EVAPORATION

Evaporation is the process of a substance in a liquid state changing to a gaseous state due to an increase in temperature and/or pressure.

The evaporation rate is defined as the amount of water lost as water vapour from a unit area surface in unit time.

Evaporation Pan

At the Trinidad and Tobago Meteorological Service (TTMS), evaporation is measured by observing the change of level of the free water surface in the **class A evaporation pan**. The water level is measured by using a hook gauge.

PRECIPITATION

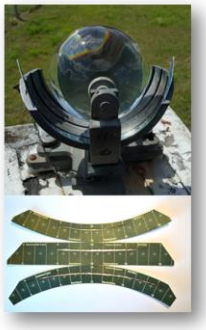
Precipitation is part of the water balance of the atmosphere, whereby, water falls to the earth in the form of rain, snow, hail, shower, drizzle, etc.

Rain gauge measures the amount of rainfall per square metre. Rainfall is measured in millimeters (mm).

Rain Gauge

SUNSHINE

The measurement of the duration of sunshine is needed to study the total radiation reaching the earth's surface.



Sunshine recorders are used to measure hourly totals of duration of sunshine to the nearest tenth of an hour.

The Campbell-Stokes sunshine recorder uses the focused heat radiation from the sun to burn a trace on a chart.

There are grooves on the bowl which hold cards, suitable for different times of the year. There are three types of sunshine cards: Summer, Winter, Equinoctial.

METEOROLOGICAL SERVICES DIVISION, PIARCO

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METEOROLOGICAL INSTRUMENTS

RAINFALL

WIND

SUNSHINE

TEMPERATURE

METEOROLOGICAL INSTRUMENTS

Meteorological data is collected and transmitted from surface stations at Piarco and Crown Point. Rainfall, temperature, relative humidity, pressure and wind are the five fundamental weather elements that are measured. Other parameters recorded include sunshine, evaporation and solar radiation.

Various instruments are used for meteorological observations. These meteorological observations are done for a variety of reasons including preparation of weather analyses, forecasts and severe weather warnings, for local weather dependent operations (e.g. aerodrome flying operations) and for research in meteorology and climatology.

PRESSURE

The pressure of the atmosphere on a given surface is the force per unit area, and is equal to the weight of the vertical column of air above the surface, extending to the outer limits of the atmosphere.

A **Barometer** is used to measure atmospheric pressure.

Digital Barometer

Atmospheric pressure is measured in hectoPascals (hPa) or millibars (mb), both units being equivalent.

TEMPERATURE

Temperature is the degree of hotness or coldness of a substance. Temperature is measured in degrees Celsius (°C). The air temperature is measured by instruments that are stored inside a **Stevenson screen,** which protects them from the direct sunlight and rain. These instruments are as follows:

Thermometers:

1. Dry bulb
2. Wet bulb
3. Maximum
4. Minimum
5. Wet Bulb Maximum
6. Wet Bulb Minimum

Chart Recorders:

7. Bi-Metallic Thermograph
8. Hygrograph (measures humidity)

The ***dry bulb*** thermometer measures the ambient air temperature and the ***wet bulb*** measures the temperature of the air, if it were cooled to 100% saturation. The relative humidity, dew point temperature and saturation vapour pressure can be calculated using the values of the dry and wet bulb thermometers.

The ***maximum*** and ***minimum*** thermometers record the highest and lowest temperatures of the day. The ***wet bulb maximum*** and ***wet bulb minimum*** thermometers record the highest and lowest temperature of the air if it were cooled to 100% saturation.

The ***Bi-Metallic Thermograph*** is used to measure temperature. As temperature changes, the bi-metallic coil expands and contracts causing an attached pen arm to note these changes on a chart.

HUMIDITY

Humidity is the amount of water vapour present in the atmosphere. Relative Humidity is the amount of water vapour in the air relative to the what the air can hold and it is expressed as a percentage. This can also be measured using **a Hygrograph.**

WIND

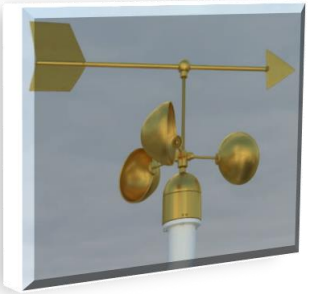
Wind is a horizontal flow of the free air relative to the earth's surface.

An **anemometer** is the device used to measure the wind speed. The wind speed is obtained by counting the number of revolutions (distance) over a given period (time). Wind speed is recorded in knots as well as m/s or km/h.

Anemometer

The wind direction is indicated by a **wind vane** and recorded in degrees or represented by the cardinal points.

The wind direction at the Trinidad and Tobago Meteorological Service (TTMS) is measured in tens of a degree starting clockwise from true North.



Wind Vane