

Report for the Great Salt Lake Advisory Council

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This paper was prepared for the Great Salt Lake Advisory Council (GSLAC) by Jim Kramer and Bill Ross based on their experience developing, supporting and managing ecosystem governance structures and programs in Puget Sound Washington and other parts of the United States. It provides an overview on ecosystem-based management in light of the Council's charge, explains the initial steps that the Council can take to begin implementing an ecosystem-based management approach, and then provides additional information and insights regarding governance structure options, integration of science, political considerations, and a few final thoughts on what is required for success.

I. Ecosystem-Based Management in the Context of the GSLAC's Charge

The GSLAC's Charge

Governor Huntsman charged the GSLAC to, "Develop a vision for the future of the Great Salt Lake" and, "Consider management structures used in other internationally significant water bodies..." The Governor asked the GSLAC to describe how an ecosystem-based management approach will create a process and structure that will take into account, "...the need to balance ecological, economic, recreation, private property and other concerns..."¹ The Governor's charge recognizes that other regions in the U.S. have turned to ecosystem-based management when they realize that the independent and isolated goals of multiple agencies and governments can only be accomplished in partnership and by taking a broader set of natural and human circumstances into consideration.

What is an ecosystem?

The Great Salt Lake watershed is an ecosystem—a dynamic and interconnected complex of plants, animals, microbes, chemical and physical environment features that interact with one another in a manner that support its continuation. The "interconnectedness" within an ecosystem is provided both by the physical environment (e.g., rivers moving nutrients downstream in support of lake algae) and by biological interactions (e.g., wetland vegetation creating habitat for feeding and nesting shorebirds). Ecosystems are nested, building to larger

¹ Governor's Executive Order 2008-0008: Creating the Great Salt Lake Advisory Council, http://www.gslcouncil.utah.gov/executive_order.htm

and larger systems. For example, the Bear River watershed is a smaller ecosystem within the larger ecosystem of the Great Salt Lake watershed.

Humans are an integral part of ecosystems, both aquatic and terrestrial. Humans significantly affect the environment and vice versa. Complex and interdependent human economic, social and policy structures interact with the landscape in profound and sometimes irreversible ways. Examples are farming communities and infrastructure, county and city structures, legislative funding and policy directives, and federal and state agencies. Each of these “systems” functions both as its own as well as within the larger human system.

A healthy ecosystem has three key properties:

1. It is resilient to changes in natural and human caused environmental conditions;
2. It has built-in redundancy in its parts so that not all members of a species or habitat type are limited to a single location. Spreading the risk of catastrophic losses of species or habitats improves the ability of the ecosystem to withstand localized losses of key components; and
3. It has a representative sample of the diversity of species and habitat types that characterized its historical state.²

Taking into account the entire Great Salt Lake ecosystem and its interconnectedness is critical for successful adoption of an ecosystem-based management approach.

What is ecosystem-based management and when is it needed? How is this approach different from more traditional natural resource management approaches?

There are many largely interchangeable definitions for both “ecosystem management” and “ecosystem-based management.” This paper uses “ecosystem-based management” which is a management approach that:

- Integrates ecological, social, and economic goals and recognizes humans as key components of the ecosystem;
- Considers ecological (not just political) boundaries;
- Addresses the complexity of natural processes and social systems and uses an adaptive management approach in the face of resulting uncertainties;
- Engages multiple stakeholders in a collaborative process to define problems and find solutions;
- Incorporates understanding of ecosystem processes and how ecosystems respond to environmental perturbations; and
- Is concerned with the ecological integrity of terrestrial and aquatic systems and the sustainability of both human and ecological systems.³

² Puget Sound Partnership, 2006. Sound Health, Sound Future. www.pugetsoundpartnership.org

³ Ecosystem-Based Management Tools Network: http://www.ebmtools.org/about_ebm.html

The overarching goal of ecosystem-based management is to have an ecosystem in a healthy, productive and resilient condition so it functions with minimal human intervention and works more in harmony with natural forces to deliver needed services and resources for human and other biological communities.

Ecosystem-based management differs dramatically from more traditional approaches that usually focus on a single species, economic sector or particular activity or concern. The geographic scope is based on ecological boundaries, thus often crossing more traditional ownership or political boundaries. It employs an iterative management approach—generally referred to as “adaptive management”—for continued strategic action or adjustments in the face of scientific and political uncertainties and changes. Through science the interconnectedness of ecosystem management decisions (e.g., downstream impacts of forest management on stream flows, effects of using water for agriculture on lake water quality) are addressed directly.

Ecosystem-based management represents the next step in managing the environment by including humans as part of the ecosystem, and is advisable when it is necessary to make complex interrelated economic, political and management decisions that can have significant implications on the social, physical and/or biological environment.

II. First Steps in Ecosystem-Based Management

Three important first steps help to foster long-term success. Each step will help to ensure that pitfalls are avoided and maximize the potential to see real results that inspire stakeholders to build upon.

Create a vision and problem statement.

Creating a scientifically based “problem statement” and clear Great Salt Lake ecosystem “vision” will identify underlying challenges and a common goal that interested parties can rally around. Affected parties, with the support of scientists, must be involved in developing a clear vision for the future of the ecosystem. It is critical to solicit the views of affected parties and identify where there is agreement as well as disagreements on the threats, problems and challenges that must be addressed. These perspectives will continue to surface and have the potential to undermine or weaken the effort if not heard, acknowledged and addressed in a transparent manner. This step can also help to identify priorities to inform how the process of actually managing an ecosystem should proceed, as addressing all issues at once in a large ecosystem is not possible.

Establish a governance structure

A decision-making body is critical to the success of large ecosystem-based management efforts. It must be able to set direction and priorities, exercise clear and accountable leadership, address conflicting mandates, and facilitate decisions across federal, state and local authorities and interests. As the Council designs a governance structure for the Great Salt Lake, the experience of other regions trying to protect large ecosystems can provide useful lessons. The U.S. Government Accountability Office (GAO) completed several comprehensive studies of large ecosystem protection/restoration programs across the country including Chesapeake Bay,

the Everglades, San Francisco / Calfed Bay and the Great Lakes. This research and analysis was used in designing the basic structure for the development of the Puget Sound Partnership in Washington State and other regions have used it to modify their existing organizational structures.

The GAO identified several critical organizational components necessary to successfully manage a large ecosystem like the Great Salt Lake, including the following:

- a. *“A decision making body that sets overall direction and priorities, and resolves conflicts”*. Historically natural resource and environmental programs have been developed separately to address a specific issue like water quality, air quality, species protection, etc. Federal, state and local authorities have created laws and agencies with single purpose mandates. Management of an ecosystem requires working across current issues and resolving the policy issues between governmental mandates. This does not mean there has to be one entity with all the authority for management but it is essential to have a governance structure that can address conflicting mandates and facilitate decisions across federal, state and local authorities.
- b. *“Responsible parties are held accountable for fulfilling commitments for actions and results”*. Success in achieving sustainable environmental, social and economic systems requires many different organizations and individuals to act in concert toward a common set of goals. Their collective actions must achieve results that add up to demonstrable progress, whether it is protection or restoration. There must be a system that both identifies the right group for specific actions and holds them responsible to do their part.
- c. *“Funding is clearly linked to outcomes, and that all funds received and spent are tracked and accounted for”*. Similar to many of the federal, state and local authorities that address the environment in a single issue manner, funding has also been segmented to address specific issues. It is important for continued public and political support that funds devoted to ecosystem management are explicitly tied to achieving ecosystem goals. Such a transformation is not always easy, because limited funding may mean that some programs are reduced or eliminated as the overall funding effort is aligned to accomplish what is most important for the overall ecosystem in contrast to a single program’s mandate. Also tracking of funding is difficult as budgets and systems are not set up to account for results especially the cumulative effect over time.
- d. *“Independent and transparent review and reporting on results and progress and a structure to track progress”*. Continued political and public support requires that there is a process to evaluate progress in a manner that is objective and easily accessible for the public and interested parties.

The GAO found that efforts focused on the Chesapeake Bay, Everglades and Calfed Bay have not achieved some of their goals largely because the governing bodies have not been authorized to carry out the four elements above and/or have not exercised the leadership necessary to achieve them. In other words, the respective structures in each region may be

appropriate for the political dynamics but they have not been fully empowered or utilized for success.⁴

Section III below explores existing governance structures in more detail.

Set priorities for progress

It is not possible to address every need and challenge at once. When choosing priorities at any particular time, it is important to have the most current understanding of how the ecosystem and human systems function from the perspectives of policy makers, scientific experts and affected parties. Biologically it is critical to understand the most significant threats to ecosystem health and socially it is critical to understand the organizational, cultural and socio-economic drivers that led to the current situation and will influence what solutions are acceptable. It is important to ask, "What is the most important progress that can be made now in light of current scientific knowledge and the readiness and willingness of the region?" It is also important to plan for the fact that management of a complex ecosystem is not a one-time action (like many traditional environmental decisions), but is a long-term commitment that requires continuous attention to the natural and human community. It requires a commitment of leadership and community involvement that continually asks the question of what significant progress can be made now.

III. Example Governance Options for Ecosystem-Based Management

Achieving the GAO criteria is a significant undertaking. Other regions in the country have used a variety of governance structures. While these efforts have not yet delivered ecosystem health of their regions, their efforts have led to important advancements, slowed the decline of the system and provided key opportunities for learning. Three examples are those employed in the Chesapeake Bay, Great Lakes and Puget Sound. The organizational structures vary from a federal agreement and office (Great Lakes) to a state agency (Puget Sound) and even non-profit structure for components of the Chesapeake Bay and Puget Sound programs. One of the important parts of the process is to create the regional structure in a manner that garners broad political interest and support. Each example illustrates how this was addressed and describes the basic organizational structure for the respective region.

Chesapeake Bay Program (www.chesapeakebay.net)

Chesapeake Bay is a large estuary nestled between the District of Columbia and the States of Maryland, Pennsylvania and Virginia. Given its proximity to the United States capitol, the Chesapeake Bay effort has been fortunate to receive a lot of political attention and funding. The Chesapeake Bay Program is a regional partnership that has led and directed the restoration of the Chesapeake Bay since 1983. Program partners include the states of Maryland, Pennsylvania and Virginia; the District of Columbia; the Chesapeake Bay Commission, a tri-

⁴ US Government Accountability Office, Chesapeake Bay Program, 2005. *Report to the Subcommittee on Interior and Related Agencies, US Senate*. Report No. GAO-06-96

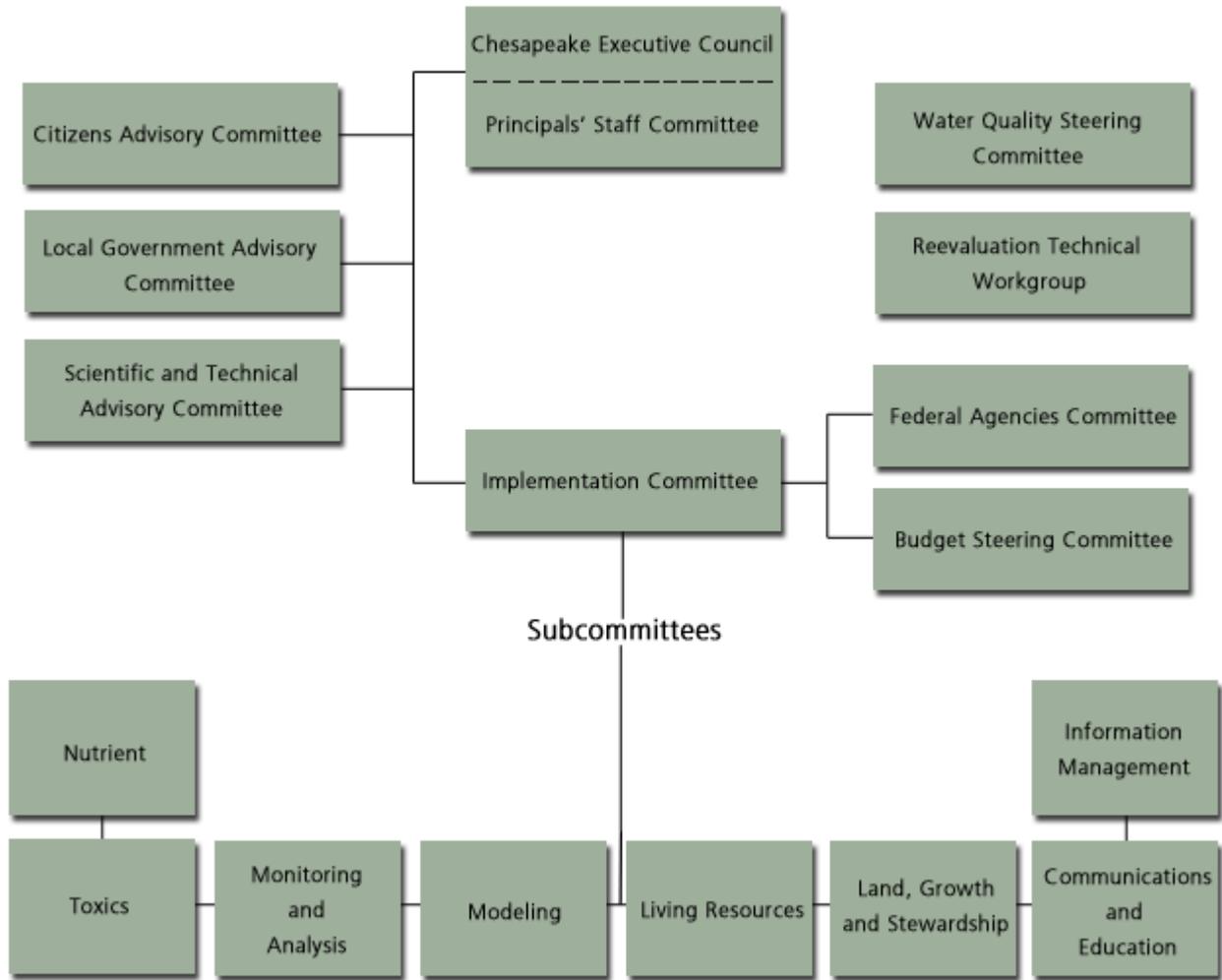
state legislative body; the Environmental Protection Agency (representing the federal government); and participating citizen advisory groups. The Chesapeake Executive Council currently includes the governors of Maryland, Pennsylvania and Virginia; the Environmental Protection Agency Administrator; the mayor of the District of Columbia; and the chair of the Chesapeake Bay Commission, a legislative body serving Maryland, Pennsylvania, and Virginia.

The Executive Council:

- Establishes the policy direction for the restoration and protection of the Bay and its living resources;
- Exerts leadership to marshal public support for the Chesapeake Bay effort;
- Signs directives, agreements and amendments that set goals and guide policy for Chesapeake Bay restoration, and
- Is accountable to the public for progress made under the Bay agreements.

The Executive Council meets annually. Its Principals' Staff Committee meets as needed to facilitate communication among the Implementation Committee, the advisory committees (Citizens Advisory Committee, Local Government Advisory Committee and the Scientific and Technical Advisory Committee) and the Executive Council.

Figure 1. Chesapeake Bay Program Organizational Structure



The Great Lakes Regional Collaboration (<http://www.glrc.us/>)

The Great Lakes has a long and varied history of complex management, including a treaty with Canada. The most recent effort on the US side is called the Great Lakes Regional Collaboration (GLRC), which is a wide-ranging, cooperative effort to design and implement a strategy for the restoration, protection and sustainable use of the Great Lakes. It involves the federal government, eight states and two Canadian Provinces. In 2003, at the request of a Great Lakes' congressional delegation and as a first step in providing the leadership and coordination all agree is needed, the Great Lakes' governors identified nine priorities for Great Lakes restoration and protection. Since their release, these priorities have been adopted by the Great Lakes mayors, the Great Lakes Commission and other Great Lakes leaders. In May 2004 President Bush issued an Executive Order, which recognized the Great Lakes as a "national treasure" and created a federal Great Lakes Interagency Task Force to improve federal coordination on the Great Lakes. The Order directed the U.S. EPA Administrator to convene a "regional collaboration to create by consensus, the national restoration and protection action

plan for the Great Lakes.”⁵

In 2006, the GLRC issued an Implementation Framework describing how the GLRC will be organized to ensure that GLRC partners will guide their future efforts to protect and restore the Great Lakes. The GLRC Executive Committee is the primary governing body, responsible for:

- Directing activities of the GLRC; e.g. presiding at major meetings;
- Signing key documents, etc.;
- Developing and implementing mechanisms to promote accountability;
- Identifying and resolving major implementation issues;
- Facilitating coordination of Great Lakes restoration and protection activities among GLRC participants; and
- Communicating with stakeholders and provide for ongoing public participation.

The Executive Committee is composed of federal, state, local, tribal, and congressional members, each with their own responsibilities as follows:

- Federal: Chair, Great Lakes Interagency Task Force;
- State: Chair, Council of Great Lakes Governors;
- Local: Designated Mayor, Great Lakes and St. Lawrence Cities Initiative;
- Tribal: The Tribal Spokesperson; and
- Congressional: The Congressional Delegation designates one permanent spokesperson from the Great Lakes Congressional Task Force and any additional representatives as the Congressional Delegation sees fit.

The Executive Committee is responsible for a public participation plan which establishes opportunities for public input at the appropriate stages of implementation so that the GLRC can have the full benefit of the ideas and expertise of the Great Lakes community.

In addition to the Executive Committee there are eight issue area technical/management teams which assist implementation of the GLRC Strategy. These teams addressed, respectively: aquatic invasive species, habitat conservation and species management, near-shore waters and coastal areas (coastal health), areas of concern/sediments, non-point sources, toxic pollutants, sound information base and representative indicators, and sustainability.

Puget Sound Partnership (<http://www.psp.wa.gov/>)

In 2006, the Governor of the State of Washington called for a new approach to address the declining health of the Puget Sound marine and freshwater ecosystems. She appointed a 24-member task force of community leaders from across the region to recommend a new approach to governing the Puget Sound ecosystem. The task force built on a highly successful and innovative approach for restoring salmon runs in the face of listing under the Endangered Species Act. The salmon effort was the first of its kind to develop a federally required recovery

⁵ <http://www.epa.gov/greatlakes/collaboration/taskforce/eo.html>

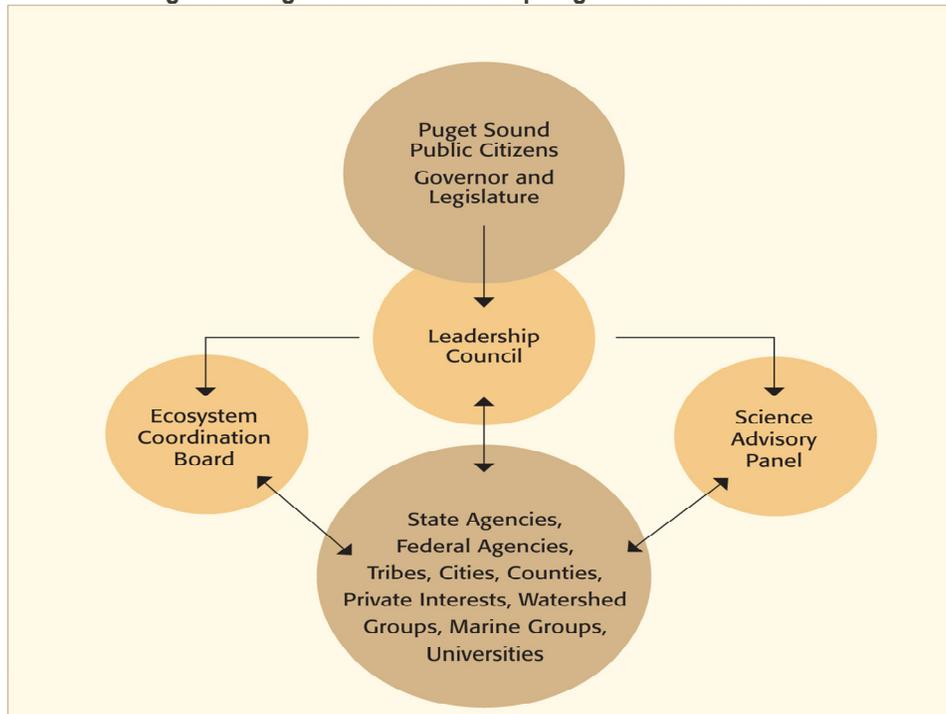
plan largely through the efforts of the affected community and then have it adopted by the federal government as the official federal plan. Central to the salmon effort was a regional committee working directly with 14 local watershed councils. The Governor's task force built on this model in proposing the creation of a new state agency focused on the protection and restoration of Puget Sound. This idea, called the Puget Sound Partnership was passed in 2007 by a near unanimous vote of the Washington State Legislature.

The intent behind the Partnership was to create a new entity that works closely with existing governments, organizations and the public to protect and restore the health of Puget Sound, including both marine and freshwater environments. The aim was and is to involve the diverse groups across Puget Sound in collaborative problem solving, while at the same time, to create mutual and clear accountability for results and consequences for inaction. Incorporation of scientific input was identified as a major facet of the new structure, as was supporting science-based efforts such as the Hood Canal Dissolved Oxygen Program and the Puget Sound Nearshore Partnership.

The creation of the Partnership does not change existing authorities of federal, state or local governments or create another government or layer of government. Rather, the Partnership provides a vehicle for building cooperation between existing public, private and non-governmental entities and enables collaboration and innovation to benefit the entire ecosystem. The Partnership also has authority to create a not-for-profit corporation as appropriate for certain functions.

The Partnership includes four core governance elements: a Leadership Council to oversee the entire effort and to make final decisions; an Ecosystem Coordination Board composed of key involved interests, institutions and governments; a Science Advisory Panel; and professional staff.

Figure 2. Puget Sound Partnership Organizational Structure



Appointed by the Governor the six-member Leadership Council provides the overall direction for the Partnership. The Governor chose members who are publicly respected and influential, and who have a significant history of success on major public policy and management issues, as well as a keen interest in the environmental and economic prosperity of Puget Sound. They specifically are not stakeholders but chosen because they are “above the fray.” In providing the overall leadership, the Council is required to approve the plan to achieve a healthy Puget Sound by 2020; set benchmarks for progress; establish funding priorities; allocate discretionary funds; determine compliance with the plan; report on progress to the Governor, legislature and public; and make other final decisions on significant issues.

To ensure significant involvement of stakeholders and responsible parties, the Leadership Council oversees the Ecosystem Coordination Board which is comprised of 27 leaders representing diverse government, sector, community, and geographically based interests from around the Sound. The Ecosystem Coordination Board's main role is to advise the Leadership Council on carrying out its responsibilities. In preparing the plan for a healthy Puget Sound by 2020 the Leadership Council must confer with the Ecosystem Coordination Board to determine the necessity, appropriateness and feasibility of proposed actions, solicit input on the best approaches for implementation of the plan and seek commitments for action.

The Leadership Council also appointed the Science Advisory Panel, comprised of experts from several disciplines representing federal and state agencies, academic institutions, and private institutions. The Panel's expertise and advice on the plan to achieve a healthy Puget Sound and advice to the Leadership Council are critical to the efforts to develop a comprehensive plan to restore Puget Sound.

The Partnership is managed by an Executive Director and staff who will serve as a critical link between all levels of government, the private sector, the Leadership Council, the Ecosystem Coordination Board, and the Science Panel. The Executive Director is accountable to the Leadership Council and the Governor for effective communication, actions and results.

Watershed councils also play an important role in developing local plans for salmon recovery, water quality and water quantity. The Partnership is expanding the role for these local organizations to foster accountability for action and results, ensure coverage and effectiveness throughout upland and marine areas, and promote interaction on a Sound-wide basis.

IV. Integrating Science into an Ecosystem-Based Management Approach

Setting policy direction and managing of an ecosystem requires weighing political, social and environmental consequences. Science can be helpful in understanding the potential consequences of actions. However, the GAO found that scientific analysis of ecological outcomes typically does not heavily influence the choice of strategies to restore ecosystems.⁶ Scientific information appears to be under used for two primary reasons. First, management decision structures are not explicitly designed to incorporate rigorous scientific input at relevant stages; and second, often the scientific community has not adequately considered in advance how best to conduct, synthesize and then communicate their scientific analyses so that they can inform key decisions.⁷ Another challenge is to clearly express scientific uncertainties in a constructive way when communicating with decision makers.

An example of this disconnect in Puget Sound is the dissolved oxygen problem in Hood Canal, a significant marine water body within the Sound. Low levels of dissolved oxygen create a problem called hypoxia where aquatic organisms die from suffocation. This situation occurred several years ago generating lots of media coverage of dead fish and other aquatic species washing up on beaches in Hood Canal. Politicians called for immediate action to address the decline in the ecosystem but scientists found no statistical significance of hypoxia on the overall abundance of species in the Canal. In fact hypoxia is a natural process in the Canal and it is still uncertain if it is occurring above natural rates because of human causes. These scientific findings and uncertainty frustrated decision makers who wanted to take immediate action. Subsequently a research program has been initiated where scientists are working closely with managers to determine human contributions for hypoxia and the immediate actions that can be taken.

Ecosystem management requires a close, carefully constructed connection between scientists, technicians and policy-makers. Where the roles of science and policy are clearly defined, it is critical for scientists to spend time with the managers, stakeholders and policy makers so that their assets can be best utilized as actions and results are discussed and assessed to inform public opinion, discourse and management decisions. This approach requires an organizational structure where the managers of the overall ecosystem process are working directly with chief

⁶ GAO, 2005 and GAO, 2001. *South Florida Ecosystem Restoration*. Report No. GAO-01-361

⁷ Ruckelshaus, M., T. Essington, and P. Levin. 2009. How science can inform ecosystem-based management in the sea: Examples from Puget Sound. In: Karen McLeod and Heather Leslie (eds.) *Managing for Resilience: New Directions for Marine Ecosystem-Based Management*. Island Press, San Francisco, CA, in press.

scientists to set up a structure and process that allows for independent and objective scientific work and resources to be used and focused in a manner that is directly informing real time management decisions.

V. Political Considerations

Three political considerations must be addressed and considered as the Advisory Council develops recommendations for a new governance structure: the relationship to existing organizations, integration of funding and political authorization.

Relationship to existing organizations

One of the most important considerations in designing an ecosystem approach is to build on rather than duplicate the responsibilities and activities of existing organizations involved managing human and natural systems. It is important to ask how a new organizational structure can *enhance* the effectiveness and efficiency of current organizations and programs and to build trust with partners by understanding what their current organizations are trying to accomplish, what is limiting their effectiveness and where there are differences across organizations that reduce the ability to reach ecosystem goals. The process must both speak to where existing organizations and infrastructure are and show a pathway to the larger common vision.

Integration of funding

Just as current laws and organizations have been developed over time to address specific issues so have many of the sources of funding that support natural and human resource management. Shifting to an ecosystem focus requires a new and fresh look at how current funding can aid or detract from taking a more integrated approach.

Political authorization

The authority to create changes in management must be addressed when initiating an ecosystem approach. For example, the Great Lakes Collaboration covers eight states. Leaders of the effort saw the importance to get buy in from the governors of each state as well as the federal and local governmental agencies. Similarly, key business or non-governmental sectors are critical to include where they can significantly affect the outcomes.

VI. Conclusion

This report highlights key considerations for the GSLAC as it develops recommendations for ecosystem-based management of the Great Salt Lake. As facilitators of efforts in other parts of the country, we believe in summary there are two critical factors for these kinds of endeavors: The first is creating a structure and process that integrates knowledge, resources, and experience. This paper identifies the technical and policy aspects of creating a new structure and process.

The second is leadership and involves building trust, faith, respect and commitment. Ecosystem based management almost by definition is extremely complex: politically, socio-economically, institutionally and biologically. Traditional natural resource management can

result in polarization, lack of sufficient demonstrable successes, and even distrust and resentment in efforts to fix environmental problems.

Ecosystem management, for all its complexity, has the capacity to bring new hope and rigor that cultivates trust that public, private and community based sectors working together can bridge human and landscape needs into one ecosystem-based approach.

As the GSLAC explores the readiness of their region to address issues at a broader scale, it is critical that the political leaders, scientists and staff who can most influence the future of the Great Salt Lake are included through respect and conscious integration of their values, viewpoints and perspectives. Including these diverse skills and perspectives may create tension at first, but often this tension is the wellspring of new ideas, new paradigms, new relationships and durable solutions that will produce the results to which the Advisory Council aspires.

By tying together the structural and process elements of ecosystem management, including the human dimension, in developing its recommendations, the GSLAC can best address the Governor's charge and advance the management of the Great Salt Lake.