



BREAKING NEW GROUND IN 2020:

AWE Launches 5 Water Efficiency Initiatives



Alliance
for Water
Efficiency

PRESENTATION SPEAKERS



Mary Ann Dickinson
President & CEO
Alliance for Water
Efficiency



Bill Christiansen
Director of Programs
Alliance for Water
Efficiency

A VOICE FOR WATER EFFICIENCY IN NORTH AMERICA

- Our mission is to promote an efficient and sustainable water future
- **Over 500** member organizations in **200 watersheds** delivering water to **50 million water users**
- Our network and research focus is on smart solutions and Efficiency First



NEW
PROJECTS IN
5
INITIATIVE
THEMES
IN
2020

1. Education
 - Learning Landscapes Curriculum and Grants
 - Practical Plumbing Handbook
2. Conservation Planning
 - Connecticut Water Plan
3. Water and Land Use Planning
 - Net Blue Project in Bozeman
 - Inventory of State Laws on Utility Planning
4. Technical Assistance and Support
 - AMI Guidance
 - Landscape Transformation Guide
5. Research
 - Drought Restrictions Study
 - Cooling Technologies Study



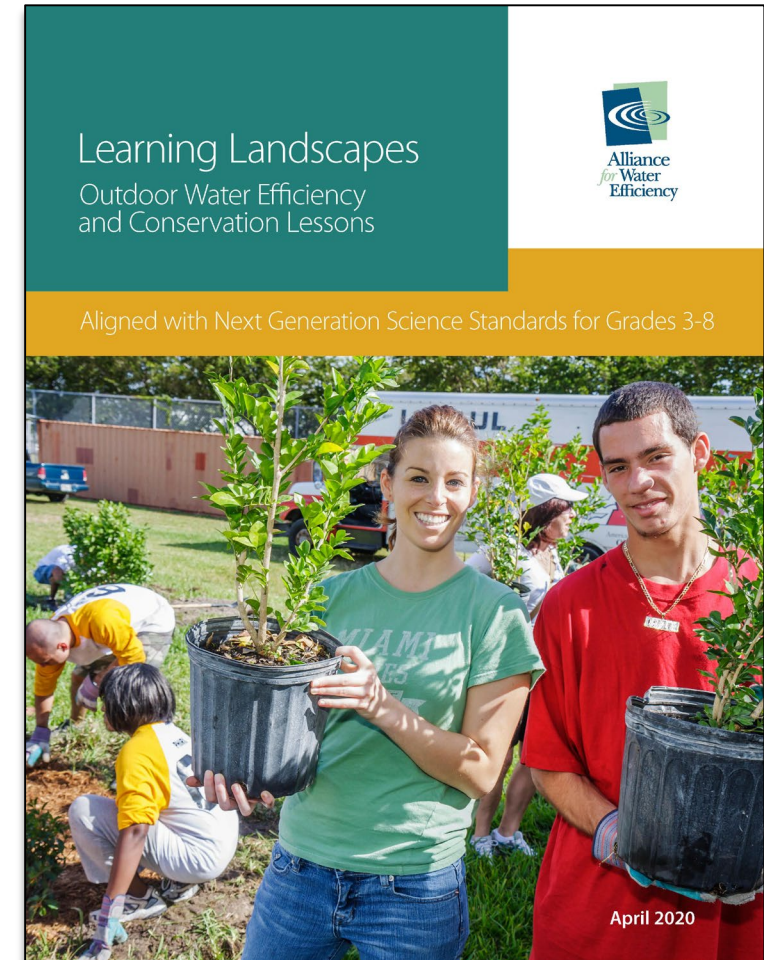
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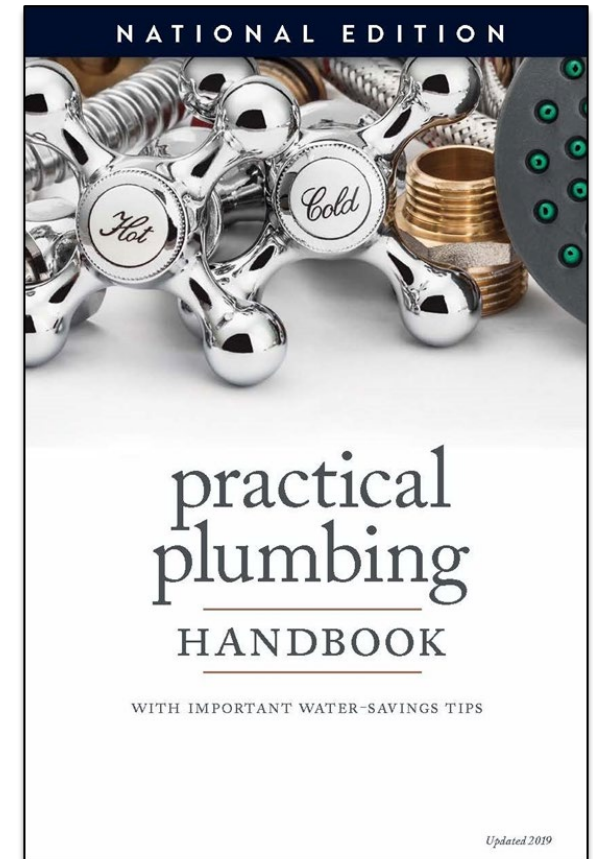
LEARNING LANDSCAPES PROGRAM

- Developed 3 curriculum lessons for upper-elementary and middle-school students that align with Next Generation Science Standards
- Released in April, 2020, the lessons have already been requested by 240 teachers
 - 141 Application Requests (lessons included)
 - 64 Lessons-Only Requests
- Awarding \$40k in grants (\$5k max each) to eight communities to help build or improve demonstration gardens using the Learning Landscapes Lessons
- Curriculum lessons posted at www.home-water-works.org



PRACTICAL PLUMBING HANDBOOK

- Consumer DIY Guide to maintaining efficiency in the home
- Written by experts but in layman's language
- Covers plumbing fixtures, clothes washers, irrigation equipment, and leaks
- Guidance on reading the water meter
- 45,000 copies sold in California version
- Bulk copies available for utilities, individual consumer copies for sale at www.home-water-works.org



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CONNECTICUT STATEWIDE WATER CONSERVATION PLANNING

- Planning Assistance to the Water Planning Council and its committees to support water conservation programs identified in the State Water Plan
- First priority is efficiency-oriented rates and revenue stability – great stakeholder interest
- AWE Rates and Revenue Stability Workshop scheduled for March 18, 2021
- Evaluating options for amendments to state laws for water conservation and drought planning
- Evaluating options for a statewide approach for outdoor water use restrictions (Connecticut currently in drought)

CONNECTICUT WATER PLANNING COUNCIL

Home About Us Publications Contact Us

WATER PLANNING WATER MANAGEMENT WORKGROUPS MEETING CALENDAR

Welcome to the Connecticut Water Planning Council

John W. Betkoski, III
Chairman

We are dedicated to the development of a comprehensive strategic water plan for the State of Connecticut. This website contains helpful information related to the Water Planning Council and the development of the water plan.

APPROVED Connecticut's State Water Plan was adopted by the General Assembly on June 5, 2019.

Connecticut State Water Plan Document Repository

Latest News
06/05/2019 -- The Connecticut General Assembly passed House Joint Resolution No. 171, approving Connecticut's first State Water Plan.
02/06/2019 -- View the utility company

Featured Links
Approved Connecticut State Water Plan
Special Download Instructions: Right-click one of the links below, and from the drop-down menu click "Save Link As" or "Save Target As" to save the file directly to your

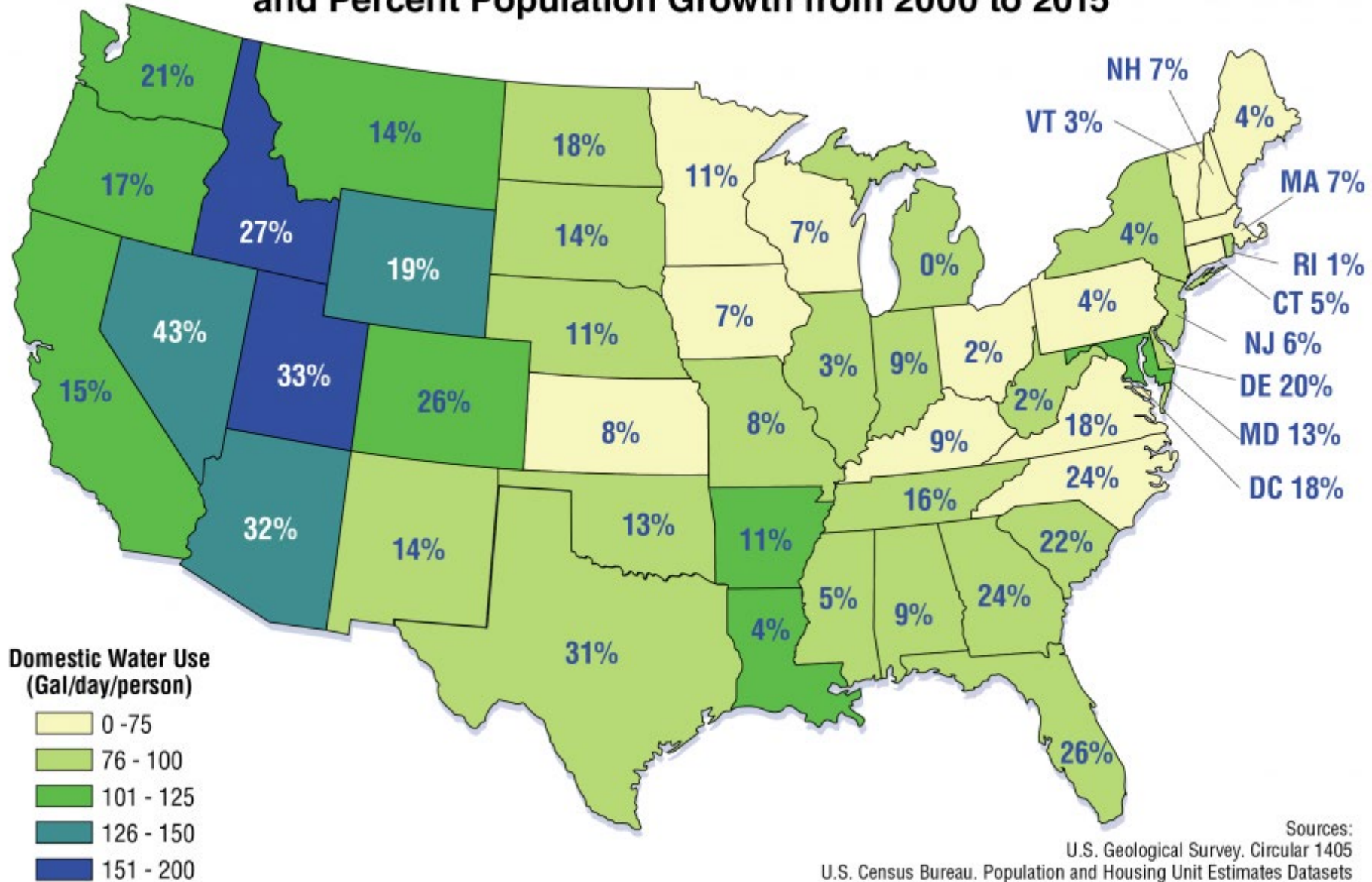
January Calendar
Receive Updates by e-mail @-ALERTS
REGISTER Online to VOTE
Regulations of CT State Agencies
Alert WE CAN'T ALERT YOU... IF WE CAN'T REACH YOU

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Domestic Water Use in Gallons per Day per Person and Percent Population Growth from 2000 to 2015



NET BLUE: SUPPORTING WATER-NEUTRAL GROWTH

- National model template ordinance that can be tailored to create a customized water demand offset strategy
- Worked with 7 partner cities across the country to develop approach
- Although applicable nationally, perfect for western water issues
- Voluntary adoption on a community or county basis
- Offsets can include outdoor as well as indoor conservation measures
- Rainwater harvesting is an offset option
- Stormwater capture is an offset option



NET BLUE: SUPPORTING WATER-NEUTRAL GROWTH

Free Toolkit available at

www.net-blue.org

Includes:

- Template customizable ordinance and user guide
- Offset methodology calculator and user guide
- Outreach materials



NET BLUE IN BOZEMAN, MONTANA

- AWE team got a grant to work on New Blue offset measures for adoption in Bozeman
- Bozeman City Commission adopted needed authority changes on August 3
- Amendments will be made to the City's Water Adequacy Manual to incorporate Net Blue provisions
- Virtual stakeholder meeting planned for Fall of 2020 to describe the results



STATE-LEVEL WATER UTILITY PLAN REVIEW

- Reviewing water requirements for utility plans for each of the 50 states
- Documenting state water plan contents for various water quantity related topics
- Searching for land use planning requirements/drivers in water plans
- Identifying exemplary models other states can follow
- Participating in regional workshops to assist in training when the final report is released
- Work is similar to AWE's Scorecard
- Partnering with Environmental Law Institute



BABBITT CENTER
FOR LAND AND WATER POLICY

A Center of the Lincoln Institute of Land Policy



**ENVIRONMENTAL
LAW • INSTITUTE®**

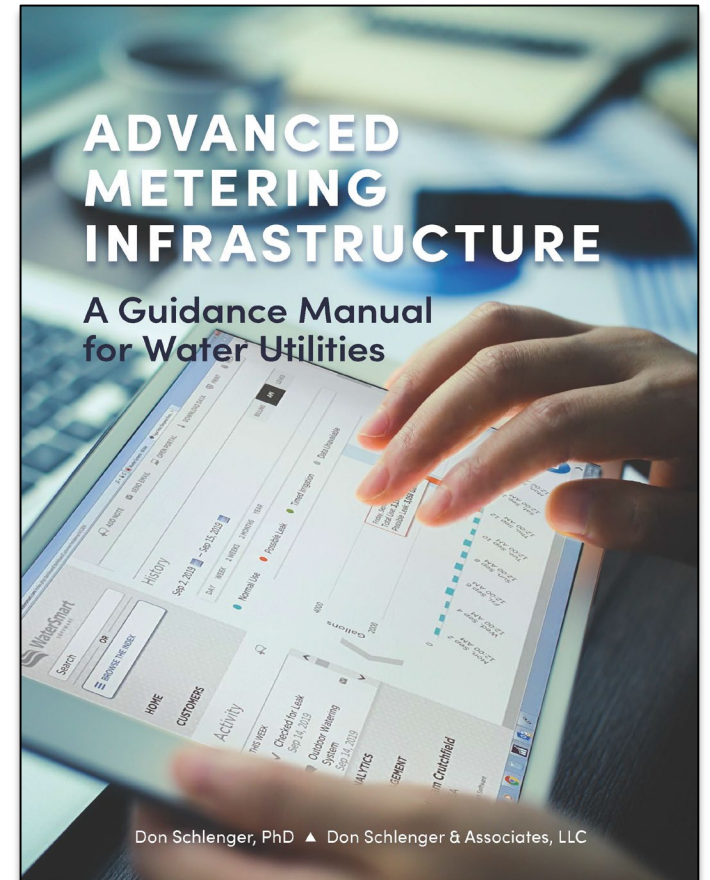
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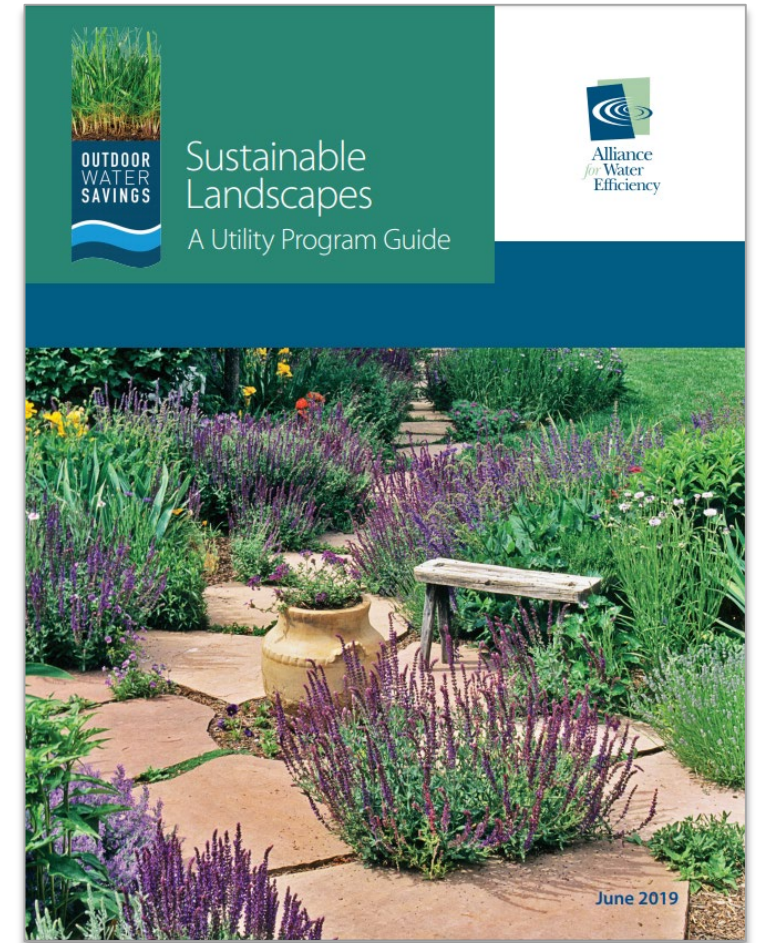
AMI GUIDANCE

- Don Schlenger, nationally recognized AMI consultant, is the project leader
- Prepared template AMI-AMR RFP, including needed interoperability guidelines
- The 100 page RFP available free of charge
- Manual of AMI Best Practice written by Don Schlenger and can be purchased from AWE
- Targeted technical assistance to participating utilities was provided during the project



SUSTAINABLE LANDSCAPES: A UTILITY PROGRAM GUIDE

- Landscape transformation study found that customers want help from their utilities, so this guide is targeted to utilities just getting started or those enhancing existing programs
- Organized into two sections:
 1. General considerations
 2. Considerations for specific types of outdoor landscape programs
- Features program examples with lessons learned



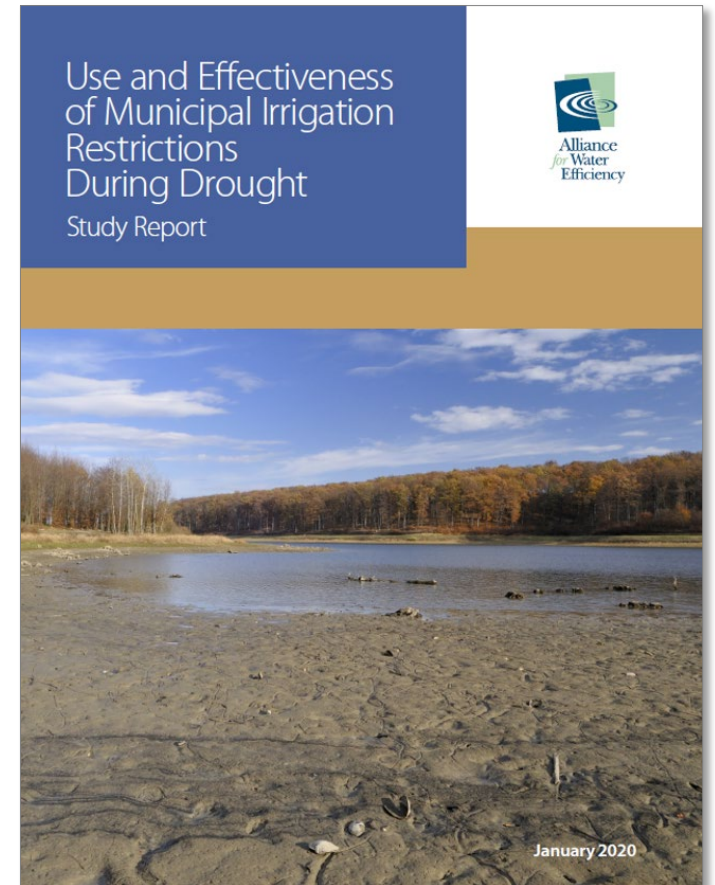
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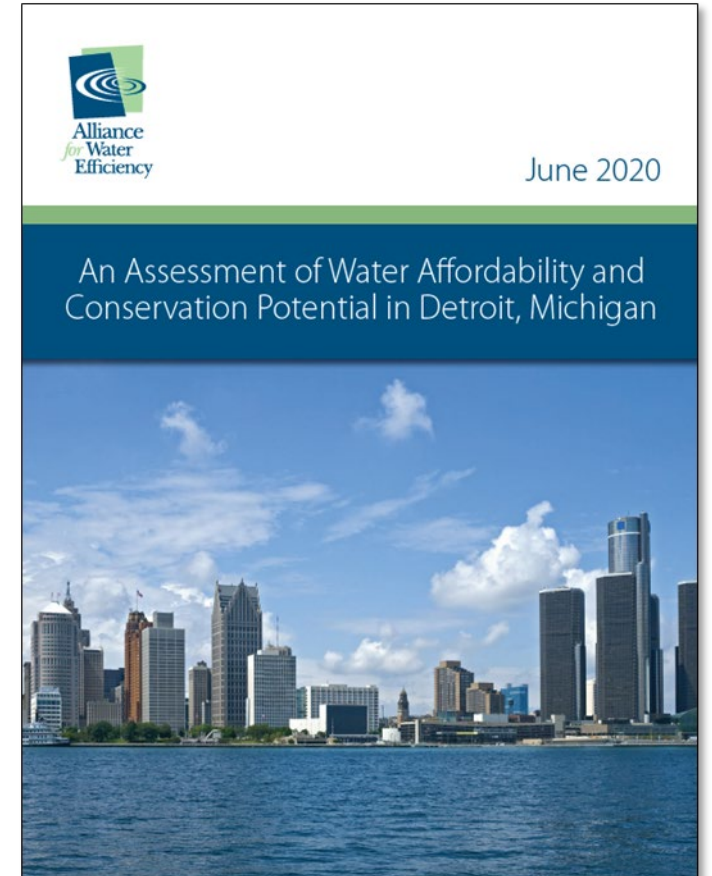
DROUGHT RESTRICTIONS STUDY

- Detailed study with 8 retail utilities and 7 regional utility organizations
- Case study participants successfully reduced annual demand by **18%-30%** and peak monthly demand by **20%-42%** through a combination of mandatory demand management measures.
- Executive Summary publicly available
- Detailed presentation by the study team on September 23 WSI Webinar



WATER AFFORDABILITY AND CONSERVATION POTENTIAL

- Water Affordability Assessment
 - Used relatively new indicators
 - Household Burden Indicator
 - Poverty Prevalence Indicator
- Conservation Potential Assessment
 - Used SF inefficient toilet stock estimates
- Assessments conducted for 291 census tracts using 2018 data
- Report released June 2020; Webinar July 2020



WATER AFFORDABILITY INDICATORS

- $$HBI = \frac{\text{Total Annual Basic Water Sector Household Cost}}{\text{Upper Boundary of the Lowest Quintile Income}}$$

- $$PPI = \frac{\text{Population Below 200\% of FPL}}{\text{Population for Whom Poverty Status is Determined}}$$

- Combination Descriptors

1. Low Burden
2. Moderate-Low Burden
3. Moderate-High Burden
4. High Burden
5. Very High Burden

| HBI: Water Costs as a Percent of Income at LQI | PPI: Percent of Households Below 200% of FPL | | |
|--|--|----------------------|----------------------|
| | ≥ 35% | 20 - 30% | < 20% |
| ≥ 10% | Very High Burden | High Burden | Moderate-High Burden |
| 7 - 10% | High Burden | Moderate-High Burden | Moderate-Low Burden |
| < 7% | Moderate-High Burden | Moderate-Low Burden | Low Burden |

REPORT HIGHLIGHTS

- **Affordability Assessment**

- HBI – 7.34 for city, tract range of 1.54 to 39.55
- PPI – 62.51 for city, tract range of 13.09 to 93.15
- Combination Descriptors – “high burden” overall but a range throughout the city (16 percent of tracts “very high burden”)



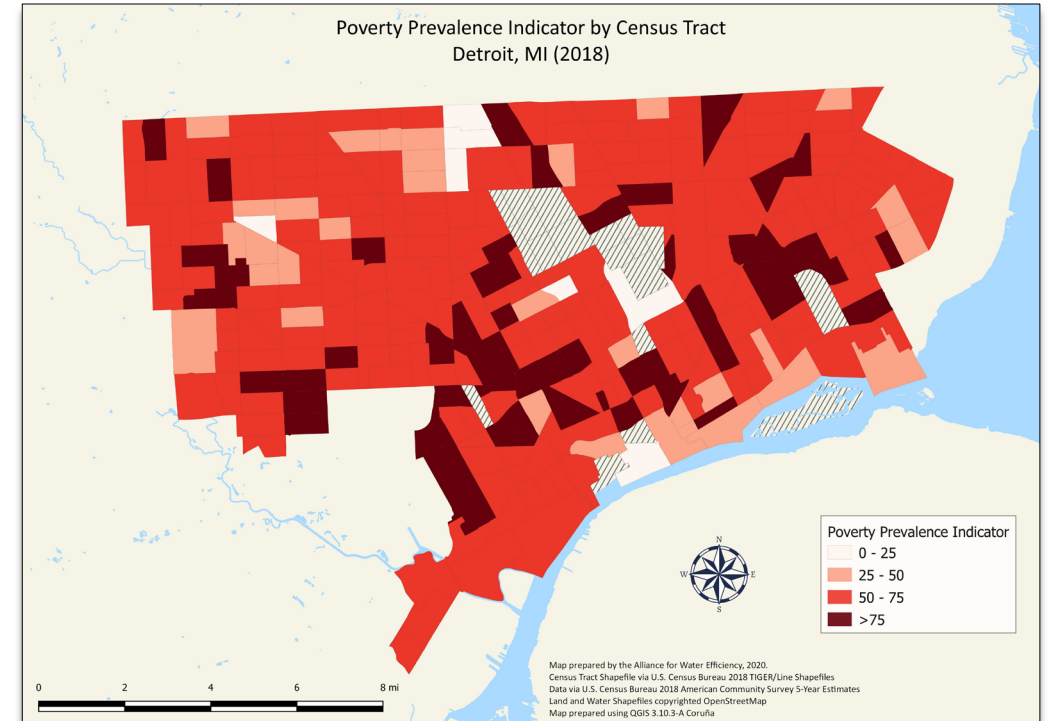
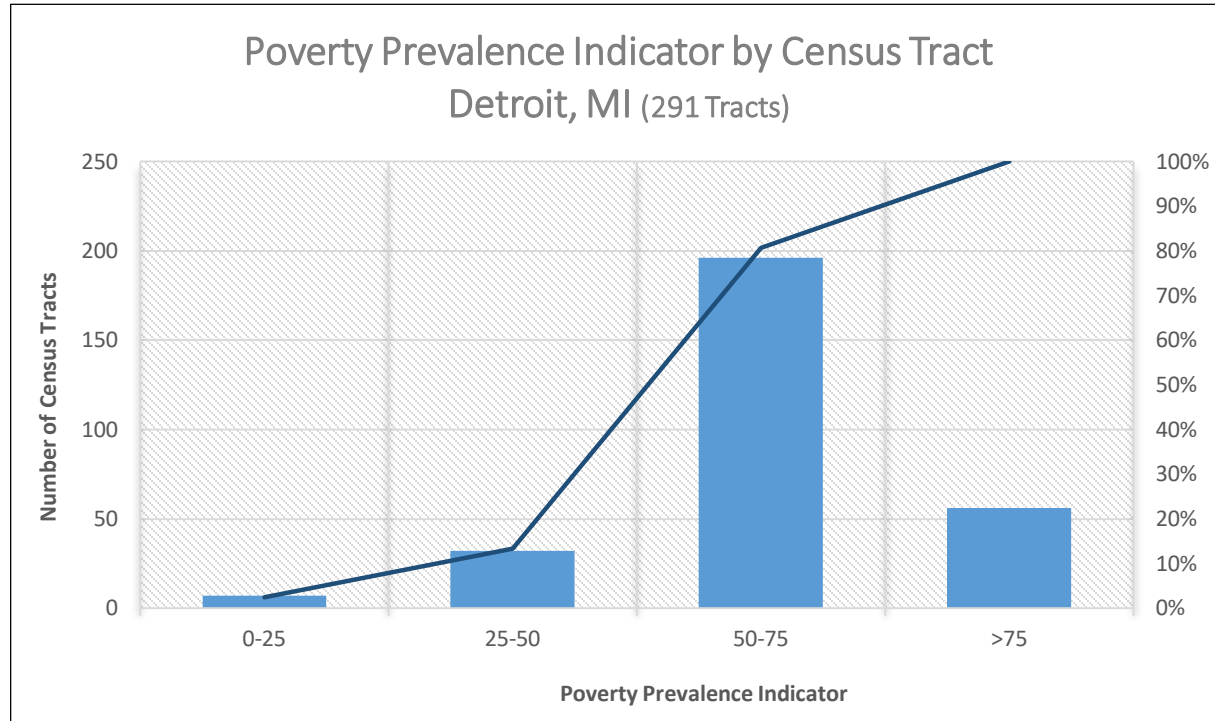
- **General Findings (2018 Census Data)**

- Poverty - 36 percent of the population of Detroit lives below federal poverty level. The U.S. rate is 14 percent.
- Poverty Age 65+ - 20 percent of the population age 65+ in Detroit lives below federal poverty level. The U.S. rate is 9 percent.

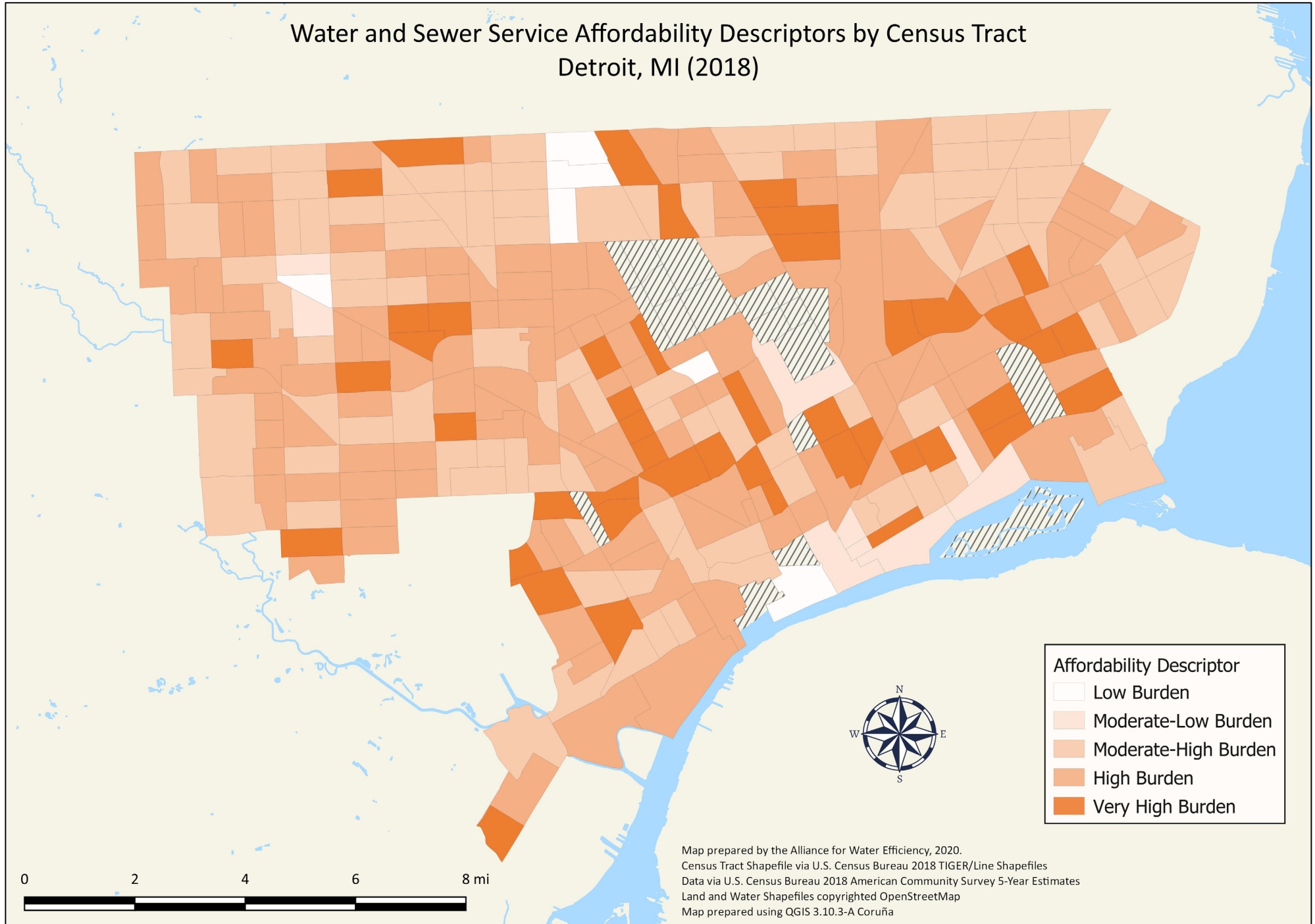
REPORT HIGHLIGHTS

- Inefficient Toilet Stock
 - About 118,000 single-family inefficient toilets estimated to remain
- Water Savings Potential
 - 1.17 BGY city, average tract potential 4 MGY
- Bill Impacts
 - Average bill reduction for customers that replace toilets of 13.67% (based on average SF indoor water use)

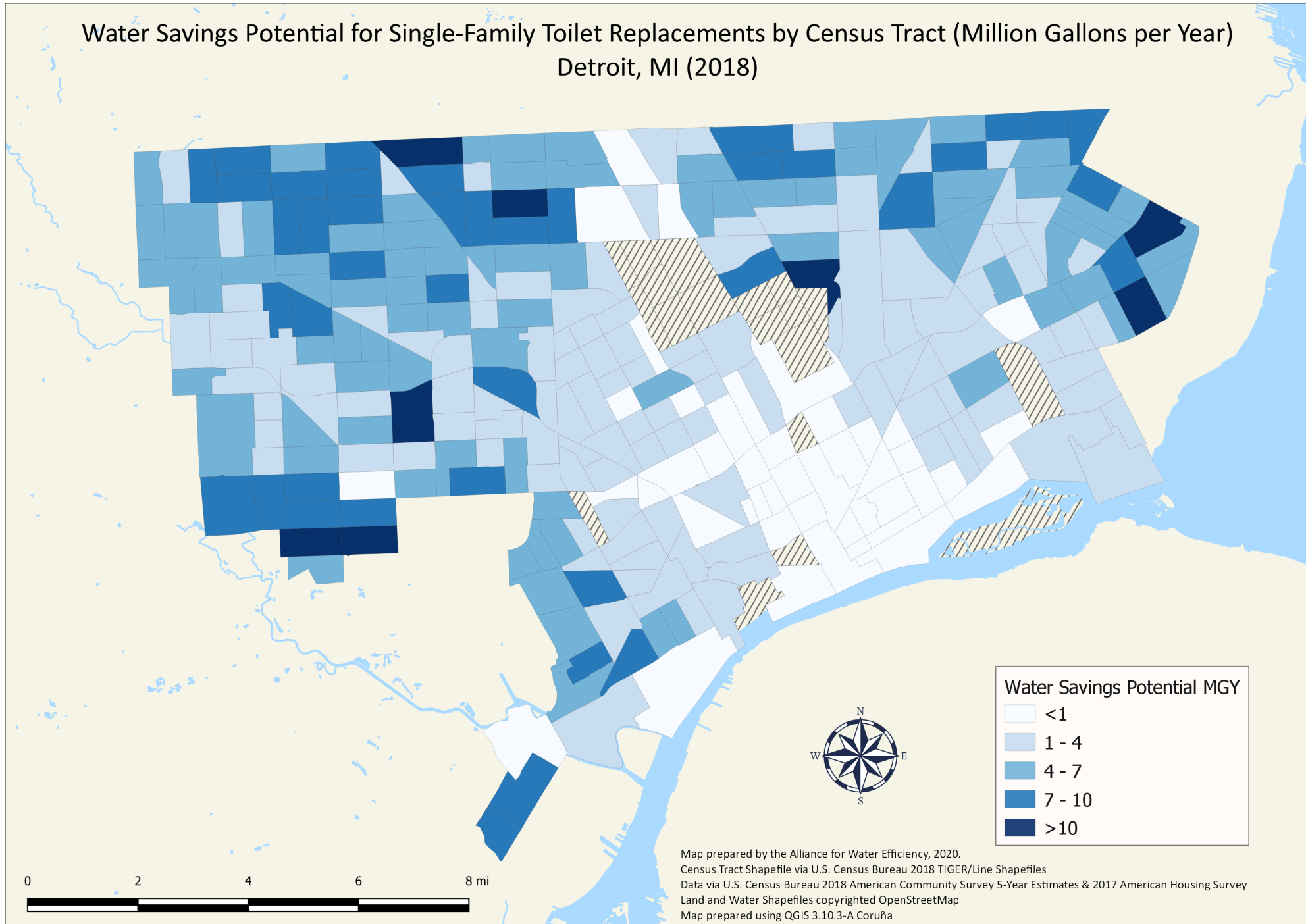
REPORT FEATURES: MATCHING HISTOGRAMS AND MAPS



Water and Sewer Service Affordability Descriptors by Census Tract Detroit, MI (2018)



Water Savings Potential for Single-Family Toilet Replacements by Census Tract (Million Gallons per Year) Detroit, MI (2018)



Map prepared by the Alliance for Water Efficiency, 2020.
Census Tract Shapefile via U.S. Census Bureau 2018 TIGER/Line Shapefiles
Data via U.S. Census Bureau 2018 American Community Survey 5-Year Estimates & 2017 American Housing Survey
Land and Water Shapefiles copyrighted OpenStreetMap
Map prepared using QGIS 3.10.3-A Coruña

KEY FINDINGS AND MESSAGES

1. The results demonstrate a clear need for assistance
2. The results demonstrate clear water conservation savings potential
3. Water conservation can play an important and meaningful role in lowering bills
4. The cost of water in Detroit is below average compared to other large cities in the U.S. (not part of this project but reference for context)

Report posted at:

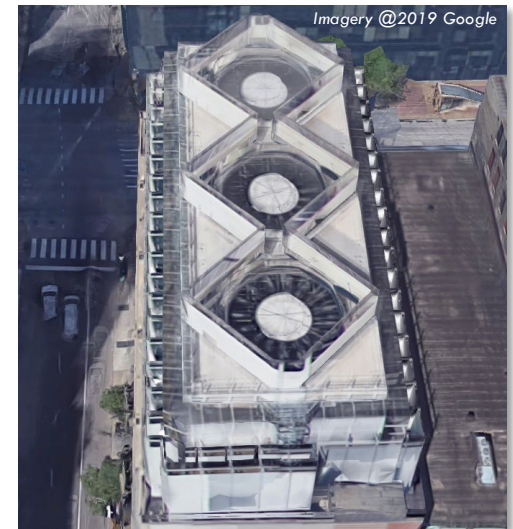
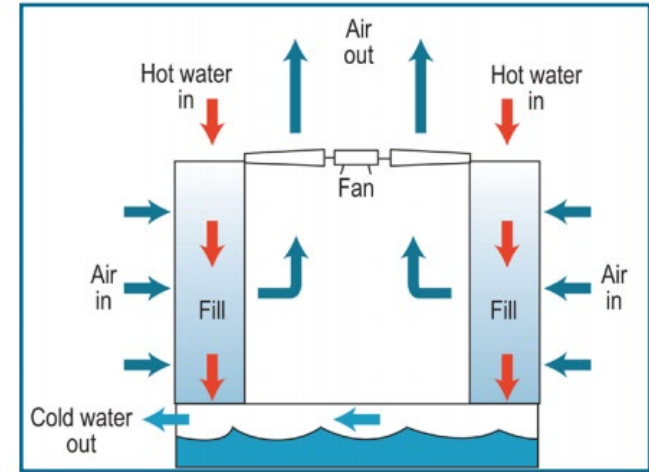
<https://www.allianceforwaterefficiency.org/news/alliance-water-efficiency-releases-water-affordability-and-water-conservation-assessment>

An aerial, top-down view of a dense urban area, likely New York City, showing a variety of skyscrapers and buildings. A semi-transparent teal rectangular box is centered over the image, containing white text. The text is a quote about water efficiency programs.

“Advance the adoption of high-quality, cost-effective efficiency programs targeting indoor and outdoor water use in commercial and industrial sectors.”

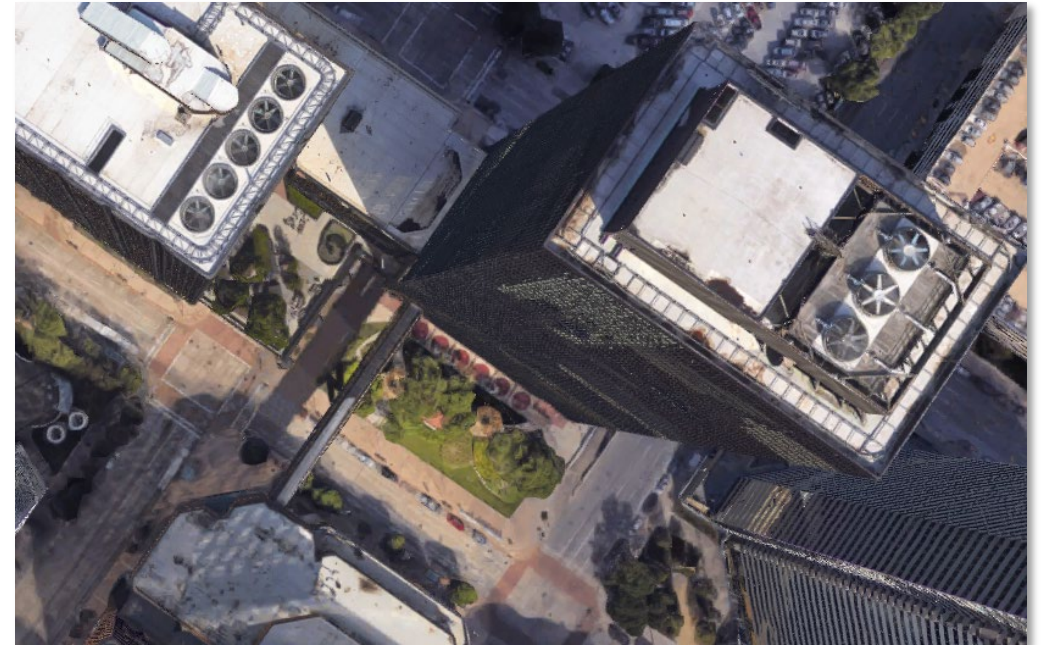
WHAT IS A COOLING TOWER?

- Key component of cooling systems
- Cooling towers recirculate water to remove heat from air conditioning equipment in buildings
- Heat is rejected from the building via evaporation into the atmosphere
- Also used for cooling related to various industrial processes



COOLING TOWER WATER USE EFFICIENCY EXAMPLES

- Energy Efficiency (reduce the need for cooling)
- Metering
- Optimize Cycles of Concentration to Reduce Blowdown
 - Conductivity Controller
 - Water Treatment
- Alternative Cooling Technologies
- Alternative Water Sources



PROJECT GOALS

1. Develop best practices for **identifying water-cooled facilities** in urban areas.
2. Develop best practices for **estimating consumptive and non-consumptive water demands** for cooling.
3. Determine the **conservation potential for various improvements** to traditional cooling technologies such as cooling towers.
4. Determine the conservation potential of **alternative cooling technologies**.
5. Develop practical guides, incorporating study results, to increase the effectiveness of cooling WUE incentive and outreach programs.



Pacific Northwest
NATIONAL LABORATORY



1. Metropolitan Water District of Southern California, California, United States
2. Southern Nevada Water Authority, Nevada, United States
3. San Antonio Water System, Texas, United States
4. California Water Service, California, United States
5. City of Guelph, Ontario, Canada
6. Denver Water, Colorado, United States
7. Austin Water, Texas, United States
8. City of Dallas, Texas, United States
9. City of Tucson, Arizona, United States
10. City of Santa Fe, New Mexico, United States
11. Santa Clara Valley Water District, California, United States
12. City of Calgary, Alberta, Canada
13. East Bay Municipal Utility District, California, United States
14. SCV Water, California, United States
15. Western Municipal Water District, California, United States
16. Municipal Water District of Orange County, California, United States
17. Los Angeles Department of Water and Power, California
18. Commonwealth Edison, Illinois, United States



RESOURCES AND TOOLS

Best Practices for Identifying Cooling Towers in Urban Areas

- **Guidebook**
 - Steps and methods for building a cooling tower inventory
- **Excel-Based Cooling Tower Estimating Model (CTEM)**
 - Number of cooling towers and tonnage
 - Pre-populated with industrial/institutional buildings likely to have cooling towers
 - Module to for estimating cooling tower systems water use and conservation potential
- **Evaluation of multiple commercially available alternative cooling technologies**
- **Guides and outreach materials**

WHY IS THIS PROJECT IMPORTANT?

- Cooling towers are unfamiliar to most people
- Difficult to understand the scope of cooling towers in a water or energy provider service area
 - How many?
 - Cooling load?
 - Water use?
 - Where are they located?
- Difficult to design effective efficiency programs
- Lack of resources and tools
- A huge opportunity for water and energy savings

Enter Location and Water Quality Inputs

Estimate Results and
Populate Inventory

Select Country:

Select State:

Select County:

Population in County (2018):

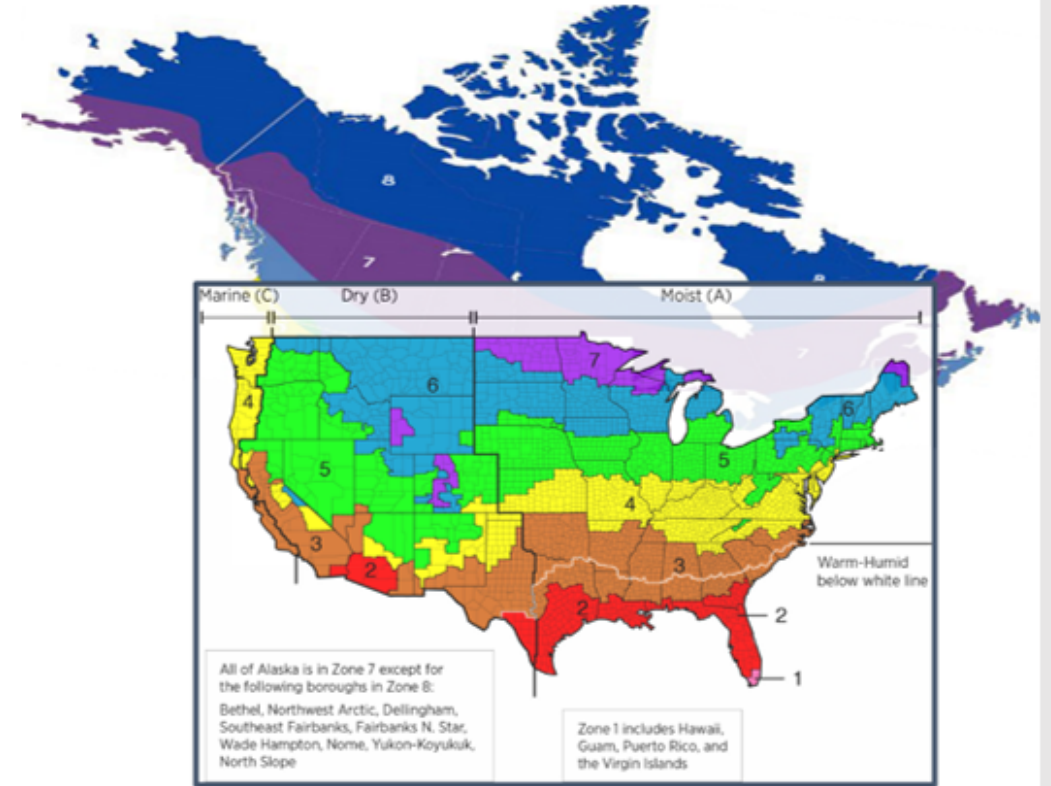
Enter Population Served:

(This input will scale the results to the service population)

IECC Climate Zone:

Select Water Quality Measurement Type:
(TDS or Conductivity)

Enter Water Quality:





CTEM Results Estimates

V2.0



Base Input Results Estimates

CTEM Results Estimates

Duty Factor:
(% annual utilization)

8.8%

Estimate Results

Clear Results
(Cannot Undo)

All results are estimates and based on North American dataset averages and statistical correlations.

| | Large-Scale Facilities | Commercial Facilities | Total Service Area | | |
|--------------------------------------|------------------------|-----------------------|--------------------|---------------|------------------|
| # of Facilities | 131 | 1,001 | 1,132 | | |
| # of Cooling Towers | 1,118 | 2,248 | 3,366 | | |
| Cooling Capacity, tons | 366,718 | 737,122 | 1,103,840 | | |
| Annual Cooling Load, tons/year | 282,542,079 | 567,923,969 | 850,466,048 | Range | Acre-feet/year ↓ |
| Consumptive Water Use, Mgal/year | 463 | 978 | 1,441 | 1,398 - 1,531 | 4,422 |
| Non-Consumptive Water Use, Mgal/year | 307 | 599 | 906 | 856 - 937 | 2,780 |
| Total Water Use, Mgal/year | 770 | 1,577 | 2,347 | 2,254 - 2,468 | 7,202 |

*This data is for Cook, IL compiled 8/31/2020 2:55:15 PM

Water Conservation Opportunity Estimates From Base Inputs

CTEM Results Estimates

Conservation Opportunity Estimates:

From Potential Increased Cycles of Concentration (CoC)

Cycles of Concentration (CoC)

Baseline

↓ Adjustable ↓

3.7

450 TDS, 900 EC

Potential

4.7

Non-Consumptive Water Use

Mgal/year (baseline)

529

Mgal/year (potential)

387

Savings Potential

Mgal/year

142

% Savings

27%

A SINGULAR VOICE AND A PLATFORM FOR
WATER USE EFFICIENCY AND WATER CONSERVATION,
BRINGING A CRITICAL PERSPECTIVE TO AN INCREASINGLY
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