

U.S. Department of Commerce | National Oceanic & Atmospheric Administration | NOAA Research



Physical Sciences Division

Hydrometeorological Processes Team

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Flood control, water supply, river transportation, irrigation, hydropower, recreation and ecosystem management are critical applications in regional weather and climate monitoring and prediction. Hydrometeorological processes, those that lead to the development of precipitation and determine its distribution and fate on the ground, are key factors in addressing these issues. The activities of this team focus on research to better understand, describe and monitor these processes and transition the results of this research to operations.

Precipitation Studies

A central science theme is examining the dynamics and microphysics of precipitating clouds. Recent studies have emphasized observational analysis of orographic and tropical convective clouds. A wide range of remote and in situ sensors are employed in these pursuits. Airborne and ground-based-transportable radars at X-, C- and S-band frequencies, using the latest Doppler and polarization techniques, are used to reveal storm morphology, airflow patterns, and particle types in precipitating clouds and quantitatively estimate precipitation amount on the surface. These radars are used in a complementary manner with various in situ instruments such as rain/snow gauges, hydrometeor disdrometers and imaging probes.

Integrating Precipitation Studies with Hydrologic Models

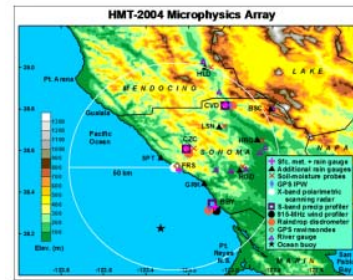
A related science theme developing in this group is investigating the fate of precipitation upon interaction with the Earth's surface. Collaborative studies with the NWS Office of Hydrologic Development, operational river forecasters, other ETL divisions and university researchers have been and continue to be fostered to better understand the linkage between soil moisture, snowpack, precipitation and runoff. These efforts involve in situ and remote sensing observations and coupled atmospheric-hydrologic modeling.

Hydrometeorological Testbed (HMT)

The application of these scientific efforts is concentrated on the [Hydrometeorological Testbed \(HMT\) program](#) that has been initiated in NOAA. This national program with a regional implementation strategy is designed for the purpose of advancing NOAA's capabilities to provide water resources information to the nation. The primary emphasis of HMT is on the transition of research to operations in quantitative precipitation forecasting (QPF) and estimation (QPE), study areas that are aligned well with the capabilities of the Hydrometeorological Processes Team. As such, the team has been an active participant and taken a leading role in the development of HMT.



Fort Ross, CA Instrumentation



HMT 2004 Microphysics Array

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<http://www.esrl.noaa.gov/psd/psd2/hydromet/index.html>

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