Field and Office Delineations

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Field vs. Office Delineations

- Field Delineations
  - Raw Data
  - Current conditions
    - Is the site disturbed?
    - Are any indicators problematic?
  - Wetlands not identified in office delineations may be discovered

Field vs. Office Delineations Cont.

- Office Delineations (Off-Site)
  - ► Quick
  - ► Available office data can be used to provide:
    - Historical data
    - Supporting data for on-site delineations
    - Information on the type of water resource
    - An approximate boundary
  - ► Not as accurate as on-site delineations

Off-Site Procedures

Off-Site procedures are described in:

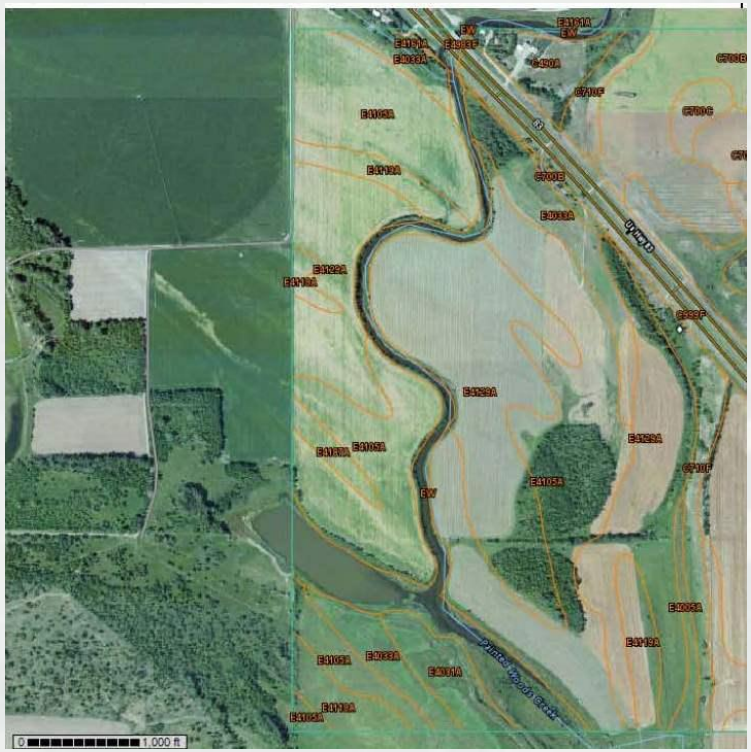
- Corps of Engineers Wetlands Delineation Manual (Part IV, Section D, Subsection 1)
- National Food Security Act Manual (Parts 513 and 514) in combination with state wetland mapping conventions

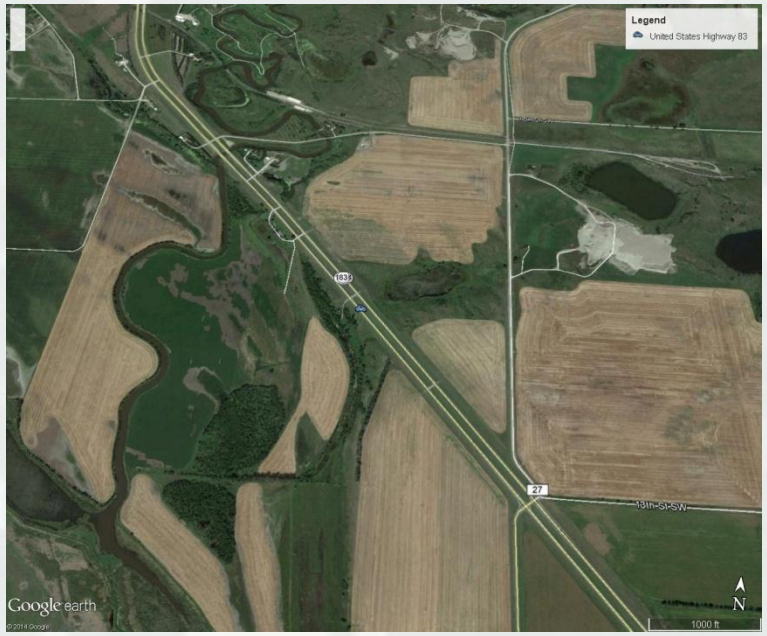
Off-Site Procedures

- More data makes for a strong determination.
- Data to include:
  - Aerial imagery
  - Historical hydrology trends
  - NWI maps
  - Soil surveys
- Benefits of providing more supportive data and concise delineations:
  - Parameters of current and past trends are understood
  - Earlier turn around by the Corps of Engineers

Preliminary Data Gathering

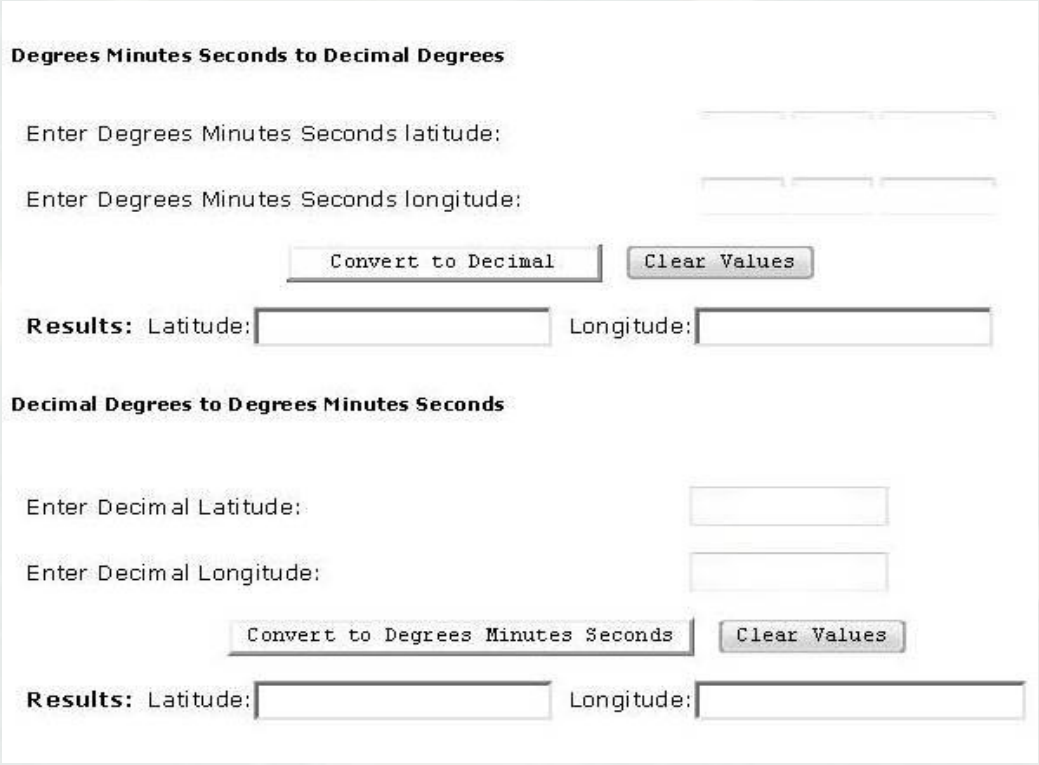
- Off-site sources of information are used to plan and carry out an on-site delineation.





Coordinate Conversion

- http://transition.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html

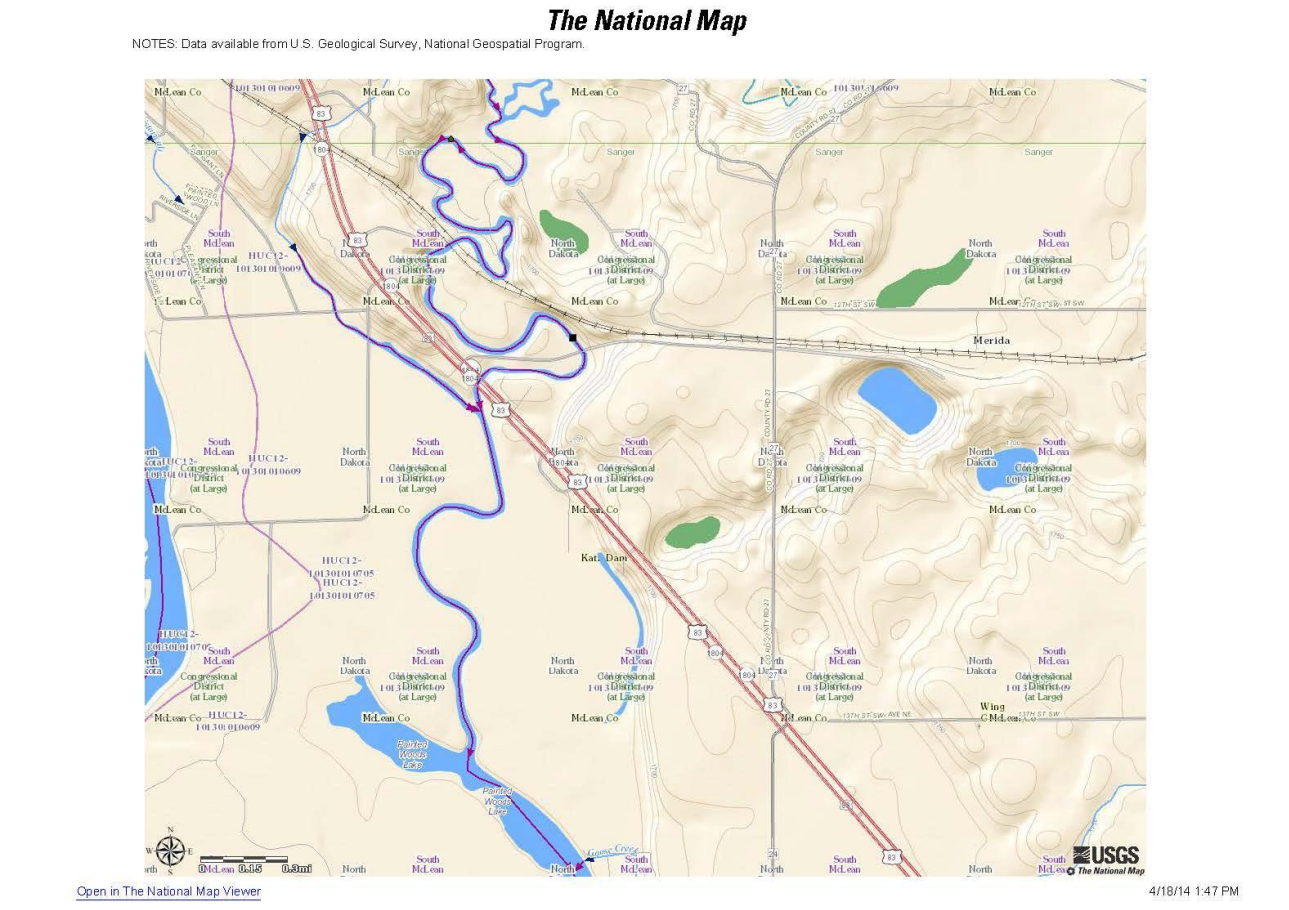


Topographic Maps

- USGS national map viewer
  - ► Transportation data
    - Roads, highways, interstates, and railroads
  - ► Hydrology data
  - ► Topographic contours
  - ► Government boundaries
    - County line
    - State lines,
    - Section, Township, Range
    - HUC information

All on one Map!!!

USGS Topographic Maps

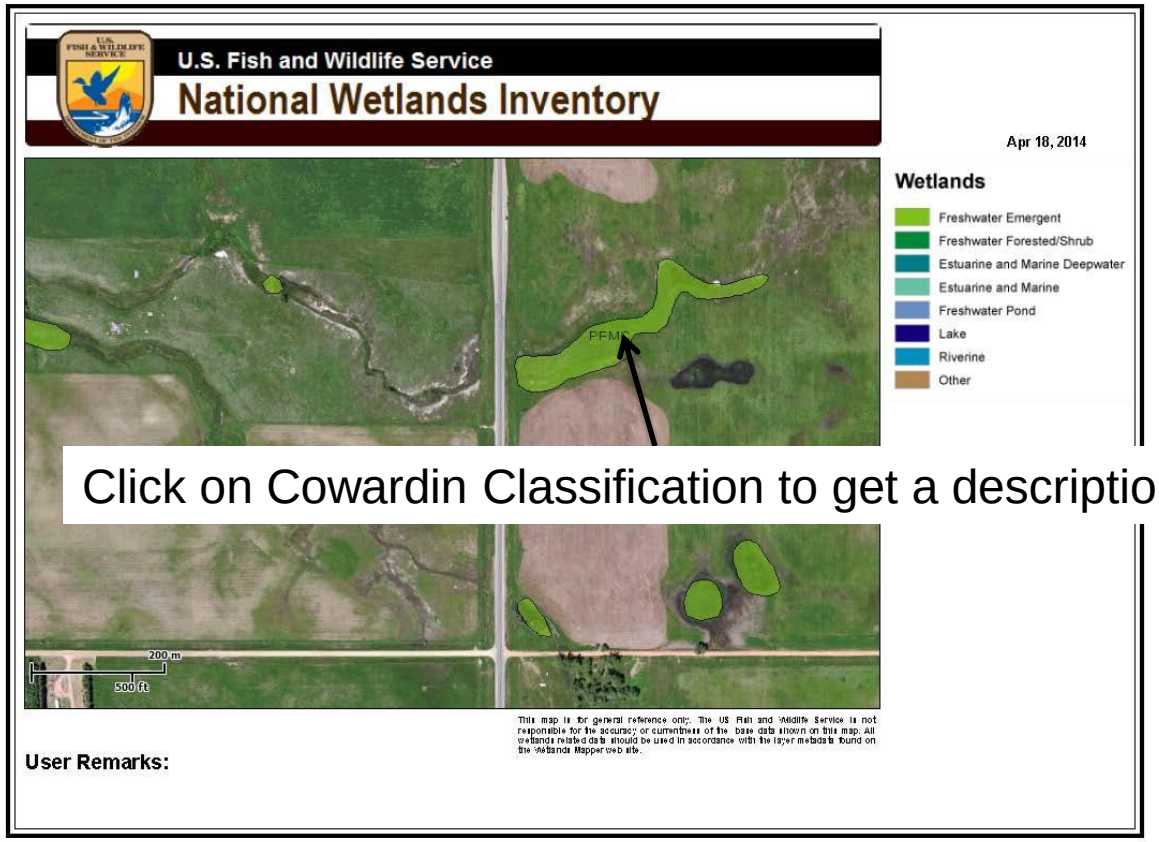


National Wetland Inventory Maps (NWI)

- Provides information regarding:
  - Wetland types
  - Hydrology
  - Approximate boundaries

- Problems with NWI?
  - The data is not updated, which can lead to:
    - Misinterpretation of wetland types and boundaries
    - Missed wetlands in the review area

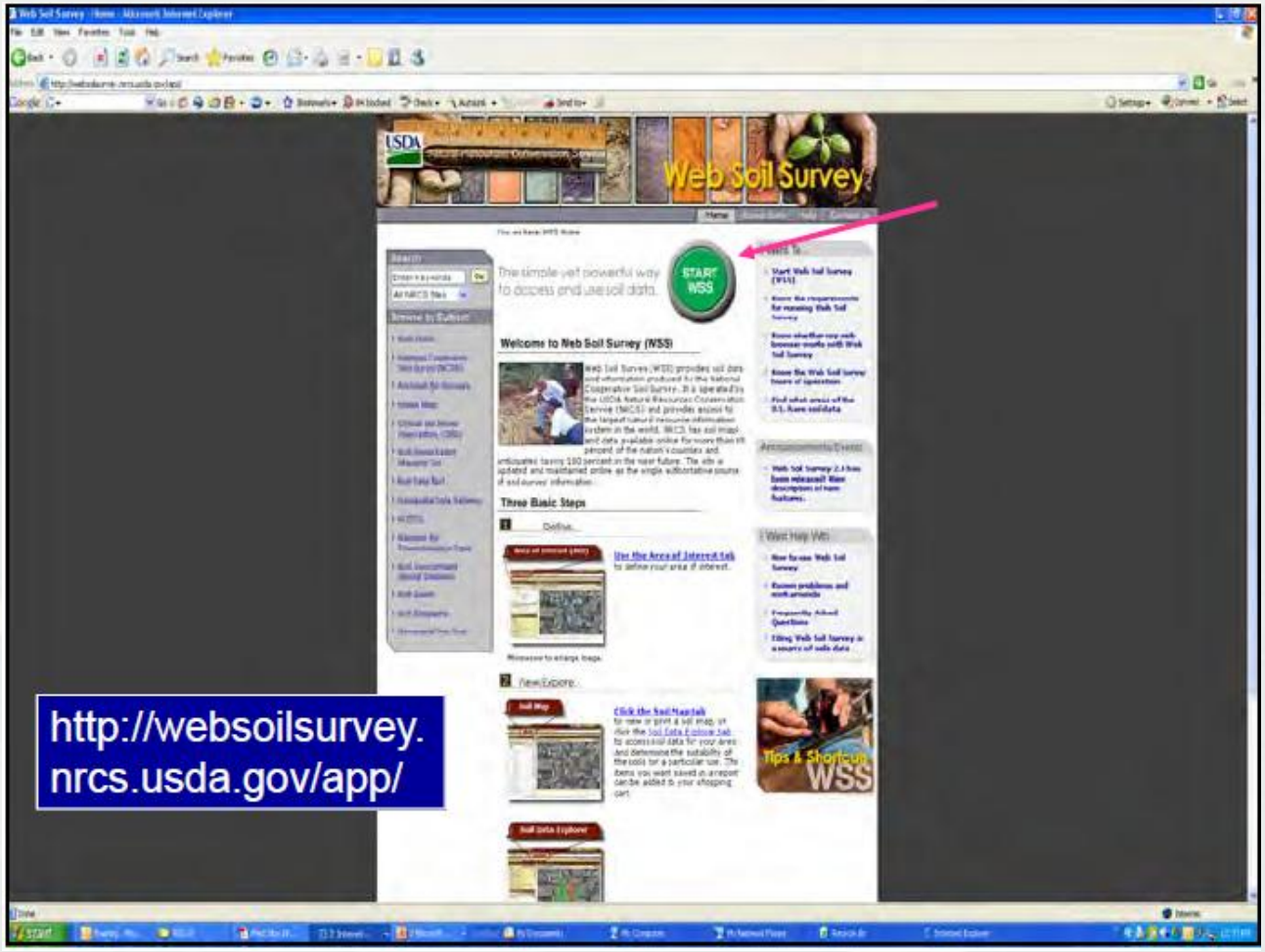
NWI Wetlands Mapper



NRCS Web Soil Survey

- Contains the latest soils data
  - Supersedes hardcopy surveys
- Data include:
  - Soil series
  - Hydric soil status
  - Water features
  - Depth to restrictive layer
  - Drainage class
- Web survey does go down… so don't wait until the last minute.

Off-Site Methods



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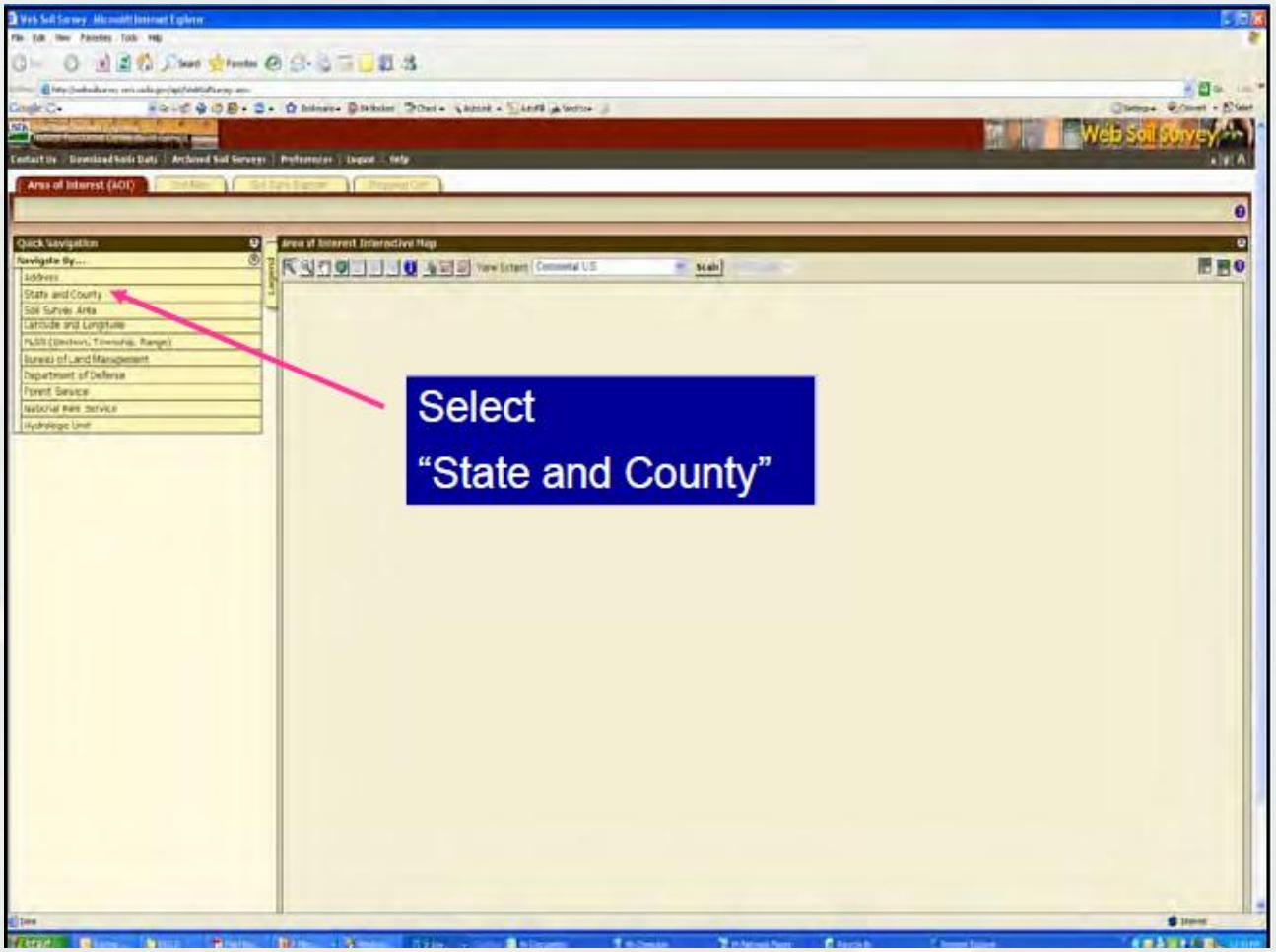

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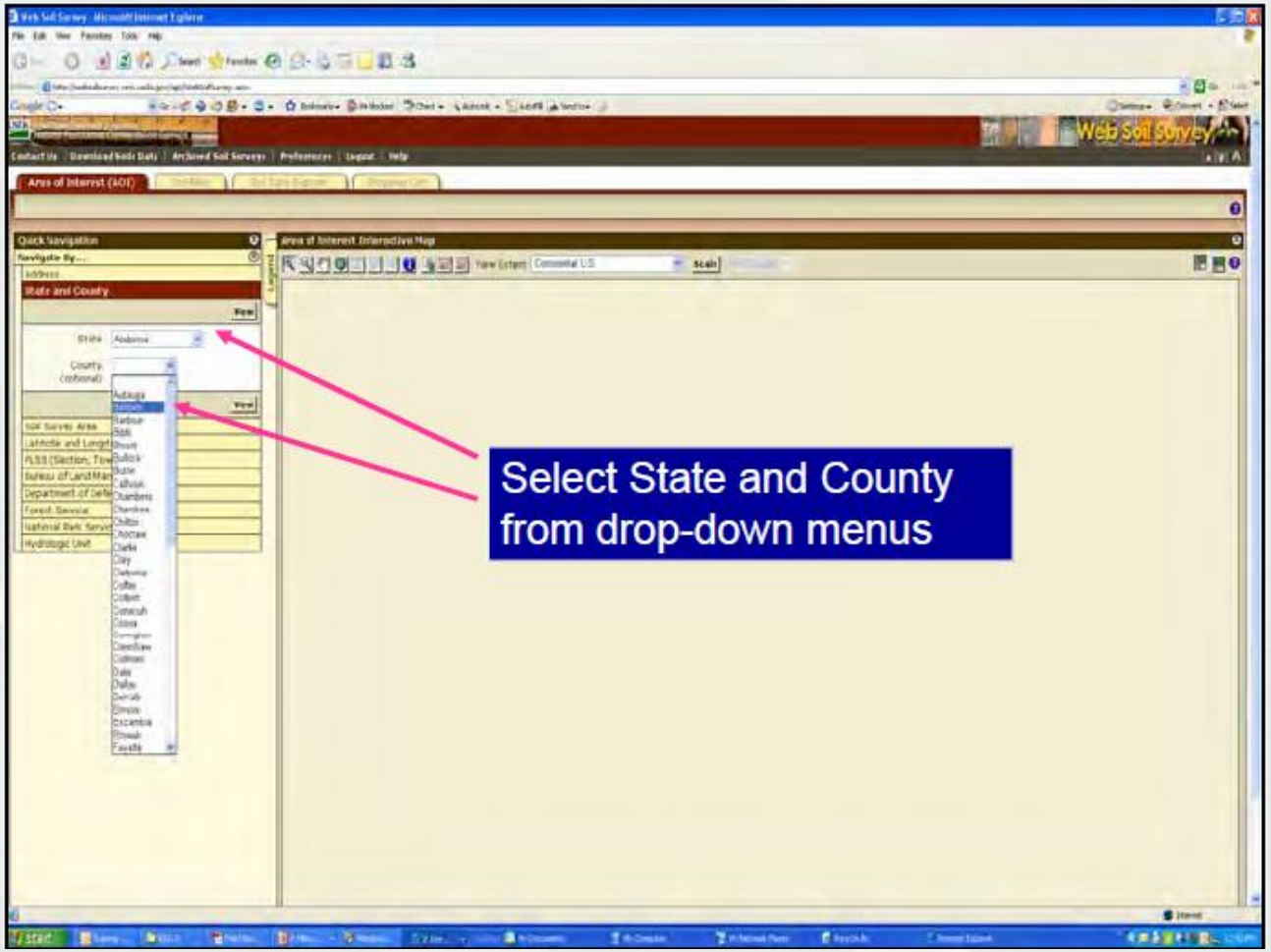

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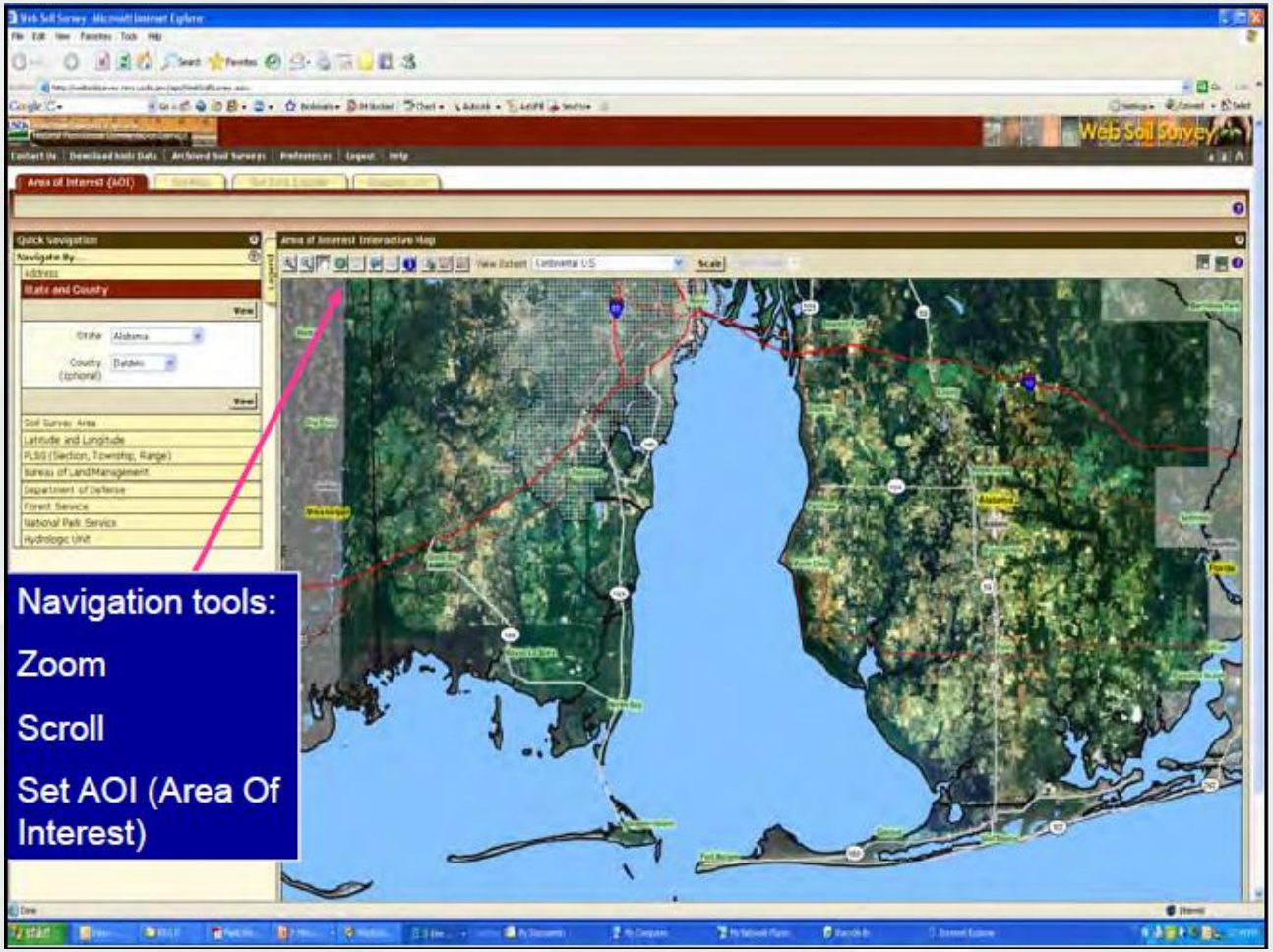

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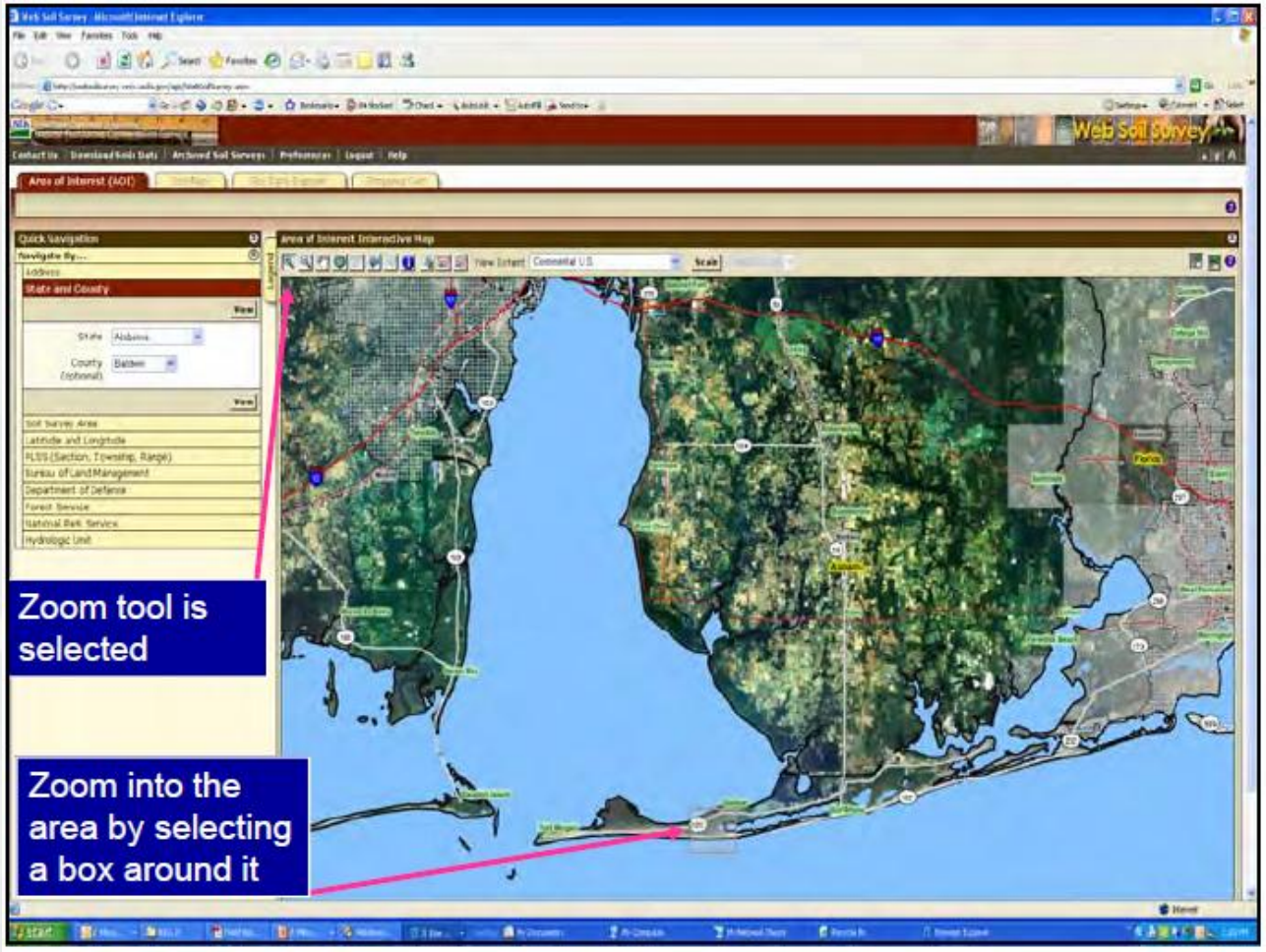

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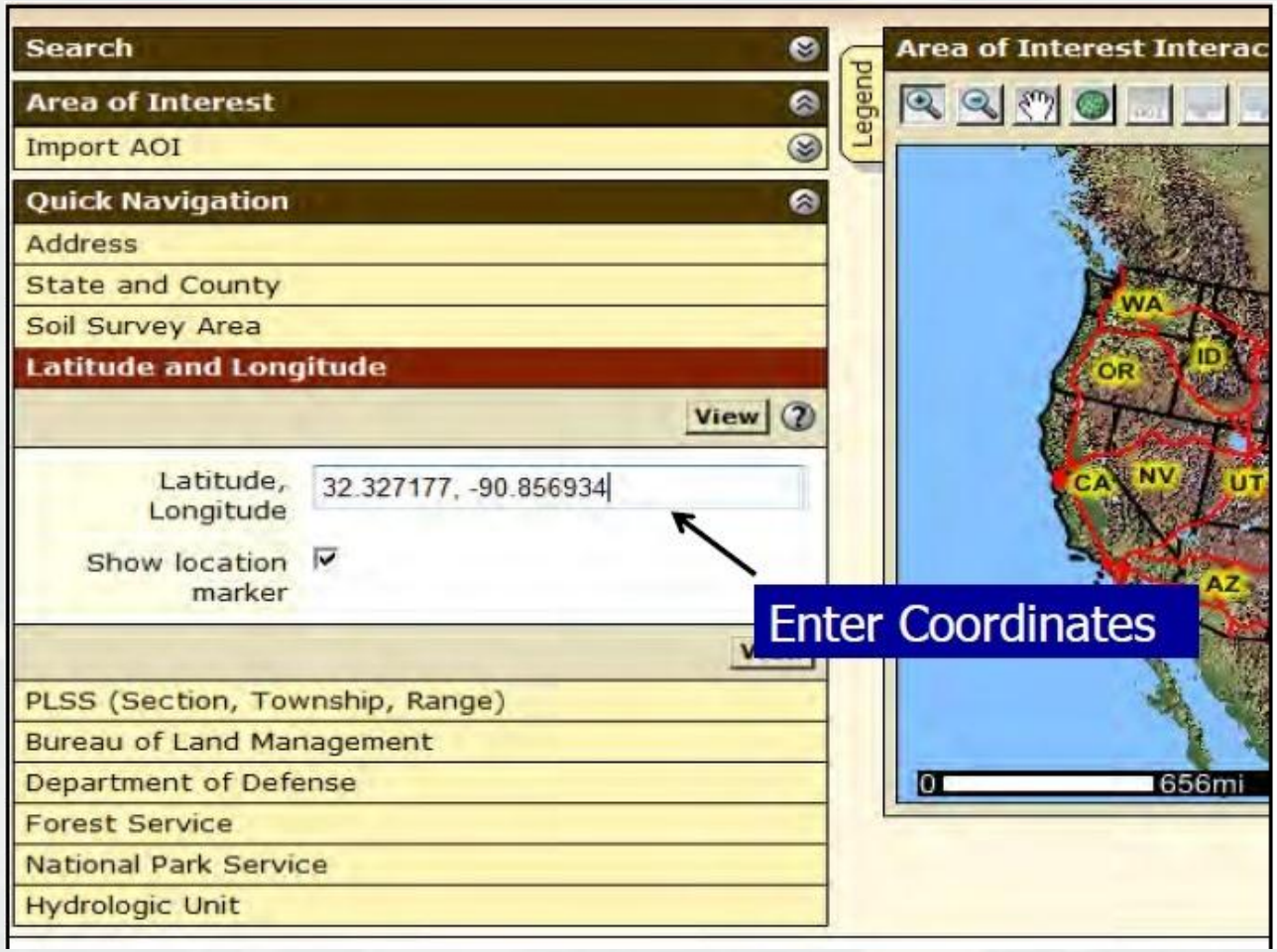

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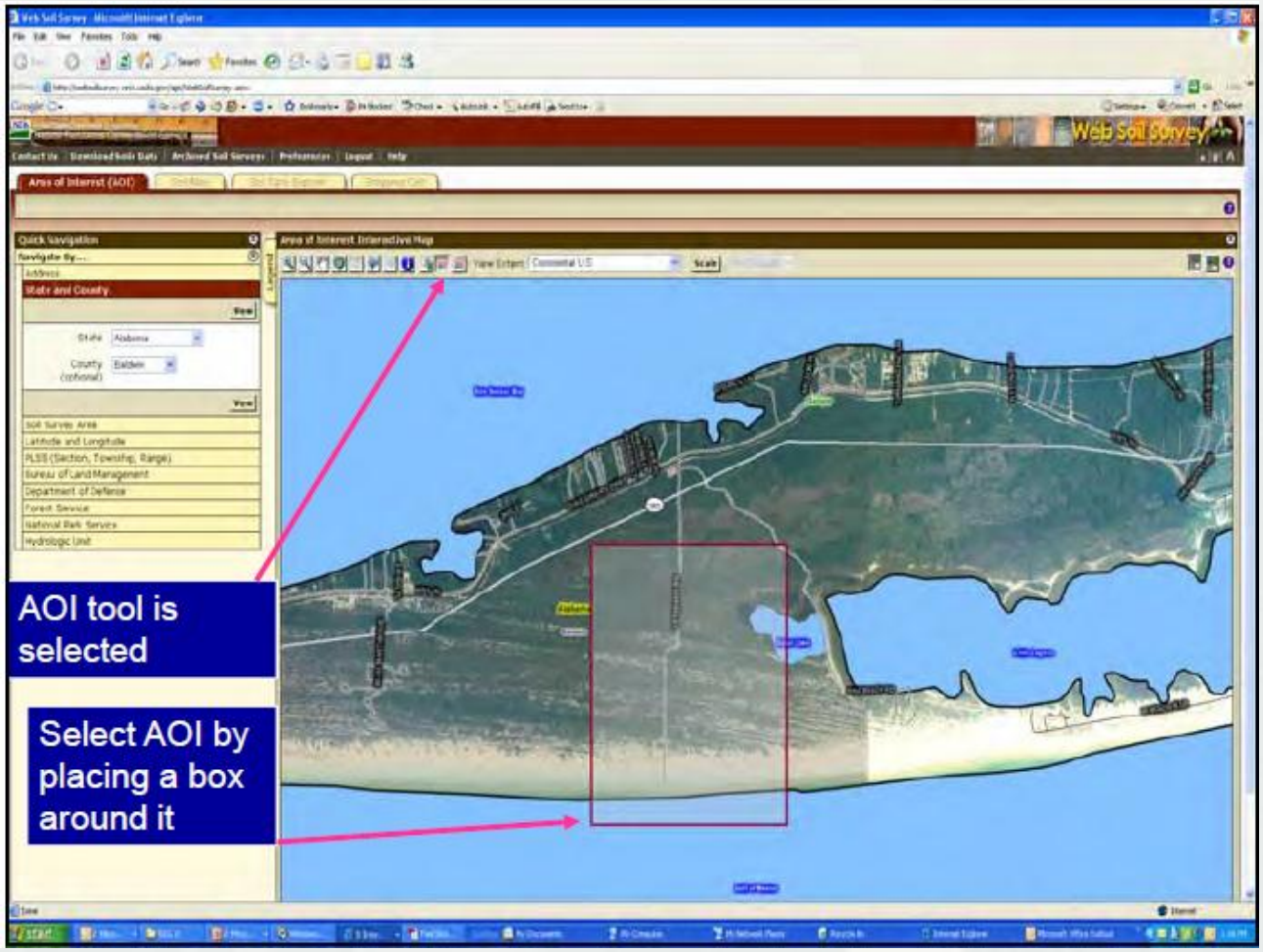

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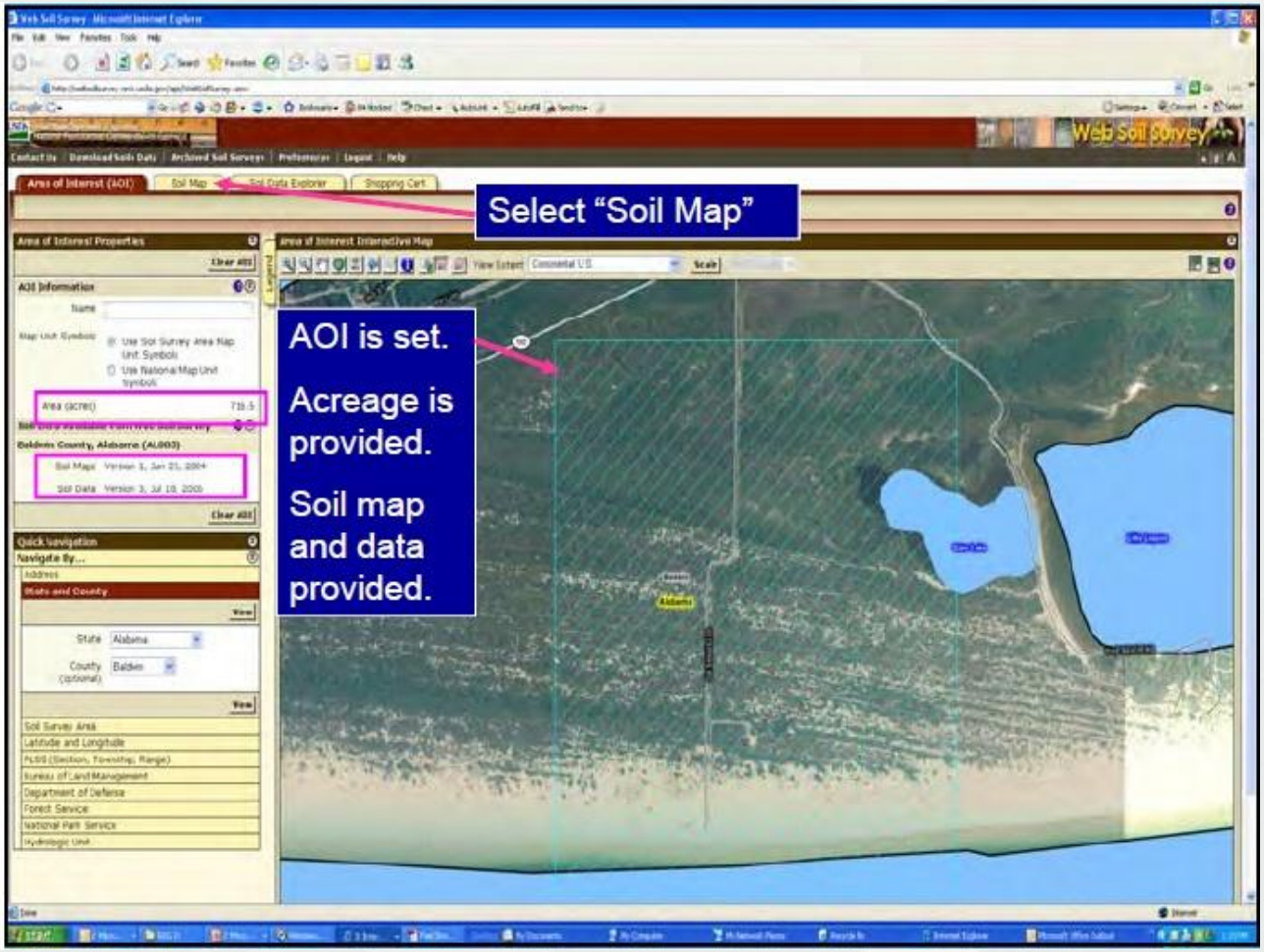

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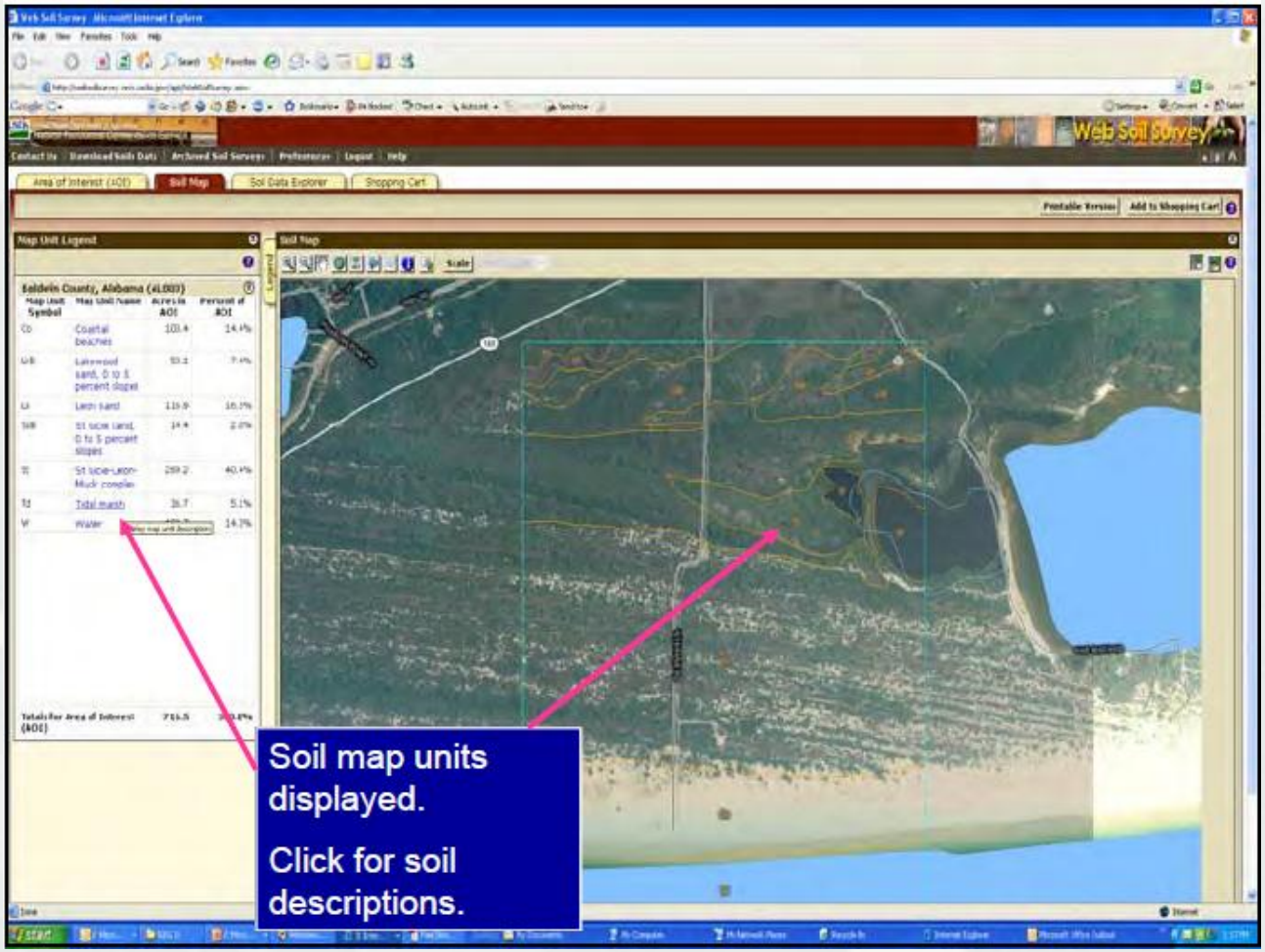

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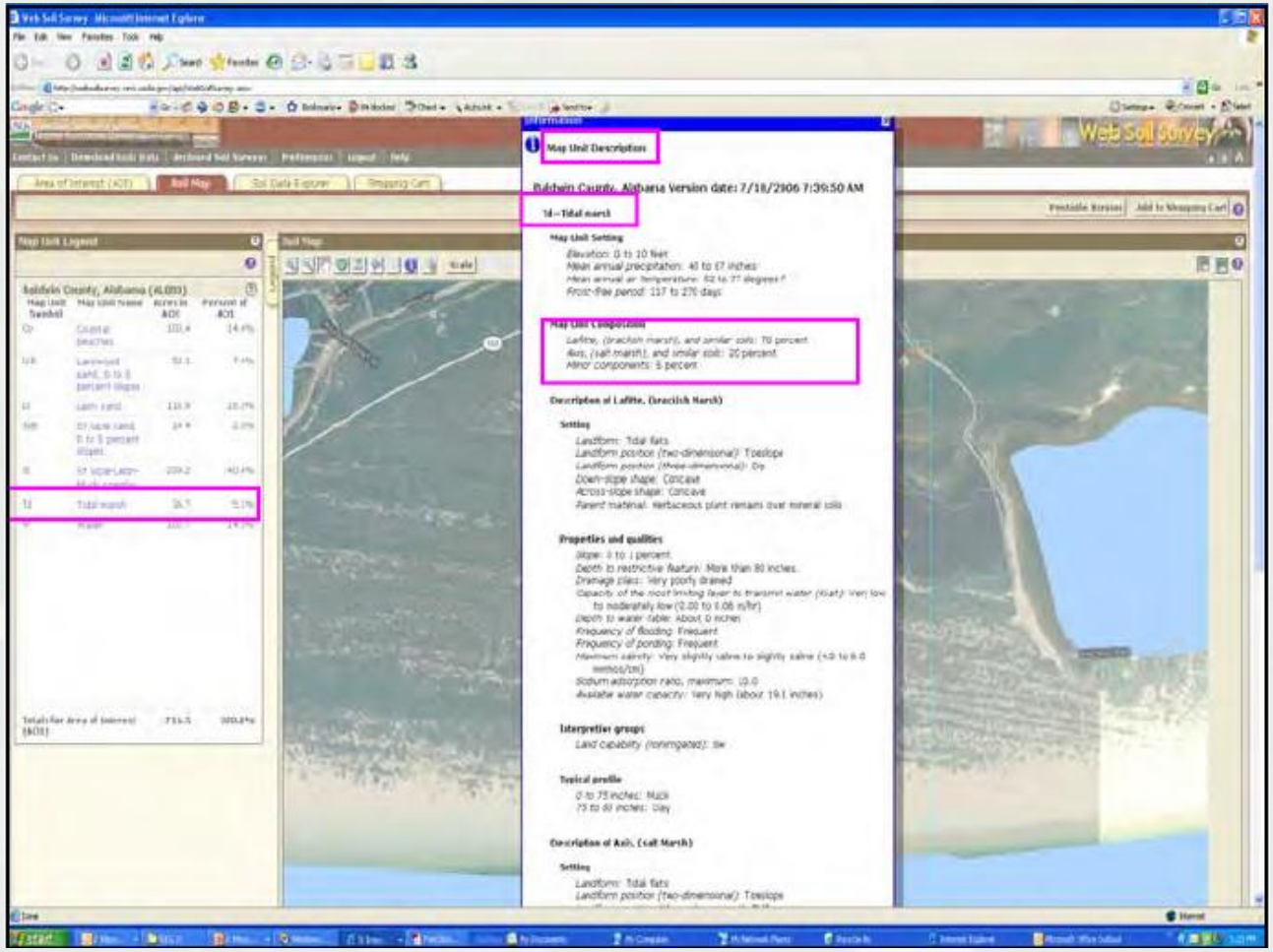

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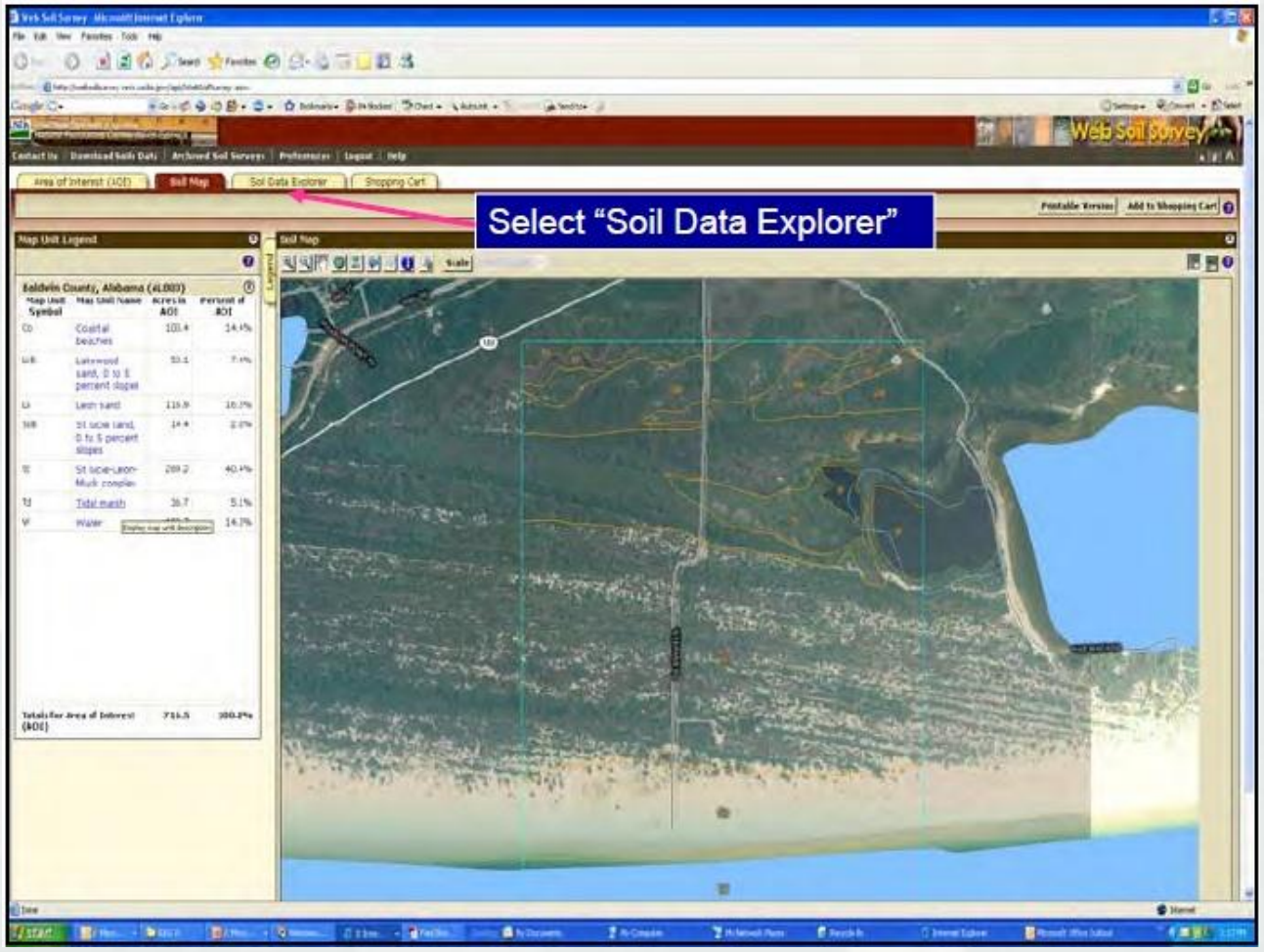

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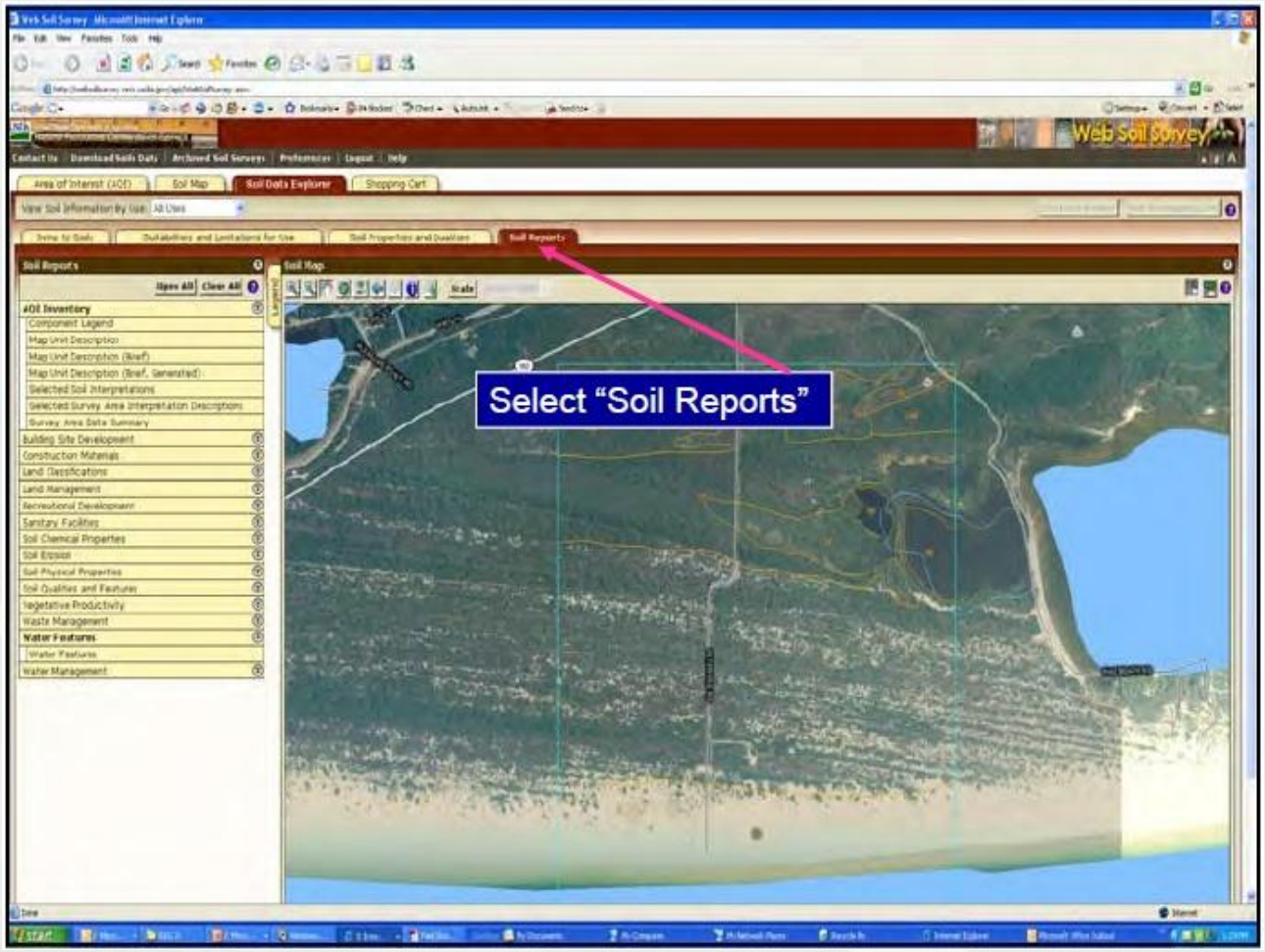

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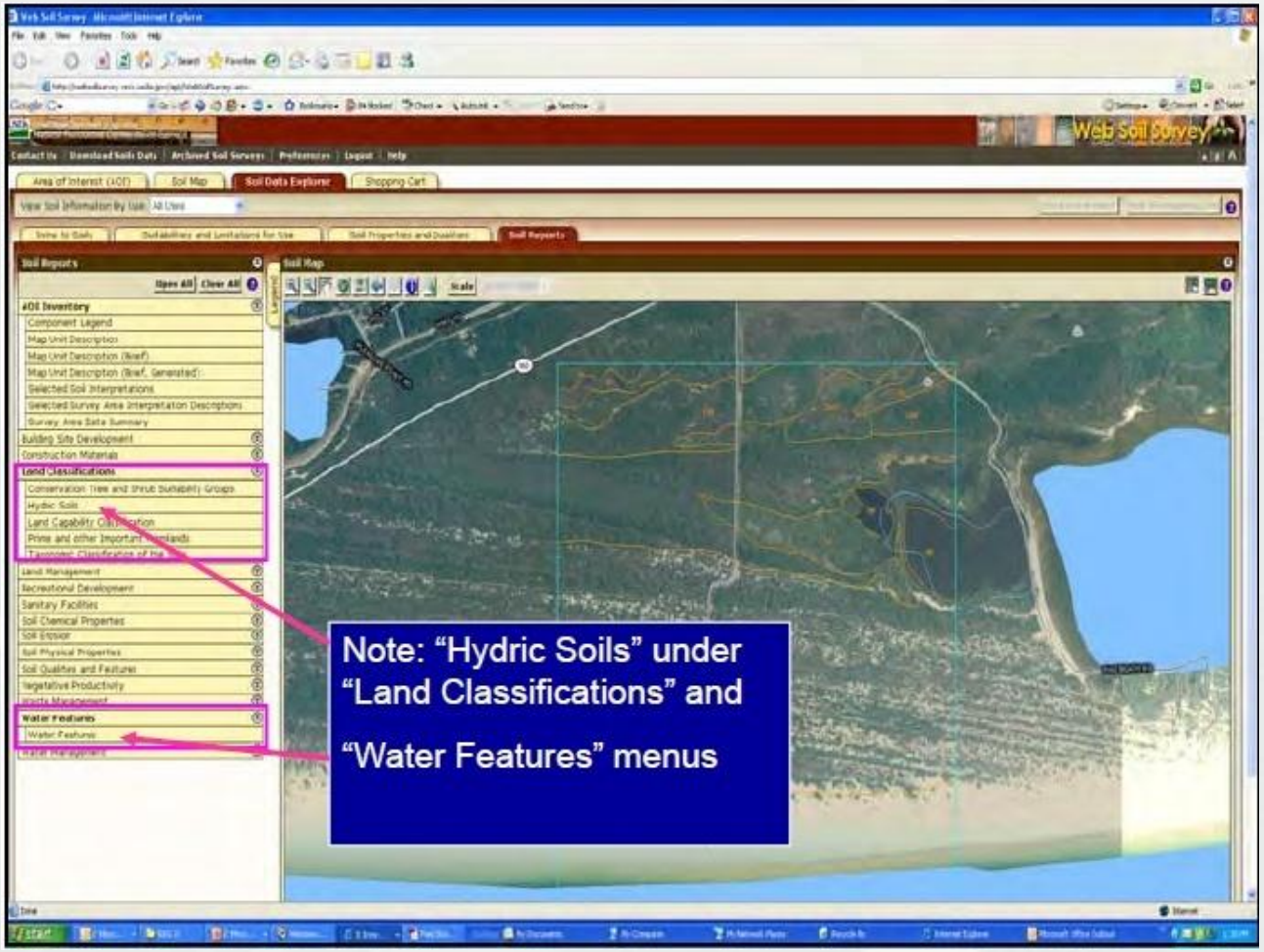
Off-Site Methods



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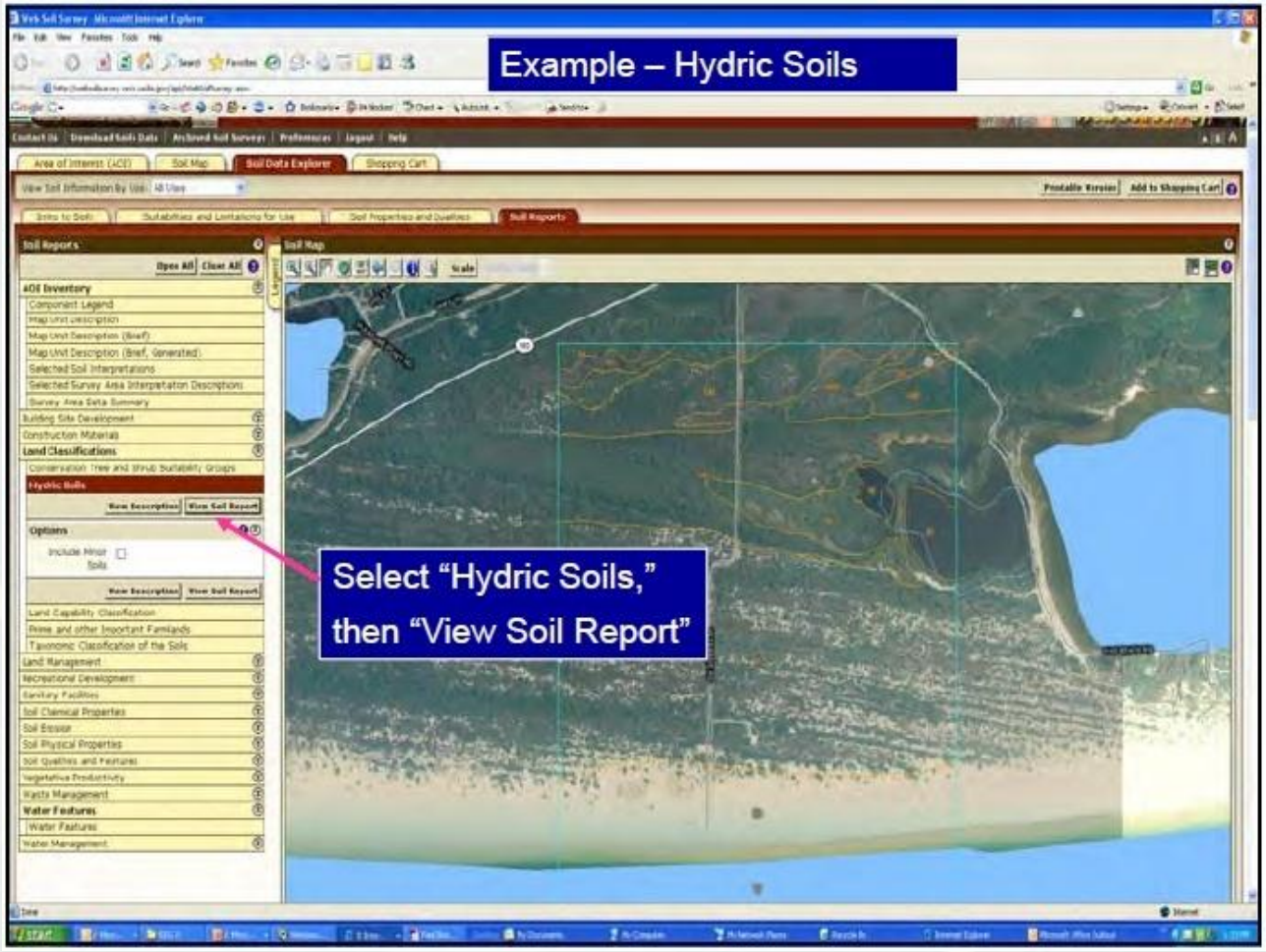

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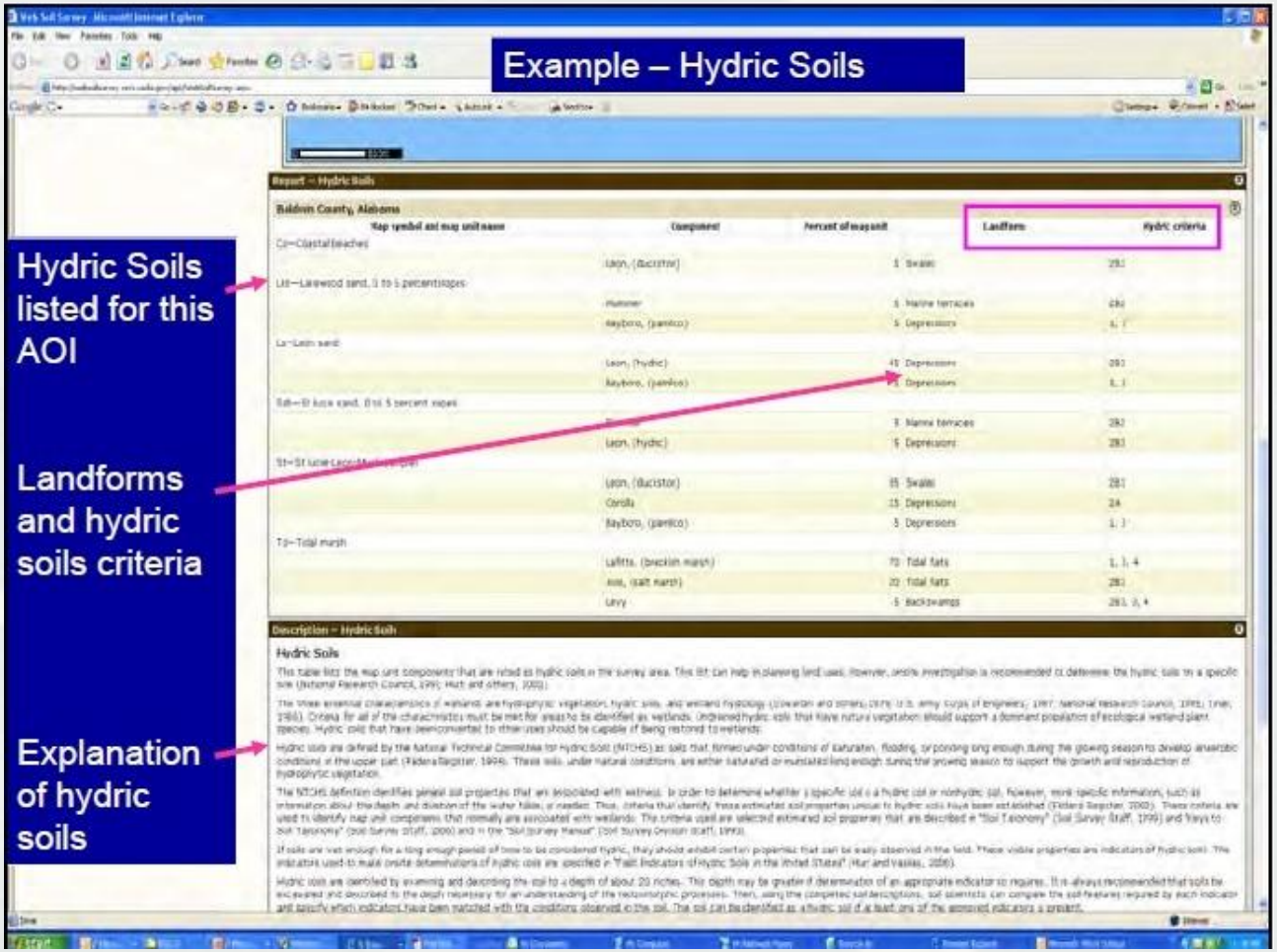

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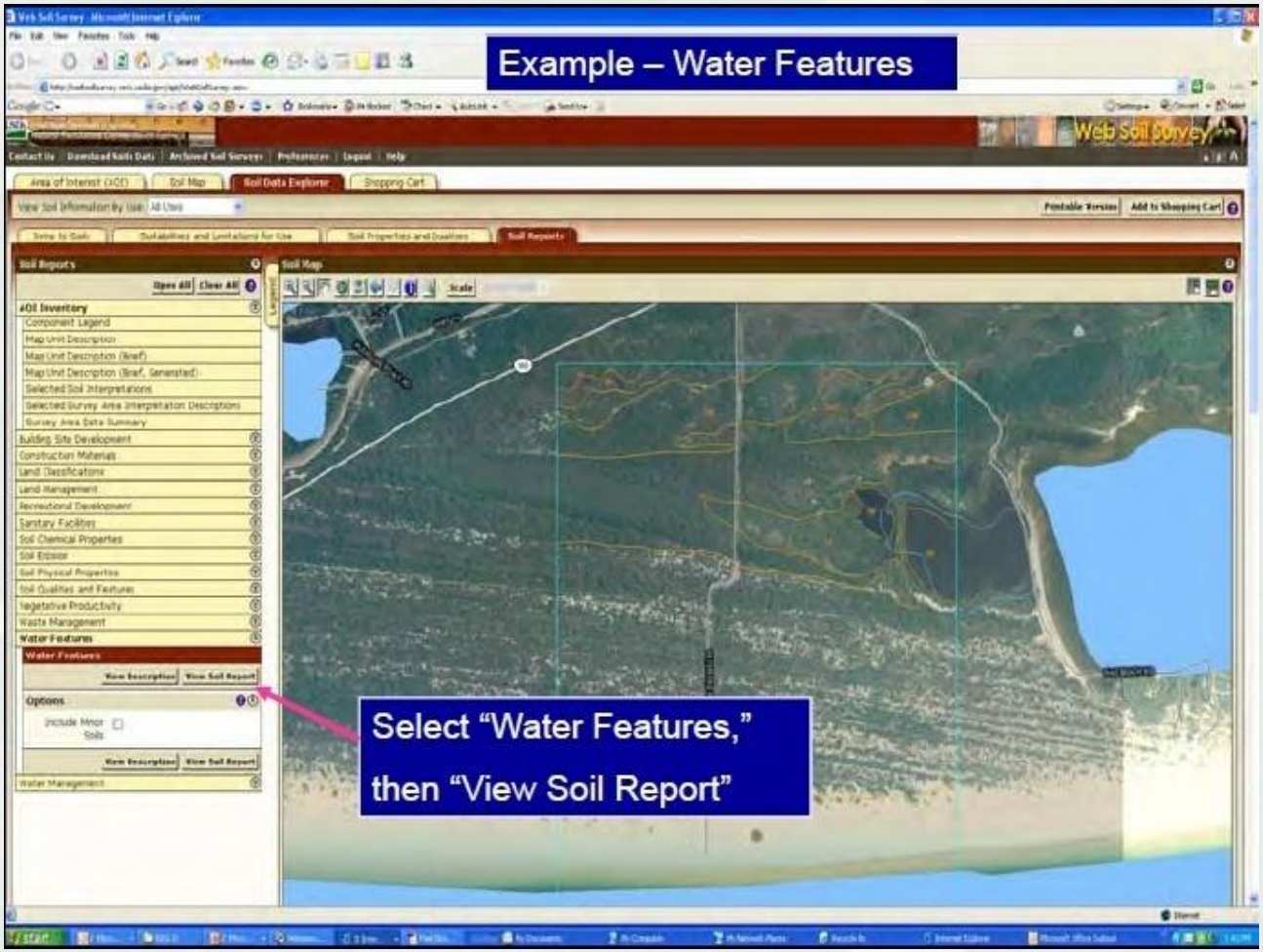

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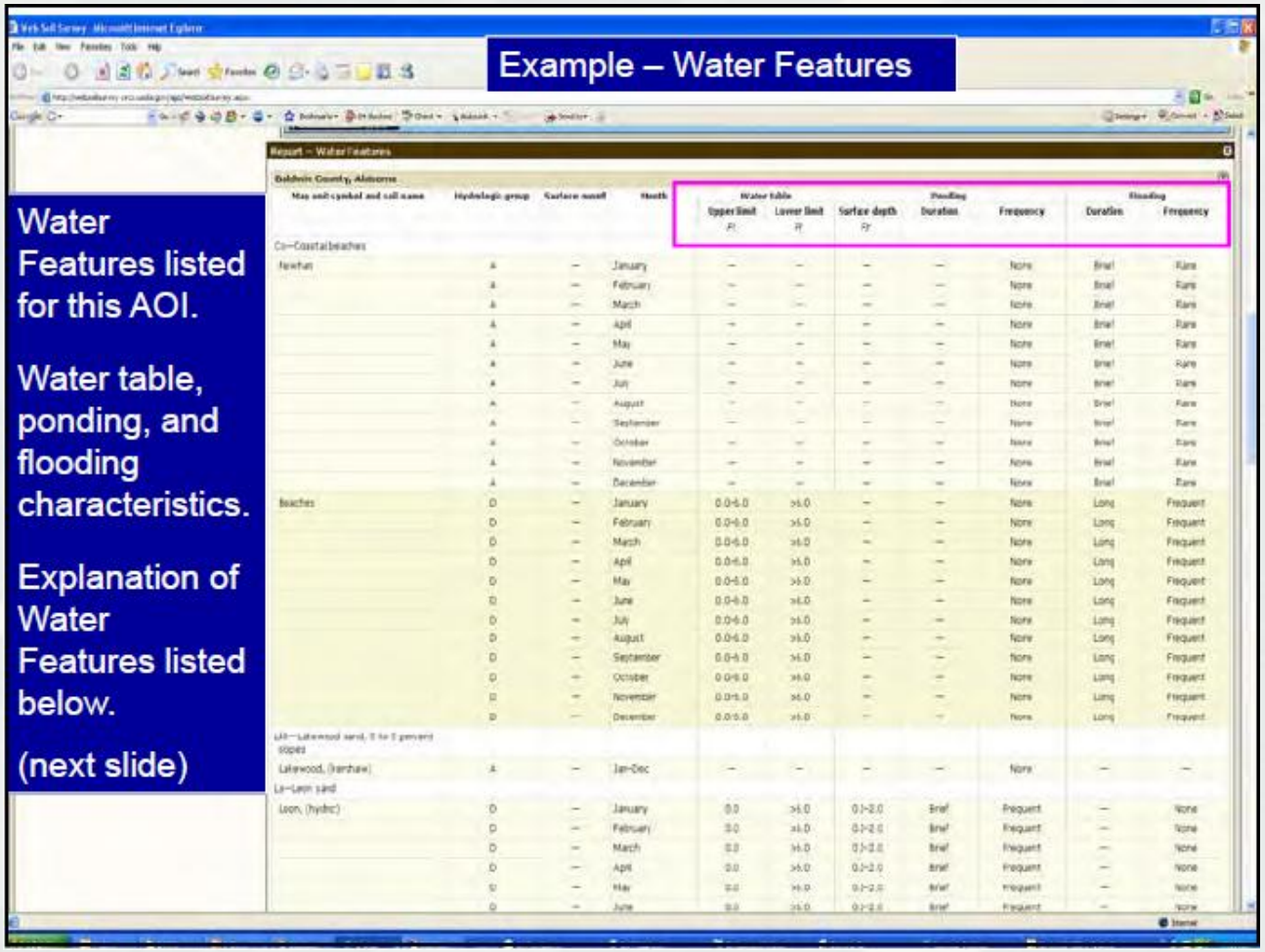

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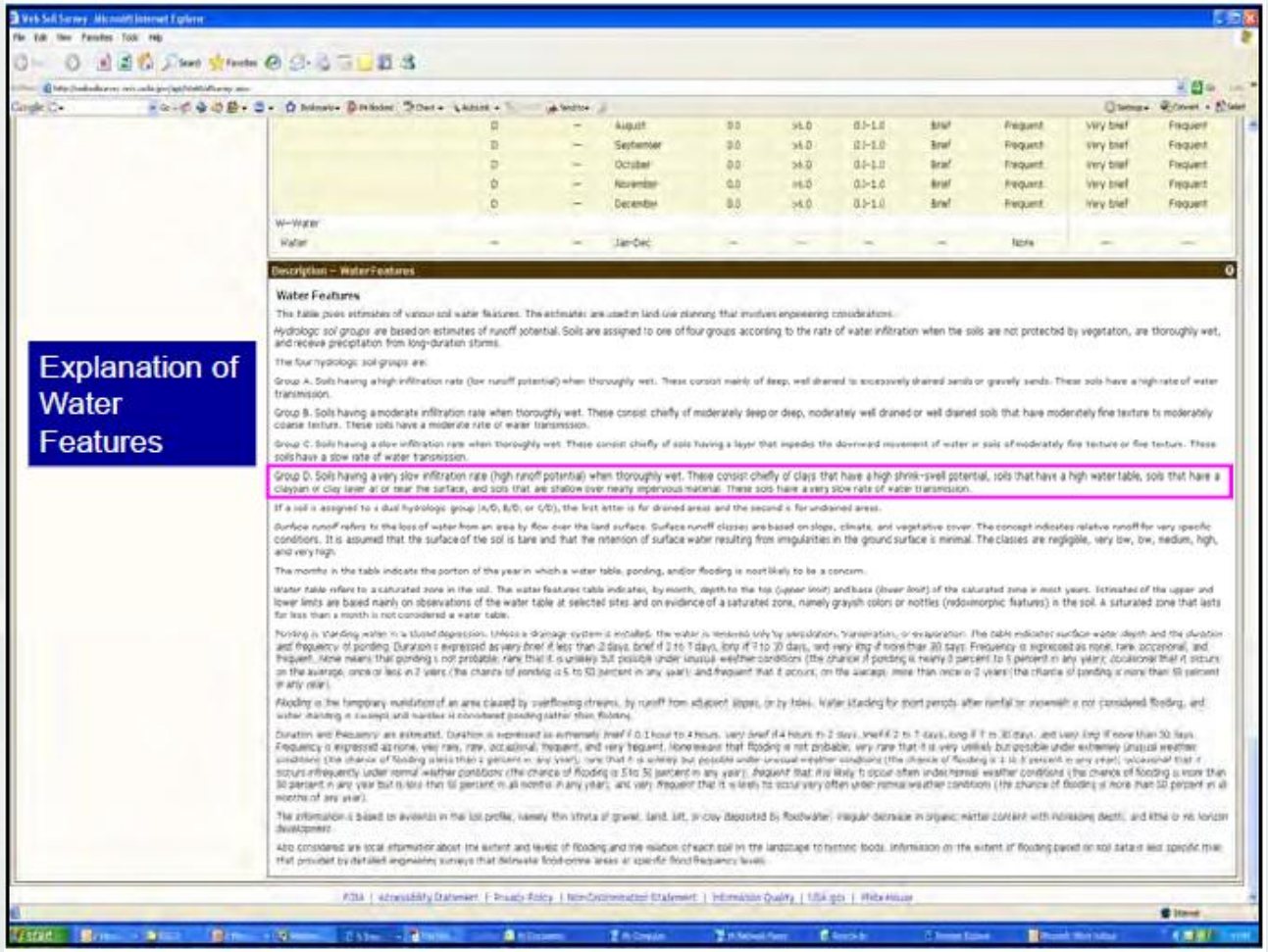

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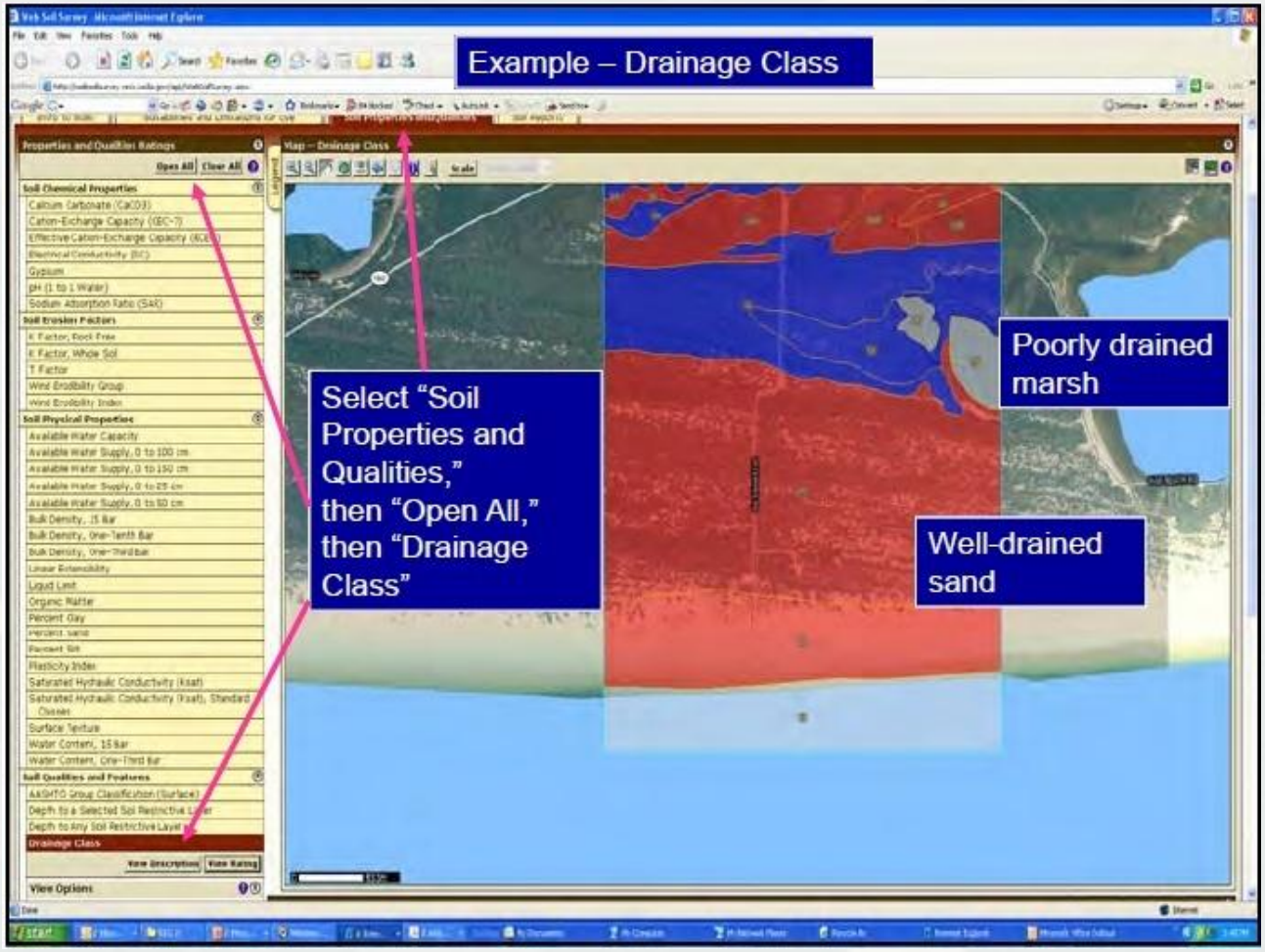

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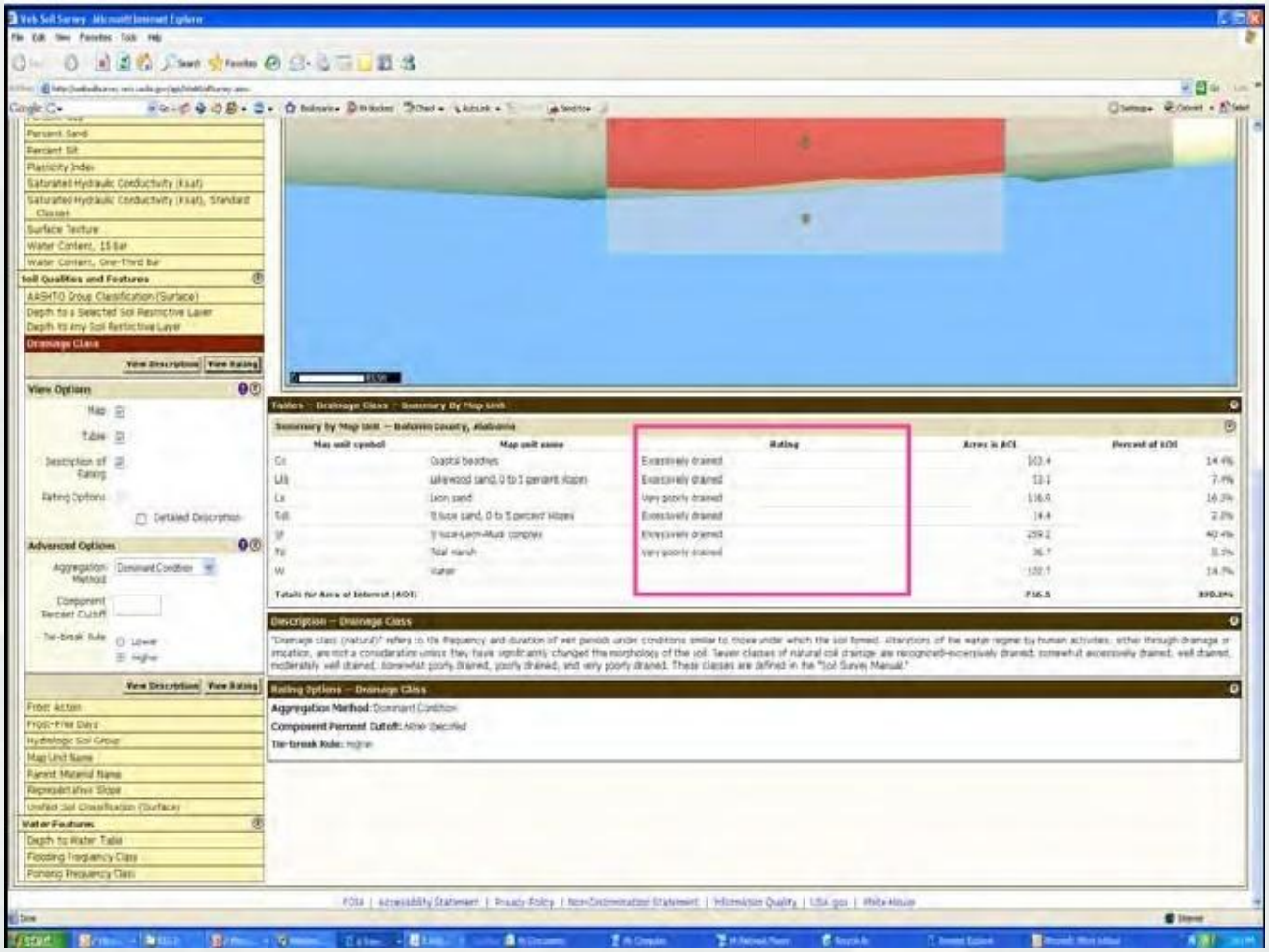

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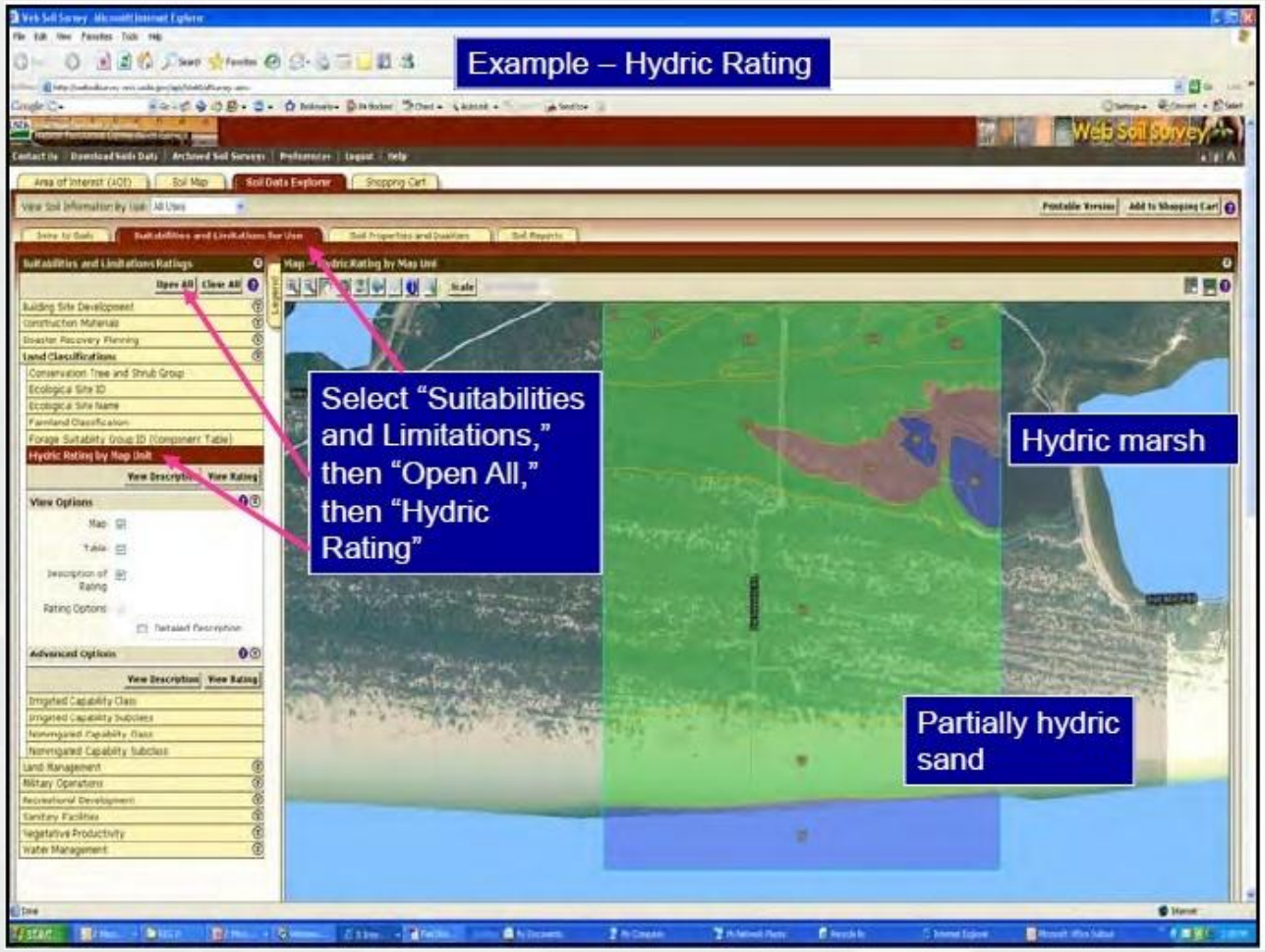
Off-Site Methods



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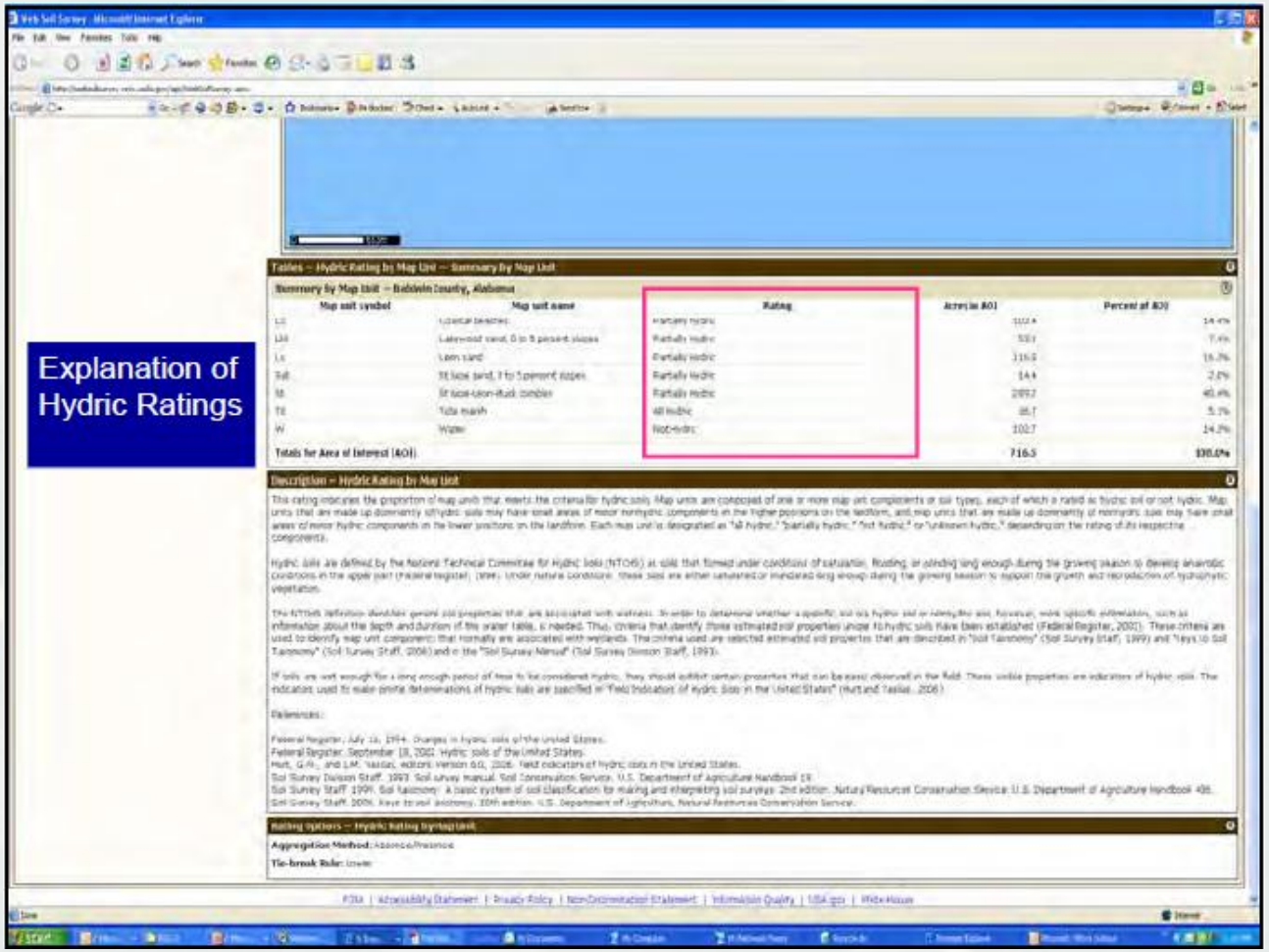


Data Sources on the Web

- Aerial imagery viewers
  - http://earth.google.com
  - http://www.bing.com/maps
  - http://maps.live.com
- USGS maps, photos, data
  - http://ask.usgs.gov
  - http://nationalmap.gov/index.html
  - http://seamless.usgs.gov/index.php
- Web Soil Survey reports and data
  - http://websoilsurvey.nrcs.usda.gov/app/

Off-Site Summary

- Aerial Imagery
  - Current and historical
- USGS Map
  - Transportation data
  - Hydrology
  - Government boundaries
  - HUC
- NWI Map
  - Water resource type
  - Hydrology information
- Web Soil Survey
  - Soil series
  - Hydric soil status
  - Depth to restrictive area
  - Drainage class

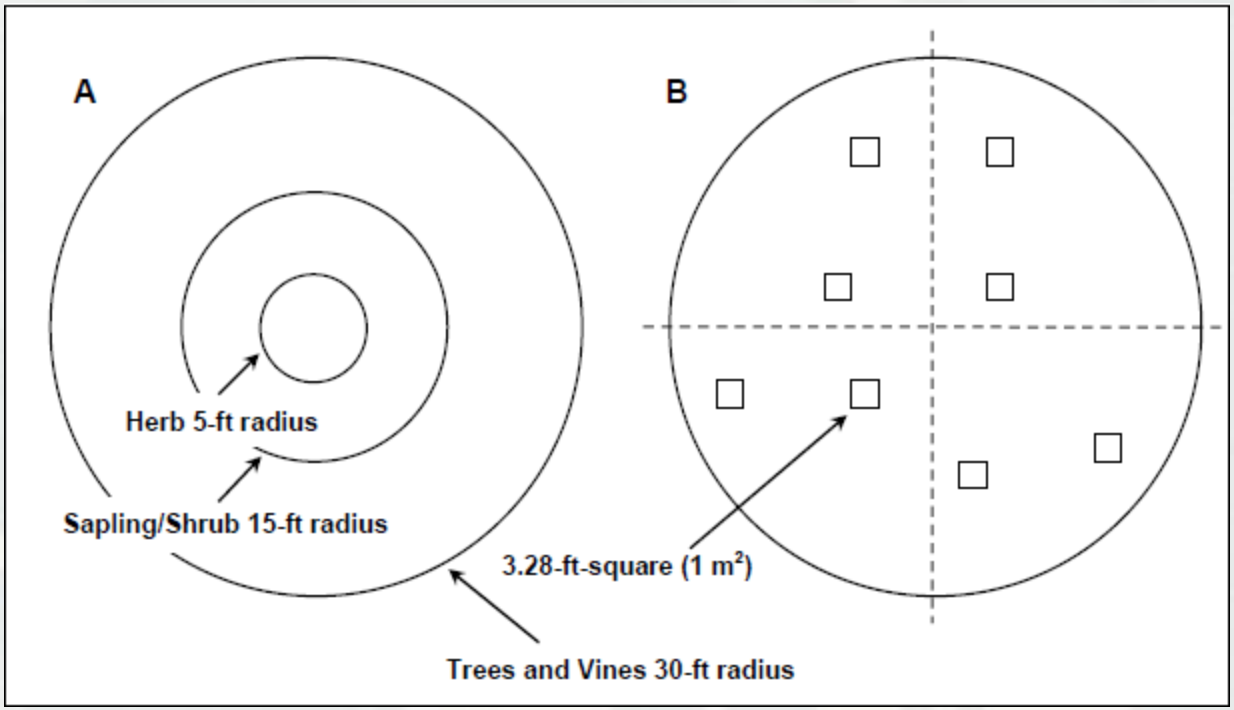
Field Delineations

- Equipment and Materials:
  - Corps of Engineers Regional Supplement
  - Base map
  - Copies of data form
  - Wetland plant list
  - Shovel, soil auger, or probe
  - Measuring tape
  - Munsell soil color book
  - Stakes or flagging tape
  - Navigation aides (e.g., compass, GPS)

Routine Method

- Use the routine method for small areas when:
  - Project area is small (<5 acres)
  - Plant communities are homogeneous
  - Plant community boundaries are abrupt
  - Project is not controversial

Vegetation Strata

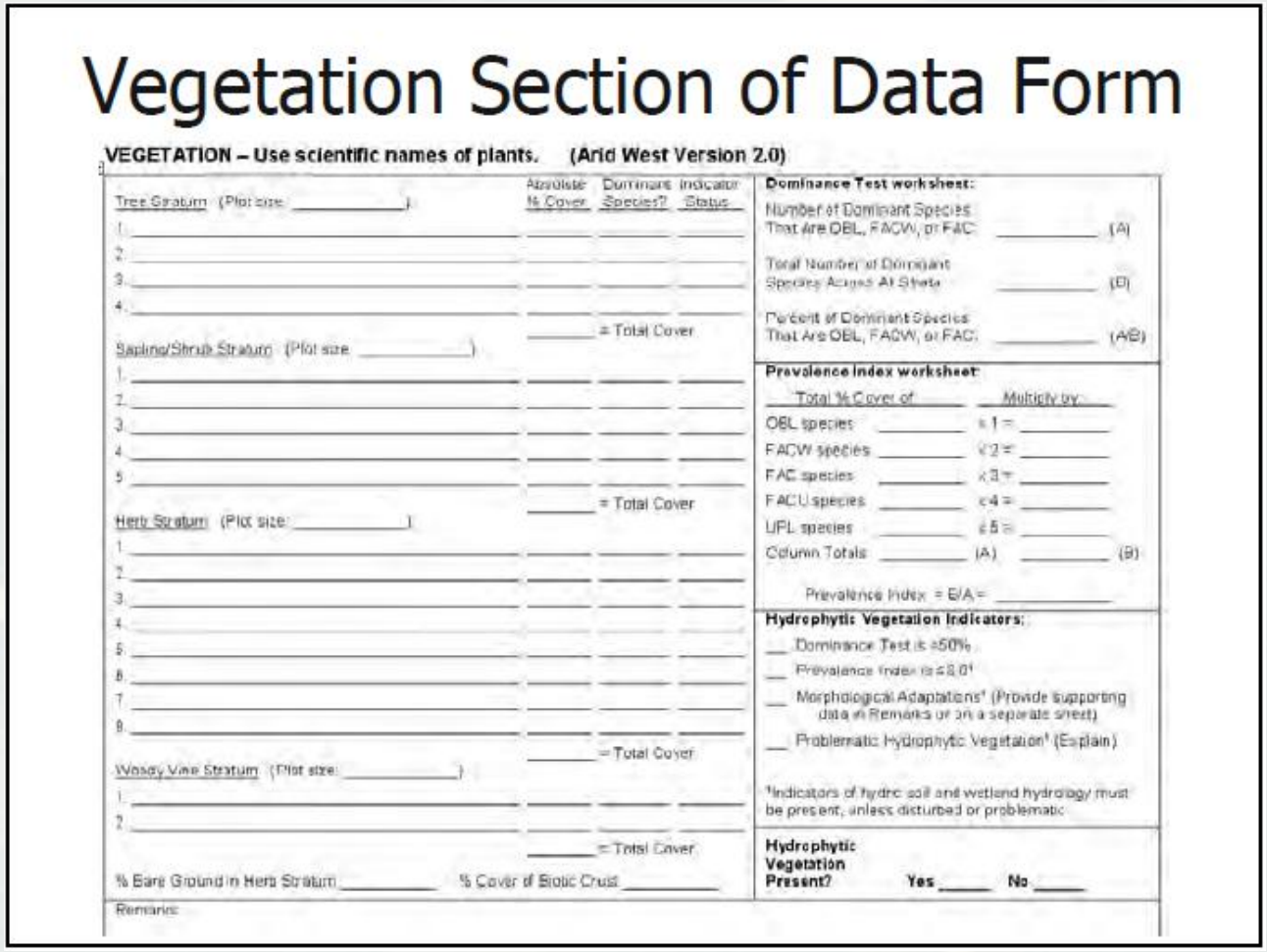


Vegetation Strata

- Sampling plots
  - Same plant community
  - Should not extend outside a plant community
- Shape of sampling plots
  - Typically a circular plot with a different radius relative to the strata being sampled
  - Can be rectangular if property rights conflict with circular plot
- Hydrophytic Vegetation Indicators:
  - Rapid Test (If this test fails, proceed to Dominance Test)
  - Dominance Test (If the 50/20 rule fails, proceed to Prevalence Index)
  - Prevalence Index (If result is $\leq$3.0, proceed to Morphological Adaptations)
  - Morphological Adaptations (e.g. cypress knees; if this fails, the vegetation is not hydric)

Data Forms

Vegetation Section of Data Form



VEGETATION – Use scientific names of plants. (Arid West Version 2.0)

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Remarks:

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of		Multiply by:	
OBL species	_____	x 1 =	_____
FACW species	_____	x 2 =	_____
FAC species	_____	x 3 =	_____
FACU species	_____	x 4 =	_____
UPL species	_____	x 5 =	_____
Column Totals	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

__ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Hydric Soils

- *Hydrology–Is standing water observed on the site or is water observed* in the soil pit? What is the depth of the water table in the area? Is there indirect evidence of ponding or flooding?
- *Slope–Is the site level or nearly level so that surface water does not run* off readily, or is it steeper where surface water would run off from the soil?
- *Slope shape–Is the surface concave (e.g., depressions), where water* would tend to collect and possibly pond on the soil surface? On hillsides, are there convergent slopes (Figure 4), where surface or groundwater may be directed toward a central stream or swale? Or is the surface or slope shape convex, causing water to run off or disperse?

Hydric Soils cont.

- *Landform–Is the soil on a low terrace or floodplain that may be subject* to seasonal high water tables or flooding? Is it at the toe of a slope (Figure 5) where runoff may tend to collect or groundwater emerge at or near the surface? Has the microtopography been altered by cultivation?
- *Soil materials– Is there a restrictive layer in the soil that could slow or* prevent the infiltration of water, perhaps resulting in a perched water table or hillslope seep? This could include consolidated bedrock, cemented layers such as duripans and petrocalcic horizons, layers of silt or substantial clay content, or strongly contrasting soil textures (e.g., silt over sand).
- *Vegetation–Does the vegetation at the site indicate wetter conditions* than at other nearby sites, or is it similar to what is found at nearby upland sites?

Hydric Soils

- Not a registered soil scientist:
  - Web soil survey… do not just write soils were not pulled.
  - 87' manual, on-site inspection (Step 3)- … it is only necessary to confirm that there has been no recent hydrologic alteration of the area:
    - A) The entire project area is occupied by a plant community or communities in which all dominant species are OBL
    - B) The project area contains two or more plant communities, all of which are dominated by OBL and/or FACW species, and the wetland-nonwetland boundary is abrupt.
  - Step 4
    - Hydric soils can be assumed to be present if either a or b or Step 3 applies
    - If evidence of altered hydrology occurs, proceed to step 5 , to determine whether hydric soils are present (physically identify)
  - However, if the hydrology indicators and vegetation do not provide a clear and concise explanation of the project area, the Corps of Engineers may request that soils be identified on-site despite the web soil survey being provided.

Hydric Soils

Soil Section of Data Form

SOIL (Arid West Version 2.0) Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Hydrology Indicators

- The list can be found in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0).

List of Hydrology Indicators

Indicator	Category	
	Primary	Secondary
Group A – Observation of Surface Water or Saturated Soils		
A1 – Surface water	X	
A2 – High water table	X	
A3 – Saturation	X	
Group B – Evidence of Recent Inundation		
B1 – Water marks	X	
B2 – Sediment deposits	X	
B3 – Drift deposits	X	
B4 – Algal mat or crust	X	
B5 – Iron deposits	X	
B7 – Inundation visible on aerial imagery	X	
B9 – Water-stained leaves	X	
B11 – Salt crust	X	
B13 – Aquatic invertebrates	X	
B6 – Surface soil cracks		X
B8 – Sparsely vegetated concave surface		X
B10 – Drainage patterns		X
Group C – Evidence of Current or Recent Soil Saturation		
C1 – Hydrogen sulfide odor	X	
C2 – Dry-season water table	X	
C4 – Presence of reduced iron	X	
C7 – Thin muck surface	X	
C3 – Oxidized rhizospheres along living roots	X	X (where tilled)
C8 – Crayfish burrows		X
C9 – Saturation visible on aerial imagery		X
Group D – Evidence from Other Site Conditions or Data		
D2 – Geomorphic position		X
D5 – FAC-neutral test		X
D7 – Frost-heave hummocks		X (LRR F)

Hydrology Indicators

- Indicator A1 Surface water:
  - Direct/visual observation of surface water during a site visit (ponding or flooding)
  - Recent precipitation
    - Naturally Problematic
    - Normal circumstances not present
- Indicator A2 High water table:
  - Must be within first 12 inches of the soil.
  - Time must be allowed for water to infiltrate into the hole, in order for the water table to stabilize.
  - Normal circumstances may not mean “inundation”
  - Do not penetrate the restrictive layer

Hydrology Indicators

- Indicator A3 Saturation:
  - Water “glistening” on soil surface
  - Is there an existing water table?
  - If saturation is present without an existing water table, this must be explained in the remarks as it may be a result of recent rainfall or the restrictive soil layer.
  - If surface water is present and not naturally problematic, all three indicators are present
    - Surface water
    - High water table
    - Saturation

Hydrology Section

Hydrology Section of Data Form

HYDROLOGY (Arid West Version 2.0)

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

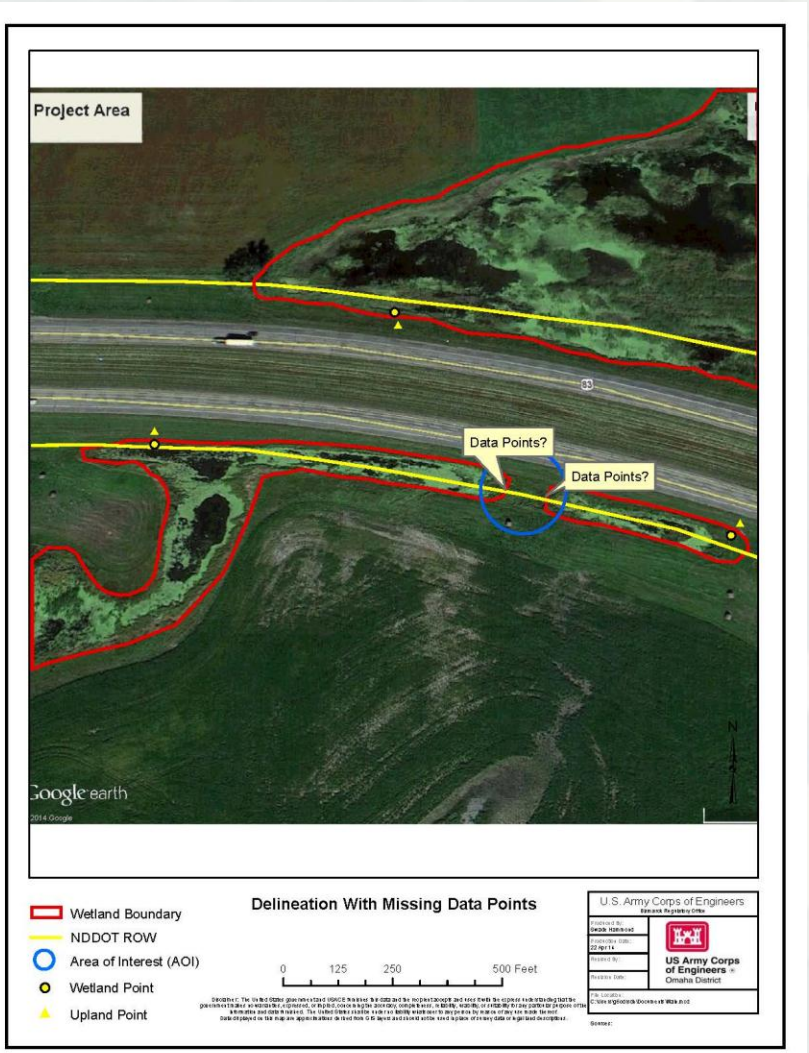
Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Mapped Examples



Mapped Examples