

Vermont Wetlands Mapping

*The past, present and future of GIS and
the Vermont Wetlands Program*



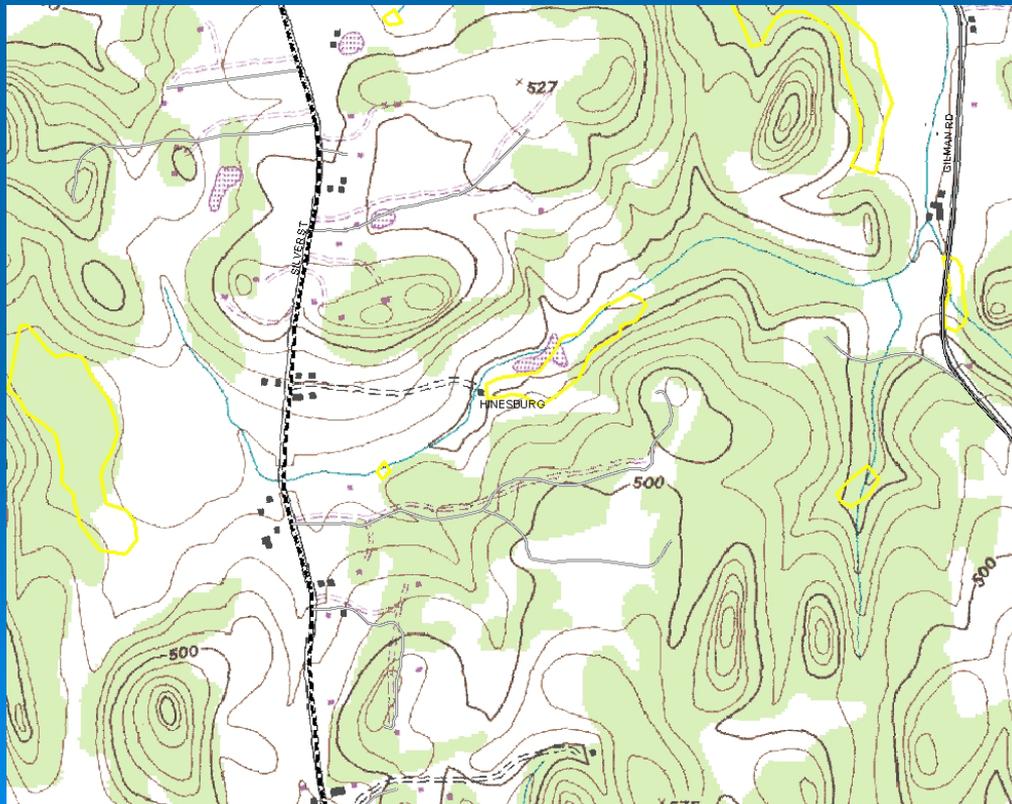
Overview

- History of the VSWI Maps
- Wetland Investigation Group
- The New Rule and the New Maps
- The future of VSWI



VSWI Maps and Jurisdiction

Class One and Class Two wetlands (those indicated on the Vermont Significant Inventory Maps, or contiguous to mapped wetland) are regulated by the Vermont Wetland Rules, **along with those similar to VSWI mapped wetlands**



Wetland Classification

Based on an evaluation of the extent to which the wetland provides functions and values:

- **Class One Wetland:** Exceptional or irreplaceable in its contribution to Vermont's natural heritage and therefore, merits the highest level of protection
- **Class Two Wetland:** Merits protection, either taken alone or in conjunction with other wetlands
- **Class Three Wetland:** Neither Class One or Class Two wetland

VSWI Maps 1990-2006

Substantial Issues

- Mapping accuracy vs. field verified boundaries
- Poor mapping of certain wetland types, over-mapping of others
- Mechanism to change maps and/or wetland classification was cumbersome and then broken
- VSWI maps only one tool out of many to detect wetlands remotely

VSWI Maps 1990-2006

Quirks

- Off kilter digital layer
- Mapping of features such as sewage lagoons or quarry pits (declassification under old rules)
 - Detected from aerial photos
 - Confirmation through field verification



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MEAD FARM RD

Wetland Investigation Group Mapping Goals

Provide a higher level of predictability for
identifying wetlands in Vermont

AND

Identify significant wetlands
(known and presumed)

The background of the slide features several concentric, light blue circular ripples that resemble water droplets or raindrops, scattered across the lower half of the page.

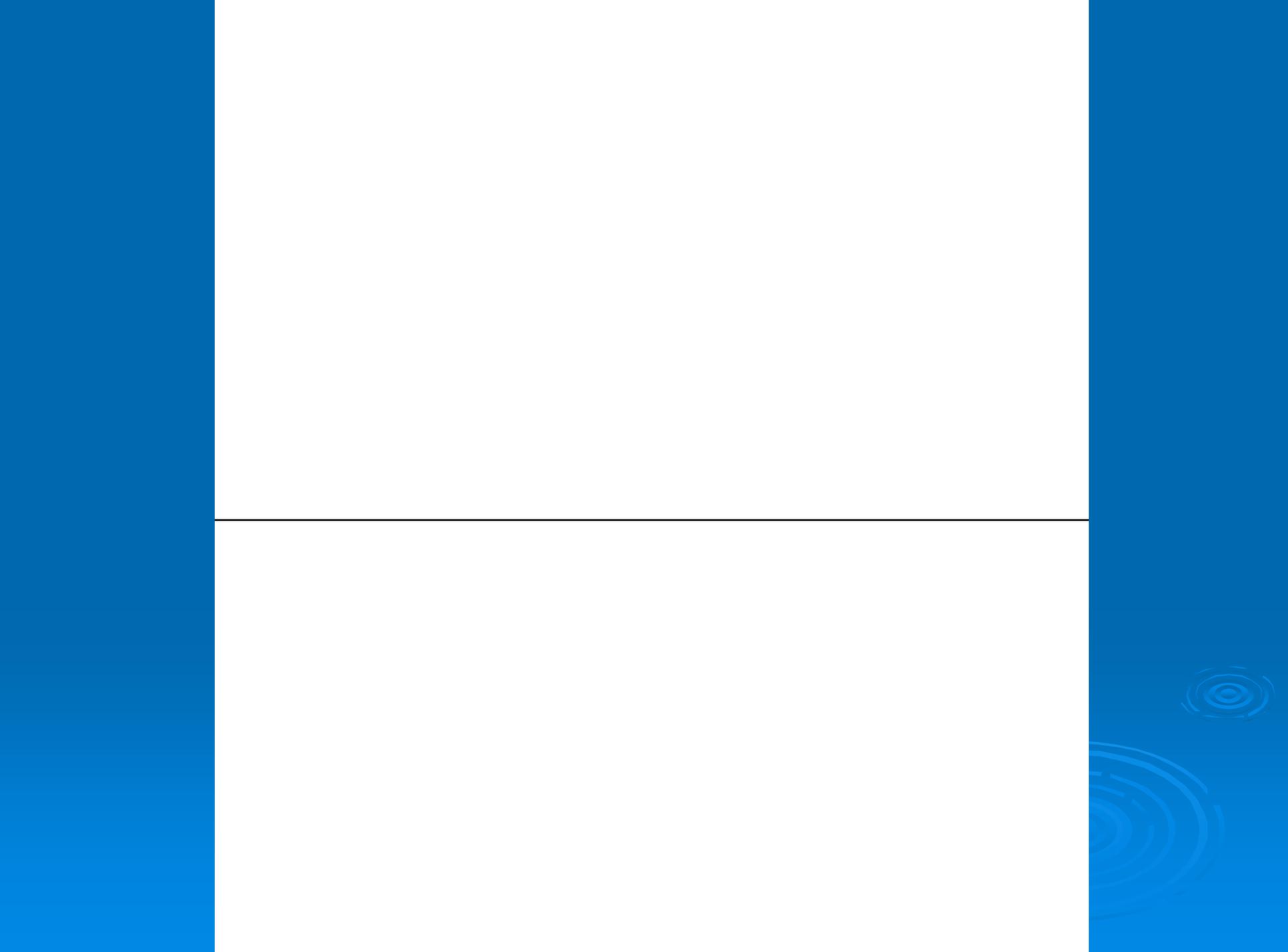
Mapping Objectives

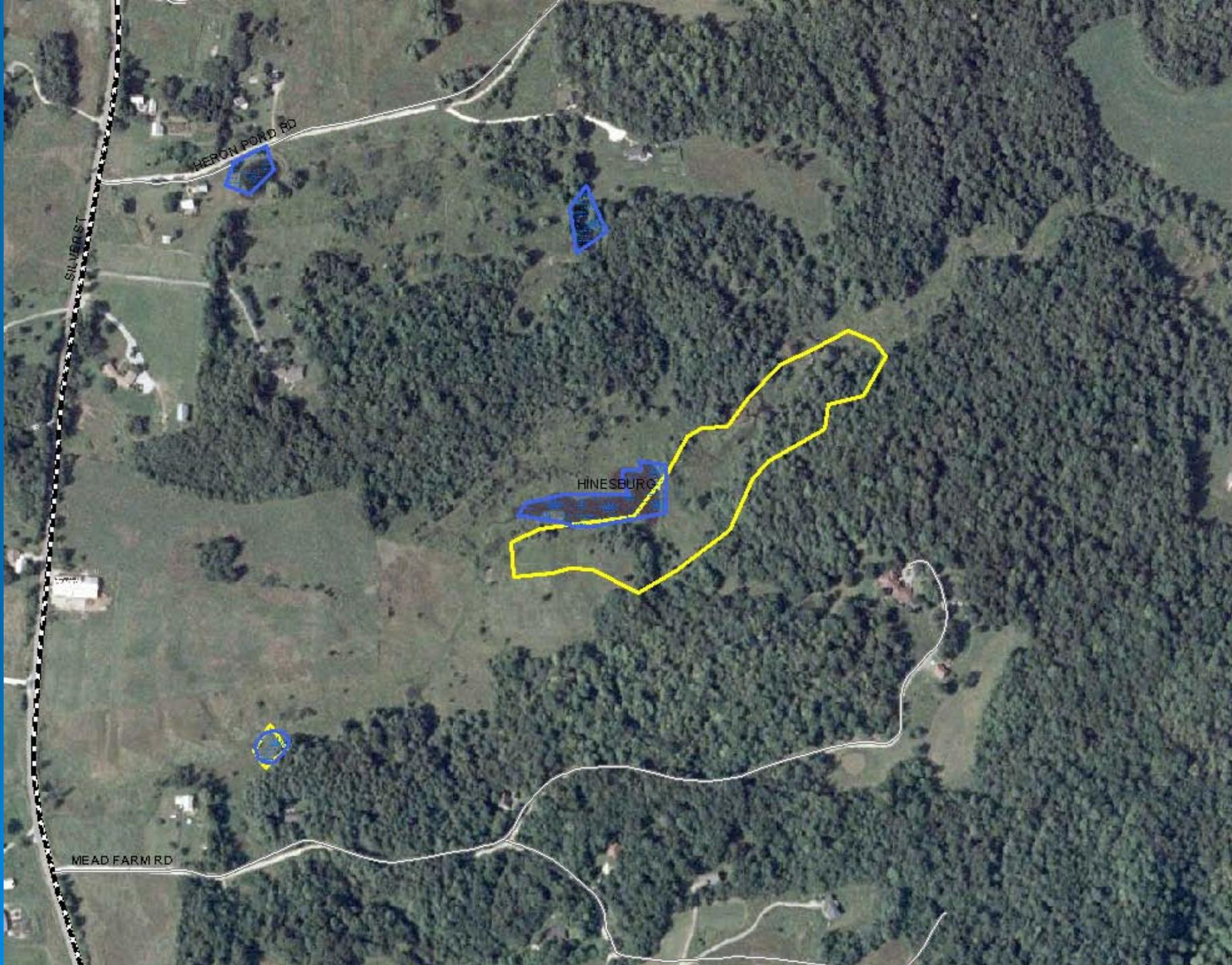
Use what we have:

- Existing VSWI maps
- New NWI maps
- Wetland mapping at the local level
- NRCS Soil Data
- Field Mapping
- Wetland Delineations
- Imagery

National Wetland Inventory Maps

- Taken from aerial photos ranging from the 1970's to as recently as 2005
- More recent NWI data contains information on wetland type (2000-2005)
- NWI mapping in the future will incorporate hydric soil, and information on hydrology (2008 on)





1:4,690

- Hartford_wetlands_arrowwood
- Bradford_wetlands_town
- Barnard_wetlands_town
- hinesburg_wetlands
- springfield_wetlands
- sb_wetlands
- richmond
- jericho
- frnkadid
- chittadid
- charlotte_wetlands
- brattleboro_wetlands
- Soils By County
 - Soils-Caledonia County
 - Soils - Addison County).lyr
 - Soils - Bennington County.lyr
 - Soils - Chittenden County.lyr
 - Soils - Franklin County.lyr

Identify

Identify from: <Top-most layer>

- 2008 National Wetland Inve
 - PUBHh

Location: 451,893.392 200919.57

Field	Value
OBJECTID	76392
ATTRIBUTE	PUBHh
HGM_CODE	
QAQC_CODE	NNNNNNNN
WETLAND_TY	Freshwater Pond
ACRES	1.19683
DECODE	http://wetlandsfws.er.usgs.gov/NWI/webatx/atx.html
GLOBALID	{CD95A43E-F1B2-4F82-B9B9-844D8EBD97D8}
SHAPE	Polygon
SHAPE.area	4843.327501
SHAPE.len	403.362401

Identified 1 feature

Display Source Selection

Wetlands and Deepwater Habitats Classification - Windows Internet Explorer

http://wetlandsfws.er.usgs.gov/NWI/webatx/atx.html

Google

Google

Wetlands and Deepwater Habitats Classification

Home Print Page Tools

Wetlands and Deepwater Habitats Classification National Wetlands Inventory Mapping Code Description

[Wetlands Mapper](#) / [Download Wetlands Data](#) / [NWI Homepage](#)

Enter Code here:

(case sensitive; ex. E2AB)

Length of descriptions: short long none

List [plant species?](#) Yes No

[\(NWI Map Codes Legend\)](#)

: No such file or directory
PUBHh: P UB H h

[P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded

[P] Palustrine - The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean derived salts is below 0.5 ppt. Wetlands lacking such vegetation are also included if they exhibit all of the following characteristics:



Drawing

Arial 10 B I U



NWI (1990 – 1999)

vs.

VSWI (1979-1989)

- NWI picks up 9% more wetland acreage
- NWI missed 1,260 polygons that were on the original VSWI (1,803 acres or 2.6%)
- NWI picked up 5,549 polygons that were not on the original VSWI (7,995 acres or 10% more)
- More improvements with newer maps, but not quantified yet.

Town Wetland Mapping

- Who wants to do mapping?
 - Towns interested in increased conservation
 - Towns engaged in the planning process
 - Towns with conservation commissions
 - Towns with zoning that addresses wetlands



Town Wetland Data

Town generated data:

*Barnard (CO)

*Bradford (AW)

*Brattleboro

Burlington

*Charlotte (M&S) (GS)

Colchester (GS)

Enosburg (AW)

Essex (AW) (NRCS)

Fayston (AW)

*Hartford (AW – VP)

*Hinesburg (M&S) (NRCS)

*Jericho (GS)

Montpelier (AW)

Mt. Holly (AW)

*Norwich (AW – VP)

*Richmond (GS)

Rutland (GS)

Shelburne (NRCS)

*South Burlington (NRCS)

*Springfield

Stowe (AW)

Waitsfield (AW)

Warren (AW)

West Fairlee (AW)

Westford (GS)

Williston (NRCS)

*Woodstock (AW)

Worcester (AW)

* = Wetland office has digital copy

AW= Arrowwood, CO= Cathy O'Brien, M&S = Morrissey and Sweeney, GS = George Springston, NRCS = Natural Resource Conservation Services

Town Wetland Mapping

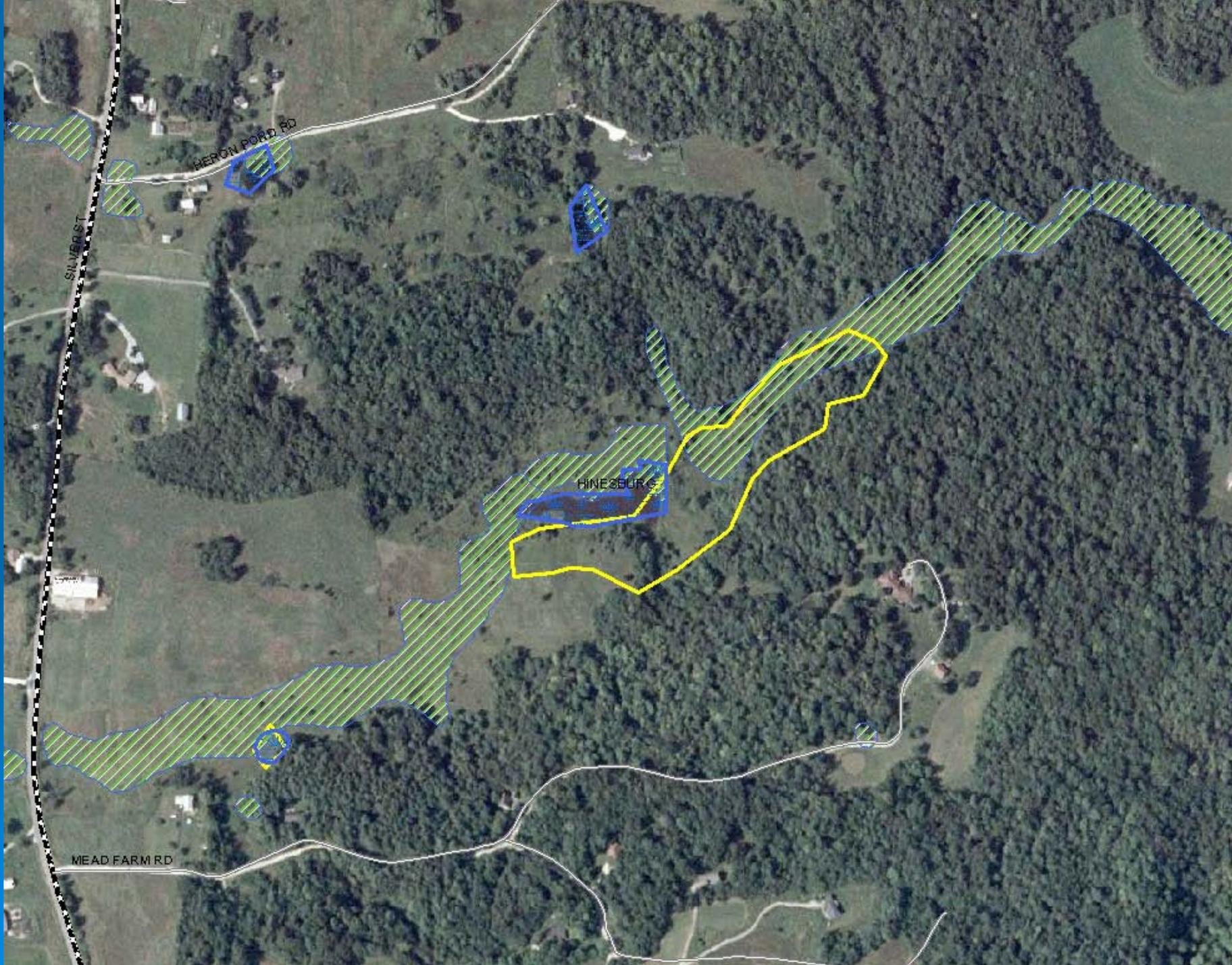
- Who did the mapping?
- What were the protocols?
- What is the quality of the data?
- What is the accuracy of the data?
- Why?



Town Wetland Mapping

Arrowwood Environmental

- Landscape Analysis:
 - 1:40,000 Color Infra-Red Aerial Photos (1992-93)
 - NRCS Soil Survey maps
 - Orthophotography (1990 black and white, or NAIP color)
 - VSWI maps
 - USGS Topo maps
 - Other Wetland Inventories on public lands
- Field checking cross section of wetland natural community types



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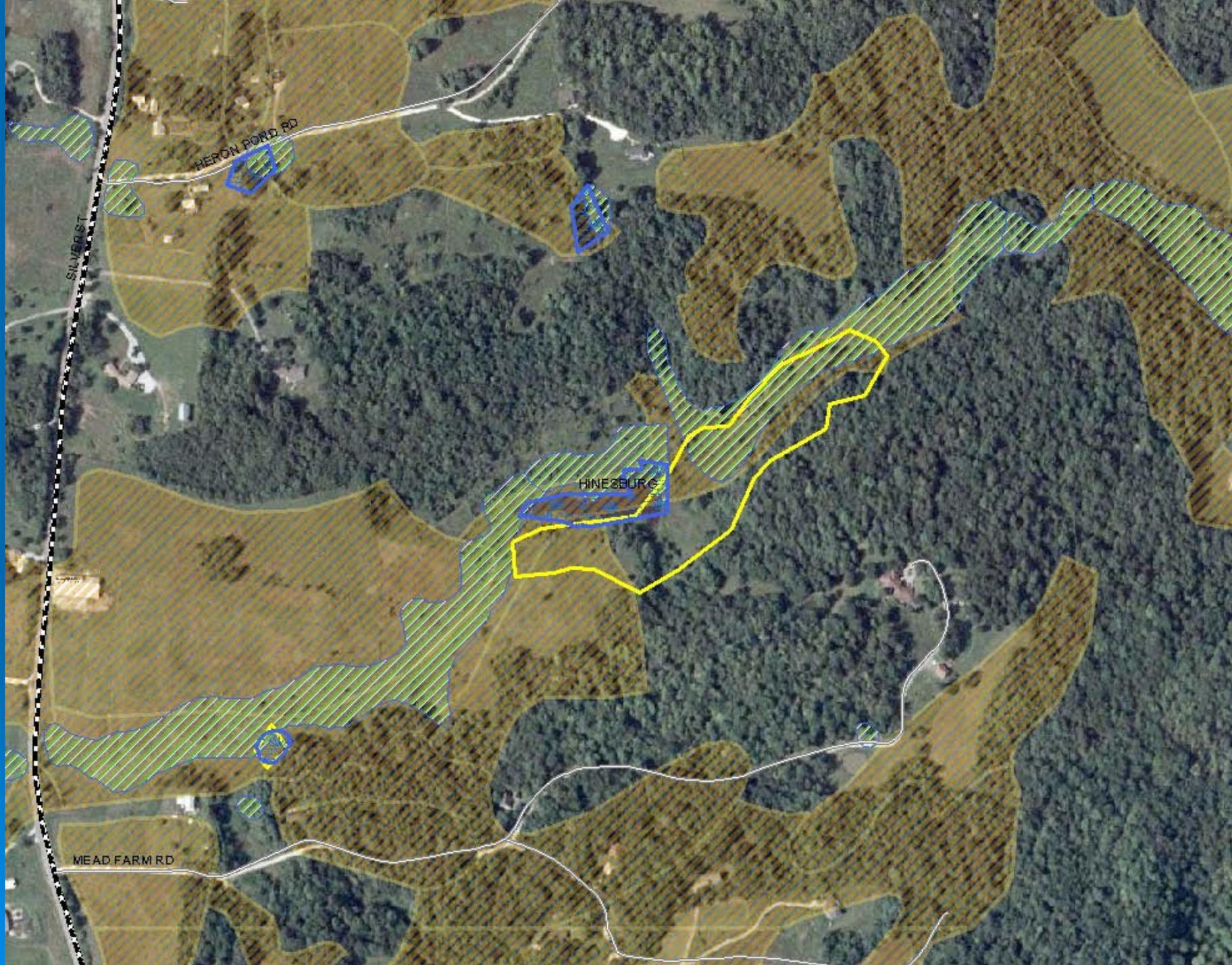
MEAD FARM RD

NWI / VSWI vs. Town Mapping

- NWI/VSWI: Producers Accuracy: 98% feature accuracy, and 85% attribute accuracy
 - Larger wetlands, wetlands with a stronger hydric signature
 - 1988 Wetland Study on Draft Rules found 93.5% of wetlands in randomized survey were significant for at least one function
- Town Mapping: Identify all potential wetlands
 - Smaller wetlands, more marginal wetlands, contiguous areas
 - No study on either producer accuracy or on frequency of significance

NRCS Soil Survey Data

- Available digitally for all counties except Essex County
- Some hydric soils units are stronger than others (Rifle mucks vs. Cabot silt loams)
- Coupled with other tools (VSWI, NWI, ortho-photos), can be a powerful tool
- Broader stroke, overestimates acreage



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New Rules, New Maps

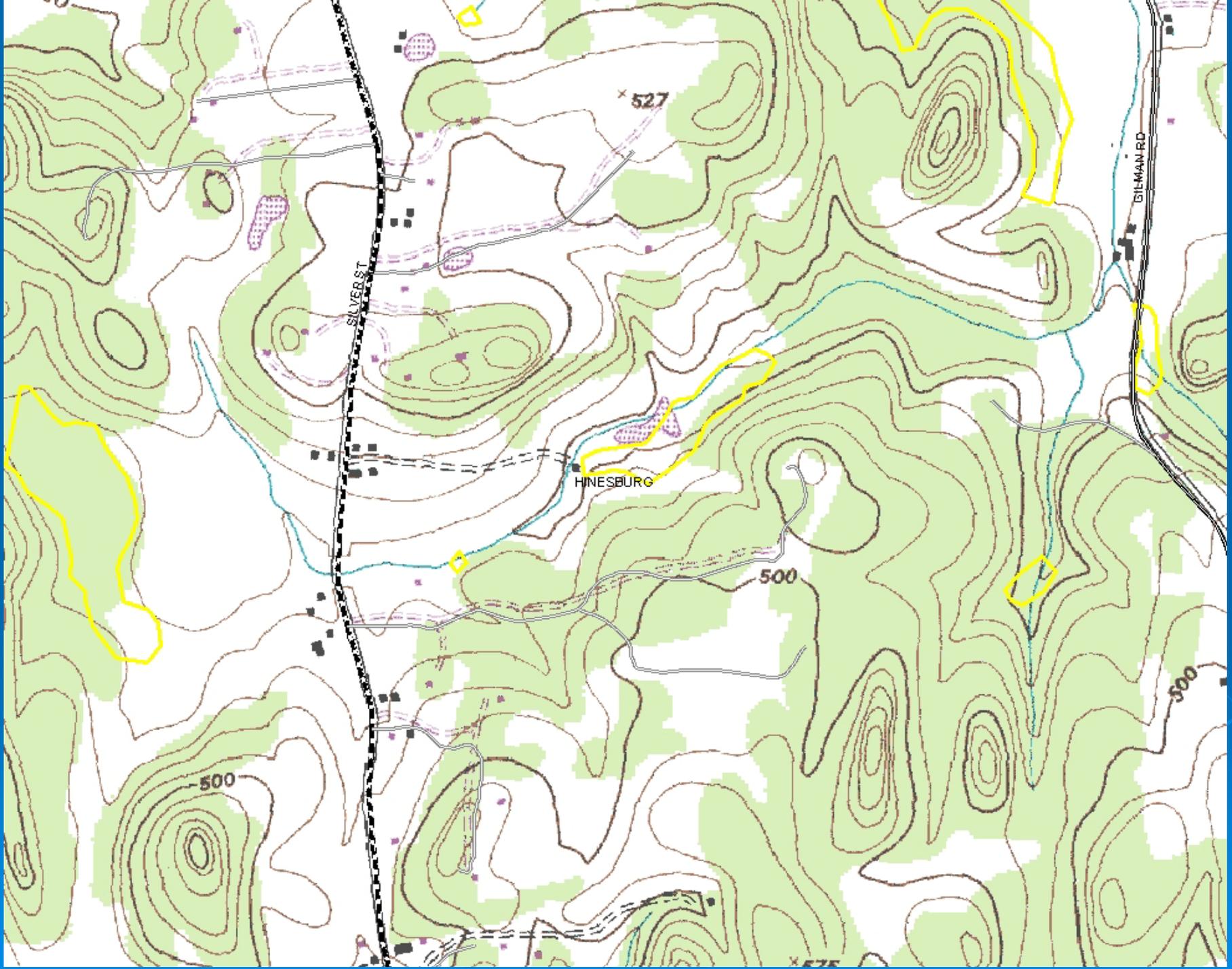
Cha Cha Cha Changes: Turn and face the strange.....

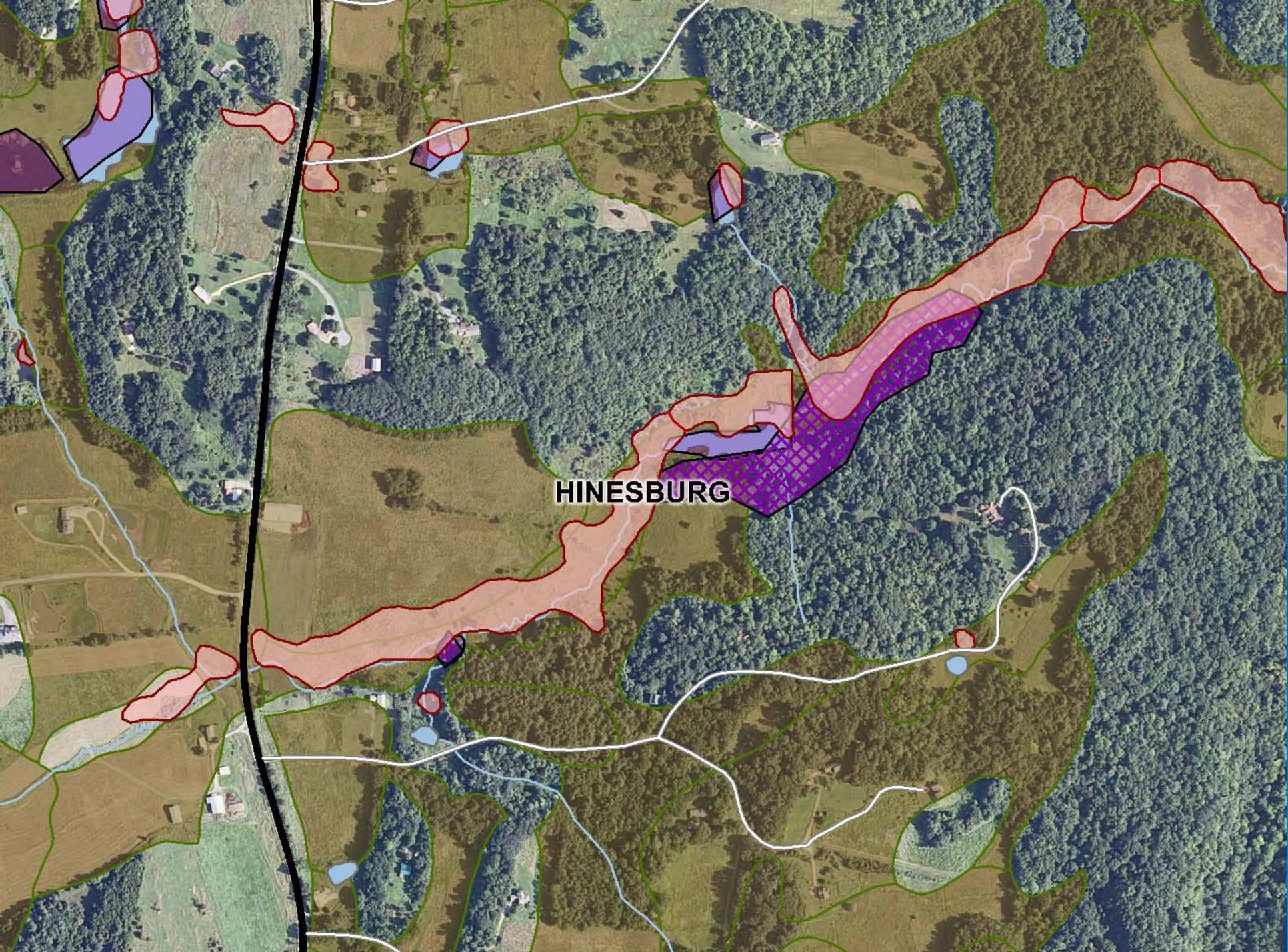


NEW VSWI Maps

- VSWI + NWI = NEW VSWI maps
- Town mapped wetlands remain available, but as an advisory layer
- Hydric soils have been added to the maps as an advisory layer
- Environmental Interest Locator:

http://maps.vermont.gov/imf/sites/ANR_NATRESViewer/jsp/launch.jsp





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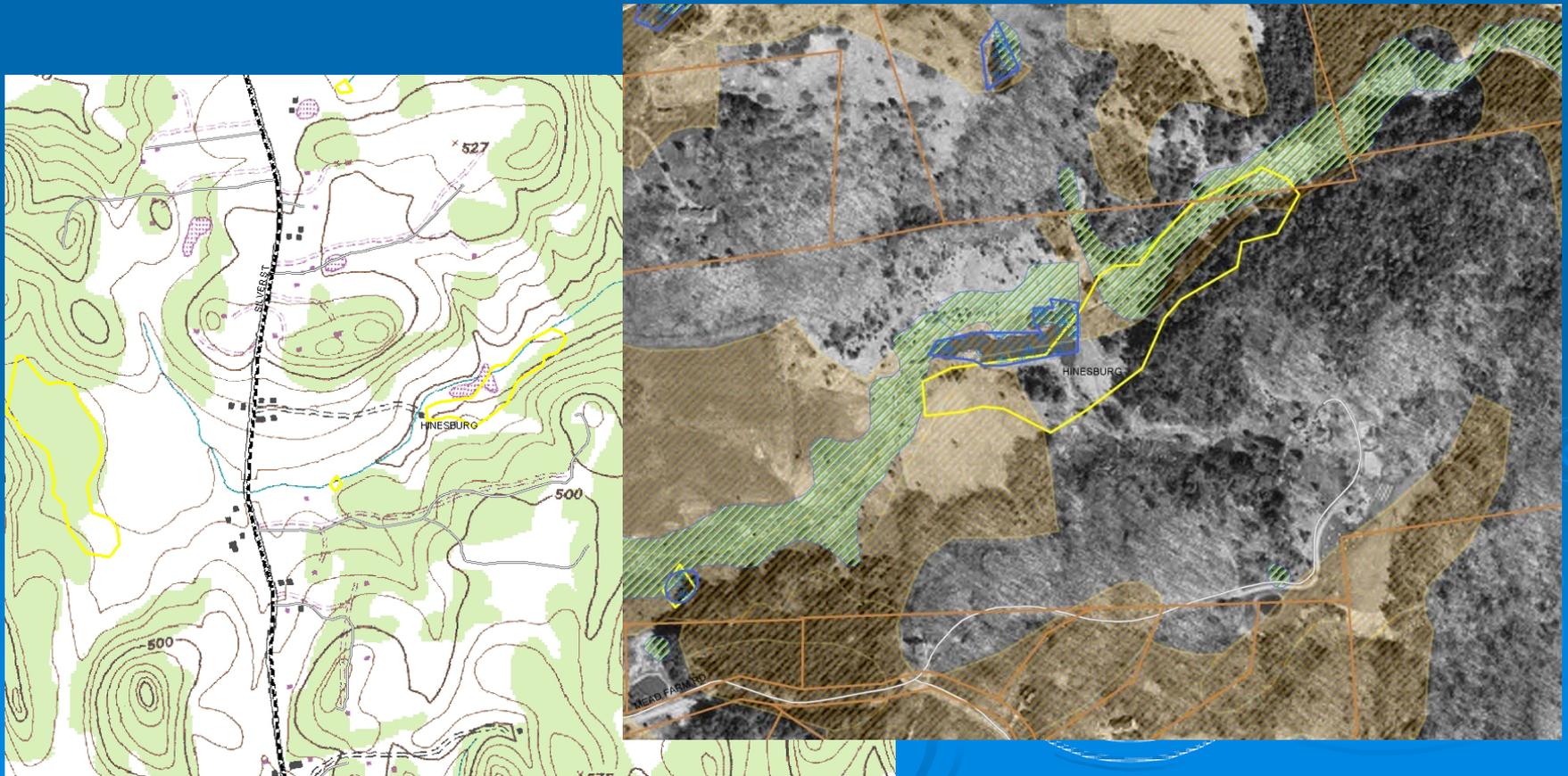
Changes in the Vermont Wetland Rules

Effective September 15, 2010

- Presumption of significance will not lie solely on the VSWI maps (Section 4.6 Presumptions)
- Ability to determine the Class of a wetland and change the maps goes from the WRP to ANR (Section 8)
- Expedited process for “housekeeping” map changes (Section 8.5)

The Future of VSWI

Using desktop, web and field GIS tools to further improve the maps



Vermont Wetland Mapping Standards

Based on “Federal Geographic Data Committee Wetlands Mapping Standards” 2009

- Use 1:12,000 or better imagery for digitizing wetlands (NAIP 2003, 1:5000 BW Ortho, CIR imagery)
- Digitize at a scale equivalent to or larger than the imagery scale
- Use additional map products to assist in wetland identification (USGS maps, NRCS soil data, VHD hydrography data layers)

Mapping Priorities

- Adding wetlands to the VSWI maps that undergo a Section 8 Determination (Class 3 to Class 2, or Class 2 to Class 3)
- Mapping those wetlands that meet the 4.6 presumptions of significance and apply for a permit
- Removing polygons that are not wetlands

Wetland Delineations

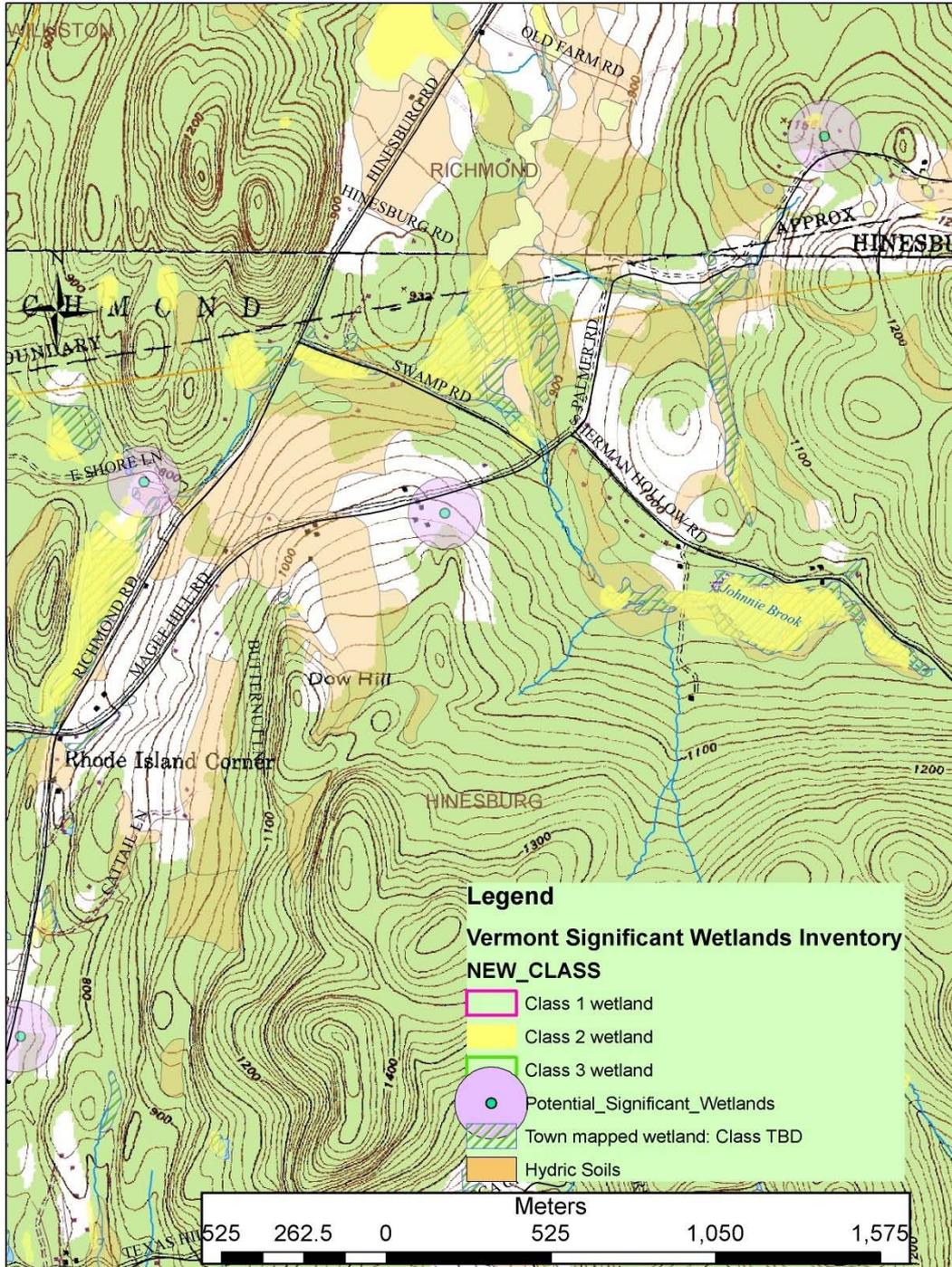
- Survey Quality GPS
- Database delineation forms to become available for on-line submittal
- Geo-spatial coordinates for wetland flag points
- Polygon submittal for GPS generated delineations with date (delineations expire after 5 years)
- GPS Wetland Delineation Data Standards TBD

Now Available

- New VSWI Layer
- Advisory Layers
 - Soils

Coming Soon

- Notification of wetland Determinations in process
- More advisory layers for town mapped wetlands and potentially significant unmapped wetlands
- Alterations of wetland polygons from delineations, field visits, imagery and GPS entry



Summary

- History of the VSWI Maps
 - Static map product
- Wetland Investigation Group
 - Opened up opportunities to improve mapping
- The New Rule and the New Maps
 - More information to the public and possibility of more dynamic mapping
- The Future of VSWI
 - Current, better mapping using as many sources of information possible

