

What we don't know still hurts us, environmental researchers warn

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Knowledge gaps continue to hobble scientists' assessments of the environment, a Michigan State University researcher and colleagues warn. Their warning follows sobering conclusions drawn from what they do know and could help set the global agenda for research funding in the years to come.

A worldwide 2005 Millennium Ecosystem Assessment enlisted hundreds of scientists to develop a view of ecosystems through the lens of services those ecosystems provide humanity, said Thomas Dietz, director of the MSU Environmental Science and Policy Program and professor in sociology and crop and soil sciences. The MEA found about 60 percent of ecosystem services supporting life — including fresh water, fisheries, clean air, pests and climate — are being degraded or used unsustainably. The MEA projected continued deterioration at current rates.

But drawing conclusions is still limited by what researchers call discipline-bound approaches that don't fully describe the range of the Earth's dynamic and complex biophysical and social systems.

"In only a few cases are the abilities of ecosystems to provide human well-being holding steady, and in almost every case we're seeing declines in ecosystems underpinning human well-being," said Dietz, who was involved in the original MEA.

Many view that assessment as a baseline for analyzing climate change, Dietz said, although that was not the purpose of the report. He and

fellow scientists are set to publish what amounts to a post-MEA gap analysis in the *Proceedings of the National Academy of Science*.

"The conclusion that things are getting worse in general comes out of the Millennium Ecosystem Assessment," he said. "Our job was to say 'OK, what science do we need to do?'"

Among the biggest knowledge gaps Dietz and colleagues found, he said, is "really thinking seriously about the interaction between humans and ecosystems, back and forth. How are we changing ecosystems and how are ecosystems affecting us?"

Probing such questions suggests a larger role for MSU, Dietz said, given its strengths in researching coupled human and natural systems.

The lack of long-term ecosystem monitoring and data collection is another deficiency the world scientific and policy communities must address, Dietz and colleagues wrote. Research tends to be underwritten for maybe three years, but data needs, in many cases, to span decades to be of greatest value.

On the other end of the spectrum, addressing abrupt ecosystem changes — "those are the scary things" — and developing early warning systems also are challenges confronting scientists and the policymakers.

Recommendations such as those made by Dietz's group tend to carry weight when national science agencies make research funding decisions, he said. Ecosystem change might sound like an academic subject to many in the developed world, he said, but "for an awful lot of people around the world, the functioning of the ecosystem is right in their front yard and at their water tap."

Source: Michigan State University

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