Michigan Sensitive Areas Identification System

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Soil Water Conservation Society Workshop

Laura Young, Michigan State University Institute of Water Research

IWR Project Team: Vicki Anderson, Jeremiah Asher, Jason Piwarski, Laura Young
NRCS: Betsy Dierberger, Sean Duffey, Jerry Grigar, Brent Stinson, Sally Van Lieu, Kim Wieber, Monica Wymer

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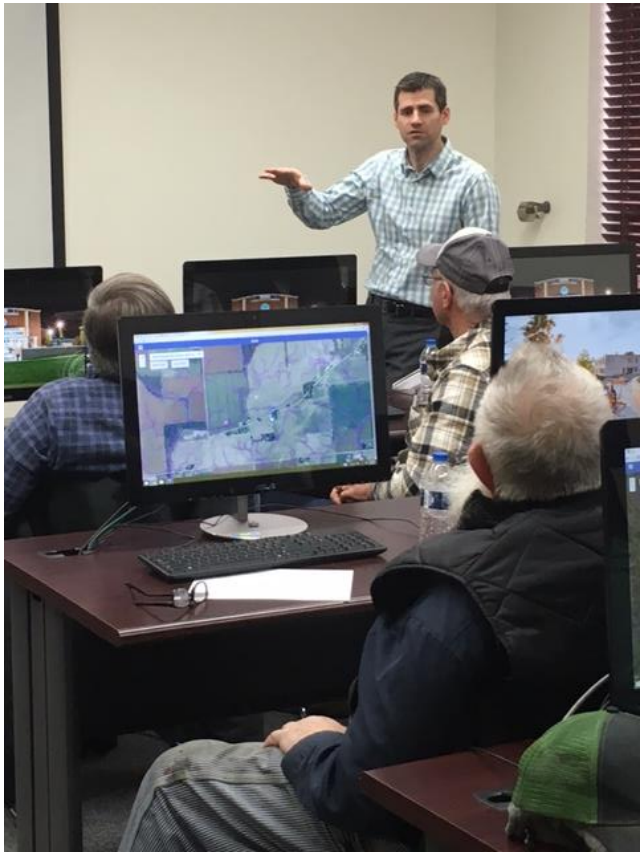
SAIS Overview - Purpose

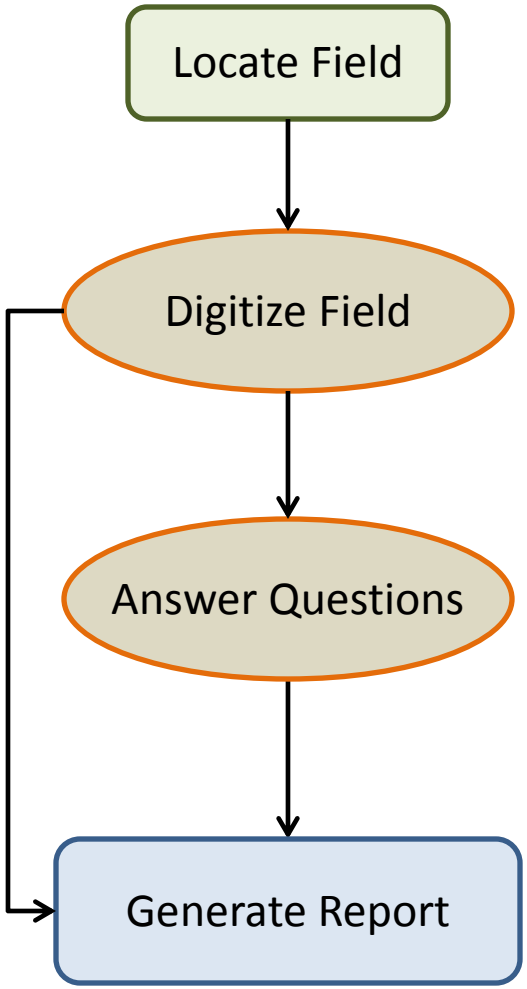
- Quick vulnerability assessment of risks such as soil erosion by wind or water and leaching of nutrients
- Not intended to replace conservation planning work
- Goal: Connect producers with NRCS and conservation organizations to address sensitive areas through conservation treatments and available assistance programs

System Overview - Development

- Developed by the MSU Institute of Water Research in collaboration with NRCS State Office staff
- Met with farmers
  - Completed user needs assessment
  - Showed users an early version of the tool



SAIS Overview - System Workflow



1. Address search or pan with mouse

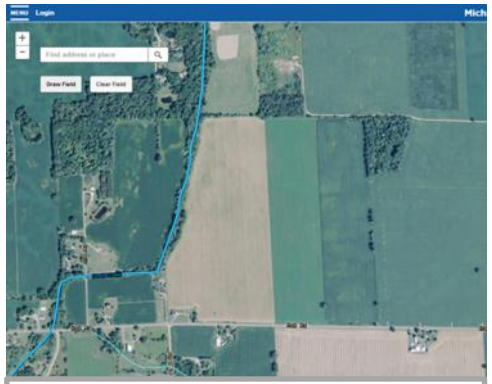
2. Click “Draw Field” and outline field with mouse

3. Answer question prompt

4. View Report

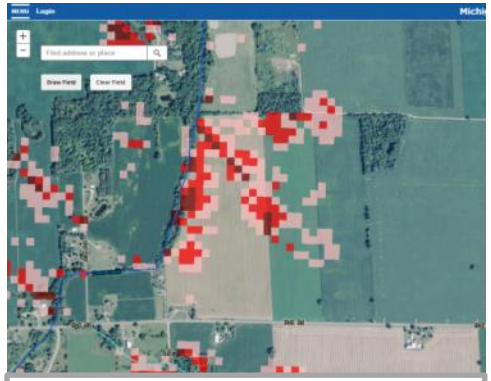
*You can also skip the questions, with the system making assumptions

Map Layers



Waterbodies and Streams

Concentrated Flow



Sediment Delivery

Nitrate Leaching

Soil Erosion by Wind

Sheet/Rill Erosion by Water

Manure Application Risk Index (MARI)

Uses 12 specific field features to obtain an overall rating for each site:

- Soil Hydrologic Group (A)
- Soil Management Group (A)
- Percent Slope (A)
- Nitrogen Leaching Index for Soil Hydrologic Group (A)
- Surface Water Setback (A)
- Concentrated Water Flow or Surface Inlet Discharge (A/Q)
- Soil Test P Value (Q)
- Residue/Cover Crops or Perennial Cover (Q)
- Vegetative Buffer Width (Q)
- Manure P_2O_5 Application Rate (Q)
- Manure N Application Rate (Q)
- Manure Application Method (Q)

A = automatically gathered data
Q = user supplied data

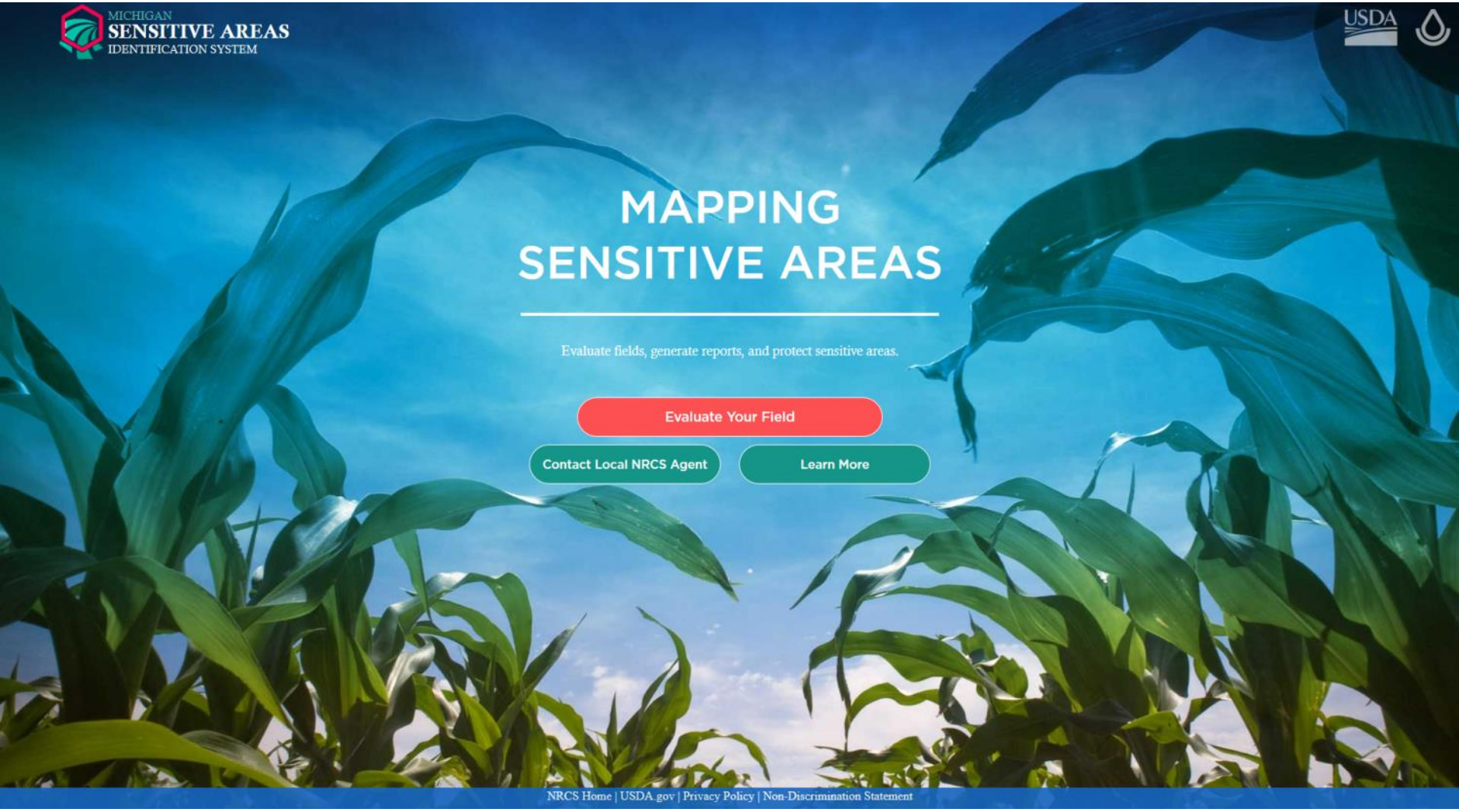
Michigan Phosphorus Risk Assessment (MPRA)

Uses 9 specific field features to obtain an overall rating for each site:

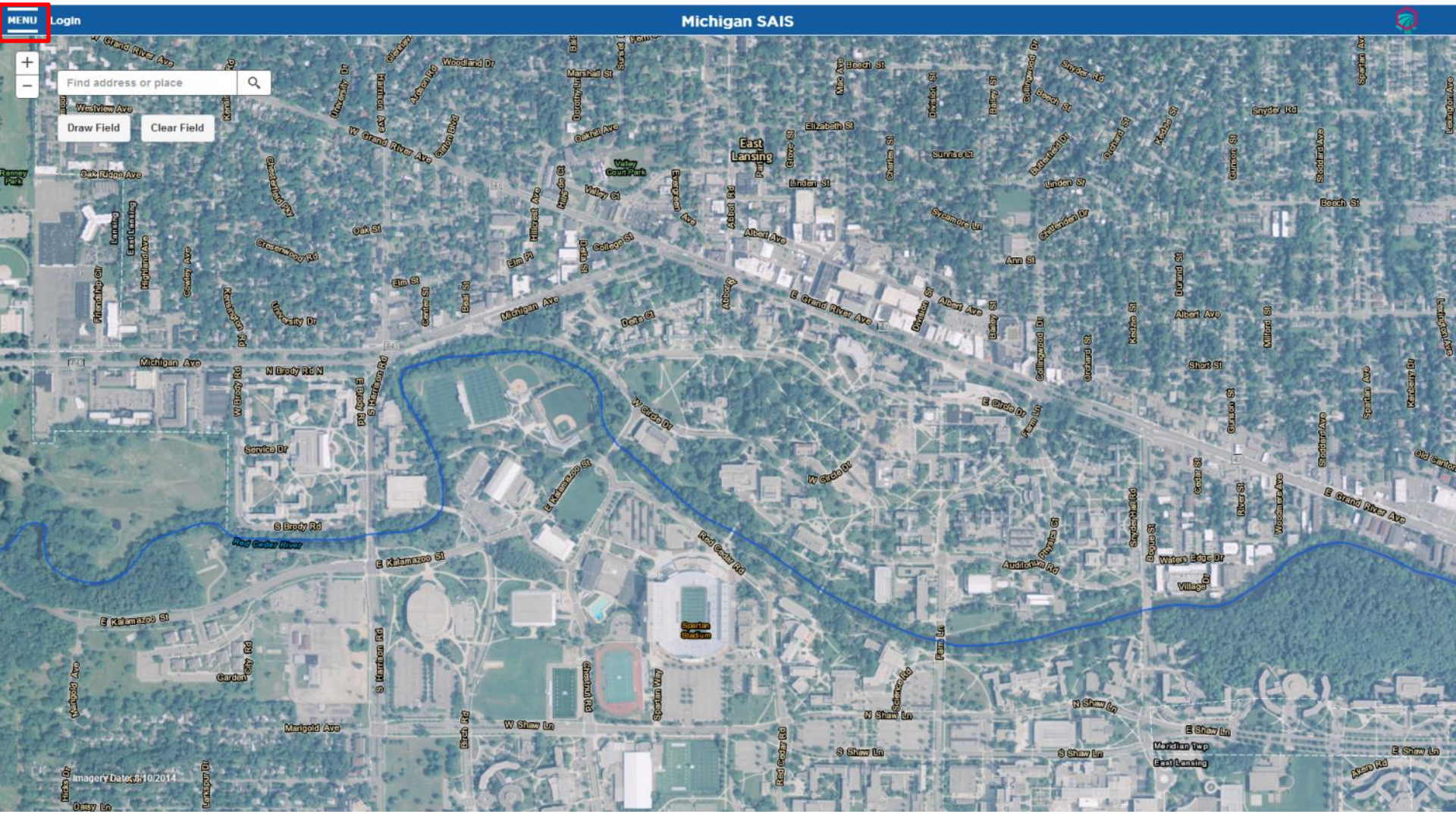
- Water Erosion (A)
- Runoff Curve Number (A)
- Distance to surface water and/or surface inlets (A)
- Subsurface drainage (Q)
- Buffers (Q)
- Soil Test P (Q)
- P fertilizer method (Q)
- Manure method (Q)
- P_2O_5 rate all sources (Q)

A = automatically gathered data
Q = user supplied data

Demo
http://sais.iwr.msu.edu



Accessing SAIS Menu



Creating an Account

Instructions

1. Find your field of interest using the map search bar.
2. Select "Draw Field" and outline your field boundary.
3. Select an option:
   - Continue exploring the map
   - Generate a basic report
   - Answer questions to generate a detailed report
4. Review and save your report.

Layer Toggle:

- ☑ Waterbodies
- ☑ Streams
- ☐ Concentrated Flow
- ☐ Sediment Delivery
- ☐ Sheet and Rill Erosion by Water
- ☐ Nitrate Leaching
- ☐ Soil Erosion by Wind

Legend

Waterbodies
- Lake/Pond
- Reservoir

Streams
- Canal/Ditch
- Stream/River

Account Management Options:

Create Account

Reset Password

Delete Account

MENU Login

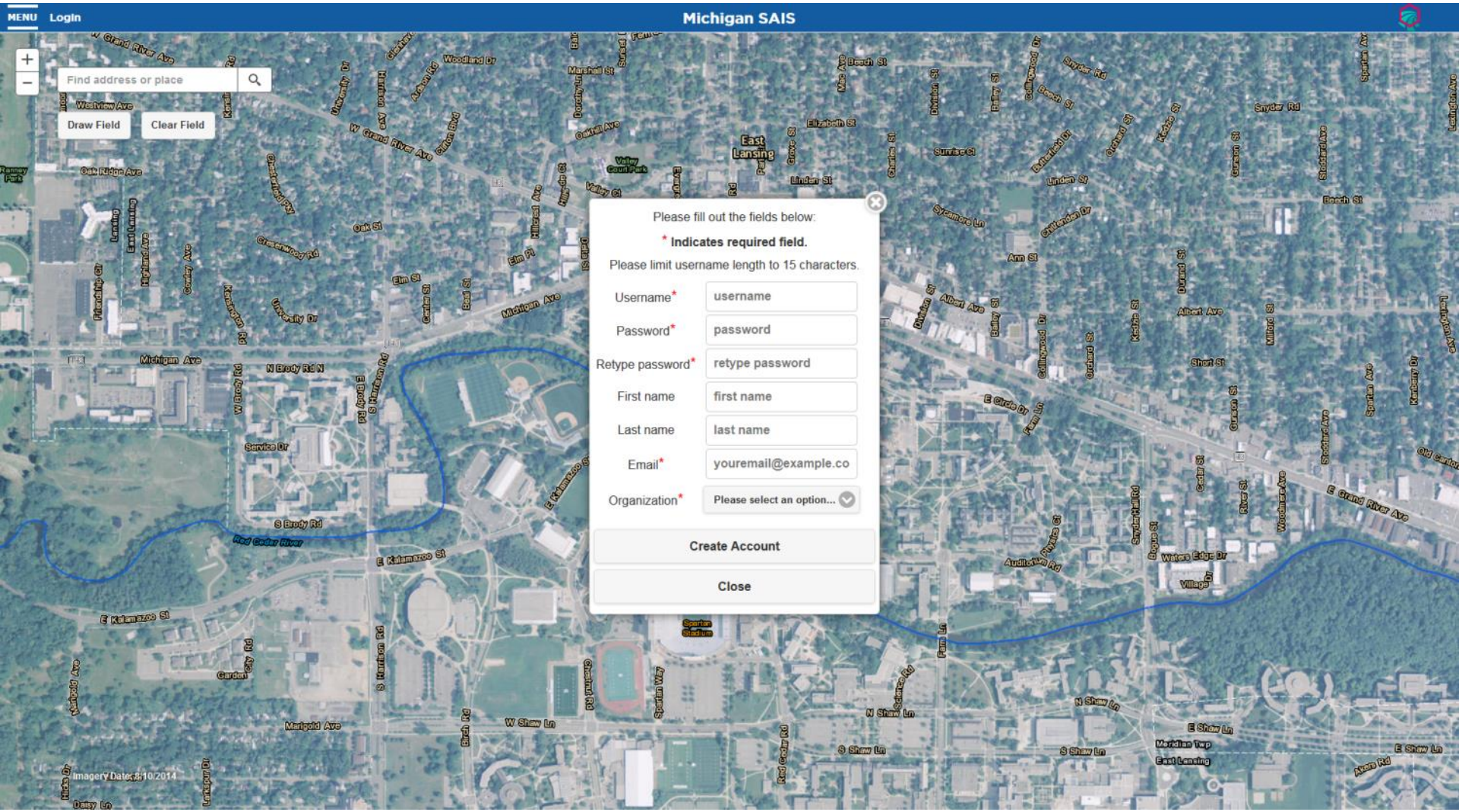
Michigan SAIS

Find address or place

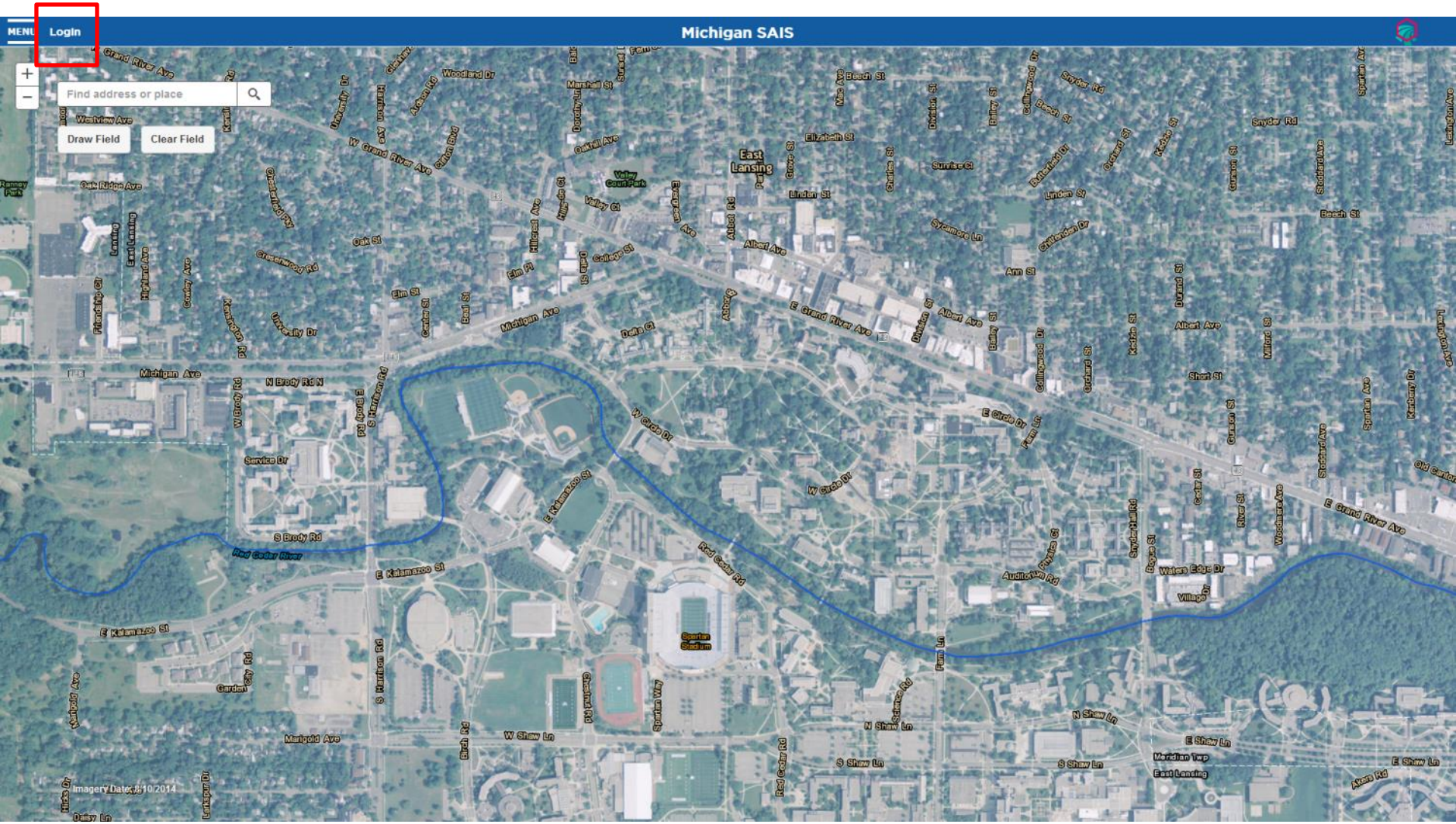
Draw Field

Clear Field

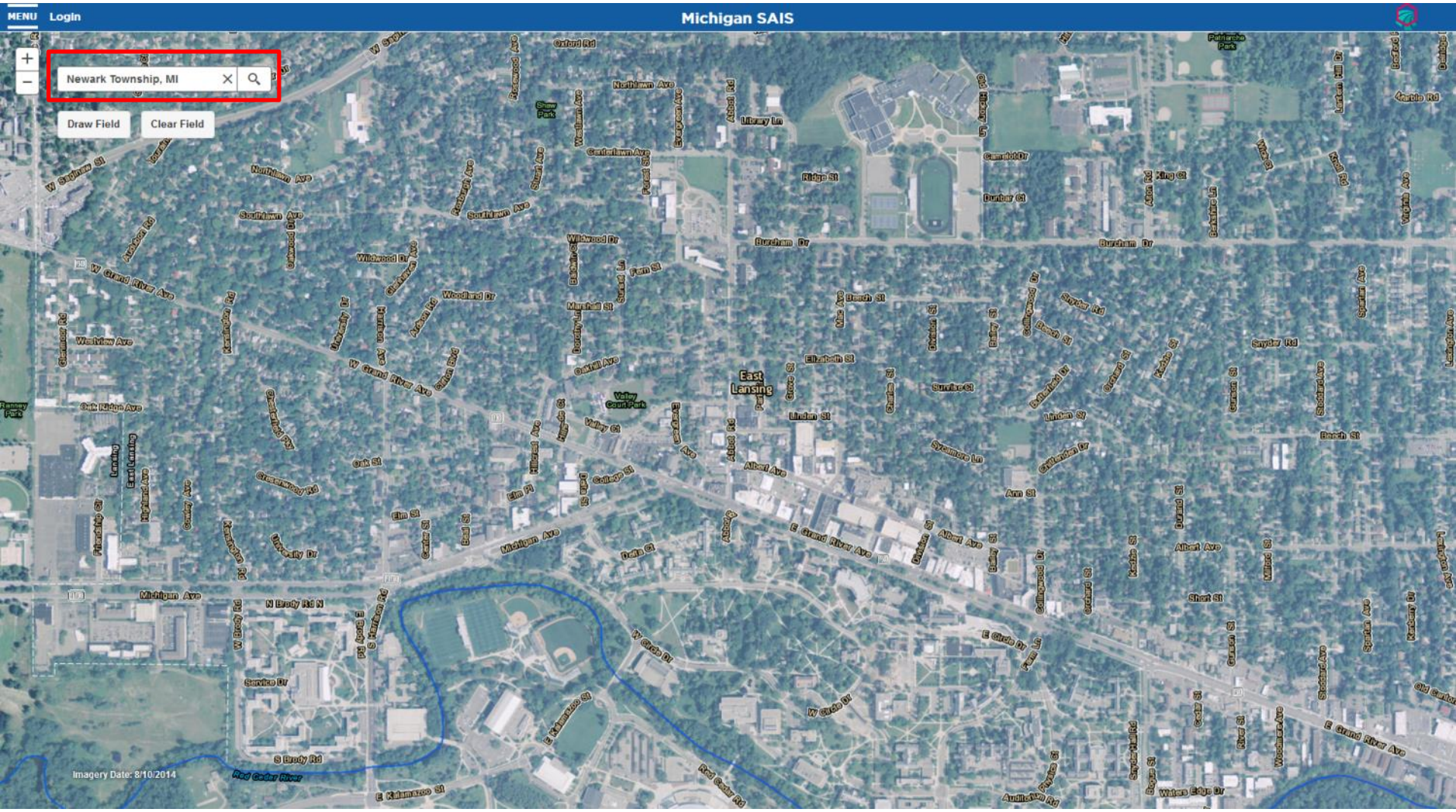
Creating an Account



Logging in


MENU
Login
Michigan SAIS
Find address or place
Draw Field
Clear Field
East Lansing
Imagery Date: 5/10/2014

Step 1: Locate field



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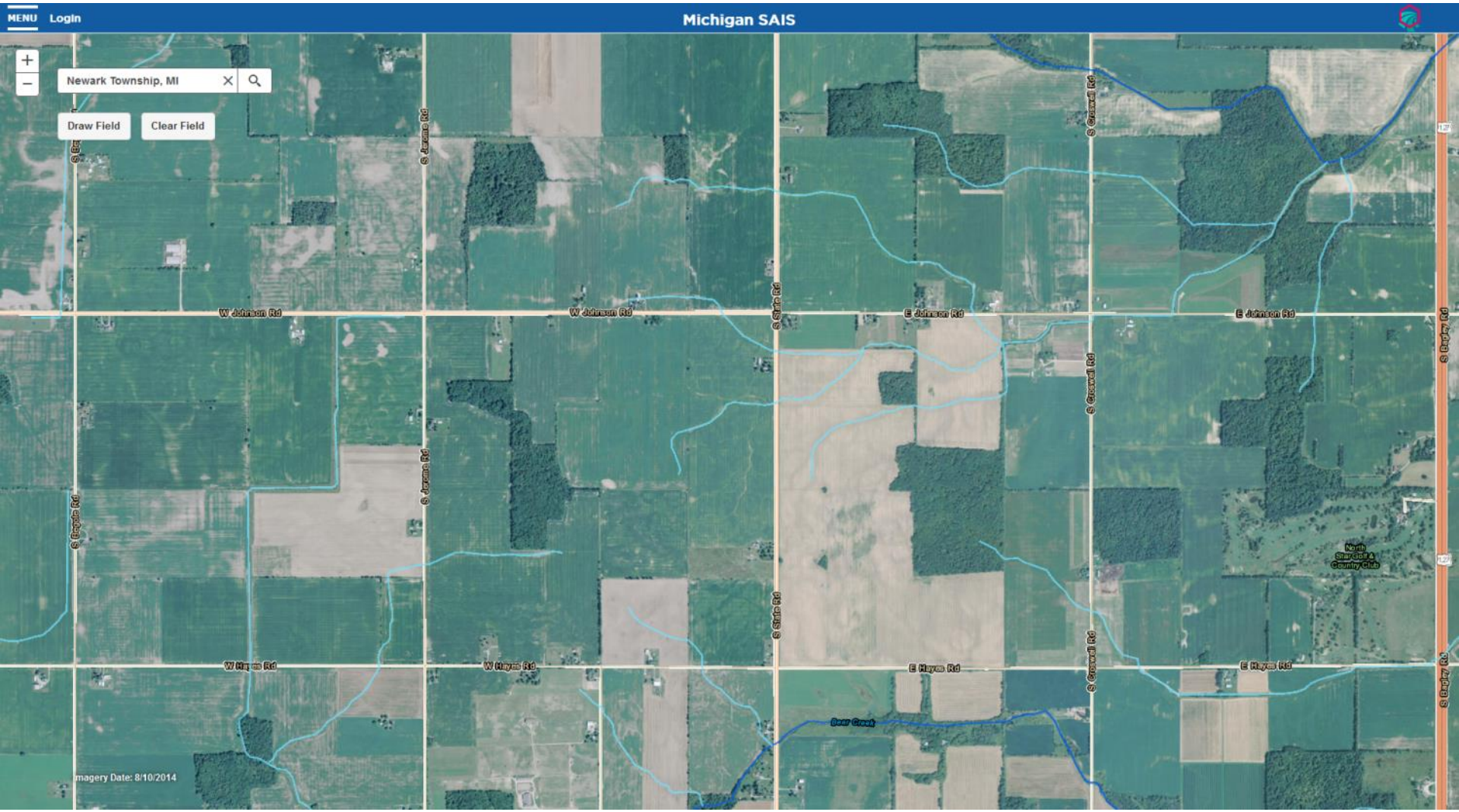
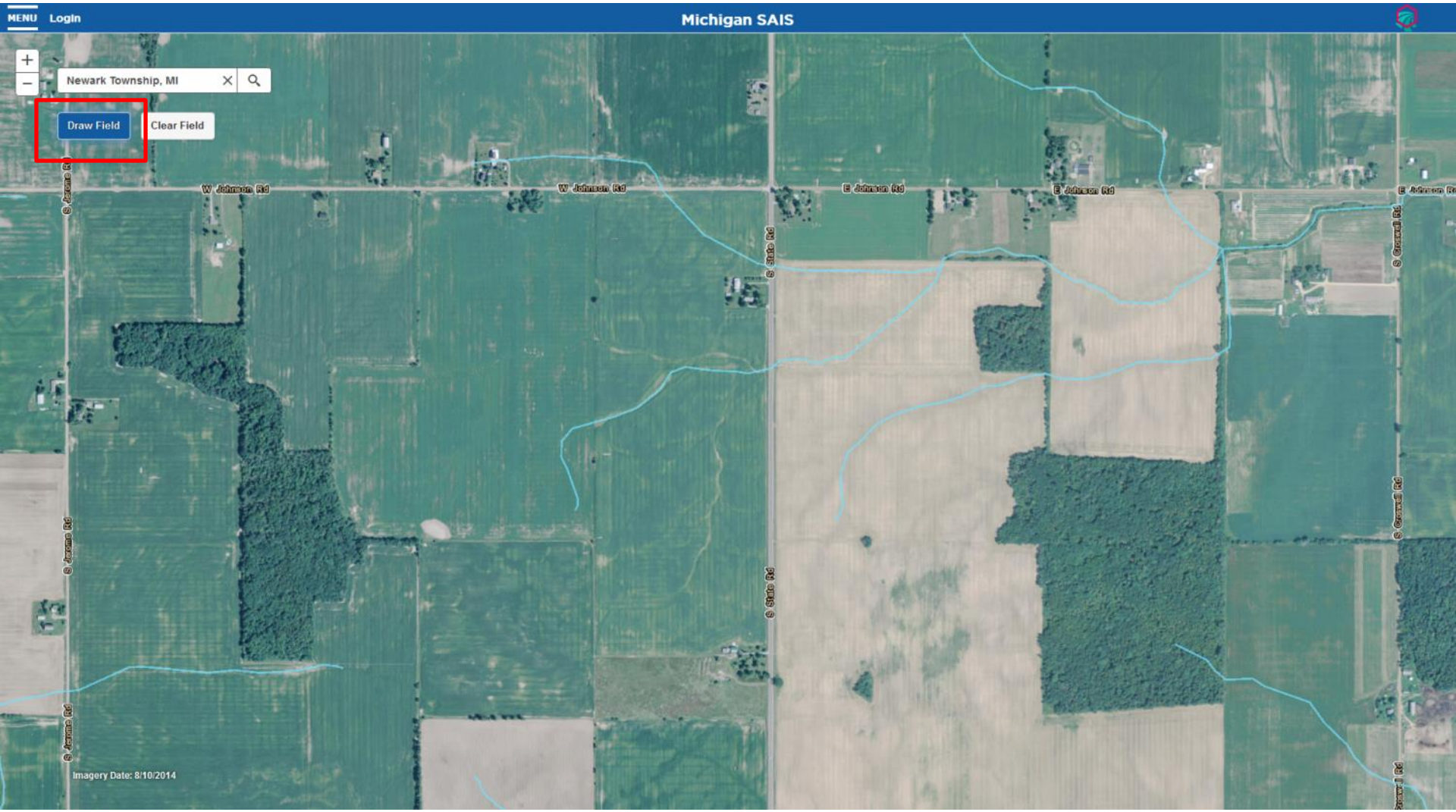


Step 2: Draw Field



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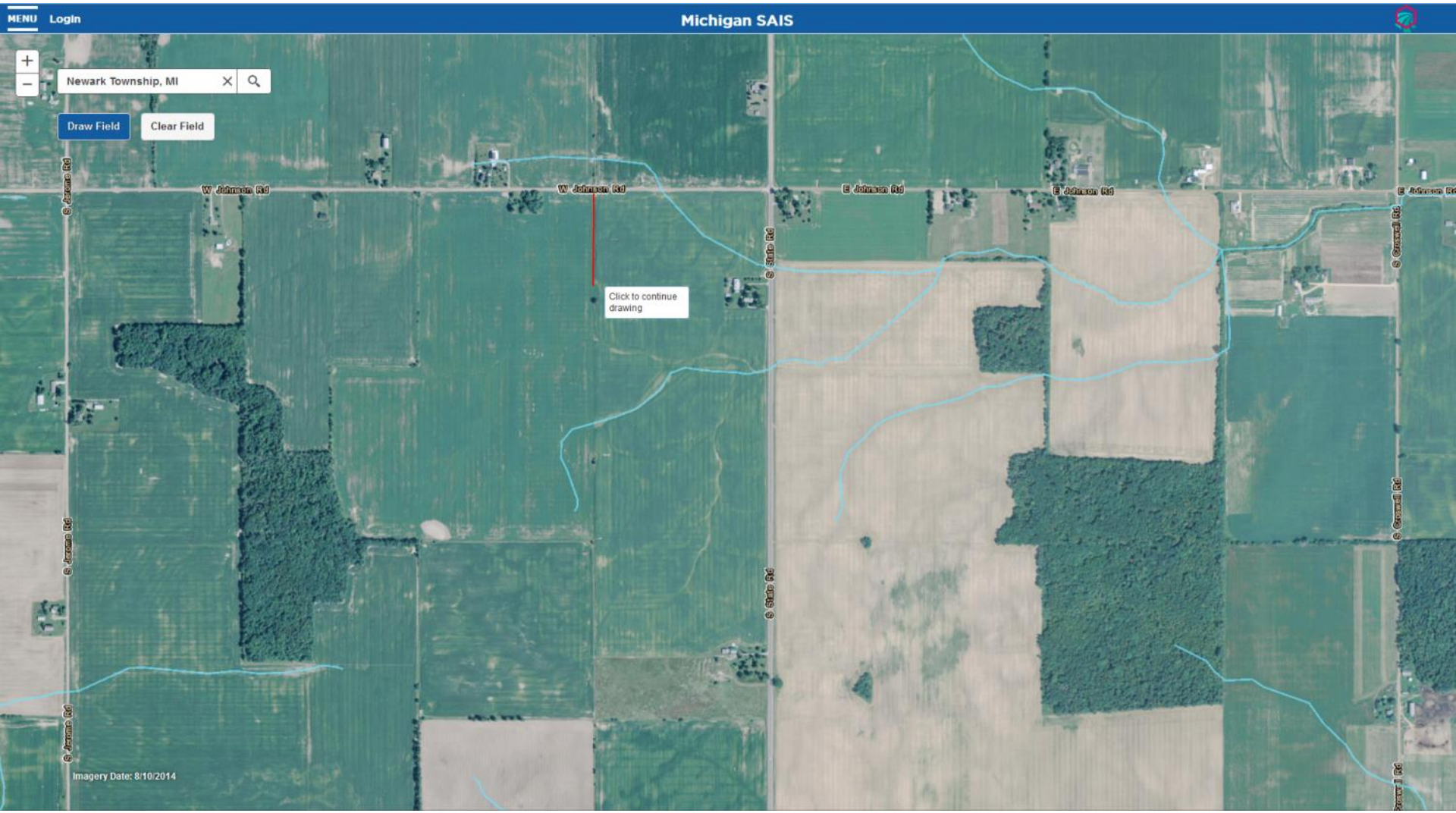

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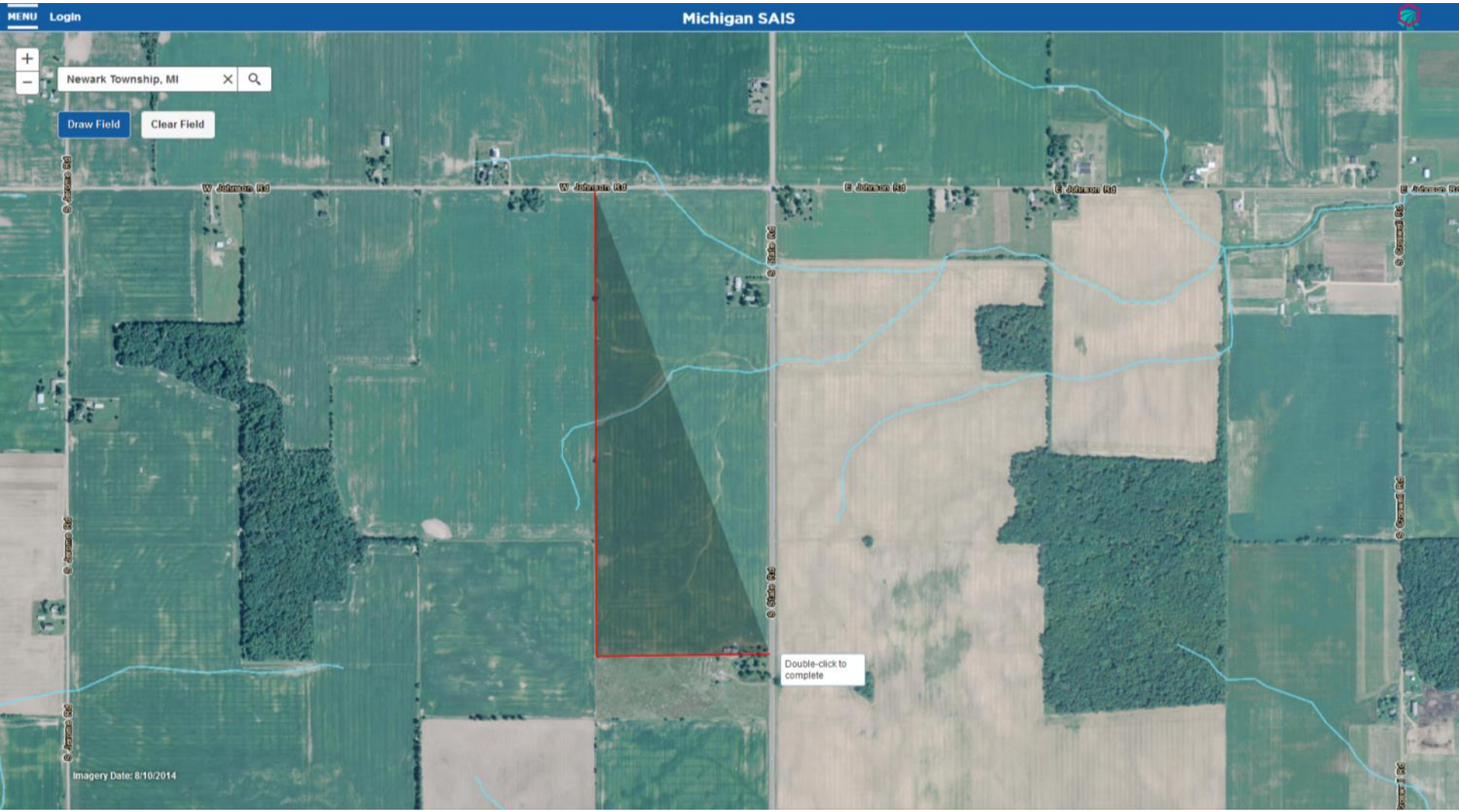
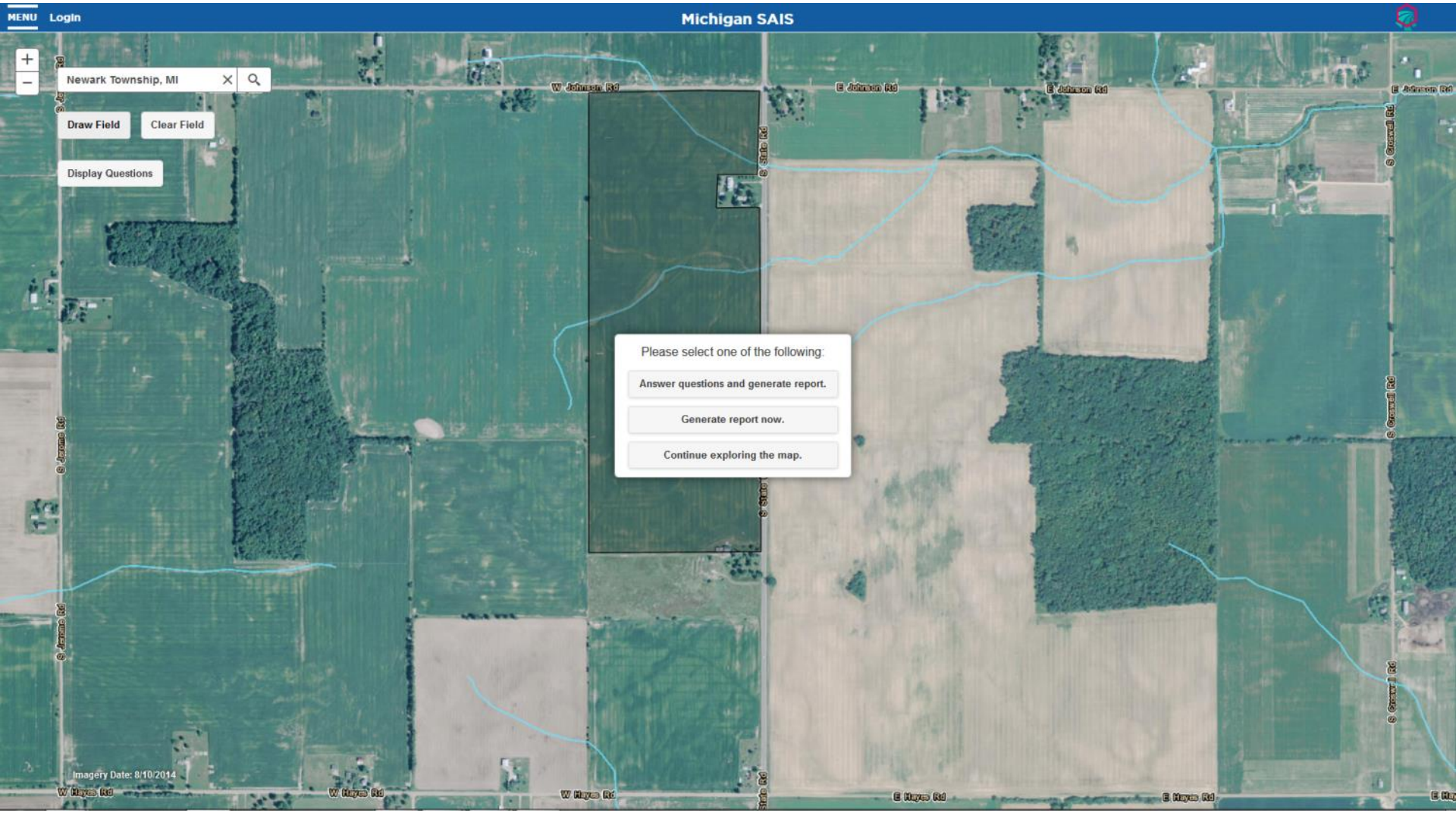
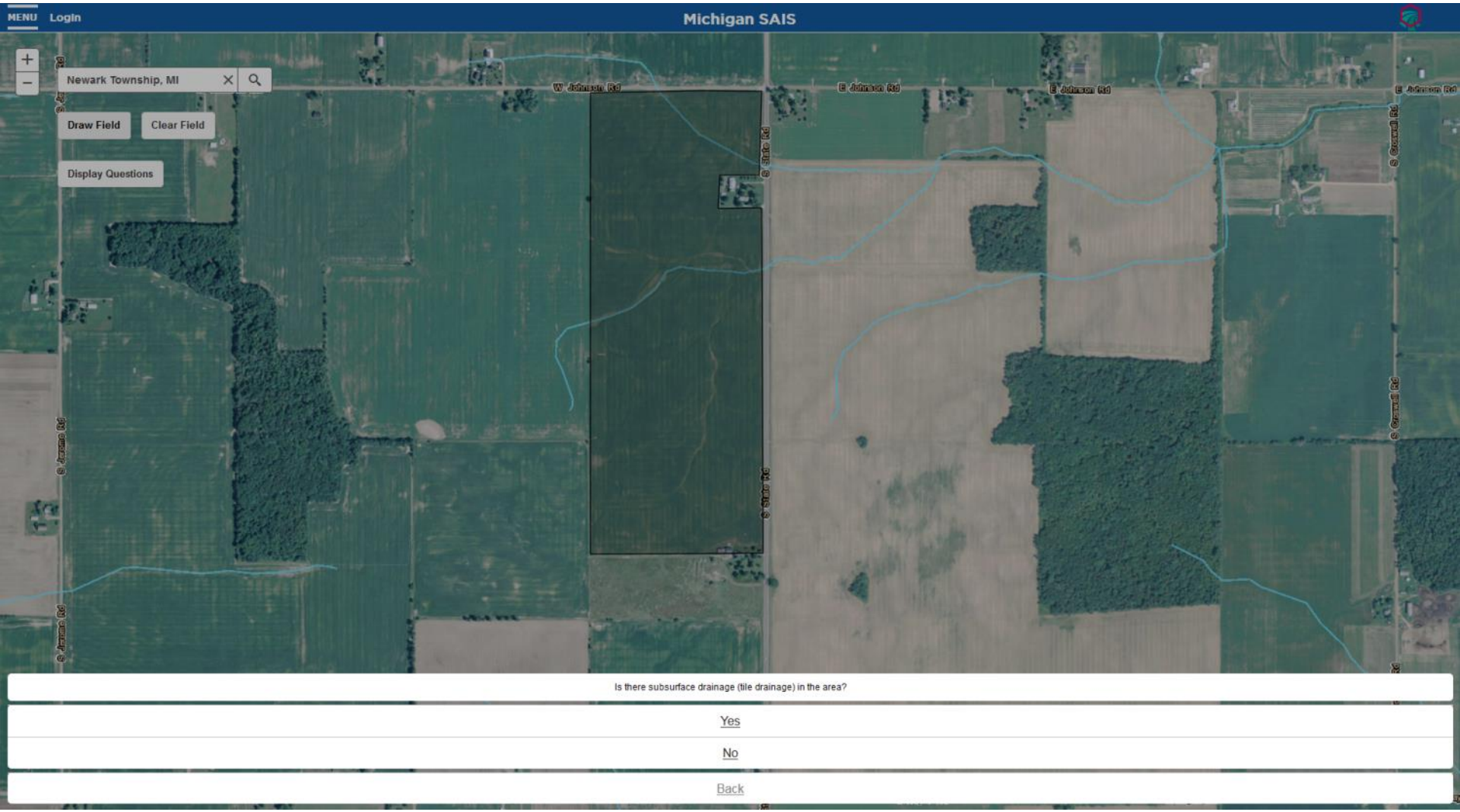


Step 3: Answer questions (optional)



Step 3: Answer questions



Step 3: Answer questions

1. Is there subsurface drainage (tile drainage) in the area?

2. Are there any surface inlets, catch basins, risers in the field(s)?

3. Are there any vegetated buffers between the field(s) and nearby surface water (ditch, drain, stream, lake, etc.)?
   - Describe your vegetative buffer.

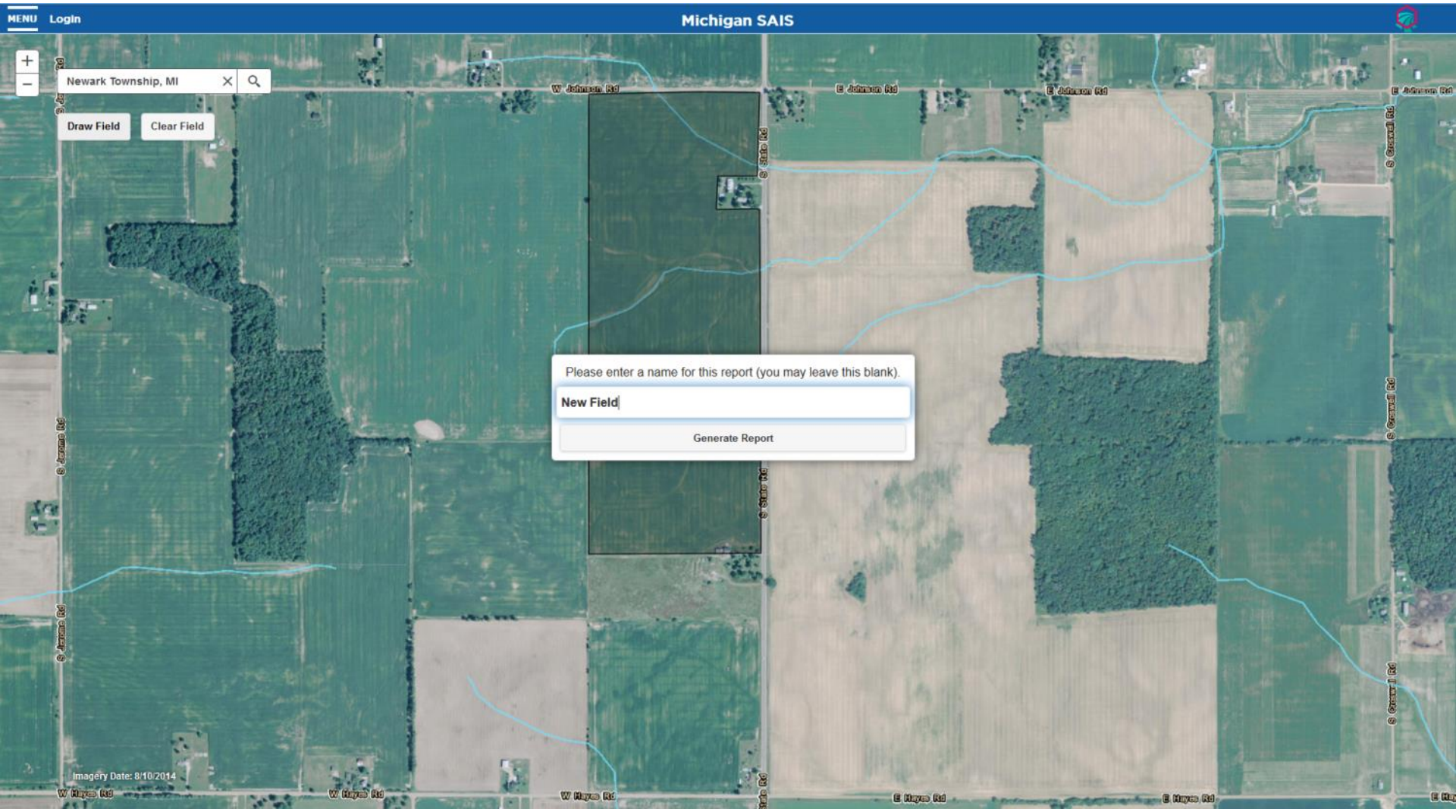
4. Do you have recent (less than 3 years old) soil test results for the field(s)?
   - What phosphorus levels were found?

5. Was fertilizer being applied to the selected farm field(s)?
   - How and when was fertilizer applied to the farm field(s)?
   - What amount of fertilizer was applied to the farm field(s)?

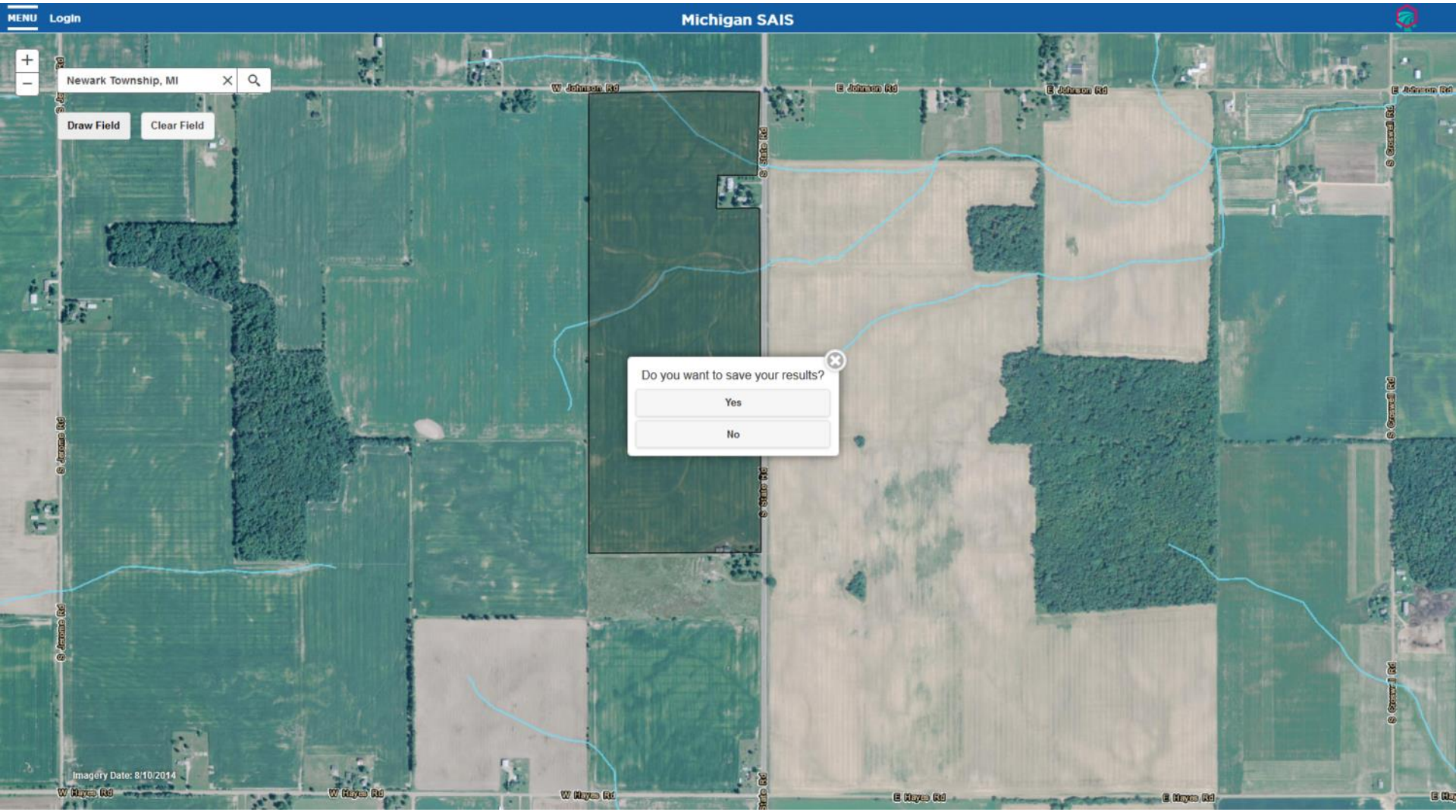
6. Was manure applied to the selected farm field(s)?
   - What was the rate of phosphorus (P^2O^5) applied with manure?
   - What was the rate of nitrogen (N) applied with manure?

7. Do you leave any crop residue on the soil surface after all pre-plant tillage operations have been completed?

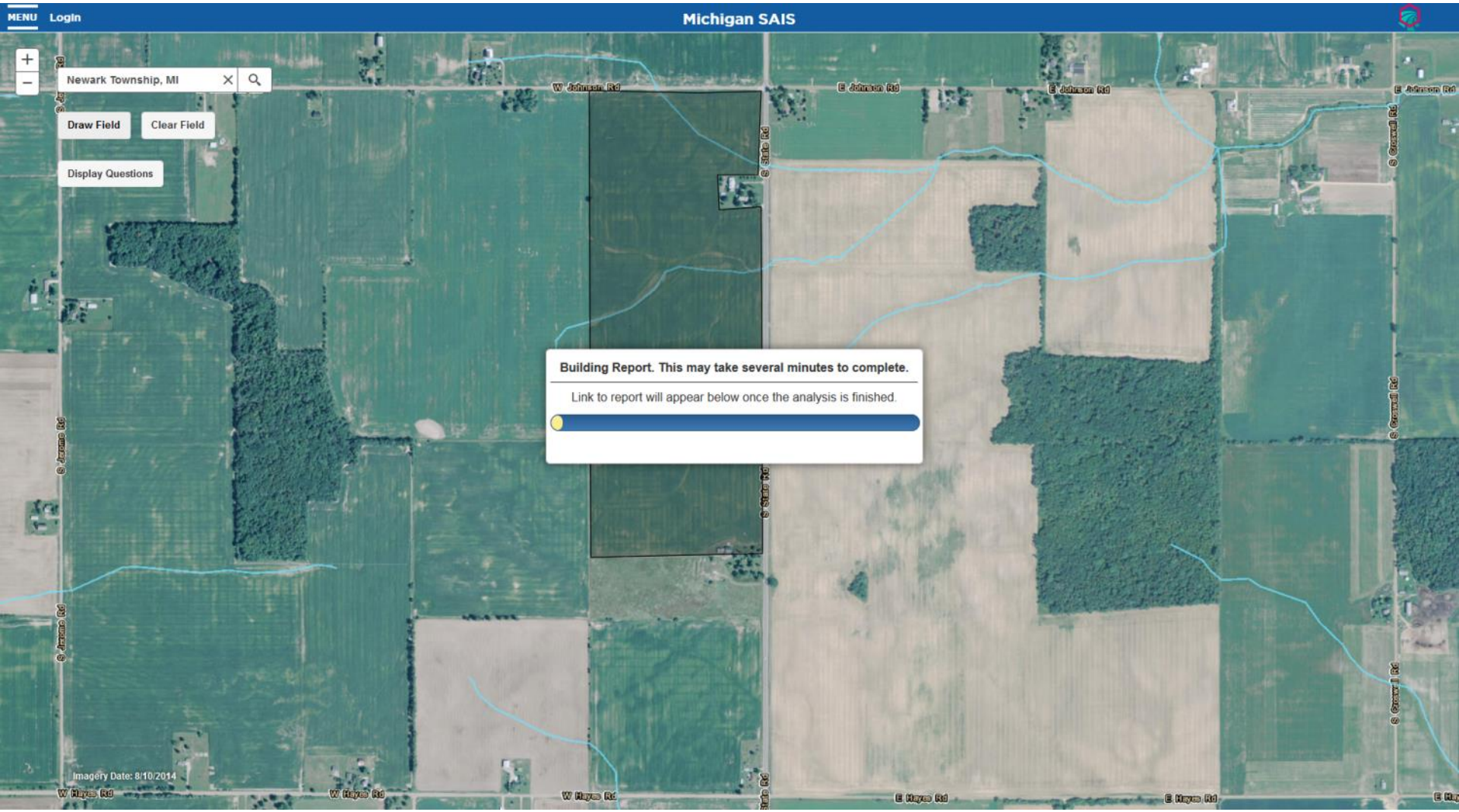
Step 4: Generate Report – Field Name



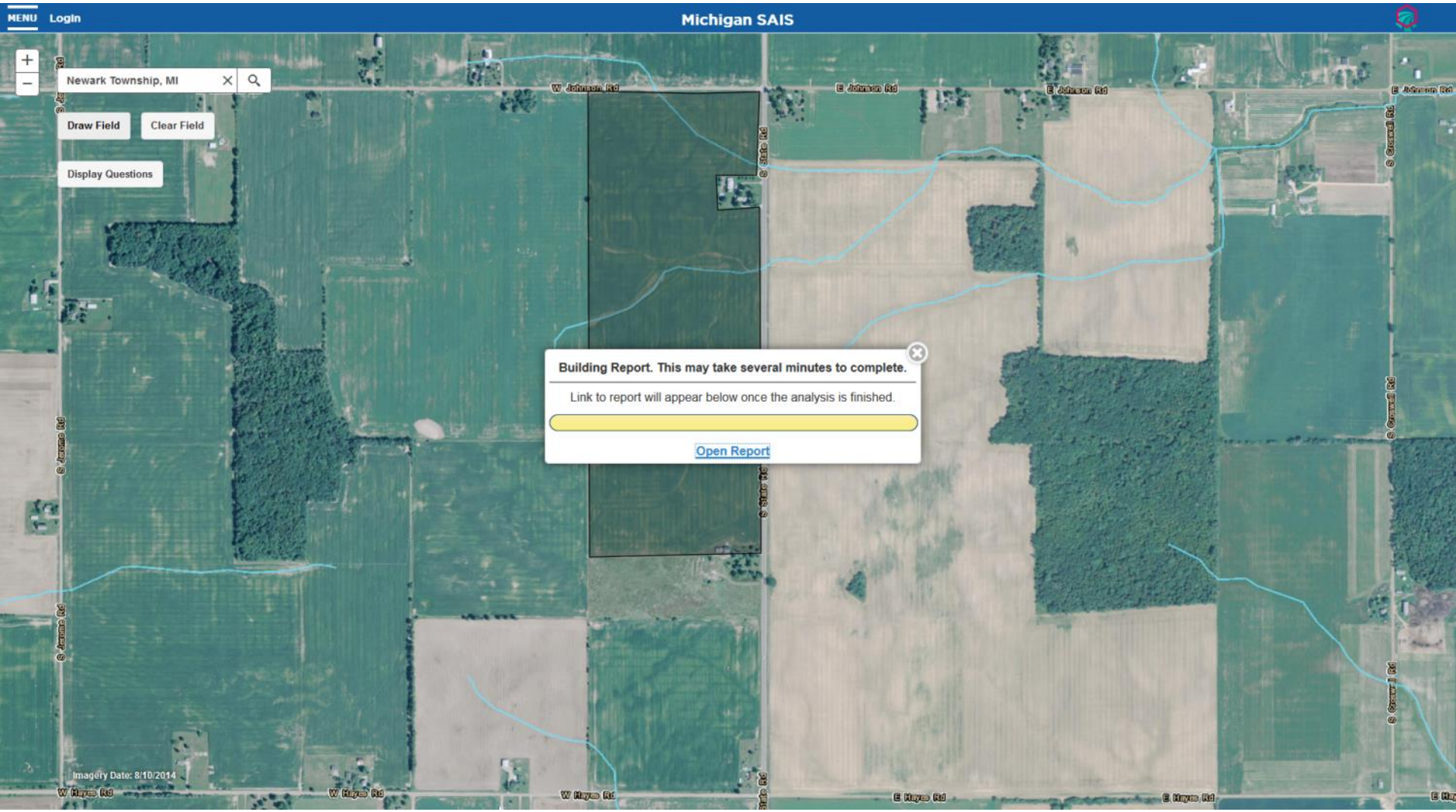
Step 4: Generate Report – Save Results



Step 4: Generate Report



Step 4: Generate Report



Step 4: Generate Report - Summary

Michigan Sensitive Areas Identification System

Report Name: New Field

Report Summary

Print Version

The Michigan Sensitive Areas Identification System has conducted an analysis of the field you selected. Results are based upon the field's physical characteristics (e.g., soils, slope) and any answers you provided in the questionnaire. After reviewing this report, it is recommended that you contact your local NRCS Field Office and further pursue the recommended practices presented to you in this report.

Location Summary

County Name: Gratiot

Township, Range, & Section: 10N 03W 25

Watershed Name: Brady Creek-Bad River

Township Name: Newark

Area: 216.6 acres

Identified Risks

Water Erosion, Concentrated Flow, Wind Erosion, Manure Runoff, Phosphorus Runoff

Michigan Phosphorus Risk Assessment

Assessed value: 30

	High: > 17
	Medium: 12-17
	Low: 0-11

Explanation:
Risk of phosphorus leaving the field is **HIGH**. There is a "high" potential risk of offsite phosphorus movement, and no manure or fertilizer phosphorus should be applied to the field. (An exception to fertilizer phosphorus application when receiving a "high" risk is allowed under MSU Extension Bulletin E2904, when starter phosphorus is applied to field corn.).

Manure Application Risk Index

Assessed value: 43

	High: > 75
	Medium: 38-75
	Low: 19-37
	Very Low: < 19

Explanation:
MEDIUM potential for manure movement from the field. The chance of organic material and nutrients getting to surface water is likely. Buffers, setbacks, lower manure rates, cover crops, crop residues, etc. in combination may reduce impact. These fields have limited potential for winter spreading and only a partial area of the field may be acceptable.

Hydrologic Soil Groups Breakdown

C: 79.0% B: 2.2% B/D: 18.7%

Explanation:
Soils are classified into hydrologic soils groups (HSG's) to indicate the minimum rate of infiltration obtained for bare soil after prolonged wetting. An "A" HSG indicates sand, loamy sand, or sandy loam. A "B" HSG indicates silt loam or loam. A "C" HSG indicates sandy clay loam. Finally, a "D" HSG indicates clay loam, silty clay loam, sandy clay, silty clay, or clay. If there is a slash between two HSG, this represents "drained"/"undrained".

Step 4: Generate Report – Recommended Practices

Recommended Practices

Highlight indicates practice that addresses multiple risks.

* *This practice implemented at a farm headquarters may help reduce this risk.*

Water Erosion
Conservation Crop Rotation
Residue and Tillage Management, No-Till
Cover Crop
Critical Area Planting
Residue and Tillage Management, Reduced Till
Filter Strip
Vegetated Treatment Area
Water and Sediment Control Basin
Concentrated Flow
Residue and Tillage Management, No-Till
Critical Area Planting
Residue and Tillage Management, Reduced Till
Grassed Waterway
Wind Erosion
Residue and Tillage Management, No-Till
Critical Area Planting
Residue and Tillage Management, Reduced Till
Manure Runoff
Agrichemical Handling Facility *
Waste Storage Facility *
Filter Strip
Nutrient Management
Vegetated Treatment Area
Phosphorus Runoff
Agrichemical Handling Facility *
Waste Storage Facility *
Filter Strip
Nutrient Management
Vegetated Treatment Area

Step 4: Generate Report –
Service Center and Client Gateway Information

NRCS Service Center Contact Information

Recommended Service Center:

Ithaca NRCS Service Center
301 Commerce Road
Ithaca, Michigan 48847
989-875-3900

Alternative Service Center:

St. Johns NRCS Service Center
2343 N. Highway US-27
St. Johns, Michigan 48879
989-224-3720

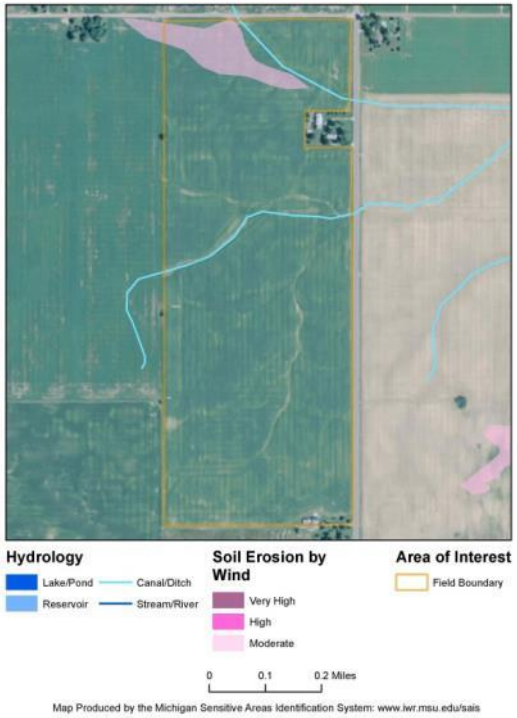
Client Gateway:

Conservation Client Gateway is a secure online web application that gives landowners and land managers the ability to track their payments, report completed practices, request conservation assistance, and electronically sign documents anytime, anywhere. Conservation Client Gateway provides users the flexibility to determine when they want to engage with NRCS online and when they prefer in-person conservation planning assistance.

Please visit **www.nrcs.usda.gov/clientgateway** for more information.

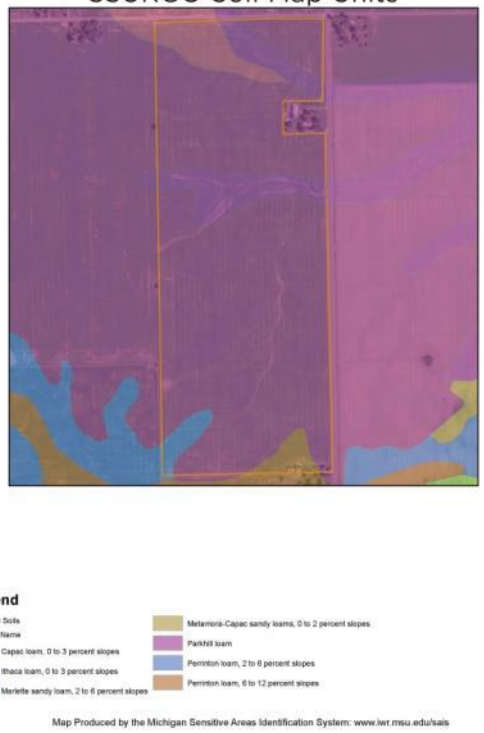
Step 4: Generate Report - Maps

Wind Erosion Sensitivity



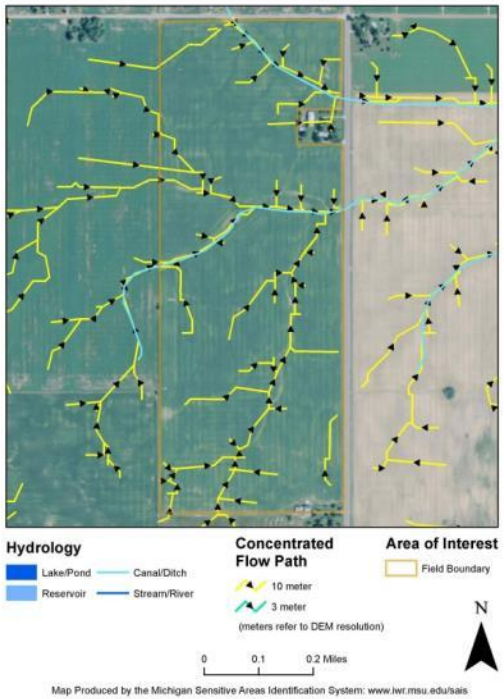
USGS Topographic Map

SSURGO Soil Map Units

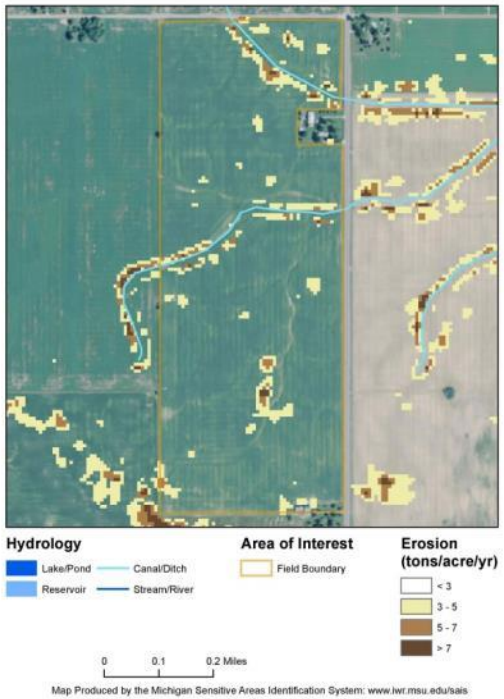


Step 4: Generate Report - Maps

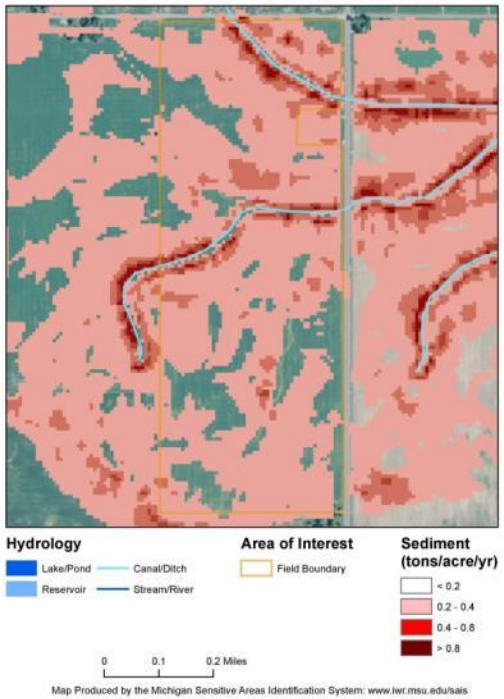
Concentrated Flow



Sheet and Rill Erosion



Sediment Delivery to Stream



Step 4: Generate Report – Practice Descriptions

Practice Descriptions

Water and Sediment Control Basin This practice improves the farmability of sloping land, reduces erosion, traps sediment, reduces and manages runoff, and improves water quality. Water and sediment control basins are constructed across small drainageways where they intercept runoff. The runoff is detained in the basin where sediment is allowed to settle out. The runoff is slowly released through an outlet. Generally, the structure uses an undergrand outlet to carry the runoff in a pipe to a receiving stream or ditch. This practice is applied where the topography is generally irregular or undulating, and water concentrates and causes gullies to form. Therefore, contour farming, strip cropping, terraces, and other practices that involve farming on the contour may not be suitable on fields where this practice is used. Operation and maintenance includes conducting periodic inspections, prompt repair or replacement of any damaged components, removal of accumulated sediment, and regular maintenance of inlets and outlets.

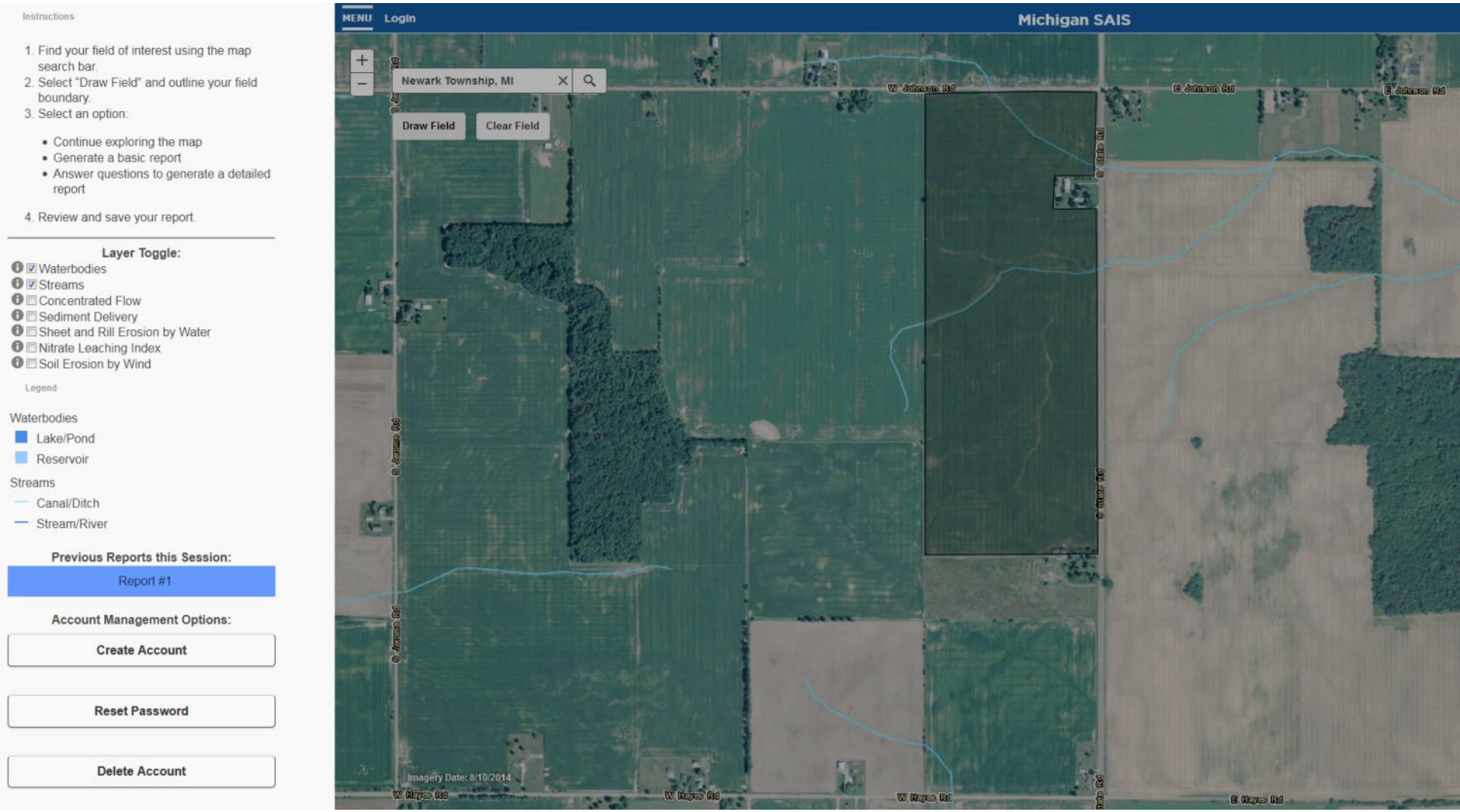
Vegetated Treatment Area This practice consists of an area of permanent vegetation used for agricultural wastewater treatment from livestock holding areas. Vegetated treatment areas are designed to improve water quality by reducing loading of nutrients, organics, pathogens, and other contaminants associated with animal manure, other wastes and wastewater. More than one treatment strip may be needed. Permanent herbaceous vegetation, consisting of a single species or a mixture of grasses, legumes, and/or other forbs adapted to the soil and climate, is established in the treatment strip. The vegetated treatment area must receive regular maintenance for it to operate as planned.

Step 4: Generate Report – Responses to Questions

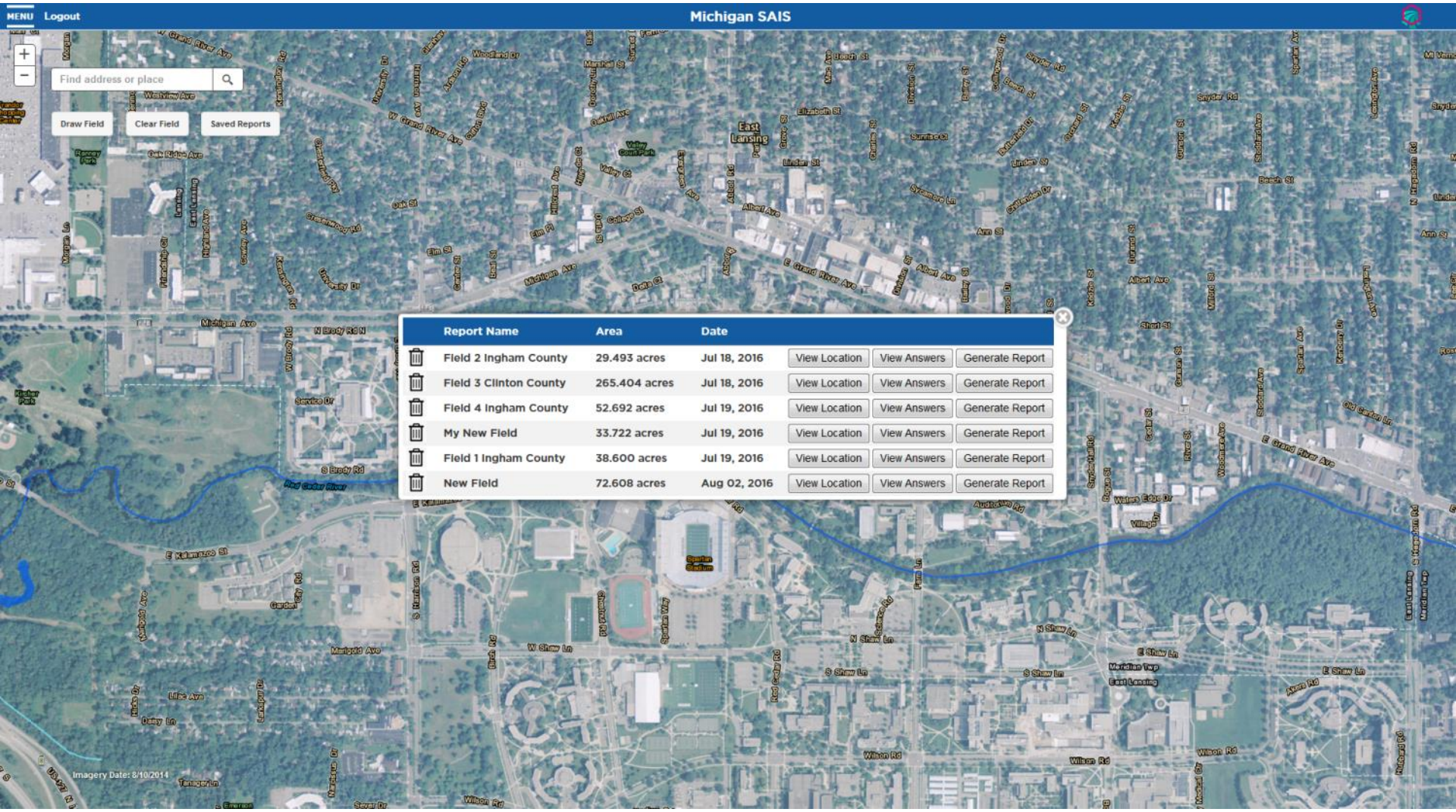
Question and Answer Summary:

1. Is there subsurface drainage (tile drainage) in the area?
    - Answer: Yes
2. Are there any surface inlets, catch basins, risers in the field?
    - Answer: Yes
3. Are there any vegetated buffers between the field and nearby surface water (ditch, drain, stream, lake, etc.)?
    - Answer: No
4. Do you have recent (less than 3 years old) soil test results for the field?
    - Answer: Yes
    - 75 - 149 ppm (150 - 298 lbs/acre)
5. Is fertilizer being applied to the selected farm field?
    - Answer: Yes
    - Surface applied and incorporated 8 - 15 days before planting
    - 3 year phosphorus crop removal application
6. Was manure applied to the selected farm field?
    - Answer: Yes
    - Incorporate manure 8 - 30 days after application
    - 61 - 99 lbs/acre of phosphorus
    - 61- to 130 lbs/acre of nitrogen
7. Do you leave any crop residue on the soil surface after all pre-plant tillage operations have been completed?
    - Answer: No

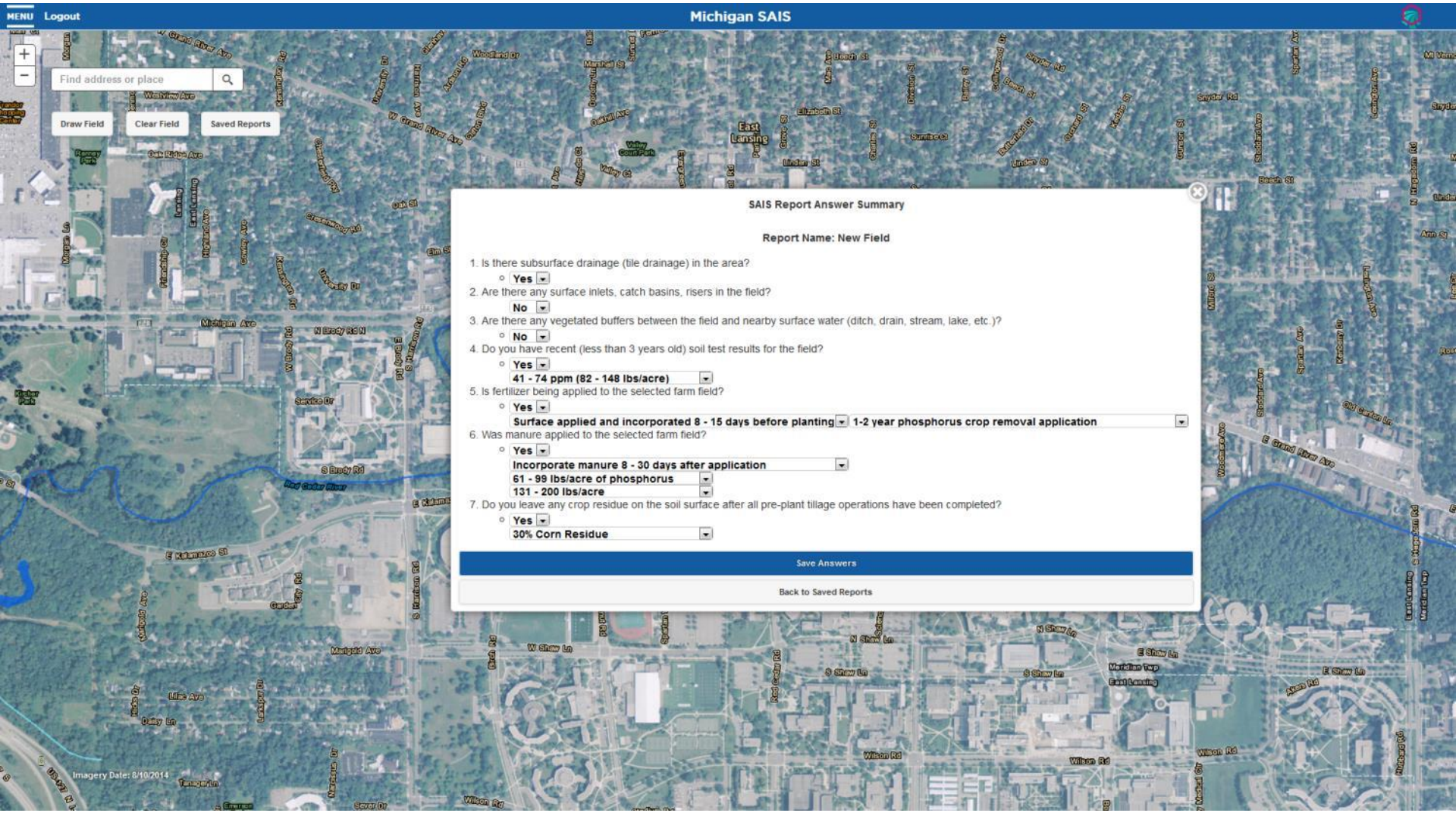
Accessing Reports and Data from the Menu



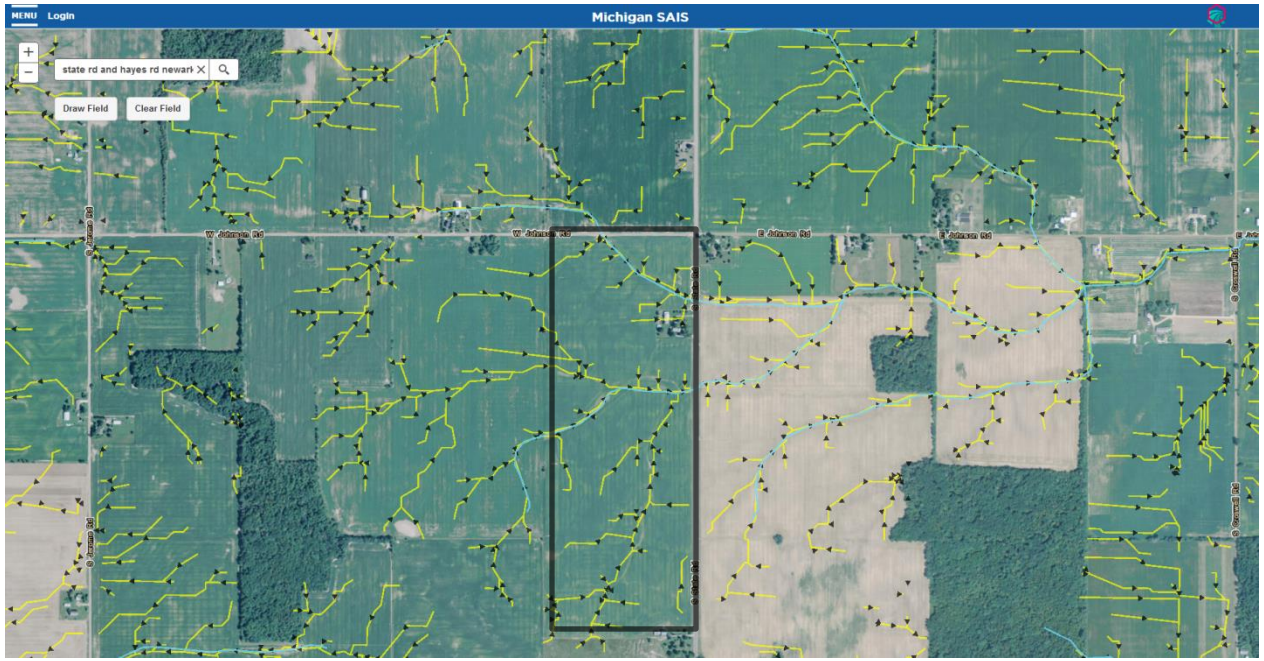
Accessing Reports – From “Saved Reports”



Updating Field Information



Concentrated Flow from the Field



Stay Connected

Try it out and learn more at
http://sais.iwr.msu.edu

Questions? Contact:

Jason Piwarski | piwarsk1@msu.edu

Laura Young | youngla9@msu.edu

Betsy Dierberger | Betsy.Dierberger@mi.usda.gov