(1-220314-C) **A New Precipitation Gauge Wind Shield for the US Climate Reference Network**

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All gauge-based precipitation measurements suffer from undercatch due to the effects of wind, but solid precipitation measurements are especially susceptible to such errors. When it is snowing and windy, unshielded precipitation gauges typically catch less than one-third of the amount of precipitation of a precipitation gauge that is protected from the wind. For this reason, the US Climate Reference Network developed a large, double layer, wooden wind shield called the Small Double Fence Intercomparison Reference (SDFIR). In past studies, the SDFIR has been demonstrated to be the most effective wind shield in use in any weather or climate network, reducing solid precipitation undercatch to less than 10% in high winds. However, SDFIRs are subject to decay, they are difficult to replace and maintain, and they hinder access to the gauge for servicing. For these reasons, a new precipitation gauge wind shield called the Low Porosity Double Fence (LPDF) has been developed by NOAA. The new wind shield is smaller, easier to install, and requires less maintenance than the SDFIR. Tested at three separate sites chosen for prevalent windy and snowy weather, the precipitation measurements recorded within the new LPDF compared well to the SDFIR. For the measurement of solid precipitation, the LPDF-shielded measurements were statistically indistinguishable from the SDFIR, and the long-term course of precipitation accumulation from precipitation gauges shielded by the SDFIR and the LPDF were almost identical.

Figure 1. Photos of Low Porosity Double Fence (LPDF) shields installed at the Boulder, CO (a), Marshall, CO (b), and Chatham, MI (c) sites.