Great Basin
Water Supply Briefing

February 7, 2018

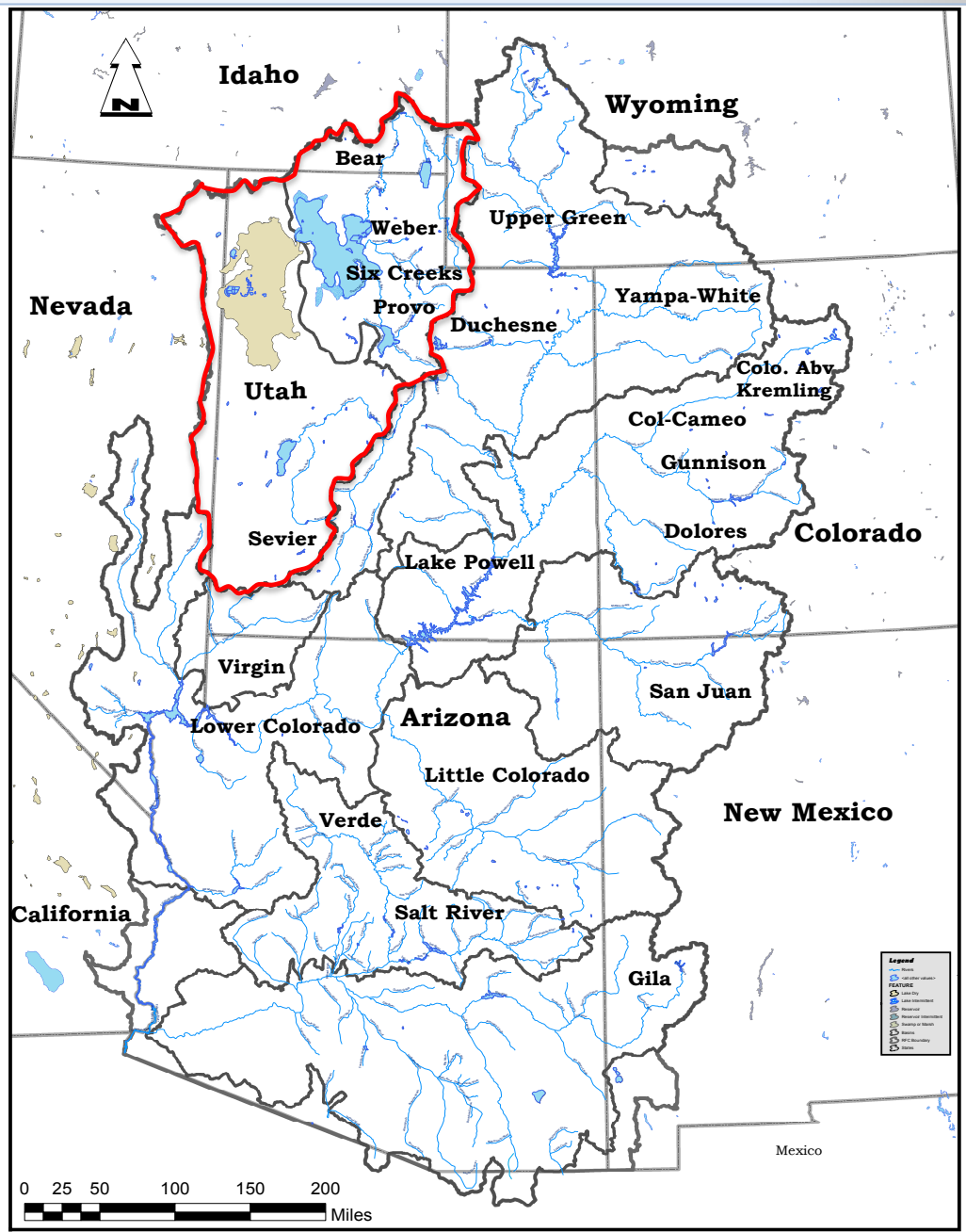
Brenda Alcorn - Sr. Hydrologist
Colorado Basin River Forecast Center

Phone: 1-877-929-0660

Passcode: 1706374

Please mute your phone until ready to ask questions

CBRFC Forecast Areas



Today's Presentation

January weather – Mild and dry pattern continued

Current snowpack conditions – Near record low snowpack in many areas

2018 water supply forecasts – February update

Select forecast site review – Evolution Plots

February forecast – Much improvement over January?

Upcoming weather – Below average precipitation again in February?

Contacts & Questions

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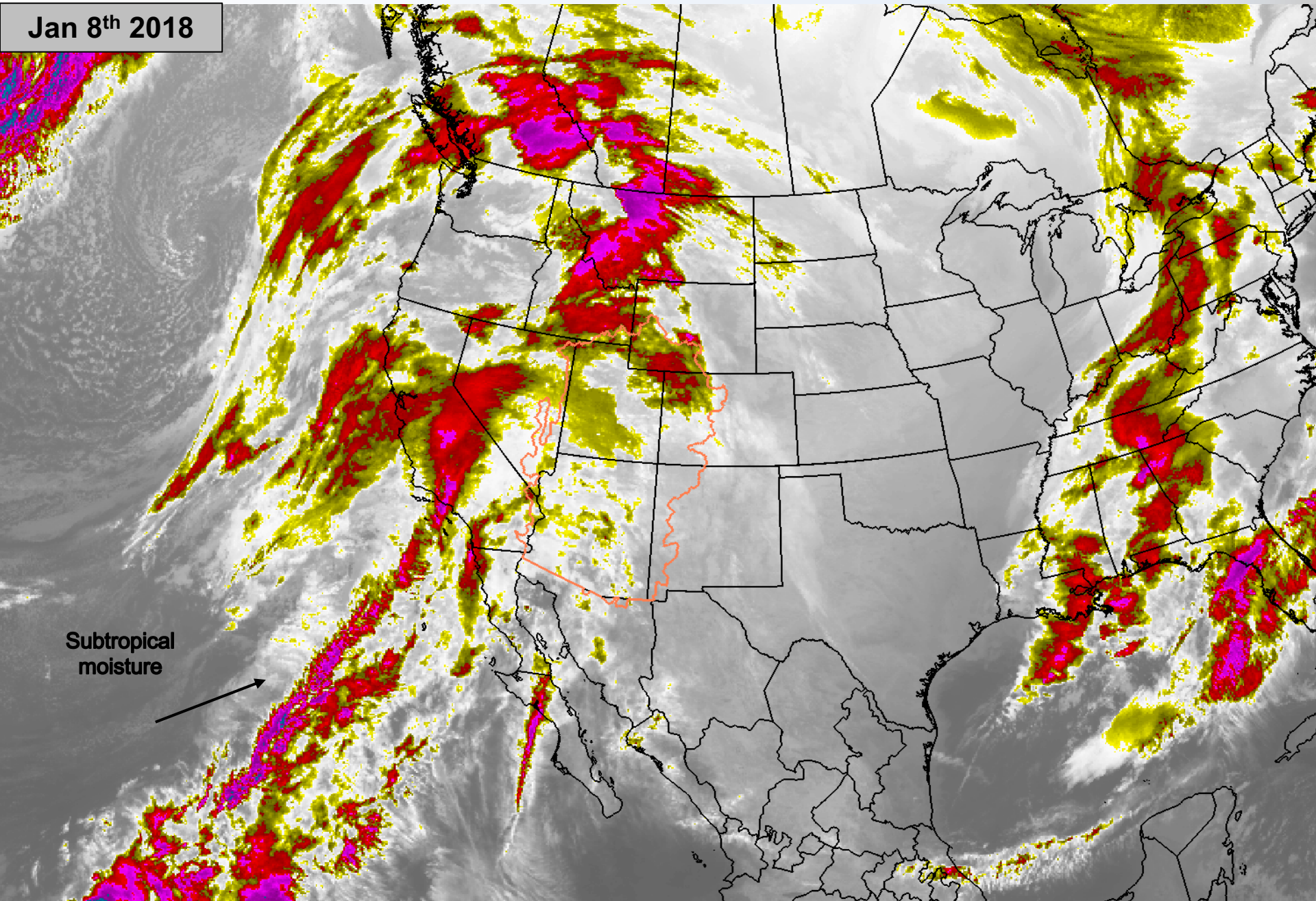
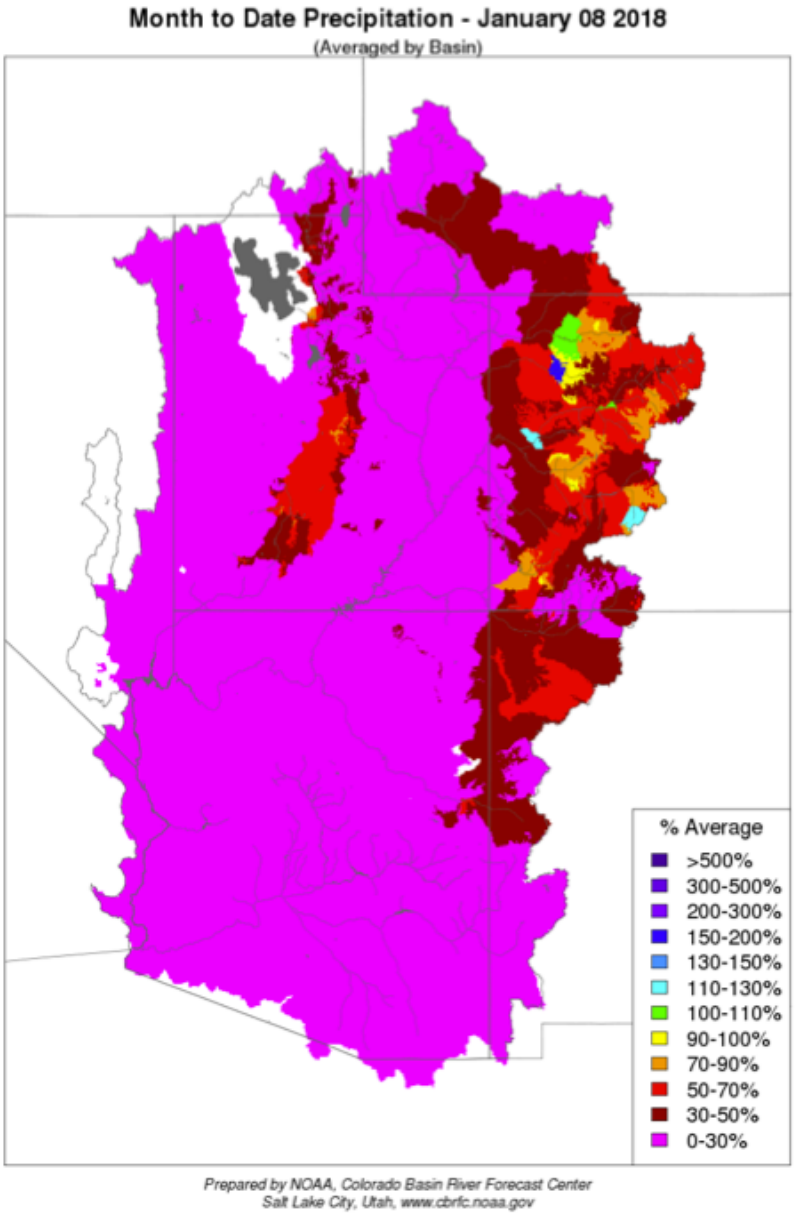
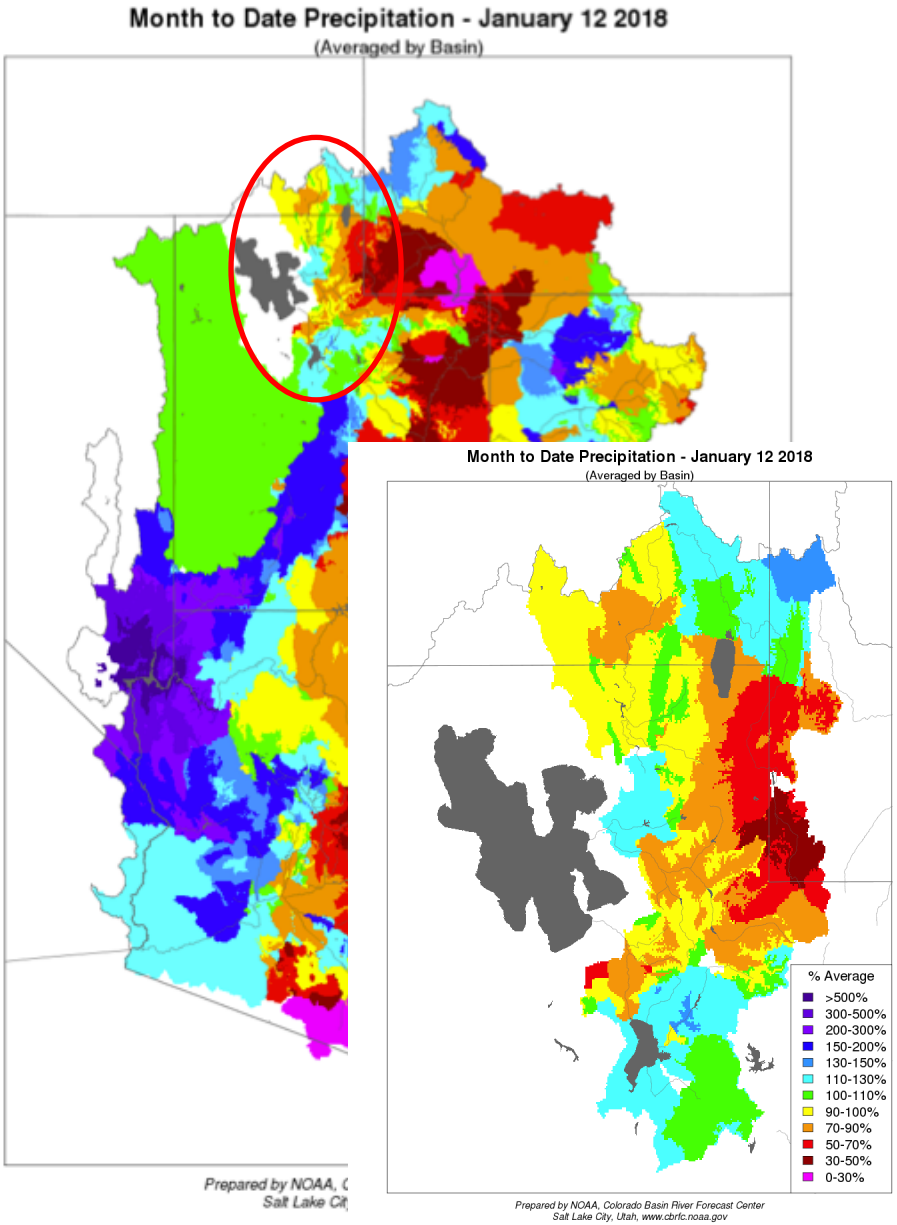
*** Please mute your phone until ready to ask questions ***

Early January Storm System brought widespread (but light) precipitation amounts



Early January Precipitation

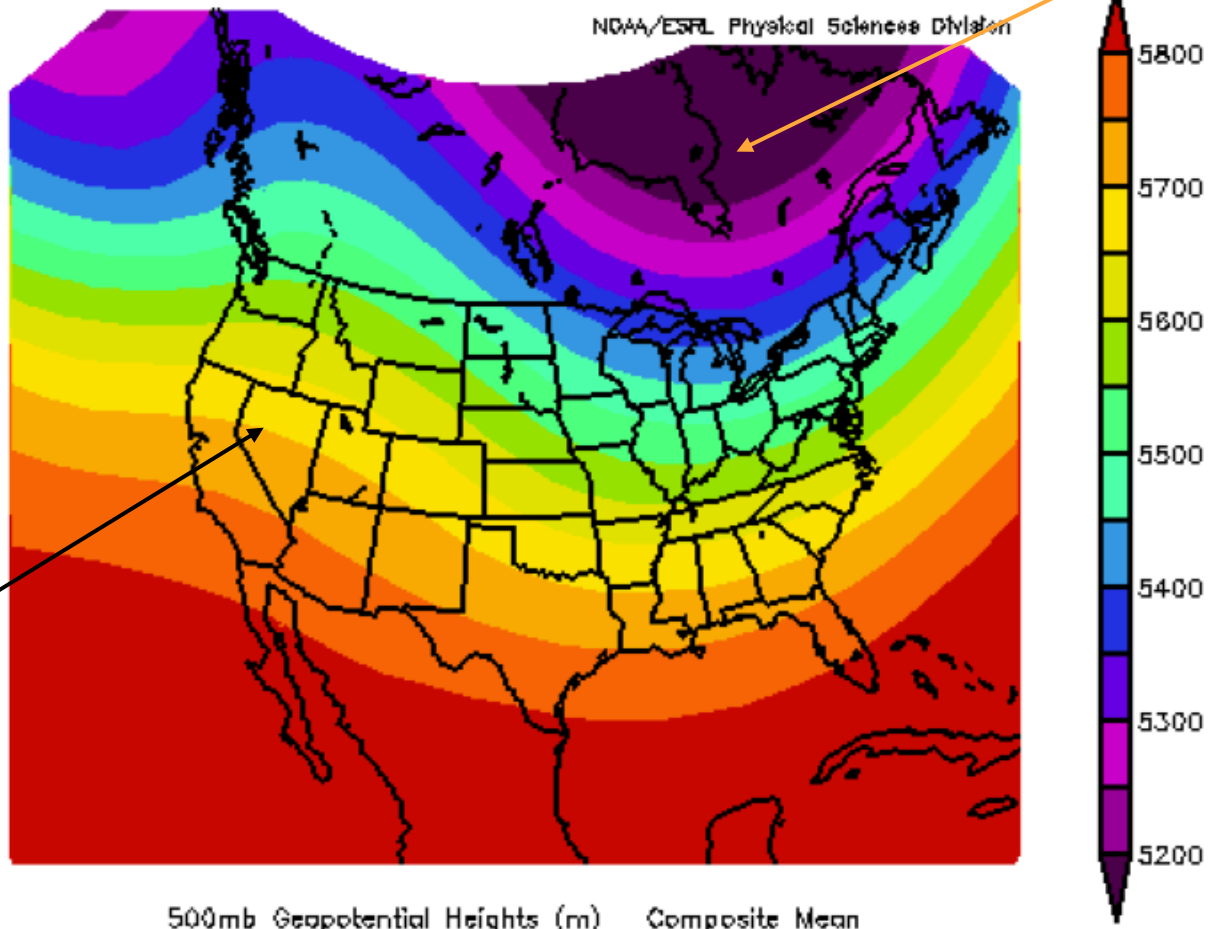




January Weather

Mean Atmospheric Pattern
January 2018

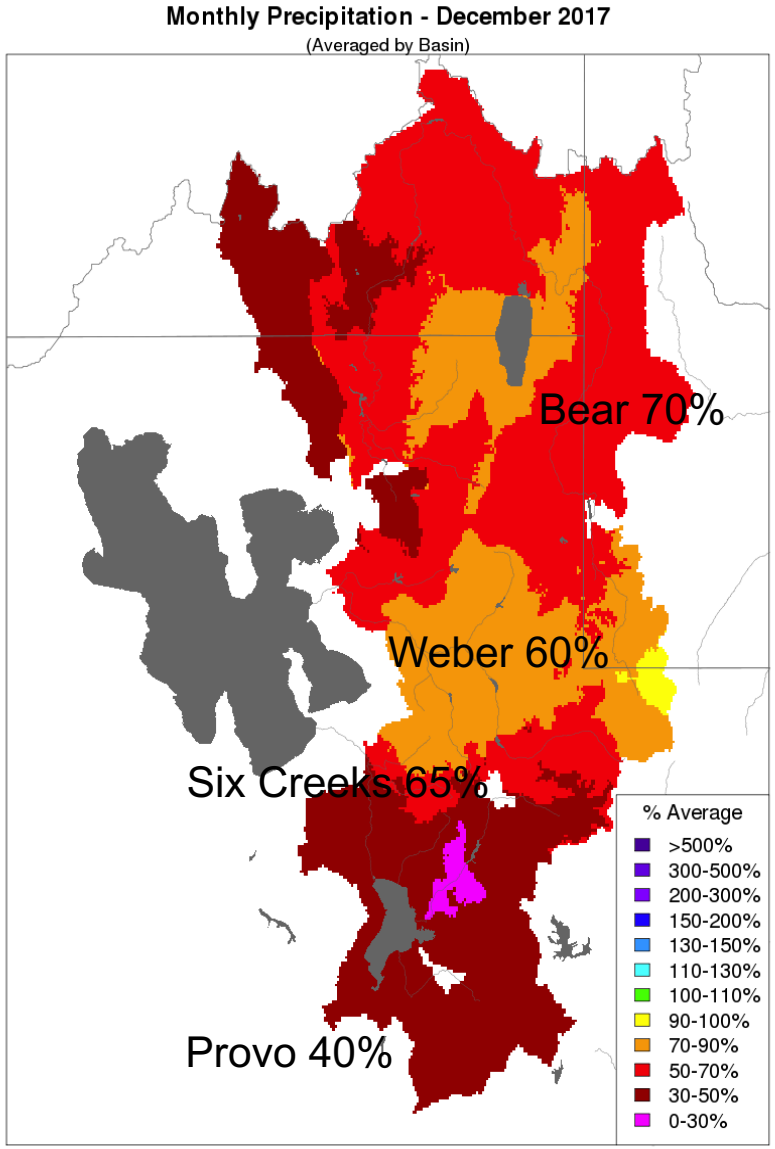
Strong persistent Low in the east

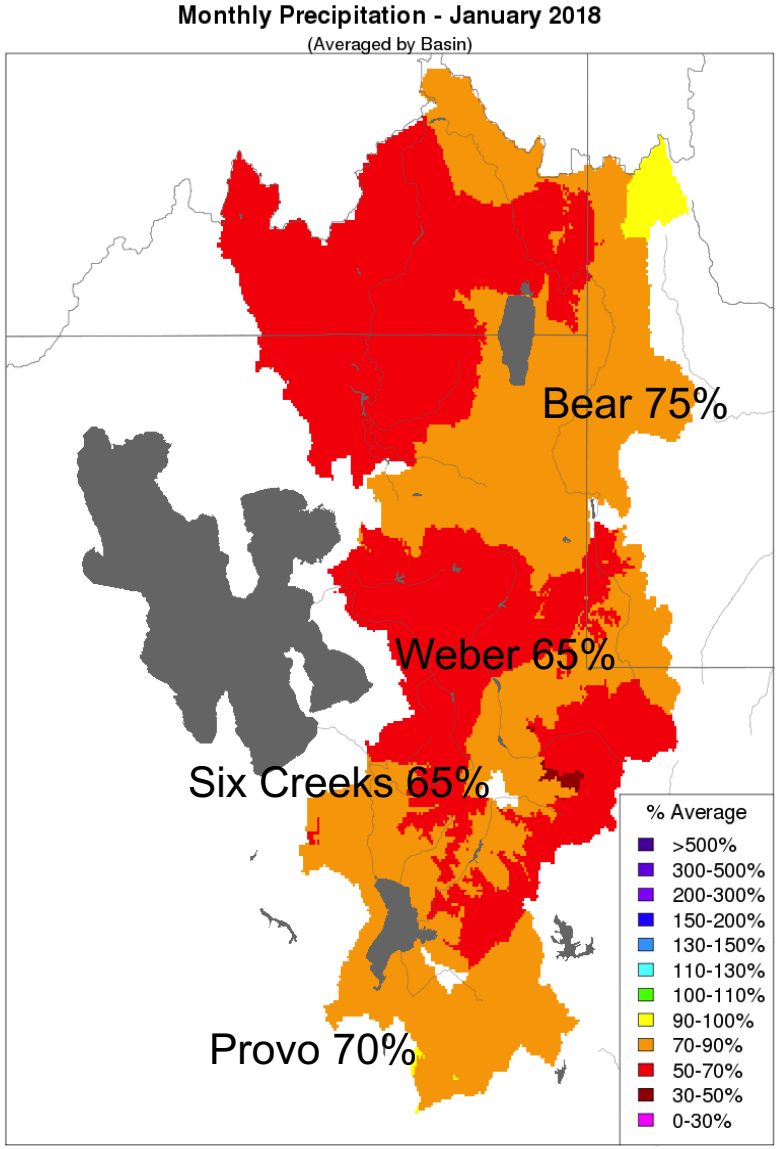


Mean high pressure in the west

Winter Weather

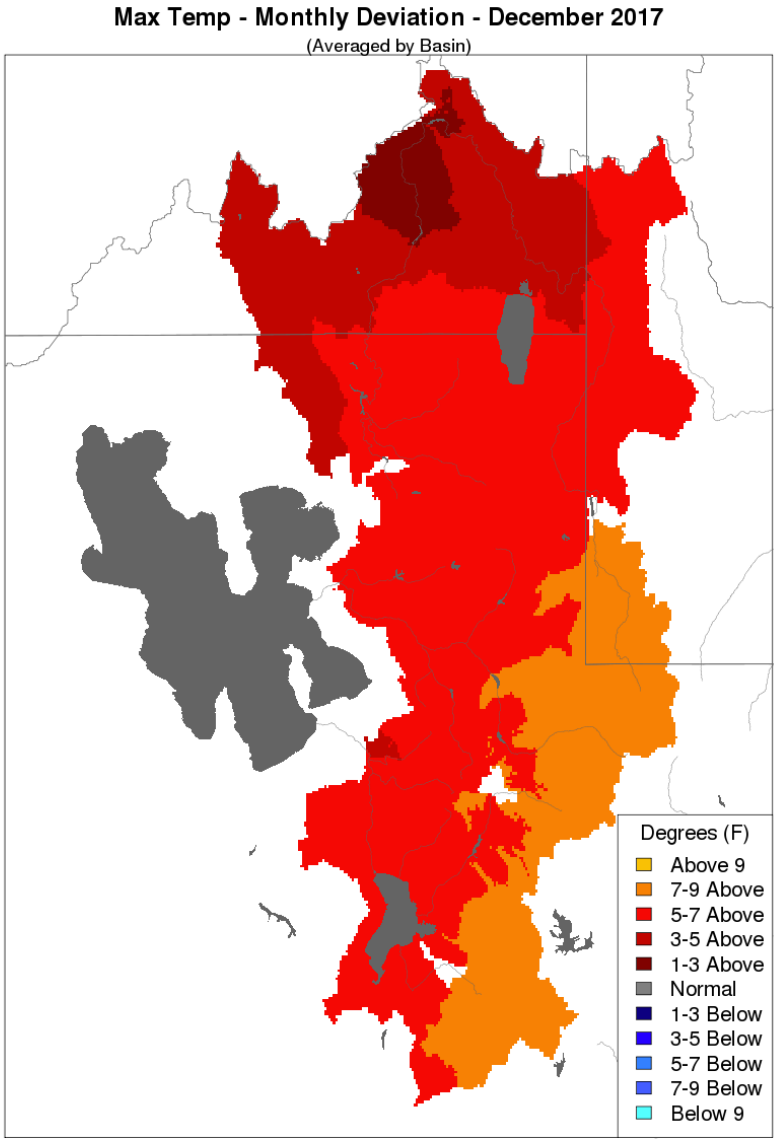
Much below average precipitation in both December and January…

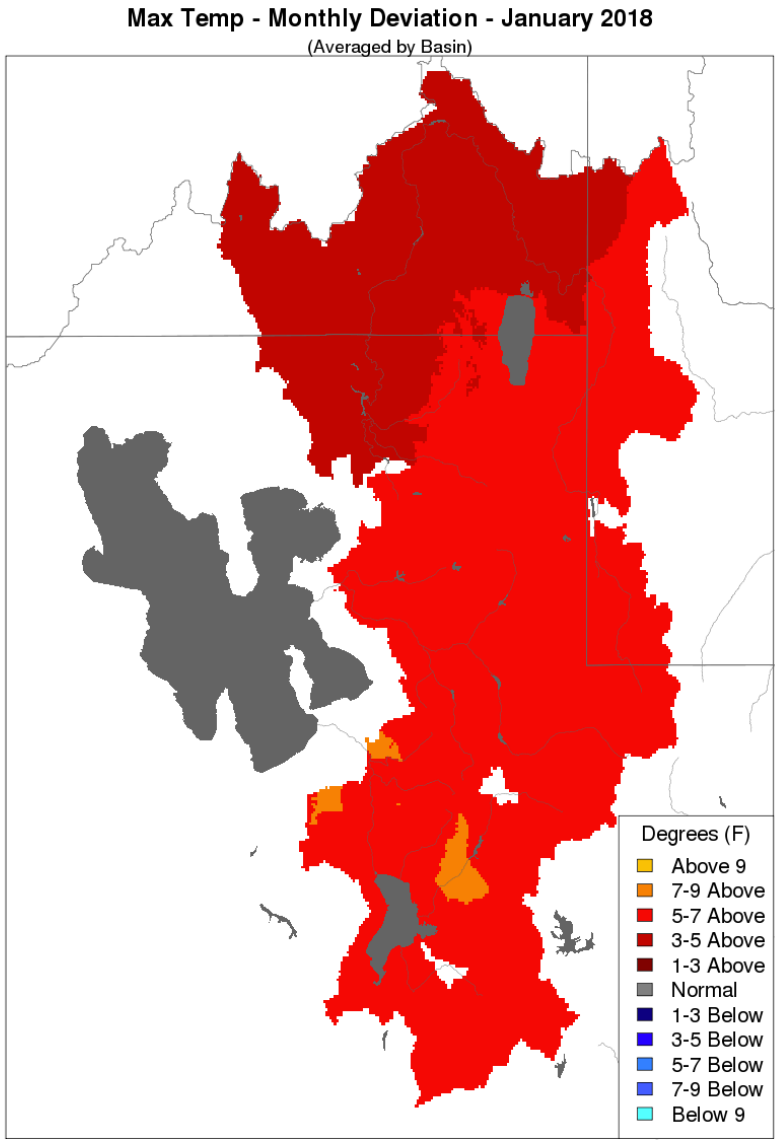




Winter Weather

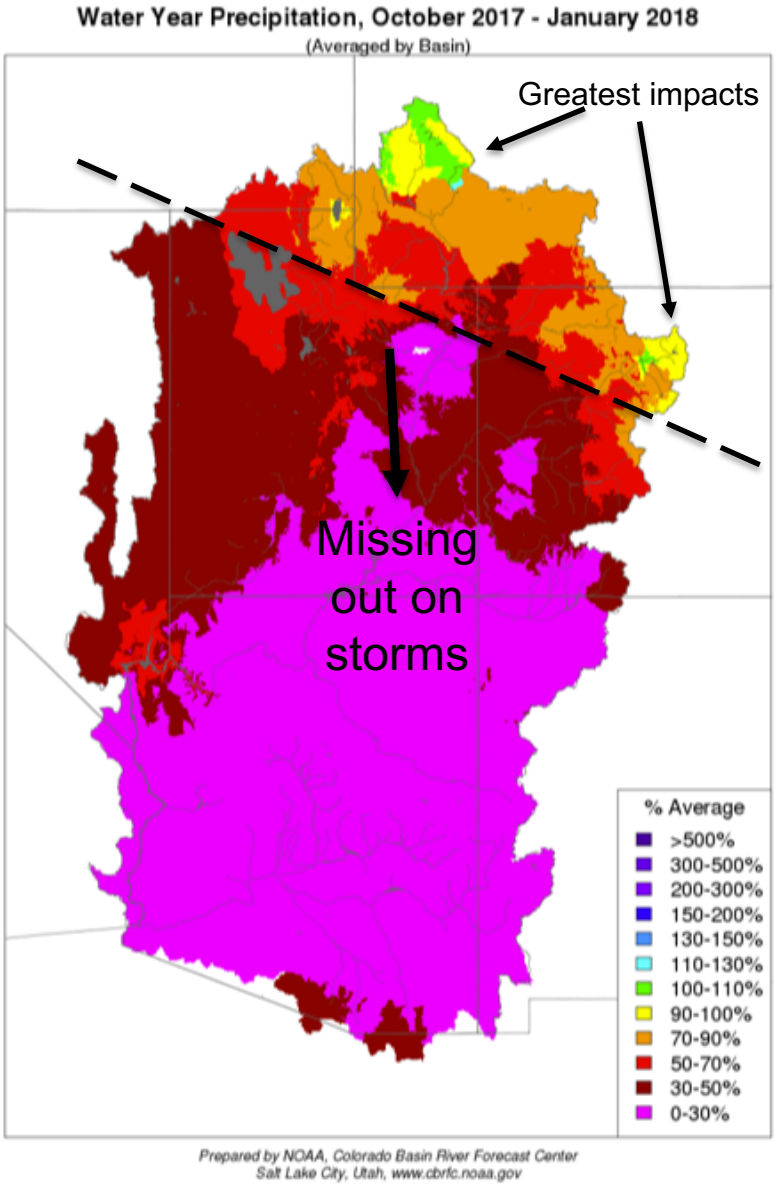
…combined with much above average temperatures



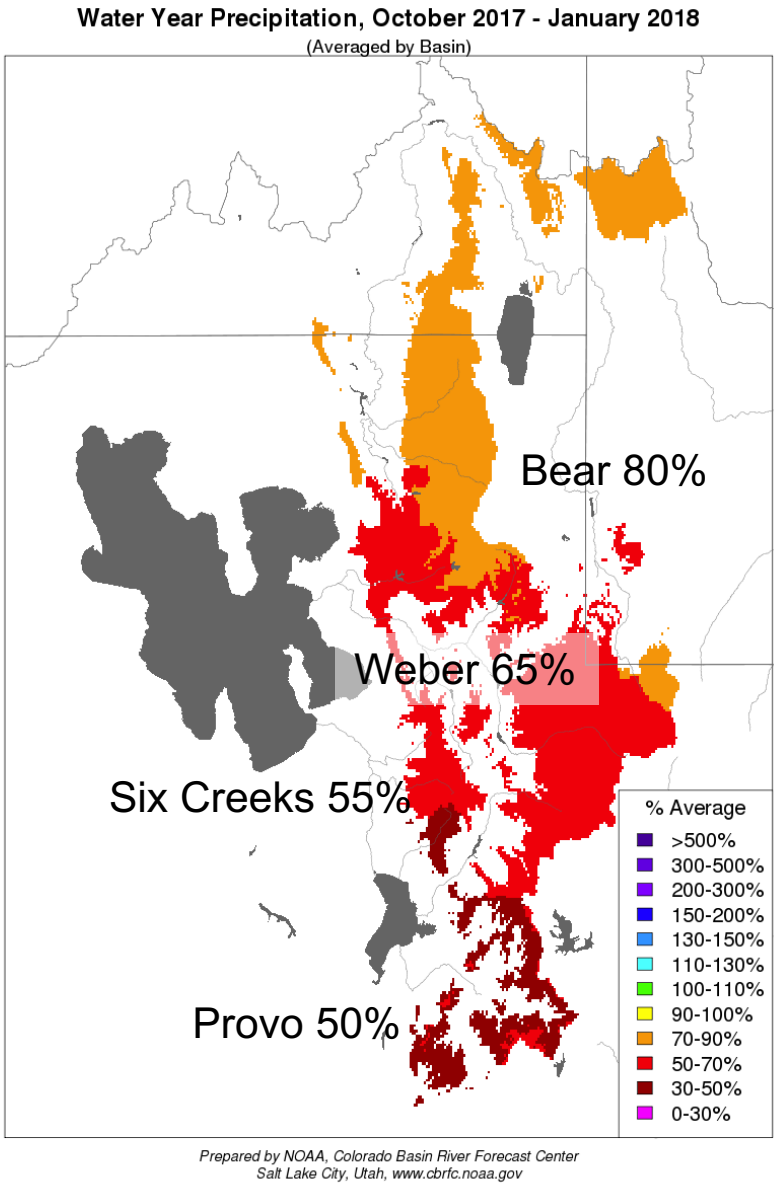


Water Year Precipitation

Entire CBRFC forecast area



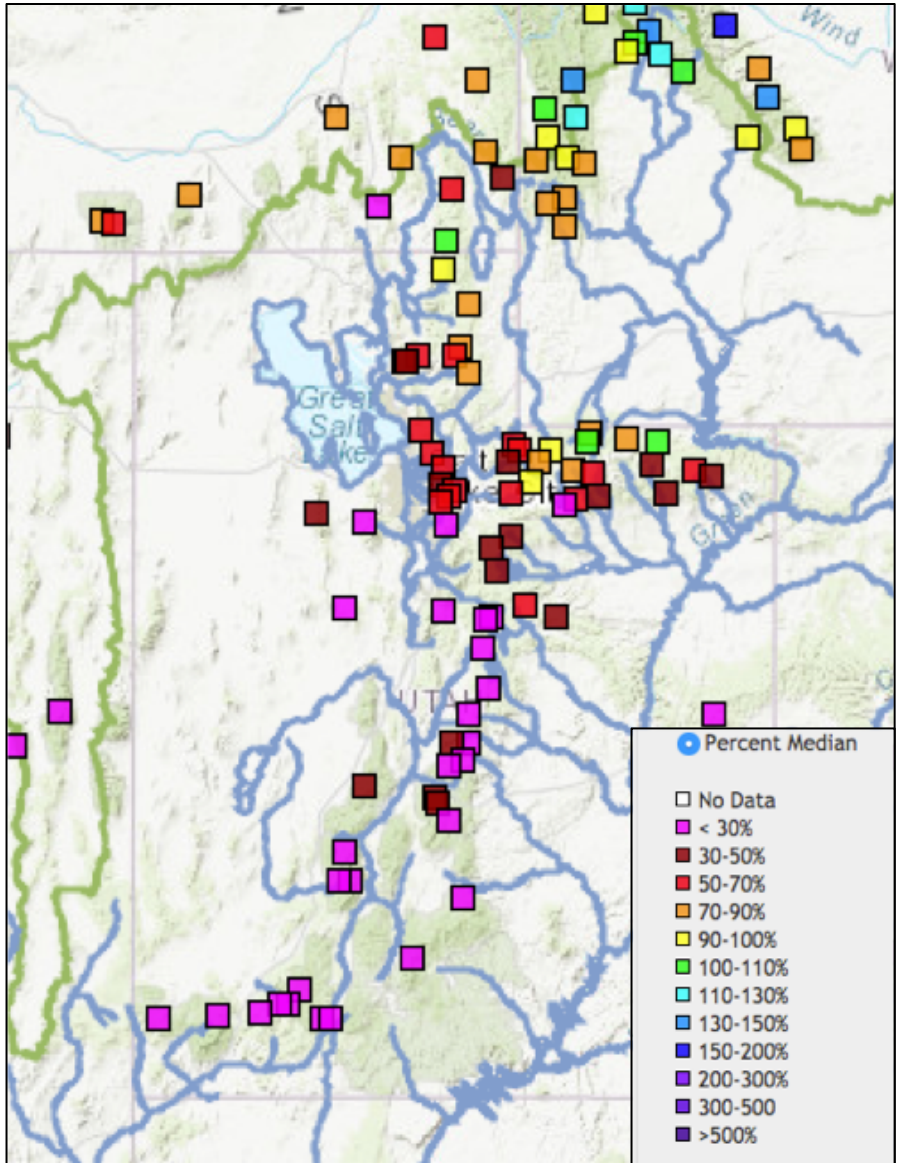
Great Basin (primary contributing areas)



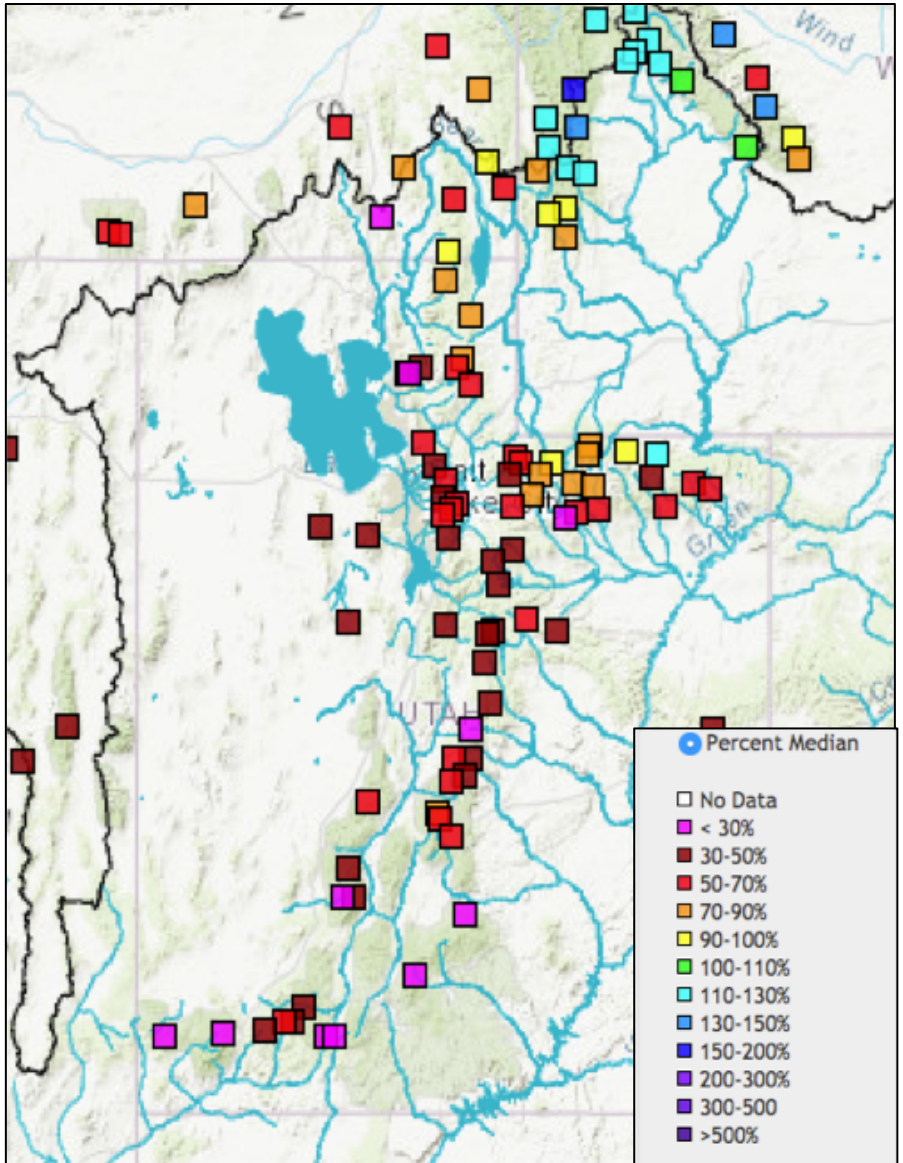
Snow Conditions

SNOTEL Snow Water Equivalent (% 1981-2010 median)

January 8, 2018



February 5, 2018



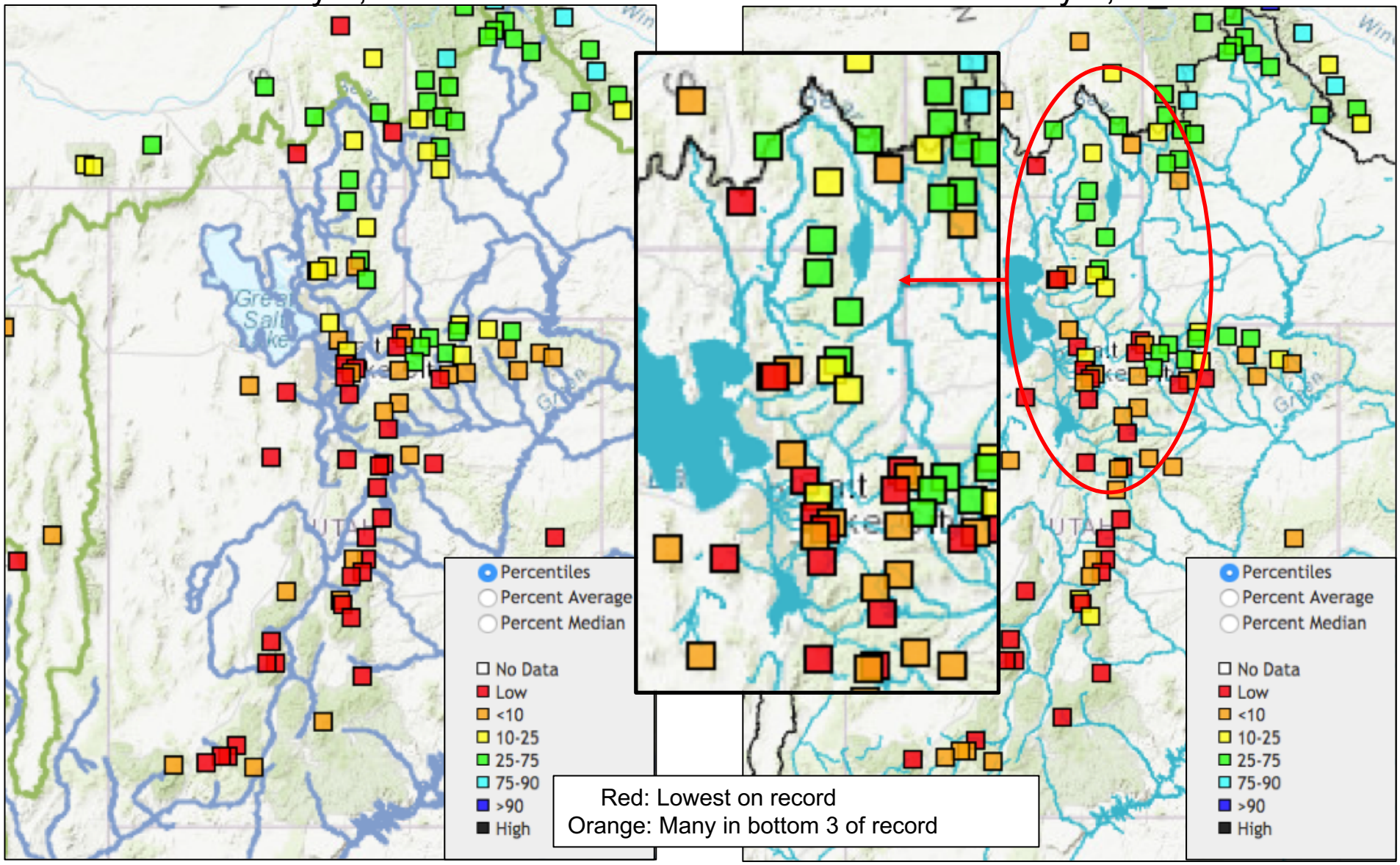
Snow Conditions

SNOTEL SWE Historical Rankings (period of record 30-40 years)

(**earliest year 1978+)

January 8, 2018

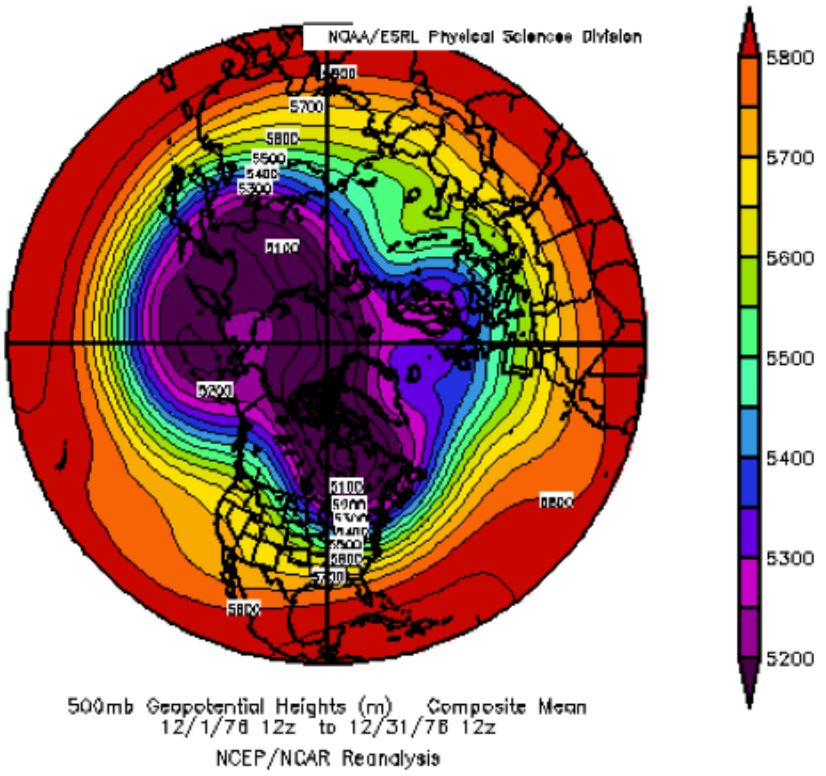
February 5, 2018



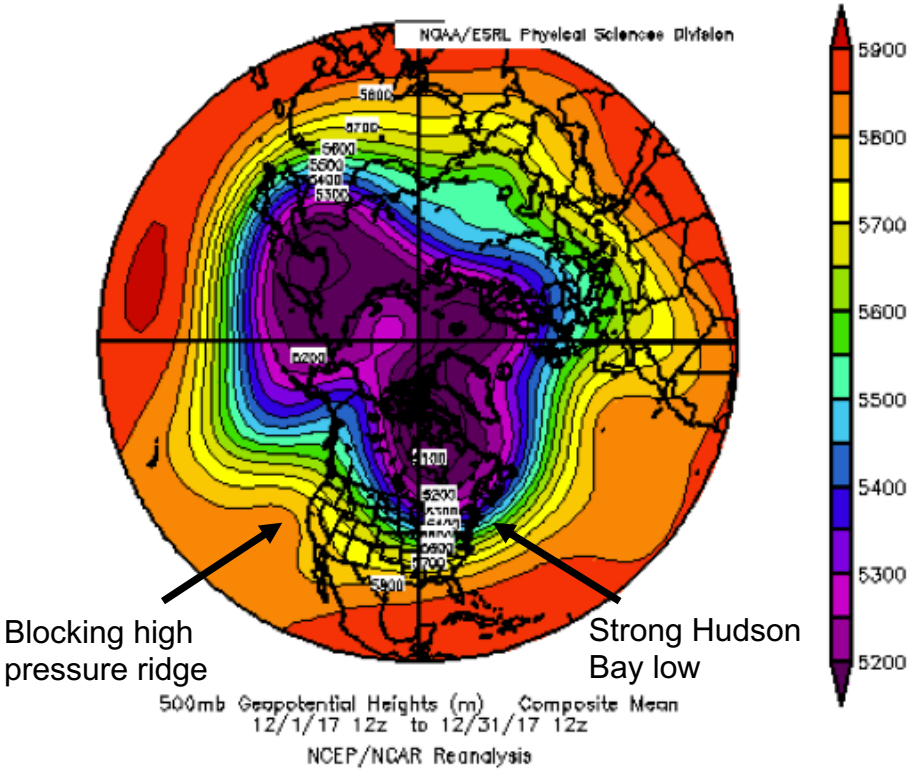
Dry seasons have happened in the past

How does this year compare?

Atmospheric Pattern
December 1976



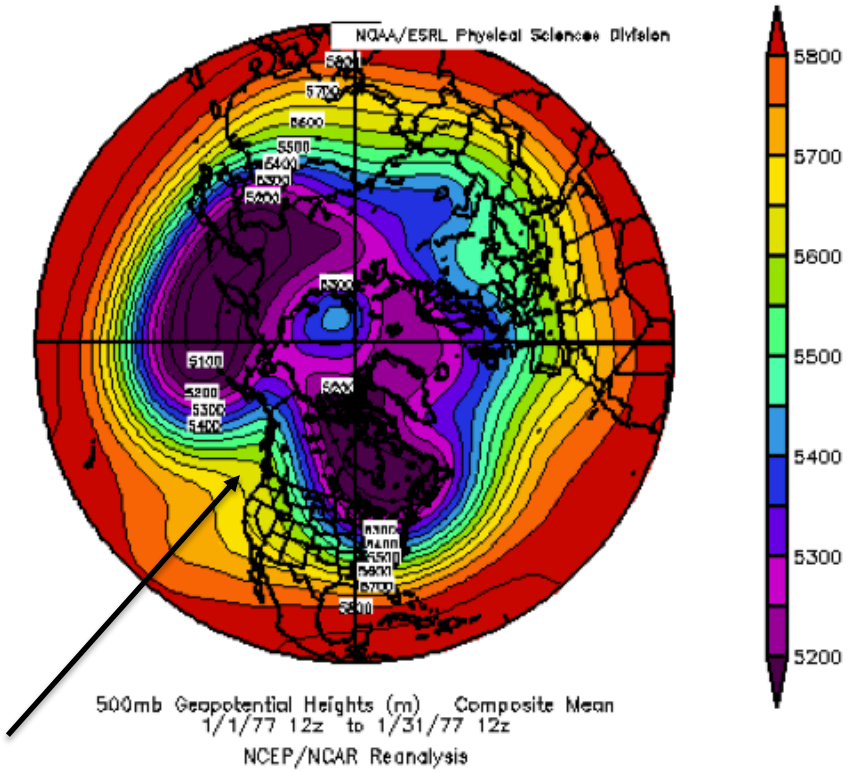
Atmospheric Pattern
December 2017



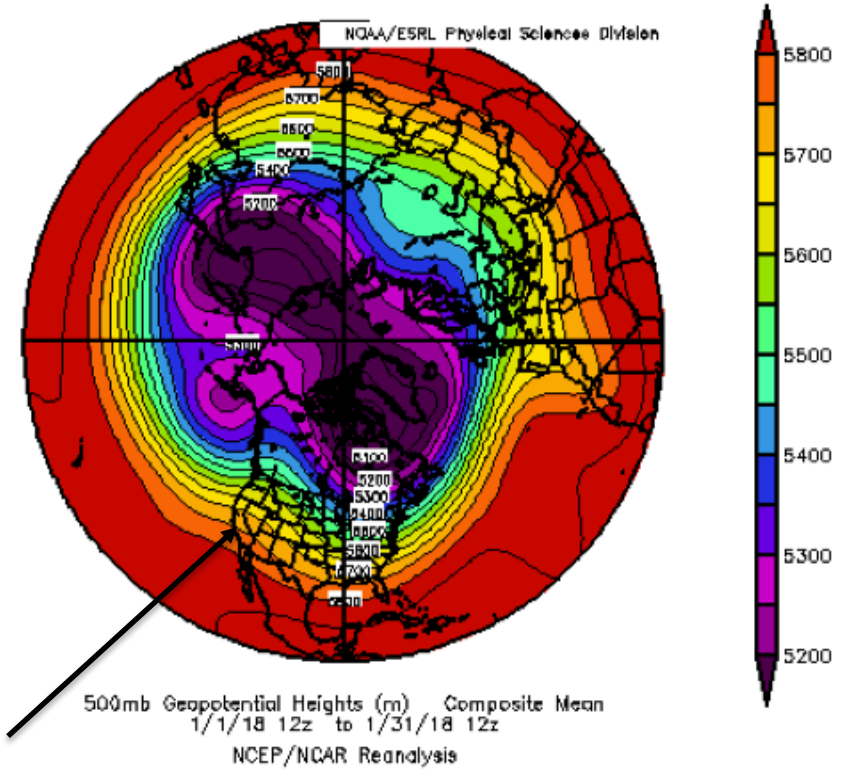
Previously 1976/77 winter was referenced because it stands out as one of the lowest snow years. There were also some similarities in the late fall / early winter atmospheric pattern. Many record low flows were established in 1977.

Comparing the January patterns

Mean Atmospheric Pattern
January 1977



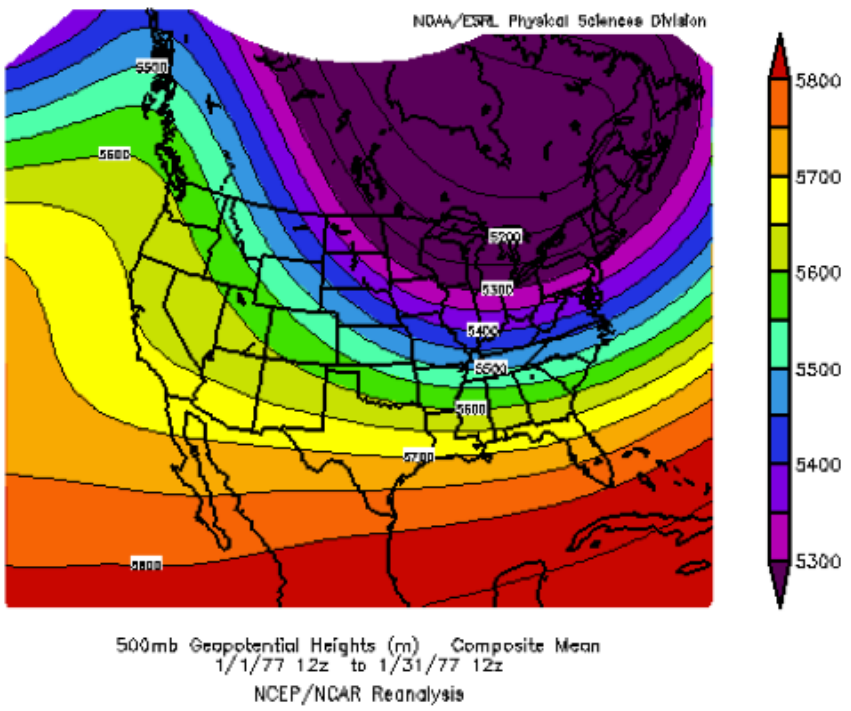
Mean Atmospheric Pattern
January 2018



Similarities in large scale features but some subtle differences as well
Location of ridge axis – strength of ridge – Pacific Ocean features

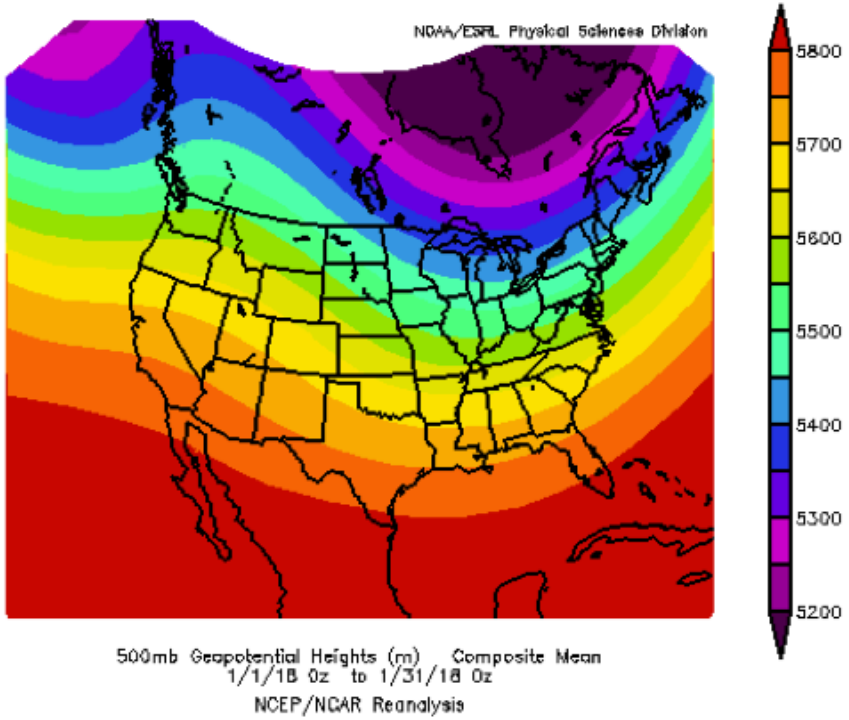
Comparing the January patterns

Mean Atmospheric Pattern
January 1977



500mb Geopotential Heights (m) Composite Mean
1/1/77 12z to 1/31/77 12z
NCEP/NCAR Reanalysis

Mean Atmospheric Pattern
January 2018



500mb Geopotential Heights (m) Composite Mean
1/1/18 0z to 1/31/18 0z
NCEP/NCAR Reanalysis

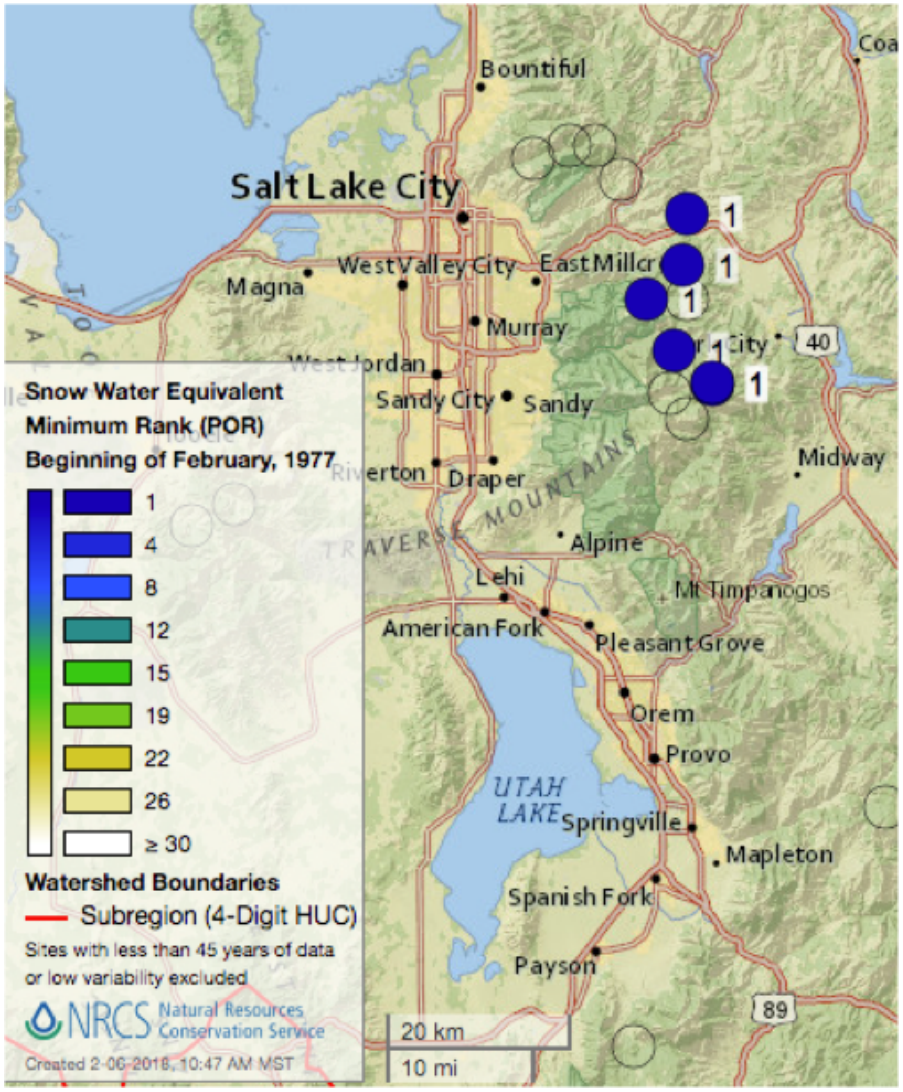
January 1977: Greater amplified ridge/trough developed the 2nd half of January and persisted through February.

January 2018: High pressure ridge remains dominant player but the pattern has recently become more progressive in a northwest flow.

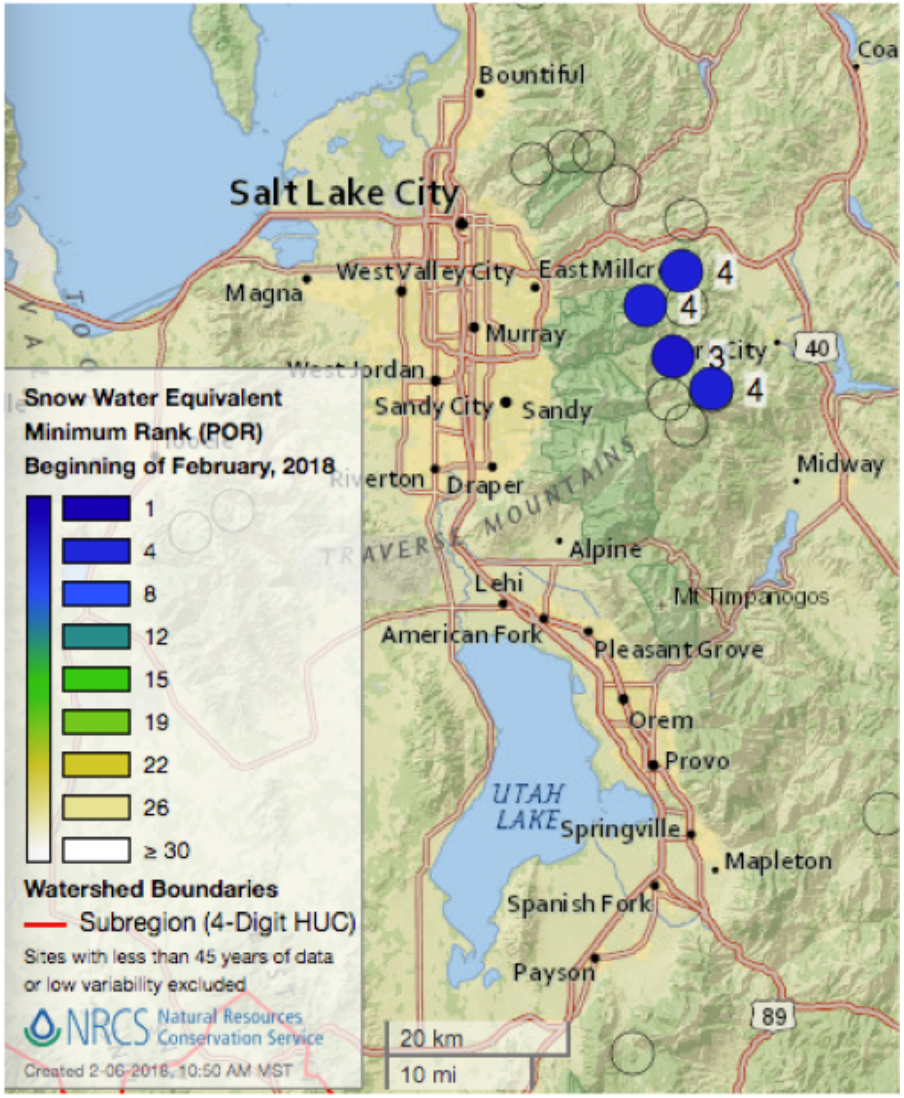
Snow Conditions

Snow Course SWE Historical Rankings (minimum years of record = 45)

Beginning of February 1977

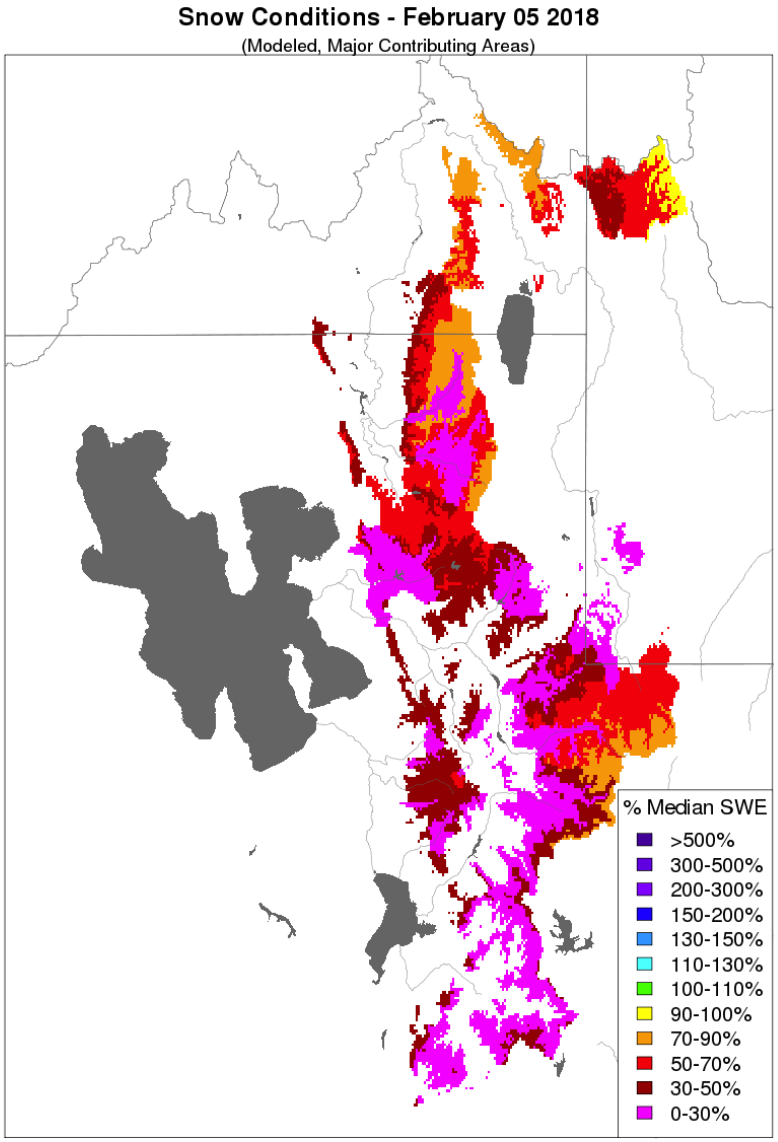


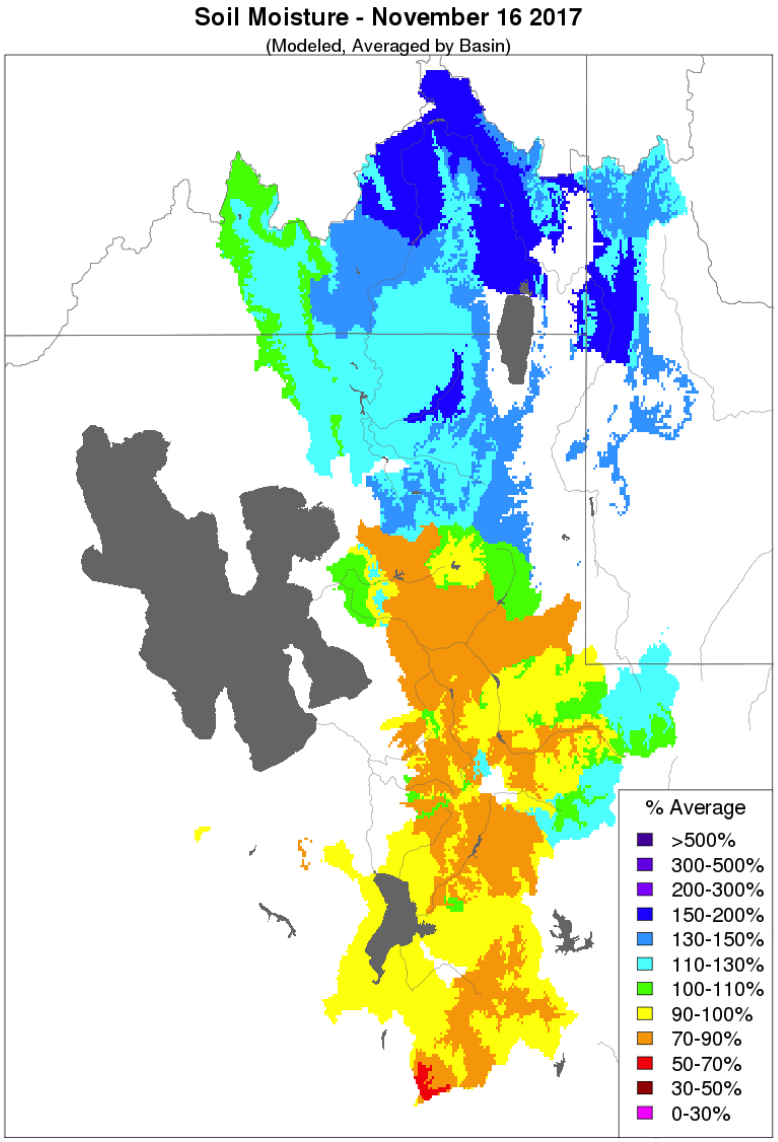
Beginning of February 2018



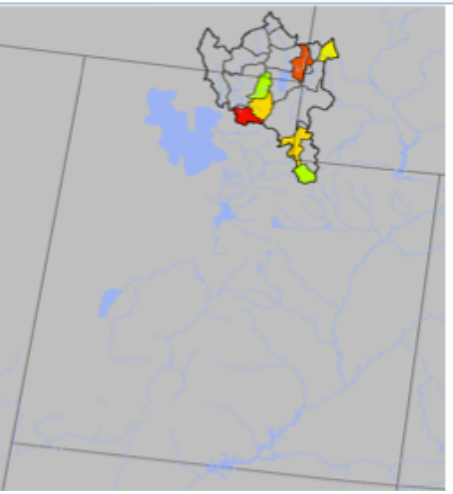
CBRFC Model States

Current SWE (% median) / Fall Soil Moisture



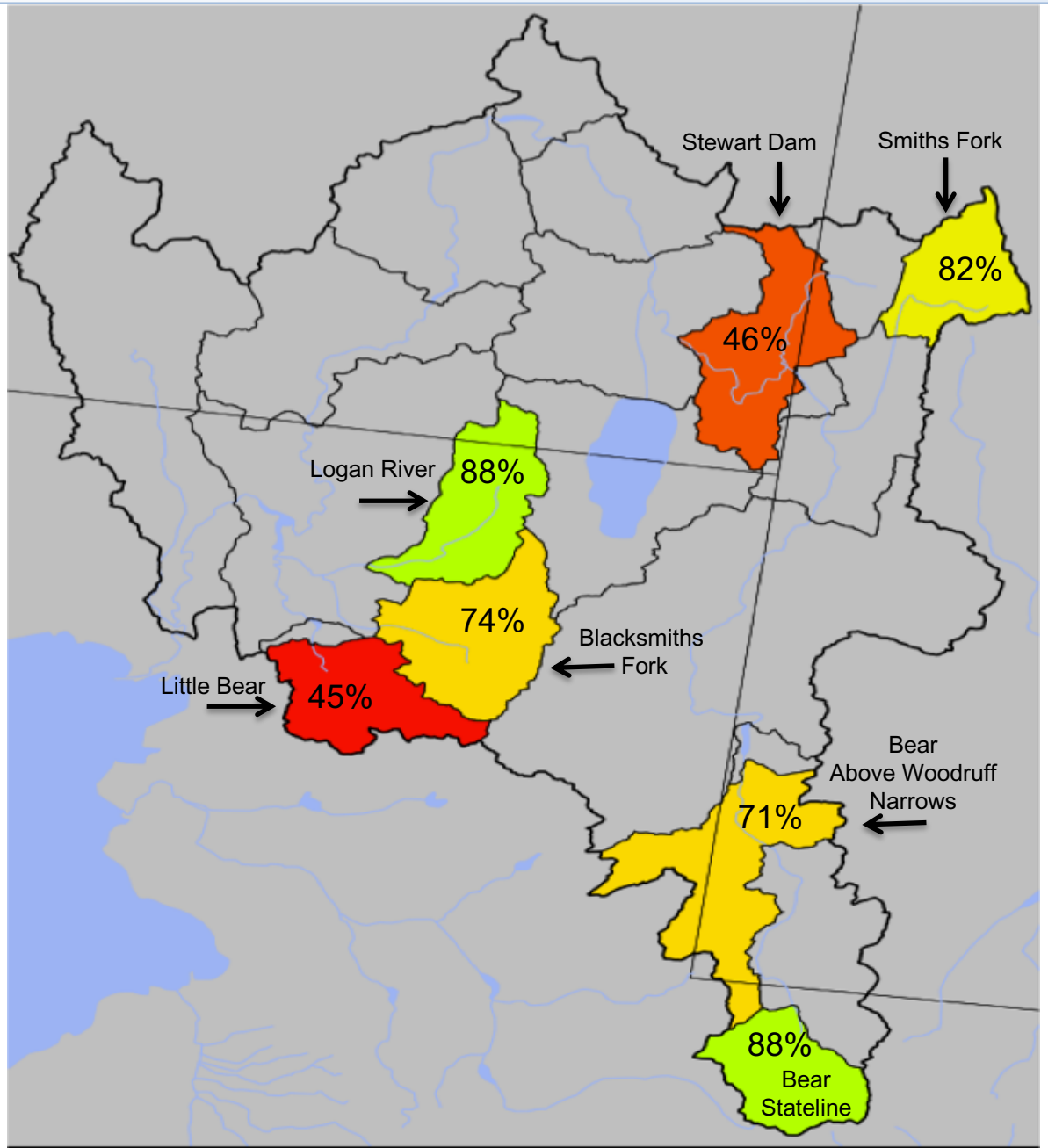


February 1st Water Supply Forecasts – Bear River Basin



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

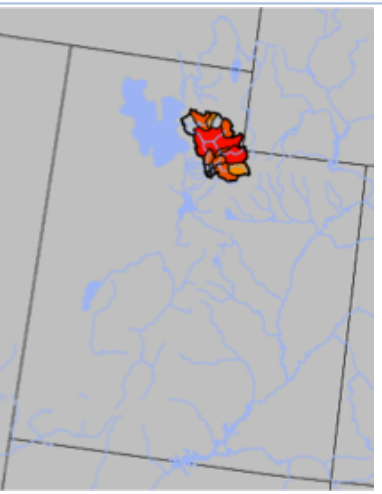
- Below 25%
- 25% - 35%
- 35% - 45%
- 45% - 55%
- 55% - 65%
- 65% - 75%
- 75% - 85%
- 85% - 95%
- 95% - 105%
- 105% - 115%
- 115% - 125%
- 125% - 135%
- 135% - 145%
- 145% - 155%
- 155% - 165%
- 165% - 175%
- Above 175%
- NA



Median
Basin
Forecast:

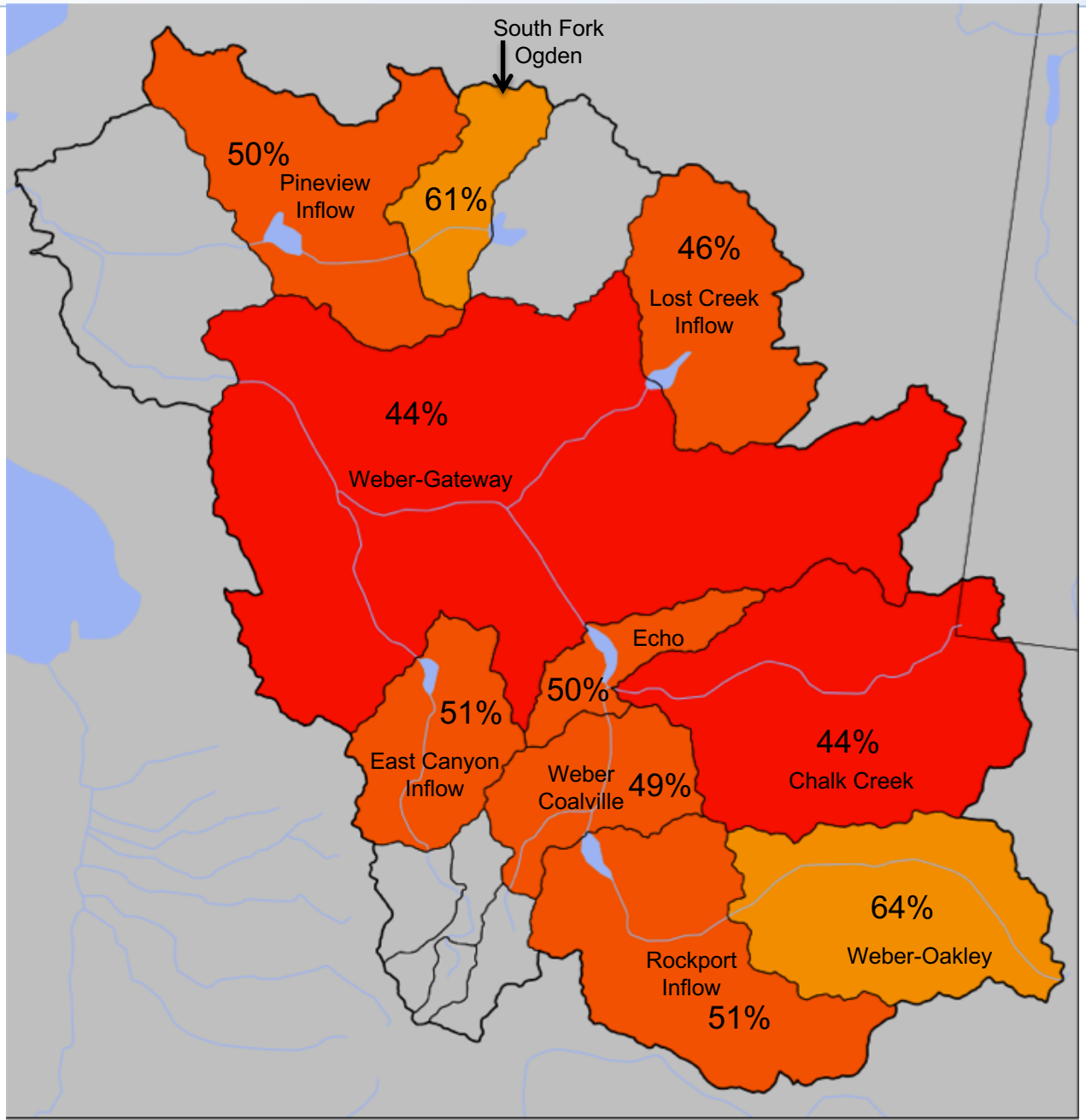
Jan – 85%
Feb – 75%

February 1st Water Supply Forecasts – Weber River Basin



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

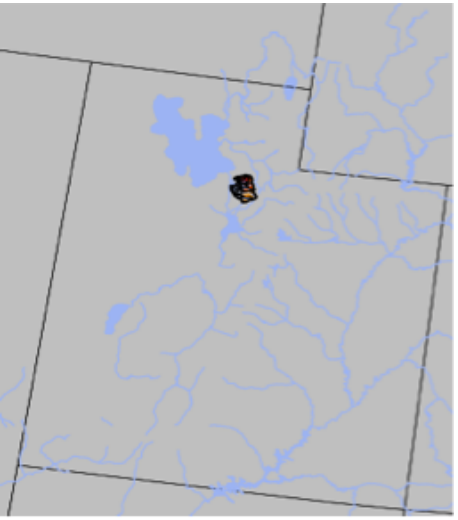
- Below 25%
- 25% - 35%
- 35% - 45%
- 45% - 55%
- 55% - 65%
- 65% - 75%
- 75% - 85%
- 85% - 95%
- 95% - 105%
- 105% - 115%
- 115% - 125%
- 125% - 135%
- 135% - 145%
- 145% - 155%
- 155% - 165%
- 165% - 175%
- Above 175%
- NA



Median Basin Forecast:

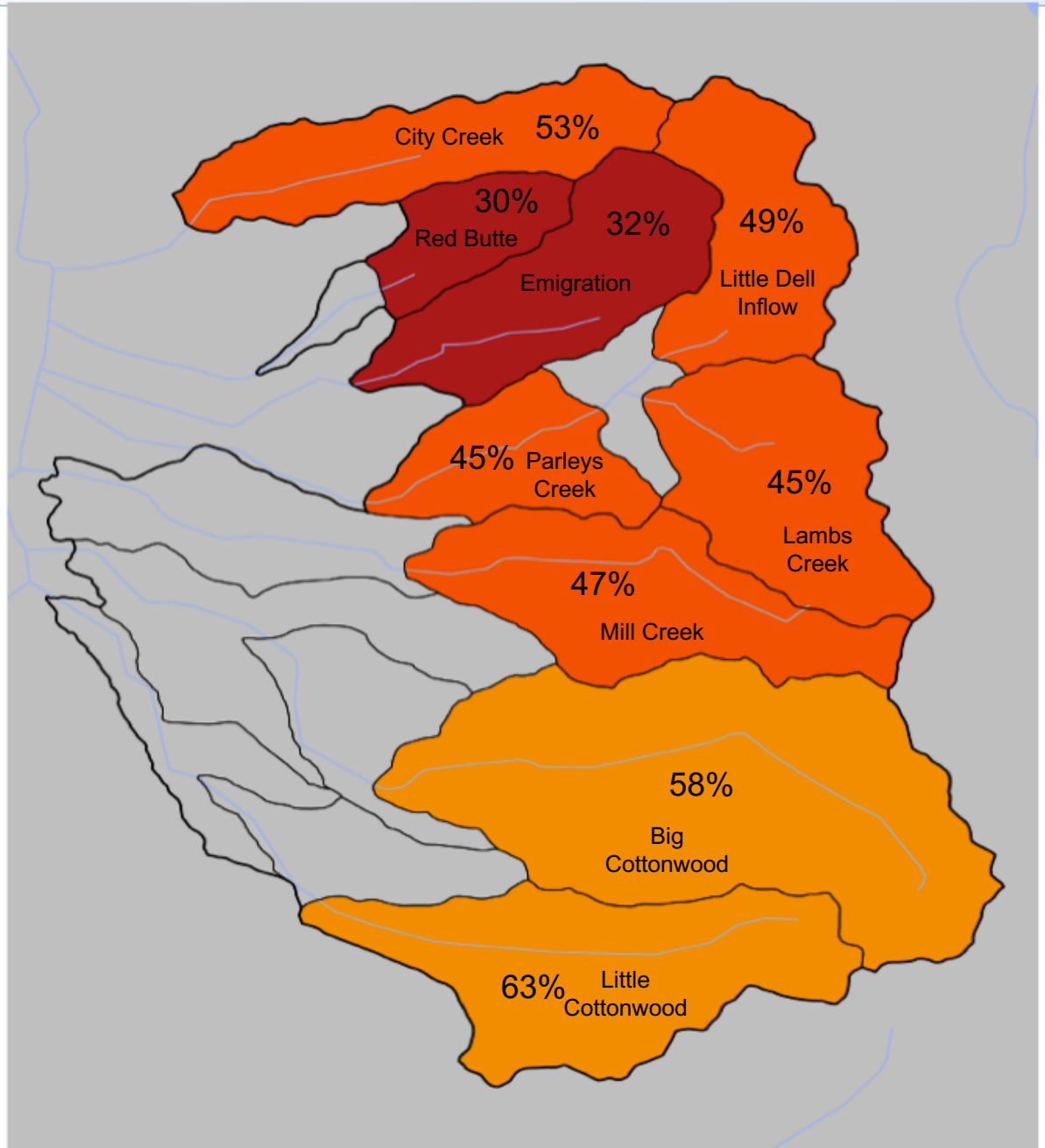
Jan – 65%
Feb – 50%

February 1st Water Supply Forecasts – Six Creeks



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

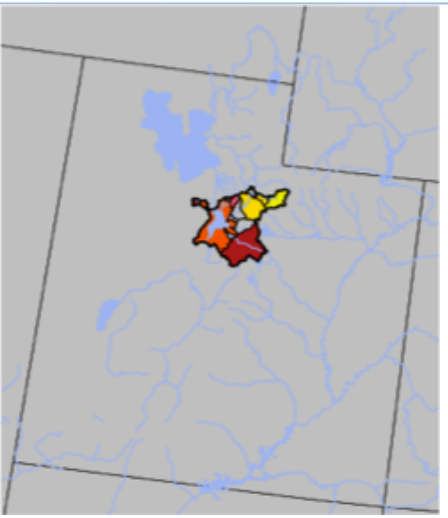
- Below 25%
- 25% - 35%
- 35% - 45%
- 45% - 55%
- 55% - 65%
- 65% - 75%
- 75% - 85%
- 85% - 95%
- 95% - 105%
- 105% - 115%
- 115% - 125%
- 125% - 135%
- 135% - 145%
- 145% - 155%
- 155% - 165%
- 165% - 175%
- Above 175%
- NA



Median
Basin
Forecast:

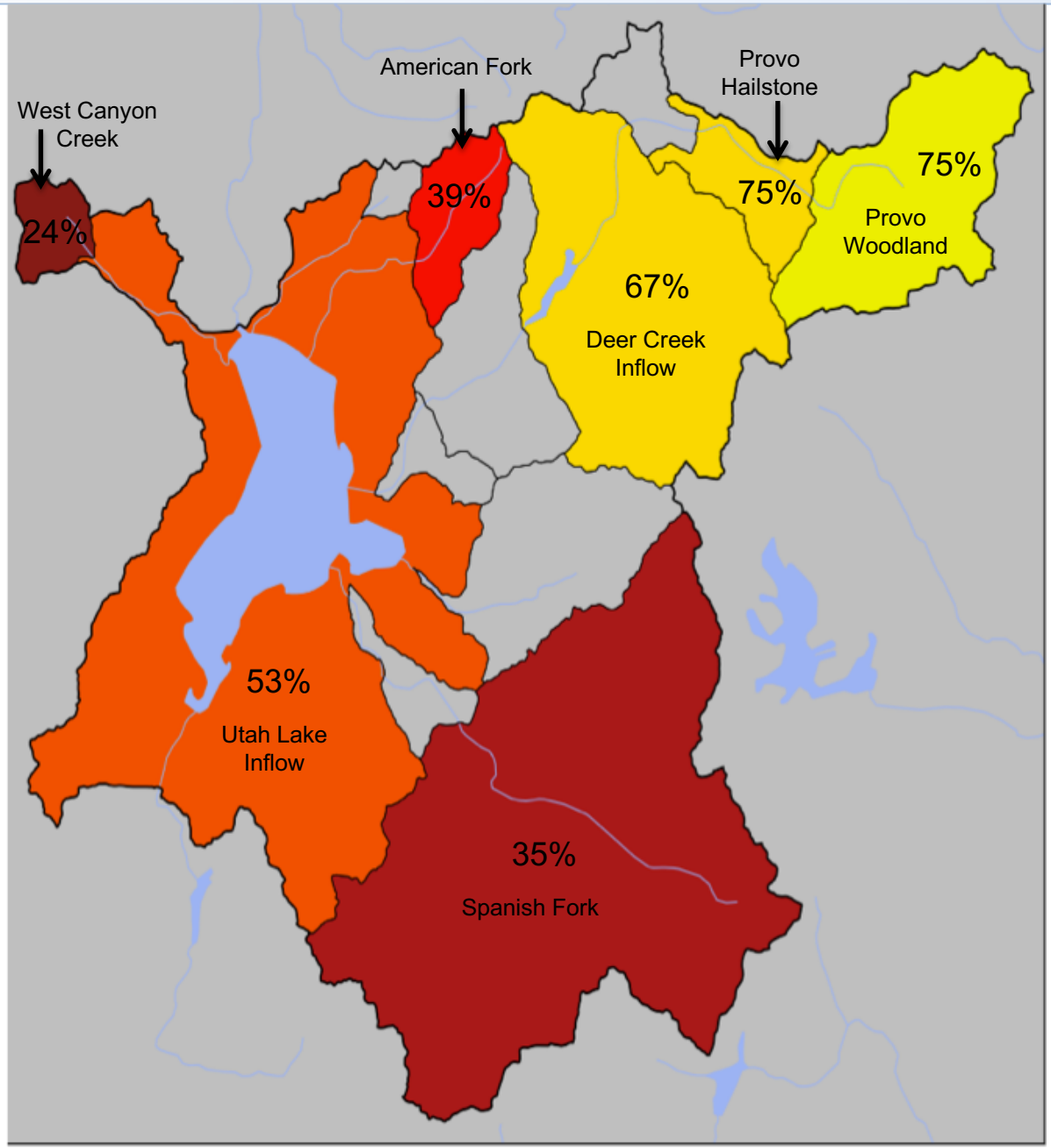
Jan – 55%
Feb – 45%

February 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%
- Above 175%
- NA

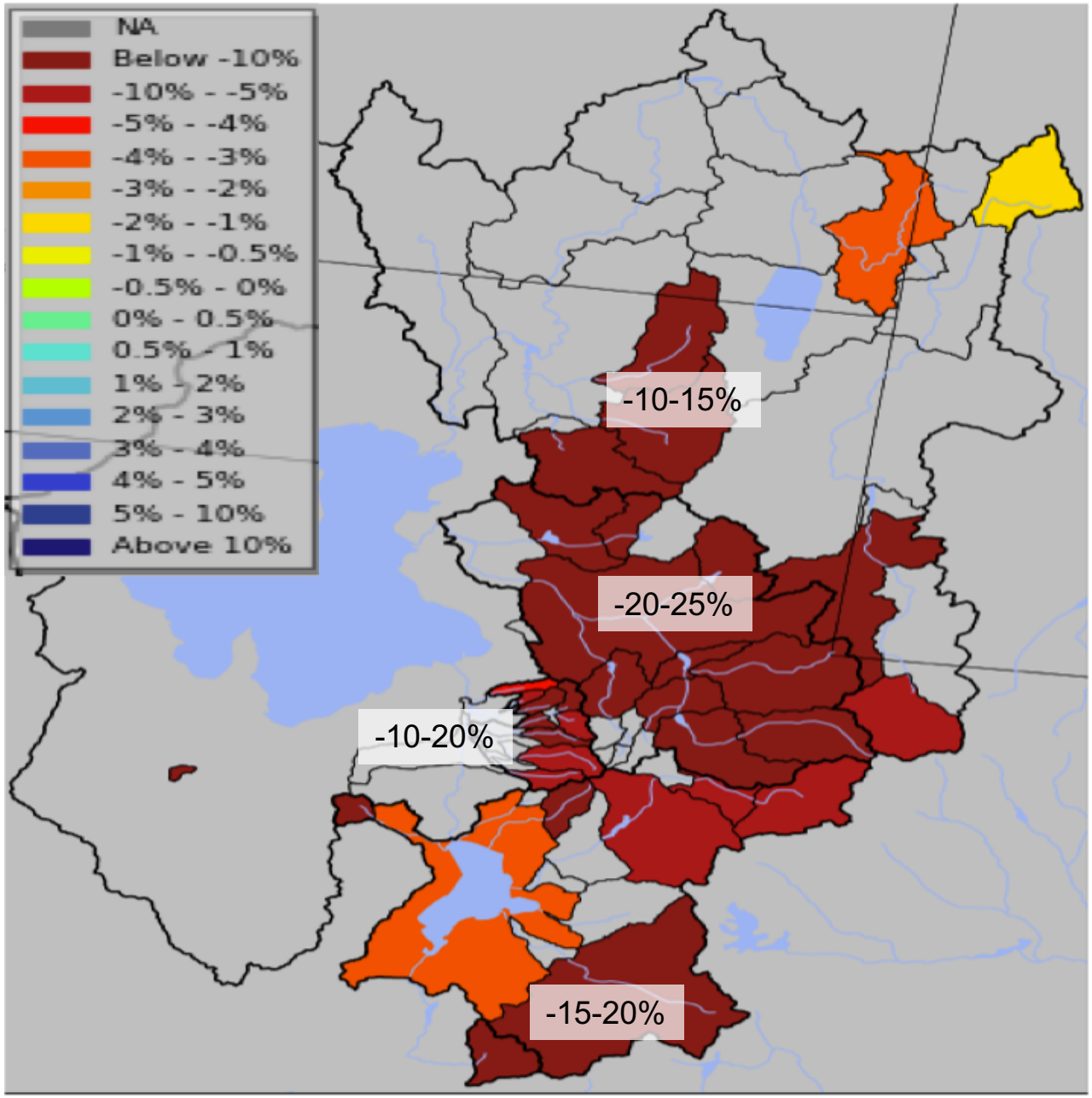


Median Basin Forecast:

Jan – 50%
Feb – 45%

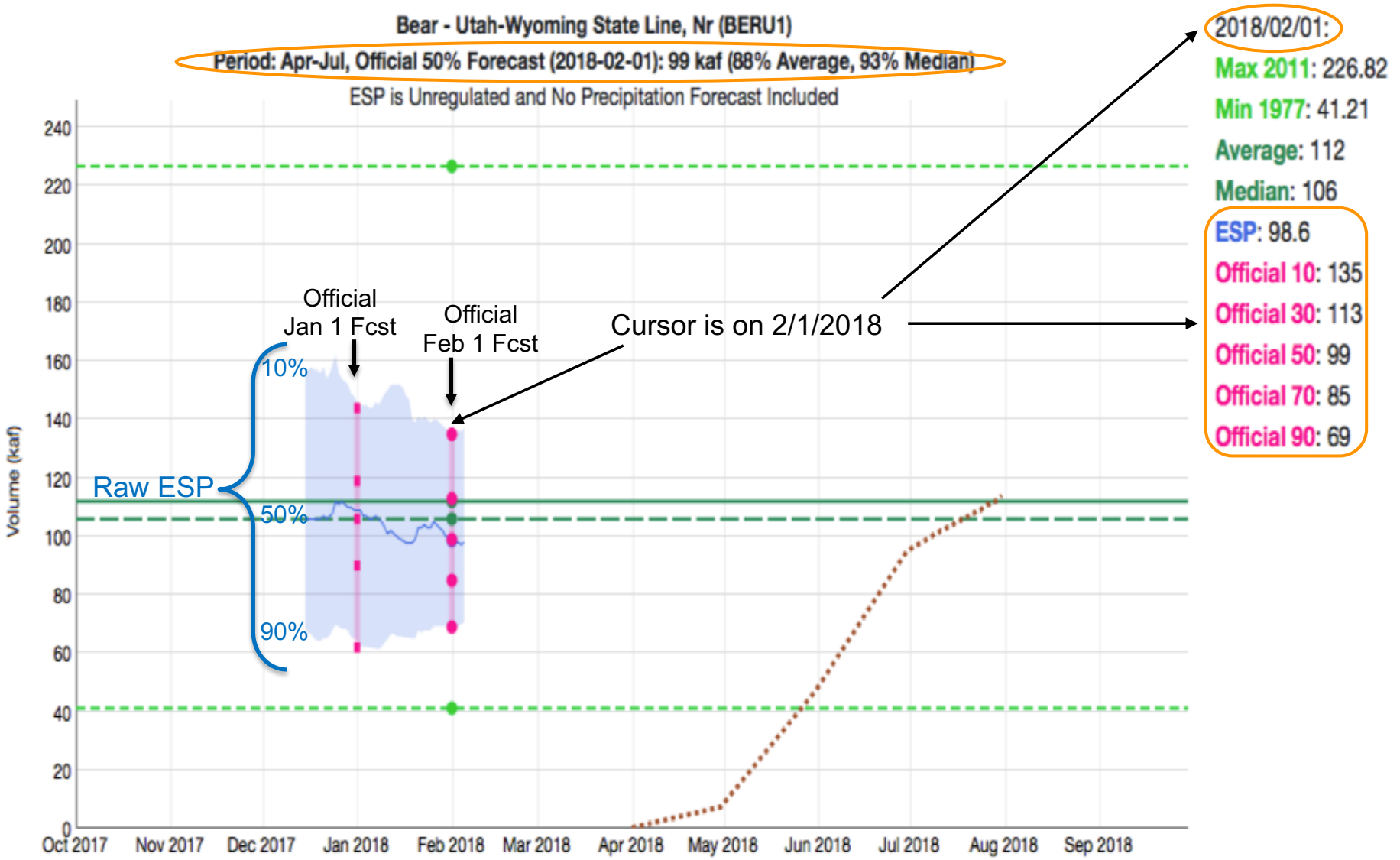
January to February Change in Runoff Forecast

% change in volume



Forecast Evolution Plot

Bear – UT/WY Stateline: 99 kaf / 88%



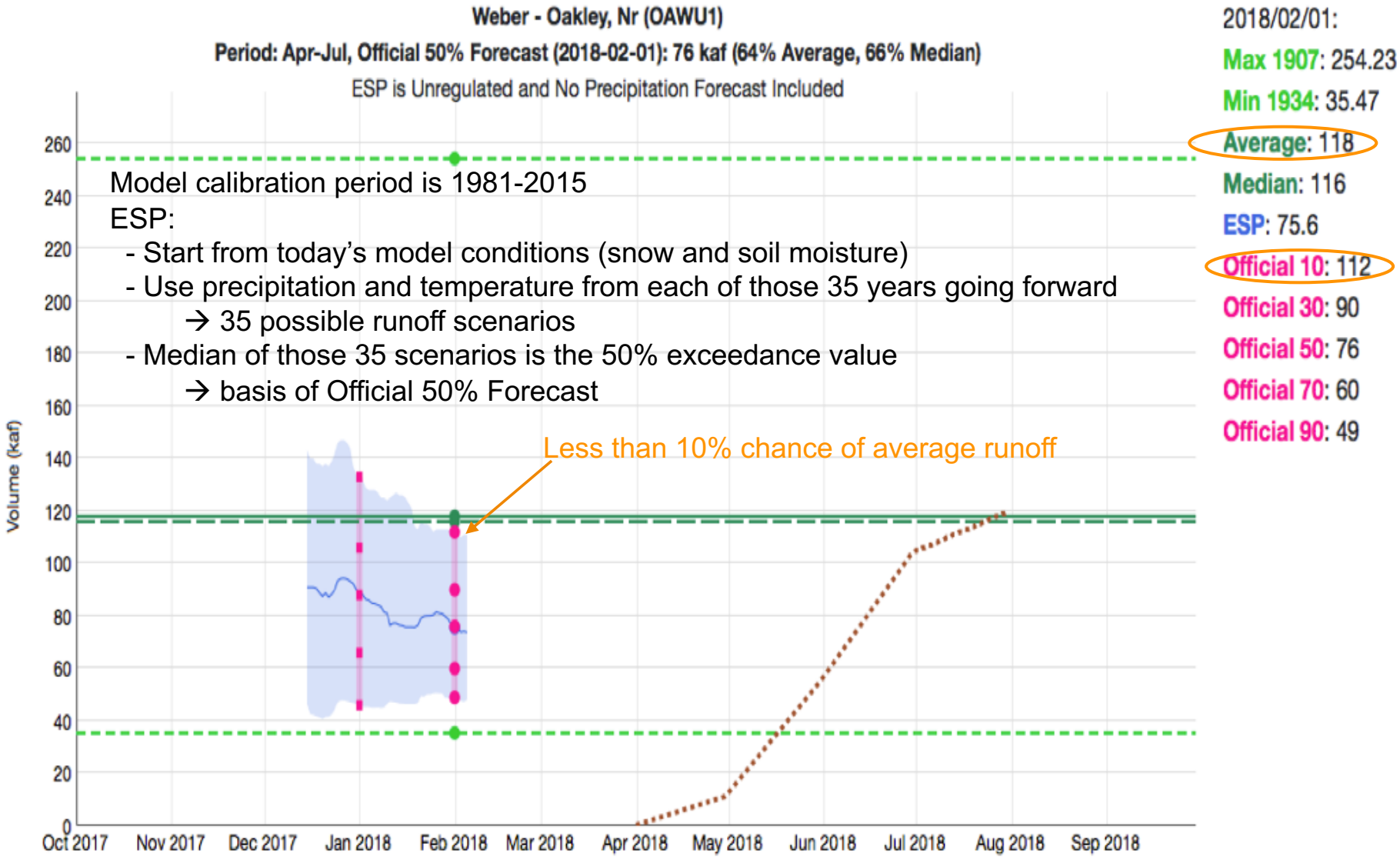
Available on CBRFC web page by selecting sites from

map: https://www.cbrfc.noaa.gov/lmap/lmap.php?interface=wsup

list: https://www.cbrfc.noaa.gov/rmap/wsup/wsuplist.php

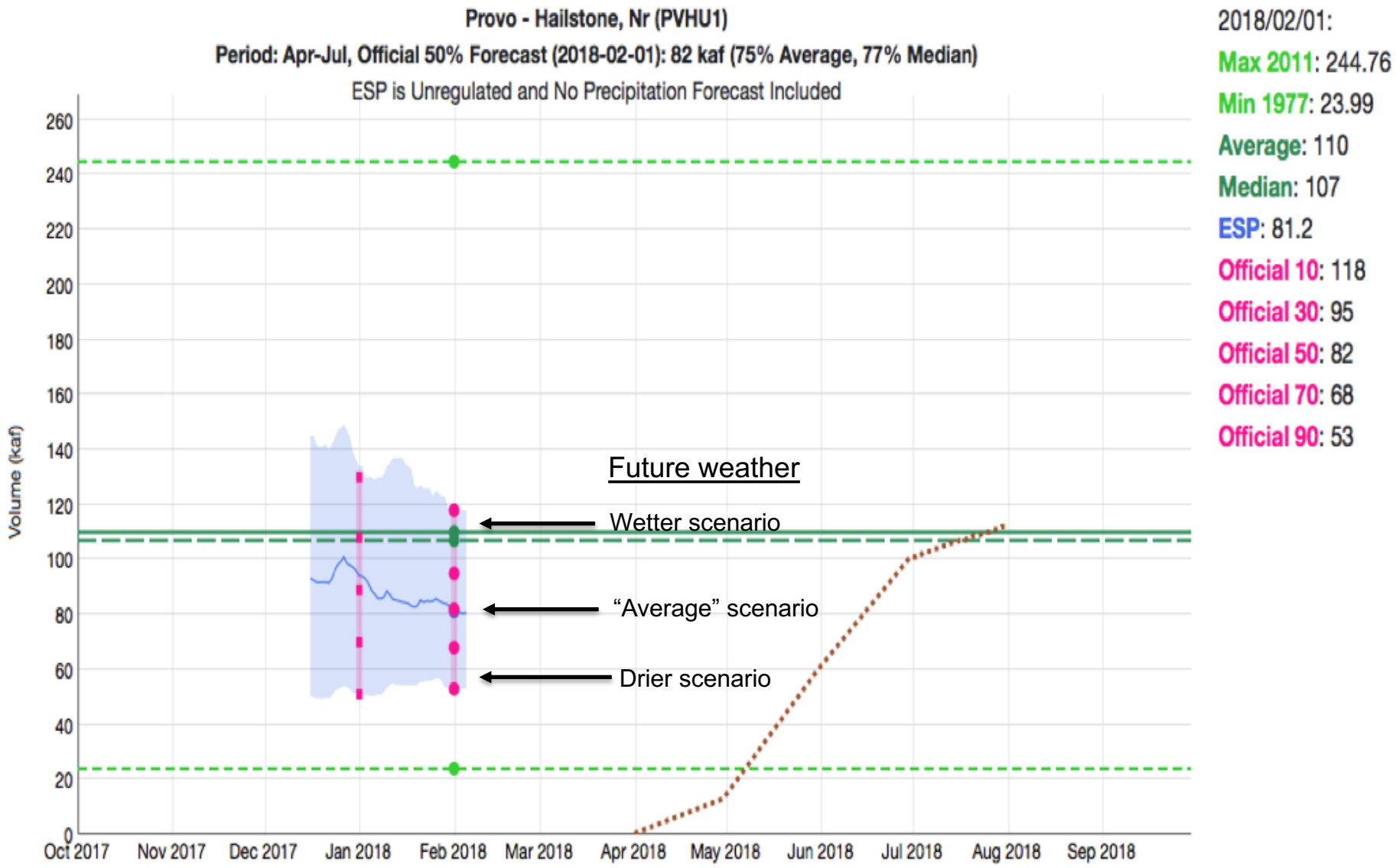
Forecast Evolution Plot

Weber – Oakley: 76 kaf / 64%



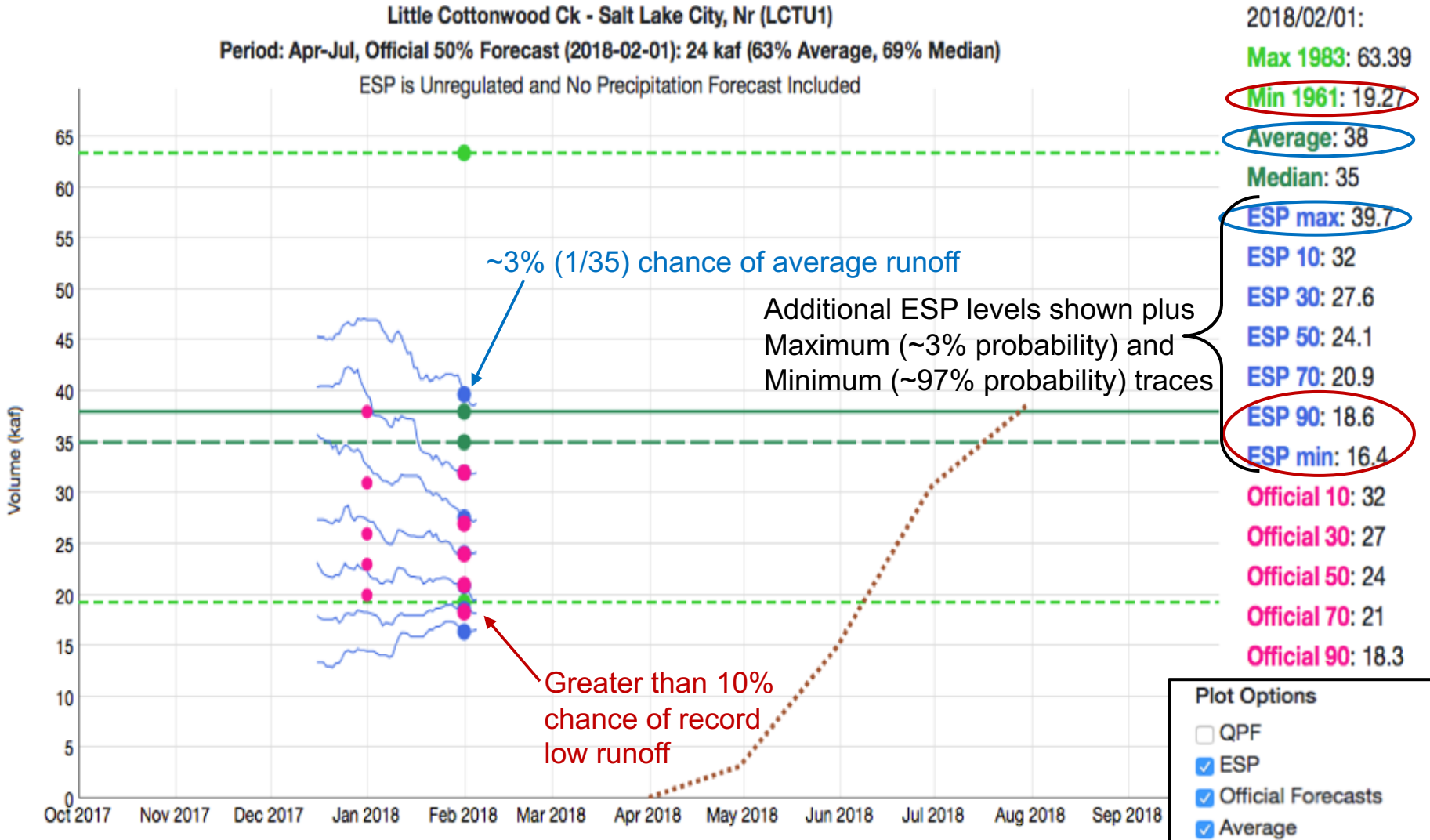
Forecast Evolution Plot

Provo – Hailstone (Jordanelle Inflow) – 82 kaf / 75%



Forecast Evolution Plot

Little Cottonwood Creek: 24 kaf / 63%



Select “Probability Traces” option →

Forecast Validation: How good are forecasts in February ?

Historical Model Error 1981-2010

February forecast error a general improvement over January
- significant snow accumulation period remains

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

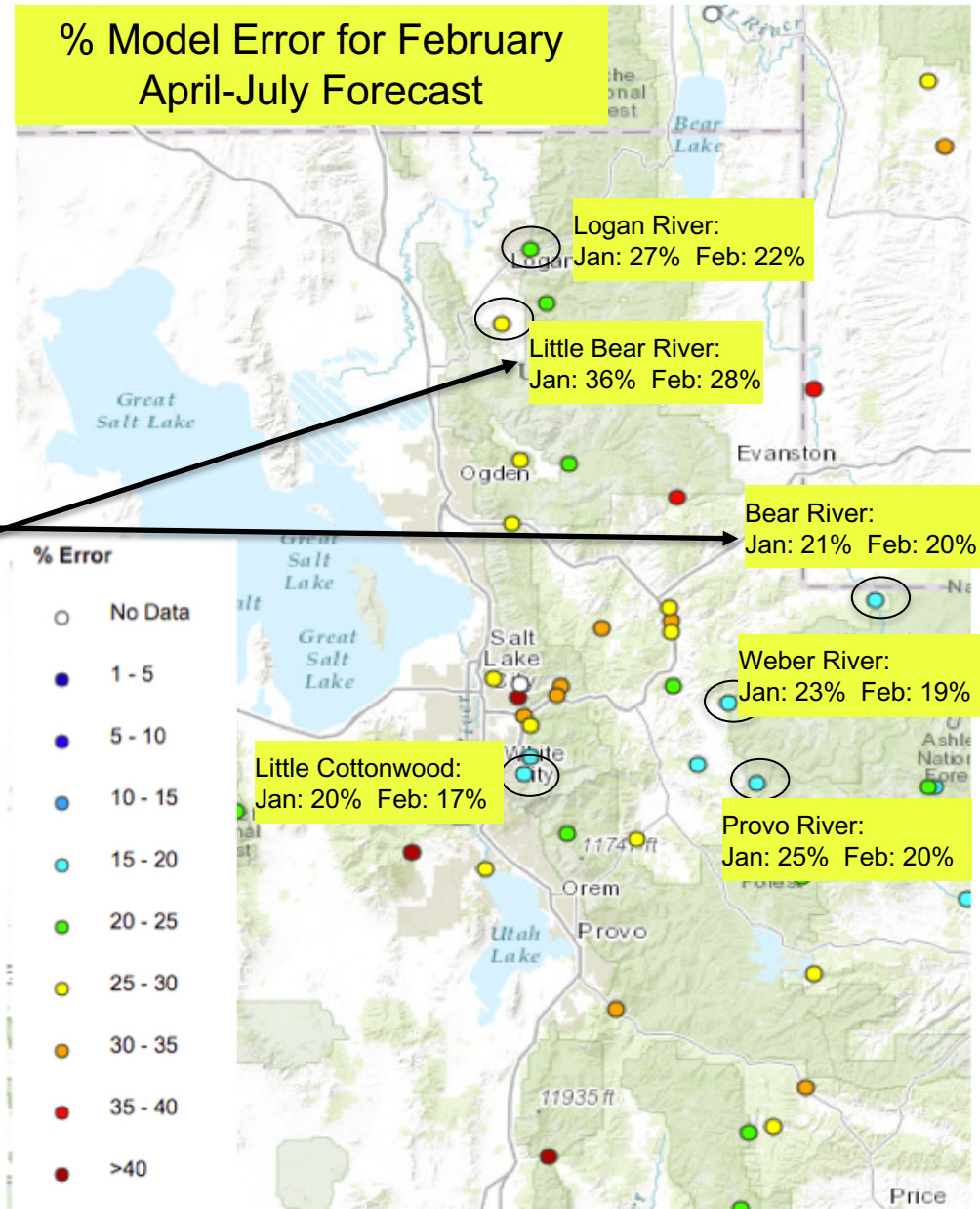
Where We Do Worse:
- Lower elevations (rain or early melt)
- Downstream of diversions / irrigation
- Little is known about diversions / demands

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

From Water Supply drop down menu
→ select Historical Verification Map

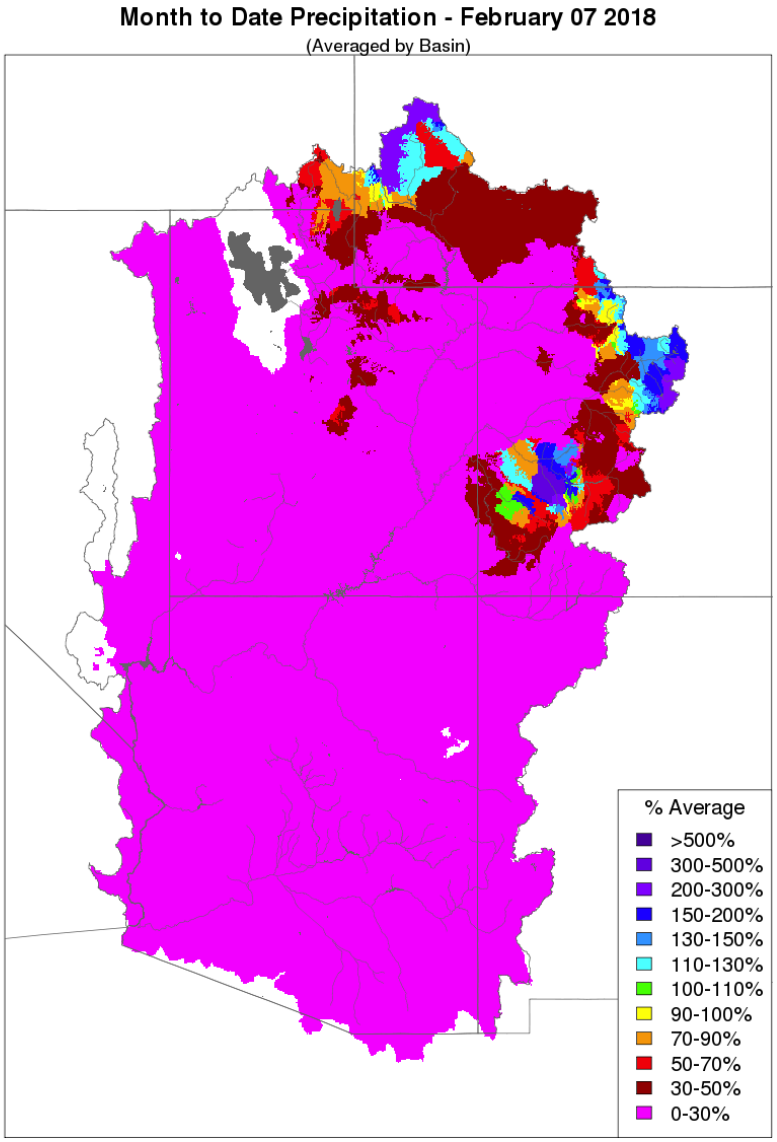
Historical Water Supply Verification - February

% Model Error for February April-July Forecast

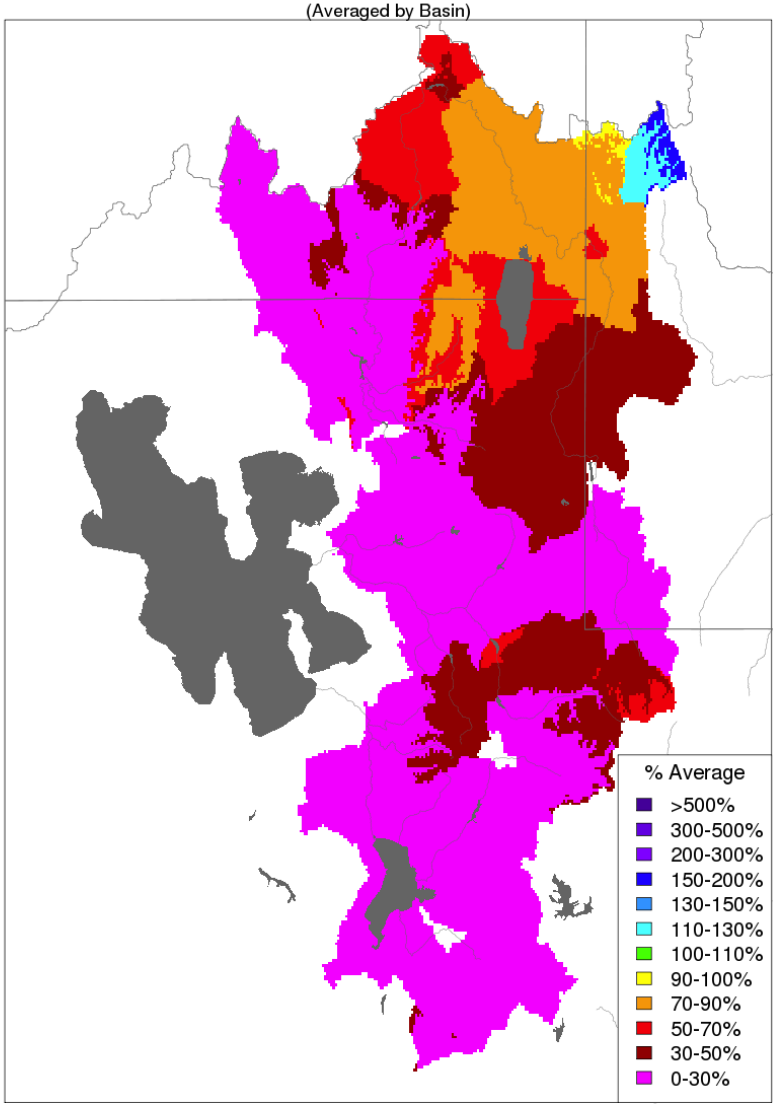


February Precipitation
First 7 days

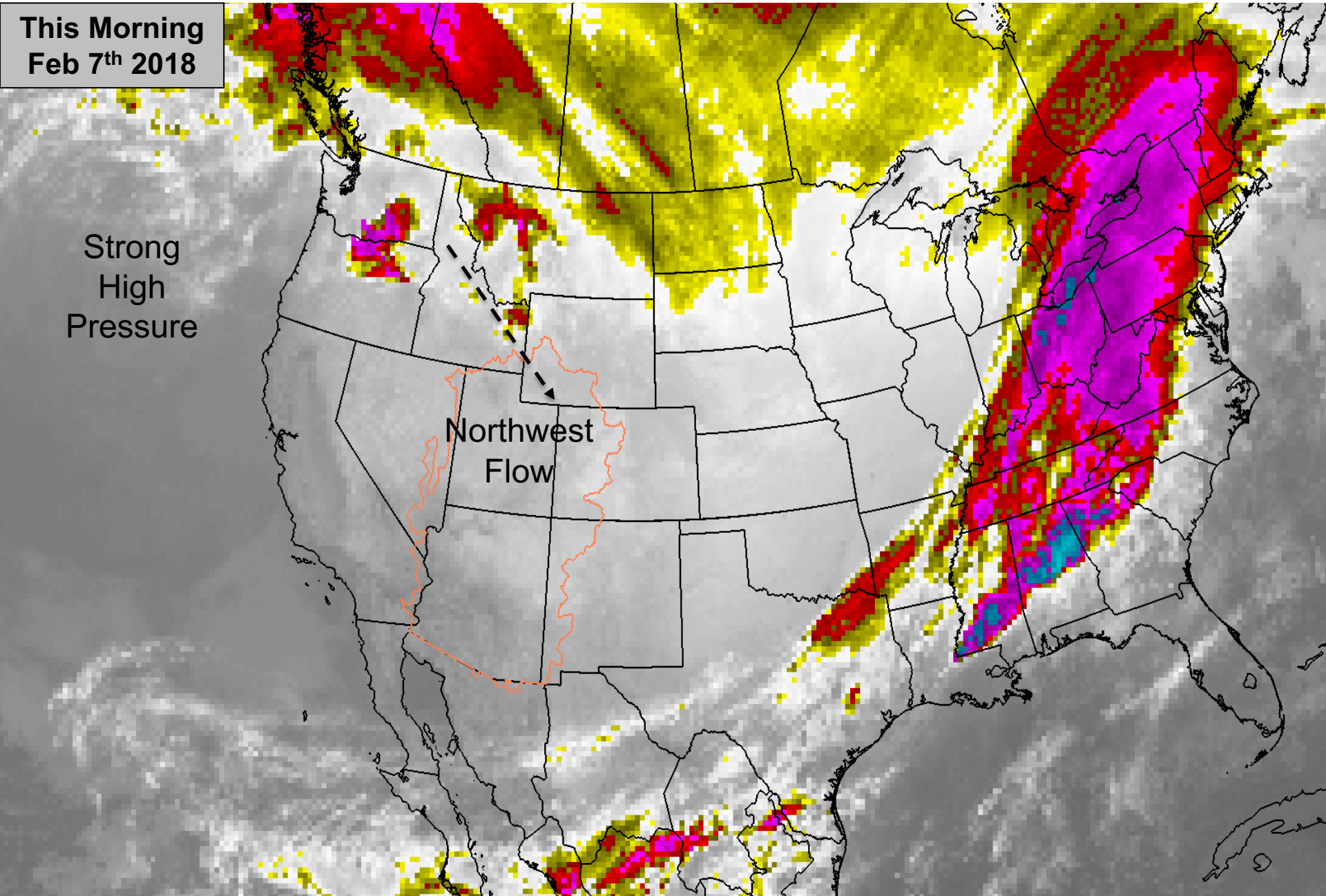
Entire CBRFC forecast area



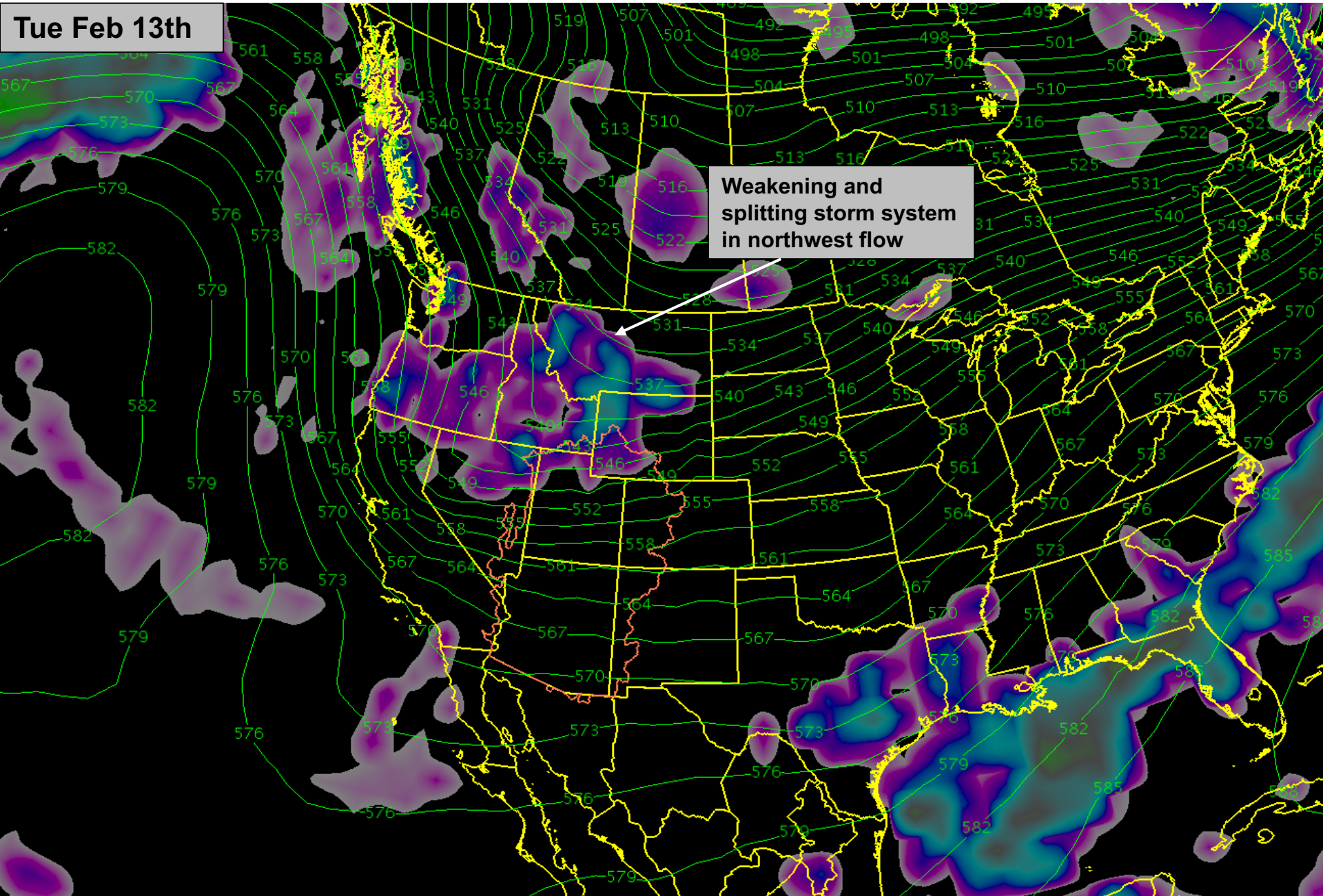
Great Basin



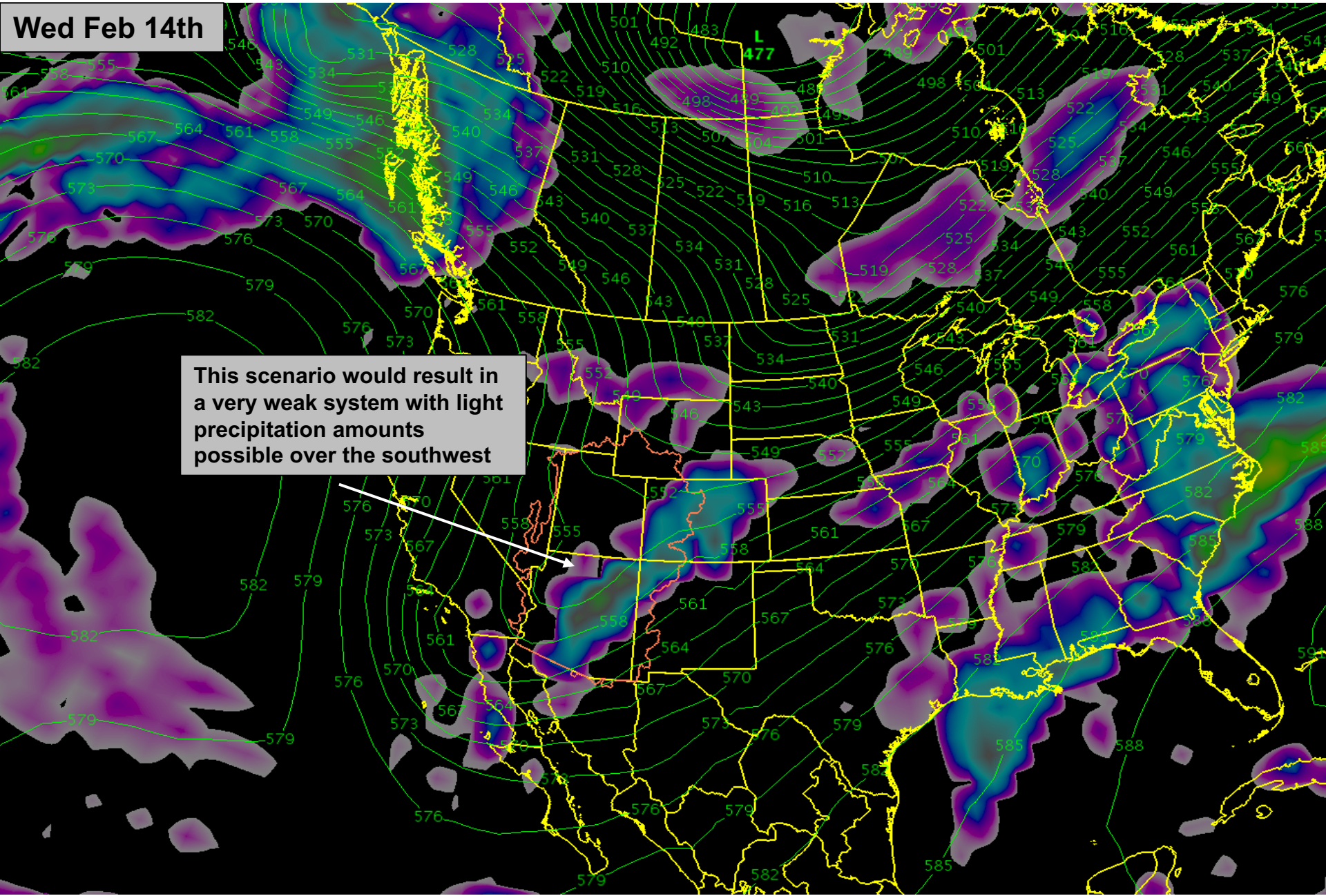
Upcoming Weather: Current Pattern as of Today → Weak storms in a northwest flow may impact the upper Green River Basin and possibly parts of the Bear River Basin.



Upcoming Weather: Next Week → A possible storm system drops southward. The model splits and weakens the storm system. Precipitation amounts likely to be light in the north.

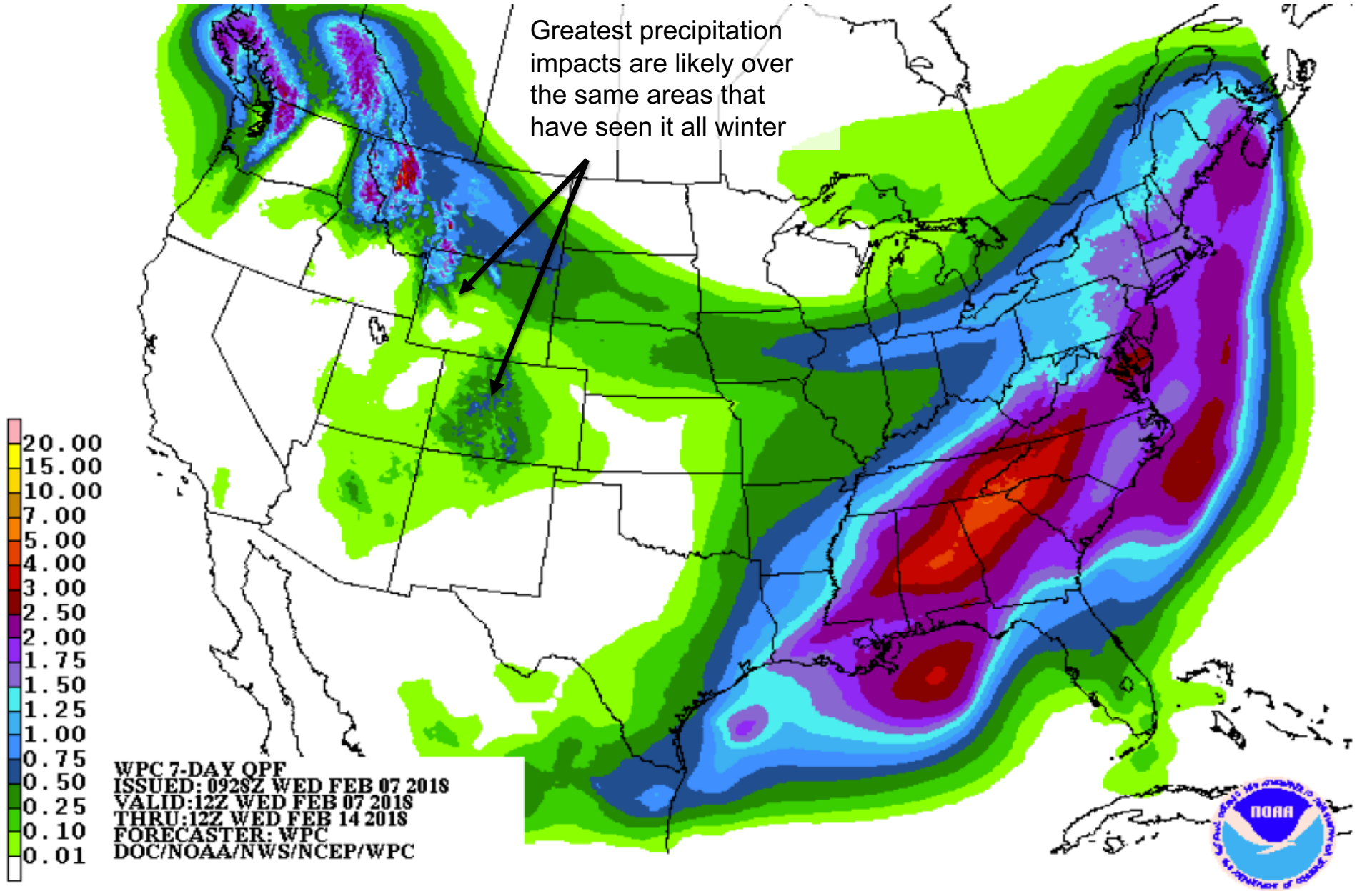


Upcoming Weather: Next Week → Models are struggling; if a closed low develops over southern California precipitation will remain south of Great Basin. Low confidence.



Upcoming Weather

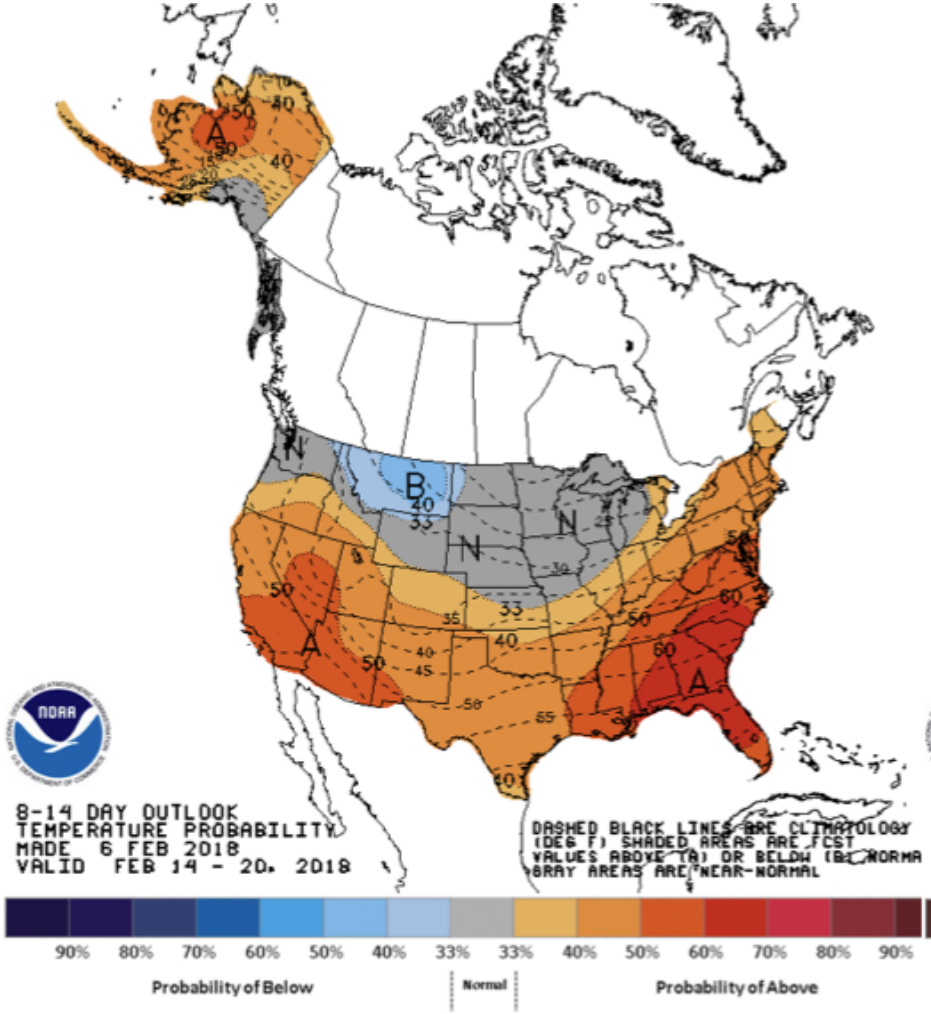
NWS Weather Prediction Center: Precipitation Forecast Feb 7 – Feb 14



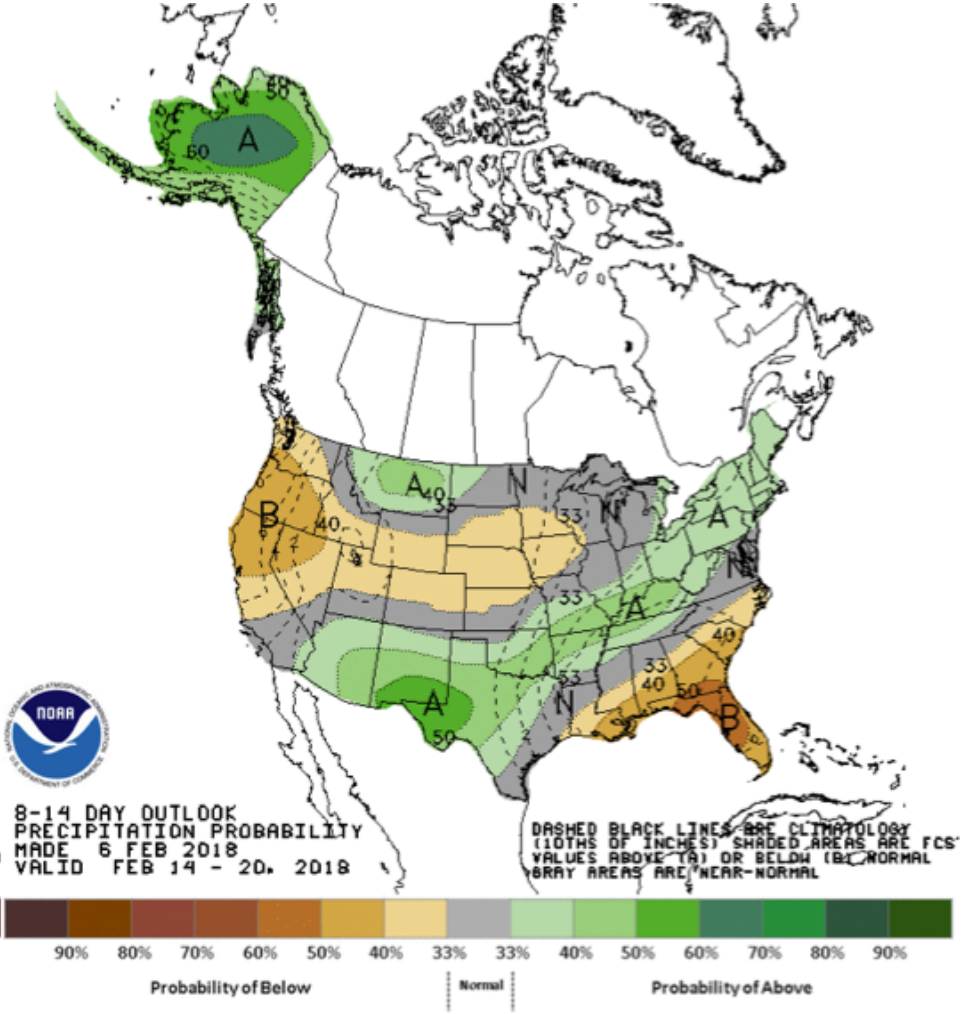
Upcoming Weather and Impacts to Water Supply Forecasts

NWS Climate Prediction Center: Temperatures & Precipitation probability Feb 14- Feb 20

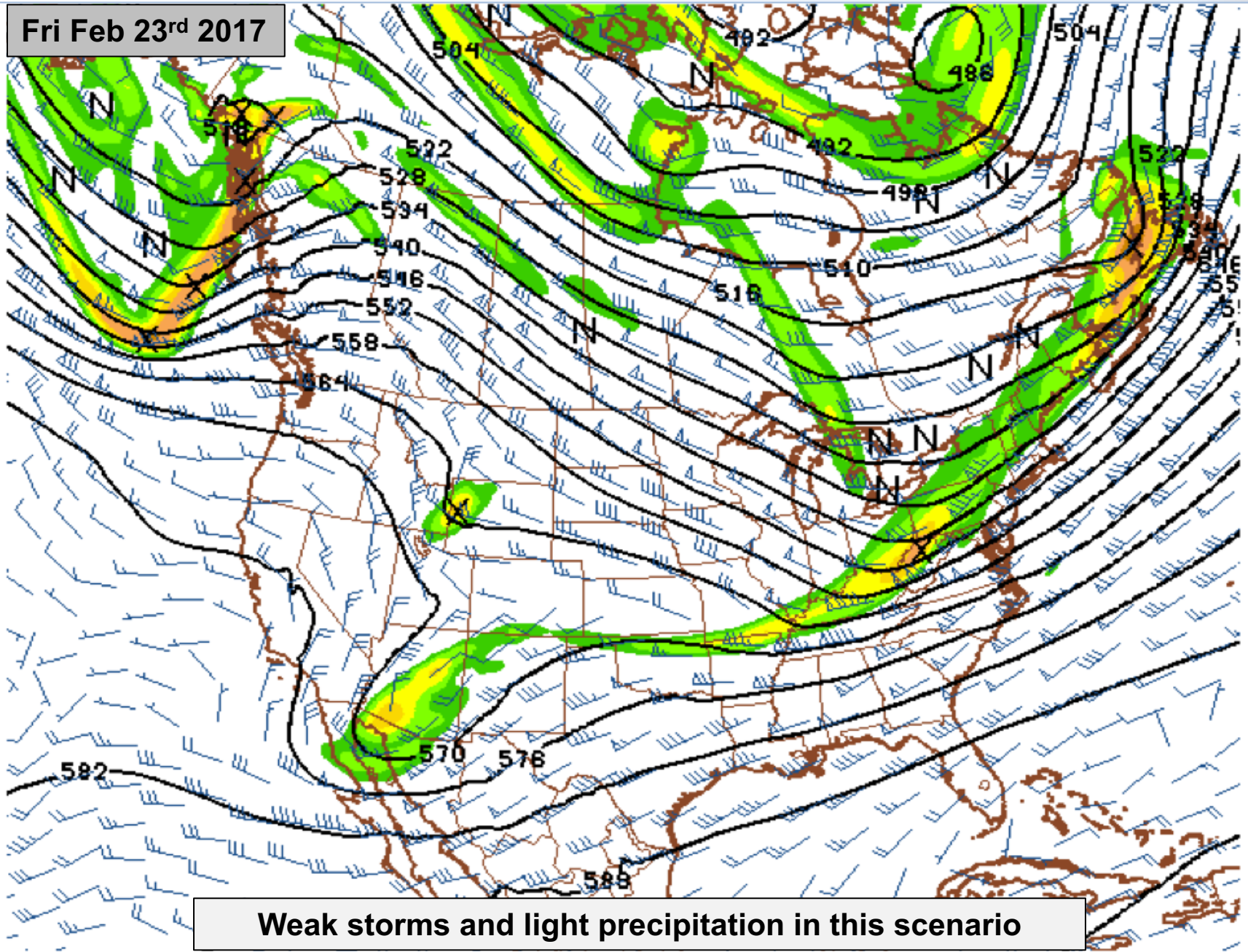
Temperature Probabilities



Precipitation Probabilities



Long Range Weather Outlook: Storm systems appear weak at best as they encounter and move around the high pressure ridge. Models are inconsistent so confidence is low.



Key Points

The dry fall and early winter continued into January with below average precipitation.

Outside of the Bear River Basin, the snowpack is near record low for this time of year.

Forecasts decreased everywhere from those issued in January. Largest decreases as a percent of volume were in the Weber River Basin.

Our official 50% forecast is based on ‘average’ conditions (1981-2015 climatology) going forward. A wet month in the future mix would result in some rebound in water supply forecasts but reaching near average runoff would take abnormally wet spring conditions in many areas.

2018 water supply briefing schedule

2018 monthly water supply briefings for the Great Basin:

Wednesday Mar 7th @ 1:30 pm MT

Thursday Apr 5th @ 1:30 pm MT

Monday May 7th @ 1:30 pm MT

Colorado River Basin webinars are same dates at 11 am MT

Peak flow briefing early March. 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)

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, VirginFocal Point
tracy.cox@noaa.gov
zach.finch@noaa.gov

Brent Bernard – Six Creeks, Provo , Sevier Focal Point
brent.bernard@noaa.gov

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