

# Hazard Manager User guide

Making use of the weather layers



# How will this guide help me?

This guide will help you understand the information that is available within Hazard Manager and how to make use of it to plan and respond to severe weather. Information available from Hazard Manager enables you to monitor the current weather conditions across your area and also check the forecast.

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## 1. Last 24 hours

This section looks at real-time information and explains how this can be used to monitor current weather conditions across your area and during the previous 24 hours. Figure 1 shows the range of weather layers available from the “Last 24 hours” menu.

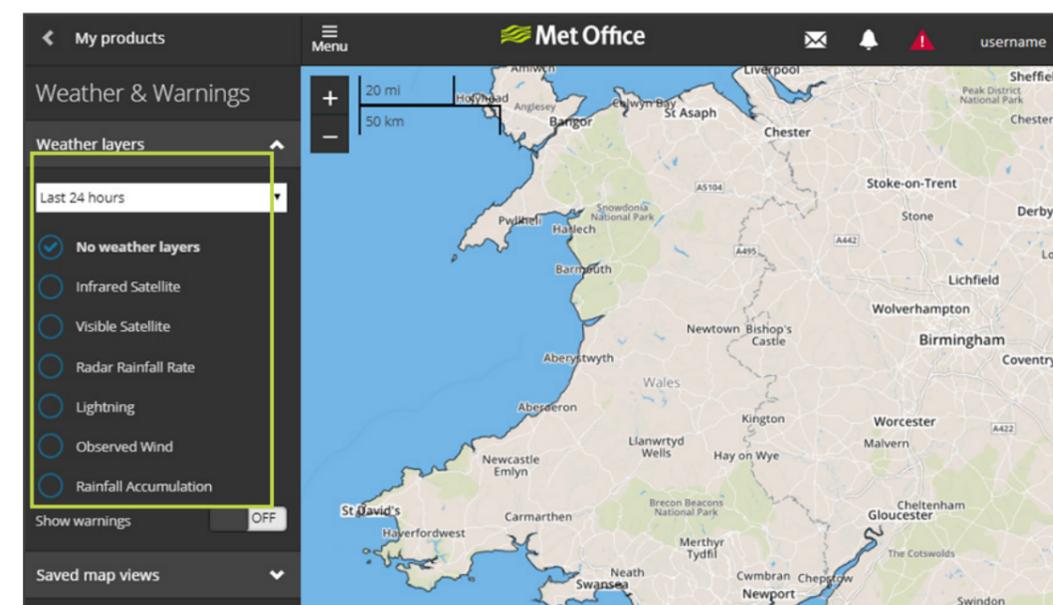


Figure 1. Weather layers available from the “last 24 hours” menu.

### 1.1 Infrared satellite

#### What is this?

Infrared satellite images detect infrared radiation to measure the temperature of the Earth’s surface and atmosphere. The images show land, sea and cloud temperatures. Whiter shading indicates lower temperatures and blacker shading indicates higher temperatures. Clouds in the higher and colder part of the atmosphere will appear white, whereas lower clouds, the land and the sea, which are warmer, will appear blacker. The legend uses the Celsius temperature scale. Infrared satellite images are available both day and night.

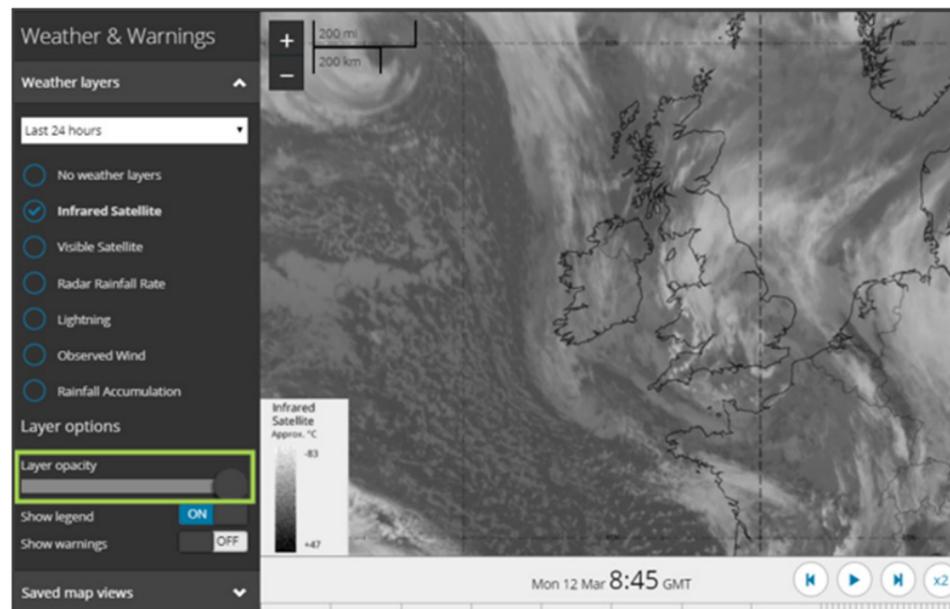
The images are available over the previous 24 hours – at 15-minute intervals for the last six hours and three hourly for the 18 hours before these in the 24-hour period.

It is recommended that satellite images are viewed with the map fully zoomed out and the layer opacity set at a maximum, otherwise it can be difficult to identify many of the features in the image.

#### How can I use this information?

Satellite imagery can be used to monitor the progress of a storm approaching the UK that has been highlighted in the weather forecast or mentioned in information from your Met Office Advisor.

The satellite images available in Hazard Manager cannot be used to monitor plumes such as volcanic ash or pollution from an industrial incident.



**Figure 2.** Infrared satellite image displayed with fully zoomed-out map and layer opacity set to medium. The enlarged legend has been added for illustrative purposes

### 1.2 Visible satellite

#### What is this?

Visible satellite images are essentially a black and white photograph of the Earth's atmosphere and surface. Objects that reflect most light, such as cloud, appear whiter than objects that reflect less light, such as land. Thicker clouds appear whiter than thinner clouds. The scale on the legend indicates albedo (or reflectivity) on a scale from 0 to 1.

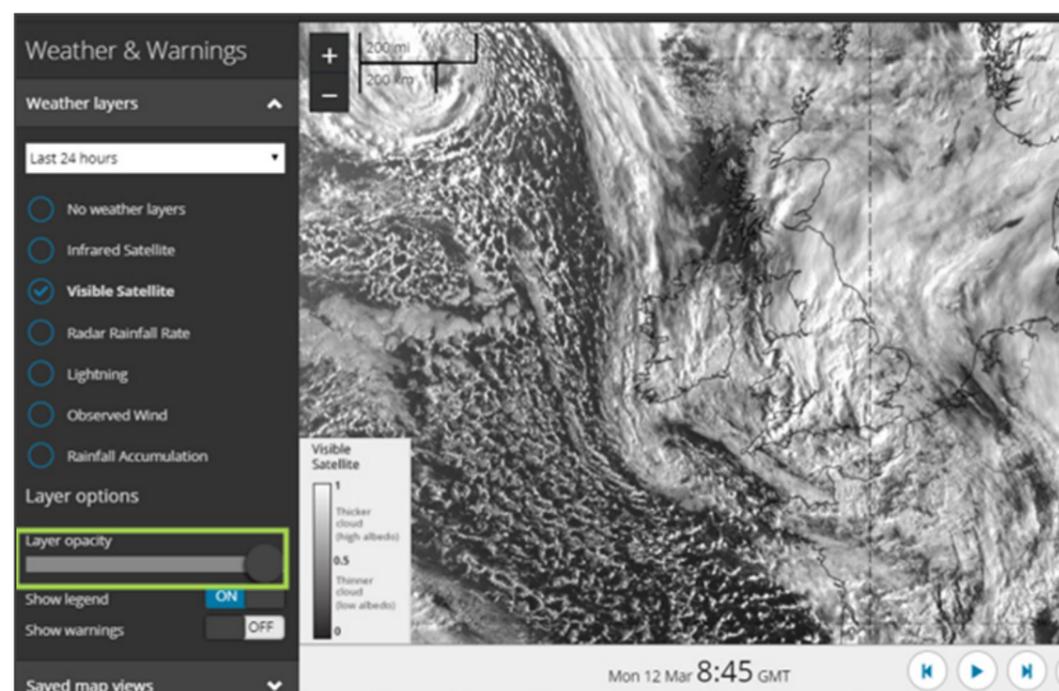
Visible satellite images are available only during daylight hours – at 15-minute intervals over the previous six hours and three hourly for the remainder of the period.

It is recommended that satellite images are viewed with the map fully zoomed out and the layer opacity set at a maximum.

#### How can I use this information?

Satellite imagery can be used to monitor the progress of a storm approaching the UK that has been highlighted in the weather forecast or mentioned in information from your Met Office Advisor.

The satellite images available in Hazard Manager cannot be used to monitor plumes such as volcanic ash or pollution from an industrial incident.



**Figure 3.** Visible Satellite image displayed with fully zoomed-out map and layer opacity set to maximum. The enlarged legend has been added for illustrative purposes.

### 1.3 Radar rainfall rate

#### What is this?

A network of rainfall radar sites around the UK detect precipitation, including rain and snow. This data is displayed in the Radar rainfall rate layer enabling the position and fall rate to be displayed in an image that covers the whole country. The radar detects rainfall rates in millimetres per hour, which are colour coded as shown in the scale on the legend.

The images are available over the previous 24 hours – at 15-minute intervals for the last six hours and three hourly for the 18 hours before these in the 24-hour period.

Zooming in on the map enables you to identify detail in the rainfall image. You can also vary the opacity to reveal location names on the map.

#### How can I use this information?

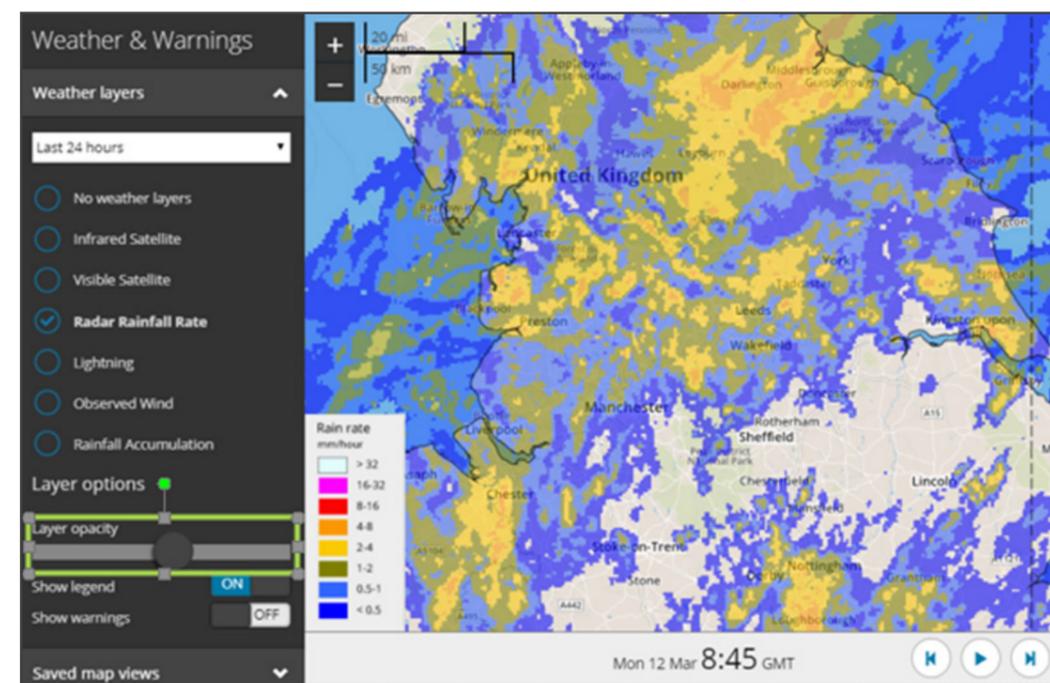
The rainfall radar can be used to monitor the position and progress of precipitation, which includes rain, snow, sleet and hail, and is particularly useful when a warning of heavy rain or snow has been issued.

Using the radar you can see how large an area of rain is and whether it is moving towards your location. By animating the radar sequence it is possible to check the speed and direction of the rain, and gauge whether any particularly heavy rain is likely to linger in the same place for any length of time.

The radar is also useful when very heavy showers are expected but it is not possible to forecast exactly where they will form. For example, a warning for heavy rain may be in place over a large area. The warning states that “very localised torrential downpours may lead to flooding.” By monitoring the radar, you can see whether any of these downpours are developing in your area, in particular over populated areas that may be susceptible to surface water flooding. Animating the radar will enable you to see whether the showers are slow moving, therefore likely to be prolonged, or will pass over fairly quickly.

Rain that falls at a rate of 4 mm per hour or more is termed heavy.

It is not possible to anticipate river response using the rainfall radar, as this is much more complex and requires flood forecasting skills.



**Figure 4.** Radar rainfall rate image displayed showing detail of heavy rain. The opacity has been set so that location names can be seen on the map

## 1.4 Lightning

### What is this?

Lightning, which is caused by an electrical discharge in the atmosphere, is detected by a network of sensors around Europe. These sensors make it possible to pinpoint the location of the lightning. A lightning discharge may be a lightning strike, in which lightning passes between a cloud and the ground, or the passage of lightning between clouds but not to the ground.

The map shows the location and the frequency of the lightning discharges over the previous hour. The scale uses white crosses to show the most recent discharges, and black crosses for those that occurred around one hour earlier. The weather layer does not show the exact location of where lightning strikes the ground.

The images are available at five minute intervals over the previous hour.

### How can I use this information?

The lightning information is very useful when monitoring the potential for lightning strikes to damage power lines, railway signals, communication masts, and buildings. Lightning can also trigger alarm systems.

You can also track the direction a storm is moving in by using the animation tool.

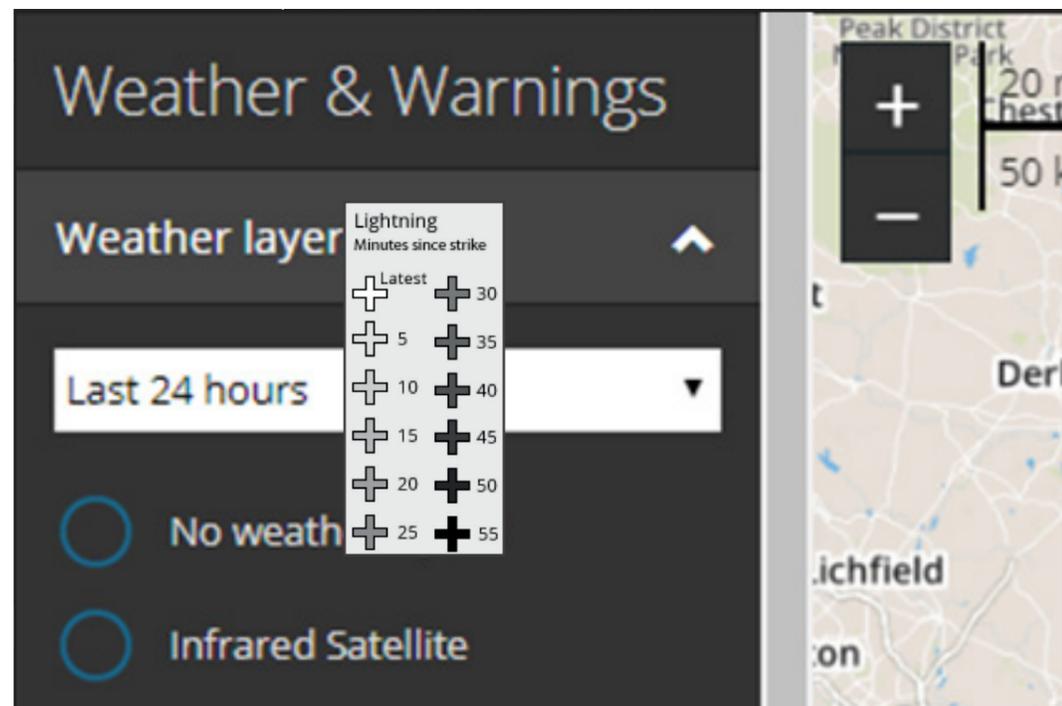


Figure 5. Lightning legend displayed. Crosses on the map will show lightning discharges within the last hour.

## 1.5 Observed wind

### What is this?

A network of weather stations around the UK record various weather elements, including average wind speed, wind gust speed, and wind direction. Wind data from these stations is added to Hazard Manager every hour. Wind speed is the average wind speed over the ten minutes before the time step you are examining; gust speed is the highest gust speed that has occurred during the previous hour; and wind direction is shown by an arrow at each weather station. Wind and gust speeds are displayed in miles per hour (mph), with the gust speed appearing in red above the wind speed circle. By hovering over the wind speed circle on the map you will be able to see the name of the weather station from which the wind data has been taken. The arrow points in the direction the wind is coming from.

The images are available over the previous 24 hours at hourly intervals.

### How can I use this information?

This information is useful for monitoring wind speeds in your area, particularly when a strong wind warning has been issued. You will be able to check the latest speeds and see whether the winds are increasing or decreasing. Generally, it is the gust speeds that are of most interest, as it is gusts that usually cause most damage. High wind speeds differ in their impact across the UK, with factors such as the time of year, the ground conditions, and the resilience of an area to strong winds also being important. If you would like to know more about wind speeds and associated impacts, please contact your Met Office Advisor.

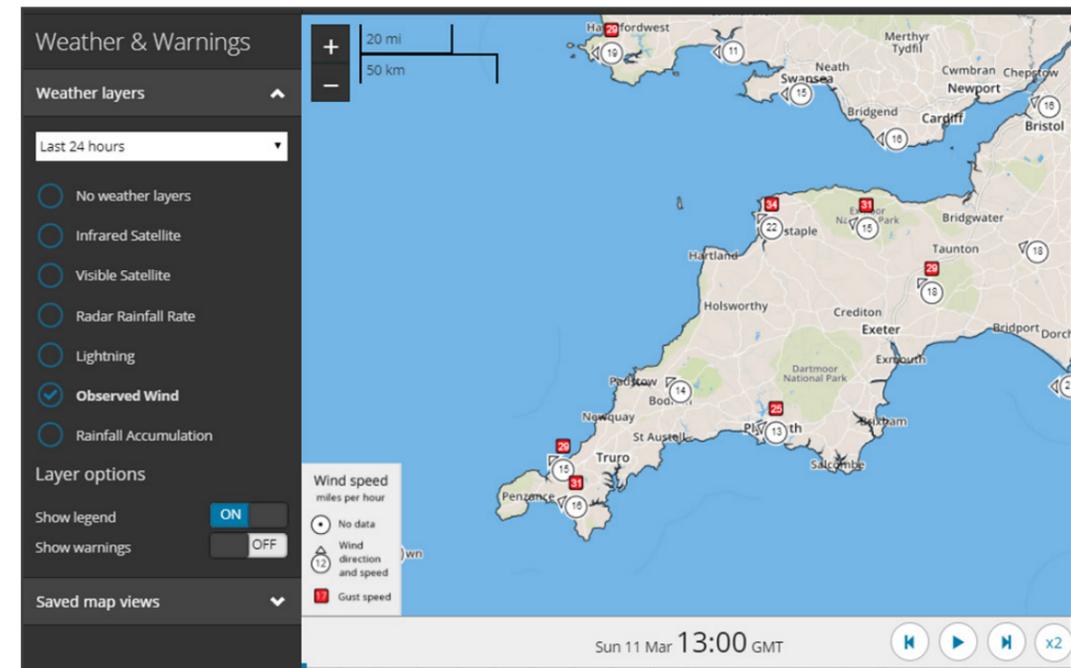


Figure 6. Observed mean wind and gusts

## 1.6 Rainfall accumulation

### What is this?

A network of rainfall gauges around the UK are able to measure rainfall on an hourly basis. These record the amount of rainfall, in millimetres, in the hour before the time of the reading. By hovering over the map you will be able to see the name of the rain gauge station.

The information is available at hourly intervals over the previous six hours.

### How can I use this information?

Hourly rainfall data can be used to check recent rainfall amounts in your area, and to gain an idea of how much rain has fallen over the past hour or several hours. Rainfall amounts often vary markedly from place to place, so the data from one rainfall gauge may not be representative of the whole of your area.

It is not possible to anticipate river response using the rainfall radar, as this is much more complex and requires flood forecasting skills.

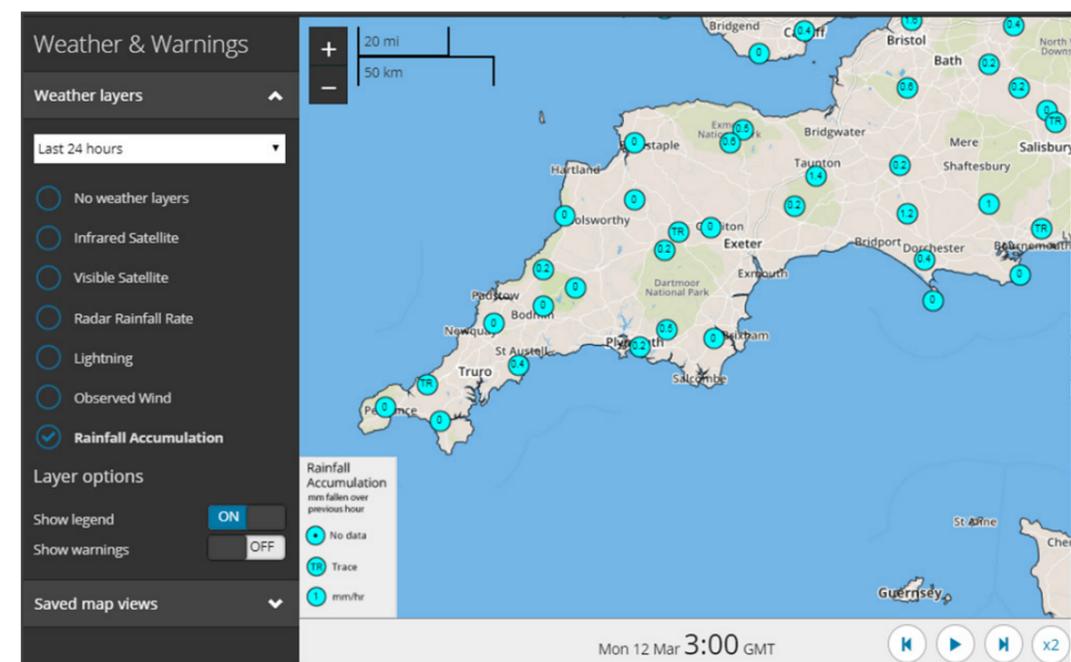


Figure 7. Rainfall accumulation image showing hourly rainfall accumulation to 0300 on Monday 12 March across parts of Southwest England. Totals vary between 0 and 1.4 mm indicating only light rain has been measured.

## 2. Next seven days

This section shows the types of forecast information available, and explains how you can make use of this information. For example the forecast information can be used to add detail when a warning has been issued, thereby making it easier for you to identify when your region is at greatest risk.

Forecast information is taken from computer models and has not been adjusted by a weather forecaster. It is always recommended that you discuss forecast information with your Met Office Advisor.

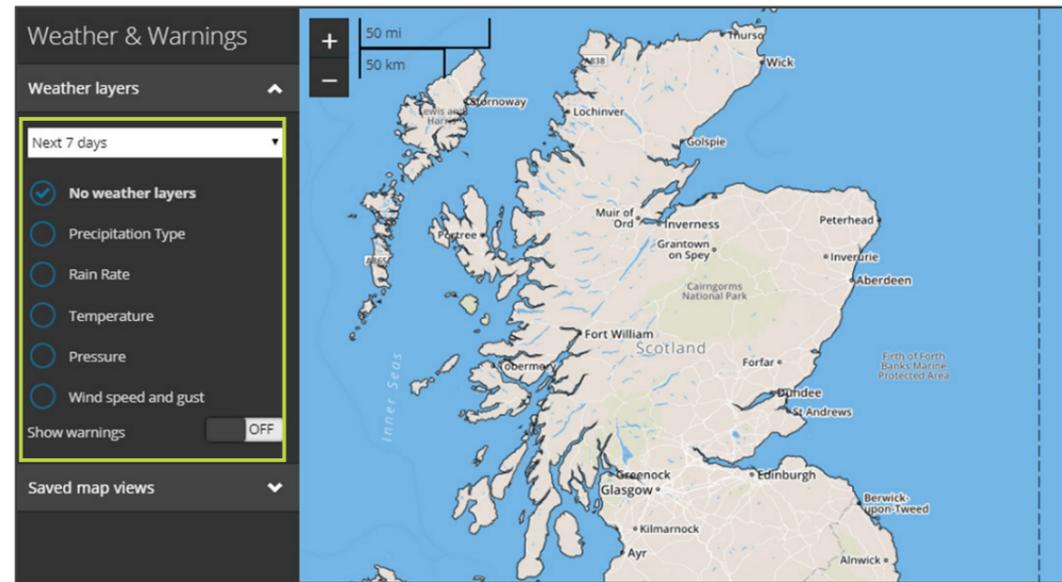


Figure 8. Weather layers available from the "Next 7 days" menu

### 2.1 Precipitation type

#### What is this?

This layer shows the type of precipitation forecast over the next seven days, including rain, snow, sleet, hail and freezing rain. Freezing rain is rain that freezes when it comes into contact with surfaces that are below 0C which can result in very icy conditions.

Data is available for the next seven days – at hourly steps for the first 42 hours and three-hourly thereafter.

#### How can I use this information?

In winter months, this weather layer may prove useful when a warning indicates that rain will turn to snow. The information can help users anticipate when and where the transition may take place. Similarly, it can be used to see whether snow will be limited mostly to higher ground or will occur at lower levels. Note that the forecast cannot be used to assess whether snow will accumulate on the roads and pavements, as this depends on other factors such as the road temperature.

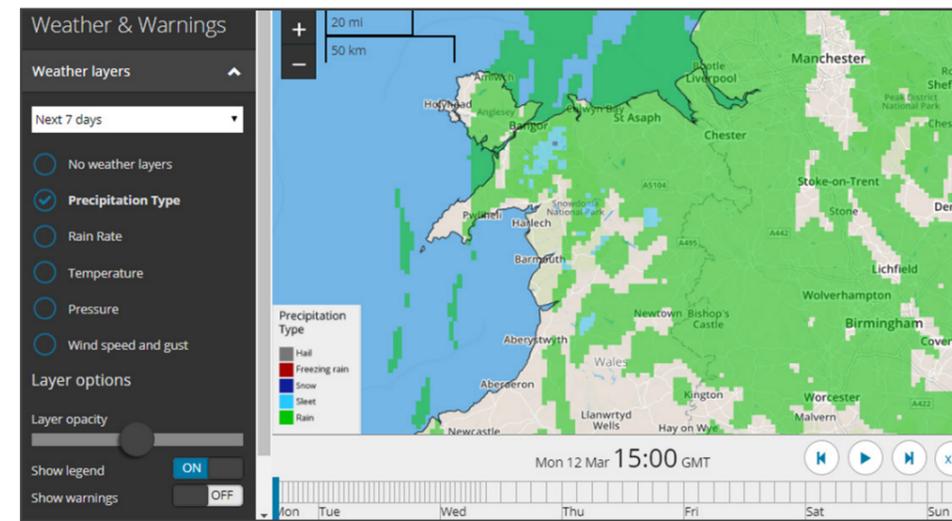


Figure 9. Image showing rain in Wales with some sleet and snow over the hills and mountains.

### 2.2 Rain rate

#### What is this?

Rain rate provides a forecast of rainfall intensity, displayed in millimetres per hour, and how this varies spatially and with time.

Data is available over the next seven days – at hourly steps for the first 42 hours and three-hourly thereafter.

#### How can I use this information?

The information can be used to obtain extra detail in the event of forecast rain or when a rain warning has been issued. By using the animation tool you will be able to see when heavy rain is most likely to affect your area, and also which parts of your area are more likely to be affected than others. When showers are forecast, model data will not pinpoint the exact location of where showers will occur. Further information in showery situations can be sought from your Met Office Advisor.

It is not possible to anticipate river response using the rainfall radar, as this is much more complex and requires flood forecasting skills.

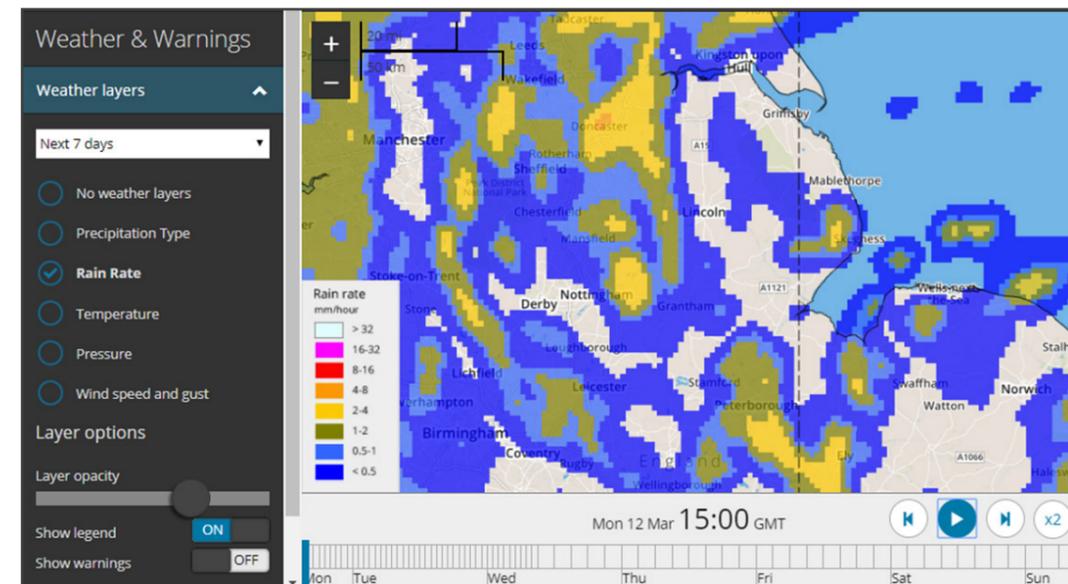


Figure 10. R. Rain rate image showing an area of rain across eastern parts of England. Rain rate is the instantaneous rate at that point in time. Further detail on actual forecast rainfall amounts can be sought from your Met Office Advisor.

### 2.3 Temperature

#### What is this?

This layer gives forecast air temperature across the UK, measured on the Celsius scale. The layer is best viewed zoomed in, with a fairly high opacity setting. The temperatures are displayed according to a colour-coded scale. Data is available over the next seven days – at hourly steps for the first 42 hours and three-hourly thereafter.

#### How can I use this information?

This information is useful for general temperature forecasts, but also in times of extreme temperatures, such as cold snaps in winter and heat wave conditions in summer. The information can help identify whether there are likely to be any regional differences, such as the variation in temperature between coastal and inland areas. The data may also be useful in assessing how persistent a period of hot or cold weather is likely to be. It is important to note that the forecast relates to outside air temperature, which means that it cannot be used to determine road temperatures and temperatures inside buildings.

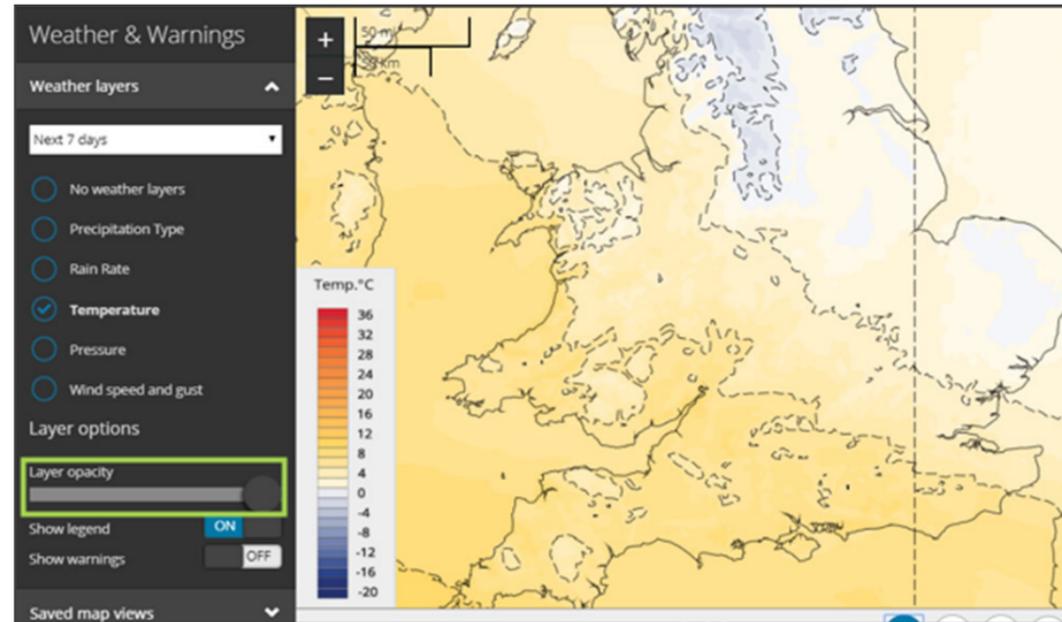


Figure 11. Forecast temperatures displayed for much of England and Wales using a high opacity setting.

### 2.4 Pressure

#### What is this?

This layer shows a forecast of air pressure. Air pressure is displayed using isobars (lines of equal air pressure). The units of measurement are hectopascals (hPa), which are also known as millibars (mb). The isobars are spaced at 4 mb intervals. This information is best viewed when zoomed out on the map.

Data is available over the next seven days – at hourly steps for the first 42 hours and three-hourly thereafter.

#### How can I use this information?

This information can be useful when forecasts indicate that a deep area of low pressure is expected to affect the UK.

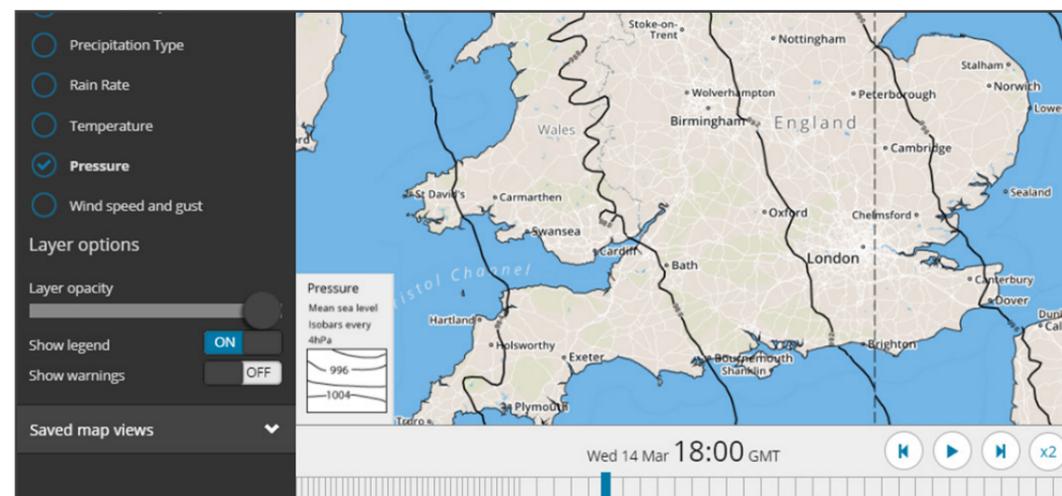


Figure 12. Forecast air pressure displayed by using isobars.

### 2.5 Wind speed and gust

#### What is this?

This layer shows a forecast for wind speed, gust and wind direction. Arrows are used to show wind direction, with the size of the arrows indicating relative speed. Gust speeds are displayed according to a colour-coded scale in miles per hour (mph). As it is gusts that are most likely to cause impacts, the average wind speed is not displayed. This layer is best viewed with a higher opacity setting.

Data is available over the next seven days – at hourly steps for the first 42 hours and three-hourly thereafter.

#### How can I use this information?

This information is useful when a wind warning is in force and more information is needed regarding the timing of the strongest gusts and the wind direction. You can then see whether some parts of your area may be more exposed than others, and therefore anticipate possible impacts, such as road or bridge closures.

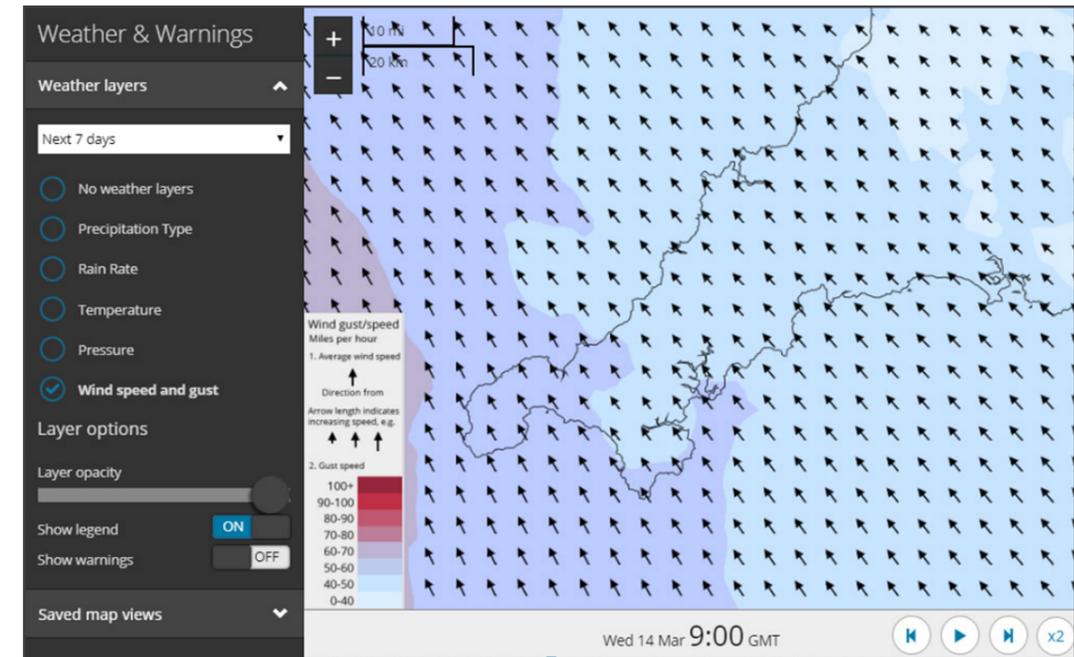


Figure 13. Forecast wind direction and gust displayed showing south-easterly winds affecting Cornwall with the potential for gusts in excess of 60 mph.

### 3. Last six hours/next six hours

Using a blend of real-time and forecast information, this menu enables you to see how the weather has progressed over the previous six hours and how it is expected to develop over the following six hours.

At present only rainfall information can be viewed using this option.

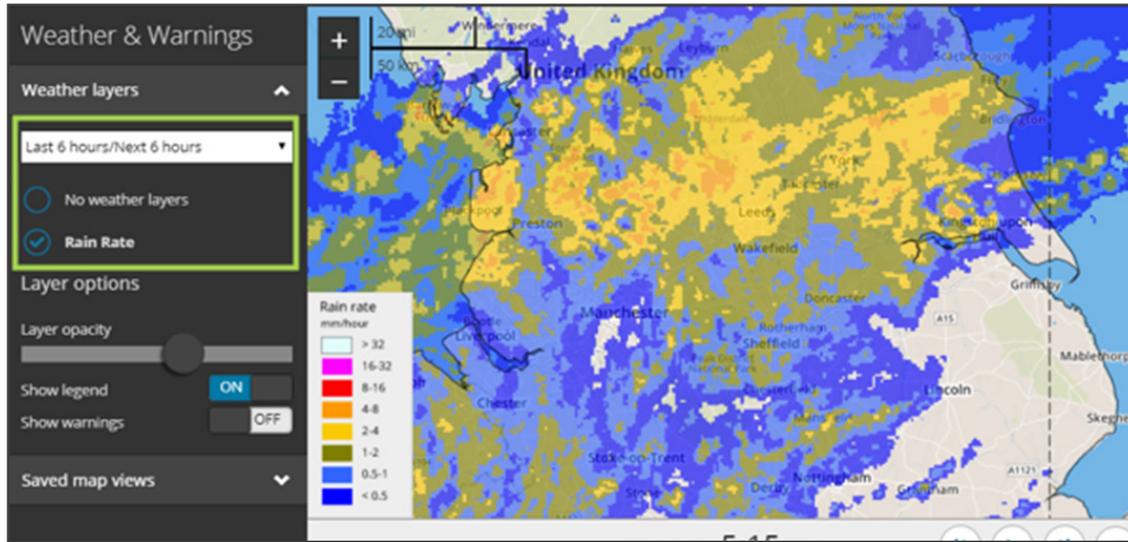


Figure 14. Weather layers available from the “Last 6 hours/Next 6” menu.

#### 3.1 Rain rate

##### What is this?

This layer shows a blend of actual radar images and forecast rain rate images. This enables you to view rainfall radar images over the previous six hours and a forecast for the following six hours.

The actual radar imagery is displayed in 15-minute time steps over the previous six hours, and the forecast data is available in hourly time-steps over the following six hours.

##### How can I use this information?

This information is useful when heavy rain is causing flooding incidents in your region, and you need to assess how much longer and at what rate the rain might continue.

When using the animation tool, you need to be aware that the real-time information is shown in 15-minute steps and forecast information in hourly steps. This may give the false impression the rainfall is moving more quickly in the forecast period.

You will also notice a difference in the appearance of the imagery as it moves from real-time data to forecast data. That the forecast information appears more smoothed and less detailed than the real-time information is due to differing resolutions.

Remember that when showers are forecast, the forecast model data does not pinpoint the exact location of showers. There may, therefore, be a ‘jump’ between the location of showers in the rainfall radar images and the forecast rain rate images.

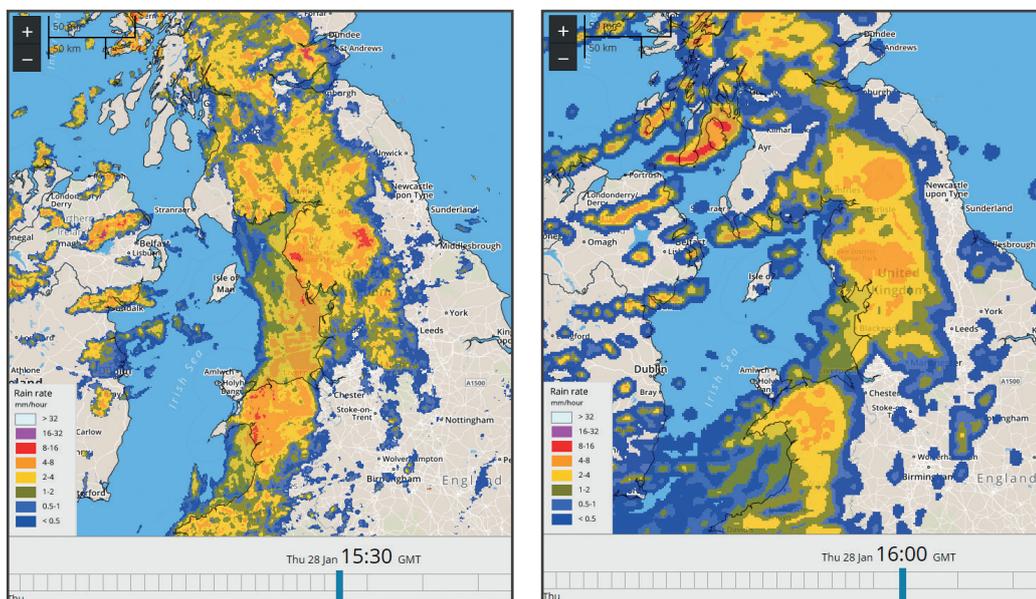


Figure 15. Real-time (left) and forecast images (right) displayed side by side, showing the difference in the appearance of the information.