Colorado Water Conservation Board

October 24, 2019

Presentation to
Water Resources Review Committee

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

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Colorado Water Conservation Board

Important Reminder

With all the attention that is traditionally placed on snowpack every spring, it is important to remember that historically, the most damaging floods in Colorado have almost always been from rain-induced events.

Some Key Flood Points to Remember

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- **Snowmelt floods usually require prolonged very warm temperatures and/or widespread late season snowpack including snow on south facing slopes.**
- **Most of Colorado's worst floods are rainfall floods.**
- **Significant burn scar flooding is a relatively new problem**
- Floods and drought are not mutually exclusive.

How Did We Avoid Widespread Flooding?

- Most significant statewide snowfall since 1997

Answer: A little luck from Mother Nature and a lot of coordination and preparedness at all levels of government.

A Yo-Yo Season of Transitions

- Denver Statistics:
  - 7th coldest May
  - 90 Degree Days Before June 26 – none
  - 90 Degree Days June 27-Sept 5 – 44 out of 71 days
  - 3rd warmest August on record
  - 2nd warmest September on record
  - Broke the September record by 3 degrees (100)
  - 3 out of the first 5 days of September broke the previous monthly record
  - 2nd coldest cold snap ever recorded before Oct. 22
  - October will likely end up as one of 20 coldest

Why Are Those Statistics Significant?

Without rain-on-snow, snowfields need significant prolonged heat to produce floods.

If the heat had arrived even two weeks earlier, this summer might have been different.

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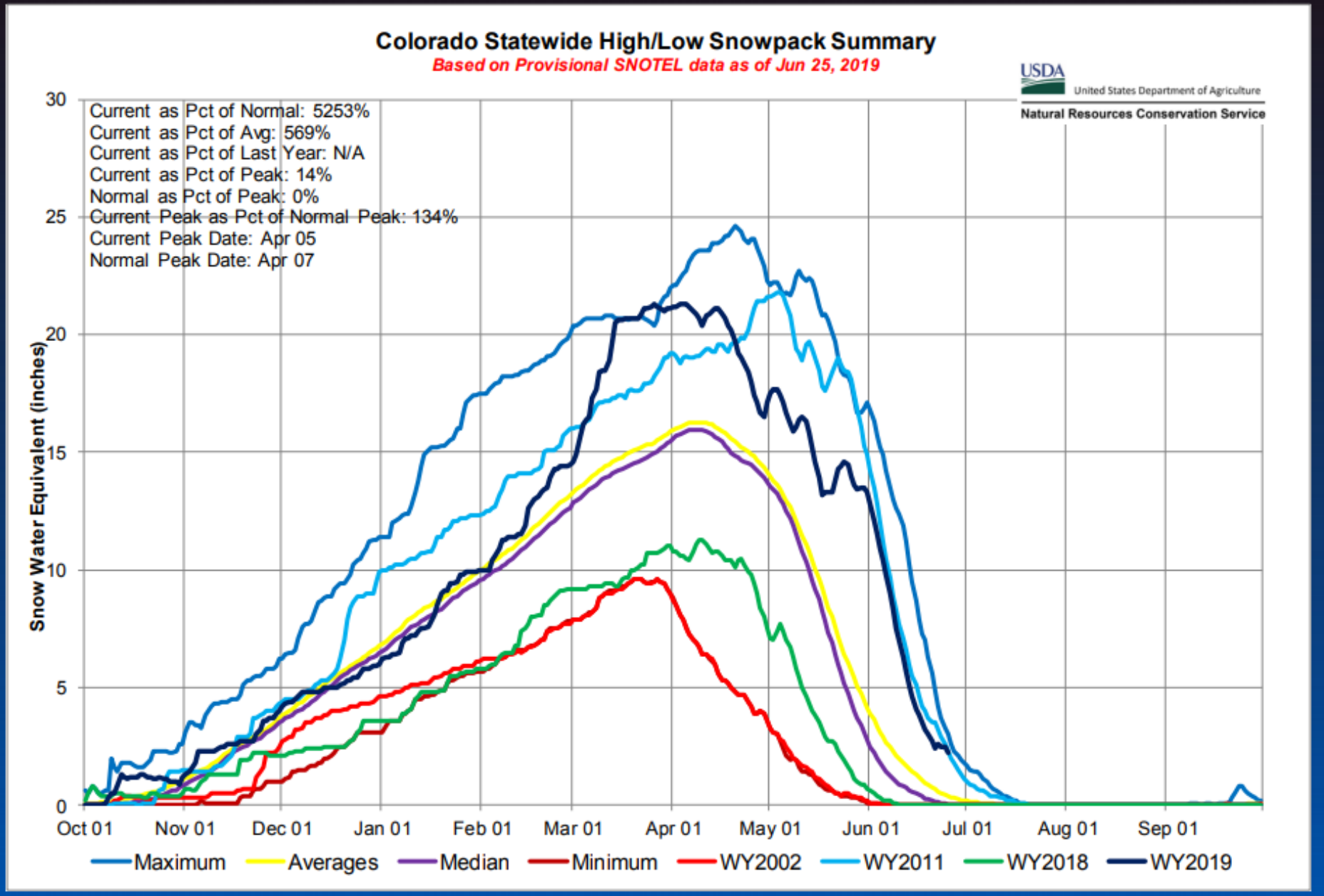
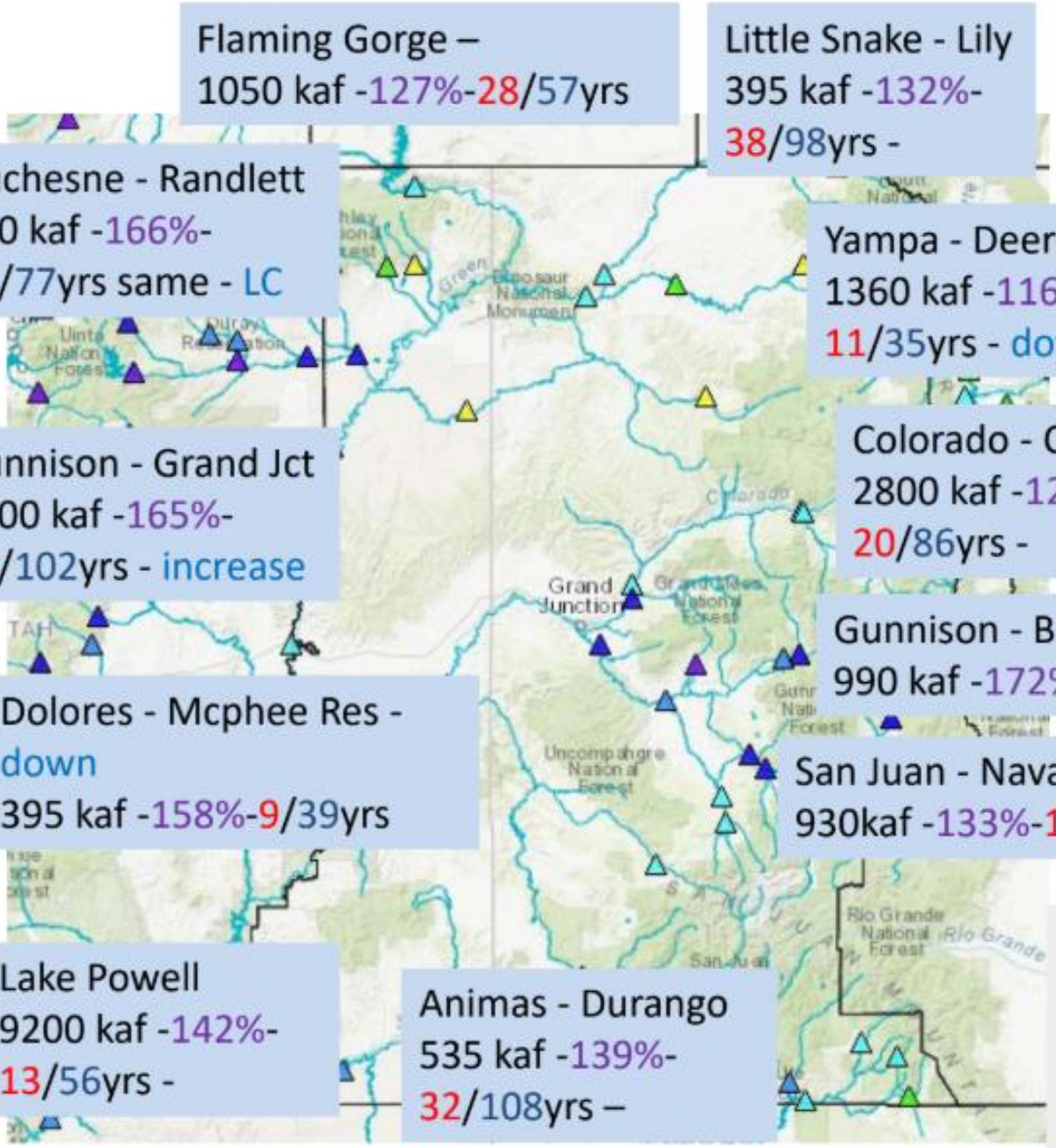
Colorado Snow Surveys



April-Upper Colorado Streamflow Forecasts



Upper Colorado
April - July
Streamflow
Volume
Forecasts
as of **May 15, 2019**
(% of 1981-2010 average)
From the CBRFC

Kaf = 1,000 acre feet

% of median

Current Forecast Rank / **Period of Record**

National
Weather
Service
Grand Junction, CO

What Did We Do to Prepare?

- Weekly conference calls with county emergency managers (May and June)
- Extensive snowpack monitoring and river forecasting by National Weather Service, Natural Resources Conservation Service, and Colorado Department of Natural Resources
- Extreme preparedness at the local level

Don’t Be Misled by Snowpack Percentages

- Reported percent of averages have much greater meaning in April and early May
- Later cold temperatures and low snowpack melt can result in misleading messages
- Example: April 15 Avg. SWE = 40 inches
  Actual SWE = 55 inches
  % of Avg. = 55/40 = 138%

Don’t Be Misled by Snowpack Percentages

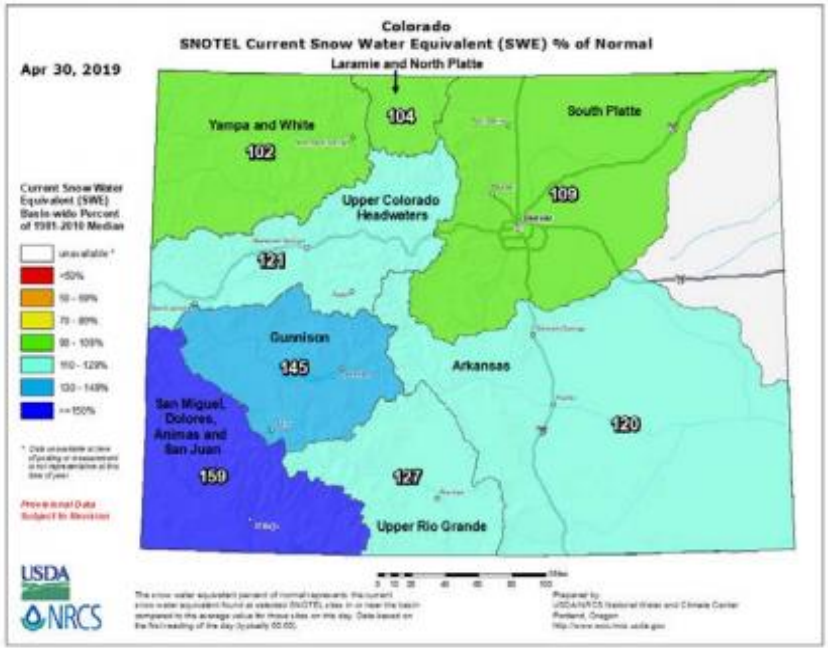
- Reported percent of averages have much greater meaning in April and early May
- Later cold temperatures and low snowpack melt can result in misleading messages
- Example: June 15 Avg. SWE = 0.8 inches

  Actual SWE = 10 inches

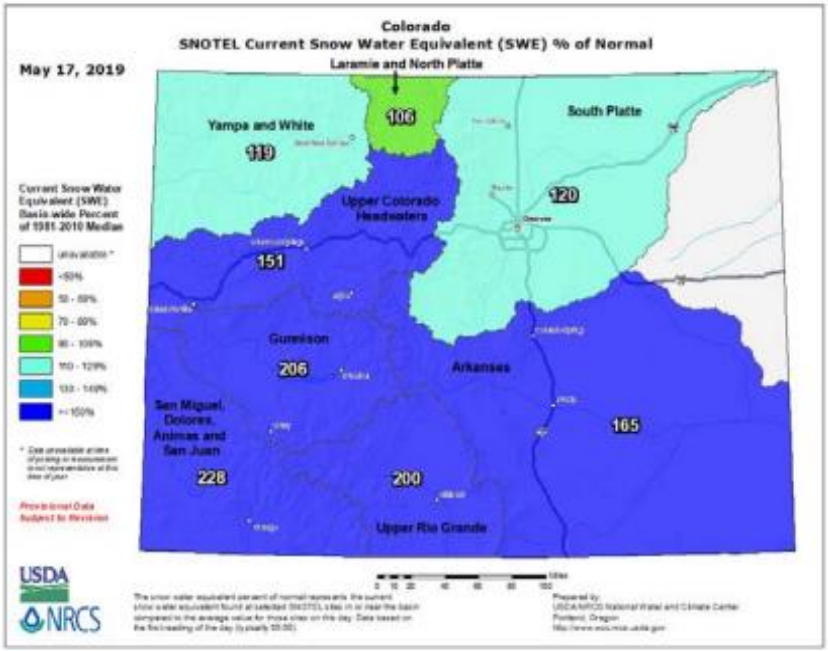
  % of Avg. = 10/0.8 = 1250%

Colorado Snowpack - NRCS Basin Averages

Apr 30, 2019



May 17, 2019



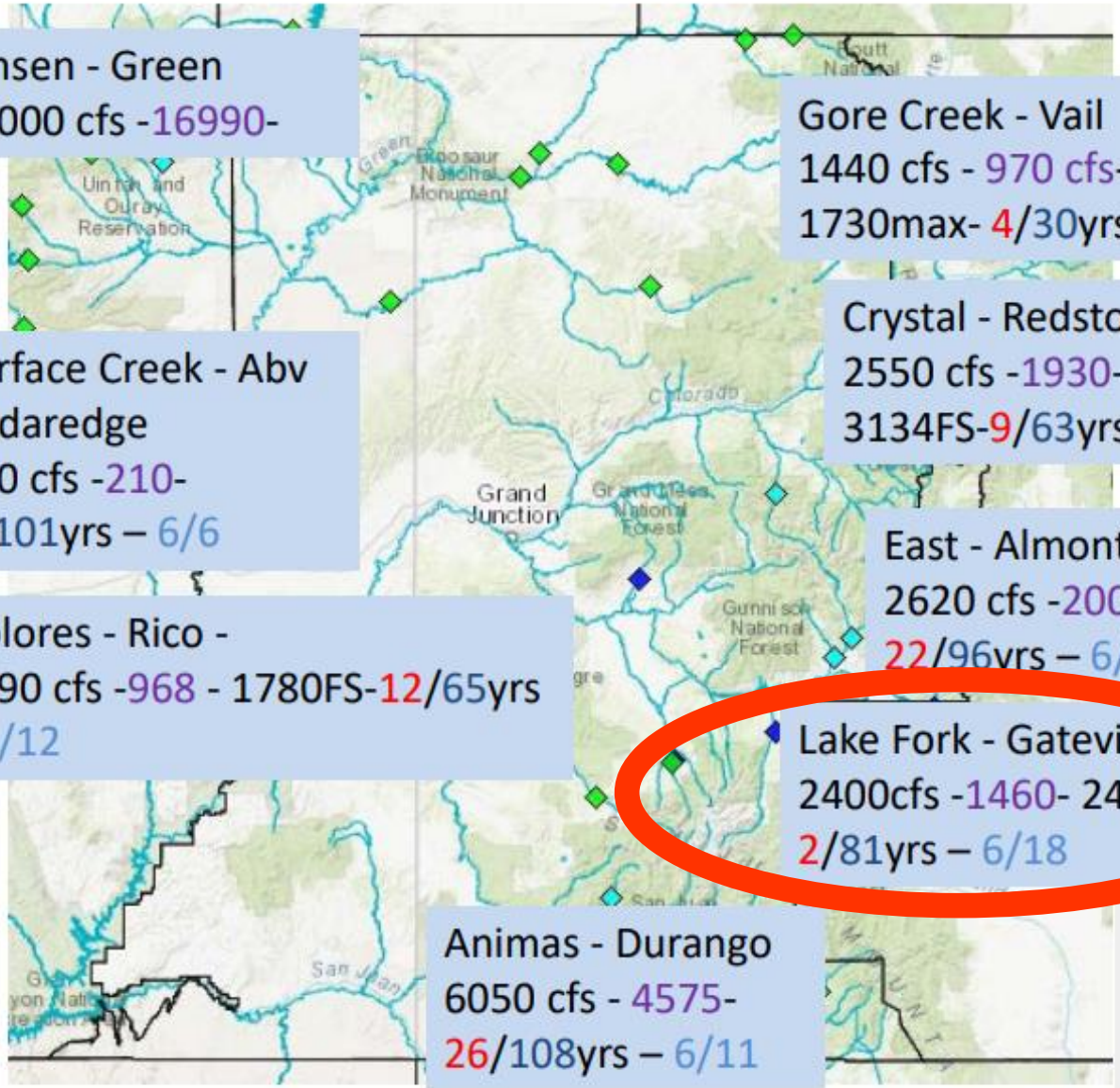
What About Burn Scars?

There was flooding reported in all major recent burn scars.

For the most part, these floods and debris flows have been less than feared by state officials.

Burn scars remain on high risk for flooding for 3-5 years after the fire

Upper Colorado Peak Forecasts (most probable)



Jensen - Green
18000 cfs -16990-

Gore Creek - Vail
1440 cfs - 970 cfs-
1730max- 4/30yrs – 6/16

Crystal - Redstone
2550 cfs -1930-
3134FS-9/63yrs – 6/17

Surface Creek - Abv Cedaredge
440 cfs -210-
9/101yrs – 6/6

East - Almont-
2620 cfs -2000- 3160FS-
22/96yrs – 6/12

Dolores - Rico -
1390 cfs -968 - 1780FS-12/65yrs - 6/12

Lake Fork - Gateview -
2400cfs -1460- 2410max -
2/81yrs – 6/18

Animas - Durango
6050 cfs - 4575-
26/108yrs – 6/11

◇ <10
◇ 10-25
◇ 25-75
◇ 75-90
◆ >90
◆ High

Upper Colorado Peak Streamflow Forecasts as of **May 22, 2019**

(% of 1981-2010 average)

From the CBRFC

cfs = cubic feet per sec
FS=Flood stage

Average flow

Current Forecast Rank / **Period of Record**

National Weather Service
Grand Junction, CO