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

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<th>Similarities</th>
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| 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 managers with the professional training needed to work within increasingly complex governance arrangements?
Questions?