

Mapping Reed Canary Grass in Wisconsin – Phase Two

Brynda Hatch, WDNR

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USEPA Wetland Grant
University of Wisconsin - Madison,
Environmental Remote Sensing Center

Outline

- Project Goal
- Pilot Study Review
- Methodology
- Results
- Statistics and Uses for Data



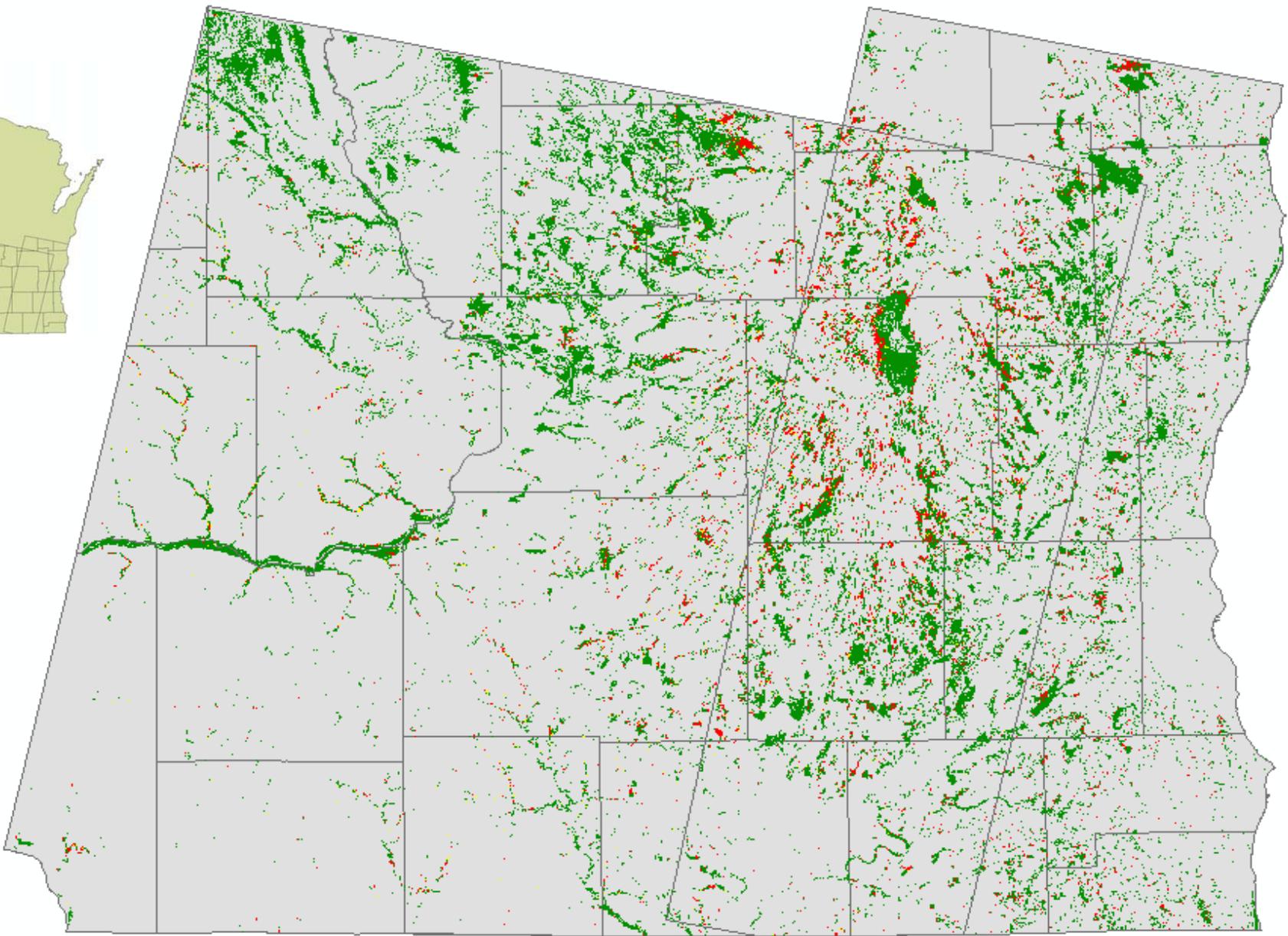
Project Goal

- Produce a statewide map showing wetland areas dominated by invasive reed canary grass (*Phalaris arundinacea*)



Pilot Study (Phase One) Results from 2001

-  Reed Canary Grass Dominant
-  Other Wetland Vegetation Dominant
-  Codominant



Pilot Study (Phase One)

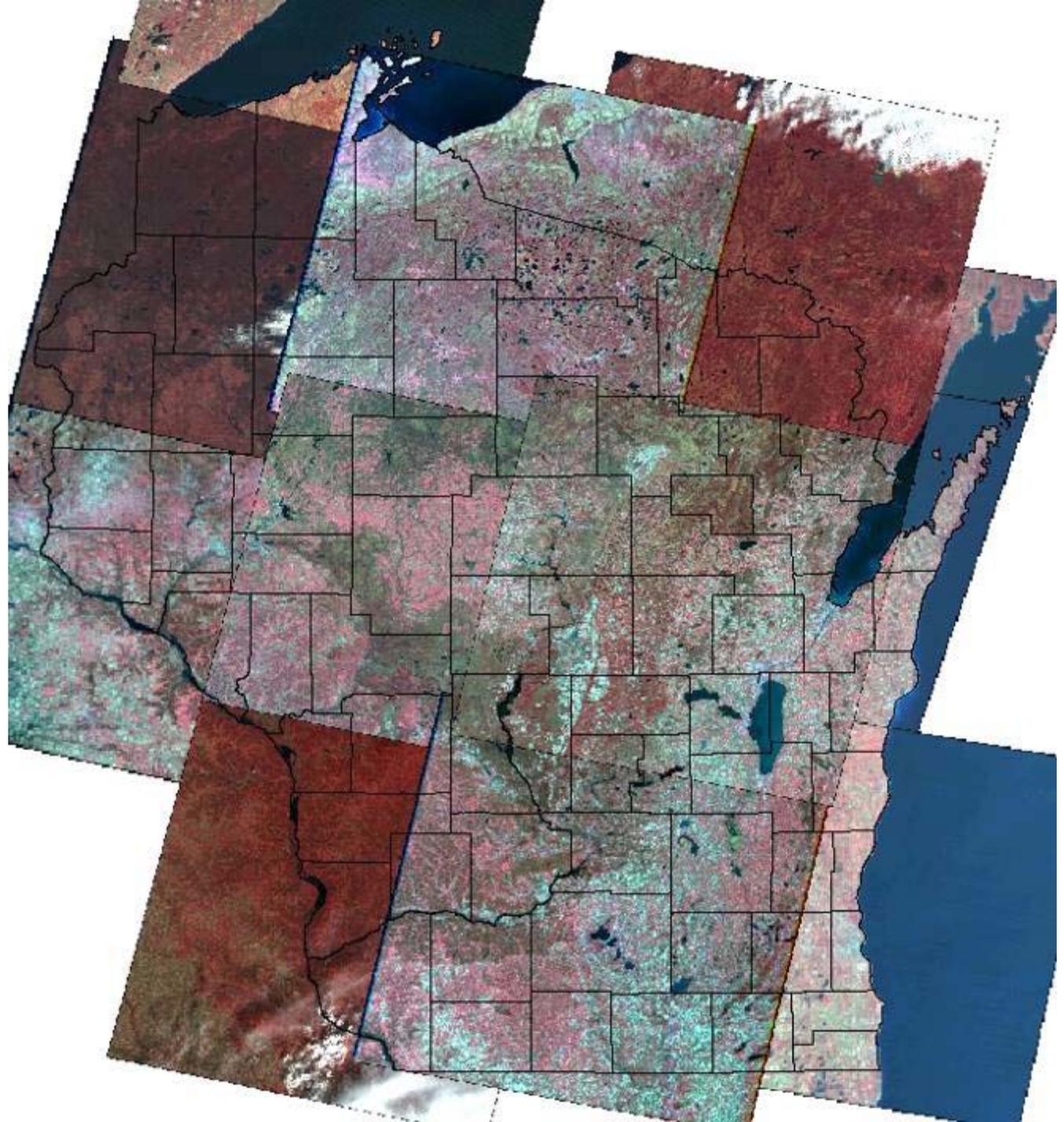
Conclusions

- Provide coarse filter, first cut at wetland health, not intended to be site-specific
- Satellite sensors can't pick up reed canary grass as understory in forested wetlands
- The codominant category will be eliminated in future efforts
- It is feasible to expand this methodology to cover the state.  Phase Two

Landsat Scenes Purchased

Total Purchase
Price = \$2980

The scenes chosen were selected for minimal cloud cover ($\leq 10\%$) and dates were within the range of Oct 09-Oct 31, 1999-2003. Ten percent cloud cover was accepted if the clouds were in an area of overlap with another scene, or outside of the Wisconsin border.



Our Volunteer Ground-Truthers

Tom Bernthal,
WDNR and Jon
Motquin, East
Central
Wisconsin
Regional
Planning
Commission



Dan Pubanz,
Wolf River
Forestry, LLC

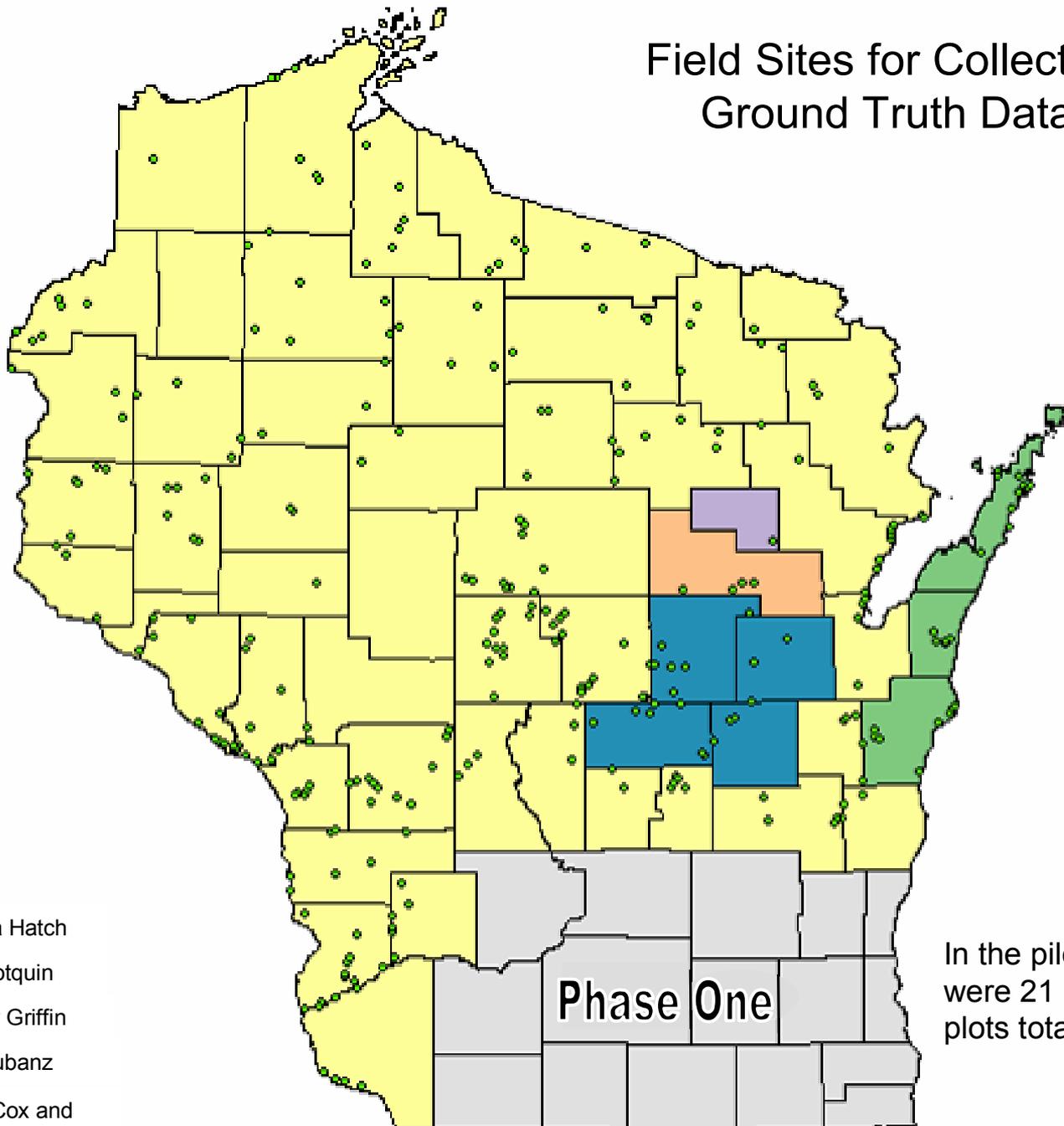
Doug Cox,
Menominee
Indian Tribe of
Wisconsin



Shirley Griffin,
Glacial Lakes
Conservancy

269 sites were visited. At each site, multiple plots were ground-truthed. Once finished, half of the plots were used for classifying the satellite image and the other half were used for accuracy assessment. There were 1388 plots total.

Field Sites for Collecting Ground Truth Data

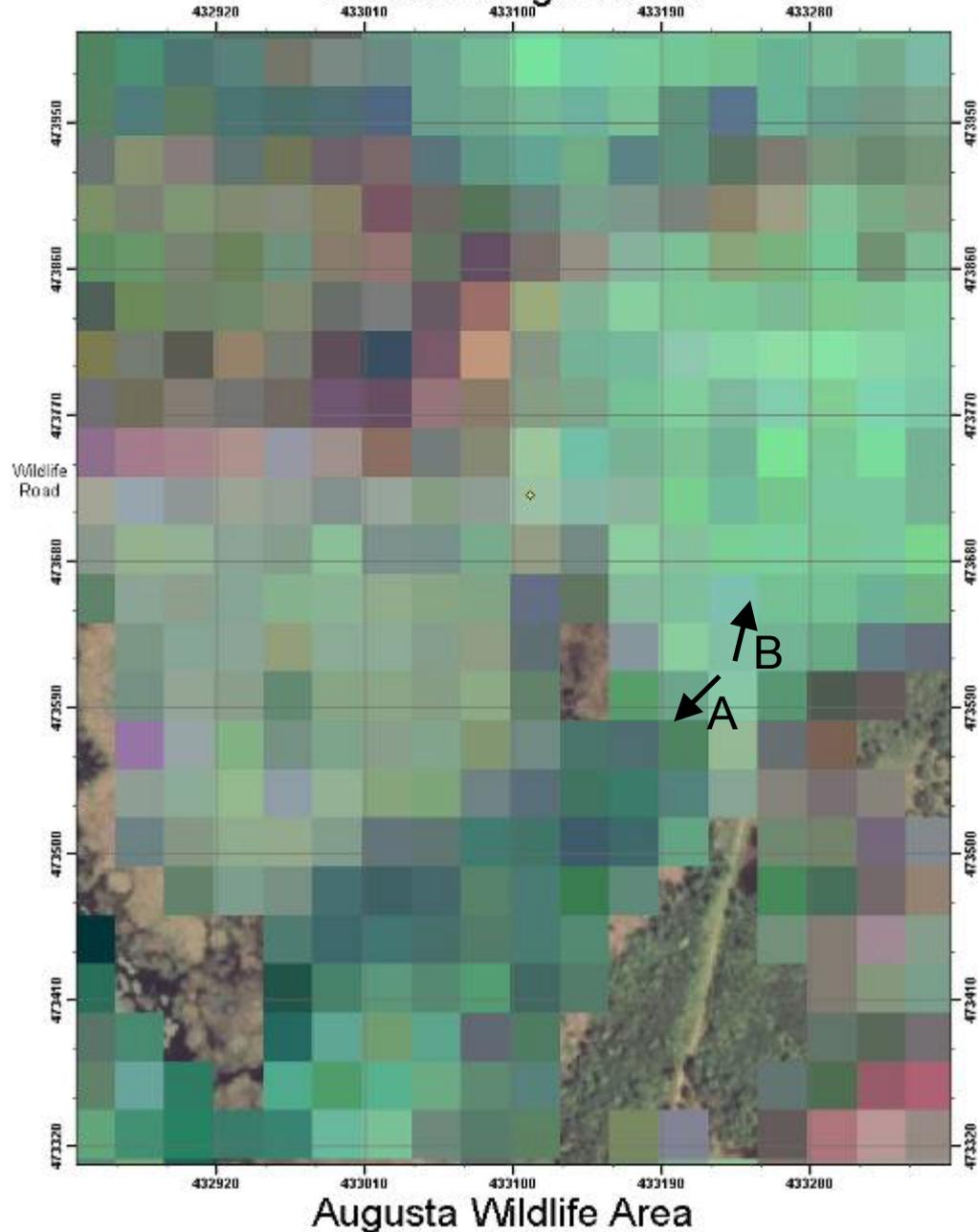


Phase Two Counties

- Visited by Brynda Hatch
- Visited by Jon Motquin
- Visited by Shirley Griffin
- Visited by Dan Pubanz
- Visited by Doug Cox and Brynda Hatch

In the pilot study there were 21 sites with 249 plots total.

Eau Claire County T26NR6WS15
Town of Bridge Creek



This is a field sheet with the satellite scene overlaid on an aerial photo. The grid marks off 90m intervals to help in geolocating the position with the GPS. Photos taken in the field help later in the classification process to remember the vegetation present in the area.



Photo A: cattail marsh



Photo B: sedge meadow



Step 1: Get the GPS signal.

Step 2: Using the field map and the GPS readings, get geolocated and scout out the vegetation on the site.

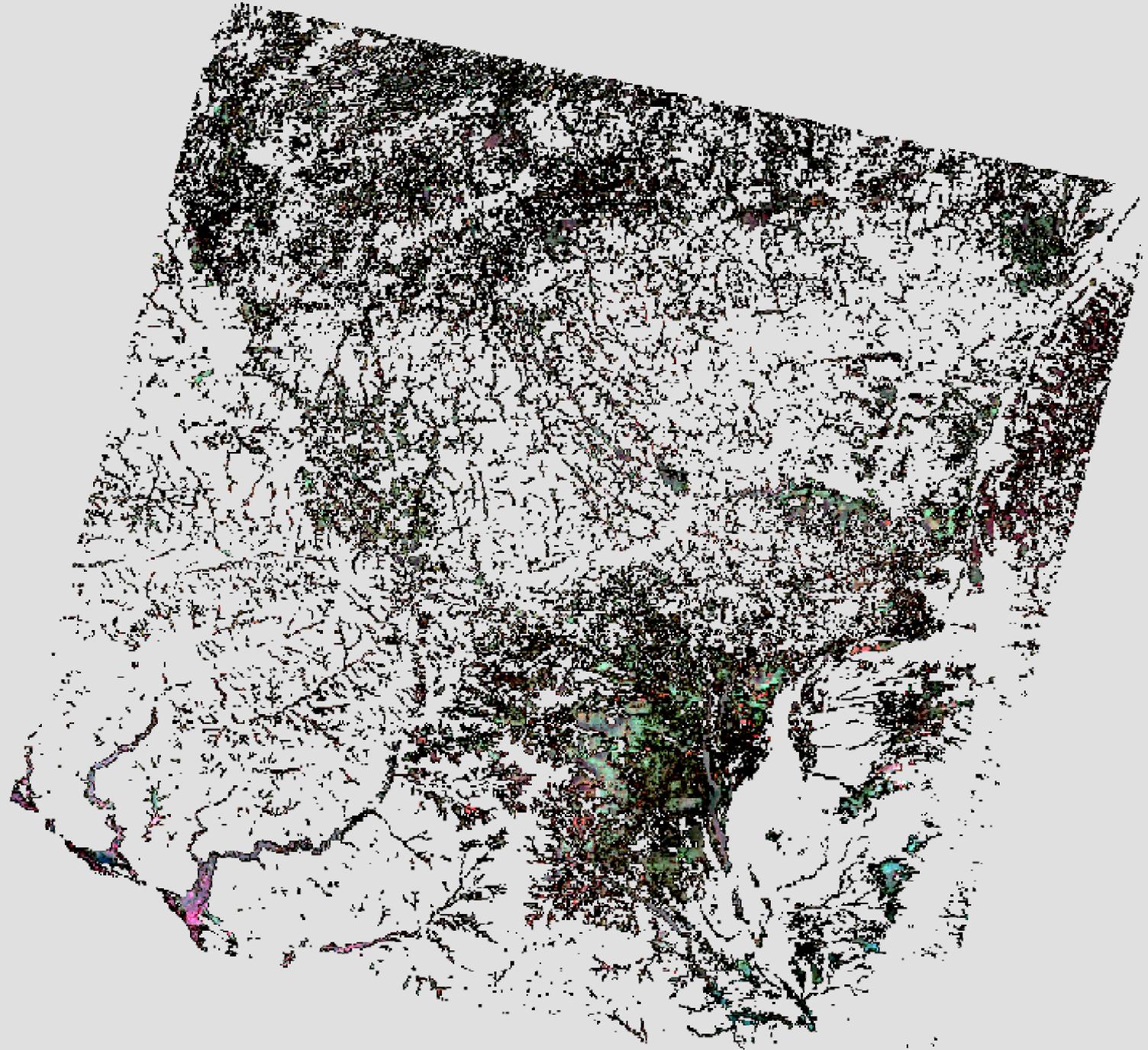
Step 3: Create a polygon of the area and record the vegetation characteristics.

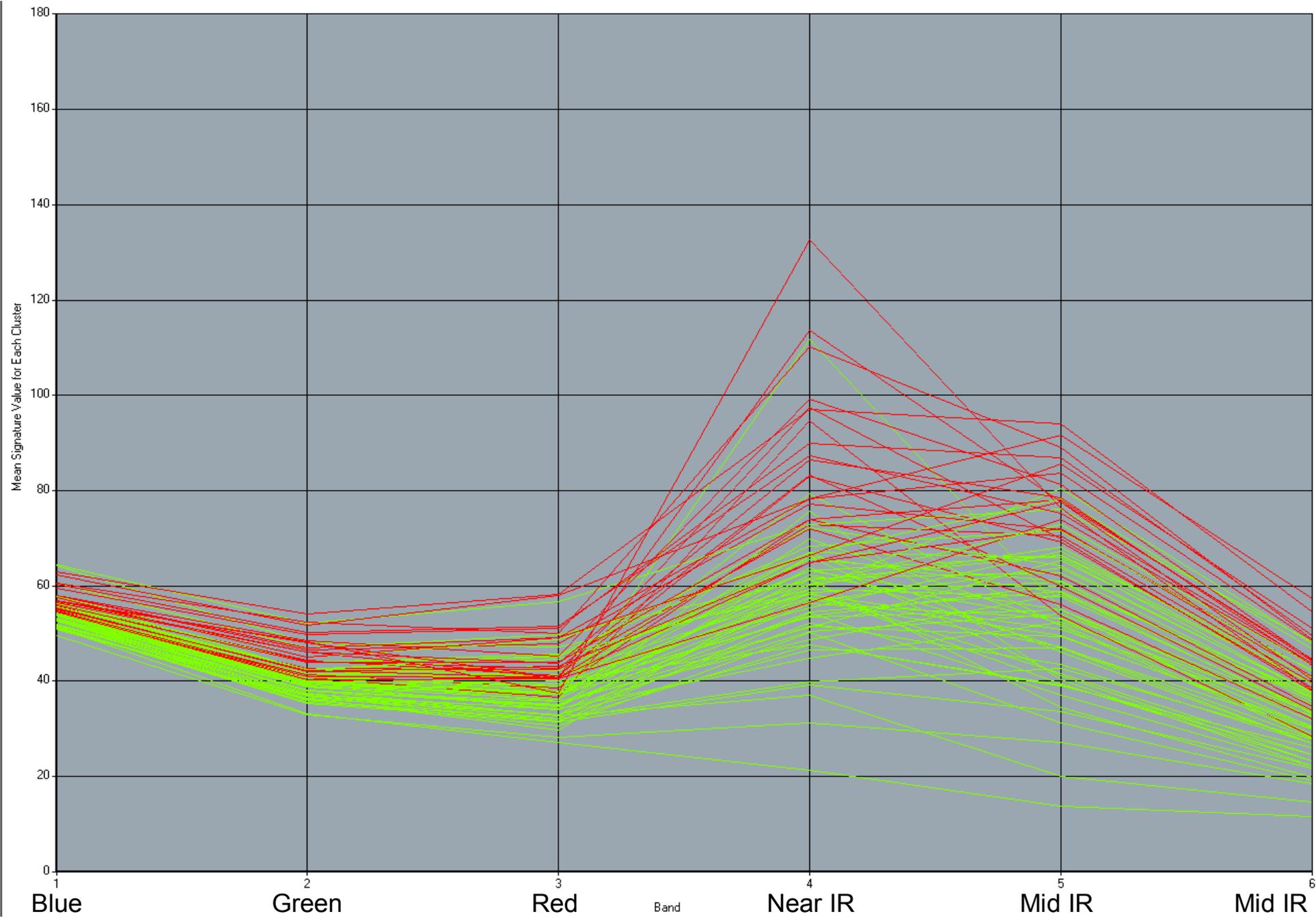


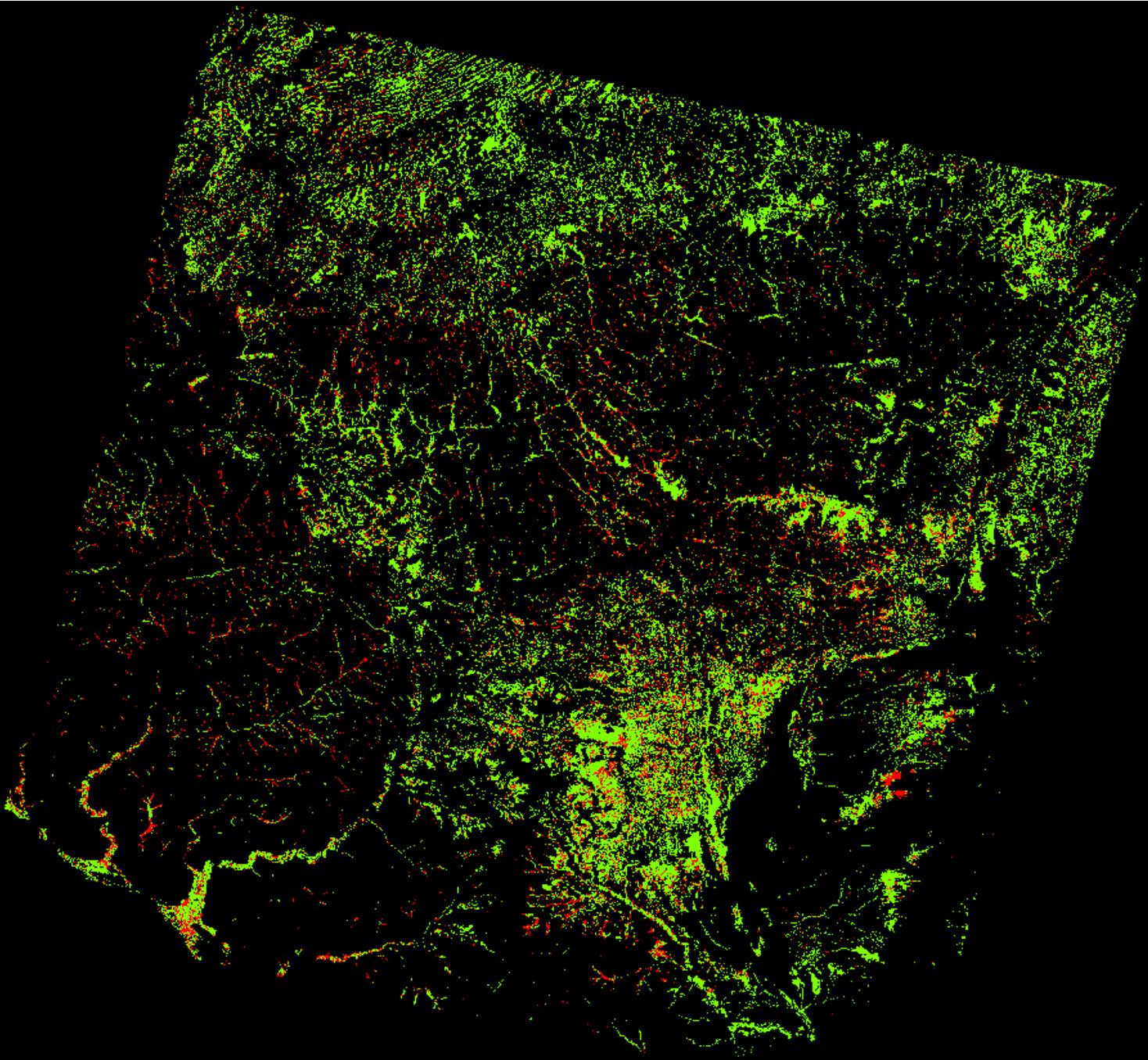
Example of Manual Recolor Process

Assigning the value of either 1) RCG dominant (RED) or
2) Other wetland vegetation
dominant (GREEN)

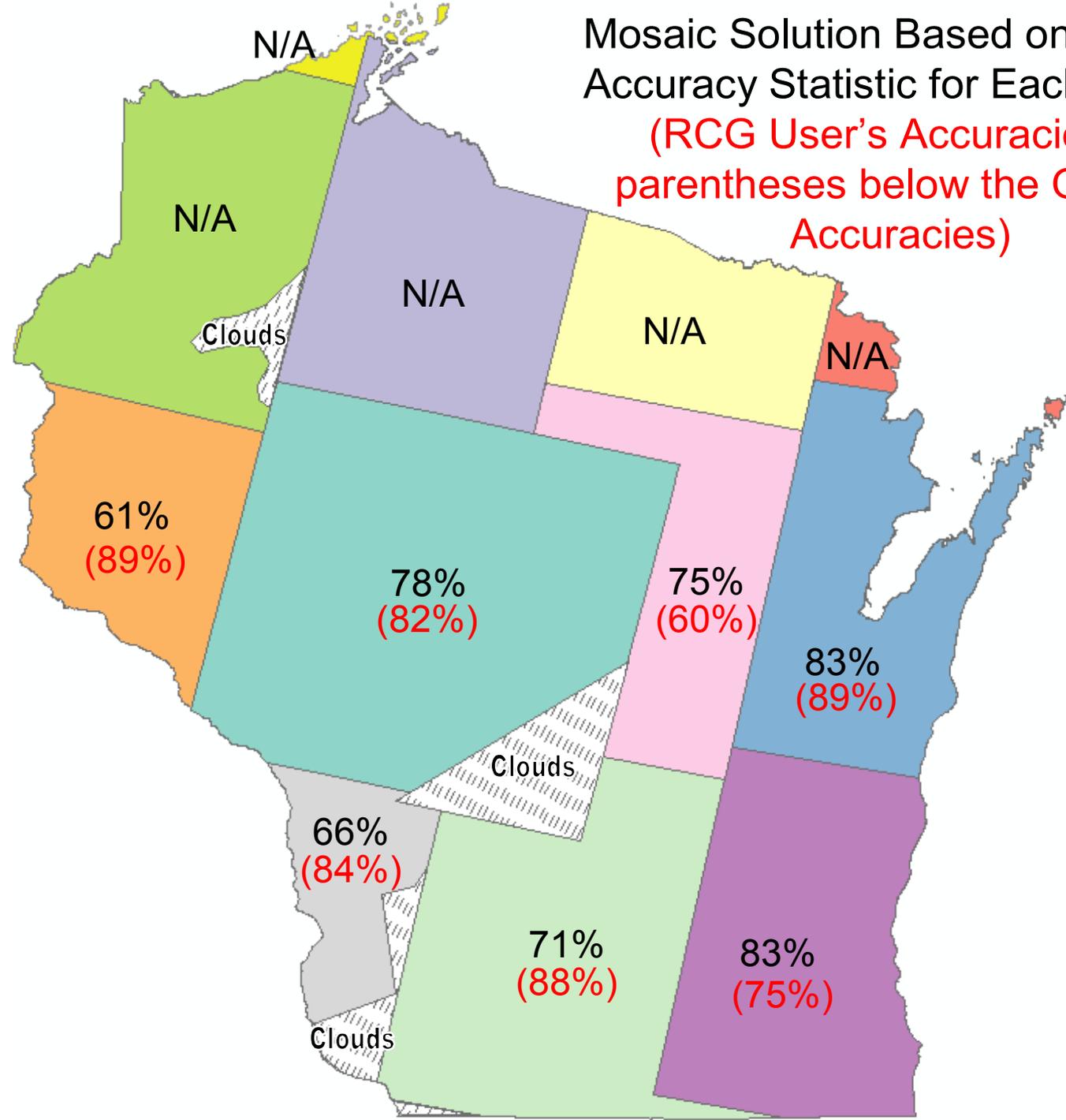
Path 25 Row 29



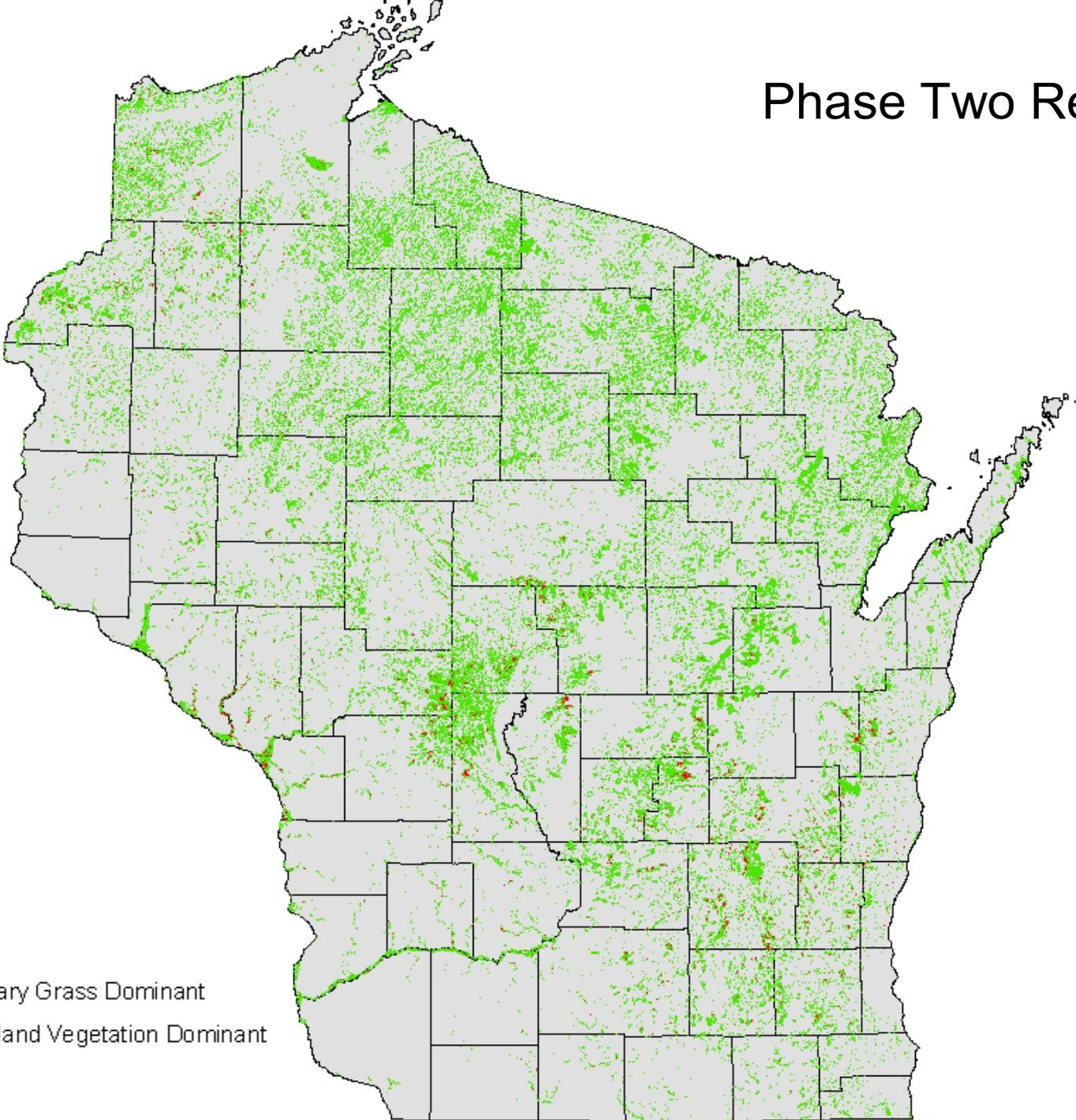




Mosaic Solution Based on Overall Accuracy Statistic for Each Scene
(RCG User's Accuracies in parentheses below the Overall Accuracies)



Phase Two Results

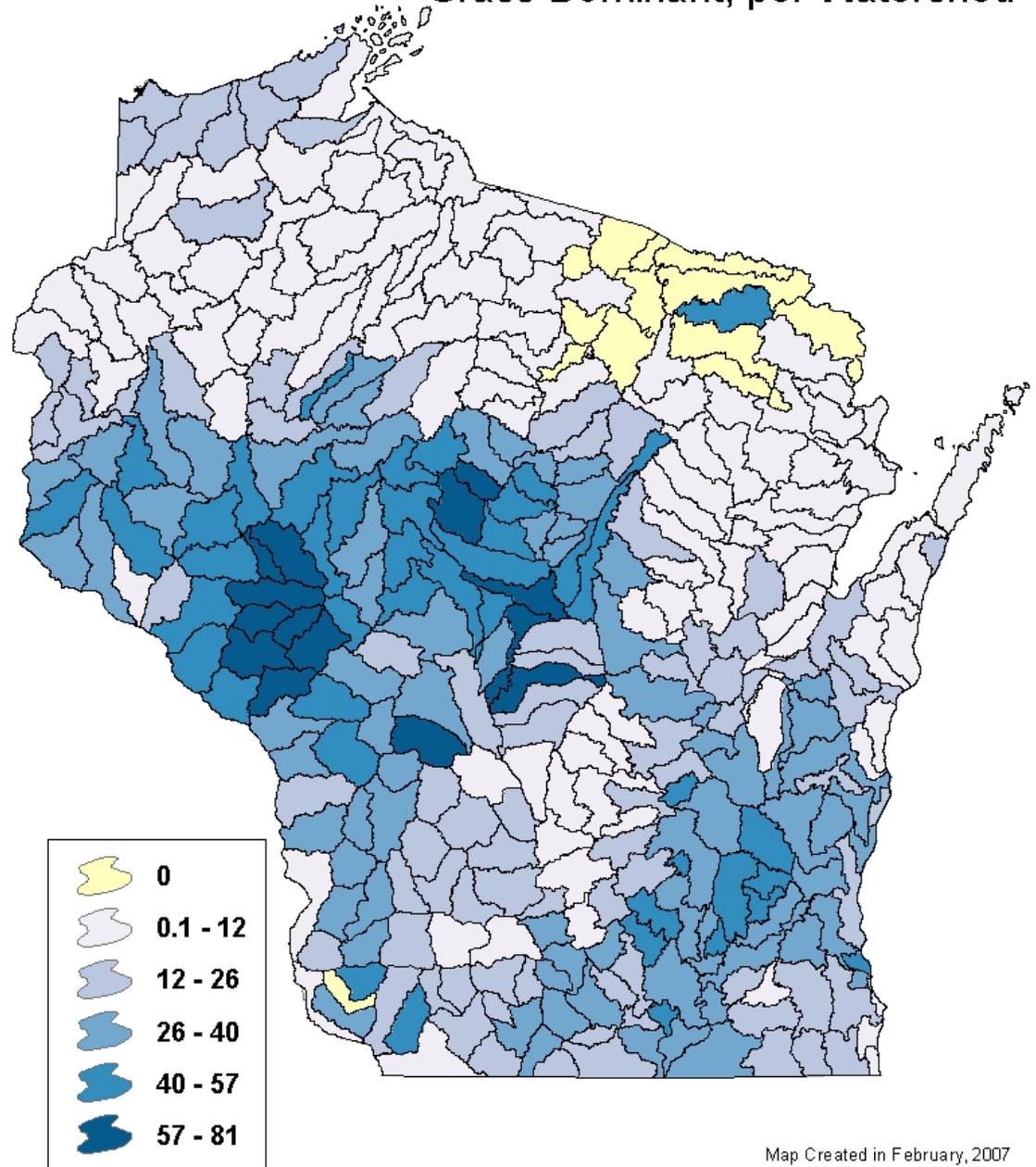


-  Reed Canary Grass Dominant
-  Other Wetland Vegetation Dominant

Percent of Open Canopy Wetlands that are Reed Canary Grass Dominant, per Watershed

Statistics:

- There are **510,000 Acres** of Reed Canary Grass Dominated Wetlands in Wisconsin
- **26.3%** of Wisconsin's Open Canopy Wetlands are Dominated by Reed Canary Grass



http://dnrmaps.wisconsin.gov/imf/imf.jsp?site=SurfaceWaterViewer

Surface Water Data Viewer

Layers · Legend · Find Location · Themes · Designated Waters · Select · Help · Print

Full State **Zoom In** **Zoom Out** **Move** **Zoom Last** **Zoom to...** **Identify** **Select** **Advanced Tools**

Map Layers

Inland Water Resources

- 24K Watersheds
- DNR Major Basins
- DNR Water Mgmt Units
- Open Water
- Rivers and Streams

Dam and Floodplain Program

Fisheries Management Waters

Invasive Species

- Eurasian Water-Milfoil Infestations
- Zebra Mussel Infestations
- Reed Canary Grass Infestations

Monitoring & Assessments

Wetlands, Plants & Habitat

Permits & Related Data

Grant Locations

Admin & Political Boundaries

Land Descriptions & Cadastral

Recreation & Trails

Map Indexes

Forests & Landcover

Transportation

Imagery & Basemaps

Elevation & Derived Products

Automatically Refresh Map

Show Legends

Notes:

Scale: 1:101,737 Quick View: Selected Map Tool: **Zoom In**

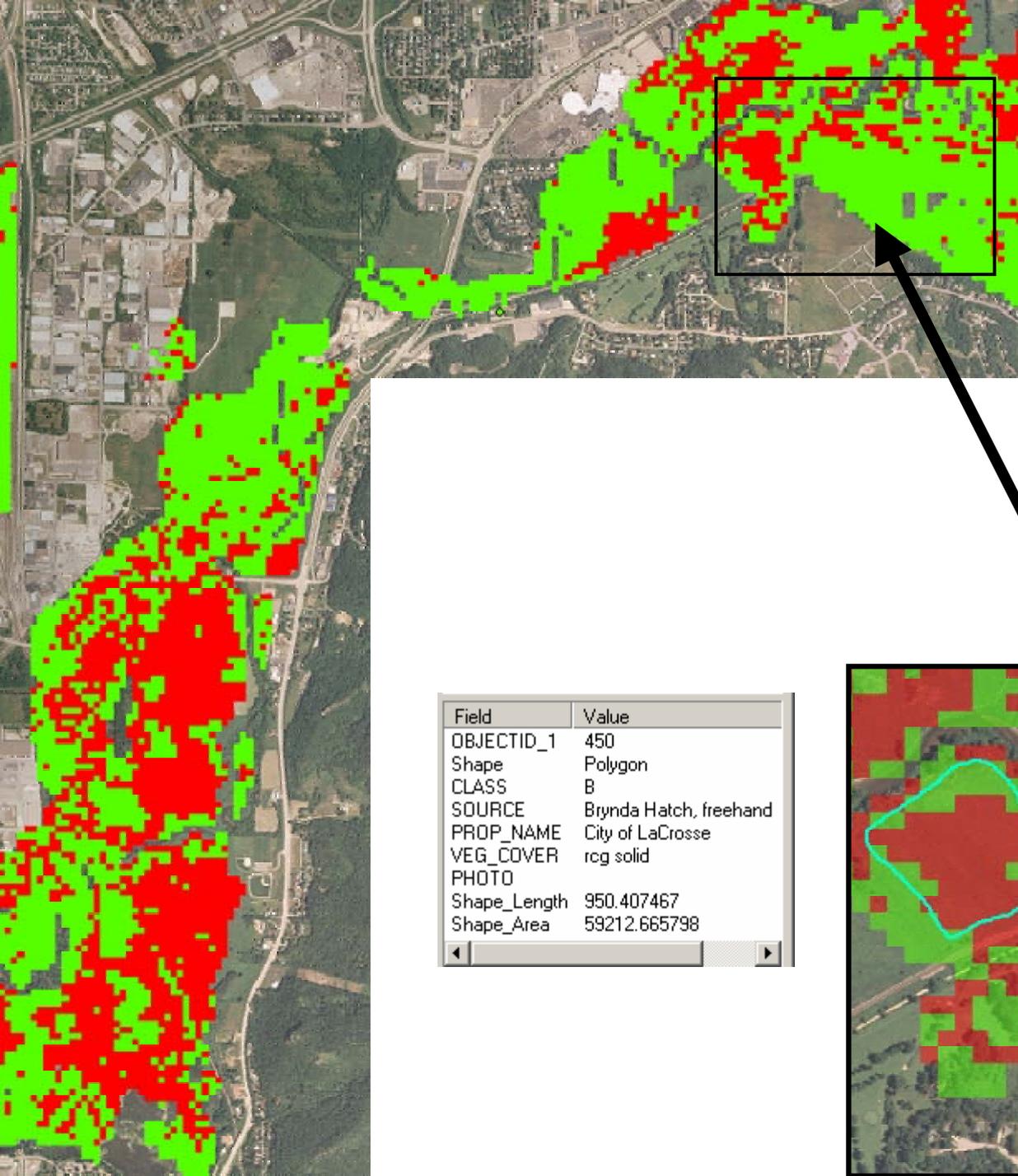
DNR Maps & Aerial Photography | DNR GIS Overview | Division of Water | Comments on this website

WTM Coordinate: X= 540292, Y= 447983 Meters --- Latitude= 44°30'18" N (44.50488), Longitude= 89°44'41" W (-89.74473) Internet

Example Areas of High Reed Canary Grass Dominance

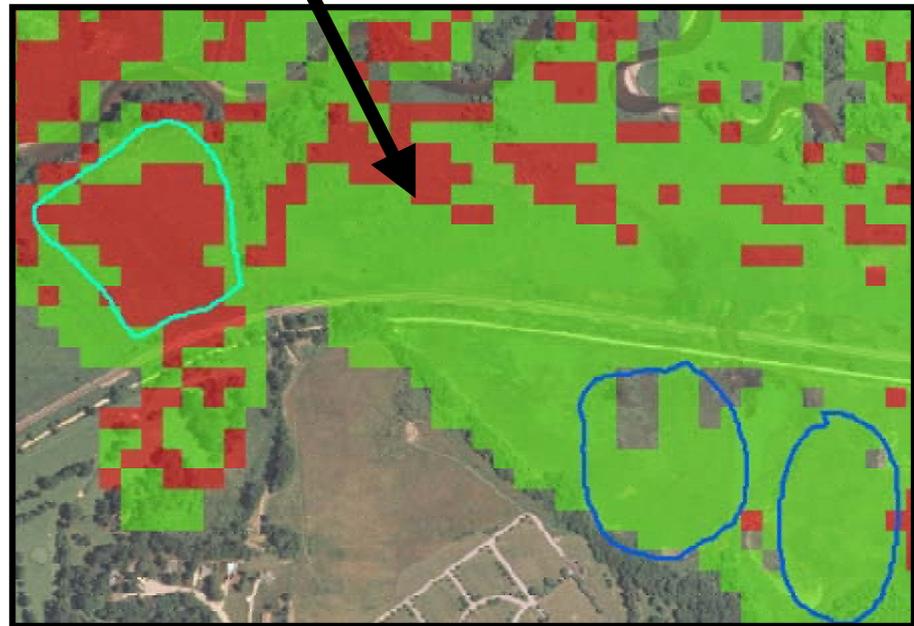


La Crosse River



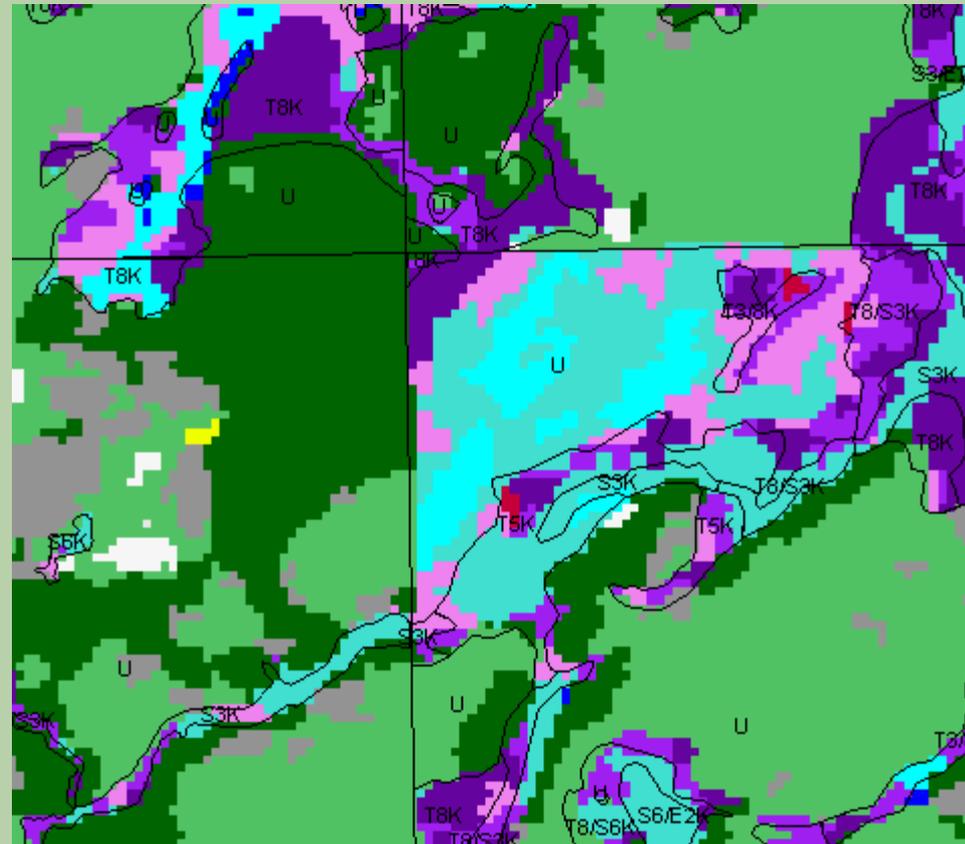
Field	Value
OBJECTID_1	452
Shape	Polygon
CLASS	A
SOURCE	Brynda Hatch, freehand
PROP_NAME	small tracts
VEG_COVER	SOLID SEDGES
PHOTO	
Shape_Length	805.881425
Shape_Area	42588.422537

Field	Value
OBJECTID_1	450
Shape	Polygon
CLASS	B
SOURCE	Brynda Hatch, freehand
PROP_NAME	City of LaCrosse
VEG_COVER	rcg solid
PHOTO	
Shape_Length	950.407467
Shape_Area	59212.685798



A Lesson Learned

- Our satellite image was masked using the wetland class from WISCLAND.
- WISCLAND received its information from the Wisconsin Wetland Inventory (WWI).
- Therefore, any inaccuracies in either of those, results in compounded errors in our project.



Recommendations

- Keep an eye on data currency.
 - WISCLAND is 15 years old.
 - The WWI ranges in age depending on the county from 7-29 years old.
 - Landsat scenes were from 1999-2003.
 - Aerial photography from 2005.
- Know your data sources.
 - WISCLAND was made using the WWI.
- Try to have your field collection done as close in time to your satellite scene capture as possible.
- Having a two-person team, one in the field and one in the office, would maximize time efficiency during field season.





Promising Uses for Data



- As a Health Gauge for Wetlands
- As an Educational Tool for Spreading the Word about Invasive Species
- To Support Efforts of such groups as the Wisconsin RCG Working Group <http://phalaris.pbwiki.com>
- To Determine Areas for Restoration and Rehabilitation
- To Help Determine...
 1. Rate of Infestation
 2. Characteristics of Sensitive Areas Vulnerable to Infestation
 3. Areas where RCG is an Imminent Threat to Species Diversity

Questions?

