Hazen

Environmental Protection Agency

Ohio Department of Natural Resources

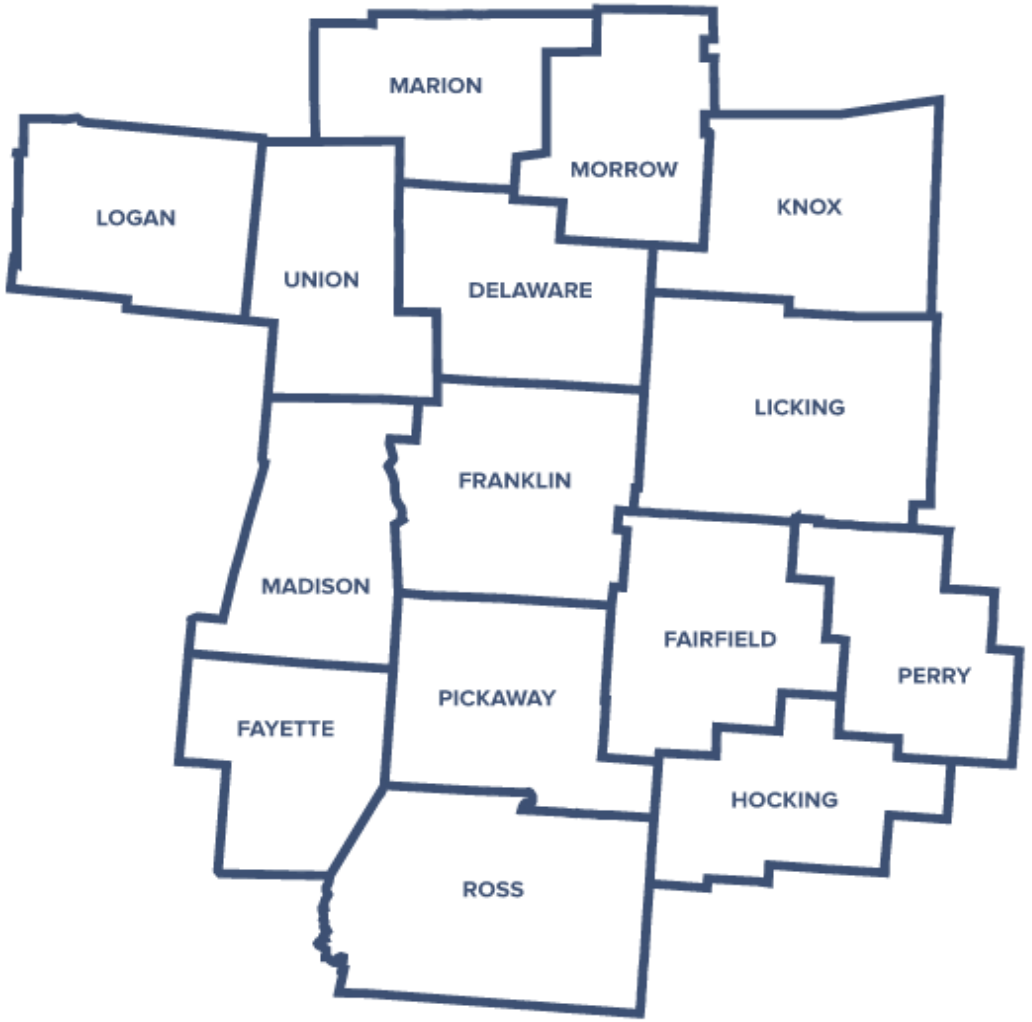
Central Ohio Regional Water Study: Delaware County

Ohio Water Development Authority

March 1, 2025

Agenda

- Introduction
- Current Conditions
- Future Conditions
- Needs Analysis
- Resource Gaps and Potential Project Options
- Areas of Opportunity
- Water Quality



Introduction

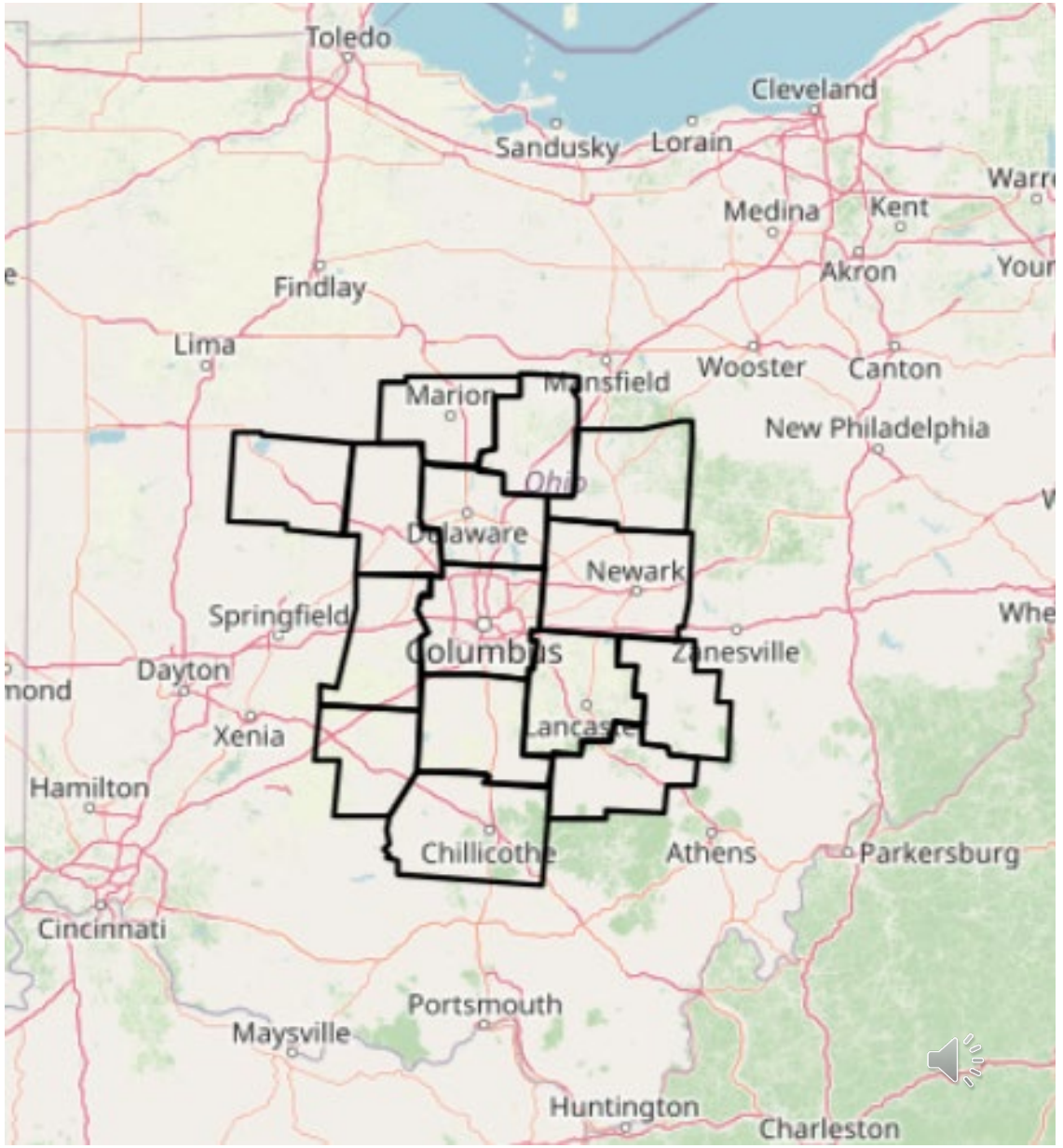
Central Ohio Regional Water Study

Overview

Integrated water resources and infrastructure model

15-county area

Goal: Identify opportunities and gaps in system's ability to meet local and regional water needs under potential future conditions (2030, 2040, 2050)



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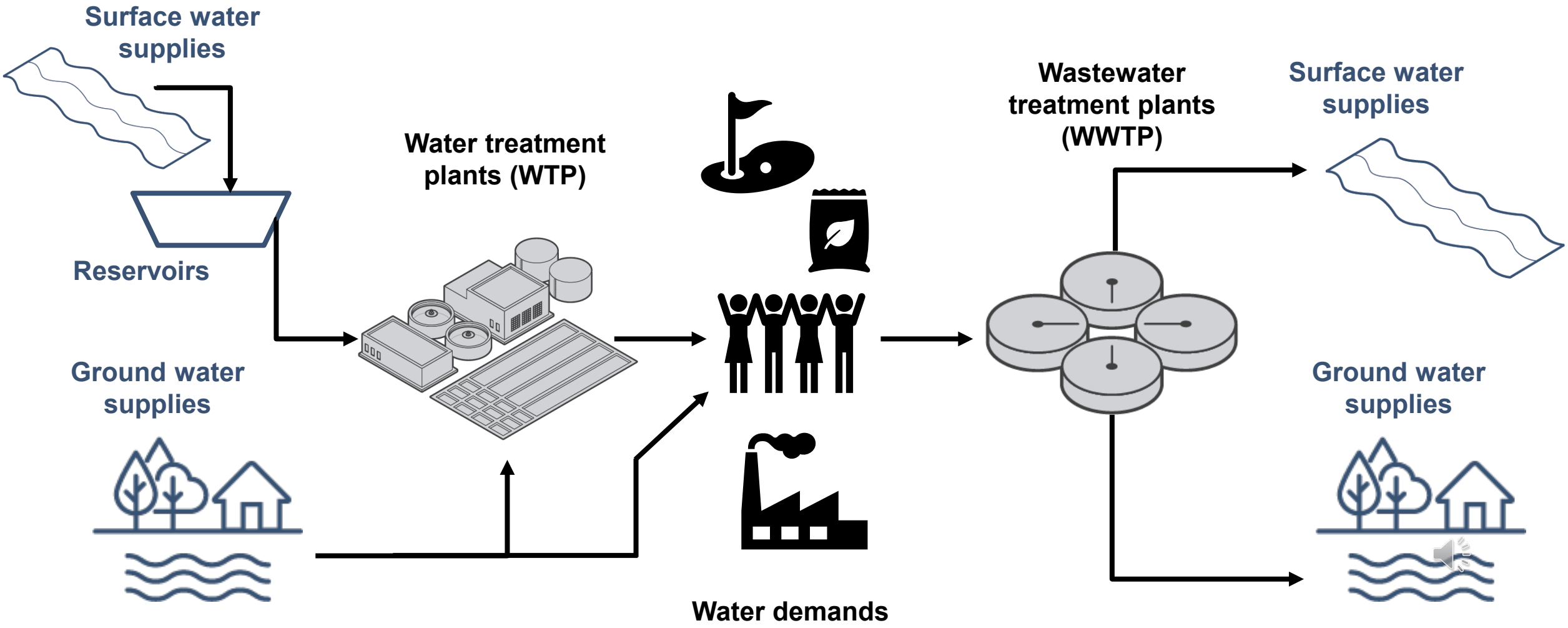
Project Objectives

- Improve, Maintain and Optimize Resources While Planning for Growth
- Identify Opportunities for Collaboration and Regionalization
- Maximize Funding Impacts through Sustainable Infrastructure Improvements
- Identify Future Needs

Current Conditions

Central Ohio Regional Water Study

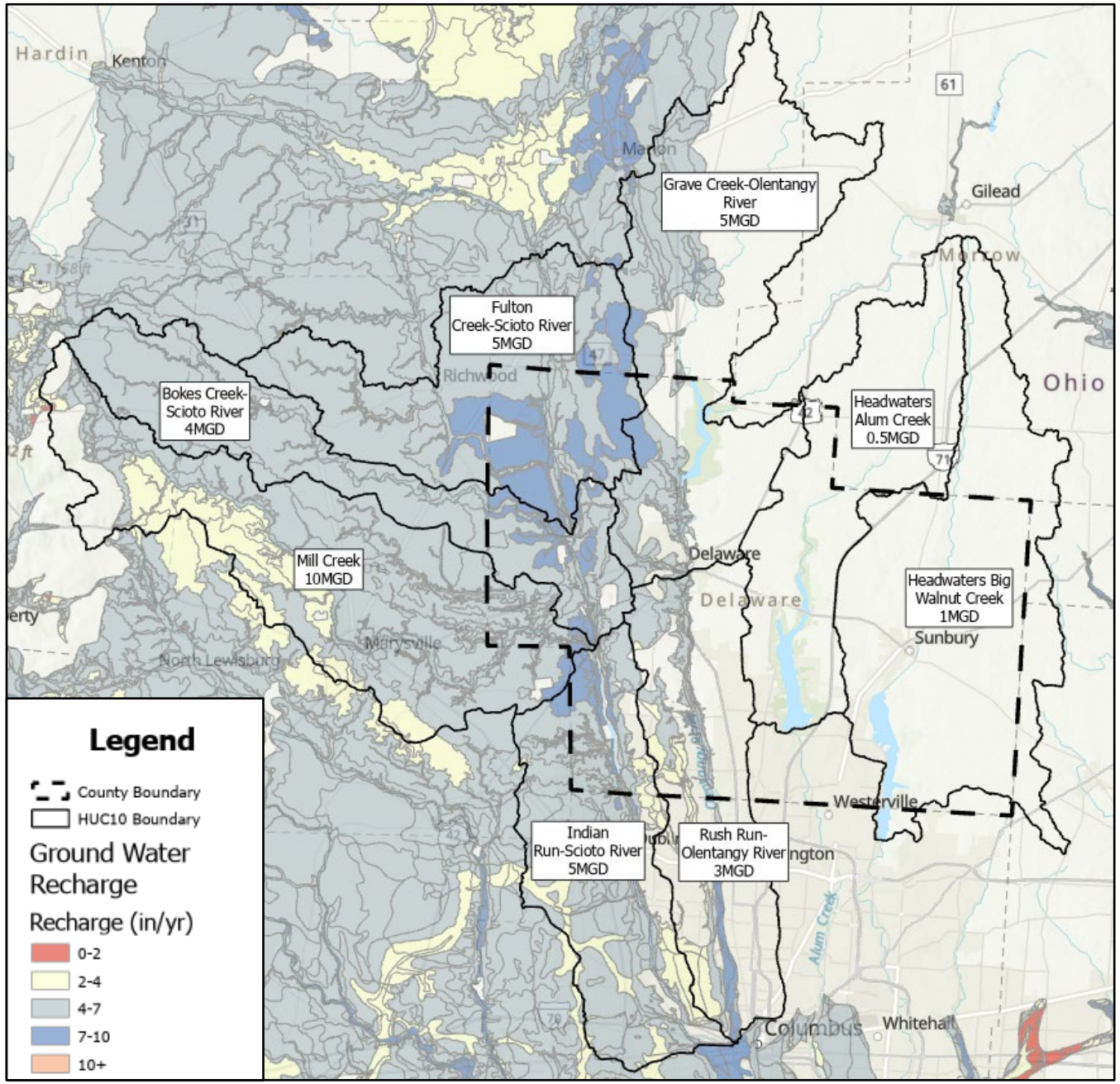
Model Components



Delaware County

Ground Water Availability

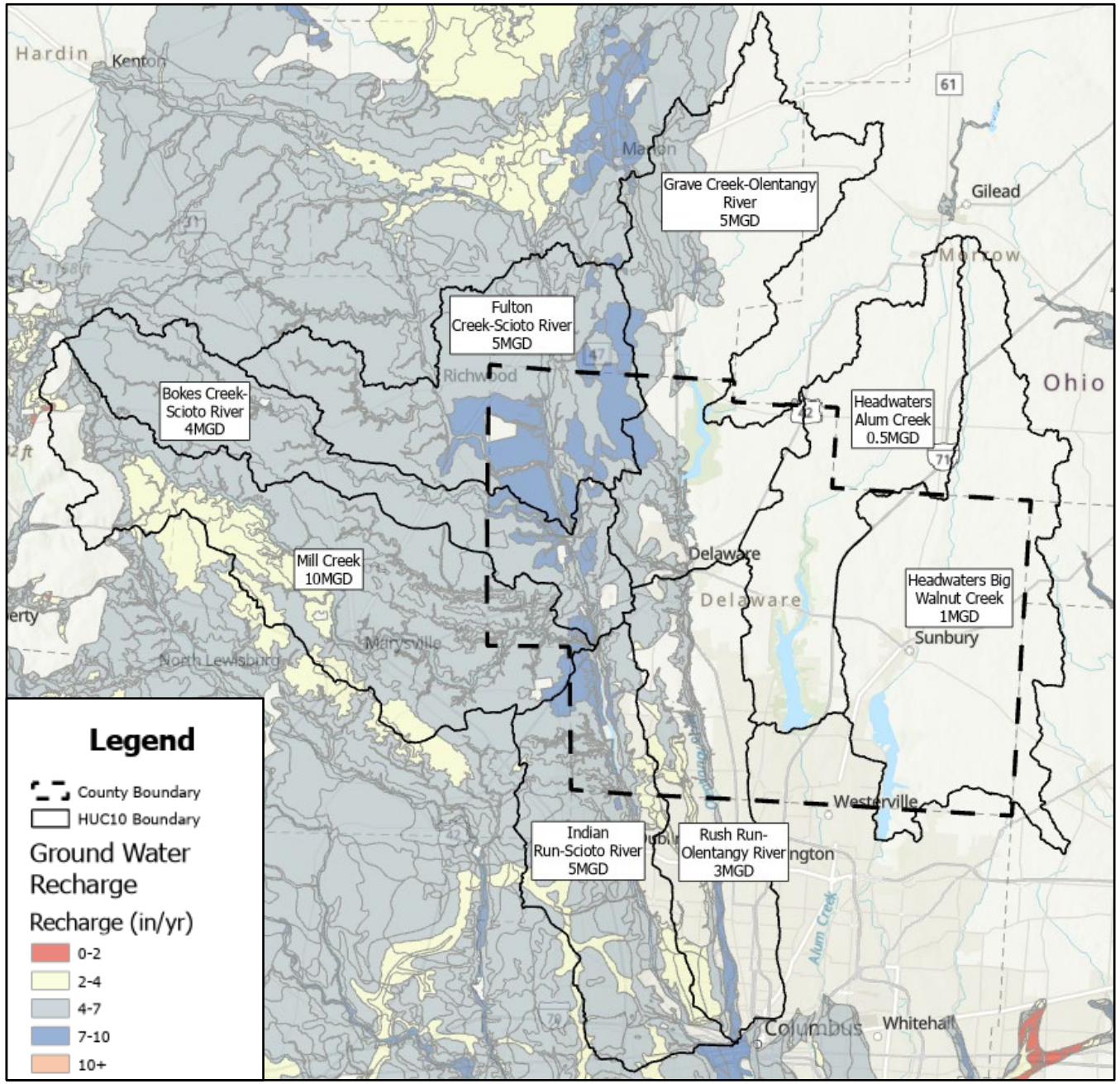
- Ground water supplies within or nearby Delaware County range from 0.5 to 10 million gallons per day of availability per HUC10
- Total of 33.5 MGD in Delaware County



Delaware County

Ground Water Availability

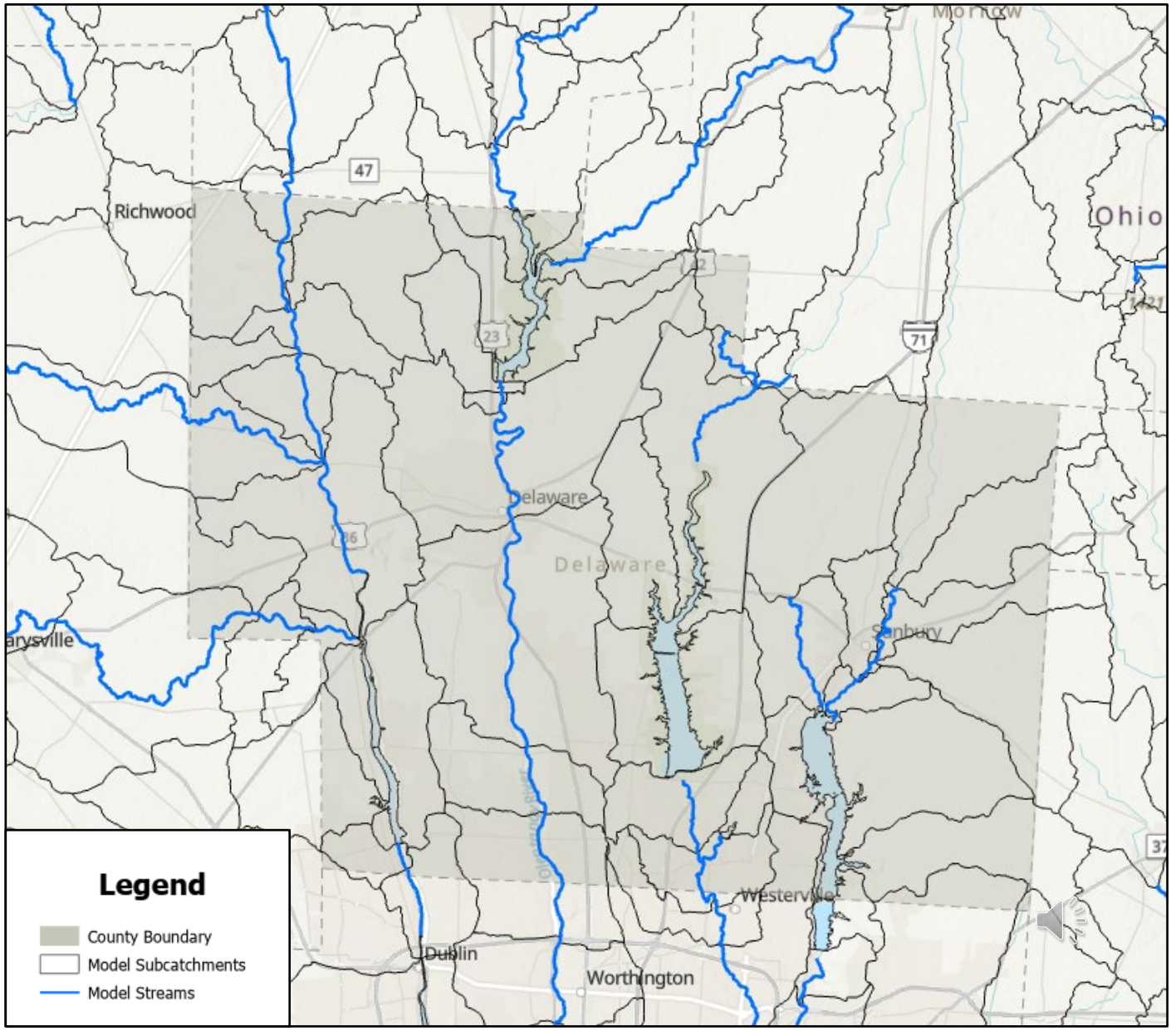
- Each HUC10 has unique aquifer characteristics that determine ground water availability.
- Eagon and Associates assisted with the ground water analysis and provided information regarding ground water resources and conditions throughout the study area.



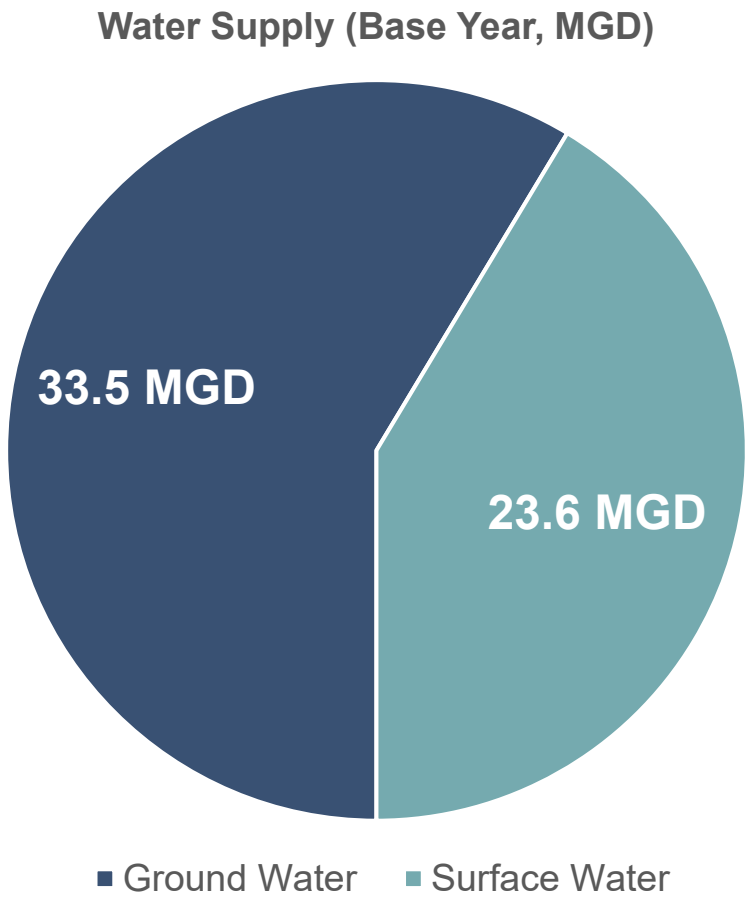
Delaware County

Surface Water Availability

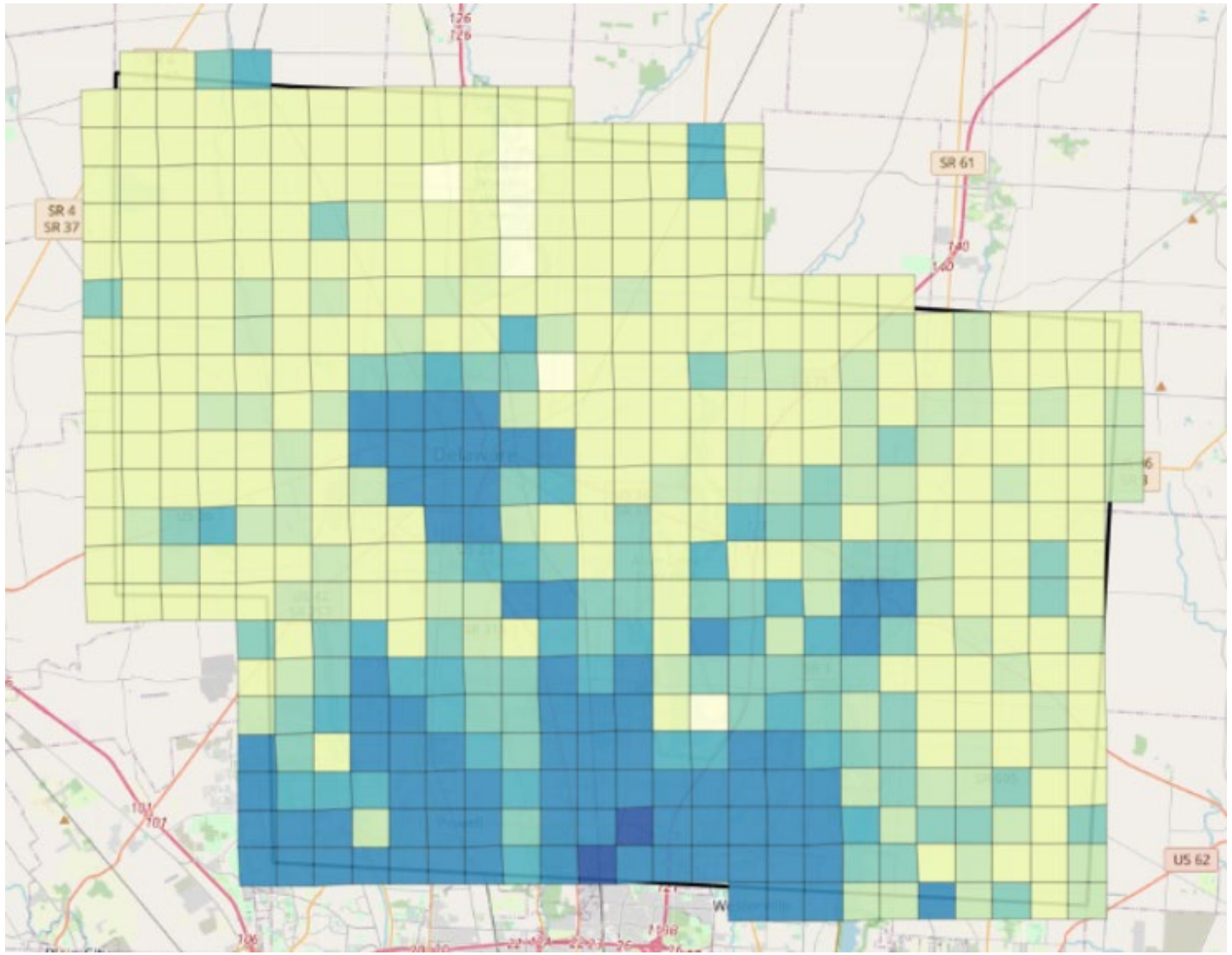
- Surface Water supplies in Delaware County total to roughly 23.6 MGD for the minimum monthly average



Current Conditions: Supply Availability



Current Conditions: Community Composition

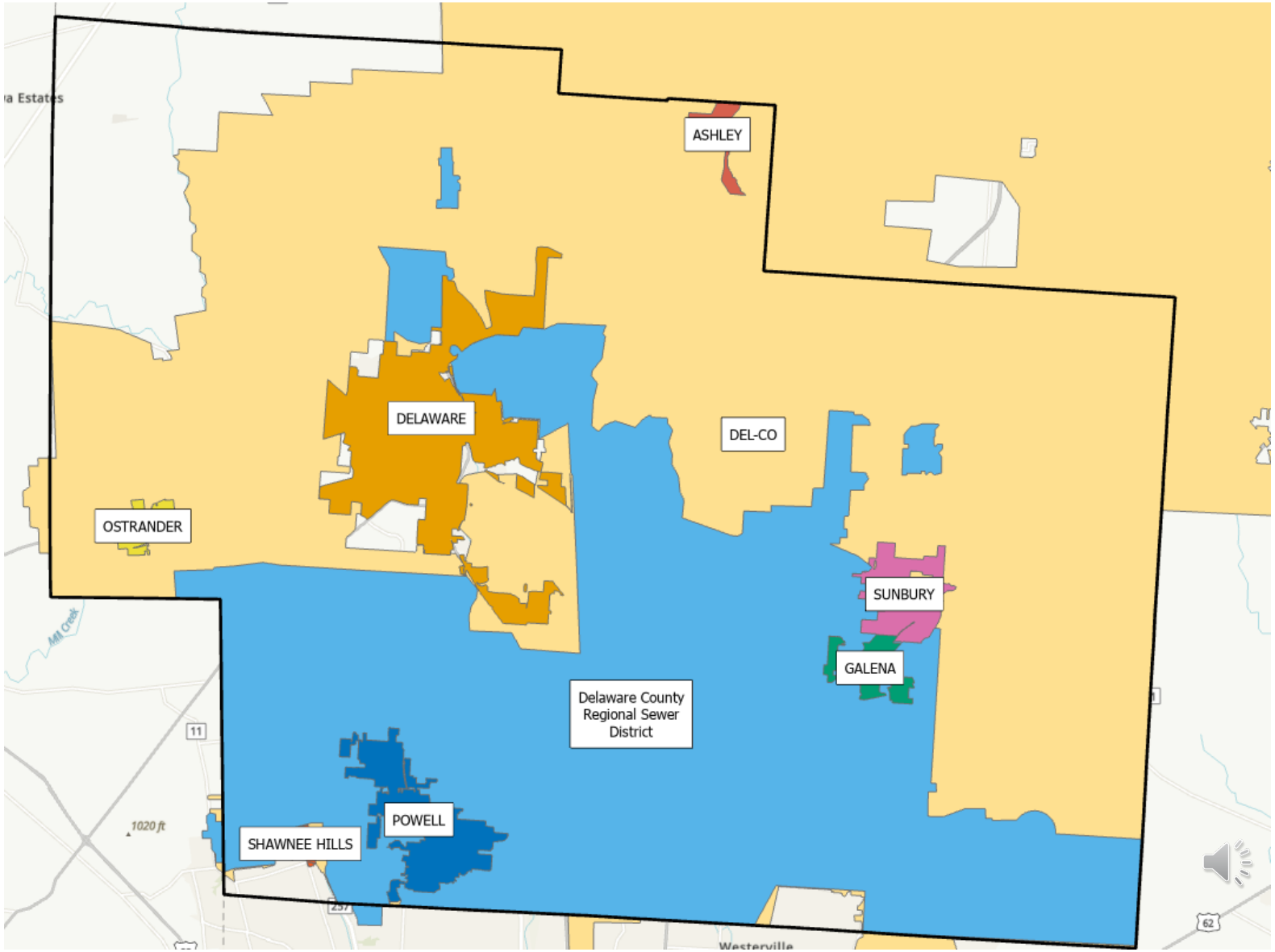


#	Label	Symbol
1	Counties	
11	Grid (1.0mi): Population Unavailable	
19	Grid (1.0mi): Population 0 to 1	
20	Grid (1.0mi): Population 1 to 100	
21	Grid (1.0mi): Population 100 to 200	
22	Grid (1.0mi): Population 200 to 500	
23	Grid (1.0mi): Population 500 to 1000	
24	Grid (1.0mi): Population 1000 to 5000	
25	Grid (1.0mi): Population 5000 to 10000	
26	Grid (1.0mi): Population 10000 to 1000000	

Base Year (2021) Population

Delaware County

Assumed Water/Wastewater Service Areas



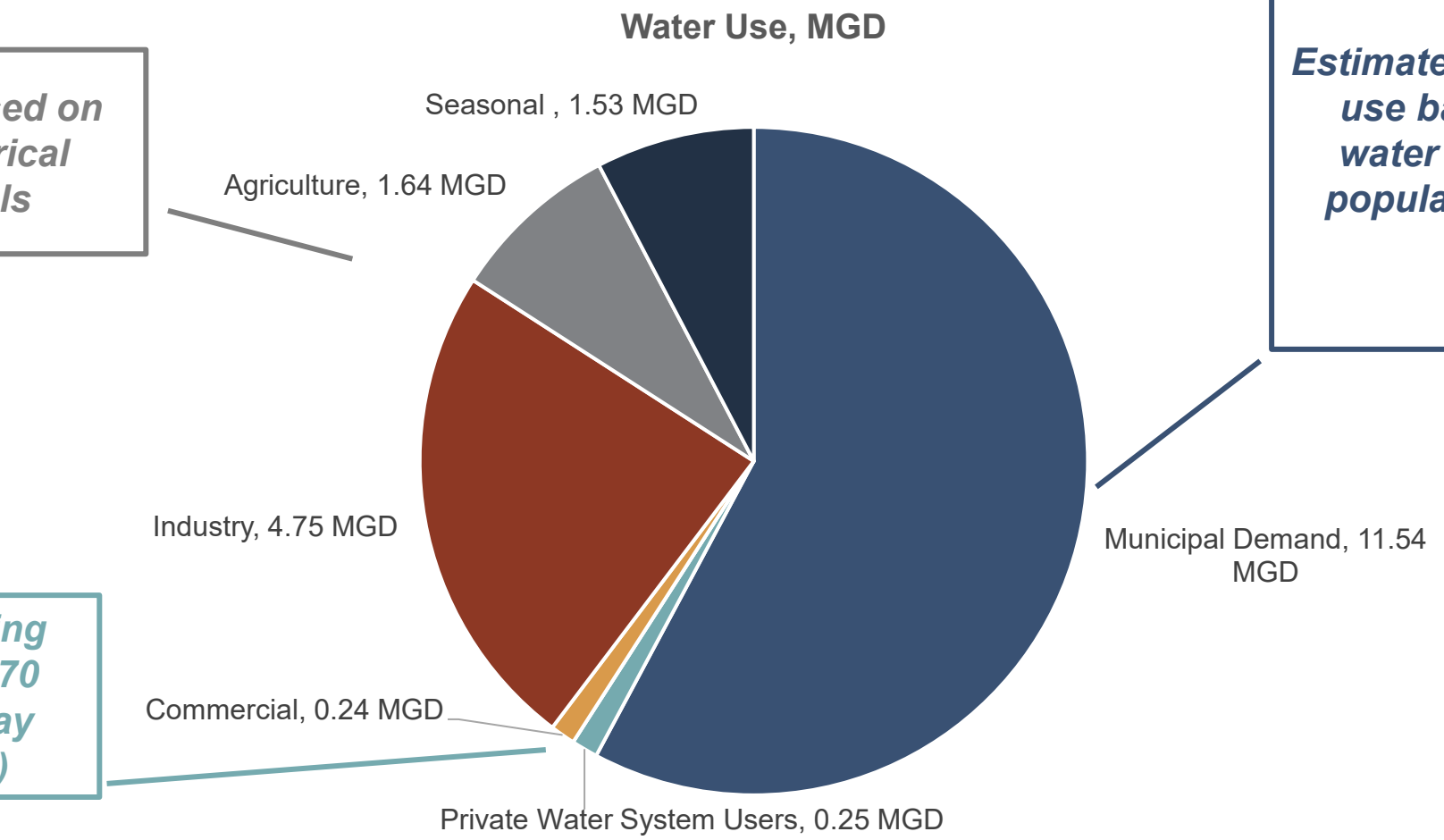
Current Conditions: Water Demands

Max Month, 19.95 MGD Total

Estimated based on recent historical withdrawals

Estimated per capita water use based on current water production and population served by a utility

Estimated using population x 70 gal/person/day (Well Users)



Current Conditions: Wastewater Flows

Max Annual Average Wastewater Flow = 15.5 MGD

Current Conditions: Infrastructure

Water Treatment Plant Capacity
53.4 MGD
(~11% ground water, 89% surface water)

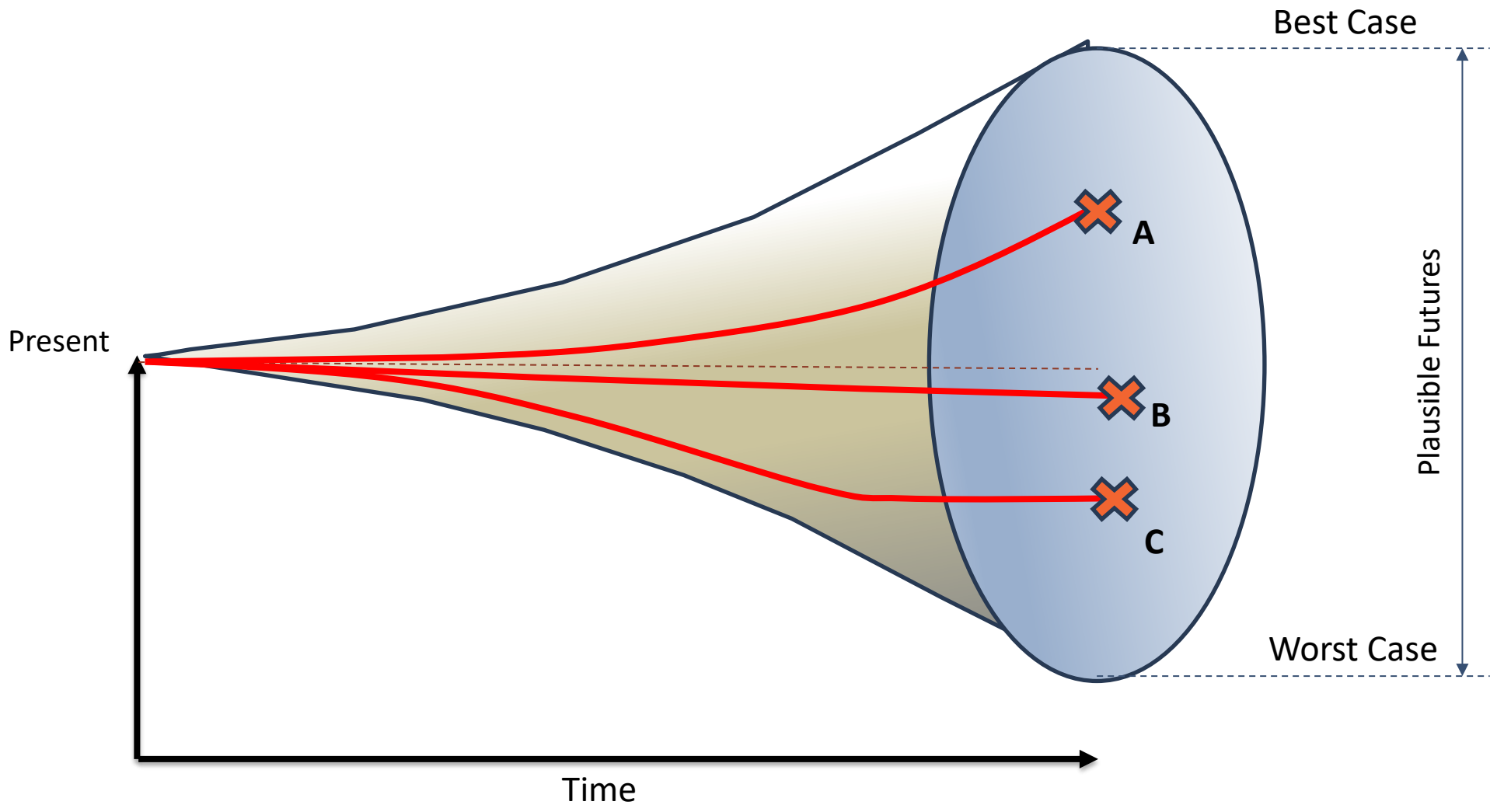
Wastewater Treatment Plant Capacity
29.3 MGD

Recall that max annual average wastewater flows are ~15.5 MGD

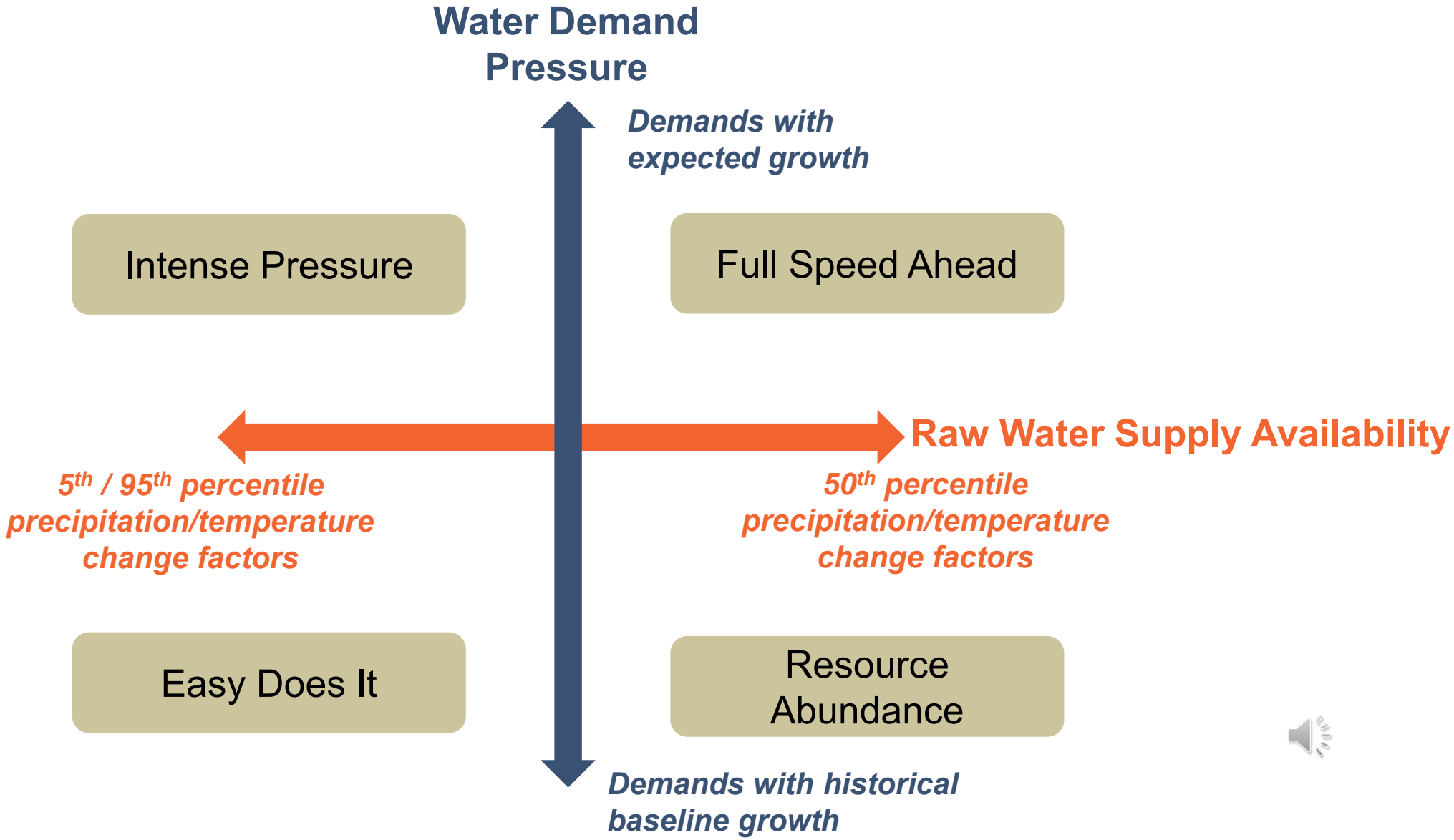
Recall that total max month water demands are ~20 MGD

Future Conditions

Scenario Planning

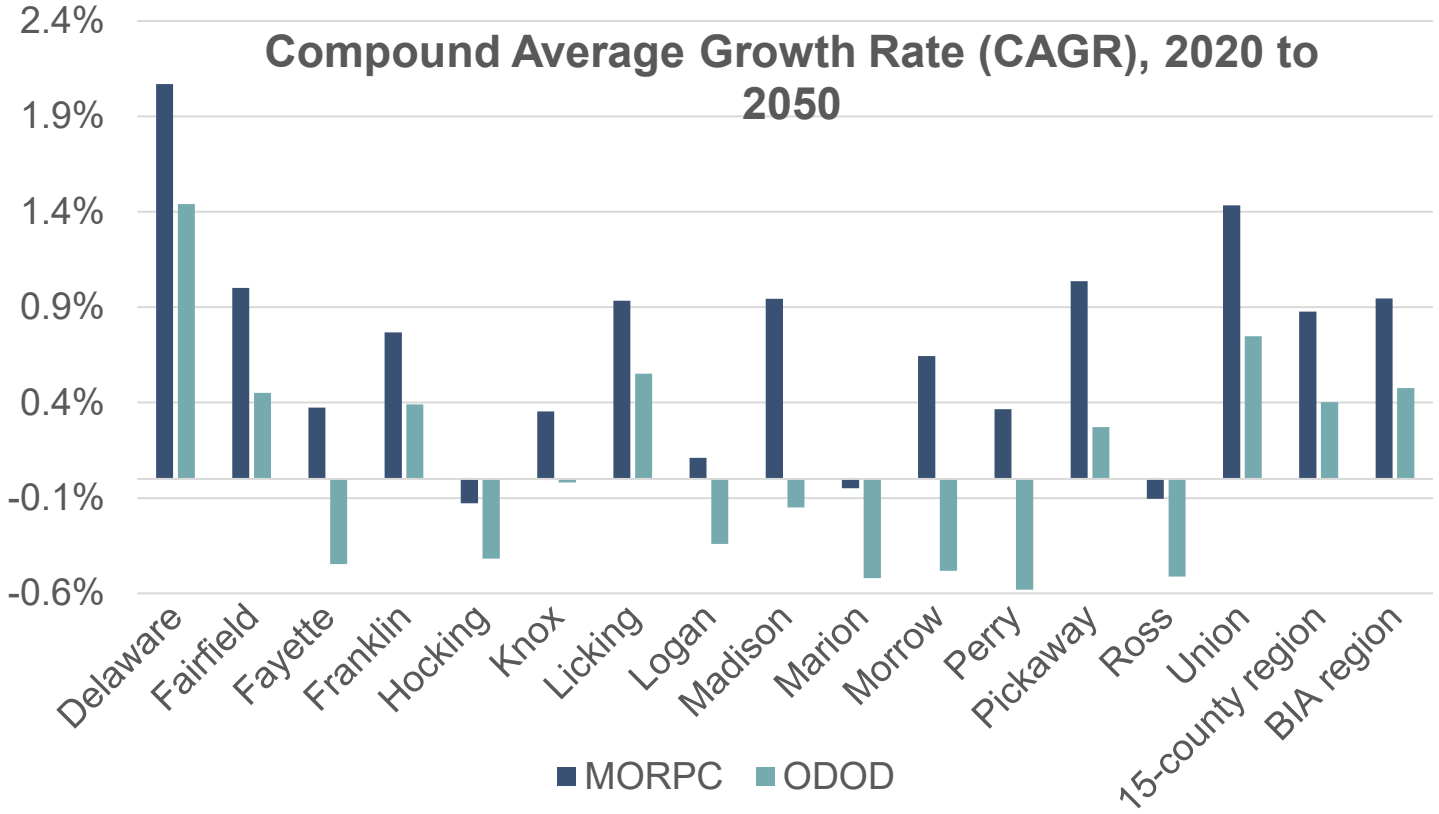


Model Scenarios



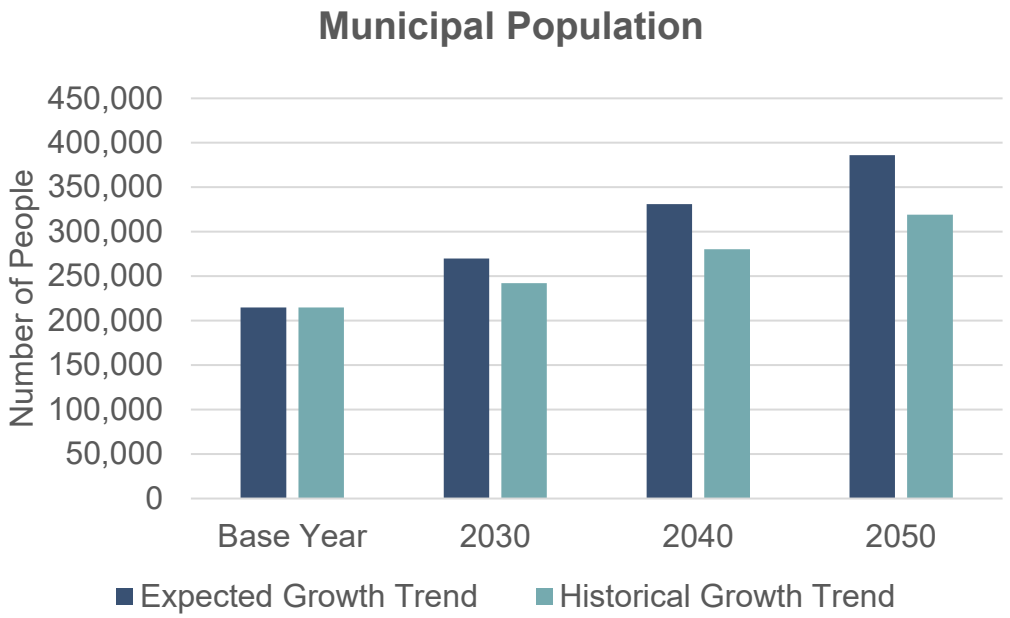
MORPC vs ODOD Population Data

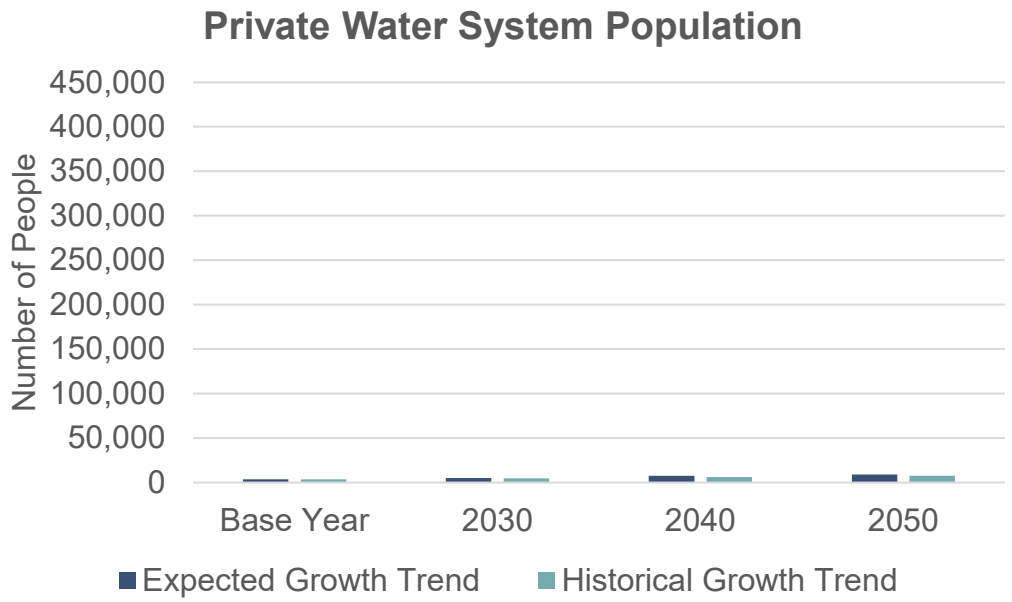
Delaware County



	2021 County Population	2050 County Population
MORPC (Expected Growth Trend)	218,514	395,100
ODOD (Historical Growth Trend)	218,514	326,847

Future Conditions: Community Composition





Future Conditions: Community Composition

Delaware County

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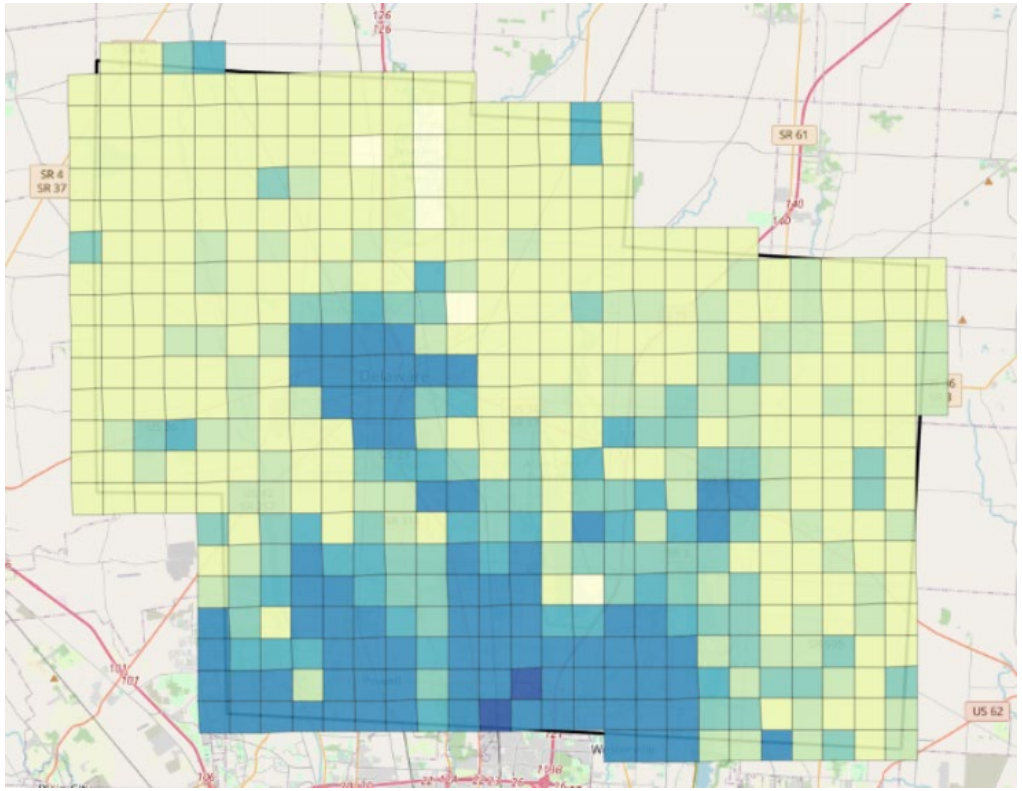
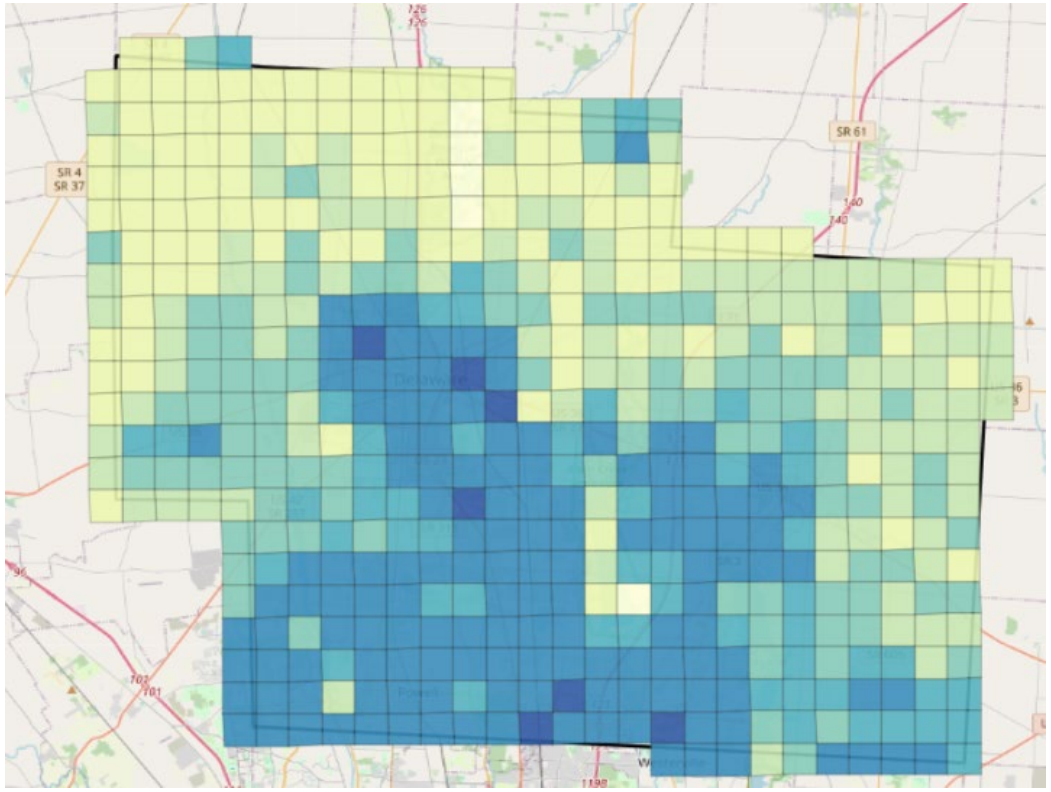


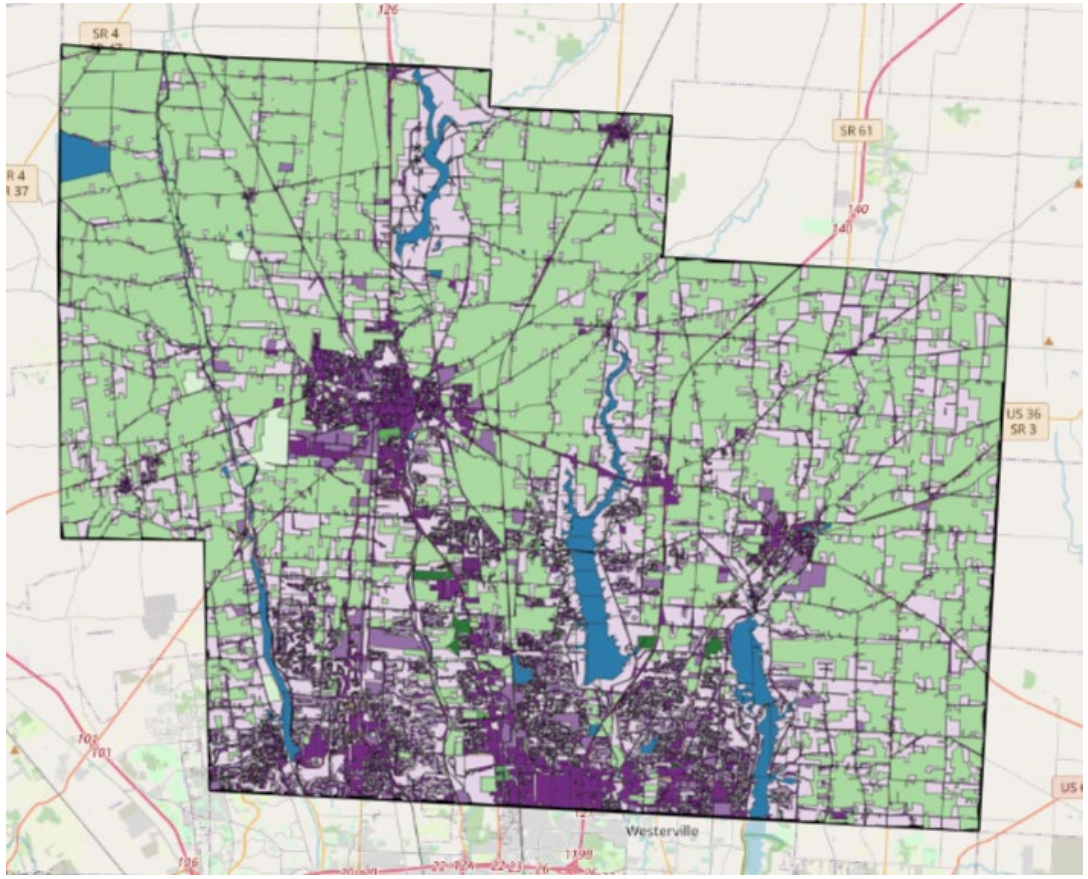
Base Year (2021) Population

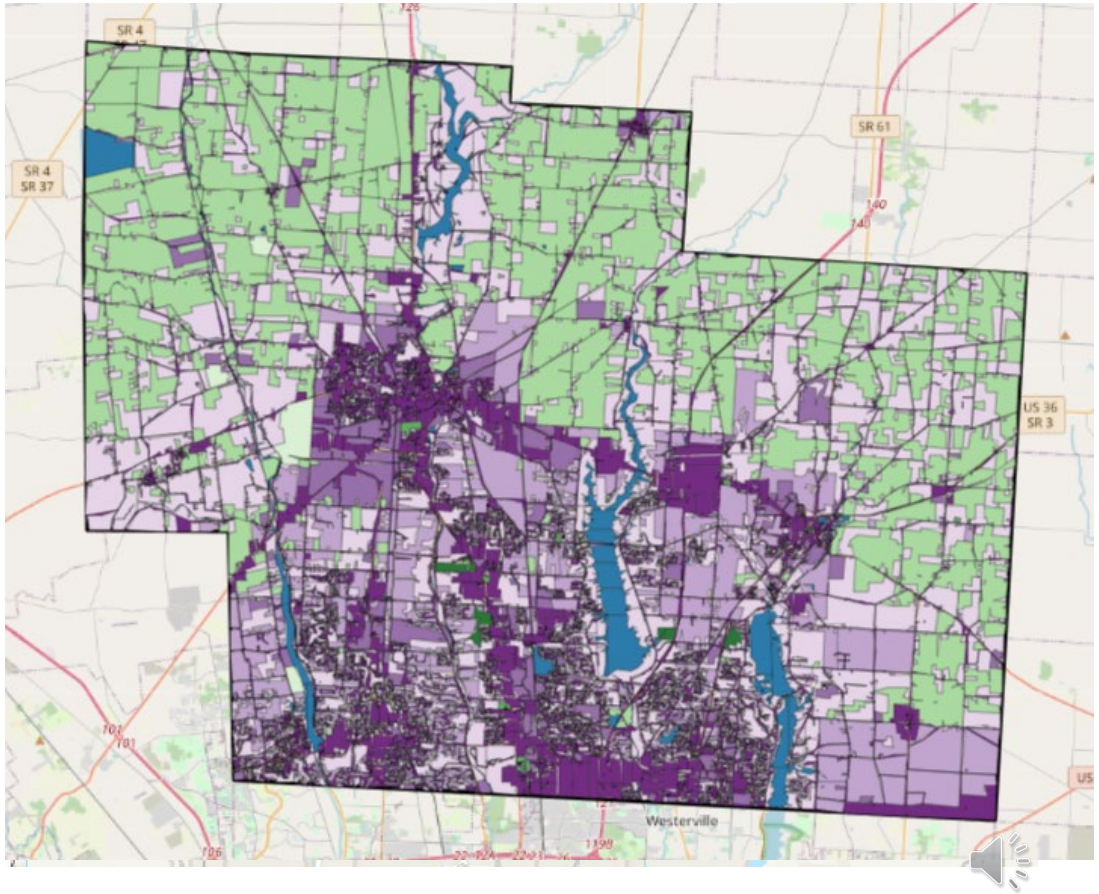


2050 Expected Growth Population

Existing and Future Land Use

#	Label	Symbol
1	Counties	
185	NLCD: 0 None Specified	
186	NLCD: 11 Water	
187	NLCD: 21 Developed Open Space	
188	NLCD: 22 Developed Low Intensity	
189	NLCD: 23 Developed Medium Intensity	
190	NLCD: 24 Developed High Intensity	
191	NLCD: 31 Barren	
192	NLCD: 43 Mixed Forest	
193	NLCD: 71 Grassland	
194	NLCD: 81 Pasture/Hay	

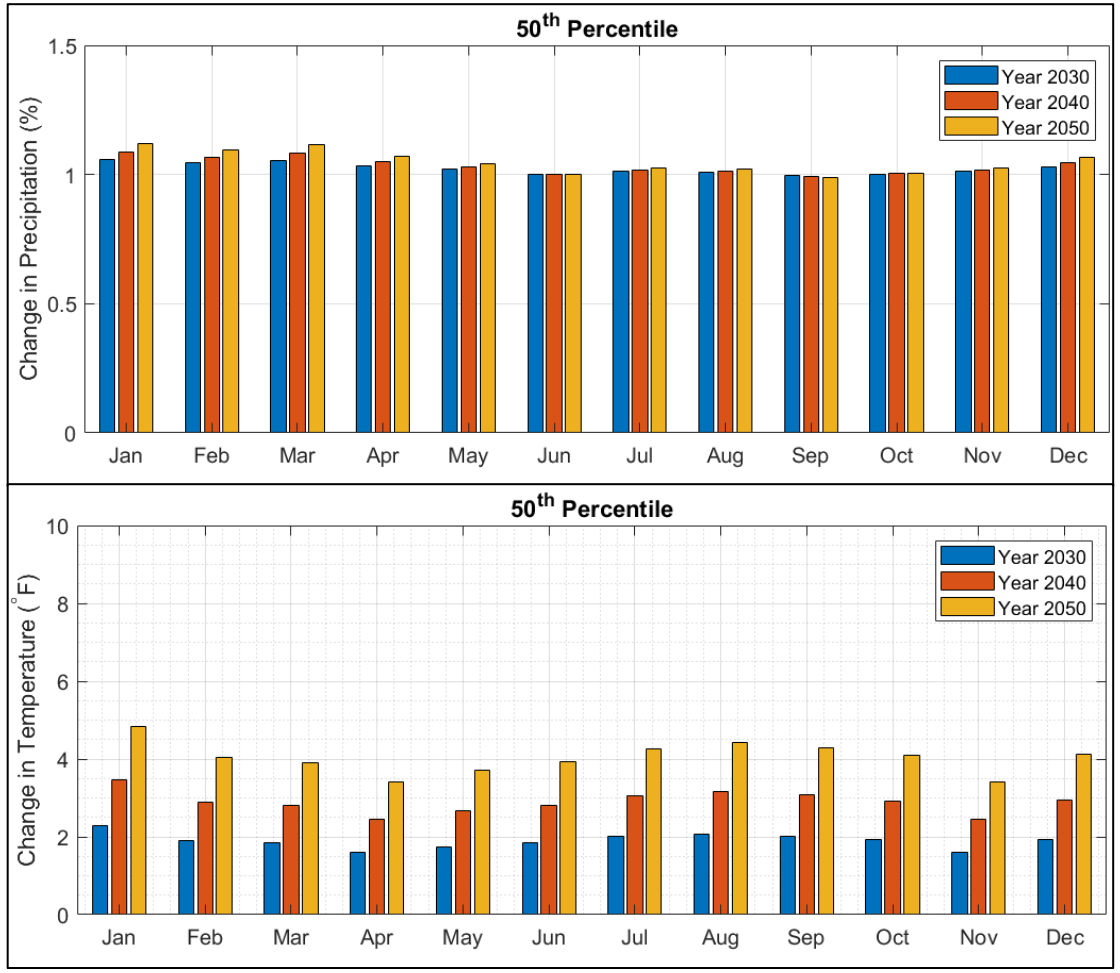




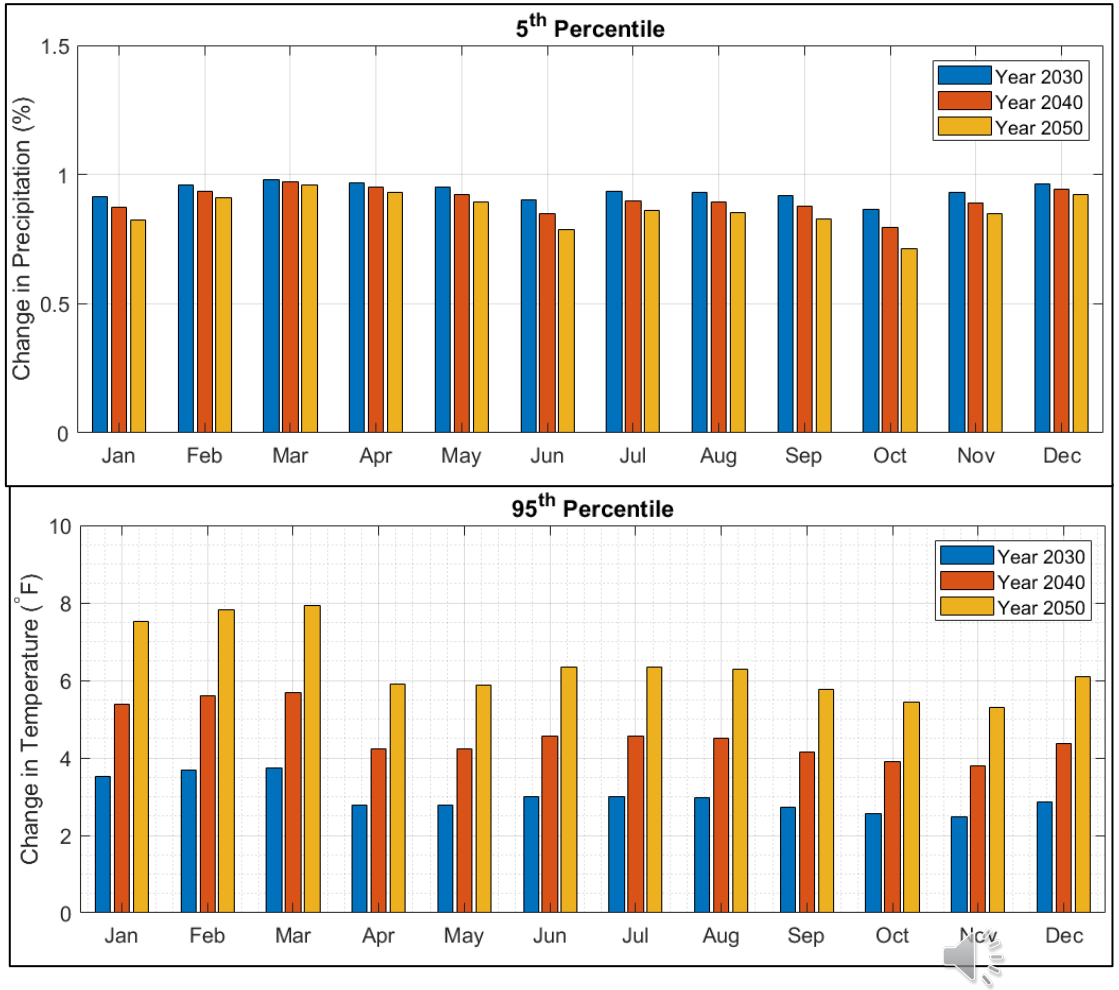
Existing (2021)

Future (2050)

Future Scenarios – Temperature and Precipitation Change

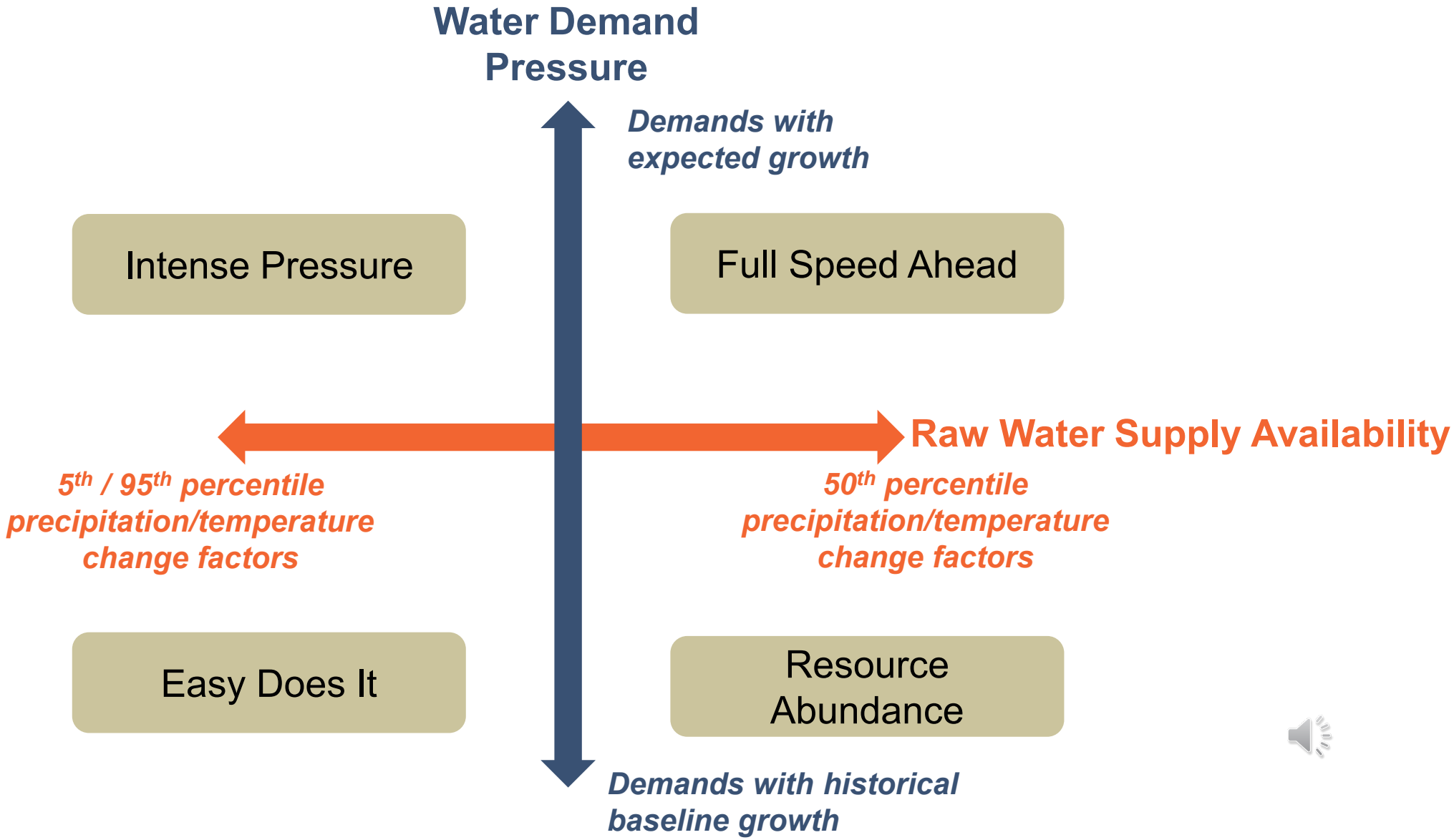


Moderate Change (50th Percentile Temperature and Precipitation)

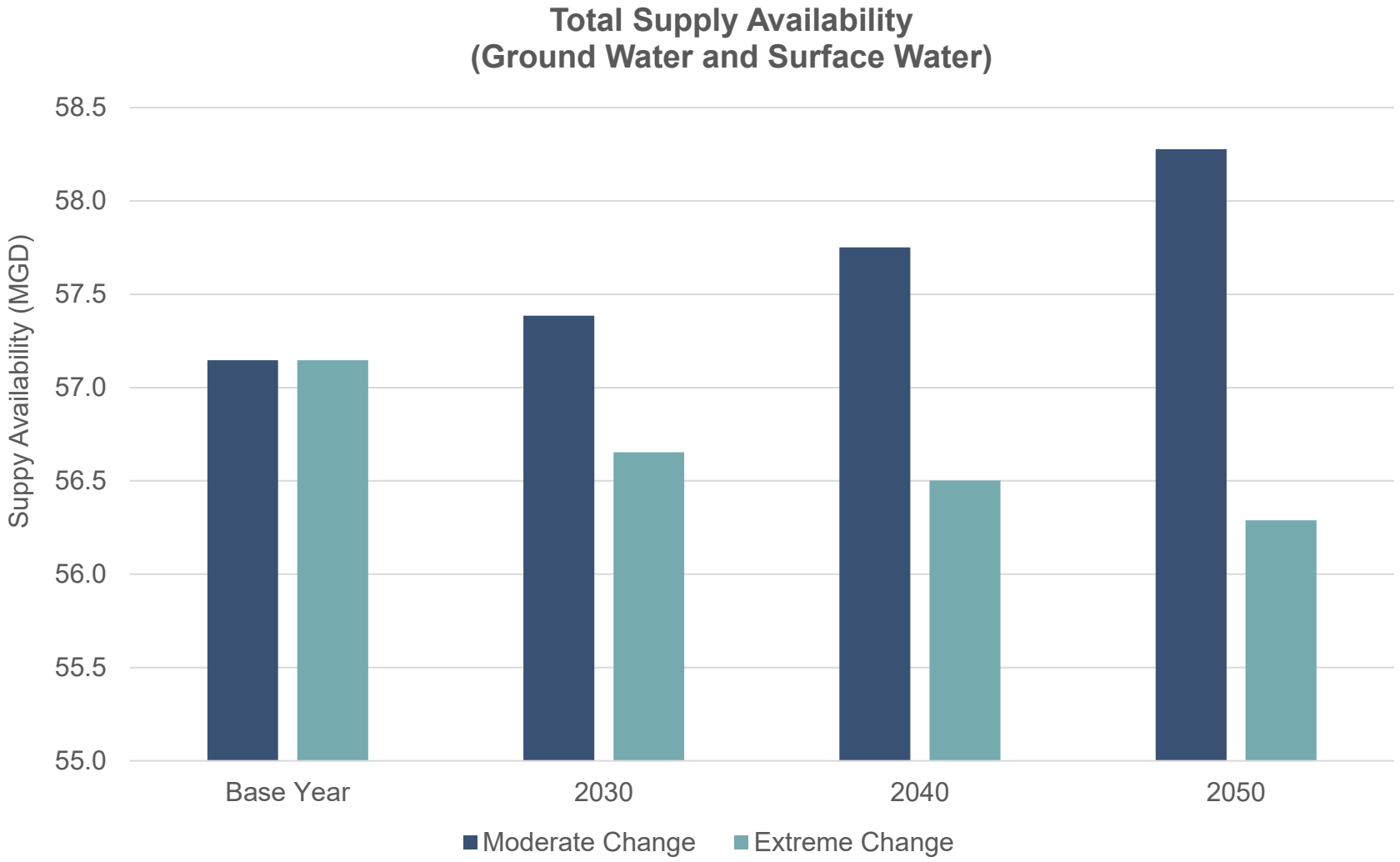


Extreme Change (5th Percentile Precipitation and 95th Percentile Temperature)

Model Scenarios

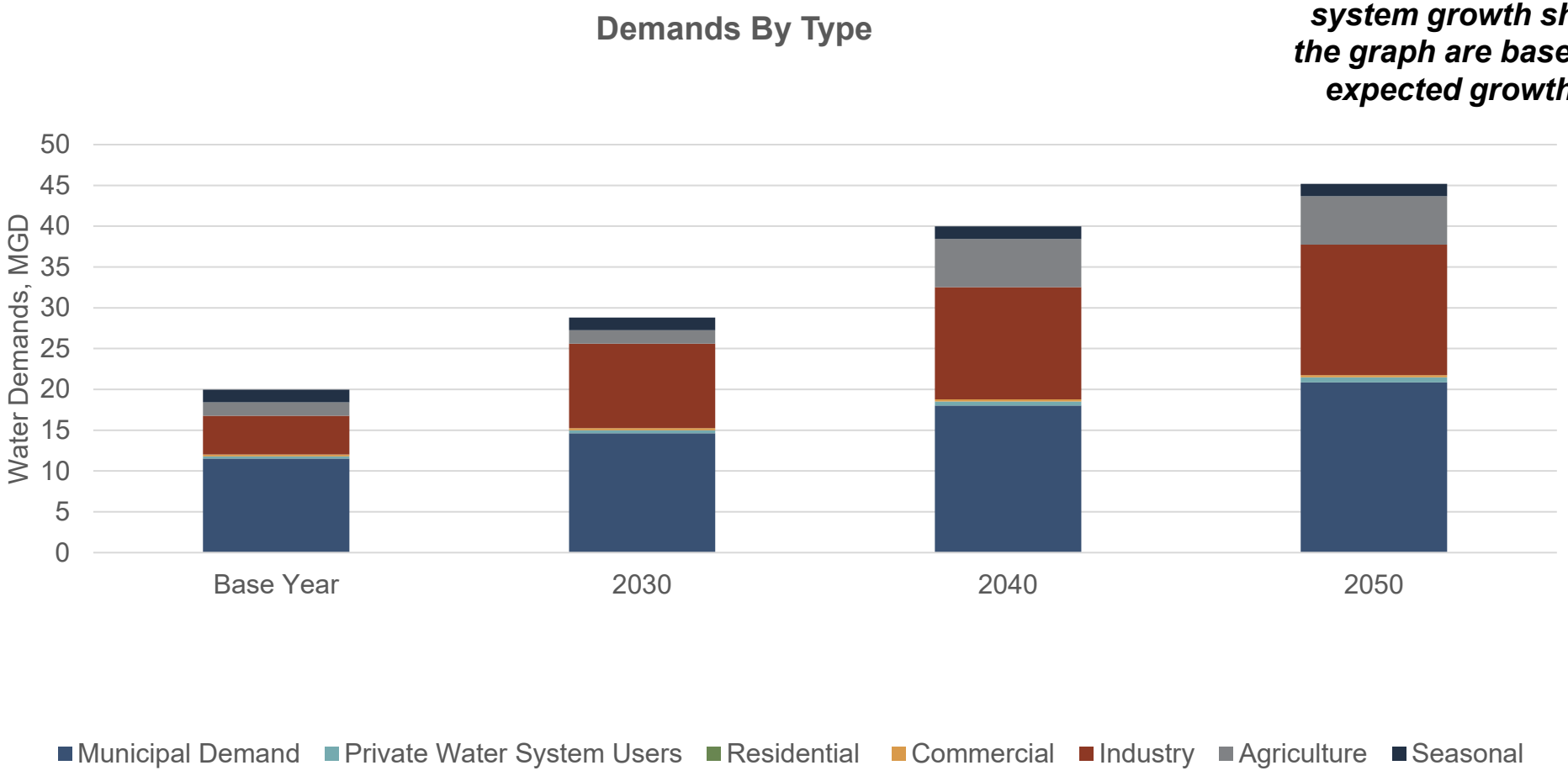


Future Conditions: Supply Availability



Future Conditions: Water Demands

Municipal and private water system growth shown in the graph are based on the expected growth trend



Agricultural Irrigation Demands

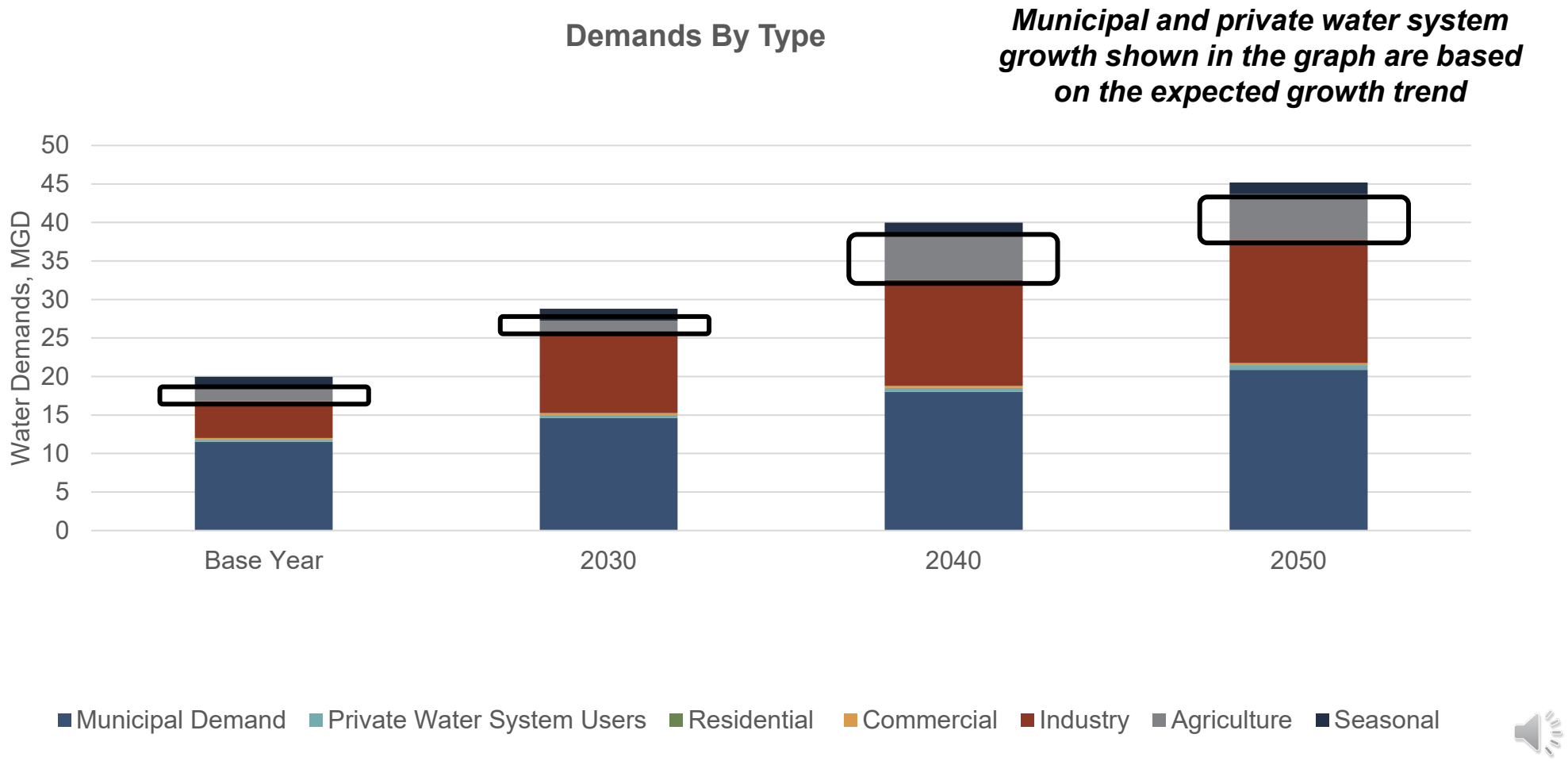
- OSU professor estimates that by 2040 irrigation will be more widespread, driven by increasing temperatures
- Estimated + 5-inches per year, supplemented in critical growing season (July / August / September)
- Increases annual ground water demand by 9.15 BG across the entire 15-county area (0.02 MG to 1.16 BG per year at HUC-10 level)

Ohio's Country Journal

Irrigation in Ohio?

The 23-tower pivot on Imboden's farm is the largest in the Midwest. Like his other irrigation pivots, it is accompanied by big benefits and big challenges.

Future Conditions: Agriculture Water Demands

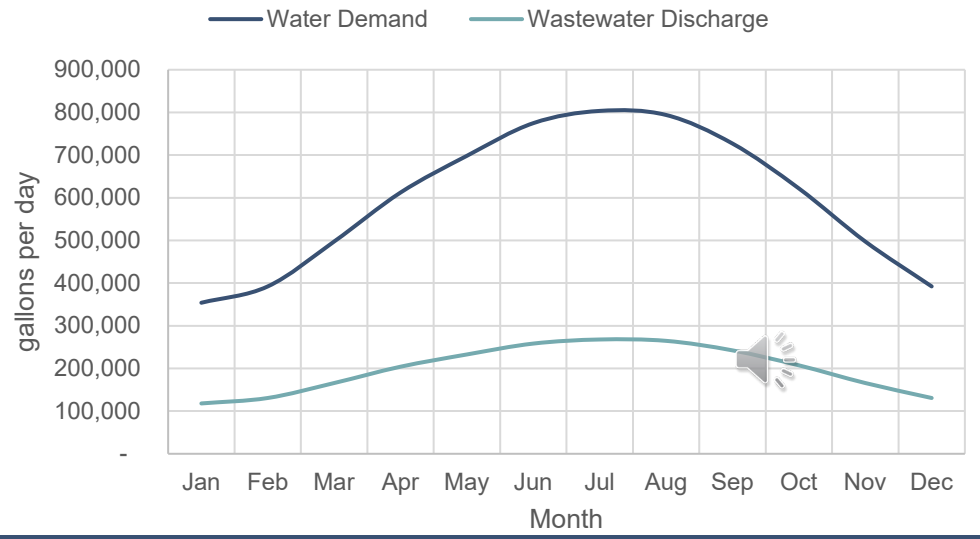


Industrial Cooling Water

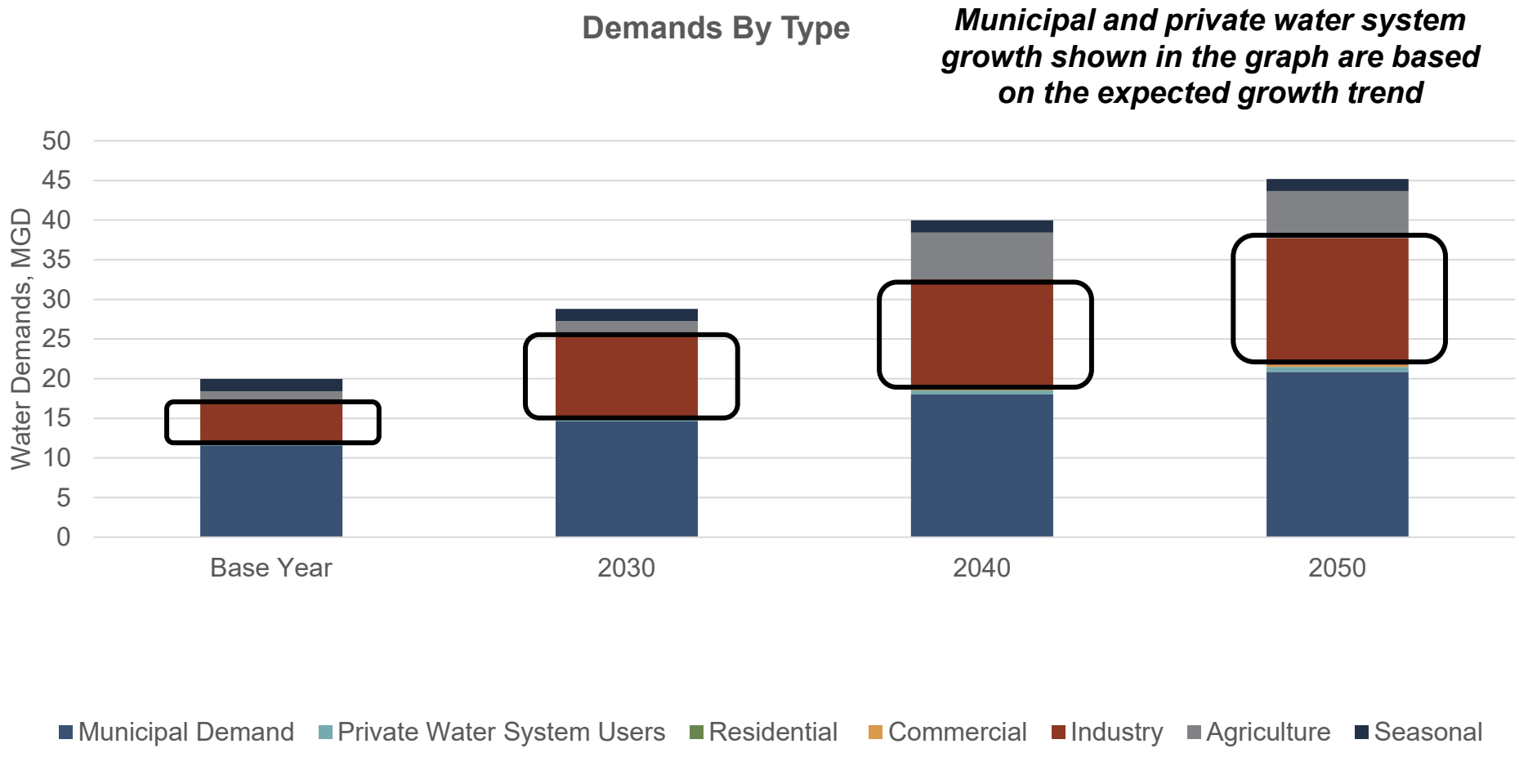
- Demand for data storage and processing and artificial intelligence is driving the need for additional cooling water
  - **Cooling methods include use of water, air, and refrigerants**
  - **Mechanical draft cooling towers using water are the most common method due to cost effectiveness**
- Example water use from single site with cooling towers is shown in graph and table. These graphics demonstrate water use variability with season and size of site.
- Factors affecting water usage:
  - **Size**
  - **Daily temperatures**
  - **Water quality**
  - **Operations**

Max Monthly Demands (MGD) per Site	2030 (50 Acre Site)	2040 (80 Acre Site)	2050 (100 Acre Site)
Water Demand	0.80	1.29	1.61
Wastewater Demand	0.27	0.43	0.54

Typical Max Day Water Usage at Single Site



Future Conditions: Industrial Water Demands



Future Conditions: Infrastructure

WTP Capacity
53.4 MGD

No Assumed Projects by 2030

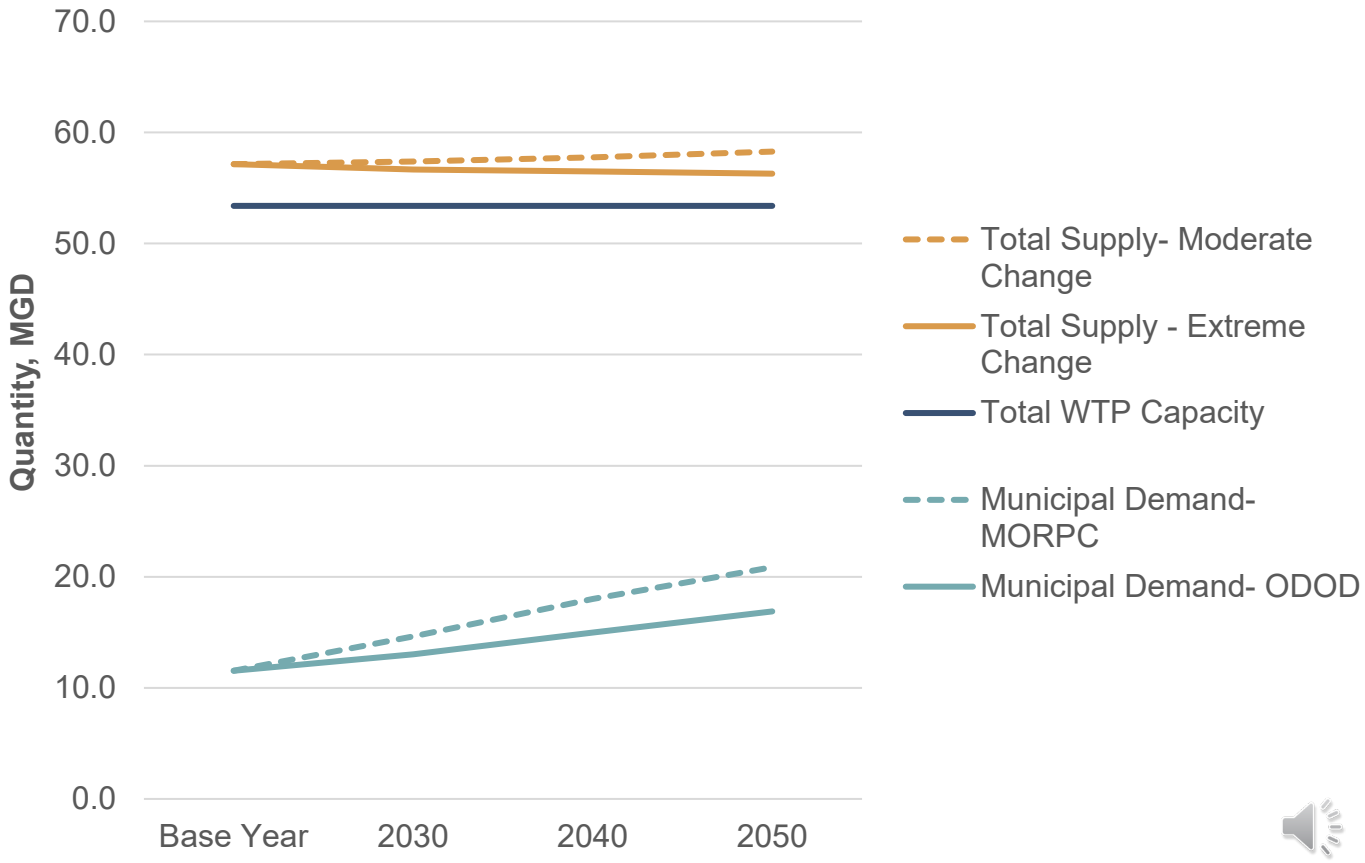
WWTP Capacity
29.3 MGD

No Assumed Projects by 2030

Needs Analysis

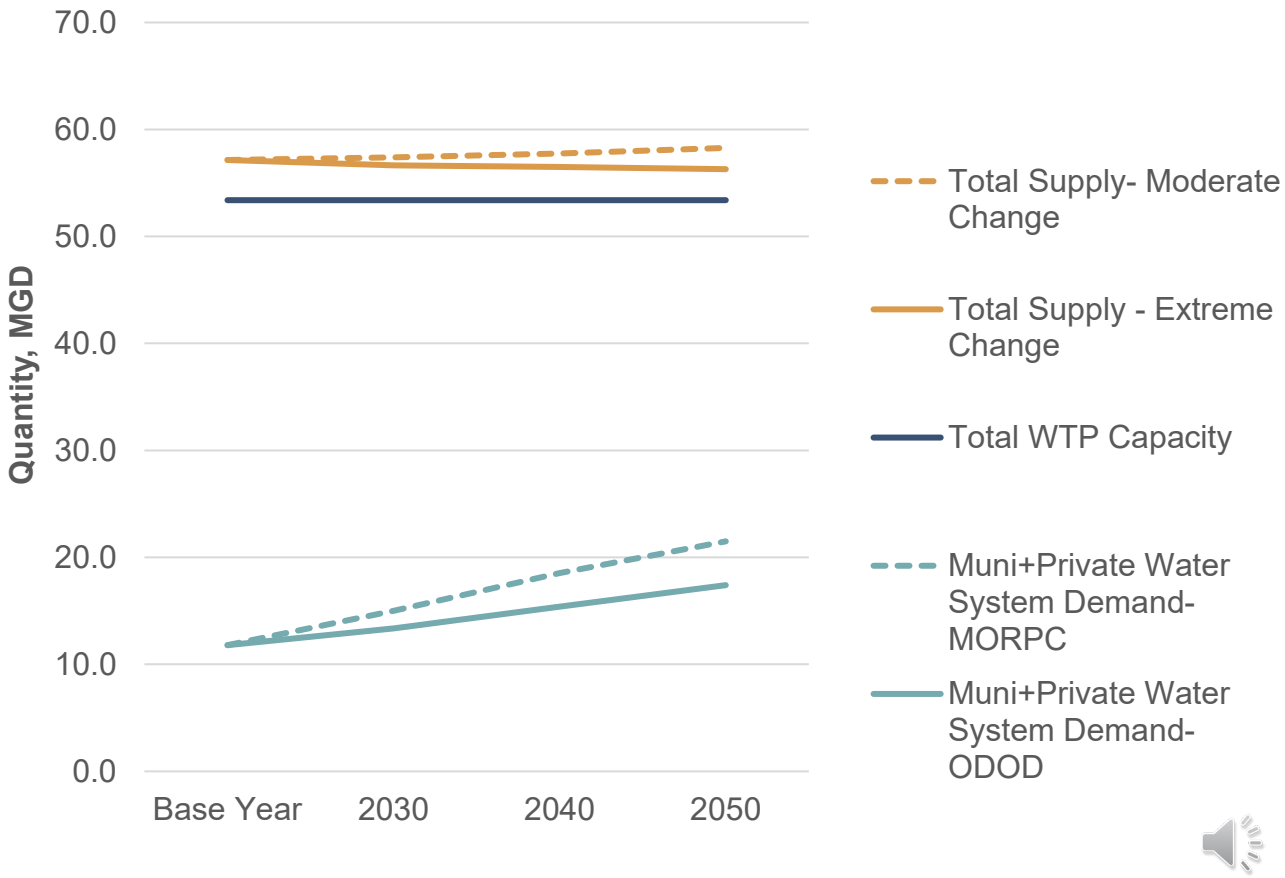
Needs Analysis: Municipal Water Demands

- Existing raw water supplies and water treatment capacity are sufficient to meet future municipal demands ***at the county-level***



Needs Analysis: Municipal + Private Water System Water Demands

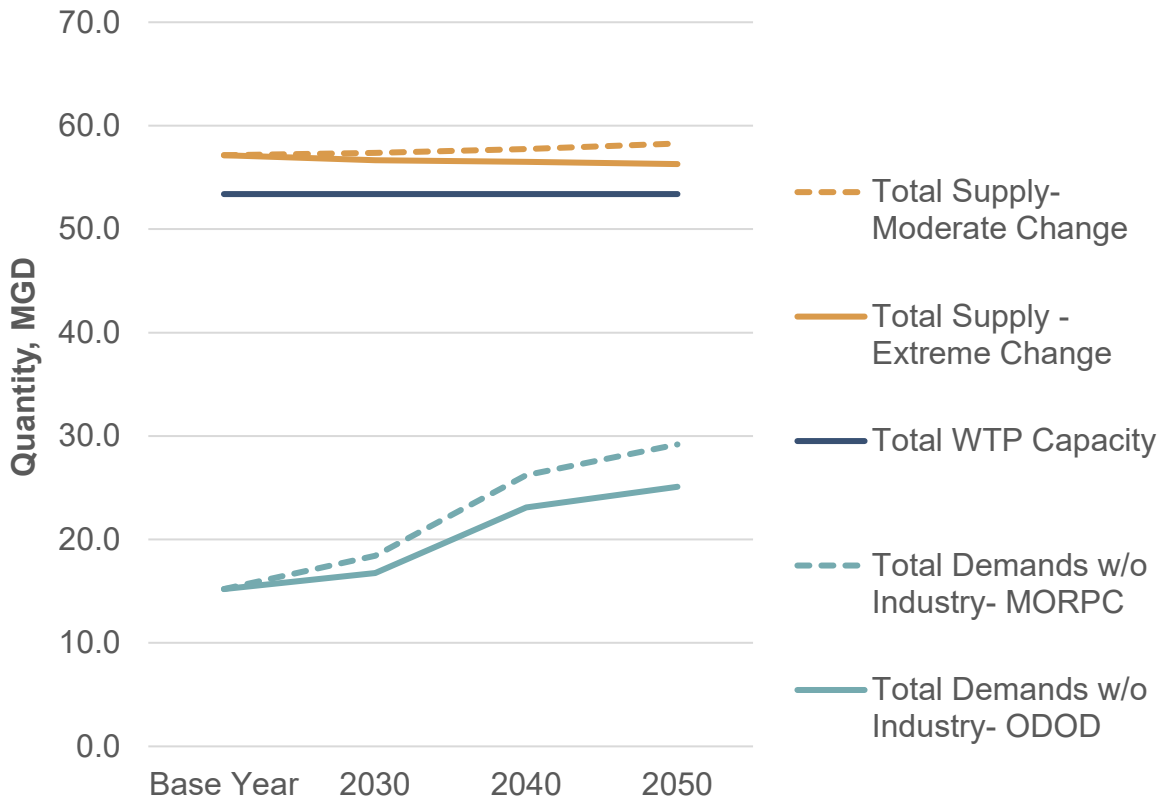
- Existing raw water supplies are sufficient to meet future municipal demands and private water system demands ***at the county-level***



Needs Analysis: Municipal + Private + Non-Municipal Water Demands

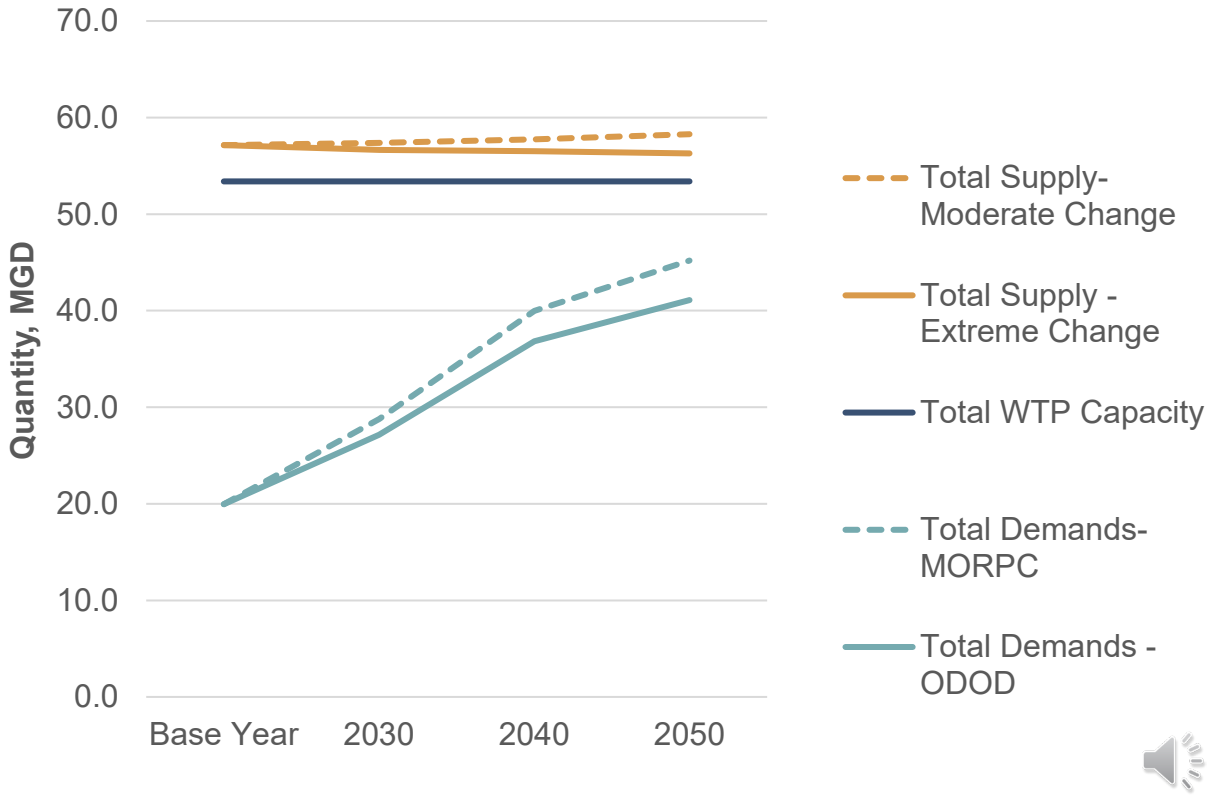
Excludes Industry Demands

- Existing raw water supplies are sufficient to meet future municipal demands, private water system demands, and non-industry non-municipal demands ***at the county-level***
- Existing water treatment capacity is sufficient if private water system and/or non-industry non-municipal demands are served by municipal WTPs ***at the county-level***



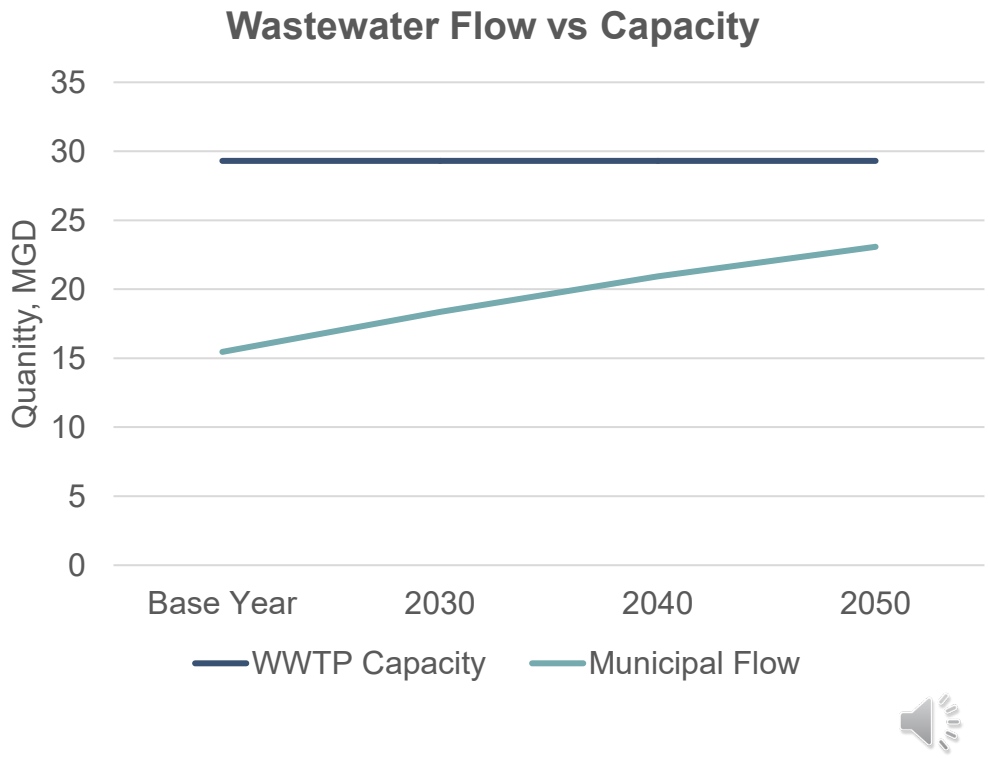
Needs Analysis: Total Water Demands

- Existing raw water supplies are sufficient to meet municipal, private water system, non-municipal, and industrial demands through 2040 at current WTP capacity ***at the county-level***



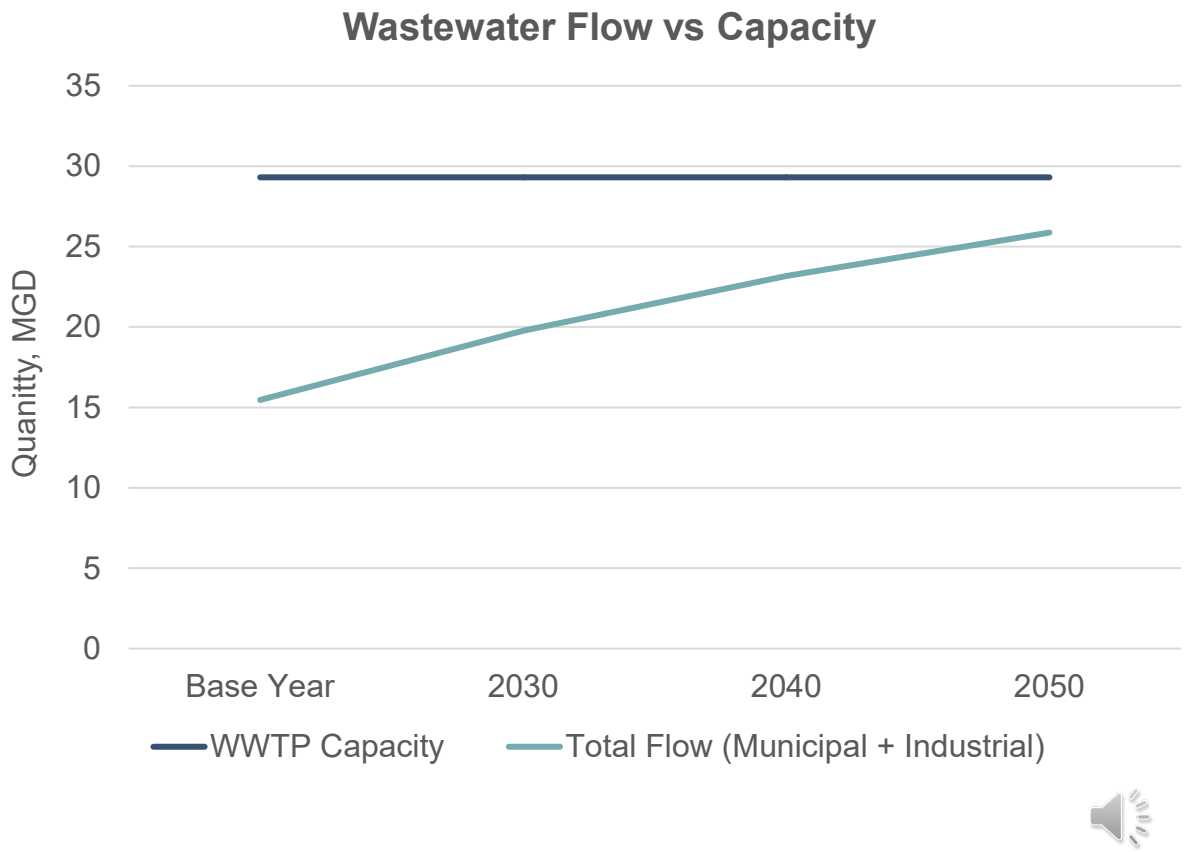
Needs Analysis: Municipal Wastewater Demands (Max Annual Average)

- Existing wastewater treatment capacity are sufficient to meet future municipal demands ***at the county-level***



Needs Analysis: Total Wastewater Demands (Max Annual Average)

- Existing wastewater treatment capacity are sufficient to meet future municipal and industrial demands ***at the county-level***



Resource Gaps and Abundances

County Level Overview

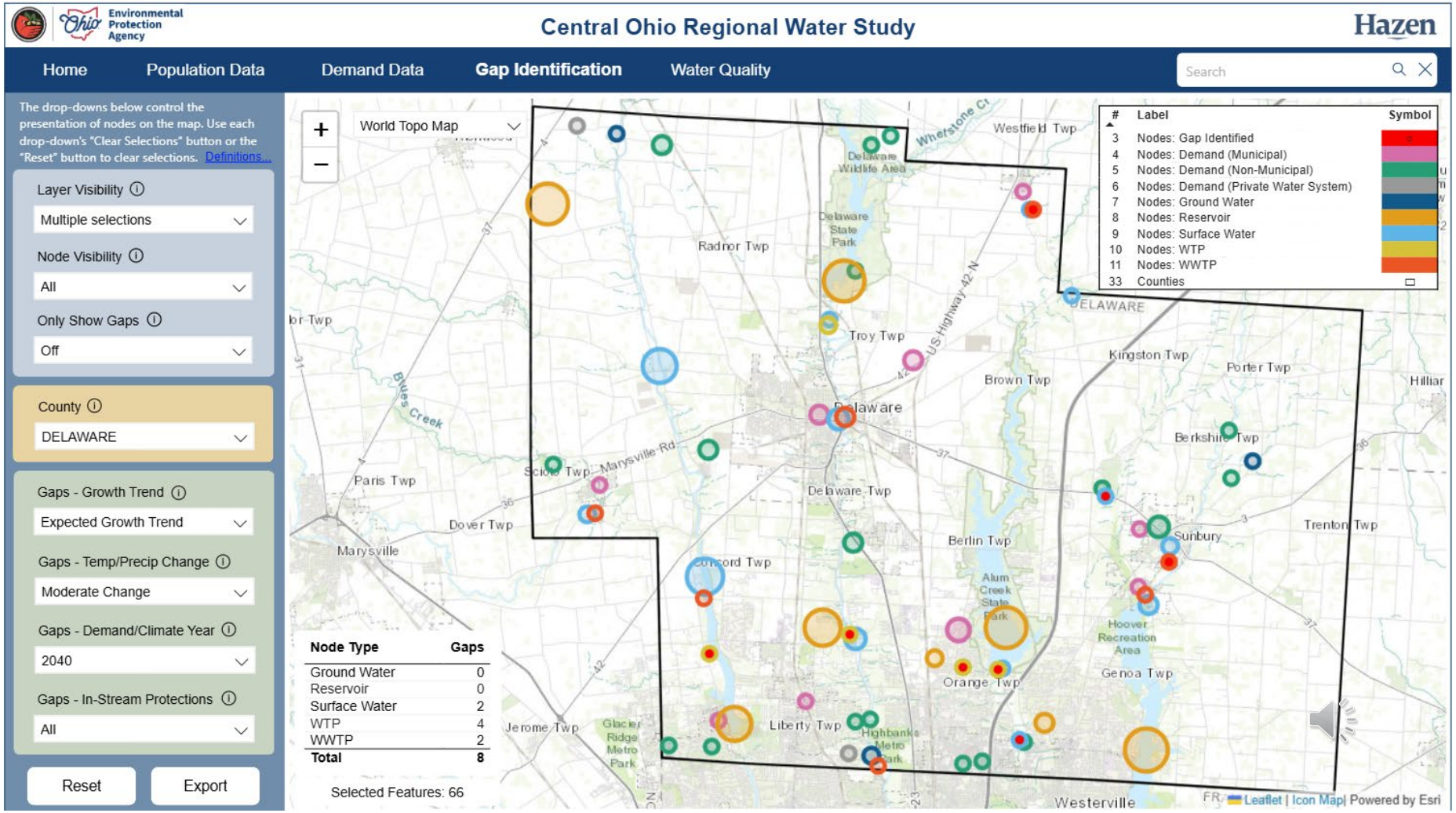
Findings – Resource Gaps

Planning Tool Visualization – Delaware County 2040, Moderate Precipitation / Temperature Change

Red nodes represent "gaps":

- SW: Is any shortage observed?
- Reservoir: Does the usable storage ever reach 20%?
- GW: Does the remaining ground water amount ever reach zero?
- WTP: Is the max month average flow > 80% of the permitted capacity?
- WWTP: Is the max annual average flow > 100% of the permitted capacity?

Node sizing reflects magnitude of gap or surplus



Findings – Resource Gaps

Full Summary of Gaps – Delaware County

Scenario		GW	Reservoir	SW	WTP	WWTP	Total
Base Year		0	0	2	1	0	3
Intense Pressure *(expected growth + high temperature/precipitation stress)*	2030	0	0	2	2	1	5
	2040	0	1	2	4	1	8
	2050	0	2	2	5	3	12
Full Speed Ahead *(expected growth + moderate temperature/precipitation stress)*	2030	0	0	2	2	1	5
	2040	0	0	2	4	2	8
	2050	0	0	2	5	3	10
Easy Does It *(historical growth + high temperature/precipitation stress)*	2030	0	0	2	2	1	5
	2040	0	0	2	3	1	6
	2050	0	2	2	4	1	9
Resource Abundance *(historical growth + moderate temperature/precipitation stress)*	2030	0	0	2	2	1	5
	2040	0	0	2	3	1	6
	2050	0	0	2	4	1	7

Resource Gaps and Potential Project Options

World of Project Options to fill Gaps…. Solution Strategies

- Gaps exist across supply, treatment, and water quality. Gaps can be filled by developing a set of solutions that could consist of several projects to develop an overall strategy
- Supply: Ground Water Wells, Reservoirs, Intakes, Dams, Other Storage, Emergency connections
- Treatment: Expand Capacity, Optimize treatment, Modify for water quality
- Policy: Restrictions, Adjust location of demand, Funding, Regionalization
- Discharge/Reuse: Receiving stream water quality, non-potable water reuse, potable reuse

Scenario Scorecard Criteria

Recall the scenarios: Base, Intense Pressure, Full Speed Ahead, Easy Does It, Resource Abundance

Scenario applicability

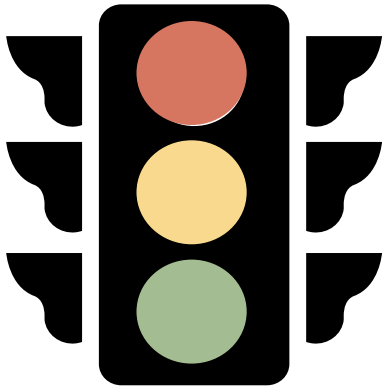
- Project that addresses more gaps across scenarios

Favorability across gaps

- Project that addresses more gaps within the same scenario ranks higher

Life cycle cost

- Projects with the lowest combined capital and O&M costs ranks higher. Capital costs are provided. Relative O&M considered.
- Green: <$75 million
- Yellow: $75 - $125 million
- Red: >$125 million



Red – Low Favorability

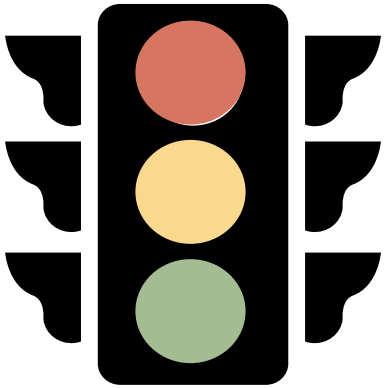
Yellow – Medium Favorability

Green – High Favorability

Scenario Scorecard Criteria

Water Quality Impact

- Projects that provide higher water quality ranks higher
- Green: Minimal water quality concerns, minimal industrial influence anticipated
- Yellow: Water quality conditions that need to be evaluated, increased permitting requirements, withdrawal from or discharge into a Superior high quality water
- Red: Elevated water quality concerns, high permitting requirements, withdrawal from or discharge into an Outstanding state water



Red – Low Favorability

Yellow – Medium Favorability

Green – High Favorability

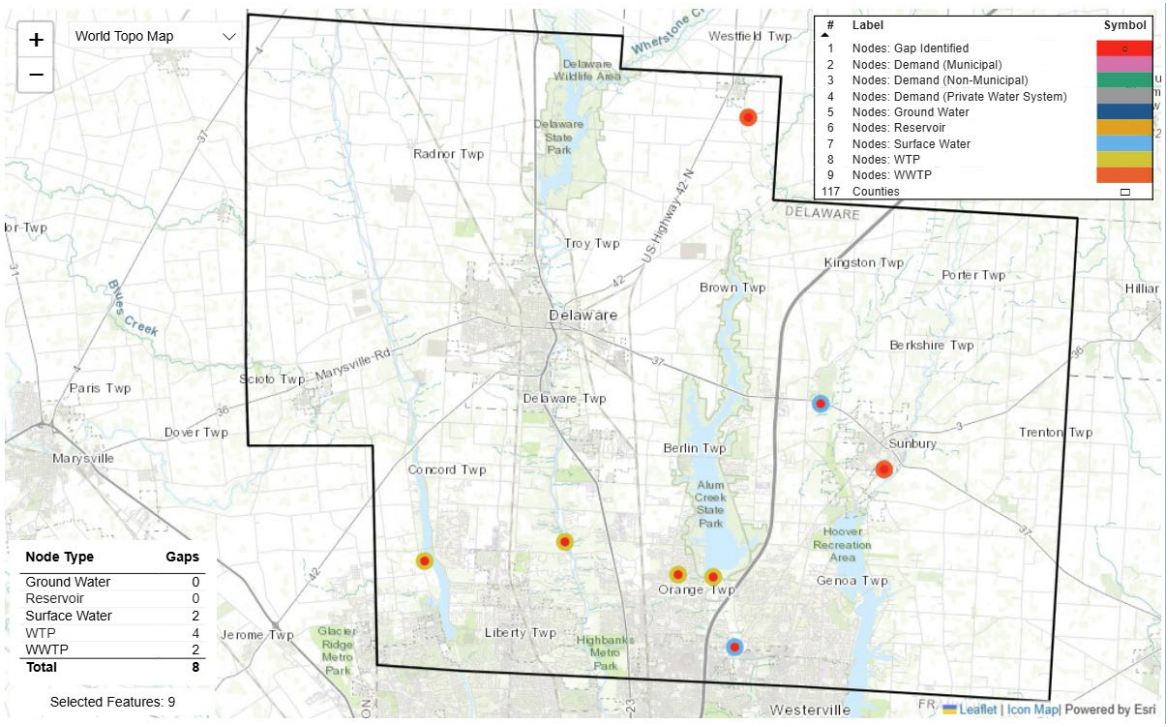
Implementation Timeline

- Projects with shorter timelines ranks higher
- Includes project planning, funding, design, construction, and start-up
- Larger infrastructure projects have longer durations
- Green: < 3 years
- Yellow: 3 – 5 years
- Red: 5 – 10 years

Approach to Resource Gaps

2040 Full Speed Ahead Scenario

- Solution strategies developed for the 2040 Full Speed Ahead Scenario *(expected growth + moderate temperature/precipitation stress)* to provide guidance on what planning might be considered in the near term
- The 2040 Full Speed Ahead Scenario was selected as the target planning scenario to allow stakeholders to assess the current and future project needs without extending too far into the future while using reasonable temperature/precipitation projections.
- Pre-planning level projects developed to fill gaps that provide conceptual solutions
- Project next steps include:
  - Project development
  - Alternatives development with economic and non-economic evaluation
  - Regulatory evaluation and approval
- Cost models for comparative purposes and are in 2024 costs.



- Projects to fill gaps categorized by type:
  - Local – Utility largely uses its own assets to fill gap or industrial provides its own onsite solutions
  - Regional – Utility collaborates with other utilities
  - Reuse – Utility leverages reuse water to provide non-potable water to an industrial user to reduce potable water demand

Resource Gaps

Projects on next slides based on 2040 gap

- Delaware County Gaps are summarized in the table below:

Name	Node No.	Capacity (MGD)	2030 Flow (MGD)	2040 Flow (MGD)	2040 Gap (MGD)	2050 Flow (MGD)
Sunbury WWTP	2146	1.13	1.79	2.38	1.25	2.77
Ashley WWTP	2141	0.19	0.16	0.19	0	0.22
DelCo WTPs	2121, 2122, 2123, 2125	45.35	32.77	41.51	0	48.84
Home Road WTP	Evaluated with Franklin County due to its service area					

Name	Node No.	2040 Gap (MGD)	Remaining Usable Storage (MG)
Little Walnut Creek (WW)	2106	0.14 (Max day)	-
Alum Creek (SW)	2111	1.20 (Max day)	-
Alum Creek Lake (Reservoir)	2163	-	173
Hoover Reservoir	2164	-	1.38

- Ashley WWTP capacity and flow are equivalent in the 2040 full speed ahead scenario
- Both Sunbury and Ashley's water demand is met by DelCo
- The DelCo WTPs were flagged for being over 80% capacity; measures can be taken now to prevent future gaps.
  - 2123 is in Knox County but evaluated with the DelCo WTPs

Sunbury WWTP

Overview (2040 Full Speed Ahead Scenario)

- Industrial and population growth driven WWTP gap of 1.25 MGD

Project	WTP Need(s)	WWTP Need(s)	Outside Fence Need(s)	Total	O&M Relative Requirements	Notes
Expand WWTP	None	2.0 MGD Expansion (Total Capacity, 3.13 MGD) $50,500,000	+ Conveyance	$50,500,000	Medium	1. Demand gap is 1.25 MGD. WWTP design based on 2.0 MGD to bring 2040 demand within 80% capacity.
Regional Interconnection with Expansion (Redirect Galena influent to Sunbury WWTP)	None	2.0 MGD Expansion (Total Capacity, 3.13 MGD) Provide wastewater lift station. $50,500,000	$4,800,000	$55,300,000	Medium	1. Gap is 1.75 MGD with added Galena demand. WWTP design based on 2.5 MGD to provide operating flexibility.

	Project Cost	Favorability Across Scenarios	Favorability Across Gaps	Life Cycle Cost	Water Quality Impact	Implementation Timeline
Option A – Expand WWTP	**$50,500,000**	Green	Green	Green	Green	Green
Option B – Regional Interconnection with Expansion	**$55,300,000**	Green	Green	Green	Green	Yellow

Ashley WWTP

- Population growth driven gap
- Local or regional projects evaluated; Reuse is not a viable project option

Project	WTP Need(s)	WWTP Need(s)	Outside Fence Need(s)	Total[1,2]	O&M Relative Requirements	Notes
Expand WWTP	N/A	0.25 MGD expansion	Conveyance	$23,200,000	Medium	1. Demand is at plant capacity in 2040. WWTP design is based on 0.25 MGD to provide operating flexibility. 2. Demand is entirely municipal 3. Water needs are met by Del-Co; the Del-Co WTP gaps are evaluated separately.
Regional Interconnection	N/A	Provide wastewater lift station. $5,300,000	$23,800,000	$29,100,000	Medium	1. Combined demand is 7.02 MGD, capacity of Upper Olentangy WRC is 10 MGD. 2. WW Lift Station rated for 0.25 MGD; conveyance estimated for 10 miles.

	Project Cost	Favorability Across Scenarios	Favorability Across Gaps	Life Cycle Cost	Water Quality Impact	Implementation Timeline
Expand WWTP	**$23,200,000**	Green	Green	Green	Yellow	Green
Regional Interconnection	**$29,100,000**	Green	Green	Green	Red	Yellow

Notes:
1. Total excludes some outside fence needs that cannot be evaluated at this planning level.
2. Construction cost estimates are for comparative purposes and should not be used for budgeting purposes. Projects costs should be developed based on additional planning and defined scope of work.

Del-Co WTPs

Overview (2040 Full Speed Ahead Scenario)

- Information encompasses all 4 Del-Co plants
  - Note: Thomas E. Stewart WTP is in Knox County
- Table 1 identifies an infrastructure gap based on expected growth trends and moderate temperature and precipitation changes.
- Table 2 provides a detailed breakdown of combined demand split between the 4 Del-Co WTPs.

Table 1. Combined Del-Co Plants

Asset	Capacity, MGD	Demand, MGD	Demand:Capacity, %
Del-Co Plants	45.35	41.48	91.5

Table 2. Individual Del-Co Plants

Asset	Capacity, MGD	Demand, MGD	Demand:Capacity, %
Timothy F. McNamara WTP	4	4	100
R.E. Scott WTP	6.55	5.94	90.7
Olentangy WTP	28.8	26.1	90.6
Thomas E. Stewart WTP	6	5.44	90.7

Note: Provided values are based off 2040 Full Speed Ahead max monthly average

Del-Co WTPs

Project Descriptions and Construction Cost Estimates: Local

LOCAL Project	WTP Name	WTP Need(s)*	WWTP Need(s)	Outside Fence Need(s)	Total[1,2]	O&M Relative Requirements	Notes
Option A – Expand Multiple WTPs	R.E. Scott WTP	1.5 MGD Expansion (Total Capacity, 8.05 MGD) $52,800,000	N/A	+ Distribution	$252,600,000	Medium	1. Production exceeds 80% of Del-Co combined capacity. Total of 9.5 MGD expansion based on bringing WTPs production within 75% of total capacity. 2. Thomas E. Steward WTP is in Knox county but evaluated together since it is a Del-Co plant. 3. Timothy F. McNamara WTP is a peaking plant, thus not considered for expansion.
	Olentangy WTP	6.5 MGD Expansion (Total Capacity, 35.3 MGD) $147,000,000	N/A	+ Distribution			
	Thomas E. Stewart WTP	1.5 MGD Expansion (Total Capacity, 7.5 MGD) $52,800,000	N/A	+ Distribution			

Notes:
1. Total excludes some outside fence needs that cannot be evaluated at this planning level.
2. Construction cost estimates are for comparative purposes and should not be used for budgeting purposes. Projects costs should be developed based on additional planning and defined scope of work.

Del-Co WTPs

Project Descriptions and Construction Cost Estimates: Regional

REGIONAL Project	WTP Need(s)	WWTP Need(s)	Outside Fence Need(s)	Total[1,2]	O&M Relative Requirements	Notes
Option B – Regional Treatment Facility	New WTP with a capacity of 9.5 MGD $175,000,000	None	+ Distribution	$175,000,000	High	1. Production exceeds 80% of Del-Co combined capacity. Total of 9.5 MGD expansion based on bringing WTPs production within 80% of total capacity. 2. SW Lime Softening WTP assumed for cost estimating.

Notes:
1. Total excludes some outside fence needs that cannot be evaluated at this planning level.
2. Construction cost estimates are for comparative purposes and should not be used for budgeting purposes. Projects costs should be developed based on additional planning and defined scope of work.

Del-Co WTPs

Project Descriptions and Construction Cost Estimates: Regional

REGIONAL Project	WTP Need(s)	WWTP Need(s)	Outside Fence Need(s)	Total[1,2]	O&M Relative Requirements	Notes
Option C – WWTP Reuse and WTP Expansion	7.5 MGD Expansion to Olentangy WTP (Total Capacity, 36.3 MGD) $158,000,000	Add 3 MGD reuse capability to Ashley WWTP $12,000,000	+ Distribution and Conveyance	$170,000,000	High	1. Production exceeds 80% of Del-Co combined capacity. Total of 10.5 MGD based on bringing WTPs production within 80% of total capacity. 2. .It is assumed that full reuse capability will not be met in 2040; sized for future treatment considerations.

Notes:
1. Total excludes some outside fence needs that cannot be evaluated at this planning level.
2. Construction cost estimates are for comparative purposes and should not be used for budgeting purposes. Projects costs should be developed based on additional planning and defined scope of work.

Scorecard: Comparing Projects

Del-Co WTPs

	Construction Cost[1,2]	Favorability Across Scenarios	Favorability Across Gaps	Life Cycle Cost	Water Quality Impact	Implementation Timeline
Option A – Expand Multiple WTPs	**$252,600,000**	Green	Green	Red	Yellow	Red
Option B – Regional Treatment Facility	**$175,000,000**	Green	Green	Red	Yellow	Red
Option C – Water reuse at Ashley WWTP and Expand WTP	**$170,000,000**	Green	Green	Red	Green	Red

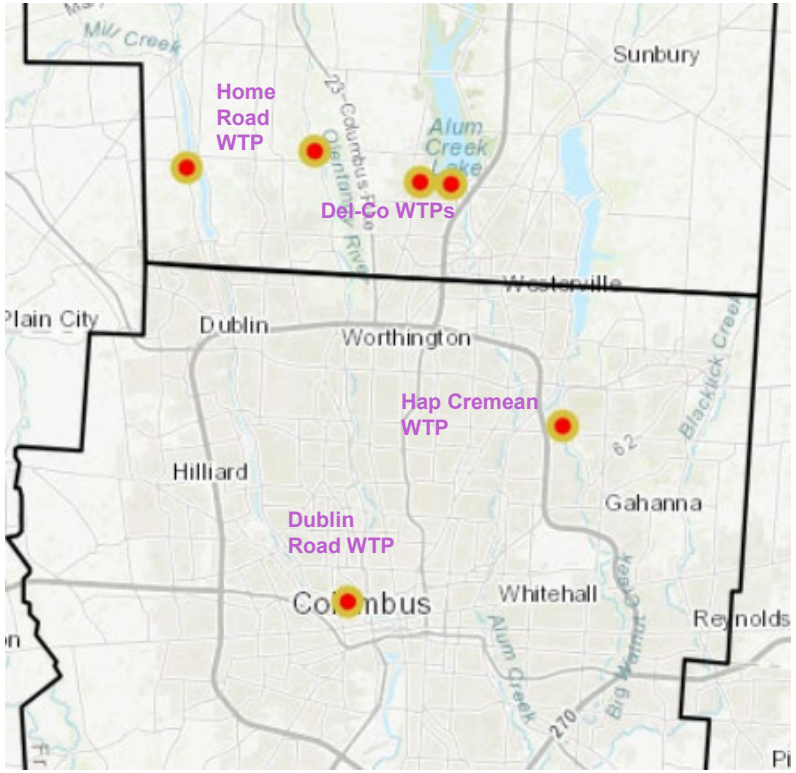
Notes:

1. Total excludes some outside fence needs that cannot be evaluated at this planning level.
2. Construction cost estimates are for comparative purposes and should not be used for budgeting purposes. Projects costs should be developed based on additional planning and defined scope of work.

Regionalization Opportunity

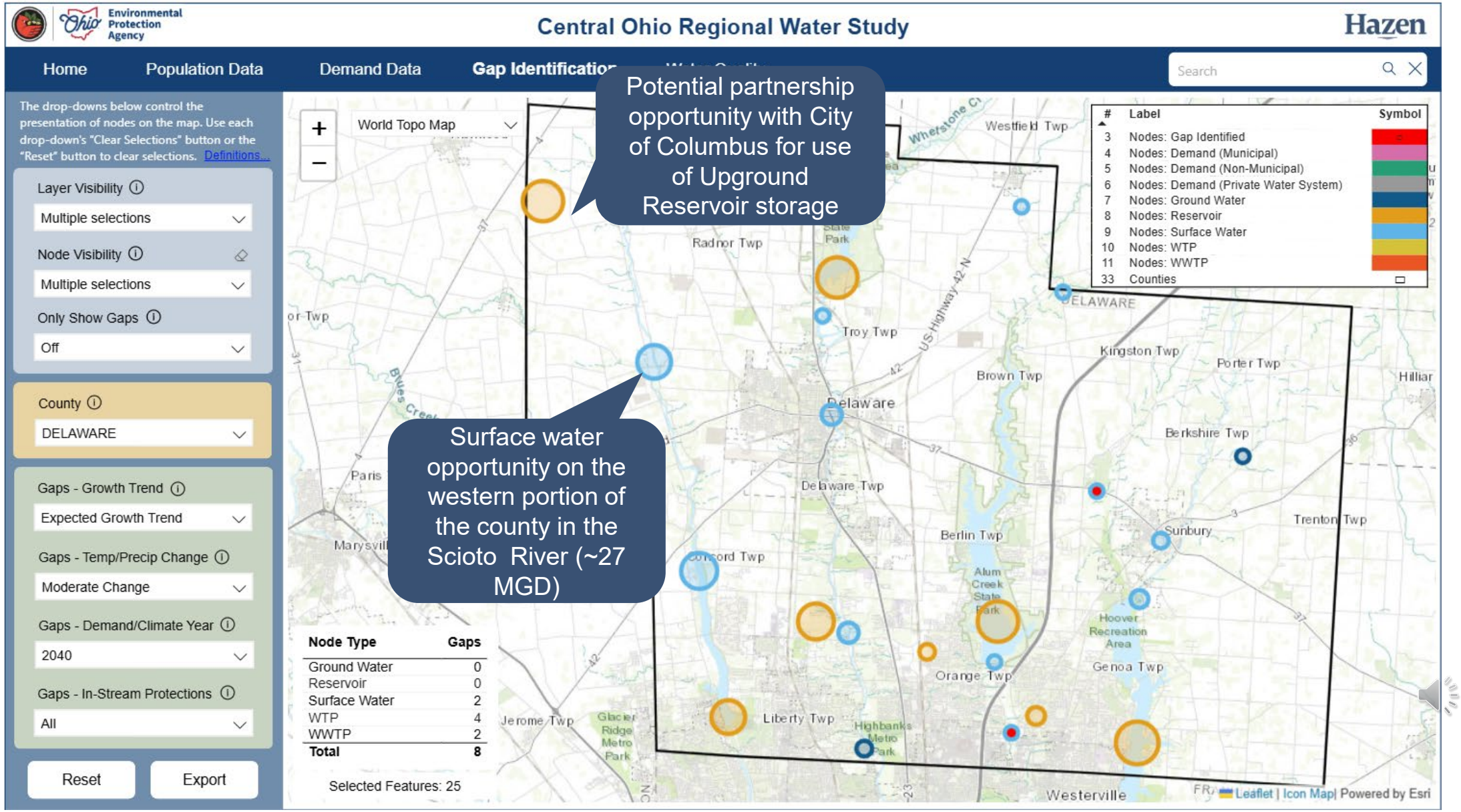
Franklin-Delaware Regionalized Project

- Opportunity to expand service across Franklin and Delaware counties
- Required and Planned Expansions in Area (MGD):
  - **Home Road WTP – 6.04**
  - **Columbus Hap Cremean WTP – 8.76**
  - **Columbus Dublin Road WTP – 5.15**
  - **Del-Co WTPs – 9.5**
  - **Total Additional Capacity in Area – 29.45**
- Municipal and industrial growth driven water demands
- O'Shaughnessy Reservoir, augmented by the Columbus Upground Reservoirs, could be potential source water
- Stakeholders continue to collaborate to share resources and maximize use of infrastructure

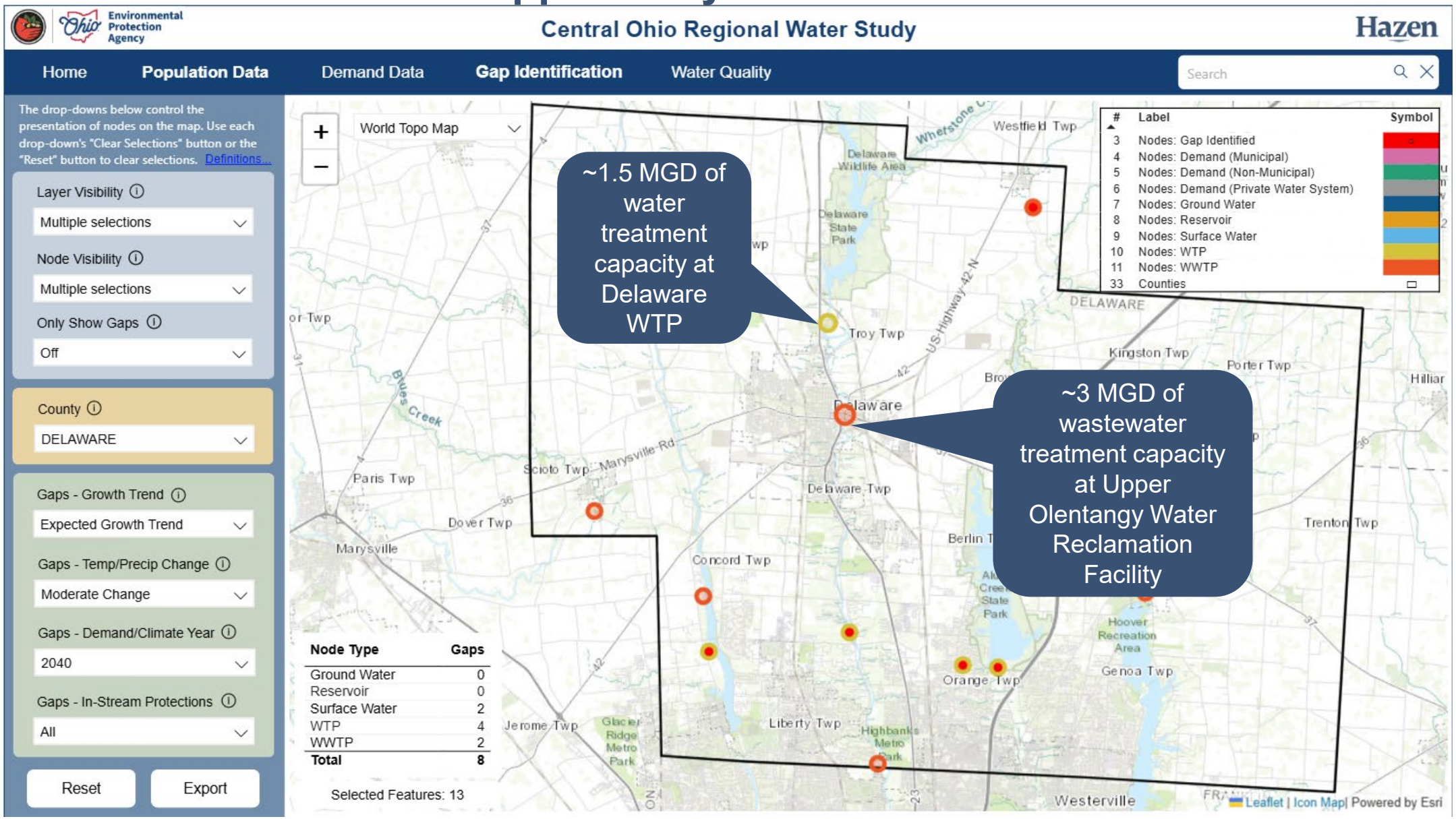


Areas of Opportunity

Water Supply Areas of Opportunity



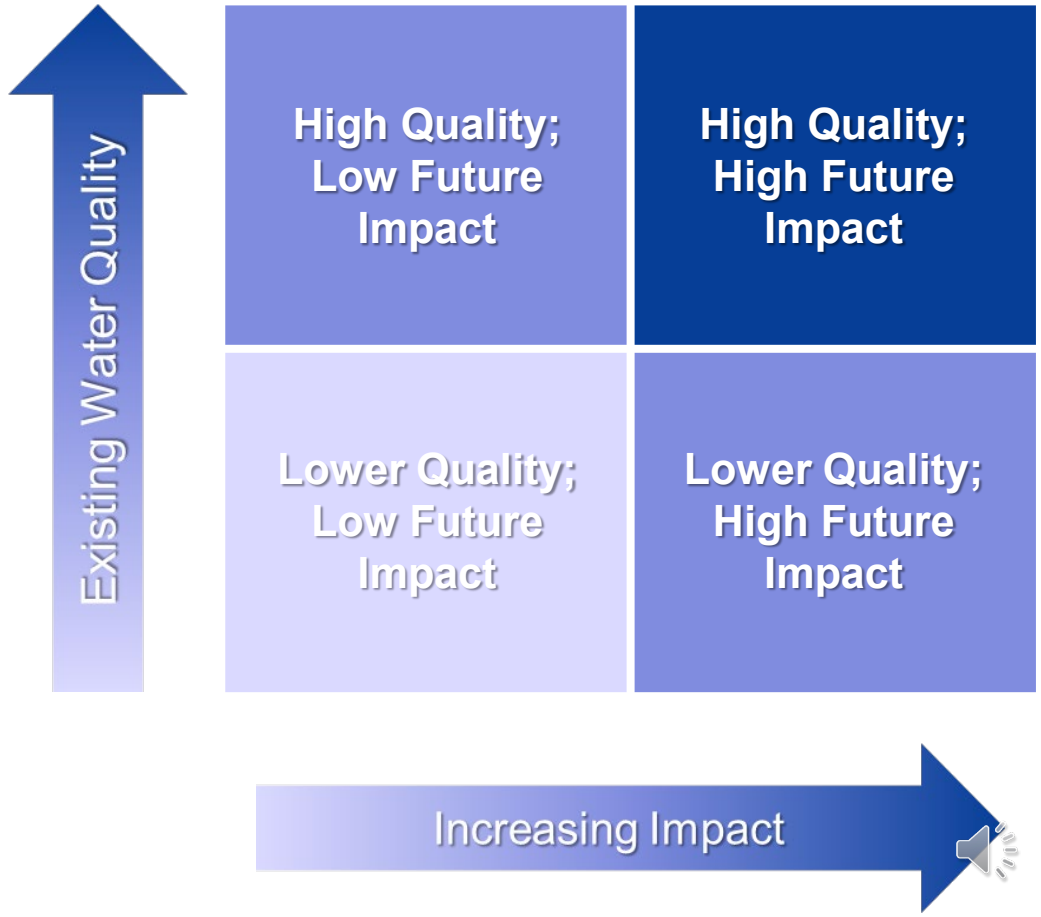
Infrastructure Areas of Opportunity



Water Quality

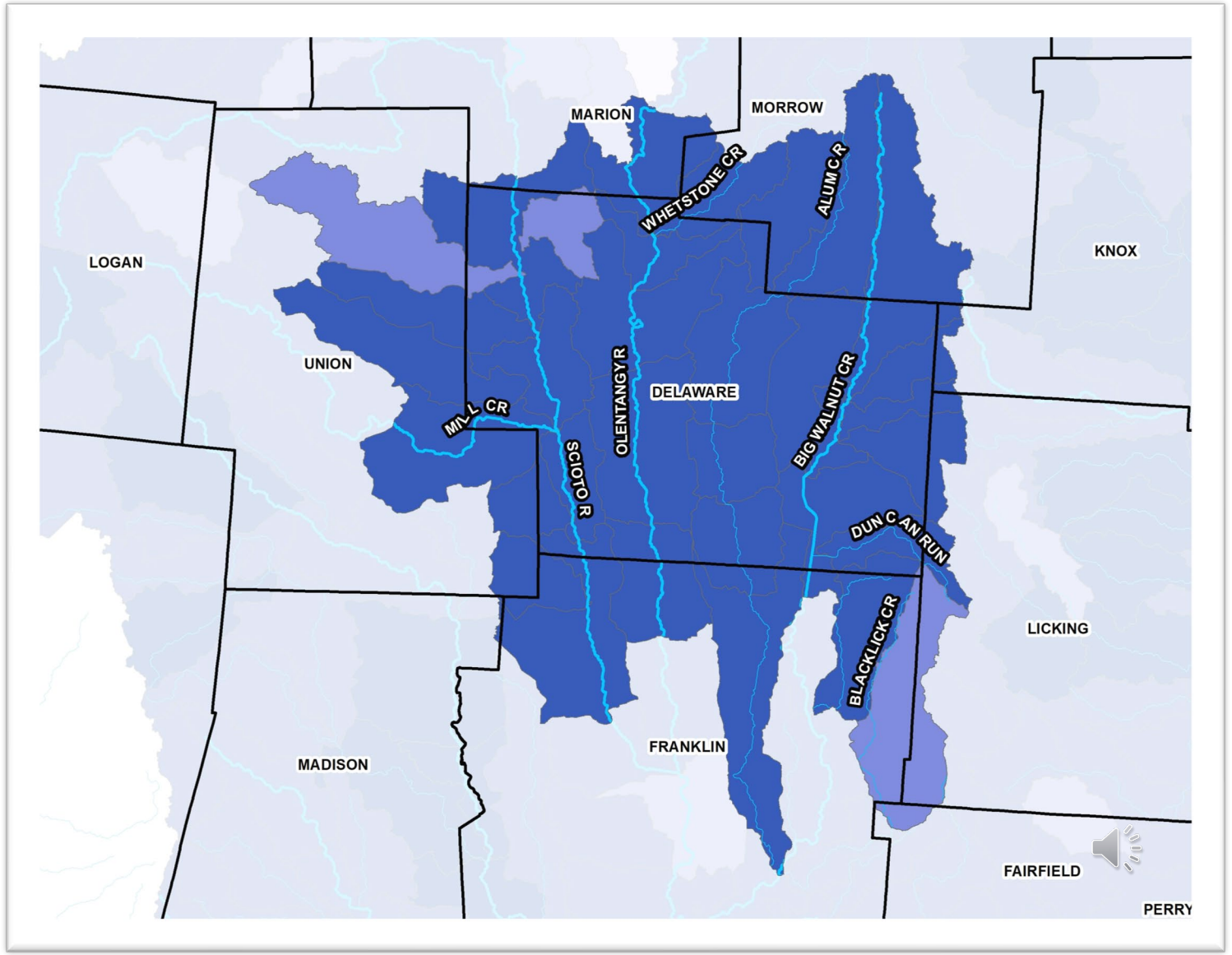
Water Quality

- Goals:
  - Characterize current water quality at the local watershed level (HUC-12)
  - Determine potential challenges based on a suite of possible future scenarios
  - Characterize watersheds and identify potential for future water quality impacts
  - Identify activities that may support the protection and improvement of streams and water quality



Existing Water Quality

- Watersheds are characterized by:
  - Quality of aquatic habitat (QHEI)
  - Targeted water quality standards
  - Stream biological health
- Majority of Delaware County watersheds have good water quality



Future Water Quality Scenarios

- Future scenarios were examined for ***potential impacts*** to water quality due to:
  - **Land use**
    - *Increased impervious area may lead to degraded streams due to loss of riparian corridor, increased flows, and reduced ground water recharge*
  - **Hydromodification**
    - *Higher flows in frequently occurring events may contribute to increased erosion and reduced water quality*
  - **Increased occurrence of low flows**
    - *Lower and longer base flows during dry periods may disrupt aquatic habitats and lead to more restrictive permitting requirements*
  - **Temperature and Precipitation Impacts**
    - *Hotter/drier conditions may result in more frequent and lower base flows*

Land Use

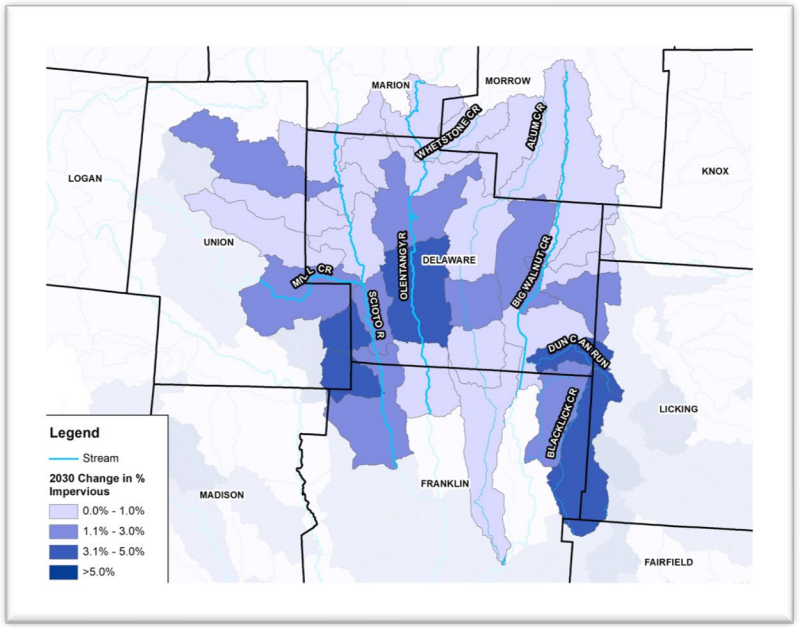
Hydromodification

Low Flows

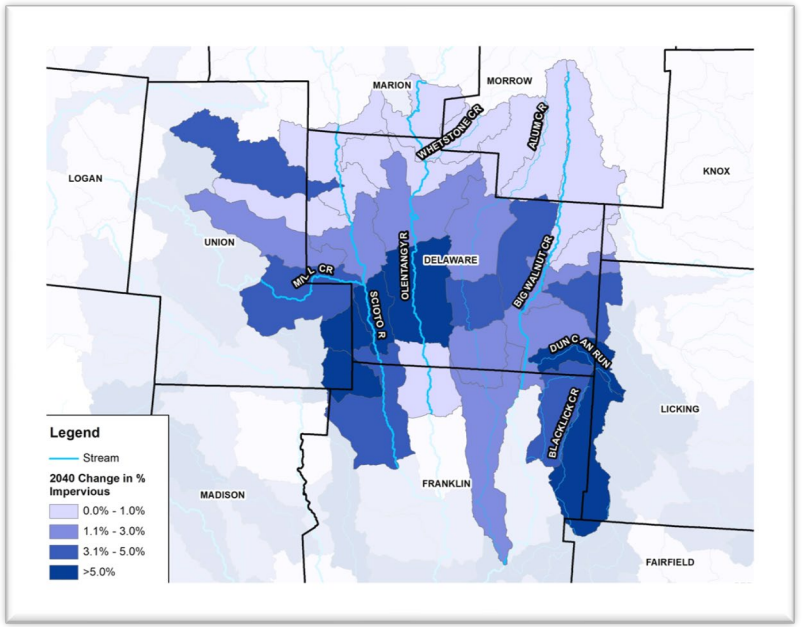
Temperature & Precipitation

Potential Land Use Impacts

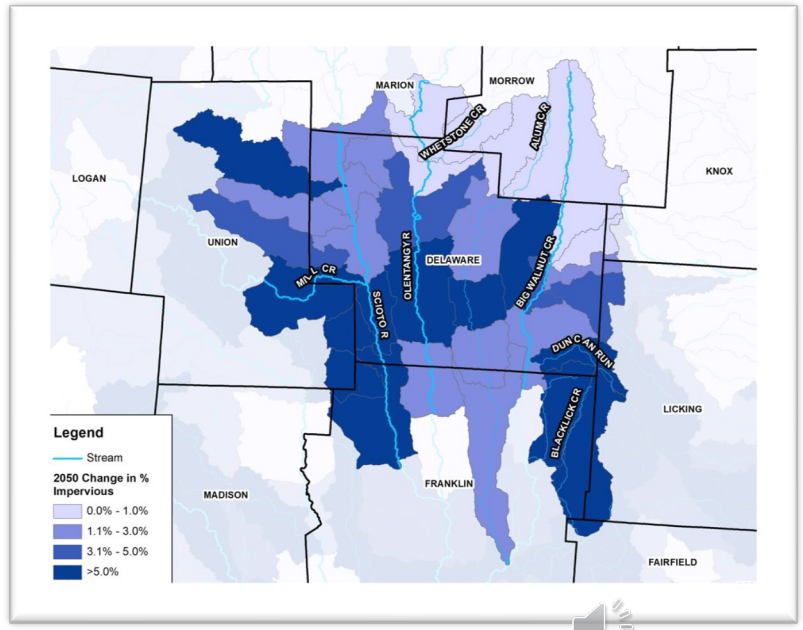
- *Land Use: Increased impervious area without appropriate setbacks, mitigation, or stormwater controls may lead to degraded streams due to loss of riparian corridor, increased flows, and reduced ground water recharge*



2030



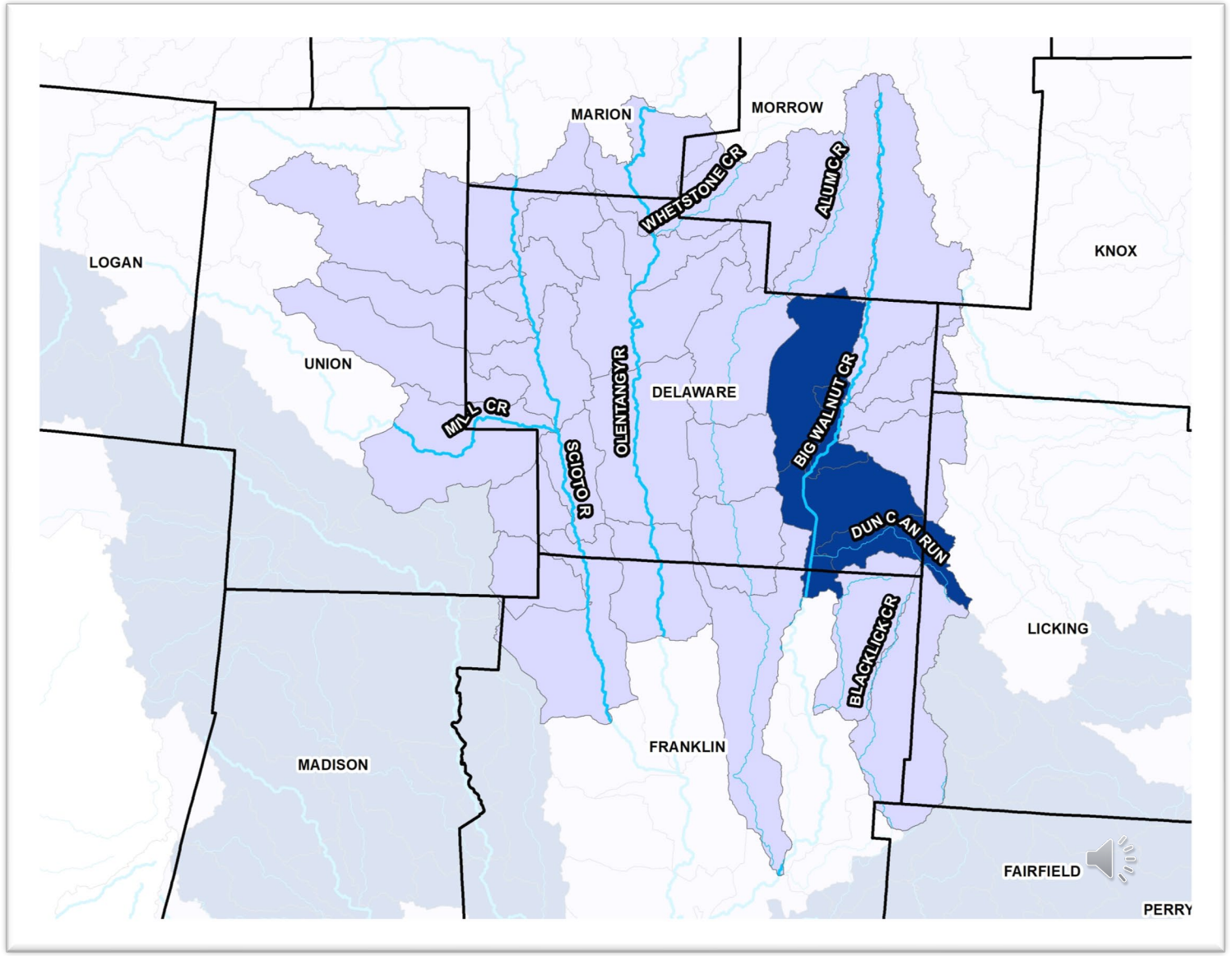
2040



2050

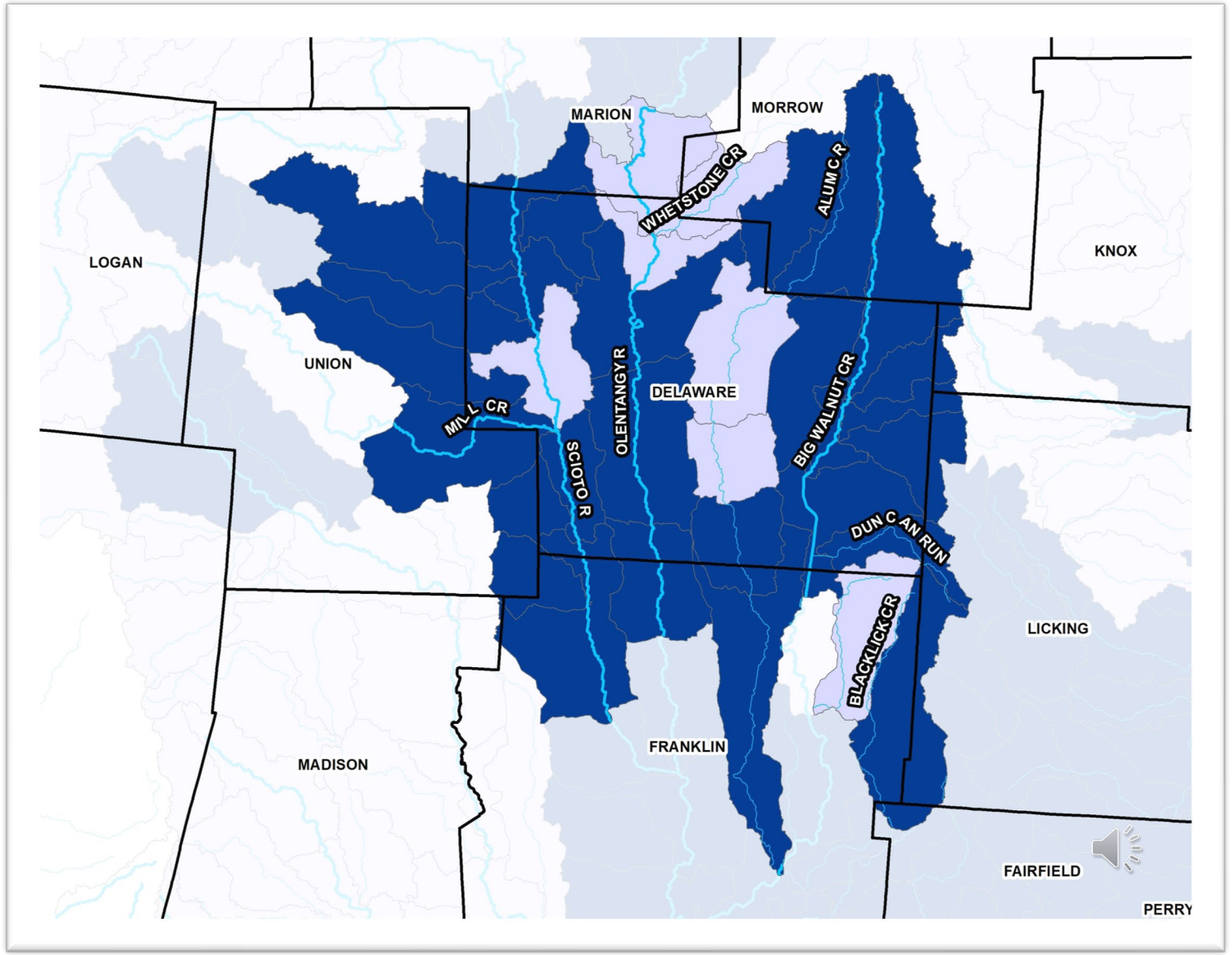
Hydromodification Impacts

- *Hydromodification: Higher in-stream flows in frequently occurring events resulting from increased development may result in streambank erosion and channelization, contributing to increased sediment load and reduced water quality*
- Watersheds in dark blue have higher potential for future hydromodification impacts
- Watersheds in light purple have lower potential for future hydromodification impacts



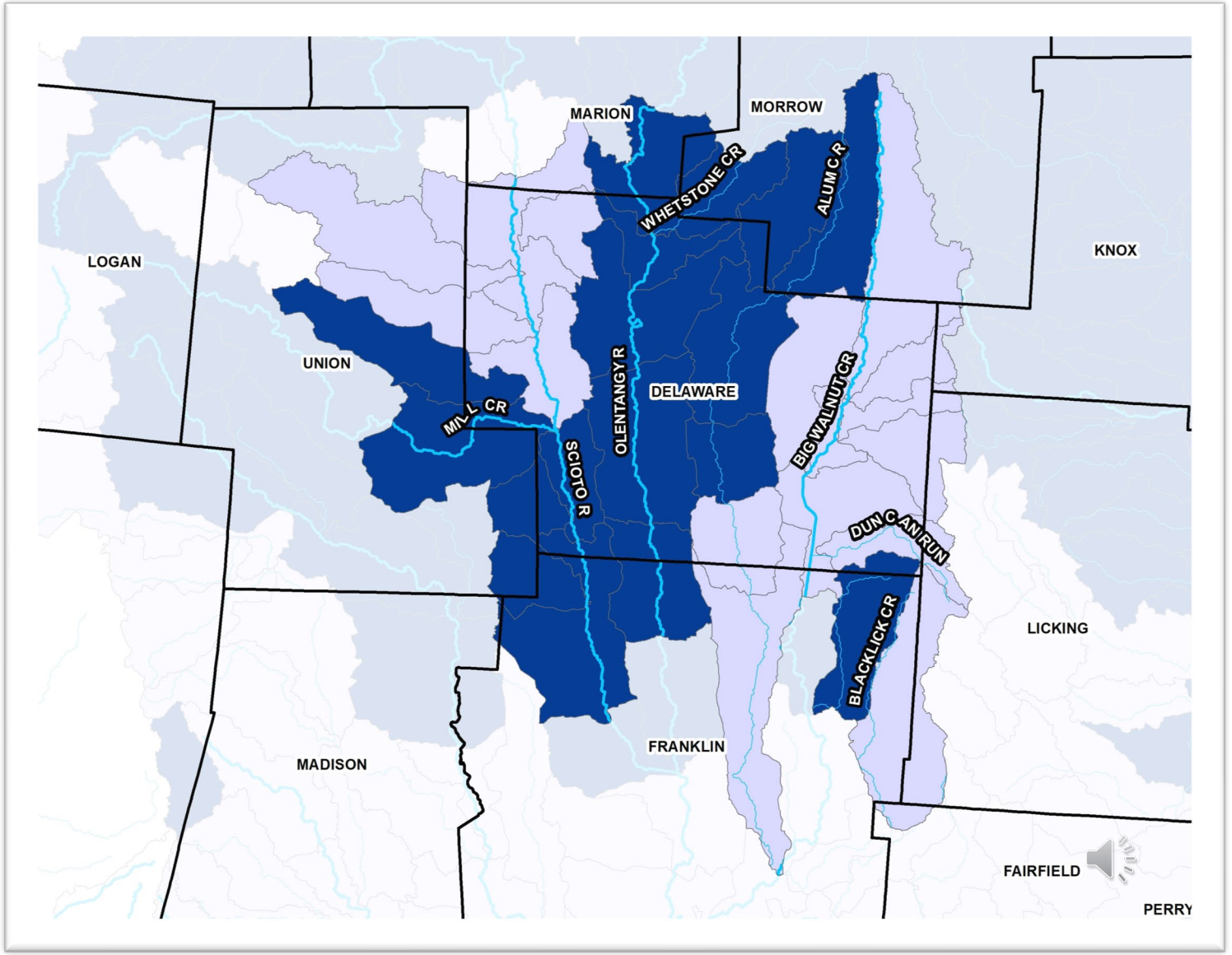
Low Flows Impacts

- *Low Flows: Lower base flows during dry periods resulting from reduced ground water levels or a decrease in pervious areas may disrupt aquatic habitats and lead to more restrictive permitting requirements*
- Watersheds in dark blue have higher potential for future water quality impacts and more restrictive permitting requirements due to low flows
- Watersheds in light purple have lower potential for future water quality impacts and more restrictive permitting requirements due to low flows
- *Note: Low flows areas are not indicative of potential water supply/availability issues but rather where changes could impact local aquatic habitat and permitting requirements*



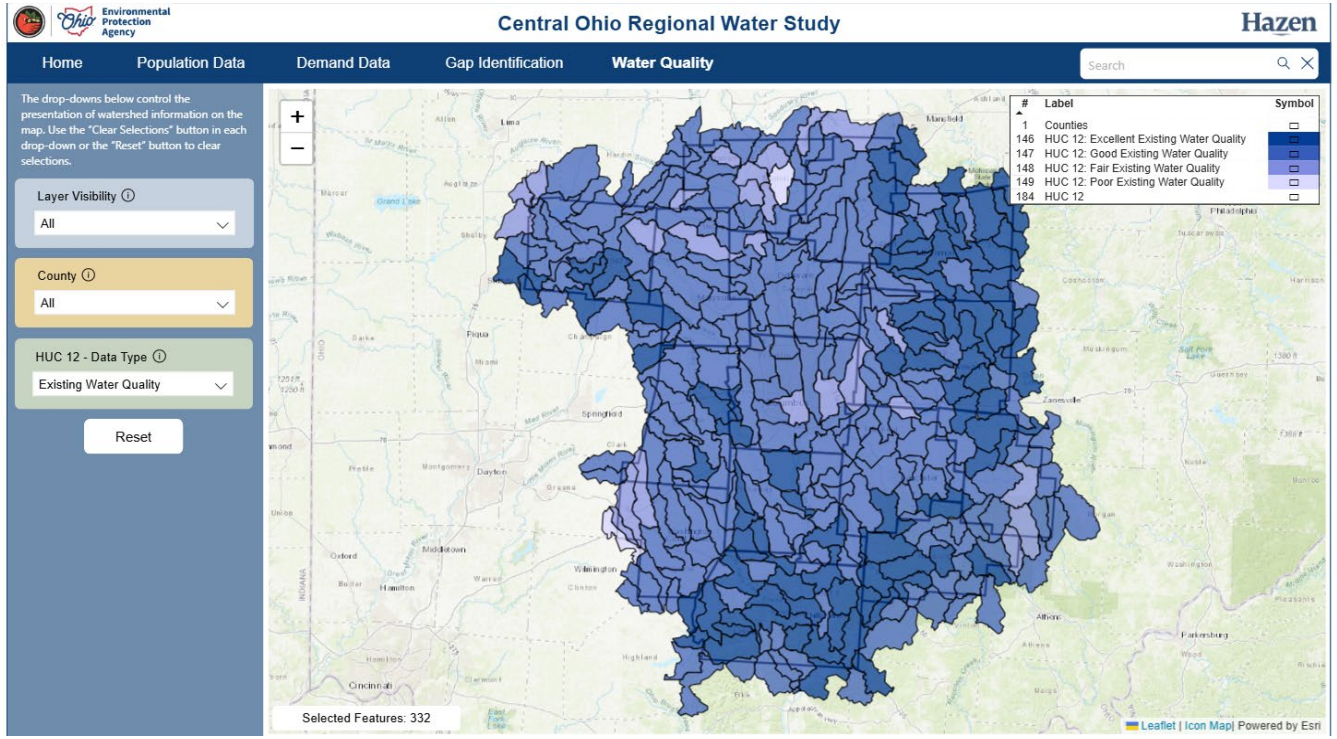
Temperature and Precipitation Impacts

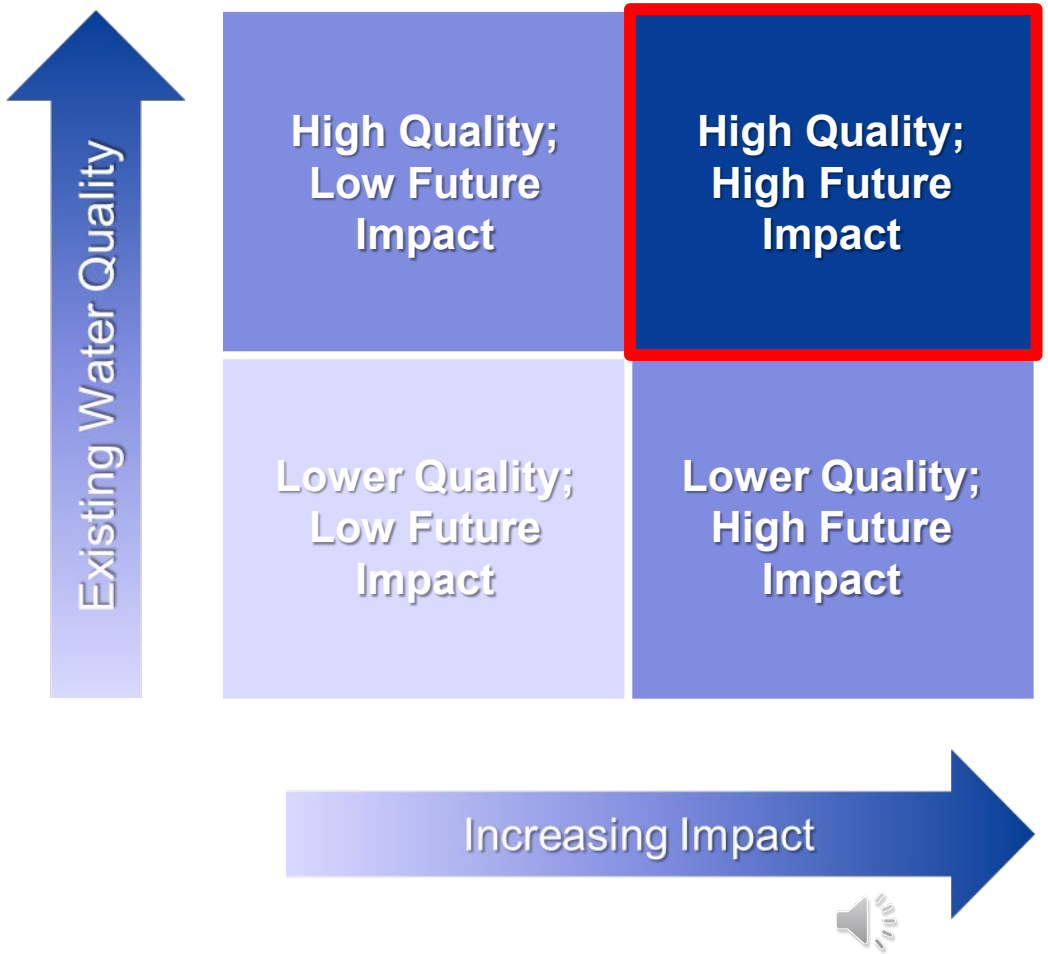
- *Temperature and Precipitation: Hotter/drier conditions may result in more frequent and lower base flows*
- Watersheds in dark blue have higher potential for future low flow impacts due to changing temperature and precipitation conditions
- Watersheds in light purple have lower potential for future low flow impacts due to changing temperature and precipitation conditions



Watershed Impacts

- Water quality dashboard can be utilized to examine individual watershed characteristics and identify watersheds with excellent existing water quality and high potential for future impacts
- Protection, conservation, and restoration activities can be identified and prioritized in those watersheds





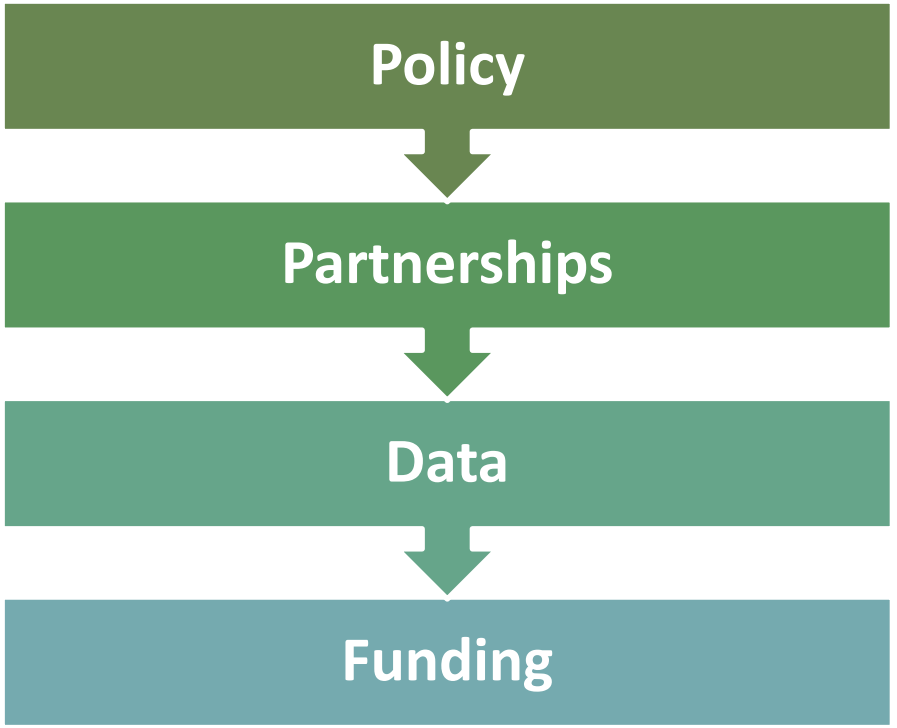
Water Quality Protection

All watersheds are living systems and are constantly changing.

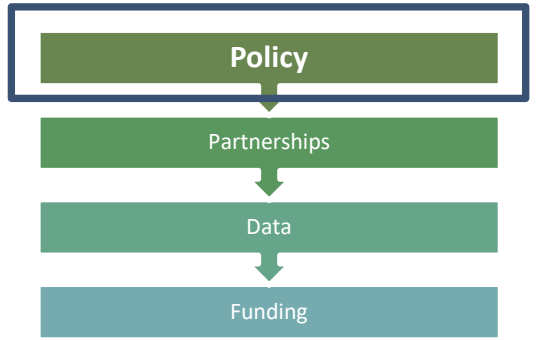
The **magnitude** of change will vary across the region based on several variables.

- Due to the enhanced benefits they provide, watersheds with high quality features should be prioritized for protection.
- Best management practices should be implemented across all watersheds to protect existing water quality.
- Opportunities for conservation should be explored along stream corridors in all watersheds to preserve riparian areas.

When properly implemented and aligned, these mechanisms may adequately protect ecosystems alongside land use changes:



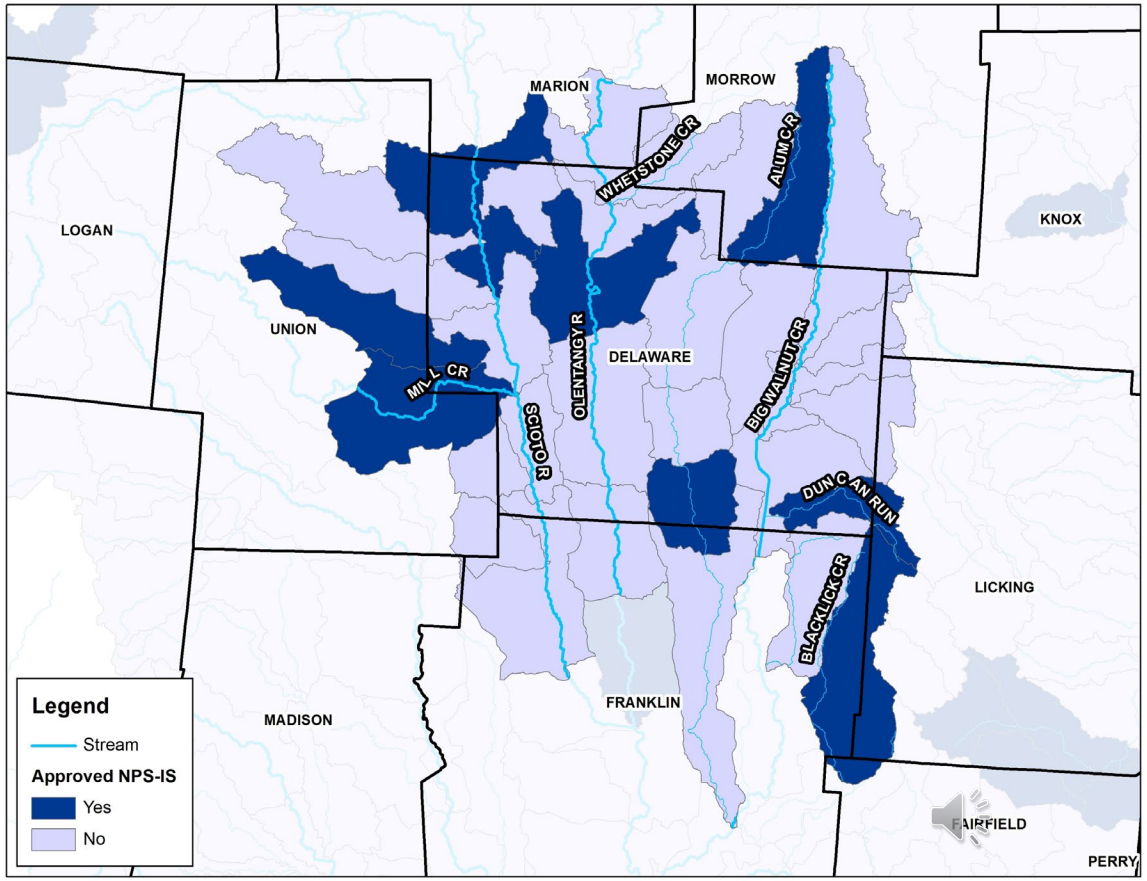
Water Quality Protection Mechanisms



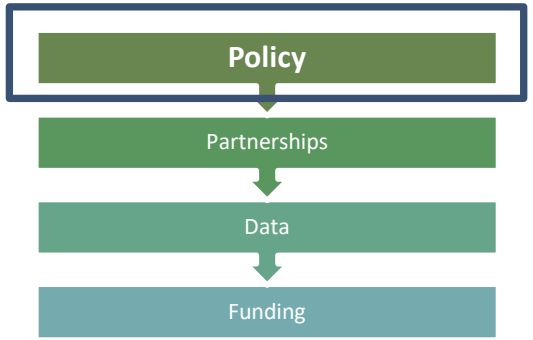
- **Review Local Ordinances**
  - Riparian Setbacks
  - Floodplain Requirements
  - Stormwater Management Plans
  - Tree Codes
  - Zoning and Planning
  - Application and review fee rates

- **Develop 9 Element Nonpoint Source Implementation Strategies (NPS-IS)**
  - Delaware County includes all or part of **33 HUC-12 watersheds**
  - Currently, **8 HUC-12 watersheds have an Ohio EPA approved NPS IS**

- **MS4 Compliance**
  - Ensure communities approaching Urban Area designation are prepared for the regulatory responsibilities under the CWA
  - MS4 communities can leverage an approved NPS-IS plan to meet permit requirements

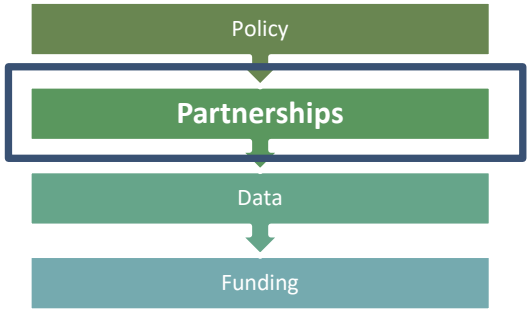


Water Quality Protection Mechanisms



MS4 Requirement	How a NPS-IS Plan Can Help
NPDES Permit	Guide permit applications and support permit reviews
Planning and Development	Encourage Low Impact Development and watershed friendly land use
Stormwater BMP Implementation	Identify green infrastructure and restoration projects
Public Education and Outreach	Offer resources, partners, and initiatives
TMDL Compliance	Provide baseline data and pollutant load estimates.
IDDE	Identify high risk areas for inspection and monitoring
Funding Opportunities	Support Section 319 grant applications

Water Quality Protection Mechanisms



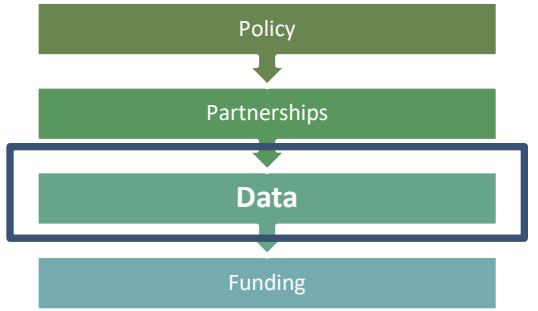
- **Pool Resources**
  - Meet routinely to discuss trends, projects, and upcoming plans
  - Invite guest speakers to learn about new opportunities
  - Delegate data collection and permit review responsibilities
  - Access technical expertise, resources, and cost sharing opportunities
- **Increase Community Engagement**
  - Organize public facing programs including clean up events, tree plantings, and citizen monitoring
  - Use NPS-IS fact sheets, reports, and maps in public education material

Friends of Alum Creek & Tributaries

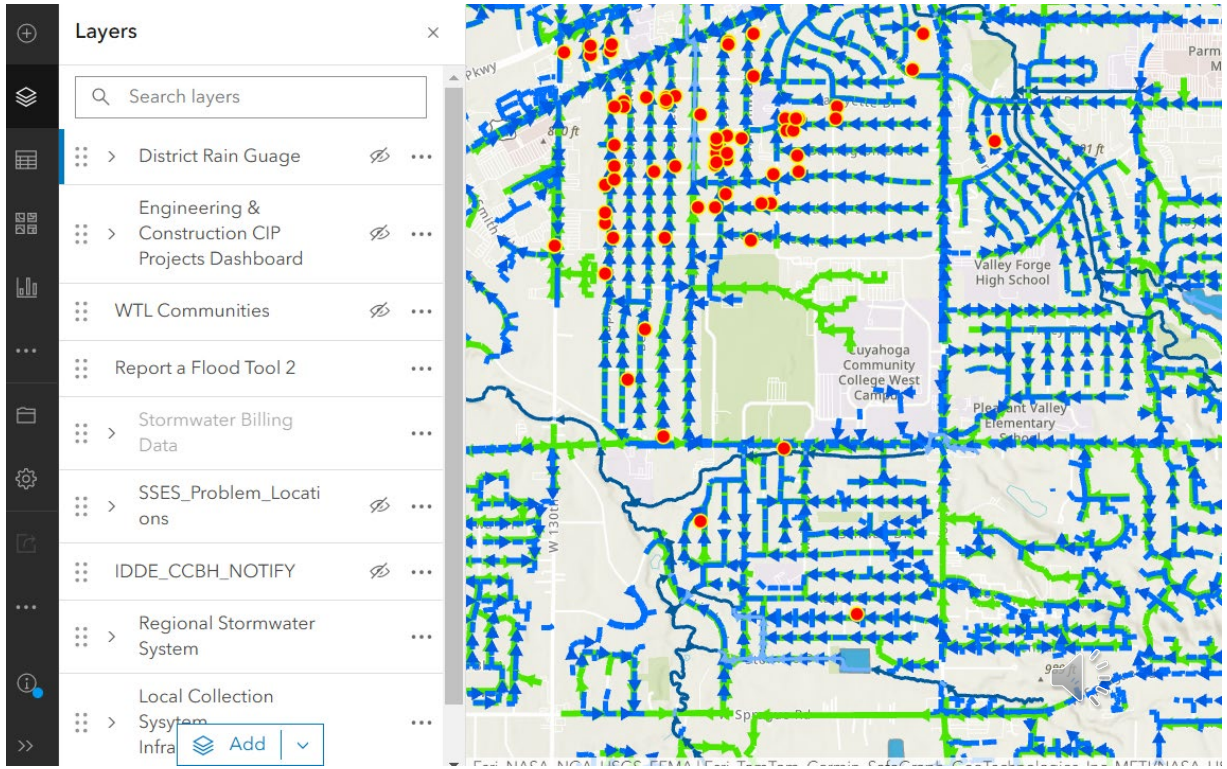
Friends of the Lower Olentangy Watershed

Delaware Public Health District
Dedicated to your health

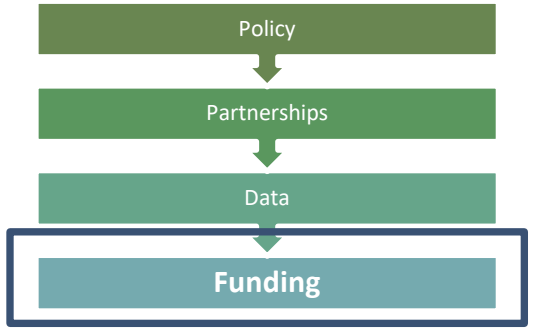
Water Quality Protection Mechanisms



- **Monitor Water Quality**
  - Offer trainings to promote Citizen Science
  - Develop monitoring plans: identify locations to monitor or identify restoration and protection needs
  - Compare data to note new trends that may emerge
- **Digitize Records**
  - Georeference data to spatially analyze trends
  - Expand data collection efforts as needed
- **Public Reporting**
  - Collect observations from the public
  - Make findings and data accessible



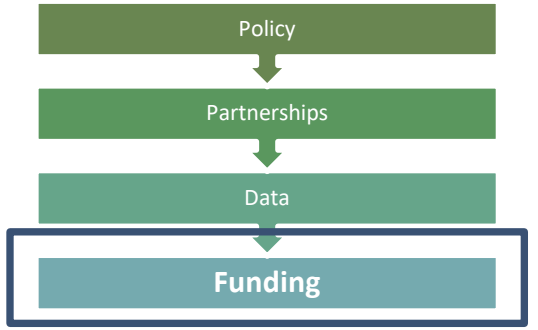
Water Quality Protection Mechanisms



- **Prioritize Infrastructure Upgrades**
  - Focus on areas identified as current or near-term gaps
  - Consider future temperature and precipitation scenarios during planning
  - Assess regional optimization of services as early as possible
- **Incentivize Sustainable Practices**
  - Establish funding programs to encourage developers to adopt green infrastructure
    - *Encourage bioretention, pervious pavement, extended detention, and other BMPs*
  - Encourage redevelopment strategies
- **Leverage Grant Programs**
  - District 17 NRAC Clean Ohio Green Space funding
  - Ohio EPA Water Resource Restoration Sponsor Program
  - Section 319 Grant Funding
    - *Limited to HUC-12s with OEPA approved NPS-IS plan*

Curb extension bioretention in Columbus

Water Quality Protection Mechanisms



H2Ohio Program

- **H2Ohio Rivers Program**
  - Agricultural Incentive Program – Expanded to be statewide in 2024 (ODA)
  - Scioto River Watershed Conservation Reserve Enhancement Program (ODNR)
  - Chloride Reduction Grant Program (Ohio EPA)
  - Equipment Grants (Ohio EPA)
  - Healthy Rivers Livery Grant Program (ODNR)
  - Dam removals (ODNR/Ohio EPA)
  - Water Infrastructure Funding (Ohio EPA)
- **H2Ohio Statewide Wetland Grant Program (ODNR)**

Central Ohio Regional Water Study

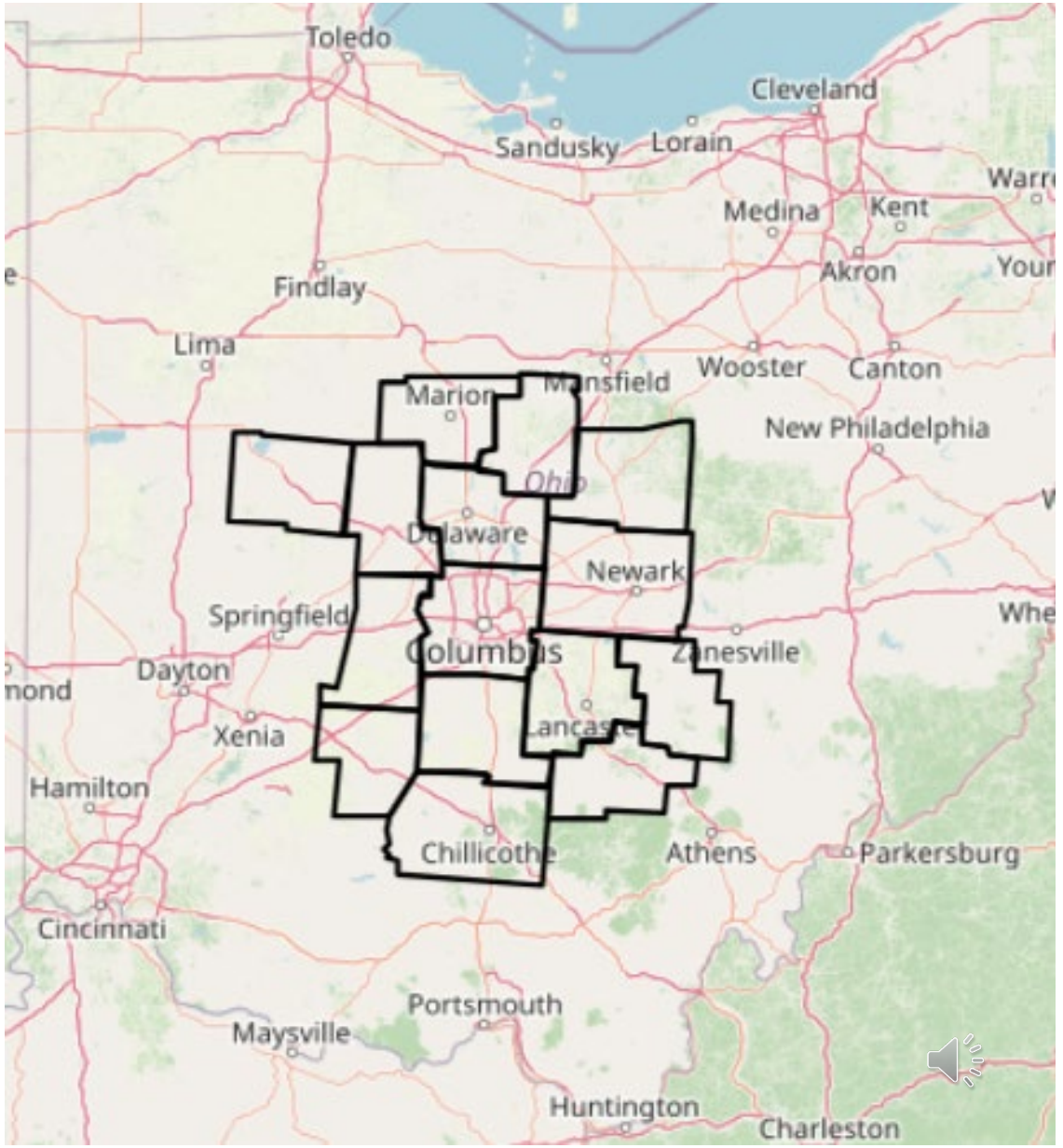
Overview

Residential & Industrial Growth

Water Resource & Infrastructure Adequacy

Future Projects and Opportunities

Planning for Water Quality Protection



Hazen

Ohio Environmental Protection Agency

Ohio Department of Natural Resources

Central Ohio Regional Water Study: Delaware County

Ohio Water Development Authority

March 1, 2025