

Types of Meteorological Instruments:-

Meteorological instruments are classified as

(1) Non-recording instruments:-

The Non-recording instruments are read at some standard time.

(2) Recording Instruments:-

The recording instruments give a continuous record of the observation for 24 hours.

Meteorological weather station at
Malakandhar Farm.



Weather/Climate Station:-

Following variable are recorded.

- Wind velocity/direction.
- Rain fall.
- Relative humidity and temperature.
- Radiation.

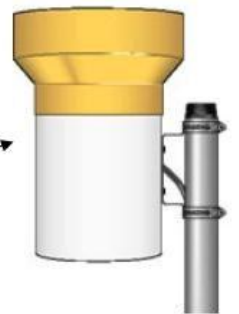
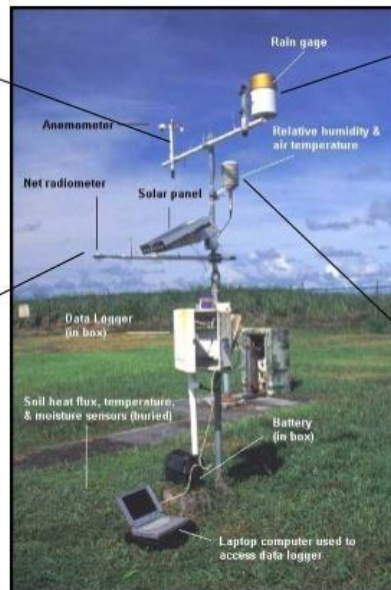
Components of Weather station



Anemometer



Radiometer



Tipping bucket rain gauge



Relative

Measurement of Atmospheric Elements:-

- 1 - Pressure .
- 2 - Air temperature .
- 3 - Relative humidity .
- 4 - Wind Direction and Speed .
- 5 - Solar Radiation .
- 6 - Duration of Sunshine .
- 7 - Rainfall .
- 8 - Evaporation .

① Pressure :-

The Non-recording instrument for the measurement of atmospheric pressure is the barometer and the recording one is the barograph

A barograph is a recording aneroid barometer. It produces paper or foil chart called barogram that records the barometric pressure over time.

The most common type of barometer used is the aneroid barometer shown in figure.

* Inside this instrument is small, flexible metal capsule called aneroid cell.

In the construction of the device, a vacuum is created inside the capsule so that small changes in outside



air pressure cause the capsule to expand or contract.

- The size of the aneroid cell is then calibrated and any change in its volume is transmitted by springs and levers to an indicating arm that points to the corresponding atmospheric pressure on dial.

(2) Air Temperature:-

The non-recording instruments used for the measurements of air temperature are maximum and minimum thermometers, which give the extreme values of daily air temperature.

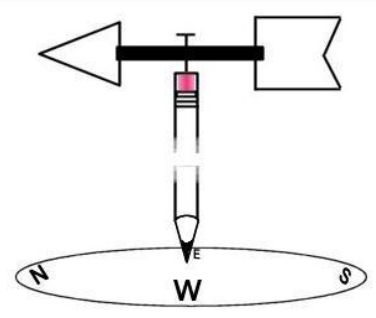


- The top thermometer contains alcohol and is used to determine daily minimum temperature.
- The lower thermometer uses mercury to determine the daily maximum temperature.
- Thermometers found inside the instrument shelter are mounted approximately 1.5 meters above the ground surface.

Thermographs are used as recording instruments to get a continuous record of air temperature.

③ Wind direction:-

Knowing the direction of wind is an important part of predicting weather because wind bring us our weather.



A wind vane also called a weather vane, is a tool for measuring wind direction and was probably one of the first weather instruments ever used. To determine wind direction a wind spins and points in the direction from which the wind is coming and has generally two ends/parts - one that is usually shaped like an arrow and turns into wind and one end that is wider so that it catches the breeze.

The arrow will point to the direction the wind blowing from. If it is pointing east it means that the wind is coming from the east.

To use a wind vane you must know north, south, east and west directions - which is usually taken from compass -

④ Wind Speed:-

Anemometer is a type of weather instrument that measures wind speed. Some of these instruments measure both wind speed and wind direction.



Anemometers are common at weather stations. A Cup anemometer is type of instrument that uses three or four hemispherical cups mounted on horizontal arms on a vertical rod. The wind pushes the cups and causes the arms to rotate at a rate proportional to the wind speed.

Some scientific anemometers use the speed of sound to measure the wind speed more precisely in three dimension.

⑤ Solar Radiation:-

The solar radiation passes through the earth's atmosphere, some of it is absorbed or scattered by air molecules, water vapors, aerosols and clouds.

The solar radiation that passes through directly to the earth's surface is called Direct Solar Radiation. Direct radiation is measured by Pyrheliometer.



⑥ Duration of Sunshine:-

The duration of sunshine (hourly and daily totals) is measured with Sunshine Recorder.

The instrument consists of a glass sphere about 10cm in diameter mounted concentrically in a section of a spherical bowl, the diameter of which is such that the sun rays are focused sharply on a card held in grooves in the bowl.

This instrument uses heat radiation from the sun to burn a trace in the chart. The length of the trace give length of bright shine hours.