Testimony prepared by
Richard A. Anthes, President of the University Corporation for Atmospheric Research and
Submitted March 16, 2006 to the
House Subcommittee on Science, the Department of State, Justice and Commerce and
Related Agencies,
Committee on Appropriations, U.S. House of Representatives

On behalf of the University Corporation for Atmospheric Research (UCAR) and the
university community involved in weather and climate research and related education, training
and support activities, I submit this written testimony for the record of the House Committee on
Appropriations, Subcommittee on Science State Justice and Commerce and Related Agencies.
UCAR is a 69-university member consortium that manages and operates the National Center for
Atmospheric Research (NCAR) and additional programs that support and extend the country’s
scientific research and education capabilities. UCAR is supported principally by the National
Science Foundation (NSF) and by other federal agencies including the National Aeronautics
and Space Administration (NASA), and the National Oceanic and Atmospheric
Administration (NOAA).

The atmospheric sciences community strongly supports the President’s American
Competitiveness Initiative (ACI), an investment that we believe will pay great dividends for this
country if it is sustained as planned over the next ten years. In the president’s budget request
for FY07, NSF is one of the critical agencies in line for ACI increases intended to double the
physical sciences research budget by 2016. This is a necessary first step in any initiative that
seeks to strengthen this nation’s economic competitiveness. However, the strength of the
country’s R&D investment is a result of multiple agencies playing multiple, complementary and
interlocking roles. We believe that the science missions of NASA and NOAA, in addition to
NSF, are critical to the health and wellbeing of this country. We look forward to the ACI
developing rapidly to shore up and strengthen the physical sciences supported by all three of the
major science mission agencies within your jurisdiction.

National Science Foundation (NSF)
NSF plays a unique role among all federal agencies. In achieving its goal to develop new
knowledge to meet societal needs and improve quality of life, NSF strengthens the ability of the
country to create new ideas; develop new technologies; create a diverse, knowledgeable
workforce; and set new standards that challenge any boundaries of invention and intellect. These
are all key components of our capacity to compete globally in the 21st Century and are
fundamental drivers of wealth-producing growth and job creation. The NSF budget request
states that the ACI investment in NSF – a commitment to double the NSF research budget over
10 years – is being made “in order to sustain a robust, competitive, and productive America.”
The UCAR community takes great pride in this national priority and supports to the fullest extent
possible the ACI focus on NSF. I urge the Committee to support the President’s overall
request of $6.02 billion for the National Science Foundation and, within NSF, the request of
$4.66 billion for Research and Related Activities (R&RA), the heart of NSF’s scientific
enterprise. In addition, I urge the Committee to support the Administration’s goal of doubling
the research budget of NSF over the course of a decade, finally realizing the promise of the
Geosciences Directorate (GEO). Within R&RA, GEO is the principal source of federal funding for university-based basic research in the geosciences, providing about 68% of the total federal support in these areas. The FY07 increase for GEO includes aggressive investment in cyberinfrastructure, without which discoveries in the geosciences simply will not be able to advance at a competitive rate; and additional investment in the interagency Climate Change Science Program in activities focused on understanding past climate variability, the advancement of knowledge about the carbon and nitrogen cycles, and the continued development of computational models of Earth system processes. I urge the Committee to support the President’s request of $744.85 million for the Geosciences Directorate and, within GEO, to provide the President’s request of $226.85 for the Atmospheric Sciences Division which provides resources for the atmospheric sciences community that are critical to the physical safety of our citizens, our economic health, and global issues of national security relevance such as severe weather, climate change, the security of our communications infrastructure, and the environmental health of the planet.

Office of Cyberinfrastructure. Given the requirements of modern research, leading-edge progress that results in societal benefits cannot be realized without the acquisition, development and operation of state-of-the-art cyberinfrastructure services including ever-improving supercomputers, high-capacity mass-storage systems, and an ever-expanding suite of software tools. NSF promises to accomplish much in this area with the creation of the Office of Cyberinfrastructure. I urge the Committee to support the President’s FY07 request of $182.42 million for the Office of Cyberinfrastructure which includes $50.0 million for the all-important achievement of petascale performance for application to important science and engineering problems.

Education and Human Resources (EHR) Directorate. Key to the success of the Administration’s ACI efforts is the improvement of math and science education in this country. It is therefore disappointing to see the EHR funding request for FY07 decline in certain areas and not keep pace with inflation overall. We believe that the strengthening of science education, so critical to the nation’s future, must be intimately connected with the best scientific practices and results being produced via the NSF scientific directorates. While we realize that the EHR request strengthens collaborations that aid in addressing workforce needs, we hope that other areas of the budget do not indicate a shrinking NSF influence in the classroom. Of some encouragement is the recognition in the request of the value of digital libraries to teachers and students. Within the Division of Undergraduate Education (DUE), the National Science Digital Library (NSDL) receives a small increase. The value of this program continues to rise as its capacity to bring first-rate education tools into the classroom is broadened and enhanced. I urge the Committee to provide as healthy an increase as possible for the Education and Human Resources Directorate so that it may play its rightful, critical role in achieving ACI goals.

National Aeronautics and Space Administration (NASA)
NASA’s Science Mission Directorate (SMD) plays a unique and central role in our nation’s ability to attract students into science and engineering fields, and to understand the universe, our own planet’s environmental complexities and its relationship to the Sun, and major factors contributing to climate change. Despite this essential role, NASA’s FY07 federal budget request would curtail long-term growth in the science portfolio, defer or eliminate many of the nation’s most successful and promising missions, and fund only a relatively small number of scientific
missions (albeit promising ones) in the next five to ten years. While the manned program is incredibly important, it cannot come at the complete expense of this critical investment.

Within SMD, NASA plays a unique and central role in the study of the complexities of the Earth system and the equally complex relationship of the Sun to Earth through the Earth-Sun System. NASA’s investment in Earth Science Research and Analysis (R&A) and the missions and tools associated with this research makes possible the study of Earth from space providing data that simply are not available from any other federal agencies. These observations, used in research and in the construction of computer models to predict weather, climate, and natural hazards, provide a critical basis from which our understanding of our planet evolves and on which informed policy decisions, both long term and emergency response, can be made. **Given the tremendous importance of this underlying activity, the R&A analysis programs should continue to receive robust funding levels at least commensurate with FY 2006 levels.**

In addition to investments in Earth-Sun System, NASA must preserve the essential PI-led programs that serve as a primary conduit through which the nation's best scientists can engage NASA in cutting-edge problems. **NASA should support the Explorer, Discovery, and New Frontier programs and fully commit to missions unless there are technical or cost related issues.** When NASA promotes premature termination of those missions for non-technical or cost reasons, it is in danger of sending the message to the community that it is an unreliable partner and that this is not a field that future scientists and engineers should pursue. Moreover, balanced, highly skilled teams of talent are lost, as are discoveries on the immediate horizon.

While the exploration initiative and International Space Station are of great human interest and of scientific value, we are far from unlocking all the mysteries of our own planet. NASA programs that are in progress and others that are yet to be implemented will enable us to protect space vehicles, astronauts, and satellites from the devastating radiation of solar storms; mitigate some of the property damage and prevent some of the deaths caused by severe weather; and help us to mitigate, understand, and cope with the inevitable effects of natural and human-induced climate change. These programs are critical to the health of our economy, to the health of the Earth, and to our national security. **As the Administration’s new vision for U.S. space exploration unfolds, I urge the Committee to protect the vibrant NASA science accounts and missions, current and planned, that make possible the study of our own planet and the environment that sustains life on Earth.**

**National Oceanic and Atmospheric Administration (NOAA)**

NOAA’s importance to the nation was made glaringly evident to the world as Hurricane Katrina bore down on the Gulf Coast last fall. Without the R&D and operations behind the accurate forecasts and warnings that moved tens of thousands of people out of the region, the number of deaths caused directly by the storm would have been catastrophic. This is just one example of the manner in which NOAA data, research, and services contribute to the nation’s security, economy, environment, and quality of life, yet NOAA hurricane forecast R&D is also just one example of areas severely under funded in the request for FY07. NOAA provides a critical link for this nation between research results, research applications, technology development, and operations, yet NOAA’s overall budget request is 5.8% below the FY06 Enacted Budget. **For NOAA to address all areas of concern and priority that have been identified by Congress, and to restore core funding that has decreased in recent years, I urge the Committee to fund**
NOAA at $4.5 billion for FY07 and to do so while maintaining vital, enhanced support for other portion’s of the Subcommittee’s research and development portfolio.

National Weather Service (NWS). The FY07 NWS request eases some of the extremely difficult pay raise pressures that were squeezing NWS operations to the breaking point. In recent years, NWS has assumed responsibility for several programs such as the Space Environment Center (SEC), the US Weather Research Program (USWRP), and the Wind Profilers. None has fared particularly well. SEC, the nation’s official source of space weather alerts and solar radiation warnings, was cut in FY06 from just over $7 million to less than $4 million. USWRP has not been able to adequately keep up with our international obligation to fund THORPEX, and has not yet implemented planned national activities for this international research program designed to accelerate improvements in the accuracy of one-to-14 day weather forecasts with deliverables such as improving disaster mitigation/response and increasing economic efficiency. The staff of the NOAA Profiler Network, 35 Doppler Radar sites that provide vital vertical wind profile data, has been cut back to the point that reliability and urgently required upgrades are severely compromised. The FY07 NWS request will allow these and other critical programs such as AWIPS and Local Warnings and Forecasts to barely meet minimum requirements. I urge the Committee to do everything possible to fund the President’s entire request of $881.86 million for the National Weather Service, a line office that provides the most critical of activities for policy makers, stakeholders, and citizens.

Office of Oceanic and Atmospheric Research (OAR). OAR conducts research and technology development that are the underpinnings for NOAA operations. If the requested amount is appropriated, OAR would receive a small increase to its base funding for FY07, some of which will keep the nation on track with its contribution to the international commitment of completing the ocean climate observing system by 2010. This is a high priority component within this country’s obligation to the construction of the international Global Earth Observation System of Systems (GEOSS). In addition, the increase will support drought impact research through the National Integrated Drought Information System (NIDIS) and develop new data sets that will enhance operational climate prediction. Also within OAR, the Hurricane Research Division (HRD) works to improve the nation’s hurricane forecasts for both path and intensity. This is an activity the importance of which is obvious, post-Katrina, yet HRD funding, modest to begin with, is cut by over $1.0 million in the FY07 request. I urge the Committee to support the foundational research, technology development, and international commitments represented by the FY07 request of $348.6 million for the Office of Oceanic and Atmospheric Research and to shore up funding for obviously critical research areas such as hurricane forecasts.

National Environmental Satellite, Data and Information Service (NESDIS). NESDIS is responsible for managing all aspects of the remotely gathered environmental data that form the basis for environmental research meeting the needs of policy makers and users. The FY07 request provides a badly needed increase to cover basic operations and to provide additional funding for data archiving, and access and assessment activities at the NOAA National Data Centers which serve over 50,000 users annually. I urge the Committee to support the President’s FY07 request of $1,033.8 million for NESDIS.

On behalf of the UCAR community, I want to thank the Committee for your stewardship of the nation’s scientific enterprise and your understanding that the future strength of the nation depends on the investments we make in science and technology today.