

Overview/Agenda

- Nutrient pollution in Vermont's major watersheds
- Approach (and funding) for addressing nutrient pollution
- Accomplishments (*Clean Water Investment Report*)



Nutrient Pollution Impairs Rivers, Lakes and Streams

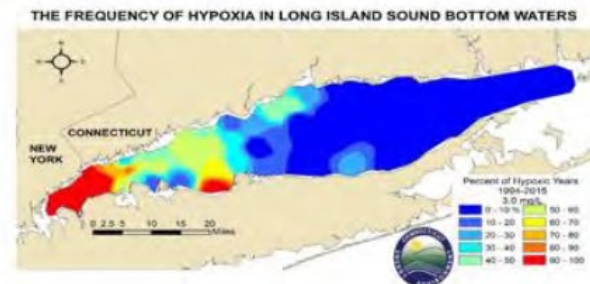
**Phosphorus TMDLs for
Vermont Segments of
Lake Champlain**



**Lake Memphremagog
Phosphorus TMDL**

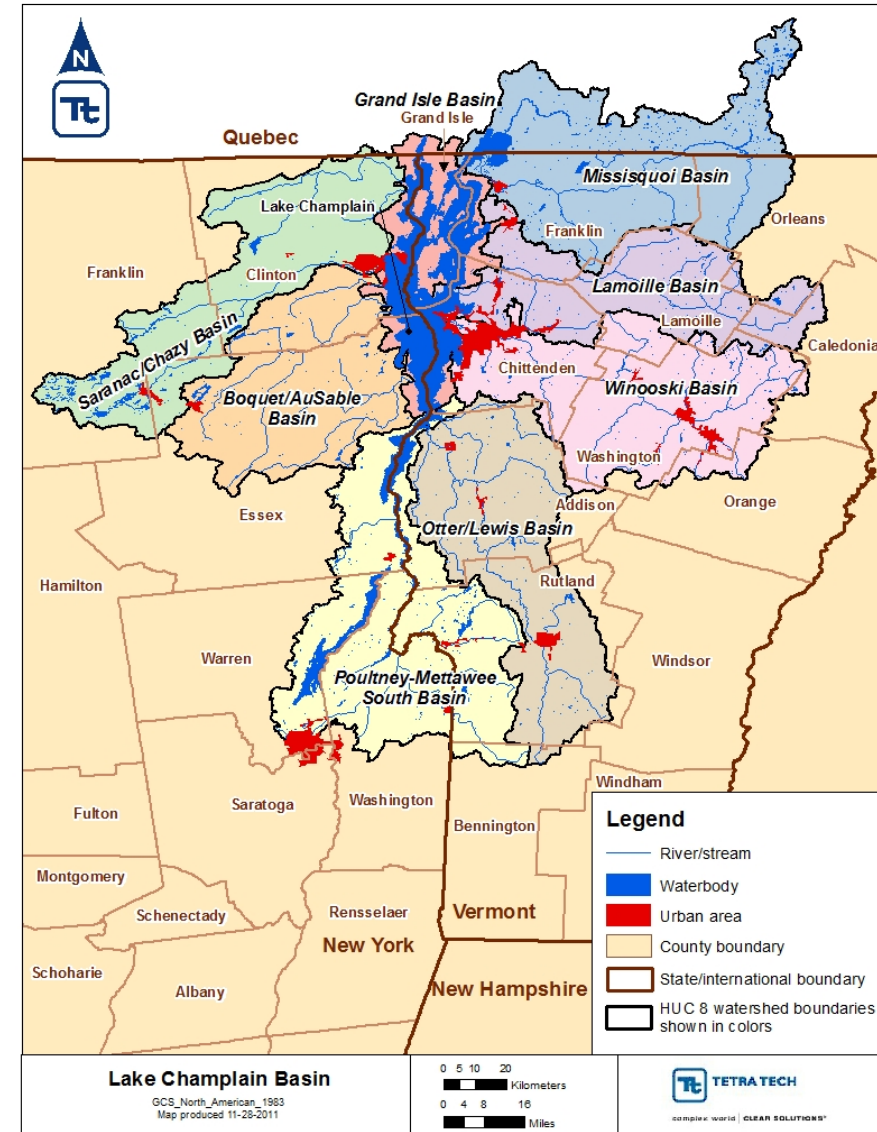


**Nitrogen TMDL for
Dissolved Oxygen in Long
Island Sound**

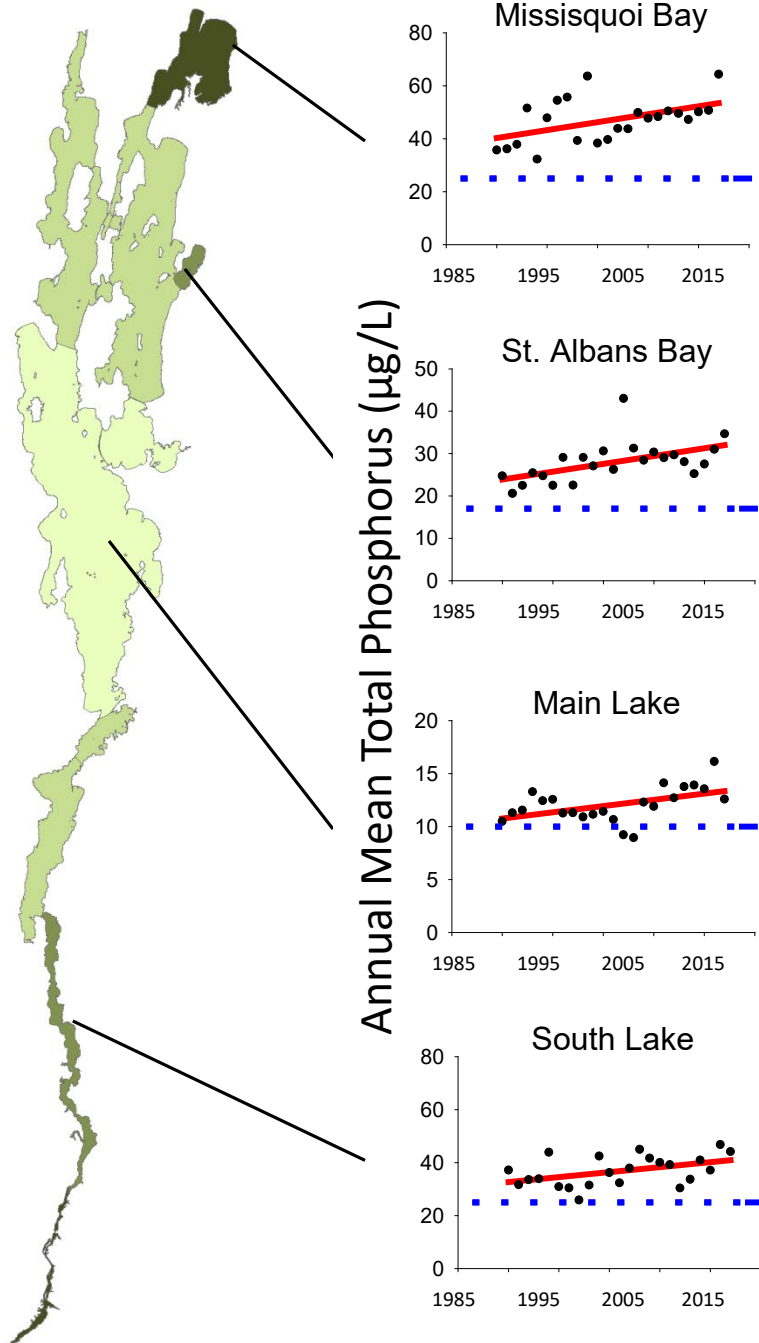


Lake Champlain Statistics

- 8,234 square mile watershed
 - 56% (VT); 37% (NY); 7% (Quebec)
 - Drains nearly half the land area of Vermont
- 120 miles long
- Surface area of 435 square miles
- Maximum depth of 400 feet
- 6th largest (natural) lake in the US
- Drinking water source for 200,000 people
- Residents:
 - 571,000 in total; 390,000 in Vermont
 - More than 100,000 dairy cows



Trends in Lake Champlain Phosphorus Concentrations



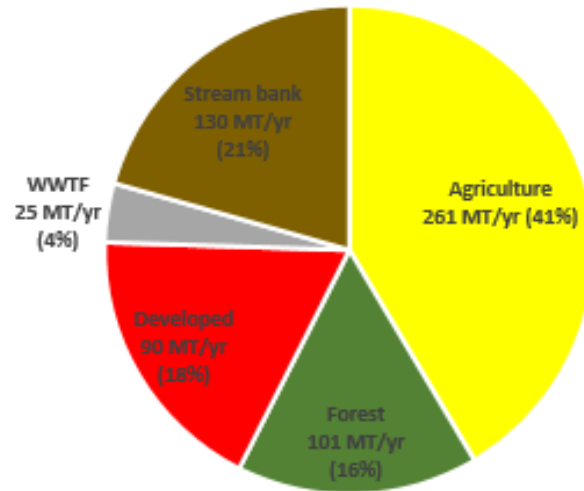
— Trend line
- - - Water quality standard

Phosphorus levels in the lake are above the allowable standards

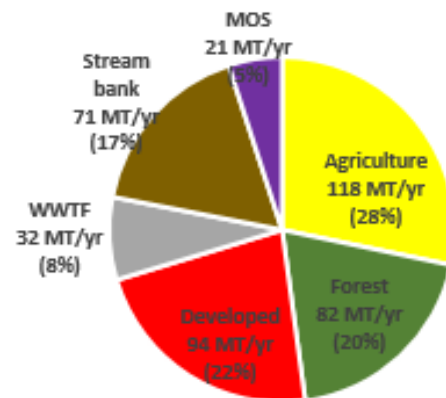
Vermont has taken many important actions, especially in the last 10 years, but much remains to be done

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

Base Load
631 Metric Tons/Year



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



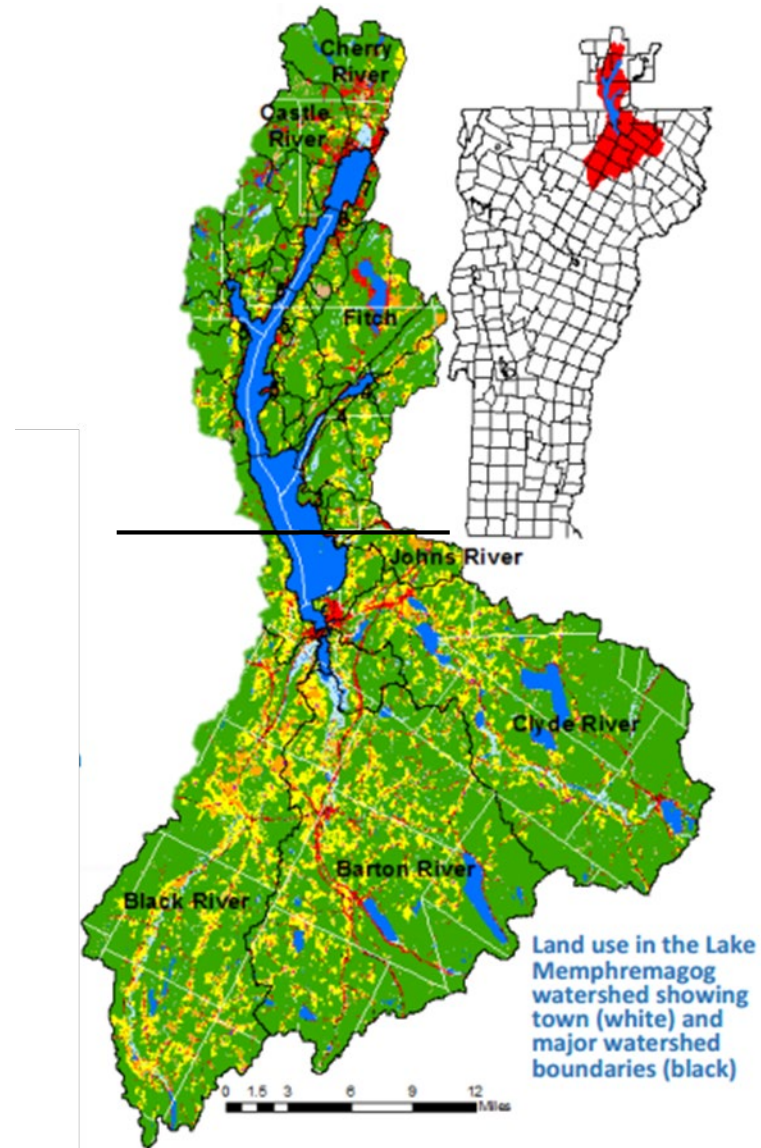
TMDL Loading Capacity and Allocations
418 Metric Tons/yr

34% phosphorus
reduction over
20 years in Lake
Champlain

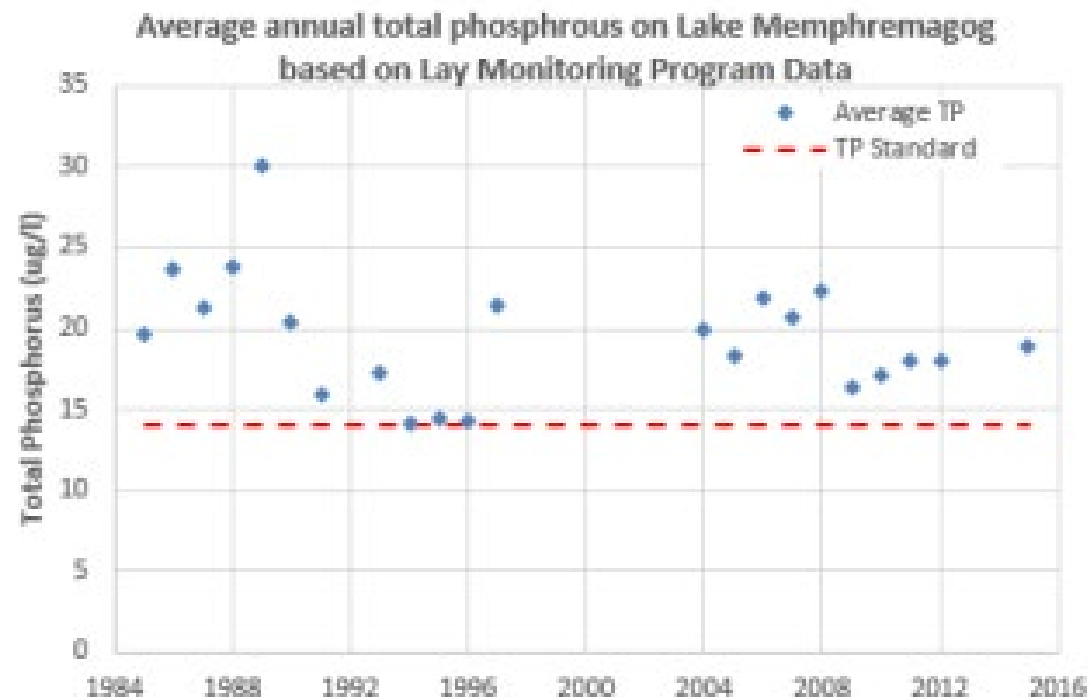


Lake Memphremagog Statistics

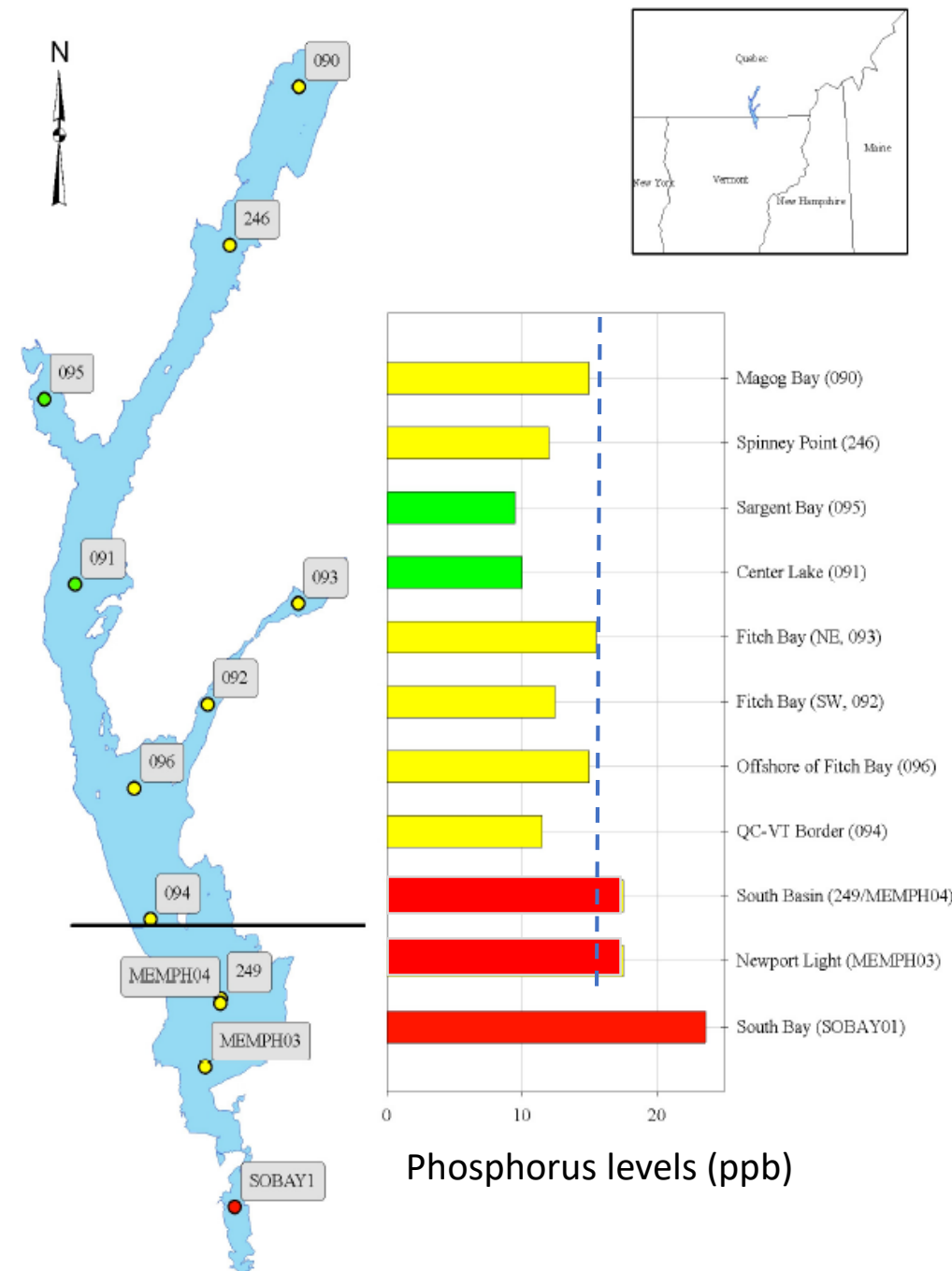
- 687 square mile watershed
 - 71% (VT); 29% (Quebec)
 - Nearly $\frac{3}{4}$ of the surface area of the Lake is in Quebec
- 31 miles long
- Maximum depth of 350 feet
 - 3rd deepest lake in Vermont
- Drinking water source for 200,000 people, mostly in Quebec

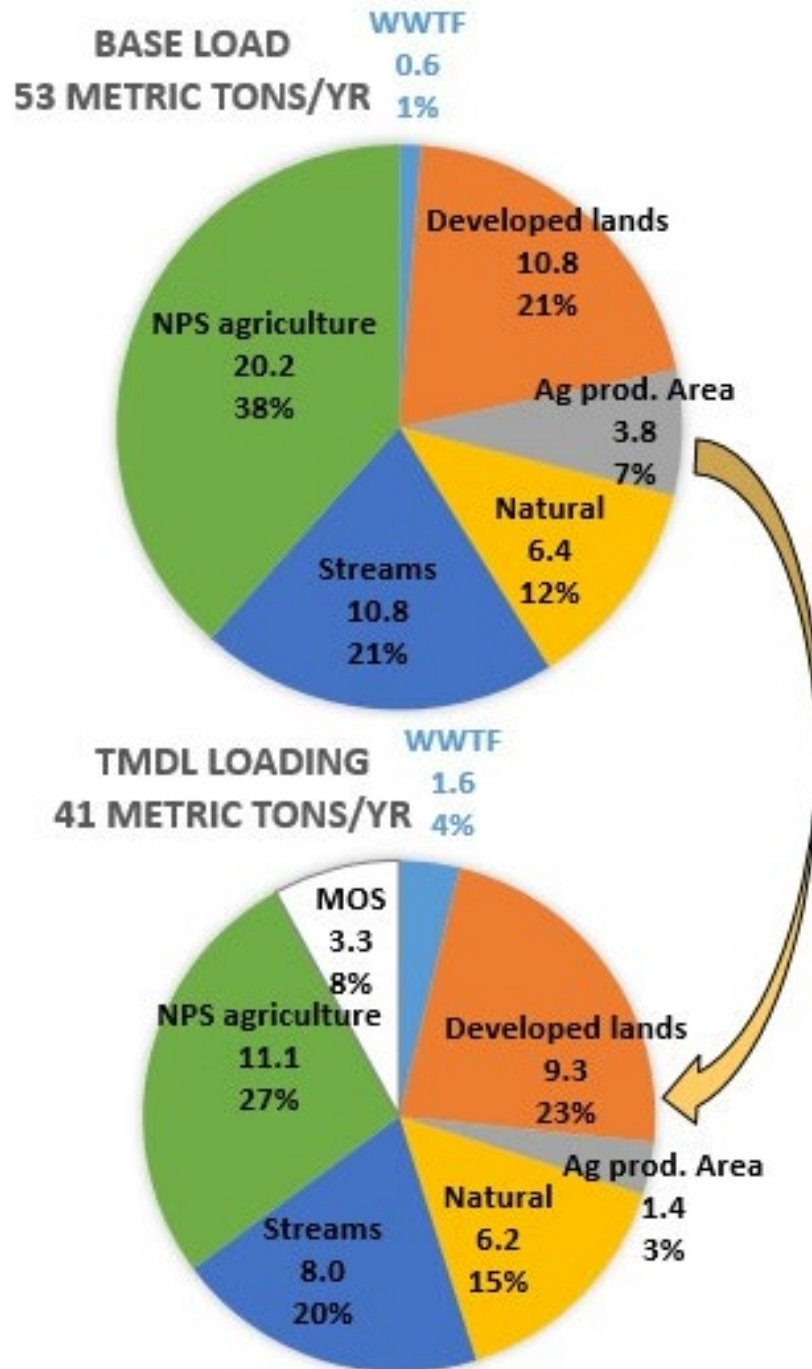


Phosphorus Loading to Lake Memphremagog



Land use	Percent of VT watershed
Developed	6%
Agricultural	17%
Forest/Wetland	77%



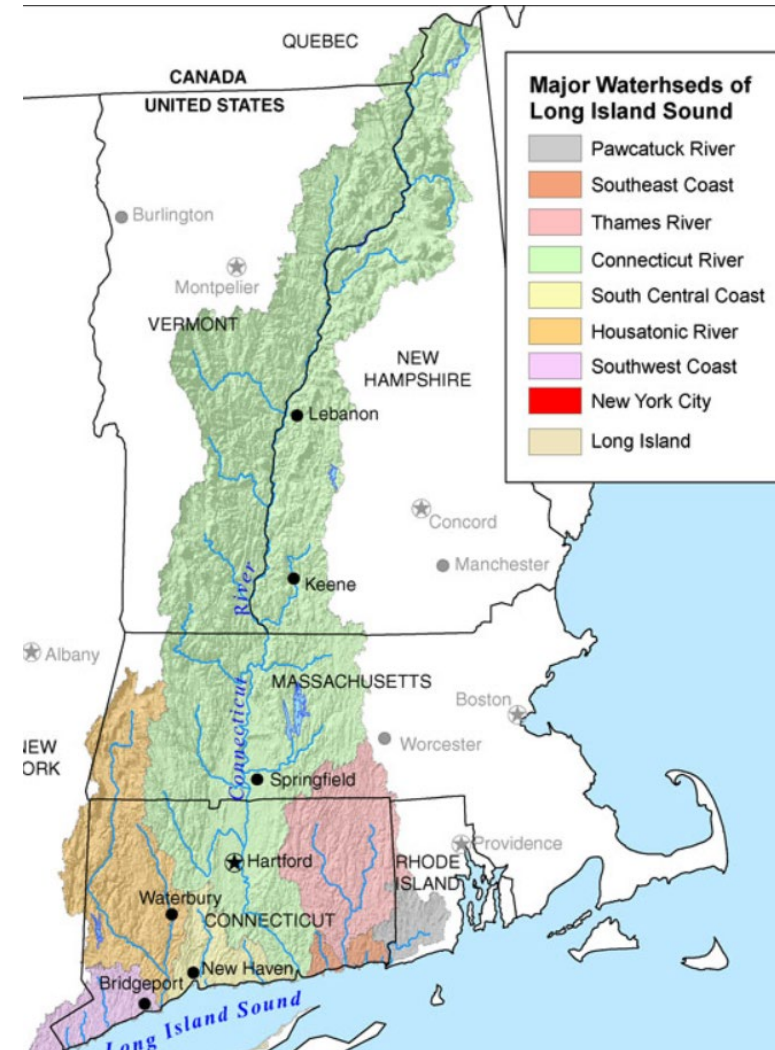


29% phosphorus
reduction
needed in Lake
Memphremagog

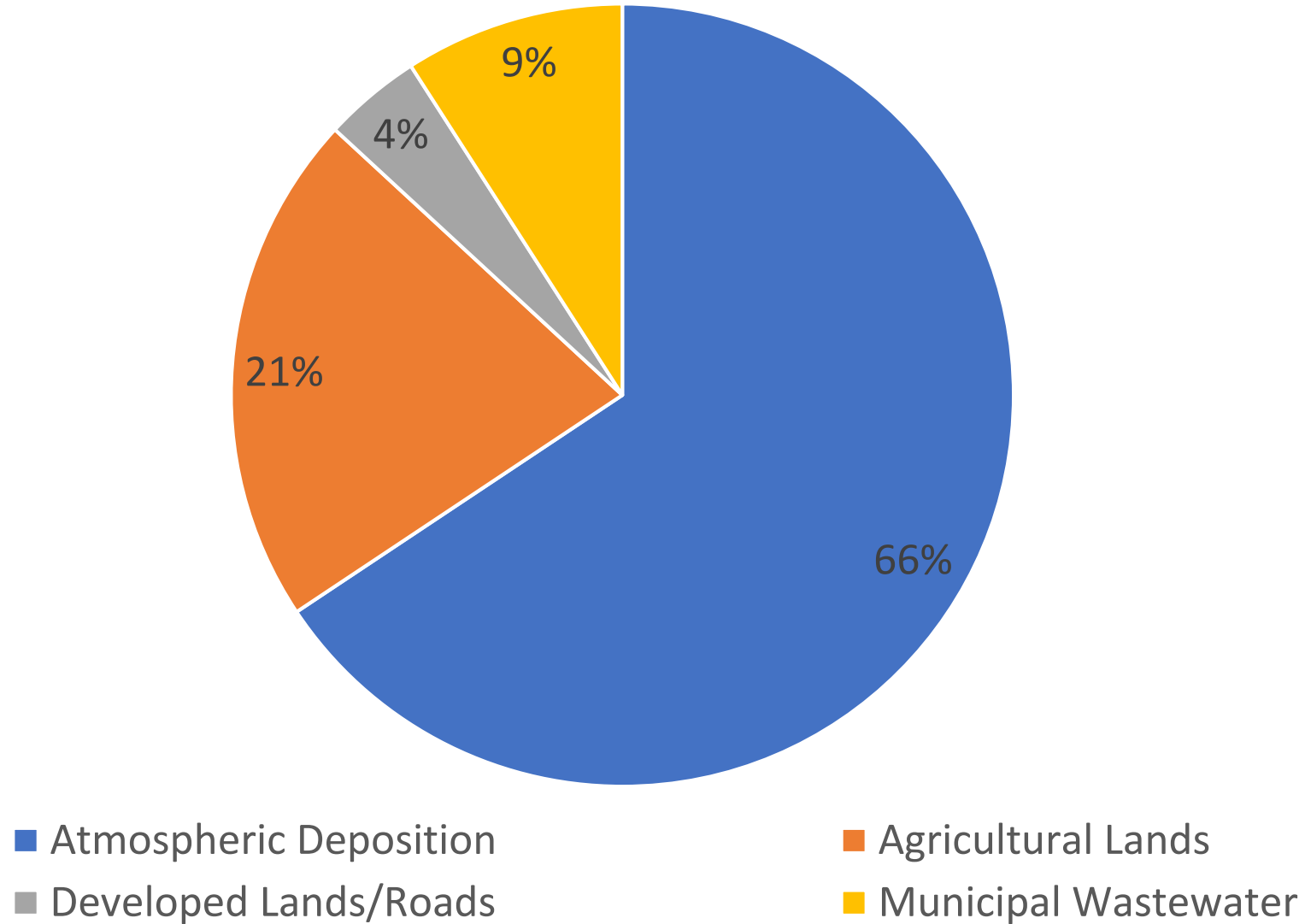


Connecticut River/Long Island Sound Statistics

- 42% of Vermont is in the Connecticut River watershed
- Connecticut River is 410 miles long with over 250 miles along Vermont
- Connecticut River drains to Long Island Sound
- Nitrogen pollution from Vermont contributes to dissolved oxygen (DO) impairment in the Long Island Sound

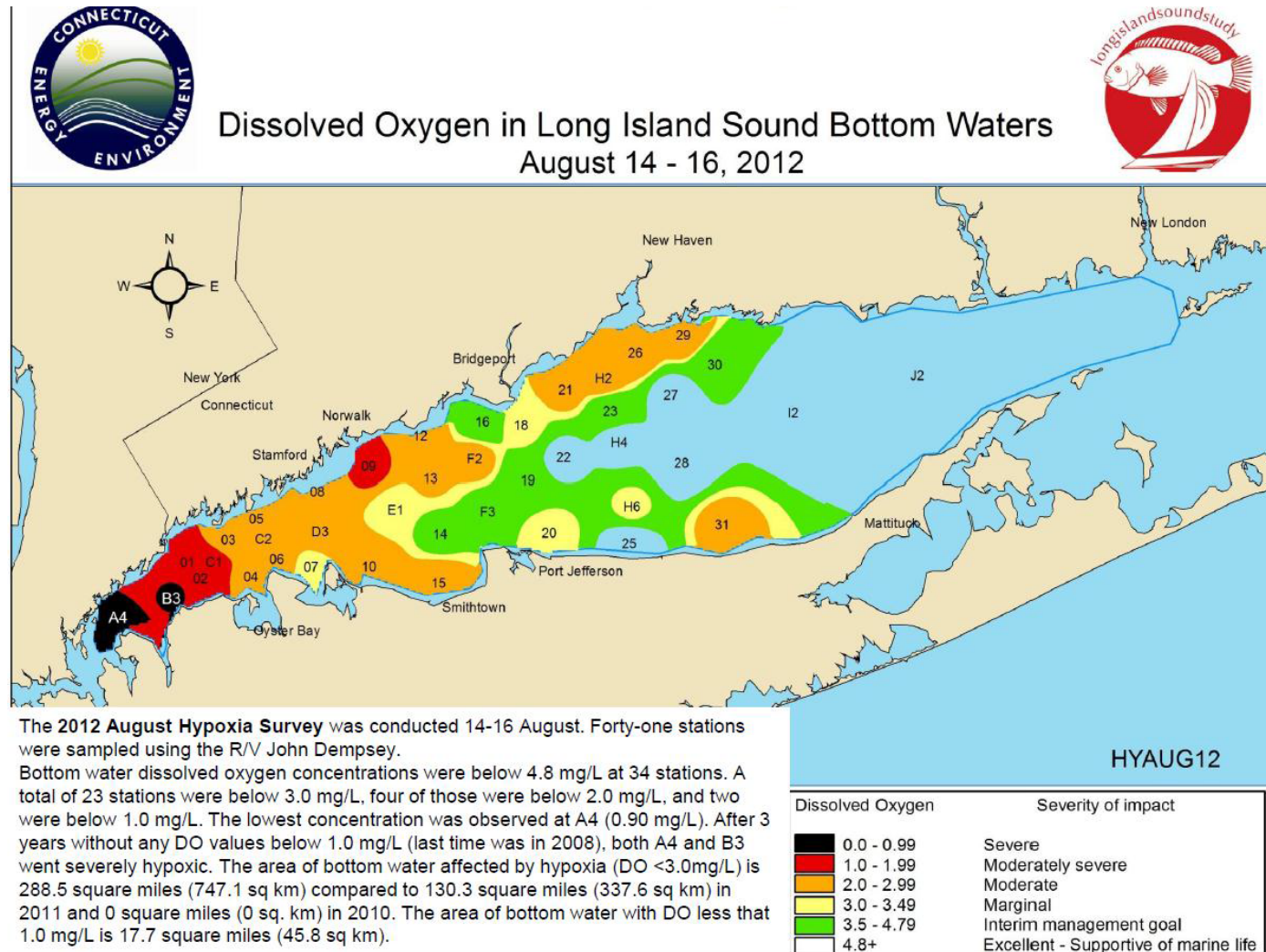


Nitrogen Loading from Vermont to Long Island Sound via the Connecticut River



Long Island Sound Nitrogen TMDL

- Basin-wide load reduction target is 58.5%
- TMDL study underway to refine required reductions regionally

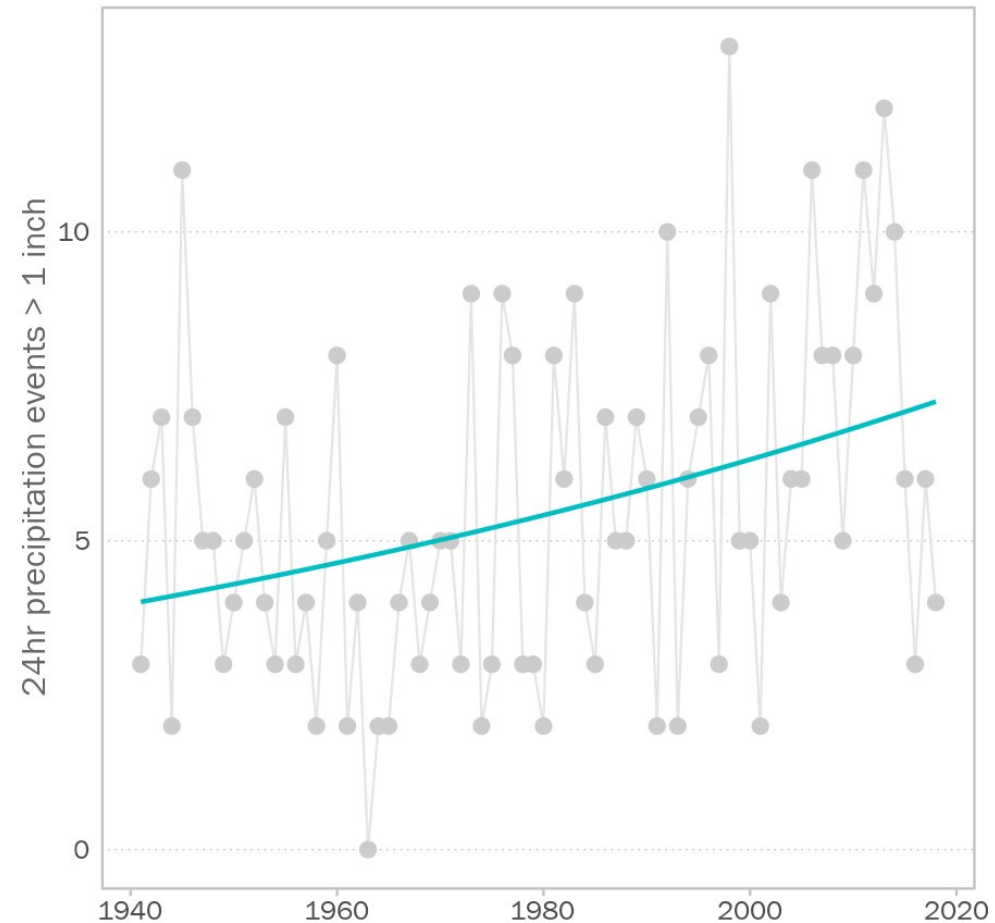
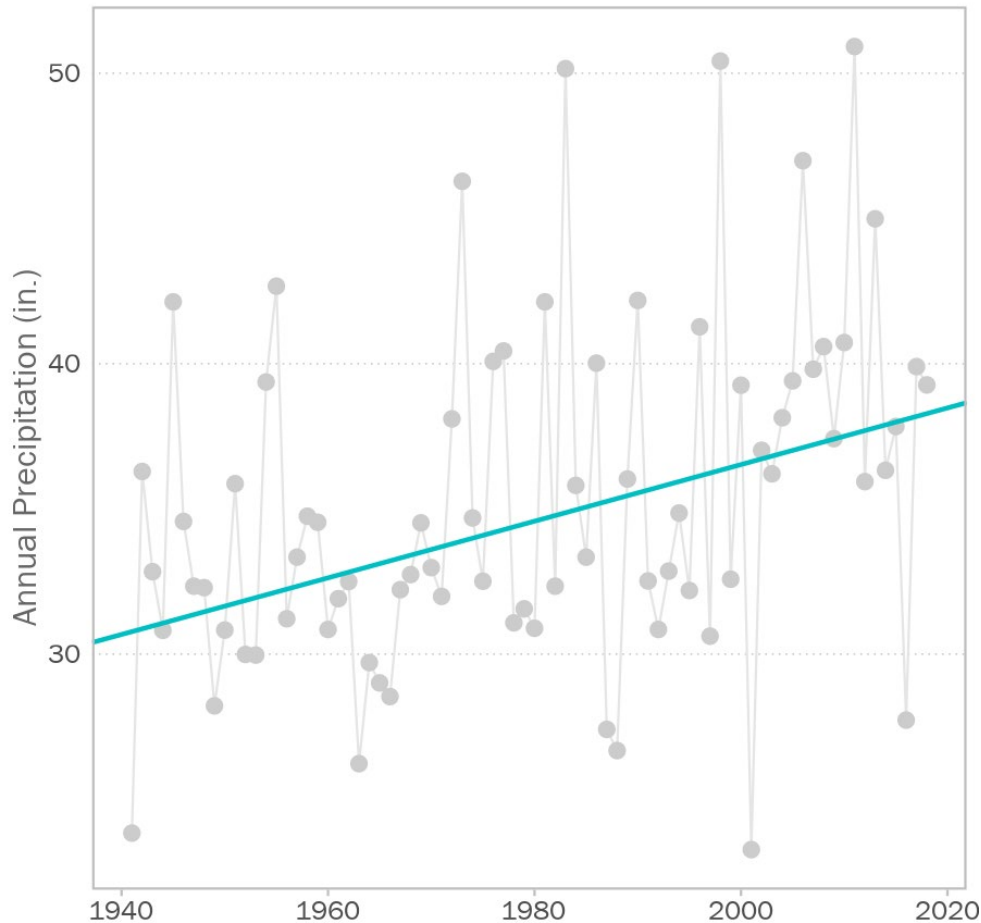


What is Driving Nutrient Pollution in Vermont?

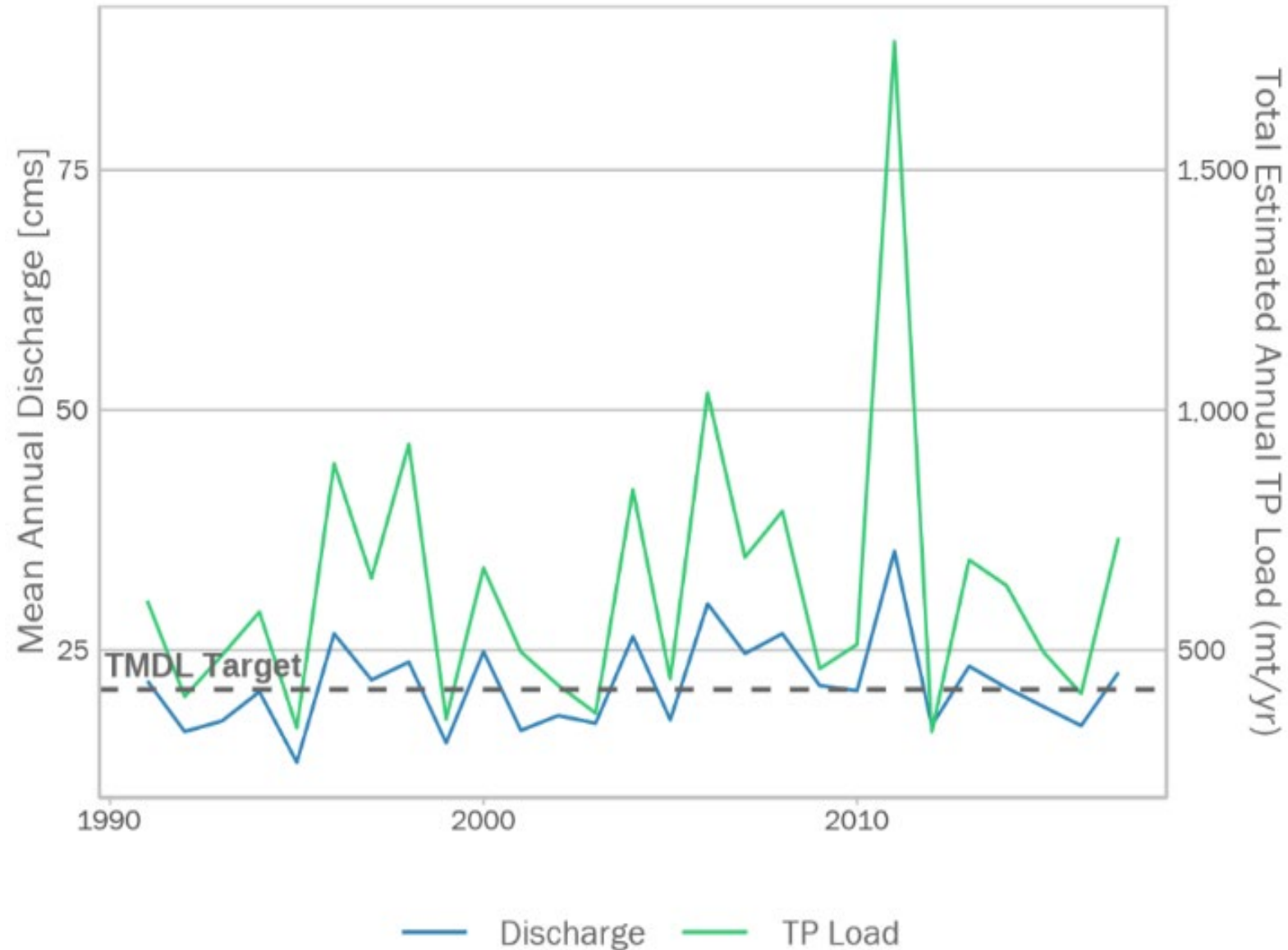
- Sewer overflows?
- Agricultural runoff?
- New construction?
- WEATHER!
 - More rain = more nutrients reaching our waterbodies
 - Weather is noisy, so can be hard to detect trends

What is Driving Nutrient Pollution in Vermont?

Significant increases in frequency of intense storms and total annual precipitation.



What is Driving Nutrient Pollution in Vermont?



What Needs to Happen?

- Significant reduction in nutrient loading
 - Lake Champlain = 34%
 - Lake Memphremagog = 29%
 - Connecticut River/Long Island Sound = 50%+
- For perspective...
 - Chesapeake Bay = 24%
 - Gulf of Mexico = 20%
 - Lake Erie = 40%

How Are We Going to Get There?

An “All-In” Approach

Forestry



Wastewater Treatment



Runoff from Developed Land



Roads



Floodplains and River Corridors



Agriculture



Combination of Mandatory and Voluntary Programs and Projects

- Mandatory - Act 64 (2015)
 - Agricultural practices
 - Stormwater runoff
 - Developed lands (3-acre permit)
 - Roads (Municipal Roads General Permit)
 - Wastewater
 - Forestry
- Voluntary (non-regulatory) – Act 76 (2019)
 - Natural resources restoration
 - Wetlands
 - Floodplains and river corridors
 - Projects that go “above and beyond” regulatory requirements

Are Some Sectors Asked To Do More than Others?

- Multiple objectives drove the mix of programs selected, including:
 - Cost-effectiveness
 - \$ per pound of pollution controlled
 - Capacity
 - Equity
 - Sustainability
 - Programs that EPA has direct control over
 - Wastewater treatment

How is Clean Water Work Funded?




Average Annual State Appropriations = \$50-60 M/year

How is Clean Water Work Funded?

Total FY21 Clean Water Gov Rec.	\$56,127,808
• Clean Water Fund:	\$20,568,808
• <i>Property Transfer Tax Surcharge:</i>	<i>\$5,790,000</i>
• <i>Escheats (unclaimed bottles):</i>	<i>\$1,940,000</i>
• <i>Meals and Rooms Tax:</i>	<i>\$11,982,000</i>
• <i>Prior Years Surplus Revenue:</i>	<i>\$956,808</i>
• Capital Bill:	\$13,900,000
• Transportation Bill:	\$7,078,000 (20% state/80% federal)
• Appropriations Bill	\$7,947,000
• <i>DEC Clean Water SRF Match</i>	<i>\$7,779,000 (100% federal)</i>
• <i>AAFM Farm Agronomic Practices</i>	<i>\$412,000</i>
• LCBP/Leahy Appropriation	\$6,390,000 (100% federal)

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Discretionary vs. Directed

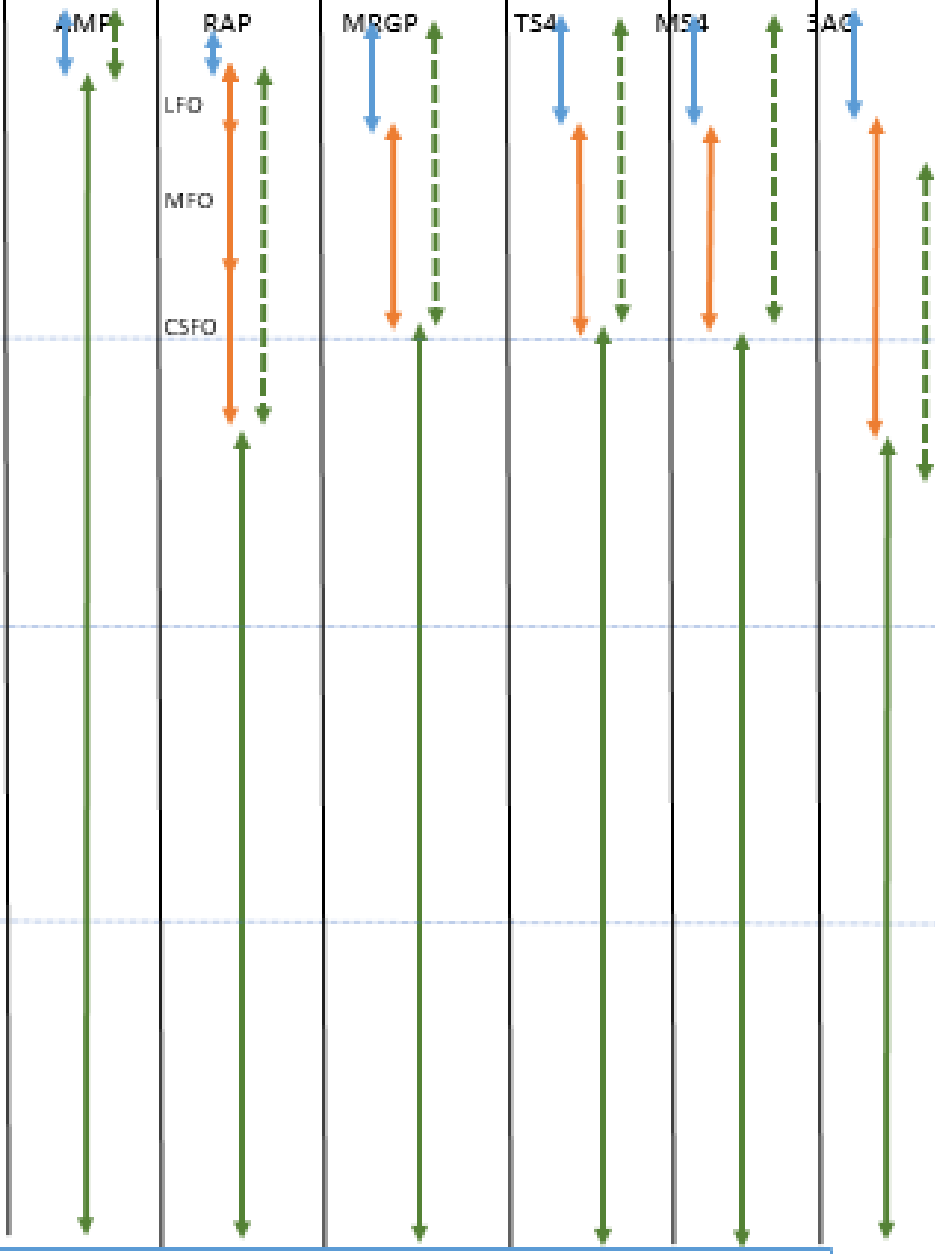
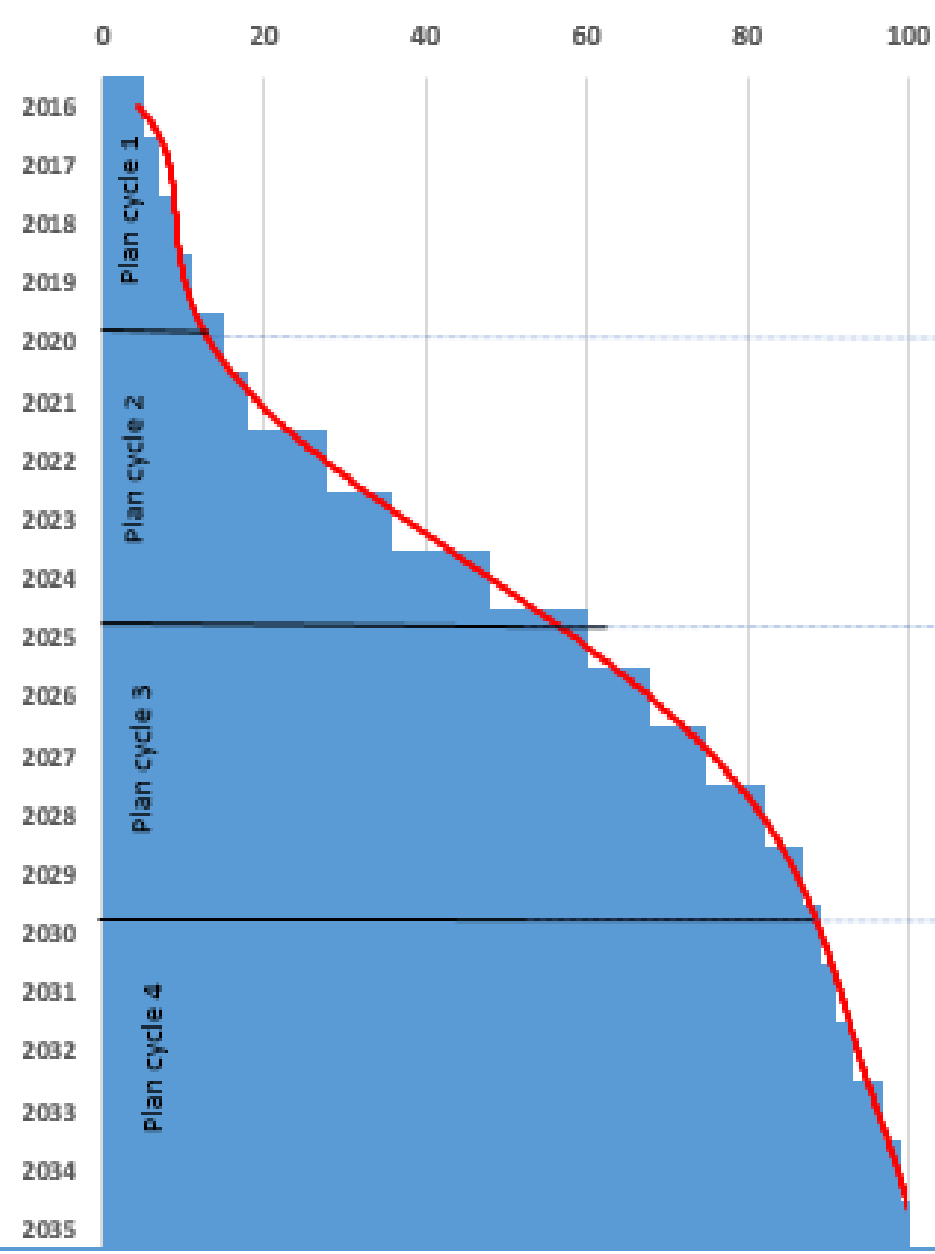
- Investments are real, but not all are discretionary
- Directed = \$26.2m
 - \$12.7m for municipal wastewater, stormwater and CSOs
 - \$7.1m for transportation-related stormwater
 - \$6.4m for projects approved by LCBP
- “Discretionary” ~ \$30m
 - Existing cost share commitments; combination of statute and agency practice

Will it Really Take 20 Years?

- YES!!
- Federal (TMDL) target is established and provides clear direction
 - Significant reductions are need
- Early years have been characterized by planning and putting systems in place
 - Implementation is accelerating
- Progress will:
 - Not come in neat increments of pollution reduced per dollar spent
 - Be complicated by climate change as total rainfall and rain intensity increase

Regulatory Program Timeline

Hypothetical Phosphorus Reduction Curve (%)

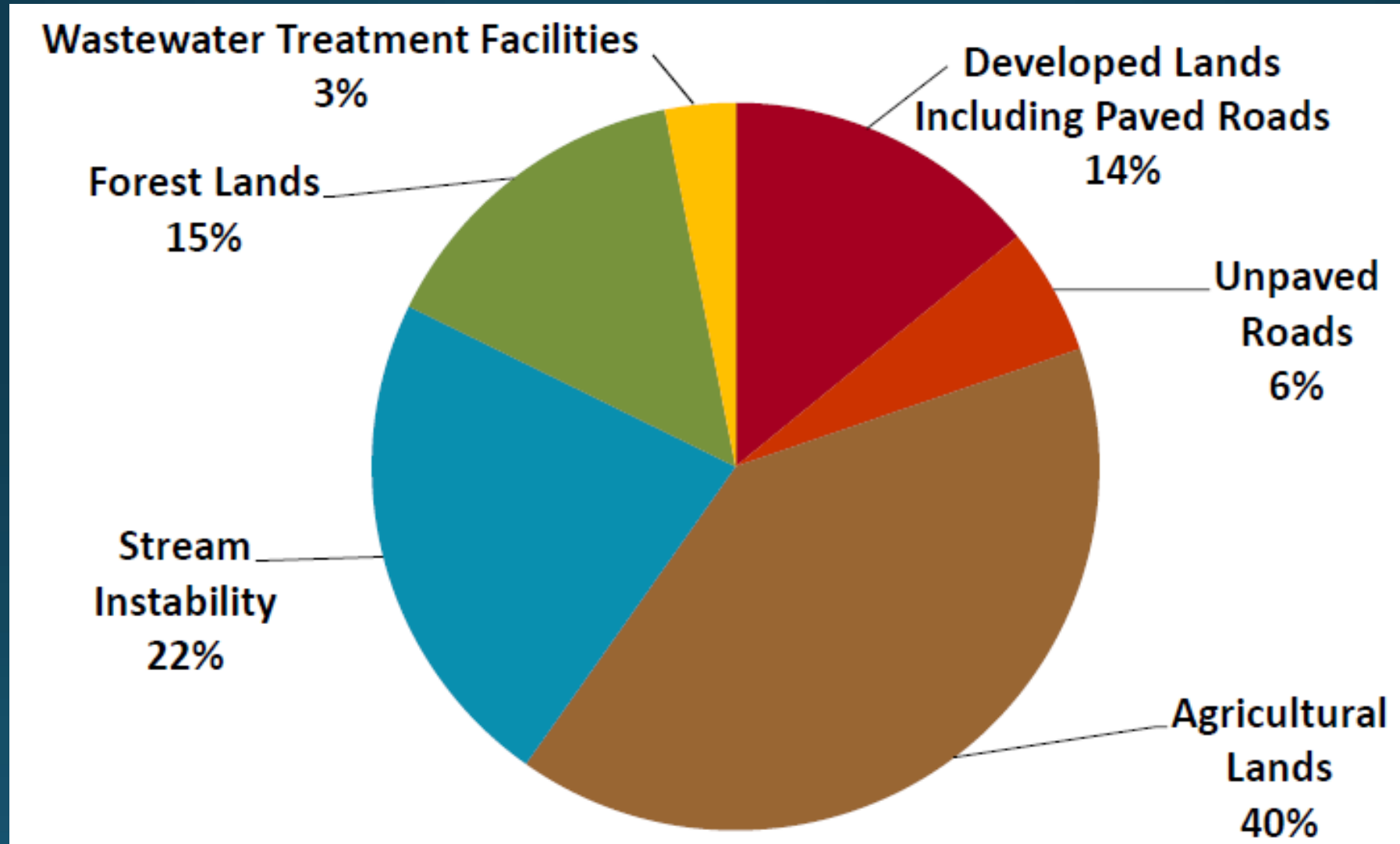


Stormwater

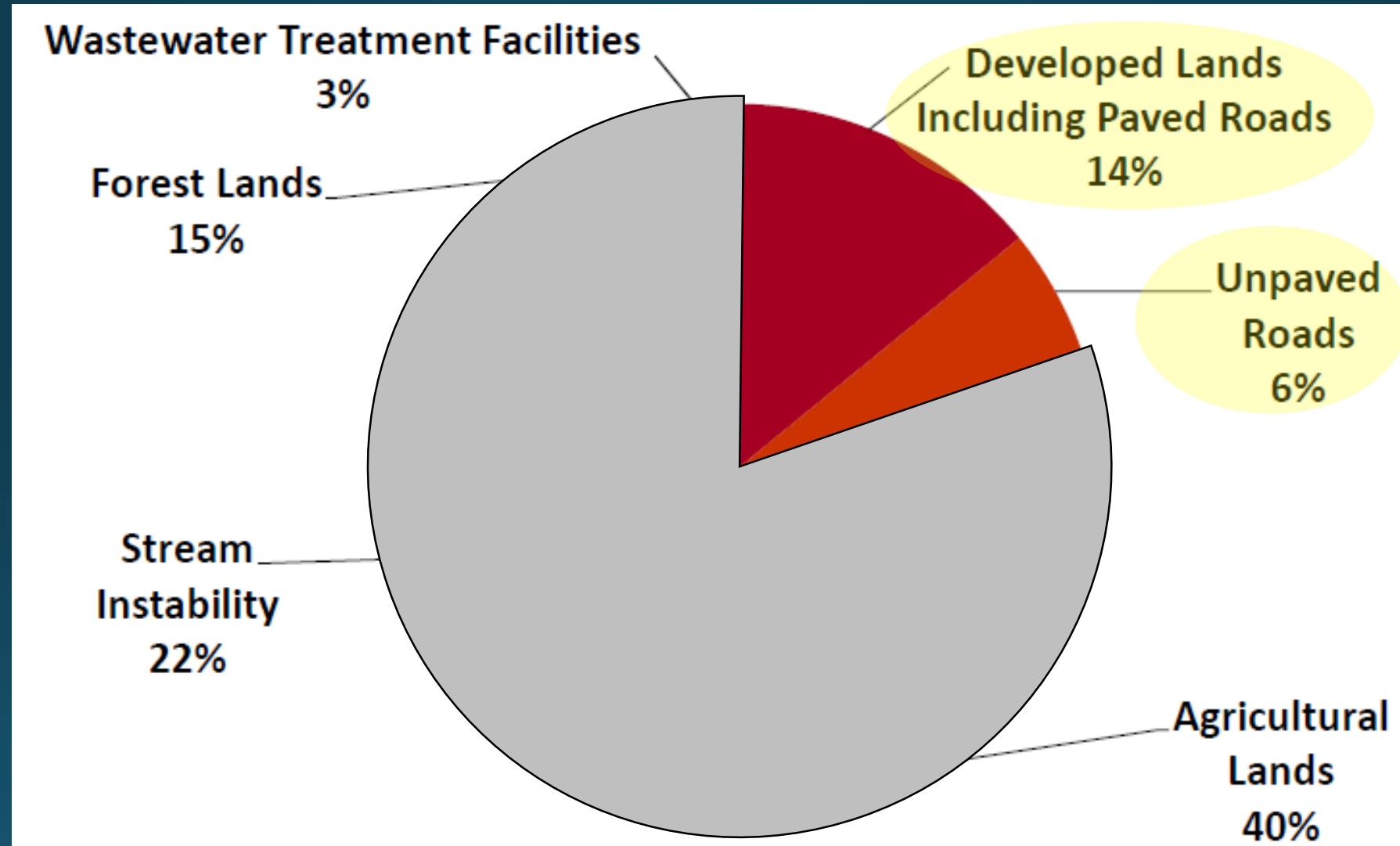
Impervious Surfaces

- 60,000 acres, statewide –roughly
- < 10% are currently regulated

Sources of Phosphorus in the Vermont-portion of the Lake Champlain Basin



Sources of Phosphorus in the Vermont-portion of the Lake Champlain Basin



Stormwater Pollutant Loading

- Lake Champlain TMDL requires a 21% reduction from “Developed Lands”
- How will it be achieved?
 - Municipal Roads General Permit
 - MS₄ General Permit
 - TS₄ General Permit
 - **3-Acre General Permit**

3-Acre Sites

- Single tract with ≥ 3 acres of impervious surface with no permit, or a pre-2002 permit; or,
- A project on one or more tracts with a pre-2002 stormwater permit for ≥ 3 acres of impervious surface;
- And, adjacent impervious surfaces where part of a related operation, e.g. a campus



- ❖ Roughly 1,000 sites statewide; half are previously permitted
- ❖ Letters sent directly to landowners outlining next steps

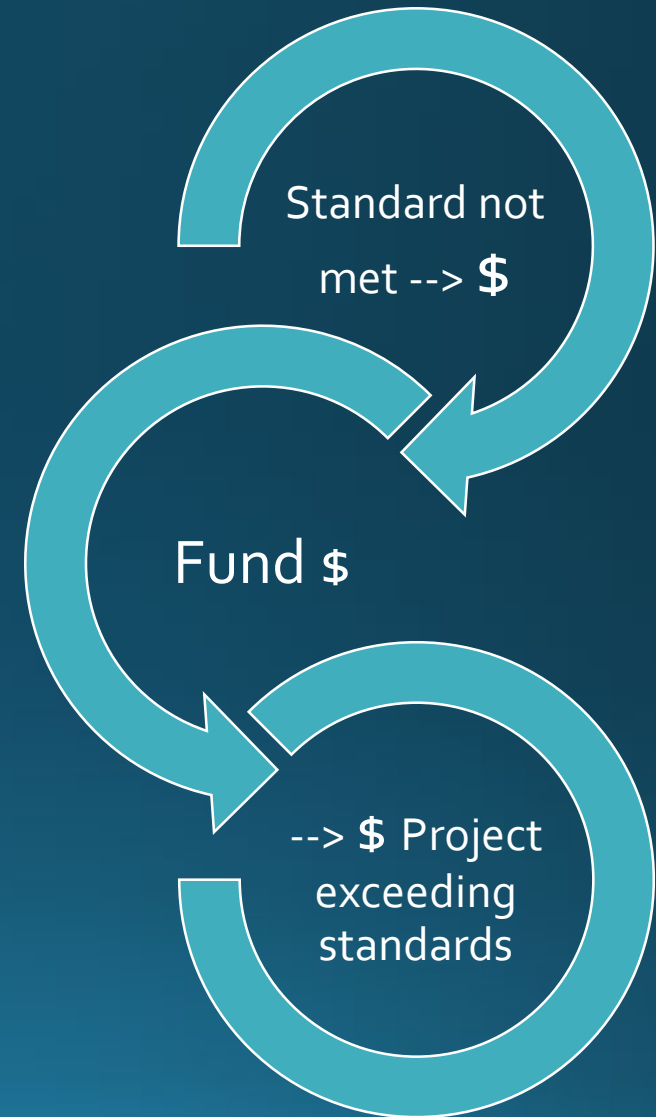
3-Acre General Permit

Requirements

- Retrofit stormwater system consistent with redevelopment standard in 2017 Vermont Stormwater Management Manual
- Maximize treatment on site, subject to Engineering Feasibility Analysis (EFA)
 - Don't need to:
 - Purchase additional land
 - Pump stormwater
 - Construct in flood plains or wetlands
- If (and only if) unable to meet standards on site → pay offsets or stormwater impact fees

Stormwater Impact Fees

- Impact fees - pay if you can't treat
 - Channel Protection Volume
 - \$25,000 per acre of impervious Surface
 - Redevelopment Standard (50% of Water Quality Volume)
 - $\$25,000/\text{acre} * (\text{required volume} - \text{actual volume})$
 - $\$25,000/\text{acre} * (50\% - 0\%) = \$12,500/\text{acre}$



General Permit, Next Steps

- Public comment closed December 2, 2019
 - MANY comments received
 - Anticipate issuing final GP in late-Q1 2020
- Key Comments on General Permit
 - Schedule for 3-Acre sites
 - All 3-acre sites need permit coverage by the end of 2023
 - Funding to support implementation
 - Working to establish package of grants and subsidized loans to support engineering, design, and implementation costs
 - Agency will release funding plan before any applications are required