



# Lake Champlain Total Maximum Daily Load (TMDL) and Restoration Plan

Public Meeting

hosted by

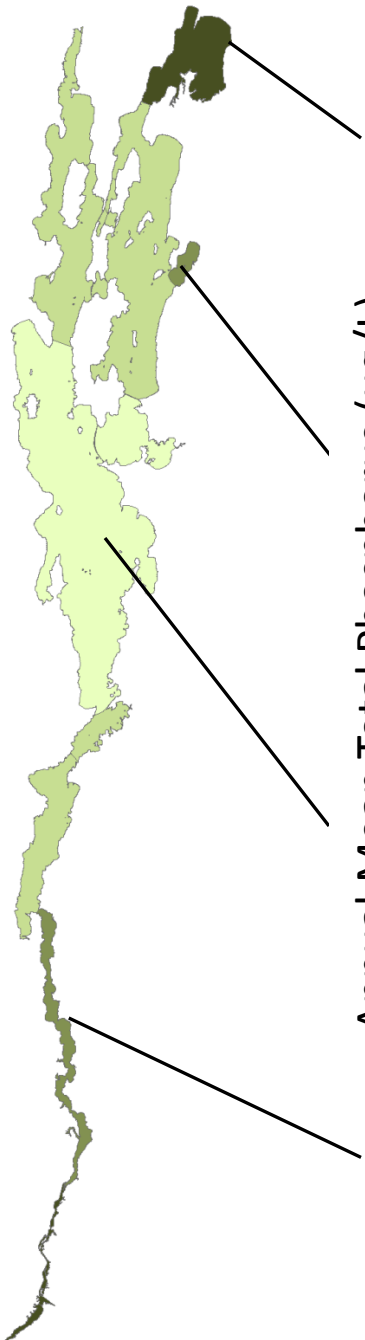
**State of Vermont**

**U.S. Environmental Protection Agency, Region 1**

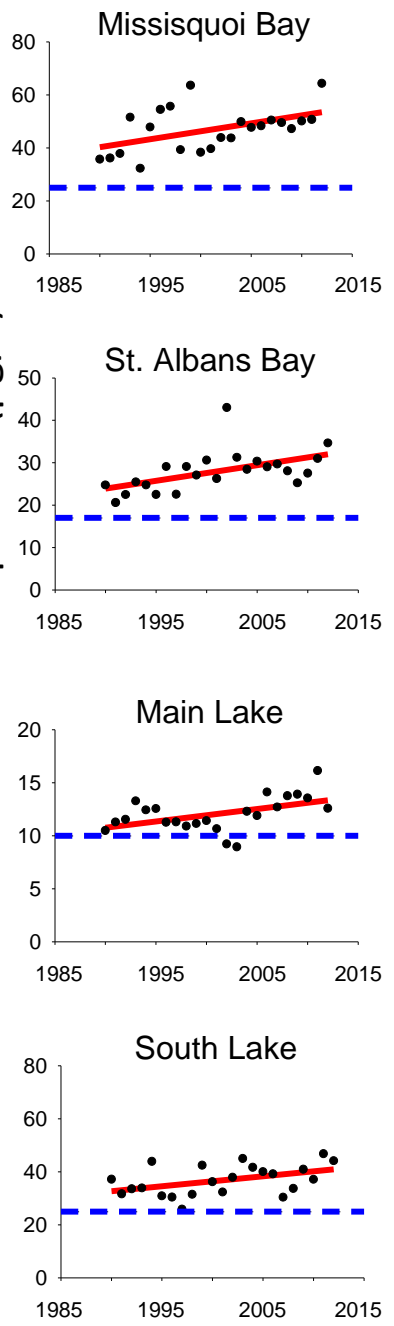
# Desired Meeting Outcomes

**Provide an understanding of the phosphorous reductions needed to restore Lake Champlain, and what the law requires us to do**

**Receive public input on Vermont's policy options being considered to achieve the reductions**



Annual Mean Total Phosphorus ( $\mu\text{g/L}$ )



— Trend line  
- - - Water quality standard

### Lessons learned from the past 20 years

Phosphorus levels in the lake are above the allowable standards.

Vermont has taken many important actions, especially in the last 10 years.

Cleaning up the lake ecosystem is complex and recovery will take time.

We need to do a lot more.

# Restoring Lake Champlain

Pollution Sources



Solutions

# Pollution Source

## Municipal Stormwater Runoff



Stormwater runoff, hitting hard surfaces and mobilizing sediments

# Investments that Work Stormwater Treatment



Green stormwater  
infrastructure, Montpelier



VTrans/VDEC constructed  
gravel wetland, St. Albans

# Pollution Source

## Road Runoff



Eroding roadside ditch



Storm-damaged gravel road

# Investments that Work

## Best Practices to Save Roads and Water Quality



Vermont Better Back Roads-funded drainage and culvert projects



# Pollution Source

## Unstable Stream Channels



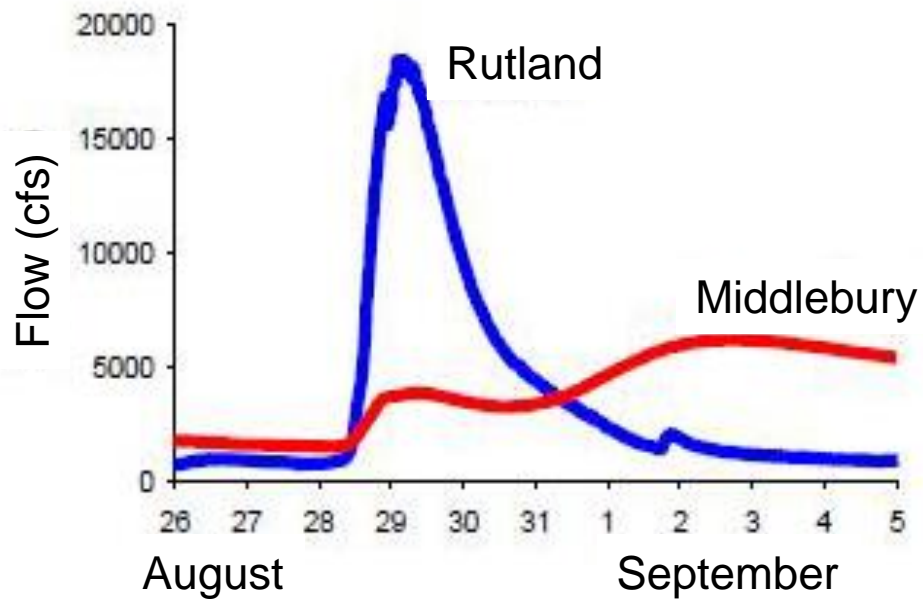
Floodplain development



Channelization

# Investments that Work

## Floodplain and River Corridor Restoration



Dampening of Irene's floodflow in the Otter Creek due to floodplain restoration & protection

Restored 200 acres of floodplain in Fairfield and Bakersfield

# Pollution Source

## Runoff from Logging Operations



Poor stream crossing at logging job



Poor management of drainage along logging road

# Investments that Work

## Sound Logging Road Practices

Temporary  
stream  
crossing  
along  
logging  
road



# Pollution Source

## Agricultural Runoff



Impacts from  
livestock access



Eroding gully

# Investments that Work

## Reducing Agricultural Runoff



Manure injection



Grassed waterway  
to prevent gullying

# Restoring Lake Champlain Basin

## Proposed Commitments

Enhance water quality rules for agriculture (Accepted Agricultural Practices, AAPs).

Develop a stormwater permit for state highways.

Develop a stormwater permit for town roads.

Require additional stormwater treatment for more densely developed areas.

Revise Vermont Stormwater Management Manual for new development.

Improve rules for managing rivers and floodplains.

Enhance water quality rules for logging (Accepted Management Practices, AMPs).

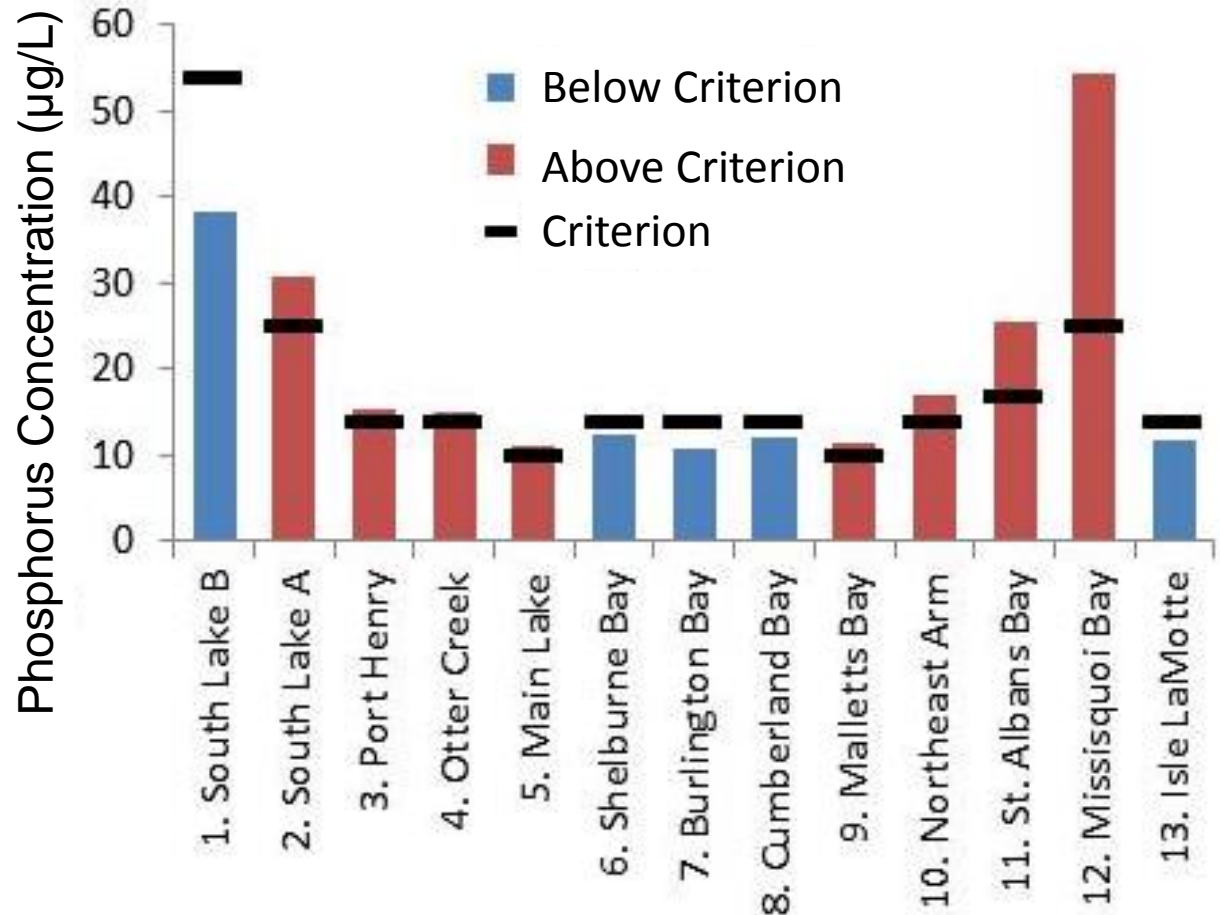
# Worst Case Scenario

Vermont does not commit to any further nonpoint source load reductions.

EPA uses authority to impose wastewater treatment to limits of technology everywhere, plus offsets.

Lake standards are not achieved in most lake areas.

Predicted phosphorus concentrations in Lake Champlain segments

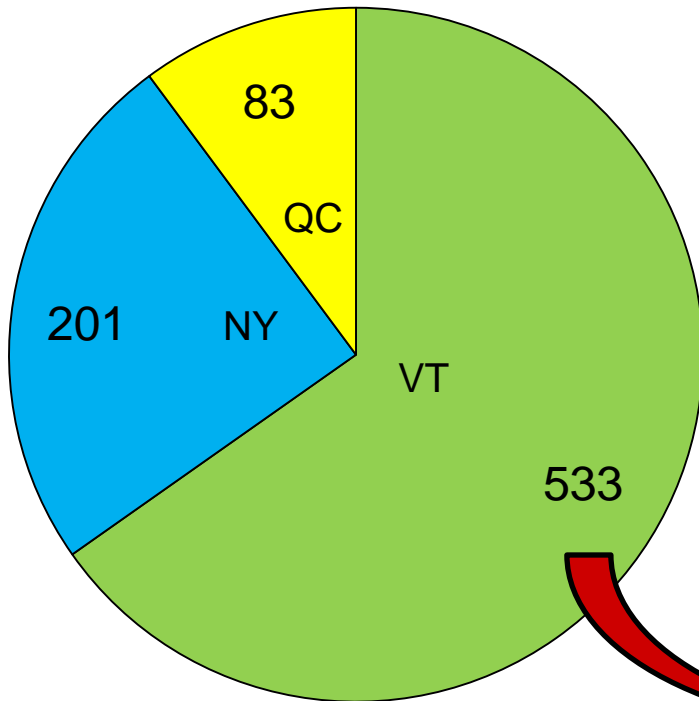




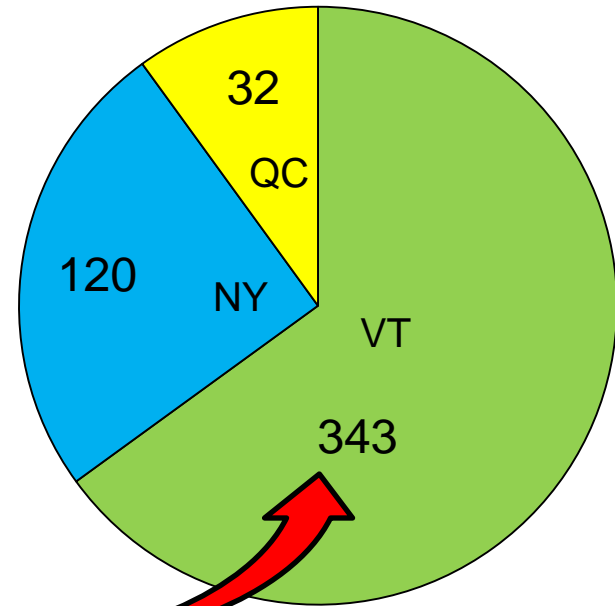
# Preliminary TMDL Results for Lake Champlain



Current (2001-2010) Load  
817 metric tons per year



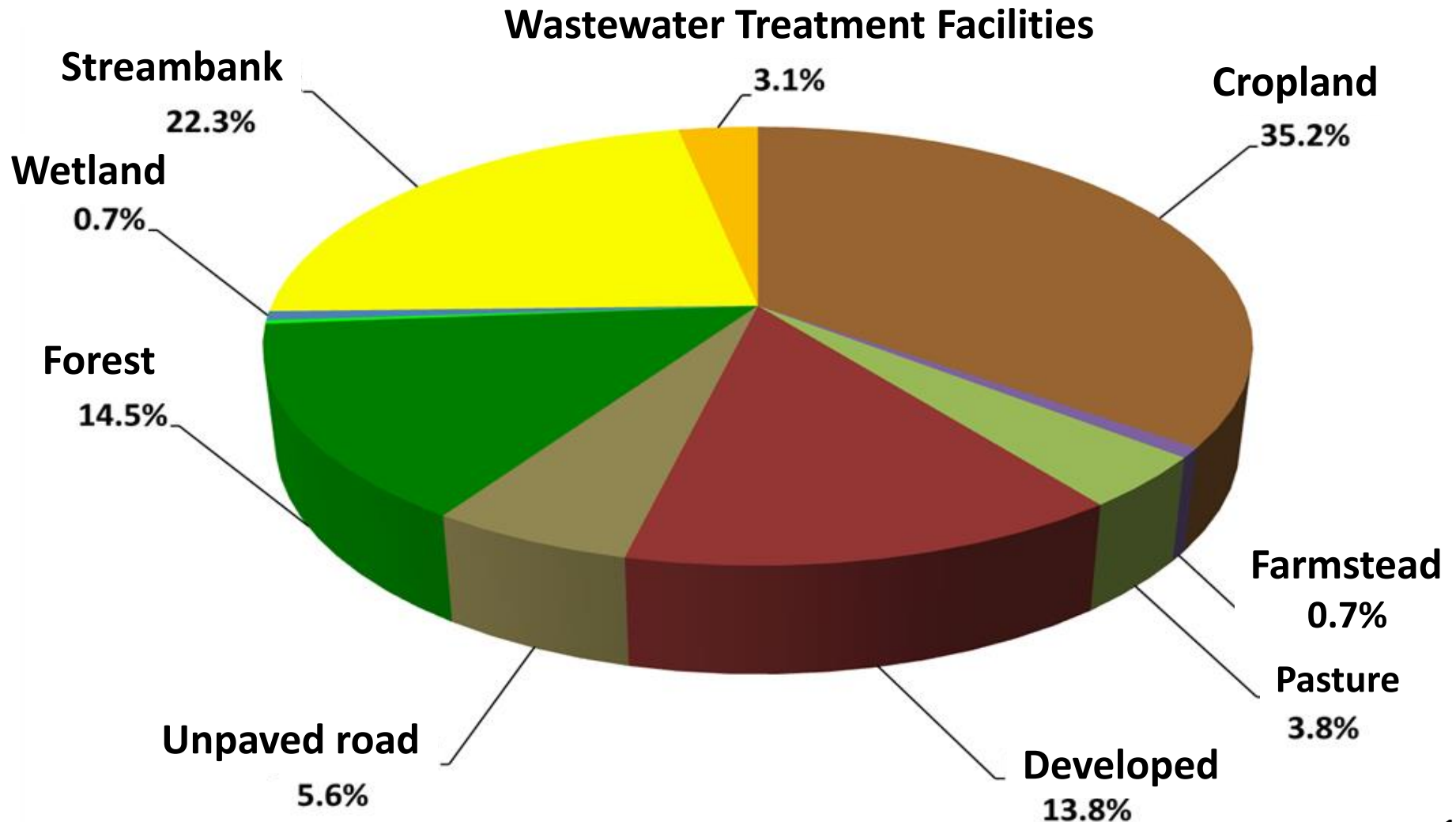
Target Load  
495 metric tons per year



Vermont Reduction Required = 190 mt/yr (36%)

# Sources of phosphorus in the Vermont portion of the Lake Champlain Basin

(from EPA – Tetra Tech, 2013)



$$\text{TMDL} = \text{WLA} + \text{LA} + \text{MOS}$$

Total Maximum Daily Load  
(Total Loading Capacity)

Wasteload Allocation  
("Point Sources")

Load Allocation  
("Nonpoint sources")

Margin of Safety

The amount of pollution the lake can receive and still meet water quality standards. Determined by data and modeling. Will be expressed at the lake segment level (e.g., Main Lake; St. Albans Bay, etc.).

Achieved by federally required permits or other regulations.

**Examples**

- Wastewater discharges
- Construction stormwater
- Municipal Separate Storm Sewer Systems (MS4s)
- Combined Sewer Overflow (CSOs)
- Concentrated Animal Feeding Operations (CAFOs)

Achieved by regulatory or non-regulatory methods. Requires "reasonable assurances."

**Examples**

- Agricultural runoff
- Unregulated stormwater
- River channel instability
- Road drainage networks
- Forest runoff

Could be a percentage (e.g., 5%) of the TMDL.

# Allowable Vermont phosphorus loads under three different scenarios (preliminary results)



# Scenario Tool to help determine needed reductions

It's important for EPA to have confidence that nonpoint source reductions can be attained

EPA developed a scenario tool to help understand potential effects of best management practices in each watershed

The tool showed that needed nonpoint source reductions can be achieved in 10 out of 12 segments with a very aggressive level of effort addressing all source sectors

- EPA is still working to identify management scenarios that will fully attain targets in South Lake B and Missisquoi Bay

EPA believes the State's draft proposed actions, with some strengthening, can achieve the load reductions needed


# Phosphorus load reductions required in Vermont lake segment watersheds

An example scenario

Lake Segment	Current Vermont Load	TMDL Target Load	Net Load Reduction Required	Percent Load Reduction Required with 5% MOS	Percent Reduction Achievable from a BMP Scenario
1. South Lake B	41.2	23.9	17.3	45%	35%
2. South Lake A	3.7	2.1	1.5	45%	58%
3. Port Henry	2.8	2.1	0.7	28%	72%
4. Otter Creek	137.1	105.5	31.6	27%	37%
5. Main Lake	143.9	104.4	39.6	31%	32%
6. Shelburne Bay	9.0	6.5	2.5	31%	38%
7. Burlington Bay	3.0	2.9	0.1	6%	9%
9. Malletts Bay	53.6	41.7	11.9	26%	38%
10. Northeast Arm	1.2	1.0	0.3	27%	44%
11. St. Albans Bay	9.3	5.4	4.0	45%	55%
12. Missisquoi Bay	124.7	44.3	80.4	66%	40%
13. Isle LaMotte	3.5	2.7	0.8	27%	57%
<b>TOTAL</b>	<b>533</b>	<b>343</b>	<b>190</b>	<b>39%</b>	

## Timeline

## Lake Champlain Restoration Plan (Phosphorus TMDL)



November 21, 2013	State releases Draft Proposal for Restoring Lake Champlain
December 2-11, 2013	EPA & State hold <b>6 public meetings</b> to discuss Draft Proposal
by January 17, 2014	State receives <b>comments from public</b> & EPA on Draft Proposal
Winter, 2014	EPA prepares the pollution load allocations (i.e., TMDL's load and wasteload allocations) , other components
Spring, 2014	State submits to EPA final Policy Commitments to meet the TMDL's reasonable assurances provision
Spring, 2014	State provides EPA a letter from the Governor & leadership of the General Assembly, supporting the Policy Commitments
Late Spring, 2014	EPA issues Draft TMDL and opens <b>public comment period</b>
Summer, 2014	EPA issues final TMDL; State begins implementation

# Questions





# Further Thoughts?

## Contacts

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## More Information

**VTDEC Restoring Lake Champlain**

**<http://www.watershedmanagement.vt.gov/erp/champlain/>**

**EPA information on Vermont Lake Champlain Phosphorus TMDL**

**<http://www.epa.gov/region1/eco/tmdl/lakechamplain.html>**

# Image Credits

## Lake Champlain

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## Question Mark

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## Lake Champlain Sunset

EPA

## All other Vermont Images

State of Vermont

# Questions for the Audience



Is there anything missing in Vermont's Proposal for a Clean Lake Champlain? How can it be improved?



What are your thoughts about how new development and redevelopment should be factored into the TMDL and Proposal for a Clean Lake Champlain?



Do you support a basin-wide approach for wastewater treatment plants or an approach where individual plants have different requirements depending on size, lake segment, etc.?

# Thank You!

