

# Water Supply Update

*Mid-month update\**

March, 2020

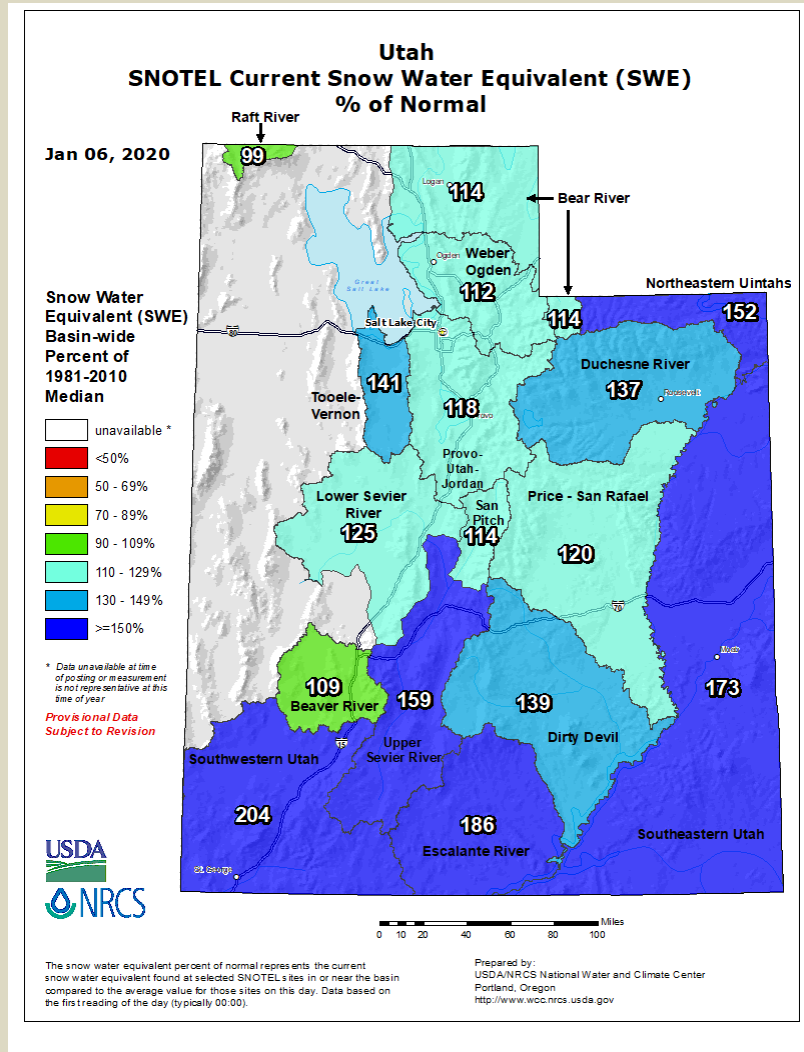
Jordan Clayton, NRCS Snow Survey

\* These slides are an abridged version of the slides that would have been presented at the annual Utah Water Users Workshop in St. George, DWR Water Board Meeting, and other venues.



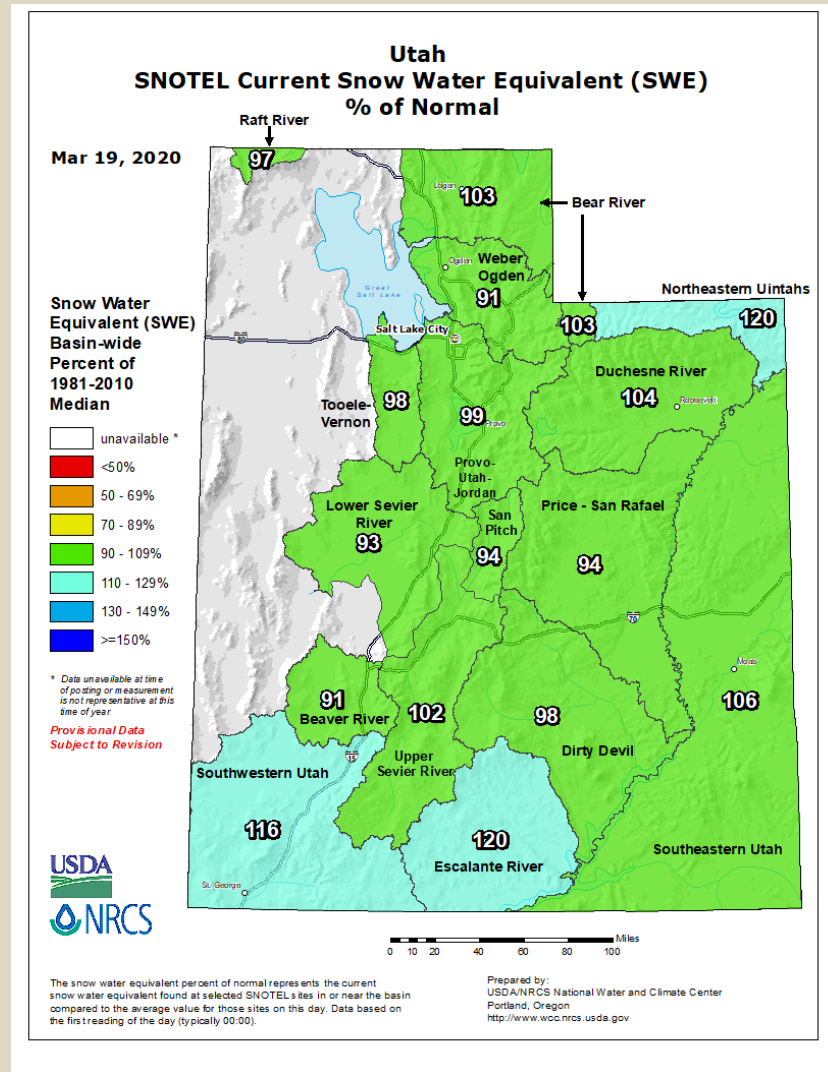


# Evolution of this year's snowpack

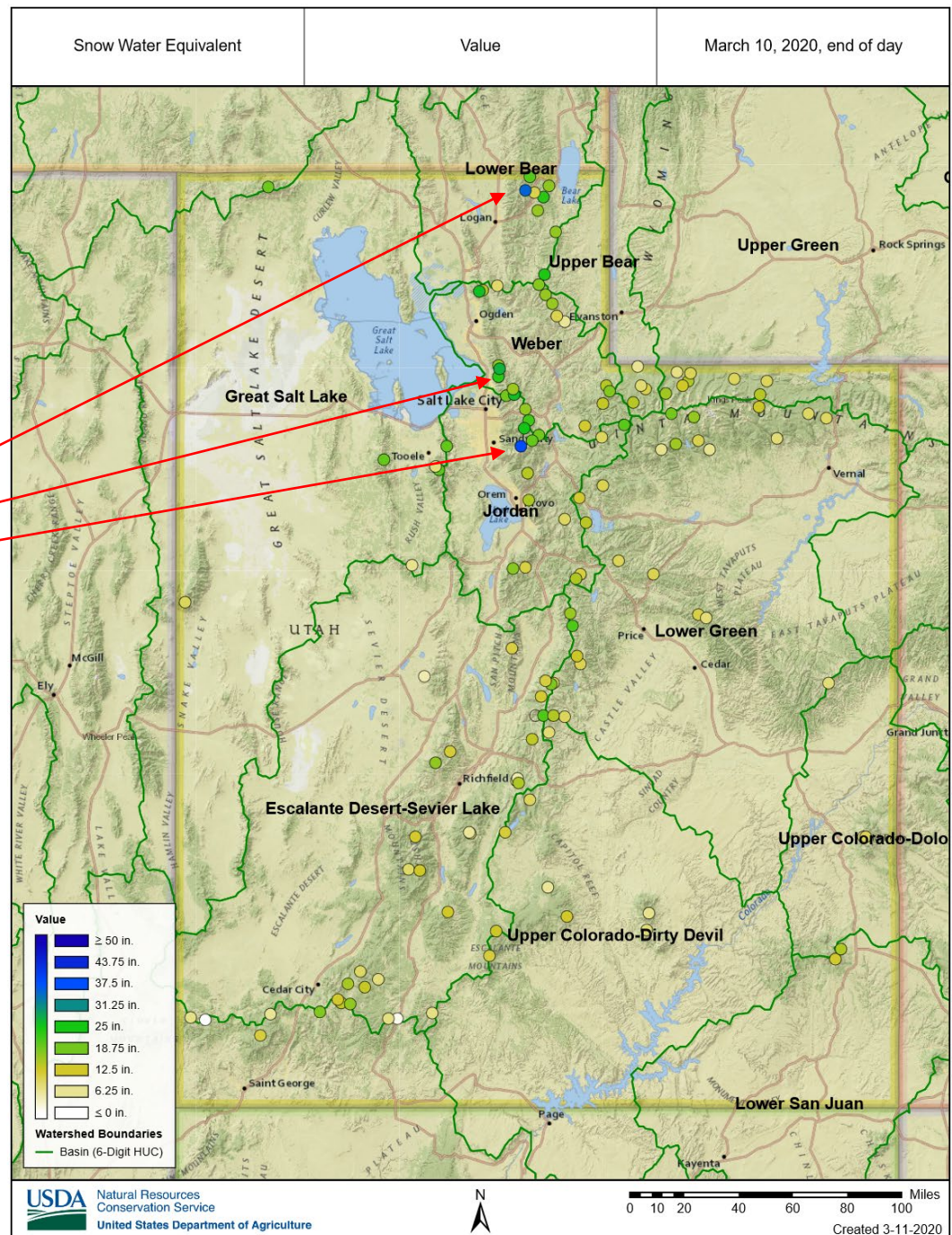


*From this...*

# Evolution of this year's snowpack



*to this.*



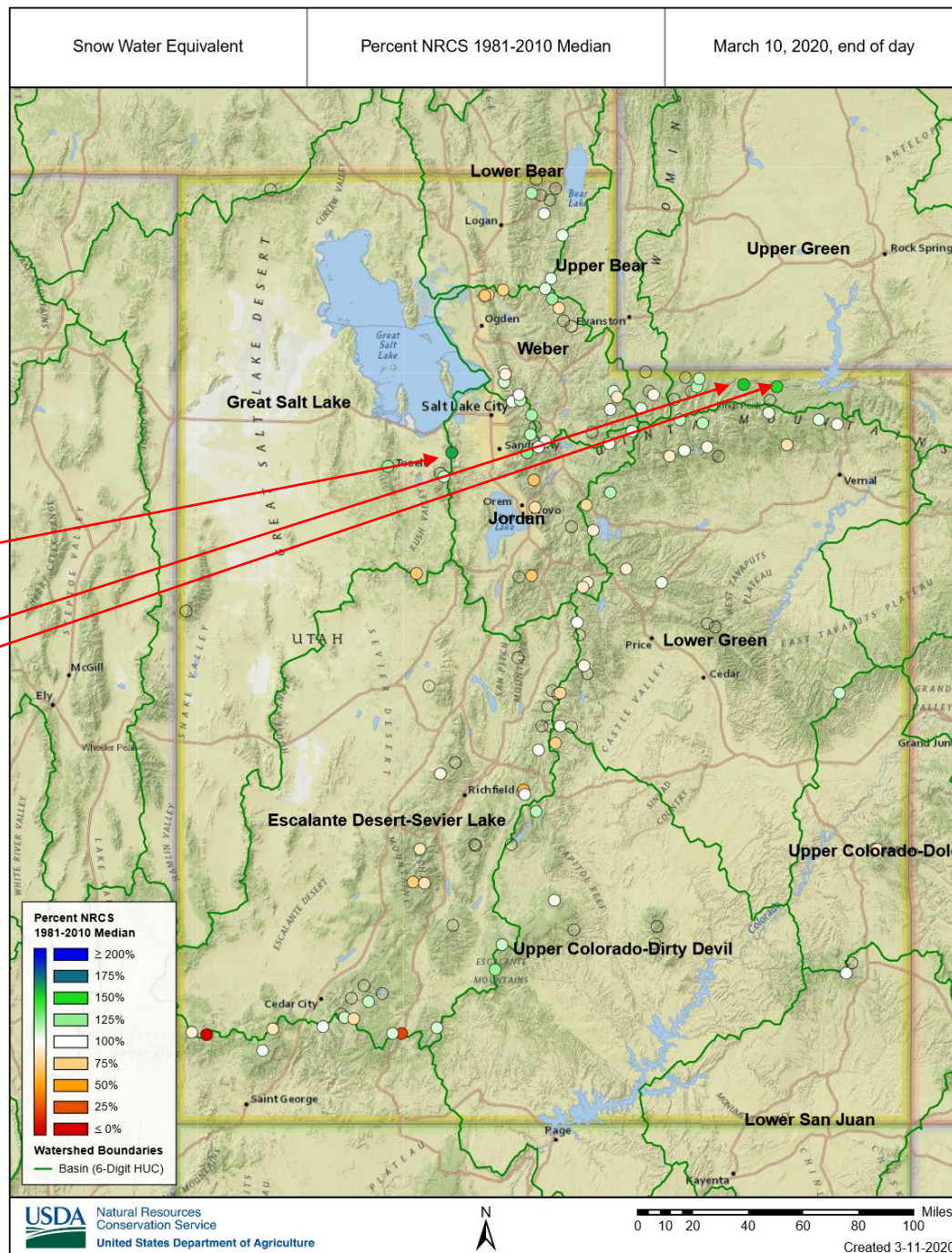
SNOTEL sites  
with the most  
SWE

Tony Grove Lake  
Farmington  
Snowbird



SNOTEL sites  
with the highest  
% normal SWE

Dry Fork  
Hole-in-Rock  
Hickerson Park





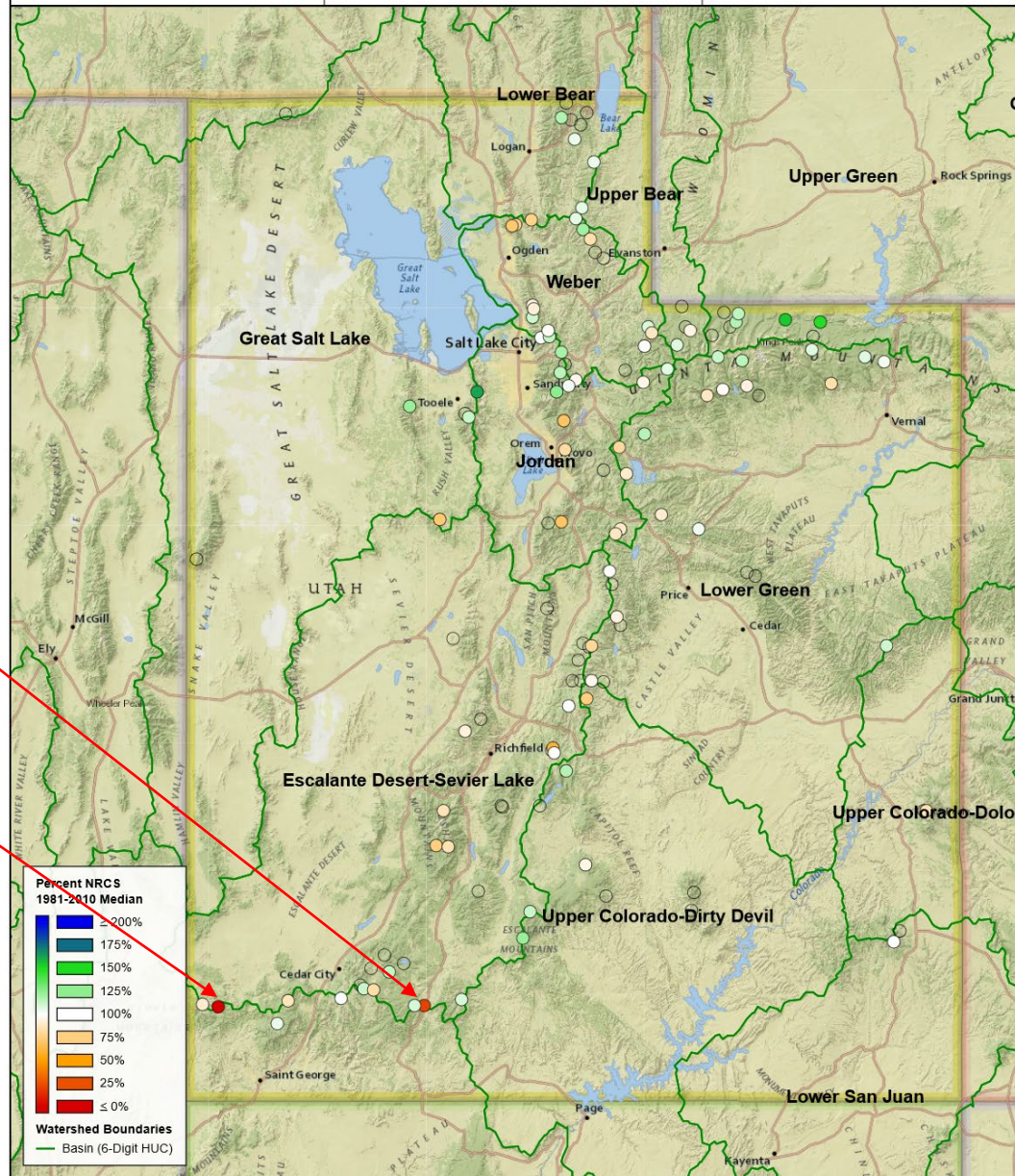
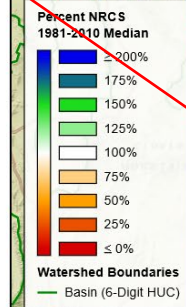
Snow Water Equivalent

Percent NRCS 1981-2010 Median

March 10, 2020, end of day

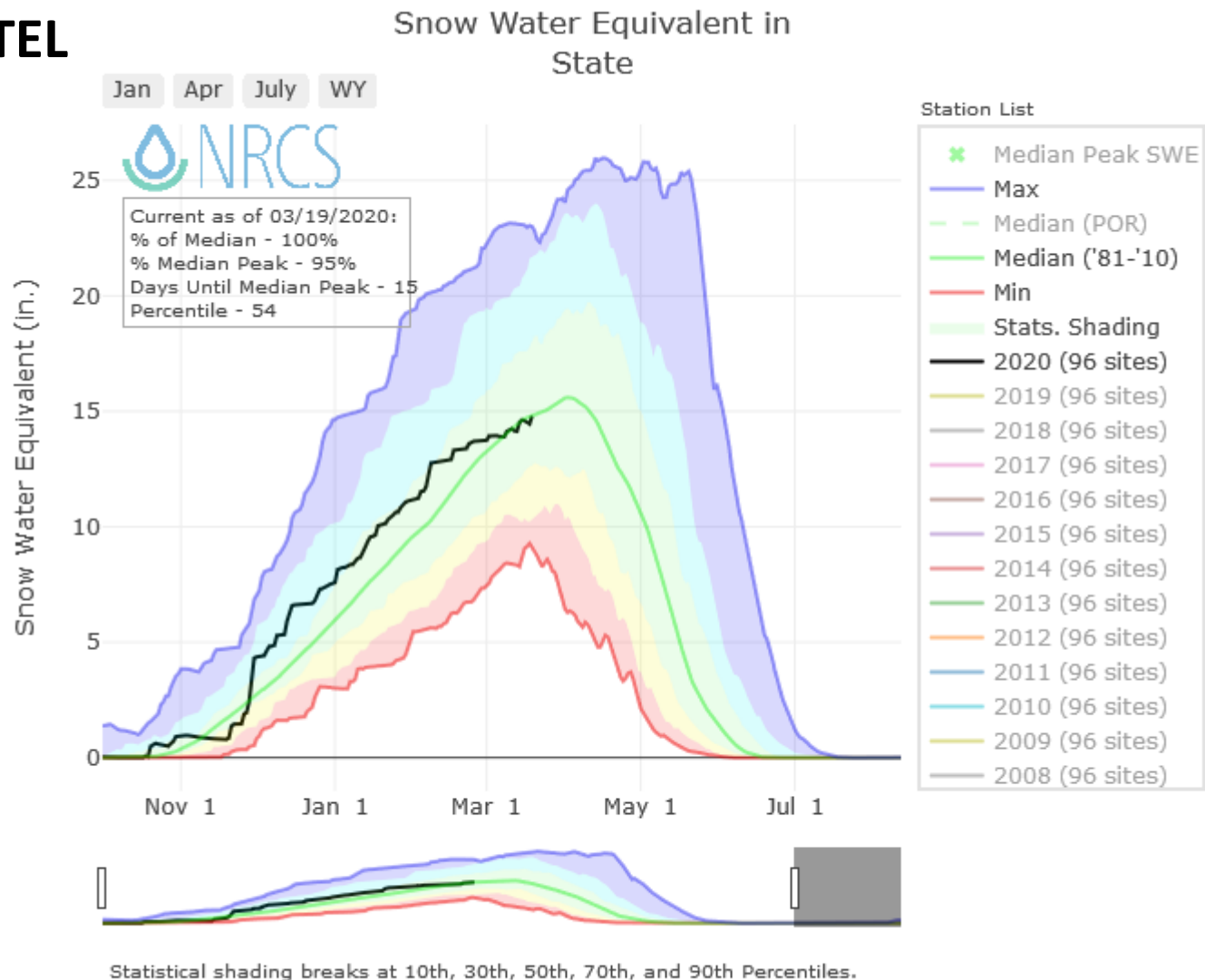
SNOTEL sites with  
the lowest %  
normal SWE

Long Valley Jct  
Little Grassy (dry)

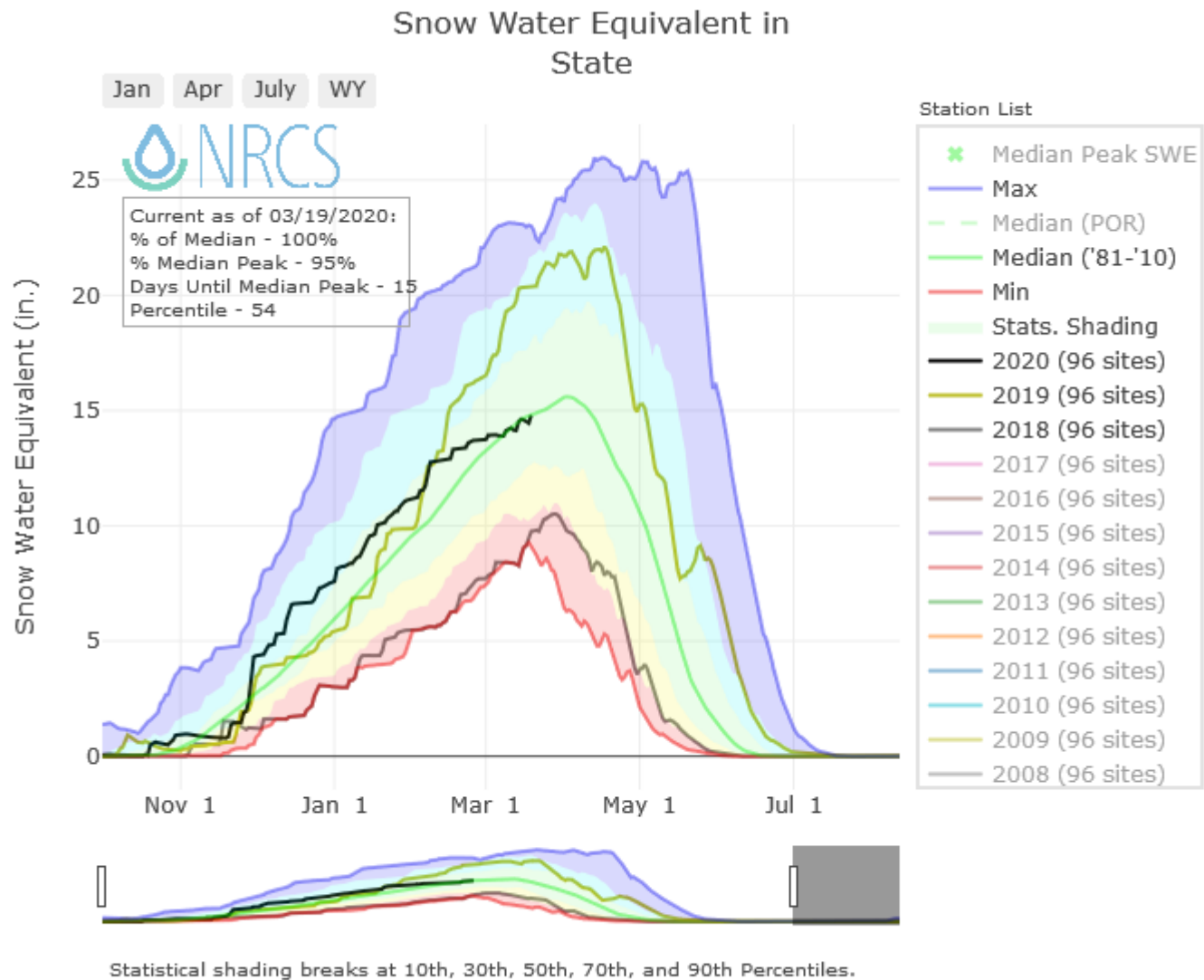




# Current conditions at Utah SNOTEL sites



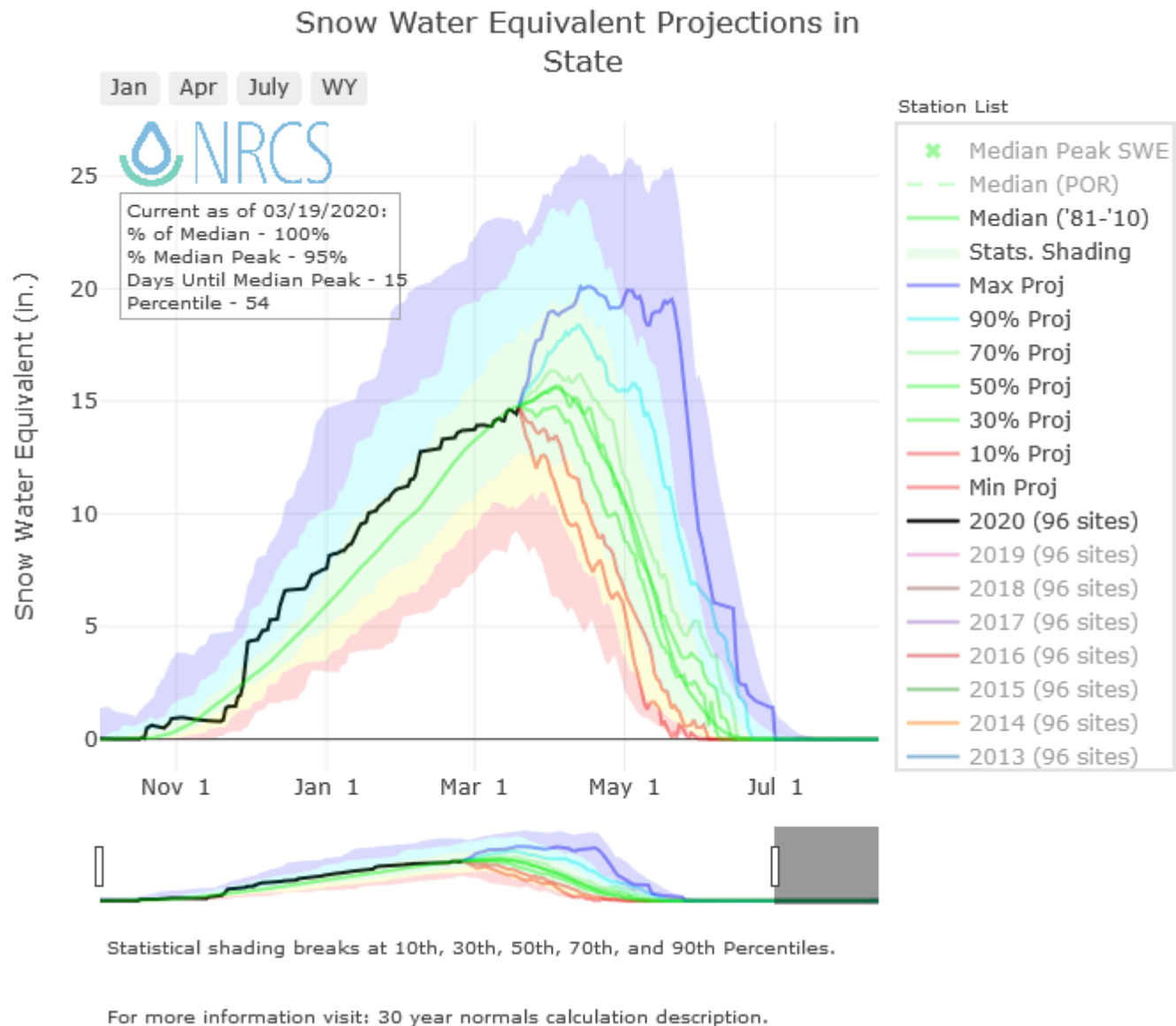
- Current water year is black line, “normal” is green line.



For more information visit: [30 year normals calculation description](#).

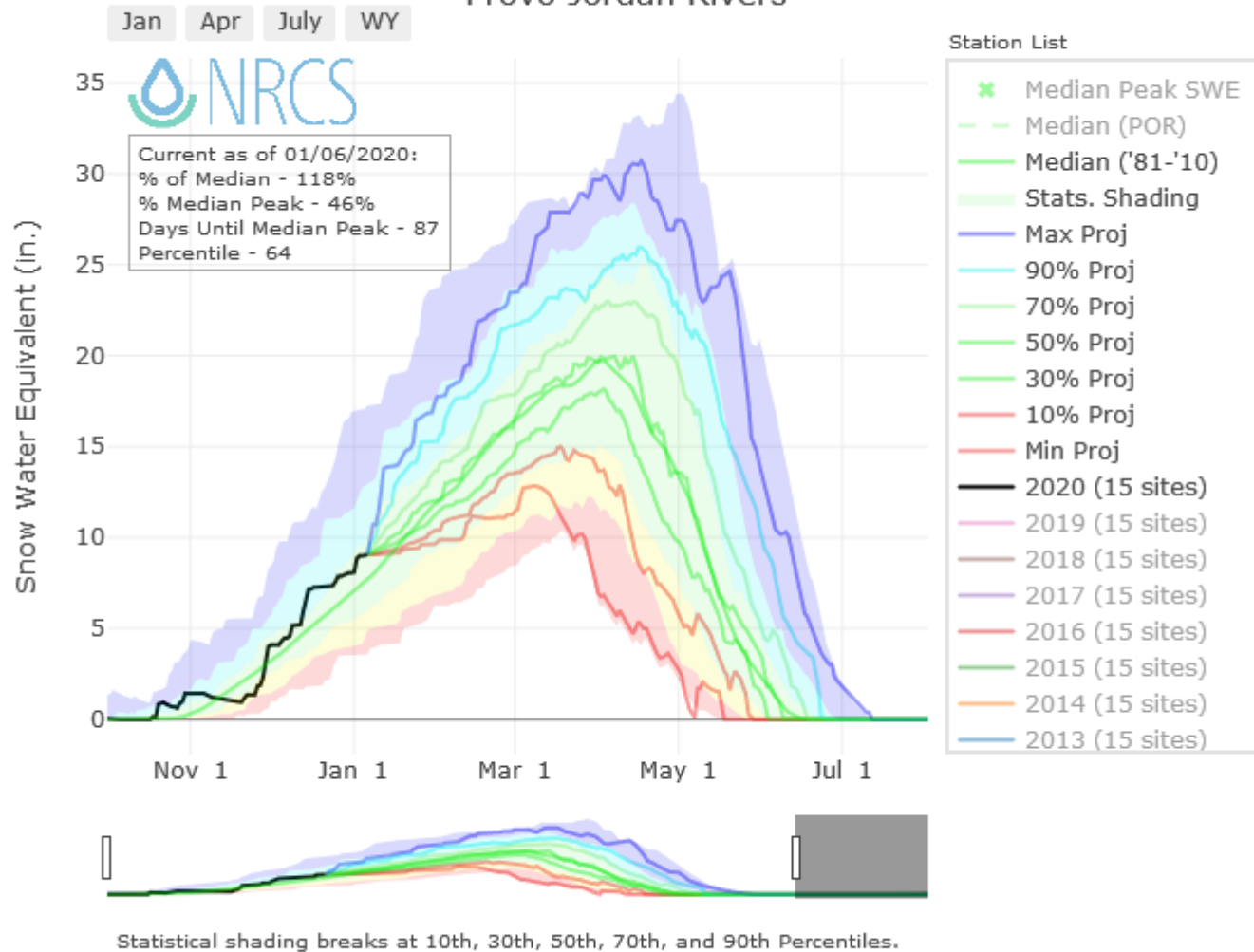
- Comparison with previous years





- Projections for this winter: best odds for roughly 50<sup>th</sup> percentile SWE

## Snow Water Equivalent Projections in Provo Jordan Rivers

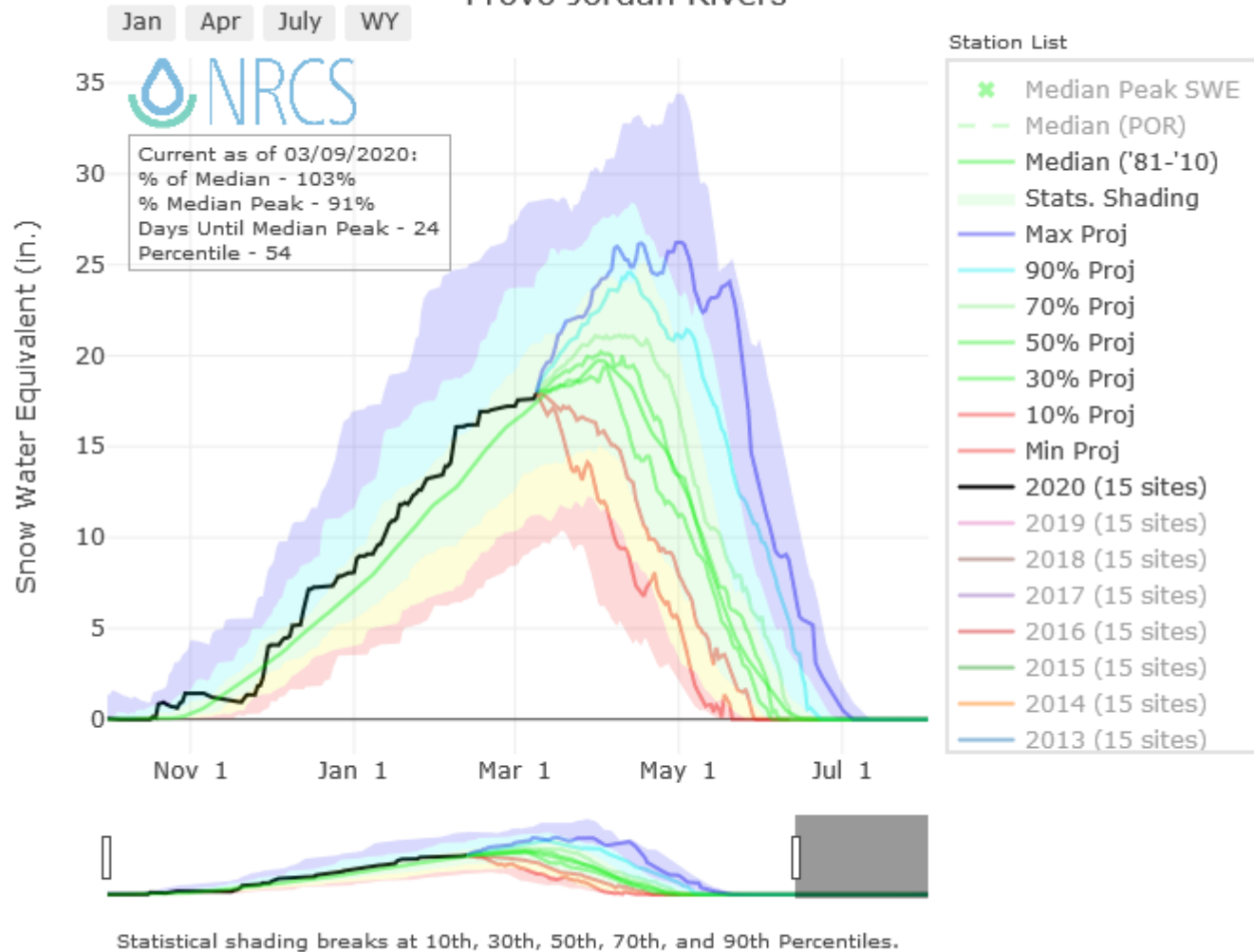


For more information visit: [30 year normals calculation description](#).

- Change in projections from January to March...



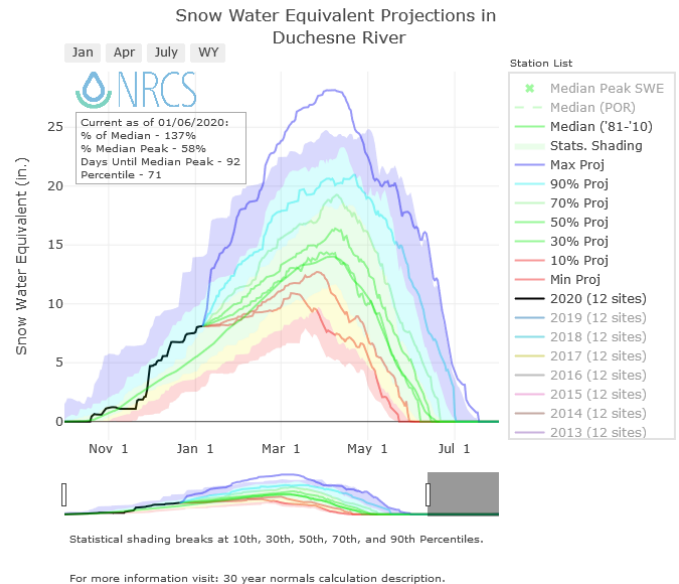
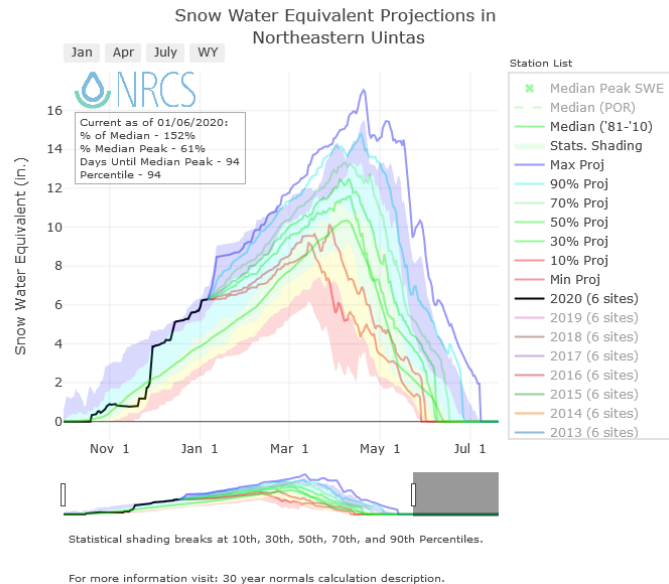
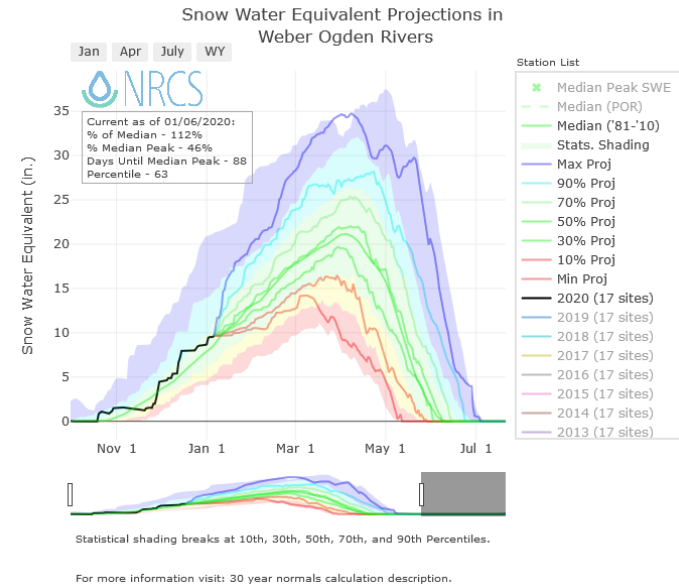
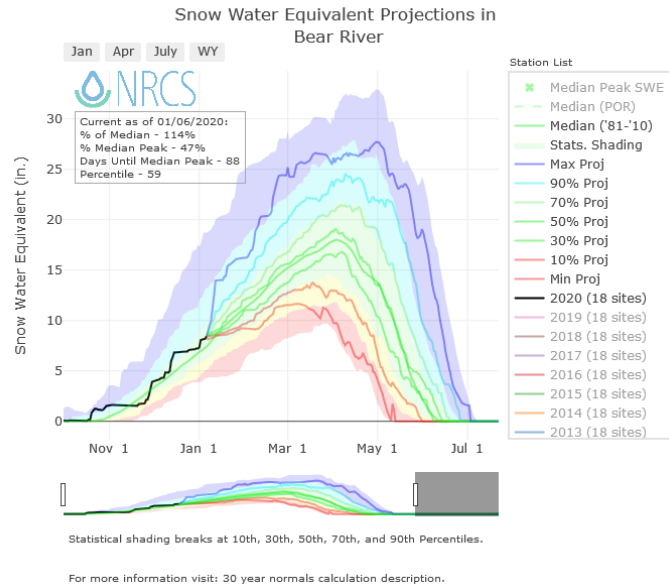
## Snow Water Equivalent Projections in Provo Jordan Rivers



For more information visit: [30 year normals calculation description](#).

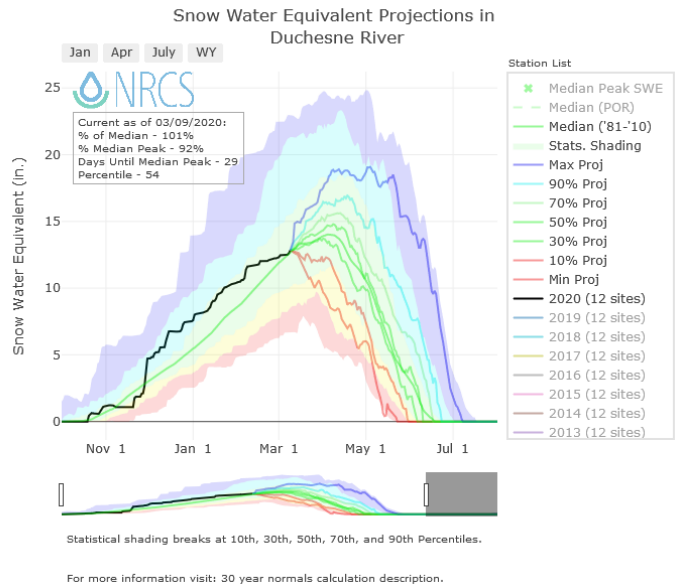
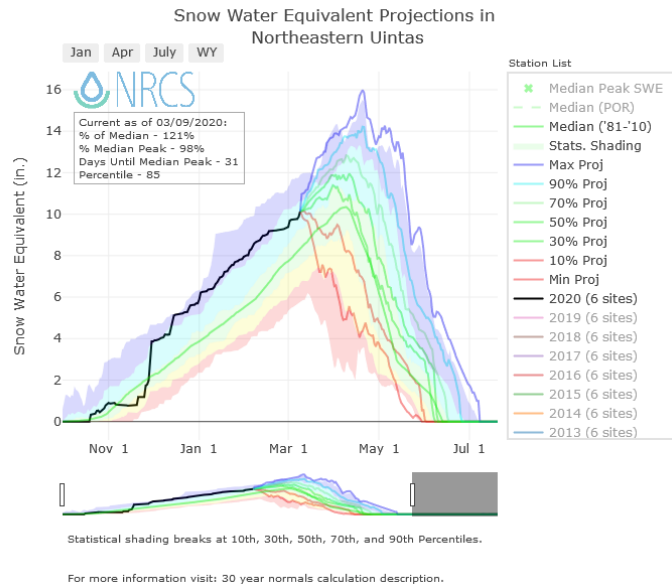
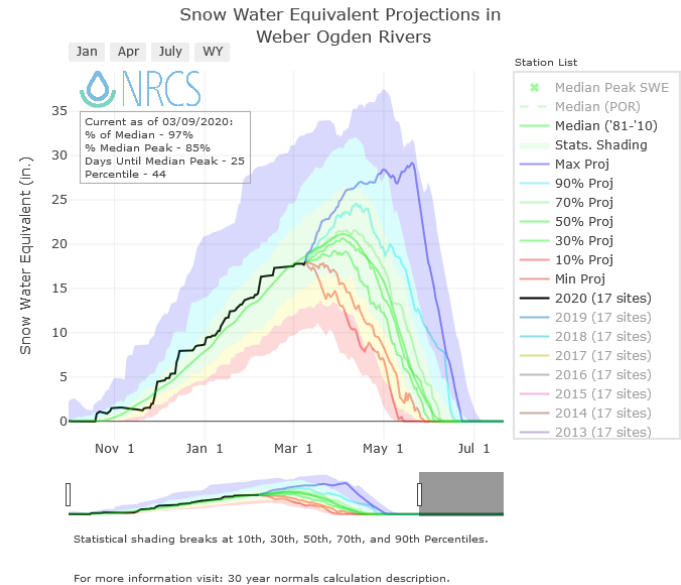
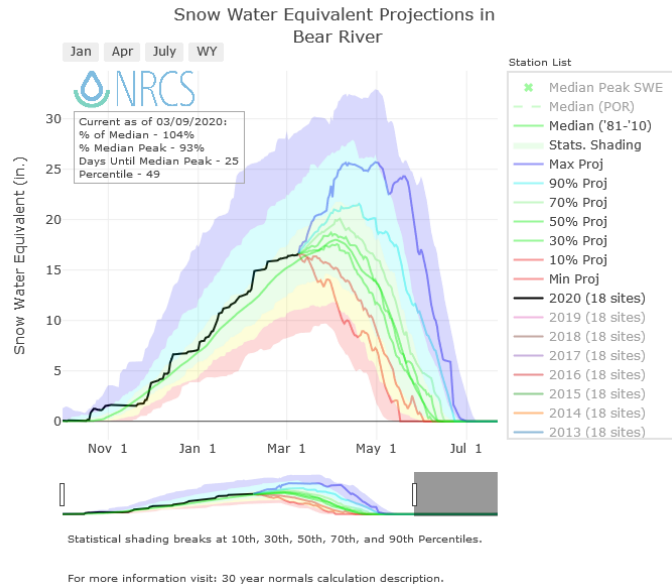
- Change in projections from January to March...

# Northern Utah

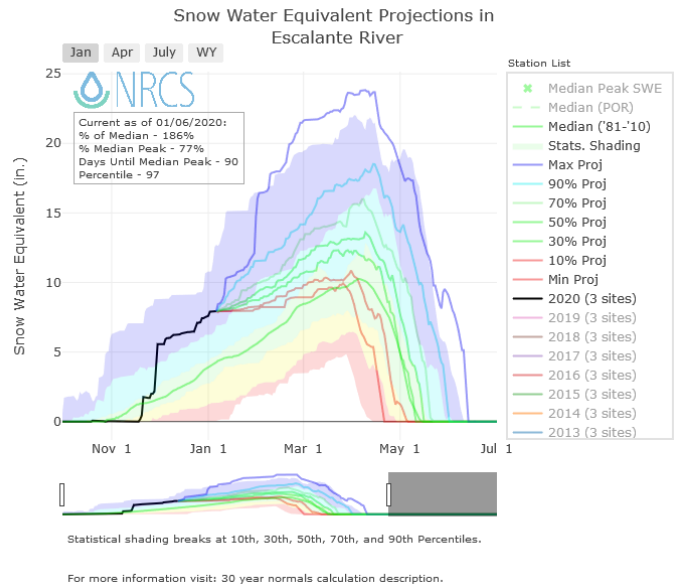
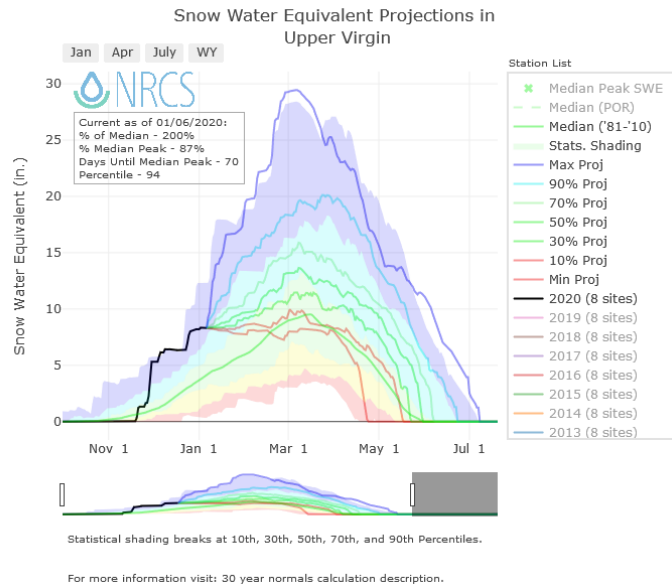
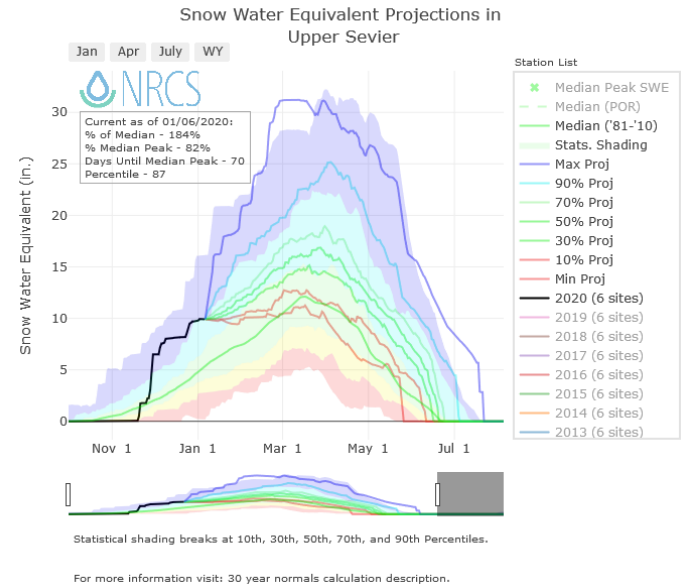
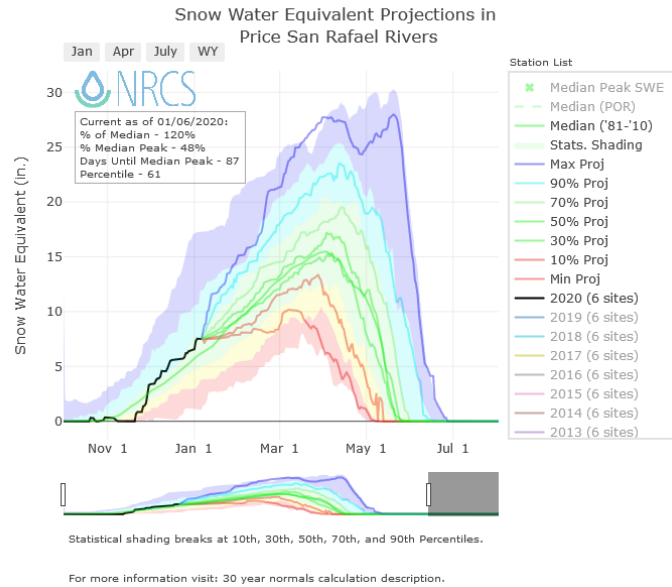




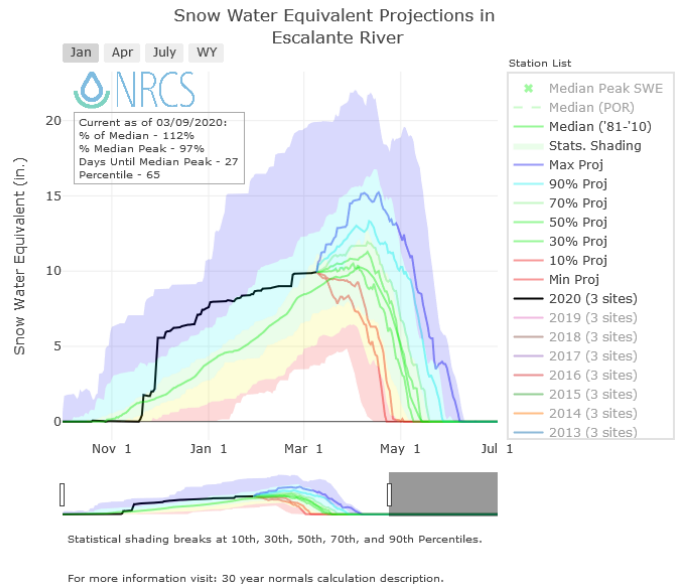
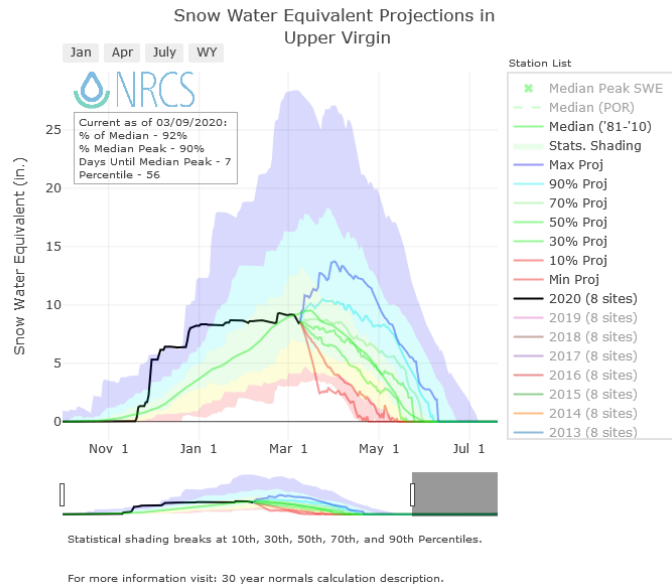
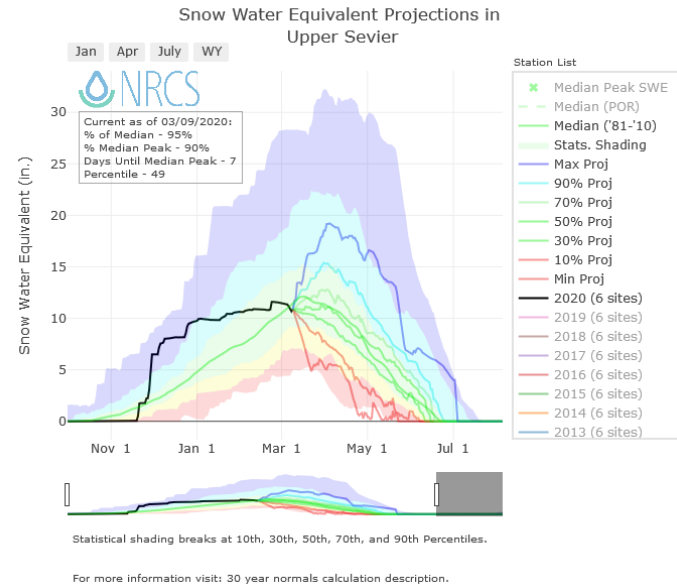
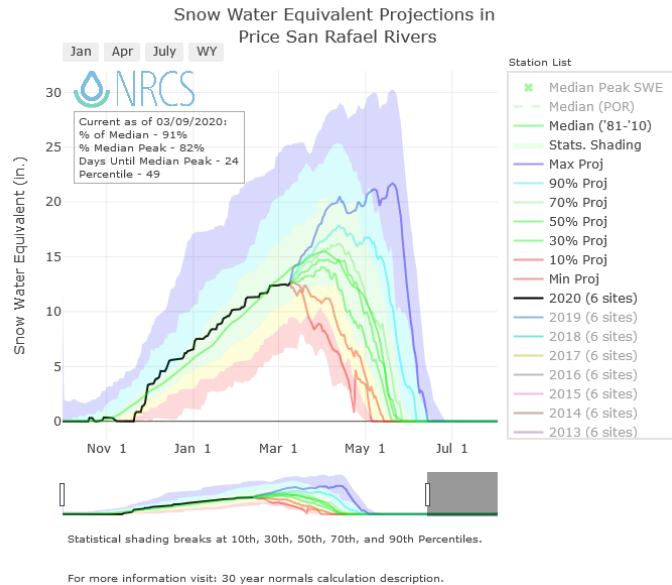
# Northern Utah



# Southern Utah

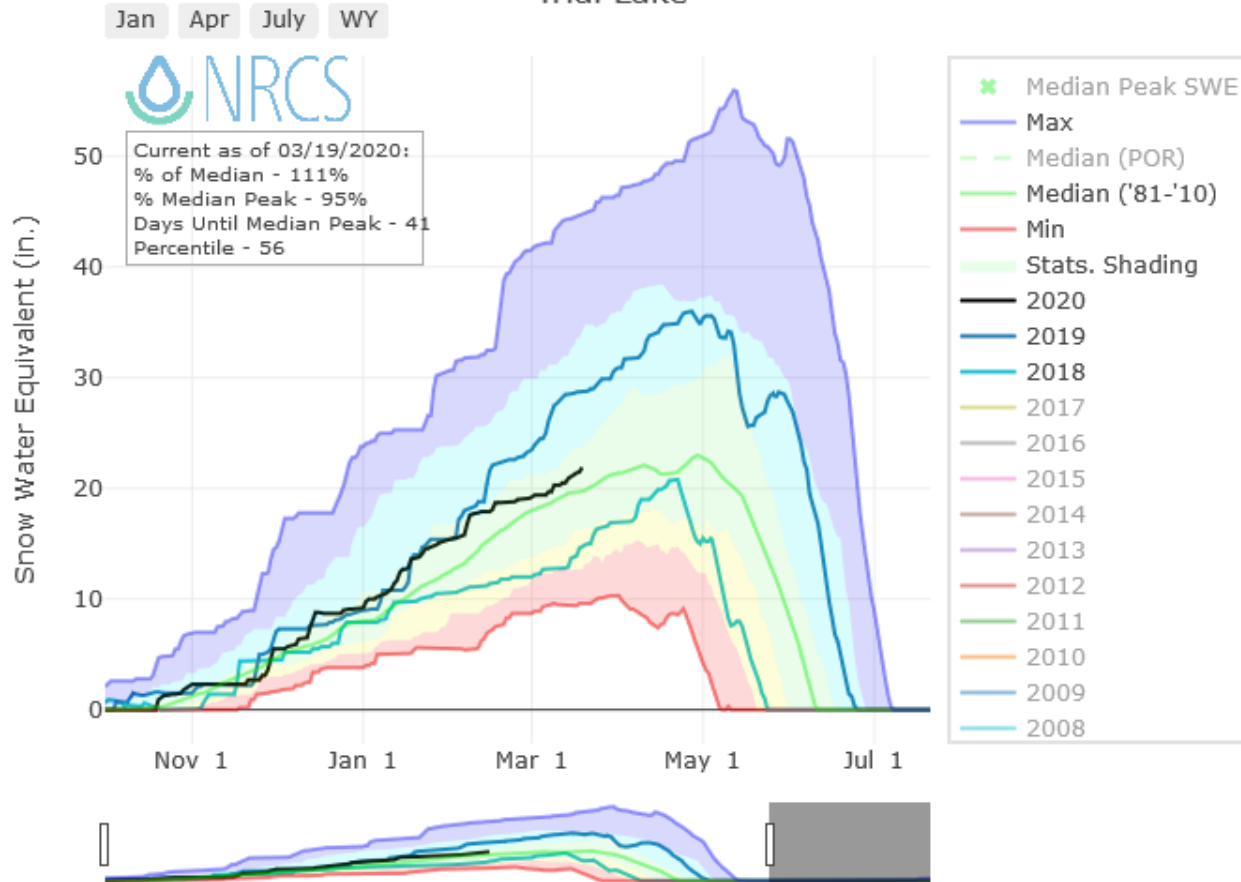


# Southern Utah



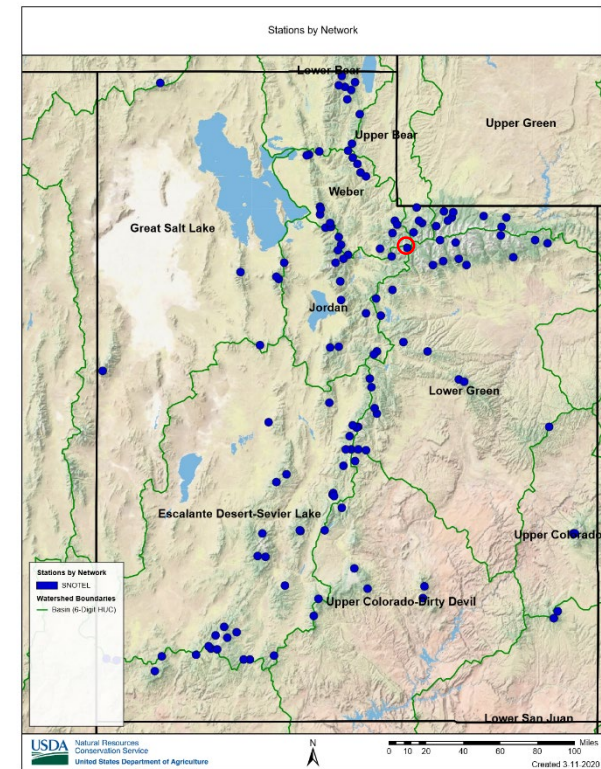


## Snow Water Equivalent at Trial Lake



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th Percentiles.

For more information visit: [30 year normals calculation description](#).



Utah snowpack  
compared with  
other Western  
states

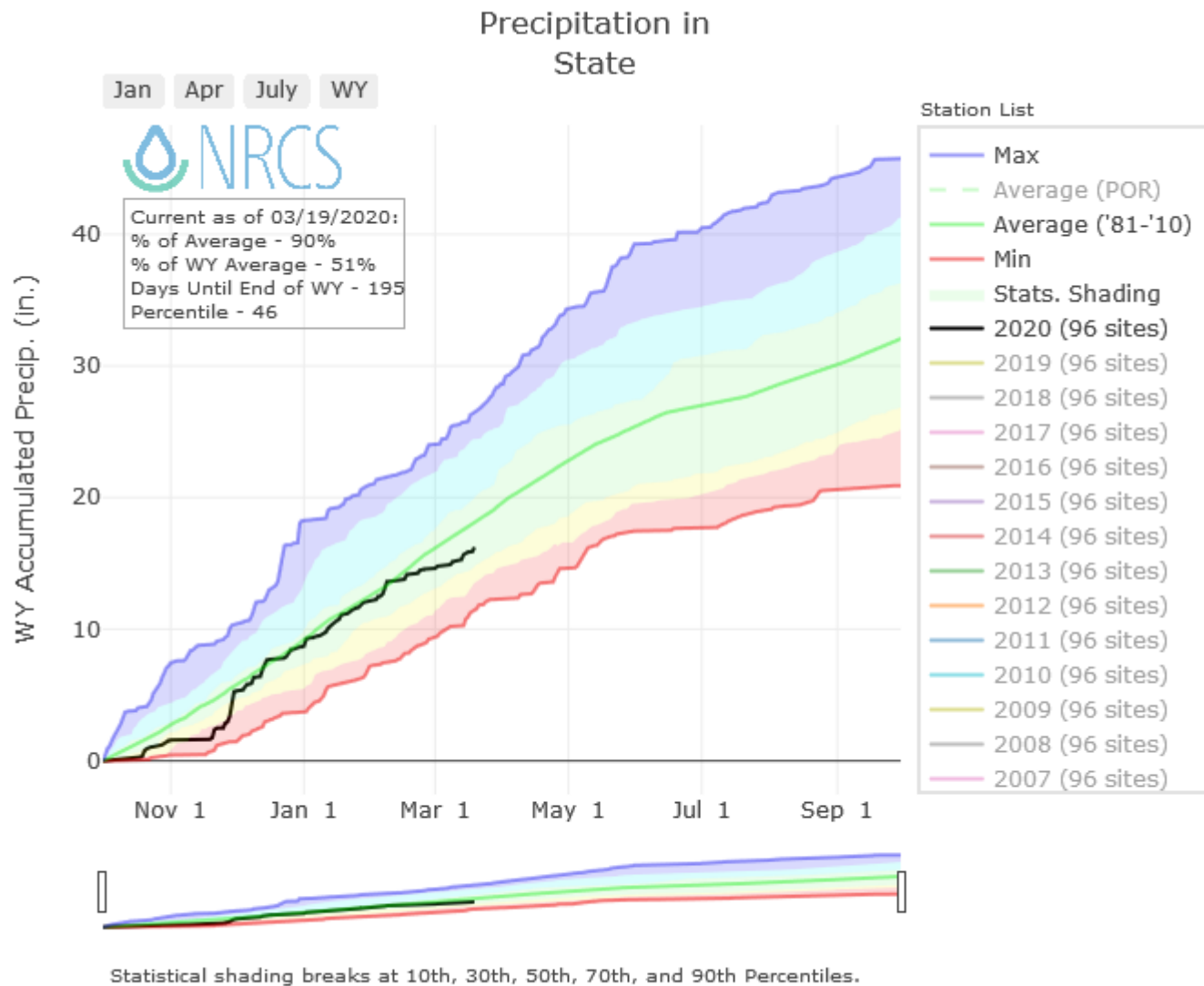
## Summary of Western US SNOTEL Snow/Precipitation Update Report

Based on Mountain Data from NRCS SNOTEL Sites

**\*\*Provisional data, subject to revision\*\***

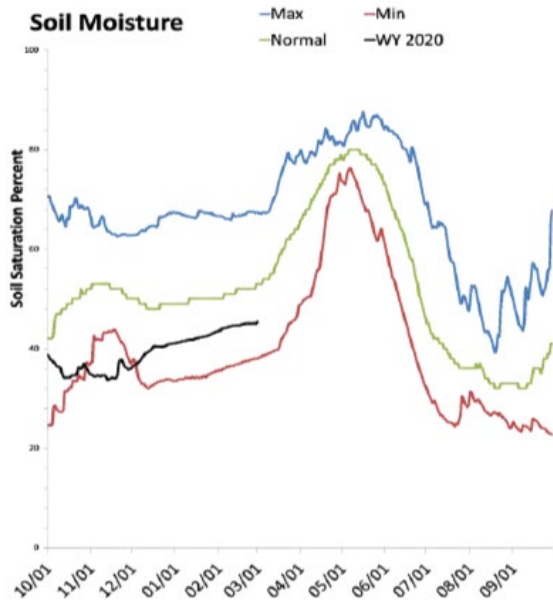
Data based on the first reading of the day (typically 00:00) for Thursday, March 19, 2020

State/River Basin	Snow Water Equivalent		Water Year-to-Date Precipitation	
	# of Sites	Percent of Median	# of Sites	Percent of Average
<b>Alaska</b>	26/59	*	40/59	114
<b>Arizona</b>	15/20	63	14/20	110
<b>California</b>	32/32	62	32/32	62
<b>Colorado</b>	95/104	103	93/104	89
<b>Idaho North of Salmon River</b>	29/31	109	27/31	92
<b>Idaho South of Salmon River</b>	63/65	92	64/65	80
<b>Montana</b>	83/91	113	86/91	98
<b>Nevada</b>	26/31	84	28/31	79
<b>New Mexico</b>	20/21	80	20/21	97
<b>Oregon</b>	70/78	88	71/78	78
<b>Utah</b>	86/90	99	86/90	90
<b>Washington</b>	54/67	104	56/67	103
<b>Wyoming</b>	79/85	112	78/85	99
<b>Arkansas River Basin</b>	5/6	91	5/6	80
<b>Colorado River Basin</b>	104/107	103	102/107	89
<b>Columbia River Basin</b>	240/266	101	243/266	91
<b>Missouri River Basin</b>	42/48	114	42/48	101
<b>Rio Grande River Basin</b>	24/29	86	24/29	85
<b>The Great Basin</b>	101/105	82	102/105	76

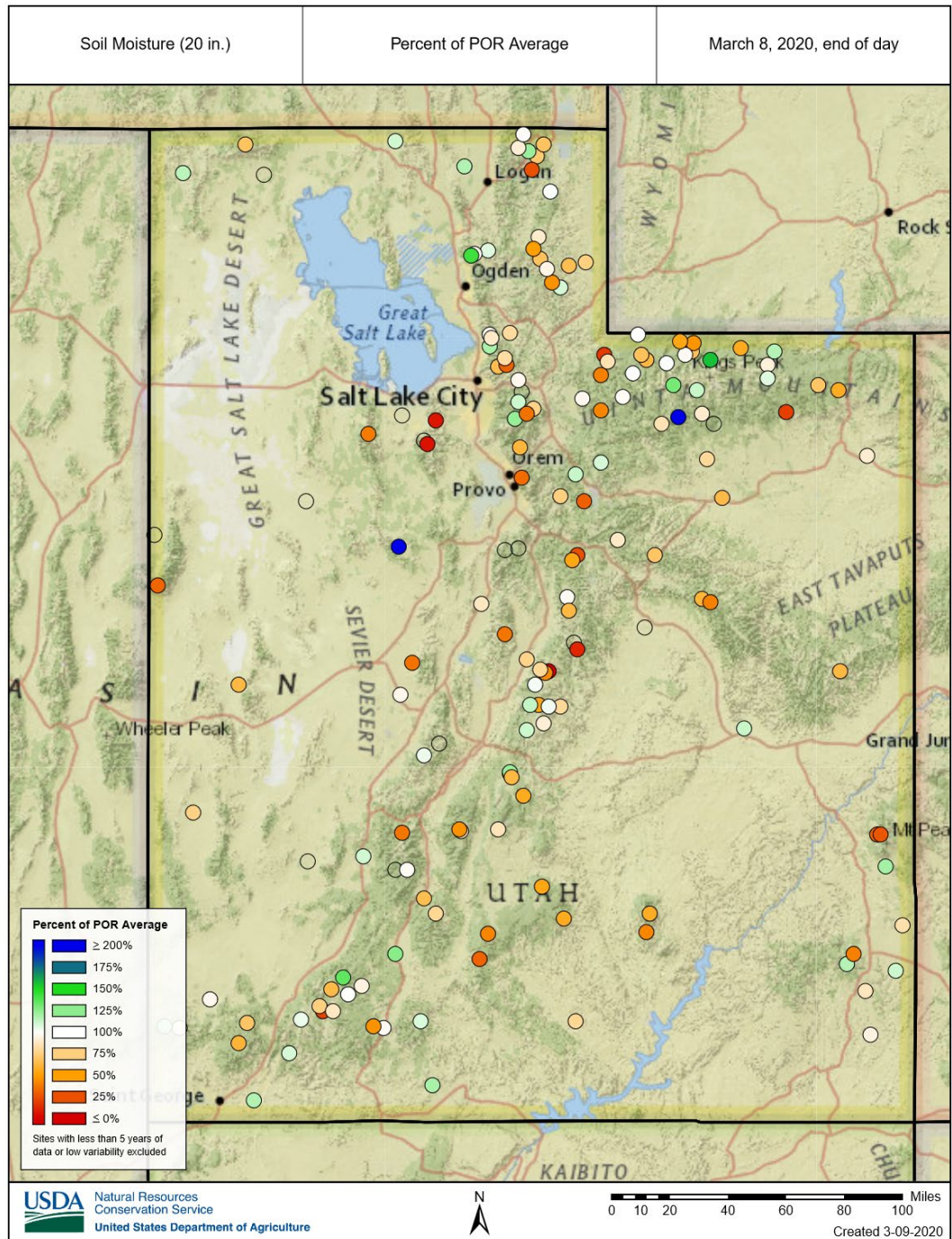


- Below average precipitation



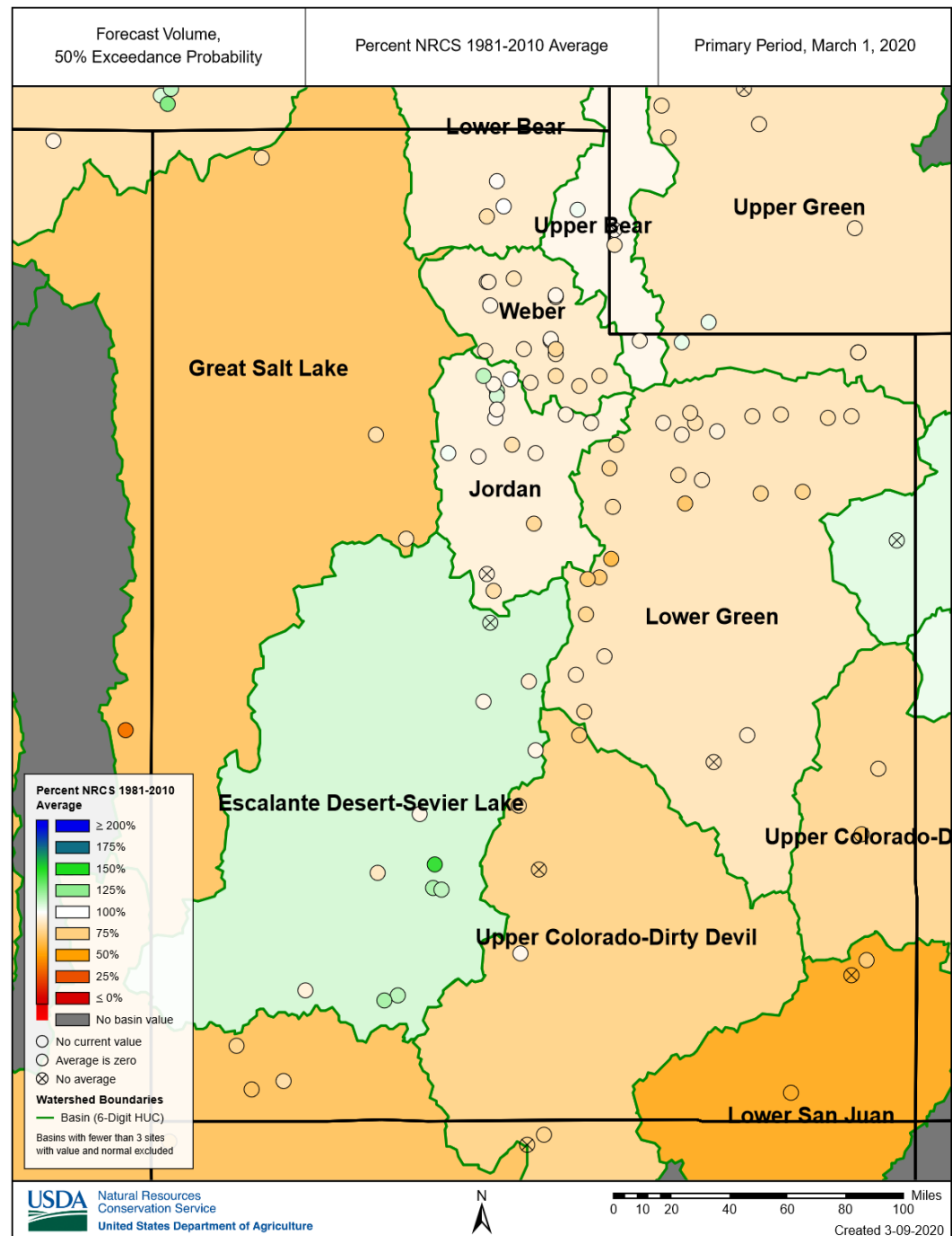


- Below average soil moisture



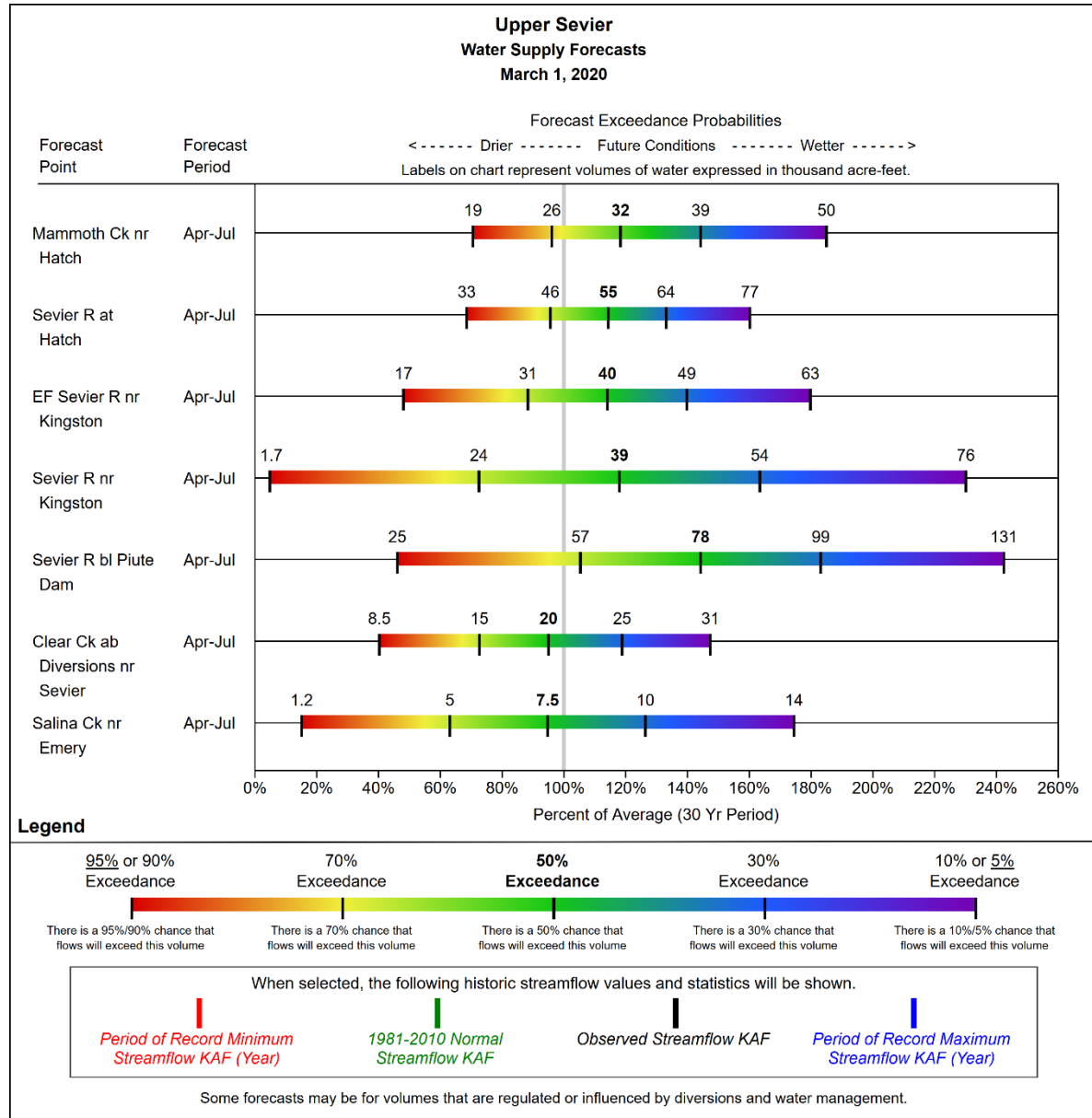
## Forecasts for April-July...

- Generally average to below-average forecasts
- Exception: Upper Sevier headwaters



# Example: Forecasts for Upper Sevier

These graphs  
are available  
for all Utah  
basins on our  
[webpage](#).

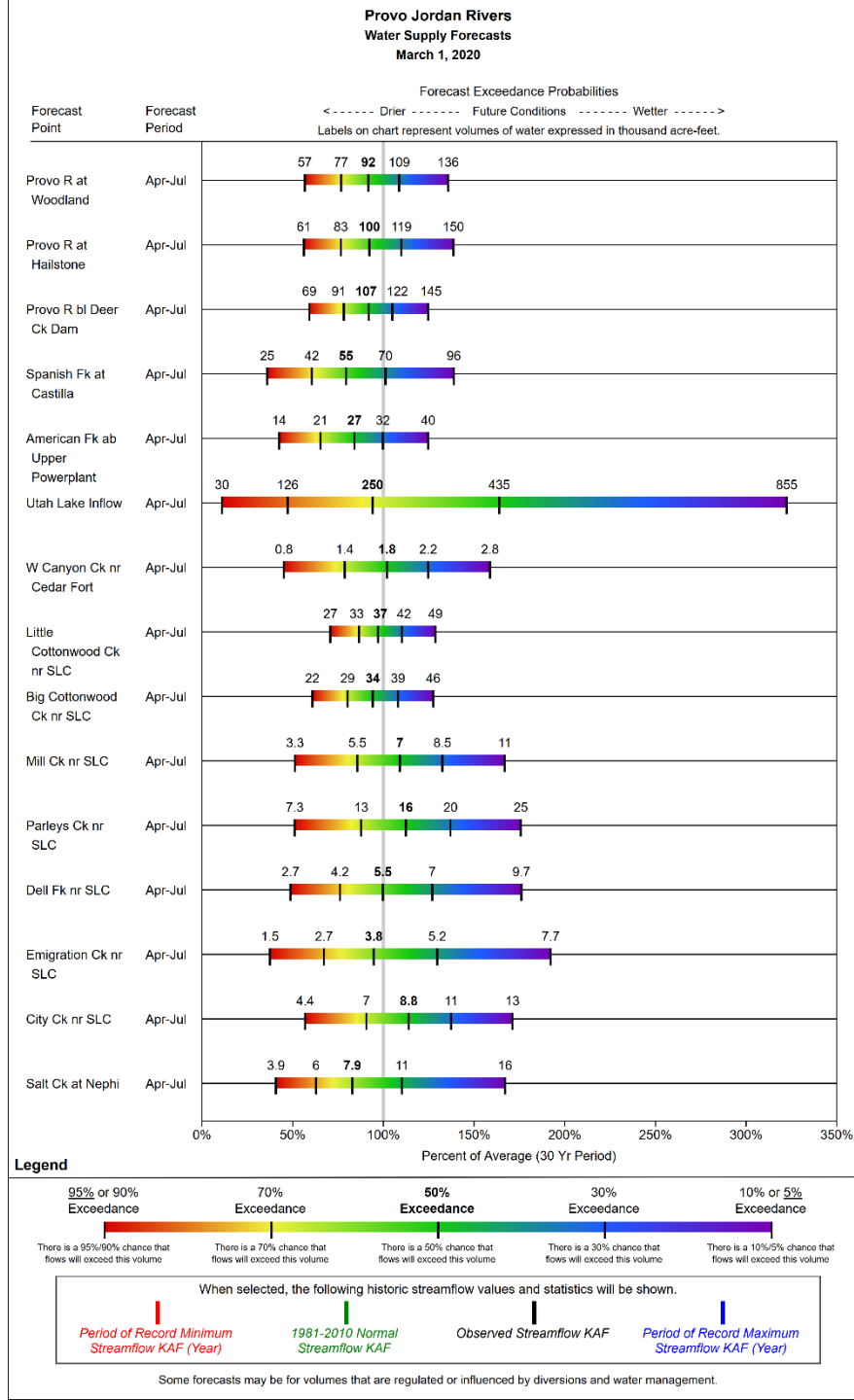




Example:

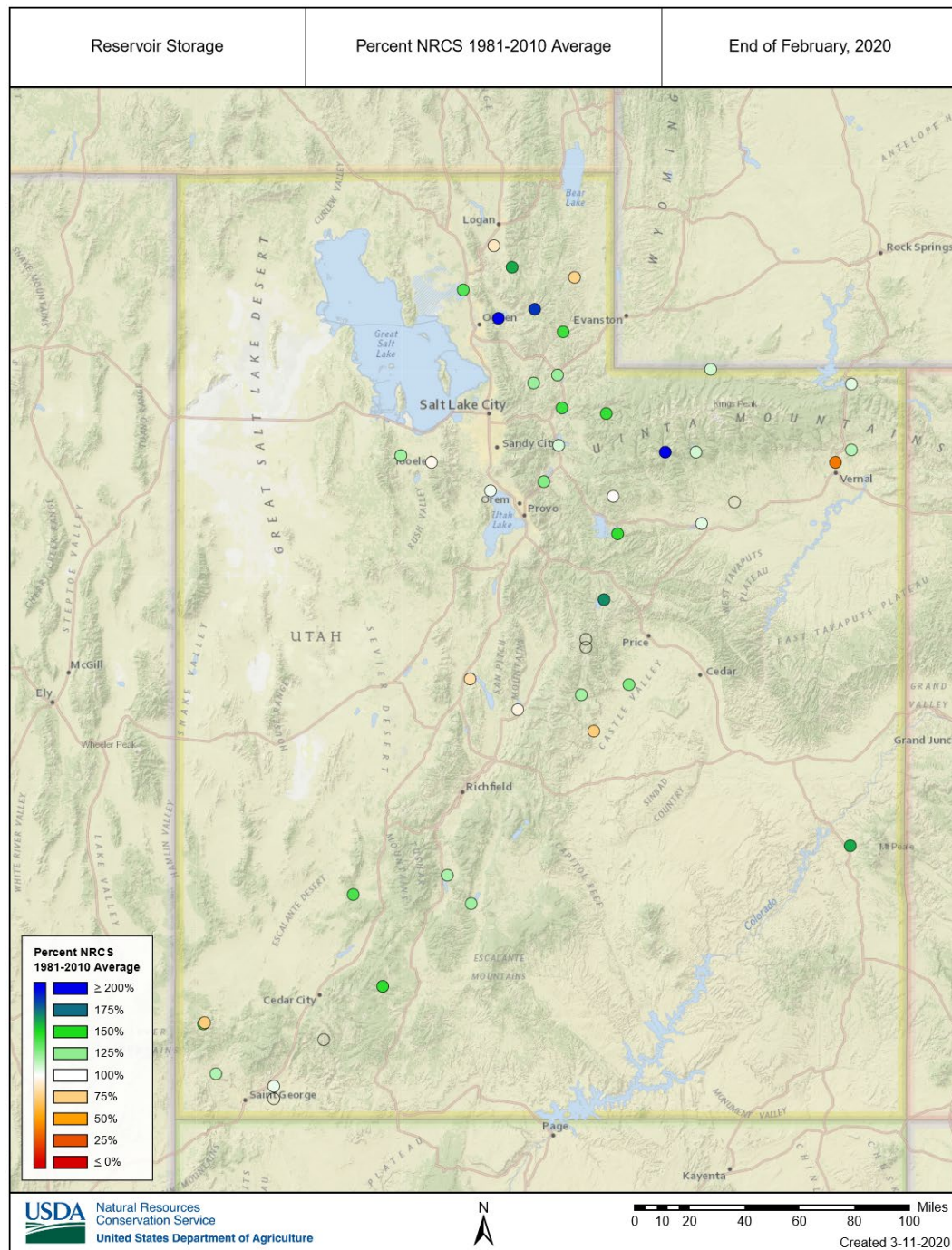
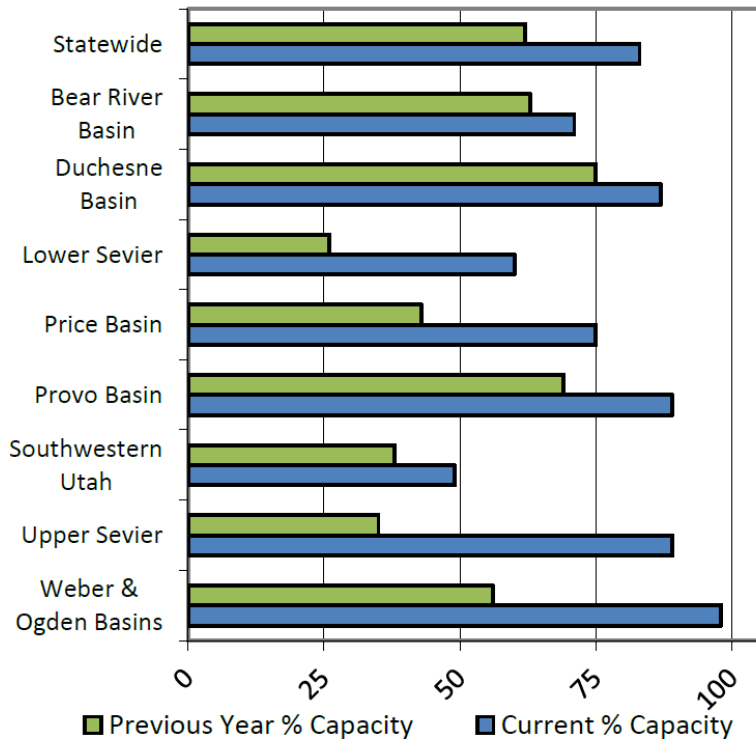
## Forecasts for Provo Jordan

These graphs are available for all Utah basins on our [webpage](#).



# Reservoir conditions

## Reservoir Storage



March 1, 2020

## Surface Water Supply Index

Basin or Region	Feb EOM <sup>*</sup> Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI <sup>#</sup>	Years with similar SWSI
	KAF <sup>^</sup>	KAF <sup>^</sup>	KAF <sup>^</sup>	%		
Bear River	908.2	152.0	1060.2	76	2.13	00, 17, 18, 82
Woodruff Narrows	52.7	104.0	156.7	63	1.12	05, 16, 19, 09
Little Bear	9.8	38.0	47.8	52	0.14	18, 16, 08, 93
Ogden River	174.5	107.0	281.5	85	2.95	97, 83, 84, 99
Weber River	363.9	300.0	663.9	63	1.12	93, 05, 19, 96
Provo River	1212.7	92.0	1304.7	59	0.77	08, 09, 10, 07
Western Uinta	181.5	104.0	285.5	78	2.34	87, 95, 82, 83
Eastern Uinta	30.0	60.0	90.0	29	-1.73	81, 12, 15, 07
Blacks Fork	11.0	90.0	101.0	45	-0.44	06, 18, 87, 08
Smiths Fork	5.7	28.0	33.7	61	0.88	14, 10, 01, 05
Price River	51.7	30.0	81.7	68	1.52	87, 96, 99, 95
Joe's Valley	47.9	49.0	96.9	59	0.71	93, 09, 08, 17
Ferron Creek	7.5	31.0	38.5	44	-0.51	15, 03, 87, 91
Moab	2.0	3.1	5.1	53	0.25	08, 99, 91, 07
Upper Sevier	110.5	78.0	188.5	80	2.54	99, 06, 85, 84
San Pitch	12.2	15.2	27.4	56	0.51	87, 05, 19, 09
Lower Sevier	140.7	94.0	234.7	56	0.51	07, 89, 88, 00
Beaver River	21.1	23.0	44.1	63	1.12	87, 81, 88, 93
Virgin River	39.0	51.9	90.9	62	1.01	99, 00, 01, 17

<sup>\*</sup>EOM, end of month; <sup>#</sup>SWSI, surface water supply index; <sup>^</sup>KAF, thousand acre-feet.



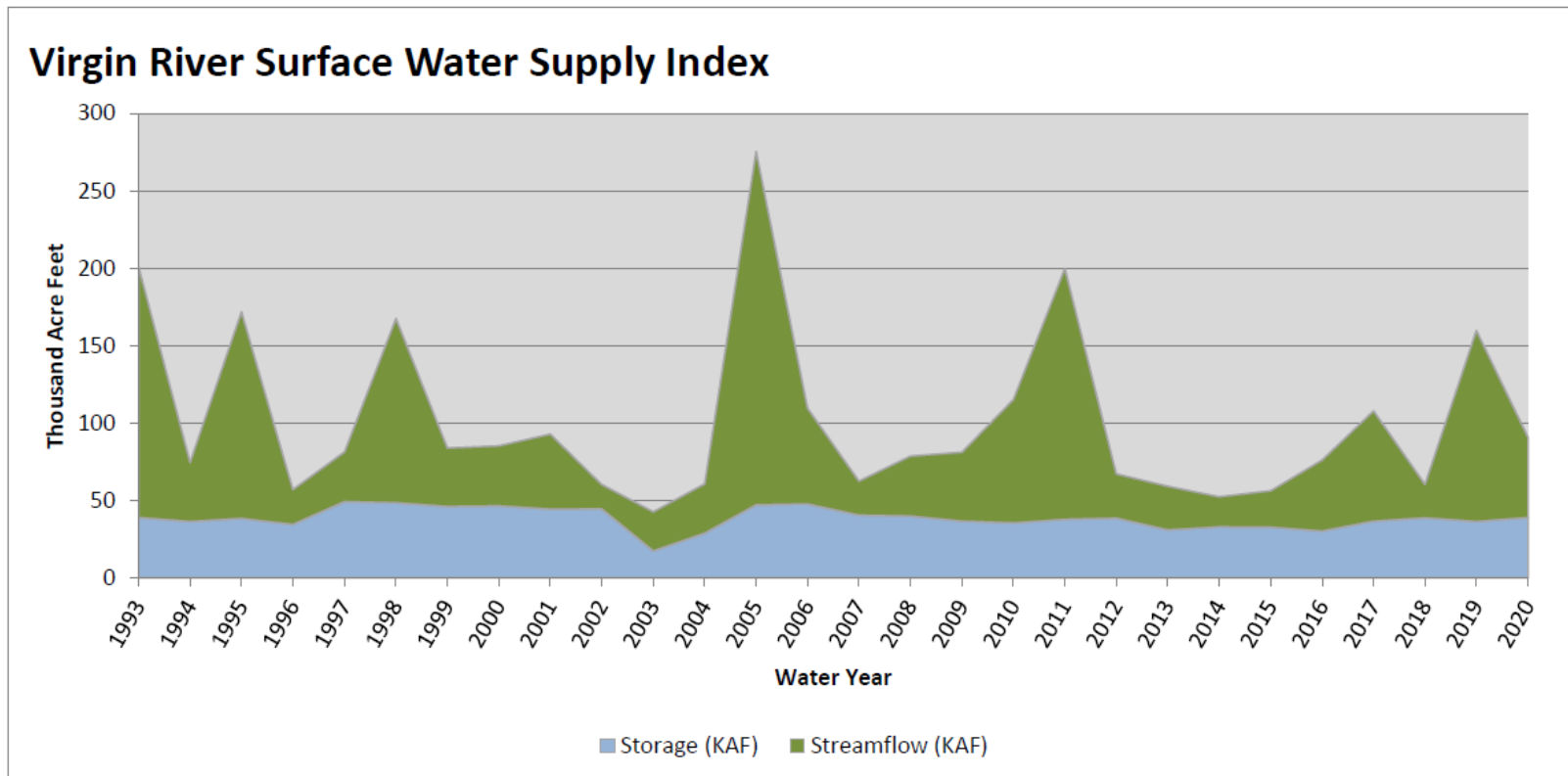
# Example: SWSI for Virgin River

March 1, 2020

## Surface Water Supply Index

Basin or Region	Feb EOM <sup>*</sup> Storage KAF <sup>^</sup>	APR-JUL Forecast KAF <sup>^</sup>	Storage + Forecast KAF <sup>^</sup>	Percentile %	SWSI <sup>#</sup>	Years with similar SWSI
Virgin River	38.96	51.90	90.86	62	1.01	99, 00, 01, 17

<sup>\*</sup>EOM, end of month; <sup>#</sup>SWSI, Surface Water Supply Index; <sup>^</sup>KAF, thousand acre-feet.



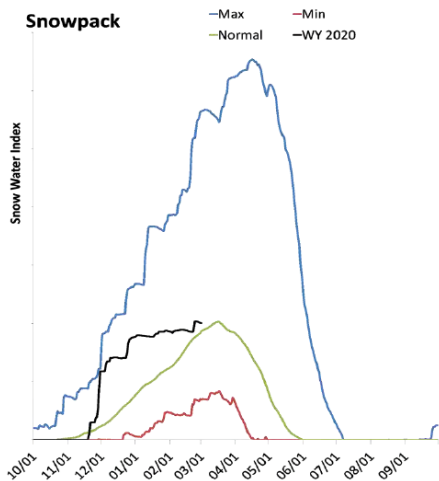
# Example: Basin Summary for SW Utah

## Southwestern Utah

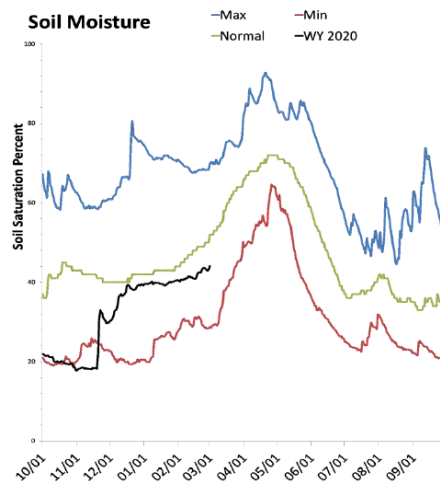
March 1, 2020

Snowpack in the Southwestern Utah is near normal at 107% of normal, compared to 162% last year. Precipitation in February was much below average at 38%, which brings the seasonal accumulation (Oct-Feb) to 90% of average. Soil moisture is at 44% compared to 51% last year. Reservoir storage is at 49% of capacity, compared to 38% last year. Forecast streamflow volumes range from 70% to 93% of average. The surface water supply index is 62% for the Virgin River.

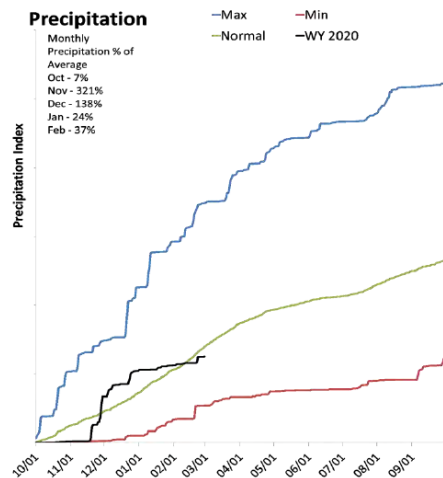
### Snowpack



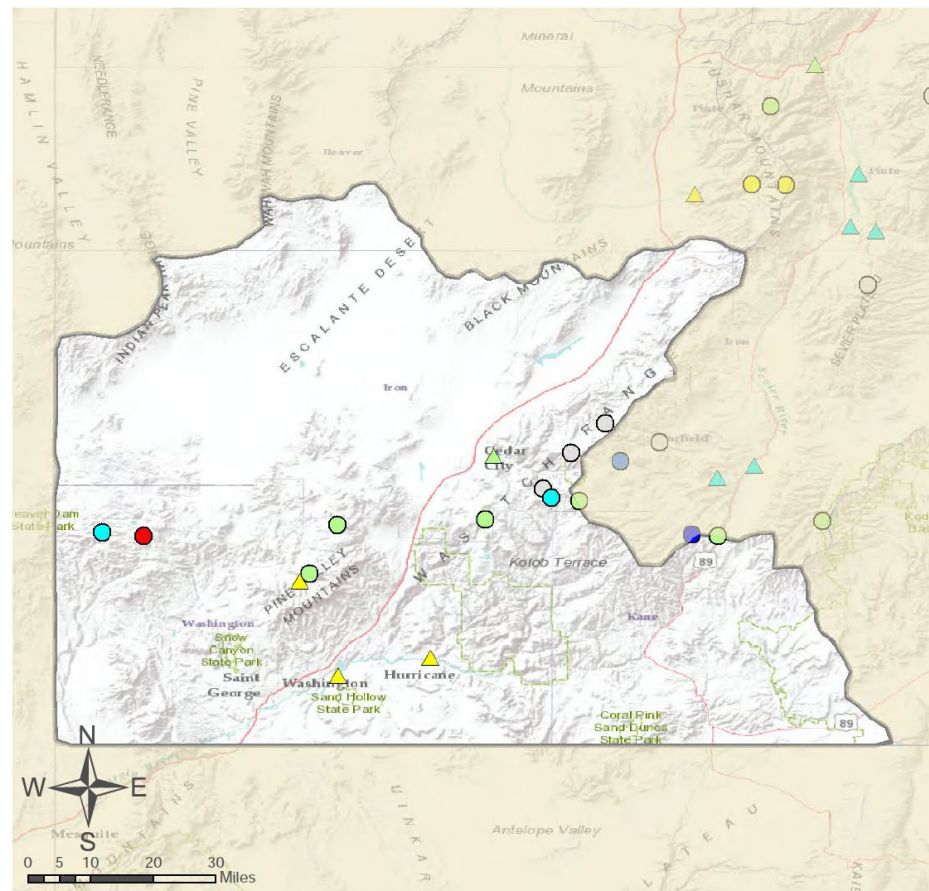
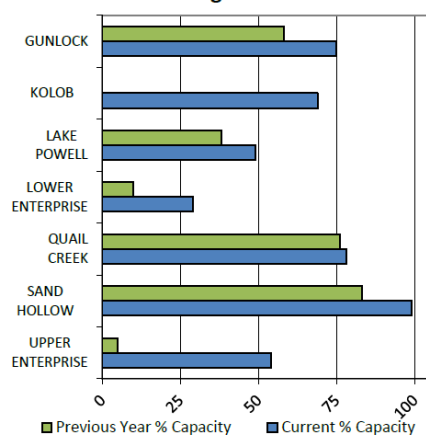
### Soil Moisture



### Precipitation



### Reservoir Storage



## Southwestern Utah

- SNOTEL Site
- △ Forecast Point

### As of March 1, 2020:

107% of Normal SWE  
 90% of Normal Precipitation  
 38% of Normal Precipitation Last Month  
 44% Saturation Soil Moisture  
 Southwestern Utah

### % of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal





# Utah Water Supply Outlook Report

March 1, 2020

- Current conditions summarized in Snow Survey's March 1<sup>st</sup> Water Supply Update Report
- go to: [Utah Snow Survey webpage](#) → “Water Supply” for pdf
- (or just email us...)



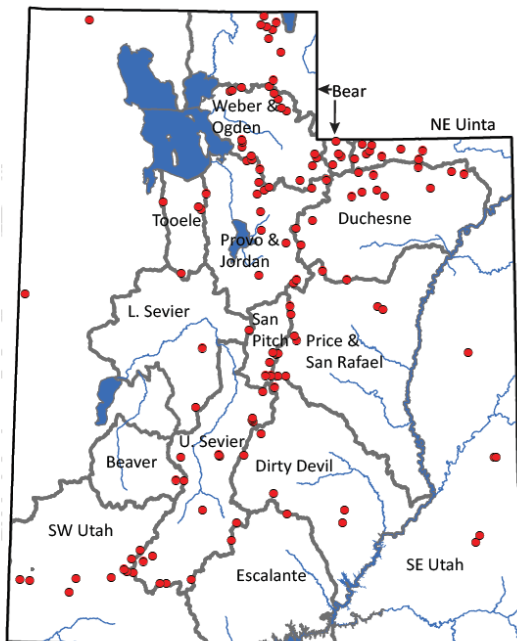
**Yankee Meadows SNOTEL, Iron County, Utah**

Photo by Lynn Kitchen

We also  
maintain SCAN  
sites...

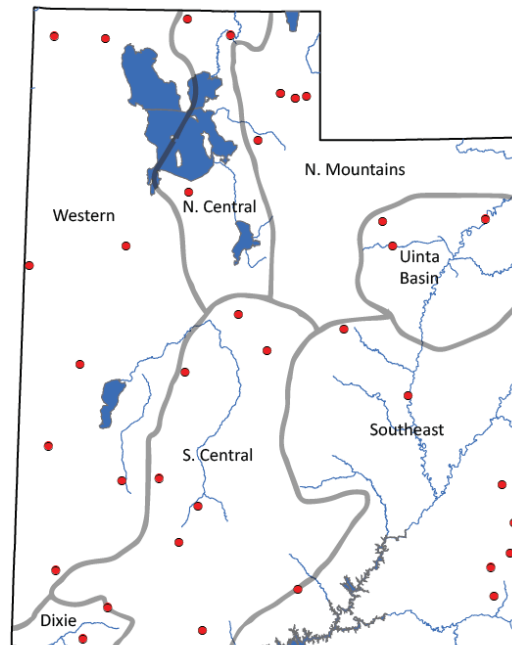
## SNOTEL

- Mountainous areas
- High elevation (>6,000 ft)
- Water supply forecasting
- Installed where snow pack represents the water supply



## SCAN

- Agricultural and range lands
- Mid elevation (3 – 7,000 ft).
- Irrigation efficiency and rangeland productivity
- Installed on spatially representative soils





# SCAN - Soil Climate Analysis Network



Slide courtesy of Kent Sutcliffe, Utah Snow Survey

# Soil Climate Analysis Network - Utah



## Utah Climate and Water Report

March 1, 2020



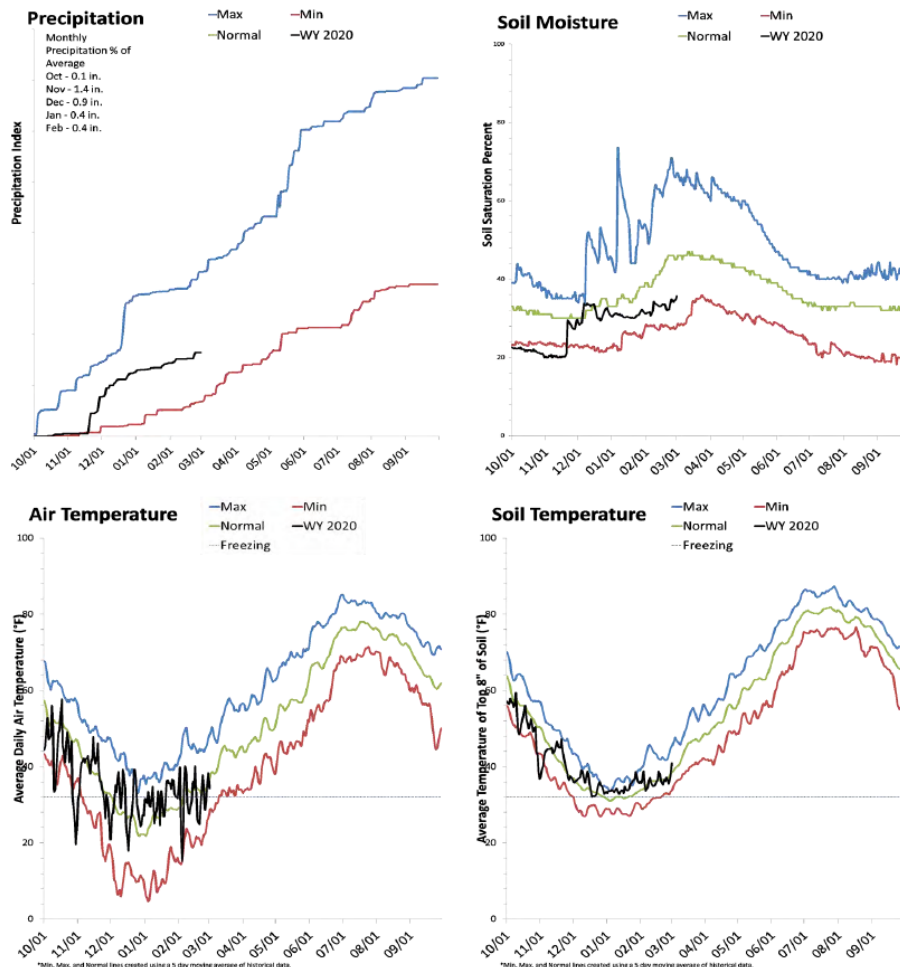
Blue skies at Thistle Flat SNOTEL, Wasatch Plateau, Utah

Photo by Kent Sutcliffe

### Western and Dixie

March 1, 2020

The average precipitation in February at SCAN sites within the basin was 0.4 inches, which brings the seasonal accumulation (Oct-Feb) to 3.3 inches. Soil moisture is at 35% compared to 30% last year.





March 1, 2020

## Water Availability Index

Basin or Region	Feb EOM* Storage	February Flow	Storage + Flow	Percentile	WAI#	Years with similar WAI
	KAF^	KAF^	KAF^	%		
Bear River	908	2.3	910	68	1.5	97, 19, 88, 87
Woodruff Narrows	52.7	2.3	55.0	85	3.0	98, 18, 17, 86
Little Bear	9.8	2.7	12.5	24	-2.2	16, 05, 19, 09
Ogden	174.5	2.4	176.9	98	4.0	86, 12, 99, 18
Weber	173.4	6.2	179.6	90	3.4	10, 94, 18, 12
Provo River	404.7	1.9	406.6	92	3.5	12, 98, 18, 06
Western Uinta	200.9	1.6	202.6	97	3.9	15, 00, 18, 12
Eastern Uinta	30.0	2.3	32.3	27	-1.9	95, 15, 93, 16
Blacks Fork	11.0	6.6	17.7	74	2.0	14, 92, 98, 87
Price	51.7	2.7	54.4	98	4.0	87, 12, 18, 85
Smiths Creek	5.7	0.4	6.1	49	-0.1	10, 00, 94, 18
Joes Valley	47.9	1.0	48.9	85	3.0	87, 06, 98, 12
Moab	2.0	0.3	2.3	88	3.2	17, 96, 07, 06
Upper Sevier River	110.5	10.4	120.9	71	1.7	83, 85, 12, 89
San Pitch	12.2	0.3	12.5	51	0.1	95, 89, 09, 11
Lower Sevier	140.7	20.1	160.8	44	-0.5	91, 14, 08, 90
Beaver	21.1	1.0	22.1	73	1.9	89, 86, 87, 06
Virgin River	39.0	7.5	46.5	42	-0.7	09, 18, 12, 07

\*EOM, end of month; # WAI, water availability index; ^KAF, thousand acre-feet.

- WAI values combine current streamflow and reservoir conditions.
- Percentiles are compared to 30 year average WAI values.



# Summary of Utah conditions

- Snow water equivalent: 100% normal
- Precipitation 90% normal
- Soil moisture: 45% saturated
- Reservoir storage: 83% full
- Streamflow forecasts: 60-120% average
- Surface Water Supply Index: 44<sup>th</sup> - 85<sup>th</sup> percentile

*Despite excellent reservoir carryover, the roughly average to below-average streamflow forecasts warrant caution for water managers...*



A snowcat, which is a small tracked vehicle with a black and orange body, is driving away from the viewer on a snowy mountain trail. The trail is marked with tracks in the snow. The surrounding landscape is a winter mountain scene with snow-covered slopes, evergreen trees, and distant mountain peaks under a blue sky with white clouds.

# ***Questions?***

Jordan Clayton

385-285-3118

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