



**US Army Corps
of Engineers**

St. Paul District

Wetlands in the Context of Road Projects

September, 2011

Wetlands in the Context of Road Projects

Goals of presentation include understanding:

- 1) need for accurate representation of wetlands and proposed impacts
- 2) time needed for concurrence before the snow flies
- 3) wetlands may occur on cropland and methods used to determine extent
- 4) options for completion of delineations and/or determinations.

Wetlands & Road Projects

Why Do We Care?

Minnesota Wetland Conservation Act

Minnesota Statutes 103G and
Minnesota Rules 8420

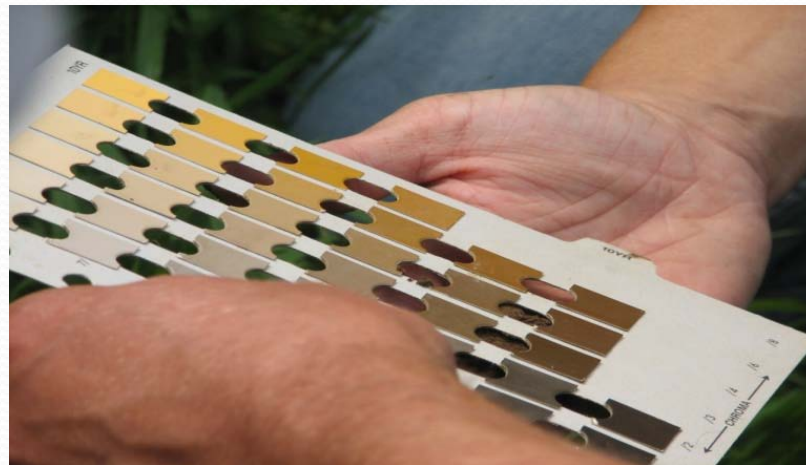
*Regulates the draining, filling
and excavation of wetlands*

Federal Clean Water Act

Section 404

*Regulates some impacts to
waters of the U.S.*

What Level of Delineation to Use?



Wetland Delineation Methods

The Corps of Engineers Wetlands Delineation Manual
(87 Manual)

describes two general types of delineation methods:
Routine and Comprehensive.

Routine :

Qualitative data (pick
representative sample
points, use estimates)

Comprehensive:

Quantitative data
(systematic sampling,
more direct and precise
measurements)

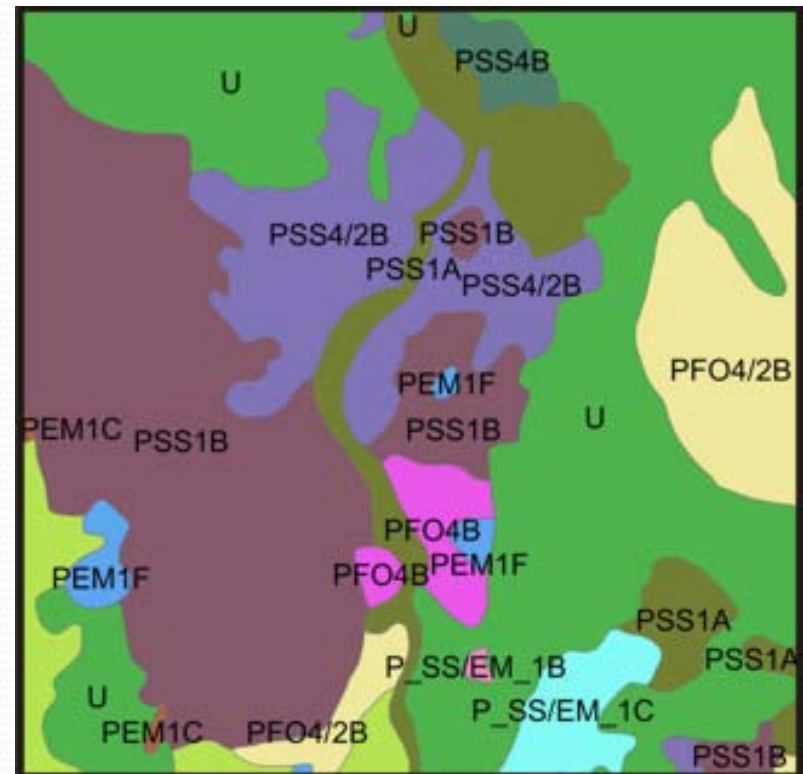
COE & BWSR both use the same methodology

Wetland Delineation Methods

CAUTION:

National Wetland
Inventory Maps are
NOT a wetland
delineation!

National Wetland
Inventory Map



Wetland Delineation Methods

The Routine Method

Level 1

- Onsite Inspection Unnecessary

Level 2

- Onsite Inspection Necessary

Level 3

- Combination of Levels 1 and 2



Wetland Delineation Methods

Routine Level 1: Onsite inspection unnecessary.

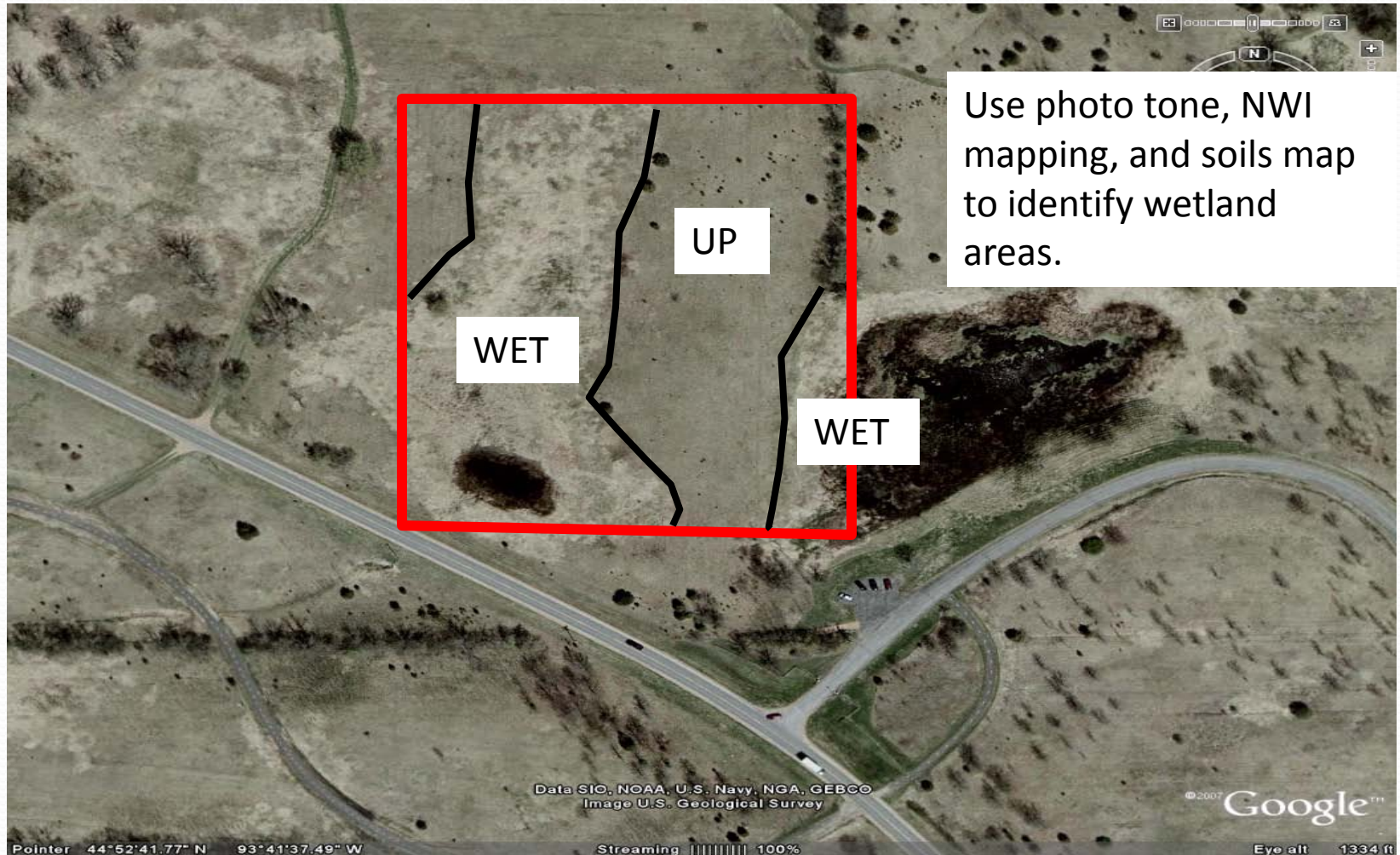
Used when exact wetland boundary is not critical.

Review of common **offsite mapping resources**:

Aerial photography • Soils • Topography • NWI

determines the potential presence of a wetland, identify its type, and/or sketch its approximate boundaries.

Routine 1



Routine Level 1 Examples

Evaluating incidental applicability for entire wetland – Routine 1 or no delineation necessary



Borrow pit may be obvious, easy to ID with off site methods

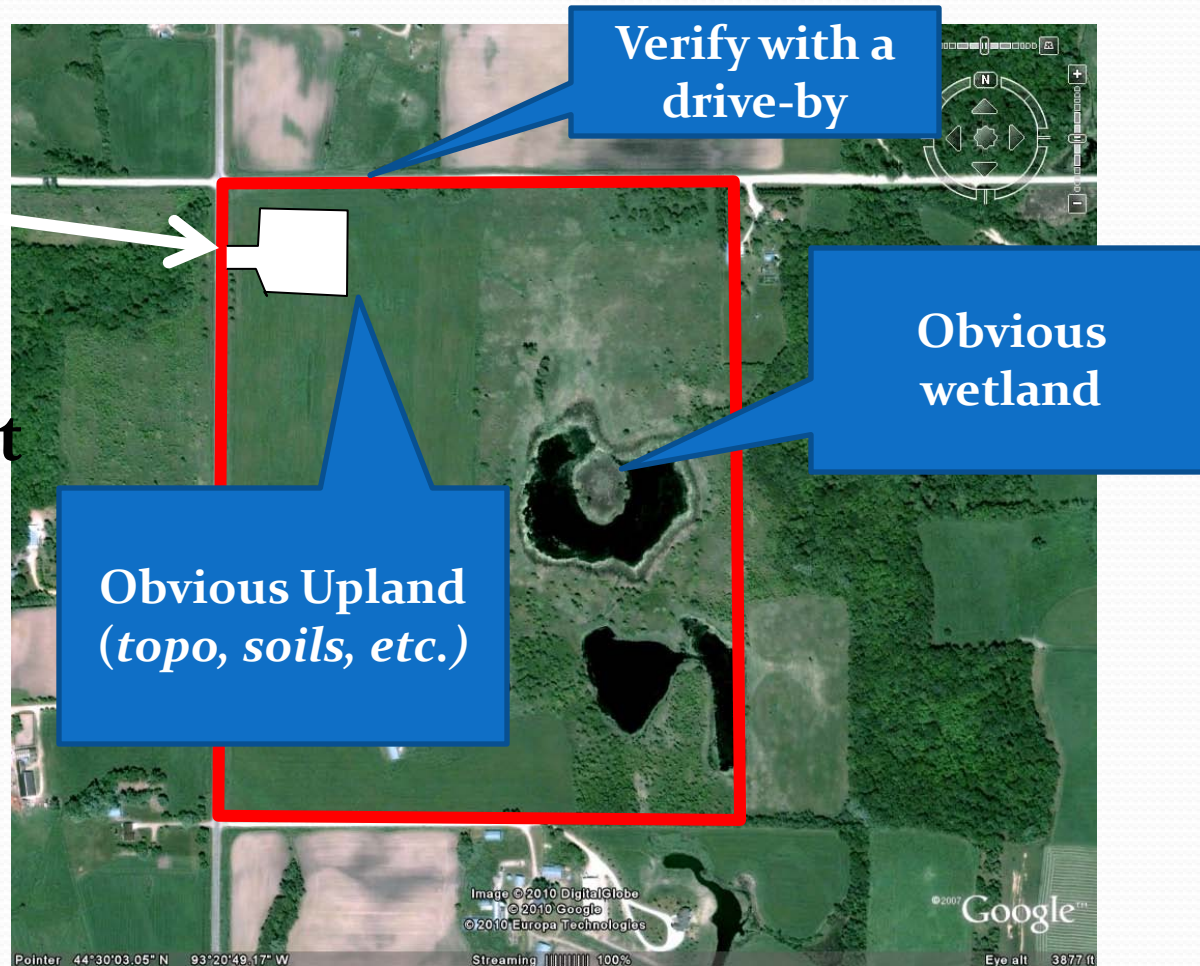
Interchange reconstruction



Caution: May NOT be incidental if wetland prior to highway construction

Routine Level 1 Example

Proposed
Highway
Department
Shed



Routine Level 1 Example

Proposed road improvement project through large wetland, all acknowledge wetland existence



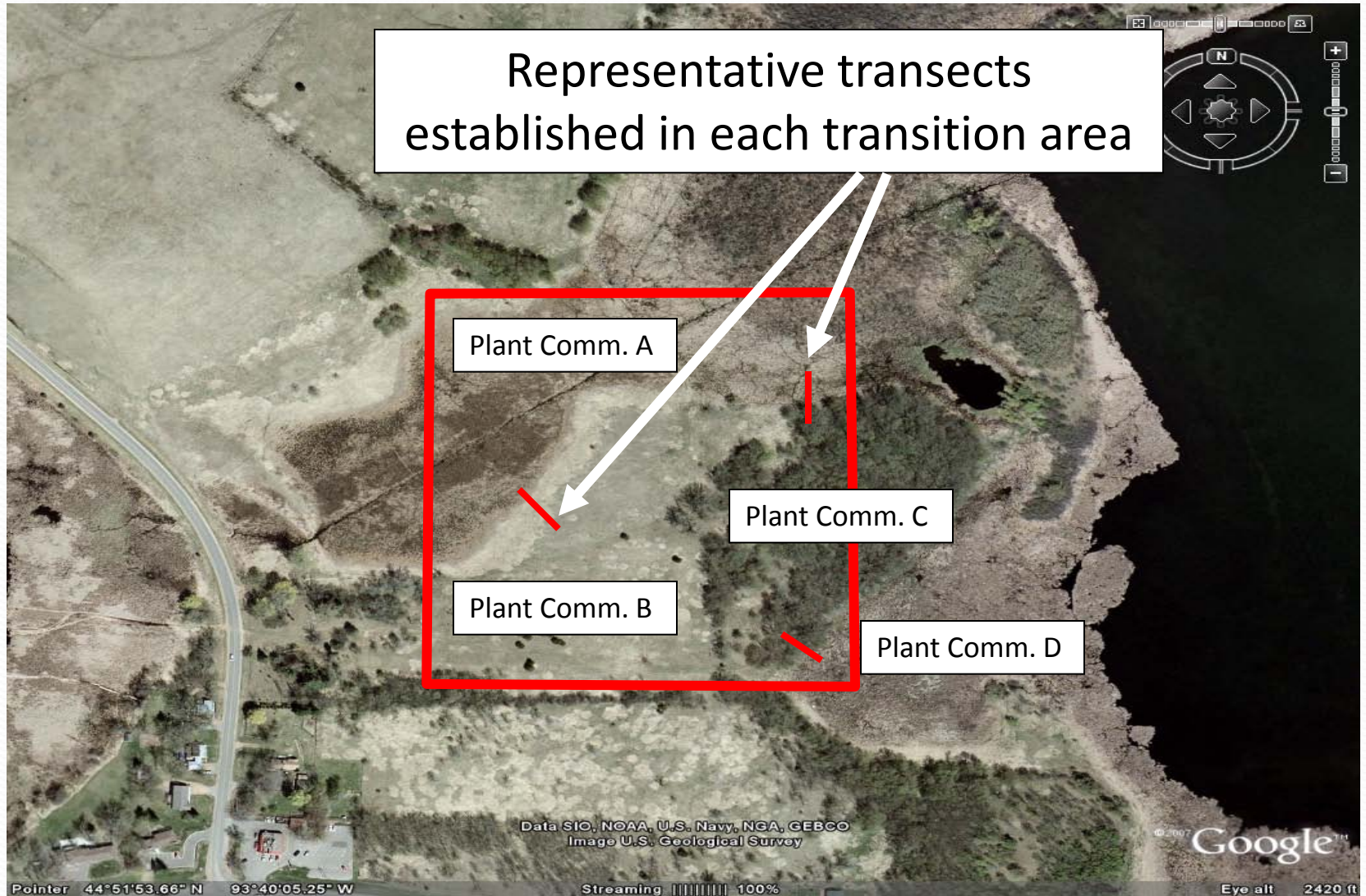
Wetland Delineation Methods

Routine Level 2

Onsite collection of field data and the physical marking of wetland boundaries, most commonly used when:

- accurate wetland boundary is critical.
- landowner wants to know the land-use constraints of property and seek assurance through a formal wetland boundary approval.

Routine 2



A few notes about choosing sampling locations



Sampling locations should be **REPRESENTATIVE** of:

Soil changes (from upland to wetland),

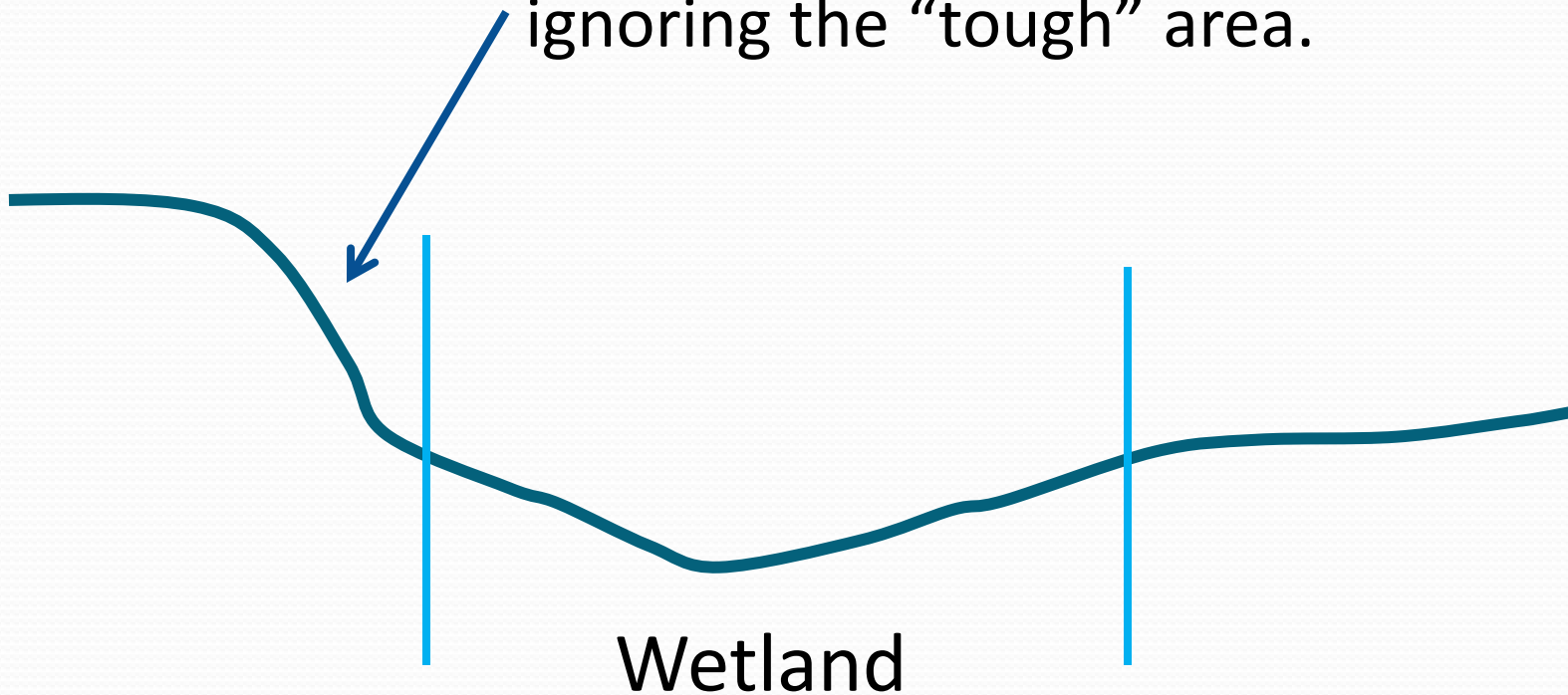
Vegetation community changes,

Hydrology indicator changes, and

Landscape changes.

Common Errors – The “safe” approach

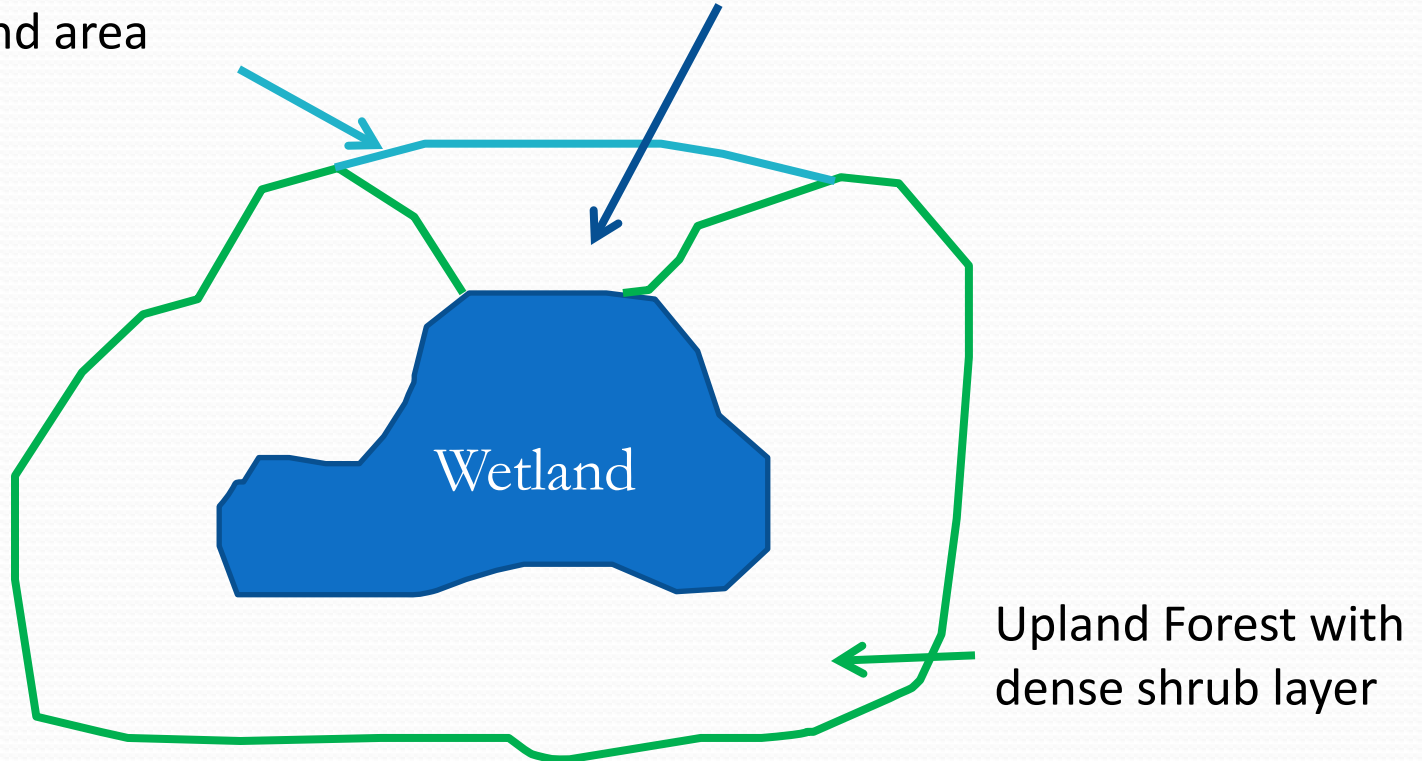
Choosing sampling location in area with the clearest boundary while ignoring the “tough” area.



Common Errors – The “lazy” approach

Choosing sampling location in most accessible location while ignoring the dominant transition area

Cleared upland area



Upland Forest with dense shrub layer

Common Errors – The “disturbed” approach

Choosing sampling location in area of disturbance

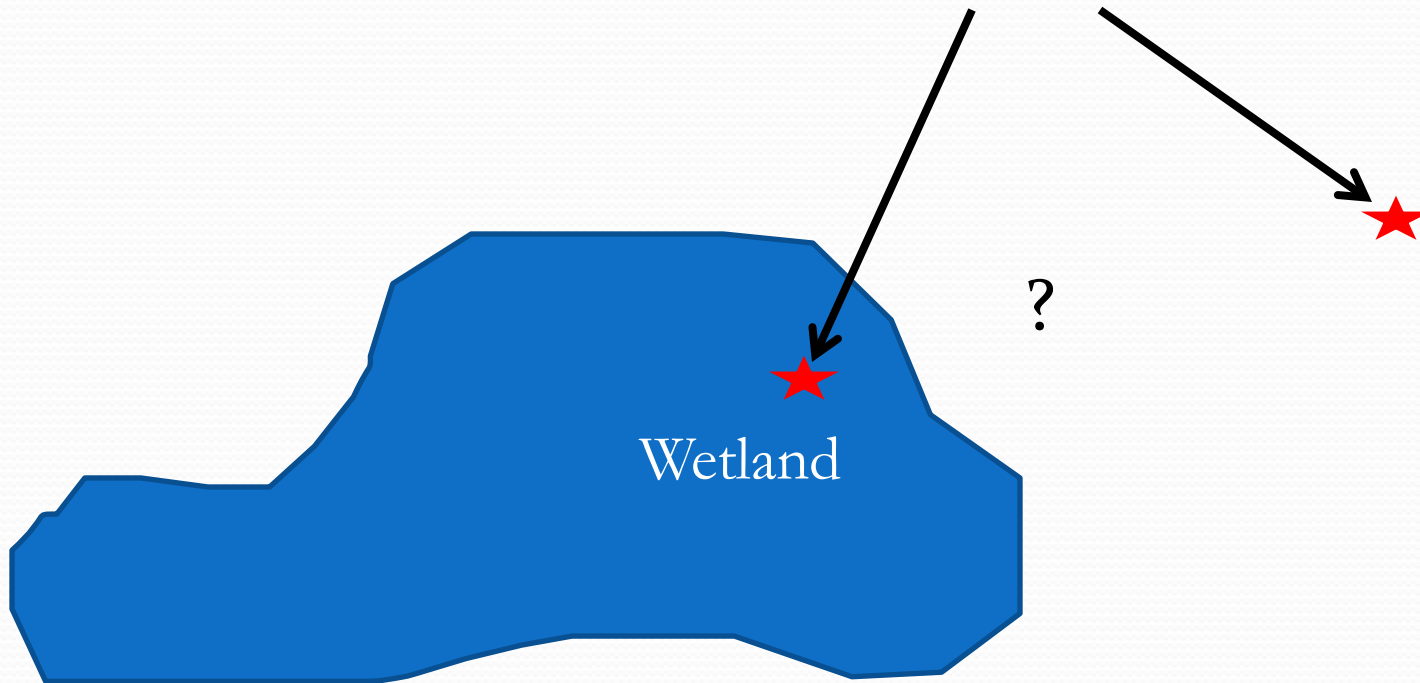
Road

Of course, if the project is a road corridor, sampling within the ROW is expected and acceptable.



Common Errors – The “long-distance” approach

Choosing sampling points so far apart that they fail to document boundary conditions.



Avoid Errors by:

Examining offsite mapping before heading to the field.

Doing an initial site reconnaissance before settling on a sampling location.

In tough areas, doing 'preliminary' sampling to help determine where 'official' sampling should be done (i.e., full data sheets).

Routine Level 2 Examples

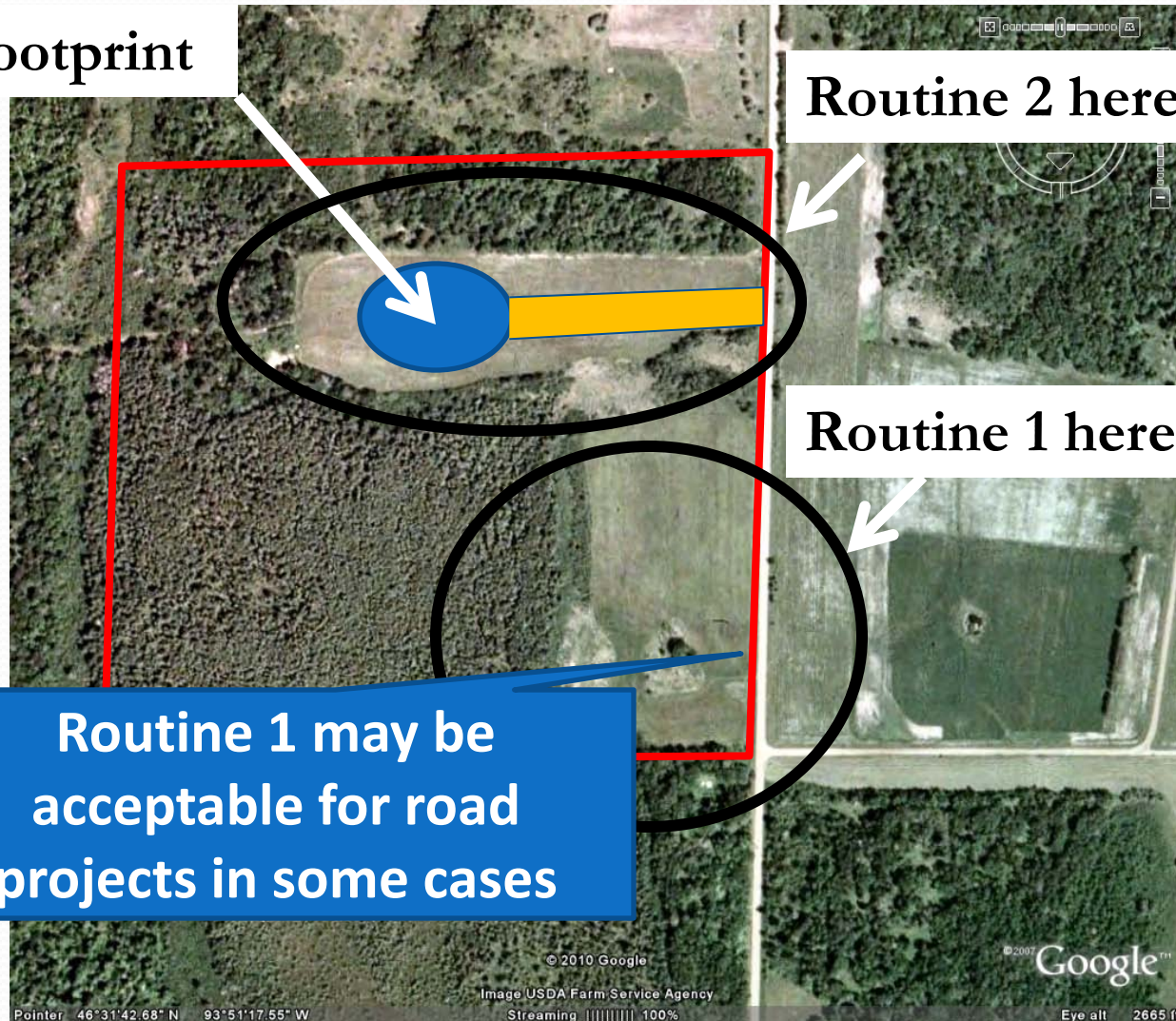
**Proposed highway upgrade
next to wetlands**



**Routine Level 2 is most common
wetland delineation method
used for road projects**

Routine Level 3 Example

Project Footprint



Wetland Delineation Methods

Comprehensive Method

Very complex, requires rigorous documentation.

Agree to the exact methodology prior to beginning the field work.

Combine with other methods (sometimes).

Comprehensive Method

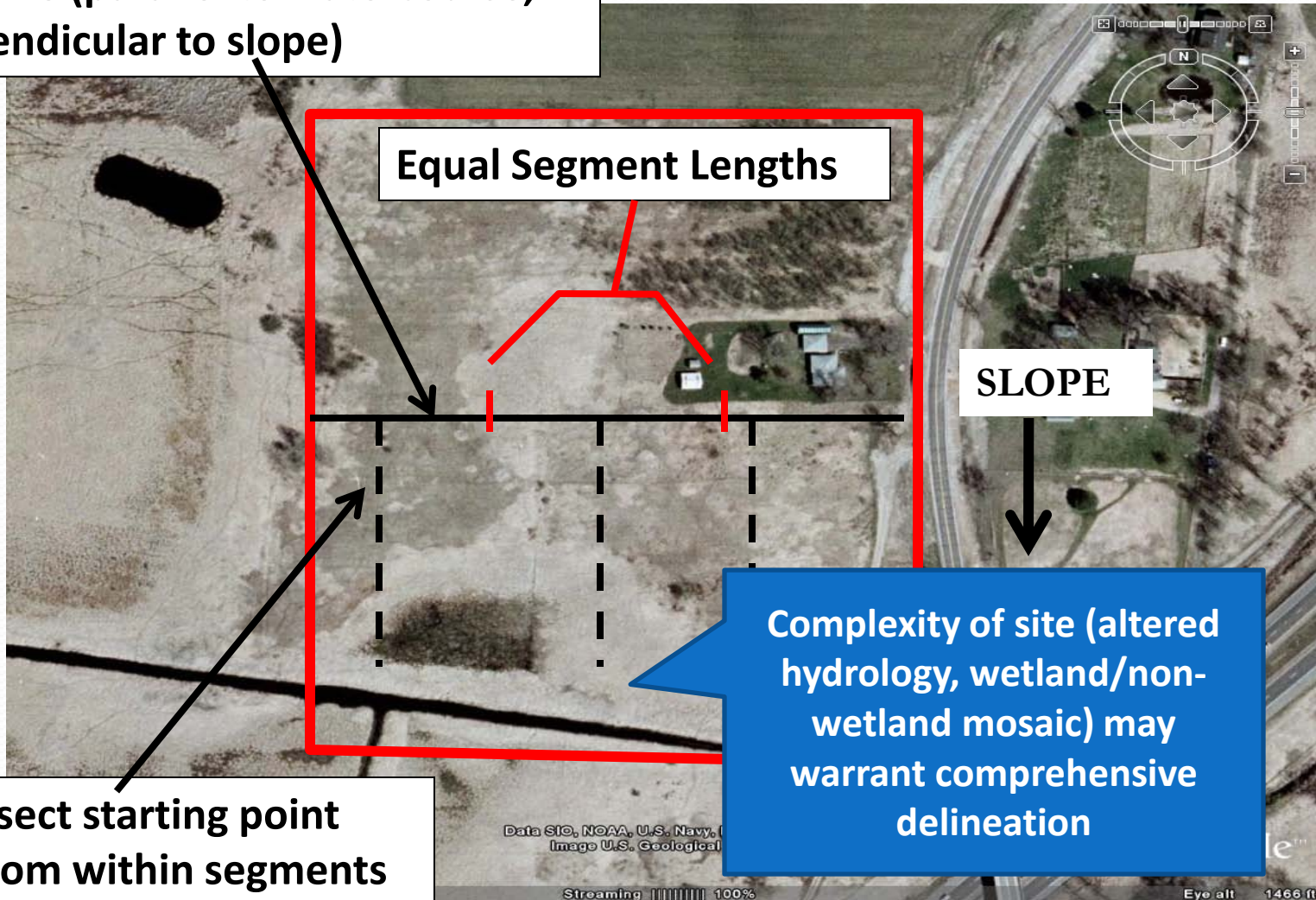
Baseline (parallel to watercourse, perpendicular to slope)

Equal Segment Lengths

SLOPE

Transect starting point random within segments

Complexity of site (altered hydrology, wetland/non-wetland mosaic) may warrant comprehensive delineation



Wetland Delineation Methods

Some examples where the comprehensive method *may* be appropriate:

1. The applicant and TEP/Corps disagree on line and further data collection using the routine method cannot, or could not, resolve the dispute. For example, a complex site where the selection of sampling point locations has a significant influence on the result.

2. The decision on a project is, or is likely to be, challenged in court. Often requires more rigorous data collection and documentation to support conclusions.

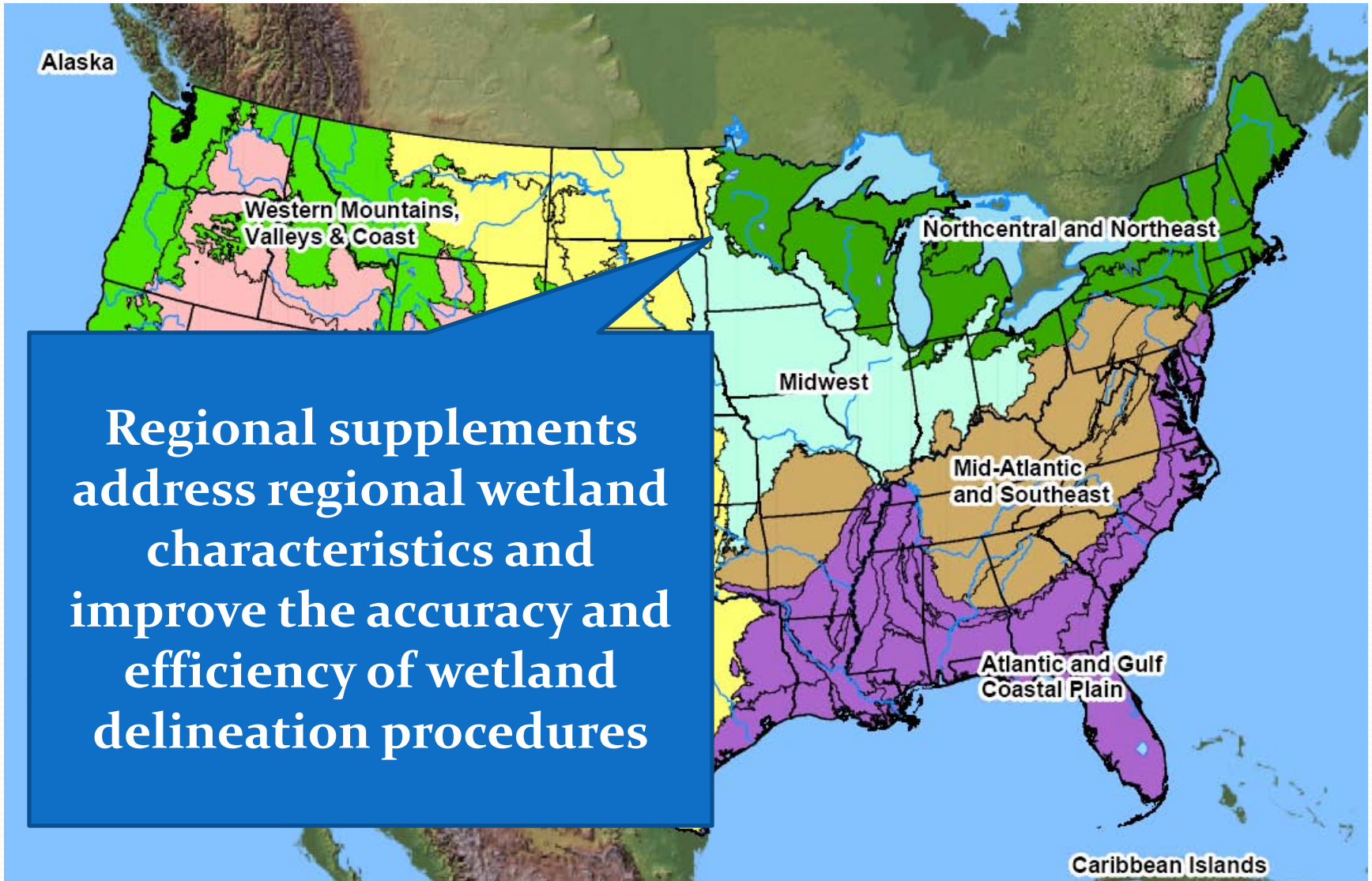
Wetland Delineation Tips

Routine Method typically used. If not? Coordinate with regulators.

Wetland *mapping and supporting data should be sufficient* to allow the WCA TEP and Corps PM to verify extent of wetlands.

Common sense and good professional judgment are essential.

Regional Supplements



Regional Supplements

Great Plains

North Central/Northeast

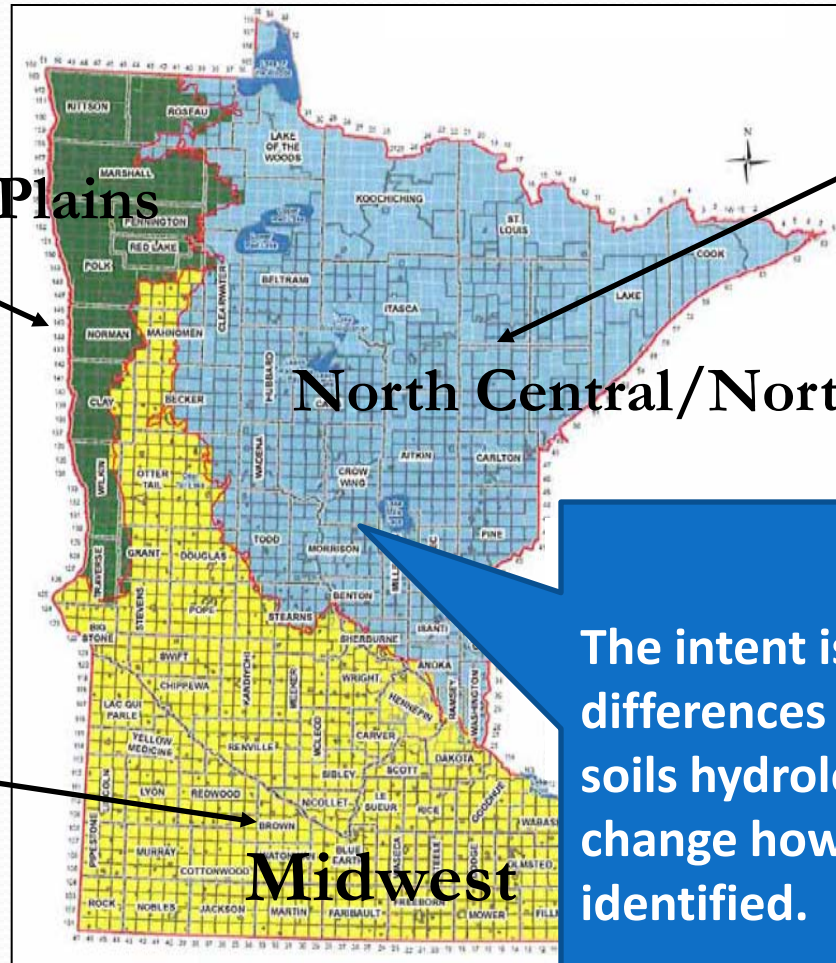

Midwest

The intent is to recognize regional differences in climate, geology, soils hydrology and plants, not to change how wetlands are identified.

ERDC/EL TR-03-01

Environmental Laboratory

Wetlands Regulatory Assistance Program
Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)
U.S. Army Corps of Engineers
March 2010



ERDC/EL TR-09-19

Environmental Laboratory

Wetlands Regulatory Assistance Program
Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region
U.S. Army Corps of Engineers
October 2009



ERDC/EL TR-08-27

Environmental Laboratory

Wetlands Regulatory Assistance Program
Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region
U.S. Army Corps of Engineers
September 2008



Supplements vs. 87 Manual

- Regional Supplements are designed for use with the current 87 Manual.
- Where differences occur, Supplements take precedence over 87 Manual.
- Corps Districts retain final authority over use and interpretation of 87 Manual and Regional Supplements.

Use of Supplements

- **Great Plains Supplement use became mandatory **June 6, 2008****
- **Midwest Supplement use became mandatory **December 4, 2008****
- **Northcentral/Northeast Supplement use became mandatory **March 20, 2010.****

Use of Supplements

- Delineations completed from now on **must use the supplement indicators and data sheets.**
- Delineations that do not use the supplements will be returned as incomplete, with **instructions to use applicable regional supplement.**

Wetland Delineation

Wetlands on cropland

Regardless of crop history on agricultural land, wetlands as identified by 1987 Manual and Regional Supplements may occur on cropland.

Note: Sod fields are ag land and are often wetland.

When identifying wetlands on agricultural land, use of offsite methods and MN Mapping Conventions may be necessary

Wetland Delineation Approaches

Off-Site Procedures on Ag Lands

- 1) Interagency Mapping Conventions for Minnesota by SCS (now NRCS), COE, FWS and EPA (1994) (Currently being updated to be named “Wetland Offsite Procedures”)
- 2) NRCS Chapter 19 of Eng. Field Handbook – Hydrology Tools for Wetland Determination (rev. 2009)
- 3) 2010 BWSR Guidance: Using Aerial Imagery to Assess Wetland Hydrology

MN State Mapping Conventions

Mapping Conventions involve noting recurrence of signatures related to wetness over multiple years.

Review at least five years of FSA aerial imagery.

Complete antecedent precipitation analysis for each slide – usually flown in July.

Signatures in a majority of “Normal” precipitation years indicate probable wetland.

Verify with field visit whenever possible.

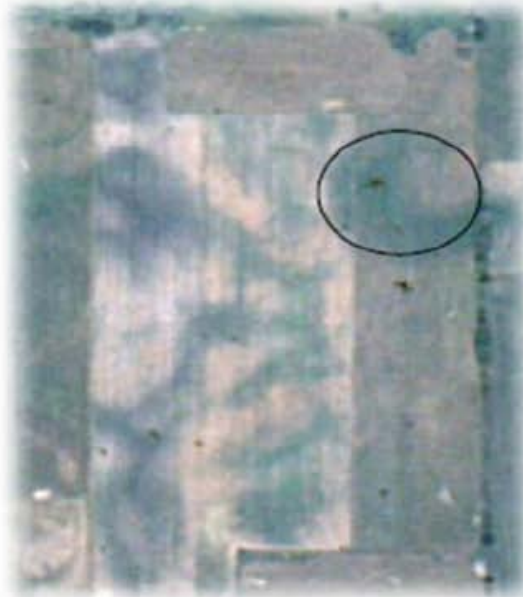


MN State Mapping Conventions

Farm Service Agency Aerial Slides (Annual)



1980

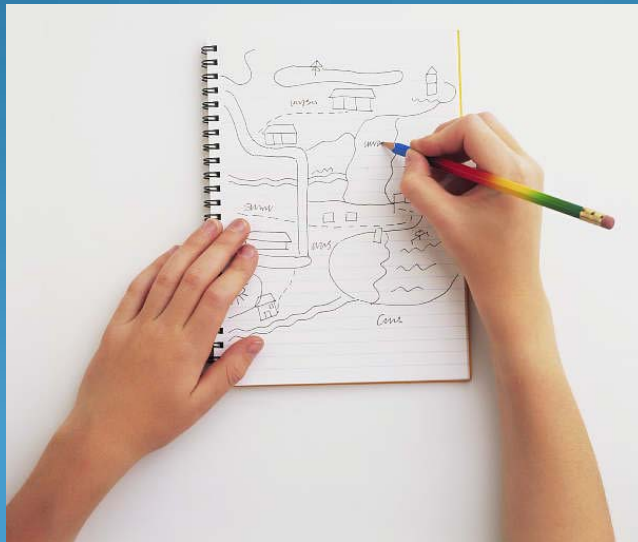


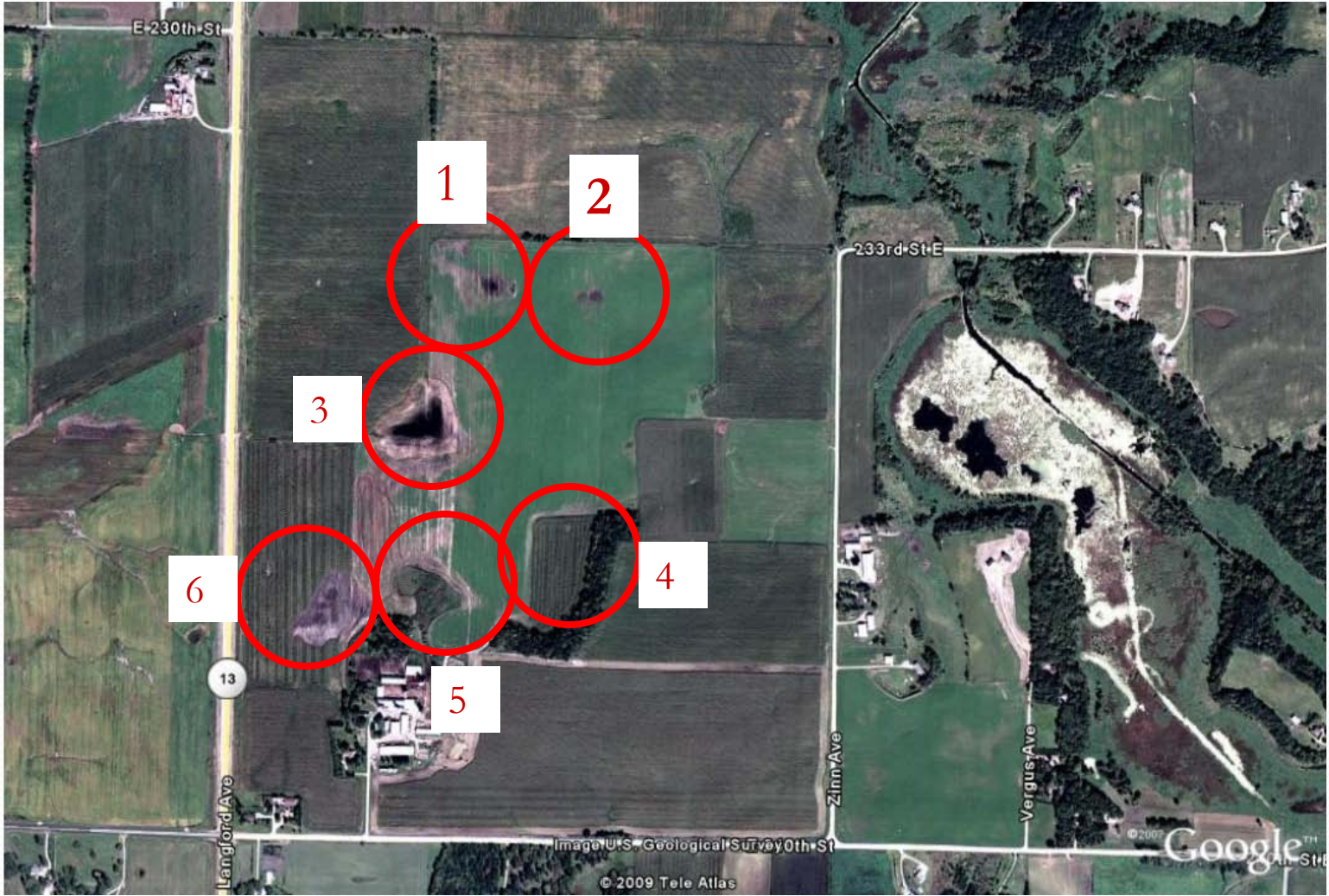
1989

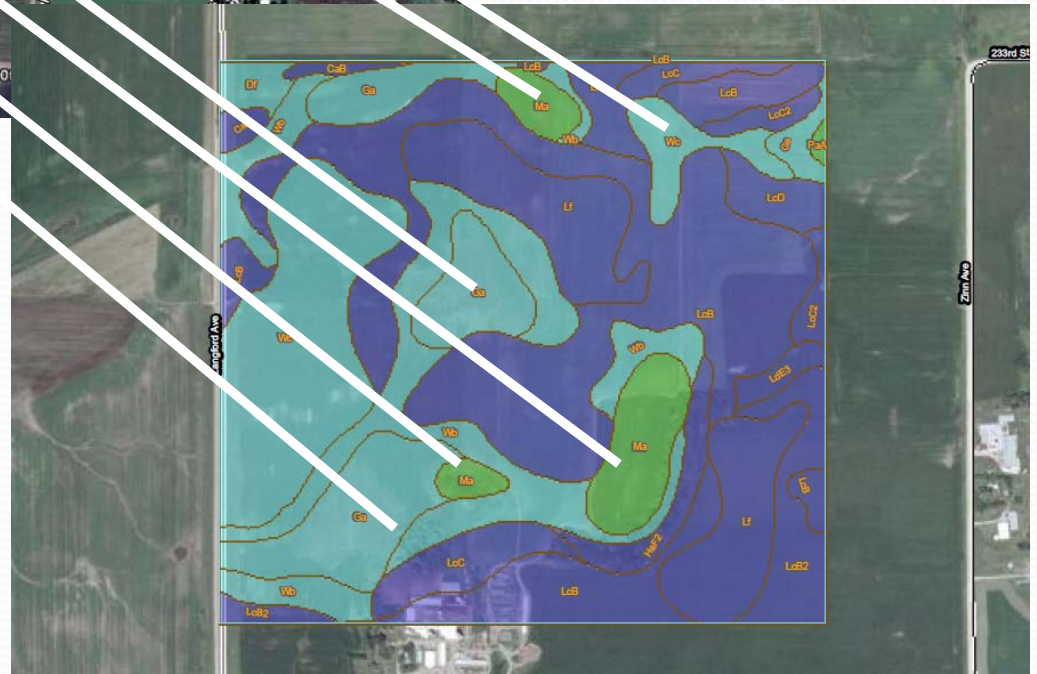
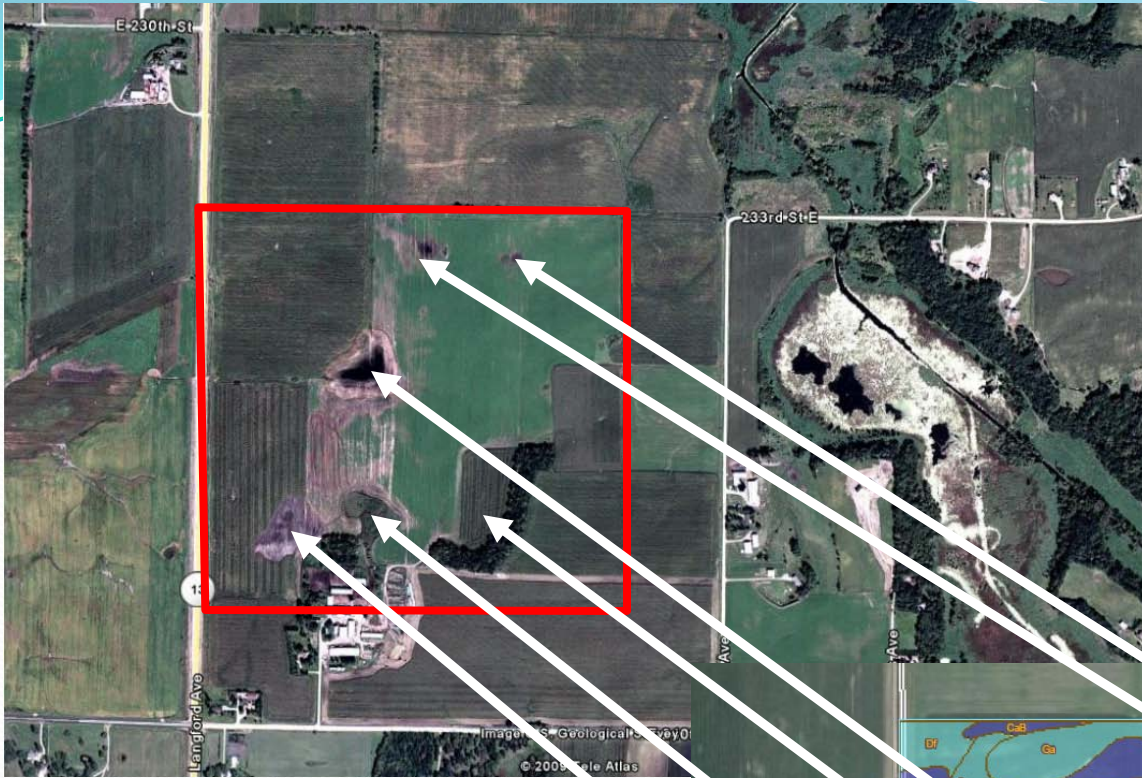


2006

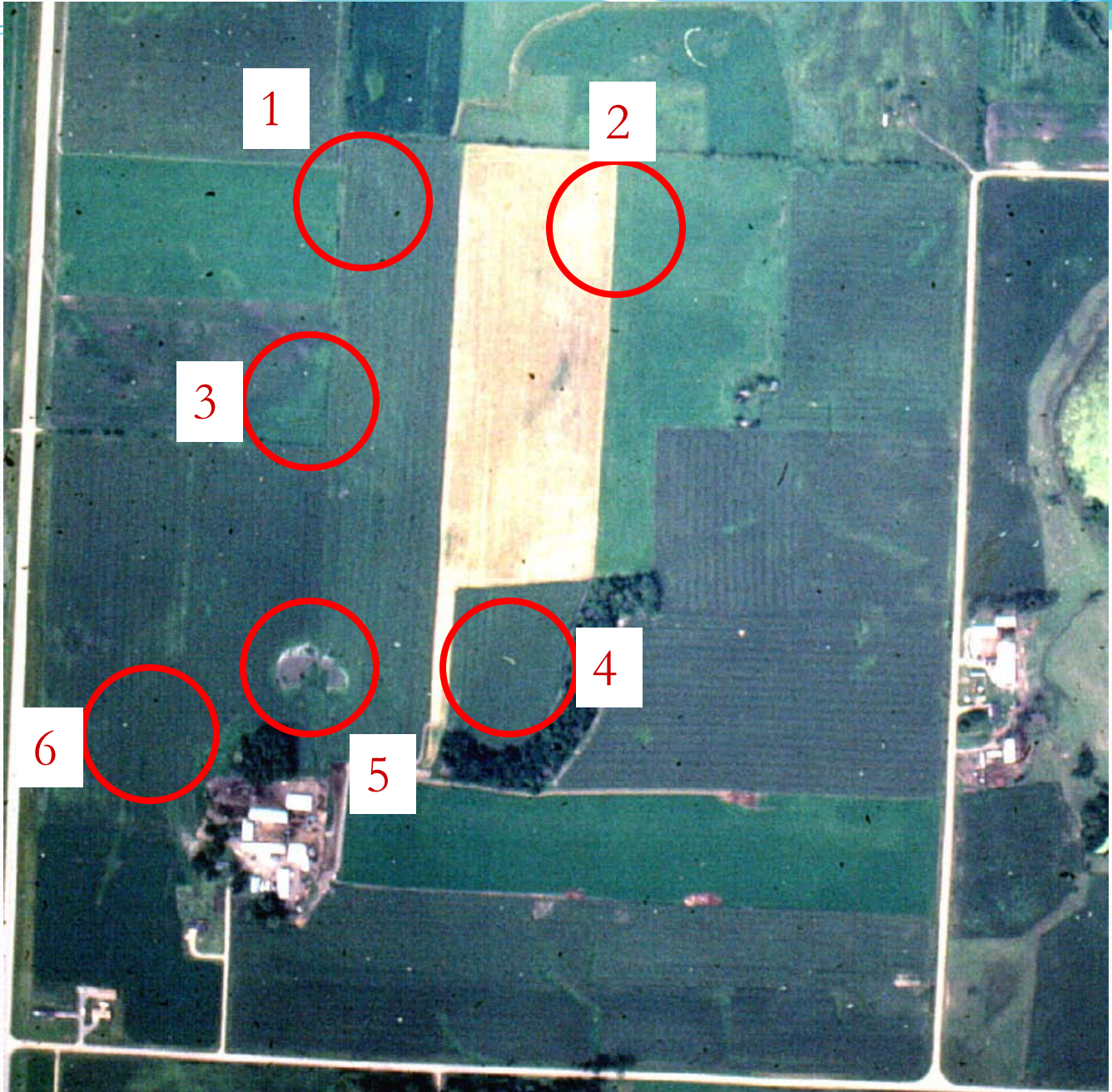
Mapping Conventions Exercise



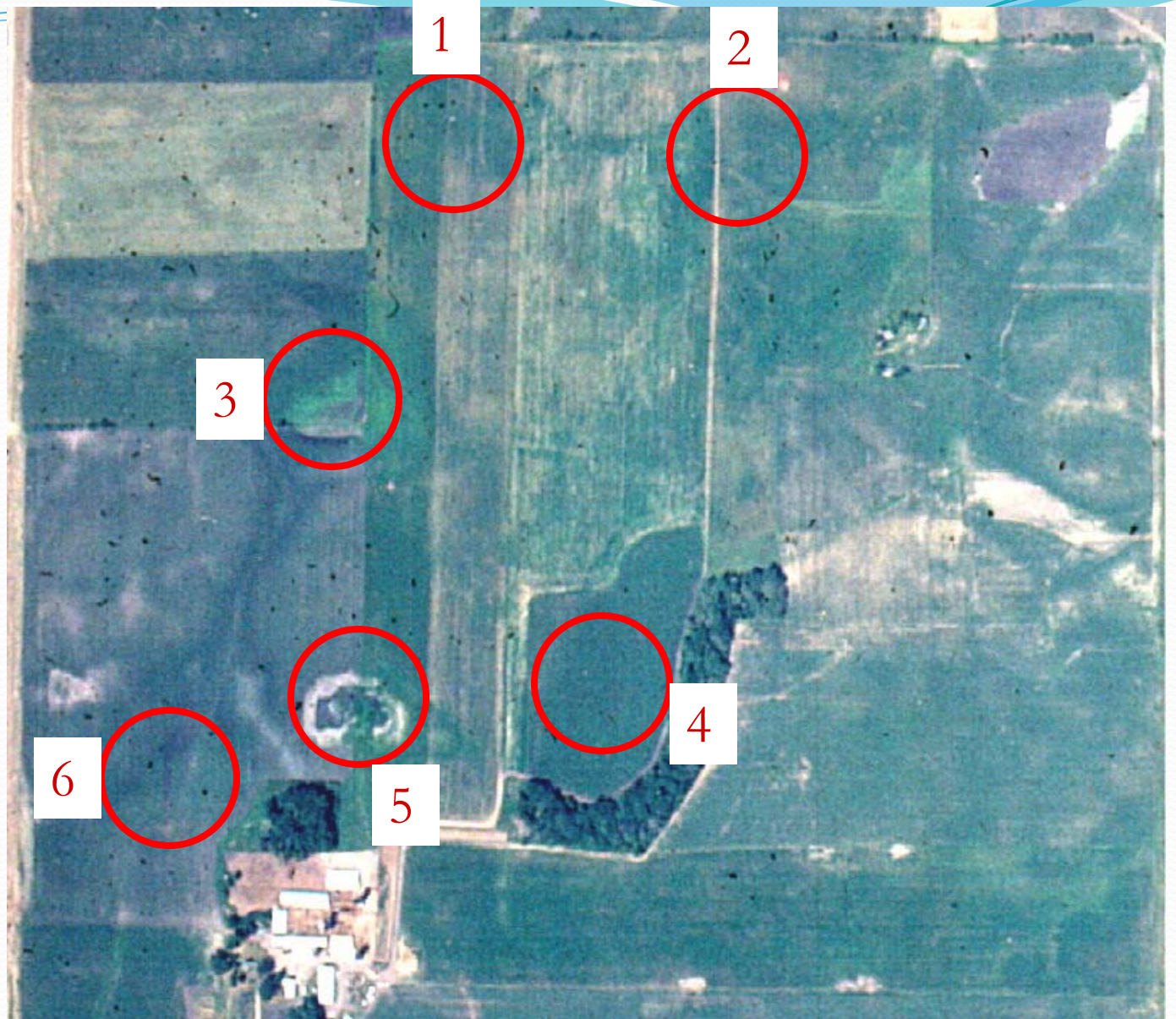




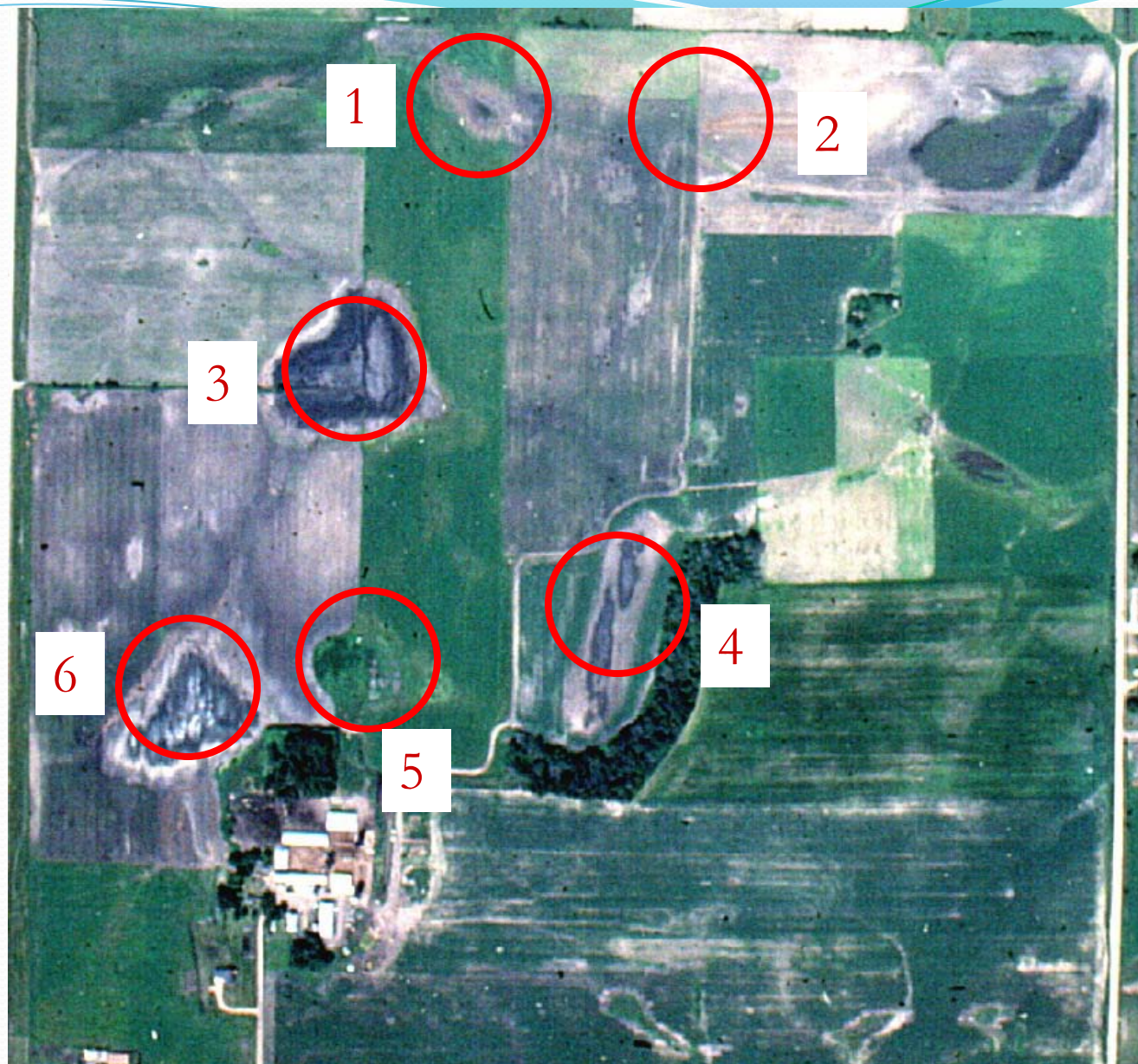
1979 Normal



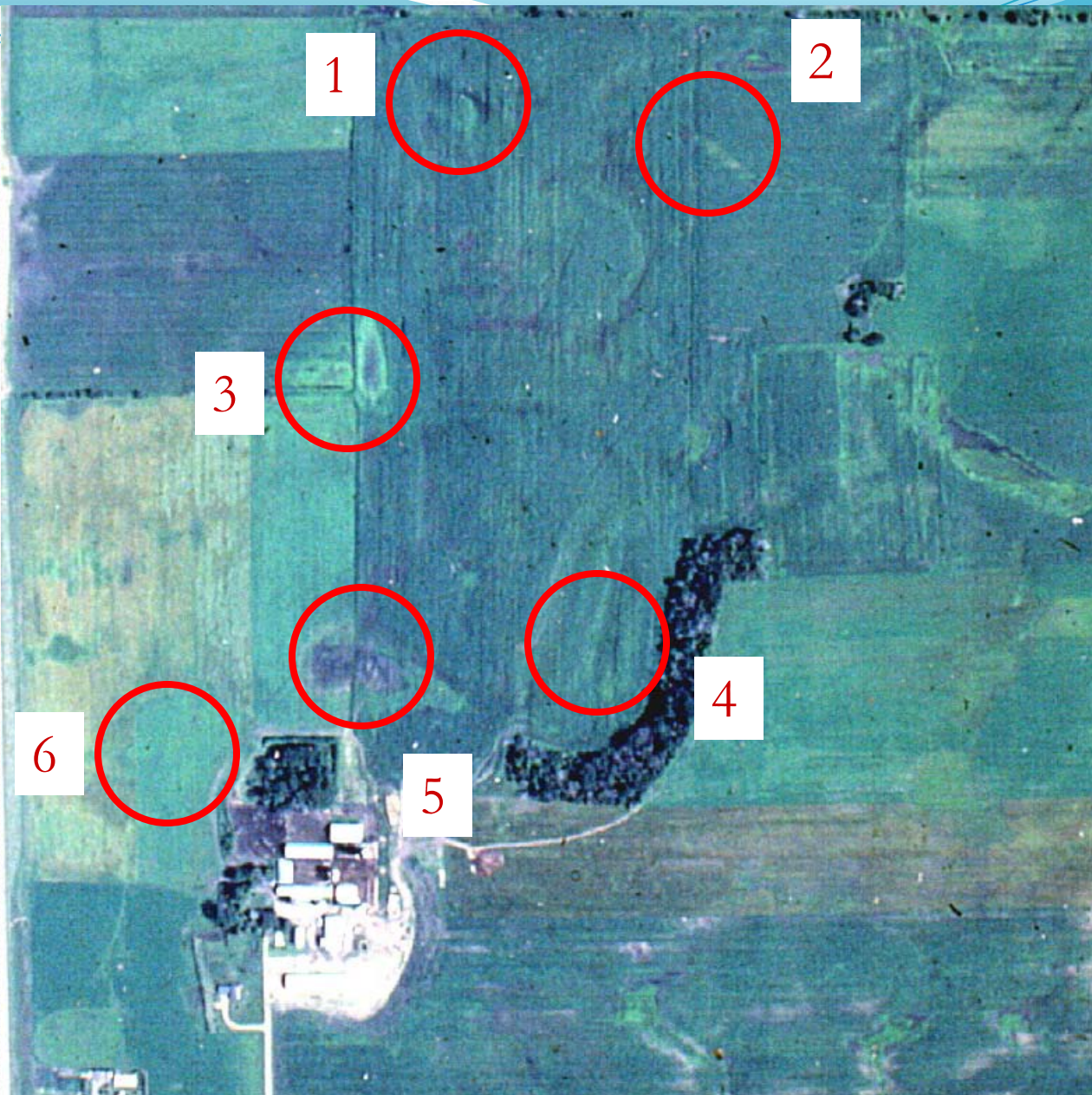
1980 Dry



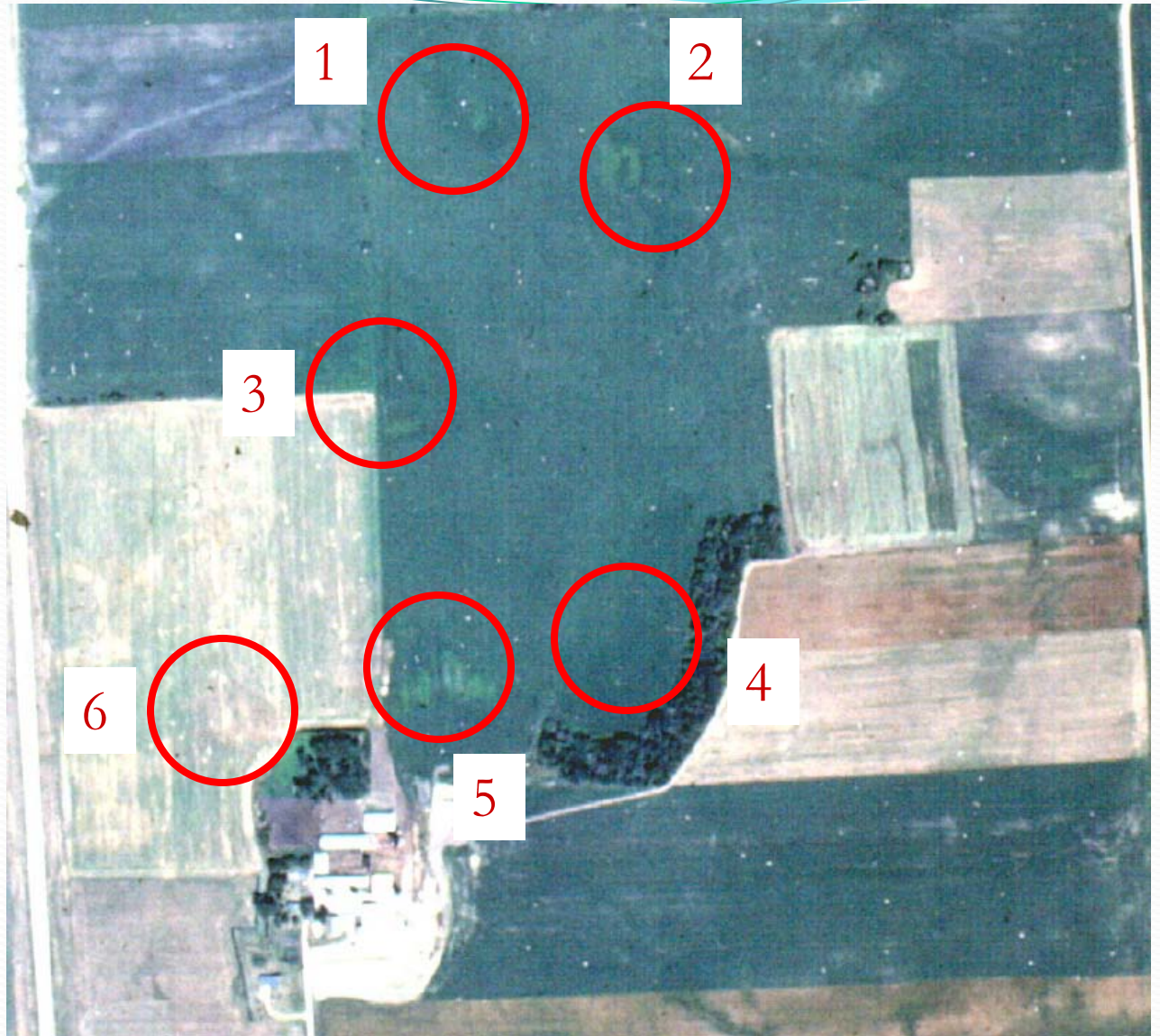
1983 Wet



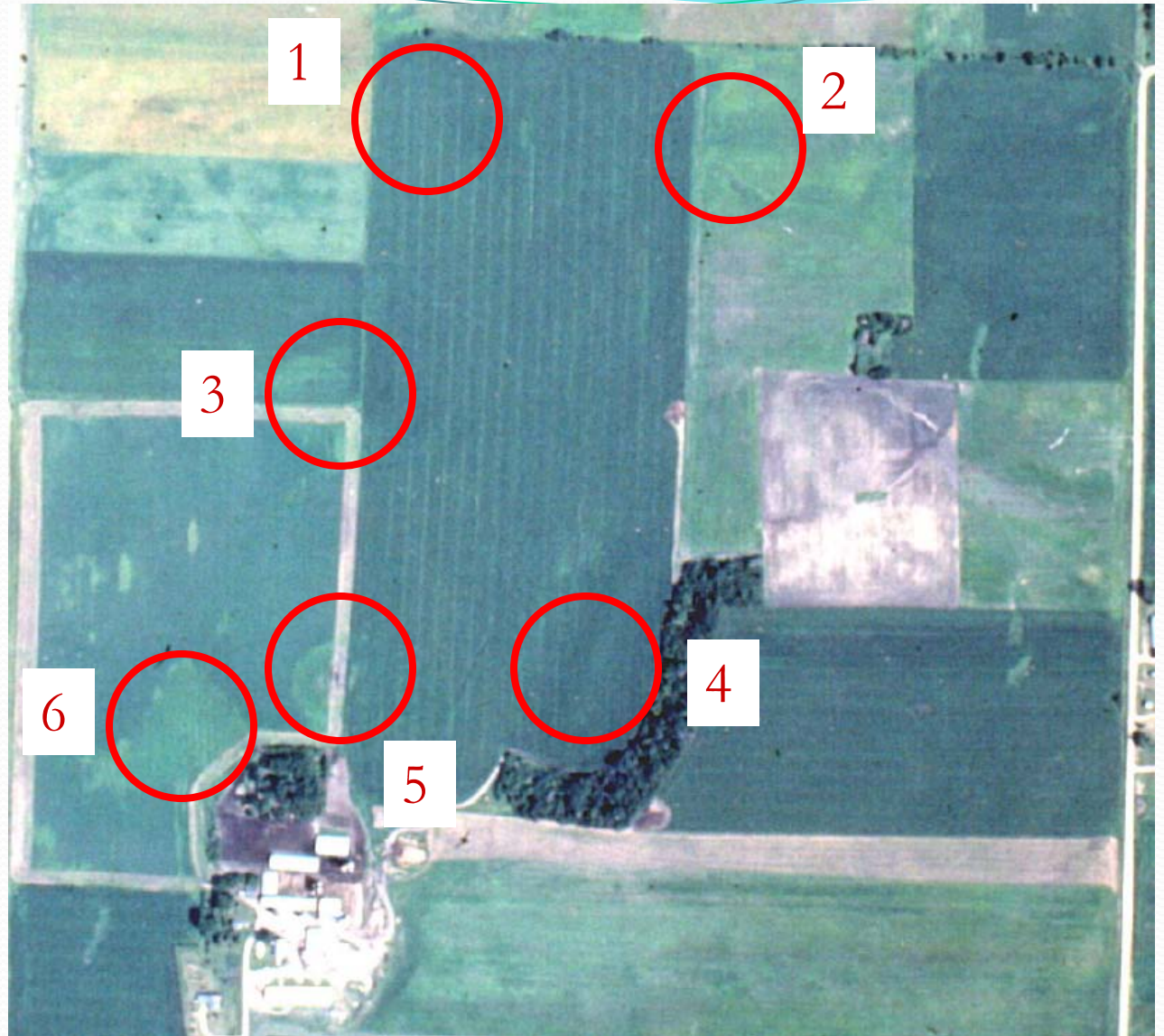
1984 Normal



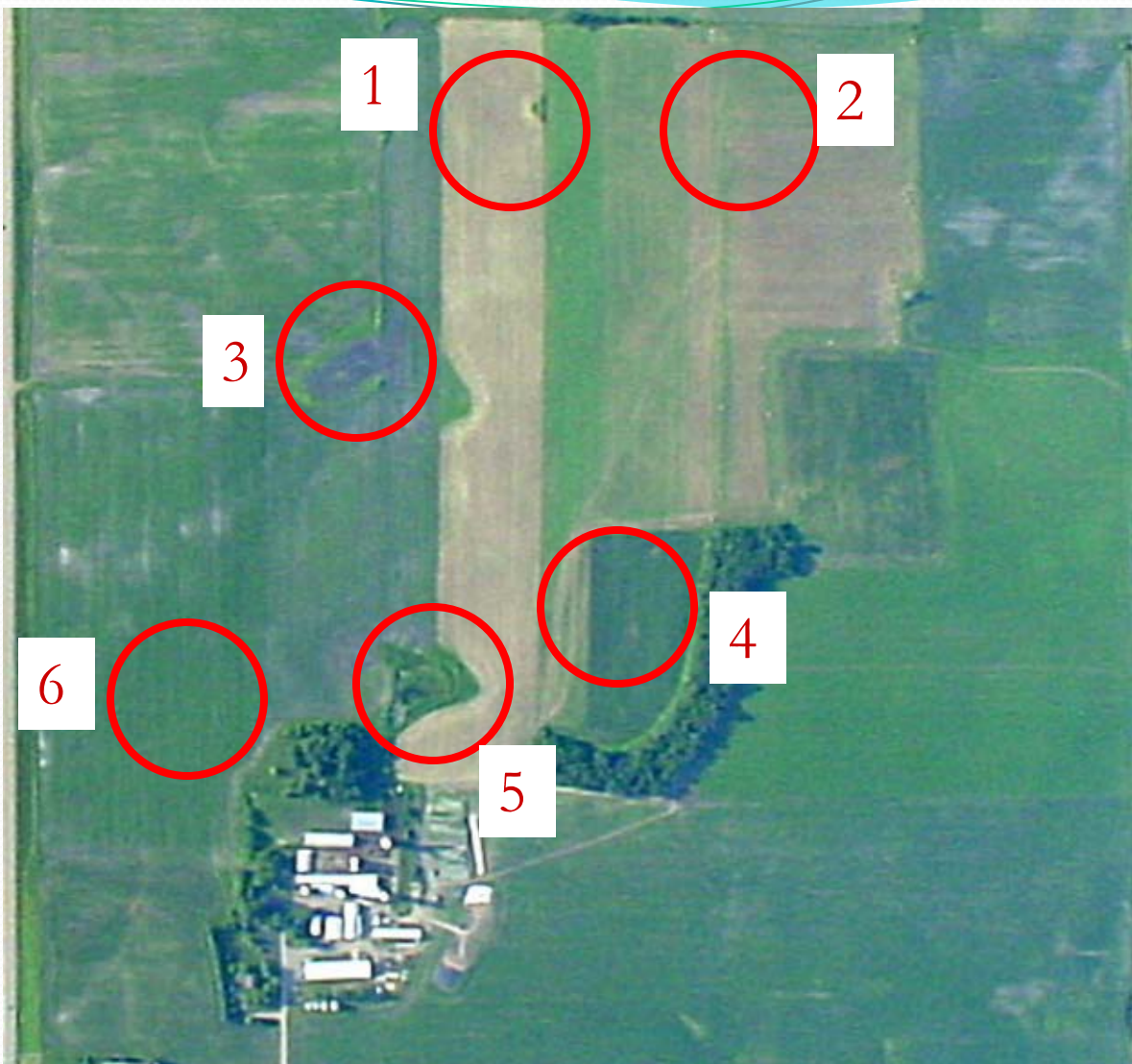
1985 Dry



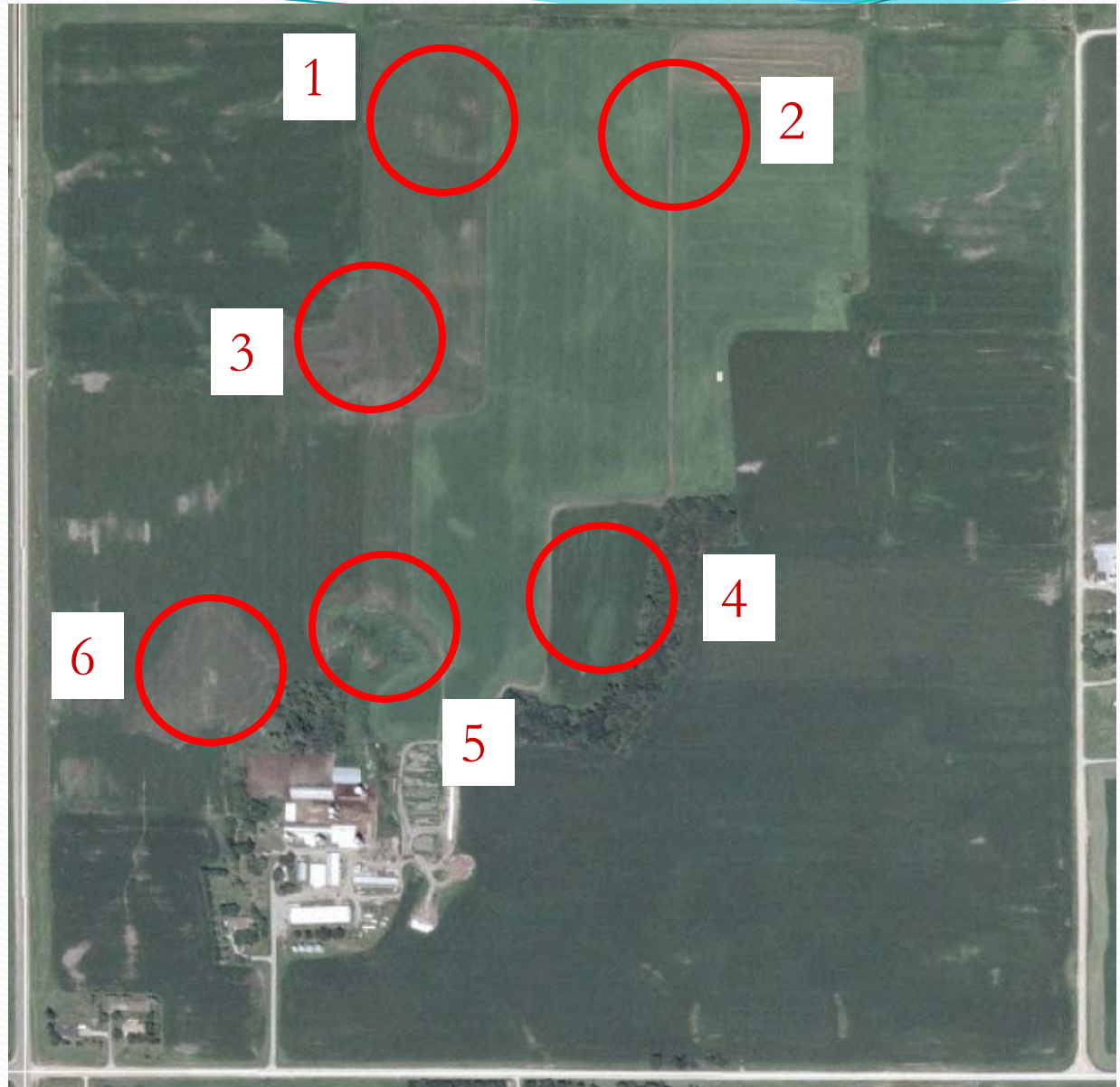
1987 Dry



2001 Wet



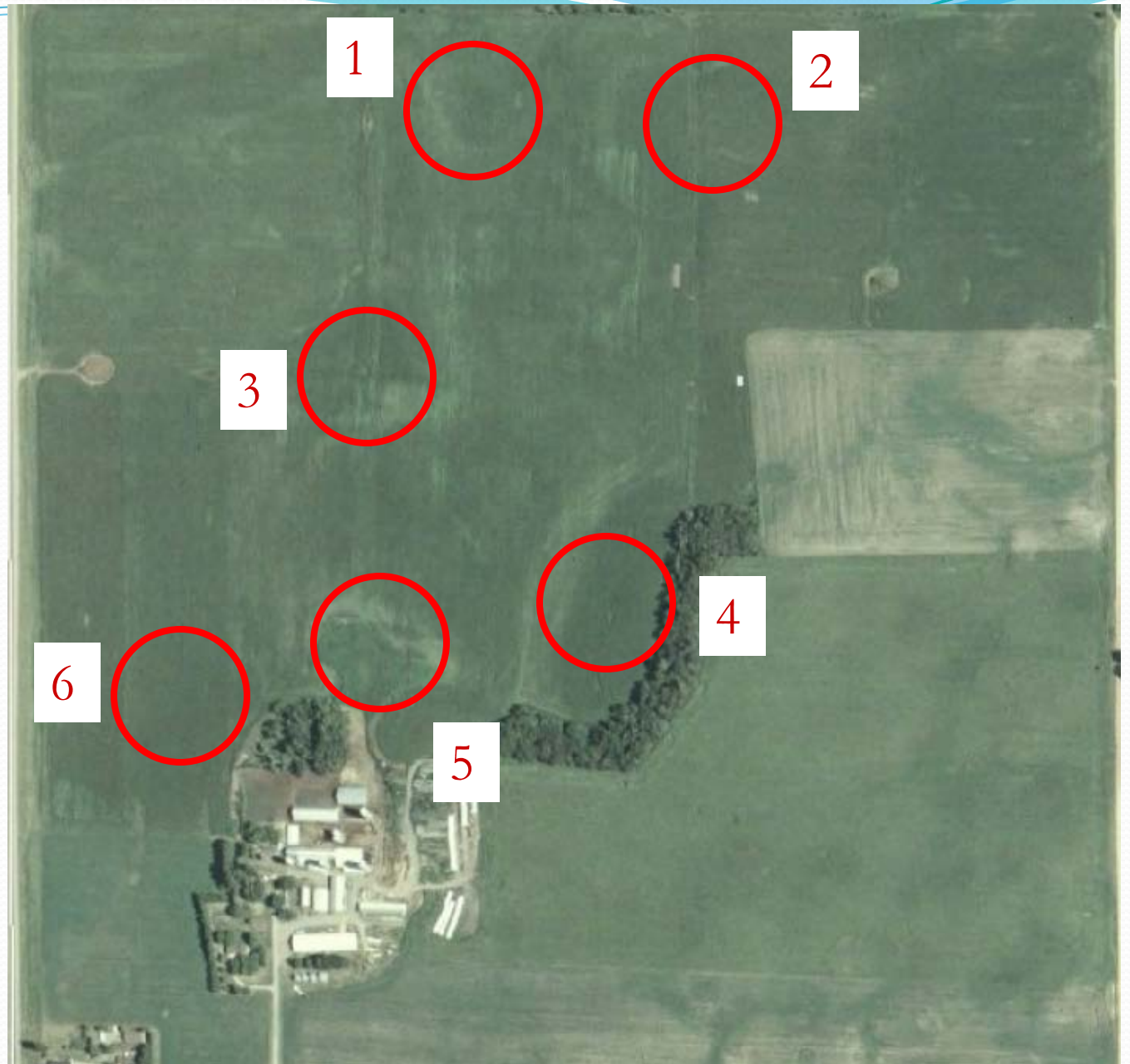
2003 Normal



2004 Normal



2006 Normal



Year	Climate Condition (wet, dry, normal) ¹	Interpretation (list hydrology indicators observed, e.g. crop stress, drowned out, standing water, etc.) ²				
		Area 1	Area 2	Area 3	Area 4	Area 5
1979	Normal	C	C	C	C (Altered)	DO
1980	Dry	C	C	DO	C (Altered)	DO
1981						
1982						
1983	Wet	DO	C	DO	DO	DO
1984	Normal	CS	C	CS	C	DO
1985	Dry	C	CS	C	C	CS
1986						
1987	Dry	C	C	C	C	CS
1988						
1989						
1990						
1991						
1992						
1993						
1994						
1995						
1996						
1997						
1998						
1999						
2000						
2001	Wet	C	C	CS	C (Altered)	NC
2002						
2003	Normal	CS	C	CS	CS	CS
2004	Normal	C	C	CS	C (Altered)	CS
2005						
2006	Normal	C	C	C	C	CS
2007						
2008						
2009						

Summary Table

	Area 1	Area 2	Area 3	Area 4	Area 5
# Normal Yrs.	5	5	5	5	5
# Normal Yrs with wet signatures	2	0	3	3(?)	5
% Normal Yrs with wet signatures	40%	0%	60%	60%	100%

¹Use MN State Climatology website to determine USDA/NRCS climate condition for legal description of parcel being investigated.

²In the space below, provide legend for interpretation symbols used.

C = Cropped CS = Crop Stress NC = Not Cropped DO = Drowned Out

Year	Climate Condition (wet, dry, normal) ¹	Interpretation (list hydrology indicators observed, e.g. crop stress, drowned out, standing water, etc.) ²				
		Area 6	Area	Area	Area	Area
1979	Normal	C				
1980	Dry	C				
1981						
1982						
1983	Wet	DO				
1984	Normal	C				
1985	Dry	C				
1986						
1987	Dry	CS				
1988						
1989						
1990						
1991						
1992						
1993						
1994						
1995						
1996						
1997						
1998						
1999						
2000						
2001	Wet	C				
2002						
2003	Normal	CS				
2004	Normal	CS				
2005						
2006	Normal	C				
2007						
2008						
2009						

Summary Table

	Area 6	Area	Area	Area	Area
# Normal Yrs.	5				
# Normal Yrs with wet signatures	2				
% Normal Yrs with wet signatures	40%				

¹Use MN State Climatology website to determine USDA/NRCS climate condition for legal description of parcel being investigated.

²In the space below, provide legend for interpretation symbols used.

C = Cropped CS = Crop Stress NC = Not Cropped DO = Drowned Out

Here are some results. Yours may differ slightly, but hopefully in the same ballpark.

Summary Table

	Area 1	Area 2	Area 3	Area 4	Area 5
# Normal Yrs.	5	5	5	5	5
# Normal Yrs with wet signatures	2	0	3	3(?)	5
% Normal Yrs with wet signatures	40%	0%	60%	60%	100%

Use MN State Climatology website to determine LOR. Use US climate condition for local description of normal yrs.

Area 2 is likely not wetland, while Area 5 is likely wetland. The other areas are borderline/questionable.

Need to do onsite investigation and possibly revisit mapping conventions based on your field review.

Growing Season



Why do we care about Growing Season?

- **Growing season dates are needed to:**
 - **Evaluate and interpret some wetland hydrology indicators, and**
 - **Analyze recorded hydrologic data to determine if the Corps Technical Standard for wetland hydrology is met.**



April 28, 2011

Growing Season

Delineation work not limited to “growing season”.

Accurate ID of soils and veg more critical.

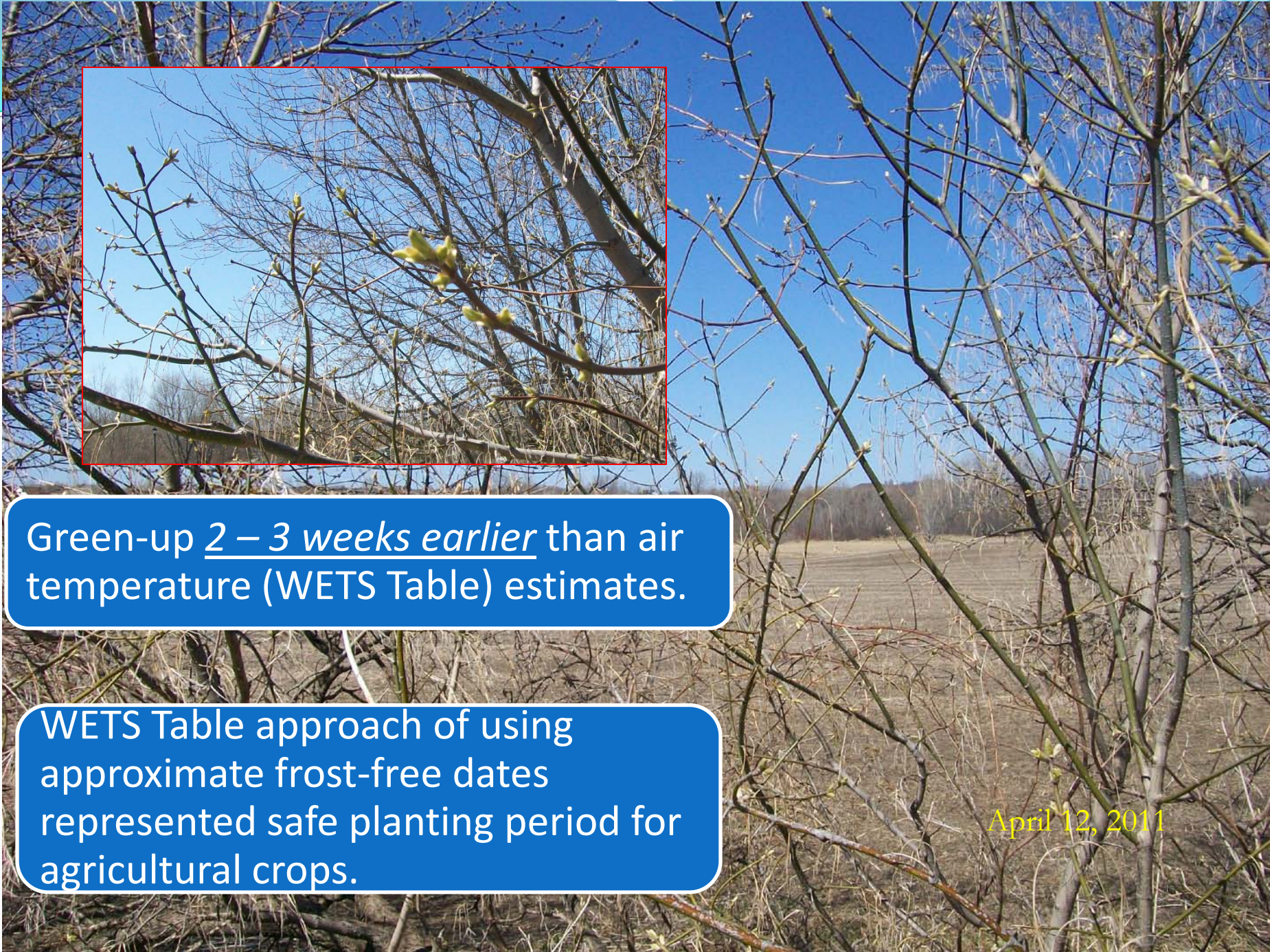
Indicators of Start of Growing Season

- “Green-up”;
- Soil temp at 12 inch depth; or
- If no site visit, growing season may be approximated by median dates of 28° F air temperature in spring and fall (WETS Table info).

“Green-Up” Indicator for Start of Growing Season

1. Two or more species of non-evergreen plants show active growth in a wetland or surrounding area with similar elevation and aspect





Green-up 2 – 3 weeks earlier than air temperature (WETS Table) estimates.

WETS Table approach of using approximate frost-free dates represented safe planting period for agricultural crops.

April 12, 2011

Growing Season

- **Regardless of when growing season begins or ends, a complete wetland delineation** requires full and accurate descriptions of hydrology, soils, and vegetation.
- To ensure timely technical review of delineation work submit early enough.
 - Submit for review in November?
 - Submit for review in September?



Preparing a Wetland Delineation Report



Why is the report important?

- Regardless of the method, results include description of techniques and materials utilized and basis for determination.
- Not only documentation, report also provides basis for regulatory permitting/compliance.
- Wetland delineations are valid for 5 years*, so it may be used in the future to re-construct the delineation lines.

Basic Format for Reports

- **Introduction** – why was it done, for whom, where is the site, when was it done
- **Methods** – 87 Manual, including the specific approach (Routine level 1, level 2, , mapping conventions, etc.). The more details the better.
- **Results** – description of wetlands identified and (just as important) a description of the areas that were determined to be upland
- **Figures**
- **Data Forms**

Report Figures

➤ Standard Figures

- Location map
- USGS topo map
- Aerial photograph
- NWI mapping
- Soil survey mapping
- DNR Protected Waters Mapping
- Wetland boundary map (survey or overlaid on one of the base maps above).
- Antecedent precipitation conditions summary (MN Climatology Web Site)

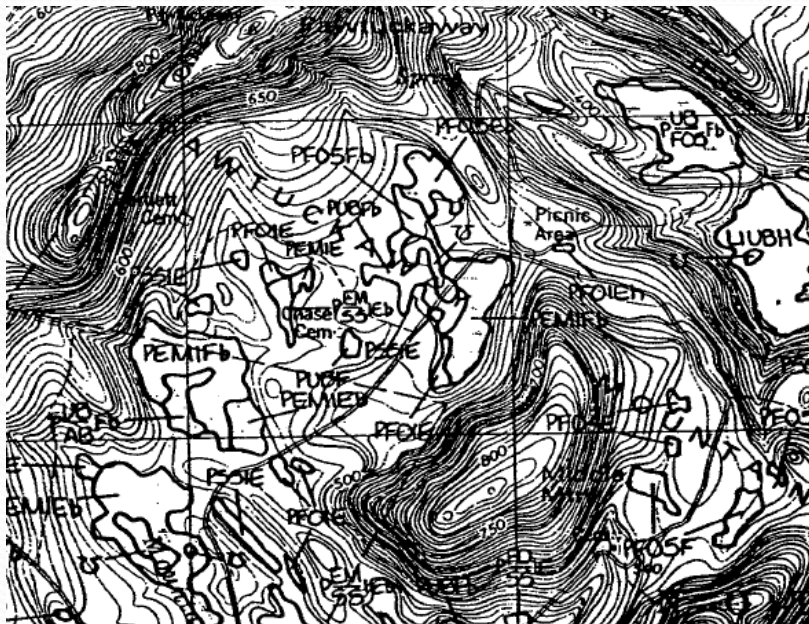
Report Figures

- **Other Figures (as needed/available)**
 - **FSA slides and/or summary of Mapping Conventions review**
 - **Local wetland maps (County/City inventories, etc.)**
 - **County biological survey**
 - **MLCCS mapping (MN Land Cover Classification System)**
 - **Local topo map**

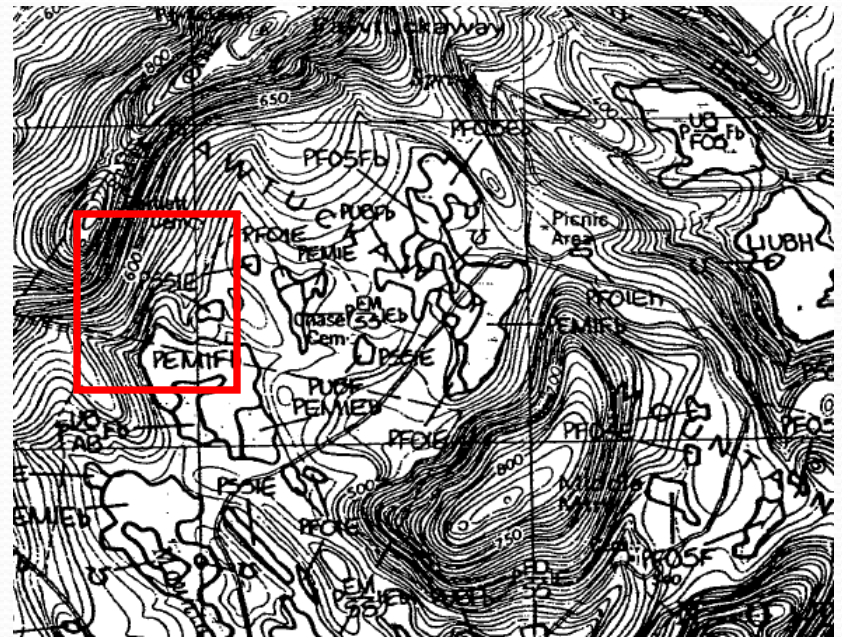
Report Figures

Figures should include site boundaries, approximate scale, and north arrow

YES



NO



1"=3000'



Report Results

For each wetland area identified:

- Describe the wetland type, dominant vegetation, soils, hydrology, and landscape position
- Describe the adjacent upland in terms of community type, vegetation, soils, and landscape position
- Describe the basis for the wetland delineation line, being specific on the transition

Do's and Don'ts

- Do be concise and specific.
- Don't LOAD the report with:
 - language from the Manual/Supplement and regulatory program, or
 - pages of OSDs or historic climate data.
 - Bigger is not necessarily better!
- Do make a clear distinction between observations and interpretations.
- Don't mix policy with science.



- Do make sure your report addresses the whole site. Knowing where the wetlands are NOT is just as important as knowing where they are.

Wetland Delineation Approaches

How to Accomplish Wetland Delineation Work:

- 1) Utilize or develop internal expertise
- 2) Hire a consultant to do delineation
- 3) Develop an agreement with SWCD to do work
- 4) Delineation work is generally an eligible project cost (Engineering Costs)

Web Sites

<http://www.bwsr.state.mn.us/wetlands/delineation/index.html>

<http://www.mvp.usace.army.mil/regulatory/default.asp?pageid=1793>

Wetlands in the Context of Road Projects

Summary:

- 1) Plans should show accurate representation of wetlands impacted by project based on 87 Manual and Reg. Supplements
- 2) Submit report early enough to allow for regulatory concurrence during the growing season
- 3) Wetlands may occur on cropland and off-site methods may help determine extent of wetlands
- 4) Several options exist to get wetland delineations or determinations done.