



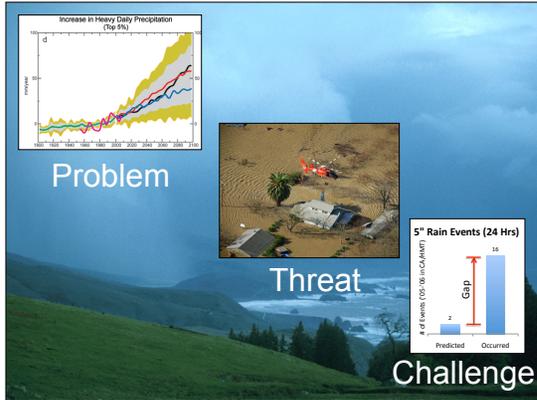
NOAA Hydrometeorology Testbed (HMT)

Research on Extreme Precipitation Supporting Water Resources in a Changing Climate



Rob Cifelli¹, K. Mahoney², L. Johnson¹, T. Schneider¹, B. Moore², S. Matrosov², S. Lim³, M. Ralph¹, A. Barros⁴, W. Petersen^{4,5}, W. Krajewski⁶

¹NOAA/ESRL-PSD, ²CIRES/UC, ³CIRA/CSU, ⁴Duke Univ., ⁵NASA/WFF, ⁶Univ. Iowa



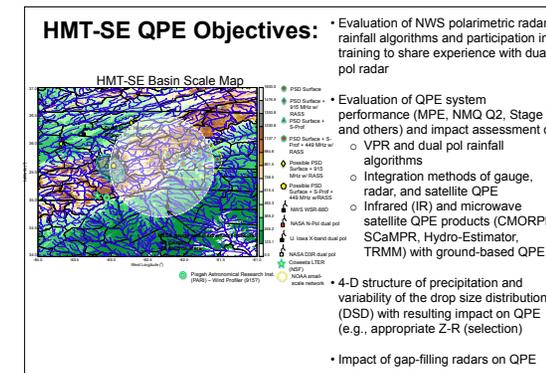
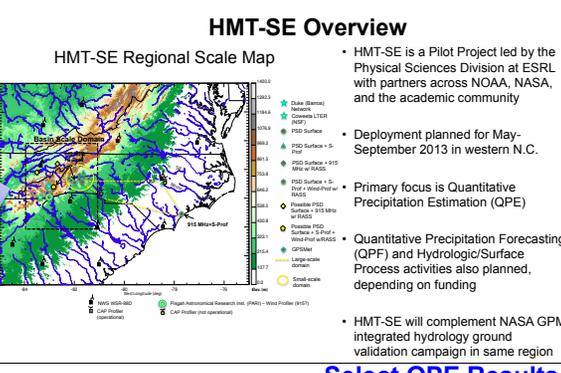
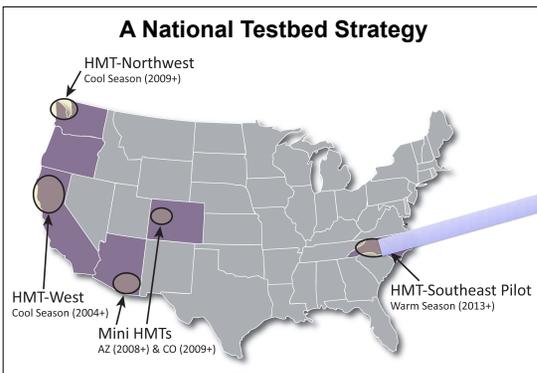
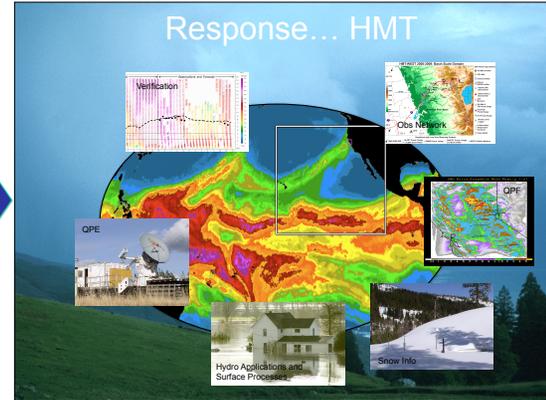
Water and a Changing Climate...

HMT has been developed to respond to the increased criticality of water to our nation's well-being. The program is aligned under two of NOAA's strategic goals:

- Climate Adaptation and Mitigation Goal** – An informed society anticipating and responding to climate and its impact
 - Improved scientific understanding of the changing climate system and its impacts
- Weather-Ready Nation Goal** – Society is prepared for and responds to weather-related events
 - Reduced loss of life, property, and disruption from high impact events
 - Improved freshwater resource management

HMT also supports one of NOAA's seven grand science challenges:

- Improve understanding of the water cycle at global to local scales



Select QPE Results

Example of Gap-Fill Radar for Warm Season Flash Flood Monitoring

1. The Challenge

Four Mile Canyon immediately west of Boulder burns > 6,000 acres and > 160 homes in September 2010. Populated area vulnerable to flash flooding and debris flows. NEXRAD is > 75 km from burn area – poor resolution.

2. NOAA PSD's Response

NOAA radar deployed in Erie ~30 km from burn area. X-band has better resolution and samples closer to the ground compared to NEXRAD. NEXRAD over estimates rainfall due to hail contamination. NOAA X-band rainfall totals compare well with gauges using polarimetric information. X-band also better captures spatial gradient of rainfall due to high resolution of measurements.

3. Flood Event

July 13, 2011 flash flood event in Fourmile. ~1" of rain in one hour. Debris flow and 4 foot rise in Fourmile Creek. Residents evacuated. Event is well captured by NOAA X-band.

4. Results

