![Met Office logo]

Recent developments in the UK Climate Station Network

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Summary

The Met Office operates a climate network of over 270 co-operating stations, with many records extending back to the 19th century.

These stations are additional to others in the synoptic network and provide data at the necessary spatial resolution for climate monitoring.

Stations are run in co-operation with a responsible authority or private observer and manual stations make a single observation each day.

Increasingly small Automatic Weather Stations (AWS) are also being used where observers are unavailable, particularly to protect long-term records.
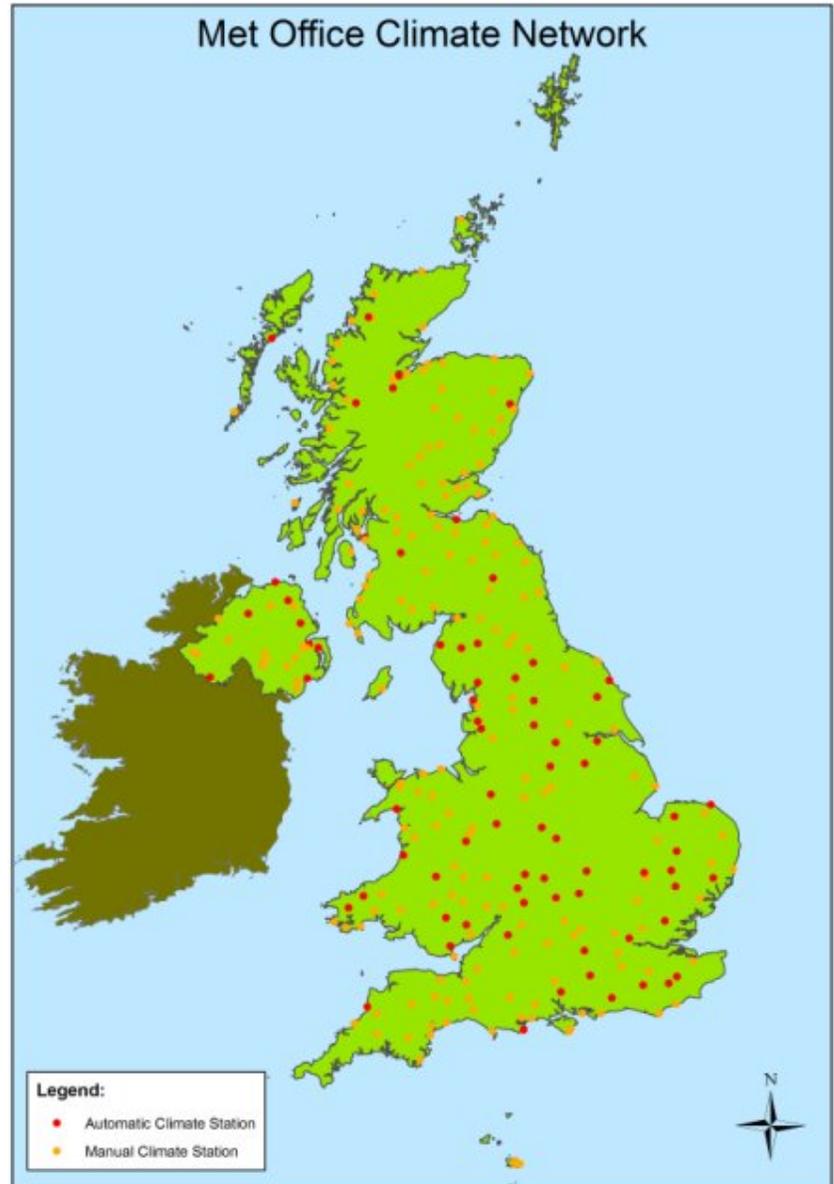
Fig 1. Map showing locations of stations in the Climate Network.

Manual observations and improvements to data entry

The majority of co-operating stations have a voluntary observer who does a single observation each day at 0900 UTC. Since March 2012, most observers enter their daily observation using our Weather Observation Website (WOW - *wow.metoffice.gov.uk*). For the first time observers have an simple mechanism for submitting extra observations and photographs as required, for example during an interesting weather event. Data submitted is immediately transferred to our climate database for the prompt completion of climatological analyses and summaries.
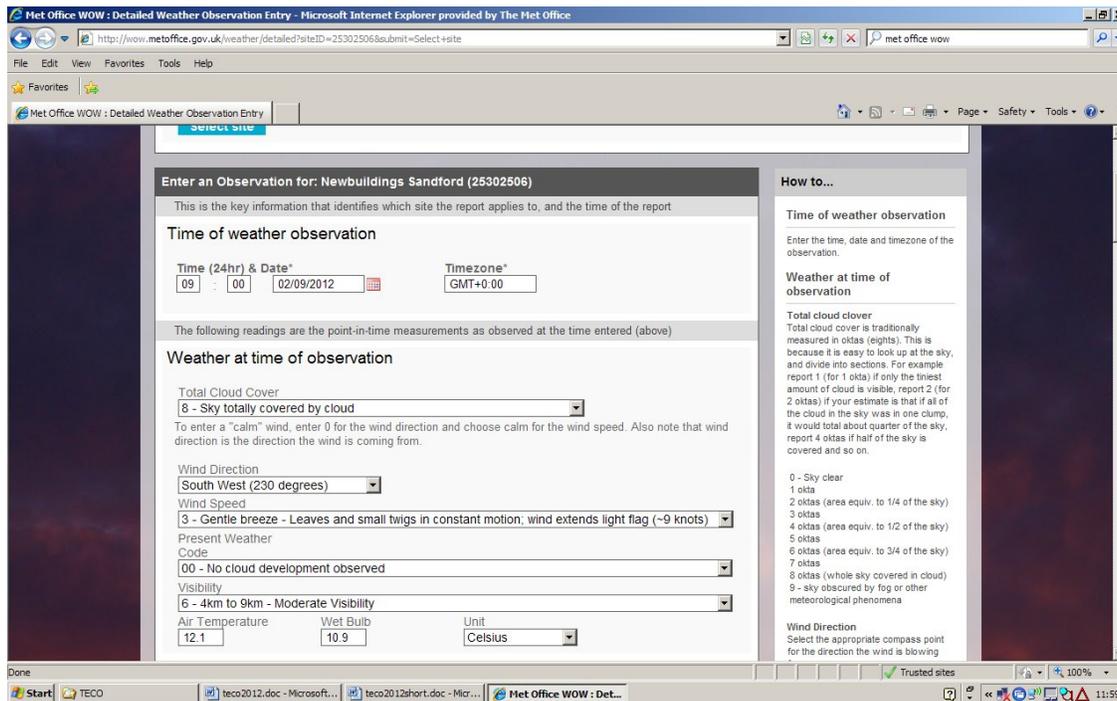

Fig 2. WOW screenshot showing data entry page.

Automation to protect long-term records

Over the last 3 years we have automated almost 80 co-operating climate stations. We install an mini-AWS with the same type of sensors as at our synoptic sites, only fewer. Installation is straightforward and unobtrusive and can sometimes be completed in a single day. Some AWS have even been installed in private gardens. Power is usually provided by a solar panel; mains power is generally only required at stations where sunshine is measured. Data is returned hourly to our Meteorological Monitoring System (MMS) via a GSM antenna.

Fig 3. Photograph of the automated climate site at Usk, Wales, taken on the day of installation.

In automating a co-operating station the main objective is to protect long-term records, typically where the observer or authority are no longer willing or able to continue manual observations. Alternatively, sometimes we are offered a suitable site for a new climate station, with a keen authority, but no observers are available.

The ex-observer/authority continues to be responsible for the grounds maintenance and is able to assist by, for example, unblocking raingauges as they are detected. They also continue to take an interest in the observations and receive daily or monthly summaries of the data from the AWS.

We have found the mini-AWS to be a useful option for maintaining the required density of climate stations. There is also the additional benefit of increased spatial resolution of real-time data for short-range forecasting.
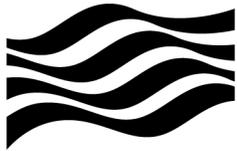
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Network management

The network is managed by six Regional Network Managers (RNMs) who are each responsible for improving data quality in their area. Each RNM is responsible for inspections, the collection and archiving of metadata, site finding and observer training. As such they are the main contact point for the station authority and observer and are able to develop a productive working relationship.

In particular the RNMs are key to the end-to-end process of data Quality Control (QC). Results from routine QC are reviewed by the RNM each month and followed up by observer training or other assistance as required.

Fig 4. Climate Network Manager and 6 Regional Network Managers.
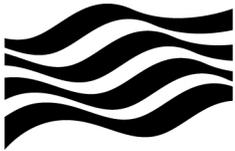
CIMO siting classification

The Met Office has classified the exposure of instruments at it's sites for many years and this year we have started to classify using the recently adopted CIMO Siting Classification scheme.

This has highlighted some differences in the interpretation of the WMO No 8 guidelines. Also it has led to the development of some tools to speed up the process of classification, such as flow diagrams to quickly guide the assessor to the correct classification decision by answering a minimum number of questions.

Fig 5. RNM assessing raingauge exposure and recording results.