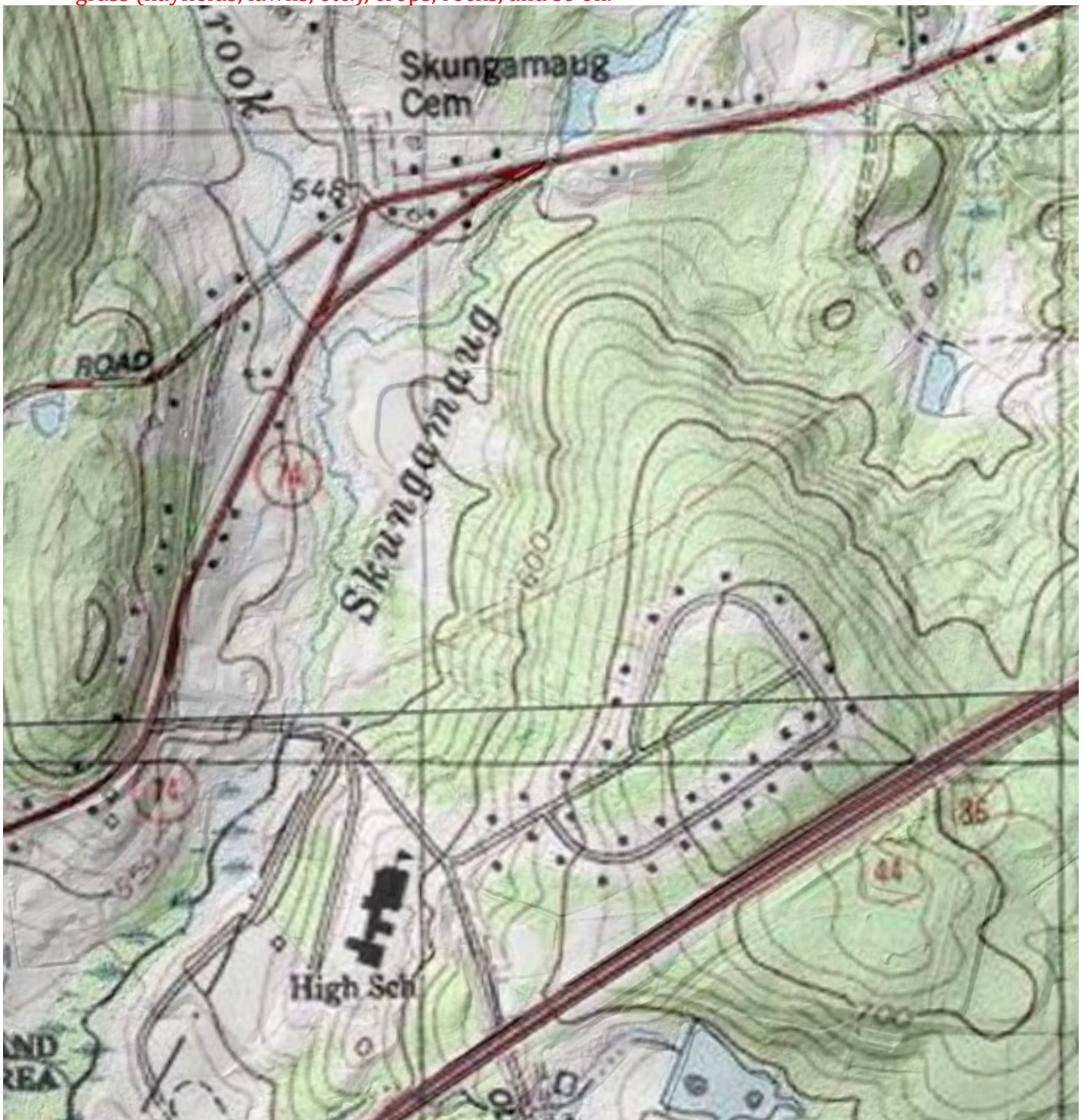


# Connecticut Envirothon Soils Workshop - Map Reading Exercises

October 27, 2019

## Exercise 1: Topographic Map - [https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs141p2\\_018306.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs141p2_018306.pdf)





































1. What are the brown colored lines on the topographic map below? **Contour lines**
2. The contour intervals are 10 feet. What is the elevation of the Skungamaug Cemetery? **550 feet**
3. What do the blue-colored areas on the topographic map represent? **Water bodies or features**
4. What do the green shaded areas on the topographic map represent? **Forested areas**
5. What do the white shaded areas on the topographic map represent? **Non-forested areas including grass (hayfields, lawns, etc.), crops, rocks, and so on.**



# Exercise 2: Soil Survey Report

1. What soil map unit symbol covers the largest area within the map? (Hint: look at percent in AOI)  
85C
2. How many acres does this soil map unit cover in the AOI?  
20.4
3. What is the soil map unit name of 85C?  
Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony
4. Looking at the topographic and soil map, is the 85C soil map unit mostly forested or open fields?  
Forested
5. On the soil map, circle soil map unit 108 and review the map legend. What does the blue-colored line represent? Streams
6. What is in the middle of soil map unit 23A? a pond

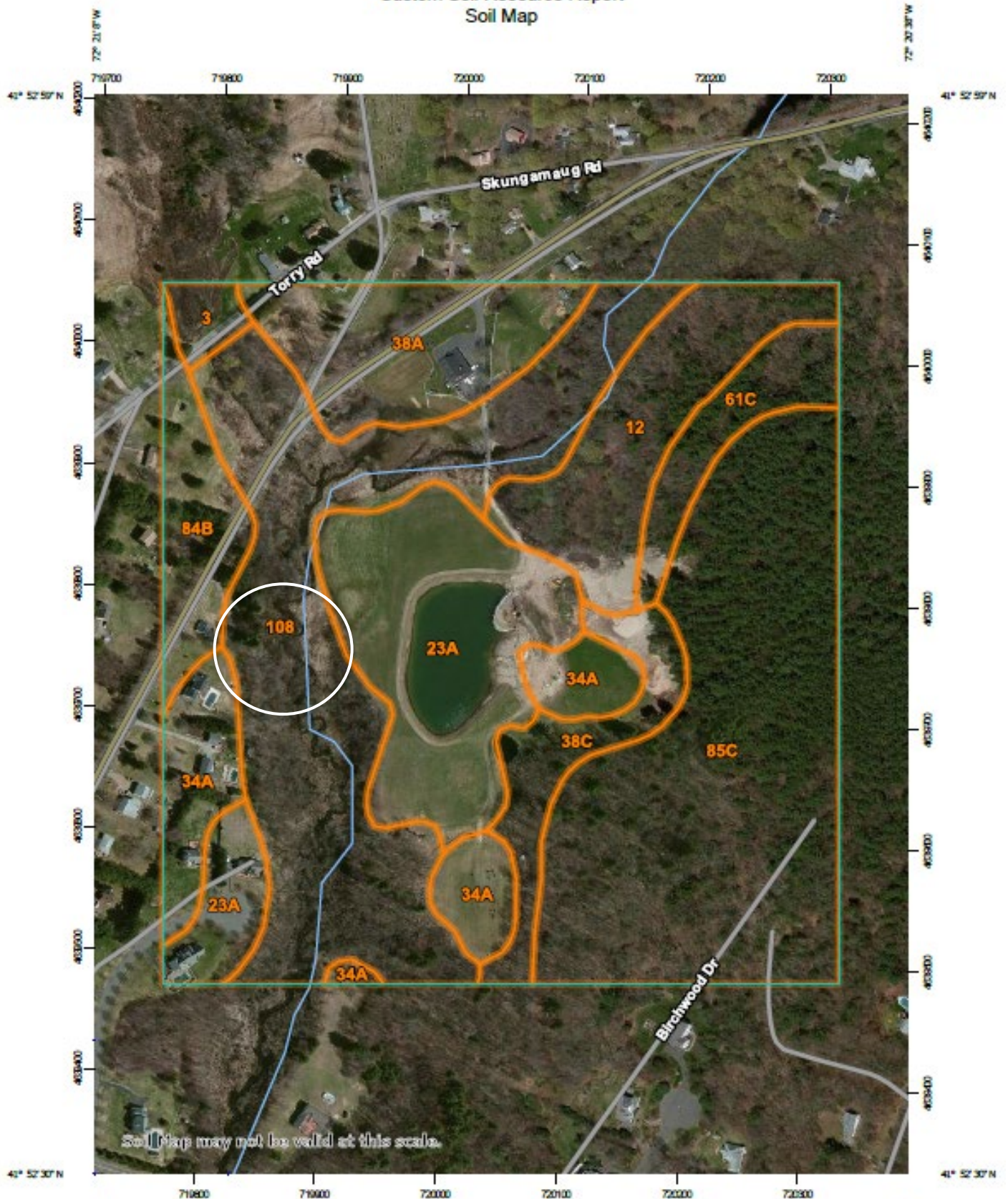
## MAP LEGEND

<b>Area of Interest (AOI)</b>	 Area of Interest (AOI)	 Spoil Area
<b>Soils</b>	 Soil Map Unit Polygons	 Stony Spot
	 Soil Map Unit Lines	 Very Stony Spot
	 Soil Map Unit Points	 Wet Spot
<b>Special Point Features</b>		 Other
 Blowout		 Special Line Features
 Borrow Pit	<b>Water Features</b>	 Streams and Canals
 Clay Spot	<b>Transportation</b>	 Rails
 Closed Depression	 Interstate Highways	 US Routes
 Gravel Pit	 Major Roads	 Local Roads
 Gravelly Spot		
 Landfill	<b>Background</b>	 Aerial Photography
 Lava Flow		
 Marsh or swamp		
 Mine or Quarry		
 Miscellaneous Water		
 Perennial Water		
 Rock Outcrop		
 Saline Spot		
 Sandy Spot		
 Severely Eroded Spot		
 Sinkhole		
 Slide or Slip		
 Sodic Spot		

Map Unit Symbol	Map Unit Name	Acres in AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	0.8
12	Raypol silt loam	6.6
23A	Sudbury sandy loam, 0 to 5 percent slopes	11.8
34A	Merrimac fine sandy loam, 0 to 3 percent slopes	5.6
38A	Hinckley loamy sand, 0 to 3 percent slopes	6.2
38C	Hinckley loamy sand, 3 to 15 percent slopes	3.6
61C	Canton and Chariton fine sandy loams, 8 to 15 percent slopes, very stony	2.9
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	3.4
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	20.4
108	Saco silt loam	19.0
<b>Totals for Area of Interest</b>		<b>80.2</b>

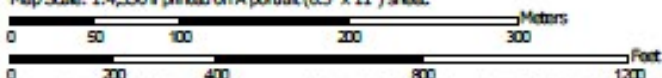


# Custom Soil Resource Report Soil Map



Soil Maps may not be valid at this scale.

Map Scale: 1:4,330 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

Use the soil map unit descriptions and land classification information below to complete the following:

1. Draw a circle around the farmland classification of soil map units 23A, 85C, and 108.  
**See red circles below**
2. Draw a rectangle around the soil parent material of soil map units 23A, 85C, and 108.  
**See red rectangles below**
3. Under the typical profile, is there an O horizon described for soil map units 23A, 85C, or 108?  
**23A and 85C**
4. What soil map unit has the highest water table?  
**108**
5. What soil map unit has a *high* rating for available water storage in the profile?  
**108**
6. What soil map unit has a depth to restrictive feature (densic material) between 20 and 43 inches?  
**85C**
7. What soil map unit has a *very low* rating for runoff class? Why?  
**23A, water infiltrates fast in the sandy soil material of the glaciofluvial deposits**
8. Draw a circle around the soil map units on the Inland Wetlands table and map that are CT Inland Wetlands.  
**See circles on map and table**

## Map Unit Descriptions

### 23A—Sudbury sandy loam, 0 to 5 percent slopes

Map Unit Setting

*National map unit symbol:* 9lkv

*Elevation:* 0 to 1,200 feet

*Mean annual precipitation:* 43 to 54 inches

*Mean annual air temperature:* 45 to 55 degrees F

*Frost-free period:* 140 to 185 days

*Farmland classification:* All areas are prime farmland

Map Unit Composition

*Sudbury and similar soils:* 80 percent; *Minor components:* 20 percent

Setting

*Landform:* Terraces, outwash plains

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Parent material:* Sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss

Typical profile

*Oe - 0 to 1 inches:* moderately decomposed plant material

*A - 1 to 5 inches:* sandy loam

*Bw1 - 5 to 17 inches:* gravelly sandy loam

*Bw2 - 17 to 25 inches:* sandy loam

*2C - 25 to 60 inches:* stratified gravel to sand

Properties and qualities

*Slope:* 0 to 5 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Moderately well drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* High  
*Depth to water table:* About 18 to 36 inches  
*Frequency of flooding:* None *Frequency of ponding:* None  
*Available water storage in profile:* Low (about 4.2 inches)  
*Hydrologic Soil Group:* B  
*Hydric soil rating:* No

### **85C—Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony**

#### Map Unit Setting

*National map unit symbol:* 2w67f  
*Elevation:* 0 to 1,520 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* ~~145 to 240 days~~  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Paxton, very stony, and similar soils:* 55 percent; *Montauk, very stony, and similar soils:* 30 percent;  
*Minor components:* 15 percent

#### Setting

*Landform:* Hills, ground moraines, drumlins  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear, convex  
*Across-slope shape:* Convex

*Parent material:* Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

#### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material  
*A - 2 to 10 inches:* fine sandy loam  
*Bw1 - 10 to 17 inches:* fine sandy loam  
*Bw2 - 17 to 28 inches:* fine sandy loam  
*Cd - 28 to 67 inches:* gravelly fine sandy loam

#### Properties and qualities

*Slope:* 8 to 15 percent  
*Percent of area covered with surface fragments:* 1.6 percent  
*Depth to restrictive feature:* 20 to 43 inches to densic material  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low  
*Depth to water table:* About 18 to 37 inches  
*Frequency of flooding:* None *Frequency of ponding:* None  
*Salinity, maximum in profile:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water storage in profile:* Low (about 4.8 inches)  
*Hydrologic Soil Group:* C  
*Hydric soil rating:* No



## 108—Saco silt loam

### Map Unit Setting

*National map unit symbol:* 9ljv

*Elevation:* 0 to 1,200 feet

*Mean annual precipitation:* 43 to 54 inches

*Mean annual air temperature:* 45 to 55 degrees F

~~*Frost-free period:* 140 to 185 days~~

*Farmland classification:* Not prime farmland

### Map Unit Composition

*Saco and similar soils:* 80 percent *Minor components:* 20 percent

### Setting

*Landform:* Flood plains

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Parent material:* Coarse-silty alluvium

### Typical profile

*A - 0 to 12 inches:* silt loam

*Cg1 - 12 to 32 inches:* silt loam

*Cg2 - 32 to 48 inches:* silt loam

*2Cg3 - 48 to 60 inches:* stratified very gravelly coarse sand to loamy fine sand

### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Very poorly drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high

*Depth to water table:* About 0 to 6 inches

*Frequency of flooding:* Frequent *Frequency of ponding:* Frequent

*Available water storage in profile:* High (about 10.1 inches)

*Hydrologic Soil Group:* B/D

*Hydric soil rating:* Yes

## **Land Classifications:**


### **Inland Wetlands (CT)**

The State of Connecticut defines inland wetlands based on soils. The Connecticut Inland Wetlands and Watercourses Act defines wetland soils to include any of the soil types designated as poorly drained, very poorly drained, alluvial, or floodplain by the National Cooperative Soil Survey, as may be periodically amended, of the Natural Resources Conservation Service of the United States Department of Agriculture.

Map unit symbol	Map unit name	Rating	Component name (percent)	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	CT wetland	Ridgebury, extremely stony (40%)	0.8	1.1%
			Leicester, extremely stony (35%)		
			Whitman, extremely stony (17%)		
			Swansea (2%)		
12	Raypol silt loam	CT wetland	Raypol (80%)	6.6	8.2%
			Walpole (2%)		
			Scarboro (2%)		
23A	Sudbury sandy loam, 0 to 5 percent slopes	CT nonwetland	Sudbury (80%)	11.8	14.7%
			Ninigret (5%)		
			Agawam (5%)		
			Merrimac (5%)		
			Tisbury (3%)		
34A	Merrimac fine sandy loam, 0 to 3 percent slopes	CT nonwetland	Merrimac (85%)	5.6	7.0%
			Hinckley (5%)		
			Sudbury (5%)		
			Agawam (3%)		
			Windsor (2%)		
38A	Hinckley loamy sand, 0 to 3 percent slopes	CT nonwetland	Hinckley (85%)	6.2	7.7%
			Merrimac (5%)		
			Windsor (5%)		
			Sudbury (5%)		
38C	Hinckley loamy sand, 3 to 15 percent slopes	CT nonwetland	Hinckley (85%)	3.6	4.4%
			Merrimac (5%)		
			Windsor (5%)		
			Agawam (3%)		
61C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony	CT nonwetland	Canton, very stony (50%)	2.9	3.6%
			Charlton, very stony (35%)		
			Chatfield, very stony (5%)		
			Sutton, very stony (5%)		
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	CT nonwetland	Paxton (55%)	3.4	4.3%
			Montauk (30%)		
			Woodbridge (5%)		
			Charlton (5%)		
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	CT nonwetland	Paxton, very stony (55%)	20.4	25.4%
			Montauk, very stony (30%)		
			Woodbridge, very stony (6%)		
			Charlton, very stony (5%)		
			Stockbridge, very stony (1%)		
108	Saco silt loam	CT wetland	Saco (80%)	19.0	23.7%
			Limerick (5%)		
			Lim (5%)		
			Rippowam (3%)		
			Winooski (3%)		
			Bash (2%)		
			Hadley (2%)		
<b>Totals for Area of Interest</b>				<b>80.2</b>	<b>100.0%</b>




## MAP LEGEND

### Area of Interest (AOI)




 Area of Interest (AOI)

### Soils




#### Soil Rating Polygons

-  CT nonwetland
-  CT wetland
-  Not rated or not available


#### Soil Rating Lines

-  CT nonwetland
-  CT wetland
-  Not rated or not available


#### Soil Rating Points

-  CT nonwetland
-  CT wetland
-  Not rated or not available


### Water Features

 Streams and Canals

### Transportation

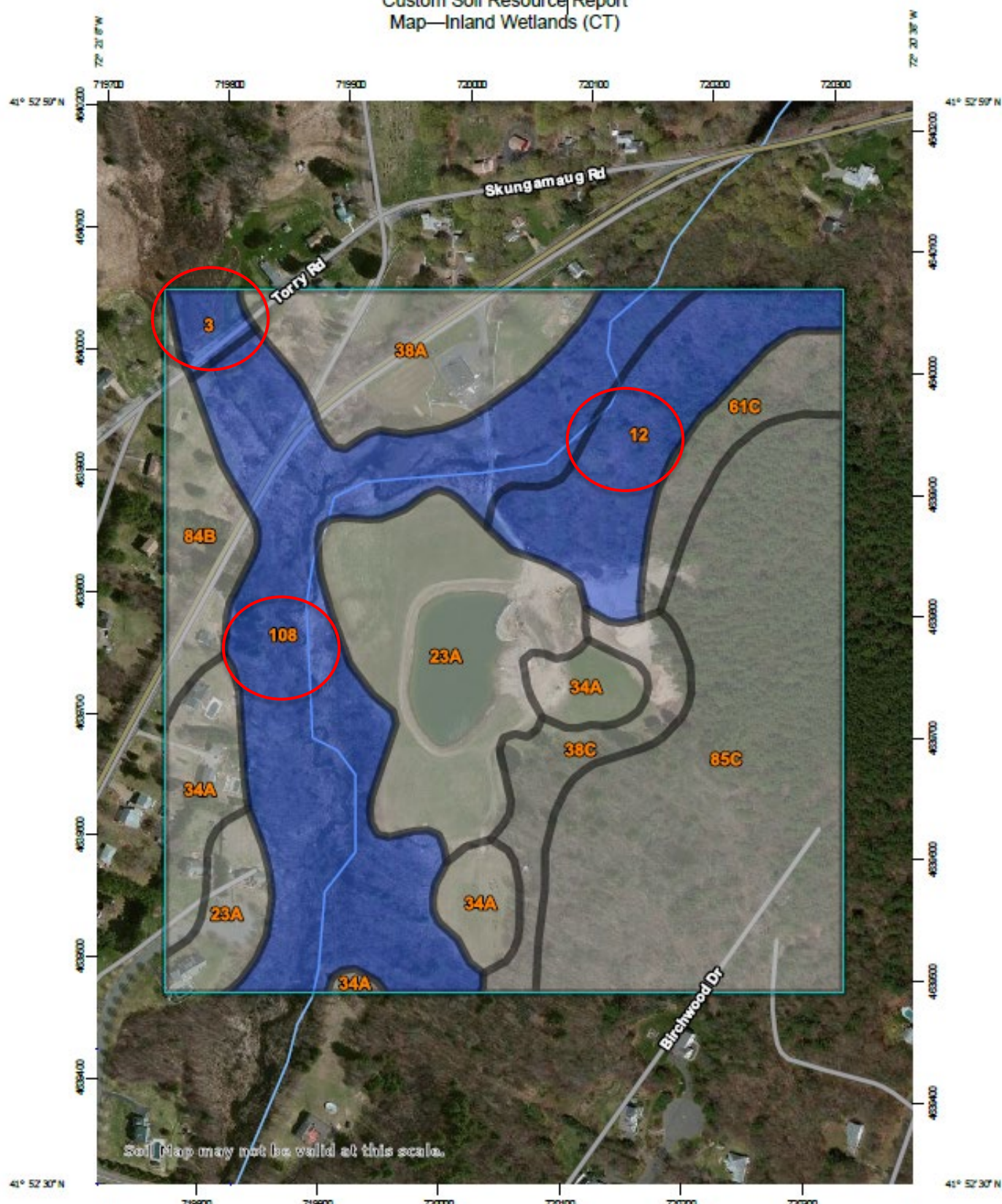
-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

### Background

 Aerial Photography



Custom Soil Resource Report  
 Map—Inland Wetlands (CT)



Map Scale: 1:4,330 if printed on A portrait (8.5" x 11") sheet.

0 50 100 200 300 Meters

0 200 400 800 1200 Feet



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

## Exercise 3: Web Soil Survey

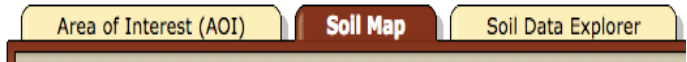


Launch Web Soil Survey by clicking the green 'Start WSS' button

On the left-hand of the screen under “**quick navigation**” click the down arrow next to “**address**” and enter the address (*1032 Tolland Stage Rd, Tolland, CT*). This address may be the site of the next Envirothon.

Create an AOI (area of interest) using either the polygon tool  , or the rectangle tool  . You should see a defined hatched area.

The next few steps will require navigating the tabs.



Click the **Soil Map** tab and observe the map unit legend. Scroll down the legend and click on Sudbury sandy loam, 0 to 5 percent slopes and read the **Description of Sudbury**.

1. Under **Settings**, what are the two landforms Sudbury soils are formed on?  
**Terraces and outwash plains**
2. Under **properties and qualities**, does this soil map unit flood or pond?  
**No**
3. Under the **Typical Profile**, how many horizons are described?  
**5 soil horizons**

Click on the **Soil Data Explorer** tab, **Soil Properties and Qualities** tab, **Soil Health Properties** tab, **Soil Health – Organic Matter**, and **View Rating**. Open the **legend** tab to see what the colors represent. Below the map is the interpretation report – view the soil organic matter ratings (percent) for each soil map unit.

1. Why are some soils much higher in organic matter than others? Could it be that some soils are forested, and others are cropped? **Some soil profiles have an O horizon and are higher in organic matter than the Ap horizons. Yes, the areas with the O horizons on the surface are most likely forested.**

Click on **Soil Qualities and Features**, **Parent Material Name**, and **View Rating**. Read the summary rating by soil map unit below the map.

1. What are the some of the soil map unit symbols of the soils formed in lodgment till? **3, 84B, and 85C Alluvium? 108**

If you have time, locate what soils are mapped at your school or home.