MAY 18, 2022

Optimized Wastewater System Operations using the PI System

Biren Saparia, Great Lakes Water Authority

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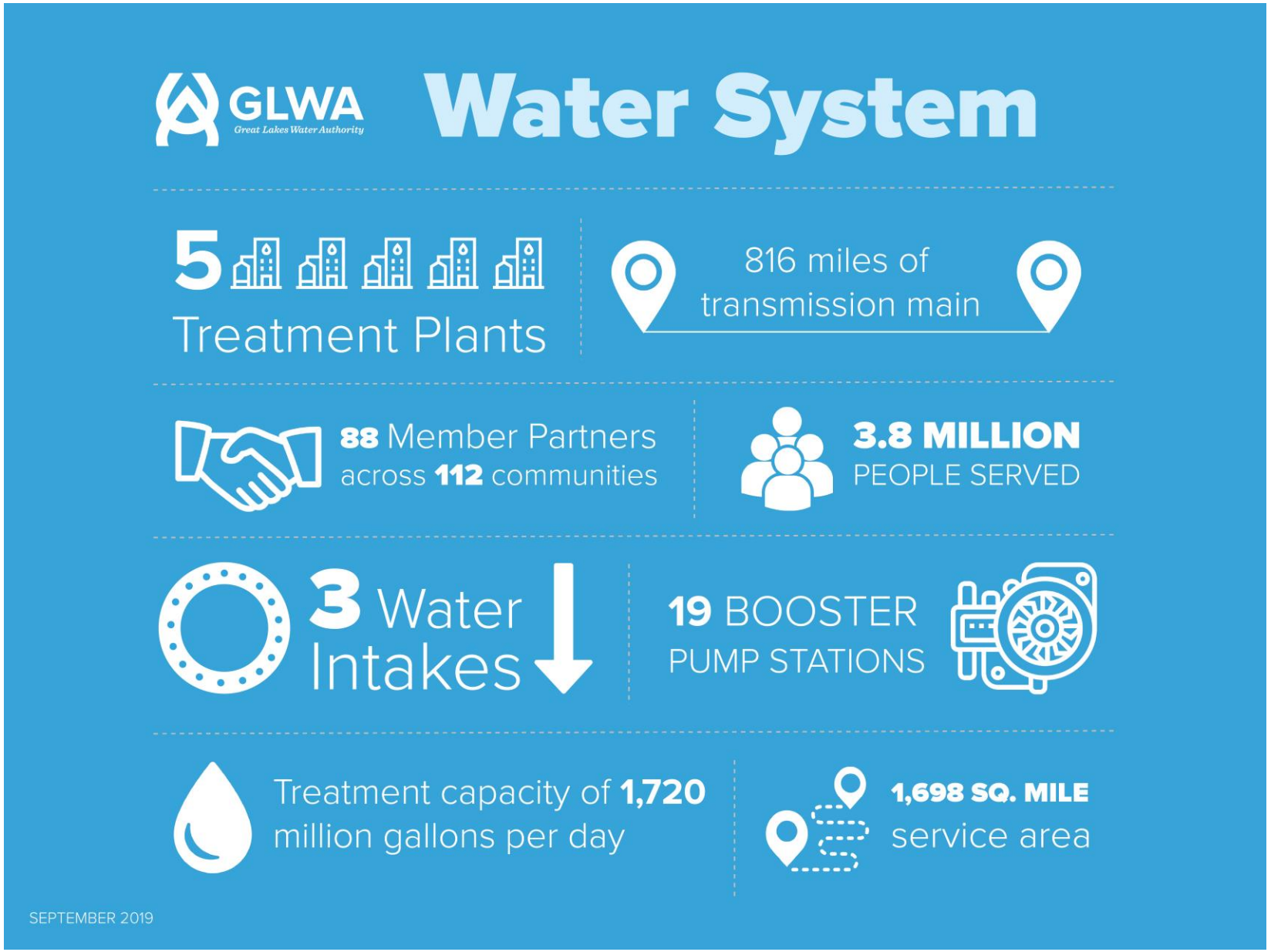
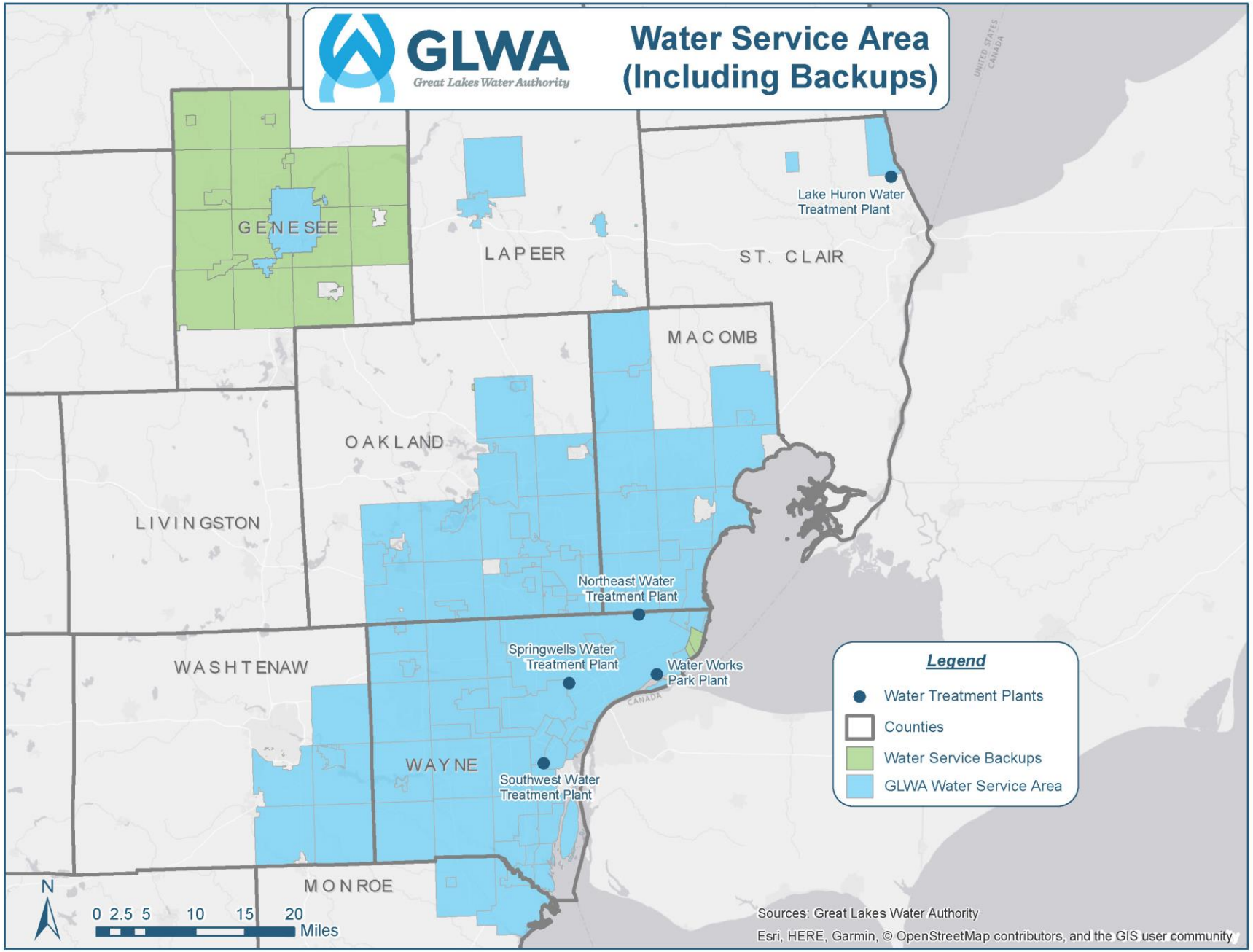
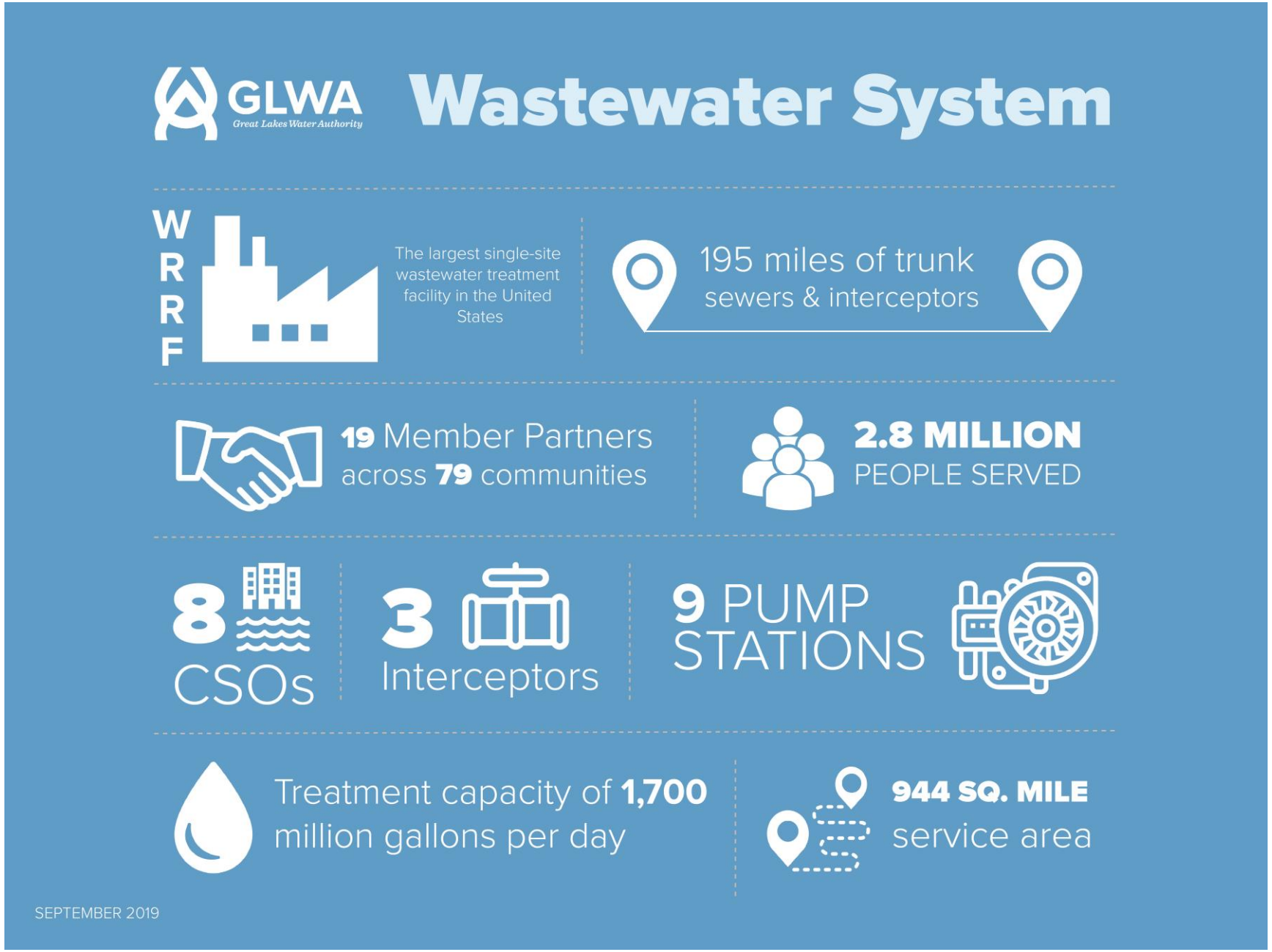
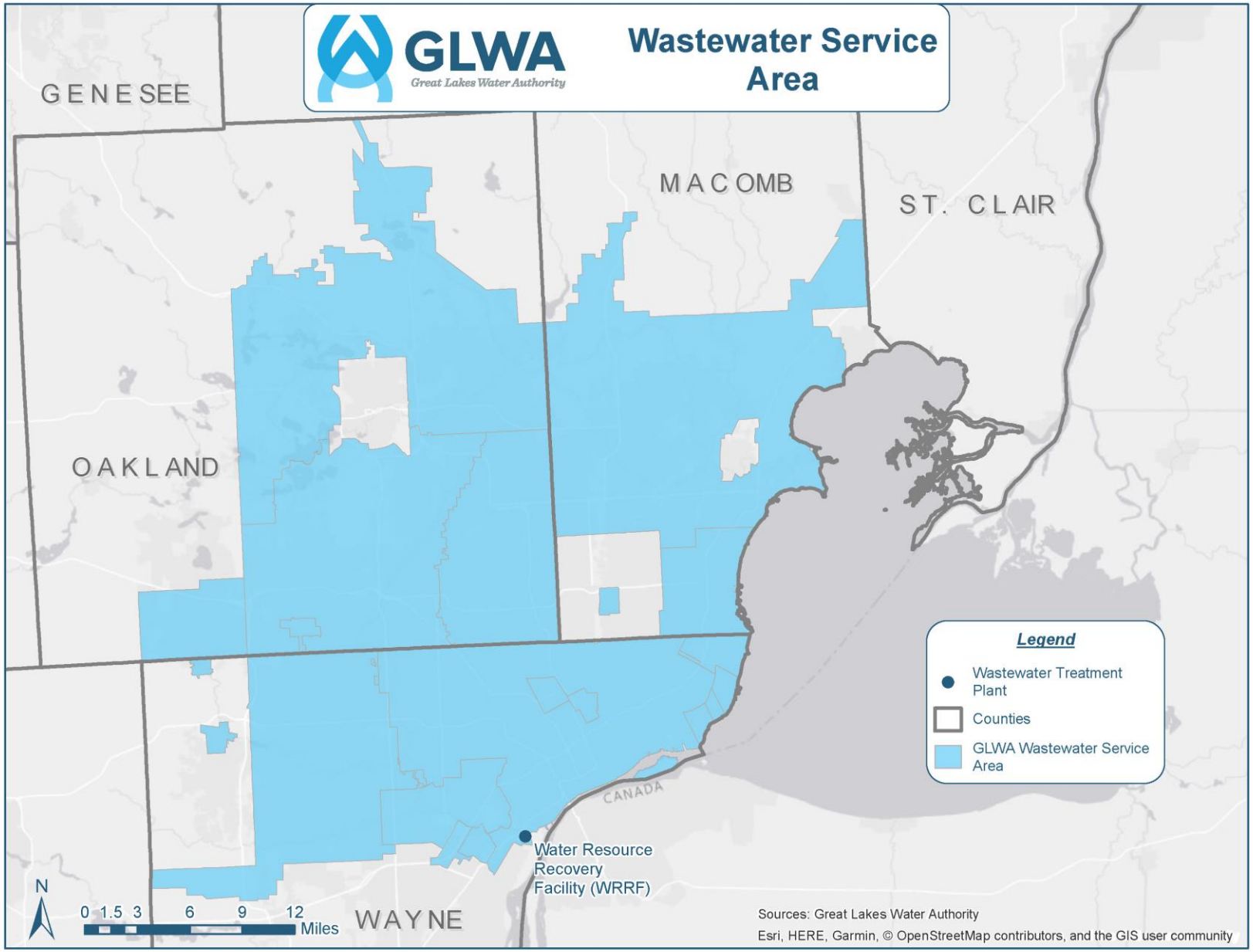

GLWA
Great Lakes Water Authority
Water System
5
Treatment Plants
816 miles of
transmission main
88 Member Partners
across 112 communities
3.8 MILLION
PEOPLE SERVED
3 Water
Intakes
19 BOOSTER
PUMP STATIONS
Treatment capacity of 1,720
million gallons per day
1,698 SQ. MILE
service area
SEPTEMBER 2019


GLWA
Great Lakes Water Authority
Water Service Area
(Including Backups)
GENESEE
LAPEER
ST. CLAIR
MACOMB
OAKLAND
LIVINGSTON
WASHTENAW
WAYNE
MONROE
Lake Huron Water Treatment Plant
Northeast Water Treatment Plant
Springwells Water Treatment Plant
Water Works Park Plant
Southwest Water Treatment Plant
Legend
Water Treatment Plants
Counties
Water Service Backups
GLWA Water Service Area
N
0 2.5 5 10 15 20
Miles
Sources: Great Lakes Water Authority
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community


GLWA
Great Lakes Water Authority
Wastewater System
WRRF
The largest single-site wastewater treatment facility in the United States
195 miles of trunk sewers & interceptors
19 Member Partners across 79 communities
2.8 MILLION PEOPLE SERVED
8 CSOs
3 Interceptors
9 PUMP STATIONS
Treatment capacity of 1,700 million gallons per day
944 SQ. MILE service area
SEPTEMBER 2019


GLWA
Great Lakes Water Authority
Wastewater Service Area
GENESEE
MACOMB
ST. CLAIR
OAKLAND
WAYNE
CANADA
Legend
Wastewater Treatment Plant
Counties
GLWA Wastewater Service Area
Water Resource Recovery Facility (WRRF)
N
0 1.5 3 6 9 12
Miles
Sources: Great Lakes Water Authority
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

AVEVA

GLWA Systems Control Center

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Challenge

- Permit Compliance
- Optimization of the Sewer Collection System to minimize the environmental impacts
- Regional Operations Coordination
- 55+ facilities and 500+ remote facilities
  - 24/7 real-time data
- Need for better understanding of the data

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Solution

- PI Integrator for Esri ArcGIS
  - Spatial visualization
  - Integration of real-time data with GIS
  - Accessibility through desktop and mobile devices
  - Optimization of water and wastewater operations
- PI Vision Dashboards
  - Created PI Vision Dashboards with aggregated data from different system
- PI DataLink
  - Utilized PI Datalink to create Hydraulic Viewer for better visualization

Types of Data

Sewer Levels	River Levels	Rain Gages	Sewer Meters
Sewer Pump Stations	CSO Basin	WRRF	Water Quality Monitors
Backwater Gate Proximity Switches	Inclinometers	Inflatable Dams	Valve Remotes

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Multiple Systems

DCS

Rockwell

Schneider

Telog

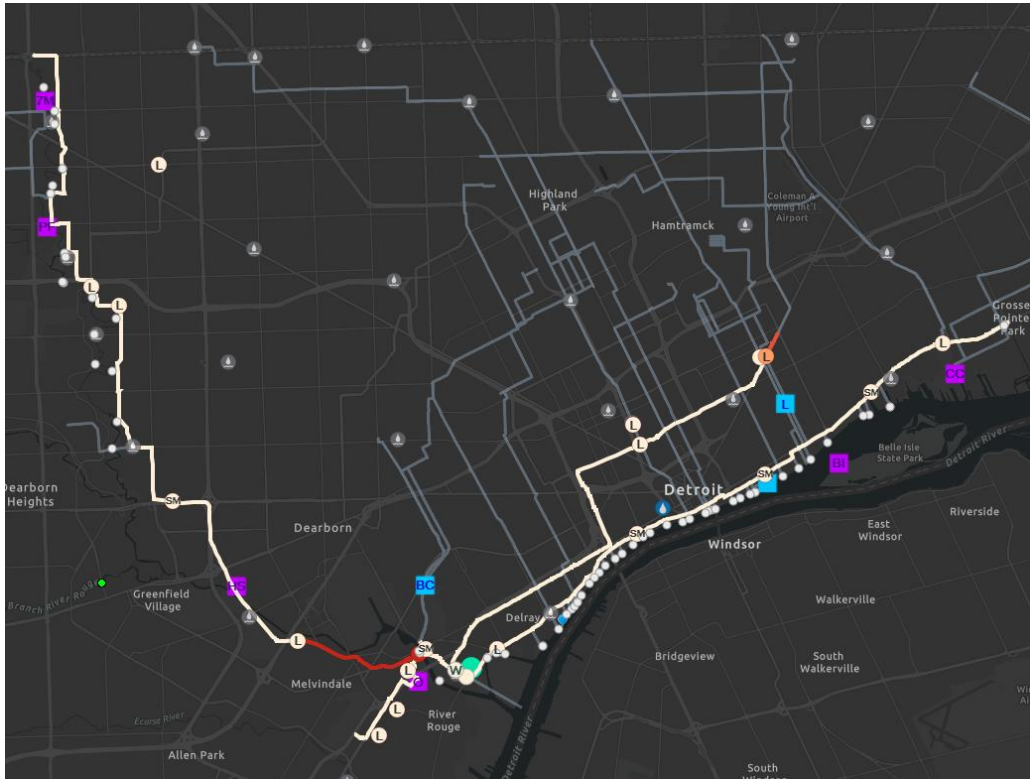
ADS Flowmeter

Ayekka

AMR/Oracle

Sewer Services: Wet Weather Map

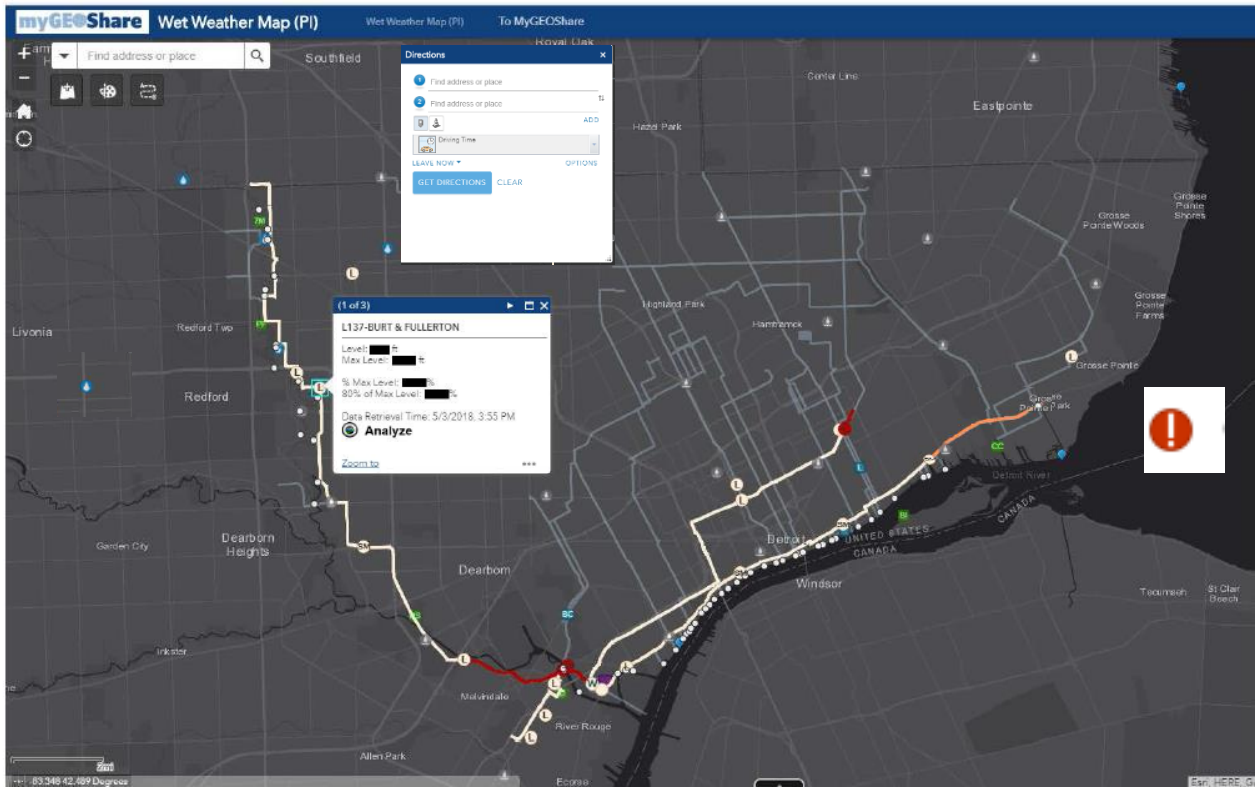
- Wet Weather Map Project Team
  - GLWA Systems Control and IT
    Softwares: PI Integrator for Esri ArcGIS
  - Displays real-time data of remote sites along three major interceptors



Source:https://dwsd.maps.arcgis.com/apps/webappviewer/index.html?appid=2a0cc7daf20144c0b35e502ccf91e896

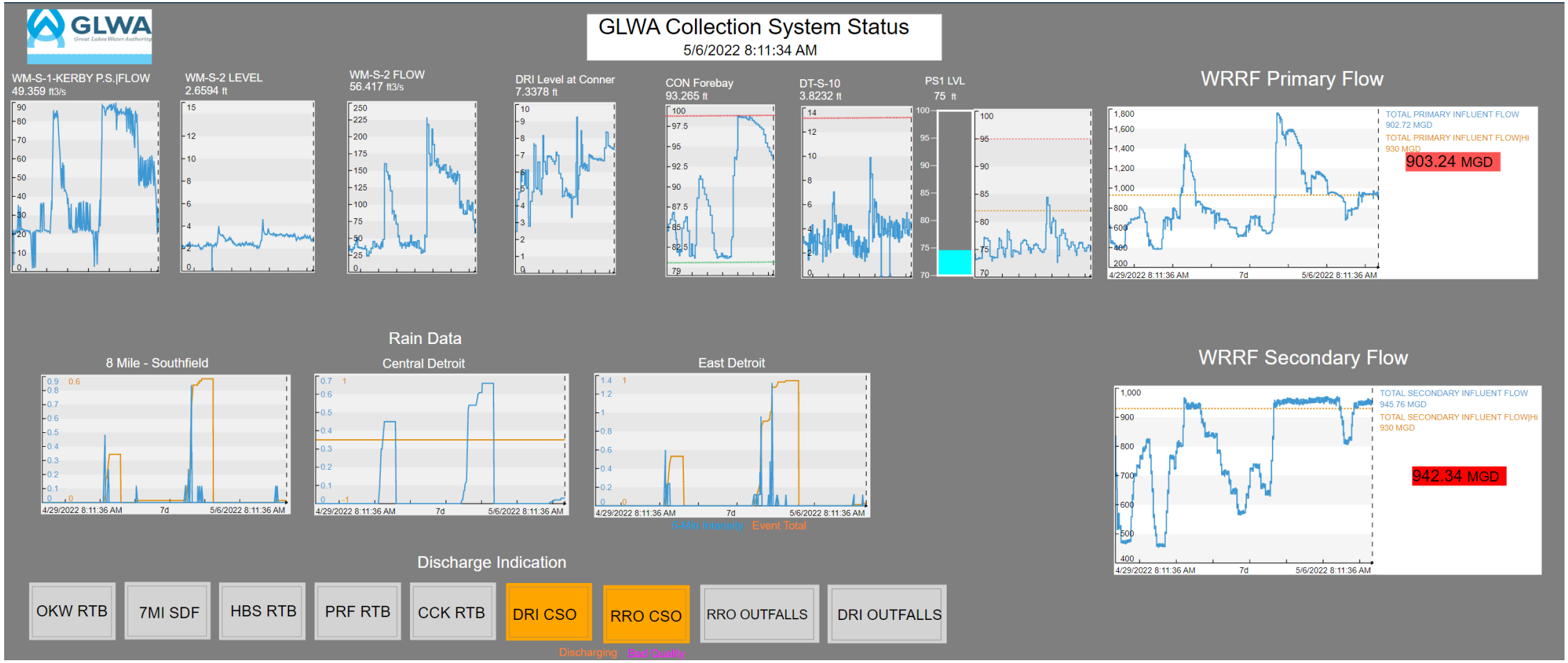
Sewer Services: Wet Weather Map

- Features:
  - Pop-up box with attribute information
  - Interceptor segments' capacity
  - Outfall sites discharging
  - Raining
  - Forecasted precipitation
  - Driving directions
  - Mobile app

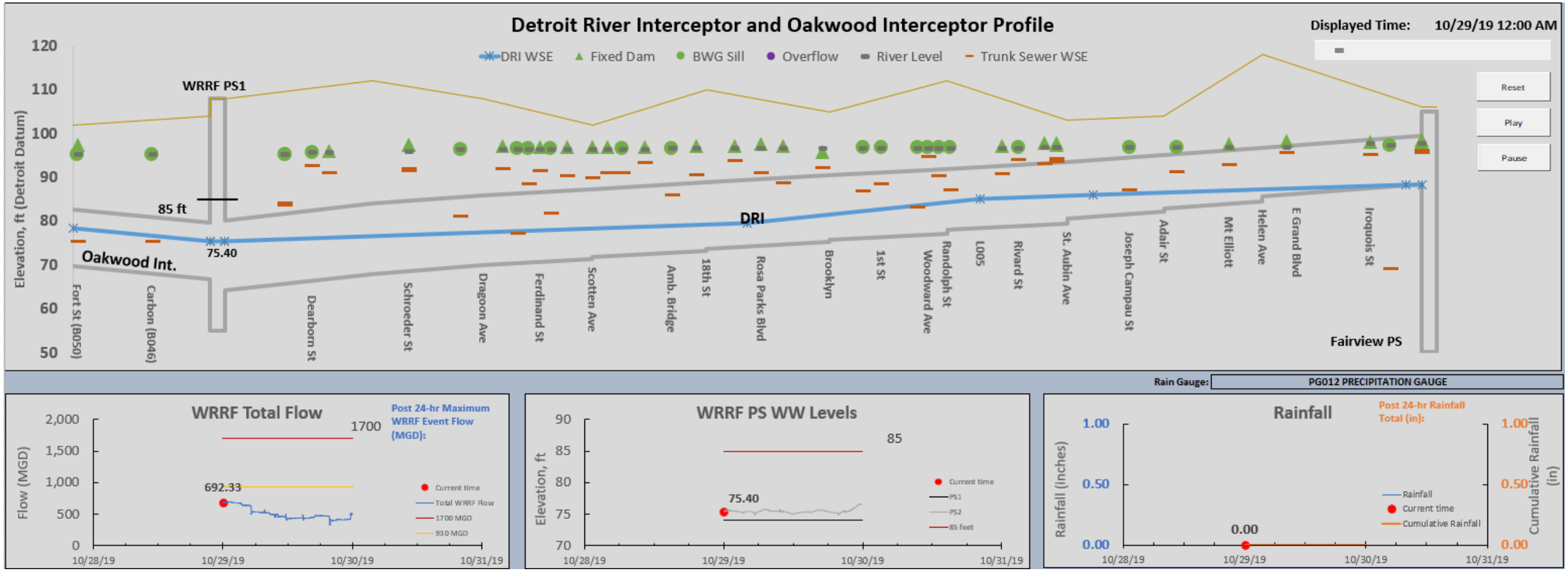


Source: https://dwsd.maps.arcgis.com/apps/webappviewer/index.html?appid=2a0cc7daf20144c0b35e502ccf91e896

Regional Operations

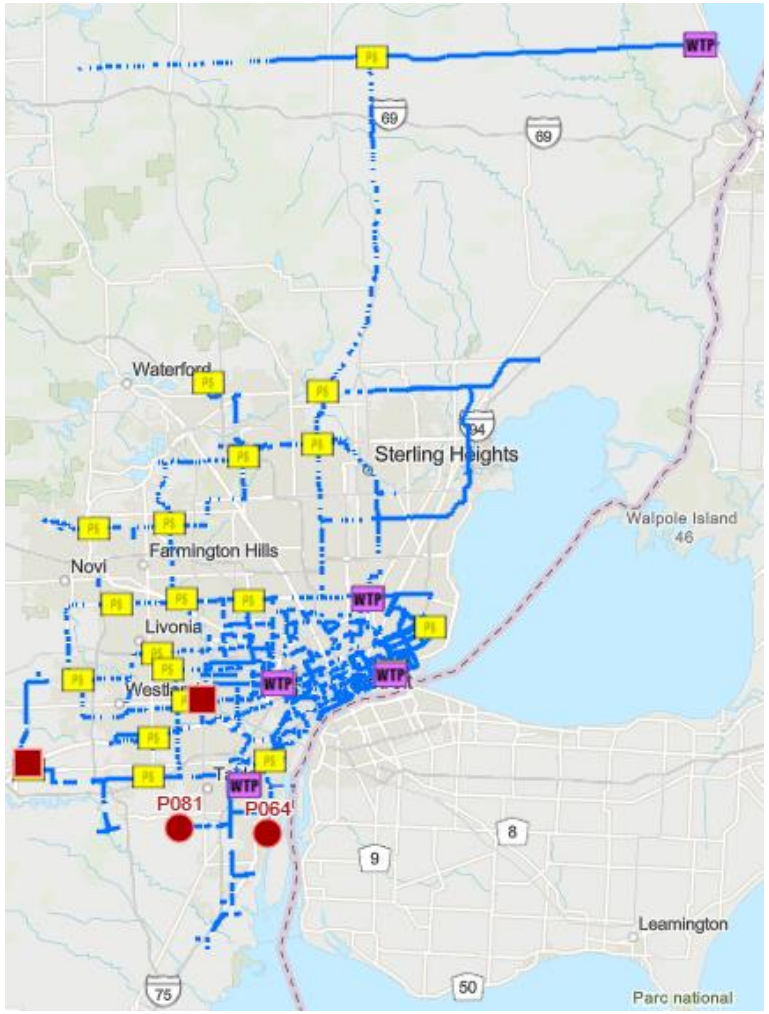


Sewer Hydraulic Viewer



Water Services: Fresh Water Map

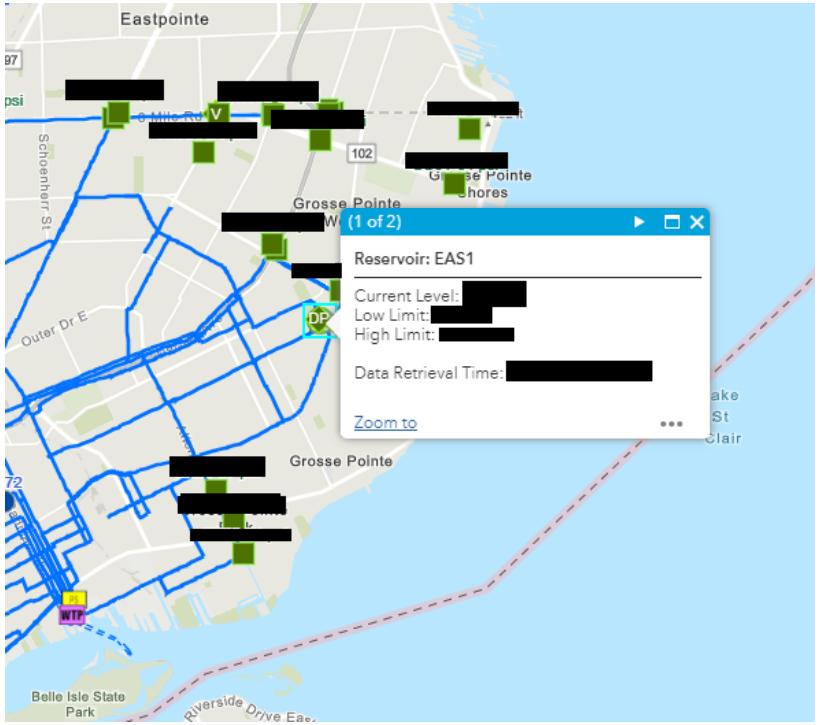
Displays Facility and Remote Sites Data along the transmission lines on a GIS Map

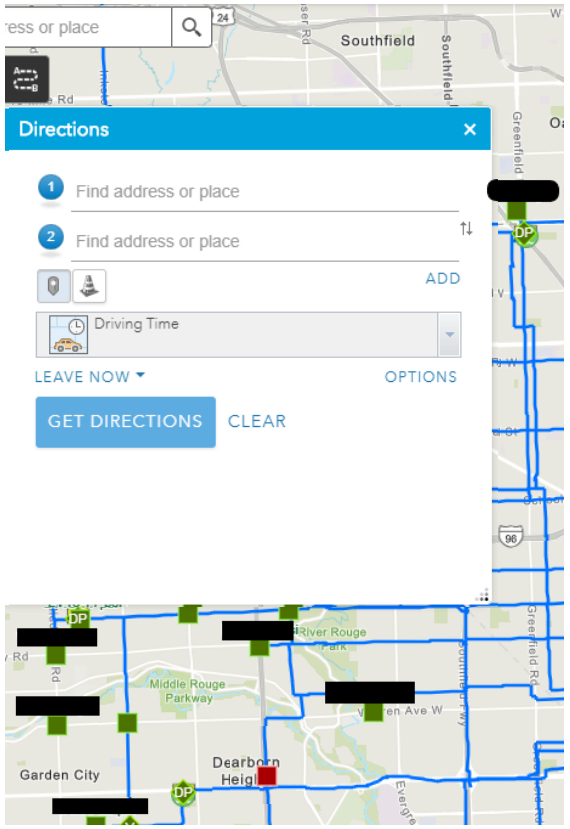


Source:https://dwsd.maps.arcgis.com/home/webmap/viewer.html?webmap=89907f7ca5d54dccb5bb7e2c37ccd85c

Water Services: Fresh Water Map

- Features:
  - Facilities and Remote Site Data:
    - Pressure
    - Reservoir Levels
    - Alarms
- Driving Directions





Source: https://dwsd.maps.arcgis.com/apps/webappviewer/index.html?appid=6e8dc394832640469752b141bf0098cf

World-class upstream operations

GLWA
Great Lakes Water Authority

Challenge

- Better spatial visualization of day-to-day operations of the Water and Sewer Systems.

Solution

- Deployed the latest AVEVA PI System technology including PI Integrator for Esri AcrGIS, PI Vision and PI Datalink to create GIS Based real-time dashboards

Benefits

- Improved communication and user engagement among inter-departments. Enables GLWA to host other community's data.
- Response Time has improved for Regulatory Reporting.
- Since becoming live, users have increased by 25% to date.

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Thank You

- Biren Saparia
- Manager, Systems Control Center
- Great Lakes Water Authority
- Biren.saparia@glwater.org

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