

From

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WMO Guide to Meteorological Instruments
and Methods of Observation (Seventh
edition, 2008), Part I – Measurement of
meteorological variables, Chapter 1 –
General (basic metadata form at Annex
1.C). Available at [www.wmo.int/pages/
prog/www/IMOP/publications/CIMO-
Guide/CIMO_Guide-7th_Edition-2008.html](http://www.wmo.int/pages/prog/www/IMOP/publications/CIMO-Guide/CIMO_Guide-7th_Edition-2008.html)

ANNEX 1.C

STATION EXPOSURE DESCRIPTION

The accuracy with which an observation describes the state of a selected part of the atmosphere is not the same as the uncertainty of the instrument, because the value of the observation also depends on the instrument's exposure to the atmosphere. This is not a technical matter, so its description is the responsibility of the station observer or attendant. In practice, an ideal site with perfect exposure is seldom available and, unless the actual exposure is adequately documented, the reliability of observations cannot be determined (WMO, 2002).

Station metadata should contain the following aspects of instrument exposure:

- (a) Height of the instruments above the surface (or below it, for soil temperature);
- (b) Type of sheltering and degree of ventilation for temperature and humidity;
- (c) Degree of interference from other instruments or objects (masts, ventilators);
- (d) Microscale and toposcale surroundings of the instrument, in particular:
 - (i) The state of the enclosure's surface, influencing temperature and humidity; nearby major obstacles (buildings, fences, trees) and their size;
 - (ii) The degree of horizon obstruction for sunshine and radiation observations;
 - (iii) Surrounding terrain roughness and major vegetation, influencing the wind;
 - (iv) All toposcale terrain features such as small slopes, pavements, water surfaces;
- (v) Major mesoscale terrain features, such as coasts, mountains or urbanization.

Most of these matters will be semi-permanent, but any significant changes (growth of vegetation, new buildings) should be recorded in the station log-book, and dated.

For documenting the toposcale exposure, a map with a scale not larger than 1:25 000 showing contours of ≈ 1 m elevation differences is desirable. On this map the locations of buildings and trees (with height), surface cover and installed instruments should be marked. At map edges, major distant terrain features (for example, built-up areas, woods, open water, hills) should be indicated. Photographs are useful if they are not merely close-ups of the instrument or shelter, but are taken at sufficient distance to show the instrument and its terrain background. Such photographs should be taken from all cardinal directions.

The necessary minimum metadata for instrument exposure can be provided by filling in the template given on the next page for every station in a network (see Figure 1.3). An example of how to do this is shown in WMO (2003*b*). The classes used here for describing terrain roughness are given in Part I, Chapter 5, of the Guide. A more extensive description of metadata matters is given in WMO (2004).

Station	Update	
Elevation	Latitude	Longitude
<div style="display: flex; align-items: flex-start;"> <div style="width: 20%; padding-right: 10px;"> <p>0 200 m</p> <p> <input type="checkbox"/> Enclosure <input checked="" type="checkbox"/> Building // Road x x Trees, bushes (12) Height (m) of obstacle Elevation contour </p> </div> <div style="width: 80%; border: 1px solid black; padding: 5px;"> <div style="display: flex; align-items: center;"> <div style="width: 10px; height: 100px; border-left: 1px dashed black; margin-right: 5px;"></div> <div style="flex-grow: 1; background-color: #cccccc; position: relative;"> <div style="position: absolute; top: 5px; left: 5px;">N ↑</div> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%);"> <input checked="" type="checkbox"/> </div> </div> </div> </div> </div>		
Radiation horizon		
<p>Temperature and humidity:</p> <p style="text-align: center;">Sensor height</p> <p>Artificial ventilation? yes/no</p> <p>Surface cover under screen</p> <p>Soil under screen</p>		
<p>Precipitation: Gauge rim height</p>		
<p>Wind: Anemometer height Free-standing? yes/no</p> <p>(if "no" above: building height , width , length .</p> <p>Terrain roughness class: to N , to E , to S, to W .</p>		
Remarks:		

Figure I.3. General template for station exposure metadata