WATER

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"It has helped us buck the conventional wisdom," said Heather Cooley, water program director for the Pacific Institute, a think tank that focuses on water issues.

Heather Cooley

Between 1950 and 1980, total withdrawals of surface and groundwater were outpacing the nation's population growth, according to the U.S. Geological Survey.

Water usage more than doubled in that time, from about 180 billion to 430 billion gallons per day, while the number of U.S. residents increased by about 50 percent.

The trend was clearly not sustainable, but water conservation efforts successfully changed that trajectory even as the population continued to increase.

"Ever since 1980, we've really seen a decoupling" of population growth and water use, Cooley said.

Water usage has leveled off or dropped in intervening USGS surveys, falling 17 percent to 354.3 billion gallons per day by 2010, according to the agency's most recent report. Meanwhile, the number of people in the U.S. has increased by more than 35 percent.

"It's a trend we see in communities across the U.S. and it's driven largely by efficiency improvements," said Cooley. "We saw declines in every single sector in 2010."

Biggest user

Thermoelectric power generation, which represents about 45 percent of all U.S. water usage, is responsible for a large chunk of that water savings.

Coal, nuclear and biomass plants rely on water for cooling and to produce steam to turn the turbine blades in their power plants. By recirculating water and making other upgrades, the facilities cut their water usage by more than 23 percent in three decades.

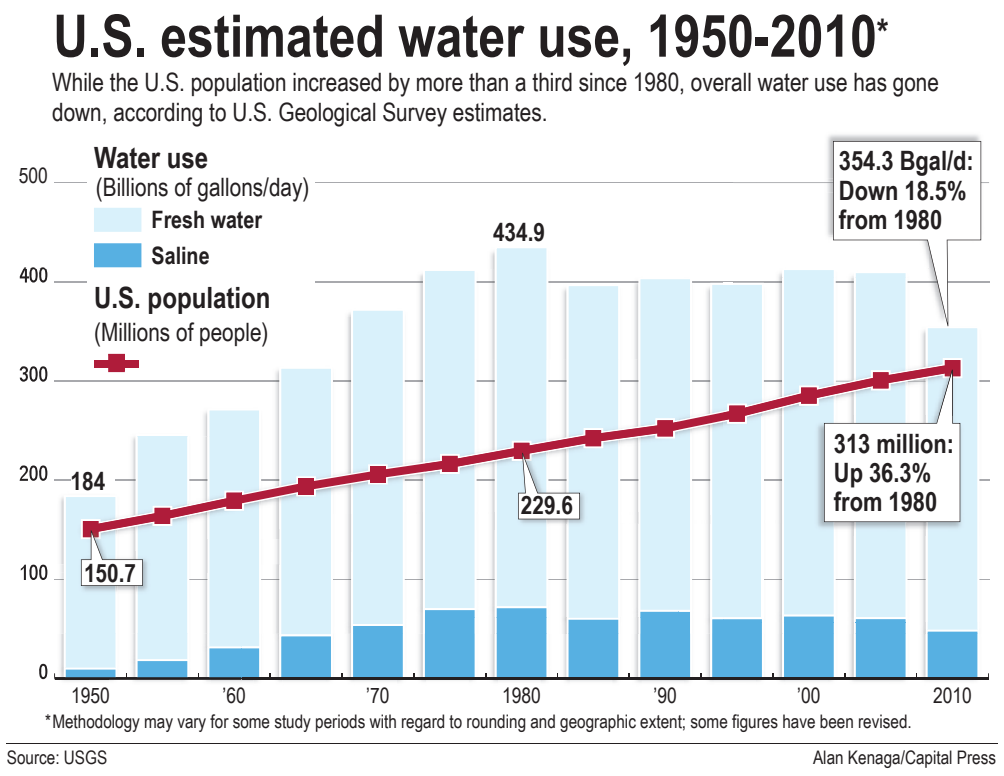
Irrigation, the nation's second-largest water user, has also reduced its consumption by 23 percent in that time, from 150 billion to 115 billion gallons per day.

Gravity systems, such as flood or furrow irrigation, were once the predominant forms of applying water in U.S. agriculture. They were overtaken in the 1990s by more efficient sprinklers, according to USDA.

Nearly 35 million acres of farmland were irrigated with sprinklers compared to 21.5 million acres irrigated with gravity systems in 2013, according to the USDA's latest data.

E.J. Harris/EO Media Group

A center-pivot irrigation system operates on a field of alfalfa and grass mix on April 7 east of Stanfield, Ore. New techniques help farmers grow more crops using less water.



Irrigators who use sprinklers have also been switching to low-pressure systems that generate larger droplets than older, high-pressure systems, further conserving water, said Glenn Schaible, a USDA economist who studies water resources.

"You get a very high evaporation rate with high-pressure systems," Schaible said, adding that as droplets get smaller, they're more vulnerable to turning into vapor.

Drip, trickle and similar micro-irrigation systems, the most water-preserving available, were used on roughly 5 million acres in 2013.

Because the high-efficiency systems are also more expensive, farmers must justify them with greater revenues, Schaible said. "It occurs more in high-value crops than elsewhere."

Farmers benefit economically from conservation technology because they can stretch their available water to irrigate more acres, said Molly Maupin, a hydrologist for USGS.

Modernizing the conveyance of water has also helped reduce water usage in agriculture, she said. Lining canals with an impermeable layer impedes seepage, while replacing canals with pipes also prevents evaporation.

"The losses in transit are being minimized as much as possible," Maupin said.

Aside from getting more efficient at how water is applied, farmers make sure it gets to their crops at the right time.

Many farmers still apply water because "Dad irrigated that way" or based on the calendar date, but fewer than 10 percent of irrigators use more advanced tools such as soil moisture sensors and crop growth models, Schaible said.

"There's still a lot of room for improvement," he said. "That's where it takes management skill and knowledge."

With irrigation scheduling, farmers fine-tune their applications of water based on its availability in the soil and the crop's level of stress. The system aims to optimize irrigation without denting yields or using excessive water.

"It allows for more precision," said Cooley, noting that competing uses and scarcity drive growers to adopt new technology. "A lot of it comes down to the cost of water."

More irrigation

In some areas such as Oregon's Willamette Valley, there's a potential for irrigating acreage that's currently under dryland farming.

Only about 20 percent of the region is currently irrigated even though it has great soils, said Margaret Matter, water resource specialist for the Oregon Department of Agriculture.

Producers of nursery stock, stung by the impacts of the recent housing downturn, are diversifying into other crops that require irrigation, she said.

Hazelnut growers who are expanding their operations or replacing old orchards are also often choosing to install irrigation systems to boost yields, Matter said.

"There's certainly evidence that irrigation demand is increasing and will increase in the future," she said.

While it may be possible to make more water available from multipurpose flood control dams, farmers will still be constrained by their ability to recoup the added expenses.

"It may be so far away from any water source that it may be cost-prohibitive to build the conveyance system," Matter said.

Other water uses

Water usage in agriculture isn't limited to irrigating crops.

Livestock consume 2 billion gallons per day, a level that has largely remained stable since 1980.

Increased sales of farmed fish, on the other hand, has been correlated with significantly more water used in aquaculture.

Fish farms' sales topped $1.37 billion in 2013, which is about 40 percent more than 15 years earlier, according to the USDA's most recent Census of Aquaculture.

Aquaculture used 9.4 billion gallons a day in 2010, more than quadruple the amount used in 1985, when USGS began tracking it as an individual sector.

Residential and commercial users who depend on public supplies decreased their consumption by 5 percent from 2005 to 2010, to 42 billion gallons a day, but previously increased their usage by more than one-third since 1980.

Domestic homes with their own wells, which consumed 3.6 billion gallons per day in 2010, only used slightly more water than 30 years earlier.

Even with a swelling population, there's an opportunity to curtail domestic and commercial water use with more efficient appliances that also conserve money, said the Pacific Institute's Cooley.

"If you look at those savings, it's actually more than enough to cover the higher upfront cost," she said.

Cities were historically paved over to quickly steer precipitation into stormwater drains, minimizing the risk of flooding, Cooley said.

Now, more buildings are diverting water from gutters into cisterns or allowing it to seep into "bioswales" to recharge groundwater, she said. "Communities are starting to realize this is a source of supply."

Urban water users are thus beginning to emulate the industrial users, which recycle water.

Industrial users consume 16 billion gallons a day, down from about 45 billion gallons a day in 1980.

Many companies found an advantage in re-circulating water repeatedly, said Maupin. Because they discharge less, the cost of removing pollutants to comply with the Clean Water Act is reduced.

"It benefits them to reuse that water more and more inside their facility," she said.

EPA

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until farm groups in northwestern Washington were angered by advertisements on public buses last month showing cows standing in an unidentified stream.

The agency didn't distance itself from What's Upstream until April 5, the same day that Republican U.S. Sens. Pat Roberts of Kansas and Jim Inhofe of Oklahoma asked the Inspector General's Office to investigate. The Inspector General's Office says it will not confirm or deny an investigation.

Meanwhile, other lawmakers in the past week have questioned EPA's support for the ongoing campaign.

State Sen. Doug Ericksen, R-Ferndale, has written Dennis McLerran, the EPA's Northwest regional director, asking for an explanation.

Ericksen represents northwestern Washington, one of two regions in the state with a large number of dairies. Tribes and environmental groups are lobbying lawmakers and state agencies for stricter manure-handling laws.

Ericksen told McLerran that the What's Upstream campaign appeared to be directed at state policymakers, without clearly identifying who's paying for it.

"I urge EPA to improve its efforts around transparency in the future, so that I and other legislators will be fully informed of the agency's involvement in campaigns that relate to issues that may come before the state legislature," Ericksen wrote.

Missouri Republican Vicky Hartzler, a member of the U.S. House Agriculture Committee, seconded Roberts' and Inhofe's call for an investigation.

"This is seemingly a blatant violation of the law by an agency actively trying to paint our farmers and producers in a negative light to advance its own regulatory agenda and expansive land grabs," she said in a written statement.

The EPA had apparently spent about $570,000 on the campaign through the end of September, based on a review of records by the Capital Press. Neither the tribe nor EPA has been able to confirm or update how much has been spent.

The Swinomish tribe is due to submit another report on What's Upstream spending and activities this month.

Courtesy of Save Family Farming

A billboard near Bellingham, Wash., promotes a campaign funded by the Environmental Protection Agency. The billboard and other campaign elements have stayed in place, even though the EPA said a week ago the campaign was a misuse of federal funds.

Plan

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Eugene, Medford, Roseburg and Salem Districts, and the Klamath Falls field office of the Lakeview District. It replaces plans that have been in effect since 1995 under the Northwest Forest Plan.

About 75 percent of the 2.5 million acres will be managed as reserves for older, more complex forests and for fish, water, wildlife and other "resource values," according to the BLM.

Of major concern to many rural residents, the updated plan increases the targeted timber harvest level on BLM land to 278 million board-feet annually. Since 1995, the BLM has administered the region with a goal of annually harvesting 203 million board-feet, Levy said.

The decline of timber harvests on land managed by the U.S. Forest Service and BLM is widely blamed for the widespread mill closures and job losses in rural Oregon. Reduced timber harvests also hurt county governments, as they received money from timber sales on O&C land. Since 1989, timber harvests on federal land in Oregon have declined by 90 percent.

Federal agencies manage 60 percent of the forestland in Oregon, but provide only 12 percent of the annual timber harvest, according to the Oregon Forest Resources Institute.

Online

The proposed Resource Management Plan is at http://www.blm.gov/or/plans/rmpswesternoregon/feis/

The Portland-based industry group American Forest Resource Council said the BLM had an opportunity to present a "bold, strategic vision" of forest management but instead developed a plan that "regurgitates the failed policies of the past."

"If the past 20 years provide any indication, this approach is doomed to fail our forests, wildlife and our communities," group President Travis Joseph said in a prepared statement.

Nick Smith, executive director of the pro-industry group Healthy Forests, Healthy Communities, said the BLM "turned its back" on rural residents.

"This is yet another example of an out of touch federal government, fueling the kind of rural frustration that garnered national attention after the Malheur standoff."

Conservation groups see other problems.

Cascadia Wildlands, based in Eugene, said the plan offers "weakened stream buffers, increased carbon emissions and relaxed standards for salmon and wildlife, all to increase certainty for the logging industry."

Executive Director Josh Laughlin called it "unthinkable" that the BLM would reduce stream buffer zones, where logging isn't allowed, by half.

Increased logging ignores the recreation-based economy in the state, the group said in a prepared statement.

John Kober, executive director of Pacific Rivers, said the BLM puts too much value on "subsidizing" county governments with logging revenue.

"The fact is, our public lands produce far more economic and social value by storing carbon, sustaining fisheries, providing recreational opportunities and delivering clean drinking water. Unfortunately, due to rapacious logging of private and state lands all of the burden for conservation is placed on federal lands," he said in a prepared statement.

Levy, the BLM spokeswoman, said the management plan will be published April 15, which begins a 30-day protest period. An agency team will be appointed to review the protests, and a final decision is expected this summer.