

Utah Water Supply Briefing

April 7th, 2021

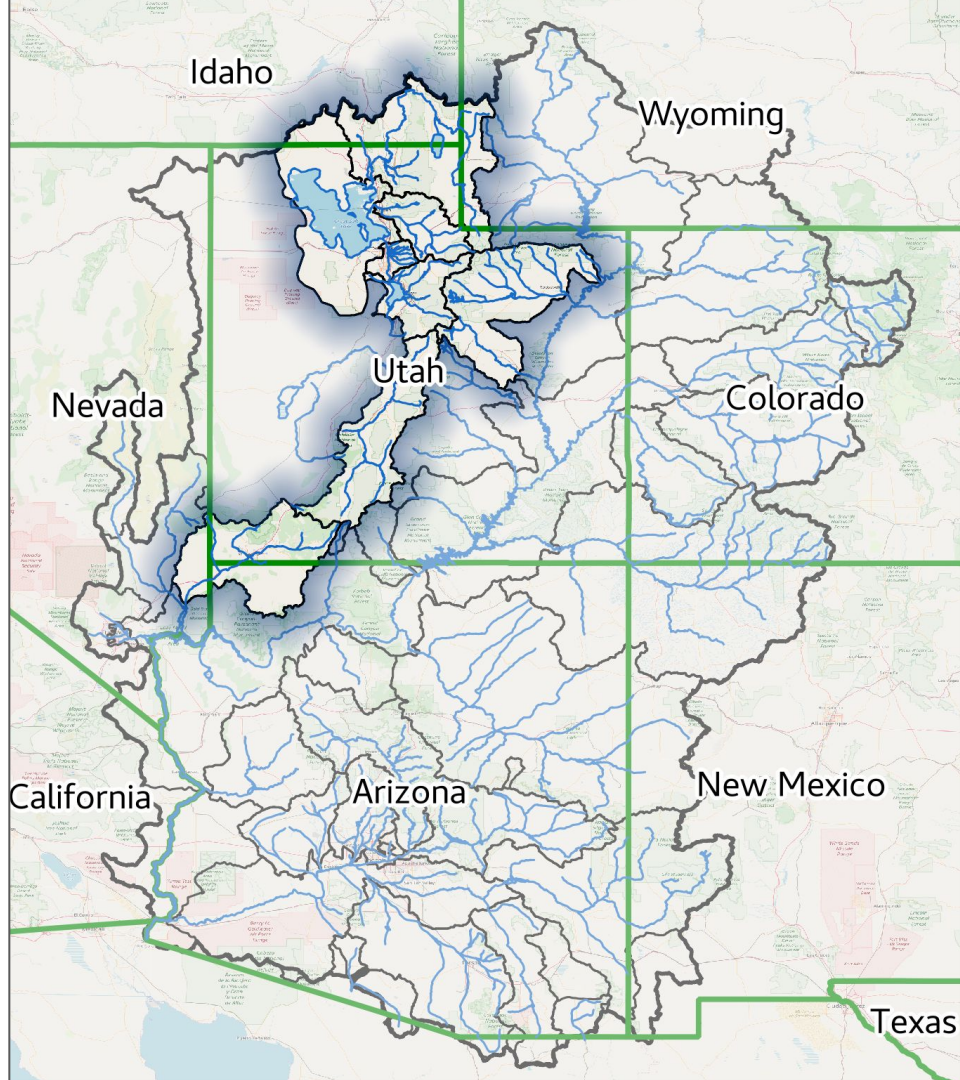
Colorado Basin River Forecast Center

Presenters: Patrick Kormos - Hydrologist
Zach Finch - Hydro Meteorologist

Utah Forecasters: Brent Bernard, Zach Finch,
Patrick Kormos

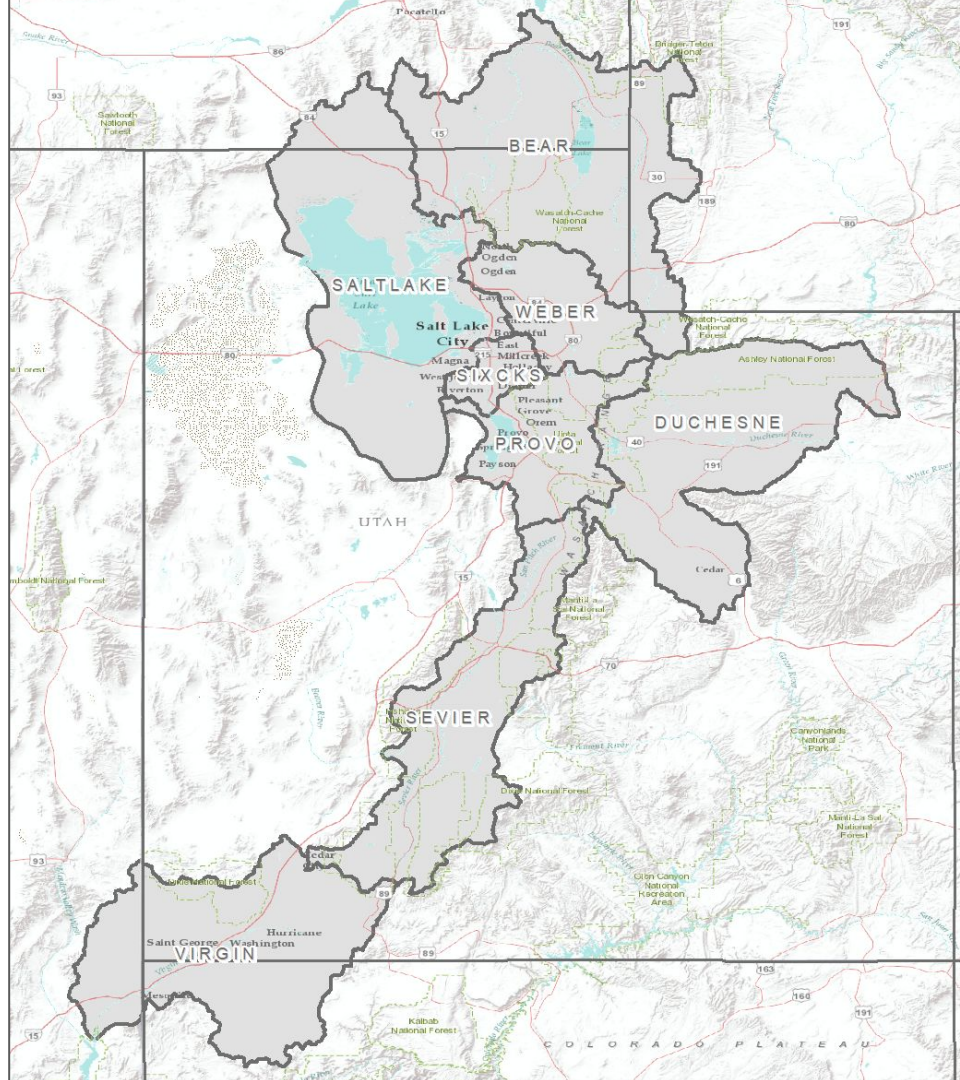
Questions: Type questions into the 'Questions'
Box or Raise Hand

**Webinar recording & slides will be
made available on CBRFC webpage**

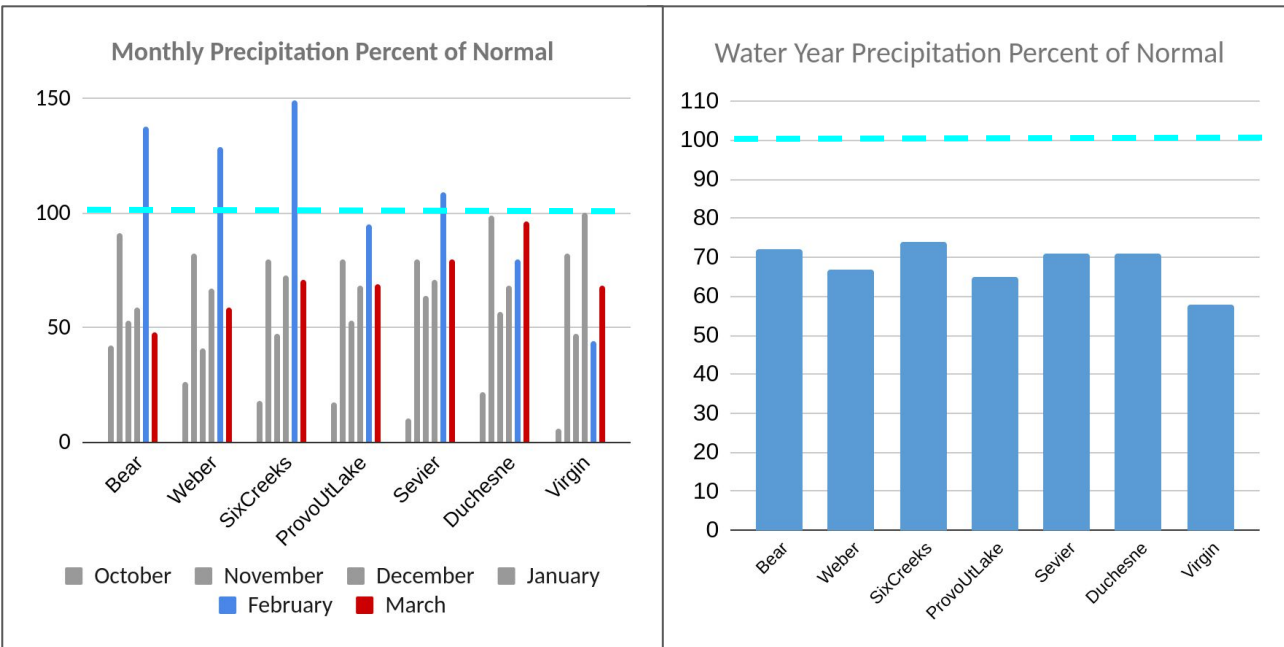


Utah Water Supply Briefing

1. March Weather Review
2. Current Snowpack
3. 2021 Water Supply Forecasts
4. Forecast Error
5. Upcoming Weather
6. CBRFC Hydro Science Update
7. Contacts & Questions



Utah Weather Review - Precipitation up to April 1, 2021



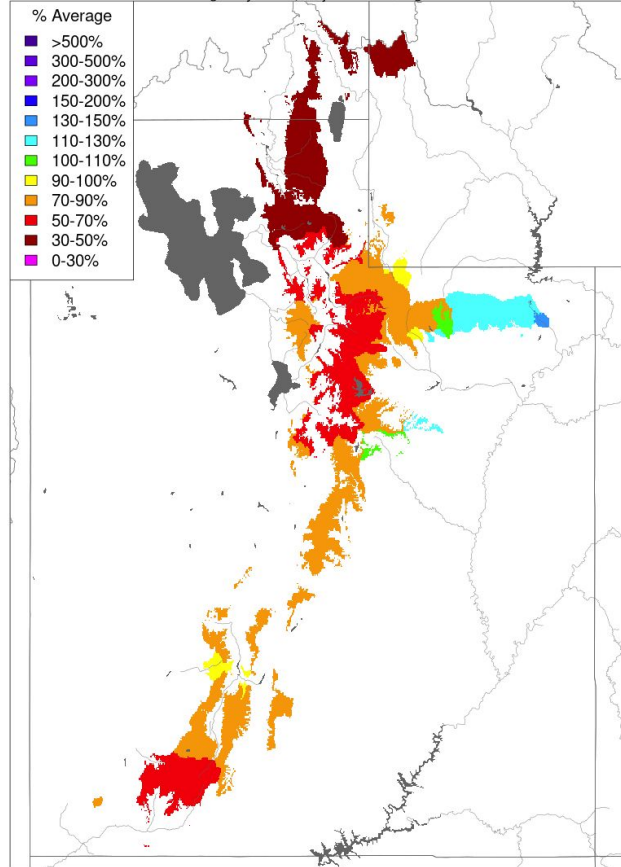
Forecast Group	Percent of WY normal
Bear	70
Weber	65
Six Creeks	75
Provo	65
Duchesne	70
Sevier	70
Virgin	60

- Below normal March precipitation -All Basins
- Duchesne: near normal March precipitation, above normal Eastern Uintas
- Below normal seasonal precipitation - All Basins

Utah Weather Review - Monthly and Water Year Precipitation

Monthly Precipitation - March 2021

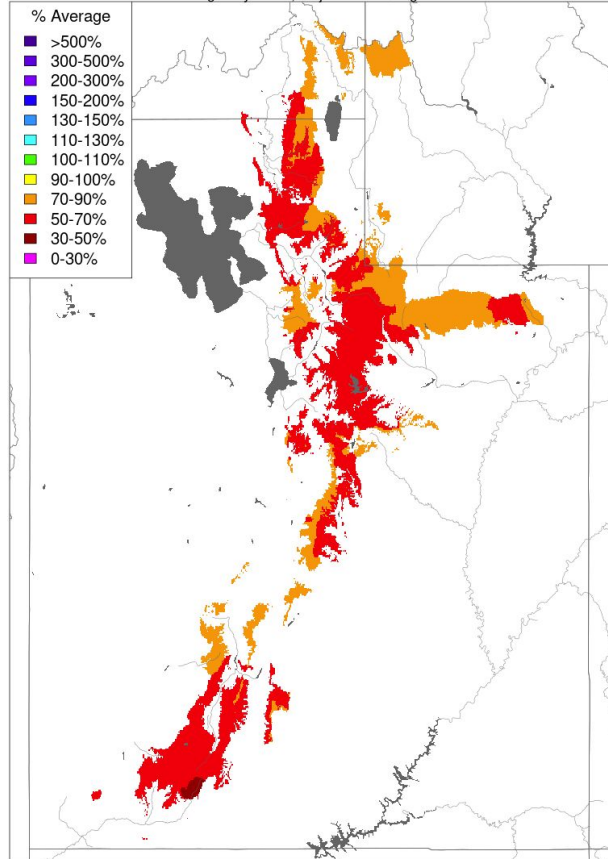
Averaged by Basin, Major Contributing Areas



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

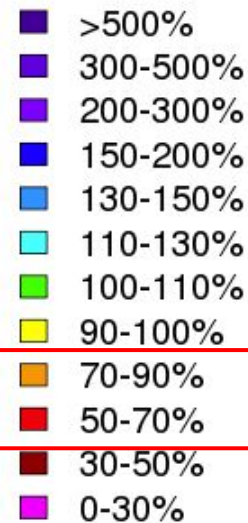
Water Year Precipitation, October 2020 - March 2021

Averaged by Basin, Major Contributing Areas

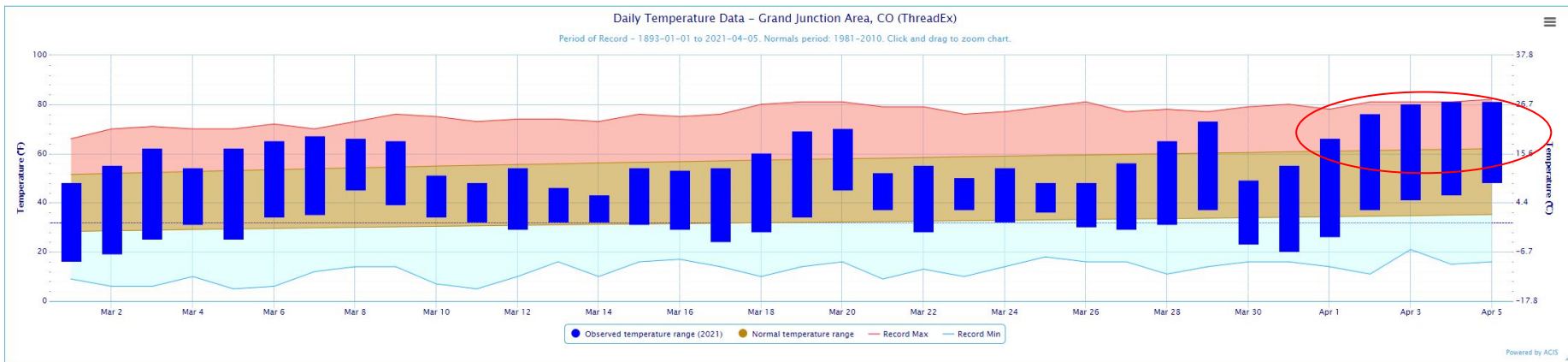
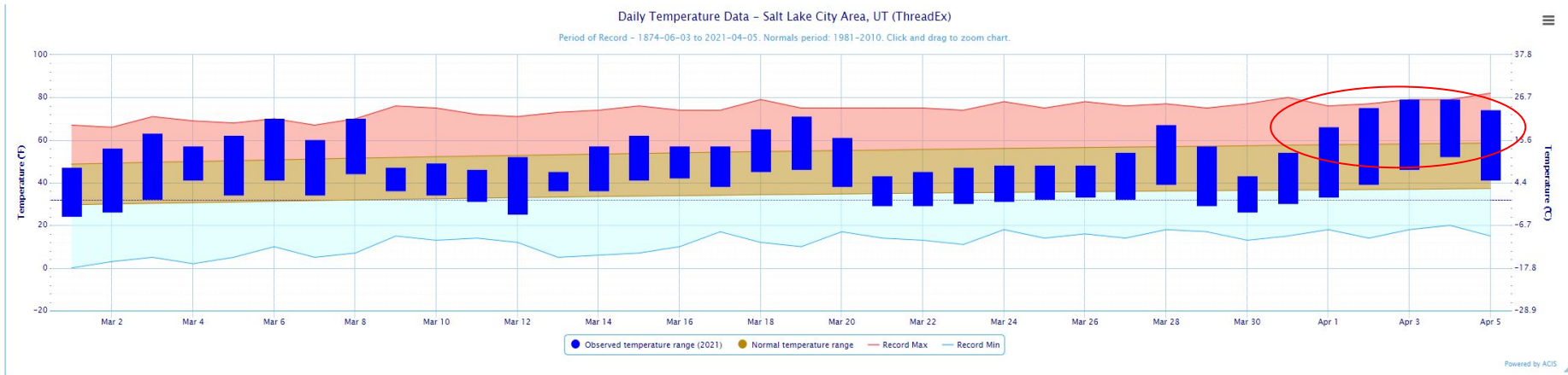


Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

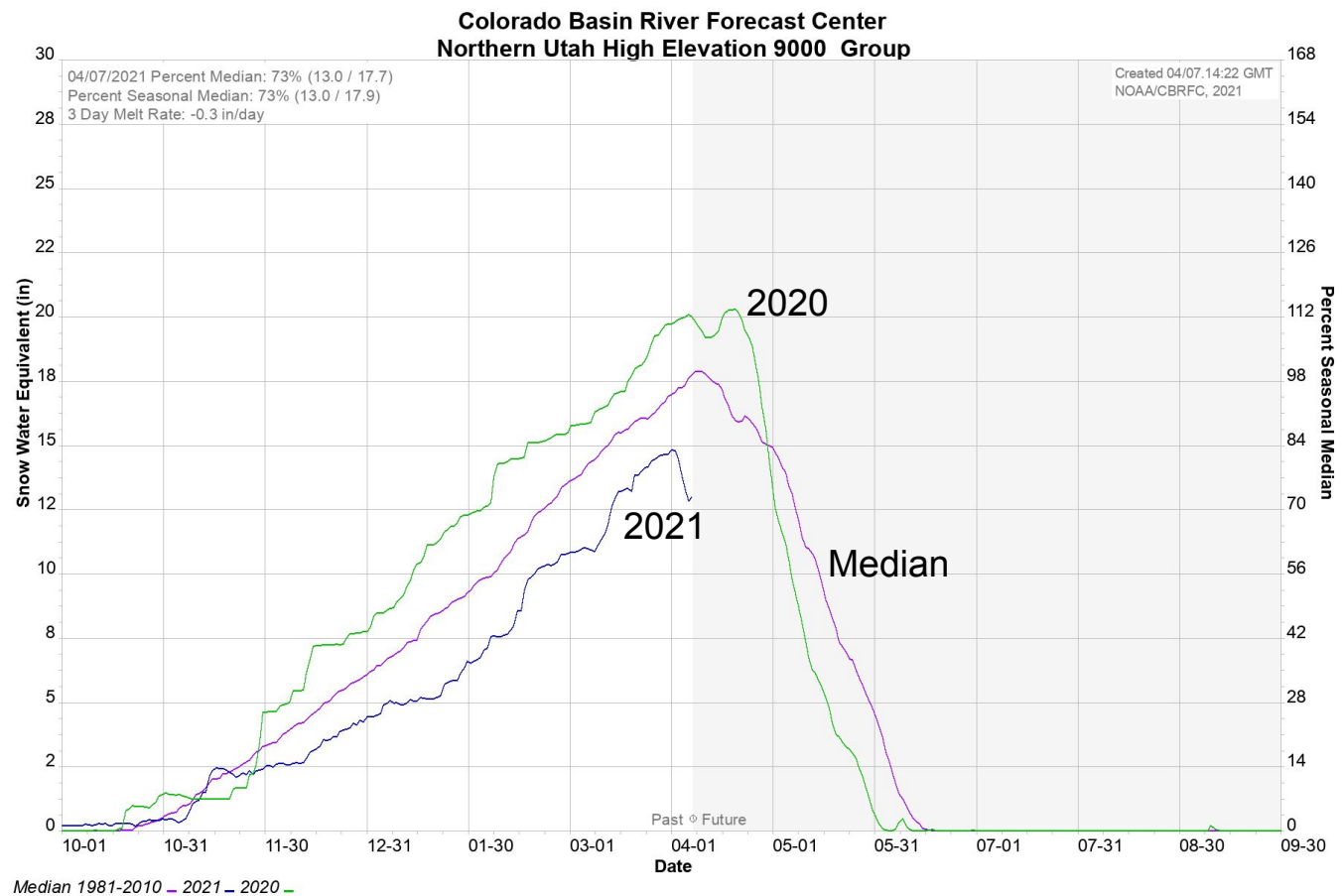
% Average



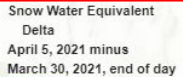
March/Early April Temperatures



Utah Current Snowpack



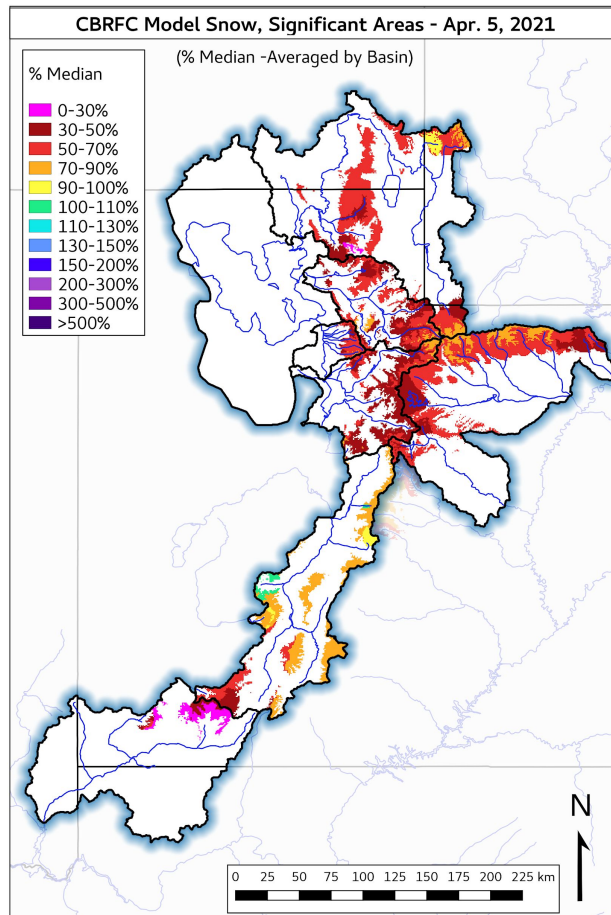
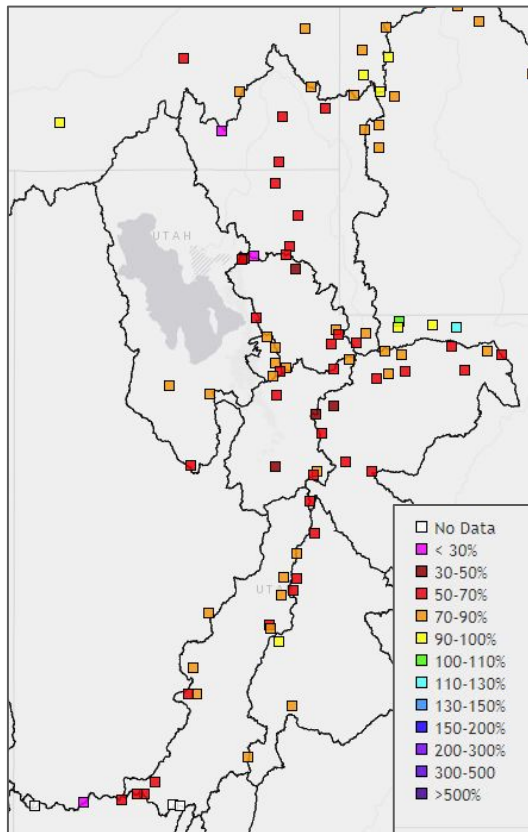
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- 1-4 inches of snowmelt during the past week
- Lost the most snow
 - below 9,500 feet
 - in central/southwest Utah and southwest Colorado.

Utah Current Snowpack - April 2021

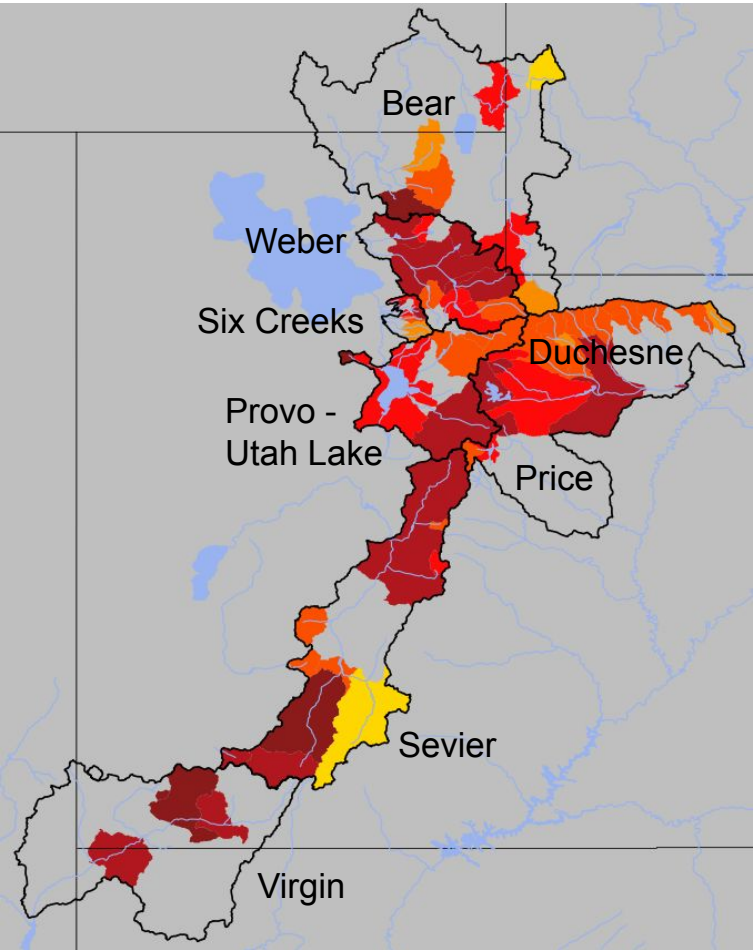
SNOTEL (Observed)



As of April 1, 2021 CBRFC Snow Groups (SNOTEL Stations)

- Bear: 75% of WY normal
- Weber: 70% of WY normal
- Six Cr: 85% of WY normal
- Provo: 70% of WY normal
- Duchesne: 80% of WY normal
- Sevier: 80% of WY normal
- Virgin: 65% of WY normal

April 1, 2021 - Utah Water Supply Forecasts - Overview

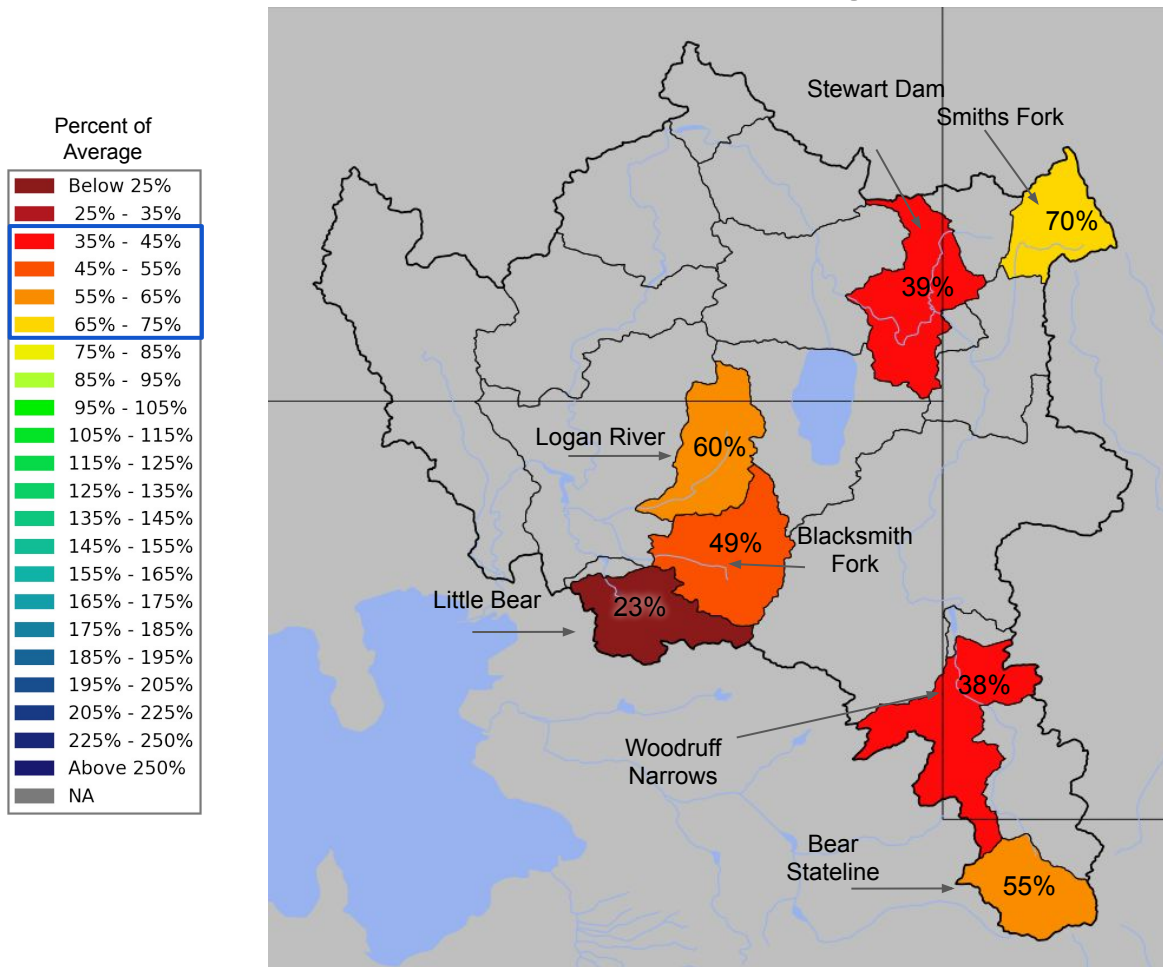


- April 1 Forecast for April-July Volume in 1000's acre feet (KAF)
- April-July Forecast Streamflow Volumes are in percent of 1981-2010 average

Median value of individual forecasts (in % of average) ...by Forecast Group.

Bear	50
Weber	35
Six Creeks	35
Provo / Utah Lake	40
Sevier	45
Duchesne	45
Virgin	25

April 1, 2021 - Utah Water Supply Forecasts - Bear



Bear River Basin Forecasts

January: **55%** of Normal

February: **50%** of Normal

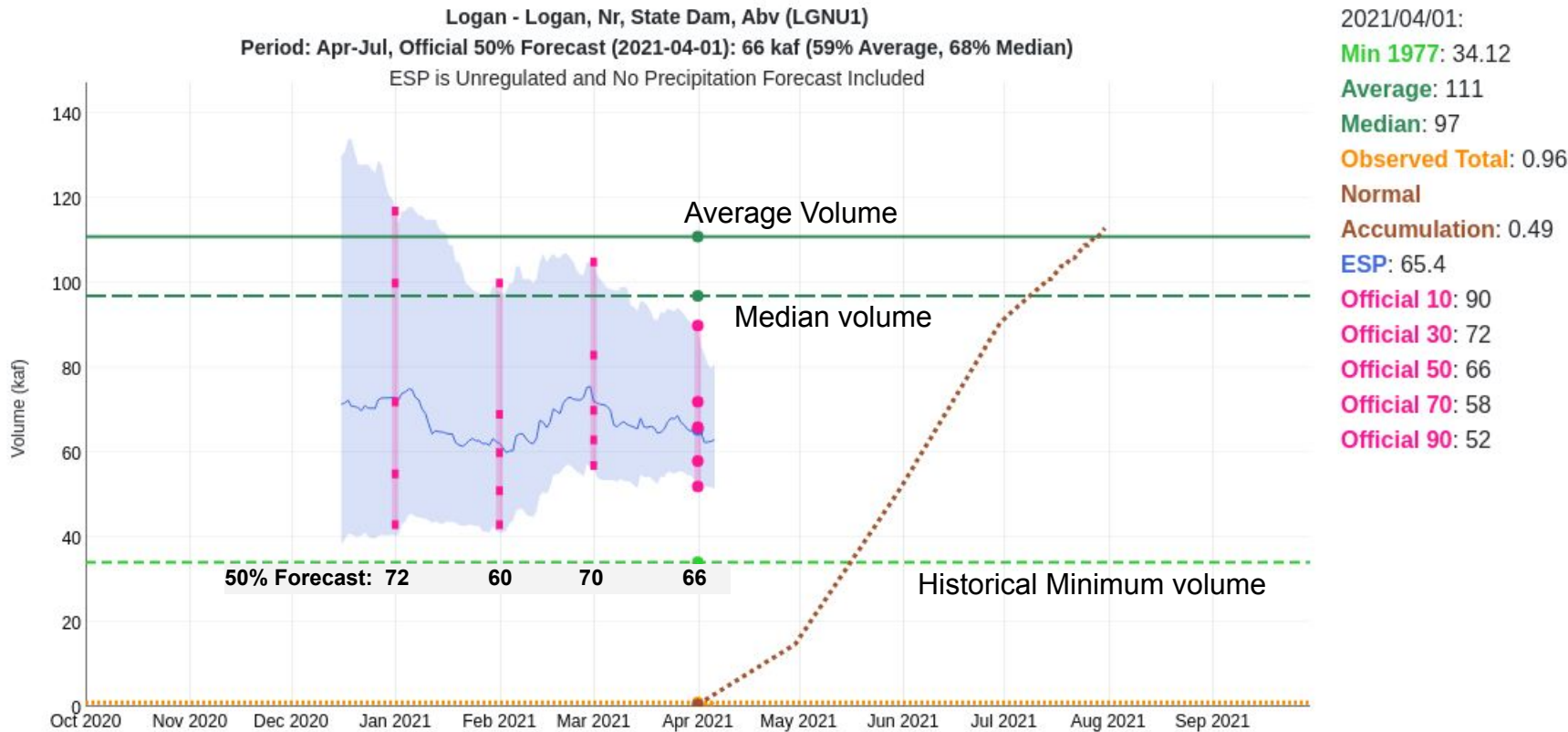
March: **60%** of Normal

April: **50%** of normal

- Forecasts range from 25-70% of normal
- >10% drops in Smith's Fork, Stewart, Little Bear

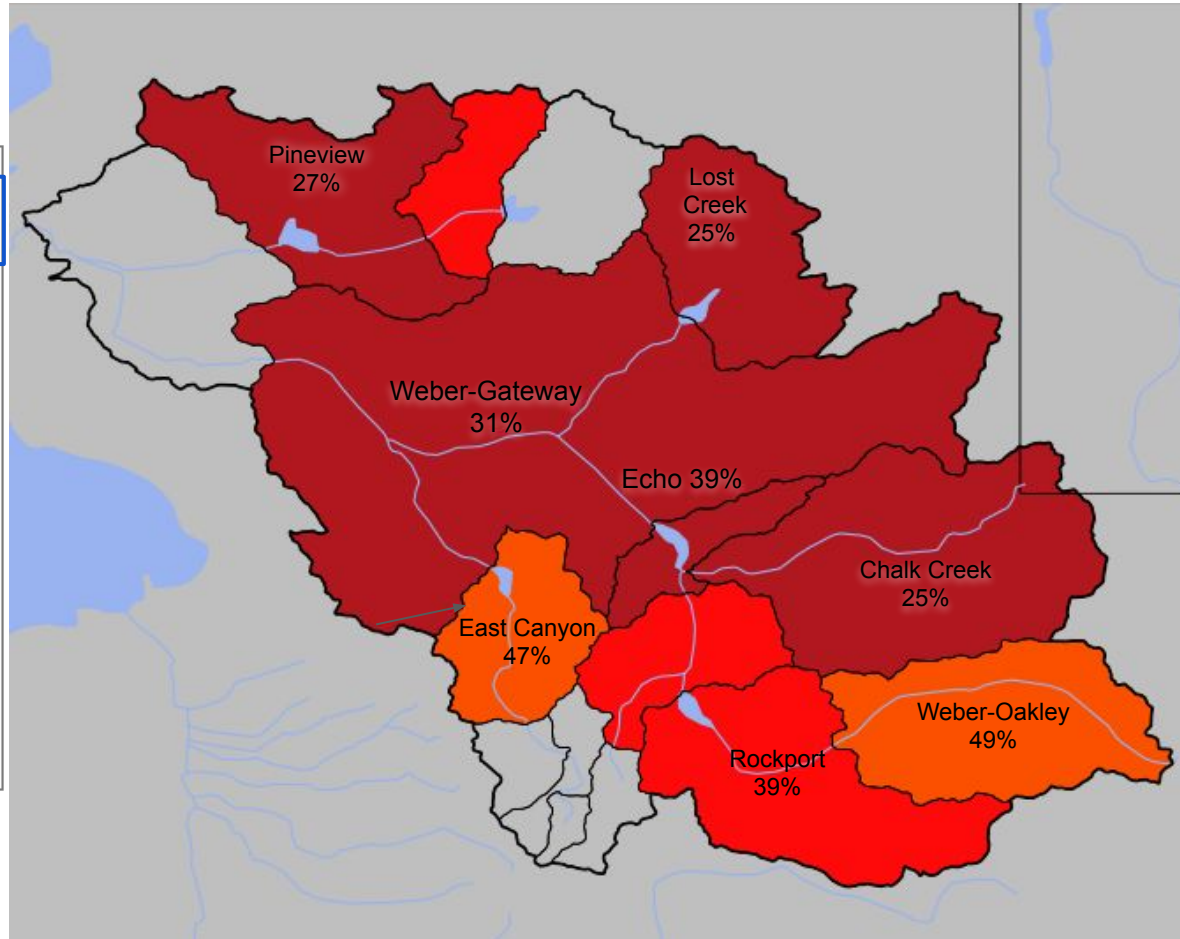
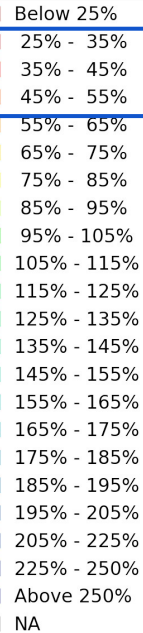
Utah Water Supply Forecasts - Bear

Logan River



April 1, 2021 - Utah Water Supply Forecasts - Weber River Basin

Percent of
Average



Weber River Basin Forecasts

January: **45%** of Normal

February: **45%** of Normal

March: **45%** of Normal

April: **35%** of Normal

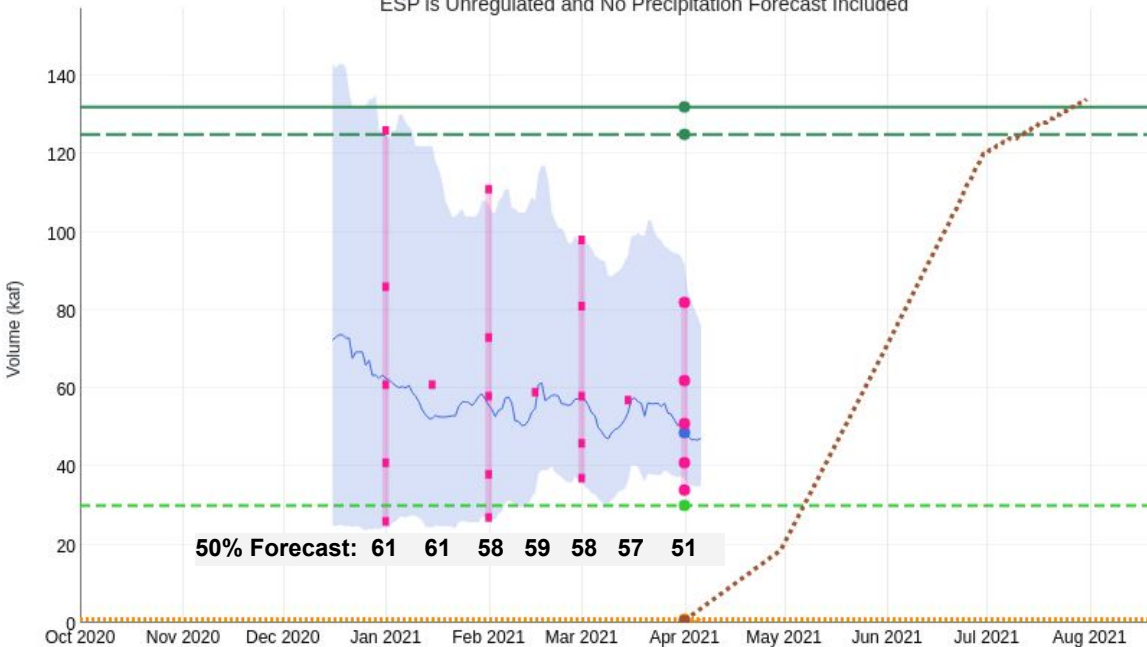
- Forecasts range from 25-50% of normal
- >10% drops in Pineview, SF Ogden, Lost Creek

Utah Water Supply Forecasts - Weber

Weber - Rockport Res, Wanship, Nr (RKUU1)

Period: Apr-Jul, Official 50% Forecast (2021-04-01): 51 kaf (39% Average, 41% Median)

ESP is Unregulated and No Precipitation Forecast Included



2021/04/01:

Min 1977: 30.07

Average: 132

Median: 125

Observed Total: 0.96

Normal

Accumulation: 0.62

ESP: 48.7

Official 10: 82

Official 30: 62

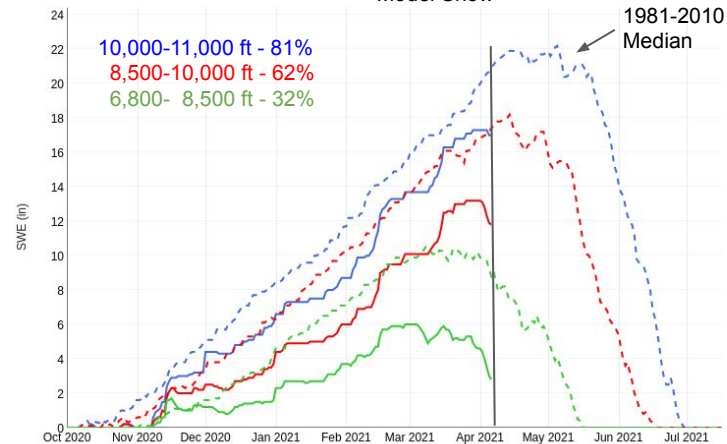
Official 50: 51

Official 70: 41

Official 90: 34

Weber - Oakley, Nr (OAWU1)

Model Snow



April 1, 2021 - Utah Water Supply Forecasts - Six Creeks

Percent of
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%

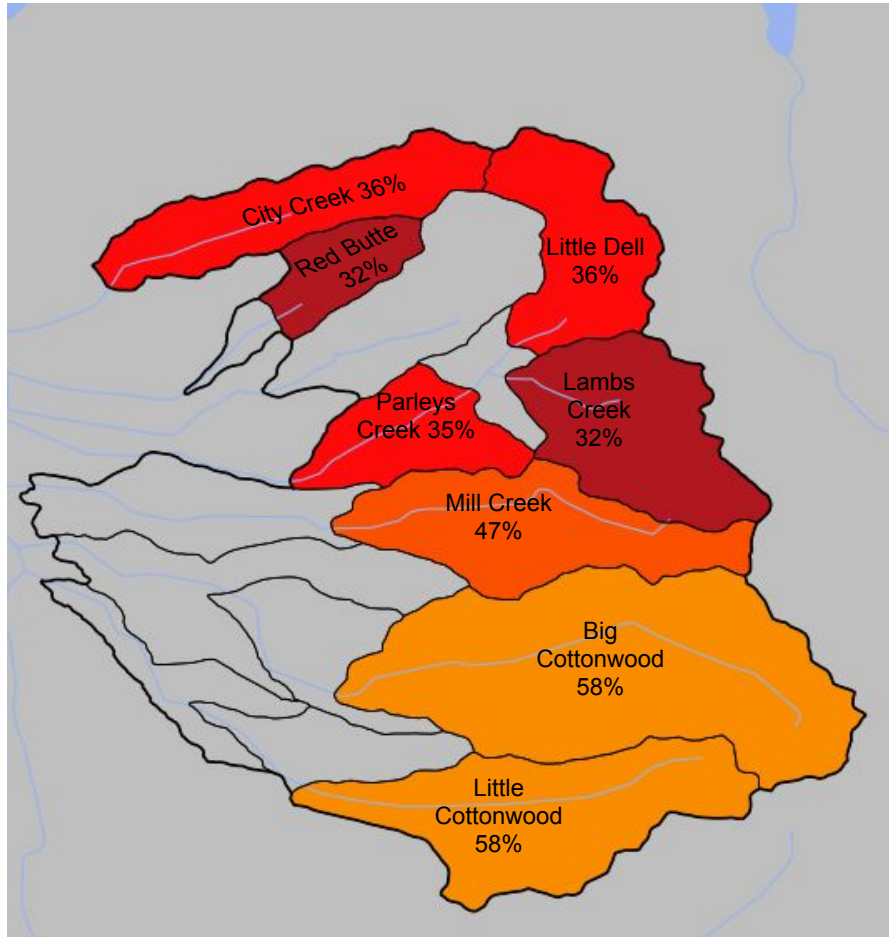
195% - 205%

205% - 225%

225% - 250%

Above 250%

NA



Six Creeks Basin Forecasts

January: **40%** of Normal

February: **40%** of Normal

March: **50%** of Normal

April: **35%** of Normal

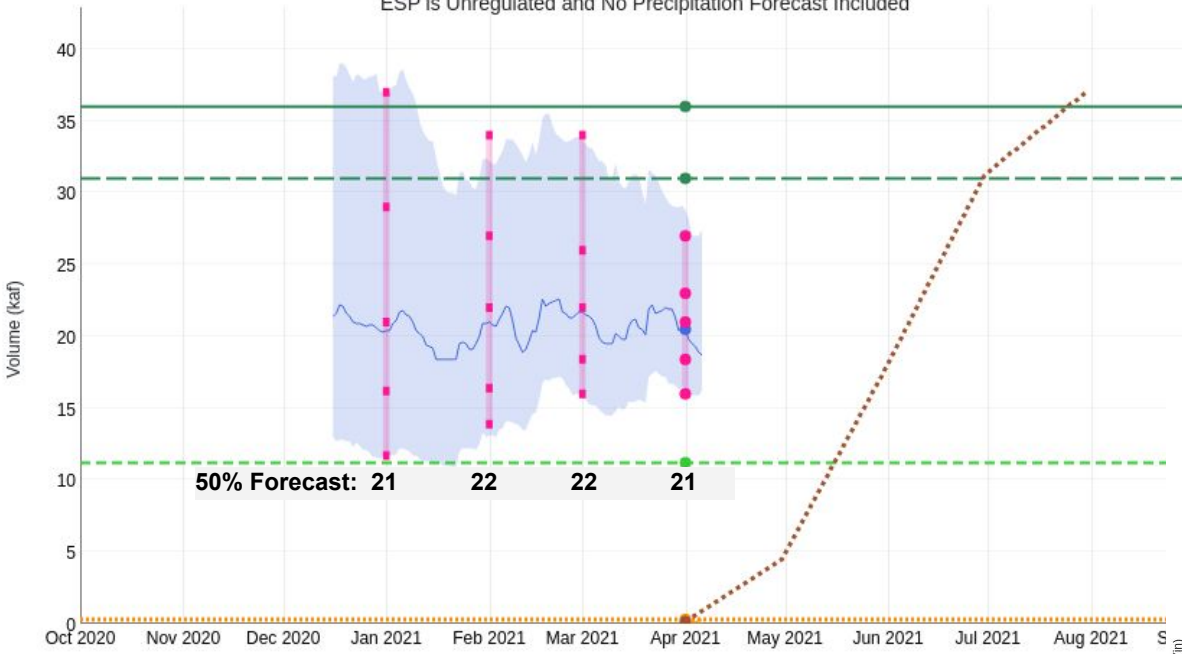
- Forecasts range from 30-60% of average
- >10% drops in Little Dell, Red Butte, Parley's, Lamb's

Utah Water Supply Forecasts - Six Creeks

Big Cottonwood Ck - Salt Lake City, Nr (BCTU1)

Period: Apr-Jul, Official 50% Forecast (2021-04-01): 21 kaf (58% Average, 68% Median)

ESP is Unregulated and No Precipitation Forecast Included



2021/04/01:

Min 1934: 11.21

Average: 36

Median: 31

Observed Total: 0.31

Normal

Accumulation: 0.15

ESP: 20.5

Official 10: 27

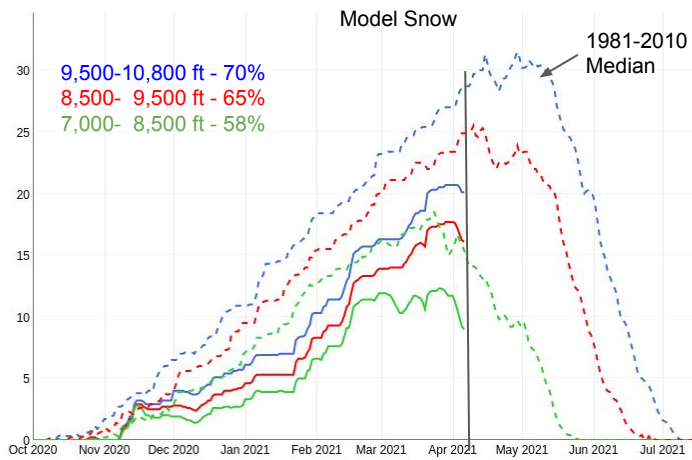
Official 30: 23

Official 50: 21

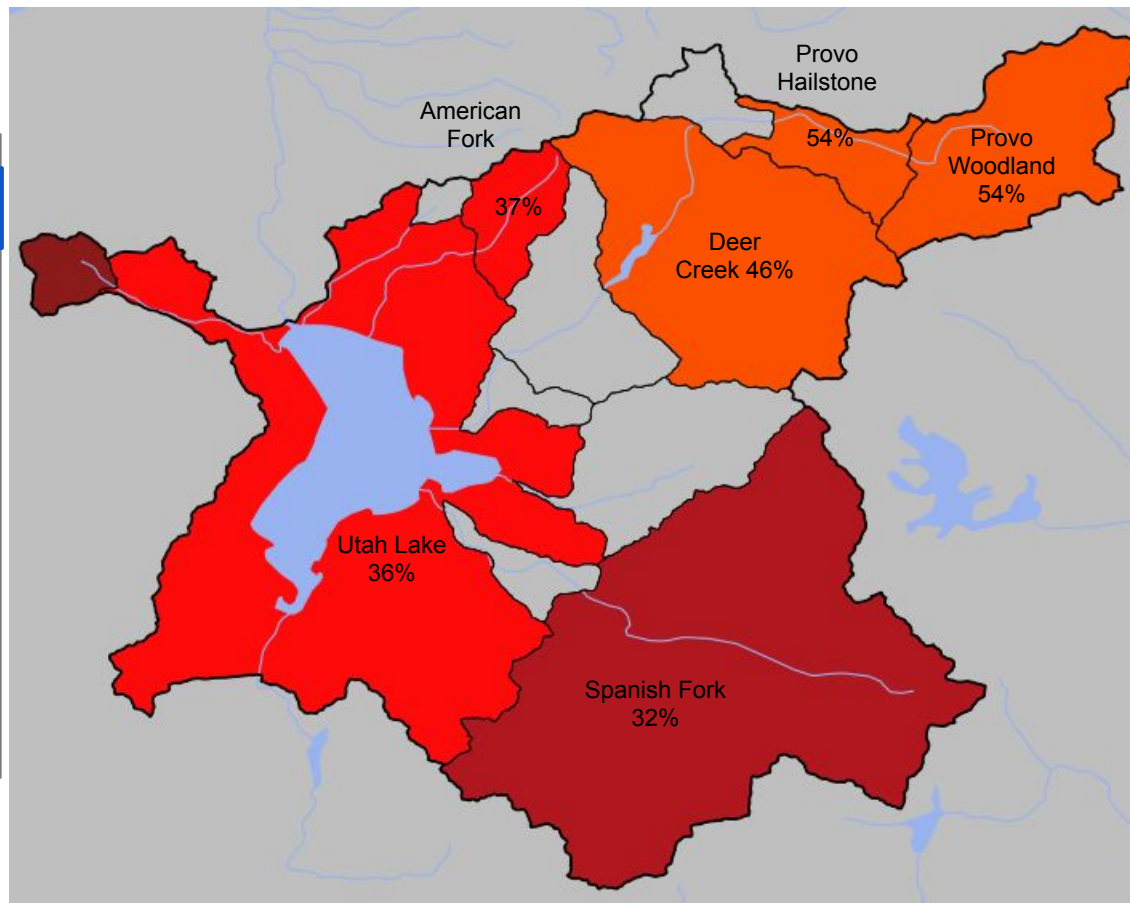
Official 70: 18.4

Official 90: 16

Big Cottonwood Ck - Salt Lake City, Nr (BCTU1)



April 1, 2021 - Utah Water Supply Forecasts - Provo - Utah Lake



Provo River Basin Forecasts

January: **50%** of Normal

February: **50%** of Normal

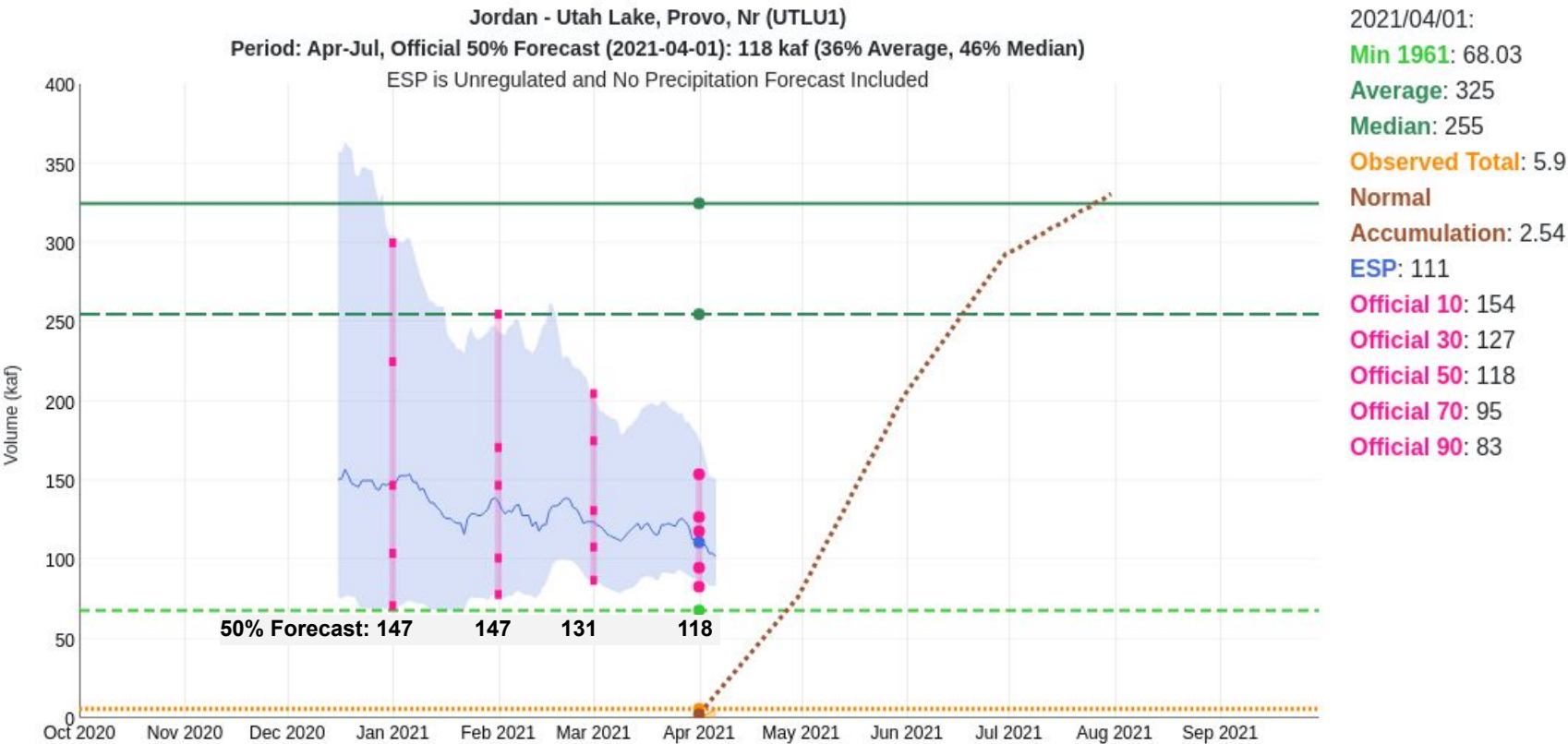
March: **45%** of Normal

April: **40%** of Normal

- Forecasts range from 25-55% of normal

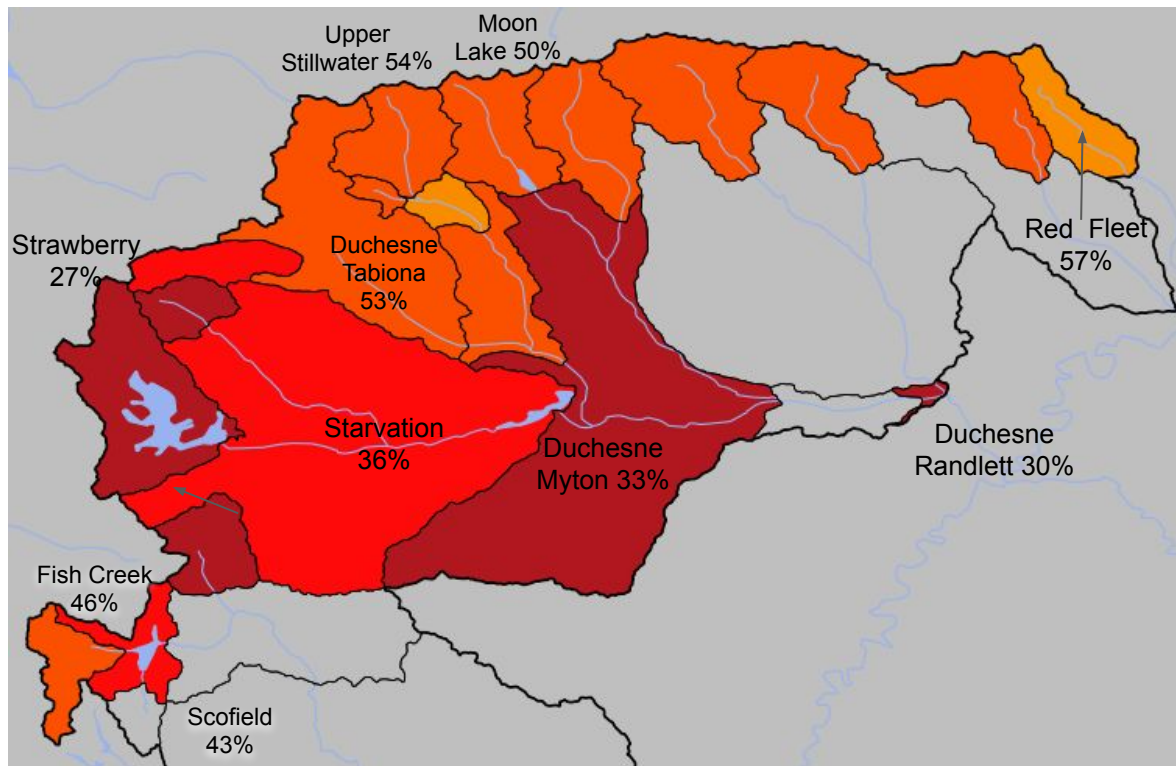
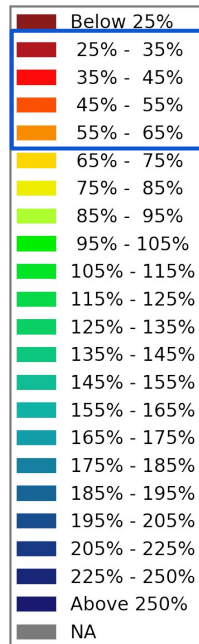
Utah Water Supply Forecasts - Provo/Utah Lake

Utah Lake Inflow



April 2021 - Utah Water Supply Forecasts - Duchesne

Percent of
Average



Duchesne River Basin

January: **50%** of Normal

February: **50%** of Normal

March: **50%** of Normal

April: **45%** of Normal

- Forecasts range from 25-55% of normal

Price River Basin

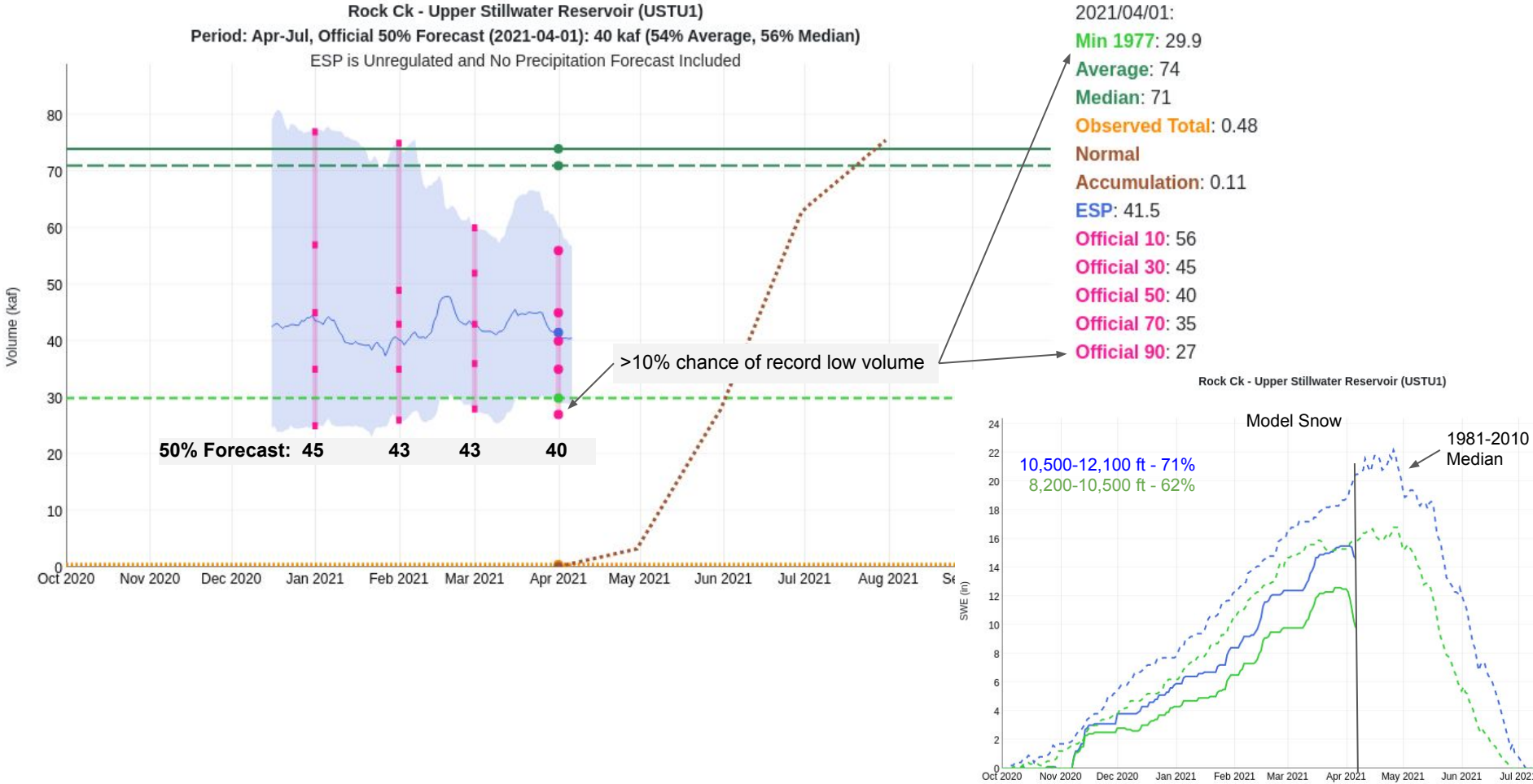
January: **50%** of Normal

February: **50%** of Normal

March: **45%** of Normal

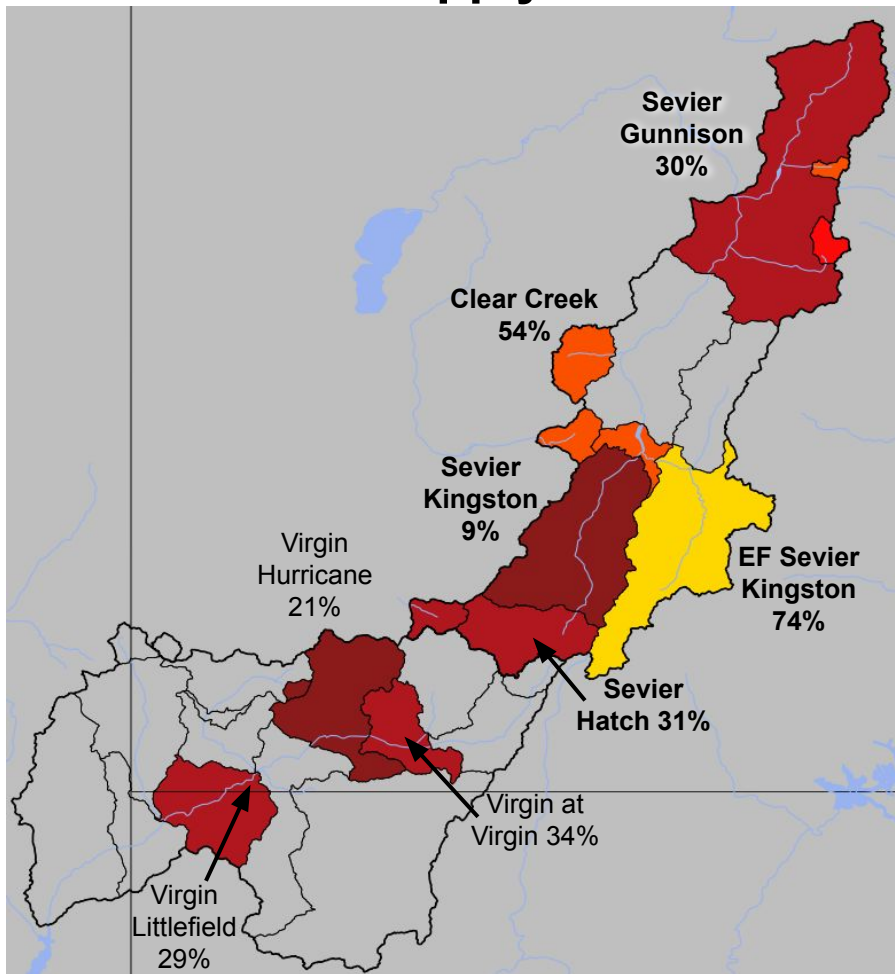
April: **45%** of Normal

Utah Water Supply Forecasts - Duchesne



April 2021 - Utah Water Supply Forecasts - Sevier and Virgin

Percent of
Average



Sevier River Basin Forecasts (regulated i.e. predicted Obs)

January: **40%** of Normal

February: **40%** of Normal

March: **45%** of Normal

April: **45%** of Normal

- Forecasts range from 10-75% of normal

Virgin River Basin Forecasts

January: **35%** of Normal

February: **40%** of Normal

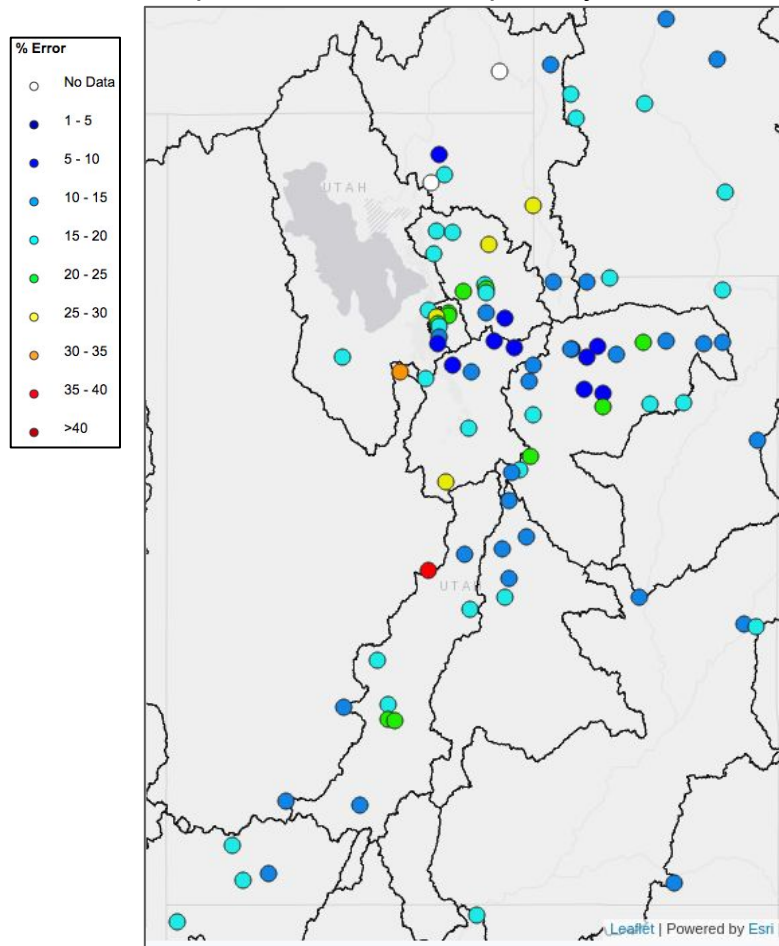
March: **40%** of Normal

April: **25%** of Normal

- Forecasts range from 20-35% of normal

Historical (1981-2010) Forecast Verification

April Forecast Error: April-July Volume



Location

BEAR - UTAH-WYOMING STATE
BEAR - WOODRUFF NARROWS
LOGAN - LOGAN- NR
WEBER - OAKLEY- NR
WEBER - ROCKPORT RES
BIG COTTONWOOD CK
PARLEYS CK
PROVO - WOODLAND- NR
PROVO - DEER CK RES
VIRGIN - VIRGIN

April Forecast Error

15%
31%
14%
14%
19%
16%
25%
13%
19%
17%

Forecasts are better than just going with average
Error tends to decrease each month into the spring

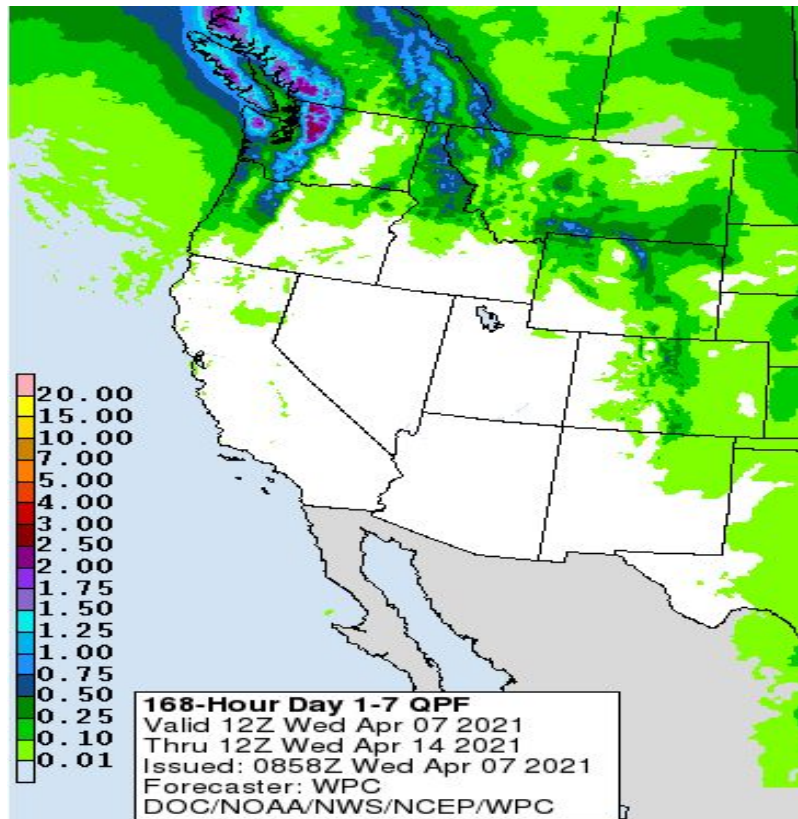
Where Forecasts are Better:

- Headwaters
- Primarily snow melt basins
- Known diversions / demands

Where Forecasts are Worse:

- Lower elevations (rain or early melt)
- Downstream of diversions / irrigation
- Little is known about diversions / demands

Upcoming Weather: WPC April 7-13 Precipitation Outlook

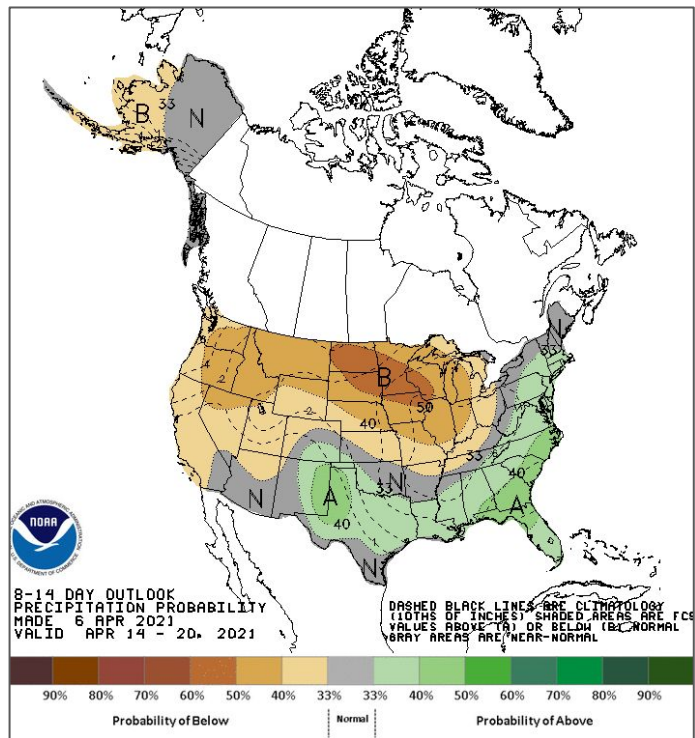


- Mainly tranquil weather through the remainder of the week, with a few weak systems brushing by to the north.
- Temps will be seasonal across the north, and 5-10 degrees above normal over southern UT.

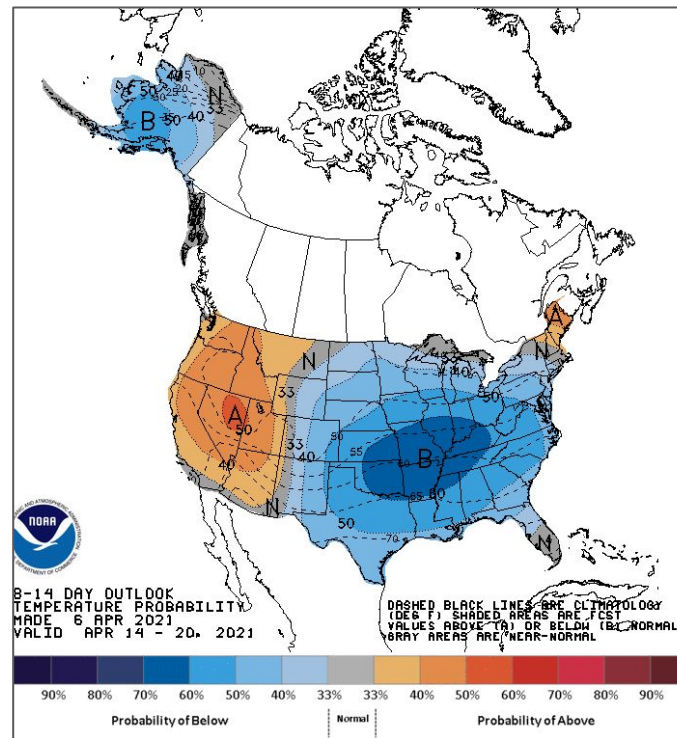
Upcoming Weather: 8-14 Day Outlook (April 14-20)

Model uncertainty is higher in the 8-14 day period, which is typical of spring. There is slightly elevated odds for below normal precip and above normal temps.

Precipitation Outlook



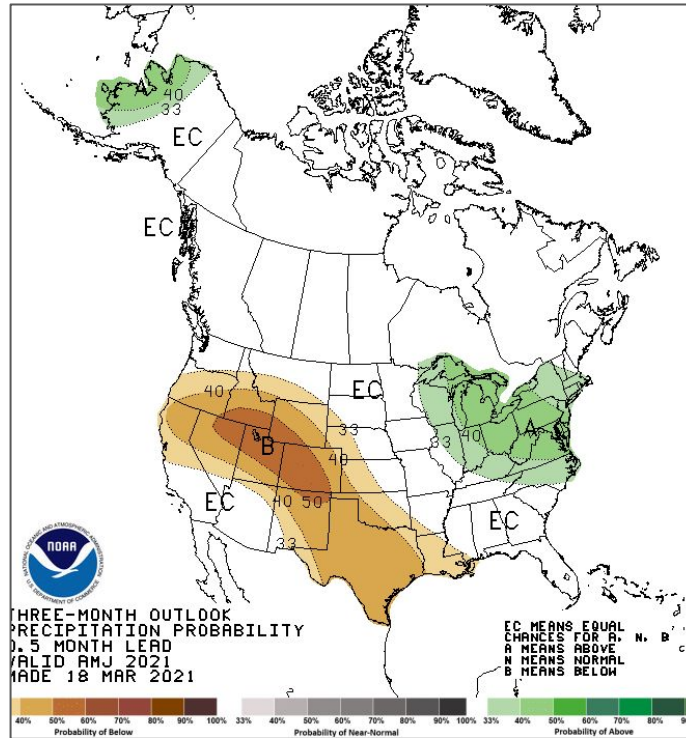
Temperature Outlook



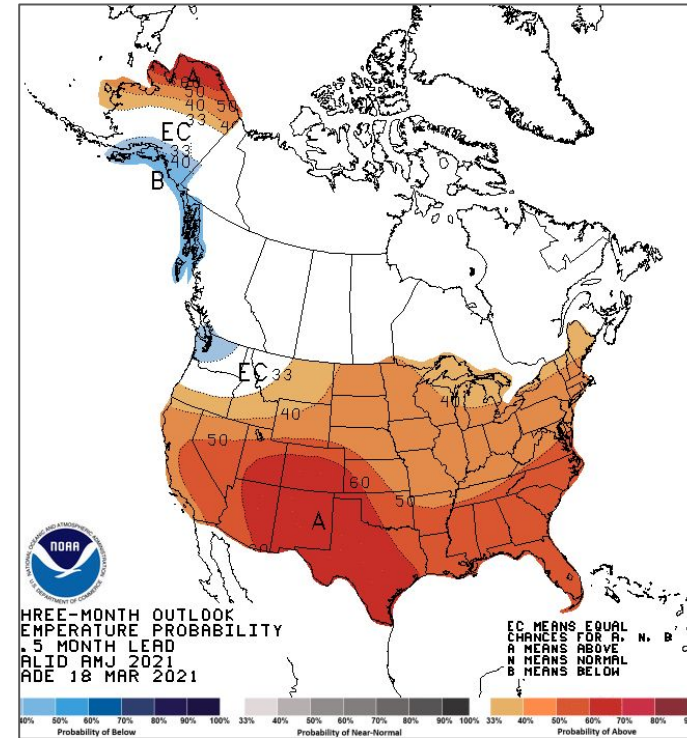
CPC Seasonal Outlook (April-June)

Elevated odds of below normal precipitation and above normal temps over much of the Great Basin

Precipitation Outlook



Temperature Outlook



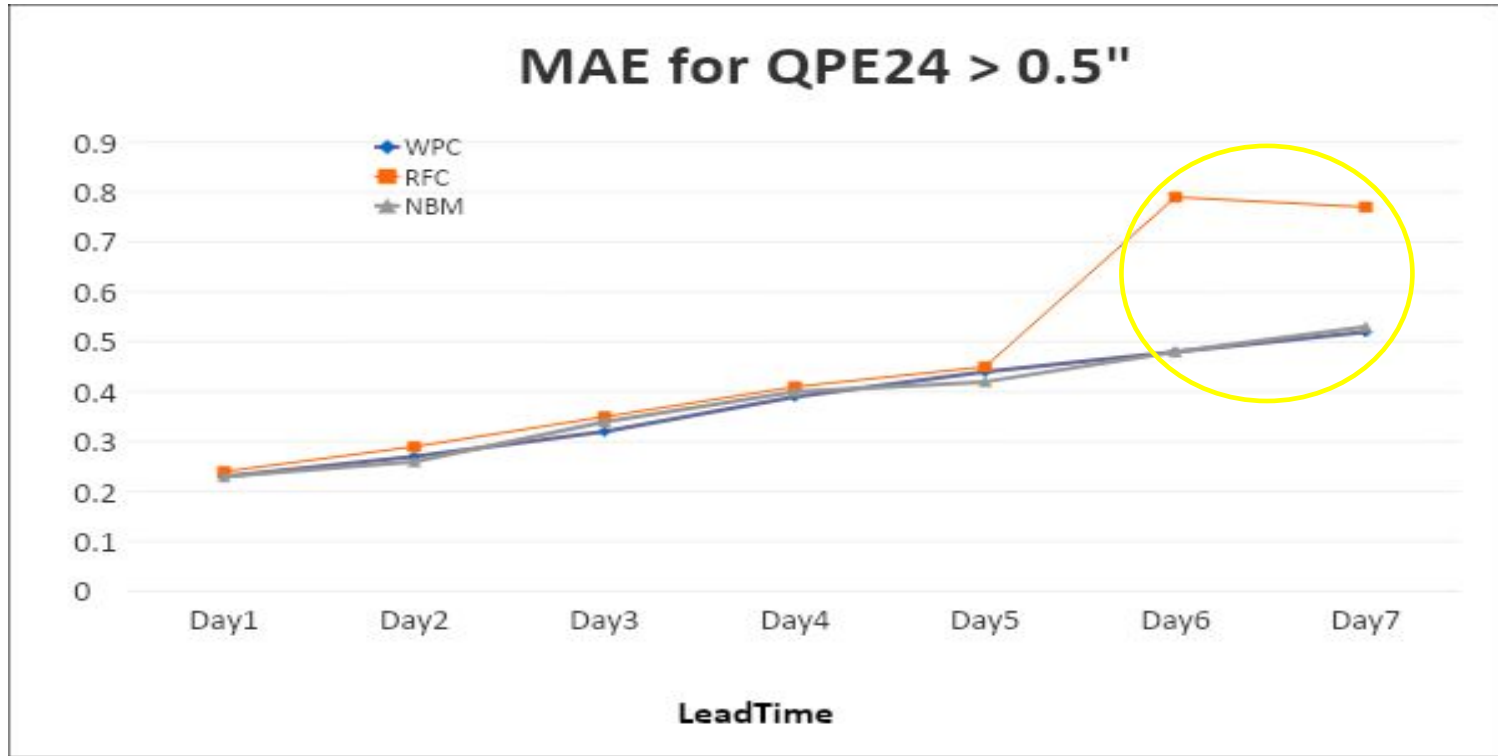
Summary

- Water year precipitation and basin snow are still below to much below normal across the state, as is soil moisture.
- March precipitation was below normal in the Bear, Weber, Six Creeks, Sevier.
- Peak snow for 2021 appears to have occurred across Utah.
- Water Supply Forecasts reflect the extremely dry conditions.
 - All water supply forecasts are below normal and have decreased
- Weather models indicating a dry spring pattern through the middle of the month.
 - Model uncertainty tends to increase during the transition to Spring.
 - Currently there is no indication of a transition to wet conditions through April 20th that would stop the decline of model guidance (water supply forecasts).

CBRFC Hydro Science Update - Quantitative Precipitation Forecast (QPF)

- Project: verify/determine if extending the forecast precipitation input to hydrologic model from 5 days to 7 days will add value to CBRFC streamflow forecasts
- Verification process:
 - Occurring since July 2018
 - 14 headwater basins across Upper Colorado (10) and Great Basin (4)
 - Compare forecast precipitation with observed precipitation on a daily timescale
 - 3 precipitation forecast datasets:
 - CBRFC (QPF=0 on Days 6/7)
 - Weather Prediction Center (WPC)
 - National Blend of Models (NBM)

QPF Verification over UCRB/Great Basin (July 2018 - June 2020)



- ❖ By forecasting QPF=0 on Days 6/7 and not using WPC, *overall* were missing out (note big jump in error).

Now Using 7 days of QPF in Great Basin

- *Verification indicates that using WPC QPF for Days 6/7 is more accurate than forecasting zero QPF. This is especially true during the wet months (Oct-May).*

Changes as of Fall 2020:

- 1) Switch to using **WPC for Days 6/7 QPF** in the *Upper Basin and Great Basin* in our daily operational model. We still use QPF=0 for Days 8-10.
- 2) Use **seven** days of QPF/QTF in our ESP run that incorporates QPF (**ESP w/QPF**). Previously we were only using five days.

2021 Water Supply Webinar Schedule

**All Times Mountain Time (MT)*

Colorado River Basin

Friday	Jan 8th	10 am
Friday	Feb 5th	10 am
Friday	Mar 5th	10 am
Wednesday	Apr 7th	10 am
Friday	May 7 th	10 am

Great Basin

Friday	Jan 8th	11:30 am
Friday	Feb 5th	11:30 am
Friday	Mar 5th	11:30 am
Wednesday	Apr 7 th	11:30 am
Friday	May 7 th	11:30 am

CBRFC Contacts & WY21 Basin Focal Points

Michelle Stokes

Hydrologist In Charge

John Lhotak

Development and Operations Hydrologist

Paul Miller

Service Coordination Hydrologist

Cass Goodman

Computer Systems Analyst

Valerie Offutt

Administrative Assistant

Ashley Nielson

Upper Green, Yampa

San Juan, Dolores, Powell

Patrick Kormos

Lower Green, Duchesne

Weber, Provo

Cody Moser

Upper CO Mainstem, Gunnison

Brent Bernard

Bear, Sevier, Six Creeks

Zach Finch

Lower Colorado River Basin

Brenda Alcorn

Senior Hydrologist

Craig Peterson

Senior Hydrometeorologist

Tracy Cox

Hydrometeorologist

CBRFC Webpage

<https://www.cbrfc.noaa.gov/>

CBRFC Operations

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CBRFC Water Supply Presentations

<https://www.cbrfc.noaa.gov/present/present.php>

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