CBRFC Forecast Areas

Great Basin
Water Supply Briefing

March 7th, 2019

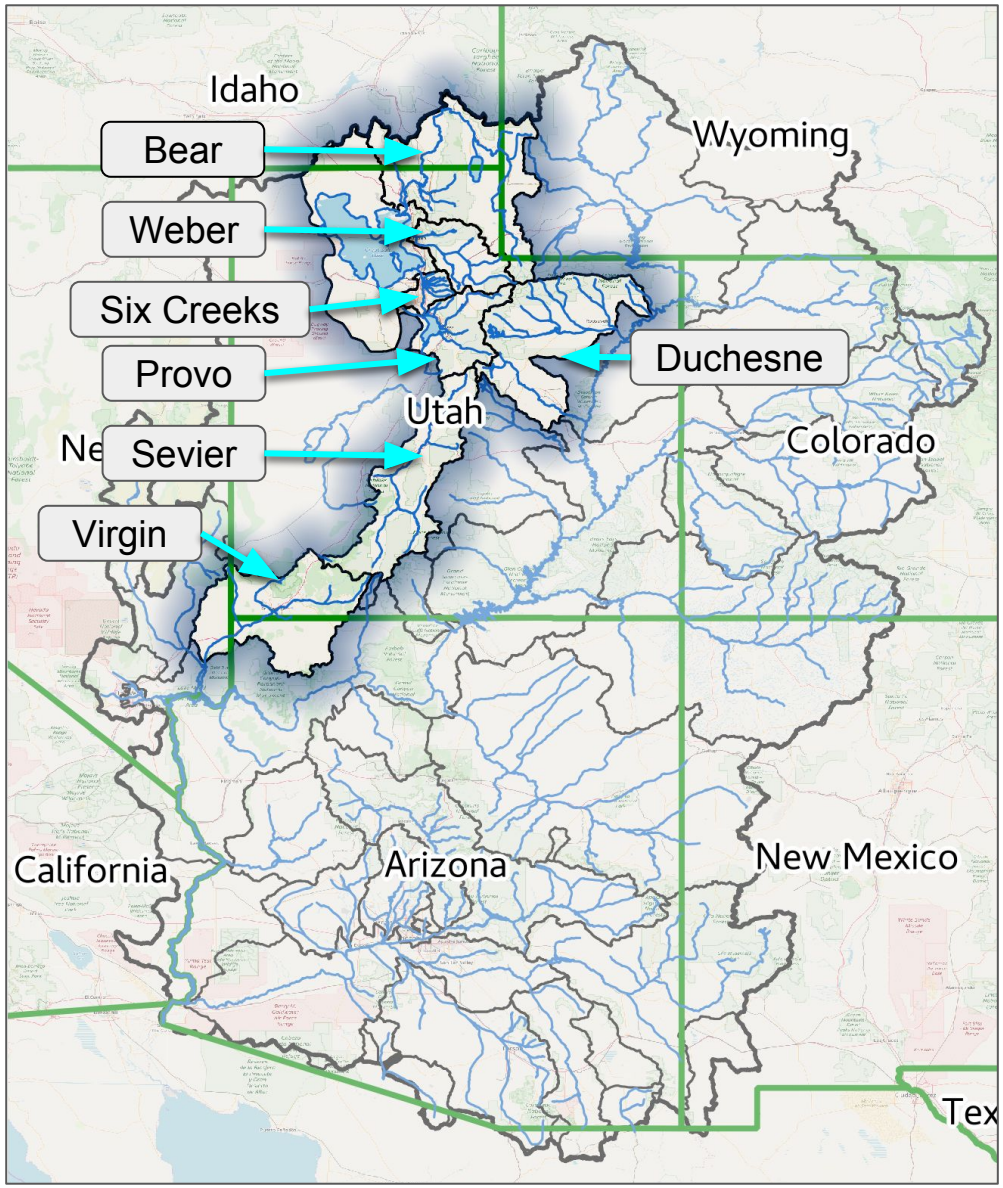
Patrick Kormos - Hydrologist
Greg Smith - Sr. Hydrologist
Brenda Alcorn - Sr. Hydrologist

Colorado Basin River Forecast Center

Phone: 1-877-929-0660

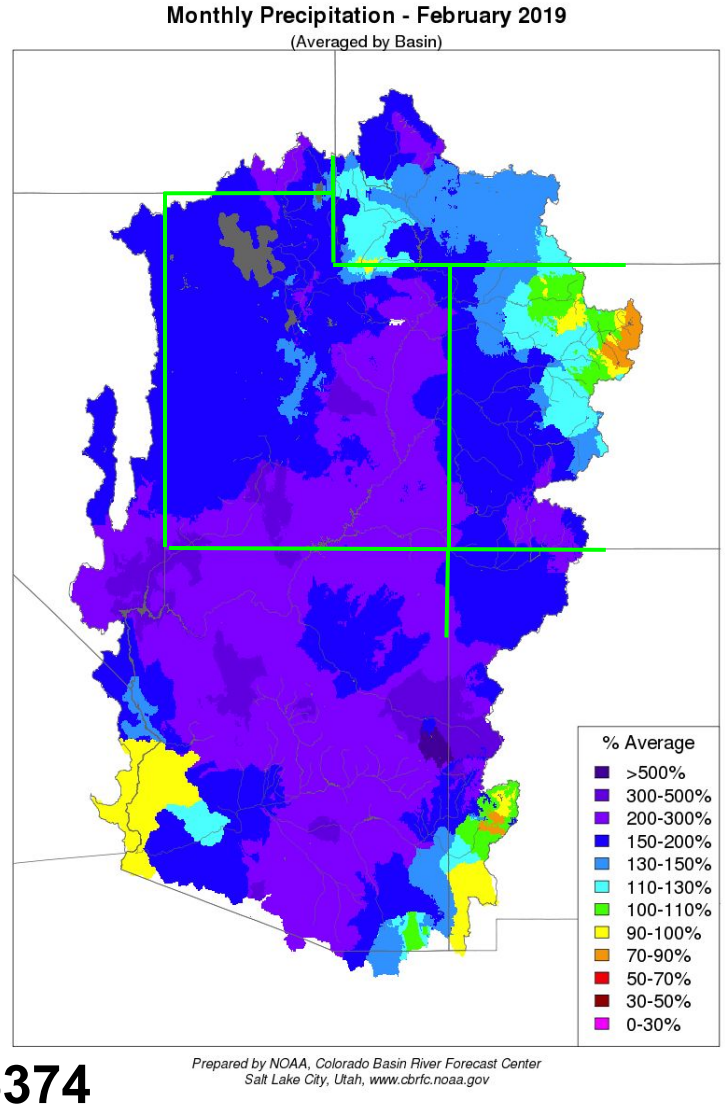
Passcode: 1706374

Please mute your phone until ready to ask questions



Today's Presentation

- Weather review
  - February Precipitation
- Current Snowpack
- 2019 Water Supply Forecasts
- March Forecast Error
- Upcoming Weather
- New Snow Evaluation Tools
- Contacts & Questions

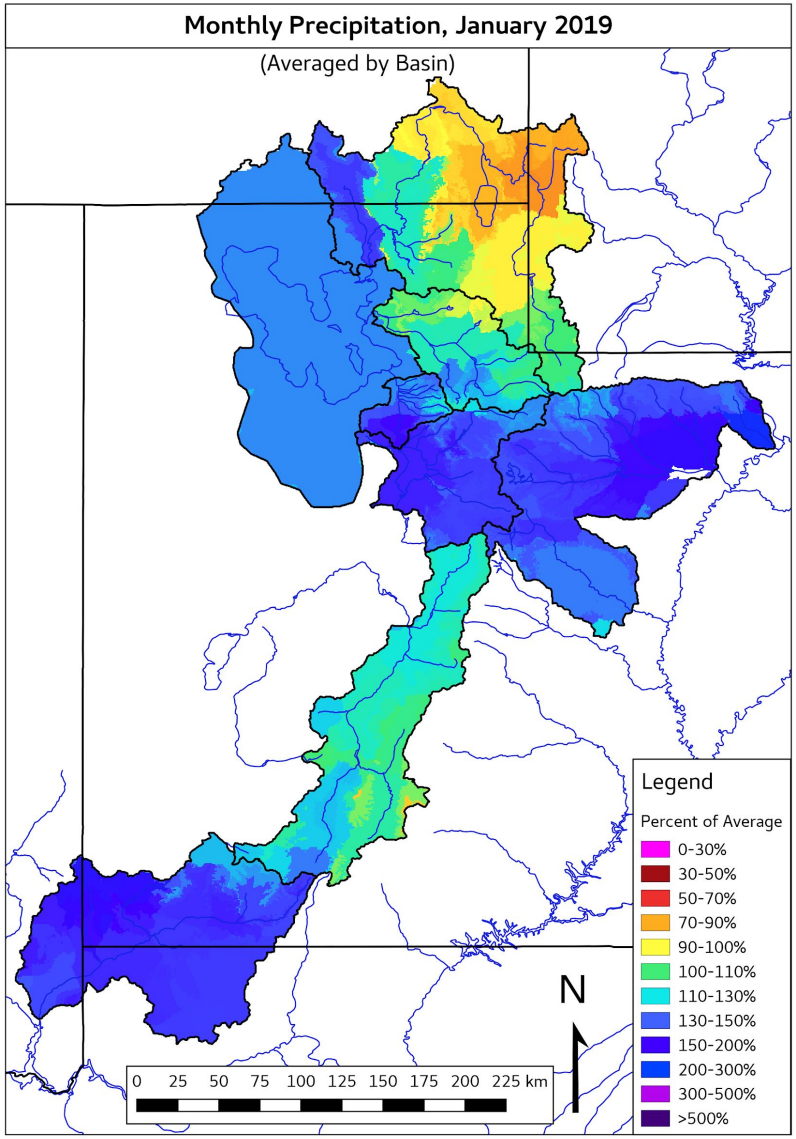


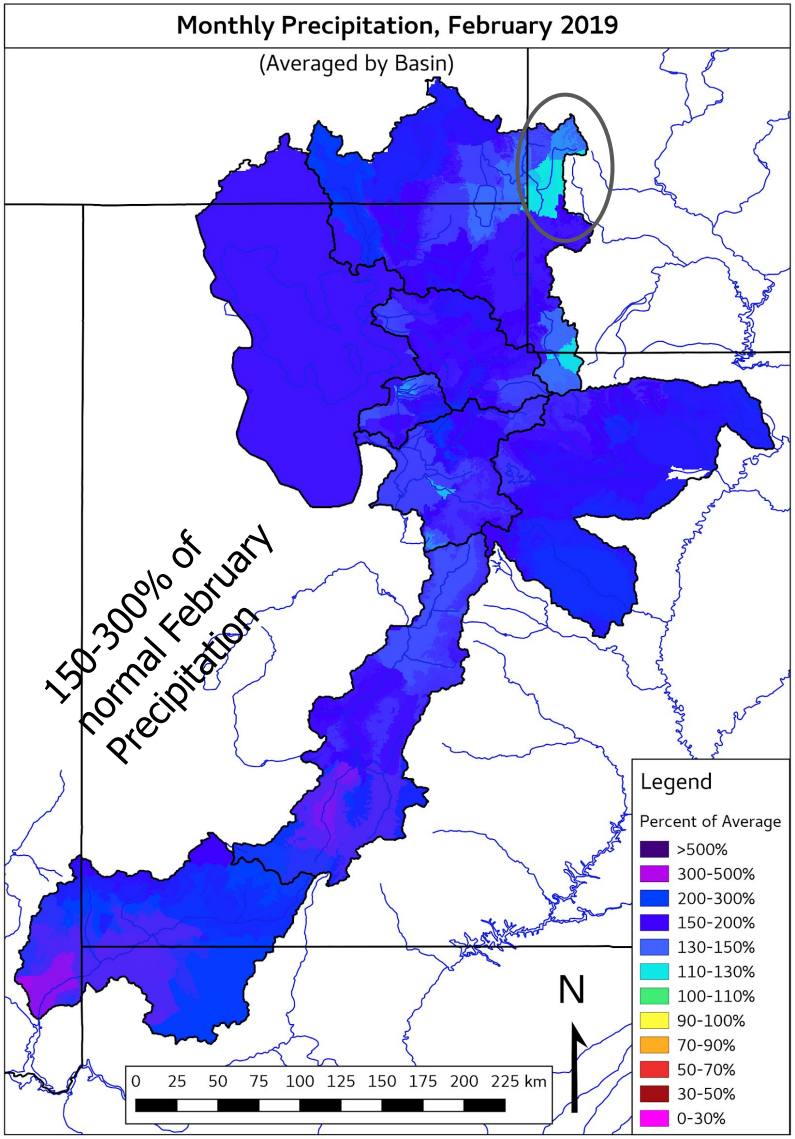
Phone: 1-877-929-0660 Passcode: 1706374

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

January was wet… February was wetter.

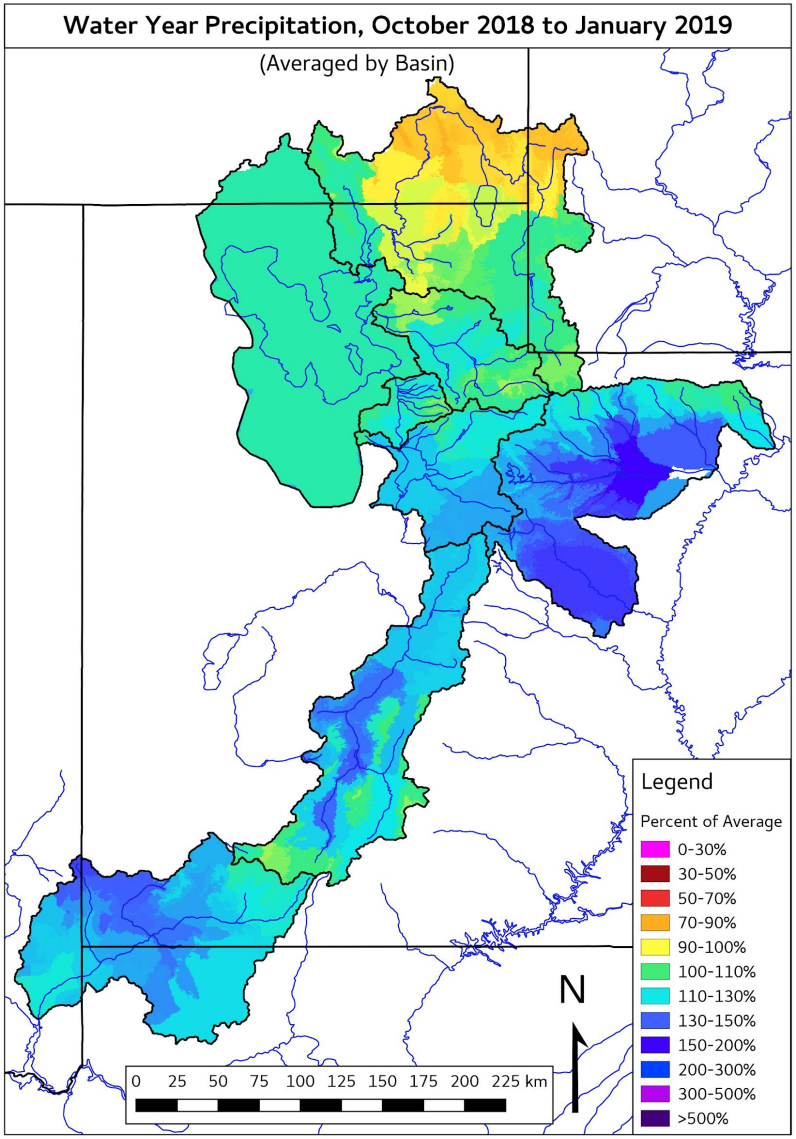
Monthly Precipitation

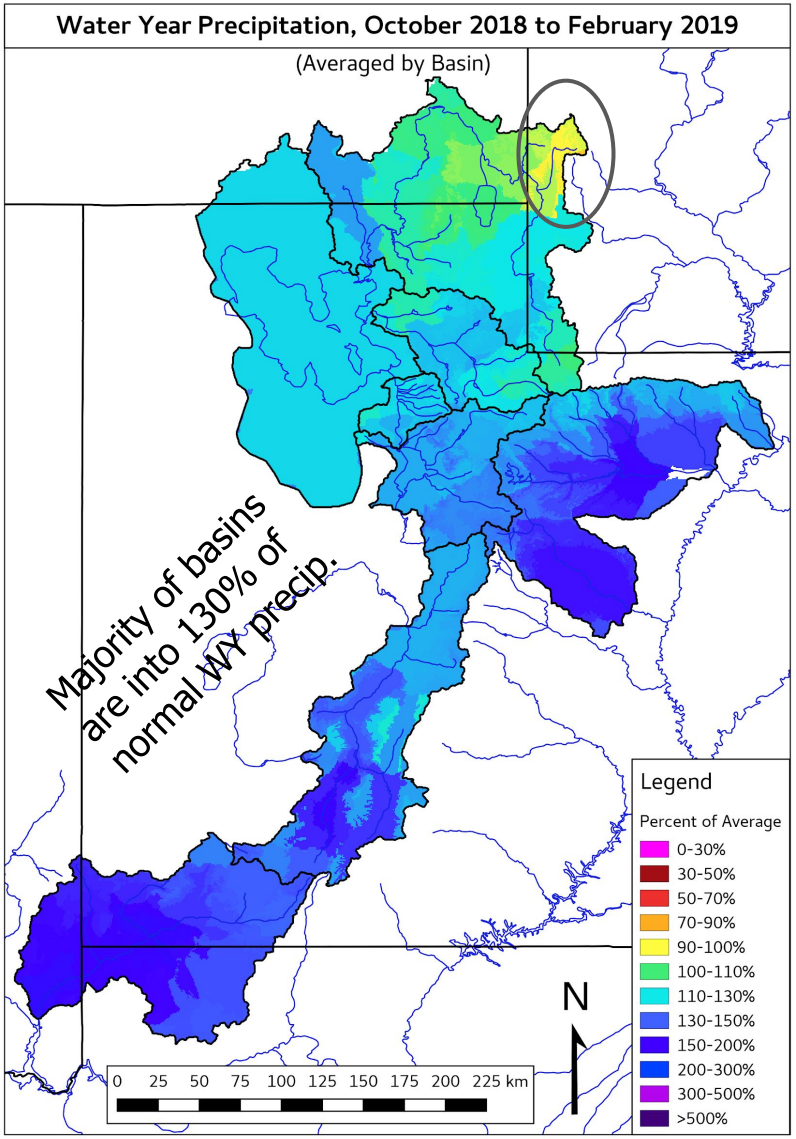




January was wet… February was wetter.

Water Year Precipitation





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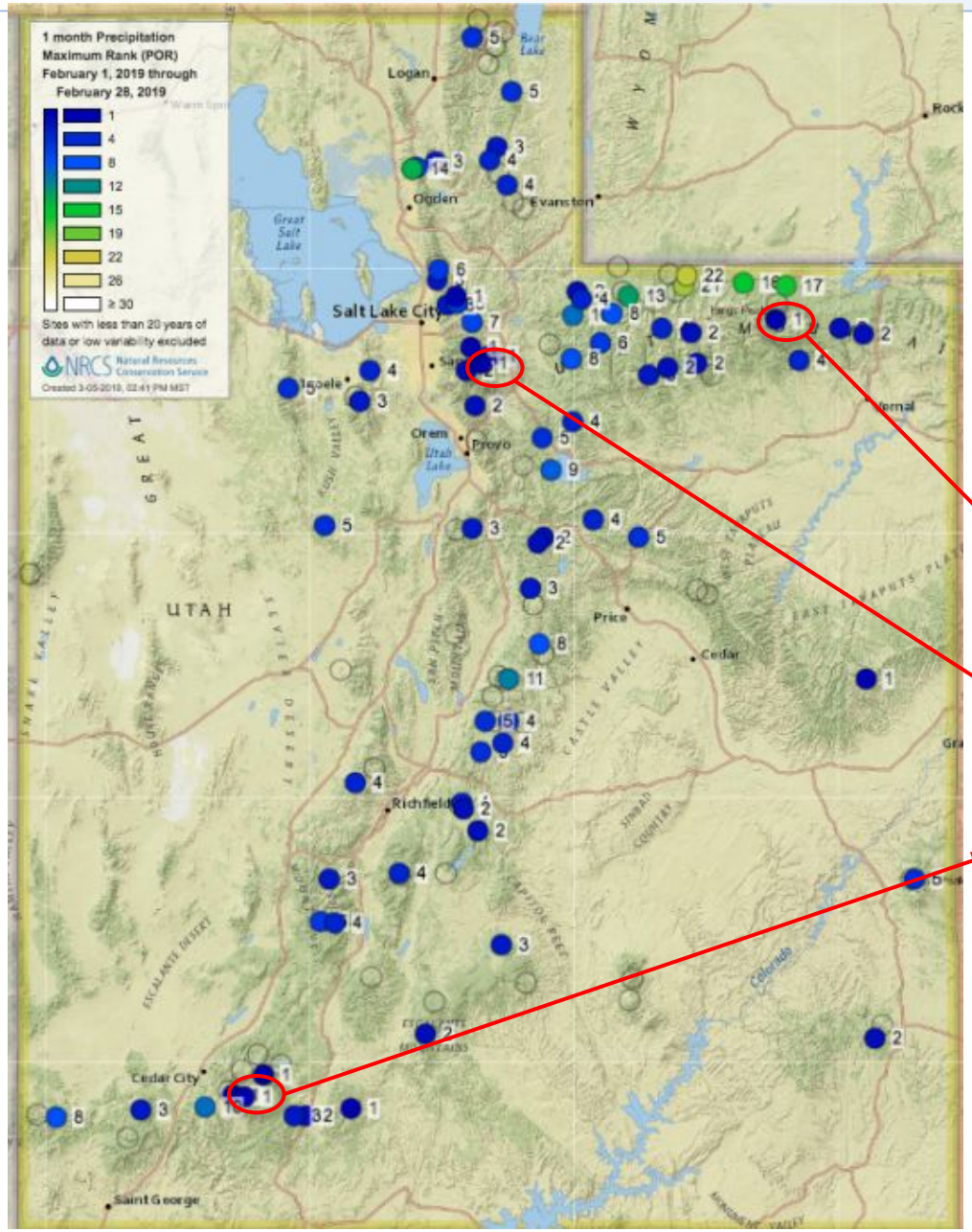


SNOTEL February precipitation rankings (most sites have 30+ years of record):

- Wettest on record at some sites
- Many in top 5 throughout Utah

SNOTEL	FEB 2019 RANK	FEB 2019 PRECIP (IN)	PREVIOUS RECORD
Chepeta (Duchesne)	1 (39 yrs)	5.9	5.8 (1986)
Brighton (Six Cks)	1 (33 yrs)	10.0	8.3 (2017)
Midway Valley (Virgin)	1 (39 yrs)	10.8	9.8 (1993)

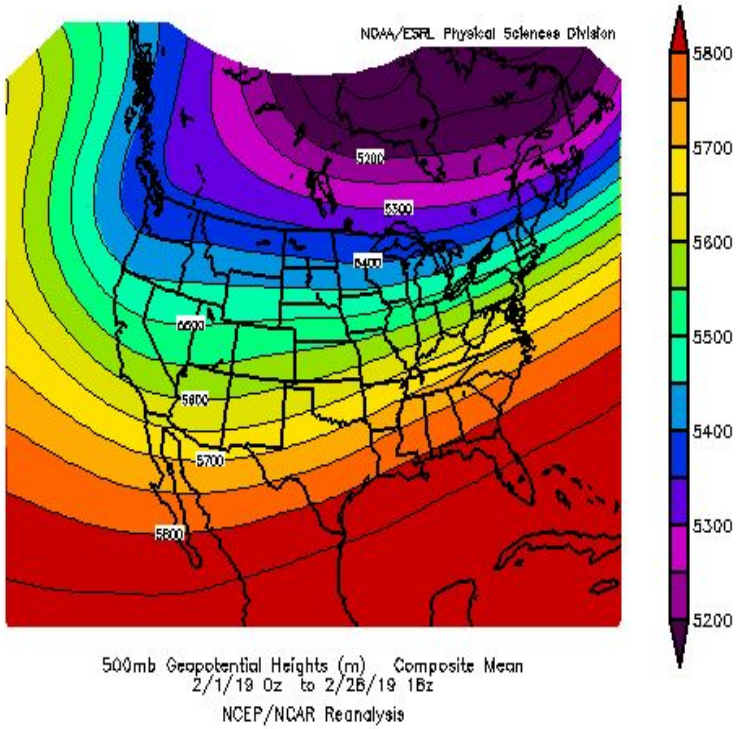
February 2019 Weather Pattern – Why So Wet ?!

Persistent trough of low pressure was located over the western U.S.

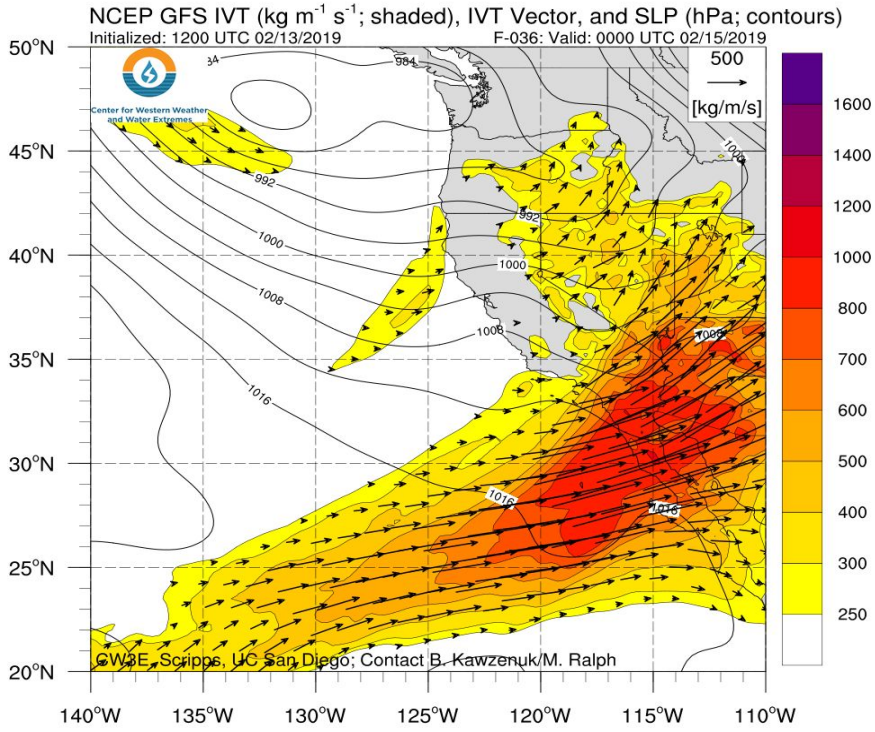
Multiple storm systems moved eastward through the Colorado River Basin.

Storms were of a Pacific origin tapping sub tropical moisture resulting in significant precipitation.

Mean upper atmospheric pattern for February shows the strong trough over the Colorado and Great Basins.



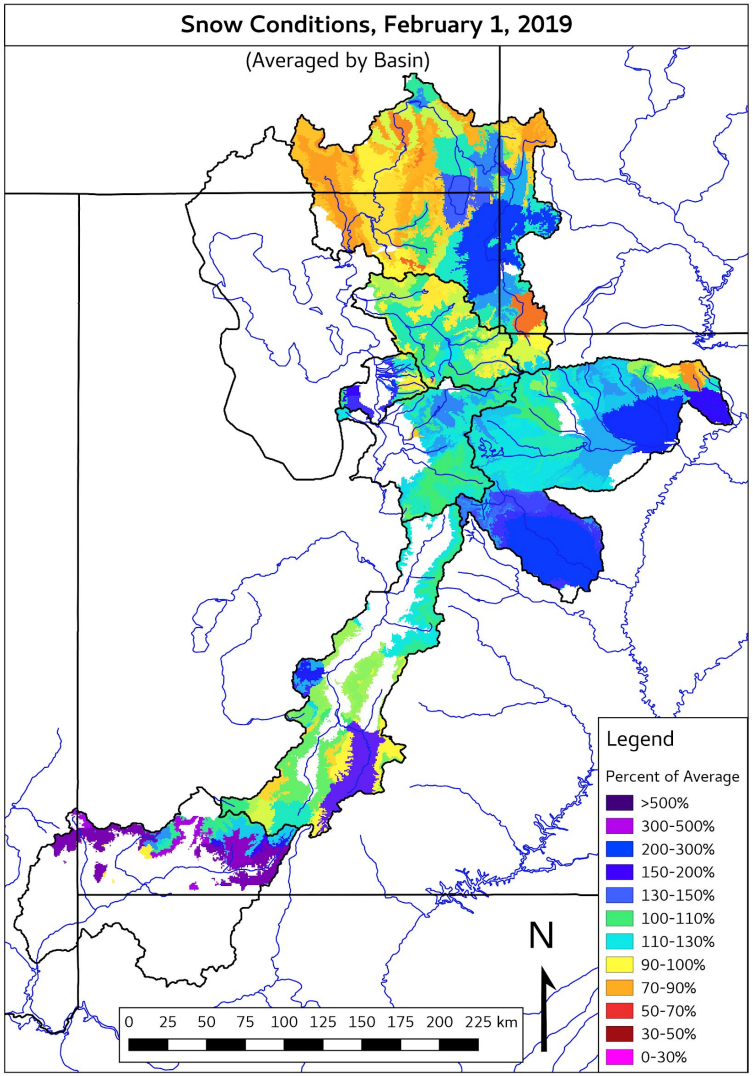
Subtropical moisture plume (red/oranges) moved across the western U.S around Valentines Day. Arizona took the brunt but heavy precipitation also fell in the Dolores and San Juan Basins.



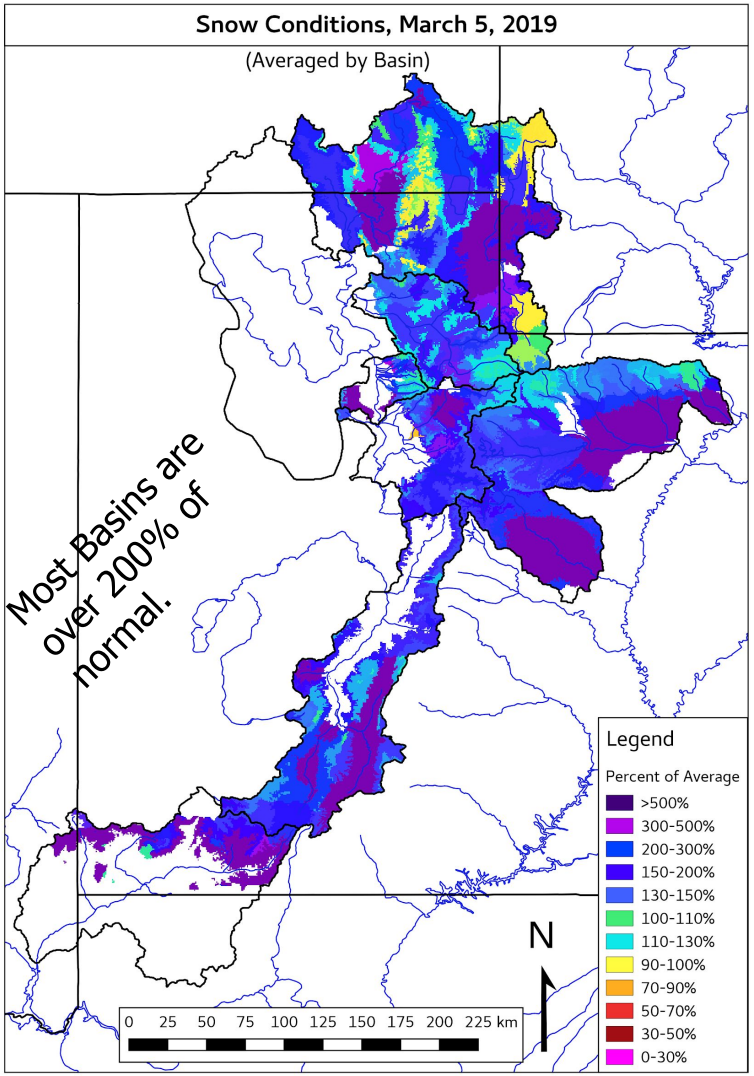
January was wet… February was wetter.

CBRFC Modeled Snow Conditions

February 1st



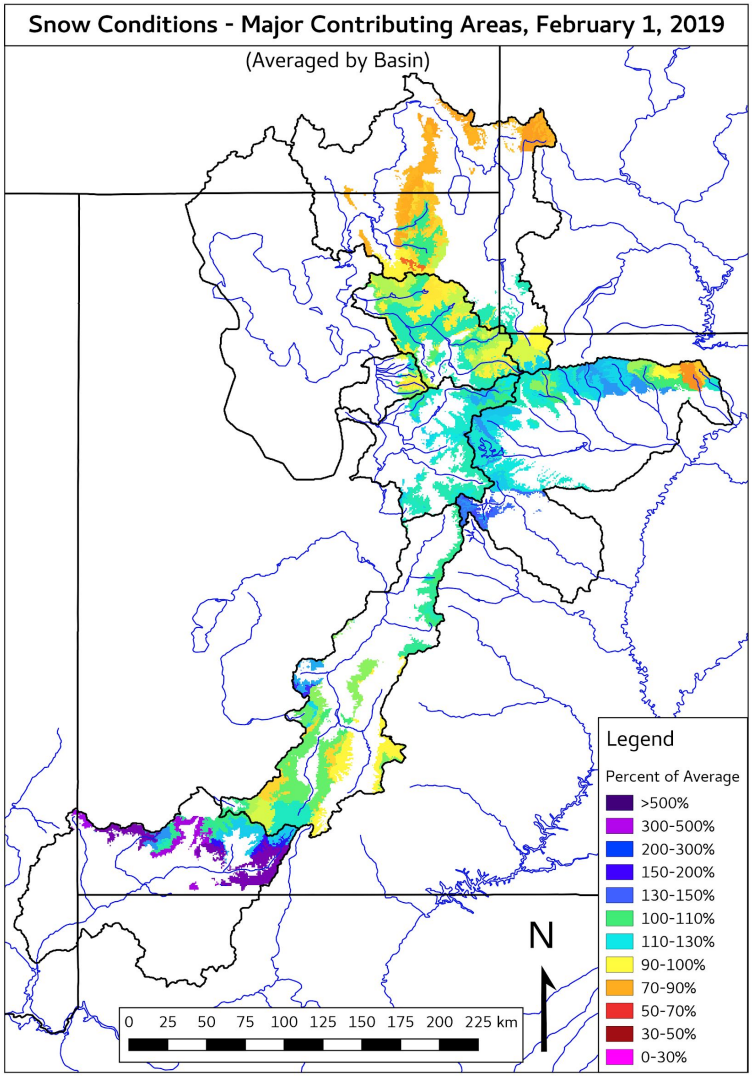
March 5th



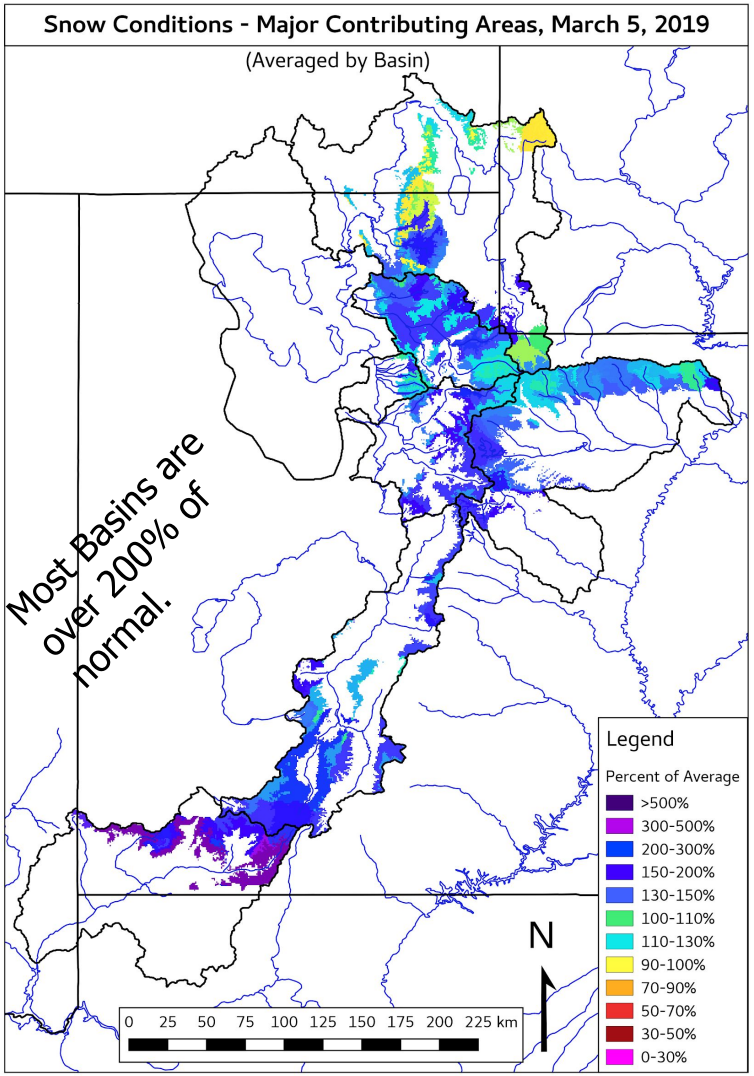
January was wet… February was wetter.

CBRFC Modeled Snow Conditions - Major Contributing Areas

February 1st

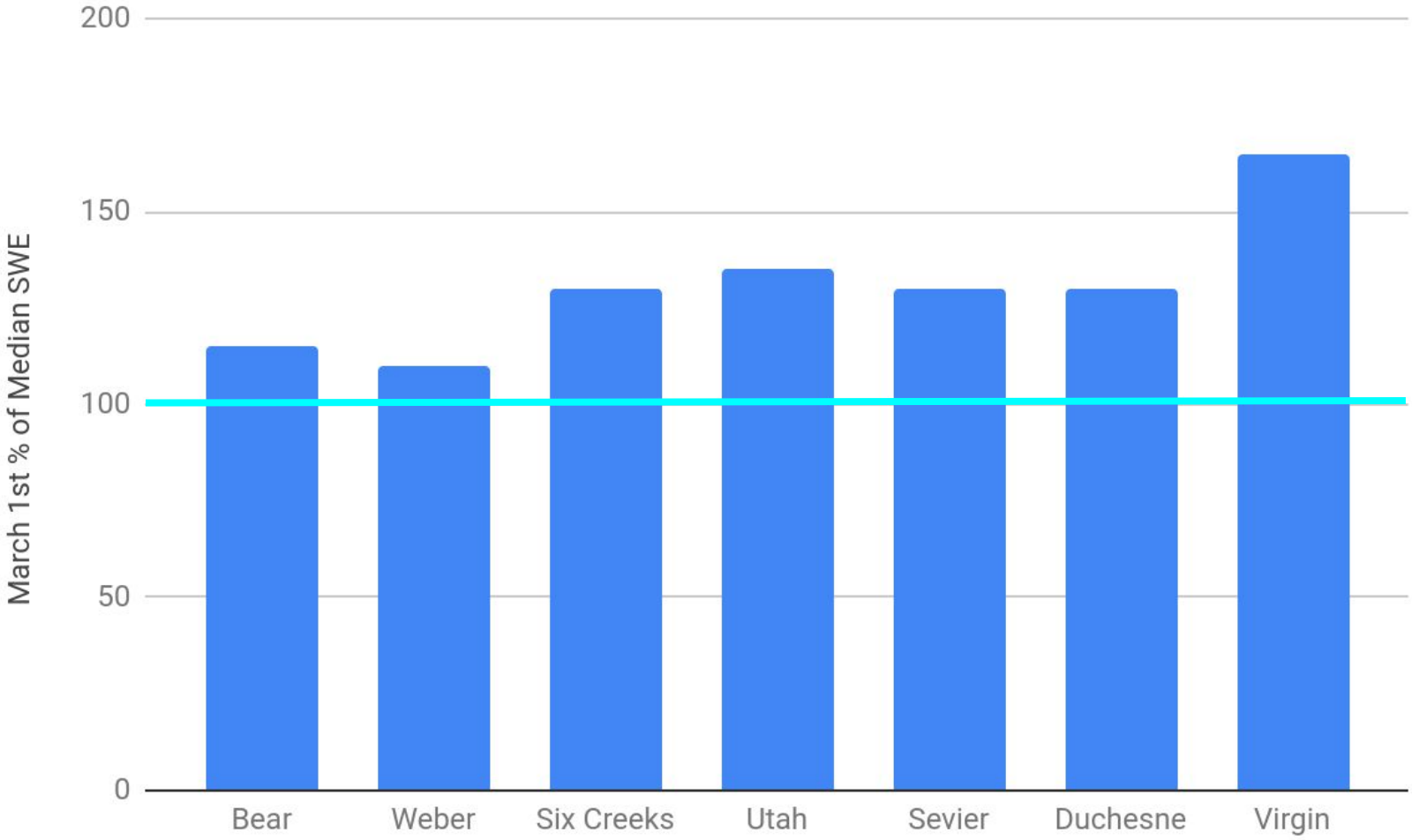


March 1st



January was wet… February was wetter.

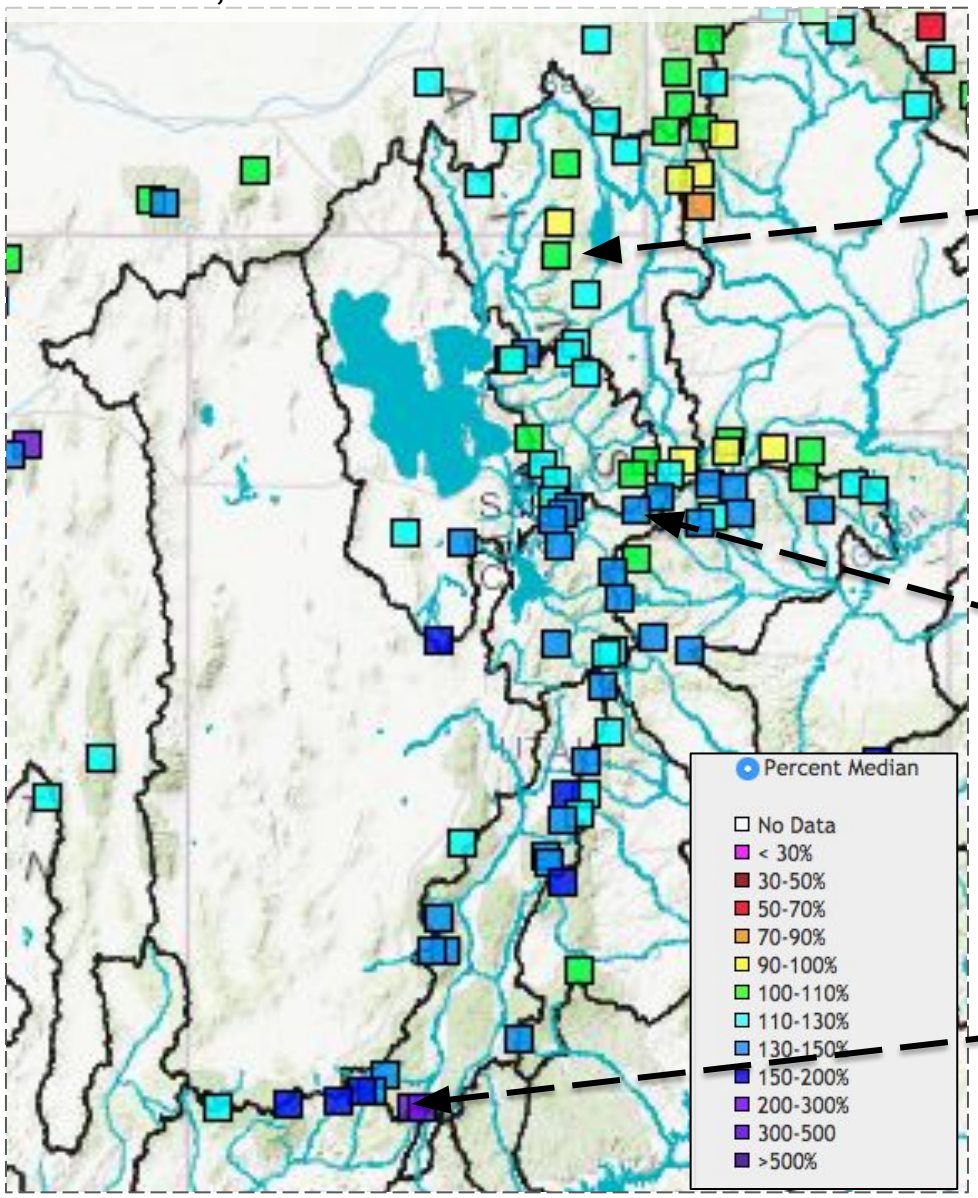
Snow Conditions - Snow Groups

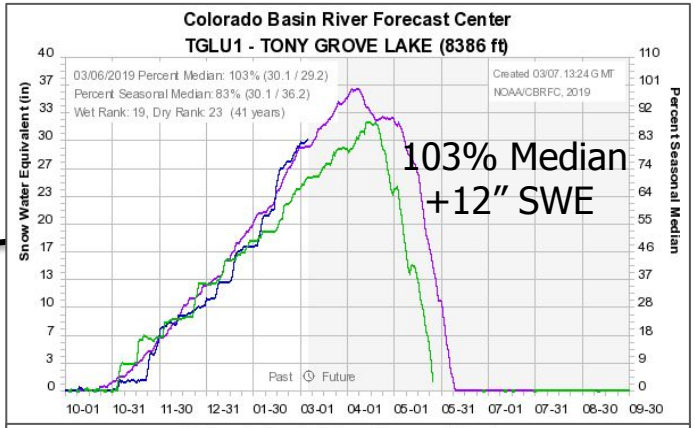


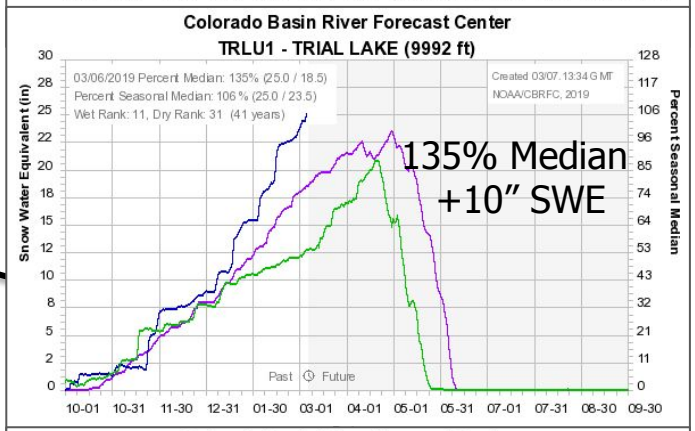
Current Snow Conditions –(SNOTEL)

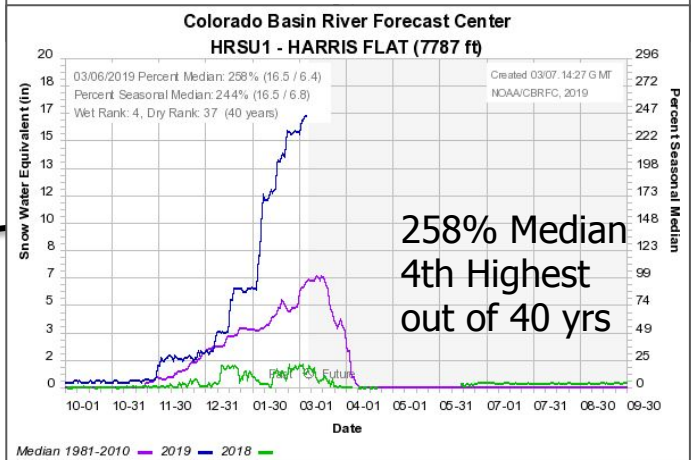
Significant snow accumulation from February to March.

March 7th, 2019





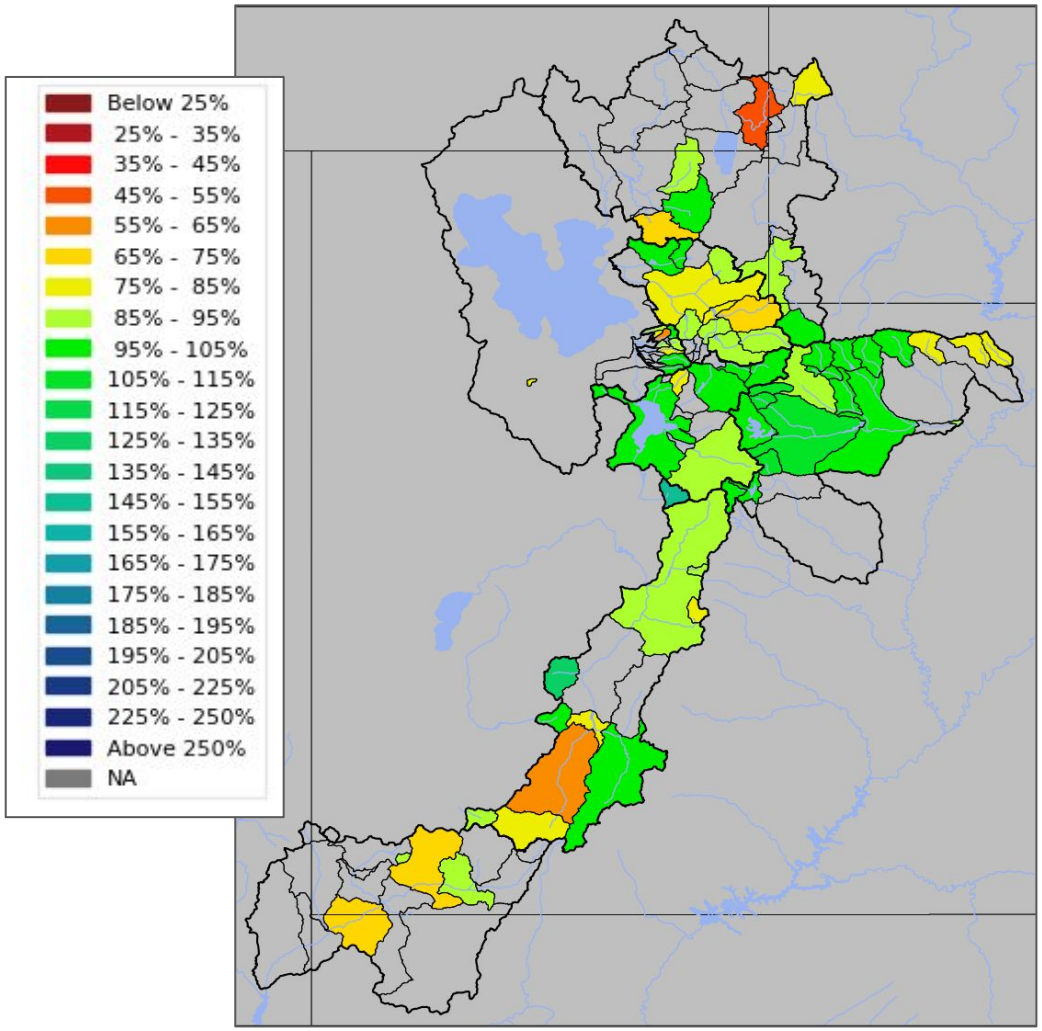




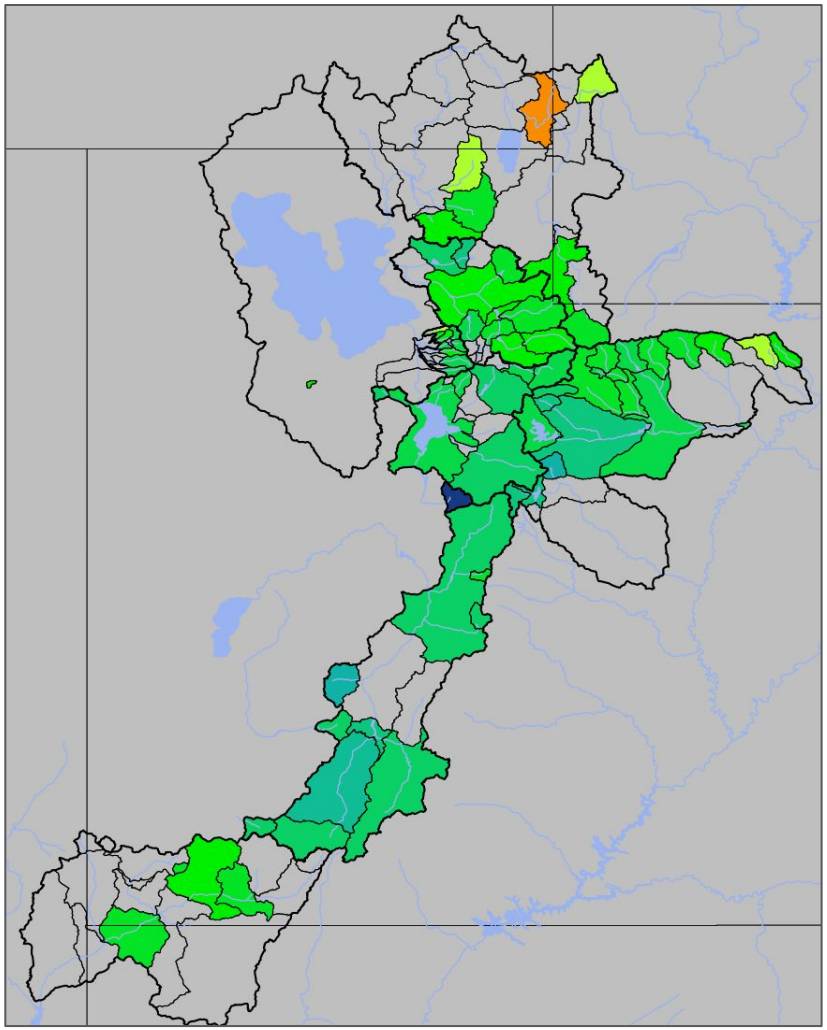
Water Supply Forecasts – Great Basin/Utah

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

February 1st



March 1st



Tracking the model guidance between forecasts: Evolution Plots

COLORADO BASIN RIVER FORECAST CENTER

NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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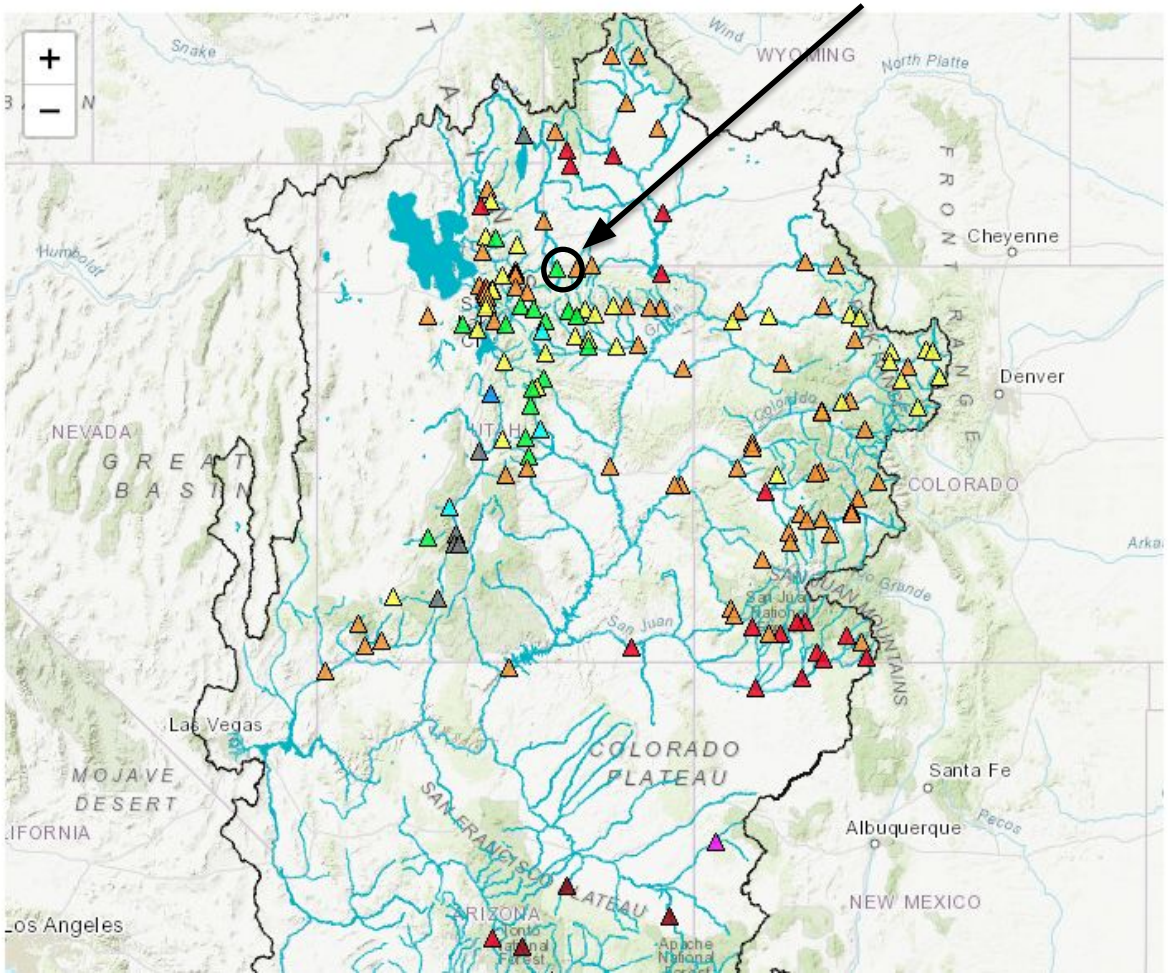
News Register for 2019 Water Supply Webinars More Info...

Conditions Map Help

Click on Bear River- Stateline point



- River Conditions
- Snow Conditions
- Water Supply Forecasts

First of Month Forecast Date: 2019-2-1
Latest Model Run Date: 2019-02-05

Help

Show Hide Other Types

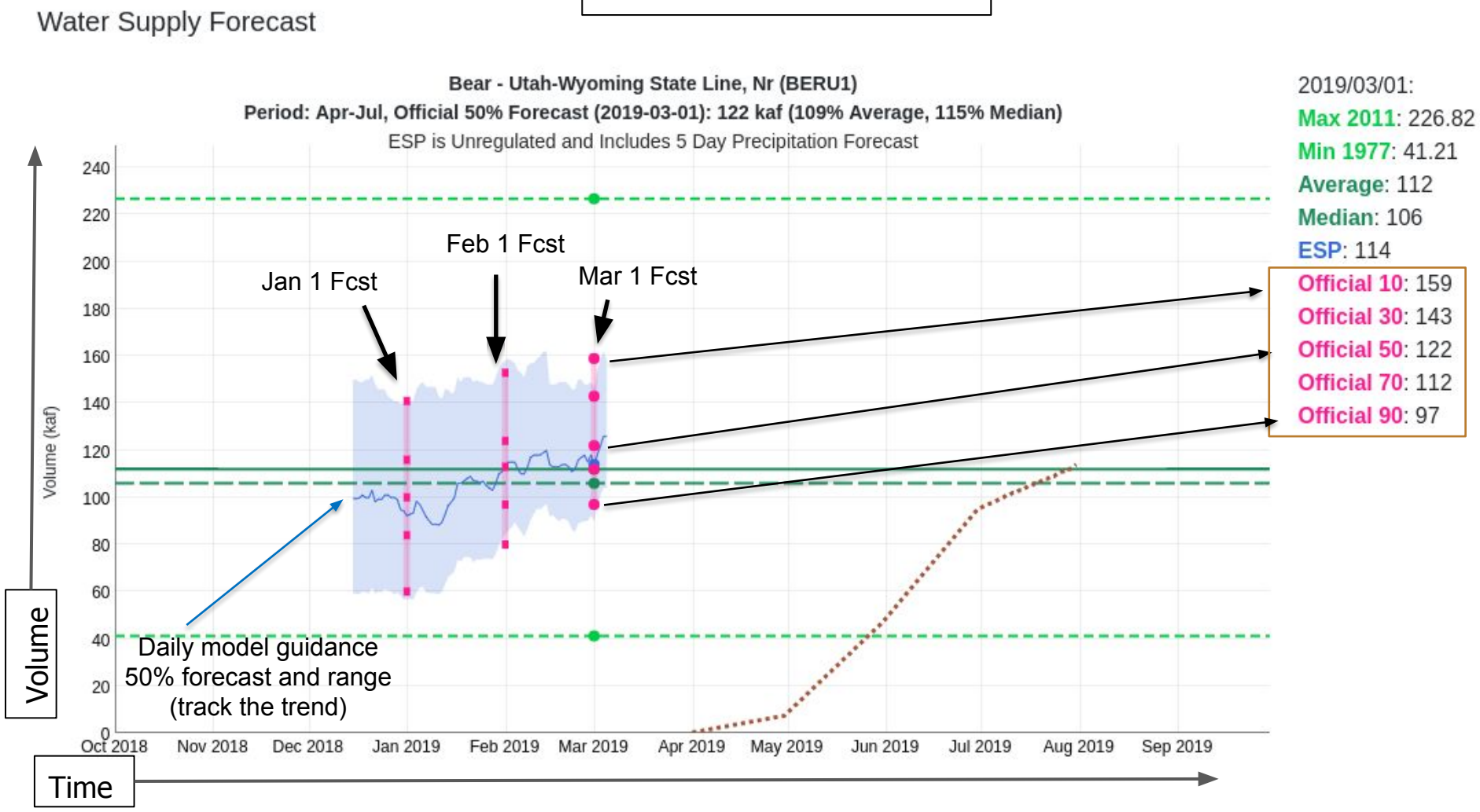
- First of Month Forecast Percent Average
- First of Month Forecast Percent Median
- Latest Model Guidance Percent Average
- Latest Model Guidance Percent Median

- < 30%
- 30-50%
- 50-70%
- 70-90%
- 90-100%
- 100-110%
- 110-130%
- 130-150%
- 150-200%
- 200-300%
- 300-500
- >500%
- Regulated
- No Forecast

Forecast Evolution Plot

Quick Recap: Bear at UT-WY Stateline

50% exceedance forecast
(the "**official**" forecast)

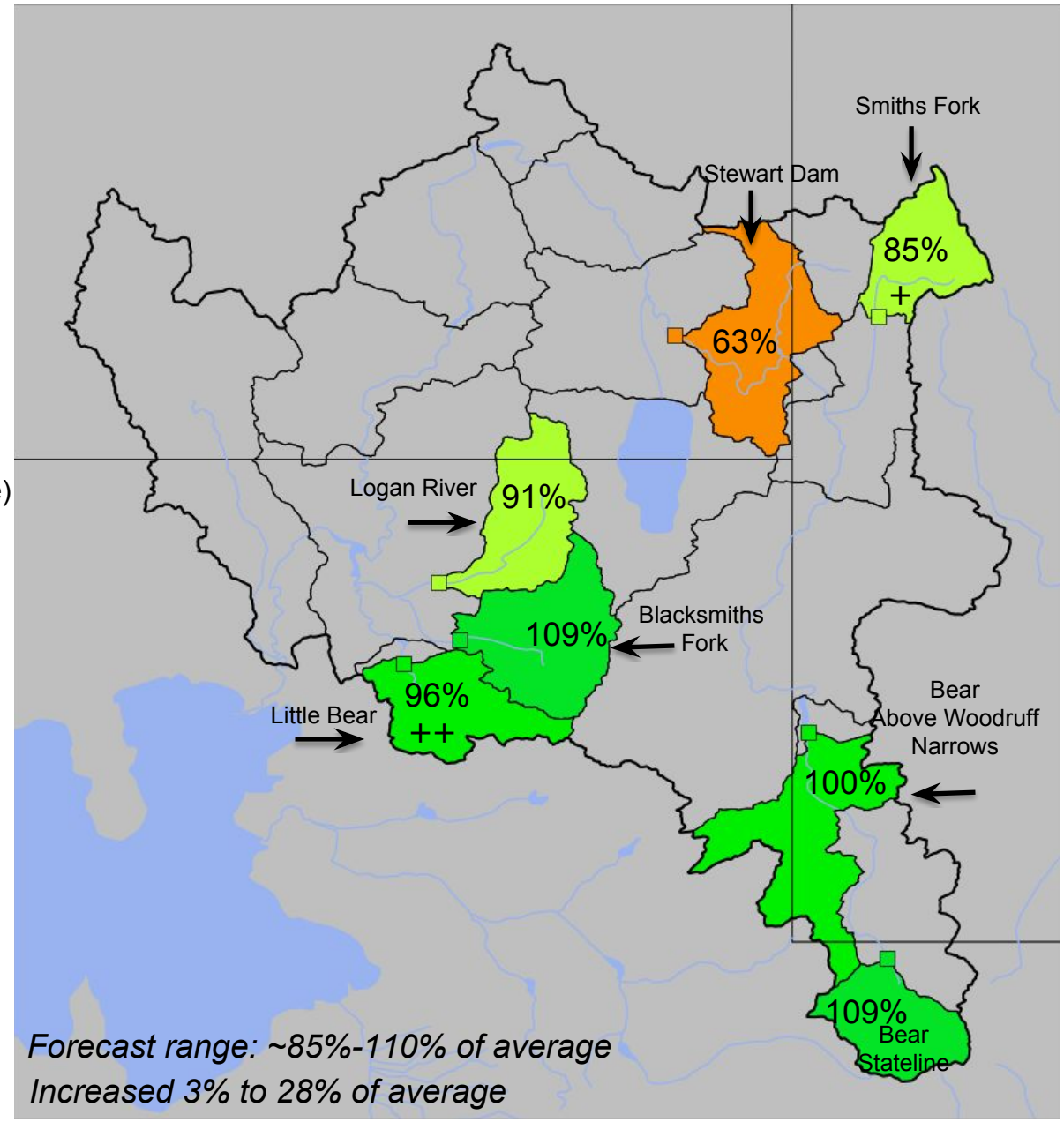


ESP – Ensemble Streamflow Prediction

March 1st Water Supply Forecasts – Bear River Basin

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

- Below 25%
- 25% - 35%
- 35% - 45%
- 45% - 55%
- 55% - 65%
- 65% - 75%
- 75% - 85%
- 85% - 95%
- 95% - 105%
- 105% - 115%
- 115% - 125%
- 125% - 135%
- 135% - 145%
- 145% - 155%
- 155% - 165%
- 165% - 175%
- 175% - 185%
- 185% - 195%
- 195% - 205%
- 205% - 225%
- 225% - 250%
- Above 250%
- NA



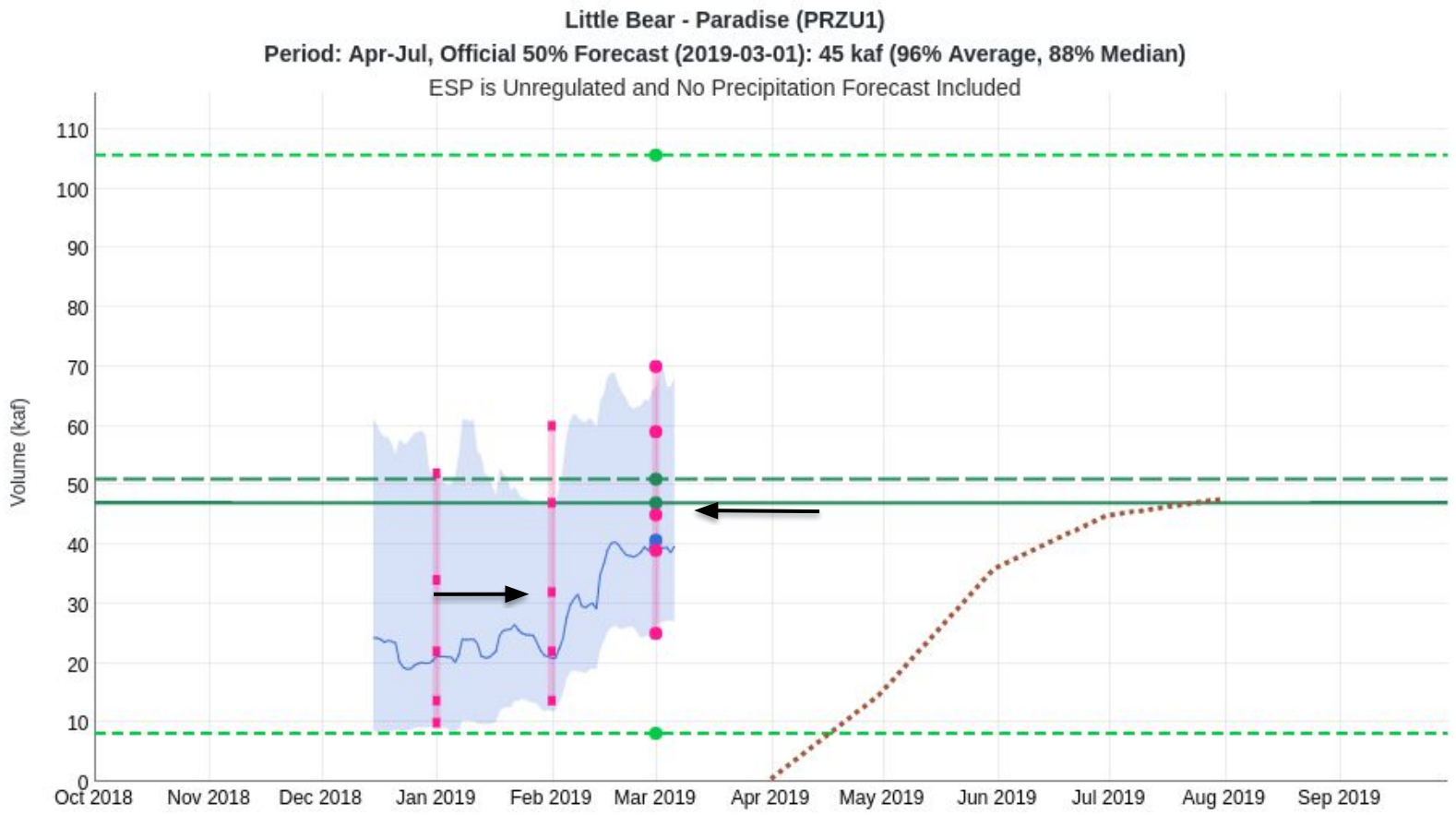
Median
Basin
Forecast:

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

Forecast Evolution Plot

Little Bear: 45 kaf / 96%

Water Supply Forecast

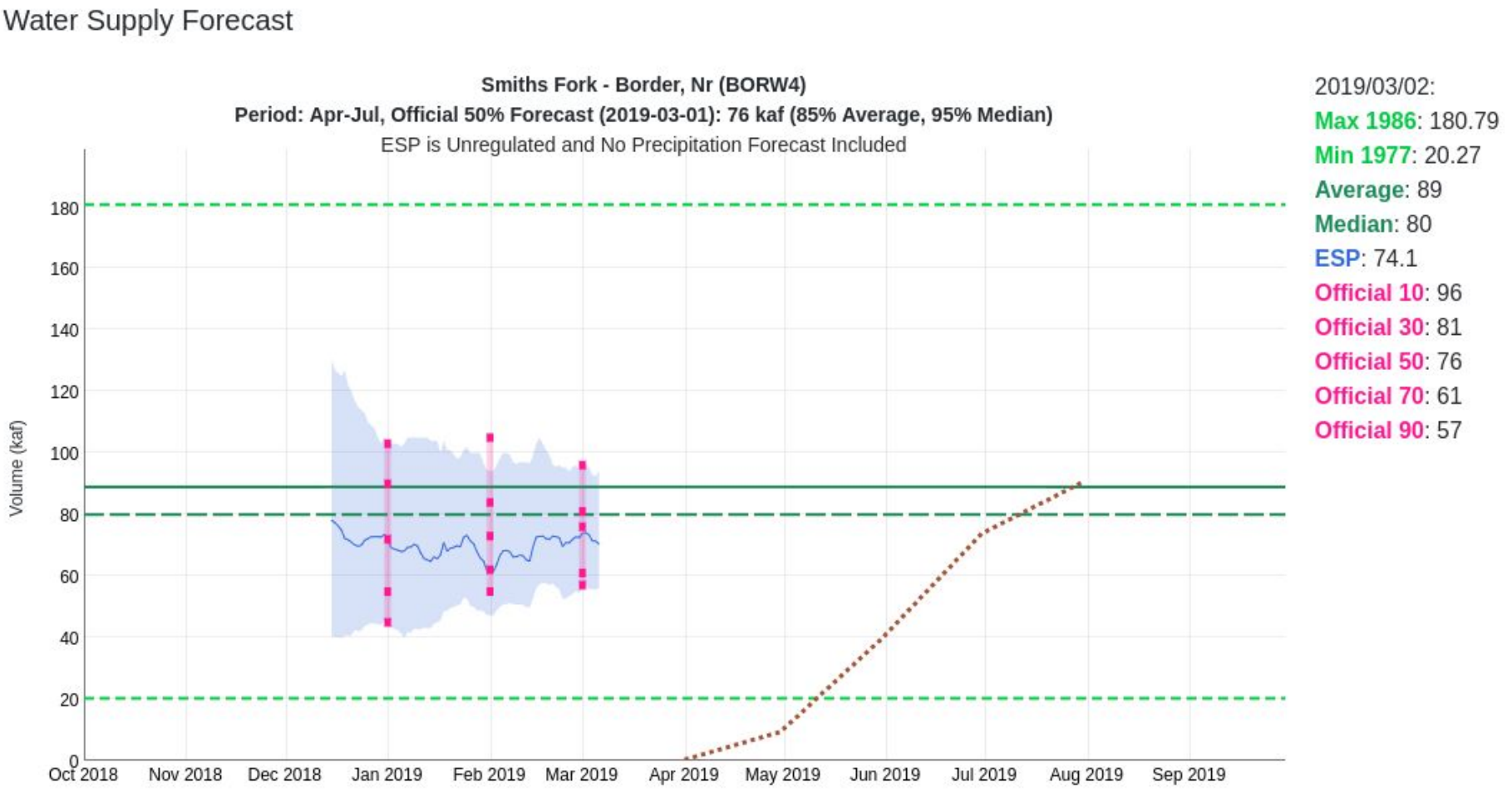


2019/03/01:
Max 2011: 105.64
Min 1977: 8.15
Average: 47
Median: 51
ESP: 40.7
Official 10: 70
Official 30: 59
Official 50: 45
Official 70: 39
Official 90: 25

28% Increase

Forecast Evolution Plot

Smiths Fork: 76 kaf / 85%

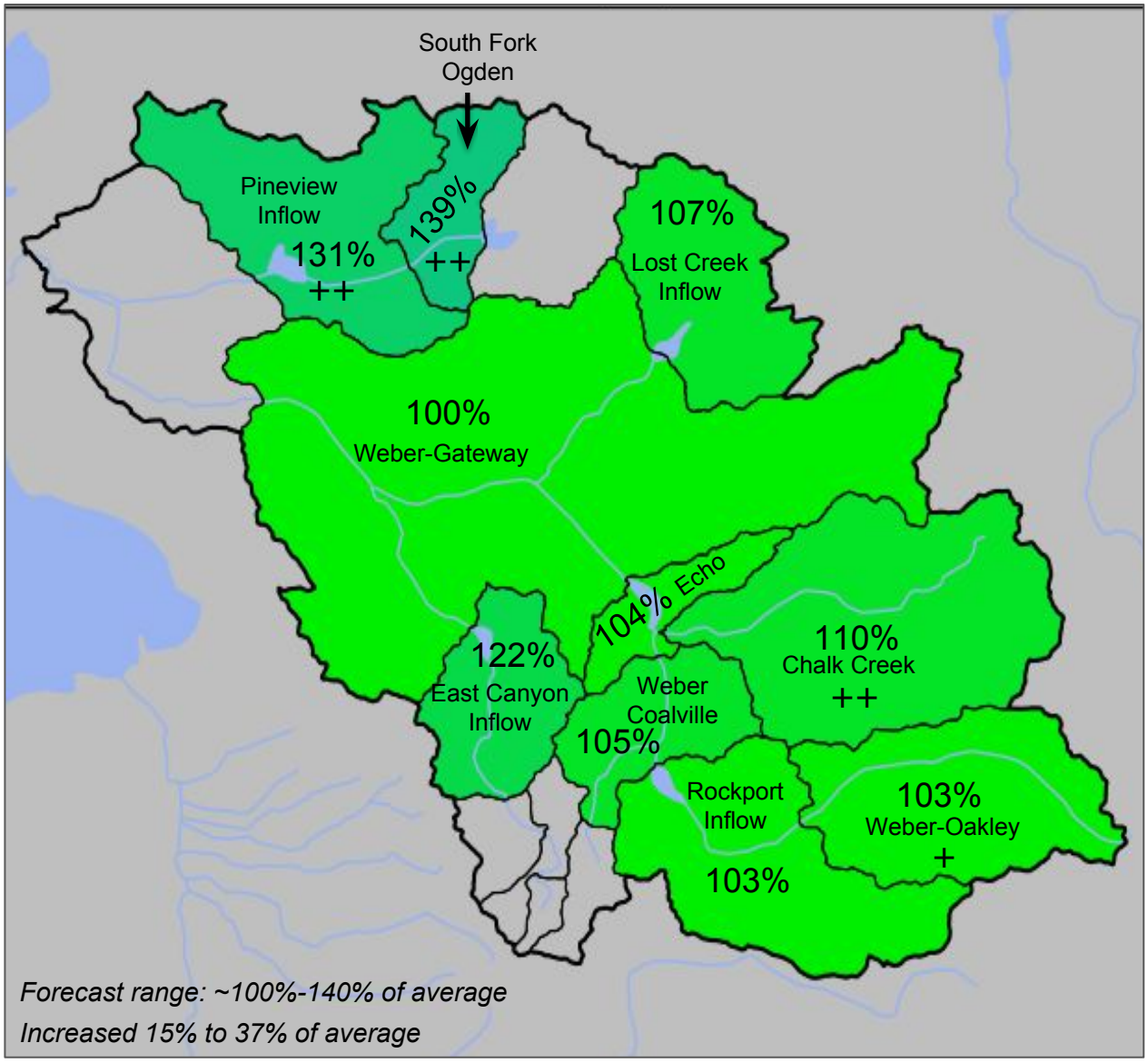


3% Increase

March 1st Water Supply Forecasts – Weber River Basin

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

- Below 25%
- 25% - 35%
- 35% - 45%
- 45% - 55%
- 55% - 65%
- 65% - 75%
- 75% - 85%
- 85% - 95%
- 95% - 105%
- 105% - 115%
- 115% - 125%
- 125% - 135%
- 135% - 145%
- 145% - 155%
- 155% - 165%
- 165% - 175%
- 175% - 185%
- 185% - 195%
- 195% - 205%
- 205% - 225%
- 225% - 250%
- Above 250%
- NA

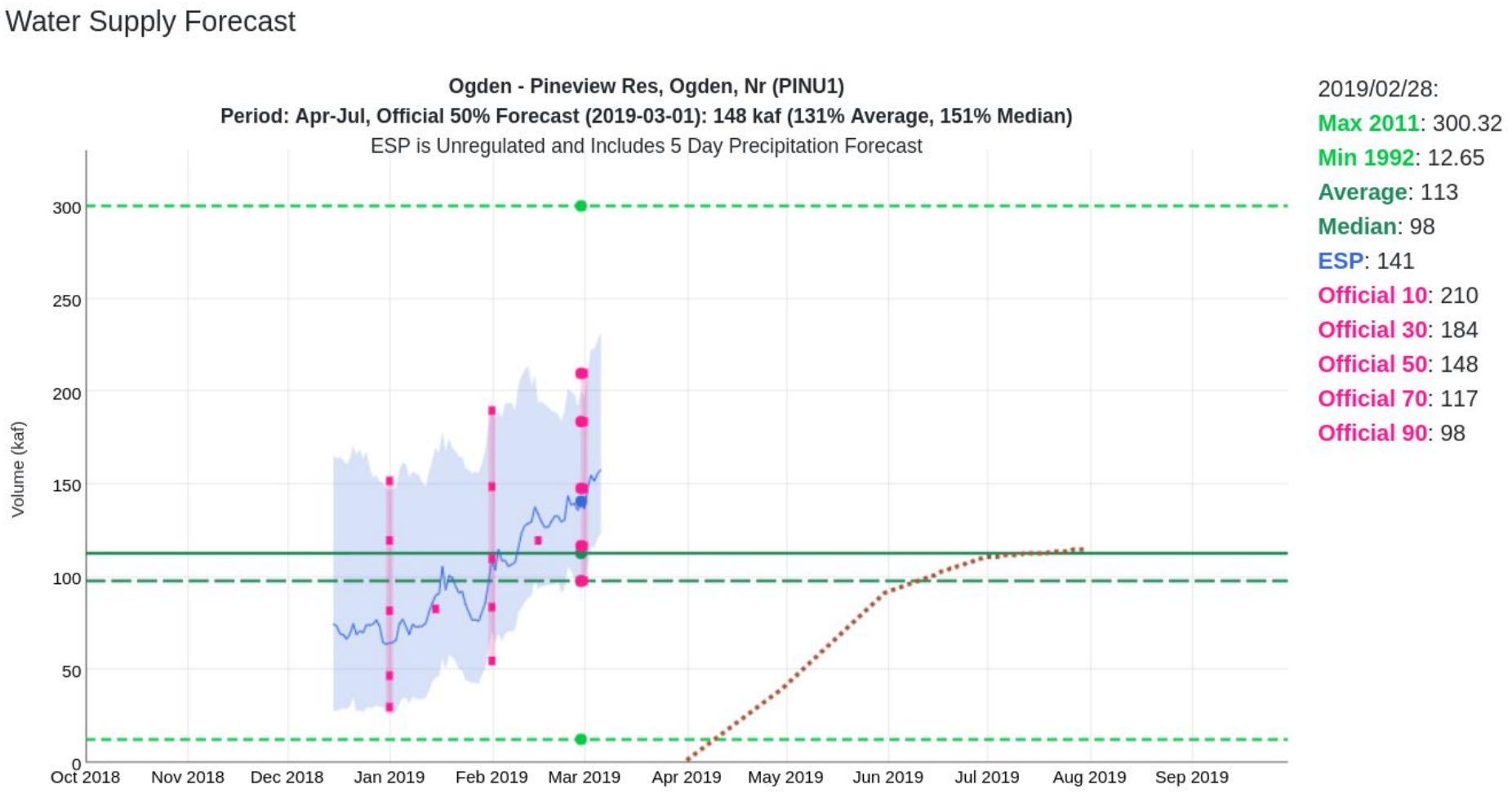


Median
Basin
Forecast:

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

Forecast Evolution Plot

Pineview: 148 kaf / 131%

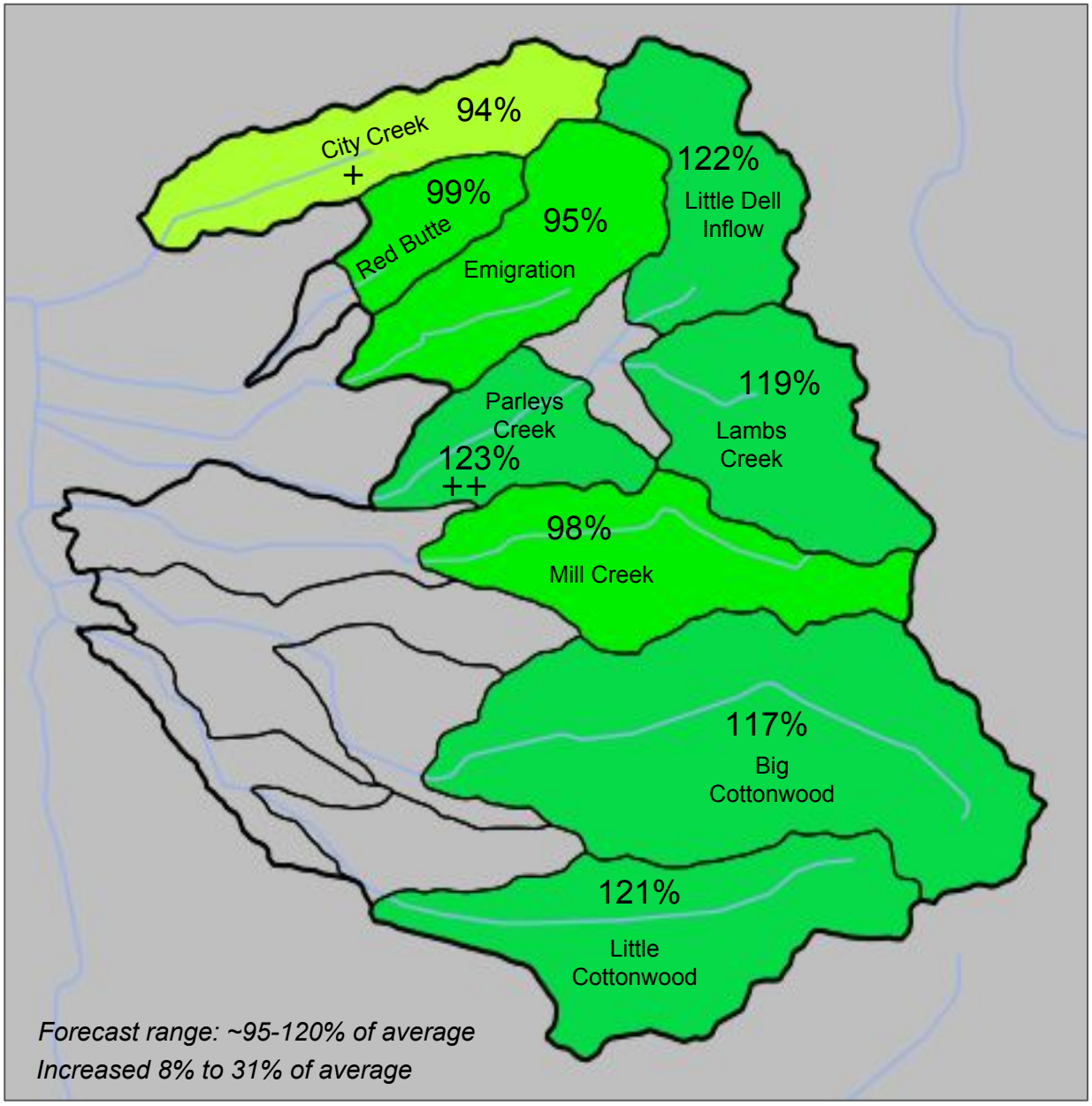


34% Increase

March 1st Water Supply Forecasts – Six Creeks

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

- Below 25%
- 25% - 35%
- 35% - 45%
- 45% - 55%
- 55% - 65%
- 65% - 75%
- 75% - 85%
- 85% - 95%
- 95% - 105%
- 105% - 115%
- 115% - 125%
- 125% - 135%
- 135% - 145%
- 145% - 155%
- 155% - 165%
- 165% - 175%
- 175% - 185%
- 185% - 195%
- 195% - 205%
- 205% - 225%
- 225% - 250%
- Above 250%
- NA

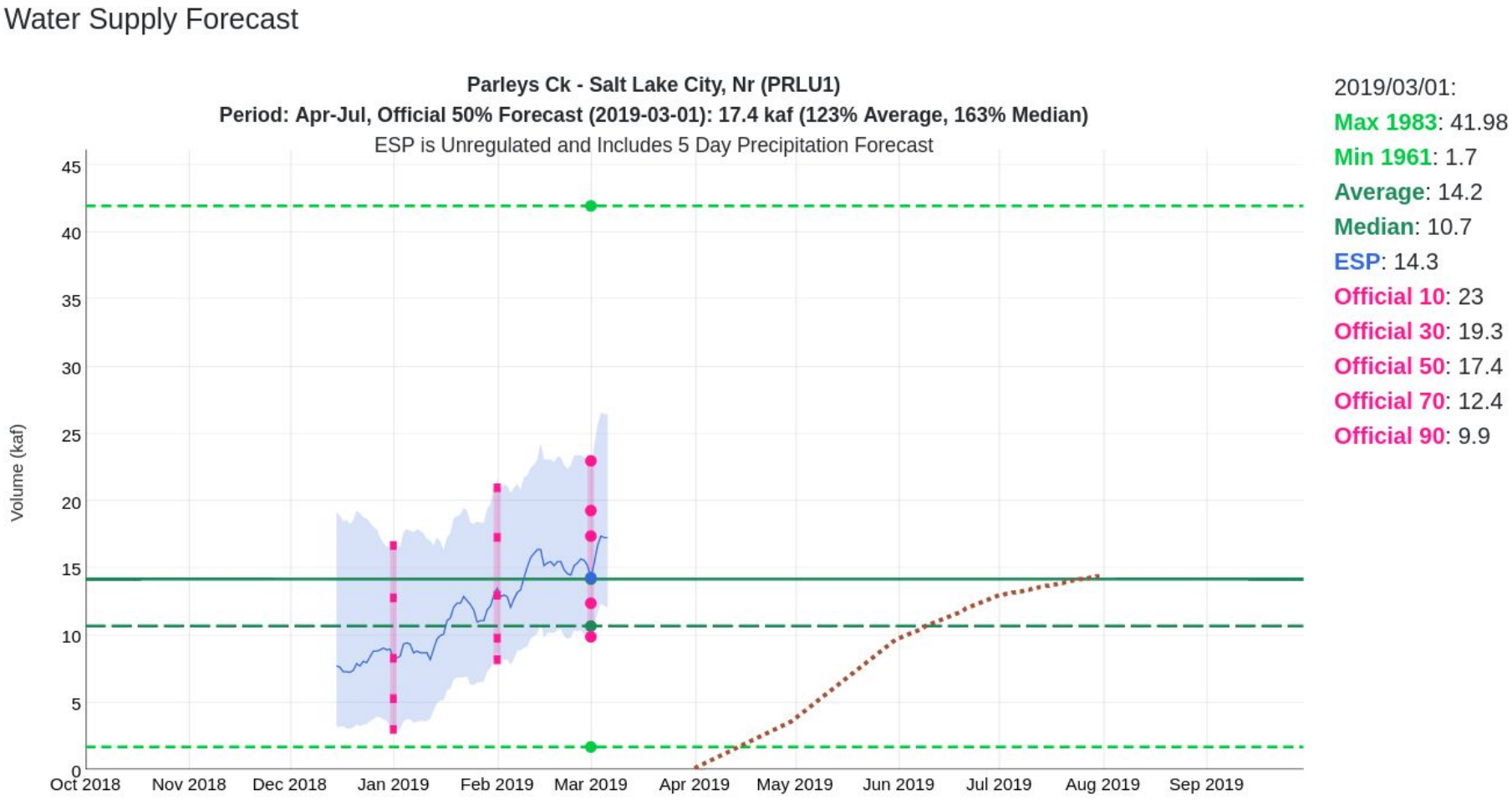


Median
Basin
Forecast:

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

Forecast Evolution Plot

Parleys Creek: 17.4 kaf / 123%

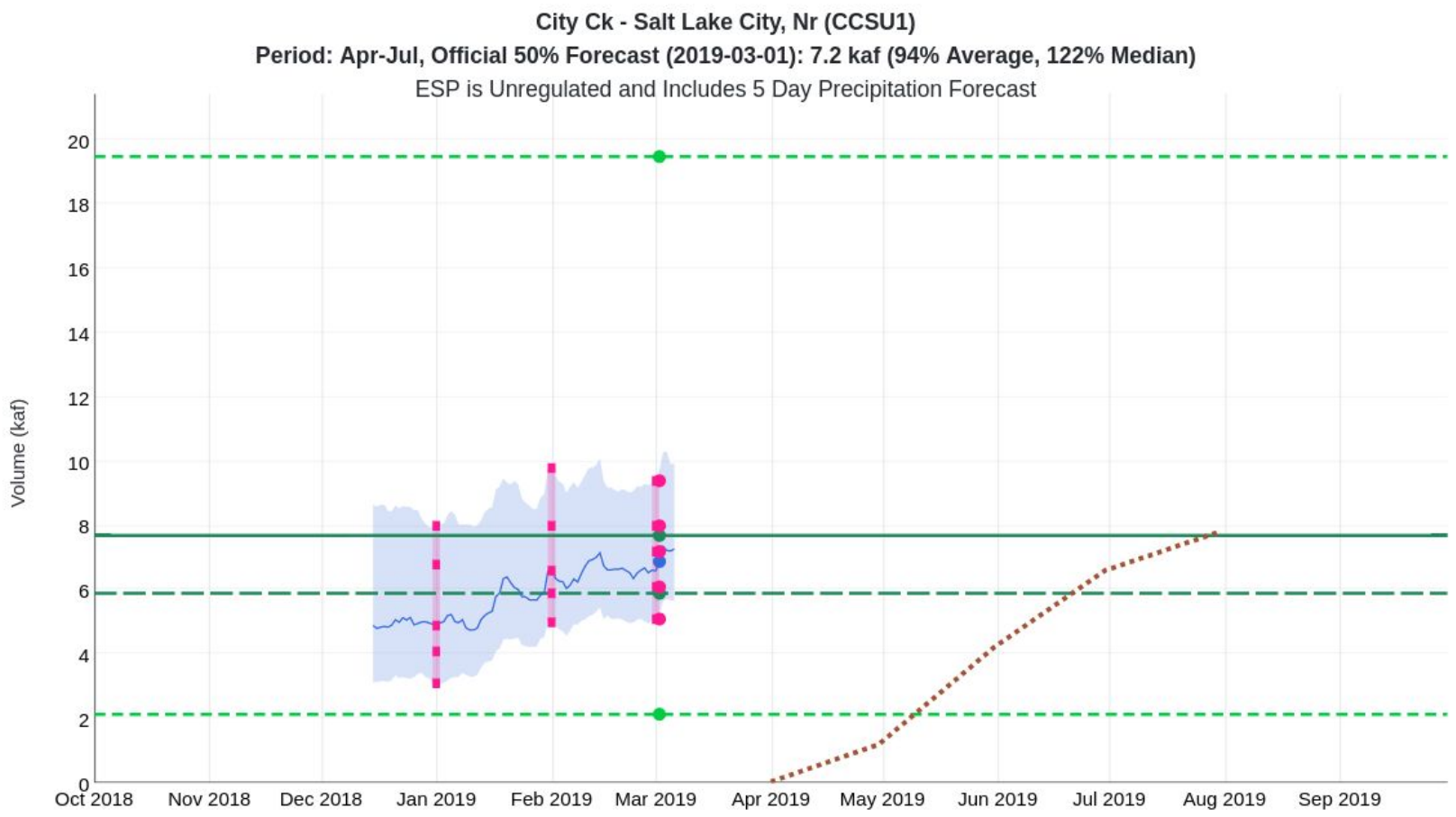


31% Increase

Forecast Evolution Plot

City Creek: 7.2 kaf / 94%

Water Supply Forecast



2019/03/02:

Max 1983: 19.48

Min 1961: 2.14

Average: 7.7

Median: 5.9

ESP: 6.89

Official 10: 9.4

Official 30: 8

Official 50: 7.2

Official 70: 6.1

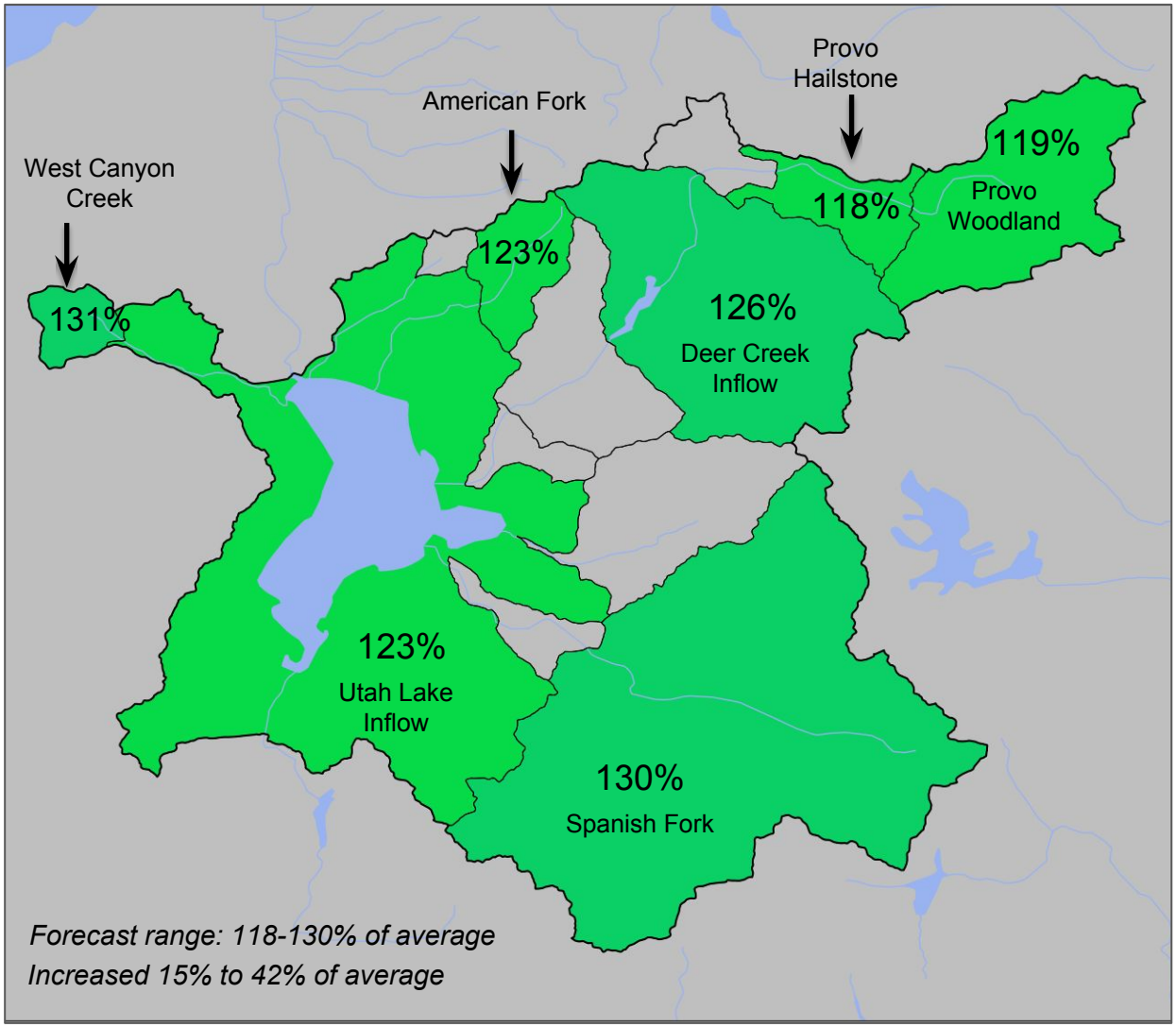
Official 90: 5.1

8% Increase

March 1st Water Supply Forecasts – Provo River/Utah Lake

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

- Below 25%
- 25% - 35%
- 35% - 45%
- 45% - 55%
- 55% - 65%
- 65% - 75%
- 75% - 85%
- 85% - 95%
- 95% - 105%
- 105% - 115%
- 115% - 125%
- 125% - 135%
- 135% - 145%
- 145% - 155%
- 155% - 165%
- 165% - 175%
- 175% - 185%
- 185% - 195%
- 195% - 205%
- 205% - 225%
- 225% - 250%
- Above 250%
- NA



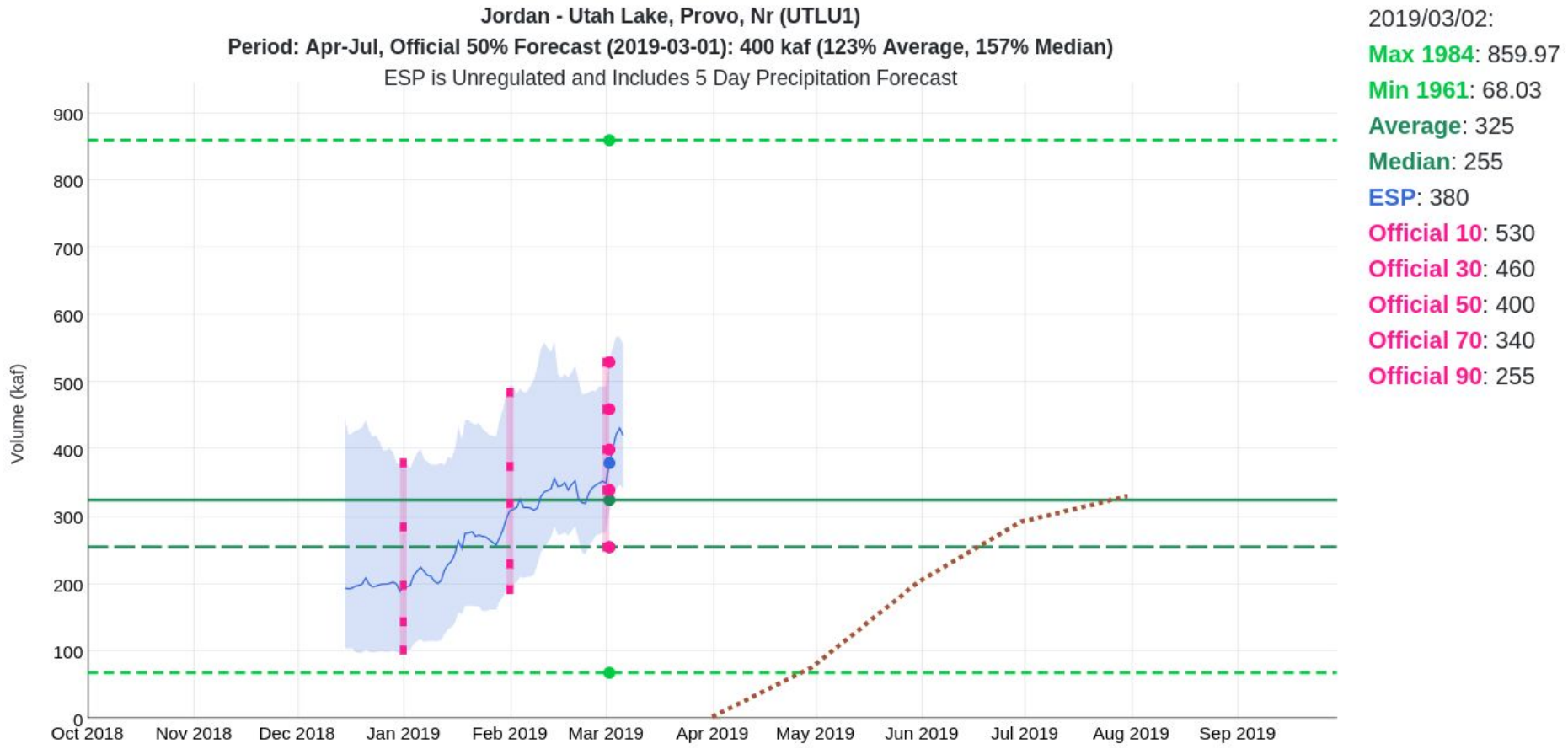
Median
Basin
Forecast:

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

Forecast Evolution Plot

Utah Lake: 400 kaf / 123%

Water Supply Forecast

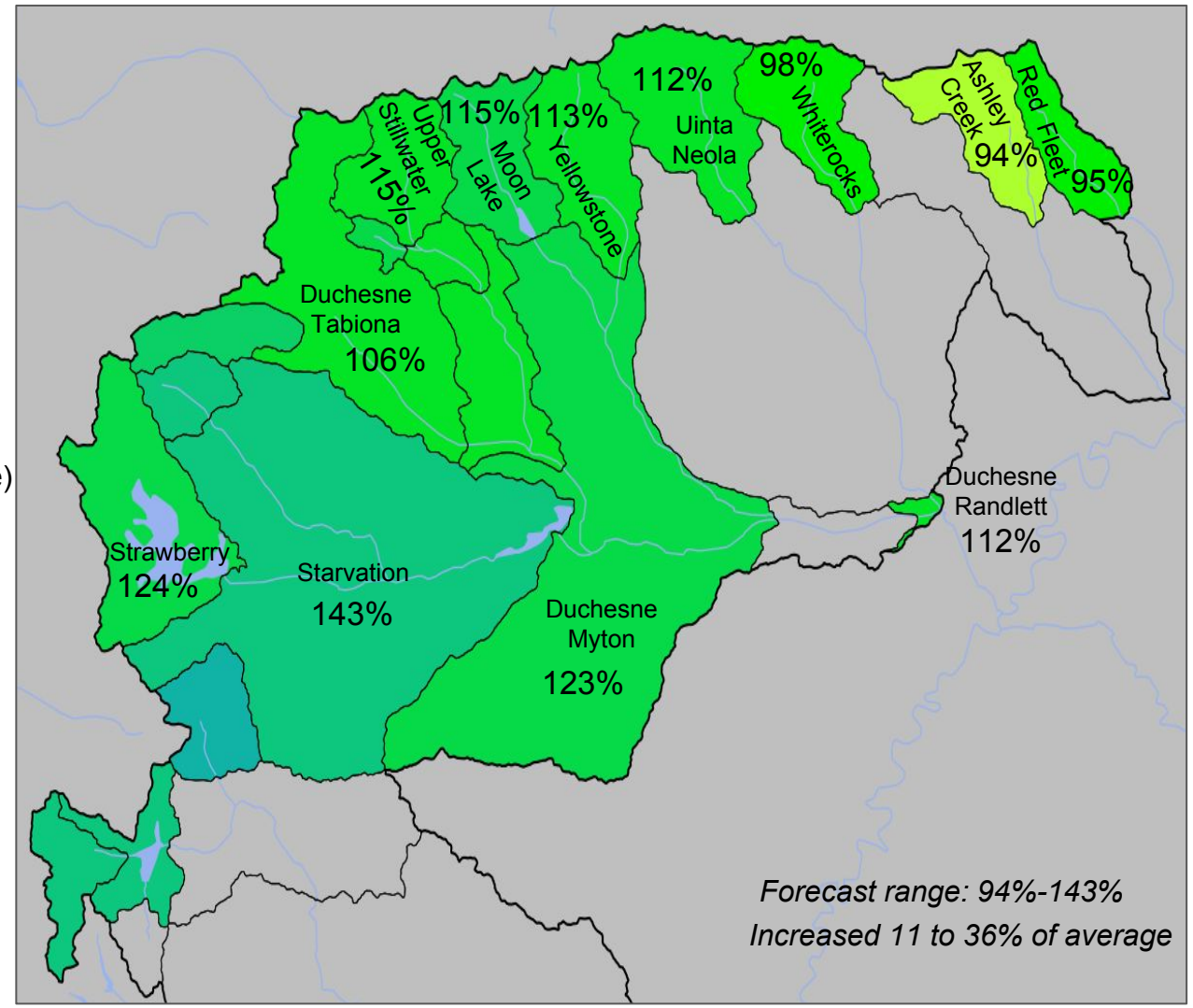


25% Increase

March 1st Water Supply Forecasts – Duchesne

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

- Below 25%
- 25% - 35%
- 35% - 45%
- 45% - 55%
- 55% - 65%
- 65% - 75%
- 75% - 85%
- 85% - 95%
- 95% - 105%
- 105% - 115%
- 115% - 125%
- 125% - 135%
- 135% - 145%
- 145% - 155%
- 155% - 165%
- 165% - 175%
- 175% - 185%
- 185% - 195%
- 195% - 205%
- 205% - 225%
- 225% - 250%
- Above 250%
- NA

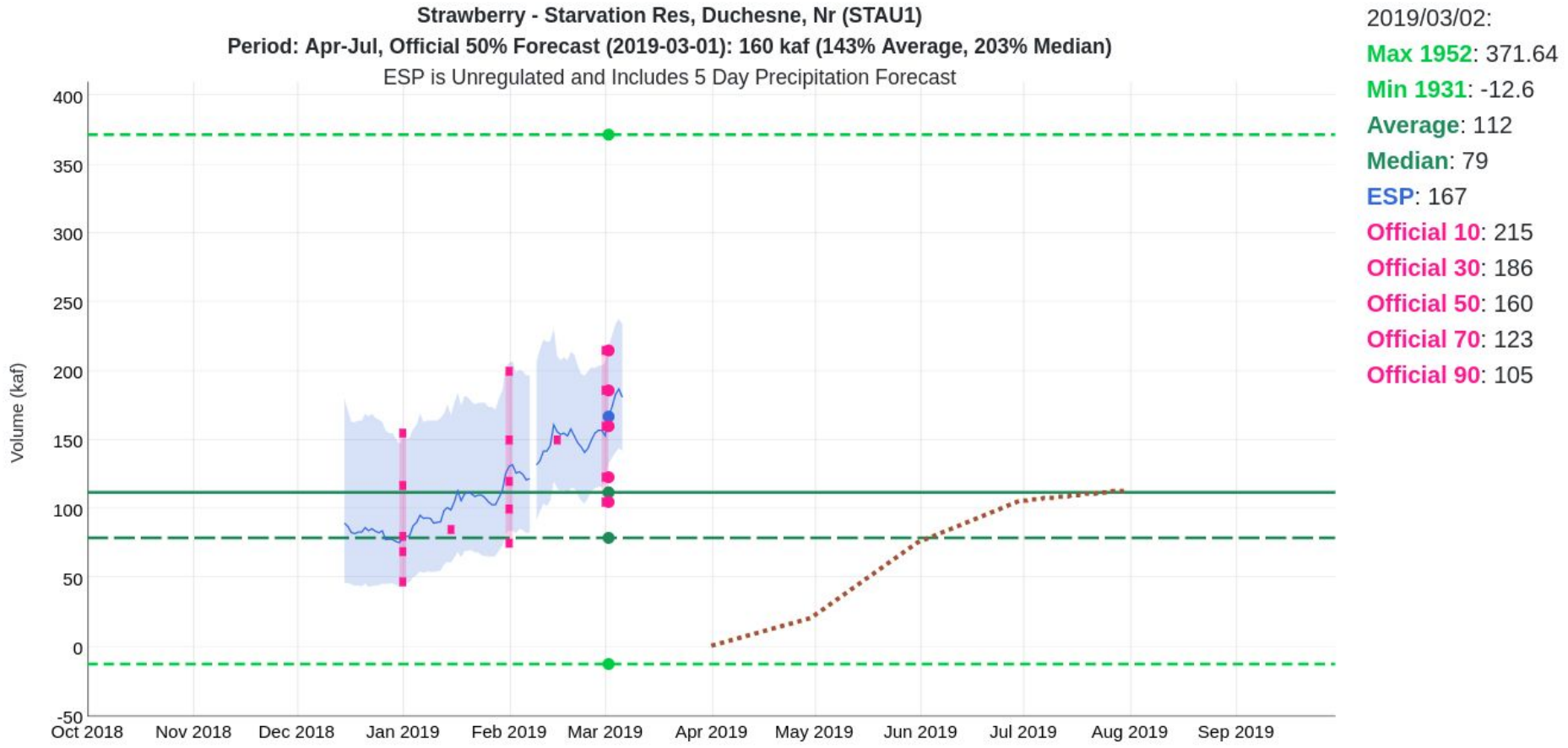


Median Basin Forecast:

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

Forecast Evolution Plot
Starvation: 160 kaf / 143%

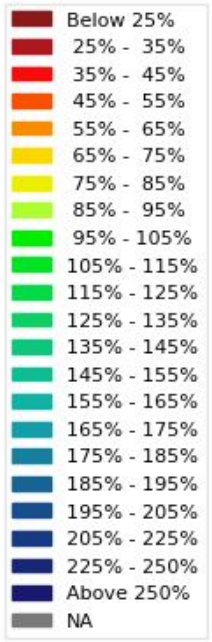
Water Supply Forecast

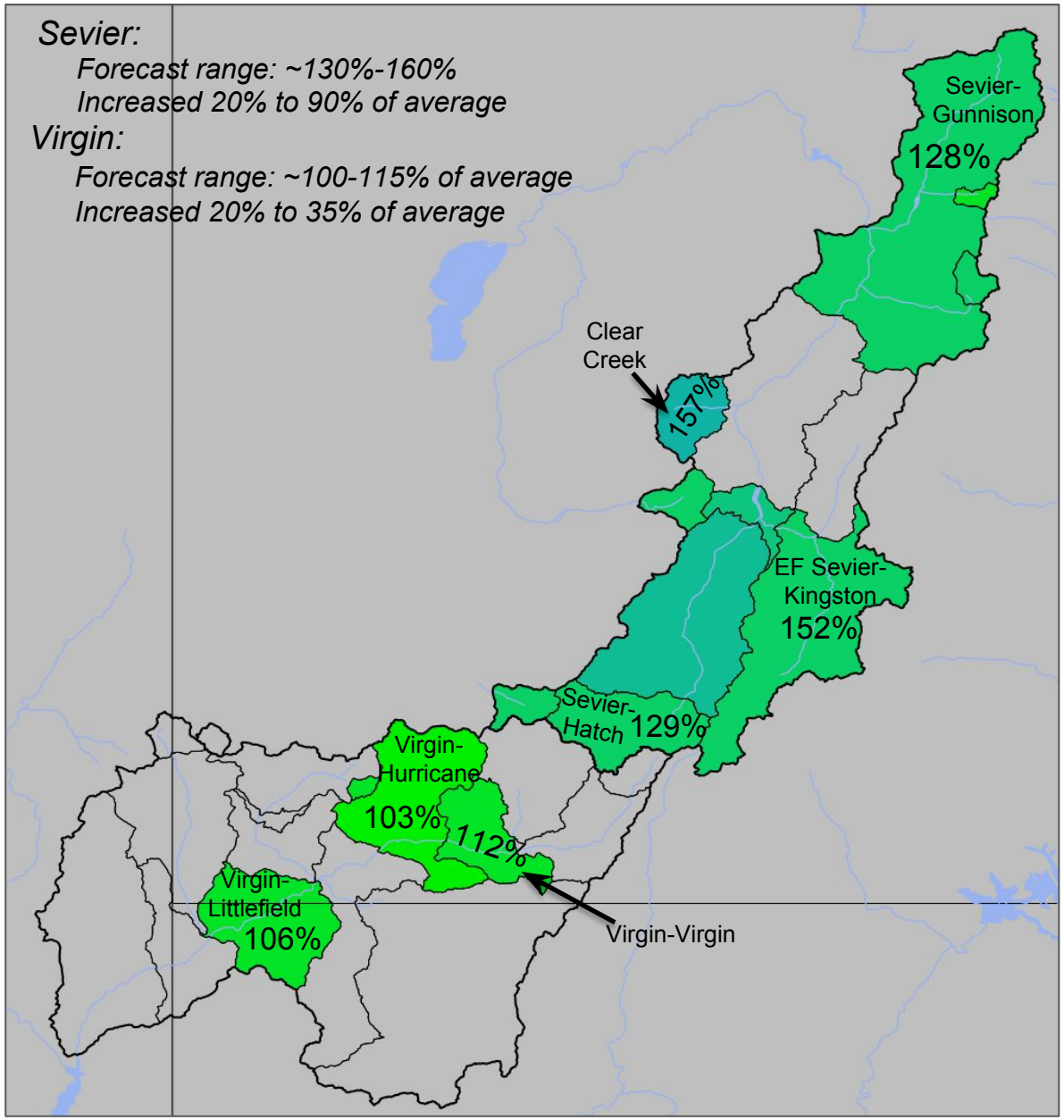


35% Increase

March 1st Water Supply Forecasts – Sevier/Virgin

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





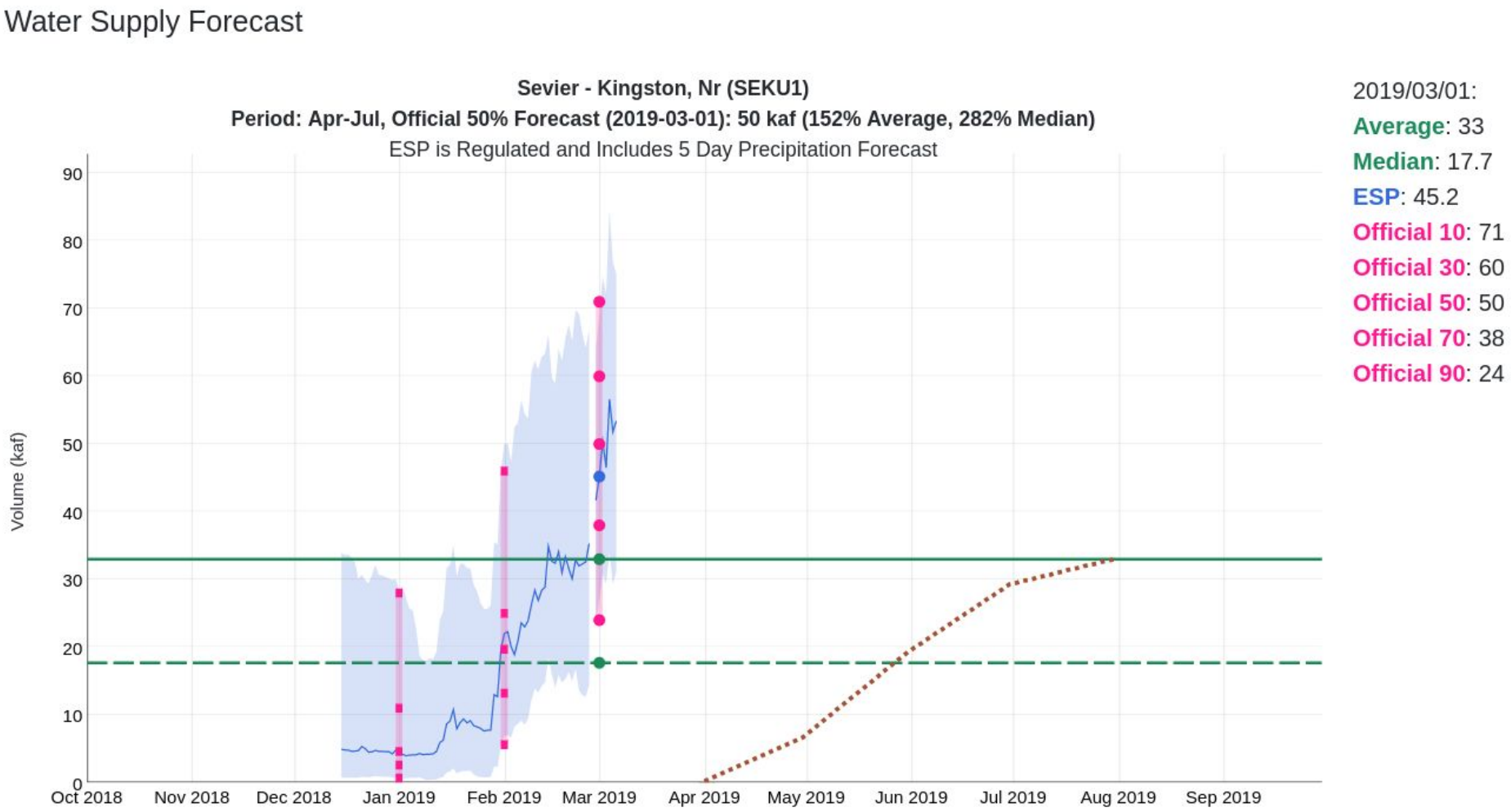
Median
Basin
Forecast:

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

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

Forecast Evolution Plot

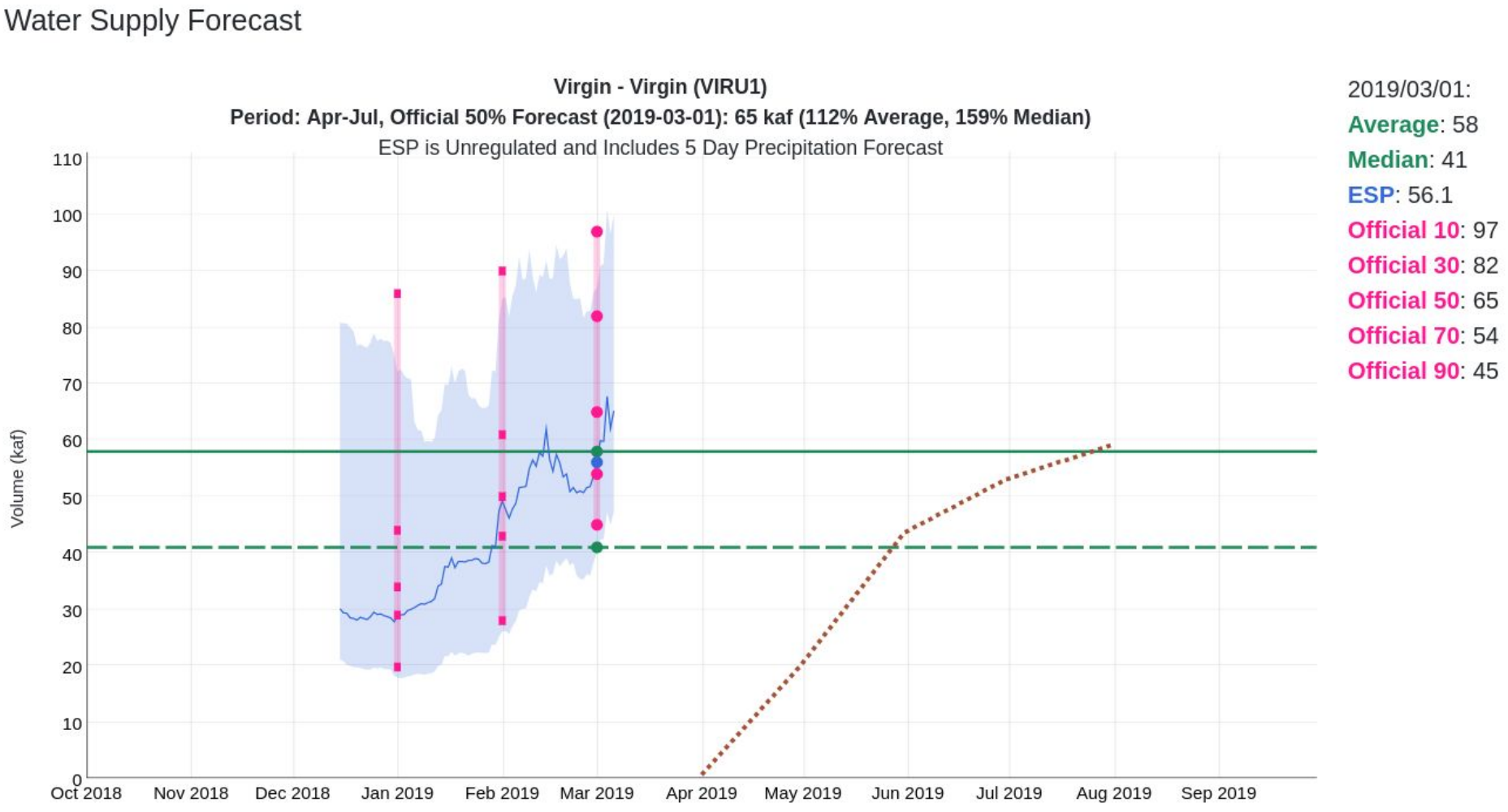
Sevier Kingston: 50 kaf / 152%



92% Increase

Forecast Evolution Plot

Virgin at Virgin: 65 kaf / 112%



26% Increase

Forecast Validation: Historical model error February to March

Historical Model Error 1981-2010

Generally not as big of an improvement from February to March as there is January to February
- March can be a pivotal month

Forecasts are better than just going with average

Error tends to decrease each month into the spring

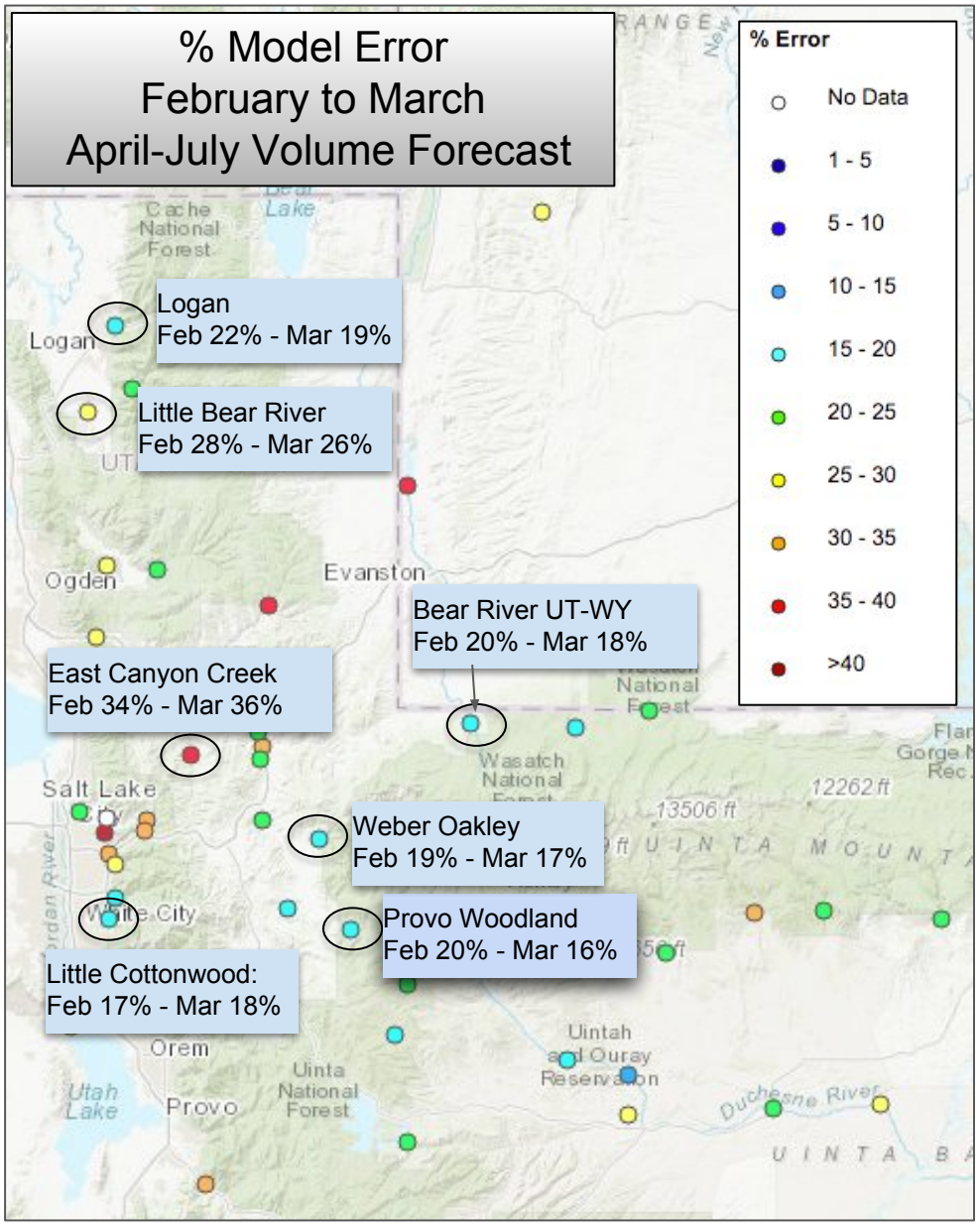
Where We Do Better:
- Headwaters
- Primarily snow melt basins
- Known diversions / demands

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

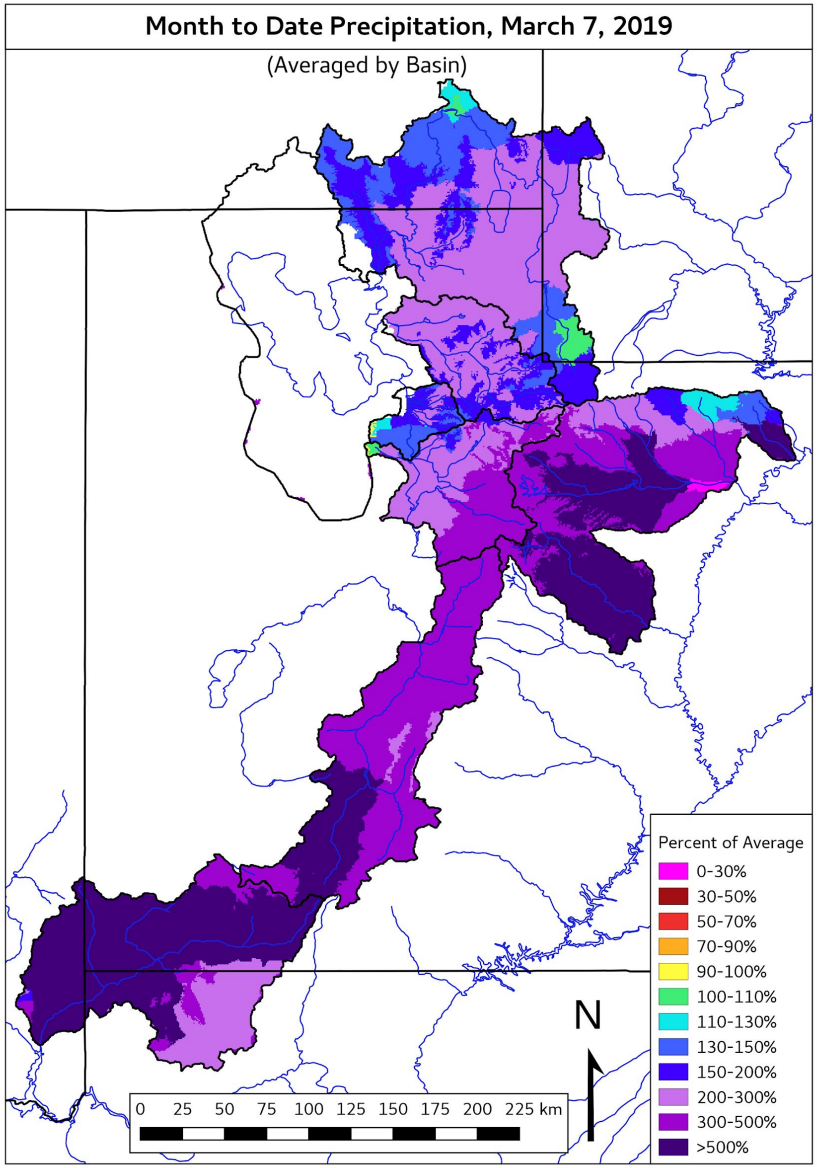
From Water Supply drop down menu
→ select Historical Verification Map

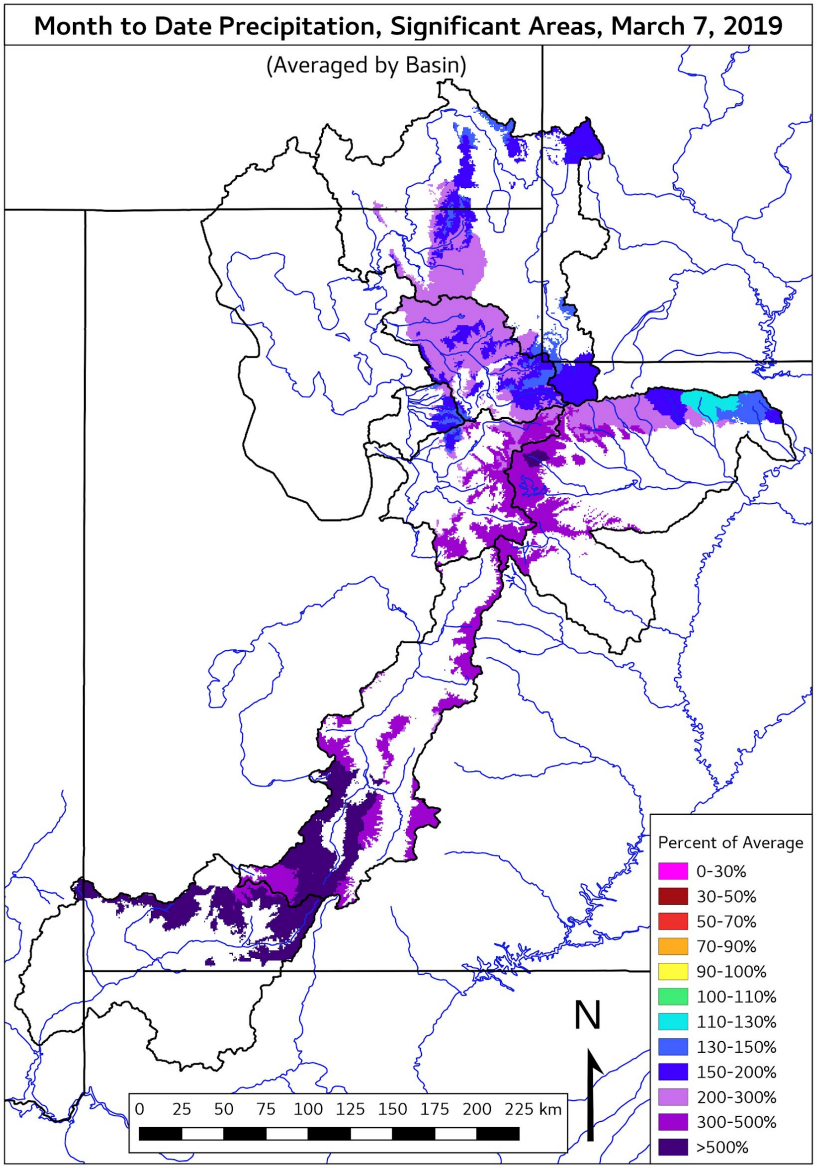
Historical Water Supply Verification - March



March 1st – 7th precipitation

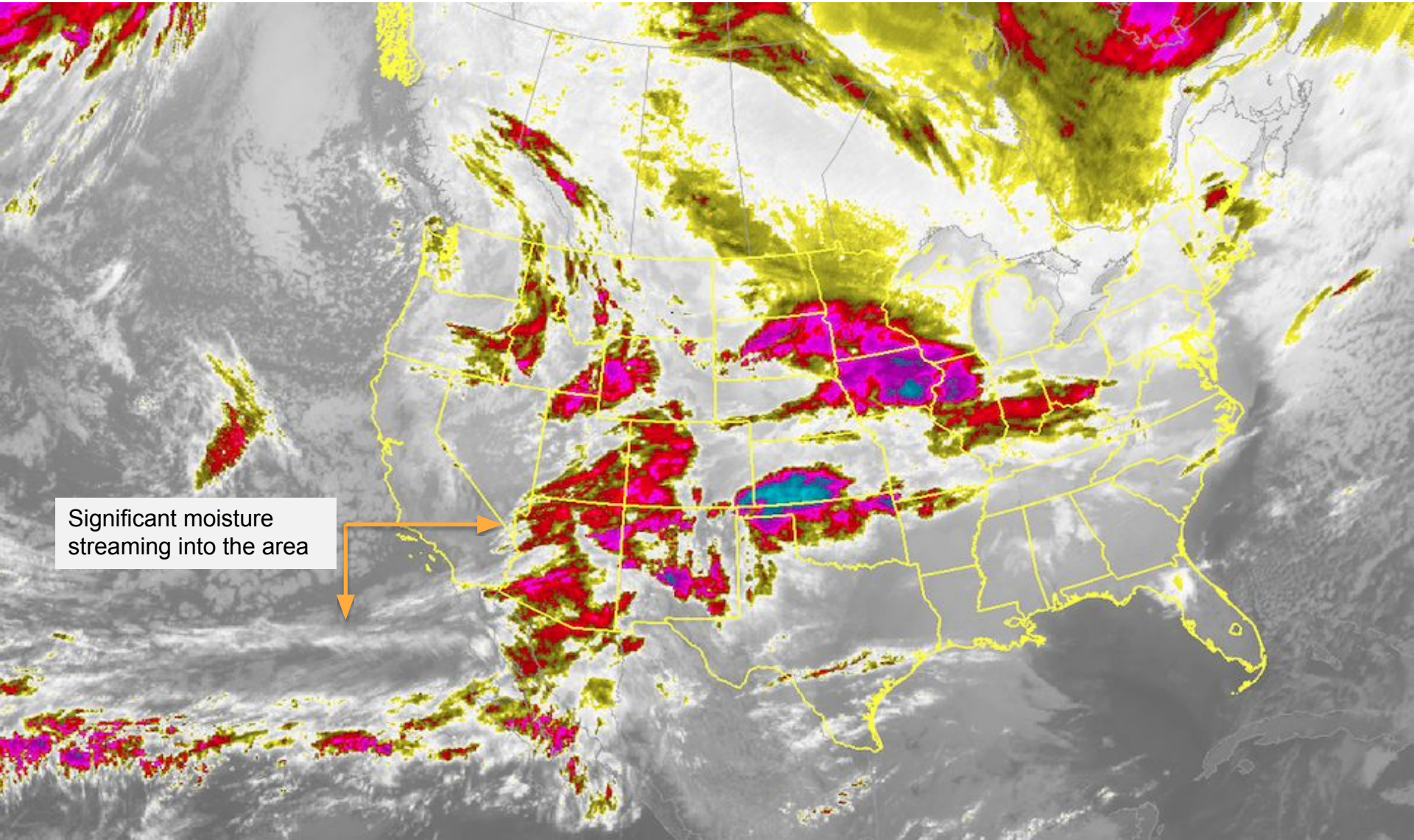
The early February precipitation was taken into account for many of the water supply forecasts





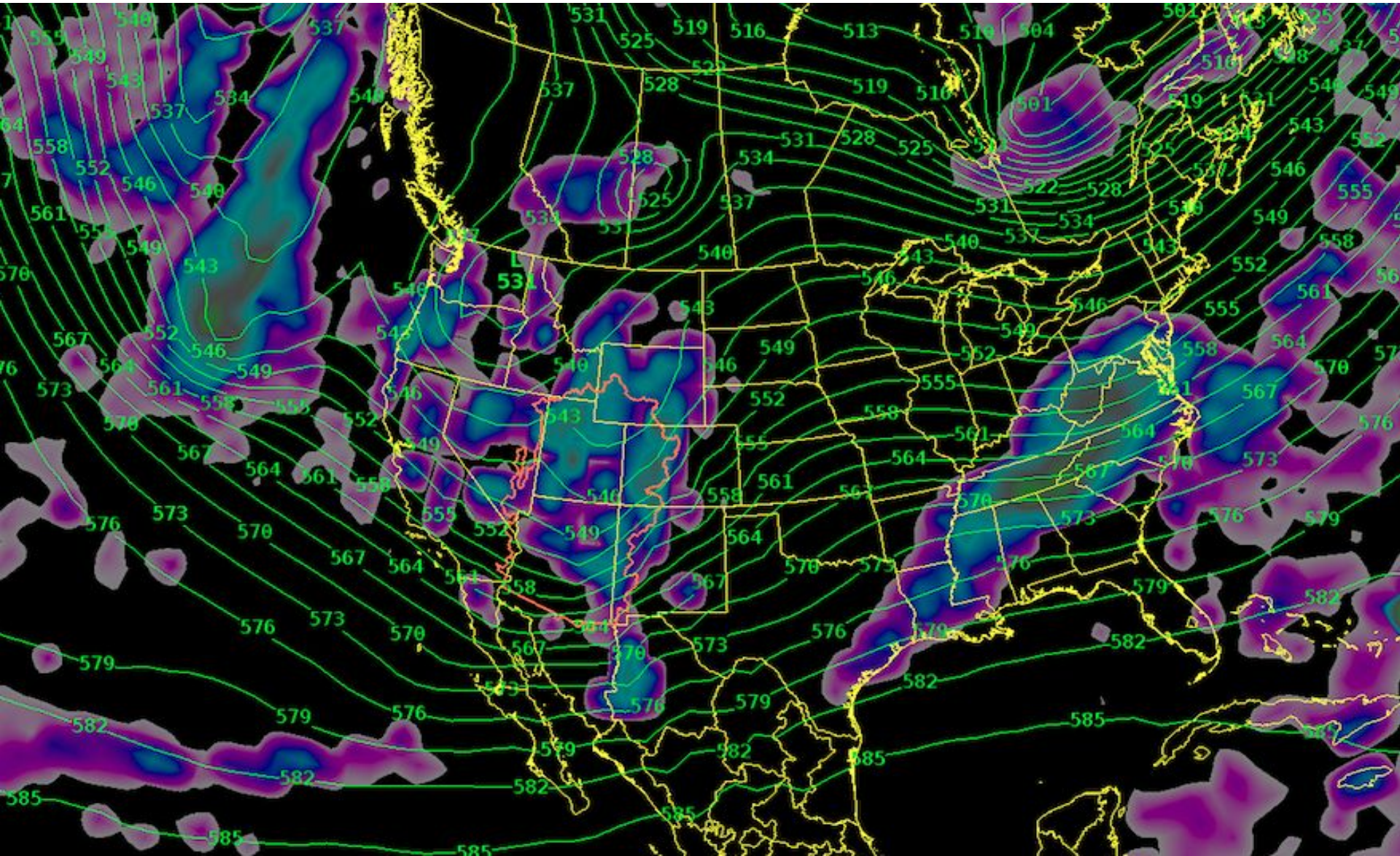
This morning – Satellite Image

The first in a series of storms is moving through the area today. This storm is another with good Pacific sub-tropical moisture source.



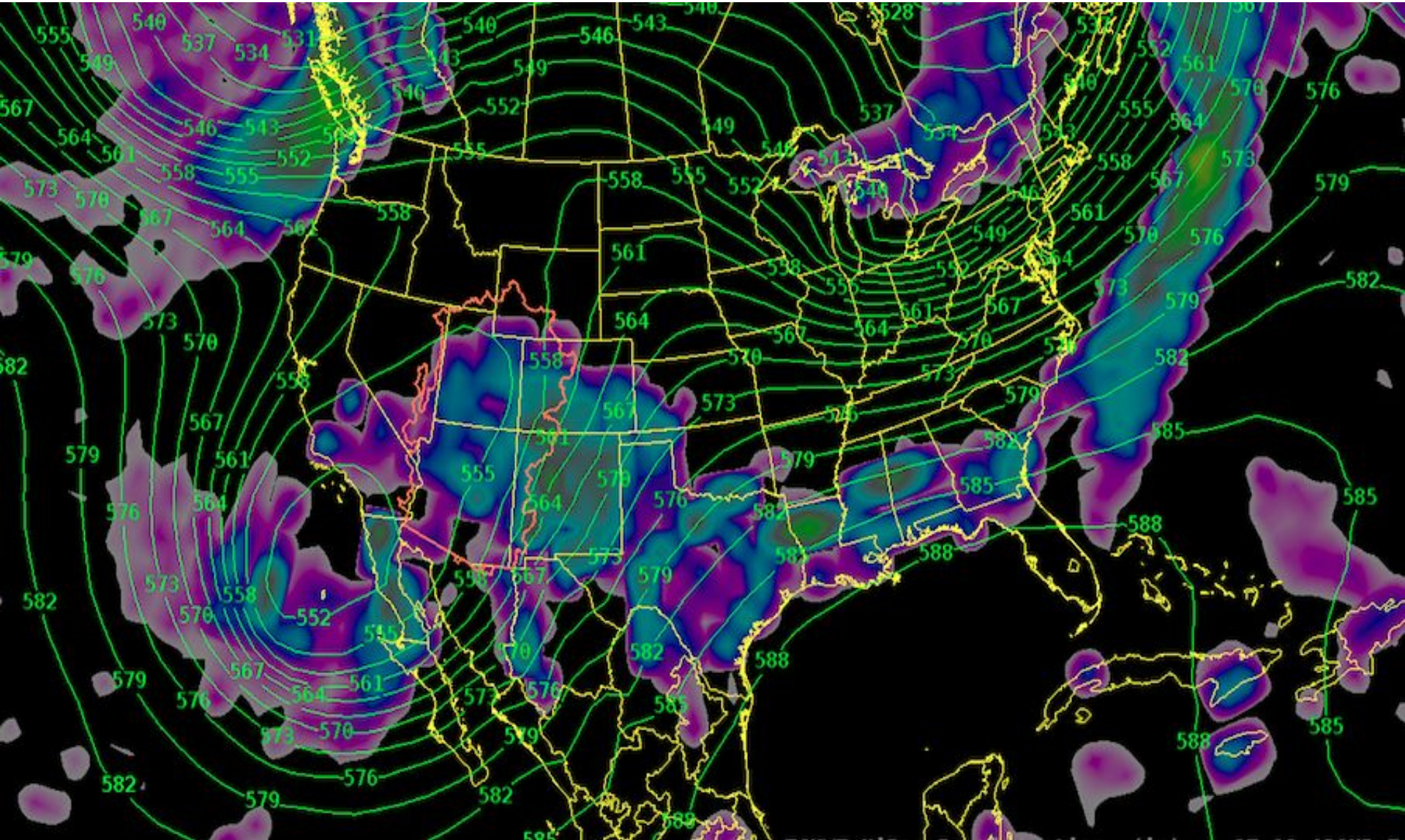
Upcoming Weather – Friday/Saturday

Another system on the heels of the first. Another system with good moisture but cooler temperatures. Snow levels will be lower with this one. Precipitation estimates .50 to 1.00 inches.



Upcoming Weather – Early next week (Mon-Tue)

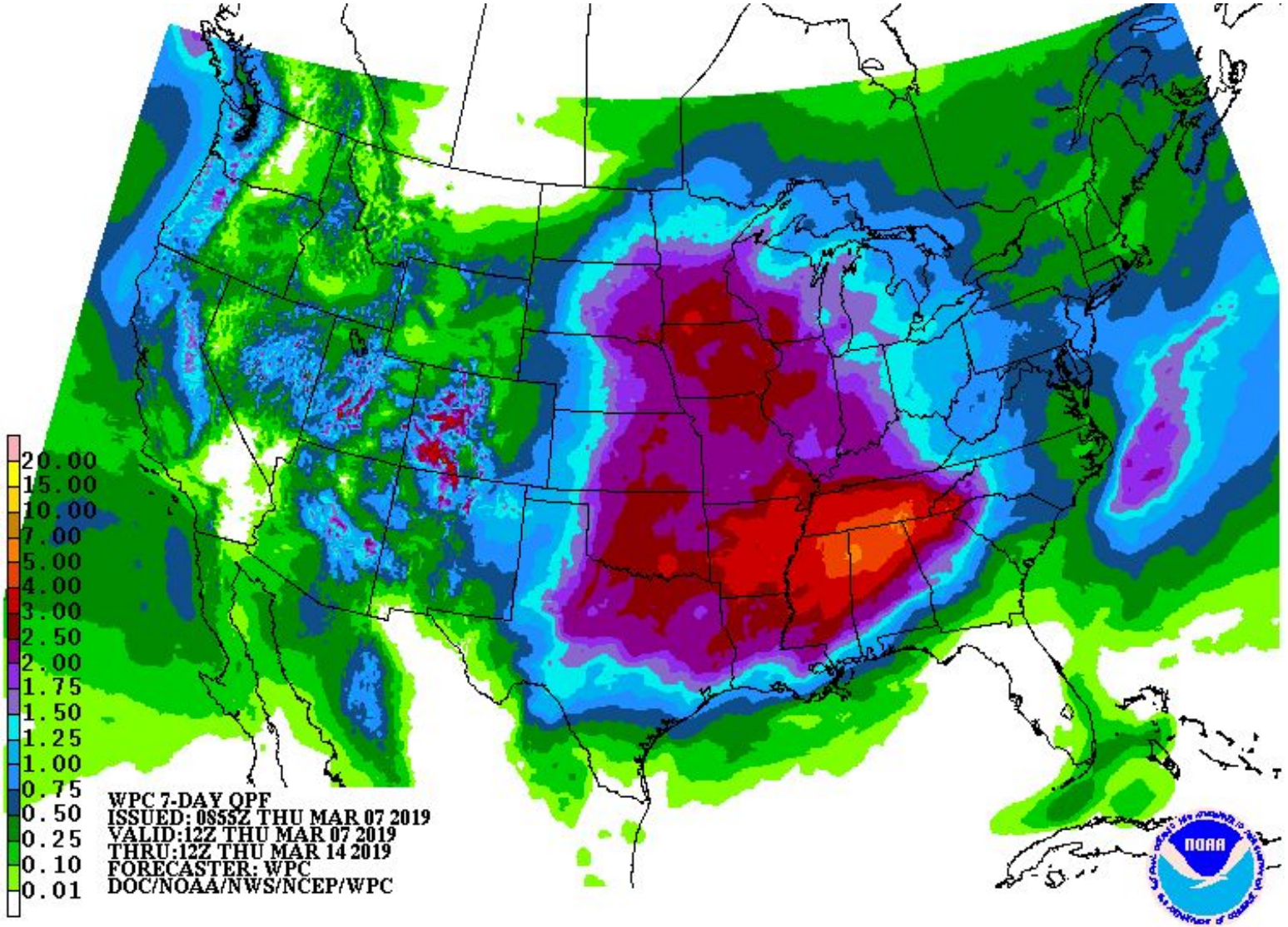
A large low pressure system drops southward along the west coast. Good moisture is ejected northward prior to the system moving inland. This could be a good precipitation producer for the Uintas and Duchesne Basin depending on the storm track.



Precipitation Outlook – Next 7 Days

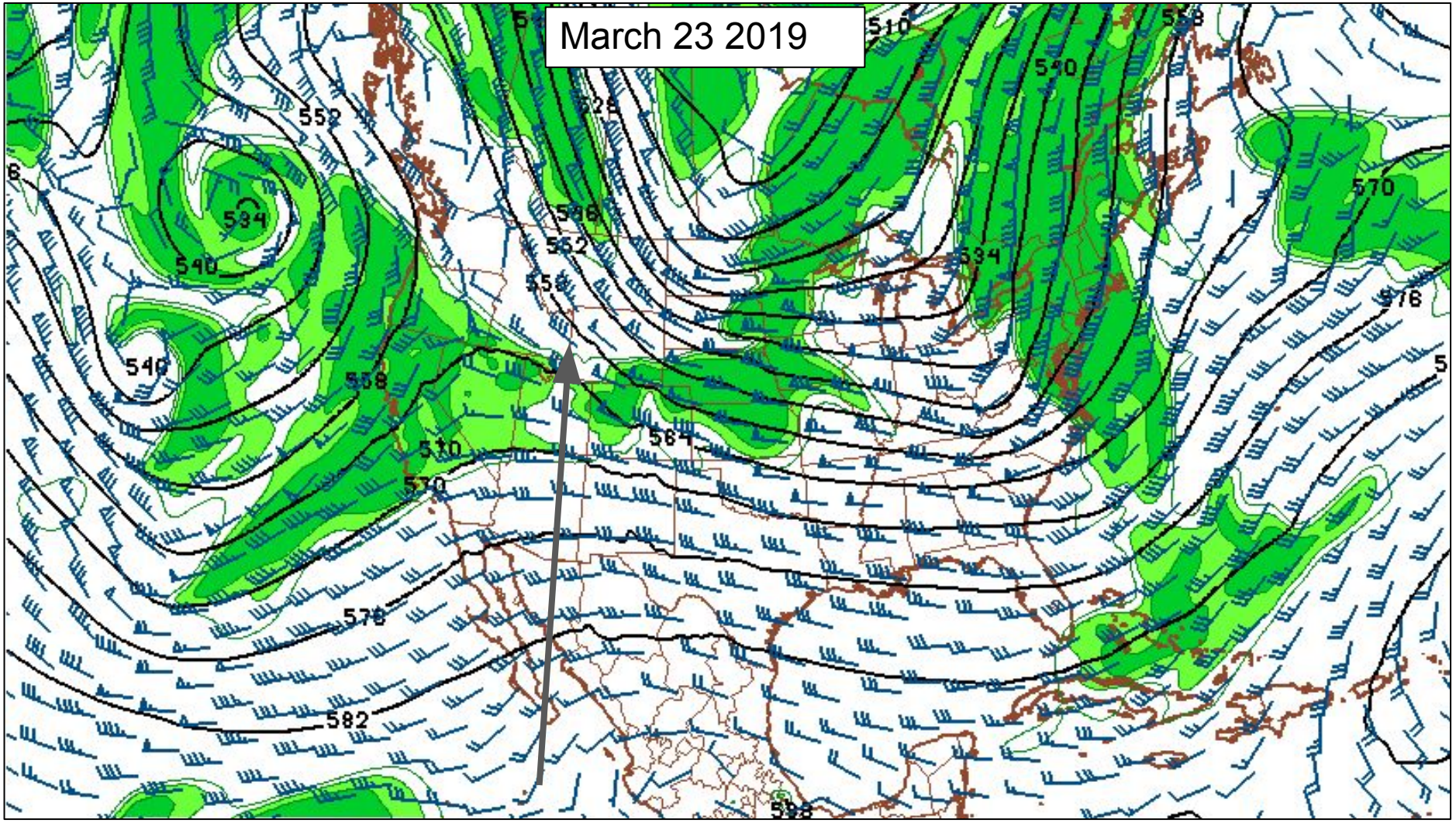
Weather Prediction Center

Precipitation March 7th – March 14th



Upcoming Weather – Longer Range Possibilities - Lower Confidence

- break in the action may occur around the March 17-22
- no persistent ridge developed
- pattern remains progressive toward the end of the month
- climate models hint at near above average April precipitation in Great Basins.

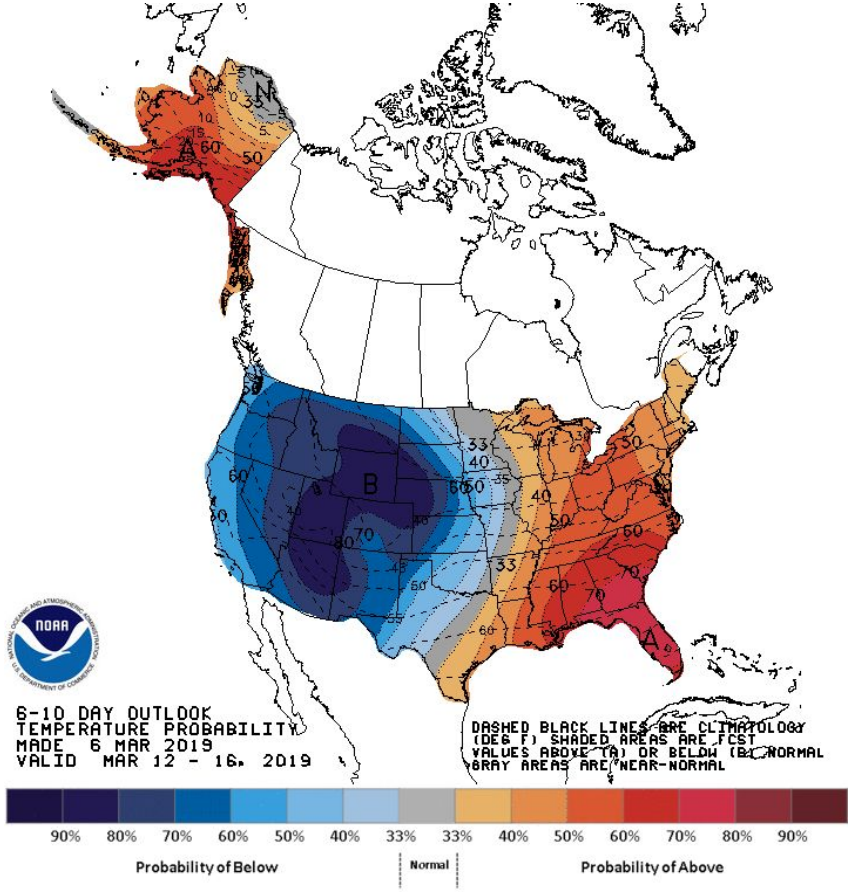


Future Temperatures

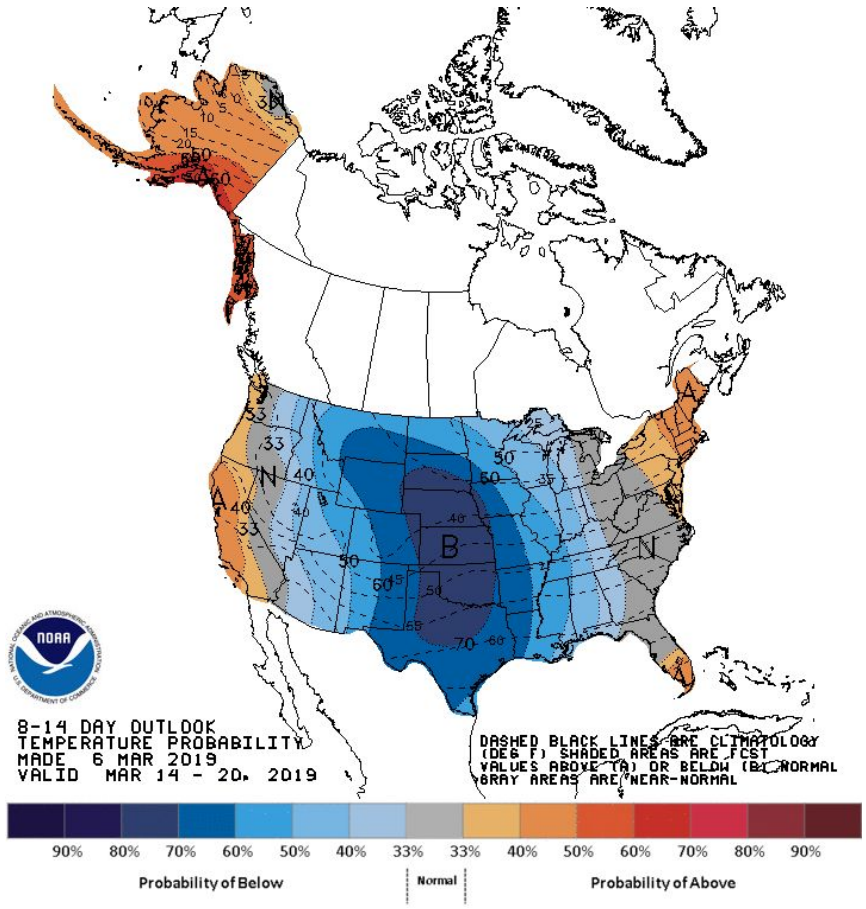
A cooler than average March should retain snowpack into April, not looking at an early melt

Impacts to Water Supply Volume Forecasts – increases are probable between now and April for many Great Basin forecast points.

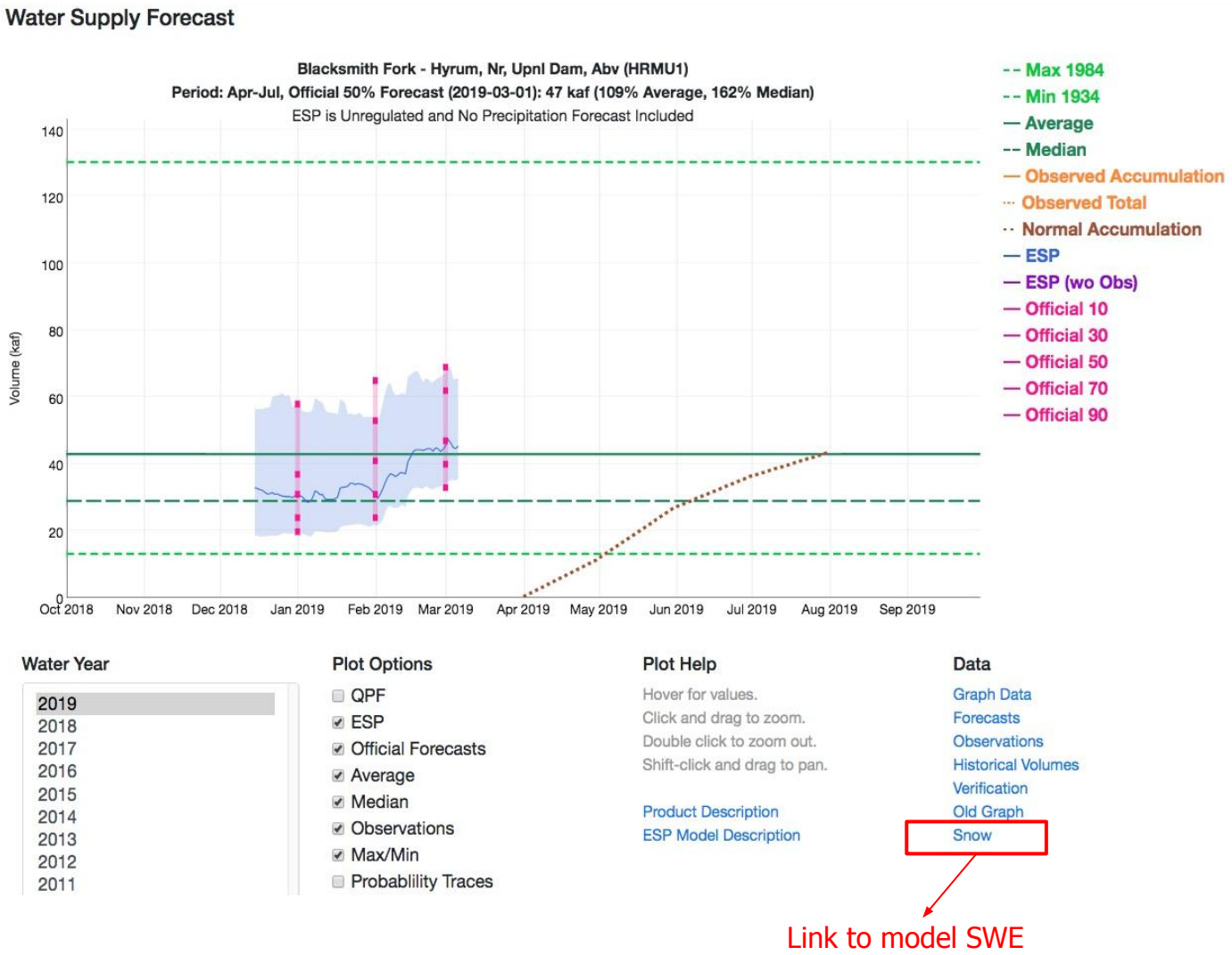
March 12-16



March 14-20



New CBRFC Snow Evaluation Tools



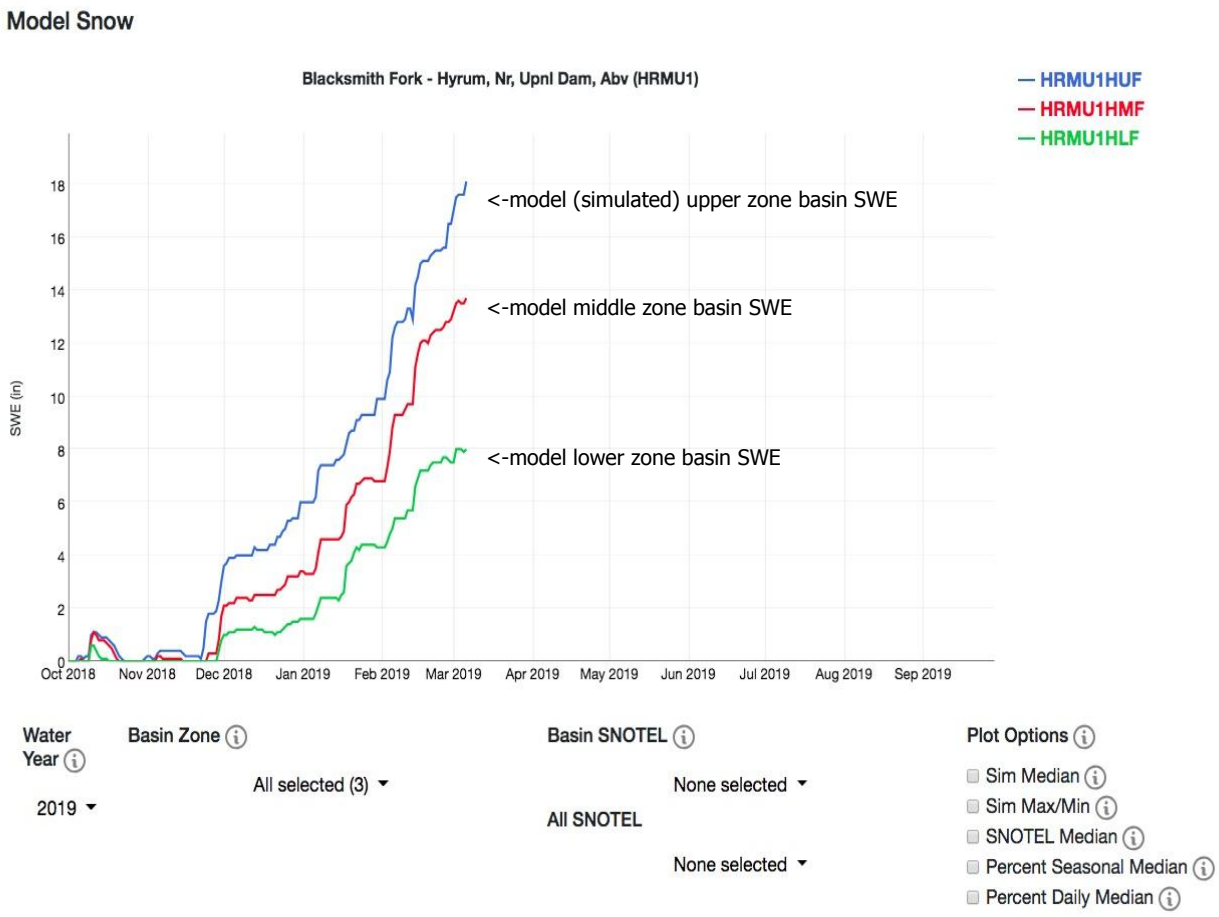
Link to model SWE

https://www.cbrfc.noaa.gov/dbdata/station/snowmodel/snowmodel_dg.html?id=HRMU1

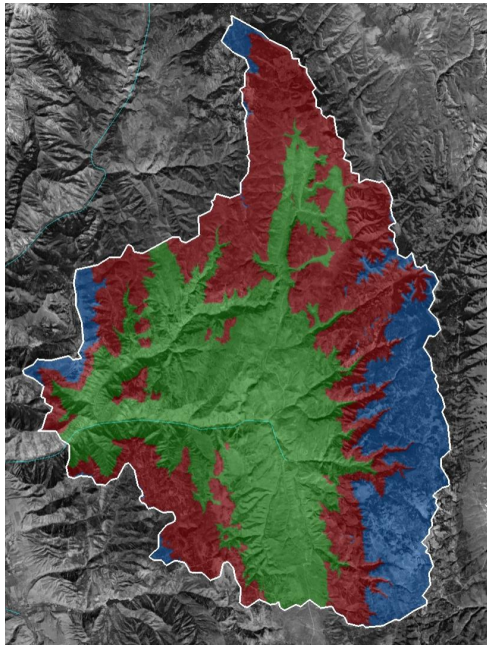
*Model SWE available for all CBRFC hydrologic model basins

New CBRFC Snow Evaluation Tools

Primary Goal: supplement/add transparency to streamflow forecast products



Blacksmith Fork - HRMU1
Basin Zone Map



Basin Elevation Zone Ranges (ft)

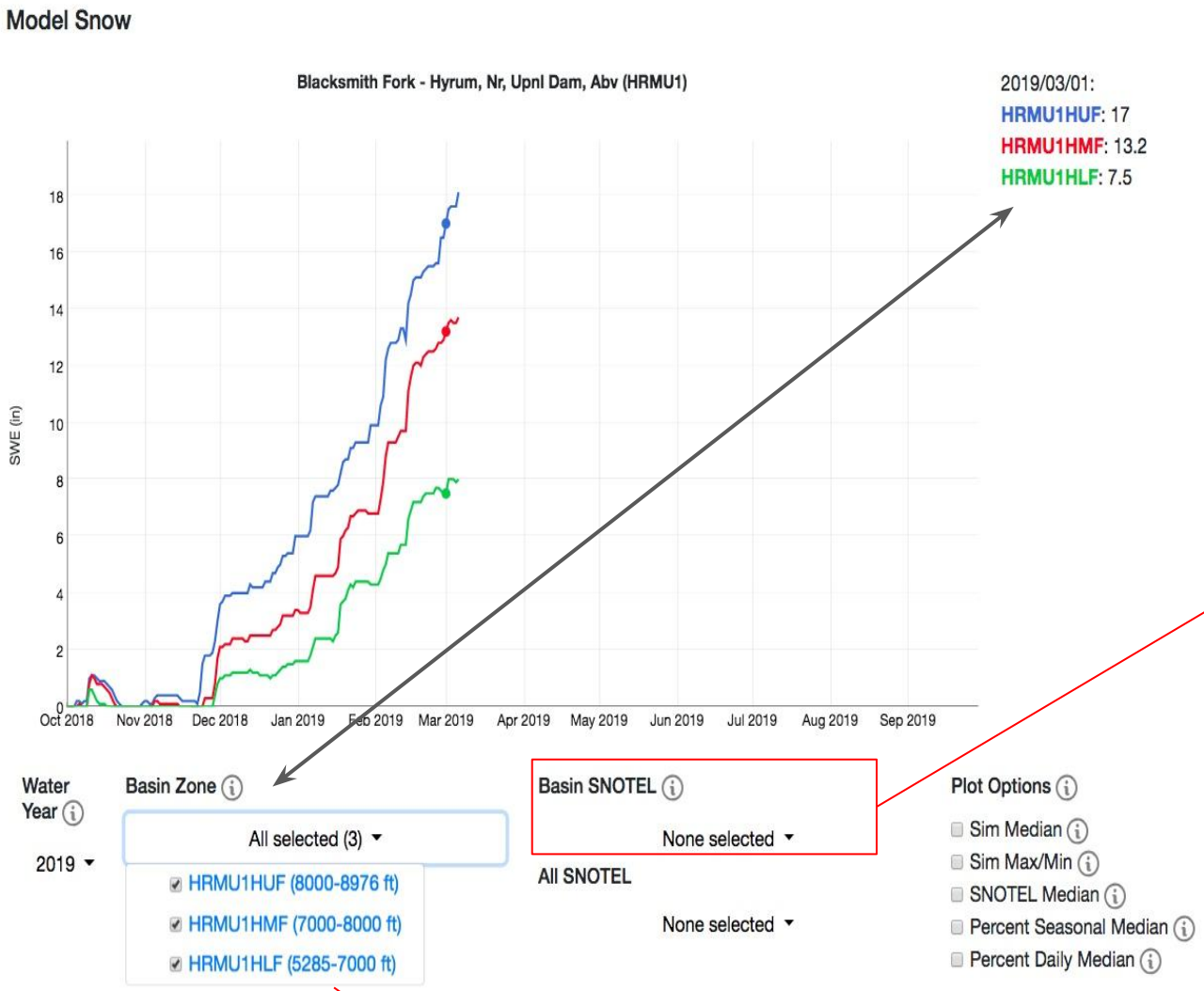
HRMU1HUF: 8,000 - 8,976

HRMU1HMF: 7,000 - 8,000

HRMU1HLF: 5,285 - 7,000

Fancy Map Not Included in Tool yet.

CBRFC Model Snow

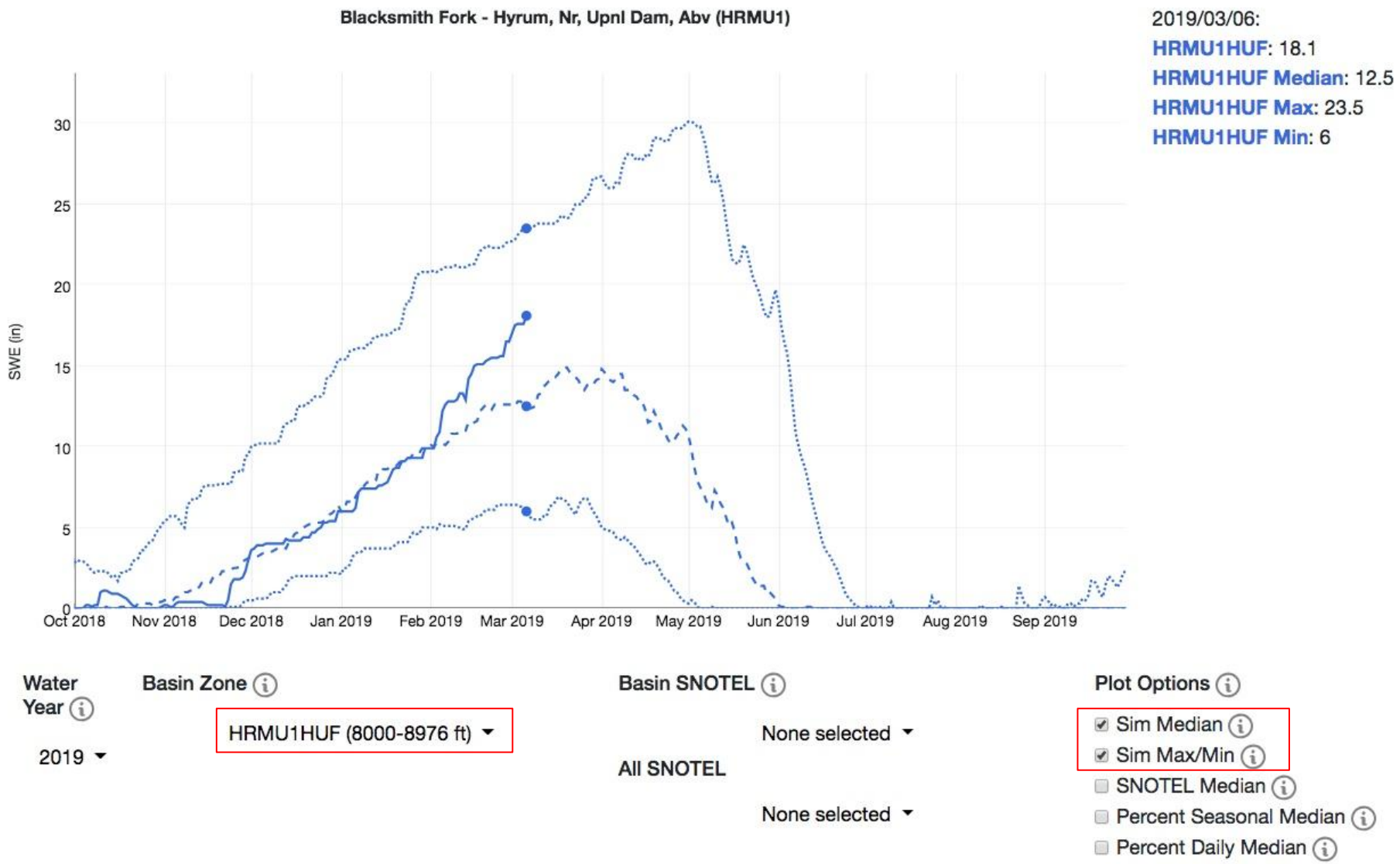


NRCS SNOTEL stations that best represent basin; determined/weighted during hydrologic model calibration process

basin elevation zone ranges

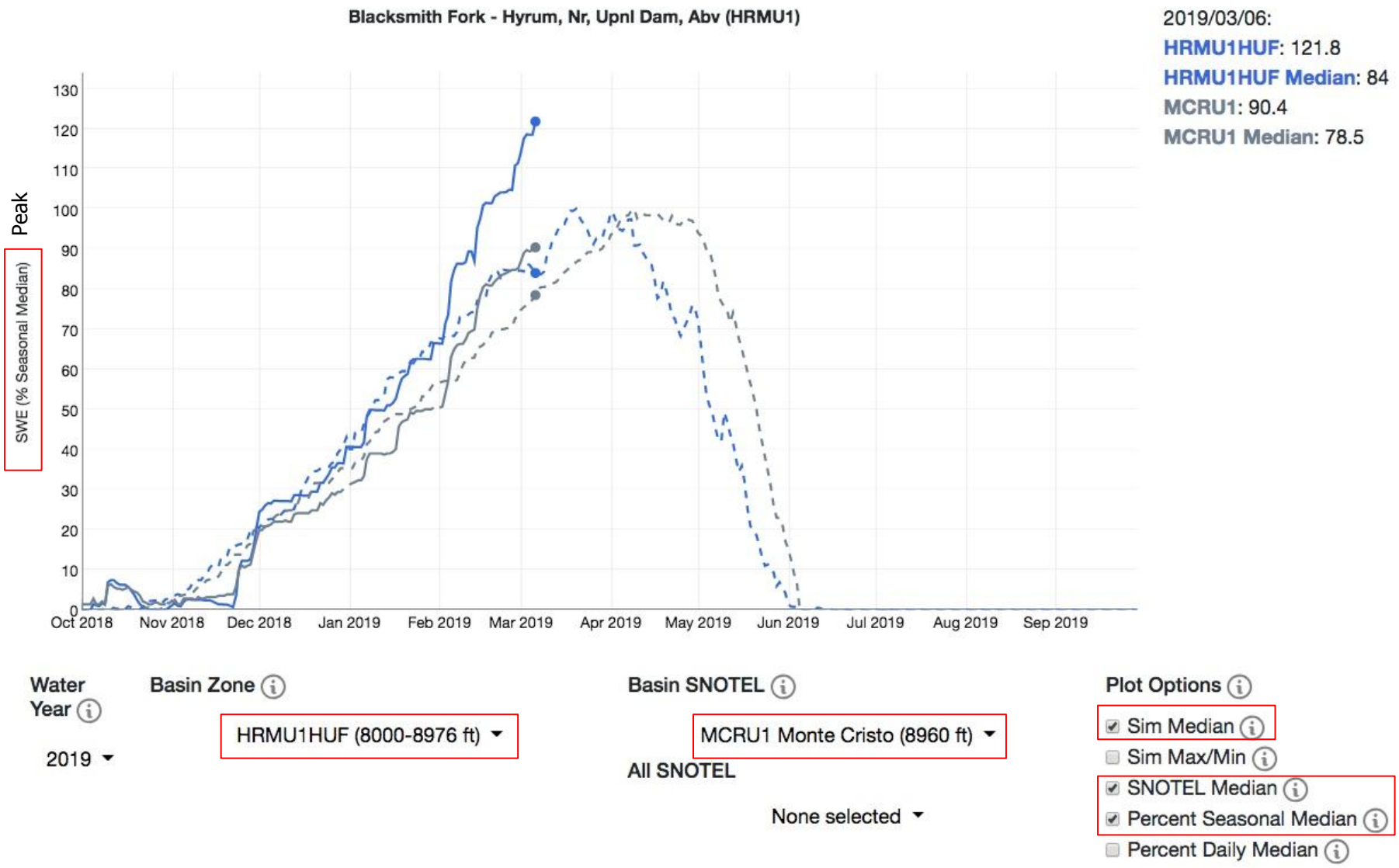
CBRFC Model Snow

Model Snow



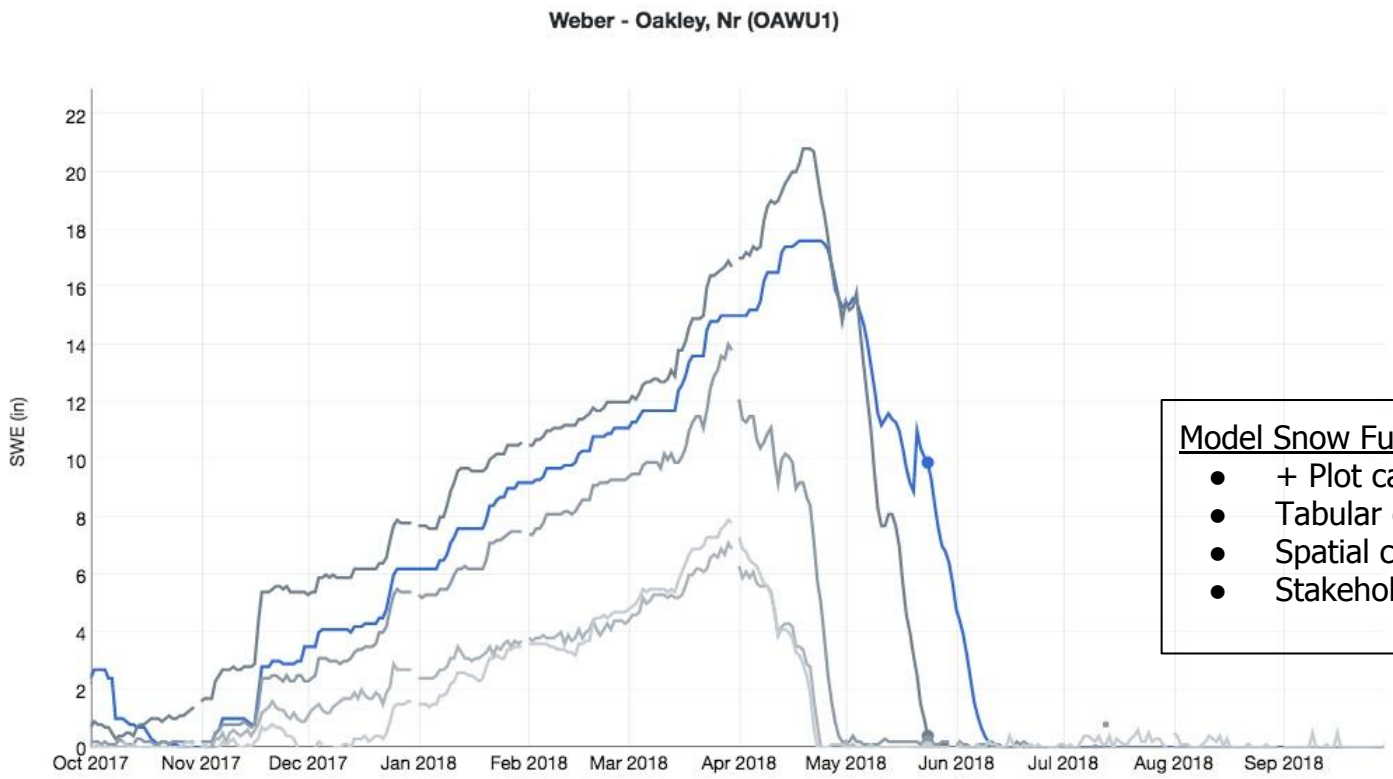
CBRFC Model Snow

Model Snow



CBRFC Model Snow

Model Snow



2018/05/24:
OAWU1HUF: 9.9
TRLU1: 0.4
HFKU1: 0.2
NWYU1: 0
SMMU1: 0

Model Snow Future Development
- \+ Plot capabilities
- Tabular component
- Spatial component
- Stakeholder/user recommendations

Water Year: 2018

Basin Zone: OAWU1HUF (10000-10974 ft)

Basin SNOTEL: All selected (4)
- TRLU1 Trial Lake (9992 ft)
- HFKU1 Hayden Fork (9212 ft)
- NWYU1 Beaver Divide (8280 ft)
- SMMU1 Smith & Morehouse (7600 ft)

Plot Options
- Sim Median
- Sim Max/Min
- SNOTEL Median
- Percent Seasonal Median
- Percent Daily Median

2019 Water Supply Briefing Schedule

2019 monthly water supply briefings for the Great Basin/Utah

Thursday April 4th @ 1:30 pm MT

Tuesday May 7th @ 1:30 pm MT

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

Peak flow briefing is March 14th 1:30 pm MT. Additional briefings scheduled as 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

Michelle Stokes – Hydrologist In Charge
michelle.stokes@noaa.gov

Paul Miller– Service Coordination Hydrologist
paul.miller@noaa.gov

Basin Focal Points (Forecasters)
Brent Bernard – Six Creeks, Provo , Sevier Focal Point
brent.bernard@noaa.gov

Patrick Kormos – Bear, Weber Focal Point
patrick.kormos@noaa.gov

Greg Smith – San Juan, Gunnison, Dolores Focal Point
greg.smith@noaa.gov

Ashley Nielson – Green River Basin, Lake Powell Focal Point
ashley.nielson@noaa.gov

Cody Moser – Upper Colorado Mainstem Focal Point
cody.moser@noaa.gov

Tracy Cox and Zach Finch – Lower Colorado Basin, Virgin Focal Point
tracy.cox@noaa.gov
zach.finch@noaa.gov