Global spot percentiles

Name

Met Office Blended Probabilistic Forecast – Global spot percentiles

Description

This product provides percentile weather forecasts for 5,956 sites (or spots) across the globe. It is produced by the Met Office IMPROVER Blended Probabilistic Forecast system. It is available in NetCDF format.

Blended Probabilistic Forecast data is derived from the Met Office's operational NWP (Numerical Weather Prediction) ensembles and nowcasts. To give more reliable predictions, these are then blended and calibrated using the IMPROVER pipeline, and verified using spread–skill and reliability checks.

This is 1 of 8 Blended Probabilistic Forecast products published by the Met Office on the Registry of Open Data on AWS. Data is available for the Global and UK domains, as gridded and spot (site-specific), and represented as percentiles and probabilities.

This info is correct as of April 2026, but some things (like the number of sites, parameters and timesteps) may change in future.

How percentiles work

Ensemble forecasts show a range of possible weather outcomes. However, some users may find it more useful to see ensemble forecasts presented as percentiles, particularly when they want to see where each member of an ensemble sits within the full range of possible outcomes.

Percentiles are generated from an ensemble forecast by first sorting all the members of that ensemble, for example from the coldest temperature to the warmest. To then identify a particular percentile forecast (e.g. the 10th percentile), we find the temperature at which 10% of the ensemble members predict colder conditions. As only 10% of the ensemble members are predicting a lower temperature than the 10th percentile forecast, this indicates that it is giving a relatively low forecast of temperature. Similarly, 90% of ensemble members would predict a lower temperature than the 90th percentile forecast, indicating that it is giving a relatively high forecast of temperature.

Precipitation percentiles should be used cautiously

Precipitation percentiles are potentially useful for experts. But we don't recommend that most people use them, as they are hard to interpret.

Precipitation is spatially noisy (i.e. it can vary a lot over small distances), especially when it is showery. This means that the individual ensemble forecasts that the percentiles are generated from are likely to have their heaviest precipitation positioned in different places. As a result, a high percentile (e.g. 95th) will pick up the high values from all those different locations and make it appear that heavy rain could occur over a wider area than is physically plausible. In other words, the spatial extent of the precipitation when using a high percentile is not physically realistic. High percentiles can be very useful for finding out what the values at the higher end may be, but not how they are spatially organised.

Likewise, the spatial extent of the precipitation will be greatly reduced for the lower percentiles. If there are differences between the ensemble forecasts about where it will rain or not, it is possible that a low percentile precipitation field may show zero precipitation everywhere. Again, that is potentially misleading because it suggests it might be dry everywhere, which is not what the individual forecasts are necessarily saying. It is better to view different percentile maps together (5th, 50th, 95th) to get a more informative impression.

Even the 50th percentile can be misleading as, by definition, it will never include the highest predicted values. Nor is there any guarantee that the peaks in the 50th percentile grid will align with the peaks in the 95th percentile grid.

How spot data works

Spot data is derived by extracting site-specific forecasts from post-processed gridded forecasts.

IMPROVER operates on two domains:

- the UK domain, which primarily covers the region around the United Kingdom, Ireland and parts of Western Europe
- the Global domain, which covers the whole world

Within each domain, IMPROVER post-processes most forecasts on a grid, though the resolution of this grid differs between the two domains. Site-specific forecasts are drawn from these grids at the end of the post-processing chains. Sites within the UK domain draw forecasts from the high-resolution UK domain grid, as this should provide the best possible forecast, whereas sites outside of this domain draw from the lower resolution Global grid. The two domains are represented in two separate datasets.

Global domain sites
There are 5,956 sites in the Global domain. (The Global domain excludes the British Isles and parts of Western Europe. For sites in the UK, Ireland and the parts of Western Europe not included in the Global domain, please see the UK Spot Percentiles dataset.)

Site-specific forecasts in the Global domain are calculated from the MOGREPS-G model alone. However this model is time-lagged to provide additional forecast spread and reduce inter-cycle variation.

Parameters and timesteps
There are 68 weather parameters available including:

- Cloud
- Temperature
- Pressure
- Humidity
- Visibility
- Precipitation rate and accumulations (see note above about care required with use)
- UV
- Wind

For most parameters, the following timesteps are available:

- Every hour from 0 to 120 hours
- Every 3 hours from 123 to 192 hours

However, timesteps vary significantly for some parameters. Check the parameter documentation for more details.

This dataset also contains deterministic “weather symbol” parameters. These are designed to complement the percentiles information in cases where the user wants to extract a single “deterministic” forecast. The 50th percentile works well for some parameters, but others are better represented by the weather symbol. Check the parameter documentation for guidance on where this applies.

Latency
Data is made available shortly after the blend time.

Archive length
Data is available for the past 30 days.

Business needs
This product supports risk-based decision-making by providing uncertainty ranges rather than single deterministic values. Typical uses include:

- assessing uncertainty for operational planning
- evaluating weather-related risk thresholds
- deriving deterministic products (e.g. 50th percentile) from probabilistic outputs

Spot forecasts provide information about weather diagnostics at single sites. By using a time series of these forecasts, you can determine how a weather diagnostic is expected to evolve at a particular location. This is ideal for users if you are not moving spatially and are instead interested in how conditions are evolving at your location. This is the kind of time-series information you see in the Met Office app when you look at a forecast for your home address.

Gridded forecasts show how a diagnostic varies spatially across a domain at a given time. By using a time series of gridded fields, you can determine how a weather diagnostic is expected to evolve across a geographic area. So you may find them more useful if you need to consider moving spatially. This kind of product is very familiar from television broadcast weather forecasts. Gridded Blended Probabilistic Forecasts are also available as percentiles and probabilities for both the UK and Global domains.

Update frequency
4 times each day at around 00, 06, 12 and 18 UTC.

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Documentation
Link to documentation doc.

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Met Office
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Contact

Please email our Service Desk at: servicedesk@metoffice.gov.uk and let them know which dataset you are using and that it's from the Registry of Open Data on AWS.

Service desk is only available Mon – Fri, 09:00 until 17:00 UTC (-1 hour during BST). As a non-operational service we aim to respond to any service support enquiries within 3-5 business days.

How to cite

Met Office Blended Probabilistic Forecast Global Spot Percentiles was accessed on DATE from https://registry.opendata.aws/met-office_bpf_global_spot_Percentiles

Usage examples

Tutorials

- Numerical weather prediction models by Met Office
- The Met Office Unified Model by Met Office
- Introduction — IMPROVER documentation

Tools & Applications

- Iris by Iris Contributors

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