

# Wetland Mapping of the Missisquoi Basin

A new tool for better planning.

Presented by Brock Freyer & Laura Lapierre  
State of VT Wetlands Program  
September 18, 2019



VSWI Map



New Wetland  
Mapping

**Call in for Audio: 802-231-4834  
(Please Mute Phones)**

# Wetlands Program Homepage

Administration and Innovation

Air Quality and Climate

Drinking Water and Groundwater

Environmental Assistance

Environmental Enforcement

Facilities Engineering

Geological Survey

Waste Management and Prevention

Watershed Management

- Business and Operations
- Clean Water Initiative
- Lakes and Ponds
- Monitoring, Assessment and Planning
- Rivers
- Stormwater
- Wastewater
- Wetlands**
- Permit Information
- What is a Wetland?
- Wetland Functions and Values



## Welcome to the Wetlands Program

The Vermont Wetlands Program is responsible for identifying and protecting wetlands and the functions and values they provide by the implementation of the [Vermont Wetland Rules](#). Activities to achieve these goals include education, project review, and enforcement.

**UPDATE: Program verification of wetland boundaries will be ending soon for the year. Once the growing season is over, the verification of wetland boundaries will need to take place in the spring. Please be patient in receiving a response as staff are in the field typically twice a week. To request a site visit, use our inquiry portal by clicking "Contact Wetlands Staff" on the left of the page.**

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email address

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Quick Links

What's New

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# Overview

- State Wetland Protection
- Why Update Maps?
- Use of Maps
- How Maps Were Updated
- How you can access the maps
- Future of VT Wetland Mapping

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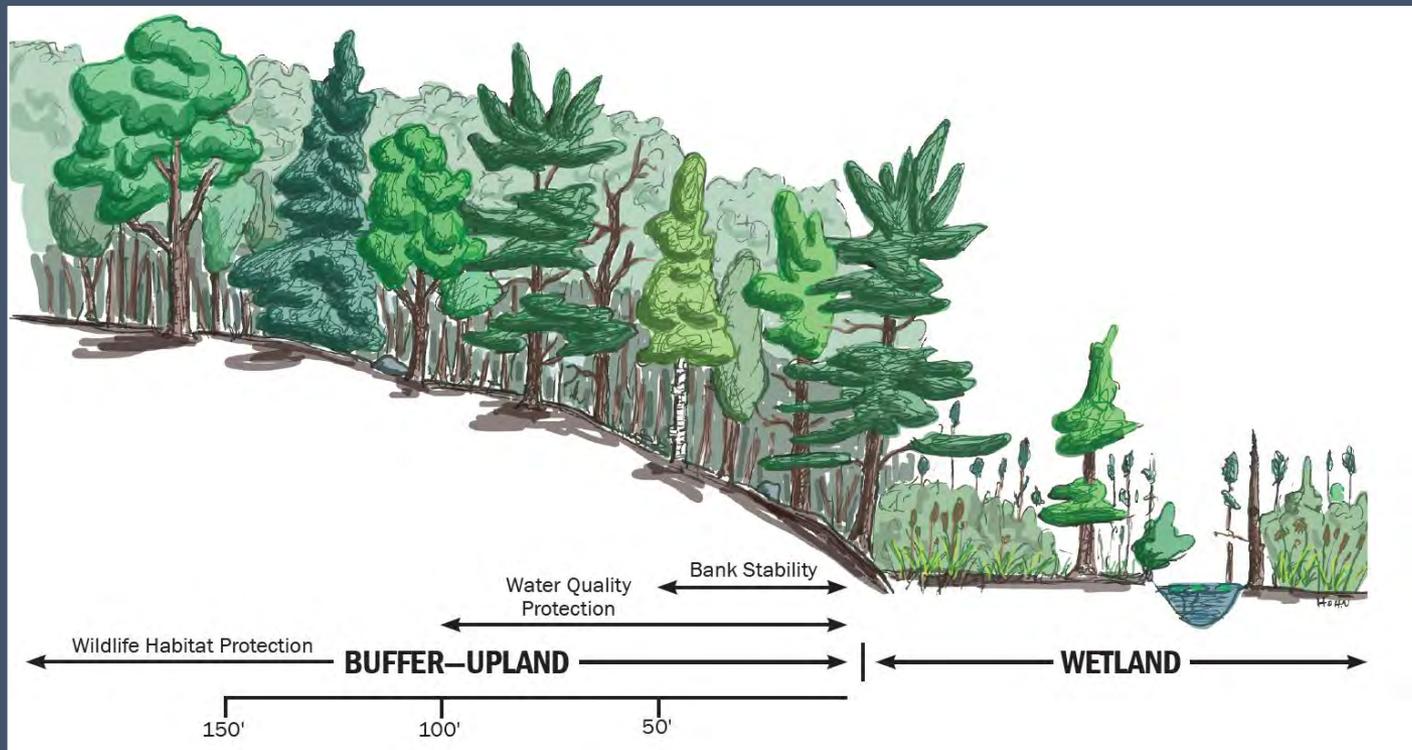
# Jurisdiction based on the extent of...



**10 FUNCTIONS and VALUES**

# VT Wetland Classification

Based on an evaluation of the extent to which the wetland provides functions and values: Class I (100ft + buffer), Class II (50ft buffer), Class III (no buffer, no state regulation)





# Wetland Mapping Products

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- **National Wetlands Inventory (NWI)**
- **Vermont Significant Wetlands Inventory (VSWI)**
- **Vermont Wetland Advisory Layer**
- ⊙ **Hydric Soils (overestimate, but helpful)**

# Map Uses

- *Preliminary* site assessments
- Refuge/park planning
- Watershed planning
- Environmental Impact Assessment reports
- Spill contingency plans
- Land appraisals
- Wildlife surveys
- Identify potentially regulated areas
- Assessment for property taxes (IN, IL)
- Locate hunting, fishing, trapping, birdwatching spots
- Get a general idea of wetland distribution

# Map *Misuses*

- ⊘ To determine absence of wetland on a parcel
- ⊘ To determine if you need a permit



# Beyond Mapping, Contact Staff

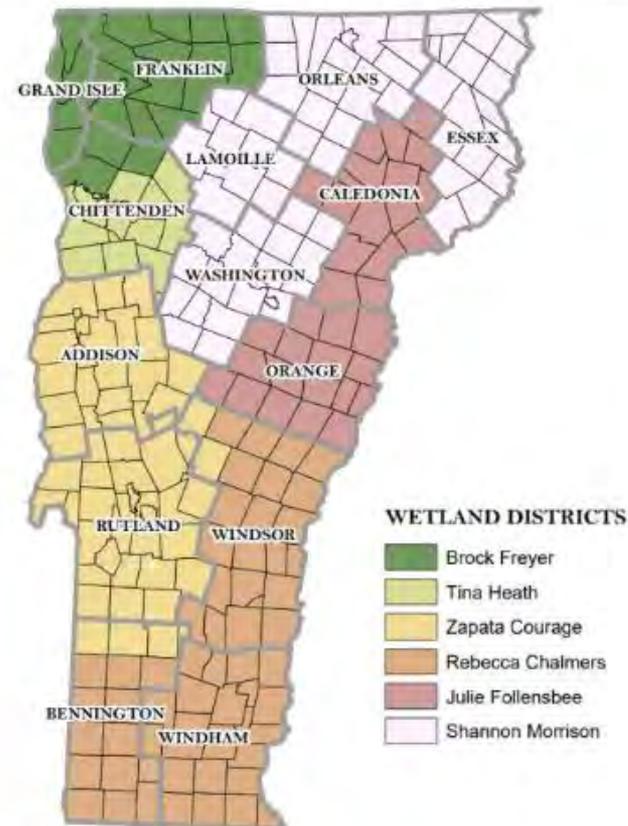
## CONTACT WETLANDS STAFF

### Wetlands Contact and Inquiry Portal

Make contact with the Wetlands Program by emailing the appropriate ecologist using the Contact Map located below. Locate the county your wetland or area of concern is in and choose the INQUIRY TOPIC under the correct ecologist. [Click here to create a location map.](#)

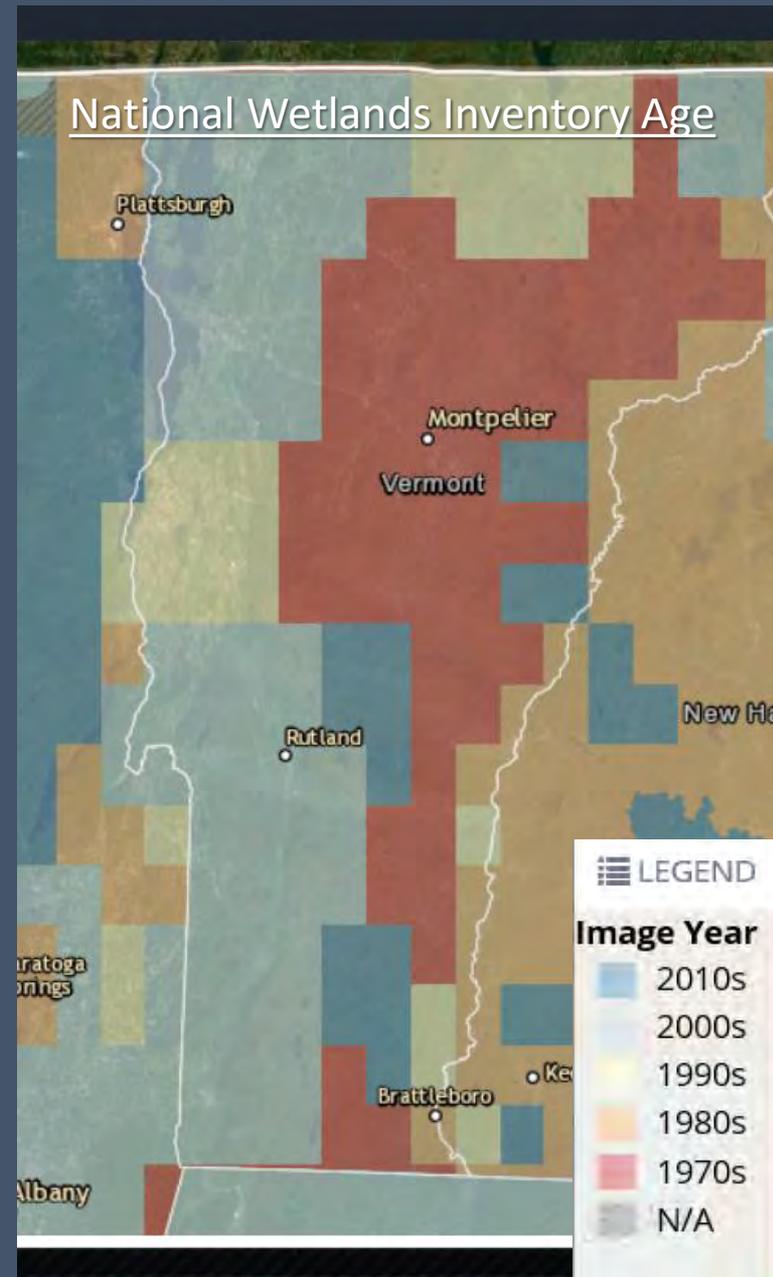
#### Brock Freyer (Franklin, Grand Isle counties, and the towns of Colchester, Milton, and Westford)

- [Request Education, Training and Outreach Support](#) - schedule wetland training, presentations, and other outreach activities.
- [Request a Field Visit](#) - Request the a property visit with landowner permission to review wetland presence and concerns for projects or land purchase.
- [Request Project Review](#) - Request review of design plans for a proposed project with wetland concerns.
- [Request Status of Pending Permit](#) - Find out the status of an existing wetland permit or wetland permit application.
- [Report a Wetland Complaint or Violation](#) - Report activity in a wetland or wetland buffer that may be in violation of the VT Wetland Rules.
- [Other Inquiry or General Question](#) - Ask a question that is not covered in the other topics.

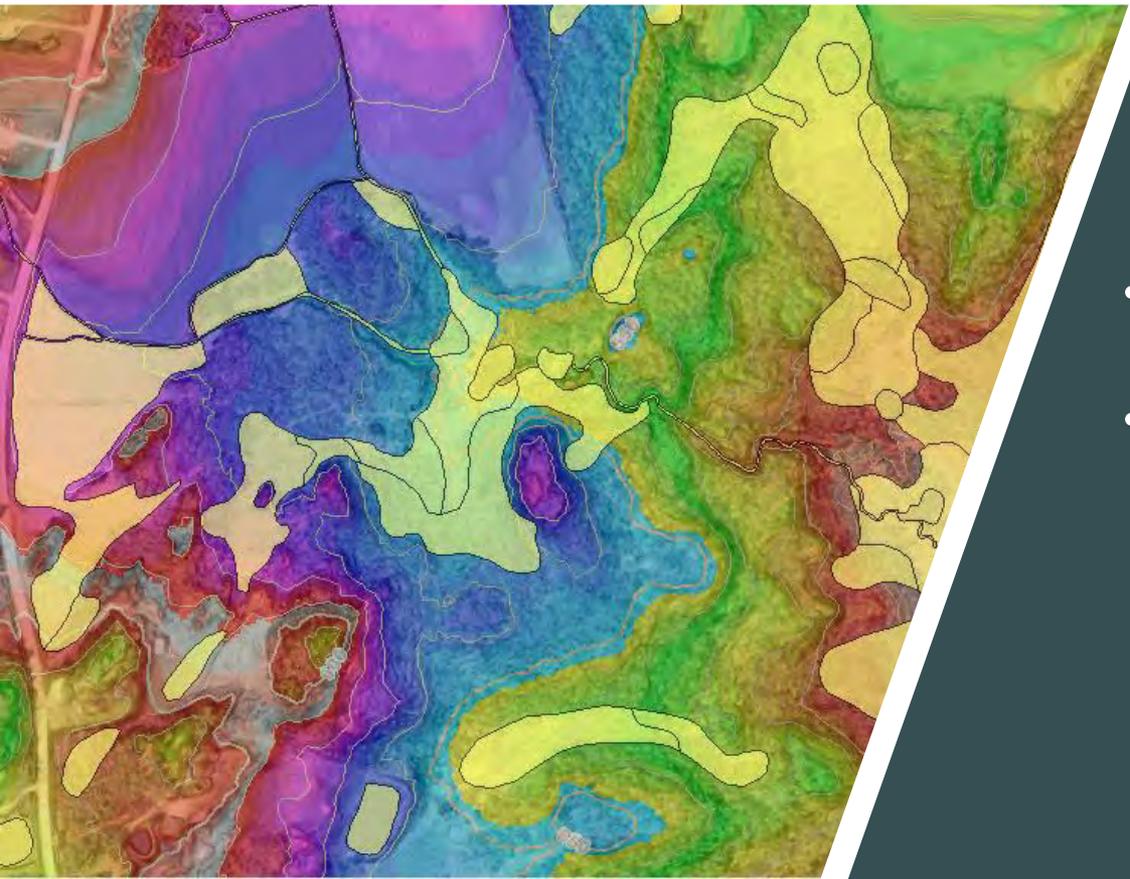
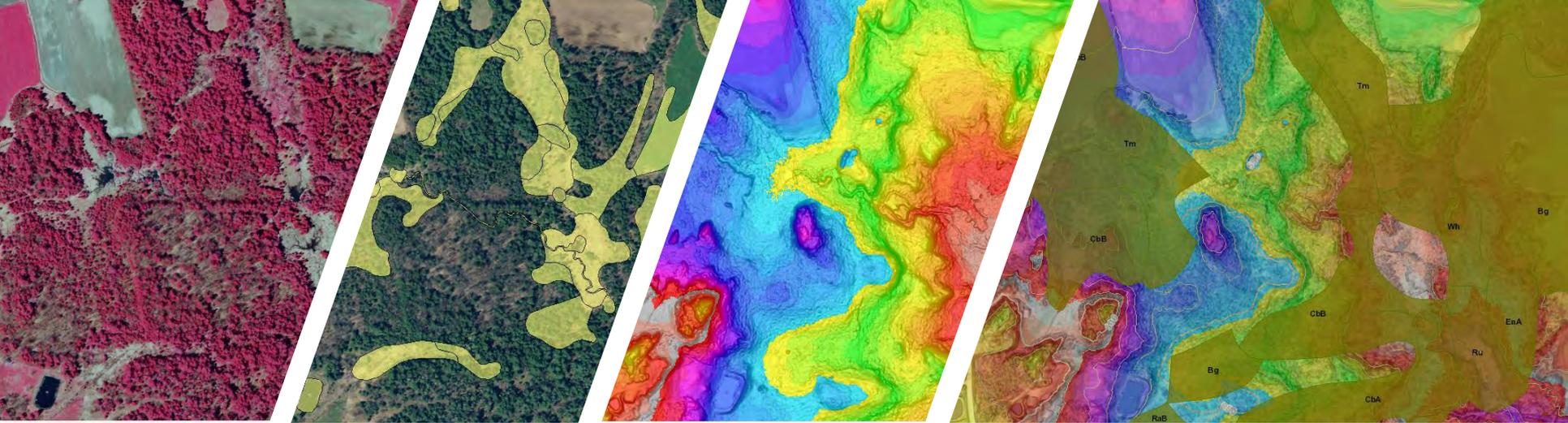


# Why Update?

- Heavily utilized tool
- Outdated
- Better techniques
- Better technology







# How'd we map all these wetlands?

- Wetland Program Development Grant (Thanks EPA!)
- Hire a pro (Great work St. Mary's University of MN – GeoSpatial Services)
  - Imagery/CIR
  - LiDAR
  - Soils
  - Field Data
  - NWI+ Coding

# NWI+: LLWW Classifications

- Cowardin Coding, plus...oh my!
  - Landscape Position
  - Landform
  - Water Flow Path
  - Waterbody Type

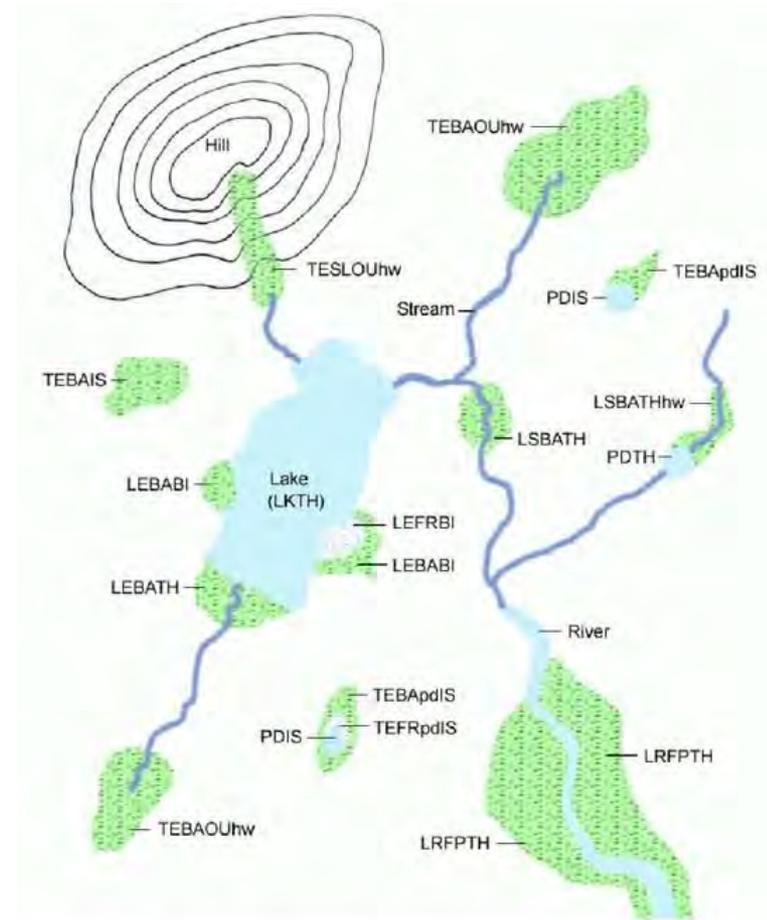


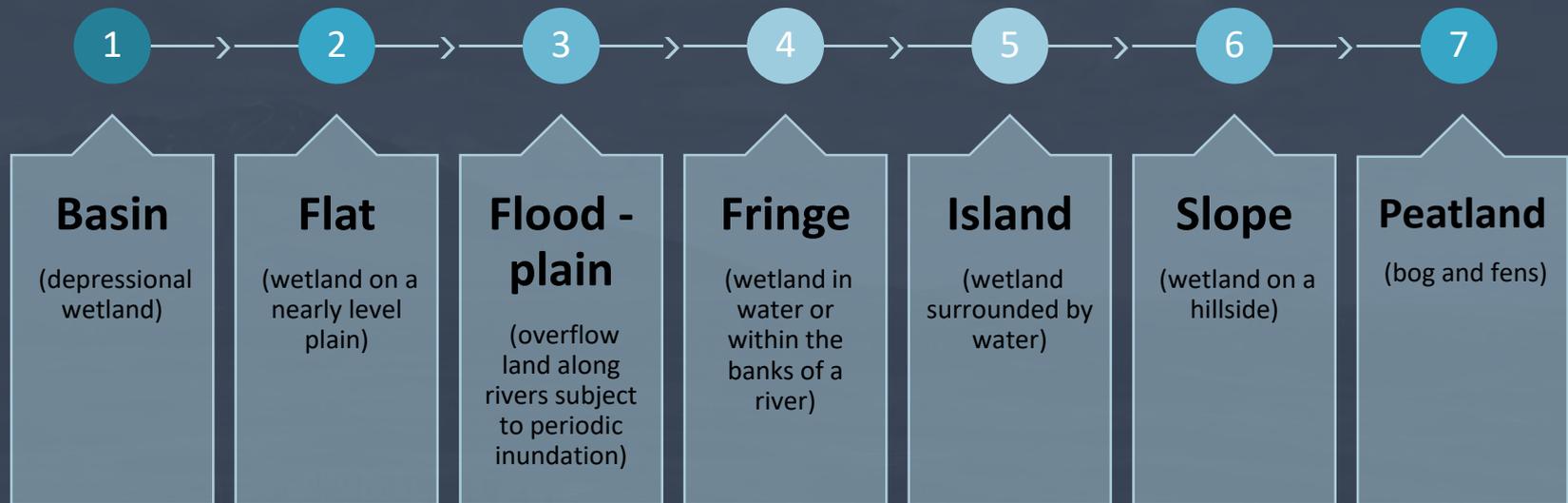
Figure 1. Application of LLWW descriptors to a region with nontidal wetlands. Landscape positions: LR – lotic river, LS – lotic stream, LE – lentic, and TE – terrene; Landforms: BA – basin, FR – fringe, FP – floodplain, SL – Slope; Water flow paths: OU – outflow, IS – isolated, TH – throughflow, BI – bidirectional-nontidal; other descriptors: pd – pond (association), hw – headwater; Waterbodies: PD – pond, LK – lake. Note: Landscape position can be added to lakes and ponds if desirable.

# LLWW - Landscape



\*Marine and Estuarine not found in VT

# LLWW - Landforms



# LLWW – Waterbody Type



River

Stream

Lake

Pond

Estuary\*

Ocean\*

# LLWW - Water Flow Path

<b>Bidirectional-outflow (BO)</b>	Water levels rise and fall with water in an outflow lake
<b>Bidirectional-throughflow (TB)</b>	Water levels rise and fall with water in a throughflow lake
<b>Outflow-artificial (OA)</b>	Water flows out of the system through a ditch or manmade channel; no direct surface water inflow
<b>Outflow-intermittent (OI)</b>	Water flows out of the system periodically usually during the wet season or during and shortly after heavy rains; no direct surface water inflow; typically associated with intermittent streams and groundwater discharge; may be the source of a stream
<b>Outflow-perennial (OU)</b>	Water flows out of the system year-round; no direct surface water inflow; typically associated with perennial streams, rivers and groundwater discharge; often the source of a stream
<b>Throughflow-artificial (TA)</b>	Water enters from a water source above and flows out of the system via a ditch or manmade channel or canal
<b>Throughflow-intermittent (TI)</b>	Water enters from a water source above and flows out of the system via an intermittent stream; flow usually occurs during the wet season or during and shortly after heavy rains
<b>Throughflow-perennial (TH)</b>	Water flows through the system more or less year-round via a perennial stream; wetlands subject to seasonal overflow
<b>Vertical Flow (VR)</b>	Water levels affected by precipitation, local runoff and groundwater; no apparent surface water inlet or outlet

# How to access the maps

**VERMONT** Wetlands Inventory Map  
Vermont Agency of Natural Resources vermont.gov

**Map Layers**

- Wetland Map**
  - Wetland Projects
  - Wetland
  - Wetland Inquiry
  - Wetland Inquiry (Status)
- Fish and Wildlife**
- Watershed Protection**
- Geology**
- Drinking and Groundwater Protection**
- ANR Basemap Data**
  - Buildings (ES1)
  - Act250 Permits \*\*INCOMPLETE\*\*
  - Roads
  - Waterbody
  - Stream
- Watershed Boundary Dataset**
  - Fim etc (where available)
  - Designated Downtown Areas
  - Designated Village Areas
  - Town Boundary
  - County Boundary
  - District Ecologist Territories
  - Slope
- Elevation - Vermont DEM (30 meter)**
- Imagery Layers**

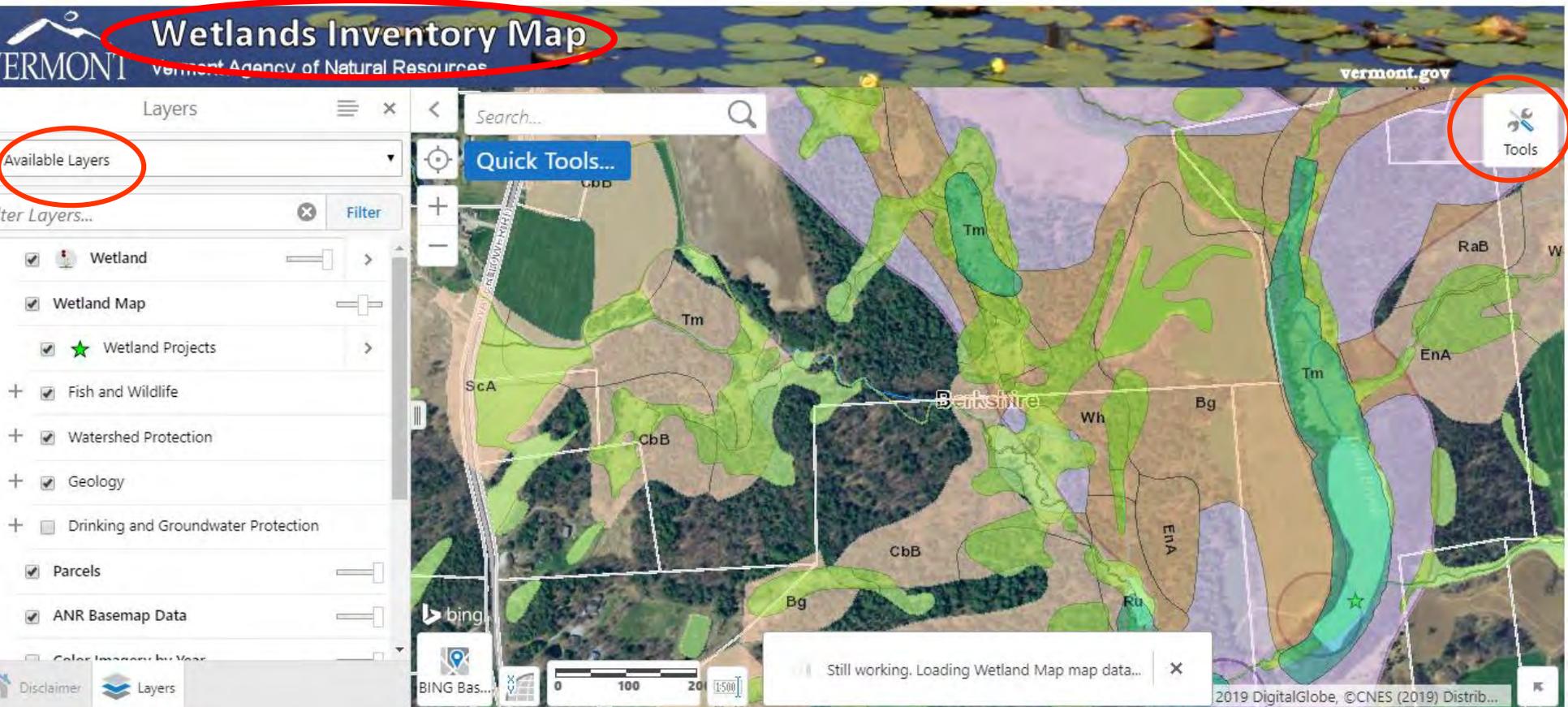
Show Legend Filter...

Disclaimer Map Layers

2500ft 1km

© AND © 2010 NAVTEQ © 2016 Microsoft Corporation Earth

Disclaimer: Mapping products are for planning purposes only. Despite our best efforts, not all wetlands are mapped (or correctly mapped)!



# How to navigate the maps



The screenshot shows a web-based map application. On the left, a sidebar titled "Identify Results (5)" lists five categories: (1) Parcels (standardized), (1) Wetlands - VSWI, (1) Wetlands - VSWI Advisory Layer, (1) Soils - Hydric, and (1) GroundWaterSPA. The main map area displays various colored regions labeled with codes like CbB, Tm, Bg, ScA, Ru, RaB, Wh, and EnA. A "Quick Tools..." menu is open over the map, listing options: "Find data on the map", "Draw a Point", "Plot a Coordinate", "Add Some Text", and "Center the Map Here". A coordinate popup shows "Lat: 44.94247° N" and "Lon: 72.78798° W". At the bottom, there is a scale bar (0, 100, 200, 1500) and copyright information: "© 2019 Microsoft Corporation, © 2019 DigitalGlobe, ©CNES (2019) Distrib...".

# How to understand the maps

# Wetland Mapping Future

- Securing funding for Little Otter Creek – Lewis Creek – Otter Creek Tactical Basin wetland update.
- Exploring ways to allow third-party additions to the Advisory Map.
- Updating VSWI with permits.
- Proposal to remove jurisdictional mapping to allow for one state wetland layer.



- Who houses all of this data?
- What does this mean for newly mapped wetland areas?
- When is this mapping available?
- Where ARE all the wetlands?
- Why can't all wetlands be mapped?
- How can my Town get updated wetland mapping?

