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How Well Are We Measuring Snow? The NOAA/FAA/NCAR Winter Precipitation Test Bed

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Precipitation is one of the most important atmospheric variables for ecosystems, hydrologic systems, climate, and weather forecasting. Despite its importance, accurate measurement remains challenging, and the lack of recent and complete inter-comparisons leads researchers to discount the importance and severity of measurement errors. These errors are exacerbated for the automated measurement of solid precipitation and underestimates of 20-50% are common. While solid precipitation measurements have been the subject of many studies, there have been only a limited number of coordinated assessments on the accuracy, reliability, and repeatability of automatic precipitation measurements. The most recent comprehensive study, the "WMO Solid Precipitation Measurement Inter-comparison" focused on manual techniques of solid precipitation measurement. Precipitation gauge technology has changed considerably in the last 12 years and the focus has shifted to automated techniques. Given the strong need for automated solid precipitation data from both the climate and weather communities, and the widely varying catch efficiencies of the various instruments, inter-comparison studies are needed. The World Meteorological Organization Committee on Meteorological Instruments and Observations (WMO-CIMO) is organizing a Solid Precipitation Inter-comparison Experiment (WMO-SPICE) focused on automatic precipitation gauges and their configurations, in various climate conditions, building on the significant efforts currently underway in many countries. The inter-comparison will aim at understanding and improving our ability to reliably measure solid precipitation using automatic gauges. The study will take place starting in 2012 at sites around the world including the US, Norway, China, Canada, Japan, Switzerland, Russia, Finland and New Zealand. The NOAA /FAA/NCAR precipitation test bed in Marshall, CO. in partnership with Environment Canada will collect data during the winter of 2011/2012 to enable the WMO-SPICE organizing committee to determine the reference to be used by all other participants in 2012 for the measurement of solid precipitation. The NOAA/FAA/NCAR testbed has been chosen as one of the lead facilities for this study because of the comprehensive set of instrumentation in place for the measurement of solid precipitation. Results from the NCAR Marshall Field research site will be highlighted and an overview and update on the WMO-SPICE will be presented.