



FRD ACTIVITIES REPORT

July - September 2011



RESEARCH PROGRAMS

NOAA/DOE Wind Forecast Improvement Project

Kirk Clawson, Shane Beard, Tom Strong, and Dennis Finn traveled to Texas for deployment of meteorological equipment at three sites for the Wind Forecast Improvement Project (WFIP) in mid-July. The installations for all sites were completed by 15 July and the official start of measurements was 18 July. FRD deployed a radar wind profiler, a fully instrumented meteorological tower, a minisodar, and a sonic anemometer at the Brady airport. A minisodar and sonic anemometer were deployed at the Colorado City airport where FRD is also providing the communications link for a radar wind profiler provided by STI. At the Jayton National Profiler Network site, which is an existing permanent NOAA 400 MHz radar profiler installation, FRD deployed a minisodar and sonic anemometer. Roger Carter and Brad Reese provided support from FRD for establishing remote communications with each site.

All phases of the operation were working very well for the first few weeks before any problems developed. Some software changes requested by the ESRL project manager precipitated a communications problem with the radar profiler at the Brady site. At about the same time (~13 August), the sodar at Colorado City developed problems that required it to be sent back to the manufacturer for repair. These problems required on-site attention and in mid-August Brad Reese and Tom Strong traveled to Texas to resolve the issues, retrieve the data cards from the sonic anemometers at all 3 sites, and perform general maintenance as part of the planned site visits every 6-7 weeks over the course of the project.

Everything worked well again until the failure of the cell phone router at Colorado City on 4 September, which interrupted all communications and data retrieval from that site. Arrangements were made to retrieve the router for repair but communications with the Colorado City site were out until 20 September when the router from the Jayton site was installed at Colorado City by ATDD colleagues. Communications were then down with the Jayton site through the remainder of the quarter pending receipt and installation of the repaired router which is was planned in conjunction with the next regularly scheduled site visits in early October.

All of the data are being quality checked on a routine daily and weekly basis. These checks indicate no apparent problems with the data. Sodar data recovery has been good at all sites except for a period of low relative humidity where recovery was diminished. There have been no identified problems with the sonic measurements at any of the sites. (Dennis.Finn@noaa.gov, Kirk Clawson, Shane Beard, Tom Strong, Brad Reese, Roger Carter, and Jason Rich)

Extreme Turbulence (ET) Probe

FRD received belated funding for the ET probe program after Congress passed a final budget for fiscal year 2011. Because funding did not arrive until July, development work on the probes was limited. The serial data line between the probe and the data acquisition computer was replaced by a fiber-optic cable to reduce the chances of voltage surges due to lightning traveling along the cable. Surge suppressors were also added to the power cable. Minor improvements were made to the data acquisition software.

One ET probe was then deployed to Tennessee Reef in the Florida Keys during the last week of August. This is the same offshore navigation light used in past years. Unfortunately, the probe sustained some damage during a vulnerable time in the deployment after it had been installed on the tower but before it was grounded to the navigation platform. A convective shower passed over the site which was apparently electrically charged even though it was produced no lightning. A static charge built up on the probe and caused sparking that damaged internal components of the system. The system had to be taken down and returned to shore for field repairs. Much of the damage was repaired, but there was still some damage that was not repairable in the field. Although the probe currently is not fully functional, it has been running since August, and it appears that useful turbulence data is still being obtained from the system. (Richard.Eckman@noaa.gov, Tom Strong, Roger Carter, Shane Beard, Randy Johnson)

HRRR Collaboration with ESRL

Approximately one year of comparisons have now been made between the HRRR model forecasts and data from the NOAA/INL Mesonet. The model still consistently underpredicts the near-surface wind speed in the Snake River Plain of Southeast Idaho. Preliminary reports from ATDD indicate that the model has no such bias at their wind-energy field site in Texas. This suggests the bias may be associated with the complex terrain in Idaho. (Richard.Eckman@noaa.gov)

U.S. Historical Climate Network–Modernization

FRD added more graphs of meteorological variables to the U.S. Historical Climate Network-Modernization HCN-M/CRN QC webpage. An additional 42 daily plots are now being generated in support of the QC. Although funding for FRD's efforts in HCN-M and CRN QC has ended, we still continue to support those efforts when possible. Grant Goodge from ATDD acknowledged that the new maps have been a big boost to his QC efforts and he is pleased to see the data displayed in a map format. (Jason.Rich@noaa.gov)

Dust Transport/Tracer Dispersion Project

The second phase of the dust transport research project, being conducted by the Pacific Northwest National Laboratory and the Desert Research Institute on the Hanford Reservation in central Washington in collaboration with FRD, was conducted 19-22 September. The design of the experiment pairs collocated dust and tracer measurements, with the source for both species being dust generated by a vehicle driven on a dirt road while simultaneously releasing an inert non-depositing tracer. Problems identified with the tracer release mechanism during the first phase of measurements earlier this year were corrected prior to beginning the second phase. The first day was devoted to the initial setup and testing of the dust sampling equipment. Simultaneous tracer measurements were made using FRD's fast response tracer gas analyzers (TGAs) to identify the optimum tracer release rates. In the days following setup, periods for making measurements were often limited by unfavorable wind directions and wind speeds. The second phase was terminated earlier than planned for this reason. The QC of the tracer data

and preparation of the tracer database for the second phase of measurements was in progress at the end of the quarter. A third phase of measurements is possible for spring of 2012. (Dennis.Finn@noaa.gov, Roger Carter)

High Performance Computing

Initial work for the proposed acceleration of the HYSPLIT dispersion model execution times using Graphical Processing Unit (GPU) computing was begun in the quarter. Dr. Inanc Senocak at Boise State University identified the graduate student Danny George who he will mentor for this research effort. Two Microway Xeon Whisperstation workstations, each with 2 NVIDIA Tesla C2070 6 gb GPU processors and necessary peripherals, were acquired. One of these will be installed for the duration of the project at Boise State University where the primary research will be conducted. The other will be installed at FRD to enable FRD staff to review progress and test new developments generated by the research. Arrangements were made for the Boise State team to acquire the necessary HYSPLIT documentation and programs to assist them in getting started. Danny George had begun work on implementing HYSPLIT when the quarter ended. (Dennis.Finn@noaa.gov, Rick Eckman)

NOAA/IDAHO NATIONAL LABORATORY (INL) METEOROLOGICAL RESEARCH PARTNERSHIP

Emergency Operations Center (EOC)

On August 22, the INL Emergency Operations (EOC) was activated due to a wildland fire burning on the INL. The fire was started by a passing car that had its tires on fire. The fire burned both on both sides of Highway 33. Of the estimated 120 acres that burned, 35 acres were on the INL land and the remainder was on Bureau of Land Management property. Kirk Clawson represented FRD in the EOC during the 3-hour activation.

Only three days later, on August 25, the INL EOC was again activated for a new wildland fire. The fire burned in an area of thick grass and sage brush that had not burned in a long time. Winds were complex during the event and made firefighting and wind forecasting difficult. Approximately 50,000 acres of INL land burned over the 3-day period. Thunderstorms were in the vicinity at the time that the fire started and is the suspected cause of the fire. Dennis Finn and Jason Rich represented FRD in the EOC.

FRD worked with the INL emergency planning organization to develop sets of artificial (or “canned”) weather data for use during emergency response drills in July, September and for the annual emergency response exercise planned for October. The data sets contained both weather information and nuclear radiation measurements that could be displayed with the same software typically used to display measurements from the INL Mesoscale Meteorological Network. The data were also modified so that the dispersion models used in the emergency operations center could perform dose calculations with the artificial data.

Team C participated in a drill at the EOC on 27 July. The drill centered on a radiological accident at the Advanced Test Reactor. A special canned weather scenario was used for the drill and the HYSPLIT model was run using a preconfigured release scenario for the INL from the library developed jointly by FRD staff and the INL emergency planning organization. This was the first use of HYSPLIT in an EOC drill using one of the preconfigured release scenarios.

INL Hazardous Weather Alert System

The NOAA INL Weather Center issued 20 hazardous weather statements last quarter. Eleven of the statements were issued for lightning that was in the vicinity or on the INL and the other 9 statements were issued for high winds. Most of the weather statements by INL Weather Center were not warned on by the Pocatello National Weather Service since the criteria for issuing weather statements are stricter for the INL than for the general public.

Transport and Dispersion Modeling

Several updates to the EOC HYSPLIT preconfigured release scenarios were completed at the request of the INL hazard assessment specialists. Work was also either completed or in progress for calculation and plotting of derived intervention levels, improved labeling of radionuclides and the time standard being used, inclusion of the release scenario identification, and the configuration of customized release scenarios. In addition, work was completed for the display of stability class on the web wind vector display page.

NOAA/INL Mesoscale Meteorological Network (Mesonet)

The semiannual maintenance and calibration process of the NOAA/INL Mesonet has begun. By the end of the reporting quarter, approximately 25% of the stations had been completed.

The construction of a large storage facility and the storage of other items adjacent to the Richfield Mesonet station has degraded its exposure to the point that it must be moved in order to meet established exposure standards. The current site was visited on 12 September and a negotiations with the current landlord for a new location on his property ensued. A new site for the tower that meets established exposure standards was selected and approved by the landlord. The site is some 475 ft. north of the current site on a small lava rock outcrop with a fetch that should remain unencumbered for many years. Plans are being developed for the move. Electrical power will cost approximately \$15,000 for the installation, so the plans include converting this station to solar power to avoid the large bill.

INL Climate

Work continues on updating the 3rd Edition of the Climatology of the Idaho National Laboratory. The climatology will include data from the NOAA INL Mesonet and CFA Thermoscreen through December 2010. The document is expected to be ready for printing by the end of the year. (Jason.Rich@noaa.gov and Kirk Clawson)

OTHER ACTIVITIES

Safety

Rick Eckman gave a presentation on bicycle safety at the July staff meeting.

The Department of Homeland Security has launched a national “If you See Something, Say Something” public awareness campaign. At the August staff meeting we viewed a video on awareness of indicators of terrorism and violent crime, and the importance of reporting suspicious activity to the proper law enforcement authorities.

INL Industrial Hygiene performed an in-door air quality test (mold and allergens) at the facility in August. Results indicate elevated levels of mold in the breezeway and basement and ultrafine particulate levels higher inside the facility than outside. Recommendations include: 1) using a bleach solution to clean the breezeway and basement, 2) changing the HVAC building filters quarterly rather than the current semiannual schedule, and 3) thorough carpet cleaning should take place at least twice/year. These recommendations will be discussed with the building owner for implementation.

Training

Rick Eckman was accepted into the 2011 Leadership Effectiveness & Advancement Program (LEAP), a year-long training program sponsored by OAR. The first LEAP meeting will be held in the Washington D.C. area in late October.

All government and contract employees completed the mandatory FY2011 NOAA Information Technology Security Awareness Course.

Donna Davis, Property Custodian completed (August) a Retire Asset course provided by the Commerce Learning Center.

Mike Huston of the Pocatello NWS visited FRD on 3 August to give training on the WFDSS Fire Weather Model. Jason Rich, Dennis Finn, and Richard Eckman attended the training.

Kirk Clawson attended a FERS retirement seminar in Chicago, IL, 2-3 August.

Travel

Kirk Clawson, Shane Beard, Tom Strong, and Dennis Finn traveled to/from Texas from 6-16 July for the purpose of deploying instrumentation and establishing remote communications at the Jayton, Colorado City, and Brady sites as part of the WFIP renewable energy project.

Kirk Clawson traveled to Chicago, IL, from 2-3 August to attend a FERS retirement seminar.

Brad Reese and Tom Strong traveled to Texas from 18-21 August to correct a communications problem at the Brady site, retrieve data cards from the sonic anemometers at all 3 sites, perform general maintenance, and replace a signal processing unit on the sodar at Colorado City.

Rick Eckman and Tom Strong traveled to the Florida Keys from 28 August to 2 September to deploy an ET probe.

Dennis Finn traveled to Richland, WA and the Hanford Reservation 18-23 September in support of a dust transport research study in collaboration with the Pacific Northwest National Laboratory, Desert Research Institute, and the University of Utah.