Release Date: August 8, 2005

News Release

4600 Rickenbacker Causeway • Virginia Key, Fla. 33149 • 305.421.4704 • http://www.rsmas.miami.edu

FOR IMMEDIATE RELEASE

Rainbands and Hurricane Intensity

Collaborative hurricane research project ultimately could improve forecasting

VIRGINIA KEY, FL (August 8, 2005) – A collaborative research team is soon to begin one of the largest hurricane research projects ever undertaken to better understand dramatic, rapid changes in tropical storm intensity that have baffled forecasters for years.

Featuring expertise that includes the University of Miami Rosenstiel School of Marine & Atmospheric Science, the University of Washington, National Center for Atmospheric Research (NCAR), the National Oceanic and Atmospheric Administration (NOAA), and the U.S. Navy, the Hurricane Rainband and Intensity Change Experiment (RAINEX) will study how the outer rainbands and inner eye of a hurricane interact to influence a storm's intensity. The National Science Foundation (NSF) provided $3 million to fund this study that may shed light on how and why a storm can change in strength in only a matter of hours.

"While great progress has been made in forecasting hurricane tracks, we need to improve in forecasting hurricane intensity," said Steve Nelson, director of NSF's physical and dynamic meteorology program, which funded RAINEX. "There are many factors that affect the intensity of hurricanes. RAINEX will investigate one of those factors: the interactions between hurricane rainbands and the eyewall. From RAINEX, we will better understand the impact of rainbands on a hurricane's maximum winds."

While researchers have studied the eye and outer rainbands of hurricanes extensively, "few, if any, experiments have ever examined these two components together and how their interaction might affect a storm's strength," said Dr. Shuyi Chen, an associate professor of meteorology and physical oceanography at Rosenstiel School and a project principal investigator. "The outer bands of a hurricane often have strong winds and lots of rain, and that can actually affect the overall intensity of a hurricane."

RAINEX will study this interaction using data recorded from hurricane research flights. Beginning August 15 through the remainder of this year's Atlantic hurricane season, two NOAA P3 aircraft, along with a U.S. Navy P3 aircraft will fly simultaneously into hurricanes well before they threaten landfall. Flying in the hurricane's outer bands and punching into the eyewall on most flights, the aircraft will use sophisticated Doppler radar and GPS dropsondes to record wind speed and direction, temperature, humidity, atmospheric pressure, and other critical data.

The University of Washington and NCAR will provide expertise in airborne Doppler radar analysis. Rosenstiel School will construct a state-of-the-art hurricane model using the data collected from the research flights.

"National Science Foundation funding allows the Navy aircraft to be added to the research. It will play a key role by observing the outer part of the storm while the other two aircraft observe the inner part," said Dr. Robert A. Houze, Jr., a professor in atmospheric sciences at the University of Washington and a principal investigator. "Ideally, we'll obtain a physical explanation of a hurricane's intensity change in terms of the relationship between the inner and outer parts of the storm. These storms can jump up in intensity or drop a full category in a day, and the intensity changes are a big challenge."

Much of what scientists currently know about the interaction between the outer rainbands and the eyewall of a hurricane comes from the state-of-the-art numerical models developed for hurricane research and prediction,

(Continued)

which can provide very detailed information but may not be completely accurate. But what researchers need is solid data to validate these models.

One of the breakthrough aspects of RAINEX is the use of the three Doppler radar-equipped aircraft. Although eyewall flights are a routine part of hurricane research, this is the first field study to include simultaneous flights in and near rainbands.

NCAR's Wen-Chau Lee will be the lead scientist for the Naval Research Lab's P-3 as it profiles rainbands. Dropsonde sensors will measure temperature and wind as the instrument falls from the plane through a storm. On most flights, the ELDORA Doppler radar will collect data as a P-3 circles rainbands from six miles away, with occasional flights through a rainband, as needed.

"My main interest is in the rainband structure," Lee said. "These flights can be turbulent, especially when we're penetrating the rainbands. I think that's the wild card—the challenge of the experiment – to capture internal rainband structure and its interactions with the eyewall in those conditions."

Once the data are collected, the researchers will assimilate them into hurricane models to gain a better sense of whether the storm's circulation speeds up or slows down as rainbands wrap around the hurricane. Additionally, the researchers will share this information with hurricane operational centers and national environmental prediction centers around the world.

"We look forward to working with our colleagues from the Universities of Washington and Miami and NCAR during the next phase of NOAA's Intensity Forecasting Experiment," said Robert Rogers, field program director for NOAA's Hurricane Research Division. "Having the U.S. Navy P-3 fly with the NOAA P-3s will expand the area covered by airborne Doppler radar to include the rainbands as well as the inner core. This data will improve our understanding of intensity change and contribute toward the development and evaluation of the next generation operational hurricane model."

For more information about RAINEX, visit: http://www.joss.ucar.edu/rainex or http://orca.rsmas.miami.edu/rainex .

Rosenstiel School is part of the University of Miami and, since its founding in the 1940s, has grown into one of the world's premier marine and atmospheric research institutions.

# # #

Media Contacts:

Ivy Kupec, Communications Director
UM Rosenstiel School
305.421.4704 (o) 305.984.7107 (m)
ikupec@rsmas.miami.edu

Vince Stricherz, Science Writer
University of Washington, Seattle
206.543.2580 (o)
vinces@u.washington.edu

Anatta, NCAR Media Relations
303.497.8604 (o) **anatta@ucar.edu**
Wen-Chau Lee, Researcher
303.497.8814 (o) 303.817.1784 (m)
wenchau@ucar.edu

Erica Rule, Atmospheric & Oceanic Research Lab
NOAA
305.361-4541 (o)
Erica.Rule@noaa.gov

Cheryl Dybas
National Science Foundation
703.292.7734 (o)
cdybas@nsf.gov

Public Affairs Office
Naval Research Laboratory
202.767.2541