



Development of Innovative Technology to Provide Low-Cost Surface Atmospheric Observations in Data Sparse Regions

Paul Kucera and Martin Steinson

University Corporation for Atmospheric Research, COMET, Boulder, United States (pkucera@ucar.edu)

Accurate and reliable real-time monitoring and dissemination of observations of surface weather conditions is critical for a variety of societal applications. Applications that provide local and regional information about temperature, precipitation, moisture, and winds, for example, are important for agriculture, water resource monitoring, health, and monitoring of hazard weather conditions. In many regions of the World, surface weather stations 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 developed a program to deploy low-cost weather instrumentation in sparsely observed regions of the world. The project is focused on improving weather observations for environmental monitoring and early warning alert systems on a regional to global scale. Instrumentation that has been developed use innovative new technologies such as 3D printers, Raspberry Pi computing systems, and wireless communications. The goal of the project is to make the weather station designs, software, and processing tools an open community resource. The weather stations can be built locally by agencies, through educational institutions, and residential communities as a citizen effort to augment existing networks to improve detection of natural hazards for disaster risk reduction. The presentation will provide an overview of the open source weather station technology that has been developed to support the expansion of Earth observations in data sparse regions of the world.