



NOAA Research in Tennessee



TN-3 (Oak Ridge)

Air Resources Laboratory Atmospheric Turbulence and Diffusion Division

NOAA's Air Resources Laboratory (ARL) conducts research and analyses at six locations, including the Atmospheric Turbulence and Diffusion Division at Oak Ridge. ARL carries out research on processes that relate to air quality and climate, concentrating on the transport, dispersion, transformation and removal of trace gases and aerosols, and the exchange between the atmosphere and biological and non-biological surfaces. The time frame of interest ranges from minutes and hours to that of the global climate. The specific goal of ARL research is to improve and eventually to institutionalize forecasting of air quality, deposition, and related atmospheric environmental variables. This is in support of concerns related to effects on human health, ecosystem viability, sustainable development, and international competitiveness. Results of ARL's research are used to provide scientific advice to elements of NOAA and other Government agencies on environmental problems and emergency preparedness. ARL is also examining the data obtained from the East Tennessee Ozone Study (ETOS) in order to better refine ozone forecasts and to develop remediation strategies. For more information please visit <http://www.atdd.noaa.gov>

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Climate Observations and Services Initiative Climate Reference Network

The U.S. Climate Reference Network (CRN) is a network of new climate stations now being developed by the National Climatic Data Center (NCDC) as part of NOAA's Climate Observations and Services Initiative. NOAA's Air Resources Laboratory's Atmospheric Turbulence and Diffusion Division in Oak Ridge, Tennessee, is heavily involved with the development, deployment, and maintenance of the network. The primary goal of the CRN is to provide long-term high-quality climate observations and records of surface air temperature and precipitation with minimal time-dependent biases affecting the interpretation of decadal to centennial climate variability and change. The CRN will provide the nation with a first-class long-term (50-100 years) observing network that will serve as the nation's benchmark Climate Reference Network. The CRN will also provide the United States with a network that meets the requirements of the international Global Climate Observing System (GCOS). Data from the CRN will be used in climate monitoring activities and for placing current anomalies into historical perspective. Data will also be used to provide the best possible information about long-term changes in surface air temperature and precipitation, including means and extremes. CRN sites are currently deployed at Oak Ridge as well as in North Carolina, Nebraska, Montana, Oklahoma, Rhode Island, New Hampshire, and Illinois. Within the next five years there will be a total of 250 stations spread throughout the United States. For more information please visit <http://lwf.ncdc.noaa.gov>

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Air Resources Laboratory Integrated Surface Irradiance Study

Solar radiation is the driving energy for the geophysical and biochemical processes that control weather and life on earth, so understanding the global surface energy budget is key to understanding climate. Because it is impractical to cover the earth with monitoring stations, the answer to global coverage lies in reliable satellite-based estimates. Accurate and precise ground-based measurements in differing climatic regions are essential to refine and verify the satellite-based estimates, as well as to support specialized research. The Integrated Surface Irradiance Study (ISIS) is a continuation of earlier NOAA surface-based solar monitoring programs in the visible and ultraviolet wavebands. ISIS provides basic surface radiation data with consistency and accuracy. The Air Resources Laboratory operates the NOAA national broadband solar radiation network, including a station located in Oak Ridge that monitors incoming radiation. For more information please visit <http://www.atdd.noaa.gov>

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Air Resources Laboratory Atmospheric Integrated Research Monitoring Network

The Atmospheric Integrated Research Monitoring Network (AIRMoN) is led by the Air Resources Laboratory and is an integral part of NOAA's Health of the Atmosphere Program. AIRMoN provides prompt evaluation of air quality changes and of wet and dry deposition of major anthropogenic pollutants and soil materials through its network of approximately 25 sites across the country. Hourly and daily air samples include measurements of the deposition of sulfur dioxide, sulfate, carbon dioxide, ozone, nitrous oxide, nitrate, and soil materials. Measuring and modeling the deposition of these pollutants allows decision makers to quantify how changes in emissions will affect air quality and deposition. Two AIRMoN stations are located in Oak Ridge. For more information please visit <http://www.arl.noaa.gov/research/programs/airmon.html>

TN-3 (Oak Ridge Reservation)

Air Resources Laboratory Environmental Monitoring Tower

The Air Resources Laboratory's Atmospheric Turbulence and Diffusion Division contributes to the GEWEX (Global Energy and Water Cycle Experiment) Americas Prediction Project (GAPP) program by operating five research energy/carbon flux towers in the continental United States. One site is located at a deciduous forest site on the U.S. Department of Energy's Oak Ridge Reservation in Anderson County. Others are at an agricultural site in central Illinois, a ponderosa pine stand in western South Dakota, and two grassland sites; one in eastern Montana and the other in central Mississippi. These sites are providing data that will be used to improve the representation of land/surface processes in both regional and global weather prediction models. For more information please visit <http://www.ogp.noaa.gov/mpe/gapp/>

**Forecast Systems Laboratory
GPS Meteorological Observing Systems**

NOAA's Forecast Systems Laboratory (FSL) operates a rapidly expanding network of GPS Meteorological (GPS-Met) Observing Systems to monitor the total quantity of precipitable water vapor in the atmosphere. Currently, there are 93 systems over the contiguous 48 states and Alaska, and plans are being made to extend these observations to Hawaii, Puerto Rico, the Caribbean Islands, and Central America. Water vapor is an important but under-observed component of the atmosphere that plays a major role in severe weather events and the global climate system. GPS-Met systems provide accurate water vapor measurements under all weather conditions, including thick cloud cover and precipitation, and do so at very low cost. The major reason why this system is so economical is that the network is being developed by FSL in cooperation with federal, state and local government agencies, universities, and the private sector. The GPS stations provide high-accuracy surveying and navigation services for National defense, automated agriculture, safe land and marine transportation, government infrastructure management, and 911 emergency response services. Fortuitously, these systems can also be used for meteorology with the addition of surface weather sensors. A GPS-Met system in Tennessee is operated by the U.S. Department of Transportation near Hartsville. For more information please visit <http://www.gpsmet.noaa.gov>

For further information about these and other NOAA programs, please contact NOAA's Office of Legislative Affairs at (202) 482-4981.

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