

FOREWORD

Welcome to this year's Annual Report which provides a summary of the work and activity undertaken by the Public Weather Service Customer Group in 2021/22.

Although the impact of COVID-19 has continued to be felt this year, we have begun to return to some of our pre-COVID-19 norms. I have held in-person meetings with colleagues in BEIS and the Met Office, although the Public Weather Service Customer Group meetings have largely remained online. Despite this, the group has continued to successfully provide scrutiny and challenge, ensuring that the Public Weather Service continues to deliver services for the UK public.



Over the last year, the Public Weather Service Customer Group has focussed its efforts on implementing and delivering the new and ambitious Customer Supplier Agreement (CSA) developed last spring. The CSA is the agreement by which the PWSCG, representing Government, the Public Sector and the general public, communicating what it requires to be delivered under the Public Weather Service. This CSA sets the direction of travel for the Public Weather Service over a 5-year period, although it will be updated yearly to reflect any changes in direction and requirements. The first year of delivery of the CSA has included both successes and lessons learnt. The launch of the Met Office's Extreme Heat warning service last June was the first of many milestones to be delivered. The launch of this service was accompanied by a series of seasonal workshops, and the official launch was swiftly followed by the first successful use of this service in July. A wide range of additional milestones have been delivered across all areas of the CSA this year, including on the accuracy, communication, and consistency of Met Office forecasts.

Importantly, we have also experienced limitations of the CSA this year. Metrics designed to monitor and improve the reach and engagement of the Public Weather Service were falling below target, and it became clear that these measures were not delivering clear benefits for the PWS. This has prompted us to turn our focus to encourage the Met Office to approach reach and engagement more strategically; consequently the Met Office are now developing a new Citizen Engagement Strategy to define their approach. We end the year with some amber ratings within our deliverables in Theme 2 (thrive) and 3 (authoritative voice) of the CSA. However we are content to accept these missed targets as we now judge they do not provide clear, auditable benefits. Looking forward to next year when a more strategic engagement strategy should come to fruition, we will ensure a more targeted approach and metrics to reach and engagement will be agreed.

The Met Office warning service was kept busy this winter, with Storms Arwen, Dudley, Eunice and Franklin resulting in three red warnings on top of a number of amber and yellow warnings. Reassuringly, awareness, action, and usefulness of the storm warnings was rated highly amongst the public. For storm Eunice, 98% of those surveyed reported that they were aware of the storm, 91% took action following the warning, and 95% rated the warning as useful. These findings demonstrate the positive impact and importance of the PWS in delivering both safety and individual and economic benefit to the UK.

The PWSCG has seen long-standing members leave the Group this year, and we have welcomed new members to take on their important roles. Our dynamic mix of skills and experience within the Group ensure that the continued delivery the CSA remains on track and serves the needs of the Government, public sector and of course our fellow citizens who rely on these services to stay safe and thrive.

As we move towards seeing life return to something more familiar, I am very keen to continue to meet with people face to face where possible. I very much look forward to working with you all wherever you are in the UK over the coming year.

A handwritten signature in blue ink, appearing to read "Simon L. P. ...".

INTRODUCTION

What is the Public Weather Service Customer Group?

The Public Weather Service Customer Group (PWSCG) acts as the customer on behalf of the Government, responders, and UK citizens for the free-at-the-point-of-use weather services and advice provided by the Public Weather Service (PWS) delivered by the Met Office. It ensures that these services meet the operational needs of public sector users of PWS outputs, and acts as the guardian for the Met Office's underpinning operational capability upon which all UK weather services depend. It is responsible for setting the outputs and monitoring the performance of the Met Office in delivering the PWS.

The responsibilities of the PWSCG are as follows:

- Setting the current and future outputs required from the PWS and specifying its performance indicators and targets;
- Monitoring the performance and delivery of the PWS outputs against the agreed performance indicators and targets, and considering in-period modifications to the PWS as appropriate;
- Reviewing whether Met Office plans for the underpinning capability and international commitments are appropriately prioritised and have a demonstrable, value for money link to support the delivery of PWS outputs and other direct services to Government, the public sector and civil aviation;
- Reviewing the socio-economic benefits delivered by the PWS, commissioning additional research as necessary;
- Supporting cross-Government cooperation to increase the use of PWS outputs and raise issues relevant to wider Government, including through the Chair's representation on Met Office Governance groups;
- Providing independent advice to Government ministers on the PWS as required;
- Consulting widely with the public and the public sector users of the PWS, as appropriate, in order to effectively undertake its responsibilities above.

PUBLIC WEATHER SERVICE CUSTOMER GROUP ACTIVITY DURING 2021/22

The PWSCG continued their role of scrutinising delivery of the PWS on behalf of the Government this year. Successful and well attended full PWSCG meetings were held in April and October in 2021.

PWS Assurance Group (PAG) meetings were also held to provide more detailed assurance on delivery of the CSA, with PAG 3 (focussing on theme 3 of the CSA) held in September and March, and a combined PAG 2/4 meeting (focussing on themes 2 and 4 of the CSA) held in February.

The PWSCG took a keen interest in and focussed on variety of areas related to PWS during the year:

- The preparation, launch and inaugural use of the Extreme Heat Warning Service;
- Review of a range of storm warnings during winter 21/22;
- The development of a roadmap for improvements to accuracy within Met Office forecasts;
- The new Met Office supercomputer and delays to the associated implementation programme;
- Improvements to consistency and communication of Met Office forecasts;
- Reach and engagement of PWS services; the PWSCG Chair and Independent Member attended additional meetings to provide a strategic view to the Met Office on challenges around reach and engagement.

Delivery of the PWS

The CSA aligns the outputs of the PWS into four themes: Theme 1 which provides PWS services to help the UK public to stay safe, Theme 2 which provides services to help the UK public to thrive, Theme 3 which encourages the PWS to have an authoritative voice when communicating the weather, and theme 4 which defines the international commitments and national capability of the PWS.

Themes 1, 2 and 3 have performance measures (PMs), which are monitored via red-amber-green (RAG) status and are required to meet yearly targets, and milestones (MSs) which are larger pieces of work to drive improvements across PWS services and, in turn, the PMs. RAG ratings for 21-22 are shown here. In addition to the main PWSCG meetings, there are five PWSCG sub-meetings that review and assess performance on these delivery themes.

Performance measure	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	EOY
PM1.1: Deliver timely, useful, and accurate warnings to the public & responder community													
PM1.2: Maintain and develop the Met Office Civil Contingency Advisor Service													
PM2.1: Produce timely and accurate weather forecasts that people use every day													
PM2.2: Improve the perceived accuracy of Met Office forecasts	No Data	No Data		No Data	No Data	No Data		No Data	No Data		No Data		
PM2.3: Maintain high public ratings of usefulness of forecasts	No Data		No Data										
PM2.4: Ensure availability of products and services													
PM3.1: Maintain the reach and increase the engagement of the Met Office's direct channels													
PM3.2: Work with partners to increase the indirect reach of Met Office information.													
PM3.3: Ensure that essential weather and climate data gets into the hands of those who need it													
PM3.4: Ensure the trust and reputation of Met Office forecasts is maintained													
PM3.5: Increase awareness that the changing climate will influence frequency of severe weather events	No data	No data	No data		No data	No data	No Data		No Data	No Data	No Data	No Data	
PM3.7: Ensure the Met Office is the guardian of the nations' memory of the weather													

	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	EOY
MS1.1: Advisor improvements													
MS1.2: Warning improvements													
MS1.2b: Launch an Extreme Heat Warnings Service													
MS1.3: Improvements to communication of warnings													
MS1.4: Improvements to advice for 'when it matters' beyond the national severe weather warnings													
MS2.1: Other accuracy improvements													
MS2.2: Improvements in communication of weather forecasts													
MS2.3: Health and wellbeing forecasts													
MS3.1: Describe all the research and evidence for the performance metrics in Theme 3													
Undertake a review of how forecasts are seen and understood and via which channels with the													
MS3.2: aim of improving communication to drive action and reach of Met Office channels													
Investigate and implement recommendations for visualisation of weather forecasts and													
MS3.3: information for multiple audiences, when and where it matters													
Develop a strategy for increasing awareness of the Met Office as the provider of weather													
MS3.4: forecasts in the United Kingdom for all members of the population													
Develop and implement a strategy for reaching people who are not getting weather information,													
MS3.5: and those who are most vulnerable to impacts from the weather and climate													
MS3.6: Maintain broadcast media customer satisfaction													
MS3.7: Develop a roadmap for data releases over the next 4 years with an annual review													

Summary of Theme 1 delivery during 21/22:

- All Theme 1 PMs and MSs have been delivered on target during 21/22. This represents the strong capabilities of the Met Office warning and advisor services which help to ensure that the UK public stay safe, and the strength of delivery across this theme is pleasing to note.

Summary of Theme 2 delivery during 21/22:

- Two of four Theme 2 PMs have ended the year as amber, indicating lower than required performance on measures of the public perceptions of accuracy (PM2.2) and on maintaining high public ratings of usefulness of forecasts (PM2.3). These PMs include multiple subcomponents designed to be stretching, and performance has been just below target in some subcomponents rather than across the totality of the PMs. Work is ongoing within the MSs which is anticipated to improve performance on these PMs over upcoming years. Consequently, the BEIS secretariat are content that the Met Office have met the required performance for signoff of these measures in 21/22.

- All Theme 2 MSs have been delivered on target during 21/22, resulting in a better understanding of how to improve the perceived accuracy of forecasts, the communication of forecasts, and health forecasts (including UV, pollen and air quality) which will deliver benefit to the UK public in their ability to thrive every day.

Summary of Theme 3 delivery during 21/22:

- One of seven Theme 3 PMs is due to finish the year rated as amber. PM3.1, which requires the Met Office to maintain the reach and increase the engagement of the Met Office's direct channels, contains three subcomponents. One of these (web market share) is performing above target, whereas time in app is currently below target, and social media engagement is mixed (Facebook and Twitter above target, Instagram and Tik Tok below target). This PM has been extensively discussed, and both the Met Office and the BEIS secretariat agree that the metrics within this PM are not driving beneficial outputs for PWS. Theme 3 PMs are consequently undergoing review to make them more meaningful for future years, particularly in light of the new Citizen Engagement Strategy being developed by the Met Office to guide reach and engagement. Consequently, the BEIS secretariat are content that the Met Office have met the required performance for signoff of these measures in 21/22.
- The remaining six PMs are rated green at end of year, representing good performance, and all Theme 3 MSs have been delivered on target during 21/22. The Theme 3 MSs will deliver improved awareness and reach of the Met Office's authoritative voice by streamlining and improving visualisation services, maintaining broadcast media satisfaction, reaching a broader proportion of the UK public (particularly those vulnerable to the impacts of weather) and driving greater understanding of Met Office forecasts.

Summary of Theme 4 delivery during 21/22:

- Theme 4 requires the Met Office to report on the technical services (observations), science, technology, international commitments, and finance that underpins the PWS. The Met Office have provided good evidence that the requirements of this theme have been met during 21/22, although a detailed review of PWS finance has been requested for 22/23 pending the outcome of the spending review process.

Overall summary of CSA delivery during 21/22:

The Met Office have delivered a wide and impressive range of work across all themes of the CSA in 21/22. Although two PMs have ended the year rated as amber, significant work has been undertaken to improve performance in these areas and to drive more strategic objectives in this area in the future. The Met Office have delivered all MSs, resulting in some immediate improvements to PWS services but also a comprehensive set of recommendations for future improvements to PWS services. These improvements will be prioritised and implemented during future years of the CSA.

At the April 2022 meeting PWSCG members signed off the 21/22 CSA as delivered.

PRIORITIES FOR 2022/2023

The first part of the year is set to be dominated by work to finalise the Citizen Engagement Strategy and associated deliverables for Theme 3 of the CSA. The Met Office and PWSCG will continue to monitor and adjust metrics for Theme 3 during 22/23, resulting in a set of clear metrics that capture current Met Office performance and implementation of the new strategy.

Another focal point for the year will be ensuring continual service of the Public Weather Service as the new Met Office supercomputer comes online. It is our role to encourage the Met Office to continue to prioritise Public Weather Service outputs during this challenging period of work, and to help drive full realisation of benefits from the new supercomputer for the Public Weather Service.

The BEIS secretariat also plan to lead a review of PWSCG membership during 22/23. This review will aim to strengthen the PWSCG and PWS delivery by exploring areas of work not currently covered by

representatives on the PWSCG and finding appropriate organisations and representatives to join the group.

Finally, although many PWSCG meetings were successfully held online during 21/22, there were no meetings of the Devolved Administration groups this year. Re-establishing these meetings alongside other PWSCG meetings is a priority for 22/23.

THE PUBLIC WEATHER SERVICE IN ACTION

Case Study of Storms Dudley, Eunice and Franklin

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. All three storms brought severe weather and formed part of a turbulent spell of wet and windy weather for the UK, which was associated with a powerful jet stream. Two rare red warnings were issued for storm Eunice, with one being the first red warning issued for wind covering south-east England, including London (see Figure 1).

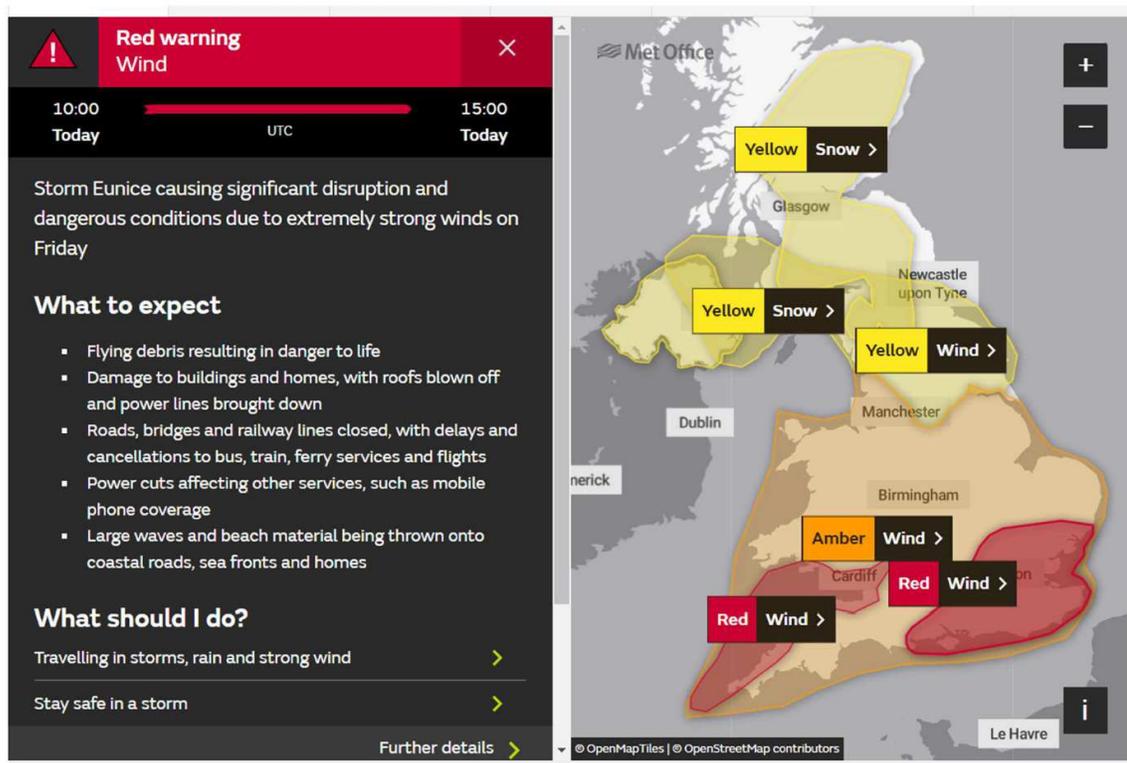


Figure 1: The map of UK warnings for Storm Eunice on the 18th of February 2022.

The Met Office reported that this was the most severe and damaging storm to affect England and Wales since February 2014, with wind gusts at over 70Kt (81mph) measured in exposed coastal locations and a gust of 106Kt (122mph) recorded at Needles Old Battery, Isle of Wight, setting a new wind gust speed record for England (see Figure 2).

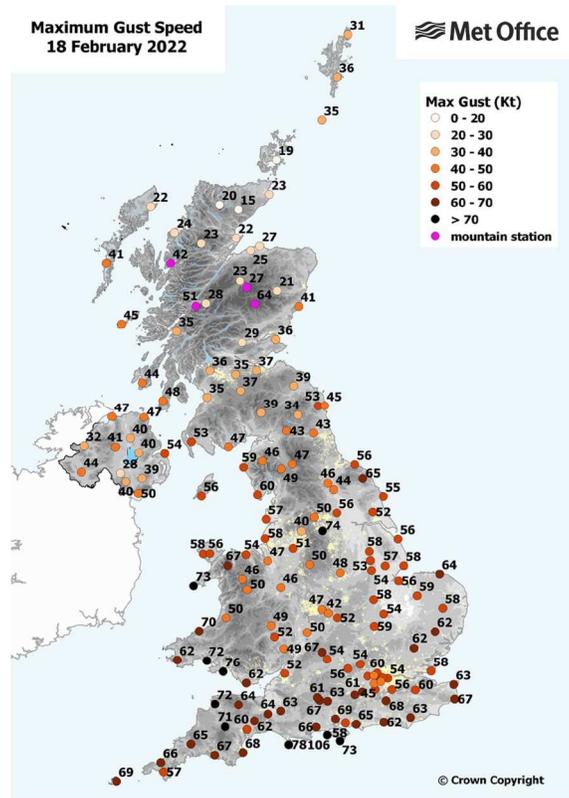


Figure 2: A map of UK wind gusts for Storm Eunice on the 18th of February 2022.

Impact

All three storms brought major weather impacts across the UK. Storm Dudley resulted in loss of power for thousands of homes across parts of Cumbria, Yorkshire and Lancashire, and rail lines heading north to both Glasgow and Edinburgh were disrupted.

Sadly, four people died in the UK and Ireland because of falling trees during Storm Eunice. During this storm, over a million homes were left without power, with ongoing power cuts lasting several days. Schools and businesses were closed across Wales and the worst affected areas of England and there was major transport disruption, with trains cancelled, roads blocked by fallen trees and overturned lorries. Hundreds of flights in the UK were cancelled and aircraft struggled to land in the strong winds. The Port of Dover was temporarily closed to all shipping, and the Humber bridge as well as both Severn bridges were closed for the first time in their history. There were widespread reports of severe structural damage on a scale not often seen; roofs were torn off buildings, the top of a church spire in Somerset was blown down and the Millennium Dome in London was damaged (See figure 3). Large waves, together with a storm surge on top of high spring tides battered western and southern coastlines and the Severn Estuary. This resulted in the whole of the Welsh Coastline being highlighted as being at severe risk of flooding for the first time. Further north, there was also significant transport disruption in parts of Scotland and northern England from snow.

The strong winds from Franklin hindered clean-up operations following Eunice. The persistent heavy rain from the successive storms and snow at higher levels resulted in significant flooding in parts of England, Wales and Northern Ireland. Three sites on the Rivers Severn, Mersey and Derwent recorded their highest ever levels and around 400 properties were flooded, with severe flood warnings issued for major rivers including the Severn. In Yorkshire, the River Wharfe flooded the railway lines at Rotherham Central station, disrupting transport. Fortunately, severe coastal flooding in the Bristol

Channel and Severn Estuary was avoided as defences held, and the storm surge did not coincide with high tide, in some places by only 90 minutes.



Figure 3: A photo of the damage to London’s Millennium Dome following Storm Eunice on the 18th of February 2022.

Public awareness

Following Storms Dudley and Eunice, the Met Office commissioned research to understand the public’s awareness of the storms, their level of action taken due to the warnings, and their ratings of usefulness for the storm warnings. The results demonstrated extremely high awareness, action taken, and usefulness for the storms. Top-line results from the surveys are shown in table 1. These positive results demonstrate the importance of the PWS National Severe Weather Warning Service for helping members of the public to stay safe during periods of severe weather.

	Storm Dudley North East Amber wind warning	Storm Eunice South West/Wales Red wind warning	Storm Eunice South East/London/East Red wind warning
Awareness	97%	99%	98%
Action taken (among those aware)	79%	89%	91%
Usefulness	92%	92%	95%

Table 1: Results from surveys conducted on the UK public following Storms Dudley and Eunice.