

LAKE CHAMPLAIN SEA GRANT

Lake Champlain Sea Grant has goals and objectives in all four of the NOAA Sea Grant Strategic Plan Focus Areas: Healthy Coastal Ecosystems, Sustainable Coastal Development, Safe and Sustainable Seafood Supply, and Hazard Resilience in Coastal Communities.

The following implementation plans are based on a 4-year planning cycle (assume 2020-2013) and are intended to show significant and measurable progress towards reaching objectives, and producing the described outcomes (as measured by indicators) within 1-4 years. Implicit in the plans is that LCSG will not be acting alone but in concert with partners and collaborators to achieve outcomes and both short/medium and long term objectives.

Focus Area: HEALTHY COASTAL ECOSYSTEMS

NOAA SG Goal 1– Sound scientific information to support ecosystem-based approaches to managing the coastal environment

LCSG Goal – Provide science-based information that will promote a healthy and diverse ecosystem and provide for sustainable human use and enjoyment of Lake Champlain, the basin and surrounding waters.

Objective - Science-based information increases awareness among basin residents of priority coastal, aquatic and watershed resource issues, and to improve their capacity to protect and restore basin resources. Priority issues are nonpoint source (NPS pollution), invasive species, water-related human health hazards, and toxic contamination.

Objective - Improve understanding by decision-makers, planners, and managers about basin ecosystem processes, and the relationships between environmental stressors and long-term human and ecosystem health. Stressors of concern in the basin include water quality degradation (phosphorus, toxins, and other contaminants), harmful algal blooms, and invasive species.

Strategies

- Support applied research to improve understanding, use and management of Lake Champlain and Lake George, the Basin's inland waters and the Great Lakes in general.
- Develop outreach efforts to improve understanding of the value of applied research to informed decision making - NOAA and other atmospheric deposition research and monitoring activities, and their contribution to the protection of human and environmental health in the basin.
- Develop and disseminate new information, policies, technologies and methods to address water quality degradation, and minimize the negative impacts of NPS pollution on coastal and watershed water quality.
- Provide technical support for citizens, municipalities and businesses that need help with specific mitigation/restoration problems, giving them access to the latest information and techniques

SHORT/MID-TERM OUTCOMES

Applied research contributes to ecosystem based management and decision making for selected key issues/stressors in the basin:

- By 2013 baseline data sets available for atmospheric deposition of mercury; by 2011 for double-crested cormorant populations on Lake Champlain; by 2012 rainbow smelt population dynamics
- By 2012 targeted invasive species in the Champlain Canal system.

Applied research contributes to improved understanding, use and management of Lake Champlain and the basin's inland waters.

- By 2013 conduct at least 4 research projects that address stressors and ecosystem processes to improve understanding and management of the basin and resources.
- LCSG supported research results or recommendations included in or cited by at least five planning, regulatory and/or action documents by 2011, ten documents by 2013.

NOAA SG Goal 2– Widespread use of ecosystem-based approaches to managing land, water and living resources in coastal areas

LCSG Goal – Ecosystem-based approaches used to promote a healthy and diverse ecosystem and provide for sustainable human use and enjoyment of Lake Champlain, the basin and surrounding waters.

Objective 2a- Decision-makers, planners, and managers apply knowledge of basin ecosystem processes to reduce the effects of environmental stressors and long-term human and ecosystem health.

Strategy

- Work with local partners to implement findings/recommendations of applied research and management plans that support ecosystem-based management.
- Promote the use of data and indicators for development of ecosystem-based decision analysis modeling, management plans and strategic planning.

Objective 2b- Local residents and communities (including youth) act to protect and restore coastal, aquatic and watershed resources in the basin as a result of increased awareness of threats from NPS pollution (including phosphorus, toxins and bacteria), invasive species, and other water-related human health hazards.

Strategy

- Provide life-long learning programs for people of all ages that enhance understanding of coastal, ocean and Great Lakes environments and promote stewardship of healthy ecosystems.
- Promote education, public awareness and community action by residents, businesses and local governments to protect and restore coastal, aquatic and watershed resources in the basin.
- Work with LC Federal partners group and other partners to improve the capacity of Basin residents to participate effectively in coastal, aquatic and watershed resource management issues.
- Provide technical support and assistance (including demonstration projects) to residents, local governments, volunteer organizations and others to implement low impact development, low input grounds care and other best management practices.

Objective 2c. Provide effective education programs for pre-college youth on water quality, water resources and watershed issues important to sustainable use and management of Lake Champlain and basin water resources.

Strategy

- Increase LCSG involvement with Great Lakes Sea Grant Network regional activities that address these topics, including Great Lakes COSEE.
- Support environmental and water resources education by making hands-on, up-to-date, inquiry-based, scientific watershed and water quality education available to Vermonters, including educators, students, and the general public.
- Support youth environmental and water resources education in schools and youth programs by providing equipment, curricula, technical support and human resources.

SHORT/MID-TERM OUTCOMES

Residents, local governments and businesses are aware of current information and methods for protection and restoration of coastal and watershed resources and participate in protection and restoration activities at the local level. Estimated size of targeted watersheds is 750 households.

- For targeted watersheds a 40% increase (300 households) in awareness among residents of the impacts of residential practices on NPS pollution, stormwater and water quality compared to the previous year's baseline. One watershed targeted each year 2010, 2011, and 2012.
- A 20% decrease (200 households) in number of households in targeted watershed that reduce use of lawn care products containing phosphorus or pesticides ("weed and feed") to reduce threats to coastal, aquatic and watershed resources compared to the previous year's baseline. One watershed annually 2011, 2012, 2013. One watershed annually 2011, 2012, 2013.
- At a 20% increase (200 households) in number households in targeted watersheds that adopt one or more lake friendly low impact grounds care practices to reduce threats to coastal, aquatic and watershed resources. One watershed annually 2011, 2012, 2013.

Planners, local officials and others aware of impacts of land use changes on water quality and lake, stream and river ecosystems, and act to protect and restore coastal, aquatic and watershed resources.

- Three towns annually adopt and install storm water reduction and NPS pollution prevention best management practices (BMP); 12 towns by 2013.
- 40% of commercial, institutional or municipal property managers adopt one or more low input/no-phosphorous grounds care practices in each targeted watershed; one watershed each in 2010- 2012 (16 managers, based on estimate of 40 commercial properties in each targeted watershed). Baseline data to be collected prior to the start of the project.

Effective education programs in place teaching K-12 students water quality, water resources and watershed issues important to sustainable use and management of Lake Champlain and surrounding basin waters.

- At least 50% increase (420 students) in environmental literacy annually among students participating in education programs about water quality and NPS pollution, and links between residential practices and water quality (estimate 60 students per school 17 school – actual baseline will be from pre-program surveys);
- By 2013 five additional schools adopt Watershed Alliance curriculum integrating watershed education into science educator's curriculum.

NOAA SG Goal: Restored function and productivity of degraded ecosystems

LCSG Goal – Restore coastal and aquatic ecosystems in the Lake Champlain basin.

Objective - Prevent the introduction of new aquatic invasive (non-indigenous and nuisance) species (AIS) into Lake Champlain or the basin, slow the spread of existing AIS and mitigate their impact in basin waters.

Strategy

- Identify imminent AIS threats and work with partners to develop AIS barriers to reduce risk of introductions and spread of specific invasive threats (spiny water flea, round goby, quagga mussels, and viral hemorrhagic septicemia - VHS) from outside the basin.
- Increase knowledge among key constituencies (boating community, anglers) about the threats posed by the spread of AIS species among lake and basin ecosystem.
- Inform key constituencies of actions they can implement to prevent or slow the spread of AIS;
- As part of NY's Four-tier Team develop assessment tools that will be used to establish lists of prohibited, regulated, and unregulated aquatic species.
- Utilize the Sea Grant National Invasive Species Database, SGNIS, and other resources to provide basin residents and stakeholders with information on AIS management and research.
- Provide technical assistance to local bait dealers to prevent of exotic bait fish introduction.
- Provide technical support to public and private trout hatcheries in VT and NY to prevent VHS introduction and transmission.

Objective. Increase public awareness and promote action by local residents and communities to restore impaired coastal, lake and watershed ecosystems.

Strategy

- Support research and provide technical support for preservation and restoration of lakeshore and riparian vegetation (remnant clay plain, sand plain cedar-shale forests) essential to stable shorelines.
- Work with public and private partners to promote use of local stocks of native plants for shoreline stabilization, stream restoration and buffer planting activities.
- Support research on effectiveness of management programs in controlling cormorant and lamprey populations to reduce ecosystem impacts.
- Provide technical assistance to support participation by local organizations in stream restoration activities (buffer planting, stream channel stabilization, geomorphologic assessment).
- Assist local organizations and municipalities in removing invasive species populations (water chestnut, milfoil, invasive stream bank plants).

SHORT/MID-TERM OUTCOMES

Increase public awareness and promote action by local residents and communities to restore impaired ecosystems.

- At least 700' of shoreline vegetation planted or native vegetation maintained 2010-2013 in seven target communities – 100' each.
- 20% increase (14 days, est. 70 days 2009 baseline) in number of volunteer days reported by local organizations engaged in invasive plant removal programs.

Key constituencies and partners are aware of aquatic invasive species (AIS) threats and take specific actions to prevent the introduction of new AIS and reduce the impact of existing AIS in basin waters.

- At least 100 individuals among key constituencies within the basin (boating community, anglers) increase in knowledge about specific AIS threats and how human actions promote invasion and spread of AIS compared to the previous year's baseline.
- At least 40 association members engaged in peer-to-peer education programs sponsored by angling, boating and lake associations over 2010 base levels.
- By 2012 40 bait dealers have a HACCP plan in place to prevent the introduction of exotic fish species with bait stocks.
- By 2014 all participating Adirondack lake associations in the Champlain drainage receive Adirondack Park Agency general permits for management of aquatic invasive plants, following Lake Management Starter Kit guidelines developed by LC Sea Grant.
- By 2012 all 6 state fish culture facilities in NY and VT, and 6 private aquaculture operations, applying knowledge of Viral Hemorrhagic Septicemia (type IVb) dynamics, transmission, VHS diagnostics and approved disease prevention, to prevent, control and contain the disease.

Focus Area: SUSTAINABLE COASTAL DEVELOPMENT

NOAA SG GOAL 1– Healthy coastal economies that include working waterfronts, an abundance of recreation and tourism opportunities, and coastal access for all citizens

LCSG Goal. Strengthen the economic base of basin communities through the sustainable growth and development of coastal and lake dependent businesses, particularly in tourism and recreation.

Objective – Basin communities have the information and tools to realize the economic potential of sustainable development of tourism and recreation.

Strategy

- Engage coastal communities in planning processes that support the efforts of community leaders to identify and pursue sustainable economic development policies and programs.
- Provide information and outreach activities to help coastal communities to enhance their waterfront-related economic activities, especially recreational fishing, boating and lake tourism.

Objective - Basin communities are able to identify and pursue sustainable economic development policies and programs.

- Provide information and outreach support to improve the accuracy and availability of information to alert the public about water quality problems that may affect recreational opportunities.
- Provide technical support to help citizens, municipalities and businesses resolve specific mitigation/restoration problems related to business development or expansion.

- Promote Clean marinas through dissemination of voluntary marina BMP guidelines to marina operators, and engage marina operators in clean boating and AIS spread prevention programs, using existing Sea Grant and Marina Net resources;
- Develop Clean Boating outreach program for recreational boaters, including bilingual (French-English) information on NPS pollution prevention (grey water) and nuisance aquatic species transport, and other issues.

Objective - Sports fishing angler organizations actively involved in sports fisheries protection, enhancement and habitat conservation efforts.

Strategy

- Develop and disseminate new information, policies, technologies and methods to prevent the introduction and spread of aquatic non-native species with the potential to negatively affect Lake Champlain economic and tourism potential;
- Inform sports fishing group, the fishing public and fishing related business about relevant fisheries research, management and related economic and development issues in Lake Champlain, the Great Lakes and other areas;
- Facilitate the participation of stakeholders in fisheries management planning.
- Support research, education and training for sports fisheries management in the research and management communities;
- Engage angler organizations in sports fisheries protection, enhancement and habitat conservation efforts;
- Extend research results from LCSG and NYSG supported research projects.

SHORT/MEDIUM TERM OUTCOMES

Community leaders identify and pursue sustainable economic development policies and programs.

- By 2013 at least 10 business development groups (Chambers of Commerce, Economic Development Commissions, etc.) adopt sustainable economic development policies for local business growth;
- By 2013, tournament leadership (LC Bass Derby) is aware of fisheries sustainability issues and how potential tournament angling can affect largemouth and smallmouth bass fisheries in Lake Champlain.

Coastal communities use planning processes that support the efforts of community leaders to identify and pursue sustainable economic development policies and programs.

- By 2013 a cumulative 10 town plans that include ordinances, policies or other support for sustainable coastal business development.

Angler organizations are aware of and actively involved in sports fisheries protection, enhancement and habitat conservation efforts.

- By 2013 25 individuals in basin angler association leadership has increased knowledge of Lake Champlain and relevant Great Lakes fisheries research, management and related economic and development issues and are actively sharing information with member; 16 are actively using the information to inform and guide their organizations.
- At least 60 basin angler association members increase knowledge about specific AIS threats to the basin.

- By 2013 40 targeted association members engaged in peer-to-peer education activities with other anglers.
- By 2013, all LC bass tournaments (1 major, 4 minor tournaments) have adopted aquatic invasive species (AIS) spread prevention tournament protocols learned from LC Sea Grant

Focus Area: SAFE AND SUSTAINABLE SEAFOOD SUPPLY

NOAA SG Goal: A sustainable supply of safe seafood to meet public demand

LCSG Goal. A sustainable supply of safe seafood to meet public demand

Objective - Support economically and environmentally sustainable development of small scale aquaculture.

Strategy

- Support a viable small scale aquaculture industry in the basin through integrated research, education, and outreach activities.
- Develop long term strategy, in collaboration with state agencies, to realize the commercial potential of small scale production of trout and fee fishing.
- Work with partners to develop a small scale pilot production demonstration aquaculture facility to demonstrate technical and financial feasibility.

Objective - Consumers are aware of both the nutritional benefits and of the risks associated with wild fish consumption.

SHORT/MID-TERM OUTCOMES

Economically and environmentally sustainable small scale aquaculture continues in the basin.

- At least 5 annual technical assistance requests by 2013,

Consumers have an increased knowledge of both the nutritional benefits and of the risks associated with wild fish consumption.

- By 2013 at least 100 households increase awareness of fish consumption advisories among target communities.

Focus Area: HAZARD RESILIENCE IN COASTAL COMMUNITIES

NOAA SG Goal. Widespread understanding of the risks associated with living, working, and doing business along the nation's coasts

NOAA Strategy

Work with the NOAA Climate Change Program, NOAA's National Weather Service, and other public and private sector partners to develop comprehensive education/literacy programs on the immediate and long-term effects of climate-related changes, and other hazardous events, on human safety and property along the coast, and how to prepare for and survive them.

LCSG Goal. Provide scientifically sound information about regional climate change and the potential impacts in the Lake Champlain Basin to the public and coastal communities to help them plan for and adopt practices that mitigate the impacts of climate change

Goal - Actively participate with GLSGN partners to implement regional climate change strategy.

Strategy

- Build climate-related messages/actions into our strategic plan and all our programs as a crosscutting theme.
- Support research that addresses priority information needs in the Lake Champlain basin, such as building ecosystem models that lead to forecasts that take climate change into account to improve management of stormwater runoff, fisheries and food web dynamics, and other topics.
- Evaluate potential synergistic interactions between changes in climate and changes in land-use.
- Partner with agencies, managers, stakeholders, industry and others to prepare our region for a changing climate.

Communicate important messages to the public:

- Gather peer-reviewed regional climate science and translate it for the public, including essential concepts of uncertainty and risk.
- Share information with businesses, and communities of the Lake Champlain Basin about climate change that will raise awareness, encourage discussions, and inspire actions.

SHORT/MEDIUM TERM OUTCOMES

Basin communities plan for and adopt practices that mitigate the impacts of climate change.

- By 2013 at least 40 public, local officials and businesses have increased awareness of the potential impacts of climate change on lake and basin environment.
- By 2013 at least 15 basin planners and decision makers consider the importance of potential climate change effects on lake and basin decision making.

Applied research contributes to improved understanding of how climate change may affect efforts to improve Lake Champlain and basin resources management (e.g. stormwater runoff, fisheries and food web dynamics, among others).

- By 2013 initiate 1 applied research project on the potential effects of climate change on stressors and ecosystem processes in the basin.
- By 2013 LCSG supported research contributes to development of ecosystem models that lead to better forecasts of the effect of climate change in the Lake Champlain basin.

NOAA SG Goal Community capacity to prepare for and respond to hazardous events

LCSG Goal. Vulnerable communities are prepared for and act to prevent erosion and shoreline destabilization.

Objective - Decision makers, local officials and coastal land owners are aware of the hazards associated with development on Lake Champlain cliffs and near unstable stream channels.

Strategy

- Produce guidelines and develop outreach and education programs on bioengineering for shoreline stabilization and erosion prevention.
- Develop best management practices for conservation and restoration of shoreline vegetation and educate shoreline land owners, construction and landscape firms in their use.
- Develop shoreline stabilization demonstration sites to educate planners, local officials, landowners and decision makers about technical and financial feasibility of using bioengineered approaches for long term shoreline stabilization.
- Provide information and technical assistance to shoreline property owners to develop plans to maintain or restore native vegetative buffers.
- Support research on native coastal vegetation and woodlands (calcareous and shale cliffs, sand plain, clay plain) to improve protection and management for shoreline protection and stabilization.
- Work with partners to facilitate local level stream geomorphologic assessments and restoration activities. Work with partner organizations to develop stream restoration guidelines and best management practices.

SHORT/MID-TERM OUTCOMES

Town land use planning and development are responsive to hazards of cliff erosion and stream channel instability.

- By 2013 five communities adapt local regulations and policies to promote conservation and management of shoreline and stream bank vegetation.
- By 2013 seven communities with increased awareness of impacts of shoreline vegetation removal
- By 2013 seven local projects use bioengineering for shoreline stabilization.
- By 2013 three lake communities use vegetated shoreline buffer (both planted and actively managed) natural vegetation on vulnerable shorelines.