CBRFC Forecast Areas

Great Basin / Utah Water Supply Briefing

May 7 , 2018

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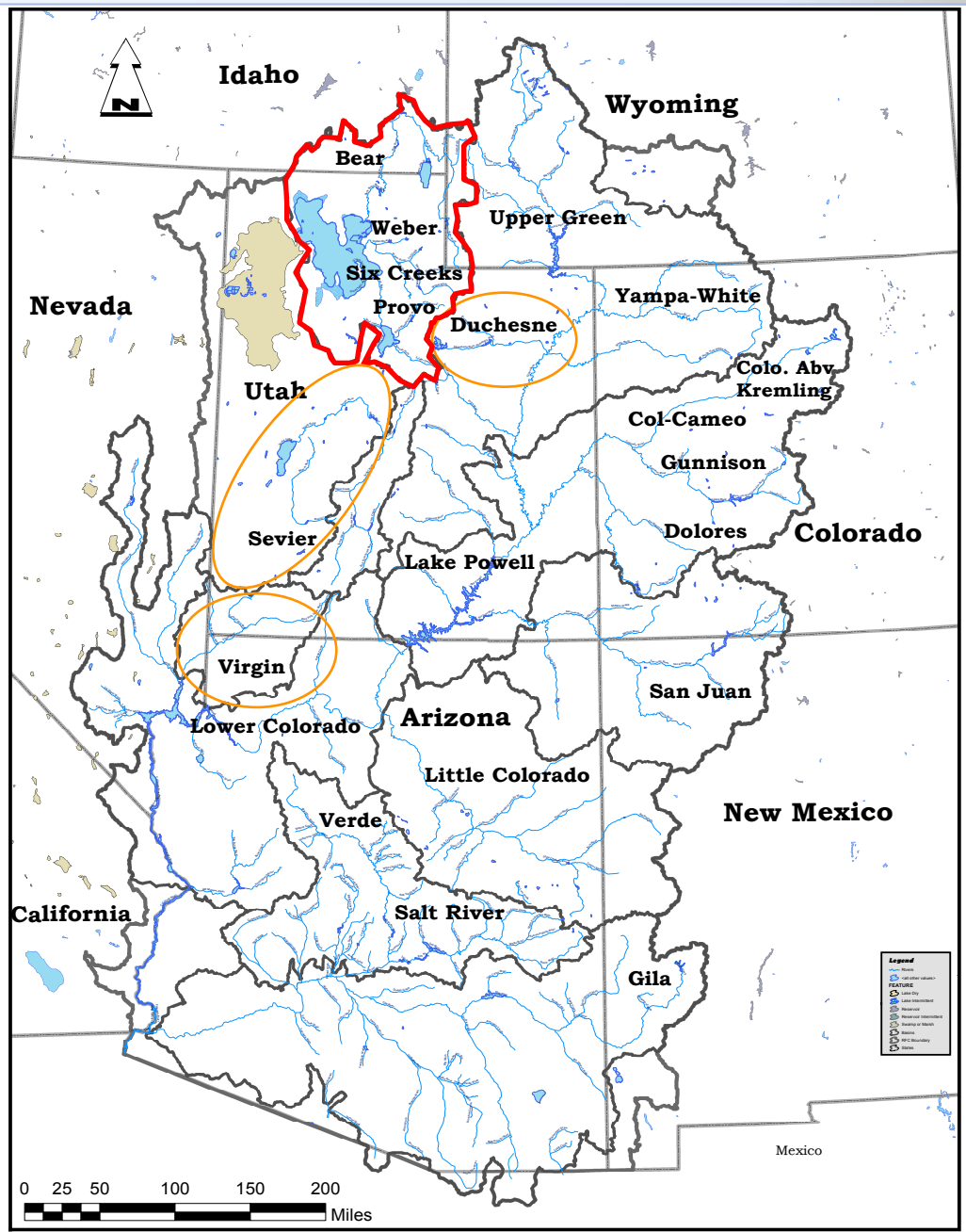
Please mute your phone until ready to ask questions



Today's Presentation

- Quick review of the weather pattern that put us in our current situation
- April weather and water year precipitation summary
- The 2018 snowpack evolution
- Latest water supply forecasts and how several rank historically.
- Current and near term weather impacts
  - Seasonal peaks are very near – They are low and early.
- Wrapping up the 2018 season

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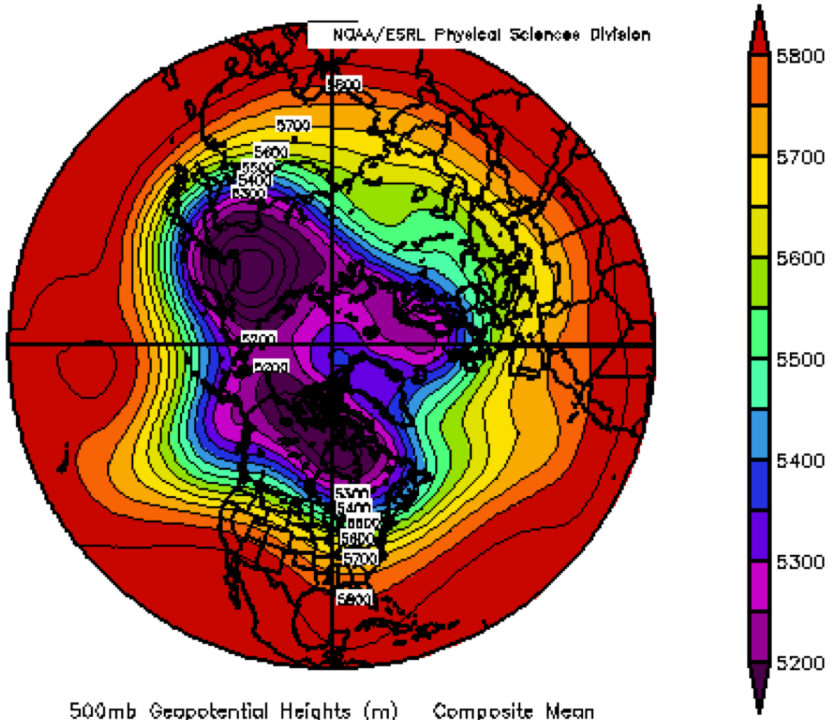
We knew we might have a problem late last fall
We anticipated water supply forecasts would start out low

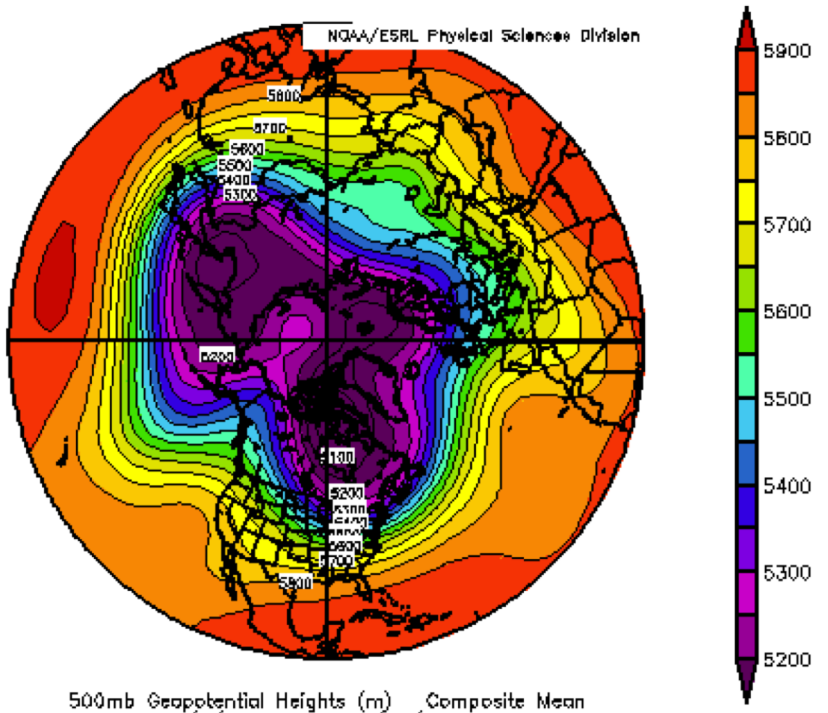
Strong low pressure in the east (Hudson Bay) and a strong ridge near the West Coast.
A high amplitude “Blocking Pattern” had become established by December.

Extended periods of dry & warm or cold & wet usually result with such patterns.

Mean Atmospheric Pattern
Nov 15 – Nov 30

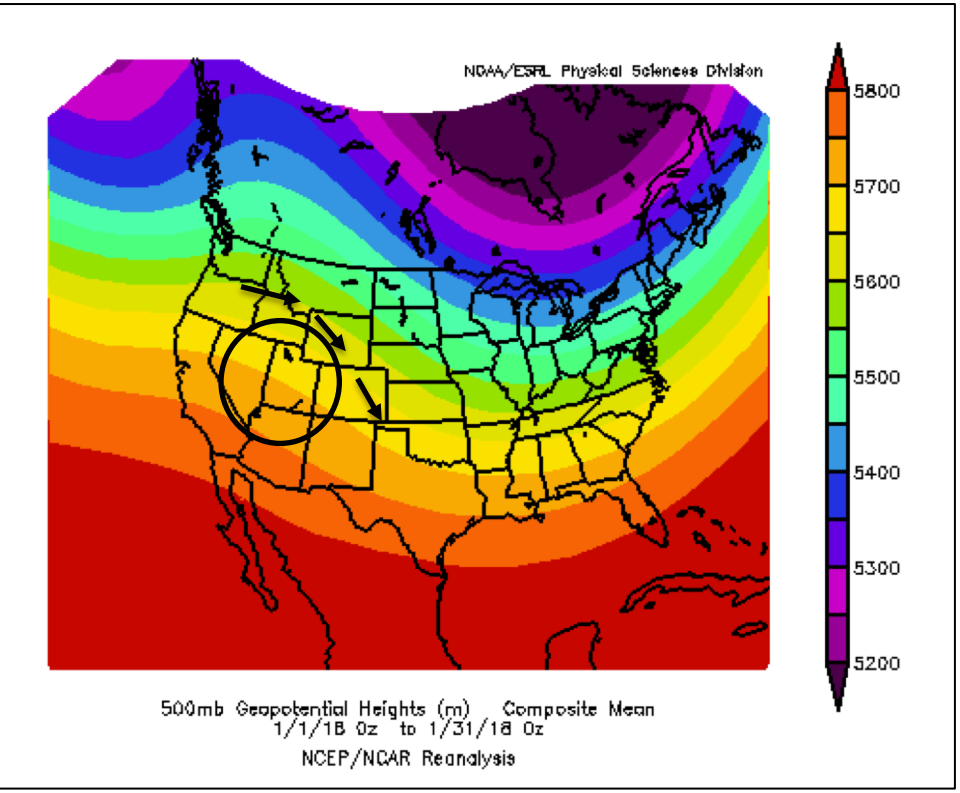


Mean Atmospheric Pattern
Dec 1 – Dec 31

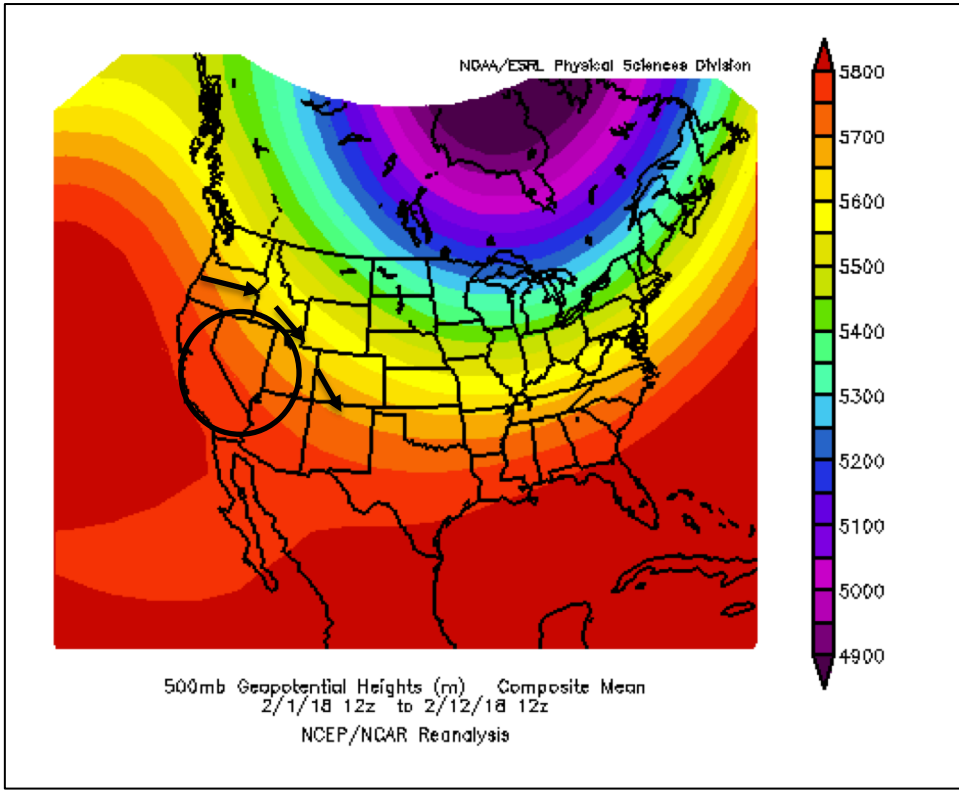


This weather pattern persisted into mid February

Mean Atmospheric Pattern
January 2018



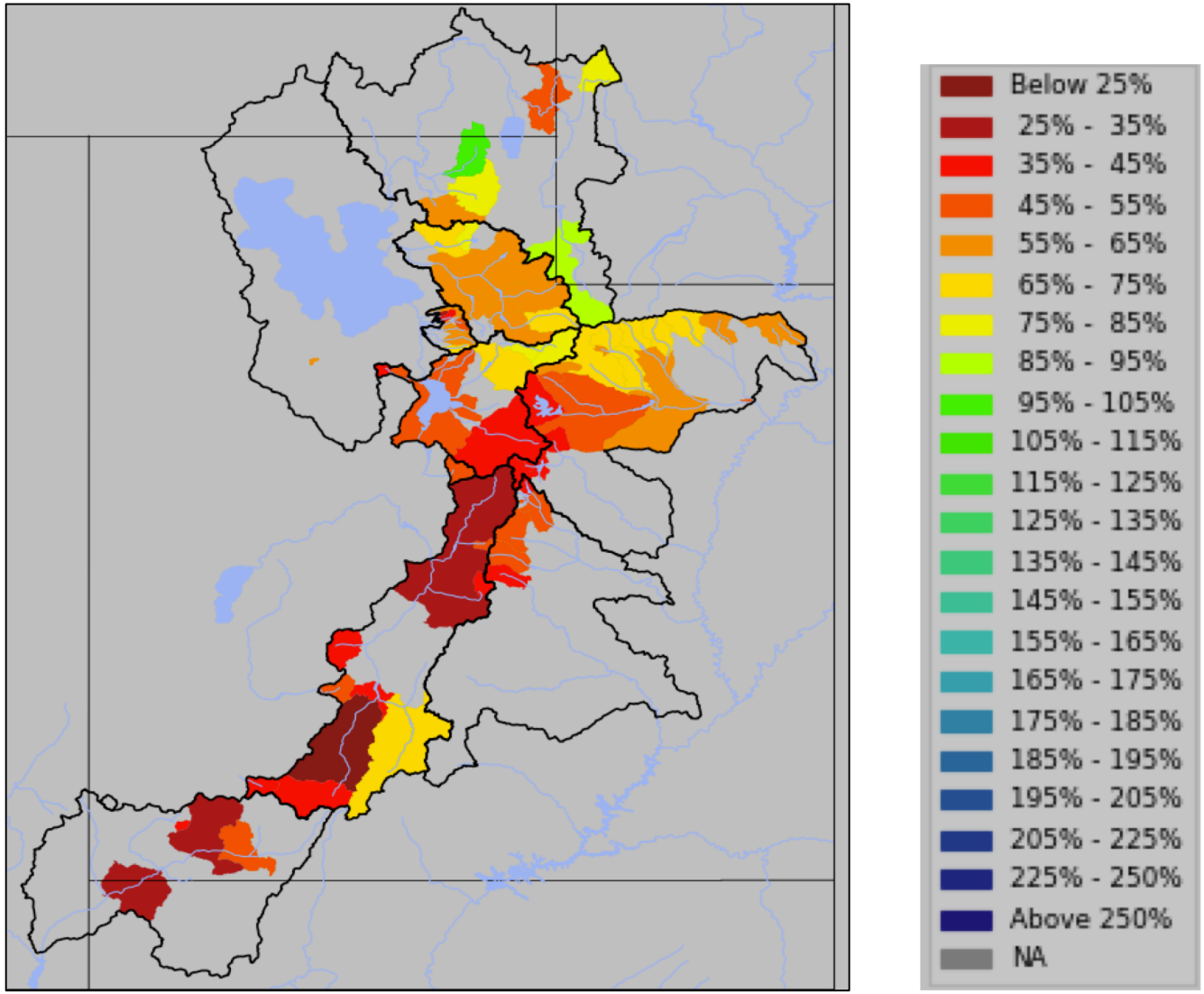
Mean Atmospheric Pattern
First half of February 2018



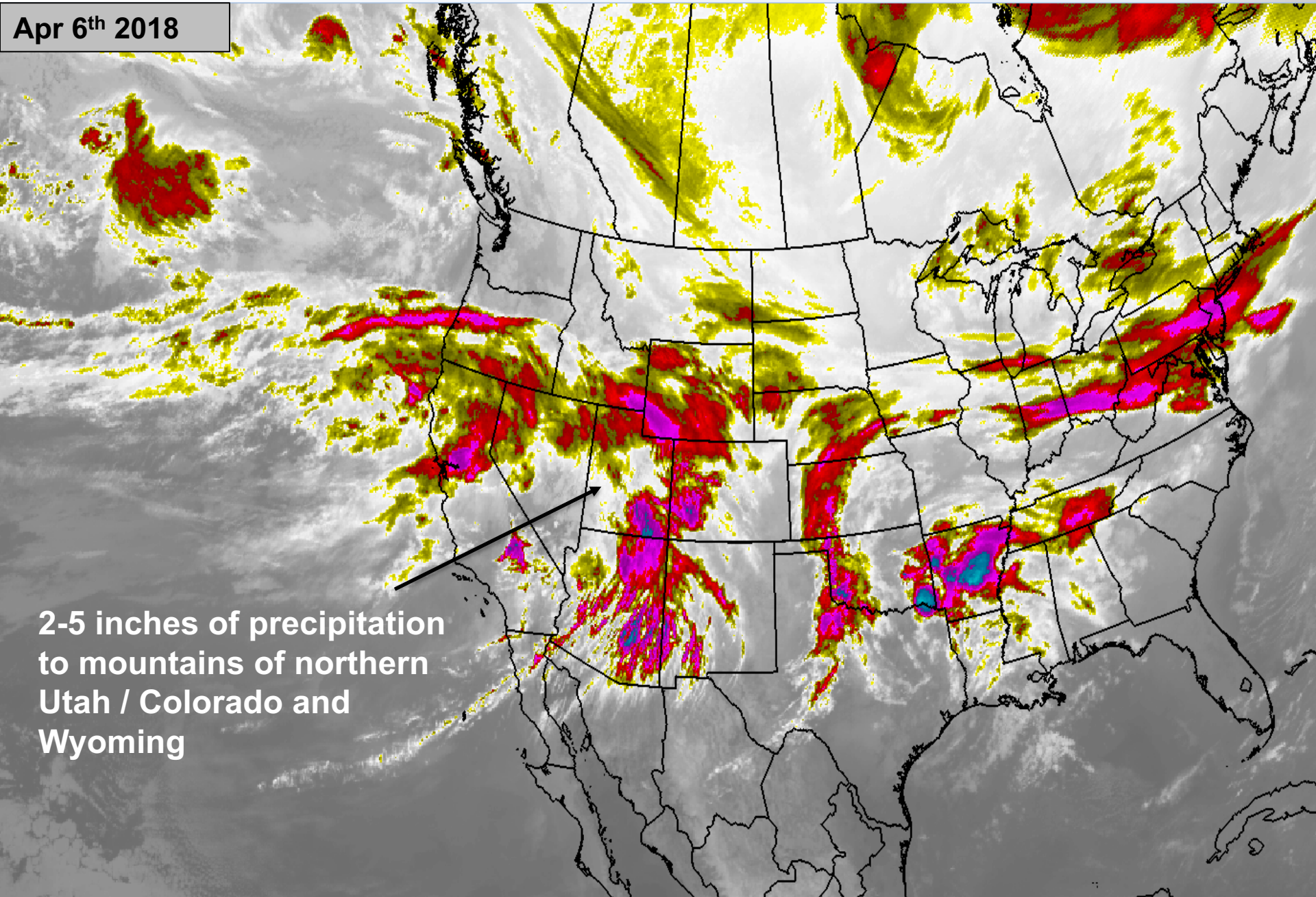
Storm track was around the periphery of the high pressure ridge. Precipitation impacts were limited to far northern portions of the Great Basin.

January 1st Forecasts: Started season below average

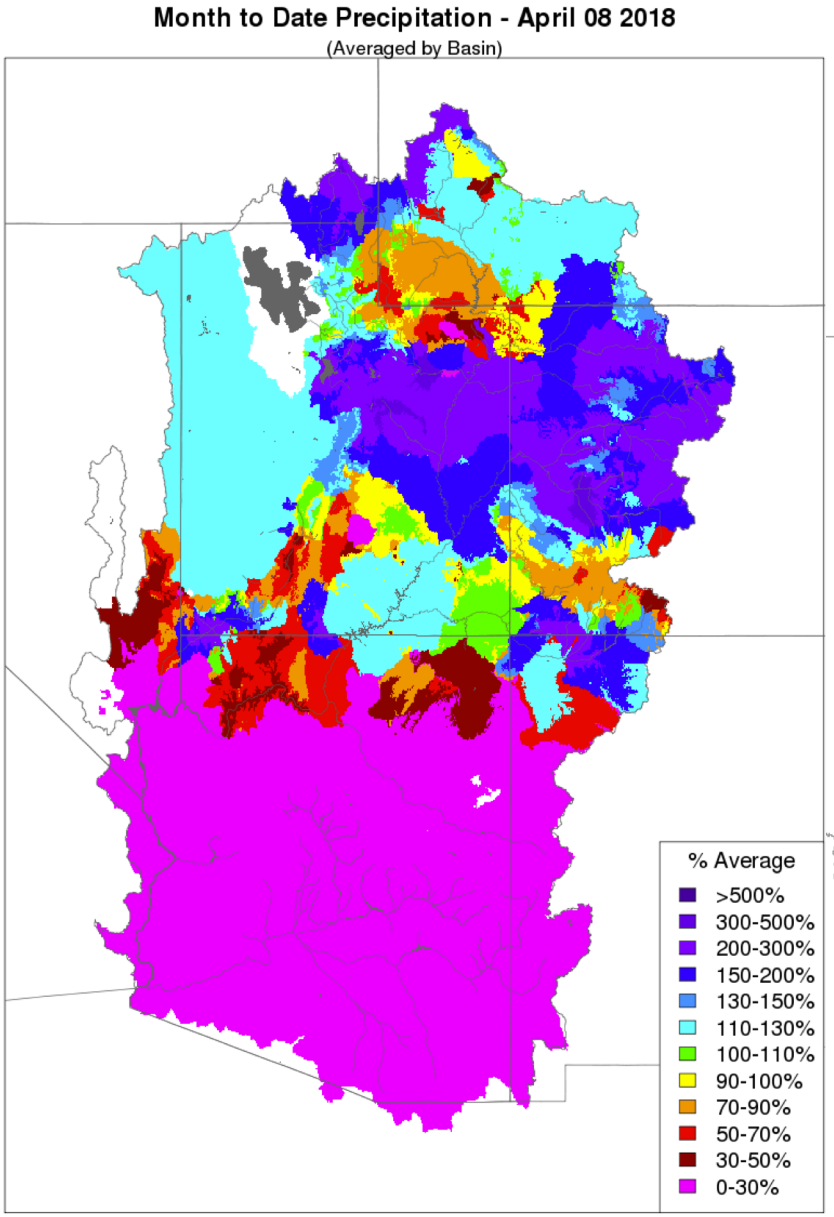
April-January streamflow
Volume forecasts
Forecasts as of Jan 1 2018

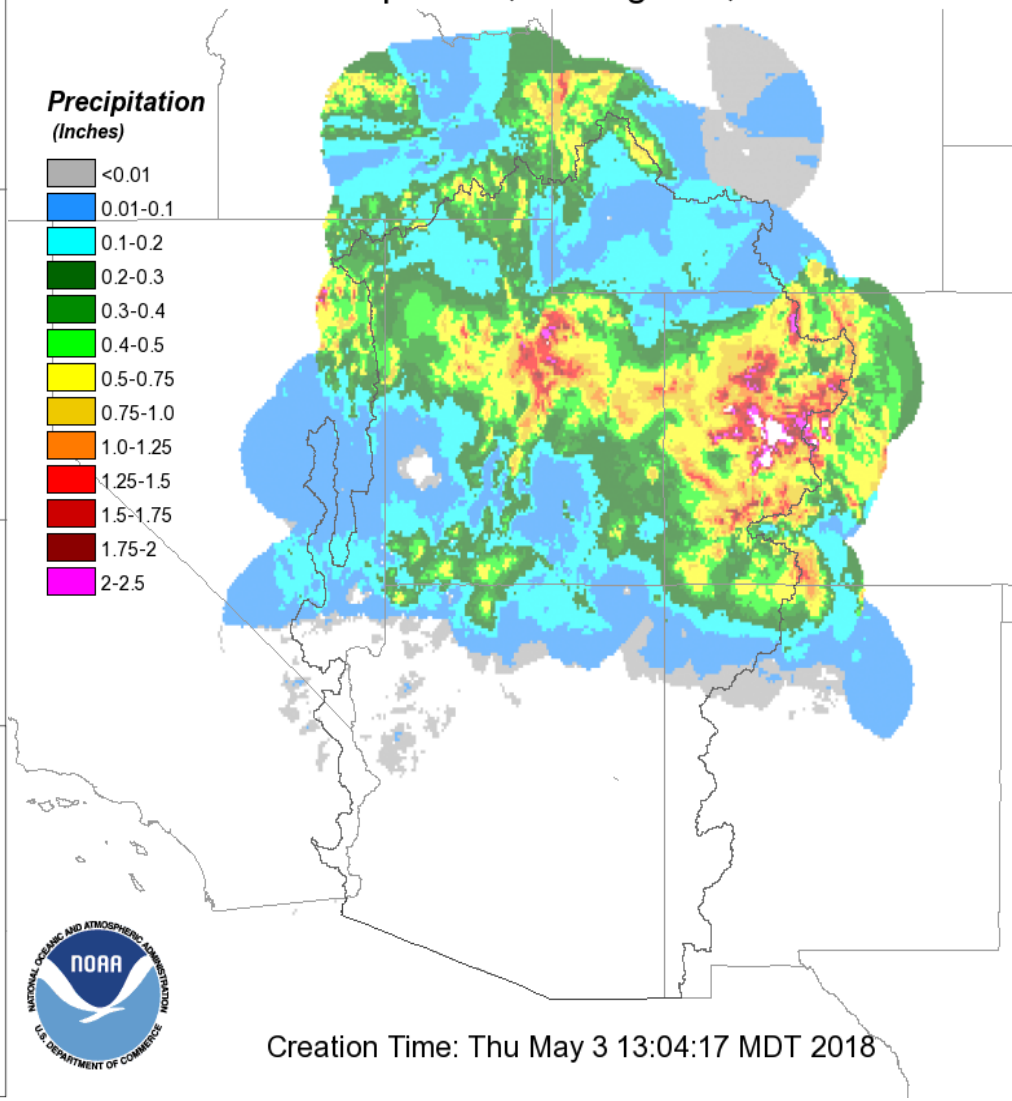


Not many April storms: A significant amount of April precipitation came from a storm system April 6th – April 8th. Warm system – high freezing levels – minor snowpack improvement



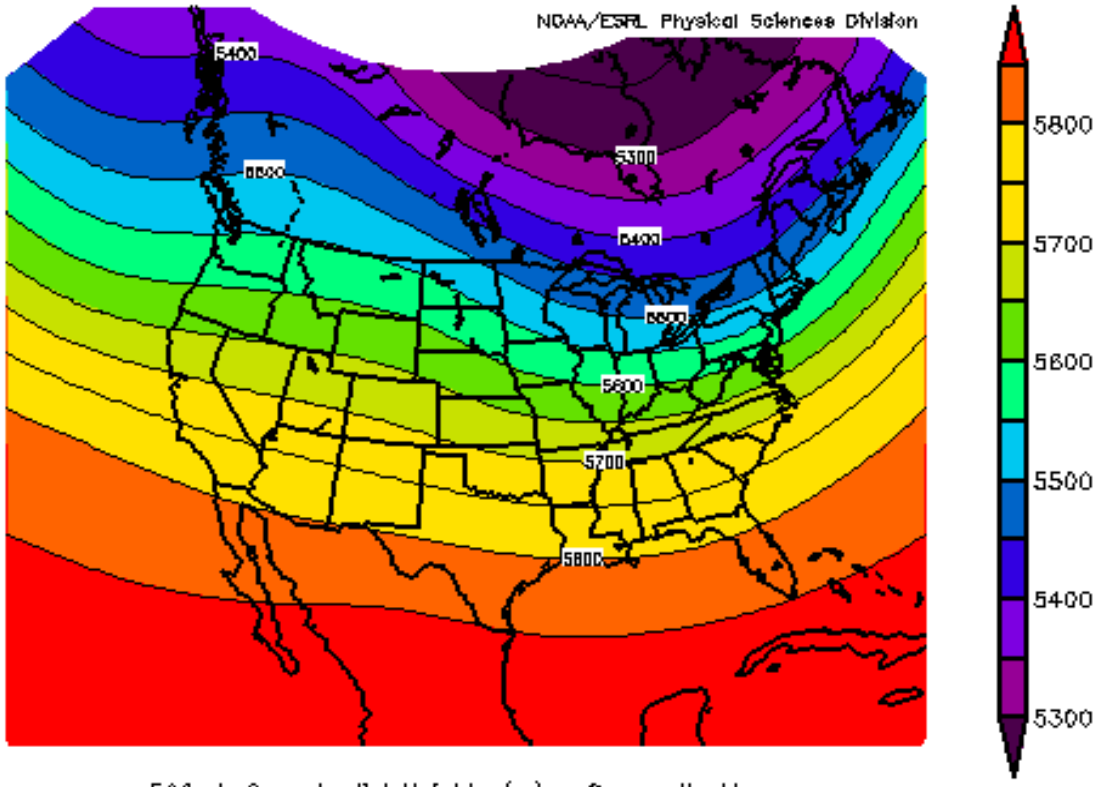
April 2018 Precipitation: Precipitation through the first week of the month





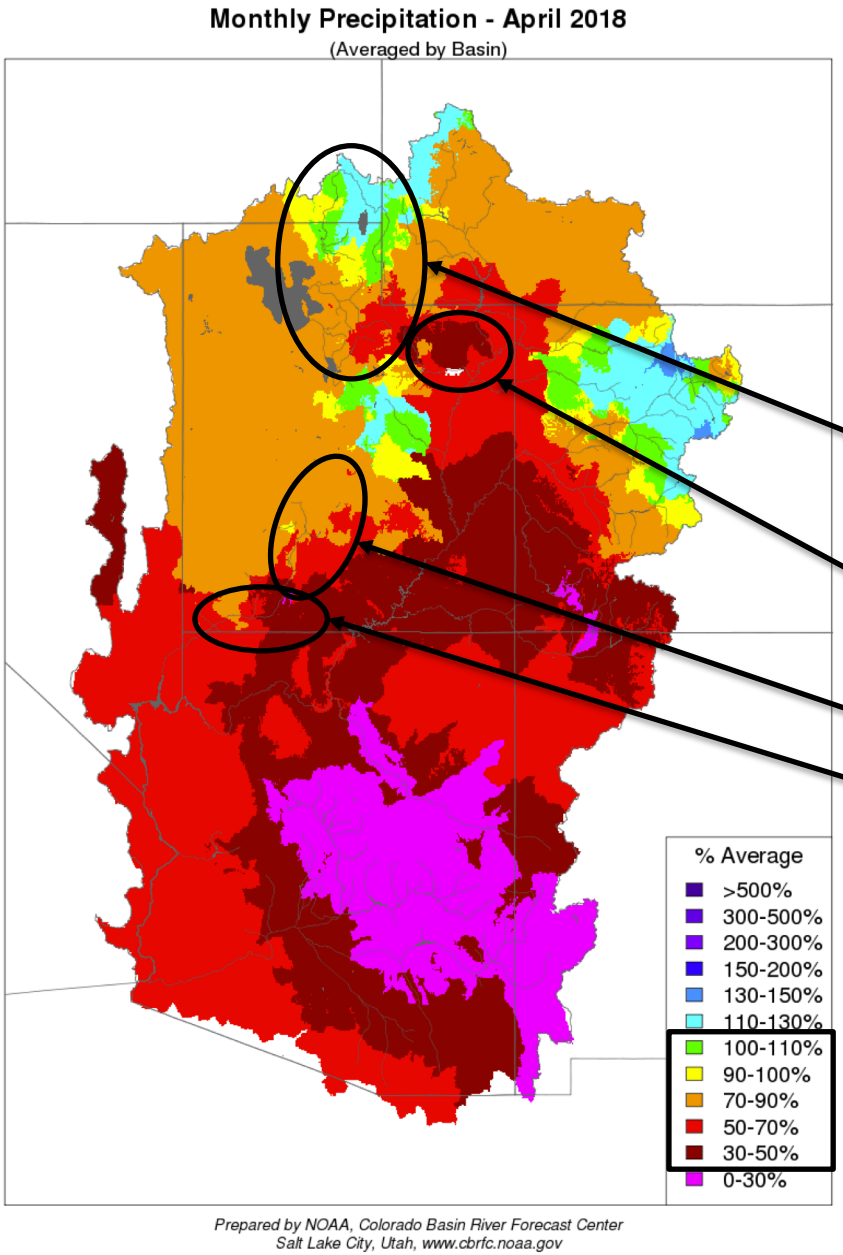
April Weather Pattern

Mean Atmospheric Pattern
April 2018



Mean atmospheric high pressure ridge
Generally below average precipitation and above average temperatures

April Precipitation – full month % of average



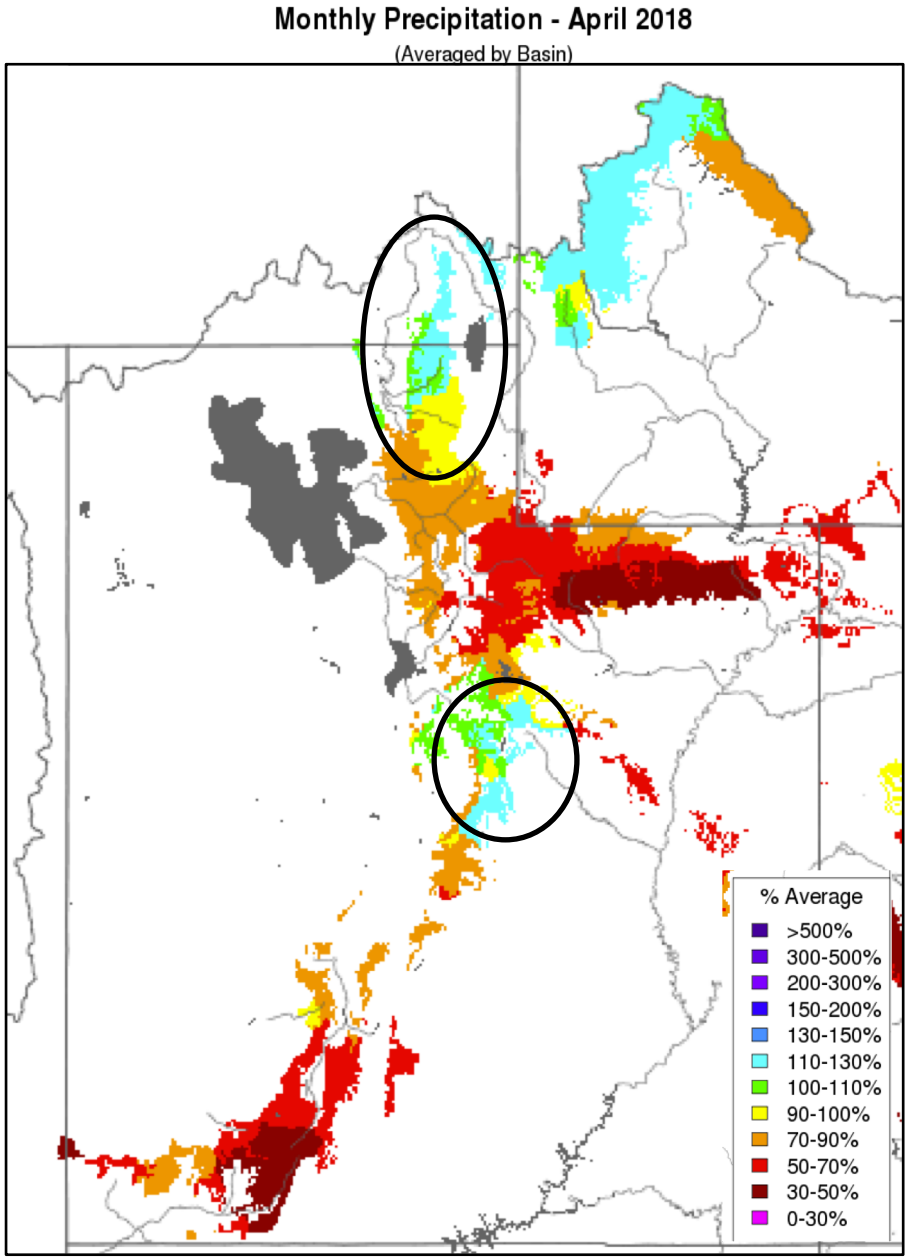
April Totals

Bear: 100%
Weber: 80%
Six Creeks: 85%
Provo: 80%

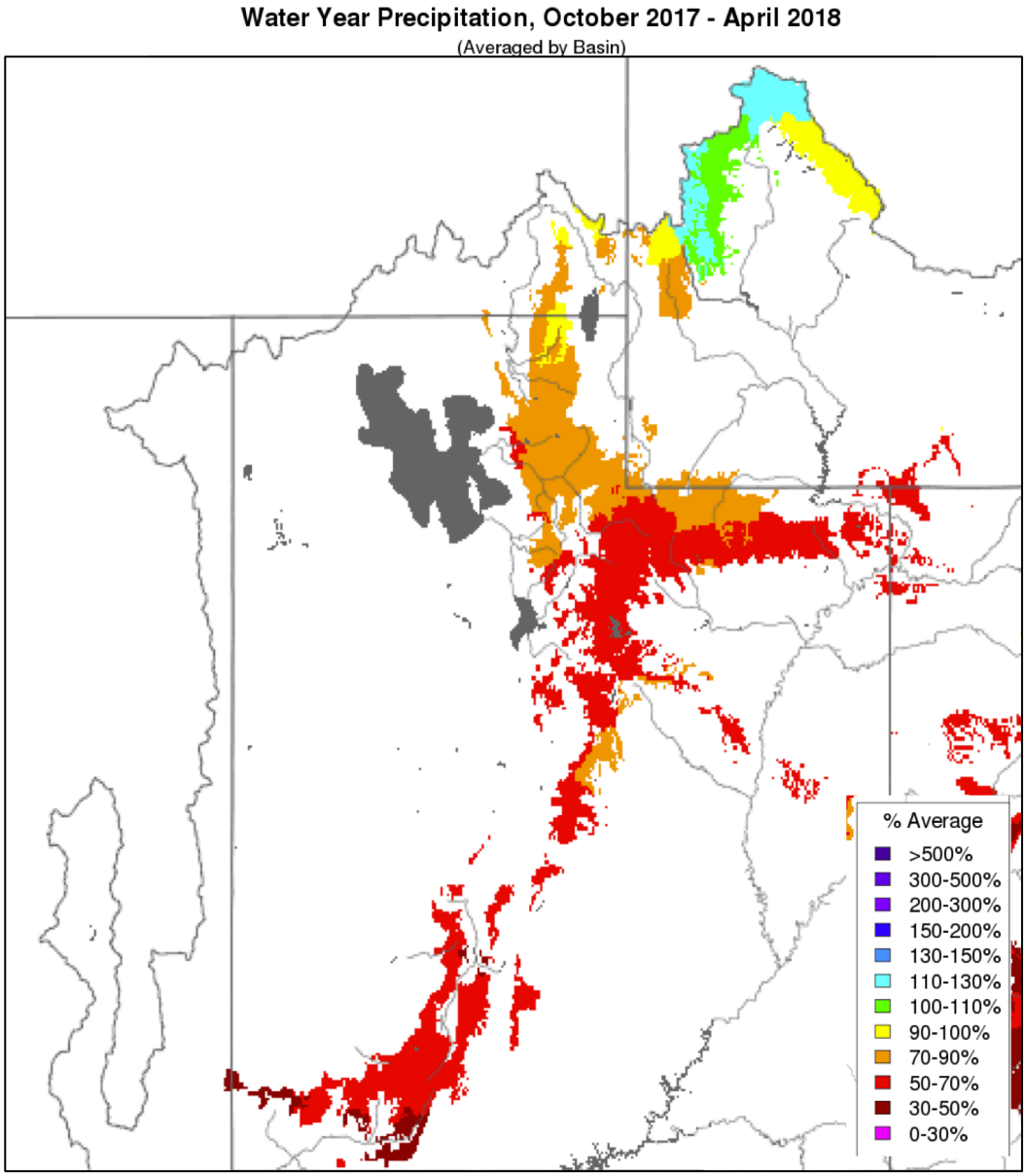
Duchesne: 50%

Sevier: 75%
Virgin: 70%

April Precipitation – Primary runoff contributing areas

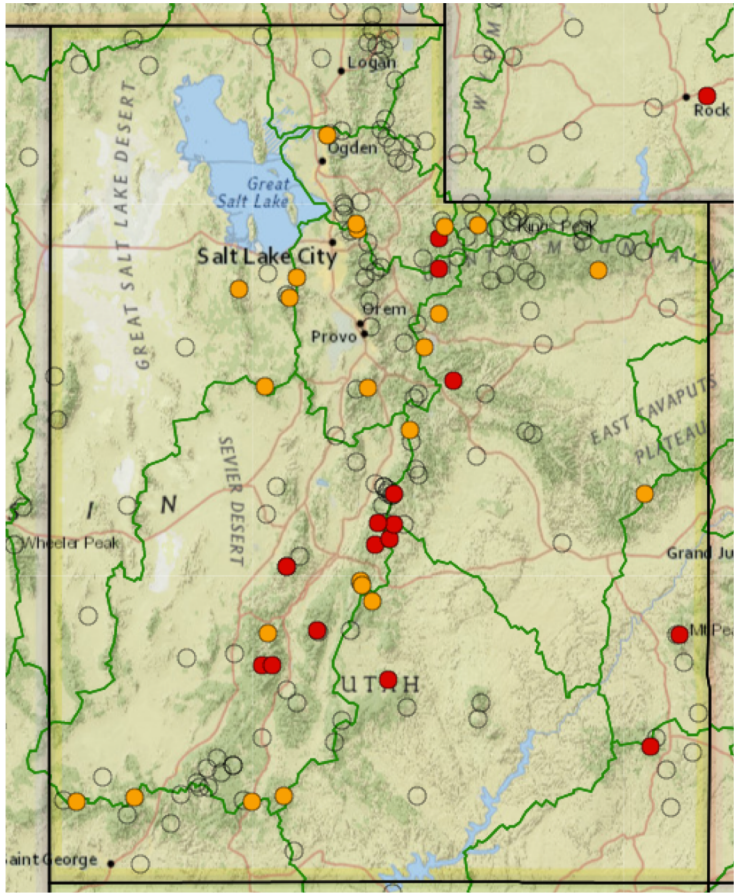


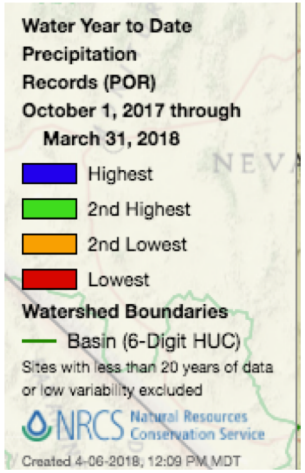
Water Year Precipitation



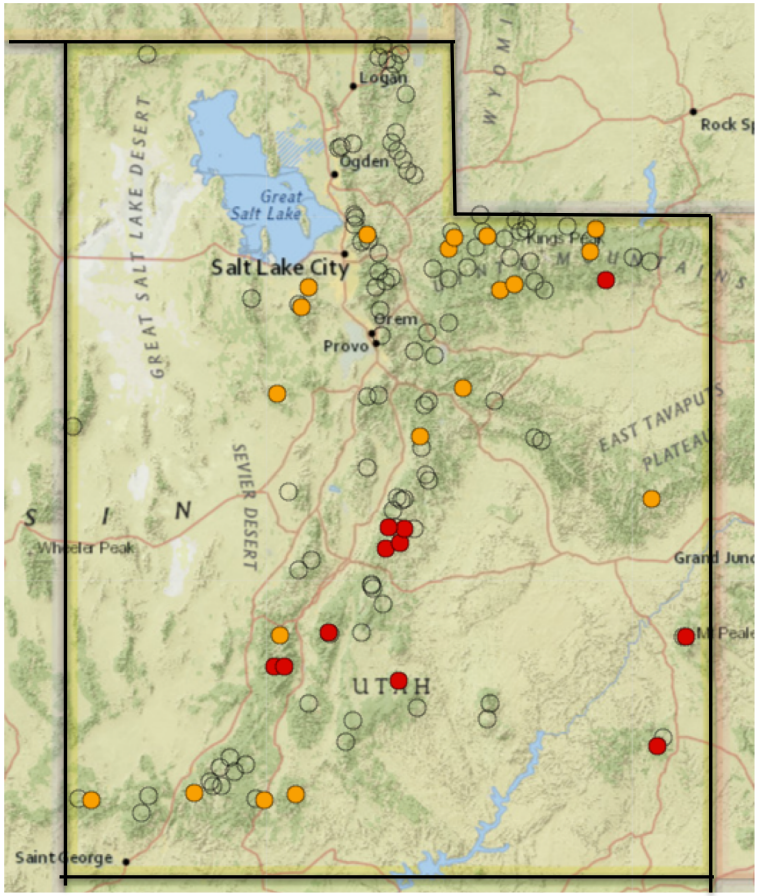
Water Year 2018 Precipitation Historical Ranking

October-March



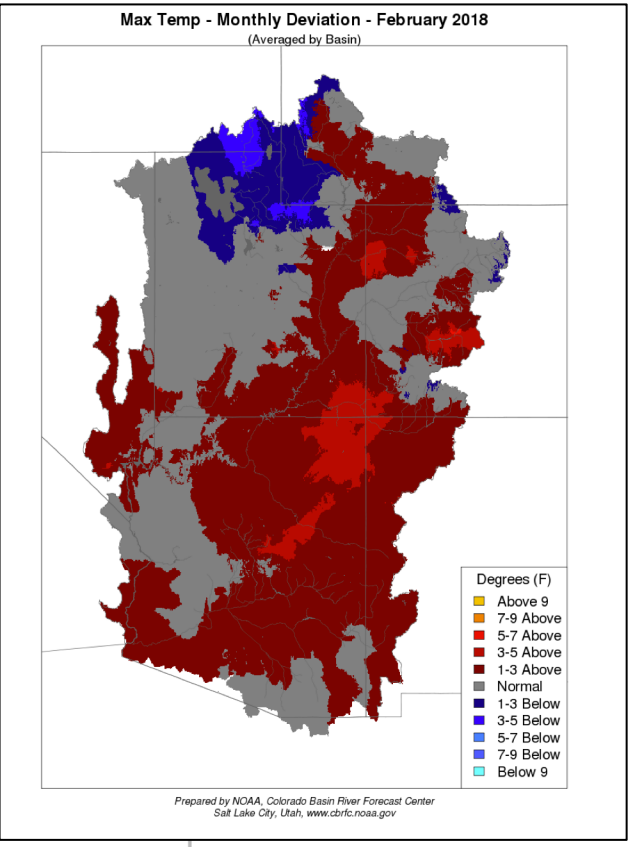


October-April



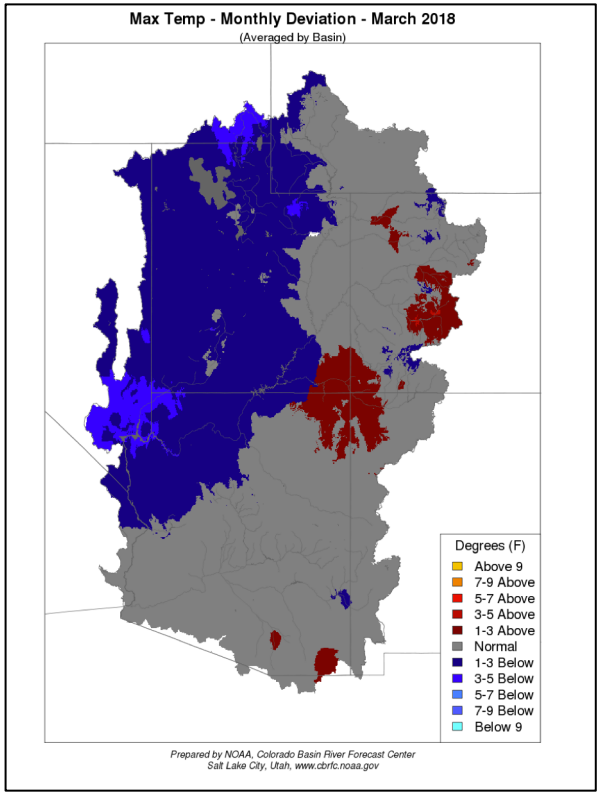
2018 Temperatures – Mean Monthly Maximum Deviation from Normal

February

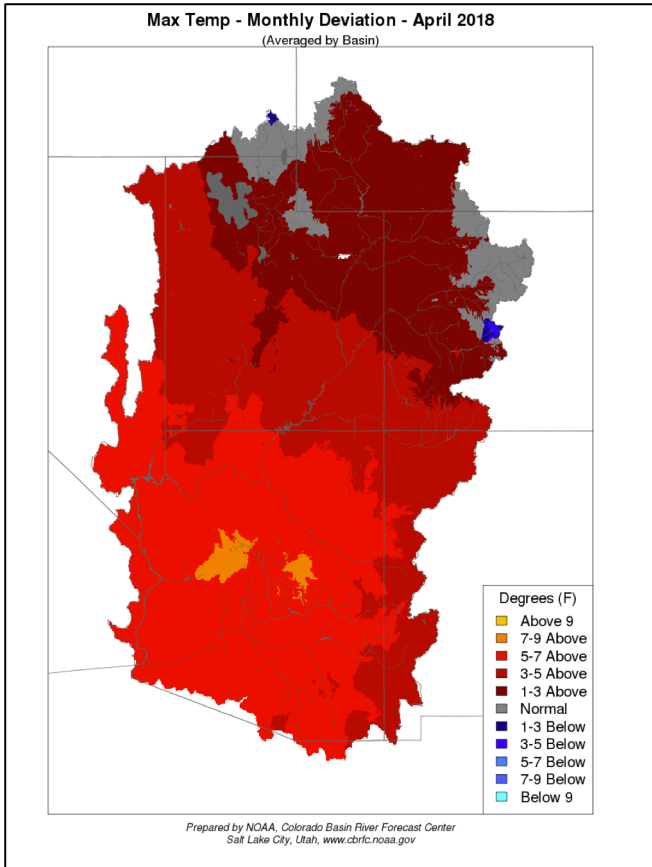


Degrees (F)
Above 9
7-9 Above
5-7 Above
3-5 Above
1-3 Above
Normal
1-3 Below
3-5 Below
5-7 Below
7-9 Below
Below 9

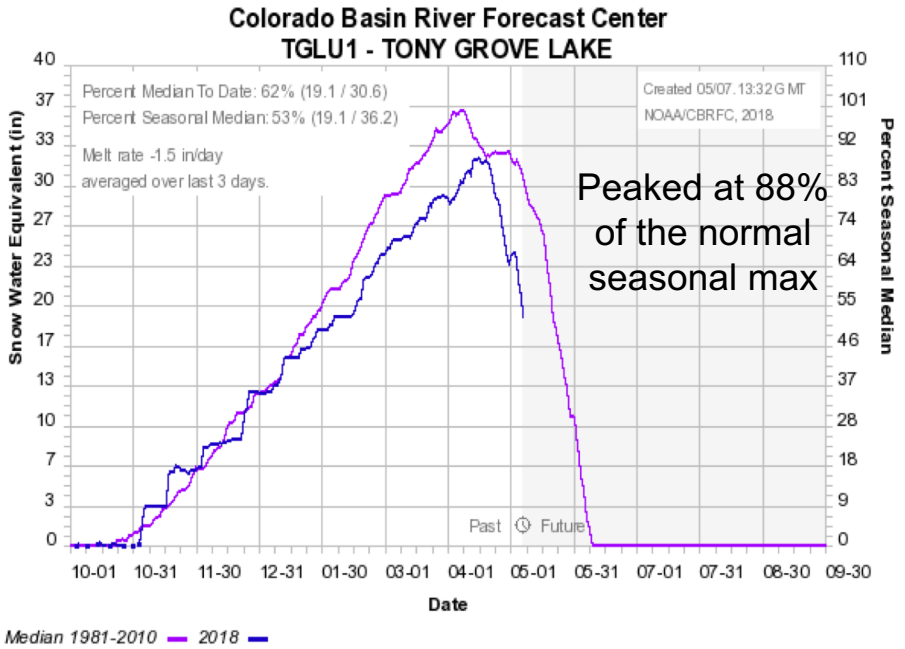
March

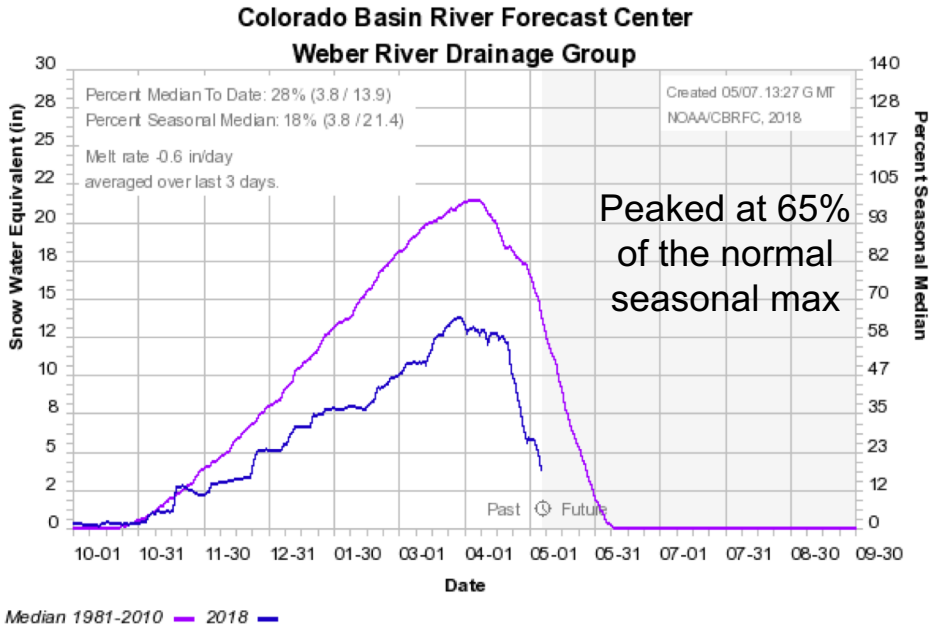


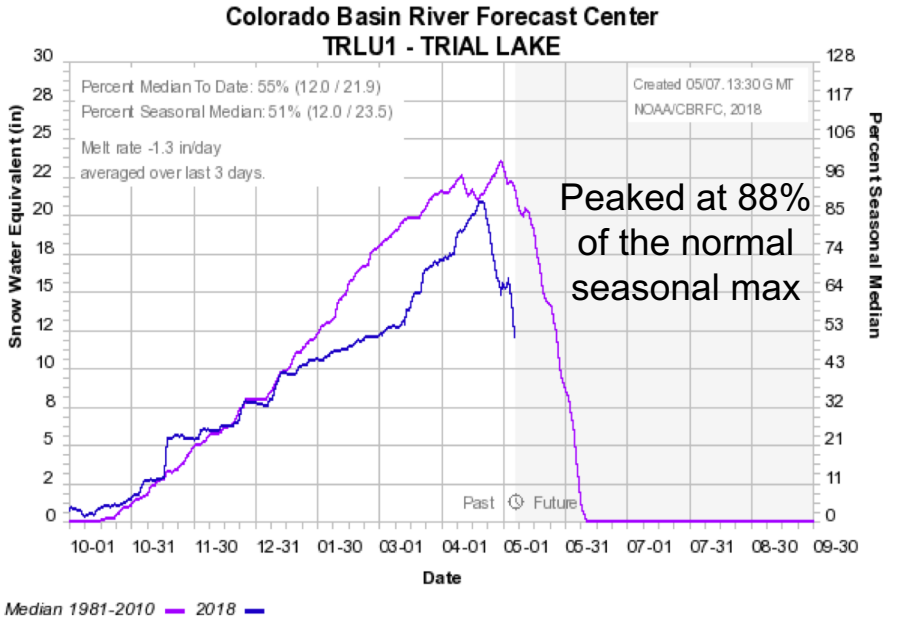
April

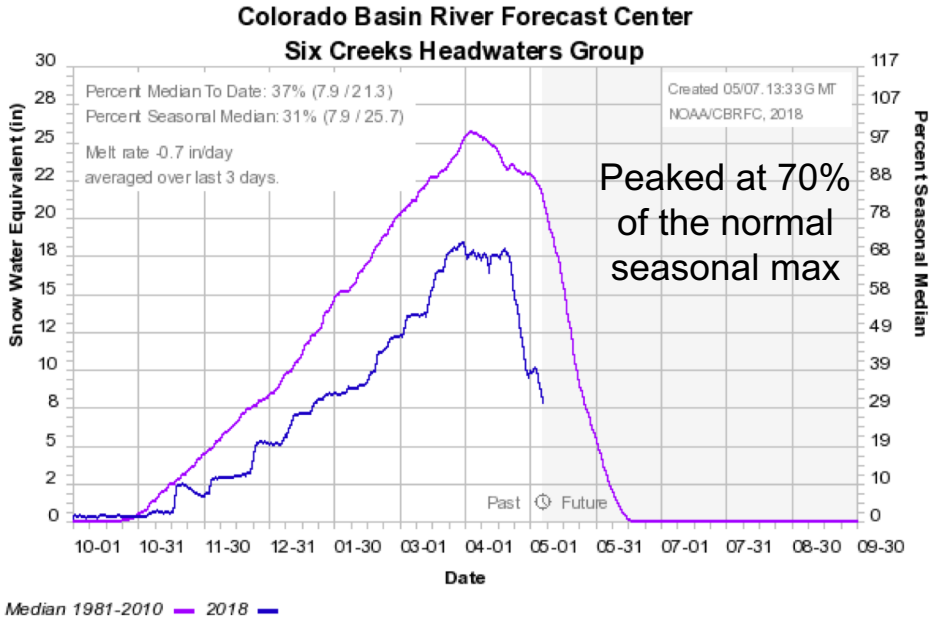


2018 Snowpack Evolution

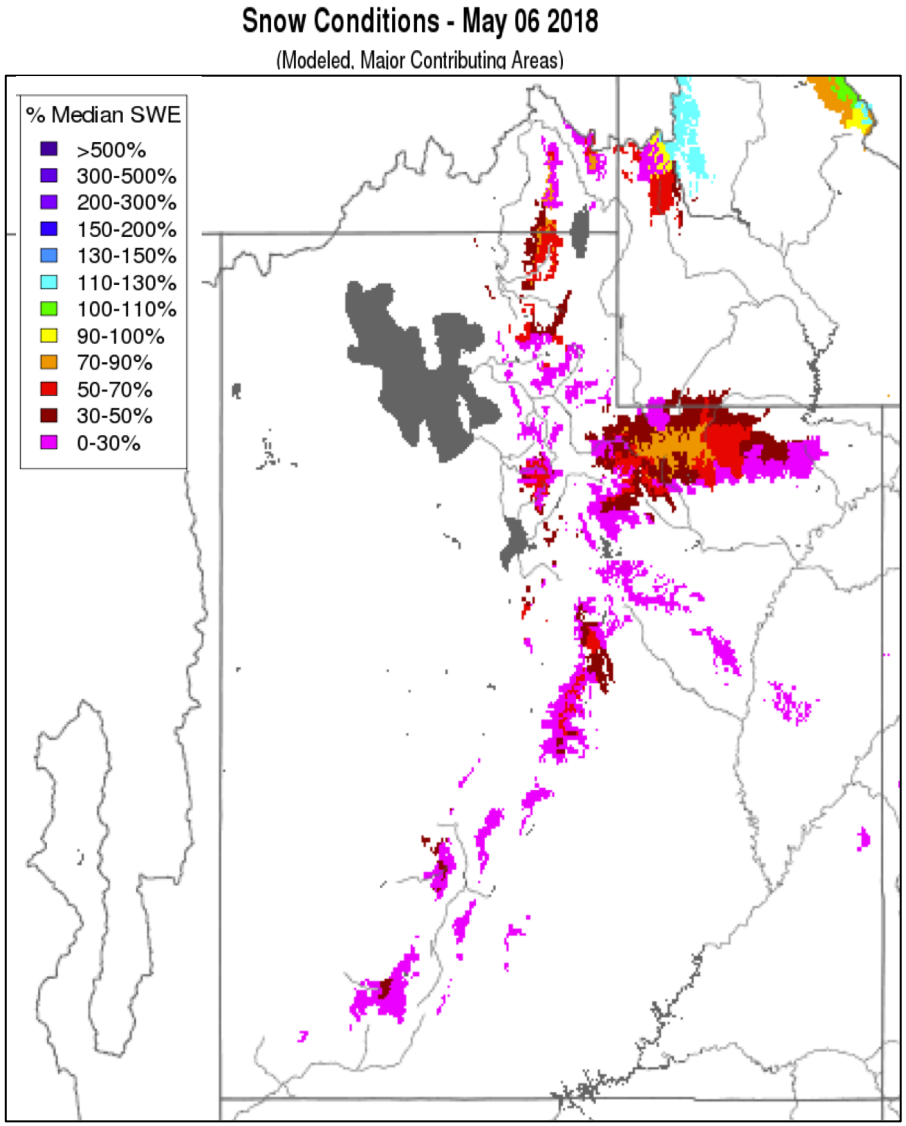


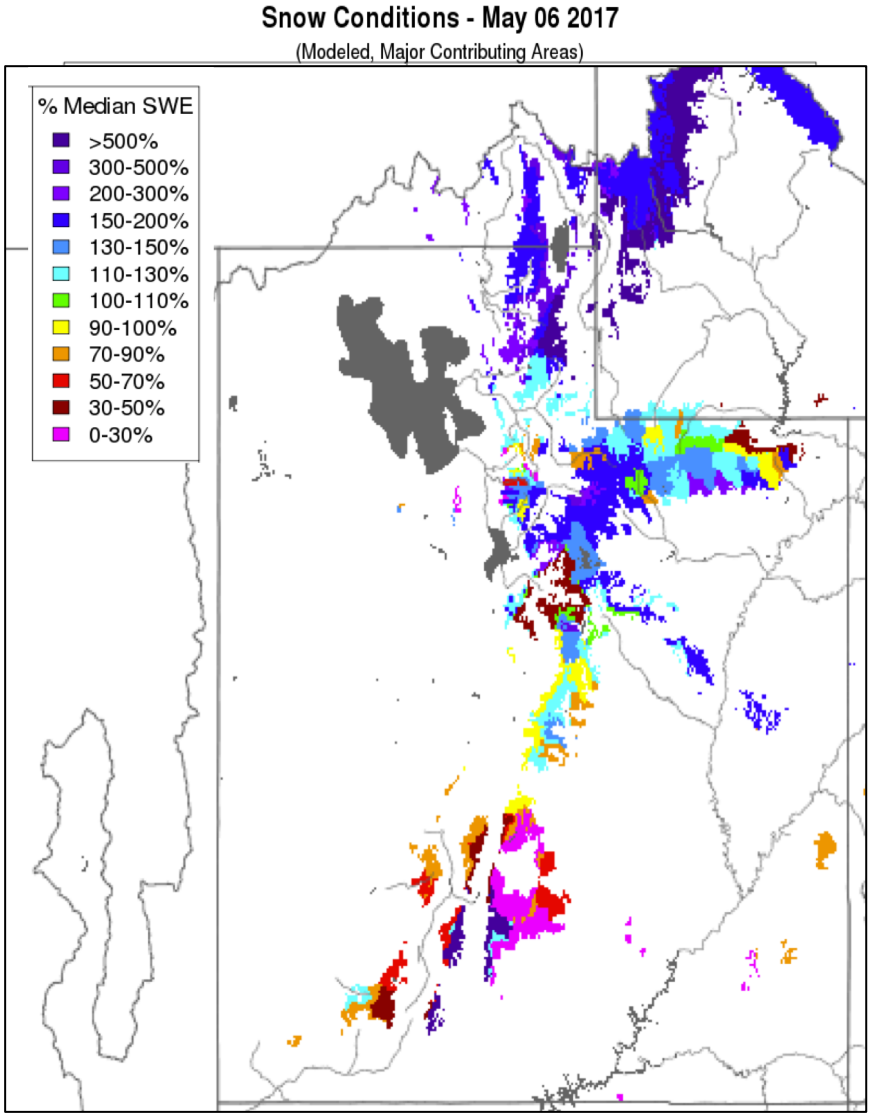






Snow Conditions: CBRFC hydrologic model – Now and Last year at this time

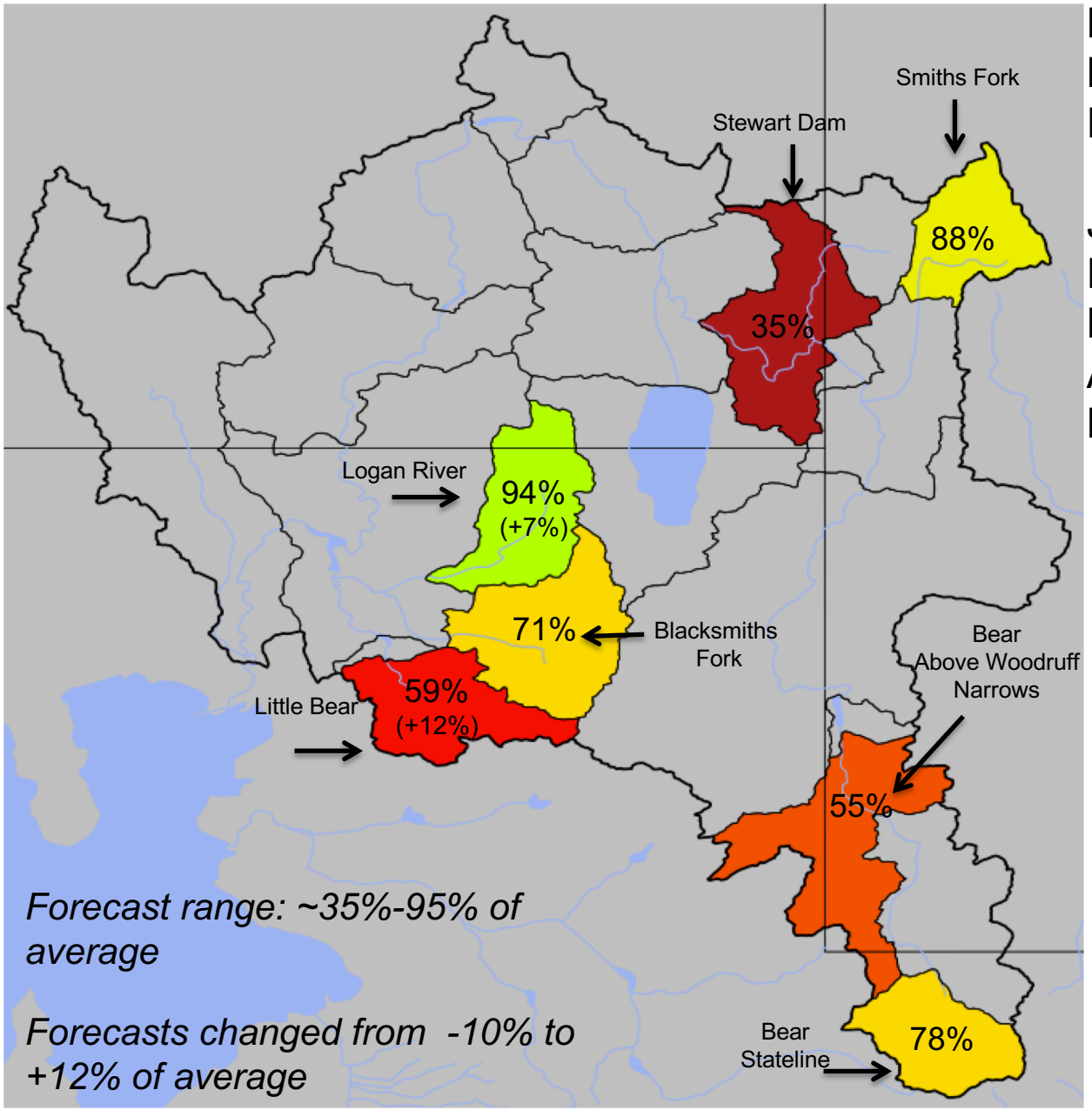




May 1st Water Supply Forecasts – Bear River Basin

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%
- Above 175%
- NA

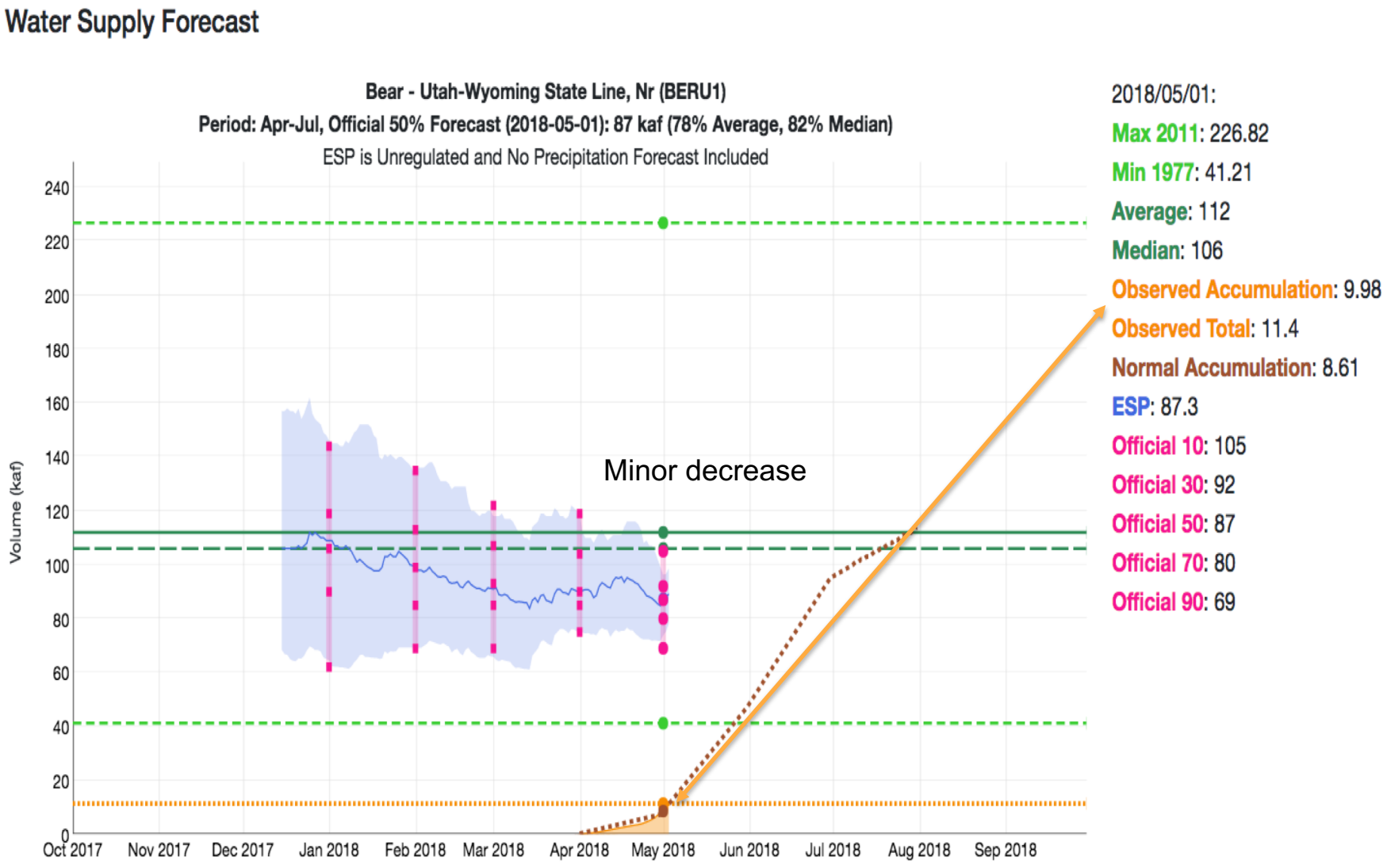


Median Basin Forecast:

Jan – 85%
Feb – 75%
Mar – 75%
Apr – 70%
May – 70%

Forecast Evolution Plot

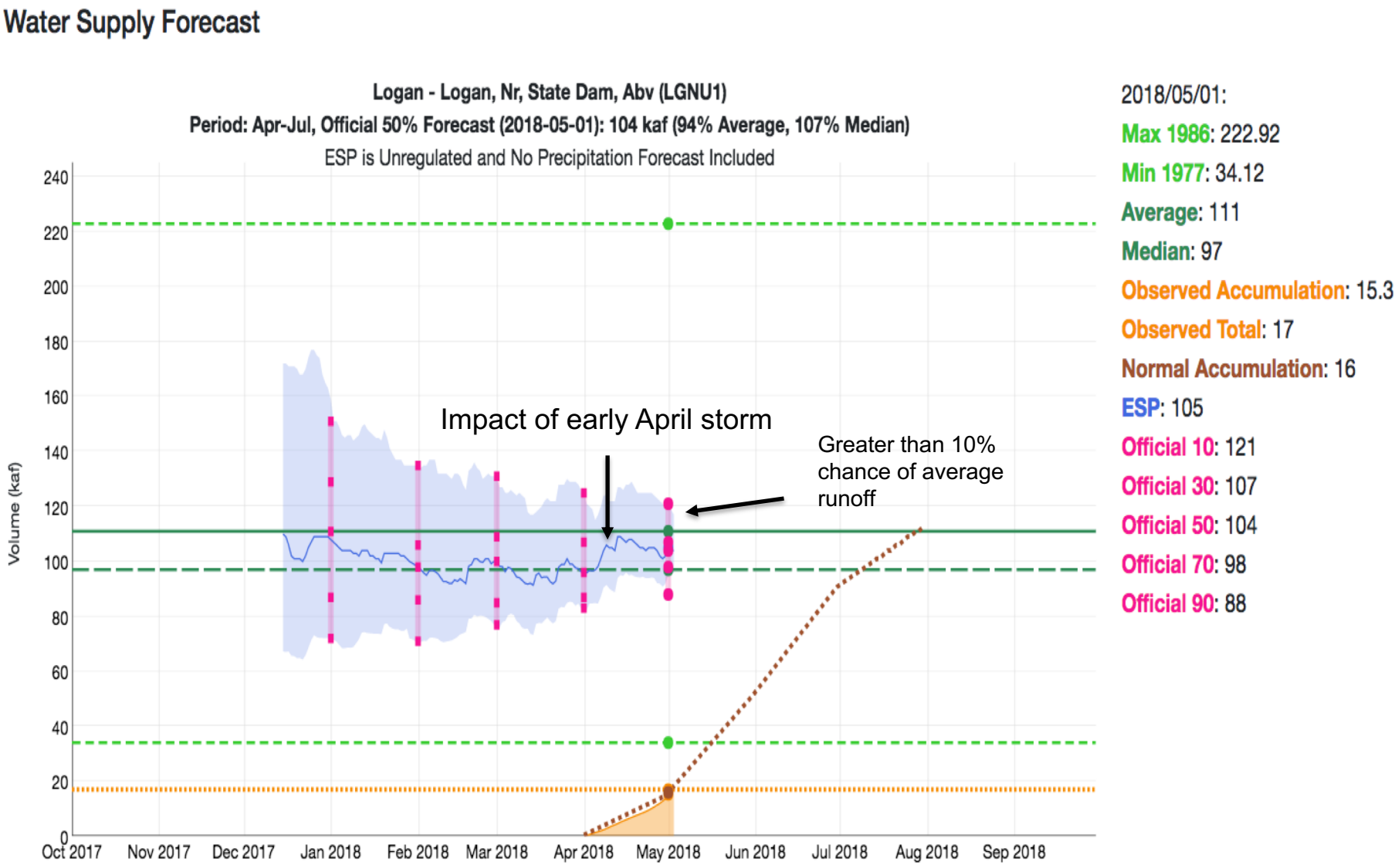
Bear – UT/WY Stateline: 87 kaf / 78% average



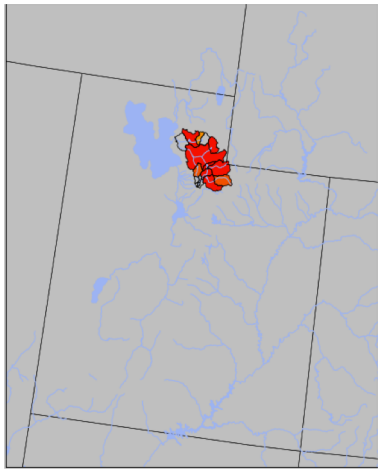
Forecast is a combination of observed from April 1st until current date and model guidance from current date through July 31st

Forecast Evolution Plot

Logan River– Logan– 104 kaf / 94% average

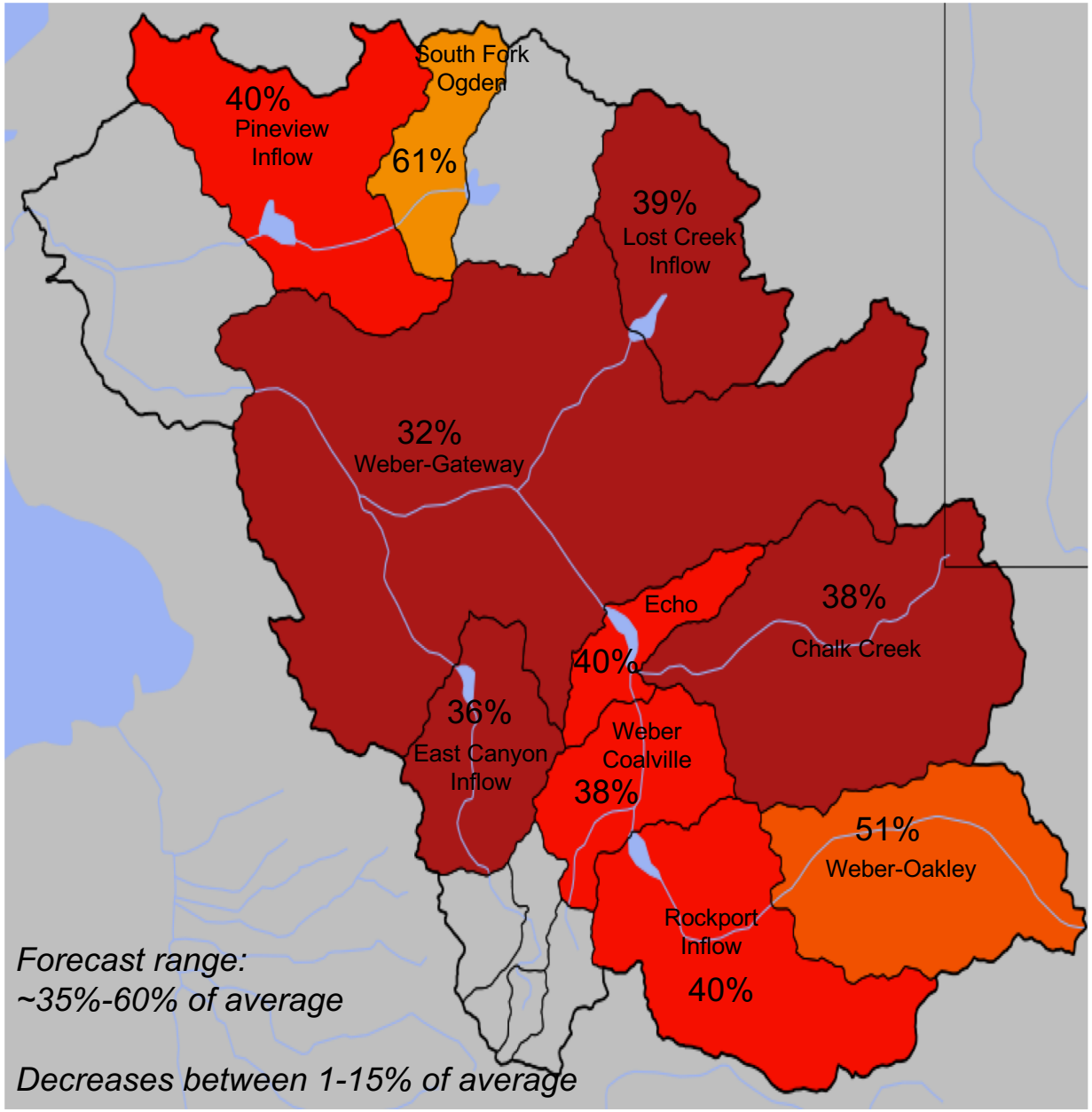


May 1st Water Supply Forecasts – Weber River Basin



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%
- Above 175%
- NA

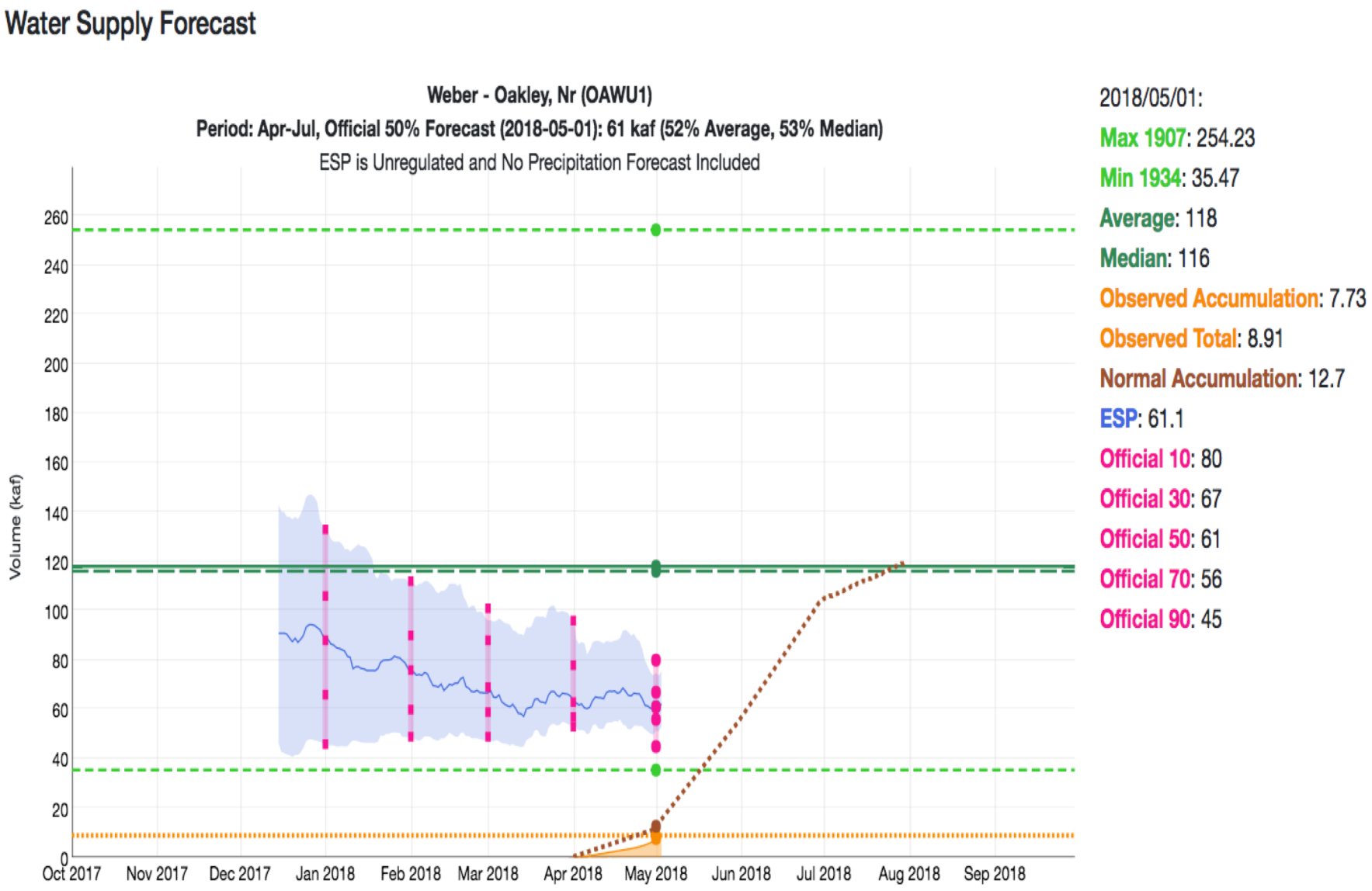


Median Basin Forecast:

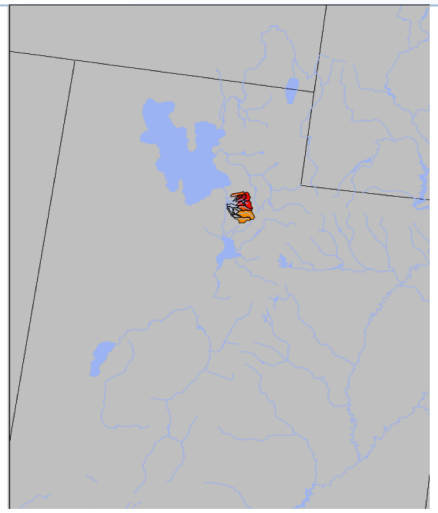
Jan – 65%
Feb – 50%
Mar – 50%
Apr – 45%
May – 40%

Forecast Evolution Plot

Weber – Oakley: 61 kaf / 52% average



May 1st Water Supply Forecasts – Six Creeks



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

- Below 25%
- 25% - 35%
- 35% - 45%
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- 55% - 65%
- 65% - 75%
- 75% - 85%
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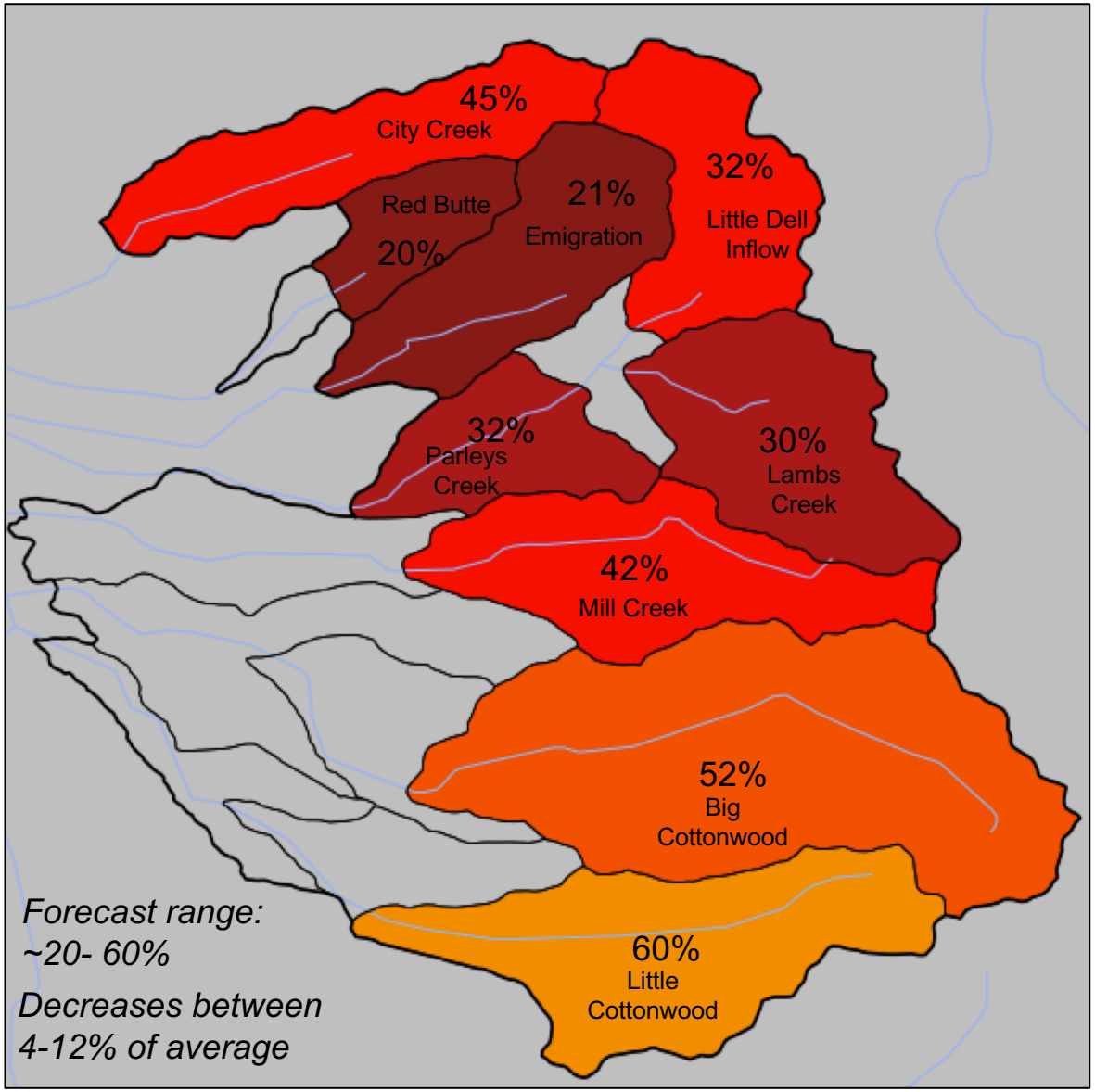
- Above 175%
- NA



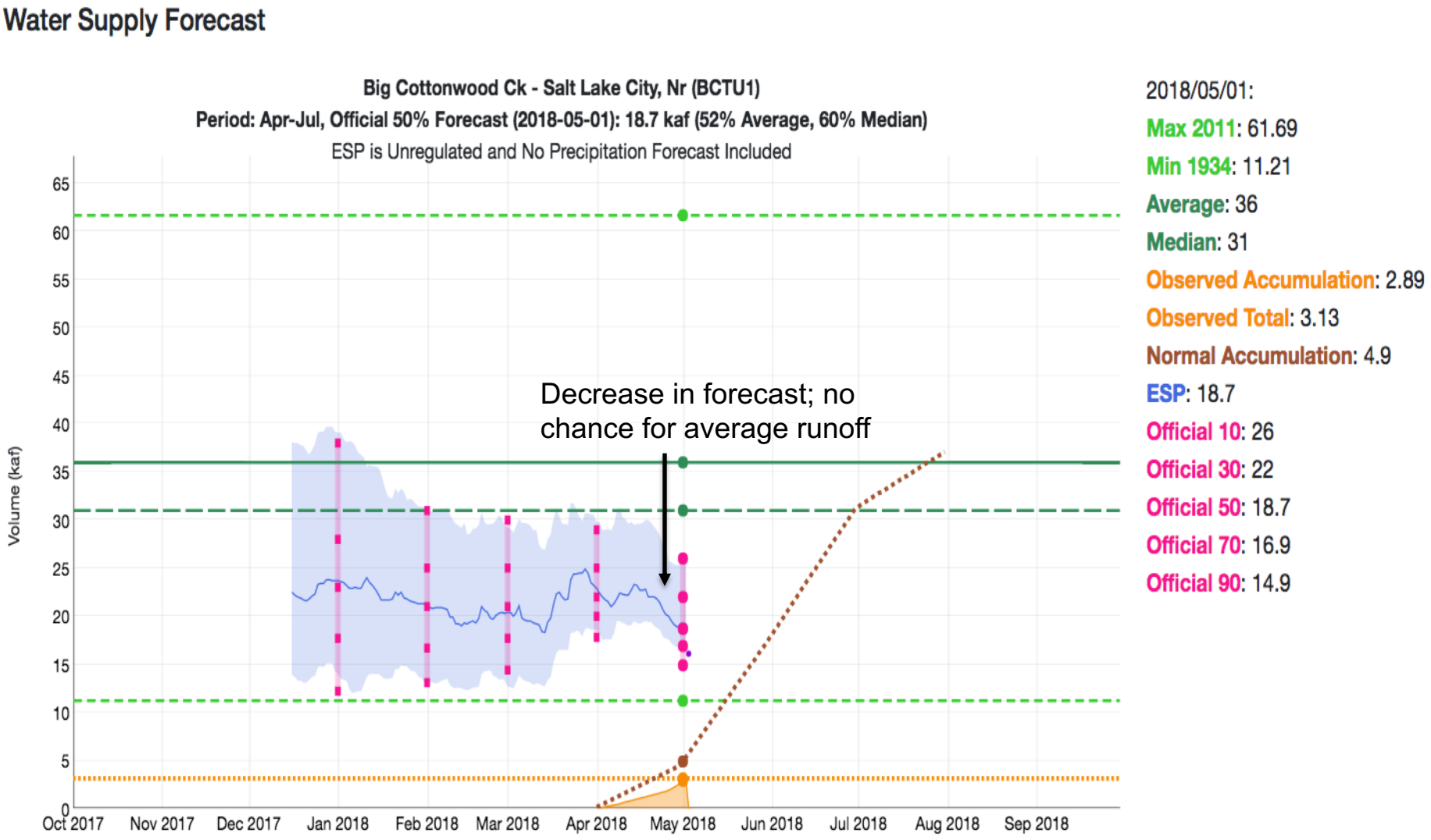
Median
Basin
Forecast:

Jan – 55%
Feb – 45%
Mar – 50%
Apr – 45%
May – 35%

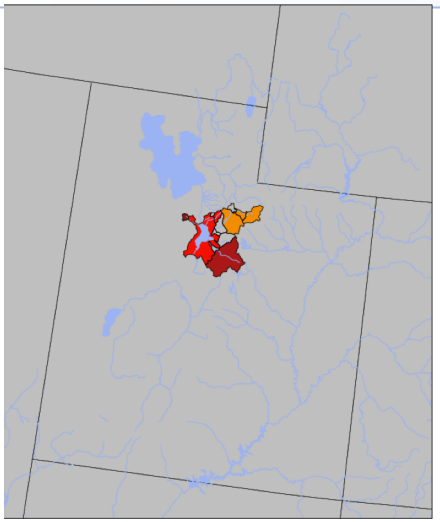
Red Butte Creek: 4th Lowest

Forecast Evolution Plot

Big Cottonwood Creek: 19 kaf / 52% average



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



April-July
Forecast
Streamflow Volumes
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- Below 25%
- 25% - 35%
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- 75% - 85%
- 85% - 95%
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- 105% - 115%
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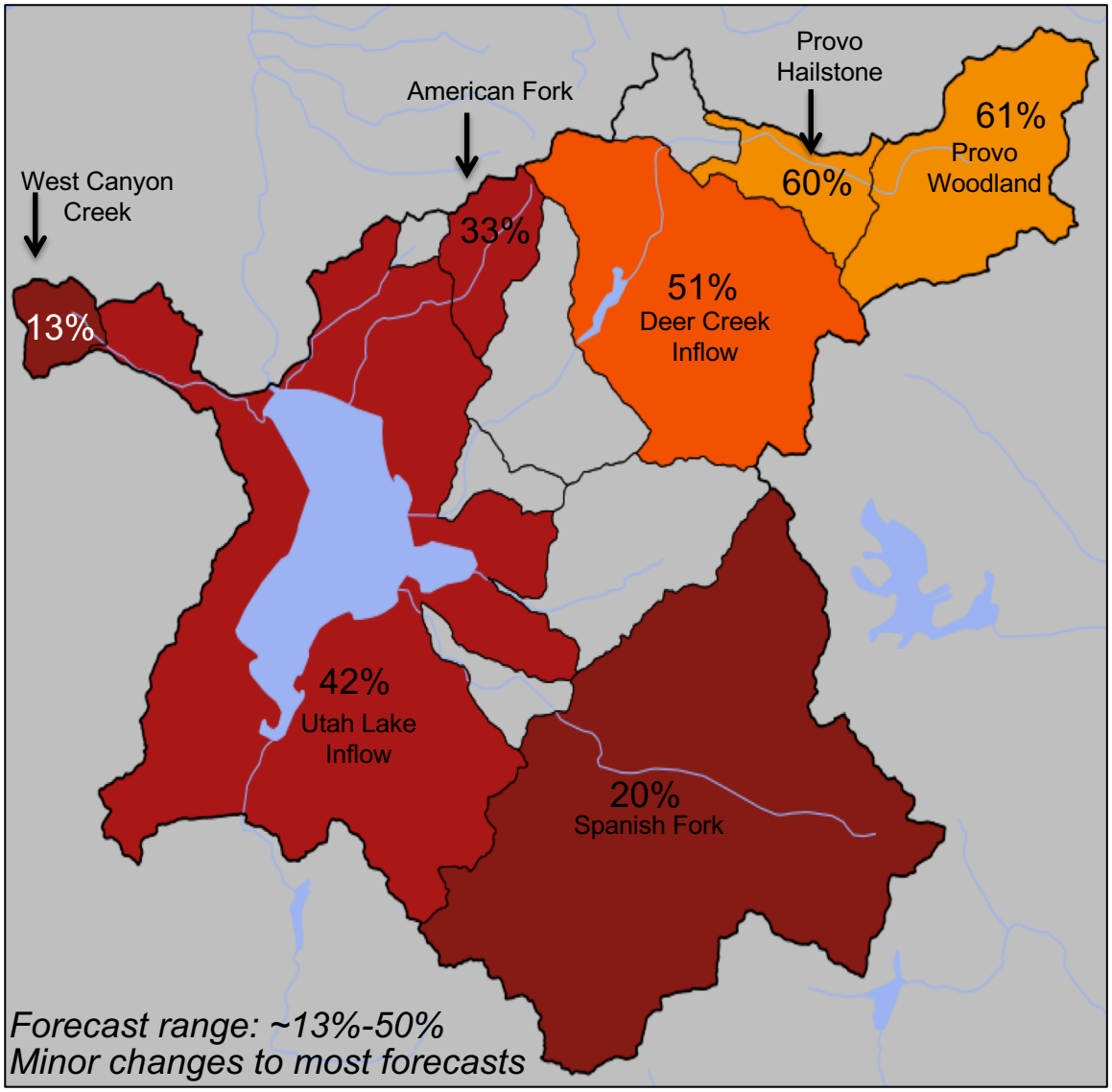
- 125% - 135%
- 135% - 145%
- 145% - 155%
- 155% - 165%
- 165% - 175%
- Above 175%
- NA



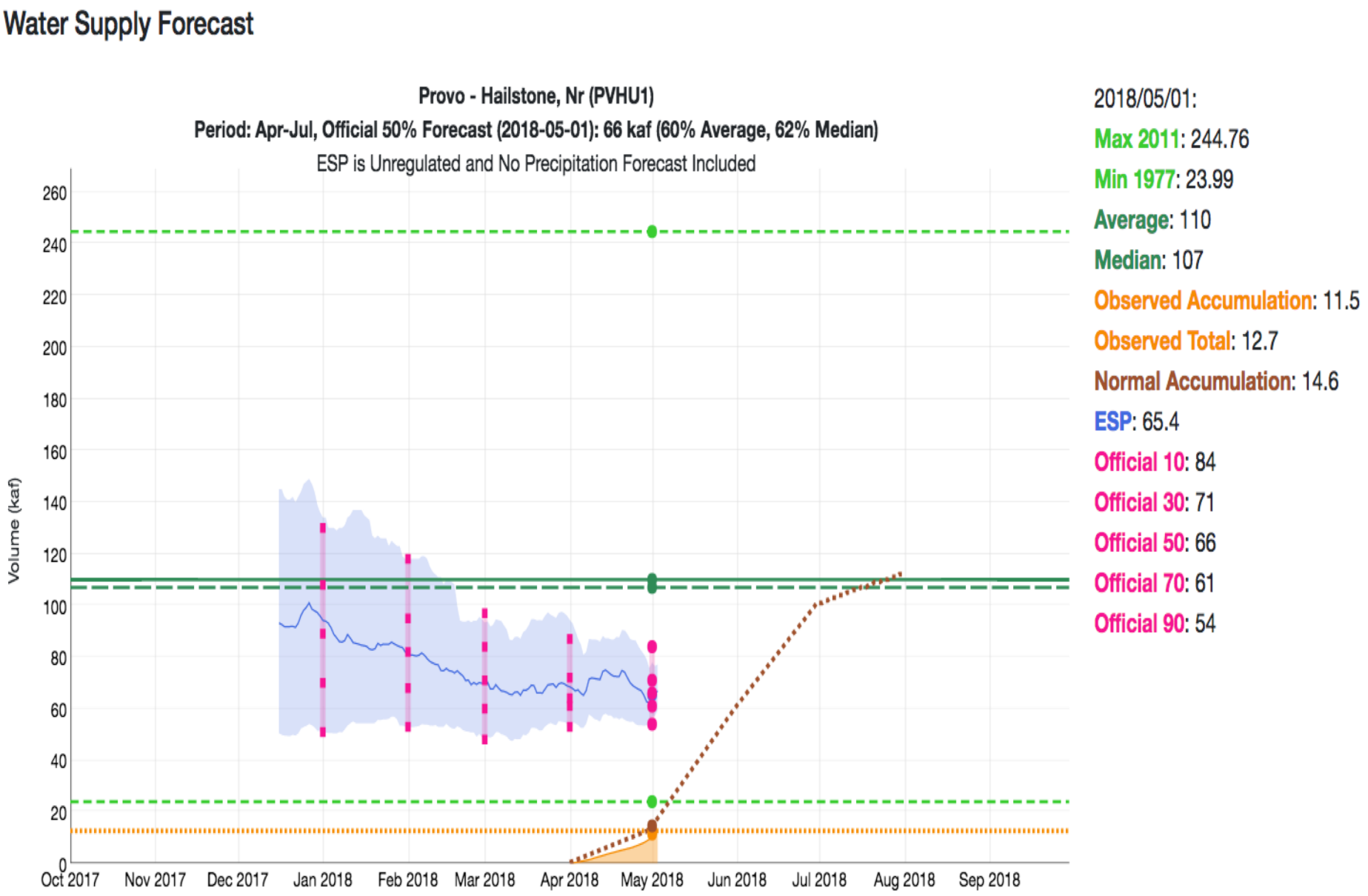
Median Basin Forecast:

Jan – 50%
Feb – 45%
Mar – 45%
Apr – 40%
May– 40%

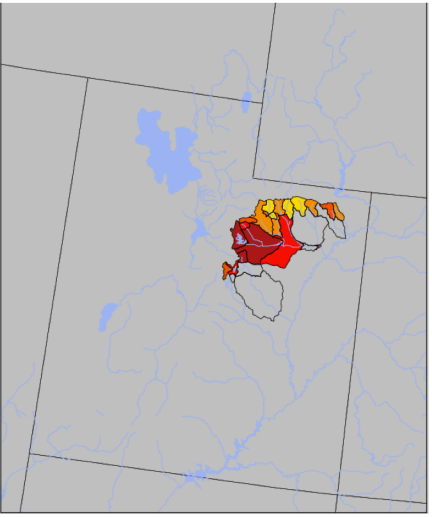
West Canyon: 2nd Lowest
Spanish Fork: 5th Lowest
American Fork: 5th Lowest

Forecast Evolution Plot

Provo – Hailstone (Jordanelle Inflow) – 66 kaf / 60% average



May 1st Water Supply Forecasts – Duchesne



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

- Below 25%
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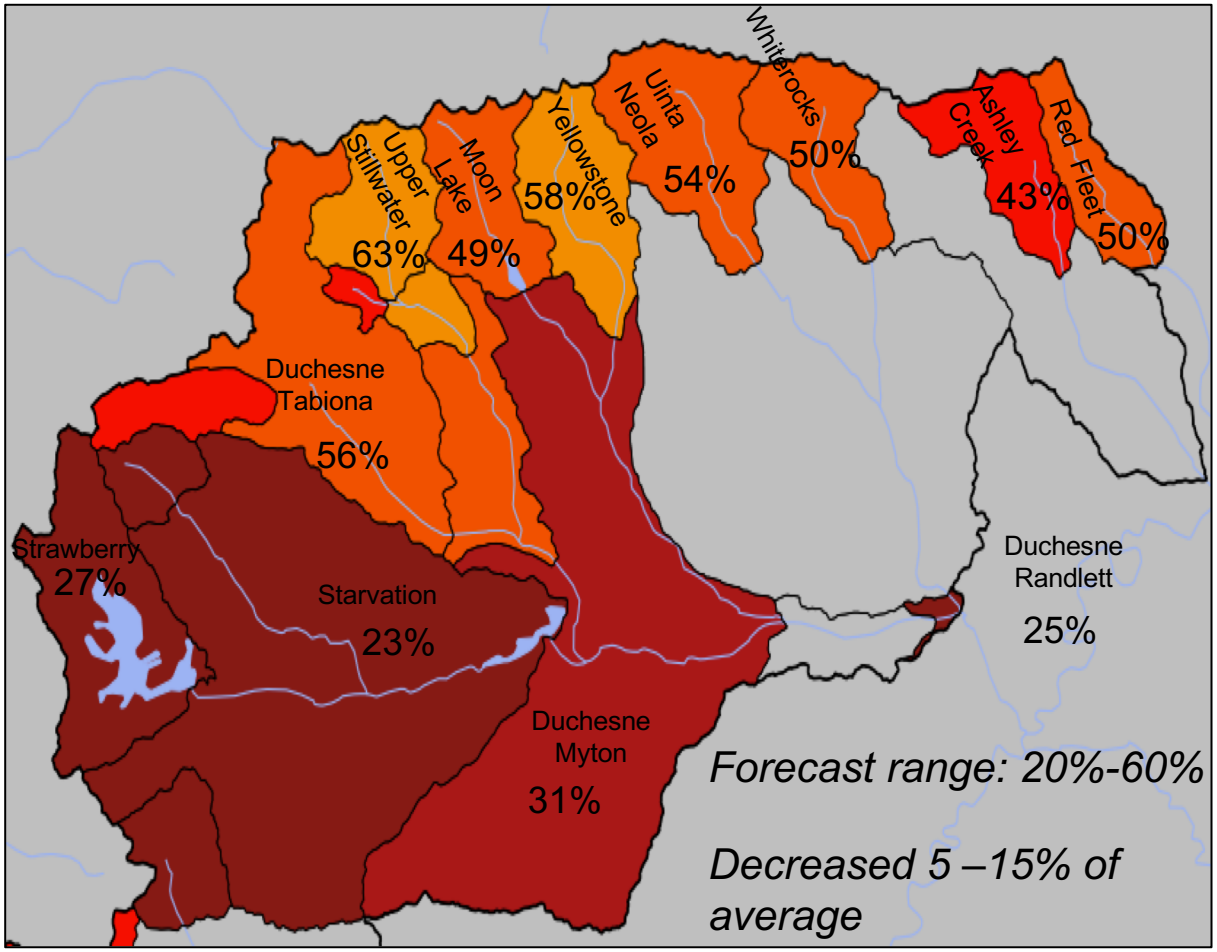


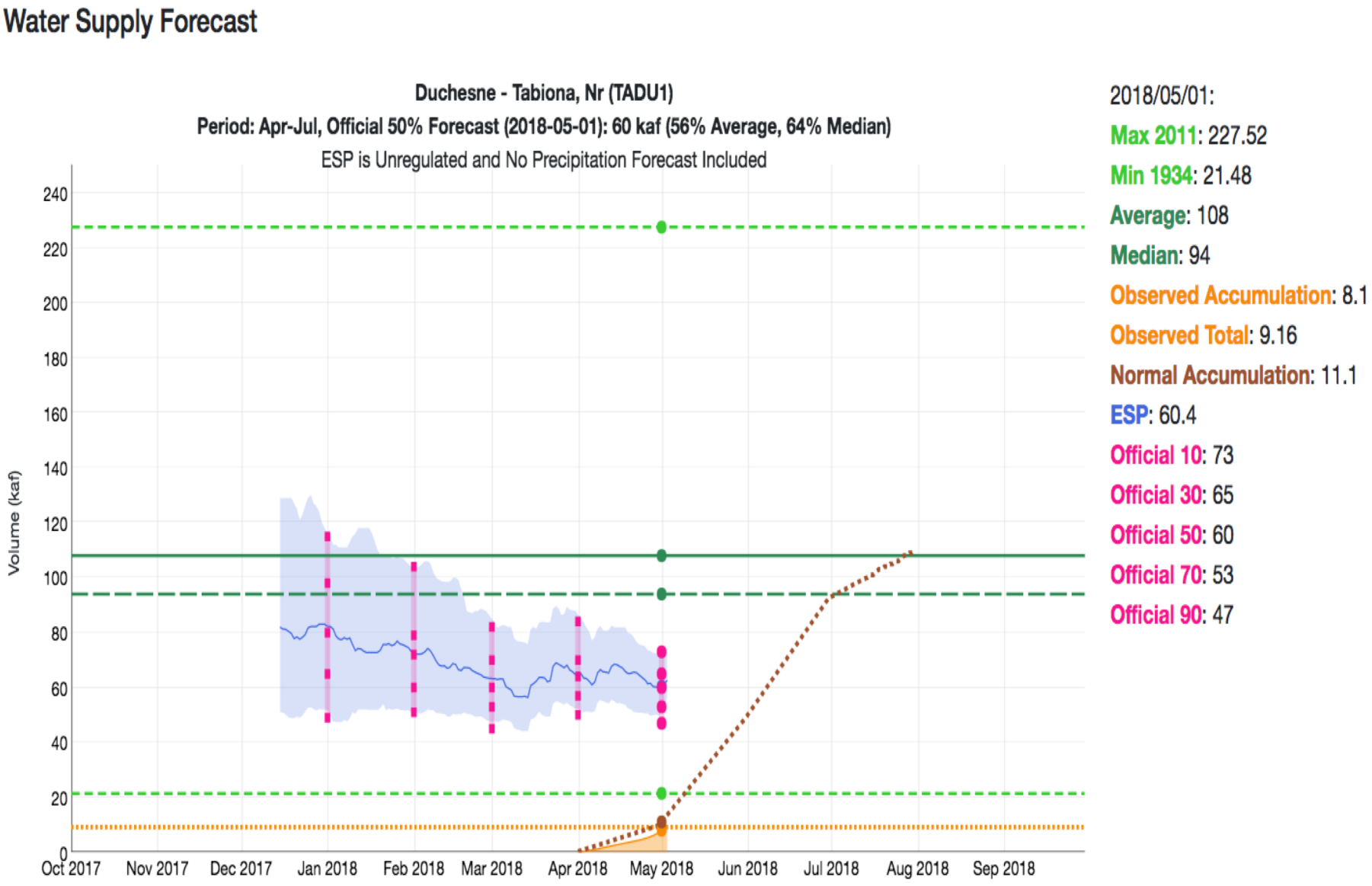
Median
Basin
Forecast:

Jan – 60%
Feb – 60%
Mar – 55%
Apr - 60%
May - 50%

White-Tabbyune: **2nd Lowest**
Strawberry Res: **3rd Lowest**
West Fork-Duchesne: **5th Lowest**
Moon Lake Res: **5th Lowest**
Duchesne-Randlett: **5th Lowest**

Forecast Evolution Plot

Duchesne – Tabiona – 60 kaf / 56% average

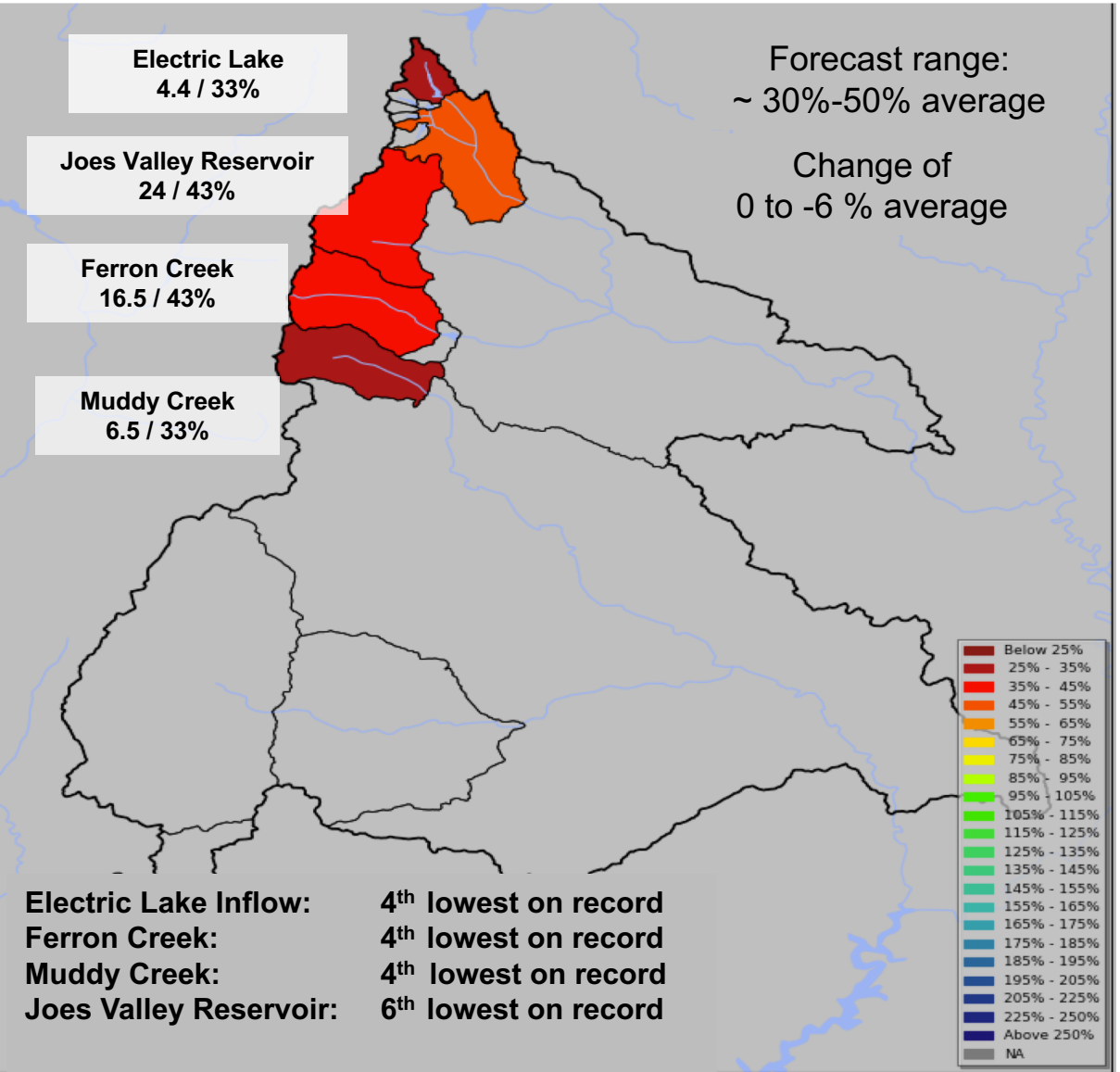


Upper Colorado: San Rafael – Dirty Devil

(Southern Utah – smaller tributaries to the Green and Colorado River)

Forecasts as of May 1 2018

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

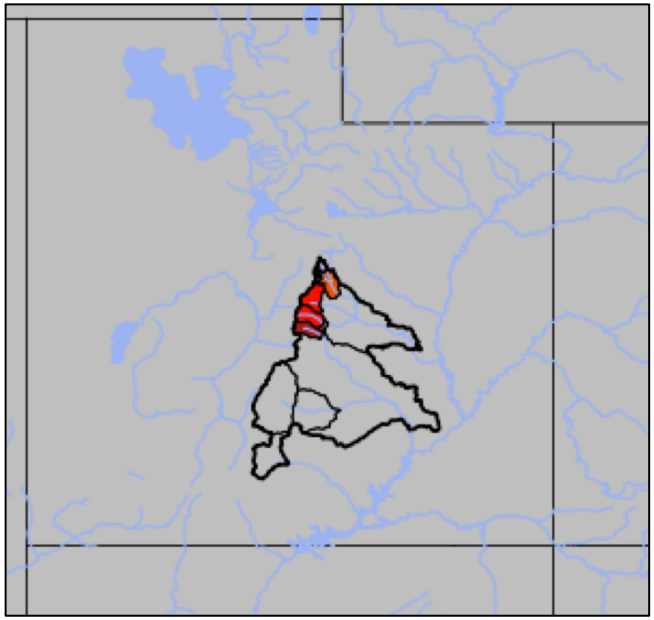


Electric Lake Inflow: 4th lowest on record

Ferron Creek: 4th lowest on record

Muddy Creek: 4th lowest on record

Joes Valley Reservoir: 6th lowest on record

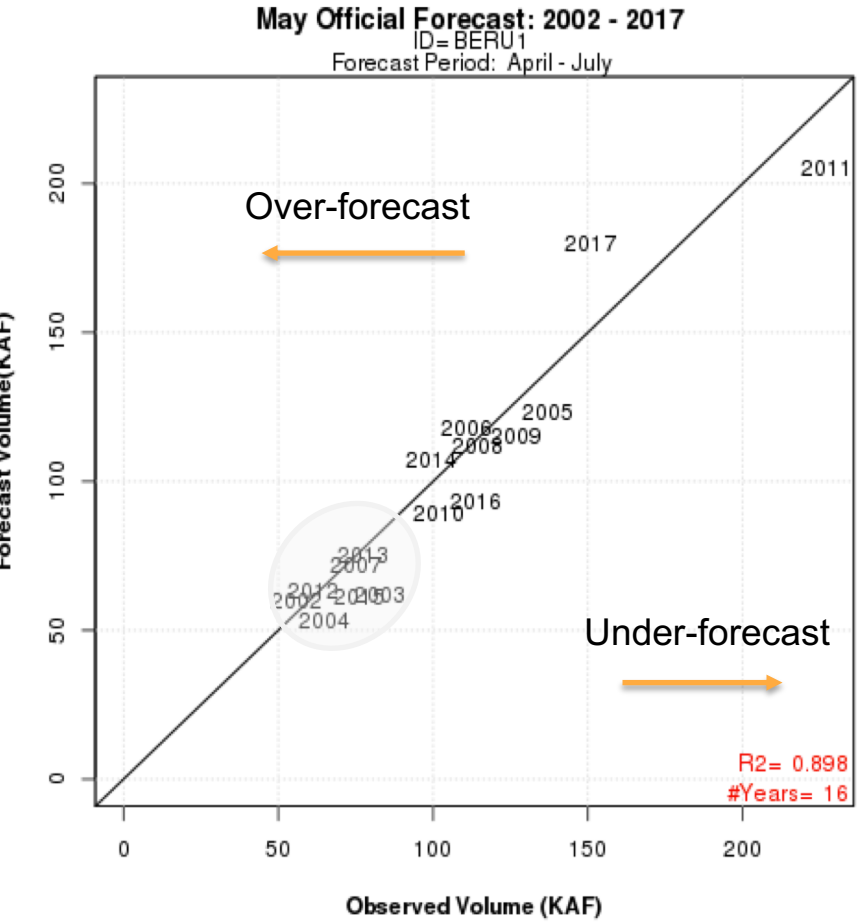


Historically, how have we forecast in low volume years (are we too high or too low?)

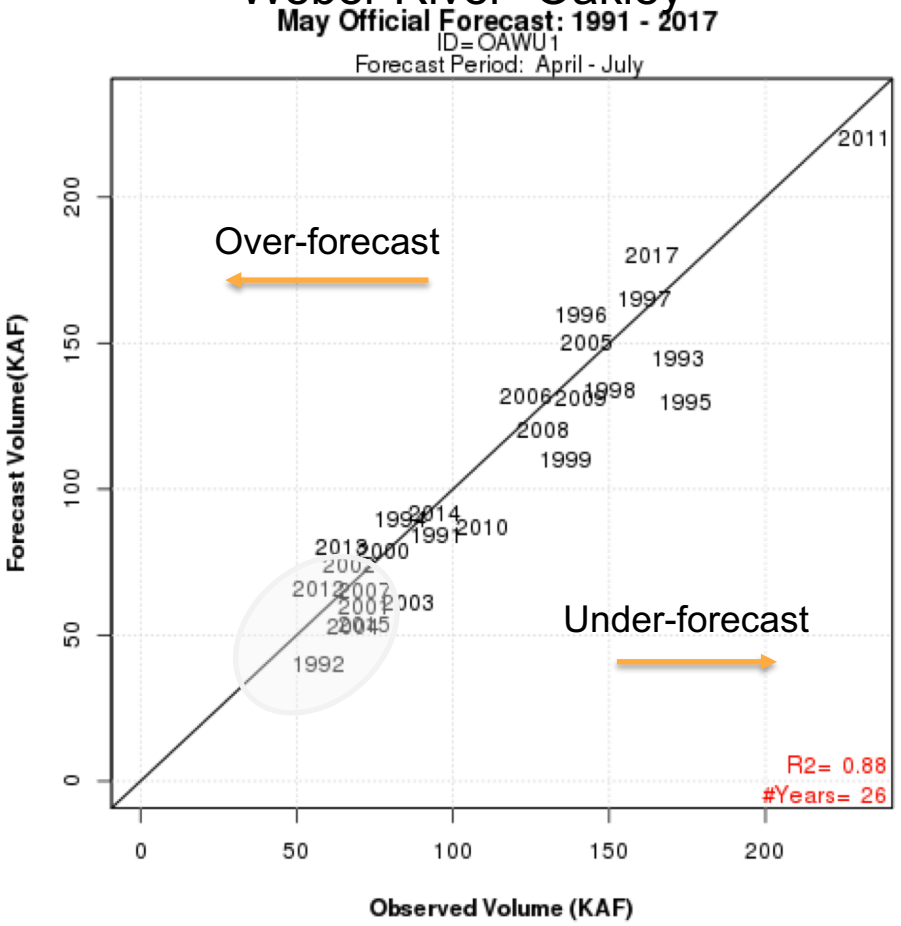
Could be many reasons we are too high/low & it can be difficult to tease out

Models struggles at extreme ends – Not enough extreme years in the calibration period
Extreme wet or dry in the future – We go with climatology (“normal” conditions) into the future
Model doesn’t have certain ”states” correct (high elevation snow, soil moisture)

Bear River-WY/UT Stateline

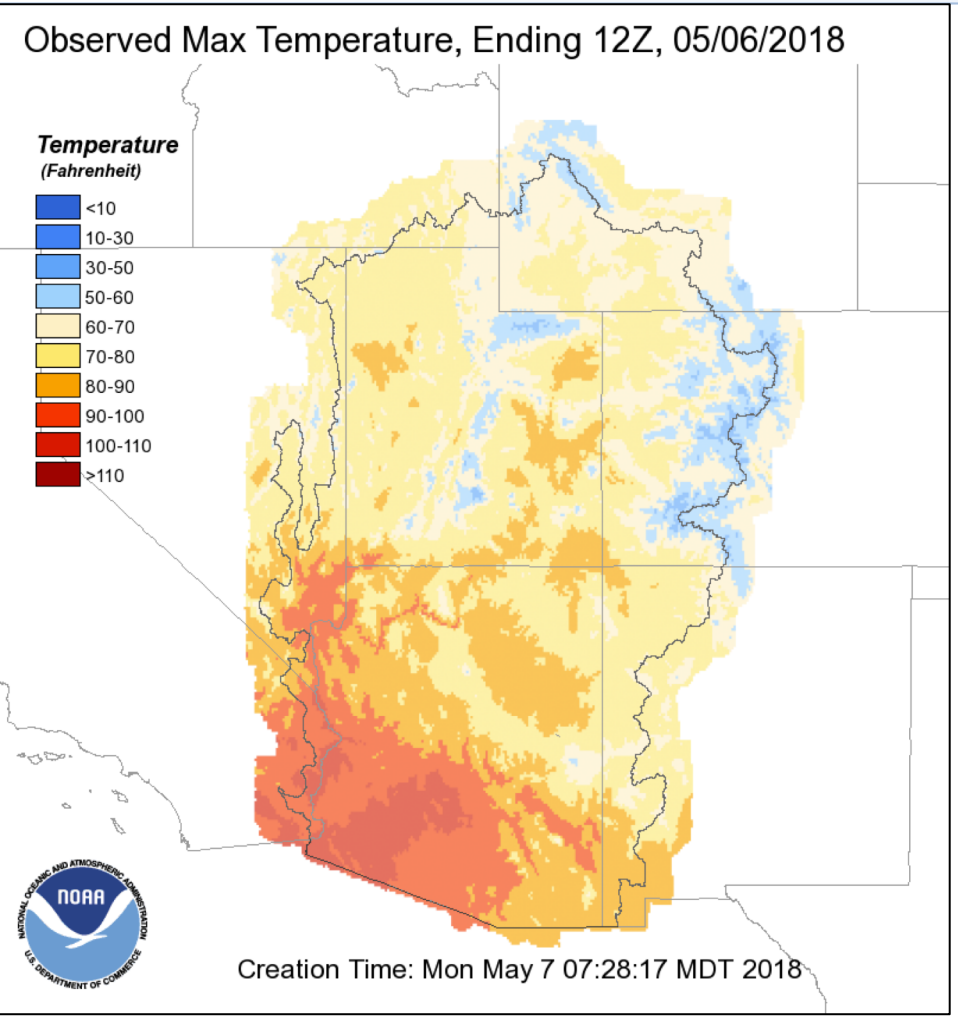


Weber River- Oakley



Current Conditions – Warmed up significantly with rivers starting to react

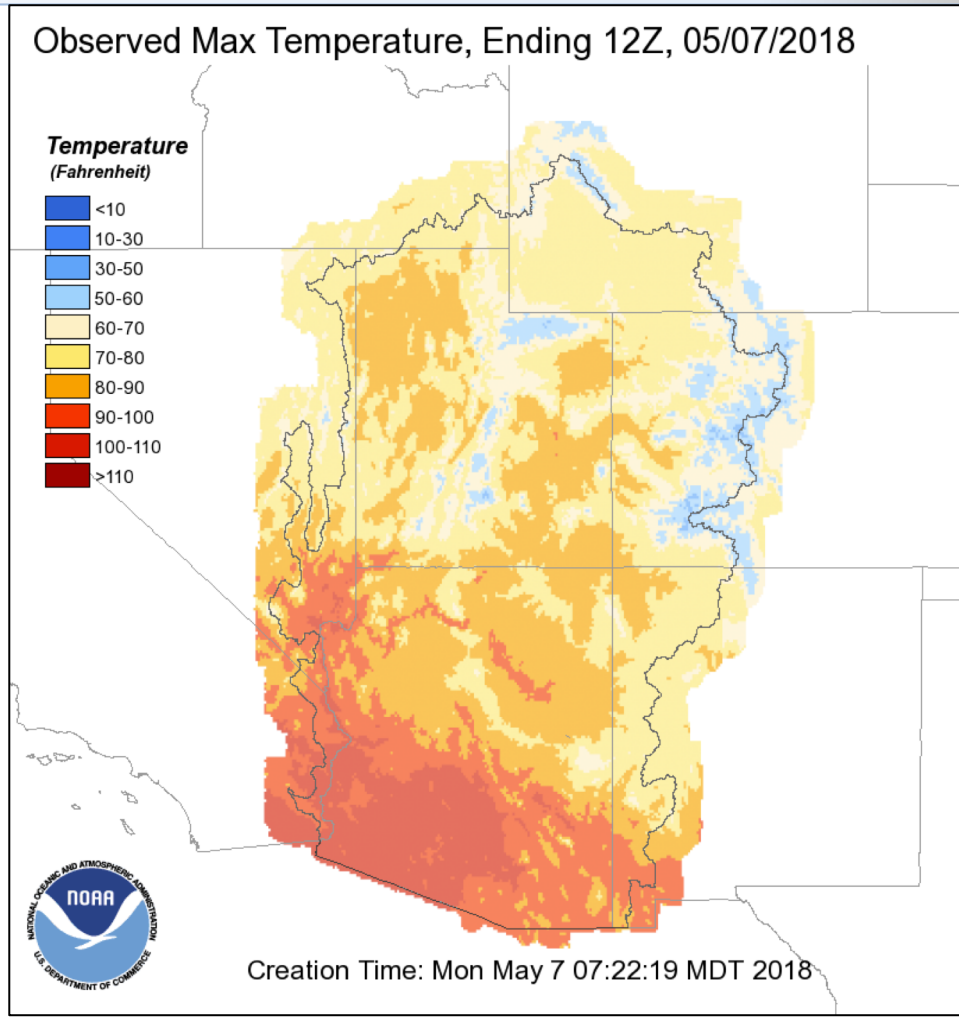
Saturday 5/5 observed temperatures



Maximum temperature departure from normal

SLC	+12
Grand Junction	+7
Craig CO	+8
Durango	+7
Big Piney WY	+11

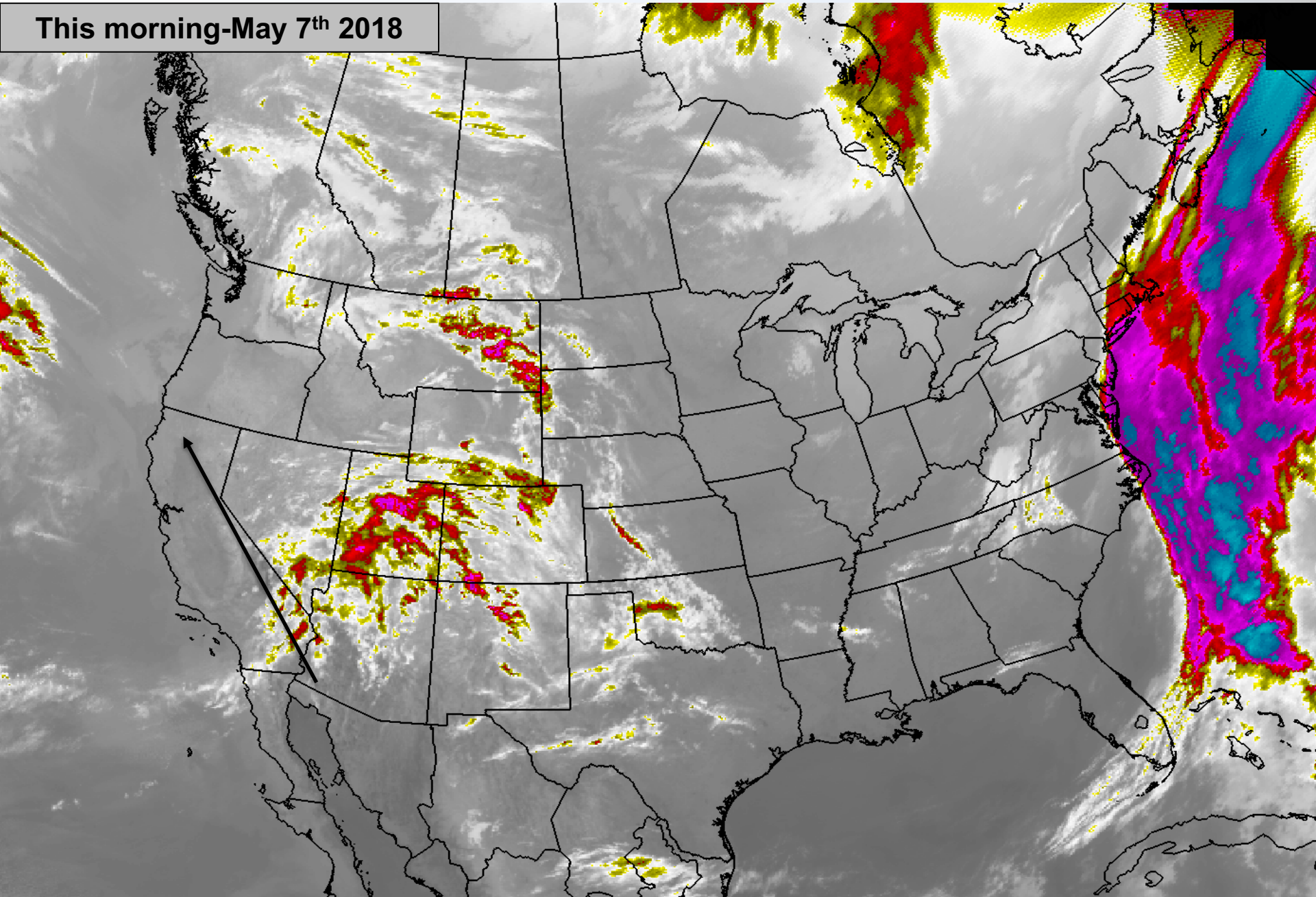
Sunday 5/6 observed temperatures



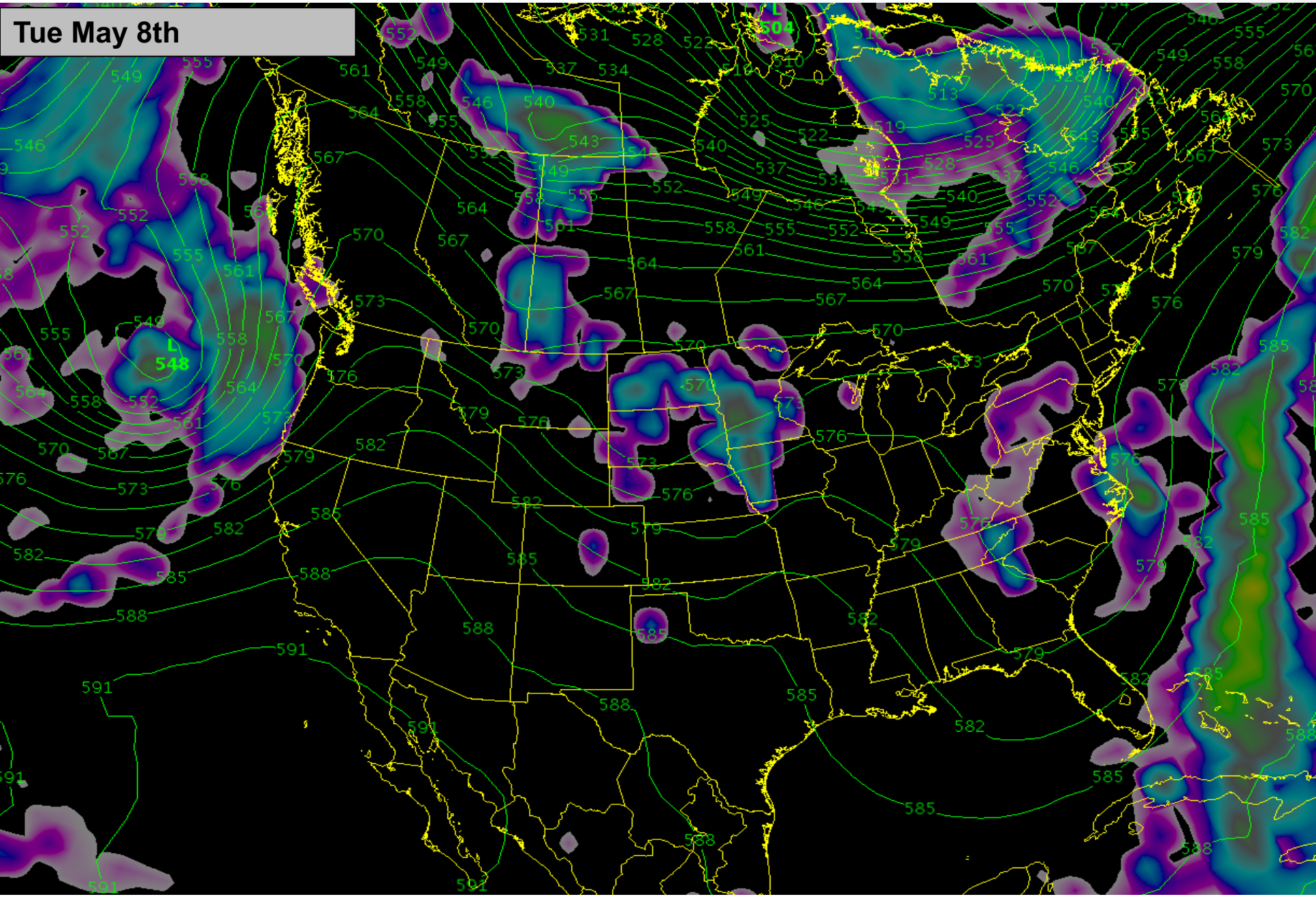
Maximum temperature departure from normal

SLC	+18
Grand Junction	+11
Craig CO	+12
Durango	+11
Big Piney WY	+16

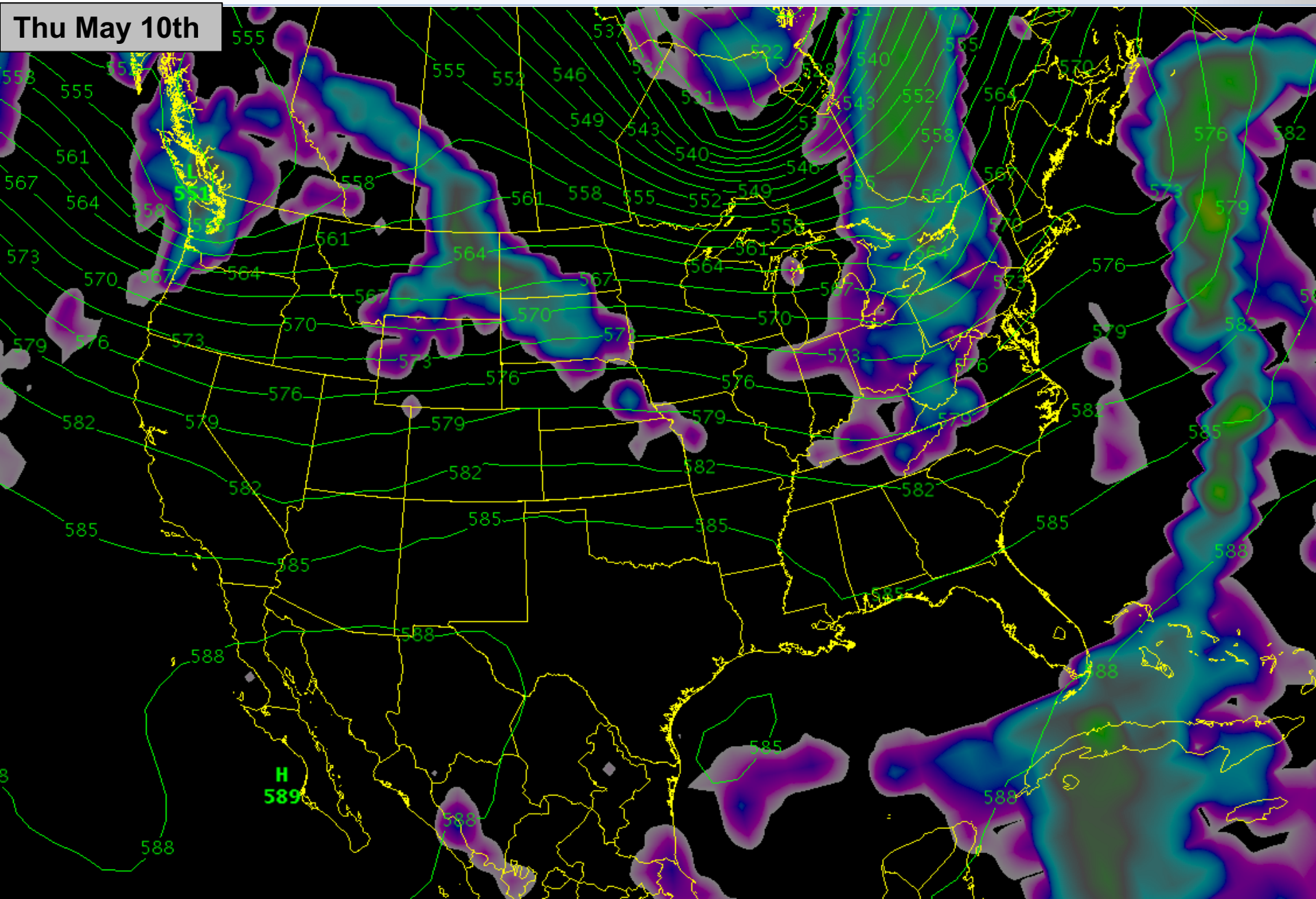
Weak storm system moving through the northern Rockies today. Temperatures a few degrees cooler but still above average. No precipitation threat, primarily a cloud storm.



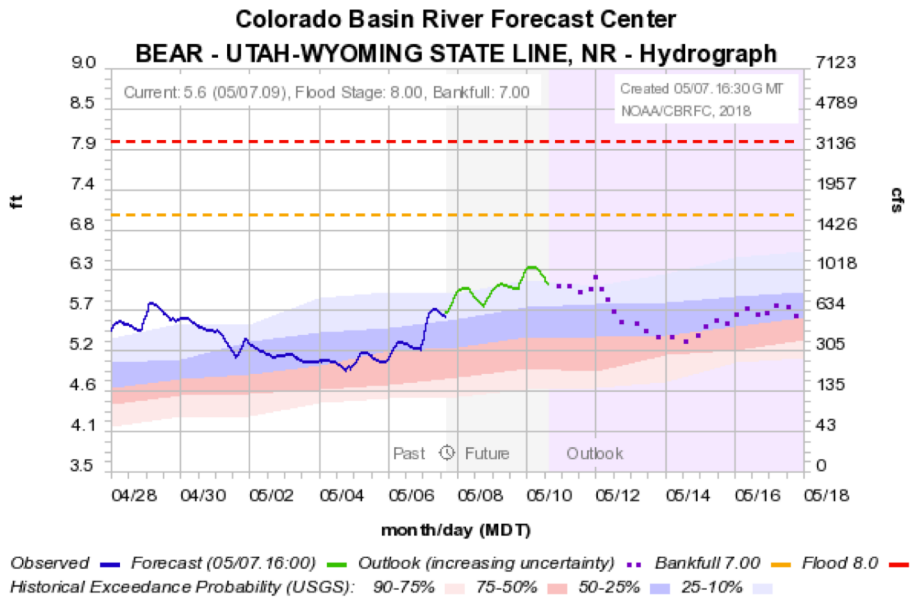
Strong ridge for midweek. This will bring temperatures 10-15+ degrees above average for many areas – initiating the spring seasonal peak flow for many locations

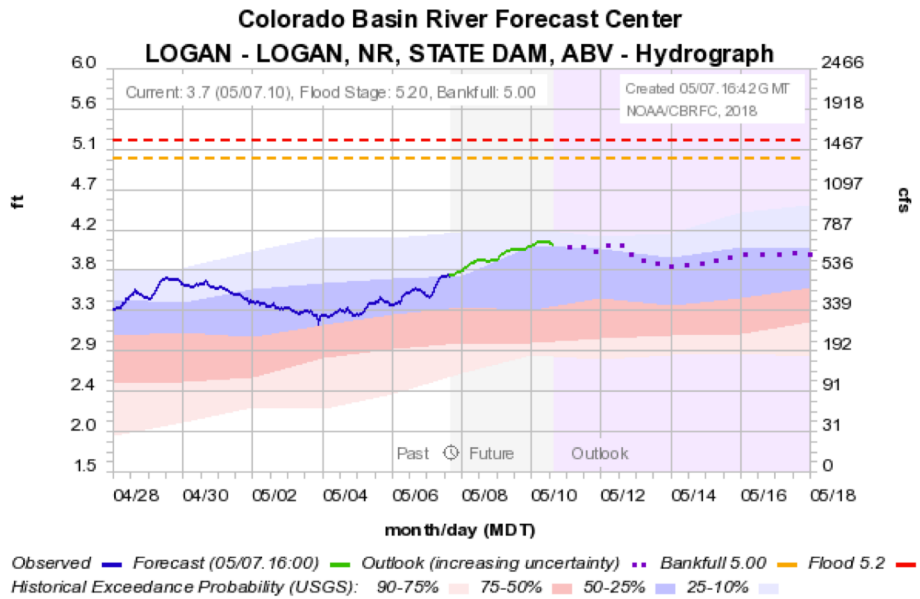


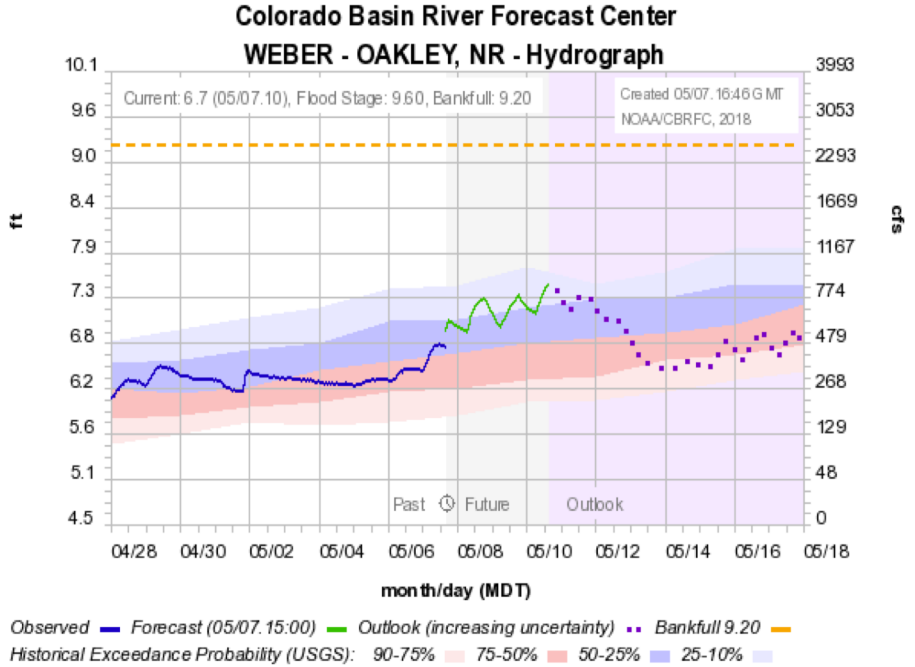
The ridge flattens but above average temperatures persist into the end of the week

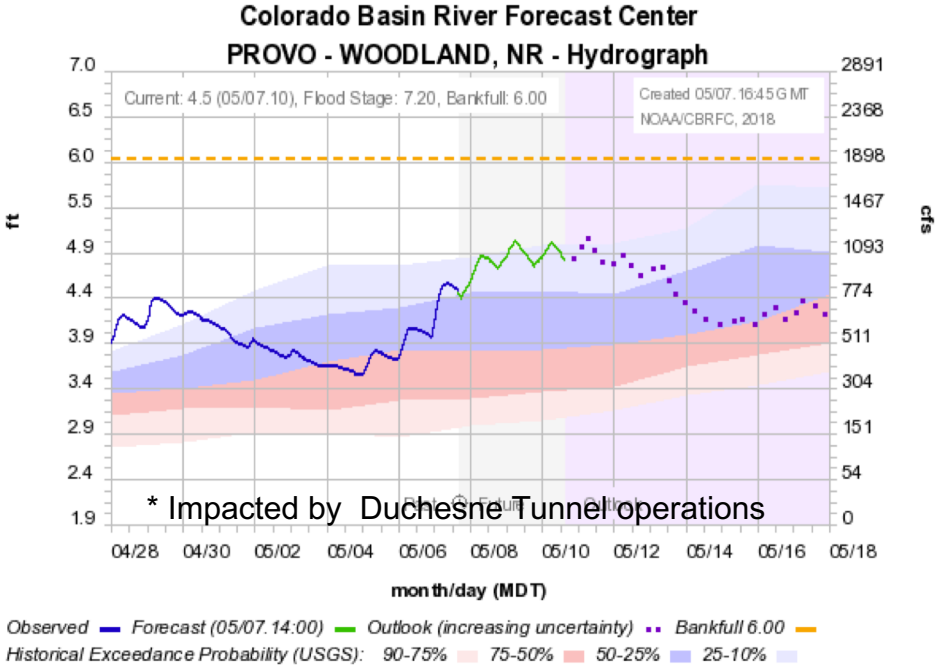


Models suggest many streams will see their seasonal peak within the next 7 days

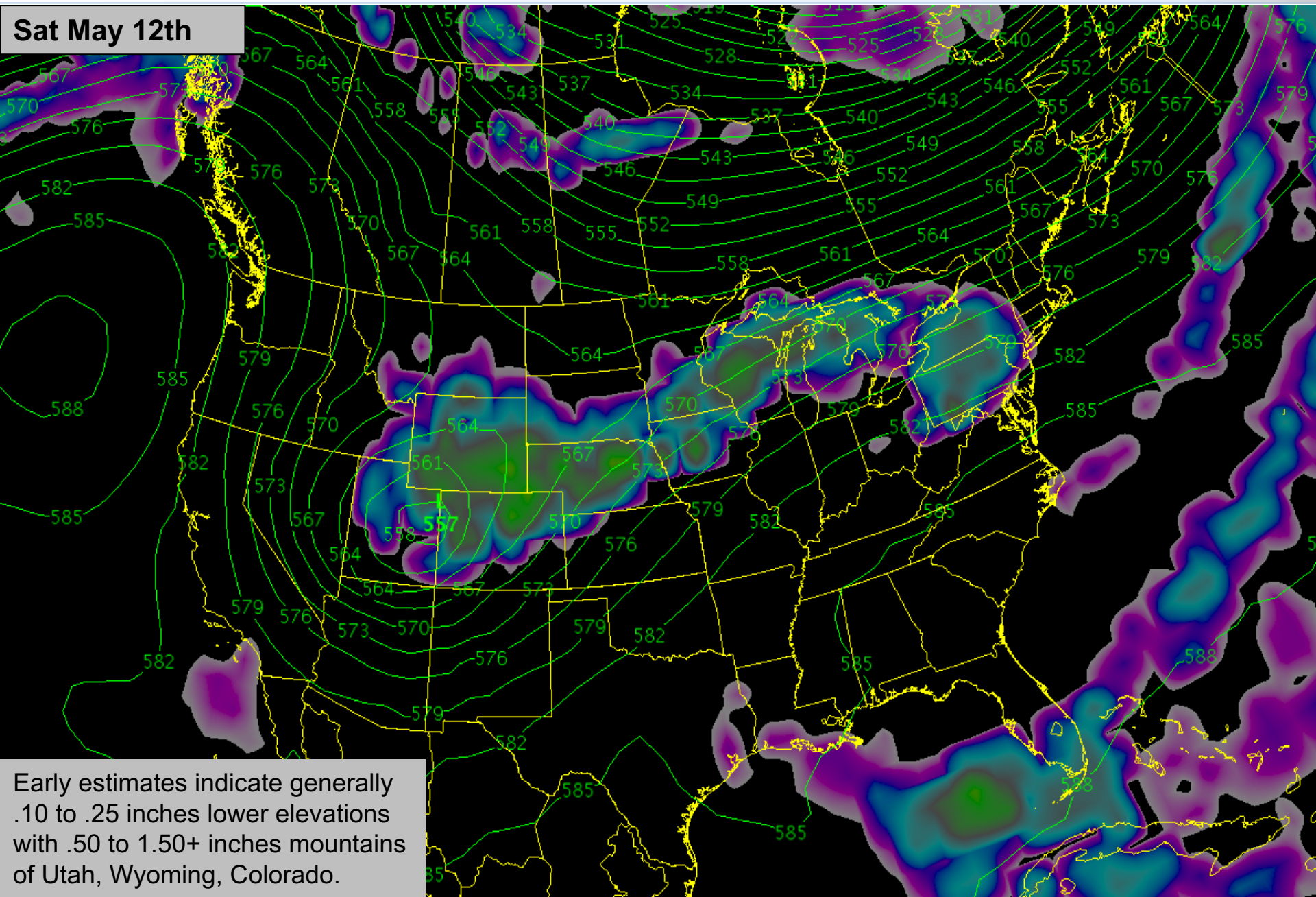








Models bring a closed low pressure into the area for the weekend. Below average temperatures and precipitation likely



Summary

Much below average water year precipitation and snow pack with the exception of parts of the Bear River Basin that was closer to average.

Expecting below average runoff volumes for all river basins in Utah.

Seasonal peaks are anticipated in many locations over the next week. Some rebound in streamflow is likely in the May 15-25th time frame but these peaks may be near or less than what is observed this week.

Most streams will likely be in seasonal recession by the last week of May.

At this point we continue to monitor the runoff, analyze and quality control meteorological guidance. A big driver of the near term streamflow are temperature forecasts. We try to get the best forecast information into the model.

Adjustments to model states may be necessary to correct streamflow simulations. This can impact our seasonal recession forecasts and water supply forecast updates. Usually these are minor and in the correct direction.

Feedback is welcome regarding these briefings.

We will be back in the fall with a review of the season and forecast verification.

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