On behalf of the **University Corporation for Atmospheric Research (UCAR)**, a consortium of 68 North American research universities involved in weather, climate, and solar research and related education, training, and support activities, I submit this testimony for the record. UCAR manages and operates the National Center for Atmospheric Research (NCAR) and additional research, education, training, and research applications programs. In addition to its 68 members, UCAR has formal relationships with approximately 100 undergraduate and graduate schools including historically black and minority-serving institutions, and 40 international universities and laboratories. 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)**.

*Almost everything that distinguishes the modern world from earlier centuries is attributable to science...*

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**Bertrand Russell**

Basic research is a critical economic driver for this country affecting advances in technology development, military applications, the health of the planet, and the quality of scientific education. We simply cannot, as the leading country of the world, afford to allow the nation’s scientific enterprise to be diminished. But in nearly every science agency, critical programs are proposed to be cut or eliminated. Overall, federal funding for R&D in the FY06 request fails to keep pace with inflation for the first time in a decade at a time when the rest of the developed world is catching up and, in some fields, surpassing our capabilities. In great part because of the dangerous state of the world since September 11, 2001, our federal dollars must be stretched and difficult funding decisions must be made. But it is precisely because of the dangerous state of the world that the United States must remain strong, not just in military might, but in technology development, the discovery of new knowledge, the protection of natural resources, the education of our future work force – all of which are tied directly to research and the application of research for the betterment of society.

**National Science Foundation (NSF)**

At a recent hearing of your subcommittee, Congressman Vern Ehlers, chairman of the House Science Subcommittee on Environment, Technology and Standards stated, “In choosing among the important programs in the new Science, Justice, and Commerce Appropriations bill, we must not overlook the fact that scientific research and development forms the foundation of increased innovation, economic vitality, and national security for our nation.” NSF’s Research and Related Activities (R&RA) account supports as much as 50 percent of this country’s civilian basic research in the physical sciences. On the face of it, R&RA receives an increase of 2.7 percent. But the transfer into R&RA of responsibility for covering the expenses of Coast Guard
icebreakers reduces this increase dramatically. The R&RA increase over FY05 is $113.0 million. The estimated cost of the icebreaking services is apparently between $48 million and $75 million, reducing the R&RA increase to a sub-inflationary 0.009 percent. This is not acceptable for a nation that wishes to remain the most powerful and wealthiest in the world.

The NSF proposal success rate has slipped in recent years from one-in-three to less than one-in-four – the lowest funding ratio in 15 years. NSF requests-for-proposals are so oversubscribed that the NSF director, Dr. Arden Bement, has been forced to create a plan to deter applicants. This is in part a staff shortage problem that should be addressed, but it is also a funding shortage issue that thwarts scientific progress and creativity. *I urge the Committee to appropriate a 6 percent increase for NSF’s Research and Related Activities in the FY06 budget. This amount, which would make up for reductions taken last year and provide a modest increase for FY06, would still be far below the level authorized in the enacted NSF Authorization Act.*

Within R&RA, the Geosciences Directorate is described in the budget request as, “…the principal source of federal funding for university-based basic research in the geosciences, providing about 62 percent of the total federal support in these areas. Not only does GEO play a critical role in addressing the nation’s need to understand, predict and respond to environmental events and changes, but [it] also helps to determine the best use of Earth’s resources.” Yet the funding request of $709.1 million for this critical activity is increased by only 2.2 percent over the FY05 current plan amount and is actually down by $4 million from the FY04 actual of $713.4 million.

*I urge the Committee to appropriate a 6 percent increase over FY05, or $735.8 million, for the Geosciences Directorate. This restores the GEO cut taken in FY05 and provides an inflation-adjusted increase for FY06. Within GEO, I urge the Committee to fund at the same 6 percent increase the Atmospheric Sciences Division (now in the FY06 request at a 2.7 percent increase) and the National Center for Atmospheric Research (now in the request at a sub inflationary increase of 1.3 percent), both of which provide 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.*

At the hearing mentioned above, Congressman Ehlers declared the 12 percent cut to NSF’s Education and Human Resources (EHR) Directorate “dramatic” and “unparalleled in other parts of the science and technology portfolio.” NSF’s education programs make a fundamental difference in the scientific knowledge and skills of our future workforce. We must support science and math education at all levels.

Funded within EHR, the National Science Digital Library (NSDL) is emerging as a center of innovation in digital libraries that will enable all school districts – rural, urban, suburban – online access to experts and educational resources to improve math and science education. NSF’s FY06 budget proposes to reduce the NSDL program from $18.4 million in FY05 to $15 million – a reduction of nearly 20 percent. This comes on the heels of a similar reduction taken in the FY05 budget process. These additional reductions in NSDL will reduce teacher and student access and additional necessary innovations to enable this national education resource reach its
full potential. I urge the Committee to reverse the decline of the Education and Human Resources account, down 21.5 percent from the FY04 level in the FY06 request, and to fund the National Science Digital Library at its FY05 amount of $18.3 million at the very least.

National Aeronautics and Space Administration (NASA)

One of the most significant issues facing the country’s scientific research enterprise is the rapid and unprecedented diminishment of NASA’s Earth, solar, and space sciences programs. Understanding the Sun and the complex, changing planet upon which we live, how it supports life, and how human activities will affect its ability to support life in the future is one of the greatest intellectual challenges facing humanity. The agency’s Earth-Sun System Missions advance our understanding of the Earth-Sun system and also lead directly to major societal benefits to the country, including improved national security, weather forecasts and warnings; climate outlooks; management of natural resources including water, agriculture, and energy; an improved understanding of space weather and its impact on communications; and mitigation of natural disasters such as drought, floods, landslides, and volcanic eruptions.

Not only are the data that the missions produce of great value, but so is the support the missions provide to young scientists. Today’s graduate and postdoctoral students are the scientists who will support the exploration of Earth and the solar system in the future. If their education and training are interrupted now, this country will not have the expertise it needs to implement the Administration’s Exploration Vision.

I urge the Committee to protect NASA unmanned science missions and to reaffirm the critical role that the agency plays in gathering knowledge about our own planet and our universe -- a role cannot be duplicated now by any other agency -- by providing NASA Science, which is in the FY06 budget request at a 0.9 percent cut, with an inflationary increase of 3 percent at the very least.

In the early days of the Space Station program and continuing up until last year, separate appropriations accounts were established to make sure that Space Station budget overruns did not undermine NASA's science programs. This “firewall” should be instituted again in order to protect NASA’s science programs including these smaller, unmanned missions. I urge the Committee to reinstate separate appropriations accounts in order to protect NASA’s science programs so that they may continue to benefit this country.

National Oceanic and Atmospheric Administration (NOAA)

Within NOAA’s Office of Oceanic and Atmospheric Research (OAR), I am pleased to see that NOAA’s key role in the interagency U.S. Climate Change Science Program (CCSP) is enhanced with increases in the budget request for Climate Observations and Services. An important example of the benefits of these increases is the continued maintenance and construction of a global ocean observing system that is critical to the documentation of climate-scale changes in ocean heat, carbon, and sea level. This progress will help meet the country’s international commitment to complete the ocean climate observing system by 2010. I urge the Committee to
maintain the FY06 funding of $16.1 million requested for OAR’s Climate Observations and Services.

The national commitment to CCSP has been weakened with the proposed cut to OAR’s Climate and Global Change Program. Proposed to be cut by 13 percent, or $8.6 million, these funds support programming that has much to do with the nation’s basic climate research and the future of the atmospheric sciences in this country. Targeted programs include U.S. participation in international field campaigns in support of climate and global change research, critical research programs in several areas of global climate change, and education program funding including support for underrepresented students through the award-winning and proven Significant Opportunities in Atmospheric Research and Science (SOARS®).

Climate and Global Change funding was proposed to be cut in the FY05 budget request, but was restored by your subcommittee and, ultimately, the Congress. The NOAA/external community partnerships represented by this program leverage the country’s research and research applications expertise, bring the best talent to bear in addressing high priority technology development requirements, enable the country to keep international field program participation commitments, and contribute to the training of a new generation of scientists that NOAA and the rest of the scientific community will need desperately as present employees retire. I urge the Committee to restore the FY06 Climate and Global Change Program base funding, to the FY05 level of $66.0 million without harming NOAA’s other commitments to the Administration’s interagency initiative, the U.S. Climate Change Science Program.

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On behalf of the UCAR community, I want to thank the Committee in advance 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. The establishment of the Science State Justice and Commerce Subcommittee gives you the unique opportunity of ensuring that three of the nation’s most important scientific and operational agencies continue to provide knowledge about our planet and universe that will advance civilization and provide tremendous societal benefits for our country. It is a grave responsibility and great opportunity.