

PROGRESS 2006

A 15th Anniversary Report about Lake Champlain's Restoration



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A look at key events since the Lake Champlain planning process began in 1990.

The Lake Champlain Basin



What's a Basin?

Lake Champlain receives more than 90% of its water from rain and snowmelt that washes over the landscape into rivers that flow to the Lake. This land is known as the Lake's drainage basin or watershed. Lake Champlain's basin spans 8,234 square miles from the Adirondacks to the Green Mountains. It includes portions of New York, Vermont, and the Province of Québec. Pollutants on the landscape—like fertilizers, pesticides, oil, and sediments—are washed into the Lake via rivers. That's why we must include the land and waters of the entire basin when protecting Lake Champlain. Learn about how you can help on page 8.

2 Welcome

LCBP



The historic Crown Point bridge over Lake Champlain.

A partnership for Lake Champlain...

The fifteenth anniversary of the Lake Champlain Basin Program (LCBP) is a great time to review our accomplishments and focus on the challenges to protect Lake Champlain. In the 1970s and 80s a growing awareness of the Lake's pollution problems prompted research at University of Vermont and Plattsburgh State. Soon after, the Lake Champlain Committee, a nonprofit lake advocacy group, led the call for New York, Vermont and Québec to adopt common phosphorus reduction goals and to work together to achieve them. The 1988 Memorandum of Understanding, signed by the governors of New York, Vermont and the Premier of Québec, did just that and established Citizen Advisory Committees.

To provide Federal funds to address pressing lake problems, the US Congress passed the Lake Champlain Special Designation Act of 1990, establishing the LCBP and mandating a comprehensive lake management plan. *Opportunities for Action* was first endorsed in 1996. In 2003, the Plan was updated and endorsed by all the partners in New York, Vermont and Québec and the US Environmental Protection Agency (EPA). Since 1991, the LCBP has received federal funds, mostly through the EPA, to assist state and local governments, and non-governmental organizations with plan implementation. The implementation is overseen by the Lake Champlain Steering Committee.

Seven US federal agencies and the International Joint Commission are partners in our implementation efforts. The New York and Vermont governors and the Premier of Québec have increased the attention and support for our collective tasks as well. Our Congressional delegation is a powerful caucus for the lake, sustaining and expanding our funding. Through the LCBP's local grant programs, nearly \$3 million has enabled hundreds of organizational and community partners to improve the watershed. New research is under way at universities and colleges. Lake-wide monitoring, funded by LCBP, lets us know how the Lake is doing and guides our budgeting priorities. More citizens than ever before are changing their habits to keep the lake clean. Looking back on 15 years of action, we are proud of our collective accomplishments.

This document highlights key events since 1990 through the timeline and more current issues are detailed in the main text. I hope you enjoy the reading, and that you will be inspired to help meet the on-going challenges to ensure a clean lake and healthy economy for the future.

– Bill Howland
LCBP Program Manager



LAKE CHAMPLAIN STEERING COMMITTEE

Ron Alvarado, *USDA Natural Resources Conservation Service (NY)*

Randall Beach, *NYS Dept. of Economic Development*

Gerard Boutin, *QC Ministère de l'Agriculture, des Pêcheries et de l'Alimentation*

Eugene Brickman, *US Army Corp of Engineers*

Stuart Buchanan, *NYS Dept. of Environmental Conservation*

Gina Campoli, *VT Agency of Transportation*

Canute Dalmasse, *VT Agency of Natural Resources*

Mario DeVicario, *US Environmental Protection Agency Region 2*

Judith Doerner, *USDA Natural Resources Conservation Service (VT)*

Larry Forcier, *University of Vermont*

Buzz Hoerr, *VT Citizens Advisory Committee and Education & Outreach Committee*

Bruce Hyde, *VT Dept. of Tourism & Marketing*

Ronald Jackson, *NY Citizens Advisory Committee*

John Krueger, *Cultural Heritage and Recreation Advisory Committee*

David Lane, *VT Dept. of Agriculture*

Jean-Pierre Laniel, *QC Ministère des Ressources Naturelles et de la Faune*

Steven Lanthier, *NYS Dept. of Agriculture and Markets*

Daniel Leblanc, *QC Ministère du Développement Durable, de l'Environnement et des Parcs*

Pierre Leduc, *QC Citizens Advisory Committee*

Kenny Miller, *Mayor of Clarenceville, QC*

Gerald Potamis, *US Environmental Protection Agency, New England*

Robert Reinhardt, *NYS Office of Parks, Recreation and Historic Preservation*

Dave Tilton, *US Fish and Wildlife Service*

Mary Watzin, *Technical Advisory Committee and University of Vermont*

NOTE: Two local government seats in NY and VT are vacant and will be filled this fall.

Une association pour le lac Champlain...

Le quinzième anniversaire du Programme de mise en valeur du lac Champlain (LCBP) est le moment tout indiqué pour revoir nos réalisations et focaliser sur les défis qu'il nous reste à relever pour protéger le lac Champlain. Dans les années 1970 et 1980, la sensibilisation croissante aux problèmes de pollution du lac a donné lieu à des travaux de recherche à l'Université du Vermont et à SUNY Plattsburgh. Un peu plus tard, le Comité du lac Champlain, groupe de pression à but non lucratif, a invité les États de New York et du Vermont ainsi que la province de Québec à adopter des objectifs communs en matière de réduction de la concentration en phosphore et à unir leurs efforts pour les atteindre. Le protocole d'entente de 1988, signé par les gouverneurs des États de New York et du Vermont et par le premier ministre du Québec, a justement concrétisé cette volonté et mené à l'établissement des comités consultatifs de citoyens.

Afin d'injecter des fonds fédéraux destinés à la résolution des problèmes urgents qui menaçaient le lac, le Congrès américain a adopté en 1990, la Loi sur la désignation spéciale du lac Champlain (Lake Champlain Special Designation Act), établissant le LCBP et demandant que soit mis en œuvre un plan exhaustif de gestion du lac. Le plan Perspectives d'action (*Opportunities for Action*) a été endossé pour la première fois en 1996. En 2003, le Plan a fait l'objet d'une mise à jour et a été endossé par tous les partenaires des États de New York et du Vermont, le Québec, de même que par l'Environmental Protection Agency (EPA) des États Unis. Depuis 1991, le programme a reçu, principalement par l'intermédiaire de l'EPA, des subventions fédérales, visant à soutenir les gouvernements des États et les autorités locales, ainsi que les organisations non gouvernementales dans la mise en œuvre du Plan. Celle-ci est maintenant supervisée par le Comité mixte sur la gestion du lac Champlain.

Sept agences fédérales et la Commission mixte internationale se sont jointes à nous en tant que partenaires des efforts de mise en œuvre. Les gouverneurs des États de New York et du Vermont et le premier ministre du Québec ont augmenté leurs préoccupations et support face à nos responsabilités collectives. Notre délégation au Congrès est un puissant intervenant en faveur du lac, en ce qu'elle veille au maintien et à la croissance des subventions allouées. Grâce au programme de subventions locales du LCBP, près de 3 millions de dollars ont permis à des centaines de partenaires organisationnels et communautaires d'améliorer le bassin hydrologique. De nouveaux projets de recherche sont en cours dans les universités et les collèges. Un suivi de la qualité de toute l'étendue du lac, financé par le LCBP, nous tient au courant de l'état du lac et nous guide dans l'établissement de nos priorités budgétaires. Les citoyens sont plus nombreux que jamais à modifier leurs habitudes afin de protéger la santé du lac. Lorsque nous jetons un regard sur les gestes posés au cours des 15 dernières années, nous tirons une grande fierté de nos réalisations collectives.

Le présent document résume l'évolution du LCBP à travers un calendrier chronologique représenté sur chacune des pages, et les préoccupations d'actualité y sont détaillées dans le texte principal. J'espère que vous aurez plaisir à en prendre connaissance et qu'il vous inspirera à collaborer à l'atteinte des défis constants que constitue le maintien de la santé du lac et d'une saine économie pour l'avenir.

– Bill Howland
Directeur de Programmes, LCBP

Lake Champlain Timeline...

This timeline highlights key events, progress, and even setbacks (such as the discovery of zebra mussels in the Lake), since the Lake Champlain Basin Program planning process began in 1990. It is our hope that even more progress towards a clean Lake will be made in the future.



IMAGE CREDITS: GARY RANDORF, LCBP

Local Connections 3

Since 1992, the LCBP has awarded nearly \$3 million in grants to local nonprofits and communities for cleaning-up streams, increasing lake and river access, preventing pollution, managing nuisance plants and animals, and revitalizing cultural heritage sites.

The LCBP's grants are part of the total federal dollars committed to Lake Champlain since 1992. In 2006, roughly \$9.7 million in federal funding will be used for programs administered by the US Department of Agriculture-Natural Resource Conservation Service, US Geological Survey, US Fish and Wildlife Service, and the US Environmental Protection Agency, among others.

The US Army Corps of Engineers began supporting watershed restoration projects in the Basin in 2004. Army Corps projects are underway in Lake George, Keene and Plattsburgh, New York, and South Burlington and St. Albans, Vermont. For more information, visit www.lcbp.org, or call 917-790-8727. Learn about the LCBP's federal partners at www.lcbp.org/federal.htm.

The lake management plan, *Opportunities for Action*, also leverages many other state, provincial and local funding sources for Lake Champlain projects. Major sources include the 1996 New York State Bond Act and

Vermont Section 319 Grants. In 2003, the Vermont Clean & Clear Initiative was started to help fund the Lake Champlain phosphorus TMDL implementation (a plan to reduce phosphorus loads required by the US EPA). Quebec passed the 2003-2009 *Phosphorus Reduction Action Plan*, which confirms its priorities for Missisquoi Bay. Private sources, such as the Waterwheel Foundation, support many watershed projects as well.

The LCBP's local grants support many recreational and cultural initiatives, such as Wayside Exhibits, Lake Champlain Bikeways, the Lake Champlain Paddlers Trail, and the Lake Champlain Birding Trail. Improvements to lake side trails, beaches, and boardwalks have also been funded. A new database at www.lcbp.org/grant_search.aspx will help local groups share information about projects.

The LCBP is also taking a lead role in planning for the 2009 400th Anniversary Commemoration of Samuel de Champlain's arrival to the Lake.



Québec school children explore the Missisquoi Bay watershed through a program created by the Missisquoi Bay Basin Corporation, an LCBP partner.

Linking to teachers, students and parents

Since 1992, 600 teachers have participated in the LCBP-established Champlain Basin Education Initiative (CBEI). These educators help students explore the watershed and participate in hands-on community projects, thus creating a new generation of lake stewards. The students, in turn, teach their parents about the Lake. The CBEI partners are: Adirondack Park Visitor Interpretive Center, Shelburne Farms, Audubon Vermont, ECHO, Lake Champlain Committee, National Wildlife Federation, UVM Watershed Alliance, and Vermont DEC (Project WET).

Students in Québec are diving into Missisquoi Bay issues through the "Clear Water Musketeers" educational program run by the Missisquoi Bay Basin Corporation. Since 2004, more than 420 students have participated.

The LCBP has operated the Resource Room within ECHO at the Leahy Center for Lake Champlain since it opened in 2003 (and at its previous incarnation the Basin Science Center). This science museum and aquarium includes 100 hands-on interactive exhibits and over 60 native species of live fish, amphibians, and reptiles. Visit www.echovermont.org or call 1-877-ECHOFUN.

The Lake Champlain Maritime Museum (LCMM) helps the public and students explore the Lake's storied history and nautical archeology. The LCBP helped fund an underwater survey by the LCMM that located more than 75 previously unknown shipwrecks in the Lake. Visit www.lcmm.org or call (802) 475-2022.



LCBP grants have supported many different types of projects in the watershed. Clockwise from upper left: Lake Champlain Paddlers Trail, water quality monitoring by the Missisquoi River Basin Association, the Colchester Bike Causeway construction, and riverbank restoration on the Poultney River by the Vermont Youth Conservation Corps.

IMAGE CREDITS: LCBP, MRBA, LOCAL MOTION, VYCC

Lake Champlain Timeline...

Target phosphorus levels agreed upon by NY, VT, and Québec (QC) under Water Quality Agreement.

Wetlands acquisition strategy starts with LCBP funds. As of 2005, 8,000 wetland acres are protected.



Zebra mussels found in Lake.

Citizens form the Friends of the Winooski. By 2006, more than 36 watershed and river groups are active in the Basin.

The LCBP helps fund a study of the Lake's growing cormorant population—a concern to anglers and wildlife biologists.



Lake Champlain Basin Science Center opens on Burlington waterfront.

1993

Nonpoint pollution study funded by LCBP to identify sources of polluted runoff.

LC Paddlers Trail begun by Lake Champlain Committee and Champlain Kayak Club with LCBP support.

LC Bikeways begins. In 2006, the network includes a 363-mile route around the Lake and along the Richelieu River to Chambly, QC, and 35 theme loops.

1994

The LCBP's Economic database study summarizes the value of a clean lake to businesses, residents, and local communities.

Public input meetings for draft Lake management plan attended by more than 600 people.

1995

St. Albans Bay phosphorus study completed.

LCBP-funded walleye and lake sturgeon studies are completed.



LAKE STURGEON

IMAGE CREDITS: SEA GRANT, USFWS

4 Monitoring & Research

LCBP



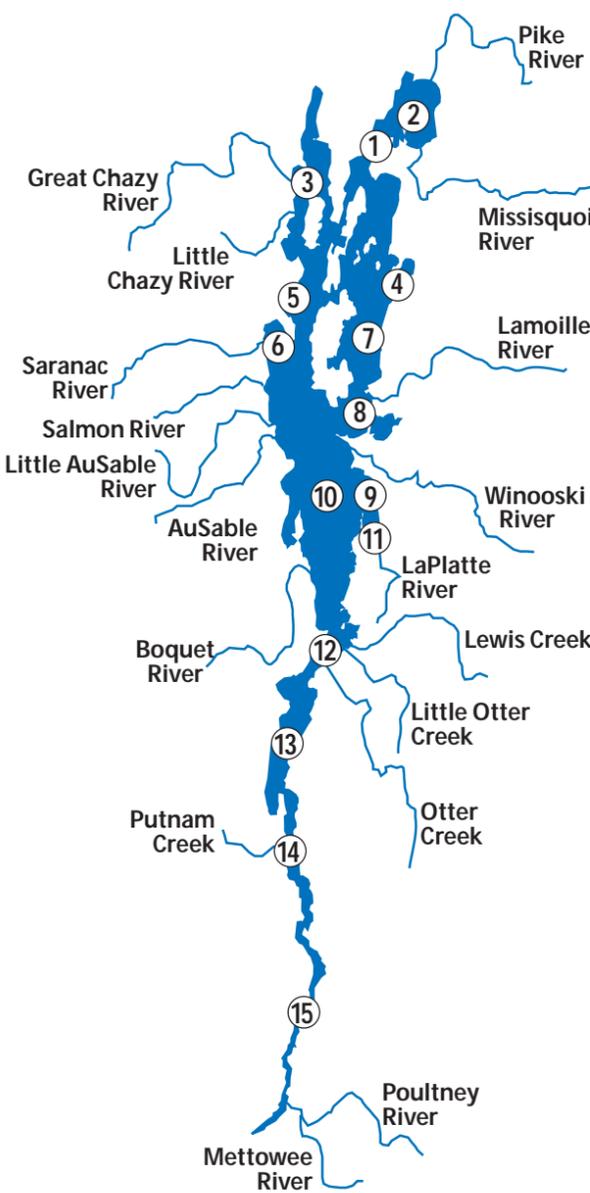
A researcher takes a water sample to look for blue-green algae (cyanobacteria) on Lake Champlain.

Just like a doctor's visit provides people with information for health decisions, Lake Champlain and its tributaries are monitored to assess their health. Scientists and citizens test the water, conduct fish surveys, and monitor for hazards like blue-green algae toxins and invasive plants and animals. The LCBP relies on this data and research to inform all aspects of the program, from funding decisions to management actions.

Since 1992, the LCBP has funded lake-wide water quality monitoring by the Vermont and New York departments of environmental conservation. Fifteen on-lake sites and water near the mouths of 18 tributaries are sampled. Measurements taken include phosphorus levels, temperature, dissolved oxygen, chlorophyll-a, phytoplankton (algae), zooplankton, and zebra mussels. Visit www.vtwaterquality.org/lakes/htm/lp_longterm.htm for more information. Québec agencies monitor Missisquoi Bay and its tributaries. In 2000, the LCBP and its partners began an extensive monitoring and research program for blue-green algae (cyanobacteria) which affect northeastern Lake Champlain. Read more about these potentially toxic algae on page six.

Ninety-two fish species live in Lake Champlain's watershed. Assessing their health is important to both anglers and Lake scientists. A healthy fishery also supports fishing tournaments, which in turn boosts the local economy. Fish catch surveys by the US Fish and Wildlife Service, the states, Québec, and universities indicate that fish populations

have changed dramatically over time due to nonnative fish introductions, loss of spawning habitats and historic over fishing. Trout and salmon populations are recovering with stocking, but walleye and sauger are declining. Nonnative threats include alewife, which were confirmed in the Lake last year, white perch and white crappie. Fish tissue is also tested for PCB and mercury toxins. Read more about the toxins in fish on page six.



The tributaries shown are monitored at their mouths.

LAKE CHAMPLAIN MONITORING SITES

- ① Missisquoi Bay
- ② Missisquoi Bay Central
- ③ Alburgh Center
- ④ St. Albans Bay
- ⑤ Point au Roche
- ⑥ Cumberland Bay
- ⑦ Inland Sea
- ⑧ Malletts Bay
- ⑨ Burlington Harbor
- ⑩ Main Lake
- ⑪ Shelburne Bay
- ⑫ Diamond Island
- ⑬ Cole Bay
- ⑭ Crown Point
- ⑮ Benson Landing

QC MNRF



A scientist from the Québec Ministry of Natural Resources and Wildlife checks out a bowfin.

Lake and watershed research

Although past programs, such as the Lake Champlain Studies Center at the University of Vermont in the 1960s, provided important data, research funding has increased since the LCBP sponsored its first study in 1991. Today, more than 60 LCBP-funded reports have been published, covering topics from lake sturgeon to sea lamprey to urban runoff control. Recent reports are online at www.lcbp.org/pubsdata.htm.

Numerous other entities perform and fund lake research, including the Lake Champlain Research Consortium, the Lake Champlain Research Institute at Plattsburgh State, UVM's Rubenstein Ecosystem Science Laboratory, and the Adirondack Research Consortium. Researchers from the University of Québec have contributed to our knowledge of Missisquoi Bay. Since 1999, Lake Champlain Sea Grant has connected the Lake to additional federal funding for research.

Lake Champlain Timeline...

LCBP sponsors the LC Maritime Museum's underwater archaeological survey.

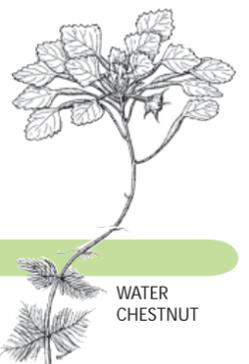
LCBP becomes ex-officio member of the Federal Aquatic Nuisance Species Task Force.

NY's Clean Water/Clean Air Bond Act begins funding LC clean-up projects.



Ben & Jerry's "Phish Food" ice cream debuts. The band Phish donates their profit-share to clean-up projects in the watershed.

Water chestnut plants found on South River (close to Missisquoi Bay). Québec launches a quick and effective response to control the spread.



WATER CHESTNUT

LC becomes a "Sister Lake" with Lake Ohrid in Macedonia and Albania. By 1998, the LC planning process is recognized as a world-wide model for cooperation.



LC Management Plan, *Opportunities for Action* signed by Governors of NY and VT and the US EPA.

LC becomes a "Sister Lake" to Lake Toba in Indonesia.

Lake Champlain Byways begins with funds from the Federal Highway Administration.

LCBP Office in Grand Isle burns, following the ice storm.

Lake Champlain Maritime Museum raises an anchor from the *HMS Confiance*, which fought in the Battle of Plattsburgh (War of 1812).

IMAGE CREDITS: LCBP, BEN & JERRY'S, VT DEC

Algae & Phosphorus 5

In 2009, the region will commemorate the 400th Anniversary of the arrival of the explorer, Samuel de Champlain. This same year is also the target for Vermont and Québec to meet their phosphorus reduction goals. Although the public commitment to reach this goal is stronger than ever, adequate funding for effective actions is essential.

Algae blooms and aquatic plant growth in the Lake are exacerbated by too much of the nutrient phosphorus. The bays and segments of the Lake are monitored to see if they meet the water quality targets for phosphorus that were agreed upon by New York, Vermont and Québec in 1993. Although many conditions, such as shallow, warm water contribute to algal blooms, as phosphorus levels go down these blooms should eventually decrease.

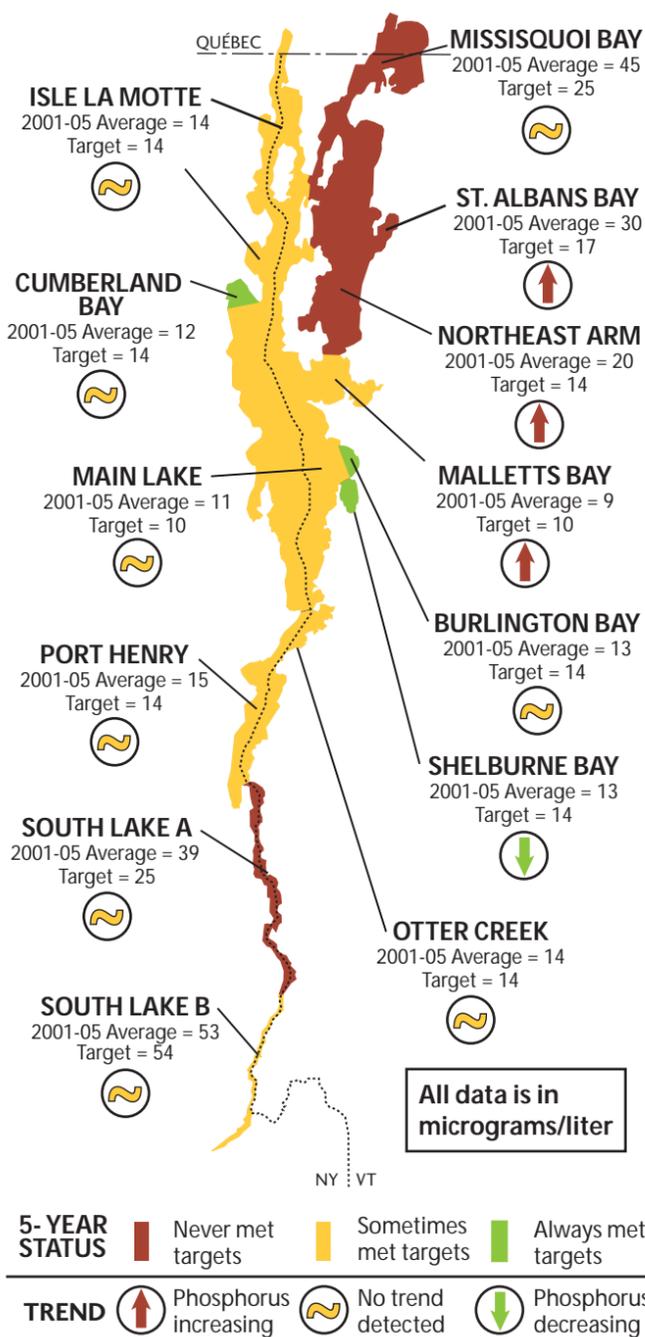
Today, about 90% of the phosphorus enters the Lake from the landscape—lawn and agricultural fertilizers are common sources. Only 10% is from wastewater (sewage) treatment plants, compared to 30% when the LCBP started in 1991. The total wastewater phosphorus discharge from plants in Vermont and New York is below the lake-wide limit set in the 2002 Lake Champlain Phosphorus TMDL (a plan to reduce phosphorus loads required by the US EPA), although treatment upgrades are still needed at some facilities. In Québec, water cleanup programs have enabled eight municipalities in the Missisquoi watershed to build wastewater treatment facilities at a cost of \$24 million (previously the residents used septic).

Reducing phosphorus runoff from agricultural sources, back roads, and suburban/urban areas is now the priority. For example, the LCBP continues to support a program to help New York farms access funding for runoff management. New 2006 funding from the International Joint Commission will be used to help small farms in the Missisquoi watershed create nutrient management plans. A recent LCBP-funded project by the National Wildlife Federation developed a manual for towns about the links between residential and commercial growth, water quality and stormwater discharge. In 2005, the City of South Burlington created the Basin's first stormwater utility to manage runoff.

The LCBP is also funding a land use change study to update the phosphorus loading estimates for different land uses in the Basin (agriculture, forest, urban).



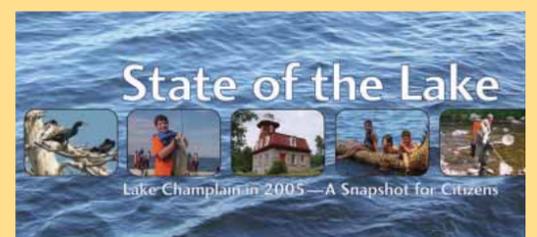
Fertilizer—whether it's from cow manure or lawncare runoff—contributes to the Lake's phosphorus problem.



NOTE: The 5-year status is whether the segment never, sometimes, or always met its targets from 2001-2005. The trend is based on a statistical analysis from 1990-2005. The data is from the LCBP/VTDEC Long-Term Monitoring Program.

What are the top priorities* for Lake Champlain?

- **Phosphorus** inputs must be reduced to decrease the impact of **algal blooms** on people and aquatic animals.
- **Toxic contamination** must be prevented to protect public health and ecosystems.
- Risks to humans from **water-related health hazards**, such as blue-green algae, pathogens and mercury/PCBs in fish, must be minimized.
- **Aquatic nuisance species** must be managed and controlled to reduce their spread. New introductions should be prevented.



How is the Lake doing?

Can I Swim in Lake Champlain? Can I Eat the Fish? What about blue-green algae, zebra mussels, water chestnut...? These are questions the LCBP often hears from the public. Last year, we issued the *State of the Lake 2005* to answer 20 common questions. Read it at www.lcbp.org/lcstate.htm or call 800-468-5227 for your copy.

*Highest four priorities listed in the management plan for Lake Champlain.

IMAGE CREDITS:LCBP, PUGET SOUND ACTION TEAM

PHOSPHORUS REDUCTION AVERAGE, STATUS AND TRENDS

This graphic illustrates progress towards reducing phosphorus levels in Lake Champlain to meet the water quality targets. Based on 2001-05 data, three lake segments always met targets (Cumberland Bay, Shelburne Bay and Burlington Bay) and four never met targets (Missisquoi Bay, St. Albans Bay, Northeast Arm and South Lake A). Trend analyses from 1990-2005 show that nine segments have no significant trends (yellow wavy line), three segments have increasing phosphorus (red up arrow) and one segment has decreasing phosphorus (green down arrow).

Lake Champlain Timeline...

Blue-green algae toxins reported in Lake after two dogs die from ingesting algae. Severe blooms found in Missisquoi Bay.

U. of Vermont Rubenstein Ecosystem Science Laboratory opens.



BLACK-CROWNED NIGHT HERON

LC Birding Trail is established.

LCBP begins Wayside Exhibit Interpretive Signage Program.



CWICNY forms to assist NY farms with pollution prevention.

State of VT River Basin Planning Initiative begins.

Cumberland Bay remediation removes more than 140,000 tons of PCB-contaminated sludge from the Bay's bottom at a cost of \$35 million.

1999

Champlain 2000 news series by WPTZ begins. In 2006, this award-winning series runs as *Champlain Connection*.

LC Sea Grant begins in NY and VT.

Missisquoi Bay Basin Corporation starts in Québec.

National Park Service heritage corridor study of the Champlain Valley released.

2000

Approval of the *LC Basin Aquatic Nuisance Species Management Plan* makes the LC Basin eligible for USFWS funds for control programs.

First targeted phosphorus reductions reached, mostly through sewage treatment plant upgrades.

2001



Valcour Bay Research Project raises a cannon used in the 1776 Battle of Valcour for restoration.

IMAGE CREDITS: USFWS, LCBP

6 Human Health & Toxins

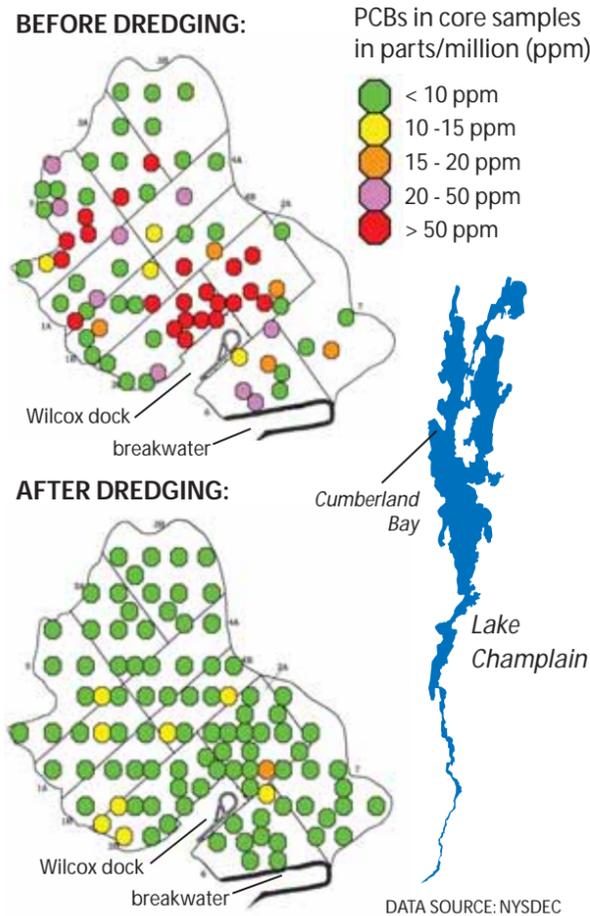
LCBP



About 54 public beaches and countless private beaches dot Lake Champlain's shoreline. Communicating accurate information about health risks is a top priority of the Lake management plan.

PCBS IN CUMBERLAND BAY SEDIMENTS BEFORE AND AFTER DREDGING

This graphic illustrates the PCB levels found in sediment samples from Cumberland Bay, before and after dredging. In the before graphic, 22 sites exceeded 50 parts/million of PCBs. Afterwards, no sites were found to be that high and only one site was in the range of 15-20 parts/million.



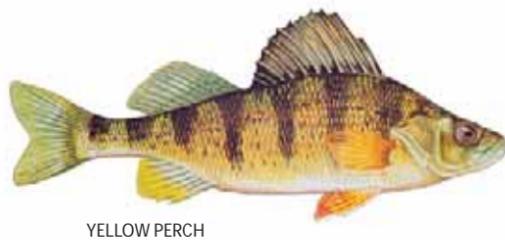
With its 2003 update of the management plan, the LCBP responded to the public by elevating water-related health hazards to a high priority concern for lake management. Preventing pollution from toxins continues to be a high priority and steps are being taken to understand and prevent new sources of toxins.

In 1991, the LCBP funded a Lake Champlain sediment toxins study by University of Vermont and Plattsburgh State researchers. It showed that Cumberland Bay, Outer Malletts Bay and Burlington Harbor all exceeded federal guidelines. In 2001, the New York State Department of Environmental Conservation (NYSDEC) completed dredging PCBs (polychlorinated biphenyls) from Cumberland Bay (off Plattsburgh). Recent data shows a decline in PCB levels in the sediment. It is likely that the PCB-related consumption advisories in brown bullhead, American eel and yellow perch will be lifted, once fish tissue samples are analyzed for PCB levels. Pollution prevention work is on-going in Outer Malletts Bay and Burlington Harbor.

Many programs prevent pollution from ever reaching the Lake. NYSDEC's "CleanSweep" program works with businesses and farmers to safely dispose of pesticides. Other successes include mercury thermometer exchanges, helping farmers to safely exchange old mercury manometers for new electronic devices, and outreach to dentists about safely disposing mercury. Mercury is the most common toxic contaminant in the Basin.

In 2005, the LCBP initiated a collaboration of scientists to investigate "new generation toxins" in the Lake. These potential toxins include pharmaceuticals, personal care products, common fire retardants, and even caffeine. The work-group will also develop a comprehensive lake-wide toxic management plan.

During 2006 and 2007, the US Geological Service will screen some locations on the Lake for these toxins. Another LCBP-funded study is researching the impacts of agricultural herbicides on Lake Champlain.



QC MDDEP

Blue-green algae at its worst. This bloom developed in August 2005 on Missisquoi Bay.

Swimming and fishing in Lake Champlain

In 1999, blue-green algae toxins became a public concern when two dogs died from poisoning. To date, these blooms have been problematic mainly in the north-eastern part of the Lake. To understand blue-green algae sources and communicate risks to the public, the LCBP and its partners began extensive monitoring and research in 2000. Monitoring summaries for all of Lake Champlain are posted on the Vermont Department of Health (www.healthvermont.gov) for swimmers and other Lake users. Another health department program is working with Town Health officers to test for blue-green algae toxins. Québec also routinely monitors Missisquoi Bay and posts advisories.

More public information is also now available about hazards from pathogens, such as *E. coli*. For example, Burlington, South Burlington, and the Town of Colchester post beach closure information online (visit www.lcbp.org/swim.htm for links).

Fishing is usually great on the Lake, but people should be cautious about how much fish they eat, especially women of childbearing age and children. Vermont, New York and Québec monitor fish for mercury and PCB toxins. The results are used by health departments for the Lake's fish consumption advisories (online at www.lcbp.org/fishadvs.htm).

Lake Champlain Timeline...

VT accepts 60% and QC accepts 40% of the responsibility for reducing phosphorus loads to Missisquoi Bay under new agreement.



The Windmill Point lighthouse in Alburgh, VT is relit. By 2004, all of LC's historic lighthouses are relit and replicas are installed on Burlington's breakwater.

ECHO at the Leahy Center for Lake Champlain opens.

Cormorant control starts on some LC islands.

NY Hudson-Fulton-Champlain Quadricentennial Commission begins.

VT's Clean and Clear Action Plan begins to fund the Lake Champlain phosphorus TMDL requirements.

2002

Clean Marine Engine Initiative for LC signed to promote the sale of less-polluting engines.

The Daniel Patrick Moynihan Lake Champlain Basin Program Act of 2002 authorizes funds of up to \$11 million/year to continue the implementation of *Opportunities for Action*.

The Lake Champlain phosphorus TMDL is finalized by the VTDEC and NYSDEC and submitted to the US EPA.

2003

Update of *Opportunities for Action* management plan endorsed by NY, VT, QC, and US EPA. It is printed in French and English.



VT and QC agree to accelerate phosphorus reduction efforts, with the goal of meeting them by 2009.

QC enacts its *Phosphorus Reduction Action Plan* for Missisquoi Bay.

IMAGE CREDITS: SID COUCHEY/CUMBERLAND HEAD TOMORROW

PROGRESS 2006 - LAKE CHAMPLAIN BASIN PROGRAM

Nuisance Species 7

Although nuisance species like Eurasian watermilfoil and water chestnut have thrived in parts of Lake Champlain for decades, the terms exotic species and nonnative became household words with the arrival of zebra mussels in 1993. Today, the LCBP and its partners are working to manage the spread and impact of six priority nonnative species and prevent the introduction of many more.

As of 2006, zebra mussels are found in nearly all of Lake Champlain, but fortunately they have only spread to two inland lakes in the Basin (Lake George and Lake Bomoseen). Outreach about identifying zebra mussels and other exotics, as well as information about boat washing to prevent the spread of these plants and animals, is a major goal of the *Lake Champlain Basin Aquatic Nuisance Species Management Plan* (2005). This plan makes the Basin eligible for funding from the US Fish and Wildlife Service for control programs.

Since its inception, the LCBP, along with the US Army Corps of Engineers, Vermont and New York, has funded water chestnut control by the Vermont DEC and The Nature Conservancy. Consistent funding has greatly

decreased the Lake acreage that needs mechanical harvesting. In 2005 and 2006, sporadic water chestnut infestations were found in the north Lake in Vermont and Québec. Fortunately, quick responses were launched to remove the plants, thanks to coordination among the programs and volunteers.

In 2005, alewives were found in the Lake. Biologists and anglers are concerned that this exotic fish will threaten native forage and game fish. In 2006, an LCBP workshop invited representatives from other alewife-infested lakes to discuss possible impacts here (summary available at www.lcbp.org). Next summer, the LCBP will fund a boat-launch steward program to prevent the further spread of all invasive species in and out of the Basin.



LCBP

A harvester loaded with water chestnuts motors to a launch where the plants will be loaded onto dump trucks and hauled away for composting.

What nuisance species cause the most problems?

Species already in or on the shore of Lake Champlain:

Alewife	Eurasian watermilfoil
Zebra mussel	Japanese knotweed
Purple loosestrife	Water chestnut

Potential invaders to the Lake:

Eurasian ruffe	Round goby
Hydrilla	Quagga mussel
Rusty crayfish	Fishhook water flea
Spiny water flea	

Photos and profiles of these plants and animals are online at www.lcbp.org/nuis-sum.htm.

What about sea lamprey?

Although certainly a nuisance, recent research suggests sea lamprey may be *native* to the Lake, having been left here by the Champlain Sea, some 10,000 years ago. A control program led by the Lake Champlain Fish and Wildlife Cooperative continues to manage their populations. Research funded by the LCBP has also investigated the feasibility of several non-chemical alternatives, such as nest raking and stream barrier dams.



SEA LAMPREY



The Adirondack Park Invasive Plant Program coordinates Phragmites (left) and other invasive plant removal from sensitive habitats. A diet of invasive alewife instead of native smelt may cause reproductive failure in lake trout and Atlantic salmon (above).

IMAGE CREDITS: LCBP, B. PIENKA

Native plants and animals

More than 300 birds, 20 amphibian, and 56 mammal species, as well as many rare plant communities live in the Lake Champlain watershed. Some animal species are faring well, including the common loon, peregrine falcon and osprey, which were recently removed from Vermont's endangered and threatened species list. Other species, such as native mussels, are severely threatened by nonnative species. Fragile habitats are also threatened by aggressive nuisance plants.

The LCBP is a member of the Lake Champlain Ecosystem Team, which is comprised of experts from the US Fish and Wildlife Service, state and provincial wildlife agencies, nonprofits, and university researchers. This "team" meets regularly to address emerging threats to native species and to consider how lake management activities affect the entire Lake ecosystem.



COMMON LOON

Lake Champlain Timeline...

Reciprocal NY-VT fishing license for LC enacted.

US Army Corps begins funding watershed restoration projects.



National Wildlife Federation and partners begin bald eagle restoration near Lake Champlain.

The International Joint Commission recommends removing the Missisquoi Bay causeway.

The City of South Burlington creates the Basin's first stormwater utility.



Middlebury College unveils a new depth map of LC, which uses data taken during the underwater survey.

2004

2005

VT Lake Champlain Quadracentennial Commission meets in Burlington.



SAMUEL DE CHAMPLAIN

LC Maritime Museum launches canal boat replica *Lois McClure*.

The Lake Champlain Committee initiates voluntary Lake Protection Pledge campaign.

Navy Memorial dedicated on Burlington waterfront.

LCBP Releases *State of the Lake* report.

Alewife fish confirmed in Lake.

The Nature Conservancy releases a Lake Champlain biodiversity plan.

New Missisquoi National Wildlife Refuge visitor center opens.

IMAGE CREDITS: LCBP, USFWS

8 The Lake & You

From volunteer watershed groups, to farmers reducing runoff to waterways, to new state and federal programs, there is promise for the future. Lake Champlain, however, is a complicated ecosystem, and it will take time to respond to clean-up efforts. Commitments must continue and grow to tackle the major issues facing the Lake.

The LCBP and its partners are committed to continue implementing the management plan and issuing reports, such as this one, to detail our progress. The commitment to the Lake, however, begins with area residents, business owners and visitors. Try these ten simple tips at home and at the water:

- 1. Test Your Turf:** Test your lawn and garden before you fertilize. You may need less than you think or none at all!
- 2. Make a Dish-wash Switch:** Most automatic dishwashing detergents still contain phosphorus. Switch to a phosphate-free version.
- 3. Look for Leaks:** Leaking oil, anti-freeze and gas can pollute the Lake, so keep your engines tuned and recycle your oil.
- 4. Leave it on the Lawn:** Let your mowed grass clippings serve as mulch. This adds nutrients and decreases the need for watering.
- 5. Check the Septic:** If not properly maintained, your septic system may pollute the Lake with harmful *E. coli* bacteria.
- 6. Only Rain in the Stormdrain:** Never pour any fluids into stormdrains—many drain directly into waterways.



CBVBM

- 7. Inspect Your Boat:** Remove mud, plants and animals from boats and trailers between launches and sanitize the bilge to keep nuisance species from spreading.



LGWC

The Lake George Watershed Conference created this boat wash station to help boaters prevent the spread of nuisance species to Lake George. Boaters can also clean their boat at home before moving it between waterbodies.

- 8. Scoop the Poop:** Pick up pet waste and throw it in the trash or toilet to keep it from washing into the Lake.

- 9. Don't Trash Toxics:** Look for key words like, *Warning! Danger! Poison! Caution!* on household products, including cleaners, paints, bug sprays, and hobby supplies. Take these items to a hazardous waste depot—do not throw them into your regular trash!

- 10. Get Involved:** Volunteer with a local watershed group and attend public meetings about water issues—let your love of the Lake be heard!

Vermont farmers have been visiting agricultural clubs in Québec to learn about how they can form similar sustainable agriculture clubs in Vermont to better protect water quality.



MRBA

River clean-ups, like this one by the Missisquoi River Basin Association, are great volunteer opportunities for all ages.

Citizen voices for the Lake

The LCBP is advised by three "Citizen Advisory Committees (CACs)" in New York, Vermont and Québec. These volunteers have led the charge on many Lake initiatives. For example, the New York CAC first called for a reciprocal New York/Vermont fishing license on the Lake and in 2003 it became a reality. The Vermont CAC advocated strongly for the 2009 phosphorus reduction target. Québec's CAC is linking Vermont and Québec farmers to share expertise on pollution reduction. All CAC and LCBP meetings are open to the public.

Contact the LCBP

Contact us to stay current with LCBP projects, read our newsletter, find more details about the programs in this publication, or share your concern about the Lake!

MAIN OFFICE

54 West Shore Road
Grand Isle, VT 05458
Phone: 800-468-5227 or 802-372-3213
Website: www.lcbp.org
Email: lcbp@lcbp.org

LCBP RESOURCE ROOM AT ECHO

1 College St.
Burlington, VT 05401
Phone: 802-864-1848 ext. 109
(open weekdays & weekends)

A fifteenth anniversary celebration for the Lake Champlain Basin Program and its partners will be held on the afternoon of October 20th. For more details contact the LCBP or visit www.lcbp.org.

Lake Champlain Timeline...

\$300,000 in funds to support Missisquoi Bay clean-up appropriated by International Joint Commission.

Draft Strategic Plan for VT Lake Champlain Quadricentennial Commission released.

NY Governor proclaims annual Adirondack Park Invasive Species Awareness Week the second week of July.

2006

LCBP's first annual LC Farm Award recognizes pollution prevention on three farms in NY, VT, and QC.



EURASIAN WATERMILFOIL

Governor proclaims annual Vermont Clean Water Day the second Saturday of every June.

Looking ahead...

The LCBP will continue its vital role coordinating the *Opportunities for Action* implementation. Upcoming efforts include taking a lead role in the Quadricentennial Commemoration of the 400th anniversary of Samuel de Champlain's 1609 exploration of the Lake and working with Vermont and Québec on the accelerated phosphorus reduction timeframe. The LCBP will also work with its partners to identify and reduce toxins, communicate health risks to the public, and stop the spread of nuisance species through rapid responses to new infestations.

