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Research as Action on Climate Change

After declining to participate in the Kyoto Protocol last year, the administration of U.S. President George W. Bush focused its attention on climate change science. Last fall the administration released a draft Strategic Plan for its Climate Change Science Program (CCSP), the new umbrella structure for the 13-year-old U.S. Global Change Research Program (GCRP) and the year-old Climate Change Science Initiative.

The Strategic Plan will be finalized in April 2003, after an exhaustive process of public and expert input, including a 3-day workshop last December, attended by more than 1,000 people (mostly government and academic scientists), and a formal review by the National Research Council.

The proposed program of research in the CCSP has great potential to add to our understanding of the Earth system, but offers little hope of producing knowledge useful to policy-makers, and most troubling, has significant potential to reinforce a political situation characterized, above all, by continued lack of societally beneficial action on climate change.

The public investment in science under the GCRP has delivered notable progress in deepening our understanding of the Earth and its climate, including major advances in areas such as abrupt climate change, coupled ocean-

ductions joined together in support of the research program, as each wagered that more research would strengthen their respective positions. As it turns out, they were both right.

The \$25 billion or so in research devoted to the GCRP to date has provided considerable grist for advocates who support action, but also has produced enough scientific surprises and complexities to sustain the opposition as well.

So, after more than a decade, the context for the president's CCSP is changed only in its details.

In the Kyoto Protocol, proponents and opponents of action now have a specific vehicle to champion or oppose, but the calculus remains the same. Science continues to flourish because of the intense politics of climate change.

The scientific community continues to promise politicians that science will provide the basis for climate change decision-making by reducing uncertainties and generating plausible

In such arenas, policy-makers accept lack of certainty as a condition of life, and while they may call upon scientific and technological research, it is not to reduce uncertainties to some theoretical point that would resolve political dispute.

On the contrary, policy-makers need research to increase the range of plausible choices available to them in the present.

Given the role of science in sustaining the political gridlock over climate change, the scientific community is in a position to motivate change. If scientists are serious about wanting to do research that supports decision-maker needs, then they could insist on a systematic and rigorous assessment of such needs as primary input to setting research priorities, and then modify priorities accordingly.

Scientists who believe that the current state of knowledge is already sufficient to justify certain policy actions could adopt a provocative strategy similar to the one used during the Cold War by physicists who believed the United States did

Both have been severely neglected. Public and private investment in energy research and development has declined by almost two-thirds, in real dollars, since the late 1970s.

In a recent article in *Science*, Martin Hoffert and colleagues conclude that mitigation of climate change, even if politically accepted, faces significant technological hurdles that cannot be overcome without considerably more attention to advanced energy research.

If nothing else, the focus on reducing uncertainty has distracted from the fact that there are plenty of certain reasons to improve energy policy, not least of which are the national security benefits gained from energy independence, the environmental and health benefits of cleaner fuels, and the long-term economic efficiencies that can be delivered by renewable energy sources.

At the same time, a large body of research on natural hazards, adaptive ecosystem management, and decision-making in the context of climate variability tells us that understanding and reducing vulnerability is the locus of knowledge with the most value for decision-makers seeking to increase societal and environmental resilience to future changes in climate. Yet vulnerability reduction remains at best a minor focus of the CCSP.

The best way to make the CCSP more useful to decision-makers would be to in-

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land-atmosphere dynamics and year-to-year variability.

This research agenda has directly reflected the priorities of the science community, for example, through the deliberations of National Research Council committees.

Fully half of the GCRP research budget has been devoted to space-based observation hardware, and the resulting data streams have also played a key role in determining research directions. In contrast, the needs and capabilities of decision-makers who in fact must deal with climate change have played little part in guiding research priorities.

In the late 1980s, policy-makers figured out that the way to survive the intense political battle over climate change was to accept the idea that science could resolve policy uncertainties about the future and thus obviate the need for action in the present. This explains why in 1990, then President George H. W. Bush joined a Democratic Congress in support of the legislation forming the GCRP. For politicians, research itself served as action.

At the time, proponents and opponents of greenhouse gas emission re-

projections about the future climate.

Politicians gladly pass off responsibility to scientists, and advocates of all stripes accept science as the turf on which the political battle over climate policy should be waged.

Not surprisingly then, the CCSP and its promoters in the Bush administration honor the tradition by emphasizing the need to reduce uncertainties and improve projections as the basis for improved decision-making.

Somehow missed in this political logrolling have been two facts. First, even full implementation of the Kyoto Protocol (which is probably politically, if not technically, impossible), will have no discernible effect on the impacts of climate on society and the environment.

Second, better decisions about people and ecosystems in the context of climate depend very little — if at all — on “reduced uncertainty” or “plausible projections” about climate change. In the face of fundamental uncertainties, decisions are made routinely on issues at least as complex and far reaching as climate, such as economic policy, foreign policy, and national security.

not need additional weapons of mass destruction: oppose research when its funding is justified on a claim that effective action on climate change depends upon reducing uncertainties.

The effect in both cases would be to remove science as a cause of gridlock and make viable new lines of research that would better support the needs of society.

Such a quixotic response is of course unlikely not simply because it would require scientists to argue against their own professional self-interest, but also because it would reveal the amazing incoherence of our current approach to connecting climate policy and science.

Put simply: the types of knowledge emphasized in the GCRP and now in the CCSP, despite their significant scientific value, are not those we will most need in dealing with the challenge of climate change. It is as if the National Institutes of Health focused its research on making better projections of when people will die, rather than seeking practical ways to increase health and life expectancy.

Two examples illustrate the point: research on energy and on climate impacts.

volve the decision-makers, in whose name the program is justified, in structuring, implementing and evaluating its research.

Practically, this would mean sharing control over resource allocation decisions in the program with the agencies whose day-to-day business actually involves decisions related to climate, such as the Federal Emergency Management Agency; Agriculture, Interior, Energy and Transportation Departments; and Health and Human Services.

We recognize that this approach would represent a fundamental shift in the science and policy of climate, and would likely result in a significant change in scientific and budgetary priorities for climate research.

But if the public, rather than the scientific community, is to be the primary beneficiary of the nation's commitment to climate research, then this is the direction we must move.

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