

**Testimony prepared by
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**Submitted April 3, 2009 to the
Subcommittee on Energy and Water Development
U.S. House of Representatives Committee on Appropriations**

Regarding FY 2010 Appropriations for the Department of Energy (DOE) Office of Science

On behalf of the **University Corporation for Atmospheric Research (UCAR)** and the larger university community involved in weather and climate research and education, I submit this written testimony for the record of the House Committee on Appropriations, Subcommittee on Energy and Water Development.

I want to thank the Subcommittee for its leadership in promoting and supporting science in the FY 2009 appropriations. ***I urge you to fund the DOE Office of Science at \$5.2 billion in FY 2010, an 8 percent increase over FY 2009 levels, to put the federal government on track to double its investment in climate change research, climate modeling, advanced scientific computing research, and other basic sciences, within the next decade. This accelerated pace of funding would meet the bipartisan mandate of the America COMPETES Act of 2007. Further, I ask that you enable the agency to apply the entire appropriation toward mission-related agency research priorities.***

UCAR is a 73-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 educational capabilities. Our mission is to better understand the behavior of the atmosphere and related global systems and to help communities, states, and nations use this information to sustain and improve life on Earth.

Through its programs in climate change research, climate modeling, and advanced scientific computing research, the DOE Office of Science plays a critical role in supporting and improving the facilities and research tools that the university community uses to predict the impacts of rising greenhouse gas levels and other climate change. The Community Climate System Model (CCSM), for example, which is funded in part by the DOE Office of Science, is a comprehensive model for analyzing Earth's past, present, and future climate. It is one of the primary tools that the Nobel Prize-winning U.N. Intergovernmental Panel on Climate Change used in its 2007 assessment report, and it is providing decision makers around the world with a clearer picture of what the impacts of sustained climate change will be on a broad global scale.

The CCSM is laying the scientific foundation for communities to begin to develop effective long-term strategies to minimize damages, by either adapting to or mitigating the impacts of climate change – but it is just one of the DOE supported programs addressing

critical climate change issues for this country. Recent federal appropriations for science research, in the Omnibus Appropriations Act of 2009 and the American Recovery and Reinvestment Act of 2009, will enable the DOE Office of Science to support the broad climate change research community to hire needed new researchers, upgrade facilities, and improve the accuracy and specificity of predictions.

As climate change alters weather patterns and landscapes, it will increasingly arrive with significant societal, environmental, and economic costs. More accurate and locally-specific predictions could help decision makers reduce these costs by providing advance warning of dangerous trends and conditions for a particular community, state, or region.

According to the Pew Center on Global Climate Change, most states have completed or are working on action plans to address and adapt to global warming. However, decision makers have posed very specific questions to the research community. For example, power companies, city water utilities, and ski area operators want to know whether coming decades will bring thinner snowpack with earlier melting and negative economic consequences as well as serious water use problems. Insurance companies and state flood control agencies want to know if coming decades will produce more frequent or more severe storms. Farmers need to know if crops they are planting now will thrive in a changed climate.

Today's climate models simulate the climate at the *global* scale and produce *global* averages as their results. But to understand how global warming will affect drinking water storage at the local level, for example, reliable regional simulations and predictions are needed. Some aspects of regional climate change are already well established. Temperature increases and altered patterns of precipitation are already affecting U.S. water resources, agriculture, land resources and biodiversity and will continue to do so.

Researchers are developing new approaches to fine-scale computer modeling to allow greater focus on regional impacts of a changing climate. One very promising regional model that has been developed and tested is the Nested Regional Climate Model (NRCM). This state-of-the-art model "nests" the finer scale Weather Research and Forecasting Model (WRF) within the CCSM to provide useful regional detail where most needed. NRCM scientists can zero in on regions of particular interest, such as hurricane- or drought-prone areas, without the much higher cost of simulating the entire globe in fine detail.

With enhanced funding, the DOE Office of Science could support the development of cost-effective, operational tools, such as the NRCM, for local and regional decision makers. Communities in every district of the country need such guidance to protect lives and manage resources in the face of global climate change.

The Department of Energy plays a vital role in sustaining U.S. scientific leadership and generating U.S. competitiveness in a time when other countries are investing heavily in scientific research and technology. On behalf of UCAR and the atmospheric sciences research community, I want to thank the Subcommittee in advance for your attention to the recommendations of our community concerning the FY 2010 appropriations for the Office of Science. We understand and appreciate that the nation is undergoing significant budget pressures at this time, but U.S. security and quality of life suffer when science is not supported. We urge you to follow the recommendations of the America COMPETES Act of 2007 and restore Office of Science and overall DOE funding to a level that benefits this nation and the world.