Testimony of
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Committee on Science and Technology
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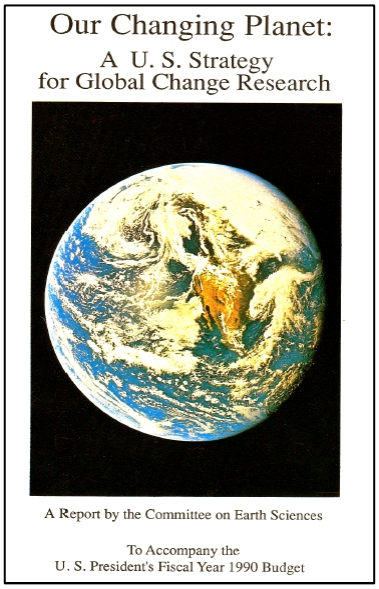
Introduction

My name is Dr. Jack D. Fellows and I submit this written testimony for the record of the House Subcommittee on Energy and Environment. I am the Vice President of Corporate Affairs at the University Corporation for Atmospheric Research (UCAR) in Boulder, Colorado. UCAR is a 70-university member consortium that manages and operates the National Center for Atmospheric Research and additional programs that support and extend the country's scientific and education capabilities related to weather and climate. The UCAR community has been a major contributor to the U.S. Global Change Research Program (USGCRP) for more than 15 years.

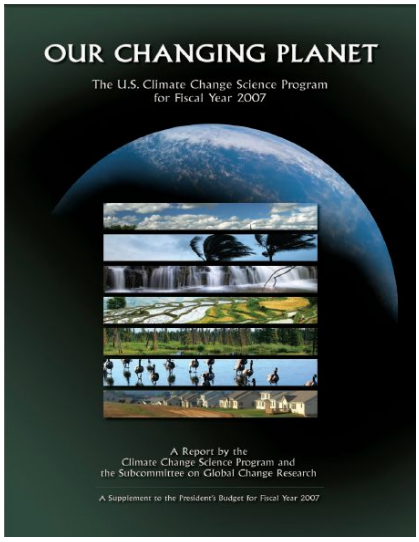
In the invitation extended to me to participate in today's hearing on H.R. 906, the Global Change Research and Data Management Act of 2007, I was asked to address the following questions:

1. What are the major strengths and weaknesses of the current U.S. Global Change Research Program?
2. Are the current levels of funding for research to support the development of adaptation practices, characterization of ecosystem, community, and economic vulnerability, and mitigation strategies adequate?
3. How can we best ensure that information needs of resources managers and policymakers at the state and local level are met by the U.S. Global Change Research Program?



In addition to addressing these three questions, I will also include my comments on how H.R. 906 can contribute to these three areas. My testimony today expresses my own views on H.R. 906 and is based on my own experiences and involvement in the USGCRP since its inception. I was a co-author of the very first USGCRP "Our Changing Planet" (OCP) report that accompanied the President's 1990 Budget and from my vantage point at the Office of Management and Budget (OMB) at that time, I assisted the Congress in its enactment of the Global Change Research Act of 1990 (P.L. 101-606), which codified the USGCRP into law.

While the USGCRP formally started in 1989, it actually began in early 1987 with some informal budget crosscuts when I was at the OMB. Those early crosscuts showed that over $1 billion of agency programs were related to global change type research. Shortly after these crosscuts, the Office of Science and Technology and OMB lead an interagency effort to improve the coordination of these programs. For over 15 years, the OCP reports have annually summarized the efforts of this critically important interagency research effort to better understand both the natural and human-induced changes occurring on our planet. The USGCRP has changed over the years both in research focus and structure. In 2001, the Bush Administration created the Climate Change Science Program (CCSP) that became the umbrella program for both the USGCRP and the Bush Administration's Climate Change Research Initiative. In July 2003, the Bush Administration released the "Strategic Plan for the U.S. Climate Change Science Program" to guide the CCSP program. I will be using the FY07 OCP report for the basis of my testimony today. The USGCRP does not change radically from year to year and the FY07 OCP report is a particularly relevant report to address the three questions I have been asked to address.



USGCRP Major Strengths and Weaknesses?

My own view is that the USGCRP has been instrumental in improving our knowledge of how our planet works and how human activities impact it. That said, I believe the program does have exceptional strengths and a few things that must be addressed to realize the goals outlined in H.R. 906.

The major strengths of the USGCRP include:

1. Its primary goal has not changed since its inception -- to provide a sound scientific basis for developing national and international policy on global change issues.
2. It has provided an important interagency mechanism for developing research priorities and budgets and coordinating the program's implementation.
3. It has provided a "critical mass" and "focal point" both within the federal and academic research and policy communities to ensure this important science is discussed, debated, reported, and remain a national priority.
4. It has periodically been independently reviewed (e.g., the National Academy of Sciences) and been responsive to those reviews.
5. It has tried to tie these interagency research efforts to societal and user needs.

The major weaknesses of the USGCRP include:

1. The program has been subject to rather substantial political influences over the years (e.g., avoidance of certain research areas, overshadowed by other Administration priorities, disjointed congressional oversight, etc).
2. The interagency process has not always had the leadership and clout to really ensure that the highest research priorities are addressed or all agency contributions were included (program priorities versus agency priorities).
3. It has not been as responsive to user needs as it could have been.
4. There has been difficulty in tracking budget categories and progress over time as cited in the 2006 GAO report entitled "Climate Change: Greater Clarity And Consistency Are Needed in Reporting Federal Climate Change Funding"

Are Current Funding Levels Adequate to Support Adaptation and Mitigation Research and Characterize Ecosystem, Community, and Economic Vulnerability?

In FY07, the USGCRP had five key goal areas (see box). While some of the wording has changed over the years, these goals have been surprisingly stable for many years. That said, U.S. climate research has historically been focused on Goals 1-3, which have emphasized improvements in fundamental understanding of the climate systems, its driving forces, and the tools to make predictions about climate variability and change. As the science has improved and its applicability to societal needs has become more evident, the importance of Goals 4-5 have clearly increased. The FY07 report has pages and pages of highlights of progress in all these goal areas. Between, FY05-07, the USGCRP funding has been between $1.7-1.8B. It is difficult to critically assess the specific program balance of such a large program. National Academy of Science panels have spent over a year doing this kind of analysis and even those reviews are largely done a high-level. That said, the CCSP Goals and Funding Percentage box above shows that the funding for Goals 4-5 are roughly 25-30 percent of the overall research funding (not including

CCSP Goals and Funding Percentage for FY05-07

Goal 1: Improve knowledge of the Earth's past and present climate and environment, including its natural variability, and improve understanding of the causes of observed variability and change. **18-21%**

Goal 2: Improve the quantification of the forces bring about changes in the Earth's climate and related systems. **27-28%**

Goal 3: Reduce the uncertainty in projection of how the Earth's climate and related systems may change in the future. **24-25%**

Goal 4: Understand the sensitivity and adaptability of different natural and managed ecosystems and human systems to climate and related global changes. **14-15%**

Goal 5: Explore the uses and identify the limits of evolving knowledge to manage risks and opportunities related to climate variability and change. **13-15%**

	FY07 Dollars in Millions		
Goal	Research	Observations	Total
1	240.60	206.80	447.40
2	304.80	156.20	461.00
3	283.20	170.80	454.00
4	160.10	41.80	201.90
5	150.70	0.00	150.70
Total	1,139.40	575.60	1,715.00

observations). I believe this is substantially up from the early years of the program, represents a reasonable balance in the program, and I expect will increase with time given policy and user demand for this type of research and information. It has just been in the last 5 years or so that the science has mature enough and the Goal 4-5 capacity capable enough to undertake the over $300 million annually being invested in the Goal 4-5 areas today. The USGCRP currently has 21 Synthesis and Assessment Products that are clearly applicable to national vulnerability, including weather and climate extremes, abrupt climate change, coastal sensitivity to sea level rise, ecosystem discontinuities, global change effects on agriculture, water resource, and energy production, human health impacts, best-practice in characterizing uncertainty, decision support systems for selected economic sectors and regions, adaptive management strategies, and many others.

One issue I wish to point out is the USGCRP observations budget has dropped from over $772 million in FY05 to roughly $575 million in FY07 (a 33% decrease). This is largely due to substantial reductions in NASA's science budget and a problem highlighted in the recent National Research Council's "Earth Science and Application from Space: National Imperatives for the Next Decade and Beyond". This is an example where other Administration priorities have weakened the USGCRP program and interagency process. We should consider very carefully whether it is in our best interest to allow our observational capabilities to decline. I believe that in the very near future, policy makers will begin to take actions to address the climate change issues documented in recent international reports. It would seem to me that observing capabilities will be even more important in the future as tools for policy makers so that they can assess the impact of the important policy choices they make in response to climate change – which is why it is so hard to understand why this Administration has allowed such a steep decline in the funding of our observing capabilities. It is quite possible that some of the stakeholders input required in H.R. 906 would also agree with the need to maintain these observational capabilities.

How can we best ensure that information needs of resources managers and policymakers at the state and local level are met by the USGCRP?

In 2001, the USGCRP sponsored the first U.S. National Assessment entitled "Climate Change Impacts on the United States: the potential consequences of climate variability and change". This assessment was required by the Global Change Research Act of 1990 and involved teams of researchers and stakeholders working in 20 regions across the U.S. Much was learned from this first assessment in terms of national vulnerability, stakeholder needs, and how to best do assessments in the future. Many of the FY07 Synthesis and Assessment Products are outgrowths of this assessment and continue to solicit resource manager and policymaker needs at all levels. So, the USGCRP continues to make substantial progress in making its investment relevant to stakeholders. But, is it enough given the urgency and political interest in this important science and policy issue? I'll try to address this in the next section of my testimony. I do believe that the type of reports and oversight recommended in H.R. 906 will go a long way to ensuring that resource managers and policymakers needs are met by the USGCRP.

How H.R. 906 can help in these three areas?

Overall I believe that H.R. 906 is a timely and important piece of legislation. We have learned a lot about climate science since 1990. Given increased awareness of the risks posed by climate change there is significant demand for data, information, models, and tools to help decision makers and resources managers cope with climate change. Thus, the USGCRP has an unprecedented opportunity to provide even more "decision support" to stakeholders. Also, we have grown wiser on how to run interagency science programs over the past 17 years. Given this increased demand for information and improved management approaches, I believe it is the right time to consider replacing the 1990 Act with H.R. 906. The type of program outlined in H.R. 906 is a significant step in the right direction for the following reasons:

1. it builds on the existing USGCRP strengths and minimize or even eliminate the weaknesses mentioned above.
2. it seeks more "balance" between the physical and mitigation/adaptation research components, and
3. it promotes further stakeholders engagement at all levels.

Many of the bill's provisions are fully consistent with the recommendations in the 2004 National Research Council report entitled: "Implementing Climate and Global Change Research: A review of the final U.S. Climate Change Program Strategic Plan". The only suggestions I have that might further strengthen the bill include:

1. **Leadership, Priorities, and Management.** Given the possible dire consequences of climate change, I find it puzzling that there is no mention of weather and climate in federal priorities like the American Competitiveness Initiative. A significant portion of our nation's economy is impacted by weather and climate and this area of research and education is preparing the next generation of environmental leaders that will contribute to both our nation's safety and to our economy. For the USGCRP leaders to make progress, this program must be recognized as a key priority in both the Administration and Congress. Without this level of recognition, the USGCRP leaders will not have the clout to make sure the program stays focused on the highest research and policy priorities. This bill would be even stronger if it required the USGCRP interagency committee to have: (1) a clear budget process linking tasks to agency and program budgets, (2) a USGCRP Director with sufficient authority to ensure that agency programs reflect USGCRP priorities and make tough tradeoffs among competing agencies desires and evolving program needs, (3) a timeline with clear and realistic deliverables, and (4) a Director that is clearly held accountable to deliver on the program's goals. This would make for an effective interagency enterprise and reflect what we have learned about interagency efforts over the past 17 years. The flip side of this is to not make it so rigid and centralized that it will actually undermine the interagency process – always a danger! One the greatest frustrations and challenges in putting together an integrated USGCRP while I was at OMB was that there is no equivalent integrated oversight mechanism in the Congress. Many people spent enormous amounts of time in the Executive Branch putting this together and then having it looked at in a

completely non-integrated manner on the Hill. Today, the restructuring of the committee jurisdictions has improved the integrated oversight of the USGCRP, but this is something to keep a watchful eye on.

2. **Reporting.** Within one year of the Act's enactment, the Program must produce: (1) a 10 year research plan that reflects user needs at the Federal, State, regional, and local levels, international coordination recommendations, categorize user need information needed to develop policies to reduce societal vulnerability to global change, and identify needed global observations; (2) a vulnerability assessment for the US and the world that goes well beyond research; and (3) a policy assessment that documents the mitigation and adaptation policies being used at the Federal, State, and local levels, evaluate them, and recommended others, (4) a data management plan, and (5) an annual report. This level of analysis and reporting is likely to be very challenging within one year and would probably benefit from a different sequencing. The research plan would be greatly enhanced from the vulnerability and policy assessment. Perhaps the research plan due date should be delayed to take advantage of a combined vulnerability/policy assessment that involves both the research plan participants and people of very different perspectives and skills (e.g., economists, policy researchers, etc). There is a much greater chance that the research plan's goals and priorities will be responsive to user needs with this input.

3. **Research and User-Need Balance.** This bill should help refocus the USGCRP to better reflect user needs. That said, it shouldn't eliminate important basic research that could lead to a major scientific breakthrough due to over emphasis on user-driven requirements. Whether this happens or not will likely be due to individual interpretation of the bill. While loosely implied, this kind of balance is not directly addressed in the bill and should be. Another way to look at this is that there should be balance between researcher-driven research that may lead to unforeseen breakthroughs and a more top-down approach to managing programs and setting priorities.

4. **Other.** Unlike Title 1, there is no reference to user needs in the Title II data management section. It would make sense that many of these data be relevant to user needs. Lastly, Title I Page 5 Lines 22-23 should include the obvious agencies involved in the Program just like the data management section (Title II Page 18 Lines 9-19).

I want to thank the Subcommittee for the chance to provide this testimony and your stewardship of the nation's weather and climate enterprise. There will be tremendous opportunities in the future for international climate leadership and for a broad range of research and technology opportunities that will have substantial return to our nation's economy. The future strength of our nation depends on today's investments in these programs.

End of Testimony