2022 Annual Water Quality Report

Stanford University Water Resources and Civil Infrastructure

JUNE 2023

High Quality Water

Stanford University Water Resources and Civil Infrastructure (WRCI) Group is pleased to provide you with the 2022 Annual Water Quality Report. The San Francisco Public Utilities Commission (SFPUC) and WRCI monitored water quality for both source and treated water supplies during 2022, and the water quality was in compliance with the State Water Resources Control Board - Division of Drinking Water (SWRCB-DDW) and the United States Environmental Protection Agency (USEPA) drinking water requirements (see page 5 for details). We continue our commitment to provide our customers with safe, high quality drinking water. The policy of WRCI is to fully inform its consumers about the water quality standards and typical concentrations. Stanford's water supply is both chloraminated and fluoridated by the SFPUC.

The SFPUC collects daily water quality samples from various locations within the San Francisco Regional Water System (SFRWS). The samples are analyzed for primary standards that apply to the protection of public health and secondary standards that refer to the aesthetic qualities of water, such as taste and odor.

Stanford also routinely collects water quality samples from various locations within the campus distribution system. The most frequently collected samples are analyzed for chloramine residual, coliform bacteria, and general physical parameters. Additional water quality samples are collected to monitor for more constituents in compliance with applicable requirements. A California certified laboratory analyzes required samples. Stanford submits monthly reports to the SWRCB-DDW that include monitoring results.

Stanford Water Resources and Civil Infrastructure Group

WRCI manages the procurement, storage, distribution, maintenance, and monitoring programs for Stanford's drinking water supply. WRCI also manages flushing, cross-connection, and backflow prevention programs to ensure a consistent high quality drinking water supply.

Learn more at
suwater.stanford.edu

In This Report

Stanford University's Drinking Water Sources

SFRWS Drinking Water Sources and Treatment

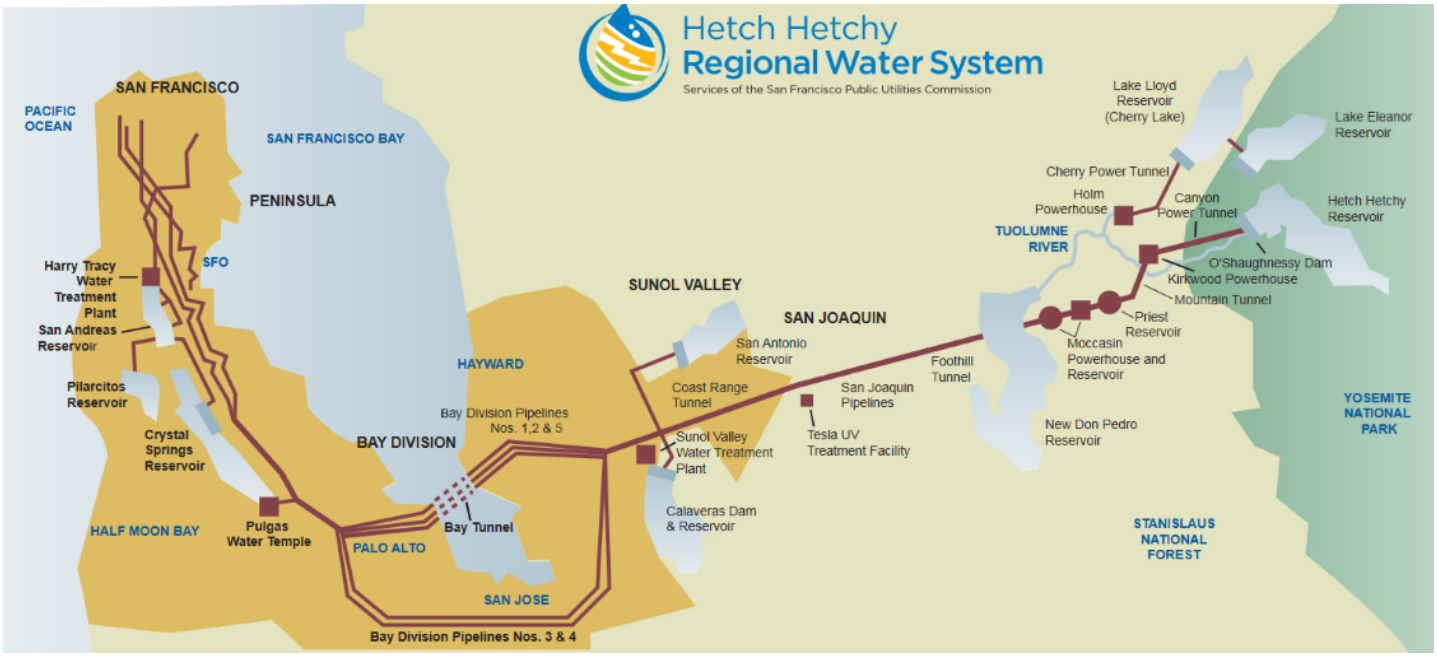
All of our current drinking water supply comes from the San Francisco Regional Water System (SFRWS), which is a wholesaler owned and managed by the San Francisco Public Utilities Commission (SFPUC). The supply consists of surface water and groundwater that are well protected and carefully managed by the SFPUC. These sources are diverse in both the origin and the location with the surface water stored in reservoirs located in the Sierra Nevada, Alameda County and San Mateo County, and groundwater stored in a deep aquifer located in the northern part of San Mateo County.

To meet drinking water standards for consumption, all surface water supplies including the upcountry non-Hetch Hetchy sources (UNHHS) undergo treatment by the SFRWS before it is delivered. Water from Hetch Hetchy Reservoir is exempt from federal and State filtration requirements but receives the following treatment: disinfection using ultraviolet light and chlorine, pH adjustment for optimum corrosion control, fluoridation for dental health protection, and chloramination for maintaining disinfectant residual and minimizing the formation of regulated disinfection byproducts. Water from local Bay Area reservoirs in Alameda County and UNHHS is delivered to Sunol Valley Water Treatment Plant (SVWTP); whereas water from local reservoirs in San Mateo County is delivered to Harry Tracy Water Treatment Plant (HTWTP). Water treatment at these plants consist of filtration, disinfection, fluoridation, optimum corrosion control, and taste and odor removal.

In 2022, no UNHHS water was used. However, a small amount of groundwater from four wells was added to the SFRWS's surface water supply through blending in the transmission pipelines. However, groundwater was not part of the water supply delivered to Stanford in 2022; that year, we only received surface water from the SFRWS.

Watershed Protection

The SFRWS conducts watershed sanitary surveys for the Hetch Hetchy source annually and for non-Hetch Hetchy surface water sources every five years. The latest sanitary surveys for the non-Hetch Hetchy watersheds were completed in 2021. All these surveys, together with SFRWS's stringent watershed protection management activities, were completed with support from partner agencies including National Park Service and US Forest Service. The purposes of the surveys are to evaluate the sanitary conditions and water quality of the watersheds and to review results of watershed management activities conducted in the preceding years. Wildfire, wildlife, livestock, and human activities continue to be potential contamination sources. You may contact the San Francisco District office of the SWRCB-DDW at 510-620-3474 to review these reports.



Contaminants in Drinking Water

SFRWS regularly collects and tests water samples from reservoirs and designated sampling points throughout the system to ensure the water delivered to you meets or exceeds federal and State drinking water standards. In 2022, SFRWS conducted more than 48,320 drinking water tests of the sources and the transmission system. This is in addition to the extensive treatment process control monitoring performed by SFRWS's certified operators and online instruments.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. In order to ensure that tap water is safe to drink, the USEPA and the SWRCB-DDW prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health.

Generally, the sources of drinking water (both tap water and bottled water) include rivers, lakes, oceans, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Such substances are called contaminants. Major categories of contaminants that may be present in water sources are listed to the right.

Potential Contaminants in Water Sources

Microbial contaminants: Viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic contaminants: Salts and metals that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and herbicides: These may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

Organic chemical contaminants: Includes synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production. Can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.

Radioactive contaminants: These can be naturally occurring or be the result of oil and gas production and mining activities.

Drinking Water and Lead

Exposure to lead, if present, can cause serious health effects in all age groups, especially for pregnant women and young children. Infants and children who drink water containing lead could have decreases in IQ and attention span and increases in learning and behavior problems. The children of women who are exposed to lead before or during pregnancy can have increased risk of these adverse health effects. Adults can have increased risk of heart disease, high blood pressure, kidney, or nervous system problems.

Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. There are no known lead service lines in the SFRWS or Stanford distribution system. We are responsible for providing high quality drinking water, but we cannot control the variety of materials used in plumbing components. You share the responsibility for protecting yourself and your family from the lead in your home plumbing. You can take responsibility by identifying and removing lead materials within your home plumbing and taking steps to reduce your family's risk. Before drinking tap water, flush your pipes for several minutes by running your tap, taking a shower, or doing laundry or a load of dishes. You can also use a filter certified to remove lead from drinking water. If you are concerned about lead in your water and wish to have your water tested, please call the Water Information Line at (650) 725-8030 or email stanfordwater@stanford.edu. Information about lead in drinking water, testing methods, and steps you can take to minimize exposure is available at epa.gov/safewater/lead.

As previously reported, at the completion of the lead user service line (LUSL) inventory, there were no known pipelines and connectors between water mains and meters made of lead (nor were there any pipelines or connectors made of unknown materials). Our policy is to remove and replace any LUSL promptly if it is discovered during pipeline repair and/or maintenance.

More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (800) 426-4791, or at epa.gov/safewater.

Contaminants in Drinking Water, continued

Cryptosporidium

Cryptosporidium is a parasitic microbe found in most surface water. The SFRWS regularly tests for this waterborne pathogen and found it at very low levels in source water and treated water in 2022. However, current test methods approved by the USEPA do not distinguish between dead organisms and those capable of causing disease. Ingestion of *Cryptosporidium* may produce symptoms of nausea, abdominal cramps, diarrhea, and associated headaches. *Cryptosporidium* must be ingested to cause disease, and it may be spread through means other than drinking water.

Special Health Needs

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as those with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly people, and infants, can be particularly at risk from infections.

These people should seek advice about drinking water from their health care providers. USEPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the USEPA's Safe Drinking Water Hotline (800) 426-4791 or at epa.gov/safewater.

Important Definitions

The table (page 5) lists all drinking water contaminants detected in 2022, and information about their typical sources. Contaminants below detection limits for reporting are not shown, in accordance with regulatory guidance. SFRWS holds a SWRCB-DDW monitoring waiver for some contaminants in its surface water supply and therefore the associated monitoring frequencies are less than annual. The following are definitions of key terms referring to standards and goals of water quality noted on the data table.

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs or MCLGs as is economically and technologically feasible. Secondary MCLs (SMCLs) are set to protect the odor, taste, and appearance of drinking water.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is evidence that addition of disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Primary Drinking Water Standard (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Regulatory Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Turbidity: A water clarity indicator that measures cloudiness of the water, and is also used to indicate the effectiveness of the filtration system. High turbidity can hinder the effectiveness of disinfectants.

State Revised Total Coliform Rule

This report reflects changes in drinking water regulatory requirements during 2021, in which the SWRCB adopted California version of the federal Revised Total Coliform Rule. The revised rule, effective on July 1, 2021, maintains the purpose to protect public health by ensuring the integrity of the drinking water distribution system and monitoring for the presence of microbial contaminants (i.e., total coliform and *E. coli* bacteria). Greater public health protection is anticipated, as the revised rule requires water systems that are vulnerable to microbial contamination to identify and fix problems. Water systems that exceed a specified frequency of total coliform occurrences are required to conduct an assessment to determine if any sanitary defects exist. If found, these must be corrected by the water system.

Stanford University's Annual Water Quality Data for 2022 (a)

DETECTED CONTAMINANTS

* SFPUC Samples † Stanford Samples

CONSTITUENTS WITH PRIMARY STANDARDS	Unit	MCL	PHG or (MCLG)	Range or Level Found	Average or [Max]	Typical Sources in Drinking Water
TURBIDITY						
* Unfiltered Hetch Hetchy Water	NTU	5	N/A	0.2 - 0.4 (b)	[3.4]	Soil runoff
* Filtered Water – Sunol Valley Water Treatment Plant (SVWTP)	NTU	1 (c)	N/A	-	[2.2]	Soil runoff
	-	Min 95 % of samples ≤ 0.3 NTU (c)	N/A	99.3% - 100%	-	Soil runoff
* Filtered Water – Harry Tracy Water Treatment Plant (HTWTP)	NTU	1 (c)	N/A	-	[0.1]	Soil runoff
	-	Min 95 % of samples ≤ 0.3 NTU (c)	N/A	100%	-	Soil runoff
DISINFECTION BY-PRODUCTS AND PRECURSOR						
† Total Trihalomethanes (TTHMs)	ppb	80	N/A	19 - 58	[53.4] (d)	By-product of drinking water disinfection
† Haloacetic Acids 5 (HAA5)	ppb	60	N/A	7.0 - 104.8	[53.3] (d)	By-product of drinking water disinfection
* Bromate	ppb	10	0.1	ND—1.7	[1.3] (e)	By-product of drinking water disinfection
* Total Organic Carbon (TOC) (f)	ppm	TT	N/A	1.3-3.9	2.3	Various natural and man-made sources
MICROBIOLOGICAL						
† Total Coliform	-	NoP ≤ 5% of monthly samples	(0)	-	[0%] (g)	Naturally present in the environment
† Fecal coliform and E. coli	-	0 Positive Sample	(0)	-	[0%]	Human or animal fecal waste
* *Giardia lamblia*	cyst/L	TT	(0)	0 - 0.04	0.01	Naturally present in the environment
INORGANIC CONTAMINANTS						
* Fluoride (source water) (h)	ppm	2.0	1	ND - 0.8	0.3 (i)	Erosion of natural deposits; water additive to promote strong teeth
† Chloramine (as chlorine)	ppm	MRDL = 4.0	MRDLG = 4	0.8 - 3.5	[2.9] (j)	Drinking water disinfectant added for treatment

CONSTITUENTS WITH SECONDARY STANDARDS	Unit	SMCL	PHG	Range	Average	Typical Sources in Drinking Water
* Chloride	ppm	500	N/A	< 3 - 15	8.7	Runoff / leaching from natural deposits
† Color	unit	15	N/A	< 5 - 10	-	Naturally occurring organic materials
* Iron	ppm	15	N/A	<6-24	11	Runoff / leaching from natural deposits
* Manganese	ppm	50	N/A	<2-2.4	<2	Runoff / leaching from natural deposits
* Specific Conductance	µS/cm	1600	N/A	37 - 210	140	Substances that form ions when in water
* Sulfate	ppm	500	N/A	1.1 - 29	15	Runoff / leaching from natural deposits
* Total Dissolved Solids	ppm	1000	N/A	< 20 - 104	61	Runoff / leaching from natural deposits
* Turbidity	NTU	5	N/A	0.1 - 0.2	0.1	Soil runoff

LEAD AND COPPER	Unit	AL	PHG	Range	90th Percentile	Typical Sources in Drinking Water
† Copper (30 samples collected)	ppb	1300	300	< 50 - 150	< 50 (k)	Internal corrosion of household water plumbing systems
† Lead (40 samples collected)	ppb	15	0.2	< 5 - 98	< 5 (k)	Internal corrosion of household water plumbing systems

OTHER WATER QUALITY PARAMETERS	Unit	ORL	Range	Average
* Alkalinity (as $CaCO_3$)	ppm	N/A	7.1 - 166	41
* Boron	ppb	1000 (NL)	28 - 105	56
* Calcium (as Ca)	ppm	N/A	3.2 - 15	9.3
* Chlorate	ppb	800 (NL)	45 - 650	147
* Chromium (VI)	ppb	N/A	0.22 -0.27	0.25
* Hardness (as $CaCO_3$)	ppm	N/A	9.1-49	32
* Magnesium	ppm	N/A	0.2 - 4.2	2.9
* pH	-	N/A	8.2 - 9.6	9.2
* Potassium	ppm	N/A	0.3 - 1	0.7
* Silica	ppm	N/A	5 - 5.9	5.5
* Sodium	ppm	N/A	3.5 - 21	14
* Strontium	ppb	N/A	16 - 159	79

KEY	
< / ≤	less than / less than equal to
AL	Action Level
Max	Maximum
Min	Minimum
N/A	Not Applicable
ND	Non-detect
NL	Notification Level
NoP	Number of Coliform-Positive Samples
NTU	Nephelometric Turbidity Unit
ORL	Other Regulatory Level
ppb	parts per billion
ppm	parts per million
µS/cm	microSiemens / centimeter

Footnotes:

(a) Only detected contaminants shown. All results met State and Federal drinking water health standards.

(b) These are monthly average turbidity values measured every 4 hours daily.

(c) There is no turbidity MCL for filtered water. The limits are based on the TT requirements for filtration systems.

(d) This is the highest locational running annual average (LRAA), which is used to determine compliance.

(e) This is the highest running annual average value.

(f) Total organic carbon is a precursor for disinfection by-product formation. The TT requirement applies to the filtered water from the SVWTP only.

(g) The highest percentage of positive samples collected in any one month.

(h) The SWRCB recommends an optimal fluoride level of 0.7 ppm be maintained in the treated water. In 2022, the range and average of the fluoride levels were 0.5 ppm - 0.9 ppm and 0.7ppm, respectively (see Page 6).

(i) The natural fluoride level in the Hetch Hetchy supply was ND. Elevated fluoride levels in raw water for the SVWTP and HTWTP were attributed to the transfer of fluoridated Hetch Hetchy water into the local reservoirs.

(j) This is the highest running annual average value.

(k) Lead and copper monitoring was conducted in 2021 at 30 homes. One home had an initial lead result above the action level (98 ppb) but a second sample was ND. All other results were below the lead and copper Action Levels. Lead and copper tap sampling in homes is required again in 2024.

Additional Information About Our Water

Fluoridation and Dental Fluorosis

Mandated by State law, water fluoridation is a widely accepted practice proven to be safe and effective for preventing and controlling tooth decay. The fluoride target level in the water is 0.7 milligram per liter (mg/L, or part per million, ppm), consistent with the May 2015 State regulatory guidance on optimal fluoride level. Infants fed formula mixed with water containing fluoride at this level may still have a chance of developing tiny white lines or streaks in their teeth. These marks are referred to as mild to very mild fluorosis, and are often only visible under a microscope. Even in cases where the marks are visible, they do not pose any health risk. The Centers for Disease Control (CDC) considers it safe to use optimally fluoridated water for preparing infant formula. To lessen this chance of dental fluorosis, you may choose to use low-fluoride bottled water to prepare infant formula. Nevertheless, children may still develop dental fluorosis due to fluoride intake from other sources such as food, toothpaste and dental products.

Contact your healthcare provider or SWRCB-DDW if you have concerns about dental fluorosis. For additional information about fluoridation or oral health, visit the SWRCB-DDW website at waterboards.ca.gov/drinking_water/certlic/drinkingwater/Fluoridation.html or the CDC website at cdc.gov/fluoridation.

Monitoring of Per- and Polyfluoroalkyl Substances (PFAS)

PFAS is a group of approximately 5,000 man-made, persistent chemicals used in a variety of industries and consumer products. In 2021, SFPUC conducted a second round of voluntary monitoring using a newer analytical method adopted by the USEPA for some other PFAS contaminants. No PFAS were detected above the SWRCB's Consumer Confidence Report Detection Levels in surface water and groundwater sources. For additional information about PFAS, you may visit SWRCB website waterboards.ca.gov/pfas, SFPUC website PFAS_factsheet.pdf (sfpuc.org), and/or USEPA website epa.gov/pfas.

Emergency Backup Groundwater

The Stanford WRCI group maintains a network of groundwater wells for a backup domestic water supply in the event of an outage from the SFPUC system. If the need for emergency backup wells is initiated, the campus community will be notified prior to changes in water source and the anticipated water quality changes.

Emergency Preparedness

Although Stanford strives to ensure a reliable supply of water for our customers, a natural disaster could interrupt water delivery. Residents are encouraged to store drinking water in case of an emergency.

Store a 3-day waster supply just in case

- Each family member (including pets) needs 1 gallon per day
- Store tap water in food-grade plastic containers; replace every 6 months
- Store bottled water in original sealed containers; replace every 6 months

If emergency supplies run out, you can treat your tap water as required or if notified

- Boil for 3 minutes, or
- disinfect by adding 8 drops of household bleach per gallon of water
- Shake or stir and let it stand for 30 minutes

Water Conservation for Residents

Conservation is a Stanford Way of Life

Thank you for helping Stanford University conserve water at a critical time during the drought. Conservation will remain essential at Stanford and in California. Although most drought restrictions have been rolled back, certain specific restrictions on water waste are still active, as noted below.

- Prohibitions on wasteful water uses include:
  - Allowing irrigation to run off from lawns and landscaping
  - Washing a car using a hose without a shut-off nozzle
  - Washing pavement (except for health and safety needs)
  - Using fountains without a recirculation system
  - Irrigating during and within 48 hours of measurable rainfall
  - Spray irrigation occuring between 7 am and 7 pm

For more information about water conservation, including conservation tips, fact sheets, and rebate details, visit suwater.stanford.edu or call the Water Information Line at (650) 725-8030.

WaterSmart: Single family residents can now receive automated leak alerts and see their hourly water use at suwater.watersmart.com. If you do not have your account number or need other assistance with WaterSmart, please email stanfordwater@stanford.edu or call (650) 725-8030.

Free Water-Saving Tools: Visit cloud.valleywater.org/shopping-cart or call (408) 630-2554 to get free water-saving devices and kits from Valley Water, including a DIY Water Wise Home Survey Kit, efficient showerheads, and faucet aerators.

Water Wise Outdoor Survey: Call Valley Water at (408) 630-2000 or visit watersavings.org to schedule a free professional evaluation of your irrigation system.

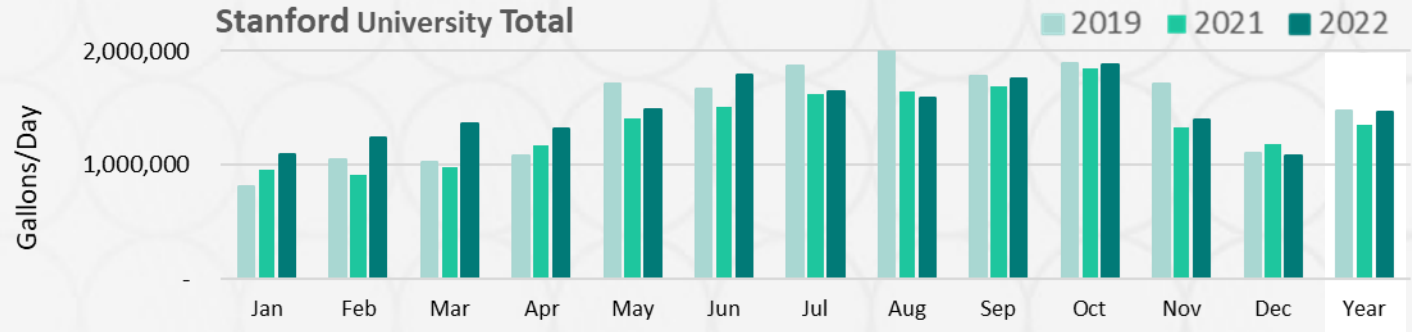
Landscape Rebates: Stanford residents are eligible for rebates from Valley Water for turf/pool removal, drip irrigation, irrigation equipment upgrades, and rainwater capture! Learn more at watersavings.org or by calling (408) 630-2554. Contact Valley Water prior to starting your project.

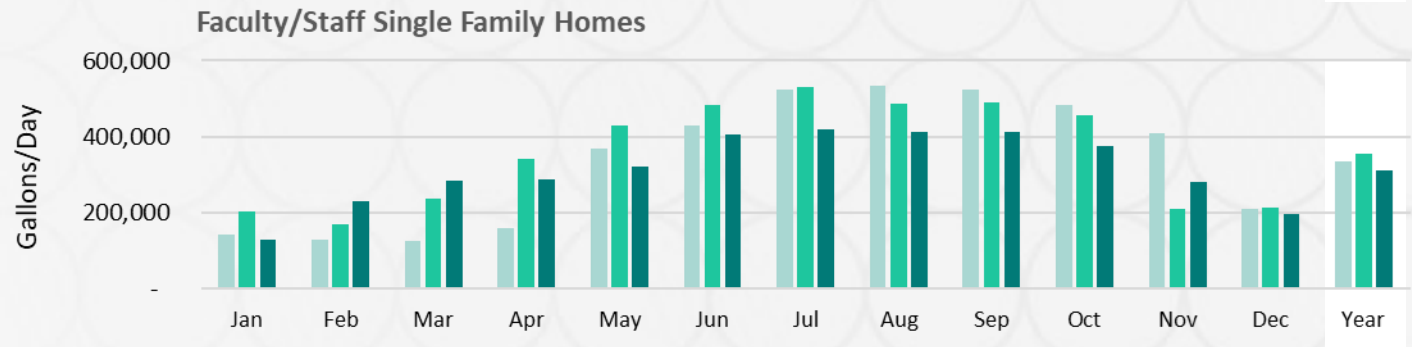
Help Us Detect Leaks

If you see a water leak on campus, please report it to the 24-Hour Maintenance Customer Service Line at (650) 723-2281. Thank you!

Domestic Water Use Trends

Thank you for continuing to conserve water.





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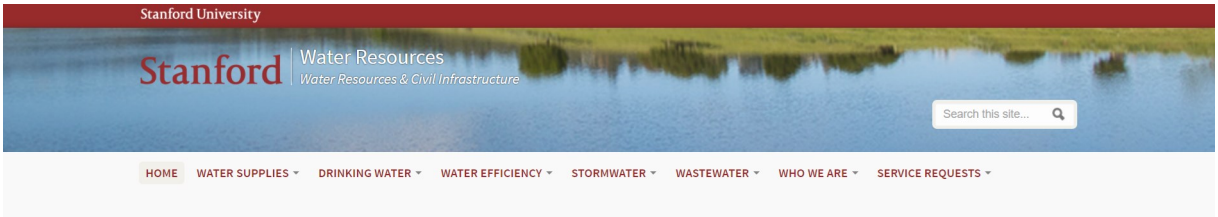
Visit our website for more information about Stanford's water systems, water conservation programs, and other resources.
suwater.stanford.edu



Contact Information

If you have questions or need additional information about this report or Stanford's water quality, please email us at stanfordwater@stanford.edu or call the Water Information Line at (650) 725-8030.

Este informe contiene información muy importante sobre su agua para beber. Favor de comunicarse Stanford University a (650) 725-8030 para asistirlo en español.

USEPA Drinking Water Homepage:
epa.gov/safewater
Safe Drinking Water Hotline: (800) 426-4791

SWRCB - Division of Drinking Water Program Homepage:
waterboards.ca.gov/drinking_water/programs

SFPUC Homepage:
sfpuc.org

Stanford Water Resources Homepage:
suwater.stanford.edu