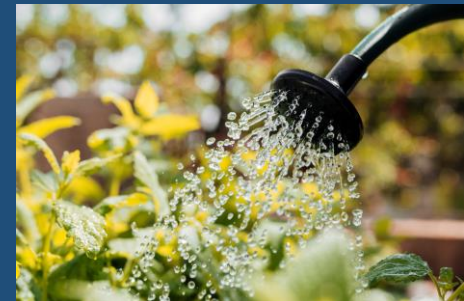
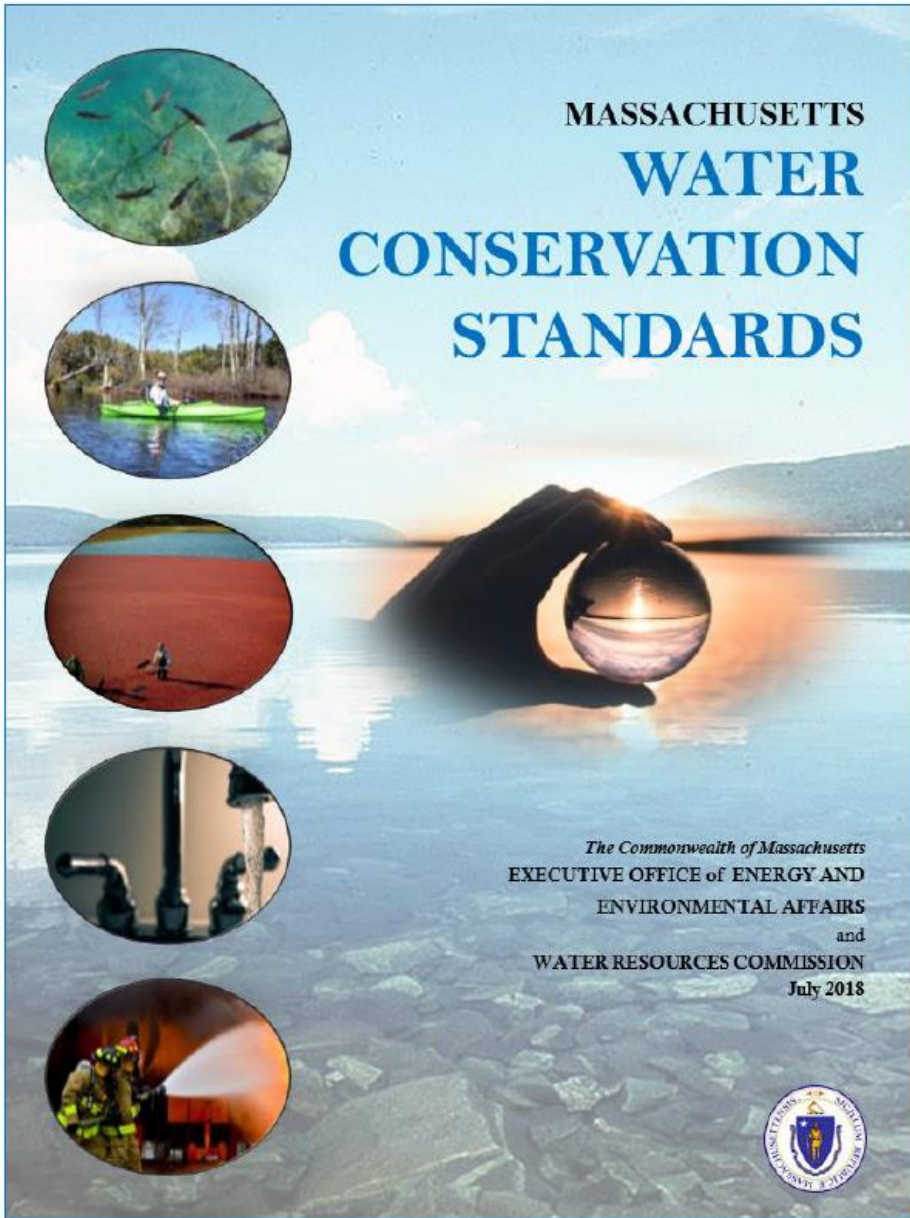


VANDANA RAO  
Director of Water  
Policy  
Executive Office  
of Energy and  
Environmental  
Affairs

# WATER CONSERVATION

## ICI & Public Sector





# SECTORS



Residential



Public Sector



Industrial Commercial  
Institutional



Agricultural



Public Education

# In Addition.....



**Water Loss  
Control**



**Metering**



**Pricing**

**Outdoor  
Water**



**Comprehensive  
Planning &  
Drought  
Management**





# PUBLIC SECTOR & ICI Apply to...

INDUSTRIAL  
Facilities

PRIVATE  
SECTOR &  
NONPROFIT  
Entities

STATE  
Facilities, Policy  
& Regulatory  
Entities

COMMERCIAL  
Facilities

INSTITUTIONAL  
Facilities

MUNICIPAL  
Bodies,  
Boards/Depts,  
Facilities &  
Public Works

Office Parks &  
Buildings

# ICI STANDARDS



6

GOLF & COMMERCIAL  
Entities enhance Water  
Efficiency

5

Practice WATER-SAVING  
LAWN & LANDSCAPING  
Techniques



4

Use best available  
WATER SAVINGS  
TECHNOLOGY in  
Buildings

4

REUSE Treated  
WASTEWATER

• Do a **WATER AUDIT & use findings to help:**

1

- Reuse and recycle cooling waters,
- Reuse process waters
- Use non-potable water
- Replace water cooling with air cooling
- Install efficient sanitary water devices
- Water efficient landscaping

2

Install SEPARATE METERS  
for Process Water

3

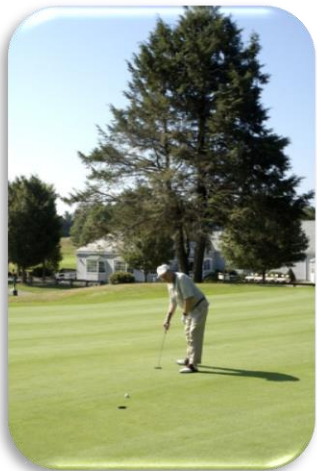
Implement a  
WATER SAVINGS  
STRATEGY



# PUBLIC SECTOR STANDARDS

2

METER or Estimate Contractor use of water from hydrants



1

For Buildings, Facilities & Grounds:

- Conduct Indoor & Outdoor WATER AUDITS based on full metering & use
- Analyze water data for trends, patterns, unusual increases/leaks
- In new buildings, install water-reducing equipment
- In existing buildings, replace/retrofit equipment
- Practice efficient lawn and landscape water use



3

Strictly Apply Plumbing Codes



# RECOMMENDATIONS

- Create demonstration sites
- Office of Technical Assistance inform and assist companies and large users
- Install and retrofit water-saving sanitary devices
- Work with code officials, state programs, manufacturers, legislators to promote water conservation
- Increase amount of pervious areas on property





# Implementation & Case Studies





## Water Conservation Implementation

# “LEADING BY EXAMPLE”

- State Program housed at DOER (Dept of Energy Resources)
- Works with agencies, authorities, and public colleges and universities to develop strategies and programs to support clean energy and sustainability efforts across state government.
- **NEW!** **Executive Order 594** recently signed by Governor Baker

*“Agencies shall implement efforts to reduce water consumption by following the recommended best practices in the Massachusetts Water Conservation Standards and any future updates.”*

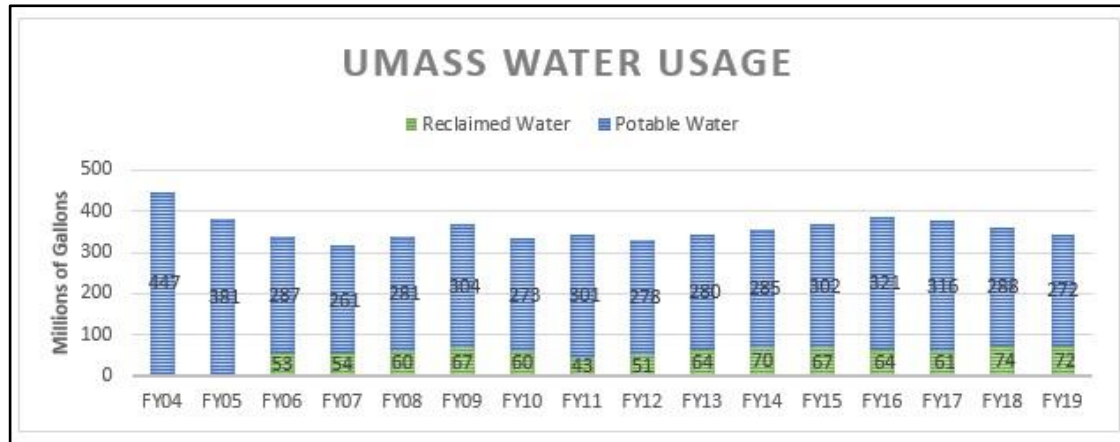
# Some Example Institutions

Facility	2013	2014	2015	2016	2017	2018	2019	% change
Fitchburg State University	33,432,000	29,689,500	28,621,500	32,001,750	33,650,250	31,810,030	30,823,353	-8%
Mass. Bay Comm. College	3,183,709	3,723,803	3,218,119	3,758,213	3,165,756	4,309,527	3,003,429	-6%
Mass. College of Liberal Arts	9,668,596	9,209,188	9,973,536	9,149,022	9,296,623	8,503,579	8,298,394	-14%
North Shore Comm. College	7,981,479	11,095,819	7,429,381	8,526,783	6,314,306	6,541,260	6,132,104	-23%
Salem State University		29,071,781	27,696,925	26,144,983	23,200,779	22,754,663	25,912,445	-11%
Westfield State University		34,678,138	36,673,312	41,118,700	39,617,030	32,617,400	27,889,130	-20%

# University of Massachusetts Amherst

## Use of Reclaimed Water

- Permitted for Boiler Water Makeup, Cooling Towers, Irrigation and Street Sweeping
- Current system can manufacture maximum of 172,800 gallons per day



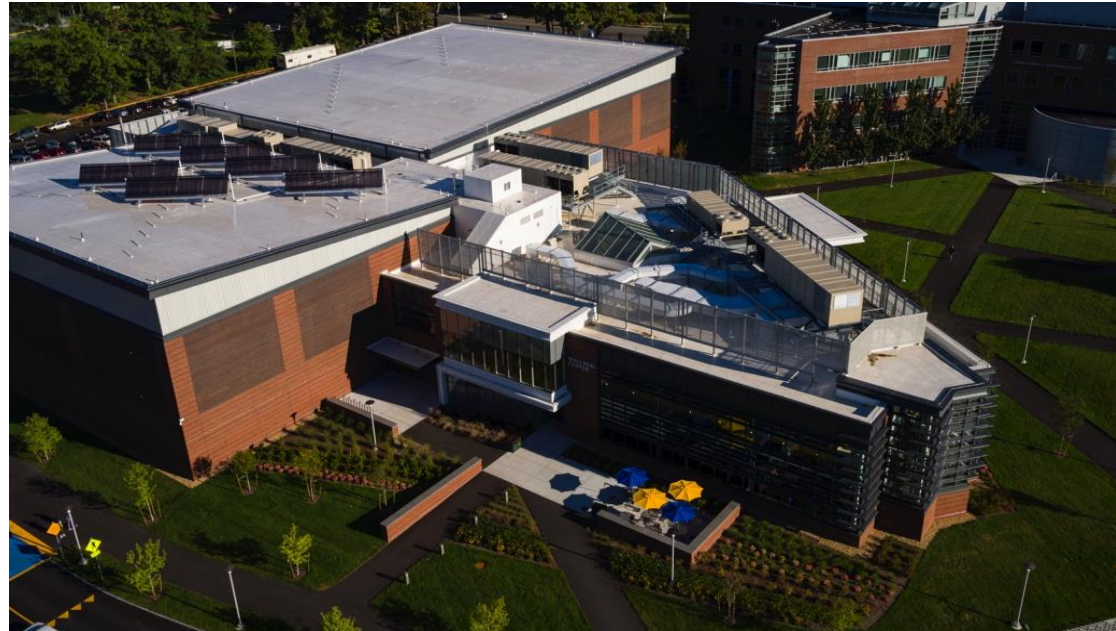
## Cooling Tower Usage

- Reclaimed Water is used on one (Honors College) of the 24 comfort cooling towers on campus. Saves 1.2 million gallons per year (MGPY) of potable water
- The Central Heating Plant operates two process cooling towers requiring 11 MGPY of water. During Class A water production, 7 million gallons of that is reclaimed water.



# Worcester State University

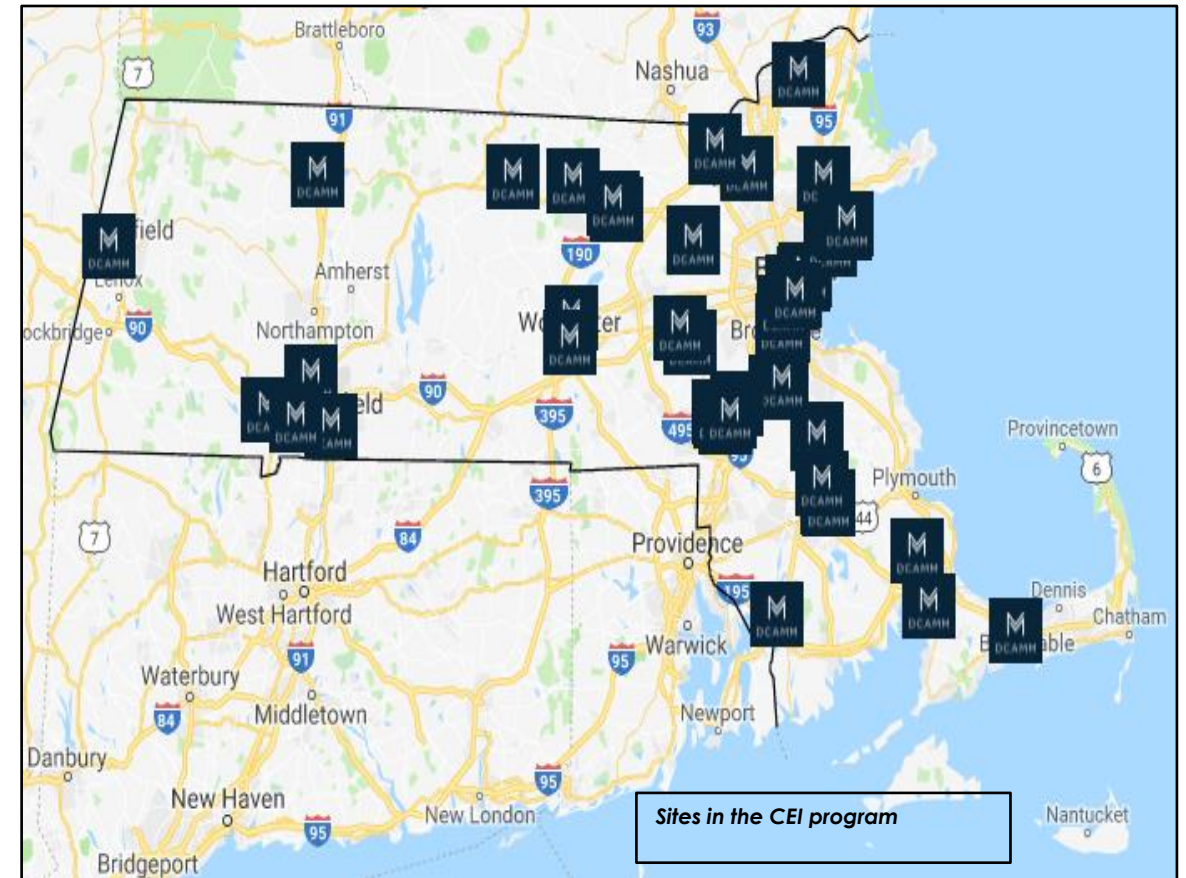
- Rainwater harvesting for irrigation from roof and stored in a 20,000 gallon underground tank
- Installed
  - Low flow faucets and shower heads
  - Low flow sprayers for food service
  - Dual flush toilets
  - Ultra low flow urinals



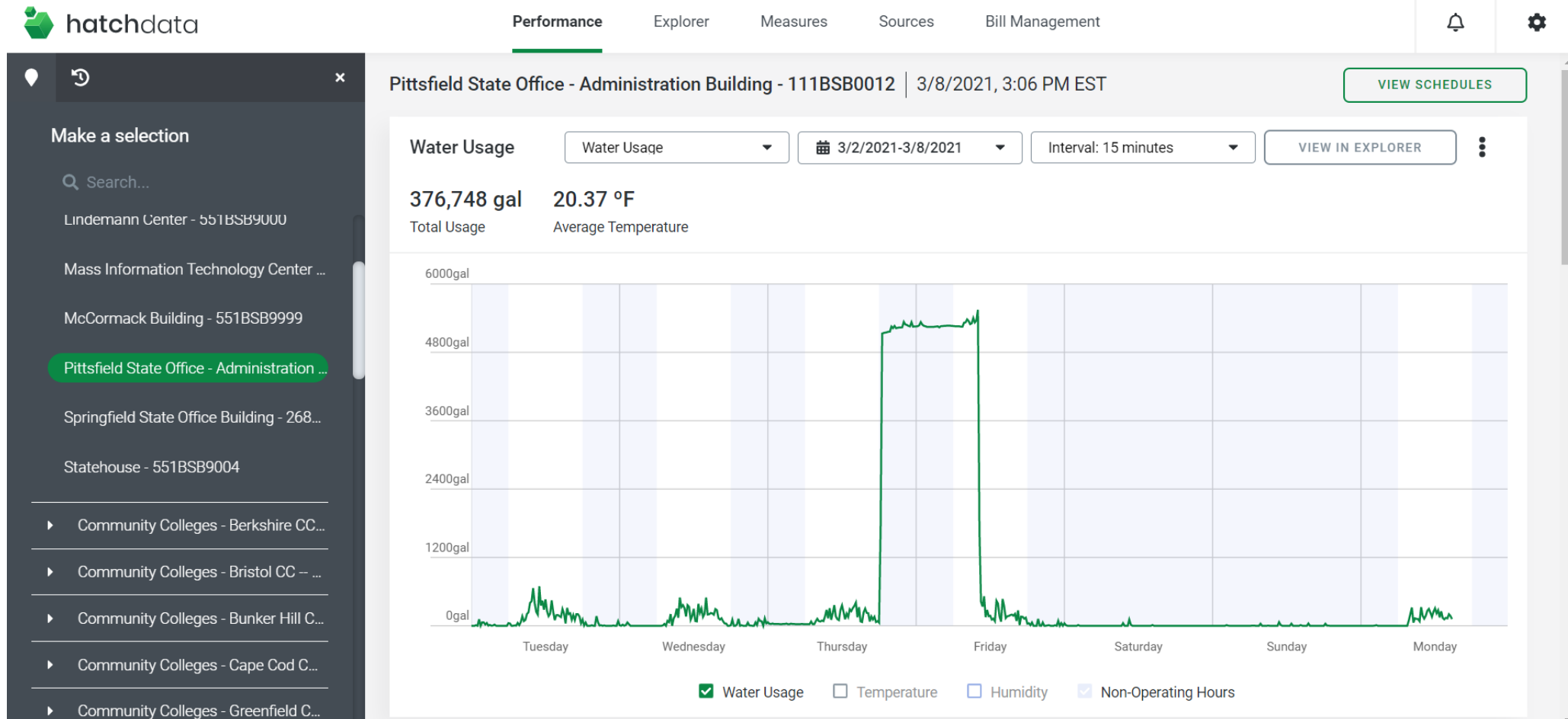
# DCAMM

(Division of Capital Asset Management & Maintenance)

- Commonwealth Energy Intelligence Program in 2016
- All information is brought into 1 platform, 1,147 meters and ~500 utility accounts tracking and recording data for:
  - electricity
  - natural gas
  - steam
  - hot and chilled water
  - oil
  - water
- Over 60 sites
- ~32 million square feet
- Major Commonwealth Buildings Including:
  - state hospitals
  - prisons
  - colleges and universities
  - trial courts
  - office buildings
- Managed by DCAMM

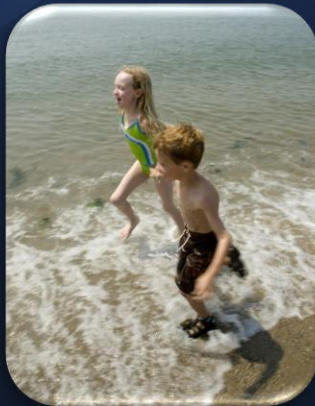


# Water Usage Data





# Department of Conservation and Recreation



- Is part of the DCAMM Accelerated Energy Program/ Utility Vendor Program; audits are conducted at each site
- WRC staff worked closely with DCR and advocated for:
  - Inclusion of “water use and conservation” within AEP.
  - Developed water conservation guidelines for AEP via interviews with plumbers, operation staff and various industry standards.
  - Provided guidelines on how to read water bills, conduct audits and gather information. Based on walk-throughs at pilot sites.
  - Identified appropriate products to use, mainly WaterSense-labeled products.
  - Conducted field inspections.
- Have upgraded Faucet Aerators, High-efficiency Toilets, High-efficiency Urinals, Low-Flow Showerheads

# Working with OTA at EOEEA (Office of Technical Assistance)



- Put together a ‘water conservation as part of resource conservation planning’ panel at the TUR (Toxics Use Reduction) Continuing Education Conference in Fall
- Encourage water conservation as part of TUR Resource Conservation planning option for companies subject to TURA
  - The TURA Program is actively trying to get businesses to participate in Resource Conservation planning
- Revisit and refine the water conservation related matters that OTA staff typically provide technical assistance on. OTA can help do outreach to industries by:
  - Targeting outreach to industries in drought risk areas
  - Asking staff which industries are heavy water users
  - Working with WWTF

INDUSTRIAL

**NEW!**

# “CLIMATE BILL – S9”

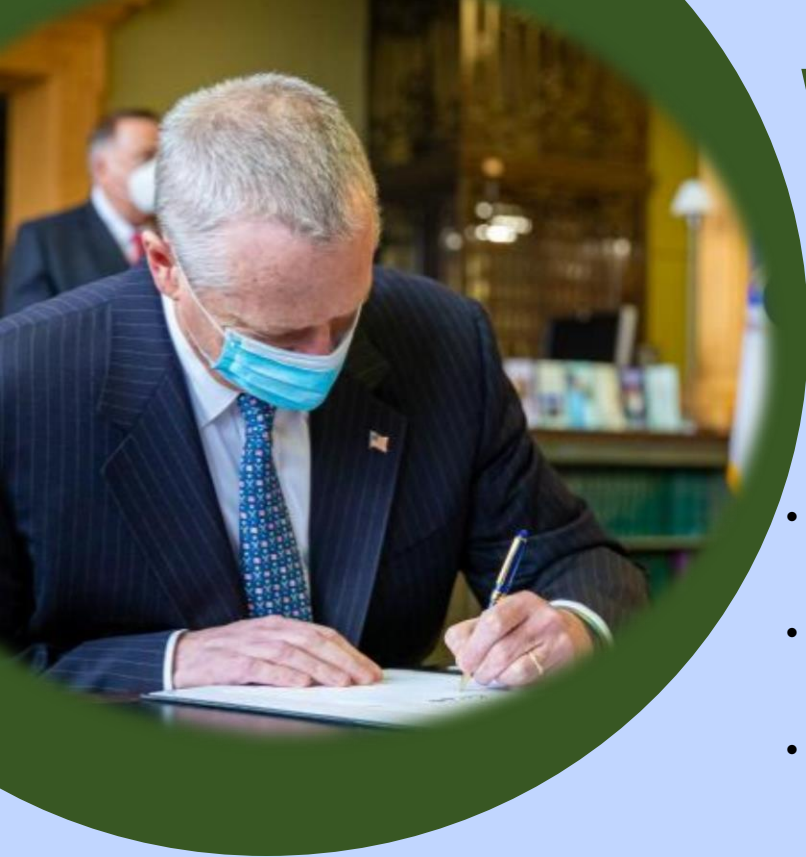
## An Act creating a next-generation roadmap for Massachusetts climate policy



- On March 26, 2021, Governor Baker signed Climate Legislation to Reduce Greenhouse Gas Emissions, Protect Environmental Justice Communities
- Changes Efficiency Standards for Plumbing fixtures
- NEW energy-efficiency requirements for commercial kitchen equipment, plumbing, and consumer appliances including faucets, residential ventilating fans, portable electric spas, showerheads, toilets, and water coolers.

*“No new, commercial dishwasher,..... commercial steam cooker, ..... faucet,..... showerhead, spray sprinkler body, urinal, water closet or water cooler shall be sold or offered for sale, lease or rent in the commonwealth unless the efficiency of the new product meets or exceeds the efficiency standards set forth in the regulations adopted pursuant to this section..”*





## Water Conservation Implementation



# “CLIMATE BILL – S9”

- The flow rate of lavatory faucets and replacement aerators shall not be greater than 1.5 gallons per minute (gpm) at 60 pounds per square inch (psi).
- For sprayheads with independently controlled orifices and manual controls, the maximum flow rate of each orifice that manually turns on or off shall not exceed the maximum flow rate for a lavatory faucet.
- The flow rate of residential kitchen faucets and replacement aerators shall not be greater than 1.8 gpm with optional temporary flow of 2.2 gpm at 60 psi.
- The flow rate of public lavatory faucets and replacement aerators shall not be greater than 0.5 gpm at 60 psi.
- The flow rate of showerheads shall not be greater than 2.0 gpm at 80 psi.
- Urinals shall have a maximum flush volume of 0.5 gallons per flush (gpf).
- Water closets, except for dual-flush tank-type water closets, shall have a maximum flush volume of 1.28 gpf.
- Dual-flush tank-type water closets shall have a maximum effective flush volume of 1.28 gpf.
- Commercial dishwashers included in the scope of the ENERGY STAR Product Specification for Commercial Dishwashers, Version 2.0, shall meet the qualification criteria of that specification.

# RESOURCES



- State Water Conservation Website: [www.mass.gov/conservemawater](http://www.mass.gov/conservemawater)
- WaterSense Water Efficiency Standards: [www.epa.gov/watersense](http://www.epa.gov/watersense)
- Institutional facilities managers should consult “WaterSense at Work” which describes BMPs on water & energy efficiency
- For facilities with automatic irrigation systems, WaterSense labels professional certification programs for irrigation auditors, irrigation designers, and irrigation installation and maintenance professionals.
- New state law (MGL c. 21 s. 67) requires system interruption devices be installed “for newly installed or renovated irrigation systems”
- Water Resources Commission staff in DCR’s Office of Water Resources available to provide guidance

# Thank you!

**VANDANA RAO**

**Email: [vandana.rao@mass.gov](mailto:vandana.rao@mass.gov)**

**Website: [www.mass.gov/eea](http://www.mass.gov/eea)**

**[www.mass.gov/conservemawater](http://www.mass.gov/conservemawater)**

**[www.mass.gov/drought-management](http://www.mass.gov/drought-management)**

