

## **M. Contributions of data to national and global-related databases and programs (1k)**

NSSL does not routinely collect, build and archive Global Earth Observing System of Systems (GEOSS) or national data sets. However NSSL has and continues to collect, quality control, and archive specialized data sets for research purposes. Furthermore, several NSSL scientists have contributed significantly to improving data quality particularly as it is related to radar information and products. These and significant research data archives are described below.

### **Category 1: Archived Data Sets**

Q2 is NSSL's next generation Quantitative Precipitation Estimation (QPE) system producing precipitation estimates every five minutes on a 1 km by 1 km grid for the contiguous U.S. These data are being used by both researchers and as guidance to operational forecasters, both within NOAA and in the private sector. Q2 uses a multi-sensor approach focused on high-resolution integration of radar, satellite, model, and surface observations to produce very high-resolution precipitation estimates. The Q2 project is a joint initiative between NSSL, NWS, and the NOAA Office of Climate, Water, and Weather Services (OCWSS) and the university research community to improve river forecasts, flood and flash flood watches and warnings as well as to enhance various hydrologic and hydrometeorological services for numerous users and customers.

The Severe Hazards Analysis and Verification Experiment (SHAVE) is a unique research project to development a high temporal and spatial resolution database of flash floods over the United States using high-resolution radar data and a geographic information system. The primary objective of this experiment is to collect data that describe the distribution of hail sizes, wind damage and flash flooding produced by severe thunderstorms. The technique developed in SHAVE allows similar data sets to be collected by NSSL researchers from all over the U.S. without having to send scientists in the field.

Daily high-resolution Weather Research Forecast model forecasts are produced and the model forecast data are supplied directly to the NWS Storm Prediction Center and three forecast offices (WFO-OUN, WFO-HUN, WFO-CHS) and posted on the web. In addition, precipitation data are sent to collaborators in NSSL's hydrometeorology group and in the Developmental Testbed Center at the National Center for Atmospheric Research (NCAR). Also, full output data sets are archived at NSSL and used for various internal and collaborative research projects.

Unique model output datasets are collected each spring at the NOAA Hazardous Weather Testbed – Experimental Forecast Project in Norman, OK. These data provide the basis for research projects by local scientists and students, as well as external collaborators. These datasets are unprecedented in the area of convection-allowing Numerical Weather Prediction.

Data from NSSL's lightning strike mapping network were incorporated in the National Lightning Detection Network during the period 1987-1993. These data were used operationally by NWS and other civilian and defense agencies in their weather-related operations.

Total lightning data from OU/NSSL's Oklahoma Lightning Mapping Array (OKLMA) are now being provided to NWS through NSSL Warning Decision Support System - Integrated Information and NWS AWIPS.

The Pan American Climate Studies Program - Sounding Network (PACS-SONET) was a research project funded by the NOAA's Office of Global Programs. The primary objective was determining the atmospheric

circulations associated with wet and dry spells in Central America during the rainy season. Another important objective was to help determine whether the current National Centers for Environmental Prediction (NCEP) operational analyses over Central America and the eastern tropical Pacific are accurate. The project contributed to data base of wind sounding in data-poor areas in North and South America. This research system is not operational at this time.

The Multi-Year Reanalysis Of Remotely-Sensed Storms (MYRORSS) is a collaboration between NSSL and the National Climatic Data Center (NCDC) to reconstruct and evaluate numerical model output and radar products derived from 15 years of WSR-88D data over the continental U.S. This project creates a rich dataset with a diverse range of applications, including severe weather diagnosis and climatological information.

### **Category 2: Contributions to Quality Control**

In a demonstration project called Collaborative Radar Acquisition Field Test (CRAFT), NSSL and co-project leaders at the University of Oklahoma (OU) collaborated with the Radar Operations Center (ROC), University Corporation for Atmospheric Research (UCAR) and National Climatic Data Center (NCDC) to obtain the high-resolution moment radar data (Level II) from all the NEXRAD radars in real time for research and operational use. The data are sent to the National Climatic Data Center for archival and distribution. CRAFT built upon NSSL technology used to communicate with the WSR-88D high-resolution data feed called the Radar Interface and Data Distribution System (RIDDS). The impact was an increase of over 40% in data archival rate and reduction in distribution time from weeks to hours.

NSSL has several members on the NWS Radar Operations Center's Radar Data Quality Team hosted by the ROC's Applications Branch. This interdisciplinary team of meteorologists and engineers has members from the ROC's Application, Engineering, and Operation branches, NSSL, and the NWS Warning Decision Training Branch. The group meets weekly in the National Weather Center and addresses general data quality issues on the NEXRAD radars. The group analyzes data problems and recommends actions to improve data quality within the NEXRAD WSR-88D network.