

Oceans, Coasts, and Wetlands:
Collaborative Science and Governance

Lynn Scarlett
Resources for the Future

Presented at:
Intecol Conference
Orlando, FL
June 6, 2012

In 2008, Hurricane Ike hurled storm surge across the Texas Coast wrenching homes from their foundations and flooding coastal communities. Damages exceeded \$20 billion. A few years earlier, along the Louisiana Gulf Coast, Hurricanes Katrina and Rita devastated communities—and then came the Deepwater Horizon oil spill. In Florida, wetlands and coastal systems have been transformed not by the fury of fierce and frequent storms but, instead, by the cumulative channeling and re-plumbing of a River of Grass.

A virtual journey to the Great Lakes, Chesapeake Bay, the Bay Delta, or to almost any wetland anywhere and everywhere—from sea marshes to prairie potholes—shows lands transformed. Each of these places displays particular details of the interplay of people and place, but they also face some shared features. These features have implications for institutions, information, decision processes, and actions.

Across these coasts and wetlands, problems unfold at multiple spatial and temporal scales and with high levels of uncertainty about cause-effect relationships, future conditions, and other relevant realities. These wetlands and coastal systems display complexities that result from non-linear interactions and interconnectedness among issues, across landscapes, between people and place, and across time. Their complexities also spring from persistent—and possibly dramatic—changes in climate, demographics, economies, and associated land uses.

In the children's book, *Alice in Wonderland*, the heroine Alice stands at a fork in the road, looks up to see the grinning Cheshire cat, and asks, "Tell me, please, which way ought I to go from here." The cat replies, "That depends a good deal on where you want to get to." For management of coasts and wetlands, I propose a destination and then reflect on this destination and how to get there.

In other contexts, Hillary Clinton applied the refrain: "It takes a village." The metaphor is apt for thinking about the governance destination relevant for many wetland and coastal restoration efforts. These settings require collaboration, linkages, and integrated efforts. They require contexts of sustained collaboration and shared governance—across agencies and

jurisdictions and among decision makers, scientists, and “publics”. These settings require collaborative boundary processes that sustain mutual learning among scientists, publics, and decision makers. Finally, coastal and wetland resource management and conservation efforts require a focus on integrated economic, ecological, and social results.

Before exploring these themes, it is helpful to return to the shared features of 21st century wetland and coastal resource management and conservation. Consider the context of multiple spatial and temporal scales of change. Many changes, whether from climate change or other ecosystem transformations, transcend the boundaries of political institutions. Sea level rise, for example, along the Gulf of Mexico, affects multiple communities and even multiple states.

This cross-boundary context suggests the need for institutions and decision processes that facilitate rather than frustrate coordination across jurisdictional boundaries. There is also a need for both horizontal and vertical interaction among multiple governing units and across different agencies. Such interaction is not new. Indeed, the governing framework in many nations, including the United States, involves some sharing of decision making among agencies and some vertical distribution of governing roles and responsibilities between national, state/provincial, and local governments.

Such federalist structures in the United States abound. For example, under the Clean Water Act, the federal government develops national standards, but states design and implement strategies to meet those standards. The Department of Agriculture funds and designs overall requirements for many Farm Bill programs, but many priorities and allocation decisions are made through states or other local organizations.

But federalism and regional decision making may require a different character to respond effectively to 21st century conservation and resource management challenges. Political scientist Kirk Emerson describes “collaborative federalism,” with joint decision making among multiple governing units. The model she describes is one of shared governance, not divided and distributed roles and decisions. Shared governance has both vertical and horizontal governing implications. These governing concepts build off ideas articulated and described by Nobel laureate Elinor Ostrom for managing common pool resources but apply these concepts to broader scales.

Collaborative federalism presents challenges. How, for example, might one effectively convene and motivate stakeholders across jurisdictions? And policy makers face practical challenges associated with limits on their authorities to expend funds outside jurisdictional boundaries. Yet such expenditures may be important. Consider source water protection in which relevant lands may lie outside a city’s boundaries. Or consider coastal storm protection, which may require protecting dunes that extend across many local town boundaries. Fundamentally, policy makers face challenges of achieving decision scales, as D.R. Porter and A.D. Wallis noted in a Lincoln Institute for Land Policy report, big enough to surround the

problem, but small enough to tailor the solution. Moreover, these scales may vary by issue, geography, and situation.

Many models of collaborative governance, ranging from informal processes to formal institutions, are emerging. In southeastern Wisconsin, 28 municipalities with separate stormwater management authorities have joined in a public-private partnership to create a trust to coordinate stormwater management in an area encompassing six watersheds. In the Tualatin Basin, water managers combined four wastewater permits and one stormwater permit into a single cluster and partnered with the US Department of Agriculture to work with farmers along 37 miles of river to plant trees within the watershed to reduce water temperatures.

Both of these partnerships are issue-specific. But other models of more multi-purpose, cross-jurisdictional government have also emerged. While I served at the U.S. Department of the Interior for nearly 8 years, I was privileged to meet people along the Maine Coast, the Platte River, southeastern Arizona, and elsewhere across the United States. People in these many places had clustered together in constellations of collaborative governance to conserve places and enhance communities. Along the Platte River, for example, three states, irrigation districts, electric power authorities, the U.S. Fish and Wildlife Service, and others implement a recovery plan for four endangered species through a single coordinating organization.

As I contemplate this emergence of collaborative organizations and their clustering into larger networks of action, I am reminded of the words of former Secretary of the Interior Stewart Udall, who once described himself as a “troubled optimist.” I, too, am a troubled optimist. I am troubled because the issues are increasingly complex and, sometimes, of enormous scale. But, as the Chinese proverb reminds us, our challenges are also our opportunities, and therein arises my optimism.

Several characteristics are important to sustaining structures and networks through which to advance shared governance.

The first characteristic is accountability. Put another way: who is responsible for doing what? And by what means can they be held accountable for performing those responsibilities? Such accountability is relatively clear when a single jurisdiction or agency is responsible for decisions, their implementation, and enforcement. But accountability may be blurred when governance is shared and actions are collaborative.

Second is the need for governing processes that engage those affected by decisions and facilitate collaborative dialogue in which participants can express multiple values and perspectives. But such participatory processes necessitate agreement on decision processes and rules that define: “how much consensus is enough?” And these processes require agreement on who participates in decision dialogues and in with what authorities.

The complexities and uncertainties of the decision context also underscore the importance of learning processes and the capacity to re-calibrate decisions based on new knowledge or changed circumstances. Yet those affected by decisions also often want (and

need) some level of certainty in actions expected of them to facilitate planning and enable calculations of trade-offs. What governance processes can both enable adaptation and provide some level of certainty regarding expectations and actions?

Finally, the cross-jurisdictional, multi-agency, and public-private dimensions of many wetland and coastal issues require processes and tools that strengthen linkages among constellations of intersecting initiatives that unfold at various scales. Many current agency rules and processes are not well-designed to facilitate partnerships, collaboration, and cross-jurisdictional action. Informal and nongovernmental initiatives and place-based collaborative efforts face their own internal and intersecting coordination challenges. Such efforts face challenges of sustaining voluntary collaboration and maintaining the pursuit of shared goals.

Despite these challenges, what might the future hold for collaborative governance? How can shared actions be undertaken across intersecting issues and multiple governing units so that more integrated actions can occur while still affirming the often distinct identities of the many participants? A number of examples of collaborative governance offer some insights into these questions. Many governance options have emerged along a continuum of very formal to informal structures and processes.

At the formal end of the spectrum are collaborative initiatives that have led to the creation of new, formally authorized organizations. An example is the congressionally designated Detroit River International Wildlife Refuge, established in 2002. The refuge includes an unusual mix of public and private lands, with diverse landowners coordinating land management to achieve shared environmental, educational, recreational, and economic goals for the area.

These formal, coordinating organizations need not always be public-sector entities. In some instances, nonprofit organizations fulfill the role of coordinating cross-jurisdictional and public-private actions. South of Tucson, for example, the Las Cienegas Watershed Collaboration, a nonprofit “meta group,” links together other organizations that operate within the watershed. The organization has a formal structure, staff, budget, and generates shared goals among participants.

Coordination among organizations and agencies also sometimes occurs through more informal “action networks,” such as the Crown of the Continent Roundtable. Such networks may be relevant when different entities have different purposes, some of which may overlap in a linked landscape. The Roundtable facilitates blended efforts through a loose constellation of changing partnerships that form and re-form as new issues emerge that would benefit from coordination of actions across a large landscape. The Roundtable (and other similar networks) helps coordinate the actions of multiple partners toward achieving shared or intersecting goals.

These models of shared governance reflect options at two ends of a continuum, but forms of collaborative governance vary depending on the types of participants, purposes, and other variables.

Large landscape resource management and conservation efforts require mechanisms to coordinate actions and governance. Because these efforts involve intersecting social, economic, and ecological goals, they often require “boundary” processes through which to link scientists, stakeholders, and decision makers in order for them to identify, produce and use relevant information, including both scientific and experience knowledge.

High levels of uncertainty in many resource management contexts, including coasts and wetlands, makes ongoing learning imperative and underscores the central role of science and technical expertise in decision making. But the importance of scientific and technical expertise raises the challenge of what some have referred to as a “technocracy versus democracy” dilemma. Resource management issues involve highly complex, technical data and interacting phenomena. At the same time, resource management policies and decisions often significantly affect people and involve trade-offs. These effects on people underscore the relevance of community participation in decisions, presenting a fundamental question: how is it possible to increase public involvement in decision making when the scientific and technical issues associated with these decisions are so complex? What are the respective roles and relationships of scientists, technical experts, decision makers, and the public? How can relevant science inform policy and management decisions?

The intersections of science and decision making may need some rethinking. In particular, strengthening the input of scientists and “publics” may require a strengthening of iterative processes by which issues are framed, information needs are articulated, and information is generated, communicated, and used.

The joint fact-finding model described and used by the U.S. Geological Survey and other boundary processes offer some potential to strengthen iterative dialogue among scientists, decision makers, and “publics.” Under joint fact-finding, scientists, decision makers, and citizens collaborate in the scoping, generation, and use of technical and scientific information to improve decision making.

Studies on knowledge use show the importance of iterative dialogues that link researchers to users. The user context also can significantly affect whether and how scientific and technical information is used. Substantial research indicates that mere reception of knowledge by users does not imply its acceptance of use. A lack of interaction between researchers and intended audiences can limit relevance and the perceived credibility of research intended to inform public policy decisions.

The context of uncertainty invokes other important questions about science and policy. For example, how much certainty about a particular cause/effect sequence or about projected futures is “enough”? The question involves both policy and scientific dimensions. Scientists typically use the protocol of a 95 percent confidence level as necessary to affirm scientific results. Policymakers use a different bar. For policymakers or managers, how much uncertainty is acceptable depends on the legal or policy context that might dictate specific decision

timelines or on public attitudes. Thus, the question of what level of certainty is sufficient to take management action is, in part, a policy decision.

Though much more might be said of the science-policy interface, I turn now to the third feature of the resource management problem set—the interconnected complexity of ecosystems and their interface with human communities. Consider a case in the Netherlands regarding sea level rise and river flows. In the Dutch “Room for the River” project, policy makers note, on the one hand, a need to plan for higher river flows through improved drainage. On the other hand, sea level rise interferes with water drainage. Improved flood protection and water management, therefore, require considering both river flows and sea levels jointly. One issue cannot effectively be addressed independently of the others. The same is true of considerations of water flows and water quality in the Everglades.

This interconnectedness raises challenges in a context of agencies in which roles and responsibilities are often segregated across issues. It also raises challenges for metrics: how might managers develop cross-issue indicators to measure outcomes on an integrated basis? Many metrics focus on ecosystem components, individual species, or other details rather than on the integrated whole. Yet quantum physicist once observed that “to fragment is to divide things up that are at a more fundamental level actually connected.” Effective wetland and coastal conservation, restoration and natural resource management may require a combination of system process indicators and indicators for specific species and components.

Indicators alone are insufficient to enhance management. Policy makers and natural resource managers also benefit from interpretation of those indicators—what do indicator trends *mean*? How do those trends relate to management options undertaken and ongoing management choices? This challenge of “meaning” reminds me of the caution of economist Thomas Sowell, who once wrote that: “information is everywhere but knowledge is rare.”

I now turn to a final notable feature of current resource management settings—dynamism. Wetlands, coasts, and marine environments—indeed, virtually all natural resource settings—are dynamic. Like the characteristic of uncertainty, the dynamic nature of climate change effects implies a need for adaptation. It may also heighten the need for policy options centered on resilience. More specifically, it may heighten the need for management options that provide functionality across a broad range of conditions.

For example, in the case of coastal protection, traditional flood and storm surge protection has relied on “gray” infrastructure such as dikes and levees. This infrastructure may perform well under certain conditions. Increasing performance of this gray infrastructure to withstand more frequent and more intense storms may be exorbitantly expensive in some cases, particularly relative to solutions that supplement existing gray infrastructure with green infrastructure like beach nourishment, wetlands restoration, and sea marsh protections. The green infrastructure options may provide greater functionality and more resilience across a broader range of conditions than traditional infrastructure.

Or consider reservoirs, which, traditionally, have been built for dual purposes of water storage and flood control. Some locations are experiencing an increased frequency of high-intensity rainfall events or prolonged droughts. These dynamic contexts may warrant a rethinking of reservoir operations to maximize water storage capacity, in combination with restoring flood plains to serve a flood protection role. Such options may offer communities greater resilience than building ever-larger reservoirs that operate as dual-purpose systems.

I offer no single set of answers to the governance and information challenges presented by issues of large-scale wetlands and coastal management and restoration. But I suggest that restoration and sustainability will result from a confluence of science, collaboration, and new forms of governance.

These three dimensions of problem-solving are important for effectiveness, accountability, and legitimacy of decisions. The temptation, in pursuit of coordination and accountability, is to pursue what I call the Homeland Security Model of putting every relevant agency into a single new “box.” But such efforts involve high transactions costs and risk losing the richness of diverse decision centers that come along with agencies pursuing diverse missions.

Shared governance, network governance, and collaborative governance—varying terms for similar governing trends—offer ways of enhancing coordination while preserving the benefits of different organization cultures and purposes. Such collaborative and networked governing structures also offer prospects of nimbleness—a clustering and re-clustering of partnerships over time and for different purposes. Such dynamic clusters are complex, but, as Elinor Ostrom reminds us, complexity is not the same as chaos.