

**T**he warnings have not fallen on deaf ears. "I think we've clearly learned some of our lessons from other large-scale research programs related to the environment, such as NAPAP. And we're trying to make sure that we don't make the same mistakes that we did before," says Gary R. Evans, head of the global change office at the Department of Agriculture.

Evans co-chairs a group created late last year with the charge of bridging the gap between climate scientists and policymakers. This committee, called the assessment working group, will support and coordinate the applied parts of the GCRP, including the kind of end-to-end analyses advocated by Dowlatabadi. As a first step, the new group is making an inventory of the research each agency currently conducts that deals with the impacts of global change and the ways to mitigate or adapt to its effects.

As yet, however, the new emphasis on assessments has translated into few real adjustments in the program and has failed to mollify critics. "It's a first step, but it's not where we think the program needs to be," says one congressional staffer.

Perhaps some of the skepticism stems from memories of the ill-fated working group on Mitigation and Adaptation Response Strategies (MARS), the predecessor of the current assessment group.

Established in 1992, MARS had a similar focus, but the effort foundered from lack of support within the Bush administration, according to Christopher Bernabo, who testified before the House science committee in May. Bernabo is president of Science and Policy Associates, Inc., in Washington, D.C.

Bernabo and others have speculated that MARS suffered under the previous administration for political reasons. They suggest the Bush White House avoided research on impacts and responses because such activity would have been tacit acknowledgment that global change was a problem requiring action.

Clinton's willingness to set a target for limiting emissions of greenhouse gases signals that Washington will look more seriously at mitigation strategies. Oddly enough, however, politics might once again block support for research on ways to adapt to global change, says Battelle's Rayner.

"There is a constituency that exists which would rather we did not put a lot of emphasis on adaptation research because they fear that this would divert national efforts away from mitigation," he says. Along with others, Rayner argues that nations need to engage in adaptation research because such efforts have the potential to make societies more resilient to floods, droughts, and other extreme

weather events that wreak tremendous destruction today and could become more frequent in the future.

Calls for more applied research have won support even from physical scientists involved in the global change research program. Jerry Mahlman, who directs one of the nation's top climate modeling laboratories, has often lobbied for more impacts research in his frequent trips to testify on Capitol Hill. But he rejects suggestions voiced by some policy experts that funds be shunted from the basic science effort into other aspects of global change research.

"It is necessary that you do the science that's in the GCRP to have any hope for policy relevance," says Mahlman, from the National Oceanic and Atmospheric Administration's lab in Princeton, N.J.

With so much talk about assessments and policy relevance these days, most researchers expect some strengthening in the applied side of global change research. It remains unclear, though, whether such modifications will fix the key weaknesses in the program.

"I've seen issues in lots of areas re-defined many times, where there appears to be a big shift. But when all the dust settles, it's really still the same approach," says Rayner. "In some ways there's almost an undignified rush to embrace, policy relevance. I just hope that something authentic survives the enthusiasm." □

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**Exploring Chaos: A Guide to the New Science of Disorder** — Nina Hall, ed. This complete collection of a series of articles originally published in *THE NEW SCIENTIST* examines the fundamentals of chaos theory and its implications. Authors include some of those at the forefront of the field, including Benoit Mandelbrot, Ian Stewart, and David Tritton. An up-to-date look at current research as well as a solid overview of this new science. Norton, 1993, 223 p., color plates and b&w illus., hardcover, \$25.00.

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