to help people make decisions and drive behaviour change, as well as maintaining and improving the advisor service and the technology used by responders (currently Hazard Manager (HM)).

Why is this a priority?

Warnings and advice from the Met Office, working with partners where appropriate, will enable the public, responders (for example Category 1 and Category 2 responders, community resilience, voluntary organisations etc) and government (for example the Civil Contingencies Secretariat) to take action to mitigate the impacts of weather events that may cause danger or disruption to people, property or infrastructure.

The services and outputs from this theme:

The National Severe Weather Warning Service

The PWS provides the UK's warnings service which issues timely, accurate and authoritative advice to the public, communities, responders, the media, and government about weather which may cause danger or disruption to people, property or infrastructure. This service should be made up of the National Severe Weather Warning Service (NSWWS) impact-based colour coded product, supporting communication information, engagement, education, and civil contingencies services. Figure 5 shows an example of output from the National Severe Weather Warning Service.

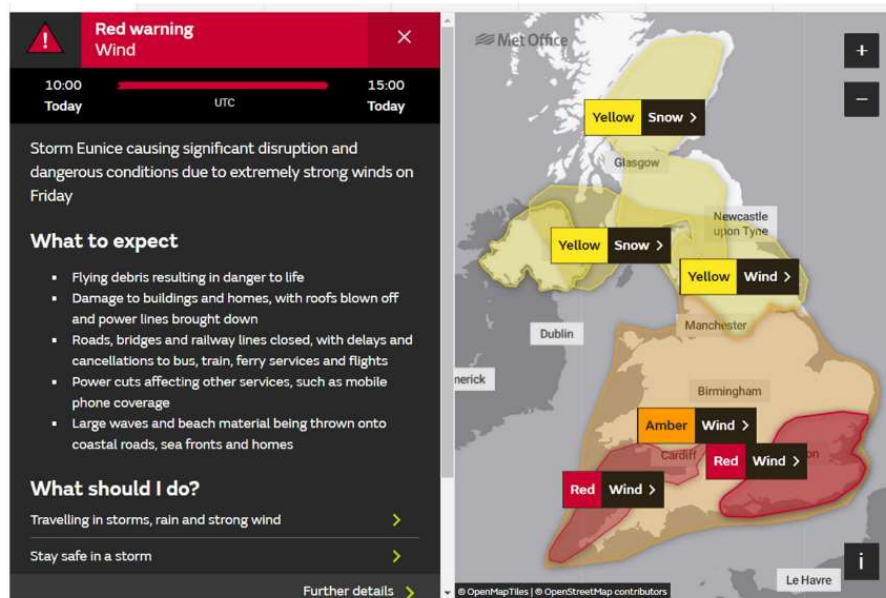


Figure 5: The map of UK warnings for Storm Eunice on the 18th of February 2022. Within the space of one week in February 2022, three named storms affected the UK. This is the first time that this has occurred since storm naming was introduced in 2015/2016.

Civil Contingency Services

The PWS will provide the UK Civil Contingencies Community with relevant, accurate and trusted advice around impactful weather and weather-related natural hazards. A team of Met Office Civil Contingencies Advisors distributed across the UK will integrate with and advise Local Resilience Fora, Civil Contingencies Groups and Partnerships as well as the UK Government and Devolved Administrations. By working closely

with responders, the Advisors will interpret the risks of weather in the context of responder decisions, supported by appropriate online information and expert advice or support.

The Advisors will also provide trusted advice to UK Government around weather and natural hazard events affecting UK interests worldwide. The PWS will also provide forecasts and advice to UK government for weather and atmospheric pollution events that pose a risk to UK citizens, property, or infrastructure abroad. The Met Office will work with partner organisations to coordinate and understand impacts of warnings, including the Environment Agency (EA), Scottish Environment Protection Agency (SEPA), Natural Resources Wales (NRW), Northern Ireland Rivers Agency (NIRA), UK Health Security Agency (UKHSA) and their equivalents in the Devolved Administrations and other members of the Natural Hazard Partnership (NHP). The Met Office will continue to own risks on the National Security Risk Assessment – cold and snow, heat and storms (the Met Office also own Space weather but as this is not a PWS service it is not covered in this CSA).

Safety forecasts

The Met Office will provide weather forecasts and warnings in areas of heightened risk, to ensure the safety of users. This will include mountain, and beach forecasts. These forecasts will be readily available, and developed in partnership with other organisations, such as the Maritime and Coastguard Agency recognising that ‘when it matters’ may also include what may be thought of as benign weather (e.g. hot, calm weather on the beach) and people can become ‘at risk’ when in a situation that is unfamiliar to them or when they are unable to take appropriate action.

PWSCG outcomes required in this theme:

Weather warnings should:

- Be accurate, timely and consistent with other forecast information both within channels and across different channels:
 - Clear start and end times;
 - As much notice as possible (dependent upon confidence);
 - Include context -compared to recent weather/memorable events/weather in the future;
 - Include clear messages around uncertainty, communicating the true risk level;
 - Include warnings of short notice weather events, pulling through nowcasting capabilities and operational improvements made during year 1 of this CSA.
- Give clear and relevant geographical detail:
 - Take a holistic view of warning services; not just warnings but the advice, communications and educational services which support them;
 - Ensure messages are clear and simple even when faced with a complex weather event;
 - Ensure warnings are issued where possible at times when they will get the most impact – e.g. at times when broadcasters can present the information.
- Include context and appropriately tailored advice to drive action and change behaviour:
 - This should be done in collaboration with partners and the media - Key messages with clear advice should be communicated consistently between the Met Office and partner organisations;
 - This advice should be clear about when people should act and what they should do;
 - The true risk level should be clearly communicated;
 - The way confidence and uncertainty of warnings is conveyed should be improved;
 - This should employ social science and marketing and communications expertise to optimise understanding and to drive action.

- Be communicated clearly and appropriately:
 - Be developed, produced, and owned in collaboration or partnership with other organisations and departments, for example through the NHP, to ensure correct messaging, reduce duplication of work whilst allowing all parties to disseminate the same message, reduce confusion and enhance clarity. This includes an attribution framework to enhance Branded attribution, single source attribution, combines source attribution and no attribution options – dependant on the use of content and data.
 - Be tested with users to ensure clear communication;
 - Be accessible via a wide variety of platforms, direct and indirect, improving reach and access;
 - Facilitate sharing of authoritative Met Office warnings by and between partners and third-party platforms and systems following guidelines to ensure that they are used appropriately;
 - Ensure published advice can be integrated into other systems where possible;
 - Ensure there is a suitable platform for civil contingency practitioners which meets their needs, life cycling and updating the technology (e.g. Hazard Manager) as appropriate;
 - Provide global weather advice and information to Government in order to keep UK citizens safe when abroad.
- Align work within a wider UK vision and framework for risk and resilience:
 - Continue to set the standard for weather warning and civil contingency services worldwide;
 - Investigate ways to tailor information to specific users (whilst not creeping into what are rightly specialist services).

There will be a network of Civil Contingency Advisors, that will:

- Be UK-wide, covering all nations and regions;
- Be resilient, with a team structure that enables them to provide a service to responders when required, with additional support from the wider Met Office to provide cover out of hours;
- Give additional information and advice around warnings, weather related hazards and impacts of weather;
- Provide training to responders on weather, natural hazards and use of Met Office products and services;
- Provide support for risk assessment and resilience planning to responders and government;
- Provide information, support and advice to government as requested, for example to support COBR and the resilience aspect of high-profile events such as COP;
- Work with partners to ensure advice to government and responders is consistent and authoritative.

The Met Office should also investigate ways to help keep people safe by:

- Investigating requirements for an extreme cold warning service;
- Implementing recommendations for ensuring that safety forecasts are available when and where they are needed as agreed in the first year of the CSA.

These outcomes will be measured by the Performance Measures, supported by deliverables which can be found in Section 4, Theme 1.

Assurance will be provided through Assurance Reports to the PWS Assurance Group (PAG 1)

The PWSCG sub-group PAG 1 provides additional scrutiny of the Met Office in its delivery of theme 1 safety of life and warning services and will be used to inform the development of reports for the PWSCG.

Many of the performance measures and deliverables are a continuation of work done in the first few years of the CSA.

The Performance Measure reports will provide quantitative and qualitative information detailing the Accuracy of warnings, usefulness and availability of services to stay safe, as well as deliver new services and improvements to the Theme.

The Met Office must assure PAG 1 that progress is being made against the PWSCG requirements included within this theme.

Information within the reports will explain the factors influencing trends in performance and any dips or peaks which occur. Factors which are outside of the influence of the Met Office will be stated. Subject matter experts within the Met Office representing and User Engagement Direct & Indirect Channels, Data Services will present the report to PAG 1 and be available for questions and discussion, to support the PAG in providing their assurance.

3.2 Theme 2: Weather forecasts every day – thrive:

Accurate weather forecasts that people see and use every day.

The Met Office should enable members of the UK public to thrive every day. This means that the Met Office should provide weather information that helps people to make informed everyday decisions that improve their lives and wellbeing, and helps businesses to make decisions that enable them to work more effectively and increase productivity.

To do this, the Met Office should provide authoritative, comprehensive, accurate, consistent, trusted and seamless forecasts for all time periods from hourly to 6 months in the context of a changing climate, and at a quality and accuracy that compares well to other providers. Forecasts will cover the whole of the UK, including mountains, islands, and coastal areas. Figure 6 shows an example of the Met Office Analysis charts produced by the Chief Meteorologists. The most important aspect is that the forecast that people use should align with the weather that they experience. To meet this aim, there are a range of improvements to accuracy that the Met Office should seek to make, described in full in the following sections.

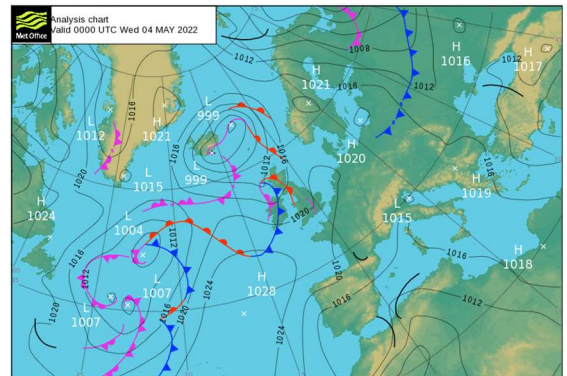


Figure 6: An analysis chart showing Met Office predictions of pressure.

Why is this a priority?

Every year the PWSCG ask the Met Office to work with an external agency to survey the public. This survey asks a representative sample of the public across the UK how they access weather and climate information, how important they think weather forecasts are, how satisfied they are with the key elements of weather forecasts and the survey also assess awareness and usage of forecasts. This is known as the Public Perception Survey (PPS) and the results of this survey in 2022 showed that the most important aspects of a weather forecast are:

- Accuracy;
- Local detail;
- Giving useful information of how a forecast is going to change;
- Usefulness;
- Ease of understanding;
- Ease of use;
- Clear presentation;
- Being provided by a trusted supplier.

Accurate weather forecasts will enable the UK public to thrive in their everyday lives. By providing clear weather information that the public trusts, the Met Office is enabling the public to either perform their daily activities without the concern of weather disruption or to take action to mitigate weather impacts. All improvements in actual accuracy will feed through to improvements in forecasts that people use to stay safe when in unfamiliar situations.

Accurate weather forecasts will also enable businesses (for example agriculture, building, leisure, tourism, green power) to make better decisions to drive effectiveness, improve productivity and efficiency. This will therefore improve their economic impact.

The Met Office should continue to improve the accuracy of weather forecasts throughout the period of the CSA. There are three aspects of accuracy that are important – actual accuracy, perceived accuracy and accuracy relative to other providers (comparative accuracy). Improvements to actual accuracy and comparative accuracy are included in this theme, perceived accuracy is covered in Theme 3.

The services and outputs from this theme:

- Be accurate, timely and consistent with other forecast information both within channels and across different channels:
- Accurate weather forecasts for all time periods from Nowcasts to 6 months;
- The provision of forecasts relevant to health and wellbeing, including for example UV, pollen, and air quality.

PWSCG outcomes required in this theme:

Improvements should be made to the accuracy of forecasts:

- The actual accuracy of precipitation forecasts should improve (this includes rain and snow):
 - Will it be wet or dry?
 - When will it start and stop?
 - How hard will it be?
- There should be a focus on improving the actual accuracy of predicted temperature, especially when it is extreme and newsworthy;
- The Met Office should produce weather forecasts which remain world class in terms of accuracy;
- Ensure that the improvements to local forecasts from IMPROVER are pulled through to all PWS services;
- As the new supercomputer comes online, the PWSCG expects the improvements in underpinning modelling to pull through to improvements in forecast accuracy;

Longer range forecasts should be improved:

- Improve the utility and understanding of the three-month forecast for government and responder communities;
- Implement 14-day forecasts on all Met Office channels;
- Investigate ways of communicating seasonal forecasts to the general public and broadcasters, assessing whether there is anything that this audience can do with seasonal forecast information and whether it would be potentially confusing.

Health forecasts should improve:

- The Met Office, working with partners and other Government Departments as necessary, should investigate ways of pulling through science and delivering useful forecasts for health such as for UV, air quality and pollen – all of which are extremely weather dependent - with improvements identified and made.

These outcomes will be measured by the Performance Measures, supported by deliverables which can be found in Section 4, Theme 2.

Assurance will be provided through Assurance Reports to the PWS Assurance Group (PAG 2)

The PWSCG sub-group PAG 2 provides additional scrutiny of the Met Office in its delivery of theme 2 weather forecasts every day and will be used to inform the development of reports for the PWSCG.

The Performance Measure reports will provide quantitative and qualitative information detailing the accuracy (actual, perceived and comparative) of weather forecast data, public perception and ease of access to make informed decisions to thrive, as well as deliver new services and improvements to the Theme.

The Met Office must assure PAG 2 that progress is being made against the PWSCG requirements included within this theme.

Information within the reports will explain the factors influencing trends in performance and any dips or peaks which occur. Factors which are outside of the influence of the Met Office will be stated.

Subject matter experts within the Met Office representing and Verification, Science and Data Services will present the report to PAG 2 and be available for questions and discussion, to support the PAG in providing their assurance.

Details of these reports are found in Section 4, Theme 2.

3.3 Theme 3: Maintaining an authoritative voice – recognised as global leaders in weather and climate services

Trusted and authoritative weather--- forecasts, accessible when and where people need them.

The other themes of this CSA require the Met Office to produce accurate weather forecasts especially through improvements in the science and technology. However, the Met Office could produce an accurate forecast, but if this is not getting into the hands of the people who need it in a way that is useful and helps them to make decisions then that investment and work is wasted. Recognising the importance of communication and engagement with end users, the Met Office developed the Citizens Engagement Strategy in 2022 with the support of the Customer Group. The purpose of the strategy is to set out and implement the Met Office’s approach to reaching all members of the UK population with trusted weather and climate services.

Met Office products and services should be:

Discoverable; Accurate; Consistent; Useful; Timely.

As the UK’s national weather provider, the Met Office should be the primary source of weather information for the UK population. This can be through direct reach, indirect reach or using data which has been made available via other sources (indirect non-attributed reach). The Met Office should maintain the authoritative voice that establishes it as a trusted and reliable source of weather information, communicating weather forecasts, extreme weather events and climate information in a clear, accessible, consistent, informative, and engaging way.

The Met Office should reach the majority of the UK population across all ages and social demographics. It should demonstrate that it is reaching ‘harder to reach’ audiences and those who are most vulnerable to the impacts of the weather and climate. It should demonstrate the effectiveness of its reach through direct, indirect and indirect non-attributed channels and engage with different audience groups, some of whom may not traditionally access weather information.

The success of Theme 3 is dependent upon the success of Themes 1, 2 and 4 – without the improvements in the science, technology, accuracy and warnings, the Met Office will not be able to maintain its authoritative voice.

Why is this a priority?

Ensuring the Met Office has an authoritative voice and communicates forecasts that are both accurate and useful on a day-to-day basis will ensure that people are aware of the weather and climate, understand how it might impact them and act in order to stay safe and thrive.

The provision of a high-quality authoritative and consistent service will establish trust and brand loyalty between customers and the Met Office, resulting in greater engagement with Met Office Weather Warnings and improving the likelihood that appropriate behaviour change will occur every day and during extreme weather.

Building and maintaining an authoritative brand through Met Office direct channels, such as the Met Office App shown in Figure 7, will encourage third party media channels and organisations to work with it, which increases the reach, use and display of data, forecasts, and warnings.

As described in Theme 2, the most important aspects of a weather forecast as evidenced by the Public Perception Survey are:

- Accuracy;
- Local detail;
- Giving useful information of how a forecast is going to change;
- Usefulness;
- Ease of understanding;
- Ease of use;
- Clear presentation;
- Being provided by a trusted supplier.

It is important that weather forecasts give information that help people make decisions, both when the weather is severe and on a day-to-day basis.

There are three different types of accuracy. Actual accuracy and comparative actual accuracy are covered in theme 2, but the perception of accuracy is interlinked with how the weather is communicated and so perception of accuracy is included here in Theme 3.

The services and outputs from this theme:

- Clearly communicated, accessible, consistent, timely and engaging provision of weather forecasts and weather information that reach the UK population and help them to make decisions and change their behaviour (direct channels);
- High quality presentation of weather forecasts, content and data that are shared with, and where possible developed in conjunction with, partner organisations (indirect channels);
- Maintenance of the Met Office Library and archive, which is a legal obligation under the Public Records Acts 1958 <https://www.metoffice.gov.uk/research/library-and-archive/about-us/our-policies>.

PWSCG outcomes required in this theme:

- The Met Office should provide **trusted** weather and climate information and advice to UK citizens in situations when they need to make decisions and act for themselves and others for reasons of safety, health, or lifestyle. This can be through direct reach, indirect reach or using data which has been made available via other sources (indirect non-attributed reach).
 - The CES will help define the relative proportion of direct and indirect reach required, as well as outline the ways in which the Met Office will reach different sections of the UK population. Examples of direct and indirect reach can be seen in Figure 8.
- The Met Office should continue to strengthen direct channels which are world class and maintain their **authoritative voice** – demonstrating **thought leadership** and **innovation**. Requirements for these direct channels include:
 - Improve the way weather is communicated, thus improving the perception of accuracy of Met Office forecasts:
 - Improve the communication of how the weather will *feel*;
 - Review how symbols or other ways of representing weather in forecasting are seen and understood and make improvements, for example by including ways to represent how heavy rain will be and to fully tell the weather story.



Figure 7: The Met Office app.

- Provide forecasts and warnings that enable the general public to understand the weather within the context of a changing climate and within appropriate historical context: – this information should be provided working in conjunction with the Met Office’s Hadley Centre for Climate Change;
- Include comparison to historical events where appropriate;
- Include more information on how seasons will change, trends of severe weather changes, frequency of severe weather events, comparison of predicted future weather to current extreme weather;
- Raising awareness of climate change and how it will change the weather in the future amongst the public both directly and indirectly.
- Give more information to help people make decisions;
- Use clear language to explain probability and uncertainty in all forecasts and warnings;
- Explain how the forecast is going to change;
- Improving direct engagement with ‘harder to reach’ audiences and those who are most vulnerable to the impacts of the weather and climate.
- The Met Office should also extend the reach of Met Office information and forecasts by:
 - Widening partnership working via, indirect and non-attributed channels to ensure authoritative advice provided by the Met Office has extensive reach to drive action and change behaviours;
 - Data should be **easily accessible**, useable, and be **attributed** to the Met Office where possible;
 - Content should be relevant/bespoke for indirect channels - content partnerships and syndication;
 - The use of partner organisations should be capitalised on;
 - Work with partners to increase the authority of our service by providing content relevant to their area of expertise;
 - Work strategically with weather partners who have competitive capability (whether this be technology or data) to enter different markets;
 - Target harder to reach audiences and drive action;
 - Build social media partnerships (for example via ambassadors or influencers);
 - Encouraging wider use of Met Office data, making it quick and easy to download and use by individuals and government, especially when it comes to warnings.
- The Met Office should ensure that the weather story is the same whatever communication channel is used to view it, and that the information within a channel is also **consistent**:
 - Ensure that communication of forecasts is consistent within all channels - for example, the forecast should match the radar picture, the weather script should match the spot forecast information etc;
 - Show consistent weather forecasts and key messages across channels (website, app etc.).
- The Met Office should continue to raise awareness of the weather and climate change in schools.
- The Met Office should also seek to maintain its authoritative voice via the delivery of a Met Office National Meteorological Library and Archive service that provides weather and climate information to enable the general public and specialist users (i.e. academia) to research and understand the science and history of meteorology and ensures compliance with the Public Records Act 1958.

The recognised engine for trusted weather and climate information, available to all UK citizens, to enhance their decision making to keep them safe and thrive			
	Direct channels	Indirect attributed	Indirect non-attributed
RATIONALE	<ul style="list-style-type: none"> Direct and indirect channels work together –our direct channels showcase our capabilities to channel partners and increase our brand value. They protect against market fragility, always allowing access to Met Office information. The trusted source of the weather story, that people can use every day. 	<ul style="list-style-type: none"> A cost effectively way to reach a very large audience, by being where people naturally go for information. Ensure the National Severe Weather Warning Service (NSWWS) is widely available to protect life and property. Through attribution and well managed partner relationships, we grow recognition and maintain authority through indirect. 	<ul style="list-style-type: none"> Maximising value to the UK economy through encouraging re-use of our data, often driving innovation and economic growth. Forcing attribution would be a barrier that would prevent some companies using our information, for example where Met Office data is used in a blend of model outputs.
STRATEGY	<ul style="list-style-type: none"> Strengthen our apps, web and social media by focusing on accuracy, depth of information and innovation, for use in everyday weather. Reinforce the position of the Met Office as a premium brand who own the severe weather story. Grow our authority across weather and be a recognised voice on climate change. Use our direct channels to increase weather and climate literacy. 	<ul style="list-style-type: none"> Grow the breadth of distribution partners who use Met Office content and attribute us. Extend the Public Weather Media Service (PWMS) to include digital channels. Introduce a new pricing model that removes price as a barrier to being a distribution partner for organisations who could help deliver our reach objective but will not purchase our data. 	<ul style="list-style-type: none"> Drive economic value to the UK by increasing the use of Met Office information in a wide range of third party non-attributed services. Grow the size of the whole weather and climate market. Over time, encourage more third parties to attribute the Met Office, moving them into indirect attributed.
AUDIENCE	<ul style="list-style-type: none"> Citizens from all socio-demographic groups come direct to us at times when the weather really matters. Loyal Met Office customers are more weather and climate literate and value greater depth of information that they can tailor to their needs. 	<ul style="list-style-type: none"> The majority of citizens who access news and information through large media and technology companies. Specific socio-demographic segments - we will target distribution partners who engage with certain audience types that we currently don't engage with directly. 	<ul style="list-style-type: none"> End users - mass market, younger demographics, niche segments. Channel partners – global tech companies, other weather service providers, niche providers.

Figure 8: Met Office table showing examples of direct and indirect reach.

These outcomes will be measured by the Performance Measures, supported by deliverables which can be found in Section 4, Theme 3.

Assurance will be provided through Assurance Reports to the PWS Assurance Group (PAG 3)

The PWSCG sub-group PAG 3 provides additional scrutiny of the Met Office in its delivery of theme 3 maintaining an authoritative voice, and will be used to inform the development of reports for the PWSCG.

The Media and Reach Group (MARG) will also challenge and steer the Met Office to ensure adequate reach through broadcasters and advise on increasing the reach of PWS outputs.

Many of the performance measures and deliverables are a continuation of work completed between 2021-2022. The PWSCG assessed this theme at the mid-year PWSCG meeting in Autumn 2022 to ensure that the requirements were relevant and based on the priorities set by the Citizen Engagement Strategy.

Performance will be reviewed by PAG 3 through submission of Assurance Reports twice per year in the form of a structured paper. These papers will provide quantitative and qualitative information detailing the reach, impact and benefit to UK citizens delivered through services and other outputs. This report will be in addition to other material provided to PAG 3 covering development deliverables that apply to Theme 3.

The Met Office must assure PAG 3 that progress is being made against the PWSCG requirements included within this theme.

Information within the reports will explain the factors influencing trends in performance and any dips or peaks which occur. Factors which are outside of the influence of the Met Office will be stated.

Subject matter experts within the Met Office representing Direct & Indirect Channels, Data Services and User & Corporate Impacts will present the report to PAG 3 and be available for questions and discussion, to support the PAG in providing their assurance.

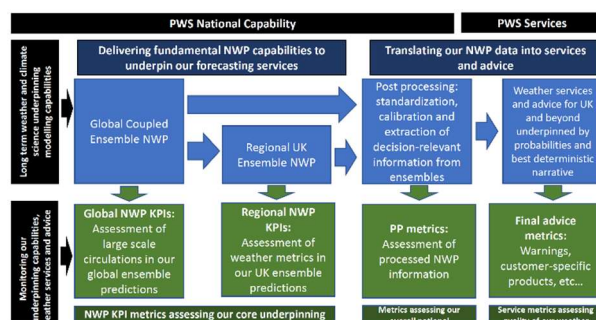
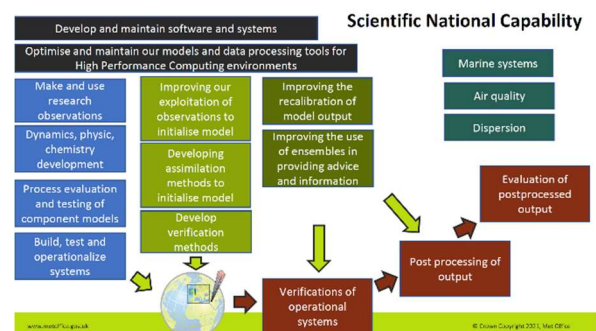
3.4 Theme 4: National capability and international commitments - recognised as global leaders in weather and climate science.

Science, observations, technology and international commitments that underpin weather forecasts and warnings.

The National Capability of the Met Office comprises the essential observations, common forecast capabilities, supercomputer, and infrastructure that underpin all Met Office weather services for PWS and the wider UK government (see Figure 9). The Met Office should ensure that the contribution of science, observations and technology continues to improve the capabilities which enable the requirements set out above to be delivered, i.e. to stay safe, thrive and maintain an authoritative voice. This includes continuing to improve the accuracy of forecasts and warnings, and the provision of consistent information for use within services. Top priorities include improving the accuracy and precision of forecasts of exceptionally high and low temperatures, precipitation (intensity, duration and location) and forecasts of severe weather whose impacts may be reflected within a warning. An additional focus on services that support health and well-being to help the public to stay safe and thrive may require the Met Office to develop capabilities that assist in the evaluation or prediction of UV, pollen and air quality.



Figure 9: The National Capability.



The Met Office Science programme forms part of this National Capability by combining scientific expertise with the subject-matter knowledge and technical skill required to develop and deliver operationally robust forecast systems. This starts with underpinning research into numerical and physical processes, including the coordination of, contribution to, and collaboration with targeted observational campaigns. This research feeds into the development of world-class seamless models, which in turn are used to build forecasting and post-processing systems providing output from hourly to centennial timescales. Collaborative development between scientists and scientific software engineers provides the assurance that these systems are scientifically and technical suitable to meet current and potential future requirements.

Observations are a crucial component and form the start of the chain of what is required to produce a weather forecast. Observations are primarily used to create accurate forecasts (via assimilation into the forecast models), verify the accuracy of forecasts & warnings, directly for users to view within products & services (to enable users to 'see' the current weather) and by meteorologists to provide guidance (especially for short term weather, including severe weather) and to improve the accuracy and usefulness of forecasts curated by a human. Observations are provided in accordance with international standards and to common user requirements which are informed by the scientific value of each observation type.

The Met Office should continue to evolve and enhance its observing networks to address identified capability gaps to enable the delivery of the highest quality forecast possible for the available PWS funding.

The National Capability is dependent upon the global exchange of essential data using common standards for use within forecast and observing systems. Collaboration with international organisations to enhance the exchange of essential data, with a particular aim to address the worsening data gaps globally, is an important component of the National Capability.

A key component of the underpinning national capability is access to supercomputing capability. It is only with the right level of investment in supercomputer resource and the means to efficiently manage the large amount of data that effective pull through of science into improved weather and climate services can be achieved.

The outputs of the National Capability required by the PWSCG include UK, some global observations, and seamless UK & global forecasts from hours to 6 months ahead. These outputs are mostly in the form of data and are used within PWS products & services and to provide advice to the public and UK government. These outputs are also provided to a wide range of government departments and for re-use by academia and by the private sector. Use of the National Capability by sector is summarised in Annex B.

The Met Office as the UK's national met service is well respected and highly regarded internationally and plays an important role in deploying a degree of 'soft power' to the overall benefit of the UK. The Met Office should maintain and, where possible, increase influence within key organisations and collaborations to ensure that UK interests are served. When representing the UK on the international stage the Met Office should seek to maximise the impact of any financial contributions made by the UK Government. If circumstances allow, the Met Office should ensure that interventions and decisions support and further widen UK Government aims and objectives that may be closely linked or aligned to those in weather and climate.

On behalf of the UK, the Met Office is an active member within international organisations and has also established itself as a trusted partner with a number of overseas governments.

The key organisations and institutions that Met Office should maintain an active role in and maintain engagement with to the benefit of the PWS are:

- EUMETSAT
 - The European Organisation for the Exploitation of Meteorological Satellites is an intergovernmental organisation based in Darmstadt, Germany. Currently with 30 Member States, it develops and operates 24/7 primary weather satellites for Europe. It also provides its members access to meteorological satellite data from other agencies.
- ECMWF
 - The European Centre for Medium-range Weather Forecasts. An intergovernmental organisation of 23 member states responsible for delivering numerical weather predictions on the medium and extended range timescales for its members.

- WMO
 - The World Meteorological Organisation is the United Nations specialised Agency responsible for international cooperation in weather, climate, and water. Through its programmes it coordinates the exchange of real time meteorological information between its 193 members and facilitates the capacity development of National Meteorological Services (NMSs) in developing countries through its Voluntary Cooperation Programme (VCP).
- EUMETNET
 - European Meteorological Services Network. An economic interest grouping of European Meteorological Services which organises cooperative programmes relating to surface observations and weather forecasting, to ensure cost-efficient, optimised, Europe-wide composite observing system. Based in Brussels, Belgium.
- ECOMET
 - Economic interest grouping of the National Meteorological Services of the European Economic Area. Operates and maintains an administrative framework to increase access to data and products throughout Europe (for ECOMET Members and 3rd parties). Based in Brussels, Belgium.

The PWS Assurance Group PAG 4 will scrutinise this theme and the Met Office should produce a report as outlined below.

Why is this a priority?

The National Capability underpins the PWS and weather services provided to a wide range of government departments as described above, providing accurate and timely observations and forecasts, and the means through which information is disseminated to users.

Without the national capability and international co-operation and commitments there would be no weather forecasts, the UK would not be able to provide the public or responders with information that will help them stay safe and thrive and the Met Office would not be able to fulfil their public task¹.

The services and outputs from this theme:

- Outputs essential to deliver PWS Services listed within the Annex to this CSA;
- Outputs that provide advice to multiple UK government departments to assist in the mitigation of weather-related risks within the National Risk Register;
- Outputs to Civil Aviation which are regulated by the Civil Aviation Authority (CAA) and which are required to perform to quality standards in accordance with the UK's international obligations, and additional national requirements as applicable;
- Capability essential to underpin outputs to UK government which enable multiple Departments to discharge their responsibilities in line with the UK's National Security Strategy;
- Capabilities that improve the quality of PWS services to meet performance levels required by the PWSCG in this CSA;

¹ The PWS Services and outputs of the National Capability which are listed within the Service Catalogue of this CSA form the Met Office Public Task.

- Capability that exists as part of the Met Office's recognised role by the World Meteorological Organisation (WMO) as the UK's National Meteorological Service;
- Pull through of new capabilities running on the new supercomputer – in conjunction with partners;

A full list of services can be found in the Annex A at the end of this document.

PWSCG requirements for this theme:

The Met Office should focus on:

- Ensuring national capability is constantly developed and its outputs are pulled through from the science to the wide range of users, focussing improvements on accuracy for forecasts that matter most to the user, with a particular focus on precipitation and extreme temperatures, whilst recognising that improvements in the accuracy of all warnings is required to stay safe.
- Ensuring that forecast capabilities on the supercomputer are developed to deliver the performance gains which are reflected within this Customer Supplier Agreement. A new supercomputer with significantly greater capacity is expected to be implemented during 2023/2024, followed by a second capacity upgrade, that will require implementation of a next generation modelling capability, pulling through improvements from the new supercomputer into improved accuracy, products, and services.
- Ensuring that the substantial increase in data volumes from the next supercomputer can be managed efficiently. Service continuity should also be maintained whilst transitioning to the new supercomputer.
- Evolve and life-cycle the UK observational network for the next generation of models, including observations from satellite, radar, surface (land and marine), upper air and from emerging novel sources (including exploiting the internet of things). This should be continuous to deliver the outcomes required through services and to ensure that the next generation models have access to the appropriate quantity and types of observations.
- Engaging with WMO, EUMETSAT, ECMWF, EUMETNET and the wider international community in line with UK Government policy and its priorities, in order to operate as a member of the global weather and climate community.
- Ensuring that absolute and relative verification capabilities are kept up to date and relevant to ensure that the Met Office can measure and report on the accuracy of forecasts as required.

Assurance will be provided through Assurance Reports to the PWS Assurance Group (PAG 4)

The key output of the National Capability is to constantly improve forecasts to stay safe and thrive; the specific service measures are within other themes. For the improvements required in other parts of the CSA to be realised it is critically dependent on the requirements in this theme. Performance will be reviewed through submission of a series of Assurance Reports, in the form of an agreed structured paper detailing development and delivery activities, for discussion with the PWSCG. These reports will include a variety of performance information that apply to the outputs from the National Capability.

The Met Office must therefore assure the PAG that progress is being made within this theme. This should be done through a report to the PAG for their scrutiny at each meeting, outlining any developments or issues which may impact upon the delivery of the Met Office's National Capability. The PWSCG chair, supported by the PWSCG secretariat should also be invited to The Met Office Scientific Advisory Committee (MOSAC) meetings.

	Reporting frequency	Overview of Assurance Reporting
1) Technical Services (Observations) 2) Science 3) Technology	Annual + Interim	October (Interim) – Provide update on Delivery Metrics and BaU activities primarily, interim review on development activities. March (End of Year) – Full assurance report including final position on BaU metrics. Annual review of development activities. Also provide roadmap development activities for the following year.
4) International Commitments	Annual + Ad-hoc following meetings	Annual Review – (March) Review of previous year’s activities – as well as forward look and plans for following year. Ad-hoc information and papers presented following international conferences and meetings of note.
5) Finance	Annual + Interim	October (Interim) – Review of 6-month position of PWS finances March (End of Year) – Review of Annual PWS Finances

The format of the Assurance Reports varies, and the structure of each report is summarised in the information below.

Technical Services (Observations)

The Technical Services Assurance reports provided to the PWSCG will detail:

Service Delivery Activities:

- The quality, availability, and timeliness of observations from across the networks;
- The availability and timeliness of essential data from satellites.

Development Activities:

- Updates on developments that will help deliver the outcomes for PWS outlined in Themes 1-3 of the CSA, including enhancements to observations networks that will result in improved and more resilient measurement of high impact, convective scale weather, including UK rainfall and lightning strikes.

End of year report:

- An annual summary report, focussed on service delivery and development activity, and including key achievements, risks and a roadmap for next year.

Science

The Science Assurance reports provided to the PWSCG for will detail:

Service Delivery Activities:

- Quality (forecast accuracy) of underpinning NWP forecasts;
- Quality of science as reported by Chair of Met Office Service Advisory Committee (MOSAC);
- Relative performance of medium range forecasts provided by ECMWF relative to other global providers.

Development Activities:

- Updates on developments that will help deliver the outcomes for PWS outlined in Themes 1-3 of the CSA, including operational implementation of new post processing capability.

End of year report:

- An annual summary report, focussed on above service delivery and development activity, and including key achievements, risks and a roadmap for next year.

3. Operational Technology

The Operational Technology Assurance reports provided to the PWSCG for discussion will detail:

Service Delivery Activities:

- Availability of critical, underpinning IT infrastructure.
- Availability and timeliness of common forecast capabilities.
- Exchange of essential data between Met Office and other National Meteorological Centres.

Development Activities:

- Updates on developments that will help deliver the PWS outcomes outlined in Themes 1-3 of the CSA.
- Provide updates on the progress of porting essential forecast model capabilities to the new supercomputer
- Service continuity maintained and data flows transitioned to technologies adjacent to new supercomputer (23/24 End of Year Report).
- Benefits of new supercomputer to PWS priorities (annual).
- Update on Met Office Data Roadmap (annual)

End of year report:

- An annual summary report, focussed on above service delivery and development activity, and including key achievements, risks and a roadmap for next year.

4. International Commitments

The International Commitments Annual Assurance report provided to the PWSCG for discussion will detail:

Service Delivery Activities:

- Report on WMO, ECMWF, EUMETSAT and EUMETNET Council/Assembly meetings decisions against Top Level UK/Met Office Objectives and impacts to PWS;
- Report from Met Office staff within influential positions at WMO Technical Commissions: **SERCOM** – The Commission for Weather, Climate Water and Related Environmental **SER**VICES and Applications;
- **INFCOM**– The Commission for Observation, **INF**rastructure and Information Systems;
- *Note: These influential positions may change and will be reviewed annually.*
- Delivery of Voluntary Cooperation Programme against plan, budget and assessment of value for money;

Development Activities:

- UK warnings provided via Meteoalarm issued with messaging that is consistent with direct channels.

End of year report:

- An annual summary report, focussed on above service delivery and development activity, including key achievements, risks and a roadmap for next year.

5. Finance

The bi-annual Finance assurance reports provided to the PWSCG will detail current in-year PWS finances Reports to include a 5-year forward look, incorporating anticipated changes arising from international subscriptions.

4 Summary tables

Theme 1 performance measures and deliverables

1. Weather forecasts and warnings when it matters: Outcomes: All citizens <i>stay safe</i> with improved <i>accurate</i> and <i>consistent forecasts</i>, ensuring everyone make <i>better decisions to stay safe and thrive</i>. Performance Measure Deliverables (PMDs) require development of a performance measure and should be delivered by the date specified in the table.			
Reference	Performance Measure	Metric	Rating frequency
PM1.1	Deliver timely, useful, and accurate warnings to the public and responder community	PM1.1a: Accuracy of warnings should be baseline 80% (with a stretch target of 82% during 23/24), improving to a baseline of 82% by April 2026, verified by the Met Office and PWSCG (rolling 3-year average). 'Very Poor' guidance should constitute less than 20% of warnings. PM1.1b: Accuracy of warnings should be stretch targets of 82% through 23/24. PMD1.1a: Review how timeliness is assessed as part of the subjective verification process, report and implement any changes as part of PM1.1.	Monthly subjective verification meeting and RAG rating November 2024
PM1.2	Ensure warnings reach as much of the UK population as possible	PM1.2a: Awareness of amber and red warnings should be at least 80%, based on ad hoc surveys. PM1.2c: Snow warnings should be at least 85%.	RAG rating as surveys are available
PM1.3	Increase the usefulness of warnings in order to increase action and	Through ad-hoc public surveys, Amber / Red Warnings verified at the following levels: PM1.3a: 'Useful' at least 85%. PM1.3b; 'Very useful' at least 40% - stretch target.	Monthly RAG rating

	drive behaviour change	PM1.3c: 'Action taken' is at least 80%. PMD1.3d: Implement a measure for reach, decision making and action by emergency responders and the resilience community by March 24.	March 2024
PM1.4	Maintain and develop the Met Office Civil Contingency Services	PM1.4a: In biennial responder surveys, achieve >85% satisfaction with Civil Contingency Advisor (CCA) team, PM1.4c: >75% very satisfied - stretch target.	Biennial RAG rating, next survey to be undertaken February 2024
PM1.5	Ensure availability of products and services	PM1.5b: The Hazard Manager IT system should be available to responders for 99.5% of the time when the system is being used. PMD1.5c: Ensure agreed continuity plans and Recovery Time Objectives (RTO) are in place for NSWWS, Hazard Manager, mobile apps and website, PWMS, Weather Data Hub.	Monthly RAG rating May 2024. Thereafter report by exception.
Reference	Objective	Deliverable	Completion date
D1.1	Authoritative, trusted, timely and useful forecasts	D1.1a: Provide Civil Contingency products and services to a wider range of eligible voluntary/community organisations by March 2024.	March 2024
D1.3	Enhance how warnings are created, delivered, viewed and understood	D1.3a: Provide advice within the NSWWS API and include within direct and indirect channels. D1.3b: Improve the simplicity of the visualisation of multiple or complex warnings at a national scale to support use and understanding by the public, broadcasters and national responders, enabling enhanced decision making and action of warnings. D1.3c: Implement improvements agreed as a recommendation of D1.5 to communication of nowcasting information. D1.3d: Undertake a review and implement recommendations of thunderstorm, lightning and rain warnings, agreed by the Customer Group.	April 2024 May 2025 March 2025 May 2025

		D1.3e: Undertake a re review into the use of emergency alerting during severe weather, implement any actions agreed with the Customer Group.	March 2025
D1.4	Authoritative, trusted, timely and useful warnings	D1.4: Review the need for a Cold Weather warning. Alongside partners, including health departments across the UK, launch the warning if required or undertake other follow-up action.	October 2024
D1.6	Implement improvements to website and app based on user needs, including safety forecasts and health	D1.6b: Deliver improvements to increase visibility of mountain hazard information and access to mountain safety forecasts. D1.6c: Implement recommendations to support output from D2.2 – pull through the science and information relating to health, including forecasts of UV, pollen & air quality.	November 2023 October 2025

Theme 2 performance measures, deliverables and reports

2. Weather forecasts everyday – thrive			
Outcomes: All UK citizens are provided with improved accuracy and consistency to help them make better decisions to stay safe and thrive, when the weather really matters to them. PMDs require development of a performance measure and should be delivered by the date specified in the table.			
Reference	Performance Measure	Metric	Rating frequency
PM2.0	Improve the accuracy of forecasts, particularly improving the accuracy of extremes and precipitation	PMD2.0a: Create new verification scheme for forecast that are available through Web and App.	Annual reporting at PAG 2.
PM2.1	Ensure availability of products and services, including digital channels, scripts, forecasts, observations, and the Public Weather Media Service (PWMS)	PM2.1a: Availability of digital channels >99.5%. PM2.1b: Availability of products by the specified publication time >98.5%.	Monthly RAG rating.
PM2.2	The Met Office should be very accurate when compared to other weather providers	PM2.2a: The Met Office ranks in the Top 3 reported weather providers for accuracy. PMD2.2b: Review methodology for measuring comparative accuracy.	Quarterly Report. Report to PWSCG in Oct 2023

PM2.5	Action taken by the public after seeing or hearing a Met Office forecast	PM2.5: Reported annually as measured via the Public Perception Survey and compared to previous years (21/22 CSA PM3.1a). Ensure public action levels do not drop below 85%.	Reported annually following survey.
PM2.6	Trust held by the public in the Met Office	PM2.6: Measured quarterly via the Corporate Trust Tracker: PM2.6a: Achieve an end of year 80% combined trust score. PM2.6b: Achieve an end of year 50% trust a lot score - stretch target.	Reported quarterly, as an average at end of year.
PM2.7	Public Perceptions of forecast accuracy	PM2.7: Public Perceptions of forecast accuracy (direct channels) measured by the Consumer Accuracy Index (CAI): PM2.7a: Improve composite scores to 79% in year 3 of the CSA period (2024). PM2.7b: Improve composite scores to 82% by the end of the CSA period (2026).	Reported quarterly, as an average at end of year.
PM2.8	Public Perceptions of forecast accuracy	Public Perceptions of forecast accuracy (UK weather market), measured via the Public Perception Survey. Weather forecasts should be viewed as: PM2.8a: "Fairly accurate" or "Very accurate" by at least 80% of the UK public. PM2.8b: "Very accurate" by 13% of the UK public - a stretch target.	Reported annually following survey.
PM2.9	Public Perceptions of forecast usefulness (UK weather market)	PM 2.9: Public Perceptions of forecast usefulness (UK weather market), measured annually via the Public Perception Survey: PM2.9a: 40% of the public should rate the usefulness of forecasts as 'very useful'. This is a stretch target.	Reported annually following survey.

		<p>PM2.9b: More than 87% should rate forecasts as 'fairly useful' or 'very useful'.</p> <p>PMD2.9c: Update PPS survey questions to fully align with the CES outcomes, including establishing benchmarks for innovation and consistency.</p> <p>PMD2.9d: Implement a new more responsive public feedback mechanism to test public feedback and perceptions.</p>	<p>December 2023</p> <p>March 2024</p>
Reference	Outcome	Deliverable	Completion date
D2.3	Launch content covering 14-day forecast period	<p>D2.3 a: Met Officer to deliver an interim 14-day forecast or outlook.</p> <p>D2.3 b: Met Office to deliver 14-day data to app/website.</p>	<p>October 2023</p> <p>June 2025</p>
D2.5	Pull-through of forecasts from enhanced post-processing capability into PWS products and services to improve accuracy and consistency	<p>D2.5a: Building on D3.1d, enhanced post processing in table and maps on web and apps, and maps in Hazard Manager.</p> <p>D2.5b: Further upgrade to web, apps and Hazard Manager using post-processed ensembles.</p>	<p>October 2024</p> <p>January 2025</p>
D2.6	Continuous development of Weather Data Hub, to improve the user experience, capabilities and provide additional data sets	<p>D2.6a: Deterministic Post-processed datasets available on Weather Data Hub.</p> <p>D2.6b: Post-processed ensemble dataset available on Weather Data Hub.</p> <p>D2.6c: Historical forecast dataset available Hub.</p>	<p>December 2023</p> <p>December 2024</p> <p>December 2025</p>
Reference	Outcome	PAG2 Annual Reports	Completion date

R2.1	Improved Accuracy and Consistency	Monitoring of the actual accuracy of the forecast.	Monthly monitoring, annual report at March PAG 2
R2.2	Improved Accuracy and Consistency	Deliver improvements to actual accuracy of forecasts based on the Met Office Roadmap.	Annual report at March PAG 2

Theme 3 performance measures, deliverables and reports

3. Authoritative voice, with enhanced reach of timely and trusted weather information through direct and indirect channels			
Outcomes:			
<ul style="list-style-type: none"> - All citizens make better decisions to stay safe and thrive. - Met Office is the recognised engine and trusted source of weather and climate in the UK. - Enhance the provision of timely, trusted and useful content available to citizens through direct and increasingly indirect channels. - Strengthen Met Office direct channels, demonstrating thought leadership and innovation through high quality, compelling and trusted services. - Increased levels of citizen engagement with attributed Met Office information through indirect channels. 			
PMDs require development of a performance measure and should be delivered by the date specified in the table.			
Reference	Performance Measure	Requirements	Due
PM3.6	Increase awareness of the Met Office as the recognised engine of weather in the UK	Increase awareness of the Met Office as the source of weather in the UK from 38% on the Met Office Trust Tracker.	Reported quarterly, with annual average.
PM3.7	Increased levels of citizen engagement with attributed Met Office information through indirect channels	PMD3.7a: Develop a new form of measurement for demonstrating engagement via indirect channels.	April 2024
PM3.8	Strengthen Met Office direct channels, demonstrating thought leadership and innovation through high quality, compelling and trusted services	PMD3.8d: Develop a new form of measurement for demonstrating engagement via direct Met Office channels.	April 2024
Reference	Outcome	Deliverable	Completion date

D3.1	Continuous development of Direct Channels including new features to enable greater use of content and the ability to target segments of users whilst maintaining high usability standards required by public digital services	<p>D3.1f: Implement recommendations agreed by PWSCG in 21/22 to deliver the self-briefing capability for media broadcasters.</p> <p>D3.1g: Provide content to underserved segments (e.g. small business and learning) on Met Office direct channels.</p> <p>D3.1h: Demonstrate on Met Office direct channels new ways to improve decision making, consistency and accuracy, (e.g. communicating forecast uncertainty).</p>	<p>December 2025</p> <p>March 2026</p> <p>October 2024</p>
D3.2	Increased levels of citizen engagement with attributed Met Office information through indirect channels	<p>D3.2e: Growth of third-party services: Attributed reach recorded from 3 additional providers by March 2024 and a further 20 by March 2025.</p> <p>D3.2f: Launch version 1 of PWDS and attribution policy applied, by March 2024. (Version 1 will include existing content – written text, presented videos and animated graphics).</p> <p>D3.2g: Additional content & data sets within Version 2 of the Public Weather Data Service by March 2025, (including web map services, gridded and spot data, observations, health, sea and mountain forecasts).</p> <p>D3.2h: Make climate data available from Public Weather Media Service.</p>	<p>March 2024; March 2025</p> <p>March 2024</p> <p>March 2025</p> <p>December 2025</p>
D3.4	Improve capabilities to syndicate content to media outlets and super publishers	<p>D3.4c: Implement enhanced syndication capability (RSS Feed - Really Simple Syndication) to super publishers.</p> <p>D3.4d: Redesign syndication email (including embedded link to access video) and reintroduce the early morning and weekend syndication email.</p>	<p>December 2023</p> <p>October 2023</p>

D3.5	Improve access to content (direct and indirect) and information to drive decision making	<p>D3.5a: Increase video content production to 7 days a week capability.</p> <p>D3.5b: Improve access to video content on direct channels.</p> <p>D3.5c: Create new content and deliver via direct and indirect channels e.g. re-use of Chief Meteorologists guidance, weather extremes.</p> <p>D3.5d: Improve the effectiveness of the editorial process to drive consistency of narrative and enable the Met Office to react to the key weather and climate topics of the day.</p>	<p>December 2023</p> <p>April 2024</p> <p>March 2024</p> <p>December 2023</p>
D3.6	Met Office is the recognised engine and trusted source of weather and climate in the UK.	<p>D3.6c: Climate change attribution applied to high-profile severe weather and communicated via the weather narrative.</p> <p>D3.6d: Raise public awareness of the unique role that the Met Office plays in the UK weather industry, and the range of places that they can access Met Office information.</p>	<p>October 2023</p> <p>August 2025</p>
Reference	Assurance report	Requirements	Due
R3.1	Engagement through Direct Channels	Report showcasing improvements in engagement and decision making via Met Office Channels.	September (Interim)
R3.2	Engagement through Indirect Channels	Report providing data showcasing increases in the percentage population accessing Met Office information via indirect Channels and partner satisfaction in the services.	March (End of Year)
R3.3	Impact, Building Trust and Maintaining an Authoritative Voice	Report demonstrating the trust and accuracy in Met Office services, supporting the recognition as the engine behind the UK weather forecasts.	

Annex A: Products and Services Catalogue

List of all the products and services that constitute the Met Office Public Task. Some of these products and services are not directly mentioned in the CSA but are included here for completeness.

All products and services are delivered against at least one of the Theme aims and are included only once in the below summary under the Theme they are most aligned to. However, please note that some products and services do contribute to the success of more than one Theme.

Theme Products and Services

Theme 1 – Weather forecasts and warnings when it matters – Stay Safe	
UK	
Services	Civil Contingency Advisors Hazard Manager NSWWS [National Severe Weather Warning Service] (service) – includes supporting communications, engagement, and education provision. Avalanche support services Gov e-mail Delivery Central Guidance Unit services (UK Operational forecast expertise)
Products	NSWWS (product) Daily Hazard Assessment Short notice warnings CHEMET (Area and Plume forecast for hazardous chemical releases) Three-month Outlook Heat warnings
International	
Services	RSMC (Regional Specialist Met Centre) – allocated by WMO for Atmospheric Transportation Modelling Services Meteoalarm (European warnings information service) Atmospheric pollution service Advice to Government Hurricane Season Forecasts Crisis Area Modelling International support services (briefing to UK government) Global Guidance Unit Services (GGU) (Global Operational forecast expertise)
Products	Global Long Range Outlook (Produced by Science) Global daily weather impact assessment Global incident forecasts International atmospheric pollution services Severe weather assessments

Theme 2 – Weather forecasts and warnings everyday - thrive	
Services	Met Office Website Met Office Mobile Apps Met Office Mobile Widget Alexa skill and Flash briefing
Products	7-day site specific and mapped forecasts across the UK Operational Forecasts <ul style="list-style-type: none"> • National and Regional video forecasts • Text forecasts • Weather forecast charts Weather related website and App content (text chart and video) Pollen forecasts (5 day pollen forecast service March-October) Mountain forecasts Beach forecasts UK event forecasts UK climate information UV forecasts Current Observations, including radar, satellite and surface based Historical Observations

Theme 3 – Maintaining an authoritative voice – recognised as world leaders in weather and climate services.	
Services	New and Emerging channels Social Media Channels Management Weather Desk (Met Office 24hr helpdesk) National Meteorological Library and Archive (digital and analogue archives) Public Weather Media Service (PWMS) Presenter Visual Cortex licence and support (with 3 rd party funding) Design Services Press Office Communications and weather campaigns Syndication services Marketing and market intelligence Schools Programme of services
Products	Bespoke Graphics Production Media Briefings from specialists (media services team and others) Briefings and scripts Downloadable weather-related curriculum for 7-14 year olds
Data Services	Weather DataHub (Link here) Datapoint (deprecated to be decommissioned) (Link here) Data Provisioning (PSI re-use data catalogue) (Link here) Weather observations Website (WOW) (Link here)

Theme 4: National capability and international commitments - recognised as global leaders in weather and climate science

Reports from Technical Services (Observations), Science, Operational Technology, International Commitments and Finance are provided to the PAG for assurance purposes, giving detail on the performance of service delivery and progress made in development activities which contribute to the lifecycle plans of products and services detailed above under themes 1 to 3.

Observations, Science and Technology capabilities listed within tables below undergo regular life-cycling which includes transformation to cloud based technologies. Tables will be refreshed annually and may not precisely reflect the latest configuration of underpinning capabilities.

<p>Technical Services (Observations)</p>	<p>Global satellite reception UK radar network UK land observations UK upper air observations Marine observations (Buoys, Voluntary observing ships, Argo Floats) Lightning observations UK AMDAR (Aircraft Meteorological Data Relay) WOW observations (Weather Observations Website) (Also included above in Theme 3) European and Global observations – exchange and collaborations Spectrum and Safeguarding Observations data quality control Climate Observations Historical Data</p>
<p>Science</p>	<p>Forecast Models <i>Atmospheric NWP</i> Global Model Deterministic UK Model Deterministic Local Area Model London Global Ensemble UK Ensemble (available for re-use 2022)</p> <p><i>Atmospheric – Extended range</i> Met Office Global Seasonal Forecasting System – Monthly (with 3rd party funding) Met Office Global Seasonal Forecasting System – Seasonal (with 3rd party funding) Met Office Global Seasonal Forecasting System – Hindcast (with 3rd party funding) <u>(Data available for re-use through Copernicus – link here)</u></p> <p><i>Dispersion Models</i> NAME (Numerical Atmospheric Dispersion Modelling Environment) (Supports Theme 1 CHEMET, RSMC and CTBTO services) UK Air Quality Unified Model (UK AQUM)</p> <p><i>Marine Models</i> Global Wave Model UK Wave Model</p>

	<p>Atlantic Wave Model Ensemble OSTIA Foundation Sea Surface Temperature and Sea Ice Analysis Global Forecasting Ocean Assimilation Model (Global FOAM) North West Shelf Seas Forecasting Ocean Assimilation Model European Shelf Seas (AMM15) (with 3rd party funding) UK surge model UK surge ensemble model Global Ocean (with 3rd party funding)</p> <p><i>Science Capability</i> Atmospheric model evaluation & development Atmospheric physics & parameterisations Data Assimilation Satellite applications Verification (capabilities and outputs) Dynamics research Post processing (Gridded, Site specific, climatological record) Impact modelling Observation based research Observations systems research Weather Science IT Informatics Atmospheric dispersion Science partnerships Ocean forecasting Climate science IT Climate monitoring & attribution</p> <p><i>Other Centres - ECMWF</i> European Centre for Medium Range Weather Forecasting (ECMWF) - Global Deterministic Model, - Global Ensemble Model, - Monthly - Seasonal</p>
Technology	<p><u>Technology</u> Supercomputing (HPC Exeter, HPC ECMWF) Other Compute (Physical, Virtual, Container, Function) Hosting (On Premise, Public Cloud) Storage (Object, Block, File System) Connectivity (LAN, WAN, Internet, Partner)</p> <p><i>Technology Applications</i> Platform Engineering (Databases, IDAM, Machine Learning etc) Software Development (Design, Build, Test, Integrate, Deploy) Application Lifecycle Management (On-Board, Configuration, Customisation, Retirement) IT Service Management (Design, Transition, Operation, Improvement, Retirement)</p>

	<p><i>Data</i></p> <p>Data Transport (Data Transfer, Data Traffic Management)</p> <p>Data Management (Common Reference, Common Metadata, Data Catalogue, Common Functions)</p> <p>Data Platform (Data Services, Data Pipelines, Data Lake, Interactive Data Environments)</p> <p>Data Supply (Observation, Simulation, Standardise, Post-Processing, Productise, Supply)</p> <p><i>Data Science (Data Science Research)</i></p>
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International Commitments	<p>World Meteorological Organisation (WMO)</p> <p>European Centre for Medium-Range weather forecasts (ECMWF)</p> <p>European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)</p> <p>EUMETNET (network of 31 European National Met Services)</p> <p>WMO Voluntary Co-operation Programme (VCP)</p> <p>European Economic Interest Group (ECOMET)</p>

Annex C: Glossary and Terms of Expression

Accuracy	There are three types of accuracy typically referred to by the Met Office. Actual accuracy represents how well the weather forecast at a particular location represents the true weather conditions observed at that location. Perceived accuracy represents how accurate Met Office users/customers believe the forecast(s) to be, based on feedback from market research. Comparative accuracy refers to how accurate the Met Office is compared to other weather providers, and this can be judged via actual accuracy measures or and perceived accuracy measures. However, the definitive comparison is based on actual accuracy
Ad hoc surveys following severe weather	The Met Office commission surveys a number of times each year in consultation with the PWSCG Secretariat after the issuing of an amber or red warning. The surveys aim to monitor the awareness and usefulness of the warnings and establish any actions taken by the public as a result. Up to 6 surveys are carried out per year.
Authoritative voice	The term ' authoritative voice ' is being used here as a general term to describe the Met Office as a trusted, expert service provider that partners choose to use. It should be noted that across the international meteorological community it is used for a more specific purpose, to describe the NMHS responsibilities for delivering non-discretionary services that provide safety of life services – such as NSWWS for example. It's a concept designed to guard against contradictory warnings in serious weather situations. Work is currently underway in the Met Office to better define the different uses of the term authoritative voice and this will be shared with the PWS Customer Group when it becomes available.
BGS	British Geological Survey is a partly publicly funded body which aims to advance geoscientific knowledge of the United Kingdom landmass and its continental shelf by means of systematic surveying, monitoring and research
CAA	Civil Aviation Authority is a DfT agency and the UK's specialist aviation regulator
CAI	Consumer Accuracy Index is an output measure from the Perceptions of Accuracy Omnibus survey which helps the Met Office to understand and monitor the drivers of consumer accuracy ratings amongst weather service users.
CCS	Cabinet Office Civil Contingency Secretariat supports the Prime Minister and Cabinet, and leads the wider government effort, on civil emergency planning and response.
Channels	Direct channel: Met Office provides content or services directly to the public and where the public are interacting directly with the Met Office. <i>E.g. Met Office website, Met Office app, Met Office weather desk, Met Office social media *</i> *Met Office social media really is a 'rented channel', e.g. through Facebook or Twitter, as the Met Office do not own the platform. However, it is included in direct as the public feel that they are interacting personally with the Met Office. Indirect channel: Met Office provides weather services to an intermediary, who then pass this on to the public. It may go through more than one intermediary and the initial content from the Met Office may change as it passes through an intermediary. <i>E.g. Public Weather Media Service and broadcast media, data services, content syndication, Met Office for Schools programme.</i>
CSA	Customer Supplier Agreement – the document which sets out what products and services the Public Weather Service will provide, which form the basis of the Met Office's Public Task. The CSA defines the key performance measures that will ensure PWS is being delivered to the required standard and deliverables that will need to be reached in order to ensure the ongoing development of the PWS.
DHA	Daily Hazards Assessment is a provided by the Natural Hazards Partnership, and is an 'at a glance' overview of potential natural hazards and health implications that could affect the UK over the next 5 days. It provides a hazards summary to help increase UK's ability to respond to and be prepared for multi-hazard events.

D	Deliverables are pieces of work designed to make improvements to PWS services. Deliverables are defined within the CSA and assessed for delivery. Note - Each deliverable has a unique identifier so that they can be tracked through the course of the CSA – therefore may not be seen in the CSA in sequence, however are tracked by the Secretariat.
EA	Environment Agency a Department for Environment, Food & Rural Affairs body which works to create better places for people and wildlife, and support sustainable development, and is responsible for flood warnings in England
ECMWF	European Centre for Medium-range Weather Forecasts a non-EU intergovernmental treaty organisation hosted in the UK. It is both a research institute and a 24/7 operational service producing & disseminating medium range numerical weather predictions to its Member States.
ECOMET	An economic interest grouping of European Meteorological Services which operates and maintains an administrative framework to increase access to data and products throughout Europe (for ECOMET Members and 3rd parties). Based in Brussels, Belgium.
Emergency responder survey	The Emergency responder survey is carried out by the Met Office every 2 years to get feedback from the responder community on Met Office services.
Emergency Responder workshops	The Met Office and PWSCG run workshops with the responder community, when appropriate, to test the effectiveness of the current service offer and to inform where changes and improvements to the service could be made in the future.
Engine	The Met Office should be the Recognised Engine or understood by the public to be the strong influence on the UK weather forecast.
EUMETNET	A non-EU grouping of 31 European National Meteorological Services that provides a framework to organise co-operative programmes between its Members in the various fields of basic meteorological activities
EUMETSAT	The European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) a non-EU intergovernmental treaty organisation responsible for the launch and operation of European weather satellites and delivering satellite data to National Met Services.
Hadley Centre for Climate Science and Services	The Met Office Hadley Centre — named in honour of George Hadley — is one of the United Kingdom's leading centres for the study of scientific issues associated with climate change. It is part of, and based at the headquarters of the Met Office in Exeter. See also (MO)HCCP.
Heatwave	A heatwave is an extended period of hot weather relative to the expected conditions of the area at that time of year, which may be accompanied by high humidity. A UK heatwave threshold is met when a location records a period of at least three consecutive days with daily maximum temperatures meeting or exceeding the heatwave temperature threshold. The threshold varies by UK county and can be found on the Met Office website here .
Extreme Heat Warning	The Extreme Heat Warning is an impact-based warning designed to highlight the potential impacts of extreme heat to protect lives and property, helping people make better decisions to stay safe and thrive. These are UK wide impact-based warnings, with medium or high likelihood of medium or high level impacts to transport, energy supply and other areas as well as health (i.e. amber or red warnings), will be distinct from the heatwave definition and heat health alerts described above, and cover impacts to the general population (not just the vulnerable) and to infrastructure.
HPC	High Performance Computer or supercomputer
MARG	Media & Reach Group - a sub-group of PWSCG with the mandate to provide assurance to the Chair of the PWSCG in the following areas. The outputs of the Public Weather Service provide adequate 'reach' to help demonstrate value for money for PWS. There is consistency in the delivered message of those outputs across the various media channels. The Public Weather Media Service (PWMS) is operating in a way that meets the needs of the broadcasters using it.
MCA	Maritime & Coastguard Agency – an Executive Agency of the Department for Transport, which works to prevent the loss of life on the coast and at sea.

MOB	Met Office Board - The main role of the Met Office Board (“the Board”) is to support, constructively challenge and provide leadership to the Executive Board, including the Accounting Officer. It should also ensure that the Met Office is working within a framework of prudent and effective governance arrangements and controls which enable risk to be appropriately assessed and managed.
(MO)HCCP	(Met Office) Hadley Centre Climate Programme - a programme of work which develops core UK climate science infrastructure and serves the needs of the UK Government by providing policy-relevant scientific evidence and advice in the post-Paris context.
MOSAC	The Met Office Scientific Advisory Committee (MOSAC) a committee of external independent experts which reviews the Met Office's science programmes annually and raises any scientific concerns in relation to the ability of the Met Office's research plans to meet its customer's requirements and its own strategic aims.
NHP	Natural Hazard Partnership is a collaboration between UK public bodies to provide authoritative, consistent, and useful, hazard, impact and risk assessment information to responder communities and governments.
National Capability	National Capability comprises the essential observations, <i>common</i> forecast capabilities and infrastructure that underpin all Met Office weather services for PWS and wider UK Government.
NMS	National Met Service an organisation whose mission is to observe, understand and predict the weather and climate of its country and to provide meteorological and related services in support of its national needs and international obligations. It thus involves an essentially five-fold mission of monitoring, research, modelling, service provision and international co-operation.
NRR	The National Risk Register describes the risks of major emergencies that could affect the UK in the next five years and provides resilience advice and guidance. This is the public facing version of the NSRA
NRW	Natural Resources Wales is a Welsh Government sponsored body, which aims to pursue sustainable management of natural resources in Wales and is responsible for flood warnings in Wales.
NSAG	National Security Advisory Group
NSRA	National Security Risk Assessment is designed to compare, assess and prioritise all major disruptive risks to the UK's national security.
NSWWS	National Severe Weather Warning Service is a service provided by the Met Office in the United Kingdom. The purpose of this service is to warn the public and emergency responders of severe or hazardous weather which has the potential to cause danger to life or widespread disruption.
NSWWS survey	An NSWWS survey is an online survey following severe weather events with Emergency Responders. They are commissioned when required.
PAG	Public Weather Service Assurance Group - a sub-group of Public Weather Service Customer Group which provides additional scrutiny of each theme of the CSA and provide assurance of the financial management of PWS funds by the Met Office.
PM	Performance Measures are metrics used to assess PWS performance during the year, as defined by the CSA. Note - Each performance measure has a unique identifier so that they can be tracked through the course of the CSA – therefore may not be seen in the CSA in sequence, however are tracked by the Secretariat.
PMD	Performance Measure Deliverables require the Met Office to complete a body of work to support the Performance Measure. Note - Each performance measure deliverable has a unique identifier so that they can be tracked through the course of the CSA – therefore may not be seen in the CSA in sequence, however are tracked by the Secretariat.
Perceptions of Accuracy Omnibus	The Perceptions of Accuracy Omnibus survey is performed to understand and monitor the drivers of accuracy amongst the Met Office and other weather service providers. Output is a Customer Accuracy Indicator.

PPS	The Public Perception Survey is commissioned annually by the Met Office (usually in the autumn) with the aim of assessing the satisfaction levels of the general public in respect of the weather forecasts generally and the services provided by PWS.
Public Sector Information	Public Sector Information means information produced, held or disseminated by the Met Office within its Public Task and in scope of the Re-Use of Public Sector Information Regulations 2015.
Public Task	Public Task means the delivery of the PWS Outputs, which the Met Office is empowered to deliver pursuant to the Meteorological Office Trading Fund Order 1996 No. 774 (as amended).
PWS	The Public Weather Service for the UK as set out in Section 2.
PWS Outputs	The deliverables for the PWS as set out in the Products and Services Catalogue at Annex A of Section 2.
PWMS	The Public Weather Media Service is a package of free (under licence) UK weather services, for eligible UK Broadcasters who sign up to the service, which is delivered by media-specialist Met Office forecasters. It provides Broadcasters with Met Office public weather service information for the UK (forecasts, weather warnings, observations, guidance, scripts and services), tailored for Broadcast media.
PWSCG	Public Weather Service Customer Group – acts as customer on behalf of the public and public sector users of the Public weather Service. Chair is a Ministerial appointment, membership includes an independent member (receives an honorarium from DSIT) to represent the views of the public, representatives from the emergency response community, the Devolved Administrations and Departmental and Arms Length Body users of the PWS.
Reach	Met Office Reach The number of people who see Met Office information or accesses its products or services via direct or indirect channels. Strongly branded Met Office reach through Met Office owned channels direct to the public. Indirect reach: Branded reach of Met Office forecasts of information achieved via a partner or 3 rd party. Information provided through a partner has a limited degree of intervention between the information leaving the Met Office and it arriving with the general public due to an agreement with the partner, and includes branded content. Information provided through a third party could be Met Office attributed and the Met Office has less control of the final message. Indirect non-attributed reach: Reach of Met Office data and presented via a third party, not attributed to or branded Met Office. Data often blended with other types of data.
Share of Claimed Usage	The Met Office's claimed share of usage is a statistic derived from Public Perception Survey responses about where and how often people access weather forecasts, which provides an indication of the most used sources of everyday weather information in the UK.
SEPA	Scottish Environment Protection Agency is Scotland's principal environmental regulator, protecting and improving Scotland's environment and is responsible for flood warnings in Scotland.
Thought Leadership	The Met Office should show that based on its experience and industry perspective, offers unique guidance, inspires innovation and influences other others.
Trust	Trust is a general brand perception measure. Brand trust is defined as the willingness of the average consumer to rely on the ability of the brand to perform its stated function (Journal of Global Strategic Management) The Met Office measures its trust score via its quarterly trust tracker survey via the following question: The Met Office is the UK's national meteorological service. It provides a range of weather and climate services for the public, governments and businesses. To what extent do you trust the Met Office in general?
UKHSA	UK Health Security Agency which exists to protect and improve the nation's health and wellbeing, and reduce health inequalities.

Weather-Health Alert System	A Weather-Health alert system ² is run by UKHSA in partnership with the Met Office. The heat-health alert (HHA) operates from 1 June to 30 September and the cold-health alert (CHA) operates from 1 November to 30 March. Both systems are based on the Met Office forecasts and data. Depending on the level of alert, a response will be triggered to communicate the risk to the NHS England, government, and public health system. Advice and information for the public and health and social care professionals, particularly those working with at-risk groups. This includes both general preparation for hot or cold weather and more specific advice when a severe heatwave or cold weather has been forecast
WMO	World Meteorological Organisation – the specialised agency of the United Nations for meteorology (weather and climate), operational hydrology and related geophysical sciences. It is an intergovernmental organization with a membership of 193 Member States and Territories.

Annex D: PWS Reporting and Assurance

A high level of assurance is required by the PWSCG to ensure that services are provided to agreed standards. Performance Measures (PMs) and Deliverables (Ds) are used to define performance in the CSA. Governance mechanisms as outlined below will be used to review progress in delivering the PWS PMs and Ds and ensure that they undergo the appropriate scrutiny. Monthly performance review meetings will be used to monitor performance during the year, with summaries presented to the appropriate PWS Assurance Group (PAG). A timeline of deliverables, reporting and meetings can be found in Figure 10. The end of year sign off process is completed based on criteria described below.

Monthly Performance Review Meetings

This meeting is conducted on a monthly basis and is attended by the DSIT PWSCG Secretariat and Met Office PWS team. The purpose of the meeting is for the Met Office to update the PWSCG Secretariat on current performance relating to the PMs and Deliverables.

NSWWS Assessment Meetings

This meeting is conducted on a monthly basis if there have been any notable weather events within the preceding month for which a NSWWS has been issued, or for which evidence suggests that an event may have been missed. The meeting will be attended by the PWSCG Secretariat, a Met Office Civil Contingencies Advisor and a Met Office Senior Civil Contingencies Advisor. This purpose of the meeting is to subjectively assess the performance of each Amber and Red (and by exception, Yellow) NSWWS warning by reviewing a broad evidence base of impact information collated by the PWSCG Secretariat and the Met Office.

PWS Assurance Groups (PAGs)

PAG 1 – Stay safe

PAG 1 will assure the metrics and deliverables for theme 1. Including assessment of the National Severe Weather Warning Service (NSWWS) and Civil Contingency Services. This will include going through any Ad-Hoc surveys, responder surveys etc. It will also assess and make recommendations regarding updates to deliverables and metrics for the yearly CSA update

²https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1153477/User-Guide-impact-based-weather-and-health-alerting-system.pdf

As this theme is such a fundamental part of the performance of the Met Office, all members of the PWSCG will be involved in this assurance. For this reason, assurance of the deliverables and metrics in theme 1, along with a review of the weather and warnings, will be a standing agenda item in each PWSCG meeting.

PAG 2 – Thrive

PAG 2 will assure the metrics and deliverables for theme 2 and will include agreement of the accuracy measures in year 1.

PAG 2 will meet once per year to assure all the deliverables and metrics in theme 2, including a full assessment of the accuracy measures, and will be run in conjunction with PAG 4 as below. It will also assess and make recommendations regarding updates to deliverables and metrics for the yearly CSA update.

This meeting will take place ahead of the PWSCG meeting in March in person, with the option to join by Microsoft Teams if necessary. The PAG will prepare a report for the PWSCG.

PAG 2 Membership

Chair PWSCG	Independent member
Civil Aviation Authority	Ministry of Defence
Environment Agency	Maritime and Coastguard Agency
Maritime and Coastguard Agency	Others on request

PAG 3 – Authoritative voice

PAG 3 will provide assurance and scrutiny of the authoritative voice and parts of the accuracy theme of the PWS. It will also assess and make recommendations regarding updates to deliverables and metrics for the yearly CSA update.

The Group will normally meet twice a year – in late March ahead of the PWSCG meeting, and in September. These meetings may be fully virtual, or in person, with the option to join by Microsoft Teams if necessary. The PAG will prepare a report for the PWSCG.

PAG 3 Membership

Chair PWSCG	Independent member
Scottish Government	Welsh Government
Northern Ireland Government	Environment Agency
Maritime and Coastguard Agency	UK Health Security Agency

PAG 4 – National capability and international commitments

PAG 4 will provide the assurance and scrutiny for the national capabilities and the international commitments. The PAG is expected to use the existing assurance mechanisms within the Met Office to inform its work (e.g. the Met Office Audit Committee and Met Office Scientific Advisory Committee) and not duplicate the work of any existing assurance mechanism. The PAG will prepare a report for the PWSCG.

This group will meet once a year in March ahead of the PWSCG on the same day as PAG 2 to present the assurance reports as outlined in the CSA (and see table above). Interim reports will be sent around by correspondence.

PAG 4 Membership

Chair PWSCG	Independent member
Civil Aviation Authority	Ministry of Defence
Environment Agency	Others on request
Maritime and Coastguard Agency	

PWS Customer Group (PWSCG) Meetings

PWSCG Formal Meetings

PWSCG meetings will be the forum for strategic discussion, looking forward, discussing the bigger, more strategic issues and will set the direction of PWS. These meetings will include summaries of the PAG meetings.

Formal PWSCG meetings will normally be held twice a year in April & October. All members and Met Office delegates are expected to attend and if unable to do so are asked to provide a deputy. On an annual basis at the April PWSCG meeting, the members will form a recommendation to the Department for Science, Innovation and Technology (DSIT) as to delivery of the performance measures and deliverables, as defined within the CSA. These will have been run through in depth at the theme PAG's as described above. Official sign off or any challenges to sign off will be recorded at this meeting. Also, at this meeting the CSA for the subsequent FY will be agreed including the Public Performance Measures and Deliverables. The meetings are timetabled and coordinated by the PWSCG Secretariat.

A formal meeting of the PWSCG will be considered quorate provided no more than one half of members and one of the independent members are absent. An inquorate meeting may proceed in an advisory capacity to the Chairperson.

Voting will be on a two thirds majority basis and the Chairperson will have the casting vote.

The PWSCG may establish sub-groups or hold special interest meetings as it considers appropriate to deliver its terms of reference.

Additional meetings within the Devolved regions will take place most years and will be chaired by the PWSCG Member within the Devolved region. Representation will normally include the Chair and Independent Member of the PWSCG, Head PWSCG Secretariat and Head Citizens and Media Business (Public Weather Service) plus representation from across government departments within the Devolved region.

Media and Reach Sub-Group (MARG)

The Media and Reach sub-Group (MARG) is a sub group of the PWSCG with the mandate to provide assurance to the Chair of the PWSCG in three principal areas. Firstly, that the outputs of the Public Weather Service provide adequate 'reach' to help demonstrate value for money for PWS. Secondly that there is consistency in the delivered message of those outputs across the various media channels. Thirdly, that the Public Weather Media Service (PWMS) is operating in a way that meets the needs of the broadcasters using it. The MARG provides challenge and steer to the Met Office to ensure adequate reach through UK broadcasters and where possible provide advice and direction in order to increase the reach of PWS outputs. The group provides challenge on behalf of the PWSCG on the form and function of the PWMS to ensure that the customers receive a fit for purpose service. The group will report back to the PWSCG on progress and set

out any recommendations for actions. The Media and Reach sub-Group (MARG) is chaired by the independent member of the PWSCG. Membership of the MARG will comprise representatives from the PWSCG and its Secretariat, Met Office staff responsible for reach via the PWMS, and a cross section of users of the PWMS. The Chair of the PWSCG may attend at his discretion. The MARG will report to PAG(3) and PWSCG.

End of Year Signoff for performance measures

- There are 16 Performance Measures in the 2023-2028 CSA, with some PMs comprising multiple elements.
- There are 9 assurance reports in the 2023-2028 CSA, with some comprising multiple elements.
- Monthly monitoring will be performed on all PMs and assurance reports as described above.
- The PWSCG expect that the Met Office will endeavour to ensure that all of the agreed performance measures are met and that the assurance reports are delivered. However, sometimes performance measures will not be met and that there may be circumstances beyond Met Office control which impact on PM delivery.
- To receive end of year signoff that the CSA has been delivered:
 - The Met Office are required to achieve all 16 PMs in the CSA;
 - The Met Office are required to deliver all 9 assurance reports as specified in the CSA;
 - However, if a PM does not meet the end of year target, then the PWSCG will accept a written description of why the target has not been met and will use the relevant PAG or PWSCG meetings to discuss whether the PWSCG will accept the missed target and approve it for signoff in the CSA for that year. The PWSCG will consider whether there have been circumstances that are beyond the control of the Met Office, situations whereby the monthly monitoring has highlighted an issue with a PM that requires an improvement plan, or other circumstances resulting in a missed PM and have the opportunity to signoff the PM.

End of year Signoff for Deliverables

- To assure PWSCG members that each Deliverable has been met, the Met Office will submit a paper describing the outcome of the Deliverable to the DSIT Secretariat team on or before the due date of that deliverable.
- The paper will be discussed in detail at the relevant PAG meeting, and the PAG will make a recommendation to the PWSCG end of year meeting
- The PWSCG group will be asked to agree or disagree that the Deliverable should be signed off.

Business as usual items required to achieve signoff.

In addition to the deliverables and performance measures described above, the Met Office will be expected to deliver the following items throughout the year:

1. An annual PWS performance report for the April PWSCG meeting;
2. Monthly advisor reports;
3. The Public Perception Survey and annual briefing for the PWS team at DSIT;

Annual CSA signoff

- For the CSA to be signed off at the end of each year the Met Office must achieve all PM's, Assurance Reports and Deliverables are signed off – unless previously agreed as per above.
- This process will be reviewed annually.