

Archaeologist Kristin Kuckelman holds a perfect arrow point.

# A Perfect Point

## Springs and Reservoir Connect the Past with the Present



Greg Hobbs stands by Goodman Lake, an ancient reservoir.

Read the first part of this story, "The Search for Mona Spring," online at [denbar.org/docket](http://denbar.org/docket).

This is the second of a two-part story on Justice Hobbs' trek through southwestern Colorado to help survey Ancestral Pueblo water sources. Here, he travels with his wife Bobbie, the Wright Paleohydrological Survey team, and archaeologist Kristin Kuckelman of the Crow Canyon Archaeological Center.

By Justice Greg Hobbs

Senior archaeologist Kristin Kuckelman leads us back into the Goodman Point Unit of Hovenweep National Monument in southwestern Colorado on Sept. 11. My wife Bobbie and I are here with the Wright Paleohydrological Institute team to survey Ancestral Pueblo water sources.

Ken and Ruth Wright welcome us at a stopping point on County Road P, northwest of Cortez. It's a quarter to eight a.m. this memorial day of the day of the 2001 assault on the Twin Towers. It is one of those high-pressure sky-is-blazing blue, end-of-summer golden days of incipient fall! Sleeping Ute Mountain looms immediately to the south. In the midst of the great drought of the late 1270s, attackers from other Pueblo settlements destroyed the Goodman Point village we are about to enter.

You can't miss the rendezvous place. A couple of Corgi greeter dogs belonging to a family on the north side have taken possession of the road's centerline. Legend of Southwestern archaeology David Breternitz and his wife Barbara arrive to a good double-wag sniffing. Pete Foster, Gary Witt, and Brendon Langenhuizen unpack from their trucks an array of survey, flow, and water quality measurement devices.

Ken previously e-mailed the day's investigatory hypothesis:

### *Juárez Spring Hypothesis—Goodman Point*

*The partially saturated Dakota/Burro Canyon formation north and west of the Goodman Point Juárez Spring drains by gravity at the rate of about three acre-feet (3,700 cubic meters) per year to the spring. Occasionally, localized precipitation doubles the two-gallon-per-minute (7.6-liter-per-minute) spring flow. With 1 percent of the annual precipitation reaching the groundwater reservoir, the likely geologic tributary area is 290 acres (1.2 square kilometers).*

I translate the problem like this: Flow from the springs of Mesa Verde and the Great Sagebrush plain underpinned the people's viability. The population had grown to between 10,000 and 30,000 people. Why? Good food supply? Better health? More migration to the area? More frequent rains? After nearly 800 years of occupation, they aggregated around A.D. 1250 from individual farmsteads into villages of 500 to 800 people. They surrounded their precious

springs with guardian walls.

Data gathering must ground our understanding of who they were, how they lived, and how – maybe why – they departed. The sciences of archaeology and paleo-hydrology have their methods and their limitations.

It's the people's art that awes us most. Their D-shaped structures containing rooms and kivas, their surroundings, and their towers—practical, beautiful, defensive—testify to their beliefs, their tenacity, and their fears.

We can only talk with them through what they left. Our tentative conclusions, supported by demonstrable facts, must necessarily adapt to findings that will certainly come after us.

So, here we go on the trail! The routed wooden National Park Service sign reads:

*Hovenweep*  
*National Monument*  
*Goodman Point Group*  
*143.3 acres*  
*Protected by Nat'l Park Service*

“Protected” is relative to what has happened in the settlement of this part of the Four Corners region. In the early 1880s, as Anglo homesteaders moved in, some omniscient government work resulted in reserving a portion of the archaeological wonders residing here. All around, the chaining of trees and the plowing of fields for hay, beans, and homes resulted in dumping many ruins into choked arroyos. Salvaged treasures, such as whole painted water jugs and perfect arrow points, were taken from this region and appear in public museums and private homes throughout the world.

Ken distributes topographical maps. The Goodman Point Unit is bifurcated by a tract of private land the government ceded back for contemporary settlement in the 1950s. Accordingly, Goodman Point village and Juárez Spring lie north of the private tract; Goodman Lake and Mona Spring are south of no-trespassing wires.

Goodman Lake, named for an 1870s Anglo cattle company foreman, is an Ancestral Pueblo reservoir located, like nearby Mona Spring, on Bureau of Land Management (BLM) property. Under permit by the National Park Service and BLM to Crow Canyon Archaeological Center, we conduct our water survey under the auspices of Kristin Kuckelman. Her research in this area dates back to the late 1970s, when she worked alongside Breternitz and others prior to construction of the Bureau of Reclamation's Dolores water project.

With the Breternitzes anchoring our orientation point on the sandstone ledge above Juárez Spring, we climb down through the collapsed guardian wall that encircled the village. We skirt many sunken kiva mounds, terraced one atop the other, on the arroyo's steep side slope.

Sleeping Ute to the south, Mesa Verde to the southeast, and the La Plata Mountains to the east. These are the views the people enjoyed, as do we.

We fight our way through guardian willows to the second Juárez Spring discharge point; the first is dry. Pete,

Brendon, and Gary take water measurements using a mobile weir. A comparison of flow rates between morning and afternoon for nearby springs shows daily variation, the consequence of willows taking their fill in the afternoon heat. Always observant, the people must have queued to fill their water jugs early in the day. I write:

Willow

You've got to respect the willow.

In the heat of the day, they'll drink  
a good long draw.

Fill your water jug early, the willow  
will shade your hot afternoon.

This way you can drink each others' company.

Kristin appears directly above on the damp side slope. It's good to see and be with her again. She says the people also may have intercepted water from this spring higher up the slope near their homes.

Throughout the Four Corners region, the Ancestral Pueblo people built berms, check dams, reservoirs, and steps into scooped-out pools wherever water might appear, or be found, by digging into a high water table for drinking water. They were dryland corn and domestic turkey farmers. All they had were wood and stone digging sticks tied together with plant fiber, baskets, pots, and animal bone for marshalling drinking water and dredging out sediment. The oldest water works discovered to date in the southwest are twenty 12,000-year-old hand-dug wells near Clovis, N. M.

Pete, Brendon, Gary, Kristin, Bobbie, and I take the two trucks around the private land to a gate along the BLM fence line. Shouldering up the water testing equipment, Kristin and I lead our group down the grass-high arroyo to Mona Spring. We located the spring on July 21, with my grandson K.J.



Archaeologist Kristin Kuckelman, Bobbie Hobbs, and Wright Paleohydrological Institute team member Brendon Langenhuizen cup water into the pitted cap rock to determine the spillover amount for an ancient reservoir fill.

during our preliminary investigation.

This time, we bow under the rocky ledge alcove from which the spring apparently issues. The sandstone walls are damp and green. Mineralized calcium carbonate mushroom-like wafers dot the drip line. We cannot find anything like the steady stream we saw at Juárez Spring. Seeps are more like it here.

Kristin pushes back tall grasses growing on the upslope side of Mona Spring's pool. She finds rocks that look like steps for filling water jars. The people must have stooped to ladle water into the jugs. Brendon and Pete take water quality samples for lab testing.

We cross the exposed cap rock straight east to Goodman Lake. Water-loving reeds are growing throughout the reservoir, which glistens in the sun. On July 21, we saw dead grass only. A healthy dose of "monsoon" rain has moved across the pitted watershed rock into the capture zone the Ancestral Puebloans created.

Brendon and Pete conduct an infiltration test on the dam by timing the movement from a tube of water into the compacted soil. The water penetrates very slowly. It's a good and tight water collecting structure the people built.

Settlers of the 1880s may have dredged the reservoir body and elevated the dam. When asked, they said the reservoir was there when they got there. They hauled household water out of here by horse and wagon.

On the hill above the reservoir on the south ridgeline toward Mona Spring are the remnants of five Pueblo-II farmsteads. Based on pottery shards lying about, the people likely lived here between A.D. 1000 and 1150.

They built the reservoir and could have used it conjunctively with Mona Spring. Due to lag time between recharge and discharge, the Mona Spring pool could have provided water in drought times. As the spring faltered, when rains returned, the reservoir would catch the cap rock run-off from intermittent storm. On the southwestern side of the reservoir below the ancient farmsteads, Bobbie sees stones in the grasses that may have been stepping stones for filling water jars.



A view of the steps to Mona Spring, used for filling ancient water jars.

When Goodman Point village was built in the mid-1200s, probably not more than a half-hour walk through pinyons and junipers, it would have brought them to the

reservoir if they needed water to supplement Juárez Spring.

Kristin and I explore the fence line between the BLM and private land. The private property has been cleared for farming and grazing. A rough road we cannot cross runs along the private side of the fence. We try to spot where the path from Goodman Point Village might have passed through to Goodman Lake. Though we see a couple of likely possibilities, we cannot be sure.

Kristin goes back to the survey work on the reservoir. I walk the entire length of the fence line east to where it stops at the corner of the Park Service/BLM boundaries. I stumble my way through the brush and two arroyos there and back. Obviously, this is not a trail the people would have taken back and forth to Goodman Lake.

They would have travelled more easily across the higher ground through what is now the private property. Kristin has marked their probable route on the contours of a topo map. Two trails—one from the Shields Pueblo and one from Goodman Pueblo—still intersect at a point on the Park Service property abbreviated by the no-trespassing wires. I bet the path was close to straight across from this intersect, south to the watershed cap rock that feeds Goodman Lake.

The rest of the afternoon we survey the water shedding capacity of the cap rock into the reservoir. Brendon relies on Kristin, Bobbie and me to help. Bobbie holds and moves a long, gauged rod. Brendon sights through the tripod surveying instrument. Kristin draws out bucketfuls of water from the reservoir. All of us cup out and pour the bucket water into the folds and pockets of the cap rock.

Brendon has tape-measured out a 100-square-foot trapezoidal area from which to calculate the water retaining capacity of pitted rock. When we finish pouring a total of 6.7 gallons of water into the spaces, he figures it would take more than a tenth of an inch of rain to fill the voids in the cap rock and begin spilling into the reservoir.

I calculate Brendon a smart young man.

We rendezvous with Ken and Ruth, who have spent the afternoon exploring for Dakota Formation outcrops and knocking on neighbors' doors throughout the area to gather well water levels. The people now living here report hauling water for decades. They didn't like the taste of the mineralized water in the shallow groundwater formation that feeds Juárez and Mona springs. Some of the wells went dry and the good ones gave only low yields. Now, a rural water utility has extended Dolores Project water to their kitchen sinks and toilets. The Ancestral Pueblo people did with what they had.

During the day, Kristin finds a perfect arrow point, more than 1,000 years old, lying on the ground beside a collapsed Ancestral Pueblo dwelling. She holds it flat and open on the time lines of the palm of her left hand. I snap a photo. A perfect point. She returns this precious artifact to the centuries, right where she found it. **D**

*Endnote: My narration of this two-part article greatly benefits from field conversations with Kristin Kuckelman and articles and reports by her and her colleagues at Crow Canyon Archaeological Center.*