

Electronic Precipitation Methodology

(Last rev. 07/10/2024)

The Parque Natural Metropolitano (PNM) station (Figure 1) is located on the north edge of Panama City. It is attached to a large construction crane.

The original crane was dismantled in 2021 and a new crane, located approximately 10m away, was put into operation in January of 2022. The new crane is taller (~70m) compared to the original crane (~60m). No difference in precipitation is expected because of the change (Figure 2).

STRI measures rainfall using tipping buckets. Tipping buckets have a resolution changed to 0.254mm (0.01") with recording intervals of 15 minutes. Totals are given at the end of each 15-minute period.

When the meteorology station for the PNM crane was installed in 1996, the station was located mid-way up the tower to one side (Figure 3). The tipping bucket for this station was a Texas Electronics, Inc. TR-525M Rainfall Sensor (Figure 4).

In April of 2008, the tipping bucket was relocated to the top of the tower (Figure 4) and was replaced with a Hydrological Services Model TB4 tipping bucket (Figure 5).

Tipping buckets are calibrated at least yearly according to the manufacturer's specifications (Figure 6).

Hydrological Services vs Manual gauges

A comparison of monthly totals over a period of 50 years on Barro Colorado shows that the Hydrological Services gauge reports approximately 13.5% less rainfall than the Manual rain gauge (Figure 7). The same trend is also observed at all other stations with both manual and electronically measured precipitation.

Figure 1



Location of PNM cranes

Figure 2



PNM Cranes (new crane left, old crane right)

Figure 3



PNM tower showing met. station approximately at the middle of the tower (25m)

Figure 3



Original Texas Electronics, Inc. TR-525M Rainfall Sensor

Figure 4



Tipping bucket on top of the PNM crane.

Figure 5



Hydrological Services Model TB4 tipping bucket

Figure 6



Tipping Bucket Calibration

Figure 6

