



# **GOES-R Proving Ground CIRA / RAMMB Progress Report**

***PG All-Hands Meeting  
04 November 2013***



# Outline

- **NHC and Pacific Region Proving Grounds**
- **Selected User Interactions and Examples**
  - A look back at the 9-16 Sep Colorado floods
  - Satellite Chat update
  - Snow/cloud discriminator imagery
- **Systems Report**
- **Conferences and Meetings**



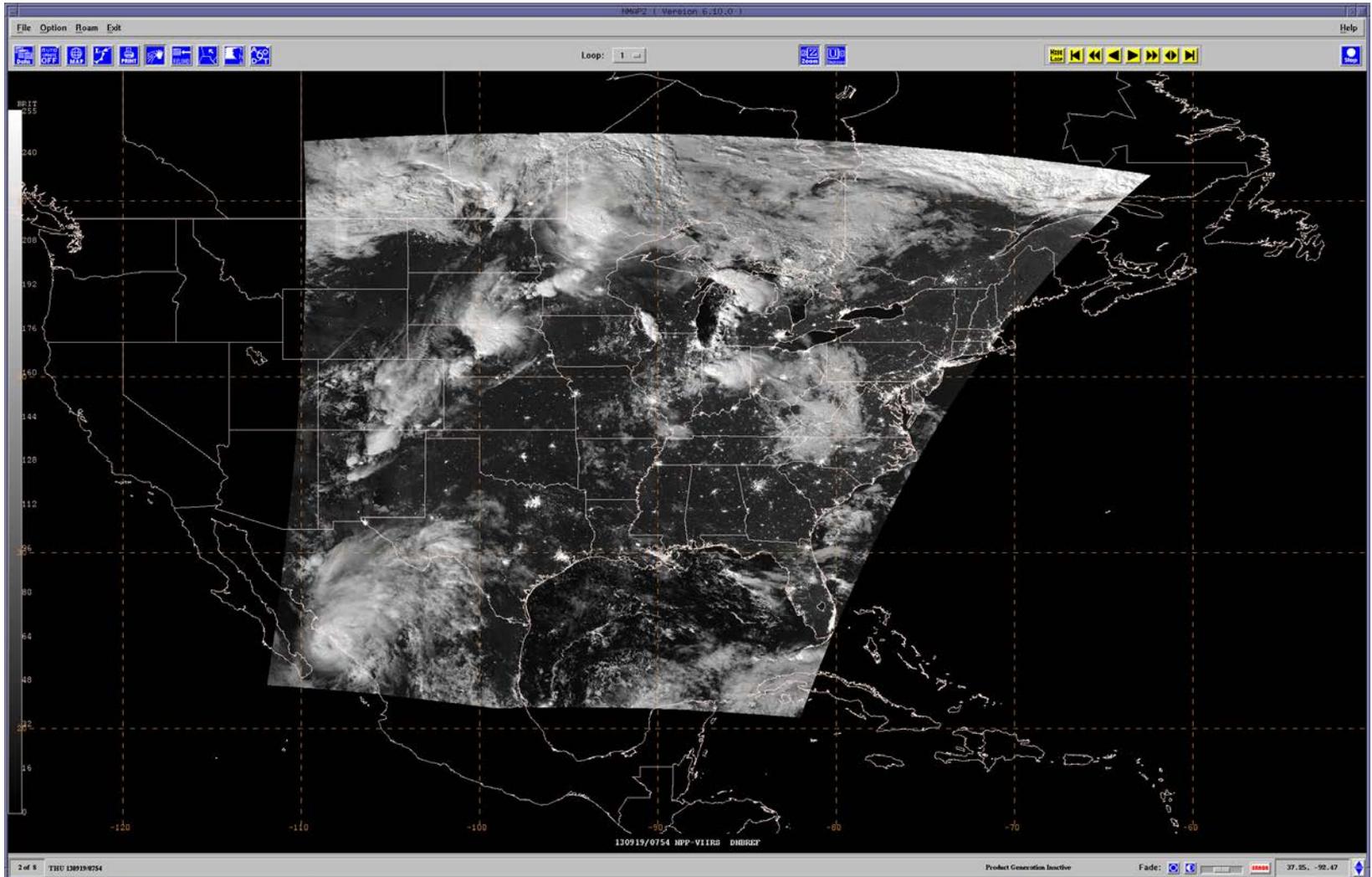
# NHC Proving Ground Update

- NHC PG Aug 1-Nov 30
- LDM Feed from SPoRT
  - Most PG products obtained through SPoRT
  - wget script at NHC could not be modified due to lack of technical support staff experience
  - M. DeMaria was acting TSB chief Aug 14-Sep 25
  - Permission obtained from NCEP/NCO to open LDM feed to SPoRT
  - NHC/SPoRT coordination allowed replacement of wget script
  - New products for NHC now available
  - Bandwidth analysis showed 30% reduction due to LDM efficiency
- LDM Feeds requested from CIRA and CIMSS

# NHC Proving Ground Highlights

- Very quiet season in Atlantic, E. Pacific also quiet
  - *No Atlantic RI cases*
- No SRSO cases from GOES-14
- Air Mass and Dust RGBs used often by HSU and TAFB
- Considerable feedback on lightning data
  - Radial scaling may be needed for small EP storms
- HIE higher refresh rate useful during Humberto
- New products
  - RGB Daytime microphysics
  - RGB Convective storms
  - Lightning Density (from Michael Folmer)
  - NPP Day/Night Band

# VIIRS Day-Night Band for Hurricane Manuel (East Pacific) in N-AWIPS





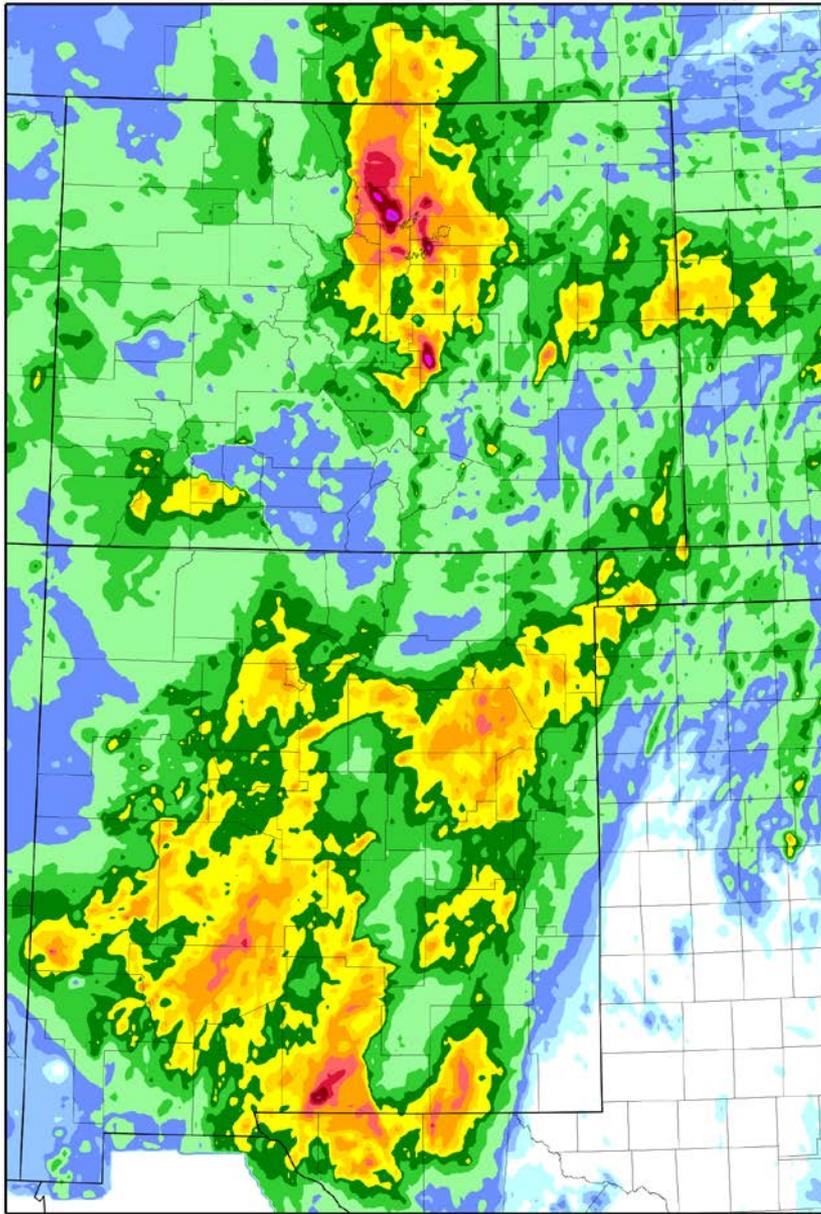
# The Great Colorado Flood of September 2013



Accumulated precipitation for period starting  
12 UTC 09 Sep 2013, ending 12 UTC 16 Sep 2013

## 9-16 Sep 2013 Total Precip

Precipitation analysis from the Advanced Hydrological Precipitation Service (AHPS). *Note that this was a very wet week in NM as well, with flooding also reported.*

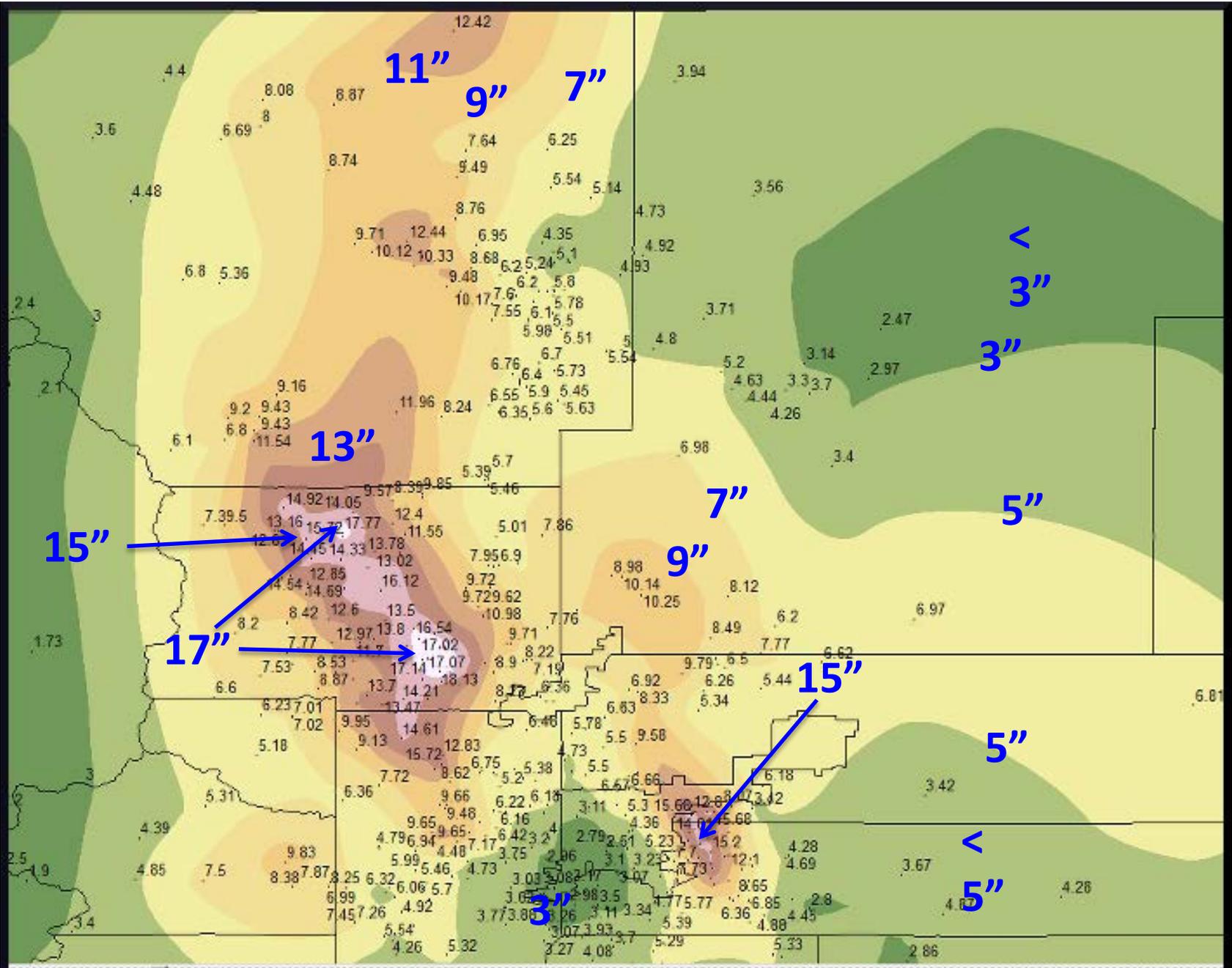


- Boulder's COOP weather station (since 1893) set new records for 1-day (9.08"), 2-day (11.52") and 7-day (16.9") totals; the previous 1-day record was 4.80" and previous 1-month record was 9.59".
- By the morning of 16 Sep Boulder officially set a new yearly record of 30.13" (old record was 29.93")
- Many sites set records in and near the Front Range
- At my house (~6 miles due east of BOU COOP site) my 7-day total was 13.47" (*equivalent of some years worth!*) with monthly total 14.44"



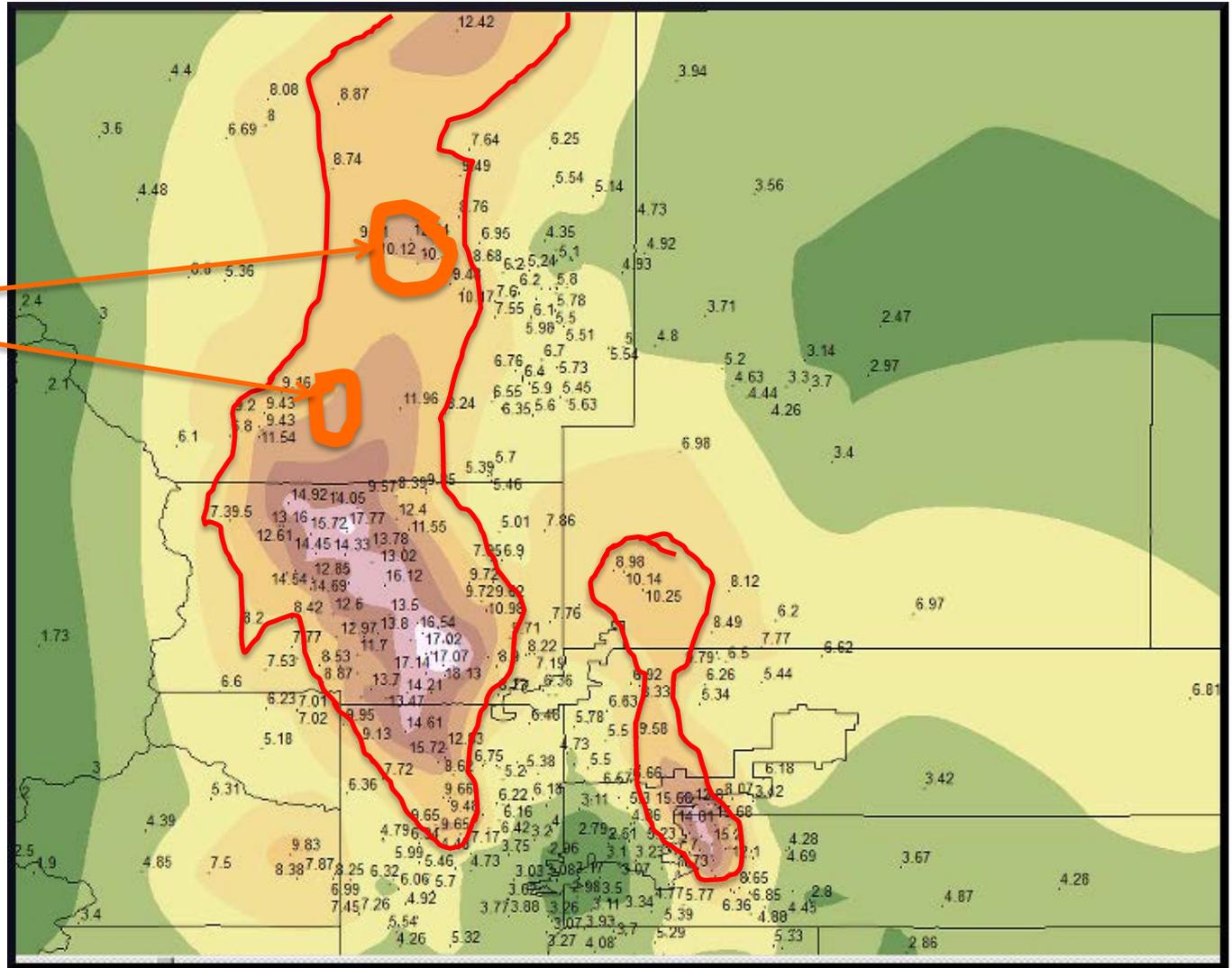


# 9-16 Sep 2013 Total Precip from the Boulder WFO (using CoCoRaHS and other data sources).



# Comparison with the 1976 Big Thompson Flash Flood

Estimate of 8" contour for 1976 Big Thompson flash flood, based on Maddox et al. (1978), compared to the ~8" contour from the Sep flood.



Slide courtesy of Russ Schumacher, CSU)



The Narrows in Big Thompson Canyon.  
Photo by Larimer Sheriff Justin Smith.

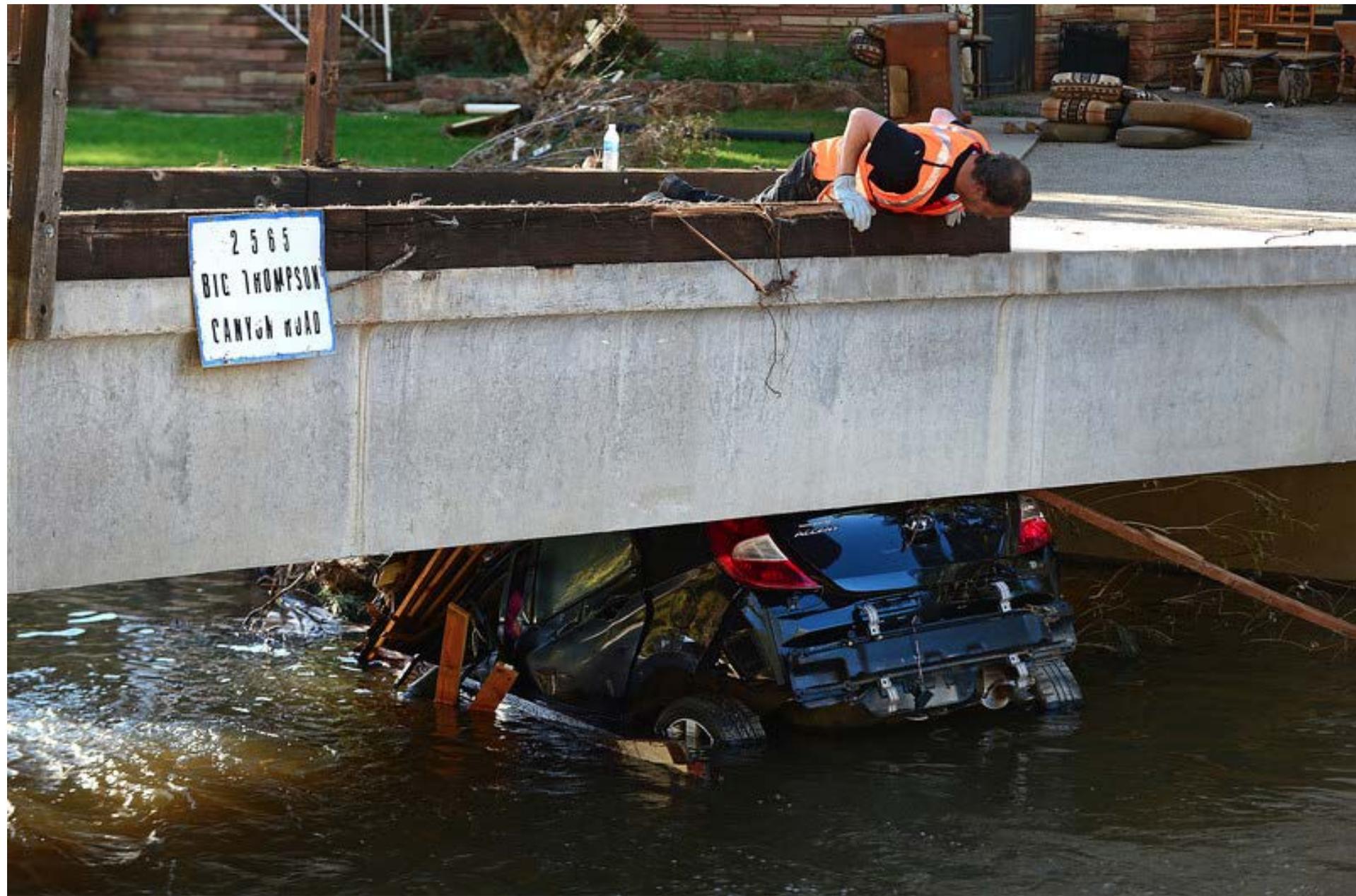
Photo by Noel Bryan, administrative staff at CSU, from very near her home in Big Thompson canyon, 2 miles down from Estes Park



# In the mountains: Close-up of damage in Big Thompson Canyon



**In the mountains:** Car jammed under bridge in Estes Park (Denver Post)



**In the mountains:** Lefthand Canyon Road out of nw Boulder (Denver Post)



This is a small side creek that flows into Boulder Creek just nw of Boulder



Scenes in an around Boulder – Friday 13 Sep ~1PM



Boulder Creek in the west part of the city of Boulder

Amazingly no one was killed in this accident early on the 12<sup>th</sup>, the road was still open at the time not knowing the bridge had washed out (southeast of Boulder) (Denver Post).



# Scenes in an around Boulder – Thursday 12 Sep ~2PM



Boulder Creek overflowing east of town (onto Valmont Road)

Meanwhile on the afternoon of the 12<sup>th</sup> many streets in Boulder became rivers, here a scene in North Boulder (Denver Post)

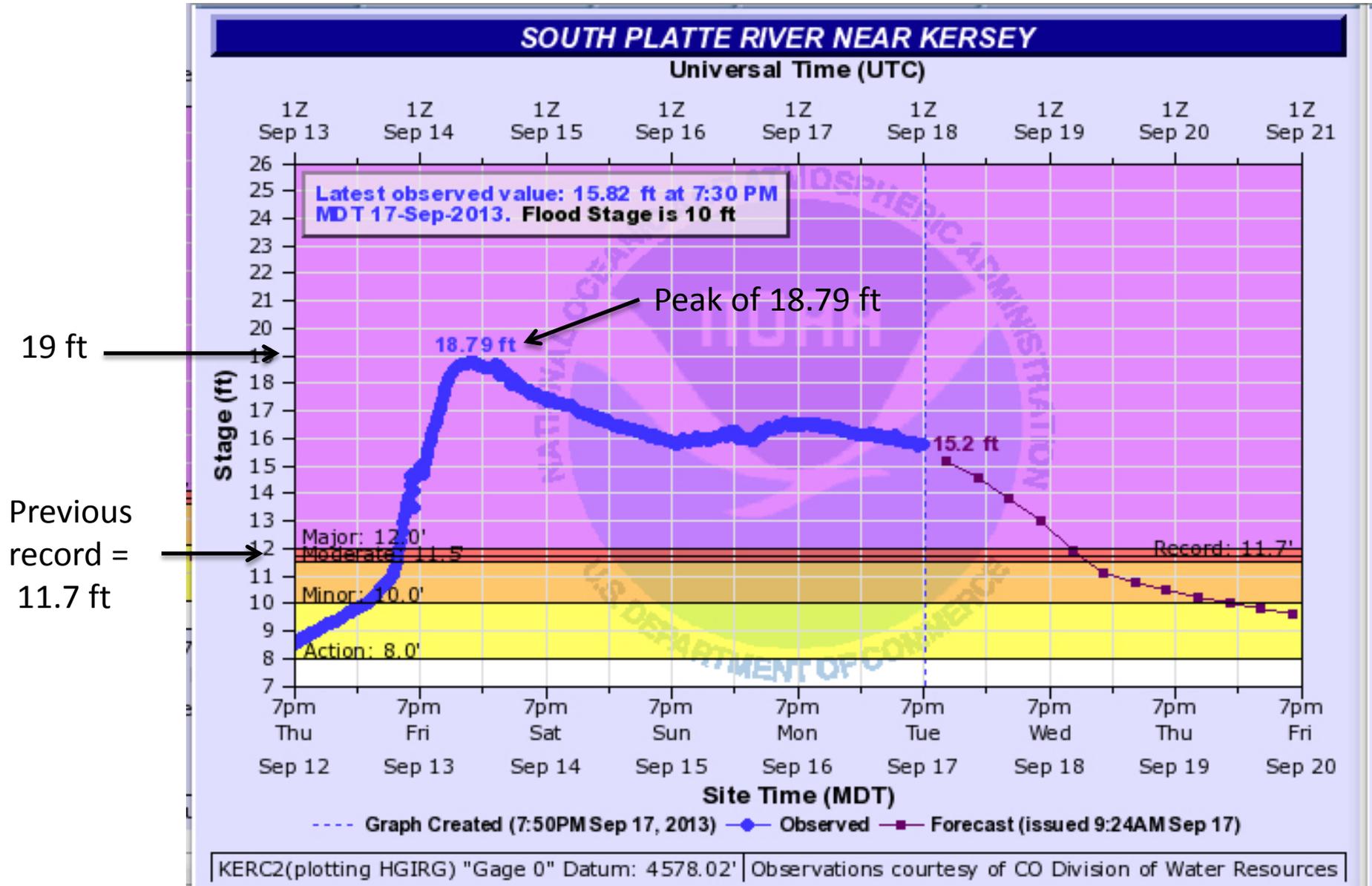


The area is full of irrigation ditches (many are typically dry, like this one) and scenes like this happened all over the area.



# And then all the water headed east onto the plains...

- The South Platte was flowing higher than its previous record (from May 1973) for 5+ days!
- Record levels continued along the Platter River all the way through much of Nebraska.



# The mighty South Platte River covering Highway 34 in Greeley (Denver Post)



Aerial view shows the extent of the flooding with the Platte River shown in the middle of this scene (Denver Post)



Friday 13 September about 9 am



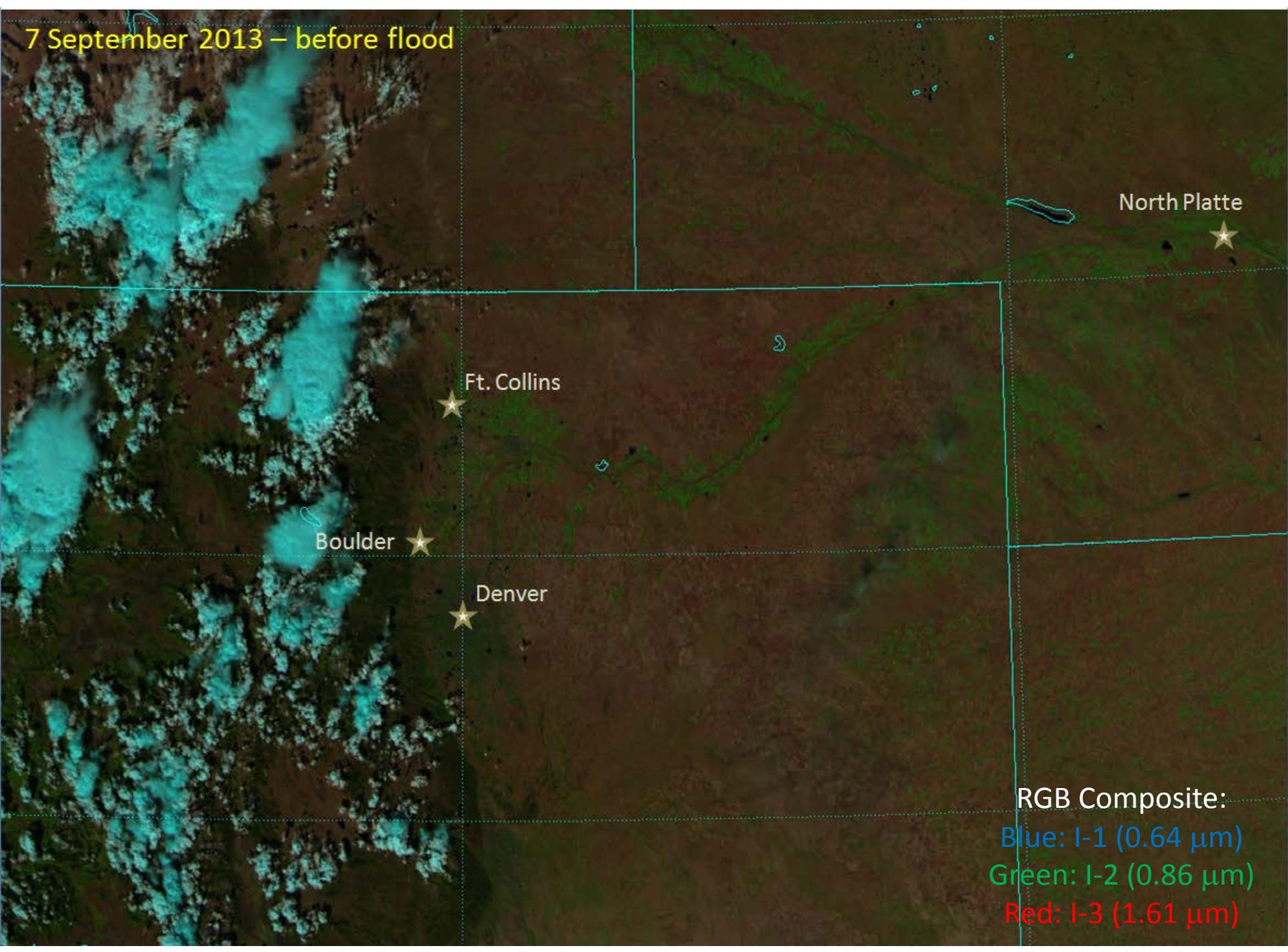
Downstream effects: St. Vrain River flowing fast and very wide barely staying under a bridge on north-south Interstate 25, which closed for fear bridges were not safe

# Colorado Flooding seen by VIIRS

Curtis Seaman

CIRA/Colorado State University

7 September 2013 – before flood



North Platte

Ft. Collins

Boulder

Denver

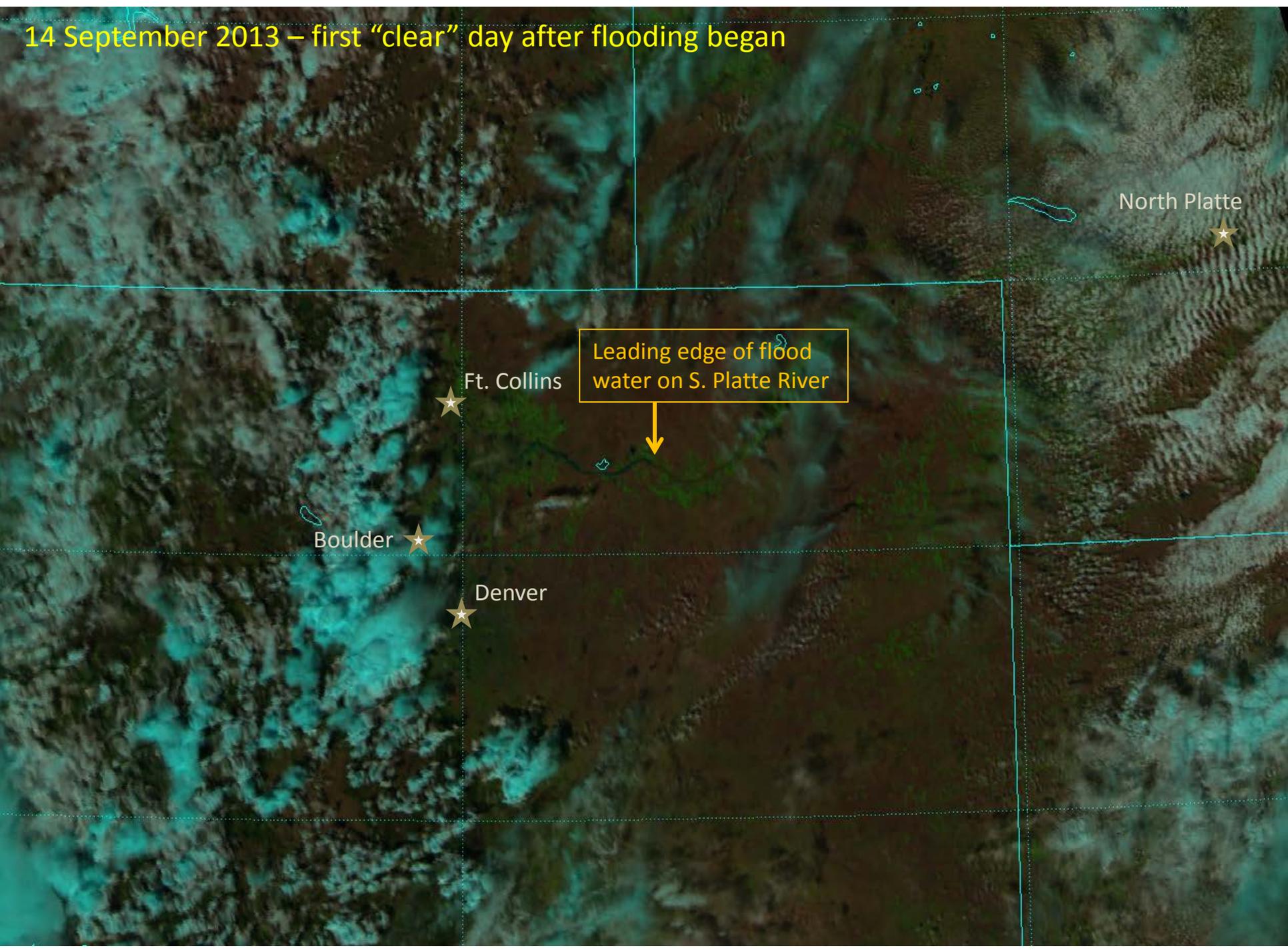
RGB Composite:

Blue: I-1 (0.64  $\mu\text{m}$ )

Green: I-2 (0.86  $\mu\text{m}$ )

Red: I-3 (1.61  $\mu\text{m}$ )

14 September 2013 – first “clear” day after flooding began



North Platte



Leading edge of flood water on S. Platte River



Ft. Collins



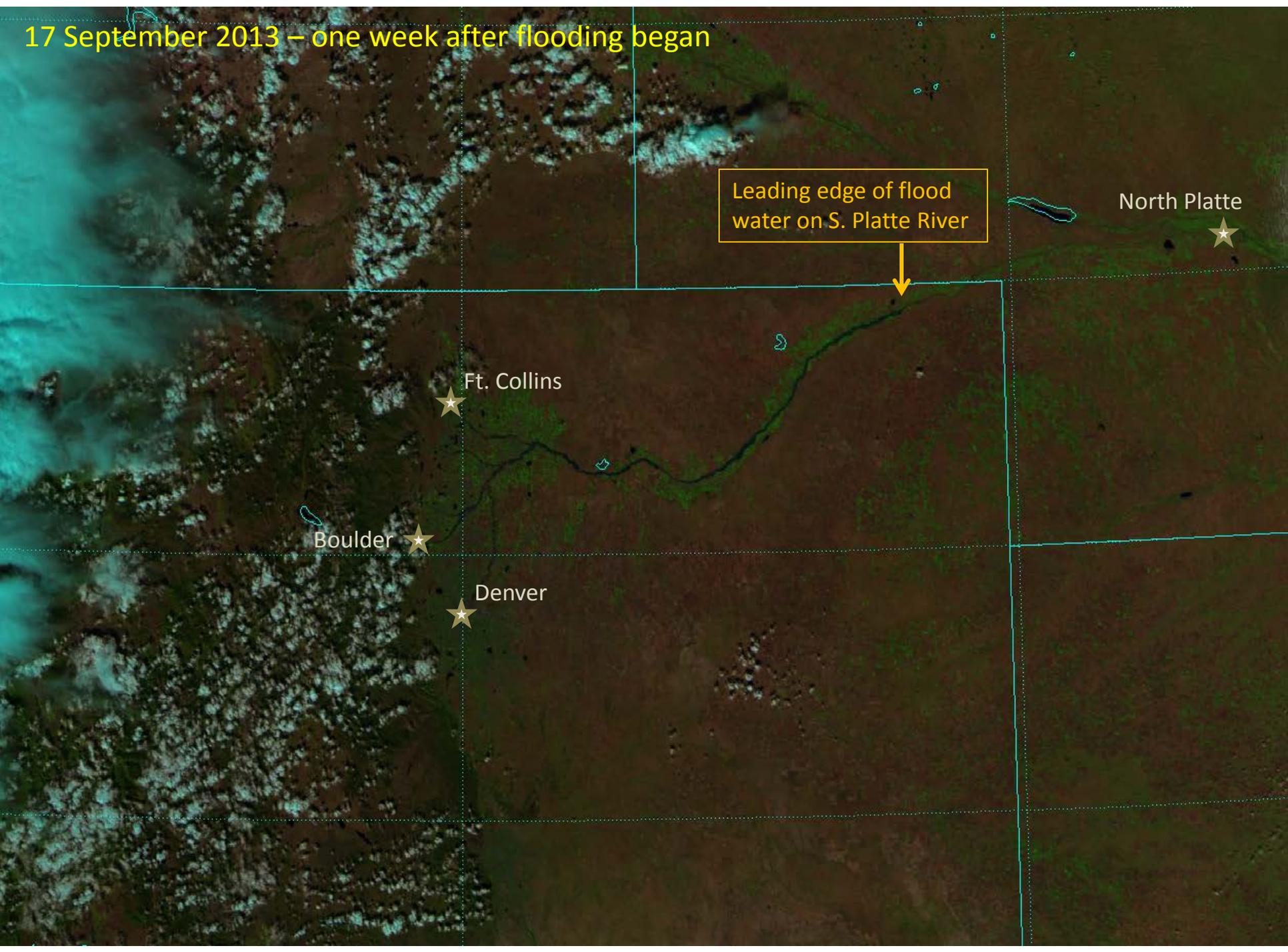
Boulder



Denver



17 September 2013 – one week after flooding began



Leading edge of flood water on S. Platte River

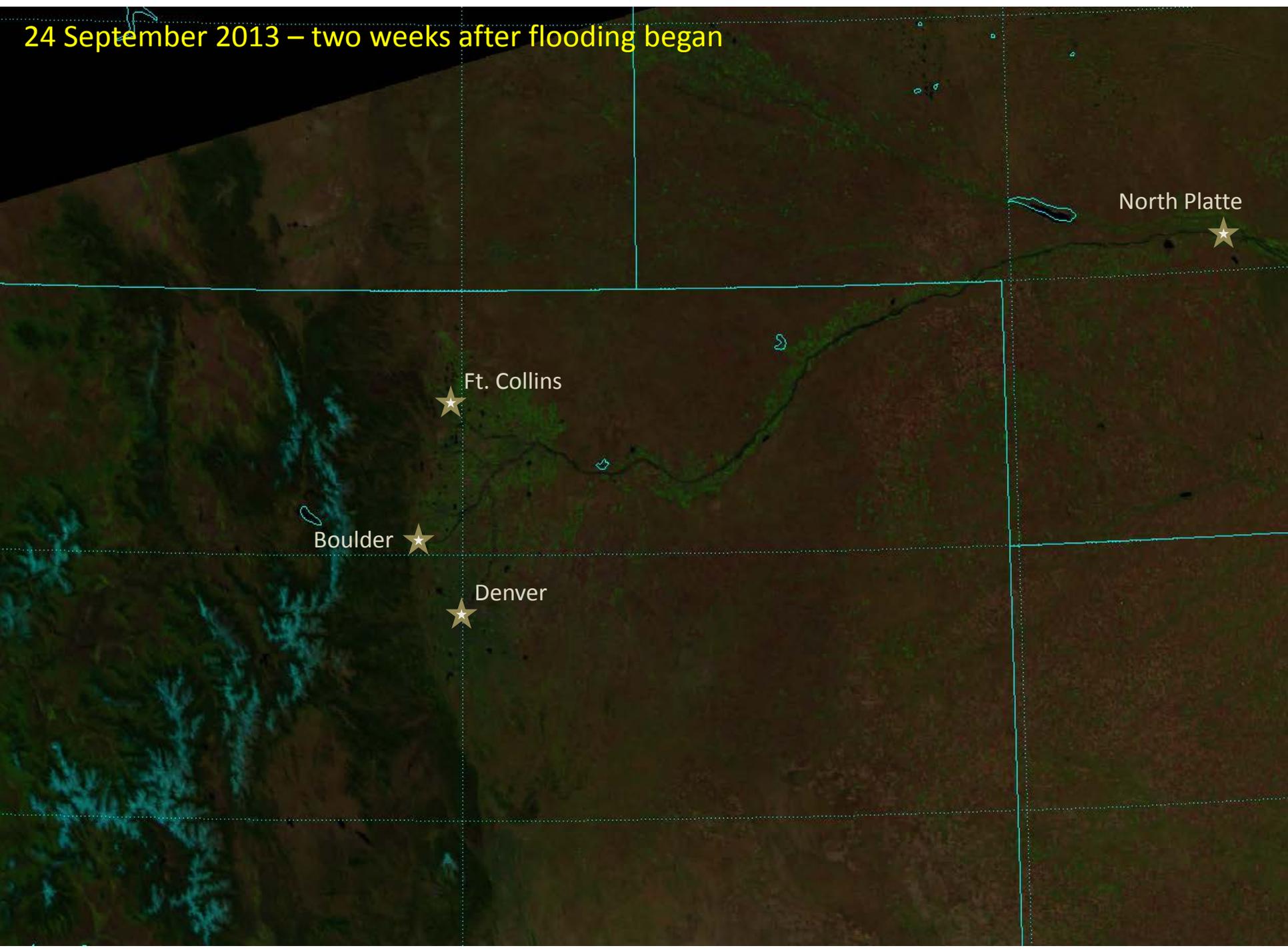
North Platte

Ft. Collins

Boulder

Denver

24 September 2013 – two weeks after flooding began



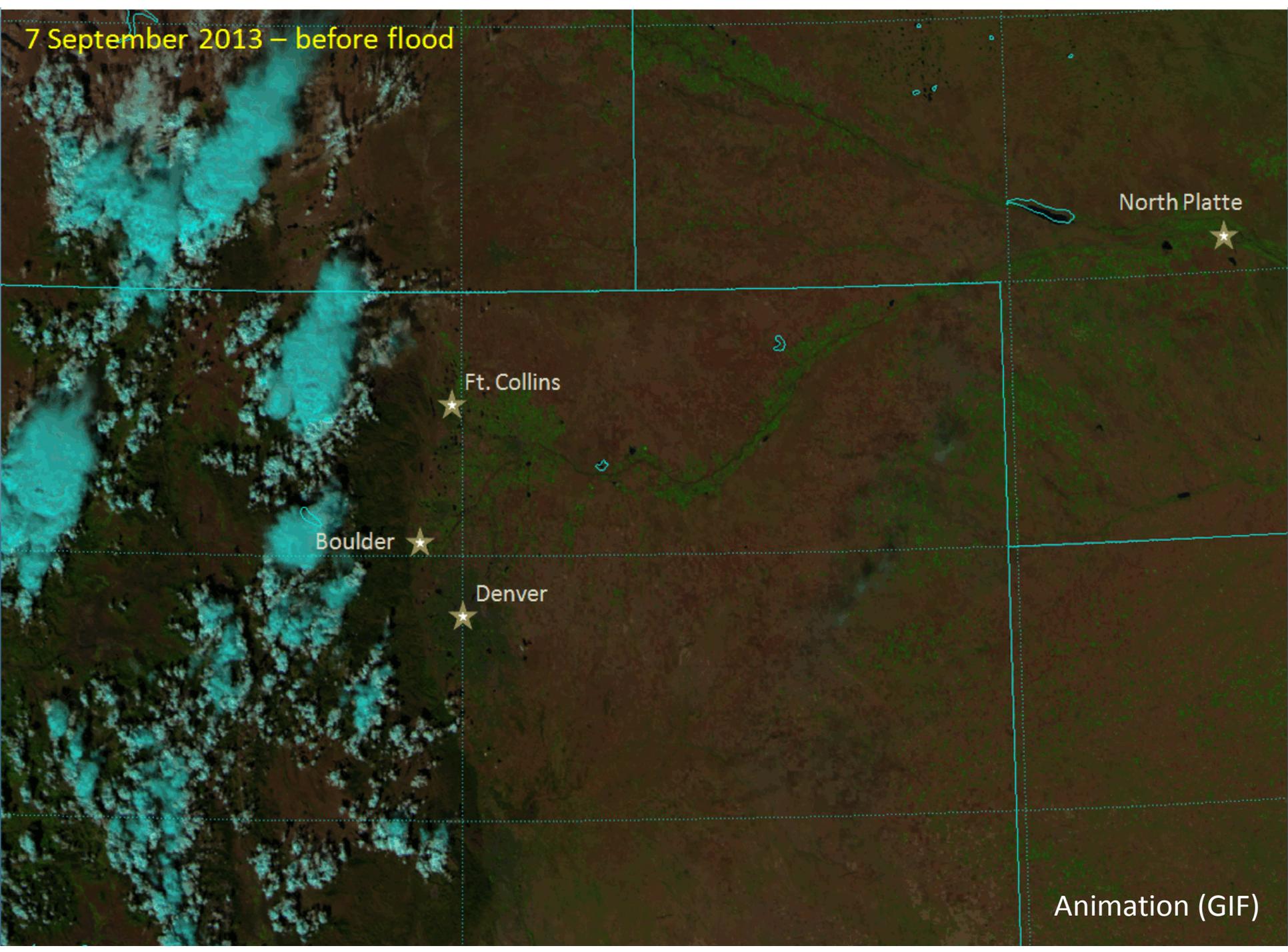
North Platte

Ft. Collins

Boulder

Denver

7 September 2013 – before flood



North Platte

Ft. Collins

Boulder

Denver

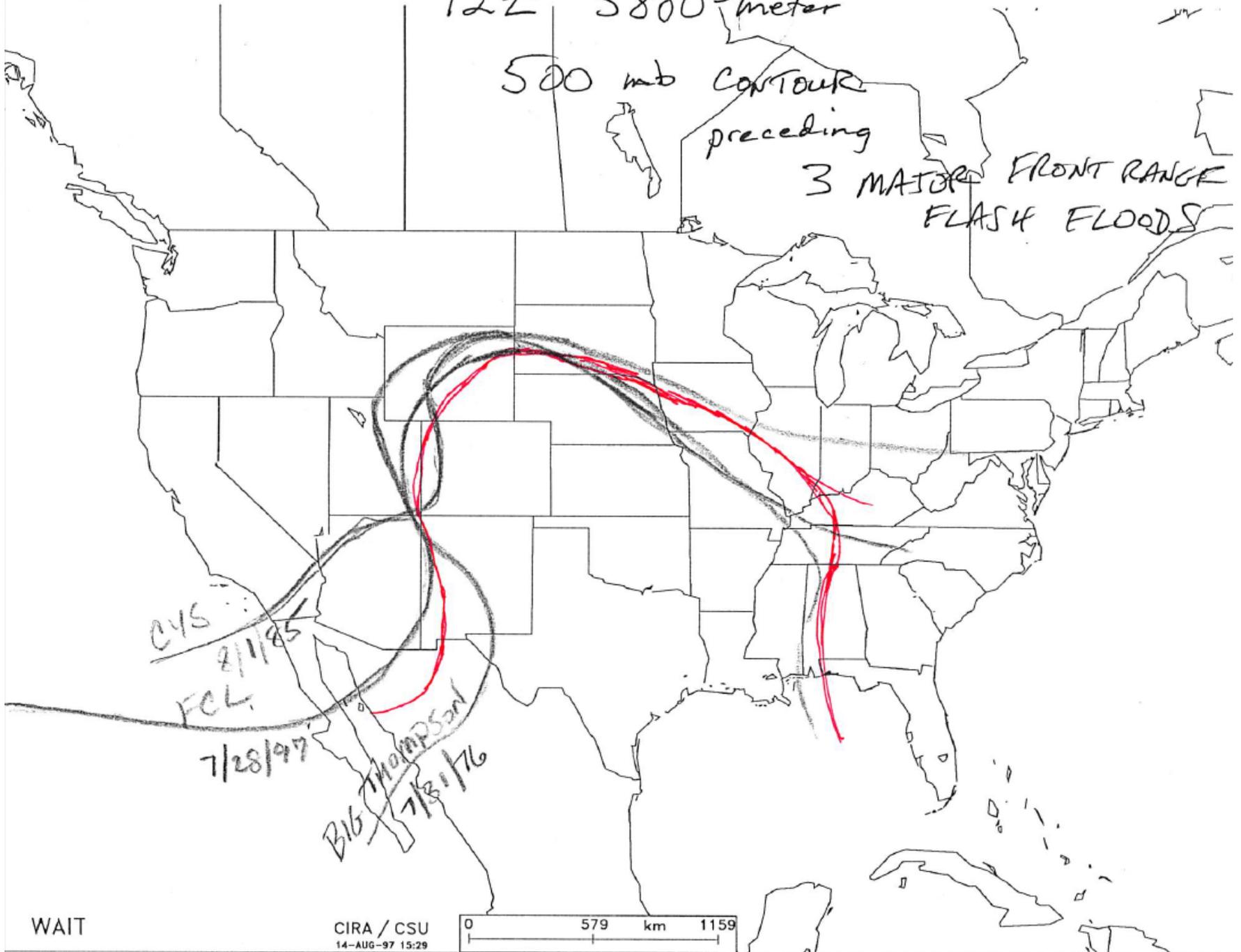
Animation (GIF)

12Z 5880-meter

500 mb contour

preceding

3 MAJOR FRONT RANGE  
FLASH FLOODS

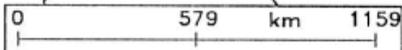


CYS  
8/1/85  
FCL  
7/28/97

BIB THOMPSON  
7/8/76

WAIT

CIRA / CSU  
14-AUG-97 15:29

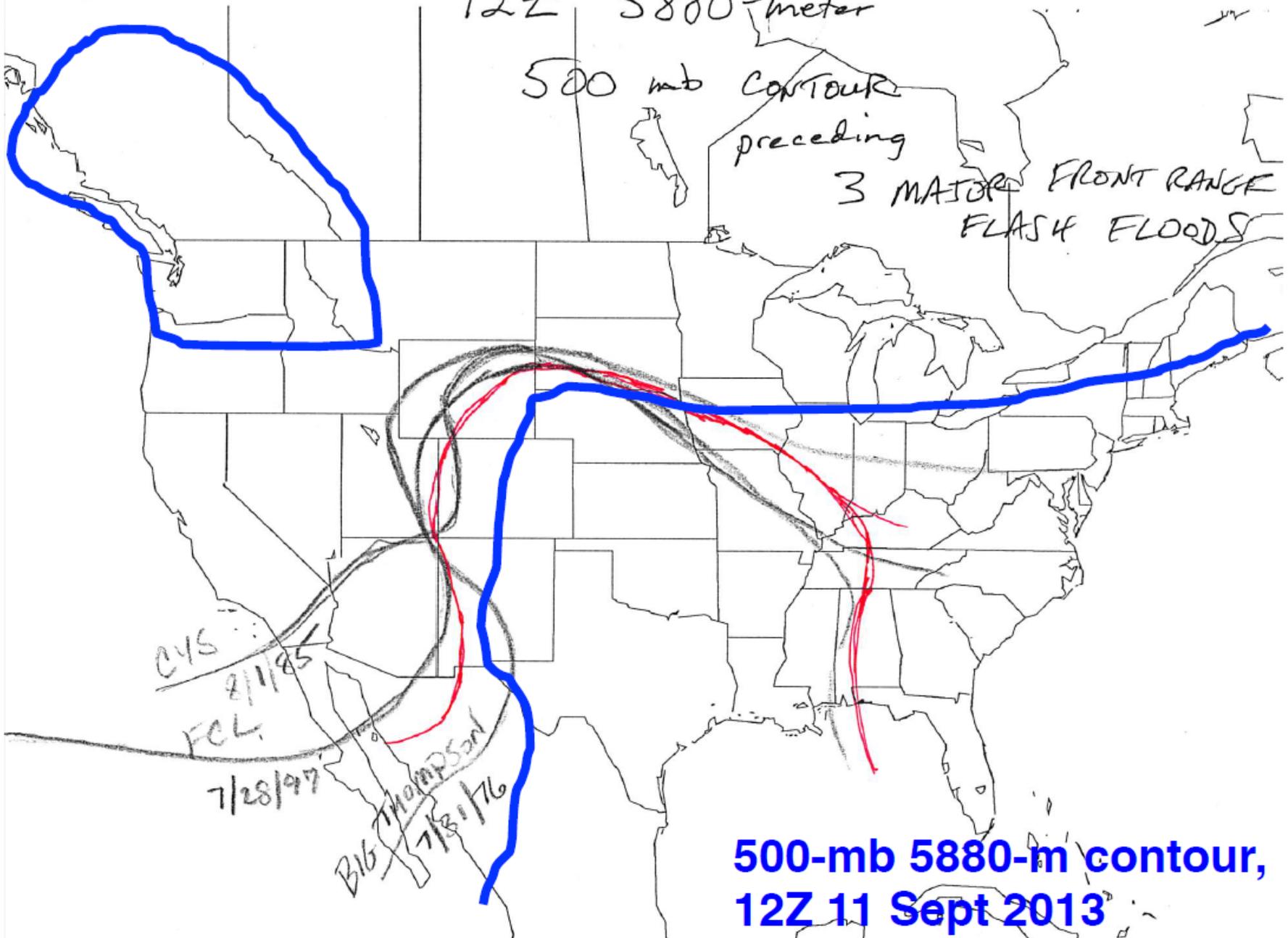


12Z 5880-meter

500 mb contour

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CYS  
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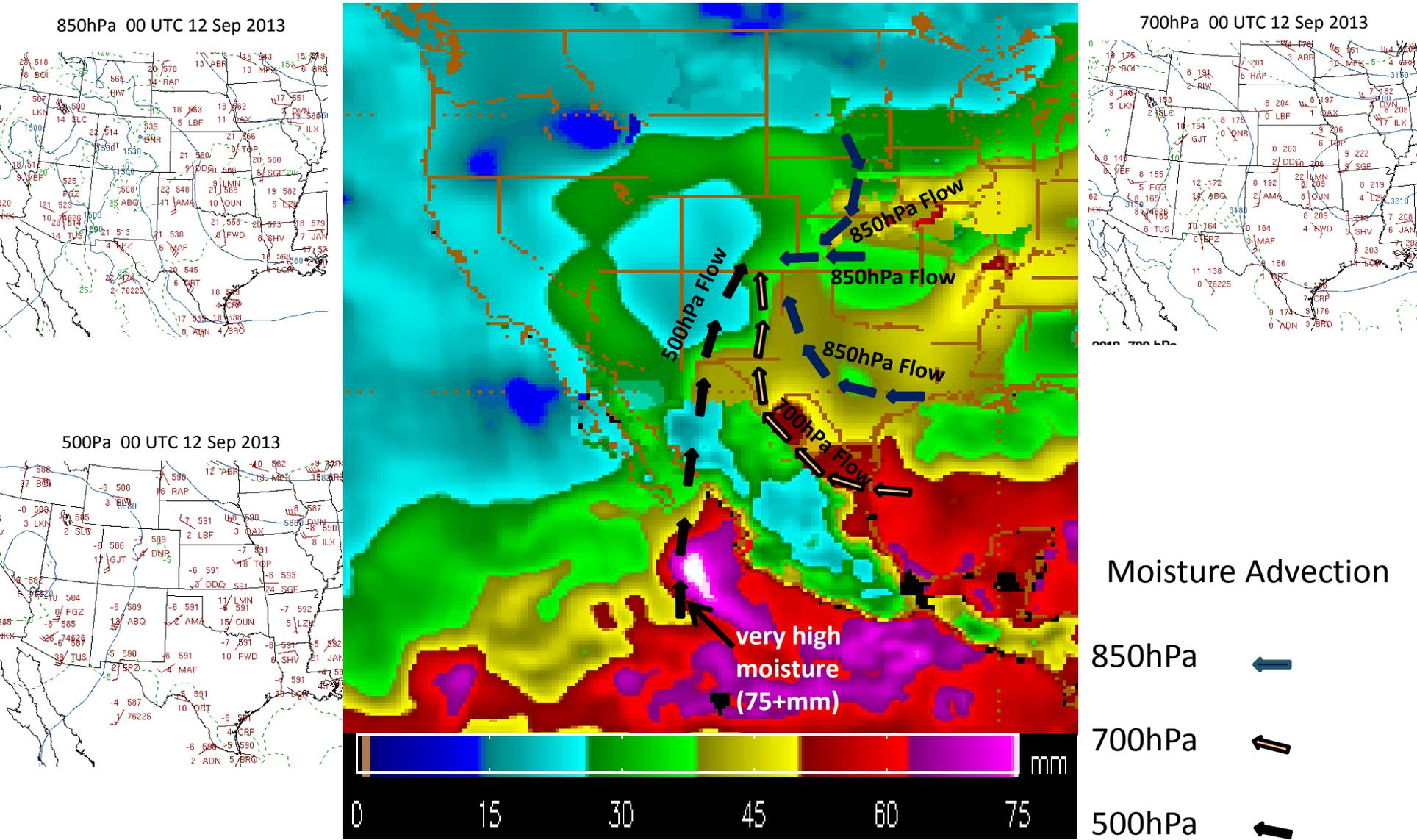
FCL  
7/28/97

Big Thompson  
7/8/76

**500-mb 5880-m contour,  
12Z 11 Sept 2013**

# Blended Total Precipitable Water (TPW)

## 00 UTC 12 September 2013



Remnants of an East Pacific tropical storm and a tropical wave in the western Gulf of Mexico juiced up the upstream areas in Mexico. Courtesy of Sheldon Kusselson (NOAA/NESDIS).

# Denver Tropospheric Water Vapor (1948–2012 versus September 2013)

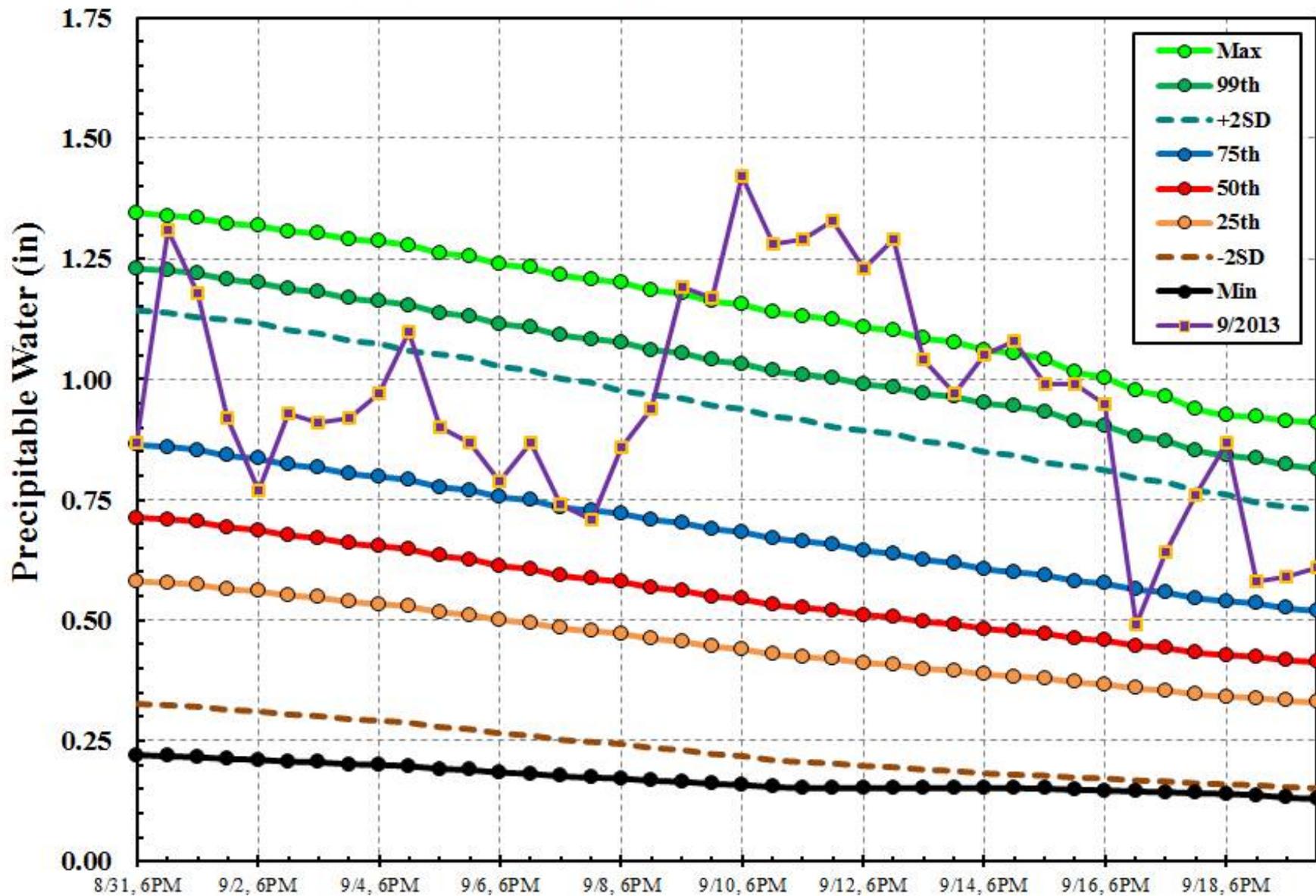
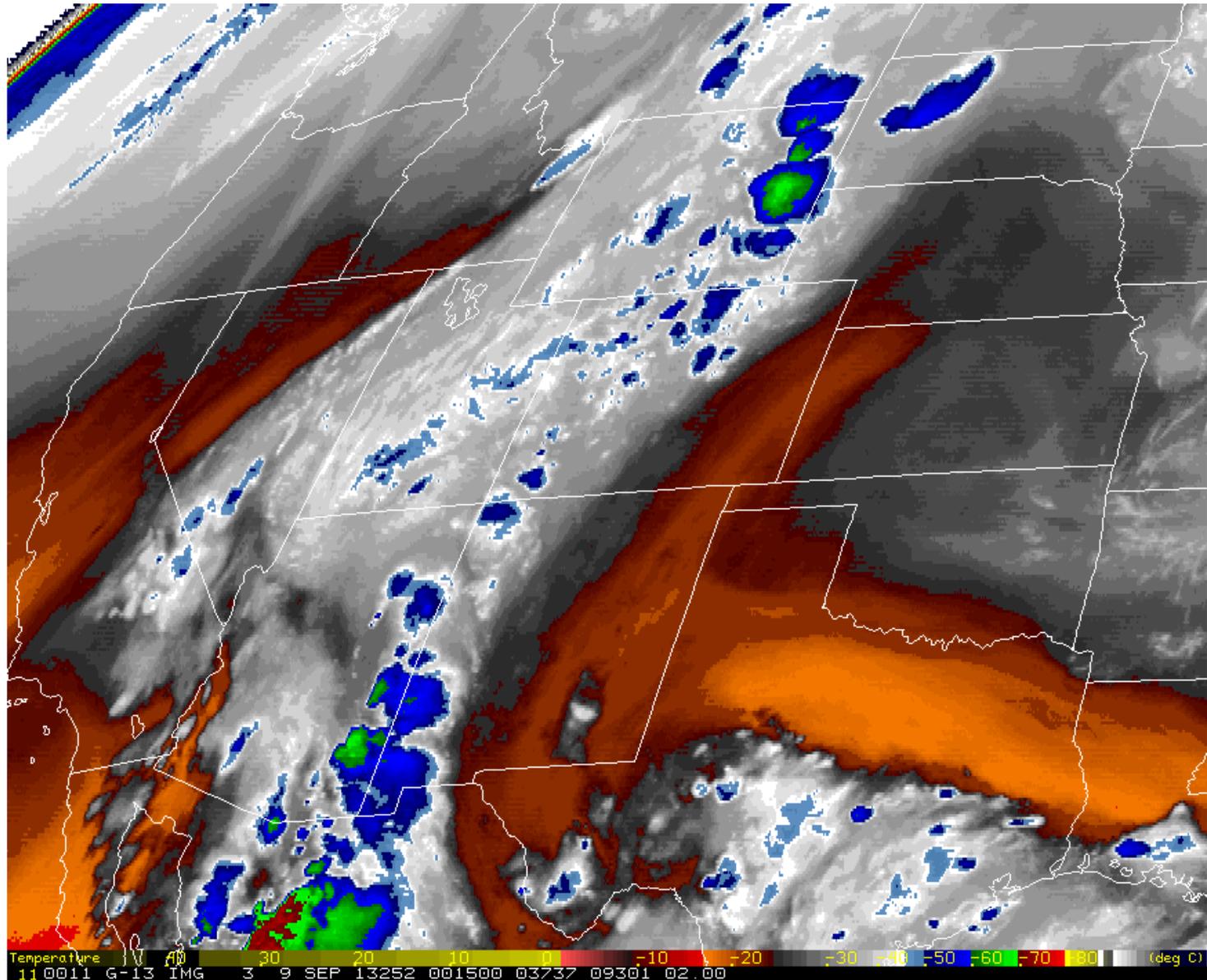


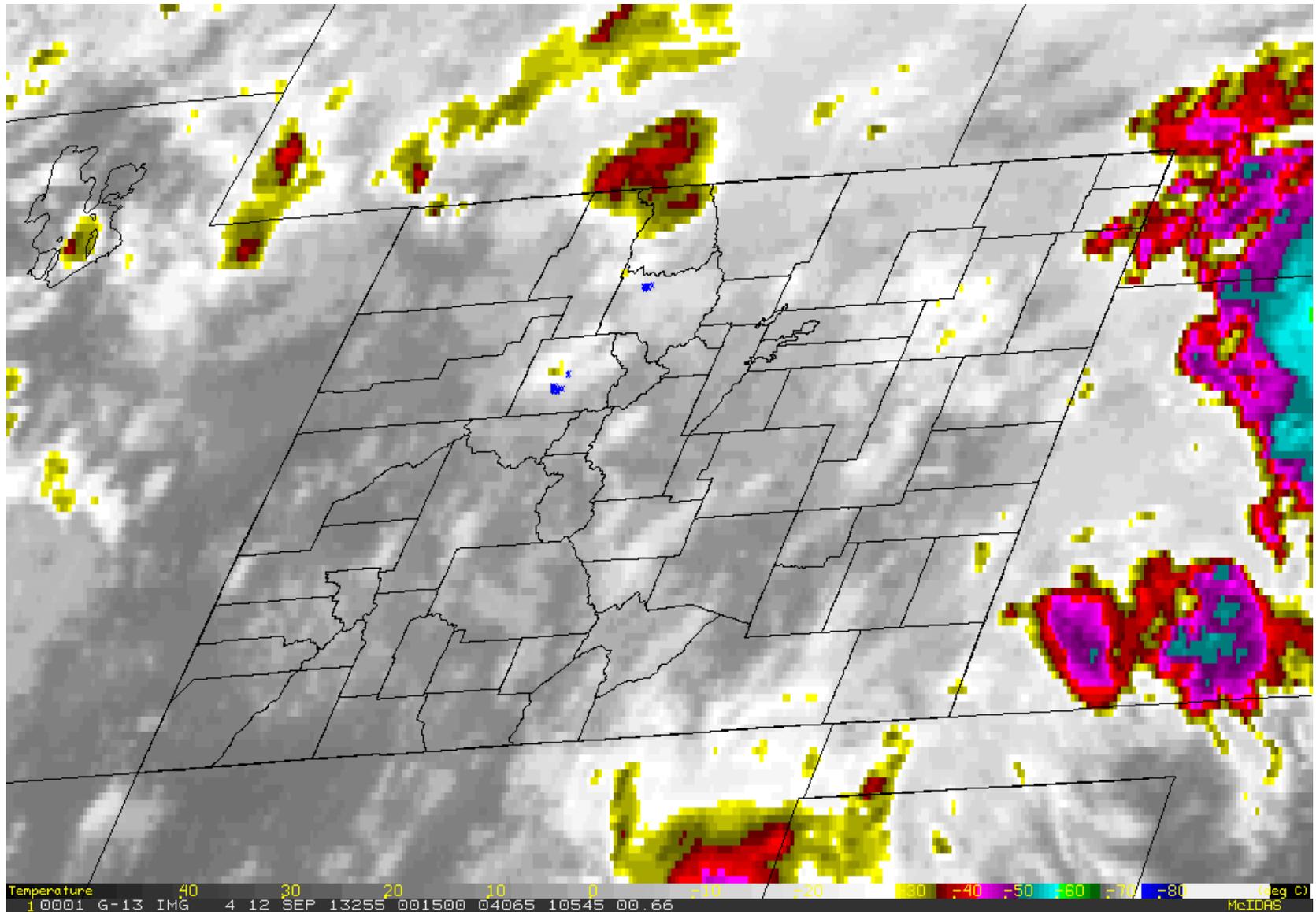
Image courtesy of Matt Bunkers, SOO @ UNR

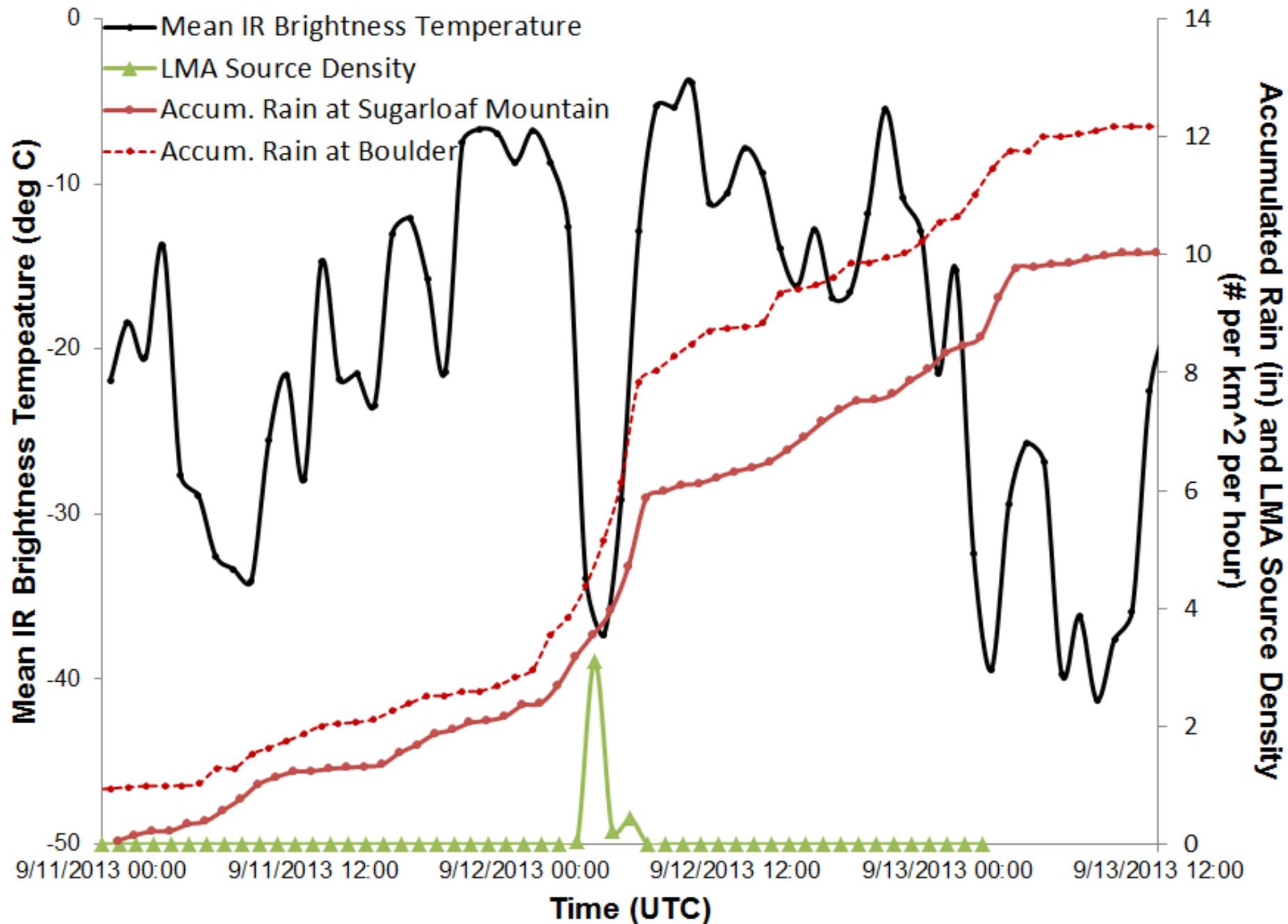
# GOES-15 Water Vapor Loop, 9-13 Sep 2013



GOES-13 IR, 0015 – 0945 Z, 12 Sep 2013 with Colorado LMA Sources (blue 'x')

Note that parallax correction has not been applied





# Promoting GOES-R and VIIRS examples on the VISIT Satellite Chat

30 minute monthly virtual session  
on a Wednesday 16:30 UTC and 20:30 UTC  
[http://rammb.cira.colostate.edu/training/visit/satellite\\_chat/](http://rammb.cira.colostate.edu/training/visit/satellite_chat/)

**Focus:** imagery and products that highlight recent events

## AUGUST

SAL Dust

Idaho Fires

GOES-12 decommission

## OCTOBER

W. Coast fog

S. Dakota blizzard

Northeast severe weather

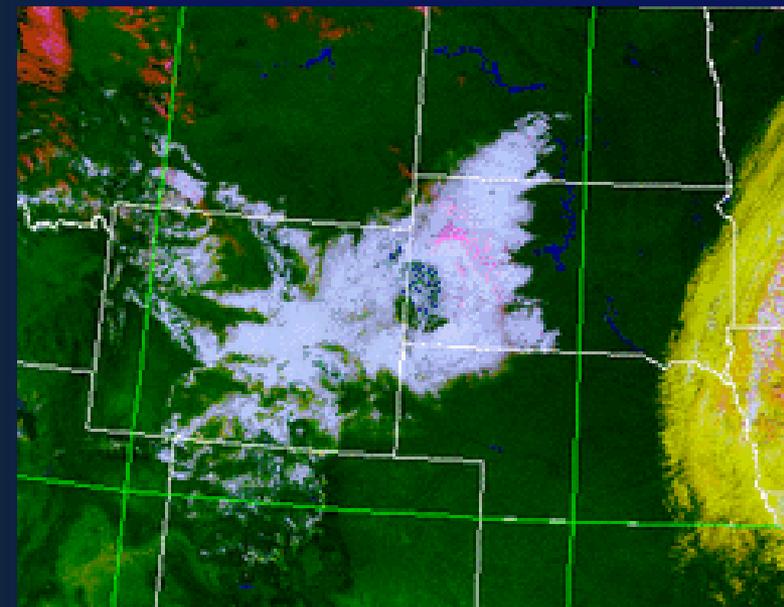
## SEPTEMBER

Flooding in Colo. and  
N. Mexico

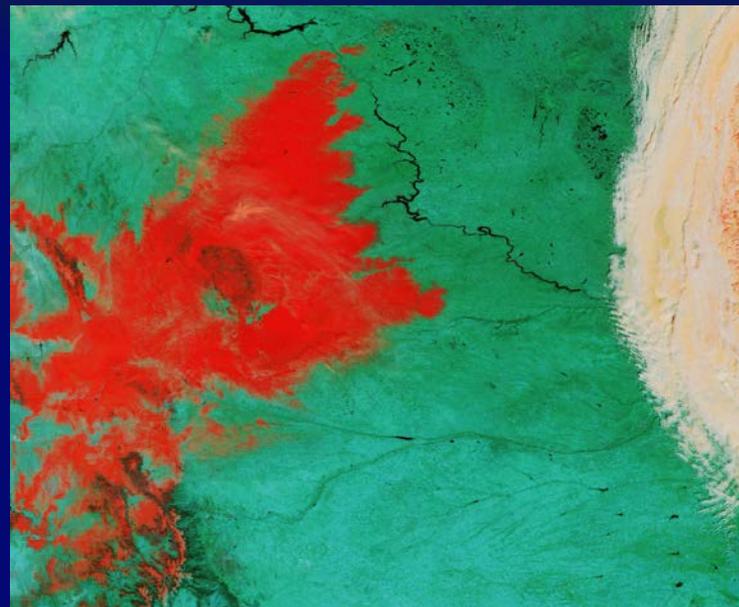
Tropical briefing



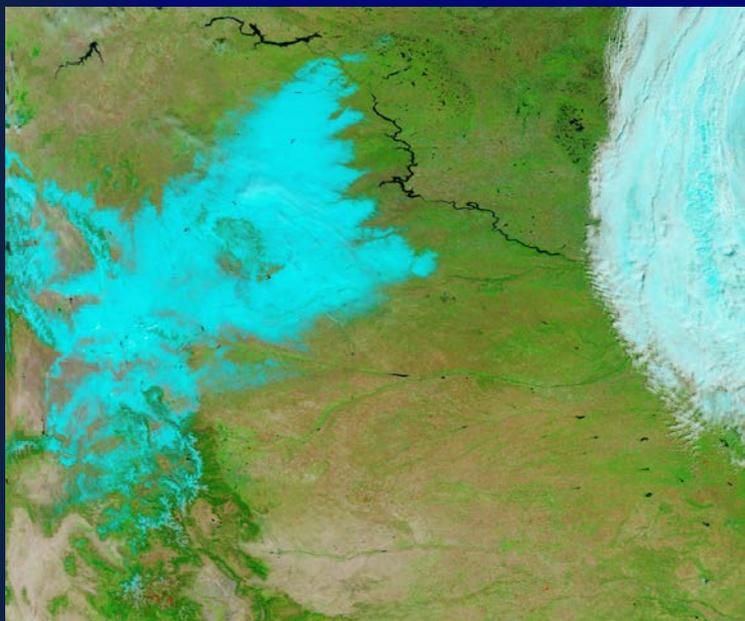
Images at ~1740 UTC on 6 Oct 2013 following the WY/SD big snowstorm



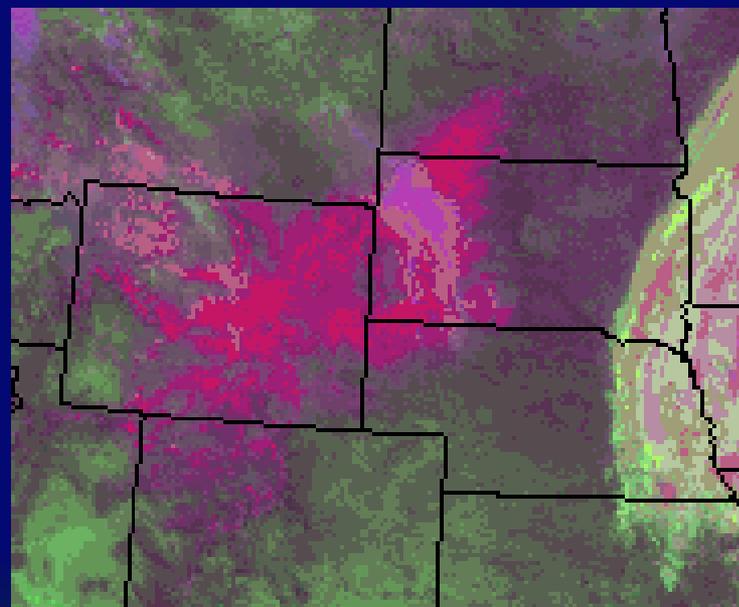
CIRA/NRL cloud layers and snow



SPoRT/ NASA False color snow



CIMSS/ NASA/EUMETSAT False color snow

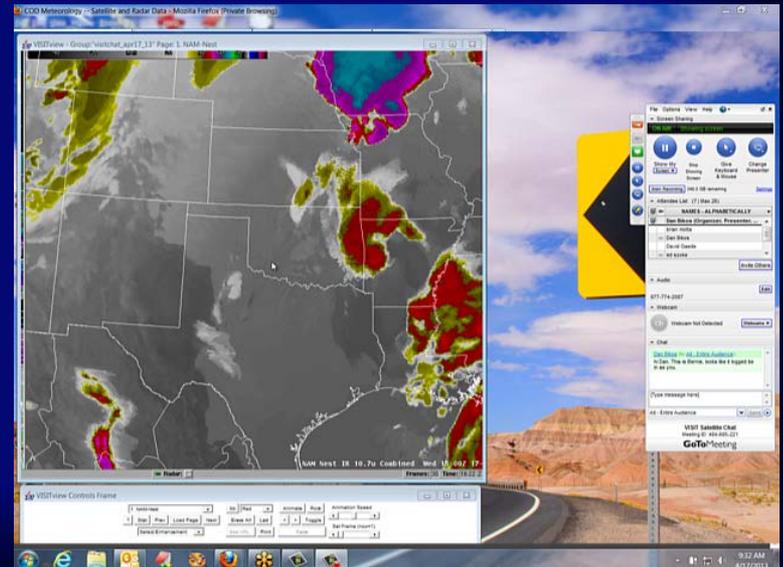


CIRA GOES cloud and snow

*We have begun discussions with SPoRT on evaluating PG snow/cloud discriminator imagery this winter as part of the Front Range WFO Collaboration effort.*

# Benefits

- Informal - interaction, comments, and questions are encouraged
- Showing products leads to requests for products, blog entries, case studies...
- Guest contributors



## AWIPS1

## AWIPS2

### ■ **Software Change Request to Raytheon**

- A CR has been submitted to allow for overwrite of satellite products in the AWIPS 2 postgres database. This is necessary to allow for updates of simulated satellite imagery as new model information is available.
- Real-time west coast ORI product is now available in AWIPS2.

### ■ **Working group participation**

- Participation in the SPoRT led Experimental Products Development Team (EPDT) bi-weekly telecons is ongoing.
- Participation in the monthly NDE-AWIPS telecons is ongoing.



# Conferences/Meetings/Training



## Recent:

- Sep 16 – 20      AMS Joint EUMETSAT Conference, Vienna (Galina Chirokova, Curtis Seaman, Steve Miller)
- Oct 17 – 21      National Weather Association (NWA) Annual Meeting (Dan Bikos and Ed Szoke)

## Upcoming:

- Nov 6 - 7      GOES-R/JPSS COMET Working Group Meeting (Bernie Connell, Dan Bikos)
- Dec 3 – 5      Vlab Virtual Training GEONETCast-Americas (Bernie Connell)
- Feb 3 – 6      AMS Annual Meeting – (Dan Lindsey, Ed Szoke, Steve Miller, Bernie Connell and Don Hillger)
- Feb ?      SPC High Impact Weather Workshop (Louis Grasso)



**Thanks!**

**Questions..?**