I submit this testimony for the record of the U.S. House Committee on Appropriations, Subcommittee on Commerce, Justice, Science, and Related Agencies on behalf of the University Corporation for Atmospheric Research (UCAR). UCAR is a consortium of 75 universities that that serves the atmospheric and geosciences research and university community. For 50 years, UCAR has managed and operated the National Center for Atmospheric Research (NCAR) for the National Science Foundation (NSF).

On behalf of the geosciences community represented by UCAR, I urge the Committee to support in the FY 2011 Commerce, Justice, Science and Related Agencies Appropriations Act the President’s request of $7.424 billion for the NSF, $5.006 billion for the Science account of the National Aeronautics and Space Administration (NASA), and $5.554 billion for the National Oceanic and Atmospheric Administration (NOAA).

President Obama has submitted a FY 2011 budget request to Congress that we believe is strong, appropriate, and good for the country. Following a recent period when science budgets were essentially flat and our status as a world leader in some scientific areas threatened, the scientific investments of the American Recovery and Reinvestment Act of 2009 and the FY 2010 Commerce, Science, Justice, and Related Agencies Appropriations Act enabled us to set the nation’s scientific enterprise back on a path for sustainability and growth. We thank the Members of the Committee for your key role in making this possible and urge you to continue this enhancement by supporting the bold statement made by the President’s FY 2011 budget request for science.

We are well aware of the serious financial issues facing the country, the President’s decision to cap federal discretionary spending, and the difficult choices concerning investments. As you know well, scientific research drives innovation around the world. The jobs involved are some of the most leveraged in this country and critical to the nation’s financial recovery and long-term future. For every research dollar invested by our citizens, the return in knowledge, technology, innovative products, and tools that help solve societal problems is many-fold. Science is critical to the country’s long-term economic recovery.

Investment in the climate- and weather-related scientific programs of NSF, NASA and NOAA will serve to make the country more resilient to the extreme weather and climate change impacts that are inevitable, provide the underlying knowledge upon which all communities can base climate change adaptation strategies and upon which the country can base an effective national energy strategy, predict the effects of solar storms on global communications, and contribute information relevant to the nation’s homeland security and defense. All of this will strengthen the economy.
We are extremely pleased to see the investment that is being made across NSF, NASA, NOAA and other agencies through the U.S. Global Change Research Program, which has been revitalized with stimulus dollars and a healthy increase in FY 2010 appropriations. This upward trajectory, so important to the nation if we are to comprehend and deal with inevitable climate change, should be continued through appropriation of the President’s budget request of $2.6 billion, distributed across key federal agencies.

I would like to comment on the budget requests of the following agencies and office:

National Science Foundation

NSF provides approximately 20 percent of the nation’s basic research funding and infrastructure through an effective competitive process that ensures that grants are awarded for the best proposals. I urge the Committee to support the President’s ongoing commitment to double NSF funding this decade as authorized by the America COMPETES Act of 2007. The President’s budget request amount of $7.424 billion for NSF in FY 2011 is on track to reach this goal. I urge you to support this overall NSF request and the $955.29 million request for NSF’s Geosciences Directorate (GEO).

GEO provides over 60 percent of all federal funding directed to university-based, basic research in the geosciences. This broad and diverse academic field contributes knowledge that is absolutely necessary to understanding climate change, extreme weather, the dynamics of water resources, solar effects on Earth, space weather effects on global communication, the interactions of Earth’s systems, energy resources, geologic hazards, and all aspects of the global oceans. In this most critical moment for the environmental health of our planet and the future of life as we know it, this Directorate is supporting tools and knowledge that are critical to our future.

In the FY 2011 request, GEO continues support for the NCAR-Wyoming Supercomputing Center Project, the design and construction of a world-class center for high performance scientific computing in the atmospheric and related geosciences. A major focus will be the integration of more components of the Earth system into global climate models and increased resolution enabling better regional climate predictions. This will result in far more accurate information for stakeholders as they struggle with climate change adaptation planning. The NCAR-Wyoming Supercomputing Center is also a sterling example of a state-federal partnership, with the state of Wyoming contributing some $50 million to the project.

Within the Directorate for Education and Human Resources, I would like to call your attention to the National STEM Education Distributed Learning (NSDL) program, the nation's online library for education in science, technology, engineering, and mathematics. National education programs such as this could be leveraged by NSF to provide even more students with interdisciplinary education services that contribute effectively to the education of tomorrow’s workforce and an informed citizenry. We appreciate NSF’s continued support for the development of such innovative and cutting edge education programs.
In 2007, I co-chaired with Berrien Moore the National Academies of Sciences study *Earth and Science Applications from Space: National Imperatives for the Next Decade and Beyond*, the Decadal Survey of this nation’s capacity to observe our home planet with satellites. I would like to strongly reaffirm my support for the vision and specific recommendations laid out in the Survey—the measurements, the science, and the applications to meet societal needs. Until I read the President’s FY 2011 budget request for NASA, I was discouraged about this country’s commitment to launching the missions we need to meet Earth observing demands now and into the future. If appropriated, the FY11 budget for NASA’s Science account, particularly the request for Earth Science within the Science Mission Directorate, will bring us closer than ever to being able to achieve goals established by the broad science community within the Survey. **I urge the Committee to support the President’s FY 2011 budget request of $5.006 billion for the NASA Science account, including $1.8 billion for Earth Science.**

I appreciate that many difficult choices have been made in the NASA budget request and am especially appreciative of the Administration’s focus on Earth Science, particularly in the context of the cuts that other areas have received. With climate change well under way, there are few NASA responsibilities more important than observing Earth’s environment. A robust observing, modeling, and research program will provide continuity in important observational data and continued advances in models that can synthesize the observations and increase our understanding and predictive capability of the Earth system. These data and the accompanying research programs are critical to the health of our economy, to the sustainability of Earth’s life-supporting environment, and to our national security.

Within NASA Science, I greatly appreciate the request of $170 million to rebuild the **Orbiting Carbon Observatory**, the original which was lost on launch in early 2009. This instrument will be designed to make precise, time-dependent global measurements of atmospheric carbon dioxide (CO₂) from an Earth-orbiting satellite. With efforts under way to slow the acceleration of climate change, in part by controlling CO₂ emissions, it is essential that our nation have an accurate way to measure levels of this greenhouse gas on a regional basis.

While we are encouraged by the budget request, we are also aware that mission cost overruns of the past have derailed many launch dates and delayed or cancelled valuable science as a result. I urge Members of Congress to continue to exercise their oversight responsibilities to keep the costs of the Decadal Survey missions under control and based on realistic cost figures from the start. The atmospheric sciences community appreciates that many difficult choices have been made in the NASA budget request.

NASA’s Science program plays a central role in understanding our planet and the behavior of the Sun. NASA’s overall role in this country’s scientific endeavor is so strategic and central to our well-being that the Science account should be one of this nation’s highest priorities. With this budget request, it appears that this it is being treated as such.
National Oceanic and Atmospheric Administration (NOAA)

Under the leadership of Administrator Lubchenco, NOAA is currently undergoing major restructuring to develop and meet the needs of two critical programs: the Joint Polar Satellite System (JPSS) and the new NOAA Climate Service. Our community strongly supports both of these programs and understands that much of NOAA’s FY11 increase, slated for the National Environmental Satellite, Data and Information Service (NESDIS) line, is targeted to finally resolve the multi-year problem of NPOESS cost and schedule over-runs. I urge the Committee to appropriate $5.554 billion for NOAA and $2.2 billion within that for NESDIS, as requested in the President’s FY 2011 budget. Furthermore, as NOAA moves forward with the critical JPSS and NOAA Climate Service, I urge you to put the Agency on track towards a $8 billion budget within the next several years.

Now that the NPOESS partnership between DOD, NASA, and NOAA has dissolved, two separate lines of polar-orbiting satellites are being pursued instead. I urge the Committee to ensure that this change in course does not come at the expense of the civilian line of NPOESS. I further urge the Committee to fully fund the President’s request of $1.06 billion for NOAA’s portion of NPOESS, the JPSS. Advancing our satellite sensory capabilities is needed more now than ever, and it is essential if we are going to advance climate research and conduct higher-resolution and regionally-specific climate modeling.

The President’s request for NOAA also funds a start for the Constellation Observing System for Meteorology Ionosphere and Climate-2 (COSMIC-2) program. COSMIC-2 builds on the great success of the existing, cost-effective COSMIC constellation of six microsatellites, a cooperative venture between the U.S. and Taiwan, which collects high-resolution temperature, moisture, and space weather data across the globe. Using the GPS radio occultation technique, COMSIC-2 will take COSMIC to the next higher scientific and operational level by collecting real-time, global atmospheric temperature, moisture, and electron density data for improved weather forecasting, climate monitoring and research, and space weather studies and prediction.

With its February announcement that it will form a NOAA Climate Service, NOAA is at the forefront of federal efforts to put into place the institutions and infrastructure to provide American people, businesses, and communities with climate information, services, and other products. The new Service aims to become a user interface that will provide accurate and timely information about how Americans can adapt strategically to the impacts of climate change. Our community strongly supports NOAA’s leadership in this area; we are working with the Agency to ensure that the new Service takes full advantage of the atmospheric observational systems, data sets, and modeling capabilities housed at NCAR and within the larger university community. We are convinced that NOAA is going about restructuring to create a climate service in a way that should effectively leverage the Agency’s existing climate programs. I ask the Subcommittee to authorize NOAA restructuring in a timely manner to allow swift establishment of the new Climate Service line office.

I want to thank the Committee for continued support of Global Learning and Observations to Benefit the Environment (GLOBE) and ask that you support its inclusion in the NOAA and NASA budgets. This proven, experiential program supports students, teachers, and scientists to
collaborate on inquiry-based investigations of the environment and the Earth system, involving more than 1,000,000 students, 50,000 teachers and 20,000 schools around the world.

In the past, inadequate budgets at NOAA have resulted in too little extramural funding and too little opportunity to leverage the expertise of the university community. In the FY10 bill, the conferees directed that NOAA must “increase extramural research funding in future requests to build broad community support and leverage external funding for mission-oriented research.” In this year’s request, the Committee’s direction was answered. **I am pleased that the President’s FY 2011 budget would provide $173.2 million for the Competitive Research Program within Oceanic and Atmospheric Research and ask that the Committee reiterate this requirement in the FY 2011 funding bill.**

**Office of Science and Technology Policy (OSTP)**

We realize that NOAA alone cannot establish the broad activities that will eventually comprise the nation’s multi-faceted climate service. UCAR has provided specific ideas for these activities to be coordinated through OSTP’s National Science and Technology Council and would be happy to share them with the Committee, including four key principles to: (1) involve White House leadership and coordination, (2) couple services and research, (3) solicit and implement external user input, and (4) enable and encourage novel public-private-academic partnerships. **I urge the Committee to fund OSTP at an FY11 level that enables it to meet the climate service coordination responsibilities that will surely fall to it.**

**Conclusion**

In a speech at the National Academy of Sciences last April, President Obama stated that, “At such a difficult moment, there are those who say we cannot afford to invest in science, that support for research is somehow a luxury at moments defined by necessities. I fundamentally disagree. Science is more essential for our prosperity, our security, our health, our environment, and our quality of life than it has ever been before.”

We agree with the President’s statement and encourage the Committee to support the 2011 President’s budget request for NSF, NASA, and NOAA. We have life-threatening environmental problems in this nation and around the globe that can be mitigated by the application of scientific research. We have economic difficulties that can be ameliorated over time with investments in scientific research and technology development that spur innovation and efficiency. The decline in our education system that threatens to weaken our workforce can be addressed in part by creative ways in which to introduce future environmental leaders to science, math and engineering. We urge the Committee to support strong investment in this country’s scientific infrastructure and goals.

I sincerely thank the members of 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.