

# NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent agency of the Federal Government established to promote and advance scientific and engineering progress. The NSF sponsors and funds scientific and engineering research and education projects and supports cooperative research to gain new understanding of the behavior of the Earth's atmosphere and oceans. NSF does not itself conduct research but funds research performed by scientists at universities and other entities. In addition, NSF provides support for the maintenance and operation of the National Center for Atmospheric Research (NCAR) which is devoted to large-scale atmospheric research projects conducted in cooperation with universities and other Federal, state and/or local organizations.



The Division of Atmospheric Sciences manages NSF's basic atmospheric research support. This research focuses on new and fundamental knowledge needed to better understand the atmosphere and related sciences and to manage atmospheric science programs including natural disaster reduction, space weather, global change, and air quality.

## **NATURAL DISASTER REDUCTION**

NSF supports fundamental and applied research to address weather phenomena that are either life threatening or economically disruptive. Focus areas include:

- Better understanding and forecasting of hurricane track and intensity;
- Better quantitative precipitation forecasting and estimation;
- Optimal use of observations in numerical models; and
- The societal/economic impacts of improved weather information.

The total research support for FY 2006 was approximately 14 million. A major activity in FY 2006 was the NSF/NOAA joint program entitled, Rainband Intensity Experiment (RAINEX). This project was focused on obtaining a better understanding of the impact of internal tropical storm dynamics on storm intensity. An excellent data set was gathered including data from hurricanes Katrina and Rita. Analysis of this data set is ongoing. In FY 2007, support is expected to remain at the same level as in FY 2006.

## **SPACE WEATHER**

NSF supports research under the National Space Weather Program (NSWP). The objective of the NSWP is to perform the research and technology transfer needed to improve the specification and forecasts of space weather events that can cause disruption and failure of space borne and ground based technological systems and can endanger human health. Examples of NSF support of space weather include conducting a highly successful competition for space weather research grants and providing support for the Center for Integrated Space Weather Modeling (CISM), a multi-institutional effort led by Boston University and dedicated to providing advance warning of potentially harmful space weather events. NSF NSWP support in FY 2006 is about \$14 million and is expected to be about the same in FY 2007.

## **GLOBAL CHANGE**

Under the United States Climate Change Research Program, NSF supports research and related activities that advance fundamental understanding of dynamic, physical, geochemical, biological, and socioeconomic systems as well as interactions among those systems. In addition to research on Earth system processes and the consequences of changes in those systems, NSF facilitates data acquisition and data management activities necessary for basic research on global change, promotes the enhancement of modeling designed to improve representa-

tions of Earth system interactions, and develops advanced analytic methods to facilitate fundamental research. NSF also supports fundamental social and economic research on the general processes used by governments and other organizations to identify and evaluate different types of policies for mitigation, adaptation, and other responses to changing global environmental conditions. The total NSF FY 2006 funding for this area of research was about \$195 million; in FY 2007, a modest funding increase is expected.

## **AIR QUALITY**

NSF supported fundamental research in the area of air quality helps develop improved understanding of the sources, formation, atmospheric processing and fates of ambient air pollutants. Atmospheric oxidant species (and their precursors), sulfur dioxide, nitrogen oxides, carbon monoxide, fine particles (and their precursors), and acids are important atmospheric constituents that influence air quality, and in turn habitability, human health and climate. Field experiments, laboratory studies, instrument development, new methods of chemical analysis, and improved models of atmospheric chemical reaction mechanisms, transport and depositional phenomena are examples of air quality research supported by NSF. These categories provide scientific and technical input for management and control of atmospheric pollutant gases and particles.

*NOTE: NSF budget data is not captured in Tables 2.1-2.5.*

