



MEMORANDUM

To: CMAP Environment and Natural Resources Committee

From: CMAP Staff

Date: September 5, 2018

Re: Proposed ON TO 2050 Water Demand Indicator Targets

Following an approach established in GO TO 2040, ON TO 2050 will include various topic-specific indicators, which are a set of performance measures to benchmark the region's progress on plan implementation. The final set of indicators should highlight and complement all of the major recommendations made in ON TO 2050. All indicators will have targets for both 2025 and 2050 to evaluate near- and long-term progress.

The committee has previously reviewed the majority of the proposed indicators and near-term (2025) and long-term (2050) targets for topics related to the environment. However, review of the proposed water demand indicator methodology and target setting was postponed until the completion of the ON TO 2050 Regional Water Demand Forecast. The ON TO 2050 Regional Water Demand Forecast builds on the previous regional water demand forecast, *Regional Water Demand Scenarios for Northeastern Illinois: 2005-2050*,¹ which was completed in 2008, incorporated in [Water 2050](#), and used to set the indicator targets for this topic area in GO TO 2040. Analysis of recent water withdrawals indicates that the region is more in line with the Less Resource Intensive Scenario of the previous regional water demand forecast (**Figure 1**), which was reflected in the [GO TO 2040 indicator](#).

Long-range forecasts require making projections about future conditions that contribute to water demand; the updated forecast relies on CMAP's ON TO 2050 Socioeconomic Forecast to project future changes in population, total and sectoral employment, median household income, and housing density. Assumptions about future water prices and active and passive conservation strategies were made based on recent trends. The ON TO 2050 Regional Water Demand Forecast uses a different configuration of water sectors in order to present the forecast at the municipal scale, in addition to the county and regional scales.² The ON TO 2050 Regional

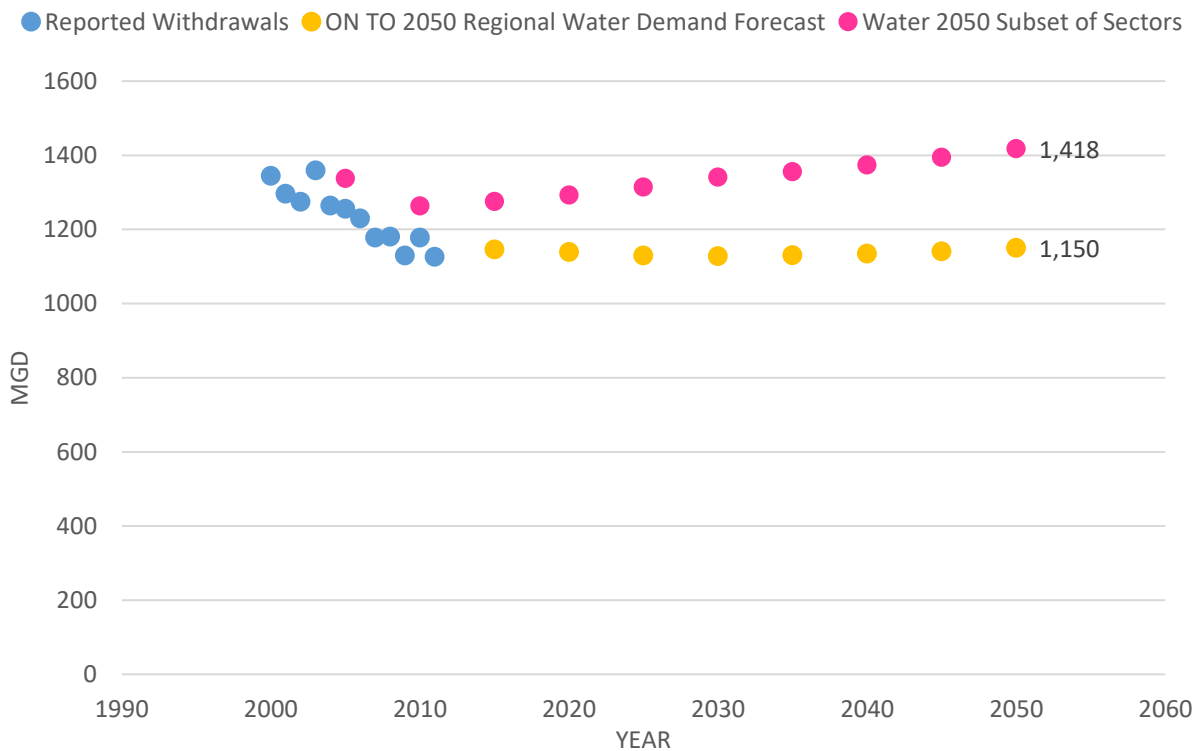
¹ Dziegielewski, B. and F.J. Chowdhury, 2008, "Regional Water Demand Scenarios for Northeastern Illinois: 2005-2050," Southern Illinois University Carbondale: Department of Geography and Environmental Resources.

² As a result, the indicator methodology has been expanded beyond public water supply to also include industrial and commercial self-supply and domestic self-supply water sectors.

Water Demand Forecast methodology will be published in the Fall 2018 along with the data for individual communities.

By 2050, total water withdrawals are estimated to be 1,150 million gallons per day (MGD), an increase of two percent from the 1,126 MGD withdrawn in 2013.³ During this same period, the region is projected to add more than 2.3 million residents and 900,000 jobs.⁴ Overall water use is estimated to be relatively stable because the amount of water used per resident or per employee is anticipated to continue to decline. Residential water use per capita is projected to continue to decline; however, it should be noted that some communities continue to report high values and should implement conservation and efficiency strategies.

Figure 1. Total reported withdrawals (2000-2013), ON TO 2050 Regional Water Demand Forecast^a (2015-2050) with Water 2050 Less Resource Intensive Scenario,^b MGD



^a Residential and non-residential withdrawals from public water supplies, industrial and commercial self-supply wells, and domestic self-supply wells. The ON TO 2050 Regional Water Demand Forecast did not include projections for water withdrawals associated with power generation or agricultural irrigation, which accounted for seven percent of withdrawals in the Water 2050 forecast.

^b The public supply, industrial and commercial self-supply, and domestic self-supply water sectors are included in the Water 2050 Less Resource Intensive Scenario above In order to provide a direct comparison between the two regional forecasts.

Source: Illinois State Water Survey, Water 2050, and CMAP ON TO 2050 Regional Water Demand Forecast

³ Water withdrawals reflect annual values expressed as average daily rates. Actual withdrawals will be higher during peak summer season and maximum-day use and lower during winter season and off-peak days.

⁴ Wage and salary employment and self-employed.

The ON TO 2050 Regional Water Demand Forecast and corresponding water supply and demand management strategies are included in the ON TO 2050 Environment chapter, within the *Coordinate and conserve shared water supply resources recommendation*. The proposed indicator methodology (see table below) utilizes the forecast to project out future water demand as well as residential water use per capita and establish targets for both 2025 and 2050.

It should be noted that the long-term sustainability of the region’s future water supply depends on the geographical distribution of demand and which water sources are supplying the water. At this time, the Chicago region lacks established sustainable yield estimates for all water sources and is therefore unable to set demand targets to match. In addition, communities and businesses may switch to other water sources that can accommodate their future demand within the plan timeframe. Current estimates by ISWS indicate the amount of sandstone groundwater withdrawals are currently twice the rate of recharge⁵ and desaturation of this resource will likely force communities and businesses to switch to the Fox and Kankakee Rivers or Lake Michigan.⁶ Shallow groundwater sources are also facing quality and quantity constraints that may inspire similar shifts.^{7,8} ON TO 2050 recommends a series of strategies to improve data availability, coordinate of withdrawals, and implement water conservation.

Water Demand

Indicator:	This indicator tracks total daily water demand, as well as per capita demand for residential water use. Total water demand includes water that is withdrawn, treated, and delivered to residential, industrial, commercial, governmental, and institutional users via public supply water systems, as well as industrial and commercial wells. This indicator corresponds to the <i>Coordinate and conserve shared water supply resources recommendation</i> in ON TO 2050. Assessing long-range forecasted demands can inform the region on the sufficiency of water supply and encourage actions that conserve water, protect supply, and/or pursue alternative drinking water sources.
Methodology:	Water demand data, in millions of gallons used daily, is provided to CMAP directly by the Illinois State Water Survey each year. Public water supply systems are maintained by municipalities, sub-regional authorities, or private companies. Private wells may serve industrial enterprises, commercial businesses, and park and golf course irrigation. Per capita values for residential water use will be based on the population served by the public supply water systems and not the entire population of

⁵ Abrams, Daniel B. 2017, “The Illinois Groundwater Flow Model: New Applications and Insights for Northeastern Illinois,” Presentation to the Northwest Water Planning Alliance Technical Advisory Committee on October 24, 2017.

⁶ Abrams, Daniel B. et al, 2015, “Changing Groundwater Levels in Sandstone Aquifers of Northern Illinois and Southern Wisconsin: Impacts on Available Water Supply,” Illinois State Water Survey, Contract Report 2015-02.

⁷ Walton R. Kelly, Daniel R. Hadley, Devin H. Mannix, “Shallow Groundwater Sampling in Kane County, 2015,” Illinois State Water Survey, March 2016, <http://www.isws.illinois.edu/pubdoc/CR/ISWSCR2016-04.pdf>.

⁸ Walton R. Kelly, Samuel V. Panno, Keith Hackley, “The Sources, Distribution and Trends of Chloride in the Waters of Illinois,” Illinois State Water Survey, March 2012, <http://www.isws.illinois.edu/pubdoc/B/ISWSB-74.pdf>.

the region, as a small portion of the region’s population (less than four percent) receives water from private wells and is termed self-supplied domestic sources.

Targets:

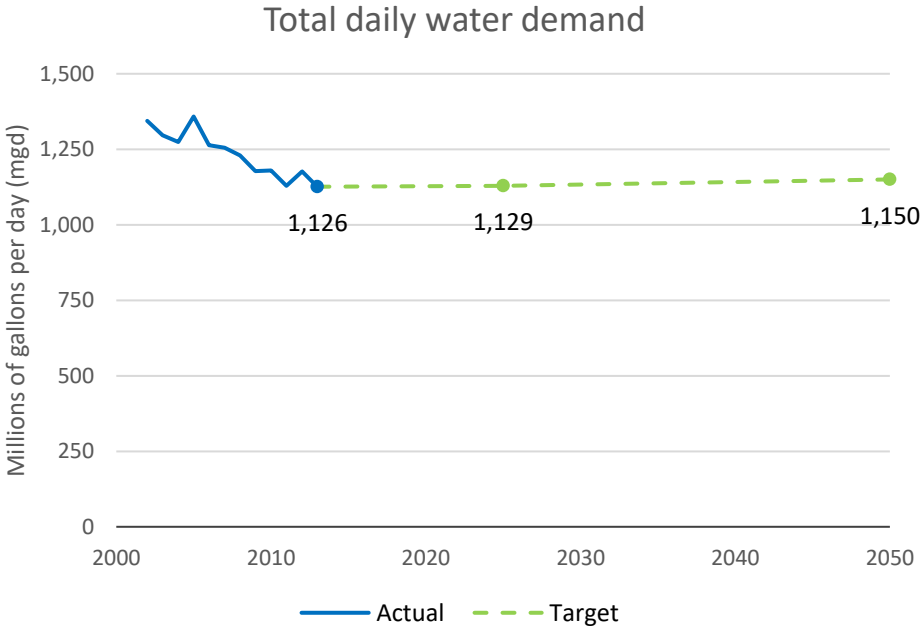
This indicator has two sets of targets -- one measuring total daily water demand, and one measuring daily residential water demand on a per capita basis. Per capita measurement allows for an examination of water conservation as an increase in total demand due to population or industrial growth can mask gains in conservation. At the same time, it is important to examine total demand because potable water is a finite resource and growth in our region is expected to increase the demand for water in 2050 above the current level of consumption.

Target values are based on the updated regional water demand forecast, which is set to be released in October 2018. The updated regional water demand forecast utilizes CMAP’s ON TO 2050 socio-economic forecast. It should be noted that the long-term sustainability of the region’s future water supply depends on the geographical distribution of demand and which water sources are supplying the water. At this time, the Chicago region lacks established sustainable yield estimates for all water sources and is therefore unable to set demand targets to match.

Total daily water demand

2025: 1,129 million gallons of water used daily

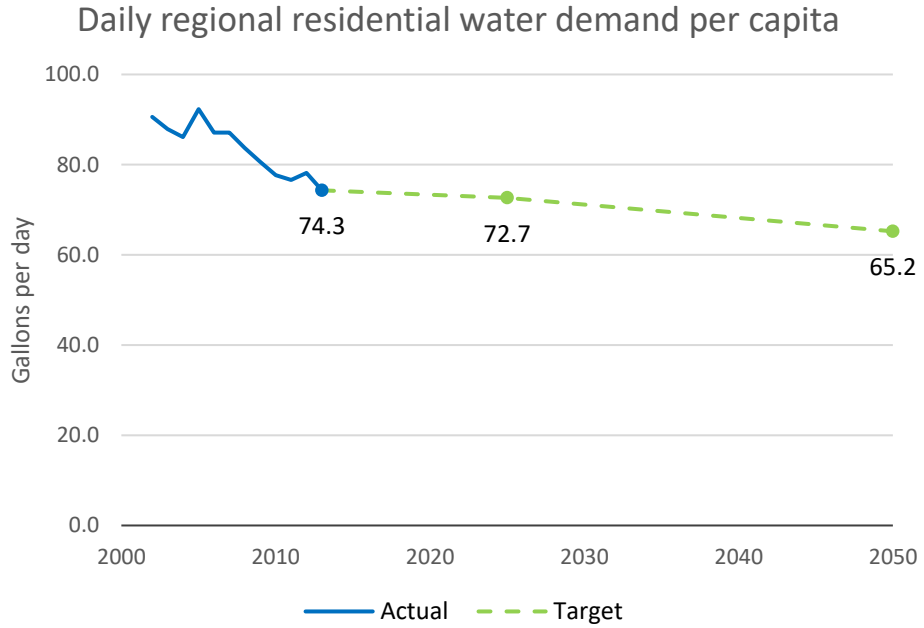
2050: 1,150 million gallons of water used daily



Daily regional residential water demand per capita

2025: 72.7 gallons of water used daily per capita

2050: 65.2 gallons of water used daily per capita



GO TO 2040
Context:

This indicator is adapted from the GO TO 2040 “Public Supply Water Demand” indicator, which was based on a water demand forecast focused on the public water supply sector. The ON TO 2050 indicator is based on a new water demand forecast, which also considers withdrawals from private wells serving businesses or private residences. As a result, the data and targets are not comparable between the two, although it should be noted that the GO TO 2040 targets allowed for an increase in overall demand while the ON TO 2050 targets are virtually flat despite anticipated population growth.