The Great Colorado Flood of May 30-31, 1935: One of the State's Top Three?

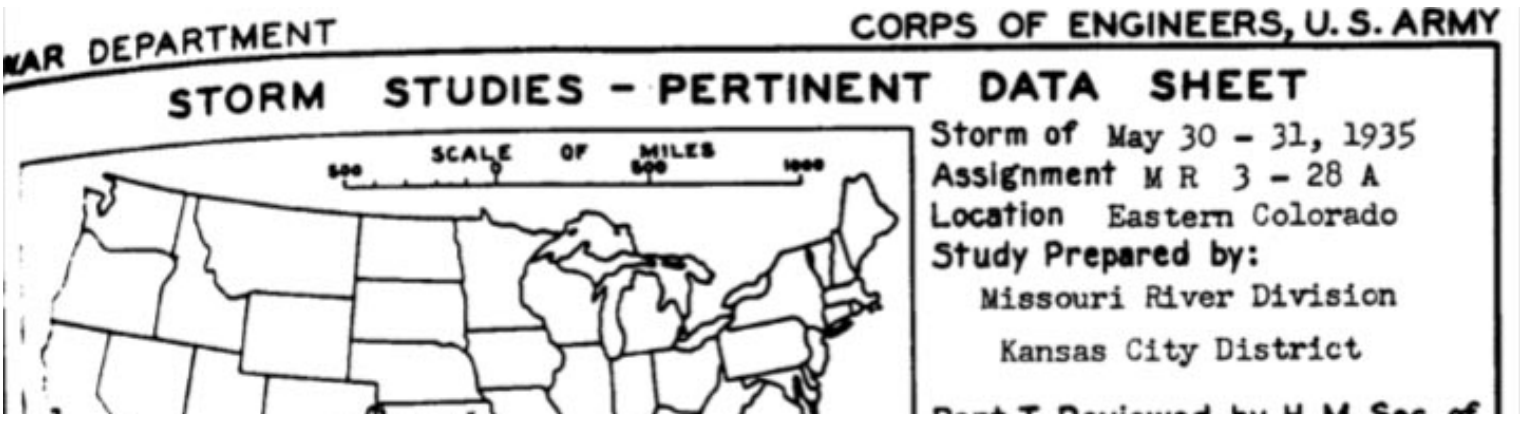
By: Christopher C. Burt , 7:10 PM GMT on September 18, 2013

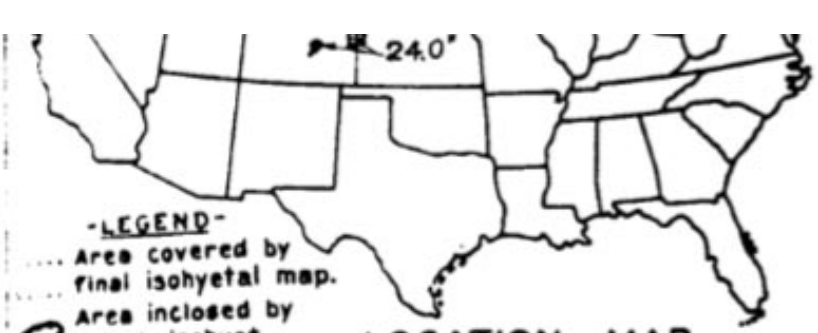
The Great Colorado Flood of May 30-31, 1935: One of the State's Top Three?

The recent storm that dropped as much as 21.13" of rainfall in the Boulder area in less than a week has been called a once in a thousand year event. For Boulder this, odds-wise, was probably true. Colorado is subject to extreme precipitation events as has been observed in the modern era at several other locations in the state since detailed weather observations began in the late 19th century. Most notably the tragic Big Thompson Flood of July 31, 1976 that claimed 144 lives. Less well known but perhaps of even greater intensity was the event of May 30-31, 1935.

May 30-31, 1935

It would appear that the most extreme rainfall event on record in Colorado was that of May 30-31, 1935. In an event that strains credulity, an astonishing 24" of rain fell in six hours (22.80" of which fell in just four hours) at two locations in eastern Colorado on the afternoon and evening of May 30, 1935. The amounts were recorded at two remote sites located about a hundred miles apart, Gauge #Sec. 34, T9S, R564W was located about 25 miles northeast of Colorado Springs, and Gauge #AB Sec. 26, T5S, R55W, just north of Burlington, near the Kansas border. The amounts of rainfall were recorded five hours apart, at Gauge #34 between noon and 6 p.m., and at #26 between 7 p.m. and 3 a.m. A third gauge halfway between the two picked up 11" in three hours, between 6 p.m. and 9 p.m.





LOCATION MAP

Part I Reviewed by H. M. Sec. of Weather Bureau, 11/16/42
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 7/14/45
Remarks: Centers: N.E. of Colorado Springs, Colo. and N.E. of Burlington, Colo.

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1 : 1,000,000

Precipitation data and mass curves: (Number of Sheets)

Form 5001-C (Hourly precip. data)	29
Form 5001-B (24-hour " ")	64
Form 5001-D (" " " ")	3
Misc. precip. records, meteorological data, etc.	37
Form 5002 (Mass rainfall curves)	63

PART II

Final isohyetal maps, in 2 sheet, scale 1 : 1,000,000 & 1 : 500,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	3
Form S-11 (Depth-area data from isohyetal map)	2
Form S-12 (Maximum depth-duration data)	7
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	2

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24							
Max. Station	24.0	24.0	24.0	24.0							
5	22.1	23.3	23.3	23.3							
10	20.6	22.2	22.2	22.2							
20	18.8	20.7	20.7	20.7							
50	16.0	18.0	18.0	18.0							
100	13.7	15.4	15.4	15.4							
200	11.2	12.6	12.6	12.6							
500	7.8	9.3	9.3	9.3							
1,000	5.8	7.2	7.2	7.2							
2,000	4.1	5.3	5.5	5.5							
5,000	2.4	3.5	3.8	4.0							
6,300	2.1	3.1	3.6	3.8							

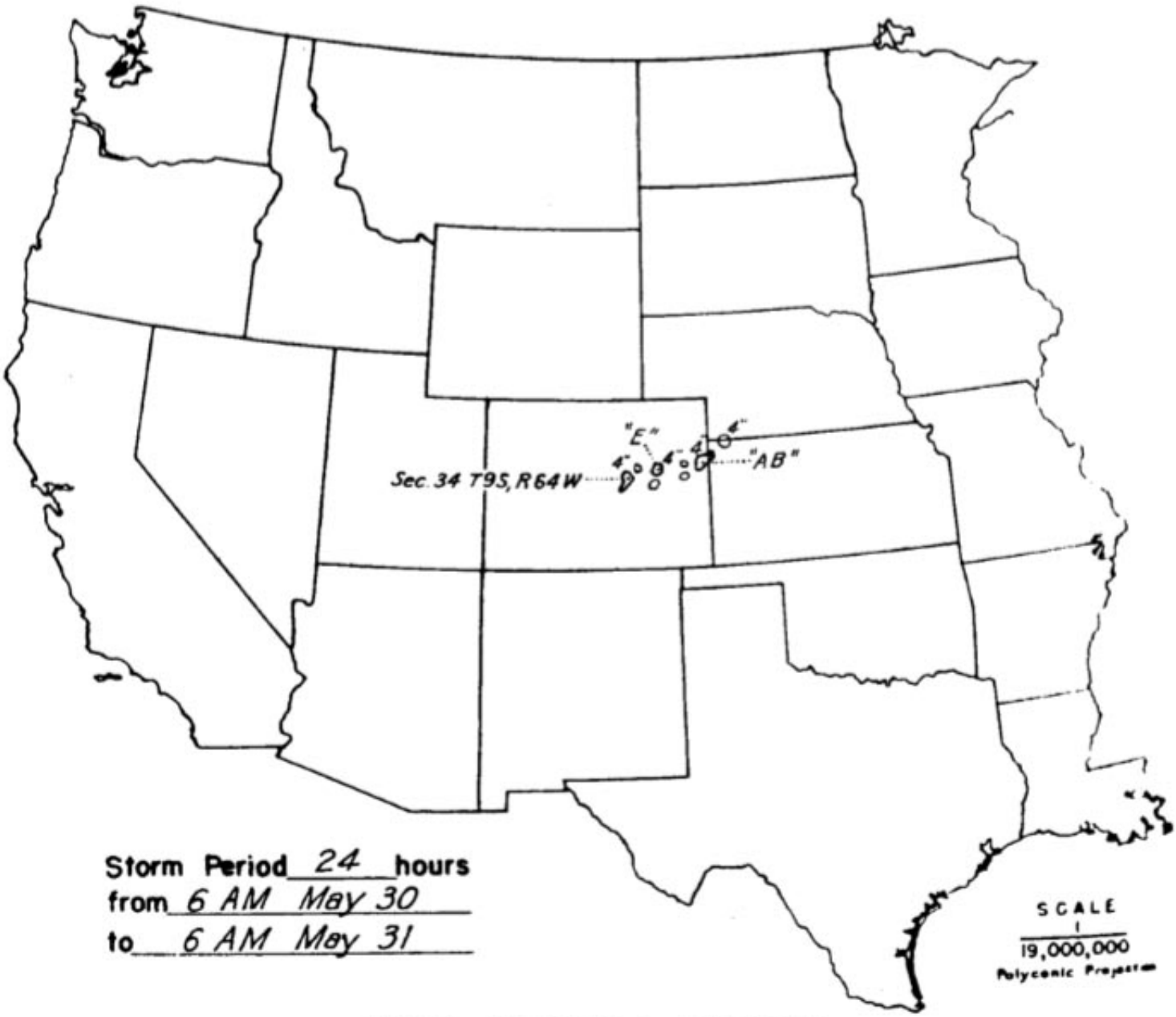
Form S-2

WAR DEPARTMENT — CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES - ISOHYETAL MAP

Storm of May 30-31, 1935 Assignment MR-3-28(A)

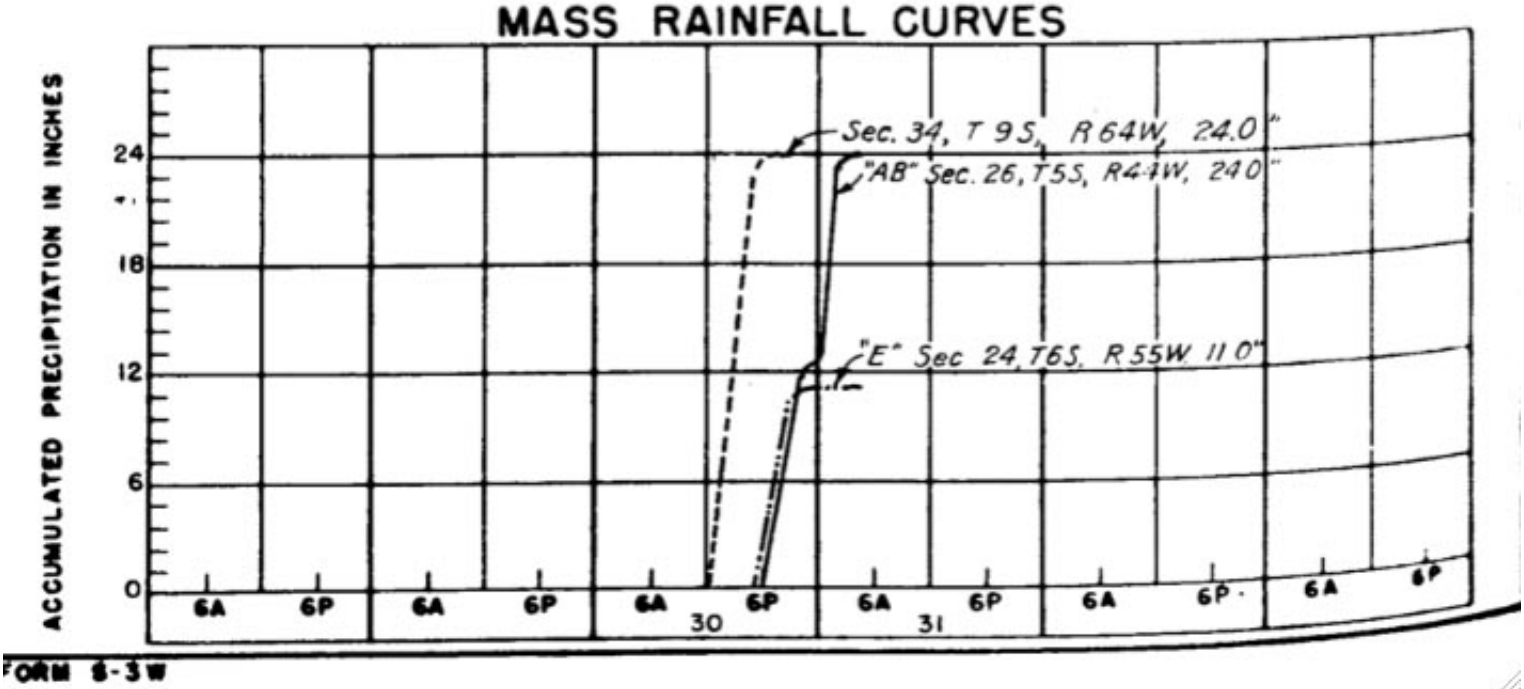
Study Prepared by: Kansas City, Mo. District
Missouri River Division



Storm Period 24 hours
from 6 AM May 30
to 6 AM May 31

SCALE
1
19,000,000
Polyconic Projection

MASS RAINFALL CURVES



FORM 8-3W

Copies of a two-page storm report concerning the rain event in Colorado during late May 1935. It was published in 'Storm Rainfall 1887-1955', Dept. of the Army, Corps of Engineers, Washington D.C. 1962.

Two feet of rainfall in less than six hours would be close to the most intense such fall ever recorded anywhere on earth. Furthermore, unlike most other rainfall records of this intensity, the rain occurred over flat terrain in a non-tropical environment. In fact, this region of Colorado normally receives only 16–18" of rain annually. The figures, however, appear to be accurate since there were three separate readings over a 100-mile area. In addition, an official weather observer in Seibert recorded 9" of rain in two hours.

Raging floodwaters sweep a bridge (on right) away along Monument Creek near Colorado Springs during the great flood of May 1935. Photo from the Pikes Peak Library District archives.

Naturally, extreme flooding ensued. The Weather Bureau's Climatological Data, Colorado Section, May, 1935, reported the following in the Monthly Review:

On the 30th, excessive local downpours occurred in the vicinity of Colorado Springs and along the northern slope of the Arkansas-Platte Divide. Four lives were lost and a total estimated property damage of $1,800,000 [about $20 million adjusted for current dollars] occurred along Monument Creek and Fountain Creek in Colorado Springs and vicinity. At the height of the flood, skies over extreme eastern counties (where the phenomenal rainfalls were recorded) were a chocolate brown. This was due to a most unusual situation. Along the Colorado-Kansas border there was a heavy dust storm. Clouds of dust could be seen for miles, while to the west torrents of floodwater roared, and at Bovina, hailstones, some as large as baseballs, were reported to have fallen. The coppery-hued sky cast a brown shadow, giving the scene a weird appearance.

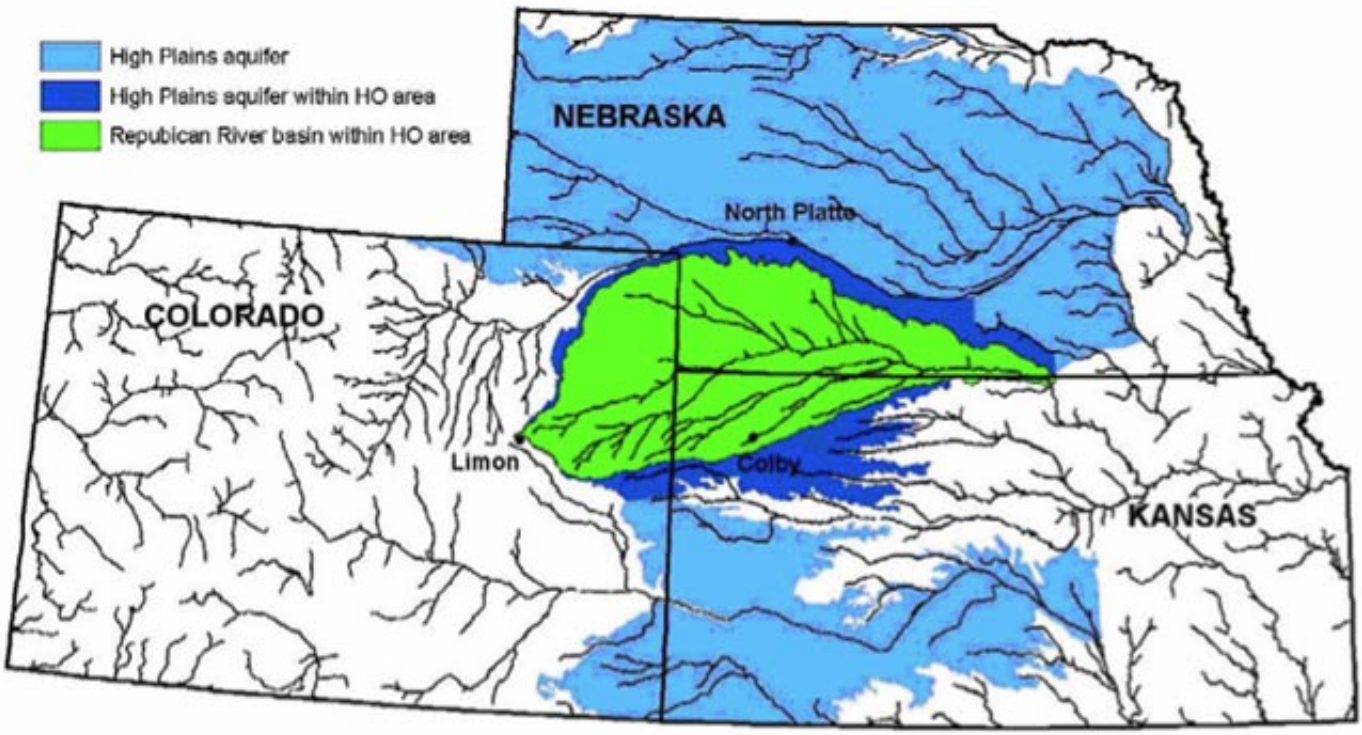
In the end, at least 21 people were killed (and probably quite a few more) in floods statewide, and property

damage totaled between $8 and $10 million [about $100 million in current dollars], ranking this event as one of the costliest disasters in Colorado history. Combined with damage and fatalities in Nebraska and Kansas the storm may actually have killed 113 and caused $800 million [1997 adjusted] in damages according to the account below.

The Flood in Nebraska

The flooding along the Republican River in Nebraska was also catastrophic. The Nebraska Department of Natural Resources published this account of the flood in an online bulletin in 1997.

"The storm of May 31/June 1 was unique for two reasons: first, it dumped an incredible amount of rain - where the Arickaree and Republican rivers meet in Colorado, 20 inches of rain was recorded, and 24 inches in 24 hours was recorded along the South Fork Republican River. The entire upper Republican watershed witnessed an average rainfall of nine inches. This storm was also unique in that it moved in the same direction as the drainage basin. As a result, the Frenchman, Red Willow, Medicine, Deer, Muddy, and Turkey creeks all reached their flood peaks at the same time as the crest passed on the Republican River.



A map of the Republican River Basin. From University of Nebraska-Lincoln, Great Plains Waters Network Observatory.

According to witness accounts, the roar of the water could be heard coming down the Republican Valley five miles away. Many survivors also reported that there were two crests - the water came up on May 28, then receded slightly, but the second crest on June 1 greatly exceeded the first. At one point, the water rose six feet in thirty minutes and was ten to fifteen feet higher than the previous record crest. Another account states that the Republican rose 10 feet in 12 minutes in McCook; naturally, anything in the path of that wall of water would be destroyed. Water was twenty feet deep in some places, and the discharge was an incredible 280,000 cubic feet/second - more than 320 times the normal flow today. Water was "bluff-to-bluff" in areas where the bluffs are typically at least two miles apart. The town of Haigler was spared

bluff." In areas where the bluffs are typically at least two miles apart. The town of Haigler was spared because it is situated on higher ground, but places like Parks, Benkleman, Max, Stratton, Trenton, Culbertson, and McCook were severely impacted if not outright destroyed. In addition to these towns, deaths also took place in Perry, Arapahoe, Orleans, Oxford, Franklin, Alma, and Cambridge. Some victims were last seen screaming for assistance from the roof of their home as it was being swept down the river."

A person escapes from the McCook, Nebraska Electric Company Building by hanging on to high wires during the flood of May 31-June 1, 1935. Note the other people still on the left-side roof of the building. Nebraska State Historical Society.

Due to the fact that deaths occurred in three states [Colorado, Kansas, and Nebraska] and that reporting back in 1935 was not very efficient, the number of deaths attributed to flooding differs. An accurate estimate would be 113 killed - most reports just say "over one-hundred" dead. A reported 11,400 head of cattle and 41,500 were killed by the high water, and one report stated that carcasses littered roads as to make them impassable. In total, 341 miles of highway and 307 bridges were destroyed, and 74,500 acres of farmland were inundated. The damage estimate of $26 million is almost certainly low - personal losses, bridges, agricultural, and railroad losses were all incredibly heavy. $26 million is equivalent to nearly $800 million in 1997 dollars."

Conclusion

So, as the above statistics seem to indicate, the flood of May 31-June 1, 1935 should rank along with the Big Thompson Flood of July 31, 1976 and last week's Boulder Area flood as among the top three most disastrous flood events in Colorado history. The final cost, in both lives and damage, is not yet determined in the Boulder case so another top contender would be the flood of June 14-20, 1965 that resulted in 21 fatalities and $4 billion (adjusted for inflation) in damages to a widespread area of eastern Colorado. It was during this event that the official state 24-hour precipitation record was set at Holly when 11.08" was measured on June 17th (most of which fell in just 6 hours). Other localities (in Douglas County) reported up to 14" in just 4 hours on June 16th.

Christopher C. Burt
Weather Historian

Extreme Weather | Flood

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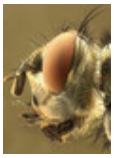
9. WunderAlertBot (Admin)
9:26 PM GMT on September 21, 2013

weatherhistorian has created a new entry.



7. bappit
4:48 PM GMT on September 21, 2013

@1900hurricane Good point! Seems pretty related to the events further north. For reference, D'Hanis is

@1900hurricane good point! Seems pretty related to the events further north. For reference, D'Hanis is part of San Antonio now. I wonder what contributed to the huge moisture influx.

Member Since: May 18, 2006 **Posts:** 10 **Comments:** 6491

6. Christopher C. Burt , Weather Historian

7:16 AM GMT on September 21, 2013

> **Quoting 5. 1900hurricane:**
> *May 31, 1935 seemed to be quite the flooding day. That day also saw the incredible D'Hanis, TX rainfall event, where 22" of rain fell in 2.75 hours!*
>
> Indeed, that event was a world record for precipitation intensity. I was going to mention it in my blog but it was slightly off topic re: Colorado and Nebraska historic floods. Anyhow, the atmosphere that day was something out of this world from Texas to Colorado.

Member Since: February 15, 2006 **Posts:** 333 **Comments:** 322

5. 1900hurricane

3:24 AM GMT on September 21, 2013

May 31, 1935 seemed to be quite the flooding day. That day also saw the incredible D'Hanis, TX rainfall event, where 22" of rain fell in 2.75 hours!

Member Since: August 2, 2006 **Posts:** 47 **Comments:** 11984

4. ColoradoBob1

5:34 AM GMT on September 19, 2013

To see these rains as one off events is truly living with blinders.
They come too fast now. Every 2 weeks I expect one.

We didn't grow-up with the flood of record coming every 2 weeks , coming somewhere on the Earth.

I leave you with the dead pig on the beach at Acapulco
from a storm that never made Cat 1 .

http://www.reuters.com/article/2013/09/17/us-stor m-ingrid-idUSBRE98D0AH20130917

Member Since: August 13, 2010 **Posts:** 0 **Comments:** 5614

3. ColoradoBob1

5:17 AM GMT on September 19, 2013

This latest flood ran from El Paso, to Wyoming .
Any flood in the record has never done that ?

Member Since: August 13, 2010 **Posts:** 0 **Comments:** 5614

2. ColoradoBob1

5:03 AM GMT on September 19, 2013

Last week in New Mexico -

Wow! Take a look at these rainfall numbers in NM By Rob Nikolewski on September 16, 2013 -

See more at: http://newmexico.watchdog.org/19454/wow-take-a-loo k-at-these-rainfall-numbers-in-nm/#sthash.DAFqaUnq .dpuf

The scale of these floods is not in the record books.

It's exactly like the Amur floods in Russia last month. The Calgary floods, and Danube floods.

It's not just a very intense storm over a small area anymore. It's 2000 x 500 kilometers of rain falling in 4 or 5 days , and it's over a foot of rain when it comes.

That's the new normal.

Member Since: August 13, 2010 **Posts:** 0 **Comments:** 5614

1. bappit

7:52 PM GMT on September 18, 2013

An amazing event!

Member Since: May 18, 2006 **Posts:** 10 **Comments:** 6491

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Weather Extremes

About weatherhistorian

Christopher C. Burt is the author of 'Extreme Weather; A Guide and Record Book'. He studied meteorology at the Univ. of Wisconsin-Madison.

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