WATER

By means of water we give life to everything. ~ Koran 21:30

In cultures across the world water is considered a precious, life-giving resource and a sacred gift. As the world's population continues to grow and expand its industrial capacity, the planet's supply of accessible potable water is diminishing rapidly, making water a commodity that is likely to become as desired and as conflict-inducing as oil. Currently we are facing two different kinds of water crises: a lack of water due to population growth and the effects of climate change, including floods & droughts, and the pollution of water. In this section you will be given information about where Santa Monica gets its water, how we use water, how to use it efficiently, how water gets polluted, and ways to prevent pollution.

THE LIMITED AND RAPIDLY DECREASING SUPPLY OF WATER

The United Nations estimates that each person on Earth needs access to between 50 and 100 liters of freshwater every single day to meet their basic drinking, cooking and cleaning needs.[1] While one-sixth of people worldwide do not have access to this minimal amount of water, the average American household uses a colossal 300 gallons daily [2] and the average Santa Monica resident uses 110 gallons per day.[3] By contrast, average daily use in countries like Mozambique is less than 2.7 gallons.[4]

By 2025, international water use is expected to increase by 50% in developing countries, and 18% in developed countries.[5] The UN estimates that by 2025, two-thirds of the world's population will be experiencing water shortages and 1.8 million people will be subjected to absolute water scarcity.[6] Although water covers two-thirds of the surface of our planet, the freshwater in rivers, lakes, and streams comprises less than 2% of the Earth's total water.[7]

Climate change is causing shifts in weather patterns such as decreased rain and snowfall along with more extreme droughts and flooding. Every single continent is experiencing massive weather shifts, ecosystem impacts and food security issues. A prolonged heat wave and drought in 2010 cut Russia's grain production by 36% and forced the government to ban wheat, barley, rye, corn and flour exports for the first time in the post-Soviet period.[8] The Black River, an important tributary to the Amazon, has dropped to its lowest level since recordkeeping began in 1902.[9] The worst drought in 60 years in the Horn of Africa sparked a severe food crisis and high malnutrition rates that threatened the survival of an estimated 11 million people.[10]

Studies show that global climate change will have an even greater impact on water resources than the current man-made diversions of water for urban and farm use, a considerable statement given that those same man-made diversions have already reduced the Colorado River from a whitewater gusher to a mere trickle by the time it reaches the Mexican border. [11]

In July 2012, one of the worst droughts in over a century prompted the US Department of Agriculture to declare a total of 1297 counties across 29 states, including the entire state of Missouri, as natural disaster areas.[12] To add insult to injury, excessive heat, high winds and wildfires further ravaged many of these same counties, causing staggering losses of crops and pastures. "With California facing one of the most severe droughts on record, Governor Brown declared a

NOTES

DESALINATION

Advocates of **desalination** praise it for its potential to alleviate the strain on scarce water supplies and ease the environmental consequences of diverting freshwater from rivers and streams to urban centers. But critics cite major environmental drawbacks -- namely the harm to marine life and the creation of the highly concentrated brine byproduct that gets discharged back into the ocean.[12] Desalination is also more expensive than recycling water and requires an enormous amount of energy to operate.

The City of Santa Barbara constructed the reverse osmosis seawater desalination facility as an emergency water supply in response to the severe drought from 1986 to 1991. [13]

After three years of below average rainfall, the City declared a drought on February 11, 2014. On July 21, 2015, in response to exceptional drought conditions, the Santa Barbara City Council voted unanimously to reactivate the Charles E. Meyer Desalination Facility By May 2017, following startup testing, the City began to distribute desalinated water into the City's water system.[14]

The City of Santa Monica evaluated desalination as part of its sustainable water master plan and concluded that the cost and environmental impacts do not make it feasible.

drought State of Emergency in January 2014 and directed state officials to take all necessary actions to prepare for water shortages."[15] In September 2014, Gov. Jerry Brown signed a trio of bills, including the The California Water Action Plan, thereby establishing a framework for statewide regulation of California's underground water sources for the first time in the state's history. [16] On April 7, 2017, following a winter of record abundant rainfall, the Governor issued Executive order B-40-17 ending the Drought State of Emergency in most of California an also rescinded state-mandated water use reductions. In addition, state agencies issued a plan to "Make water conservation a California way of life" as directed by Governor Brown's previous Executive Order B-37-16(May 2016). The plan requires new legislation to establish long-term water conservation measures and improved planning for more frequent and severe droughts.

Currently California's water supply and delivery system may not be able to meet Southern California's growing needs. With aging infrastructure and climate change our state faces a complex set of problems that threaten the future of our population, economy and environment.[18] Currently about 19% of California's electricity is required to transport our water around the state.[19] In 1996, five wells located at the Santa Monica-owned well field in the Mar Vista area of Los Angeles were shut down when testing revealed the presence of a gasoline additive, Methyl Tertiary Butyl Ether (MTBE). The contaminant leaked from underground storage tanks and product pipelines in the area surrounding the well field. Therefore, until 2010, the City had to purchase 80% of its drinking water supplies from the Metropolitan Water District of Southern California (which imports water from northern California and Colorado) to make up for the loss of the wells and meet the demands of its residents and businesses. In December 2006, a comprehensive settlement agreement with the responsible oil companies provided the funding to design and construct a state-of-the art water treatment facility that uses granular activated carbon (GAC) filtration and reverse osmosis (RO) to remove contaminants from the wells water.[20]

Currently, the City of Santa Monica gets 70% of its potable water supply from local groundwater. The remaining 30% comes from imported water originating in Northern California and the Colorado River. Santa Monica is expected to reach water self-sufficiency by 2023, using only local water to meet its needs.[21] For more information on Water Self-Sufficiency, visit the Office of Sustainability and the Environment online at sustainablesm.org/water.

In Southern California's hot, dry areas, the water required to maintain lawns and gardens can account for as much as 60% of water use in single-family homes. It is estimated that as much as 50% of water used for irrigation is wasted due to inefficient watering methods and systems, evaporation, wind, or runoff.[22]

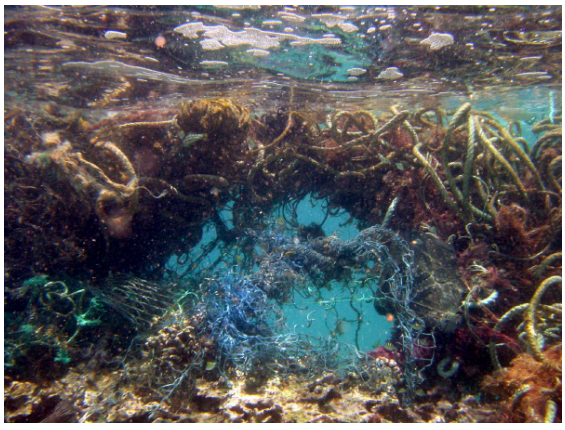
POLLUTION, RUNOFF AND THE VANISHING WATERSHEDS

Not only is water becoming scarcer, the world's remaining water is becoming increasingly more polluted. Virtually all manufacturing activities create unwanted by-products and pollutants and these pollutants are the cause of major water quality degradation around the world. Globally, the most pervasive water quality problem is the contamination of water resources by waste products that are high in the nutrients phosphorus and nitrogen mainly coming from raw sewage, fertilizers and animal waste from agricultural run-off.[23] According to the UN's World Water Assessment Programme, human activities such as deforestation and other land-use changes, soil degradation, withdrawals for agricultural and industrial use, and water contamination have a profound and often negative impact on the availability and quality of water resources.[24] And as global populations grow and food production increases, an increase in the flow of nutrient-rich waste into rivers and coastal ecosystems is also anticipated. More than 80% of sewage in developing countries is discharged without being treated, polluting rivers, lakes and coastal areas.[25] Many industries, including those known to be heavily polluting such as leather and chemicals – are moving from high-income countries to emerging market economies where oversight and water pollution controls are less stringent.[26]

Urban runoff occurs when storm or dry-weather runoff water flows through urban areas and picks up animal waste, fertilizer, motor oil and other contaminants, ultimately ending up in the ocean. Discarded nitrogen-rich, fossil fuel-based fertilizers and animal waste can cause algal blooms, which use up oxygen in the water, killing aquatic life and contributing to "dead zones" such as the one in the Gulf of Mexico.[27] During the first flush, the major concentration of storm water has the highest negative impact on water quality. The first flush takes place during the first rains of the season and picks up the largest amount of debris. The trash on your street may eventually end up floating next to you at the beach.

PLASTIC POLLUTION

Plastics pollute waterways and kill marine animals and birds. Plastics don't go away – they break down into smaller and smaller pieces and work their way up the food chain when they are mistakenly eaten by marine life. There are now 5 giant vortexes, known as **gyres**, of plastic trash floating in the world's oceans. The most famous, called the North Pacific Gyre, is more than 2x the size of Texas and floats about 1,000 miles off the coast of California. The plastic and toxins it attracts have become a part of the Pacific Ocean's ecosystem, killing birds and marine life [29].



Although renowned for our beaches, in 2014, the NRDC ranked California among the worst in beach water quality nationwide, coming in 11th out of all 30 coastal states.[28] Santa Monica Bay is one of the country's most important natural resources, providing the 9 million people who live in its watershed with a mild climate, aesthetic beauty, recreation, food, fresh oxygen and commercial opportunities.[30] The large and well-known Santa Monica Bay Watershed is actually comprised of numerous smaller watersheds. To find your local watershed and where it drains, go to epa.gov/surf. It's important to remember that urban runoff from all watersheds within the Santa Monica Bay Watershed drain directly into the Bay.

The watersheds and marshes – nature's own way of cleansing urban runoff before it enters the ocean – are also shrinking and becoming contaminated themselves. Wetlands are one of the world's most important environmental assets, containing a disproportionately high number of plant and animal species compared to other areas of the world.Throughout history they have been integral to human survival but both climate change and ever-increasing development have put our wetlands in danger. [31]

Many of our natural creeks have also been paved over and are unable to percolate water through the earth and naturally cleanse pollutants. Concrete channels also rob us of natural recreational areas, wildlife habitats, and create flooding hazards near our homes.

HIDDEN WATER

While ocean pollution and devastating droughts are large-scale and newsworthy water crises, there are also many different ways that we use (and misuse) water in our daily lives. Did you know that producing a single cup of coffee requires 55 cups of water?[32]

Every single thing that we eat, drink, wear and use requires some amount of water to produce and very often this amount far exceeds the size of the final product. It takes an estimated 39,090 gallons of water to make a car and 518 gallons to make a single car tire. It takes around 1,800 gallons of water to grow enough cotton to produce just one pair of blue jeans and a whopping 400 gallons of water to grow the cotton required for an ordinary t-shirt. In order to produce a single barrel of beer (32 gallons), it requires 1,500 gallons of water.[33]

Although it might be easy to picture the water used in washable clothes and cars, it is perhaps more difficult to imagine the vast amounts of water used to create a more intricate product like a computer. A microchip is tiny--weighing less than a teaspoon of water--but requires more than 70 pounds to make.[34] Along with excessive water, chemicals including phosphoric, sulfuric and nitric acids, along with gases and solvents such as boron, phosphorus and ammonia are used to create these chips The result is a wastewater sludge that continues to pollute Superfund sites with cancer-causing organic compounds such as trichloroethane, a chemical that was used in the early days of Silicon Valley until storage tanks leaked into community groundwater supplies When you switch on your computer in the morning, consider not only the amount of energy it takes to run the machine but also the amount of water it took to build it.

Along with our thirst for technology, the activity that has the highest impact on the world's water is our increasingly homogenized and modified food system. People around the world are consuming more and more meat and dairy products, water consuming foods from the highest levels of the food chain. Raising animals in factory farms for dairy products and meat, especially beef, requires incredible amounts of water, not only for the animal's consumption but primarily because of the water required to grow the crops that the animals eat. Producing these water intensive foods results in wasted water and it takes up valuable cropland that could be used to grow food for human consumption. Additionally, a shocking amount of animal waste comes out of these factory farms and pollutes the surrounding environments. California officials identify agriculture, including cows, as the largest source of nitrate pollution in more than 100,000 square miles of polluted groundwater.[37] One way to reduce water consumption is by purchasing more environmentally-friendly foods. For more information, check out the City of Santa Monica's Sustainable and Healthy Food Purchasing Guidelines online.

By using a water footprint calculator you can measure your own direct and indirect water use. These calculators help us to understand the total volume of freshwater that is used to produce the goods and services that we consume. Find out what your water footprint is using one of the many online calculators by

NOTES

searching "Water Footprint Calculator."

BOTTLED WATER & PRIVATIZATION

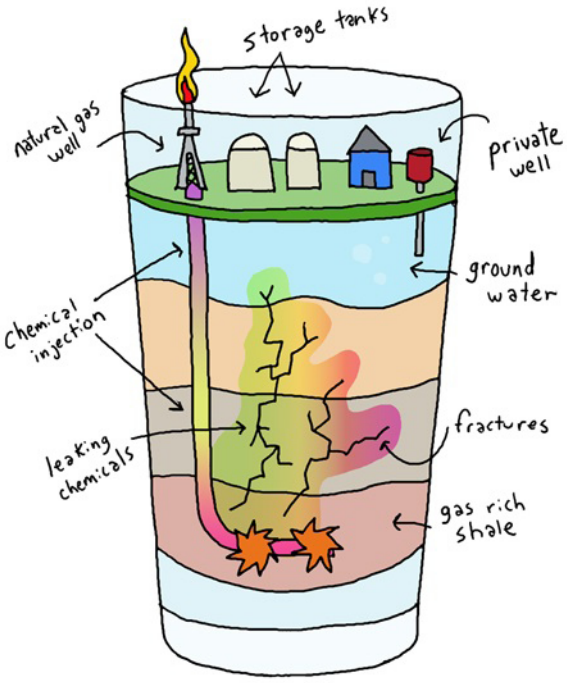
During this time of increasing water shortages and impending crisis, the privatization of water is emerging as a booming economic market. This new market is also sparking the debate over whether water is a product to profit from or a basic human right. On July 28, 2010, the United Nations General Assembly overwhelmingly agreed to a resolution declaring the human right to "safe and clean drinking water and sanitation."[38] At the same time, throughout the world, water and sanitation services are increasingly being sold by publicly owned entities to private companies. In addition, many water companies are buying up land where water resources exist in order to bottle and sell it, restricting or eliminating the local people's access to the water in the process. Sadly, many multinational corporations are prioritizing profits for their stockholders and executives over the basic needs of the communities they serve.[39]

This has not stopped communities around the world from standing up to corporations and demanding that their local water supply remain in local hands. In Felton, California citizens rallied to ensure that they could re-buy their local water from an international company who also controls all of the water in England. When the company acquired the water rights they proposed an increase of 74% over 3 years, terms that the residents of the town thought were reprehensible. The local group won popular support and the water is now owned by the people and their water bills have been reduced by nearly 50%.[40] A similar victory was shared by the citizens of McCloud, California who in 2008, won a decisive victory against Nestle's proposed water bottling plant that would have pumped 200 million gallons of water from nearby Mt. Shasta Springs [41] In 2015, environmental organizations filed a lawsuit demanding that the Forest Service halt Nestle's use of wells and piping in the San Bernadino National Forest. These groups argued that Nestle's contract with the agency had expired in 1988, yet the company had continued to pump water from the region without a renewed permit. In September 2016, a federal judge ruled that Nestle's permit was still valid..[42]

Many people choose bottled water because they think it is safer and healthier than tap water. Few realize that while the EPA does have strict quality standards for tap water it actually does not regulate bottled water. Instead, the FDA regulated bottled water, and studies show that bottled water is not more regulated, nor safer to drink.[43] In fact, bottled water has been proven to be less healthy because chemicals from the bottle contaminate the water. Regardless of the fact that much of bottled water is just packaged tap water, bottled water costs about 2,000 times more than tap water.[44] Still, Americans buy ½ billion bottles of water a week with 80% of these bottles ending up in landfills.[45]

HYDRAULIC FRACTURING

Hydraulic fracturing or '**fracking**' is a controversial drilling method used to extract natural gas from deposits deep below the Earth's surface. A mixture of toxic chemicals, sand and a tremendous amount of water is injected under high pressure into dense rock formations in order to crack the rock and release the natural gas. Accidents and leaks of this toxic mixture have polluted rivers, streams and drinking water supplies across the United States. Fracking is currently exempt from federal water and environmental protection regulations and the rapid expansion of this new form of drilling is causing widespread environmental degradation. For more about fracking see the Energy chapter. [46]



"What the frack?" by Option-G

Action Items

What the City of Santa Monica is Doing:

WATER SELF-SUFFICIENCY

The City of Santa Monica has pledged to be water self-sufficient by 2023. This means meeting our City's water needs without importing water. It can be done with your help!

THE BENEFITS

Self-sufficiency means ending the use of imported water, maximizing local water supplies and using water more efficiently. When you use water wisely you help:

- Reduce emissions of greenhouse gasses (GHG)
- Increase water reliability
- Reduce pollution
- Protect against drought
- Decrease impacts to fish and wildlife
- Preserve water for future generations
- Reduce the stress on Northern California and Colorado River water sources

USING WATER "WELL"

Improvements to the City's water treatment facilities now make it possible for Santa Monica to locally produce up to 70% of the water it uses everyday by pumping groundwater from City wells.

The well water supply is limited, however, which requires Santa Monica to import 30% of its drinking water from Northern California and the Colorado River. The most effective way to bridge the gap between supply and demand is to use water more efficiently and reduce water use.

TOGETHER WE CAN

Did you know that the average Santa Monican used 73.5 gallons of water each day in 2018? To meet the City's 100% self-sufficiency goal by 2023, each person needs to maintain this level – or 26,828 gallons, per person, per year. It's up to us to achieve this goal. In fact, the water use per person per day dropped to this level from 127 gallons in 2013, due to people's awareness and actions to combat drought, but that needs to remain permanent. We can do this together!

PLEDGE TO TAKE ACTION

Join your neighbors and pledge to help end our reliance on imported water.

On the website, www.sustainableSM.org/water, you'll find detailed, how-to instructions on how to save water and rebate information, where applicable. A knowledgeable representative is also available at (310) 458-8972 or email savewater@smgov.net for guidance.

IT'S UP TO US!

By working individually and together as a community to take long-term water efficient actions, we will help preserve the environment we all share and end our reliance on imported water.

Visit sustainableSM.org/water to learn how to use water more efficiently. It's Up To Us, Santa Monica.

DO YOU EVER...

- IGNORE A LEAKING FAUCET?
- TAKE A LONG SHOWER?
- LEAVE THE WATER RUNNING WHILE YOU BRUSH YOUR TEETH OR SHAVE?
- RUN THE DISHWASHER HALF FULL?
- POUR CHEMICAL CLEANERS DOWN THE DRAIN?
- HOSE OFF YOUR DRIVEWAY?
- WASH YOUR CAR ON THE DRIVEWAY AND LEAVE THE WATER RUNNING?
- EAT BEEF?

NOW YOU CAN...

❑ 1. FIND AND FIX LEAKS.

Local ordinances require that all leaks be fixed immediately. A toilet leak can waste 250 or more gallons per day.[47] According to WaterSense, a leaky faucet that drips at the rate of one drip per second can waste more than 3,000 gallons per year.

❑ Find leaks.

- To detect leaks in the toilet, add a colored liquid to the tank water and wait 15 minutes. If the colored water appears in the bowl then the toilet is leaking. (Flush as soon as the test is done, since food coloring can stain the bowl.)
- The City offers plenty of water saving tips and resources at at www.sustainablesm.org/water
- To detect other leaks, read your water meter when no water is being used. If the red triangle on your meter is spinning when the water is off, you know you have a leak.
- Regularly check for leaks in your sprinkler system. This can waste 600 gallons per month.[48]

❑ Fix leaks.

- Most replacement parts for your toilet are inexpensive, readily available and easily installed. Be sure to only use your toilet manufacturer's products. For an excellent online primer on toilet repair, visit toiletology.com.[49] Helpful how-to repair videos can also often be found online.
- Renters should inform landlords of any leaks immediately. Landlords are required to fix them.

❑ Free Water Use Consultation

- Santa Monica residents and businesses can have an expert in water conservation check for leaks and other water saving opportunities. A detailed site-specific recommendation report is provided including rebates and resources.

❑ 2. INSTALL WATER-SAVING DEVICES.

❑ Install a WaterSense toilet or go even lower with a PHET

- In most homes in the US, about 30% of water is flushed down the toilet.
- A WaterSense labeled toilet, or High-Efficiency Toilets (HET), uses only 1.28 gallons per flush, which is 20% less than older low flow toilets (1.6 gallons per flush). By replacing old, inefficient toilets with WaterSense labeled models, the average family can reduce water used for toilets by 20 to 60 percent—that's nearly 13,000 gallons of water savings.
- By installing the newest Premium High-Efficiency Toilets (PHET) you only use 1.06 gallons per flush or less! This is almost 20% less than the WaterSense standard and at least 34% less than older low flow toilets. Rebates for PHETs are available at www.sustainableSM.org/rebates

WaterSense℠ Meets EPA Criteria
Certified by IAPMO R&T

❑ Install a WaterSense showerhead.

- A WaterSense showerhead uses 2 gallons of water per minute compared to the average showerhead that uses 2.5 gallons per minute.[50]

A family of four could save 2,900 gallons of water a year if they installed a 2 gallon per minute water saving showerhead [51] (and 14,000 gallons if they installed a 1.5 gpm showerhead!).[52] Free 1.5 gpm showerheads are available from the City of Santa Monica at 1717 4th St, Suite 100.

❑ Install **aerators** on your kitchen and bathroom faucets that use no more than 1.5 gallons per minute.

Aerators reduce the water flow and add air to the water so you'll feel greater pressure with less water. This can reduce indoor water use by as much as 40%. Free faucet aerators are available for residents from the City of Santa Monica at 1717 4th St, Suite 100.

❑ Install an automatic shutoff nozzle on your garden hose. Free hose nozzles are available for residents from the City of Santa Monica at 1717 4th St., Suite 100.

❑ 3. BUY WATER SAVING APPLIANCES.

❑ **WaterSense**, a partnership program sponsored by the U.S. Environmental Protection Agency (EPA), is making it easy to find and select water-efficient products with a label backed by independent testing and certification. WaterSense will also recognize professional service programs that incorporate water efficiency. Generally speaking, WaterSense labeled products will be about 20% more water efficient than their less efficient counterparts in the same category. In addition, WaterSense labeled products perform their intended function as well as or better than their less efficient counterparts, while lowering your water bill.

❑ Install a horizontal axis (h-axis) or "front loader" washing machine. Front loaders can reduce water usage by 40-60% and use up to 30-50% less electricity than standard washers.[53] Santa Monica residents can visit sustainablesm.org/rebate or call your local water supplier to see if they have any rebate offers.

❑ 4. INCREASE THE EFFICIENCY OF YOUR APPLIANCES.

❑ Operate your clothes washer only when completely full.

❑ Use the appropriate water level or load size selection on the washing machine. Clothes washers can use as much as 30-45 gallons of water per cycle.[54]

❑ Operate the dishwasher only when completely full. Old dishwashers use as much as 10 gallons per cycle, new dishwahers use 5 gallons or less. A full dishwasher is more water efficient than washing the same load by hand.[55]

❑ 5. CHANGE YOUR BEHAVIOR.

Aside from the need to conserve water because it is a non-renewable resource, curbing our water appetite will also reduce the energy and chemicals needed to treat our sewage and septic systems. This treated water then needs to be recycled or dumped into our waterways, upsetting the natural balance of local wildlife. More water to be treated and disposed of also means higher utility rates for all of us.

❑ Turning off the water when brushing your teeth or shaving can save more than 8 gallons of water per day.[56]

❑ Taking short showers instead of baths can save an average of 45-60 gallons of water per wash.[57]

❑ Turn off the water while lathering with soap or shampooing.

❑ Keep a bucket or a large pitcher in the bathroom/kitchen to capture excess water while you are waiting for the hot water to make it to the faucet. You can use this water for your pets, plants, to wash produce, to cook with, etc.

❑ Reduce the water flow in your sinks so that its width is no wider than the width of a pencil. One way to do this is to adjust the water flow altogether by moving the knobs underneath the bathroom and kitchen sinks.

❑ Keep drinking water in the refrigerator instead of letting the faucet run until the water is cooled.

❑ Choose tap water instead of bottled water. Download the "Take Back the Tap Guide to Safe Tap Water" from foodandwaterwatch.org. Visit http://www.ewg.org/report/ewgs-water-filter-buying-guide to find EWG's Water Filter Buying Guide and check out EWG's National Drinking Water Database which compiles testing results from water utilities so you can see what pollutants are in your tap water.

- Visit EWG's Guide to Safe Drinking Water at http://www.ewg.org/tap-water/

- Wash fruits and vegetables in a basin rather than under running water.
- Allow frozen foods to thaw in your refrigerator overnight instead of running water over them.
- Scrape dishes (instead of rinsing them) before loading them into the dishwasher.
- Add food waste to your compost pile instead of using the garbage disposal.
- Sweep driveways, sidewalks and steps instead of using a hose.
- Wash your car with a waterless car wash product, water from a bucket, or use a commercial car wash that recycles water.
- If you have a pool, use a cover to reduce evaporation when it's not being used (be sure your cover is ASTM rated).
- Learn about your water footprints. A **water footprint** is an indicator of both direct and indirect water use of a consumer or producer. The water footprint of an individual, community, business, or product is defined as "the total volume of freshwater that is used to produce the goods, services, or products used or consumed."[58] You can calculate your own water footprint searching online for "Water Footprint Calculator."
- Report water waste. Include address, violation, date and time. In Santa Monica email waterwaste@smgov.net or call 310-458-8972. If you have an iPhone or Android you can download the free Santa Monica Works app (formerly GO) at www.smgov.net/santamonicaworks.aspx that allows you send violation reports (including photos, comments and GPS locations) directly to the city of Santa Monica from your phone.

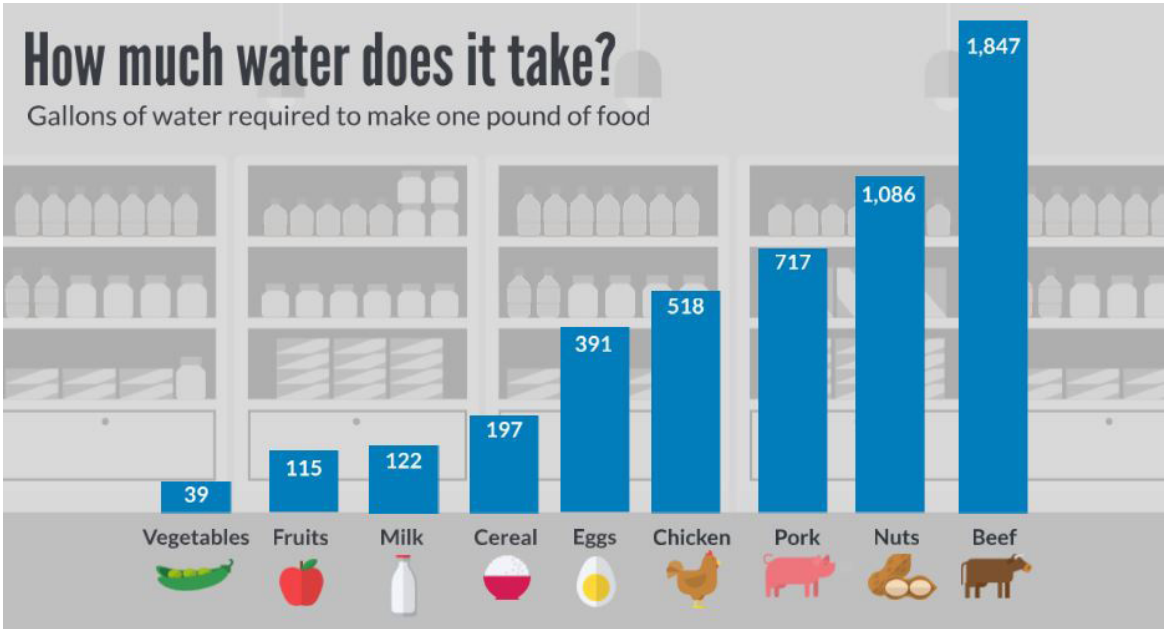
6. EAT LOWER ON THE FOOD CHAIN TO HELP CONSERVE WATER AND TO MINIMIZE POLLUTION.

"Lower on the food chain" means enjoying more whole grains, legumes and local, organic produce. Items higher on the food chain include meats and processed foods that require incredible resources to grow, transport, package and distribute.

Producing beef and other water-intensive foods results in not only wasted water but also higher land use and pollution of the surrounding environments. California officials identify agriculture, including cows, as the largest source of nitrate pollution in more than 100,000 square miles of polluted groundwater.[59]

Discarded nutrients in animal waste cause algal blooms, which use up oxygen in the water and kill aquatic life and contributing to a "dead zone" in the Gulf of Mexico. This dead zone is the second largest in the world.[60] It fluctuates in size each year and currently covers over 6,000 square miles of seafloor, about the size of the states of Connecticut and Rhode Island combined[61]

Amount of water required to produce one pound of food:[62]



The amount of water used to grow a single pound of beef equals the water used in approximately 6 months of daily 8-minute showers with a 2 gallon-per-minute showerhead. You can save more water by not eating a pound of beef than you would save by not showering for a year.[63]

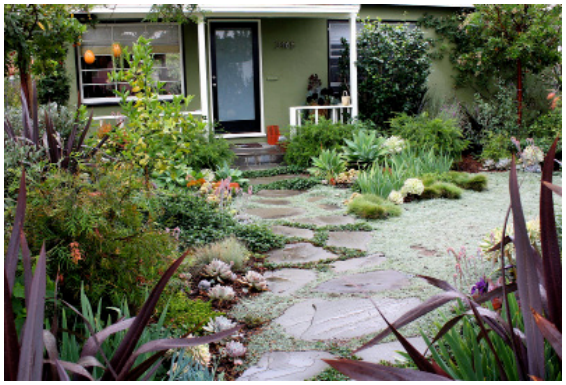
7. UPGRADE TO A SUSTAINABLE GARDEN

- Landscaping with **climate appropriate** and/or California **native plants** has many advantages, including:
  - Minimal water use. Plants that are native to California and Mediterranean climates will continue to thrive during droughts.
  - Require no fertilizers since the plants are adapted to the natural soil conditions. Be sure to identify your soil type prior to choosing plants.
  - If your soil and plants are healthy, your plants will be more resistant to natural pests and disease.
  - Native plants will provide a great habitat for local wildlife like birds and bees.
  - Visit the city of Santa Monica's demonstration garden at 3200 Airport Ave., Santa Monica, CA, 90405
  - Santa Monica City residents can take advantage of the City's Sustainable Landscape Rebate Program ("cash for grass") by visiting www.sustainablesm.org/rebates or calling 310-458-8972 x 1.

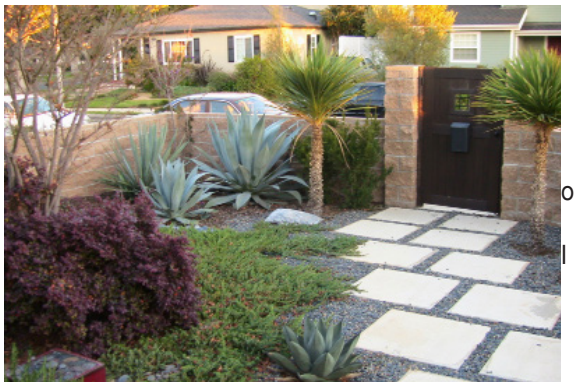
- Install **drip irrigation** or high efficiency nozzles on your sprinklers (i.e. rotary nozzles) with pressure-regulating devices and adjust to make sure that you're only using as much water as your plants truly need. Traditional sprinklers often over-water plants and grasses. Converting sprinklers to drip around your shrubs can save up to 80% on your water use. Go to sustainablesm.org/landscape for more information.[64]

- Sign up for sustainable landscaping classes at www.bewaterwise.com/training.shtml

- Minimize your lawn and its needs. The best substitute for a lawn is a native garden. A typical suburban lawn may need up to 22,000 gallons of water annually in addition to rainfall. Lawns also do not provide much water-storing capacity or habitat for native wildlife while requiring fertilizers and polluting gas-powered maintenance equipment.[65]
  - If you need a lawn, choose a warm season variety like Carex (native grass) or Buffalo grass UC Verde or native Bent grass. These grasses are lush, beautiful and require very little care since they have adapted for our climate. For a more detailed list of warm-season grasses, visit sustainablesm.org/landscape.
  - Water in the early morning (before 5 a.m. if possible) to reduce evaporation and to prevent water from sitting on the plants, which welcomes pests and causes disease creating the need for chemicals. Watering restrictions are in place throughout Southern California. In Santa Monica no spray irrigation is allowed any day of week between 10:00 am to 4:00 pm. In addition Santa Monica now prohibits spray irrigation systems for new commercial developments and homes, prohibits turf grass on new commercial developments and limits turf grass to 20% of the irrigable area for new homes. For more restrictions visit, sustainablesm.org/water. For other cities, find out at bewaterwise.com or call your local city or water supplier.
  - Adjust the sprinklers' water spray pattern to reduce the amount of water that comes out of each sprinkler thereby eliminating overspray and runoff.
  - Run the cycle and soak schedule on your automatic sprinkler system. To find out how much water your plants need, visit lacoastalgardens.com then click on the watering tips tab.



- Use these sources for native plant species and other climate-appropriate landscaping ideas (See Support Tools for additional native plant organizations):
  - lacoastalgardens.com
  - Theodore Payne Foundation theodorepayne.org
  - Surfrider Foundation Ocean Friendly Gardens surfrider.org/ofg.asp



- Use **mulch**. Two to four inches of organic mulch, such as finely shredded bark, shredded leaves or gravel, will slow evaporation of moisture in the plants' root area. Mulch also shades and cools the soil, in addition to slowing water runoff and suppressing weeds. It enriches plants, building healthy soil as it slowly decomposes.[66] Mulch is the top dressing over the soil and should not be confused with compost which a soil amendment that is incorporated into your soil before you plant.[65]

- For local organic mulch visit lacoastalgardens.com
- For compost bins: Santa Monica residents call (310) 458-8546; Los Angeles residents: san.lacity.org/srpcd/mulch_compost.htm.

❑ Harvest rainwater. Check your city's rebate programs (Santa Monica residents call (310) 458-8223 and see the Support Tools for rain barrel and rain chain sources.

- Use a rain barrel to capture rain from your roof, storing it for use in irrigating your plants.
- Build a dry creek and/or permeable surfaces to capture rainwater for irrigating your garden and preventing urban runoff.
- Use a rain chain to divert rainwater from your roof into a permeable streambed or shrub bed.
- Divert your gutter to the landscape. Accordion-style diverters can be found at local hardware stores.

❑ 8. INSTALL A GREYWATER SYSTEM.

Greywater is wastewater collected from clothes washers, bathtubs, showers, and laundry or bathroom sinks. The water is collected, filtered and redirected for irrigation. A typical four-person home with older plumbing fixtures can save ~30,000 gallons per year (about $400) using a greywater system.[67]

❑ Speak to your local Building and Safety Department about rules and regulations concerning greywater systems. Greywater systems are not appropriate or legal in all areas. Santa Monica's Greywater Guidelines can be found at sustainablesm.org/landscape (navigate to more>Graywater in the side menu).

❑ Other greywater resources include L.A. Greywater Action (offers workshops and a list of contractors) greywateraction.org, the Oasis Design at oasisdesign.net or (805) 967-9956, Ecowaters Project at ecowaters.org (978) 318-7033, and Rocky Mountain Institute at rmi.org or (970) 927-3851. L.A. Greywater Action offers workshops, greywateraction.org

❑ 9. REDUCE YOUR CONTRIBUTION TO URBAN RUNOFF AND WATER POLLUTION.

Urban runoff is a serious concern, in both dry and rainy seasons. It can be contaminated with pesticides, fertilizer, animal droppings, trash, food wastes, automotive by-products and other toxic substances that are part of our urban environment. Waters that flow over streets, parking lots, construction sites and industrial facilities carry these pollutants through a storm drain network or open creeks and eventually drain (usually untreated) into the beaches where you swim. Storm water/urban runoff is considered the number one source of pollution to Santa Monica Bay.[68] The water that drains from your toilets, showers, faucets, clothes washers, goes down the sewer pipe to a wastewater treatment facility where it is treated then dumped into the ocean.

❑ Avoid dumping any hazardous materials down the storm drain, street, alley or indoor or outdoor drains. Every time you pour hazardous cleaners, medications, paint and other chemical products down the drain or toilet, you're making it harder for your local wastewater treatment plants to do their job. Treatment plants are only designed to treat sewage, not harmful chemical products. The chemicals added to your wastewater will reduce the potential of the treatment system in keeping pollutants out of our waterways, while increasing the costs of treating the water.

❑ Create permeable surfaces to capture storm water. For ideas, visit sustainablesm.org/runoff or the Surfrider Foundation's Ocean Friendly Gardens website at surfrider.org/ofg.asp.

❑ Keep your car free from leaks. Dripping transmission fluid, oil and other automotive liquids will always end up in the bay.

❑ Wash your car with one of the effective waterless car wash products, they work extremely well and actually reduce the amount of scratches caused from the minerals in the water.

- EcoTouch - ecotouch.net
- Freedom - freedomwaterlesscarwash.com

❑ 10. GET ACTIVE

❑ Volunteer

- Food and Water Watch

- Heal the Bay
- Santa Monica Baykeeper
- Sierra Club Los Angeles Chapter Water Committee
- Surfrider Foundation

❑ Write a letter

- Coastal Protection
- Ballona wetlands/wetland conservation
- Visit Environment California's web site for current water issues
  environmentcalifornia.org
- Stay abreast on the latest latest updates to Chemical Safety Improvement Act

❑ Participate in the following thematic events:

- California Coastal Clean-up Day – Third Saturday of September
- World Water Day – March 22nd
- International Day of Action for Rivers – March 14th - internationalrivers.org

❑ Find a green job or new ways to make your current job more sustainable.

Non-Native Species of California Coast – the Cig-Egret

NOTES

GREEN JOBS – WATER

WATER QUALITY

- **Utility Worker** – A great opportunity for semi-skilled workers with a high school degree or its equivalent to begin a career in the environmental sector. Utility Workers assist in the maintenance and subsequent repair of water distribution and wastewater collection systems, a vital role in water conservation and management. There are openings for upward mobility in supervision and high-level utility positions.
  - Look into www.amwater.com for information on how to be recruited as a valued utility worker.

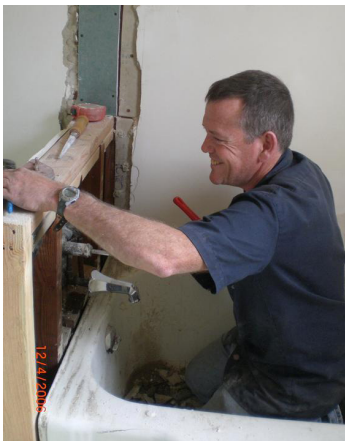
- **Water Treatment Plant Operator** – Operate or control an entire process or system of machines, often through the use of control boards, to transfer or treat water or liquid waste. A high school diploma or equivalent is the typical education/ training requirement. However, the completion of an associate's degree or a one-year certification program in water quality and wastewater treatment technology increases a person's chances for employment or promotion. Approximately 115,000 new jobs are expected to be created in this field by 2016. Most of these jobs (78.95%) are expected to be in local government. Typical salaries range from $28,120 to $45,190.

- **Water Resources Manager/Specialist** – Ensures that the public has safe water to drink and that purified water is returned to rivers, streams, and oceans. Emphasis is on master planning, watershed management, including land conservation, land use planning, agricultural engineering, toxicology assessments, mapmaking, hydraulic modeling, and designing distribution systems. Employers will look for a bachelor's degree in chemical, biochemical, civil, or environmental engineering, environmental studies, or hydrology, with postgraduate work growing more necessary as the facilities grow more complex. Salary averages around $116,840.
  - Go to www.waterjobsonline.com for listings in the United States and abroad.

- **Water Quality Consultant** – Deal with issues surrounding water quality discharge permitting. A Bachelor's Degree in a related field is required but a Masters Degree in Professional Engineering is recommended. Areas of recommended college coursework include; Hydrology, Wastewater, Engineering, Permitting and Land Use. A high level of experience is needed with 3-5 years with water quality issues recommended. Salary ranges from $72,000 to $92,000 a year. The American Job Center Network predicts 13,700 new environmental scientist and specialist jobs by 2022.
  - Visit the Water Environment Federation at http://www.wef.org/ for information on technical education and training for water quality professionals who clean water and return it safely to the environment

WATER CONSERVATION

- **Plumbing Retrofitter** – Excellent emerging career path that with have meaningful impacts on water conservation, reuse, and efficiency. Plumbing retrofitters are commissioned by single family homes, multi-family complexes, business and municipalities to evaluate current plumbing, make recommendations, and finally to install appliances such as low or dual flush toilets, low flow faucets and shower heads, in addition to any extensive renovation of the plumbing infrastructure. Aspiring retrofitters should have some secondary level education in a community, vocational or technical college. Moreover, a plumbing license is necessary and can be obtained by either apprenticeship training or certification through community colleges or other programs.
  - For more information on starting a careers as a plumbing retrofitter visit www.greencareersguide.com/Plumber-Retrofitter-Water-Conservation.html



- **Water Systems Designer/Engineer** – Design and install energy efficient water systems in residential and commercial settings. There is a huge potential for growth as building codes change. A minimum of a secondary level education in Trade School or Apprenticeship training is required. Areas of recommended college coursework include; Plumbing, Pipefitting, Energy Efficiency, and Mechanical Engineering. Salaries are equal to those in other engineering fields.
- **Water Conservationist** – Plan and develop coordinated practices for water conservation. A Bachelor's degree in fields such as environmental studies, general agriculture, or hydrology is usually required. In the federal government, a combination of experience and appropriate education occasionally may substitute for a four-year degree. Approximately 1,000 new jobs are expected to be created in this field by 2016. The majority of these jobs will be in Federal, State and Local government. Salary averages $61,220.
- **Landscape Designer** – Design and install beautiful landscapes that utilize drought tolerant and native plants and conserve valuable resources. Landscape designers work closely with architects, hydrologists, engineers and gardeners. A Bachelor's or Master's degree in landscape design is usually required. In addition, specific training on drought tolerant and native landscaping practices, as well as strong communication skills will help a landscape designer be successful. Average salary for a landscape designer in California is $77,200.
- **Water Conservation/Efficiency Product Sales & Marketing** – From water-less urinals to rain-barrels to the latest and greatest low-flow showerhead, the range of products designed to help conserve water resources are abundant. Getting those products into the hands of the customers who will use them requires a sales and marketing strategy and individuals who can carry that strategy out. The educational requirements for these types of sales and marketing jobs are not cut and dried but a Bachelor's or Master's degree in Business or Marketing would certainly be beneficial.

REFERENCES

Green Careers – Choosing Work for a Sustainable Future by Jim Cassio & Alice Rush
Green Jobs: A Guide to Eco-Friendly Employment by Llewellyn, Hendrix, Golden
Great Jobs for Environmental Studies Majors by Julie DeGalan & Bryon Middlekauff
Career One Stop
American Job Center Network

SUPPORT TOOLS

How Do We Use Our Water?

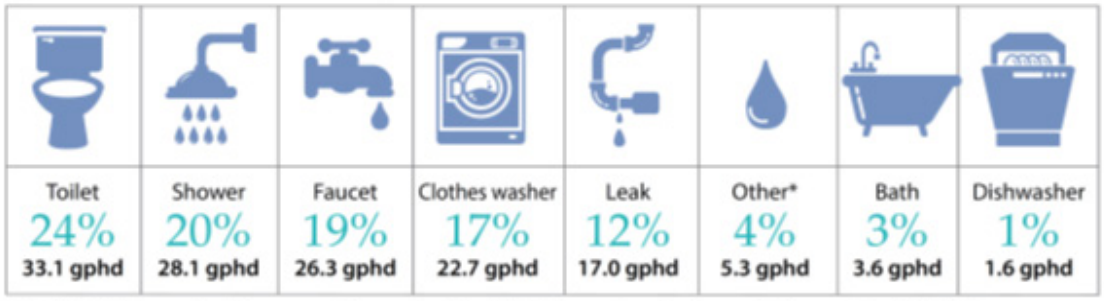
RESIDENTIAL INDOOR WATER USAGE IN AVERAGE U.S. HOME

HOW MUCH WATER DO WE USE?

Daily water demand is approximately 10.17 million gallons per day in Santa Monica.

U.S. indoor residential water use is estimated to average 88,000 gallons per household per year (241 gallons per household per day). The average water use per person is estimated to be 58.6 gallons per day. [69] Outdoor use varies tremendously: your use could be insignificant or, if you have a large lawn which requires watering, it could be more than 200 gallons per day. To be certain, compare your winter and summer water bills.

Figure 1. Indoor household use by fixture

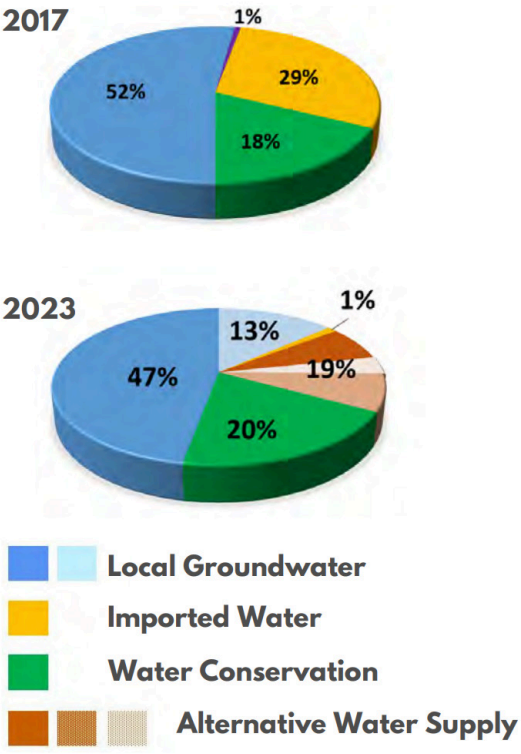


* The "Other" category includes evaporative cooling, humidification, water softening, and other uncategorized indoor uses.

WHERE DOES OUR WATER COME FROM?

Our watershed does not currently meet all the water needs of our community. However, in 2011 Santa Monica made great progress towards our goal of water self-sufficiency with the reopening of previously contaminated local wells. Currently the City imports approximately 30% of its water from the Colorado River and Northern California. The charts show water use in Santa Monica as of 2017. Santa Monica is projected to be water self-sufficient by 2023. Data from City of Santa Monica Office of Sustainability and the Environment.

SANTA MONICA WATER SOURCES DURING 2017 AND ITS PROJECTED 2023 SOURCES



GLOSSARY OF KEY TERMS

Aerator a device that screws into the threads of a water faucet that infuses the water with air, infusing the water with air decreases the amount of water used while increasing pressure. Aerator flow is rated in gallons per minute (GPM).

Dead Zone: Areas in the world's ocean that are depleted of oxygen and are created when chemical fertilizers and other nitrogen rich pollutants flow into the ocean. This causes an increase in phytoplankton and algal bloom, a phenomenon that removes oxygen from the water and causes it to be unlivable for most marine and plant life.

Desalination: The process of removing salt and other minerals from salt water to produce fresh water suitable for human consumption. The process is extremely expensive and uses a huge amount of energy. It also produces byproducts that can be harmful to marine life.

Drip Irrigation: A slow, even application of low-pressure water to soil and plants using plastic tubing placed directly at the plants' base. This method results in very little evaporation or runoff, saving water by directing it more precisely, reduced transmission of pathogens, and fewer weeds.

Drought is a condition of moisture deficit sufficient to have an adverse effect on vegetation, animals, and man over a sizeable area. (Warwick) Drought Resistant Plants are plants that can grow in dry situations (i.e. require little or no additional irrigation) once they get established.

First Flush is the initial surface runoff of a rainstorm. During this phase, water pollution is more concentrated compared to the remainder of the storm.

Climate Appropriate Plants are plants that can grow in dry situations (i.e. require little or no additional irrigation) once the plant is established.

Fresh Water is water that contains less than 1,000 milligrams per liter (mg/L) of dissolved solids; generally, more than 500 mg/L of dissolved solids is undesirable for drinking and many industrial uses.

Greywater recycling is the re-use of water that has been used in low impact needs, such as showering and bathing, hand washing, and clothes washing. The water is collected, filtered and redirected for secondary use such as irrigation.

Gyre: Any large system of rotating ocean currents, particularly those involved with large wind movements. There are five major ocean gyres on Earth and each has become a collection points for plastic pollution coming from land that are pulled into the rotating currents and trapped there.

Native Plants are plant species that have evolved and adapted to local conditions over thousands of years and are usually much more tolerant to the prevailing weather extremes at a given location. They have adapted to survive winter cold and summer heat, periodic drought, wild fires and high winds. Once established, most species require little or no additional irrigation beyond normal rainfall and because they typically grow more slowly, they generate much less yard waste. Native plant species are well adapted to unaltered, local soil conditions, thriving without artificial fertilizers. Additionally, native plant species are generally more resistant to local pests and diseases, although invader pests and diseases may prove problematic. It is easy to see that native plant species are very well adapted for inclusion in "low-maintenance" gardens and landscapes. (Los Angeles County Department of Public Works)

Premium High-Efficiency Toilet a toilet that flushes at 1.06 gallons or less per flush.

Potable Water or **Drinking water** is water safe enough to be consumed by humans or used with low risk of immediate or long term harm.

Storm Water Runoff See Urban Runoff

High-Efficiency Toilet a toilet that flushes at 1.28 gallons or less per flush or less.

Urban Runoff is a mixture of water and a variety of possible pollutants such as trash, human, animal and food wastes, paint, fertilizers, pesticides, construction rubble, gasoline, and oil that are carried through open creeks or the storm drain system to our open ocean. Except in rare cases (such as the Santa Monica Urban Runoff Facility), these pollutants are not filtered or treated in any way. Many of these pollutants are hazardous to ocean animals and plants, and may cause illness in people who go into the ocean near flowing outfalls.

Water Consuming Foods an excessive amount of water is utilized in production of these types of foods.

Watershed is a boundary defined by the flow of water - all water within a watershed flows to a single discharge point. Many of us live in a small, local watershed (such as the Santa Monica Watershed) that drains into a larger watershed (such as the Santa Monica Bay Watershed). Everyone lives in a watershed – to see which watershed you live in, see pg. 63.

Check out the Green Map for the Ballona Creek Watershed at www.lagreenmap.org.

ENDNOTES

1. “Water for Life Decade - Human Right to Water.” United Nations. N.p., n.d. Web. 01 Sept. 2016.
2. “EPA WaterSense - Water Education & Our Water Cycle - Water Use Today.” United States Environmental Protection Agency. N.p., n.d. Web. 01 Sept. 2016.
3. City of Santa Monica Water Resources Division, SWRCB Reports, 2018.
4. More than Water - Impact Evaluation of Drinking Water Supply and Sanitation Interventions in Rural Mozambique. UNICEF. (2011, October). https://www.oecd.org/countries/mozambique/49295401.pdf.
5. “Water Scarcity.” United Nations Water. N.p., 2013. Web..
6. U.S. Geological Survey. “The World’s Water.” USGS Water-Science School. N.p., n.d. Web. 01 Sept. 2016..
7. Shiklomanov, Igor. “World Fresh Water Resources.” Water in Crisis: A Guide to the World’s Fresh Water Resources. By Peter H. Gleick. New York: Oxford UP, 1993. N. pag. Print.
8. Sheremet, Agata. “Russia Unlikely to Return to Deficit-ridden Grain Market before Winter- Analysts.” RIA Novosti. N.p., 15 Mar. 2011. Web.
9. Phillips, Tom. “Drought Brings Amazon Tributary to Lowest Level in a Century.” The Guardian. Guardian News and Media, 27 Oct. 2010. Web. 23 June 2014.
10. Taylor, Alan. “Famine in East Africa.” The Atlantic. Atlantic Media Company, 27 July 2011. Web. 23 June 2014.
11. ”8 Mighty Rivers Run Dry From Overuse.” National Geographic. N.p., n.d. Web. 01 Sept. 2016..
12. USDA. Office of Communications. USDA Designates an Additional 39 Counties in 8 States as Primary Natural Disaster Areas Due to Worsening Drought. Usda.gov. Web. 18 July 2012.
13. “Desalination” santabarbaraca.gov. Web. 30 January 2018.
14. “Desalination” santabarbaraca.gov. Web. 30 January 2018.
15. “California Drought” ca.gov/drought. Web.
16. Mason, Melanie. “Gov. Jerry Brown Signs Historic Groundwater Management Legislation.” LA Times. N.p., 16 Sept. 2014. Web.

18. Fountain, Henry. “In California, a Move to Ease the Pressure of Aging Dams” The New York Times. N.p., 28 Feb. 2017. Web.
19. Copeland, Claudia, and Nicole Carter. “Energy-Water Nexus: The Water Sector’s Energy Use.” Congressional Research Service. N.p., 24 Jan. 2017. Web.
20. Seascape. Santa Monica: City of Santa Monica, Winter 2010/2011.
21. Water Quality Report. Santa Monica: City of Santa Monica, June 2018.
22. WaterSense. “Outdoor Water Use in the US.” EPA. Environmental Protection Agency, n.d. Web.
23. “Nutrient Pollution.” Environmental Protection Agency. N.p., n.d. Web. 01 Sept. 2016..
24. World Water Assessment Programme. “Water for a Sustainable Word.” United Nations World Water Development Report. Paris, France. 16 March 2015.
25. “Facts and Figure: Water Pollution on the Rise Globally.” UNESCO. Web.
26. ”Nutrient Pollution.” Environmental Protection Agency. N.p., n.d. Web. 01 Sept. 2016.
27. The Floods’ Lingering Effects: New Study Shows Gulf “Dead Zone” One of the Largest on Record.” The Nature Conservancy. N.p., n.d. Web
28. Dorfman, Mark and Haren, Angela. "Testing the Waters." NRDC. June 2014. Web.
29. Lebreton, L., et al. “Evidence That the Great Pacific Garbage Patch Is Rapidly Accumulating Plastic.” Nature.com. 22 Mar. 2018. Web.
30. Littlefield, Amy. “California: Beaches Face Rising Tide of Pollution Natural Resources Defense Council Reports a 4% Increase in Violations.” Los Angeles Times. Los Angeles Times, 29 July 2009. Web.
31. ”Coastal Wetlands.” Environmental Protection Agency. Environmental Protection Agency, n.d. Web. 01 Sept. 2016
32. “Product Water Footprints: Coffee and Tea.” Water Footprint Network. 2014.
33. “Water Footprint and Virtual Water.” Water Footprint Network. 2014. Web.
34. “Your Computer’s Lifetime Journey.” NRDC. N.p., 30 Nov. 2011. Web.
35. Williams, Eric D., Robert U. Ayres, and Miriam Heller. “The 1.7 Kilogram Microchip: Energy and Material Use in the Production of Semiconductor Devices.” Environmental Science & Technology 36.24 (2002): 5504-510.
36. “Your Computer’s Lifetime Journey.” NRDC. N.p., 30 Nov. 2011. Web.
37. “Facts about Pollution from Livestock Farms.” NRDC: 21 Feb. 2013. Web.
38. “General Assembly Declares Access to Clean Water and Sanitation Is a Human Right.” United Nations News Centre. United Nations, 28 July 2010. Web.
39. “Facts and Figures: Problems with Water and Sewer Privatization.” Food Water Watch General. Web.
40. Lohan, Tara. “How Felton, Calif., Achieved Water Independence.” YES! Magazine. 27 May 2010. Web.
41. Fried, Kate. “Activists Celebrate Nestle Withdrawal From McCloud, Calif.” Food & Water Watch General. N.p., 11 Sept. 2009. Web.
42. Kelman, Brett. “Nestle Can Keep Piping Water from National Forest, despite Permit That Is 28 Years out of Date.” Desert Sun. N.p.,Sept 2016. Web.
43. “The Truth About Tap.” National Resource Defense Council. N.p., n.d. Web. 01 Sept. 2016..
44. Boesler, Matthew. “Bottled Water Costs 2000 Times As Much As Tap Water.” Business Insider. Business Insider, Inc, 12 July 2013. Web
45. Schriever, Norm. “Plastic Water Bottles Causing Flood of Harm to Our Environment.” Huffington Post Green. Huffington Post, 29 July 2013.

Web.
46. Tiemann, Mary and Vann, Adam.“Hydraulic Fracturing and Safe Drinking Water Act Regulatory Issues". Congressional Research Service. 13 July 2015. Web.
47. “Toilet Leak Detection.” NYC Environmental Protection. N.d., Web.
48. “Water.” Santa Monica Office of Sustainability and the Environment. City of Santa Monica, n.d. Web.
49. “Toilet Care and Repair Course.” Toiletology 101. Web.
50. “Conserving Water.” EPA. Environmental Protection Agency. Web.
51. “Conserving Water.” EPA. Environmental Protection Agency. Web.
52. “EPA WaterSense.” EPA. Environmental Protection Agency. Web.
53. Robertson, James. “Washing Machines Buying Guide.” National Geographic. Web.
54. “Residential Clothes Washer Introduction.” Alliance for Water Efficiency. Web.
55. Jacewicz, Natalie. “To Save Water, Should You Wash Your Hands of Hand Washing Dishes?” NPR. 24 Nov. 2017. Web.
56. “Conserving Water.” EPA. Environmental Protection Agency. Web.
57. “Conserving Water.” EPA. Environmental Protection Agency. Web.
58. “Introduction.” Water Footprint and Virtual Water. Water Footprint Network. Web.
59. “Facts about Pollution from Livestock Farms.” NRDC: 21 Feb. 2013. Web.
60. “What Is Hypoxia?” Hypoxia in the Northern Gulf of Mexico. Louisiana Universities Marine Consortium. Web.
61. ”2015 Gulf of Mexico Dead Zone ‘above Average’” National Oceanic and Atmospheric Administration (NOAA). N.p., 4 Aug. 2015. Web
62. Hoekstra, Arjen Y. “The Water Footprint of Food.” Waterfootprint.org. N.p., n.d. Web.
63. “Efficiency Is the New Conservation.” Denver Water, www.denverwater.org/tap/efficiency-new-conservation.
64. “An Overview of Drip Irrigation.” UMassAmherst. The College of Natural Sciences, n.d. Web. 02 July 2014.
65. “Conserving Water.” EPA. Environmental Protection Agency. Web.
66. Prinzing, Debra. “Imagine: Rain, Rain, Stored Away.” Los Angeles Times. Los Angeles Times, 17 Jan. 2008. Web.
67. “FAQs.” Greywater Corps. Web.
68. “Urban Runoff.” Office of Sustainability and the Environment. City of Santa Monica, 2014. Web.
69. “Residential End Uses of Water, Version 2” The Water Research Foundation. 2016. Web.