

CBRFC Forecast Areas

Colorado Basin Water Supply Briefing

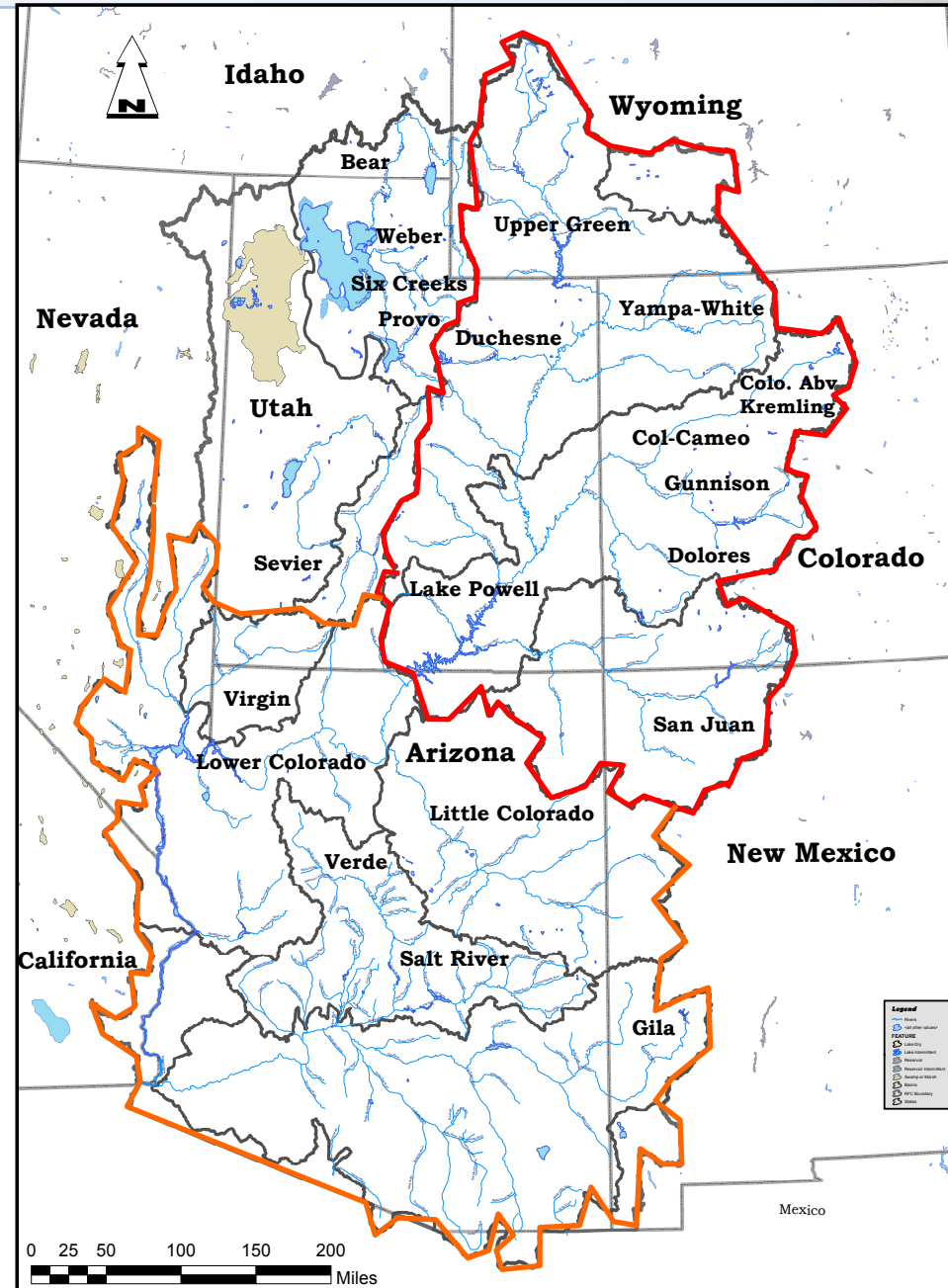
April 4th 2019

Greg Smith - Sr. Hydrologist
Colorado Basin River Forecast Center

Phone: 1-877-929-0660

Passcode: 1706374

Please mute your phone until the
question period
Thank You!



Today's Presentation

Very wet start to March

Record precipitation in the first 15 days

Snowpack well above the seasonal peak in many areas

Update on current snowpack conditions

2019 Water Supply Forecasts – Widespread increases since early March

Select forecast site review

Flows in similar snowpack years (analog years)

Peak Flows

Information about magnitude of streamflow peaks – flood potential

Upcoming Weather

Likely impacts to the forecasts going forward

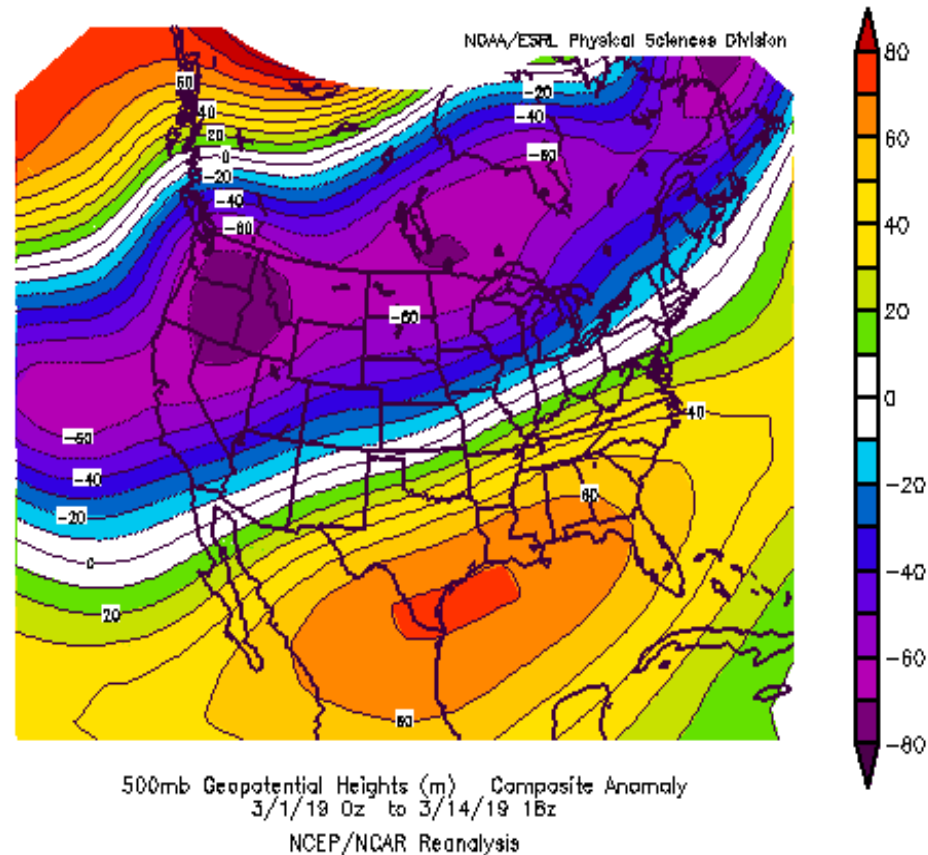
Contacts & Questions

Phone: 1-877-929-0660 Passcode: 1706374

*** Please mute your phone until the question period ***

Early March weather pattern

500mb Height Anomaly – first two weeks of March

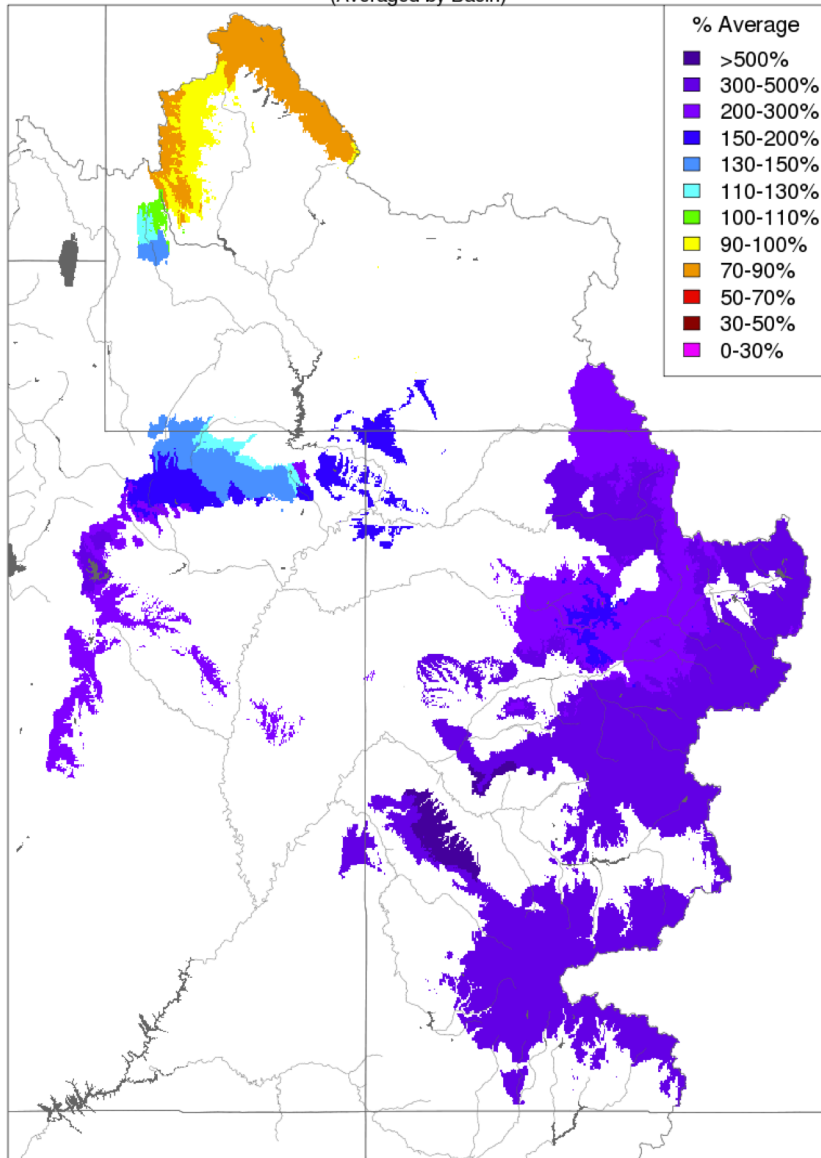


Negative values (cool colors) indicate an anomalous trough over the western US. This pattern persisted since early February.

March Precipitation – Very wet first half of the month

Month to Date Precipitation - March 15 2019

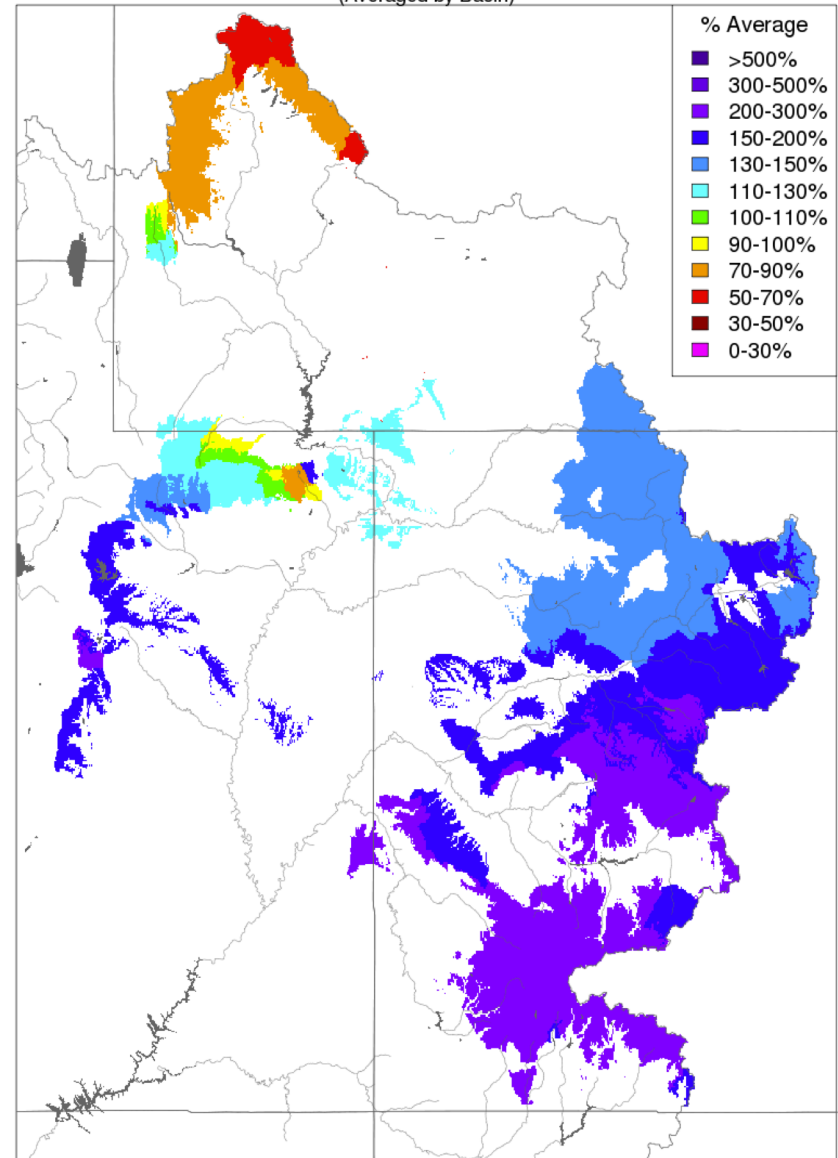
(Averaged by Basin)



Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

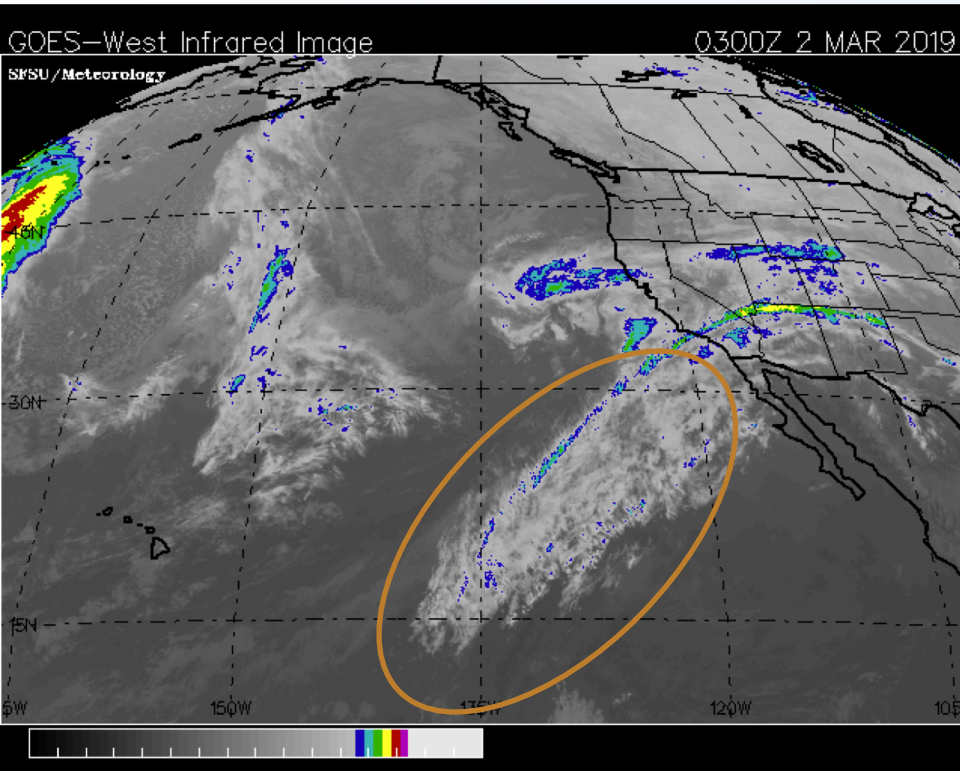
Monthly Precipitation - March 2019

(Averaged by Basin)

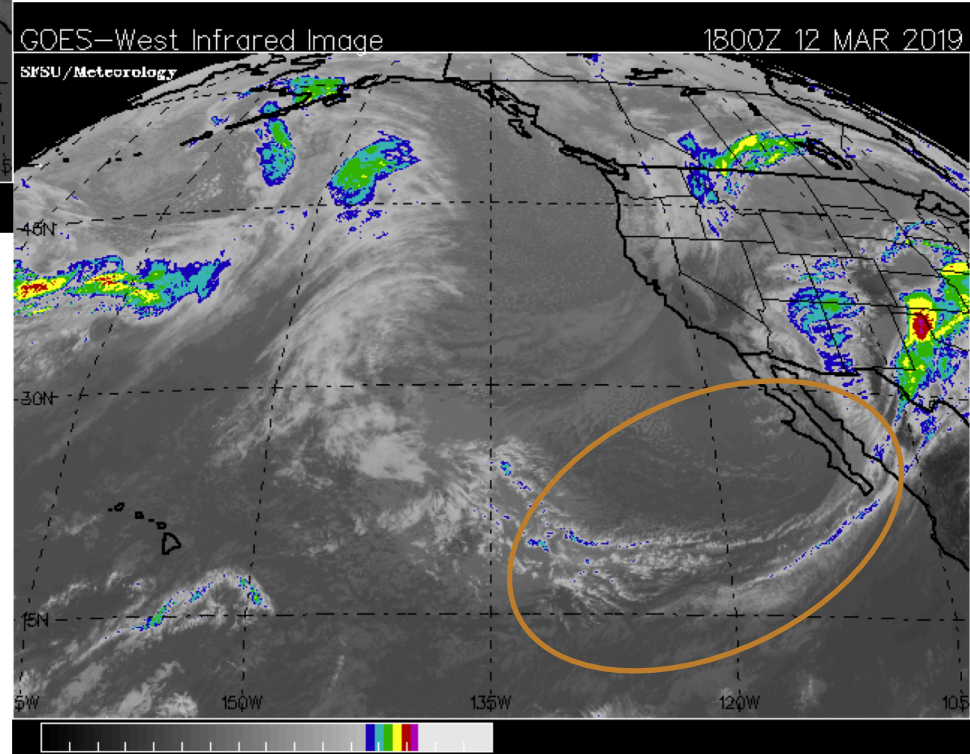


Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

Early March storms contained significant moisture

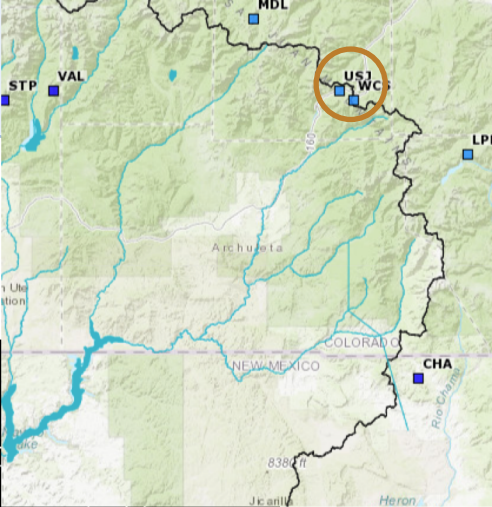


March 12th 2019



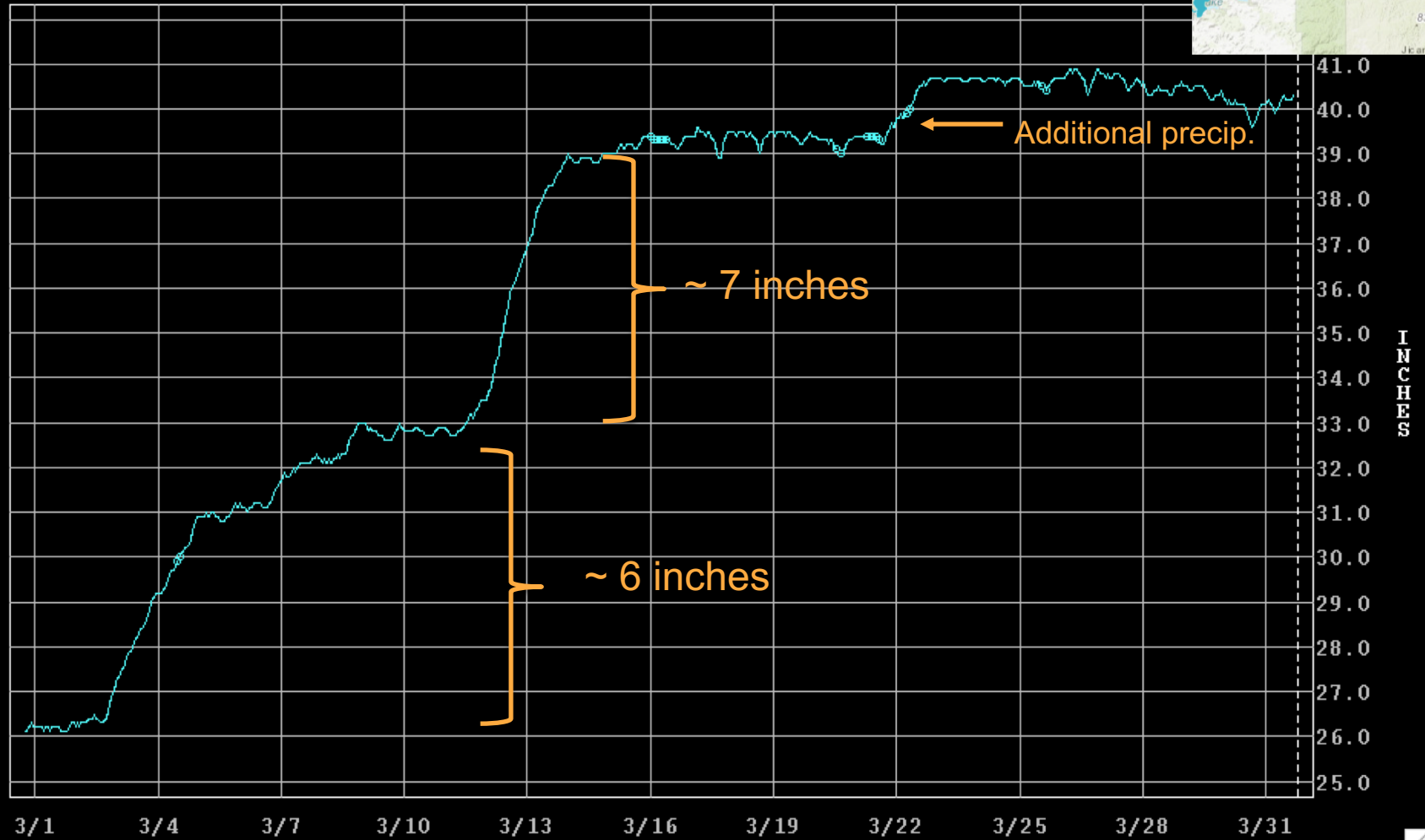
Upper San Juan March precipitation

March Precipitation ~14.1 inches
Period of record average: 6.12 inches
Record: 17.3 inches in 1979

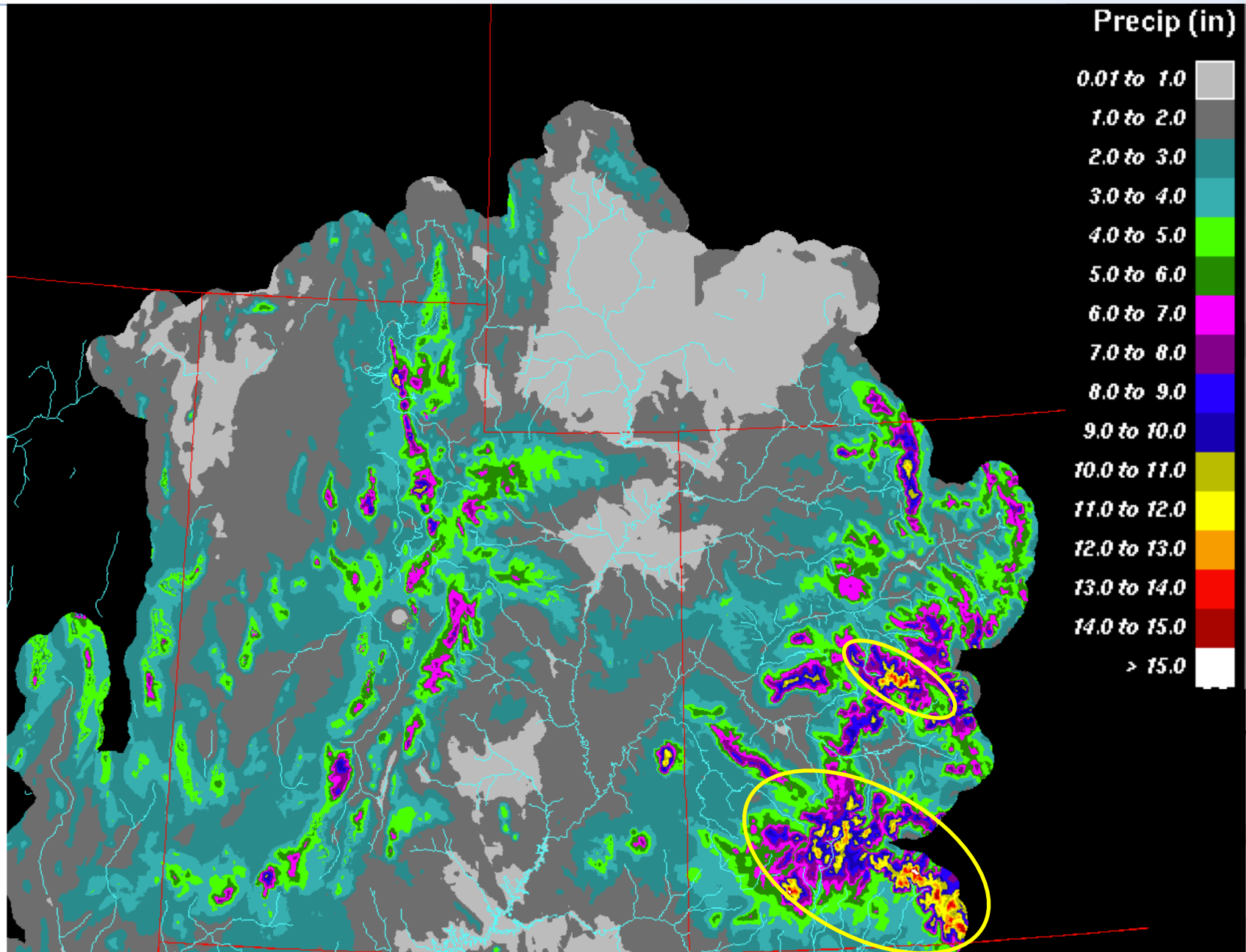


Provisional data

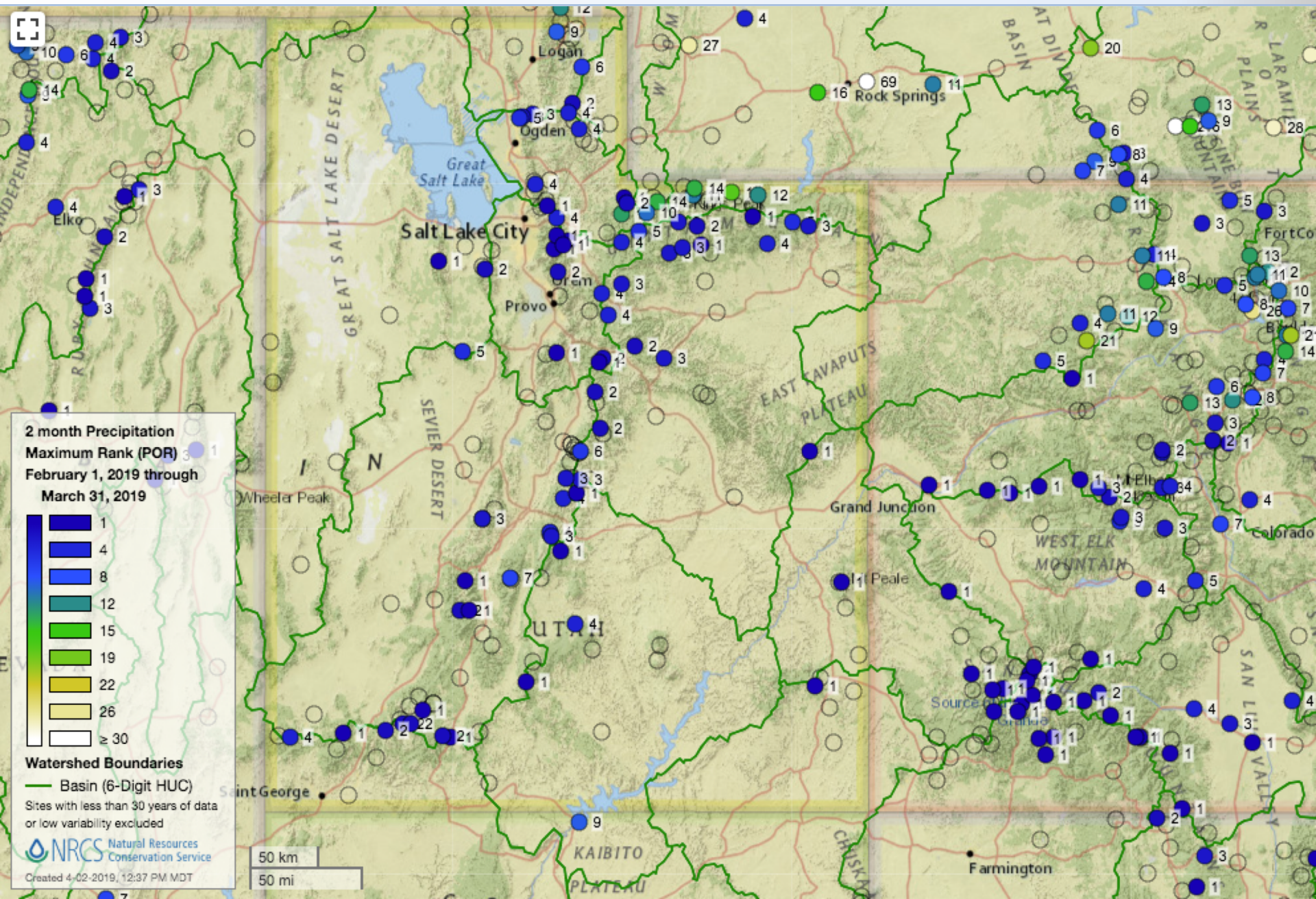
UPPER SAN JUAN
USJC2 SWIRMZZ SNOW WATER EQUIVALENT, INSTANTANEOUS, OBSERVED, METEOR
Max= 40.9 at 03/26/2019 22Z
Min= 26.1 at 03/01/2019 19Z



Gridded precipitation field for March 2019 (Upper Colorado / Great Basin)

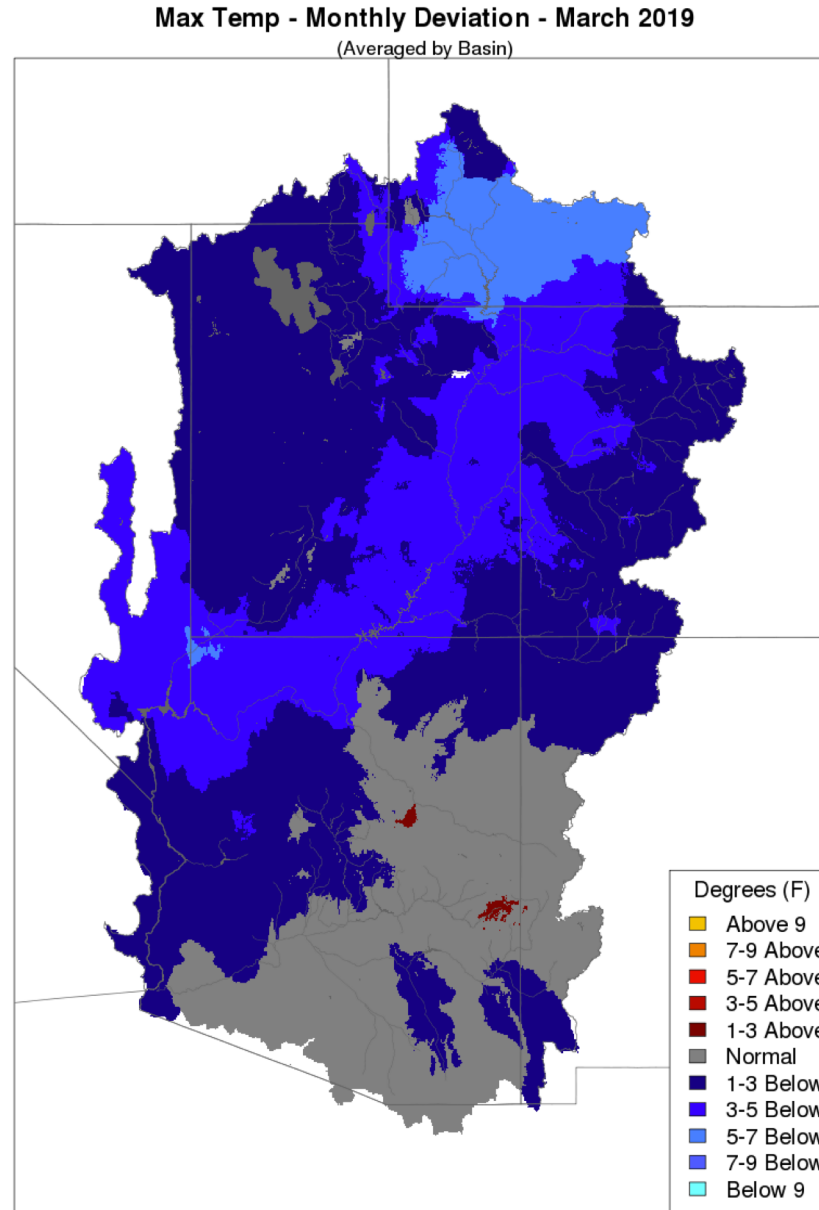


Feb-Mar precipitation ranking

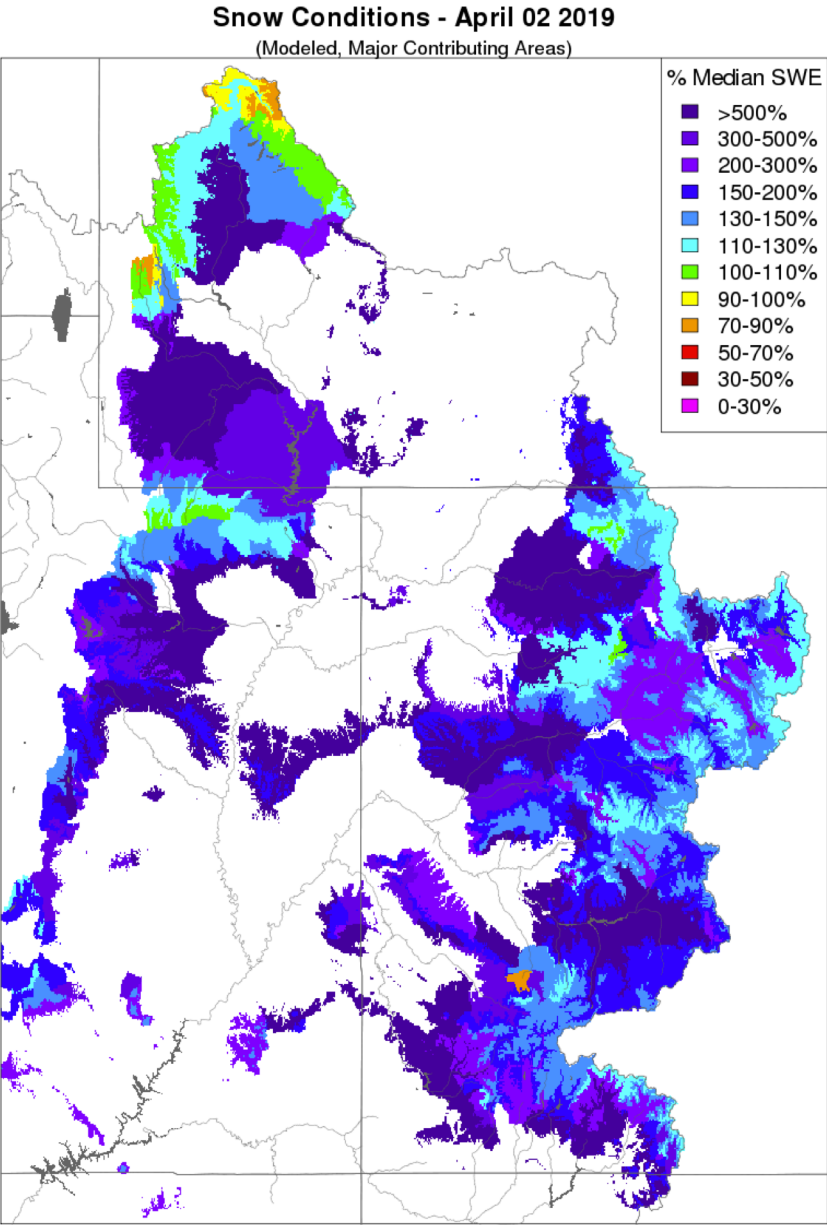


March Temperature – Mean monthly maximum deviation from normal

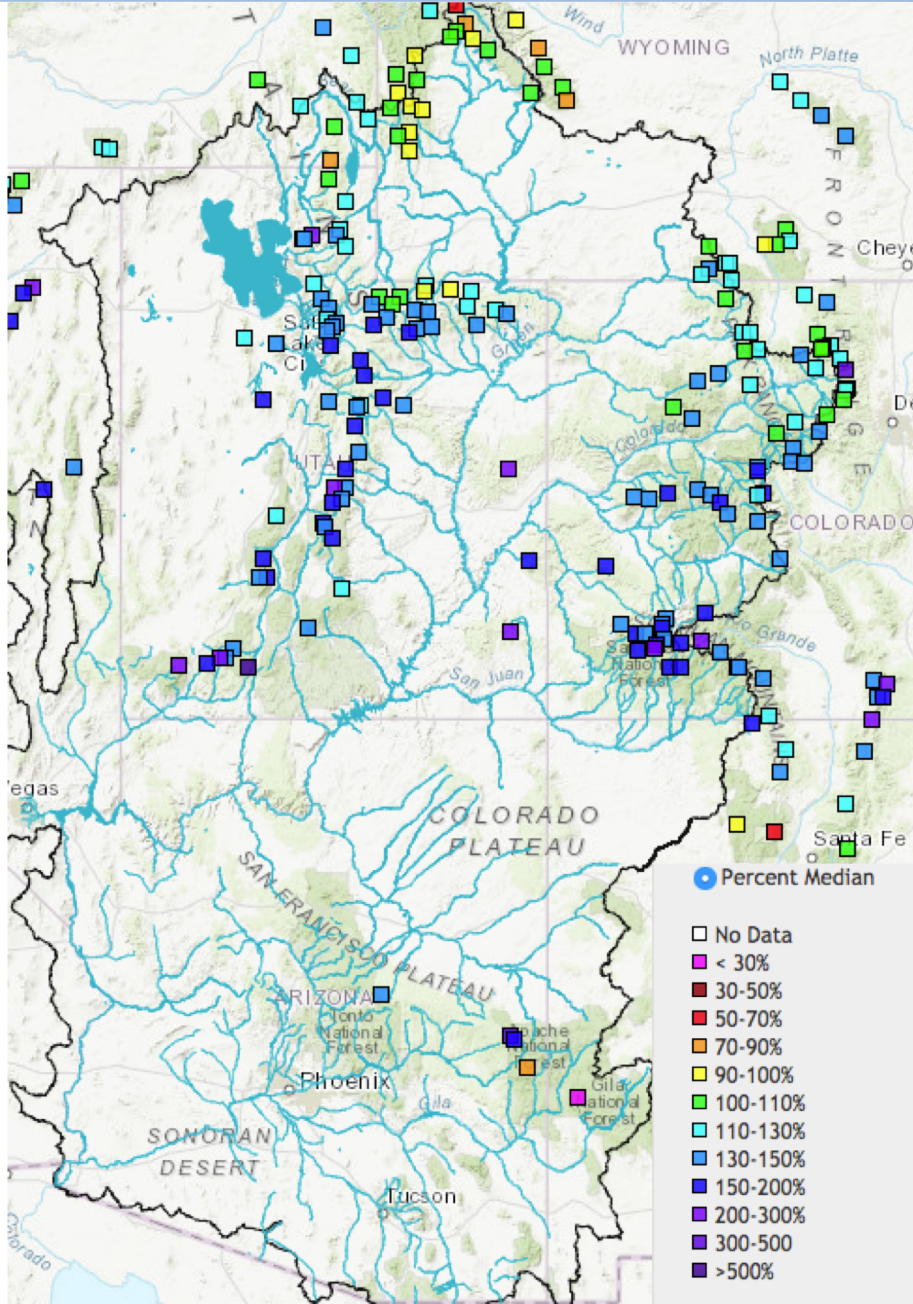
Cooler temperatures preserved some lower elevation snow



Early April snowpack conditions

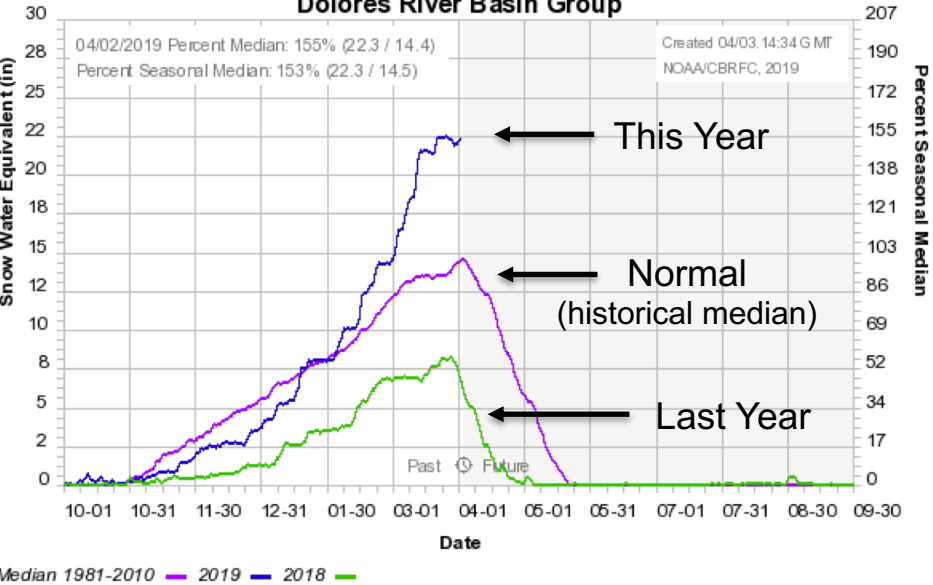


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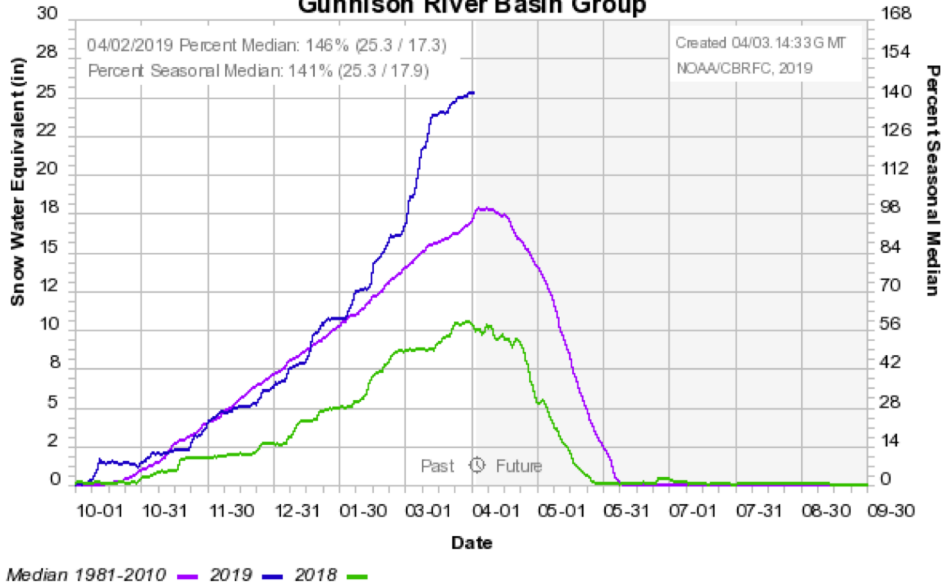


River Basin SNOTEL group plots

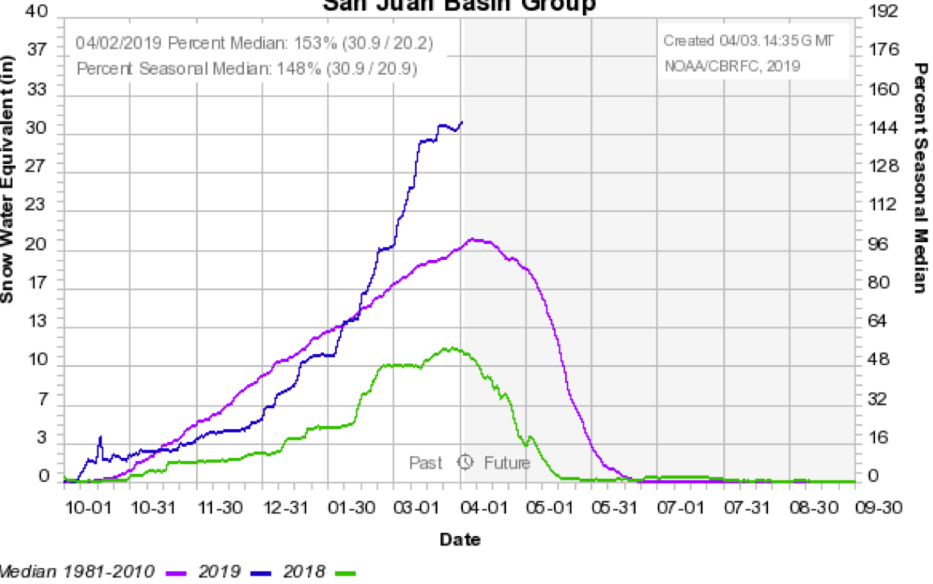
Colorado Basin River Forecast Center
Dolores River Basin Group



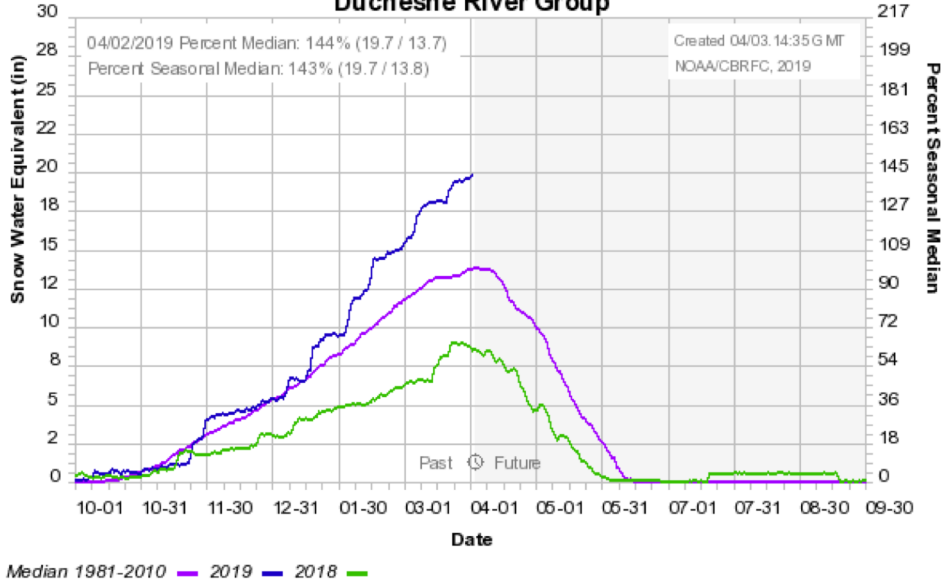
Colorado Basin River Forecast Center
Gunnison River Basin Group



Colorado Basin River Forecast Center
San Juan Basin Group



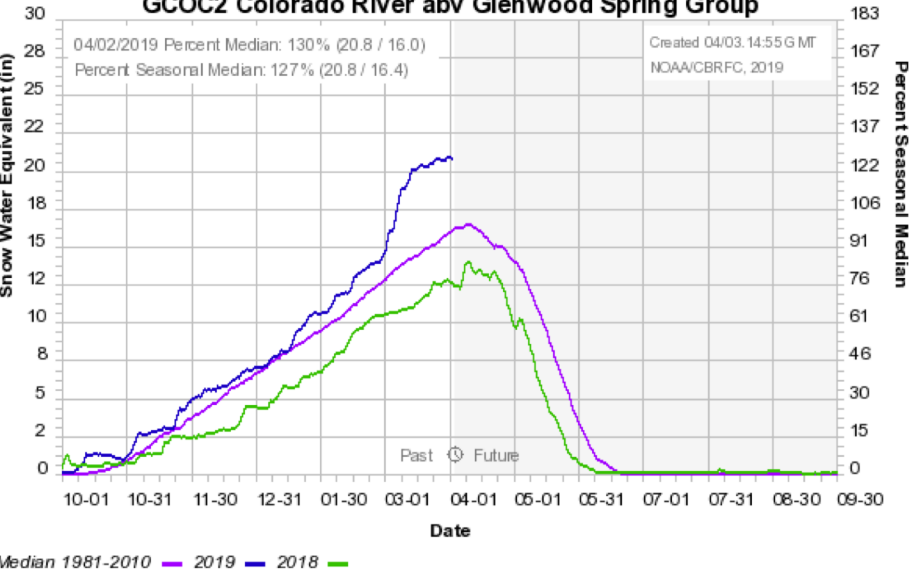
Colorado Basin River Forecast Center
Duchesne River Group



River Basin SNOTEL group plots

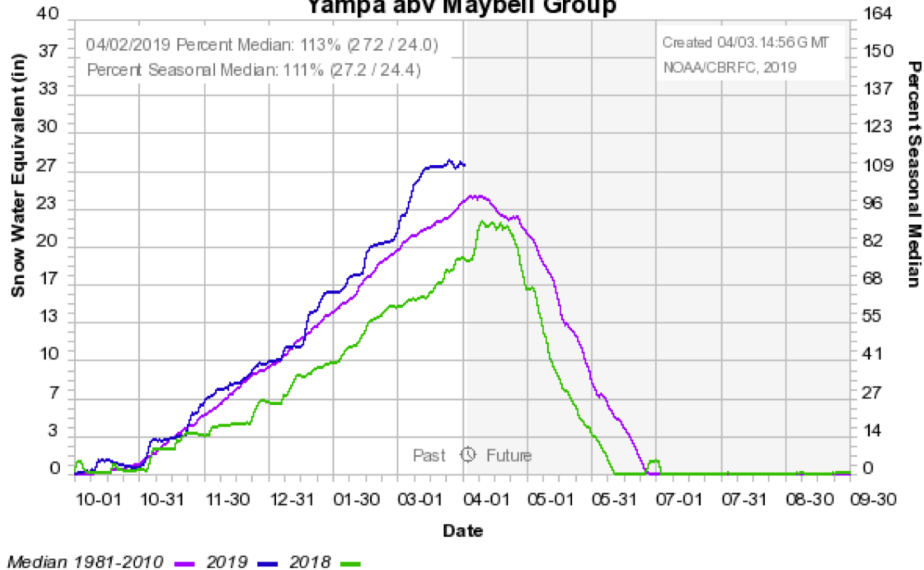
Colorado Basin River Forecast Center

GCOC2 Colorado River abv Glenwood Spring Group



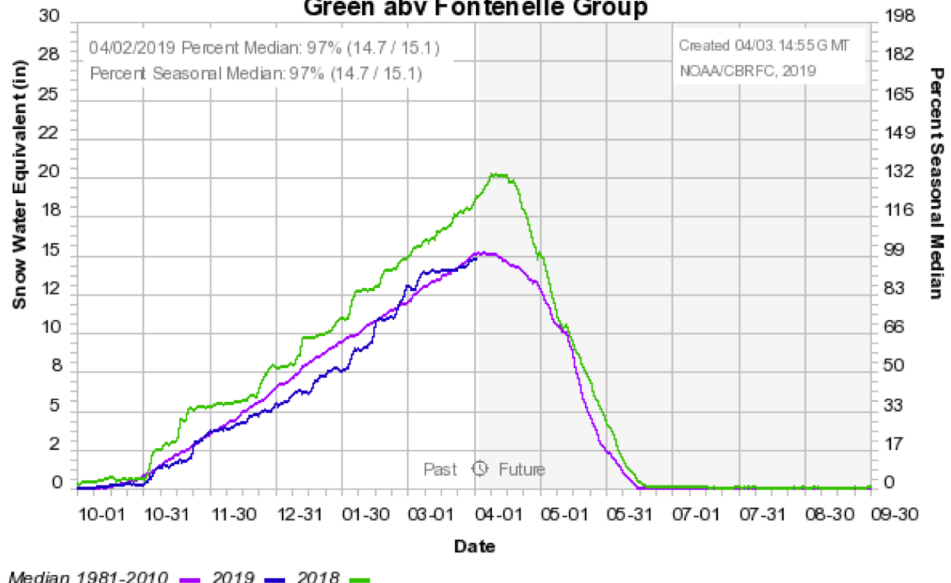
Colorado Basin River Forecast Center

Yampa abv Maybell Group



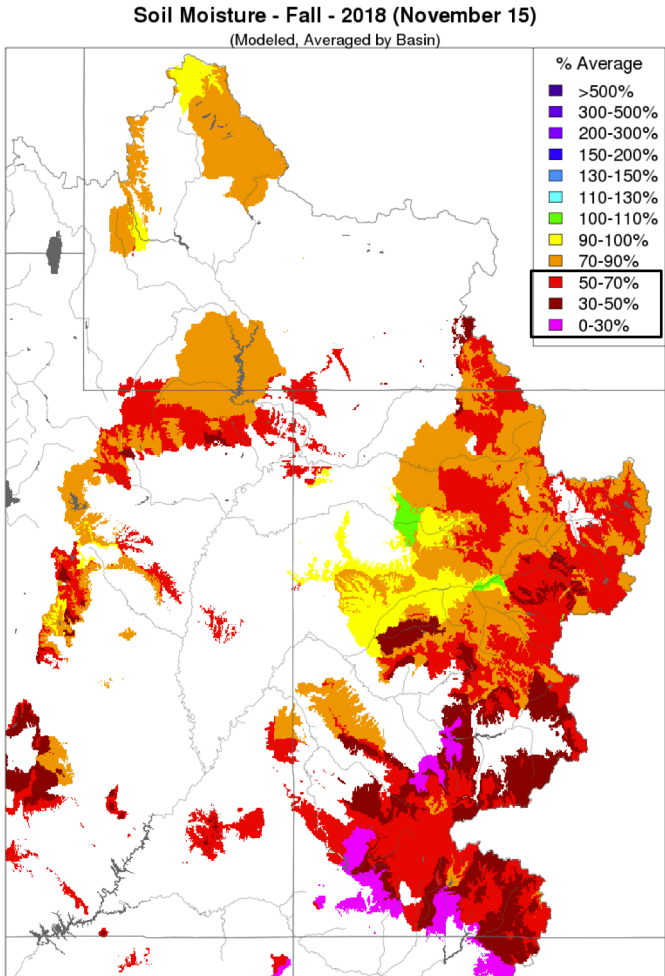
Colorado Basin River Forecast Center

Green abv Fontenelle Group



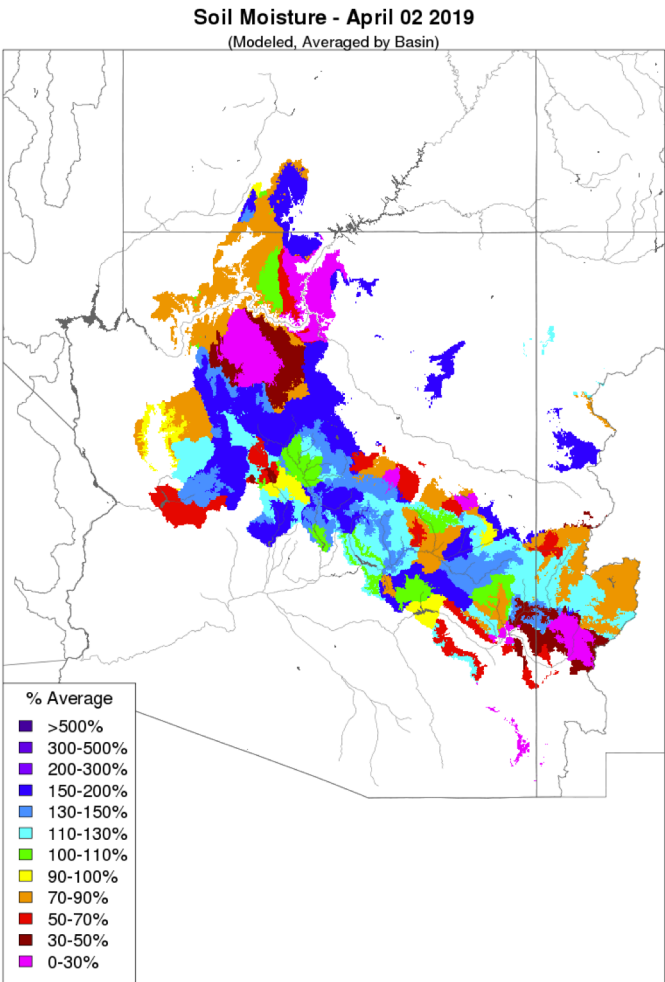
Soil Moisture Impacts

Upper Colorado Basin: Dry soil conditions are still expected to have some impact on the runoff volumes. However in areas of significant snowpack and where melt is delayed these impacts will likely be less.



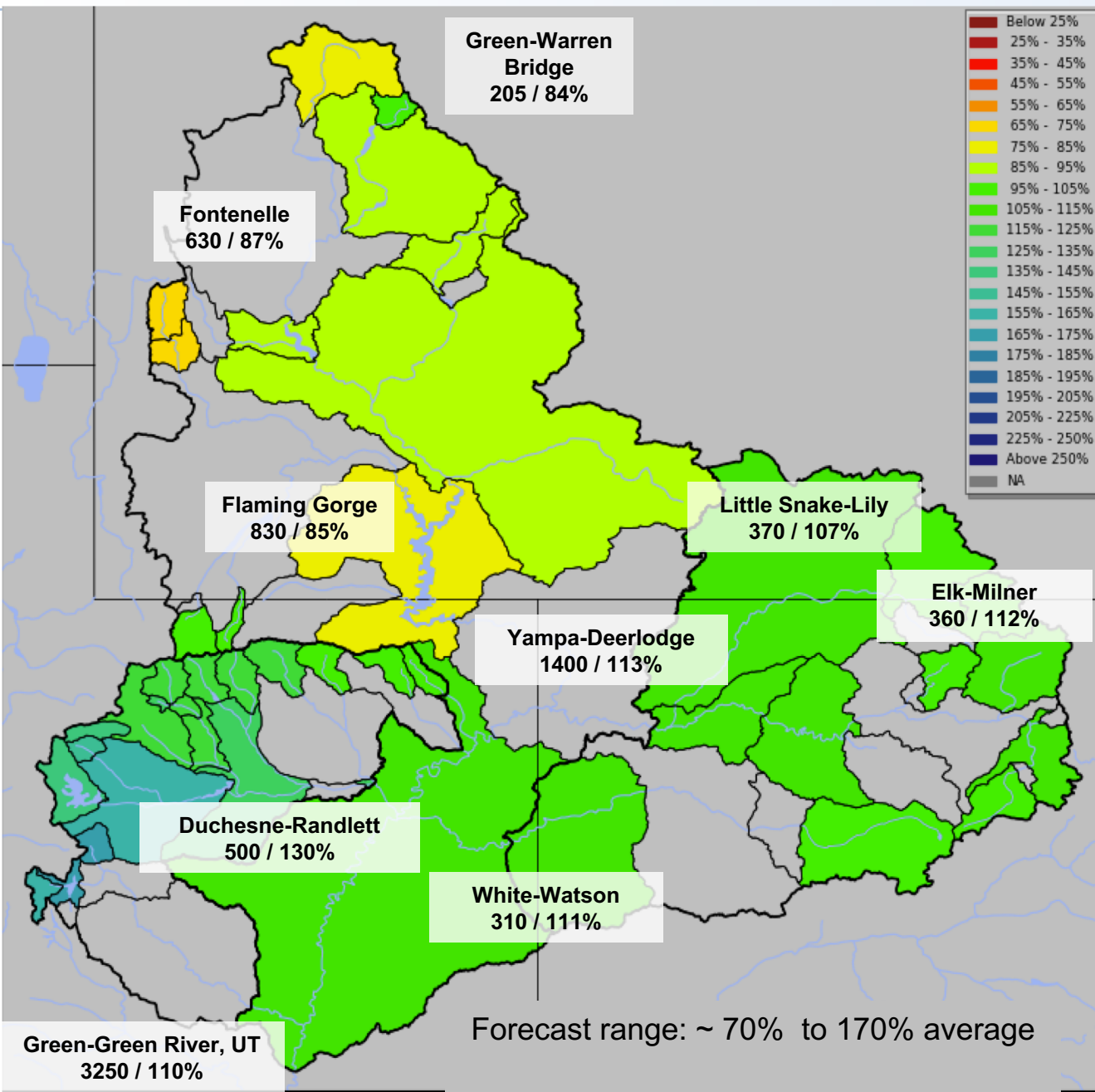
Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

Lower Colorado Basin: Recent rainfall and snowmelt has increased soil moisture in many Lower Colorado Basin areas. More efficient runoff is likely due to additional rainfall. However we are entering a time of year where large rainfall events are less likely.



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Salt Lake City, Utah, www.cbrfc.noaa.gov

Upper Colorado: Green-Yampa-White-Duchesne



Forecasts as of Apr 1 2019

Volume 1000's acre feet /
% of 1981-2010 average

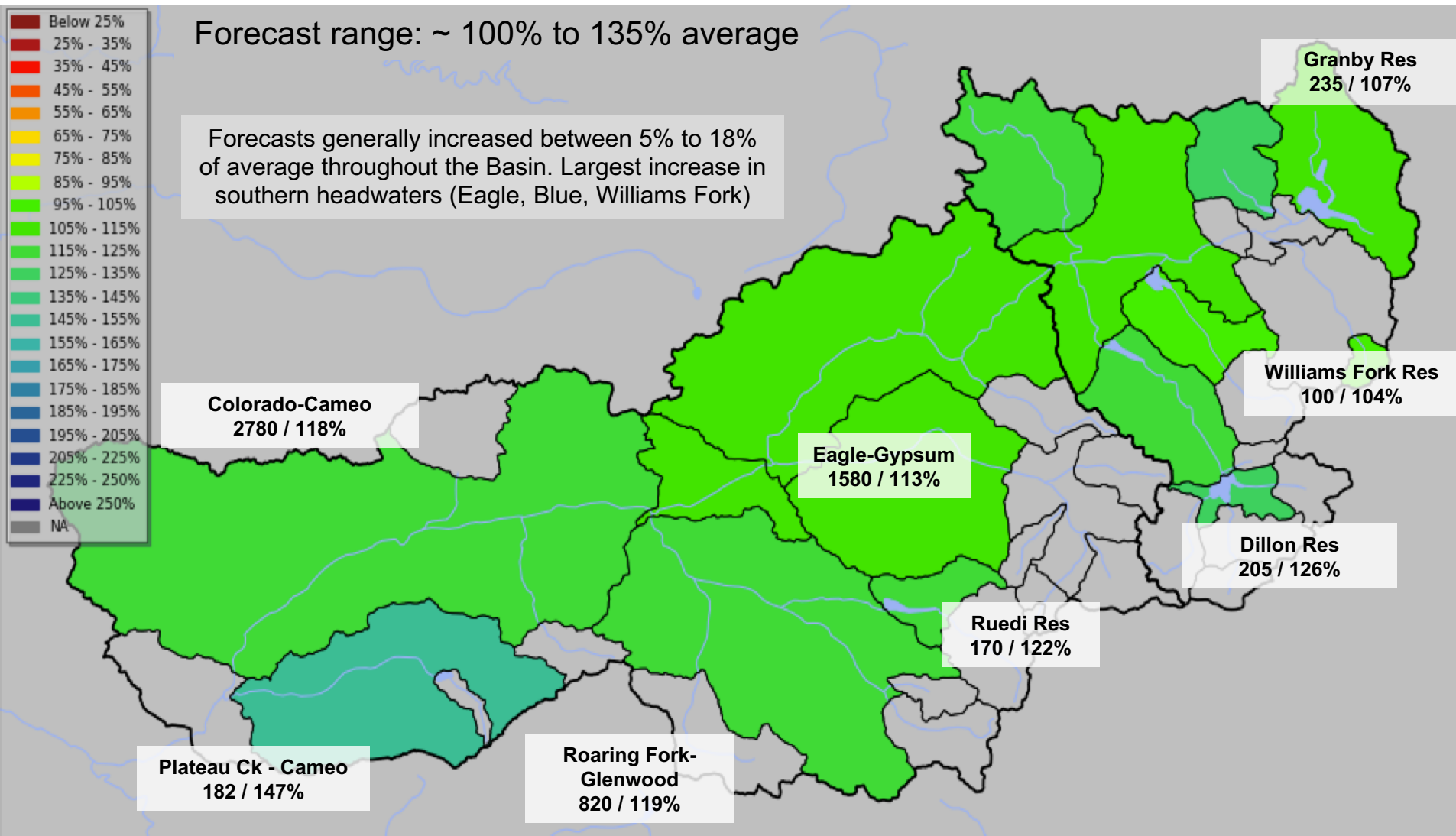
Minimal to no change in upper
Green. Increases everywhere
else (+5-15% of average).

Largest increases in the western
Duchesne River Basin

Upper Colorado: Colorado River Mainstem

Forecasts as of Apr 1 2019

Volume in 1000's acre-feet / % of 1981-2010 average

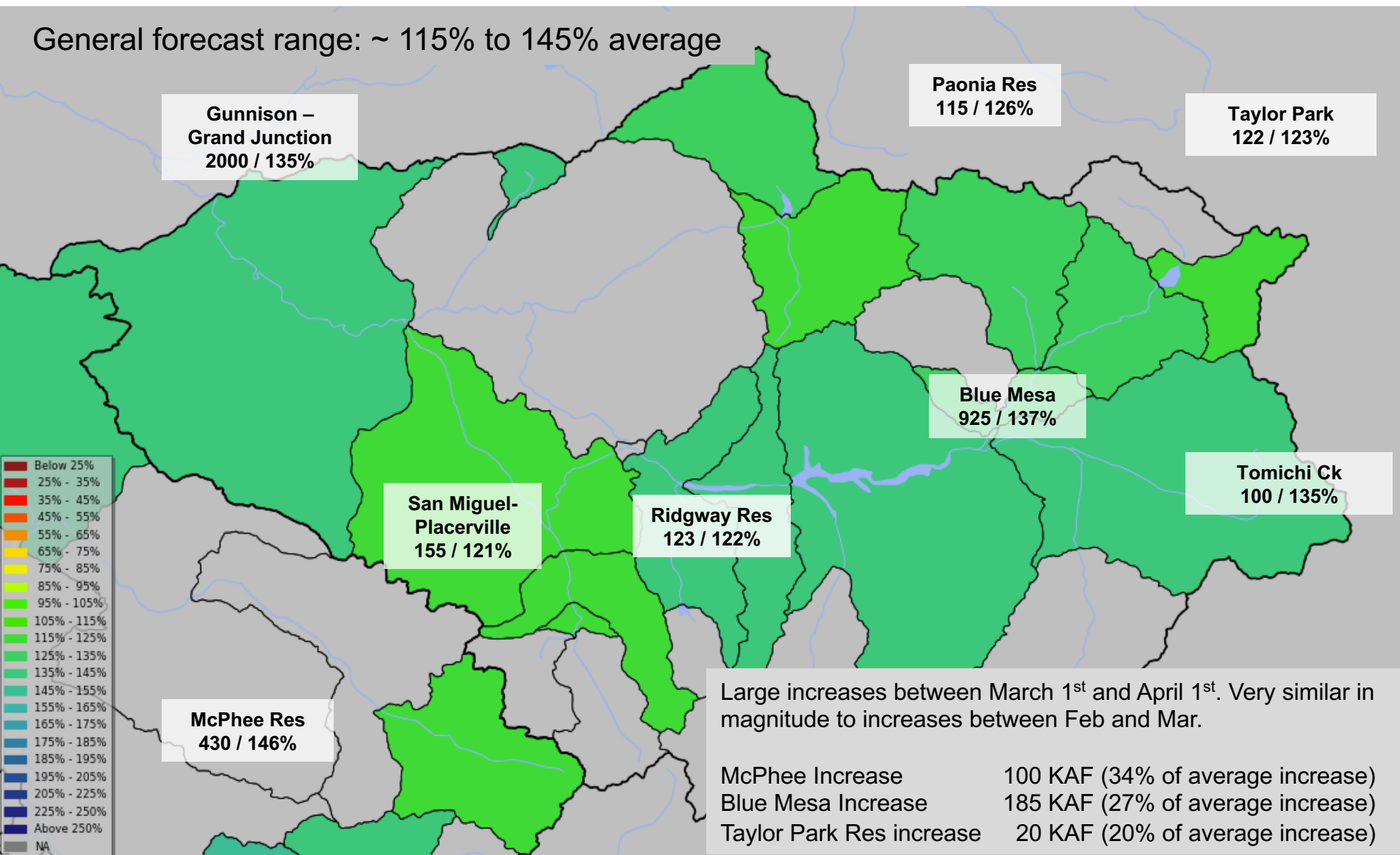


Upper Colorado: Gunnison and Dolores Basins

Forecasts as of Apr 1 2019

Volume in 1000's acre-feet / % of 1981-2010 average

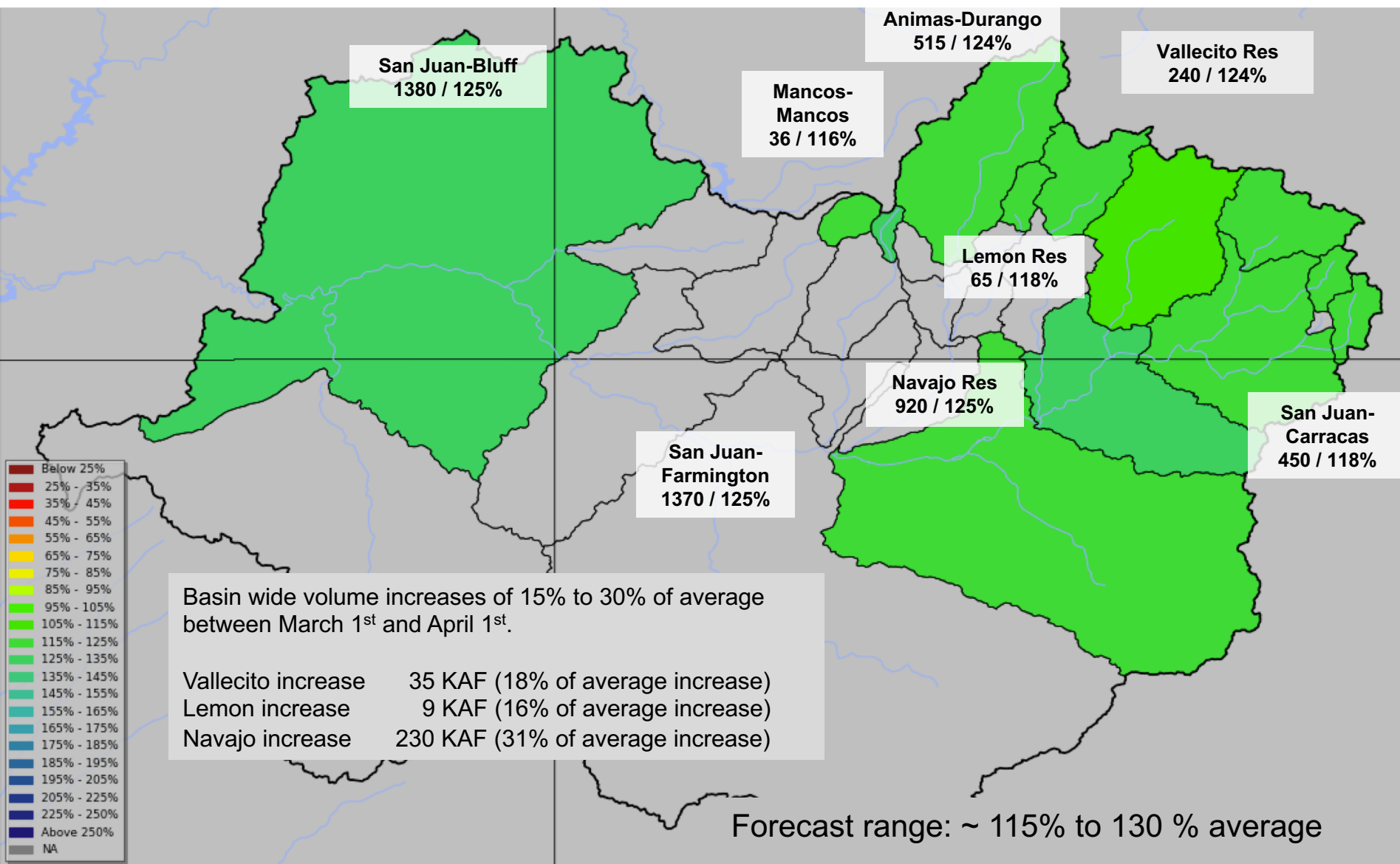
General forecast range: ~ 115% to 145% average



Upper Colorado: San Juan Basin

Forecasts as of Apr 1 2019

Volume in 1000's acre-feet / % of 1981-2010 average



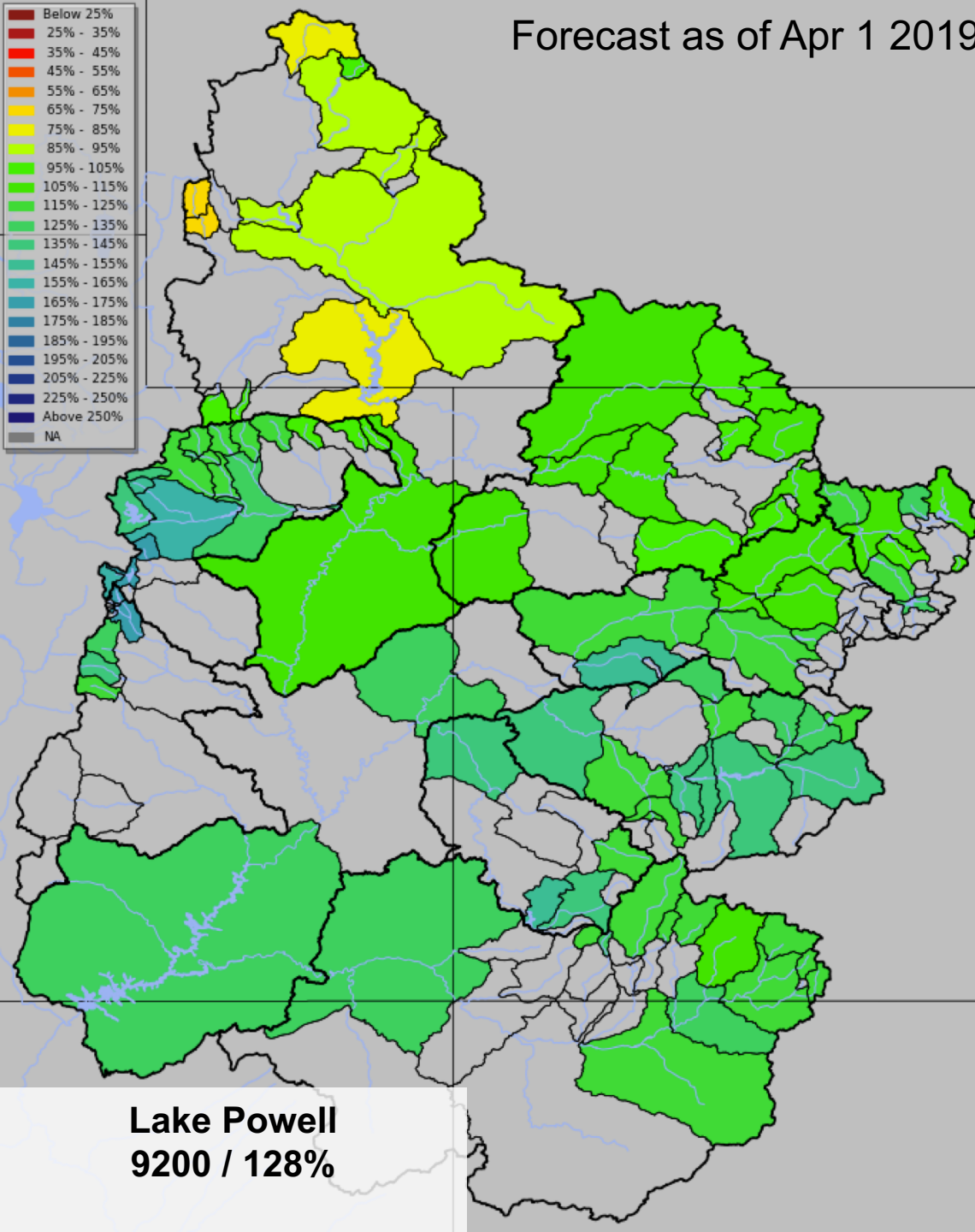
Forecast as of Apr 1 2019

Upper Colorado April-July Streamflow Volume Forecasts (% of 1981-2010 average)

Lake Powell:
9200 KAF / 128 % average

Lake Powell summarizes the impacts of the very wet February through early March period in the upper Colorado River Basin.

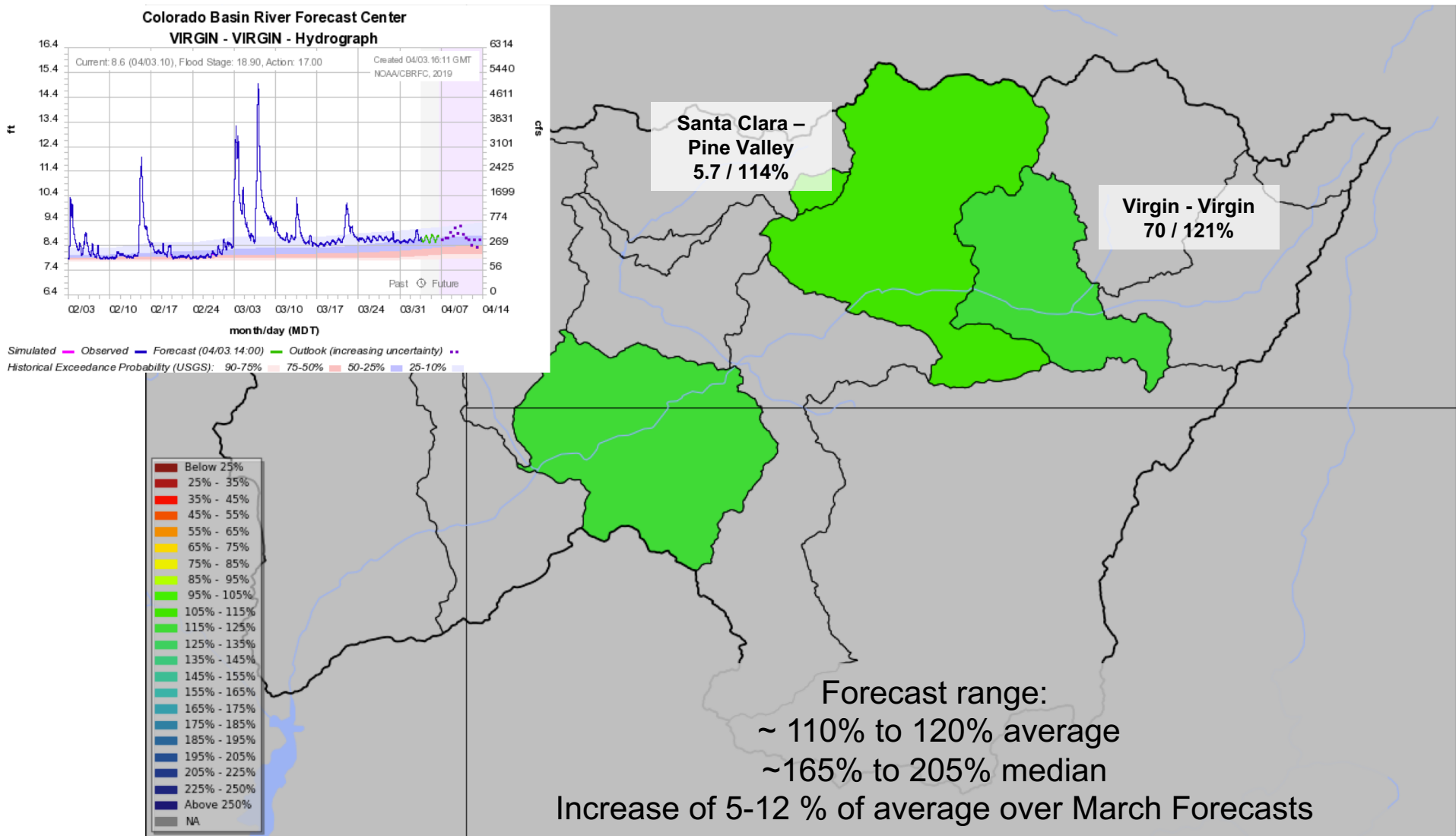
The Lake Powell inflow forecast increased 1.9 million acre-feet from early March (26% of average increase)



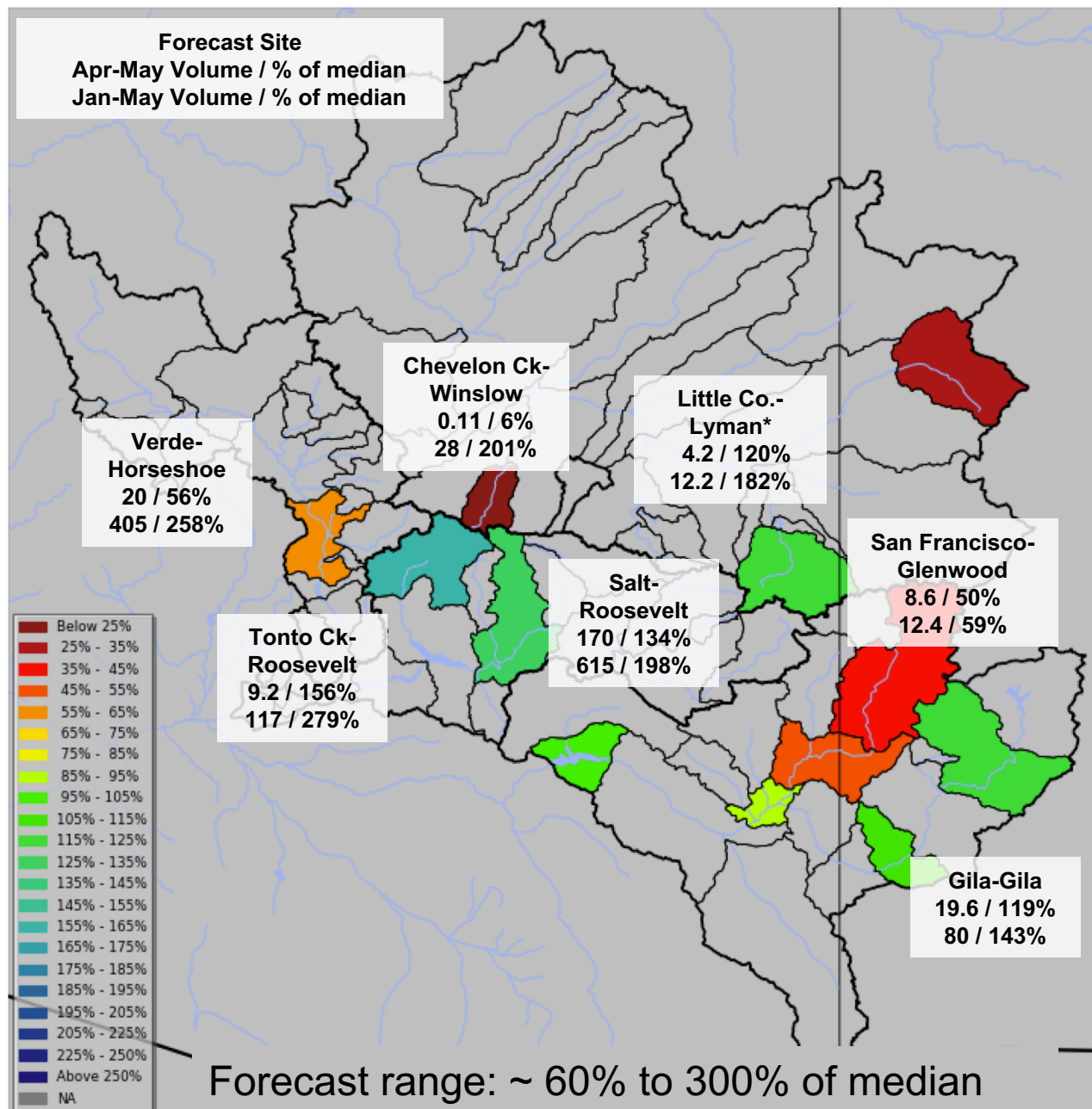
Lower Colorado (Virgin River) April-July Streamflow Volume Forecasts

Forecasts as of Apr 1 2019

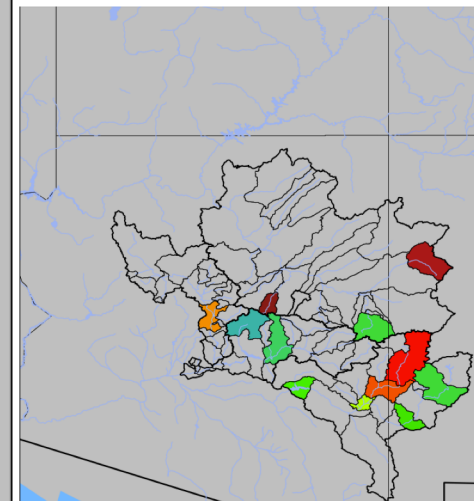
Above average flow occurred in February/March due to potent storm systems that brought rain and lower elevation snowmelt. Virgin River headwater observed February volume was exceed 140% of average and March over 250% of average.



Lower Colorado Apr-May & Seasonal (Jan-May) forecast streamflow volumes (1000's acre-feet / % of 1981-2010 median)



Forecasts as of
Apr 1 2019



Nearly all of seasonal
flow has already been
observed.

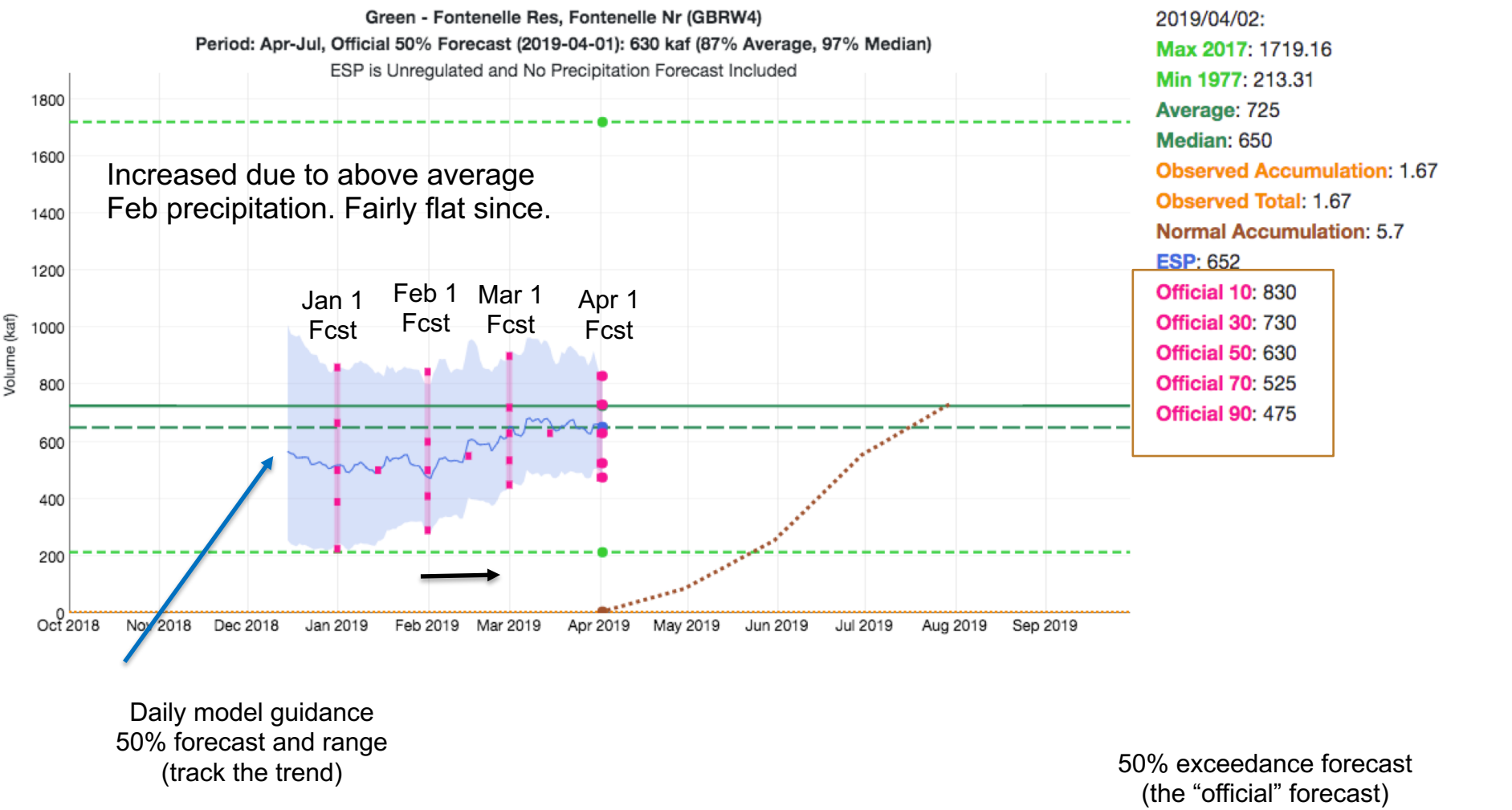
Climatologically
entering a drier period
of the season.

* Apr-June forecast period

Forecast Evolution Plot: Fontenelle Reservoir (Upper Green Basin - Wyoming)

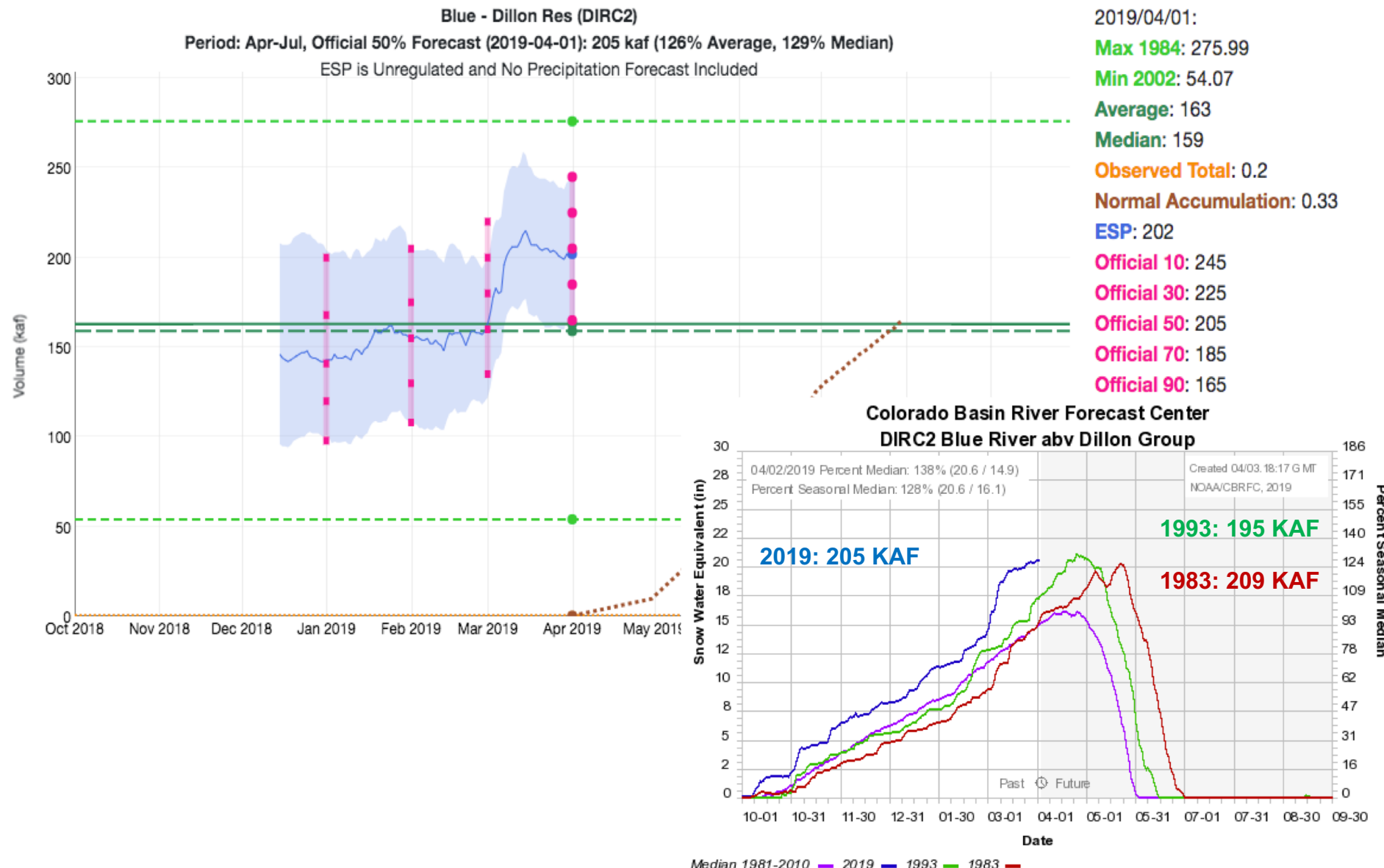
ESP – Ensemble Streamflow Prediction

Water Supply Forecast



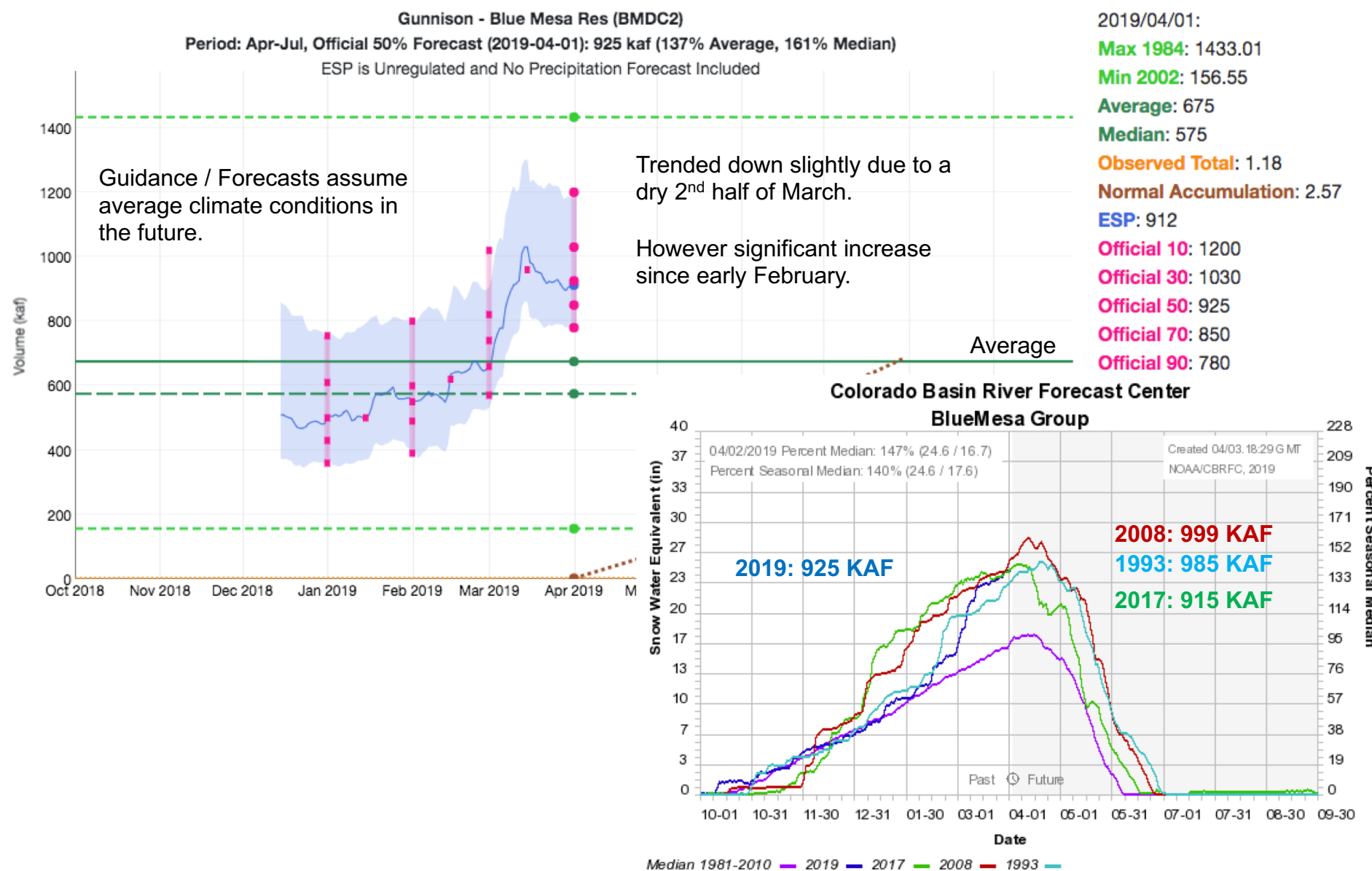
Forecast Evolution Plot: Dillon Reservoir Inflow (Colorado Headwaters)

Water Supply Forecast



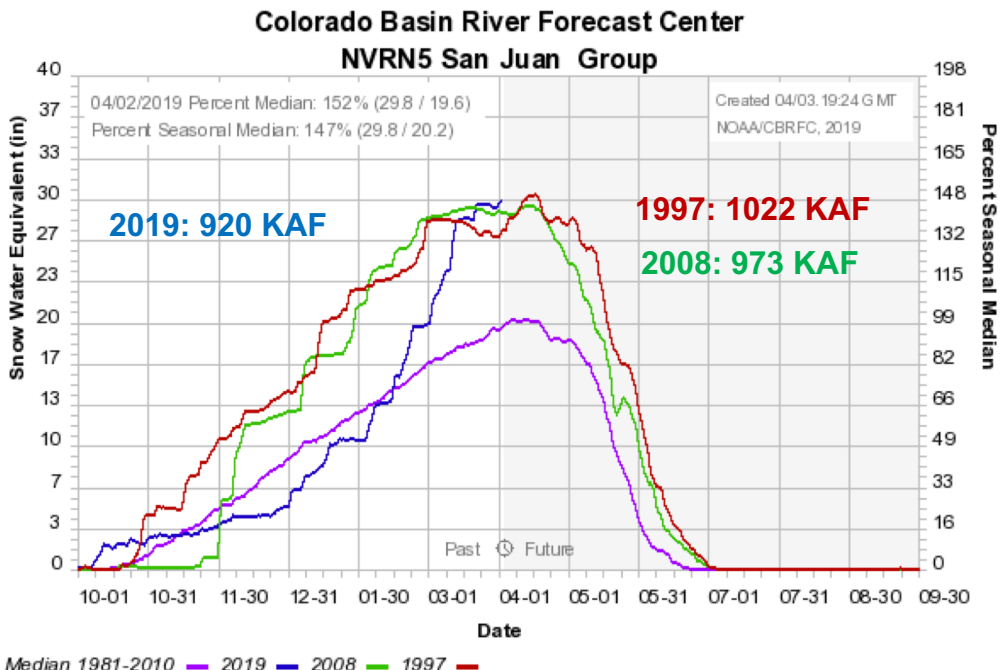
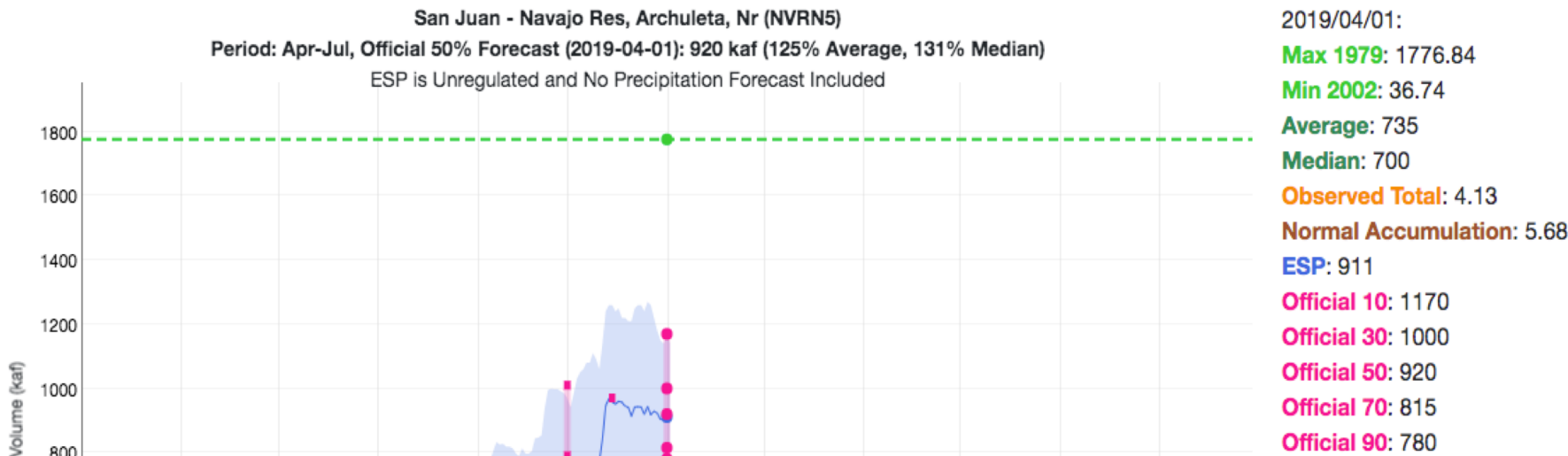
Forecast Evolution Plot: Blue Mesa Inflow (Gunnison Basin)

Water Supply Forecast



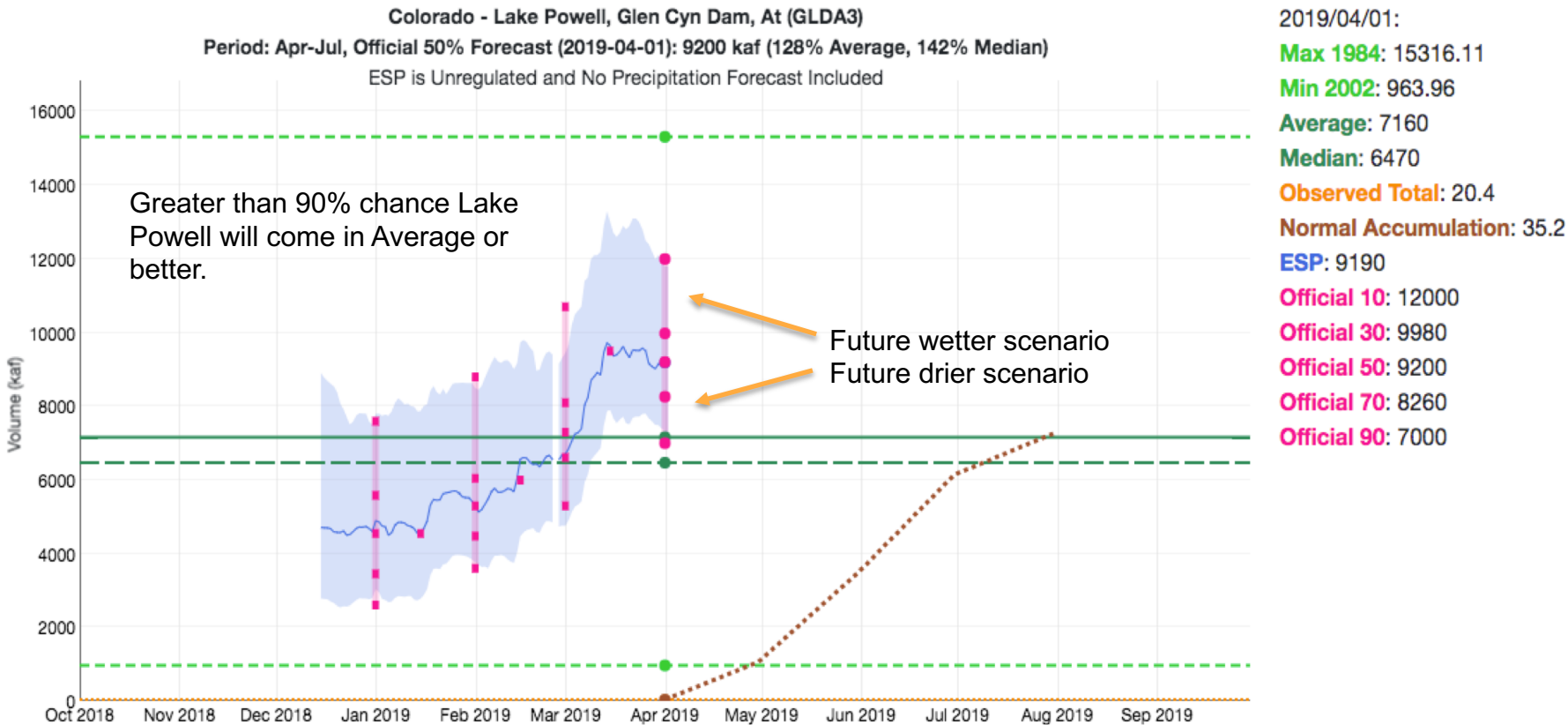
Forecast Evolution Plot: Navajo Inflow (San Juan Basin)

Water Supply Forecast



Forecast Evolution Plot: Lake Powell Inflow (Upper Colorado Basin)

Water Supply Forecast



Since early February Lake Powell inflow forecast increased 3.9 million acre-feet (about a 54% of average increase)

If the forecast verifies it would be the 2nd highest observed volume in the last 22 years

(2011 12.5 MAF & 1997 11.6 MAF)

Peak Flow/Flood Potential Updates

Percentile Ranking of Peak Flows

- Additional piece of information regarding flooding potential
- Not all locations have a defined flood stage
- Provides historical context
- Will eventually be available on the webpage

FORECAST PEAK RANKING INFO:

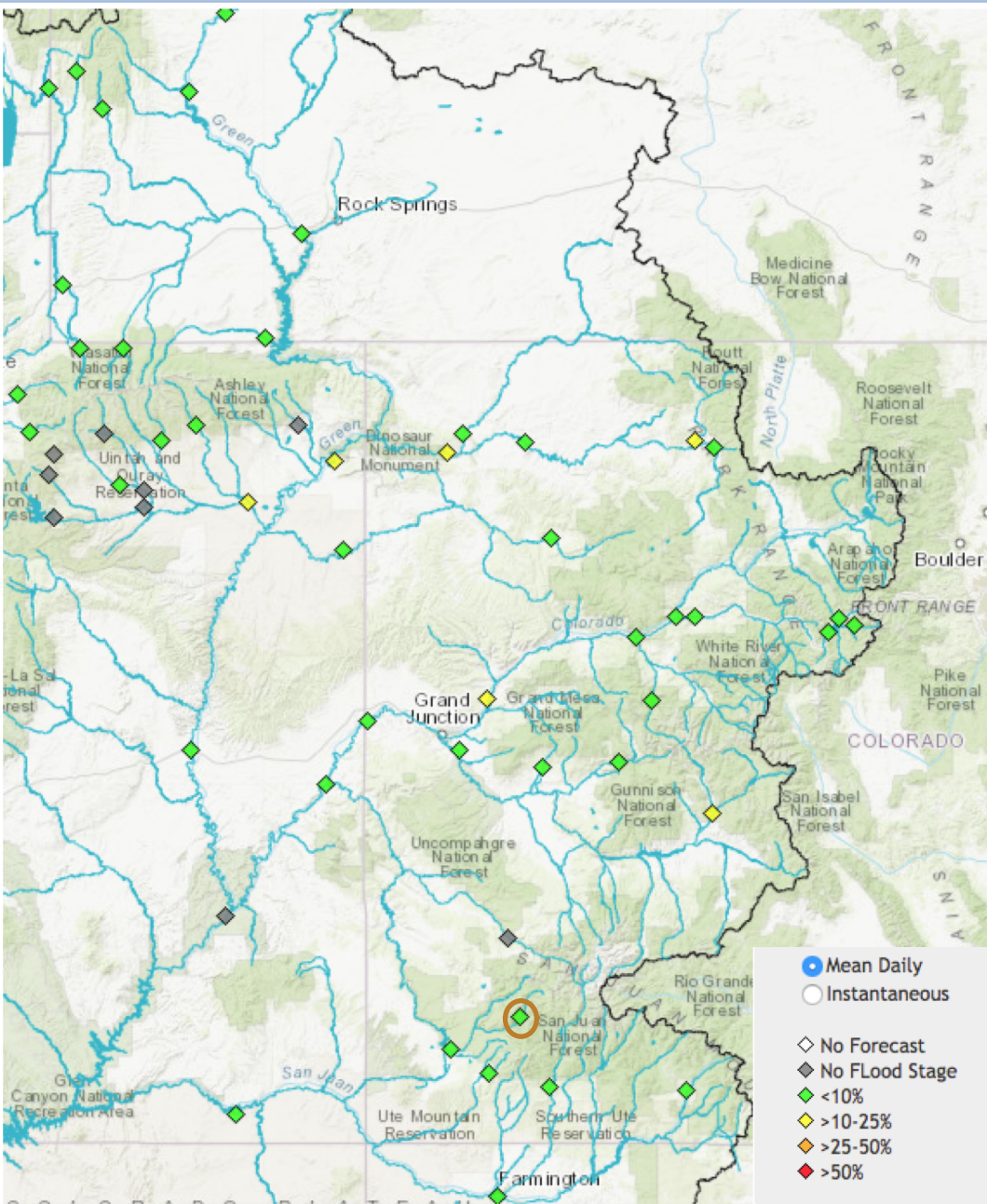
EAST RIVER - ALMONT				ANIMAS RIVER - DURANGO			
3/26/2019	FLOW (CFS)	RANK/#YEARS	PERCENTILE	3/26/2019	FLOW (CFS)	RANK/#YEARS	PERCENTILE
ESP 90	1869	42/97	43	ESP 90	4159	48/109	44
ESP 75	2174	55/97	56	ESP 75	4742	66/109	60
ESP 50	2338	59/97	60	ESP 50	5447	77/109	70
ESP 25	2782	80/97	82	ESP 25	5974	84/109	77
ESP 10	3255	89/97	92	ESP 10	6489	88/109	81
BANKFULL	2446	65/97	67	BANKFULL	7554	101/109	93
FLOOD	3156	88/97	91	FLOOD	10406	108/109	99

Currently no forecast points in the model are forecast to reach flood stage. However many streamflow peaks will be forecast to be in the top 30% of their historical record.

The next 6 weeks will determine how the high water / flood potential threat will really play out.

Given the current snowpack levels a delayed melt / increase in snowpack into mid May could significantly increase flood potential in certain areas.

- Currently no forecast points reach flood stage at the 50% exceedance forecast.
- Several sites have a 10% chance for the mean daily flow to reach flood stage
- A subset of those sites have a 25% chance of the instantaneous peaks to reach flood stage



How high might streams be running compared to historical record?

Upper Colorado Headwaters:

Blue River – Top 15%

Tenmile Creek – Top 30%

Crystal River – Top 30%

Gunnison Headwaters:

Surface Creek – Top 20%

Dolores Headwaters:

Above Rico - Top 20%

San Juan Headwaters:

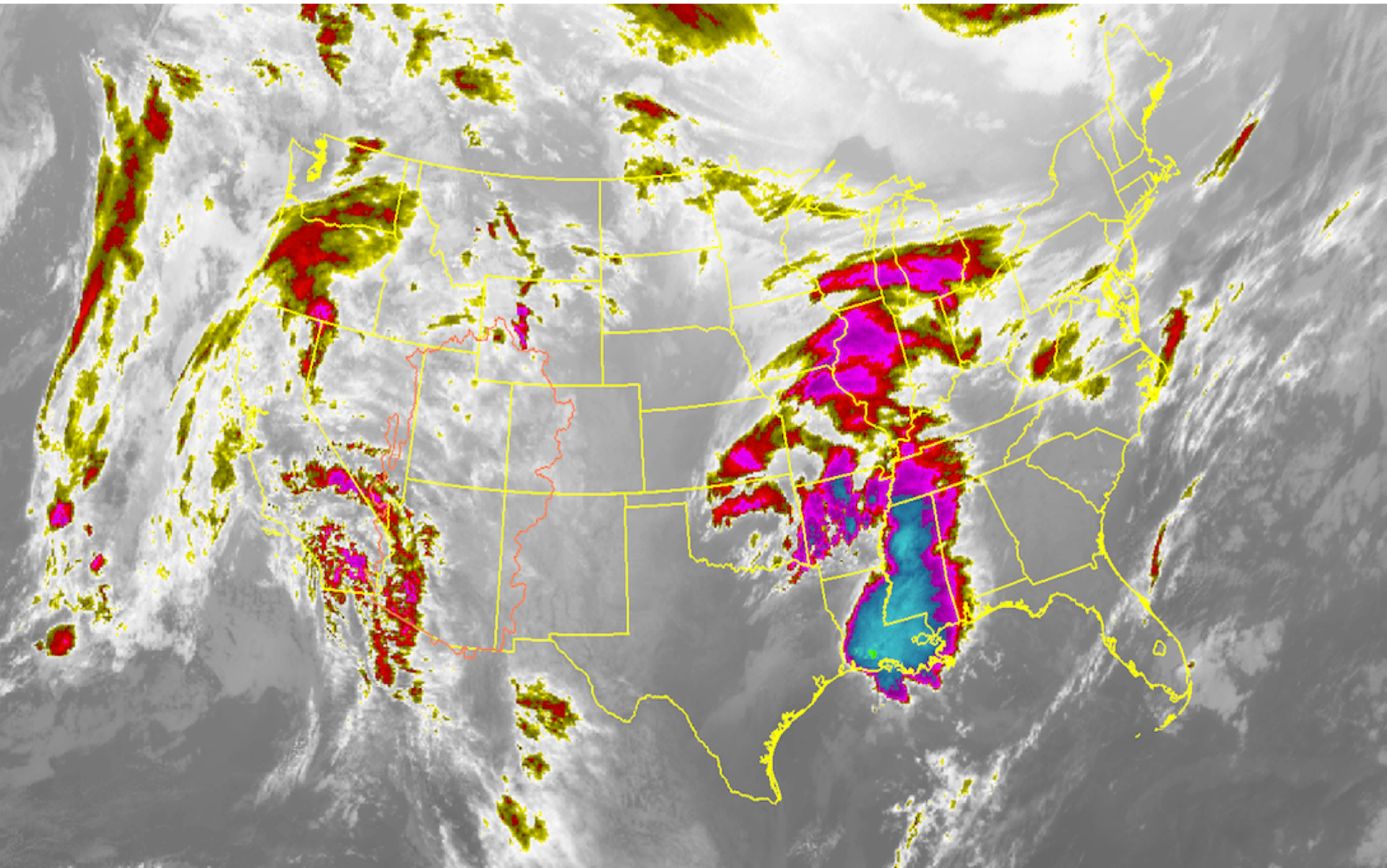
Upper San Juan- Top 25%

Animas – Top 30%

 25% chance instantaneous peaks will reach NWS defined flood stage

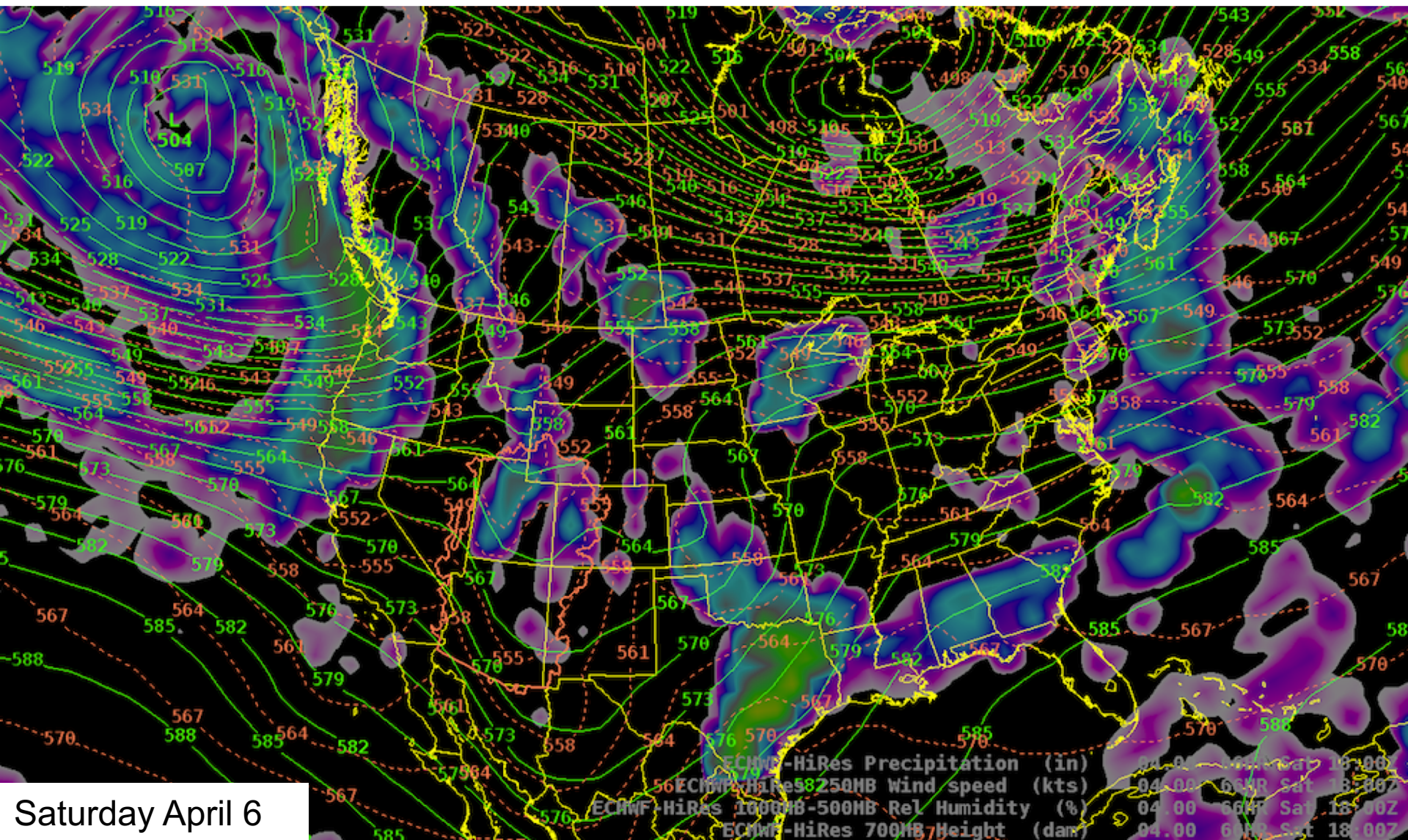
This morning – Satellite image from this morning

In between storm systems today and Friday



Upcoming Weather – Weak storm system Saturday

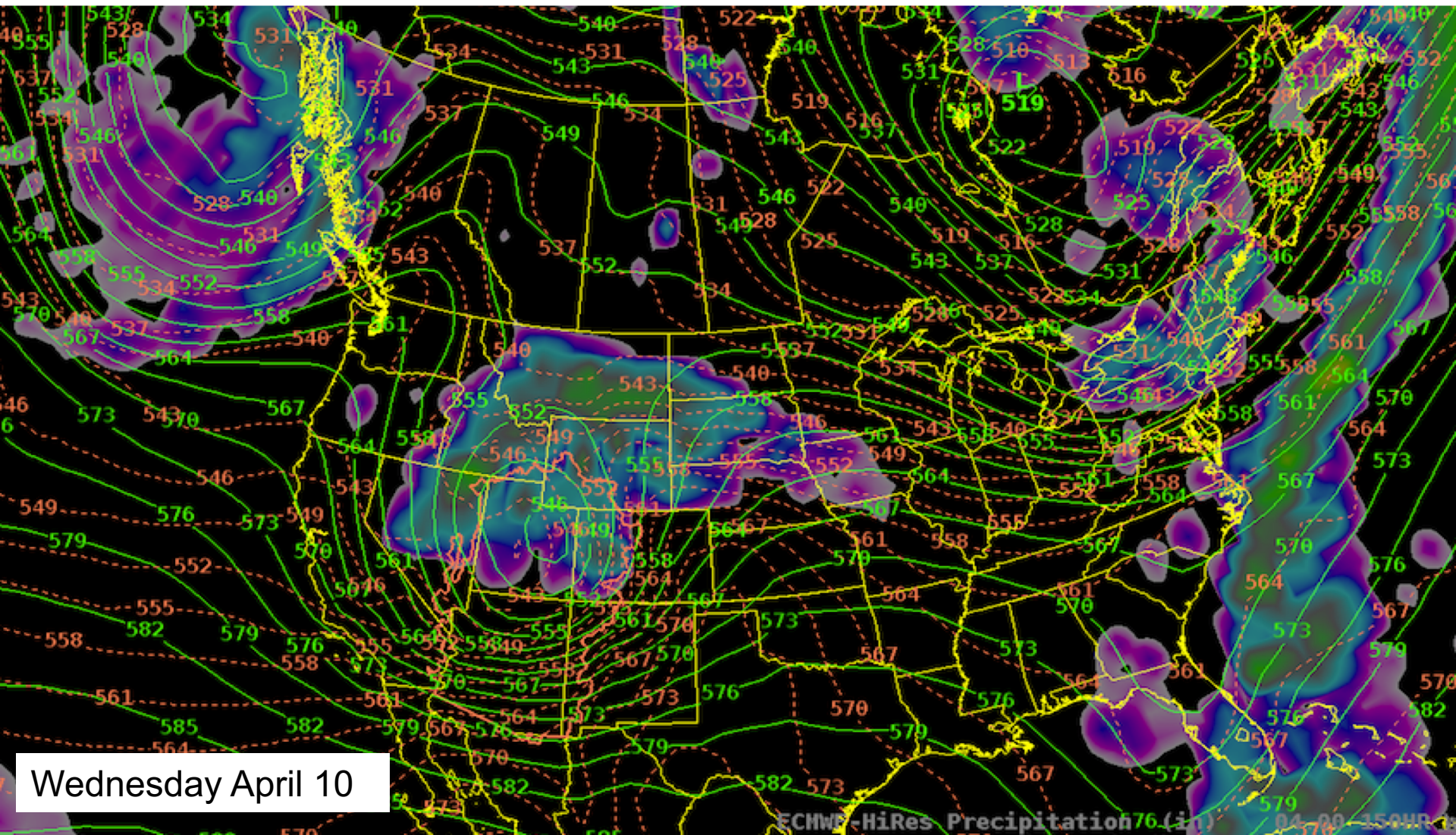
Splitting storm system moving through the northern Great and Colorado River Basins. Precipitation amounts should be generally light, upwards to .50 to .75 northern mountains. Ridge and warmer temperatures early next week should enhance snowmelt in certain areas.



Saturday April 6

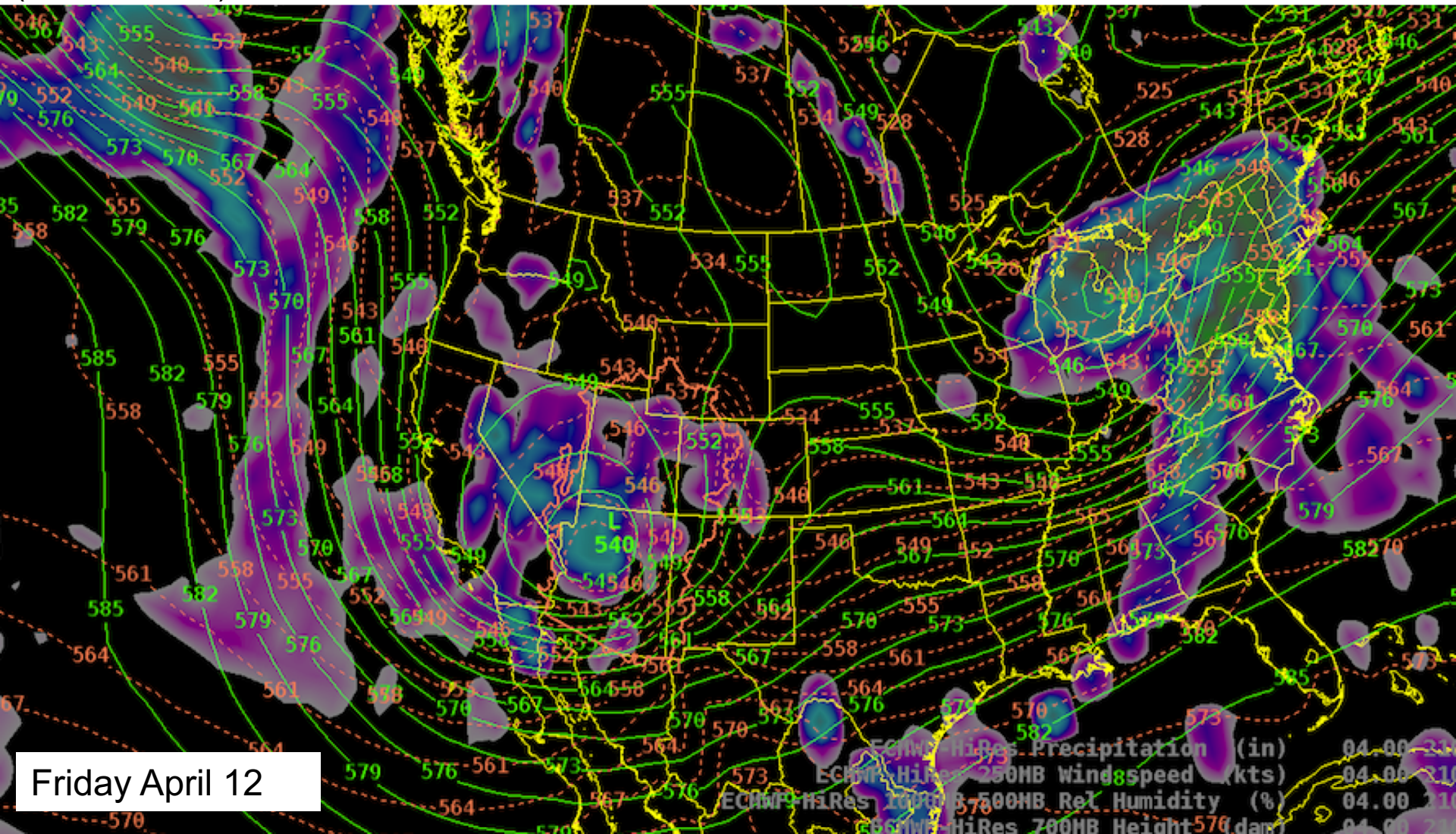
Upcoming Weather – Early next week (Tue-Thu)

Models suggest a more robust storm system for the middle of next week. Primary impacts look to be from central Utah / Colorado north. This system is colder and would bring several inches of snow to the mountains and possibly snow to lower elevations.



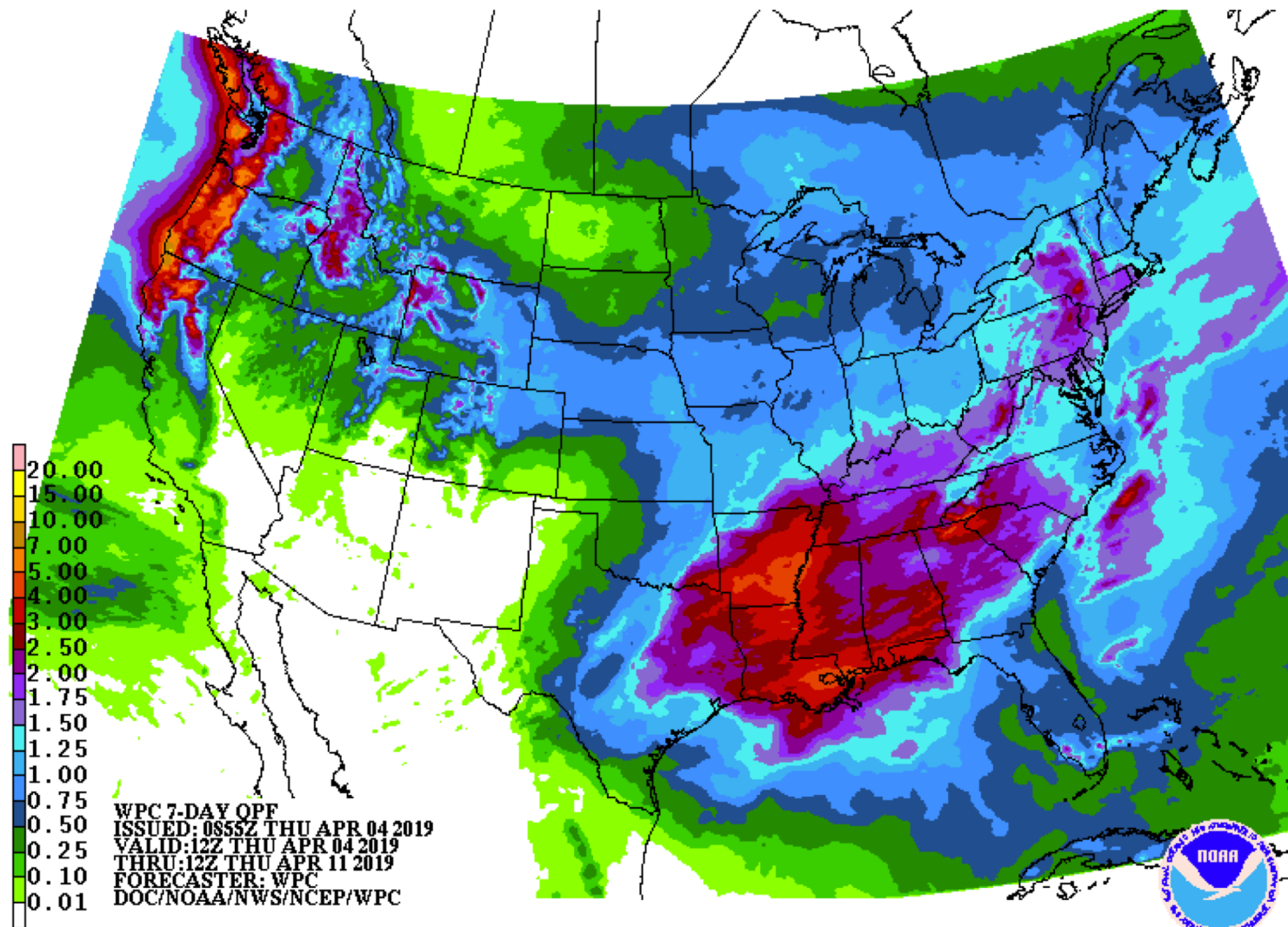
Upcoming Weather – 2nd weekend of April (12th-13th)

Models are becoming more consistent with the idea of a large closed low pressure system moving through the southern part of the forecast area. Confidence is low considering the long lead time. Potentially a good precipitation producer for those areas that already have a significant snowpack (SW Colorado).



Precipitation Outlook – Next 7 Days

Weather Prediction Center Precipitation Outlook April 4th – April 11th



The 8-14 day outlook – Very April like with a progressive storm pattern

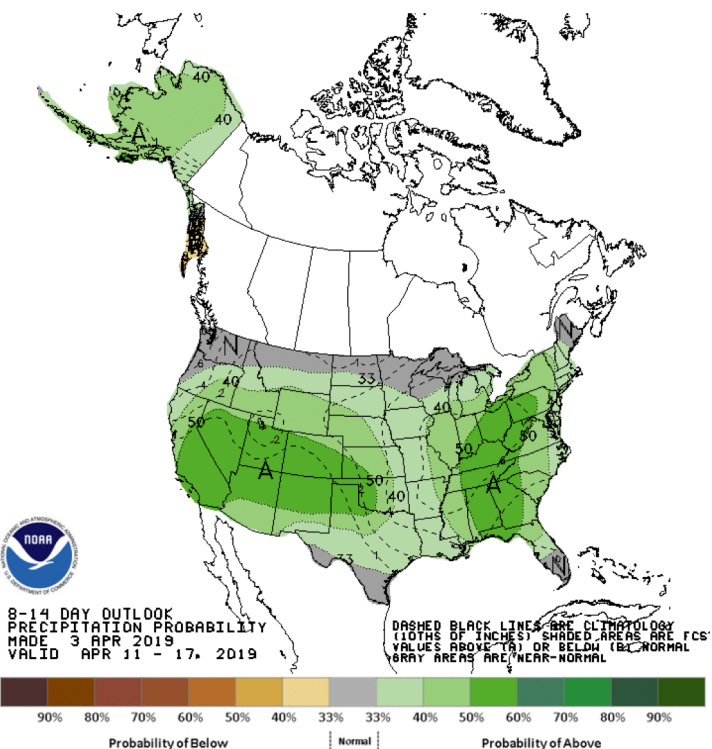
Pattern is trending wetter/cooler for the first half of April. Not as wet as the previous couple of months.

Periodic warming between storms will slowly increase snowmelt in middle elevations and areas south.

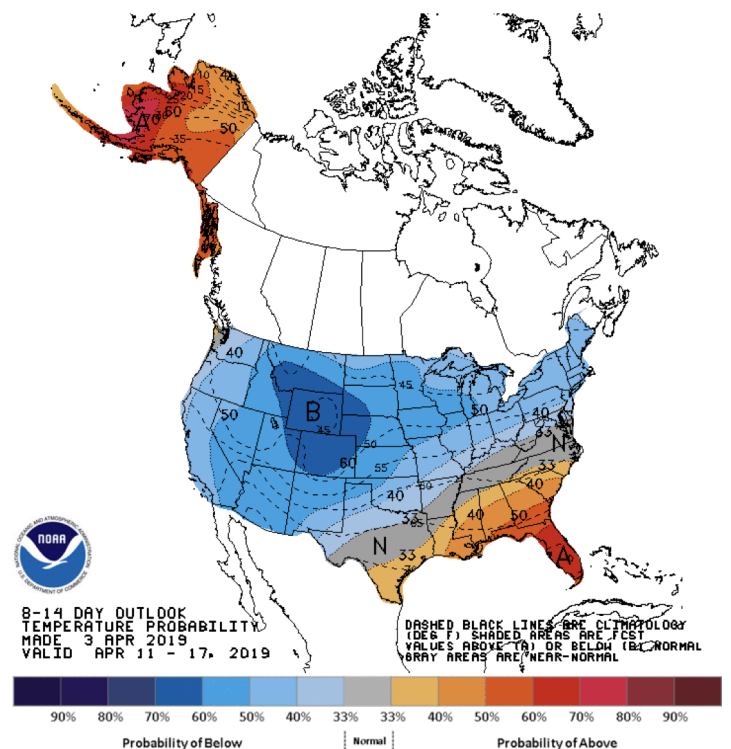
Next 2 weeks: Precipitation should be near to above average and temperatures below average Upper Colorado / Great Basins. Some increase to high elevation snowpack is probable.

Impacts to Water Supply Volume Forecasts – Less dramatic changes in the trends between now and mid April. Northern / High elevation basins might experience some increase if additional snow / melt is delayed into May.

April 11-17



April 11-17



2019 water supply briefing schedule

2019 monthly water supply briefings for the Colorado Basin

Tuesday May 7th @ 11 am MT

Great Basin webinars are same dates at 1:30 pm MT (there is one today)

Additional webinar will be scheduled in early June if needed

Date/Times are subject to change. All registration information has been posted to the CBRFC web page.

CBRFC Water Supply Contacts

Please contact us with any questions

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Cody Moser – Upper Colorado Mainstem Focal Point

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