WEATHER: TEMPERATURE, BAROMETER, PRESSURE, PRECIPITATION, WIND SPEED AND DIRECTION, HUMIDITY

weather: the state of the atmosphere at a particular place and time as regards heat, cloudiness, dryness, sunshine, wind, rain, etc.

Temperature: the degree or intensity of heat present in a substance or object, especially as expressed according to a comparative scale and shown by a thermometer or perceived by touch.

Barometer:

A barometer is a scientific instrument that is used to measure air pressure in a certain environment. Pressure tendency can forecast short term changes in the weather. Many measurements of air pressure are used within surface weather analysis to help find surface troughs, pressure systems and frontal boundaries.

Barometers and pressure altimeters (the most basic and common type of altimeter) are essentially the same instrument, but used for different purposes. An altimeter is intended to be used at different levels matching the corresponding atmospheric pressure to the altitude, while a barometer is kept at the same level and measures subtle pressure changes caused by weather and elements of weather. The average atmospheric pressure on the earth's surface varies between 940 and 1040 hPa (mbar). The average atmospheric pressure at sea level is 1013 hPa (mbar).

Pressure:

Pressure is defined as the physical force exerted on an object. The force applied is perpendicular to the surface of objects per unit area. The basic formula for pressure is F/A (Force per unit area). Unit of pressure is Pascals (Pa). Types of Pressures are Absolute, Atmospheric, Differential, and Gauge Pressure.

Precipitation:

water that falls from the clouds towards the ground, especially as rain or snow:

Hail and sleet are types of precipitation.

The forecast is for dry, cloudy weather with no precipitation expected.

Wind Speed:

Wind speed, or wind flow speed, is a fundamental atmospheric quantity caused by air moving from high to low pressure, usually due to changes in temperature.
Note that wind direction is usually almost parallel to isobars (and not perpendicular, as one might expect), due to Earth's rotation.

Wind speed affects weather forecasting, aviation and maritime operations, construction projects, growth and metabolism rate of many plant species, and has countless other implications.

Wind speed is now commonly measured with an **anemometer.**

Wind Direction:

Wind direction is reported by the direction from which it originates. For example, a northerly wind blows from the north to the south. Wind direction is usually reported in cardinal directions or in azimuth degrees. Wind direction is measured in degrees clockwise from due north.

Humidity:

Humidity is the concentration of water vapour present in the air. Water vapour, the gaseous state of water, is generally invisible to the human eye. Humidity indicates the likelihood for precipitation, dew, or fog to be present. The amount of water vapors needed to achieve saturation increases as the temperature increases. As the temperature of a parcel of air decreases it will eventually reach the saturation point without adding or losing water mass. The amount of water vapour contained within a parcel of air can vary significantly. For example, a parcel of air near saturation may contain 28 grams of water per cubic metre of air at 30 °C, but only 8 grams of water per cubic metre of air at 8 °C.

Device for measurement of Humidity:

A device used to measure humidity is called a psychrometer or hygrometer. A humidistat is a humidity-triggered switch, often used to control a dehumidifier.

There are various devices used to measure and

regulate humidity. Calibration standards for the most accurate measurement include the gravimetric hygrometer, chilled mirror hygrometer, and electrolytic hygrometer. The gravimetric method, while the most accurate, is very cumbersome. For fast and very accurate measurement the chilled mirror method is effective. For process on-line measurements, the most commonly used sensors nowadays are based on capacitance measurements to measure relative humidity, frequently with internal conversions to display absolute humidity as well. These are cheap, simple, generally accurate and relatively robust. All humidity sensors face problems in measuring dust-laden gas, such as exhaust streams from dryers.

Humidity is also measured on a global scale using remotely placed satellites. These satellites are able to detect the concentration of water in the troposphere at altitudes between 4 and 12 kilometres. Satellites that can measure water vapor have sensors that are sensitive to infrared radiation. Water vapor specifically absorbs and re-radiates radiation in this spectral band. Satellite water vapor imagery plays an important role in monitoring climate conditions (like the formation of thunderstorms) and in the development of weather forecasts.