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We need monsoon soon

As we wait for summer storms, we let plants die, cars stay dirty so tap will still come on

By Tom Beal

ARIZONA DAILY STAR

We gather whenever the clouds do, cast knowing glances at the darkening sky, watch the trees for the wind's direction and assess our chances.

Think it'll rain?

Last week we had an early rehearsal of the annual pageant before drier air moved in to remind us that it's not quite time for the Mexican monsoon, those days when moisture from the south piles in daily for months at a time, converting our mountains into cloud factories.

Each day of the monsoon, the rising sun first warms the eastern flanks of the Rincons, Catalinas, Santa Ritas and other sky islands of Southern Arizona, creating a convective flow that lifts the moisture skyward into colder air where it condenses into rain droplets and ice crystals, forming towering cumulonimbus clouds that break off and float over the valley to, "my house, please, my house."

Our pleas, our prayers, for life-giving rain in this season of heat, in the midst of a drought that could last for 20 years, are echoes of our desert's ancestors, who waited for rain with an urgency we can only imagine.

Not that our situation isn't urgent.

Half our annual rainfall usually comes in these next couple months.

We've failed to reach our annual average in 10 of the past 12 years.

And we've been officially in drought for seven of the last eight years, and most of Southern Arizona is currently at the "exceptional" stage — the driest designation available.

But we have advantages our ancestors did not. We turn the tap and water flows.

Perverse as it may seem, our first response to drought is to use more water. Those shade trees and fruit trees transplanted from wetter climes need more water than the clouds have delivered in this decade. When the sun blazes, we need our showers and swims and evaporative cooling.

Our desert's early inhabitants were adept at capturing whatever nature provided.

Be a rain watcher

- Arizona's climate watchers are looking for rain-gauge hosts.

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If you would like to be one, go to www.rainlog.org and sign on.

The project's partners are the Arizona Cooperative Extension Service of the University of Arizona, the U.S. Department of Agriculture's Southwest Watershed Research Center, the UA's SAHRA (Sustainability of semi-Arid Hydrology and Riparian Areas) and the Upper San Pedro Partnership.

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The earliest settlers built canals along seasonally wet rivers or mounded the earth to create agricultural bowls on the slopes of mesas. They developed impermeable ceramic containers to store and transport water. They waited for summer rains to fill their fields and their pots, and when the rains didn't come, the people left. The archaeologists call one such vanished group "Sinagua" — "without water."

- Go Online: Watch a thunderstorm form over the Santa Catalina Mountains in time-lapse photos at prism.asu.edu/clouds/animations.asp

Here, along the Santa Cruz River and its tributary washes, a succession of Hohokam, Pima and Tohono O'odham captured river floods for summer farming, as some O'odham still do. The O'odham also developed an elaborate set of rituals to instruct the birds to find Wind and ask him to bring his friend Rain back to their villages — to flood their fields, to keep the earth from burning.

The Spanish explorers followed the rivers north and settled alongside the native villages, by the springs and the flowing portions of the rivers. Tucson exists because this is one of the places where the Santa Cruz River reliably rose to the surface.

First dams, then pumps

Like the natives, they needed the monsoon to keep the springs fed and the river flowing and they put that task in the hands of San Juan Bautista, St. John the Baptist, whose feast day, June 24, was proclaimed the first day of the monsoon. In Tucson, on average, the monsoon begins July 3.

Tucson's Mexican period brought dams that created lakes from intermittent flows on the Santa Cruz.

The American period brought even more technology to the task of slaking our thirst. Stronger pumps and deeper wells brought ancient water to the surface. Ultimately, a 336-mile uphill, concrete river connected us to a watershed that begins high in the Rocky Mountains.

That water you're dripping on your parched plants this week comes from a mix of sources — rain that fell on Tucson in Hohokam times, snow that melted as recently as last spring somewhere in the Colorado River's 246,000-square-mile watershed.

Tucson Water draws 45 million gallons a day from the Central Arizona Project, good for about half our winter use but less than a third of summer peaks of 165 million gallons.

CAP use could increase to 110 million gallons daily if Tucson Water had the ability to store and deliver more — the reason it is asking to boost our water bills by 4.6 percent this year and 5 percent annually until 2011.

Pay 35 percent more by 2011, turn the tap, and the water will continue to flow.

Monsoon "is salvation"

The monsoon is still a critical element of our very existence, bringing on average 6.06 inches of our annual 12.17 inches of rain, as measured at Tucson International Airport. And, as we know from the O'odham and from a recent series of catastrophic fires, the monsoon truly does keep the earth from burning.

"It is salvation," according to Mitch Basefsky of Tucson Water.

Hydrologically, our summer rains aren't the most critical component of natural recharge. They come fast and furiously, running off roofs, driveways and parking lots onto asphalt streets, into metal culverts and hardened washes, filling our stabilized rivers, heading north, running away from the aquifer.

The winter rains sink into our lawns or sit atop our nearby sky islands as snow, then seep slowly into the ground, restoring green to the forests, feeding our mountain springs and our canyon creeks and our lowland aquifers more efficiently.

But a hot, dry summer can erase a good winter because if rain does not come this hottest time of year, we suck that water back out of the ground. Last year, as we waited for the monsoon to begin 15 days late on July 18, we came dangerously close to outstripping our ability to keep those taps flowing.

Rain came just in time. The city didn't need to enact bans on outdoor watering, car washing and pool filling.

This dry winter, the prospect of those measures loomed early. January saw a 15 percent increase in water use over the previous year. Water managers were concerned about what would happen if that trend continued.

Tom Arnold, senior management analyst for Tucson Water, said his models predicted high demand for water in May. "Demand came in surprisingly low, given the weather conditions," he said.

People know we're in drought, he said, and are doing something about it.

Early results from a survey returned by 2,200 Tucson Water residential customers shows that half have responded to drought with a variety of strategies.

"They're watering less often for shorter periods, moving landscaping, letting plants die, planting fewer annuals, cutting back on vegetable gardens, replacing plants with more drought-tolerant plants, washing cars less," said Arnold.

We've apparently grown cognizant of the perverse logic of our water use.

Leaving, like the ancients

Gary Woodard, who is helping to crunch the numbers, said the survey also discovered a new tribe of Sinagua. One percent said they planned to simply leave if the drought deepened.

We Tucsonans have always taken pride in using less water than other nearby hot places — Scottsdale and Phoenix to name a couple. Apparently, said Woodard, a water researcher at the University of Arizona, we're prepared to use even less if convinced of the need.

Tom Swetnam, who reads the rings of ancient trees to compile our rain record, says we go through "20-to-30-year periods of relatively wet or dry weather." The last severe drought came in the late 1940s and lasted a decade until 1957. "A lot of ranchers went out of business, and Arizona and New Mexico were both declared disaster areas by President Eisenhower, who came out to visit."

"Uncharted territory"

Past performance isn't enough to predict the length of the drought, especially now with evidence of profound changes in weather patterns, said Swetnam, director of the UA's Laboratory of Tree-Ring Research. "We're in uncharted territory because of climate change. There may be no analog to the past," he said.

But for now, we turn the tap and water flows.

Elsewhere, drought remains very real — to the migrants trekking north through the waterless landscape, to ranchers whose herds must be thinned when the rain doesn't fall, to homeowners in the Tucson Mountains and other parts of Southern Arizona where the aquifers are fickle and well pumps are sucking sand.

Tucsonan Brad Lancaster, who wrote the book on water harvesting (actually three books), tries to live by the weather cycles and formed a very real connection to the drought when he watched his cistern go dry early this year.

He is now inviting neighbors to bring their laundry by and increase the gray water flow to his yard. If something doesn't happen soon, he may need to use potable water on his fruit trees.

Lancaster is also part of a group using ancient techniques of water diversion in a thoroughly modern setting. Last week, volunteers from several groups planted native trees along one of our intermittent urban streams — North Cherry Avenue at its confluence with East Fort Lowell Road.

The city is cutting the curbs to allow storm runoff to be directed to wells around the newly planted trees, part of a demonstration plot for several methods of water harvesting on the grounds of the Nature Conservancy's headquarters and the nearby Yoga Flow studio.

"Our streets run like ephemeral waterways. If that's what they are, let's design the streetside planting to recognize that. Plant the same native vegetation that grows along our ephemeral streams and get really nice, healthy shade trees."

It's a return to that much earlier technology, to the times before we could just turn a tap and watch the water flow.

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