

A scenic view of Lake Champlain under a blue sky with scattered white clouds. In the foreground, a small white lighthouse with a black top stands on a rocky island. Several sailboats are visible on the water. In the background, rolling green hills are visible across the lake.

# Lake Champlain

## Total Maximum Daily Loads (TMDLs)

Public Outreach Meetings

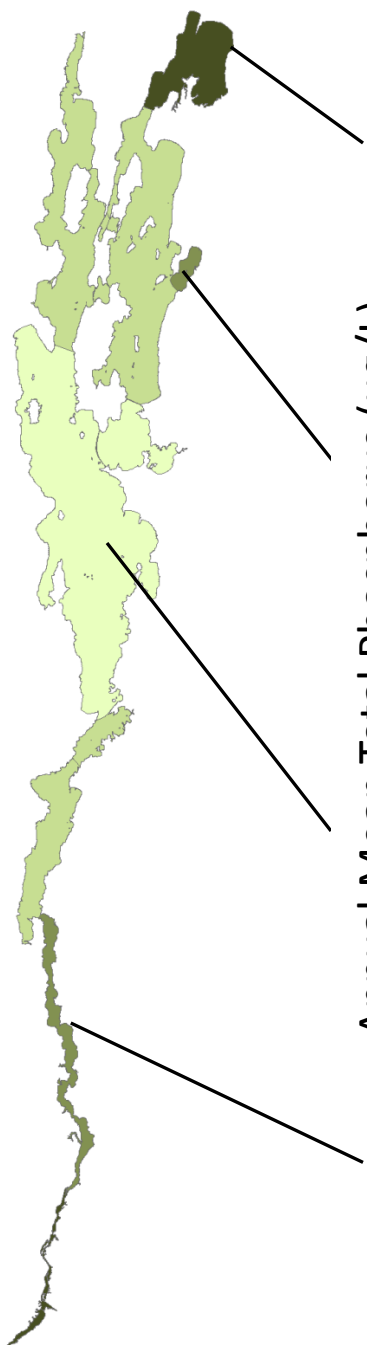
U.S. EPA Region 1  
State of Vermont  
August, 2015

# Meeting Agenda

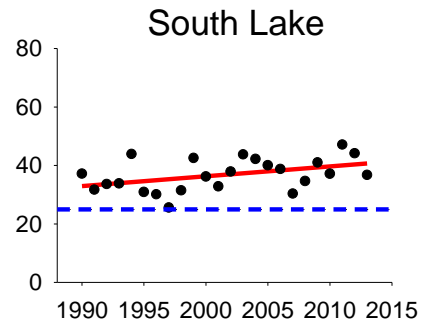
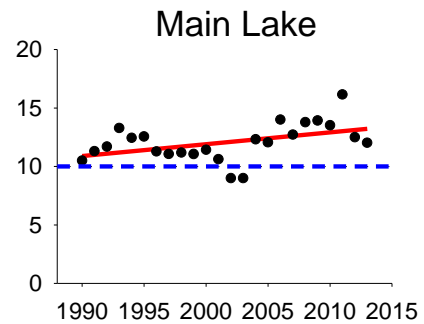
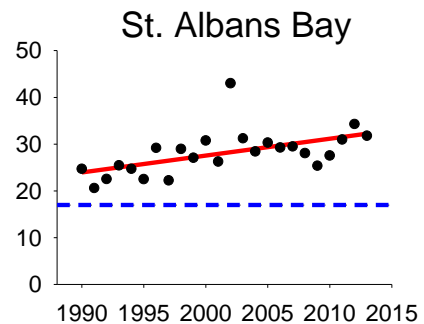
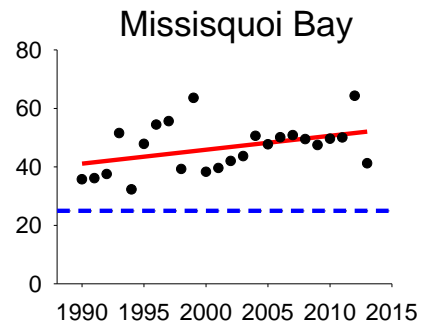
- Introduction & Background
- TMDL components
- Accountability Framework
- Overview of Act 64 and the Phase I Implementation Plan
- Questions

# Desired Outcomes

- Understanding of main elements of the revision of the TMDLs for Lake Champlain
- Understanding of Vermont's Plan to implement the TMDLs
- Understanding how you can provide formal comments on the TMDL allocations



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



## Lessons learned from the past 20 years

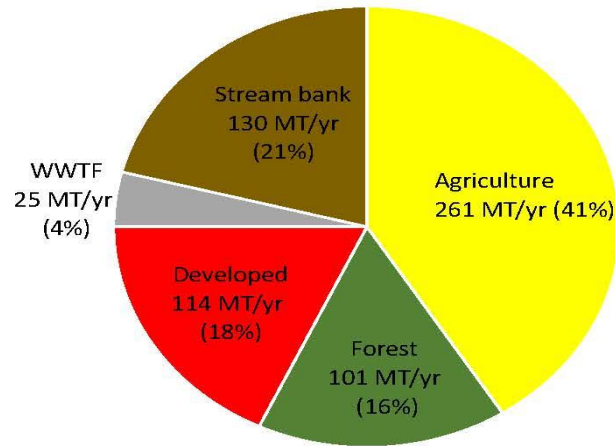
Phosphorus levels in the lake are above the allowable standards.

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

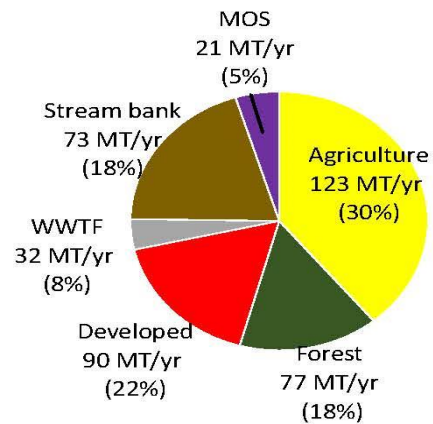
Cleaning up the lake ecosystem is complex and recovery will take time.

We need to do a lot more.

Base Load  
631 Metric Tons/year



Vermont Reduction  
Required=213 mt/yr (34%)



TMDL Loading Capacity and Allocations  
418 Metric Tons/yr




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

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).

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)
- State and local roads
- Developed land stormwater

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

**Examples**

- Agricultural runoff
- River channel instability
- Forest runoff

Accounts for uncertainty.

# Wasteload Allocation - WWTFs

- Targeted approach – reduces WWTF load allocation in segments where they make a difference
- Reductions based on size of facility
  - Over 0.2 MGD: 0.2 mg/l at design capacity
  - 0.1-0.2 MGD: 0.8 mg/l at design capacity
  - Less than 0.1 MGD: retain current permit limits

# Wasteload Allocation: Stormwater

- Aggregated within each segment
- Set % reduction for “Developed Land”
  - residential, commercial/industrial, roads
- Maximize flexibility to get reductions in most efficient way
- Includes small allocations for future growth
- Rigorous tracking and accountability



# Wasteload Allocation Summary

Lake Segment	WWTFs	Stormwater % reduction from “Developed Land”
1. South Lake B	Current permitted load	24%
2. South Lake A	Current permitted load	21%
3. Port Henry	No WWTPs	11%
4. Otter Creek	Current permitted load	22%
5. Main Lake	L = 0.2; M = 0.8; S = Current	24%
6. Shelburne Bay	L = 0.2; M = 0.8; S = Current	21%
7. Burlington Bay	L = 0.2; M = 0.8; S = Current	38%
9. Malletts Bay	Current permitted load	26%
10. Northeast Arm	No WWTPs	10%
11. St. Albans Bay	L = 0.2; M = 0.8; S = Current	22%
12. Missisquoi Bay	L = 0.2; M = 0.8; S = Current	30%
13. Isle LaMotte	Current permitted load	12%

# Load Allocation

- With Waste Load settled and portion set aside for Margin of Safety, the remainder is allocated to the nonpoint sources
- Comprised of runoff from Agriculture and Forests lands and loads from unstable stream corridors
- Used lake model to determine reduction needed in each segment to attain standards everywhere
- Each lake segment interacts with one or more other segments

# Credited Nonpoint Source Programs

The model simulates the following:

- Agricultural BMPs such as cover crops, conservation tillage, ditch buffers, riparian buffers, gully stabilization, livestock exclusion, barnyard management
- Enhanced forest management practices for logging roads and water crossings
- Stream channel stabilization through actions that aid attainment of natural equilibrium conditions, such as re-establishing floodplain access

# Load Allocation (% reduction)

Lake Segment	Forests	Stream corridors	Agriculture
1. South Lake B	60.0%	30.5%	60.7%
2. South Lake A	5.0%		60.2%
3. Port Henry	5.0%		21.1%
4. Otter Creek	5.0%	40.1%	47.9%
5. Main Lake	5.0%	28.9%	49.1%
6. Shelburne Bay	5.0%	55.0%	22.2%
7. Burlington Bay	0.0%		0.0%
9. Malletts Bay	5.0%	44.9%	27.6%
10. Northeast Arm	5.0%		22.0%
11. St. Albans Bay	5.0%	55.0%	35.4%
12. Missisquoi Bay	60.0%	65.3%	82.6%
13. Isle LaMotte	5.0%		22.3%

# Margin of Safety

- Accounts for the uncertainty about pollutant loadings and waterbody response
- Leaves a portion of the assimilative capacity unallocated
- EPA has included an explicit 5% margin of safety



# TMDL Equation (metric tons)

Lake Segment	TMDL =	WLA	+ LA	+ MOS
1. South Lake B	28.90	8.78	18.68	1.45
2. South Lake A	12.52	2.18	9.72	0.63
3. Port Henry	5.91	0.62	5.00	0.30
4. Otter Creek	105.87	28.56	72.02	5.29
5. Main Lake	127.64	38.48	82.77	6.38
6. Shelburne Bay	8.90	3.68	4.78	0.45
7. Burlington Bay	3.16	2.97	0.03	0.16
9. Malletts Bay	46.46	16.88	27.26	2.32
10. Northeast Arm	15.50	3.68	11.05	0.78
11. St. Albans Bay	10.55	3.56	6.46	0.53
12. Missisquoi Bay	48.64	14.87	31.34	2.43
13. Isle LaMotte	3.59	0.91	2.50	0.18
Total	417.64	125.16	271.60	20.88

# TMDL Equation (reduction requirements)

Lake Segment	WWTF	Developed Land	Ag Prod Area	Forest	Streams	Ag	Total Overall
1. South Lake B	0.0%	23.7%	80.0%	60.0%	30.5%	59.5%	43.4%
2. South Lake A	0.0%	21.0%	80.0%	5.0%		59.5%	52.7%
3. Port Henry		10.6%	80.0%	5.0%		20.0%	15.8%
4. Otter Creek	0.0%	22.2%	80.0%	5.0%	40.1%	46.9%	24.7%
5. Main Lake	61.1%	23.8%	80.0%	5.0%	28.9%	46.9%	21.3%
6. Shelburne Bay	64.1%	21.3%	80.0%	5.0%	55.0%	20.0%	12.5%
7. Burlington Bay	66.7%	38.1%	0.0%	0.0%		0.0%	30.5%
9. Malletts Bay	0.0%	26.3%	80.0%	5.0%	44.9%	23.9%	17.6%
10. NE Arm		9.8%	80.0%	5.0%		20.0%	13.0%
11. St. Albans Bay	59.4%	9.8%	80.0%	5.0%	55.0%	34.3%	24.3%
12. Missisquoi Bay	51.9%	30.1%	80.0%	60.0%	65.3%	82.8%	64.3%
13. Isle LaMotte	0.0%	12.0%	80.0%	5.0%		20.0%	12.4%
Total	42.1%	24.1%	80.0%	23.4%	43.4%	51.5%	33.8%

# Accountability Framework: 2015-17

- Intended to ensure that commitments made in VT's Phase I Plan are carried out
- Primary focus on major milestones related to putting major programs and permits in place
- Secondary focus on implementation and enforcement of programs already in place
- Interim report card by end of 2016, determination made at end of 2017

# Accountability Framework Post 2017

- Watershed specific
- Keyed to Implementation Table in five year Phase II plans
- Mid-point check-in at 2.5 years
- Major evaluation and determination as next five year plan developed
- Consequences could be tailored for watershed or applied broadly if systemic problems

# Reasonable Assurance

Rests on three legs:

- Very detailed Vermont implementation backed up by Act 64
- Model built specifically to evaluate these kind of measures
- Accountability Framework as backstop



# Public Comment Period

TMDL document and supporting materials available at EPA Region 1 website.

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

EPA taking public comment on TMDL through September 15<sup>th</sup>

Send comments to: [perkins.stephen@epa.gov](mailto:perkins.stephen@epa.gov)

# Act 64: the Vermont Clean Water Act

- Addresses:
  - Stormwater Runoff Management
  - Road-related Stormwater Management
  - Agricultural Water Quality
  - Increased Fees & New Positions
  - Clean Water Fund

# The Vermont Lake Champlain Phosphorus Phase 1 Plan

- Incorporates Act 64 elements
- Includes Natural Resource Restoration and Management (rivers, wetlands, forests)
- Describes Basin Planning as “Phase 2” to support implementation
- Supports the new “Vermont Clean Water Initiative”

Phase I Plan Program Areas
Agricultural Programs
Stormwater Management
Rivers Management
Wetlands Management
Lakes Management
Forest Management

# Stormwater Management Requirements

- Addresses discharges of stormwater from impervious surface of 3 or more acres that were:
  - Unpermitted or
  - Permitted prior to 2002 stormwater manual.
- Requires ANR to adopt a general permit by Jan. 2018
- Requires ANR to develop a schedule to require:
  - Retrofits in the Champlain Basin no later than 2023
  - Retrofits in the rest of the State no later than 2028



# Stormwater Management - Roads

- New general permit to be issued by Dec, 2017
- Elements of the General Permit:
  - A schedule for each municipality to:
    - Inventory roads
    - Prioritize projects
    - Implement needed fixes
  - Criteria and technical standards for implementation
- “TS4” permit for State Roads





## VTrans' Role in Partnering with Municipalities – Providing Educational, Technical, and Financial Assistance



Key factors in identifying and prioritizing projects:

- The area of concern is near a stream or other surface water
- Sediment from the road is reaching surface water
- Degree of impact (function of topography, road condition, and length of ditch runs)

# Agricultural Water Quality

- Accepted Agricultural Practices (AAPs), to be referred to as “required agricultural practices (RAPs), are to be revised by July 1, 2006
- “Small farms” are to be defined by July 2016
- Small farms are to be certified for RAP compliance annually after 2017





## Revisions to RAPs:

- Reduces the “tolerable soil loss” from field erosion
- Increases restrictions on manure stacking near water
- Increases nutrient management planning on ALL farms, including small farms

Reduce erosion rates in half



## Revisions to RAPs (continued):

- Increases vegetative buffer standard for:
  - Surface waters – 25 feet
  - Ditches – 10 feet
- Require standards for:
  - Livestock exclusion from waterways
  - Soil conservation such as cover cropping in critical areas
  - Tile drainage by January, 2018





## Next Steps: Vermont will:

- Update the Implementation Plan within 3 months of TMDL issuance
- Hold a 30-day public comment period
- Issue the final Phase I Plan
- Establish a method of tracking to account for activities
- Increase coordination between regional planning commissions and DEC basin plans
- Support municipalities, farmers and other sectors in project implementation using existing grant, loan programs, technical and educational assistance
- Report on the execution of the Plan



# Questions?

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

Send comments to: [perkins.Stephen@epa.gov](mailto:perkins.Stephen@epa.gov)