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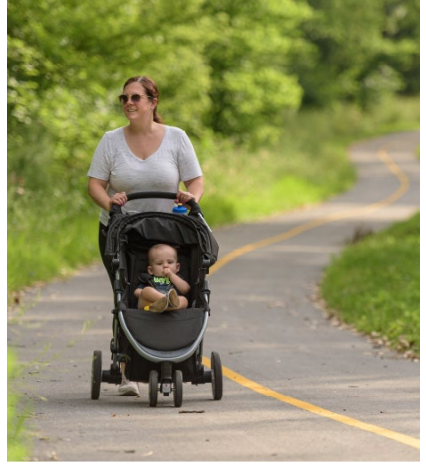
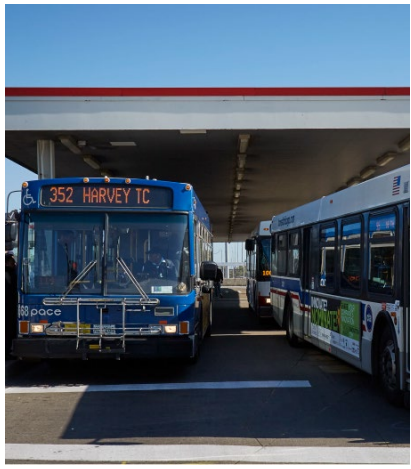
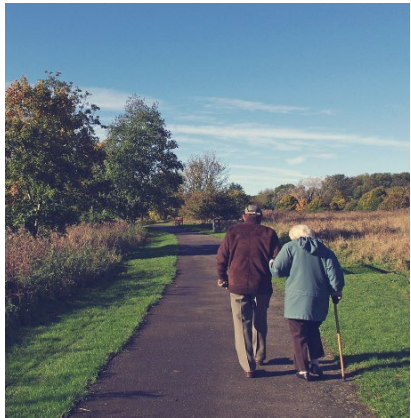
# NWPA Water Supply Sustainability Plan: *Goal refinement*

**May 23, 2023**

**Technical Advisory Committee**



# Vision recap

## NWPA Water Supply Sustainability Plan Vision:

"The NWPA water supply sustainability plan will serve as a roadmap for members seeking to take voluntary steps toward feasible and effective long-term use of water supply resources."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# Interactive polling

Join at menti.com use code 1440 7970

Mentimeter

## Instructions

Go to

www.menti.com

Enter the code

1440 7970

Or use QR code

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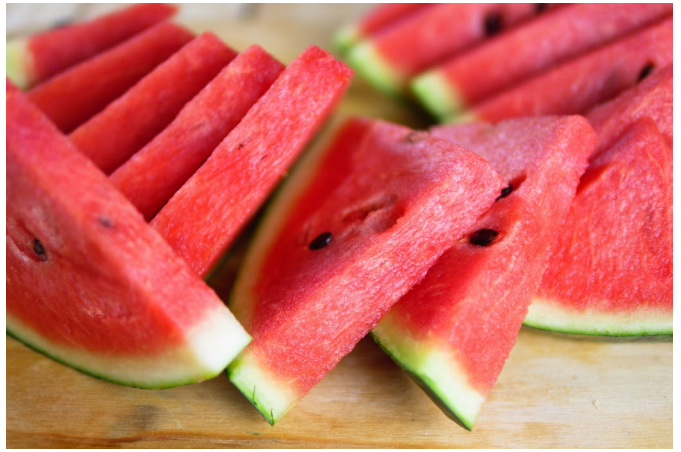
# Interactive poll warm-up



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# Lake Michigan goal recap

**Proposed goal statement**:

Illinois' use of Lake Michigan water does not exceed the diversion limit of 3,200 CFS as measured over a forty-year accounting period.

**Revised goal statement**:

NWPA communities needing an alternative water source have access to a sufficient, affordable, and safe water supply from Illinois' Lake Michigan.

**What we heard:**

- Main concern is increased usage from collar communities, decreasing available supply
- 3,200 CFS is a legal mandate, not a goal
- Goal should be focused on NWPA communities, not the state

**Potential metrics (ranked by TAC):**

1. Change in LMO2 allocations over time
   - **Requires more timely accounting**
2. Lake Michigan water levels
3. Water retained in Lake Michigan watershed

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# Lake Michigan goal refinement question


Goal A:
"Illinois' use of Lake Michigan water does not exceed the diversion limit of 3,200 CFS as measured over a forty-year accounting period."

- OR -

Goal B:
"NWPA communities needing an alternative water source have access to a sufficient, affordable, and safe water supply from Illinois' Lake Michigan."

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# Fox River goal recap

**Proposed goal statement**:

Minimum-instream flow is maintained on the Fox River, reducing the need for backup water supply sources, such as deep sandstone wells.

**Revised goal statement**:

The Fox River provides NWPA communities with an affordable, safe, and reliable water supply while sustaining aquatic ecosystems.

**What we heard:**

- Primary concern of low flow events is a decline in water quality, followed by the use of groundwater sources for backup supply
- Goal should consider quantity and quality

**Potential metrics (ranked by TAC):**

1. Projected water withdrawals
2. Current/historic withdrawals
3. Flow rate under low-flow conditions (Q710)

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# Fox River goal refinement question


Goal A:
"Minimum-instream flow is maintained on the Fox River, reducing the need for backup water supply sources, such as deep sandstone wells."

- OR -

Goal B:
"The Fox River provides NWPA communities with an affordable, safe, and reliable water supply while sustaining aquatic ecosystems."

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# Sandstone aquifer goal recap

## Proposed goal statement:

Water levels are sustained, allowing for the continued use and operation of deep sandstone wells to meet the region's current and future demands.

## What we heard:

- Need two goals to account for geographical differences across sandstone
- More of a management goal than a sustainability goal

## Revised goal statements:

Water withdrawals west of the Maquoketa shale aquifer are maintained at a rate that allows for the continued use and operation of deep sandstone drinking water wells.

Water withdrawals east of the Maquoketa shale aquifer are managed at a rate that gives NWPA communities experiencing adverse dewatering impacts adequate time to switch water sources.

## Potential metrics (ranked by TAC):

1. Projected water withdrawals
2. Water levels in sandstone aquifers
3. # of communities switching off sandstone

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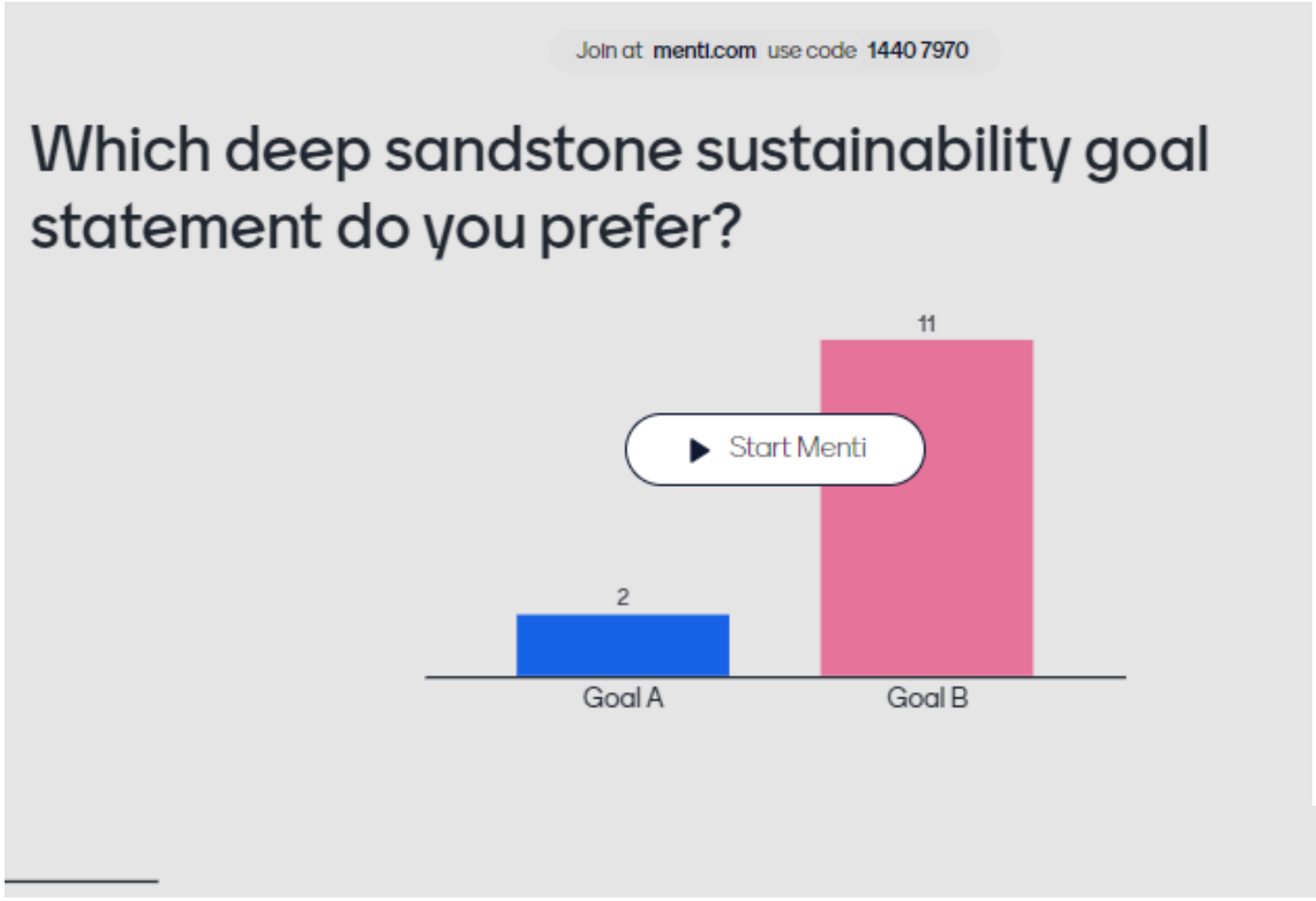
# Sandstone aquifer goal refinement question




Goal A:
"Water levels are sustained, allowing for the continued use and operation of deep sandstone wells to meet the region's current and future demands."

- OR -

Goal B:
1. "Water withdrawals west of the Maquoketa shale aquifer are maintained at a rate that allows for the continued use and operation of deep sandstone drinking water wells."

2. "Water withdrawals east of the Maquoketa shale aquifer are managed at a rate that gives NWPA communities experiencing adverse dewatering impacts adequate time to switch water sources."

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# Shallow aquifer goal recap

**Proposed goal statement**:

Water levels in shallow aquifers are sufficient for the use and operation of sole-source community and household wells.

**Revised goal statement**:

Shallow aquifers provide NWPA communities and households with an affordable, safe, and sufficient water supply while supporting healthy aquatic ecosystems.

**What we heard:**

- Goal shouldn't be limited to sole-source communities
- Economic component to water treatment
- Maintaining groundwater recharge areas and protecting ecological health is important

**Potential metrics:**

- Projected water withdrawals
- Current/historic withdrawals
- Flow rate under low-flow conditions (Q710)

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# Shallow aquifer goal refinement question

Go to **www.menti.com** and use the code **2330 3434**

## Which shallow aquifer sustainability goal statement do you prefer?


Goal A:
"Water levels in shallow aquifers are sufficient for the use and operation of sole-soured community and household wells."

- OR -

Goal B:
"Shallow aquifers provide NWPA communities and households with a safe and sufficient water supply while supporting healthy aquatic ecosystems."

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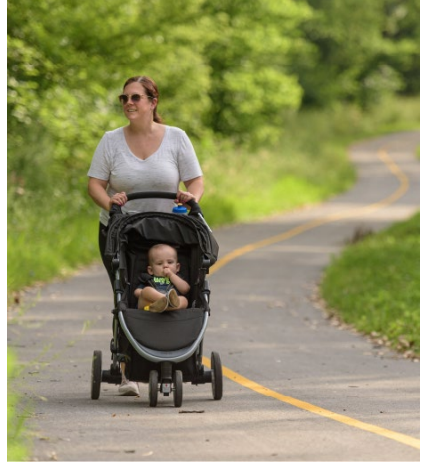
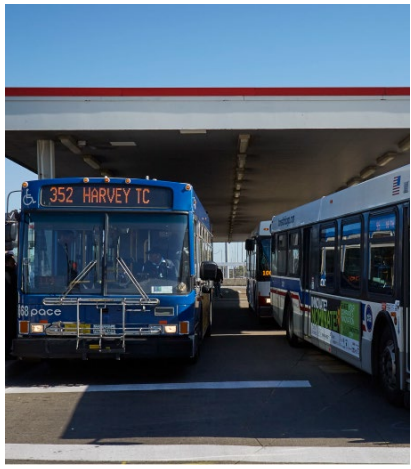
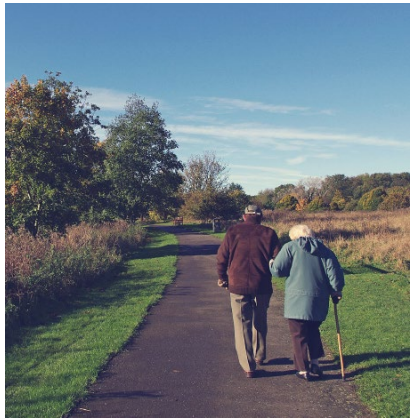
# NWPA Water Supply Sustainability Plan: *Profile & Strategy Selection*

**May 23, 2023**

**Technical Advisory Committee**



# NWPA Profile

Provide an overview of the NWPA profile purpose and structure

Highlight key findings from the profile

Discussion questions

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# NWPA Profile

Purpose:

Review existing conditions of the NWPA region that will help frame the water conservation strategy selection and assessment

Structure:

1. Introduction
2. Water demand in NWPA region
3. NWPA water demand by source
4. Sustainable yield estimates (when available)

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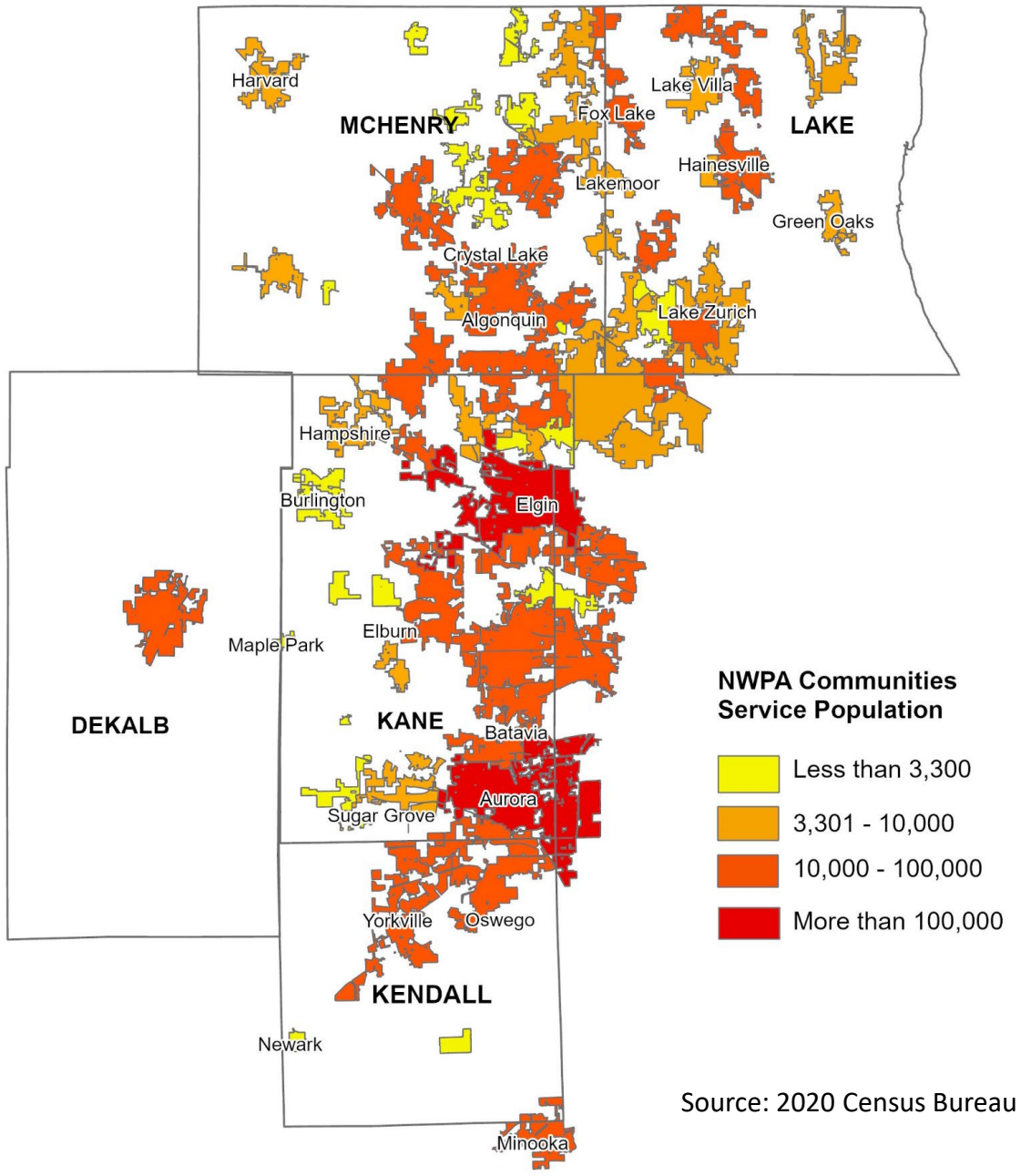
# NWPA region

78 member municipalities and 5 counties

- 56 public water utility
- 22 domestic self supply

| Service Population* | Number of Municipalities |
|---|---|
| Less than 3,300 | 22 |
| Between 3,300 – 10,000 | 28 |
| Between 10,000 and 100,000 | 26 |
| More than 100,000 | 2 |

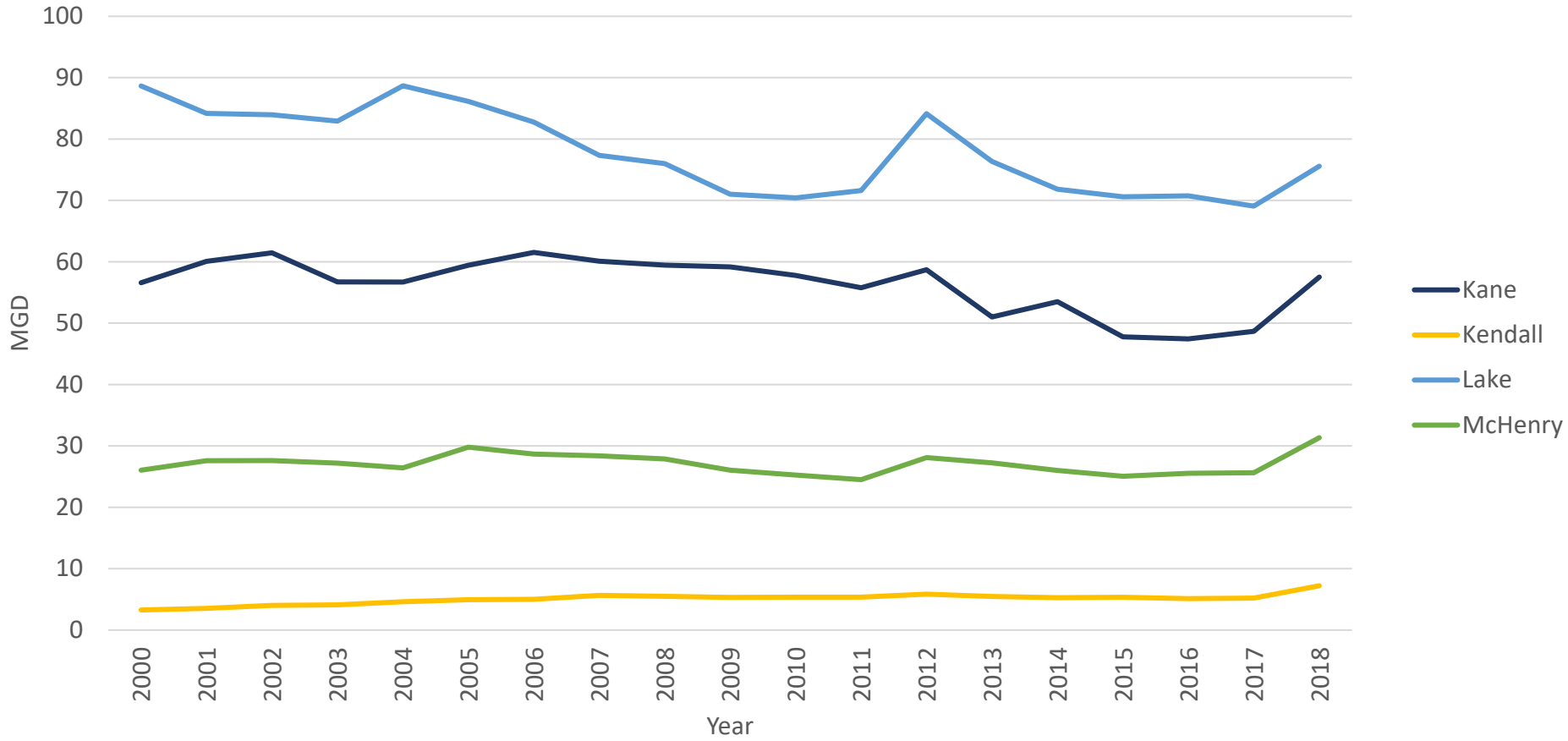
*Service population ranges are based on US EPA's Water Conservation Guidelines




Source: 2020 Census Bureau

# Water Demand

**Water demand by counties in NWPA region, 2000-2018 reported withdrawals, MGD**




Source: ISWS Illinois Water Inventory Program (IWIP), 2021

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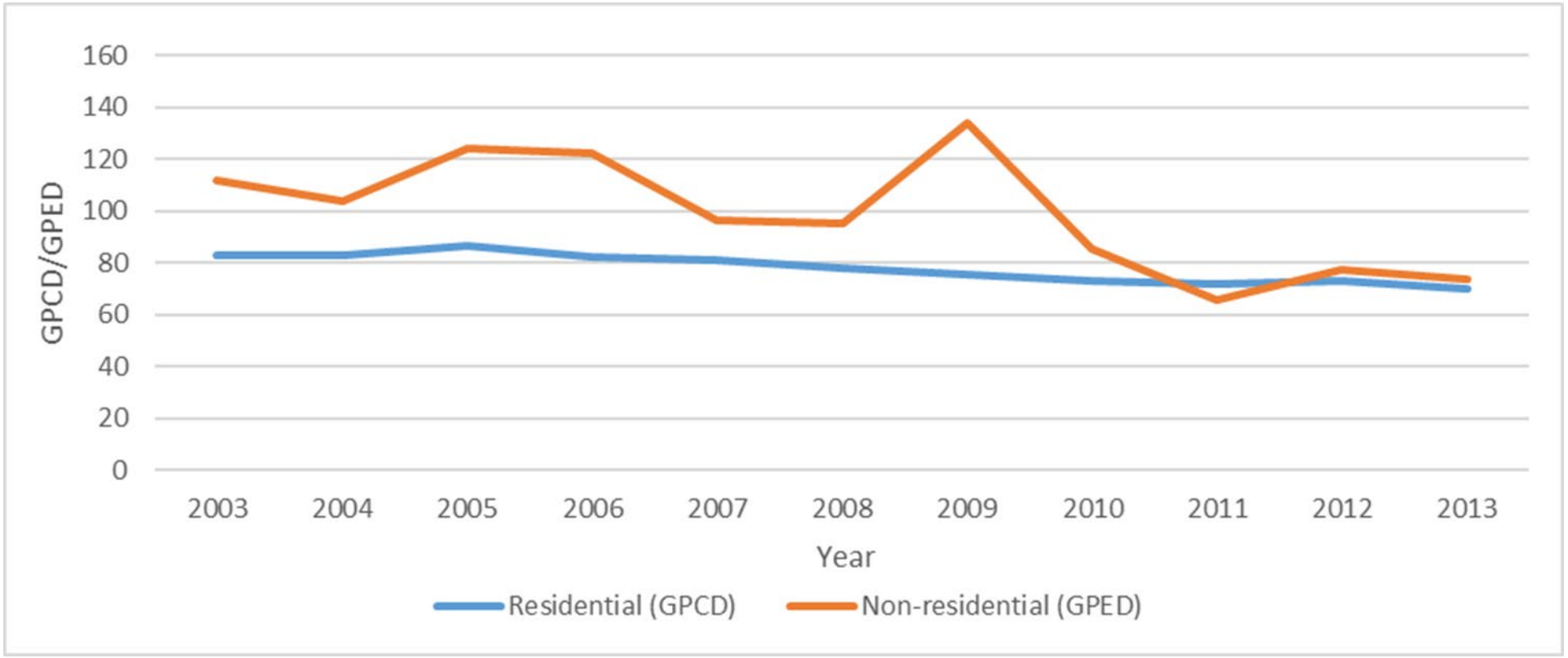
# Water Demand by GPCD/GPED

**Residential and non-residential sector water demand within the NWPA Region, 2003-2013**




Source: CMAP ON TO 2050 Water Demand Forecast, 2018

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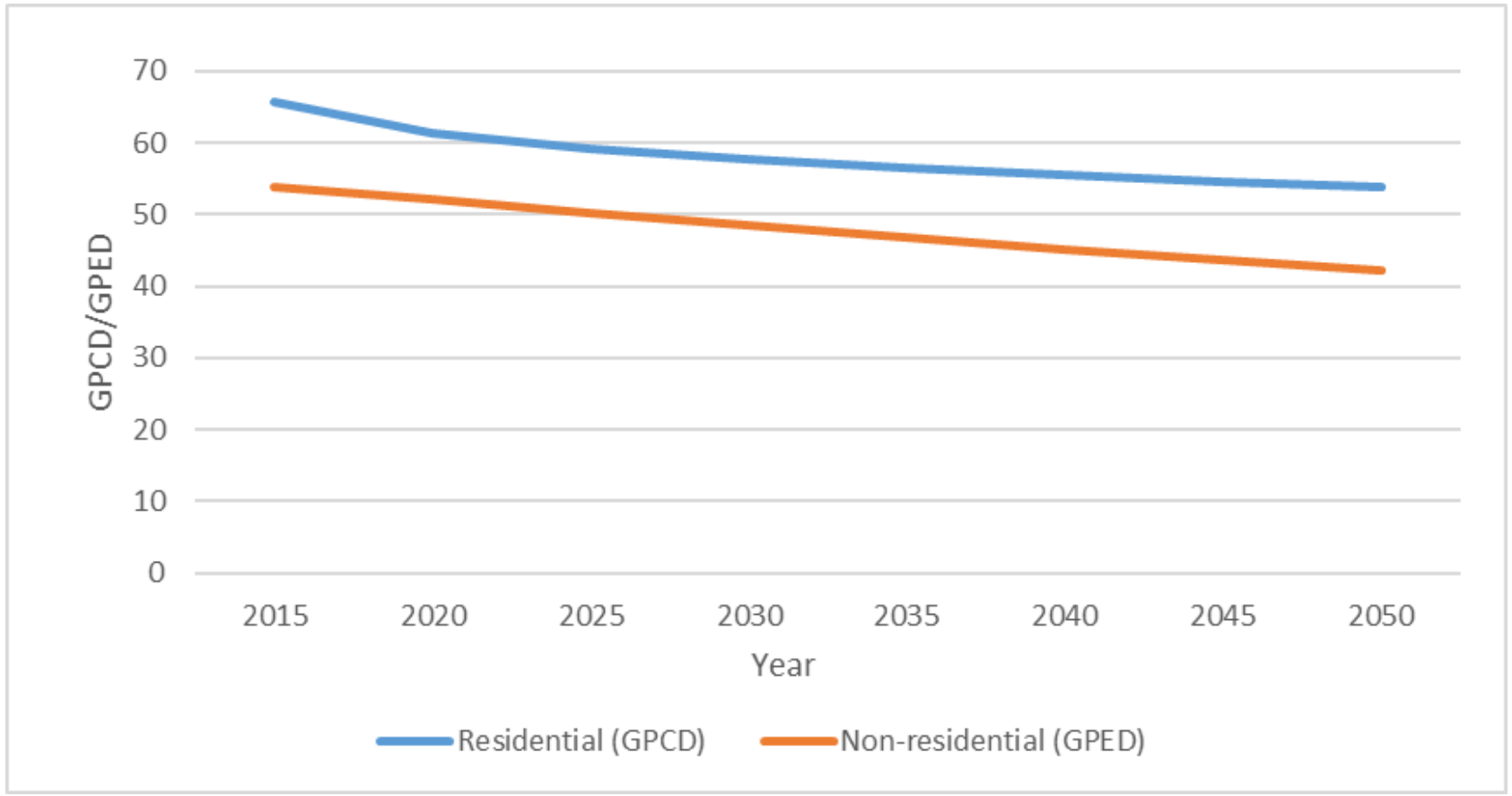
# Future Water Demand by GPCD/GPED

**Projected Average Daily Water Withdrawals for Residential and Non-Residential Sectors (GPCD/GPED) in the NWPA Region, 2015-2050**




Source: CMAP ON TO 2050 Water Demand Forecast, 2018

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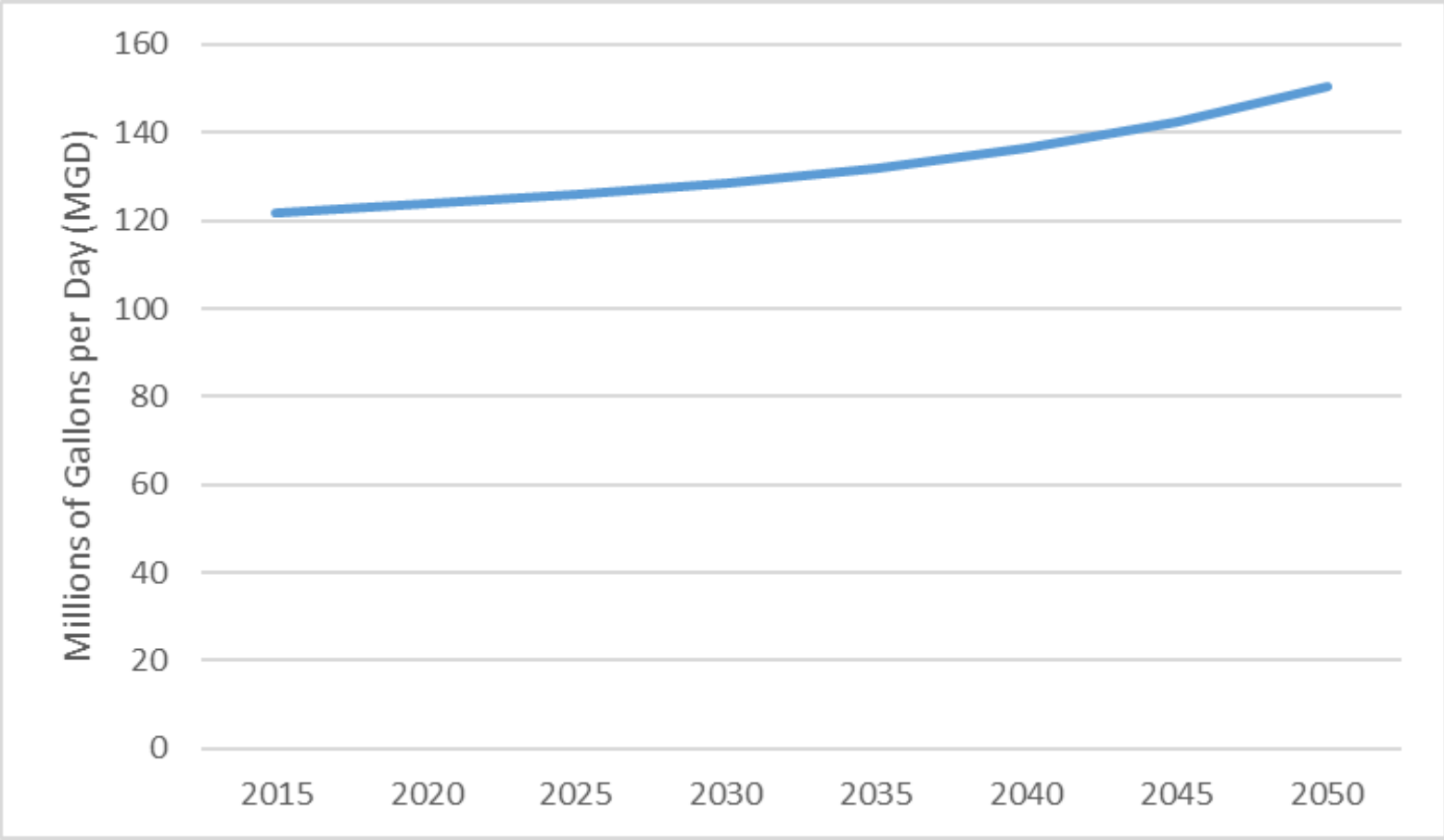
# Future Water Demand

**Future Water Demand for the NWPA Region, 2015-2050**




Source: CMAP ON TO 2050 Water Demand Forecast, 2018

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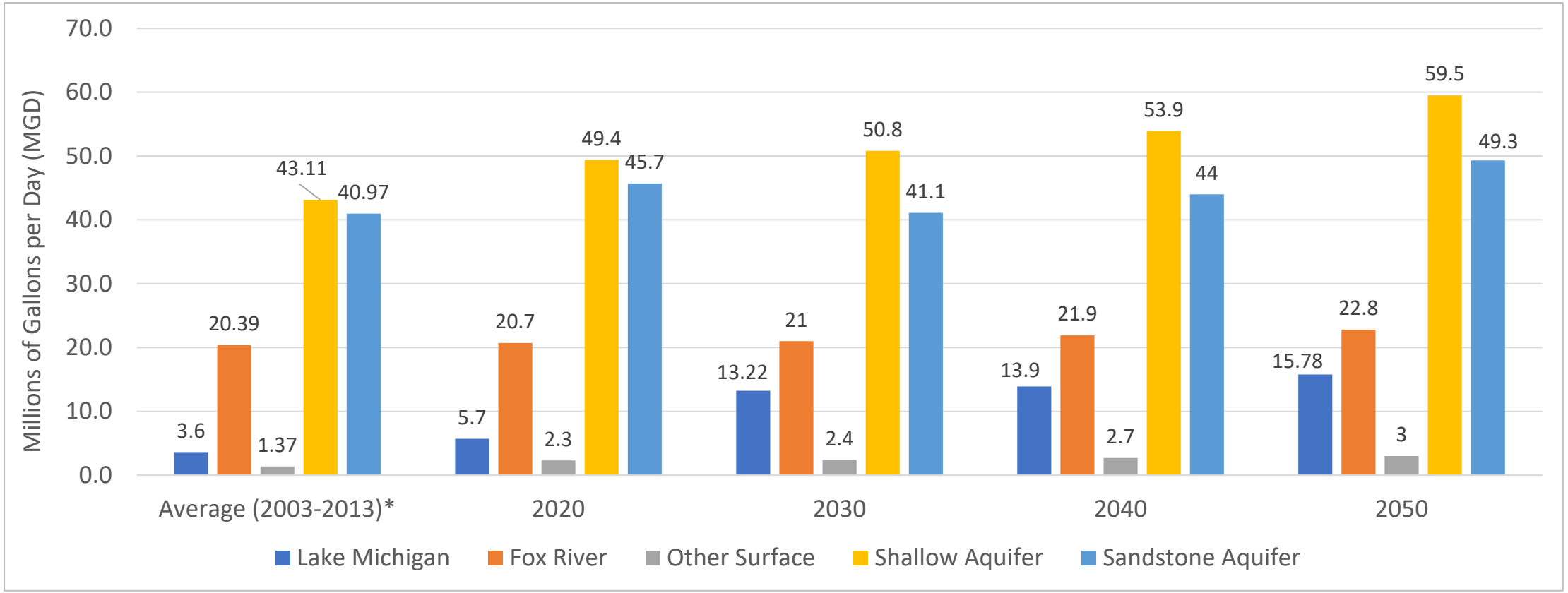
# Water Demand by Source




Source: CMAP ON TO 2050 Water Demand Forecast, 2018

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# Discussion questions

Would it be helpful to see growth trends of NWPA communities over time?

Would it be helpful to see which NWPA communities have a predominant land use (e.g., residential, agriculture, industry) that could influence water use?

Is impervious cover an important data point to include in the profile?

Are there any other data points that would be helpful to include? Any other feedback?

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# Strategy selection

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# Strategy selection process

**Purpose**: Prioritize and select water conservation strategies for further exploration

- Strategy investigations: What it will take to assess strategies
- Strategy assessments: evaluation of selected strategies


*Plan chapter / plan deliverable

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# Strategy overview

Types of water conservation strategies

- Community conservation strategies
  - Fundamental/foundational
  - Conservation needs and  interests
- Region-specific strategies (quantity)
- Integrated resources management strategies (quantity and quality)

Considerations when reviewing strategies:

- Ability to achieve/implement water sustainability goals
- Feasibility to quantify potential water savings with available data, literature, and research
- Strategy implementation potential across NWPA communities

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# Community conservation strategies

## Foundational strategies; implementation estimated at 1-3yrs

| Strategy | Assessment feasibility* | Specific guidelines and community size/capacity | | |
|---|---|---|---|---|
| | | *Basic (3k-10k)* | *Intermediate (10k-100k)* | *Advanced (100k+)* |
| Capacity development | 2 | • SDWA requirements** | | |
| Universal metering | 2 | • Source-water metering<br>• Service-connection metering<br>• Meter public-use water | • Fixed-interval meter reading<br>• Meter-accuracy analysis | • Test, calibrate, repair, replace meters |
| Water accounting and loss control | 2 | • Account for water<br>• Repair known leaks | • Analyze non-account water<br>• Water system audit<br>• Leak detection and repair strategy<br>• Automated sensors / telemetry | • Loss-prevention program |
| Costing and pricing | 2 | • Cost-of-service accounting<br>• User charges<br>• Metered rates | • Cost analysis<br>• Nonpromotional rates | • Advanced pricing methods |
| Information and education | 1 | • Understandable water bill<br>• Information available | • Informative water bill<br>• Education programs, etc. | • Workshops;<br>• Advisory comm. |

*Feasibility to quantify a strategy's potential water savings with available data, literature, and research (1: data not available, research does not exist or inconclusive; 2: need to collect data, conduct utility survey, or research; 3: can use existing data/research.)

**Most applicable to <=3k communities

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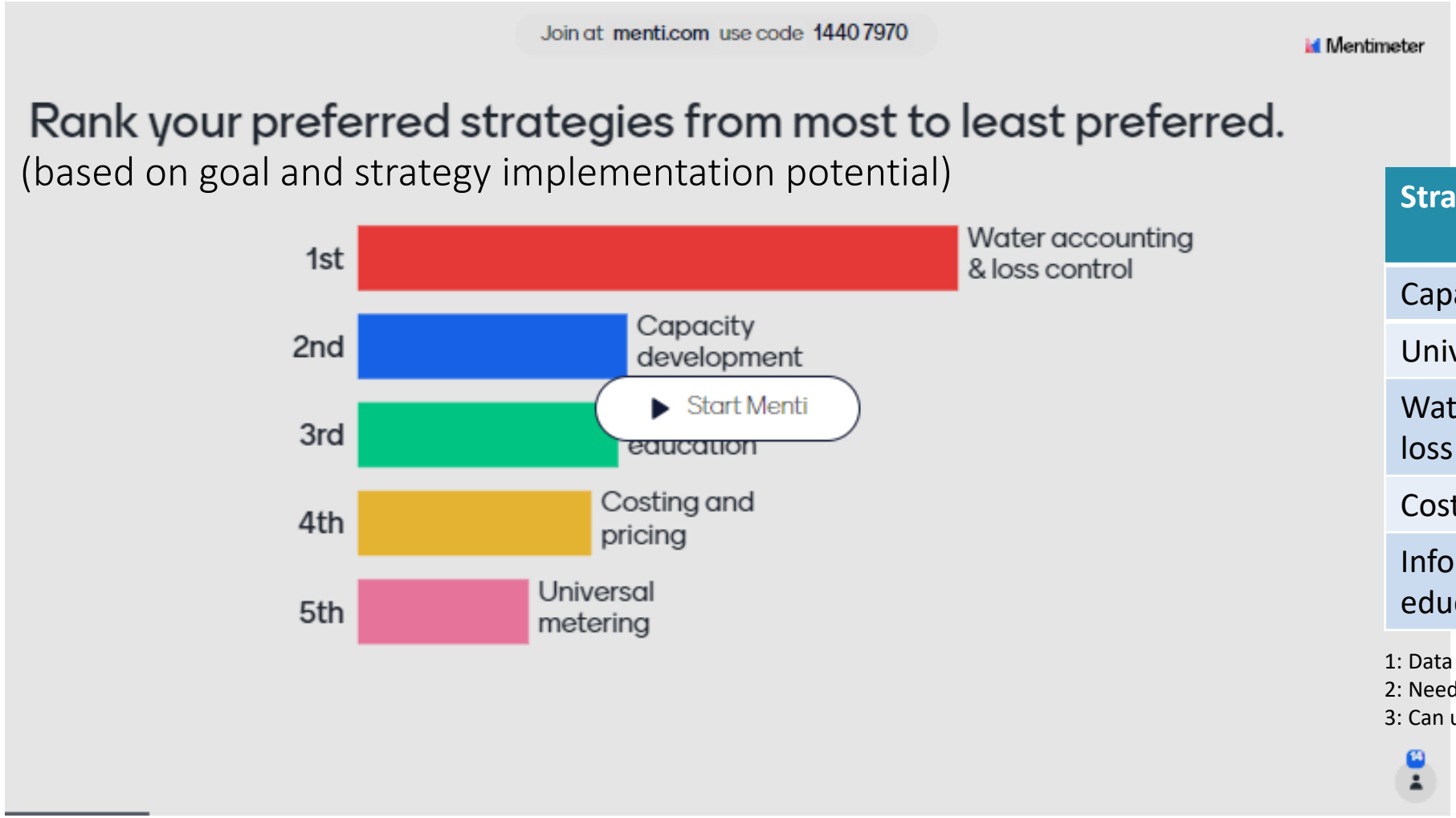
# Which community conservation strategies would you like to explore further?




| Strategy | Assessment feasibility* |
|---|---|
| Capacity development | 2 |
| Universal metering | 2 |
| Water accounting and loss control | 2 |
| Costing and pricing | 2/3 |
| Information and education | 1 |

1: Data not available, research does not exist / inconclusive
2: Need to collect data, conduct utility survey, or research
3: Can use existing data/research

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# Community conservation strategies

Strategies targeted at communities with conservation needs and interests

| Strategy | Assessment (quantification) feasibility* | Implementation timeline (1-3 yrs.) | Specific guidelines and community size/capacity | |
|---|---|---|---|---|
| | | | *Intermediate (10k-100k)* | *Advanced (100k+)* |
| Water-use audits | 1 | | • Audits of large-volume users<br>• Large-landscape audits<br>• Large-user audit tech assistance | • Selective end-use audits |
| Retrofits | 3 | X | • Retrofit kits available | • Distribution of retrofit kits<br>• Targeted programs |
| Pressure management | 1 | | • Systemwide pressure management | • Selective use of pressure-reducing valves |
| Landscape efficiency | 2 | X | • Promotion of landscape efficiency<br>• Selective irrigation submetering | • Landscape planning and renovation<br>• Irrigation management |

*Feasibility to quantify a strategy's potential water savings with available data, literature, and research
1: data not available, research does not exist or inconclusive
2: need to collect data, conduct utility survey, or research
3: can use existing data/research

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# Community conservation strategies

Advanced strategies targeted at communities with conservation needs and interests

| Strategy | Assessment (quantification) feasibility* | Implementation timeline (1-3 yrs.) | Specific guidelines and community size/capacity |
|---|---|---|---|
| | | | *Advanced (100k+)* |
| Replacements and promotions | 3 | | • Rebates and incentives (non-residential and residential)<br>• Promotion of new technologies |
| Reuse and recycling (graywater and wastewater) | 2 | X | • Industrial applications<br>• Large-volume irrigation applications<br>• Selective residential applications |
| Water-use regulation | 3 | | • Water-use standards and regulations<br>• Requirements for new developments |
| Integrated resource management (system-based) | 1 | X | • Supply-side technologies and practices<br>• Demand-side technologies and practices |

*Feasibility to quantify a strategy's potential water savings with available data, literature, and research
1: data not available, research does not exist or inconclusive
2: need to collect data, conduct utility survey, or research
3: can use existing data/research

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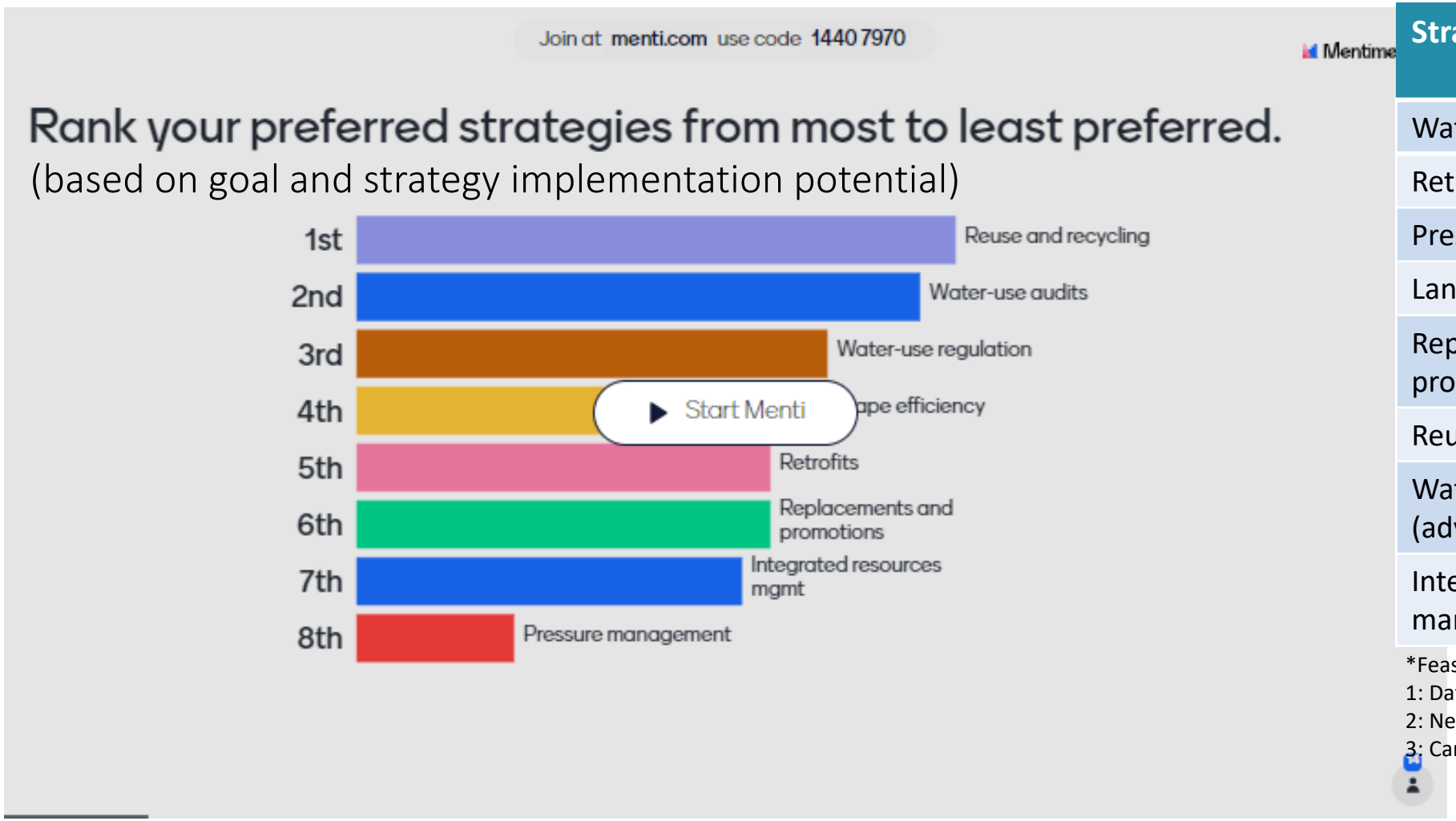
# Which community conservation strategies would you like to explore further?




| Strategy | Assessment Feasibility* |
|---|---|
| Water-use audits | 1 |
| Retrofits | 3 |
| Pressure management | 1 |
| Landscape efficiency | 3 |
| Replacements and promotions (adv.) | 3 |
| Reuse and recycling (adv.) | 2 |
| Water-use regulation (adv.) | 3 |
| Integrated resource management (adv.) | 1 |

*Feasibility scale:
1: Data not available, research does not exist / inconclusive
2: Need to collect data, conduct utility survey, or research
3: Can use existing data/research

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# Region-specific conservation strategies

Low feasibility to quantify; longer implementation timeline than 1-3yrs

| Strategy | Implementation timeline (1-3 yrs.) | Assessment feasibility* | Goal implementation | | | |
|---|---|---|---|---|---|---|
| | | | *Shallow aquifer goal* | *Fox River goal* | *Sandstone aquifer goals* | *Lake Michigan goal* |
| Lake Michigan (LM) permitting | | 1 | | | ✓ | ✓ |
| LM permit compliance | | 2 | | | | ✓ |
| Drought preparedness | X | 2 | ✓ | ✓ | ✓ | ✓ |
| Wholesale agency assistance | | 2 | ✓ | | ✓ | |
| New well location optimization | | 1 | ✓ | | ✓ | |
| Private well use estimation | | 1 | ✓ | | ✓ | |
| Sustainable withdrawal targets | X | 1 | ✓ | ✓ | ✓ | ✓ |
| Artificial aquifer recharge | | 1 | ✓ | | ✓ | |

*Feasibility to quantify a strategy's potential water savings with available data, literature, and research
1: data not available, research does not exist or inconclusive
2: need to collect data, conduct utility survey, or research
3: can use existing data/research

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# Which region-specific conservation strategies would you like the Plan to consider?


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# Integrated water resources conservation strategies (quantity and quality)

| Strategy | Implementation timeline (1-3 yrs.) | Assessment feasibility* | Goal implementation | | | |
|---|---|---|---|---|---|---|
| | | | *Shallow aquifer goal* | *Fox River goal* | *Sandstone aquifer goals* | *Lake Michigan goal* |
| Pollution prevention | | 1 | ✓ | ✓ | | ✓ |
| Land use planning and development – *New development* | | 1 | ✓ | ✓ | ✓ | ✓ |
| Land use planning and development – *Source water protection & watershed planning* | X | 1 | ✓ | ✓ | ✓ | ✓ |
| Stormwater management | X | 2 | ✓ | ✓ | | ✓ |
| Groundwater governance | | 1 | ✓ | | ✓ | |

*Feasibility to quantify a strategy's potential water savings with available data, literature, and research
1: data not available, research does not exist or inconclusive
2: need to collect data, conduct utility survey, or research
3: can use existing data/research

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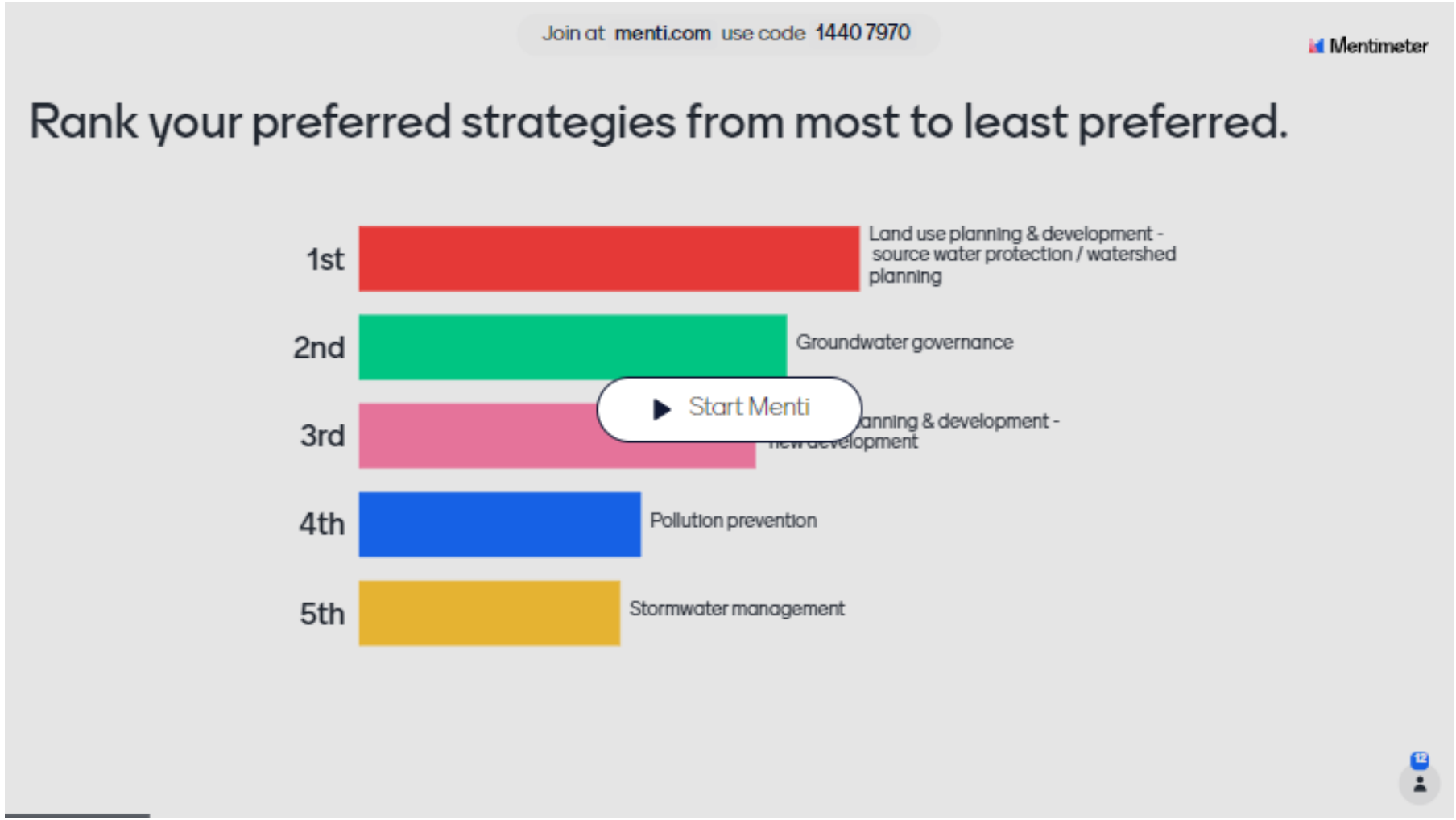
# Which integrated resource conservation strategies would you like the Plan to consider?

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# Upcoming TAC meetings

**June 27**
Strategy confirmation & investigation/evaluation process

**July 25**
WSSP: Strategy assessment (strategy #1)

**August 22**
WSSP: Strategy assessment (strategy #2 TBD)

**September 26**
WSSP: Strategy assessment (strategy #2,3 TBD)

**October 24**
WSSP: Strategy assessment (strategy #3,4 TBD)

**November 28**
WSSP: Strategy assessment (strategy #TBD)

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# Questions?


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