

**Great Lakes Working Group  
Draft Final Report to the  
New York Ocean and Great Lakes  
Ecosystem Conservation Council  
September 3, 2008**

**INTRODUCTION**

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 the larger North American Great Lakes system. New York is at the beginning or the end of the Great Lakes, depending on one's vantage point; the vast majority of the water in the system exits to the ocean through the St. Lawrence River and, conversely, the St. Lawrence Seaway serves as the main gateway for vessel traffic inbound from the Atlantic Ocean. The watersheds of these lakes encompass much of the geography 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. The lakes are an integral part of many New York communities, yet many also consider them to be an underappreciated and underutilized asset for the region. Additionally, the potential effects of climate change in the Great Lakes - changes in weather patterns and water levels - require efforts to help reduce the vulnerability of New York's residents, ecosystems, and economy.

**Formation of the Council and Working Group Process**

The New York Ocean and Great Lakes Ecosystem Conservation Act, recognizing the value of the Great Lakes Ecosystem to New York, mandated that the New York Ocean and Great Lakes Ecosystem Conservation Council (the Council) define executive and legislative actions necessary to integrate ecosystem-based management (EBM) with existing programs to advance the policy and principles set forth by the Act. The Great Lakes Working Group has led the development of recommendations on how to incorporate the principles of EBM in New York's Great Lakes Region. These recommendations will be presented to the Council for its consideration and for potential adoption within the final report, as the Council deems appropriate.

Representatives of the Council agencies first met in March 2008 to identify key issues and needs. Priorities came not only from agency expertise and experience, but also from the substantial previous efforts of both public and private entities. Many of the issues and challenges facing New York's Great Lakes resources are already well documented. Various groups interested in Great Lakes issues have spent considerable time and resources documenting the lakes' ability to deliver services to communities in New York and elsewhere, and drafting reports that contain recommendations on how to best utilize, restore, or develop the lakes. The goal of the Great Lakes Working Group has been to build on these various perspectives and recommendations, while at the same time utilizing the State's broad mandate to create a comprehensive approach to managing our Great Lakes resources. Studies that were consulted during the development of the Working Group's recommendations included: the updated Lake Ontario Lakewide

Management Plan (2008); the LOCI Action Agenda (January, 2006); the Great Lakes Regional Collaboration's "Strategy to Restore and Protect the Great Lakes" (December 2005); the bi-national "Great Lakes and Saint Lawrence Seaway Study" (November 2007); the Brookings Institution Metropolitan Policy Program's report "The Vital Center"(2006); the Great Lakes Commission's report "State and Provincial Land Use and Smart Growth Trends in the Great Lakes Region" (May 2007) and others.

## **Document Organization**

Ecosystem-based management, by its nature, is concerned with seeking comprehensive approaches to managing resources and human activities across traditional divides. In attempting to organize this document, it became apparent that there are inherent difficulties in attempting to organize concepts that in many cases involve multiple sectors or cross-cutting approaches. At the same time, the Working Group appreciated the need to provide a manageable and digestible format to laying out their recommendations, and determined that most recommendations could fit into broad categories based on the general subject area and type of action they called for. The document therefore is organized into the following non-prioritized categories, with an underlying understanding that many linkages exist between the categories and their recommendations:

- ▶ Improving Watersheds and Land Use in Great Lakes Communities;
- ▶ Preparing for Future Action and Adaptation;
- ▶ Building Awareness and Capacity for Stewardship;
- ▶ Support for Community Improvement;
- ▶ Leadership and Sound Decision-Making;
- ▶ Improving Water Quality;
- ▶ Enhancing Transportation - Moving People and Freight;
- ▶ Maintaining Safe Maritime Commerce;
- ▶ Protecting and Restoring Fish and Wildlife Habitats;
- ▶ Reducing the Impact of Invasive Species and Pathogens;
- ▶ Managing for Multiple On-Lake Uses;
- ▶ Managing Agriculture and Forestry for Multiple Benefits;
- ▶ Harnessing Energy Resources in the Great Lakes Basin

In reviewing the recommendations, some had clear applicability outside the Great Lakes Region, while others were Great Lakes specific. Within any of the categories, cross-cutting recommendations are presented first, followed by the basin-specific recommendations.

An Appendix of Acronyms follows the Recommendations, and then brief descriptions of the Council agencies. These descriptions identify the key agency missions, reflecting their respective roles and expertise as they relate to the comprehensive management of New York State's Great Lakes resources.

## **KEY RECOMMENDATIONS**

- Improve local and regional planning efforts and coordination of activities, strategically tailoring work plans to apply EBM principles within the four major drainage basins in New York.
- Initiate spatial planning as a decision-making tool, identifying areas of existing usage, critical habitat, and related information to aid in managing resources for competing interests.

- Develop a long-term monitoring program to address the State’s comprehensive information needs, relative to the Great Lakes, and prioritize research areas. Information should relate to management objectives and ecosystem indicators to facilitate an adaptive management approach.
- Support approaches to invasive species prevention/management, including the NYS Invasive Species Task Force and Partnerships for Regional Invasive Species Management.
- Create a Great Lakes Health Index that is integrated with the long-term monitoring program, in order to establish clear, measurable parameters for assessing each system's ability to provide critical ecosystem services to New York communities. Such an index should monitor and evaluate success in implementing EBM and identify areas where adaptive management is necessary.
- Take steps to improve Great Lakes water quality to achieve “Drinkable, Swimmable, Fishable” water and to ensure sustainable water supplies, including continued execution of New York components of related basin-wide agreements, such as the Great Lakes Water Quality Agreement and the Great Lakes-St. Lawrence River Basin Water Resources Compact.
- Adapt habitat conservation and restoration approaches to incorporate EBM principles, addressing broader ecosystem connections between land, air, and aquatic habitat and human uses.
- Adapt and continue Working Group structure to provide a forum for inter-agency collaboration, allowing agencies to access ongoing technical and scientific support and expertise, and to provide ongoing recommendations and advice to the Council as appropriate.
- Develop a strategy for the Great Lakes Basin that will support public and private working landscapes - related to agriculture, forestry, and tourism/recreation activities, among others - and that will advance EBM principles.

## **WORKING GROUP RECOMMENDATIONS TO THE COUNCIL**

### **Improving Watersheds and Land Use in Great Lakes Communities:**

#### **Background:**

Changes in land use have a cumulative impact on water quality and quantity, and thus, the vitality and resilience of ecosystems. An increase of urban land area initiated by sprawl results in loss of farmland, increased stormwater runoff and impairment to water quality. Increased stormwater temperature impacts coldwater ecosystems and spurs excess algal growth. Stormwater conveyance systems deliver water in surges, exacerbating erosion and destroying habitat.

Development that is highly dispersed and poorly planned leads to higher levels of environmental degradation. Dispersed development can increase the amount of impervious

surfaces allowing less water to infiltrate the soil and prevent the replenishment of aquifers - increasing runoff, and leading to flooding and the pollution of existing water supplies. Such urban sprawl alters the physical configuration and stability of stream channels, reducing their value as wildlife habitats. Sprawl increases the cost of providing public utility services, housing, and roads; results in population loss and declining employment opportunities; and, contributes to aging infrastructure and an overall declining quality of schools. Inter-municipal coordination and collaboration of local leaders, academic, and private sector partners is key to a successful program. Sprawl also increases commuting times and related greenhouse gas outputs.

### **Challenges:**

Although many communities in New York's Great Lakes Region have not experienced significant population growth in recent years, planning and infrastructure decisions continue to enable sprawl to occur throughout the area. Sprawl has fragmented important wildlife habitat and impacted water quality by changing the watershed's landscape and its resource characteristics. Lack of planning coordination among communities has led to the continued outward push of suburban boundaries. Without incentives to local land-owners for preservation of open space, economic factors will lead to continuous development of former agricultural and forested lands.

### **Opportunities:**

Smart growth efforts in State, county and local governments can align zoning, property tax, and infrastructure spending policies and incentives to encourage redevelopment and concentrate new development near transportation nodes and existing infrastructure, promote the use of public transit, and avoid sprawl so that the everyday services we need are closer to us. Smart growth development approaches have clear environmental benefits: improved air and water quality, greater habitat and open space protection, farmland preservation, clean-up and re-use of brownfield sites, and fish and wildlife protection. New York can build on its past successes in local and regional waterfront revitalization programs and watershed planning by integrating the principles of smart growth and EBM.

### **Recommendations:**

- **Recommendation 1: Integrate New York State's Smart Growth Initiative and Regional Economic Blueprints with the principles of EBM**, to obtain sustainable development, balanced growth for communities, and natural resource protection. This can best be accomplished through close coordination with local governments as municipalities and counties have broad control over many land-use decisions. Such efforts should be closely aligned with the preservation of agricultural lands, unfragmented forests, and parks - with the objective of maintaining upland resilience, biodiversity, and ecosystem integrity.  
Lead Implementing Agency/ies: DOS, ESD, DAM.
- **Recommendation 2: Support lake level management plan alternatives which use**

**EBM strategies to balance ecosystem restoration with other social and economic benefits.** Develop strategies and implementation plans which, over time, will restore biodiversity to areas impacted by static water levels and provide adequate resources to address resulting property damage - while balancing ecosystem improvements with other social and economic factors affected by water level management. Management of water levels on Lake Ontario and other New York waters has implications for the diversity of wetland communities and important fish and wildlife habitats associated with them. The strategy must also address water availability, waterfront development, shoreline erosion, property damage, boundaries, public access and recreation.

Lead Implementing Agency/ies: DEC, DOS.

- **Recommendation 3: Incorporate the tools and principles of smart growth, regional blueprints and EBM into new and existing Local Waterfront Revitalization Program amendments,** new local and regional waterfront revitalization programs, natural resource management plans, local comprehensive plans and other local and State management plans, in order to create sustainable communities, wise land use, energy conservation, environmental preservation, downtown revitalization, housing opportunities, and business development.  
Lead Implementing Agency/ies: DAM, DEC, DOS, ESD.
- **Recommendation 4: Coordinate the development of multi-functioning corridors designed to support wildlife migration and accommodate climate-driven range shifts,** promote heritage tourism, and facilitate energy transmission and transportation (including pedestrian, bicycle, automotive, rail, and canal). Collaborate across State and local agencies, in coordination with the New York State Open Space Program, to manage, monitor, and plan for appropriate siting of corridors with respect to local constraints and opportunities. Protect existing open space and forested lands to maximize habitat connectivity by maintaining matrices of stepping stone fragments. Initiate invasive species monitoring and control within corridors as they are established.  
Lead Implementing Agency/ies: DAM, DEC, DOS, DOT, ESD, OPRHP.
- **Recommendation 5: Develop incentives and programs relating to private lands, to preserve and maintain functions necessary to advance the principles of EBM.** Explore similar incentives to protect, conserve, and enhance potential habitat for fish and wildlife, such as the purchase of development rights.  
Lead Implementing Agency/ies: DAM, DEC, DOS.
- **Recommendation 6: Develop a Great Lakes Region Action Plan that includes four work plans strategically tailored to apply EBM principles within each of the four action zones and their inherent drainage basins.** This planning must incorporate appropriate watershed management measures to advance the goals and objectives of the bi-national lakewide management plans and fish community objectives for Lake Erie, Lake Ontario, and their connecting channels. These

watershed plans would build on existing binational plans and strategies as well as watershed restoration and planning models that have been funded by DEC/DOS for the Hudson River, Salmon River, Lake George, Finger Lakes, and elsewhere. Coordination and implementation of EBM activities and measures to protect and restore water quality, conserve water supplies, and improve wildlife habitat will rely on a number of partners, such as regional/local Watershed Coordinating Councils, County Environmental Management Councils, and local governments through an expanded Local Waterfront Revitalization Program.

These local and regional watershed management plans must:

- ▶ Incorporate sound watershed planning principles.
- ▶ Include linkages to the lakewide management plans (LaMPs) and remedial action plans (RAPs) for specific Areas of Concern
- ▶ Employ best available scientific information.
- ▶ Promote EBM principles and approaches.
- ▶ Broaden stakeholder participation to identify and prioritize potential measures that could be taken locally to mitigate and adapt to impacts of future climate change.
- ▶ Reflect the needs of local communities in the watersheds.

Lead Implementing Agency/ies: DEC, DOS, DAM.

- **Recommendation 7: Improve community resilience to flood hazards** in the following ways:

- ▶ Obtain updated local flood plain maps for all counties. Support more responsible development and land uses which avoid or minimize risk. Develop and promote incentives for communities to incorporate proactive approaches in their local planning and regulations and to further address their community's ability to recover after a major flood event. Develop guidelines to assist municipalities in post-flood redevelopment activities which will avoid or sufficiently mitigate risks and maintain ecosystem functions.
- ▶ Support and provide financial and technical assistance for communities in flood risk areas to develop effective emergency response and evacuation plans, or improve upon existing plans. Encourage plans which incorporate mechanisms to coordinate local resources, information, and communications with those of neighboring communities during times of crisis; increase public awareness of individual risk and responsibility; and increase preparedness at the household, community, and regional levels.

Lead Implementing Agency/ies: DEC, DOS, DOT, SEMO, DAM.

## **Preparing for Future Action and Adaptation:**

### **Background:**

The Great Lakes ecosystem is a dynamic and complex interaction of biological, chemical,

and physical components that is not yet fully understood and that is sensitive to human-induced change. Research and monitoring provide the means to assess risks; make informed, scientifically-supportable, and effective management decisions; set timelines for management actions; and to identify meaningful indicators of ecosystem health. Monitoring also enables decision-makers to evaluate the performance of their management efforts and to adapt as necessary, reacting to ecosystem change, including impacts related to climate change.

### **Challenges:**

Development of comprehensive research and monitoring, and accessibility to (and sharing of) data have been hampered by a lack of coordination between levels of government, across many political boundaries, and between government agencies, academics, and nonprofit organizations. Data traditionally have been collected in a piecemeal fashion with few mechanisms for distribution and sharing of information. Standards for data organization have not been established, limiting the compatibility of databases for convenient sharing among stakeholder groups. Additionally, the current funding level for Great Lakes research does not sufficiently support the level of research and development needed to address the host of ecological issues currently affecting the system, to meet present-day demands, and to implement restoration efforts. (Great Lakes Regional Collaboration Strategy, 2005)

### **Opportunities:**

Despite these limitations, a great deal of information has been collected on the Great Lakes ecosystems, waters and watersheds, natural resources, and socio-economic status and trends. New York's Great Lakes continue to be a region of great interest for academic study and scientific research. As technology and communications continue to evolve, and as Geographic Information Systems (GIS) and remote sensing capabilities are utilized to a far greater extent, the time is ripe for the coordination of existing Great Lakes data, identification of information needs and gaps, prioritization for research and monitoring, updating of mapping and inventory products, and the development of a central repository of useful data sets, both for the public and for more restricted access.

### **Recommendations:**

- **Recommendation 8: Assess the comprehensive information needs relative to New York's Great Lakes and develop a long-term time-series monitoring program, focused on priority sites and populations, to monitor those needs.** Appropriate data will be incorporated into the Ocean and Great Lakes Data Catalog and be accessible through the New York Ocean and Great Lakes Atlas.
  - ▶ Create a Great Lakes Health Index, as part of a statewide health index effort, that establishes clear, measurable parameters for assessing each system's ability to provide critical ecosystem services to New York communities. Such an index should monitor and evaluate success in implementing EBM and identify areas where adaptive management is necessary.

- ▶ Establish a long-term monitoring program, in coordination with on-going research, with presently available data, and with existing observation systems (such as the Great Lakes Observing System (GLOS)), to determine aquatic trophic relationships in the Great Lakes and to predict potentially significant foodweb changes in order to support and facilitate informed management decisions.
- ▶ Develop a program to continuously monitor sources, concentrations, and distribution of contaminants in fish and human tissue, as well as in sediment within the Great Lakes Basin. This information is necessary to evaluate the success of remediation efforts and to guide future management decisions.
- ▶ Fully fund the New York State Great Lakes fish consumption advisory program to ensure the development of timely, scientifically-informed public fish consumption advisories, designed to prevent potential health problems resulting from ingestion of contaminated fish.
- ▶ Map current development areas by land use category, through the Atlas project, to serve as the baseline for spatial planning efforts.
- ▶ Map non-point sources of pollution and model potential pathways within the basin using advanced GIS technology. Further quantify and conduct a comparative analysis of inputs from various non-point sources.
- ▶ Perform hydrogeologic assessment of principal aquifers in the Great Lakes watershed. This assessment should include mapping of principal aquifers, delineation of existing and potential groundwater recharge zones and rates, and assessment of potential threats to the aquifer from point and non-point sources. Develop a monitoring program for principal aquifers to guide management and protection decisions.

Lead Implementing Agency/ies: DAM, DEC, DOS, GLWG, SUNY.

- **Recommendation 9: Identify and prioritize research needs to address management issues.** Applied research should be a priority so that the result will provide clear and concise data to allow public and local officials to make more informed management decisions.  
Lead Implementing Agency/ies: DEC, GLWG, Science Advisory Group, SUNY.
- **Recommendation 10: Develop climate and lake level change impact scenarios and devise strategies that address multiple alternatives for adapting to climate induced change.** Establish new policies based on potential climate scenarios and anticipated lake level changes to address future impacts. Undertake a pilot study that explores the feasibility of adaptation and mitigation alternatives.  
Lead Implementing Agency/ies: DEC, DOS, SUNY.
- **Recommendation 11: Monitor actual and potential land use changes and conduct analysis addressing a broad range of impacts to determine the causes of observed land use change.** This analysis should include the multitude of drivers of land use, ground and surface water hydrology and watershed functions, land conversion, population trends, land development patterns and infrastructure.

Lead Implementing Agency/ies: DEC, DOS.

- **Recommendation 12: Identify and promote components of the GLOS to determine how climate-driven changes will impact New York State Great Lakes resources.** This will be critical in order to determine the impacts of climate shifts on the economy of the State and region - business, agriculture, recreation. Incorporate data from the GLOS into the Ocean and Great Lakes Data Catalog.  
Lead Implementing Agency/ies: DEC, DOS, SUNY.
- **Recommendation 13: Create a New York Great Lakes Information Portal** to serve as a central repository and access point for data and information relevant to New York Great Lakes issues, and established as a component of the NYS GIS Clearinghouse in conjunction with the NY Ocean and Great Lakes Atlas. The Portal should be developed in collaboration with the Great Lakes Commission's Great Lakes Information Network. The Portal should utilize standards developed by the NYS GIS Coordinating Body and the Council's Technical Working Group to facilitate data sharing. It should be populated using existing scientific databases and all future data developed from studies pertaining to the Great Lakes. The Portal should house both proprietary and non-proprietary data, making accurate and timely information easily accessible to the scientific community, managers and policy-makers, and to the public as appropriate.  
Lead Implementing Agency/ies: CSCIC, DOS, SUNY.
- **Recommendation 14: Establish a funding mechanism to support bi-national, multi-jurisdictional, and other collaborative monitoring,** surveillance and research projects that benefit New York's Great Lakes Basin.  
Lead Implementing Agency/ies: DEC, DOS, ESD, SUNY

### **Building Awareness and Capacity for Stewardship:**

#### **Background:**

Public awareness is increasing in regard to the benefits of ecosystem health, including the linkage between the health of the Great Lakes and the region's economy. Education and outreach programs build the knowledge and skills that support long-term interest in stewardship of coastal resources and are critical to the success of EBM. Through greater understanding of ecological concepts, people are more likely to work towards protecting these resources.

#### **Challenges:**

Currently, members of many communities located within the Great Lakes basin remain unaware of the tremendous value of this resource, or of their own potential role in restoring and maintaining its health. Until learning about and appreciating the complexity and

interaction of the various components of an ecosystem, individual members of the public will not be motivated to take the necessary steps to improve ecosystem health. Critically important Great Lakes monitoring programs can be undervalued by the public because the programs' role and importance for understanding the ecosystem has not been adequately conveyed.

### **Opportunities:**

A variety of agencies, nonprofit organizations, and institutions currently provide various environmental education programs and materials, including the Center for Great Lakes Environmental Education, Great Lakes Information Network, Cornell Cooperative Extension, the Finger Lakes Institute, and the Center for Environmental Information. Many constructive partnerships already exist, providing built-in mechanisms to broaden the scope and reach of awareness efforts. The State and other organizations currently administer many programs which provide capacity-building or technical expertise, which can be focused and targeted to address specific areas of need. A comprehensive education and public awareness strategy is necessary to utilize existing learning networks, expand overall Great Lakes literacy and environmental stewardship, and promote ecosystem understanding. The principles and tools of EBM need to be integrated with the base curriculum at every level of schooling, beginning in primary and continuing through college. Advanced training on EBM principles is also necessary for State agency personnel, local government officials, and planning boards.

### **Recommendations:**

- **Recommendation 15: Incorporate the principles and tools of EBM into primary and secondary education as well as the undergraduate education of professionals** (engineering, planning, business, architecture, environmental science, public administration). Support existing environmental education programs such as the Great Lakes Student Summit, an biennial international environmental education conference for students. Develop advanced interdisciplinary curricula in policy and management that includes consideration of ecosystem impacts in the design and implementation of all projects and policies that affect the physical environment. Lead Implementing Agency/ies: NYSED, SUNY.
- **Recommendation 16: Support the development and implementation of training and outreach programs for decision makers** including State agency personnel, local government officials, and planning boards. Train agency personnel to view their roles and responsibilities in the context of their ecological relationships to the Great Lakes and the management of Great Lakes resources and uses. Lead Implementing Agency/ies: DOS, SUNY.
- **Recommendation 17: Increase and sustain planning assistance to local communities incorporating EBM principles.** Assistance should target under served areas based on interest and need.

Lead Implementing Agency/ies: DAM, DEC, DOS, DOT, OPRHP.

- **Recommendation 18: Develop an outreach and education plan to increase public awareness of New York's Great Lakes and their management.** This plan, involving State agencies, educational institutions and relevant nonprofit organizations, should expand overall Great Lakes literacy and environmental stewardship campaigns, promote ecosystem understanding, demonstrate the link between ecosystem health and the Great Lakes economy, and disseminate place-based knowledge among New York residents.  
Lead Implementing Agency/ies: NYSED, OPRHP, SUNY.
- **Recommendation 19: Issue a periodic publication summarizing existing and proposed monitoring programs and measures of progress towards goals for management of New York's Great Lakes.** This publication will be targeted toward the general public to disseminate monitoring information and, through education, increase public support and perceptions of monitoring programs.  
Lead Implementing Agency/ies: DEC, DOS, GLWG.

## **Support for Community Improvement:**

### **Background:**

Providing appropriate funding to communities is critical to the improvement of ecosystem health and quality of life in the Great Lakes Region. The Environmental Protection Fund (EPF) is a critical funding source for the New York State's environmental programs, administered by the New York State DAM, DEC, DOS, and OPRHP. Created by the New York State Legislature in 1993, the dollar value of the EPF has gradually increased, providing a reliable and dedicated source of funding for environmental protection, including open space conservation, land acquisition, public access, historic preservation, park development, urban waterfront redevelopment, and water quality improvement projects and activities.

### **Challenges:**

Many communities in New York are aware of their potential negative impact to the overall health of the Great Lakes ecosystem. They may even have plans in place, in keeping with an ecosystem approach, to address threats to the Lakes. However, these communities sometimes lack the financial means to implement those plans. Financial support is necessary to continue existing programs and to provide incentives to protect and improve the Great Lake ecosystem. Currently there is limited coordination between the four State agencies charged with administering the EPF, for grant solicitation, review and project selection. There are no incentives to encourage projects with ecosystem benefits or grant selection criteria to elevate the priority for funding these projects. Fund matching requirements for EPF grants are often hard for communities to meet, especially for more costly construction projects.

Agriculture and forestry producers own and manage large tracts of working landscapes and their activities can greatly impact ecosystem health. While these businesses strive for stewardship, conservation practices can be costly to implement. Communities are also having difficulty funding commercial and harbor dredging since, although the U.S. Army Corps of Engineers funds maintenance dredging and dredged material management at federal navigation projects, these funds are limited and do not include many harbors important for commercial operations and recreation.

### **Opportunities:**

Effectiveness of the EPF can be enhanced by interagency collaboration of the administering agencies to better serve communities. Developing and promoting innovative funding mechanisms is necessary for activities such as commercial and harbor dredging, plastics pollution and coastal debris reduction programs. Incentives should be provided to working landscapes to encourage stewardship. To ensure that financial resources are accessible, coordination and administration of the Environmental Protection Fund needs to encourage projects which improve the health of the Great Lakes ecosystem.

### **Recommendations:**

- **Recommendation 20: Provide incentives that recognize agricultural and forest product producers** for incorporating environmental management, sound conservation practices and the principles of EBM into agriculture and forestry (tax breaks, reduced insurance premiums, greenhouse gas credits, green payments, non-competitive cost-share for additional stewardship, establishment of permanent fund to support sustainable agricultural and forestry practices).  
Lead Implementing Agency/ies: DAM, DEC, GLWG.
  
- **Recommendation 21: Enhance delivery of Environmental Protection Funds** in the following ways:
  - ▶ Build ecosystem benefits into EPF selection criteria.
  - ▶ Consider annual multi-agency focus on a specific region or issue.
  - ▶ Strengthen funding partnerships between foundations and municipalities to leverage matching funds for EPF grant applications.
  - ▶ Strengthen interagency collaboration for EPF solicitation, review and project selection.
  - ▶ Provide incentive for EPF projects with ecosystem benefits (e.g. reduce EPF match to 25/75.)
  - ▶ Allow federal funds as an EPF match source.Lead Implementing Agency/ies: DAM, DEC, DOS, OPRHP.
  
- **Recommendation 22: Develop and support a comprehensive coastal debris pollution reduction education program** for New York State, specifically addressing the flow of litter and other human-generated debris into the Great Lakes coastal

environment. The program goals should focus primarily on reducing land-based discharges of plastic debris ("floatables" - bottles and other plastics such as monofilament line, plastic resin pellets, plastic bags), construction/ demolition debris, and other types of trash. The program should focus on building public awareness and should include a strong component for public involvement.

Lead Implementing Agency/ies: DEC, DOS, ESD, NYSED.

- **Recommendation 23: Build on existing State plans and activities that encourage tourism in New York's Great Lakes Region** (State Park activities, "I Love New York" tourism program, New York's Seaway Trail). Identify and evaluate additional mechanisms to assist communities to capitalize on their aesthetic, cultural and recreational resources.

Lead Implementing Agency/ies: DOS, ESD, OPRHP.

- **Recommendation 24: Increase public access along the shorelines of the Great Lakes Region.** Collaborate with State programs, local communities and recreational/sporting organizations to evaluate public access sites and prioritize areas that need enhanced access to Great Lakes resources.

Lead Implementing Agency/ies: DOS, ESD, OPRHP.

- **Recommendation 25: Establish Great Lakes Underwater Seaway Trail.** This trail will promote recreational diving, tourism, and maritime and other waterfront cultural heritage education and protect shipwrecks and other irreplaceable underwater resources. Build on activities developed under a pilot project to identify and establish dive sites in the City of Oswego and Lake Ontario, and the City of Dunkirk and Lake Erie.

Lead Implementing Agency/ies: DEC, DOS, OGS, NYSED, OPRHP.

## **Leadership and Sound Decision-Making:**

### **Background:**

There are numerous State agencies, including the nine member agencies of the Council as well as federal agencies, U.S. and Canadian governments, local governments, and regional organizations with varying missions and a broad spectrum of interests working to manage resources within the Great Lakes Region. In 1988, The Great Lakes Basin Advisory Council (GLBAC) was created to assist New York State in its effort to protect the environmental, social and economic health of the Great Lakes Region. Consisting of twelve public and six agency members, the Council also functions as a link between the government and the public.

### **Challenges:**

This multi-layered governance structure can lead to decreased efficiency and separation

among different jurisdictions and stakeholder interests. Collaboration between these entities would prevent the potential for redundancies, such as separate programs developing similar tools, projects, and datasets aimed at solving the same problems. Such redundancy prevents resources from being re-directed to other areas that need attention. This array of interests and jurisdictions can lead to uncertainty in the legal aspects of regulation and siting of structures, and in riparian and littoral rights. Without greater coordination, economic development will be stifled, and regional ecosystem restoration goals will not be realized.

### **Opportunities:**

Formation of the Council has provided a critical first step by creating a forum for discussion of issues and coordination of efforts within New York. Full integration of EBM principles with existing agency efforts and a comprehensive review of Great Lakes programs, within and outside of New York State, are both necessary in order to identify areas of potential conflict and collaboration. Training for personnel on how to incorporate EBM into their job responsibilities is also needed. The Great Lakes Working Group could continue to provide recommendations and advice to the Council while also serving as forum for Great Lakes issues and future collaboration opportunities.

### **Recommendations:**

- **Recommendation 26: Formalize the Great Lakes Working Group.** Define a future role for the Great Lakes Working Group to provide the Ocean and Great Lakes Ecosystem Council with ongoing technical and scientific support and expertise, and to provide ongoing recommendations and advice to the Council. Expansion of the Great Lakes Working Group should be considered to include the New York State Department of Education.

Specifically, the GLWG could:

- ▶ Monitor and facilitate the implementation of the November 2008 report.
- ▶ Discuss Great Lakes issues and projects and identify future opportunities for collaboration within and between agencies.
- ▶ Identify agency implementation opportunities to support bi-national committees, management plans and related efforts to protect, conserve, restore and enhance the natural resources of the Great Lakes Basin as authorized by the Great Lakes Water Quality Agreement, Convention on Great Lakes Fisheries, Great Lakes Panel on Aquatic Invasive Species, Great Lakes Bi-national Toxics Strategy, and others having direct policy, resource, monitoring and funding implications to New York's Great Lakes Basin. This includes, but is not limited to the International Joint Commission Water Quality and Air Quality Boards, Lake Erie and Lake Ontario lakewide management plans (LaMPs), the Lake [Fishery] Committees and the Niagara River Toxics Management Plan.
- ▶ Institute EBM's collaborative outcome-based approach to protect critical habitats and enhance biodiversity. Coordinate activities to preserve undeveloped shorelines, maximize wetland areas and riparian buffers, protect

benthic and pelagic habitats, create and enhance fish spawning and nursery habitats, preserve open space, preserve or establish urban green space, improve habitat connectivity for wildlife, and prevent fragmentation of forested lands.

- ▶ Identify opportunities to make the overall State permitting process more efficient and reliable within key economic growth sectors related to healthy Great Lakes resources.
- ▶ Review the regional missions and programs of State agencies. The Council should undertake a comprehensive review of the missions and programs of its various agencies and identify potential conflicts as well as areas of collaboration in an effort to create an institutional management structure that will encourage coordination within and among agencies that manage the Great Lakes resources. This initiative will strengthen all programs that address Great Lakes issues and include training for agency personnel that presents their roles and responsibilities in the context of their ecological relationships to the Great Lakes and the management of its resources and uses. This activity should be conducted at all levels of the council (Working Groups, Agency Steering Committee, etc.)

Lead Implementing Agency/ies: Council staff, GLWG, NYSDOH.

- **Recommendation 27: Develop an EBM handbook on legal aspects of regulation and siting of in-water structures, and riparian and littoral rights** - State ownership of underwater lands, local and county water use controls, State Navigation Law, delegation of dock regulation to waterfront municipalities, dock construction guidelines, riparian rights, Public Trust, offshore/nearshore development, and private/public access.  
Lead Implementing Agency/ies: DEC, DOS, OGS, OPRHP.
- **Recommendation 28: Revisit charge and membership of the Great Lakes Basin Advisory Council.** Maintain appointments of Great Lakes Basin Advisory Council members ensuring that at least one member is also a member of the GLWG and the Council also includes a representative from citizen advisory committees.  
Lead Implementing Agency/ies: DEC.
- **Recommendation 29: Support implementation of the Great Lakes and St. Lawrence River Compact and the Great Lakes and St. Lawrence River Sustainable Water Resources Agreement,** promoting EBM in the Great Lakes Region. Council agencies should collaborate to develop policies and recommendations to minimize or avoid cumulative impacts of water withdrawals.  
Lead Implementing Agency/ies: GLWG.
- **Recommendation 30: Establish New York as the leader in lower Great Lakes ecosystem management.** Integrate State priorities with regional and federal agendas.

- ▶ Continue to identify key priority areas for the State that have a strong external connection (local, federal, national, international) and ensure that communication with federal partners takes place on a time-scale that respects the federal budget and regulatory timeline.
- ▶ Actively participate in regional collaborations in the Great Lakes.
- ▶ Work with the Ontario government to identify areas of common interest or concern on Lake Ontario; extend to Pennsylvania, Ohio, and Michigan on Lake Erie.
- ▶ Provide State funding resources to build the capacity needed to take full advantage of Federal and bi-national programs and initiatives.
- ▶ Review federal policies, regulations, and statutes for mechanisms to involve the State in management processes and decisions; where appropriate, provide recommendations to the federal government on ways to improve these mechanisms in order to enhance consultation or coordination with the State.

Lead Implementing Agency/ies: All Agencies.

## **Improving Water Quality:**

### **Background:**

The Great Lakes represent the largest single source of surface freshwater in the world. The importance of Great Lakes water resources is difficult to overstate. New York State encompasses approximately 12% of the Great Lakes shoreline and 14% of the basin's drainage, comprises 18% of the total Great Lakes Basin population, and contains 19% of Great Lakes "Areas of Concern" (Great Lakes Research Consortium). New York also is at the 'downstream' end of the system, meaning that it receives many pollutants that originate in watersheds further upstream and out-of-state. New York therefore must work on a broader regional basis to promote water quality restoration activities. Maintaining the health and natural functions of Great Lakes ecosystems is critically linked to local, regional, and State economies and to our continued ability to benefit from this valuable resource. Minimizing and mitigating the flow of contaminants into the lake basins and remediating and restoring impaired waters or habitats is vital to maintain healthy, functional ecosystems which support a diversity of wildlife; to provide continued scenic and recreational opportunities; to support local economies; to safeguard the public water supply; and otherwise protect human health.

### **Challenges:**

Water quality has been an ongoing concern for the Great Lakes, particularly in the nearshore environment. Industry, development, and rising, concentrated human populations have led to unsafe levels of pollutants in many areas. Lake Erie is the smallest of the Great Lakes in volume and is exposed to the greatest effects from urbanization and agriculture. The Lake Erie Basin, containing very fertile soils, is intensively farmed and is the most densely populated of the five lake basins. Lake Ontario holds almost four times the volume of water compared to Lake Erie and its U.S. shore is less urbanized, with major urban centers located on the Canadian side.

Both lakes are subject to the effects of water quality degradation resulting from microbial contamination, algal blooms, and chemical contamination – including pollution from environmentally persistent toxins, bio-accumulative toxins, and emerging threats such as pharmaceuticals. Pollutants may enter the lakes via rivers, precipitation, atmospheric deposition, sewage treatment plant outfall pipes, combined sewer overflows, waste sites, and runoff from urban and agricultural areas, in addition to other possible sources. It is extremely difficult to estimate pollutant loads to the lakes because the sources are multifarious and are constantly changing in response to a variety of known and unknown factors.

Polluted waters pose many threats and can compromise the safety, taste, and odor of drinking water; can render beaches and nearshore areas unswimmable; can have long-term effects on the health of humans and animals in terms of disease, growth and development, and reproduction; can impact the health and functioning of ecosystems and result in lost or degraded habitats; and can result in economic losses for fisheries, recreational fishing/boating and tourism industries, and ultimately threaten the economic stability and quality of life for entire communities.

### **Opportunities:**

The legacy of industrial contamination within the Great Lakes is well-documented, and established frameworks exist for site restoration. As a signatory to the Great Lakes Water Quality Agreement (1972/78), Great Lakes - St. Lawrence River Compact (2005), and the Great - Lakes St. Lawrence River Sustainable Water Resources Act (2005), New York State has expressed its commitment to "restore and maintain the chemical, physical, and biological integrity of the Great Lakes Basin Ecosystem". Recurring themes under these agreements include recognition of the interconnected waters of the Great Lakes as a single hydrologic system; the need to take collaborative, adaptive, regional, and consistent approaches "to protect, conserve, restore, improve, and effectively manage the waters and water dependent natural resources of the basin" and "to prevent significant adverse impacts of water losses and withdrawals on the basin's ecosystems and watersheds".

### **Recommendations:**

- **Recommendation 31: Identify and consider potential changes to current wetlands laws, regulations, and policies.** Develop and support programs which maintain or improve Great Lakes wetland areas and/or enhance wetland quality, to facilitate greater contaminant removal capacity and enhanced habitat for biodiversity. Improve policies to better integrate habitat restoration, mitigation and enhancement. Strengthen coordination among and between federal, State and local agencies. Update New York State wetland maps. Prioritize conservation and restoration sites which take into account the potential to improve local water quality and fully consider ecosystem extent, function, and health. Revisions would minimize interagency redundancies and address loopholes in existing laws and regulations.  
Lead Implementing Agency/ies: DEC, DOT, DAM, GLWG.

- **Recommendation 32: Significantly reduce toxic substances from Great Lakes Basin waters**, in pursuit of the Great Lakes Water Quality Agreement's objective, through the following;
  - ▶ Develop a joint agency response capability to track potential or suspected sources of persistent toxic pollutants.
  - ▶ Develop and implement effective regional monitoring, investigation and remediation programs.
  - ▶ Support the implementation of the Great Lakes Binational Toxics Strategy by encouraging State and local programs and voluntary incentives aimed at reducing contamination from environmentally persistent substances including mercury, PCBs, dioxins, furans, and pesticides.
  - ▶ Prioritize and conduct research, to monitor for new and emerging pollutants, like pharmaceuticals, found in the waters and sediments.
  - ▶ Identify and initiate research needed to understand potential cumulative impacts upon Great Lakes ecosystems and human health.
  - ▶ Support updates and expansion of the Great Lakes Water Quality Agreement to ensure that bi-national programs recognize EBM priorities for New York State.

Lead Implementing Agency/ies: DEC, DOH, GLWG, SUNY.

- **Recommendation 33: Assess extent of sediment contamination and feasibility of remediation, particularly within areas of concern, tributaries, embayments and harbors.** Create a State fund to remediate contaminated sediments, promote development of environmentally sound sediment treatment and destruction technologies, encourage beneficial reuse of sediment, and invest in best available disposal options.

Lead Implementing Agency/ies: DEC.

- **Recommendation 34: Develop community or watershed based long-term strategies for water and wastewater management, and for financing.** Building on the 2008 Wastewater Infrastructure Needs of New York State report, gather and analyze additional data on wastewater treatment facilities and septic systems to determine which systems are in need of repairs or replacement, prioritize critical areas where the risks and/or potential impacts of most wastewater system failures are higher, and to develop cost estimates for these repairs or replacements. Develop and promote innovative funding mechanisms for upgrading water infrastructure to serve cities, villages, and hamlets with respect to wastewater effluent quality and drinking water treatment and distribution systems, in order to protect and improve the quality of New York's water resource. Implement identified opportunities for potential upgrades to currently operational wastewater treatment facilities, for correction of combined sewer overflows, for alternative siting locations for outfall pipes and new facilities, for mitigation of discharge nutrient loads, and for alternative methods.

Lead Implementing Agency/ies: DEC, DOH, DOS.

- **Recommendation 35: Apply EBM approaches to Clean Water Act Section 303d-listed impaired waterways and water bodies within the GLB.**  
Lead Implementing Agency/ies: DEC.

## **Enhancing Transportation - Moving People and Freight:**

### **Background:**

New York's Great Lakes Region lies at a significant transportation crossroads. One of the nation's most historically important east / west transportation corridors was established with the construction of the Erie Canal in the 1920s. Linking both the Atlantic and the Hudson River to the Great Lakes provided the State with the opportunity to prosper and grow, making boom towns out of cities like Rochester and Buffalo. As modes of transportation changed and demographics shifted, New York's Great Lakes Region has been forced to adapt to new needs and demands. The opening of the St. Lawrence Seaway in the 1959 diminished Buffalo's role as the eastern terminus of the upper Great Lakes. However, New York's Great Lakes Region continues to be at the crossroads for much of the Northeast, with the Niagara and St. Lawrence Rivers serving as two of the country's main areas for cross-border trade with Canada, and the New York State Canal - Thruway corridor linking the area's major population centers.

At the community level, infrastructure planning and investment decisions, whether about adding more lanes to a highway or about developing alternative forms of transit, shape transportation methods for decades. Without regard to basic smart growth principles, such decisions may ultimately work against achieving broader ecosystem goals, such as habitat restoration and increased public access to recreation amenities.

### **Challenges:**

Population growth and increased sprawl in the rural and urban fringe areas of the Great Lakes has led to an increase in the number of vehicles on the roads, fuel consumption, and miles traveled. The continued emphasis on providing motorized transportation systems has resulted in strained highway infrastructure, increased greenhouse gas outputs, along with limited options for alternative modes of transport. Transportation management commitments by state and local governments are needed to break the cycle of increasing dependence on commuting by single-occupancy vehicles. Such a commitment can substantially reduce emissions through investments and policies that will expand public transportation and encourage bicycling and walking, thereby shifting the disconnect between people and the outdoors which has long hindered a stewardship ethic and the maintenance of public health.

Aging and inadequate infrastructure also effects waterborne transportation. As one of the most efficient alternatives for companies that rely on bulk cargo, infrastructure inadequacies, coupled with falling water levels in the Great Lakes, have challenged operations at the State's major ports of Buffalo, Ogdensburg and Oswego. As lake water levels decrease with warmer

temperatures, ships that ferry bulk materials must lighten their loads or risk running aground, threatening international shipping. Maintenance of adequate channel depth is essential to port activity. Dredging should be efficient, with dredged material re-used in a safe, cost-effective manner.

### **Opportunities:**

Planning activities that are already well-established, such as those at the Department of Transportation, can be adjusted to incorporate smart growth principles and to reflect ecosystem goals. With more comprehensive coordination, community development and growth can concentrate on reducing the volume carried on existing highways.

New York's Great Lakes ports are strategically positioned as the first U.S. port-of-call for vessels entering the Great Lakes from the St. Lawrence (Ogdensburg), and as the last port-of-call for vessels leaving the upper Great Lakes, prior to entering the Welland Canal and St. Lawrence Seaway system (Buffalo). The State's potential as a gateway for waterborne and border-based commerce could be re-captured with additional investments in infrastructure. To combat the uncertainty in energy prices, New York should capitalize on its natural waterborne and land-based transportation corridors to strengthen its role as a leader in transportation.

### **Recommendations:**

- **Recommendation 36: Establish a mechanism to foster collaboration between State agencies and communities during DOT's capital improvement programming** to ensure that projects comprehensively address local ecosystem needs, goals, and priorities.  
Lead Implementing Agency/ies: DOT, GLWG.
- **Recommendation 37: Support mechanisms to reduce motorized commutes.**  
Assess regional transportation improvements such as car pooling and enhanced use of bus and rail services by the commuting public. Increase support for and availability of alternate work schedules and workplace locations.  
Lead Implementing Agency/ies: DOT, ESD.
- **Recommendation 38: Design, construct, and expand networks enabling and facilitating non-motorized transportation methods** including paths, walkways and hike /bike /blueway /rail trails.  
Lead Implementing Agency/ies: DEC, DOT, ESD, GLWG, OPRHP.
- **Recommendation 39: Support a bi-national Great Lakes planning effort to assess current Great Lakes and St. Lawrence Seaway usage and analyze alternative shipping and intermodal shipment opportunities,** to enhance transportation benefits to the region. Emphasize transportation options that take ecosystem principles into consideration and minimize the biological and chemical

impacts of invasive species, sediment dredging, water quality degradation and negative viral and bacteriological effects, while also taking advantage of economic development and job creation opportunities. Develop an EBM compatible strategy to address aging infrastructure of New York ports and harbors along the Great Lakes and St. Lawrence Seaway and to incorporate new technologies for improving efficiency and linkage to other transportation modes.

Lead Implementing Agency/ies: DEC, DOS, DOT, ESD.

- **Recommendation 40: Develop an EBM-compatible strategy to address aging infrastructure of New York ports and harbors along the Great Lakes and St. Lawrence Seaway** and to incorporate new technologies for improving efficiency and linkage to other transportation modes.

Lead Implementing Agency/ies: DEC, DOS, DOT, ESD.

- **Recommendation 41: Incorporate EBM principles into any study assessing improved local, regional and international border crossing opportunities** for both goods and people.

Lead Implementing Agency/ies: DOT, GLWG.

## **Maintaining Safe Maritime Commerce:**

### **Background:**

New York State waterways function as a critical link with the Atlantic Ocean, the Midwest, and the Canadian provinces. The St. Lawrence Seaway, at the New York border with Quebec, facilitates waterborne commerce, allowing ships from around the world to enter a network to the interior of North America, via Lake Ontario and Lake Erie. The cost-effectiveness and efficiency of water transportation compared with other modes allows shippers to move bulk commodities (iron ore, coal, grain, limestone, salt, petroleum products), supporting a diversified economy throughout the Great Lakes Region. Important New York State ports include Ogdensburg, Oswego, Rochester, and Buffalo. New York's Great Lakes and waterways also support many recreational uses for residents and visitors alike, contributing to the character of New York's waterfront communities, and improving quality of life through the region's natural, cultural, and historic resources.

Natural sedimentation processes in tributaries and streams, and along lake shores, combined with increased erosion and sediment transport due to human activities, create the total sediment load to receiving water bodies. Loading is often particularly high where land use throughout the watershed is agricultural, where there is considerable construction activity, or where impervious surfaces and topography lead to high volumes of urban runoff. Flowing soils and accumulated sediments can inhibit navigability of channels, waterways, harbors, marinas, and ports. The result is a perceived societal need for periodic dredging to maintain human uses.

## **Challenges:**

Maintenance dredging is an ongoing and expensive process. Maritime commerce has steadily increased, as have the size and draft depths of vessels. Thus, dredging and maintenance of ever deeper channels are required. Increases in size and draft of cargo vessels correspond to the desire for increased cargo capacity. For a vessel sized to fit the St. Lawrence Seaway, the loss of an inch of draft translates into a 100 ton cargo reduction (Great Lakes Dredging Team. 1999). Recreational boating is experiencing growth both as an individual activity and as a major Great Lakes Regional industry with increasing sales of boats, trailers, outboard motors, marine accessories, and sports fishery equipment. Regional tourism is closely linked to recreational boating opportunities. Marina development and interest in residential shoreline developments have also been accelerating.

Dredging projects are primarily undertaken for maritime commerce purposes, funded on a cost share basis between federal/State/local governments with the greatest share from the U.S. Army Corps of Engineers. Dredging for recreational boating (harbors and marinas) typically receives no federal funding. The disposal of dredged materials is a major consideration adding to the financial cost, while future dredging management will also be affected by lake level regulation and climate change impacts. Significant problems related to dredging include: location and long-term availability of proper disposal sites; disposal and containment of contaminated sediments; impacts on fish spawning habitats; social equity in financing projects; immediate and cumulative environmental impacts of both dredging activity and of dredge material disposal. Additionally, should climate change lead to perpetually lower lake levels, dredging needs would be compounded.

## **Opportunities:**

While society recognizes a need to dredge for maritime commerce and to enhance recreational opportunities, it also upholds the importance of striking a balance between economic benefits, protecting environmental and ecosystem quality, and preserving the integrity of waterfront communities.

Careful, comprehensive planning and improved agency coordination through implementation of an EBM approach can result in more unilaterally desirable conditions and outcomes. Dredged material management plans, required for channel deepening projects, offer the opportunity to think more broadly about the effects of dredging and disposal, and to cross-reference for consistency with the goals of the bi-national Lakewide Management Plans, New York State's coastal policies, and local planning.

## **Recommendations:**

- **Recommendation 42: Revisit and update the 2000 dredging management plan for Lake Ontario and prepare a similar plan for Lake Erie.** This effort will help maintain the viability of New York's Great Lakes ports, harbors, water-dependent

business and recreational facilities and will contribute to making the most beneficial use of dredged materials. Issues that need to be addressed include: greening of ports; lake levels impacts on dredging needs; responsible management of material disposal; relationship of land uses to the need for dredging activities; increased need for dredging to support recreational purposes; consideration of channel deepening; ecological implications of removing sediments deposited at river mouths, influence on invasive species spread.

Lead Implementing Agency/ies: DEC, DOS.

- **Recommendation 43: Evaluate and establish innovative financing mechanisms to provide a perpetual funding source to support public and private harbor dredging and sediment reuse.** Evaluate opportunities for private contributions from water-dependent and adjacent businesses which profit from viable harbors. Explore opportunities to reduce costs, by the coordination of dredging activities with neighboring communities.

Lead Implementing Agency/ies: DEC, DOS, EFC, ESD.

- **Recommendation 44: Support the work of the Great Lakes Dredge Team,** co-chaired by the U.S. Army Corps of Engineers and the Great Lakes Commission, to develop basin-wide strategies to improve the effectiveness and cost efficiency of dredging activities.

## **Protecting and Restoring Fish and Wildlife Habitats:**

### **Background:**

The aquatic and terrestrial habitats found in and around Lakes Ontario and Erie, inclusive of New York's Great Lakes shorelines, embayments, tributaries, and uplands are critically important to support countless species of plants, fish, reptiles, amphibians, insects, birds, and mammals. Healthy habitats are crucial to support and maintain overall ecosystem health and functions, to build sustainable regional economies, to foster biodiversity, to protect endangered species, and to preserve our Great Lakes natural heritage.

### **Challenges:**

Significant amounts of nearshore and wetlands habitats have been lost or fundamentally altered in the Great Lakes. Nearshore ecosystems have been compromised since the late 1980s by the arrival of invasive zebra and quagga mussels which have altered or eliminated habitat for native benthic organisms. Wetlands and the nearshore are two of the most biologically productive habitat types. Freshwater wetlands provide important food sources for many organisms, offer refuge for migratory waterfowl, and serve as breeding, spawning, and nursery grounds. In addition, wetland plants filter contaminants and nutrients flowing from streams and runoff into the larger water bodies. Nearshore habitats are critical to nearly all Lake Ontario fish, as eggs, fry, and juvenile life stages of most fish depend on these

habitats during these most vulnerable life stages.

### **Opportunities:**

While fish and wildlife management and conservation efforts have traditionally been single-species in focus, present and future success in these areas depends upon a shift of focus toward protecting assemblages of species. This will require the broad adoption of a more holistic view of ecosystems and habitat protection which fully considers species' bio-energetic requirements and life cycle needs by preventing and mitigating against habitat fragmentation in our land use decisions and by facilitating and reestablishing connectivity of habitats that are already impeded. There are many existing efforts and strategies to inform and guide the development of actions, including the State Comprehensive Wildlife Conservation Strategy, Great Lakes Fish Community Objectives, Lakewide Management Plans, and others.

### **Recommendations:**

- **Recommendation 45: Take an EBM approach to protect and restore habitat assemblages, rather than just single species management.** Reevaluate and update Significant Coastal Fish and Wildlife Habitats and assess other important habitats in and along New York's Great Lakes in order to accomplish planning for habitat protection. Set priorities for improvements and restoration efforts.  
Lead Implementing Agency/ies: DEC, DOS.
- **Recommendation 46: Develop a comprehensive aquatic habitat strategy that supports the Binational Lake Committee plans for managing Great Lakes fisheries** and advances the Lake Erie and Lake Ontario Fish Community Objectives by developing habitat indicators, identifying and implementing opportunities to create and enhance spawning, nursery and refuge habitat within the Great Lakes and their tributaries. Explore and prioritize funding opportunities for site-specific implementation projects for critical habitat rehabilitation in order to promote self-sustaining fish populations and to cost-share with federally funded projects.  
Lead Implementing Agency/ies: DEC, DOS, OGS.

### **Reducing the Impact of Invasive Species and Pathogens:**

#### **Background:**

Invasive species are non-native species that cause harm to the environment or to human health. Once introduced, these species spread rapidly and have the potential to significantly alter the integrity of established, natural ecosystems. Populations of invaders can grow at exponential rates and quickly dominate previously healthy systems due to a lack of control by natural predators in their 'new' environment and the resultant ability to out-compete the native species. Alteration of ecosystems in this way leads to important environmental and

socio-economic concerns, and in some instances, may have implications for human health.

### **Challenges:**

Invasive species, both aquatic and terrestrial, have become a pervasive problem throughout the Great Lakes and across the United States. More than 160 non-native aquatic species are established in the Great Lakes and during the past several decades established populations have been discovered at an average rate of one every 8 months. Not all of those species are invasive, but economic losses in the Great Lakes Basin from those that are invasive were estimated in 2005 at \$5 billion per year. Forty two percent of threatened and endangered species in the U.S. are at risk, primarily due to invasive species (Great Lakes Regional Collaboration Strategy, 2005). Invasive species of particular concern in the Great Lakes include: mollusks (such as zebra and quagga mussels), plants (such as Eurasian Watermilfoil, Purple Loosestrife), fish (such as Common Carp, White Perch, Sea Lamprey), and crustacea (such as Rusty Crayfish, Spiny Water Flea) (Great Lakes Information Network).

### **Opportunities:**

As the United States “gateway” to the Great Lakes, New York is in a position to have a significant impact on broader invasive species management regimes for the Great Lakes. In response to the growing need for action, New York State passed legislation in 2003 to establish a multi-agency Invasive Species Task Force to work collaboratively to address the issue and develop appropriate responses. In 2007, the New York State Invasive Species Council was appointed to formalize and continue the work of the Task Force . While strides have been made, significant gaps remain in order to fully protect against new invasions and further mechanisms need to be developed to address the full scope of the problem. To achieve success, a regulatory approach will need to consider the complexity of controlling the introduction and spread of invasives, given the increasingly global nature of commerce and transportation. Cooperation and coordination across all levels of government and across political boundaries (both interstate and international) is necessary to ensure effective control of invasive species introduction and transmission. This is especially important with regard to ballast water controls for ships entering the St. Lawrence Seaway and other canals and waterways connected to the Great Lakes.

### **Recommendations:**

- **Recommendation 47: Continue implementation of the recommendations called for in the New York State Invasive Species Task Force Final Report (2005) under the purview of the New York State Invasive Species Council.** Coordinate resources and tools to support for agencies working on invasive species and pathogen issues. Participate in legislative and cooperative efforts (State, interstate, Federal, bi-national) to establish and implement environmentally protective standards to prevent the spread of invasive species from all pathways.  
Lead Implementing Agency/ies: DAM, DEC.

- Recommendation 48: Promote collaboration between local and county governments, businesses and organizations through the Partnerships for Regional Invasive Species Management (PRISMs)** to develop adaptive, regional invasive species management plans using best available scientific information, with oversight and technical assistance from State government agencies. Coordinate effective rapid response protocols. In keeping with an ecosystem-based approach, any plans or actions should first be precautionary and should anticipate a full range of potential impacts. Enhance PRISMs to integrate efforts to comprehensively and continuously map and monitor the spatial and temporal distributions of invasive species and pathogens in New York's Great Lakes, embayments, tributaries, and uplands. Establish standards and procedures for analysis of data and information sharing, to implement effective regional management strategies. Develop reliable methodology for comprehensive evaluation of introduction and transmission vectors. Develop models to predict future conditions and outcomes related to various management approaches.  
Lead Implementing Agency/ies: DEC, DAM, SUNY.
- Recommendation 49: Develop Memoranda of Understanding among State agencies for resources and collaborative funding for invasive species prevention and eradication** along highways and canal rights-of-way, and along wildlife, transportation and other corridors.  
Lead Implementing Agency/ies: DEC, DOT.

## **Managing for Multiple On-Lake Uses:**

### **Background:**

Most navigable bodies of water in New York are State-owned, including the beds of Lake Erie, Lake Ontario and the St. Lawrence River. The territorial limits of New York State extend offshore in the Great Lakes to the midpoint between the shorelines of New York and the Provinces of Quebec and Ontario. The underwater lands of the Great Lakes within New York are generally owned by the State of New York, except under limited circumstances in nearshore areas where the State has conveyed interests to other public and private entities. New York maintains a moratorium on drilling within the State's territorial limits.

Although New York's Public Lands Law provides the statutory guidelines for the use and occupation of structures on or over public lands, which are held under the jurisdiction of the Office of General Services, other New York State agencies also have a current, or potential, role in surface water and bottomland planning, management and use. The New York State Significant Coastal Fish and Wildlife Habitat program, for instance, established in the New York State Waterfront Revitalization and Coastal Resources Act of 1981, aims to protect New York's most important coastal habitats. Under this program significant habitats maps and narratives were developed to identify important habitats and provide site specific information that is useful for impact assessment.

## **Challenges:**

Increasing uses, activities and development in New York's Great Lakes waters necessitates better coordination and integration among agencies and programs in order to anticipate and effectively address new proposals for projects such as dredged material disposal areas and borrow pits, power cables, wind generators, gas lines, and water turbines, while protecting ecosystems, underwater archeological resources, scenic vistas, and existing lake uses, activities and economies such as recreational fishing and boating, shipping and transportation.

While the Significant Coastal Fish and Wildlife Habitat program protects significant areas along the Great Lakes shorelines, it does not identify habitat in the open waters of the Great Lakes. This omission may leave valuable habitats vulnerable to degradation.

## **Opportunities:**

As the many competing uses of the Great Lakes have intensified, and will continue to intensify, spatial planning of water surface and submerged lands will be necessary to promote a balance between various uses while also protecting aquatic resources. Communities must anticipate and plan to allow for appropriate development and uses while protecting natural resources. Spatial planning can be implemented through variety of mechanisms including ordinances, designation of special use and protection areas, and other techniques. Precedents for lake spatial planning in New York exist already, including the Significant Coastal Fish and Wildlife Habitats program, and comprehensive harbor management planning, conducted pursuant to Executive Law Article 42 §922.

## **Recommendations:**

- **Recommendation 50: Expand the New York State Significant Coastal Fish and Wildlife Habitat designation program to include offshore areas**, in order to protect unique or significant freshwater ecosystems from environmentally degrading activities. Areas for potential designation will include those with high biodiversity, critical spawning grounds, nursery areas, and migratory corridors.  
Lead Implementing Agency/ies: DEC, DOS.
- **Recommendation 51: Prepare harbor management plans to identify and assess issues relating to water surface and submerged lands**, ordinances, and special use guidelines, in order to achieve balance among the various commercial and recreational uses of harbor systems and the quality and quantity of natural resources.  
Lead Implementing Agency/ies: DOS, OGS.
- **Recommendation 52: Initiate comprehensive lake spatial planning.** Identify and assess issues relating to water surface and submerged lands, ordinances, and special use guidelines, in order to manage competing uses. Evaluate application of spatial planning as a mechanism to identify areas of existing usage, critical habitat, and

related information, and to balance intensifying and competing interests within the Great Lakes while maintaining protection for aquatic resources and critical habitats. Identify the appropriate authority and potential obstacles to implementation. Lead Implementing Agency/ies: DOS, OGS.

## **Managing Agriculture and Forestry for Multiple Benefits :**

### **Background:**

Agriculture and forestry are integral to the economy, culture, and environment of the New York State Great Lakes Region. These working lands provide valuable ecosystem services, including clean air and water, timber, agro-forestry and agricultural products, wildlife habitat and corridors, jobs, recreational opportunities, scenic vistas, flood protection, and greenhouse gas reduction.

### **Challenges:**

While the benefits that these working landscapes provide are accessible to the entire community, private landowners bear the responsibilities and costs of land ownership. Rising property taxes coupled with increasing development pressure have led to fragmentation, and to the conversion of working landscapes to developed uses. Agricultural lands provide great benefits to the ecosystem. If improperly managed, however, farming activities may cause surface and ground water degradation. It is crucial that comprehensive nutrient and waste management planning and implementation continue on both regulated and non-regulated farms while providing new resources for development and evaluation of new and alternative technologies to handle, treat, and use agricultural waste. Nutrient and waste management are major environmental concerns that can only be addressed in close cooperation with individual farmers.

In addition to crop farming, it is possible that the Great Lakes region will see increased interest in aquaculture. World-wide, aquaculture, water pollution, and a greater demand for seafood will continue to put pressure on wild fish stocks. Locations with abundant supplies of water, which is necessary to keep farmed fish healthy, are likely to become more appealing as aquaculture develops nationally.

### **Opportunities:**

To ensure ecosystem health, economic and financial motivations need to be incorporated into a working landscape strategy which will promote continued private landownership and sustainable management of forest and agricultural lands.

New York State's Agricultural Environmental Management (AEM) program provides technical assistance to farmers to operate environmentally sound and economically viable businesses. However, the AEM program needs to be expanded to incorporate EBM

principles to more effectively address broad-scale natural resource and ecosystem issues and concerns. Research needs to be expanded and new practices and associated standards developed. Increased technical assistance for agricultural crop production are needed to improve economic sustainability and limit potential environmental impacts to the ecosystem. When agricultural producers utilize the AEM program, implement sound conservation practices, and incorporate EBM principles into their agricultural business, they should be recognized and rewarded with additional incentives. It is also essential to identify and anticipate the potential impacts that an increase in aquaculture could have on the Great Lakes ecosystem and work pro-actively to prevent potential negative impacts such as wastewater discharge and the spread of parasites and disease to native species.

### **Recommendations:**

- **Recommendation 53: Expand the New York State AEM program to incorporate an EBM approach** to address potential ecosystem benefits through assessment, planning, implementation, evaluation, education, outreach, and training.
  - ▶ Strengthen agricultural nutrient and waste management. Continue to develop comprehensive nutrient and waste management plans for farms in high impact locations.
  - ▶ Emphasize research on buffers that will address proper buffer width, plantings that may have commodity benefits to communities, mitigation of tillable soil lost to erosion.
  - ▶ Encourage new technologies to handle, treat and use agricultural waste regardless of farm size, including development of on-farm alternative energy production.
  - ▶ Develop new standards and provide technical assistance for agronomic practices, including vineyard management practices to improve long-term economic sustainability and limit potential impacts that agricultural crop production may have on the ecosystem.
  - ▶ Consider mechanisms to improve data reporting to other state agencies.Lead Implementing Agency/ies: DAM, DEC, GLWG.

- **Recommendation 54: Develop a Great Lakes Basin working landscape strategy.** This strategy will study and address causes of land fragmentation, to identify land conservation objectives for the maintenance of ecosystem services, to conduct an inventory of working landscapes and an analysis of contiguous large parcels, and to provide recommendations on: potential tax policy incentives, regional land use controls, native species reforestation and wildlife corridor preservation. Conduct education to increase awareness of fragmentation, directed to municipal officials, planning boards, community leaders, land managers and owners of large undeveloped lands.  
Lead Implementing Agency/ies: DAM, DEC, DOS.

- **Recommendation 55: Investigate methods to promote local agricultural and**

**forestry products.** This initiative would enhance the commercial viability of local and regional products, thus stimulating the economy across the region and the State of New York.

- ▶ Encourage institutions that purchase large quantities of food such as schools and corrections facilities, to buy local food products. Encourage participation in The New York State Farm-to-School Program which facilitates and organize events for New York Harvest for New York Kids.
- ▶ Expand on education and information programs that promote local food and forestry products and encourage use of "Pride of New York" products, promoted through the Department of Agriculture & Markets.
- ▶ Foster the relationship between local restaurants and local producers to encourage the use of locally grown products and feature locally grown choices on menus.

Lead Implementing Agency/ies: DAM, ESD.

- **Recommendation 56: Define standards for environmentally sound land and water based aquaculture operations,** and quantify potential positive and negative effects on the Great Lakes ecosystem.

Lead Implementing Agency/ies: DAM, DEC, DOS.

## **Harnessing Energy Resources in the Great Lakes Basin:**

### **Background:**

Generation and transmission of energy currently plays an important role in the Great Lakes watershed, helping to support local economies, creating jobs, and providing energy for New York and the Northeast. There are currently over 200 wind generators in operation taking advantage of Lake Erie and Lake Ontario winds, several nuclear power plants that use lake water for cooling, important hydropower dams on the Niagara and St. Lawrence Rivers, and a biofuel plant in Oswego. Many proposals are being considered for additional generation and transmission facilities. There are, presently, proposals for over 300 additional wind turbines in the Cape Vincent, Clayton vicinity, and for additional turbines at the Steel Winds project in Buffalo; there are proposals for hydrokinetic projects in the Niagara and St. Lawrence Rivers; a new nuclear plant is being considered at Nine Mile Point. Biofuel development is a growing industry, with production in Buffalo already becoming a reality. Changes in the region's agriculture will be required, to include growing crops as biofuel. The area is also traversed by electric and gas lines.

As the global energy market continues to evolve, and demand for renewable energy sources increases, New York will need to find ways to balance increasing energy needs with other priorities within the region. To date, most energy projects in New York have been operated with an appreciation of local community concerns, although each project may have impacts that the region must consider along with the benefits.

## **Challenges:**

There are two core challenges for the region relating to energy development. First, is to determine how existing fossil fuel and renewable energy facilities can reduce their impacts on the ecosystem, while maintaining their regional and local benefit. The second challenge is to develop new energy-generating facilities incorporating EBM principles. Generation and transmission of new energy sources will require creating and upgrading infrastructure to accommodate increased supply and to provide/enhance connections to the grid. New York's existing and future energy projects must continue to provide energy for the region, support the agricultural and forested landscape, provide jobs, local tax revenue and economic support. At the same time, it is essential that energy production entities provide corridors for wildlife mobility and recreational use, minimize impacts to wildlife from transmission lines and wind turbines, minimize disturbance to stream flows and fish migration from impoundments, and minimize impacts on waterbodies resulting from thermal water pollution or water cooling operations. Other challenges associated with energy development include air emissions, aesthetics, and emergency response to facility accidents.

## **Opportunities:**

Governments have the opportunity to expedite the growth of the energy industry in New York's Great Lakes Region, while ensuring that ecosystem needs are also being met. The key step that government can take is providing assistance with siting of generation and transmission facilities. With its responsibility for oversight of numerous permitting and regulatory programs related to site-selection, the State is in an ideal position to pro-actively encourage energy development in places, and in ways, that are aligned with economic development, conservation, and land use plans for the region. Development of siting criteria consistent with existing laws and regulations, and preparation of maps showing areas that are potentially suitable and unsuitable for energy projects would aid the growth of this industry while minimizing the state's regulatory burden.

## **Recommendations:**

- **Recommendation 57: Investigate the incentives and opportunities for, and the feasibility and implications of, carbon sequestration in soils and vegetation,** including crops to reduce the amount of carbon dioxide gas in the atmosphere. Include feasibility assessment for under-lake carbon sequestration, incentives for conversion from conventional to conservation tillage practices and conversion of marginal agricultural lands into forests, grasslands or wetlands, develop appropriate bio-fuel and other renewable energy technologies, and incentives such as carbon credits for forest management and reforestation.  
Lead Implementing Agency/ies: DAM, DEC, NYSERDA, SUNY.
- **Recommendation 58: Promote ecosystem based principles when developing a State energy plan, and when administering Public Service Law Article VII** (siting of transmission facilities) and Article X (construction of electric generating facilities).

The Statewide energy planning process, especially siting, should consider both the benefits that result from energy facilities and the potential negative environmental impacts in the Great Lakes Basin. Consider the impacts of individual alternative generation methods, when reviewing alternative energy facilities, as well as the benefits of offsetting pollutants from traditional sources. Take a proactive approach on the siting of energy facilities, energy transmission corridors, and development of alternative energy on the shoreline and in the waters of the Great Lakes. Develop criteria for energy generation and transmission corridor siting which consider but are not limited to; impacts on biota and critical habitats; aesthetics, archeological, cultural and historic resources; current uses; current and future energy needs. Preliminary identification of areas where energy siting could be acceptable, and areas where it is not appropriate, should be undertaken to facilitate the siting and regulatory process.

Lead Implementing Agency/ies: DEC, DOS, NYSERDA, GLWG.

## APPENDIX of ACRONYMS

AEM	Agricultural Environmental Management
CSCIC	NYS Office of Cyber Security and Critical Infrastructure Coordination
DAM	NYS Department of Agriculture and Markets
DEC	NYS Department of Environmental Conservation
DOH	NYS Department of Health
DOS	NYS Department of State
DOT	NYS Department of Transportation
EBM	Ecosystem Based Management
EPF	Environmental Protection Fund
ESD	NYS Empire State Development Corporation
GIS	Geographic Information System
GLBAC	Great Lakes Basin Advisory Council
GLOS	Great Lakes Observing System
GLWG	Great Lakes Working Group
LaMPs	Lakewide Management Plans
LOCI	Lake Ontario Coastal Initiative
NYS	New York State
NYSED	NYS State Education Department
NYSERDA	NYS Energy Research and Development Authority
OGS	NYS Office of General Services
OPRHP	NYS Office of Parks, Recreation and Historic Preservation
PCBs	polychlorinated biphenyls
PRISM	Partnerships for Regional Invasive Species Management
RAPs	Remedial Action Plans
SEMO	NYS State Emergency Management Office
SUNY	State University of New York
U.S.	United States

# **NEW YORK STATE - AGENCY MISSIONS AND PROGRAMS.**

## **Background:**

The New York State Legislature, in passing the New York Ocean and Great Lakes Ecosystem Conservation Act – Article 14 of the State's Environmental Conservation Law, established the New York Ocean and Great Lakes Ecosystem Conservation Council. Eight of the State's governmental agencies plus its major public institution of higher learning constitute the nine member parties to the Council.

A core principle of EBM is to affect a transition within the regulatory environment, fostering interagency collaboration and compromise, that results in a decision-making process based on an holistic understanding of ecosystems, balances competing uses, and remains adaptive and responsive to change over the long term. The following paragraphs briefly summarize the various functions and goals of each agency in order to set the appropriate context for the recommendations contained in this report.

## **Department of State:**

The mission of the New York State Department of State (DOS) is to defend the public's safety, protect and develop a sustainable environment, strengthen local communities, and serve the business community. Effectively, DOS is the vehicle for delivering State policy to local governments. DOS is responsible for administration and oversight of the State's coastal policies, through its Division of Coastal Resources. The division also has responsibility to review projects for consistency with these policies, works with local governments and communities to advance the public's beneficial use and enjoyment of its waterfronts and waterways, and coordinates the development and approval of Local Waterfront Revitalization Programs, providing communities with a critical tool to define a local vision for their waterfront.

DOS administers and enforces the State's building codes; issues licenses and permits; offers technical and financial assistance for plans and projects that serve to expand public access, restore habitats, reinvigorate urban waterfronts and strengthen local economies; supports redevelopment of brownfields through the Brownfield Opportunity Areas Program; provides technical assistance and competitive grants to two or more units of local government for the development of projects that achieve savings and improve municipal efficiency through the Shared Municipal Services Incentive Program; and jointly administers Environmental Protection Fund grants in support of "Smart Growth" projects. DOS continues to expand collaborative relationships through numerous statewide and regional initiatives designed to maintain and improve quality of life within and beyond the coastal area.

## **Department of Environmental Conservation:**

The New York State Department of Environmental Conservation (DEC) administers numerous programs authorized and governed by the State's Environmental Conservation Law and certain federal laws and international agreements with the overarching goal of "*conserving, improving, and protecting New York State's natural resources and environment*". Specifically, the DEC represents New York State as a party to several Binational and basinwide activities, including but not limited to, the Lake Erie and Lake Ontario lakewide management plans (LaMPs), Niagara River Toxics Management Plan, Great Lakes Binational Toxics Reduction Strategy, and the Great Lakes Air Deposition Network all authorized by the U.S./Canada Great Lakes Water Quality Agreement; the Great Lakes Fishery Commission and Lake Erie and Lake Ontario Lake Committees authorized by the U.S./Canada Convention on Great Lakes Fisheries; the Great Lakes Commission authorized by the Great Lakes Basin Charter; the Great Lakes Panel on Aquatic Nuisance Species authorized by the National Invasive Species Act; the Regional Body of the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement; and various Advisory and Control Boards to the International Joint Commission authorized by the International Boundary Waters Treaty of 1909.

Operating from headquarters in Albany and nine regional offices, more than 3,300 DEC staff pursue programmatic and regulatory and enforcement activities to protect and enhance New York State's environmental quality and wealth of natural resources. The DEC has created a Great Lakes Basin Program consisting of four primary administrative units or "action zones", stretching from the New York – Pennsylvania border at Lake Erie to the New York – Ontario border on the St. Lawrence River, to assist in coordination, implementation and public involvement.

The DEC can provide planning, financial and technical advisory assistance with conserving, improving, and protecting natural resources and the environment, and controlling water, land, and air pollution. A variety of funds are available for municipal wastewater treatment improvement, pollution prevention and remediation, and agricultural and non-agricultural nonpoint source abatement and control. Significant support is available to acquire open space that protects water resources, to acquire public parklands and protect farmland, to coordinate community wildlife/habitat conservation projects, and to assist regional partnerships for invasive species eradication and control. The DEC also administers funds for Great Lakes research, environmental information and public awareness projects.

### **Department of Agriculture and Markets:**

The mission of the Department of Agriculture and Markets is to foster a competitive New York State food and agriculture industry to benefit both producers and consumers of agricultural products and services. Agriculture and food production are important economic strengths of New York State. The State is a leader in dairy production and apple growing, and its climate and soils produce high quality fruit and wine grape crops. New York is among the top producers in the United States for numerous agricultural commodities.

The goals of the Department are to:

- Encourage economic development in the State's agricultural and food industry;
- Ensure consumer safety regarding food, milk, and other commodities sold in the State;

- Encourage the appropriate use and management of agricultural resources to protect the environment and preserve productive agricultural lands.

### **Empire State Development Corporation:**

The Empire State Development Corporation (ESD) is New York State's lead economic development agency. The agency, co-headquartered in Albany, Buffalo and New York City, is supported by a network of 18 satellite offices throughout New York State and around the world. ESD is comprised of dedicated professional staff who strive to provide businesses with the highest level of assistance and service in order to encourage continued economic investment and prosperity in New York State.

During the past ten years, progressive economic development strategies, coupled with bold financial and tax incentives, have resulted in a new era of business growth for the Empire State. ESD works closely with businesses to build or relocate new facilities, expand their operations and workforce, and enter new markets and international arenas. ESD also offers a wide selection of financial assistance, investing hundreds of millions of dollars in private and public economic development projects statewide to help revitalize neighborhoods, create and retain jobs, and attract hundreds of thousands of visitors. Restore NY is a program initiative designed to encourage economic development and neighborhood growth by providing municipalities with financial assistance for revitalization of commercial and residential properties.

### **Energy Research and Development Authority:**

The New York State Energy Research and Development Authority (NYSERDA) is a public benefit corporation created in 1975 under Article 8, Title 9 of the State Public Authorities Law. NYSERDA works to develop energy-efficiency programs, conducts energy and environmental research and development, and provides technical and planning assistance to all sectors to guide decision-making and implement energy efficiency programs. NYSERDA administers the New York Energy \$martSM program, which is designed to support certain public benefit programs during the transition to a more competitive electricity market.

NYSERDA manages the Western New York Nuclear Service Center at West Valley, coordinates the State's activities involving nuclear energy including the regulation of radioactive materials, the monitoring of low-level radioactive waste generation and management, and finances projects aimed at energy savings and cost reduction for ratepayers.

NYSERDA's Environmental Monitoring, Evaluation, and Protection (EMEP) program aims to increase understanding and awareness of the environmental impacts of energy choices and emerging energy options, and to provide a scientific and technical foundation for formulating effective and equitable, energy-related environmental policies and resource management

practices. The EMEP program focuses on identifying critical information needs and research gaps with respect to electricity-related environmental issues affecting New York State.

### **Department of Transportation:**

The New York State Department of Transportation (DOT) is charged with developing and coordinating comprehensive transportation policy for the State. DOT works to ensure that those who live, work, or travel in New York State can take advantage of a safe, efficient, balanced, and environmentally sound transportation system.

DOT facilitates the development and operation of transportation infrastructure and associated services for highways, railroads, mass transit systems, ports, waterways and aviation facilities. The department develops and updates long-range, comprehensive statewide master plans for balanced development of public and private commuter and general transportation facilities. In addition, DOT administers a public safety program for railroads and motor carriers engaged in intrastate commerce, directs State regulation of such carriers in matters of rates and service, and provides oversight for safe operation of bus lines, commuter railroads, and subway systems.

DOT funds and implements environmental benefit projects that improve water quality, restore wetlands, promote eco-tourism, protect fish and wildlife, and enhance transportation corridors through its Environmental Initiative.

### **Office of General Services:**

The New York State Office of General Services (OGS) provides a broad range of support services that facilitate the operations of State government and assist local governments, public authorities, and public and private agencies. The OGS Bureau of Land Management in the Real Estate Division is responsible for issuing licenses and permits for use of state-owned lands, including underwater lands. The Bureau is comprised of three units: the Submerged Lands and Natural Resources Unit, the Survey and Mapping Unit, and the Appraisal, Inspection and Marketing Unit.

The Submerged Lands Act of 1953 granted to the State broad authority over natural resources within its jurisdiction, including oil, gas, minerals, and aquatic animal and plant life. Other items considered under the Act include artificial reefs, dredge disposal and borrow pits, and power cables. Structures such as wind generators, gas lines, and tidal turbines may become issues in the near future. OGS conducts coordinated review of all proposed uses of underwater lands with other State agencies including DOS, DEC, and OPRHP.

### **Office of Parks, Recreation and Historic Preservation:**

The Office of Parks, Recreation, and Historic Preservation (OPRHP) works to provide safe and enjoyable recreational and interpretive opportunities for New York State residents and visitors, and encourages responsible stewardship of the State's natural, historic, and cultural resources. The OPRHP, authorized under the Parks, Recreation, and Historic Preservation Law (PRHPL), provides guidance for planning, development, operation, organization, and other matters as they relate to the State parks.

Stewardship is fundamental to OPRHP activities, as outlined in the PRHPL (Article 3.01, Declaration of Policy) which states that "stewardship of the natural, ecological, historic, cultural, and recreational resources within the State park, recreation, and historic site system is a primary responsibility of the State." OPRHP offers financial assistance for the planning, development, and maintenance of existing parks and recreational facilities; historic preservation of properties listed on the National or State Registers of Historic Places; preservation and restoration of eligible lands, water, or structures within a New York State Designated Heritage Area; and for the acquisition of permanent easements or fee title to lands, waters or structures designated for public recreational enjoyment and/or for conservation or preservation. OPRHP coordinates with other State agencies, local governments, and private land owners to preserve, restore, and enhance natural resources and the overall experience for park visitors.

### **State University of New York:**

"The mission of the State University system shall be to provide to the people of New York educational services of the highest quality, with the broadest possible access, fully representative of all segments of the population in a complete range of academic, professional and vocational post-secondary programs including such additional activities in pursuit of these objectives as are necessary or customary. These services and activities shall be offered through a geographically distributed comprehensive system of diverse campuses which shall have differentiated and designated missions designed to provide a comprehensive program of higher education, to meet the needs of both traditional and non-traditional students and to address local, regional and state needs and goals.

In fulfilling this mission, the State University shall exercise care to develop and maintain a balance of its human and physical resources that:

- Recognizes the fundamental role of its responsibilities in undergraduate education and provides a full range of graduate and professional education that reflects the opportunity for individual choice and the needs of society;
- Establishes tuition which most effectively promotes the university's access goals;
- Encourages and facilitates basic and applied research for the purpose of the creation and dissemination of knowledge vital for continued human, scientific, technological and economic advancement;

- Strengthens its educational and research programs in the health sciences through the provision of high quality care at its hospitals, clinics and related programs;
- Shares the expertise of the State University with the business, agricultural, governmental, labor and nonprofit sectors of the state through a program of public service for the purpose of enhancing the well-being of the people of the State of New York and in protecting our environmental and marine resources;
- Promotes appropriate program articulation between its state-operated institutions and its community colleges as well as encourages regional networks and cooperative relationships with other educational and cultural institutions for the purpose of better fulfilling its mission of education, research and service."

The State University of New York's College of Environmental Science and Forestry: As an integral component of the greater State University system, the College of Environmental Science and Forestry in Syracuse (ESF) provides a number of research institutes and centers that focus on water quality, watershed studies, and hydrology. The mission of ESF is to advance knowledge and skills and to promote the leadership necessary for the stewardship of both the natural and designed environments.