



Overview of the Lake Champlain TMDL and Water Quality in Vermont

*Jared Carpenter,
Lake Champlain Committee*



Vermont's economy relies heavily on tourism and people come here to enjoy the outdoors, including clean lakes and rivers.

According to the Vermont Treasurer's 2017 Clean Water Report, over \$2.5 billion is spent annually by visitors and vacation homeowners, much of that linked to our lakes and rivers. Per a UVM study, visitor spending contributed \$318 million in tax and fee revenues in 2013 and supported an estimated 30,000 Vermont jobs.

According to U.S. Bureau of Economic Analysis, in 2023, the economic value added in Vermont was:

- \$82.2 million for RVing.
- \$70.1 million in boating / fishing, and
- \$31.1 million in climbing / hiking / tent camping

During the 2024 foliage season, 2.5 million visitors invested \$500 million in our economy and that was in just a few weeks.

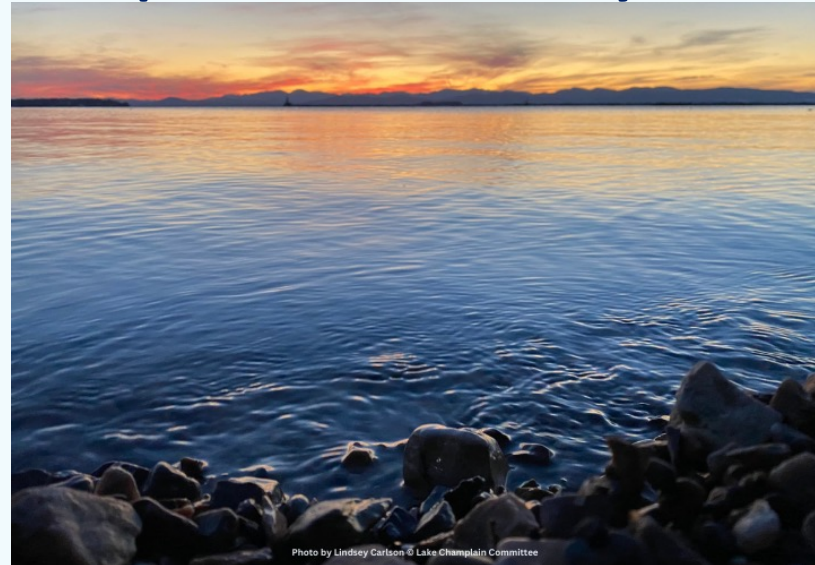




“The \$300 million estimated annual tourist expenditures in Vermont’s four main lakeside counties generate an additional \$72.75 million in spending and nearly 1,070 jobs. Extrapolating from the town-scale model, a one-meter decrease in water clarity during the months of July and August would lead to the loss of 195 full-time equivalent jobs, a \$12.6 million reduction in tourism expenditures and a total economic reduction of nearly \$16.8 million.”

Brian Voigt et al, An Assessment of the Economic Value of Clean Water in Lake Champlain, University of Vermont, Gund Institute for Ecological Economics, for the Lake Champlain Basin Program (Sept 2015).

When Vermont Water Quality Decreases, It Impacts Our Economy





Phosphorus runoff feeds Cyanobacteria blooms in Lake Champlain and other Vermont lakes and ponds.



Credit: Dawn Coster

Most think of cyano blooms being connected to just Lake Champlain, but lakes throughout Vermont are experiencing cyanobacteria blooms.



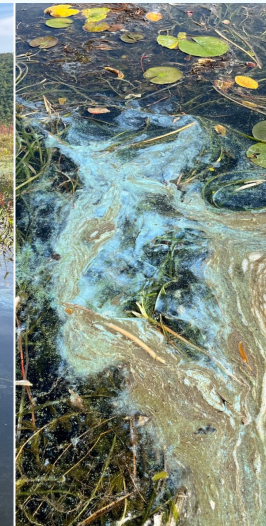
Mirror Lake, Calais, VT.



Credit: Elaine McDevitt



Bristol Pond, New Haven, VT.



Credit: Elaine McDevitt

And blooms are now seen in Vermont rivers,
not just lakes and reservoirs.



Both photos from Poultney River, Wards Marsh Wildlife Management Area Boat Launch.

Credit: Elaine McDevitt



Lake Champlain has a larger than average drainage basin relative to lake volume, meaning nutrient runoff is a bigger factor than for other large lakes.

Sources of nutrients include agriculture, developed lands, and erosion from forests and streambanks.

<https://neiwppc.org/program-partners/lcbp/>





A large watershed supplies more water to the lake and creates a greater challenge of limiting pollution that washes off the land area to the lake. In contrast, the Great Lakes are much larger than Lake Champlain in surface area and water volume, but their watershed ratio is much smaller.

Lake Champlain drainage basin to lake volume is 19:1 where larger watersheds result in higher nutrient pollution for the Lake, with 435 sq miles of surface water in a 8,234 sq mile watershed.

Winslow, Michael, A Natural and Human History of Lake Champlain, Lake Champlain Basin Program (2016). <https://www.lcbp.org/publications/natural-human-history-lake-champlain/> and

By contrast, the Lake Michigan watershed ratio is 2:1 watershed to water surface ratio, with a total area of 45,598 square miles.

(Tip of the Mitt Watershed Council, www.watershedcouncil.org)

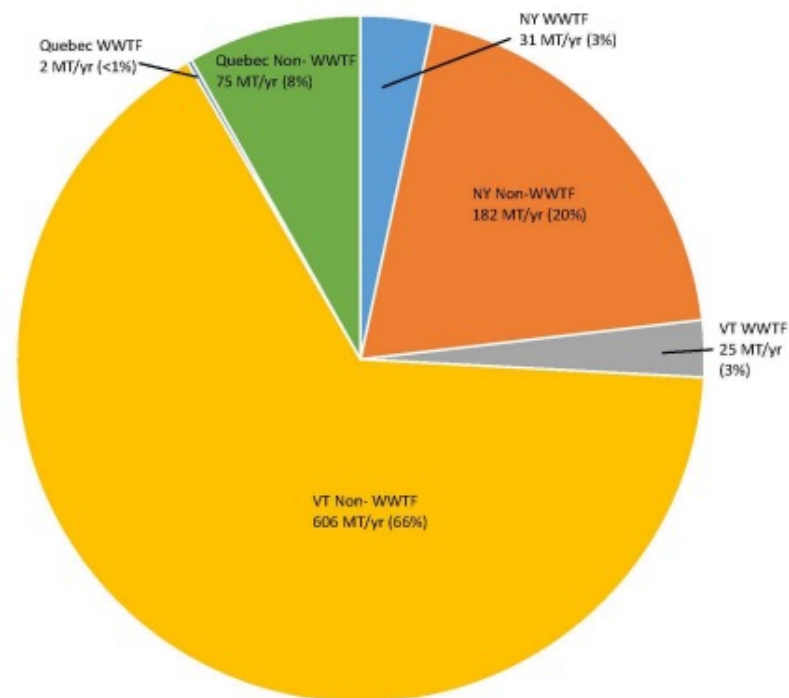


Lake Champlain Phosphorus Loading by State

Quebec WWTF 2 MT/yr
Quebec non-WWTF 75 MT/yr
Total 77 MT/yr (8% of total)

New York WWTF 31 MT/yr
New York Non-WWTF 182 MT/yr
Total 213 MT/yr (23%)

Vermont WWTF 25 MT/yr
Vermont Non-WWTF 606 MT/yr
Total 631 MT/yr (69%)



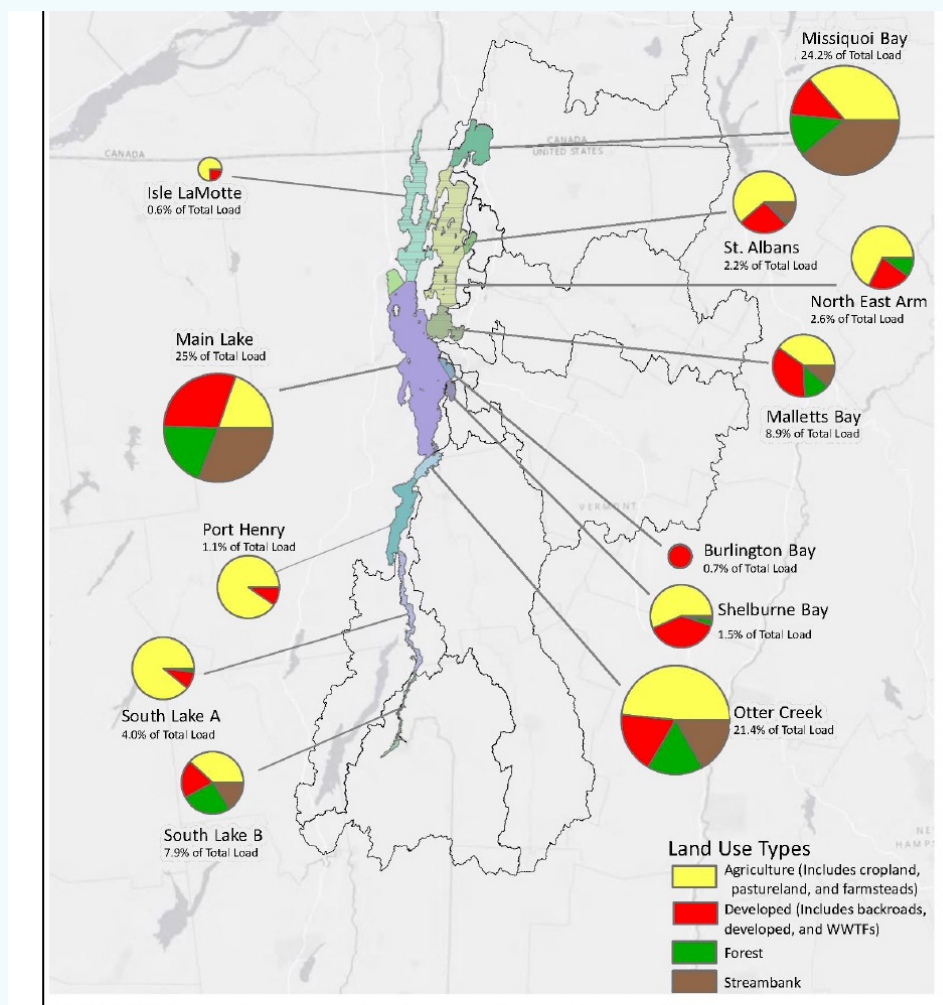
From Phosphorus TMDLs for Vermont Segments of Lake Champlain, U.S. Environmental Protection Agency (June 17, 2016) pg. 17.

Vermont Sources of Phosphorus Loading to Lake Champlain Segments, by Land Use

Yellow = Agriculture
 Red = Developed Lands
 Green = Forests
 Brown = Streams

Southern and northern-most portions of the Lake are most impacted by agriculture, but the Main Lake is more balanced in the phosphorus sources.

From Phosphorus TMDLs for Vermont Segments of Lake Champlain, U.S. Environmental Protection Agency (June 17, 2016) pg. 14.



Phosphorus Reduction Requirements in the Lake Champlain Basin

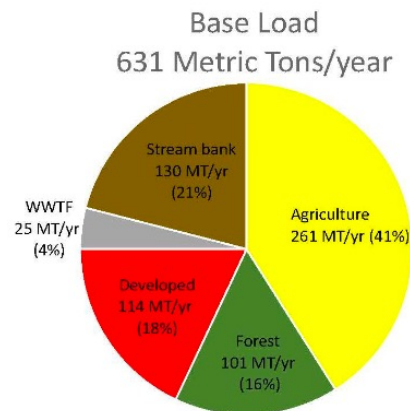
In the TMDL, the U.S. Environmental Protection Agency requires the following reductions by 2036. Any change to this formula likely requires EPA approval.

Agriculture reduction of 261 MT/yr to 118 MT/ yr (load of 41% to 28%)

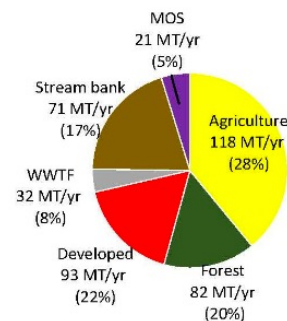
Stream Bank Erosion 130 MT/yr to 71 MT/yr. (load of 21% to 17%)

Developed Lands increases from 18% to 22%, but still a reduction from 114 MT/yr to 93 MT/yr.

From Phosphorus TMDLs for Vermont Segments of Lake Champlain, U.S. Environmental Protection Agency (June 17, 2016) pg. 48.



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



TMDL Loading Capacity and Allocations
418 Metric Tons/yr



The TMDL requires specific reductions for specific segments of Lake Champlain

Table 8. Percent reductions needed to meet TMDL allocations.

Lake Segment	Total Overall	Wastewater ¹	CSO	Developed Land ²	Agricultural Production Areas	Forest	Streams	Agricultural Nonpoint
01. South Lake B	41.4%	0.0%		21.1%	80.0%	40.0%	46.7%	62.9%
02. South Lake A	55.5%	0.0%		18.1%	80.0%	5.0%		62.9%
03. Port Henry	55.4%			7.6%	80.0%	5.0%		62.9%
04. Otter Creek	23.6%	0.0%		15.0%	80.0%	5.0%	40.1%	46.9%
05. Main Lake	20.5%	61.1%		20.2%	80.0%	5.0%	28.9%	46.9%
06. Shelburne Bay	11.6%	64.1%		20.2%	80.0%	5.0%	55.0%	20.0%
07. Burlington Bay	31.2%	66.7%	11.8%	24.2%	0.0%	0.0%		0.0%
09. Malletts Bay	17.6%	0.2%		20.5%	80.0%	5.0%	44.9%	28.6%
10. Northeast Arm	12.5%			7.2%	80.0%	5.0%		20.0%
11. St. Albans Bay	24.5%	59.4%		21.7%	80.0%	5.0%	55.0%	34.5%
12. Missisquoi Bay	64.3%	51.9%		34.2%	80.0%	50.0%	68.5%	82.8%
13. Isle La Motte	11.7%	0.0%		8.9%	80.0%	5.0%		20.0%
TOTAL	33.7%	42.1%	11.8%	20.9%	80.0%	18.7%	45.4%	53.6%

¹Percent change from current permitted loads

² Includes reductions needed to offset future growth

To accomplish this, the Vermont Legislature passed Act 64 (2015) and Act 76 (2019)



No. 64
2015

Page 1 of 135

No. 64. An act relating to improving the quality of State waters.

(H.35)

It is hereby enacted by the General Assembly of the State of Vermont:

* * * Findings and Purpose * * *

Sec. 1. FINDINGS AND PURPOSE

(a) Findings. The General Assembly finds that:

(1) Within the borders of Vermont there are 7,100 miles of rivers and streams and 812 lakes and ponds of at least five acres in size.

(2) Vermont's surface waters are vital assets that provide the citizens of the State with clean water, recreation, and economic opportunity.

Act 64, the Vermont Clean Water Act

No. 76
2019

Page 1 of 36

No. 76. An act relating to the provision of water quality services.

(S.96)

It is hereby enacted by the General Assembly of the State of Vermont:

Sec. 1. 10 V.S.A. chapter 37, subchapter 5 is amended to read:

Subchapter 5. ~~Aquatic Nuisance Control~~ Water Quality Restoration and Improvement

§ 921. DEFINITIONS

As used in this subchapter:

Act 76, the Clean Water Service Delivery Act



After almost ten years, how are we doing so far?

We are far from our 2036 targets, but some of the regulations, particularly for stormwater have not been fully implemented yet.

From Vermont Clean Water Initiative 2023 Performance Report pg. 51.

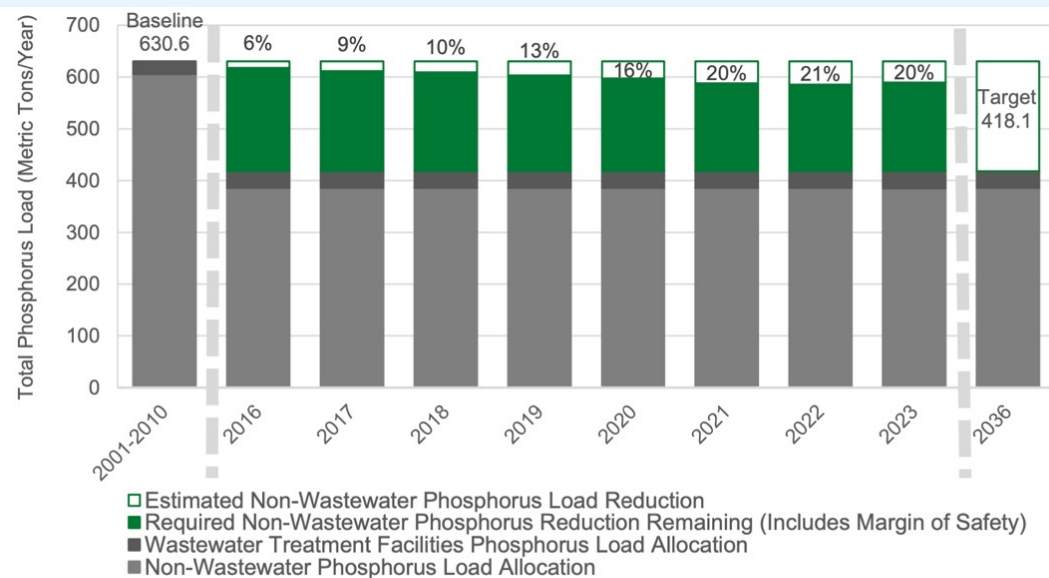
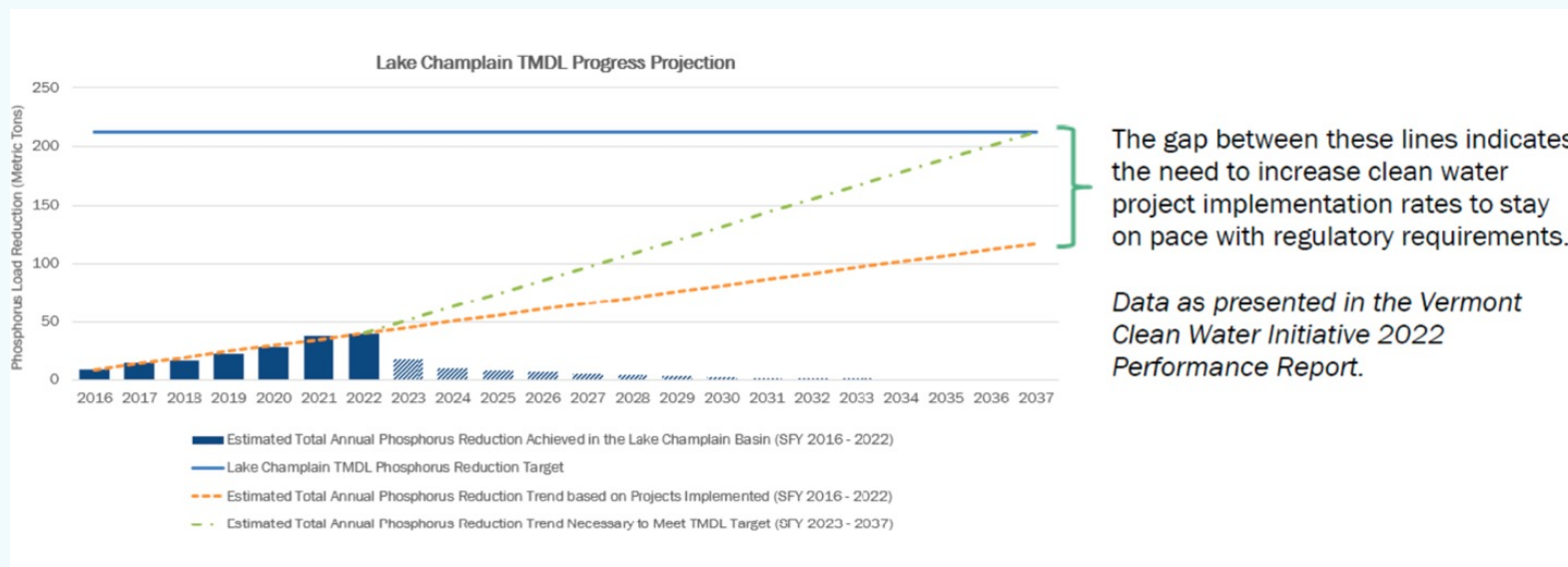


Figure 25: Estimated total phosphorus load reductions in effect during SFY 2016–2023 relative to the Lake Champlain TMDL total phosphorus baseline and target total phosphorus load in metric tons per year.



The rate of P reduction needs to increase



From Julie Moore Testimony, VT Clean Water Fund and Funding (March 14, 2024)



To do this, Vermont needs to reduce its annual discharge to waters at a faster rate.

We are in danger of missing the 2036 goals.

Vermont is required to reduce P discharge to the Lake from the baseline of 631 mt / year to 418 mt/yr (34%), a reduction of 213 mt/yr.

Phosphorus TMDLs for Vermont Segments of Lake Champlain, USEPA (June 17, 2016) pg 48.

However, at almost the halfway point, P discharge is being reduced by about 45 mt/yr, or less than one-quarter of the annual goal.

VT Clean Water Initiative 2023 Performance Report, pg 8.

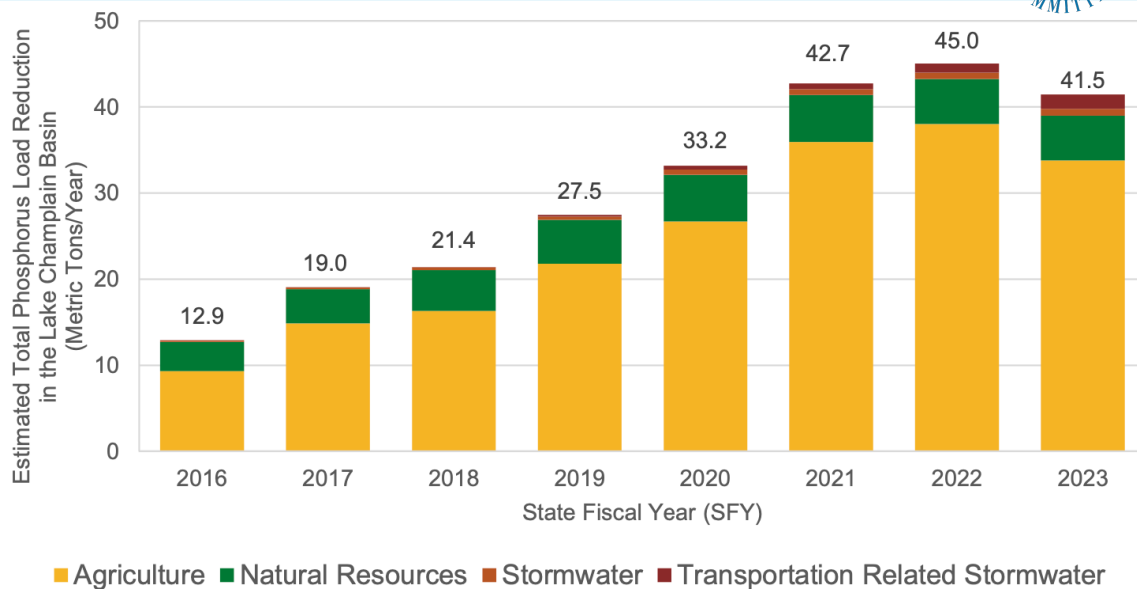


Figure 24: Annual estimated total phosphorus load reductions (metric tons per year) associated with projects implemented through state and federal funding and regulatory programs in the Lake Champlain basin in effect during SFY 2016–2023 by land use sector.⁴⁷



Vermont Clean Water Fund (10 V.S.A. §1388)

§ 1388. Clean Water Fund

(a) There is created a special fund to be known as the Clean Water Fund to be administered by the Secretary of Administration. The Fund shall consist of:

(1) revenues from the Property Transfer Tax surcharge established under 32 V.S.A. § 9602a;

(2) other gifts, donations, and impact fees received from any source, public or private, dedicated for deposit into the Fund and approved by the Secretary of Administration;

(3) the unclaimed beverage container deposits (escheats) remitted to the State under chapter 53 of this title;

(4) six percent of the revenues from the meals and rooms taxes imposed under 32 V.S.A. chapter 225; and

(5) other revenues dedicated for deposit into the Fund by the General Assembly.

(b) Notwithstanding any contrary provisions of 32 V.S.A. chapter 7, subchapter 5, unexpended balances and any earnings shall remain in the Fund from year to year. (Added 2015, No. 64, § 37, eff. June 16, 2015; amended 2017, No. 208 (Adj. Sess.), § 4b, eff. May 30, 2018; 2019, No. 76, § 3a, eff. Oct. 1, 2019.)

Clean Water Fund Revenue Sources



Clean Water Fund Operating Statement - Appropriation Basis - December 2024

	Actual	July 2022 Rev. update	Jan 2023 Rev. Update	July 2023 Rev. Update / Draft Budget	Jan 2024 Rev. Update / Gov Rec Budget	Jul 2024 Rev. Update / As Passed	July 2023 Rev. Update	Jan 2024 Rev. Update	Jul 2024 Rev. Update / Draft CWB	Jul 2024 Rev. Update
Revenue	FY2024	FY 2025	FY 2025	FY 2025	FY 2025	FY 2025	FY 2026	FY 2026	FY 2026	FY 2027
Clean Water Surcharge (PTT)	8,145,774	8,300,000	8,800,000	7,340,000	7,240,000	8,510,000	7,500,000	7,350,000	8,680,000	8,950,000
Interest Income	2,583,435	-	-			1,000,000			500,000	
Reversions	100,000	-	-							
Donations	-	-	-							
Escheats	3,384,163	2,810,630	2,985,808	3,507,887	3,507,887	3,495,688	3,492,328	3,492,328	3,476,062	3,451,971
Meals and Rooms Tax	14,769,082	14,382,000	14,556,000	14,928,000	14,748,000	15,762,000	15,396,000	15,258,000	16,326,000	16,818,000
Subtotal Sources	28,982,454	25,492,630	26,341,808	25,775,887	25,495,887	28,767,688	26,388,328	26,100,328	28,982,062	29,219,971

Clean Water Fund FY24

PTT Clean Water Surcharge	\$8.14 million
Escheats	\$3.38 million
Meals and Rooms Tax	\$14.76 million

Proposed FY26 Clean Water Budget

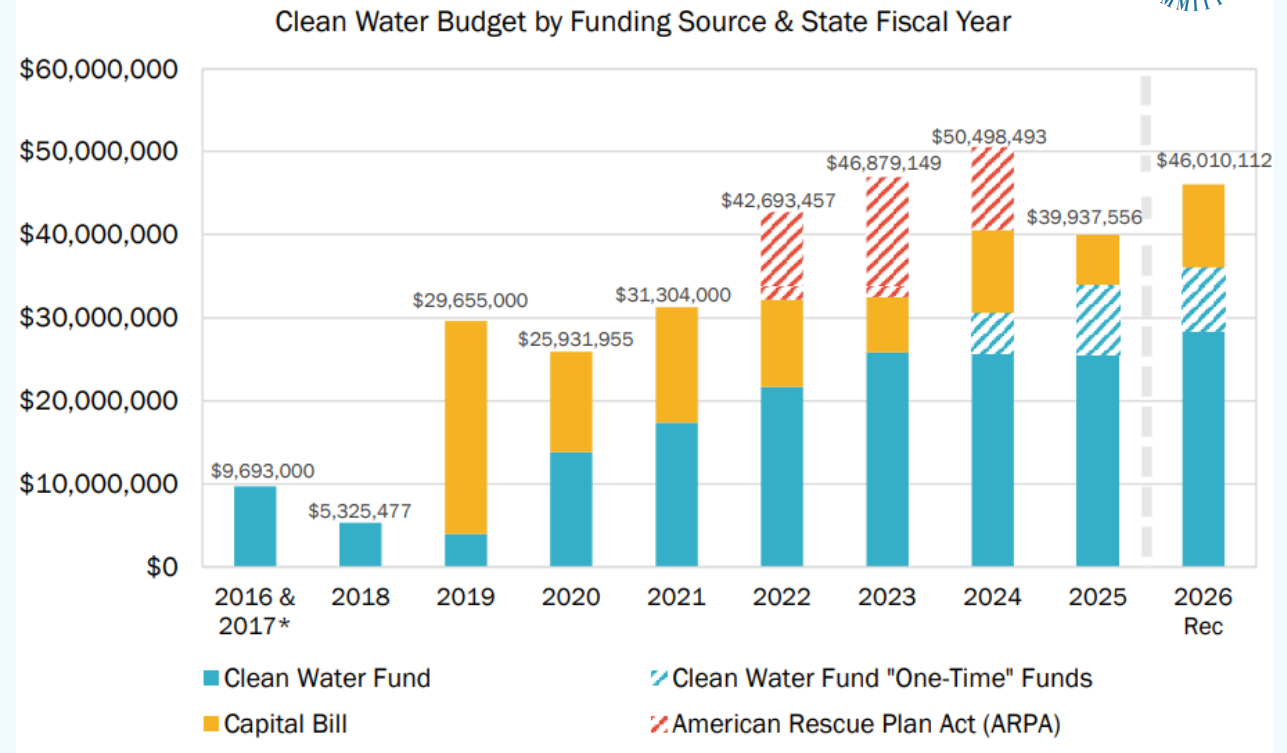
State Revenue (Clean Water Fund)	
PTT	\$8,680,000 (31% of CWF)
Escheats	\$3,476,062 (12%)
M&R Tax	\$16,326,000 (57%)
State Revenue Total	\$28,482,062
Capital Funds	\$10,000,000
One Time Funds	\$7,528,050
Total	\$46,010,112

Vermont’s goal is to maintain the Clean Water Budget at \$50 to \$60 Million (10 V.S.A. §1387):

“the State should commit to funding the Clean Water Initiative in a manner that ensures the maintenance of effort and that provides an annual appropriation for clean water programs in a range of \$50 million to \$60 million as adjusted for inflation.”



Clean Water Budget by Funding Source and State Fiscal Year





Proposed Repeal of Sunset of the PTT Clean Water Surcharge

[Section 9602a effective until July 1, 2027; see also section 9602a effective July 1, 2027 and repealed effective July 1, 2039 set out below.]

§ 9602a. Clean water surcharge

There shall be a surcharge of 0.22 percent on the value of property subject to the property transfer tax under section 9602 of this title, except that there shall be no surcharge on the first \$200,000.00 in value of property to be used for the principal residence of the transferee or the first \$250,000.00 in value of property transferred if the purchaser obtains a purchase money mortgage funded in part with a homeland grant through the Vermont Housing and Conservation Trust Fund or that the Vermont Housing and Finance Agency or U.S. Department of Agriculture and Rural Development has committed to make or purchase. The surcharge shall be in addition to any tax assessed under section 9602 of this title. The surcharge assessed under this section shall be paid, collected, and enforced under this chapter in the same manner as the tax assessed under section 9602 of this title. The Commissioner shall deposit the surcharge collected under this section in the Clean Water Fund under 10 V.S.A. § 1388, except for the first \$1,000,000.00 of revenue generated by the surcharge, which shall be deposited in the Vermont Housing and Conservation Trust Fund created in 10 V.S.A. § 312. (Added 2015, No. 64, § 38, eff. June 16, 2015; amended 2017, No. 85, § 1.9; 2017, No. 85, § 1.10, eff. July 1, 2027; repealed on July 1, 2039 by 2017, No. 85, § 1.11(a)(5).)



The PTT is an integral part of the Clean Water Fund

Estimates based on July 2024 projections

FY19	\$4.99 million
FY20	\$4.97
FY21	\$8.32
FY22	\$12.09
FY23	\$9.19
FY24	\$8.14
<i>FY25</i>	<i>\$8.51</i>
<i>FY26</i>	<i>\$8.68</i>
<i>FY27</i>	<i>\$8.95</i>

Proposed FY26 Clean Water Budget

State Revenue (Clean Water Fund)	
PTT	\$8,680,000 (31% of CWF)
Escheats	\$3,476,062 (12%)
M&R Tax	\$16,326,000 (57%)
Clean Water Fund Total	\$28,482,062
Capital Funds	\$10,000,000
One Time Funds	\$7,528,050
Total	\$46,010,112



Increased Salinity as a Threat to Vermont Infrastructure and Water Quality

Sodium Chloride (road salt) is used for public safety on roads and sidewalks, but it leaches into surface and groundwater. This harms:

Infrastructure including roads, bridges and drinking water systems.

Aquatic biota due to acute and chronic spikes of salinity in lakes and rivers.

Matthew Vaughn PPT, Vermont Citizens Advisory Committee, Long-term chloride trends for Lake Champlain and its Tributaries (Feb. 12, 2024).

