

State Specific Training Module for Vermont



Purpose of this Module

This module will provide some general information that TSPs need to conduct conservation planning in our state. This information is general in nature so the TSP may need to follow up with additional reading or training to make sure they have the knowledge, skill, licenses and certifications to conduct conservation planning in this state.



Overview of Vermont

- **Population: 621,760** (2010) - 48th in Nation
 - Largest City: Burlington - 38,889
- Spectacular landscape, generally clean environment,
- Agriculturally based rural communities
- Tourism is a big contributor to economy- especially skiing,

- **Number of Farms: 7,000**
 - Average Farm Size: 177 acres
 - Total Farmland: 1.2 million acres
 - Ag products include: apples, corn, hay, greenhouse & nursery products, Christmas trees, maple syrup, fruits and vegetables, dairy, beef, poultry, sheep, forest products, etc.
 - **Dairy** represents ~ 72% of Vermont's total agricultural economy

- VT - biggest producer of **maple syrup** in the United States



- VT - world famous for **Morgan horse** breed

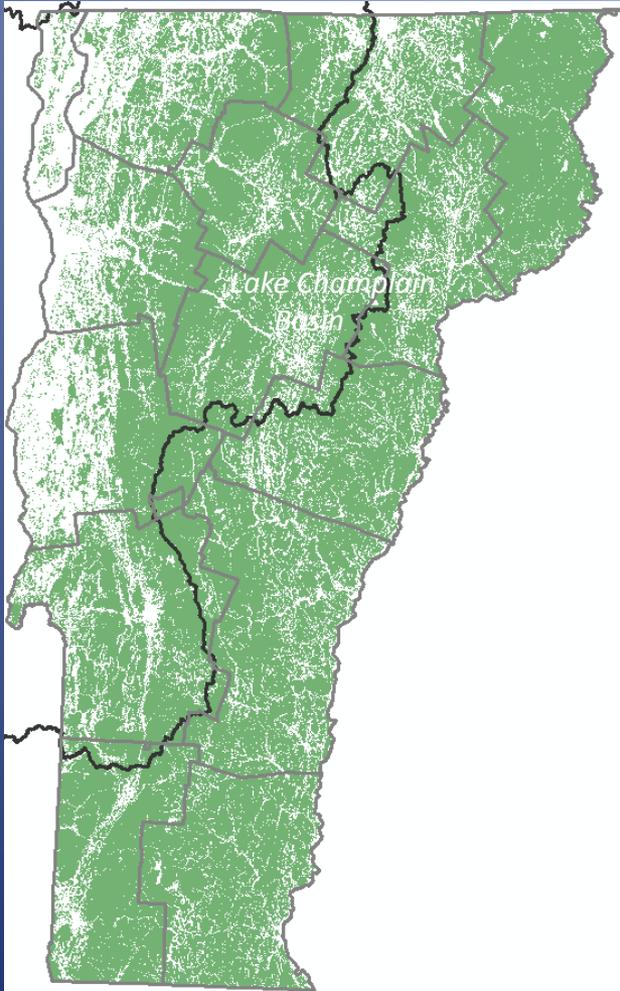


- Vermont –well known for **stone quarries & products** (marble, granite and slate). VT marble used in American monuments and government buildings, including the Jefferson Memorial and Supreme Court.



-**Forest** comprises approximately 70-75% of the VT landscape. -Over 80% of forestland is **privately** owned.



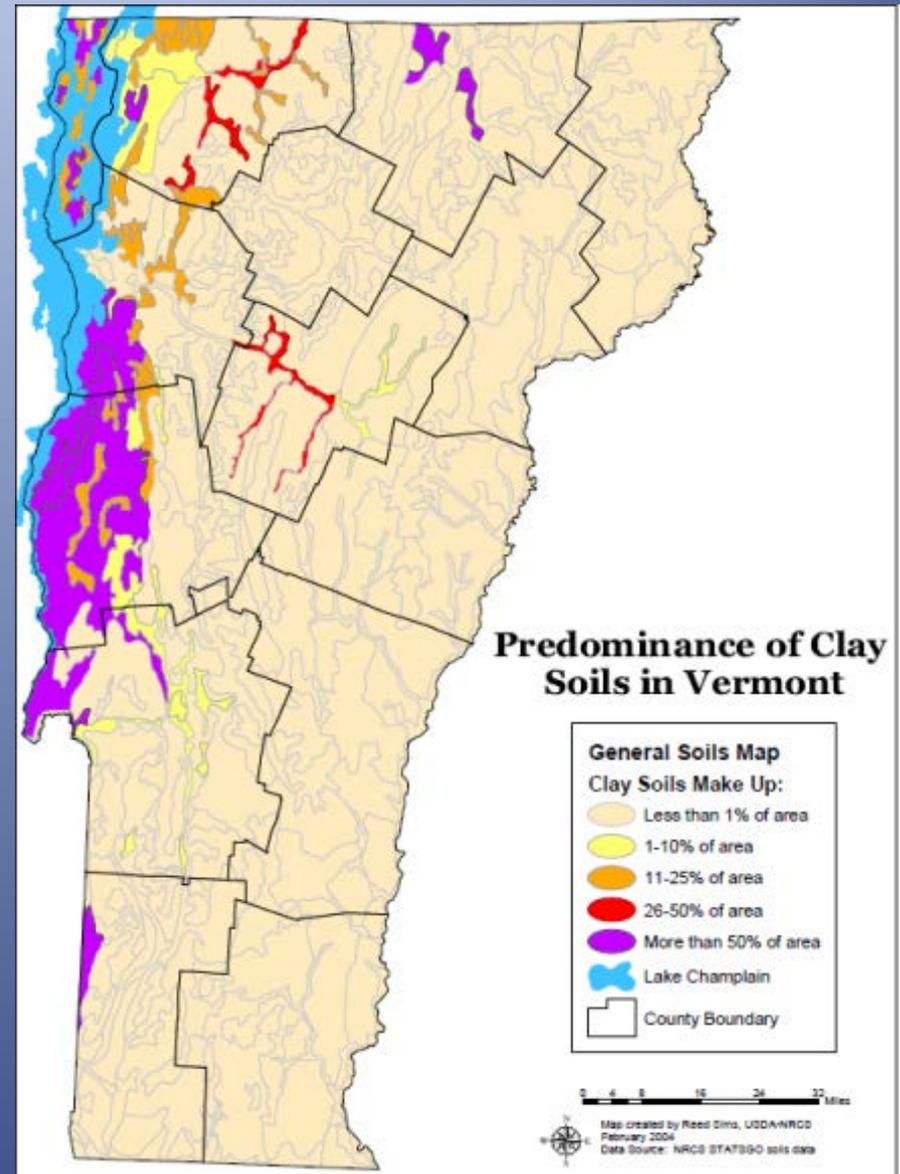


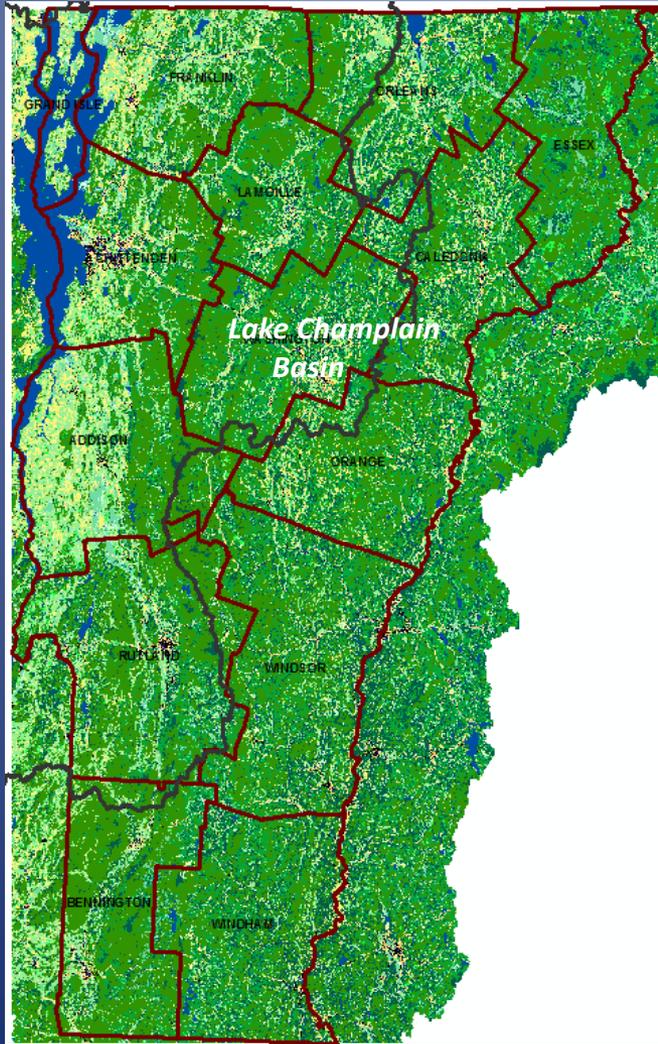
Forest Cover In Vermont

7,051 square miles

- Weather is very changeable & four distinct seasons.
- **Agricultural Growing Season – Very Short**
ranges 120 (uplands) to 180 days (valleys).
(this can make it difficult to be successful with some conservation practices (cover crop, residue management))
- **Terrain** ranges from
 - relatively flat to moderately sloping (Lake Champlain valley and river valleys) , to
 - very hilly and often quite rocky (especially in the Green Mountains)

- **Soils** – Wide variety of soils (nearly 200 Soils in VT)
- Most fertile land is near Lake Champlain and in the Connecticut River Valley
- Soils generally either Lacustrine Clay or Glacial Till
- VT soils generally have good potential for agriculture or forestry.





General Land Cover In Vermont

Dark Greens are Forest

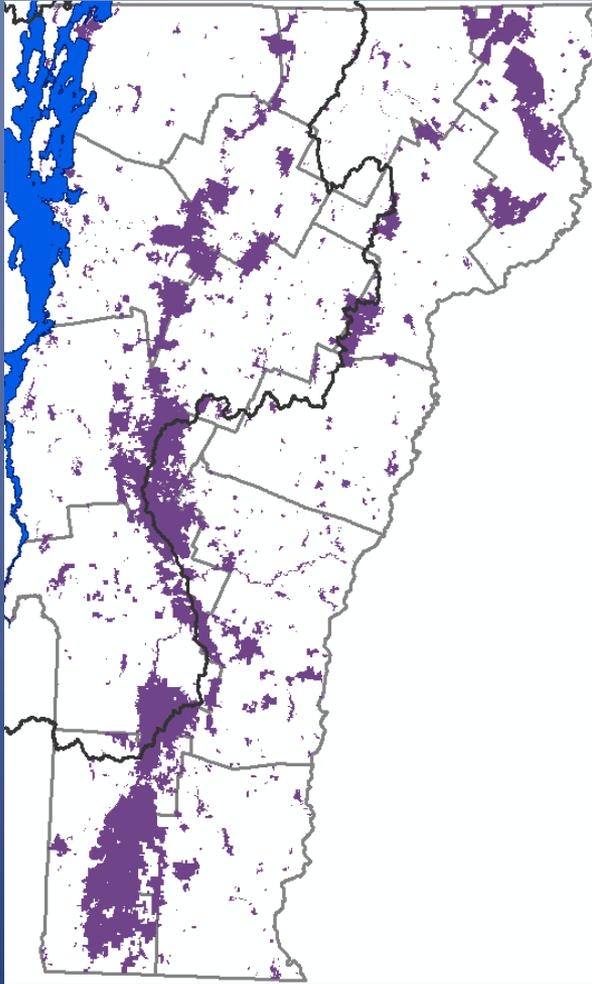
Light Green and Yellow are Crop, Hay and Pasture

Black is Developed Land (residential and commercial)

Turquoise is Wetlands

Blue is Water

Source: National Land Cover Data, 2011



Conserved Land In Vermont

1,046 square miles in the State (15% of land) are conserved, public lands including wildlife areas, parks, farm easements, wetlands and National Forest Land.

Total land area of the state is 9,614 square miles.

- **Dairy Farms:**

- Dairy Farms in VT

- **1964 = 7,000 +**

- **2012 = 995** (approx. 3% loss/year currently)

Average Vermont dairy farm ~ 130 cows.

- Dairy Farm Sizes range from under 100 milkers with less than 100 acres of ag-land,

- Up to 2,000 + milkers with 2,000 - 3,000 acres of Agricultural Land (annual crops, hay, pasture).



- Dairy Farms:

27 LFOs (Large Farm Operations)
(700 mature dairy animals)

142 MFOs (Medium Farm Operations)
(200 to 699 mature dairy cows)



Farm Size by County

County	MFO Count	LFO Count
Addison	39	10
Bennington	2	0
Caledonia	7	1
Chittenden	8	0
Essex	6	0
Franklin	45	6
Grand Isle	4	1
Lamoille	3	0
Orange	7	2
Orleans	12	5
Rutland	3	0
Washington	2	1
Windham	2	1
Windsor	2	0
Total Farms	142	27

- Challenges -- 'Unique Factors':

Manure, Lots of it....

–majority of P from agriculture = manure generated on dairy farms

–often not stored properly, nor applied during times of plant uptake.

–Inadequate storage /poor management = farmers spreading in the late fall or early spring, most often on bare ground.

State law bans spreading
of manure from
December 15 to April 1



- Challenges -- **‘Unique Factors’**:

Economics: The State of Vermont lacks sufficient resources to enforce existing regulations which requires LFOs and MFOs to follow the NRCS 590 standard, plus numerous other requirements.

The price of milk greatly impacts the ability of Vermont dairy farmers to implement significant conservation measures on the farm.



Lake Champlain Basin

Lake Champlain

- Lake is over 120 miles long
- Within Vermont, New York, and the Province of Quebec
- 6th largest freshwater lake in U.S.
- Total basin area = 8,234 sq. miles,
- 56% of the Basin lies in Vermont,
- 2,951,065 Acres in Vermont
- 48% of VT Acres are in the 'Basin'



- Improving Water Quality in **Lake Champlain** = Absolutely Critical
 - Significant pressure from the public and all partners to accomplish positive results



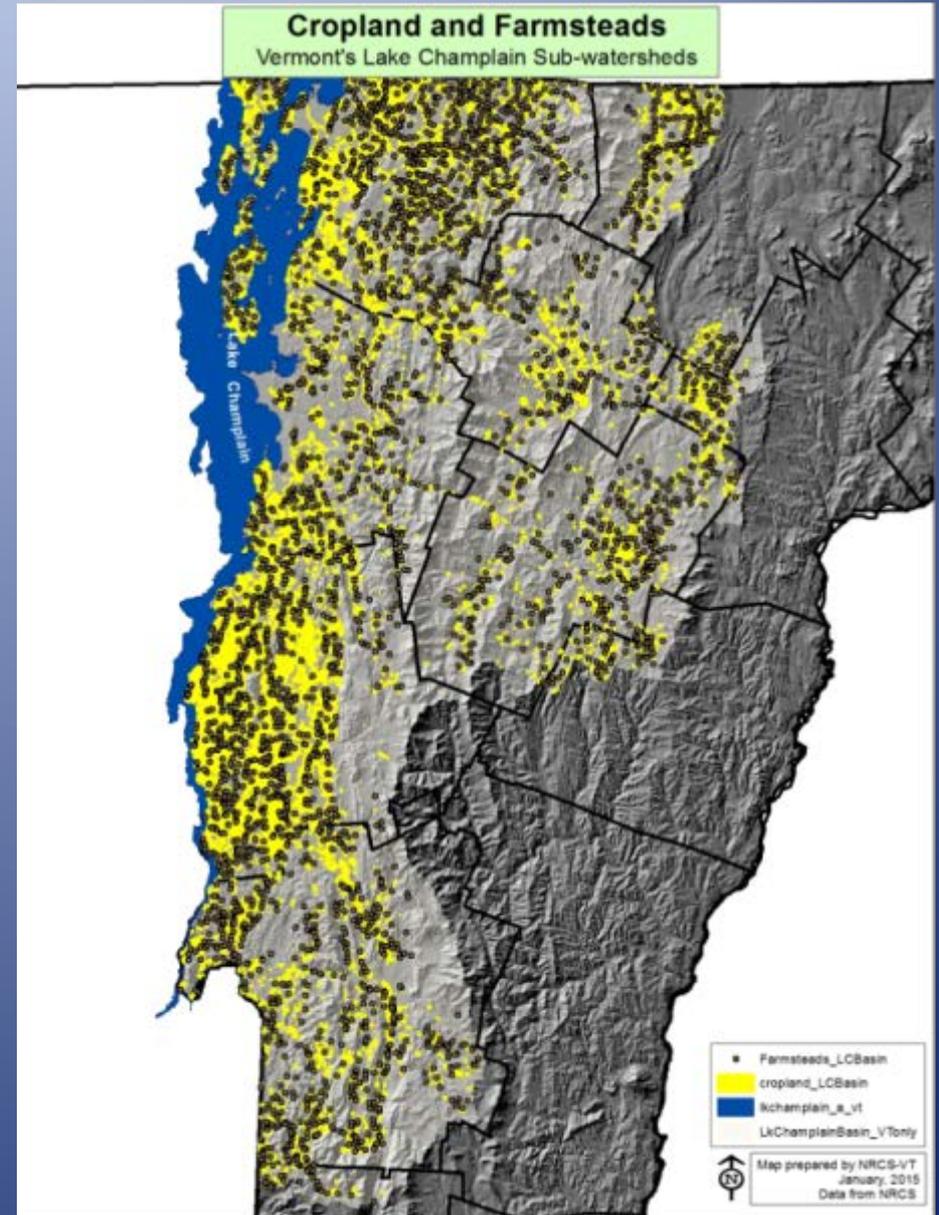
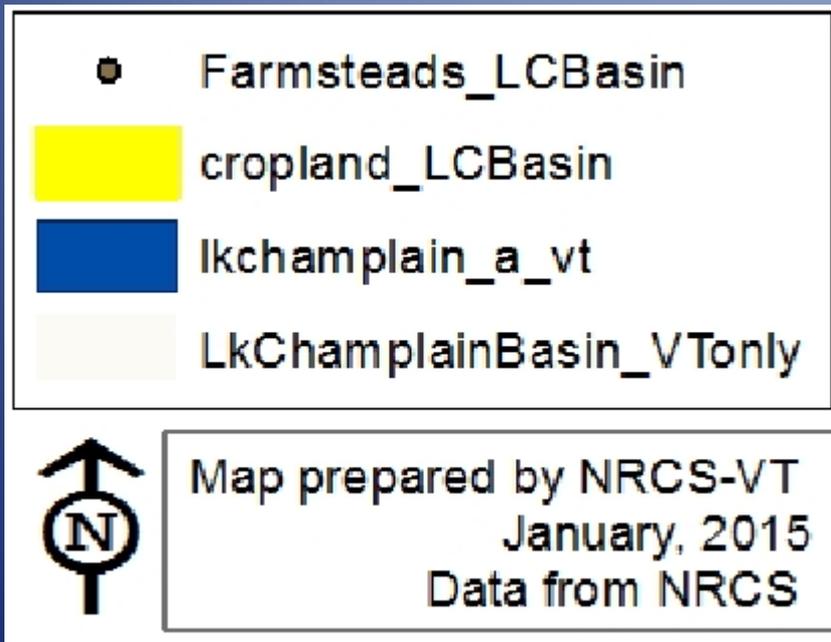
- Efforts to reduce sources of phosphorus have accelerated over the past 10 years but the Lake has been slow to recover
- **Challenges going forward -- 'Unique Factors':**

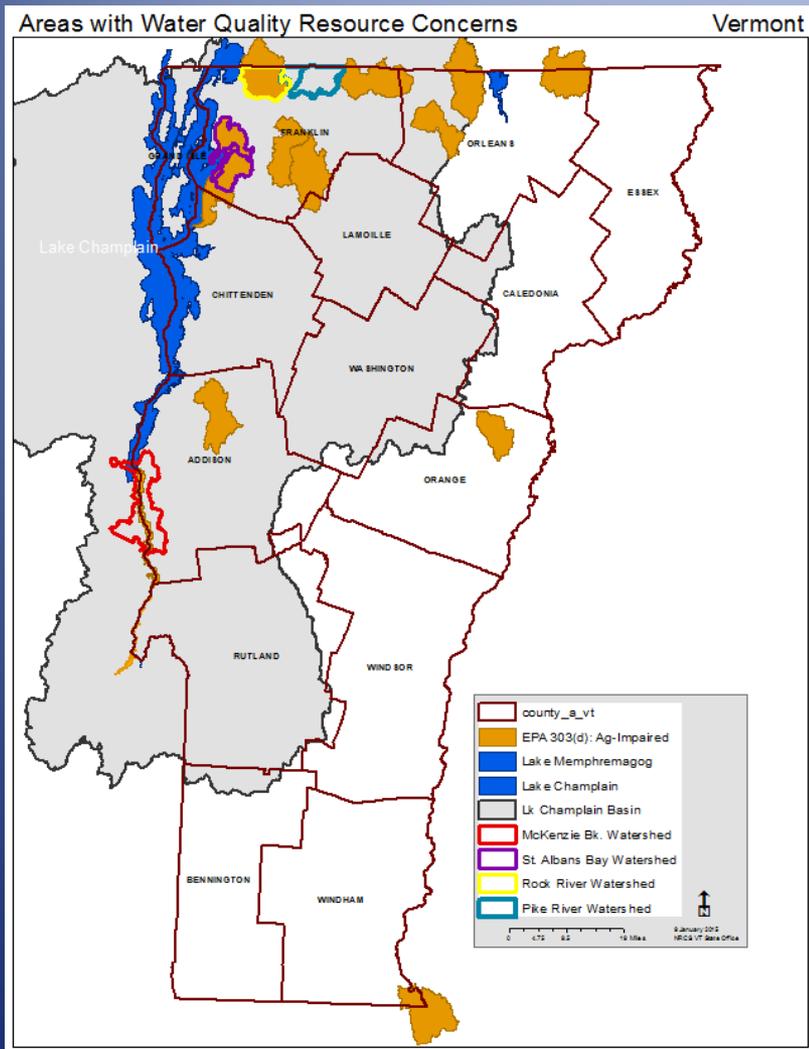
Soils –predominant soil of Champlain Valley is heavy clay
-K factor of .49, some of most erodible soils in the nation

Drainage – most crop fields are either surface or sub-surface drained: facilitates rapid movement of nutrients off the farm fields

Climate –short growing season, farmer perception it is necessary to fall plow (clays) , = barrier to the adoption of cover crops

- There are **Lots of Opportunities** for environmental improvements in VT.



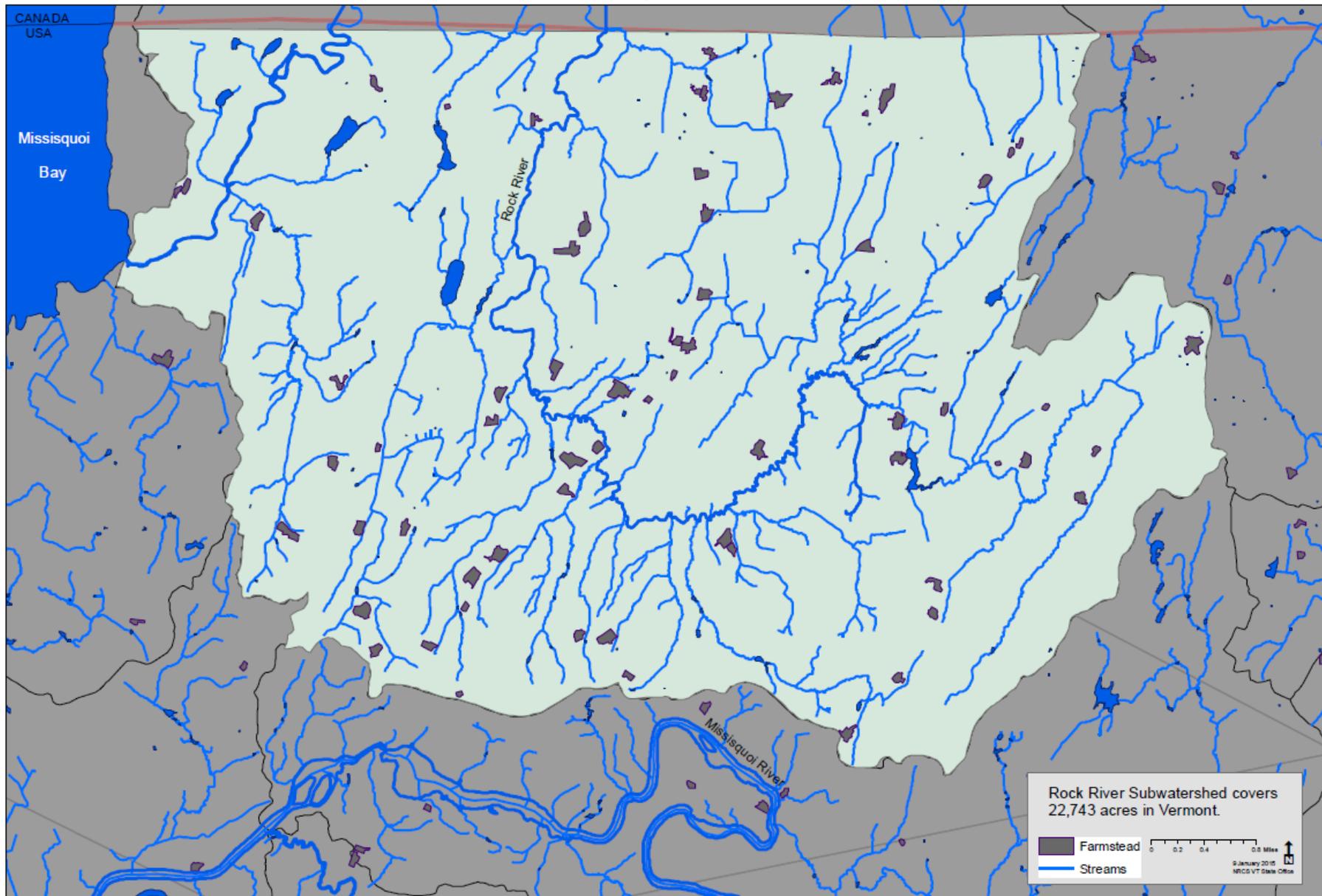


Four watersheds will be the water quality focus areas for USDA and our federal, state and local partners:

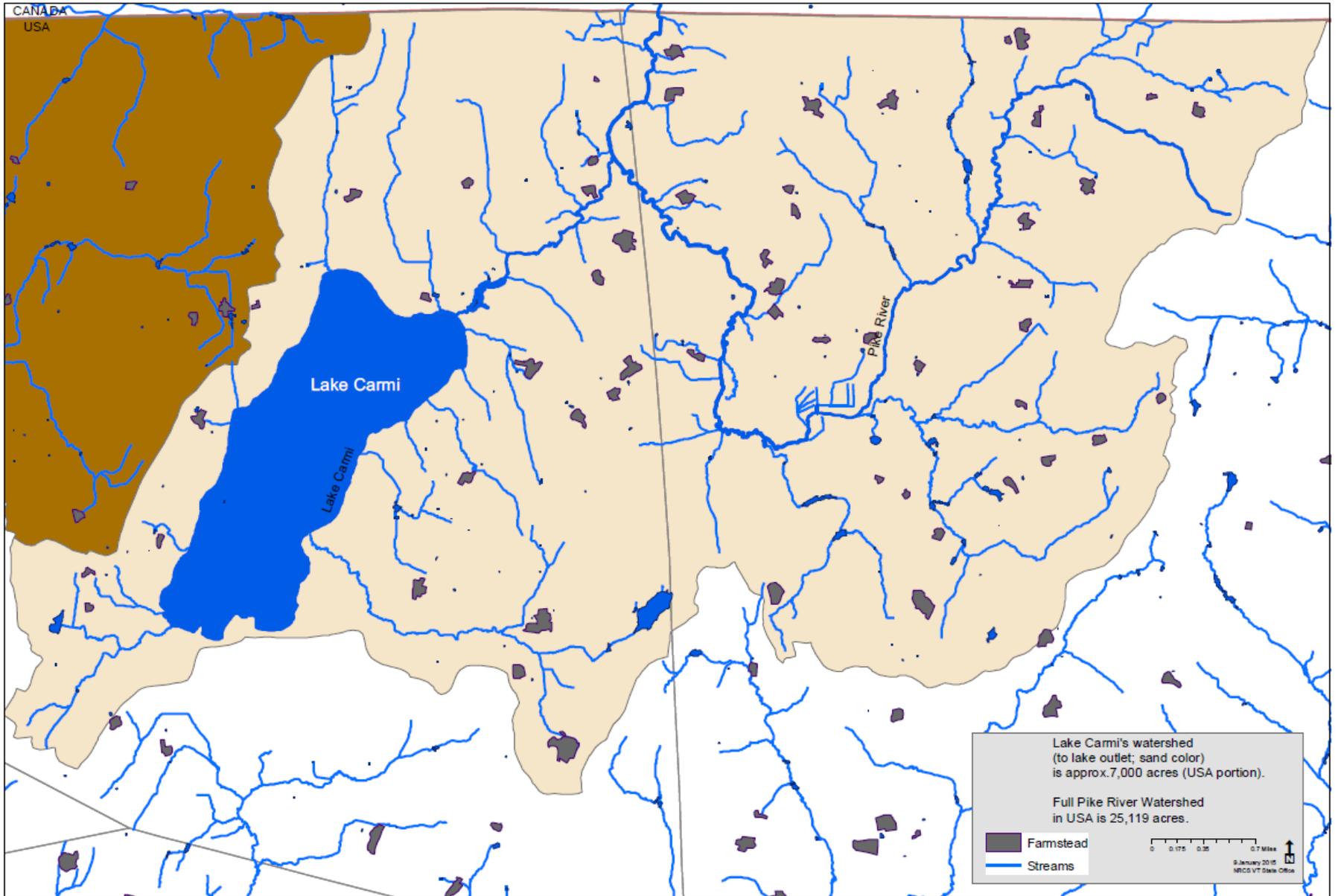
- **Rock River**, northwestern Vermont
- **Pike River** and Lake Carmi, northern Vermont
- **St. Albans Bay**, northwestern Vermont
- **McKenzie Brook**: a collection of small rural watersheds that feed directly to South Lake Champlain, including Hospital Creek and Braisted Brook

In all of these target watersheds, excess contributions of Phosphorus to the waterways and eventually to Lake Champlain is the concern. These watersheds are predominantly agricultural land, so solutions will be developed and implemented within the Ag sector.

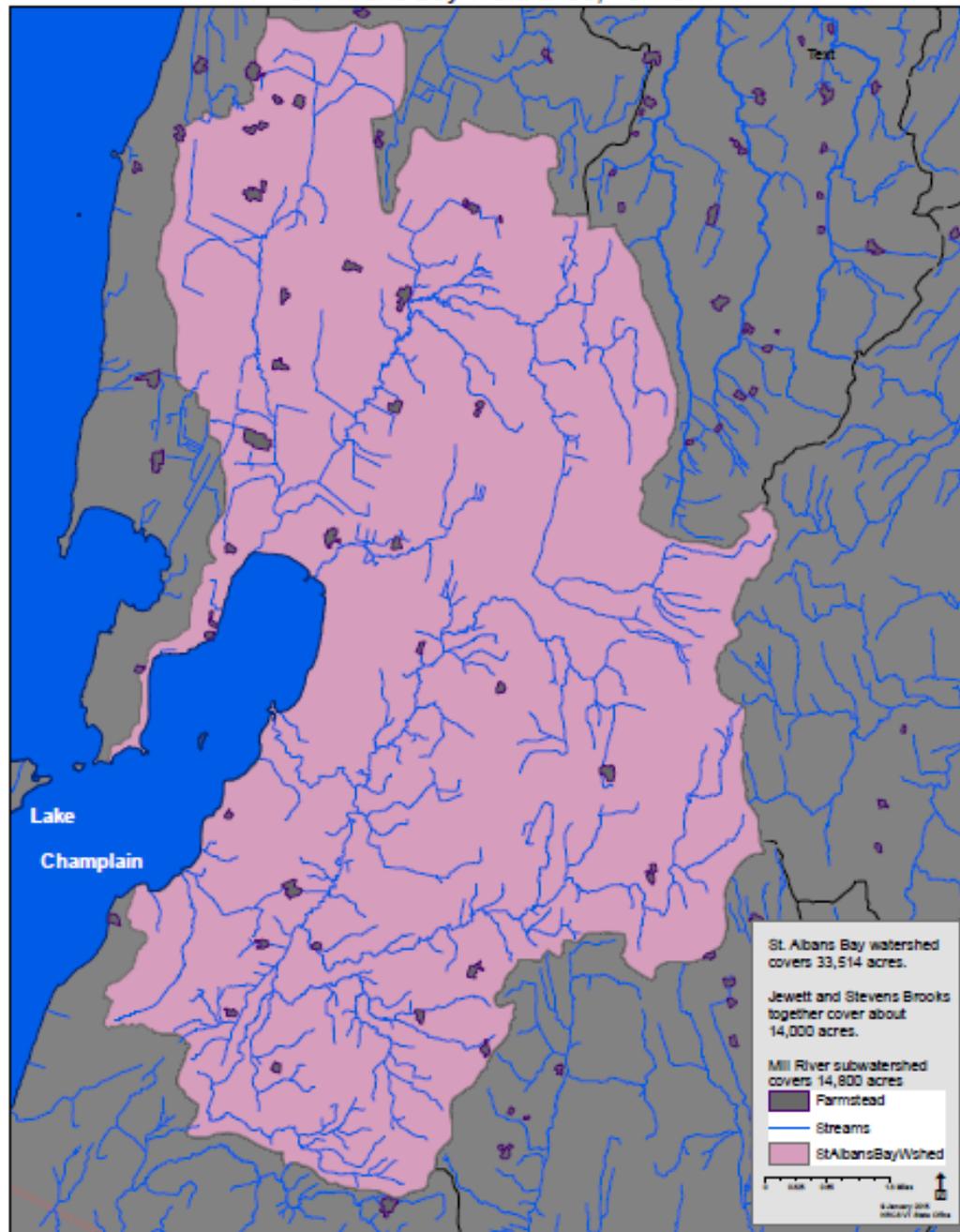
Rock River Subwatershed, Northwestern Vermont



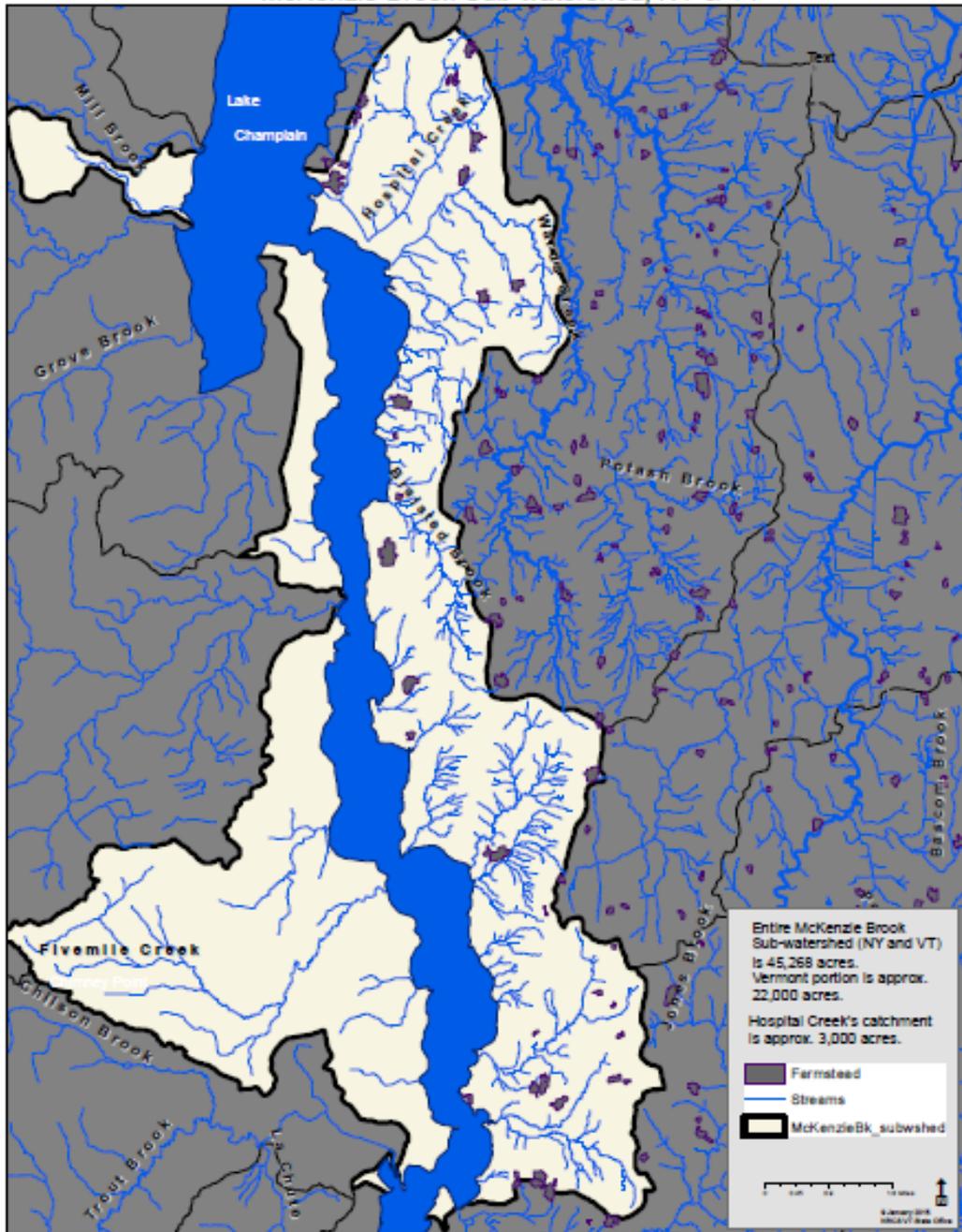
Lake Carmi and the Pike River Watershed, Northern Vermont



St. Albans Bay Watershed, Vermont



McKenzie Brook Sub-watershed, NY & VT



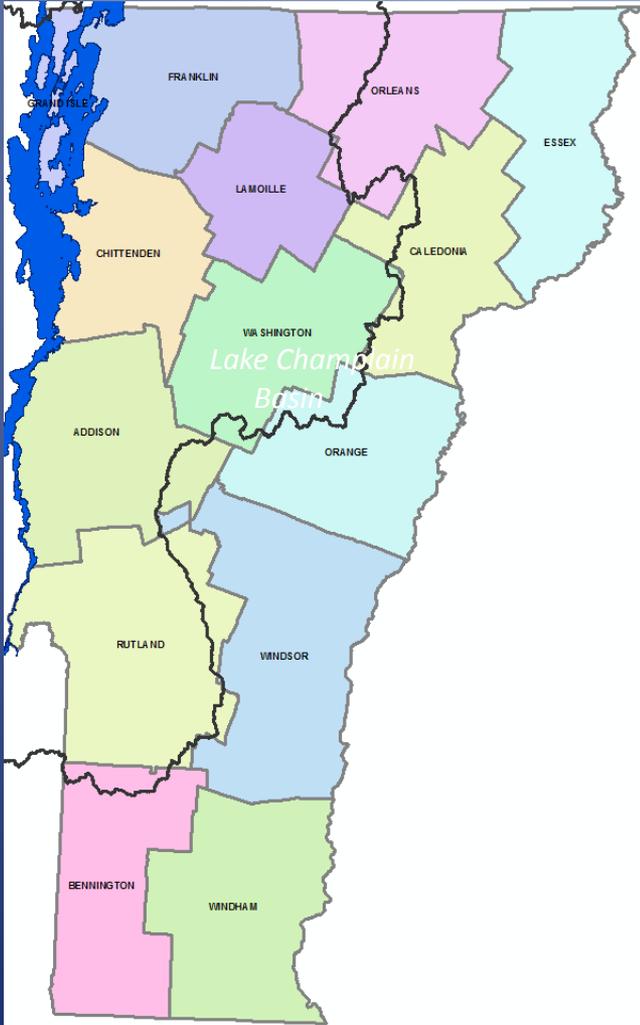


Water Quality Resource Concerns in Vermont

Overview

- NRCS national resource concerns for water quality include:
 - Excess nutrients in surface and ground waters
 - Excess pathogens and chemicals in surface and ground waters
 - Petroleum, heavy metals and other pollutants transported to receiving waters
 - Excessive sediment in surface waters
 - Elevated water temperature

Crop/Hay Fields with High or Very High Risk of Erosion & Runoff In Vermont



Number of at-risk fields
in each county:

Total number of
crop/hay fields:

Addison.....	9,431	.....	10,241
Bennington.....	730	.....	1,560
Caledonia.....	2,431	.....	3,238
Chittenden.....	2,923	.....	3,807
Essex.....	310	.....	654
Franklin.....	4,711	.....	7,917
Grand Isle.....	236	.....	1,214
Lamoille.....	812	.....	1,562
Orange.....	2,667	.....	3,668
Orleans.....	3,721	.....	6,198
Rutland.....	2,972	.....	4,967
Washington.....	1,461	.....	1,989
Windham.....	1,253	.....	1,951
Windsor.....	1,641	.....	2,663

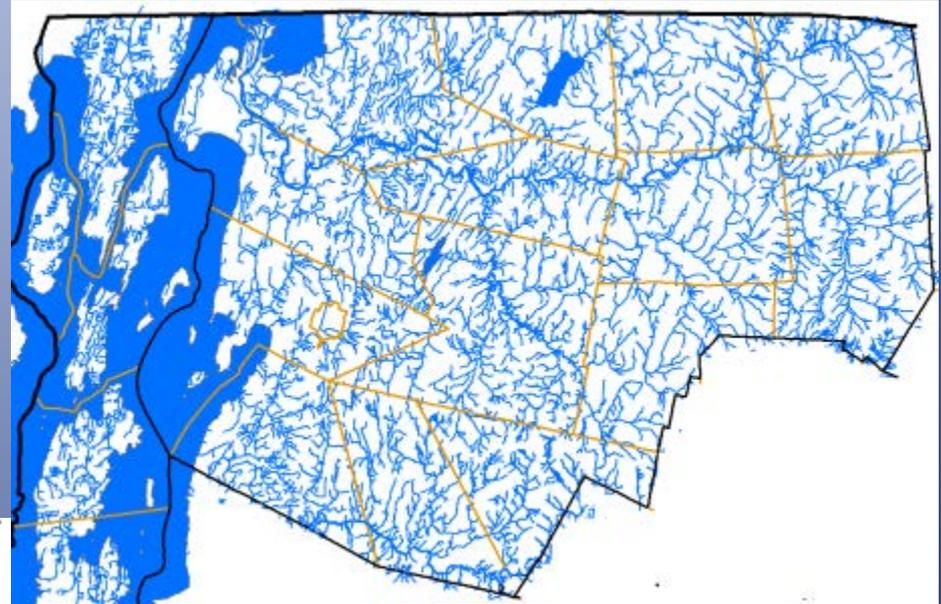
Surface Water Protection:

*Typical Farm Field is in close proximity to Surface Waters

*Typical Soil Loss , nutrient runoff and sedimentation concerns

*Typical significant Resource Inventory And conservation planning workload statewide

Franklin and Grand Isle Counties example



Vermont Focus:

Excess Nutrients in Surface and Ground Waters

- The **primary concern is excess phosphorus loading to surface waters** in the Lake Champlain and Lake Memphremagog Basins
 - Causing sometimes toxic algae blooms in Lake Champlain and excessive aquatic plant growth
 - Sources in some watersheds are predominantly from agriculture, including soil erosion, manure runoff and tile drainage discharge
 - EPA has will be issuing a new TMDL for phosphorus in the Lake Champlain Basin the summer of 2015
- In isolated locations excessive nitrate levels have been observed in groundwater sources of drinking water including springs and drilled wells
 - Sources often are associated with annual cropland where high rates of fertilizer and manure have been applied

Vermont Focus:

Excess Pathogens and Chemicals in Surface and Ground Waters

- Vermont has several rivers and streams that are impaired (on the EPA 303d list) due elevated levels of bacteria (E. Coli)
 - Agricultural sources of bacteria are tied to excessive sediment losses and to manure runoff from fields and farmsteads



Vermont Focus:

Petroleum, Heavy Metals and Other Pollutants Transported to Receiving Waters

- Generally petroleum, heavy metals and other pollutants are not an issue on Vermont farms
 - However, there is a risk of petroleum contamination to ground and surface waters on most Vermont farms
 - Almost every Vermont farm maintains at least one fuel storage tank for use as tractor fuel or for heating fuel
 - These facilities should be assessed as part of the farmstead resource assessment to determine the presence of spills or the risk of future spills

Vermont Focus:

Excessive Sediment in Surface Water

- Some Vermont rivers and streams are listed as impaired due to excessive sediment (on the EPA 303d list)
 - Usually excessive sediment is also associated with excessive nutrients (esp. phosphorus) and bacteria (pathogens)
 - Conservation practices that are implemented to reduce sediment loading often also reduce the amount phosphorus and bacteria reaching surface waters

Vermont Focus:

Elevated Water Temperature

- A few Vermont rivers and streams are listed as impaired due to temperature (on the EPA 303d list), other stream reaches may be impaired but not listed
 - Usually associated with agricultural lands where trees and shrubs have been removed from the riparian zone

State Requirements for Licenses or Certificates

- No Nutrient Management Certification required in Vermont
- Pesticide practices require a VT Pesticide Applicator License
- No Forestry License required in Vermont
- Engineering License required for the following Technical Service Categories:
Channel and Streambank Stabilization, Contaminant Reduction Control, Energy-Reduce Use, Land Treatment-Surface Water Management, Manure and Waste Water Handling and Storage, Reservoir Sealing, Surface Water Detention/Retention, Waste Utilization-Energy Generation, Water Supply Facilities, Water Well, Well and Shaft Technology, Wetlands (Engineering Components)



State Laws on Agricultural Nonpoint Source Water Quality

VT Agency of Agriculture, Food and Markets

Regulations are called Accepted Agricultural
Practices (AAPs)

AAPs

State-wide restrictions designed to conserve and protect natural resources by reducing non-point source pollution through the implementation of improved farming techniques rather than investments in structures and equipment.

AAPs

All agricultural operators are required to conduct their farming activities in compliance with the AAPs, including all medium and large farms operating under permits.

AAPs regulations address:

- Animal waste management
- Erosion and sediment control
- Vegetative buffer zones along surface waters
- Fertilizer management
- Pesticide management
- Streambank management
- Animal mortality management
- Groundwater contamination
- Setbacks for manure storage and land application

AAPs are found on the following
website:

- <http://agriculture.vermont.gov/sites/ag/files/ACCEPTED%20AGRICULTURAL%20PRACTICE%20REGULATIONS.pdf>

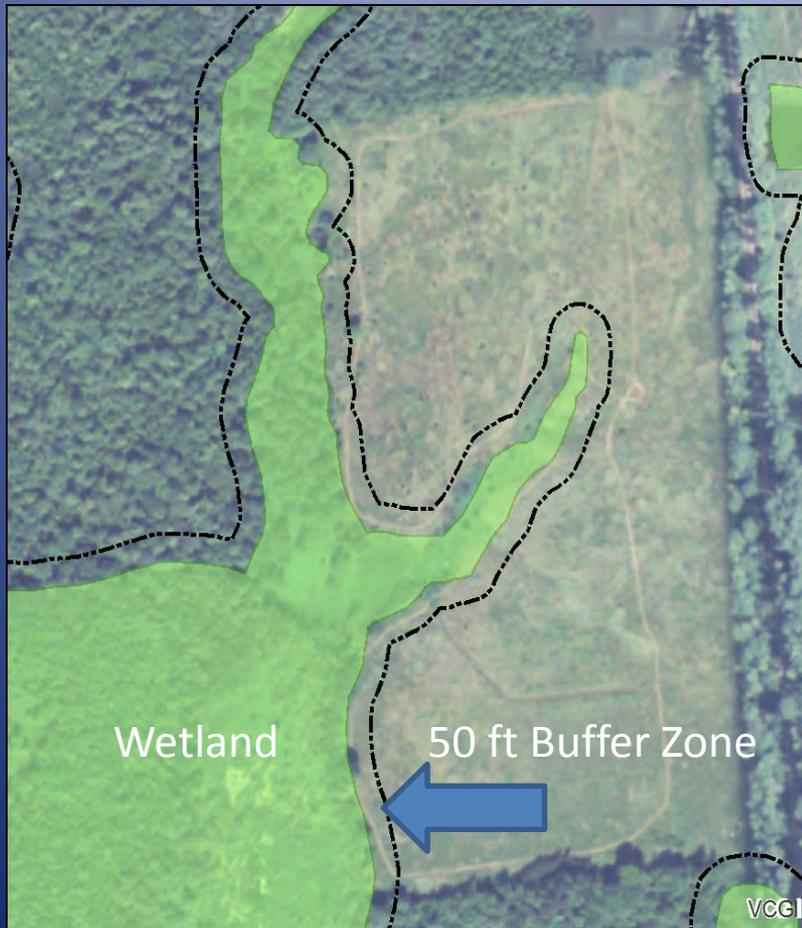
Common Agronomic Practices in Vermont

- Conservation Crop Rotation (328)
- Cover Crop (340)
- Nutrient Management (590)
- Residue and Tillage Management – Reduced Tillage (345) and No-till/Strip Till (329)
- Prescribed Grazing (528)
- Filter Strip (393)
- Critical Area Planting (342)
- Forage and Biomass Planting (512)
- Integrated Pest Management (595)
- Row Arrangement (557)

A scenic view of a wetland area. In the foreground, there is a pond with dark water, reflecting the sky and surrounding vegetation. The water is dotted with green lily pads. The pond is bordered by tall, green grasses and reeds. In the background, a large body of water, possibly a lake, stretches across the horizon under a blue sky with light, wispy clouds. The overall atmosphere is peaceful and natural.

Wetlands

Vermont Wetland Rules



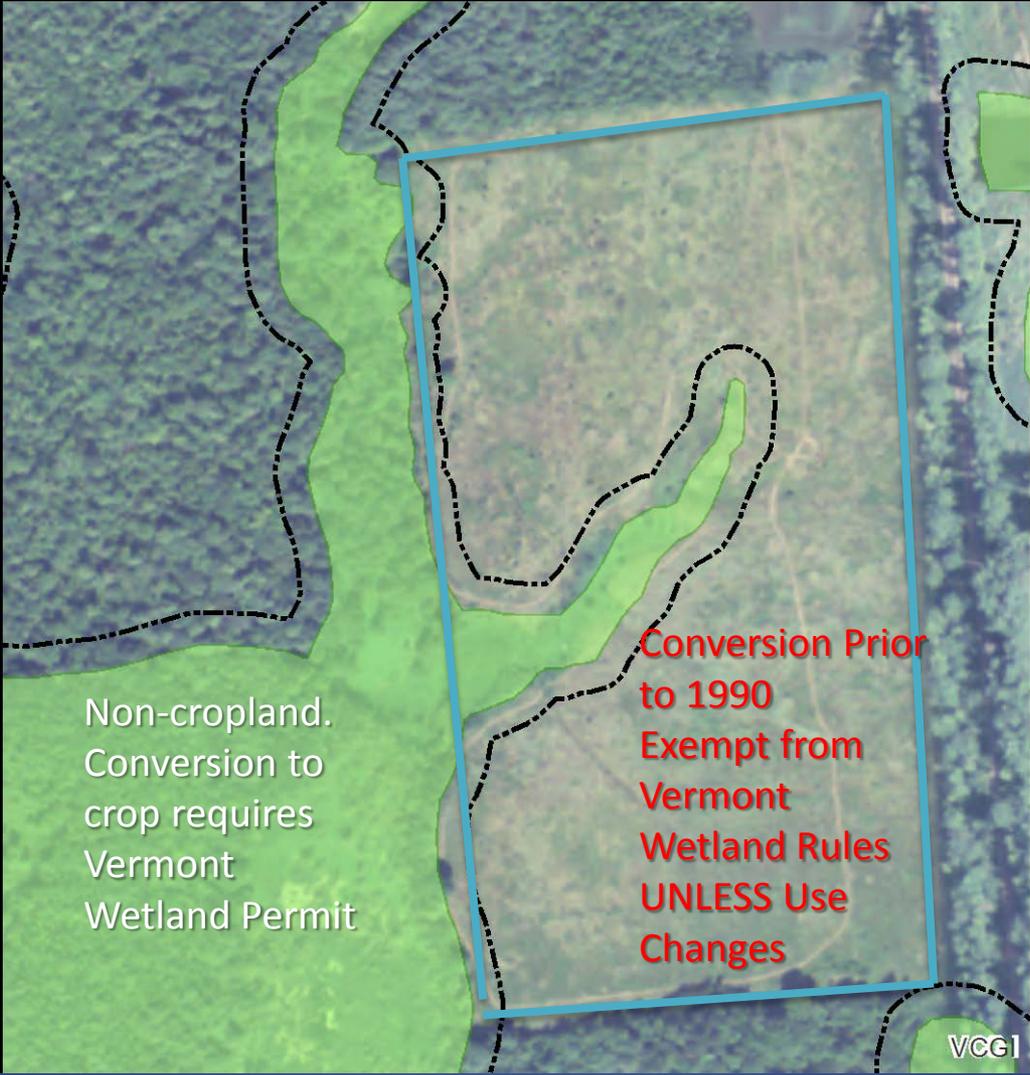
- Regulations for Class I and II wetlands. Minimum 50' buffer zone.

Vermont Wetland Rules Exemption

Farming exemption applies to all areas used to grow food or crops in connection with farming activities, including areas in ordinary rotation, as of the effective date of the rules (1990).

The farming exemption expires whenever the area is no longer used to grow food or crops or is no longer in ordinary rotation. E.g. Placing a barn in a cropped wetland would require a permit.

Conversion of new wetland and buffer areas to farmland require a VT wetland permit (\$200 flat fee).



Non-cropland.
Conversion to
crop requires
Vermont
Wetland Permit

Conversion Prior
to 1990
Exempt from
Vermont
Wetland Rules
UNLESS Use
Changes

Crop Conversions After 1990

Wetland and buffer areas which have been converted to crop after 1990 may continue in crop production provided no new draining, dredging or grading occurs and the VT Agency of Agricultural Food and Markets Accepted Agricultural Practices are followed.

Draining, dredging or grading, including the **installation of tile drains** within wetland or buffer converted to crop after 1990 **requires a Vermont Wetland Permit.**

Vermont Wetland Permit Review

- Permit application review evaluates whether activity will significantly effect the functions or values of the wetland.
- Tile drainage = wetland area loss. Depending on size of area, and wetland function/value, tile drainage may or may not be approved.
- Check with your District Wetland Ecologist early in your planning process.

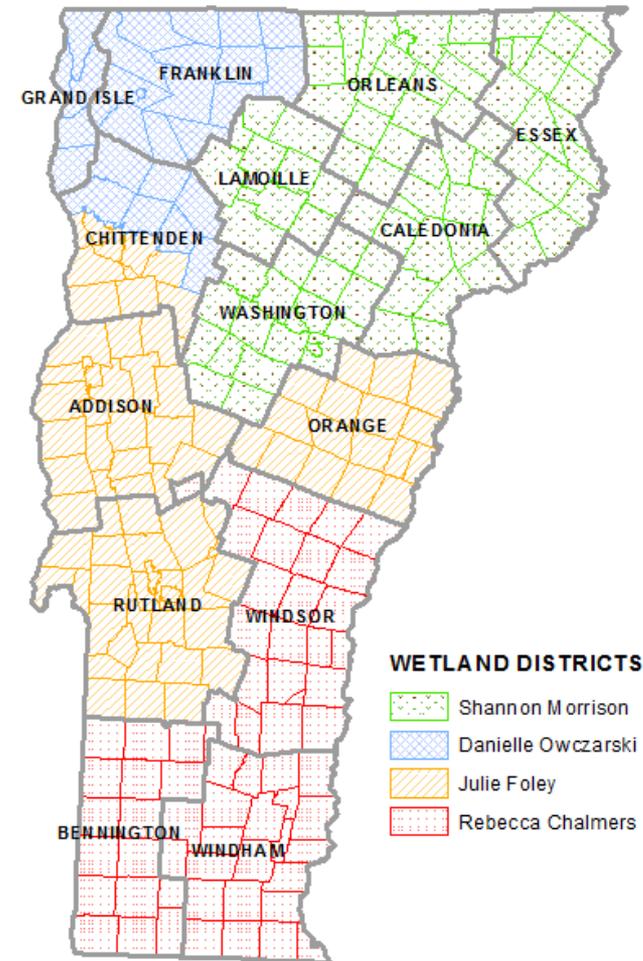
Wetlands Program Contact Page

Wetlands Contact and Inquiry Portal

Make contact with the Wetlands Program by emailing the appropriate ecologist using the Contact Map to the right. 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.

INQUIRY TOPICS:

- **Request Education, Training and Outreach Support** – Contact a wetland ecologist to schedule wetland training, presentations, and other outreach activities.
- **Request a Field Visit** – Request to have a wetland ecologist visit a property with landowner permission to review wetland presence and concerns for projects or land purchase.
- **Request Project Review** – Request to have a wetland ecologist review 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 the VT Wetlands Staff a question that is not covered in the other topics.



Rebecca Chalmers	Julie Foley	Shannon Morrison	Danielle Owczarski
Request Education, Training and Outreach Support			
Request a Field Visit			
Request Project Review			
Request Status of Pending Permit			
Report a Wetland Complaint or Violation			
Other Inquiry or General Question			

DIG SAFE



- Call 811 or 888-DIG-SAFE
- Dig Safe is a free service
- State Law requires that you contact Dig Safe prior to installing tile drainage on agricultural fields. (Vermont Statutes Title 30 Chapter 86 and Public Service Board Rule 3.800)
- Fines for not calling Dig Safe can be up to \$5,000 per violation.

A photograph of a dense forest. The trees are tall and thin, with dark trunks. The leaves are green, and the ground is covered in brown, fallen leaves. The word "Forest" is written in white text in the center of the image.

Forest

Forest in Vermont

- About 75% of Vermont is Forest land representing ~4.6 million acres
- 71% of the forest cover is Northern Hardwood consisting primarily of Maple, Birch and Beech
- Over 80% of the forest land is privately owned
- Public forest land includes the Green Mountain National Forest, State Forests and Wildlife Management areas, and Town forests.
- Vermont is the top producer of maple syrup in the U.S.

Forestry in Vermont

- Established in 1980 the Use Value Appraisal (UVA) or “current use” program has helped conserve Vermont’s working lands – lands taxed on forestry value, not development value
- Over 1.6 million acres forest and ~40% of all eligible land enrolled
- Managed actively for timber by existing USFS silvicultural guides
- When land is enrolled in the UVA program, the State attaches a permanent lien to the deed
- Parcels must have 25 acres enrolled, and a minimum of 20 acres under active forest management

http://www.vtfpr.org/resource/for_forres_useapp.cfm

Forest Mgt. Laws in Vermont

- Pertinent Laws –
 - Timber Harvesting in Vermont – Summary of Laws and Regulations
http://www.vtfpr.org/regulate/documents/Timber_Harvest_2012Web.pdf
 - Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont (AMP's)
<http://www.vtfpr.org/watershed/ampprog.cfm>
 - As of 2015 there is no licensing requirements for consulting foresters in Vermont

Forest Concerns & Practices

- Non-native pests are a major concern of forests in Vermont
 - Invasive exotic plants such as buckthorn, honeysuckle and barberry are commonly found and controlled on working forest land
 - Exotic insects pests are present or nearby
- Water quality concerns are found on skid roads and crossings that were not properly closed out following timber harvests

Fish & Wildlife Habitat

- Most of Vermont provides good habitat for species that prefer extensive forest including moose, bear, and forest songbirds (vireos, thrushes, warblers) and brook trout
- In the Champlain Valley of Vermont, extensive wetlands (marsh, swamps, lake influenced), large hayfields/open land, small woodlots and farmland reverting to forest provide habitat for waterbirds, grassland and shrubland songbirds, warm water fish, many rare plants and animals and the federally endangered Indiana bat

Fish & Wildlife Habitat Concerns

- Historic and current wetland loss
- Fragmentation of forest habitat including riparian corridors
- Fragmented aquatic habitat (primarily culverts)
- Poor water quality (nutrients, temperature)
- Loss of early successional habitat

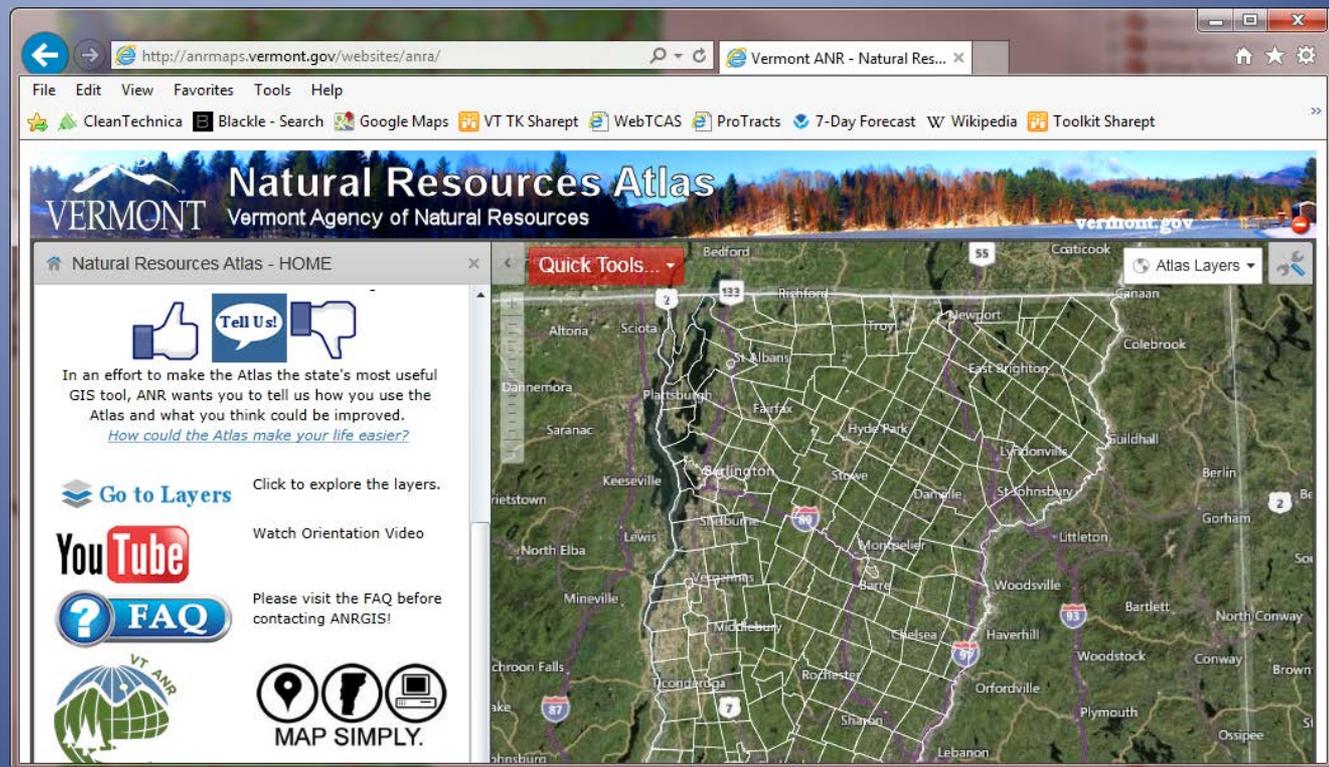
Rare, T+E Species Review

- During the planning process, review the Wildlife Diversity Program (State Fish and Wildlife) database for occurrences of uncommon, rare, threatened and endangered species and significant natural communities
- Implementation of conservation programs through planning and application of conservation practices and measures shall also provide for the conservation of Federally listed and proposed species as well as state species of concern
- Review the planning area using ANR Atlas online mapping tool (see subsequent slide) and contact the Wildlife Diversity Program to determine any potential opportunities for or effects of practices

- Vermont ANR Atlas URL

<http://anrmaps.vermont.gov/websites/anra/>

This has all GIS layers that State Agencies maintain.



Inventory Tools

- Vermont Agency of Natural Resources
'ANRAtlas' - <http://anrmaps.vermont.gov/websites/anra/>
 - Online web mapping using a broad array of over 150 map layers
 - Layers include: various types of imagery, soils, wetlands, RTE species (rare, threatened and endangered species), significant natural communities, public water supplies, road, water features, parcels, watersheds, river corridors, and much more.

Expected TSP Workflow

- The State Resource Conservationist (SRC) will be responsible for reviewing TSP conservation planning for the National Planner Certification.
- Subsequent conservation plans will be reviewed by the District Conservationist (DC) at the local USDA Service Center.
- The SRC will conduct plan reviews for TSP planner certification renewals.
- TSPs will work with the local District Conservationist to make sure the proper environmental evaluations (NRCS CPA-52) are completed.



Additional References

- Vermont Field Office Technical Guide at www.nrcs.usda.gov
- University of Vermont Nutrient Recommendations for Field Crops at <http://pss.uvm.edu/vtcrops>

Key Vermont NRCS Contacts

(802) 951-6796

- Vicky Drew, State Conservationist
- Robert Sylvester, State Resource Conservationist
- Rob Allen, State Engineer
- Kip Potter, Water Quality Specialist
- Sandra Primard, Agronomist
- Toby Alexander, Forest and Wildlife Specialist
- Jim Eikenberry, Wetlands Specialist
- Kevin Kaija, Grazing Specialist

Certificate of Completion

After viewing the State Specific Training module, please print and sign the completion certificate on the following slide.

The certificate is your acknowledgement that based on the information provided in this module, you have the proper knowledge, skills and ability to conduct planning in this state.

Send the signed certificate to the State TSP Coordinator. Copy the below link to your browser for a list of State TSP Coordinators.

<https://techreg.sc.egov.usda.gov/RptStateContact4Admin.aspx>

STATE SPECIFIC TRAINING MODULE COMPLETION CERTIFICATE

I, _____, hereby verify I have viewed and understand
TSP Name
the content of the Vermont State Specific Training Module and affirm I have
the knowledge, skills and ability to conduct conservation planning services
in that state.

TSP signature

Date

Non-Discrimination Statement

- Non-Discrimination Policy

The U.S. Department of Agriculture (USDA) prohibits discrimination against its customers, employees and applicants for employment on the bases of race, color, national origin, age, disability, sex, gender identity, religion, reprisal, and where applicable, political beliefs, marital status, familial or parental status, sexual orientation, or all or part of an individual's income is derived from any public assistance program, or protected genetic information in employment or in any program or activity conducted or funded by the Department. (Not all prohibited bases apply to all programs and/or employment activities.)

Non-Discrimination Statement Continued

- To File an Employment Complaint

If you wish to file an employment complaint, you must contact your agency's EEO Counselor within 45 days of the date of the alleged discriminatory act, event, or in the case of a personnel action.

Additional information can be found online at

http://www.ascr.usda.gov/complaint_filing_file.html

- To File a Program Complaint

If you wish to file a Civil Rights program complaint of discrimination, complete the USDA Program Discrimination Complaint Form, found online at http://www.ascr.usda.gov/complaint_filing_cust.html, or at any USDA office, or call (866)632-9992 to request the form. You may also write a letter containing all of the information requested in the form. Send your completed complaint form or letter to us by mail at U.S. Department of Agriculture, Director, Office of Adjudication, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9419, by fax at (202)690-7442, or email at program.intake@usda.gov

Non-Discrimination Statement Continued

- Persons with Disabilities

Individuals who are deaf, hard of hearing or have speech disabilities and you wish to file either an EEO or program complaint please contact USDA through the Federal Relay Service at (800)877-8339 or (800)845-6136 (in Spanish).

Persons with disabilities, who wish to file a program complaint, please see information above on how to contact us by mail or by email. If you require alternative means of communication for program information (e.g., Braille, large print, audiotape, etc.), please contact USDA's TARGET Center at (202)720-2600 (voice and TDD).

- Supplemental Nutrition Assistance Program

For any other information dealing with Supplemental Nutrition Assistance Program (SNAP) issues, persons should either contact the USDA SNAP Hotline Number at (800)221-5689, which is also in Spanish, or call the State Information/Hotline Numbers.

- All Other Inquires

For any other information not pertaining to civil rights, please refer to the listing of the USDA Agencies and Offices.