



# DUPAGECOUNTY

## STORMWATER MANAGEMENT



### East Branch DuPage River Watershed Based Plan Incorporating GIS Tools & Apps in Watershed Planning

# Background

## DuPage County, IL

- Located just west of Chicago/ Cook County
- Population: 926,000 (2nd most populous in IL)
- 336 square miles



**DUPAGE**COUNTY



STORMWATER MANAGEMENT

# Who Are We?



## Stormwater Management in DuPage County

- Countywide program established in 1989
- Guided by the Stormwater Management Planning Committee & Plan
- Enforce the Countywide Stormwater Management & Floodplain Ordinance
- Flood Control Facilities have a floodwater capacity of nearly 6 billion gallons

### Programs

- Watershed Management
- Water Quality
- Floodplain Mapping
- Regulatory Services
- Flood Control Operations & Maintenance
- Shared Services



**DUPAGE**COUNTY



STORMWATER MANAGEMENT

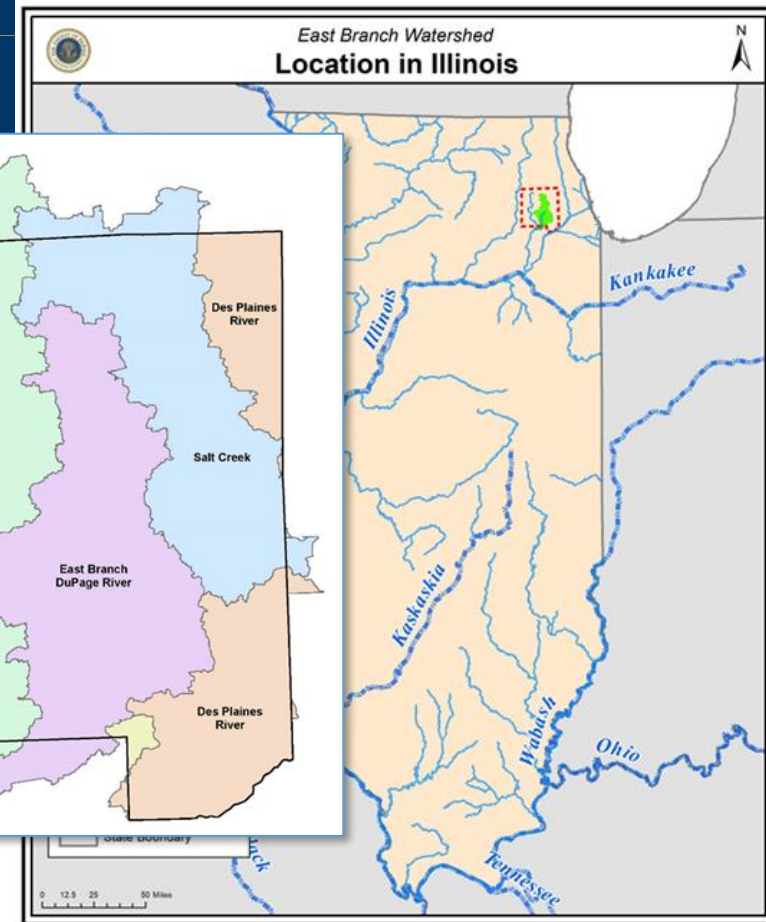
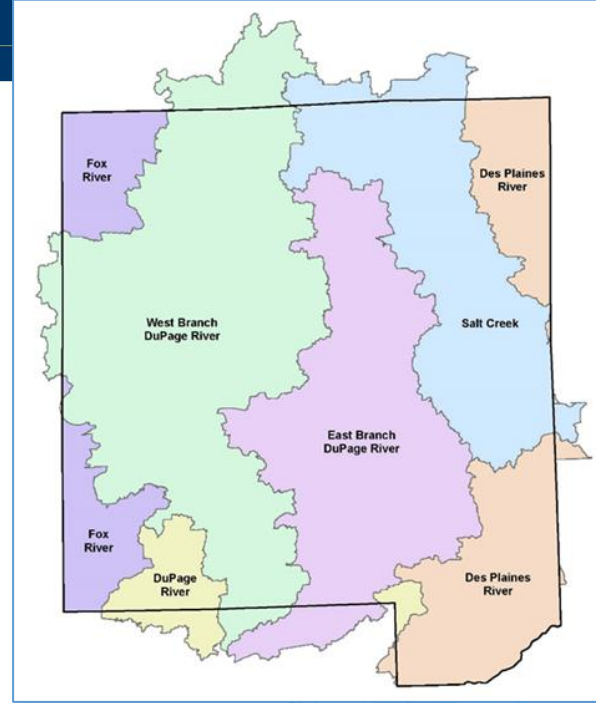
# Background

## East Branch DuPage River

- Drains to DuPage River, Des Plaines, Illinois
- 211 Stream Miles

## East Branch Watershed

- One of Three Major Watersheds in DuPage County
- 81 Square Mile Watershed
- 16 Municipalities



# East Branch Watershed Plan



## Background

- DuPage County received IEPA 604b grant to study the East Branch DuPage River
- Identify causes of water quality issues and identify potential solutions
- Projects and programs identified in plan are more eligible for IEPA 319 grant funding

## Missions:

To convene local organizations and individuals who have a mutual interest in protecting and preserving the quality of natural resources within their respective watershed.

To improve the quality of the East Branch DuPage River and surrounding watershed to meet federal, statewide, and regional water quality initiatives.

# Goals of Water Quality Plan



## 9 Minimum Control Measures required by EPA

- Identify causes
- Estimate load reduction
- Describe critical areas
- Estimate assistance needed
- Education component
- Project schedule
- Milestones
- Indicators
- Monitoring component



**DUPAGE**COUNTY



STORMWATER MANAGEMENT



# East Branch Watershed



## Urban Pollutants & Sources

- Nutrients/ phosphorus – point sources, urban runoff
- Algae – point sources, urban runoff
- Dissolved oxygen – urban runoff, hydromodifications
- Sediment – stream alterations/ erosion, hydromodification, storm sewers
- Oil & grease – urban runoff, point sources
- Pesticides – lawns and gardens
- Fecal coliform –pet waste, failing septic systems, sanitary sewer overflows
- Chlorides – road salt, water softeners
- Heavy metals – roof shingles, motor vehicles
- Legacy contaminants- arsenic, methoxychlor, hexachlorobenzene, dieldrin



**DUPAGE**COUNTY



STORMWATER MANAGEMENT

# East Branch Watershed



## Non-Pollutant Related Impairments

- Flow regime alterations
- Alterations to stream-side vegetative cover
- Loss of instream cover
- Change in stream depth and velocity patterns



**DUPAGE**COUNTY



STORMWATER MANAGEMENT





# DUPAGECOUNTY

STORMWATER MANAGEMENT

## East Branch DuPage River Watershed Plan

Field Data Collection



# Detention Basin Assessments



## East Branch Basins

- 1084 basins identified through aerial imagery and from municipal data

## Assessments

- Basin Type
- Vegetative Coverage
- Slope
- Erosion
- Overall Basin Quality
- Photos





# Stream & Lake Assessments

## Assessments

- Channelization
- Erosion
- Riparian Buffer
- QHEI

## Streambank Erosion

Quantify pounds per year sediment & nutrient loss using STEPL modeling

- Height
- Length
- Lateral Recession Rate



# Streambank Erosion Measurements



## On Foot

- Less equipment needed,
- Easy access to banks for measurement

## Kayak

- Full access to river
- No private property restrictions

## Drone

- Can see hard to access areas, tributaries
- Must estimate measurements



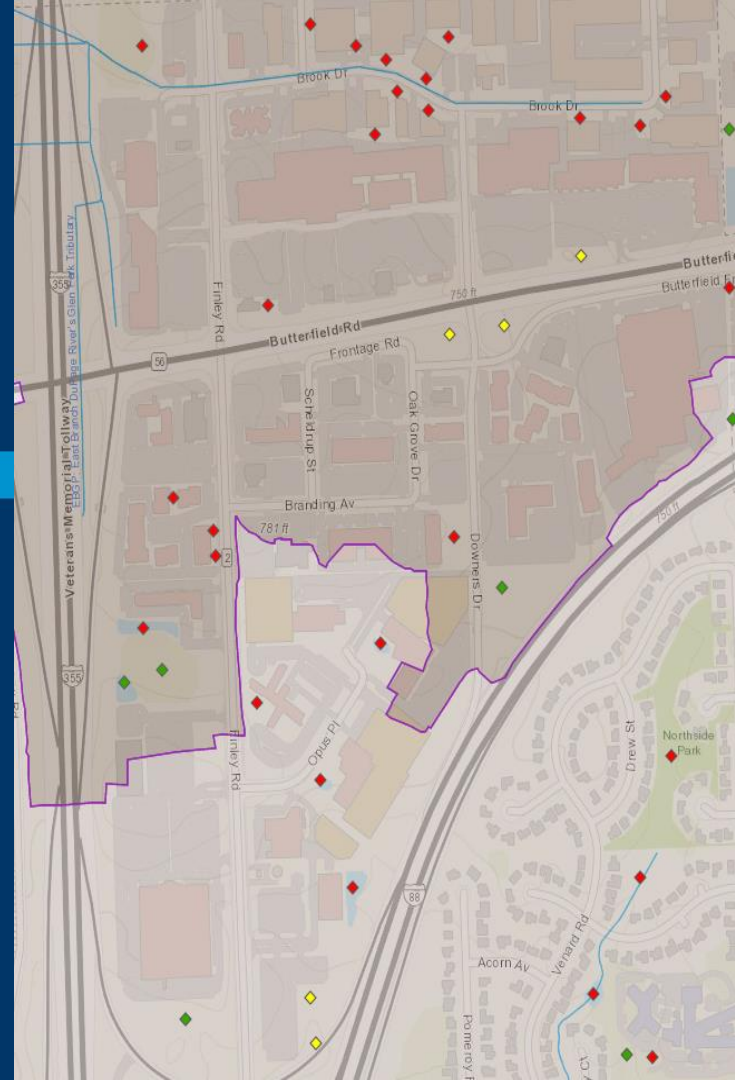


# DUPAGECOUNTY

STORMWATER MANAGEMENT

## East Branch DuPage River Watershed Plan

### Desktop Data Collection

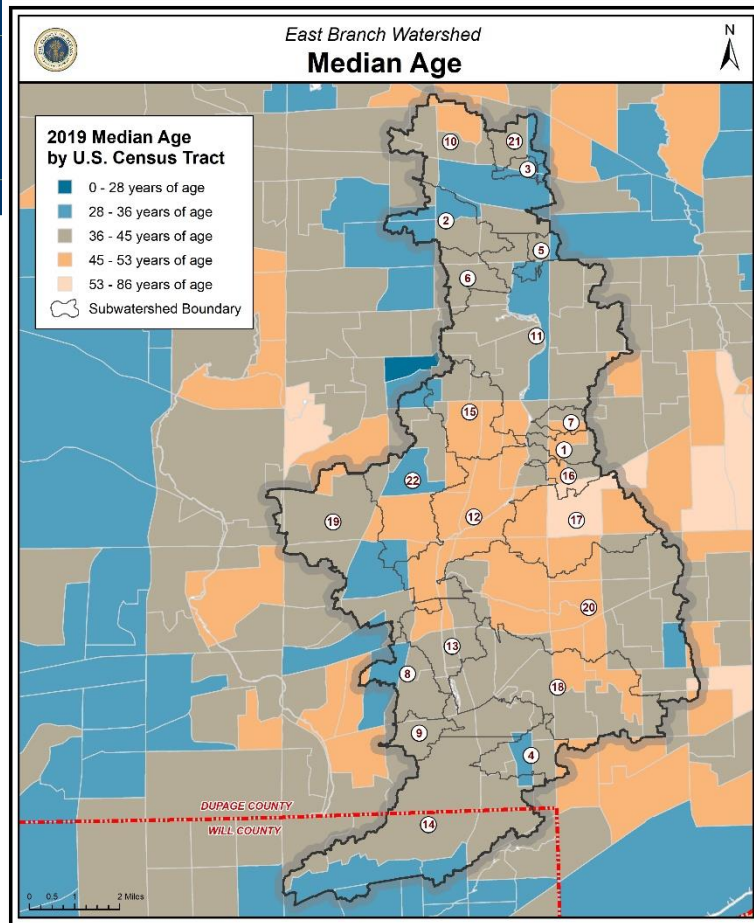




# Watershed Resource Inventory

## GIS Data

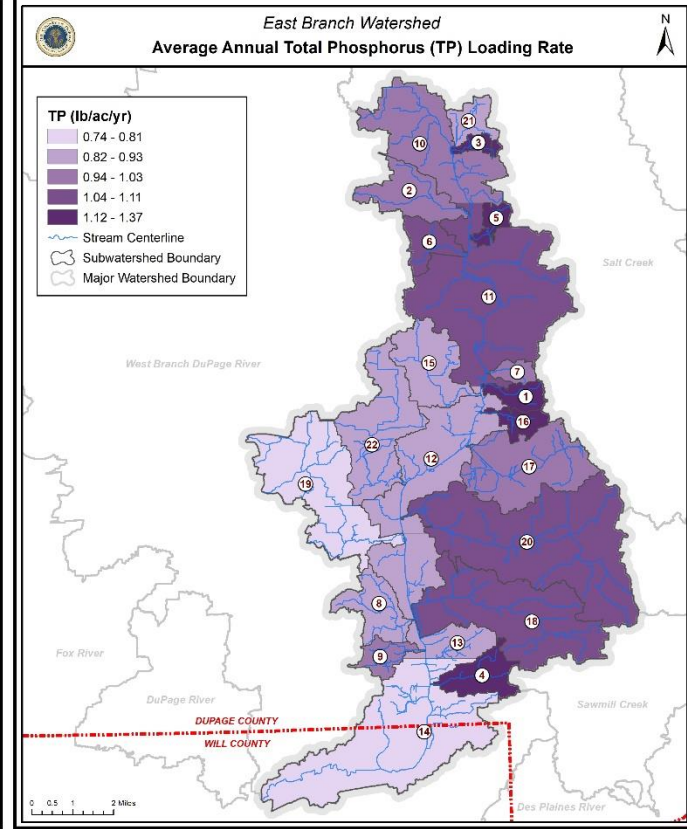
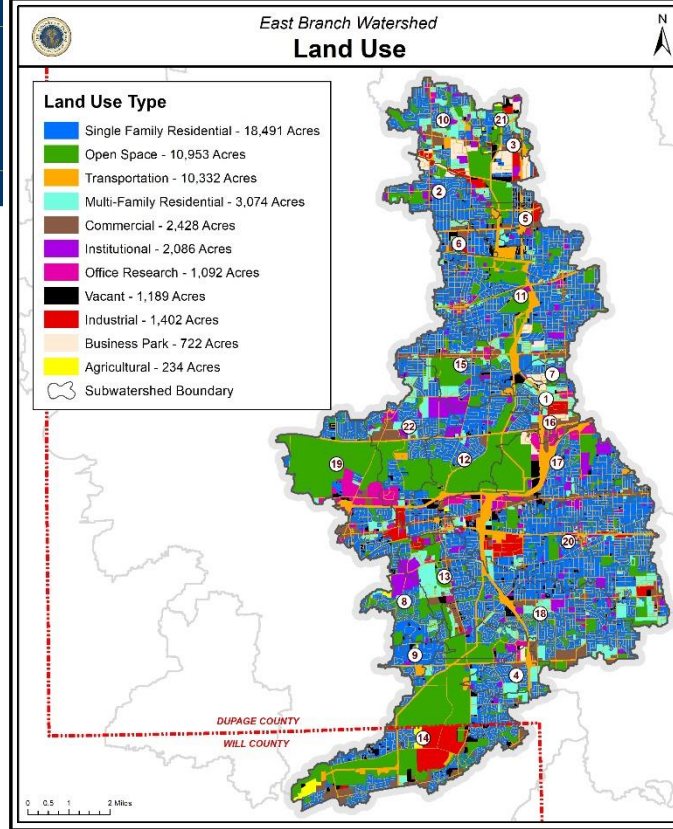
- Population Density & Growth
- Median Age
- Median Income
- Unemployment Rate
- Environmental Justice
- Soils
- Topography
- Wetlands
- Floodplains
- Land Use
- Drainage System
- Subwatersheds



# Land Use

## Pollution Loading By Land Use

- Different Land Use = Different Pollutants
- Use STEPL Modeling to Allocate lbs/year



**DUPAGE**COUNTY

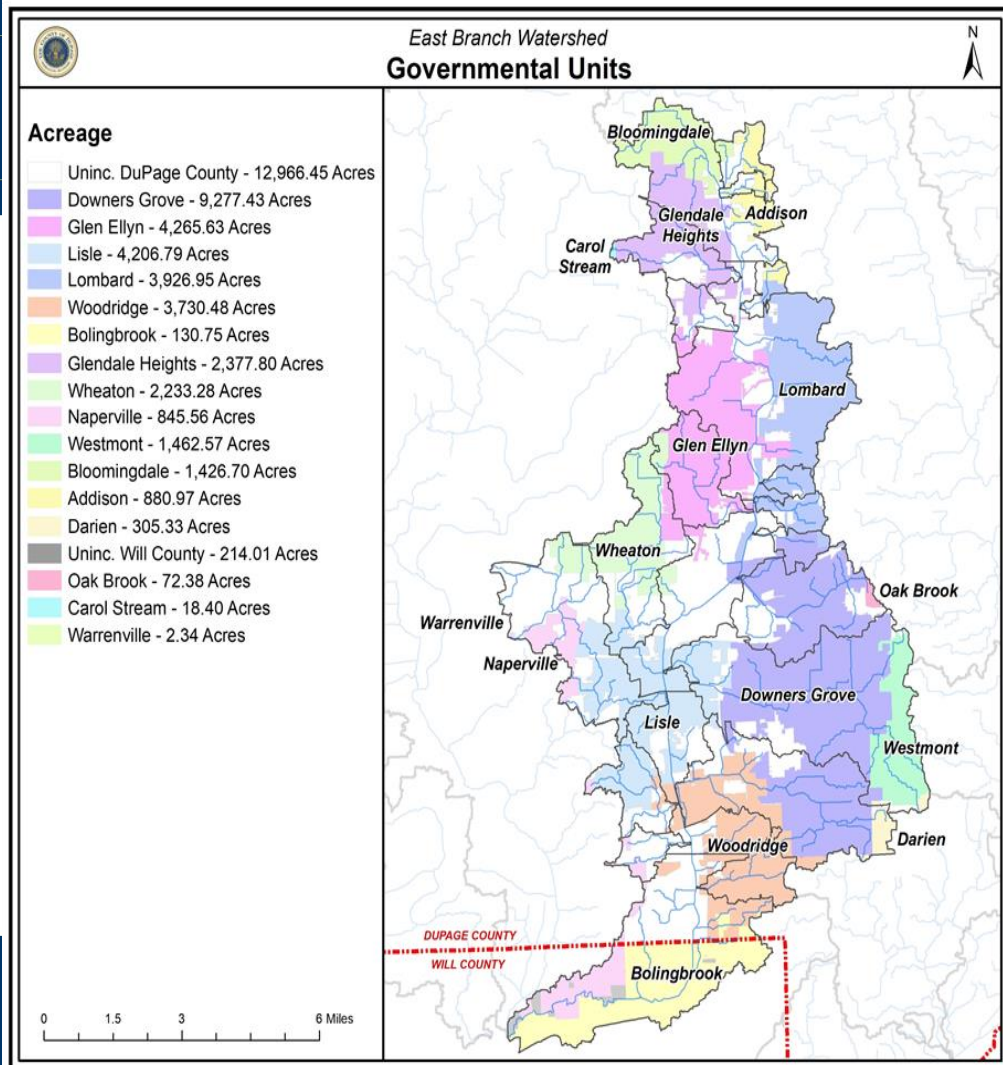


STORMWATER MANAGEMENT

# East Branch Watershed

## Steering Committee

- Representatives from 16 Municipalities and 2 Counties, Tollway, Forest Preserve
- Business owners, utilities, organizations





# Stakeholder Meetings



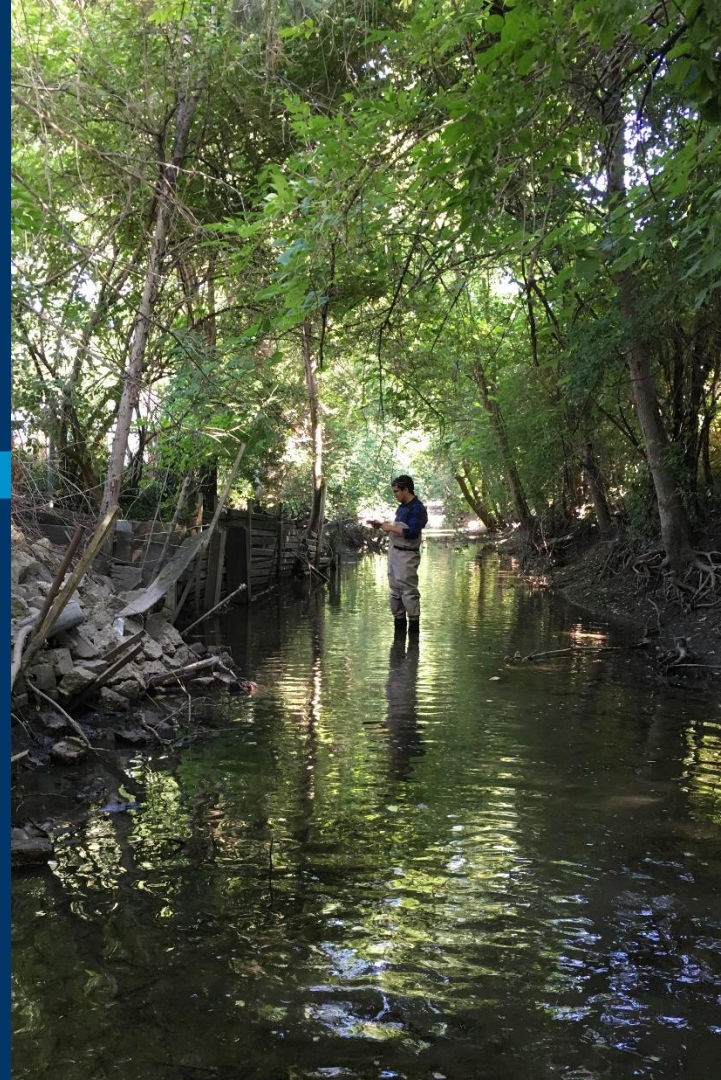


# DUPAGECOUNTY

STORMWATER MANAGEMENT

## East Branch DuPage River Watershed Plan

### Web Data Collection & Analysis





# East Branch (EB) Study

## Web Data Collection and Analysis

- EB Basins Assessment
- EB Erosion Assessment
- EB Critical Areas



**DUPAGE**COUNTY

Love Blue. Live Green.



STORMWATER MANAGEMENT

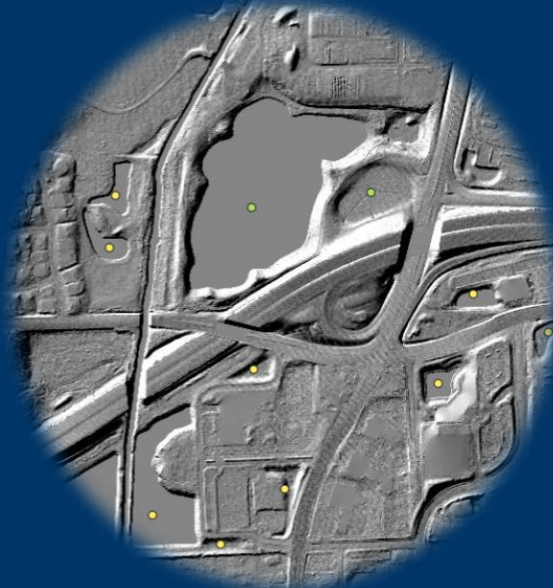




# Basins Data Collection



Satellite Imagery

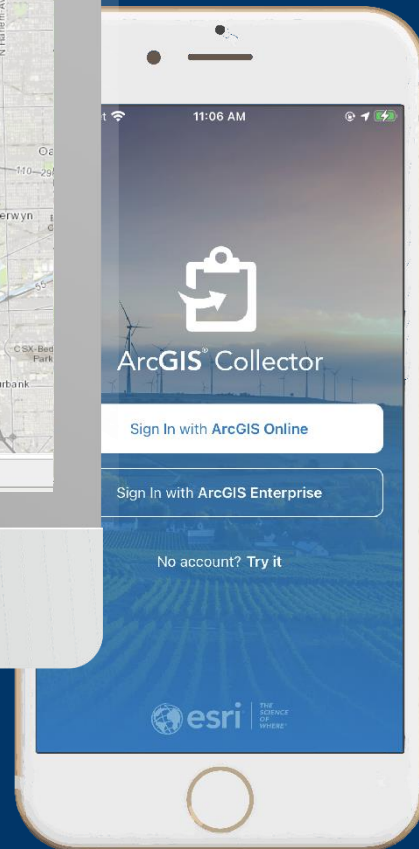
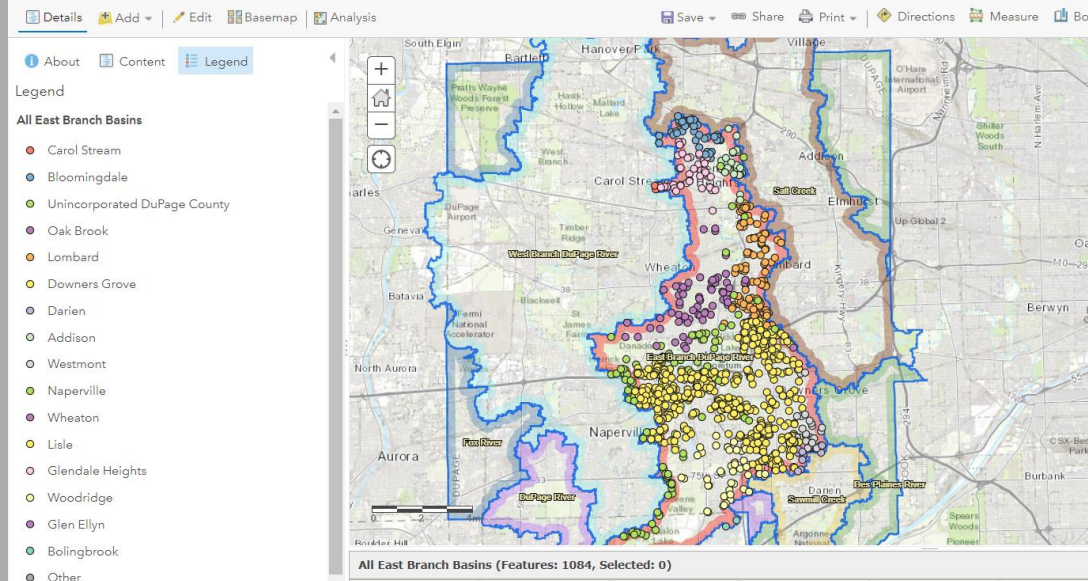


DTM Hillshade

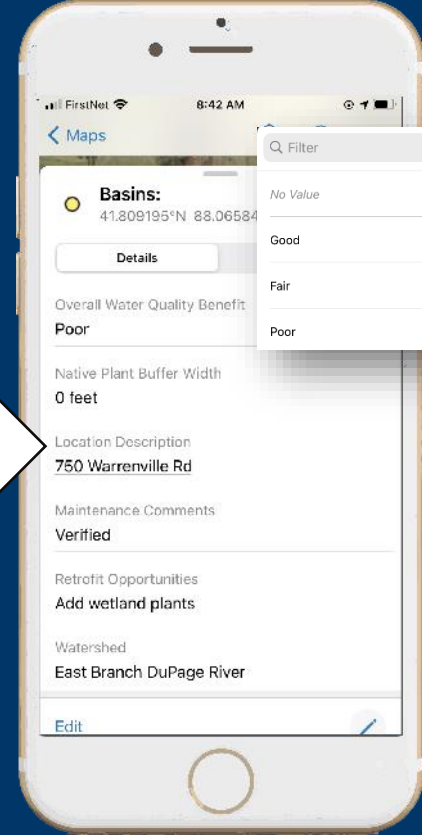
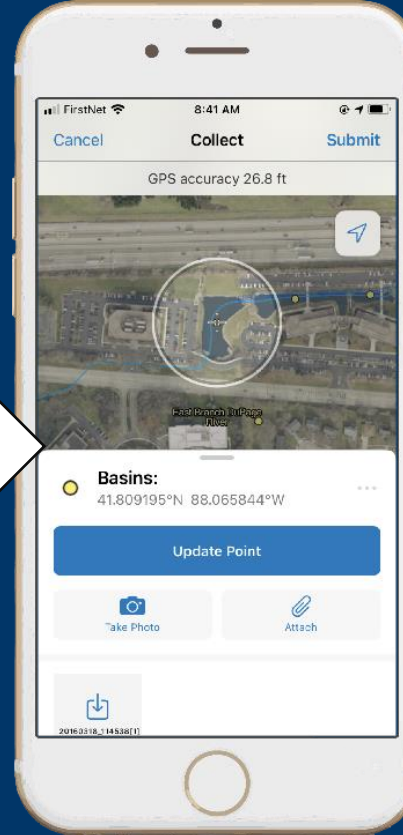
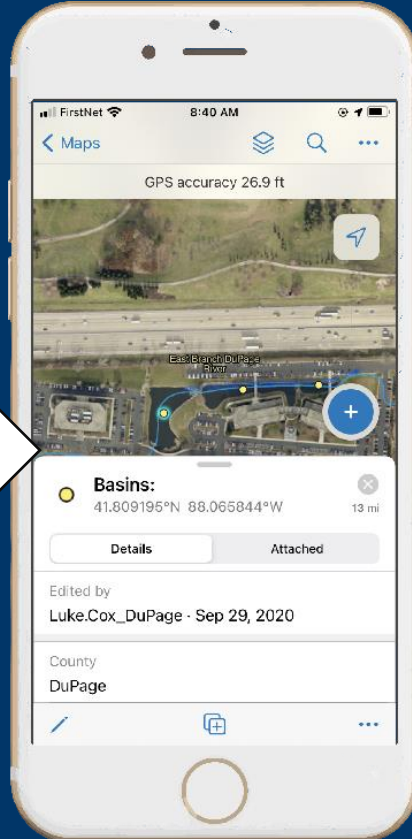
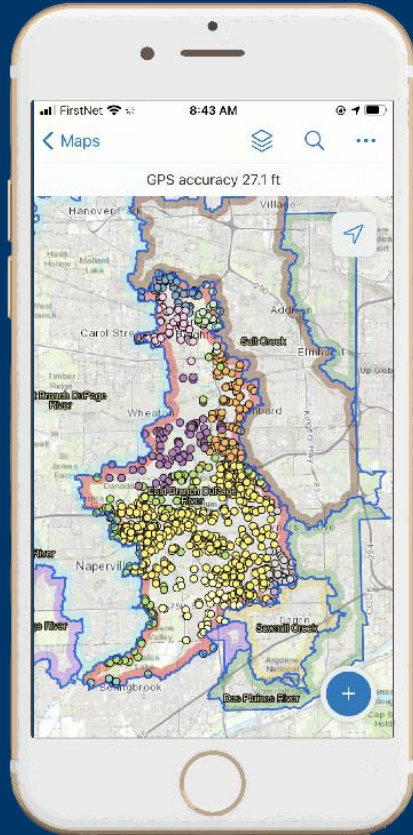
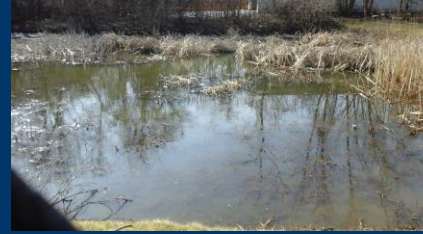


Municipalities

# Basins Assessment



# ArcGIS Collector





# Basins Data Analysis

Totals Basins Assessed



1.1k

Remaining 0

Assessment Feeds

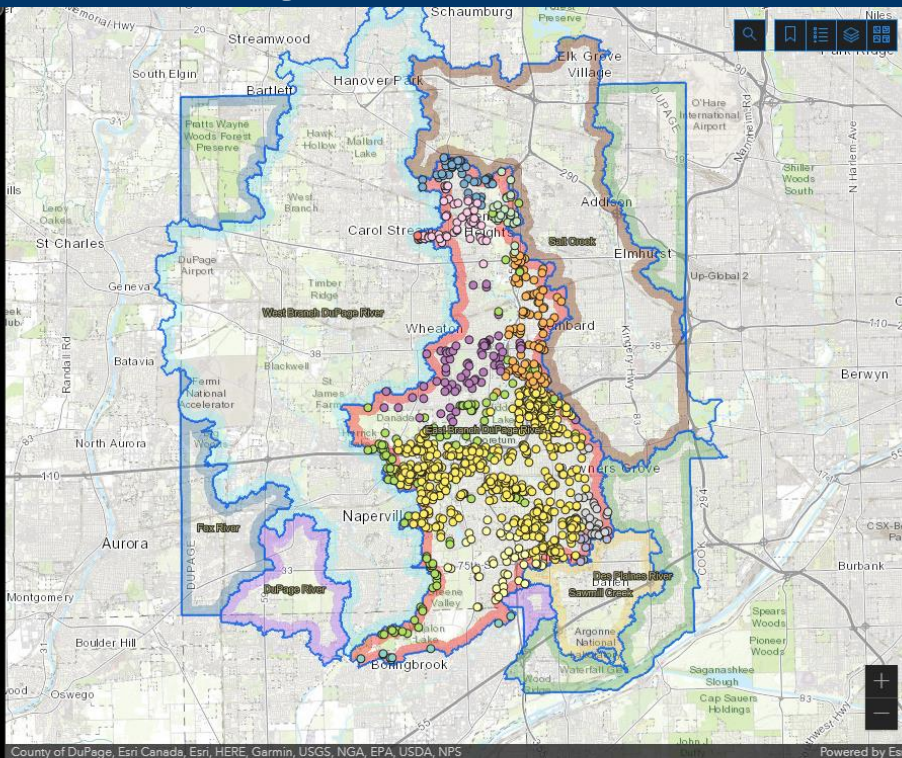
- 11/23/2020, 1:53 PM - Falsey\_DuPage
- 11/23/2020, 1:51 PM - Falsey\_DuPage
- 11/23/2020, 1:49 PM - Falsey\_DuPage
- 11/23/2020, 1:49 PM - Falsey\_DuPage
- 11/23/2020, 1:48 PM - Falsey\_DuPage
- 11/23/2020, 1:47 PM - Falsey\_DuPage
- 10/6/2020, 8:52 AM - Luke\_Cox\_DuPage
- 10/6/2020, 8:52 AM - Luke\_Cox\_DuPage
- 10/6/2020, 8:52 AM - Luke\_Cox\_DuPage
- 10/6/2020, 8:52 AM - Luke\_Cox\_DuPage
- 10/6/2020, 8:51 AM - Luke\_Cox\_DuPage

1 of 50

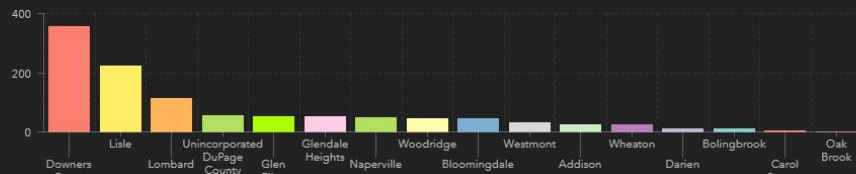
Details

Basins: Unisource South Basin

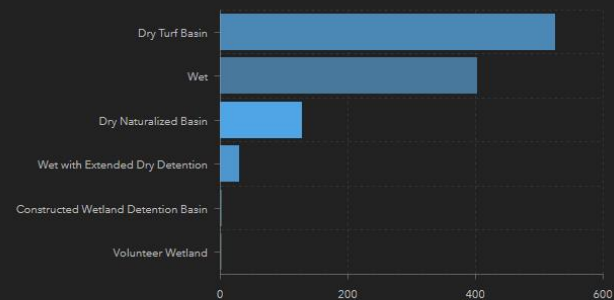
Municipality	Addison
Ownership	Private
Name of Basin	Unisource South Basin
Basin Type	Wet
Overall Water Quality Benefit	Fair
Onstream	No
Side Slope Cover	Invasive Plants
Additional Side Slope Cover	Rip Rep



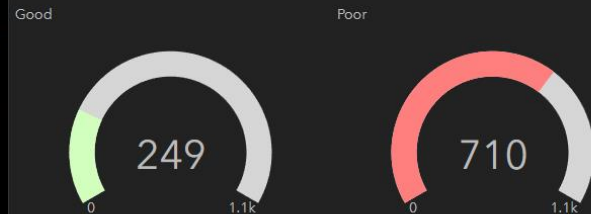
Basins Per Municipality



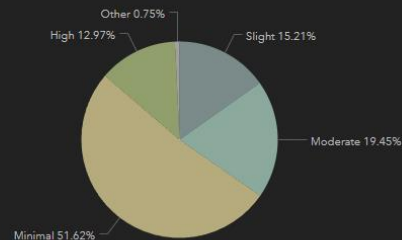
Basin Type



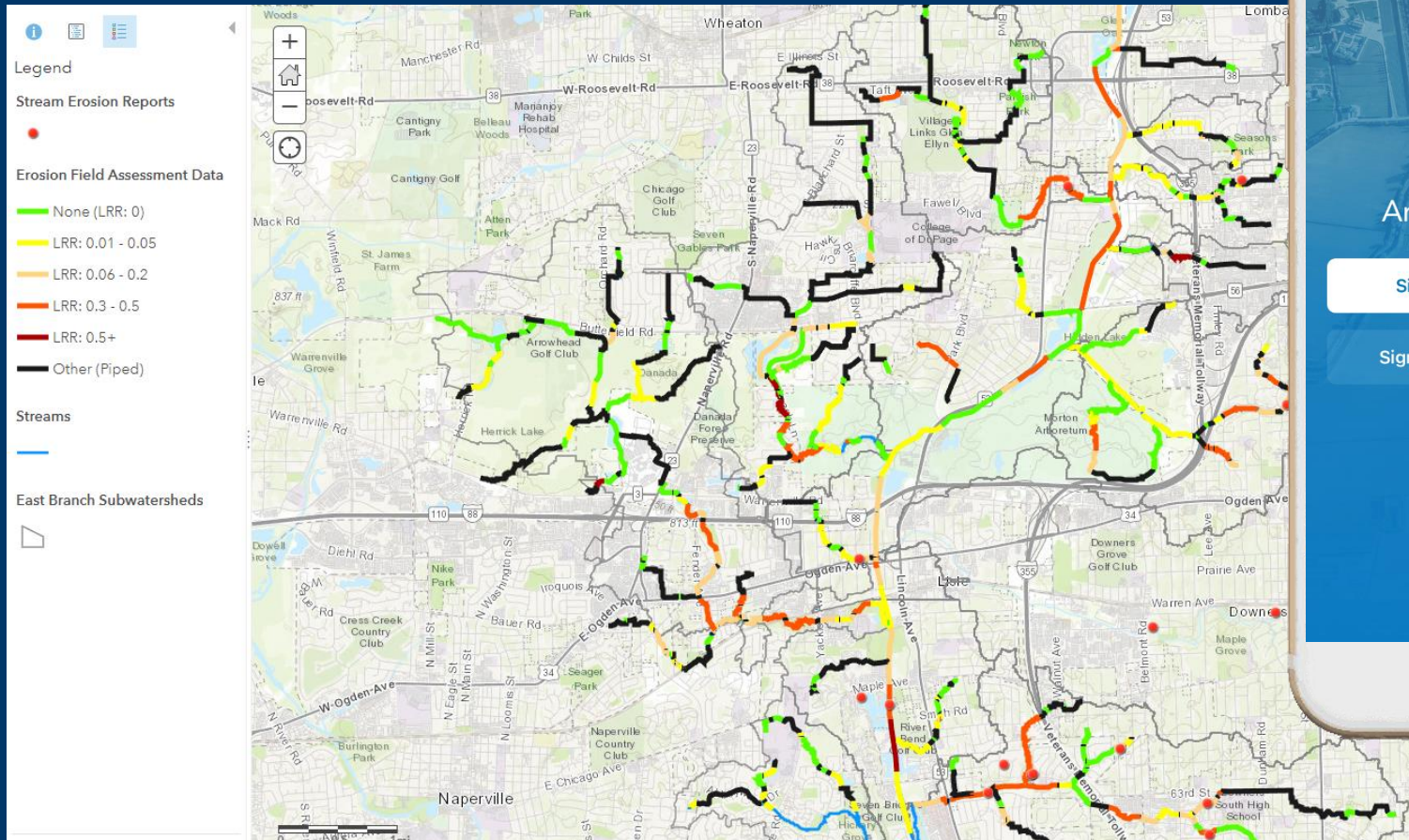
Overall Water Quality Benefits



Shoreline Erosion For Wet Basins

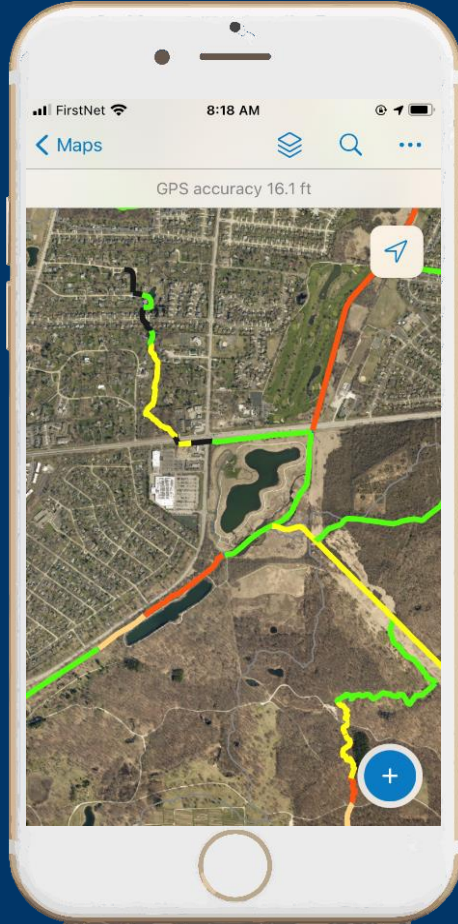


# Streambank Erosion Data Collection





# ArcGIS Field Maps



## Erosion Field Data

Inspection Date	6/4/2021, 11:12 AM
Inspector	LC
Stream Type	Open Channel
Verified	In Field
Lateral Recession Rate (ft/yr)	Severe (LRR: 0.3 - 0.5)
Erosion Height (ft) - Average of both banks	2.0
Notes	

[Zoom to](#) [Edit](#) [Get Directions](#)

- Streaming Walking Path
- Map Markups



# ArcGIS Field Maps Migration

- **Maps** – Maps that are accessible from Collector are also accessible in Field Maps.
- **Downloaded maps** – Need to be copied into the Field Maps Map Packages folder on the device.
- **App Linking** – Base URL and some parameters have changed for Field Maps.

## Layer Settings

Use HTTPS when accessing layers. [i](#)

[Update Layers to HTTPS](#)

Update ArcGIS Server site references. [i](#)

[Update References](#)

## Application Settings

Select the tools and capabilities to enable in applications that access this web map.

☒ Enable Search [-]

Hint text

Search by Address or Place

☐ By Layer

☐ By Table

☒ By Address

☒ Use in ArcGIS Collector

☒ Use in ArcGIS Field Maps Mobile

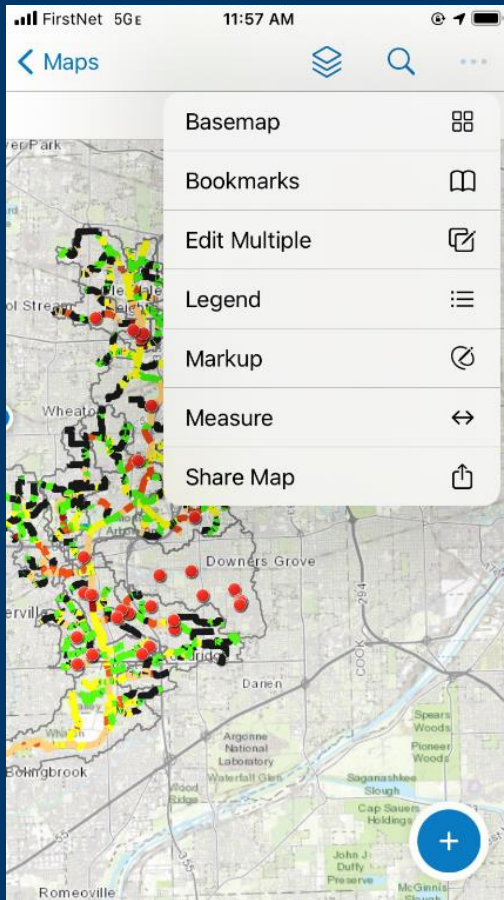


**DUPAGE**COUNTY

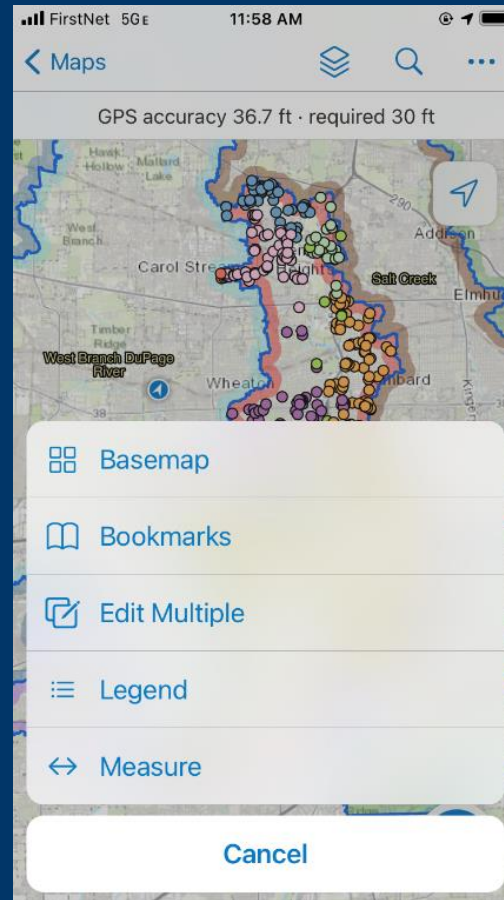


STORMWATER MANAGEMENT

# User Interface (UI)



Field Maps UI

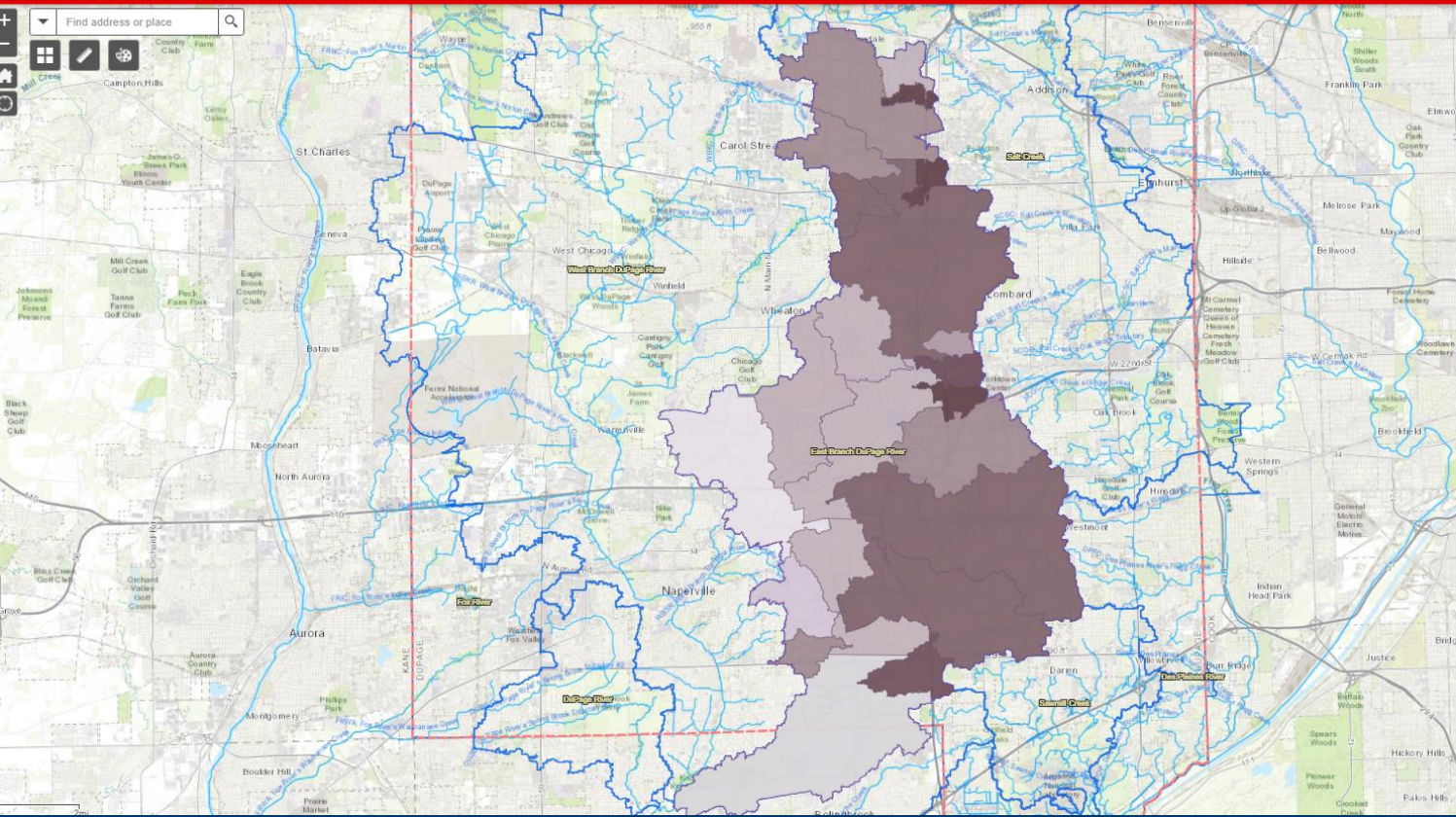


Collector UI



# East Branch Critical Areas

## East Branch Critical Areas



## Pollutant Loads

### Layers

#### ☒ Total Phosphorus (TP)

##### Phosphorus

- 1.12 - 1.37
- 1.04 - 1.11
- 0.94 - 1.03
- 0.82 - 0.93
- 0.74 - 0.81

#### ☒ Total Suspended Solids (TSS)

##### Sediment

- 0.19 - 0.20
- 0.16 - 0.18
- 0.15
- 0.13 - 0.14
- 0.11 - 0.12

#### ☒ Total Nitrogen (TN)

##### Nitrogen

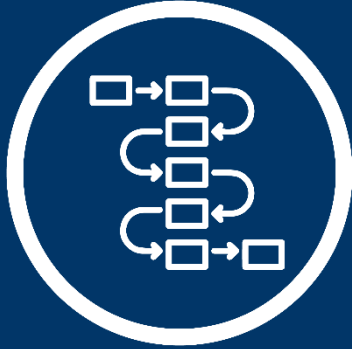
- 7.58 - 8.73
- 6.35 - 7.57
- 5.83 - 6.34
- 5.32 - 5.82
- 4.89 - 5.31

#### ☒ Biological Oxygen Demand (BOD)

##### BOD

- 26.40 - 32.52
- 23.18 - 26.39
- 21.03 - 23.17
- 19.18 - 21.02
- 17.14 - 19.17

# Benefits



Adopt modern workflows



Increase accuracy



Save time and money



Gain location perspective



Monitor status in real time



Effective communication

# Wrap Up



## Summary

- East Branch DuPage River is over 81 square miles in area with 159 stream miles to assess
- Utilizing GIS Apps and Tools allowed us to efficiently complete field inspections
- Minimized paperwork and data transfer
- Effectively communicate with stakeholders over a virtual format
- Replicable for other communities

## Next Steps

- Continue working with stakeholders to finalize projects
- Modeling pollutant load reductions
- Work with stakeholders on goals and milestones
- Submit to IEPA for review and approval by the end of 2022



# Questions?



## Tamara Freihat

GIS Analyst

DuPage County Stormwater  
Management

(630) 407-6717

[tamara.freihat@dupageco.org](mailto:tamara.freihat@dupageco.org)

## Mary Beth Falsey

Water Quality Supervisor

DuPage County Stormwater  
Management

(630) 407-6680

[marybeth.falsey@dupageco.org](mailto:marybeth.falsey@dupageco.org)