

Quake sets springs and streams flowing

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SANTA CRUZ — Dozens of area creeks and springs have begun gushing water in the wake of the earthquake, even though October is normally the driest time of year.

Changes in water flow are common following earthquakes, geologists say, although the reasons for the changes are not well understood.

Local water companies are watching the situation with some apprehension, worried that the sudden increase in water supply may later be followed by a decrease in water.

But one man's report of increased water flows *preceding* the Oct. 17 earthquake has scientists intrigued.

Dan Friend, a former ranger at Big Basin State Park, was hiking in the Waddell Creek area that Tues-



Bill Lovejoy/Sentinel

Bob and Anne Briggs measure flow at once-dry Casa Spring.

day afternoon when a sudden roar of water caught his attention.

"I was on the observation platform beneath Berry Creek Falls, looking through my lunch bag when the sound of the falls got louder," Friend said Wednesday. "It really got my attention."

The flow over the falls had been "a trickle," Friend said, but over the course of five minutes it gushed to four or five times that amount. Even though he knew there was no dam above the falls, Friend was alarmed by the sudden increase and began looking for some place to run.

But the flow seemed to stabilize after a few minutes, and Friend puzzled over the event as he ate his meal.

"I couldn't connect it, so I kept hiking," he said.

The earthquake struck approximately 90 minutes to an hour later as Friend was setting up camp in a

narrow canyon with a stream flowing through the bottom.

"I was setting up my tent when I heard what sounded like a helicopter," Friend said. "The sound got louder for about five seconds before the ground started moving. It was like standing on the deck of a boat in rough seas, a rolling sensation."

Limbs crashed down from the swaying trees, and boulders breaking from the canyon's steep sides "whooshed through the underbrush, scooted right across the creek, hit the boulders in the creek and just exploded," Friend said. "I felt like a tenpin."

Friend quickly grabbed his belongings and "scurried" from the canyon, he said, heading back toward the trailhead at Highway 1. During that fast-paced 6.5 mile hike, Friend noticed a new spring welling up in the middle of the trail, and two springs that had been

nearly dry spilling over with five to six times their former flow.

Waddell Creek itself was flowing at twice its former rate, and the water was very muddy.

Friend's account has caught the attention of scientists who have studied the linkage between water levels and earthquakes for years. Geologists hope that precise water measurements may eventually provide an early warning system for some earthquakes.

"Mr. Friend's report is similar to reports of premonitory events that occurred before earthquakes in China and Japan," said Evelyn Roeloffs, a geophysicist for the US Geological Survey. "But so far his is the only case I've heard of where changes that occurred before a quake have been reported by...such a credible witness."

Changes in wells and streams were one of the factors used to predict the 1975 earthquake in Haiching, China, Roeloffs said. Coupled with a series of small tremors, authorities evacuated buildings throughout Haiching shortly before the quake hit, saving an estimated 100,000 lives.

"Premonitory slippage" along earthquake faults can precede large earthquakes by hours or days. Scientists hypothesize that the fault slippage squeezes areas of the earth's crust, forcing water to the surface.

Earthquakes usually force more water than usual to reach the surface, but occasionally they cause streams and wells to dry up. In the summer of 1988, an earthquake reportedly filled streams in the Mountain Charlie area of the Santa Cruz Mountains with water. Two

weeks later the streams dried just as suddenly, forcing the Mountain Charlie Water Works to turn in drinking water for residents.

With the Oct. 17 earthquake, water districts in Boulder County, Felton, Lompico and Scotts Valley have reported greatly increased flows in mountain streams and springs, and water gauges belonging to the U.S. Geological Survey have confirmed increased flows in Pescadero Creek, Zayante Creek and the Pajaro River.

Bob Briggs, an 18-year resident of Rancho del Oso, has measured stream flows in the Waddell Creek area for years. Waddell Creek had a flow of 1.5 cubic feet of water per second on Oct. 12, but it jumped to 12.6 cfs on Oct. 19, Briggs reported, several days before a rainstorm hit the area.

Nearby Brown House Spring increased its flow by a factor of 12.5 following the quake, Briggs reported, and Casa Spring, which had been dry since 1970, has been flowing at a rate of 25 gallons per minute since Oct. 17.

Briggs has documented numerous other changes, and is seeking flow information on other local waterways. Briggs can be contacted by writing to Rancho del Oso, Davenport, CA 95017.

Local water officials also are monitoring the situation with some apprehension. The extra water looks like a boon right now, but there is always the possibility for long-term negative changes in the local water supply.

"It could mean more water for us or...it could mean less," said Ross Foulk, president of the drought-stricken Lompico Water District. "We don't know what to expect."

Damaged bridge blown up

WATSONVILLE — The old Thurwachter Bridge, which has been all but abandoned for the past four years and was severely damaged in the earthquake, was blown up Tuesday afternoon.

The bridge was off Beach Road, linking Santa Cruz and Monterey counties.

Soldiers from Fort Ord carefully laid explosives across the structure Tuesday and set off the blast about 4 p.m., sending shock waves through Watsonville.

The bridge, which is known as Thurwachter on this side of the

river and McGowan on the other side, was closed to vehicular traffic four years ago because of its dilapidated condition.

It had been used primarily as an access across the river for agricultural equipment.

The Monterey County Board of Supervisors decided the structure should come down for fear that heavy winter rains would cause it to collapse and cause flooding.

Monterey County is planning to rebuild the bridge this summer with cooperation from Santa Cruz County.

REFERENCE

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EARTHQUAKE