Water Conservation in FSM

Rebecca Johnson, Eileen Kearney, Jocelyn Toscano-Contreras

Introduction to Water Conservation

What is Water Conservation? Why is it Important?

- Efficient use of water to reduce consumption and waste
- Reduce water consumption means to
  - Reduce cost from water usage
  - Reduced impact on environment
  - Run a more efficient Establishment
- Important Because:
  - High cost
    - Water Losses Cost U.S. Utilities US$6.4 Billion Annually (Bluefield Research. (2025, July 16).)
  - Harms environment

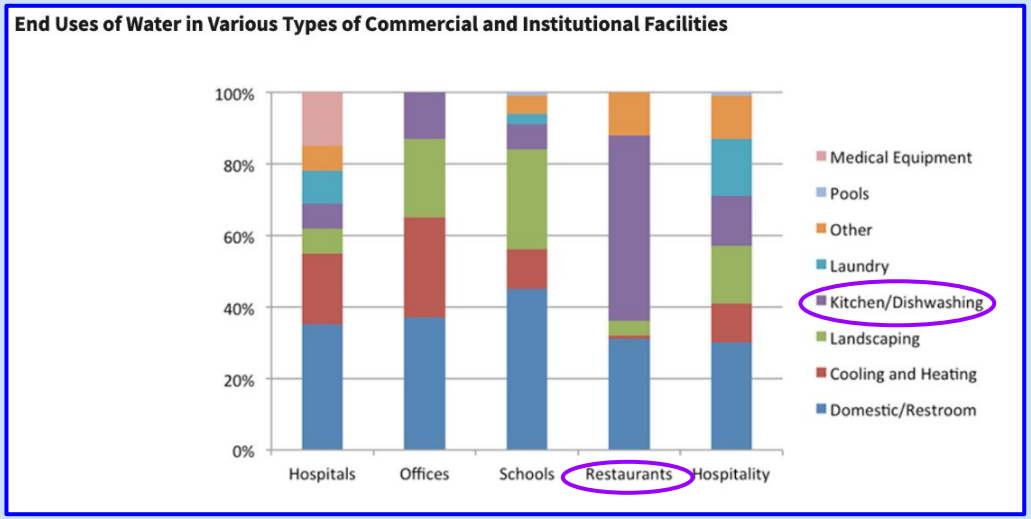
Terms & Definitions

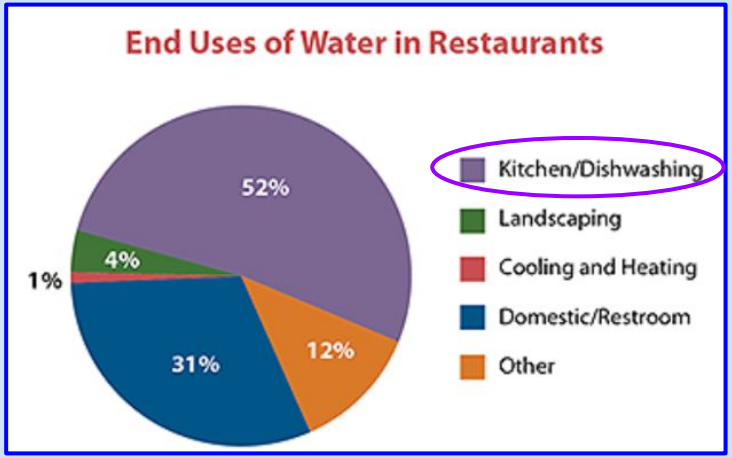
- Industrial Water
  - Industrial applications: heating, cooling, or lubricating equipment.
- Portable Water
  - Water that meets state water quality standards for human consumption.
- Sustainability Tracking, Assessment and Rating System (STARS):
  - Self reporting framework for colleges/universities to measure sustainability performance. Uses a common set of measurements that enables meaningful comparisons over time and across institutions.
- Sustainable Water Systems:
  - Maximize water use conservation or efficiency, optimize water resource management, protect resources in the context of the local watershed, and enhance economic, social, and environmental sustainability while meeting operational objectives.

Terms & Definitions

- Wastewater:
  - Water that is discharged from domestic, industrial, or other use.
- Water systems:
  - Natural and/or human-made systems that provide water to and support the functions of watersheds and/or human communities.

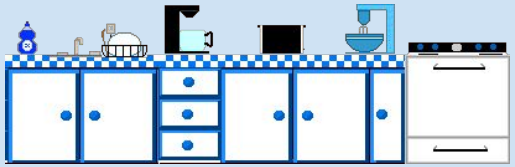
Water Use:

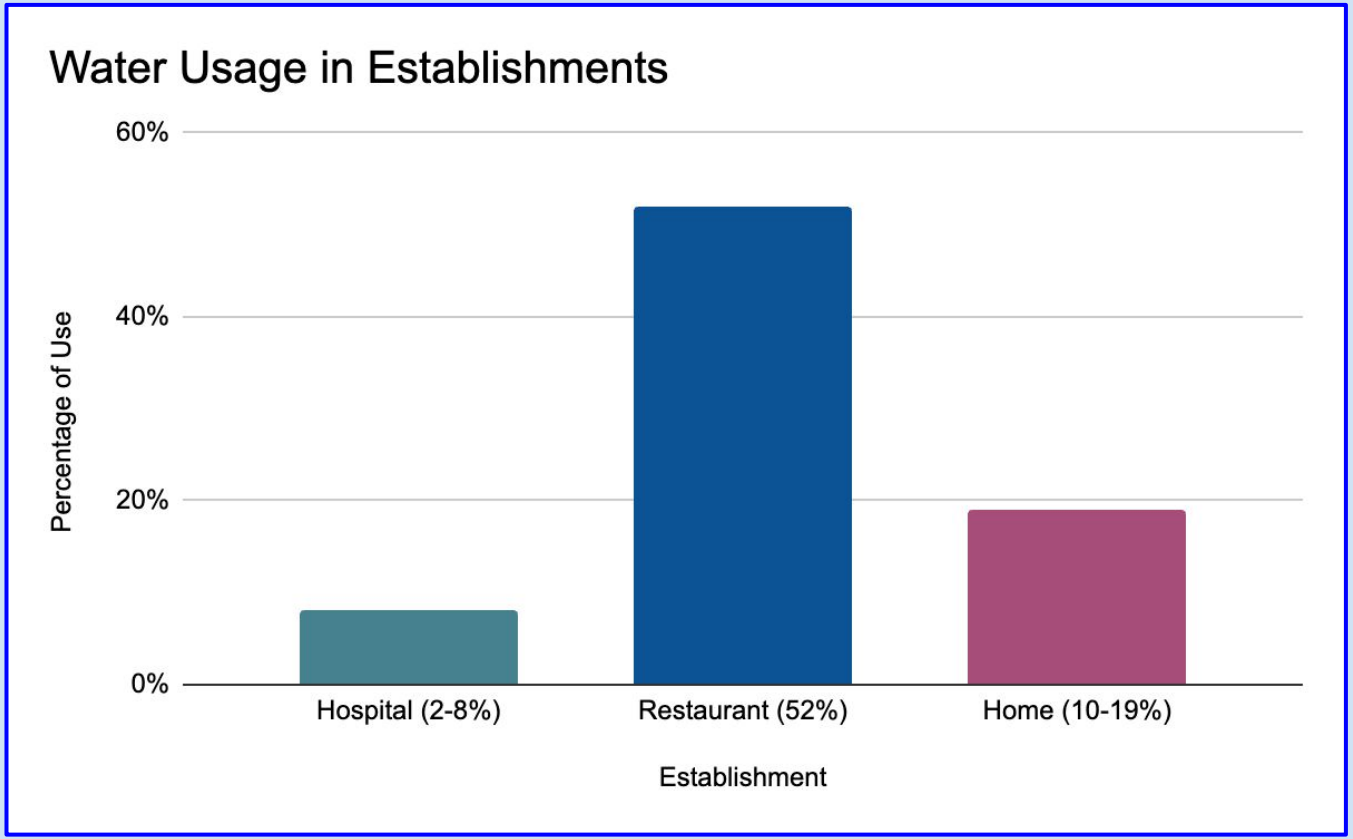




Environmental Protection Agency.

Kitchen Water Usage





Gierran, R. (2025, October 16).

Restaurant Water Usage

- Restaurants account for **15%** of all water use in US commercial institutional buildings
- Kitchens account for **52%** of water use
- 5,800 gallons/day for average US restaurant, 2.1 million gallons/year (Gierran, R. (2025, October 16).)

Ways Water Gets Wasted In Kitchens:

- Faucet leak
  - One drip/sec wastes over 3,000 gallons/year
- Older equipment
  - water-cooled ice machines→130-180 gallons/100 pounds of ice wasted (Gierran, R. (2025, October 16).)
    - That's 219,000 gal/year
- Using high flow pre-rinse valves
- Not utilizing load sensors
- Running dishwashers when not full

Current Strategies

Overview of Current Strategies to Conserving Water

1. Quantify the current water consumption
2. Water monitoring
3. Sanitary and equipment fixtures/swaps
4. Cleaning methods
5. Mechanical Systems

https://freesvg.org/save-water

Current Strategies to Conserving Water

1. *Quantifying Water Consumption*

Pros:

- Seeing how much water is consumed and if data aligns with target goals

Cons:

- Initial investment to quantify data
- Ongoing maintenance

2. *Water Monitoring*

Pros:

- Identify sources of major water loss
  - Leaks, broken/malfunctioning equipment, high flow valves, etc.
- Also aids water consumption quantification

Cons:

- Costly to install source meters, submeters
- Improper installation can lead to meter inaccuracies
- Time and effort required for training and physical monitoring

Current Strategies to Conserving Water

3. Sanitary Equipment Fixtures/Swaps

Pros:

- Since sanitary equipment and fixtures can account for 50% of water usage, fixing issues or adding WaterSense technology can reduce the amount of water used on a long-term basis

Cons:

- Costly to replace equipment depending on budget
- Possibility of missing underlying issues regarding plumbing

4. *Kitchen Equipment Fixtures/Swaps*

Pros:

- More efficient water conservation than with previous equipment (ex: commercial dishwasher, pre-rinse spray valve)
- Energy-Star equipment + WaterSense technology => save water

Cons:

- Costly to replace equipment depending on budget

Current Strategies to Conserving Water

5. Mechanical Systems

Pros:

- Eliminating single-pass mechanical systems can reduce water consumption
- Using controls to monitor and use mechanical systems when needed

Cons:

- Costly to implement air-cooled systems instead of water-based systems
- Other equipment replacements might cause the need for replacing other systems

6. Cleaning Methods

Pros:

- Soaking dishes instead of rinsing each one (turning faucet off in between)
- Some machines for cleaning are energy/water efficient (Energy Star)

Cons:

- Could take more time and/or effort for workers to clean the facility if using things other than dishwashers that waste water

7. Cooking Methods

Pros:

- Condensation return method for steam kettles and other cooking equipment

Cons:

- Costly to install

UC Sustainability Policy

UC Sustainability Policy on Water Conservation

Sustainable Water Systems- report + track water usage and create water action plans:

- Water usage and reduction:
  - Irrigation
  - Landscaping
  - Stormwater management
  - Water-efficient technologies + renovations
  - Education and outreach

https://commons.wikimedia.org

UC Sustainability Policy on Water Conservation

Reporting Methods:

- ➢ Identify operational scope where water is being used (the campus, excluding the third-party operated facilities)
- ➢ All locations report based on:
  - Measure per capita water consumption by *Weighted Campus User* (WCU) and *Adjusted Patient Day* (for health sites like UCD Med Center)
  - Potable water usage (total gallons) to calculate baseline and target (total and individual locations)
  - Sustainability Tracking, Assessment and Rating System *(STARS)*: Self reporting framework for colleges/universities to measure sustainability performance

Reporting Schedule: beginning of the following year, each UC location develops an annual progress report

- Current Water Action Plan
- Information on their water usage reduction

UC Sustainability Policy on Water Conservation

Water Action Plans:

- Address major categories of usage
- Take into consideration the regional conditions + regulatory requirements
- Recognize historical progress
- Identify long-term solutions for achieving less water waste
- Replace old systems that drain water to waste after one use with new sustainable ones

Water Recycling and Stormwater Evaluations:

- Each renovation or construction project must include water recycling/stormwater reuse

Watering the Lawn (Photo – Brian J. Matis)

UC Sustainability Policy on Water Conservation

Drinking Water Access Goals:

- Increase the number of bottle filling stations
  - Have available bottle fillers at every drinking fountains
- Decrease + discourage the use of plastic bottled water delivery
  - Has adverse environmental impacts
    - Plastic waste
    - Greenhouse gas emissions
- Consider water usage/demand during environmental conditions like heat waves

https://freerangestock.com

FSM at UC Davis

Specific FSM Sustainability Practices in UC Davis

In Residence Halls :

- Low-flow faucets
- Low-flush toilets and urinals
- Cleaning equipment and procedures that reduce water usage in communal kitchens
- Water refill stations in every residence hall

Specific FSM Sustainability Practices in UC Davis

In Dining Commons:

- Trayless dining
  - Removed tray dining in 2008 after pilot program success
- Low-flow faucets and nozzles
- Motion sensor hand washing stations in kitchens
- Force- thaw food only in emergency
- Recirculating water troughs in dishoom

(9)UC Davis: Tray-Less Dining

Specific FSM Sustainability Practices in UC Davis

<u>In Dining Commons (cont.):</u>

UC Davis uses SMARTPOWER by ECOLAB

- ➢ Reduces water use by
  - ○ Using proprietary chemistry that use highly effective formulas designed to remove tough stains
    - ■ Ex: SMARTPOWER Machine Detergent= reduces rewash by breaking down food soils

(8)SMARTPOWERTM | Ecolab

FSM at Other UCs

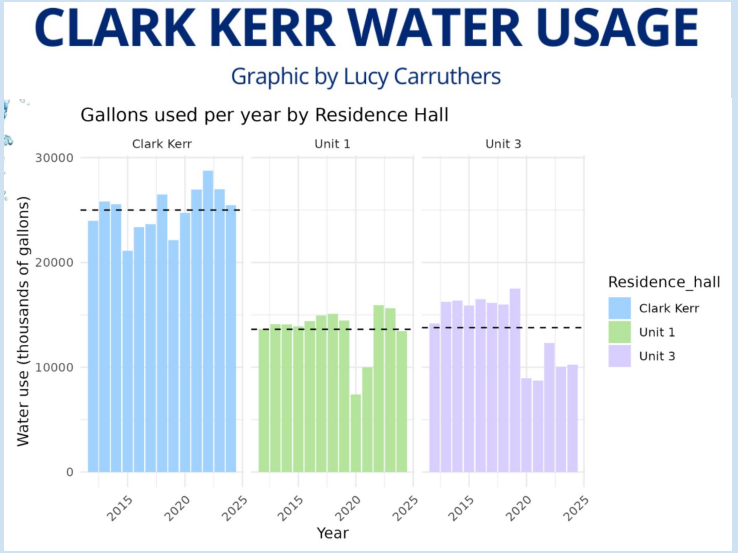
FSM Sustainability Practices in other UCs

UC LA:

- Tray-free dining
  - Not eliminated but encouraged to

UC Berkeley:

- Address leaks in residence halls
- Conduct water audits across campus to locate high water consumption and address it
- Education to students

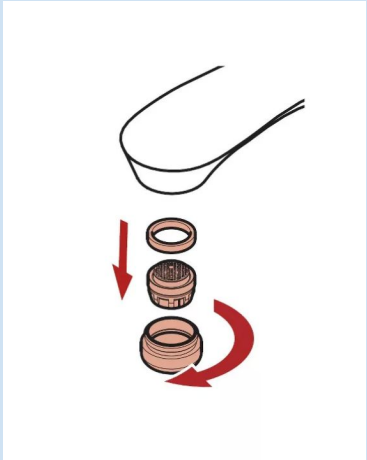


(16) “A Story of Water at UC Berkeley Residential Halls.”

FSM Sustainability Practices in other UCs

UC Irvine:

- Trayless dining in residential dining since 2008
- Purchased Energy Star appliances for all dining commons
- Increasing water refill stations across campus



UC Riverside:

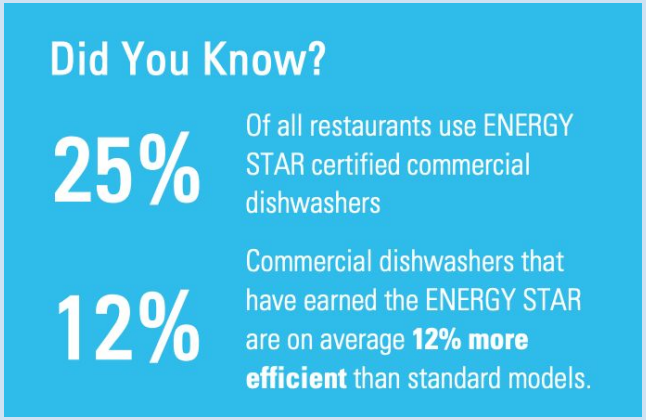
- Energy star-certified kitchen equipment
- Trayless dining
- Low-flow aerators and recirculating dishwashers
- Replacing garbage disposals with strainers

FSM at Non-UCs

FSM Sustainability Practices in California

LA Department of water and power:

- Loading dishwashers till full
- Run dishwashers on low flow rate
- Ensure manual fill valves close
- rinse nozzles replaced/ repaired
- Repair water leaks
- Replacing old washing equipment with more efficient models



(17)Energystar

FSM Sustainability Practices in California

San Diego:

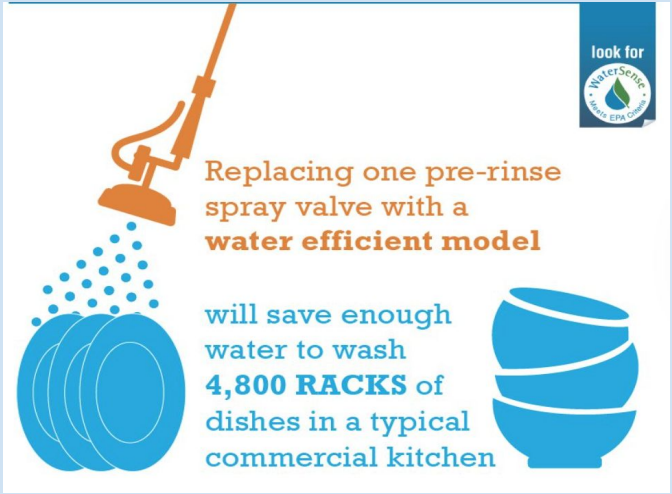
- Steaming/ frying vegetables instead of boiling
- Planning ahead and thawing food in refrigerators instead of running under cold water
- Use 3-compartment sink instead of dishwasher
- Pre-soaking utensils before rinsing them with water
- Melt ice naturally instead of using water

WebstaurantStore

FSM Sustainability Practices in California

Davis :

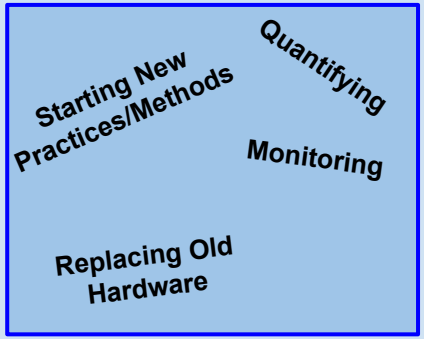
- In commercial establishments with eating and drinking will only serve water on request
- Restaurants are required to use a pre rinse spray valve when washing dishes
- Property owners must fix leaks, breaks or malfunctions when found or within 72 hours of notice from city of Davis



(6) Pre-rinse spray valves. WebstaurantStore.

Summary

- Water waste in FSM is Immense
- Many strategies to be sustainable and conserve water are being implemented



- UC Policy
  - Sustainable Water System-action plans
  - Reporting & Annual Progress Reports
  - Education & Creating New Goals
- UC Davis
  - Implementation In
    - Residence Halls
    - Dining Commons

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Questions?

1. What is the main source of water usage in restaurants?
2. What are some common reasons for water waste?
3. In the Sustainability Policy, what are some of the consumption data the UC system reports pertaining to water?
4. Did anyone hear of any sustainability practices that weren't heard of before?
5. Where have you seen some water saving strategies on campus or at sites?
6. Does anyone have any opinions on water conservation strategies? Is one more preferable or realistic compared to others?