Making synoptic and NCM observations

The purpose of synoptic observations is to provide a general view of the weather conditions over a geographical area at a particular time. The National Climatological Message (NCM) is a coded message containing climatological data.

The main synoptic observations are taken at 00, 06, 12 and 1800 UTC. Intermediate synoptic hours are 03, 09, 15 and 2100 UTC. Some stations (especially those using automated systems) provide synoptic observations every hour.

- If your station has an automated system, the readings provided must always be checked and any changes made before sending the observation.
- If you have SAMOS (Semi-Automatic Meteorological Observing System), the automated readings will be displayed for you to check. You then need to add cloud amount, type and height, and present and past weather to complete the observation.
- If you have CODET (Computerised Observation — Data Encoding and Transmission), you will have to go out to the enclosure, record and enter the readings yourself into the CODET register.

Normally, a routine synoptic observation requires the following readings; however, your station may have agreed to provide a certain number of additional elements at particular hours.

- Dry- and wet-bulb temperatures
- Rainfall total
- Cloud amount, type and height
- Present weather
- Visibility
- Wind direction and speed
- Pressure
- Past weather

Steps required *(when making synoptic observations)*

Steps	Check	Notes
Open screen door. Read and note dry-bulb temperature	The dry bulb should usually be higher *(warmer)* than the wet bulb. If the air is very moist, such as in fog, the dry- and wet-bulb temperatures may be the same	
Read and note wet-bulb temperature	If the wet bulb is higher than the dry bulb, or they are reading the same when the air is dry, the muslin may have dried out	See 'Temperature and relative humidity' booklet for resolving general thermometer problems
Take rain measure, lift funnel off rain gauge, remove bottle, measure and record all the precipitation *(carry out in several stages if large amounts are present)*. Replace empty bottle and funnel. Empty rain measure completely.	If precipitation is falling at the time of observation, neither the record for the 24-hour total 'thrown back' to the previous day, nor that for the 24-hour total following it, are to be recorded as zero. Record 'TRACE' if <0.05 mm is measured, or if you definitely know some precipitation has fallen but no rainfall is detected in the gauge. Make sure you melt any frozen precipitation (including any in the funnel) and include it in the measurement	Precipitation includes all rain, snow drizzle, hail, etc. AND any liquid deposits from fog, heavy dew or hoar frost that have accumulated in the rain gauge. Solid precipitation *(e.g. snow)* should be thawed and measured as liquid water. See 'Precipitation' booklet for further guidance
Note the amount of sky covered by cloud		Must be between 0 and 9 *(only use 9 for sky not visible)*. See 'Cloud observation and coding' booklet for further guidance
Note the present weather – is there any precipitation?	Make sure present weather matches the rest of the observation *(e.g. if you report drifting snow, there must be a strong wind)*	Always report the most significant aspect of the weather *(e.g. thunderstorm rather than fog)*. See 'Present weather' booklet for further guidance
Estimate visibility using known distances of local landmarks	Make sure your visibility is compatible with the rest of your observation — if you report fog, your visibility MUST be <1 km	See 'Visibility' booklet for further guidance
Note wind direction	Use '00' for calm conditions (no direction)	See 'Surface wind' booklet for further guidance
Note wind speed	Use '00' for calm conditions (no speed)	See 'Surface wind' booklet for further guidance

Steps *(continued)*	**Check**	**Notes**
Read and note the pressure and determine the change/tendancy	Compare the pressure with the reading made three hours earlier	See 'Pressure' booklet for further guidance
Depth of accumulated, undrifted snow	Read every hour whenever there is *any* lying snow on the ground *(including '998' code figure)*	See 'State of ground and snow depth' booklet for further guidance
Assess the past weather	Period to be considered varies *(can be 1, 3 or 6 hours)*	See 'Past weather' booklet for further guidance

Additional readings at certain hours ***(needed for NCM observations)***

What to measure	**Notes**
Maximum and minimum temperatures	Read and reset at 0900 and 2100 UTC *(also read at 0600 and 1800 UTC* ***WITHOUT*** *resetting)*
Grass minimum temperature	Read and reset at 0900 UTC *(also read at 0600 UTC* ***WITHOUT*** *resetting)*
Soil temperature	Read and reset at 0900 UTC at selected stations
Assess the state of concrete slab	Read at 0900 UTC. No assessment to be made when the slab is covered by snow or the ground is frozen
Concrete-slab minimum temperature	Read and reset at 0900 UTC
State of ground	Three-hourly readings from 0000 UTC
Amount of precipitation	Separate gauges are normally used for synoptic and climatological measurements. Some stations also report hourly precipitation. Readings made at 0000 and 1200 UTC cover the previous 6 hours. Readings made at 06, 18 and 2100 UTC cover the previous 12 hours. Readings at 0900 UTC cover the previous 24 hours, unless yesterday's reading was made at 2100 UTC, when it covers the previous 12 hours *(2100–0900 UTC)*

Additional readings at certain hours *(continued)*

What to measure	Notes
Depth of accumulated, undrifted snow	Read at 0900 UTC whenever there is any lying snow on the ground *(including '998' code figure)*
Depth of accumulated, undrifted fresh snow	Read at 0900 UTC whenever there is more than half cover of lying snow on the ground *(you cannot have a '998' code figure)*
Duration of bright sunshine	Change the sunshine card in a Campbell–Stokes recorder daily as soon as you can after sunset, unless there is a different agreement *(e.g. to change it at 0900 UTC when doing climatological observations)*

If you have an automated measurement system, check the automatic readings at the observation time (for any missing or erroneous readings) and make any changes before sending the observation. This is your opportunity to make sure that the observation being sent is of the highest quality.

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