



Forum: Colorado flood not 'The Big One,' but still an event for the history books

Broomfield event provides analysis of September storm

By Charlie Brennan, Camera Staff Writer Boulder Daily Camera

2013 Colorado Flood

Fatalities:	10 (most in a Colorado flood since 1976)
Counties impacted:	20
Damaged homes:	16,000-plus
Destroyed home:	1,882
Damaged businesses:	750
Destroyed businesses:	200
Miles of state highways damaged:	200
Economic toll:	\$2 billion (considered very preliminary)



Keenan Gates walks across a makeshift bridge in Salina after assessing the damage to his mother's home on Sept. 17 at the Salina Junction in the Fourmile Canyon area of Boulder County. (Jeremy Papasso / Daily Camera)

BROOMFIELD — It likely will happen again and it could have been worse.

Those were two of the messages Thursday out of the Colorado Flood Forum taking place at the Omni Interlocken Resort, as about 250 people gathered to hear a comprehensive analysis of the September flood that shattered weather records, claimed 10 lives in the state and caused an estimated \$2 billion to \$3 billion in damage.

Kevin Houck, chief of the watershed and flood protection section of the Colorado Water Conservation

Board, took on the question on the minds of many in attendance: Was this, a storm that triggered 100-to-1,000-year rains depending on location, the "Big One?" "I'm hedging a little bit," Houck admitted. "I would say that in some cases the answer is yes. and in some cases the answer is no. If I had to go to one side or the other, I would say I would lean more toward no, this is not the big one."

Houck pointed out that the 10 lives lost does not place the September event even in the top five Colorado flood events for its human toll — the 1976 Big Thompson Flood killed 144. A flood in Pueblo in 1921 claimed 78. He also said that the economic toll may not ultimately exceed the \$3 billion cost — in today's dollars — of the 1965 Cherry Creek Flood.

A flood of data was tossed out at the forum's morning session, along with qualifiers that some numbers — such as the storm's cost in dollars and cents — are still being calculated, evaluated and debated. But, said Houck, "This was a human disaster, as well ... It's very important to remember that there is a human side to this as well, and that's something we never want to forget."

The forum, perhaps the most extensive examination of the September food to have been convened to date, was co-hosted by the Colorado Association of Stormwater and Floodplain Managers and Colorado State University.

Nezette Rydell, meteorologist in charge at the National Weather Service in Boulder, addressed a question voiced countless times while the storm was raging: Had this been predicted? "You ask a meteorologist, did you predict this? You'll get two answers. Yes and no. Nobody predicted eight inches of rain in one day. It didn't happen. We were talking about abnormal amounts of rain."

The Boulder area broke every rainfall record in its books, for a day, for a month, and, ultimately, for a year, highlighted by 9.08 inches of rain falling in one 24-hour period at the peak of the deluge. But Rydell posted, during her presentation, the National Weather Service forecast for the Boulder area five days in advance of the storm's most intense downpours, which indicated that Wednesday would feature "heavy rain as much as one inch per hour."

Rydell cautioned, however, that the science of weather forecasting is not yet sufficiently advanced that meteorologists can pinpoint with greater specificity that something as unprecedented as September's crippling downpours are imminent. "This was an extreme event. Modeling doesn't really do a lot with extreme events," said Rydell. " ... This was not in their realm of experience."

Even more than five months after the fact, Rydell emphasized that the research into, and lessons to be drawn, from the storm, is still in the early phase. "Doctoral students will be kept very busy for a long time to come" trying to figure out why the storm set up over the Front Range the way that it did, punishing some areas with rainfall characterized by the weather service at one point as "biblical," while not affecting others so severely. But one thing of which she is already certain, Rydell said, "There will be a next time. It's going to happen again."

'Sometimes better lucky than good'

Mike Chard, director of Boulder's Office of Emergency Management, who spoke as a member of a morning panel session, hailed the city and county's response to a situation that had some mountain-area residents, in particular, believing they were "descending into the seven circles of Hell" when the storm was at its most intense. "We thought we were going to have 300 to 500 people dead in the canyons" at one point, said Chard. Instead — thanks in part to periodic breaks in the rain that allowed for helicopter extractions of residents from Jamestown, Salina, Lyons and other isolated communities — he said about 1,700 were successfully evacuated in the largest airlift since Hurricane Katrina in

2005.

"We're very thankful that sometimes, better lucky than good," said Chard, who credited the county's experience with the devastating Fourmile Fire of 2010 for fueling the coordinated, multi-agency response to September's events. "We handled the flood remarkably well. We've had disasters that were a fraction of this, and we had more community criticism." But Chard confessed that there were more than a few moments when officials wondered how they'd pull through, recalling the sense of, "I can't believe this is going on, it can't get any worse. It felt like getting punched in the face almost every five minutes with a new problem."

He recalled Boulder County officials, emergency preparedness personnel and individual homeowners facing a continuing wave of problem solving, getting knocked down, picking back up, regaining traction and fighting through a historically challenging week. "I think it speaks strongly to the level of preparedness in our county, the effort and investment putting into reinforcing infrastructure, floodplain management, flood insurance programs for residences, the preparedness and community's willingness to accept the message and know what to do when something happens — all are huge contributory factors to the success that we had during this flooding event.

"We'll carry that forward and develop an even higher level of preparedness as a community, city and county, that I think will add more resilience into our community."

'We're still begging for data'

Bob Kimbrough, associate director of the Colorado Water Science Center of the United States Geological Survey, presented data on peak stream flows, but did not place that data in the context of whether the numbers represented a 100-year-flood event. Previously, he said the volume of water in Boulder Creek at North 75th Street, based on a 20-year record of measurements at that point, had a 1-in-100 chance of occurring in any given year.

He did say, however, that indirect measurements for St. Vrain Creek — including 31,400 cubic feet per second at Lyons and 37,000 cubic feet per second near Interstate 25 — likely will prove to be records for that drainage. But, as with many other aspects of the storm review, more work remains to be done.

"We want to get the peak discharges right before we go down the road of assigning annual exceedence probabilities," Kimbrough said. "That's the first step, and we're still working on that. "When we have a number like 31,400 (cubic feet per second) at Lyons that potentially could be three times the peak record, I think we need to take the time to do further evaluation of that number. and that's why we're interested in doing some 2-D or 3-D modeling on that same reach, to see if we can improve that estimate, or at least confirm it. So it's too early, we think, to be assigning annual exceedence probabilities."

Colorado state climatologist Nolan Doesken told those in attendance that the September flood was "a data-rich" event, with statistics gleaned from some 2,500 rain gauges. But, "We're still begging for data," Doesken said, citing the North Fork of the Big Thompson as one location where gauges were overwhelmed or rendered non-functional.

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