Seeking new ways to incorporate science in environmental decision making: ***the MIT-USGS Science Impact Collaborative***

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The role of science in environmental decision-making

"Use of scientific information in policy making can lead to better natural resource management decisions; more effective environmental policy; and help avoid or mitigate the consequences of human-induced stressors on the environment." (Karl 2006)

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Science is not a panacea

"A myth has grown up in the midst of natural resource decisionmaking [that] good science can , by itself, somehow make difficult natural resources decisions for us and relieve us of the necessity to engage in the *hard work of democratic deliberations* that must finally shoulder the weight of those decisions."

(Under Secretary Rey, USDA cited in Kemmis, 2002

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The mission of the MIT-USGS Science Impact Collaborative

We are committed to developing and applying tools and strategies that will contribute to the most effective and sustainable use of science in environmental policy making and natural resource management decision making.

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The people and the projects

Master's and PhD interns supported by US Federal agencies: tremendously diverse backgrounds, including... geology, environmental science, physics, economics, environmental engineering, political science, urban planning and biology.

A range of partner projects with Federal agencies, in a wide variety of environmental and political settings: from the Colorado high plains to the Mississippi delta, via Hawaii and the coast of California.

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Current research questions

- How can ecosystem-based management decisions by made across multi jurisdictions (and property lines) and institutions?
- What computational tools improve opportunities for collaboration and systems learning?
- What are the policy implications of climate change with respect to the above questions?
- How can different systems models be integrated to support more complex and nuanced decision-making?
- Can local working groups be scaled up to regional levels through networks?
- What are the institutional arrangements and societal and political transformations necessary to move toward collaborative governance?

Collaborative modeling and water conflict in Colorado

- *MUSIC project in partnership with the US Bureau of Reclamation*, under its research program "Institutional Solutions to Western Water Conflict".

- Exploring the role of *innovative, integrated computational tools within a collaborative process.*

- Seeking to provide *systems learning and decision-support opportunities* for communities struggling to resolve water resource conflict.

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Bridging social and environmental modeling, opening the black box

- Integrating *Colorado State University's MODSIM model* of the Lower Arkansas River Basin, with an *agent-based simulation of society and economy* in the valley.

- Conducting the model building process through a series of workshops, guided by a multi-stage framework for stakeholder engagement with modeling tools and systems thinking.

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The men behind the curtain

Dr Herman Karl, USGS and MIT Visiting Lecturer;
Professor Lawrence Susskind, Department of Urban Studies and Planning *(co-directors)*

...and Beaudry Kock - someone who happened to wander into the room at the right time.

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The future as MUSIC sees it

- The emergence of a new generation of interdisciplinary scientist-practitioners.

- Increasingly efficient and effective collaboration between stakeholders, managers and scientists.

- The non-adversarial use of science in management disputes.

- Integrated, adaptive, collaborative and sustainable management of ecosystems.

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