

# Building Sponge City: Redesigning LA For Long-Term Drought

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For thousands of years, city planners have engineered water into submission — think aqueducts.

"That's really the core of modern water infrastructure," says David Sedlak, the author of *Water 4.0*. "It's the ancient idea that the Romans gave us. Collecting water somewhere on the outskirts of the city, sending it with gravity into the city, and then when we're done with it, we put it back underground in a sewer and send on its way."

It's the way most cities are designed. And you can hear the echoes of that ancient plumbing in Los Angeles, where rain answered prayers last month amid an epic drought. But that precious water is wasted when it slides off roofs and into sewers.

Some urban designers in LA see water scarcity as an opportunity. They say a downpour could be captured, turned into drinking water and used for irrigation.

But most of the time, it's banished — sent to a river and out to the ocean.

If you were to follow a drop of rain from the sky and onto an LA sidewalk, eventually you'd end up at the mouth of the Los Angeles River, which isn't really a river. Engineers turned it into a narrow concrete channel in the 1940s. Today, it's more like a 51-mile-long bathtub that empties out at the port of Long Beach.

Kayak guide Steve Appleton says this is a river in name only.

But really, it's a flood-control channel, which is why signs on the river prohibit anything recreational. In a rainstorm, all that runoff from the sewers could surge through the channel.

Of course, this river was once dangerous to more than kayakers. Before it was channelized, the LA river could flood disastrously. Entire towns were wiped out, and in 1938, more than 100 people died.

With the river caged by concrete, "it stabilized this constant threat," Appleton says.

The city could develop right up to the river's edge, paving over the floodplain in the process.

The problem today is the city needs that rain. It can't afford to just send it out into the ocean anymore. Almost 80 percent of California is in extreme drought. (That's a technical term, just one notch shy of "exceptional" drought.)

And so there's a call now to build cities like sponges.

Over on Elmer Avenue, a working-class neighborhood, the city spent \$2.7 million to make over the street with permeable driveways and snazzy drought-tolerant landscaping.

"I'd like all the blocks to look like this," says resident Rick Martin. "I can't imagine they would spend this kind of money for the whole city."

Hadley Arnold would love it if they did. She's the co-founder of the Arid Lands Institute, a nonprofit based at Woodbury University in Burbank dedicated to the decidedly non-ancient Roman idea that cities should, wherever possible, soak up every raindrop.

"In most of our neighborhoods in Los Angeles, we are required to send some stormwater off of our properties as fast as possible," Arnold says. "Get it into a storm drain, get it out to sea."

"In the future, we will be using water multiple times, and we will probably have multiple-grade waters."

- Hadley Arnold, Arid Lands Institute

Elmer Avenue is an experimental block that soaks it up "to treat it as a precious resource," she adds.

Along each sidewalk is what's called a bioswale — a gully filled with drought-resistant plants. When it rains, the water collects and filters down into cisterns buried below the street.

"In an average rain year, this block puts enough water for approximately 30 families for a year into the ground," Arnold says.

The Arid Lands Institute would like to scale this up. It has mapped the region to help developers find the best spots for water to percolate down.

To Arnold, this is part of a grand urban design challenge. She says the peaked roofs on Elmer Avenue are designed for snow and ice, not the desert, and that they should be redesigned.

"Roofs that are like a wide mouth open to the sky," she says. "Roofs that are like a cup or a bowl, or an umbrella turned upside down."

This new design would help catch as much rain as possible.

And plumbing should be smarter, she says, meaning we should not be flushing our toilets with water we could drink.

"In the future, we will be using water multiple times, and we will probably have multiple-grade waters," she says.

Arnold imagines an entire city designed like this, like a sponge. It's a plan that might have surprised William Mulholland, the engineer who masterminded California's water system. Mulholland is memorialized by the city with a big Roman-style fountain.

Standing by the fountain, Arnold also wonders what the monuments of a much drier future might look like.

"The ace in our species pocket is the ability to innovate," Arnold says. "And I think the single biggest question in front of us right now is the rate at which we do it. Can we do it fast enough, given the urgency?"

**Answer the following questions in complete sentences on your own notebook paper.**

1. What does the author mean by the statement that water is "banished" ?
2. What is the LA River? What does it do?
3. How much of California is in extreme drought?
4. How can a city be built like a sponge? List
5. What does the author mean by using water multiple times?
6. What does the author mean by the statement "the ace in our pocket is the ability to innovate"?