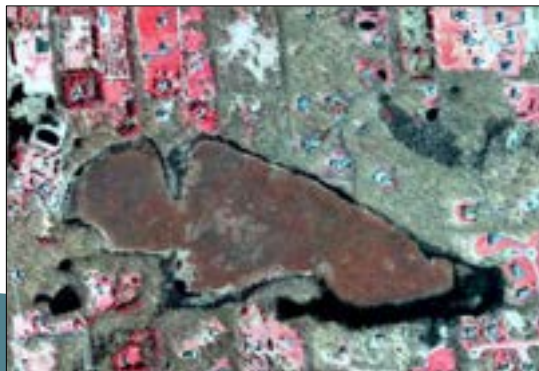


ADVANCES IN WETLAND DATA COLLECTION

Michigan Wetlands Conference 2023

Jeremy Jones



What advances have been made?

Data
Availability

Data Collectors
& Accuracy

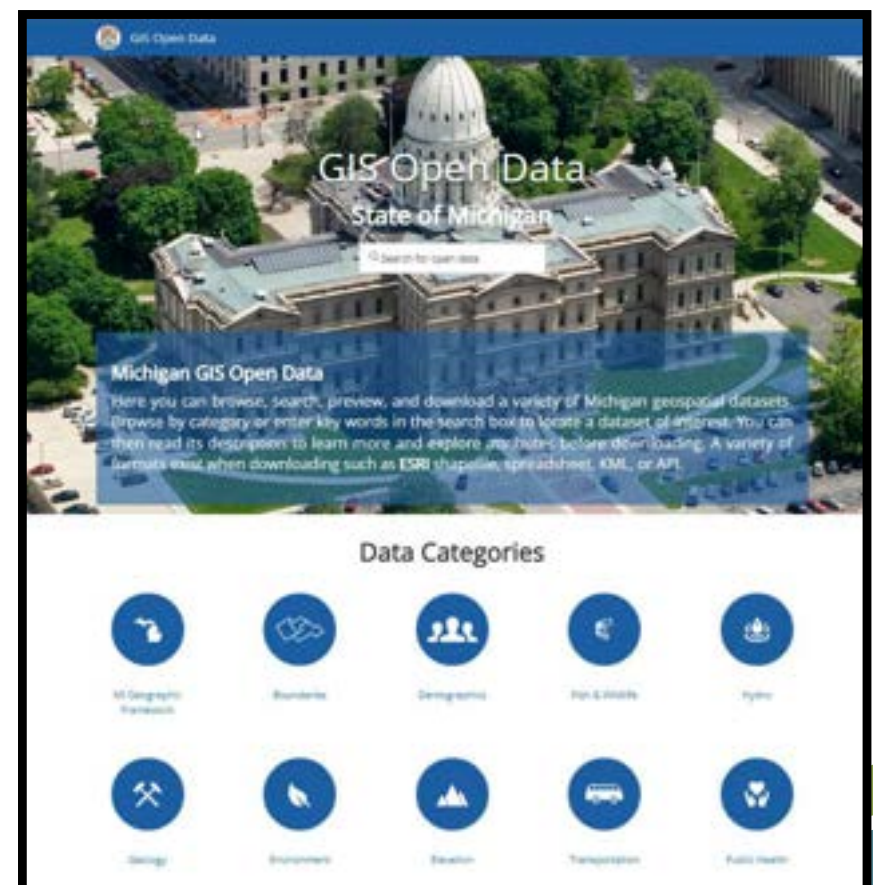
Apps and Maps

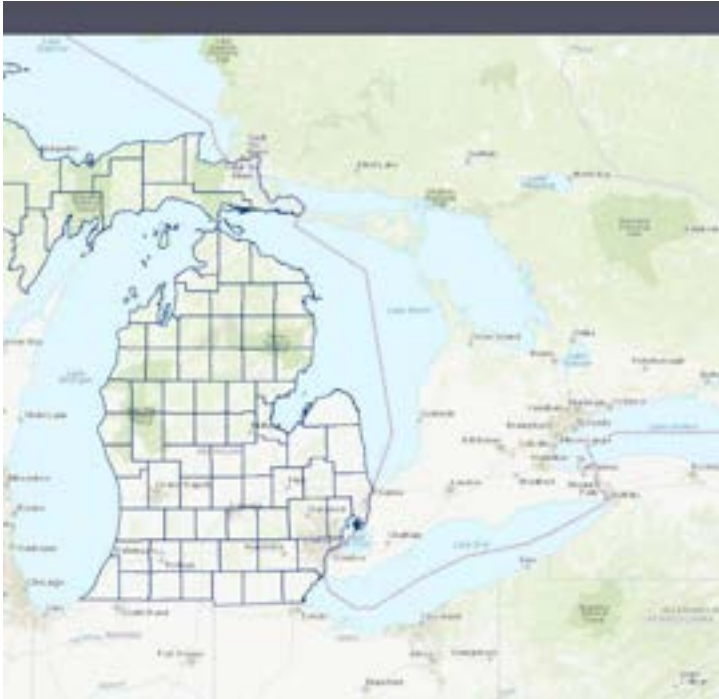
How does this
benefit you?

Examples

Vector Data (Points, Lines, Polygons)

Open Data Portal (EGLE Maps & Data)





Michigan Imagery Solution (MIS)

The Michigan Imagery Solution (MIS) is an image service provided by the State of Michigan, Department Management & Budget (DTMB), Center for Shared Solutions (CSS).

The purpose of the MIS is to provide access to high quality digital ortho photography to State of Michigan contracted vendors. Data hosted within the MIS has use restrictions. Refer to the [Use Agreement](#) for details. Creation of an MIS account indicates user acceptance of all terms of the Use Agreement.

- Already have an account?

[Proceed to MIS](#)

[Forgot password?](#)

[Change Password](#)

- Need an account?

[Create New Account](#)

Raster Data Imagery

High Resolution, NAIP, Historical, Topo, Coastal

Aerial Photo Resources

- Wetlands Map Viewer

- Various Years of Summer Imagery
- Best Available High-Resolution Imagery
- Topo Map



- Google Earth

- Imagery
- Timeline



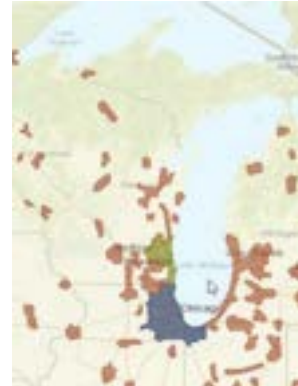
- NearMap

- High resolution current Imagery
- Oblique Imagery
- Multiple images per year in some cases
- Only in Populated areas
 - Expansion in the future



- Counties

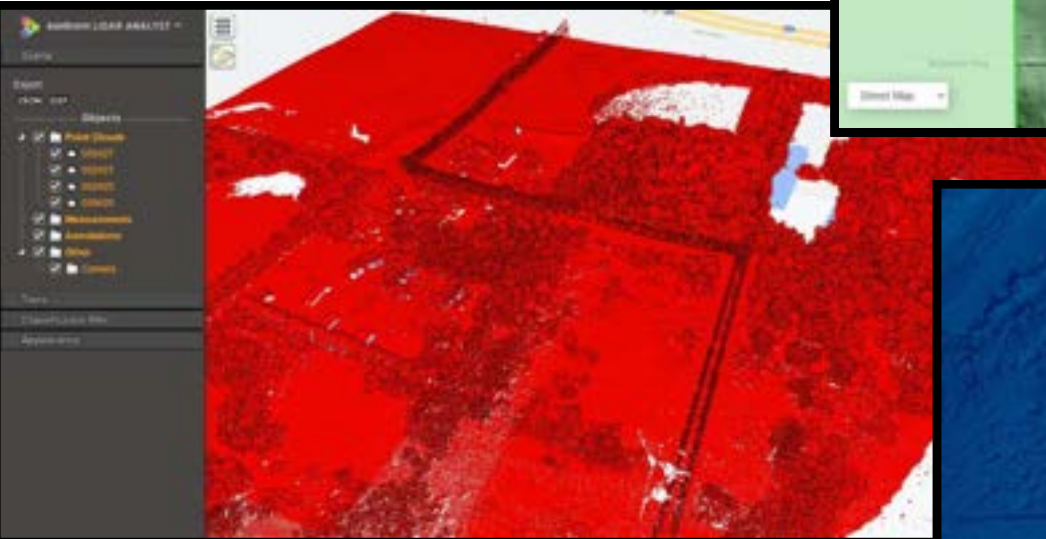
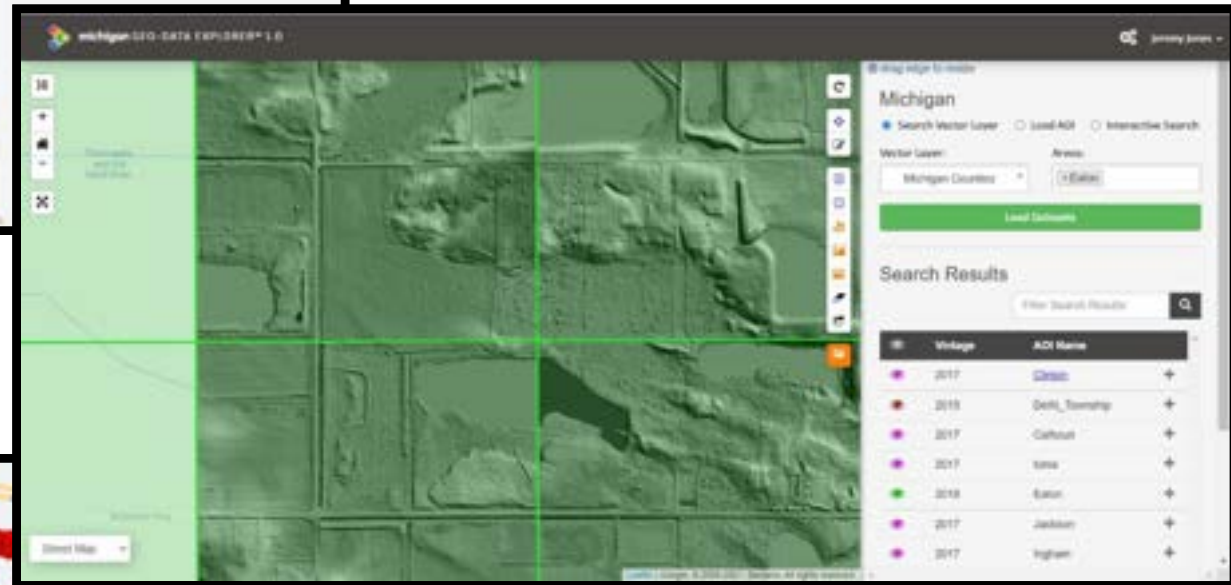
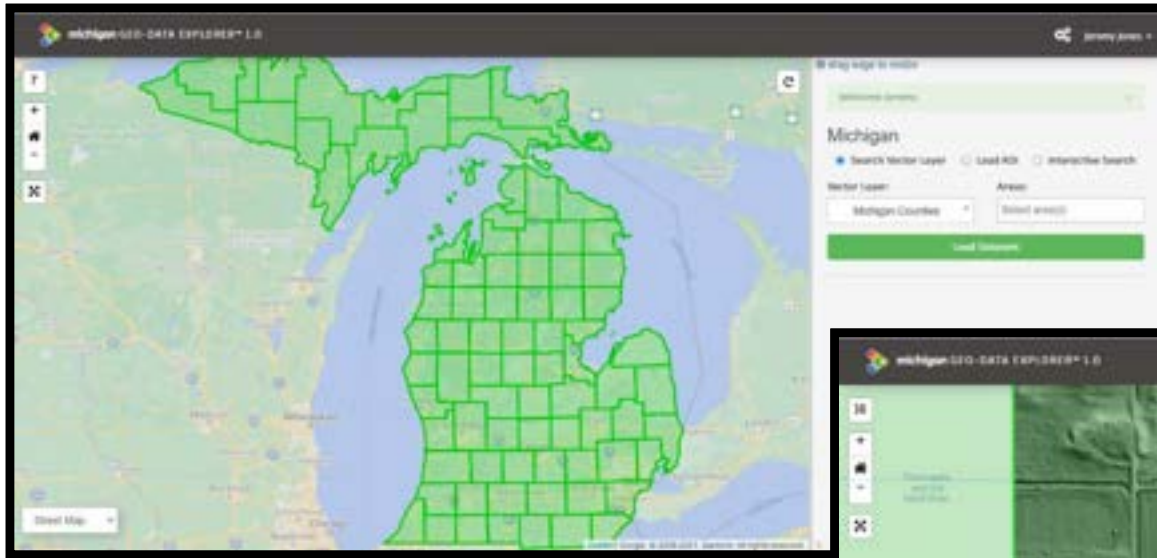
- Parcel Viewers with Imagery



- Other Sources

- USDA Farm Service Agency (NAIP)
 - <https://naip-usdaonline.hub.arcgis.com/>
- Michigan State University
 - <https://rsgis.msu.edu/aerial/about>

LiDAR





Data Collectors



Apps and Maps

- ArcGIS Field Maps
- Survey 123
- GPS Connection Apps
 - Zeno Connect
 - Trimble Mobile Manger
- MDOT CORS Network



Improved Data Quality

- Utilizing MDOT CORS network for high accuracy horizontal and vertical data

The screenshot displays the MDOT CORS website interface. At the top left is the MDOT logo. The main heading is "MDOT CORS - MSRN - Site Overview". Below this is a map of Michigan showing the locations of CORS stations. To the right of the map is a "SBC Login" form with fields for "User name", "Password", and "Forgot password?", along with a "Remember me" checkbox and a "SBC Login" button. Below the login form is a "Tweets from @MichiganDOT" section featuring a tweet from Dectreon about a documentary on wireless charging. At the bottom left, there are two location pin icons and a "Subscribe Now" button. The bottom right section contains subscription details for "GPS and GLOMSS Corrections RTCM3.1", including a "FREE" price, "Unlimited" subscription period, "Unlimited" consumption limit, "Unlimited" working area, and article number "GPSGLD 3.1".

<https://mdotcors.michigan.gov/sbc/Account/Index?returnUrl=%2Fsbc>

ArcGIS Online Field Maps

- Field workers can access data immediately for map creation and sharing
- Easy collaboration between various work groups
- No post processing
- Office central staff can provide instant updates to maps for use immediately in the field
- Site plans, elevation data, aerials all can be provided for improved field data collection

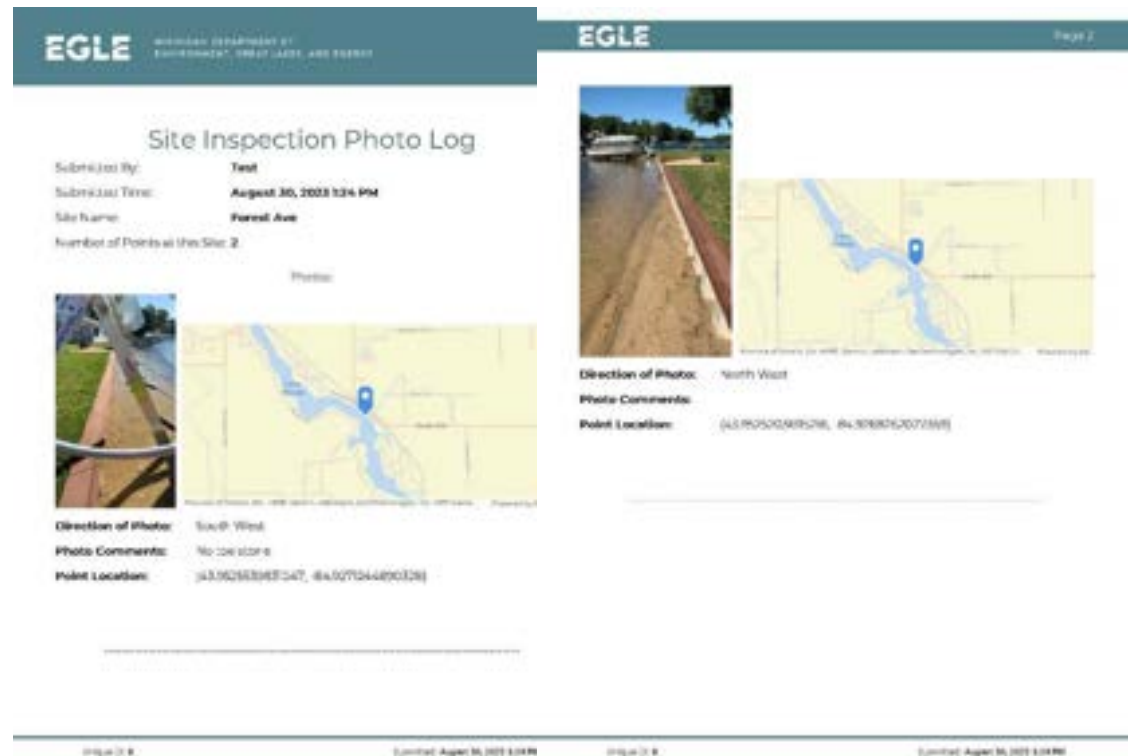
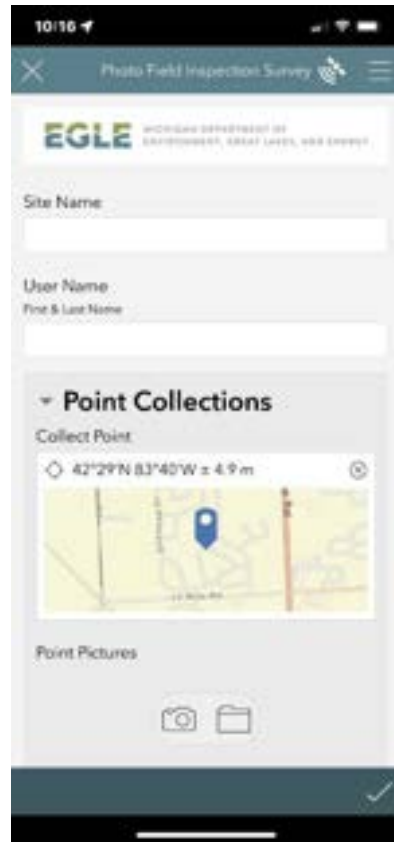


Survey 123



Survey 123 Examples

- EGLE Photo Site Photo Log/Report Generator



Inland lake survey examples

11:44

Inland Lake Shoreline Energy Analysis

This survey was built to aid inland lake homeowners, contractors, consultants, and other interested parties in evaluating shoreline energy potential on inland lake shoreline properties. Included in the survey are some questions that can be used to inform shoreline protection design.

Section I: Submitter Information

Full Name

Submitter Email Address *

Verify Email *

Project Address

Project City

Project State

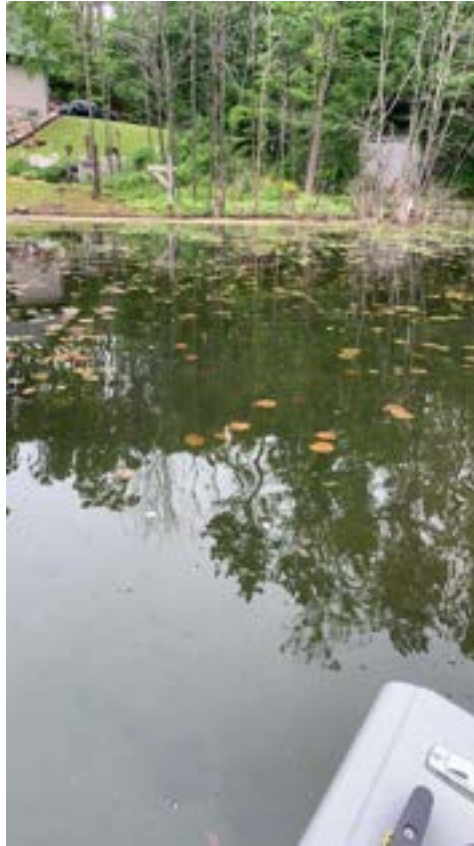
Section II: Wave Energy Information

Distance Across the Lake?

What is the maximum fetch distance from the proposed project site? The longest unobstructed distance across the lake (uninterrupted by islands or points) from the proposed project site is called the maximum fetch. Measure your maximum fetch line using one of the methods in the description and type the distance in miles in the space provided. (Measurement in MILES)

Water Depths on Fetch Line?

Determine the water depth at five equally spaced points along the maximum fetch line drawn in Question 1. What is the depth of water at each point along your maximum fetch line? Depth contour maps for some lakes can be found on the web from Michigan DNR or provided freely by the private company Navionics. (Measurement in FEET)



12:01

My Survey

Survey Depth

Rake Fullness

Native/Invasive Type

Rake Fullness Score

1

2

3

Native/Invasive Type

Rake Fullness Score

1

2

12:01

My Survey

Species List:

<input type="checkbox"/> Arrowhead	<input type="checkbox"/> Brittle naiad
<input type="checkbox"/> Bullhead	<input type="checkbox"/> Bulrush
<input type="checkbox"/> Carolina fanwort	<input type="checkbox"/> Cattail
<input type="checkbox"/> Clasp leaf pondweed	<input type="checkbox"/> Common bladderwort
<input type="checkbox"/> Common stonewort	<input type="checkbox"/> Common waterweed
<input type="checkbox"/> Coontail	<input type="checkbox"/> Curly leaf pondweed
<input type="checkbox"/> Eurasian watermilfoil	<input type="checkbox"/> Fern leaf pondweed
<input type="checkbox"/> Flatstem pondweed	<input type="checkbox"/> Floating leaf pondweed
<input type="checkbox"/> Hybrid milfoil	<input type="checkbox"/> Illinois pondweed
<input type="checkbox"/> Large leaf pondweed	<input type="checkbox"/> Long leaf pondweed
<input type="checkbox"/> Mare's tail	<input type="checkbox"/> Northern milfoil
<input type="checkbox"/> Sago pondweed	<input type="checkbox"/> Southern naiad
<input type="checkbox"/> Spatterdock	<input type="checkbox"/> Spiny naiad
<input type="checkbox"/> Starry stonewort	<input checked="" type="checkbox"/> Thin leaf pondweeds (general)
<input type="checkbox"/> Variable pondweed	<input type="checkbox"/> Varied leaf milfoil
<input type="checkbox"/> Water lily	<input type="checkbox"/> Water marigold
<input type="checkbox"/> Watershield	<input type="checkbox"/> Water stargrass
<input type="checkbox"/> Whidestem pondweed	<input type="checkbox"/> Whorled milfoil
<input type="checkbox"/> Wild celery	

Flood Emergency

11:41

My Survey

Date and Time *

Observers *

Other (Insert Name Below)

Start of Survey Location (culvert)

Culvert ID:

11:42

My Survey

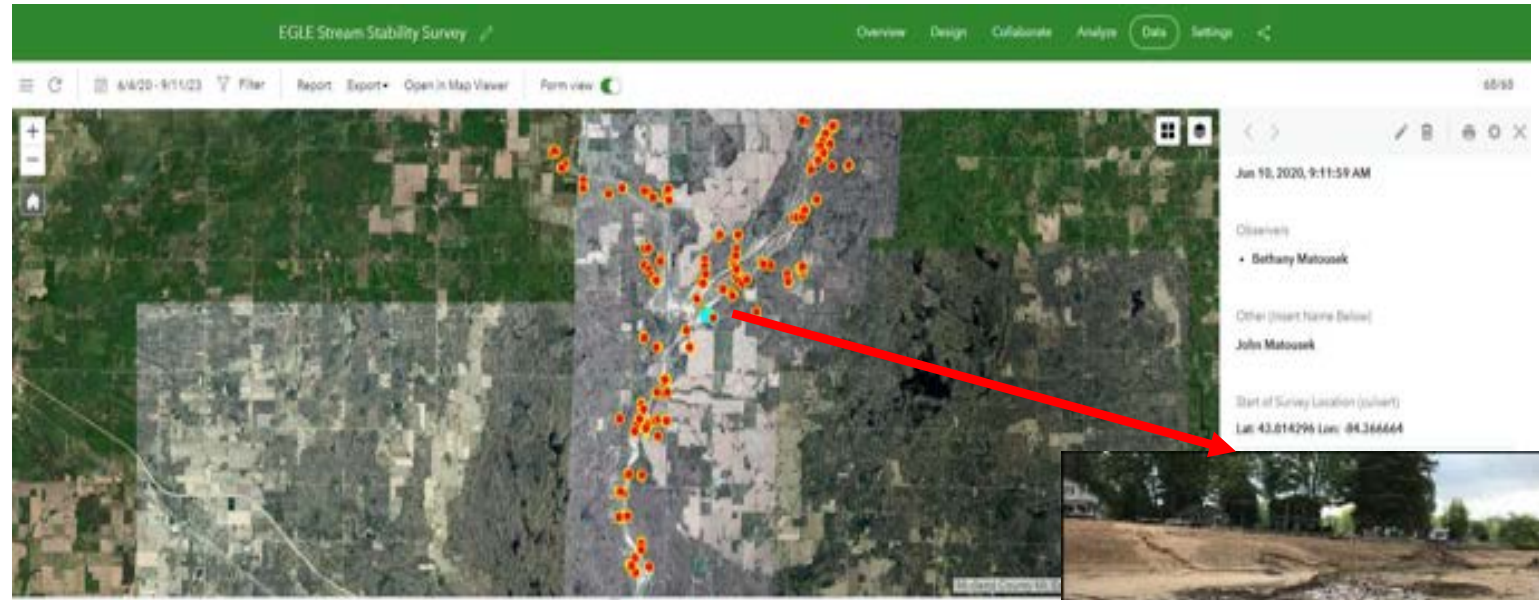
Road Name:

Stream Name:

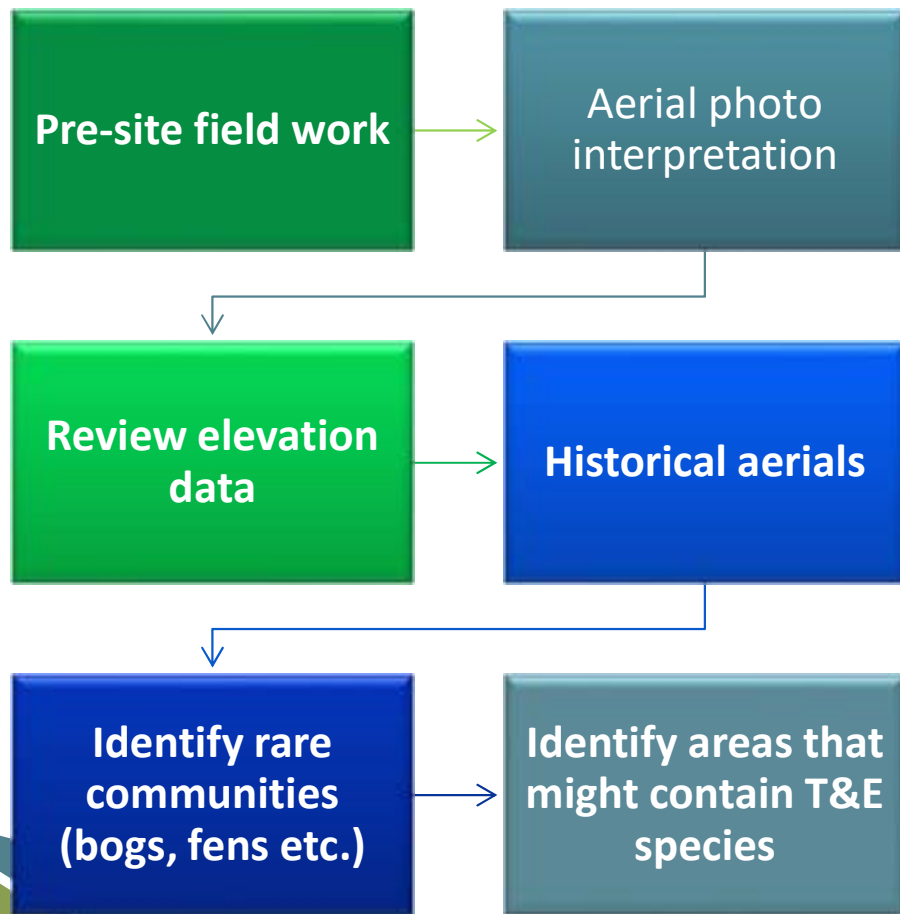
Other Road/Stream:

- Culvert Information:
- Channel Observation:
- Headcut
- Channel Blockage
- Evaluation Summary

image 1



How can wetland professionals' benefit from these improvements?



How can wetland professionals' benefit from these improvements?

Improved site history evaluation

Collect better field data

Elevation Data

Quality boundaries

Photos

Survey's

Improved site planning

Avoid and minimize impacts in project design

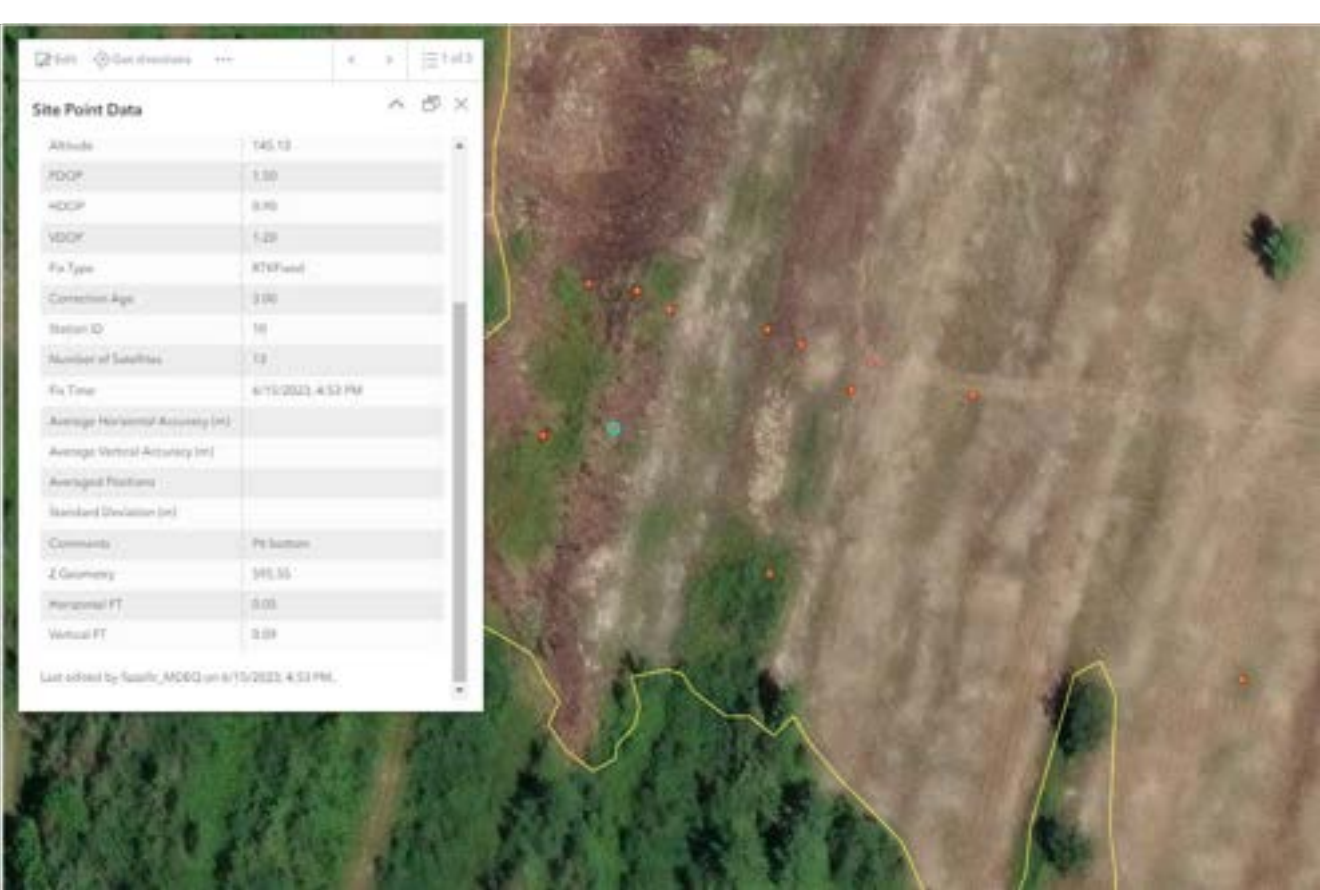
Address past violations or alterations

Develop better restoration plans, and mitigation plans

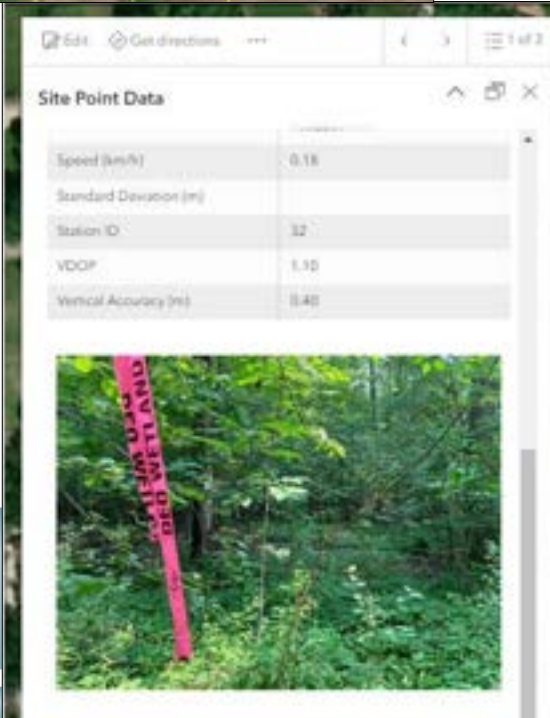
An aerial photograph of a landscape. A winding river flows through the center-right of the image. A road runs diagonally from the top right towards the center. There are several large, irregularly shaped areas colored in bright red, scattered across the brownish, textured ground. The overall scene appears to be a natural or semi-natural environment with some human-made features.

Examples

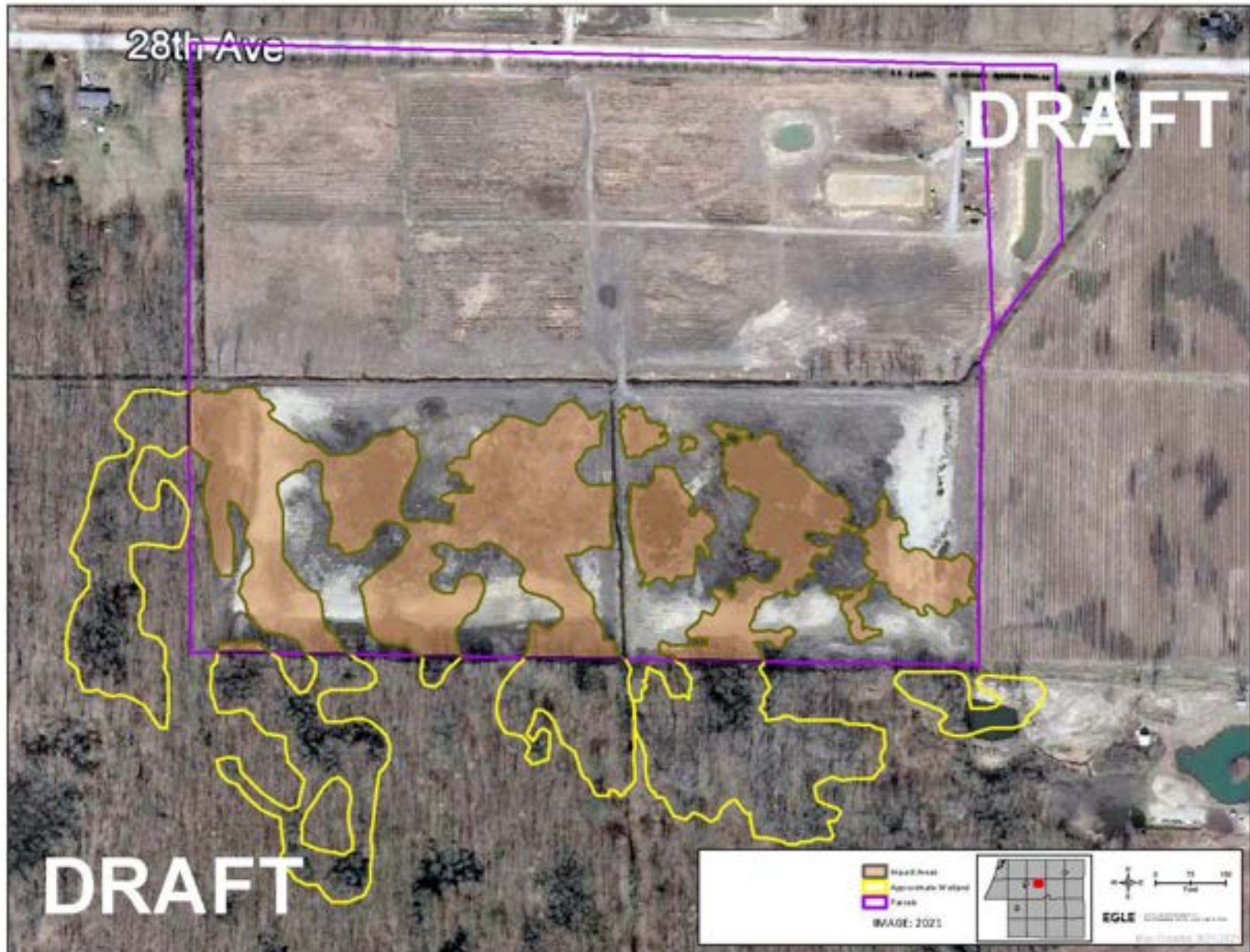
Data Collection, Site History,
Violation Restoration



Leica Flex & GG04



Documenting Site History



Violation/Restoration



Violation/Restoration

Stream Channel Restoration

Remove the unauthorized stream culvert crossing (Figure 1), specifically:

- 1) Remove all culvert cover fill currently over and/or immediately around the culvert pipe to a depth sufficient to expose the remnant, native stream bed and bank surfaces. These bed and bank surface elevations should correspond to those of the immediately adjacent, non-filled reaches upstream and downstream of the crossing. All removed fill shall be disposed to an upland location¹.
- 2) Remove the unauthorized culvert to an upland location. The removed culvert must not be staged, stored, or disposed to wetland, bottomland, or floodplain.

Wetland Grade Restoration

- 1) Remove all unauthorized driveway fill (Figure 1) from the property's wetland, specifically:
 - a. All limestone, rock, gravel, sand, upland soil, or other materials originating in upland or brought into the wetland from an offsite location must be removed, disposed to upland, and stabilized with seed and mulch or other suitable measures. Prior to any removal, submit an upland spoils disposal location map or figure for MDEQ approval. If the proposed upland spoils disposal location is located on property not under the ownership, written authorization of spoils disposal signed by the property owner(s) must also be submitted.
 - b. All driveway fill originating as spoils generated from unauthorized dredging within the wetland must be returned to the borrow pits to restore the original surface grades of those areas (Figure 1). Mineral soil spoils should be separated from organic soil spoils to the degree feasible. Mineral soil spoils shall be placed in the bottom of the borrow pits, followed by the organic soil spoils which are placed on top to restore the original surface grades of the dredged wetland areas.

Fill removal shall be to a depth sufficient to expose the remnant, native wetland soil surface (black organic muck) within the driveway footprint and re-establish pre-existing





Violation/Restoration Cont..

Technology Advances Improve Wetland Resource Protection and Management



As the technology of data collection, and GIS and LiDAR resources continues to improve, wetland professionals will be able to more accurately identify, protect, and restore wetlands.



Project designers can avoid and minimize impacts early in the design phase.



Restoration/mitigation projects can more accurately target restoration of functions in areas where it is most likely to be successful, and in areas where there have been cumulative losses.



Property owners and land managers can better understand & manage their land, or better plan for development

Thank You! Questions?

Jeremy Jones
Wetlands GIS Analyst
Wetlands, Lakes, and
Streams Unit

Environment Great
Lakes and Energy

jonesj28@michigan.gov

517-899-6122

