

3. Water

TRANSITION



STREETS



This page intentionally left blank.

Transition Streets

3.1 WATER OVERVIEW

Water is essential to all of life on our planet. It covers about 70% of the Earth's surface and yet less than 1% of that is fresh water available for human use. This small fraction must be shared by over 7 billion people globally for domestic, agricultural, industrial and environmental use.

In the U.S., the average person uses about 88 gallons of water every day,^[1] or an average of 350 gallons per household.^[2] That's a drop from a high of 112 gallons per person in 1982.^[3] That decline was partly the result of federal policies that improved the efficiency of water-using appliances.

While our water use is declining, it remains much higher than in other wealthy nations, and is nearly twice the global average. In the U.K., the average person uses 37 gallons a day; in Germany, 32 gallons a day.^[4]

Right now, aquifers and waterways across the nation are under pressure from droughts, damaging floods, industrial contamination, agricultural run-off and other forms of pollution.^[5] Drought has hit the Western states particularly hard. In 2018, California experienced the most destructive wildfires on record. In 2017 and again in 2018, Montana's Glacier National Park burned out of control.

Indoor Household Water Use



Source: Water Research Foundation Residential End Uses of Water, Version 2, 2016.

The federal government's recently released [National Climate Assessment](#) (2018)^[6] warned that human health, life and economies are endangered as reliable clean water for agriculture, urban areas, industry and ecosystems is jeopardized.

If we do not take action now, it will mean increased water stress in the future.

The good news is that through awareness, we can make decisions about how to conserve this precious resource. By doing so, we can create more resilient and sustainable communities.

3.2 WATER OVERVIEW

The facts

In the U.S. approximately 30% of domestic water is used outdoors. In drier areas that number can be closer to 60 or even 70%. The remainder of residential water use is inside our homes.^[1] You can easily reduce water waste by making small behavioral changes and by choosing more water-efficient appliances.

Each of the actions in this chapter can significantly reduce the amount of water that your household uses. Some of these actions will cost you nothing, and some will cost a little bit of money but this can be offset by the reduction in your water and power bills.

The actions listed below are the basic and most cost-effective things you can do in your home. In your group, have a brief chat about the actions, and then decide which ones you want to tackle and when. Record your own action plan in section 3.22.

- **Know how much water you are using** (3.3)
- **Feeling flushed** (3.7)
- **Drips and leaks** (3.10)
- **Showers & baths** (3.12)
- **Washing clothes** (3.14)
- **The kitchen sink** (3.16)
- **Outdoors** (3.18)
- **Harvesting rainwater** (3.20)
- **Greywater** (3.21)



Municipal or well water? In 2015, 283 million Americans got their water from public suppliers and 42.5 million used self-supplied sources, like wells, mostly supplied by fresh groundwater. While the cost of water may not be a big motivating factor for water savings among well users, droughts and declining aquifers will have a big impact on their water access over time. Saving water is vitally important for everyone.

Notes

3.3 KNOW HOW MUCH WATER YOU USE

Cost: none

\$ Savings: low

Effort: low

CO2 saved: low

Challenge

Managing water starts with measuring your use of it. An easy way to understand individual water use is to look at your water bill—not just the amount due, but how much water you used.^[2] Your water bill may provide a gauge for your water use over time, but it doesn't give you information about your immediate water consumption. And your monthly bill won't alert you if you have a leak, which can account for up to 12% of your indoor water use.^[1]



Solution

Read your own water meter regularly (see 3.4). Just being more aware of how much water you use can have a positive impact on reducing the amount of water your household wastes. It also shows you the actual savings from all your efforts after doing the actions in this section.

Generally, in warm states your water meter will be located outside near the curb in front of your home in a concrete box labelled "water" or with your water provider's logo. In colder states, your water meter will be located inside your home in the basement or lower level. If you can't find your meter, call your water provider and ask.

Since insects, centipedes and insects may have taken up residence in the dark box around your meter, take care when removing the lid.

Yes but ... how can I keep track of my water if I'm not at home? Consider installing a water monitor or leak detector to get meaningful, immediate feedback about water usage. If you live in an older home, have old appliances, or are away from home for months at a time, these monitors could quickly alert you to unusual water use (such as leaks) so you can act to prevent damage to your home. See reference 7 for examples.

Transition Streets

3.4 ADVICE ON READING YOUR METER

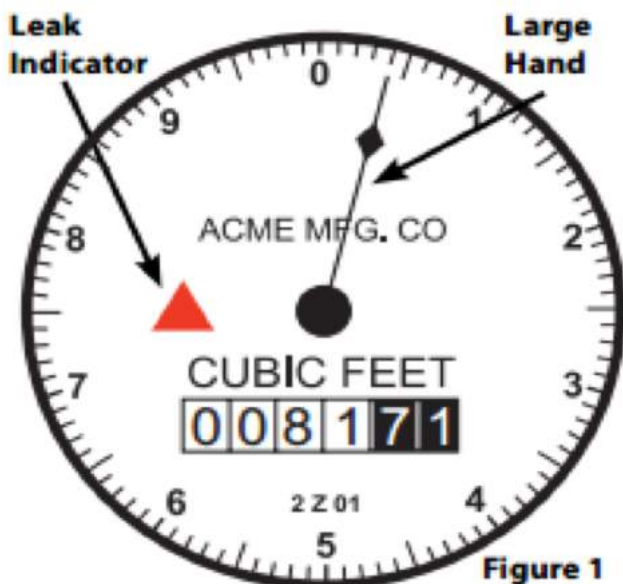
There are two common types of water meters, the **straight-reading meter** which resembles the mileage-indicator on an automobile odometer, and the **round-reading meter** which has several separate dials.

For the **straight-reading meter**, the reading is taken from the figures shown under the words “cubic feet.” The meter reads 008171, which is the total number of cubic feet of water recorded since the meter was installed (one cubic foot of water = 7.48 gallons). The large hand is used only for testing purposes and leak detection. Newer meters also have a small triangle that is usually red or blue, that spins when water is used. They are sensitive and can even detect small water drops that are leaking.

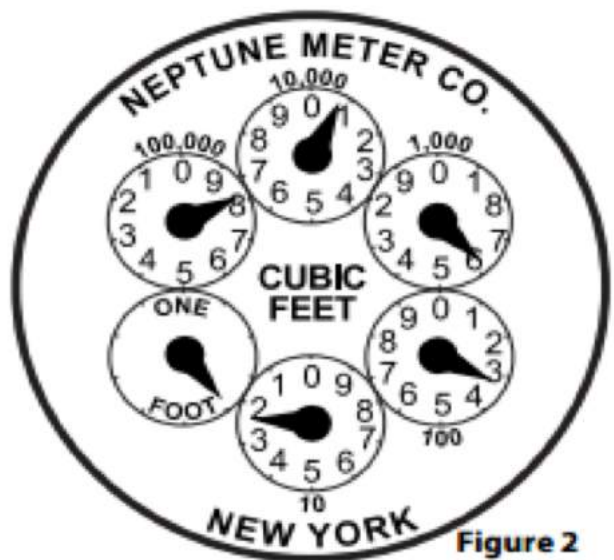
The **round-reading meter** has several small dials in a circle, and is a little more difficult to read. The dials are marked off in ten divisions, and are read much like a clock, except that the hand on every other dial turns counterclockwise. To check the readings, start with the “100,000” dial, and the readings are 8, 0, 6, 3, and 2 or 80,632 cubic feet.

Call your local water utility if you have any difficulties in reading the figures on your meter.

Note: If you live in an older property you may have a different type of meter.



STRAIGHT-READING METER



ROUND-READING METER

*One cubic foot of water = 7.48 gallons

Sample log of water meter readings

Date	Water Meter Reading (cu. ft.)	Usage (cu. ft.)	Gallons/day
6/01/2019	20,035	n/a	n/a
6/08/2019	20,130	95	102
6/15/2019	20,221	91	97
6/21/2019	20,307	86	64

Next steps, hints & tips

- Estimate your average daily consumption (see 3.6).
- Check your water meter weekly during this time when you are making changes to reduce your water use (see the sample water meter readings log provided above). Record your meter readings in the log below.
- To calculate the daily use per person in your household: 1. Divide the usage by the number of days. 2. Multiply by 7.48 gallons per cu. ft. 3. Divide by the number of people in your household. How does your household compare to the national average of 88 gallons (10.9 cubic feet) per person/day, or 350 gallons per household/day? ^[1,2] Set a goal for reducing your consumption based on your usage.
- Keep the log visible. Stick it on the fridge so everyone in your household can see it. Are you seeing progress in your weekly usage? Consider rewarding everyone for their efforts by sharing some of the savings.
- Learn more about your bill at: <https://www.epa.gov/watersense/understanding-your-water-bill>.
- For up-to-the minute water usage reports, consider a water monitor.^[7]

Your water meter readings log

Date	Water Meter Reading (cu. ft.)	Usage (cu. ft.)	Gallons/day

Transition Streets

3.6 QUICK USAGE ESTIMATER

Water conservation tips

Appliance	Normal Use	Conservation Use
Shower (5 minutes)	Conventional showerhead 25-35 gallons	Water-saving showerhead 10 gallons
Tub bath	Full water level 36-45 gallons	Minimal water level 10-12 gallons
Toilet flushing	Conventional 3.5-7 gallons/flush	Ultra low-flow toilet 0.8-1.1 gallons/flush
Brushing teeth	Tap running 5 gallons	Wet brush, rinse briefly ¼ gallon or less
Shaving	Tap running 20 gallons	Water in basin 1 gallon
Washing hands	Tap running 2 gallons	Water in basin 1 gallon
Dishwashing (by hand)	Tap running 25 gallons	Wash & rinse in tub/sink 5 gallons
Dishwasher (automatic)	Older model 9-14 gallons/cycle	Efficient model 2-3.5 gallons/cycle
Washing machine (full load)	Top loading - older 20-56 gallons/load	Front loading - high efficiency 12-14 gallons/load
Leaks	All faucets, shower, toilet etc. 27 gallons/day average	Check all faucets and your water meter
Toilet leak	Slow leak 15 gallons/day	Use dye tablets to drop into tank, check bowl for dye
	Flapper valve leak 1,000-2,000 gallons/day	Check your water meter or bill for dramatic increase in water use
Outdoor watering	Average hose or sprinkler system 10 gallons/minute or 300 gallons/30 minutes	Water deeply, infrequently and only when plants need it

This chart compares conventional versus more efficient appliances and conservation habits. The numbers provided are estimates and don't account for variation in appliances and usage. Consider tracking your own *actual* usage, or using one of these online calculators:

- WECalc (Home-Water-Energy) Calculator: wecalc.org/
- WaterSense Calculator: <https://www.epa.gov/watersense/watersense-calculator>
- Water Footprint Calculator: www.watercalculator.org

Transition Streets

3.7 FEELING FLUSHED

The Practical
Action Plan

Cost: none-med

\$ Savings: med

Effort: low-med

CO2 saved:
low-med

Challenge

Toilets are the main source of water use in homes today. About 25% of all the clean, drinkable water we use is flushed down a toilet.^[1]

Older, inefficient toilets use as much as 7 gallons of water in one flush.^[8]

New “WaterSense®” toilets use as little as 0.8 gallons per flush (gpf), which could save the average family 20 to 60% in water use.^[8] Learn more at

<https://www.epa.gov/watersense/residential-toilets>.



Solution

If your toilet was made before 1994 and you don't want to replace it, consider installing a water displacement device such as a toilet dam or an early closing toilet flapper. These devices reduce the amount of water used per flush by displacing space in the water chamber above the toilet, or by reducing the amount of water released by closing the plunger faster than a traditional buoyant flapper.

Note that these devices are only suitable for toilets rated at 3.5 gallons per flush and higher. Performance can vary between toilet types. Learn more about these devices at the Alliance for Water Efficiency:

http://www.allianceforwaterefficiency.org/Toilet_Retrofit_Devices.aspx. Be sure to read the cautions if you have a dual flush toilet.

Yes, but ... our toilet doesn't flush well. Won't this make it worse? A displacement device can cause problems if water pressure is too low to properly flush. If you have to flush twice, or if you have clogs, a WaterSense® toilet may be a better option for you.

Transition Streets

3.8 FEELING FLUSHED

The Practical Action Plan

Type of Toilet	Year	Flush	Water Used Per Flush
	1950s – 1980s	Single	5.0-7.0 gallons
	1980 –1994	Single	3.5-4.5 gallons
	1994 – present (standard)	Single	1.6 gallons
	1994 – present (high efficiency)	Single	1.28 gallons
	Present	Single Dual	0.8 gallons 1.1 gallons (avg)

Note: Check your toilet tank for a stamp or date to determine how many gallons per flush (gpf). You can also visit the manufacturer’s website to find more information. See also, the Alliance for Water Efficiency: <http://www.allianceforwaterefficiency.org>.

Transition Streets

3.9 FEELING FLUSHED

Your savings

By replacing an older toilet with a WaterSense® or low-flow toilet, the average family can reduce their water use by approximately 13,000 gallons a year, saving more than \$110 per year.^[8]

Save \$110 on your
water bill, and 13,000
gallons of water a year!

Notes:

Next steps, hints & tips

- Learn more about WaterSense® products, see www.epa.gov/watersense/products/toilets.html.
- Many water providers offer rebates for upgrading to more efficient toilet models.
- Use the table on the previous page to identify what type of toilet you have and what type of water displacement device you could use. Before you install a water displacement device, be alert to any problems you are currently encountering that could be made worse with less water.
- If a displacement device is the right choice for your needs, you can make your own from a large plastic bottle filled with water.
- Flush less often. If it's yellow, let it mellow; if it's brown, flush it down.^[9]
- Check that the water level in your tank is set to the mark about one inch below the overflow. If it is just below the overflow, it will flush about ¼ gallon more than the designed amount.
- Avoid using your toilet as a waste basket. It will reduce maintenance costs for your local waste water provider and potential plumbing problems in your own home.

Transition Streets

3.10 DRIPS AND LEAKS

The Practical Action Plan

Cost: none-low

\$ Savings: med

Effort: low

CO2 saved:
low-med

Challenge

A dripping or leaking faucet is not just annoying, it can add up to staggering water losses and wasted money. For the average household, leaks can account for nearly 10,000 gallons of lost water every year, adding 12% to your water bill.^[1] In 10% of homes, leaks are so bad they are wasting 90 gallons or more per day.^[10]

Faucet or leak drip rate	Gallons lost / day	Gallons lost / year
1 drop per second	3.65 gal / day	1,300 gal / year
Drops breaking to a stream	22.5 gal / day	8,200 gal / year
1/8 inch stream	400 gal / day	146,000 gal / year
¼ inch stream	1441 gal / day	526,000 gal / year

Solution

Check regularly for drips and leaks from faucets, water heaters, washers, showers, tubs and ice-making refrigerators. Common causes of leaks are worn toilet flappers, worn out washers, and old plumbing valves.

Reading your meter regularly can help you determine if you have drips or leaks. The cost to repair most of these problems is minimal and often not hard to repair yourself.

If you live in a cold climate, your plumbing could be at risk of freezing and bursting if it is outdoors or if your home is without heat for a period of time. Make sure your external water pipes and faucets are turned off and drained before freezing weather hits. Have someone check on your home if you are away during the colder months.

A water monitor – whether a whole house monitor, or a monitor on the floor near a washer or water heater – can alert you to leaks (see reference 7).

Yes, but ... I changed the washer and it's still dripping. A dripping tap usually means that the washer needs renewing, but it can also be caused by a damaged valve seating. If the drip is from a mixer nozzle, then change both tap washers.

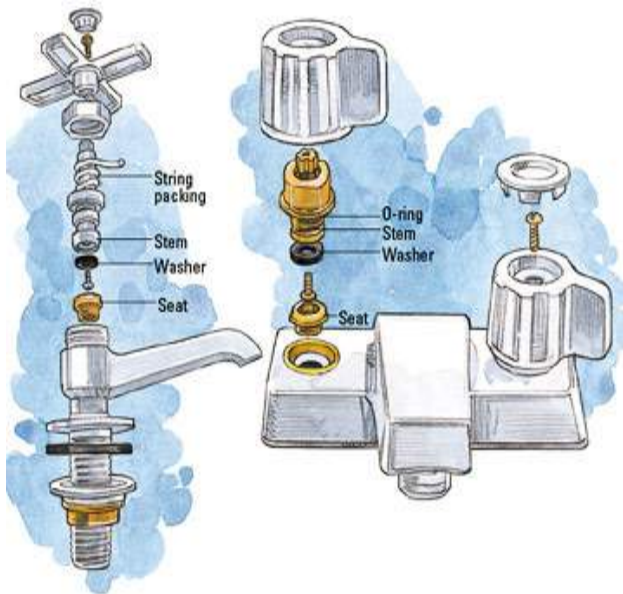
Transition Streets

3.11 DRIPS AND LEAKS

The Practical
Action Plan

Your savings

Your savings will vary, depending upon how serious the leak is and how easy the fix is. A washer costs mere cents, whereas replacing a valve on old plumbing could cost several hundred dollars. Consider replacing old faucets with a WaterSense® faucet or accessory, which can reduce flow rates about 30%.^[11]



Notes:

Next steps, hints & tips

- Check your pipes for visible leaks around gaskets or pipe fittings.
- Check your water meter before and after a two-hour period when no water is being used. If the meter changes at all, you probably have a leak (also see section 3.4).
- See the EPA's "Checking for Leaks" website for tips and videos: <https://www.epa.gov/watersense/fix-leak-week>.
- For more info on bathroom sink faucets and accessories, visit http://www.epa.gov/watersense/products/bathroom_sink_faucets.html
- Use dye tablets to check if your toilet tank has a leak into the bowl. Flappers are often under \$5.
- Call your local water provider to ask about free leak detection kits and water reduction devices, like faucet aerators and low-flow showerheads.
- If you're not into DIY, hire a local plumber or handyman. Do not try any major plumbing project without consulting a professional.
- In the yard, check your sprinkler head and hoses for leaks. A leak as small as the tip of a ballpoint pen can waste as much as 6,300 gallons of water per month.^[12]

Transition Streets

3.12 SHOWERS AND BATHS

The Practical Action Plan

Cost: none-med

\$ Savings: med

Effort: low

CO2 saved:
low-med

Challenge

Baths and showers make up more than 20% of the average American's water use.^[1] A single bath can use 20-45 gallons of water. Taking a shower can use half that amount of water, depending on how long you shower. (The average shower duration is just over 8 minutes.) The trend toward multi-head showers, however, significantly increases water use.^[13]



Solution

Baths and showers represent one of the greatest opportunities for indoor water conservation.

Many modern showerheads are designed to reduce the water flow rate while maintaining good pressure. Older showerheads use as much as 5 gallons per minute, whereas new, low-flow showerheads use 2 gallons or less per minute.

WaterSense® showerheads can save the average family 2,900 gallons of water – and the fuel to heat it – per year. Simply replacing your showerhead with a more efficient model could reduce your water consumption by more than half.^[14] Reuse your shower greywater and save even more.

Behavior changes, like taking showers rather than baths and cutting back the amount of time you spend in the shower, will save both water and money.^[15]



Yes, but ... I really do need to shower every day. If you do need an all-over shower, consider using a timer to reduce the time you spend in the shower.

Transition Streets

3.13 SHOWERS AND BATHS

The Practical
Action Plan

Savings

Replacing a standard showerhead (with a low-flow WaterSense® rated showerhead could save 2,900 gallons of water a year, and \$70 off your bills. Electric water heater? You could save more than 370 kWh of electricity, enough to power a house for 13 days!^[14]

Save \$70 or more a year in water and electricity costs.

Next steps, hints & tips

- ❑ Consider installing a low-flow showerhead, which limits water flow to 2 gallons or less per minute. Check your water or energy company for rebates on low-flow showerheads, and for free products.
- ❑ For more info on WaterSense® showerheads visit: <http://www.epa.gov/WaterSense/products/showerheads.html>.
- ❑ Limit your time in the shower to 5 minutes or less. It's easy to do if you take a "navy shower," turning the water off when soaping up or shaving and back on when it's time to rinse off.
- ❑ Get a shower timer to help limit your (and your teenager's) time. Some timers can tell you how much water you are using, and alert you when you've used the maximum recommended amount. See www.aliexpress.com/popular/waterproof-shower-timer.html.
- ❑ Save the cold water that comes out of the tap before the hot water arrives. Keep a bucket in the shower to catch cold water and use it to flush the toilet or water plants. If you do take a bath, you can use that bath water to flush your toilet as well. You can also consider installing a greywater system to reuse bath water.
- ❑ Install an on-demand hot water system where you are using hot water (under the kitchen sink, by the shower, etc.) so you don't waste water and heat energy as water works its way through the house. Learn more about this option: https://www.energystar.gov/products/water_heaters/demand_hot_water_recirculating_system.

Yes, but ... How about brushing my teeth? Assuming you do this for 2 minutes twice a day, you can save an additional 200 gallons of water a month if you turn off the faucet while you brush your teeth.^[16]

Cost: none-high

\$ Savings:
low-med

Effort: low

CO2 saved: low-
medium

Challenge

Washing clothes accounts for about 17% of the water we use in our homes^[1] and considerable energy for both washing and drying. Washing machines vary tremendously in how much water they use per wash. Older top loading models can use between 20-56 gallons per load, compared to modern high efficiency (HE) models, which average closer to 14 gallons per load.^[17]



Solution

Each of these simple steps can have as big an impact on your energy bill and water use as buying a more efficient – and expensive – washing machine.

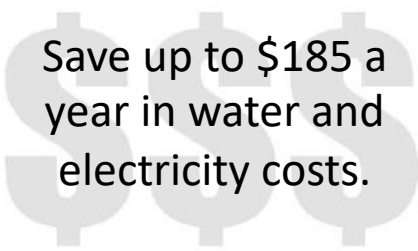
- Wear clothes longer between washes so you wash less often
- Reduce the temperature of your water
- Wash more clothes per load
- Hang your clothes to dry

But you should know that you can save big if you go with ENERGY STAR[®] washers and dryers. Clothes washers that have earned the ENERGY STAR[®] rating use 33% less water and approximately 25% less energy than standard models.^[17] Clothes dryers that have earned the ENERGY STAR[®] rating use approximately 20% less energy than standard models.

Even if you can't afford a top-of-the-line model, you'll find new machines and front-loading machines give you more cleaning options, use less water and energy, are gentler on your clothes, and save you money over time.

Want to see exactly what your laundry is costing you? Visiting the website of Mr. Electricity: <https://michaelbluejay.com/electricity/laundry.html>.

An ENERGY STAR® washer can save you about \$35 a year on your utility bill, compared to a standard model, and more than 2,000 gallons of water! Save another \$150, or more, simply by switching from hot to cold water wash.^[18] Hang up your clothes to dry and use 100% renewable power.



Save up to \$185 a year in water and electricity costs.

Next steps, hints & tips

- Water heating consumes about 90% of the energy it takes to operate a clothes washer. Wash in cold water. It will usually do a good job of cleaning.
- Washers use about the same amount of energy regardless of the size of the load, so run full loads whenever possible. If your washer has a half-load feature, use it when you have only a few items to wash.
- Try reducing the amount of laundry you do. Wear your clothes more than once and hang towels up to dry after showering so you can use them again.
- If you're purchasing a new machine, choose a model with a capacity that is appropriate for your situation. If you live alone, consider a small, apartment-sized model.^[16]
- If it fits in your budget, choosing an ENERGY STAR® machine can save you money and water. Check your local water provider or utility company for rebates.
- Familiarize yourself with your washing machine's cycle options. Some settings provide the same cleaning power but with less water and energy.
- Avoid pre-washing. Most modern washing machines and washing powders are so effective that you don't have to pre-wash.
- Be sure to use "High-Efficiency" (HE) detergents with modern front loading machines. They are specifically designed to keep dirt suspended in lower volumes of water. Regular detergents will reduce the machine's performance.
- Learn more about different types of washing machines at: http://www.allianceforwaterefficiency.org/Residential_Clothes_Washer_Introduction.aspx.
- Consider setting up a greywater system from your washing machine, especially if you have an older machine. See page 3.21.

Transition Streets

3.16 THE KITCHEN SINK

The Practical
Action Plan

Cost: none-med

\$ Savings:
low-med

Effort: low

CO2 saved: low

Challenge

When it comes to wasting water in the kitchen, the dishwasher isn't the culprit, it's probably you. The way you use your kitchen faucet, the type of aerator and how you hand wash your dishes makes a big impact on your water use. Hand washing one load of dishes can use 20 gallons of water or more.^[19] Many people rinse their dishes before putting them in a dishwasher, an unnecessary waste of time and water when dishwashers don't require it.



Solution

When washing up, don't let the faucet run; use a tub or plug your sink.

The aerator (a screw-on tip of the faucet nozzle) restricts the maximum flow rate of water from the faucet. New kitchen faucets usually have a 2.2 gallon per minute aerator, but you can purchase one with a flow rate of 1 gallon per minute and save even more.^[20]

A common misconception is that dishwashers use more water. In fact, dishwashers can be water savers. In the 1980s, dishwashers used as much as 14 gallons per cycle, but modern models can use as little as 2 gallons—often a lot less than washing up by hand. A new ENERGY STAR® dishwasher will save, on average, 3,870 gallons of water over its lifetime.^[21] Refer to the rankings of dishwashers at www.energystar.gov/products.

Yes, but ... sometimes I have to wait for ages for hot water to arrive at the tap, which wastes lots of cold water down the sink. Collect all that cold water in a watering jug that you leave by the sink, then use it on the garden or your houseplants.

3.17 THE KITCHEN SINK

Savings

Handwashing your dishes costs \$430 more in energy and water than using an ENERGY STAR® rated dishwasher over its lifetime. These dishwashers also use less than half as much energy (for water heating) as washing dishes by hand, and save more than 5,000 gallons of water each year.^[22] When washing dishes by hand, see best practices below and save over 14,600 gallons of water per year.

Save up to \$400 in energy and water costs and 5,000 gallons of water over the lifetime of your dishwasher.

Next steps, hints & tips

- Consider installing a more water-efficient faucet, or a faucet aerator with a flow rate of 2.2 gallons per minute or less. Aerators are cheap, quick fixes that you can install yourself. An aerator could save over 3,000 gallons of water per year.^[20]
- Shut off the faucet when possible. When washing up by hand, use a tub or plug your sink. You'll save 20 gallons of water or more each time.^[19] If you do two loads of dishes per day, that saves over 14,600 gallons of water per year.
- Make sure your faucet doesn't drip or leak (see 3.10).
- Consider composting your food waste or setting up a worm bin instead of using the garbage disposal in your sink. Such units require lots of water to operate properly.
- Plan ahead to avoid having to thaw frozen foods under running water.
- Keep a jug of water in the fridge so that you don't have to run the tap for ages while waiting for cold water to flow.
- When using your dishwasher, make sure to use a full load every time. Two half loads still use more water and energy than one full load.
- Become familiar with your dishwasher's cycle options for lower temperature/duration cycles. Check your user manual or see the manufacturer's website.
- Most modern dishwashers are so effective that you don't have to pre-rinse.
- Consider purchasing an ENERGY STAR® certified dishwasher:
<https://www.energystar.gov/products/appliances/dishwashers>.

Transition Streets

3.18 OUTDOORS

The Practical
Action Plan

Cost: low-med

\$ Savings:
med-high

Effort: low-high

CO2 saved:
low-high

Challenge

About 30% of the water used by the average American households is devoted to outdoor landscaping. In dry areas, that could be as high as 60%-70%.^[1]

The typical suburban lawn consumes 10,000 gallons of water, above and beyond rainwater, each year^[23] and requires lots of fertilizer and maintenance. Inefficient watering is one culprit. Your garden hose uses as much as 23 gallons of water per minute; sprinklers can use as much as 600 gallons of water per hour. Is that water actually going where needed? Or is it watering pavement or evaporating into the air?



Solution

Maybe it's time to rethink the American lawn. Landscaping that fits your region's climate is easier to care for and uses less of our precious fresh water.

Improving the efficiency of our outdoor water use will not only save water, it will often improve the health of our plants. It's a simple change to water the right part of the plant during the right time of day, and it will make a big difference. By using water-efficient gardening practices like mulching, drip irrigation and swales, you can have a beautiful, living garden even in times of drought.^[24]

Try to avoid using tap water to water the vegetable garden. Instead, store and use rainwater (see 3.20), which is better for your plants. Consider reusing water (greywater) on your landscape (see 3.21).

Yes, but ... I'm concerned about the chemicals in soap that might be in greywater. If you set up a system to use greywater, you will need to be careful that the soaps you use in your home do not contain sodium or boron, and are not anti-bacterial.^[25] (See 3.21 for links to learn about products that can be damaging to plants and soil.)

Transition Streets

3.19 OUTDOORS

The Practical
Action Plan

Savings

The varying cost of water in municipalities across the nation – and the amount of water needed by different types of landscapes – makes it impossible to put a dollar value on outdoor water savings. But the savings in water itself is huge – 30 to 70%. That impacts human, animal and plant life in your area.



Next steps, hints & tips

- When planning your landscaping, select plants that are native, require less water and are appropriate for your local climate. For example, drought-resistant trees and plants can save 30 to 60 gallons of water per 1,000 square feet each time you water them.^[28] For more information on plants that are native to your area, check your local nursery or Native Plant Society.^[29]
- Make good decisions about watering your plants.
 - Use a watering can for watering potted plants and small raised beds. That way you know exactly how much water your plants are getting. Don't over water. That can lead to root rot.
 - Give your plants' roots a good soaking once or twice a week in dry weather. That's better than lightly watering them every day. Water should be directed underneath the foliage. There should be enough to wet the top few inches of soil, where most plants' roots are located.
 - Use drip irrigation instead of sprinklers. If you really must use a sprinkler, use it early in the morning or late in the evening, so less water evaporates.
 - Put a nozzle on your hose. That will reduce water output while increasing pressure.
- Mulching soil around your plants can cut water loss by as much as 20%.^[30]
- Rather than washing your car with a running hose, try using a bucket and sponge. (Ideally, fill the bucket from the rain barrel.)

Transition Streets

3.20 HARVESTING RAINWATER

Overview and where to go for more information

Rainwater harvesting

Rainwater harvesting can reduce stormwater runoff while saving water for later use. A 1,000 square feet of roof area can collect about 600 gallons of water during a 1-inch rainfall. This free water can be used during dry periods.

Rainwater is ideal for ornamental landscaping, and depending on the quality of your rainwater collection method, may also be suitable for edible gardens. (Learn more about water quality considerations of roofing materials^[26]). When managed properly, rainwater harvesting can also help reduce stormwater runoff from your property.

Rainwater collection system designs range from large underground tanks storing thousands of gallons, to interconnected above-ground, gravity-fed storage containers holding hundreds of gallons, to a single 50-gallon rain barrel filled from your downspout.

When done properly, rainwater does not need any treatment and requires only modest maintenance. If you live in a cold climate, you will need to winterize your rain barrel system so it doesn't freeze and crack.^[27]

For those in dry states, see Brad Lancaster's series on rainwater harvesting and drought resilient landscaping at www.harvestingrainwater.com.

A home use, 350-gallon blue barrel interconnected rainwater collection system



Some states have laws regarding rainwater capture. This website outlines laws by state: <http://www.ncsl.org/research/environment-and-natural-resources/rainwater-harvesting.aspx>.

Transition Streets

3.21 GREYWATER

Overview and where to go for more information

Greywater reuse systems

Greywater is previously used household water from all sources *other than toilets and diaper-washing* (which is called blackwater). Capturing waste water and using it for a purpose that does not require a high level of purity, like flushing toilets and watering non-edible plants, can be safe and save huge amounts of water. For example:

- Water-saving toilet tank covers (lid sinks) enable clean water to be used for hand-washing *before* that water enters the tank to be used for flushing.
- You can also use shower, bath, washing machine and dehumidifier water to flush toilets. (A 5-gallon bucket of water poured into the toilet bowl will flush waste with sufficient force.)

In some communities, greywater capture is legal and encouraged. In other areas it is heavily regulated or there are no codes at all. See the Greywater Action website for information on the laws in your state as well as plumbing codes, system designs and best maintenance practices (<https://greywateraction.org/greywater-codes-and-policy/>).



FOR A SUSTAINABLE
WATER CULTURE

A few considerations

- Kitchen sink greywater is higher in organic matter, oils, grease and fats than other types of greywater. It requires special care (learn more at <https://www.storey.com/article/kitchen-greywater-water-conservation/>). It can contain pathogens, like *listeria*, so it is advisable not to use it on edible plants.
- Water from dehumidifiers can contain mold, algae and lead.^[31] Do not put it on plants.
- Greywater that originated from cleaning may contain soap, shampoo, bleach, dye and high levels of sodium or boron. These can be damaging to soil organisms, making it unsuitable for landscape use. Just because a product says it is biodegradable, that does not always mean it is healthy for plants. Learn more at the link above, and also at <https://greywateraction.org/greywater-faq/> and <https://www.thisoldhouse.com/ideas/plant-friendly-soaps-are-safe-greywater-irrigation>.

3.22 YOUR WATER ACTION PLAN

Reminder

Possible actions:

- Know how much water you are using (3.3)
- Feeling flushed (3.7)
- Drips and leaks (3.10)
- Showers and baths (3.12)
- Washing and drying clothes (3.14)
- The kitchen sink (3.16)
- Outdoors (3.18)
- Harvesting rainwater (3.20)
- Greywater (3.21)

**What other ideas does your team have that aren't covered above?
Add them below if you think they are relevant for you...**

My actions	Already done	When I'll do this	Notes

Group actions

How will you help each other out in your team? Can one member who has already tackled an action help others? List team actions here (with named person and due date):



Transition Streets

3.23 LOCAL RESOURCES

Local resources

Add your own information about local resources, grants, contractors, etc. for each of the water-saving actions below.

Local water utility resources:

Rebates/incentive programs:

Sustainable landscape planning info/contractors/classes:

Drought tolerant and native plants nurseries:

Soil, compost and mulch resources:

Water-wise irrigation supplies:

Rainwater harvesting and catchment:

Greywater reuse systems and installation:

Plumbers specializing in water conservation and reuse:

Water meter/monitors:

Transition Streets

3.24 THE BIG PICTURE: WATER & CONSUMER CULTURE

Questions for discussion

You've undoubtedly heard of a "carbon footprint," the measure of how much carbon a person (or a product) is responsible for creating. We can also talk about a person or a product's "water footprint."^[32] That can be measured for a single process (growing rice), for a product (a pair of jeans), or for a person.

Nobody will have a water footprint of zero because we all drink water and it takes water to make just about everything we buy. But as some of the biggest shoppers on the planet, the average American's water footprint is oversized.

Two-thirds of our water footprint is embedded in our food. For example, a pound of fresh tomatoes has about 14 gallons of embedded water; apples about 83 gallons; tofu about 240 gallons; pork about 570 gallons; and a pound of beef about 1,800 gallons (depending on how they were grown).^[32]

Purchasing consumer goods adds another 583 gallons of water per day to our footprint.^[32]

Add all this up and the average American's water consumption jumps from 88 to around 2,000 gallons a day, nearly twice that of citizens in most other industrialized nations.

What do you know about your own water footprint? Take a look at the chart on page 3.25. How many of these items have you purchased in the last year? Use this calculator: <https://www.watercalculator.org/>.

We can think about saving water using the same five R's we considered when reducing other types of waste (see section 5 in this workbook) – **REFUSE, REDUCE, REUSE, RECYCLE/REPURPOSE/REPAIR** and **RETURN TO EARTH**. For example, we can:

- Refuse bottled water when offered.
- Reduce the water we waste by shutting off the faucet when brushing our teeth.
- Reuse dehumidifier water to flush the toilet.
- Recycle shower water for plant irrigation (with appropriate products).
- Set up a water-saving hügelkultur mound for growing strawberries on top of rotting wood and other organic matter.

Transition Streets

3.25 REDUCING YOUR WATER FOOTPRINT

Use this water footprint chart to consider the water usage embedded in the production of food and other products we consume regularly. These numbers are based on estimated global averages for industrial production. Ecological farming practices like permaculture, holistic land management, and dry farming can significantly reduce the water footprint of certain foods.

Item	Water Footprint
T-shirt (cotton)	659 gallons
Jeans (cotton)	2,108 gallons
Smart phone	3,190 gallons
Leather shoes	3,626 gallons
Car	13,700-22,000 gallons
1 gallon of gasoline	3-6 gallons of water
Steak – beef (6 ounces)	674 gallons
Hamburger (including bun, lettuce, tomato)	660 gallons
Egg	52 gallons
Soda (17 ounces)	46 gallons
Coffee (1 cup)	34 gallons
Wine (1 glass)	34 gallons
Salad (includes, lettuce, tomato, cucumber)	21 gallons

Information on chart from: <https://www.watercalculator.org/water-use/#stuff>

By the year 2030, experts predict that global demand for water will outstrip supply by 40 percent.^[32] Every region in our country could be impacted by water scarcity due to depleted or contaminated aquifers (from fracking), industrial and agriculture run-off (algae blooms), and human-caused pollution.

- What are the most important water use issues in your area? How well are regulations protecting your water resources?
- What's the connection between individual/household behaviors and bigger water use issues? What changes can you make to reduce your own water footprint? What about on a larger scale?

Transition Streets

3.26 REFERENCE INFO

- [1] U.S. Environmental Protection Agency, WaterSense, "How We Use Water." <https://www.epa.gov/watersense/how-we-use-water>
- [2] U.S. Environmental Protection Agency, WaterSense, "Understanding Your Water Bill." <https://www.epa.gov/watersense/understanding-your-water-bill>
- [3] USGS, "Estimated Use of Water in the United States 2015," <https://pubs.usgs.gov/circ/1441/circ1441.pdf>
- [4] The Hamilton Project, "In Times of Drought: Nine Economic Facts about Water in the United States," 2014. http://www.hamiltonproject.org/assets/files/nine_economic_facts_about_us_water.pdf
- [5] Grace Communication Foundation, "How the United States Uses Water," 2018. <https://www.watercalculator.org/footprints/how-united-states-uses-water/>
- [6] U.S. Government, National Oceanic and Atmospheric Administration (NOAA), "Fourth National Climate Assessment," 2018. <https://nca2018.globalchange.gov/>
- [7] Examples of water monitors, include: <https://smartdesignworldwide.com/ideas/water-watcher-monitor-residential-use/> and <https://streamlabswater.com/>; examples of leak detectors include: <https://reliancedetection.com/products/water-alarms-leak-detection/water-heater-leak-alarm-shut-off/> and https://getnotion.com/pages/water-leak-detector?gclid=Cj0KCQiAjZLhBRCAARIsAFHWpbEfi_6BcGvVNWv54ZdNbcjc2pT71YDr9p6U7rkiLnC6RFI4e883f3AaAjzUEALw_wcB
- [8] U.S. Environmental Protection Agency, WaterSense, "Residential Toilets." <https://www.epa.gov/watersense/residential-toilets>
- [9] Andrew Fiouzi, "Letting It 'Mellow if It's Yellow' Is Way Better for the Environment," Mel Magazine, November 2017. <https://melmagazine.com/en-us/story/letting-it-mellow-if-its-yellow-is-way-better-for-the-environment>
- [10] U.S. Environmental Protection Agency, WaterSense, "Check for Leaks." <https://www.epa.gov/watersense/fix-leak-week>
- [11] U.S. Environmental Protection Agency, WaterSense, "Bathroom Faucets." <https://www.epa.gov/watersense/bathroom-faucets>
- [12] Save Our Water, <https://saveourwater.com/conservation-lifestyle/around-the-yard>
- [13] Alliance for Water Efficiency, "Residential Shower and Bath Introduction." http://www.allianceforwaterefficiency.org/Residential_Shower_Introduction.aspx
- [14] U.S. Environmental Protection Agency, WaterSense, "Shower Heads." <https://www.epa.gov/watersense/showerheads>
- [15] Grace Communication Foundation, "How to Save Water, Shower and Bath" 2017. <https://www.watercalculator.org/footprints/how-united-states-uses-water/>
- [16] Carla Davis, "6 Times You Can Turn Off the Tap to Save Water," NC State University, March 10, 2014. <https://sustainability.ncsu.edu/blog/changeyourstate/6-times-you-should-turn-off-the-tap-to-save-water/>
- [17] Energy Star, "Clothes Washers", https://www.energystar.gov/products/appliances/clothes_washers?qt-consumers_product_tab=0#qt-consumers_product_tab
- [18] Mr. Electricity, "How Much Does It Cost to Run a Washing Machine," January 2016. <https://michaelbluejay.com/electricity/laundry.html>
- [19] Grace Communication Foundation, "How to Save Water, Dishwashing" 2017. <https://www.watercalculator.org/save-water/dish-washing/>

Transition Streets

3.27 REFERENCE INFO

- [20] Alliance for Water Efficiency, Home Water Works, "Faucets." <https://www.home-water-works.org/indoor-use/faucet>
- [21] EnergyStar.gov, "Dishwasher vs. Hand Washing Dishes." https://www.energystar.gov/products/appliances/dishwashers/dishwasher_hand_washing
- [22] EnergyStar.gov, "Dishwashers Overview." <https://www.energystar.gov/products/appliances/dishwashers>
- [23] UCCE Master Gardeners of San Joaquin County, "Conserving Water with Lawns," http://sjmastergardeners.ucanr.edu/Water_Conservation_/Lawn_Watering/
- [24] Water Use it Wisely, 100 Ways to Conserve, "Landscape Planning and Design." <https://wateruseitwisely.com/100-ways-to- conserve/landscape-care/principles-of-xeriscape-design/planning-and-design/>
- [25] GreyWater Action, <https://greywateraction.org/>
- [26] Minnesota Stormwater Manual, "Water Quality Considerations for Stormwater and Rainwater Harvest and Use/Reuse" May 9, 2017. https://stormwater.pca.state.mn.us/index.php?title=Water_quality_considerations_for_stormwater_and_rain_water_harvest_and_use/reuse
- [27] Blue Barrel Systems, "How to Winterize your Rain Barrel System." <https://www.bluebarrelsystems.com/blog/winterize-rain-barrel-system/>
- [28] Save Our Water, <https://saveourwater.com/conservation-lifestyle/around-the-yard>
- [29] Listing of native plant societies: <http://ahsgardening.org/gardening-resources/societies-clubs-organizations/native-plant-societies>
- [30] StopWaste, "A Bay-Friendly Landscaping Guide to Mulch." http://www.stopwaste.org/sites/default/file/Gardens%20and%20Landscapes/Landscapes/Landscape%20Resources/mulch_guide_2011.pdf
- [31] Andy Martin, Stanford Magazine, "Don't Drink the Water (from your dehumidifier)" November-December 2010. <https://stanfordmag.org/contents/don-t-drink-the-water-from-your-dehumidifier-essential-answer>
- [29] Grace Communication Foundation, "What is a Water Footprint." <https://www.watercalculator.org/footprints/what-is-a-water-footprint/>

This page intentionally left blank.