

## Assessment to Inform Decisions on Climate, Energy, and Environment

### What is assessment?

People around the world are experiencing rapid changes and complex choices in building vibrant and secure societies. For pressing environmental questions, understanding of the risks and opportunities can help support smart decisions about the future.

Assessment is an organized process for evaluating the state of knowledge on issues relevant to decision-making (see Figure 1). In assessment, experts interact with decision-makers to understand questions and perspectives, take stock of varied landscapes of evidence, and communicate what is known and what is not. Prominent environmental assessments have included Intergovernmental Panel on Climate Change reports, the Millennium Ecosystem Assessment, the Global Energy Assessment, and the Scientific Assessments of Ozone Depletion. Assessments have also focused on specific regions, such as the Arctic; countries, as in the United States National Climate Assessment; and even states and cities. Assessments

### About the Researchers

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to date have helped inform policies and actions across scales from community decision-making through to international negotiations.

This brief is based on work by Stanford researchers Katharine Mach and Chris Field. Their analysis appraises recent experiences with assessment and identifies priorities for the future. This research brief describes some of the conclusions.

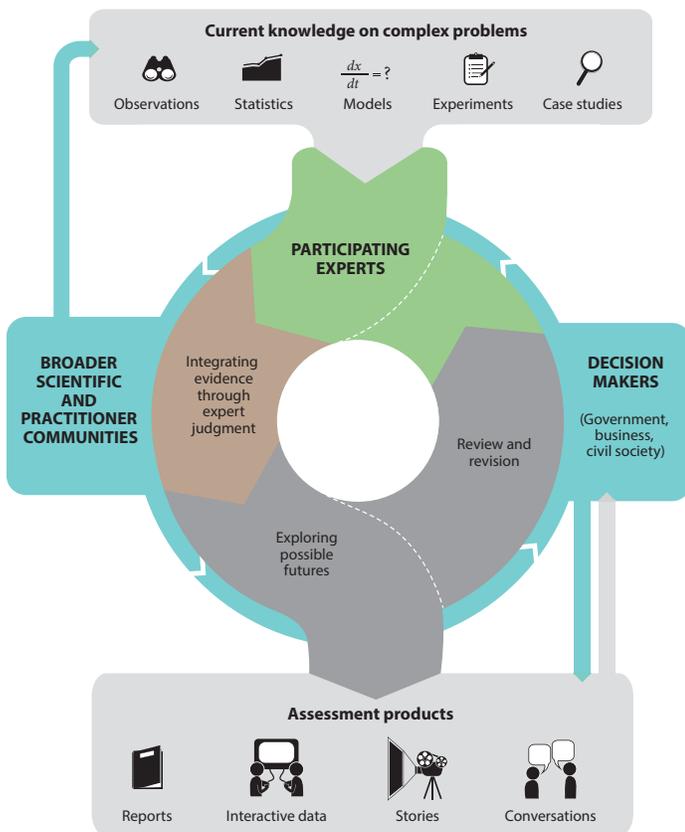


Photo by IISD/ENB ([enb.iisd.org/climate/ipcc40/30oct.html](http://enb.iisd.org/climate/ipcc40/30oct.html))

Decision-makers and experts interacting in the approval of an Intergovernmental Panel on Climate Change policymaker summary.

## Integrating diverse evidence

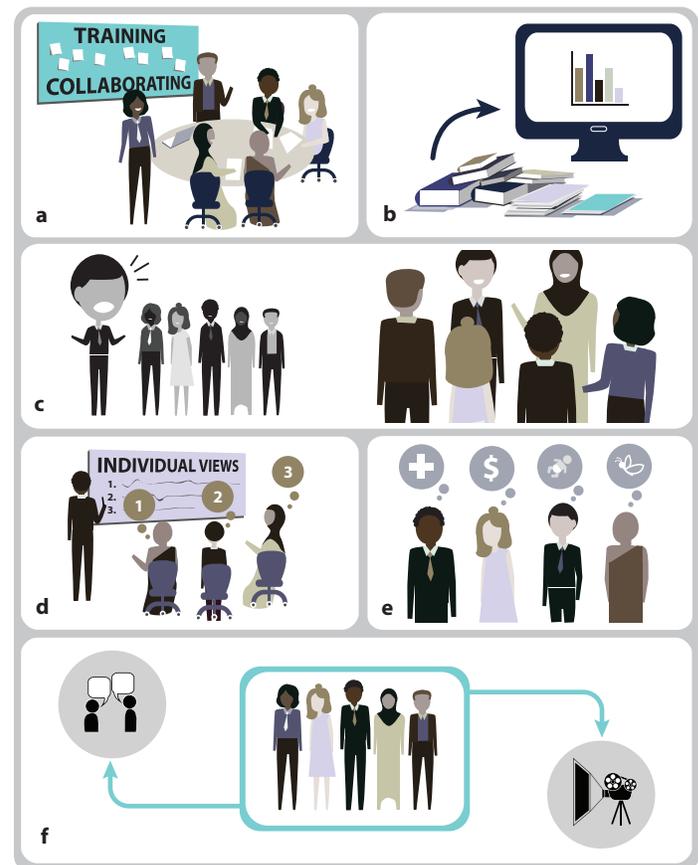
Assessment is important and also difficult because relevant knowledge on complex issues often spans disciplines from physics to economics, medicine to law. Relevant knowledge also traverses boundaries between science and societies. Climate change risks, for example, range from water and food insecurity, to threats to biodiversity, to cascading impacts for societies during extreme events such as heat waves or floods. Possible responses are understood not just through



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**Figure 1.** The process of assessment. In assessment, experts evaluate the state of knowledge on topics relevant to societies and decision-making. Decision-makers from government, business, or civil society often engage in assessment processes at multiple stages. These interactions can be central to assessment's relevance and impact.

experiments and models, but increasingly through the real-world experiences of communities, businesses, and governments across scales. Evaluation of all relevant evidence is fundamental in assessment. It must grapple with uncertainties about possible future outcomes stretching from Earth system responses to the



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**Figure 2.** Stages of assessment important in supporting expert judgments about current understanding. (a) Training on approaches and atmospheres for expert judgment. (b) Literature synthesis to foster awareness of the range of results and perspectives. (c) Open interactive discussions. (d) Documentation of individual views to bolster collective judgments. (e) Awareness of worldviews and value-based dimensions infused across disciplines and societies. (f) Communication and engagement, using a range of methods, stories to reports, to support learning and dialogue.



development of societies, economies, and technologies. Almost always, there are contested views on the evidence and the options for response. In recent assessments, a focus on risk has supported integration of diverse evidence responsive to uncertainties and contested priorities.

Expert judgment is integral in synthesizing understanding. But opinions on the state of knowledge can be subject to pitfalls and shortcuts. For judgment about the evidence, deliberate practices are important in minimizing biases. They are also key in revealing the range of perspectives and fostering creative insights (see Figure 2). Individual and collective judgments can be unleashed through adequate training and support, documentation of individual views, acknowledgment of values and worldviews, and open, interactive discussions.

### Exploring possible futures

Assessment can explore wide ranges of possible futures and their connections to current and ongoing decisions. Scenarios of different global futures have been used to coordinate research and enable assessment. Future assessment processes have opportunities to create scenarios to explore surprising or extreme outcomes. For example, scenarios can be used to evaluate societal preparedness for the large magnitudes of sea level rise



that could occur with ice-sheet collapse, the timing of which is deeply uncertain. Future assessment could also further develop scenarios exploring implications for different decisions and goals, related to well-being, security, equity, or prosperity, for instance. Scenarios can unfold futures societies might want and foster understanding of how to get there, including through interactive approaches.

### Incorporating two-way interactions

Assessment cannot be successful without including decision-makers, drawing for example from stakeholders in government, business, or civil society. Such participation helps foster shared understanding and assure that assessments address questions that matter. Although sometimes fraught with complications, it is also essential in creating processes perceived as fair and inclusive and therefore legitimate in informing policy. The influence that an assessment has builds from rigorous scientific products. But a good process is equally important.

Sometimes assessment directly stimulates action in the world. The last assessment by the Intergovernmental Panel on Climate Change supported development of the Paris Agreement, for example. Perhaps more often, assessment shapes how people think about issues and

understand their options. Future assessments have opportunities to expand engagement with different decision-makers and stakeholders, to broaden the conception of expertise, and to further use assessment products and processes as a basis for sustained dialogue.

### Conclusion

Advancing knowledge foundations for ongoing decisions will likely benefit from continued experimentation and learning in diverse assessment processes. Responding to climate and environmental challenges provides

opportunities for synergies and co-benefits, along with necessary balancing of diverse societal priorities. Effective assessment can help frame and empower choices.

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This brief draws from the paper “Toward the next generation of assessment,” by Katharine J. Mach and Christopher B. Field in *Annual Review of Environment and Resources*. For a link to the article and related resources, see <https://woods.stanford.edu/publications/toward-next-generation-assessment>. The material in this brief is discussed in depth in the paper. Please refer to the paper for citations and other helpful references.