Michigan Wastewater Network Overview

MDHHS Communicable Disease Conference

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May 14, 2025

What is Wastewater Monitoring?

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MDHHS Michigan Department of Health & Human Services

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Public health officials can use the resulting wastewater data to better understand the spread of diseases in the community, which helps guide decisions about testing, vaccinations, and other measures to reduce that spread.

WASTEWATER MONITORING IN MICHIGAN

Wayne State University Engineering and Facilities Teams

Michigan State University Xagoraraki Laboratory team member

MDHHS – project coordination, data analysis, health education, communication.

Michigan Network for Environmental Health & Technology (MiNET) – water-quality lab network testing & monitoring disease targets in wastewater.

Michigan State University (MSU) – lead laboratory role, standardize lab testing, technical assistance

19 local projects – sample collection, lab testing, and local data analysis, communications, and coordination

Lead agencies are universities, local health departments, private lab, and city/county governments.

Each project has a lab with corresponding local health departments and other stakeholders involved in collection (utilities, environmental contractors, etc.) and data ownership & dissemination (healthcare providers, universities, municipal governments, etc.).

It's all about **partnership!**

- 19 Local projects
- 18 Labs
- 340+ Sampling sites
- Coordinated by MDHHS with CDC support

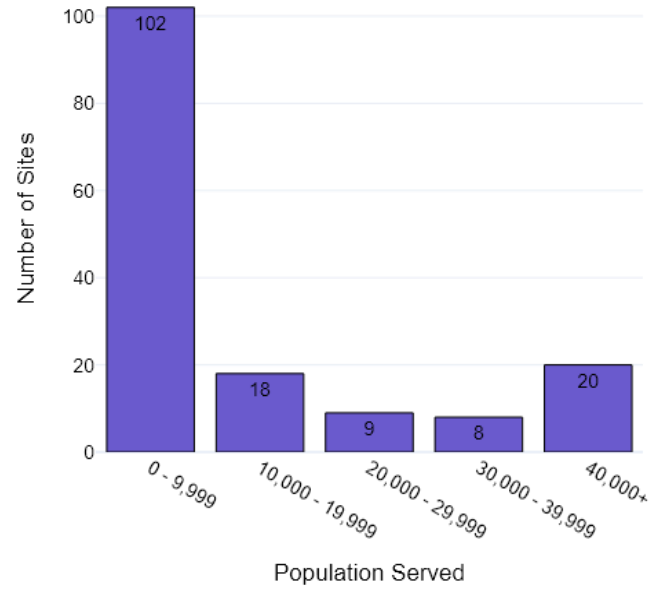
Estimated Population Served *

* Based on data reported from local partners

Total community site population coverage = ~ 6.5 million

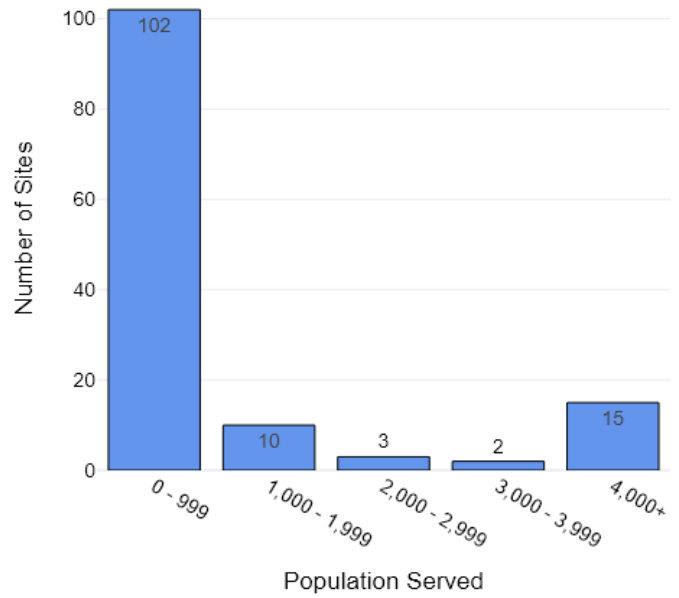
Community Sites

Median population served: 6,000



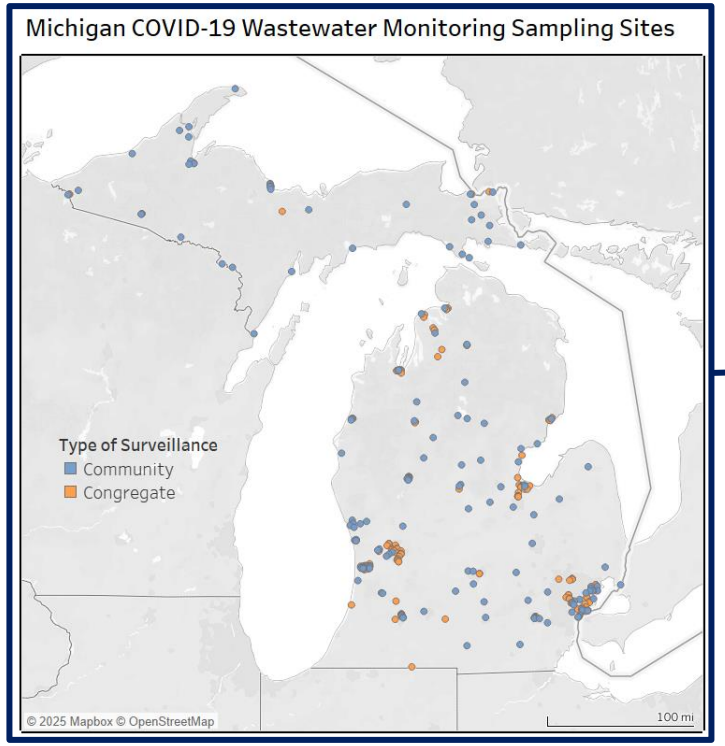
Congregate Sites

Median population served: 420



(Total Michigan Population: ~ 10.14 million)

DATA FLOW

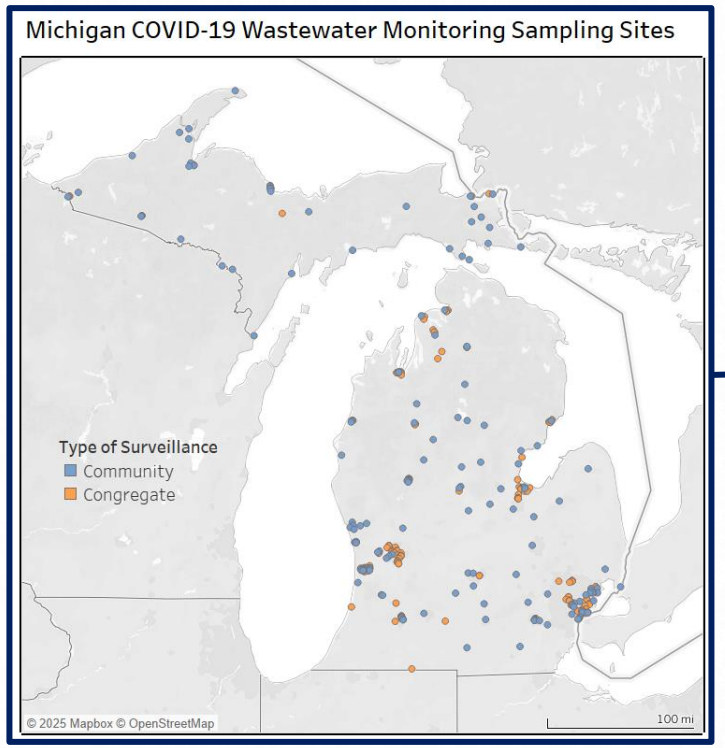


340+ sampling sites

18 Labs

MICHIGAN STATE UNIVERSITY

DATA FLOW



340+ sampling sites

5 Tribal Nations

18 Labs

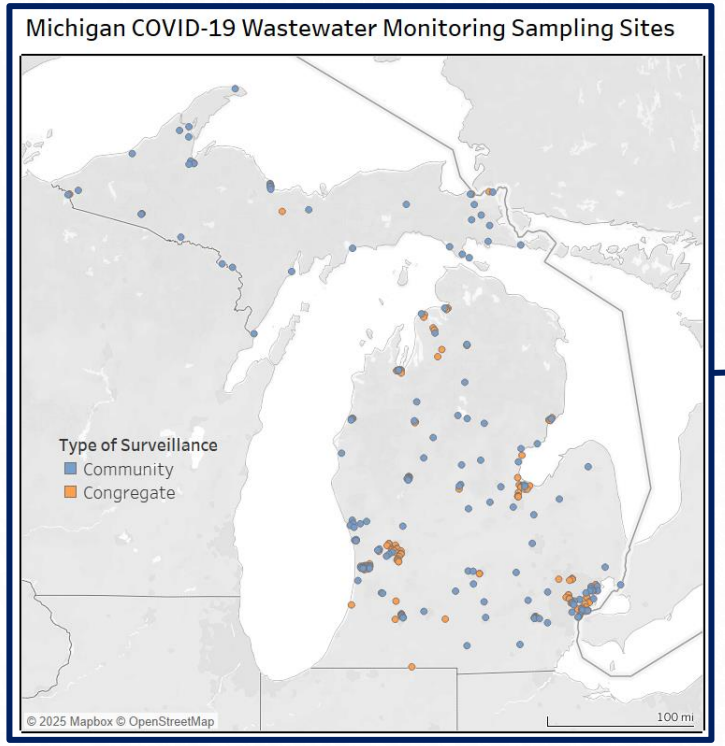
MICHIGAN STATE UNIVERSITY

MDHHS

36 Local Health Depts

Additional Stakeholders

DATA FLOW



340+ sampling sites

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MICHIGAN STATE UNIVERSITY

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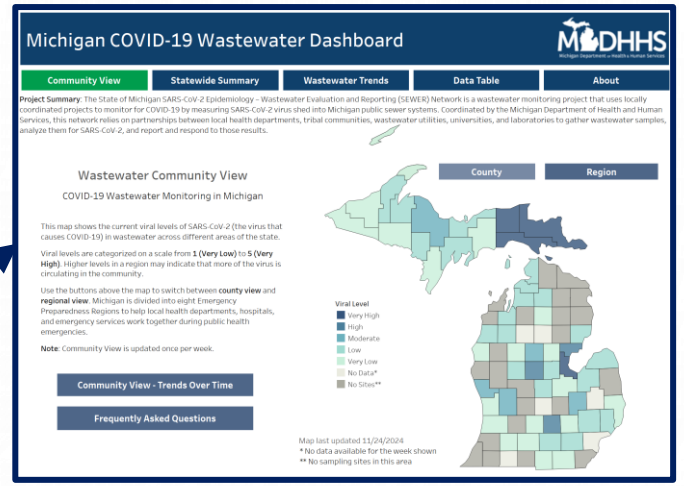
CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

MDHHS

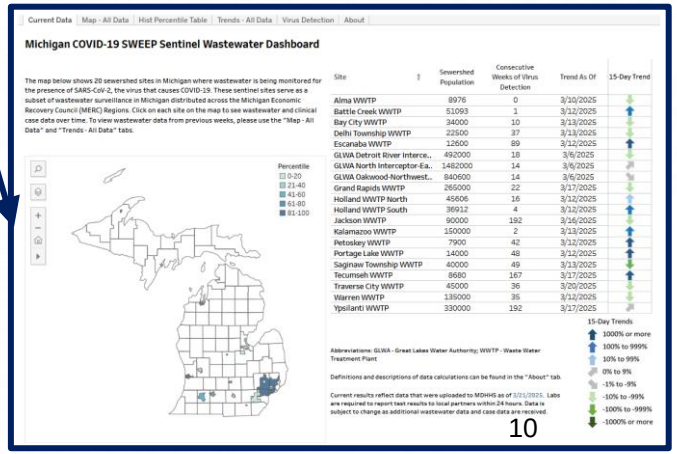
Additional Stakeholders

COVID Data Tracker

Project Dashboard



SWEEP Dashboard



Pilot Project

October – December 2020

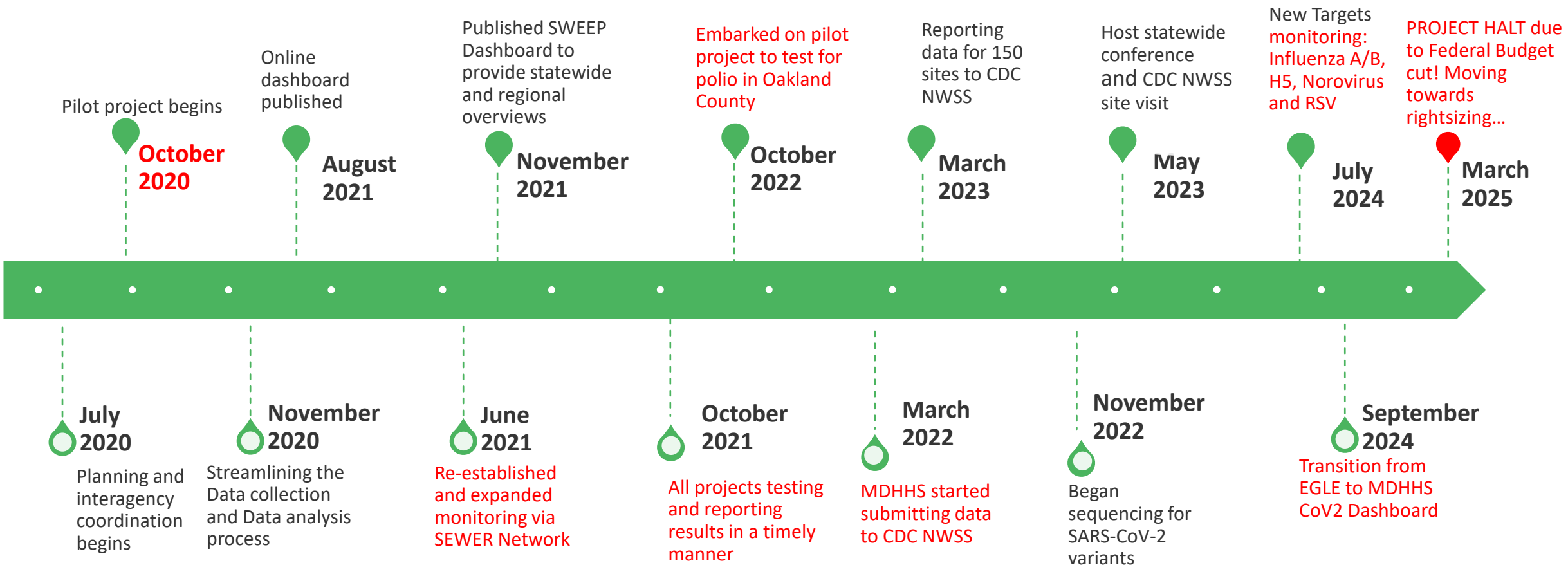
- 20 local projects testing for SARS-CoV-2
- 270 sampling sites in 37 counties, City of Detroit
- Two surveillance strategies:
  - **Wastewater treatment plant surveillance:** community-level data to evaluate trends
  - **Congregate facility monitoring:** targeted testing of specific populations. Long-term care/assisted living facilities, K-12 schools, universities, prisons, etc.
- Goals:
  - Determine feasibility of wastewater testing
  - Standardize methods
  - Inform local responses to the pandemic (had to have local health department involvement)

SARS-CoV-2 Epidemiology – Wastewater Evaluation and Reporting Network

June 2021 – March 2025

- 19 local projects:
  - 18 laboratories (14 academic, 2 LHDs, 2 private)
  - 36 local health departments
  - 5 Tribal nations
- 340+ sampling sites:
  - wastewater treatment plants
  - sewersheds
  - congregate facilities
- Coverage in 58 counties, City of Detroit
- Still using both WWTP monitoring and congregate facility monitoring

Timeline of Project Highlights



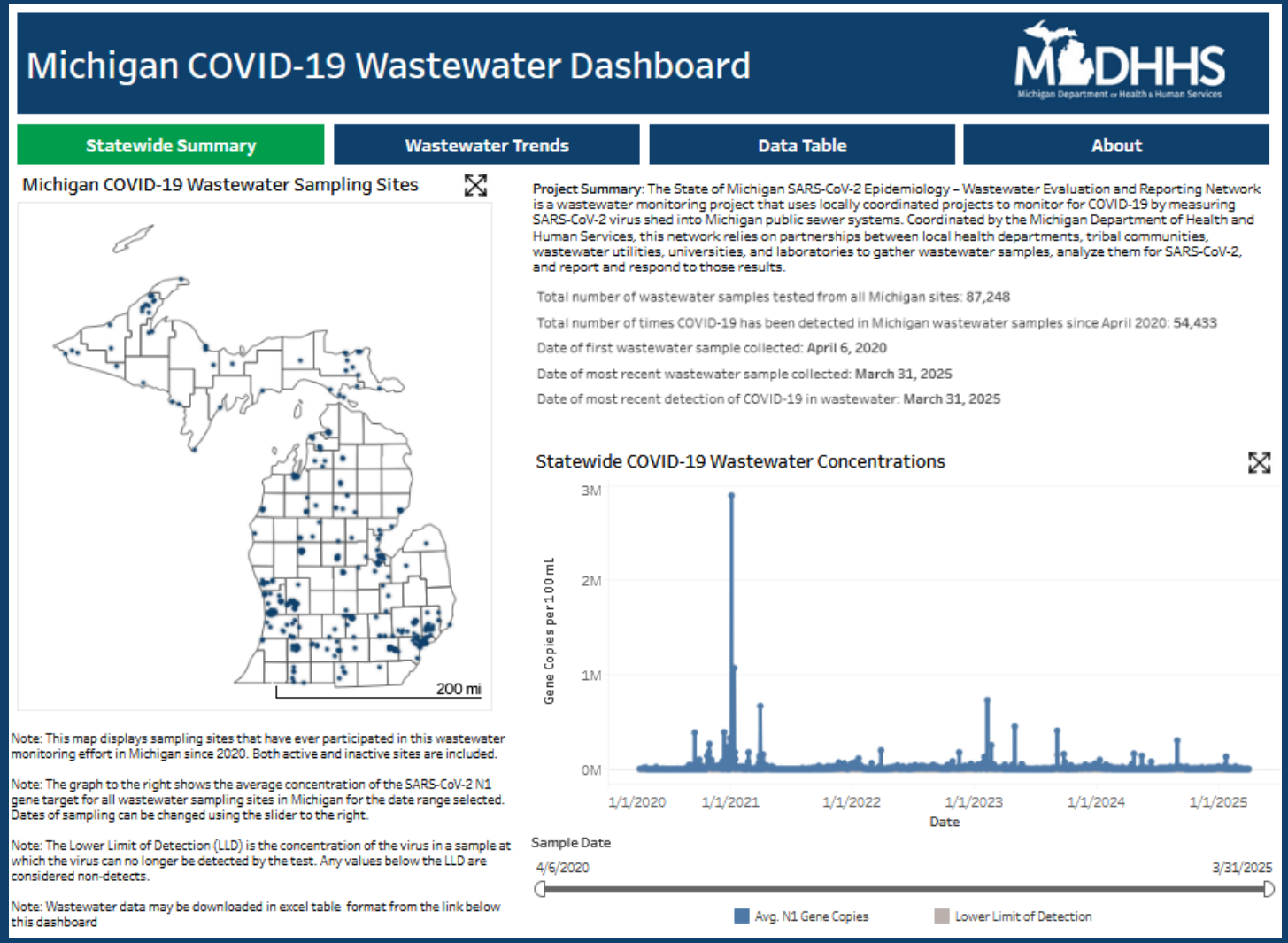
STRENGTHS AND UNIQUE FEATURES

- Large number and variety of partners and expertise
  - Coordinating committee – MDHHS, EGLE, MSU
  - Local project leads – academic institutions, local health departments, local governments, private lab
- Engaged partners
  Weekly and quarterly calls
  Statewide conference
- Number and types of sampling sites with regional coverage
- Regular Quality checks to disseminate verified results
- Continual improvement

MICHIGAN COVID-19 WASTEWATER DASHBOARD

Dashboard shifted from EGLE to MDHHS- August/September 2024

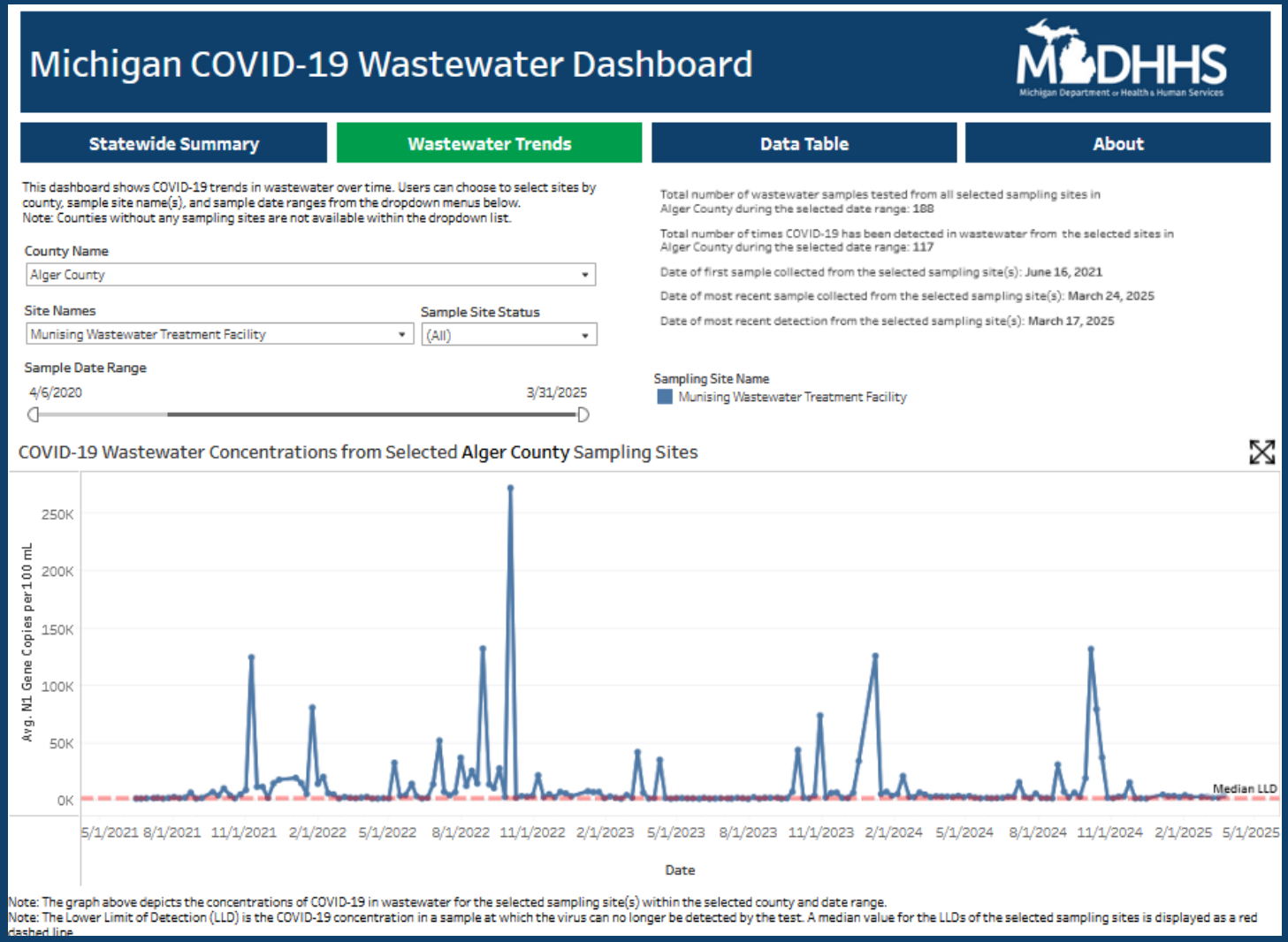
[Michigan COVID-19 Wastewater Dashboard]



MICHIGAN COVID-19 WASTEWATER DASHBOARD

Data trends for multiple sites

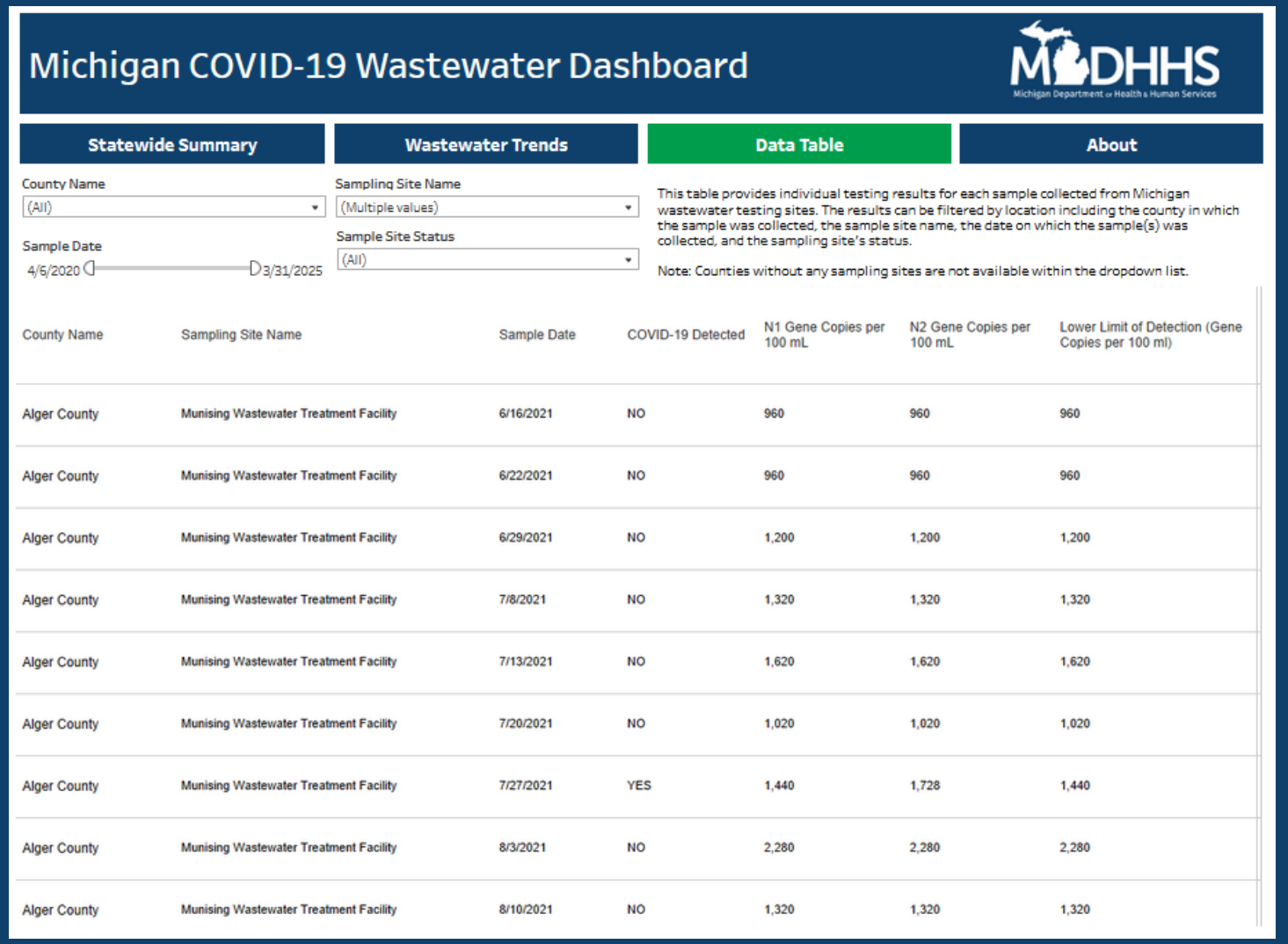
[Michigan COVID-19 Wastewater Dashboard]



MICHIGAN COVID-19 WASTEWATER DASHBOARD

Full data table for all Michigan sites (2020 –Present)

[Michigan COVID-19 Wastewater Dashboard]



Michigan COVID-19 Wastewater Dashboard

MDHHS Michigan Department of Health & Human Services

Statewide Summary | Wastewater Trends | Data Table | About

County Name: (All)

Sampling Site Name: (Multiple values)

Sample Site Status: (All)

Sample Date: 4/6/2020 – 3/31/2025

This table provides individual testing results for each sample collected from Michigan wastewater testing sites. The results can be filtered by location including the county in which the sample was collected, the sample site name, the date on which the sample(s) was collected, and the sampling site's status.

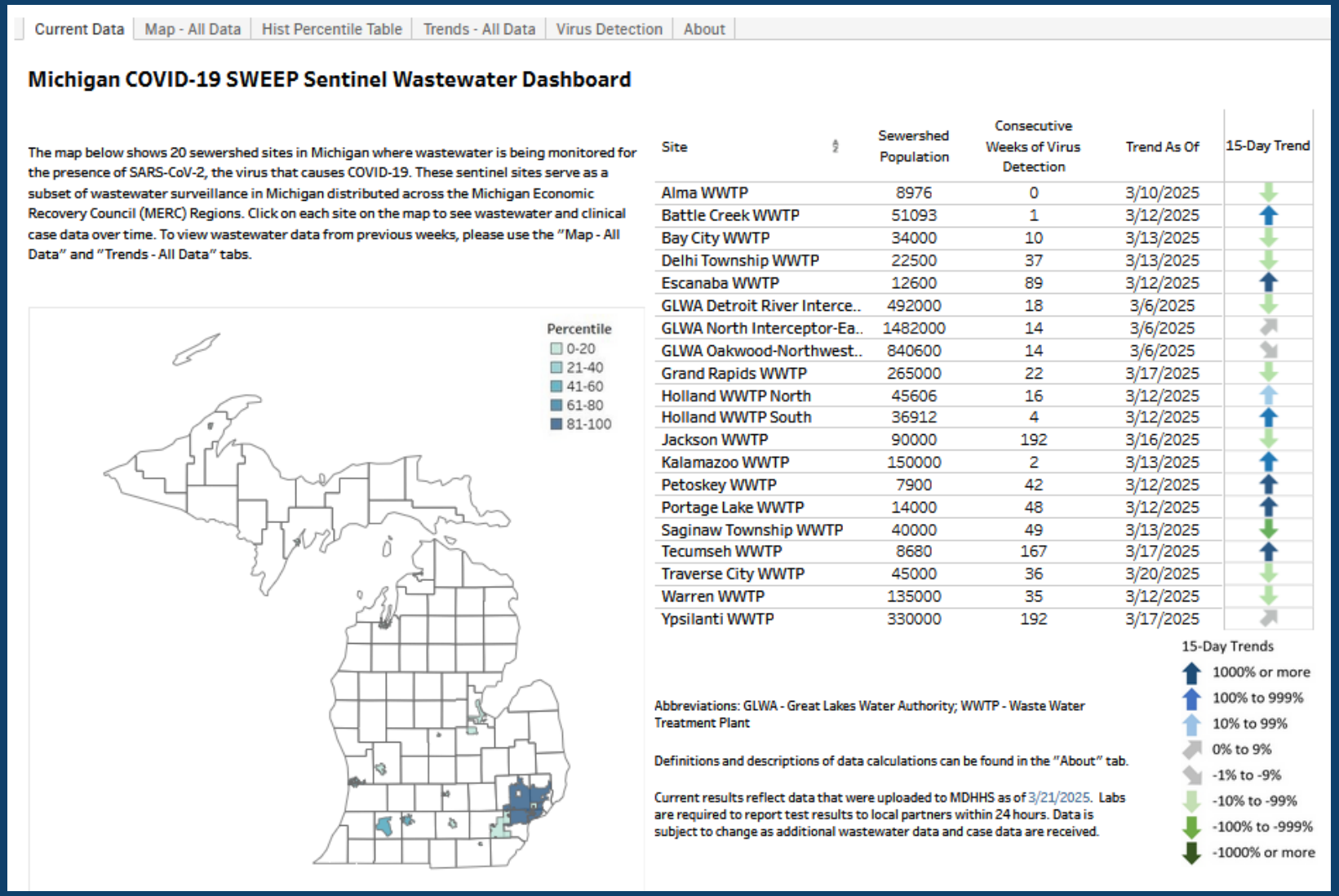
Note: Counties without any sampling sites are not available within the dropdown list.

County Name	Sampling Site Name	Sample Date	COVID-19 Detected	N1 Gene Copies per 100 mL	N2 Gene Copies per 100 mL	Lower Limit of Detection (Gene Copies per 100 ml)
Alger County	Munising Wastewater Treatment Facility	6/16/2021	NO	960	960	960
Alger County	Munising Wastewater Treatment Facility	6/22/2021	NO	960	960	960
Alger County	Munising Wastewater Treatment Facility	6/29/2021	NO	1,200	1,200	1,200
Alger County	Munising Wastewater Treatment Facility	7/8/2021	NO	1,320	1,320	1,320
Alger County	Munising Wastewater Treatment Facility	7/13/2021	NO	1,620	1,620	1,620
Alger County	Munising Wastewater Treatment Facility	7/20/2021	NO	1,020	1,020	1,020
Alger County	Munising Wastewater Treatment Facility	7/27/2021	YES	1,440	1,728	1,440
Alger County	Munising Wastewater Treatment Facility	8/3/2021	NO	2,280	2,280	2,280
Alger County	Munising Wastewater Treatment Facility	8/10/2021	NO	1,320	1,320	1,320

SENTINEL WASTEWATER EPIDEMIOLOGY EVALUATION PROJECT (SWEEP)

- The SWEEP Dashboard displayed several wastewater metrics for 20 wastewater treatment plants across Michigan.
- The data includes the number of weeks with positive tests, how the level of SARS-CoV-2 compares to previous samples, the size of that change, and the trend over time.

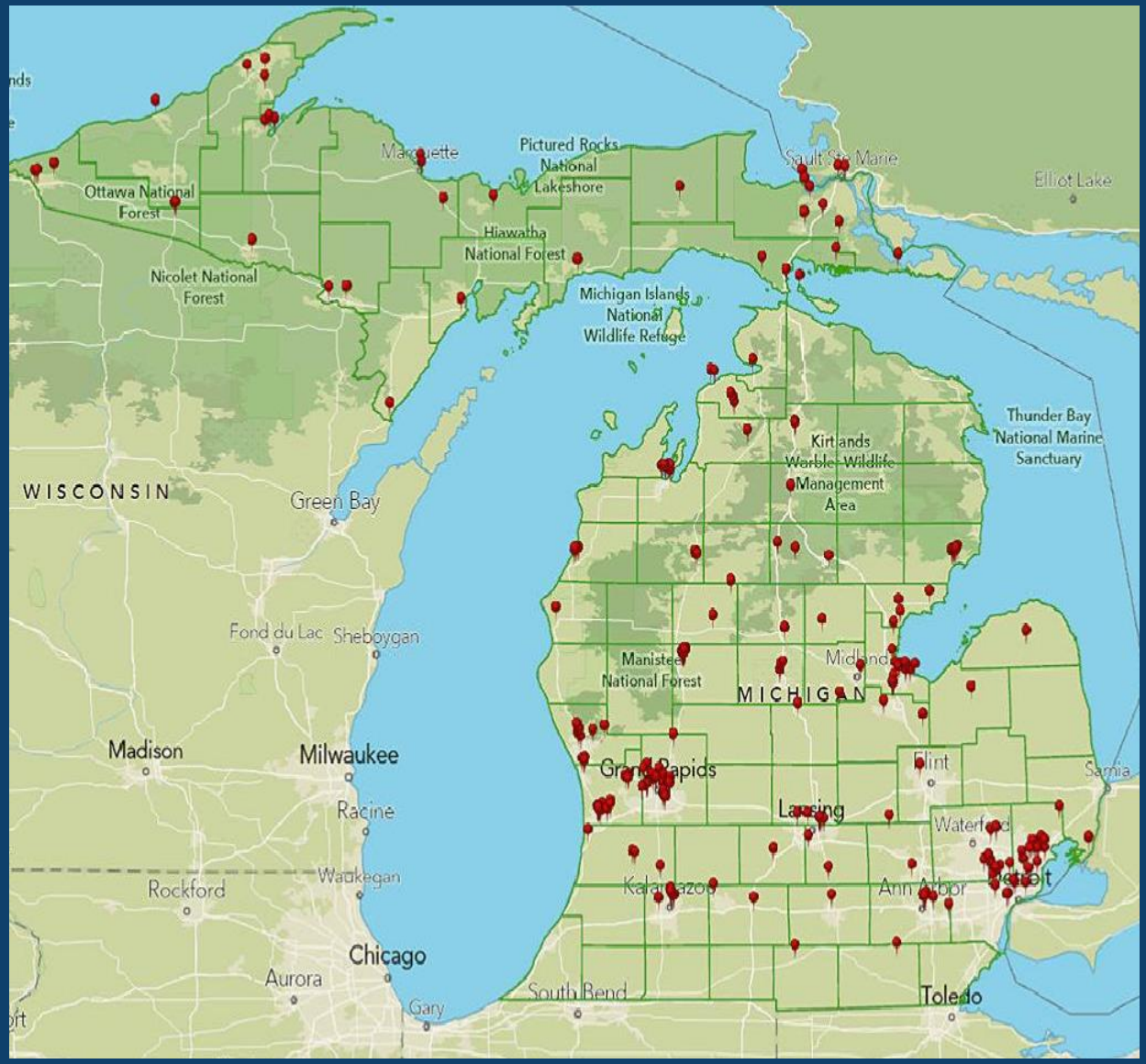
[Sentinel Wastewater Epidemiology Evaluation Project (SWEEP)]



PROGRESS AND PLANS

Project Progress:

- To enhance resource efficiency, a shift was made from the EGLE dashboard to MDHHS Wastewater dashboard.
- The team managed 340+ sites and reduced the number of sites through rightsizing will ease the workload and the required facilitation, allowing us to concentrate on more critical priorities.
- Incorporating GIS mapping to understand disease spread.
- Internal and External quality checks (Important for H5 detections to rule out false positives)
- The Integration of broader public health monitoring for other targets including multi-virus dashboards and revamping the previous dashboards to customizable options for different user groups is still in works but has been halted due to budget cuts .

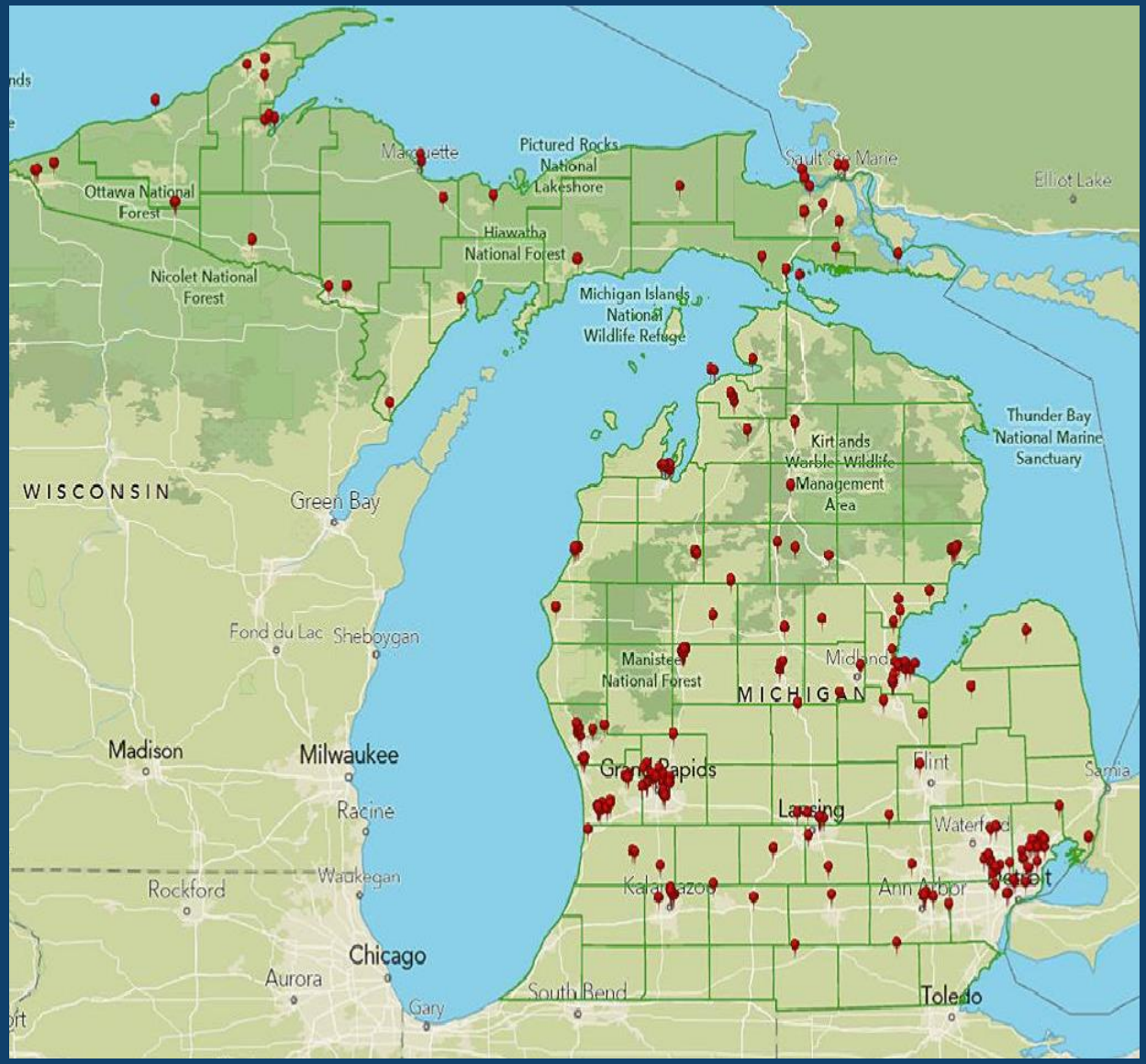


Wastewater Sites in Michigan

PROGRESS AND PLANS

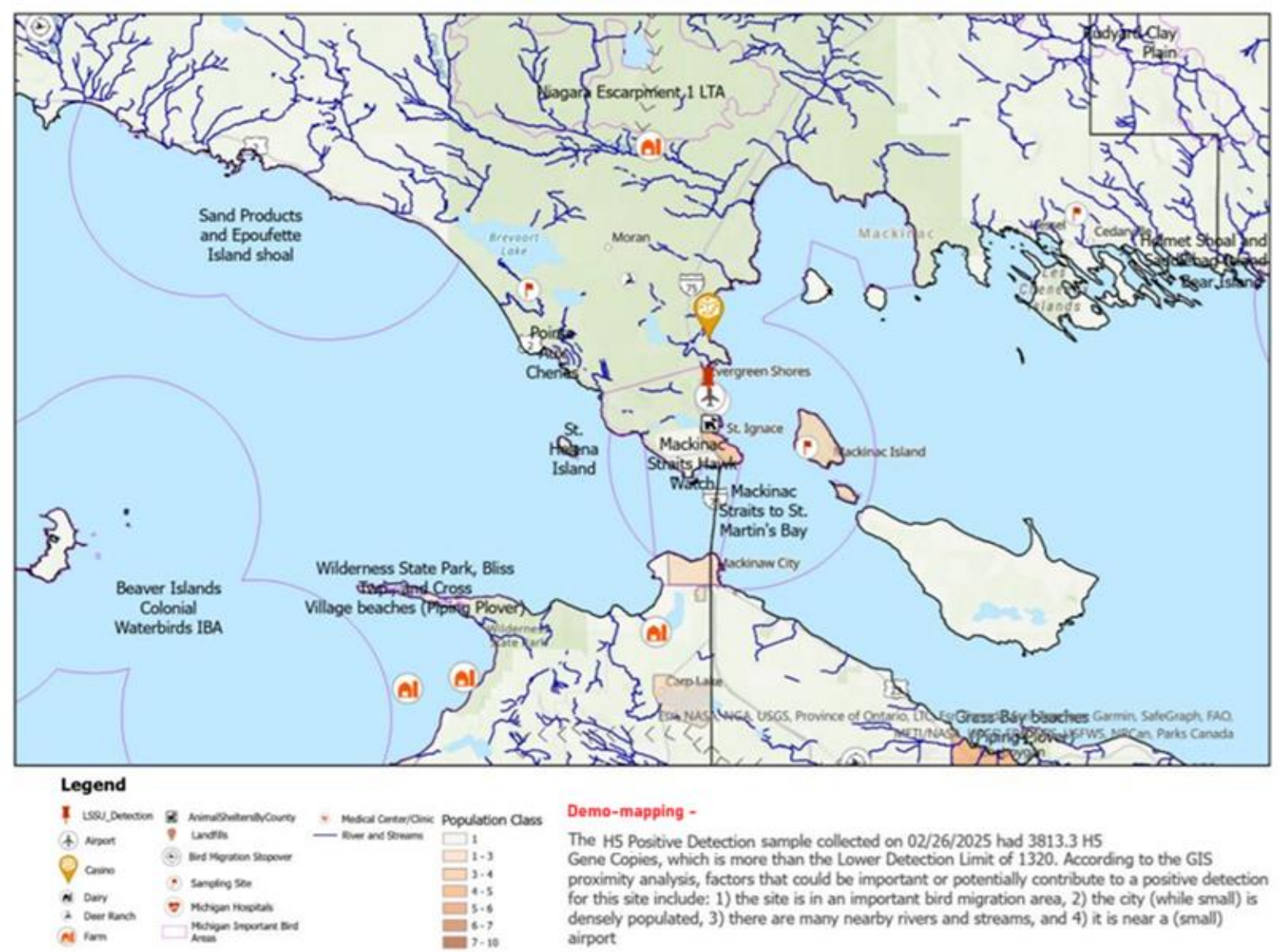
Future Opportunities:

- Dependent on Funding availability.
  - Community level wastewater monitoring for *Candida auris*.
  - Use historical data and current data to assess the H5 target using geo-mapping.
  - Considering the alert systems for multiple targets.
  - Potentially broadening the pathogen scope to enhance community awareness.



Wastewater Sites in Michigan

H5 MAPPING



- A calculated effort has been made to develop GIS skills to make informed decisions through easily interpretable visual data patterns.
- H5 mapping based on proximity analysis will help in identifying outbreaks based on environmental, social and biological factors through correlations and geographical clustering.
- It is an early intervention strategy to support vulnerable populations and tracking transmission routes in case of H5 emergency in Michigan.

PUBLIC HEALTH ACTIONS TAKEN

- Increased clinical testing, vaccination, public communication, and outreach efforts in affected community
- Provided alerts for H5 detection
- Alerted healthcare and other public health response stakeholders
- Alerted community leaders
- Coordinated with universities to implement testing and isolation for students
- Monitored clinical case data in conjunction with wastewater data

THANK YOU TO ALL OUR PARTNERS!

MDHHS Wastewater Network Team

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Matthew Flood – Wastewater Data Analyst

Anum Zia – Wastewater Epidemiologist

Lillian Jensen – CSTE Applied Epidemiology Fellow

For more information, visit
www.michigan.gov/covidwastewater

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