Basin 17 Water Quality Monitoring and Tactical Basin Planning Update

Quebec Vermont Steering Committee meeting

May 5th, 2022

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Vermont Department of Environmental Conservation

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Water Quality Monitoring Update

- Sampling has been done by Sarah Damsell with the Orleans County Natural Resources Conservation District in recent years and processed at the VT AAFM laboratory.
- Sampling has been taking place since 2005 with a small shift in targeting of high flow events in 2010
- The monitoring covers four tributaries in Vermont (Black, Barton, Clyde and Johns)
- Monthly sampling + 10 high flow events +/-

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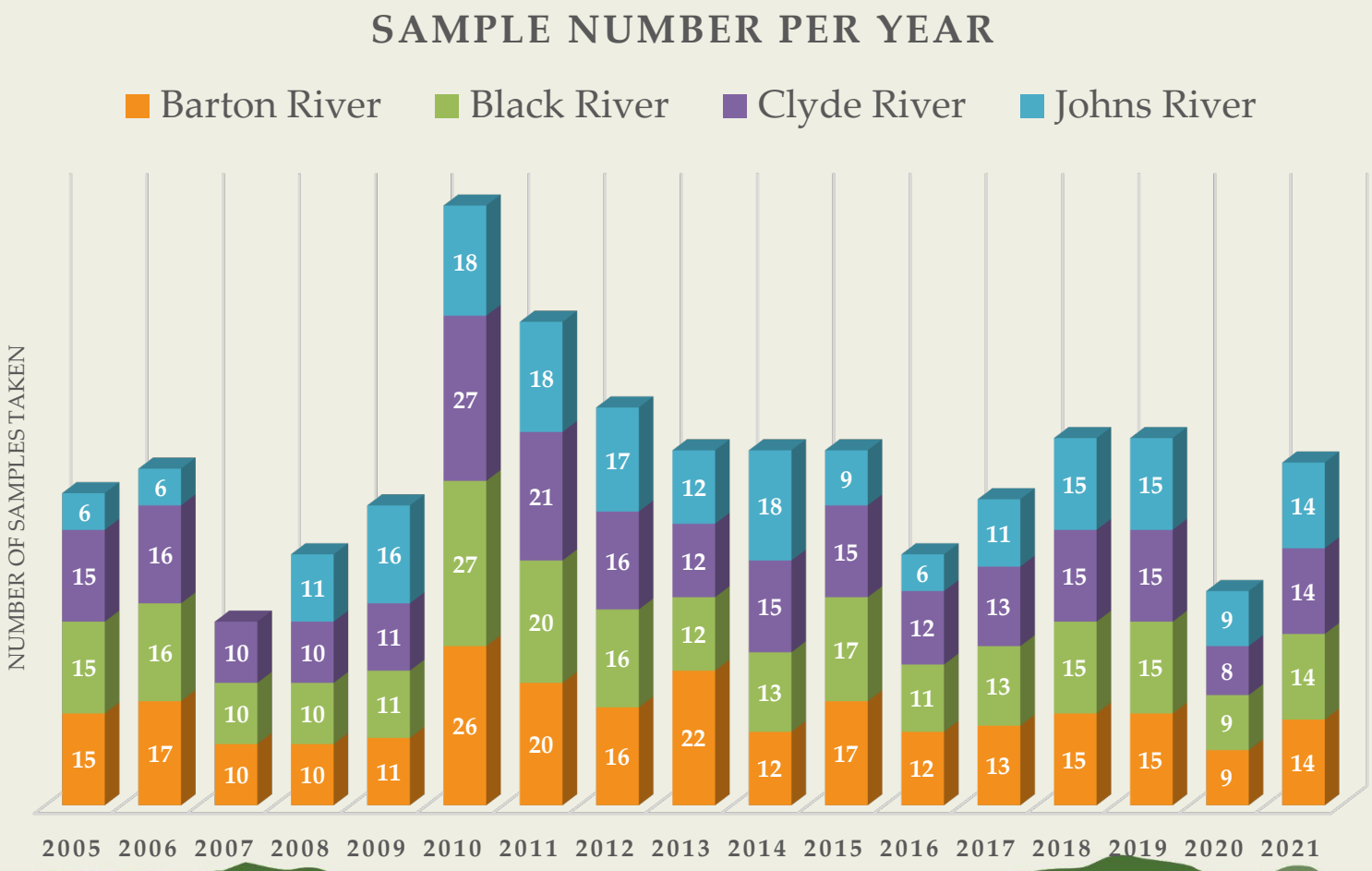
Water Quality Monitoring Update

- Sample numbers were low in 2020 due to COVID lab shutdown impacting spring runoff sampling
- Low flow all summer of 2021 limited the number of events.
- We are still consistently below the target number of sampling events (18).



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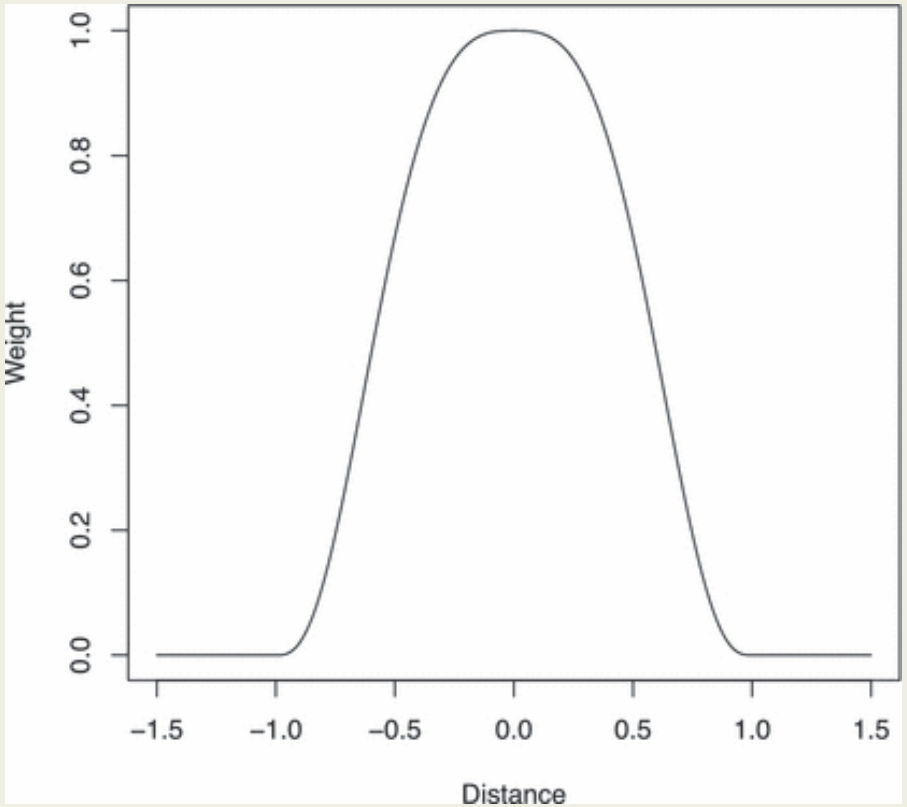
Tributary Loading Analysis using Weighted Regression on Time, Discharge and Season (WRTDS).

- This program estimates loading establishing a concentration discharge relationship using other sampling dates points with similar time, discharge and season.
- The program weights samples based on a “Tukey’s Tricube Weight Function” →
- The program widens the distance to pull in enough samples to establish a relationship.
- We are a little under 20 years of data and more importantly 200 datapoints necessary for trend analysis
- Data is estimated for every date and then totaled for each year to produce annual and flow normalized loading.



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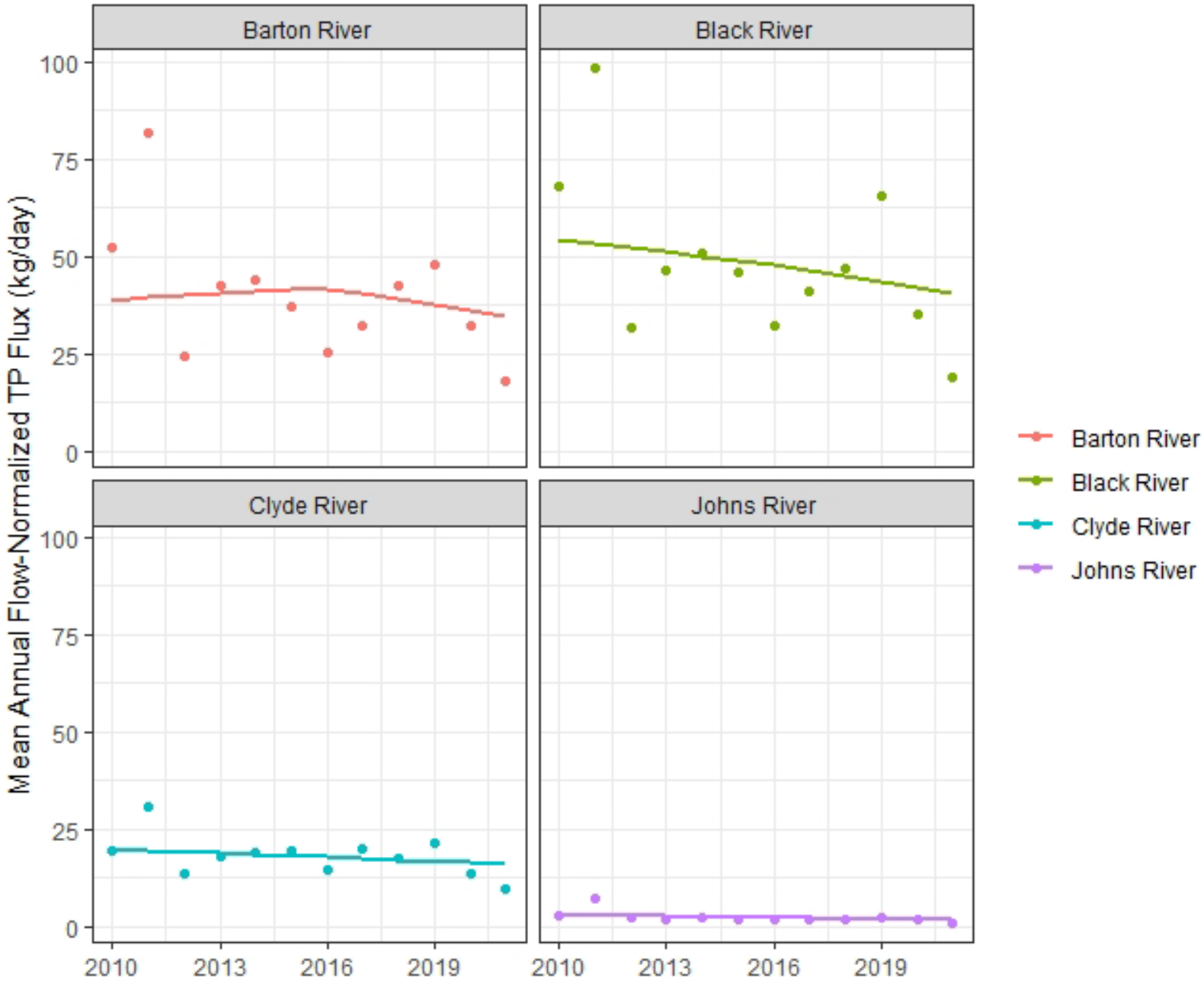

WRTDS – Preliminary Results…

Dots represent the estimated flux for each year and lines are flow normalize flux (kg/d).

This is preliminary analysis as we don't have enough data to support trend analysis.

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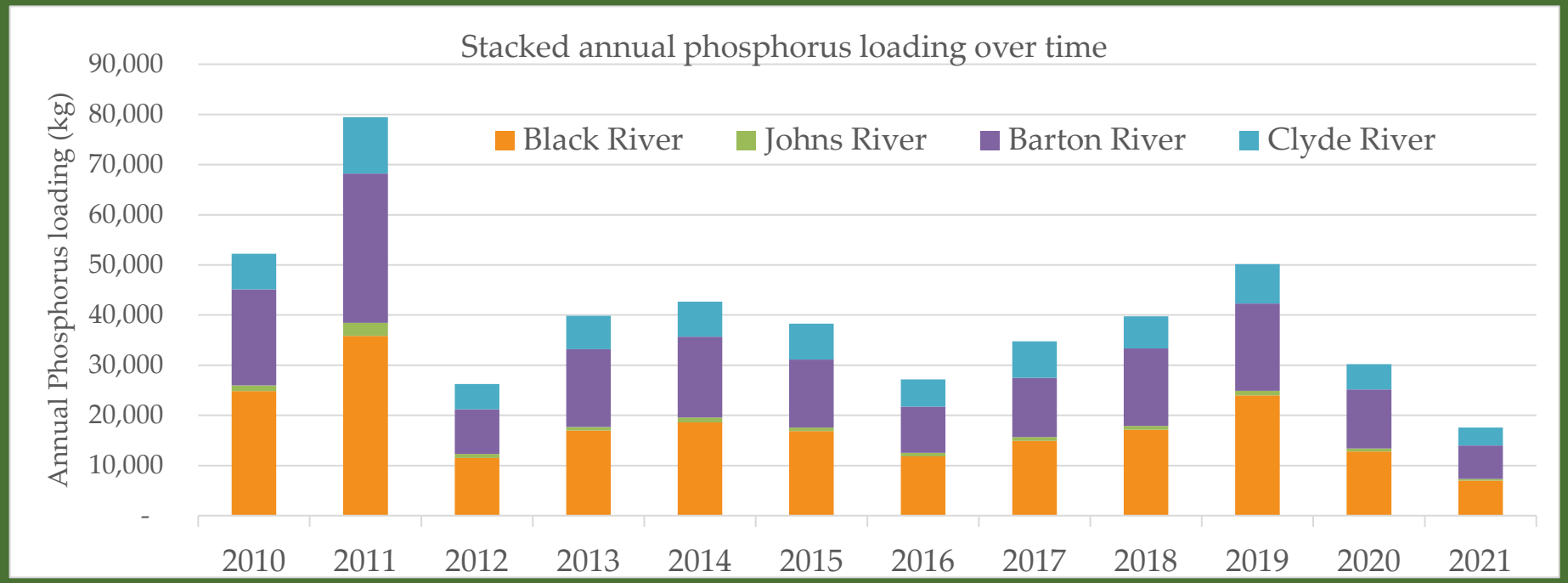
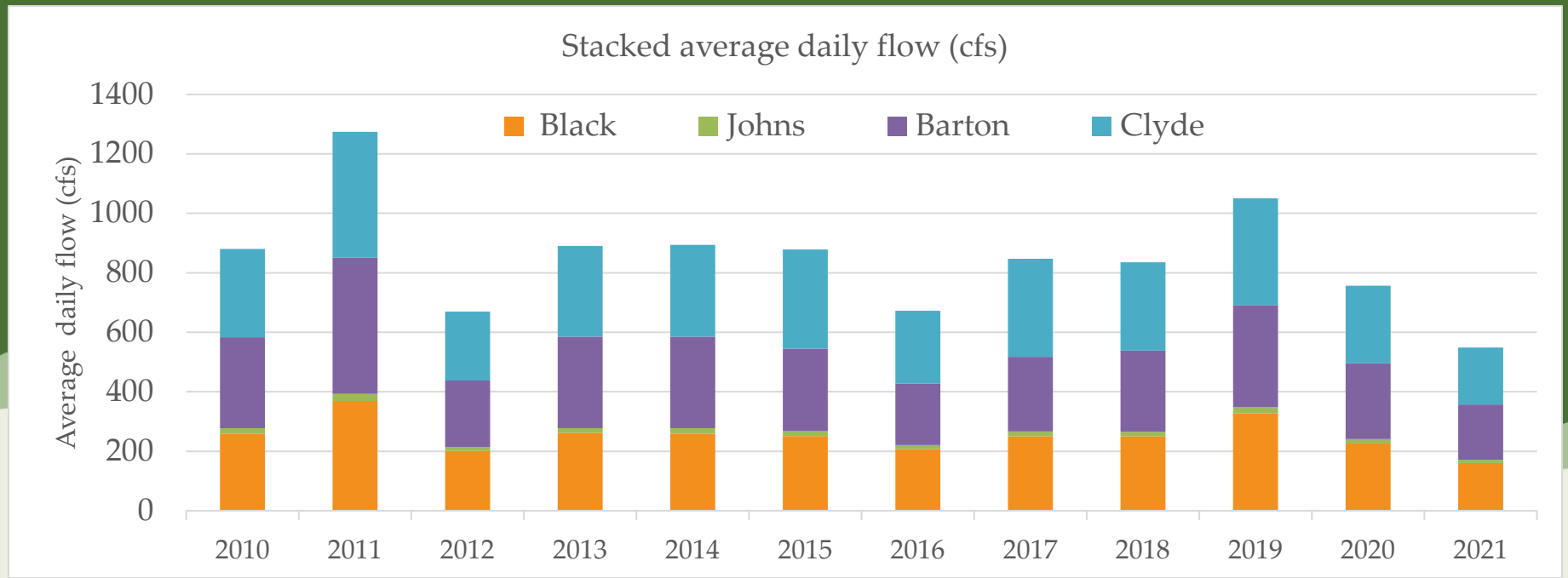

Stacked annual phosphorus loading over time
Annual Phosphorus loading (kg)
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
-
Black River
Johns River
Barton River
Clyde River
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021


Stacked average daily flow (cfs)
Average daily flow (cfs)
1400
1200
1000
800
600
400
200
0
Black
Johns
Barton
Clyde
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021

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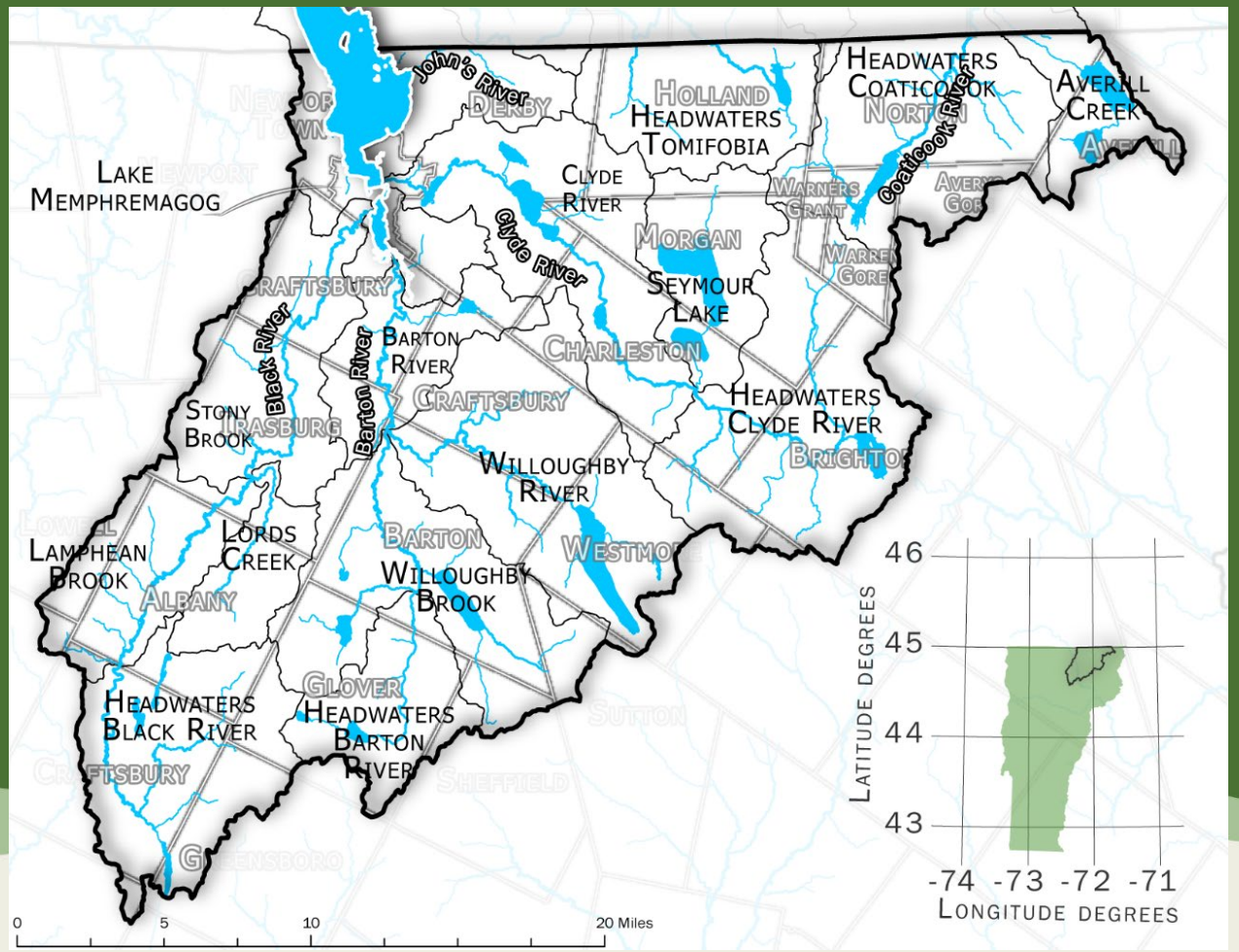
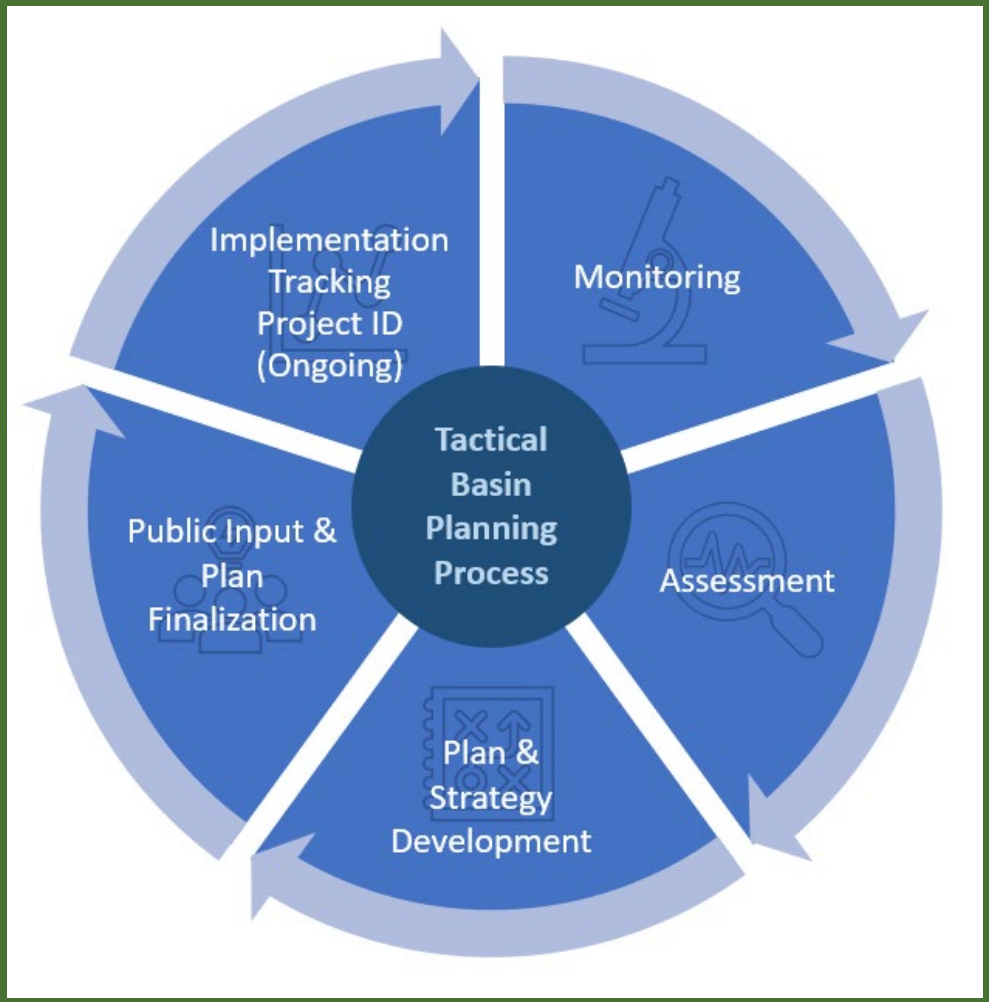
Tactical Basin Plan update:





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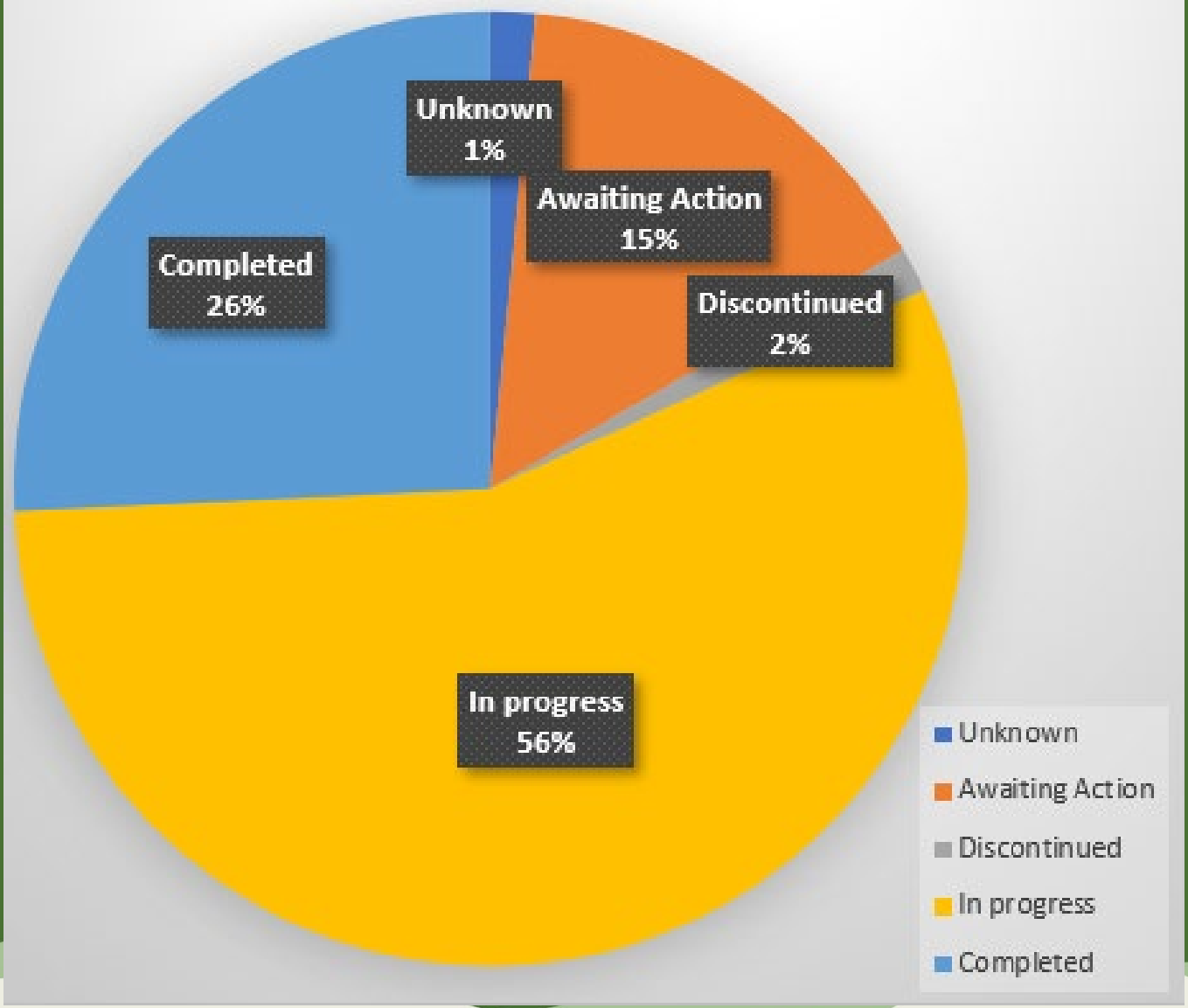
Strategy update from 2017 plan:



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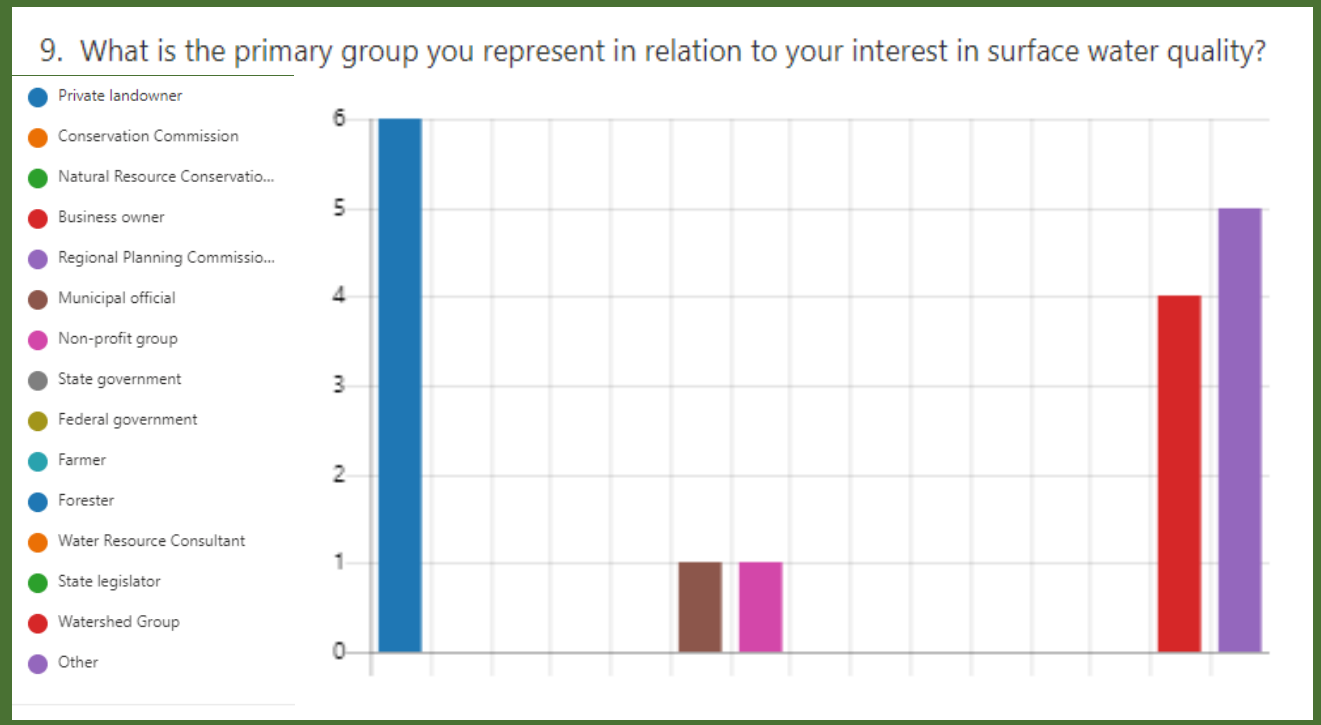
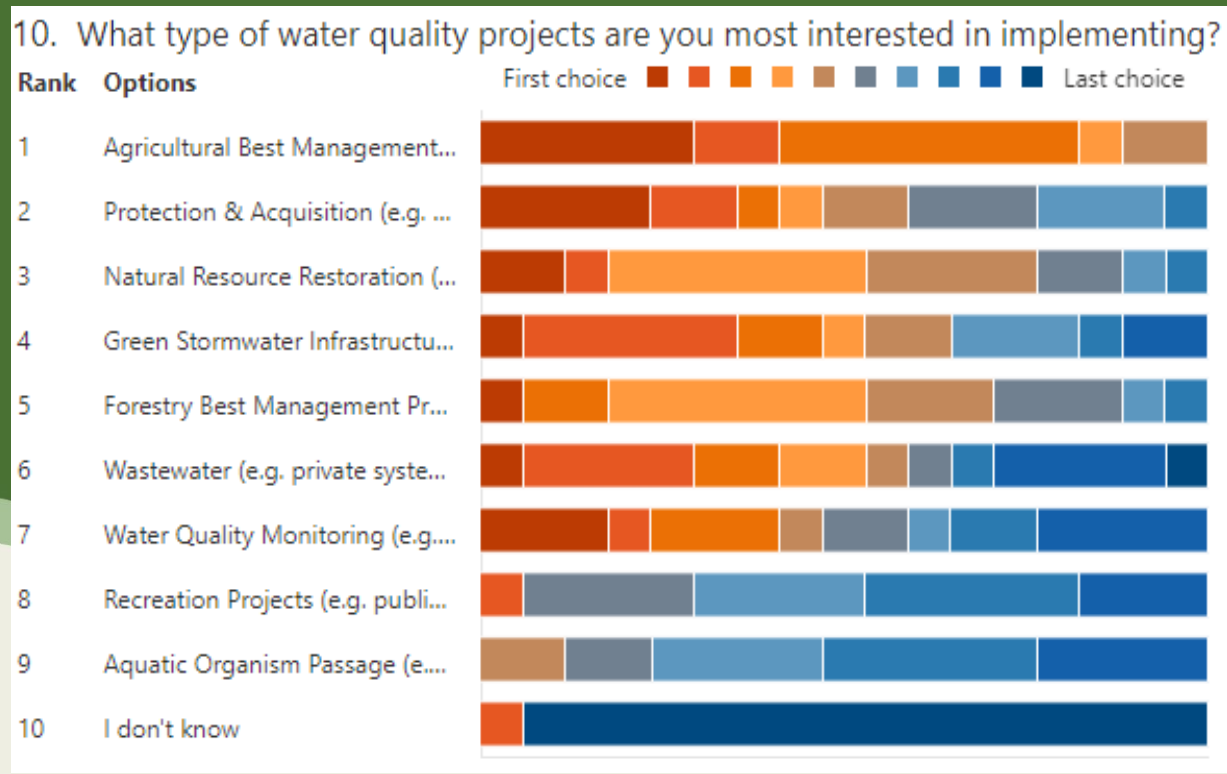
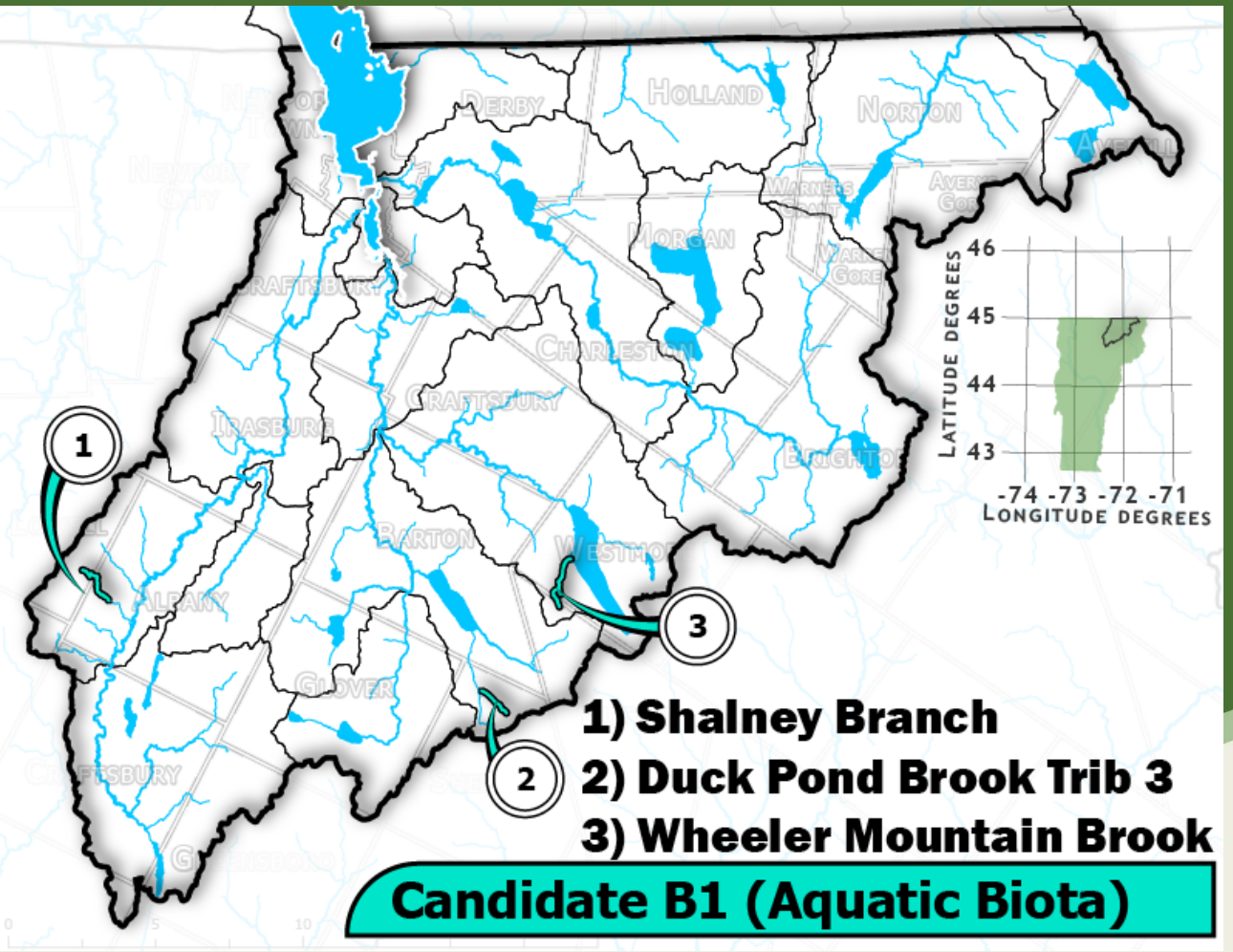
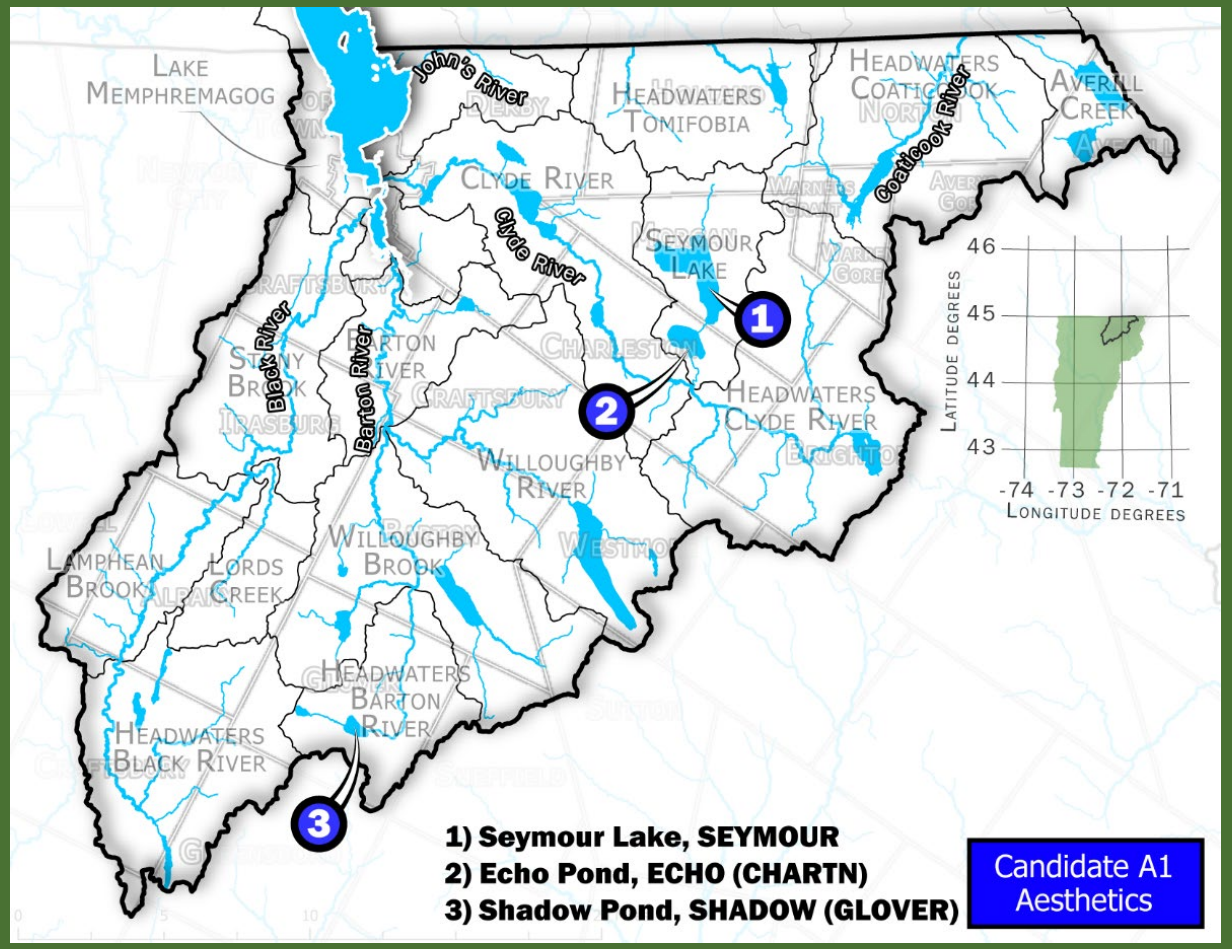
Survey results – 17 responses so far… mostly watershed groups and landowners and business owners.





Reclassification priorities for rivers and lakes





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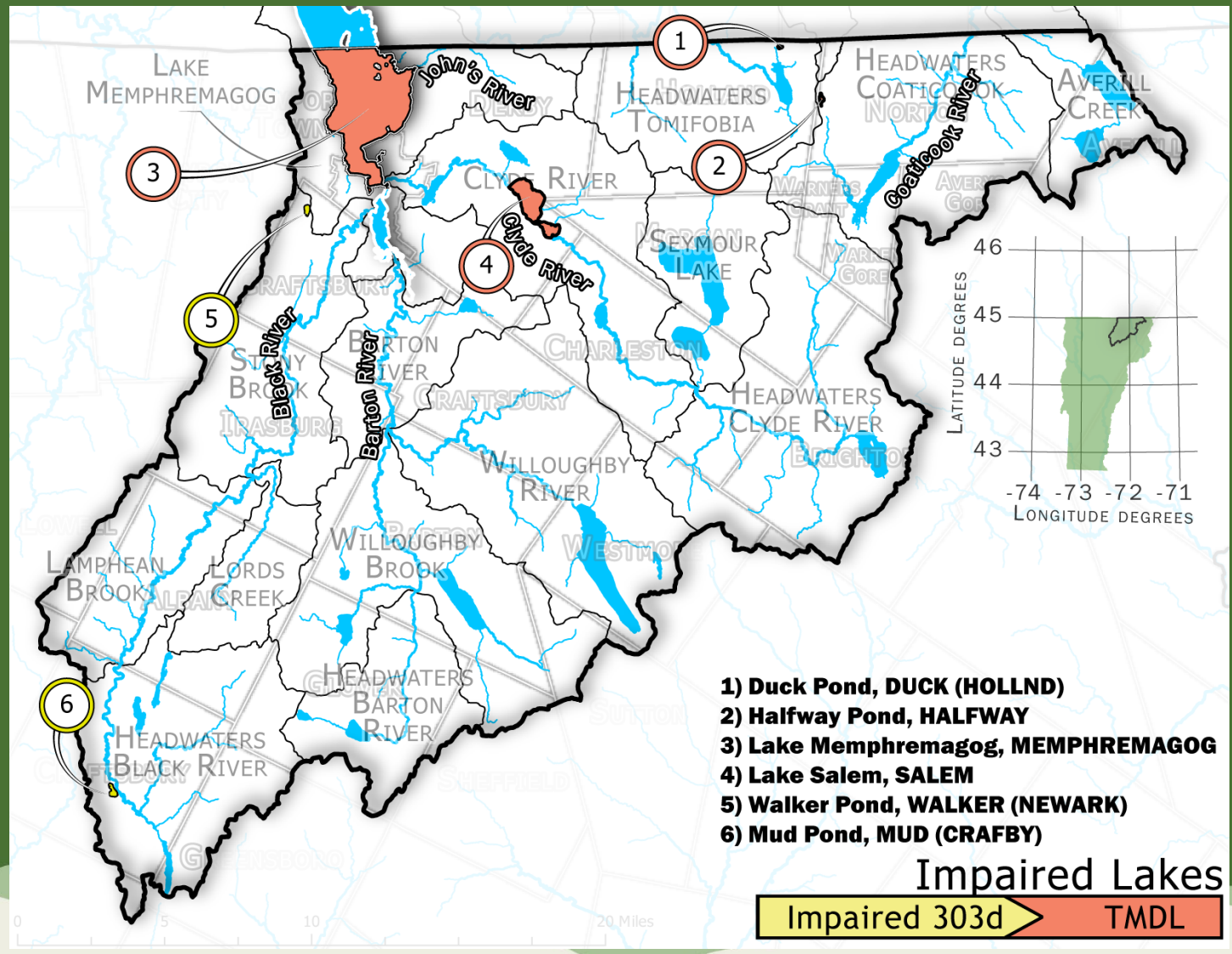
Impaired Lakes in the Lake Memphremagog Watershed

- Duck and Halfway Pond (Acid)
- Lake Memphremagog Phosphorus
- Lake Salem (Mercury)
- Mud Pond and Walker Ponds extremely elevated TP concentrations from



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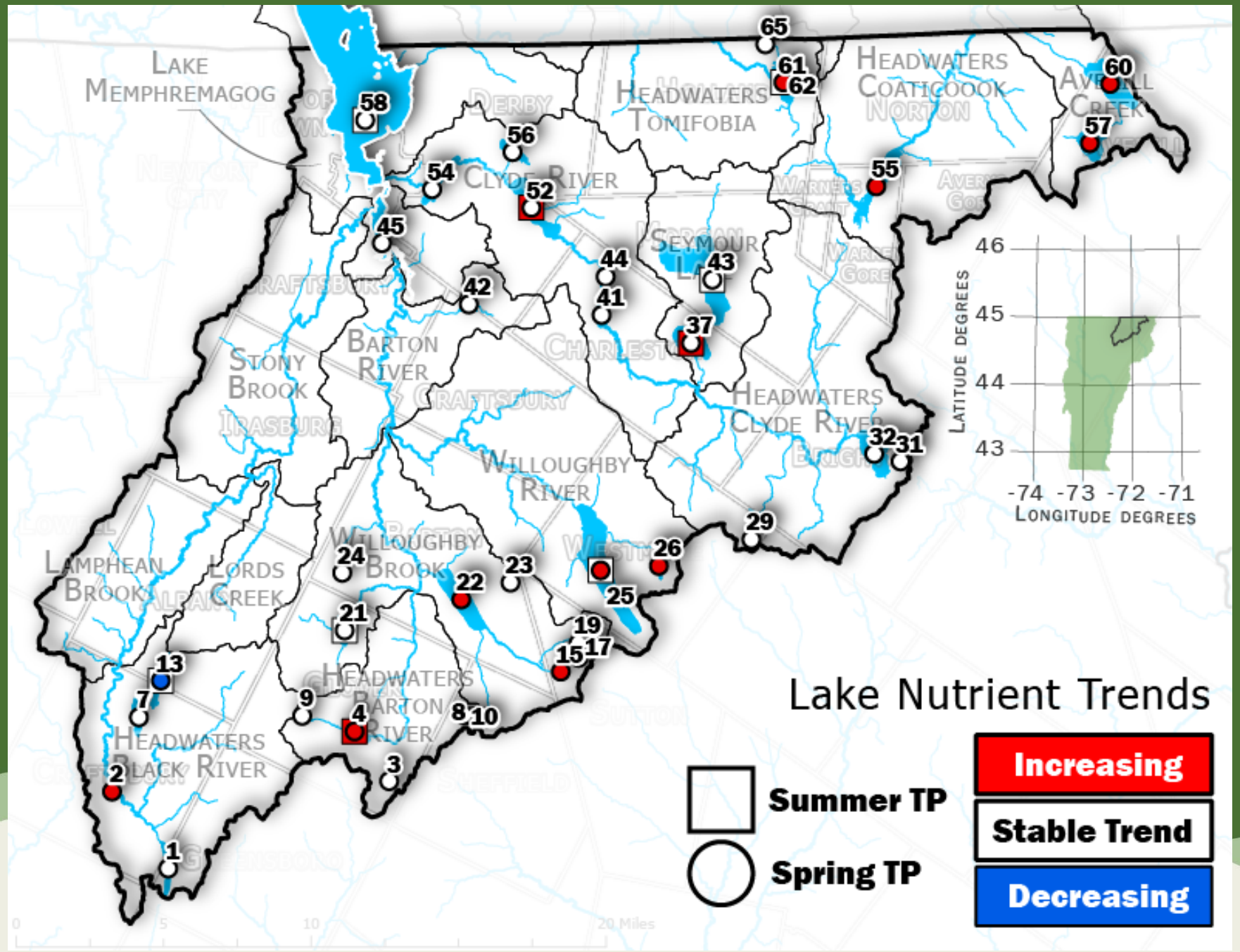

Lakes with Nutrient Trends

- Little and Great Averill
- Norton
- Holland
- Echo
- Salem
- Long
- Willoughby
- Bean Pond
- Crystal Lake
- Shadow Lake
- Mud Pond

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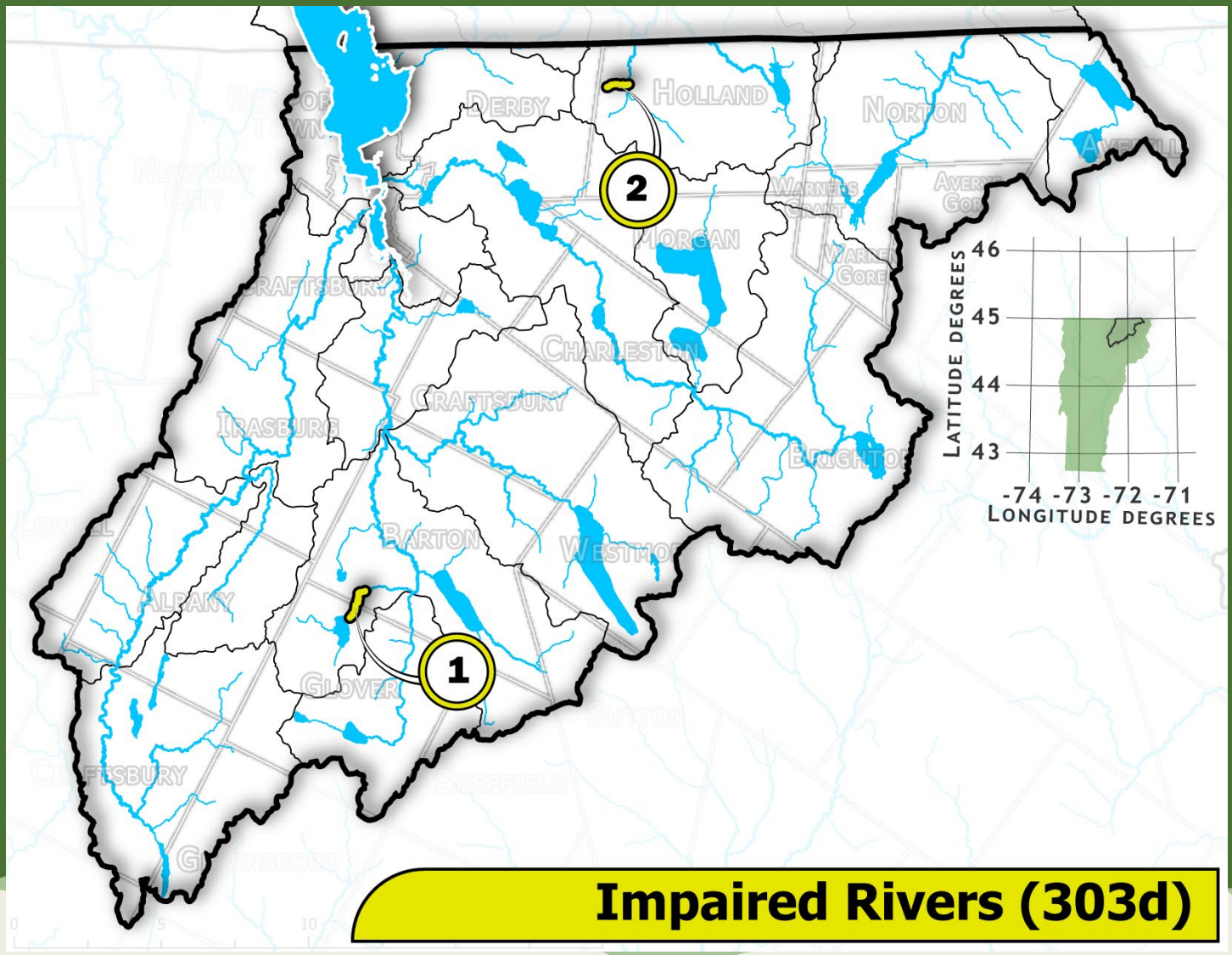
Impaired Rivers in the Lake Memphremagog Watershed

- Stearns tributary nutrient enrichment due to agricultural runoff
- Roaring Branch nutrient enrichment due to agricultural runoff



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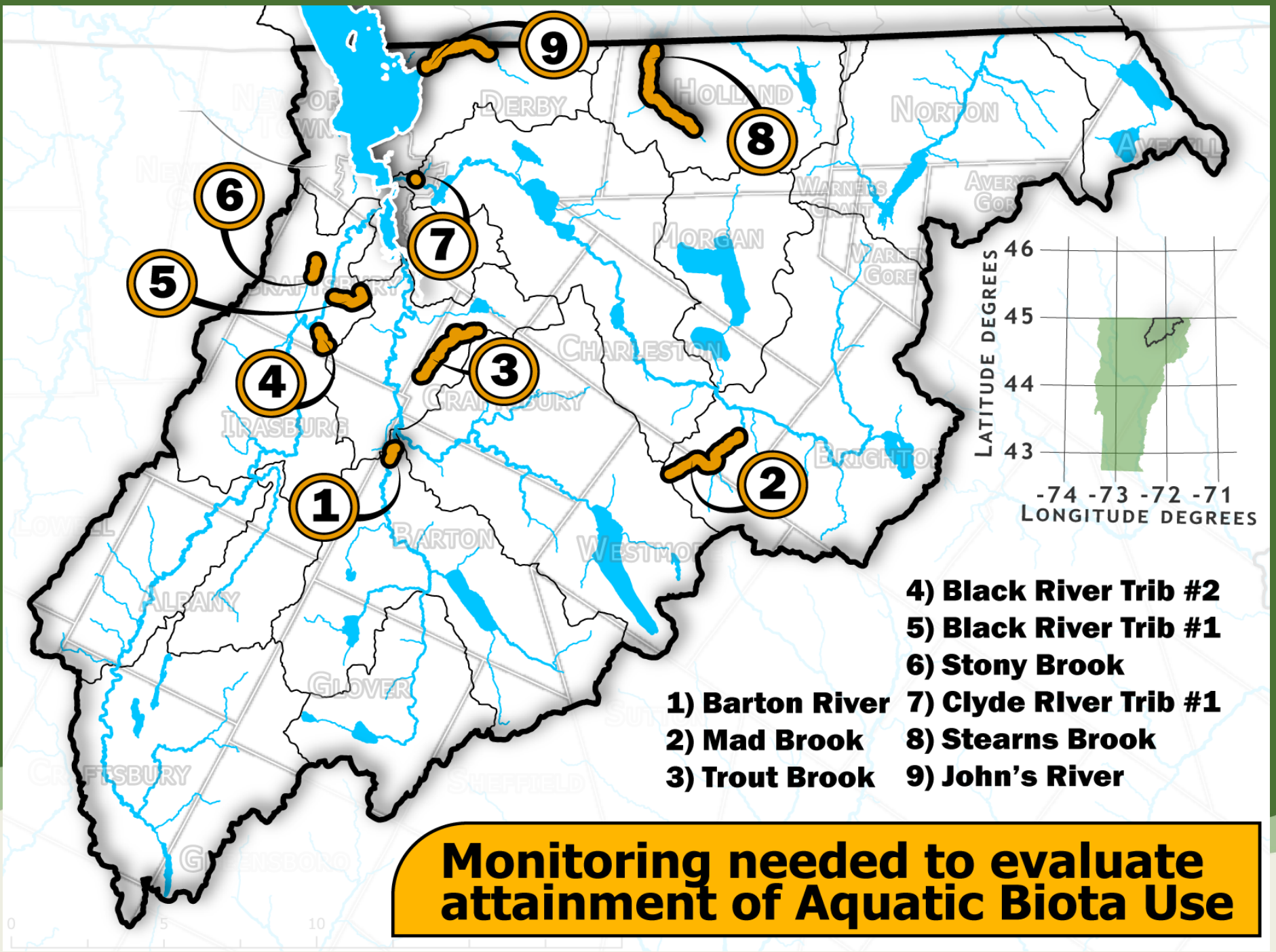

Monitoring needed to evaluate attainment of Aquatic Biota Use

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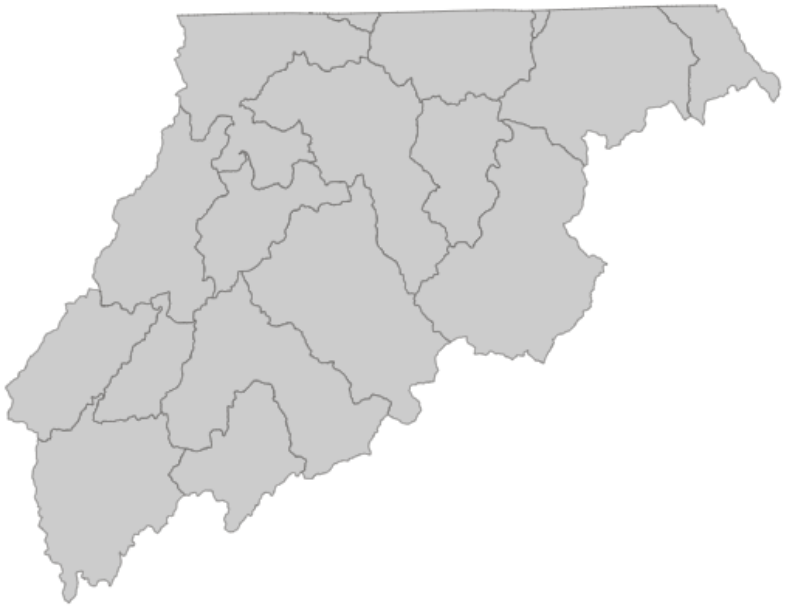
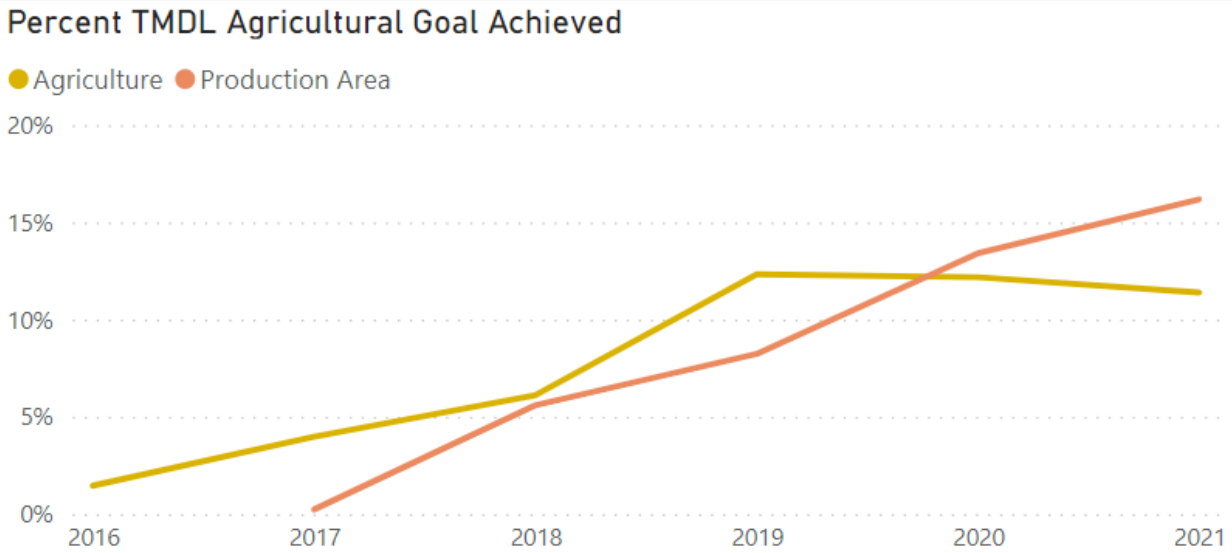
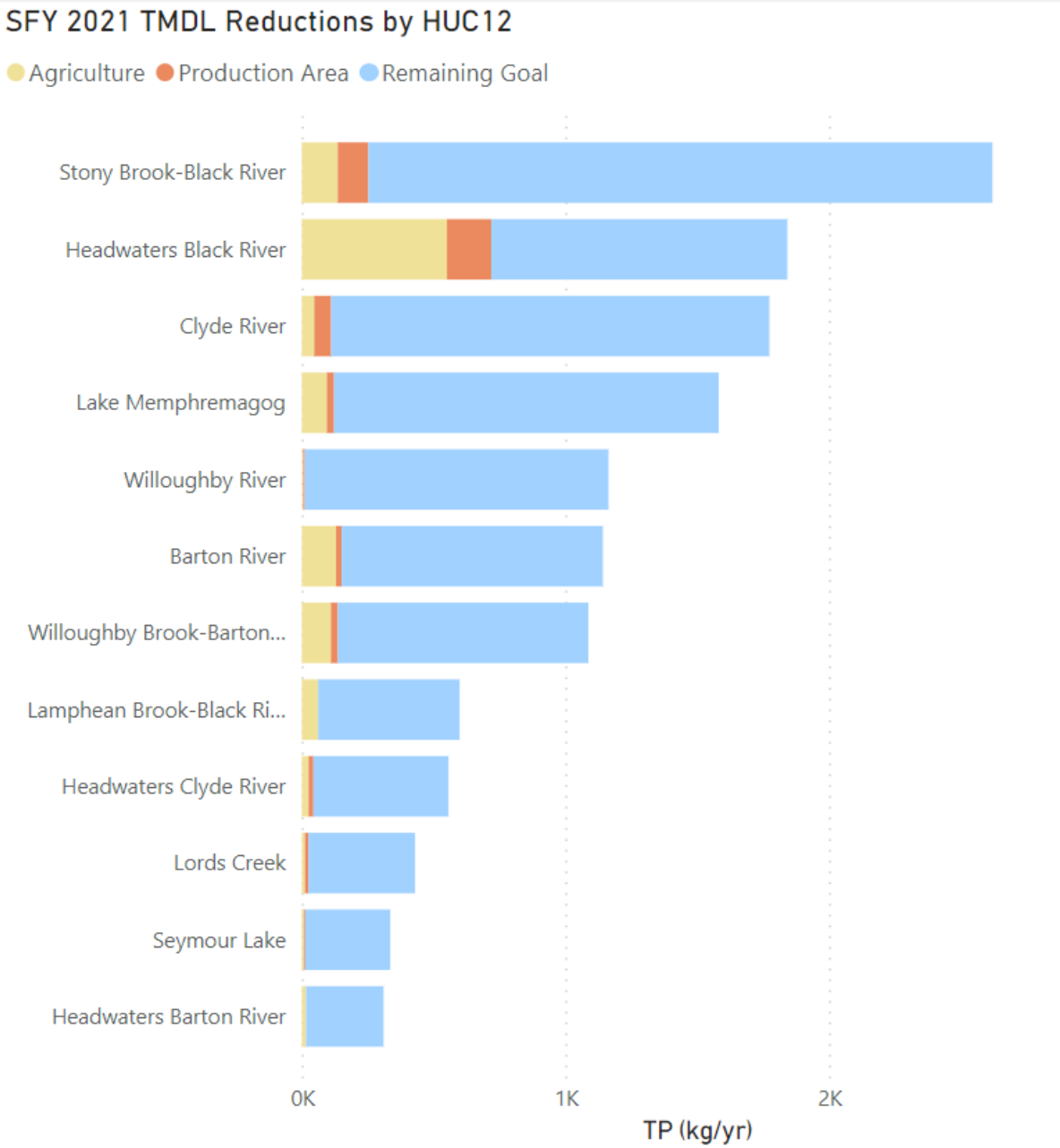
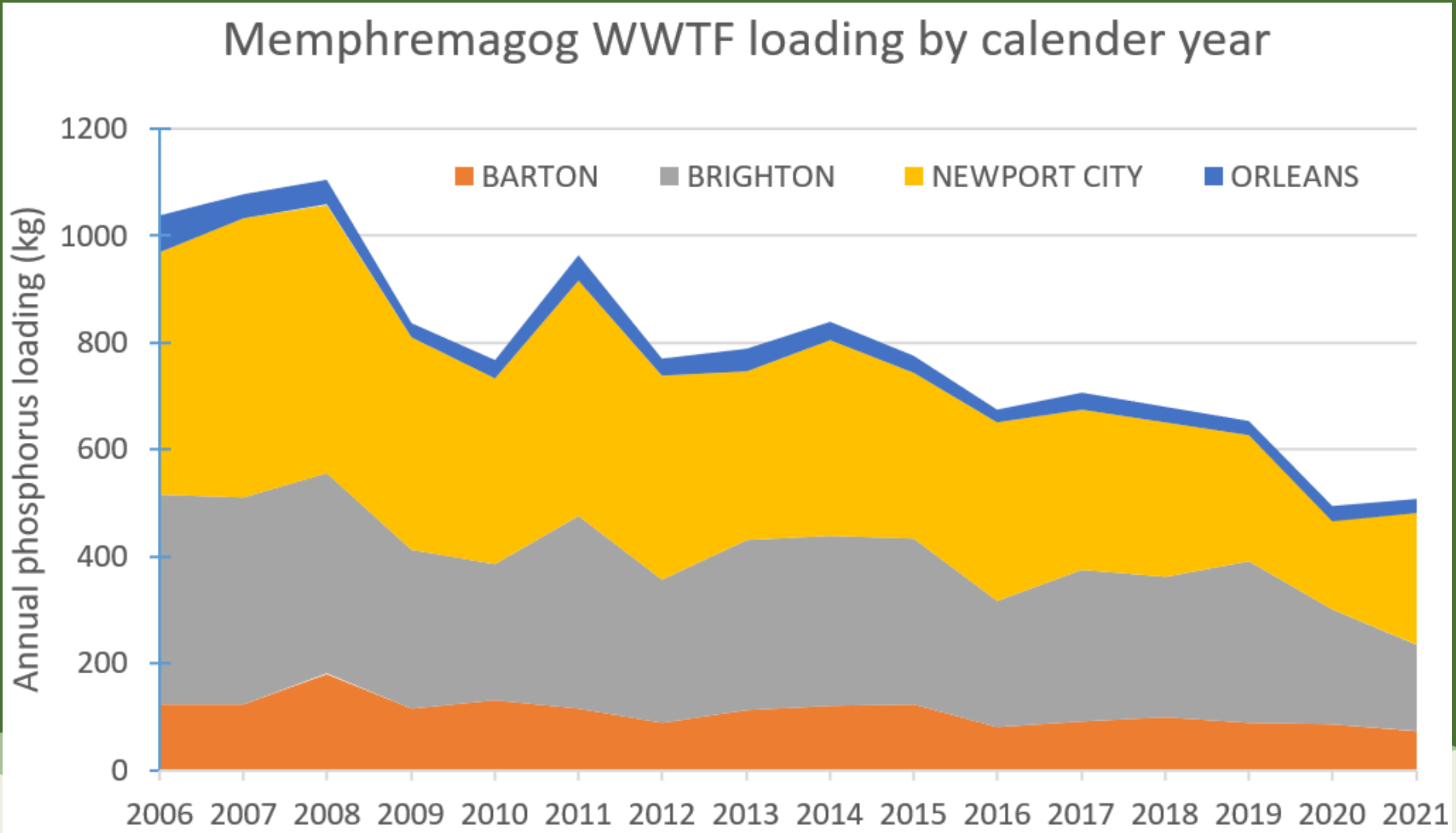
VT-17 Lake Memphremagog Basin Agricultural Practice Accounting








Memphremagog WWTF loading by calender year
BARTON
BRIGHTON
NEWPORT CITY
ORLEANS
Annual phosphorus loading (kg)
1200
1000
800
600
400
200
0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021

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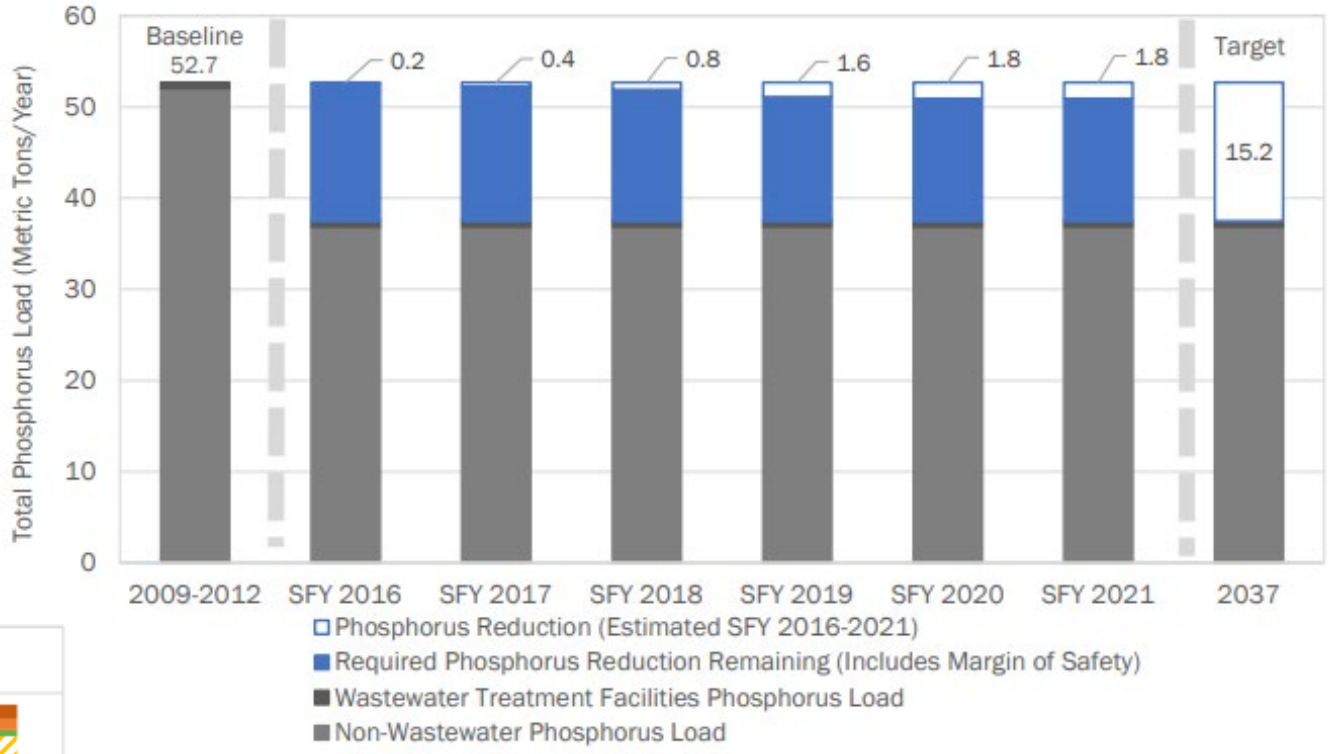
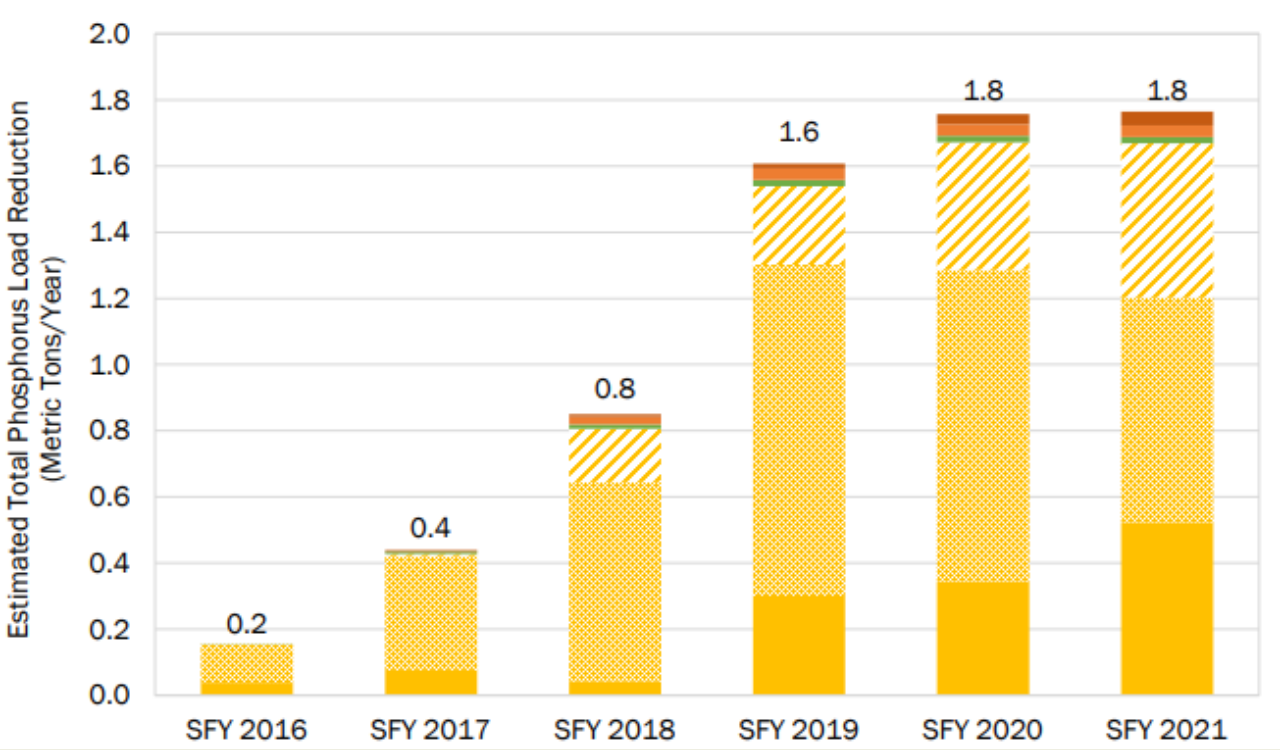
Clean water performance report – Memphremagog TMDL TP reductions





- State-Funded & Regulatory Roads
- State-Funded & Regultory Stormwater
- State-Funded Natural Resources
- Regulatory Agriculture (Production Area Compliance)
- Federally Funded Agriculture
- State-Funded Agriculture

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Draft Strategies:

AGRICULTURE

Agriculture

- Conservation practices that reduce sources of pollution from farm production areas and farm fields.

DEVELOPED LANDS

Developed Lands--Stormwater

- Practices that reduce or treat polluted stormwater runoff from developed lands, such as parking lots, sidewalks, and rooftops.

ROADS

Developed Lands--Roads

- Stormwater and roadside erosion control practices that prevent erosion and treat road-related sources of pollution.

WASTEWATER

Wastewater

- Improvements to municipal wastewater infrastructure that decrease pollution from municipal wastewater systems through treatment upgrades, combined sewer overflow (CSO) abatement, and refurbishment of aging infrastructure.

NATURAL RESOURCES

Natural Resources

- Restoration of "natural infrastructure" functions that prevent and abate pollution. Natural infrastructure includes: floodplains, river channels, lakeshores, wetlands, and forest lands.

- Target outreach and funding in sub watersheds where there are substantial remaining opportunities for Agricultural field practices (using pay for phosphorus and other incentives.)
- Expand partner capacity and funding to develop and implement Lake Wise practices.
- Coordinate riparian/wetland restoration efforts between partners including piloting smaller processed based restoration techniques
  - Develop Memphremagog specific phosphorus reduction estimates through the FFI.
- Identify and implement private and forest road erosion control projects, using alternative funding models (state and CWSP funding)

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Lake Memphremagog Tactical Basin Planning Timeline

July – Dec 2021

- ❑ Public Survey
- ❑ Gather maps & data from DEC
- ❑ Update report card

Jan - April

- ❑ Gather external information
- ❑ Local work group and BWQC presentations
- ❑ Draft Strategy table

May - July

- ❑ Sector specific meetings
- ❑ Complete preliminary draft of plan
- ❑ Early review of draft plan

Aug – Sept

- ❑ Internal and partner review of draft plan
- ❑ Incorporate feedback into plan
- ❑ Draft final plan

Oct - Nov

- ❑ Release final draft of plan
- ❑ Hold public meetings

Dec 2022

- ❑ Address comments
- ❑ Release Final Plan

Questions about the process?