

Manual Relative Humidity

(Last rev. 30/10/2024)

Fortuna Station (see Figure 1) Relative Humidity is manually measured at Fortuna using two different systems: sling psychrometer and a dial hygrometer.

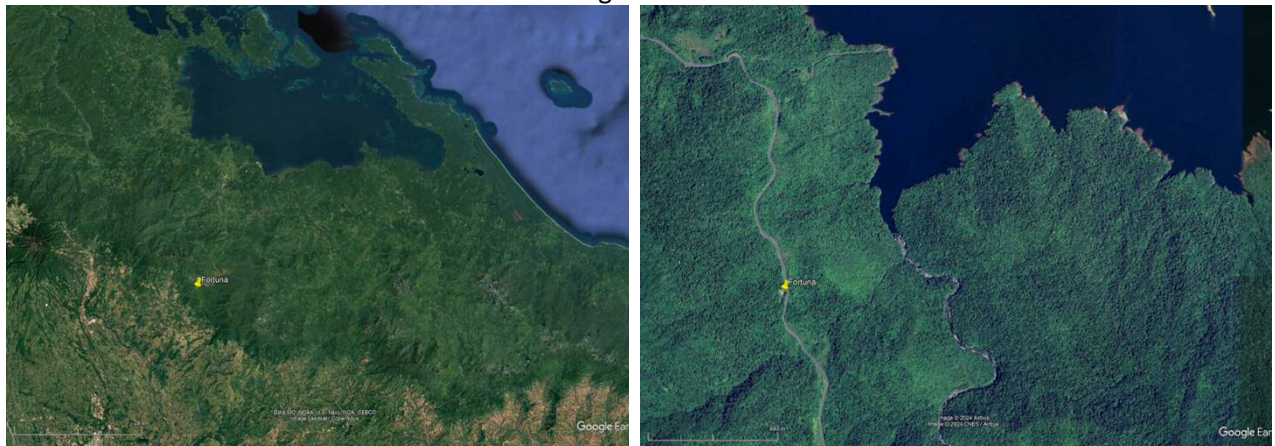
Manual Relative Humidity is recorded, usually between 12:00 and 1:00pm.

Data are collected as wet and dry bulb temperatures using a Bacharach Sling Psychrometer (see Figure 2). The wet bulb of the Psychrometer is wetted with distilled water. The Psychrometer is then vigorously rotated for 60-90 seconds following which wet and dry-bulb temperatures are recorded.

A Robert White Instruments dial precision hygrometer, located inside a standard Stephenson's screen instrument shelter, is also used to measure relative humidity (see Figure 3).

Measurements are made between 8:30 and 10:00am.

Figure 1.



Location of Fortuna Station

Figure 1



Bacharach Sling Psychrometer

Figure 1



Robert White Instruments dial precision hygrometer

Appendix A

Calculation of Relative Humidity from Wet/Dry bulb temperatures

Wet/dry bulb temperatures are converted to relative humidity using the following equation:

$$P = 101.325 * e^{(-.0001184 * \text{Elevation})}$$

$$A = .00066 * (1 + .00115 * T_w)$$

$$E_{Swb} = e^{((16.78 * T_w - 116.9) / (T_w + 237.3))}$$

$$E_d = E_{Swb} - P * A * (T_d - T_w)$$

$$E_{Sdb} = e^{((16.78 * T_d - 116.9) / (T_d + 237.3))}$$

$$\text{Relative Humidity} = 100 * E_d / E_{Sdb}$$

Where: T_w = Wet-bulb temperature (in degrees Celsius)

T_d = Wet-bulb temperature (in degrees Celsius)