

# Colorado Flood Threat Bulletin Program

## 2013 Review and 2014 Outlook

# Agenda

- Flood Threat Bulletin Program
  - FTB, STP, FTO
- 2013 In Review
  - Verification, September Front Range Flooding Event, Social Media Integration & Successes
- 2014 Look Ahead
  - Twitter protocols, NextGen QPF
- Meet The Team
- Questions



## Colorado's flood threat = meteorology and topography

Colorado's "meteorological mixing pot of weather" is further stirred by its interactions with complex terrain. Along the front Range unique terrain induced features like "the Denver Cyclone" increase the threat of urban flash flooding. West of the Continental Divide long periods of above normal heat can trigger spring snow melt flooding. Monsoon moisture surges can bring the threat of "Big Thompson-like" flash floods.

# The Flood Threat Bulletin

- May 1 – September 30
- [www.coloradofloodthreat.com](http://www.coloradofloodthreat.com)
- Web-based forecast of snow-melt, river and flash flooding threat in Colorado on a county-specific basis.
- Storm Total Precipitation Map: Google-Earth based map of precipitation over past 24 hours.
- Flood Threat Bulletin: 24-hr statewide, county-specific flood threat prediction available daily by 1100AM.
- Flood Threat Outlook: 15-day statewide, flood threat probability and precipitation amount outlook issued Tuesday and Thursday.

# FTB Page

- County-specific forecasts of rainfall and flood threat
- Spatial threat identification
- Prime time for storms
- Storm movement
- Chance of precipitation
- Web-based;

## Colorado Flood Threat Portal

FLOOD THREAT

FLOOD THREAT

Flood Threat

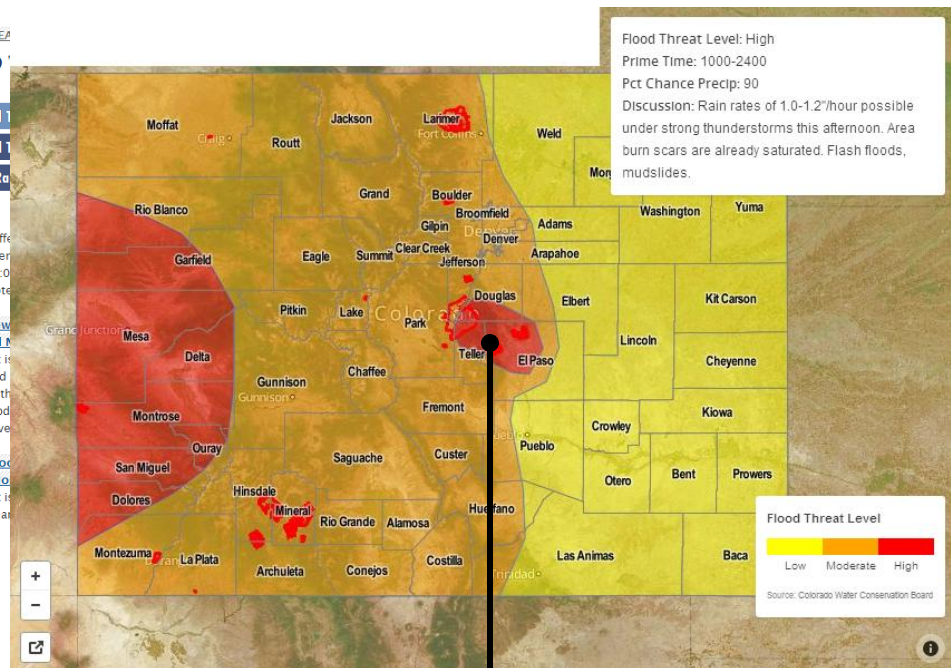
Flood Threat

24-Hr Rain

About:  
The CWCB offers flood threat forecasts issued at 11:00 am and 11:00 pm of the state threat flooding. Updated by weather.

Daily Statewide Bulletin and Forecast  
This product is issued at 11:00 am and 11:00 pm of the state threat flooding. Updated by weather.

7-15 Day Forecast  
Updated Monthly  
This product is issued at 11:00 am and 11:00 pm of the state threat flooding. Updated by weather.



Chance of Precip.	Prime Time	Discussion
90%	10 AM – 12AM	Rain rates of 1.0-1.2" possible under strong thunderstorms this afternoon. Area burn scars are already saturated. Flash floods, mudslides.

# STP Page

## Colorado Flood Threat Portal

[24-Hr RADAR PRECIPITATION MAP >](#)

24-HR RADAR PRECIPITATION MAP (Sep 11, 2013)

- [Flood Threat Bulletin](#)
- [Flood Threat Outlook](#)
- [24-Hr Radar Precipitation](#)

### About:

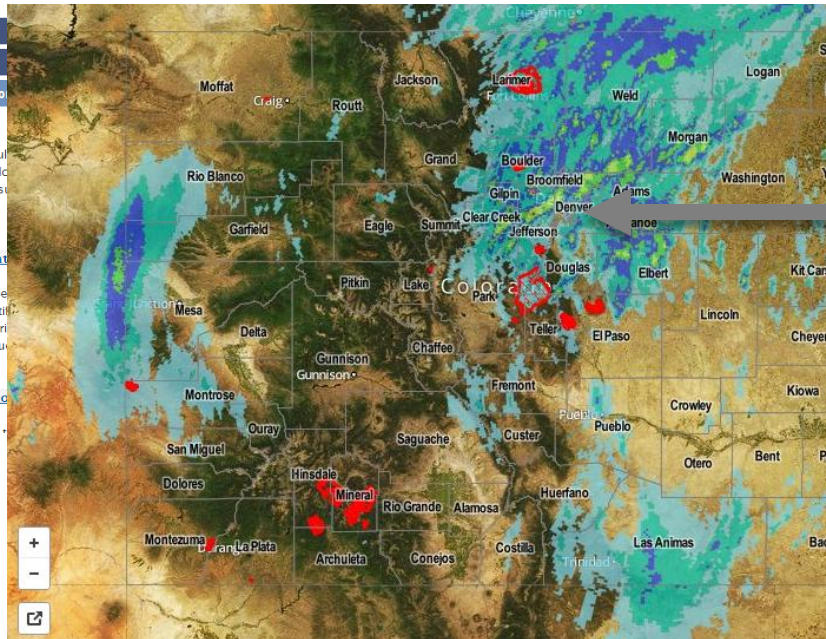
The Colorado Flood Threat Bulletin offers a daily assessment of flood potential around the state, issued at 11:00 am each day from May through September.

### [Daily Colorado Flood Threat Bulletin and Map](#)

This product is issued daily by 11:00 am and is used to identify areas of the state that are at risk of flooding. Updates can be issued as needed by weather situation.

### [7-15 Day Flood Threat Outlook \(Updated Mon. and Thurs.\)](#)

This product is an outlook of



## Heavy Rainfall

An energetic disturbance moved NNE across the state and combined with deep moisture to create heavy rain. Rain rates were routinely above 1"/hour, with some locations nearing 2"/hour. This rainfall is from Sept. 10, 2013, and shows the saturation that helped enhance the flooding event to come over the next few days.

The STP product merges observed National Weather Service WSR-88D Radar Storm Total Precipitation products from the Goodland KS, Front Range CO, Pueblo CO, Grand Junction CO and Cheyenne WY radars. Rainfall < 0.50 inch omitted. MADIS/CoCoRaHS provides observed rainfall. Event summaries included. 3-5 day summed precipitation indicates where soil moisture content may be high enough to promote excessive runoff.

# FTO Page

## Colorado Flood Threat Portal



[FLOOD THREAT OUTLOOK - NEXT 15 DAYS >](#)

FLOOD THREAT OUTLOOK - NEXT 15 DAYS (Sep 11, 2013)

Flood Threat Bulletin

Flood Threat Outlook

24-Hr Radar Precipitation

### About:

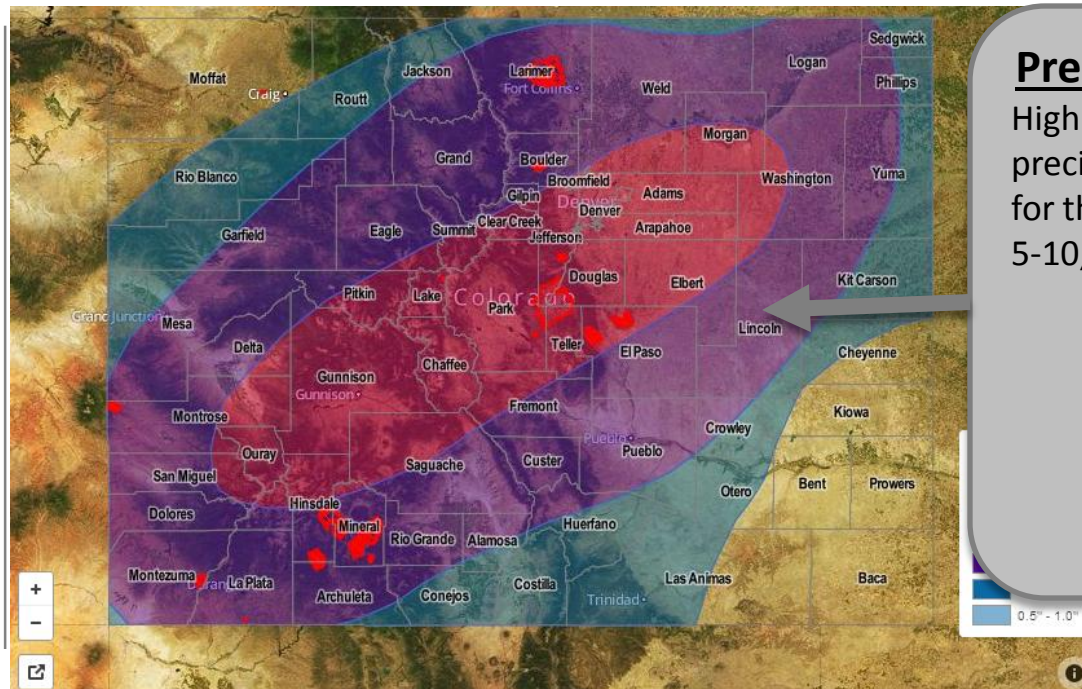
The CWCB offers a daily assessment of flood potential around the state, issued at 11:00 am each day from May through September.

### [Daily Statewide Flood Threat Bulletin and Map](#)

This product is issued daily before 11:00 am and is used to identify areas of the state that are at risk of flooding. Updates can be issued as needed by weather situation.

### [7-15 Day Flood Threat Outlook \(Updated Mon. and Thurs.\)](#)

This product is an outlook of the flood threat and precipitation amount and chance in the state over the next 15 days.

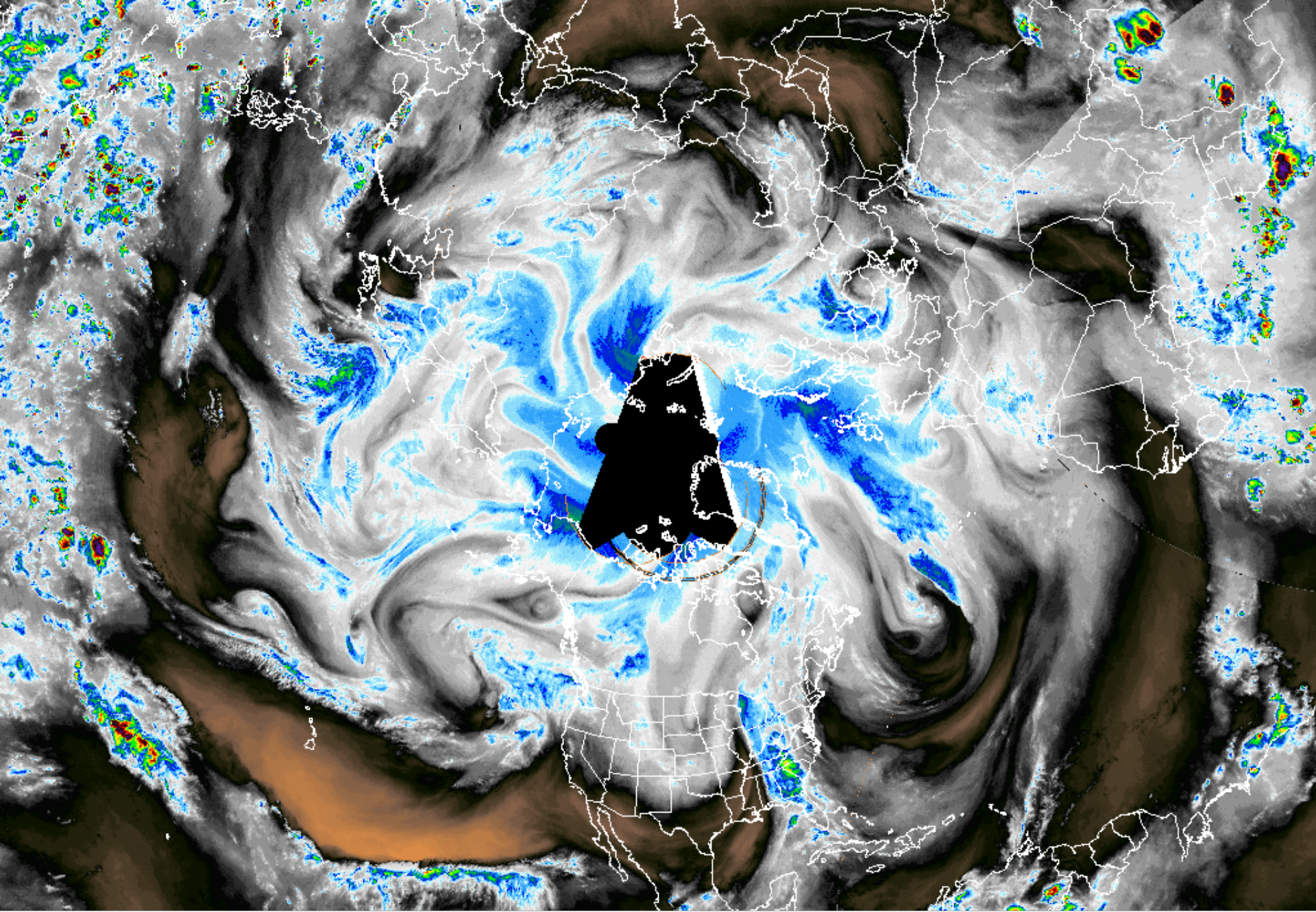


### Precipitation Map

Highlights the precipitation estimates for the periods of 0-5, 5-10, 10-15 days.

# FTO: 15-day Outlooks

- Based on model ensemble projections of atmospheric circulation patterns and precipitation + a dose of experience.
- Three 5-day estimates of both flood threat and precipitation amounts  $>0.50$  inches.
- Provided a 5-10 day “heads up” on high flood threat for the September 2013 floods.
- Precipitation forecasts can be useful for water supply/demand planning.



# Near-Term

- Both the Polar Vortex and the Northern hemispheric Storm Track are active but slowing.
- Still one to three intrusions of cool Canadian air possible.
- Three-five Great basin “cut-off lows”/storm systems likely between May 20 and June 15.
- Check out the 15-day flood threat and precipitation outlooks for details.



# 2013 in Review

# Verification

- 85 flooding days occurred in 2013 season
- Overall FTB accuracy: 84.3%
- FTB accuracy of correctly forecasting flooding days: 84.7%
  - Both are well above forecast goal of 70%
- FTB False Alarm Rate: 13.3%
  - Well below the goal of 25%
  - 2012 FAR: 17.5%, which suggests progress being made at improving the forecasts

# September Floods

- A major flooding event set its sights on Colorado during the middle of September
- FTB program issued county-specific QPF and flood threat forecasts, including prime time for flood threat, for county and state EM's
- Also went above normal procedures to issue updates to the forecast at various junctures during the day

# Front Range Flooding Event

- Moist, southerly winds from Gulf of Mexico
- Cool front on plains converging moisture in E CO
- Stalled upper-level low pulled monsoon moisture into CO from Mexico for a week



# Colorado Flood Threat Portal



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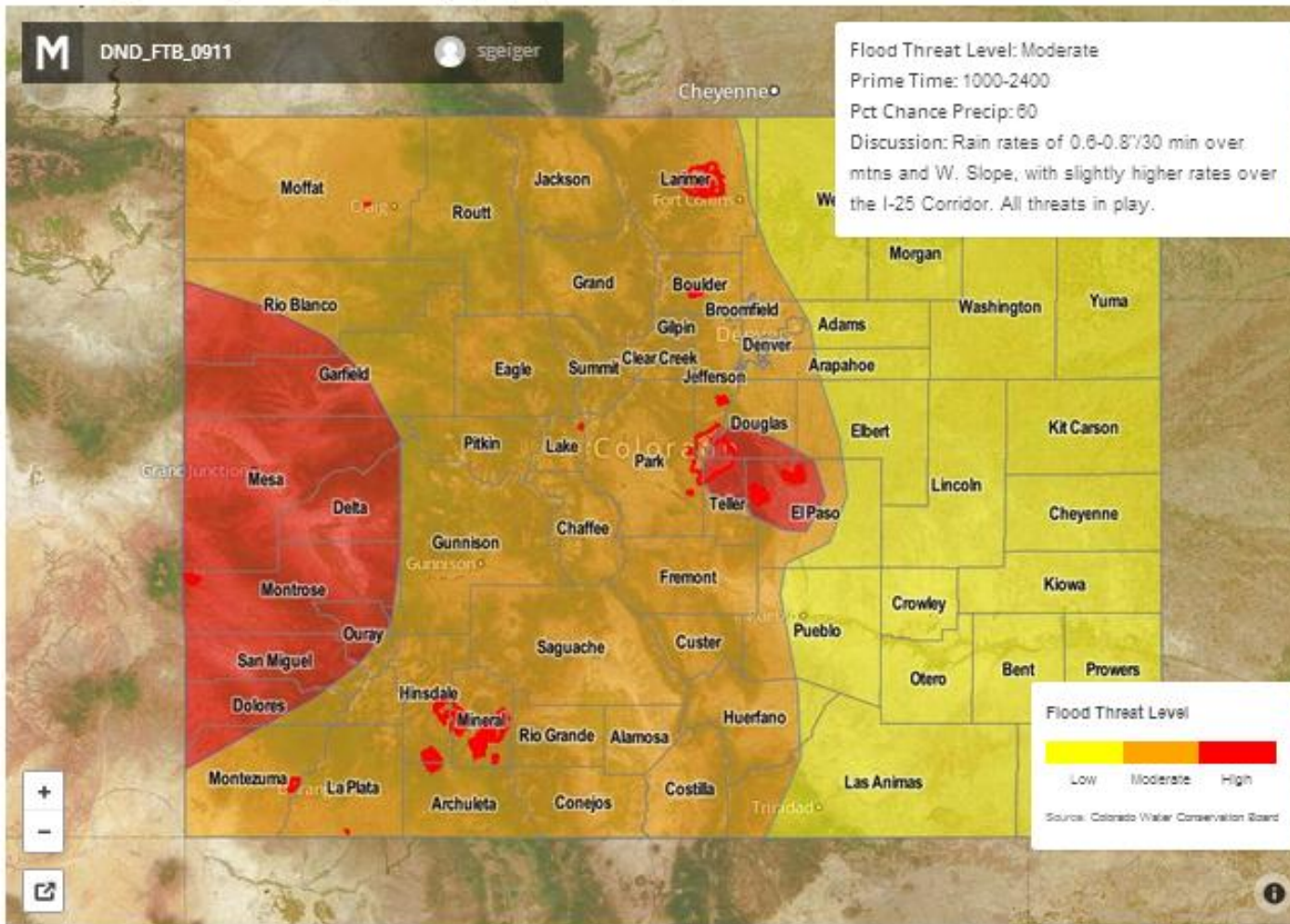
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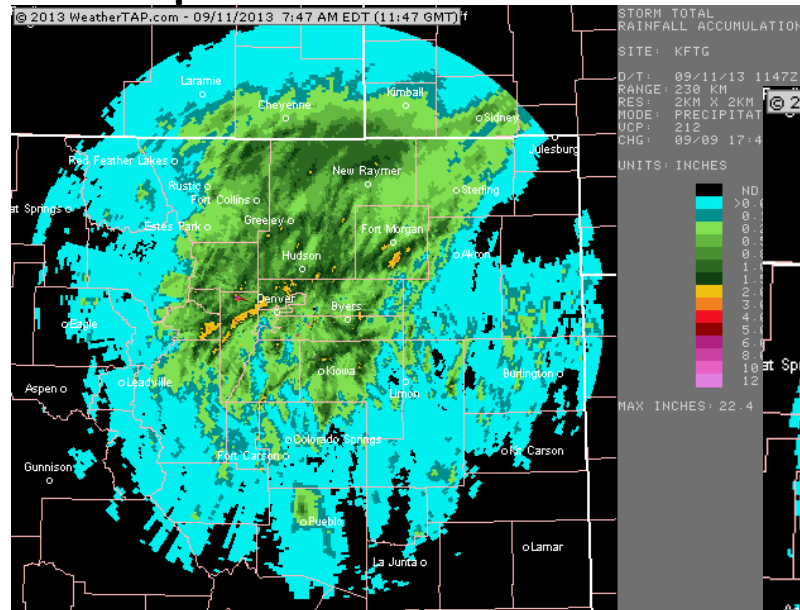
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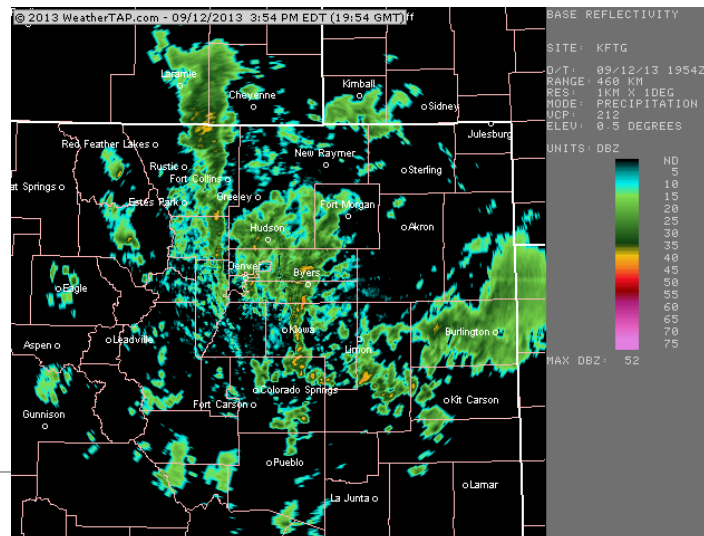
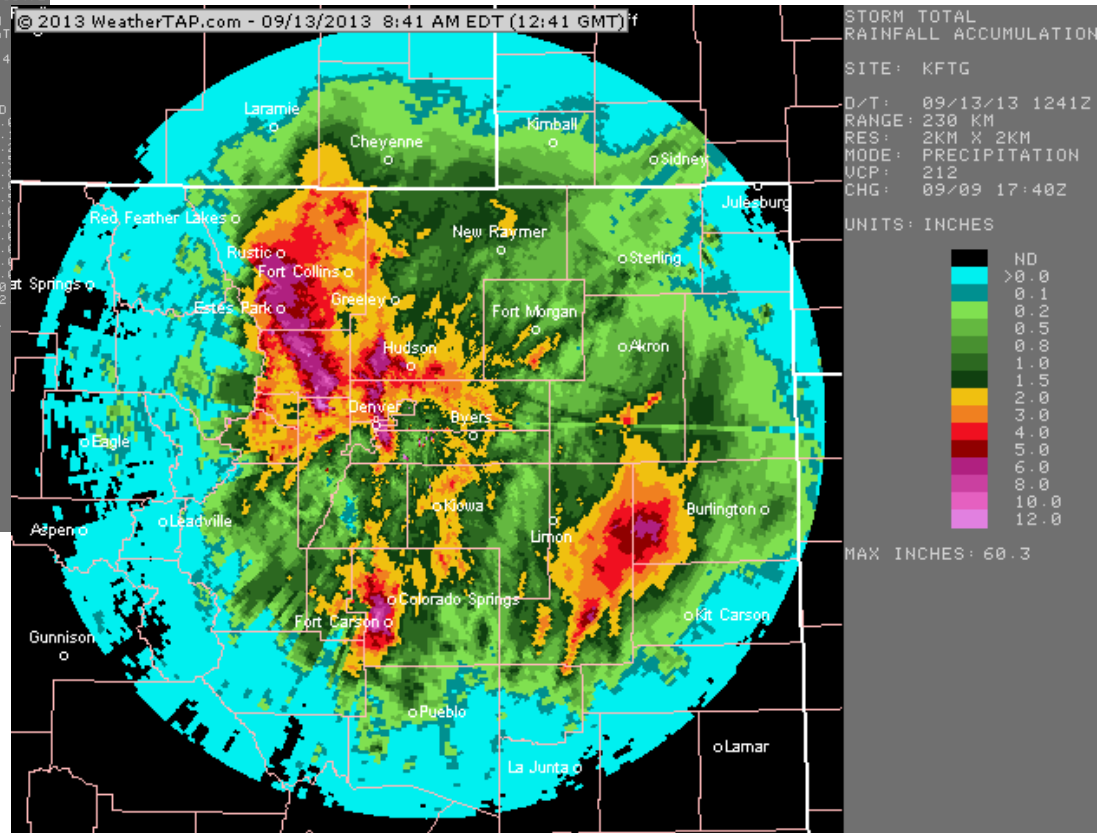
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# Radar accumulated rainfall tells a story

## Sept 10-11 rainfall

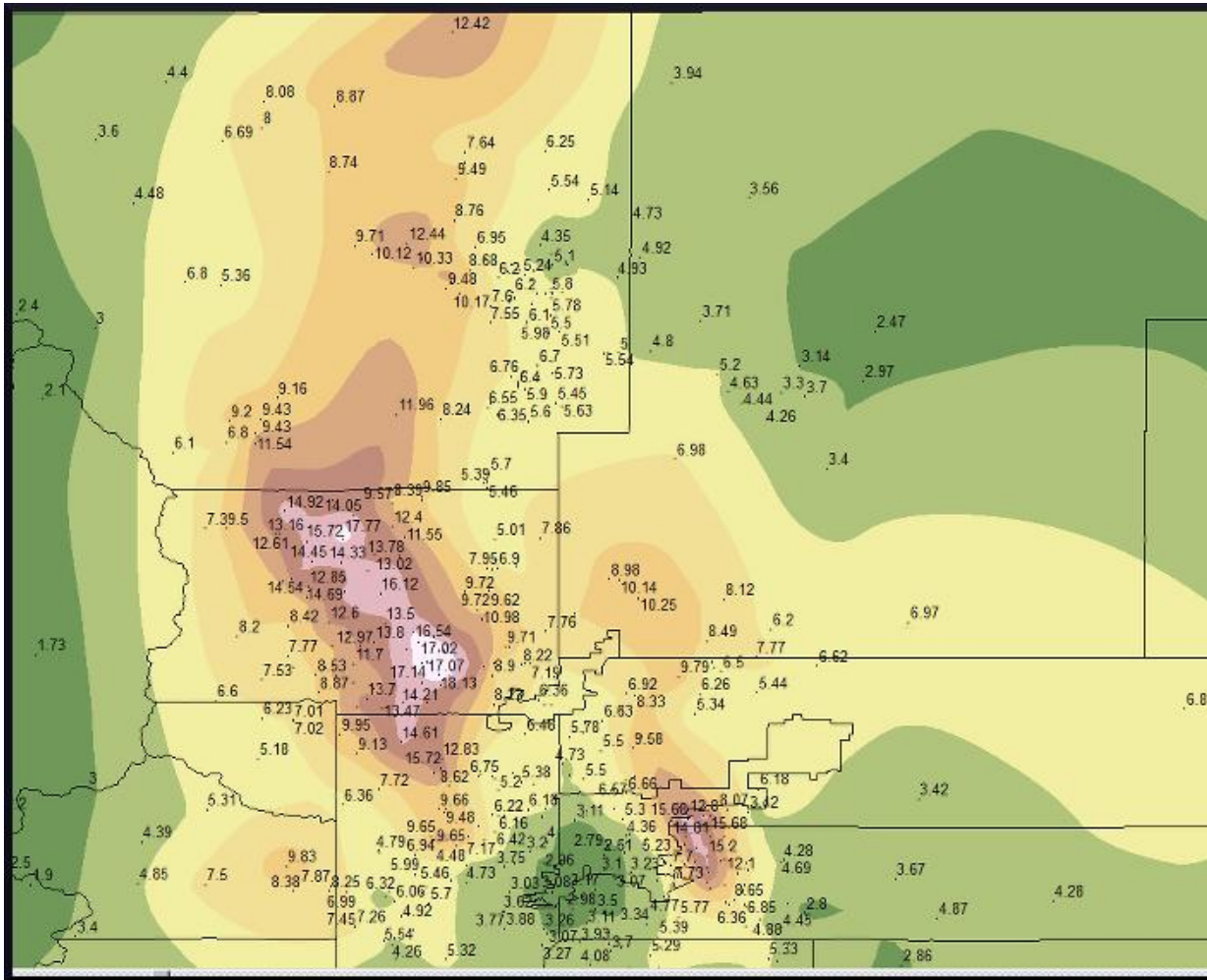


## Sept 9-13 rainfall



## Sept 12 radar ~230PM

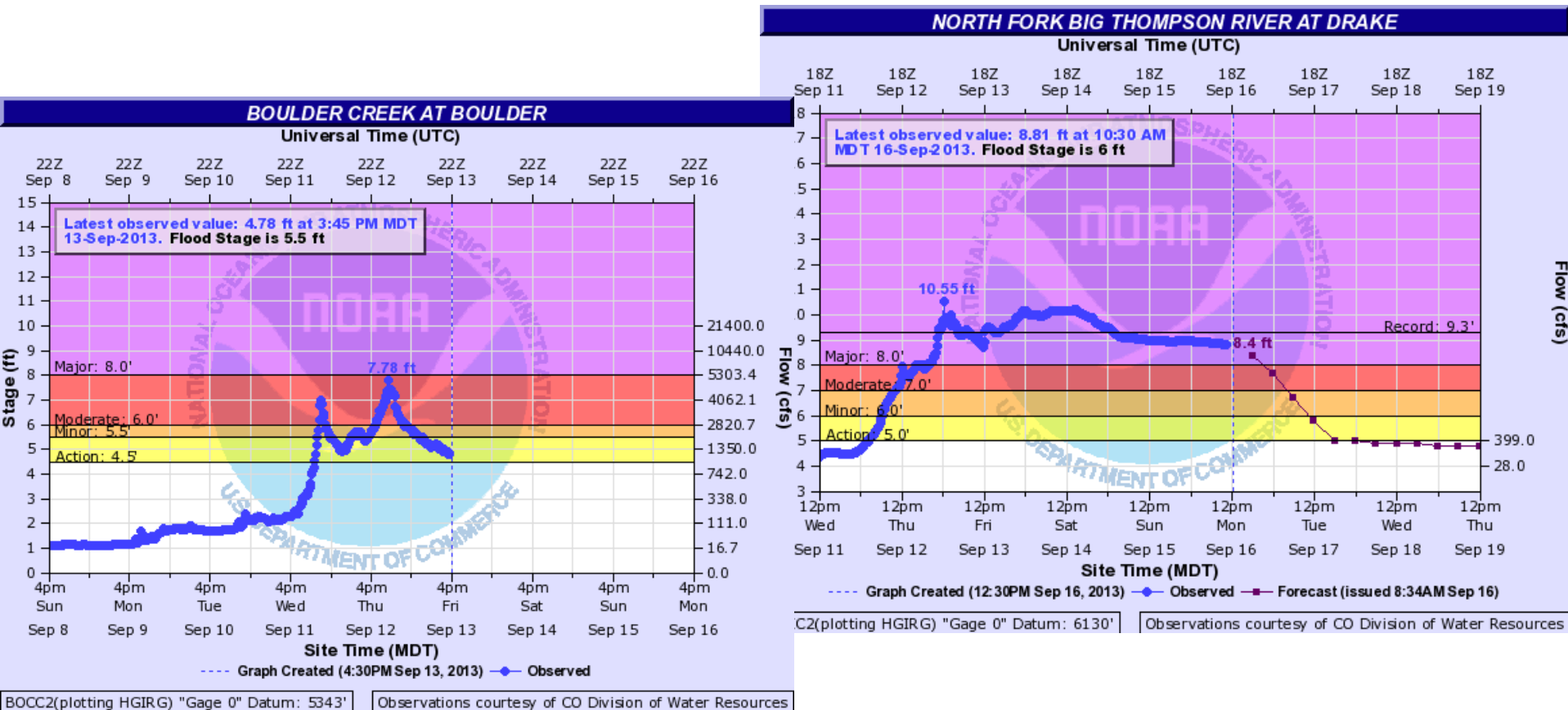
# Front Range Flooding Event



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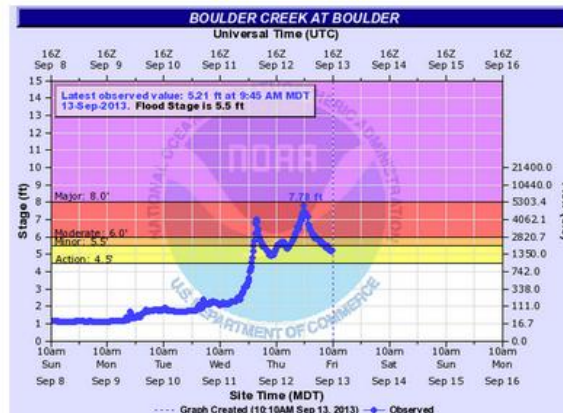
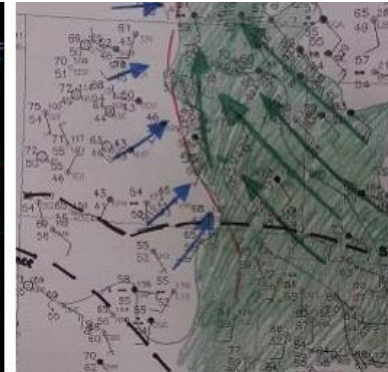
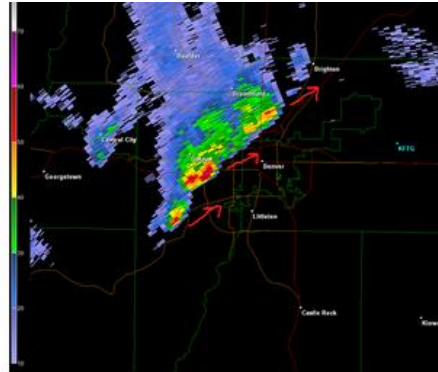
# Front Range Flooding Event



- Boulder Creek at Boulder: 7.78', nearly major flood stage
- North Fork Big Thompson River at Drake: 10.55', major flood stage

# Social Media Integration

- @COFloodUpdates
- Provided FTB updates and “nowcasts”
- Used hashtags like #COwx and #COFlood to join conversation
- Shared relevant pictures of damage/flooded roadways



# Example Tweets

- Updating flood conditions as reports come in
- Providing emergency information from EM's
- Real-time meteorological analysis highlighting concerns for more thunderstorms
- Radar imagery “nowcasts” showing expected storm tracks and impacted locations



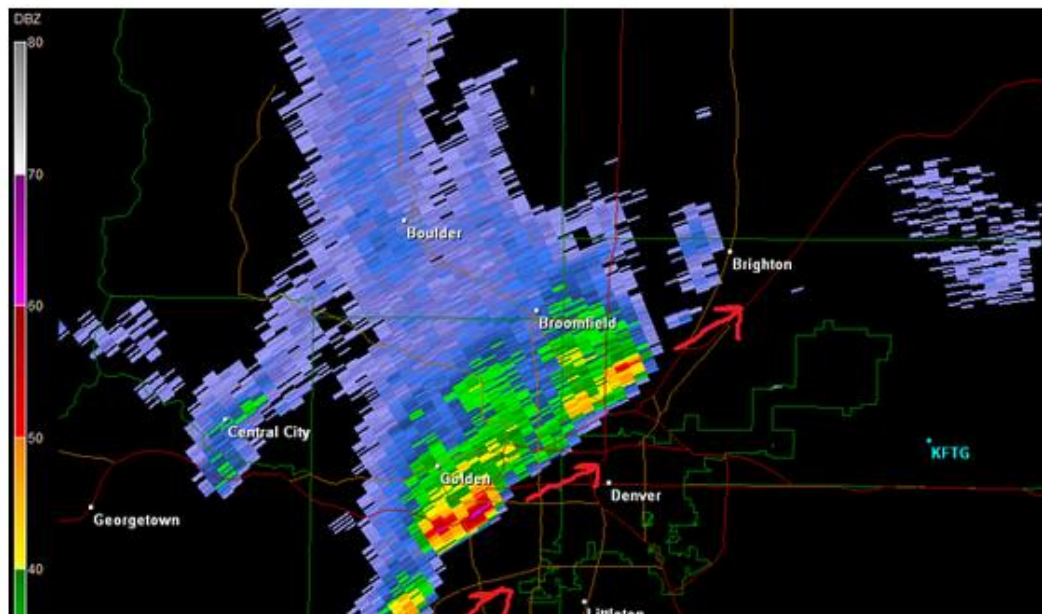
**CO Flood Updates**

@COFloodUpdates

Thunderstorms have developed just west of Denver, and will be moving across the metro over the next hour. #cowx

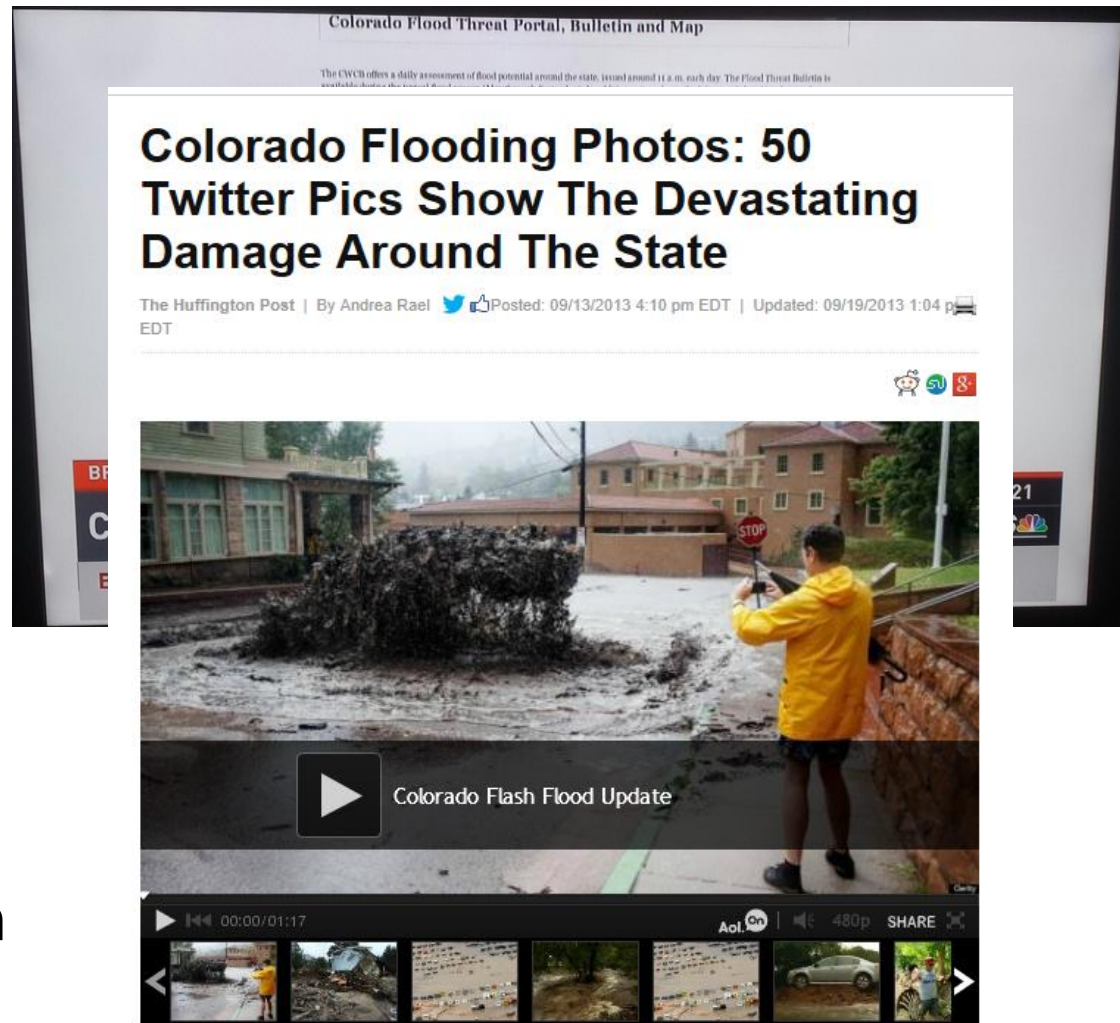
[pic.twitter.com/iaTCNvF1nR](https://pic.twitter.com/iaTCNvF1nR)

↩ Reply 🗑 Delete ★ Favorite ⋮ More



# Social Media Results

- Interacted with local news outlets
- Mentioned in a Huffington Post online article
- Increased awareness of the FTB program
- More people visited the site in 18 days following account creation than in previous 2 years



# Social Media Results

- In just 18 days, the Twitter campaign tripled the total FTB site visits
- Brought in users from nearly 40 new Colorado cities
- Website received 7,726 visits in just the 4 days following the account creation



# 2014 Look Ahead

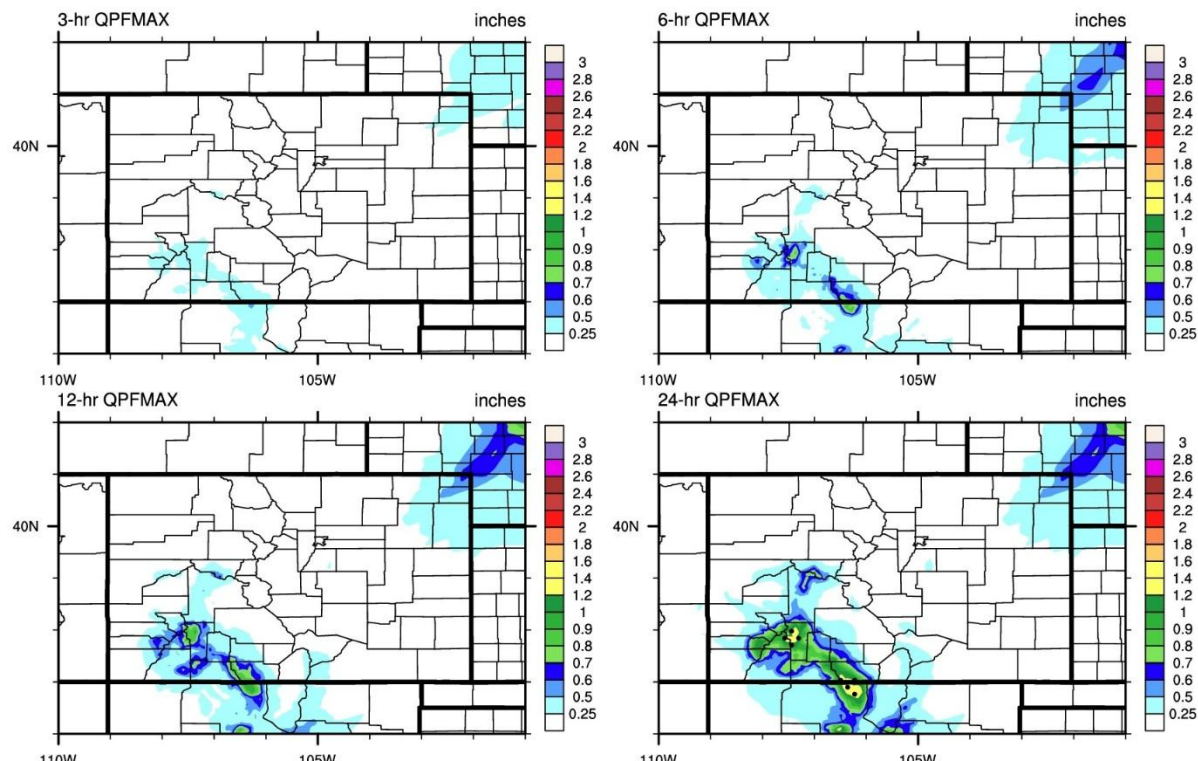
# Twitter Protocols

- Tweet the updates to the Flood Threat Bulletin Products
  - Storm Total Precipitation, Flood Threat Bulletin, Flood Threat Outlook
- Use relevant hashtags to join the broad conversation
  - #COwx, #BoulderFlood, #COFlood, etc.
- Mention (@) accounts that use the information
  - @COEmergency, @LarimerSherrif, @9NEWS, etc.

# QPF

- NextGen QPF
- Ensemble comprised of ~2 dozen members
- 3-hr, 6-hr, 12-hr, and 24-hr QPFMAX

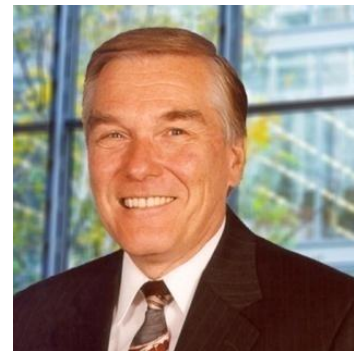
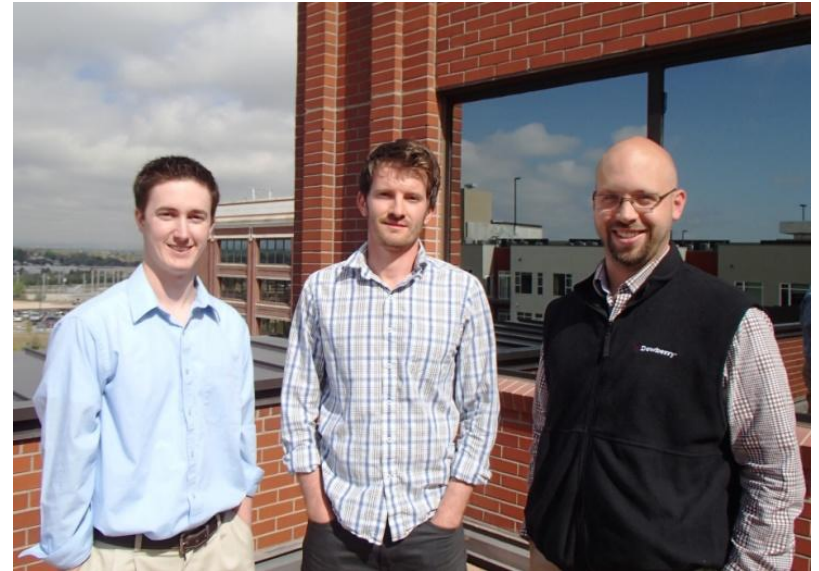
Maximum precipitation estimates for 05-12-2014



3-hr, 6-hr, 12-hr, and 24-hr intervals for 24-hr period starting at 6 AM of the indicated day. Black dots indicate where the probability of exceeding 1 inch in the indicated time frame is 30% or greater.

# The Team

- Top (from left to right):
  - Brad Workman
  - Dima Smirnov, Ph.D.
  - Stu Geiger, CFM
- Bottom (from left to right):
  - John Henz, CCM
  - Rob Rahrs, GISP





# Questions

[www.coloradofloodthreat.com](http://www.coloradofloodthreat.com)

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