

## **New Institutions for Natural Resource Management**

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Managers of natural resources face a wide range of uncertainties when attempting to manage specific areas in a time of global climate change. The issues they face are fraught with complexities about the fundamental dynamics of ecological systems and possible trajectories of these systems, some of which are known, but many are likely to be novel. A wide body of literature suggests that non-linear transitions and regime shifts are likely to occur, along with fundamental questions of reversibility and resilience. Managers must also confront the uncertainties of the human dimensions to these coupled socio-ecological systems. New ways of confronting the uncertainties associated with climate change must be developed and applied. Scenario development and adaptive environmental assessment are well-developed tools in this context, and should be applied along with new ways of integrating science, policy and politics.

New institutions should be developed to help navigate through largely uncharted waters. These new institutions should be designed to conduct experiments that are structured to learn and understand. We learn as much by failures as we do by successes, so we need to focus on actions that are safe to fail, for people and ecosystems. Safe to fail policies provide room for mistakes, and the ability to learn from our mistakes. But such policies require institutions that build trust and social capital, and focus on learning by individuals and groups.

Examples of existing resource management institutions will be presented to provide some ideas for what new institutions should be structures. One model is the Adaptive Management Group in the Glen Canyon, a FACA committee established a decade ago to guide adaptive management probes in the middle Colorado River. Other groups such as the Quivira Coalition provides bridging and meshing functions that appear to be gaps in a government and regulatory world. Finally the role of Skunkworks-type groups in resource management will be discussed.