



Review Draft

Our Waters, Our Communities, Our Future

***Taking Bold Action Now to
Achieve Long-term Sustainability of
New York's Ocean and Great Lakes***

presented to

**Governor David Paterson and
The New York State Legislature**

by the

**The New York Ocean and Great Lakes
Ecosystem Conservation Council**

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DRAFT

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INTRODUCTION

New York is a Coastal State

Much of New York's geography, ecology and history are a result of the richness of the State's water resources, particularly the Atlantic Ocean and its estuaries, and the vast Great Lakes system. Water resources have been, and remain, New York State's richest treasures and are critical to its future growth and economic vitality. The State's culture, identity, and economy – its past, and its future – are intrinsically connected to the environmental quality of its ocean and Great Lakes ecosystems. Water and aquatic resources provide an important economic engine and quality of life factor for our State and its many communities by providing such critical services such as public drinking water supplies, sources of clean hydroelectric power, recreation and business opportunities, and transportation.

New York is an oceanic state. It has nearly two thousand miles of tidal shoreline and hundreds of beaches, many of which are world class recreational destinations. Its ocean ecosystems encompass a diversity of marine habitats that are home to many important species and provide special character to so many communities. The State's numerous estuaries - Long Island Sound, the tidal Hudson River, Peconic estuary and Long Island south shore bays - support a commercial marine fishery that had a total economic value in 2006 of approximately \$250 million.

New York is also home to one of the biggest ports in the United States, and has a shipping and transportation industry that

annually contributes more than \$18 billion in international and domestic economic activity. Over 60% of our State population lives in counties that are located within the ocean and estuarine regions. New York's ocean waters are home to a rich diversity of sea life, including whales, seals, oysters, mussels, flounder and migratory birds.

The northern and western borders of New York State are bounded by two of the world's largest lakes - Lake Ontario and Lake Erie - both of which are integral components of a larger Great Lakes system that contains 20% of the world's surface fresh water. Lakes Erie and Ontario serve as the main gateway for vessels traveling from many interior U.S. and Canadian industrial communities to the Atlantic Ocean and beyond. Their economic significance cannot be over-emphasized. The watersheds of these lakes encompass much of the landscape of upstate New York, and consist of a rich diversity of communities and natural resources. New Yorkers utilize the lakes as a source of drinking water, access their shores and waters for recreational activities, transport people and goods across the lakes, and conduct countless other activities within the Great Lakes Basin.

New York's Coastal Ecosystems Are Threatened

For all their grandeur and importance, New York's ocean and Great Lakes ecosystems, and the services they provide, are in trouble.

Despite nearly four decades of success through State and federal environmental programs (regulatory and non-regulatory)

and investments in environmental infrastructure and clean-ups, New York's coastal regions continue to face critical problems, emerging threats and troubling economic and environmental declines:

- Commercial seafood fishers bring to dock only 21% of what they did 50 years ago. For both commercial and recreational fishers, New York's most important saltwater fish and shellfish are depleted or being overfished. Species like oysters, lobsters, mussels, sturgeon, shad and herring that once supported the economy and food supplies of the State are now at risk.
- In 2006, ocean and Great Lakes communities lost valuable revenue because beaches were closed over 1200 days due to pollution. More than a third of New York's important estuary and bay waters are impaired or threatened. Stormwater runoff and overflows from sewage treatment plants contribute to water quality problems, such as marine debris and algae blooms that strip oxygen from the water, diminish essential light levels, and kill underwater grasses which serve as nurseries for fish. In 2003, a hypoxic area in Long Island Sound covered 345 square miles – an area larger than the entire land mass of New York City.
- Summer brown tide, the harmful algae bloom that triggered the collapse of Long Island's scallop fishery, has reappeared and spread in Great South Bay on Long Island. In 2008, the entire Huntington-Northport Harbor complex had to be closed for shellfishing because of another harmful algal bloom, the toxic red tide.
- Communities are increasingly vulnerable to storm damage because in the past century, more than a third of Long Island Sound's tidal wetlands have been lost. These ecosystems provide valuable habitat for juvenile fish, filter pollutants from the water and mitigate flood damage. Tidal wetlands continue to be lost due to sea level rise, sediment budget disruptions, ammonia and hydrogen sulfide toxicity and other reasons.
- While aquatic life and recreational uses are largely supported in the open waters of the New York/New Jersey Harbor, the condition of the water is typically rated poor due to fish consumption advisories that are largely the result of legacy pollutants (e.g., PCBs and DDT) and atmospheric mercury.
- Sportfish anglers are advised by the State's Department of Health to limit the consumption of fish from freshwaters and some marine areas, with additional restrictions for women and children under 15. Other advisories address eating locally caught striped bass, American eel, bluefish, and internal organs of crabs and lobsters from the marine district.
- Local economies and public infrastructure are at significant risk from climate change effects, including sea level rise that will also have uncertain consequences for coastal ecosystems and aquatic life.
- Economic revitalization is hampered by the remaining legacy of industrial contamination within the Great Lakes and its basins.

- Communities are increasingly at economic risk from pervasive challenges from aquatic and terrestrial invasive species.
- The current approach to community land and water use decision-making is fragmented and outdated, and does not adequately consider regional or broad ecosystem issues. Changes in land use have had cumulative negative impacts on water quality and quantity, and thus, the vitality and resilience of ecosystems.
- Industry, development and land-use practices, and concentrated human populations have led to unsafe levels of pollutants in many areas. Water quality is an ongoing concern, particularly in the nearshore environment.
- Significant areas of nearshore and wetland habitats have been lost or fundamentally altered.

These challenges require a fundamental re-thinking of traditional management approaches. Typically, each activity or threat to ecosystem health has been considered in isolation; coordinated management of cumulative impacts has been rare. Traditional approaches have focused on addressing a single species, a specific activity, such as agriculture, or transportation, or a specific problem, such as habitat loss. In the absence of a comprehensive and integrated approach, past efforts have achieved substantial yet incomplete successes.

In addition, these ecosystem challenges require a renewed focus on the human aspect of environmental quality. For example, climate change will impact all

sectors of human activity, requiring a coordinated effort to combat and adapt to it. The search for renewable energy will require finding space for new, important infrastructure while also accommodating other human uses. And communities will need new tools and skills to deal with these challenges as partners with the State.

National Attention and Recommendations

In recent years numerous public and private entities have sounded the alarm on the declining health of the ocean and Great Lakes and called for a more integrated management approach. The reports of highly respected groups such as the Pew Oceans Commission (2003) and the U.S. Commission on Ocean Policy (2004) brought national visibility to the silent decline and loss within our ocean and Great Lakes ecosystems. In 2005 a group of nationally respected scientists and policy experts submitted to U.S. policymakers their “Scientific Consensus Statement on Marine Ecosystem-based Management.” These reports called for a revised approach to national ocean policy through a comprehensive and coordinated national effort that would move away from fragmented, single-issue approaches and toward Ecosystem-based Management.

Addressing our ecosystem challenges would greatly enhance the economic well-being of New York’s communities. A recent Brookings Institute report¹ calculated that

¹ "Healthy Waters, Strong Economy: The Benefits of Restoring the Great Lakes Ecosystem" By John C. Austin, Soren Anderson, Paul N. Courant, Robert E. Litan; September 2007, The Brookings Institution, Great Lakes Economic Initiative.

spending approximately \$26 billion for a comprehensive restoration strategy in the interstate Great Lakes basins would yield an estimated \$50 billion in direct economic benefits. Investments in ocean ecosystems can be expected to yield similar economic benefits. Just as important, these investments would yield a much more bountiful and healthy ecosystem.

These and other reports point to the tremendous benefit that our ocean and Great Lakes ecosystems provide to New Yorkers. In short, we depend on healthy ecosystems to support water supplies and clean air; economic sustainability and opportunity; recreation and fish and wildlife resources; our heritage and way of life. We must take opportunities to reverse declines, enhance environmental quality and quality of life, and realize new economic growth.

New York's Response:

Ecosystem Based Management

In August of 2006, New York made a bold State-level commitment to conserving, maintaining and restoring our coastal ecosystems. Recognizing that healthy, productive and resilient ecosystems provide important services that people and the State's communities and economy need, the Legislature and the Governor approved the [New York Ocean and Great Lakes Ecosystem Conservation Act \(The Act\)](#). The Act established the [New York Ocean and Great Lakes Ecosystem Conservation Council](#), made up of the nine State agencies with responsibility for managing human activities that impact ecosystems. It also declared a set of principles for Ecosystem-

The New York Ocean and Great Lakes Ecosystem Conservation Council

is made up of the heads of nine State agencies with responsibility for managing human behavior that impacts coastal resources:

Honorable Alexander B. "Pete" Grannis
- Chair,
Commissioner
[Environmental Conservation](#)

Honorable Patrick Hooker
Commissioner
[Agriculture and Markets](#)

Honorable Marisa Lago
Commissioner
[Economic Development](#)

Mr. Francis J. Murray
President and CEO
[Energy Research and
Development Authority](#)

Honorable John Egan
Commissioner
[General Services](#)

Honorable Carol Ash
Commissioner
[Parks, Recreation and Historic
Preservation](#)

Honorable Lorraine Cortés-Vázquez
Secretary of State
[State](#)

John J. O'Connor
Officer-in-Charge
[State University of New York](#)

Honorable Astrid Glynn
Commissioner
[Transportation](#)

[Council Executive Director](#)
George Stafford
Deputy Secretary of State

EBM principles support:

- sustainable activities in and uses of the coastal ecosystem;
- maintenance of ecological health and integrity;
- recognition of ecosystems' interconnections among land, air and water;
- enhanced understanding of coastal ecosystems;
- decisions informed by good science;
- caution when risks are uncertain; and
- broad public participation in planning and decision making.

based Management for the State's governance of coastal ecosystems.

New York recognizes that the next generation of challenges and opportunities requires taking a more comprehensive, integrated approach to coastal management. Many State agencies have valuable existing authorities, tools and programs that help our coastal ecosystems. The supporters of the Act recognized this, but saw their success hampered by the lack of coordination and clear goals, objectives and indicators of success. The traditional structure encourages a fragmented approach that fails to recognize the interdependencies among all the components of the ecosystem and takes too narrow a view of the role of human activities in them.

Ecosystem-based Management (EBM) is an innovative approach to management that is distinct from traditional models. EBM recognizes that humans are integral parts of any ecosystem and that ecosystems are

vital in supporting human life. It emphasizes the need to establish strong partnerships to address complex and often contentious issues and requires the integration of ecological, social, economic, and institutional perspectives.

The Act charges the Council with the following responsibilities:

- Promote the understanding, protection, restoration and enhancement of New York's ocean and Great Lakes ecosystems as well as sustainable and competitive economic development;
- Accommodate community needs, in a manner that recognizes that community well-being, environmental quality and economic viability are interdependent goals;
- Develop and implement an adaptive approach to effectuate healthy ecosystems along with human activities;
- Integrate and coordinate EBM with existing laws and programs;
- Develop guidelines for programs and activities that affect coastal ecosystems;
- Encourage scientific research and the sharing of information that will aid decision-making and management efforts;
- Use academic, research and non-profit institutions in coastal management; and
- Facilitate regional coordination and cooperation on multi-jurisdictional coastal resource issues.

A Call to Action:

Contents of this Report

The Act required the Council to issue a Report to the Governor and Legislature, which addresses seven specific tasks.

1. *Define executive/legislative steps to integrate EBM with existing programs;*
2. *Identify opportunities for EBM with neighboring states and the federal government.*
3. *Define implementation of executive actions to advance EBM;*
4. *Create an ocean/coastal resources atlas for the public and decision makers;*
5. *Establish a research agenda that identifies EBM priorities;*
6. *Demonstrate improvements in two study areas using EBM; and*
7. *Recommend actions to restore and protect submerged aquatic vegetation.*

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Part I of this report is a progress report by the Council, reviewing its actions and achievements to date.

Part II describes the priorities for achieving healthier coastal ecosystems and more sustainable human communities, presented under the following themes: Water and Land, Economy, Climate Change, Energy, and Capacity Building.

Part III provides an agenda of executive, legislative, funding, and interstate/federal actions to advance EBM with priorities that acknowledge the State's current fiscal situation.

What is Ecosystem-based Management?

Achieving sustainability in our economies, communities, and natural environment requires rethinking traditional, fragmented approaches to managing complex and interrelated problems.

Ecosystem-based Management (EBM) is an emerging, integrated approach that considers the entire ecosystem, including humans, to achieve improved environmental conditions and sustained ecosystem services that support human needs and social goals.

Ecosystem-based Management develops and uses scientific understandings of how marine, freshwater, and terrestrial ecosystems function across a wide continuum of scale and scope. Scientific information should inform management decisions and guide adaptive measures as new information becomes available.

Ecosystem-based Management considers the interdependent and cumulative impacts of different sectors, including human, social, and economic activities. Some of the principles that generally guide EBM are:

- EBM emphasizes the ***protection*** of ecosystem structure, function, and key processes based on science;
- EBM is ***place-based*** in focusing on a specific ecosystem and the range of activities affecting it;
- EBM explicitly accounts for the ***interconnectedness within systems***, recognizing the importance of interactions among many target species or key services and other non-target species;
- EBM acknowledges the ***interconnectedness among systems***, such as air, land and sea;
- EBM ***integrates*** ecological, social, economic, and institutional perspectives, recognizing their strong interdependencies and mutual influences;
- EBM is most effective when working in ***collaboration***, such as agencies working together with citizens, landowners, businesses, local governments, interested organizations, and others to face problems, identify opportunities, make feasible improvements, and find common solutions. The processes are often as unique as the situation, but the common theme is the active participation of partners to achieve measurable objectives in support of ecosystem management goals.
- EBM should incorporate ***adaptive management*** using scientifically-based evaluation, testing of alternate management approaches, and readjustment as new information becomes available from monitoring programs.

Each New Yorker has a stake in the Council's mission, and every community should consider itself a proud, bold guardian of our waterways which are so closely tied to the history, economic vitality and distinct character of New York State.

Part I: ACTIONS, ACHIEVEMENTS AND OUTCOMES TO DATE

A. Recognizing Existing Ecosystem-based Management Efforts in State Agencies

Prior to the enactment of the 2006 New York Ocean and Great Lakes Ecosystem Conservation Act, some New York State programs and activities had been consistent with many of the EBM principles. Many agencies' programs to manage human activities already reflect EBM principles, such as adapting their approaches to incorporate new scientific understanding, or engaging stakeholders in meaningful participation.

Below are but a few examples from Council agencies showing how some New York State programs have evolved over time toward an EBM approach.

New York State Department of Agriculture and Markets (DAM)

The Department of Agriculture and Markets strives to foster a competitive food and agriculture industry that benefit both producers and consumers by promoting a viable agricultural industry, fostering agricultural environmental stewardship and safeguarding the food supply. Many of its programs are especially relevant to EBM including:

- The Agricultural Environmental Management (AEM) program helps farmers make cost effective, science-

based management decisions while protecting and conserving the state's natural resources since 2000. Legislation to allow AEM plans to address ecosystem issues in addition to water quality was signed into law by the Governor on July 21, 2008.

- The Agricultural Non-Point Source Program prioritizes aquatic/marine ecosystem needs and Soil and Water Conservation Districts carry out the implementation of agricultural best management practices to address those needs.
- The Agricultural Farmland Protection Program (AFPP) encourages the retention of farmland in agricultural production.
- The Soil and Water Conservation Districts play key roles in helping landowners and users manage soil, water and related resources on public and private land, including farmland.

New York State Department of Environmental Conservation (DEC)

DEC's mission embodies the principles of Ecosystem-based Management: to conserve, improve, and protect New York's natural resources and environment, and control water, air, and land pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well being. This broad mission is reflected in a broad range of DEC programs - regulatory, enforcement, grantmaking, monitoring, research, recreational, educational, planning, and natural resource conservation and

management - that affect ecosystem health. DEC's work encompasses a breadth of function from habitat protection to coastal erosion prevention, pesticide registration to fisheries management, and recreational programs to industrial permitting. DEC is responsible for direct land stewardship responsibilities of over 1,900 facilities on over four and a half million acres. DEC enforces a multitude of federal and state laws and regulations, covering thousands of facilities requiring air, water, or waste permits; overseeing hundreds of contaminated sites in need of remediation; and ensuring the clean-up of thousands of oil and chemical spills per year.

- Six agency priorities serve to concentrate and organize the Department's work and guide the development of future initiatives integrating EBM principles: Combat climate change; Foster green and healthy communities; Connect New Yorkers to nature; Promote a toxic-free future; Work for Environmental Justice; and Safeguard NY's unique natural assets.
- While the law defines some regulatory programs as single focus, DEC manages numerous other programs to more holistically address natural resource challenges. They include the interstate programs for the Delaware, Susquehanna and Allegheny rivers, the Long Island Sound Study, the Hudson River Estuary Program, the plans developed under the Watershed Restoration and Protection Strategies (WRAPS) program, the statewide open space conservation program, the unit management planning for DEC state-owned lands, and the work of the

Invasive Species Council. DEC also participates in the interstate Lake Champlain Basin Commission.

- DEC has created an [Office of Climate Change](#) with units holistically focusing not only on 'command and control' approaches, but on science, policy, outreach, and partnerships.
- The [Pollution Prevention Institute](#) is designed to complement DEC's existing regulatory approaches to chemicals policy with technical assistance, green business support, green chemistry research, and partnerships between academia, state government, and local industries.

New York State Department of State (DOS)

The mission of DOS is to defend the public's safety, protect and develop a sustainable environment, strengthen local communities, and serve the business community. The Department is well-positioned to be a leader in EBM because of the multi-sector focus of its mission, which is reflected in its diverse programs. Some of these programs lie directly at the nexus of environmental stewardship and community development, and the following exemplify the types of integrated approaches that have made DOS a leader in advancing ecosystem health for New York:

- DOS houses the state's [Coastal Management Program](#) (CMP), which has broad authority to guide human activities that impact ecosystem health in coastal areas. [Local Waterfront Revitalization Programs](#) (LWRPs) serve as local CMPs, allowing for greater refinement of the State's CMP at the

local level. Once approved, these LWRPs require new local laws to implement them.

- The DOS consistency determination process is a powerful tool that affects direct federal and state actions in the state's defined coastal zone. The decision-making process currently includes a review and application of EBM principles reflected in the State's CMP policies.
- [Harbor Management Plans](#) incorporate EBM principles in planning for multiple uses in intensively-used waterbodies.
- The [Brownfield Opportunity Areas Program](#), an interagency partnership between DOS and DEC, incorporates the former's planning and community development expertise and the latter's expertise in clean-up requirements. This site redevelopment work employs collaboration with federal, state and local officials, stakeholders and the public and incorporates many EBM principles.
- In September of 2008, DOS reorganized and consolidated agency programs, resulting in the creation of the Office of Coastal, Local Government and Community Sustainability. This will aid the implementation of EBM at the local level through integration of agency programs, grant funds, and decision-making.
- Building construction is the most pervasive human use affecting ecosystems. The major function of DOS's [Division of Code Enforcement and Administration](#) is to ensure that buildings

are constructed and maintained in accordance with the latest nationally developed technical standards for building construction, fire prevention, and energy conservation. The Division's process for regularly updating the Codes is based on the latest international code standards and is an example of adaptive management.

- The [Appalachian Regional Commission](#) (ARC) is a federal/state planning and economic development program whose objective is to *achieve social and economic parity for the region with the nation*. The Appalachian Regional Commission's program is a place-based, comprehensive economic and social development program for a specific and significant geographic portion of the State. The Appalachian Regional Commission's strategic plan for [2005-2010, Moving Appalachia Forward](#), indicates that the goal of economic parity should be achieved through sustainable community and economic development.
- The Local Government Efficiency Grant Program was enacted in Spring of 2008 and replaces the Shared Municipal Services Program which has provided grants for the same purpose over the last few years. The general purpose of the program is to encourage municipalities to save money and improve services by consolidating or sharing services. Ecosystems do not follow municipal boundaries, and their management requires cooperative actions of responsible local governments, which are facilitated by this program.

New York State Department of Transportation (DOT)

- Through its Environmental Initiative, begun in 1998, DOT has taken a proactive role in evaluating its activities in the context of ecological impact by promoting an environmental ethic throughout the department, advancing State environmental policies and objectives with agency resources, partnering with others to construct environmental enhancement methods and strengthening relationships with environmental agencies and groups.
- DOT formed the Interagency Aquatic Connection Team (InterACT) in coordination with DEC as an interagency, interdisciplinary team committed to ensuring that stream crossings are designed, installed and maintained in a manner that protects the ecological integrity of aquatic systems, while accommodating practicable technology, engineering criteria and human safety.
- [Context Sensitive Solutions](#) (CSS) was adopted as agency policy in 1999 to ensure that safe and efficient transportation projects are designed and developed in harmony with New York's communities. NYSDOT staff work together with members of the public, elected officials, other state agencies and interest groups to design projects that balance general transportation safety needs with community preservation interests. Launched in 2005, the Green and Blue Highways Program encourages implementation of various low- or no-cost maintenance and operation activities across the State that protect and enhance the environment...

- The [New York State Scenic Byways Program](#) was created in 1992 by the State Legislature to encourage both economic development and resource conservation, recognizing that each of these aspects of a byway must be fostered to ensure the success of the other.

New York State Office of Parks, Recreation and Historic Preservation (OPRHP)

The OPRHP serves as steward for state parklands totaling more than 330,000 acres at over 220 facilities across New York. The mission of OPRHP calls for safe and enjoyable recreational and interpretive opportunities as well as responsible stewardship of the park system's natural, historic, and cultural resources.

- Through its master planning OPRHP establishes an overarching vision for each park and site, including appropriate public use, facility development and natural and historic resource stewardship. The agency's environmental framework provides direction for present and future agency decisions and actions in regard to the natural resources and environmental quality and management.
- OPRHP has undertaken several initiatives including revitalization of its recreation facilities and infrastructure, natural resource stewardship enhancements, creating connections and enhancing sustainability.

New York State Energy Research and Development Authority (NYSERDA)

In its unique role as a non-regulatory authority, NYSERDA's EBM focus has been on the use of innovation and technology to solve some of New York's most difficult energy and environmental problems in ways that improve the State's economy. Placing a premium on objectivity, NYSERDA uses its resources to help other agencies, municipalities and organizations fulfill their EBM approaches by providing assistance on energy and environmental issues.

- The Environmental Monitoring, Evaluation and Protection (EMEP) is designed to increase understanding and awareness of the environmental impacts of energy choices and emerging energy options and provide a scientific, technical foundation for formulating effective, equitable, energy-related environmental policies and resources management practices.

With its EBM Guidelines funding, NYSERDA funded grants to municipalities, including those in coastal communities, concerned with reducing their carbon footprint and prepare for the effects of global warming.

New York State Office of General Services (OGS)

OGS has substantially integrated EBM principles within several of its programs. It has already incorporated EBM principles into its mission statement, existing policies and business practices, including:

- establishment of a Green Leasing Program that uses a "green" checklist for leasing projects,
- implementation of an award-winning [Alternative Fueled Vehicles Program](#),
- using the Leadership in Energy and Environmental Design (LEED) system for new architectural engineering and construction projects as well as for existing buildings, where applicable,
- coordination with DEC to protect underwater lands in the Hudson River corridor.
- creating a digitized inventory of State-owned lands and conveyed underwater lands along the Hudson River, Long Island Sound and the Atlantic Ocean.

Department of Economic Development (DED)

Department of Economic Development (DED) encourages and supports activities that both strengthen the State's economy and protect and preserve the environment.

DED offers a range of resources to help businesses identify and transform environmental concerns into market opportunities and competitive advantages.

Through its Small Business Environmental Ombudsman (SBEO) program in the Environmental Services Unit (ESU), DED provides New York State businesses with the tools they need to understand and comply with environmental regulations and provides financial assistance for investments in projects that improve business productivity and competitiveness

through enhanced environmental performance.

State University of New York (SUNY)

The State University of New York includes 64 geographically dispersed campuses and comprises the nation's largest comprehensive system of public higher education with a total enrollment of more than 414,000 students. SUNY is involved in local research initiatives as well as projects that extend around the world.

SUNY scientists and researchers have been crucial in building our knowledge of marine and aquatic science, as well as those community and economic issues that are important for the successful implementation of Ecosystem-based Management.

- The Council's Scientific Advisory Group (SAG) was composed of largely of SUNY scientists from a range of disciplines, including ecologists, physical oceanographers, environmental engineers, biologists, social scientists, and economists.
- The New York Marine Sciences Consortium (NYMSC), hosted by Stony Brook University, was formed to be the voice for the marine science community and contribute through research and education to reshaping the state's policies for stewardship of aquatic environments. It consists of 26 degree-granting academic institutions with expertise in marine science.
- The Great Lakes Research Consortium is an organization of [eighteen colleges and universities](#) in New York, and is housed in

housed at the State University of New York College of Environmental Science and Forestry at Syracuse. Its mission is to improve the understanding of the Great Lakes ecosystem, including the physical, biological, and chemical processes that shape it, as well as the social and political forces that affect human impact on the lakes and their associated economic resources.

B. Developing Agency Guidelines to Integrate Ecosystem-based Management into the Existing State Programs

The 2006 statute directed the Council to integrate EBM principles into existing agency programs and laws. The Council conducted an initial inventory of approximately 200 state government programs that manage those human activities that affect ecosystem health. Council agencies initially undertook a detailed evaluation of a number of state programs and drafted guidelines describing how their respective programs were or could be more consistent with EBM principles and offered EBM-inspired recommendations. This critical guidelines work will continue.

The State Programs Evaluated by the Council Included:

- Agricultural Environmental Management (DAM)
- Agriculture Non-Point Source Abatement and Control Grant Program (DAM)
- Soil and Water Conservation Districts (DAM)
- Agriculture and Farmland Protection Program (DAM)

- Great Lakes Regional Collaboration Strategy (DEC)
- Open Space Conservation Plan (DEC)
- Watershed Conservation Program (DEC)
- Hudson River Estuary Program (DEC)

- Appalachian Regional Commission (DOS)
- Building and Energy Conservation Code (DOS)
- Local Government Efficiency Grant Program (DOS)
- Local Waterfront Revitalization Program (DOS)
- Coastal Policies and Consistency (DOS)

- Smart Growth Initiative (DOT)
- Aquatic Connectivity (DOT)
- Integrated Vegetation Management (DOT)
- Climate Change and Energy Efficiency (DOT)

- Master Planning (OPRHP)
- State Comprehensive Outdoor Recreation Plan (OPRHP)
- Open Space Conservation and Connectivity (OPRHP)
- Environmental Management Bureaus (OPRHP)
- Park Operations (OPRHP)

- Environmental Monitoring, Evaluation and Protection Program (NYSERDA)

- Land Management: including a) State-owned underwater lands; b) Transfer of environmentally-sensitive underwater lands; c) Real property inventory and management program (OGS)
- Facilities Management: including a) Energy and water conservation; b) Using energy from renewable sources; c) Stormwater management; d) Green cleaning (OGS)
- Design and Construction of Facilities: including a) Use of Leadership in Energy and Environmental Design (LEED); b) Internal green building council; c) Construction waste management (OGS)
- Leasing Services (OGS)
- Procurement Services (OGS)
- Fleet Services (OGS)

- New York Marine Sciences Consortium (SUNY)

- Pollution Prevention and Waste Reduction (DED)

The following is a subset of recommended agency actions that came out of the guidelines work.

Department of Agriculture and Markets (DAM)

- Partner with USDA-NRCS to develop interim practice standards, allowing for certification of practices that have not been fully incorporated into the Agricultural Best Management Practice Catalog
- Encourage place-based approach to regional planning, as has been successfully achieved by Conservation Districts in the Upper Susquehanna Coalition, the Champlain Watershed Improvement Coalition, and the Finger Lakes – Lake Ontario Watershed Protection Alliance.
- Incorporate EBM criteria into current Soil and Water Conservation district practices and add EBM scoring factors in AEM report card.
- Consider collaborating with the Department of State and the NY Planning Federation on a statewide discussion of planning for agricultural development
- Permanent staff additions are needed to ensure the Department’s Agricultural and Farmland Protection Program responsibilities are met.

Department of Environmental Conservation (DEC)

- Expand the capacity of the observer network to conduct monitoring and track environmental conditions
- Create four “action areas” for implementing Ecosystem-based Management in the Great Lakes: Lake Erie (including the Niagara River); Southwest Lake Ontario (including the Genesee River); Southeast Lake Ontario (including the Seneca, Oneida, and Oswego Rivers); and Northeast Lake Ontario (including the St. Lawrence and Black Rivers); and create an action area for the ocean. Use the Hudson River Estuary Program as a model for implementing EBM in the Great Lakes and the ocean basins.
- The [Hudson River Estuary Program](#) will identify specific opportunities to more fully integrate social and economic factors into their work to enhance and protect Hudson River health and improve the use of performance measures and indicators for tracking progress in meeting goals. Priorities for the Hudson Estuary Program include recovery of signature fisheries, such as shad, water quality improvements to make the river swimmable, conservation of habitat and scenic landscapes, watershed management and building ecological resilience in the face of changing conditions. In 2010, the Estuary Program will adopt a new 4-year Action Plan for the Estuary ecosystem. Coordination of these efforts and alignment of goals and strategies with the Ocean “action zone”

plans, the NY-NJ Harbor Estuary comprehensive plan, and the Hudson River Research Reserve Management Plan is recommended. Alternative funding strategies, such as is envisioned in a proposed Community Preservation Act, could give municipalities additional ways to raise revenue for important natural resource and open space protection.

- Work toward a “whole Hudson” EBM goal, by initiating a Mohawk Valley regional EBM action planning process and seeking implementation funding.
- Work toward developing EBM goals for the Long Island Sound, South Shore Estuary, Peconic Estuary and New York and New Jersey Harbor and seek implementation funding to advance those goals.
- Develop an ecosystem monitoring and assessment program based on indicators that inform adaptive management decision-making, beginning with implementation of the [Northeast Monitoring and Reporting Framework](#), which was developed by 14 northeast states to assess the condition of priority regional resources and measure the effectiveness of conservation actions and environmental improvements.
- Conduct targeted natural resource inventories to identify the location and condition of key habitats and associated species to prioritize the implementation of conservation strategies.
- Adapt habitat conservation and restoration approaches to incorporate EBM principles, addressing broader

ecosystem connections between land, air, and aquatic habitat and human uses.

- Utilize professional literature and existing programs to evaluate potential impacts of climate change on our natural resources which include habitat loss, habitat degradation, change in timing of biological functions, and harm to populations of fish and wildlife. Before advancing possible adaptation strategies, documentation is needed of existing baseline conditions of habitats and species, population trends, and projections of impacts to-date from climate change.

Department of State (DOS)

- Expand the Local Waterfront Revitalization Program as the local delivery mechanism for EBM and Smart Growth principles statewide and strengthen the application of these principles in existing LWRPs
- Revise coastal policies and use coastal consistency requirements to help enforce EBM objectives as they are established through regional and special area programs
- Revise local boundary determination process, expand inventory and analysis to include descriptions of ecosystems for consideration of ecological effects and establish periodic review of approved LWRPs
- Regulate site design and construction in the Building Code and more fully capture building renovation in the [Energy Conservation Code](#)

Department of Transportation (DOT)

- Expand training to communities on smart growth planning to include information on EBM principles, for increased awareness and application to their own comprehensive planning efforts
- Use the Interagency Aquatic connections Team (InterACT) process to ensure that ecological decisions are made in a manner that ensures transportation safety and operational reliability
- Update the [Integrated Vegetation Management \(IVM\)](#) policy and guidance, and continue to investigate new vegetation management products and techniques, and increase the resources available to roadside vegetation managers

Office of Parks, Recreation and Historic Preservation (OPRHP)

- Integrate EBM into master planning process for State Parklands and acquisition decisions for new parcels
- Integrate EBM into the [Statewide Comprehensive Outdoor Recreation Plan \(SCORP\)](#)
- Expand stakeholder involvement in planning and evaluations
- Provide targeted training in Ecosystem-based Management to operational staff as well as other staff throughout the agency
- Adopt policies that provide direction for present and future agency decisions and actions in regard to the management of

natural resources and environmental quality

- Implement the Oceans/Great Lakes Literacy Project (kiosks at Great Lakes State Parks)
- Better integrate Planning and Environmental Management programs through EBM
- Enhance water quality monitoring and predictive modeling at state park beaches and lakes

New York State Energy Research Development Authority (NYSERDA)

- Within the Environmental Monitoring, Evaluation and Protection (EMEP) Program, examine the environmental impacts of alternative energy, climate change, and biofuels to New York State and the broader region
- Increase stakeholder input on specific projects and expand into other sectors, such as K-12 schools, to involve more stakeholders
- Raise awareness, particularly among other agencies and organizations seeking EBM integration, of the products and services provided by NYSERDA

Office of General Services (OGS)

- Position the agency's State-Owned Real Property Inventory Program for use as a centralized database and management tool in the statewide implementation of EBM.

- Increase the use of performance measures and data analysis, in conjunction with other agencies, to monitor the impact of OGS practices and programs that directly or indirectly affect New York’s watersheds and coastal ecosystems.
- Adopt a formal public trust policy for OGS's management of state lands underwater that incorporates the principles of EBM.
- Continue its work in assisting all state agencies to comply with [Executive Order 111](#) by achieving a 35% reduction in energy consumption in buildings they own, lease or operate by 2010 (relative to 1990 levels).
- The State of New York should establish one or more “Excelsior State Seashore” preserves on Long Island, and “Excelsior State Shoreline” preserves at inland water bodies throughout the state to protect wetland and aquatic ecosystems from degradation
- Actively promote and encourage more sustainable practices, such as the use of green cleaning and maintenance products, in all state-leased facilities.
- Utilize procurement as a tool to promote environmental sustainability by developing environmentally-sensitive specifications for commodities, services, and technology, and by training all state purchasers so environmental impact is considered when making purchasing decisions.

State University of New York (SUNY)

- Support research efforts by SUNY faculty to improve our knowledge of ecosystems and ecosystem-based management and create appropriate mechanisms for funding such research.
- Support and implement the recommendations in the Scientific Advisory Group’s Research Priorities Agenda as included in the report.
- Provide support to the Great Lakes Research Consortium (GLRC) and the newly created New York Marine Sciences Consortium (NYMSC) and use these organizations to foster collaborative research efforts and promote education.
- Encourage the GLRC and NYMSC to each host an annual conference that focusing on the status of NY marine, estuarine and Great Lakes ecosystems. Such forums would be open to scientists, managers, agency professionals, and the stakeholder communities to increase general knowledge and provide for exchange of ideas.

Department of Economic Development (DED)

- Prioritize projects that result in environmental improvements and associated economic benefits

C. EBM Projects Supported by the Environmental Protection Fund from State Fiscal Years 2006-2007 and 2007-2008

In addition, all of the agencies have been actively engaged in implementation projects funded by the SFY 2006-2007 and 2007-2008 Environmental Protection Fund that seek to improve ecosystem health. These projects are listed below.

New York State Department of Agriculture and Markets (DAM)

- Undertake a Conservation Riparian Buffer Initiative in the Sandy Creeks watershed to install streamside buffers and critical reaches of two streams to improve water quality. This two year project also matched federal assistance dollars for development of work program. \$250,000 (2007-2008, Sandy Creeks)
- Agency Guidelines to integrate EBM policies and principles into agency decision-making processes and day-to-day activities have been completed for 4 programs that manage human activities affecting ecosystem health. \$100,000 (2007-2008)

New York State Department of Environmental Conservation (DEC)

- A pilot [Marine Fishery Observer Program](#) is being designed and will be implemented to conduct sampling aboard commercial trawl and gill net vessels to generate critically necessary data to better estimate bycatch in commercial fishing operations. The

project will focus on Atlantic sturgeon, American shad, river herring, scup, winter flounder, and butter fish and protected resources. \$75,000(2006-2007)

- The Seagrass Task Force will deliver its report in December, 2009. The work includes research (e.g., examining the impacts of groundwater quality on seagrass) and monitoring and restoration activities (e.g., restoration off Caumsett State Park) to preserve and enhance submerged aquatic vegetation populations and meadows. Includes publication of Seagrass Long Island. \$325,000 (2007-2008)
- Large Whale Passive Acoustic Monitoring project, in partnership with Cornell University's Bioacoustics Research Program, will generate marine endangered species distribution data in New York's nearshore waters to provide information about how various whale species use New York's marine ecosystem and how their survival may be impacted by human activity. \$100,000 (2007-2008).
- Winter Flounder Study in Long Island Waters is estimating the natural and fishing-related mortality, growth and movement patterns of young of the year and of the inshore adult population. Will estimate change in population based upon salinity and temperature. \$125,000 (2007-2008); \$125,000 (2006-2007)
- A continuation of on-going [Atlantic Coastal Cooperative Statistics Program](#) (ACCSP) intended to fully implement and maintain ACCSP standards for

vessel and dealer reporting, data delivery, and biological sampling in New York's commercial food fish fisheries; and to expand the universe of ACCSP standard reporting requirements to include New York's crustacean, baitfish, and Hudson River commercial license holders; through Cornell Cooperative Extension. \$275,000 (2007-2008)

- Through the Atlantic States Marine Fisheries Commission, a continuation of [Northeast Area Monitoring and Assessment Program \(NEAMAP\)](#) fishery survey will generate critically important fishery data, independent of commercial landings that will be used to improve management science. This trawl survey will supplement existing NMFS survey data, and will estimate biomass, length and age structures, and diet compositions of finfishes and selected invertebrates in the study area. \$275,000 (2007-2008)
- Phase 1 of Lake Ontario Near-Shore Nutrient Investigation, in partnership with four SUNY universities, Cornell University, Niagara University, and various Canadian agencies and colleges, will identify and describe nutrient dynamics in Lake Ontario's near shore waters over three years to determine the causes of increasing toxic and nuisance algal blooms impacting Lake Ontario beaches. \$100,000 (2007-2008)
- Agency Guidelines to integrate EBM policies and principles into agency decision-making processes. These funds will support the preparation of guidelines evaluating how DEC can incorporate EBM principles into agency programs, as well as other activities in

support of the Council. \$140,000 (2007-2008)

- Fishery Monitoring in Great South Bay conducted analyses to determine the level of sampling required to develop robust estimates of abundance and biological rates for finfish and shellfish in the Bay. A survey design is needed since a long-term survey database is lacking. \$75,000 (2006-2007)
- Peconic Bays Habitat Protection through the integration of Peconic Estuary data sets (i.e. fish trawl, water quality and benthic mapping) to better understand the habitat-animal relationship in the Peconic Estuary. \$150,000 (2006-2007)

New York State Department of State (DOS)

- Agency Guidelines to integrate EBM policies and principles into agency decision-making processes and day-to-day activities have been completed for 5 programs that manage human activities affecting ecosystem health. \$35,800 (2007-2008)

Rather than undertake agency-specific projects, DOS has and will continue to allocate its funds to the following Council-wide activities on behalf of all Council agencies:

- DOS and the Council's Technical Working group have developed the Council's Ocean and Great Lakes Atlas. Work is ongoing to continually expand the data and deliver and maintain a high quality tool for all New Yorkers to easily access information and to inform decision making. \$500,000 (2007-2008); and \$720,000 (2006-2007)

- DOS serves as the Executive Director of the Council and houses the Council staff. It therefore was instrumental in contracting and managing several projects to achieve the tasks required by the Act. For example, two demonstration projects (described below) were undertaken under contracts with the Tug Hill Commission and the Nature Conservancy. \$775,000 (2007-2008) and \$700,000 (2006-2007) (funds for Demonstration Area projects)

New York State Department of Transportation (DOT)

Leveraging funds from the Federal Highway Administration Eco-Logical grant program, DOT will oversee an applied research project with Tioga County Soil and Water Conservation District. The project will pilot a watershed/ecosystem approach in the Susquehanna Basin and the Finger Lakes/Lake Ontario Basin. \$100,000 (2007-2008)

New York State Office of Parks, Recreation and Historic Preservation (OPRHP)

- OPRHP has developed educational exhibits and materials on ocean literacy, EBM and conservation which have been placed at key State Park facilities along the Atlantic shore. Background research on sea turtle conservation and the type and extent of resources sought by sea turtles in Long Island while foraging, nesting and migrating, has guided the educational panels. This background research will help to inform future conservation efforts. Many on-the-ground watershed and coastal ecosystem health projects, such as invasive species control, have been implemented and

completed. Pilot approaches to training of regional staff in the concepts of EBM have been initiated. \$125,000 (2007-2008)

- Agency Guidelines to integrate EBM policies and principles into agency decision-making processes and day-to-day activities have been completed for 5 programs that manage human activities affecting ecosystem health. \$100,000 (2007-2008)

New York State Energy Research and Development Authority (NYSERDA)

- NYSERDA, through the FOCUS on Local Government program, will assist local governments with climate change response and help communities reduce their environmental footprint and lower their energy costs. \$100,000 (2007-2008)

New York State Office of General Services (OGS)

- An Underwater Lands Mapping Project will locate infrastructure and navigational ways on all previously granted lands on State owned underwater lands. This information will be placed on the Council's Atlas and help to gain capacity needed to plan for and site offshore uses. \$25,000 (2007-2008)
- An analysis of the Public Trust Doctrine to identify opportunities for improved capacity of New York State to make determinations on various underwater land proposals. \$25,000 (2007-2008)
- Agency Guidelines to integrate EBM policies and principles into agency

decision-making processes and day-to-day activities have been completed for 6 programs that manage human activities affecting ecosystem health. \$75,000 (2007-2008)

Department of Economic Development (DED)

- DED is developing a green business plan for Rodman landfill in the Sandy Creeks watershed. The plan will develop new business and job opportunities that use low cost thermal energy that will advance the cause of alternative energy in New York and create jobs. \$150,000 (2007-2008)
- Agency Guidelines to integrate EBM policies and principles into agency decision-making processes and day-to-day activities have been completed for two programs that manage human activities affecting ecosystem health. \$100,000 (2007-2008)

State University of New York (SUNY)

- The Great South Bay Modeling project is building an ecosystem model of the Great South Bay for use in evaluating and guiding restoration efforts, with first year efforts centering on the development of model components (circulation, trophic levels, etc.) in an effort to accurately represent the spatial-temporal variability and critical food web components. \$325,000 (2007-2008)
- Lead the Scientific Advisory Group (SAG) charged with the development of a New York Ocean and Great Lakes Ecosystems Research and Monitoring Agenda to identify priority issues and assist in the

development of a strategy for the ocean and Great Lakes Observing System programs \$200,000 (2007-2008) and \$38,000 (2006-2007);

- Support the newly established New York Marine Sciences Research Consortium to serve as the voice for marine research and education and advance marine research priorities in the State. \$100,000 (2007-2008)

D. Establishing Principles to Align Council Agencies

The people of New York rely on coastal ecosystems to provide many services, from energy to drinking water. As the health of these systems decline, so does their ability to support local communities and economies. The Act established an overarching policy of managing human activities and natural resources within an ecosystem context and provided guiding principles for taking an EBM approach. Ecosystem-based Management is comprehensive and integrated across issues and sectors. It should form a coordinated management umbrella for State agencies that manage those human activities with the greatest effect on ecosystem health.

New York State, for example, has already seen great successes in the regional coalitions of Soil and Water Conservation Districts. Supported by nine partner agencies, the statewide Soil and Water Conservation Committee has created successful integrated conservation management coalitions such as the Upper Susquehanna Coalition, the Champlain Watershed Improvement Coalition of New York (CWICNY), and the Finger Lakes – Lake

Ontario Watershed Protection Alliance (FLOWPA).

In addition to EBM, New York has embraced a Smart Growth approach to land-use and development. Smart Growth and EBM are reinforcing approaches, emphasizing the local nature of many ecosystem challenges and encouraging sustainable practices.

These two initiatives embody principles that support more comprehensive and coordinated approaches to managing human activities. As a next step, the Council will combine these into a set of shared principles that can guide future agency actions and advance the agendas of both EBM and Smart Growth in New York. Through a commitment to these principles, State agencies will work more closely together and in better partnership with local governments to create a sustainable future.

E. Establishing a Research Agenda

Better knowledge of the interconnections and feedbacks between all components of an ecosystem is crucial to make accurate predictions of change, evaluate risks, or develop and implement management practices. It is essential to improve the base of scientific information about the Ocean and Great Lakes ecosystems in order to properly support the effective implementation of actions that are intended to maintain or improve ecosystem health.

Steps to Meet the Challenge

The Council is committed to developing a research and monitoring agenda that

includes identification of broad physical, chemical, biological, and social science issues affecting the management of the Ocean and Great Lakes ecosystems. To accomplish this, the Council appointed a Scientific Advisory Group (SAG), composed of 19 scientists from a range of disciplines, including ecologists, physical oceanographers, biologists, social scientists, environmental engineers, and economists. Each council agency and aquatic or estuary program then submitted its EBM research and monitoring priorities. These recommendations, along with science priorities in relevant literature and reports, including the National Ocean Research Priorities Plan (2007) and the New York Sea Grant (2007) report on the demonstration areas created by the Act, were included in a draft priorities plan. This draft plan outlined four research themes and an initial list of 117 potential research priorities that could be applied across a range of ecosystems.

In April 2008, the SAG held a series of four statewide full-day workshops where scientists, resource managers and agency staff provided feedback on the draft priorities plan. Guided by this input, the SAG issued a final report describing its suggestions for research and monitoring objectives and priorities, included in the appendices to this report.

Defining New York's Ocean and Great Lakes Ecosystems

As part of their deliberations, the SAG defined the major marine, estuarine, and Great Lakes ecosystems that exist in New York State. Marine and estuarine ecosystems include the Continental Shelf, Long Island Sound, Peconic Estuary,

lagoonal bays located on the south shore of Long Island, along with the Hudson River estuary (including the Mohawk River and the upper Hudson River) and the watersheds that drain to marine waters. Great Lakes ecosystems include offshore waters, nearshore waters, river mouths, drowned river mouths, attached ponds and embayments, the Niagara River and the St. Lawrence River and their tributaries and the watersheds that drain into the Great Lakes.

Research required for EBM

While each ecosystem possesses unique features, they also share some similarities in the services they provide and the threats they face. An approach that builds from these common areas, while also recognizing the unique features of each ecosystem, will advance ecosystem knowledge more rapidly. The SAG identified the following proposed research priorities as necessary to advance EBM in New York across all aquatic systems.

Research Theme 1: What are the ecosystem's structures, functions, and services? This will provide a model of the ecosystem and its value to society.

Research Theme 2: How has the ecosystem changed, and why? This provides an understanding of the drivers of ecosystem change.

Research Theme 3: How do we forecast future ecosystem states? This builds the capability to predict future ecosystem states and prescribe corrective actions necessary to avoid undesirable future scenarios.

Research Theme 4: How do we as a society resolve competing human uses, and create a governance system that can effectively implement EBM? This involves strategies that will enable society to develop sustainable living practices as both an integral part of the ecosystem and as its steward.

F. Creating an Ocean/Coastal Resources Atlas

The acquisition, creation, dissemination and maintenance of spatial information and related tools are critical to implementing EBM. The Act recognized the value in making this information more readily available to the public and decision-makers by requiring the development of "an ocean and coastal resources atlas."

Agency Collaboration and Partnerships

The Council established a Technical Working Group composed of representatives from each of the Council agencies to guide the collection of information and methods for distribution of data. This group was instrumental in developing the Atlas and identifying data collection priorities.

As part of the Atlas effort, the Council asked hundreds of organizations to share their social, economic, and environmental digital data on New York State's ecosystems. As a result, more than 1,200 data sets now are housed in a "Digital Data Repository" as of October 2008. Collection of data for the repository is an ongoing effort, currently focused on filling critical data gaps. An online data catalog was developed to allow

users to search information collected in the data repository.

The Council has signed a Memorandum of Agreement with the National Oceanic and Atmospheric Administration's Coastal Services Center to provide technical support and access to contractors. Data being created through this agreement includes mapping of land-use, impervious surfaces, landscape characterization, and benthic habitats.

To ensure that critical ecosystem information is being made available to potential users, the Council invited stakeholders to identify data gaps and priorities, through an online survey held in February 2008 and a priority data needs workshop held in April 2008. For a full report summarizing results of these two stakeholder efforts, see the Data Priorities Workshop Results and Analysis document in the appendices to this report.

Meeting the Requirements of the Act and Needs of New Yorkers

The Council created a unique information source through the on-line Atlas (www.nyogatlas.com) that allows users to build maps by selecting features of interest, print maps and download information into GoogleEarth or two different software packages.

G. Demonstrating Improvements in Two Study Areas Using EBM

Background and Setting

The Act established two demonstration areas, the Great South Bay on Long Island

and the Sandy Creeks Watershed on the eastern shore of Lake Ontario, to gain on-the-ground experience in applying EBM. These areas have served as learning laboratories for the Council agencies to collaborate on various approaches to EBM planning and implementation. The goal is to apply lessons learned as the Council begins to implement EBM statewide.

The two demonstration areas have contrasting landscapes, communities, and economies. Great South Bay is a water body steeped in maritime tradition, surrounded by a densely populated urban/suburban mainland and a barrier island complex that includes the Fire Island National Seashore. The Sandy Creeks Watershed is a rural, working landscape with small communities and headwater tributaries that run through significant stands of northern hardwood forest and agricultural lands.

The Great South Bay is legendary in New York State history for its oyster and hard clam fishery. Since the 1970's, the health of the estuary has declined dramatically. Great South Bay is confronted by numerous challenges, such as fishery declines, water quality problems, brown tide, land use change, and invasive species.

The Sandy Creeks Watershed forms a gradient from an important freshwater dune/wetland/pond complex to a large expanse of highly productive agricultural lands to water-rich forested headwaters on the Tug Hill Plateau. Local communities rely on the area's natural resources to support the regionally important dairy and forestry industries and to provide economically significant recreational opportunities.

Progress to Date

A steering committee oversees project development in each demonstration area. Members of the committee include the NYS Department of State Division of Coastal Resources, NYS Department of Environmental Conservation, The Nature Conservancy (TNC), and a place-based program in each region (the South Shore Estuary Reserve Council in Great South Bay, and the Tug Hill Commission in Sandy Creeks). Each project area was designed to address known problems and to learn how EBM might be applied.

In Great South Bay, implementation efforts focused on hard clam and sea grass restoration activities. In addition, nitrogen loads and levels were studied and assessments of management options were conducted. EBM planning in Great South Bay was spearheaded by TNC which produced a comprehensive technical report and recommendations, entitled *An Ecosystem-based Management Plan for the Great South Bay Demonstration Area*. The document includes an assessment of the Great South Bay ecosystem, using the CAP process to identify surrogates, ecological indicators, and threats.

In 2007, a stakeholder outreach process was initiated, presenting a summary of progress on the Great South Bay report. The reports and projects will be used to continue to engage stakeholders in a broad discussion of how to manage Great South Bay according to EBM principles. The technical report will be an important scientific basis and reference document for stakeholders, agencies, managers, and decision-makers in general, for identifying priorities for action.

In the Sandy Creeks Watershed, a number of implementation projects are ongoing, including an aquifer study, recreation projects, education and outreach kiosks, and the Heritage Program's work to map and locate priority biodiversity hotspots in the area. In addition, an invasive species control program is targeting two aggressive plants that are altering the landscape and threatening the health of the ecosystem: swallow-wort and purple loosestrife. To support the control of all invasive species, work is being done to locate, map, and inventory the distribution of invasions. An electronic database containing location and species data is being produced, allowing all agencies, partners, and the public access to the information.

Stream bank plantings were installed on five farms to help stabilize the banks and to improve water quality and fish habitat. The project partnered the Department of Agriculture and Markets and the Jefferson County Soil and Water Conservation District to select the critical locations for immediate efforts and conduct an inventory and analysis to identify additional stream banks in need of stabilization. Monitoring of the installed buffers is being conducted to measure improvements in water quality.

In 2007, the Department of Environmental Conservation and the Jefferson County Soil and Water Conservation District worked together to restore a section of Skinner Creek, improving the stream bank and markedly decreasing soil erosion. Several site visits in 2008, including two during sizable rain events, demonstrated that the work performed substantially improved the riparian area.

Two forestry workshops shared the latest best forest management practices with foresters, managers and landowners. The workshops included classroom and field components, introducing a range of best management practices about how to identify and minimize impact on sensitive wetland areas. Participants learned how to construct portable skidder bridges that are now being used to cross streams during harvesting. Over fifty foresters attended the workshops.

Technical reports for the Sandy Creeks watershed were developed as resources for future EBM efforts in the region. These included a *Baseline Conditions Report* and a *Sandy Creeks Watershed EBM Strategy*, which will provide future guidance to stakeholders and managers. Stakeholder meetings were held to engage the local community in the project, followed by smaller focus group meetings with individual stakeholder groups. The results from these meetings were presented at an open-invite assembly at which stakeholders articulated their vision and priorities for the ecosystem. This information informed the recommendations for this report and the next steps for the demonstration area.

The demonstration projects have been useful learning laboratories for applying EBM principles to multi-stakeholder and multi-sector landscapes. The lessons that these pilots offer for applying EBM at a regional, multi-jurisdictional scale, such as the Great Lakes basins and the ocean coastal region, include:

- Ecosystem-based Management plans need to be developed through an effective stakeholder engagement process in order to produce a consensus

vision of issues and ecosystem goals - this will improve the chances that plans are implemented and local partners get involved;

- Inclusion of the scientific community and diverse user groups will help to ensure that the plan's ecological integrity is solid;
- Using a small steering committee can be an effective coordination tool to ensure that the project stays on course;
- As a science-based document, an EBM plan must be iterative and adaptive - it should be revised as further information becomes available or conditions change;
- A commitment to adequate funding for implementation is critical for progress and continued trust with stakeholders - it helps to see tangible results; and
- EBM requires taking a long-term view - actions will need to take place over the long-term, with a commitment of governmental and non-governmental partners.

H. Recommend Actions to Restore and Protect Submerged Aquatic Vegetation

The Act required the Council to recommend measures to preserve and enhance submerged aquatic vegetation populations and meadows. Given the importance of seagrass for fish habitat and the significant declines in seagrass beds, particularly on Long Island, the New York State Seagrass Task Force was established by an act of the Legislature in 2006. This Task Force was

charged with identifying and assessing the severity of various threats, developing restoration goals, recommending short-term and long-term research and monitoring, and proposing management, public outreach and education tools. The expectation was that the Task Force would have completed its analysis and issued its report in time for this report but the Legislature extended the deadline for the Task Force report until December 2009. The Council will rely on the Task Force report to meet this requirement of the Act.

DRAFT

Part II: PRIORITIES TO ACHIEVE HEALTHY ECOSYSTEMS IN NEW YORK

The Ocean and Great Lakes Ecosystem Conservation Act directs the Council to define and implement an adaptive approach to “ensure the coexistence of healthy ecosystems with human activities.” The Council’s work has built on the premise that healthy ocean and Great Lakes ecosystems are essential to the continued vitality of New York’s communities. Ecosystem-based Management requires the integration of the human and natural components of ecosystems, including our communities, human uses and economic activity, into approaches to restoring ecosystem health.

The Council has identified five integrated categories of priorities that respond to underlying issues and challenges of the Great Lakes and ocean ecosystems. These broad categories are forward-looking and goal-oriented, and when taken as a whole, would lead to healthier ecosystems over the long-term. Part III of this report lists a suite of recommended actions that are built from these priorities:

- **Water and Land:** affecting patterns of resource use and protecting biodiversity in the offshore and estuarine environments, the coastal transition zone, and upland watershed areas;
- **Economy:** enhancing vitality and community well-being;
- **Climate Change:** reducing pollution that causes climate change and developing adaptive responses to its impacts;

- **Energy:** emphasizing energy conservation and the importance of developing local, alternative sources of energy; and
- **Building Capacity:** strengthening the ability of partners and collaborators to implement EBM.

Water and Land: Managing Natural Resources, Human Activities and Environmental Quality

Achieve healthy ecosystems that meet human needs and interests in New York’s interconnected marine, freshwater, and terrestrial environments.

Traditionally, resource management has focused on addressing distinct environmental problems, such as individual sources of pollution, and managing wildlife populations and human activities on a sector-by-sector and species-by-species basis. As a result, the cumulative effects of independent, sometimes highly localized decisions can be overlooked or discounted. Conversely, decisions that are statewide or coastwide in nature can overlook or discount unique local circumstances or knowledge. The many connections among air, water, plants, animals, and land within New York’s ecosystems, along with the impact of human activities, require integrated approaches that will lead to healthy ecosystems over the long-term. The results of fragmentary actions include imperiled fisheries, loss of habitat, declining water quality, upland land use conflicts, underwater (offshore) land use conflicts,

Great Lakes water management concerns, and the spread of invasive species.

By taking coordinated action within a broad, shared vision, agencies and other decision-makers can account for the linkages between aquatic environments and their associated watersheds. Place-based management integrates aquatic conditions and issues with those in their associated terrestrial ecosystems. It should operate at the appropriate ecosystem scale, or scales, to prioritize implementation measures. This can mean taking actions at each or any level, from local to global. Measures to address key ecosystem stressors, such as pollution or invasive species, as well as preventative or protective measures, would allow for the sustainable use of natural resources and maintain ecosystem services that are important for New York's future. The local nature of many of these measures will require an emphasis on regional collaboration, public-private partnerships, working with local government and the involvement of stakeholders.

Priorities:

Manage Multiple Uses in Offshore Environments - New York's ocean and Great Lakes offshore areas face increased, and sometimes competing, uses of finite resources and spaces. Decisions often fail to take into account the interconnections within ecosystems. Integrated spatial plans should be developed for management of current and potential offshore uses to help achieve sustainable use and development of the ocean and the Great lakes and to protect sensitive areas. Taking an EBM approach to managing offshore human activities would help to safeguard important ecological processes and

maintain biodiversity, and could provide, within our current knowledge, the sustainable use of the resources of those waterbodies. Such a planning effort should seek to identify, protect, and restore important components of coastal and marine ecosystems, including critical habitats and biodiversity. This should include undertaking mapping to identify critical benthic and fishery habitats. Planning should be done in a manner that maximizes compatibilities among sectors and avoids or minimizes conflicts. Uses that would need to be accommodated include transportation, fishing, energy generation and distribution, and recreation.

Use a Regional Approach to Establish Place-Based Ecosystem Goals and to Implement Priority Actions - Regional ecosystem-level implementation should be strengthened and expanded in New York to offer integrated frameworks to enhance the health of specific ecosystems and the range of specific human activities affecting them. Structuring EBM planning and implementation at a "landscape" or regional scale provides the advantage of being able to consider common variables, geographic features and history and ecosystem connections.

Regional EBM efforts should be organized around easily recognized physiographic regions such as the Great Lakes. The Great Lakes region will include Lake Erie (including the Niagara River); Southwest Lake Ontario (including the Genesee River); southeast Lake Ontario (including the Seneca, Oneida, and Oswego Rivers); and Northeast Lake Ontario (including the St. Lawrence and Black Rivers. The Ocean region will stretch from metropolitan New York City along the south shore of Long Island to the eastern

end of Long Island and will include and build on the estuary programs of Peconic Bay, Long Island's South Shore, and New York Harbor. These offer the advantage of having shared concerns, culture and history, but also commonalities and interconnections that might not be addressed through a one-size-fits-all state-level approach. Since many people have a sense of place within their respective regions, the ability to engage multiple stakeholders to solve problems should be enhanced. Using this form of place-based EBM, New York would be able to establish a long-term approach that takes into account the cumulative impacts of multiple important human activities on individual ecosystems, as well as the effects of long-term environmental changes in each unique setting.

Each regional program should seek to incorporate into their action planning efforts of existing estuary, watershed and other related programs within their boundaries and should take into consideration natural, social, and economic factors from outside the individual regional programs' boundaries.

Enhance Local Planning and Protection in Coastal Transition Zones - In all coastal areas, development has increased, human use of coastal resources has pushed further offshore and upland, and the needs and interests of people, habitats, plants and animals are competing within an increasingly limited space. Working with local governments, planning efforts should seek to improve the health and resiliency of coastal transition zones between offshore and onshore areas, while recognizing the strong linkages between the land and water. This should include a consistent and science-based approach to land-use

planning in coastal areas that are within the range of projected water-level fluctuations, including impacts from climate change (e.g., sea level rise and increase in severe storms).

Minimize Effects of Upland Development on Ecosystem Health – Local land use and related development decisions have significant impacts on ecosystem health. To lessen adverse ecosystem impacts from human activity, capacity needs to be increased for integrated land-use planning that considers EBM, smart growth, open space conservation, source water protection, wildlife migration routes, heritage conservation and development, and greenhouse gas reduction strategies.

Protect Sensitive Coastal and Offshore Habitats - Due to the significant ecosystem services provided by these areas, the Council should support management measures that comprehensively protect and restore sensitive coastal and offshore habitats.

Restore Marine and Great Lakes Fisheries – New York's fisheries remain in peril. In response, management approaches to fishery and other marine resources require enhancing data collection and monitoring activities and a determination of restoration and management goals. Important objectives should be the reduction of accidental catches of non-targeted species during commercial fishing (known as bycatch); an improved understanding of biodiversity; protection of sensitive habitats; understanding and minimizing impacts of fish diseases and other stresses; and management to achieve sustainable catches.

Support EBM Approaches to Managing Great Lakes Water Levels – The State should encourage water level management alternatives that use EBM strategies to achieve ecosystem restoration and social and economic benefits. These include restoring biodiversity to areas affected by previously static water levels and providing adequate resources to address future property damage. The strategies must address water availability for consumption; waterfront development; shoreline erosion; property damage; public access; recreation and habitat restoration.

Manage Invasive Species – In response to the growing problem of invasive species that can cause harm to the environment or to human health, legislation was passed in 2003 that called for the establishment of an Invasive Species Task Force to analyze existing efforts, to identify needs, and to develop recommendations. The Task Force submitted its report to the governor and legislature in November 2005. As a result of the recommendations in that report, a permanent Invasive Species Council was created, and major strides have been made in meeting most of the report recommendations. These efforts and coordinated programs, such as Partnerships for Regional Invasive Species Management (PRISMs), should be continued as mechanisms to protect against invasive species, respond to early detection of invasives and manage, to the degree feasible, invasive species that have become established.

Reduce Point, Combined Sewer Overflow and Non-Point Sources of Contamination and Pollution – Many land-based impacts derive from the pattern of human development across the landscape, as well

as from specific sources of pollution or contamination. Control of land and air sources of nutrient pollution is critical, particularly those of air-borne and stormwater sources. The State should make targeted efforts to virtually eliminate toxic substances and emerging pollutants from Great Lakes waters and sediments, particularly within designated “Areas of Concern”, tributaries, embayments and harbors. Another key priority is making targeted investments in wastewater treatment infrastructure to address water quality impairments and upgrade New York’s aging infrastructure in a manner that achieves water quality, while also supporting smart growth and Ecosystem-based Management goals by implementing policies and programs to encourage low-impact development, green infrastructure, distributed power generation and walkable communities.

Riparian Buffers - Riparian (streamside) buffers are critical to maintaining healthy streams and waters. Their conservation is a major element of any holistic watershed program. Riparian areas are often severely damaged during the land development process, leading to unintended negative impacts to streams and rivers. Composed of trees, shrubs and grasses, these buffers help to reduce pollution entering waterways by slowing down and filtering runoff, thus extending retention time and improving water quality. Buffers also help to reduce flooding and erosion by stabilizing shorelines and absorbing high velocity flows. In addition, they serve an important role for wildlife as a shoreline transition zone and travel corridor, increase overall biodiversity and improve in-stream health.

Economy: Achieving Economic Vitality and Community Well-Being within the Context of Healthy Ecosystems

Promote economic growth and community development, recreational activities and other human use activities in a manner that achieves ecosystem health.

New York's ocean and Great Lakes communities face many long-term and emerging challenges that must be met to achieve a sustainable economic future. These challenges include changes and transitions within State, regional, and national economies; distressed urban centers; a legacy of pollution and environmental contamination in some of New York's older industrial communities; climate change; inequities in access to opportunities; aging infrastructure; and changing rural economic conditions.

The coastal and offshore resources upon which these communities rely are similarly impacted by these challenges. The continued ability of New Yorkers to rely, in part, on these resources requires a comprehensive approach to their restoration and maintenance, many of which are in a degraded condition. Pressures on fishery stocks are widespread and poorly understood, threatening to further depress the state's fishing industry. Commercial navigation and related activities can have damaging environmental impacts. For example, dredging can spread toxic sediments or impair sensitive habitats, discharge of ballast water can propagate the spread of invasive species, and navigation through areas of high marine mammal density can lead to collisions with

threatened or endangered species. Taken together, the pollution legacies of past industrial activities, the degradation of aging storm water and sewage treatment infrastructure, combined sewer overflows, and impacts from agricultural activities, have all contributed to chronic water quality issues. Poor water quality in turn limits the state's tourism potential, necessitating beach closures that are estimated to annually cost New York tens of millions of dollars each year.

Addressing these ecosystem challenges would greatly enhance the economic well-being of New York's communities. Emphasis should be placed on actions that can promote community growth and quality of life in ways that can achieve ecosystem health and are sustainable over the long-term. The State should also encourage the growth of emerging industries of the 21st Century, creating economic growth by capitalizing on New York's valuable natural, cultural and intellectual assets.

By fostering green and healthy communities, New York will be able to accomplish its multiple goals of sustaining the environment, the economy and the dynamic human social and cultural fabric; and making New York a more desirable place to live and work. The actions necessary to accomplish these goals will require the involvement of all components of our society, including government and the private and non-profit sectors.

Priorities:

Promote Smart Growth – New York should continue its activities through the Governor's Smart Growth Cabinet to help municipalities, regions and the State adopt

planned, efficient growth mechanisms. Such mechanisms help integrate sustainable community and economic development goals by preserving and enhancing the built and natural environments. They also encourage growth in developed areas with existing infrastructure, particularly in municipal centers, downtowns, urban cores, historic districts and older suburbs adjacent to cities.

Maintain Working Waterfronts -

Maintaining sustainable port and harbor usage, public access (including dockage) and related navigation activities will increase the vitality of New York's coastal communities and improve on economic and recreation opportunities. Activities should be integrated with New York's marine spatial planning and management efforts and related ecosystem goals. Develop dredged material management plans to ensure proper use of dredged material from navigational dredge projects. Ensure dredging windows support and protect natural resources during dredging operations.

Promote Sustainable Natural Resource Use and Extraction -

New York is fortunate to have many valuable natural resources that provide important jobs and economic benefits for communities throughout the State. The productive use of lands, soils and mineral resources should be conducted in a manner that acknowledges the non-renewable nature of these resources and employs best management practices. Users of renewable resources such as water, forests and fish and shellfish should employ sustainable practices that support economically viable operations while also meeting environmental and Ecosystem-based Management objectives. Best

management practices for agriculture should continue to be encouraged.

Promote Tourism – New York should encourage tourism opportunities that capitalize on the State's rich collection of parks, State and National heritage areas, public lands and waters, and historic, cultural and agricultural resources. Approaches should reflect economic development (including development of heritage assets) and resource protection goals, and should be integrated with spatial planning efforts to improve access for visitors in coastal areas.

Develop Environment-based Industries –

The State should provide assistance to companies to develop green products and technologies and to include pollution-reduction strategies in their business operations. This should include such methods as process modifications; materials and fuel substitutions; waste minimization; recycling; and energy conservation.

Revise the State Investment Strategy -

New York State agencies should adopt principles to guide sustainable economic development and conserve and enhance the environment. These principles should include and integrate Smart Growth; Ecosystem-based Management; regional economic development; and infrastructure priorities, and should provide guidance for the strategic investment of existing resources. The Ocean and Great Lakes ecosystem offer a place to pilot these principles.

Re-develop Brownfields – The clean-up and re-development of formerly contaminated sites which abound in coastal areas should

be facilitated. A comprehensive approach should be promoted that takes advantage of the numerous programs available, such as the Environmental Restoration Program, Brownfield Cleanup Program, Brownfield Opportunity Areas, Superfund, RCRA, oil spill programs and Empire Zone Tax Credits. This should be examined in conjunction with development of dredged material management plans calling for the beneficial reuse of dredged material.

Ensure Environmental Justice - All communities in New York should enjoy the same degree of protection from environmental and public health threats and equal access to the decision-making process as ecosystem priorities are established and implemented. Council activities should seek to both reduce environmental burdens and target benefits to under-served populations or areas struggling with disproportionate burdens.

Climate Change: Adapting to Dynamic Coastal Ecosystems

Address the causes of global climate change and respond to environmental change, particularly sea-level rise, in a manner that allows the State and municipalities to implement an adaptive approach.

New York's ocean and Great Lakes ecosystems have always been dynamic, changing places, and human influences have introduced uncertainty into this natural variability. The impacts of climate change and corresponding fluctuations in sea and lake water levels are likely to affect many sectors of New York's government, natural resources, and economy. These include disruptions or impairments to

transportation systems, freshwater supplies, wastewater treatment facilities, shoreline habitats and other infrastructure. Shifts in the biological, physical, and chemical attributes of New York's coastal ecosystems - along with a redistribution of species and habitats - will affect ecosystem health and function, agriculture, coastal infrastructure, commercial and recreational fishing, and tourism.

The combination of natural variability and human-induced changes will pose significant challenges to coastal communities and to the state and local governments responsible for maintaining infrastructure and preserving ecological, economic and public health. A planning strategy that assumes a constant environment or that relies on models based only on previous trends will fail, because it does not contemplate and cannot accommodate such unpredictability.

Through the coordination of governmental efforts, New York can continue to build its capacity to deal with ecosystem changes and to track key ecosystem targets. The Council should work in concert with the Sea Level Rise Task Force and the State's Office of Climate Change, and with other levels of government to integrate more stakeholders and a broader set of issues into existing planning and adaptation efforts, to reflect the local nature of environmental changes. This effort should allow managers to identify emerging challenges, set and adapt a course of action, and measure relative progress in achieving management objectives.

Priorities:

Reduce Greenhouse Gas Impacts – A comprehensive approach to reducing greenhouse gas effects should be promoted, addressing the causes and impacts of emissions. To reduce the creation of new greenhouse gas sources, agencies should assess relevant emissions within their review processes for proposed projects. All cost-effective options should be pursued to reduce emissions from the transportation sector (35% of emissions) by providing transportation choices, investing, as much as feasible, in transit and other alternative modes, vehicle efficiency, and alternative vehicle technology, and developing land use patterns that facilitate transportation alternatives, such as mass transit or walking. Investigate options for slowing greenhouse gas influences on climate change, including carbon sequestration mechanisms, appropriate bio-fuel and other renewable energy technologies, and incentives such as carbon credits for forest management and reforestation. All agencies should adapt their management strategies to help protect ecosystems as changes occur (e.g. wetlands, inundation zones, connections into and across north – south and elevations, etc.).

Prepare Local Communities for Ecosystem Changes – Management strategies for community responses to changes, based on scientific information and analysis, should be developed and adapted to reflect current and projected environmental conditions. These strategies should build local capacity to deal with predicted ecosystem changes, including the development of climate change impact scenarios and integrated adaptation

strategies that will prepare communities and local governments for predicted ecosystem changes. The strategies should broadly address the multiple alternatives involved in adapting to sea level rise or lake level change, including managed retreat and the potential need for desalination for municipal water supplies. Based on the continuing analysis of this information, New York should establish new policies for post-storm redevelopment.

Identify and Prioritize the Protection of Coastal Habitats – In light of climate-change induced sea level rise, inventory and map those coastal wetland habitats and other coastal habitats most at risk for inundation. Develop strategies for protecting low-lying adjacent upland areas to allow for long-term landward migration of coastal wetlands in response to sea-level rise.

Energy: Developing Ecosystem Approaches to Meet Critical Energy Needs

Achieve renewable, sustainable, and efficient energy production and transmission in a manner that is consistent with place-based ecosystem goals for coastal areas, promotes community well-being, is adaptive, and engages stakeholders.

No current issue may be more urgent and comprehensive than increasing energy demands and the search for new, alternative sources of energy. New York's economic health is closely tied to its ability to meet its energy needs; the State is the fourth largest energy user in the U.S., but only 13% of the total primary energy

requirements are met from in-State resources. Governor Paterson has committed to the dual goals of reducing electric energy demand 15% by 2015 and having renewable sources provide 30% of the State's electrical power by 2015 (known as "45 by 15").

At the same time that demands for more renewable energy sources are growing, New York's existing generation facilities are aging. These two factors will increase the need to site new facilities and will increase the public scrutiny on the siting process. Many types of energy facilities could capitalize on New York's abundant renewable resources, such as turbines that capture wind power or anaerobic digesters that convert manure to electricity. Each has the potential to impact land and water use and natural resources in New York's ocean and coasts, while also having the potential to deliver more localized sources of power and enhance economic opportunities.

The Council agencies should work in partnership with New York's Energy Planning Board, the Renewable Energy Task Force and a broad diversity of stakeholders to encourage energy conservation and development programs that will meet community energy needs, align with the local and regional economic development, conservation, and land use plans, and protect ecosystem integrity.

Priorities:

Encourage Sustainable Energy

Development – The Council should promote distributed energy generation, focusing primarily on the siting process. Critical elements in siting new facilities should include: stronger local government

and community participation; integration of energy development into spatial planning to address opportunities for renewable energy generation within a broader ecosystem context; and refinement of siting criteria within the development of a State energy plan to ensure protection of natural resources. The Council should also promote the development and deployment of emerging technologies, such as using methane generated by concentrated-animal feeding operations and using digesters for onsite energy generation for agricultural, wastewater and food industry operations.

Because of the increasing attention on New York's potential for offshore development, the Council should work to establish clear policy guidelines regarding the development and siting of renewable energy generation facilities and transmission corridors in the State's offshore economic zone. These guidelines should acknowledge energy consumption needs while ensuring ecosystem health, compatible with the protection of diverse, healthy populations of fish and wildlife and the habitats that support them, identify areas that are most suitable for energy development activities and for energy storage while not adversely affecting other ecosystem resources, and focus on promoting the best technologies/science available for renewable energy production and transmission.

Reduce Energy Demand – Reductions in energy consumption should be supported that are based on individual and local actions, lessening the need for increases in energy generation and the related construction of production and transmission facilities. All agencies should support the "45 by 15" initiative and should

aggressively promote energy efficiency in State operations (via Executive Order 111) and in the public and private sectors. Programs funded and implemented by the New York State Energy Research and Development Authority and other agencies should be used as mechanisms to protect economic and ecosystem health. Programs include the systems benefit charge, Renewable Portfolio Standard, Regional Greenhouse Gas Initiative, energy efficiency portfolio standard, efficiency codes and standards, and green building tax credit. The Council should also pursue all cost effective options to reduce greenhouse gas emissions from the electricity and buildings sectors, by: 1) expanding the deployment of efficient, clean, renewable energy sources; 2) investing through the Governor's 45 by 15 Initiative in the efficient end-use of electricity and natural gas; 3) strengthening the building energy code; and 4) developing CO2 performance standards for new sources of electricity.

Promote Efficient Transportation –

Recognizing the significant energy requirements of transportation and the link between sound development and transportation choices, the Council should promote more efficient transportation networks. Responsible local land use planning and joint development, in coordination with transportation system development and operations, can reduce the growth of "vehicle miles traveled" (a measure of energy use and greenhouse gas emissions) and provide a more sustainable transportation system. In turn, this supports smart growth planning and contributes to better management of congestion; more effective energy use, and reduced greenhouse gas emissions. Federal funding should be provided only to projects

that promote sustainable development, in communities that have invested in smart growth planning. New York should also protect public health and the environment by prioritizing investment in public transit systems and alternative modes of travel that minimize pollution including actions encouraging bikeable and walkable communities. In addition to its energy requirements, the transportation sector is a significant source of the pollution that causes urban smog, acid rain and global warming. By prioritizing investments in transit and alternative modes, including water-borne transportation, New York can provide real transportation choices to New Yorkers, reduce overall transportation costs and energy use for New Yorkers, reduce congestion and increase mobility, and reduce the pollution that causes global warming. Investments should recognize the functions and interconnections of important natural resources within our ecosystems.

Capacity Building: Providing the Tools to Put EBM Principles into Action to Protect the Ocean and Great Lakes Ecosystems

Equip and empower decision makers and citizens to implement EBM principles.

Ecosystem-based Management recognizes that humans are part of all ecosystems because human activities influence the health of the environment and consequently, the health of communities. People are the agents for political, community and personal change. Science, data tools and plans may be compelling, but their value falls short if they are not

accessible and put to good use. Ecosystem decisions should involve economic, social, scientific, cultural, legal, and political considerations. Therefore, at the core of EBM is the recognition that humans must manage their activities as the critical driver for restoring, protecting, and sustaining ocean and Great Lakes ecosystems. To that end, the Council is uniquely positioned to build everyone's capacity to put EBM principles into practice through building knowledge, tools and skills.

Council agencies already have significant experience that demonstrates the critical value of appropriate multi-sector, multi-level approaches to complicated and sometimes contentious ecosystem challenges.

Therefore, in addition to knowledge, technical tools, and skills, the Council also supports building collaborative partnerships at federal and interstate, and local and regional levels. Federal and interstate partnerships address the need for efficient and effective use of resources for building knowledge and data in an increasingly tight fiscal climate. Such joint initiatives also lead to consistent and grounded management of interconnected ecosystems and activities.

Further, stakeholders in ocean and Great Lakes communities and regions have expressed their desire to be active participants in decisions that impact their communities' futures. To equip and empower such participation requires the creation of various opportunities, incentives, and venues for stakeholders as well as decision makers to learn and share knowledge, build skills, and participate in collaborations that result in decisions and actions.

The Council through its member agencies should foster and advocate the best practices and programs of existing initiatives and organizations, and create new partnerships and opportunities for putting EBM principles into action.

Priorities:

Provide leadership and organizational frameworks, at various geographic scales and across political jurisdictions, to advance EBM and Smart Growth principles through cooperative programming aimed at delivering priority outcomes.

Build State and Local Capacity for EBM by coordinating and providing learning opportunities for government decision makers at all levels and with state agency staff to integrate EBM principles into their decision making; to increase their confidence and repertoire of skills to build partnerships; and expand their interactions with stakeholders beyond traditional processes. Provide opportunities to recognize and share best practices.

Build Individual and Community Capacity for EBM -- Coordinate and promote active learning processes to increase knowledge and skills for integrating EBM and Smart Growth principles into decision-making and joint problem-solving. Launch and support campaigns that build understanding of and appreciation for ocean and Great Lakes ecosystems, environmental stewardship, place-based knowledge, the impact of individual and cumulative human behavior on ecosystem health, and best practices. Support collaborative processes to address specific situations, and create Web-based applications and public events that bring diverse partners and stakeholders together

to update progress, share best practices, celebrate exemplar cases, provide trainings, and build linkages. To achieve measurable gains, link these efforts to the implementation of EBM programs for Long Island Sound, South Shore Estuary, Peconic Bay, New York Harbor Estuary, Hudson River Estuary (including Mohawk River and Upper Hudson watersheds), Lake Champlain, Susquehanna Watershed, New York City Watershed, and Great Lakes and Oceans.

Scientific Data Collection, Research and Analysis -- With targeted investments, generate the data necessary to understand ecosystem conditions and processes and to offer data that will show change over time, and will allow for adaptive management. Create a mechanism to integrate science, management and education.

Understanding Ocean and Great Lakes Processes--Develop a research and monitoring program, including an Ocean Observing System that is appropriately coordinated with the federal Integrated Ocean Observing System program, to address the State's critical biological, chemical, and physical information needs for ocean ecosystems and provide greater ability to adapt management techniques. The program should:

- assess existing baseline information and identify key ecosystem components, including living resources, processes, goods and services;
- monitor trends in sea level, temperature, salinity, ocean acidity, phytoplankton, nutrients, and currents in the State's ocean and estuaries using

both automated and traditional data collection methodologies;

- describe and monitor how climate-driven changes in marine and estuarine systems cause shifts in fish populations, marine habitats, and the spread of invasive plant and animal species and pathogens, and related impacts on State and regional economies, infrastructure, businesses and recreation;
- follow National Ocean Service data collection and dissemination standards and methodologies, and implement with federal, inter-state, academic and equipment manufacturing partners building on and enhancing the model established by Governor Paterson in 2008 for an observing system in NY Harbor and on the Hudson (HRECOS);
- capture and manage data in a central location as a geo-referenced data system and for use by agency resource managers, policy analysts, and academics; and
- develop symbiotic partnerships between the scientific community and resource managers to improve grant writing capacity and the relevance of funded research. Such partnerships will both inform and direct hypothesis-driven analyses of ecosystem dynamics and direct management decisions.

Understanding Great Lakes Processes – Develop a research and monitoring program, including the Great Lakes Observing System and related monitoring activities, to provide information on climate-related, invasive species-related

and water quality-related ecosystem shifts and to increase management effectiveness.

Access to Information and Data – Ensure that public and private organizations can access ecosystem data that can be used and analyzed to better understand place-based knowledge and to inform local decision-making.

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Part III: INITIAL AGENDA TO ACHIEVE EBM GOALS

Executive Actions, Legislative Actions, Funding Efficiencies and Innovations, and Partnerships

Addressing the challenges facing New York's ocean and Great Lakes ecosystems through Ecosystem-based Management (EBM) will require a strong commitment to long-term efforts. The Council will undertake periodic assessments to measure success and evaluate future opportunities. Part III responds to the following requirements for the Report set by the New York Ocean and Great Lakes Ecosystem Conservation Act:

- define executive and legislative actions necessary to integrate ecosystem-based Management with existing programs needed to advance the coastal ecosystem principles;
- include a plan, schedule, and funding opportunities for implementation of executive actions; and
- identify opportunities for regional Ecosystem-based Management with neighboring states, nations, and the federal government

The Council, through its member agencies, is committed to taking specific actions to achieve healthy ocean and Great Lakes ecosystems. The recommended priorities are based on the combined efforts of the Council, member agencies and diverse stakeholders, and are built on the understanding that collaborative ecosystem protection works best. Additionally, it is

clear that advancing a strong agenda in Washington will be important to assist New York's efforts.

The Council's recommendations focus on the areas of greatest need of offshore ecosystems and integrating EBM in State, regional and local decision making. The recommendations are presented in two categories: those that can be accomplished within proposed funding levels and those requiring additional funding. Changes to these may affect the ability of Council agencies to implement these recommended actions. The priorities identified in this report should be periodically reviewed and revised by the Council.

The agenda listed below will continue the momentum of ongoing activities by Council agencies, and to the greatest extent possible, achieve meaningful results in ecosystem health by advancing the Council's top priorities detailed in Part II.

As the State's fiscal situation improves, additional resources may be available to address the many other important measures that have been identified to implement EBM in New York State. A separate section presents actions that may be possible when the State's fiscal situation improves or new funding sources are secured.

A. Executive Actions Feasible within the Proposed Governor's Budget for 2009-2010

The following actions are based on the operating budgets and staffing levels at agencies and the Environmental Protection Fund as proposed in the 2008-2009 Deficit

Reduction Bill and the Executive Budget for 2009-2010. External events will no doubt have a significant impact on our State's fiscal situation, and will affect the State's ability to act on many worthy and important competing needs.

1 Transitioning the Council to Implementation

The Council, as created by the Act, and through its member agencies, will continue to foster the implementation of Ecosystem-based Management for the Ocean and Great Lakes ecosystems. The nine-agency Council provides an integrated organizational structure, based on partnerships, and does not require creating a new bureaucracy.

The Council will continue to serve as the statewide coordinating and advocacy body to support the implementation of Ecosystem-based Management in New York State. The Council, through its member agencies, will continue to play a valuable role to advance the integration of Ecosystem-based Management principles into State, regional, and municipal government management activities in offshore, nearshore, and terrestrial areas. The Council's role, as provided in the Act, is to:

- promote a better understanding of Ecosystem-based Management;
- lead the multi-sector integration of EBM principles into existing State programs;
- facilitate the collaborative application of resources and provide other inputs that enhance and support the nine agencies' existing EBM related programs;

- recommend legislative and executive actions to advance EBM objectives in New York;
- identify opportunities for collaboration and resources from interstate, federal or international partners; and
- support regional place-based programs and local programs applying EBM principles.

The Council has and will continue to establish committees and working groups as needed to address specific subjects or serve specific functions relating to its role.

Agency Steering Committee - This group of policy-level representatives of the Council agencies, chaired by DOS, will continue its role to:

- provide policy advice to the Council in the development of Council protocols, actions and documents;
- advance continued development of guidelines that integrate Ecosystem-based Management principles and priorities into Council agencies' existing and proposed programs such as DEC's proposed Ocean, Long Island Sound, Hudson River and Great Lakes regional EBM programs; and
- facilitate interagency collaboration to advance EBM principles.

Technical and Science Advisory Groups - These groups will continue to provide guidance and advice to the Council and its member agencies on the issues relating to adaptive management, science-based decision-making, research priorities, Atlas

development and maintenance, and information management.

Stakeholder Advisory Team - This Team will advise the Council and its member agencies on matters relating to stakeholder involvement and provide feedback on the Council's stakeholder engagement activities. It will propose to the Council a strategy to build stakeholder capacity in multi-faceted ways to equip and empower broad stakeholder engagement in implementing EBM principles into existing or proposed EBM efforts.

Ocean and Great Lakes Working Groups - The Ocean and Great Lakes Working Groups will be co-chaired by DOS and DEC. The Working Groups will continue to be a catalyst by which agencies can discover and create interagency efficiencies and opportunities for collaboration, and put them into action. They will serve as liaisons between regional program initiatives and the Council, and work to refine the Council's statewide goals and principles to reflect unique regional circumstances. At the request of the Council or the Agency Steering Committee, they will refine general EBM recommendations, for example in this Report or in the Working Group Reports, into "actionable" implementation proposals that address regional goals.

The Working Groups will foster interagency collaboration at the local and regional level and provide technical assistance to the variety of regional entities active in planning and decision-making, such as metropolitan planning organizations, county-level planning efforts, Partnerships for Regional Invasive Species Management (PRISMs), state designated greenways, heritage areas, watershed-based planning

efforts, and open space advisory committees. The Working Groups may also foster coordination with DEC's regional EBM programs and with DOS with regard to local government EBM activities.

2 *Develop and Implement Regional EBM Action Plans*

EBM is by definition a place-based and integrated approach to environmental management at the local, regional and State levels and contrasts with a fragmented approach that independently addresses individual sources of pollution, permitting for individual land uses, or management of individual species. DEC has a broad range of responsibilities and programs that affect coastal ecosystems and clearly many of the principles of EBM are embodied in the DEC mission. Unfortunately, DEC's programs do sometimes utilize a fragmented approach, often as a reflection of the statutes the agency implements. In response, landscape-scale, interdisciplinary approaches to environmental management have evolved in DEC program activities, as well as DOS coastal management programs. For New York to be most successful in adopting EBM principles, DEC needs to expand and strengthen its capacity for delivering EBM.

Towards this goal, DEC will have primary and ongoing responsibility for implementation of EBM principles at the regional level through its existing and proposed additional place-based programs. These programs will establish ecosystem goals with measurable long-term and short-term objectives and actions. In new regional programs for Great Lakes Basins

and the ocean, DEC will establish four “action zones” for the Great Lakes and one for the ocean. The ocean zone will stretch from metropolitan New York City along the south shore to the end of Long Island including offshore waters under New York jurisdiction. The ocean action plan will integrate and build on existing (on-going) estuary programs for Peconic Bay, South Shore Estuary Reserve and New York Harbor. It will also seek an inter-relationship of ecosystem goals from adjoining eco-regions (e.g. Hudson River Estuary and Long Island Sound). In these regional programs, DEC will coordinate and collaborate with Federal agencies, other state agencies, local government and private stakeholders that can enhance ecosystem health at the regional scale. With local, regional and state stakeholders, DEC will develop and implement an ongoing program for regional EBM Action Plans. The participation of all Council agencies will be essential in the planning process. This does not preclude any other state agency from also collaborating or communicating with federal agencies in any way.

3 Aiding Local Governments to Achieve EBM

Local governments in New York State have substantial authority and responsibility to manage land and water use. Their responsibilities include home rule authority to regulate land use; administer the building and energy conservation codes; develop infrastructure (sewers and sewage treatment, water supply and roads); regulate docks, vessels and other nearshore, in-water activities; provide recreational facilities; and acquire open space.

The Department of State will advance Ecosystem-based Management and Smart Growth through municipal and inter-municipal planning. DOS will evolve the Local Waterfront Revitalization Program (LWRP) to provide a consistent statewide mechanism for EBM and Smart Growth. DOS will incorporate EBM, Smart Growth, open space planning, and Coastal Zone Management Act purposes. Regional coastal programs will be developed to complement DEC EBM Action Plans and guide local and inter-municipal watershed plans and integrate EBM into those programs.

DOS will use its existing resources to enhance local capacity by continuing targeted local government training. In addition, DOS will provide examples of ordinances and regulations to guide local governments in taking action on protecting coastal, tidal, and riparian zones.

4 Complete Incorporating EBM Principles into State and Regional Programs

Guideline Work As described in Part I of this Report, the Council identified an initial inventory of 200 government programs that manage those human activities with impacts on ecosystem health. Council members conducted a detailed evaluation and analysis of many of these programs. Agencies then identified recommendations to achieve greater ecosystem health through modifications to these programs and other activities reflected in the executive and legislative initiatives found in this Report. Details of this analysis are presented in Part I. To further these efforts, agencies should:

- Implement the integration of EBM/Smart Growth Principles into the programs already evaluated by the agencies; and
- Evaluate, as time and resources permit, the remaining programs to identify opportunities to improve ecosystem health.

Regional Programs Just as Council agencies are evaluating opportunities to improve their efforts at a statewide level, the Council agencies' regional programs that operate across the State may also have opportunities to integrate EBM principles into their program activities. The Council will reach out to applicable regional entities to solicit their interest, and will assist them to identify ways to align their activities with EBM. Types of New York's regional programs can be found in the Appendices to this report.

5 Accommodate Completing Demands for Limited Offshore Resources and Space

Plans should be developed for offshore areas with the greatest potential for conflicts over human use of those areas. These plans should take a proactive approach to protecting public and ecological health, the siting of offshore energy facilities, energy transmission corridors and the development of alternative renewable energy in the ocean and Great Lakes in a manner that is consistent with the State energy plan. Energy, as well as other activities, should be comprehensively analyzed, and comprehensive criteria developed that address: impacts on habitats and biota, visual aesthetics, commercial and recreational fishing, recreational boating,

shipping, and submerged historic, cultural and archeological resources, including shipwrecks.

The planning process should identify critical offshore habitats requiring protection. Special management measures will be developed to ensure the long-term sustainability of the ocean and Great Lakes' ecologically sensitive areas.

As an initial priority within the available staff and financial resources, the Department of State, with the Council member agencies, should work with neighboring ocean states to develop an offshore plan for a portion of our shared waters. The plan will guide decisions to site new clean, renewable energy production and distribution facilities and address use conflicts and other human activities while protecting critical habitats.

6 Track Ecosystem Health to Measure Success Over Time

Much is unknown about our ocean and Great Lakes ecosystem health that would allow the public and decision makers to track its biophysical and socio-economic aspects. Council agencies recognize value of characterizing the resources that exist in New York's ocean and Great Lakes systems and the severity of any human impacts on those ecosystems. The Council will develop an Ocean and Great Lakes Ecosystem Health Index that would, over time, allow for clear assessments of the success of New York's EBM actions.

7 Complete EPF Funded Ocean and Great Lakes Ecosystem Projects

With the help of the Environmental Protection Fund and other sources, a number of critical research efforts are underway that are necessary to help resource managers better protect, restore and sustainably manage the fisheries, water quality and habitats of the ocean, estuarine and Great Lakes ecosystems. Continuation of these projects will be challenging in tight fiscal times. However, these projects are key to the long-term sustainability of New York's fisheries and the economic uses they support and could build on the gains of recent decades in improving water quality. The Council and member agencies should work to identify funding and opportunities that will bring these priorities to fruition. Key projects include:

- Sustainable fisheries management, including On-Board Fishery Observer Program and NEAMAP;
- Marine mammal conservation, including monitoring programs;
- Habitat conservation, including mapping, inventory and assessment of habitat function.
- Nutrient management for Lake Ontario's near shore and New York's marine waters, including reduction of inputs from lands and waters that flow to these water bodies.

8 Build Capacity to Equip and Empower Diverse Constituencies

EBM principles recognize the need to build collaborative partnerships and alliances at

all levels to increase the likelihood of successful planning, informed decision making, efficient and effective implementation. Participants in EBM bring different levels and kinds of knowledge and skills. The unique character of individual regions and local and regional expertise present unique opportunities and challenges. Through the Council's efforts, stakeholders representing a diversity of vantage points have expressed that they want to be active partners in EBM and that they want more knowledge, information, and skills so they can productively work together to make sustainable decisions for communities and coastal ecosystems. Within existing resources, the Council and its member agencies will broadly communicate the role and benefits of EBM by producing, distributing, and /or promoting educational materials for different audiences via electronic, print and mass media. The Council will encourage local agencies, non-governmental organizations and other partners to do the same. The Council will work with partners to support capacity building opportunities such as: EBM training for involved State, regional and local agencies; production of web-based resources; best practices/cases; and discussion boards.

Council agencies have existing successful programs that provide environmental education to the public. These should be utilized to bring more awareness of issues relating to the ocean and Great Lakes ecosystems. OPRHP should implement an Oceans/Great Lakes Stewardship Campaign Project (e.g., kiosks at Great Lakes State Parks). DEC should continue to enhance outdoor public education efforts for children and fishery management outreach for general audiences, related to

watersheds and water bodies. NYSERDA should increase stakeholder input on specific projects and expand into other sectors, such as K-12 schools, to involve more stakeholders. Additionally, the Council should explore opportunities to work with existing NGOs to extend these educational objectives.

9 Implement Key Recommendations of the Council's Science Advisory Group

The Act called for establishing a research agenda to effectively focus resources on the most critical research needs. The Council's Scientific Advisory Group identified the main research themes discussed in Part I. Guided by these themes, the Council is committed to developing, over time, the comprehensive research, monitoring, and data collection necessary for applying EBM to marine, estuary and Great Lakes systems.

To move forward, the Council will develop a prioritized and targeted set of research needs that will be pursued in the short term that reflect current management priorities and develop a strategy for funding those priorities, given tight fiscal times. The Great Lakes Research Consortium (GLRC) and the newly created New York Marine Sciences Consortium (NYMSC) will assist the Council in that effort and will foster collaborative research activities. Because the ocean and Great Lakes ecosystems are multi-state and bi-national in scale, the Council will look to the federal government to play a key role in financing needed research.

10 Continue to Evolve EBM in the Pilot Areas

The two demonstration areas, the Great South Bay on Long Island and the Sandy Creeks Watershed on the eastern shore of Lake Ontario, should continue their efforts to gain on-the-ground experience in developing and implementing integrated EBM strategies. In the next phase, the demonstration projects should:

- Assist and advocate for the integration of existing land-use plans, reports, analyses, resources, studies and baseline conditions from all agencies, institutions, non-governmental organizations, partners, and municipalities. This 'build-on' process will provide a well-researched and knowledgeable platform to encourage cross-jurisdictional, cross-boundary, and coordinated communication among all participants. This will help identify action priorities from local stakeholders and management agencies to improve ecosystem health while achieving desired community outcomes;
- Provide ongoing and meaningful processes for stakeholder engagement;
- Involve State agencies in prioritizing and implementing actions; and advance implementation projects in a manner consistent with goals and priorities established through the DEC regional EBM action planning process for the ocean and the Great Lakes.

11 Reduce Debris in Ocean and Great Lakes Waters

This is to reduce coastal and offshore pollution and minimize associated impacts to recreation, fish and marine mammals. In addition to current efforts which focus on

addressing marine debris cleanup and removal, actions should be taken to reduce the occurrence of marine debris and prevent litter and refuse from entering waterways and coastal areas. Potential implementation projects could include: 1) enhancing enforcement and strengthening litter-prevention laws; 2) addressing large-scale sources single-use packaging industrial sources of debris and; and 3) focusing on environmental literacy through a rigorous public messaging campaign in schools, marinas, beaches, and parks.

12 Prohibit the Discharge of Waste from Boats into the Environment

Using existing agency resources, no-discharge zones will be designated for New York's coastal ocean areas along the south shore of Long Island and south shore embayments, NY/NJ Harbor, and Long Island Sound.

13 Maintain and Enhance the Web-based Ocean and Coastal Resources Atlas

The Council will continue the Atlas project and make improvements, as appropriate. As offshore and other information is collected, it will be made publicly available through the Atlas.

B. Recommended Executive Actions Requiring Additional Funding to Achieve

Given the current fiscal reality in New York State, the Council recognizes it will be difficult to fund many of the priorities identified during the past two years by the Council. The following list offers

investments that, as fiscal conditions improve, and as State or Federal funding become available, hold critical value for the State's future growth, prosperity and ecosystem health.

Investments must be made to address the causes of ecosystem degradation, measure the progress of initiatives to address them, and build the capacity of decision-makers and citizens to integrate this knowledge into policy and action programs. These investments will enhance the State's potential for economic development in areas with high growth potential, such as alternative energy development and tourism. In addition, improvements in environmental quality will have a positive impact on property values and related economic development in coastal areas.

Vital scientific information and analysis, outlined by the Scientific Advisory Group, are needed to help managers make sound decisions, and to balance single-issue projects with larger, more regional efforts. Increased investments will be needed to build the fundamental knowledge needed to understand the ten diverse ecosystems identified in New York State, including the physical, chemical, biological and social elements of the ecosystem.

The Council has identified the following specific actions as its highest priority for new funds:

- Evaluate effectiveness of existing **fishing gear management measures** and develop recommendations that reduce or eliminate impacts on habitat and non-targeted species. Fund implementation of an On-Board Fishery Observer

Program. Establish a program to eliminate “ghost gear

- **Continue establishing DEC’s four “action zones” for the Great Lakes and one for the ocean** to coordinate and implement regional action plan recommendations, as well as a regional action grants program.
- Continue the **ocean offshore use plan and initiate Great Lakes offshore use plans to support** a proactive approach to the development of alternative renewable energy in the ocean and Great Lakes in a manner that is consistent with the State energy plan and addresses use conflicts and other human activities while protecting critical habitats.
- Initiate scientific **studies of significant fish habitats** in New York’s offshore waters, bays, estuaries, freshwater wetlands, and riverine systems. Based on this analysis, implement protective measures and develop restoration priorities; and
- Expand **NYS Significant Coastal Fish and Wildlife Habitat program** to offshore areas that are characterized by high biodiversity; critical spawning grounds; nursery areas; and migratory corridors for fish, marine mammals and sea turtles.
- Implement a **Coastal Sediment Management Program** to reduce sedimentation of coastal ports, marinas, embayments and barrier island openings and remediate contaminated sediments in Great Lakes Areas of Concern and other coastal/inland waterways. A revolving loan fund should be

established to assist local communities in maintaining harbors/marinas.

- Address the **\$36 billion need for repair and improvements to aging water and wastewater infrastructure**. The vast majority of this infrastructure is located in more densely populated coastal areas.
- Provide **State funding matches** to the array of federal programs (e.g., Great Lakes Legacy Act, Water Resources Development Act, and Great Lakes Fishery Restoration Program).
- Through State Open Space Plan, focus on **land acquisition projects** and other protection measures that would include the landward migration of tidal wetlands as sea levels rise. These lands can provide critical protection to coastal communities.
- Support the implementation of the **Great Lakes Binational Toxics Strategy** by applying EBM principles and practices to State and local programs and voluntary incentives aimed at reducing contamination from environmentally persistent substances including mercury, PCBs, dioxins, furans, pesticides, and emerging contaminants.
- Continue State support for on-going Atlantic Coastal Cooperative Statistics Program (ACCCSP) fish survey program.
- Implement ecosystem-based monitoring and restoration projects in support of **Lake Erie and Lake Ontario Fish Community Objectives, developed by the respective Lake Committees under the auspices of the bi-national Great Lakes Fisheries Commission**, to restore

and manage sustainable sportfish and native fish populations.

- **Expand the Hudson River Estuary Program** to cover the full watershed with action zones for the Mohawk and upper Hudson.
- Implement the **Seagrass Management Plan** that is being developed by the NYS Seagrass Task Force.
- Conduct **natural resource inventories** to identify the location and condition of habitats and associated species to prioritize the implementation of conservation strategies.
- **Develop a Pilot Ocean Observing System** in the Great South Bay using state-of-the-art technology to deliver real time data on the ecological attributes throughout the Bay. This work will provide a starting point for New York to develop and maintain capacity for rolling out observing systems across the State. The work will also help leverage federal support for deploying observing systems in other New York locations.
- Reassess the beneficial use impairments in New York **Areas of Concern (AOCs)**, identifying and implementing management options to restore impairments to meet delisting objectives within impaired and threatened waterways.
- Undertake required **mapping of Coastal Erosion Hazard Areas** in order to promote enhanced Coastal Restoration Strategies
- Develop an **ecosystem monitoring and assessment program** based on indicators

that inform adaptive management decision-making, beginning with implementation of the Northeast Monitoring and Reporting Framework, which was developed by fourteen northeast states to assess the condition of priority regional resources and measure the effectiveness of conservation actions.

- Track down potential or suspected sources of **persistent toxic pollutants** found in New York's Great Lakes Basin waters, embayments, and tributaries in pursuit of the Great Lakes Water Quality Agreement's goal to virtually eliminate toxic substances from Great Lakes Basin waters.
- Conduct research and monitor **new and emerging pollutants** found in waters and sediments (e.g. pharmaceuticals).
- Establish an **Invasive Species Contingency Fund** to provide rapid response assistance to eradicate or prevent the spread of new introductions of invasive species (plants animals or pathogens new to the State as a whole or to a region within the State). This will be linked to the ongoing efforts through the Partnerships for Regional Invasive Species Management (PRISMs). The availability of this funding will enable New York to act quickly to protect important environmental and economic assets from the potentially devastating ecosystem consequences of new introductions.
- Convene alternating biennial **Great Lakes and Ocean Summits** to create ways to recognize exemplary EBM programs; report on the status of initiatives in

support of Priority Recommendations (Part II); recognize exemplary EBM actions; promote networking and partnership building, targeted training and sharing of best practices; and assess and adapt the EBM Implementation Actions for the following two years.

- Encourage the GLRC and NYMSC to each host an **annual scientific conference** that focuses on the status of New York marine and Great Lakes ecosystems. Such forums would be open to scientists, managers, agency professionals and the stakeholder communities to increase general knowledge and provide for an exchange of ideas.
- Within NYSERDA's **Environmental Monitoring, Evaluation and Protection (EMEP)** Program, examine the effects of projects related to alternative energy, climate change and biofuels.
- OPRHP should enhance monitoring and predictive modeling of water quality at state park beaches and lakes.
- Enhance OPRHP outreach through initiating the development of a statewide ocean and Great Lakes literacy campaign on State Park properties with an emphasis on EBM. Undertake a **Tidal Wetlands Sentinel Monitoring and Assessment Program**. Review and document existing knowledge and conduct new research about **climate change impacts to biodiversity and habitats**.
- Undertake an **ecosystem modeling analysis** of the effects of possible severe weather scenarios as a result of climate change, in order to predict the potential

impacts of flooding, erosion, and altered precipitation quantities that may occur and their affects on communities and infrastructure, habitats and fish and wildlife.

- Add staff resources within DEC's Marine Bureau to be able to more fully accomplish agency resource management responsibilities and EBM. DEC has a Marine Resources Bureau, headquartered on Long Island that coordinates management of New York's marine resources, serving the marine and coastal district, including the waters of the Atlantic Ocean within three nautical miles from the coastline, Long Island Sound, and the Hudson River up to the Tappan Zee Bridge. Staff cover a wide range of issues, such as fisheries management; endangered marine species; programs for Long Island Sound, the NY Harbor, and Peconic estuary; marine resources impact assessment and permitting; shellfish bacteriology and management; water quality and classification; and tidal wetlands issues.
- Provide additional staff resources within DEC for regional EBM programs, including ocean and Great Lakes action areas.
- Add staff to the DOS Office of Local Governments, Coastal Resources, and Community Sustainability. A key to successful EBM is the ability of local decision makers and stakeholders to embrace and integrate EBM and Smart Growth principles into local decision making. The DOS will need additional staff in order to fully integrate EBM and Smart Growth into its Local Waterfront

Revitalization Program activities and municipal grant programs.

equitable reductions of water withdrawals.

C. Legislative Actions

In the near term, the Council recommends the following statutory changes:

- Develop alternative **financing options for local natural resource and open space protection**, such as is envisioned in a proposed Community Preservation Act, to give municipalities additional options for raising revenue.
 - Amend Article 42 of the Executive Law to evolve the **Local Waterfront Revitalization Program (LWRP)** as the State's delivery mechanism to encourage local government planning and implementation of EBM/Smart Growth principles to all communities.
 - Require protection of **buffers in at-risk coastal and riparian areas** to minimize flooding, erosion, wind damage, and other hazards related to forecasted sea level rise and severe storms; and improve water quality and opportunities for public recreation at the same time.
 - **Water Resources Management Program:** To fulfill the requirements of the Great Lakes Compact and to better protect water supply resources, New York needs a program to require an annual registration or permit for all water withdrawals (public water supply, industrial, commercial and agricultural) and authorize requirements for water conservation measures by large water users, not just public water suppliers. Further, DEC needs authority to, in times of drought, ensure systematic and
- Amend Article 14 of the Environmental Conservation Law to **expand membership of the Council** to include the Department of Health, the Department of Education and the Environmental Facilities Corporation. These agencies have missions that complement those of the current Council agencies and their expertise will be necessary to fully execute the Council's broad, integrated mission.
 - **Establish Marine Fishing License:** Establishing a marine recreational fishing license in New York State, the revenues from which would be deposited into the Marine Resources Account of the Conservation Fund, would fulfill the federal requirements of an angler registry, would generate significant revenues, and ensure that these revenues are used to support New York's marine resources program.
 - **Smart Growth Bill:** New York State should adopt a screening tool for the prioritization of funding programs based on Smart Growth principles and energy efficiency. This would support the efforts of the Smart Growth Cabinet, which reviews state agency spending and policies to determine how best to discourage sprawl and promote smart land use practices.
 - **Climate Protection Act:** This would provide for New York to develop a Strategic Greenhouse Gas Reduction Plan, with participation from Council member agencies, and other relevant agencies. The Plan would aim to achieve

clear short, intermediate and long term goals. Greenhouse gas emissions, primarily from the combustion of fossil fuels, are increasing and destabilizing the climate system. Preventing severe impacts on humans and the environment requires a significant reduction in greenhouse gas emissions.

Accomplishing this goal will require a fundamental transformation in the generation and use energy in the State, including the creation of a sustainable energy system. Under this plan, the State would evaluate and propose ways to address technologic, economic, social, regulatory and legal issues to make significant reductions feasible, as well as propose concrete measures to achieve short and long term emission reduction goals.

- Amend Article 11 of New York State Executive Law to incorporate an Ecosystem-based Management principles in **building design standards**. Expand energy conservation standards by eliminating the current “50% rule” applied to energy conservation standards for building renovations. Eliminate the “10 year payback” rule. Similarly, amend Article 18 Uniform Fire Prevention and Building code and Article 11 State Energy Conservation Construction Code to incorporate stormwater runoff management.
- Require **environmental education** based on EBM principles in K-12 instruction.
- Establish one or more “**Excelsior State Seashore**” preserves on Long Island, and “Excelsior State Shoreline” preserves at inland water bodies throughout the State to protect offshore aquatic ecosystems

from degradation and to call attention to New York’s exemplary assets across the State’s diverse coastal areas. Site selection should balance shore preservation with clean, renewable energy development.

- Establish an **Underwater Heritage Trail** along ocean and Great Lakes coasts to promote multiple uses, such as recreational diving, tourism, and maritime and other waterfront cultural heritage education, for economic benefit and to promote and protect irreplaceable underwater resources.
- Require **ports and harbors** in New York’s ocean and Great Lakes to minimize adverse environmental impacts from maritime transportation in coastal areas by: a) developing plans to reduce emissions and wastes, and b) requiring adequate spill response capacity for petroleum and chemical bulk storage facilities using updated habitat sensitivity maps, enhanced training, equipment, coordination, and liability.
- To effectively address the chronic and widespread nature of marine debris in New York, and to alleviate associated impacts on ocean and Great Lakes ecosystems, legislative proposals should be considered that would:
 - Require all **commercial fishing gear** to be marked so that it can be tracked to its owner.
 - Create a **fishery gear buy-back program** to reduce “ghost-fishing” by abandoned or unattended fishing gear.

- **Encourage or mandate post-consumer take-back** efforts for producers of single-use packaging materials.
- **Provide incentives for utilizing biodegradable packaging materials** as part of a comprehensive reduced packaging program.
- Authorize the development of an **aquatic preserve program** that would seek to designate and protect unique offshore ecosystems from damaging activities.

D. Funding Efficiencies and Innovations to Achieve Executive Actions

New York spends millions of dollars annually on efforts to improve ecosystem health. In current times of significant budget challenges, the State should take a comprehensive and coordinated approach to its spending. The Council is committed to exploring and implementing opportunities that go beyond the traditional single-agency funded activities. By applying a multi-sector, collaborative approach, the Council seeks ways to align the expertise, resources, and priorities of multiple agencies, and target funding to those actions that will have the maximum impact on all aspects of the ecosystem – community-well being, environmental quality, and economic vitality.

Efficiencies New York could develop more efficient and better-leveraged funding mechanisms, achieving success sooner and making each dollar spent go farther. Action should include:

- **Expand/evolve the Co-Funding Initiative to Support EBM:** New York State's Water and Sewer Infrastructure Co-Funding Initiative is a cooperative effort between eight state and federal government agency partners that helps communities obtain optimal public financing for infrastructure projects. New York will expand this highly attractive model to address broader ecosystem-level goals and to apply to all Council agencies. This will reduce or eliminate many time-consuming and non-productive consultations with individual agencies. A co-funding mechanism will streamline the process of coordinating each agency's protocols and requirements within the context of the guiding EBM principles. The benefits include enhancing interagency coordination; building on the expertise, networks and resources at the Environmental Facilities Corporation; incorporating EBM and energy efficiency initiatives into the well-established water and sewer funding programs; bringing to the table more programs and funding opportunities targeted to ecosystem health objectives; and helping participating agencies to more quickly incorporate EBM principles. An EBM co-funding collaborative among participating agencies, non-profits and NGOs will provide a forum to ensure project efforts are coordinated and efficient. The achievement of ecosystem health goals will be the guiding principles of such a collaborative.
- **Establish a dedicated fund to support ecosystem research:** While scientific understanding of ecosystem dynamics is sufficient to begin an EBM approach, investment in new knowledge of ecosystem function and research to

evaluate the success of EBM is critical. The research agenda created by the SAG provides a blueprint for building the knowledge necessary to implement EBM. The academic institutions represented by the Great Lakes Research Consortium and the New York Marine Sciences Consortium are poised to provide the necessary research. To accomplish this, a more flexible means of providing funds to support research is needed. As called for in the SAG's report, *Research and Monitoring Priorities for Ecosystem-based Management of New York's Oceans and Great Lakes*, the establishment of a fund to support university-based research on ecosystem science. The Scientific Advisory Group would review proposals and make recommendations that would then be approved by the Council. Funding could come in part from partnerships with the federal government and private foundations.

- **Assess ecosystem services:** Decision makers are placing increasing emphasis on determining the economic value of ecosystem services in recognition of the critical role they play in the health and vitality of coastal communities. A related increase is in the need to invest in the maintenance of these ecosystem services, especially those likely to be degraded. As pricing ecosystem services will be a difficult task, cost-effectively using this concept in State decisions will require creative implementation approaches.
- **Revise Agency Funding Criteria:** Many agencies and organizations already address ecosystem issues, but because their activities often remain tied to

political jurisdictions or one agency's agenda, unproductive focus has often been directed to end-of-pipe solutions. The Council agencies should assess funding for projects consistently, and base their decisions on an ecosystem scale to address the root causes and many contributing factors of ecosystem degradation.

- **Provide Incentives for Innovative Drinking Water and Wastewater Management Approaches:** New York State established the Clean Water State Revolving Fund (SRF) to help address wastewater infrastructure needs. Wastewater treatment and drinking water production can successfully be managed using methods that include wetland retention and land acquisition for water quality preservation. Providing capital for municipalities to approach these issues in unique ways may also allow for increased capacity at existing treatment facilities (as less water enters the facility) and hence demand less chemical treatment and less energy demand.
- **Include EBM Criteria in Project Performance Standards:** The Council recommends that the State require programs to base a portion of their funding on relative success in achieving ecosystem goals. Applying EBM performance measurements to environmental financing is practical. The State would also affirm the adaptive management principles of EBM by offering technical expertise to guide the project over its lifetime. This feedback mechanism would ensure the necessary actions occur to reach ecosystem goals.

Innovations

- **Establish a Natural Resource Industry Revolving Loan Fund:** This would target the key natural resource industries of fishing, timber harvesting and agriculture. Many important regional job-creating industries in New York State depend on natural resources for their success. Encouraging these industries to adopt and embrace sustainable practices and conserve working landscapes not only would help to protect the environment and provide for longevity of these industries, but also would represent an economic boost to many regions of the State.
- **Investigate the feasibility of a Watershed-based Substate Revolving Fund (SSRF):** Both the [Federal Clean Water Act](#) and the [Safe Drinking Water Acts](#) permit [State Revolving Fund](#) (SRF) administrators to allocate SRF equity to the creation of substate revolving funds (SSRFs). The creation of watershed-based substate revolving funds in New York State may require a re-tooling of current SRF practices. Other means for capitalizing SSRF could be considered, such as funding from the Environmental Protection Fund (EPF), a future environmental quality bond act, general fund appropriations or other dedicated revenue sources (e.g. user fees or surcharges). SSRFs should support new strategies for addressing water quality on a watershed basis such as mitigation banking.

E. Opportunities for Interstate and International EBM Management

New York is unique among coastal states because of its significant ocean and Great Lakes resources. New York is also at a geographic crossroads for the ocean, marking the change between the New England and Mid-Atlantic regions. In the Great Lakes, New York's St. Lawrence Seaway serves as the United States' entry and exit point between the Lakes and the Atlantic Ocean, and the Lakes themselves mark the US border with Canada.

This distinctive situation requires an approach to management that reaches beyond state boundaries. The regional management approach advocated by both the U.S. Commission on Ocean Policy and the Pew Oceans Commission has historically been advanced in numerous coastal areas, including the Great Lakes. Beyond these traditional interstate partnerships, however, other opportunities exist to create valuable and more effective interstate and international partnerships:

Mid-Atlantic

The Mid-Atlantic region stretches from the shores of Connecticut to Virginia, encompassing a broad diversity of coastlines and communities. It is one of the few US coastal regions that have not yet organized. Starting a new organizational structure will be challenging, but represents an opportunity for New York and its neighbors to demonstrate strong regional commitment to advancing mutual ecosystem-level priorities.

- Explore, with neighboring Mid-Atlantic states, opportunities to work together based on the Governor's call for greater regional coordination among the Mid-Atlantic ocean states. Priorities for

partnership and collaboration could include identifying appropriate offshore energy production and distribution sites; determining shared approaches to climate change; addressing regional water quality issues and related impacts on beaches; and enhancing habitat management and protection.

New England / Northeast

The Governors of New England's ocean states created the [Northeast Regional Ocean Council](#) (NROC) in 2005. In a joint session with Canadian premiers from Eastern Canada, the governors created an "oceans working committee" within NROC as a conduit for additional collaboration with those Canadian provinces. The purposes of the committee are "to foster cooperation and collaboration on research and development, education, exploration, observation, and oceans management; share information, including reports, initiatives and plans; support existing initiatives; work to address shared challenges like oil spills and invasive species; and serve as a mechanism for cooperation on all aspects of ocean management."

While New York has not been an official partner with New England states through NROC, some of the state's most valuable marine resources can be found in and around Long Island Sound. In addition, many traditional New York fishing communities share a similar cultural and economic history with those found in New England states. New York should engage NROC in a way that respects the NROC's organizational history and existing partnerships.

- Explore New York's potential involvement in the Northeast Regional Ocean Council (NROC). Discussions should, among other outcomes, lead to an agreed-upon set of key issues of interest to agencies that is developed through the Council; determine New York's potential for engaging in NROC, focusing on shared resources in Long Island Sound; identify shared values and key areas of common resource protection; and gauge NROC's interest in New York's involvement.

Great Lakes

The waters of the five Great Lakes and St. Lawrence River constitute vast and complex ecosystems with political and geographic boundaries that connect the US and Canada and include eight states and two provinces. New York is the gateway to the system. All vessels coming in from the Atlantic Ocean must first pass through New York's St. Lawrence Seaway, making New York vulnerable to potential invasive species from all of these ocean-going vessels no matter which Great Lake is the final destination. All of the water moving through the Great Lakes to the Atlantic Ocean must travel through Lake Erie, Lake Ontario, and the St. Lawrence Seaway, making New York vulnerable to negative impacts from activities on the upper lakes.

Beginning with the [Boundary Waters Treaty of 1909](#), numerous treaties, agreements and organizational structures have been created with the goal of achieving joint management goals for these resources, some of them taking a broad, ecosystem approach.

The [1972 Great Lakes Water Quality Agreement](#), for example, targets the ecosystem benefits desired by communities, and seeks to restore heavily impacted areas and achieve those benefits. Similarly, in 2004, the Great Lakes Regional Collaboration was established to tie together the numerous levels of government and their priorities in a cohesive strategy for Great Lakes restoration. These agreements and strategies, and others, are reflected in many of the priorities and actions of this report.

Within specific agreements, one State agency is the designated lead for executing New York's actions and coordinating subsequent refinements. If New York is to achieve its EBM ecosystem goals, the State must proactively encourage improved system-wide coordination. Some actions are:

- Provide multi-sector input to the Great Lakes Regional Collaboration and interstate agreements. Interstate organizations are already well established with goal-setting coordinated across the international Great Lakes basin, so a new organization is not needed. Instead, Council agencies should fully support New York's interstate commitments through a coordinated, EBM approach, and work together to identify emerging issues that could benefit from greater interstate attention.
- For example, the Council should encourage the implementation of the Great Lakes / St. Lawrence River Compact and Great Lakes / St. Lawrence River Sustainable Water Resources Agreement by developing a statewide

water resources strategy that includes water conservation, planning, drought management, and efficient-use incentives. Appropriate Council agencies should also create a Coastal Restoration Strategy and adaptive management monitoring process that integrates EBM principles with habitat restoration and coastal development, erosion and risk mitigation, to support the International Joint Commission's adoption of a new regulatory plan for water level/flow control in the Lake Ontario-St. Lawrence River basin.

The Council should also pursue partnership opportunities with First Nations to enhance the EBM initiative. First Nations in New York possess a wealth of deep and valuable knowledge and understanding of the State's ecosystems. Their expertise, participation, and partnership can will provide a more diverse and comprehensive foundation for EBM.

F. Federal and Congressional Agency Actions

The challenges that exist at the federal-state interface are complex and will require a concerted effort by both the federal government and New York. The value of federal partnerships cannot be overstated, and New York should take the following actions to further strengthen its relationships with federal agencies:

- Seek avenues for greater State participation in federal decision making. Work with federal partners to identify interagency ocean governance organizations (e.g., Committee on Ocean Policy, Committee on the Marine

Transportation System) that may benefit from additional State and/or regional representation, and develop mechanisms for this interaction between the State and federal levels.

- Build partnerships and pursue federal resource commitments for sustained funding and legislative attention required to achieve:
 - adequate research, monitoring and data collection in marine, estuary and Great Lakes systems to provide a scientific basis for decision-making, monitor progress, and enable resource managers to set priorities, especially those research projects described in Section B or identified by the SAG;
 - funding for current and projected wastewater infrastructure needs that could include a well-funded Clean Water State Revolving Fund, low-interest loan programs, federal grants, State grants, hardship community grants and adequate local rates;
 - a comprehensive federal program to reduce pollution that causes global climate change (i.e. cap and trade program) and builds a new clean energy future;
 - refinancing principles for intermodal federal surface transportation programs that integrate economic, environmental and energy policy goals and adequate federal funding for maintaining a state of good repair for roads and bridges as well, as providing alternative transportation choices;
 - an EBM-compatible strategy to address aging infrastructure of New York ports and harbors, particularly along the Great Lakes and St. Lawrence Seaway; and incorporate new technologies for improving efficiency and linkage to other transportation modes;
 - an interstate organization to address shared ocean concerns;
 - funding to continue [Northeast Area Monitoring and Assessment Program](#) (NEAMAP);
 - interim practice standards that certify practices that have not been fully incorporated into the Agricultural Best management Practice Catalog through a partnership between NYS DAM and U.S. Department of Agriculture-Natural Resources Conservation Service; and
 - funding partnership with the U.S. Army Corps of Engineers, similar to Section 542 arrangement for the Lake Champlain Basin, to develop watershed or landscape-scale management programs around the state.
- Issue statements/resolutions of support and endorsements to:
 - establish clear policy guidelines regarding the development and location of energy corridors in the State's offshore economic zone;
 - promote adoption of those components of the OCEANS-21 bill from the 110th Congress (H.R. 21)

that are critical to successful implementation of EBM in New York;

- amend the language of the Coast Guard Reauthorization Act from the [110th Congress \(H.R. 2830, S. 1892\)](#) to strengthen regulation of invasive species and ballast water;
- support implementation of the [Great Lakes-St. Lawrence River Basin Water Resources Compact in New York](#);
- support Congressional approval of legislation to reauthorize the Great Lakes Legacy Act and to increase

funding to clean up contaminated sediment in polluted “areas of concern” within the Great Lakes basins;

- update and expand the Great Lakes Water Quality Agreement to recognize New York’s EBM initiative; and
- support the implementation of the Great Lakes Binational Toxics Strategy by encouraging State and local programs and voluntary incentives to reduce contamination from environmentally persistent toxic substances.

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Sandy Creeks Watershed Ecosystem-based Management Strategy
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Advancing EBM Along the Coasts of New York: Recommendations from Seven Regional Programs
Draft Summary Report of Agency Guidelines and Recommendations
Environmental Facilities Corporation EBM Financing Report
Statewide 2006 Stakeholder Dialogues Summary Report
Transitioning the Ocean and Great Lakes to a Sustainable Future – Implementation of EBM in NYS

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Ocean and Great Lakes GIS Data Catalog, Data Gaps, and Mapping Strategies
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Seagrass Task Force Appendices
Regional Programs in New York State

Enabling Legislation

[New York Ocean and Great Lakes Ecosystem Conservation Act \(ECL Article 14\)](#)

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