

Vital signs water

12 ways communities will have to adapt to handle climate change

Whatever your water crisis, whether drought or flood, these DIY solutions will help you adjust to climate change's new reality



Water could (should?) become a thing of the past in some communities. Photograph: Alamy

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[Climate change](#) is making both droughts and flood more frequent and severe. Whether your area is suffering from too much water or too little, here are things you can do to adapt.

Drought

In the face of relentless droughts such as the historic one underway in California, we all want to help conserve. But with water utilities increasingly introducing tiered pricing - in which people who use more water pay an increasingly higher price for it - cutting back can reap monetary savings as well.

Replace lawns with native plants

Outdoor water use accounts for 30% of residential demand across the US, and

80% in the arid West, according to Mary Ann Dickinson, president of the Alliance for [Water Efficiency](#). Nixing grass for drought-tolerant native plants can save as much as 10,000 gallons of water a year. Or reduce your lawn's size and replace standard grass with low-water varieties that make do with two-thirds less water.

Local native plant societies often know which plants made your lot home before you did. In the West, where most rain comes during the winter, plant natives in the fall. Natives also provide habitat for local butterflies and birds, and can be more resistant to wildfire than ornamentals.

Cut the flush

Toilets use the most water of all indoor fixtures, nearly [30% of home water use](#), according to the EPA. [Drop-A-Brick](#) offers an easy way to cut back. The flattened brick is filled with a powder that turns solid when it gets wet, giving it the weight needed to sink. One \$15 Drop-A-Brick in a toilet's tank will displace almost half a gallon of water per flush, saving around \$25 a year on water bills.

Why use a manufactured, \$15 brick instead of a Lifehacker-style solution like a milk jug filled with water? It "actually improves flushing performance in most [toilets] because it causes water to accelerate more quickly through the flush valve, according to engineers," said Ali Hart, director of toilet relations for "Project: Drop-A-Brick." No more flushing twice to clear low-flow toilets!

"The real goal of this campaign," she added, "is to raise awareness about urban water conservation."

Get savvy

People tend to dramatically underestimate personal water use. One study found that Americans [lowballed their water use](#) by a factor of two. One reason is that we typically get one water bill every two months - a huge gap between use habits and measurement.

Tech companies like [WaterSmart](#) and [Dropcountr](#) are trying to reverse this trend.

Dropcountr's mobile app allows you to track how you use water, set conservation goals, access rebates for low-flow appliances and more. It also alerts you to usage trends that may land you in a higher-priced billing tier and adds a competitive factor by tracking how well you're keeping up (or rather down) with the Joneses.

Use rain barrels and graywater systems

Plants don't need drinking-quality water. Connecting [rain barrels to downspouts](#) is an inexpensive way to harvest rain to supply your garden. Such on-site water supplies increase your water security, independence, and efficiency.

Overachieving water conservers have long put a bucket in the shower or kitchen sink to collect "greywater" for plants outside. But an installed system delivering greywater from, say, your washing machine in the garage into your garden would be much easier. Such systems have long been illegal in many jurisdictions, but that's beginning to change thanks in part to groups like [Greywater Action](#).

Opt for dual plumbing

Your toilet doesn't require drinking water, either. A dual plumbing system allows you to reroute greywater or rainwater back into your house for flushing (or use utility-delivered treated wastewater in some districts). Pipes that route non-potable water are colored purple so that everyone knows not to connect them to sinks. A diverter valve allows people to choose potable water for some needs and alternative water for the rest.

If you're buying a new house in an area where purple pipes are now in the building code, such as San Francisco, you could be on the cutting-edge of water

conservation. Otherwise, save this strategy for a major remodel.

Floods

Worldwide, increasing development in floodplains is paving over soil that would otherwise soak up water. Coastal plain development is also booming, creating infrastructure that's more vulnerable than ever as sea levels rise with climate change. A World Bank report last year found that flood damage to coastal cities worldwide could reach [\\$1tn annually](#).

To avoid paying your share of that, consider the following adaptations.

Location, location, location

This may be obvious, but think before you move. Whether buying or renting, [consult flood maps](#) to see if that lovely home is at high risk. If you simply must live near a coast or river, choose or build a home elevated to a height above your area's predicted flood level rise.

Raise the mechanicals and valuables

Move vulnerable elements like furnaces, water heaters and electric panels to higher ground when building or remodeling. If you have a basement, don't keep a giant plasma TV, gaming center or collection of antiquarian books down there.

Relocate

If flooded, put government emergency grants or insurance payouts toward moving to higher ground, not rebuilding. Some cities that flood regularly have used such funds to buy out willing homeowners and transform floodplains into open space. If your city doesn't offer this option, introduce it at planning meetings. After Tulsa, Oklahoma, bought and removed more than 800 flood-damaged homes and vulnerable buildings and turned the floodplain into a park, flood insurance rates dropped 25%.

Plan for soft failure

If you're already living in a flood zone, you can make your home resilient via renovations that minimize the effect of floodwater.

Choose [flood damage-resistant materials](#) such as glazed brick, concrete, stone, steel or recycled plastic lumber. Anchor the foundation to resist flotation, collapse, or lateral movement. Create ["flow-through" features](#) on the lower levels to prevent water pressure damage.

Use rain gardens and low-impact development

Permeable surfaces are your friends. Rather than paving your driveway, choose materials such as pavers that allow water to seep through them into the ground, or gravel.

Consider your lot's slope. Water should flow away from your home, not toward it. [Creating a rain garden](#) will slow runoff and allow more absorption into the ground. Add slopes that funnel water into a bioswale (a fancy name for a ditch covered in stones or native grasses), toward planting spaces or a nearby creek, or even into an underground storage catchment that can hold water for drier times, or allow water to seep slowly into the aquifer.

If you're a city-dweller with pavement right up to your house, investigate a permit to dig up part of the sidewalk and plant a small garden that will convey water underground.

Stay informed

Apps are not just for the drought-afflicted. Using real-time data from the US Geological Survey and National Weather Service, FloodWatch gives both recent

and historical river heights, precipitation totals, and flood stage data throughout the United States. The app allows you to monitor nearby rivers and streams and keep an eye on potential flooding issues, giving you time to move valuables to safety.

For worldwide information check out the [Flood App from Swiss Re](#), the leading global reinsurer. With a focus on climate change adaptation, the app offers reliable if general information on flood risks and how to manage and insure these risks.

Get flood insurance

Floods are the most common natural disaster. But flood losses are often not covered under standard renter or homeowner's insurance policies. The good news is that often you can purchase flood-specific insurance. However, some firms are leaving flood-prone areas, reasoning it's bad business to continue insuring such risky properties. If that's the case where you live, consider it a sign that you should move.

In the United States, the National Flood Insurance Program (NFIP), administered by Fema, provides federally subsidized plans in locales that agree to implement its floodplain management ordinances. Homeowners, business owners, and renters in participating areas can purchase these plans via www.FloodSmart.gov.

Erica Gies is an independent reporter who covers water and energy for the New York Times, The Economist, Scientific American and other publications.

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