

green
town

**Water: Safe,
Affordable and
Climate Effective**
Climate Resilience of
Broadview

**Ron Burke, Alliance for Water
Efficiency
Justin Keller, Elevate**



WATER: SAFE, AFFORDABLE AND CLIMATE EFFECTIVE
GREENTOWN CLIMATE AND EQUITY
JUNE 22, 2023

RON BURKE, CEO

Alliance for Water Efficiency

AWE: A VOICE FOR WATER EFFICIENCY

- Our mission is to promote an efficient and sustainable water future
- 530+ member organizations in 200 watersheds delivering water to over 50 million water users
- A unique network of water efficiency experts and practitioners
- A forum for collaboration around policy, information sharing, education, and stakeholder engagement
- AWE provides training, research, and other resources for water efficiency professionals
- Advocate for funding and policies that advance water efficiency
- Visit allianceforwaterefficiency.org/membership to learn more



WHO WE BRING TOGETHER

- Water suppliers (retail and wholesale)
- Water planning agencies
- Plumbing, appliance & irrigation manufacturers and retailers
- Efficiency-focused businesses
- Efficiency service providers
- Environmental community
- Energy community
- Government (federal, state, municipal)
- Academic representatives
- Cultural institutions



ALLIANCE TO
SAVE ENERGY
Creating an Energy-Efficient World



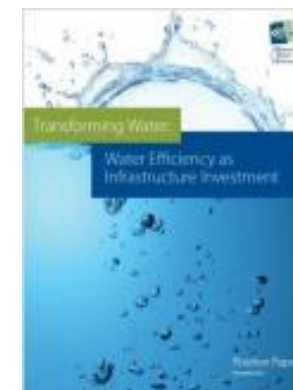
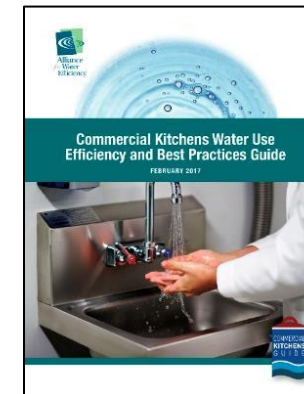
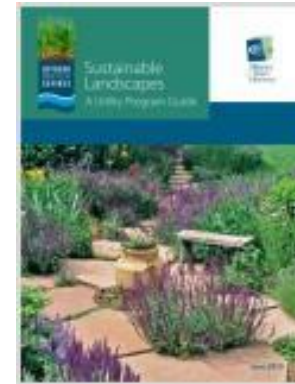
- Water efficient fixtures and appliances

WATER EFFICIENCY: MORE THAN A TOILET REBATE

- Water loss and leak management
- Landscape transformations
- Agriculture and landscape irrigation optimization
- Commercial, industrial and institutional (CII) strategies
- Process efficiency, including efficiencies in wastewater management
- Advanced water metering
- Smart/connected/automated technologies
- Water reuse and recycling
- Rainwater/stormwater capture and use
- Building, plumbing and land use codes/regulations
- Drought/water shortage management

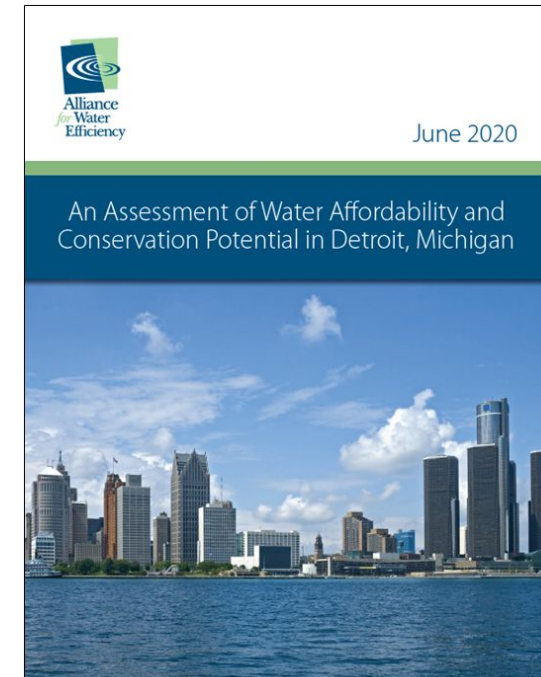
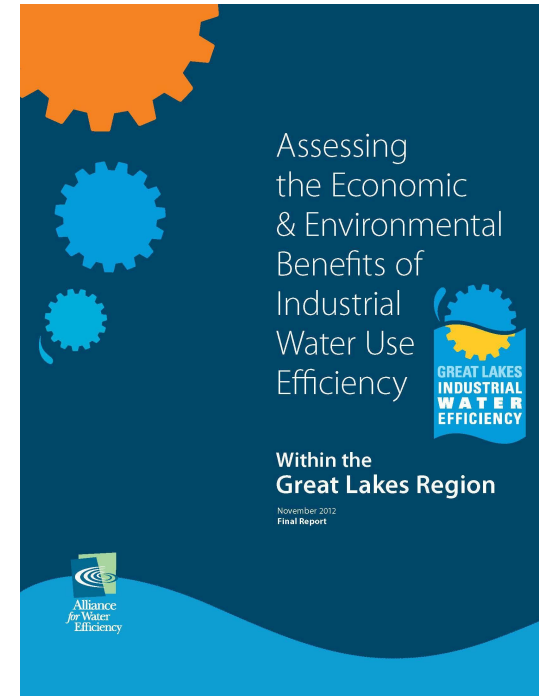
AWE REPORTS

- *Assessing water affordability and conservation potential for Long Beach, California.*
- *Use and Effectiveness of Municipal Irrigation Restrictions During Drought*
- *Sustainable Landscapes: A Utility Program Guide*
- *Landscape Transformation: Assessment of Water Utility Programs and Market Readiness Evaluation*
- *Transforming Water: Water Efficiency as Infrastructure Investment*
- *Water Conservation Keeps Rates Low in Arizona*
- *Net Blue Water-Neutral Community Growth: Report and Model Ordinance*
- *Saturation Study of Non-Efficient Water Closets in Key States*



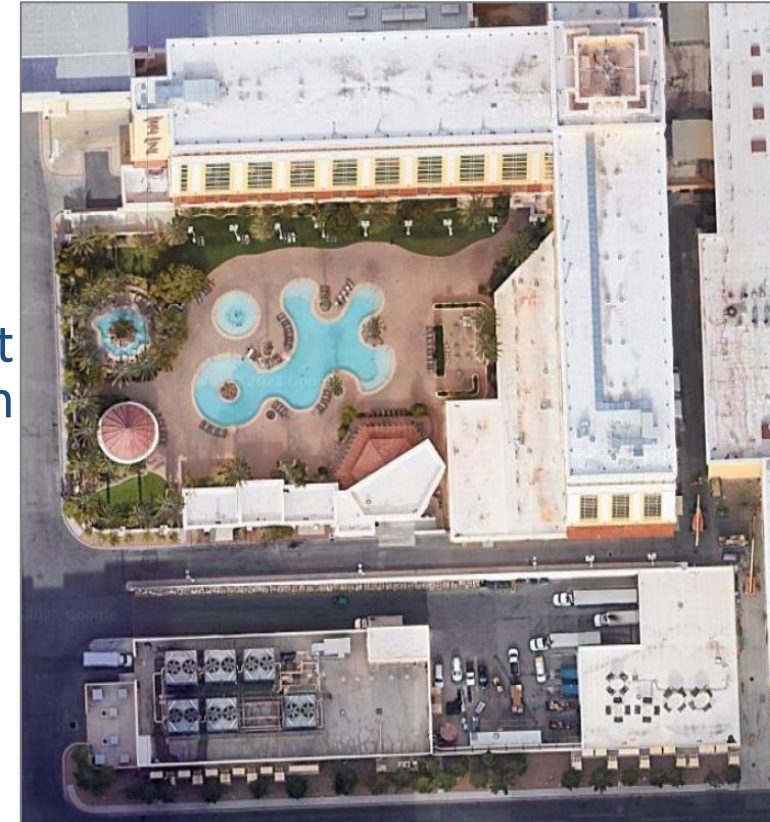
GREAT LAKES-FOCUSED PROJECTS

- Great Lakes/Northeast Regional Member Meeting (2021)
- Canadian Member Meeting (2021)
- [*Assessing water affordability and conservation potential for Detroit, Michigan \(2020\)*](#)
- [Water Loss Control Initiative \(2015-16\)](#)
 - Survey
 - Audits/Recommendations
 - Workshop
 - Policy Development
 - Outreach/Training
- [*Assessing the Economic and Environmental Benefits of Industrial Water Use Efficiency Within the Great Lakes*](#)



COOLING TOWER WATER EFFICIENCY PROJECT

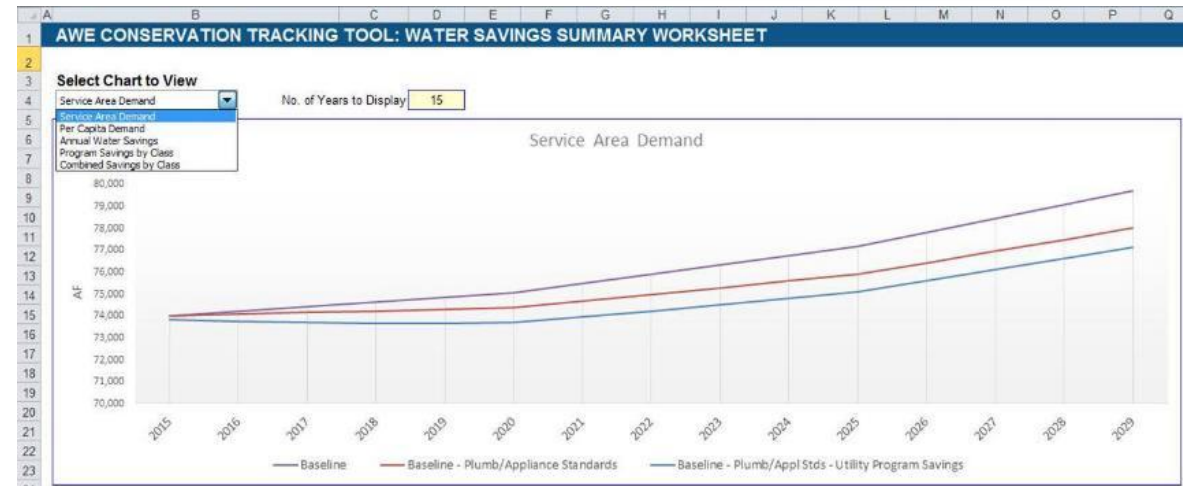
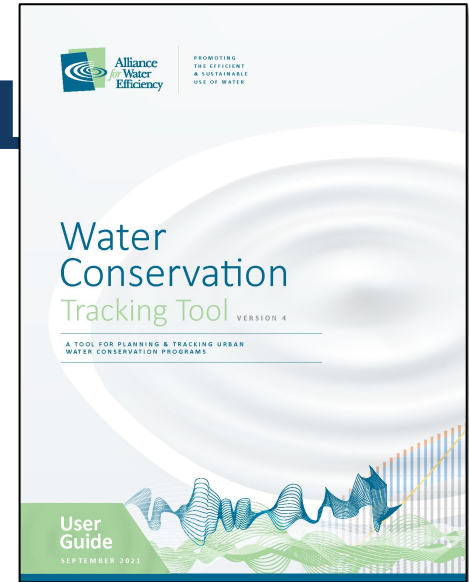
- **Cooling Tower Estimating Model**
- **Tool to evaluate water how efficiency varies with water quality differences**
- **Alternative Technologies Report**
- **Comparing Alternatives Tool (CAT)**
- **Practical materials including:**
 - “How-To” document with easy-to-understand basics about cooling towers, guide for creating a cooling tower program design with email and outreach examples
 - Cooling tower audit assessment form (tool for assessing individual cooling towers) with a return-on-investment calculator to evaluate efficiency improvements for individual towers
- [Final webinar](#)
- [Project reports, models, resources](#)



WATER CONSERVATION TRACKING TOOL

Excel-based spreadsheet tool for evaluating the water savings, costs, and benefits of urban water conservation programs and for projecting future water demands.

- Quickly compare alternative conservation measures in terms of their water savings potential, impact on system costs, and potential benefits to utility customers.
- In the development of long-range conservation plans. It can be used to construct conservation portfolios containing up to 200 separate conservation program activities.
- As an accounting system for tracking the implementation, water savings, costs, and benefits of actual conservation activities over time.



VIDEO COMMUNICATION RESOURCES

Animated videos to help water agencies communicate with customers about the value of water service.

WATER: WHAT YOU PAY FOR

- Seeks to communicate the value of water service, by explaining why safe drinking water has a cost.
- Describes the water service a typical residential water bill covers, and the costs of delivering a consistent, reliable flow of safe and affordable drinking water to faucets.

GOOD QUESTION: WHY ARE MY RATES GOING UP?

- Seeks to communicate the impact of water conservation on rates, by explaining how conservation can help keep utility costs and customer water rates lower over time
- Explains how conservation is a win-win - keeping utility costs down and money in customers' wallets - by avoiding unnecessary costs
- Customization options for both videos are available for AWE members.

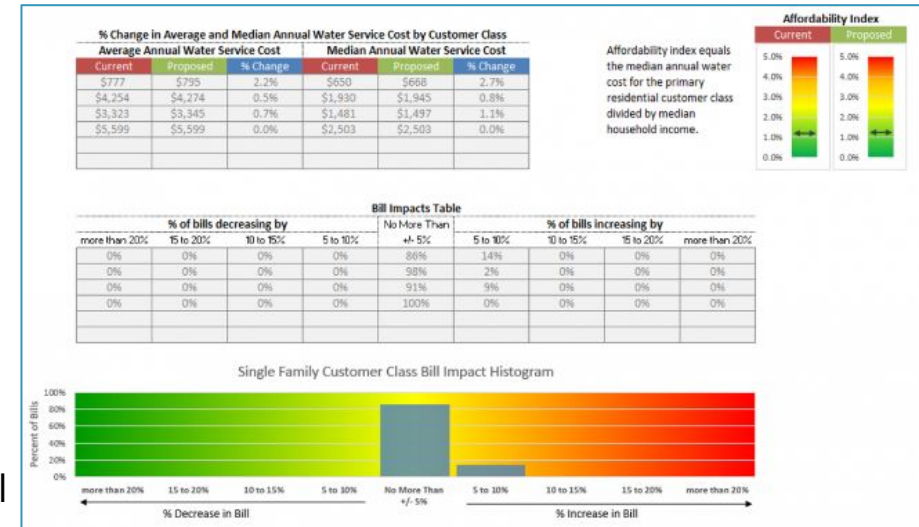


FINANCING SUSTAINABLE WATER

Information on rate structures that balance revenue management, resource efficiency and fiscal sustainability. Financingsustainablewater.org

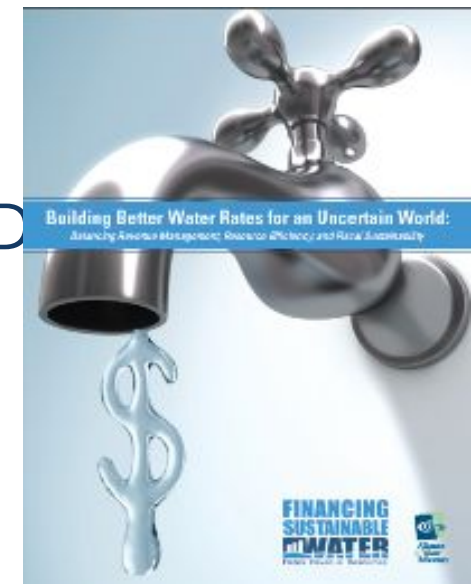
SALES FORECASTING AND RATE MODEL

- Analytical tool that can explicitly model the effects of rate structures.
 - **Customer Consumption Variability** – weather, drought/shortage, or external shock
 - **Demand Response** – Predicting future block sales (volume and revenue) with empirical price elasticities
 - **Drought Pricing** – Contingency planning for revenue neutrality
 - **Probability Management** – Risk theoretic simulation of revenue risks
 - **Fiscal Sustainability** – Sales forecasting over a 5 Year Time Horizon



BUILDING BETTER WATER RATES FOR AN UNCERTAIN WORLD

- Handbook providing the background and concepts needed to develop, evaluate, and implement an effective rate structure
 - Ratemaking Principles and Concepts
 - Steps for Building a Better (Efficiency-Oriented) Rate Structure
 - Implementing an Efficiency-Oriented Rate Structure
 - Public Engagement and Communications
 - Financial Policies and Planning for Improved Fiscal Health



HOME-WATER-WORKS.ORG

A consumer-facing website providing tips and resources to help water users conserve water in and around their homes.

WATER CALCULATOR

The Water Calculator estimates household water use, and compares your home to both a typical household and an efficient household in your zip/postal code. The calculator also estimates your carbon footprint from hot water consumption, and helps identify specific strategies for improving overall household water efficiency.

The Calculator was updated last year to feature a Spanish translation option, mobile responsiveness, updated graphics and more!

Customization options available to AWE members

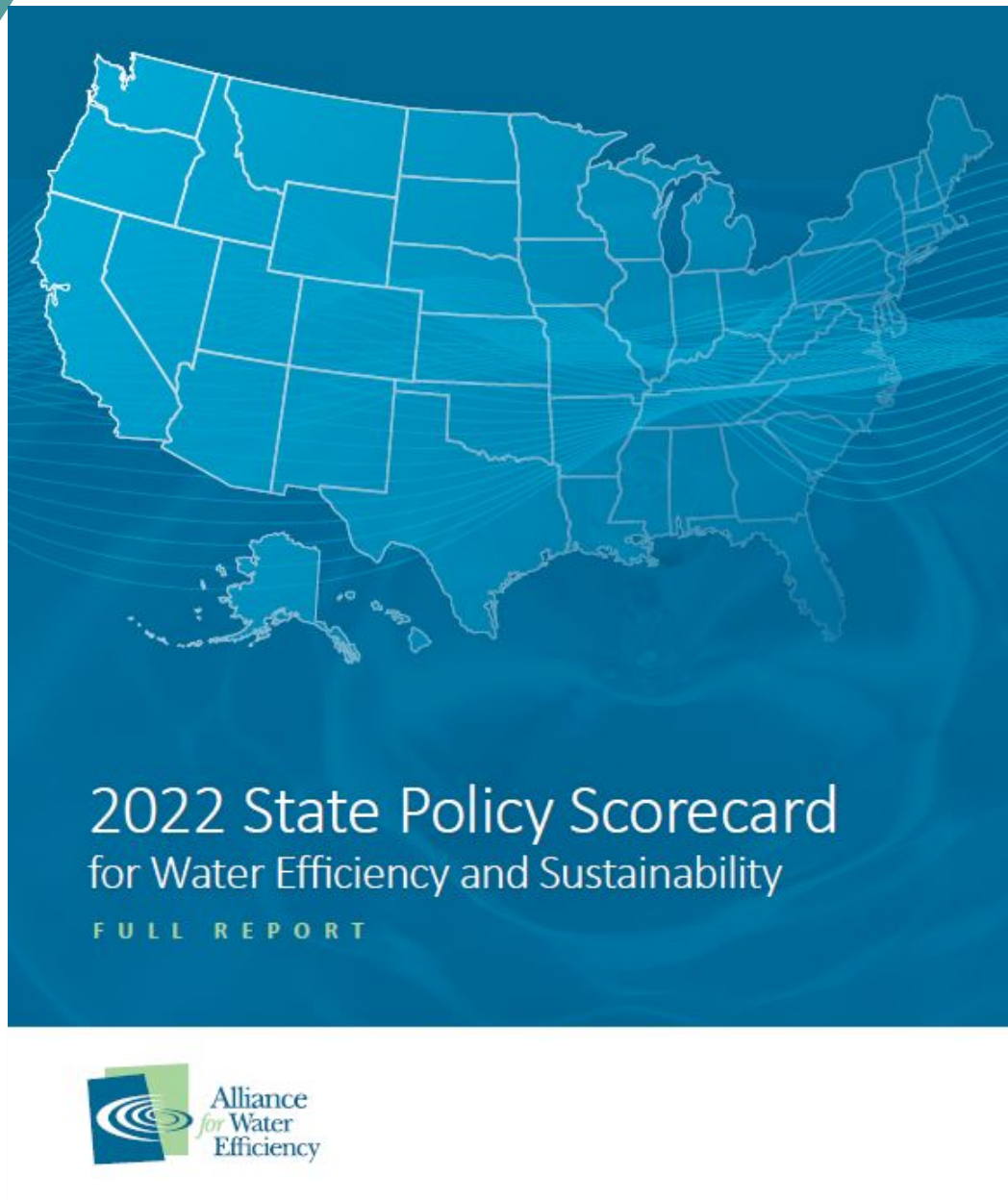




U.S. FEDERAL POLICY



- AWE filed lawsuits to block rules that weakened U.S. federal showerhead, clothes washer, and dishwasher water efficiency standards (Trump Administration)
- Helped persuade Biden Administration to reverse those rules
- Successfully advocated for \$400M in western states water efficiency funding in infrastructure bill; AWE continues to advocate for a new national grant program
- Helped pass legislation in the U.S. House to make water conservation rebates tax-free; unfortunately, the provision stalled in the Senate but AWE continues to advocate for passage.
- AWE's advocacy contributed to inclusion of \$4 billion for western drought relief in the

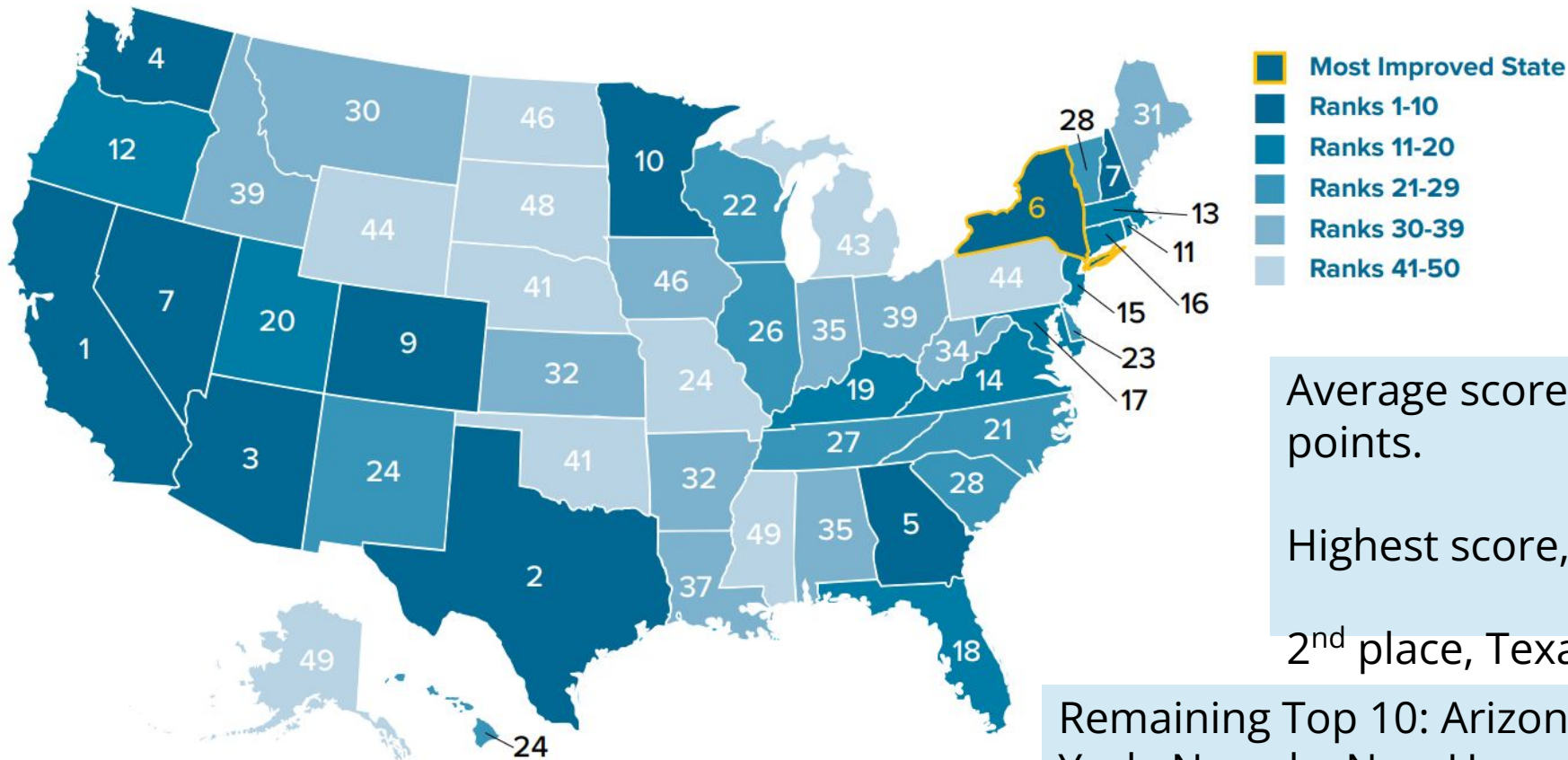


www.allianceforwaterefficiency.org/2022Scorecard

1-50 STATE RANKING

2022 State Rankings Map

**States with the same score are tied for that ranking*



Average score = 23 out of 89 possible points.

Highest score, California = 72.5 points.

2nd place, Texas = 54.5 points.

Remaining Top 10: Arizona, Georgia, Washington, New York, Nevada, New Hampshire, Colorado, and Minnesota .

ILLINOIS

19
POINTS
TOTAL

#26
NATIONAL
RANKING

#3
REGIONAL
RANKING (OF 12)
MIDWEST REGION

About the Scorecard

The 2022 U.S. State Policy Scorecard for Water Efficiency and Sustainability evaluates and scores U.S. states by their adoption of policies and laws that advance water efficiency, conservation, and sustainability. The Scorecard is intended to encourage further legislative action at the state level.

Scorecard Summary	Points
Plumbing Fixture Standards and Codes	4.5/12
Water Loss Control	6.5/11
Water Conservation Planning	5/27.5
Drought Preparedness Planning	0/8.5
Climate Action Planning	0/4
Water-Land Use Planning Integration	0/6
State Funding for Water Efficiency Programs	0/4
State-provided Technical Assistance for Water Efficiency	0/3
Rate Structures that Encourage Conservation	0/4
State Funding for Water Bill Assistance	0/2
State Funding and Support for Water Reuse	0/4
Accounting for Energy Savings from Water Efficiency	1/1
Completion of Survey	2/2
TOTAL POINTS	19/89

Priority Scoring Factors

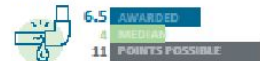
The categories below are highlighted in order to encourage states to make the most progress in heavily weighted sectors.

Plumbing Fixture Standards and Codes



*When the median U.S. or state score is 0, at least half of jurisdictions will have not adopted this category policy.

Water Loss Control



Water Conservation Planning

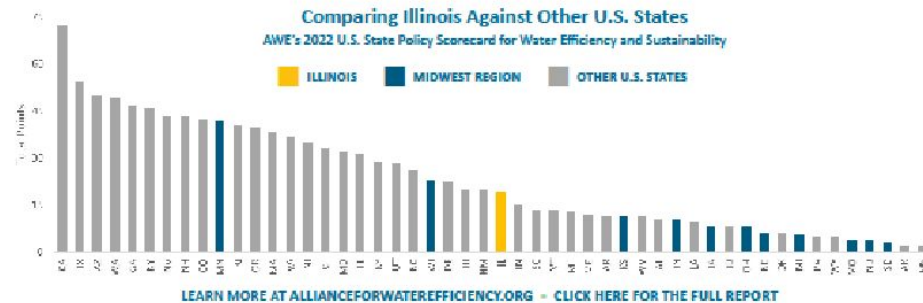


Drought Preparedness Planning




Recommendations for Illinois

- ✓ Allocate state funds to support water conservation and customer assistance programs
- ✓ Require water utilities to develop and implement drought preparedness plans
- ✓ Require water rate structures that encourage conservation

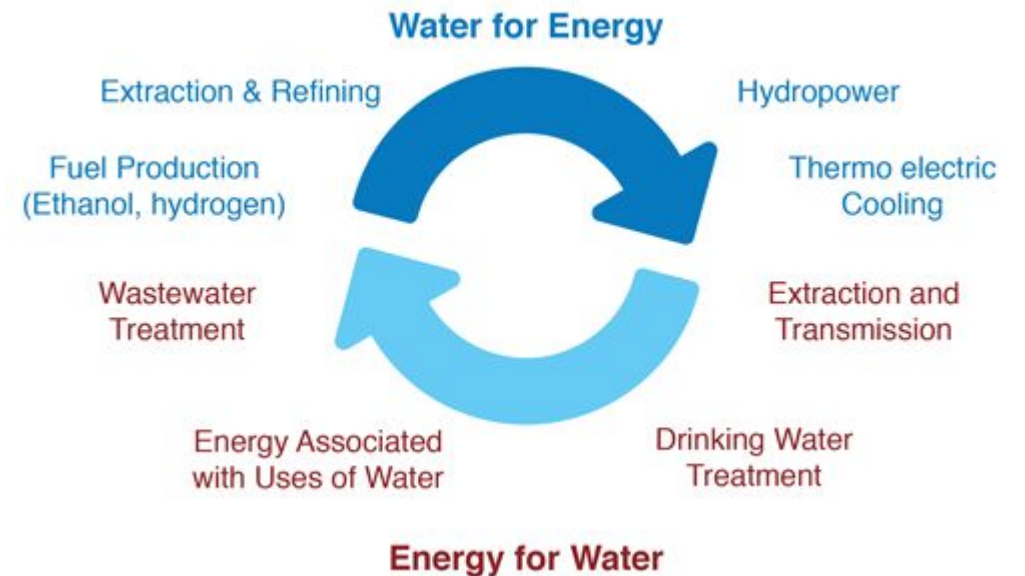


WATER - ENERGY - CLIMATE NEXUS

Water Savings = Energy Savings = GHGs



- End-user energy savings (reduction in the amount of energy needed to heat, cool, and pressurize water in homes and businesses)?
- System-wide/embedded energy savings (reduction in energy used to collect, treat, and deliver water and collect and treat wastewater)
- Hot and cold water energy savings



Los Angeles Times

Want to save energy and fight climate change? Try using less water

BY [SAMMY ROTH](#). STAFF WRITER

MARCH 4, 2021

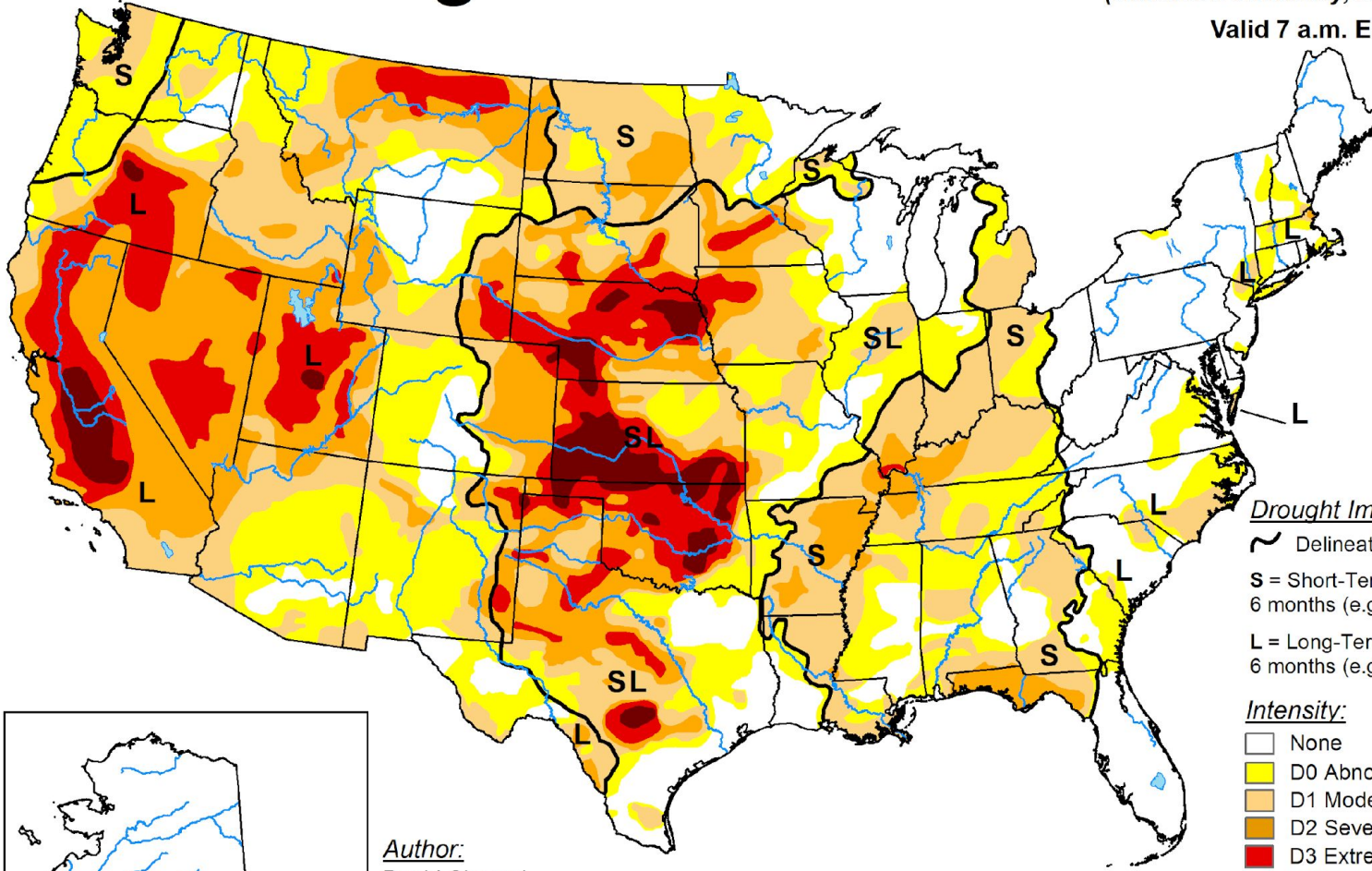
ACCOUNTING FOR EMBEDDED ENERGY IN WATER: ILLINOIS

- 2018: Illinois allows energy utilities to claim energy efficiency credit for water efficiency projects
- Wisconsin and California only other states with this policy
- Elevates “cold water” efficiency
- **Water Supply Energy Factor = 2,571 kWh/MG**
- **Wastewater Treatment Energy Factor = 2,439 kWh/MG**

U.S. Drought Monitor

December 6, 2022
 (Released Thursday, Dec. 8, 2022)

Valid 7 a.m. EST



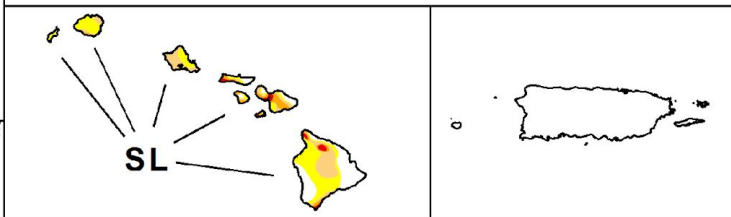
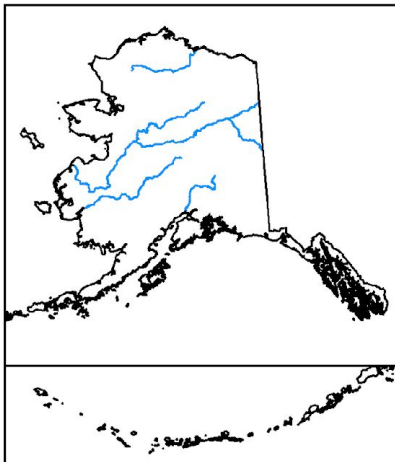
Drought Impact Types:

- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

Author:
 David Simeral
 Western Regional Climate Center



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

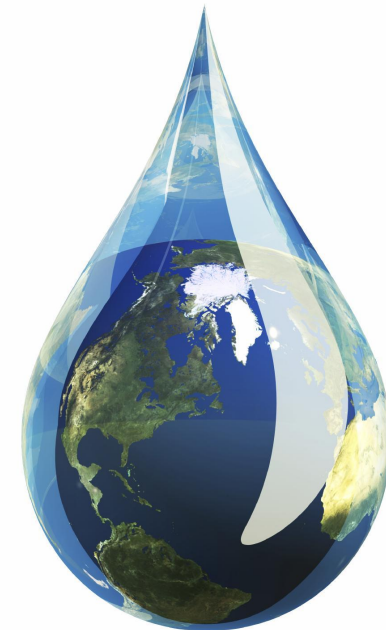


droughtmonitor.unl.edu



Water Efficiency is Important Even Where Water is Plentiful

- Support for energy efficiency has little to do with “energy scarcity” and preventing brownouts.
- Similarly, water efficiency has multiple benefits that go beyond water scarcity and preventing water restrictions.



Water Efficiency and Conservation: Important Even When Water is Abundant



Water efficiency and conservation are typically the fastest and least expensive ways to help ensure that communities and agriculture have access to affordable, sustainable water supplies. Climate change is fueling hotter, dryer weather, and nearly every state experienced drought in 2022, which was the worst drought in hundreds of years in the Western U.S.

However, water efficiency and conservation offer multiple sustainability benefits beyond keeping the water running, just as energy efficiency does more than keep the lights on. It's time to **de-bunk the common misperception** that water efficiency and conservation are only important in arid regions or when drought sets in.

A brief overview of water efficiency and conservation's other benefits:

Mitigating climate change

by reducing energy use and greenhouse gas emissions associated with heating, pumping, and treating water/wastewater.



Adapting to climate change

by making communities more resilient to drought and heavy rain events.



Reducing costs for businesses and supporting corporate sustainability goals.

Making more water available to support healthy stream flows and lake levels for plants and animals.



Reducing

the need to build or expand expensive drinking water and wastewater systems.

Limiting nutrient runoff

associated with landscape and agriculture.

Helping communities manage water shortages related to water quality problems.



Using technologies

that detect leaks to save water and help prevent property damage.

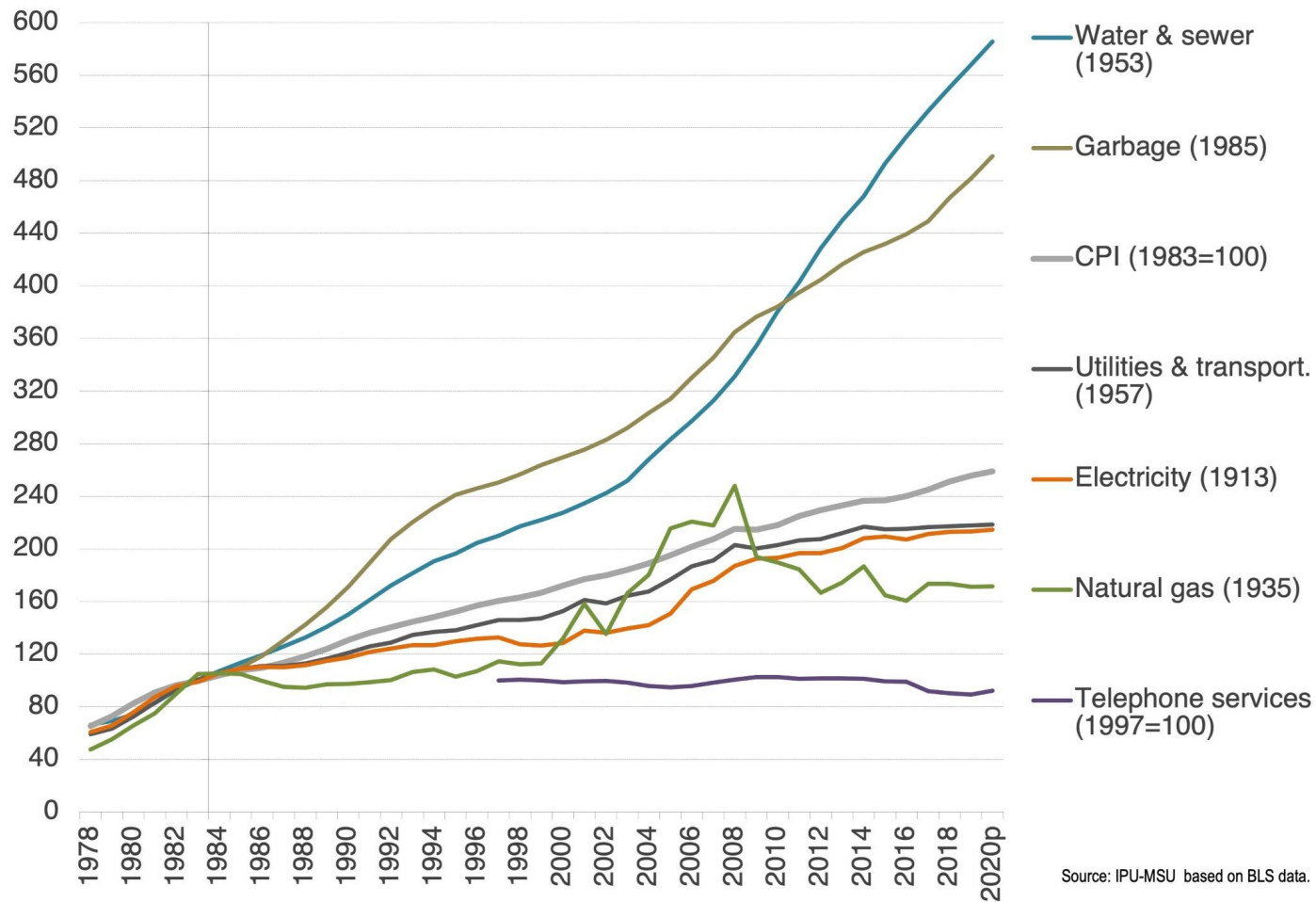
Making water bills more affordable.



Minimizing land subsidence linked to excess groundwater withdrawals.

“BUT WATER IS MUCH CHEAPER THAN ENERGY => LESS INCENTIVE TO BE EFFICIENT” THAT IS CHANGING

Trends in the CPI for public utilities (BLS)



Source: IPU-MSU based on BLS data.



ANNUAL WATER CONSERVATION AND EFFICIENCY ASSESSMENTS



Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271
www.dnr.illinois.gov

JB Pritzker, Governor
Colleen Callahan, Director

Water Conservation and Efficiency Program Review Illinois' Thirteenth Report to the Compact Council and Regional Body

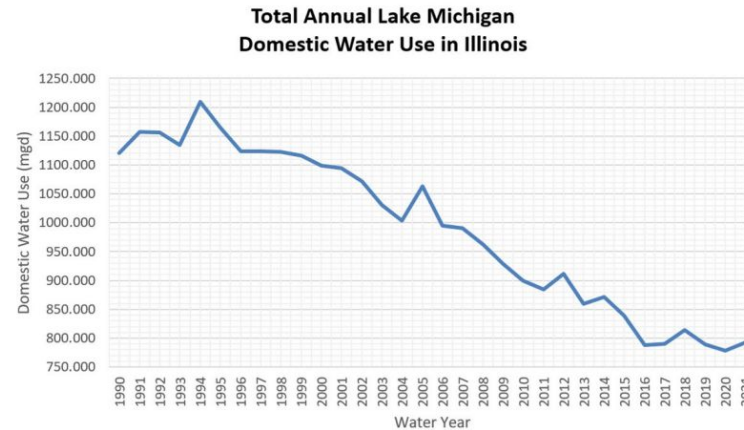
November 12, 2022

Lead agency and contact person:

John Rogner
Assistant Director
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702

Illinois' Water Conservation and Efficiency Program

A. Status of Illinois' Domestic Water Use from Lake Michigan



In water year 2021 total domestic Lake Michigan water use was 792 million gallons per day (mgd), an increase of approximately 14 mgd as compared to water year 2020's pumpage. Overall, the plot above shows the long-term decline in total domestic use of Lake Michigan water. The drought years of 1994, 2005 and 2012 are clearly visible, but the overall downward trend in water use that has occurred since 1990 is significant. In water year 2021 the annual precipitation was 31.31 inches, 10.00 inches less than 2020's value of 41.31 inches.

Press Esc to exit full screen

WATER EFFICIENCY MAKES WATER MORE AFFORDABLE

- Water rates are rising faster than other costs, on top of inflation and stagnant incomes
- Utilities will increasingly be asked to actively address affordability challenges.
- Recent AWE research:
 - Detroit: 7% of annual income goes to water, some up to 40%
 - Replace old toilets & save 14%
 - Long Beach: 3% of annual income, some up to 24%
 - Replace old toilets + clothes washers & save 13%
 - Add turf replacement: 22% bill savings
- How are you supporting historically underserved customers and/or customers with low or limited incomes?

Revealed: millions of Americans can't afford water as bills rise 80% in a decade



More than two-fifths of residents in some US cities live in neighbourhoods with unaffordable bills. Illustration: Erre Gálvez/The Guardian

Exclusive: analysis of US cities shows emergency on affordability of running water amid Covid-19 pandemic

Advertisement

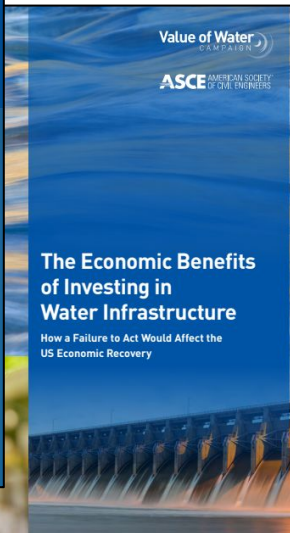
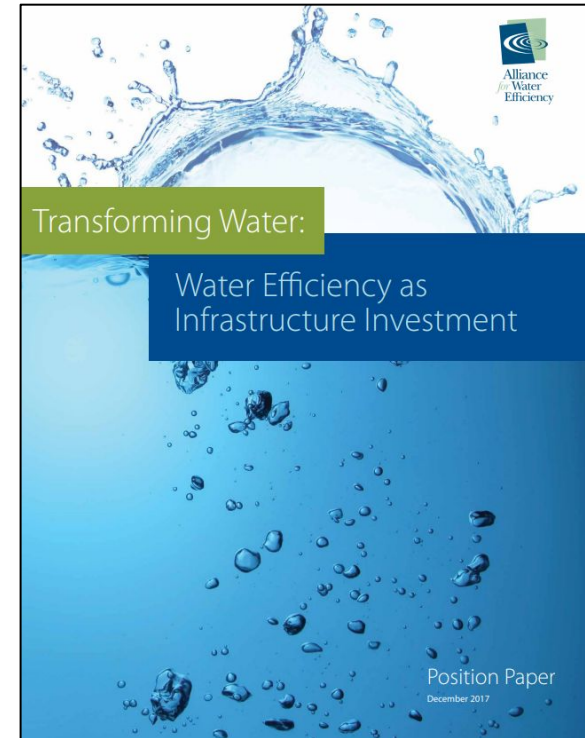
<https://www.theguardian.com/us-news/2020/jun/23/millions-of-americans-cant-afford-water-bills-rise>

<https://www.allianceforwaterefficiency.org/impact/our-work/assessment-water-affordability-and-conservation-potential-detroit-michigan>

<https://www.allianceforwaterefficiency.org/impact/our-work/assessment-water-affordability-conservation-potential-long-beach-ca>

WATER EFFICIENCY HELPS YOUR LOCAL ECONOMY

- “You’re not selling water; you are selling civilization.”
- All businesses rely on water; water efficiency helps insulate businesses from rising water and energy costs
- Economic impact of investing in water efficiency:
 - 2017 AWE study:
 - 2.5-2.8 multiplier for economic output
 - 1.3-1.5 multiplier for gross domestic product
 - 12-26 jobs for every \$1M invested
- Help with corporate social responsibility initiatives/requirements/reporting
- Support local agriculture



WATER EFFICIENCY CAN HELP MANAGE RAINWATER

- Minimize Combined-Sewer Overflows (CSO)
- Landscape transformations can reduce runoff and support pollinators & wildlife habitat
 - Rain gardens, turf replacement, permeable surfaces
 - Improve stormwater quality & health of waterways
- Rainwater capture and water reuse can reduce demands on sewer systems and limit nutrient discharges



Rain City Strategy approved

On November 5, 2019, City Council unanimously approved an ambitious green rainwater infrastructure and urban rainwater management initiative called the Rain City Strategy.

The strategy and its action plans reimagine how we can manage rainwater, representing a significant opportunity to take bold strides toward becoming a water-sensitive city.

WATER EFFICIENCY IS NECESSARY TO ADAPT TO CLIMATE CHANGE

What may come to the region?

- Longer growing seasons
- More extreme heat
- More drought & wildfire
- More intense storms, flooding
- More evaporation
- Wetter winter/springs
- Less rainfall during the summers
- Increased variability

The Great Lakes Region Is Not a ‘Climate Haven’

The water-rich U.S. region may have cooler temperatures and sit high above sea level. But it can't be a refuge for anyone if it doesn't take action now to adapt to its own changing climate.



On August 2nd, 2014, residents of Toledo, Ohio awoke to urgent warnings not to drink or use their tap water. Half a million people were unable to drink their water, cook with it, or brush their teeth. The cause? Toxins from a harmful algal

bloom growing in Lake Erie.

Groundwater supplies, where drinking water is pulled from, are projected to decline by 18% due to less snow in the winters, a longer spring, and increased demand for water due to higher temperatures.

“This is absolutely concerning,” Jayne Knott, a research associate at the UMass-Boston School for the Environment and another author of the report, told the *Globe*. “We depend on groundwater for our drinking water.”



33 North LaSalle Street, Suite 2275
Chicago, Illinois 60602

OFFICE 773-360-5100
TOLL-FREE 866-730-A4WE

<https://www.allianceforwaterefficiency.org>

Alliance for Water Efficiency

*Thank
You!*



ELEVATE

Water Affordability in Northeastern Illinois

Justin Keller, AICP

Strategist, Water Programs at Elevate

Topics

- Water affordability overview
- Case study: Village of Broadview
- Why does this matter?



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Water Affordability

- Key Terms
- EPA Methodology
- Timeline



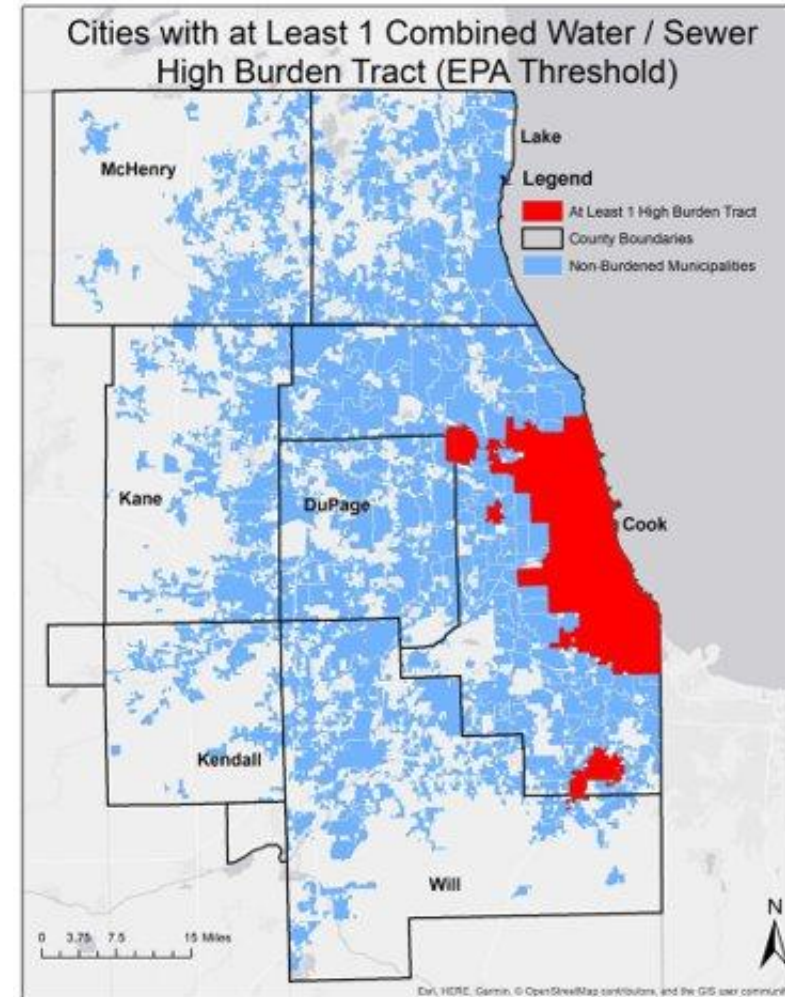
Key Terms

- **Water affordability** is a function of the interaction between *cost of service* and *income*
- **Water bill burden** is the percentage of a household's income that goes toward paying water bills
 - The same water bill could be a low burden for one household but a high burden for another
 - The industry varies on a best-practice measurement of "high" water bill burden

Water Bill Burden Description	Water Bill Burden Threshold (Water Only)	Water Bill Burden Threshold (Water + Sewer)
Low	< 1.25%	< 2.25%
Mid-Range	1.25 – 2.25%	2.25 – 4.5%
High	> 2.5%	> 4.5%

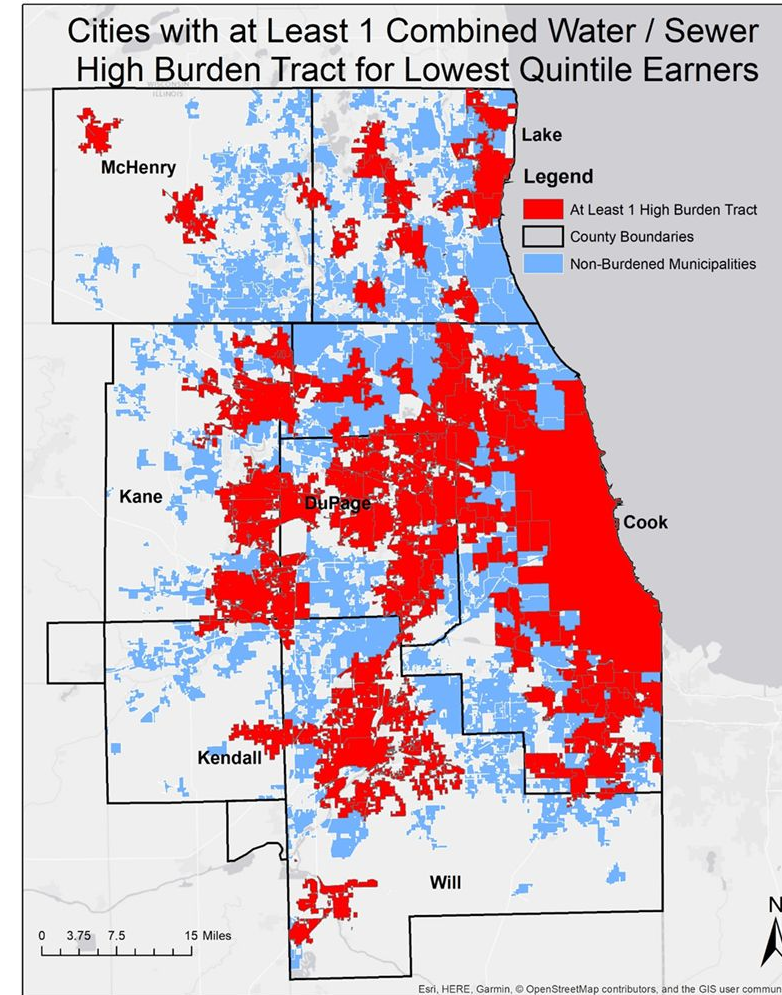
EPA Method – MHI

- 4.5% EPA indicator of affordability for combined water/sewer, assuming monthly usage = 5k gals



EPA Method – Quintiles

- Lowest income quintile by census tract (bottom 20% of earners)
 - Half of region's municipalities have at least one census tract where lowest income earners have a high water burden
 - 4.5% threshold is considered arbitrary but is useful for comparison



Report & Technical Assistance

- **2019** – published report, analyzing water affordability challenges across NE Illinois
- **2020-21** – partnered with Chicago & Evanston to understand the scale and scope of water affordability challenges for their residents
- **2022-23** – partnered with Broadview & Harvey to explore water affordability challenges with additional municipalities



Visit: ElevateNP.org/Water-Affordability



ELEVATE

Case study: Village of Broadview



Broadview Scope of Work

- **Pro-bono technical assistance**
- **Analysis:**
 - Review of water and sewer billing data 2020-2022
 - Interviews w/ various stakeholder groups
- **Recommendations:** propose solutions tailored to Broadview



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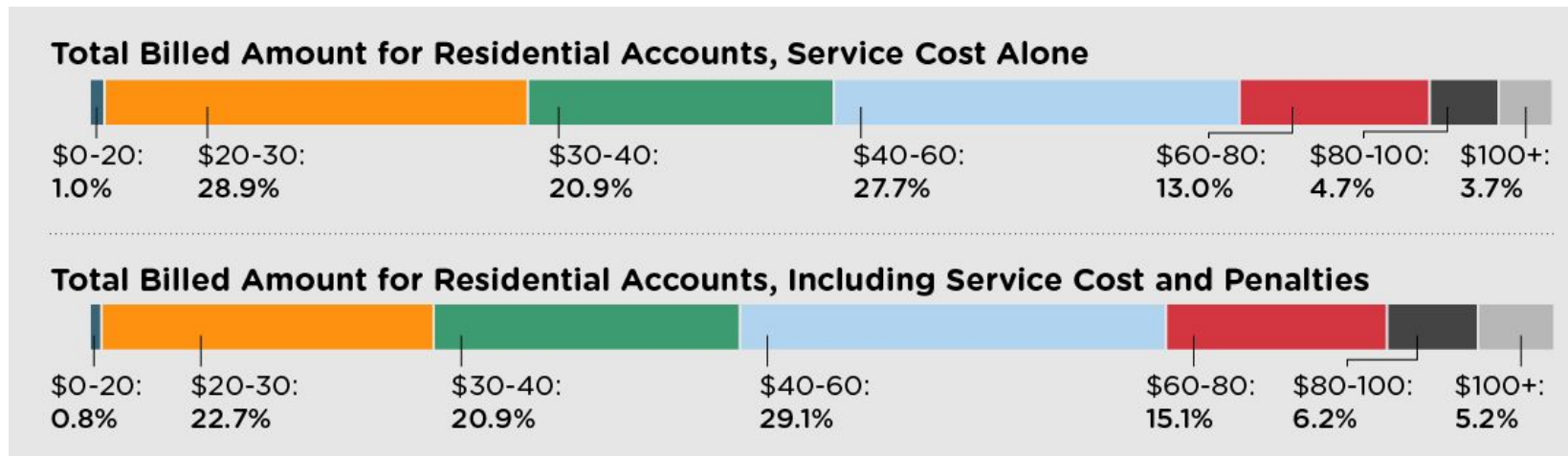
Metropolitan  **Planning Council**

Data Analysis Overview

- Analysis aimed to understand billing and debt trends for Broadview's **residential water customers**
 - 62,000 bills from 2,385 accounts with consistent billing
 - Billing dates from July 2020 through August 2022
- Examined three elements of water billing:
 - Cost of Service
 - Carried Balances
 - Point-in-Time Debt Snapshots

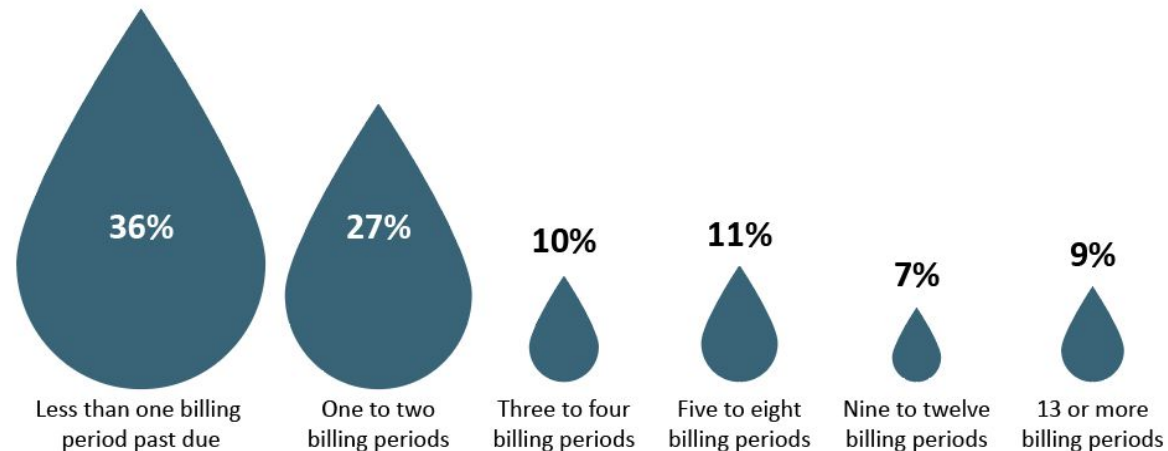
Cost of Service

- Average monthly cost of water and sewer service alone: **\$45.92**
 - 78% of customers had monthly bills \leq \$60
- Including late fees, average total monthly bill: **\$50.26**
 - 73% of customers had total monthly bills \leq \$60



Carried Balances

- Throughout the study period, an average of 350 (out of 2,385) residential customers carried a balance from one month to the next
 - Avg. 63% of accounts carried a balance for two or fewer billing cycles
 - = Broadview's residential customers **generally pay their bills on time or not more than two months late**



Debt Snapshots

- Customers generally carry low amounts of water debt, but a small cohort of consistently past due accounts held a significant amount of debt at **three point-in-time debt snapshots**:

Year	% Residential with no debt	% with <\$100 debt, for Residential with debt	Number of accounts with >\$500 debt	% total debt held by accounts with >\$500 debt
2020	88%	59%	20 (0.8%)	68%
2021	87%	65%	22 (0.9%)	73%
2022	83%	58%	51 (2%)	78%



ELEVATE

Stakeholder Engagement

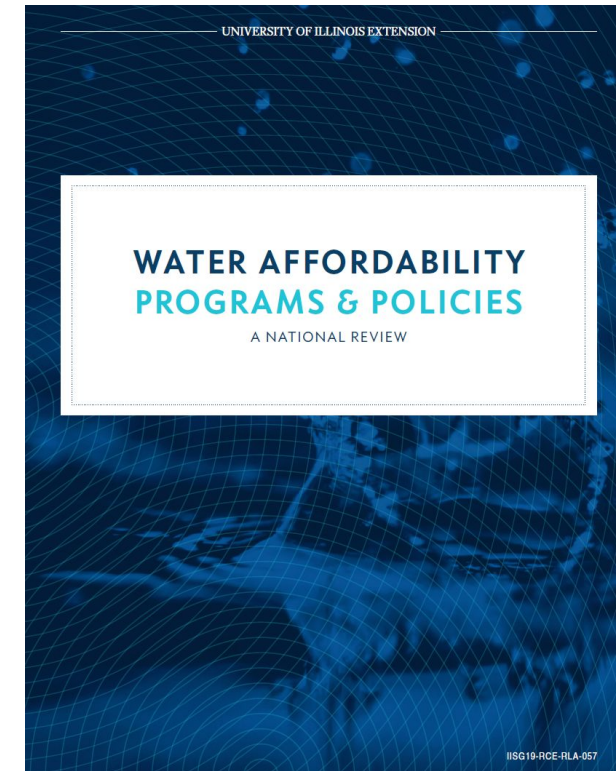
Stakeholder engagement

- **Residents:** satisfied with the cost of water; appreciate leadership and transparency from Water Department and elected officials*
- **Small businesses:** feel Village water is reasonably priced and suitable for their needs*
- **Staff:** installation of smart meters allows Village to track usage and provide data-based responses to customers when billing or usage spike
- **Elected officials:** value communication; working with customers to implement incremental rate increases so that water bills do not cause an undue or excessive burden

**small sample size*

Recommendations

1. Reduce costs
2. Promote water conservation
3. Design and implement equitable rates
4. Strengthen customer assistance programs
5. Target the hard-to-reach



SOURCE: iseagrant.org



ELEVATE

Why does this matter?

Rising Water Costs

- Higher energy costs for pumping and transmission
- Higher materials costs for pipes, valves, treatment chemicals, and more
- Higher labor costs for water operators, public works staff, administrators, and contractors
- Higher fuel costs for public works vehicles – meter reading, water main work, etc.
- Higher costs associated with new regulatory compliance (LSLs, PFAS)
- Climate change-related impacts on source water and infrastructure
- Much of our water infrastructure is 50-100 years old and coming to the end of its useful life!

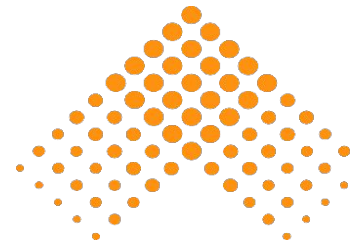


Customer-level affordability must be a consideration.




Contact information

- **Justin Keller, AICP**
- Justin.Keller@ElevateNP.org

Visit: ElevateNP.org/Water-Affordability



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-  ElevateNP.org
-  info@ElevateNP.org
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