



# *Les enjeux transfrontaliers de la gestion integree de l'eau: le cas du Richelieu et du Lac Champlain*

*23 May 2012*

*William G. Howland, LCBP Manager*

# The Lake Champlain Basin

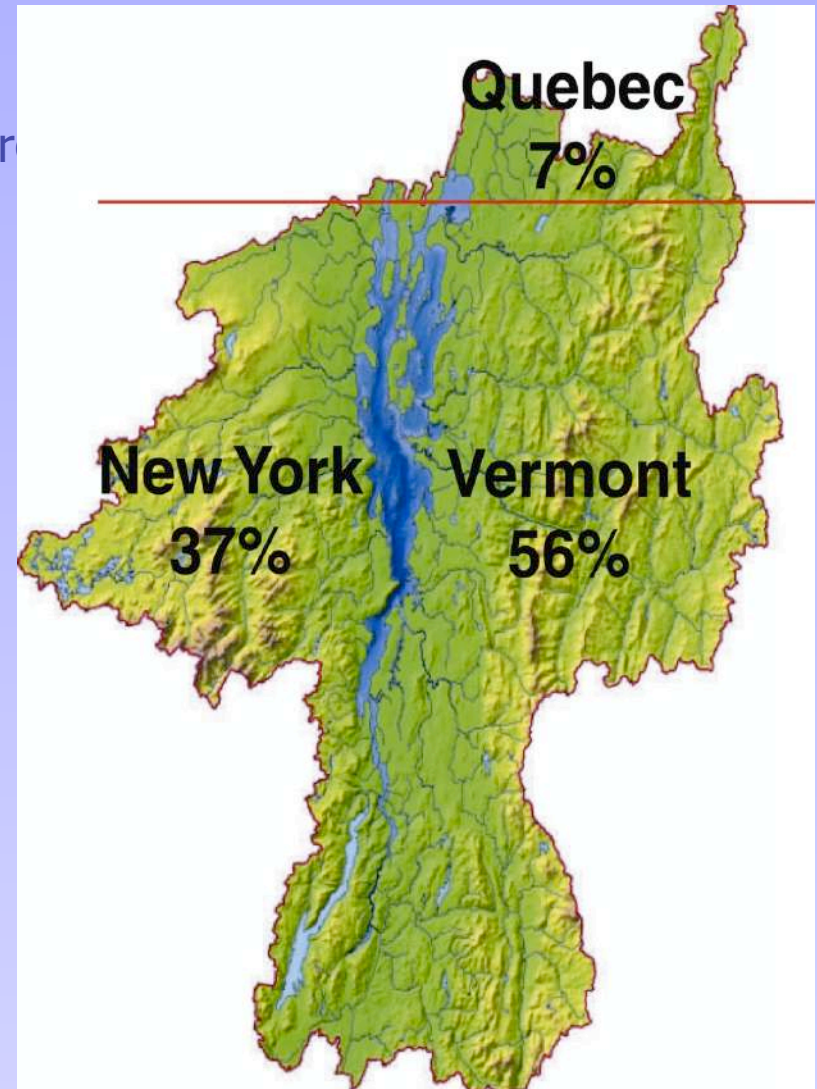
**The Basin:** 21,326 square kilometers.

- The Drainage Basin is 18.9 times as large as the Lake

**The Lake:** 1,127 square kilometers

- Over 122 meters deep
- 193 kilometers long

**The Richelieu River:** – Lake Champlain waters enter the Richelieu River and flow north to the St Lawrence River.



# Origins of the LCBP

- **1988 Memorandum of Understanding... 2010**

- New York State: 1988 Governor Cuomo..... 2010 Governor Paterson
- Vermont: 1988 Governor Kunin ..... 2010 Governor Douglas
- Québec : 1988 Premier Bourassa ..... 2010 Premier Charest

- **Lake Champlain Special Designation Act of 1990**

- US Public Law 101-596 - Nov. 16, 1990 - *amended the Federal Water Pollution Control Act (33 U.S.C. 1324(d))*
- Established the *Lake Champlain Management Conference* and the *LCBP*

- **Great Lakes and Lake Champlain Act of 1993**

- Daniel Patrick Moynihan Lake Champlain Basin Program Act of 2002 *further amended the US Federal Water Pollution Control Act*

(Authorizing \$11,000,000 per year through the EPA)

- **Funding** - Québec, north of the border, *US Federal* south of the border

ENTENTE DE COOPÉRATION  
  
EN MATIÈRE  
D'ENVIRONNEMENT  
RELATIVEMENT  
À LA GESTION DU LAC CHAMPLAIN


ENTRE  
  
LE GOUVERNEMENT DU QUÉBEC,  
  
L'ÉTAT DE NEW YORK  
  
ET  
  
L'ÉTAT DU VERMONT

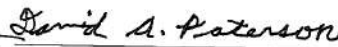
Done in triplicate in the English and French languages, both texts being equally authentic.

At Québec, the March 11, 2010 At Albany, the March 16, 2010

THE STATE OF VERMONT

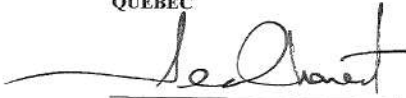
THE STATE OF NEW YORK

  
James H. Douglas  
Governor

  
David Paterson  
Governor

At Québec, the March 11, 2010

THE GOUVERNEMENT DU  
QUÉBEC

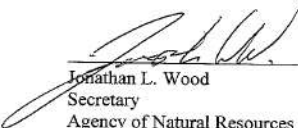
  
Jean Charest  
Premier ministre


Witnessed:

At Québec, the March 11, 2010 At Albany, the March 17, 2010

THE STATE OF VERMONT


THE STATE OF NEW YORK

  
Jonathan L. Wood  
Secretary  
Agency of Natural Resources

  
Pete Grannis  
Commissioner  
Department of Environmental  
Conservation

At Québec, the March 11, 2010

THE GOUVERNEMENT DU  
QUÉBEC

  
Line Beauchamp  
Ministre du développement durable, de  
l'Environnement et des Parcs

# Lake Champlain Basin Program Operating Structure

## Lake Champlain Steering Committee

### Québec Members

- Ministère du Développement durable, de l'Environnement et des Parcs
- Ministère des Ressources naturelles et de la Faune
- Ministère de l'Agriculture, des Pêcheries et de l'alimentation
- Mayor: Municipalité de Saint-Georges-de-Clarenceville

### New York Members

- Dept. of Environmental Conservation
- Dept. of Economic Development
- Office of Parks, Recreation and Historic Preservation
- Dept. of Agriculture and Markets
- Mayor (vacant)

### Vermont Members

- Agency of Natural Resources
- Agency of Transportation
- Department of Agriculture
- Agency of Commerce and Community Development
- Mayor (vacant)

### US Federal Members

- US Department of Interior
- US Department of Agriculture, NRCS
- US Environmental Protection Agency
- US Fish & Wildlife Service
- US National Park Service
- US Army Corps of Engineers

### Other Members

▪ Citizens Advisory Committee Chairs: **Québec, Vermont, New York**

▪ Standing Committee Chairs: **Technical,**

▪ Lake Champlain

**Educational, Cultural Heritage**  
SeaGrant

## LCBP Executive Committee

**Technical  
Advisory  
Committee**

**Education &  
Outreach  
Advisory  
Committee**

**Heritage Area  
Partnership  
Advisory  
Committee**

### 3 Citizens Advisory Committees:

**Québec  
Vermont  
New York**

# Lake Champlain

- **Lake Segments:**

The Lake is divided into five distinct areas, each with different physical and chemical characteristics and water quality.

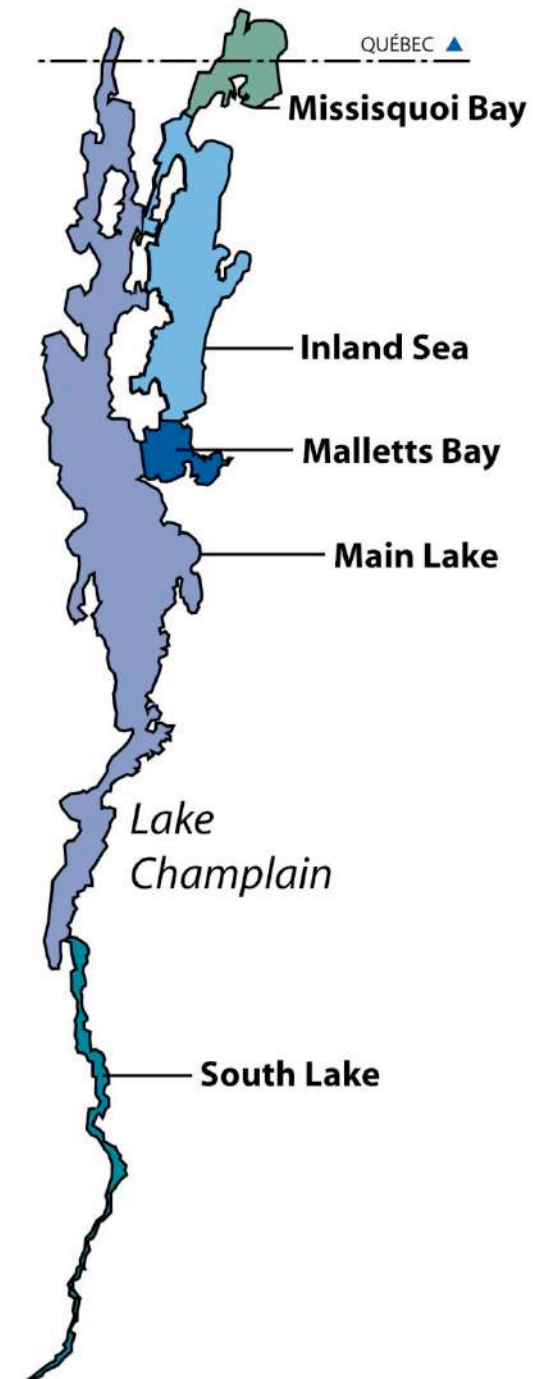
- **Drinking Water Use:**

200,000 people or about 35% of the Basin population, depend on Lake Champlain for drinking water.

- **Population in the Basin:**

571,000 in 2000. About 68% live in Vermont, 27% in New York, and 5% in Quebec.

Density is about 61 people per sq. mi.

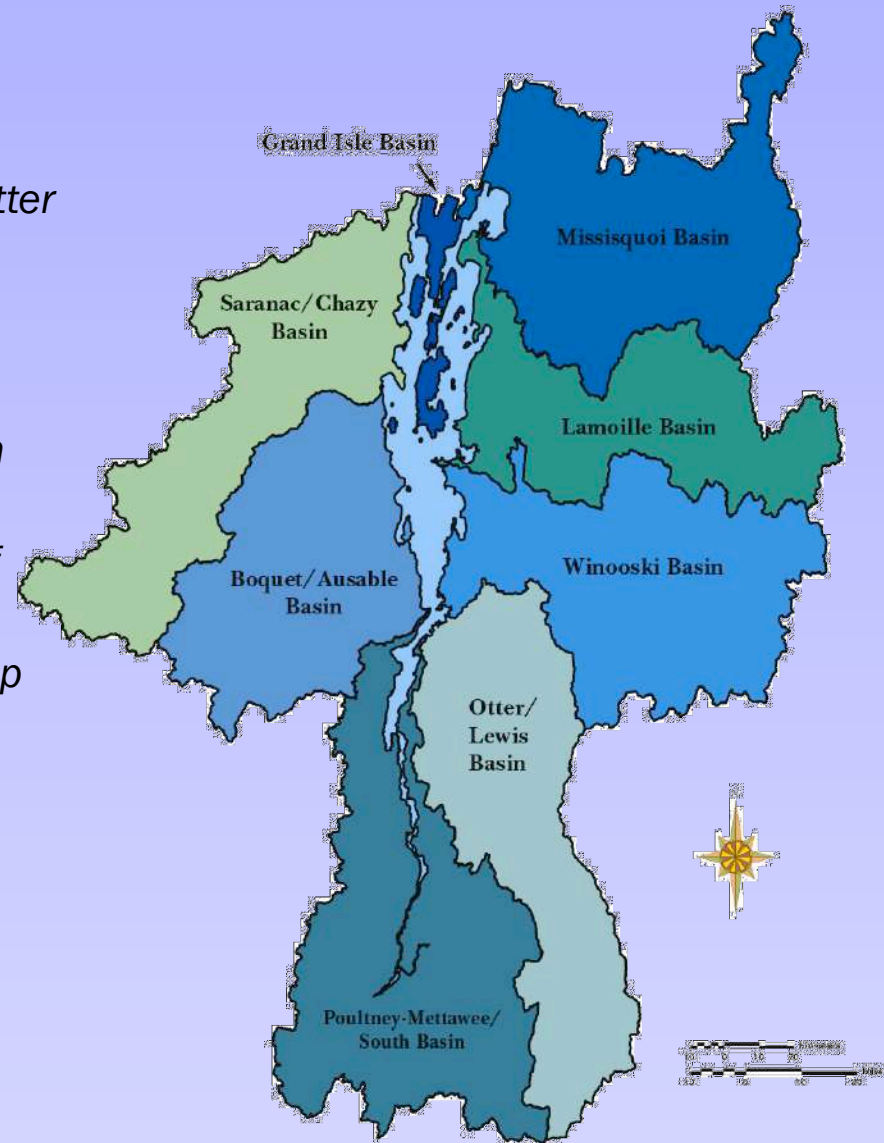




# Opportunities for Action

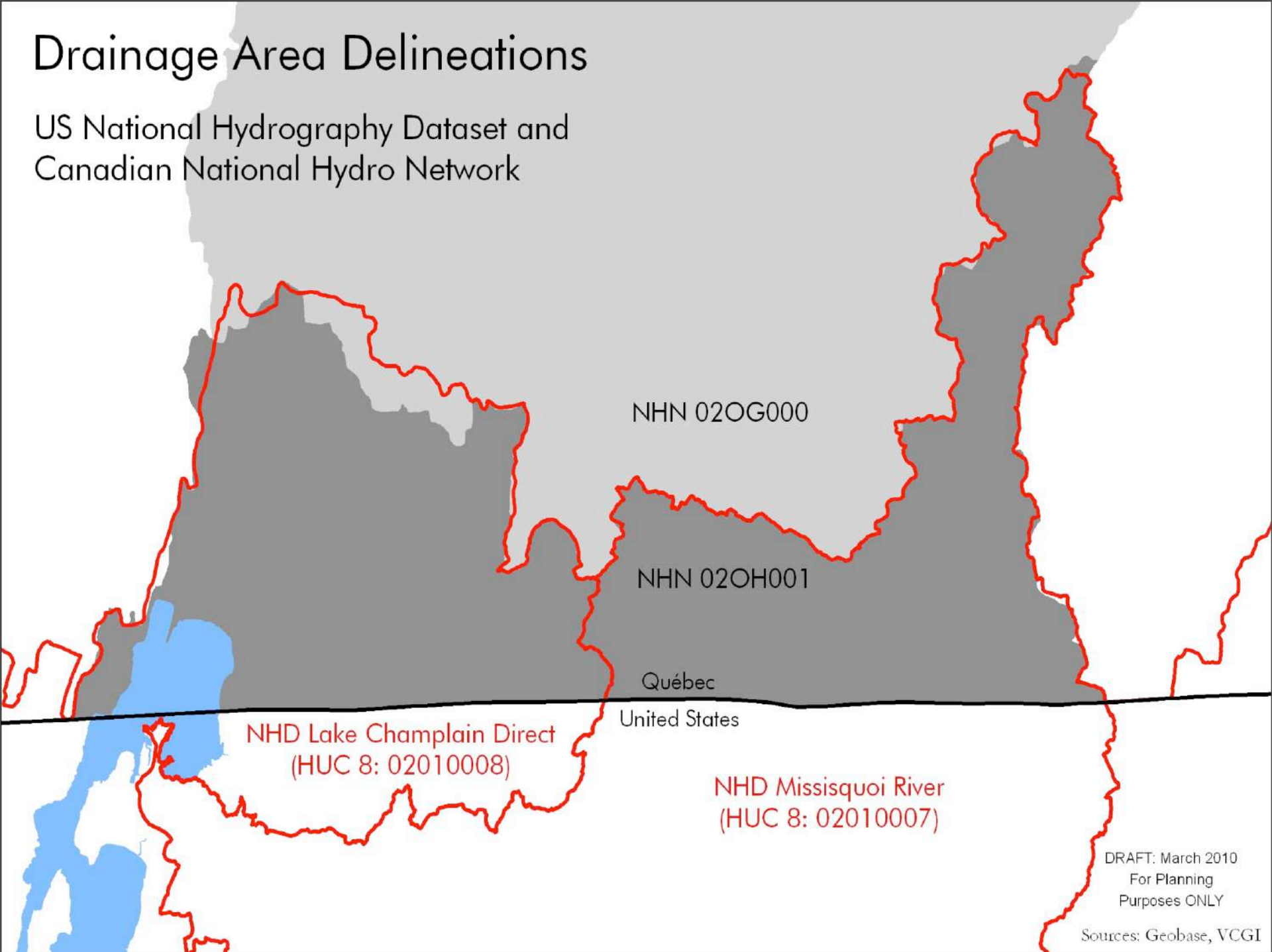
## Highest Priorities for Action

- *Improve public understanding of pollution problems and promote behavioral change to better stewardship*
- *Reduce phosphorus inputs*
- *Reduce toxic contamination*
- *Maintain diverse plant & animal communities in the Basin*
- *Prevent the introduction & control the spread of nonnative aquatic invasive species*
- *Identify potential changes in climate and develop adaptation strategies to minimize adverse ecosystem impact.*
- *Build knowledge of history, culture and special resources in the Basin and make information accessible to all.*



# Drainage Area Delineations

US National Hydrography Dataset and  
Canadian National Hydro Network



DRAFT: March 2010  
For Planning  
Purposes ONLY

Sources: Geobase, VCGI



# Blue-Green Algae - Where is the Problem?

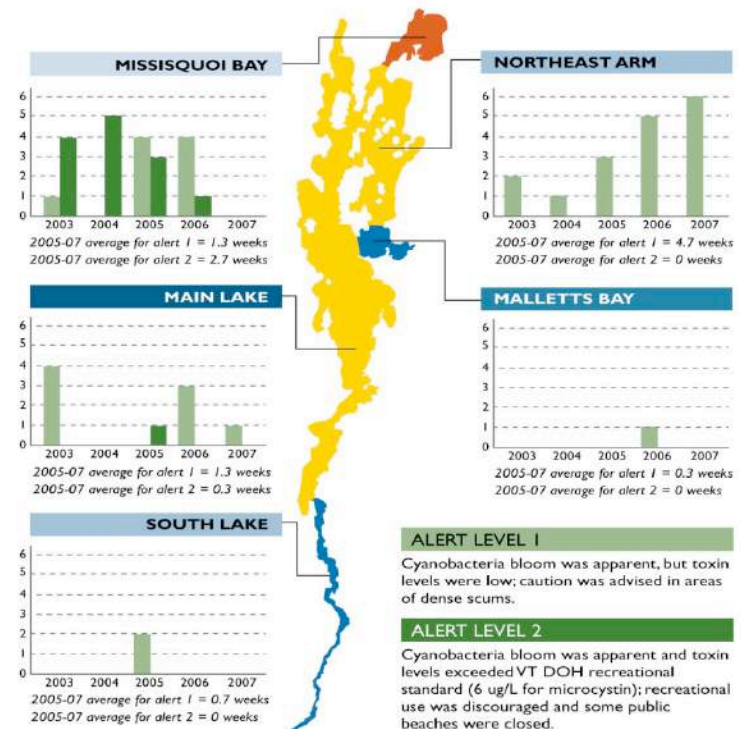
## Blue-Green Algae Blooms

- Blooms smell bad and they look ugly
- Blooms are sometimes toxic
- Several dogs have died from exposure
- People worry ... for good reason



*Algae blooms are often severe in Missisquoi Bay, St. Albans Bay, and smaller northeastern bays, but most of the Lake has never had a dense blue-green bloom.*

### WEEKS OF CYANOBACTERIA (BLUE-GREEN ALGAE) BLOOMS AT ALERT LEVELS



#### LAKE SEGMENT STATUS\*

- GOOD** The segment averaged less than one week at alert levels 1 or 2.
- FAIR** The segment averaged more than one week at alert level 1 and less than one week at alert level 2.
- POOR** The segment averaged more than one week at alert level 2.

\*Averages were calculated for 2005-07 for the months of June - September.

#### LAKE SEGMENT TREND

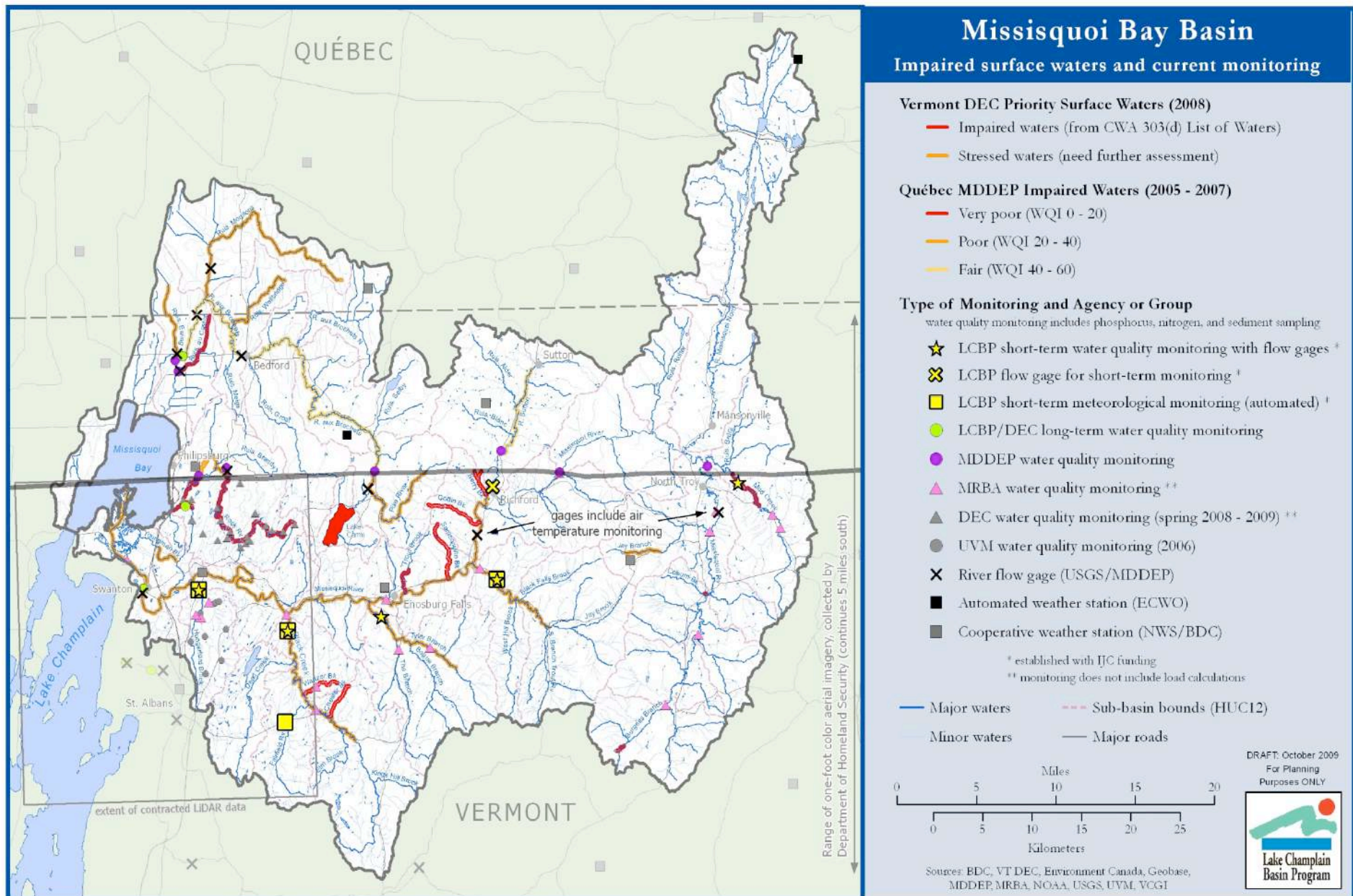
- No trend data is available

NOTE: Missisquoi Bay data is for locations in Vermont only.  
DATA SOURCE: LVM Rubenstein Ecosystem Science Laboratory cyanobacteria monitoring and evaluation program and LCBP Technical Report #s 51,52,53, and 55.

GRAPHIC FROM: State of the Lake and Ecosystem Indicators Report - 2008. Lake Champlain Basin Program, June 2008.



# Quebec - Vermont Phosphorus Reduction Agreement 2002: 60%/40%



DRAFT: October 2009  
For Planning  
Purposes ONLY



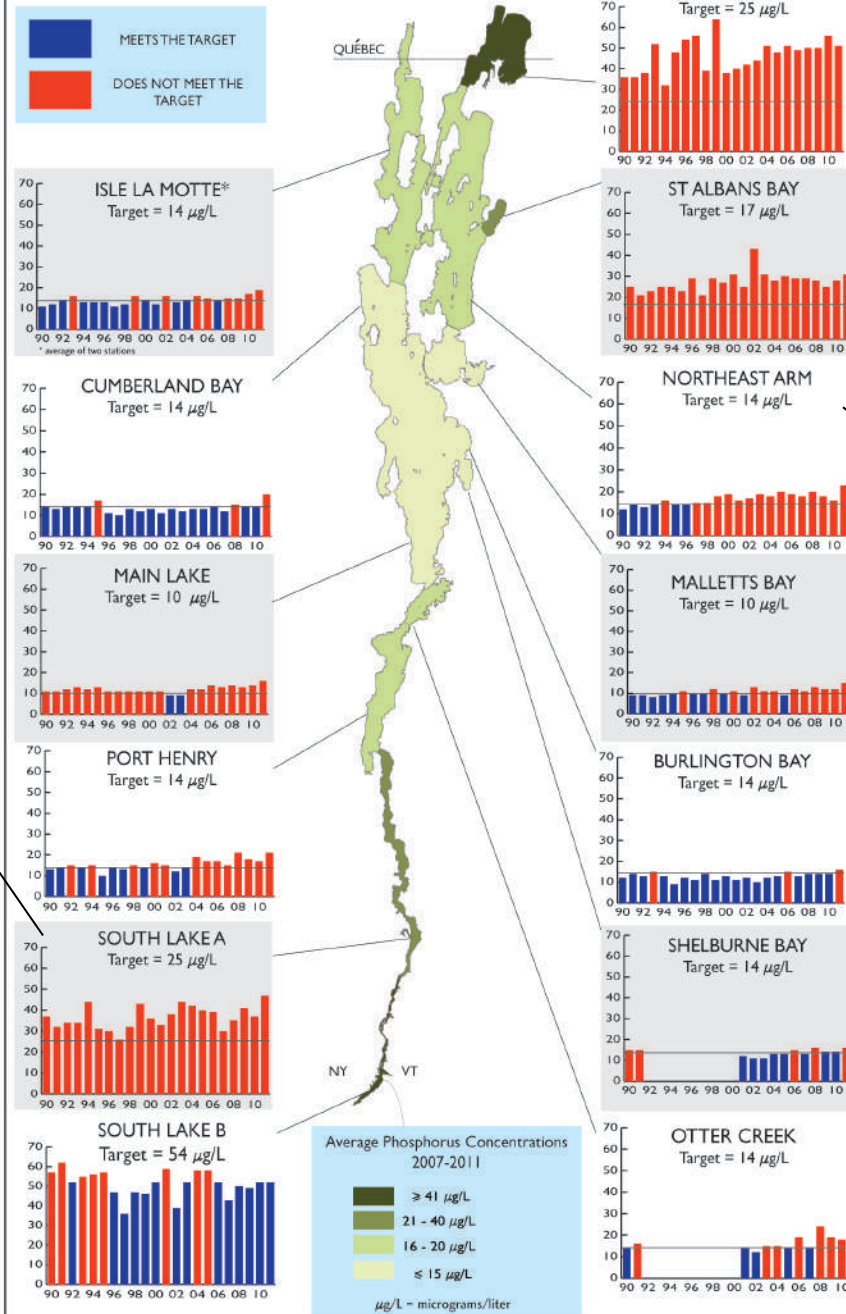
# Management Requires cross-boundary collaboration

## South Lake



- Exceeds P targets
- Excess weed growth
- Water chestnut and Eurasian watermilfoil
- Much of the watershed is intensively farmed

## TOTAL PHOSPHORUS CONCENTRATIONS IN LAKE SEGMENTS 1990-2011



## Missisquoi Bay



- Greatly exceed P target
- Seasonal BGA blooms
- Extensive agriculture

## Northeast Arm

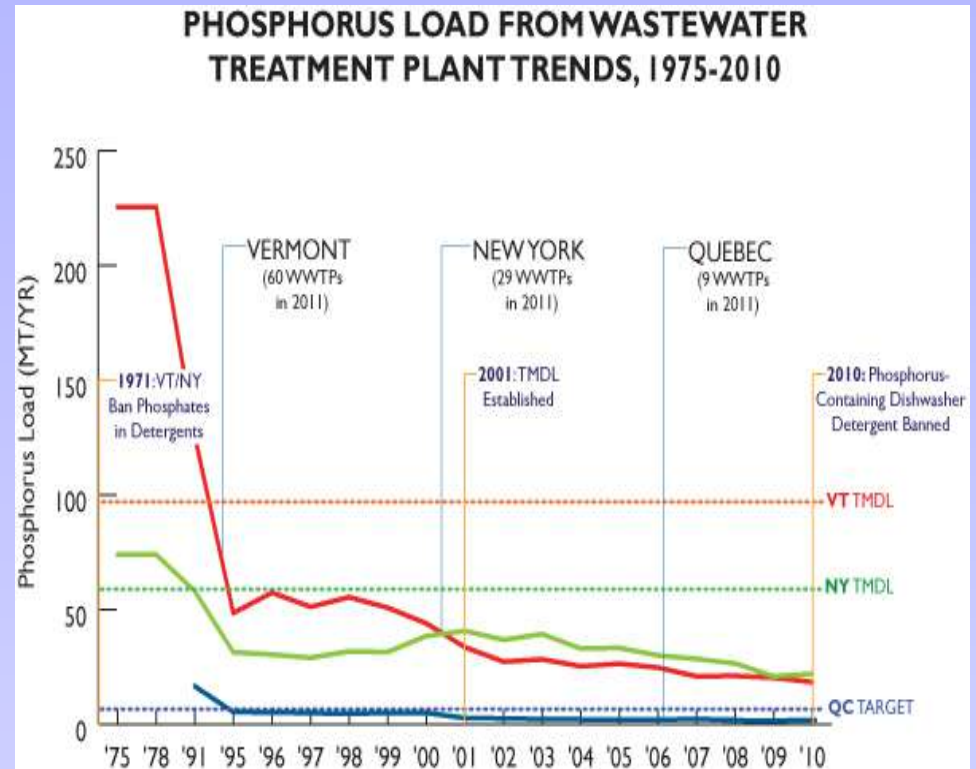


- Exceeds P targets
- Seasonal BGA blooms
- Eurasian watermilfoil
- Extensive agriculture and urban areas



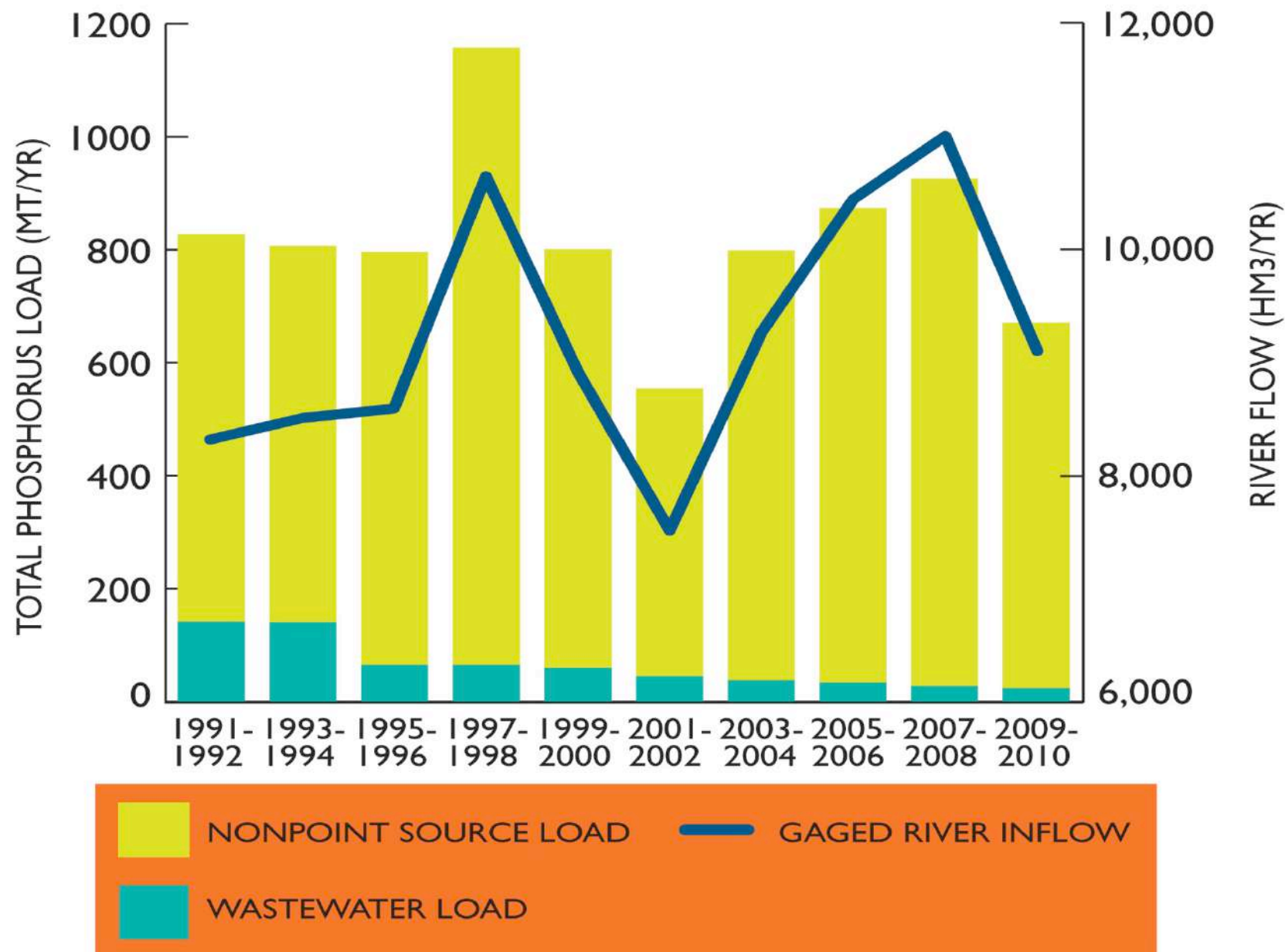
# How Much from Point Sources?

- Point sources = 5%



From Treatment Plant Monitoring Data

# TOTAL PHOSPHORUS LOAD TO LAKE CHAMPLAIN COMPARED TO RIVER FLOW







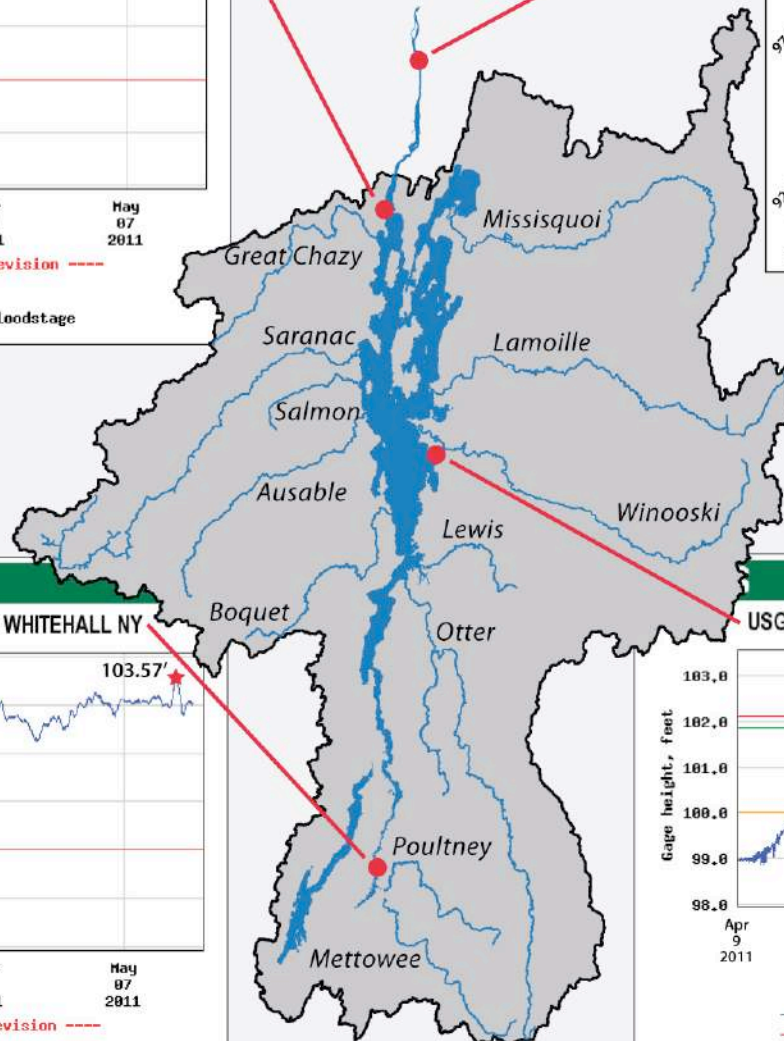
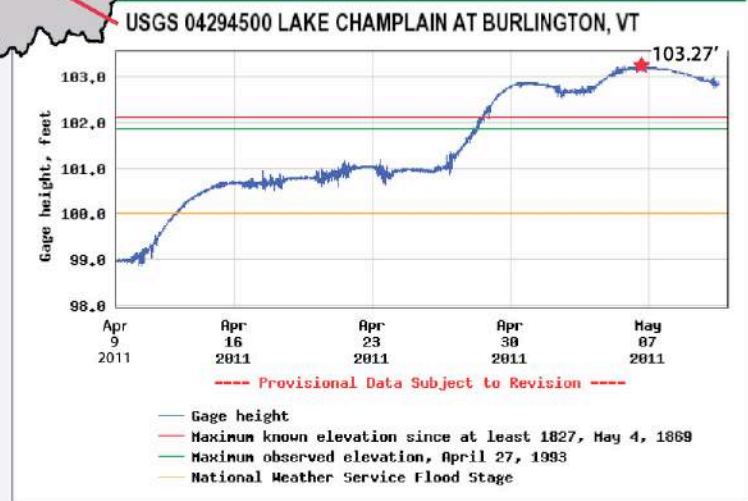
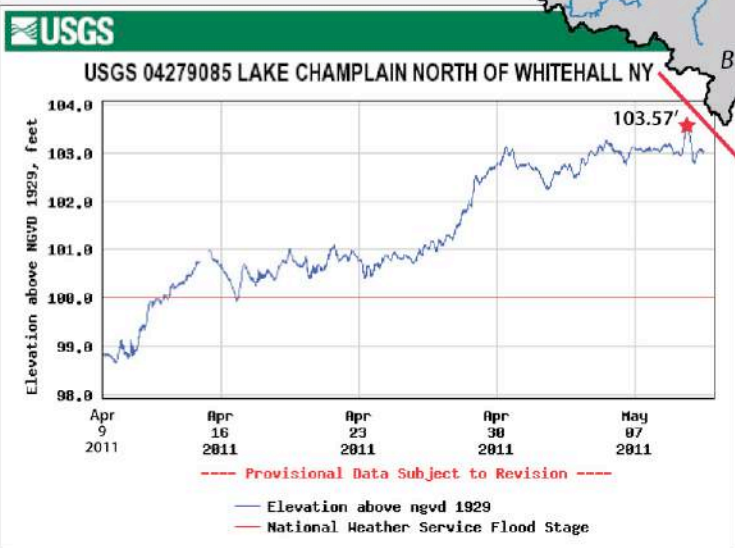
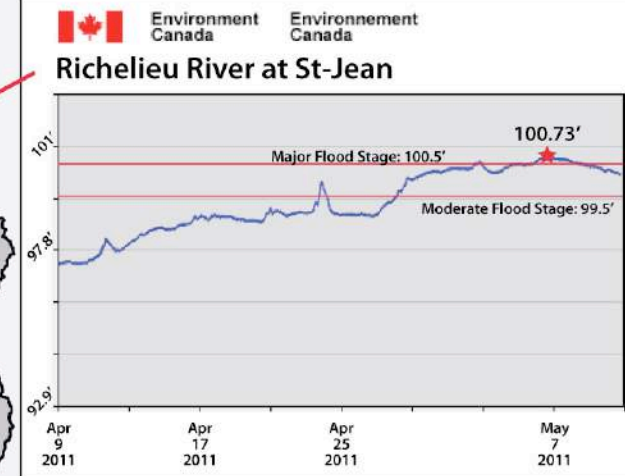
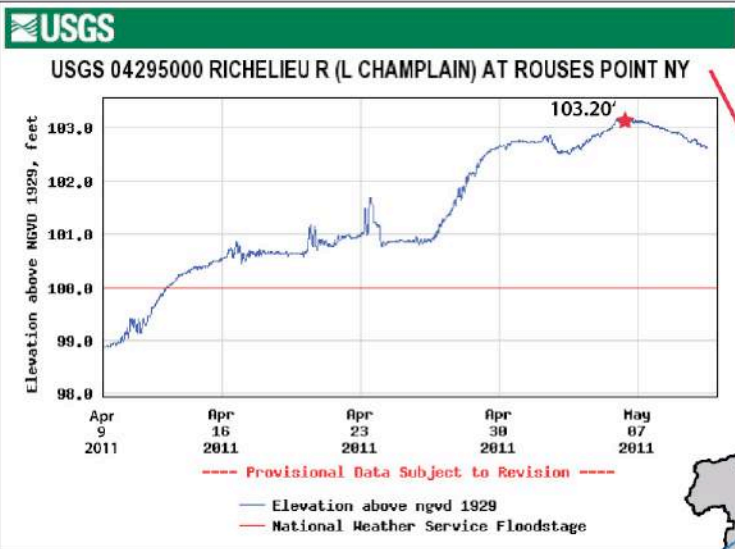
mardi 22 mai 2012





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# Lake Champlain Flood Stage - gages from April 9<sup>th</sup> to May 11<sup>th</sup> 2011







**Flooding and road maintenance: May, 2011**  
**Venise-en-Québec, QC**  
**Credit: Martin Mimeault, MDDEP**





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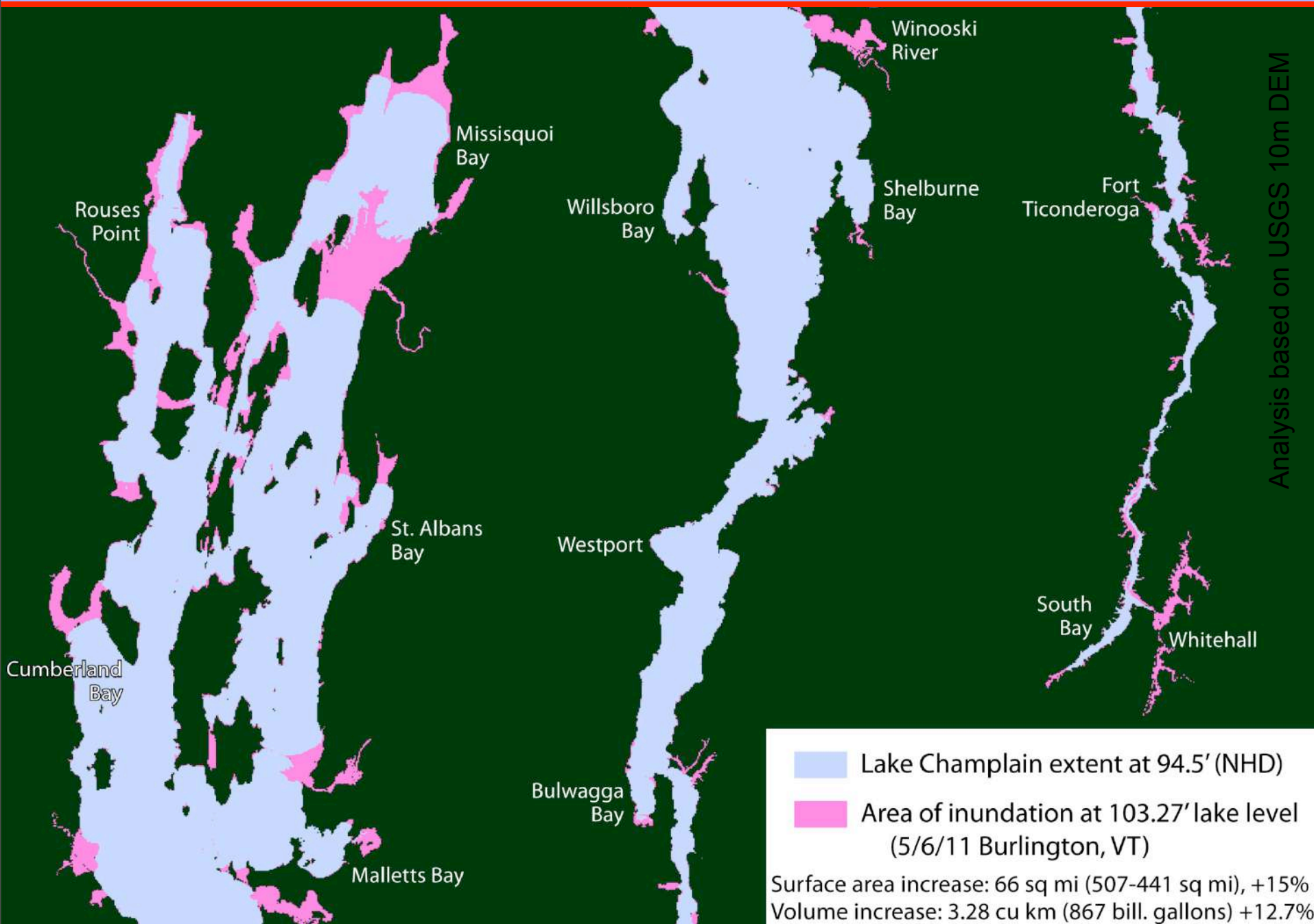
Stormwater ditch, culvert, US Rt 2 Runoff  
North Hero, VT 4/28/11



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# May, 2011 Lake Champlain Flood







04.29.2011 11:05

Ferry Landing at Perkins Pier, Burlington, VT





**Sediment Plume, Winooski River Delta  
Colchester/Burlington, VT**

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St. Jean-sur-Richelieu, 2011



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**IRENE: East Pittsford, VT**  
credit: Lars Gange & [Mansfield Heliflight](#)

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**IRENE: Rt 100 Near Mendon, VT** credit: Lars Gange & [Mansfield Heliflight](#)

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**IRENE: Otter Creek Sediment Plume**  
**Lake Champlain**

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**Missisquoi Bay, St. Armand, QC  
September, 2011**

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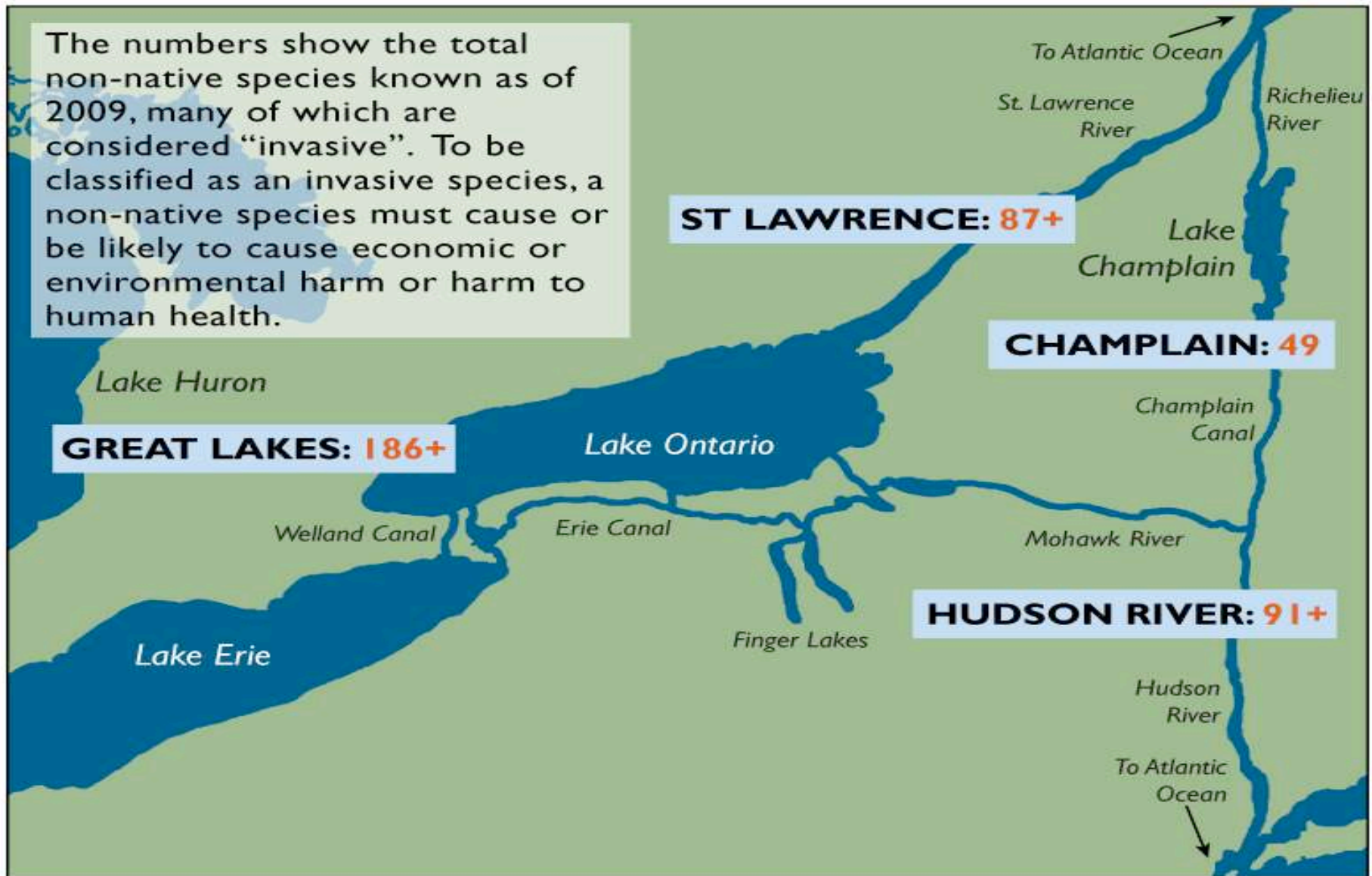


**Bedford, QC Municipal Water Intake –  
Missisquoi Bay, September 2011**

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# NUMBER OF KNOWN NON-NATIVE SPECIES IN LAKE CHAMPLAIN AND ADJACENT WATERS

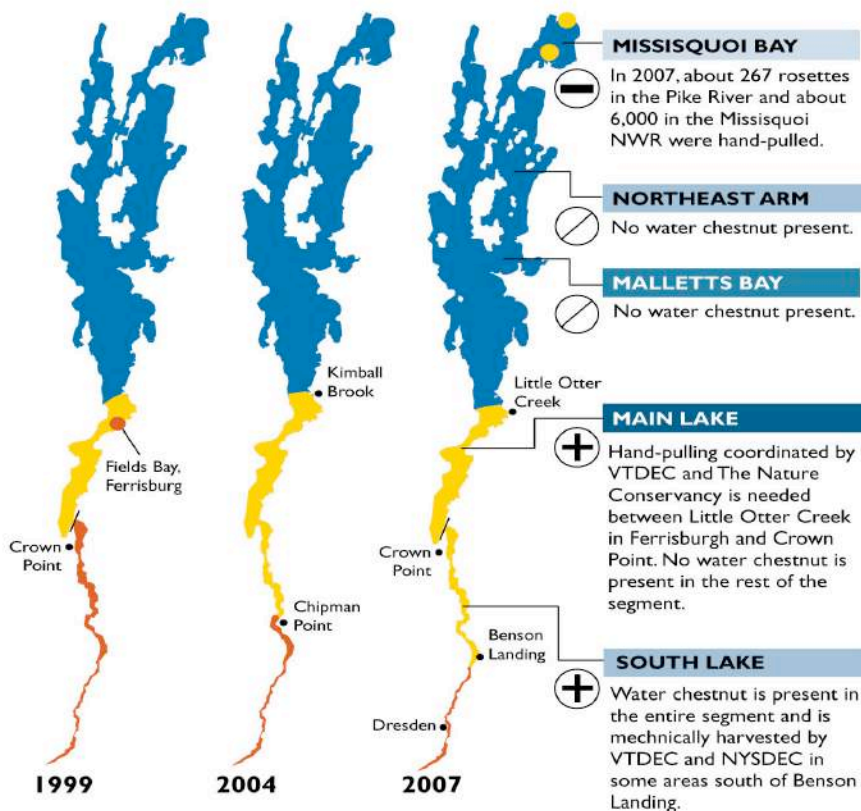
The numbers show the total non-native species known as of 2009, many of which are considered “invasive”. To be classified as an invasive species, a non-native species must cause or be likely to cause economic or environmental harm or harm to human health.



DATA SOURCE: Updated in 2007 from Mark Malchoff, Lake Champlain Sea Grant; Ellen Marsden, U. of Vermont. Updated 2009 Lake Champlain number from LCBP.



# STATUS OF WATER CHESTNUT INFESTATIONS ON LAKE CHAMPLAIN



## STATUS

**GOOD**

No water chestnut present and no management needed

**FAIR**

Water chestnut present with less than 25% coverage (typically managed by hand-pulling)

**POOR**

Water chestnut present with greater than 25% coverage (typically managed by mechanical harvesting) in an area covering greater than 10% of the segment

## TREND



Improving: water chestnut is decreasing



No trend: neither improving nor deteriorating



Deteriorating: water chestnut is increasing



No trend data is available

DATA SOURCES: VTDEC, NYSDEC, QC MDDP

GRAPHIC FROM: State of the Lake and Ecosystem Indicators Report - 2008. Lake Champlain Basin Program, June 2008.







L. Johnson

mardi 22 mai 2012



# *Lake Champlain Basin Program*



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Near Appletree Bay.

Photo: B. Wood

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