

ELIZA GREGORY



## Finding the true value of US climate science

A new strategy for addressing climate change takes a realistic approach to the challenge of making science useful, says **Ryan Meyer**.

National science efforts are rarely short of ambition and grandiose promises. Focusing on energy, health, global warming or whatever, they all argue that their research will make the world a better place.

Take the US\$3-billion Human Genome Project and the breathless promises of cures and treatments that it would bring. In fact, the benefits have been modest because solving societal problems is a lot more complicated and difficult than generating new knowledge.

Is there an alternative? Is it possible to be realistic and nuanced about the limited role that science often has, but still to offer a compelling case for public support? The US Global Change Research Program (USGCRP) will shortly release a strategic plan that does just that.

Over the past two decades, the USGCRP, which coordinates 13 federal agencies and departments, has spent more than \$30 billion on climate-change research. In doing so, it has improved our understanding of climate systems. But, as the National Research Council pointed out in 2009, when it comes to fulfilling its legal mandate of supporting decision makers with useful information, the USGCRP has been a disappointment.

At the core of the programme's difficulties is the (faulty) assumption that better information leads to better decisions. Better information is rarely sufficient. Repeated studies have shown that making information useful demands engagement with those who will use it. This is about more than just communicating science effectively. It is about responsive scientists and science institutions. Although the USGCRP aims to serve a broad range of users, from policy-makers and natural-resource managers to fishermen and urban planners, historically it has not canvassed or accounted for their needs.

This is a long-standing problem, and in 2003 the USGCRP did produce a strategic plan that tried to address it. Littered with the word 'stakeholder', the plan invoked ideas such as participatory research, integration of natural and social sciences, and better communication and education efforts. These are important ideas, strongly advocated by those who study the challenge of how to connect knowledge with action. But the new discourse rang hollow. There was no coherent plan (let alone resources) to implement the concepts, and the central goals of the programme remained entirely focused on advancing knowledge. The USGCRP did not provide any coherent account of how doing science in this way would be different from what had gone before, or how science institutions would need to change in order to deliver better value to society.

What, then, is different this time? In its 2012 report, the USGCRP has expressed a more nuanced and humble account of the role of

science in society's responses to climate change.

For example, the draft plan provocatively states: "scientific knowledge is only one part of a much broader process. Information may be scientifically relevant without being decision relevant." This idea is echoed throughout its pages and is an important logical policy step. Research may offer, for example, marginal improvements in climate prediction, new data sets, or information on the distribution of a particular animal species. But these results will be irrelevant if framed poorly, or delivered at the wrong time, to the wrong people. Decision makers do not read journal articles, nor are they likely to adjust their practices to accommodate the scale or inherent uncertainty of a new model or indicator. For example, researchers examining the use of climate forecasts by water-resource managers found various barriers and constraints. These obstacles

are mainly cultural and institutional, and so increases in the quality of the forecasts themselves are unlikely to stimulate increased use.

Although the USGCRP was previously organized around five goals, all concerned with increasing scientific knowledge, this time, advancing science is just one of four stated objectives. The other three — to inform decisions, to sustain assessments and to communicate and educate — are woven in with the scientific activities. This should help to make the programme's substantial science investment more relevant to local, regional and national societal needs.

The latest plan also acknowledges difficult but crucial science-policy trade-offs. For example, it discusses the "dynamic tension" between increasing model complexity and policy-makers' needs for simplicity and tractability. For a government

science programme to explicitly recognize these choices as a proper concern of science management is a new and welcome step.

Will this bold vision be realized? The USGCRP does not yet have a strong mechanism for allocating funds among its new priorities. Some in the research community will surely lobby against trade-offs that seem to threaten the status quo. And, as it has in the past, the National Research Council reviewed this plan with a critical eye, pointing out that the USGCRP will need more resources and greater leverage over agency budgets and priorities to make it happen. Without these ingredients, the idea will probably run into the sand.

Despite these doubts, the USGCRP deserves applause for taking such an important conceptual step in the right direction. It has produced a plan for science that feels compelling, plausible and ambitious. It is a useful example for other science-policy organizations to follow. ■

**Ryan Meyer** is the science integration fellow at the California Ocean Science Trust in Oakland.  
e-mail: [ryan.meyer@calost.org](mailto:ryan.meyer@calost.org)

THE REPORT  
**EXPRESSES**  
A MORE NUANCED AND  
HUMBLE ACCOUNT  
OF THE ROLE OF  
SCIENCE IN SOCIETY'S  
**RESPONSES**  
TO CLIMATE CHANGE.

➔ [NATURE.COM](http://NATURE.COM)  
Discuss this article  
online at:  
[go.nature.com/5hvr4p](http://go.nature.com/5hvr4p)