



Setting up a weather station – some simple guidelines

Introduction

The Royal Meteorological Society, through its Special Interest Group on Meteorological Observing Systems, has developed both summary and detailed guidance on setting up a weather station. This is particularly targeted at professionals from a non meteorological background, or amateur observers who want their data to be of high quality. Others setting up a weather station may not want to adhere to this level of technical detail, but there are several simple things that all those making meteorological observations can do to make the observations comparable to those made elsewhere or of use to others should they be requested.

Following these guidelines cannot guarantee that the observations from a weather station will be fit-for-purpose, but it will improve the quality of the observations collected and ensure a more appropriate use of the meteorological information being collected. Further information is available from the Special Interest Group who can be contacted through the Society.

Temperature

The usual problem with temperature measurements is too much shelter from the wind, and not enough from the sun and rain. The thermometer is best deployed in a well-designed screen, which is in an open area away from buildings or hedges etc. When this is not possible, make sure that the thermometer is not exposed to direct sunlight, and is away from any walls that could be heated.

Wind

It is very difficult to find a good location for an anemometer, as the ideal site has no significant obstructions for hundreds of metres around. The exact requirement for the wind measurement may also dictate the chosen location for the anemometer. Where possible choose an open site, if necessary at roof-top, and measure the height of the anemometer above ground. If the data is requested, quote this height and any other information that may be useful, such as the height of the building, location of nearby trees or obstructions, etc. DO NOT correct the observations to the standard height of ten metres.

Rain

As with wind, shelter is a key problem. In particular try and make sure that there are no significant obstructions in the direction of the prevailing wind. An obstruction is usually significant if it is higher than half the distance between it and the rain gauge.

Pressure

There are not usually significant problems with measuring pressure, however in some circumstances the readings may be affected by gusts of wind.

Humidity

If you measure humidity, do not be surprised if there is an error of 5% or more. Maintaining a sensor in calibration is difficult, and in most cases an accuracy of better than 5% is not critical, or even achievable. Many sensors that measure humidity directly are not user adjustable, but you can get something of a check on a very foggy day with above freezing temperatures, when you should record around 95 to 100%.

Time

Most scientific applications use UTC (sometimes denoted as GMT), but if you use BST make this clear. Many locations take readings at a standard time of 09:00 UTC.

General Exposure

If your site is in use over a long period, remember that surrounding vegetation and trees grow, and this can change the exposure of your instruments.

Useful References recommended by the Society:***The Royal Meteorological Society* (www.rmets.org/weather/observing/index.php):**

- The guide on setting up a weather station. Version 2.3, authored by Andrew Overton.
- Guidelines for Automatic Weather Station site managers.
- Guidelines for Automatic Weather Station site auditors.

The UK Met Office:

- http://www.metoffice.gov.uk/media/pdf/k/5/Fact_sheet_No._17.pdf

The World Meteorological Organisation

- <http://www.wmo.int/pages/prog/www/IMOP/publications/WMO-8-Guide-contents.html>

Other useful documentation

- *The Observer's Handbook*, HMSO, 1982.
- *Siting and Exposure of Meteorological Instruments at Urban Sites*, T.R. Oke, 2004 (downloadable via links from 'www.urban-climate.org').
- *Measuring the Natural Environment (Second Edition)*, Ian Strangeways, Cambridge University Press (2003).

