How Can 100-year+ Events Possibly be Overlooked?

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URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

2018 AUG
Conference
Ventura, CA

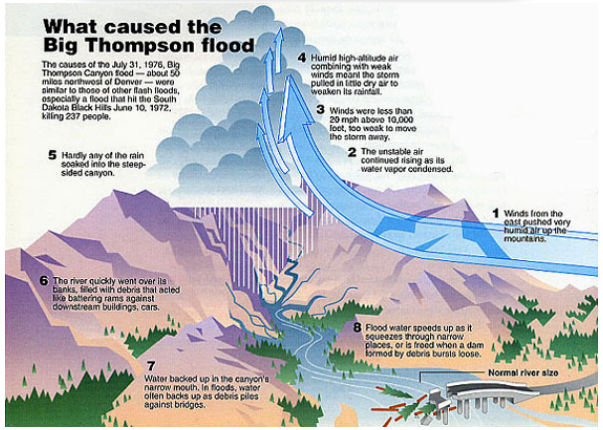
What are your chances of getting a hole in one?

A: For the average golfer about 12,000 to 1 for each attempt, requiring ~3000 rounds to achieve the goal.

120+ in ~20 years

SO…WHAT ABOUT STORMS?

July 31, 1976



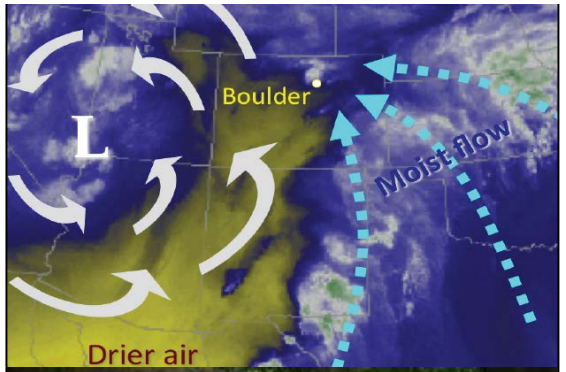
HUFFPOST

The 1,000 Year Storm: Colorado's Flood Is One For The History Books

By Matt Ferner
09/20/2013 12:11 pm ET | Updated Dec 06, 2017

Just how rare was the deluge in Colorado that resulted in the deaths of as many as 10 people, hundreds unaccounted for, nearly $2 billion in property damage, the evacuation of more than 10,000 people that affected at least a 200 mile stretch of the state, north to south?

Very rare. So rare that the amount of rainfall is likely to occur less than once every 1,000 years.



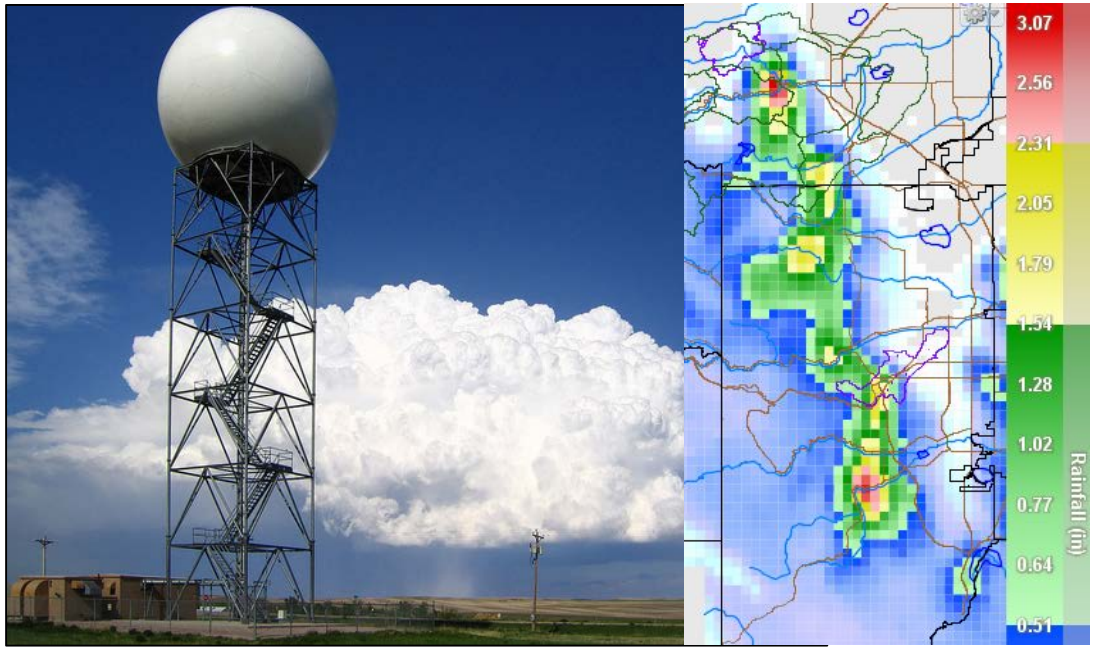
Nobody missed this one!

How about 2017

- ❑ Did something big happen?
- ❑ Is there one in particular that you remember?
- ❑ If so, why?

Tools for today's analysis

An ALERT rain gage at the Denver Tech Center ***(over 200 system-wide)***



Radar & Derivatives

Let’s first look back at September 2013.

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A view from a single rain gauge point.

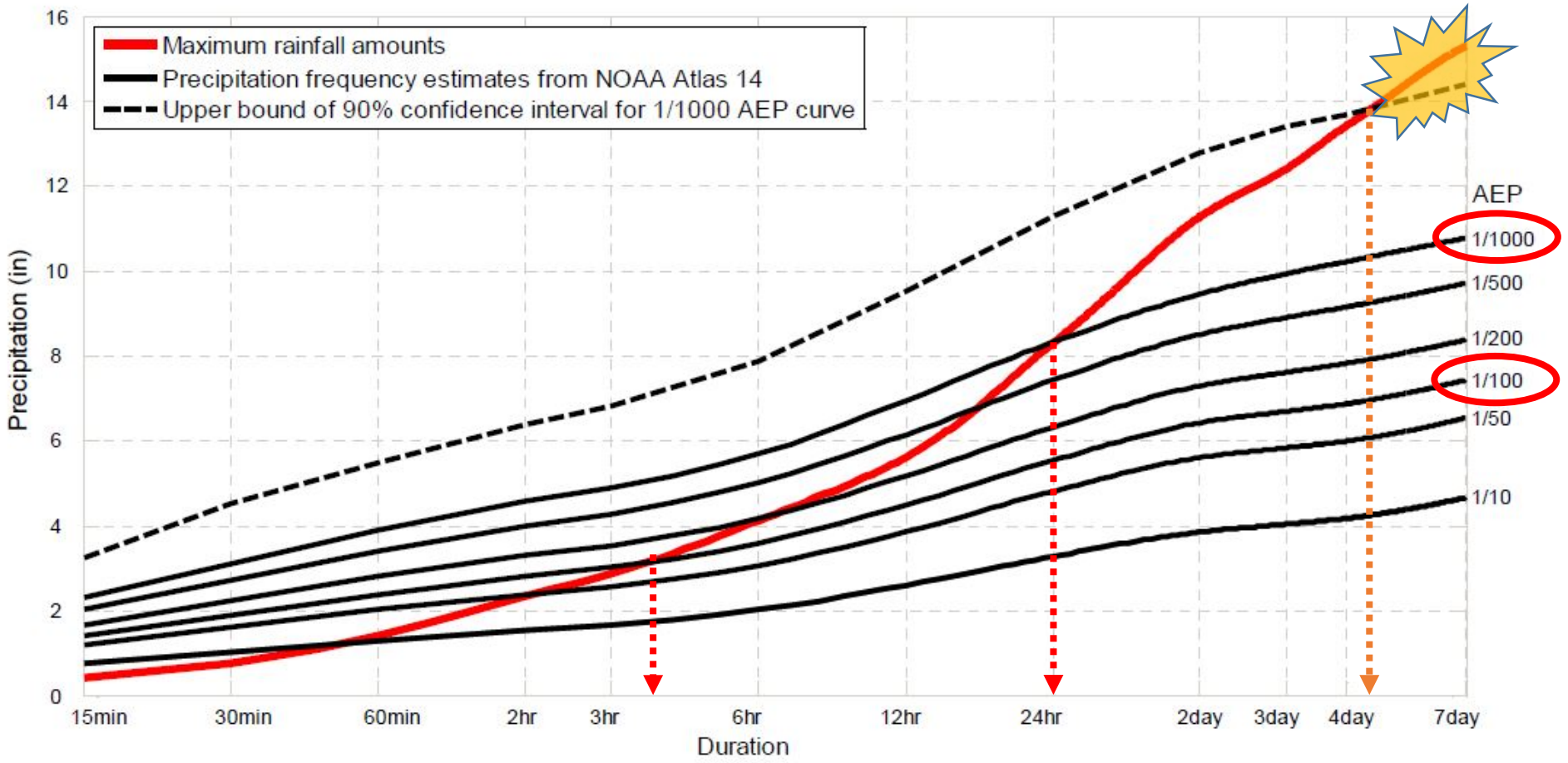
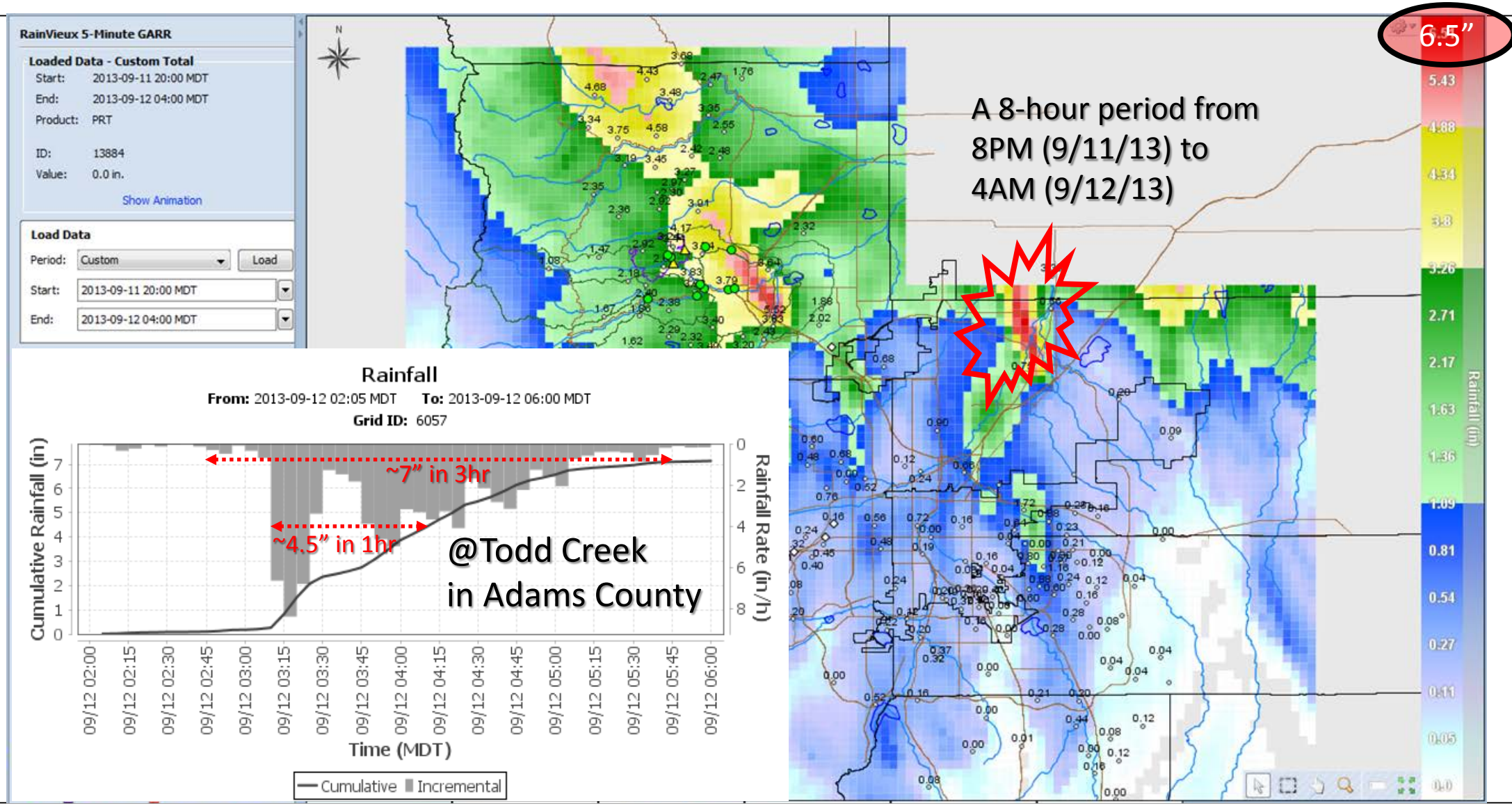


Figure 1. Maximum observed rainfall amounts in relationship to corresponding precipitation frequency estimates for the Justice Center gauge.

Let’s broaden our perspective a little.



Who remembers…

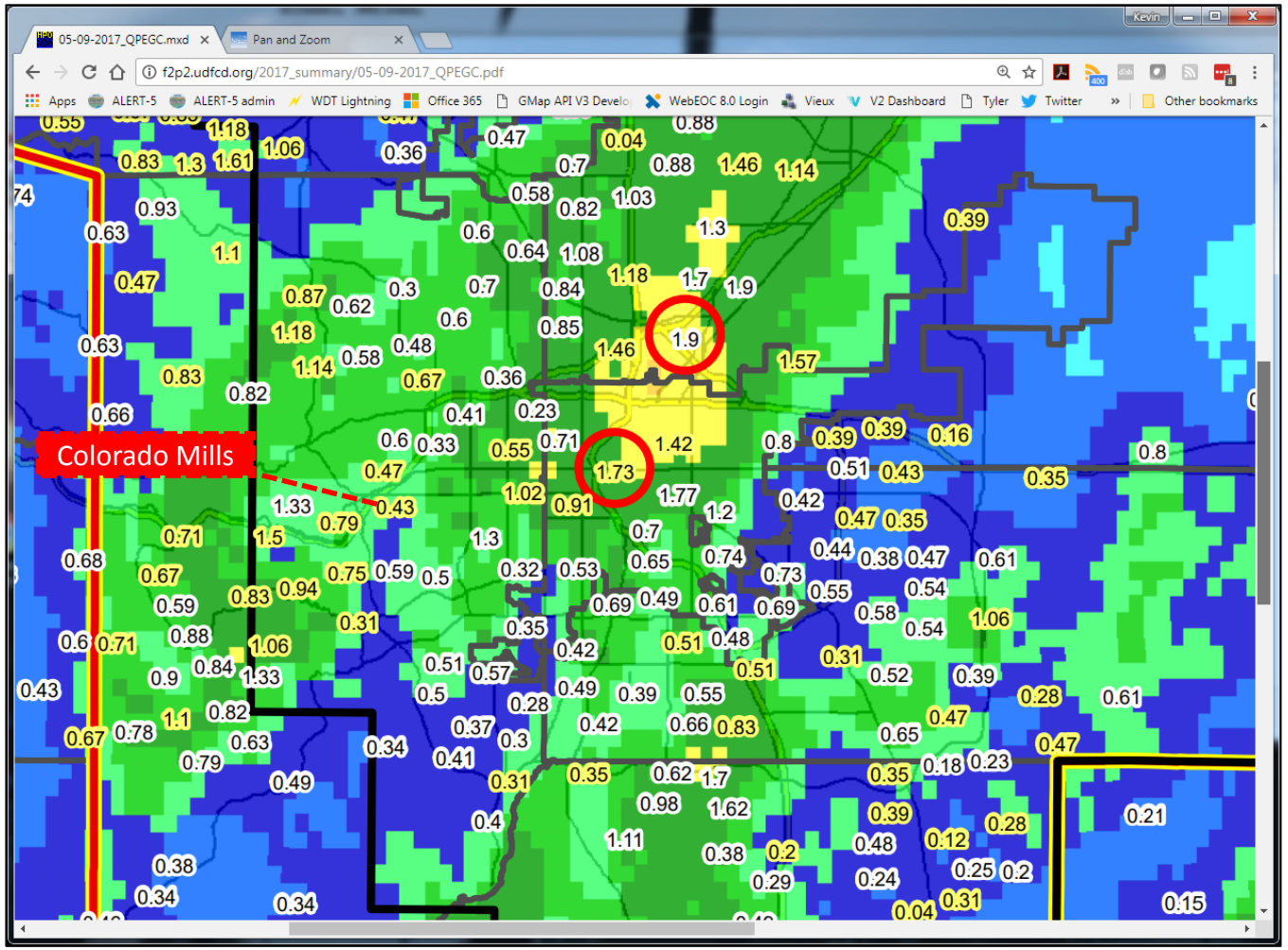
The Great Todd Creek Flood of September 12, 2013

So again, how about 2017?

- ❑ Did something big happen?
- ❑ Is there one in particular that you remember?
- ❑ If so, why?

May 8, 2017…THE WINNER

Colorado Mills Hail Storm
Insured losses > $2.2 Billion



Rainfall amounts not very notable.

Now let's take a look at July 26, 2017

A small stream out of its banks but no notable damages.

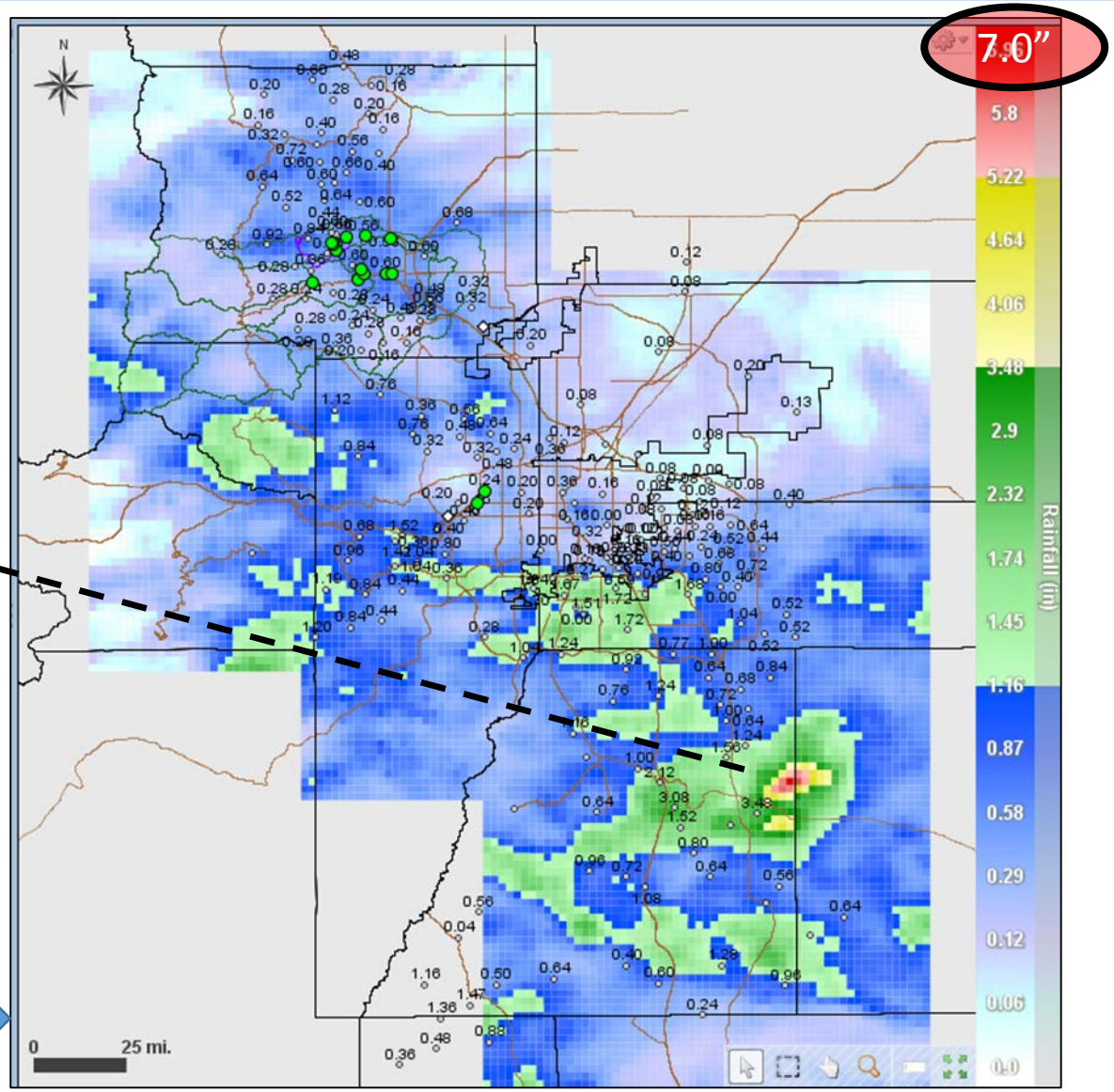
- Consistent with evening news reports about street flooding in Greenwood Village

July 26, 2017

If not in Greenwood Village, where was the big event this day

?

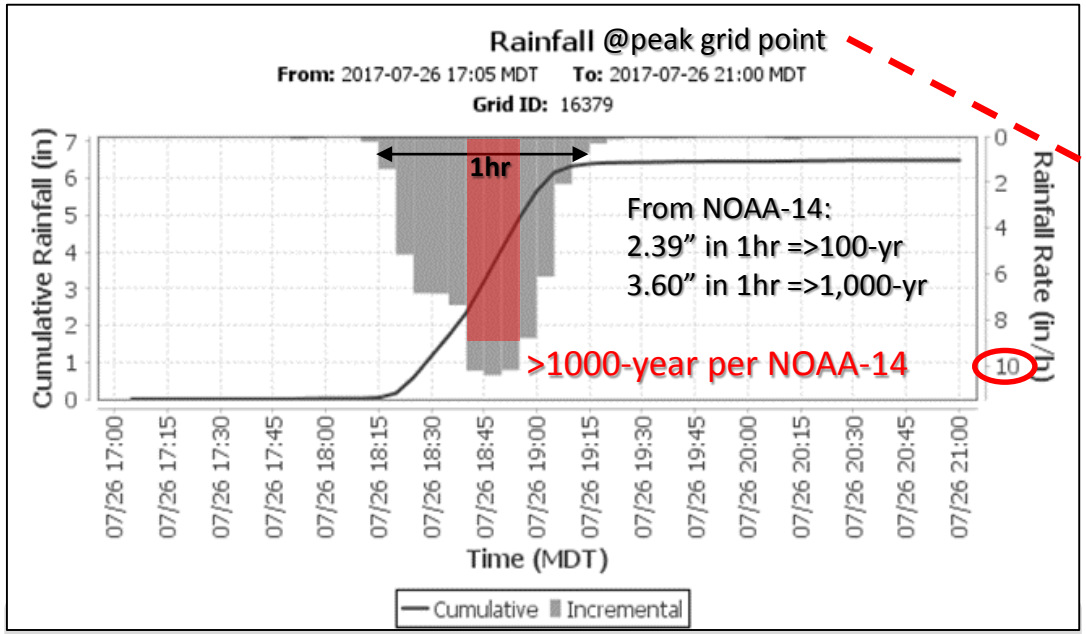
12-hour Gage-Adjusted Radar Rainfall (GARR) estimates between Noon and Midnight



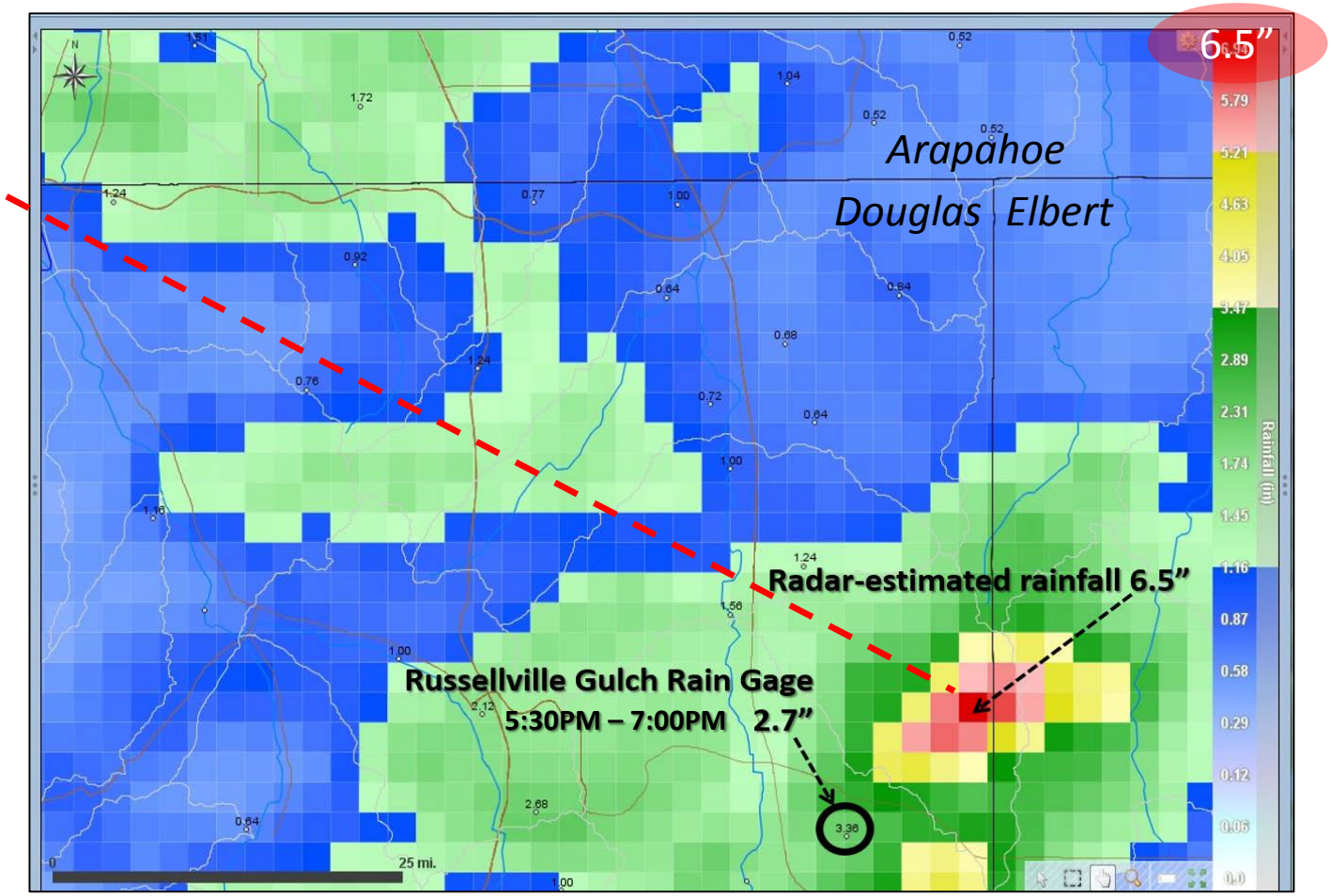
July 26, 2017…*The Unseen*

Russellville Gulch ALERT Station:

10 Minute Peak Intensities						15 Minute Peak Intensities						30 Minute Peak Intensities					
Station	Date	Tips	Inches	in/hr	Frequency	Station	Date	Tips	Inches	in/hr	Frequency	Station	Date	Tips	Inches	in/hr	Frequency
2900	7/26/17 18:20:55	30	1.181	7.087	<200yr	2900	7/26/17 18:23:49	40	1.575	6.299	<200yr	2900	7/26/17 18:30:21	60	2.362	4.724	<500yr



Check out these 5-min intensities!



Really…a 1,000-year event was overlooked?

If true, what must happen for events this big to get noticed?

1. Lots of broken stuff
2. People inconvenienced
3. Fatalities

The Historic *"1,000-YEAR"* Fox Hill Flood of 2017

Storm Date: July 26
Photo Date: July 28

Thank you!

Kevin Stewart, kstewart@udfcd.org

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SOME OTHER CLOSING THOUGHTS…

- ✓ “Rare” events are not that rare.
- ✓ They happen all the time.
- ✓ Will your next big event get noticed?