



HMT 2004: NOAA Hydrometeorological Testbed for California's Flood-prone Russian River Watershed

Participants

- NOAA Environmental Technology Laboratory
- NOAA Aeronomy Laboratory
- NOAA Forecast Systems Laboratory
- NOAA National Severe Storms Laboratory
- NOAA National Centers for Environmental Prediction
- NOAA National Weather Service-Western Region
- NOAA California/Nevada River Forecast Center
- University of Washington



The 2004 Hydromet Testbed will focus on the Russian River Area of Northern California.

Background

A demonstration project focused on improvements in quantitative precipitation estimation (QPE) and quantitative precipitation forecasting (QPF) in mountainous areas is designed to improve hydrologic forecasts and warnings. This demonstration project uses the Hydrometeorological testbed (HMT) approach which has been proposed to address the nation's regions that are most vulnerable to fresh-water flooding. The HMT will accelerate critical research and development and its transition to operations. It has been adopted in NOAA's and OAR's Strategic Plans, and recommended by the Hydrology Team of the Science and Technology Infusion Plan (STIP). The HMT will improve use of existing NOAA observational, modeling, and human infrastructure, identify critical gaps in NOAA's current observing and modeling capabilities, and recommend how to fill those gaps based on proof-of-concept results.

HMT-2004 Field Operations

As in past winters dating back to the 1997/98 El Niño, ETL's Regional Weather and Climate Applications Division will operate a network of 915-MHz wind profiling radars along the Pacific coast from northern Oregon (as part of NOAA's Coastal Storms Initiative) to southern California, as well as others in California's central valley and Sierra foothills. From December 8th, 2003 through March 21st, 2004, ETL, NOAA/AL and NOAA/FSL will also conduct focused observations along the coast in the vicinity of Fort Ross State Park and in the Alexander Valley on the leeward side of the coastal mountains. This region of California north of San Francisco has particularly poor coverage by the NWS's operational network of WSR-88D radars. These HMT observations will employ additional advanced-technology instruments, including a polarimetric X-band scanning weather radar, a trio of S-band precipitation profiling radars, raindrop disdrometers, soil moisture probes and special high-resolution rain gauges.

HMT-2004 Goals

- Demonstrate the concept of a regional Hydrometeorological Testbed as a conduit to infuse new science and technology into operations.
- Continue to develop a climatology of orographic precipitation along the coastal mountains of California north of San Francisco to examine linkages between climate and weather.
- Document storm features that slip beneath coverage of the nearest WSR-88D radars, and send the X-band radar images to NWS forecast offices via the Web.
- Study the microphysical features and orographic precipitation mechanisms in storm clouds over the coastal mountains.
- Continue testing experimental polarimetric radar estimations of rainfall rate and classifications of hydrometeor types.
- Investigate the impact of a modest coastal barrier on upwind versus leeward precipitation and integrated precipitable water.
- Deploy an array of rainfall gauges, and soil moisture probes to provide data for evaluating operational stream flow models.
- Provide a rigorous test and evaluation of NSSL's QPE-SUMS (Quantitative Precipitation Estimation and Segregation Using Multiple Sensors) approach in the challenging environment of a mountainous watershed basin.

- Develop linkages to the Sacramento River Forecast Center (RFC) that will enable NSSL to install QPE-SUMS and demo its capabilities within an operational environment prior to the major HMT effort in the American River basin planned for FY05 and FY06.
- Gather data sets with which to refine the performance of QPE-SUMS algorithms for QPE including removal of bright-band and ground-clutter contamination and inclusion of numerical forecast model parameters.