

# **SENSOR DEPLOYMENT AND SITING REQUIREMENTS: NWS-SOP STATIONS**

**Adapted from: *Instrument Requirements and Standards for the NWS Surface Observing Programs (Land)***

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## **Combined Sensor Deployment and Siting Requirements NWS-SOP Stations**

### **Air Temperature**

Specific permission to depart from the standards may be granted in writing by the Regional Headquarters and must be documented on the station information forms. Site the temperature sensor according to the following standards:

- a. Over level terrain (earth or sod) typical of the area around the station, and;
- b. At least 100 feet from any extensive concrete or paved surface.
- c. All attempts will be made to avoid:
  - (1) areas where rough terrain or air drainage are proven to result in nonrepresentative temperature data,
  - (2) areas where water tends to collect, and
  - (3) areas where drifting snow collects.
- d. If the sensor is within a shelter, position the shelter so it opens to the north with the floor 4 to 6 feet above the surface. Shelters should be located no closer to an obstruction than four times the height of the obstruction.
- e. In the case of remoted sensors not exposed in shelters, the air intake will be 4 to 6 feet above the surface. Remoted sensors should be located no closer to an obstruction than four times the height of the obstruction.
- f. An object will be considered an obstruction if the object is greater than ten degrees in horizontal width as measured from the sensor and within 200 feet of the sensor.

## Wind Speed/Direction

- a. The wind sensor will be oriented with respect to true north. The site should be as level as possible.
- b. The standard height above the ground for wind sensors is 33 feet. If local restrictions prevent installing the sensors at the 33-foot standard, install them no less than 20 feet above the ground.
- c. The sensor height must be at least 15 feet above the height of any obstruction within 500 feet. If practical the sensor should be at least 10 feet higher than any obstruction between 500 and 1,000 feet of the sensor.
- d. An object will be considered an obstruction if the object is greater than 10 degrees in horizontal width as measured from the sensor.

## Precipitation

The exposure of the precipitation gauge is of primary importance in the accuracy of precipitation measurements, especially snowfall measurements. An ideal exposure would eliminate all turbulence and eddy currents, near the gauge, that tend to carry away the precipitation. The loss of precipitation in this manner tends to increase with wind speed and orifice height.

- a. The orifice of the gauge will be horizontal and 3 to 5 feet above the surface. Exceptions must be granted by the Regional Headquarters in writing and described in the station information documentation.
- b. The gauge site should have protection in all directions by objects of uniform height. Where the heights of the objects are uniform and the height of these objects and the distance from the gauge is generally uniform, their height above the gauge orifice should not exceed twice their distance from the gauge.
- c. In open areas, the heights of obstructions above the orifice should not exceed twice their distance from the gauge.

## Solar Radiation

Locate the sensor where there are no stationary obstructions reflecting sunlight or casting a shadow on the sensor.