

# CBRFC Forecast Areas

## Great Basin Water Supply Briefing

April 4<sup>th</sup>, 2019

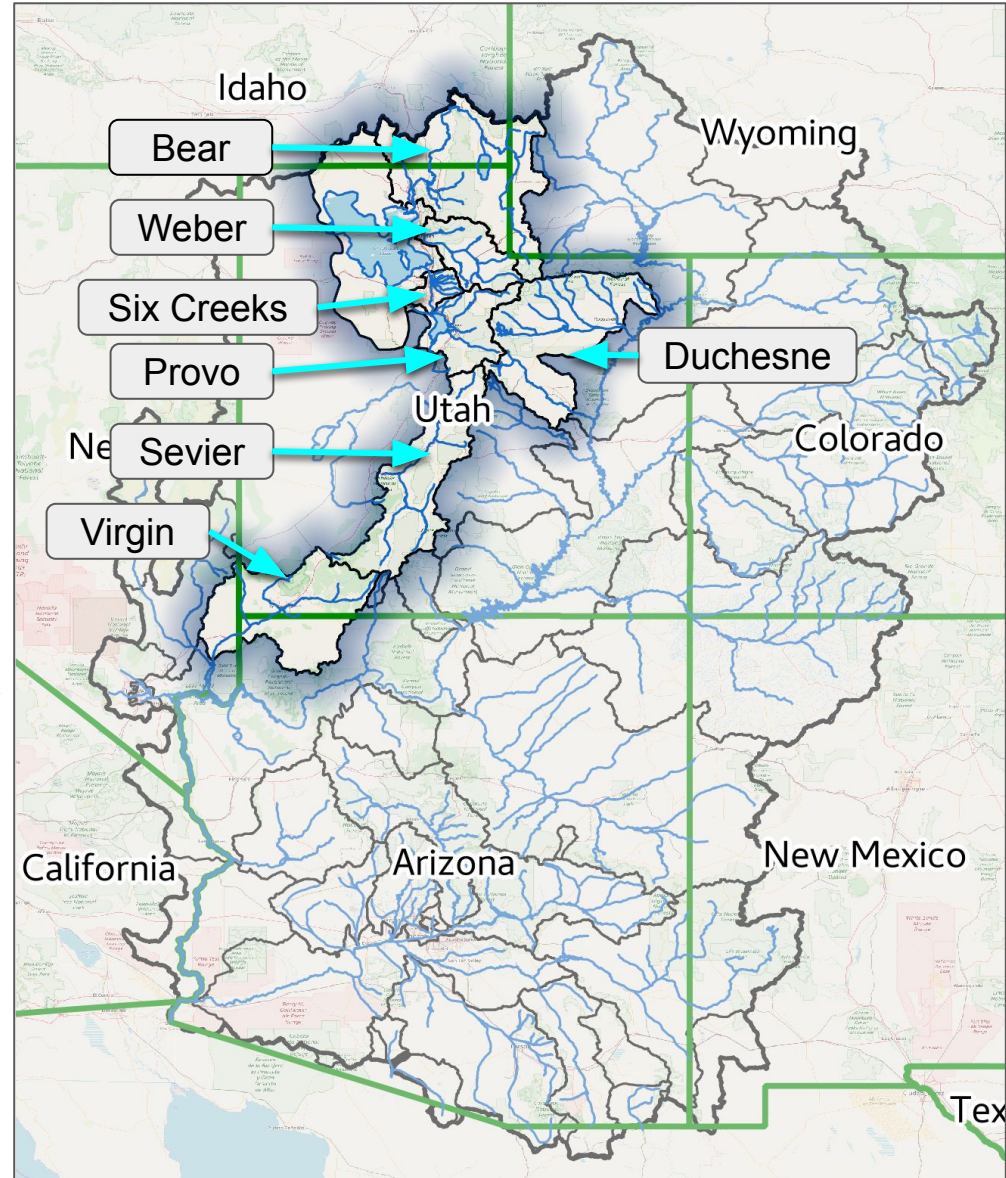
Patrick Kormos - Hydrologist  
Greg Smith - Sr. Hydrologist  
Brenda Alcorn - Sr. Hydrologist  
Ashley Nielson - Sr. Hydrologist

Colorado Basin River Forecast Center

**Phone: 1-877-929-0660**

**Passcode: 1706374**

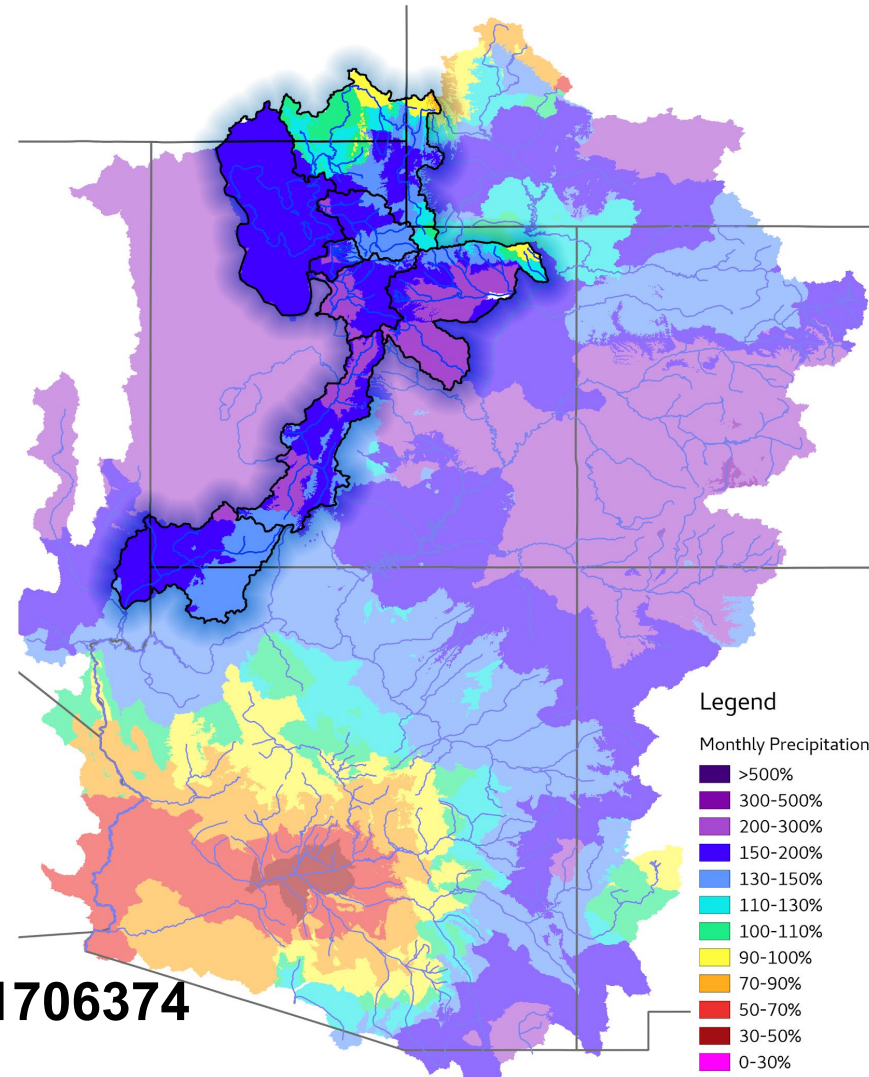
**Please mute your phone  
until ready to ask questions**



# Today's Presentation

March Precipitation, 2019  
(Averaged by Basin)

- Weather review
  - March Precipitation
- Current Snowpack
- April 1 Water Supply Forecasts
- April Forecast Error
- Peak Flow Information
- Upcoming Weather
- Contacts & Questions

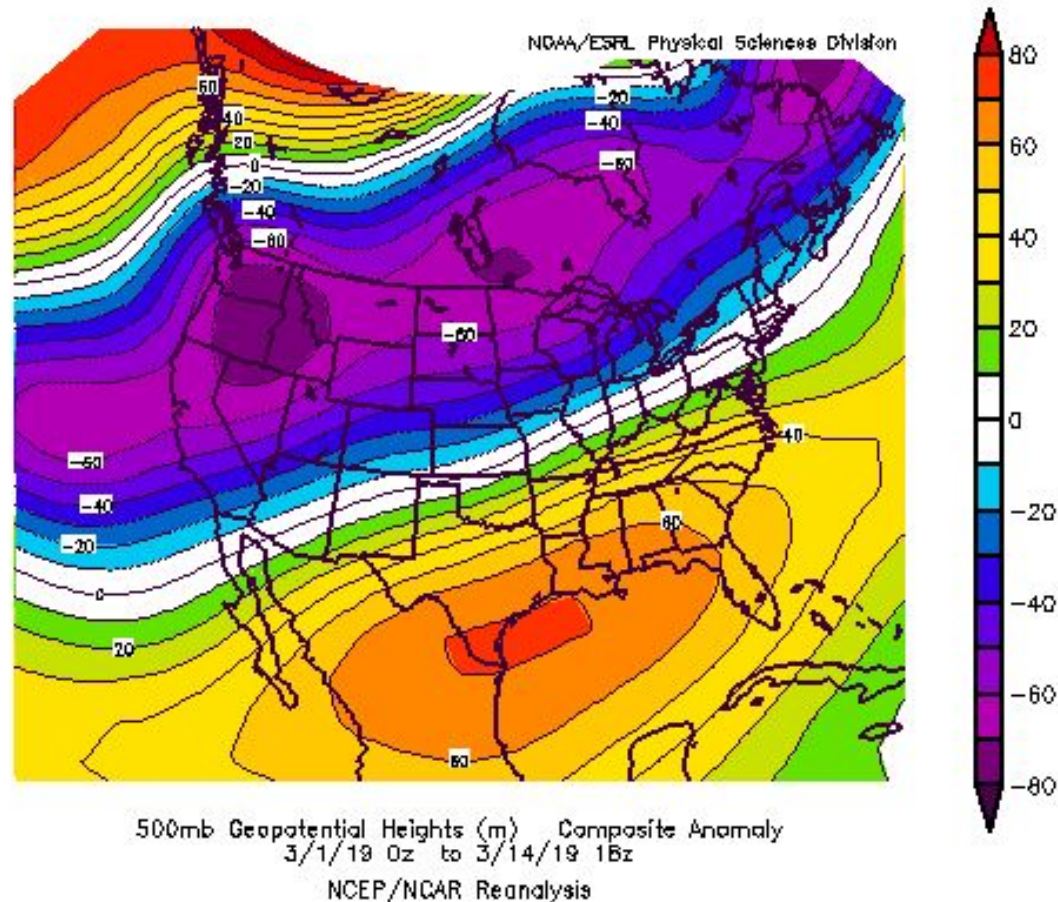


Phone: 1-877-929-0660 Passcode: 1706374

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

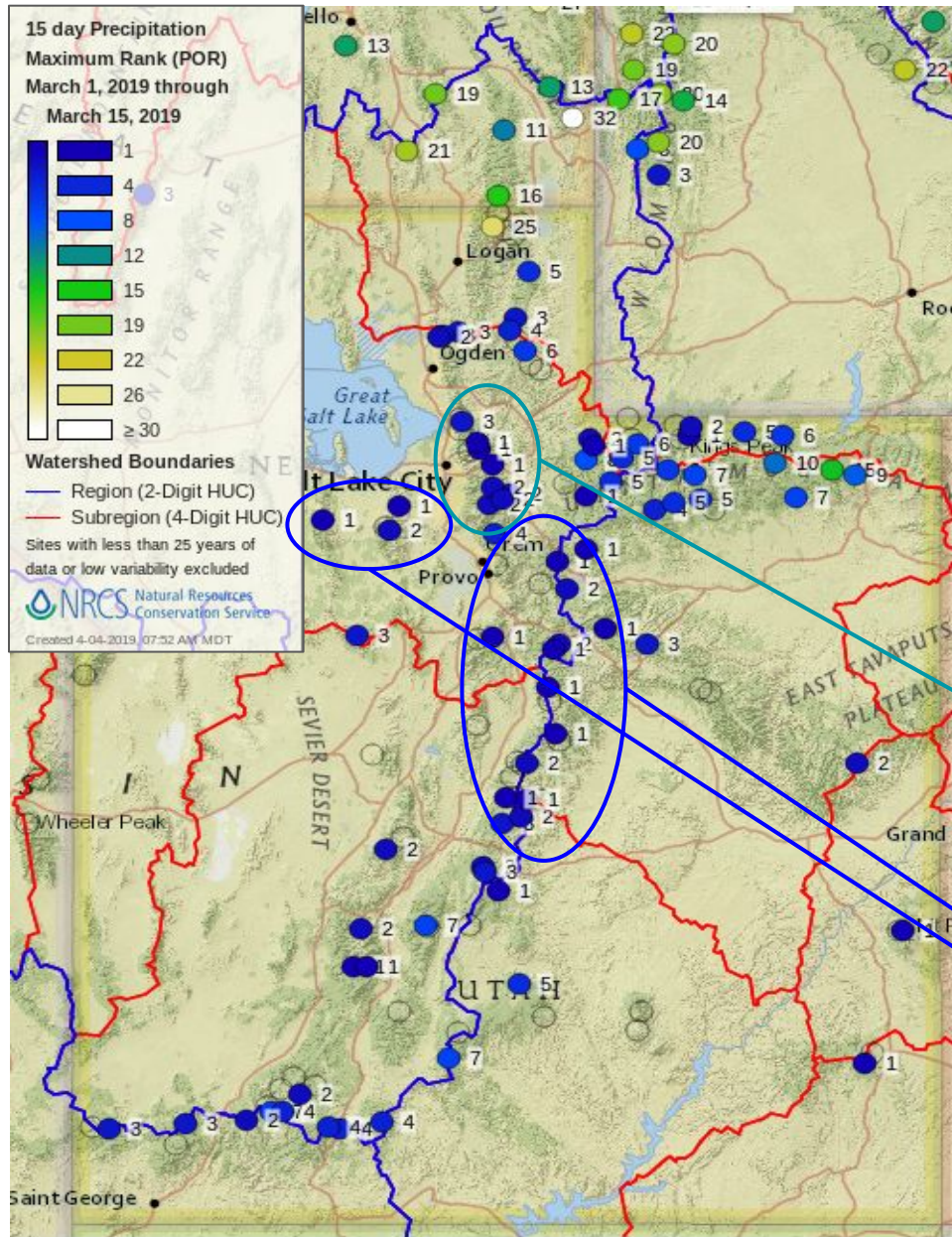
# Early March Weather Pattern

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.

# Early March Precipitation



Record precipitation at many SNOTEL sites through the first half of the month

- Especially central Utah mountains and Wasatch Front

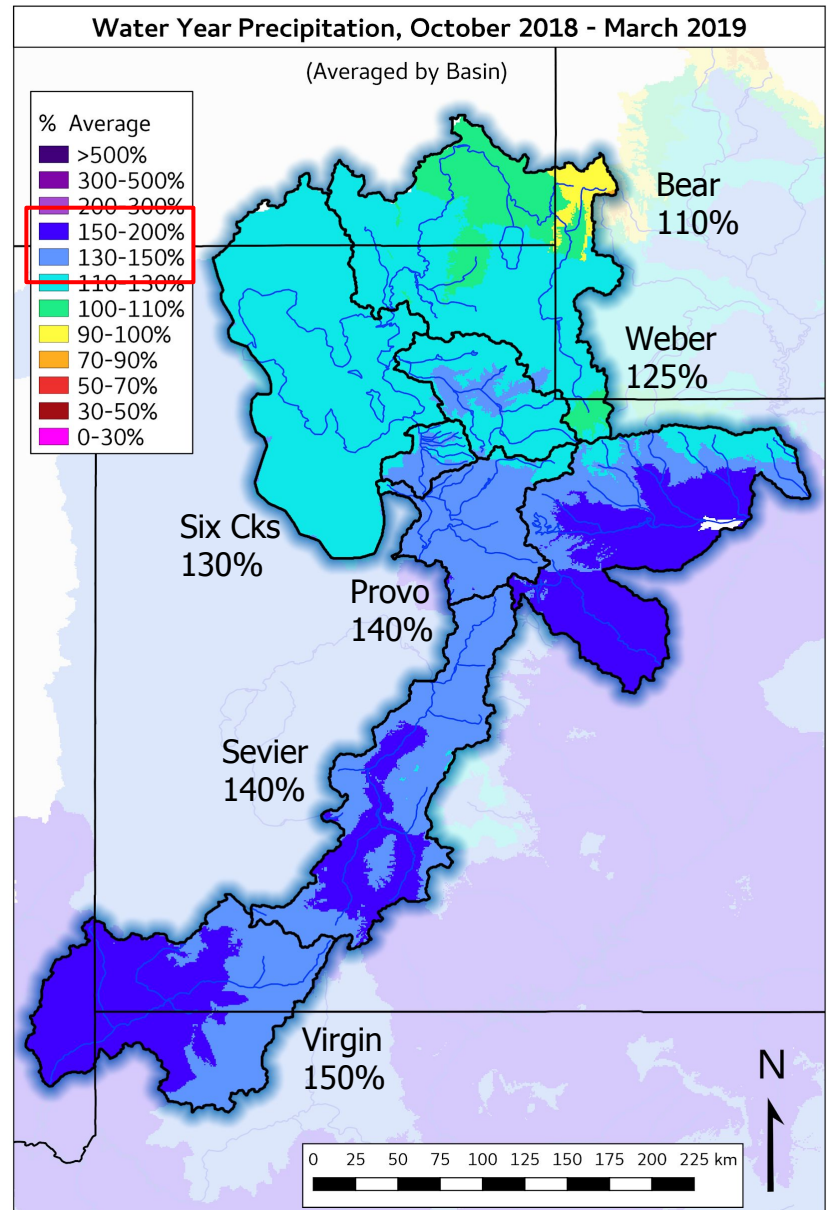
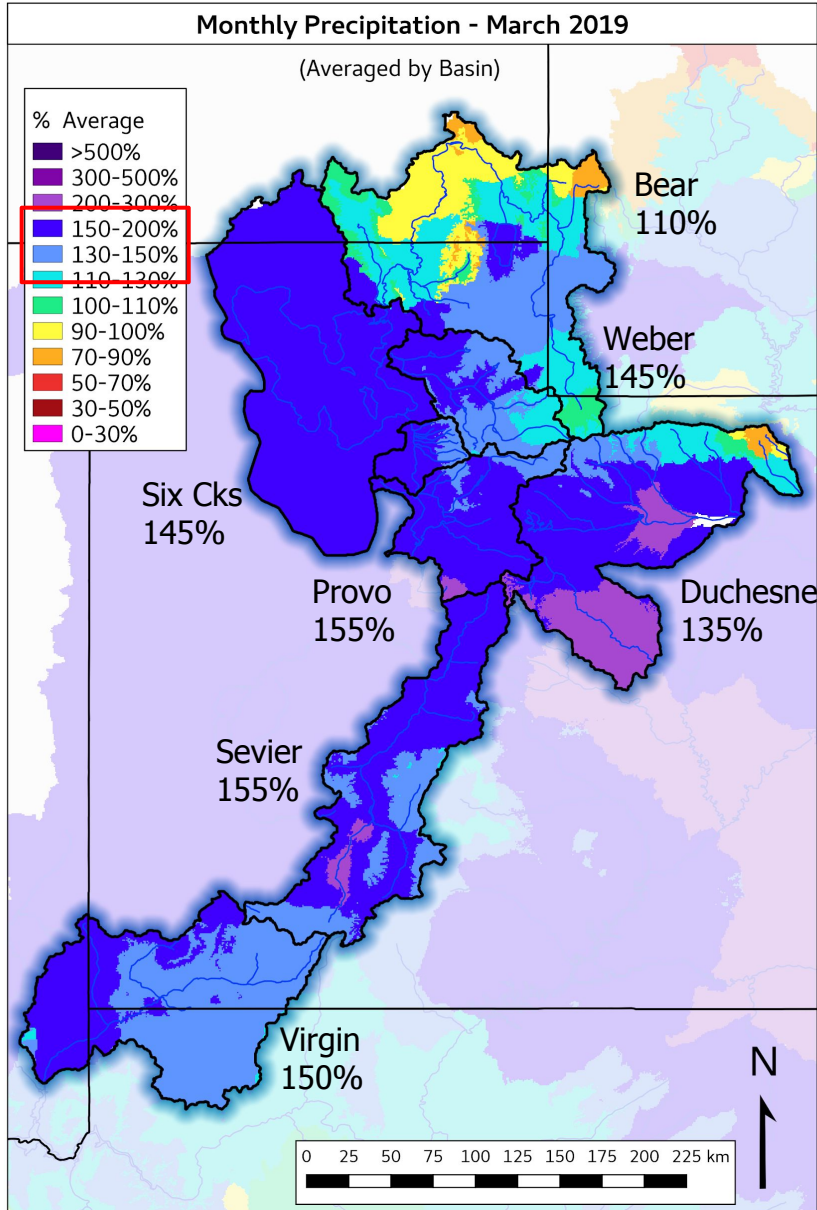
Additional storms the last week of the month added to the totals

- S. Bear, Weber, Six Creeks basins benefited most from these

Sites in this area generally ended up ranked in the top 5 for March total precipitation

Sites in these areas generally ended up ranked in the top 3 for March total precipitation

# March Monthly and Seasonal Precipitation (%Avg)

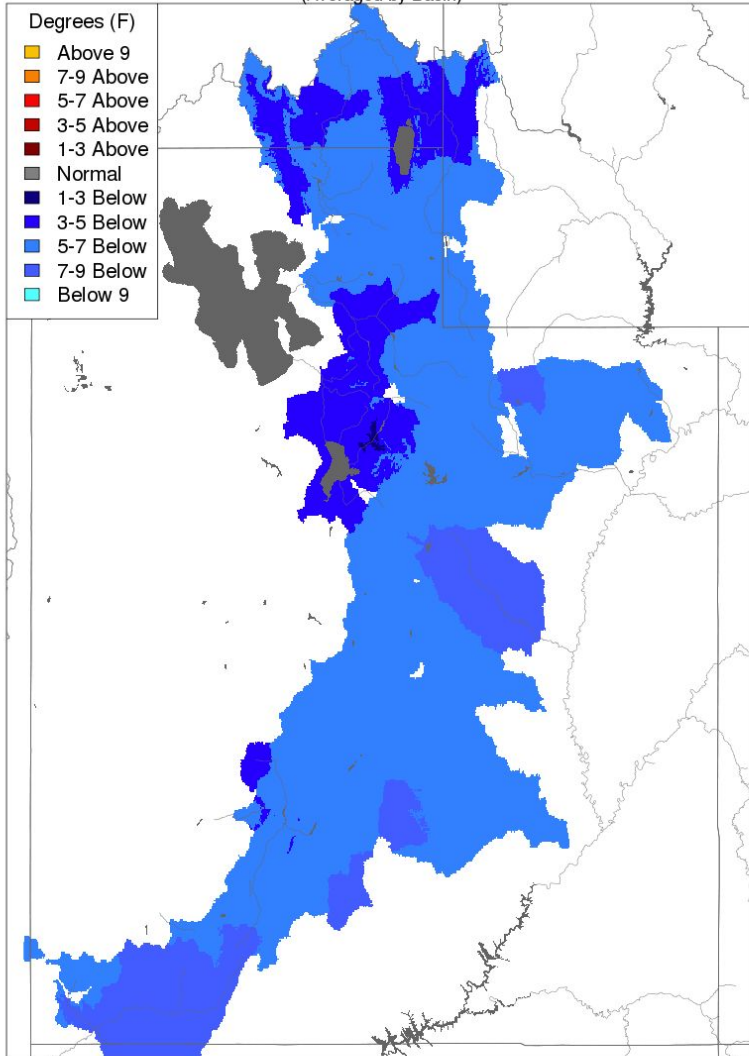


# Maximum Monthly Temperature Anomalies

Cooler than normal temperatures combined with the above normal precipitation have allowed lower elevation snowpack to continue to accumulate and persist into early April

Max Temp - Monthly Deviation - February 2019

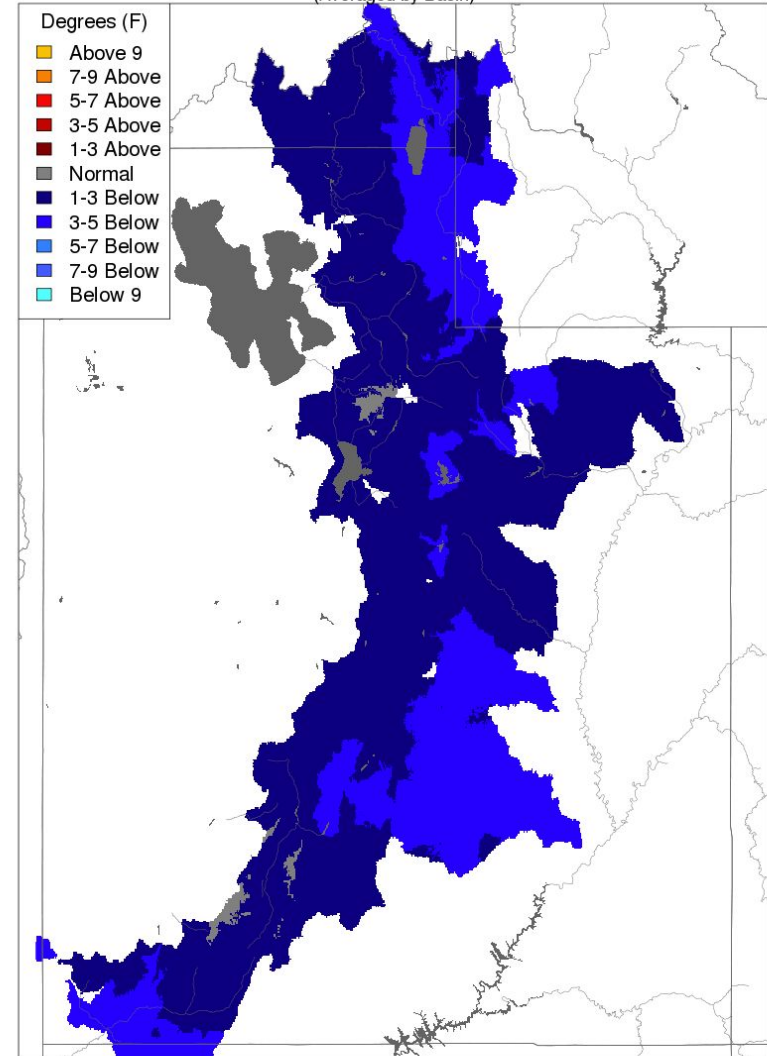
(Averaged by Basin)



Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)

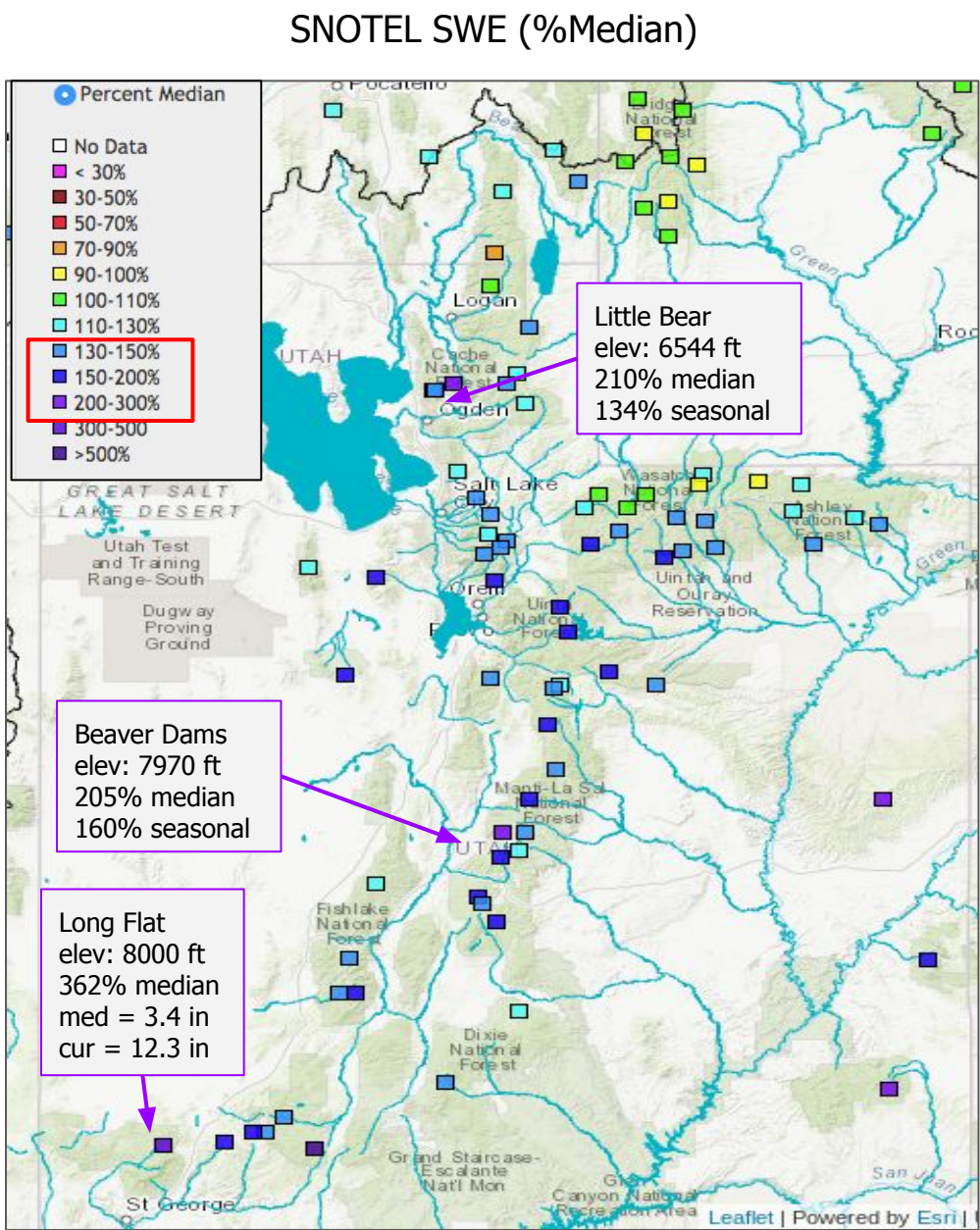
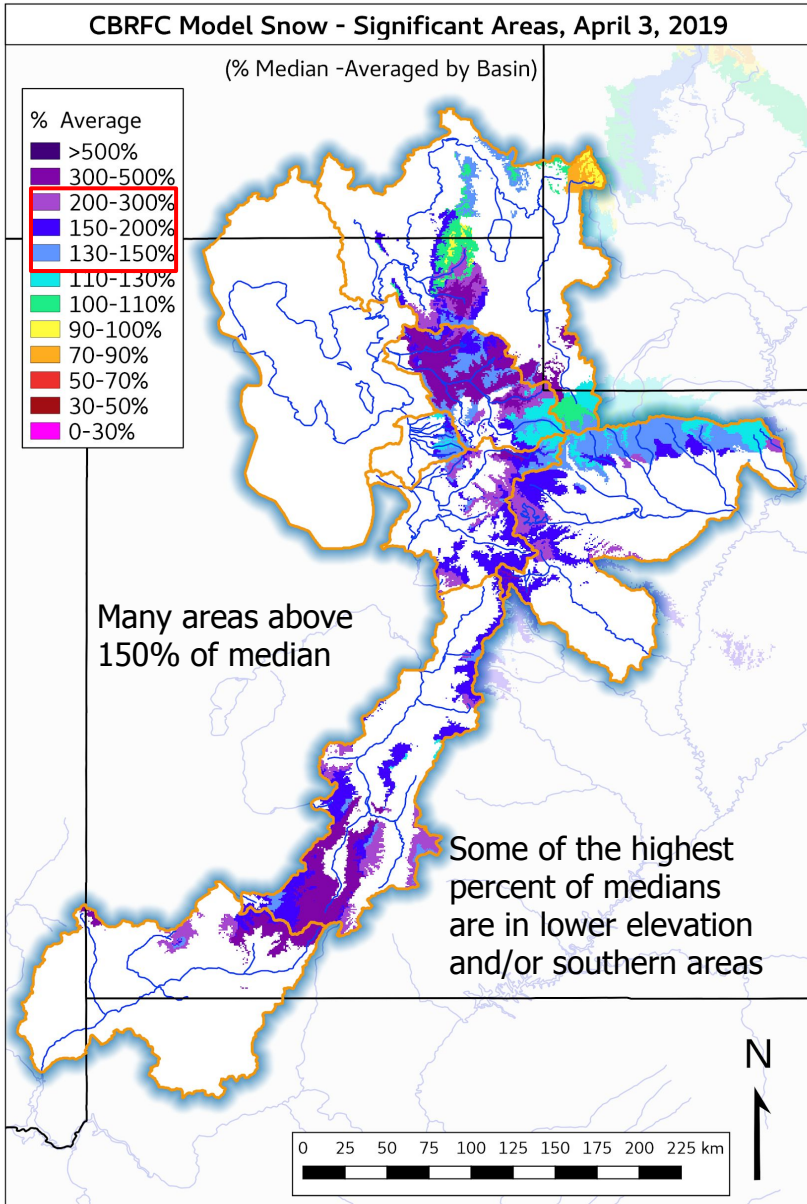
Max Temp - Monthly Deviation - March 2019

(Averaged by Basin)

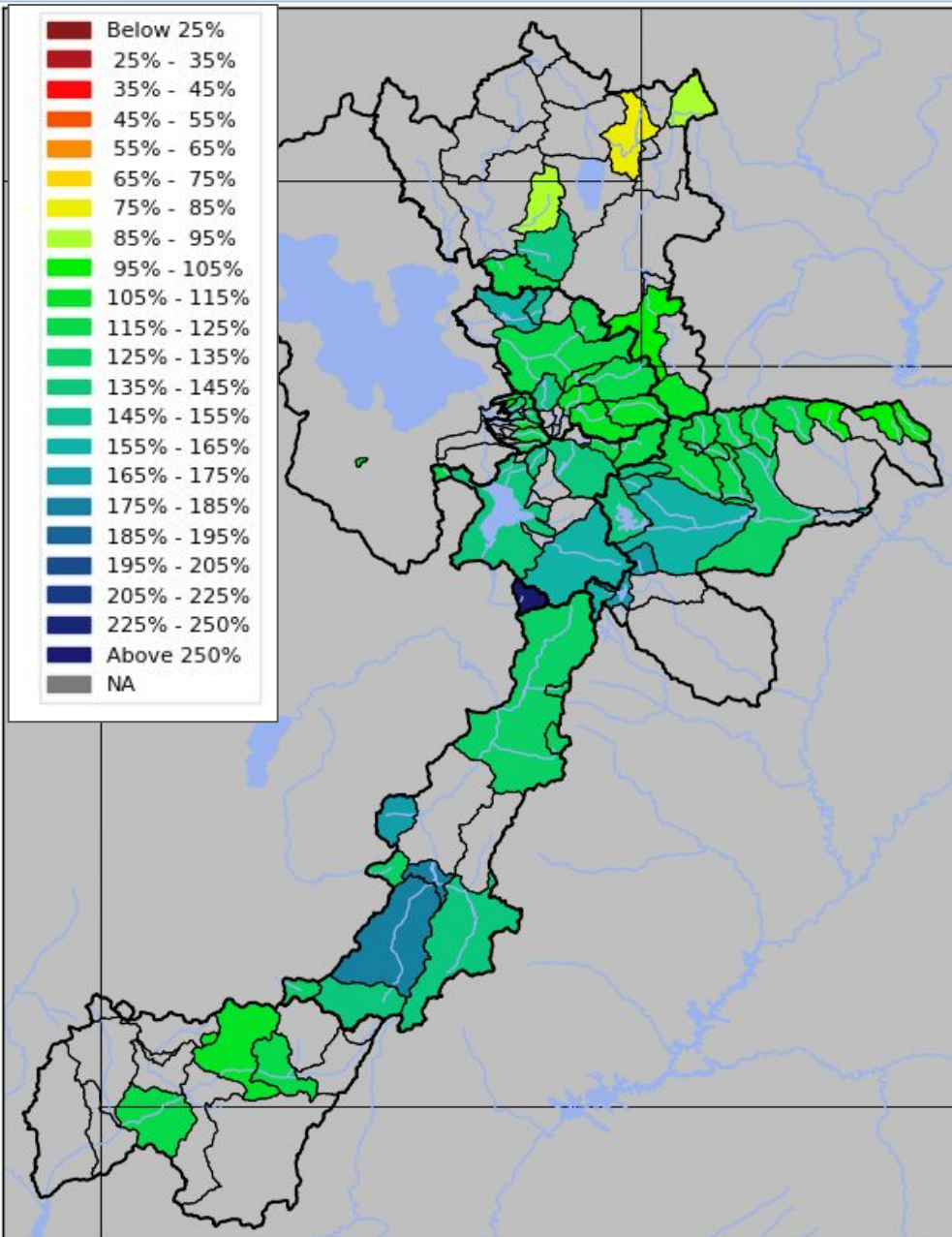


Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)

# Current Snowpack - April 3 Snow Conditions



# Water Supply Forecasts – Great Basin/Utah



- April 1 Forecast for April-July Volume in 1000's acre feet (KAF)
- April-July Forecast Streamflow Volumes (% of 1981-2010 average)
- Across the board increases
- Largest increases in the Weber and South Bear Basins

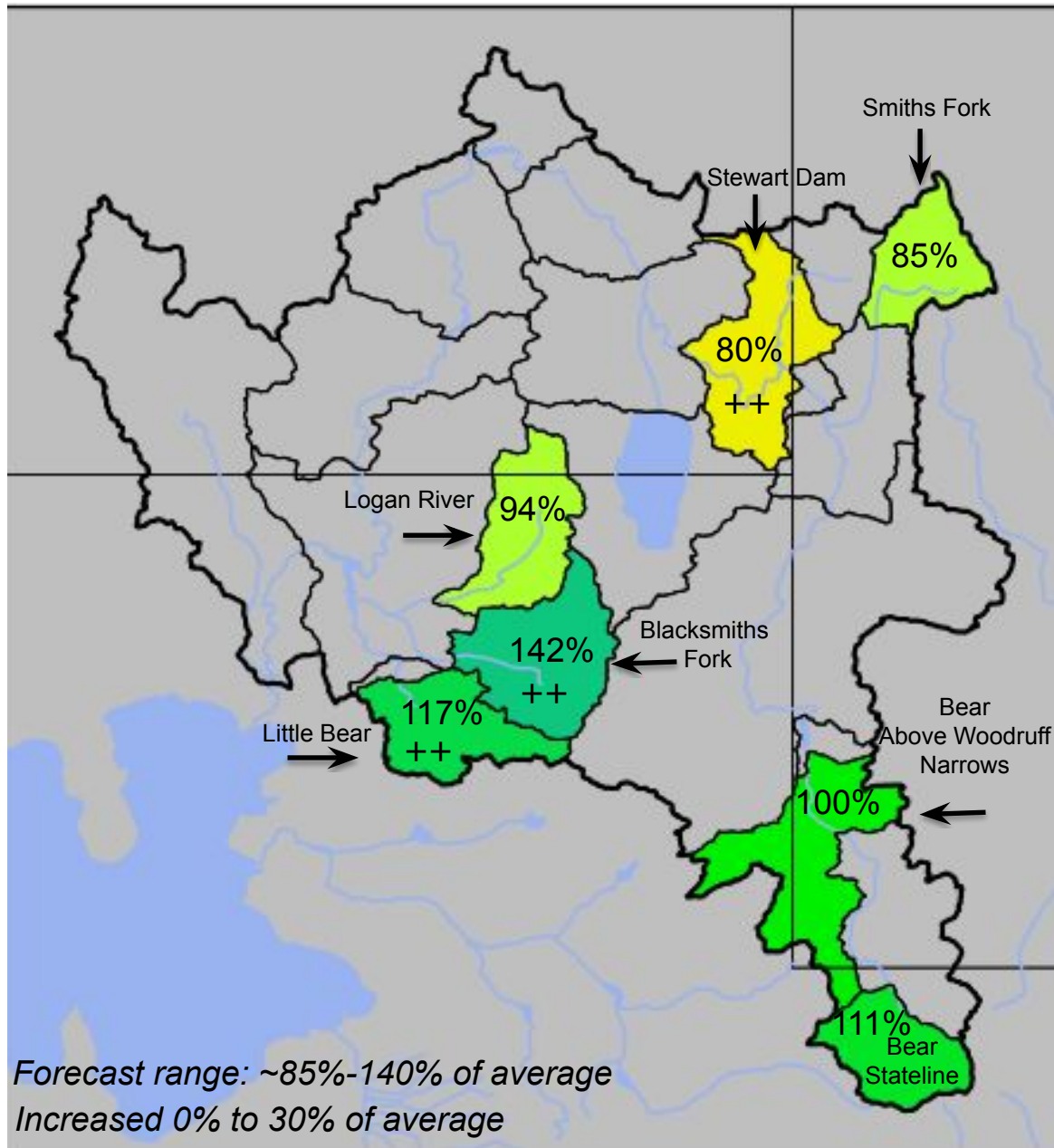
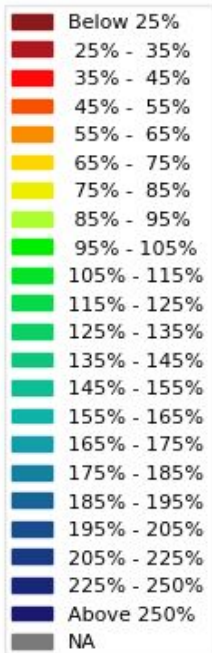


# April 1<sup>st</sup> Water Supply Forecasts – Bear River Basin

Median  
Basin  
Forecast:

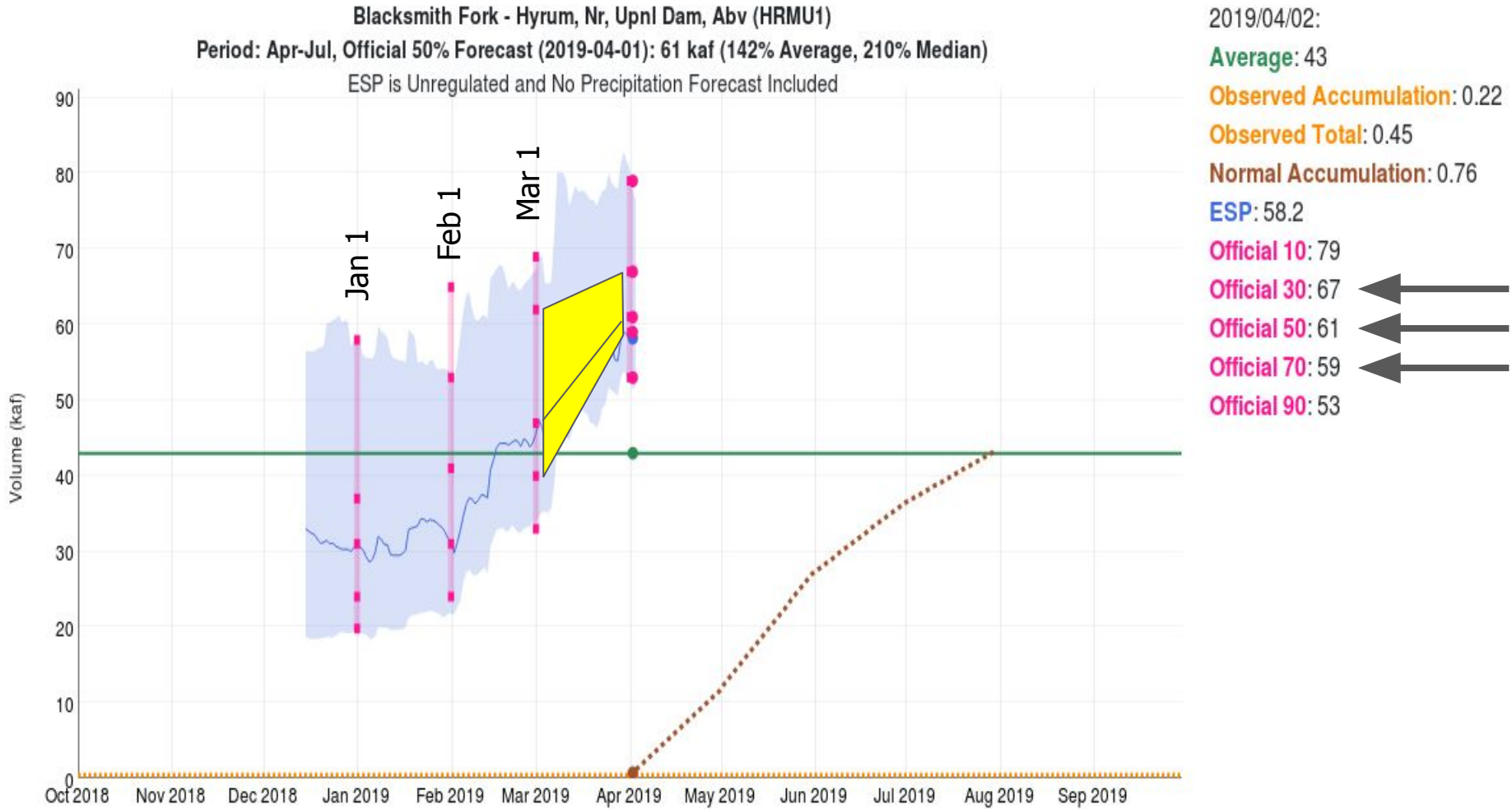
Jan - 70%  
Feb - 85%  
Mar - 95%  
Apr - 100%

April-July  
Forecast  
Streamflow Volumes  
(% of 1981-2010 average)



# Forecast Evolution Plot

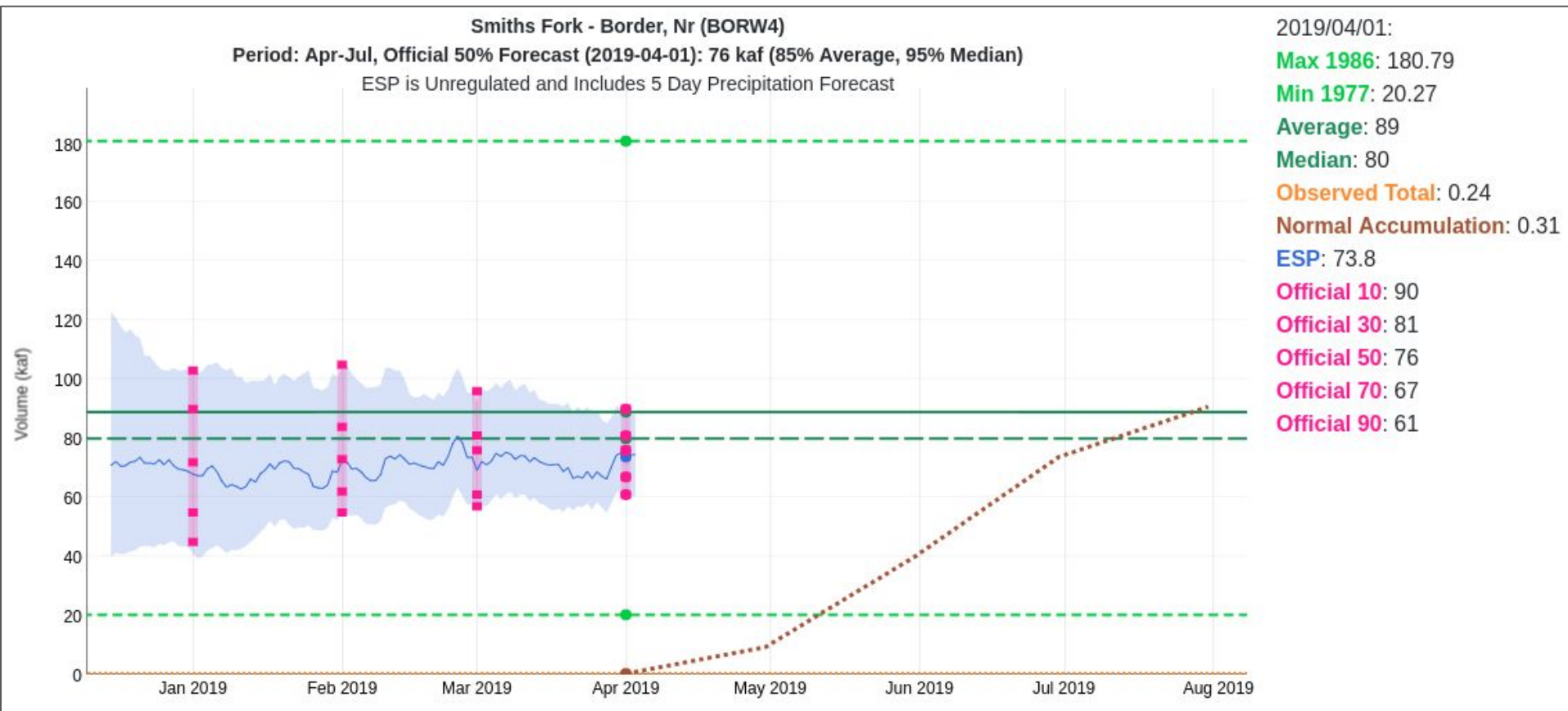
Blacksmith Fork: 61 KAF / 142% Avg



30% increase in volume form March 1 to April 1 Forecast

# Forecast Evolution Plot

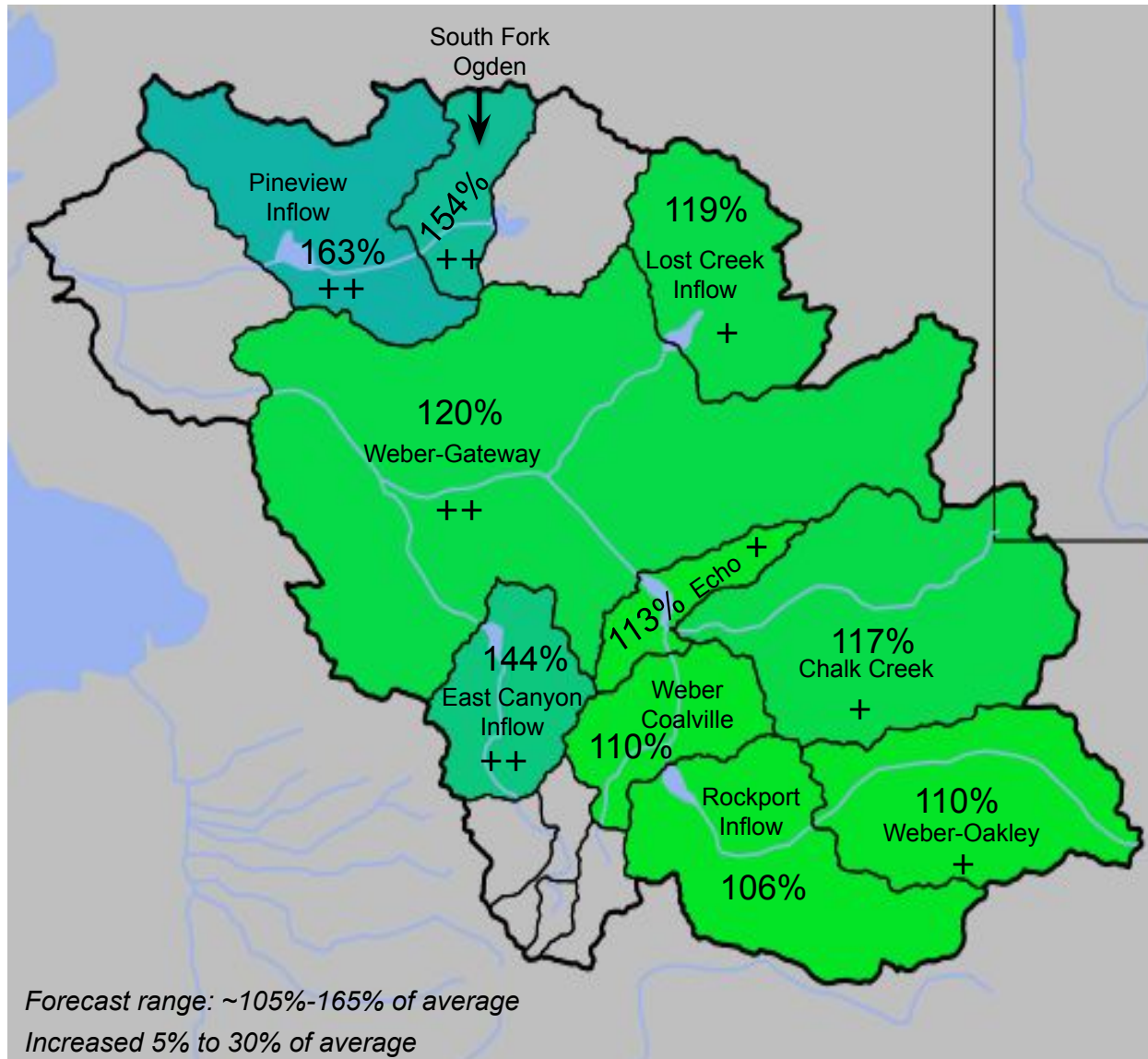
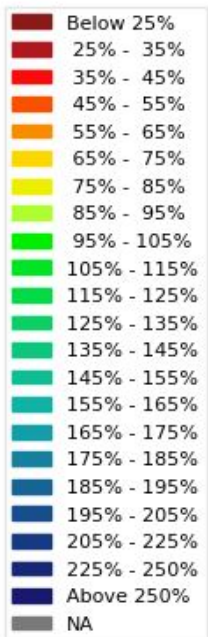
Smiths Fork: 76 kaf / 85%



Same Official 50 Forecast for April as March. Confidence has increased.

# April 1<sup>st</sup> Water Supply Forecasts – Weber River Basin

April-July Forecast  
Streamflow Volumes  
(% of 1981-2010 average)

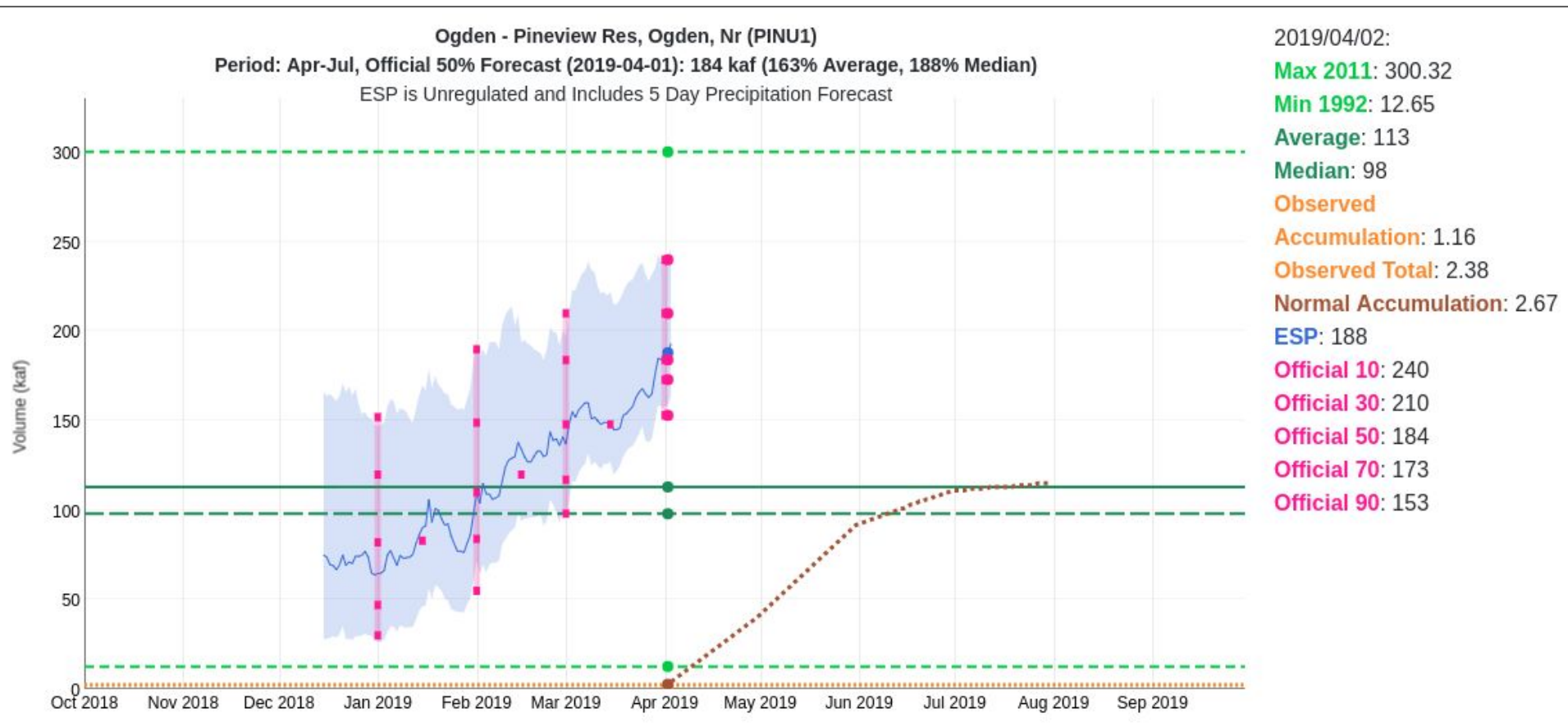


Median  
Basin  
Forecast:

Jan - 75%  
Feb - 85%  
Mar - 105%  
Apr - 120%

# Forecast Evolution Plot

Pineview: 184 kaf / 163%



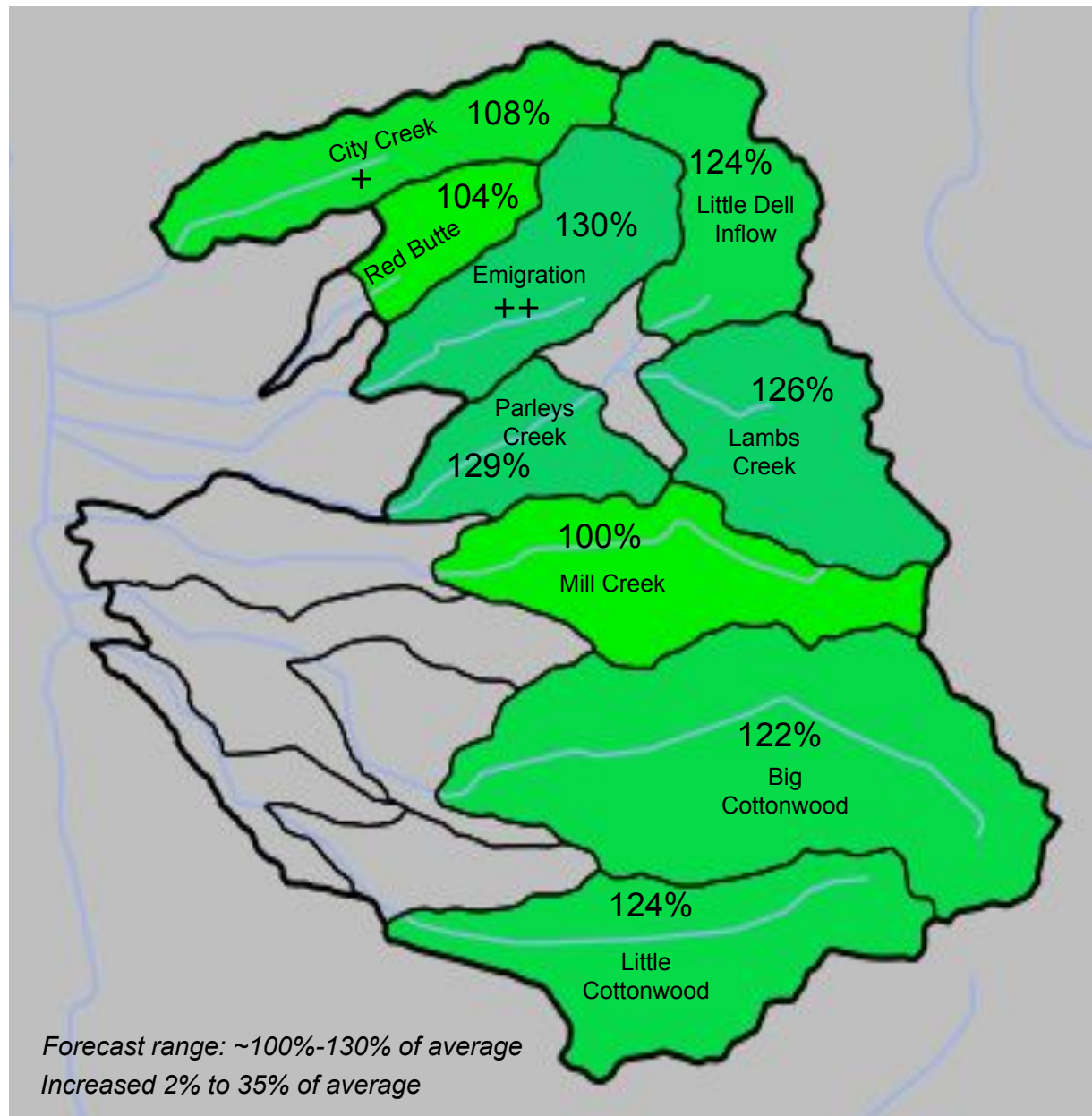
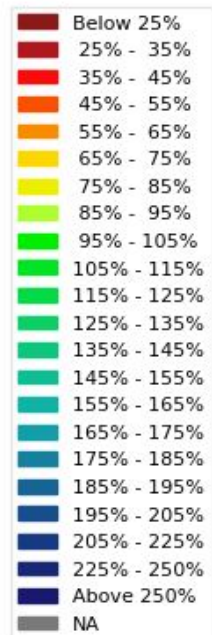
24% increase in volume form March 1 to April 1 forecast... again

# April 1<sup>st</sup> Water Supply Forecasts – Six Creeks

Median  
Basin  
Forecast:

Jan - 65%  
Feb - 90%  
Mar - 115%  
Apr - 125%

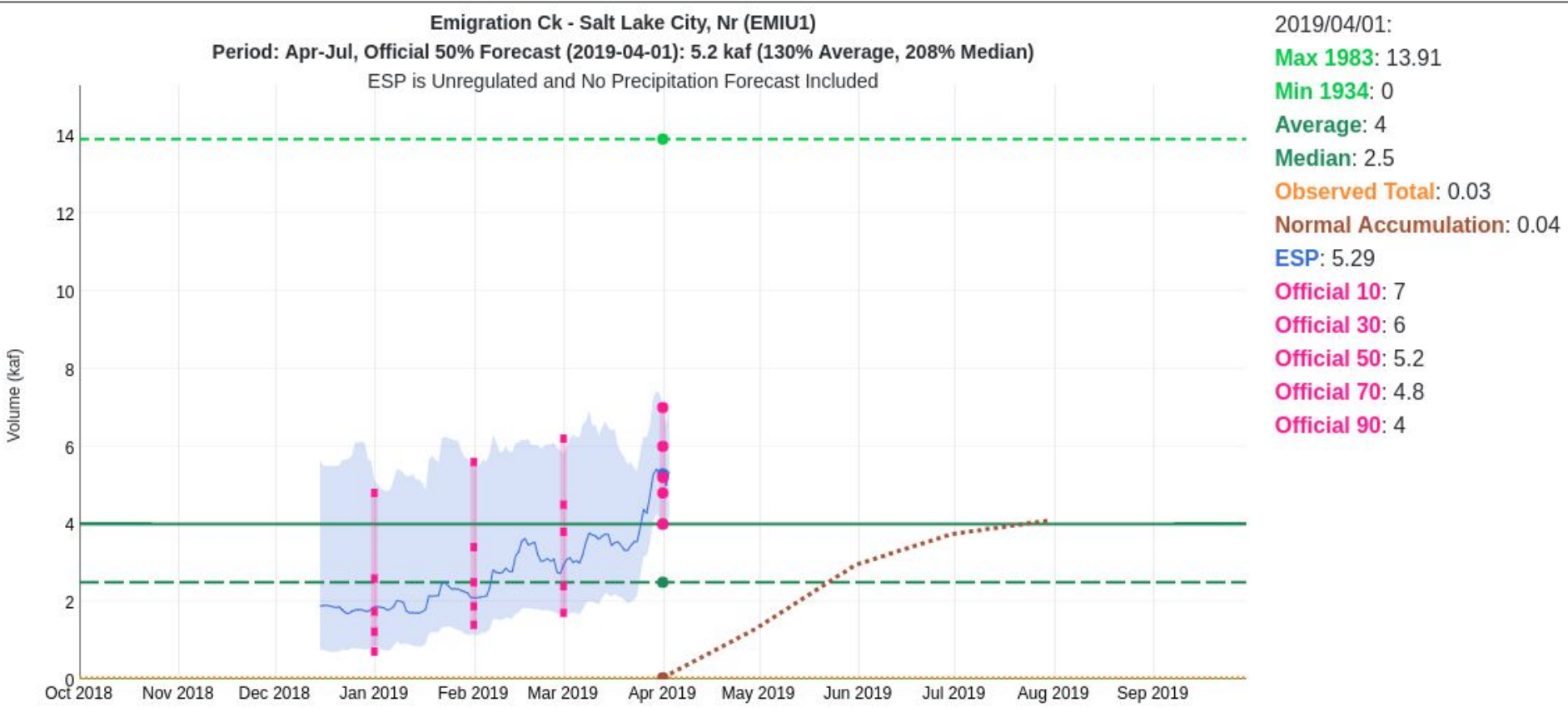
April-July  
Forecast  
Streamflow Volumes  
(% of 1981-2010 average)



Forecast range: ~100%-130% of average  
Increased 2% to 35% of average

# Forecast Evolution Plot

## Emigration Creek: 5.2 kaf / 130%

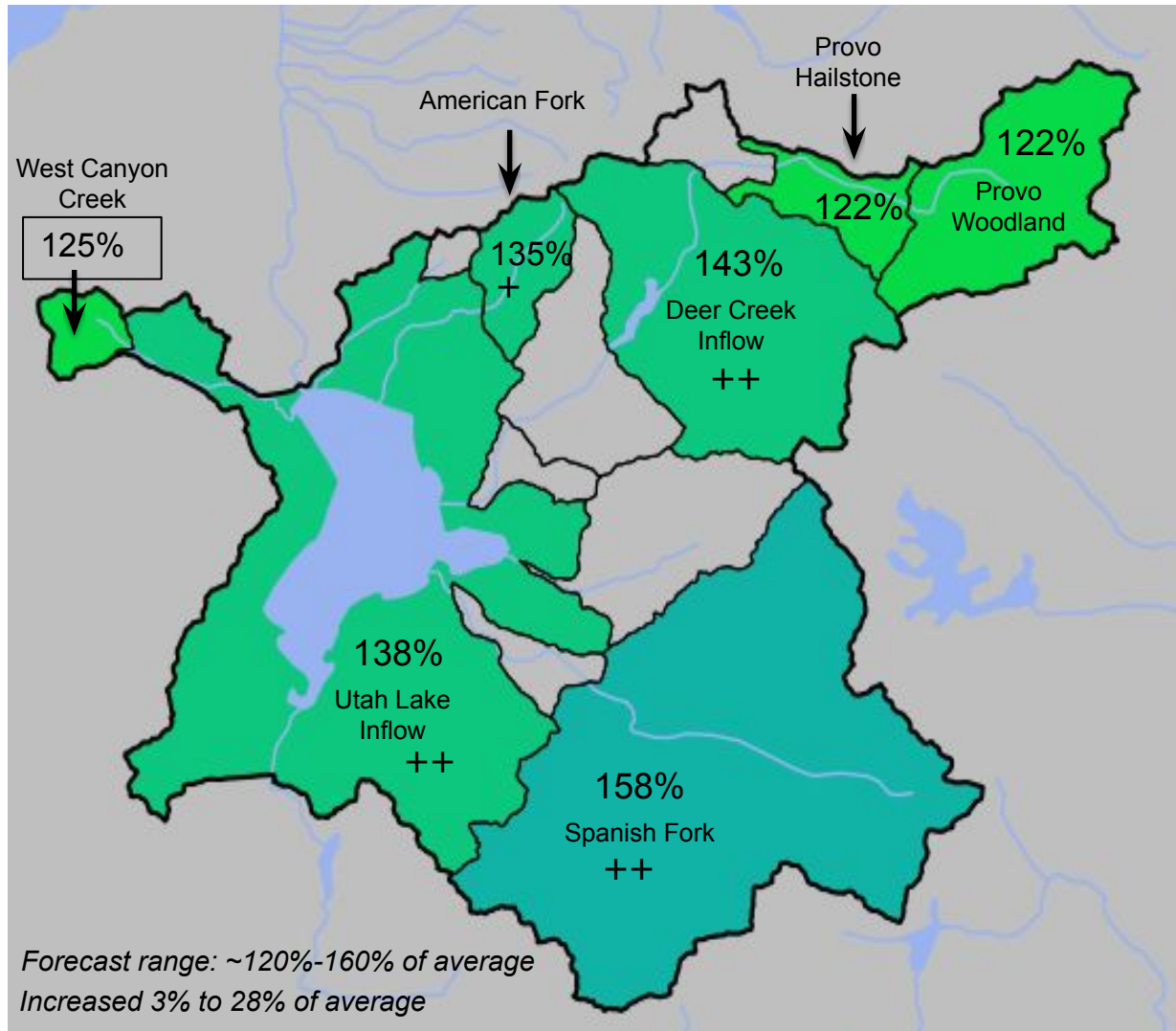


37% increase in volume form March 1 to April 1 forecast - rating change

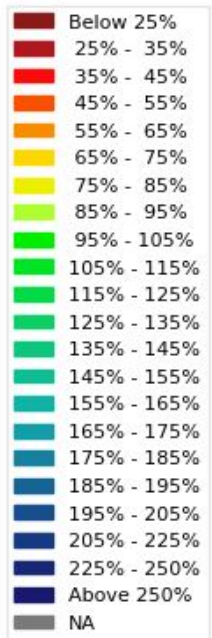
# April 1<sup>st</sup> Water Supply Forecasts – Provo River/Utah Lake

Median  
Basin  
Forecast:

Jan - 70%  
Feb - 100%  
Mar - 125%  
Apr - 135%



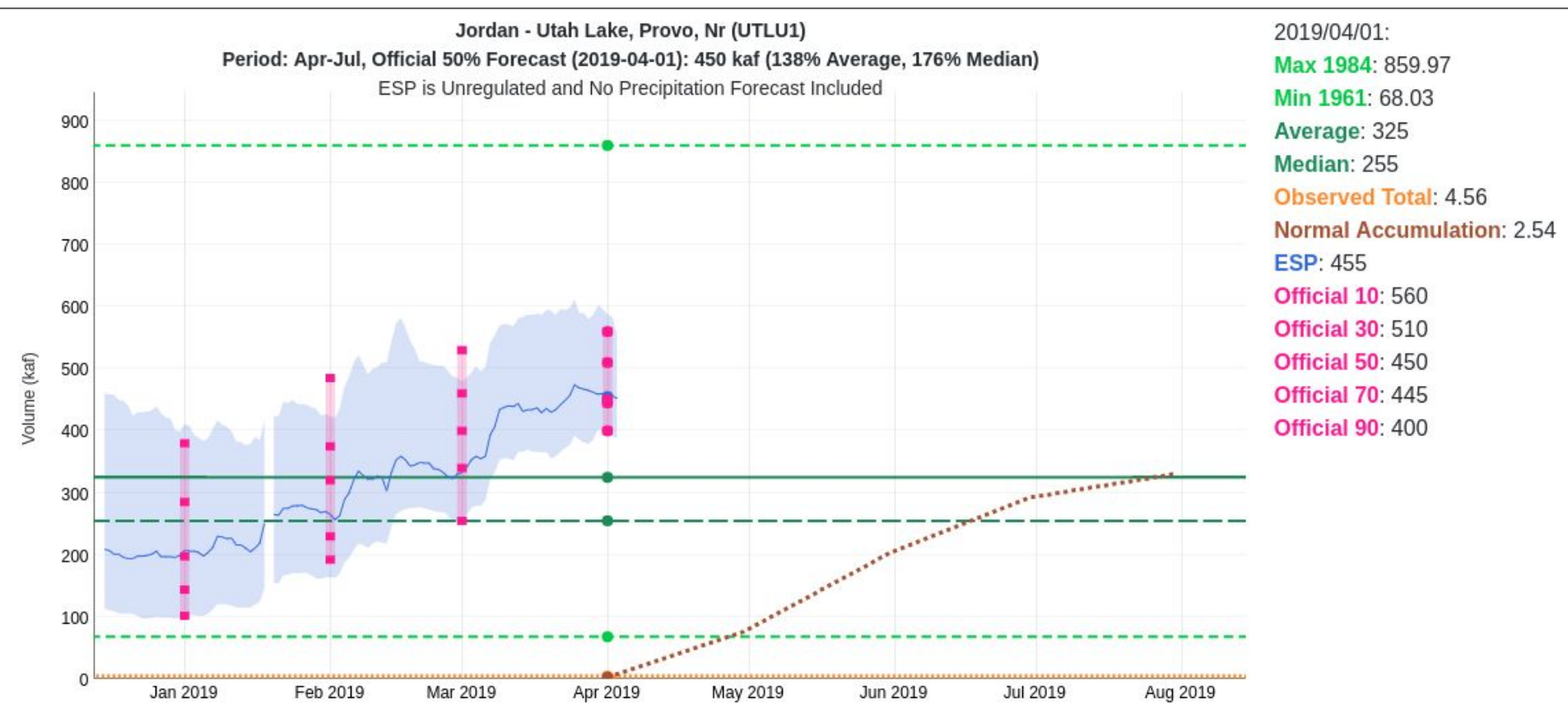
April-July  
Forecast  
Streamflow Volumes  
(% of 1981-2010 average)





# Forecast Evolution Plot

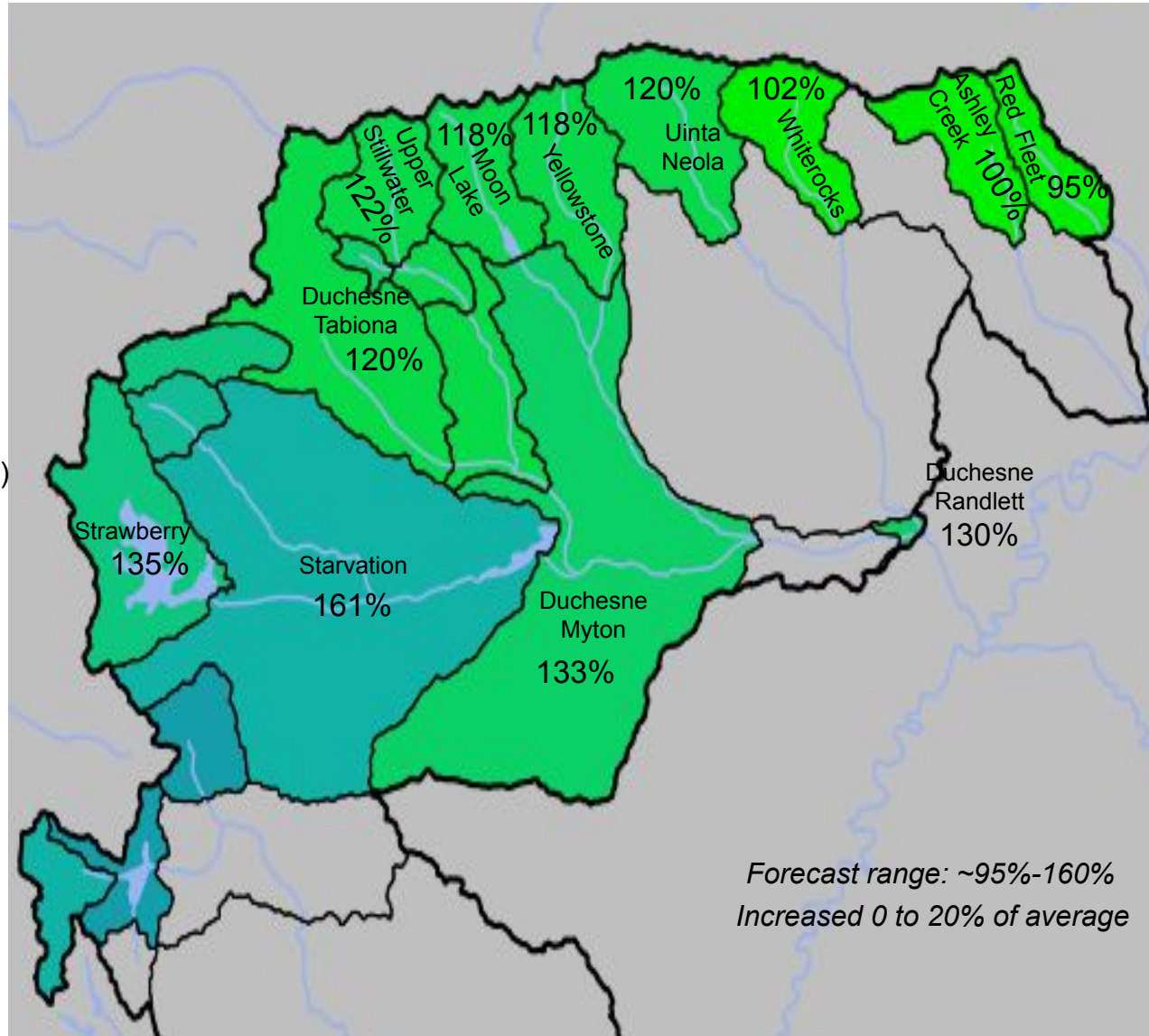
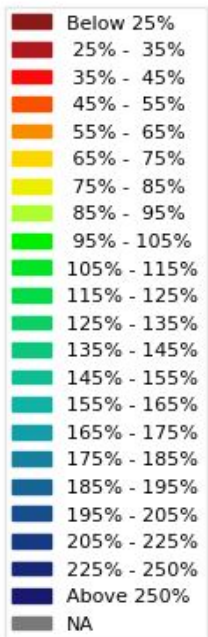
Utah Lake: 450 kaf / 138%



12.5% increase in volume form March 1 to April 1 forecast

# April 1<sup>st</sup> Water Supply Forecasts – Duchesne

April-July  
Forecast  
Streamflow Volumes  
(% of 1981-2010 average)



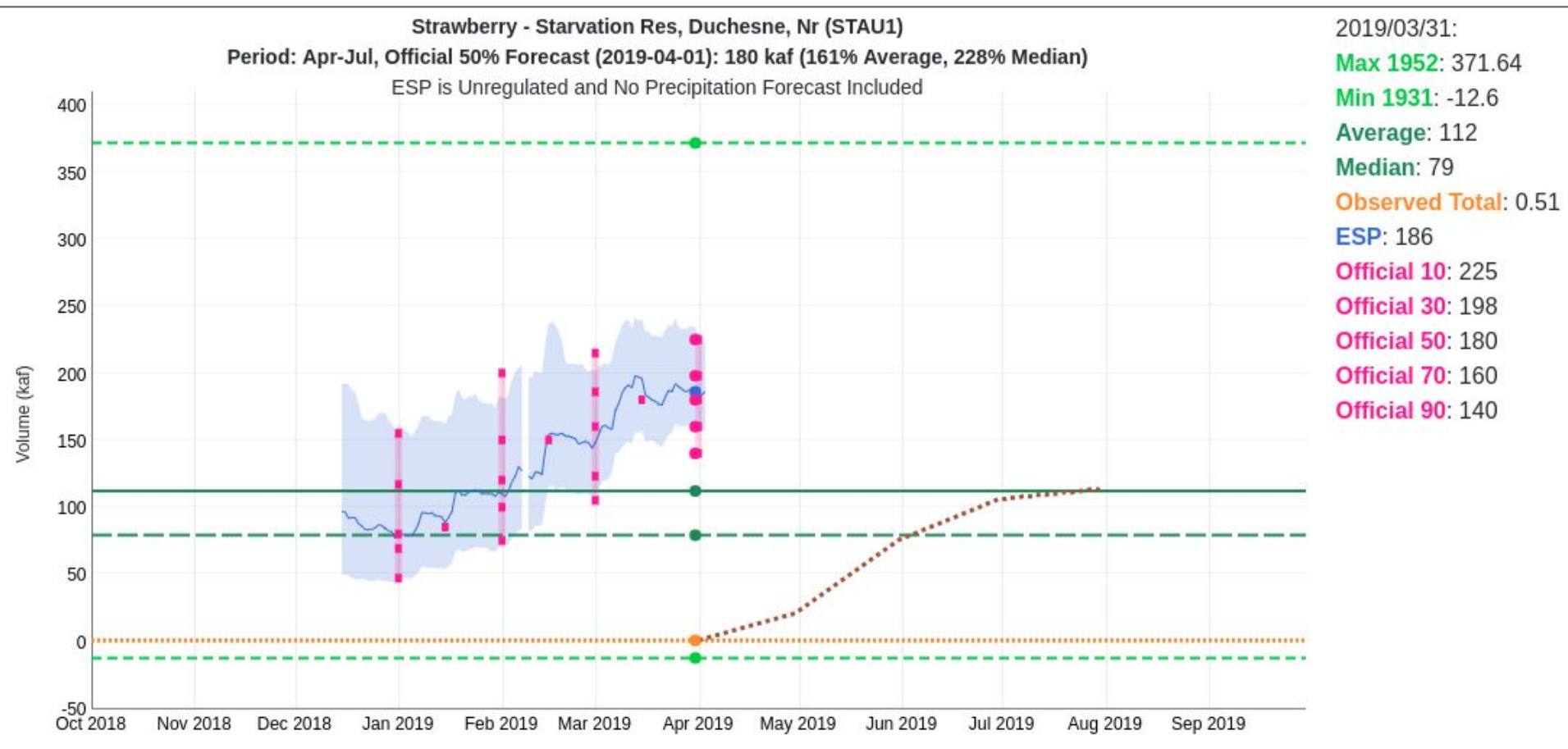
*Forecast range: ~95%-160%  
Increased 0 to 20% of average*

Median  
Basin  
Forecast:

Jan - 75%  
Feb - 100%  
Mar - 115%  
Apr - 120%

# Forecast Evolution Plot

Starvation: 180 kaf / 161%



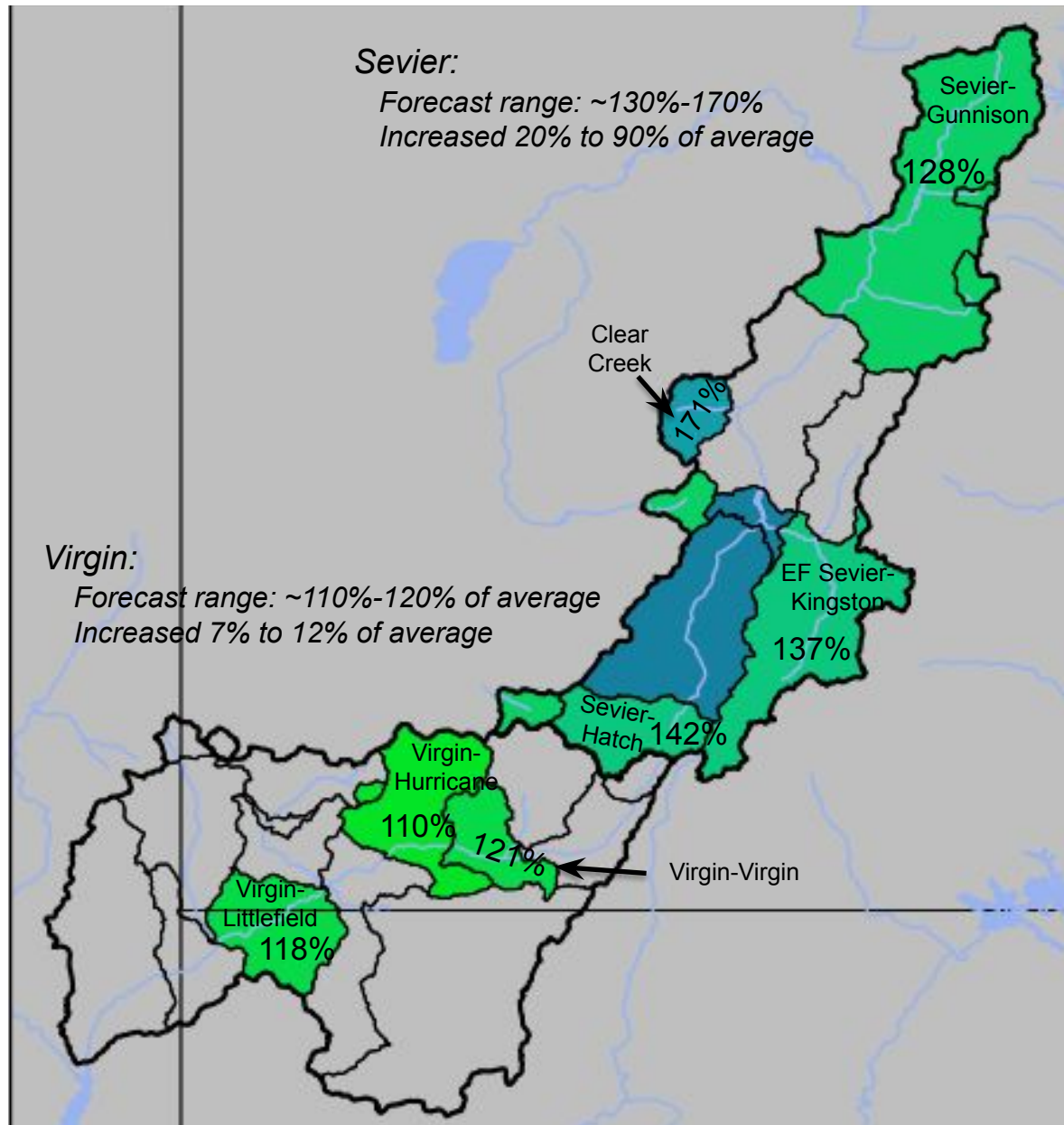
12.5% increase in volume form March 1 to April 1 forecast - captured by mid month update

# April 1<sup>st</sup> Water Supply Forecasts – Sevier/Virgin

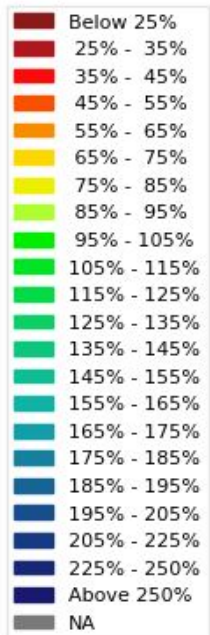
Median  
Basin  
Forecast:

Sevier:  
Jan - 60%  
Feb - 90%  
Mar - 130%  
Apr - 135%

Virgin:  
Jan - 50%  
Feb - 80%  
Mar - 110%  
Apr - 115%

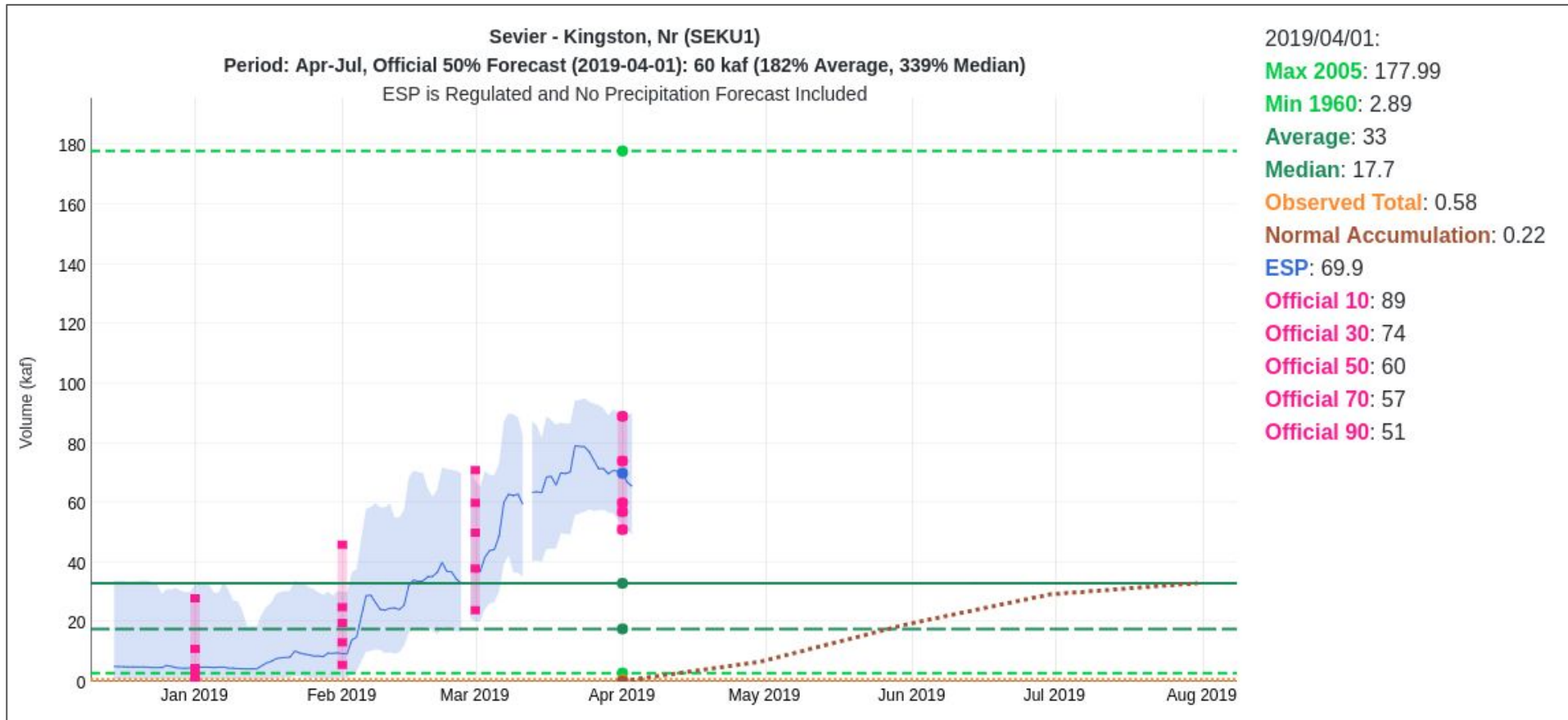


April-July  
Forecast  
Streamflow Volumes  
(% of 1981-2010 average)



# Forecast Evolution Plot

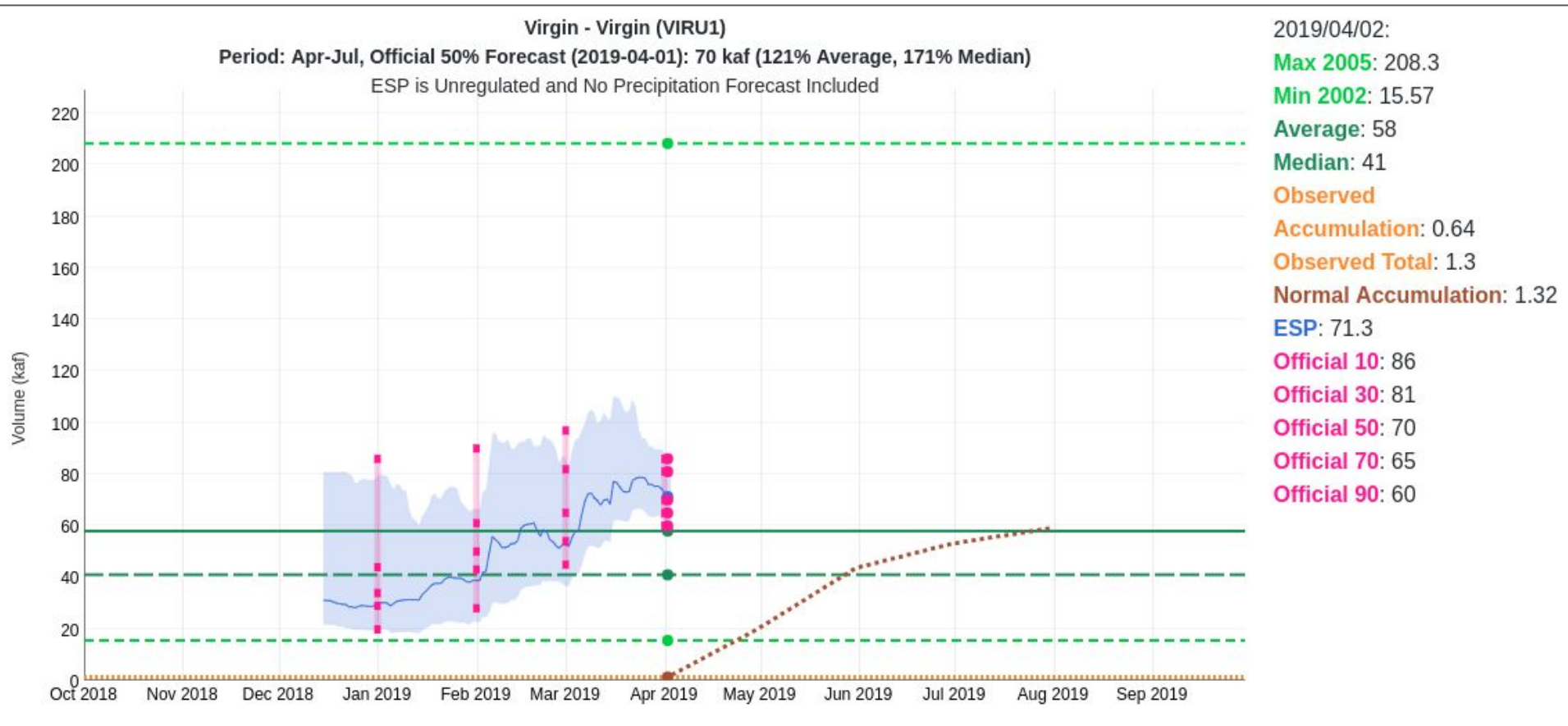
## Sevier Kingston: 60 kaf / 182%



20% increase in volume form March 1 to April 1 forecast

# Forecast Evolution Plot

## Virgin at Virgin: 70 kaf / 121%



8% increase in volume form March 1 to April 1 forecast

# Forecast Validation: Historical model error March to April

## Historical Model Error 1981-2010

Generally a 5% better forecast on April 1st over March 1st  
Forecasts are better than just going with average  
Error continues to decrease each month into the spring

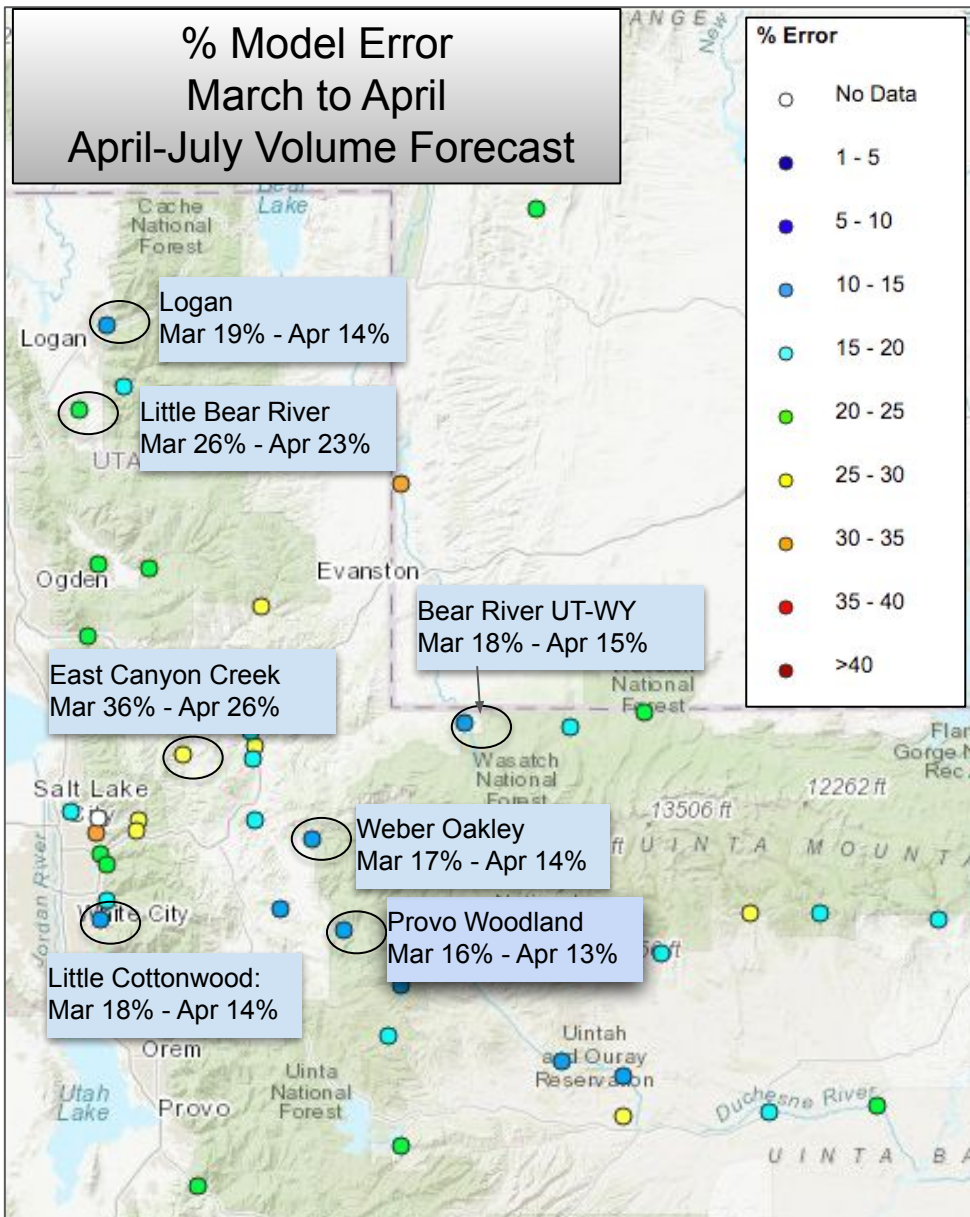
Where We Do Better:  
Headwaters  
Primarily snow melt basins  
Known diversions / demands

Where We Do Worse:  
Lower elevations (rain or early melt)  
Downstream of diversions / irrigation  
Little is known about diversions / demands

Map is available at:  
<https://www.cbrfc.noaa.gov/arc/verif/verif.php>

From Water Supply drop down menu  
→ select Historical Verification Map

## Historical Water Supply Verification - April



# Peak flow / Flood Potential Update

**COLORADO BASIN RIVER FORECAST CENTER**  
 NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME RIVERS SNOW WATER SUPPLY RESERVOIRS WEATHER CLIMATE HELP ABOUT NEWS SEARCH

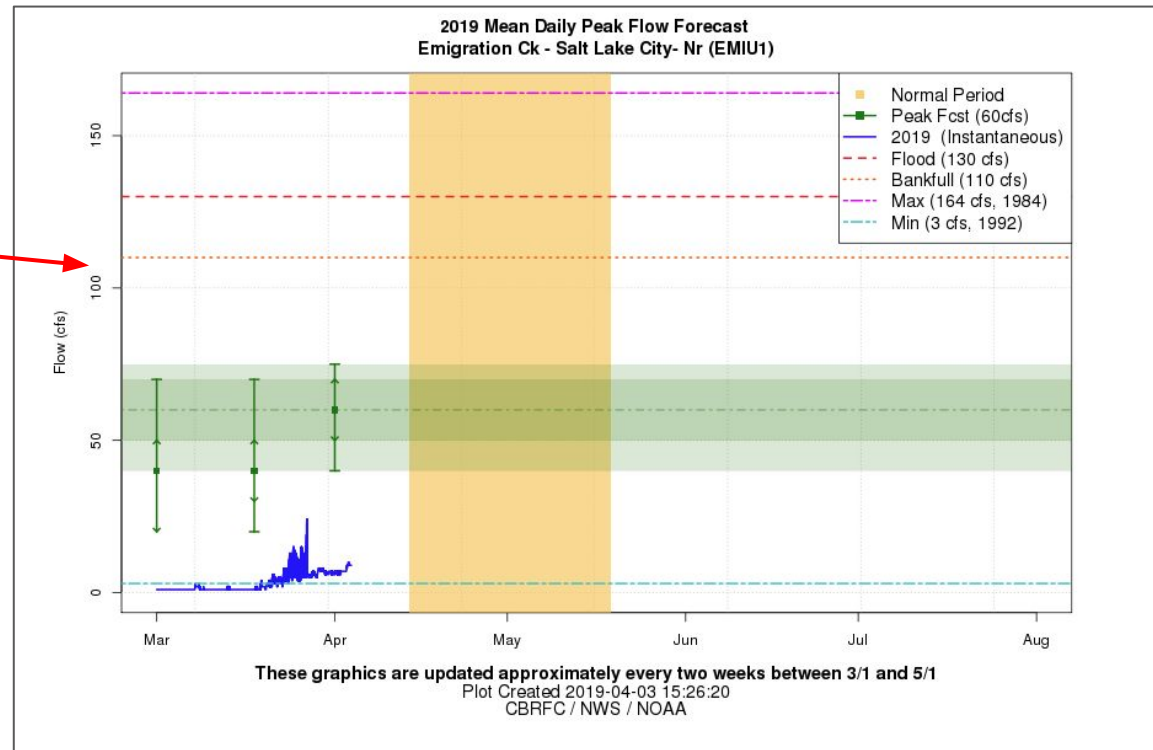
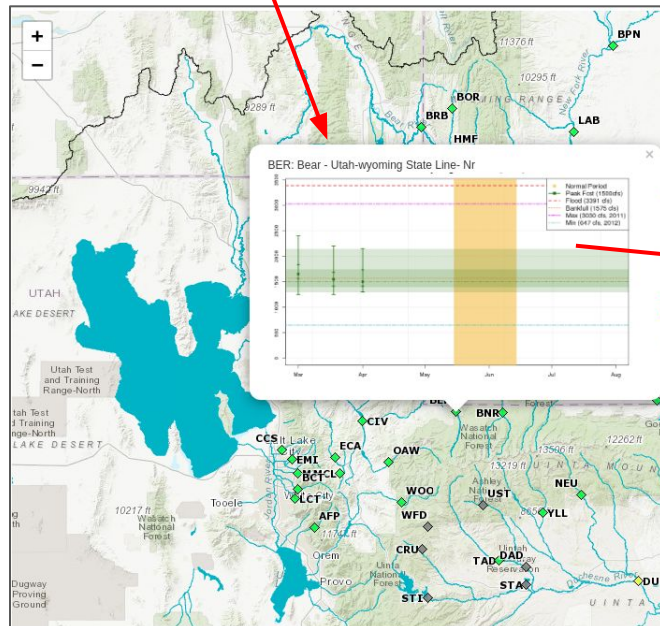
News Water Supply Webinars [More Info...](#)

- Conditions Map
- Conditions List
- Peak Flow Map
- Peak Flow List
- Peak Flow Archive
- Recreational Forecasts
- Text Products
- Internal Text Products
- 5 Day Flood Outlook
- Hydro Data
- AHPS

**River Conditions**  
 Data Updated: 04/04/16Z [Help](#)

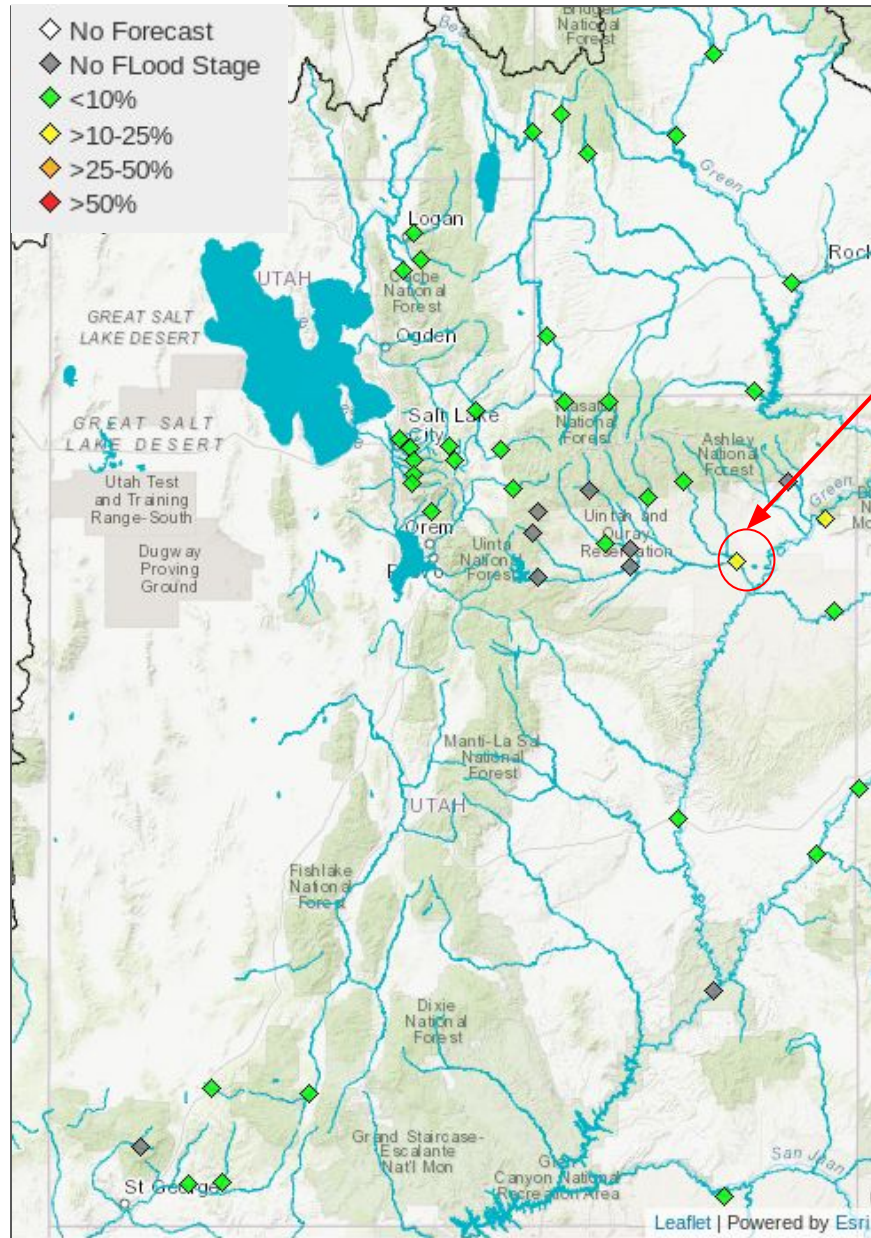
Show [Hide Other Types](#)

- Data
- Forecast
- Reservoir Inflow
- Reservoir Outflow
- Official Flood
- Active





# Current Peak Flow Flood Probability



- Currently no points forecast to reach flood stage
- Some sites have forecast instantaneous peaks close to flood stage at the 10% level.
- Duchesne (Randlett) has a slightly greater than 10% chance of reaching flood stage
- Current rankings of the 50% peaks fall in the 50th to 75th range.
- Many 10% peaks fall in the 85th to 95th percentile range.
- The next 4-6 weeks will determine how the high water / flood potential threat will play out.
- Combination of snowpack levels and probable delayed melt could increase flood potential
- Prolonged sprint warm-up or rain events can cause flooding issues in any year

# 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 MEAN DAILY PEAK FLOW RANKING INFORMATION

#### Emigration Ck - Salt Lake City

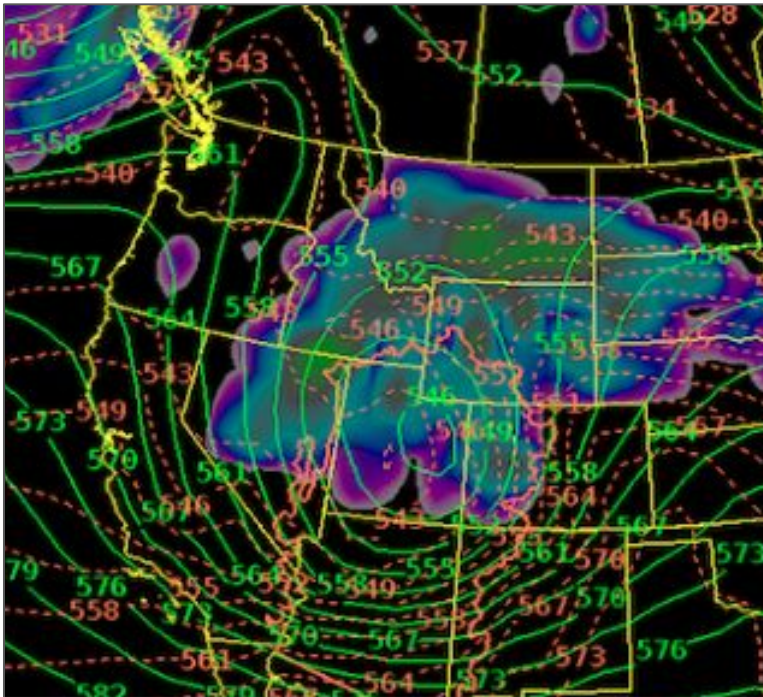
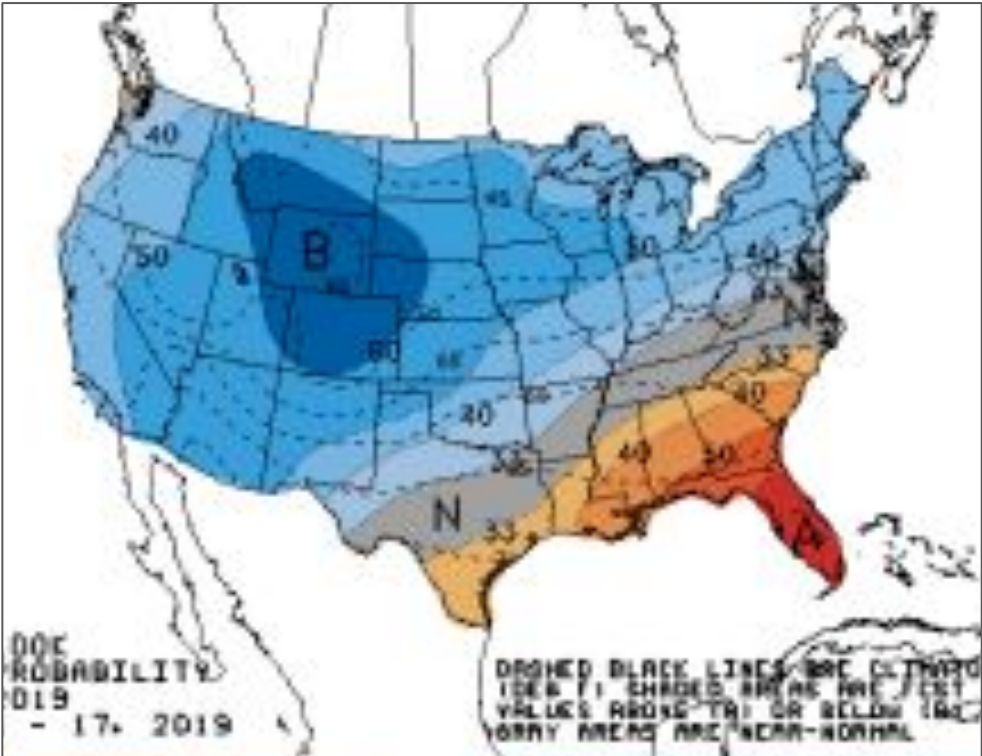
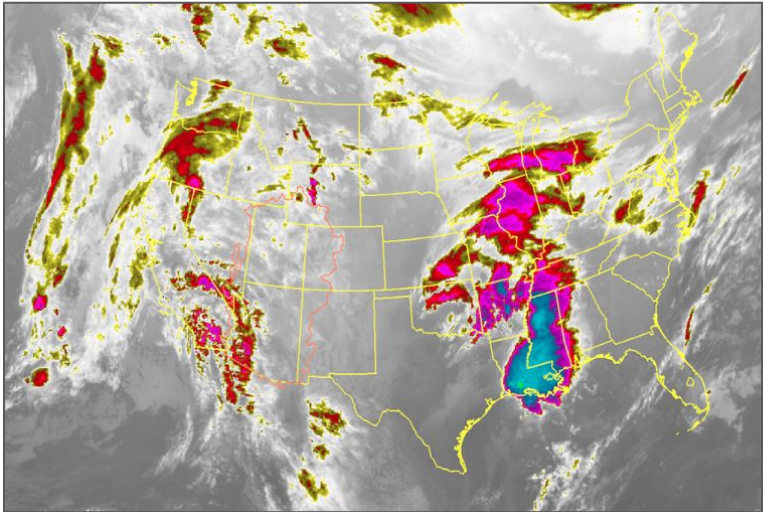
4/1/2019	FLOW (CFS)	RANK/ #YRS	PERCENTILE
<b>FCST 90</b>	40	23 / 40	57
<b>FCST 75</b>	50	26 / 40	64
<b>FCST 50</b>	60	33 / 40	82
<b>FCST 25</b>	70	33 / 40	82
<b>FCST 10</b>	75	33 / 40	82
<b>BANKFULL</b>	110	38 / 40	95
<b>FLOOD</b>	130	38 / 40	95
<b>MAX</b>	164	1984	

#### Provo - Woodland

4/1/2019	FLOW (CFS)	RANK/ #YRS	PERCENTILE
<b>FCST 90</b>	1450	20 / 57	34
<b>FCST 75</b>	1650	26 / 57	45
<b>FCST 50</b>	1950	40 / 57	70
<b>FCST 25</b>	2150	45 / 57	79
<b>FCST 10</b>	2700	56 / 57	98
<b>BANKFULL</b>	1950	40 / 57	70
<b>FLOOD</b>	3250	57 / 57	100
<b>MAX</b>	2820	2010	

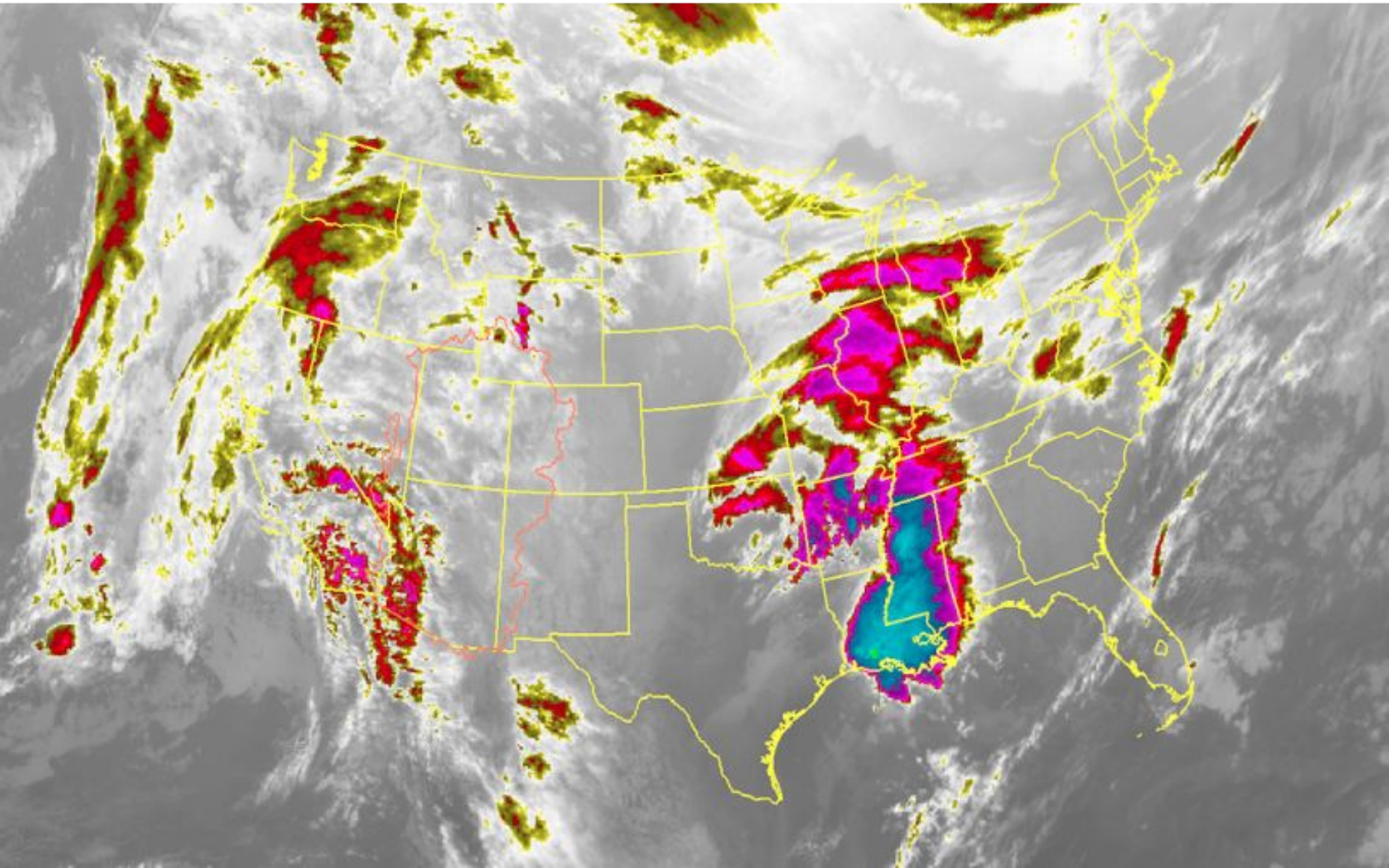
# Upcoming Weather Summary

- Several Storm Systems are set up to impact Utah and the Great Basin in April.
- Temperatures will be cooler than normal.



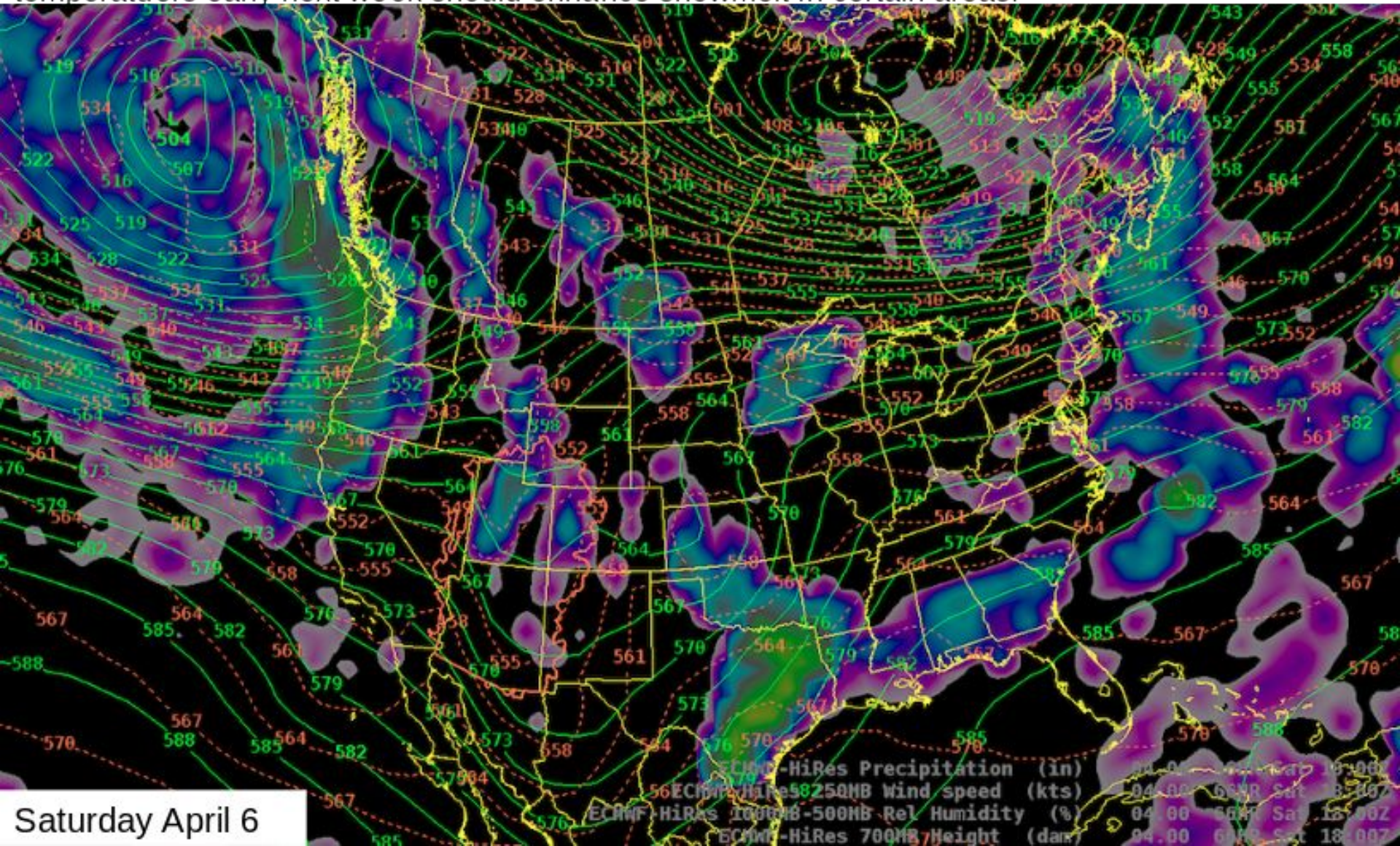
This morning – Satellite image from this morning

In between storm systems today and Friday



# Upcoming Weather – Weak storm system Saturday

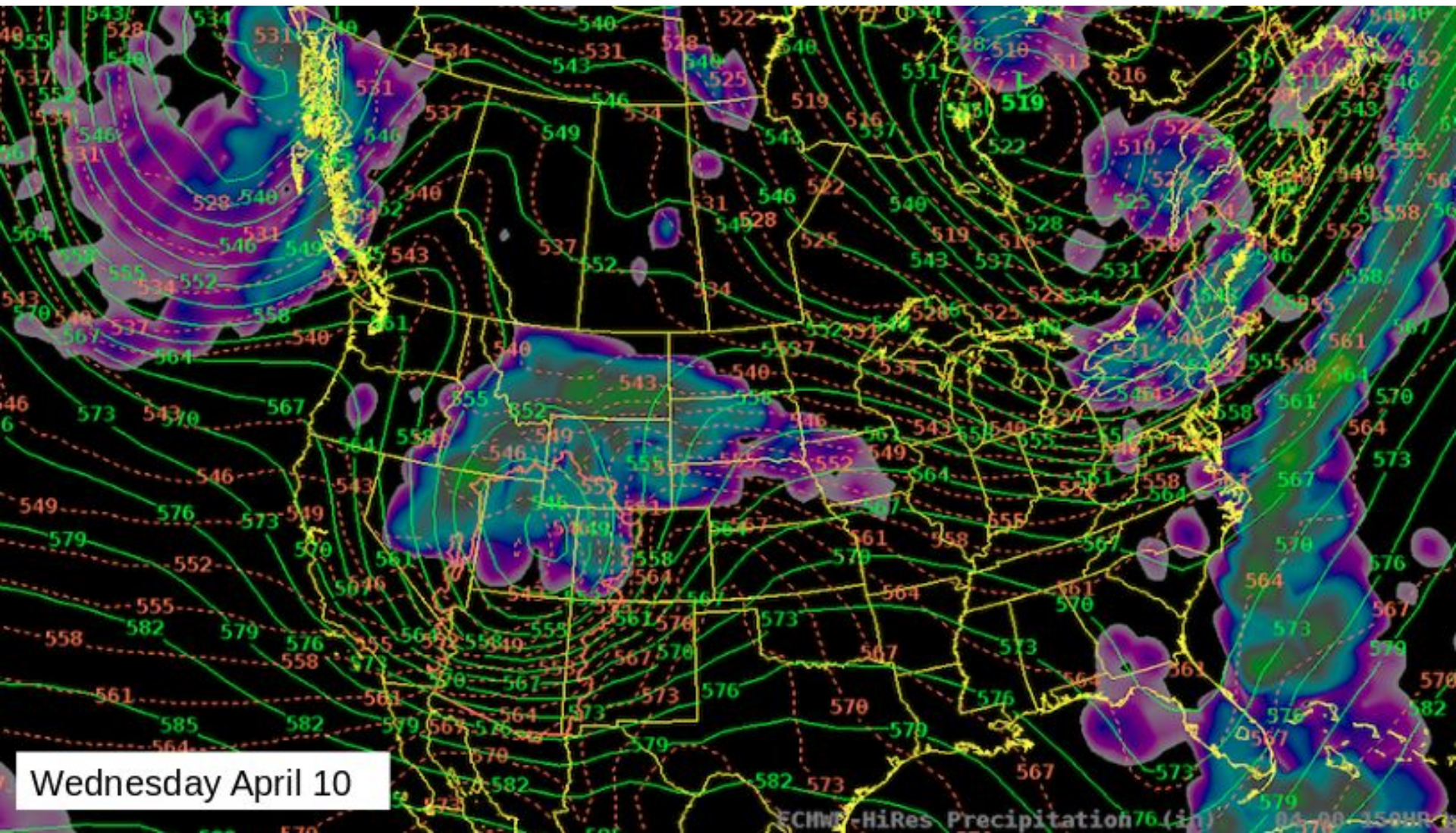
Splitting storm system moving through the northern Great and Colorado River Basins. Precipitation amounts should be generally light, upwards to .75 northern mountains. Ridge and warmer temperatures early next week should enhance snowmelt in certain areas.



Saturday April 6

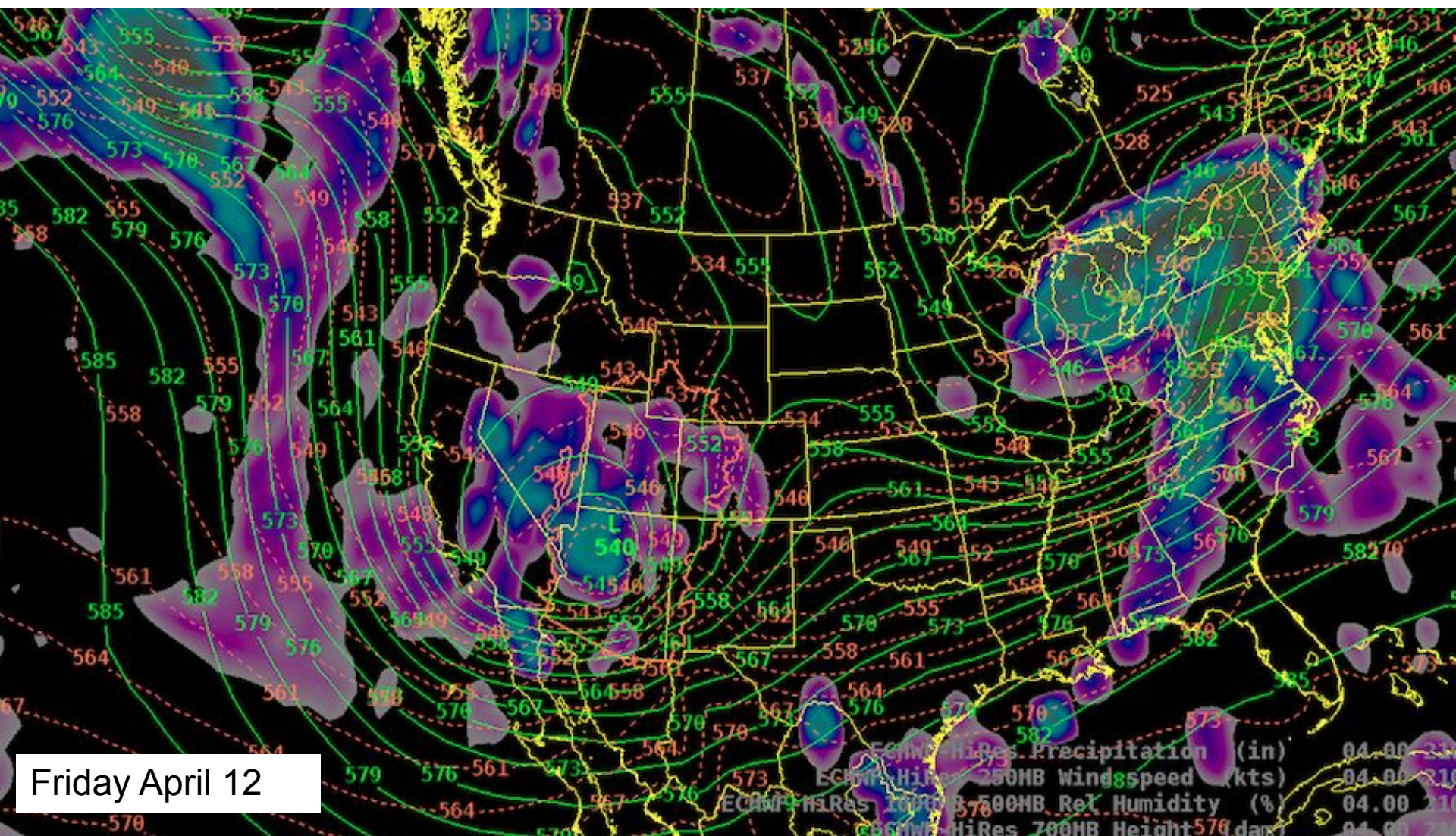
# Upcoming Weather – Early next week (Tue-Thu)

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 – 2<sup>nd</sup> weekend of April (12<sup>th</sup>-13<sup>th</sup>)

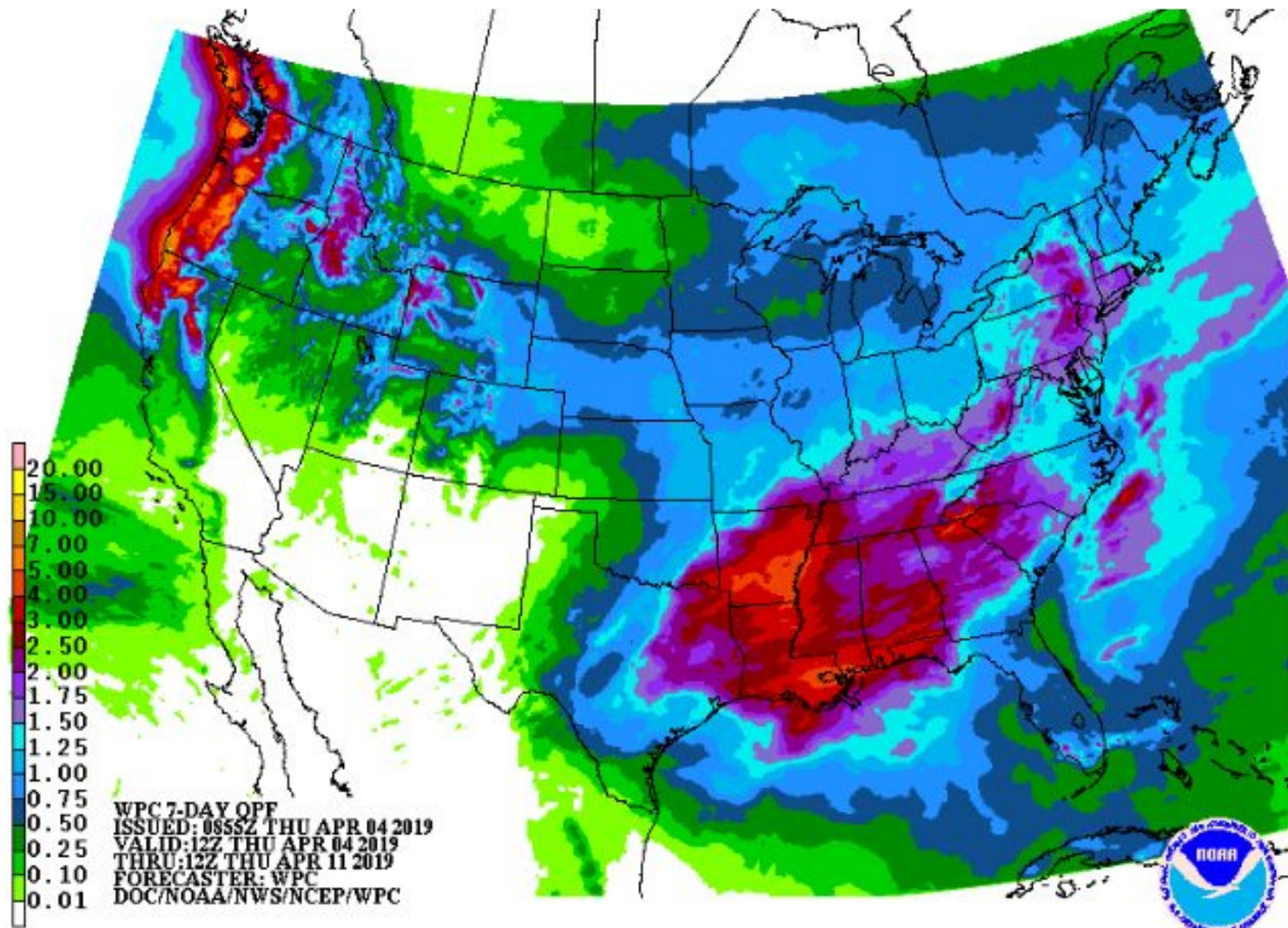
Models are becoming more consistent with the idea of a large closed low pressure system moving through the southern part of the forecast area. Confidence is low considering the long lead time. Potentially a good precipitation producer for southern Utah Basins.



Friday April 12

# Precipitation Outlook – Next 7 Days

Weather Prediction Center  
Precipitation Outlook April 4<sup>th</sup> – April 11<sup>th</sup>





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

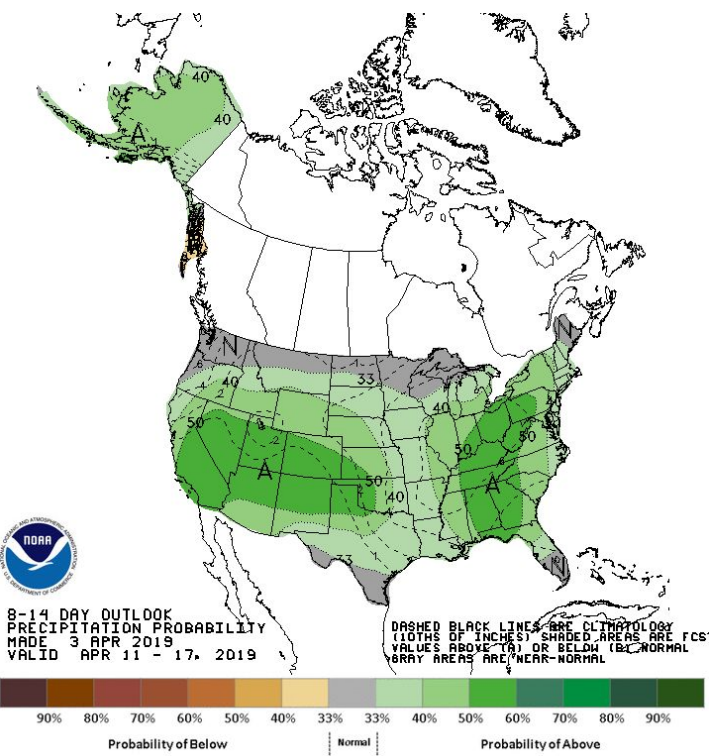
Pattern is trending wetter/cooler for the first half of April. Not as wet as the previous couple of months.

Periodic warming between storms will ripen snowpacks and slowly increase snowmelt.

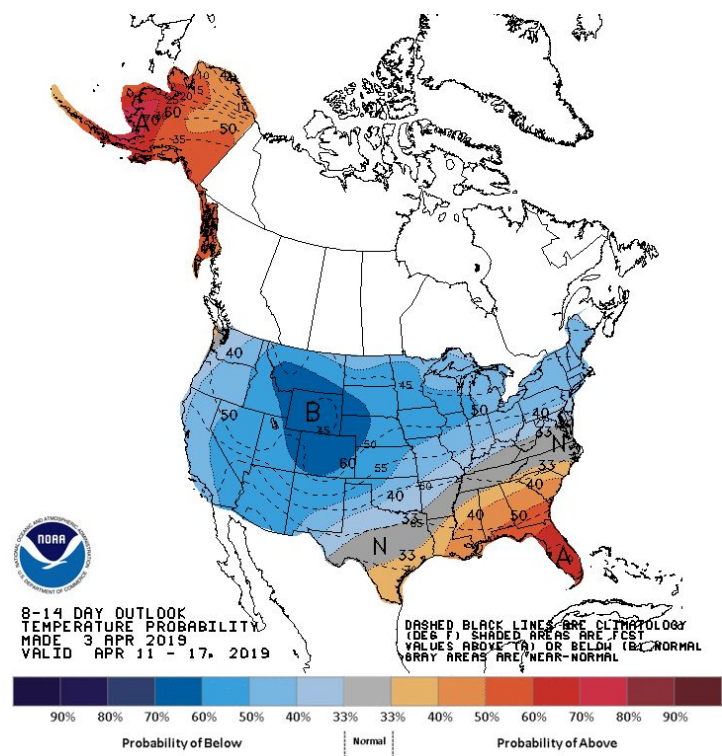
Next 2 weeks: Precipitation should be near to above average and temperatures below average in the Great Basin. Some increase to high elevation snowpack is probable.

Impacts to Water Supply Volume Forecasts – Less dramatic changes in the trends between now and mid April. Cooler temperatures and the possibility for some increases in snowpack can delay melt into May. Peak flows may increase.

April 11-17



April 11-17



# 2019 Water Supply Briefing Schedule

**2019 monthly water supply briefings for the Great Basin/Utah**

**Tuesday May 7<sup>th</sup> @ 1:30 pm MT**

**Colorado Basin webinars are same dates at 11:00 am MT.**

**Additional webinar will be scheduled for 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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Basin Focal Points (Forecasters)

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Patrick Kormos – Bear, Weber Focal Point

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Greg Smith – San Juan, Gunnison, Dolores Focal Point

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Ashley Nielson – Green River Basin, Lake Powell Focal Point

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Cody Moser – Upper Colorado Mainstem Focal Point

[cody.moser@noaa.gov](mailto:cody.moser@noaa.gov)

Tracy Cox and Zach Finch – Lower Colorado Basin, Virgin Focal Point

[tracy.cox@noaa.gov](mailto:tracy.cox@noaa.gov)

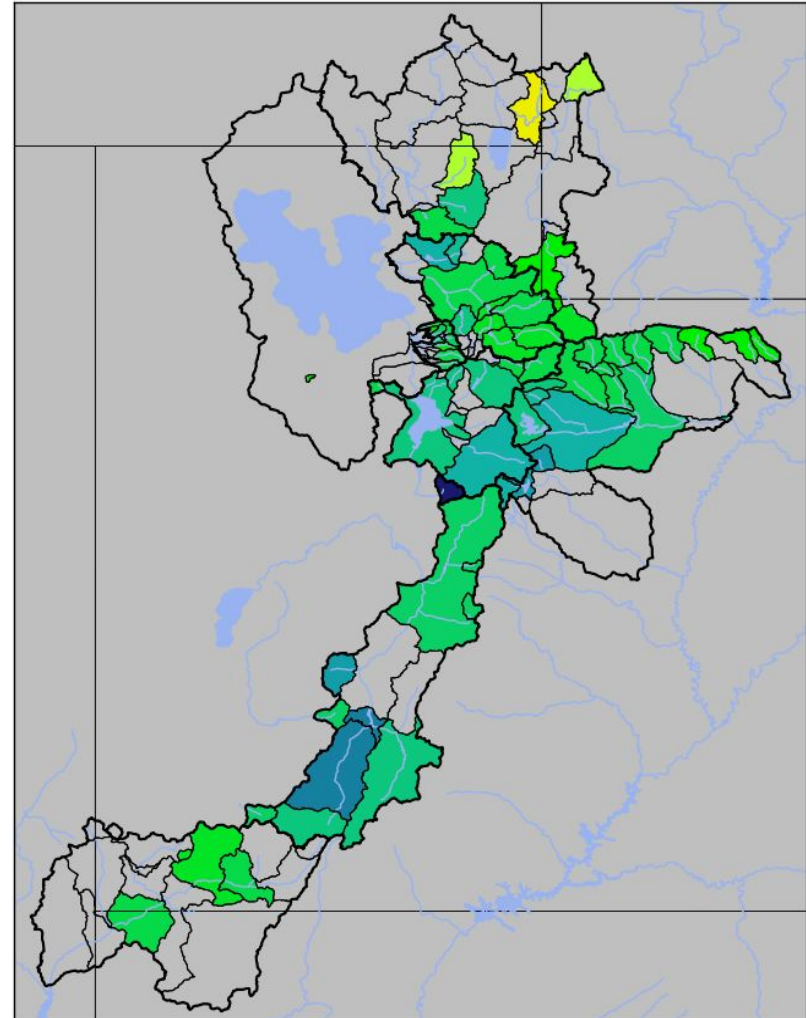
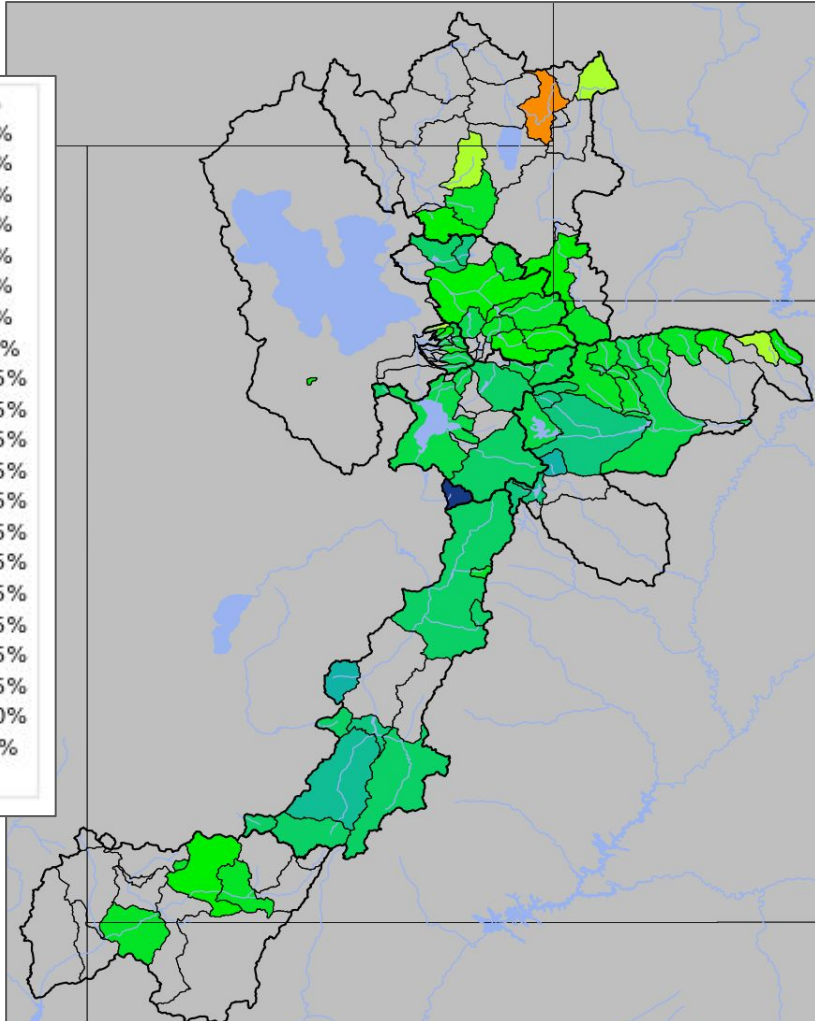
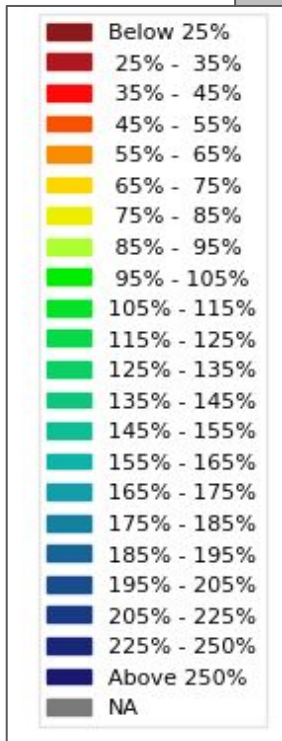
[zach.finch@noaa.gov](mailto:zach.finch@noaa.gov)

# Water Supply Forecasts – Great Basin/Utah

April-July Forecast Streamflow Volumes (% of 1981-2010 average)

March 1<sup>st</sup>

April 1<sup>st</sup>



# Apr 1<sup>st</sup> – 4<sup>th</sup> precipitation

Bear, N. Weber, Duchesne, N. Provo off to a good start.

