



# Changing Water Demand

## Projecting water use in the Chicago region to 2050

McHenry County

Water Resource Action Plan

June 12, 2019



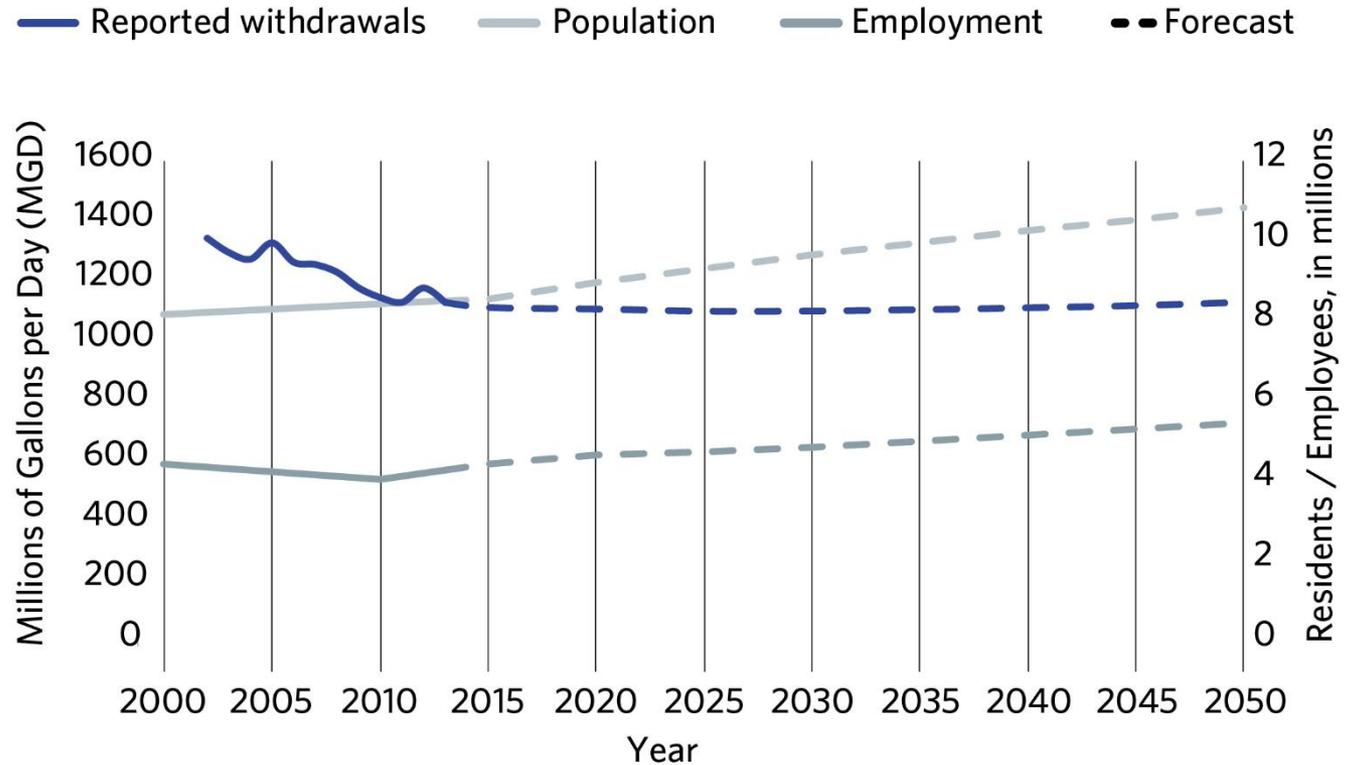
# Water demand by 2050 for the Chicago region

# Regional demand for water by 2050

## Regional Water Demand and Socioeconomic Forecast

Note: Private residential wells are not included.

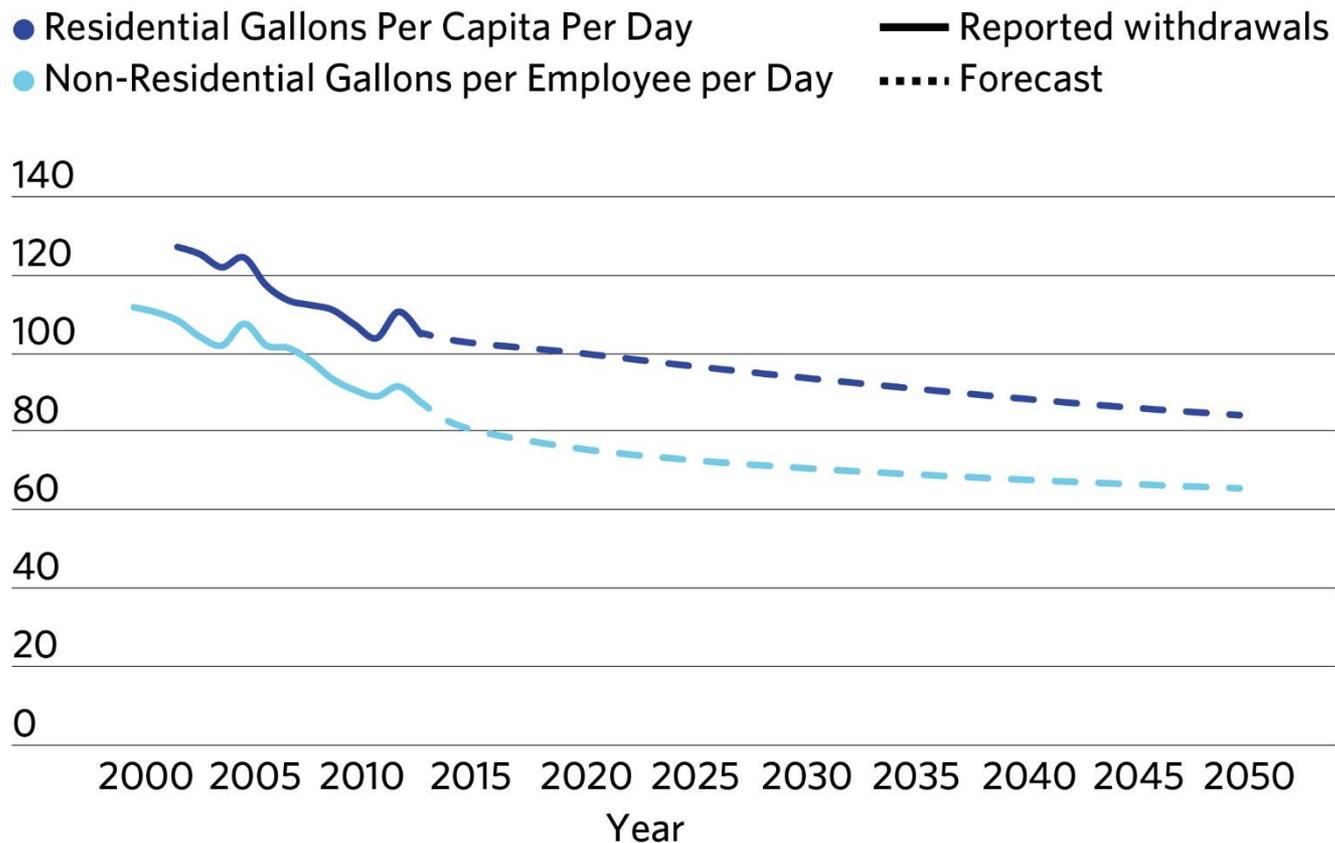
Source: CMAP ON TO 2050  
Regional Water Demand Forecast  
CMAP ON TO 2050  
Socioeconomic Forecast.



# Conservation and efficiency continues

## Daily per capita / employee water use by sector

Source: CMAP ON TO 2050 Regional Water Demand Forecast.

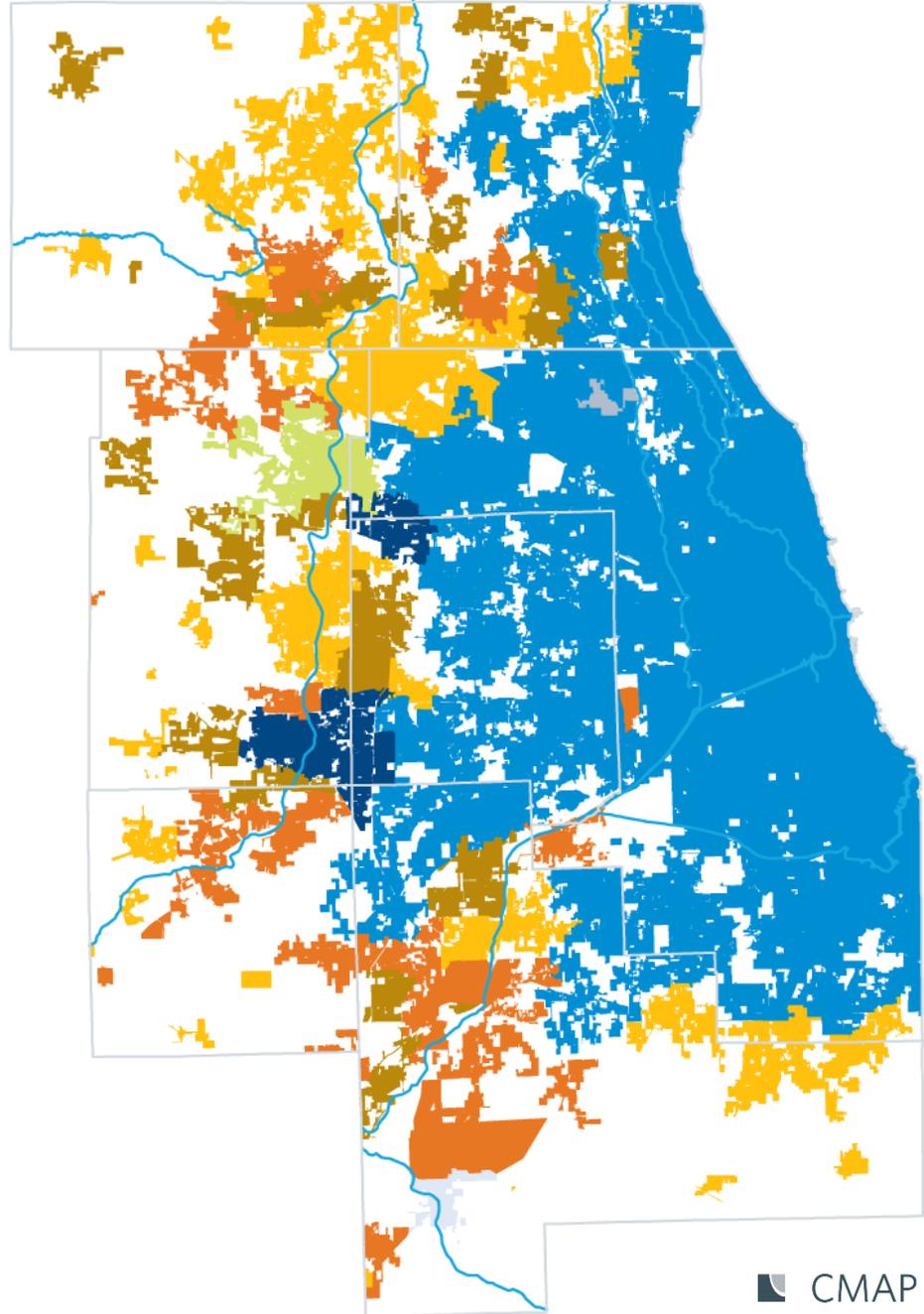


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## Water source by locale

- Groundwater, shallow bedrock/glacial
- Groundwater, sandstone
- Mixed groundwater sources, shallow/sandstone
- Mixed sources, Fox River/groundwater
- Mixed sources, Lake Michigan/groundwater
- Surface water, Lake Michigan
- Surface water, Fox river
- Surface water, Kankakee River

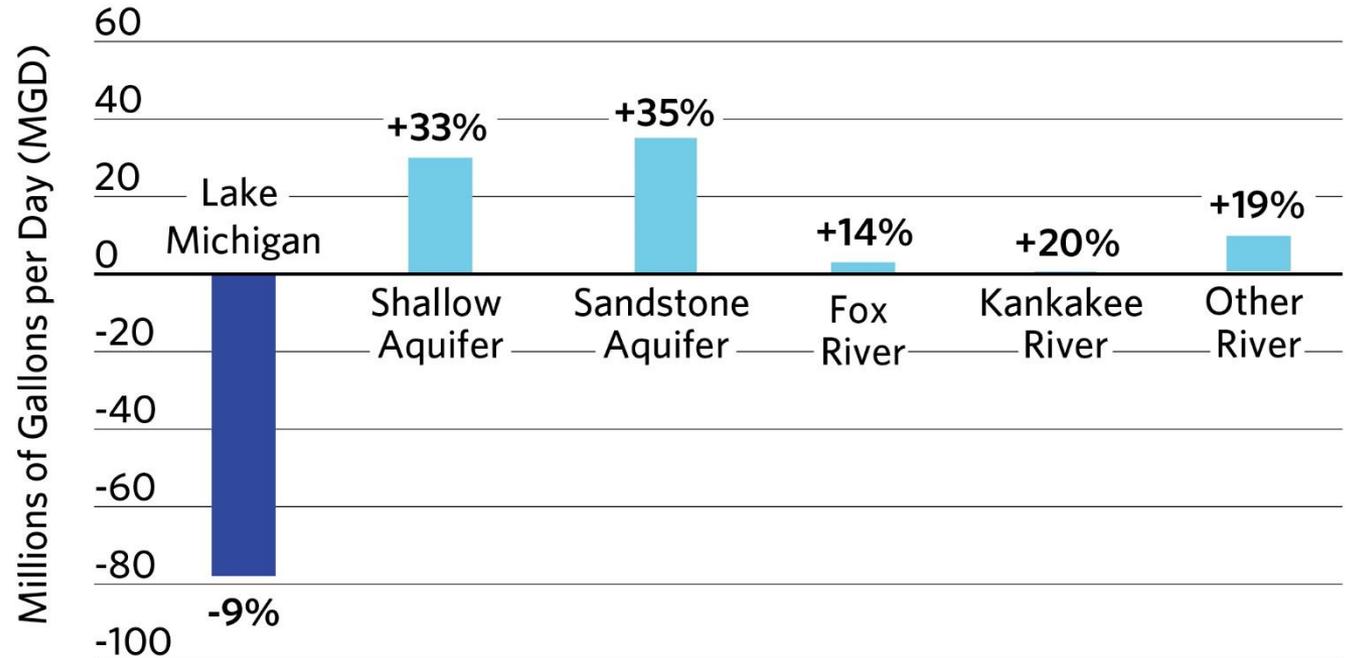
Source: Illinois State Water Survey, 2014



# Forecasted demand exceeds groundwater supplies

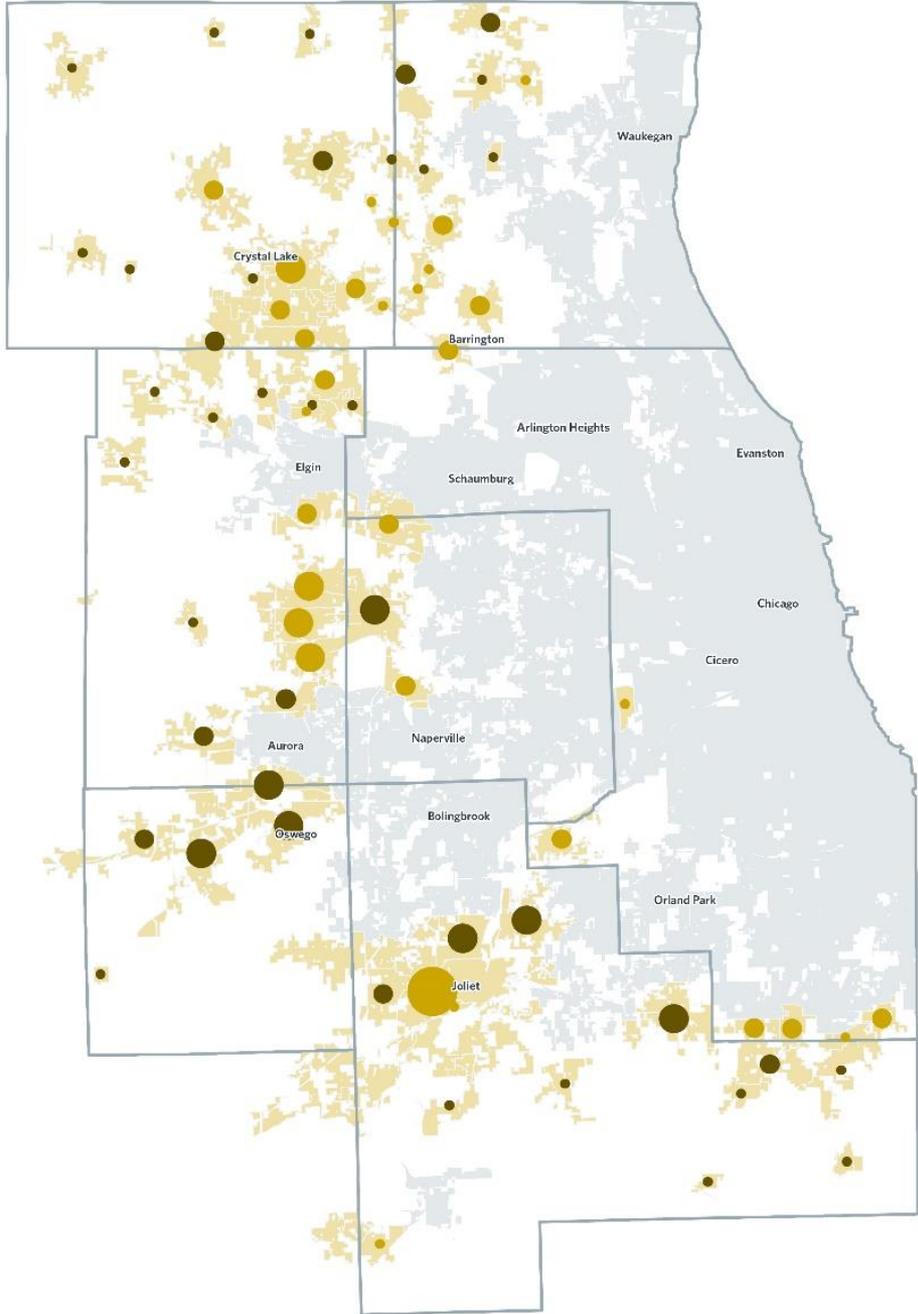
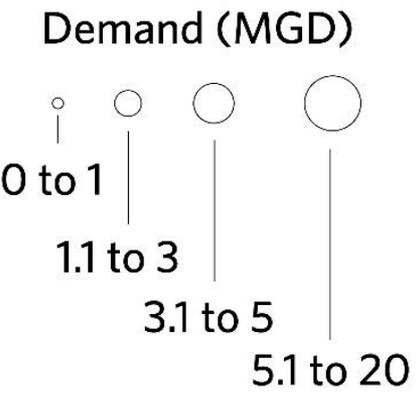
## Projected changes in water demand by water source, 2011-50

Source: CMAP ON TO 2050  
Regional Water Demand  
Forecast.



# Forecasted 2050 water demand for groundwater dependent municipalities

- Demand decreased between 2011-50
- Demand increased between 2011-50
- Surface water
- Groundwater

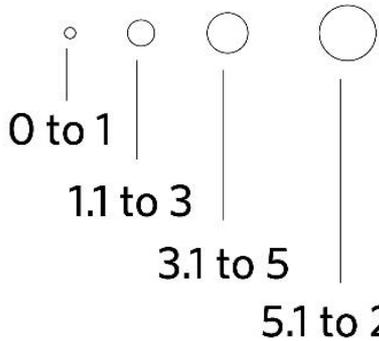


Source: CMAP ON TO 2050 Regional Water Demand Forecast.

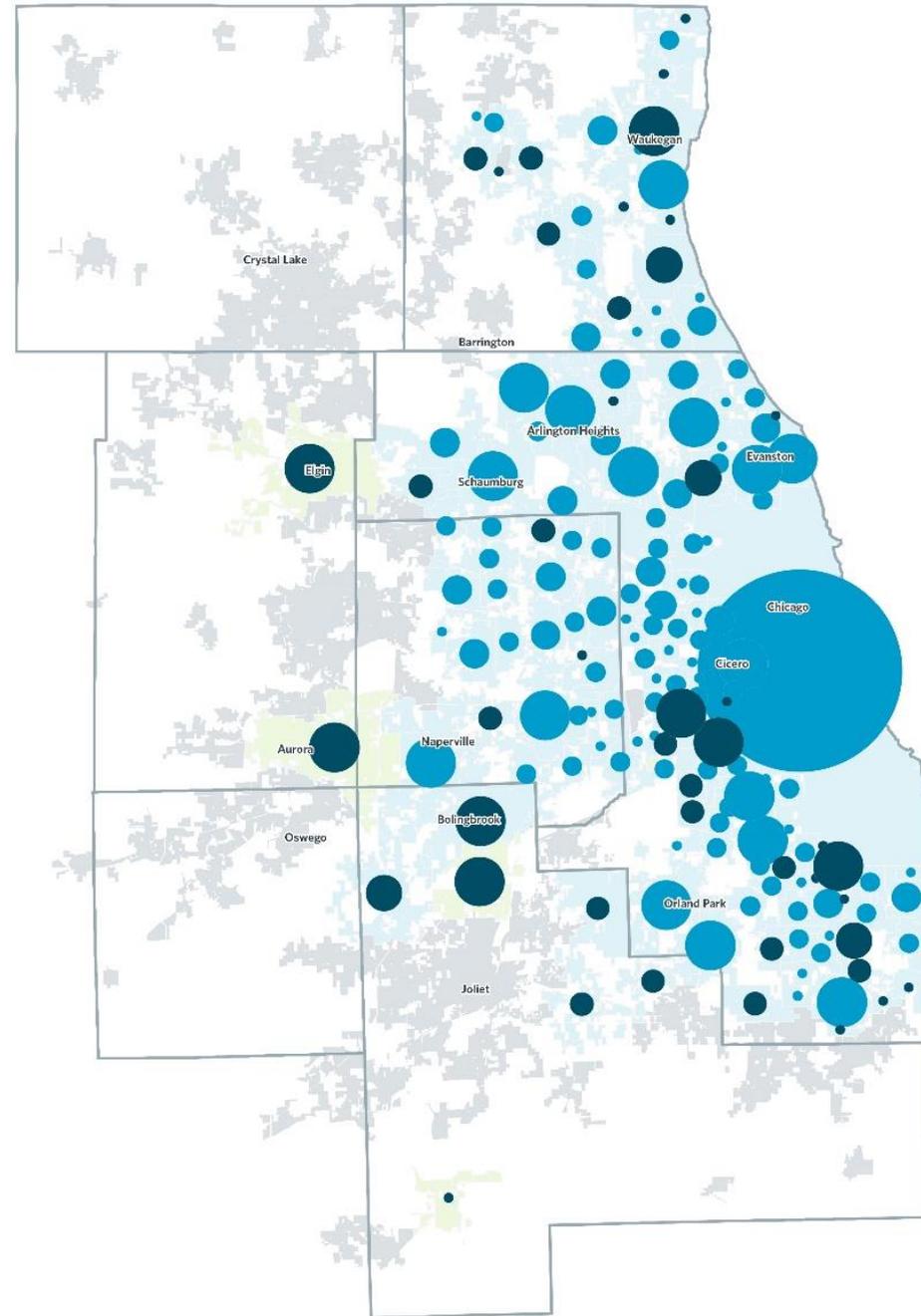
# Projected change in demand for Lake Michigan and river dependent municipalities, 2011-50 (MGD)

- Demand decreased between 2011-50
- Demand increased between 2011-50
- Groundwater
- River
- Lake

Demand (MGD)



Largest symbol size (Chicago) represents 432 MGD



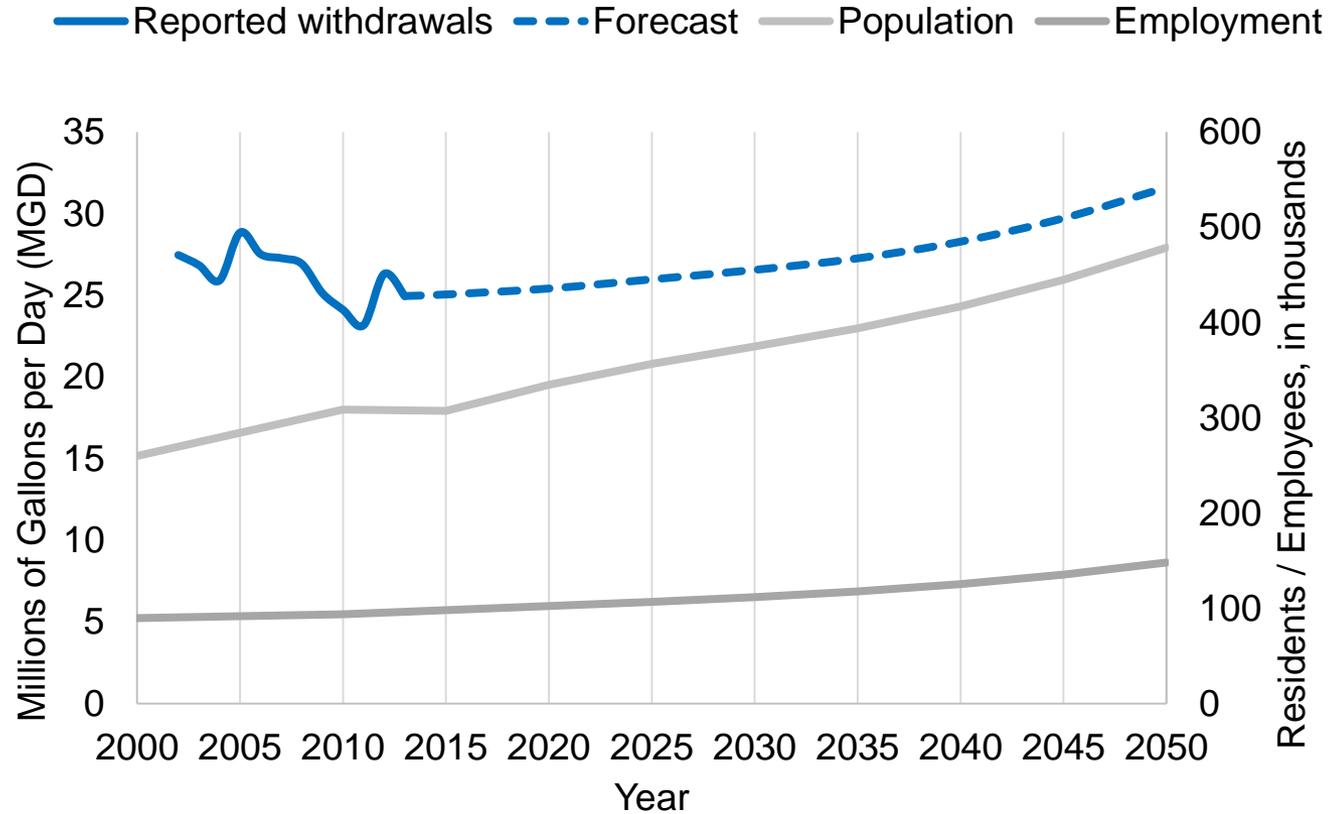
# Water demand by 2050 for McHenry County

# McHenry County demand for water by 2050

## McHenry County Water Demand and Socioeconomic Forecast

Note: Private residential wells are not included.

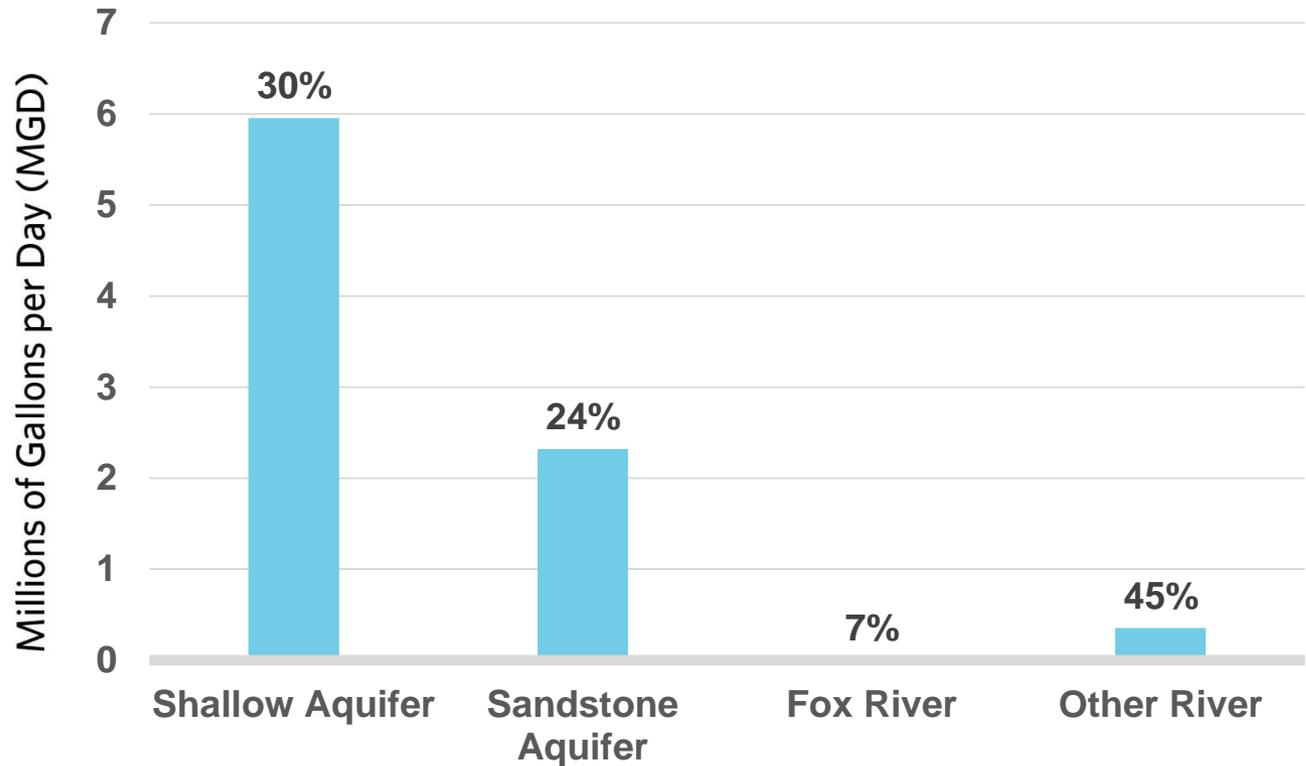
Source: CMAP ON TO 2050  
Regional Water Demand Forecast  
CMAP ON TO 2050  
Socioeconomic Forecast.



# McHenry County demand by source

Projected changes  
in water demand by  
water source,  
2011-50

Source: CMAP ON TO 2050  
Regional Water Demand  
Forecast.



# Factors of water demand

**Population**

**Housing density**

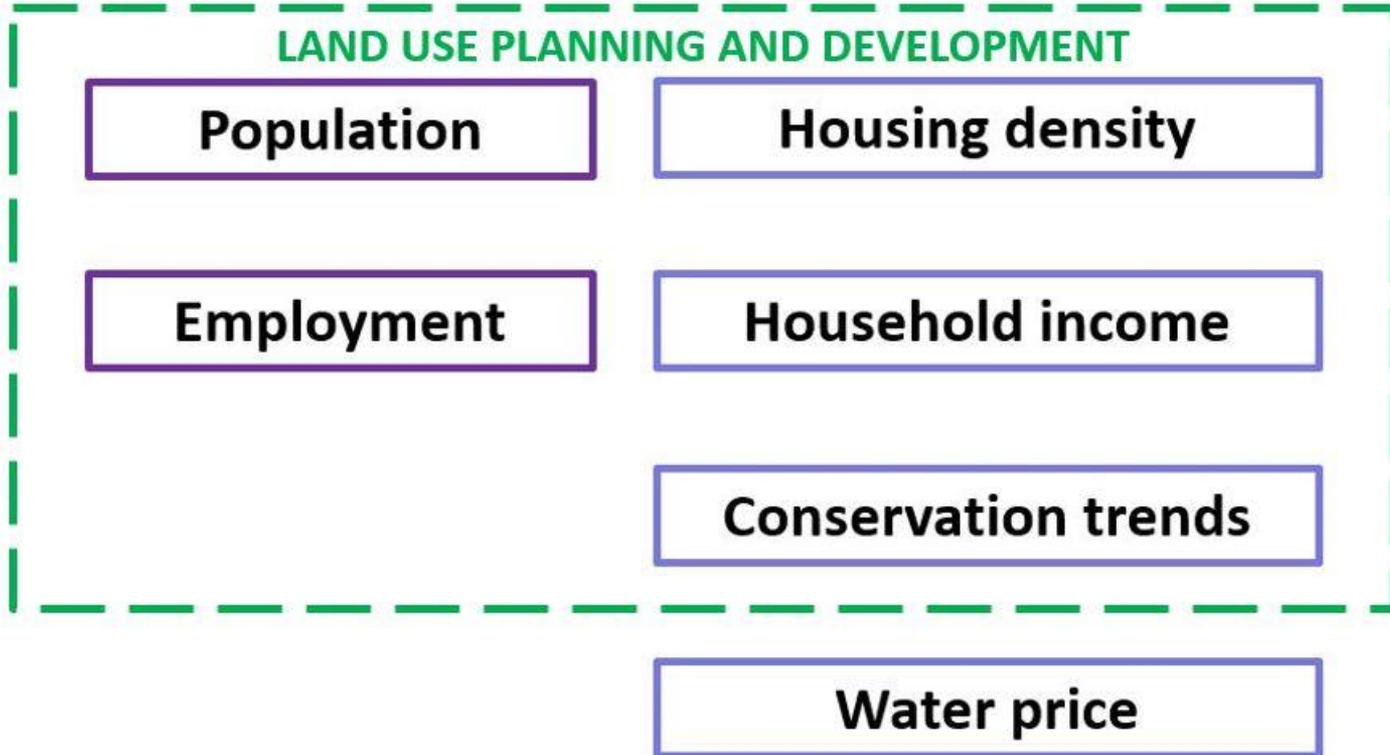
**Employment**

**Household income**

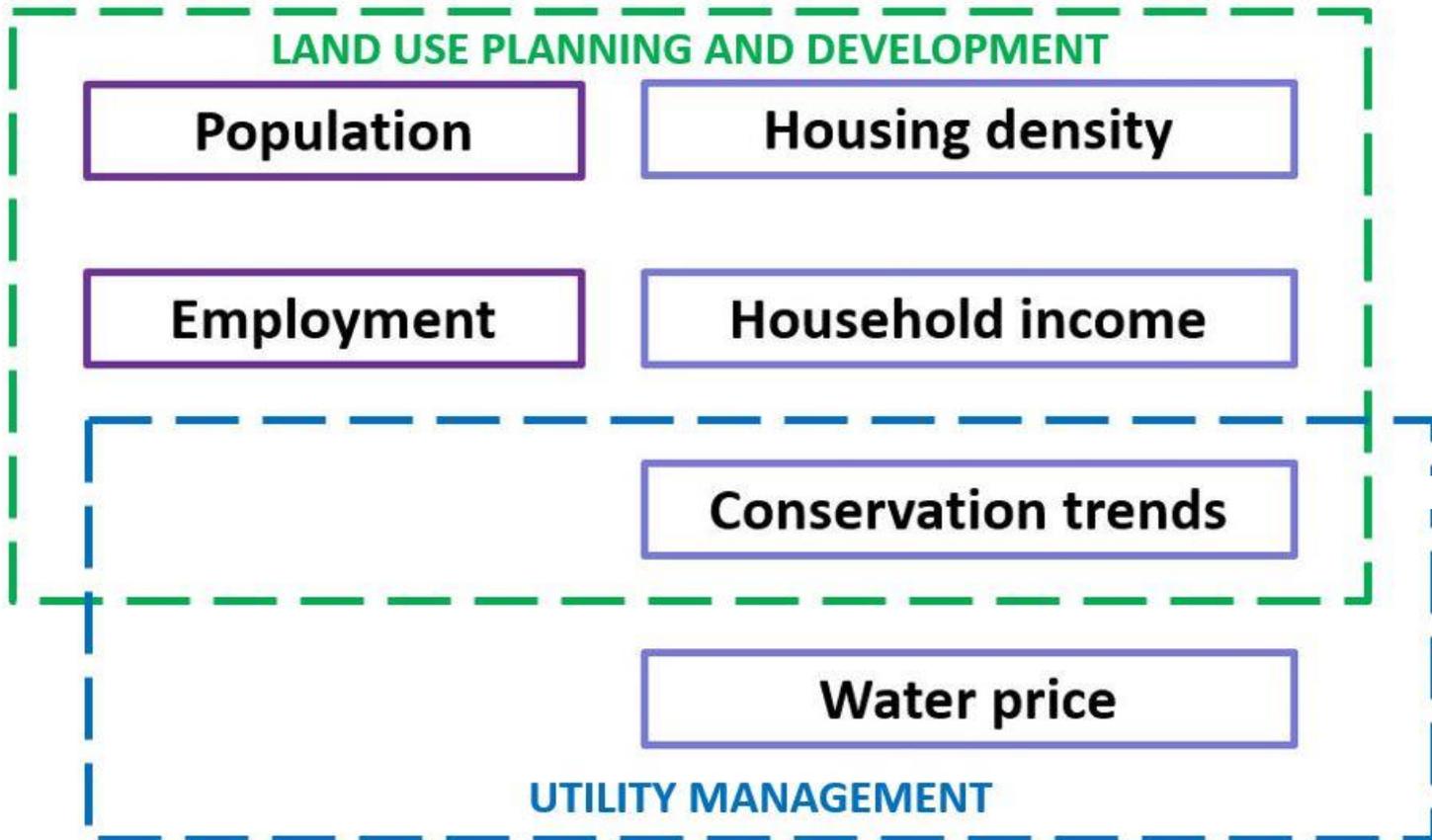
**Conservation trends**

**Water price**

# Integrate water and land use decisions

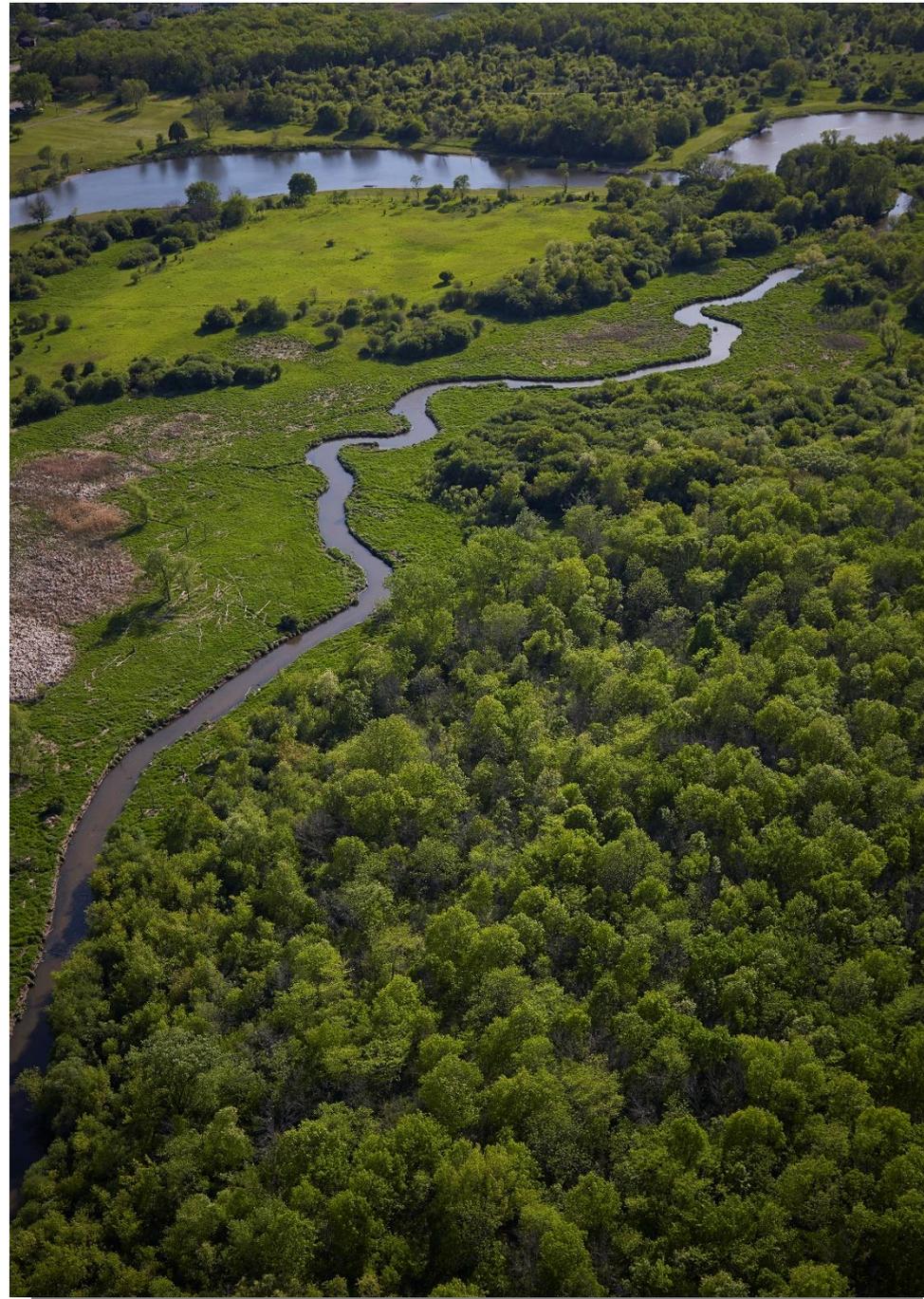


# Integrate water and land use decisions



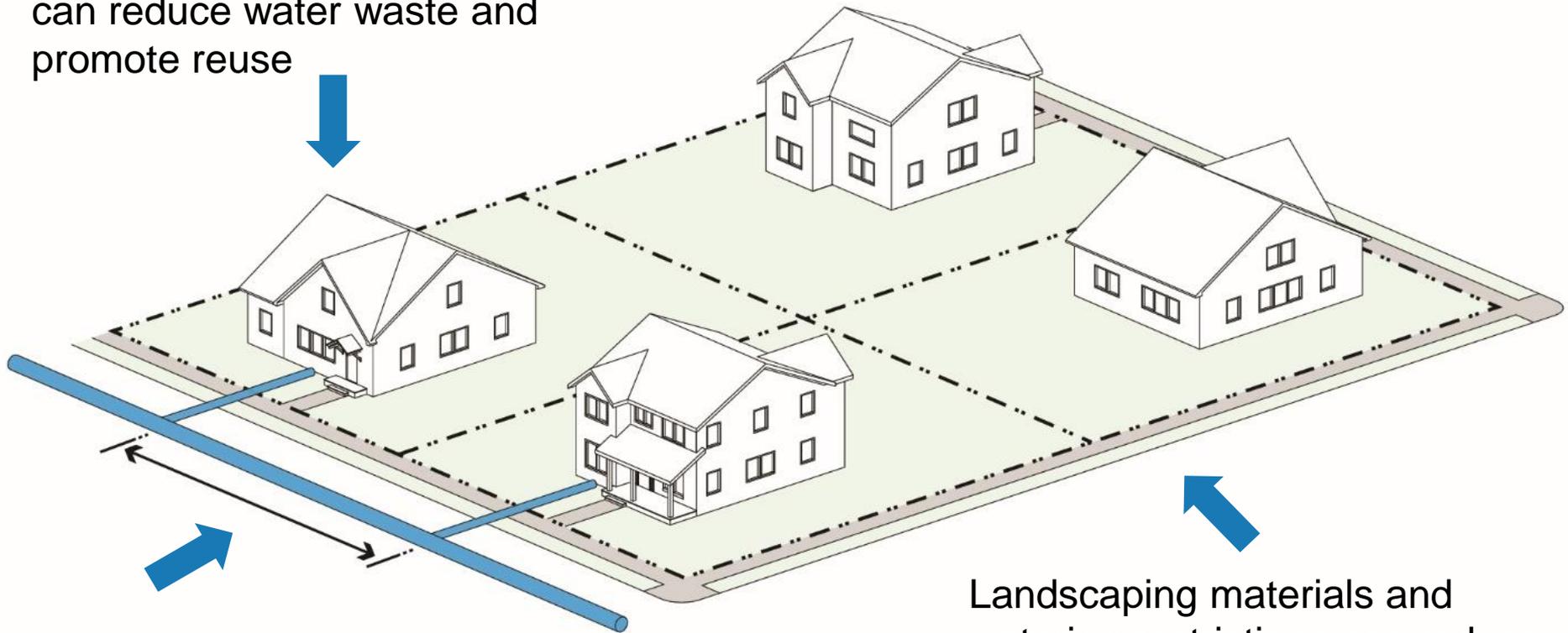
**Incorporate water  
supply and demand  
considerations into  
local planning**

# Protect the quantity and quality of drinking water sources



# Reduce water use and infrastructure costs

Water efficient plumbing fixtures can reduce water waste and promote reuse



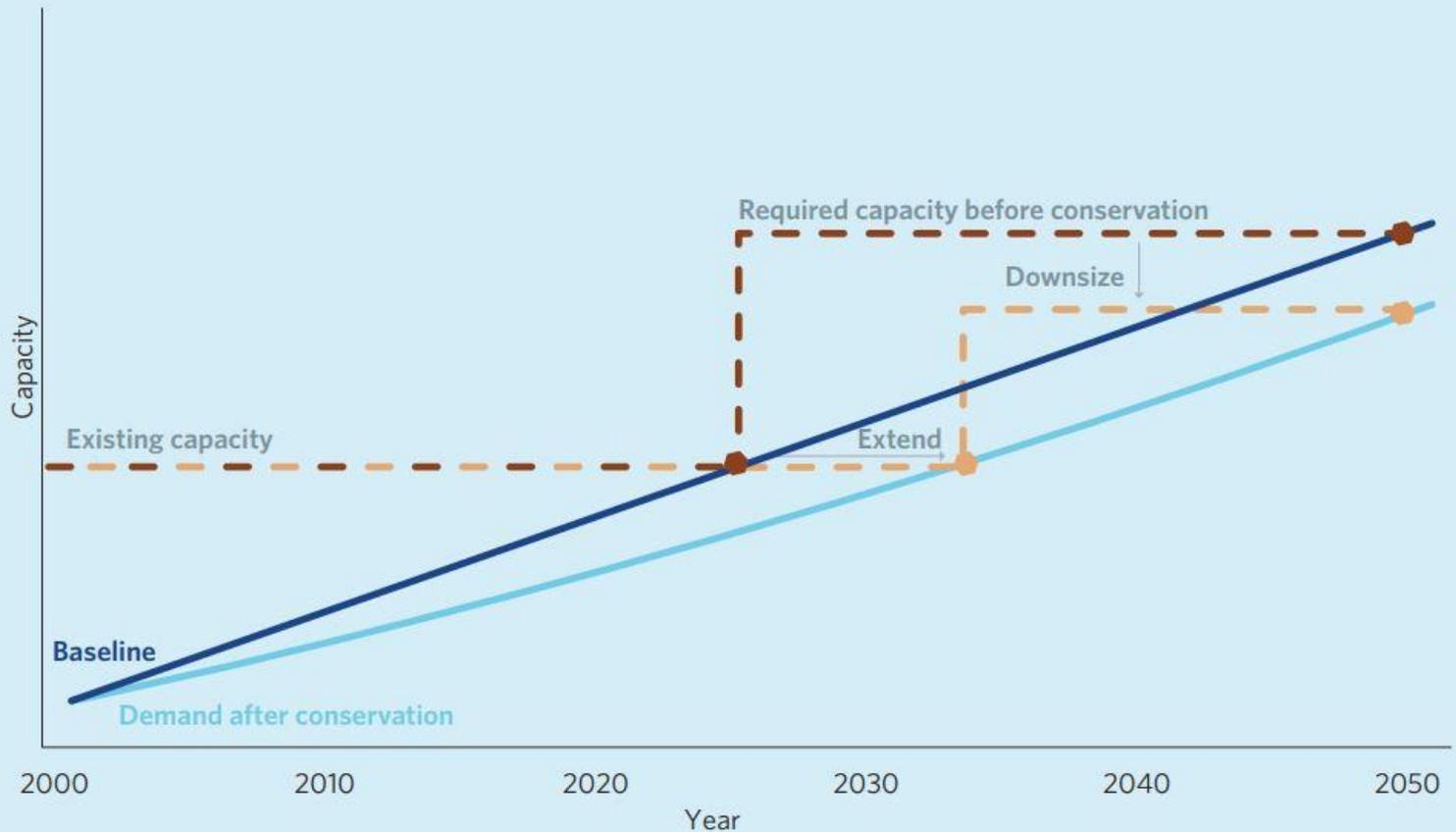
Compact development can minimize the amount of infrastructure needed per household

Landscaping materials and watering restrictions can reduce water use

# Conservation can delay and minimize expensive infrastructure investments

Example of extending or downsizing a capital facility, peak demand/capacity in million gallons per day

Source: American Water Works Association, 2006. Water Conservation Programs - A Planning Manual. AWWA Manual M52, First Edition, page 75.



# Municipal data

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## How municipal characteristics shape the regional water demand forecast

Source: Chicago Metropolitan Agency for Planning.

1



**Collect  
annual data  
community  
characteristics**

2



**Analyze past  
demand trends**

3



**Anticipate  
future  
conditions**

4



**Calculate future  
water demand  
per municipality**

5



**Add up  
demand  
estimates  
for each  
community**

# Available data by municipality

## Reported and Forecasted:

Total annual withdrawals

Withdrawals by source

Residential withdrawals

Residential GPCD

Residential population

Non-residential withdrawals

Non-residential GPED

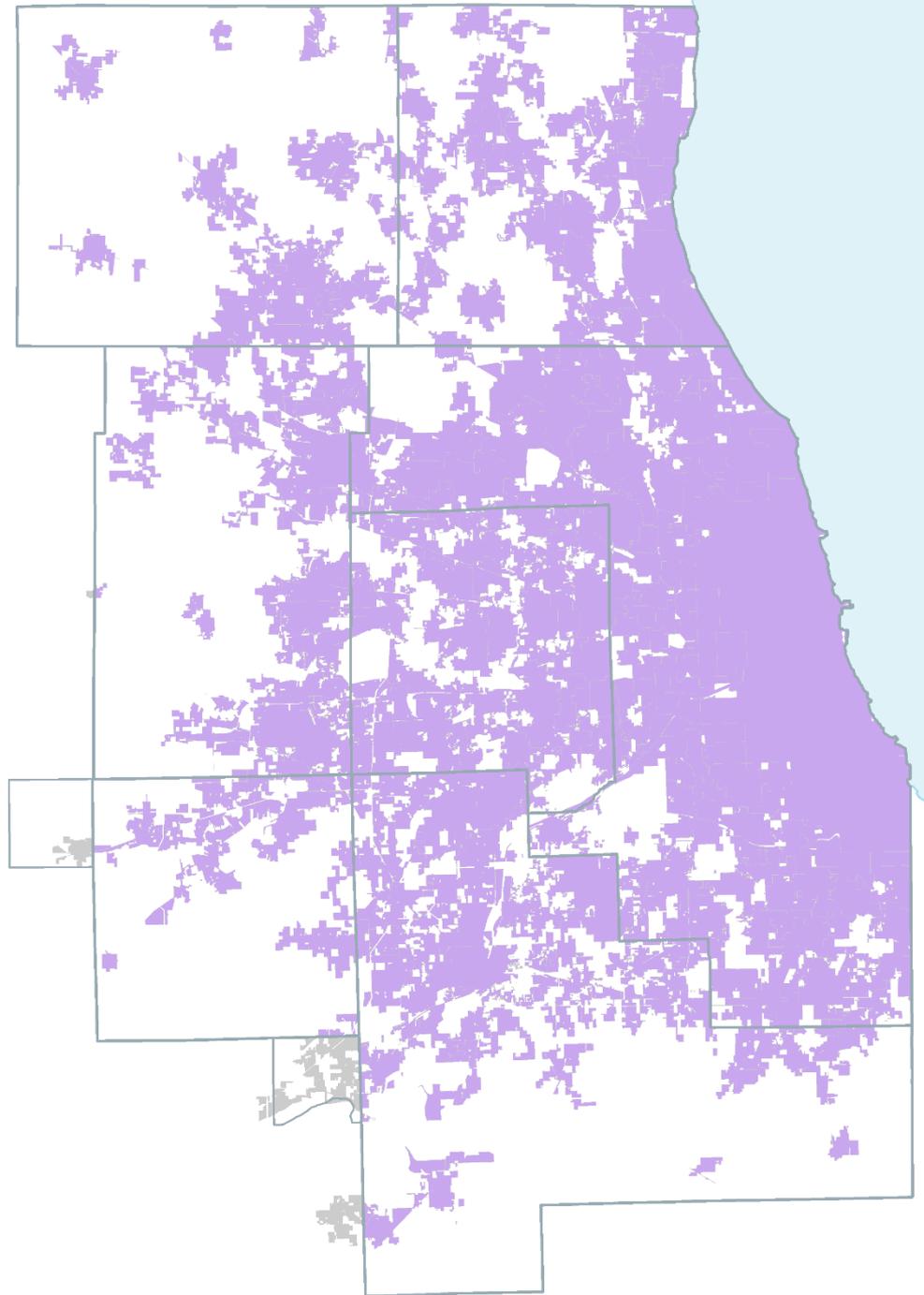
Non-residential employment

Median household income

Housing density

Marginal Price

Additional regression data





Dec 19, 2018

## ON TO 2050 Regional Water Demand Forecast

Communities across the globe face an increasing array of water resource challenges and the Chicago region is not immune. Despite access to Lake Michigan, significant portions of the region are already encountering water supply and quality issues. To maintain a long-term drinking water supply, ON TO 2050 recognizes the need to coordinate and conserve its shared water supply resources. Assessing long-range forecasted demands in the context of available water supply can inform local and regional planners about the sufficiency of water supply and encourage actions that conserve water, protect supply, and/or pursue alternative drinking water sources.

CMAP, in partnership with [Illinois-Indiana Sea Grant](#) and [University of Illinois Extension](#), developed the [ON TO 2050 Regional Water Demand Forecast](#) to inform decisions about land use, transportation, and infrastructure that affect water supply and demand. This forecast builds on the previous regional water demand forecast for Water 2050, [Regional Water Demand Scenarios for Northeastern Illinois: 2005-2050 \(2008\)](#) and is based on the ON TO 2050 Socioeconomic Forecast. The forecast is presented in 5-year intervals to the year 2050 at the municipal, county, and regional scale, as well as by drinking water source and sector for the seven counties of the Chicago region. It focuses on the largest water sectors -- residential public water supply, non-residential water supply, and domestic self-supply -- and provides individual forecasts for 245 municipalities in the region. As a long-range water demand forecast, it is intended for planning purposes and is not suited for assessing infrastructure capacity or peak demands at the system level.

Forecast data is available for download on the [CMAP Data Hub](#). For additional information on the water demand forecast methodology and

**Full report and data are at [www.cmap.illinois.gov](http://www.cmap.illinois.gov)**

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**2050 Forecast of Water Demand**

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Organization: Chicago Metropolitan Agency for Planning (CMAP)

**2050 Forecast of Water Demand**

Data and documentation associated with the ON TO 2050 Regional Water Demand Forecast.

**Data and Resources**

- ON TO 2050 Regional Water Demand Forecast Report** (PDF) - This document describes the methodology used to develop the ON TO 2050... [Explore](#)
- Region and County Totals** (XLS) - Spreadsheet reported and projected water withdrawals at the region and county... [Explore](#)
- Municipal Totals** (XLS) - Spreadsheet with reported and projected water withdrawals by sector at the... [Explore](#)

Forecast   Municipality   ON TO 2050   Socioeconomic   Water

**Additional Info**

Field	Value
Source	www.cmap.gov
Author	Chicago Metropolitan Agency for Planning
Maintainer	Mapa Park

**Or visit [datahub.cmap.illinois.gov](http://datahub.cmap.illinois.gov)  
and search for “water forecast”**



[www.cmap.illinois.gov/onto2050](http://www.cmap.illinois.gov/onto2050)  
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