

# Linking Analysis and Public Deliberation:

## Lessons from Environmental Assessment and Decision Making

*Implementing responsible science: What frameworks exist for public engagement for research that may involve similar issues/concerns as gene drives?*

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Michigan State University occupies the ancestral, traditional, and contemporary Lands of the Anishinaabeg – Three Fires Confederacy of Ojibwe, Odawa, and Potawatomi peoples. The University resides on Land ceded in the 1819 Treaty of Saginaw.

“All models are wrong. Some models are useful.”

--George E.P. Box

“Everything has been said before, but since nobody listens we have to keep going back and begin all over again.”

–Andre Gide

## Rationale: getting it right

- ❖ We have to calibrate the science to the context.
- ❖ The models often don't "get at" what matters to the public.
- ❖ *"The typical objections of laypersons, then, is not to science per se ...but to institutions that attempt to maintain a monopoly on knowledge claims and which sometimes misapply abstract science to the peculiarities of local settings."* -- Rosa 1998, also Rosa et al. 2013.
- ❖ Bringing in multiple perspectives helps get the science right.

## Multiple kinds of expertise.

- ❖ Scientific expertise on the technology and systems impacted, including risk analysis
- ❖ Scientific and other analytical expertise on values, ethics and on deliberation and decision processes
- ❖ Local and indigenous knowledge
- ❖ Expertise on law, policy, institutions especially in context
- ❖ Value expertise—what is important?—Everyone but especially those who will bear costs, risks and benefits.

## Rationale: making it fair and building trust

- ❖ Who has a voice? Who decides what is a favorable trait? What is safe? What alternatives are considered? How are decisions made?
- ❖ Public concern/ skepticism is not entirely or even mostly based on disagreement about facts. Decision are based on facts and values and people differ in their values/ ethical stances.
  - ❖ Advocating for an application is based on values and ethics as well facts. We should expect clarity about values and ethics just as we do about facts.
  - ❖ Is the justification utilitarian? Kantian? Capabilities? Deliberative?
- ❖ Deliberation broadens consideration and builds trust.

### Communicating **SCIENCE** Effectively

A Research Agenda

Bringing values and  
deliberation to science  
communication

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**Public values and goals for public participation**

[David Bidwell](#) [Pia-Johanna Schweizer](#)

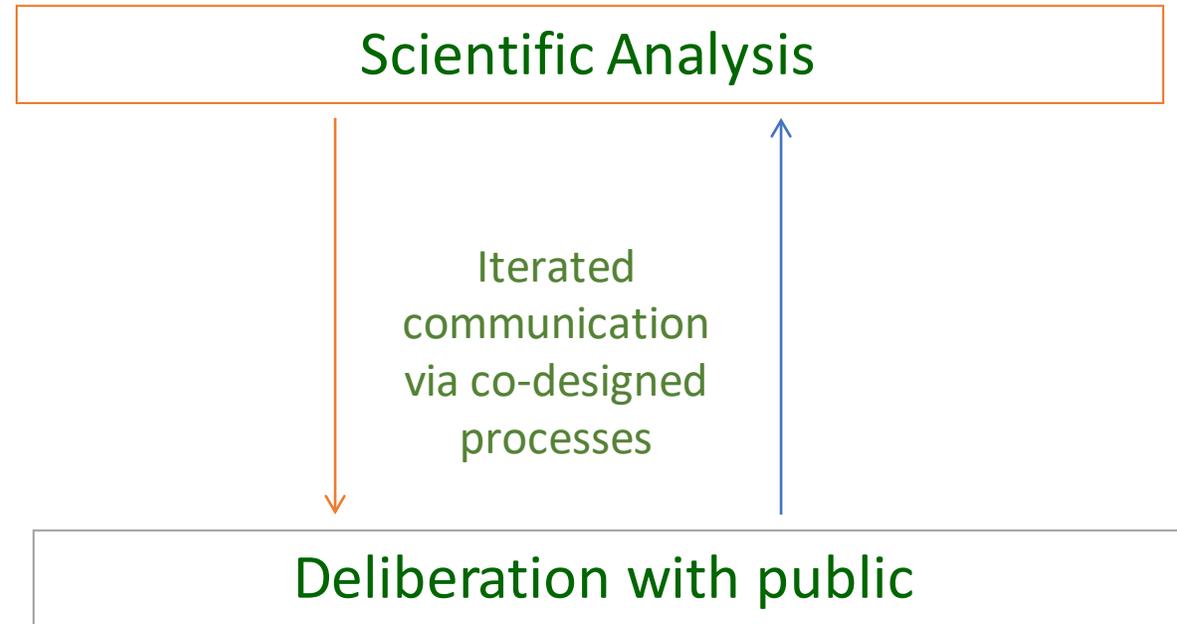
Environmental Policy and Governance 2020

<https://doi.org/10.1002/eet.1913>

## History and theoretical underpinnings

- ❖ The theoretical underpinnings:
  - ❖ John Dewey's analysis of policy engaging science. *The Public and Its Problems* (1923): the public is all interested and impacted parties, all should be engaged.
  - ❖ Jurgen Habermas's critique of modes of decision making. *Towards a Rational Society* (1970)
- ❖ Literature has evolved since the 1980s: Dietz (1984, 1987), Dryzek (1987), Forester (1985). Applied to environmental and social impact assessment (NEPA) and risk assessment.
- ❖ Key motivations:
  - ❖ Addressing context
  - ❖ Environmental justice
  - ❖ Building trust, acknowledging importance of multiple value/ethical perspectives.

## NRC/NASEM tradition

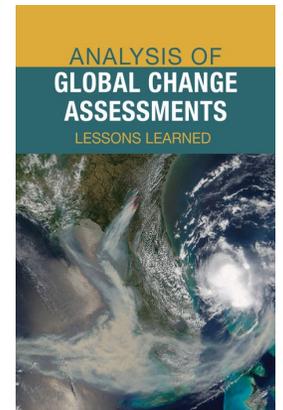
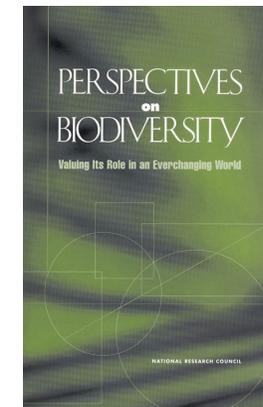
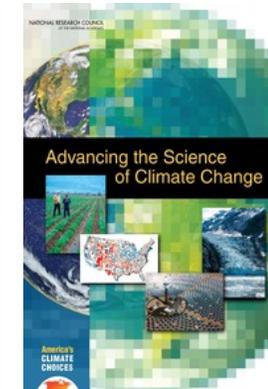
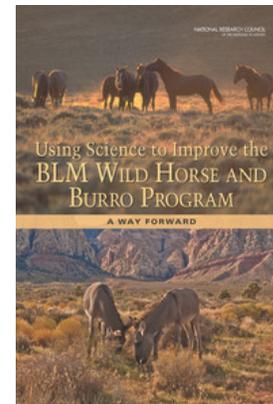
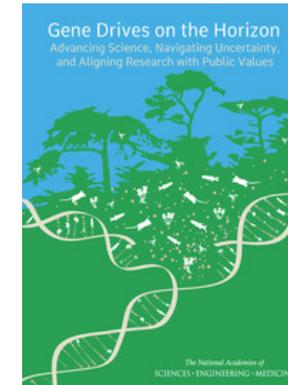
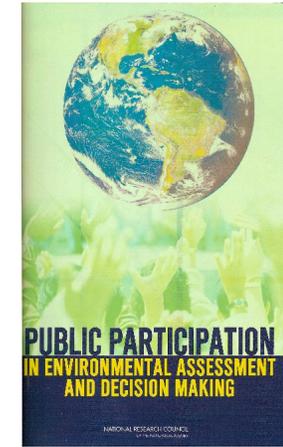
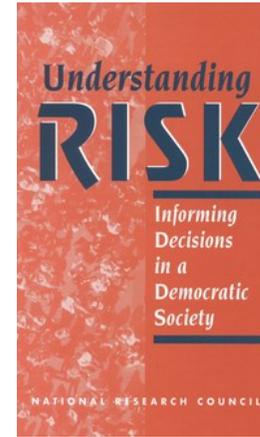


- ❖ Iterative process co-designed by all involved.
- ❖ Getting the science right—community expertise can help understand context.
- ❖ Getting the right science—addressing issues on the community agenda as well as those on the scientific agenda.
- ❖ Building trust in the science.

## NRC/NASEM tradition

NRC/ NASEM began to call for “analytic deliberative processes” in many reports.

- ❖ *Understanding Risk* (1996) emphasized that risk communication should be a conversation, not a lecture from scientific experts.
- ❖ *Public Participation in Environmental Assessment and Decision Making* (2005) examined the evidence about the practice of public engagement around environmental policy, programs, projects.
- ❖ Many reports on many issues since then call for the approach.

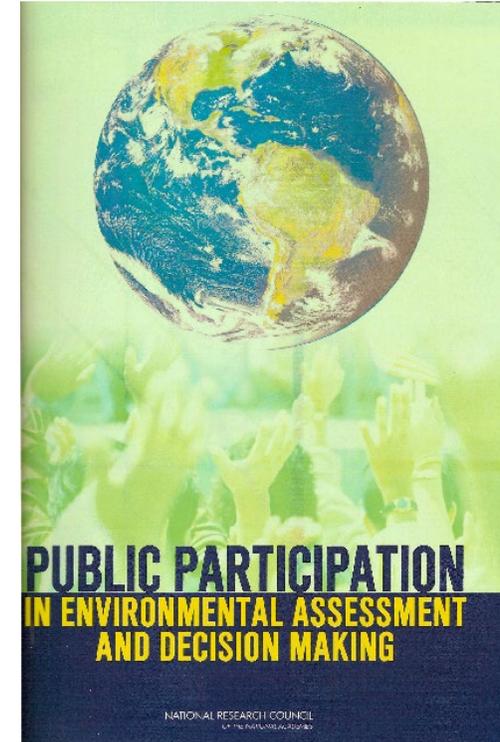


## Learning from experience: Assessment of public participation research

+ Major conclusion: **“When done well, public participation improves the quality and legitimacy of decisions and builds the capacity of all involved to engage in the policy process.”** (U.S. National Research Council 2008: 226).

Three goals can be achieved. When done well, participation improves:

- ❖ the quality of decisions or assessments;
- ❖ the legitimacy of decisions;
- ❖ the capacity for decision making of all involved.



~1000 studies  
reviewed; 15  
recommendations

## What might transfer?

- ❖ Deliberation to aid “downscaling”: Applying what is known in general, in the abstract, in the lab, in other contexts to a particular local context.
- ❖ An emphasis on diversity of participants, environmental justice, a realization that values as well as facts matter.
- ❖ A commitment to ongoing evaluations of experiences to build the diagnostic questions and design principles.

## What might transfer?

- ❖ Diagnostic questions and design principles.
  - ❖ Given the diversity of issues and contexts, how can one generalize across many studies?
- ❖ Elinor Ostrom faced this issue in the study of common pool resources (the drama of the commons) (Stern et al. 2020) .
- ❖ Use the literature to identify:
  - ❖ Diagnostic questions to understand the nature of the problem at hand.
  - ❖ Design principles that extract generalizations that can guide design of a process for the problem at hand.



# What might transfer?

- ❖ PPEADM identified:
- ❖ 17 Diagnostic questions about:
  - ❖ who should participate (interested and impacted parties)
  - ❖ scientific context
  - ❖ convening and implementing agencies
  - ❖ abilities of and constraints on participants
- ❖ 15 Design principles, see Table 1

**Table 1. Design principles for public participation**

Agencies should proceed with:

- i) Clarity of purpose
- ii) Commitment to use the process to inform actions
- iii) Adequate funding and staff
- iv) Appropriate timing in relation to decisions
- v) Focus on implementation
- vi) Commitment to self-assessment and learning from experience

The process must be

- i) Inclusive
- ii) Collaborative in problem formulation and process design
- iii) Transparent
- iv) Based on good-faith communication

The process must attend to uncertainty by:

- i) Ensuring transparency of decision-relevant information and analysis
- ii) Paying explicit attention to both facts and values
- iii) Promoting explicitness about assumptions and uncertainties
- iv) Including independent review of official analysis and/or engaging in a process of collaborative inquiry with interested and affected parties
- v) Allowing for iteration to reconsider past conclusions on the basis of new information

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Adapted from reff. 13 [US National Research Council (2008) *Public Participation in Environmental Assessment and Decision Making*, eds Dietz T, Stern PC (National Academy Press, Washington, DC)].

## ❖ Key open issues:

## ❖ Who speaks for wolf?

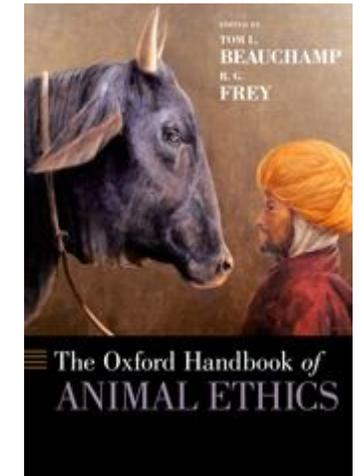
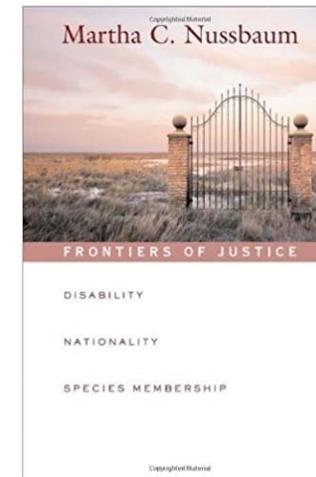
❖ Clearly many feel that some consideration must be given to how to incorporate ethical analysis regarding impacts on non-humans, their interests and capabilities.

❖ How can we incorporate the interests/capabilities of other species who cannot deliberate through the speech acts we use?

## CONSERVATION

## Engage with animal welfare in conservation

Conservation could better promote not just the quantity of species but the quality of animal life. *Science* 2020 369:629-30



## Key open issues:

- ❖ Experience with national and global deliberative processes is growing but majority of work so far is local to regional. (Gunderson and Dietz 2018)
- ❖ There is trend towards not just deliberation for assessment and decision making but to co-management and shared governance.
  - ❖ This might imply thinking about management/governance of the problem the gene drive is meant to address, so gene drives become one part of the overall strategy.

## Asides:

+Modeling and risk assessment should be careful about a non-stationary climate.

Historical climatologies likely underestimate mean and variance.

+For ecological risk assessments, remember the LTERs as sites but as loci of experience.



Council of Canadian Academies. 2019. *Greater Than the Sum of Its Parts: Toward Integrated Natural Resource Management in Canada*. Ottawa: Council of Canadian Academies.

## Final point

- ❖ Adaptive risk management: we can learn from experience.
  - ❖ That requires funding research on governance as well as on the technology itself. We need a cumulative literature.
  - ❖ Avoid homophily and biased assimilation—people with diverse and critical views to be in the conversation early on. Again, both facts *and* values need careful assessment.
  - ❖ Evolutionary change requires variation!

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