Q2: A National Multi-Sensor QPE System

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Accurate quantitative precipitation estimates (QPE) and very short-term quantitative precipitation forecasts (VSTQPF) are critical to accurate monitoring and prediction of water-related hazards and water resources. While tremendous progress has been made in the last quarter century in many areas of QPE and VSTQPF, significant gaps continue to exist in both knowledge and capabilities that are necessary to produce accurate high-resolution precipitation estimates at the national scale for a wide spectrum of users. Toward this goal, a national Next-Generation QPE ("Q2"[1]) system has been developed at the National Oceanic and Atmospheric Administration's National Severe Storms Lab (NSSL). The system consists of four major components: 1) data quality control; 2) multi-sensor precipitation classification; and 3) multi-sensor QPE; and 4) evaluation. It serves as a hydrometeorological platform for assimilating different observational networks and for creating high spatial and temporal resolution QPEs for flood warnings and water resource managements on the national scale.

Q2 system has been running in real-time since June 2006 (http://nmq.ou.edu), and it generates a suite of QPE products for the Conterminous United States at a 1-km horizontal resolution and 5 minute update cycle. The experimental products are provided to users from government agencies and universities in real-time and have been utilized in various meteorological and hydrological applications. In 2006, working with the National Weather Service's Office of Climate, Weather, and Water Services, NSSL began prototype testing of the high-resolution gridded Q2 precipitation products as input into the Flash Flood Monitoring and Prediction program[2]. Dissemination of Q2 products to selected River Forecast Centers (RFCs) began in 2007 with all RFCs currently having access through the Advanced Weather Interactive Processing System (AWIPS) Multi-sensor Precipitation Estimator (MPE[3]). The Q2 system has facilitated systematic evaluations and advances of hydrometeorological sciences and will be transferred to operations in year 2010.

This paper provides an overview of Q2 system components and products and describes its current development projects and future plans.

References:

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