



# FRD ACTIVITIES REPORT

## January 2005



### Research Programs

#### *First Directly Measured Hurricane TKE From ET Probe*

The ET probe data collected in Hurricane Ivan have been passed through a series of quality assurance procedures, and the processed data are now available in NetCDF format.

Turbulence data from the probe indicate that the turbulent kinetic energy (TKE) increased by roughly a factor of 10 from the time the system was activated to the storm's peak (Fig. 1). To our knowledge, this is the first directly measured TKE from a hurricane. The vertical momentum flux to the surface experienced a similar increase. The peak wind gust detected by the system was 50.3 m/s. Although the radar images indicate the probe passed through the eastern edge of Ivan's eye, the wind data do not show any abrupt drops of wind speed during the eye's passage. It appears that the probe stayed close enough to the eyewall to experience high winds throughout the storm's landfall. (Richard Eckman, 208.526.2740)

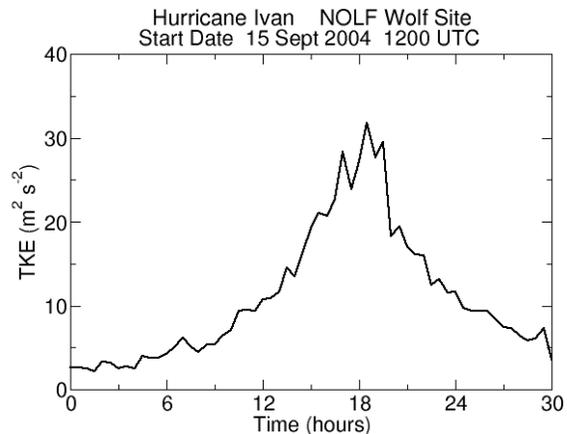


Figure 1. Plot of the Turbulence Kinetic Energy (TKE) collected from the ET probe during Hurricane Ivan.

#### *Tracer Analysis Facility (TAF) Adaptation for Perfluorocarbon Tracer Analysis*

All parts on order that are necessary to begin perfluorocarbon tracer analysis have been received. The capillary column fits into the ATGAS oven (Fig. 2) without any major modifications needed. Extra supports were added to the oven to hold the capillary column in place. A new heater was added to increase the oven temperature to at least 150°C. This new heater was tested and found to easily hold temperatures constant at a set point of over 150°C. However at this temperature, the outside of the oven is too warm to the touch and may need extra insulation depending on the determination of final analysis temperature. Three concentrations of

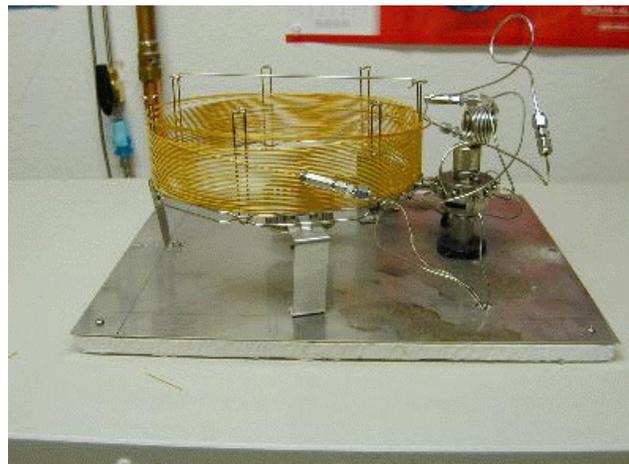


Figure 2. Picture of the new capillary column.

perfluorodimethylcyclobutane (PDCB) were ordered from Scott-Marrin and are scheduled for delivery the end of February. The gas divider will be used to make more concentrations as needed. (Debbie Lacroix, 208.526.9997)

### ***Smart Balloon Improvements***

The balloon lower instrument fiberglass containment enclosure has been redesigned to allow easier access to the electronic equipment. In addition, new modifications to the ballast release valve and ballast pump tubing will provide a faster response to altitude adjustments. Past designs combined the smaller tubing into a single tube before being mounted to the wall of the containment tube, but that took too long for ballast air to be released from the balloon. For example, last year during North East Air Quality Study (NEAQS), balloon one encountered precipitation that nearly brought the balloon to the ground because the balloon was unable to release ballast air at a rate fast enough to compensate for the accumulation of rain on the skin of the balloon. Now the tubing from each of the two ballast pump diaphragm ports and the ballast release valve have been replaced by individual and larger diameter tubing that goes directly to the wall of the containment tube. This modification decreases the resistance to airflow from the balloon and will allow quicker altitude adjustments. The new design should ensure that the balloon will be able to quickly compensate for precipitation encounters in the future.

Our first shipment this year of a high strength balloon shell and 3 bladders were received and tested. However, problems with manufacturing were encountered in the balloon shell and with each of the bladders. All parts have been returned to the manufacturer to determine how the problems can be resolved, and to fabricate a suitable balloon for testing. We hope to be testing the next revision of the balloons in late February or early March. (Randy Johnson 208.526.2129, Shane Beard, Vance Hawley)

### ***PIGS Upgrade***

The software that runs on the Automated Tracer Gas Analysis Systems (ATGAS) has been modified to support the new variable timing capabilities of the Programmable Integrating Gas Samplers (PIGS). The changes were needed for the ATGAS to recognize the new information provided by the PIGS downloaders, and to successfully identify samples analyzed on the ATGAS and match them with their location and timing information. A thorough review of the entire software suite was conducted and approximately nine different computer programs were modified. The final step in the process is modifying the software that controls the PIGS downloaders. This should be completed soon and we hope to conduct a test of the complete system in late February or March. (Roger Carter 208.526.2745)

## **Cooperative Research with DOE NE-ID (Idaho National Laboratory)**

### ***INL Climatology***

Further work was completed on the updated climatology for the INL. The 1989 edition of the climatology has a dispersion section showing annual-average modeling results for releases from

INTEC. In the update, this section is replaced by a discussion based on newer modeling results from a long-term study of dispersion patterns at INL (documented in NOAA Tech Memo OAR ARL-246, by R. M. Eckman). A major difference in the newer work is that dispersion results are provided for four different release points: INTEC, RWMC, TAN, and TRA. The dispersion patterns are generally quite different at these facilities due to the effects of the local topography. (Richard Eckman, 208.526.2740)

### ***INL Drills, Exercises, and Emergencies***

The annual rounds of the requalification drills have started at the EOC. Team C (Neil Hukari and Roger Carter) participated in a drill on January 12, while Team B (Kirk Clawson and Brad Reese) participated in a drill on January 19<sup>th</sup>. Both drills centered on traffic accidents involving tanker trucks near the CFA facility in which hydrochloric acid and some form of nuclear radiation were released into the atmosphere. Both drills went smoothly. FRD employees used the MDIFF transport and dispersion model and current meteorological conditions to provide simulated evacuation support to the Emergency Director.

### ***Mesoscale Modeling***

Some modifications were required to the FRD MM5 mesoscale modeling system as a result of name changes initiated by NOAA/NCEP. The 12 km Eta model, which is the source of initialization input to the FRD system, has been renamed to the North American Mesoscale (NAM) model. Of course, this resulted in changes to the file and directory naming conventions on the NCEP ftp servers. The scripts used by the FRD system have been updated to reflect the changes. (Richard Eckman, 208.526.2740)

### ***Transport and Dispersion Modeling***

INL made its annual request for meteorological data in January. This request was for summary wind statistics covering all of 2004. These data are used by the INL contractors as part of their environmental compliance programs. (Richard Eckman, 208.526.2740)

### ***INL Radar Profiler***

In December 2004, the INL telephone contractor identified deterioration in the telephone line used to retrieve data from the 915MHz radar profiler located on the INL. We are currently working with the INL to get the cable replaced. However, the cable is located about one half mile off of the maintained roads and is currently under about a foot of snow making replacement difficult. We hope conditions will permit replacement of the cable in early March. (Roger Carter 208.526.2745, Tom Strong)

## **Other Activities**

### ***FRD Core Competencies Review***

FRD received word that the ARL Core Competencies Review Team would visit FRD on February 2. Efforts were made to clean up offices and work spaces, and to prepare hands-on demonstrations of our major projects and capabilities. PowerPoint presentations of the demonstrations were also developed to send home with the review team for future reference and review. An agenda that included interactions from our major stakeholders and that also included a working lunch with FRD staff sans the director was prepared. The staff are fully prepared to host this prestigious group.

### ***Safety***

Over 120 pounds of alkaline batteries were sent for recycling following the guidelines established in the pollution prevention (P<sup>2</sup>) section of the new NOAA Environmental Management Manual. (Debbie Lacroix, 208.526.9997)

The Occupational Safety and Health Administration (OSHA) is requiring federal government agencies to adopt worker safety and health recordkeeping and reporting requirements that are essentially identical to the private sector. These new requirements go into effect beginning Jan. 1, 2005. Therefore, all Designated Responsible Officials (DRO) will be required to fill out the OSHA 300 log annually and post it between February 1<sup>st</sup> and April 30<sup>th</sup>. The use of the new OSHA 301 Accident Report Form will not be necessary since NOAA utilizes U.S. Dept. of Commerce form CD-137, Report of Accident/Illness to report all injuries and illness occurring throughout the organization. (Debbie Lacroix, 208.526.9997)

Several changes are in the works for the Safety and Environmental Compliance Office (SECO), formerly ECHSSO (Environmental Compliance Health Safety and Security Office). The new website can be found at [www.seco.noaa.gov](http://www.seco.noaa.gov). One of the biggest changes is that line offices will need to budget for their own environmental cleanup, compliance, and other corrective action projects. SECO will work with Line Offices to identify and develop a training schedule for high-risk operations. Line Offices will be responsible, however, for funding instructors travel to ensure that appropriate operations receive training, and for coordinating with the SECO to determine optimum training schedules. (Debbie Lacroix, 208.526.9997)

Starting this year NOAA must contribute to the Department's annual Resource Conservation and Recovery Act (RCRA) Survey that documents green purchases and progress towards waste division goals. An Affirmative Procurement Plan (APP) is in final review/approval at the Department. This is aimed at increasing the acquisition of recycled products and environmentally preferable products. Input from FRD has already been delivered to the appropriate officials. (Debbie Lacroix, 208.526.9997)

NOAA is working on developing an Aviation Outsourcing Safety Program as well as a NOAA policy on the use of non-NOAA aircraft. This proposed program will be funded in the current FY06 budget and requires 3 FTE. The program will provide development of NOAA-wide

aviation safety standards, centralize procurement and standardization of aviation safety training and aviation life support equipment for NOAA scientists, inspect/evaluate aviation vendors for ability to comply with NOAA aviation safety standards, provide guidance and assistance for writing contract language to require NOAA aviation safety standard compliance by vendors, and provide aviation accident/incident investigation and data management. (Debbie Lacroix, 208.526.9997)

Debbie Lacroix provided input on FRD's major occupational safety and health initiatives in answer to the official request from the Department of Labor (DOL) for submission of the FY 2004 Annual Report on Occupational Safety and Health. This year the DOL is requesting information about the President's SHARE (Safety, Health and Return-to-Employment) initiative, and motor vehicle safety/seat belt usage.

### ***Training***

On January 11, Paula Fee attended a 2-hr teleconferencing training, "Understanding CBS Cost Accumulation Information", presented by Mike Boller, Commerce Business Systems (CBS).

### ***Visitors***

On January 18, Battelle Energy Alliance (BEA) representatives from Oak Ridge, TN, Richland, WA and Idaho Falls met with FRD senior staff to give an overview of the Facilities and Site Services available to FRD. The meeting was an opportunity for FRD to mention any concerns regarding the services provided by the current M&O contractor, BBWI. On February 1, 2005, BEA will be the new contractor for the renamed Idaho National Laboratory (INL).