



THE ATMOSPHERIC RESERVOIR

Examining the Atmosphere and Atmospheric Resource Management

"Gauging Your Interest"

By Mark D. Schneider

Rain gauges come in all sorts of shapes and sizes, so it's natural to be confused as to what type to use. There are many factors determining why your recorded rainfall for a particular day varies from what your neighbor reads in their gauge. You may have experienced a downpour of rainfall while driving and then dry conditions a short distance further. Convective rainfalls such as thunderstorms create large variability in both quantity of rain and areal coverage. Another factor determining rainfall variability is the design of the rain gauge itself. Regardless of the size and shape of a rain gauge, it should have a calibrated measurement scale that attempts to be representative of the actual quantity of water it collects. This is the reason why you shouldn't set a coffee can outside, collect rain with it and then place a regular ruler inside to measure the rainfall. The coffee can would require a ruler or scale that was specifically engineered for its size and shape.

Certain sizes and shapes of rain gauges are more efficient at collecting rainfall; take for example a four-inch versus a one-inch diameter cylindrical gauge. The larger opening of the four-inch gauge has a better collection efficiency and therefore records more accurately. Smaller gauges usually have measurement scales with larger intervals such as whole or half inch markings versus a



Atmospheric Resource Board Cooperative Observer Network (ARBCON) Rain Gauge.

larger gauges' one-hundredth of an inch scale resulting in reduced accuracy.

So you might be asking whether or not there is an official or "standard" rain gauge. There is, however most of us don't own one because of size and cost considerations. The National Weather Service (NWS) still uses large 20 cm diameter (approximately eight-inches) precipitation gauges at major reporting locations such as airports and these became the "standard" for reporting in the early 20th century. Most official observations today are made with four-inch diameter plastic gauges with funnel-shaped

lids that empty into a smaller one-inch diameter tube. This one-inch tube contains a measurement scale to the nearest one-hundredth of an inch of water. If more than an inch of water collects during the day, it will overflow into the larger four-inch gauge and then be poured through the funnel into the smaller tube and added to the initial recorded inch.

The North Dakota Atmospheric Resource Board Cooperative Observer Network (ARBCON) consists of approximately 500 observers statewide who report rainfall during the April through September growing season. ARBCON observers are provided four-inch diameter cylindrical rain gauges, the same type of gauges that the NWS Cooperative Observers use. ARBCON observers began using wedge-shaped rain gauges in 1977, but changed to four-inch gauges in 2010 to accommodate snowfall reporting.

If you check your rain gauge daily and are interested in reporting for ARBCON, you can contact Daniel Brothers at (701) 328-2788 or dabrothers@nd.gov. ARBCON would provide you with a rain gauge in exchange for your valuable observations.

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