9 July 2004

The Honorable Vernon Ehlers
Chairman
Subcommittee on Environment, Standards, and Technology
Committee on Science
House of Representatives
Washington, DC 20515

Dear Chairman Ehlers:

I appreciate the opportunity to send comments on behalf of the University Corporation for Atmospheric Research (UCAR) concerning the National Oceanic and Atmospheric Administration (NOAA) Act (H.R. 4546). I believe that you have received a letter from the Weather Coalition concerning the parts of this bill that are weather-related. UCAR is a member of the Coalition, so I will not repeat any of the points that we offered in the Coalition letter, but will address only Sec. 602. Abrupt Climate Change Research Program. I know that you are familiar with UCAR’s 68-member university consortium and with the National Center for Atmospheric Research (NCAR), the world-renowned weather and climate research laboratory operated by UCAR.

General comments:

Please allow me to give some background information of which you may be aware. NOAA has had a modest paleoclimatology program under the Office of Global Programs that falls under the Climate Change Data and Detection (CCDD) section. While the National Science Foundation (NSF) has played the main role in taking samples and making paleoclimatology measurements, NOAA’s has operated a data center that gathers and distributes paleoclimatology data and encourages synthesis of those data. NOAA and NSF have been partners in the grants process and have collaborated well to meet the goals of both agencies. Climate scientists at NCAR have called for expansion of the paleoclimatology program in the past and were distressed to see that it was proposed to be cut in the Administration’s FY05 request. Specifically, NCAR scientists have called for the provision of much-needed validation data (instrumental data on site) at locations where ice, coral and tree cores are taken, so that better interpretation of core data can be made. [See Science, Trenberth and Otto-Bliesner, 23 April pp. 589-591.]

However, over the past few years, research has indicated that the probability of an abrupt change resulting from a change in the thermohaline circulation (THC) is less than previously thought. Paleoclimatology evidence for such change exists only for times when boundary conditions differed radically from anything that we can expect in the future. Results from eddy-resolving ocean models show the THC to be more stable than indicated by ocean-only simulations and by relatively simple models, the results of which are unrealistic because they leave out important negative feedbacks associated with the atmosphere. Thus, there is room to question the efficacy of creating a new program in
the abrupt climate change area if it would detract from or come at the expense of other climate research initiatives.

Specific Comments:

Regarding (b) Purposes of Program, bullet (1):
Past abrupt climate change is usually thought of as events related to temperature that are associated with Ice Ages and that are not relevant to the future with global warming. The activity described in this bullet sounds like research that has already occurred and that has achieved the goal of describing past instances of abrupt climate change. Instead, high-resolution measurements that resolve the annual cycle are needed in order to uncover the main manifestations of abrupt climate change through (for example) precipitation variables in particular.

Regarding (b) Purposes of Program, bullet (2):
This is a real issue and could be very worthwhile, given that thresholds likely exist and that the climate system is probably more nonlinear than the results of climate models.

Regarding (b) Purposes of Program, bullet (3):
For constructive incorporation to occur, global sequences and timing need to be well established and forcings (such as volcanic eruptions) well understood. Additional measurements are needed to get the detailed forcings data necessary in addition to variables data such as temperature, precipitation, etc.

Regarding (c) Purposes of Program:
Under the definition in this bill for abrupt climate change, the 1993 Mississippi Basin floods would qualify, even though they lasted only one season. It may be that change will be continuous and not easily discernable as going from one discrete state to another. Or change could happen quickly, slow down, and then speed up again. In any case, the definition should include time scale as a factor.

Conclusion:
There are good reasons, within the country’s overall Climate Change Research Program strategic plan, to establish increased NOAA funding for research into abrupt climate change. A number of new proxy records have been developed over the last five years that will allow better evaluation of the timing, magnitude, and spatial extent of climate anomalies associated with past abrupt events. Improvements to the NCAR climate model, CCSM3, will allow us to explore in depth the mechanisms for abrupt change, including freshwater fluxes into the oceans, vegetation feedbacks, and the role of the tropics.

However, the probability of abrupt climate change is low. There are many things that we do not understand about the climate system and many areas where data collection and analysis, as well as model development, need to be improved. Given that no credible climate model demonstrates that abrupt climate change could happen in the next 100-plus years, I believe that more immediately pressing problems are the shortage of funds for
NOAA’s National Climatic Data Center (NCDC) and for related synthesis activities that would use collected data more efficiently and effectively than is now possible.

I do hope that you will find these comments to be of some use.

Sincerely,

Richard A. Anthes
President