Water Conservation Tips and Tricks

EARTH WEEK 2021
Getting to Know You

If you feel comfortable, please answer the Zoom poll.

Responses will help us tailor the presentation to your needs.
SUSTAINABLE STANFORD OVERVIEW
Institutionalizing Sustainability

Evaluations, programs, system efficiencies, outreach, and education

- Strategic Planning
- Collaborative Governance
- Evaluations, Assessments, and Reporting
- Business Systems
- Communications
- Conservation Campaigns

“Stanford is a living lab of sustainability — in research, teaching, campus action, student experience, and community. Across the university, we have made great strides and are committed to accelerating our work to deepen our impact and service. Our research identifies challenges and helps develop critical solutions that can have a lasting impact on campus and around the world.”
Conservation Campaigns and Programs

- **Practical Training:** Green Events, Green Labs, Sustainable Office Spaces, Zero Waste
- **Seasonal Conservation Campaigns:** Focus on reducing waste, conserving energy and water, and material reuse
- **Outreach and Events:** Earth Day, Year in Review, Cardinal Green Newsletter, Departmental Meetings, Employee Orientation, Tours
- **My Cardinal Green**

Stanford is your home, wherever you are.
Live Cardinal Green, Anywhere
My Cardinal Green

Here's What Others are Doing

- 4,500 People on campus are working on earning points
- 680,695 kWh per year have been saved by My Cardinal Green users
- 3,707 Unique actions have been completed by My Cardinal Green users
- $327 In operations costs avoided by you

1. Take survey
2. Action dashboard
3. Complete actions and earn points
4. Receive a reward

Sustainable.Stanford.edu/my-cardinal-green
Stanford Water Resources & Civil Infrastructure
suwater.stanford.edu

Domestic Water

Lake Water

- 1.4 MGD Faculty/Staff Housing
- 1.4 MGD Housing & Dining
- 1.0 MGD Athletics
- 1.0 MGD Academic
- 1.0 MGD Other
- 1.0 MGD CEF
1. Where Our Water Comes From
2. Why Save Water
3. What Water is Used For
4. How to Save Water
Where Our Water Comes From
Where Our Water Comes From

**Surface water**

*Watershed:* Area of land that drains to a common point

**Groundwater**

*Aquifer:* Body of rock or sediment that is saturated with groundwater
Domestic Water

Hetch Hetchy System

About 175 miles (282 km) across

Shannon1, Wikipedia, CC BY-SA 4.0
1. Where Our Water Comes From
2. Why Save Water
3. What Water is Used For
4. How to Save Water
Why Save Water
Why Save Water

- Save Money
- Save Energy
- Save Up
- Save Our Environment
Save Money
$440 / person
Public spending on water in the US, 2017

$2.9 Billion
Cost of earthquake upgrades to Hetch Hetchy system

Hetch Hetchy Reservoir
Image: SFPUC
Save Energy
Energy is used to:
- Treat
- Pump
- Heat
- Process

What percent of California’s energy use is related to water? Answer: 12%
Save Up
Which US state has the most variability in precipitation from year to year?

Answer: California

“Atmospheric Rivers, Floods and the Water Resources of California” (2011)
Save Up

Precipitation
Yosemite Area

CA DWR

Water Year (Oct – Sep)

Precipitation (in)

1987-92 Drought
2007-09 Drought
2012-16 Drought

Oct-Apr YTD
Save Our Environment
Save Our Environment

1910

1978

14 of 31 Extinct in 50 Years?

CA Trout, SOS II (2017)
1. Where Our Water Comes From

2. Why Save Water

3. What Water is Used For

4. How to Save Water
What Water is Used For
Freshwater Withdrawals in California

USGS, “Estimated use of water in the United States in 2015”
Residential Water Use

Water Research Foundation, “Residential End Uses of Water” (2016)
### Indoor Residential Water Use

Water Research Foundation, “Residential End Uses of Water” (2016)

<table>
<thead>
<tr>
<th>Use</th>
<th>Percentage</th>
<th>GPHD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet</td>
<td>24%</td>
<td>33</td>
</tr>
<tr>
<td>Faucet</td>
<td>20%</td>
<td>27</td>
</tr>
<tr>
<td>Shower</td>
<td>20%</td>
<td>27</td>
</tr>
<tr>
<td>Laundry</td>
<td>16%</td>
<td>22</td>
</tr>
<tr>
<td>Dishwasher</td>
<td>2%</td>
<td>2</td>
</tr>
<tr>
<td>Bath</td>
<td>3%</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>3%</td>
<td>4</td>
</tr>
<tr>
<td>Leaks</td>
<td>13%</td>
<td>18</td>
</tr>
</tbody>
</table>

**Total:** 138 GPHD (gallons / household / day)
1. Where Our Water Comes From
2. Why Save Water
3. What Water is Used For
4. How to Save Water
How to Save Water
How to Save Water

Virtual Water

Leaks

Outdoors

Kitchen/Laundry

Bathroom

= My Cardinal Green

= For student dorms

For student dorms
Virtual Water

<table>
<thead>
<tr>
<th>Water is used to:</th>
<th>Water-saving ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grow food</td>
<td>Reduce food waste</td>
</tr>
<tr>
<td>Generate energy</td>
<td>Turn off computer when not in use</td>
</tr>
<tr>
<td>Make products</td>
<td>Fix broken appliances instead of buying new</td>
</tr>
</tbody>
</table>

![Industry](image.png)

- Ag

- [Image of food plant]
Outdoors

- Water-wise landscape
- Upgrade irrigation
- Cover or remove pool
- Sweep, don’t hose
- Use car wash
- Rainwater capture
Pollution Prevention

• Avoid pesticides [ourwaterourworld.org](http://ourwaterourworld.org)
• Litter and plastic 🌿
• Personal care products 🌿 and cleaning supplies [ewg.org](http://ewg.org)
• No FOG down the drain 🌿
• Don’t flush wipes 🌿
Leaks

How much water will a leak of 1 drip per second waste in 1 year?

2,000 - 3,000 gallons / year
(6 - 8 gallons / day)

USGS Drip Calculator, EPA WaterSense
Leaks

- Check bill
- Read water meter
- Walk through residence

Digital meter

Analog meter
Leaks: Home Walk-through

Take a few minutes to walk through your residence. Look and listen for…

- Dripping faucets or showerheads
- Hissing toilets
- Water damage around dishwasher, washing machine, water heater, etc.

What did you notice?
Leaks: How to Respond

- **Homeowners**: Know how to shut off water
  [www.epa.gov/watersense/fix-leak-week](http://www.epa.gov/watersense/fix-leak-week)
- **Renters**: Contact maintenance
- **Student Dorms**: Report R&DE’s Fix-It form
  [fixit.stanford.edu](http://fixit.stanford.edu)
- **Other campus facilities**: Report to 24-hr Maintenance Line (650) 723-2281
Gallons per minute (gpm) or per flush (gpf)

Efficient  OK  Inefficient pre-1994  Very Inefficient pre-1980s

Standards: CA California  WS WaterSense  US United States (effective 1994)

EPA.GOV/WATERSENSE

BATHROOM
Faucet

KITCHEN
Faucet

Shower

Toilet
Toilet

• Replace with high efficiency toilet
  ≤ 1.28 gpf
  [look for WaterSense](https://www.epa.gov/watersense) [MaP](https://map-testing.com)
  [epa.gov/watersense](https://www.epa.gov/watersense) [map-testing.com]

• Retrofit existing toilet
• Use shower warm-up water to flush
• Don’t use toilet as trash can

Fix or report leaky toilets
Fix or report leaky toilets

- Constant hissing
- Water overflowing
- Tangled or stuck parts
- Leaking flapper
- Fix or report leaky toilets

Toilet

SFPUC Leak Guide
Leaking flushometer toilets in student dorms: Please submit Fix-It Request to R&DE via fixit.stanford.edu
Finding Flow Rates

1. Find a timer and measuring cup
2. Turn on faucet or showerhead to full flow
3. Time how long it takes to fill measuring cup

Come back with measurements (time and volume)

Be careful not to drop your timer into the water!
Finding Flow Rates of Fixtures

Flow Rate = \frac{Volume}{Time} = \frac{2 \text{ cups}}{5 \text{ seconds}} = 0.4 \text{ cups per second}

= 1.5 \text{ gallons per minute}
Finding Flow Rates of Fixtures

Flow Rate = \frac{Volume}{Time} = \frac{500 \text{ milliliters}}{2.5 \text{ seconds}} = 200 \text{ milliliters per second}

\approx 3.2 \text{ gallons per minute}
Standards: CA California  WaterSense  US United States (effective 1994)

EPA.GOV/WATERSENSE

Gallons per minute (gpm) or per flush (gpf)

- Efficient
- OK
- Inefficient pre-1994
- Very Inefficient pre-1980s

- BATHROOM
  - Faucet
- KITCHEN
  - Faucet
- Shower
- Toilet
• Replace with high efficiency showerhead

  ≤ 2 gpm

  epa.gov/watersense

• Reuse warm-up water

• Use shower timer

Fix or report leaky showerheads
Faucets

• Install aerators
• Turn off tap and sing a song while washing hands

Fix or report leaky faucets
Faucet

- Collect and reuse water
- Keep a pitcher in the fridge

Dishwasher

- Run full loads
- Energy Star

Laundry

- Run full loads
- Energy Star
- Wash cold + hang dry
Top Water-Saving Actions
1. Fix or report **leaks**

2. Use water-wise **landscaping**

3. Reduce **food** waste

4. Switch to efficient **fixtures**

5. Run full loads of **laundry**

6. Be **mindful**

ADD YOUR OWN!
Additional Resources

General

- sustainable.stanford.edu  Sustainable Stanford
- southbaygreengardens.org  South Bay Green Gardens

Agency Water Conservation Websites

Rebates, webinars, leak detection guides, and more

- suwater.stanford.edu  Stanford
- bayareaconservation.org  BAWSCA (Bay Area Water Supply & Conservation Agency)
- sfwater.org/conservation  SFPUC (San Francisco Public Utilities Commission)
- watersavings.org  Valley Water
- ebmud.com  EBMUD (East Bay Municipal Utility District)

Unless otherwise noted, images and graphics are by Stanford staff
1. Where Our Water Comes From
2. Why Save Water
3. What Water is Used For
4. How to Save Water
Q&A and Discussion

Thoughts, questions, or ideas?
Water Resources & Civil Infrastructure

🌐 Website: suwater.stanford.edu
✉️ Email: stanfordwater@stanford.edu