# 37. A Movable Observing System Testbed (MOST) for Climate and Weather Research

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Many scientific, forecasting, and climate monitoring applications suffer from significant gaps in regional observing system capabilities. In some cases these gaps are well known, and in others not yet recognized, but they often involve the need for additional observations of the atmospheric boundary layer. Improved monitoring and understanding of the boundary layer, as well as other processes, have clear potential to impact many weather-sensitive sectors, from air quality to water resource and emergency management, as has been indicated by many members of those communities. A foundation of recent programs that have adopted this testbed approach, e.g., the CALJET and PACJET experiments on the West Coast and the Temperature and Air Quality Forecasting Pilot Studies in New England, have depended on better measurements of the boundary layer.

The 915-MHz wind profiler with radio acoustic sounding system developed by NOAA was designed specifically to provide wind and temperature profile measurements in the boundary layer and lower free troposphere. NOAA and CIRES researchers in the Weather and Climate Applications Division of NOAA/ETL have developed a Moveable Observing System Testbed (MOST) concept that could eventually lead to a national boundary-layer profiler network. MOST is intended to capture diverse meteorological conditions associated with differing geographic regions, document inter-annual variations in key meteorological factors influencing weather and air quality, monitor weather patterns in major pollution source regions and transport corridors, and establish a climatological baseline to optimize future regional network enhancements. Regional networks would be implemented based upon research and impact assessments and would engage scientists, forecasters, and observing system users to evaluate final siting priorities within the region. NOAA/ETL has successfully applied the MOST concept to regional studies in the West and, more recently, in the Northeast (see figure below). The poster summarizes recent results that demonstrate how MOST has been applied to research in coastal weather, hydrometeorology, interannual climate variability, and air quality.

MOST Concept Applied to 2002 New England Air Quality Study and New England Temperature and Air Quality Pilot Studies