Northern Arizona faces a summer forecasted to be longer, hotter and drier than ever. Water harvesting, a conservation method with roots in grandma's rain barrel, satisfies the thirst for a water supply solution. MICHÈLE VAN HAECKE explores this common-sense approach to saving water, the Earth and money

Harvesting the Clouds

Water is life in arid Northern Arizona.

Lack of rain, record-high spring temperatures and forecasts for a long, hot summer are alarming. Regional rainfall has dwindled by 25 to 50 percent since 1995. In March, the federal Bureau of Land Management warned that severe drought might fuel a fire season to rival 2000 and 2002. Dry skies plus relentless temperature spikes mean each raindrop counts.

When rain is liquid gold, why not bank it? Water harvesting – collecting and storing rain – is one thirst-quenching solution to water supply problems. Long the realm of self-sufficient mavericks in solitary outposts, rain harvesting has evolved into a sensible solution for the average homeowner. Systems can be as complex as storing enough water to soak a small village or as simple as catching runoff in a whiskey barrel. Whatever the system, water harvesting stows precious precipitation.

When it Rains, it Stores

Rainfall in Northern Arizona may not be a deluge, but drops add up. Last year, 17.9 inches fell on Flagstaff, 15.3 on Prescott and Sedona's red rocks soaked up 14. Compared to Phoenix's average seven inches or parched Death Valley's 1.84, the drizzle is promising. The typical American household (two adults, three-point-five kids and one thirsty pet) uses about 75 gallons of water a day. A typical shower on their typical single-family roof can yield 623 gallons. All it takes is a mere inch of rain and the right collection system.

"It's all about storage," said Barnabas Kane, a second-generation landscape architect whose Prescott company, TBK Landscape Architects, includes some water harvesting in all plans. "The rest of it is minutia."

Need varies according to use, home size and– mostly– landscaping. These factors determine the water budget, a mathematical plan for figuring how big or small systems should be. Using water for household chores swells budgets. Landscaping with native plants shrinks them. Existing supplies also weigh in.

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Rainwater harvesting...

"My well was the driving force behind my water harvesting system," said Kane, who installed a 5,000-gallon system at his Prescott home last summer. The well was shallow, sensitive and in a neighborhood full of septic fields. Now, two 2,500-gallon tanks collect enough rain to soak his half-acre site during dry spells.

Saving for a Sunny Day

Storage and collection are the guts of water harvesting. Roof peaks, pitches and gables are water entry points. Gutters and downspouts transfer to tanks. Caps and filters block debris. Roof washers divert dirty runoff.

Plumbing and pumping are the muscle that takes water where it's needed. Water loses pressure the farther it flows and suffers from head loss, friction created when it moves against pipes. Pumps and pressure tanks add force to make drip-irrigation systems drip and showers shower. Bladder tanks maintain pressure and prevent pump wear. Water treatment is the brain that makes rainwater safe for household use. Treatments ranging from chlorine tabs to reverse osmosis disinfect, condition and improve water taste.

...collection, storage and treatment.

Systems can be built from costly manufactured parts or found items like old bathtubs.

"You can really improvise," said Steve Morgan, a TBK landscape architect who teaches environmental landscape design at Yavapai College. "It's not like you have to go out and buy something fancy."

Raining Buckets

Like any budget, water budgets balance outflow (use) and income (rain). It takes a dozen 55-gallon barrels to catch 623 gallons. Most tanks are large-capacity workhorses that hold up to 18,000 gallons. Collecting water in a rain barrel won't water a large yard or fill a pool, but reduces supply drain.

"The response to the rain barrels, specifically, has been nothing but positive," said Flagstaff Conservation Coordinator Jonathan Koehn. "It's kind of a carrot on a stick."

Last summer, the city's Clean & Green Committee sold barrels to residents as part of its water conservation plan. Since the program was new, city leaders were surprised when their 350-barrel inventory ran out in two weeks. This year, residents can reserve barrels and pick them up at local plant nurseries.

"It's been really interesting to see the progression of different ideas moving along," Koehn said. "First it was recycling. Then people started thinking, 'Hey, what more can we do in our own homes?'"

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The Silver Lining

"Any time you give people an opportunity to save on water, save the environment and also save money … it's a lot more inviting," Morgan said.

Rain is free. Wells are costly to build and maintain, and city water comes with fees. The big picture looks good for Earth and the bank account.

System costs depend on complexity and materials. Charming stone cisterns can run more than most homes. Cement tanks require professional excavation and construction. Plastic and fiberglass tanks are durable and cost between 35 cents and $1 per gallon. Gutters and pipes range from 30 cents to $15 per foot. Roof washers, pumps and pressure tanks run in the hundreds.

Good planning cuts costs. Preparation requires more muscle than money and projects can be spread out over time. Most systems can be installed by anyone who knows the ABCs of PVC pipe. They require some fine-tuning but– barring leaks– post-installation costs are minimal.

It all comes out in the wash, Morgan said.

"If you're supplying that 60 percent (used for landscaping) off of your roof, that's savings for you," he said. "It's also good for the environment."

More on>
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- **"Rainwater Collection for the Mechanically Challenged," by Suzy Banks with Richard Heinichen, is a do-it-yourself guide to water harvesting. Book and video formats are available at www.oikos.com's bookstore.**
- **Flagstaff residents who want to participate in the city rain barrel program can reserve barrels through Flagstaff Clean & Green, 928-779-7622 or www.flagstaff.az.gov. Distribution is planned for the first week in July.**

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