Ecosystem-Based Management:
Opportunities and Challenges

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Objectives

- Describe the ecosystem-based approach from an institutional perspective
- Discuss what we know and don't know based on the U.S. experience with the approach
- Identify factors that influence ecosystem-based management programs
- Provide some advice to practitioners

Ecosystem Management in the U.S.

- **Wide variety of watershed based programs operating at different scales that use an ecosystem approach**
  - Great Lakes Program
  - Chesapeake Bay Program
  - National Estuary Program (NEP)
  - Lake Tahoe
  - Special Area Management Plans
  - State Watershed Partnership Programs
- **Other ecosystem-based programs include**
  - South Florida Ecosystem Restoration (Everglades)
  - Greater Yellowstone Ecosystem
  - Marine Sanctuary Program
  - Gulf of Mexico/Gulf of Maine Programs

Similarities & Differences

Similarities	Differences
Complex Environmental Commons	▪ Rules governing commons are crafted by organizations operating at a different institutional level ▪ Multiple interrelated environmental problems
Systems Perspective	▪ Scales vary ▪ Single effort vs. multiple, overlapping efforts ▪ Synoptic (comprehensive) vs. strategic
Role of Science	▪ Emphasis on applied vs. basic research ▪ Scientific vs. time and place information ▪ Availability of environmental monitoring data varies ▪ Little emphasis on social science or evaluating program effectiveness
Public Participation	▪ Advisory committees vs. collaborative decision making ▪ Conflicting human values vs. science and environmental integrity
Institutional Arrangements Matter	▪ Top-down vs. bottom-up in orientation ▪ Improving existing institutions vs. building new institutions ▪ Organizational arrangement varies ▪ Availability of resources varies
Collaboration & Networks Used in Implementation	▪ Multiple policy instruments & actors ▪ Interagency cooperation and coordination ▪ Includes NGOs and private sector ▪ Limited to win-win, win-no-lose actions

What is the Ecosystem-Based Approach?

- **Many assume that no ecosystem is "managed" without some form of centralized government program**
  - Programs in the U.S. often emphasize science and participatory planning
- **But all ecosystems are "managed" in various ways**
  - Complex set of government programs at the federal, state, and local level whose decisions and actions influence the health and integrity of an ecosystem
  - Ecosystem-based management is as much a governance problem as it is one of science or policy design

Ecosystem Governance

- **Governance**
  - Means for achieving direction, control, and coordination of organizations with varying degrees of autonomy in order to advance the objectives to which they jointly contribute
- **Challenge for practitioners:**
  - Find ways to enhance governance in a world of shared power where the capacity for solving problems is widely dispersed and few organizations have the power to accomplish their missions by acting alone

Improving Ecosystem Governance

- **You improve ecosystem governance by**
  - Building, enhancing, expanding, changing, and managing interorganizational networks
  - Altering, changing, or improving how decisions are made both within and across organizations (integration and coordination)
  - Building new institutions that improve problem solving capacity
- **These efforts generate public value by**
  - Improving government service delivery (efficiency, effectiveness, accountability, customer satisfaction, etc.)
  - Accomplishing things that cannot be done by working alone
  - Stimulating learning and the diffusing of innovations
  - Improving social capital/civil society (trust)

Efforts to Enhance Governance Can Be . . .

- **Externally driven**
  - Individuals or organizations outside the network work to improve institutional design and administration of organizations within the network
  - Politics, lobbying, one level of government trying to influence actions of another, etc.
- **Internally driven**
  - Network members (individuals or organizations) work to improve institutional design and administration of organizations within the network to improve performance or solve shared problems
  - Wide range of collaborative activities
- **Activities occur among actors at different levels within organizations**
  - High-level administrators and political officials (IGR)
  - Mid/low-level policy professionals (IGM)

Sometimes Efforts to Improve Governance Are . . .

- **Intentional**
  - Organizations get together and consciously try to find ways to improve governance
- **Emergent**
  - Organizations are forced to adapt to changing behavior of other organizations or changes in the political, social, or economic environment
  - Self organization is common in many complex adaptive systems
- **Occur in a polycentric network structure**
  - Behavior is typically voluntary and not legislated from the top-down.
  - It isn't purely bottom-up because organizations have power differentials and are at different levels of government outside the cooperative relationship

What can be learned from the U.S. experience with the ecosystem-based approach?

What Factors Limit the Transferability of Lessons from the U.S. to the Baltic Sea?

- U.S. has an abundance of government at the federal, state, and local level
- Capacity of state and local governments has expanded greatly since the 1970s
- Problems have become more complex (e.g., habitat restoration, NPS pollution, etc.) and cannot be addressed by single agencies acting alone
- Multiple funding sources at different levels of government
- NGOs are very active in addressing some problems

Scale & Boundaries

- **Choice of scale and ecosystem boundaries is critical**
  - Clear boundaries create a sense of place and a rationale for joint action
  - Ecosystem boundaries rarely correspond to political boundaries
  - Larger scale expands the set of potential problems and the distance between potential collaborators
  - As the number of problems expands so do the number of affected stakeholders
  - This can lead to higher the transaction costs (coordination)
  - The larger the scale the less specificity associated with the resulting policies and actions

Scale & Boundaries

- **Should you pick ecosystem boundaries and then identify problems? Do you define problems and then pick boundaries?**
  - Ecosystems are a heuristic concept
  - Programs tend to set boundaries and then look for problems
  - May be better to select boundaries that fit the focal problem
  - All problems are not watershed problems – some are best addressed at other levels
  - Think holistically but act strategically
- **Use nested arrangements in large ecosystems**
  - General large scale policies
  - Smaller focused management efforts address problems in greater detail and create addition opportunities for collaboration

Decision Making Processes

- **Need a well managed decision making process**
  - Need to find focal problem (s) to create a rationale for joint action
  - Need rules for who is involved, what problems will be addressed, what gets decided, and how it gets decided and then institutionalize the rules
  - Joint decision making and advisory committees are different concepts and should be organized differently
  - Need to consciously find ways to minimize transaction (coordination) costs (real or perceived)
- **Decisions are the product of the interaction between science, values, and public policy**
  - Group decision making doesn't produce "rational" value optimizing decisions

Science

- **Most problems are "wicked" and involve questions of transscience**
  - Problem can be defined using language of science but cannot be answered definitively by science
- **Important to "nest" science in the decision making process**
  - Scientists often have trouble communicating with decisionmakers
  - Information needs of decisionmakers rarely correspond to research interests of scientists
  - Academy often rewards basic rather than applied research
  - Timeframes of research are often out of sync with needs of decisionmakers
  - Many scientists feel uncomfortable participating in political process
- **"Sound science" is in the eye of the beholder**
  - Even the best science can be politicized

Values

- **The public, scientists, administrators, and politicians may frame problems in different ways**
  - Need mechanisms to develop a shared understanding of problems and resolve conflicts
- **Is the environment really any different than any other forms of social policy?**
  - What do you do when there is a disconnect between science and values? Which wins?
  - Is it really possible to separate politics from administration? Should it be separated?

Public Policy

- **Science plays an important role in agenda setting**
  - Helps elevate items on agendas of elites and sometimes the public
  - Media and policy "entrepreneurs" will use "science" in an attempt to manipulate public opinion
- **Science has different roles at other stages of the process**
  - Science can shape the discussion of policy options
  - Science can evaluate progress and determine whether programs work
  - But science rarely tells decisionmakers what to do or makes decisions
- **Distribution of costs and benefits is important**
  - Timing of benefits vs. costs
  - Is the distribution of who benefits and loses diffuse or specific

Importance of Learning

- **Regardless of the role of "science" information is at a premium in ecosystem-based programs**
  - Scientific vs. time and place information
  - Environmental conditions vs. institutional performance
  - Few true policy experiments or attempts at "adaptive management"
  - Environmental goals/performance targets are still value-based
- **Different types of learning occur at different levels**
  - ***Individual***: managers are smarter and make better "guesses"
  - ***Organizational***: participation in networks leads to innovation adoption, policy change, and collaborative "know how"
  - ***Network***: policy oriented learning, epistemic communities
  - ***Societal***: changes in values and expectations, improved understanding of how ecological systems function, improved understanding of "problems"

We also know quite a bit about the strategies used to implement ecosystem-based management programs . . .

General Techniques for Managing Intergovernmental Relations (IGR)

- **Grants management**
  - Intergovernmental grants system creates a wide range of opportunities to manage intergovernmental relationships
- **Mandates**
  - Different types of mandates are frequently used to manage IGR
- **Regulations**
  - Regulations and other legal requirements are often used to manage IGRs (e.g., GPRA)
- **Actions of political and governmental leaders**
- **Create coordinating institutions (e.g., council of governments)**

Strategies for Improving Ecosystem Governance

- **Collaborating to get things done (action sets)**
  - Coping and adjusting arrangements
  - Direct Action
  - Leveraging resources & capacity building
- **Building, managing, and reconfiguring networks**
  - Interorganizational planning
  - Developing shared priorities and policies
  - Creating collaborative/network organizations
  - Performance management systems

Growing Research on Collaboration and Networks

- **Reasons why organizations collaborate:**
  - ***Rational***: Self-interest, acquire resources, reduce transaction costs, political pressure
  - ***Institutional***: participants come to view as collaboration as being a preferred course of action for solving joint problems
- **Important to remember that participants are typically autonomous and retain independent decision-making powers**
  - Cannot be forced to participate in collaborative efforts
  - Social mechanisms such as communication, relationships (trust), mutual interests, and reputation govern these activities rather than formal authority

Collaboration

- **Any joint activity by two or more organizations intended to increase public value by working together rather than separately**
  - Interactive process involving an autonomous group of actors who use shared rules, norms, or organizational structures
- **Collaboration is a particular type of network relationship frequently used to**
  - Solve problems, reach agreement, undertake joint actions, share resources, improve service delivery, etc.
  - Occurs at the operational, policy making, or institutional levels

Coping and Adjusting Arrangements

- **Common activity is personal contacts that**
  - Seek advice, information, or approval from other agencies
  - Understand administrative interpretations of rules and procedures
- **Bargaining and negotiations**
  - Seek waivers or exceptions to program requirements or regulations on a temporary or permanent basis
  - Resolve differences or reach agreement on courses of action
  - Establish acceptable norms of agency behavior
- **Setting up model or pilot programs to diffuse innovations**
  - May operate outside existing standards, rules, or regulations

Direct Action to Address Ecosystem Problems

- **Coping and adjustment is often used to plan, organize, and implement collaborative activities**
- **Collaborate on actions that *directly* improve environmental conditions**
  - Install, upgrade, or replace BMPs or other environmental infrastructure (e.g., sewers, stormwater detention ponds, drinking water, etc.)
- **Collaborate on actions that *indirectly* improve environmental conditions**
  - Environmental education, permitting, enforcement, etc.

Leverage Resources

- **Using direct grants, loans, bonds, tax exemptions, and other financial instruments in creative ways**
  - Combining funding to accomplish more than can be accomplished by working alone
- **Combining and deploying other resources**
  - Information, legal authority, staff, equipment, office space, etc.
  - Utilize economies of scale to take advantage of technical specialization
- **Relying on nongovernmental organizations for service delivery**
  - Nonprofits increasing are government service providers

Building and Managing IONs

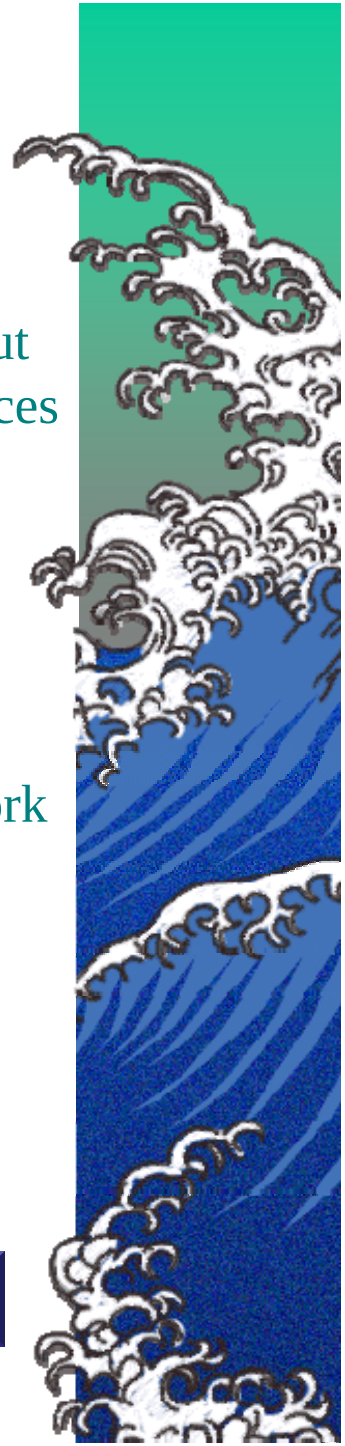
- **Interorganizational networks (IONs)**
  - Set of organizations bounded by a common orientation such as a policy area, problem, type of service delivery, or geographic area (e.g., watershed or ecosystem)
  - Governance networks include both governmental and nongovernmental organizations
  - As scale increases so do the range of problems and potential organizations involved - this can increase transaction costs
- **Important to recognize that there are multiple-overlapping networks involved in ecosystem governance**

Interorganizational Planning

- **Common strategy (e.g., used by many ecosystem-based programs)**
  - Incentives like planning/implementation funding or authority often used to encourage participation
- **Many problems cross jurisdictional boundaries, are complex, and involve a wide range of competing values**
  - Use task forces, work groups, committees, or other mechanisms to plan at the network level
  - Decisions are made collectively rather than individually
  - Broad participation by governmental, NGOs, and the public is common

Shared Priorities and Policies

- **Developing shared priorities and policies**
  - There are many legitimate objectives and competing views about how to solve environmental problems or manage natural resources
- **Provides a steering function that**
  - Improves communication between actors
  - Coordinates actions in the absence of a centralized coordinator
  - Integrates policies across different organizations
  - Improves decision making and resource allocation by the network
  - Improves accountability
- **Should focus on defining problems and developing shared priorities and policies**
  - Formal or informal shared norms



Collaborative Organizations

- **Collaborative organizations come in a variety of forms and go by different names**
  - Informal citizen-based structures that function as a special interest group
  - Agency-based organizations whose membership consists of other organizations
  - Partnerships, coalitions, alliances/strategic alliances, consortiums, network brokers, and network administrative organizations
- **Perform a variety of functions such as**
  - Convener, catalyst for action, conduit for information, advocate, organizer, funder, technical assistance provider, capacity builder, partner, dispute resolver, facilitator

Performance Management Systems

- **Performance management systems combine**
  - Performance measures
  - Monitoring of environment and program performance
  - Reporting processes
- **Used for many purposes at the network level**
  - Evaluation or accountability of programs
  - Steering, coordinating, and setting priorities for networks
  - Motivating network members to take actions that advance shared goals, objectives, or policies
  - Promoting and celebrating progress by network participants
  - Encouraging learning
  - Raises questions of competing interests and values

What are some challenges associated with using these strategies to improve ecosystem governance?

Strategies are Constrained By . . .

- **Financial - intergovernmental grant system**
  - ***Lack of local control over what gets funded***: The one who controls resources sets priorities – this occurs at the federal/state level rather than the network level (e.g., watershed, coastal zone, etc.)
  - ***Distributional problems***: implementation funding is often treated as "green pork"
  - ***Need to be systematic over long time periods***: Hard to systematically solve problems when priorities change frequently and there is no budgetary stability over long time periods
  - ***Administrative Costs***: Grants management can be complicated for collaborative projects
  - ***Flexibility in using grants***: need slack resources to participate in collaborative activities but legislatures/agencies provide limited discretion in how resources are used

Strategies are Constrained By . . .

- **Legal Constraints**
  - Federalism, separation of powers, due process, etc.
  - Division of legislative responsibility
  - Divisions of jurisdictional authority (federal, state, local)
- **Bureaucratic Constraints**
  - Organizations promote stability and often resist change
  - Organizations are designed to protect competing interests
  - Turf guarding by individuals, agencies, and levels of government is common
  - Differing professional training, social norms and values, histories, capacities, and organizational cultures across organizations

Strategies are Constrained By . . .

- **Context matters:**
  - ***Physical environment*:** size, location, relative isolation, visible boundaries, proximity of organizations
  - ***Political environment*:** trends include performance measures, reinvention, resource shortages, shifting local politics, etc.
  - ***Socioeconomic environment*:** are there local resources to support implementation?
  - ***Institutional environment*:** institutional ecosystem creates opportunities and constraints on joint action
  - ***Local culture*:** rural vs. urban, nature of the problems, local preference for specific policy solutions
  - ***Situational histories*:** particularly previous governance efforts, history of organizational conflicts

Human Dimension

- **Disposition and skills of implementors**
  - Staff/organizations may not like working together
  - Staff/organizations may lack skills to participate effectively or manage network processes
- **Turf guarding as a result of real or perceived**
  - Threats to job security/career enhancement
  - Challenges to professional expertise
  - Loss of policy direction or undermining agency priorities
  - Anxiety over accountability
  - Conversely, collaboration can create and expand turf

Human Dimension

- **Importance of trust and social norms**
  - Trust is an important governance mechanism that lowers transaction costs and promotes efficient resource exchanges
  - Trust occurs at the individual, organizational, and network level
  - Produced by an interactive, on-going process that builds trust and personal relationships through repeated interactions
  - While it builds slowly, it is destroyed quickly
  - Needs to be maintained over time or it will erode

Human Dimension

- **Leadership is critical to initiate, maintain, and expand collaborative processes involved in ecosystem-based management**
  - ***Entrepreneurs*:** View programs as a way to attract new resources or elevate problems on federal/state agendas
  - ***Coordinators*:** Someone has to call meetings, provide a central point of contact, and keep the effort going as interest ebbs and flows
  - ***Facilitators*:** Unclear if outside facilitators are necessary but someone has to help resolve disputes
  - ***Fixer, broker, or devil's advocate*:** find opportunities for joint action, keeps participant's "eye on the ball", keeps the group grounded in practical and political realities
  - ***Champions*:** Strong advocate for particular courses of action who gets others to follow

Resources

- **It takes time, money, equipment, staff, technical expertise, and legal authority to get things done**
  - If resources are distributed among organizations it creates complementary relationships and incentives for joint action
- **Slack resources are important**
  - If partners contribute nothing more than staff to attend meetings, then it is unlikely the group can accomplish much
  - Some projects require capital, others require staff, equipment, etc. that can be allocated to support network activities
  - Organizations with slack resources may be more likely to make investments in relation-specific assets

Resources

- **Problem occurs when there is a heavy reliance on external funding**
  - Funding agency sets priorities rather than ecosystem-based management effort
- **Stability and dedicated funding source is important**
  - Allows participants to plan and budget with confidence
  - Reduces transaction costs related to finding funding
  - Facilitates repeated interactions and implementation efforts over long time periods to maintain trust
  - Allows long-term systematic approach to avoid “random acts of environmental kindness”

Accountability

- **Accountability is a fundamental principle of public administration**
  - For what? To whom?
  - Internal vs. external, formal vs. informal mechanisms
- **Accountability is a "two-edged" sword**
  - There is a constant tension between autonomy and accountability
  - Collaboration can often be used to create peer pressure at the political, professional, and individual level that stimulates action
  - Too much accountability creates disincentives for organizations to participate in joint action

Some other interesting observations when ecosystem-based management is viewed from an institutional perspective . . .

Inertia & Bandwagon Effects

- **In ecosystem-based management programs it is common to find that**
  - Initial collaborative efforts are slower than expected
  - They then increase in scope and number as participants gain experience and learn how to work together *or*
  - They decline further as enthusiasm and resources diminish, participants are unable to overcome their differences, or they are unable to find ways to work together
- **Collaborative Inertia**
  - Participants underestimate the time and effort required to build relationships and trust – precursors to joint action
  - Takes time to plan and organize efforts, secure necessary resources, and reach agreement on a course of joint action

Inertia & Bandwagon Effects

- **Bandwagon effects**
  - Once a threshold level of success is achieved, efforts build momentum, pick up speed, gain new members and resources, and expand to address new issues and problems
- **Advice for practitioners**
  - Gradually scale up efforts over time to facilitate learning
  - Start with issues where there is strong support, build on early successes, and expand efforts to other issues/problems over time
  - Enlarge “shadow of the future” so there is reason for continued interaction
  - Trust builds slowly, can be destroyed quickly, and it must be maintained

Institutional Evolution

- **Co-evolution/co-adaptation of institutions**
  - Institutions continuously adapt and change to each other as well as changes in society and the environment
  - Most change is incremental but sometimes there are periods marked by profound changes – "punctuated equilibrium"
  - Changes can be symbiotic – one agency implements another's policies
  - Reframing of problems that motivate collective action due to learning and changing societal values – leads to self-organizing (Internal)
  - Cycles of planning & institutional changes introduced from outside the watershed – new government program, law suit, etc. (External)

Institutional Change

- **Intentional changes**
  - Actions/directions of those inside/outside the network
  - Changes in constitutional level rules can impose changes on collective-choice/operational level rules
- **Emergent changes**
  - Organizations adapt to changing behavior of other organizations in the network and in response to what they learn
- **Path-dependent quality**
  - Important moments of choice that constrain and guide subsequent changes to institutional arrangements
- **Second law of thermodynamics doesn't hold**
  - Most change is incremental and evolves towards greater complexity and functional specialization in the governance system

Adaptive Management

- **Use of true "adaptive management" is limited**
  - Lots of constraints on its use
  - Reluctance to revise plans even when they get out of date
  - Implementation often follows a learning by doing but the problem then becomes one of accountability
- **Use performance measures and reporting processes to encourage learning**
  - Lots of examples
  - This policy-oriented learning takes place over longer timeframes
- **Best thought of as a management philosophy**
  - Encourages policy-oriented learning and embraces organizational change and innovation

Summary & Conclusions

- **Efforts to improve ecosystem governance are not rocket science . . . It's a lot harder**
  - Governance challenges are as formidable as the scientific
  - Institutional system is growing more complex and will be resistant to simplification or efforts to "centralize" coordination by adding additional layers of "coordinators"
- **Important to understand the "ecology of governance"**
  - The unique contextual setting, tradeoffs among problems, and how institutions function and interact
  - Avoid quest for the single comprehensive plan – focus on implementation because it creates environmental improvements
  - Look for strategic opportunities to improve ecosystem governance – don't separate planning from implementation
  - Think holistically, act strategically

Summary & Conclusions

- **Avoid the "centralized is best" mindset**
  - Applies to both planning and implementation
  - Tendency to try and manage all activities using one large committee or program
  - By way of contrast, you could use series of targeted efforts involving only the actors need to complete the task
  - This polycentric approach can reduce transaction costs, increase flow of information, and allows potential collaborators to negotiate directly with one another
  - Don't confuse "centralization" with "coordination" or "integration"
  - Fragmentation, duplication, overlap, and competing priorities are not always "bad" things

Summary & Conclusions

- **Wide range of additional skills required to manage the collaborative processes associated with ecosystem-based programs**
  - These aren't the typical skills taught in a marine/environmental science or marine/environmental policy curriculums
  - Tendency to promote our best scientists/technical specialists and make them "managers" but they don't have management training
  - How do we provide the next generation of ecosystem mangers with the professional training needed to work within increasingly complex governance arrangements?

Questions?