



## **Development of Innovative Low-cost Hydrometeorological Sensors to Improve Monitoring in Data-sparse Regions**

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Accurate and reliable real-time monitoring and dissemination of observations of atmospheric and hydrologic conditions in general is critical for a variety of research and decision support applications. Combined precipitation and stream gauge observations provide information about the hydrological cycle in a basin and are critical for a variety of hydrometeorological applications. In many regions of the World, weather station, precipitation gauge, and stream gauge networks are sparsely located and/or of poor quality. Existing stations have often been sited incorrectly, not well-maintained, and have limited communications established at the site for real-time monitoring. The University Corporation for Atmospheric Research (UCAR) with support from USAID, has started an initiative to develop low-cost hydrometeorological instrumentation including tipping bucket and weighing-type precipitation gauges along with stream gauges as solution to increase observation networks in sparsely observed regions of the world. The goal of the project is to improve the number of observations (temporally and spatially) in these regions to improve the quality of applications for environmental monitoring and early warning alert systems on a regional to global scale. One important aspect of this initiative is to make the data open to the community. The hydrometeorological instrumentation have been developed using innovative new technologies such as 3D printers, Raspberry Pi computing systems, and wireless communications. The presentation will provide an overview of the new observation technology and experiences with sensor the performances.