Utah Water Supply Outlook Report

February 1, 2020

Temple Fork SNOTEL

Photo by Troy Brosten

Water Supply Outlook Reports
and Federal - State - Private Cooperative Snow Surveys

For more water supply and resource management information, contact: your local Natural Resources Conservation Service Office or:
Snow Surveys
245 N Jimmy Doolittle Rd, SLC Utah, 84116. Phone (385)285-3118
Email Address: jordan.clayton@usda.gov

How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snowcourses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in statistical and simulation models to prepare runoff forecasts. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

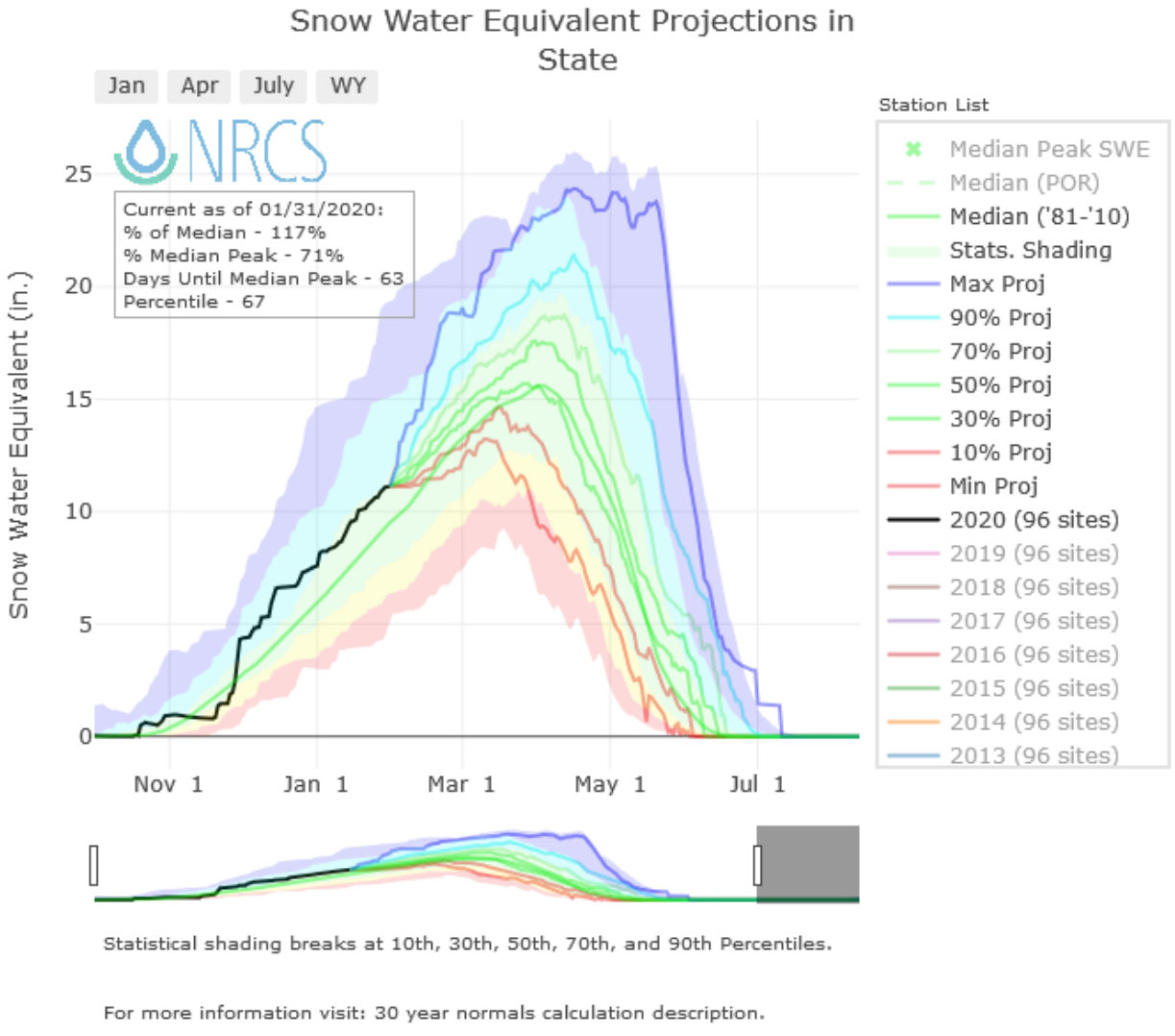
The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

STATE OF UTAH GENERAL OUTLOOK
February 1, 2020

SUMMARY

Utah's snowpack continues to be above-average throughout the state! As of February 1st, our statewide snow water equivalent (SWE) is 117% of normal, with just over 2 months to go until the typical peak accumulation. The individual SNOTEL sites with the most SWE are Snowbird (27.2"), Tony Grove Lake (25.0"), and Ben Lomond Peak (21.6"). The site doing the best in terms of percent normal is Harris Flat SNOTEL at 223%.

Things are looking hopeful for us to remain above average for the rest of the winter. Below is our "spaghetti graph" showing the projected statewide snow water equivalent (in inches) for the remainder of the water year for a range of possible outcomes. The rainbow colors in the background are shaded based on the 10th, 30th, 50th, 70th, and 90th percentiles. These projections suggest that even if we receive slightly lower than average snowfall from now on (30% projection curve), we'll receive about 5" of SWE statewide and will remain at around the statewide average based on our last 30 years' observations (green "median" line). Conversely, if we get average snowfall from now on, we'll end up at roughly the 70th percentile for snowpack. That's good news because soil moisture values at our SNOTEL sites are below average (43% of saturation), and the dry soils and low antecedent streamflow—because of the unusually dry summer—require us to have an above-average snowpack this winter to produce fairly average runoff conditions. So let's hope that snow keeps falling!



As we noted in last month's report, precipitation started off slowly this water year but has improved substantially; current statewide precipitation is 96% of average. Southern Utah watersheds are generally above or close to 100% of normal precipitation, and all Northern Utah basins are between 90-97% of normal (except for the NE Uintas).

Streamflow forecasts for April to July are generally between 90 and 110% of average in northern Utah, with slightly above average flows predicted for the Wasatch Front. The snowpack in the Sevier River headwater areas is still doing well despite lower totals for January, which is reflected in the correspondingly optimistic forecasts for that region. Southeastern and Southwestern Utah are also predicted to have above average runoff from this year's snowpack. Forecasts are a little lower for the Price River (78%), White River (73%), Fish Creek near Scofield Reservoir (83%), and other nearby streams.

Surface Water Supply Indices (combining reservoir storage and forecast streamflow) are highest for the Upper Sevier, Bear River, Beaver, and Western Uinta watersheds.

SNOWPACK

Statewide snowpack is above normal at 117% compared to 103% last year. The Southwestern Utah and Escalante watersheds are currently above 150% snow water equivalent (SWE), with the Upper Sevier, Southeastern Utah, Northeastern Uintas, and Tooele-Vernon areas not far behind. The only major basin less than 100% SWE is the Beaver at 97%.

PRECIPITATION

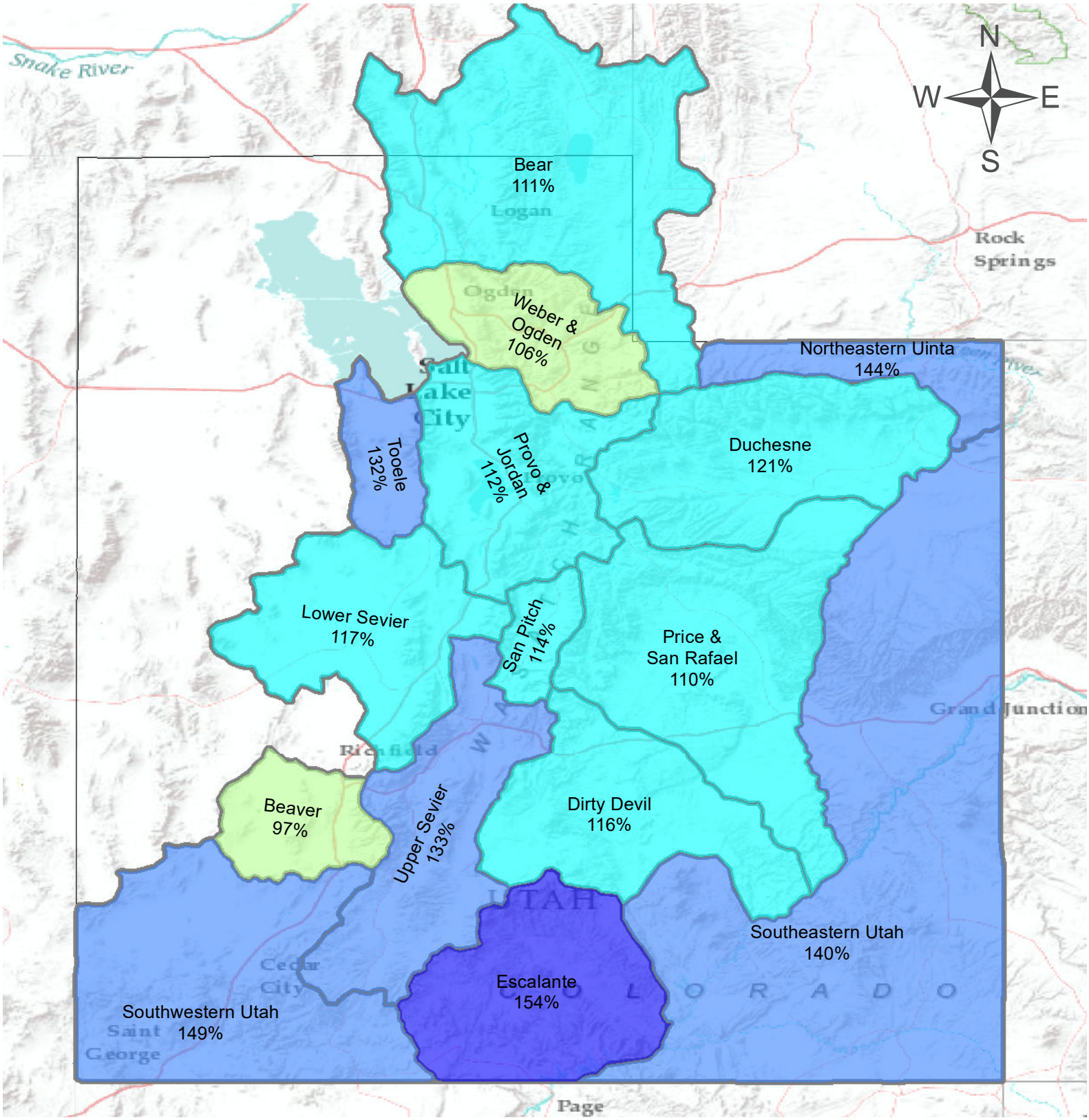
January precipitation across the state was average at 99%, which brings the seasonal accumulation (Oct-Jan) to 96% of average. While our water year total precipitation got off to a slow start, we caught up after some large storms, and now our statewide percent of average has been hovering just below 100% for the past month.

RESERVOIRS

Reservoir storage is at 80% of capacity statewide compared to 60% last year. Due to the excellent 2019 water year, overall reservoir levels remain relatively high despite the dry conditions last summer.

STREAMFLOW

As noted above, the streamflow forecasts for April to July reflect not just the snow water equivalent but also the dry start to the water year and the below-average soil moisture. This explains the lower forecasts for the Price and White Rivers (78% and 73% of average, respectively). At the other end, the Sevier River near Kingston is the most optimistic, with 142% of average flow expected during the April to July runoff period.



Statewide Snow Water Equivalent

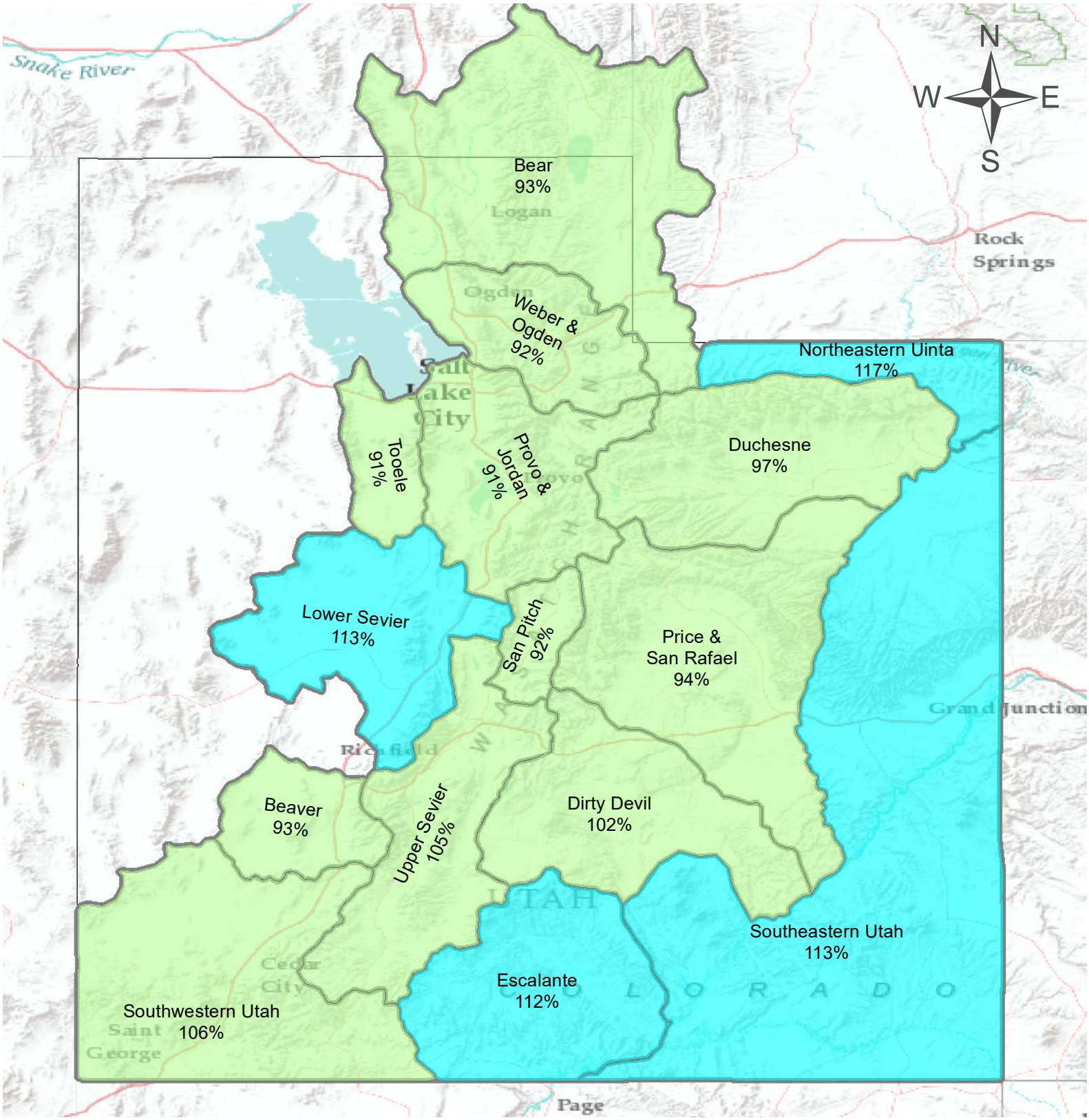
As of February 1, 2020:

117% of Normal Snow Water Equivalent

0 10 20 40 60 80 100
Miles

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%



Statewide Precipitation

As of February 1, 2020:

96% of Normal Precipitation

99% of Normal Precipitation Last Month

0 10 20 40 60 80 100
Miles

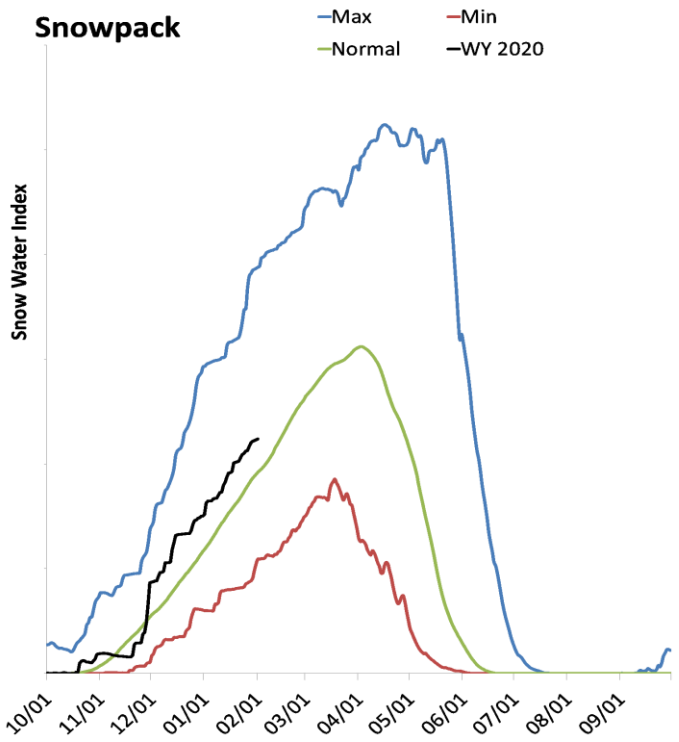
% of Normal

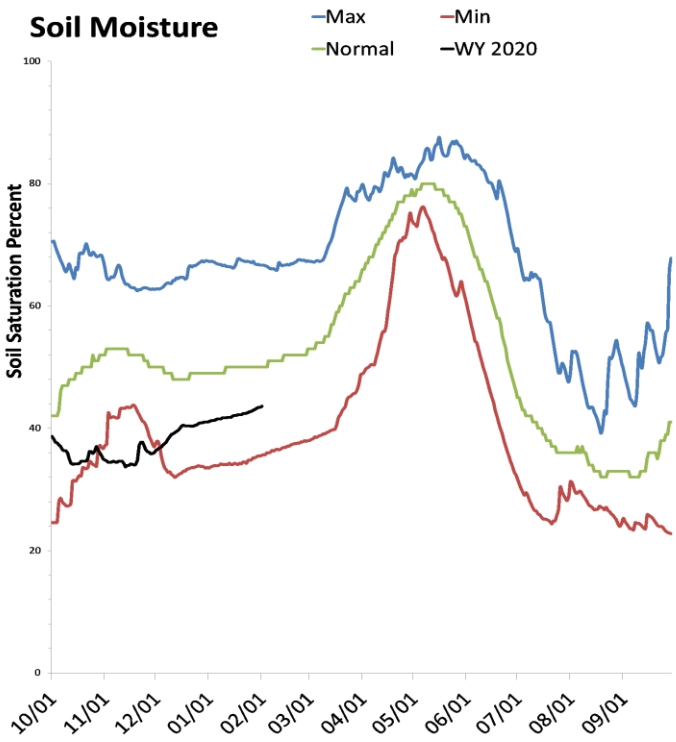
- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%

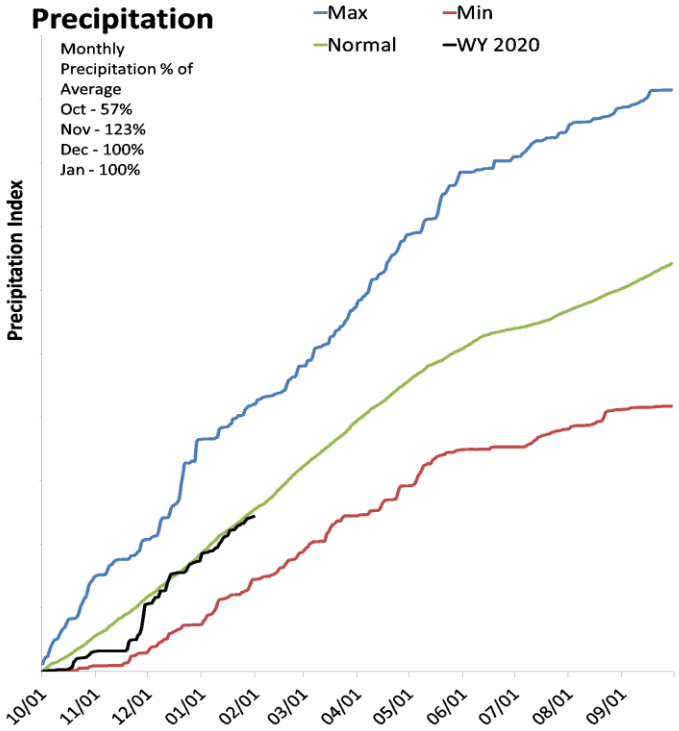
Statewide Utah

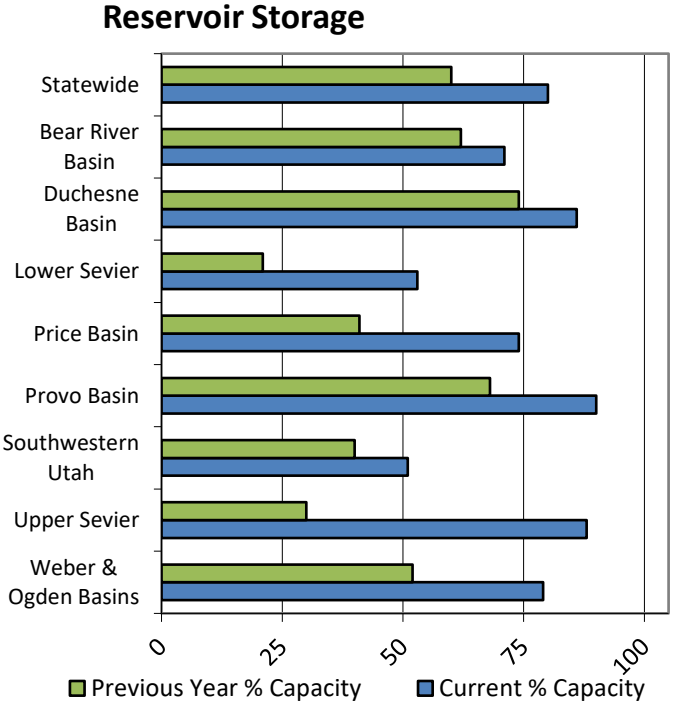
February 1, 2020

Snowpack in Utah is above normal at 117% of normal, compared to 103% last year. Precipitation in January was near average at 99%, which brings the seasonal accumulation (Oct-Jan) to 96% of average. Soil moisture is at 43% compared to 49% last year. Reservoir storage is at 80% of capacity, compared to 60% last year. Forecast streamflow volumes range from 78% to 142% of average.







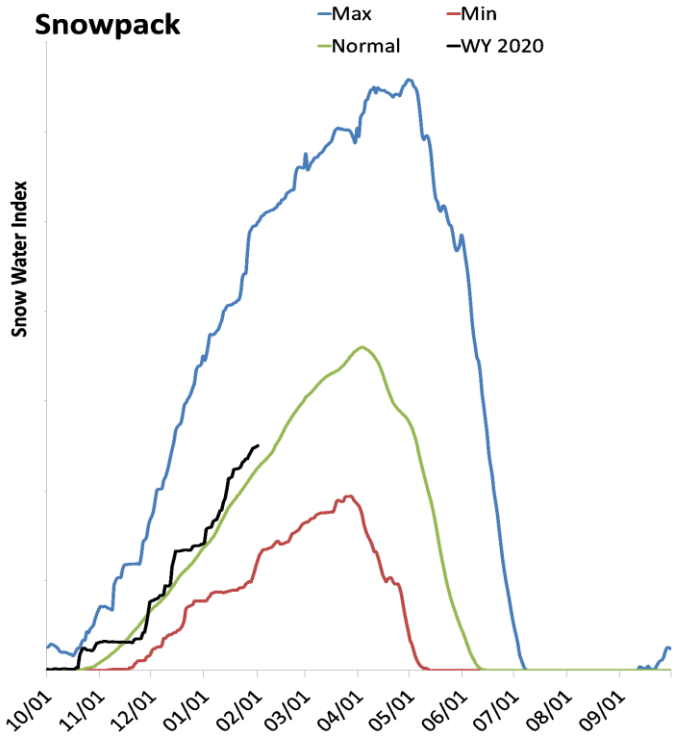


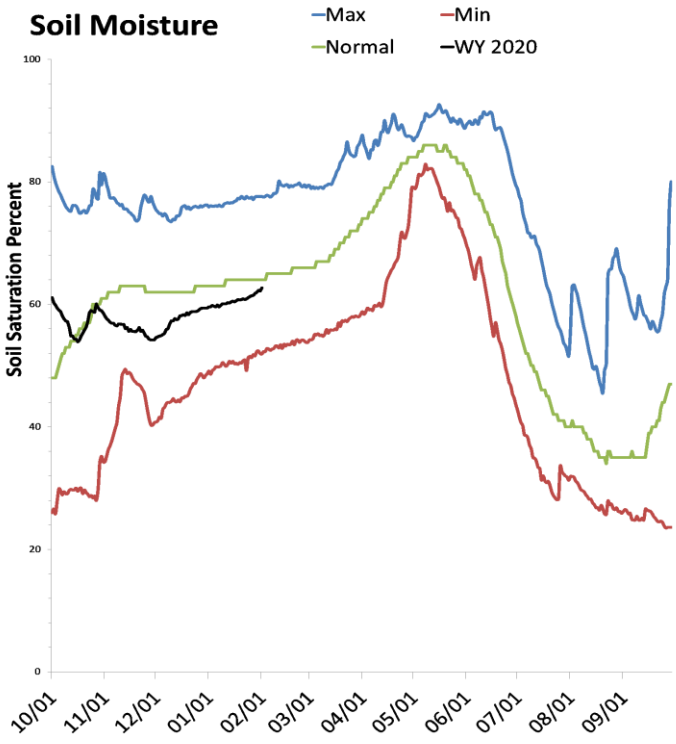
SNOTEL Data

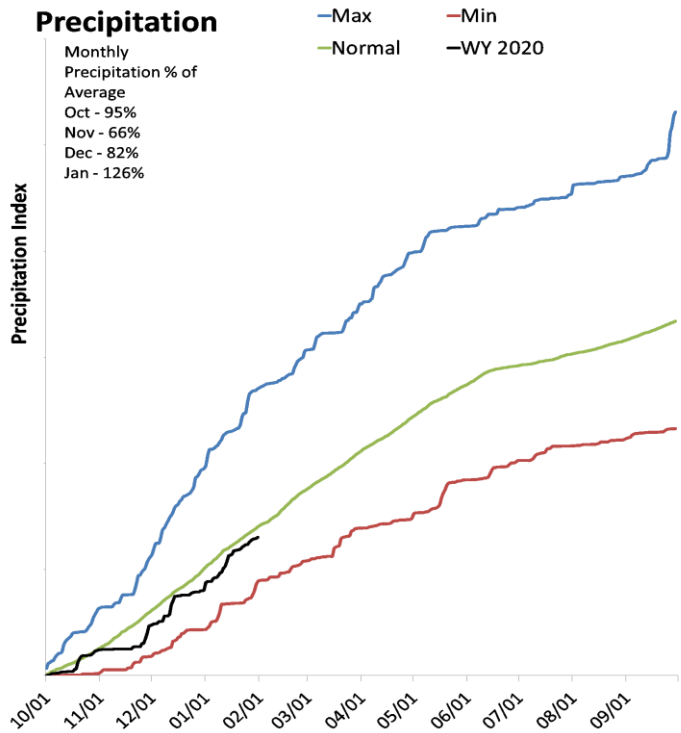
Bear River Basin

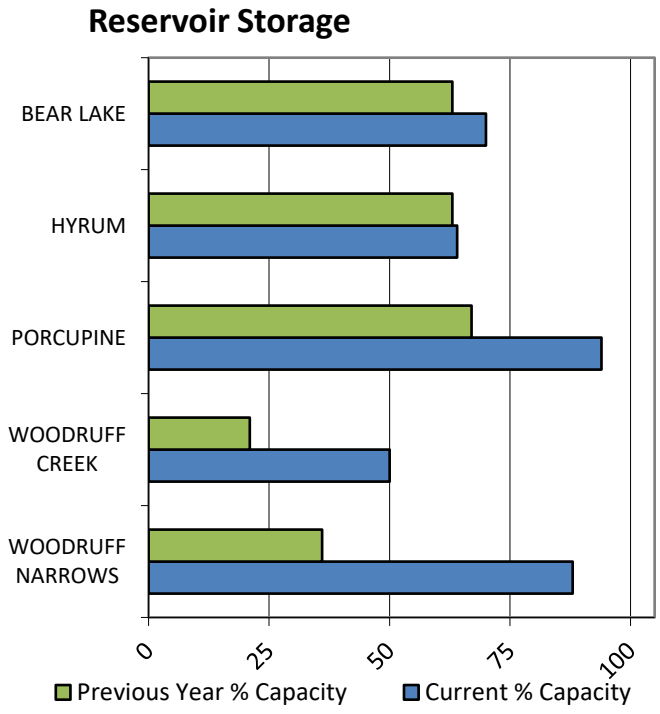
February 1, 2020

Snowpack in the Bear River Basin is above normal at 111% of normal, compared to 89% last year. Precipitation in January was above average at 125%, which brings the seasonal accumulation (Oct-Jan) to 93% of average. Soil moisture is at 62% compared to 58% last year. Reservoir storage is at 71% of capacity, compared to 62% last year. Forecast streamflow volumes range from 93% to 107% of average. The surface water supply index is 76% for the Bear River, 63% for the Woodruff Narrows, 59% for the Little Bear.









SNOTEL Data

Data Current as of: 2/6/2020 11:17:36 AM

Bear River
Streamflow Forecasts - February 1, 2020

Bear River	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Bear R nr UT-WY State Line								
	APR-JUL	74	98	115	103%	131	155	112
	APR-SEP	82	108	126	102%	144	171	123
Bear R ab Resv nr Woodruff								
	APR-JUL	38	90	125	103%	161	215	121
	APR-SEP	37	94	132	103%	171	230	128
Big Ck nr Randolph								
	APR-JUL	0.34	2.7	4.3	113%	5.9	8.3	3.8
Smiths Fk nr Border								
	APR-JUL	60	77	89	100%	101	119	89
	APR-SEP	70	90	104	100%	118	138	104
Bear R bl Stewart Dam								
	FEB-JUL	61	153	215	100%	275	370	215
	FEB-SEP	66	168	240	100%	310	410	240
	MAR-JUL	53	144	205	100%	265	355	205
	MAR-SEP	55	156	225	98%	295	395	230
	APR-JUL	26	112	170	93%	230	315	183
	APR-SEP	38	135	200	98%	265	360	205
Little Bear at Paradise								
	APR-JUL	20	36	46	102%	56	72	45
Logan R nr Logan								
	APR-JUL	70	96	113	102%	130	156	111
Blacksmith Fk nr Hyrum								
	APR-JUL	24	37	46	107%	55	68	43

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2020	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Bear Lake	912.3	820.7	584.8	1302.0
Hyrum Reservoir	9.8	9.7	10.2	15.3
Porcupine Reservoir	10.6	7.6	6.0	11.3
Woodruff Creek	2.0	0.9	2.4	4.0
Woodruff Narrows Reservoir	50.6	20.7	29.0	57.3
Basin-wide Total	985.4	859.6	632.4	1389.9
# of reservoirs	5	5	5	5

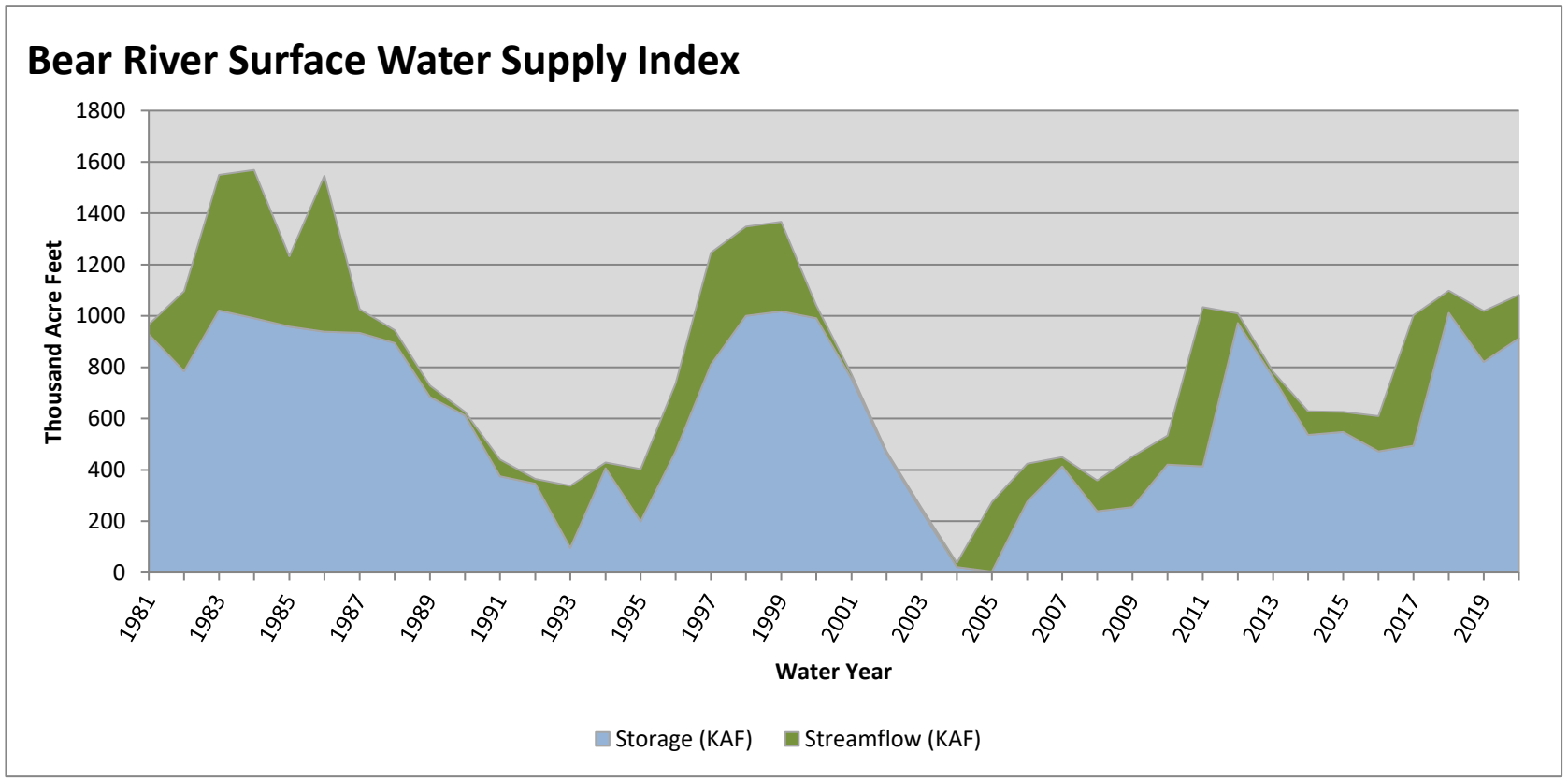
Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Upper Bear	3	118%	111%
Middle Bear	7	112%	86%
Lower Bear	3	93%	77%
Logan River	7	114%	87%

February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Bear River	**912.33**	**170.00**	**1082.33**	**76**	**2.13**	**11, 00, 82, 18**

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

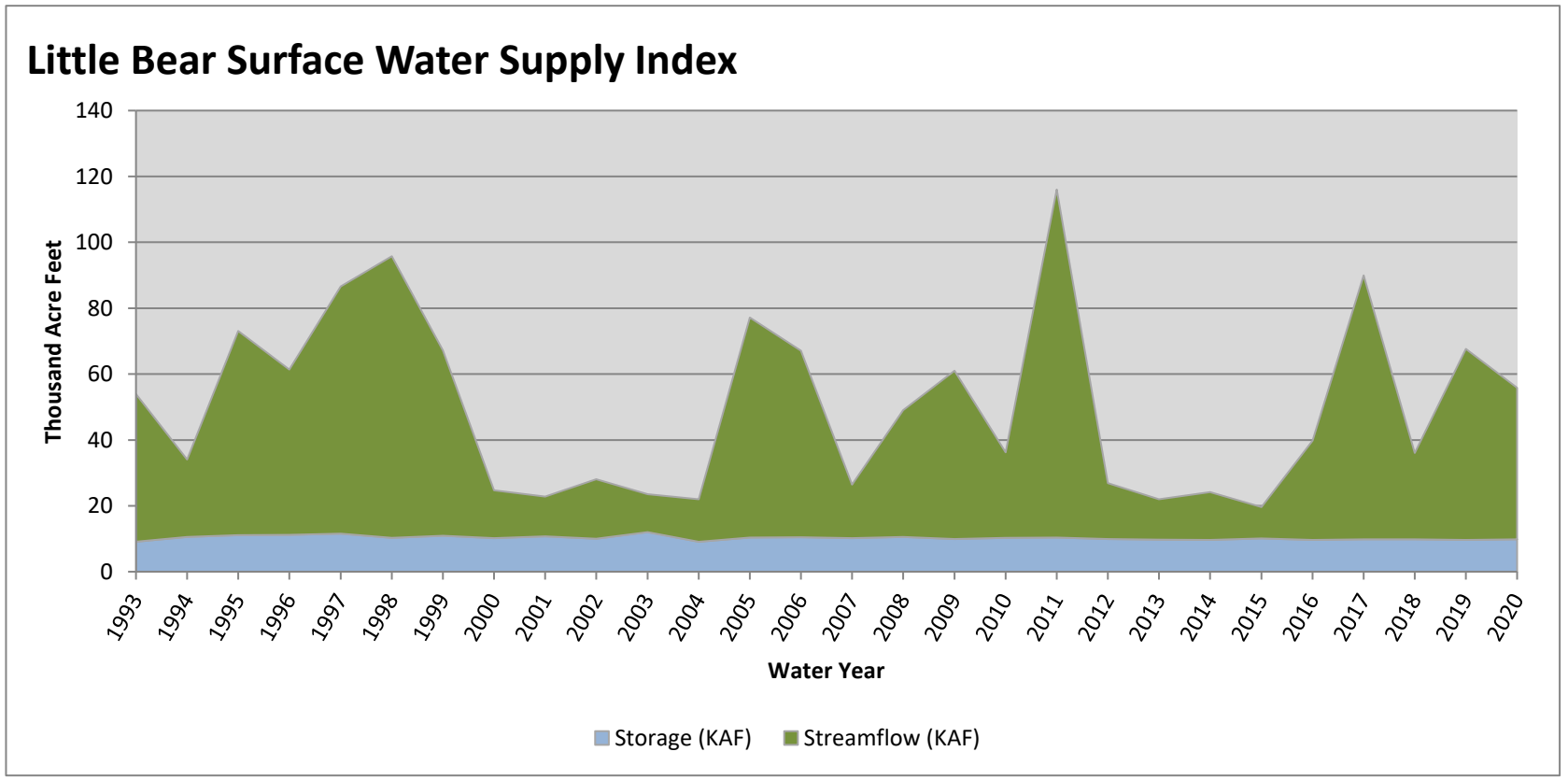


February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Little Bear	**9.84**	**46.00**	**55.84**	**59**	**0.72**	**08, 93, 09, 96**

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

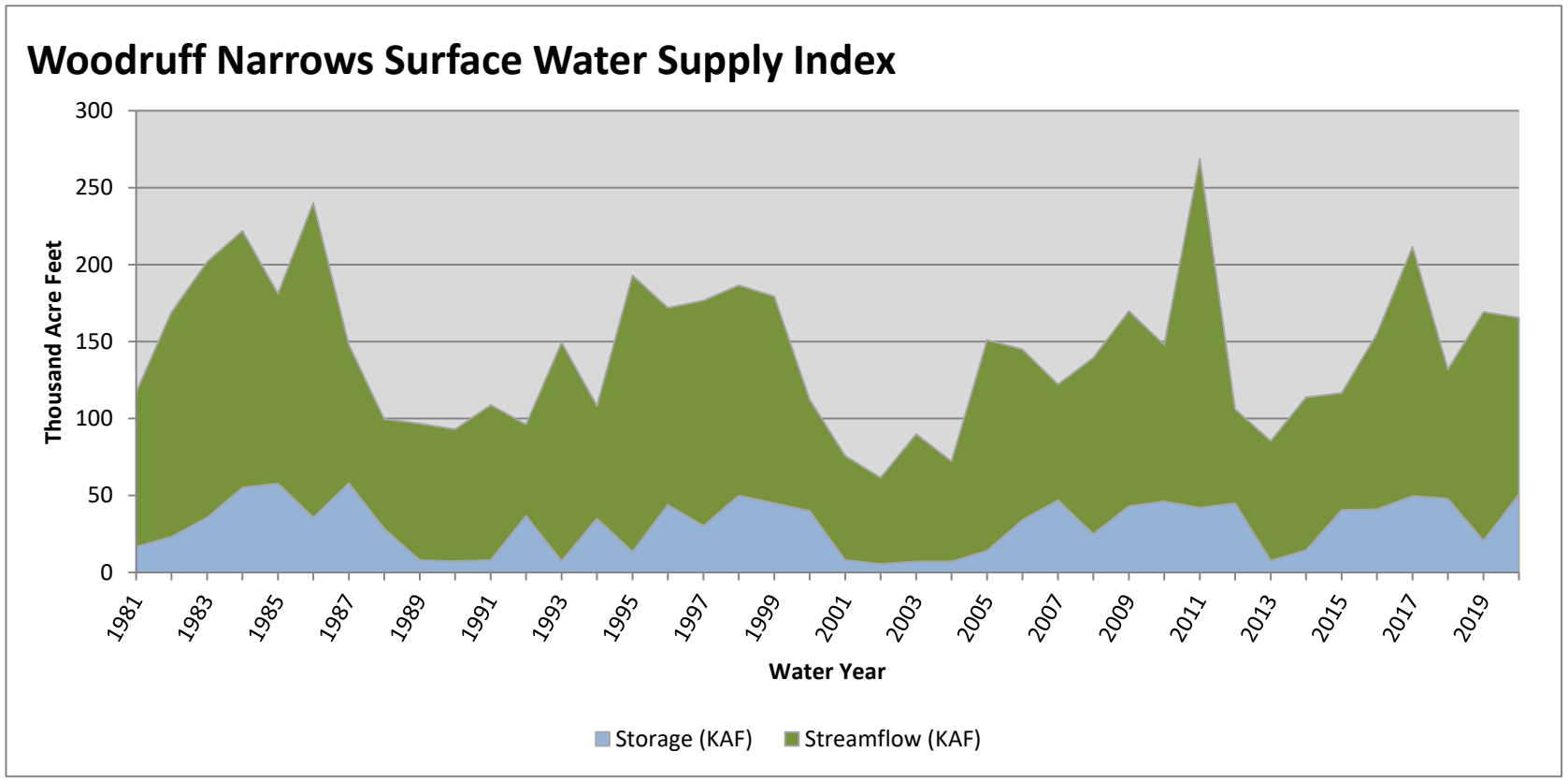


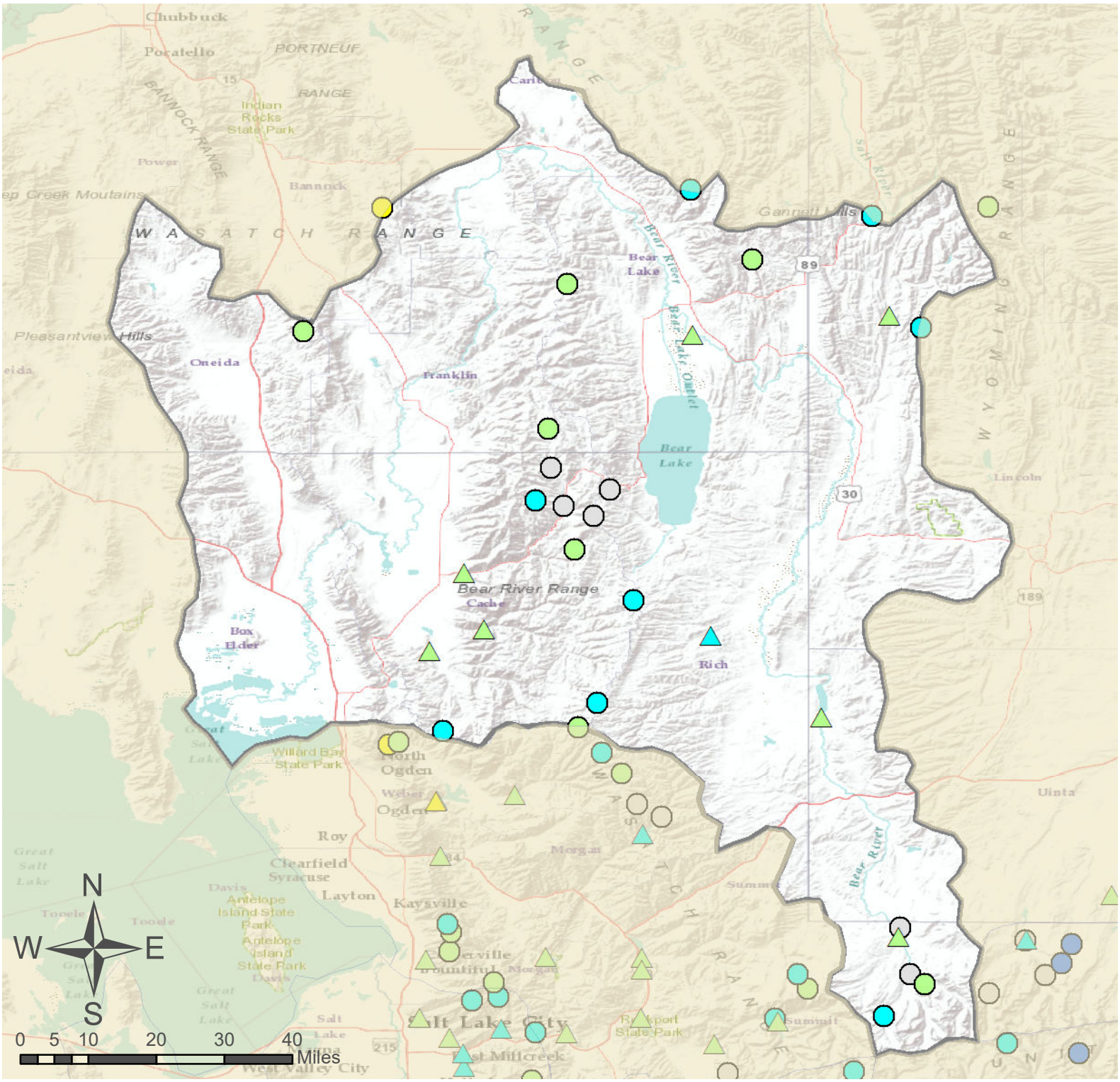
February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Woodruff Narrows	**50.59**	**115.00**	**165.59**	**63**	**1.12**	**05, 16, 82, 19**

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





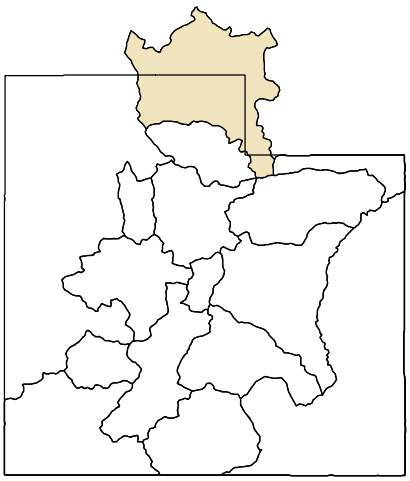
Bear River Basin

SNOTEL Site

Forecast Point

% of Normal

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



As of February 1, 2020:

111% of Normal SWE

93% of Normal Precipitation

125% of Normal Precipitation Last Month

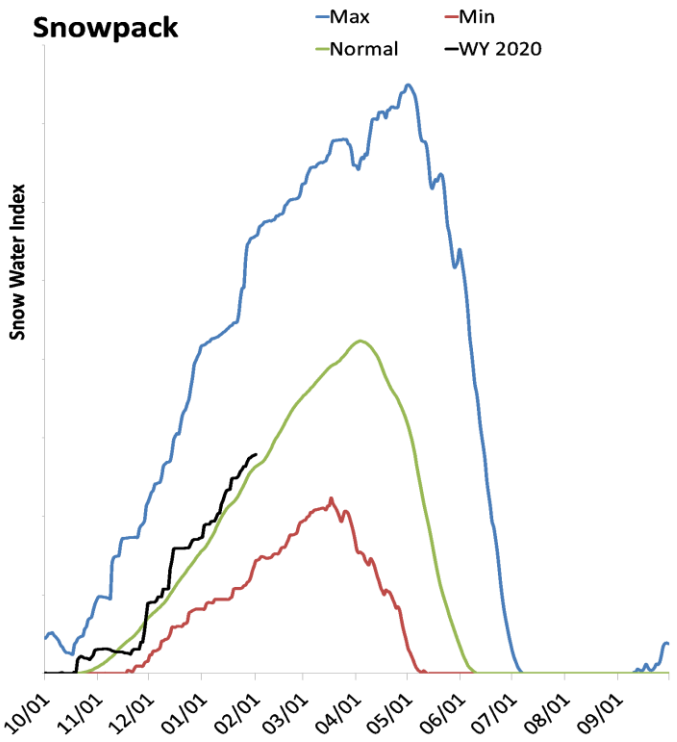
62% Saturation Soil Moisture

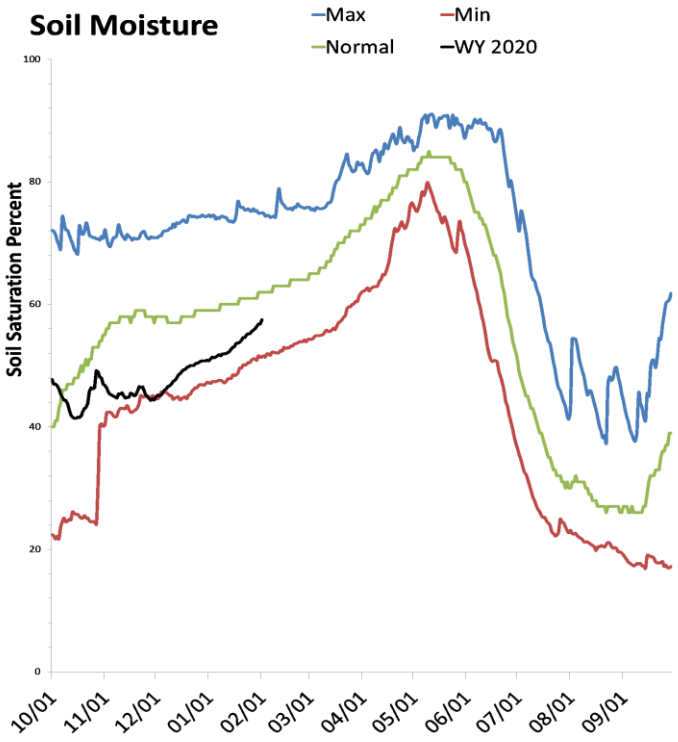
Bear River Basin

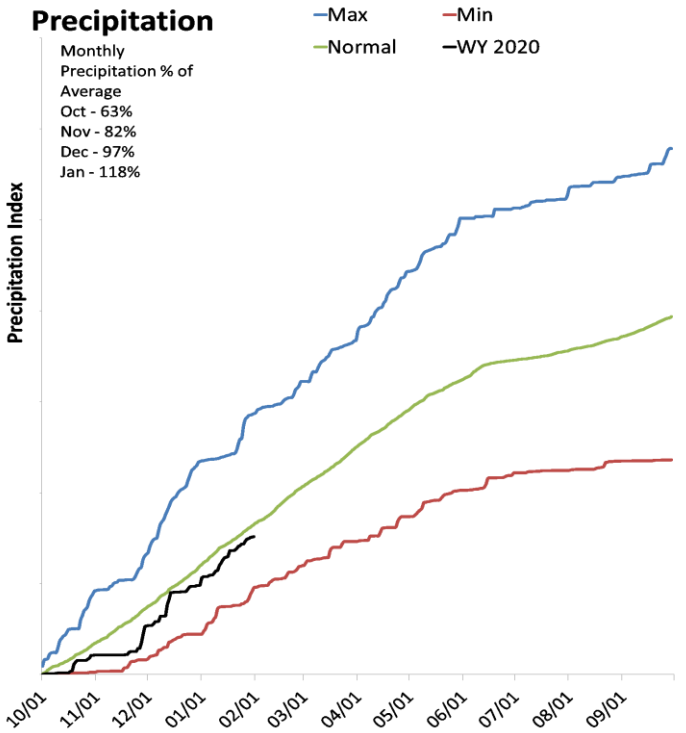
Weber & Ogden River Basins

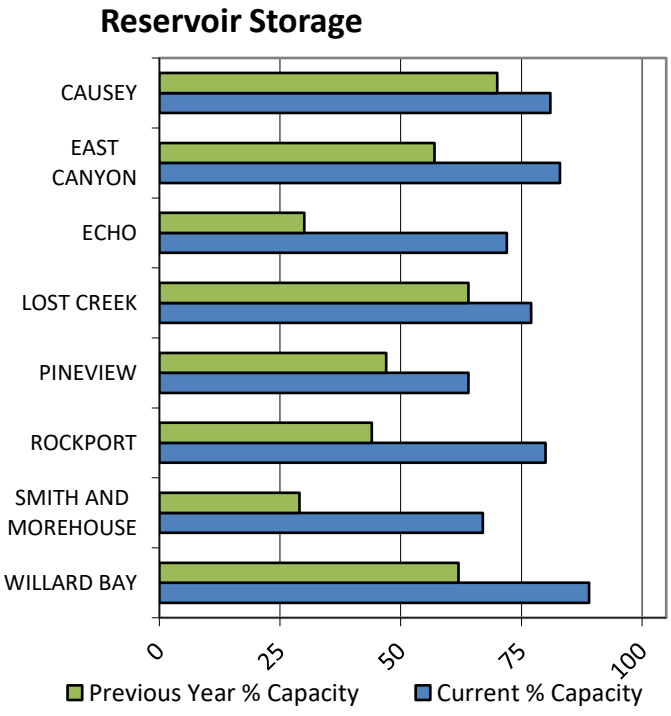
February 1, 2020

Snowpack in the Weber & Ogden River Basins is near normal at 106% of normal, compared to 100% last year. Precipitation in January was above average at 117%, which brings the seasonal accumulation (Oct-Jan) to 92% of average. Soil moisture is at 57% compared to 58% last year. Reservoir storage is at 79% of capacity, compared to 52% last year. Forecast streamflow volumes range from 87% to 114% of average. The surface water supply index is 63% for the Ogden River, 71% for the Weber River.









SNOTEL Data

Data Current as of: 2/6/2020 11:17:47 AM

Weber Ogden Rivers
Streamflow Forecasts - February 1, 2020

Weber Ogden Rivers	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Smith & Morehouse Resv Inflow	APR-JUL	24	29	33	97%	37	42	34
Weber R nr Oakley	APR-JUL	67	93	111	95%	129	155	117
Rockport Reservoir Inflow	APR-JUL	55	91	116	94%	141	177	123
Chalk Ck at Coalville	APR-JUL	12.1	28	39	95%	50	66	41
Weber R nr Coalville	APR-JUL	55	92	117	93%	142	178	126
Echo Reservoir Inflow	APR-JUL	57	117	158	95%	199	260	166
Lost Ck Reservoir Inflow	APR-JUL	4.1	9.9	13.8	114%	17.7	23	12.1
East Canyon Ck nr Jeremy Ranch	APR-JUL	4.2	10.9	15.5	102%	20	27	15.2
East Canyon Ck nr Morgan	APR-JUL	11.2	21	28	100%	35	45	28
Weber R at Gateway	APR-JUL	99	240	335	106%	430	570	315
SF Ogden R nr Huntsville	APR-JUL	22	42	55	98%	69	89	56
Pineview Reservoir Inflow	APR-JUL	47	91	120	102%	150	194	118
Wheeler Ck nr Huntsville	APR-JUL	2.1	4.2	5.5	87%	6.9	8.9	6.3
Centerville Ck	APR-JUL	0.76	1.08	1.3	96%	1.52	1.84	1.35

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2020	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Causey Reservoir	5.8	5.0	3.2	7.1
East Canyon Reservoir	41.1	28.3	34.7	49.5
Echo Reservoir	52.9	22.5	46.3	73.9
Lost Creek Reservoir	17.2	14.4	12.3	22.5
Pineview Reservoir	70.1	51.4	51.4	110.1
Rockport Reservoir	49.0	27.0	34.5	60.9
Willard Bay	190.6	132.2	133.7	215.0
Smith And Morehouse Reservoir	5.4	2.4	3.6	8.1
Basin-wide Total	432.1	283.2	319.7	547.1
# of reservoirs	8	8	8	8

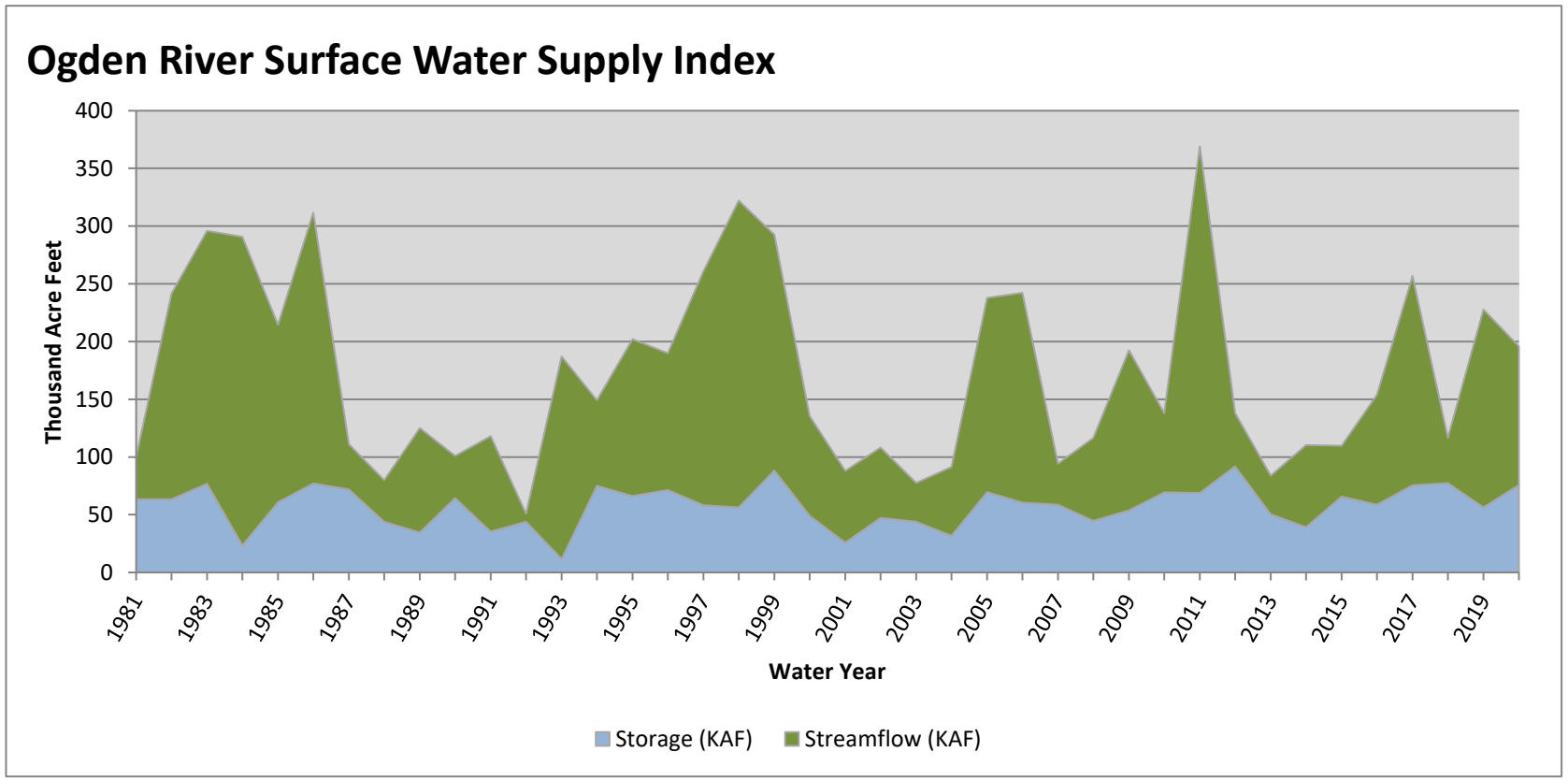
Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Upper Weber	9	110%	99%
Lower Weber	7	109%	106%
Ogden River	5	98%	95%
Lost Creek	3	108%	93%

February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Ogden River	**75.88**	**120.00**	**195.88**	**63**	**1.12**	**96, 09, 95, 85**

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

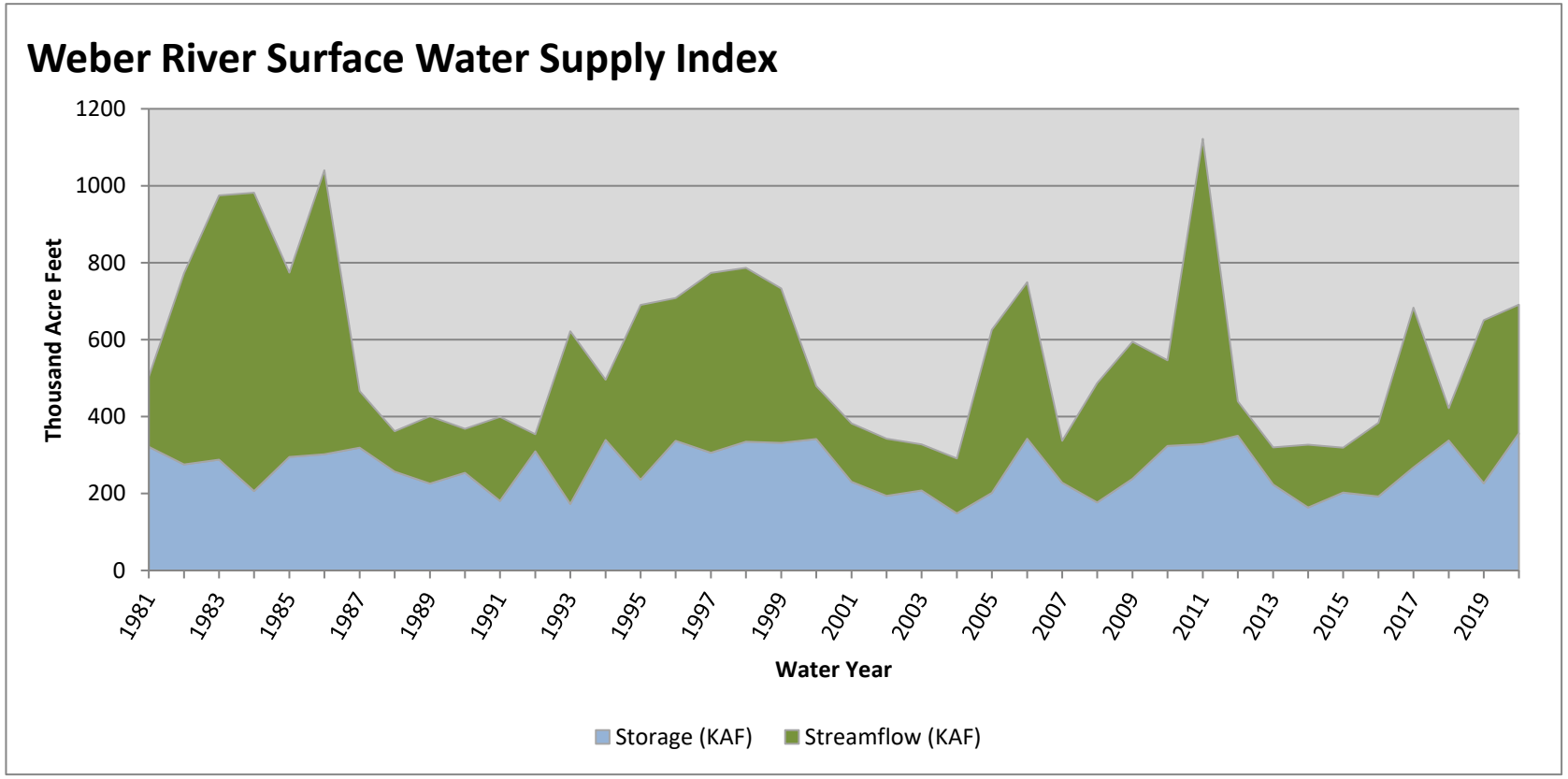


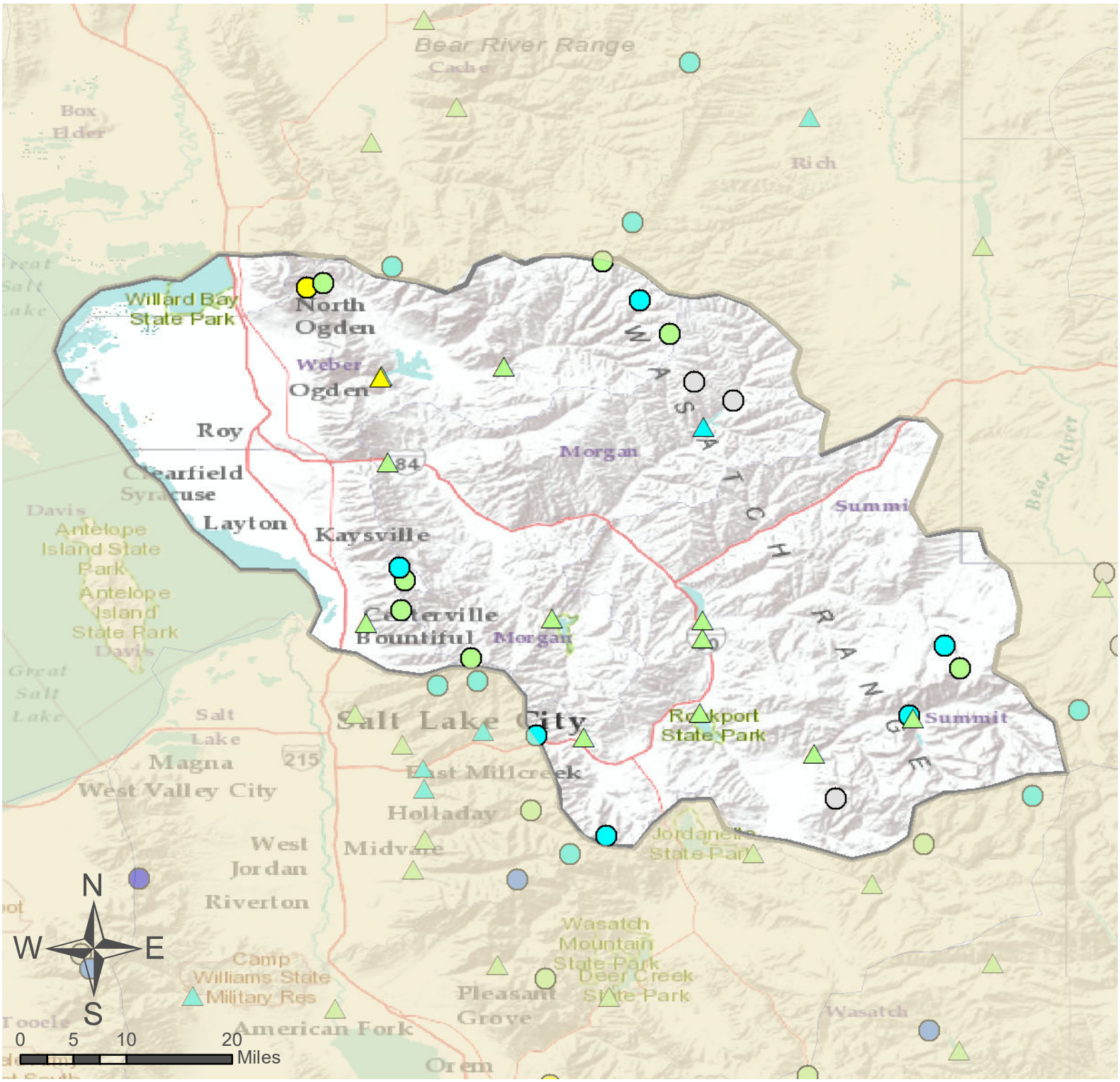
February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Weber River	**356.25**	**335.00**	**691.25**	**71**	**1.73**	**17, 95, 96, 99**

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





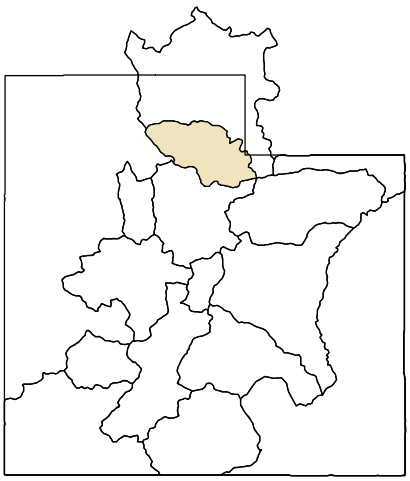
Weber & Ogden River Basins

SNOTEL Site

Forecast Point

% of Normal

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



<u>As of February 1, 2020:</u>

106% of Normal SWE

92% of Normal Precipitation

117% of Normal Precipitation Last Month

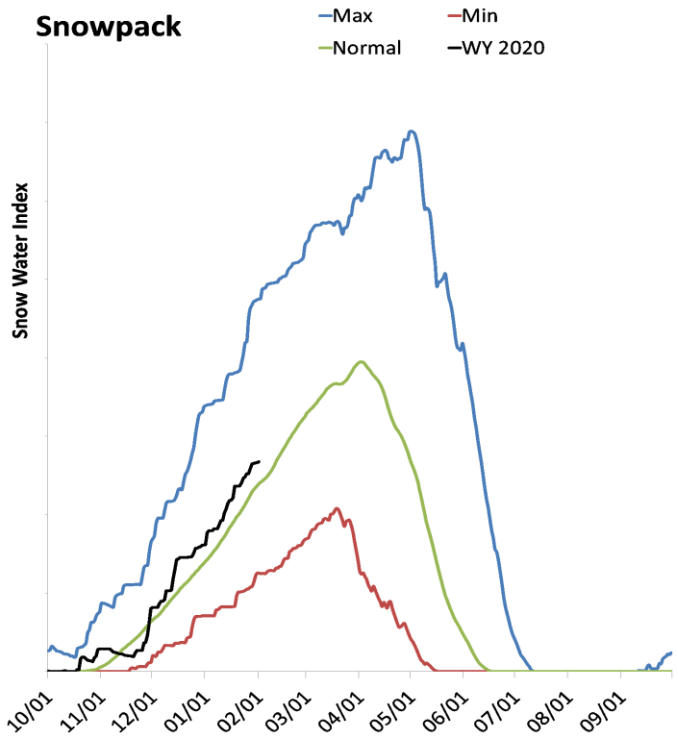
57% Saturation Soil Moisture

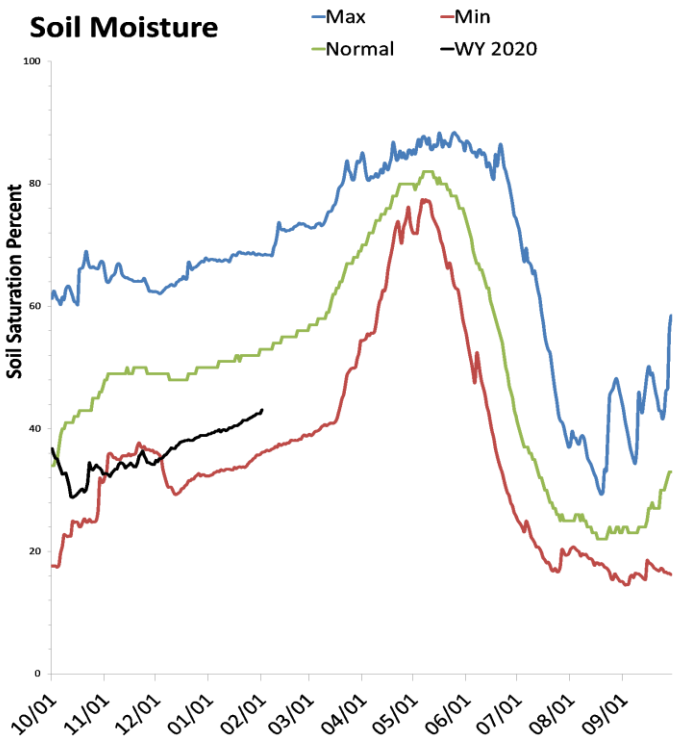
Weber & Ogden River Basins

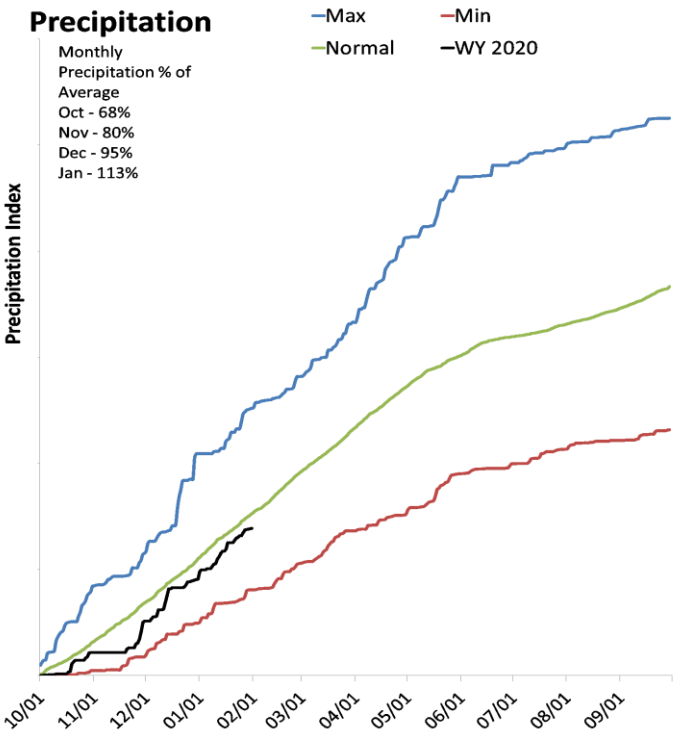
Provo & Jordan River Basins

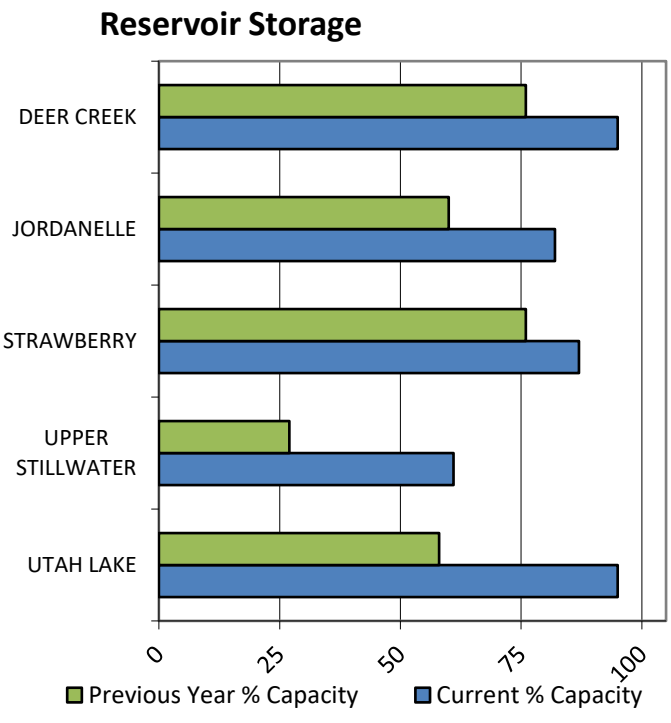
February 1, 2020

Snowpack in the Provo & Jordan River Basins is above normal at 112% of normal, compared to 110% last year. Precipitation in January was above average at 113%, which brings the seasonal accumulation (Oct-Jan) to 91% of average. Soil moisture is at 43% compared to 54% last year. Reservoir storage is at 90% of capacity, compared to 68% last year. Forecast streamflow volumes range from 94% to 114% of average. The surface water supply index is 74% for the Provo River.









SNOTEL Data

Data Current as of: 2/6/2020 11:17:54 AM

Provo Jordan Rivers
Streamflow Forecasts - February 1, 2020

Provo Jordan Rivers	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Provo R at Woodland	APR-JUL	56	78	96	96%	115	146	100
Provo R at Hailstone	APR-JUL	60	84	103	95%	124	157	108
Provo R bl Deer Ck Dam	APR-JUL	67	93	111	96%	129	155	116
Spanish Fk at Castilla	APR-JUL	5.5	36	72	104%	108	160	69
American Fk ab Upper Powerplant	APR-JUL	14.2	24	30	94%	36	46	32
Utah Lake Inflow	APR-JUL	18.6	114	270	102%	630	890	265
W Canyon Ck nr Cedar Fort	APR-JUL	0.69	1.47	2	114%	2.5	3.3	1.76
Little Cottonwood Ck nr SLC	APR-JUL	32	37	41	108%	45	51	38
Big Cottonwood Ck nr SLC	APR-JUL	25	33	38	106%	43	51	36
Mill Ck nr SLC	APR-JUL	3.2	5.4	7	109%	8.5	10.8	6.4
Parleys Ck nr SLC	APR-JUL	6.1	11.7	15.5	109%	19.4	25	14.2
Dell Fk nr SLC	APR-JUL	0.44	3.5	6.1	111%	8.6	12.3	5.5
Emigration Ck nr SLC	APR-JUL	0.42	2.5	4	100%	5.4	7.5	4
City Ck nr SLC	APR-JUL	3.5	6.3	8.2	106%	10.1	12.8	7.7
Salt Ck at Nephi	APR-JUL	0.48	5	9.1	96%	13.2	19.3	9.5

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2020	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Deer Creek Reservoir	141.7	113.8	107.7	149.7
Strawberry Reservoir	959.2	845.5	658.4	1105.9
Utah Lake	827.0	508.8	752.5	870.9
Jordanelle Reservoir	263.5	191.5	242.0	314.0
Basin-wide Total	2191.5	1659.6	1760.6	2440.5
# of reservoirs	4	4	4	4

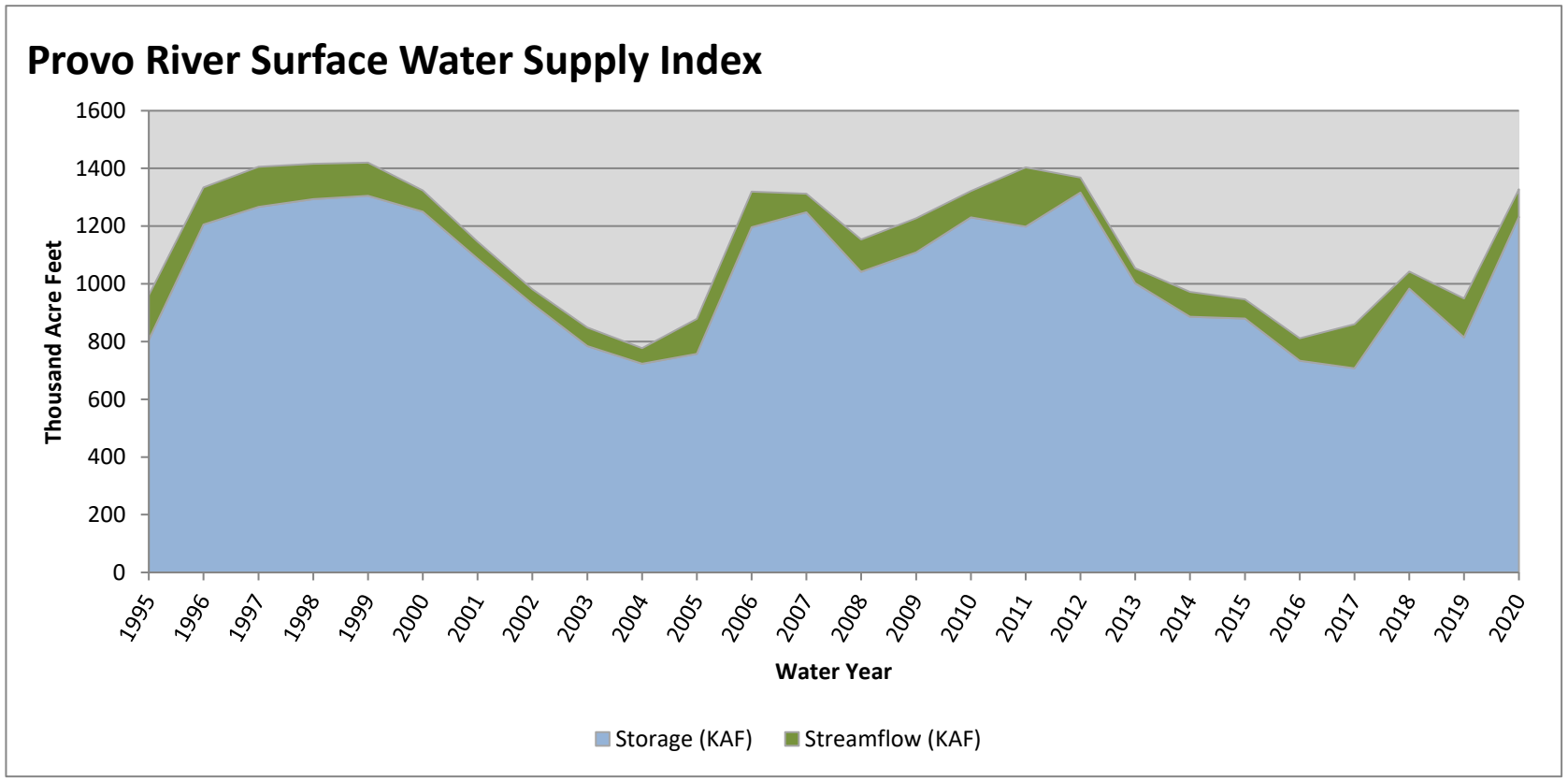
Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Provo River	6	102%	109%
Jordan River	14	117%	103%
Utah Lake	13	106%	107%
Spanish Fork River	5	95%	111%
Six Creeks	13	114%	103%
Cottonwood Creeks	7	115%	96%

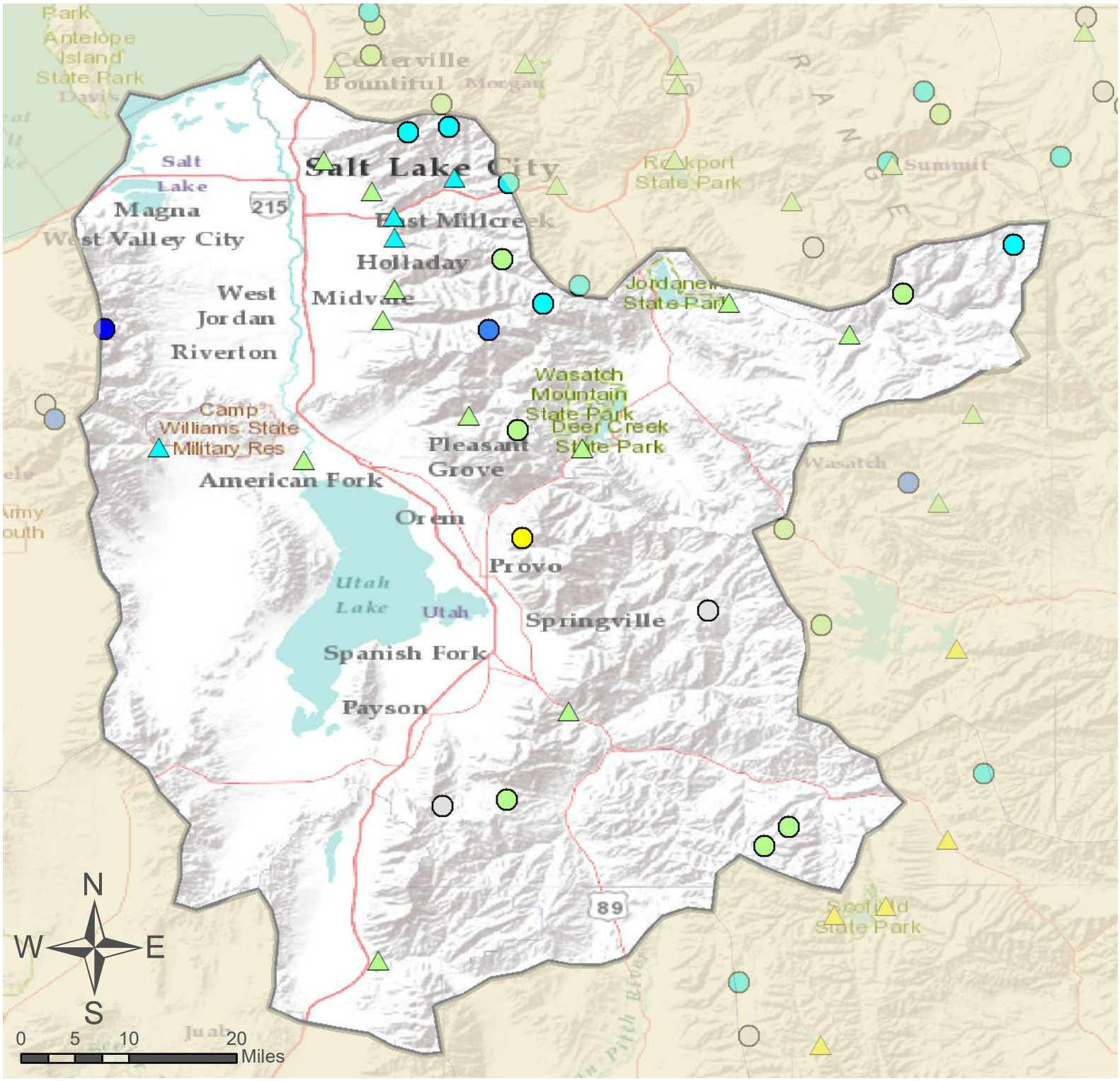
February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Provo River	**1232.29**	**96.00**	**1328.29**	**74**	**2.01**	**10, 00, 96, 12**

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





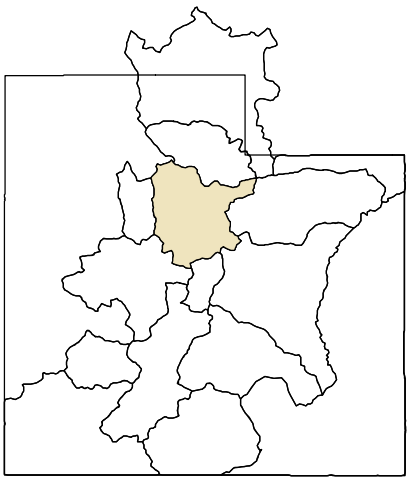
Provo & Jordan River Basins

SNOTEL Site

Forecast Point

% of Normal

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



<u>As of February 1, 2020:</u>

112% of Normal SWE

91% of Normal Precipitation

113% of Normal Precipitation Last Month

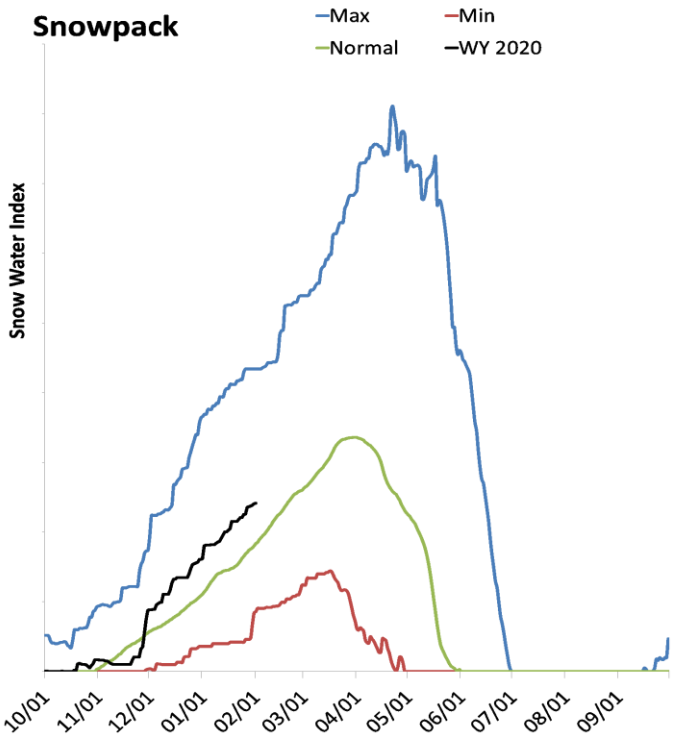
43% Saturation Soil Moisture

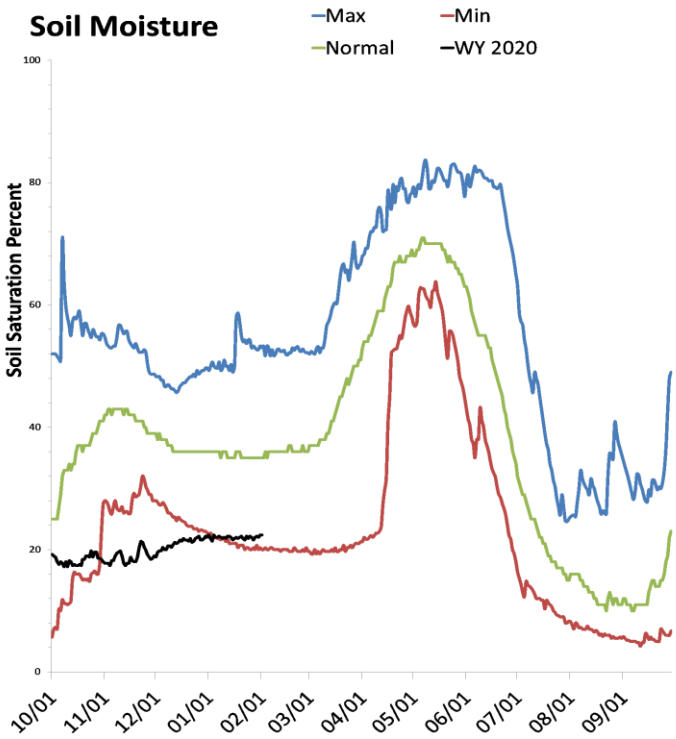
Provo & Jordan River Basins

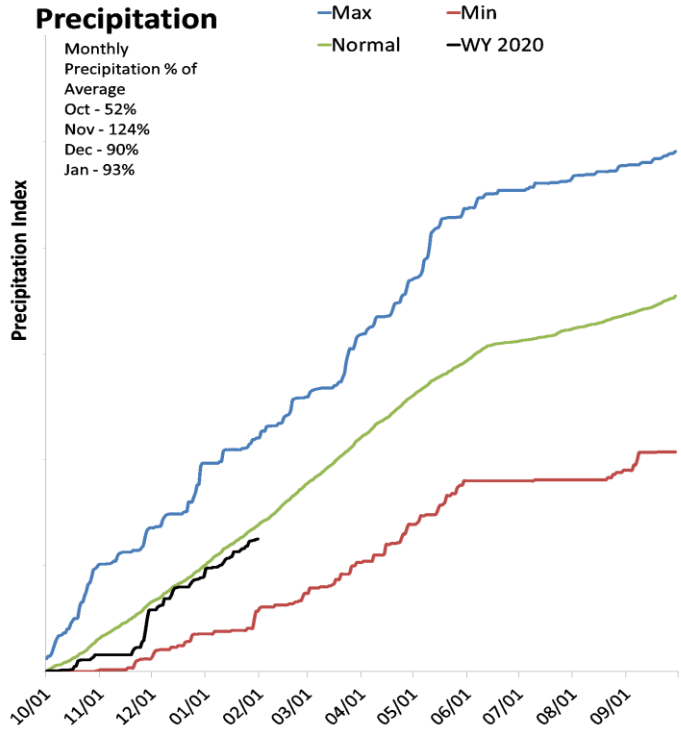
Tooele Valley & West Desert Basins

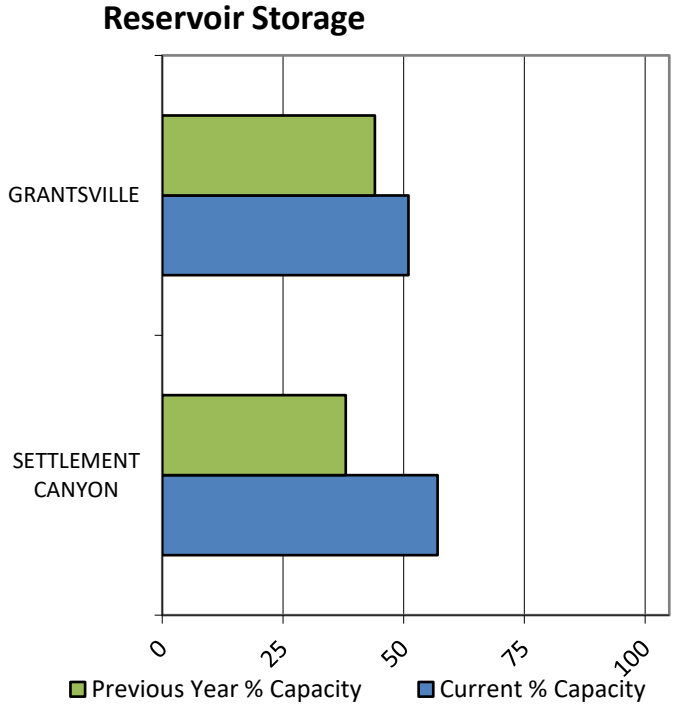
February 1, 2020

Snowpack in the Tooele Valley & West Desert Basins is much above normal at 132% of normal, compared to 122% last year. Precipitation in January was near average at 92%, which brings the seasonal accumulation (Oct-Jan) to 91% of average. Soil moisture is at 22% compared to 32% last year. Reservoir storage is at 53% of capacity, compared to 43% last year. Forecast streamflow volumes range from 95% to 135% of average.









SNOTEL Data

Data Current as of: 2/6/2020 11:18:02 AM

Tooele Valley West Desert
Streamflow Forecasts - February 1, 2020

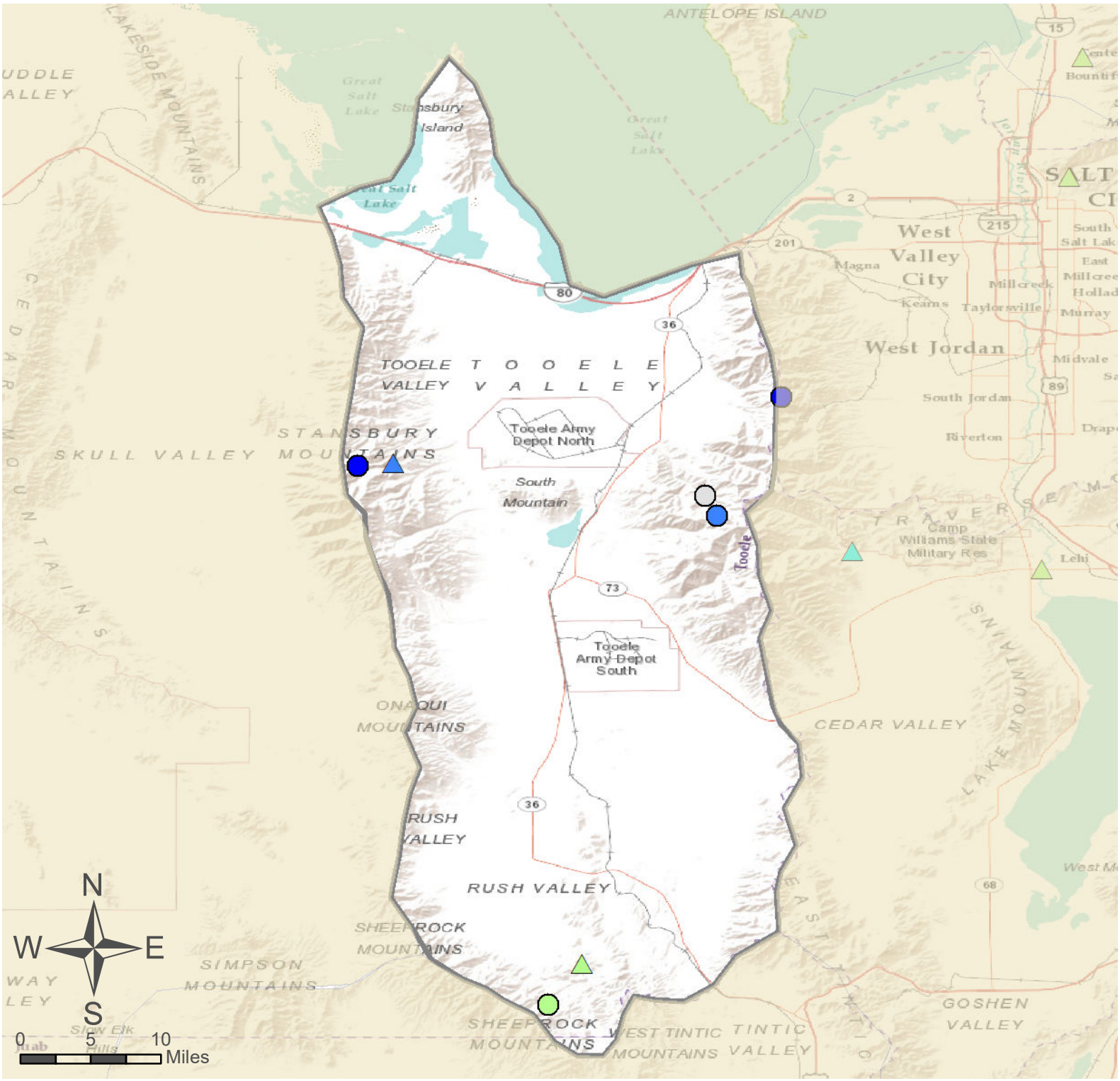
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Tooele Valley West Desert	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Vernon Ck nr Vernon	APR-JUL	0.11	0.69	1.32	95%	1.95	2.9	1.39
S Willow Ck nr Grantsville	APR-JUL	2.4	3.5	4.2	135%	4.9	6	3.1
Dunn Ck nr Park Valley	APR-JUL	1.49	2.5	3.2	110%	3.9	4.9	2.9
W Canyon Ck nr Cedar Fort	APR-JUL	0.69	1.47	2	114%	2.5	3.3	1.76

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2020	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Settlement Canyon Reservoir	0.6	0.4	0.7	1.0
Grantsville Reservoir	1.7	1.5	1.8	3.3
Basin-wide Total	2.3	1.8	2.5	4.3
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Tooele Valley	3	151%	107%
Raft River	1	122%	81%
Deep Creek	0		
Northwestern Utah	2	128%	120%



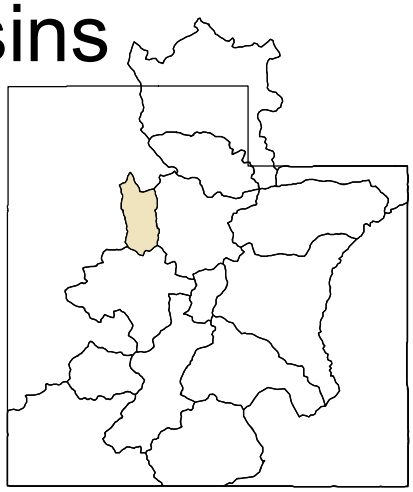
Tooele Valley & West Desert Basins

SNOTEL Site

Forecast Point

% of Normal

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



<u>As of February 1, 2020:</u>

132% of Normal SWE

91% of Normal Precipitation

92% of Normal Precipitation Last Month

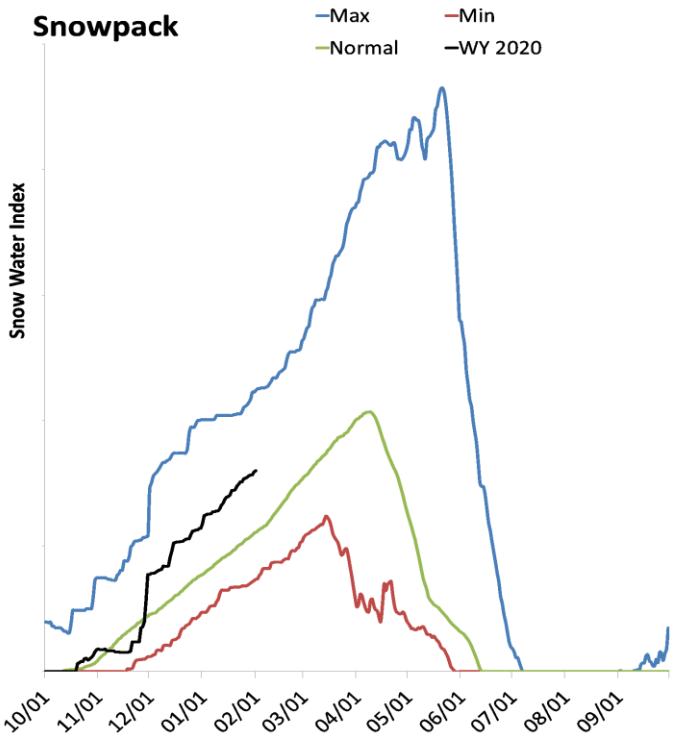
22% Saturation Soil Moisture

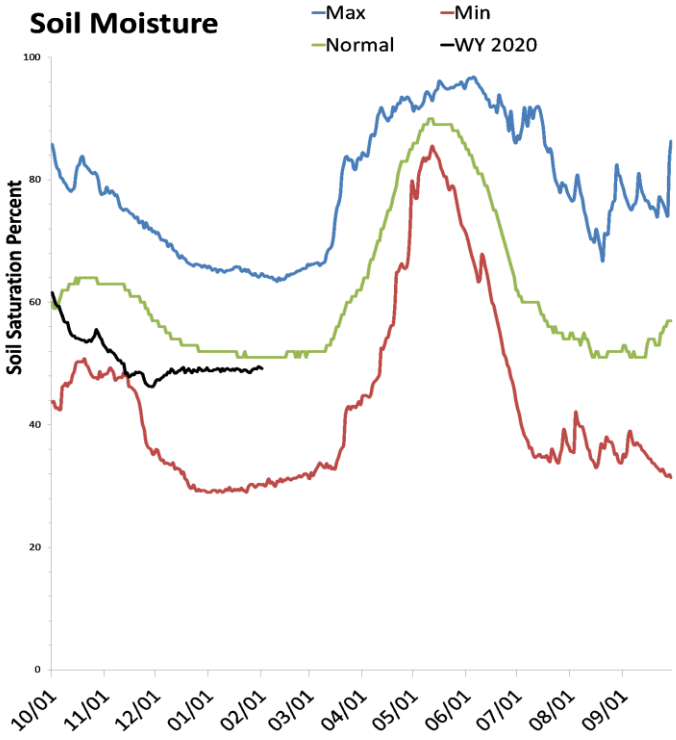
Tooele Valley & West Desert Basins

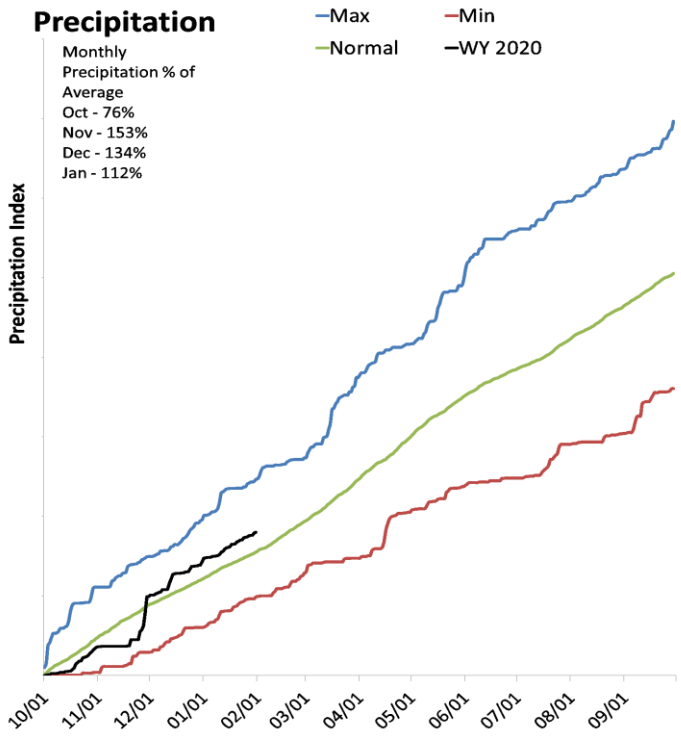
Northeastern Uinta Basin

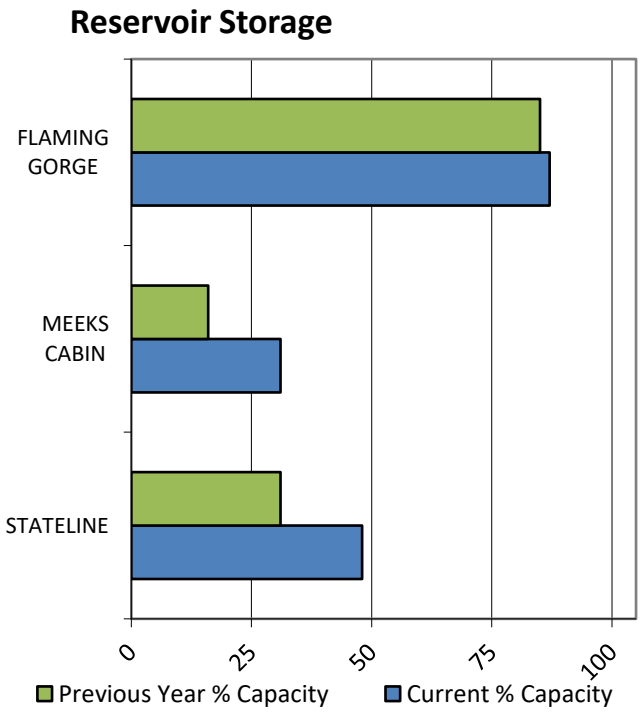
February 1, 2020

Snowpack in the Northeastern Uinta Basin is much above normal at 144% of normal, compared to 102% last year. Precipitation in January was above average at 114%, which brings the seasonal accumulation (Oct-Jan) to 117% of average. Soil moisture is at 44% compared to 44% last year. Reservoir storage is at 87% of capacity, compared to 85% last year. Forecast streamflow volumes range from 86% to 116% of average. The surface water supply index is 66% for the Blacks Fork, 66% for the Smiths Creek.









SNOTEL Data

Data Current as of: 2/6/2020 11:18:09 AM

Northeastern Uintas
Streamflow Forecasts - February 1, 2020

Northeastern Uintas	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Blacks Fk nr Robertson	APR-JUL	66	86	100	116%	116	140	86
EF of Smiths Fork nr Robertson [2]	APR-JUL	19.1	25	29	107%	34	42	27
Flaming Gorge Reservoir Inflow [2]	APR-JUL	445	670	845	86%	1040	1370	980
Ashley Ck nr Vernal	APR-JUL	26	38	47	94%	57	74	50
Big Brush Ck ab Red Fleet Reservoir	APR-JUL	10.9	16.3	20	95%	24	29	21

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2020	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Flaming Gorge Reservoir	3273.6	3197.7	3049.0	3749.0
Stateline Reservoir	5.8	3.7	5.4	12.0
Meeks Cabin Reservoir	10.1	5.1	11.9	32.5
Basin-wide Total	3289.5	3206.4	3066.3	3793.5
# of reservoirs	3	3	3	3

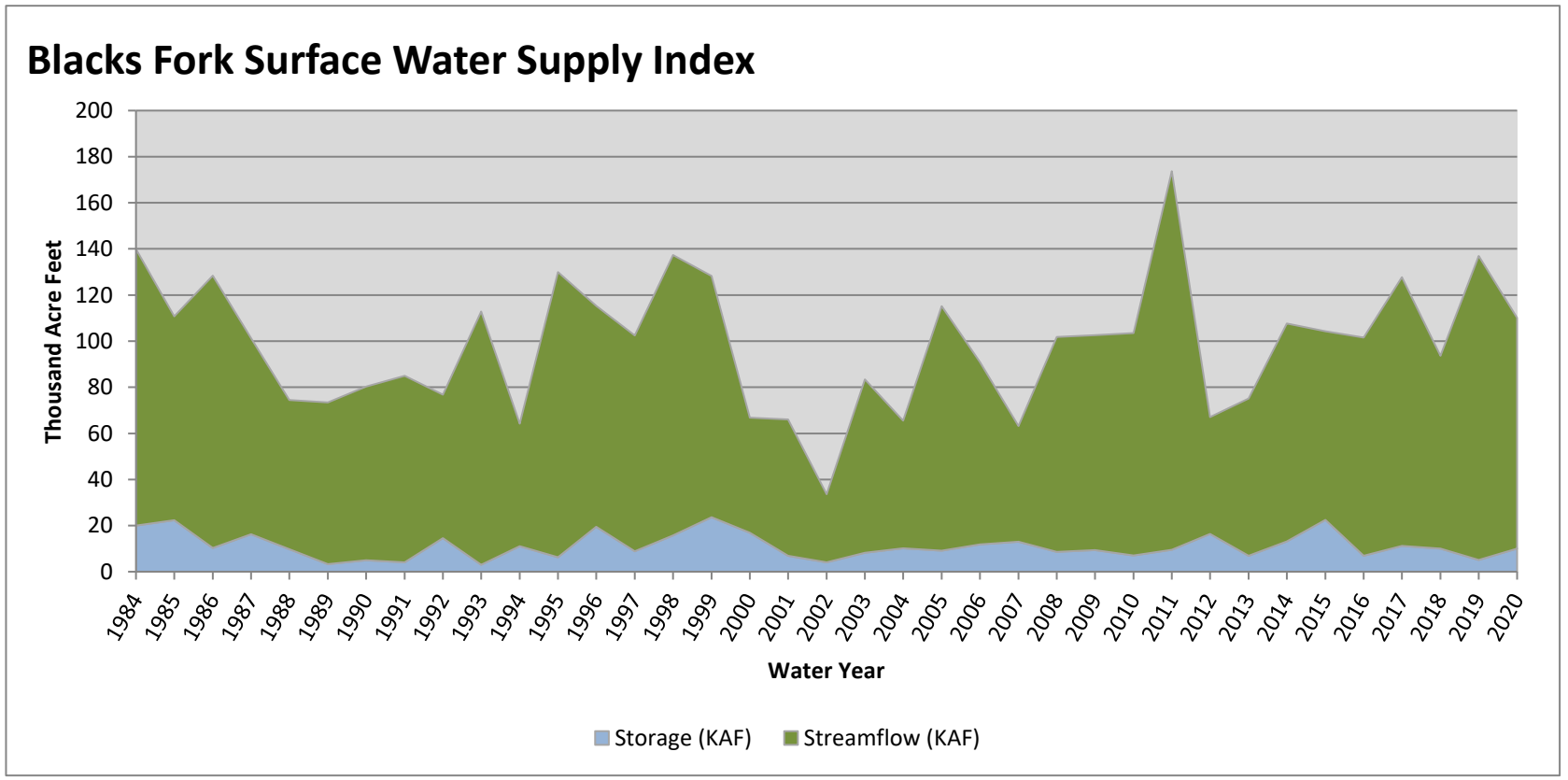
Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Blacks Fork River	3	128%	106%
Upper Green	2	192%	104%
Ashley Brush Creeks	4	125%	97%

February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Blacks Fork	**10.09**	**100.00**	**110.09**	**66**	**1.32**	**15, 14, 85, 93**

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

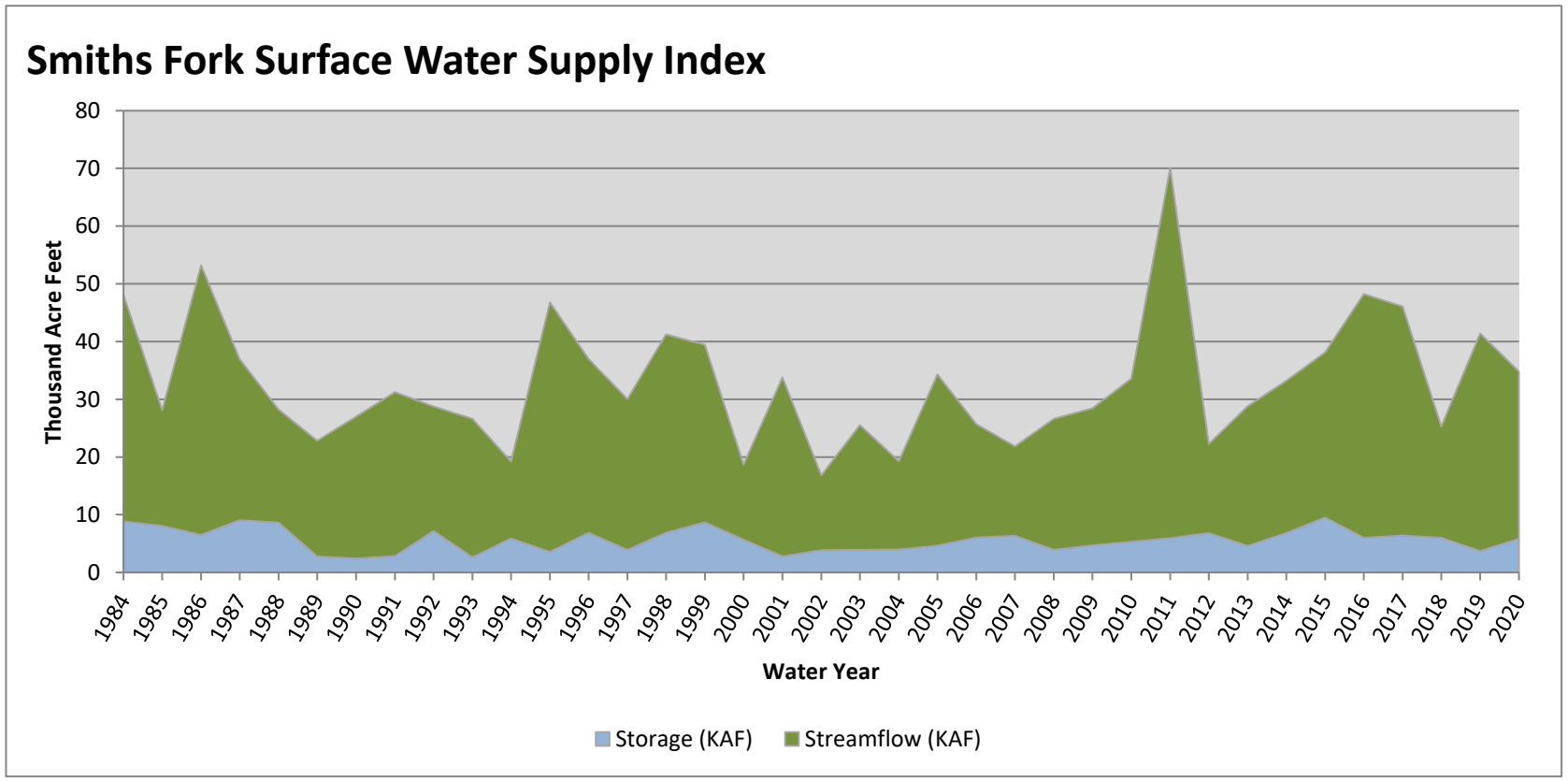


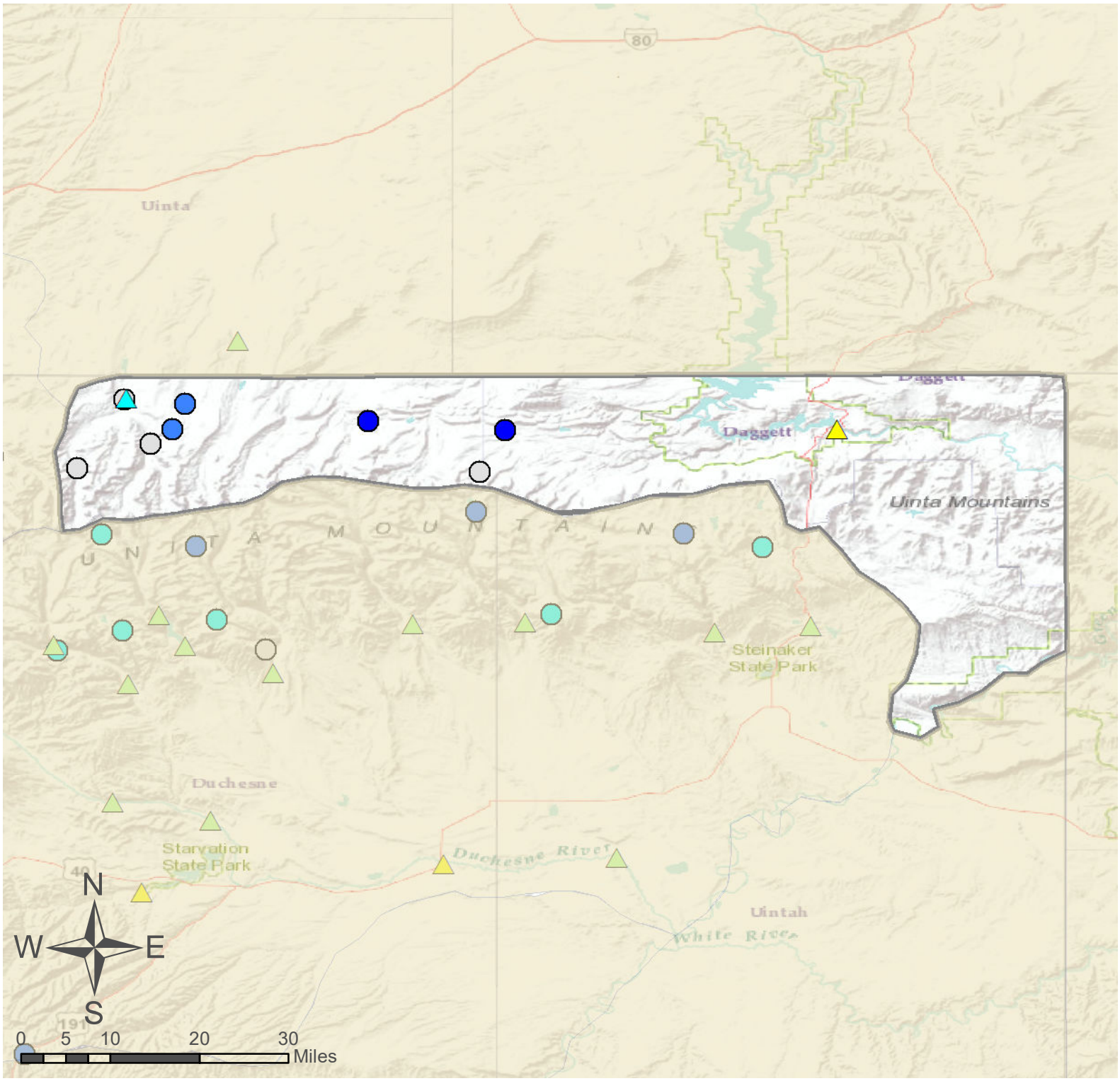
February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Smiths Fork	**5.81**	**29.00**	**34.81**	**66**	**1.32**	**01, 05, 87, 96**

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





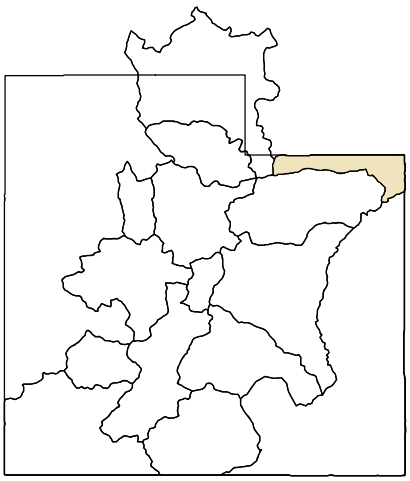
Northeastern Uinta Basin

SNOTEL Site

Forecast Point

% of Normal

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



<u>As of February 1, 2020:</u>

144% of Normal SWE

117% of Normal Precipitation

114% of Normal Precipitation Last Month

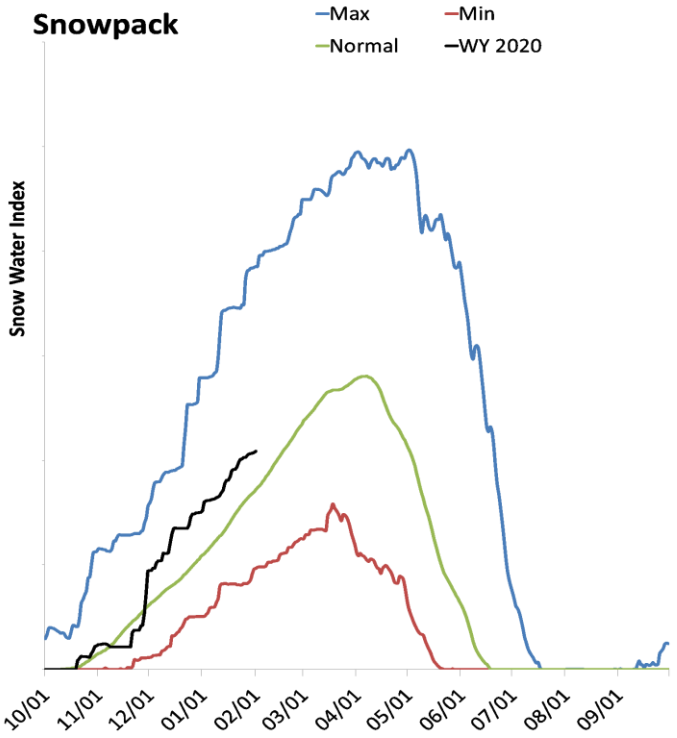
44% Saturation Soil Moisture

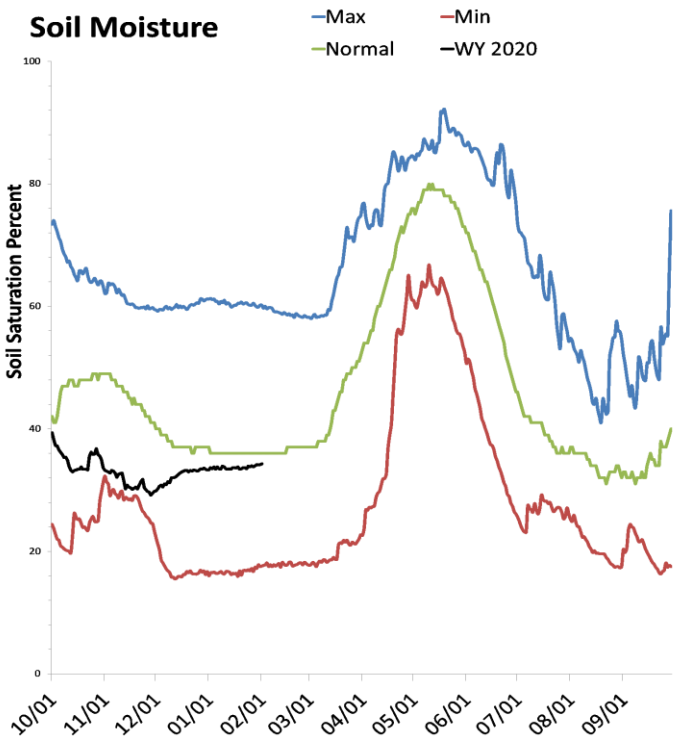
Northeastern Uinta Basin

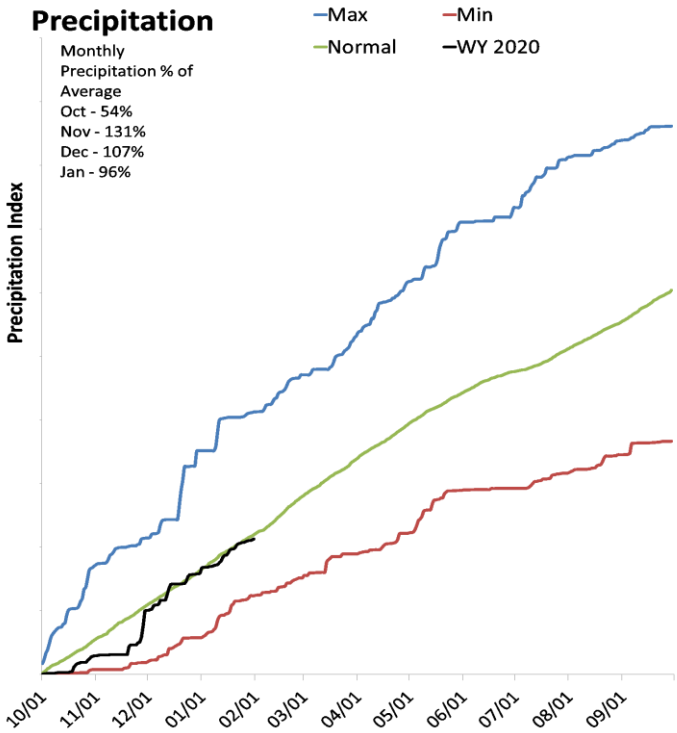
Duchesne River Basin

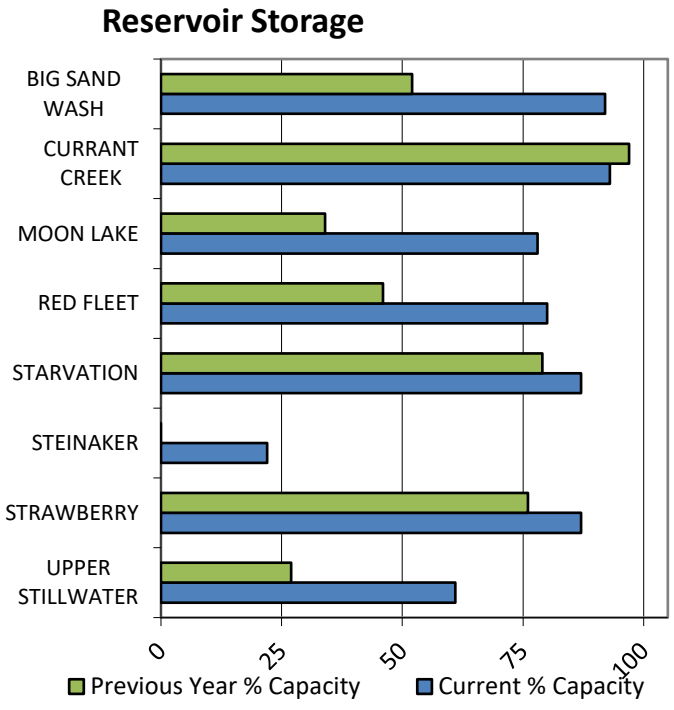
February 1, 2020

Snowpack in the Duchesne River Basin is above average at 121% of normal, compared to 114% last year. Precipitation in January was near average at 95%, which brings the seasonal accumulation (Oct-Jan) to 97% of average. Soil moisture is at 34% compared to 35% last year. Reservoir storage is at 86% of capacity, compared to 74% last year. Forecast streamflow volumes range from 86% to 100% of average. The surface water supply index is 80% for the Western Uintas, 34% for the Eastern Uintas.









SNOTEL Data

Data Current as of: 2/6/2020 11:18:16 AM

Duchesne River
Streamflow Forecasts - February 1, 2020

Duchesne River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
WF Duchesne R at VAT Diversion	APR-JUL	10.5	14.5	17.5	94%	21	26	18.6
Duchesne R nr Tabiona [2]	APR-JUL	65	85	100	93%	117	143	108
Upper Stillwater Reservoir Inflow[2]	APR-JUL	50	64	73	99%	84	101	74
Rock Ck nr Mountain Home [2]	APR-JUL	61	76	87	99%	99	118	88
Duchesne R ab Knight Diversion [2]	APR-JUL	127	162	188	96%	215	260	195
Currant Ck Reservoir Inflow[2]	APR-JUL	9.6	14.3	18	90%	22	29	20
Strawberry R nr Soldier Springs [2]	APR-JUL	12.6	35	50	86%	65	87	58
Strawberry R nr Duchesne [2]	APR-JUL	44	72	94	84%	119	162	112
Lake Fork R ab Moon Lake Reservoir	APR-JUL	36	49	59	97%	70	87	61
Lake Fk R Bl Moon Lk nr Mountain Home[2]	APR-JUL	41	53	62	94%	72	87	66
Yellowstone R nr Altonah	APR-JUL	39	52	61	100%	71	88	61
Duchesne R at Myton [2]	APR-JUL	156	230	290	88%	355	465	330
Uinta R bl Powerplant Diversion nr Neola[2]	APR-JUL	36	56	72	97%	90	120	74
Whiterocks R nr Whiterocks	APR-JUL	30	43	53	98%	64	82	54
Duchesne R nr Randlett [2]	APR-JUL	145	255	345	90%	450	630	385
Ashley Ck nr Vernal	APR-JUL	26	38	47	94%	57	74	50
Big Brush Ck ab Red Fleet Reservoir	APR-JUL	10.9	16.3	20	95%	24	29	21

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2020	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Steinaker Reservoir	7.4	-3.7	21.7	33.4
Red Fleet Reservoir	20.7	11.9	17.9	25.7
Big Sand Wash Reservoir	23.7	13.4		25.7
Upper Stillwater Reservoir	19.7	8.8	8.6	32.5
Starvation Reservoir	143.3	130.9	138.8	164.1
Moon Lake Reservoir	27.9	12.3	24.4	35.8
Currant Creek Reservoir	14.4	15.0	14.9	15.5
Strawberry Reservoir	959.2	845.5	658.4	1105.9
Basin-wide Total	1185.1	1024.4	863.0	1379.5
# of reservoirs	6	6	6	6

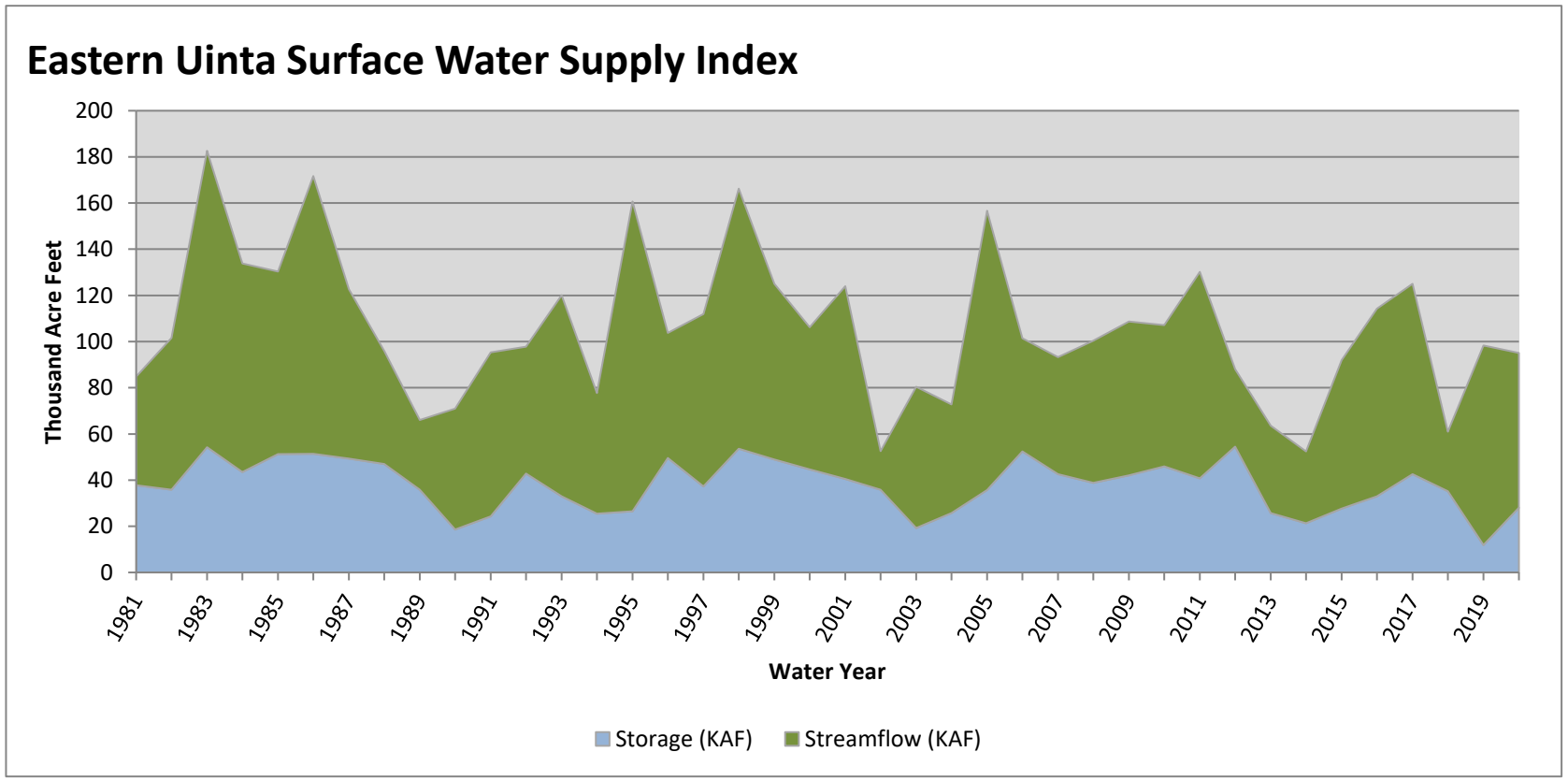
Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Strawberry River	5	114%	117%
Lakefork Yellowstone Rivers	6	125%	117%
Uinta Whiterocks River	2	125%	96%

February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Eastern Uinta	**28.10**	**67.00**	**95.10**	**34**	**-1.32**	**15, 07, 91, 88**

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

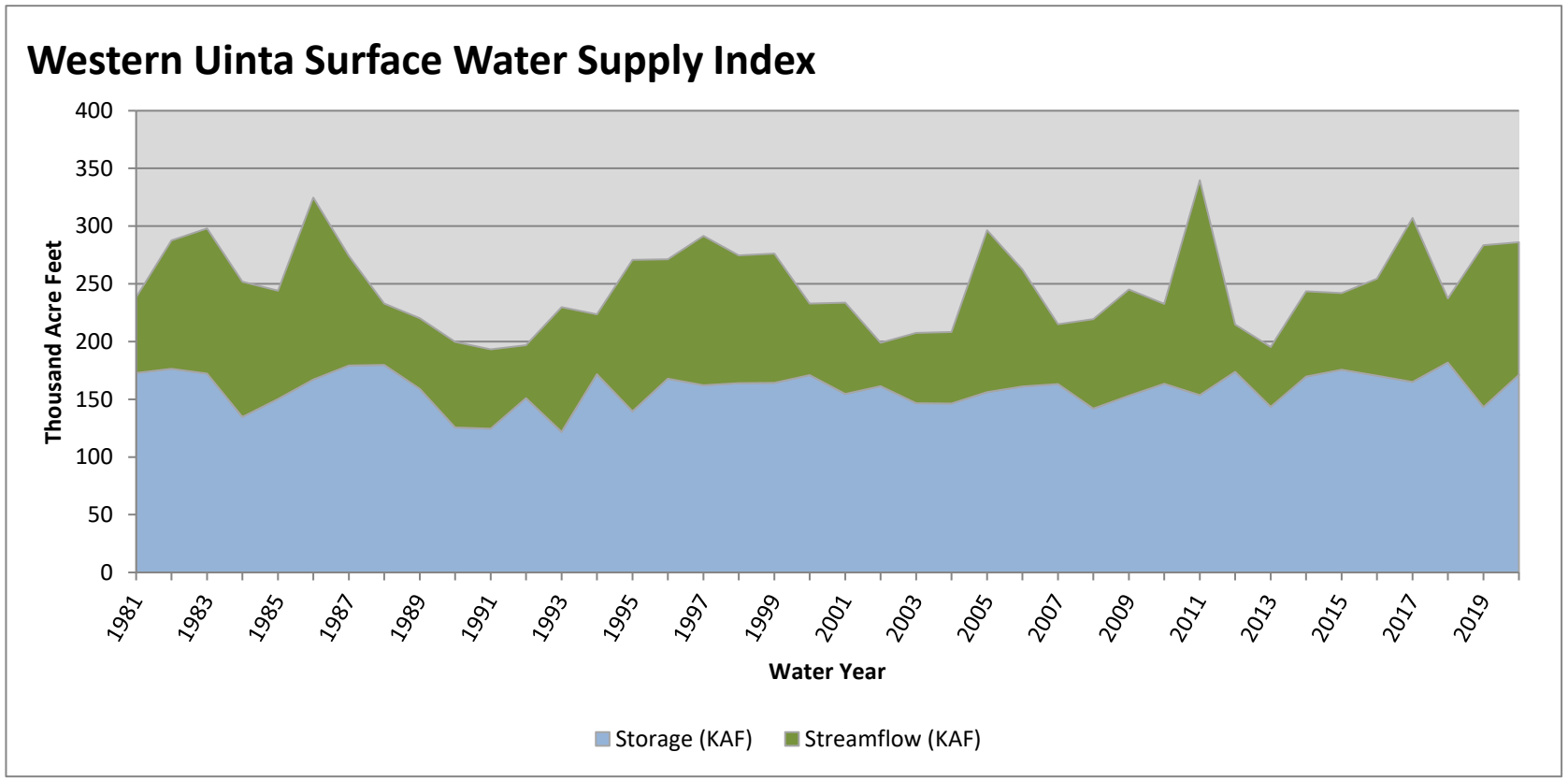


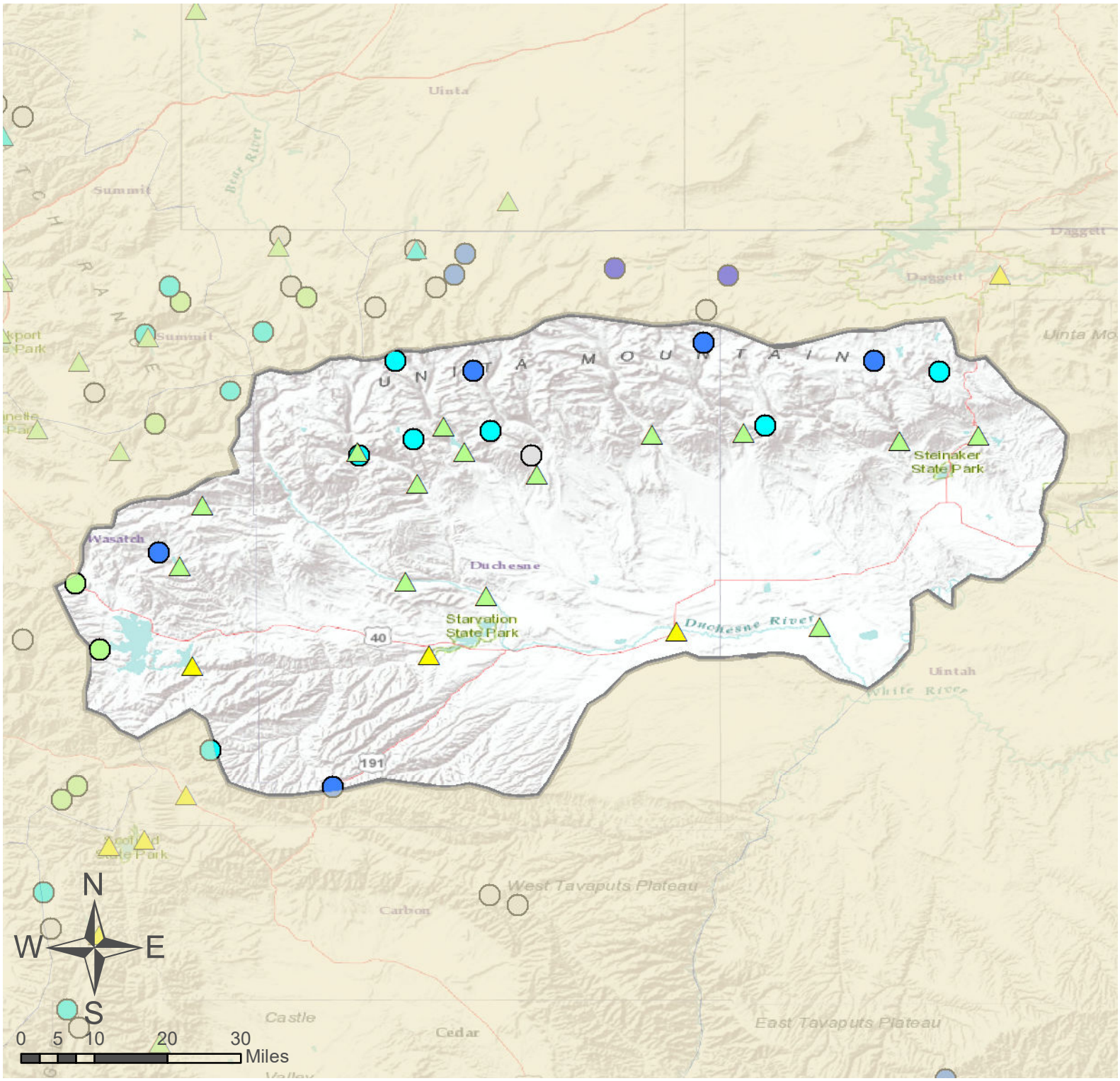
February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Western Uinta	**171.15**	**115.00**	**286.15**	**80**	**2.54**	**99, 19, 82, 97**

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





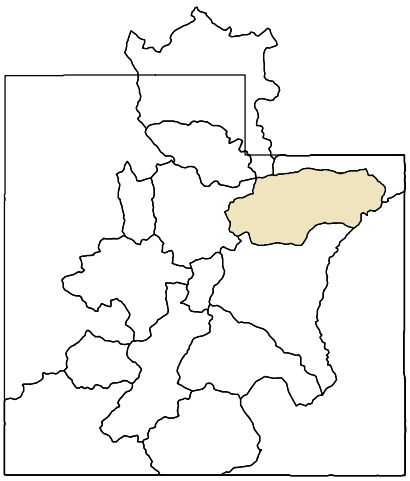
Duchesne River Basin

SNOTEL Site

Forecast Point

% of Normal

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



As of February 1, 2020:

121% of Normal SWE

97% of Normal Precipitation

95% of Normal Precipitation Last Month

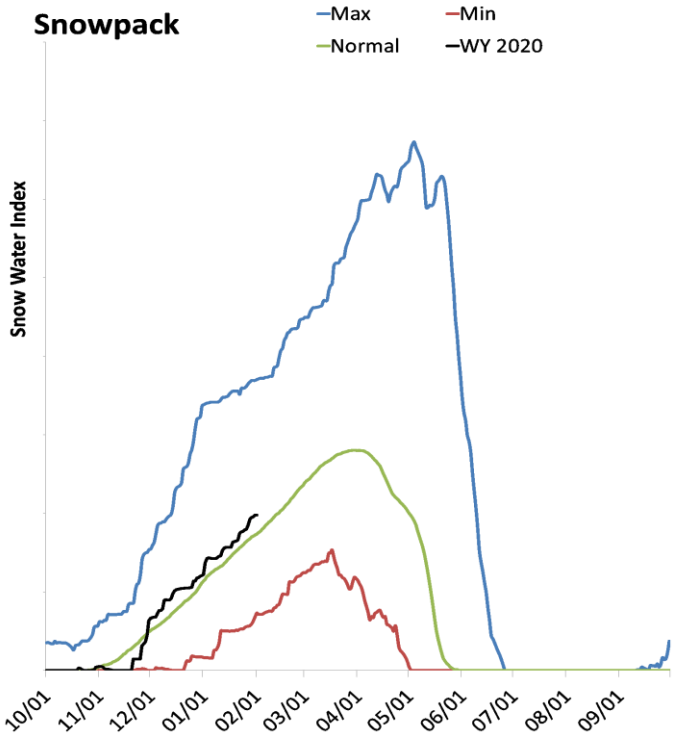
34% Saturation Soil Moisture

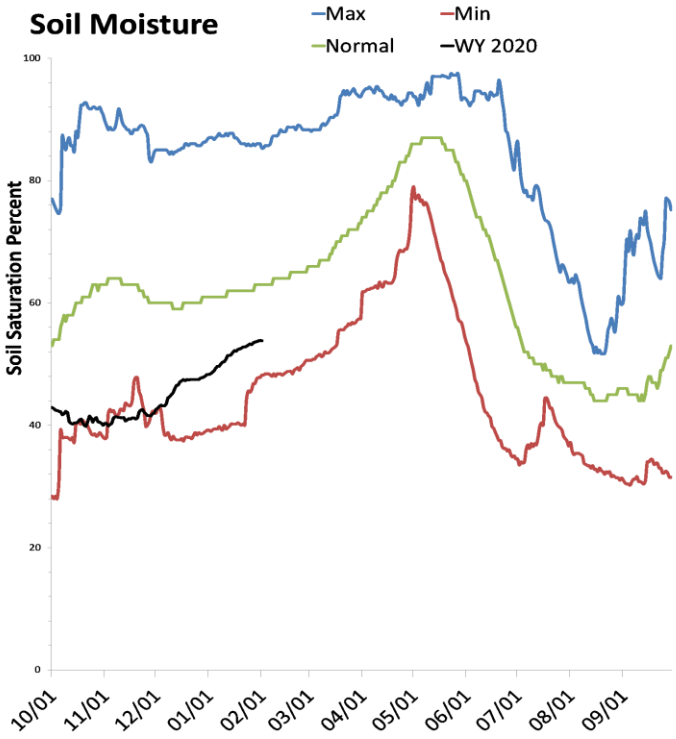
Duchesne River Basin

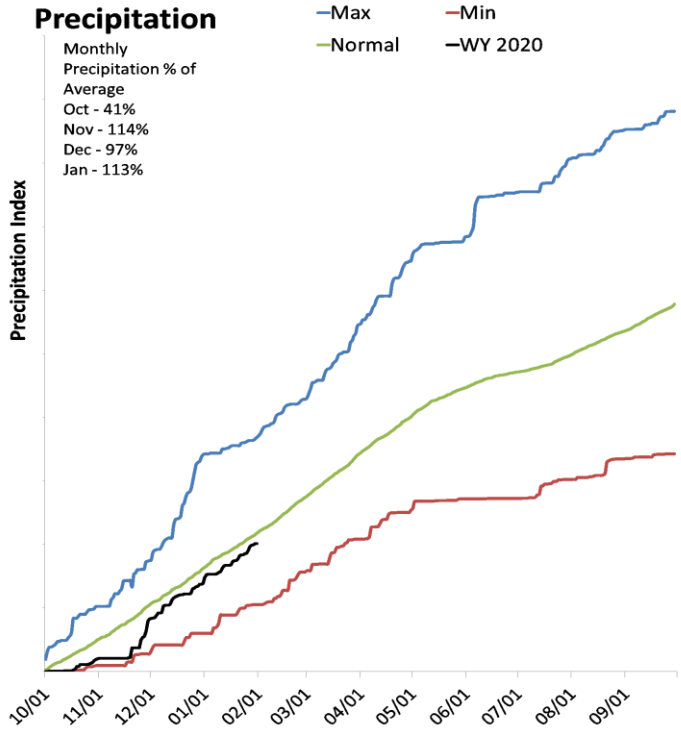
San Pitch River Basin

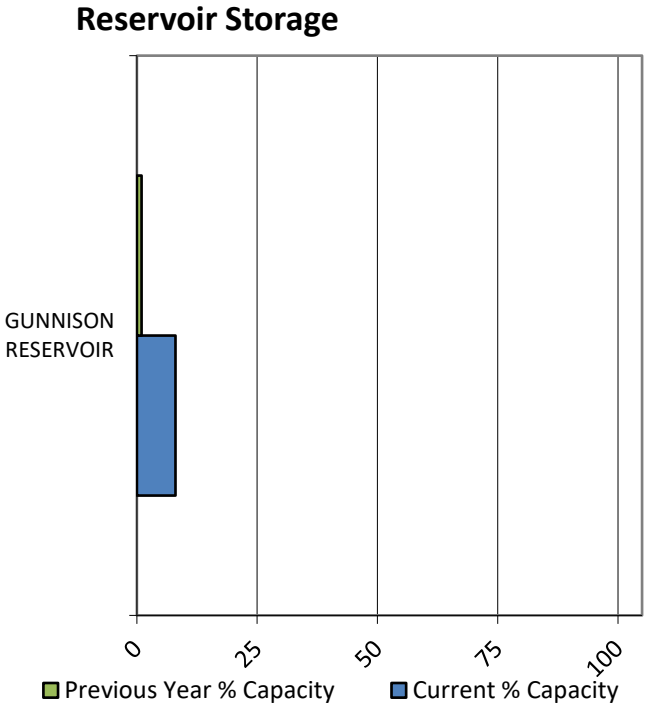
February 1, 2020

Snowpack in the San Pitch River Basin is above normal at 114% of normal, compared to 114% last year. Precipitation in January was above average at 112%, which brings the seasonal accumulation (Oct-Jan) to 92% of average. Soil moisture is at 54% compared to 65% last year. Reservoir storage is at 8% of capacity, compared to 1% last year. The forecast streamflow volume for Manti Creek is 102% of average. The surface water supply index is 41% for the San Pitch.









SNOTEL Data

Data Current as of: 2/6/2020 11:18:56 AM

San Pitch River
Streamflow Forecasts - February 1, 2020

San Pitch River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Manti Ck bl Dugway Ck nr Manti								
	APR-JUL	10.1	14	17	102%	20	26	16.7
Sevier R nr Gunnison								
	APR-JUL	57	89	110	111%	131	163	99

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2020	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Gunnison Reservoir	1.6	0.2	11.4	20.3
Basin-wide Total	1.6	0.2	11.4	20.3
# of reservoirs	1	1	1	1

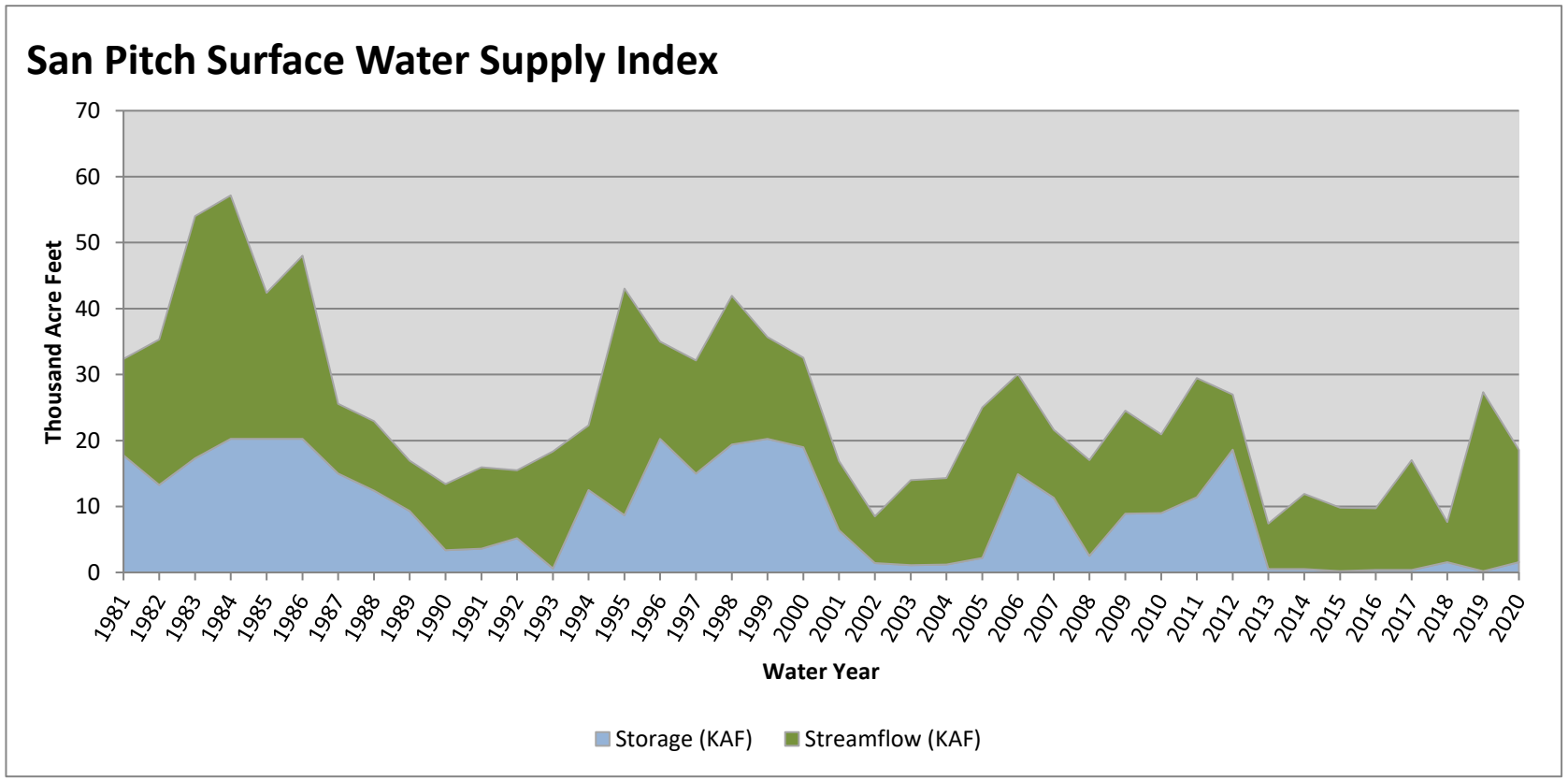
Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Upper San Pitch	2	112%	117%
Lower San Pitch	5	111%	108%

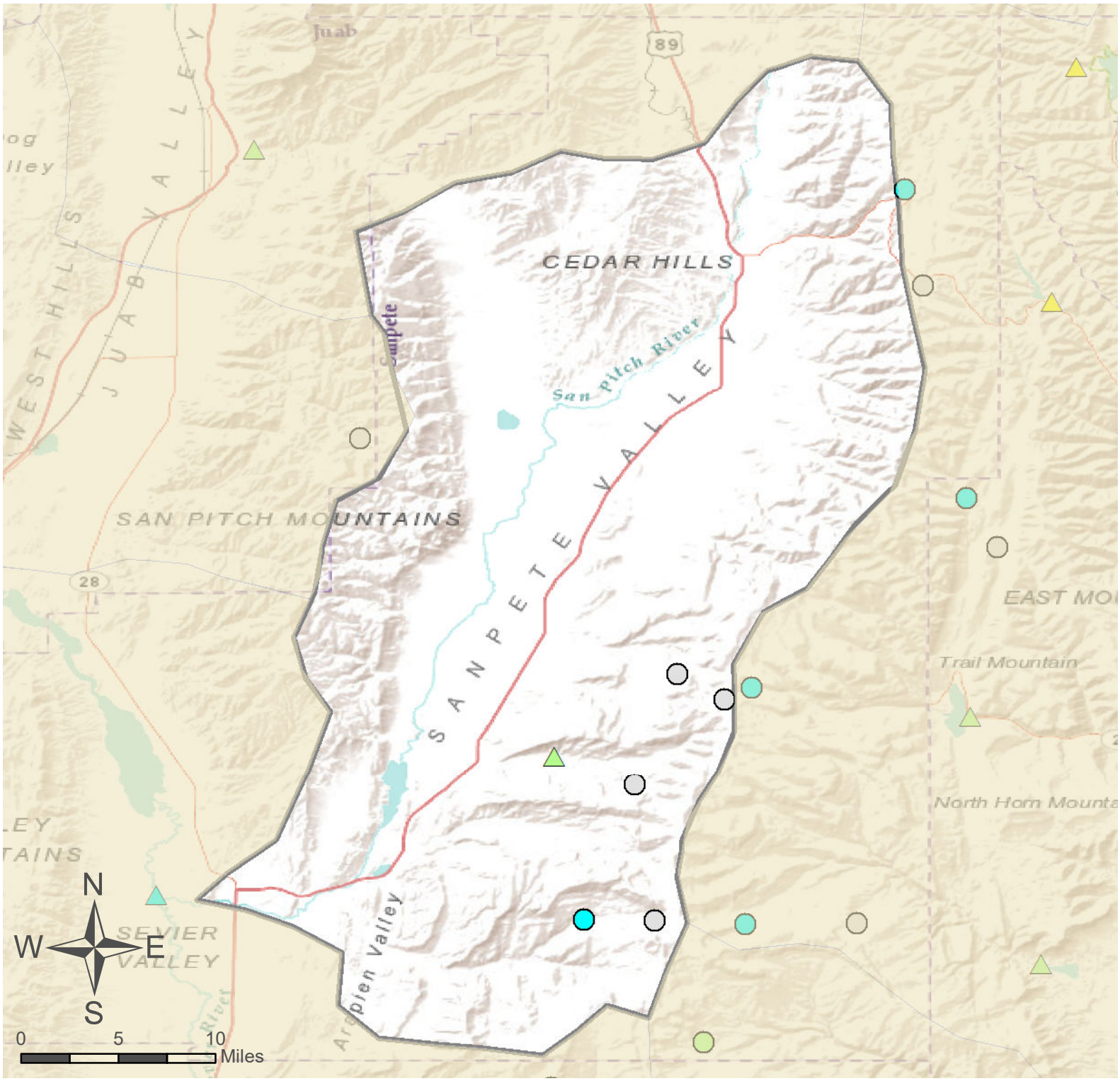
February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
San Pitch	**1.58**	**17.00**	**18.58**	**41**	**-0.71**	**17, 93, 10, 07**

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





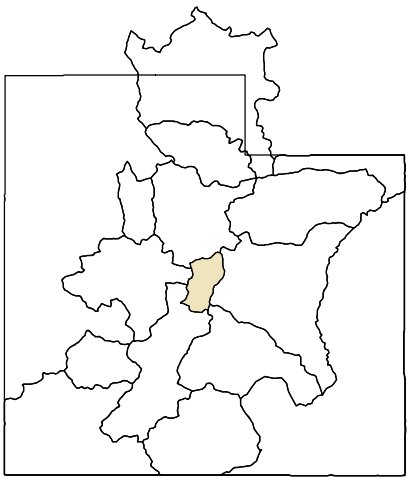
San Pitch River Basin

SNOTEL Site

Forecast Point

% of Normal

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



<u>As of February 1, 2020:</u>

114% of Normal SWE

92% of Normal Precipitation

112% of Normal Precipitation Last Month

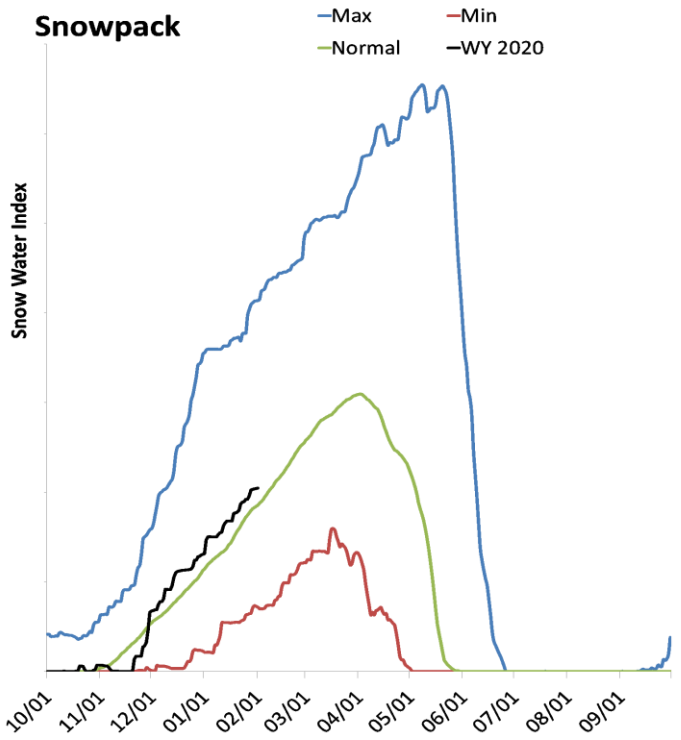
54% Saturation Soil Moisture

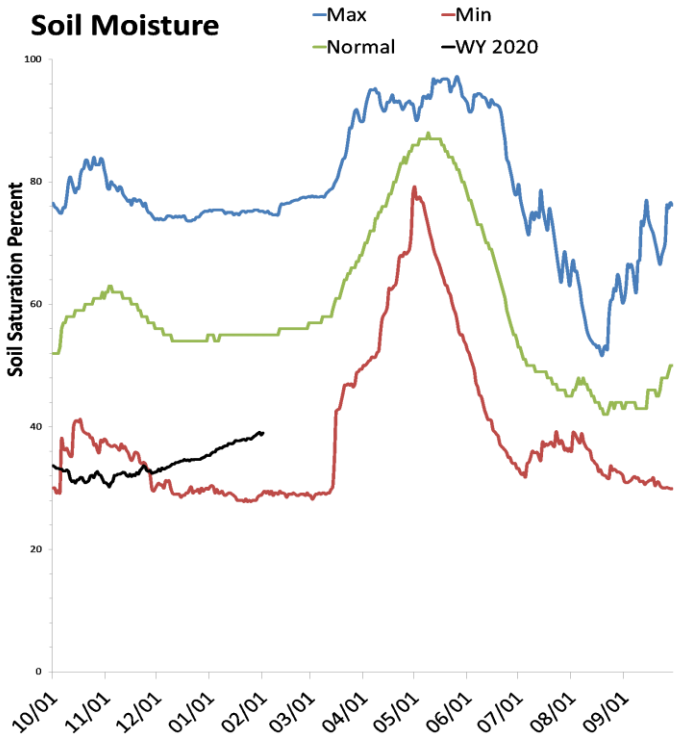
San Pitch River Basin

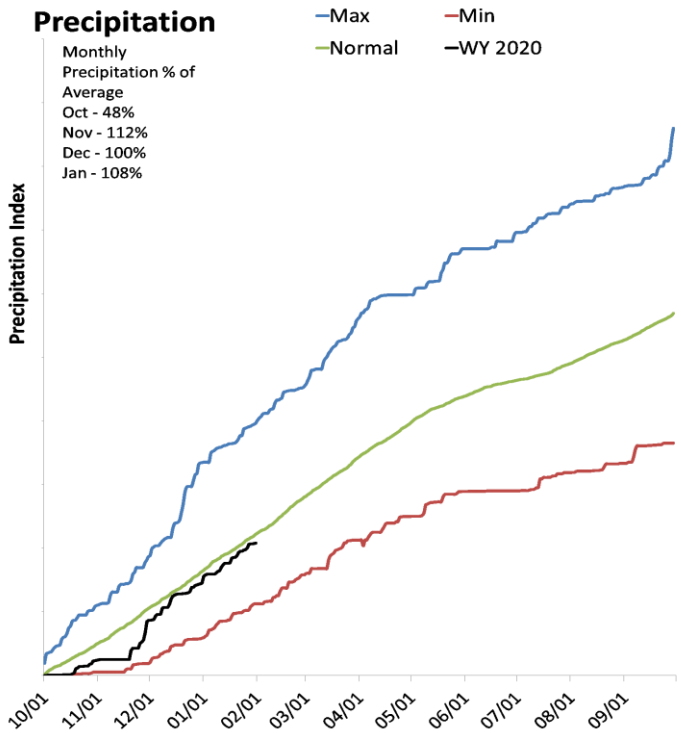
Price & San Rafael Basins

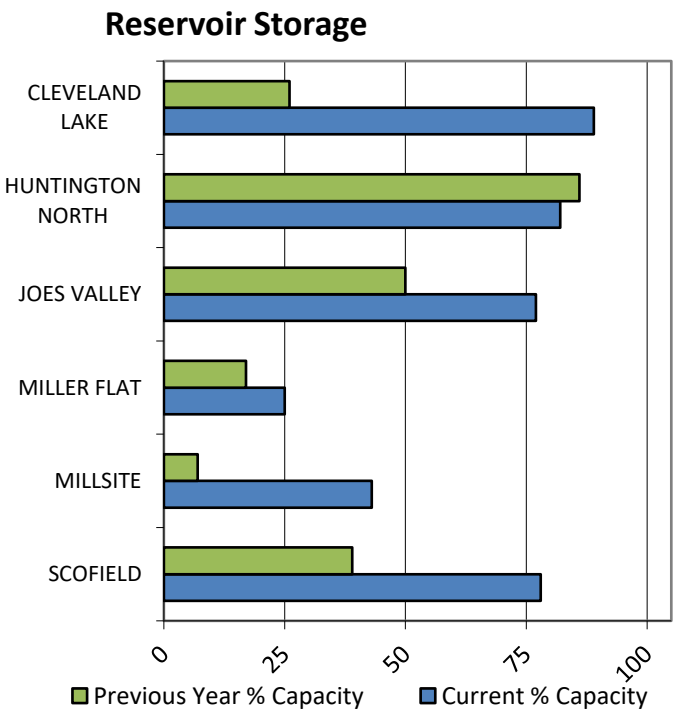
February 1, 2020

Snowpack in the Price & San Rafael Basins is above normal at 110% of normal, compared to 111% last year. Precipitation in January was near average at 108%, which brings the seasonal accumulation (Oct-Jan) to 94% of average. Soil moisture is at 39% compared to 58% last year. Reservoir storage is at 74% of capacity, compared to 41% last year. Forecast streamflow volumes range from 78% to 95% of average. The surface water supply index is 73% for the Price River, 63% for Joe's Valley, 49% for Ferron Creek.









SNOTEL Data

Data Current as of: 2/6/2020 11:18:23 AM

Price San Rafael Rivers
Streamflow Forecasts - February 1, 2020

Price San Rafael Rivers	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Fish Ck ab Reservoir nr Scofield	APR-JUL	13.3	19.9	25	83%	31	41	30
Price R nr Scofield Reservoir[2]	APR-JUL	14.6	24	32	78%	42	57	41
White R bl Tabbyune Creek	APR-JUL	6.8	10.2	13	84%	16.1	21	15.5
Green R at Green River, UT [2]	APR-JUL	1610	2200	2660	90%	3160	3970	2960
Electric Lake Inflow [2]	APR-JUL	6.1	9.1	11.6	87%	14.3	18.8	13.3
Huntington Ck nr Huntington [2]	APR-JUL	23	32	38	95%	46	57	40
Joes Valley Reservoir Inflow[2]	APR-JUL	34	45	53	95%	62	77	56
Ferron Ck (Upper Station) nr Ferron	APR-JUL	24	30	35	92%	40	47	38

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2020	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Joes Valley Reservoir	47.3	30.8	39.9	61.6
Millsite	7.2	1.2	10.1	16.7
Huntington North Reservoir	3.4	3.6	2.7	4.2
Cleveland Lake	4.8	1.4		5.4
Miller Flat Reservoir	1.3	0.9		5.2
Scofield Reservoir	51.5	25.7	29.9	65.8
Basin-wide Total	109.5	61.2	82.6	148.3
# of reservoirs	4	4	4	4

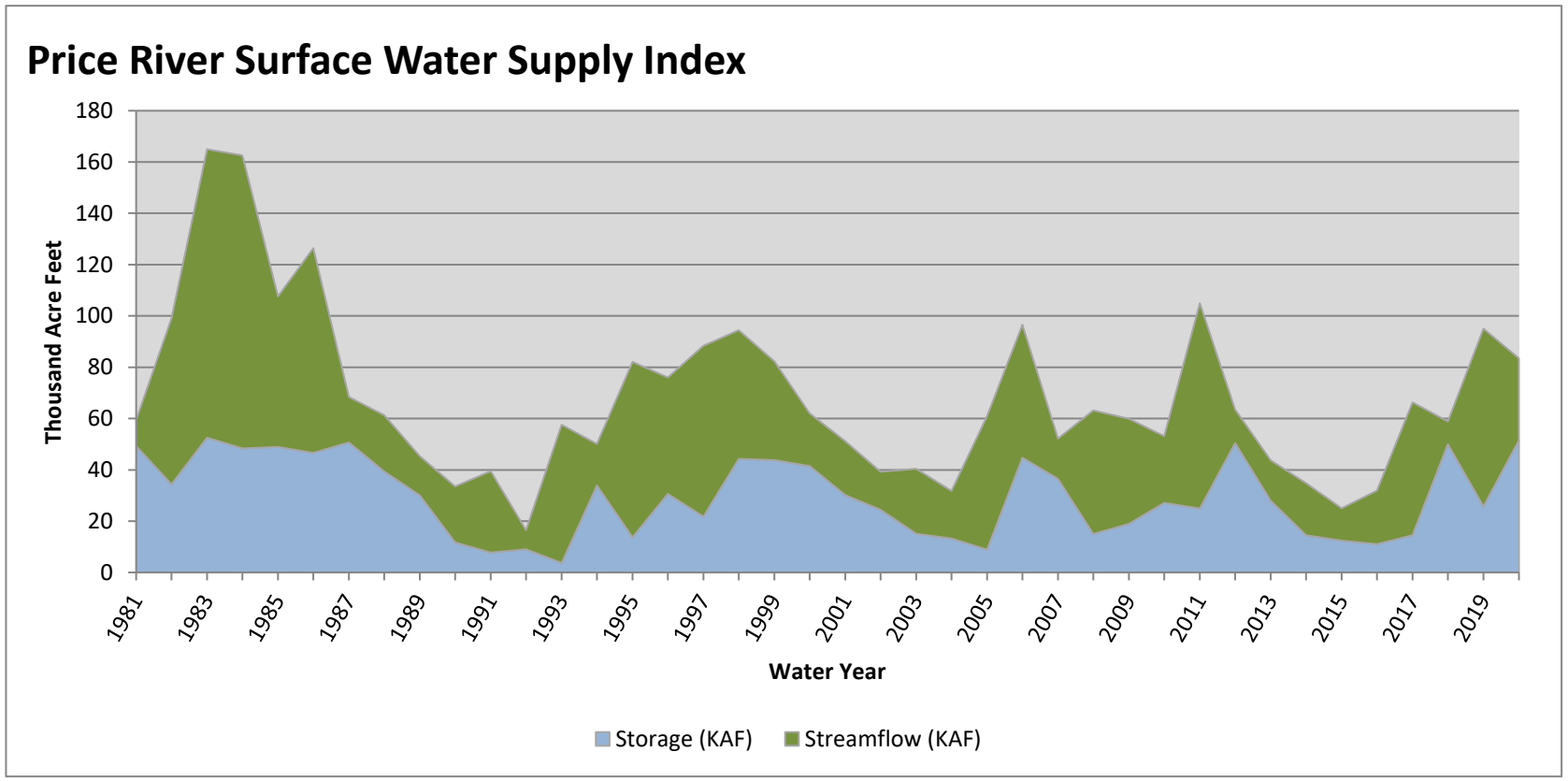
Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Price River	4	114%	114%
San Rafael	4	113%	111%

February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Price River	**51.48**	**32.00**	**83.48**	**73**	**1.93**	**95, 99, 97, 98**

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

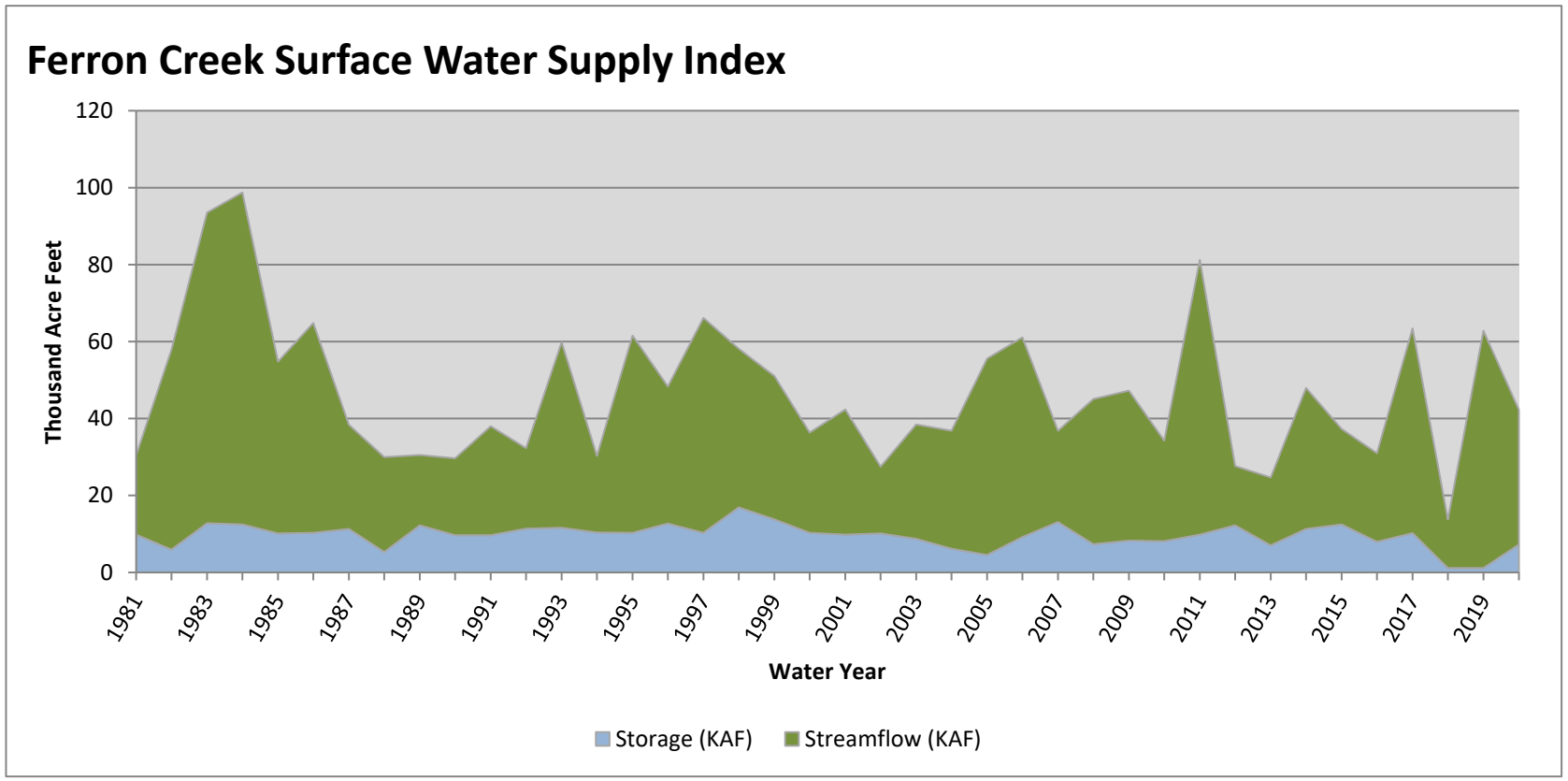


February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Ferron Creek	**7.24**	**35.00**	**42.24**	**49**	**-0.1**	**87, 03, 01, 08**

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

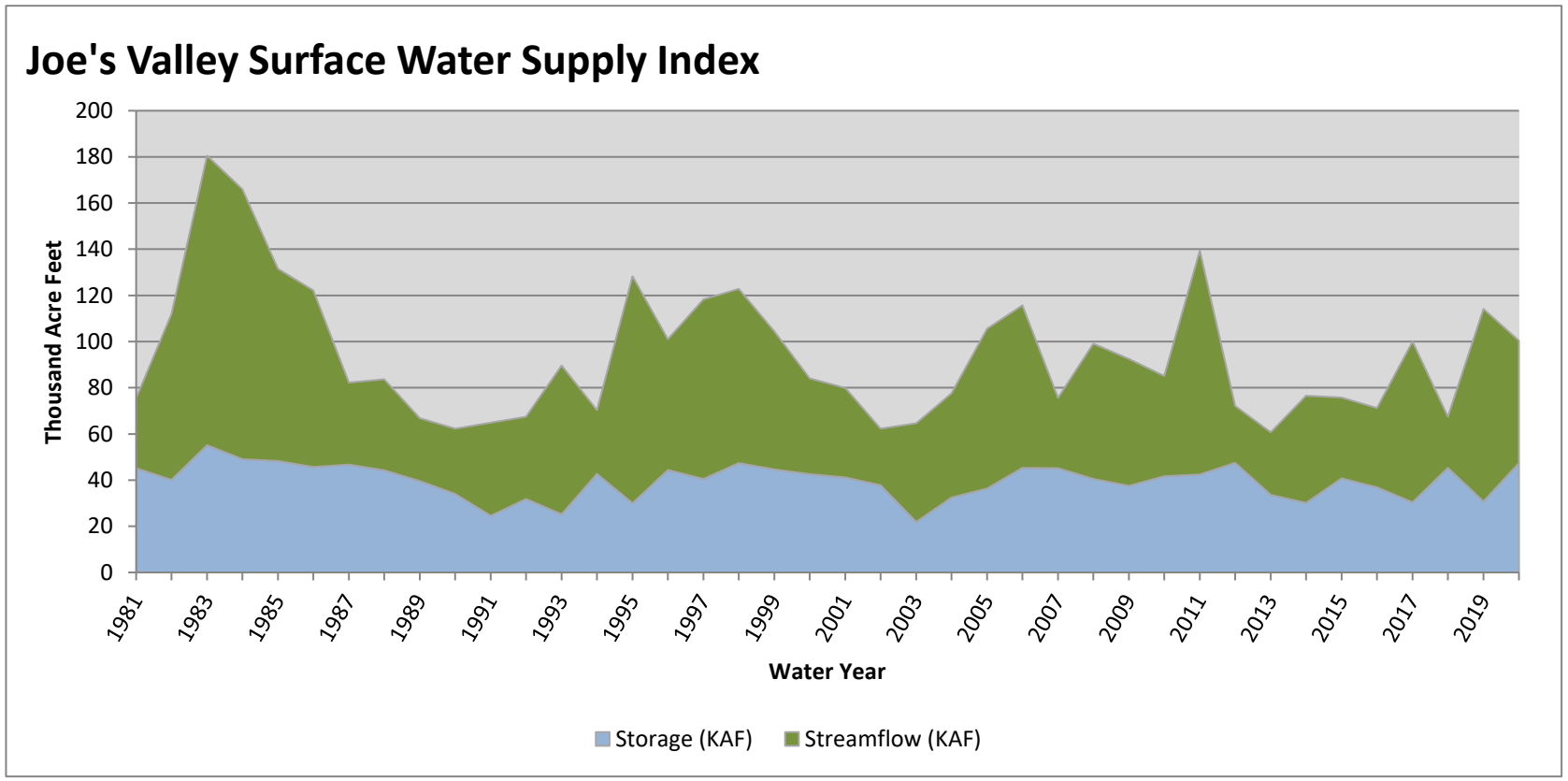


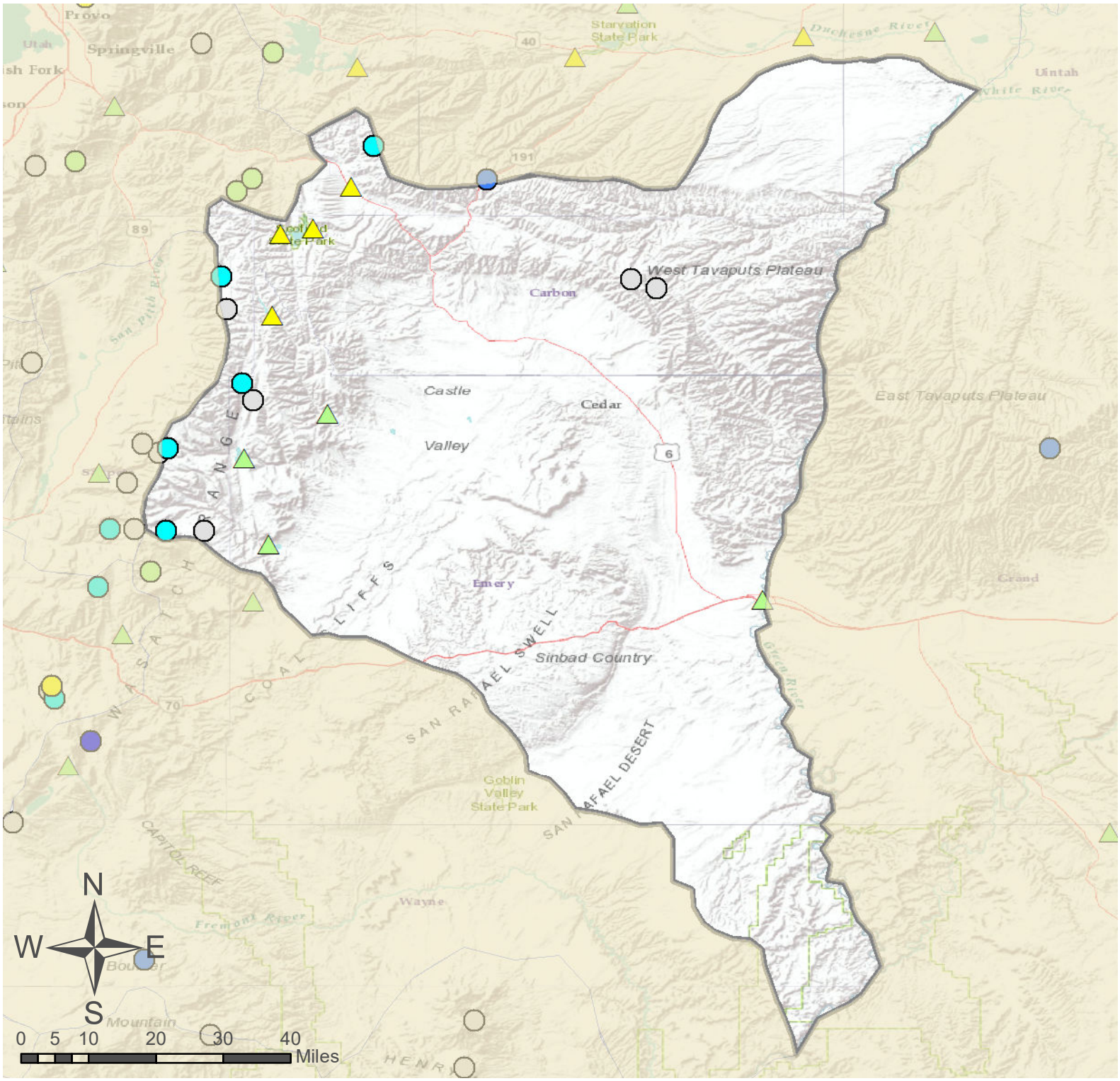
February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Joe's Valley	**47.34**	**53.00**	**100.34**	**63**	**1.12**	**08, 17, 96, 99**

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





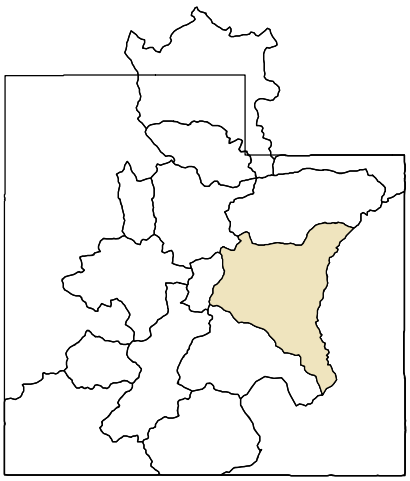
Price & San Rafael Basins

SNOTEL Site

Forecast Point

% of Normal

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



As of February 1, 2020:

110% of Normal SWE

94% of Normal Precipitation

108% of Normal Precipitation Last Month

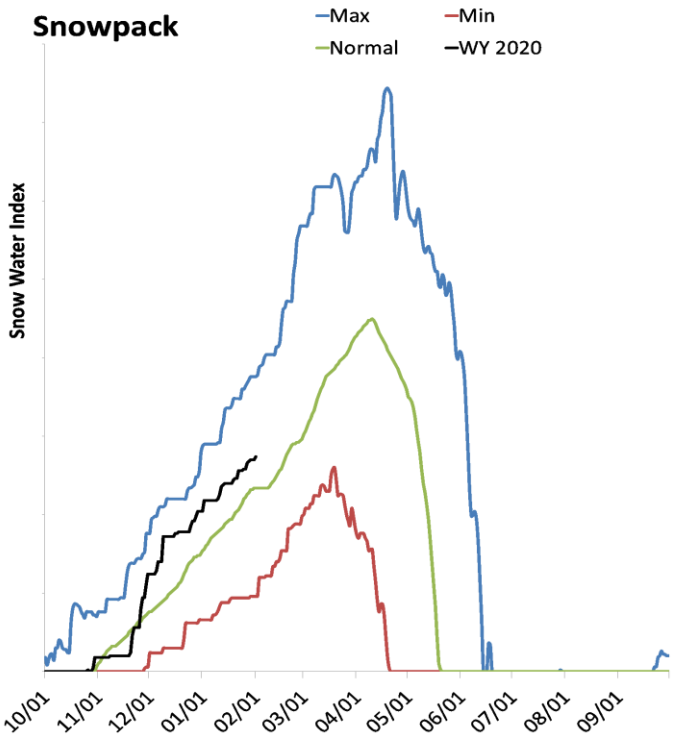
39% Saturation Soil Moisture

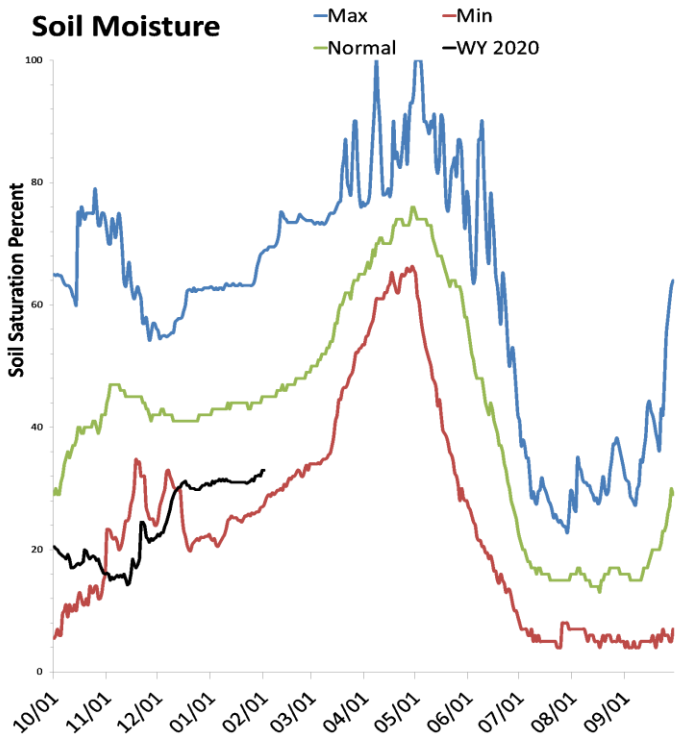
Price & San Rafael Basins

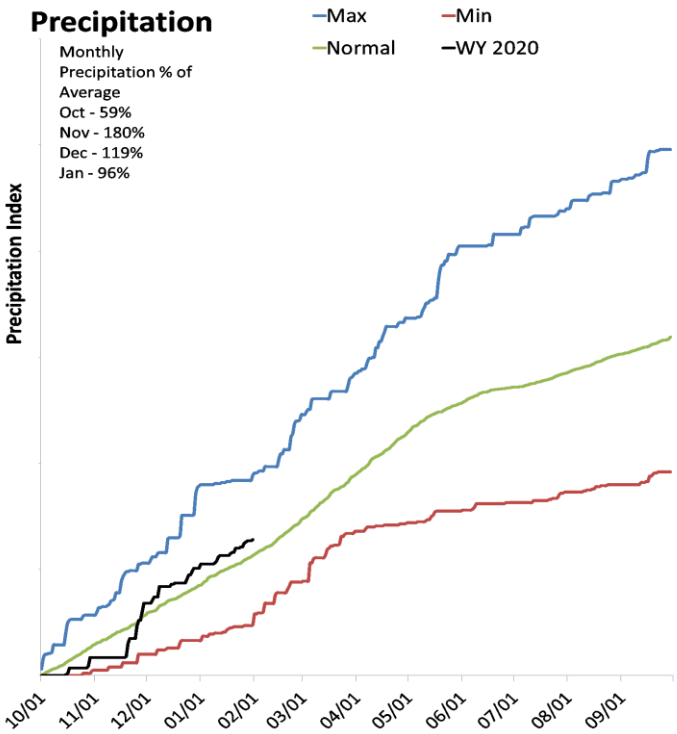
Lower Sevier Basin

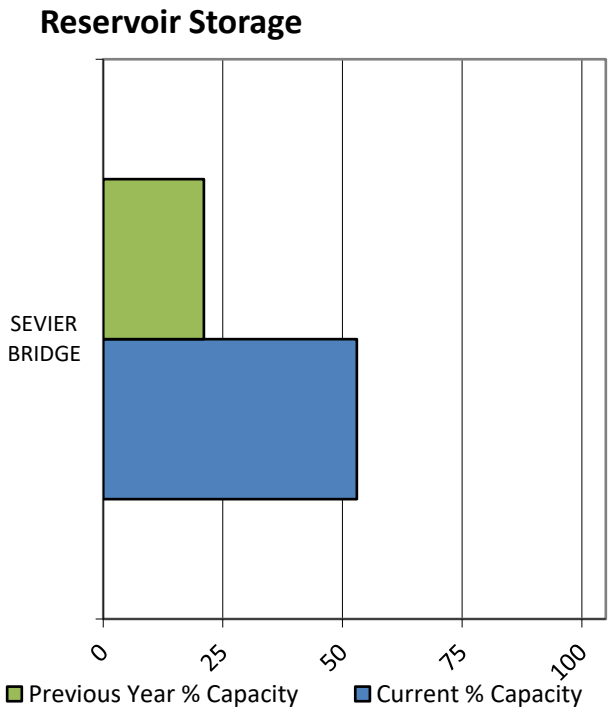
February 1, 2020

Snowpack in the Lower Sevier Basin is above normal at 117% of normal, compared to 106% last year. Precipitation in January was near average at 96%, which brings the seasonal accumulation (Oct-Jan) to 113% of average. Soil moisture is at 33% compared to 38% last year. Reservoir storage is at 53% of capacity, compared to 21% last year. Forecast streamflow volume for the Sevier River nr Gunnison is 111% of average. The surface water supply index is 59% for the Lower Sevier.









SNOTEL Data

Data Current as of: 2/6/2020 11:19:03 AM

Lower Sevier
Streamflow Forecasts - February 1, 2020

Lower Sevier	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Chicken Ck nr Levan Sevier R nr Gunnison Oak Ck nr Oak City	APR-JUL	57	89	110	111%	131	163	99

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2020	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Sevier Bridge Reservoir	124.9	49.2	155.7	236.0
Basin-wide Total	124.9	49.2	155.7	236.0
# of reservoirs	1	1	1	1

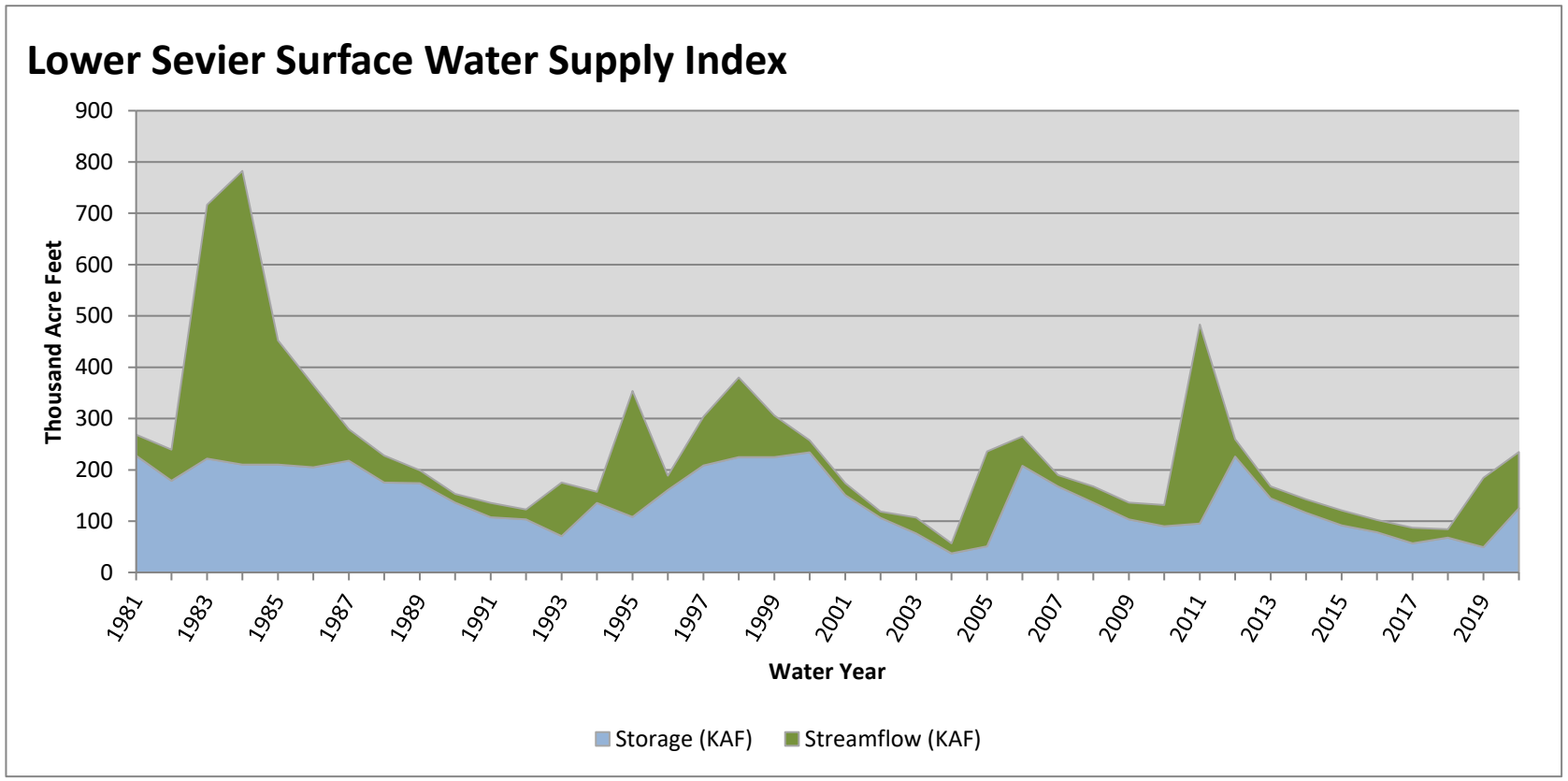
Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Lower Sevier	1	117%	106%

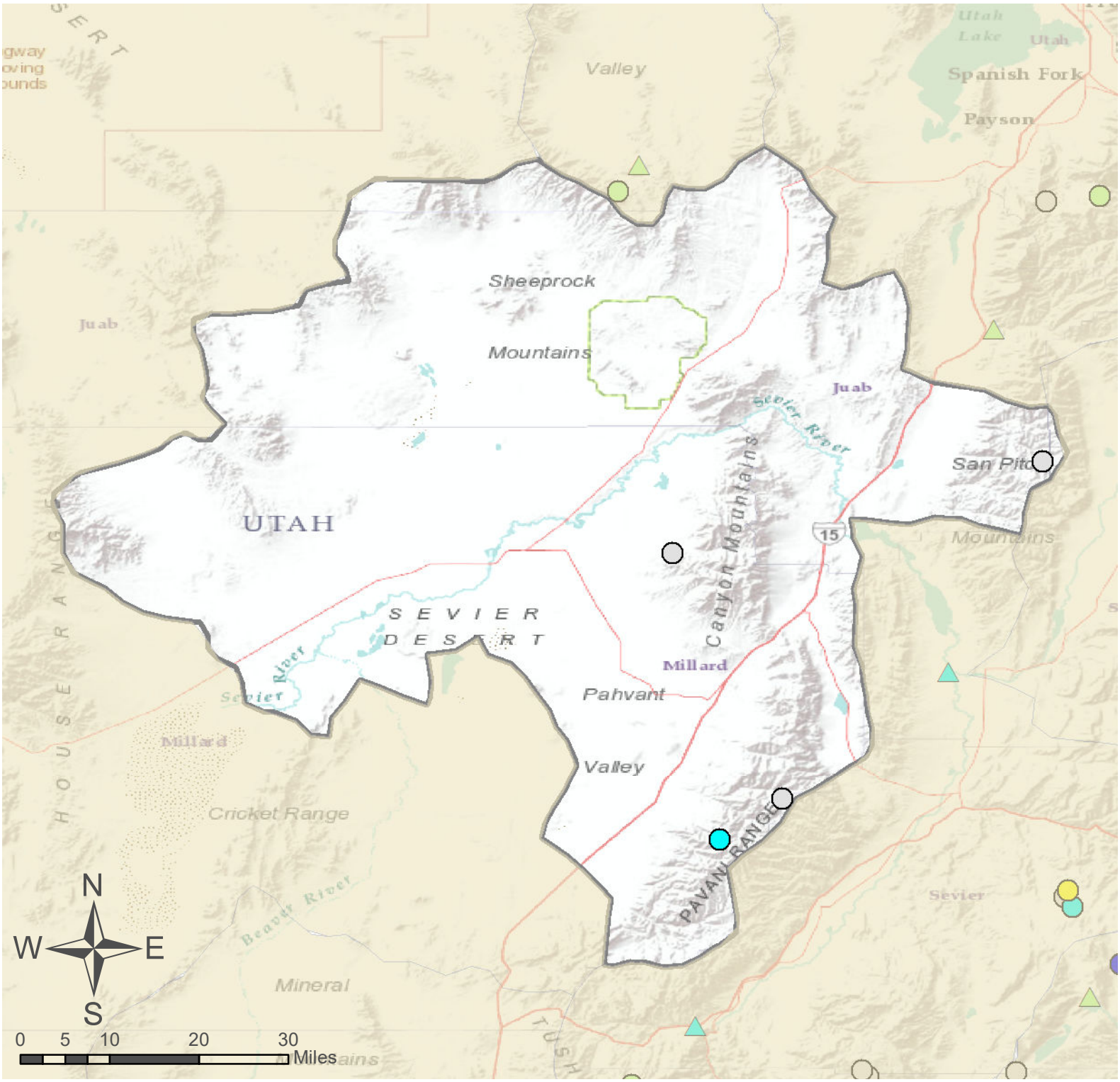
February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Lower Sevier	**124.92**	**110.00**	**234.92**	**59**	**0.71**	**89, 88, 05, 82**

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





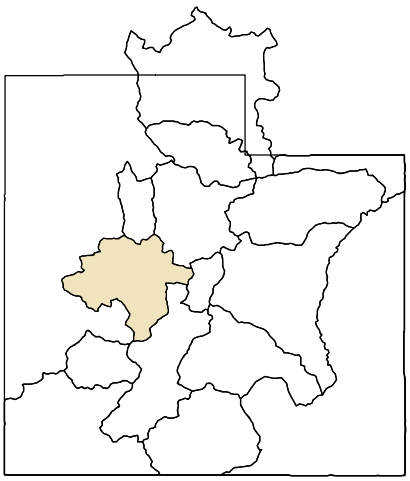
Lower Sevier Basin

SNOTEL Site

Forecast Point

% of Normal

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



<u>As of February 1, 2020:</u>

117% of Normal SWE

113% of Normal Precipitation

96% of Normal Precipitation Last Month

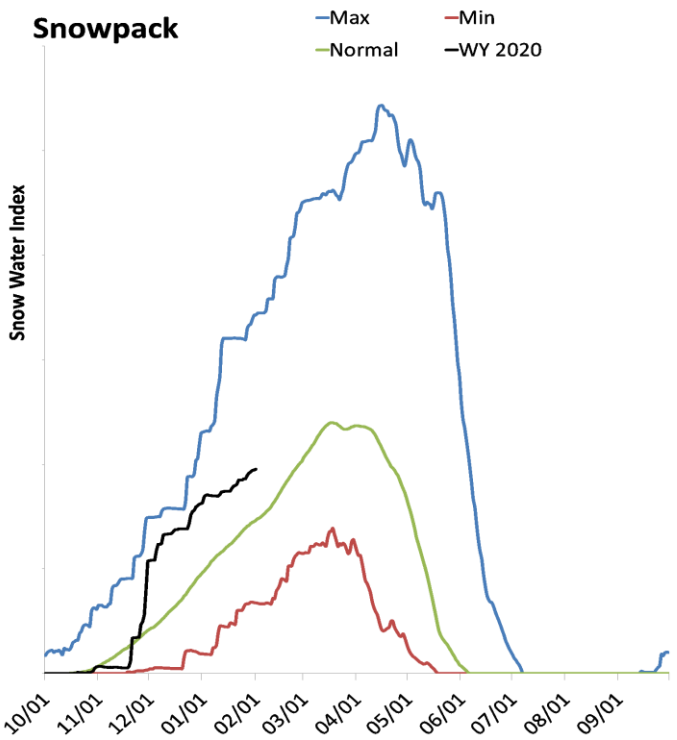
33% Saturation Soil Moisture

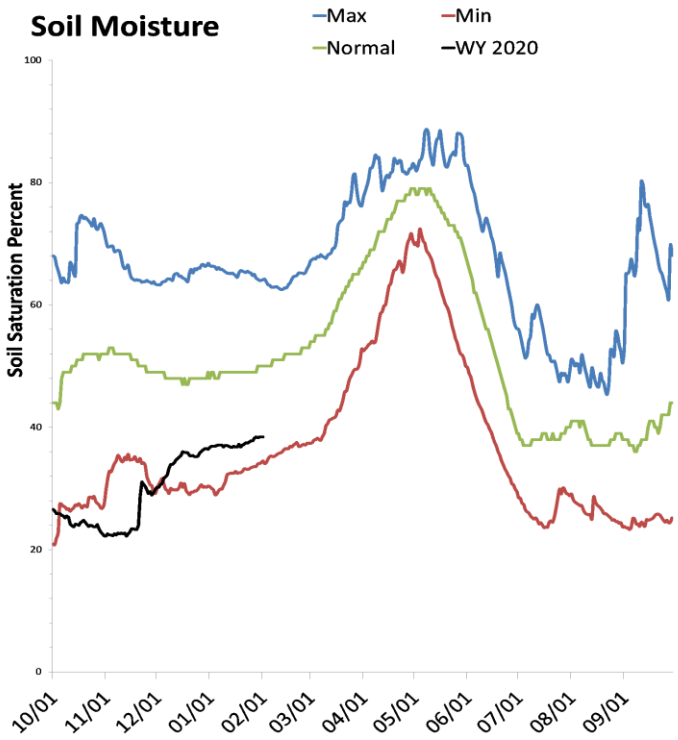
Lower Sevier Basin

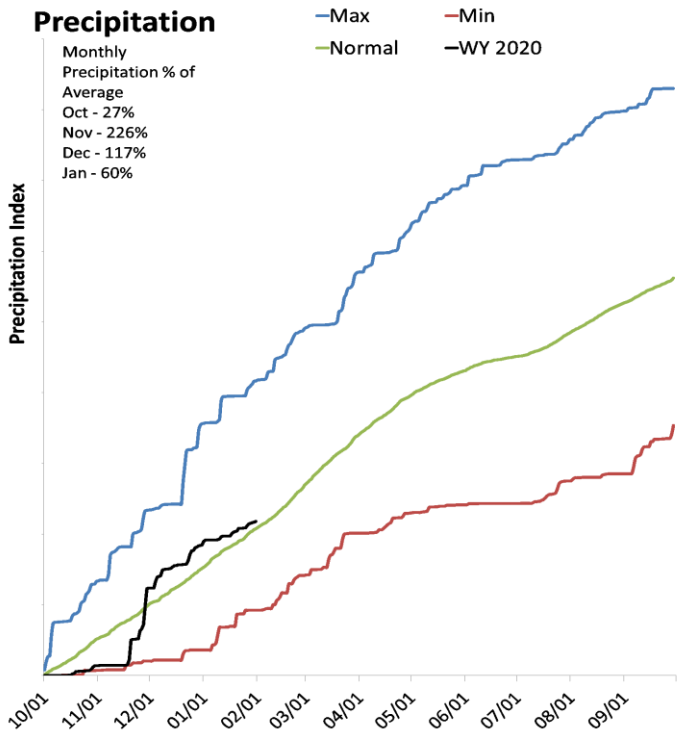
Upper Sevier Basin

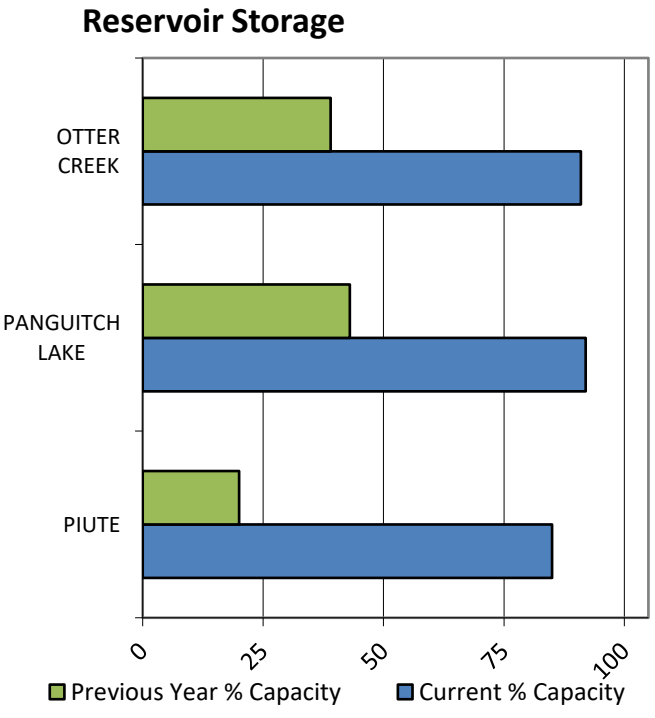
February 1, 2020

Snowpack in the Upper Sevier Basin is much above normal at 133% of normal, compared to 111% last year. Precipitation in January was much below average at 60%, which brings the seasonal accumulation (Oct-Jan) to 105% of average. Soil moisture is at 39% compared to 44% last year. Reservoir storage is at 88% of capacity, compared to 30% last year. Forecast streamflow volumes range from 104% to 142% of average. The surface water supply index is 83% for the Upper Sevier.









SNOTEL Data

Data Current as of: 2/6/2020 11:18:49 AM

Upper Sevier
Streamflow Forecasts - February 1, 2020

Upper Sevier	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Mammoth Ck nr Hatch	APR-JUL	2.7	12.5	37	137%	62	98	27
Sevier R at Hatch	APR-JUL	36	50	60	125%	70	84	48
EF Sevier R nr Kingston	APR-JUL	26	39	48	137%	57	70	35
Sevier R nr Kingston	APR-JUL	11.6	33	47	142%	61	82	33
Sevier R bl Piute Dam	APR-JUL	38	70	92	139%	114	146	66
Clear Ck ab Diversions nr Sevier	APR-JUL	10.9	18.1	23	110%	28	35	21
Salina Ck nr Emery	APR-JUL	1.94	5.7	8.2	104%	10.7	14.5	7.9

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2020	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Piute Reservoir	60.9	14.6	49.2	71.8
Otter Creek Reservoir	48.0	20.4	35.0	52.5
Panguitch Lake	20.5	9.7	12.7	22.3
Basin-wide Total	129.4	44.7	96.9	146.6
# of reservoirs	3	3	3	3

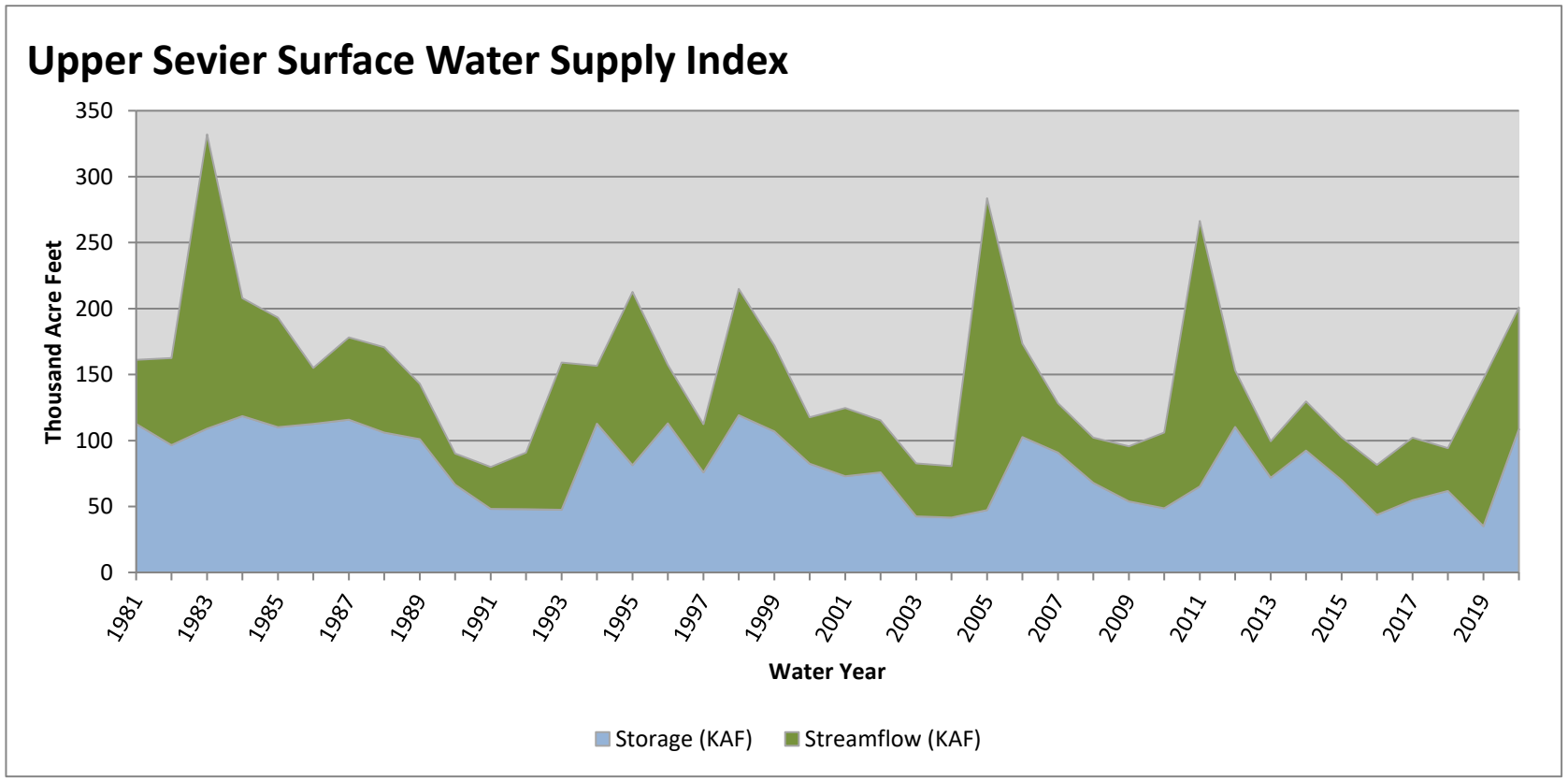
Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Upper Sevier	12	133%	111%
Middle Sevier	7	105%	113%
East Fork Sevier River	3	162%	94%

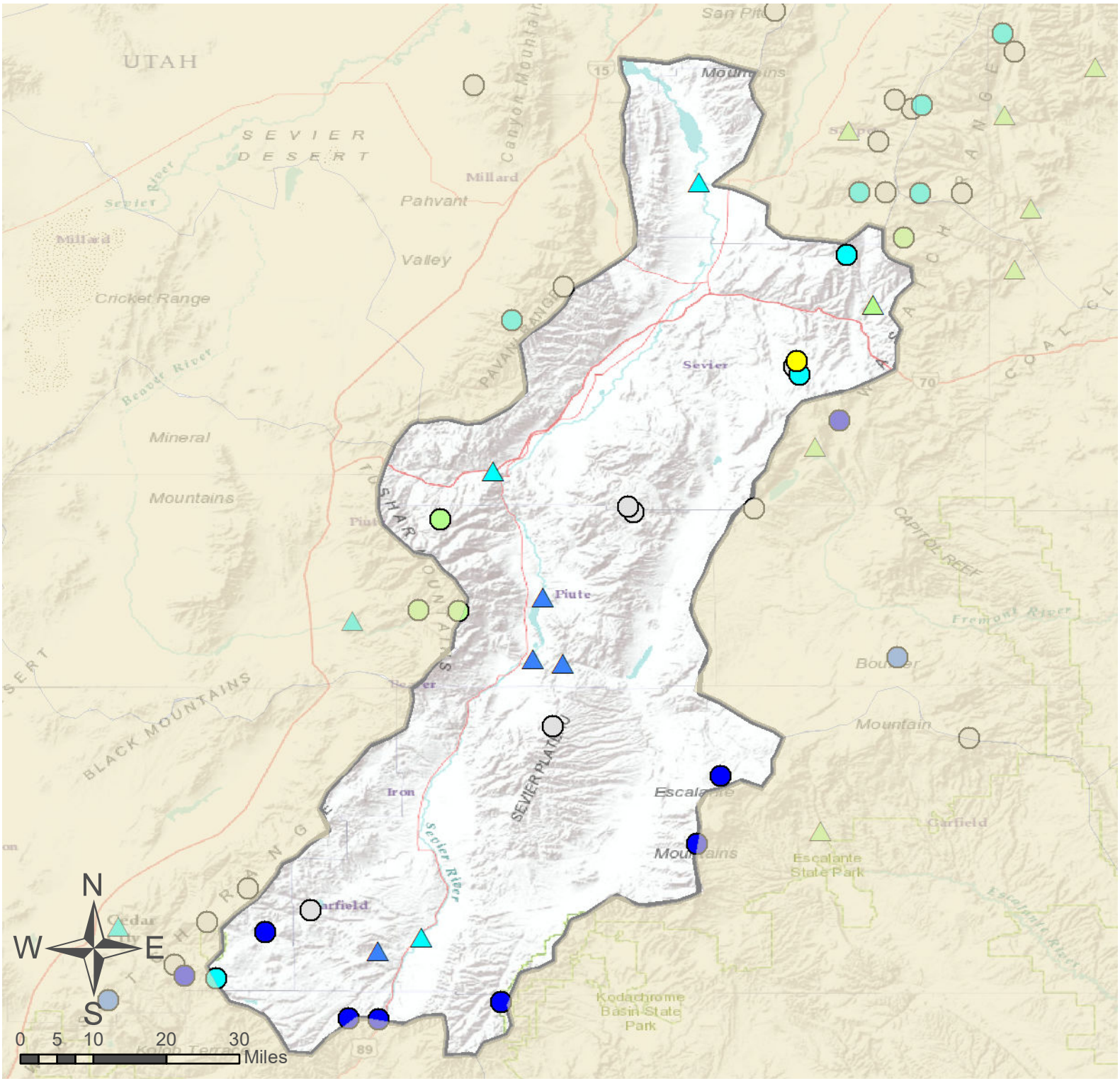
February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Upper Sevier	**108.86**	**92.00**	**200.86**	**83**	**2.74**	**87, 85, 84, 95**

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





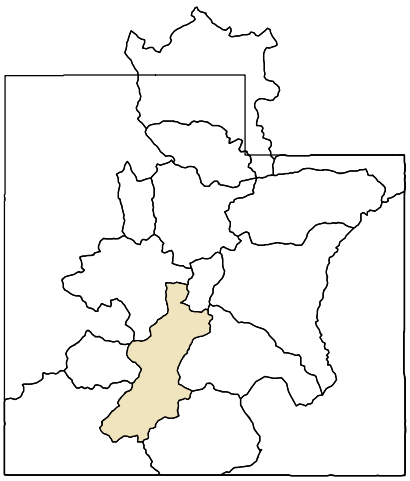
Upper Sevier Basin

SNOTEL Site

Forecast Point

% of Normal

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



As of February 1, 2020:

133% of Normal SWE

105% of Normal Precipitation

60% of Normal Precipitation Last Month

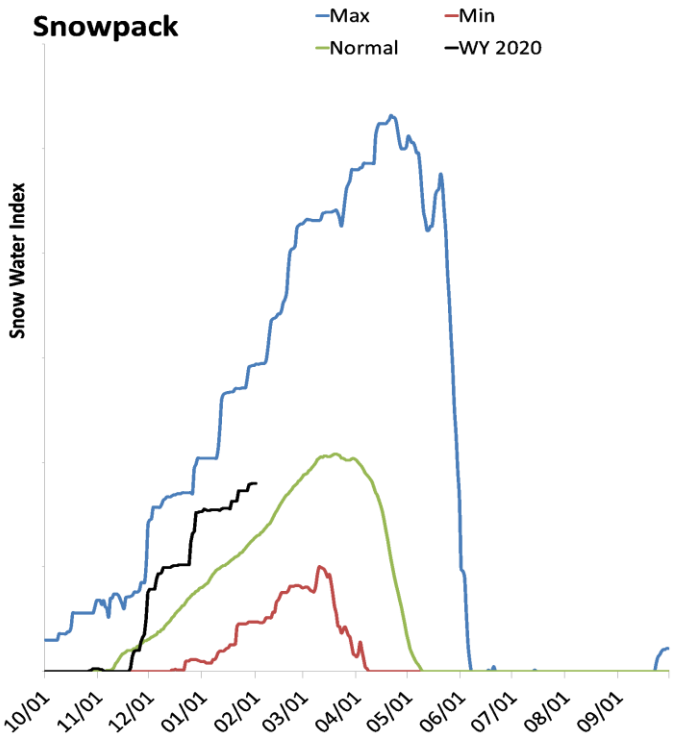
39% Saturation Soil Moisture

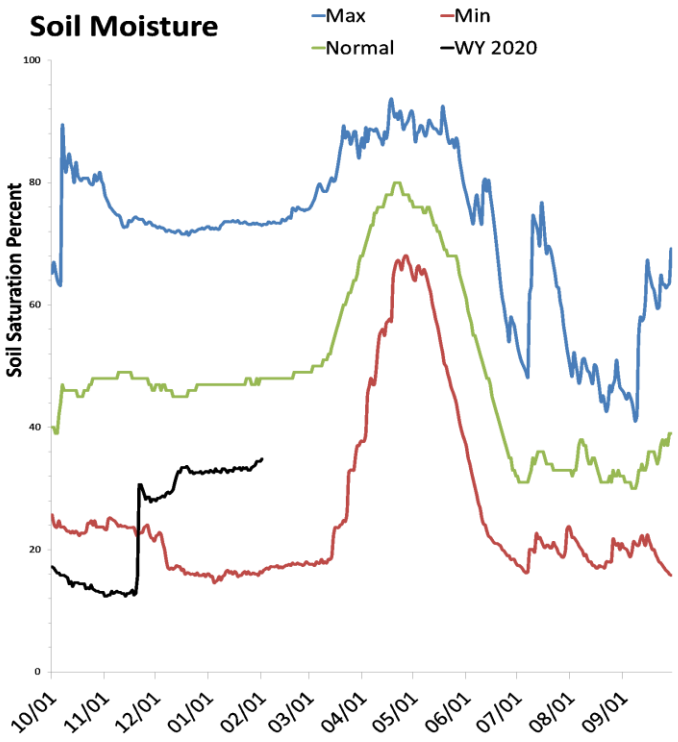
Upper Sevier Basin

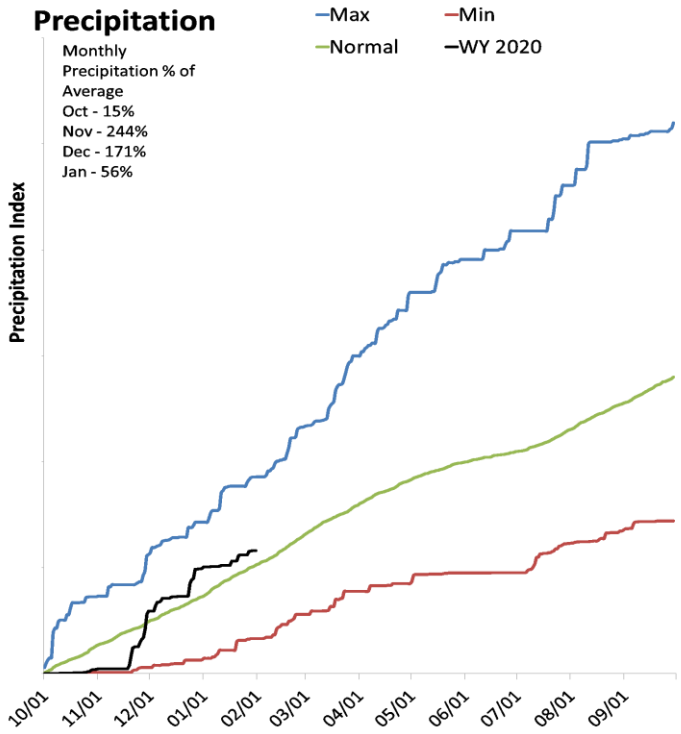
Southeastern Utah

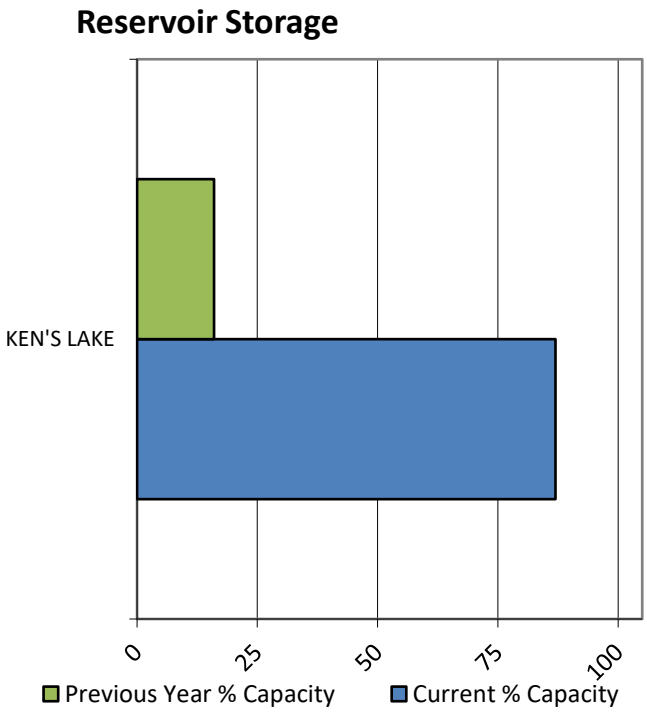
February 1, 2020

Snowpack in the Southeastern Utah is much above normal at 140% of normal, compared to 115% last year. Precipitation in January was much below average at 56%, which brings the seasonal accumulation (Oct-Jan) to 113% of average. Soil moisture is at 35% compared to 45% last year. Reservoir storage is at 87% of capacity, compared to 16% last year. Forecast streamflow volumes range from 68% to 126% of average. The surface water supply index is 71% for Moab.









SNOTEL Data

Data Current as of: 2/6/2020 11:18:39 AM

Southeastern Utah
Streamflow Forecasts - February 1, 2020

Southeastern Utah	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Mill Ck at Sheley Tunnel nr Moab	APR-JUL	2.3	3.4	4.3	100%	5.2	6.8	4.3
South Ck ab Resv nr Monticello	MAR-JUL	0.55	0.98	1.37	126%	1.85	2.7	1.09
Colorado R nr Cisco [2]	APR-JUL	2150	2930	3520	82%	4180	5240	4280
San Juan R near Bluff [2]	APR-JUL	415	600	745	68%	910	1170	1100

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2020	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Ken's Lake	2.0	0.4	1.1	2.3
Basin-wide Total	2.0	0.4	1.1	2.3
# of reservoirs	1	1	1	1

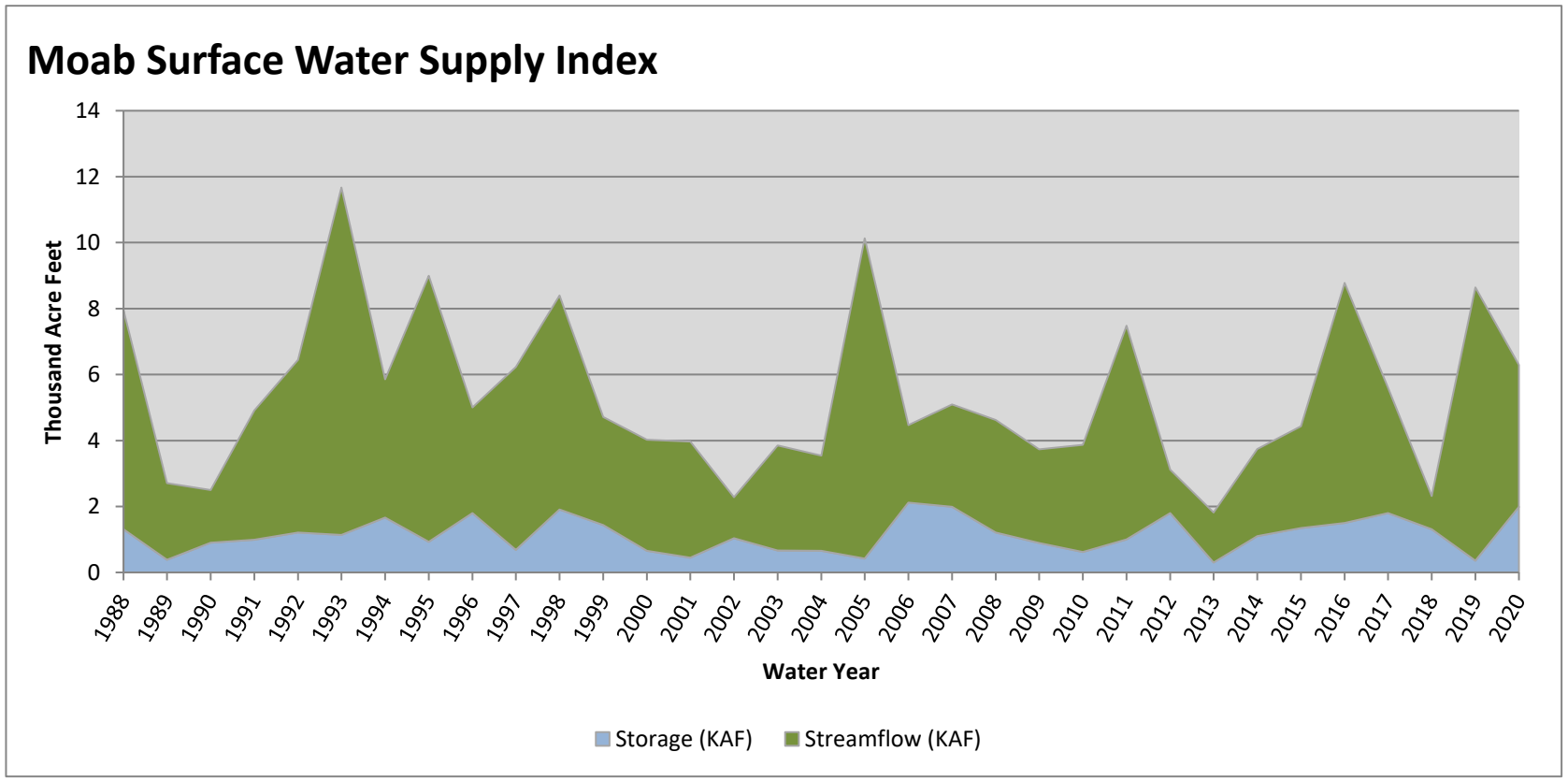
Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Lasal Mountains	1	107%	104%
Lower San Juan	1	178%	128%
Lower Green	2	143%	108%
Henry Mountains	0		

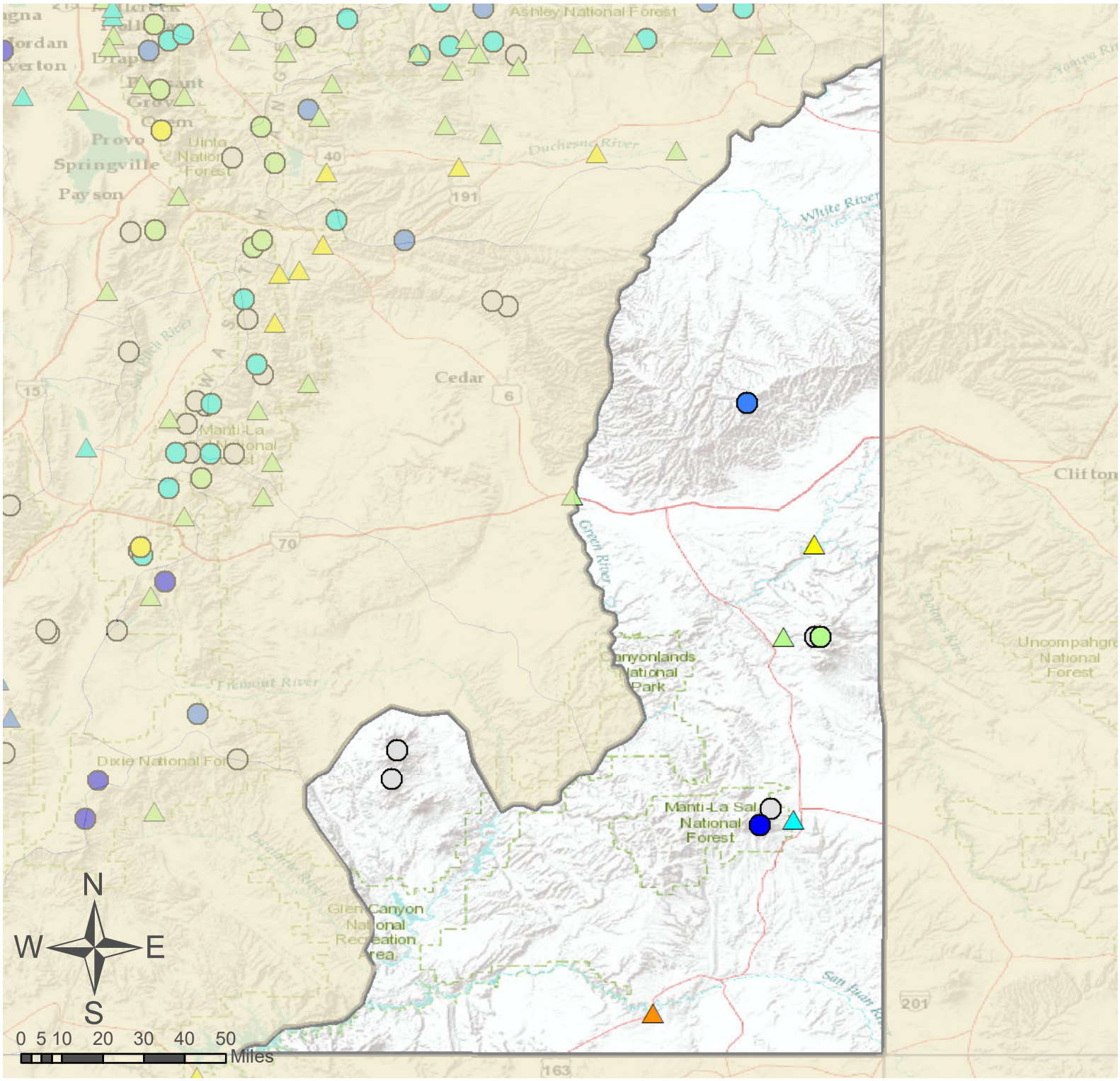
February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Moab	**1.99**	**4.30**	**6.29**	**71**	**1.72**	**94, 97, 92, 11**

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





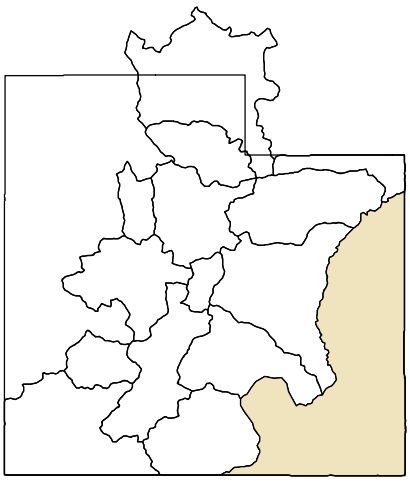
Southeastern Utah

SNOTEL Site

Forecast Point

% of Normal

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



As of February 1, 2020:

140% of Normal SWE

113% of Normal Precipitation

56% of Normal Precipitation Last Month

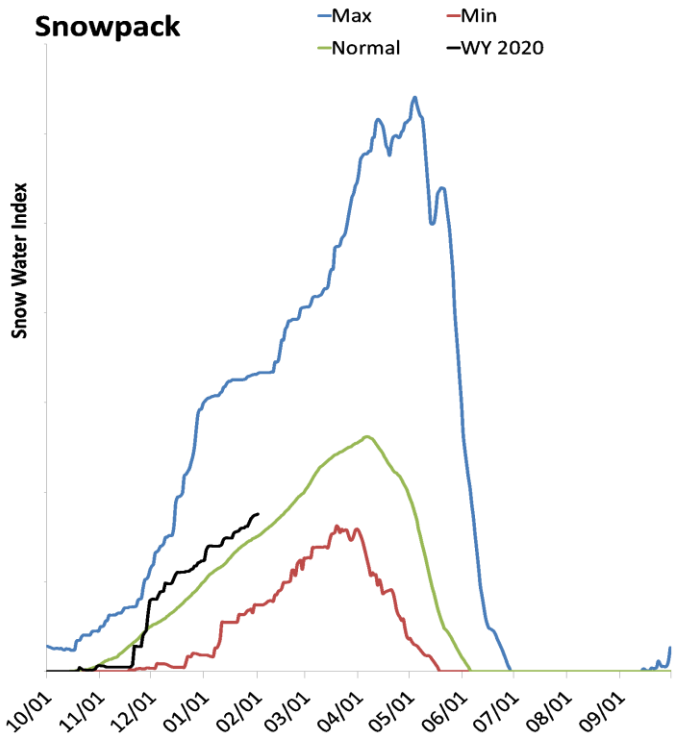
35% Saturation Soil Moisture

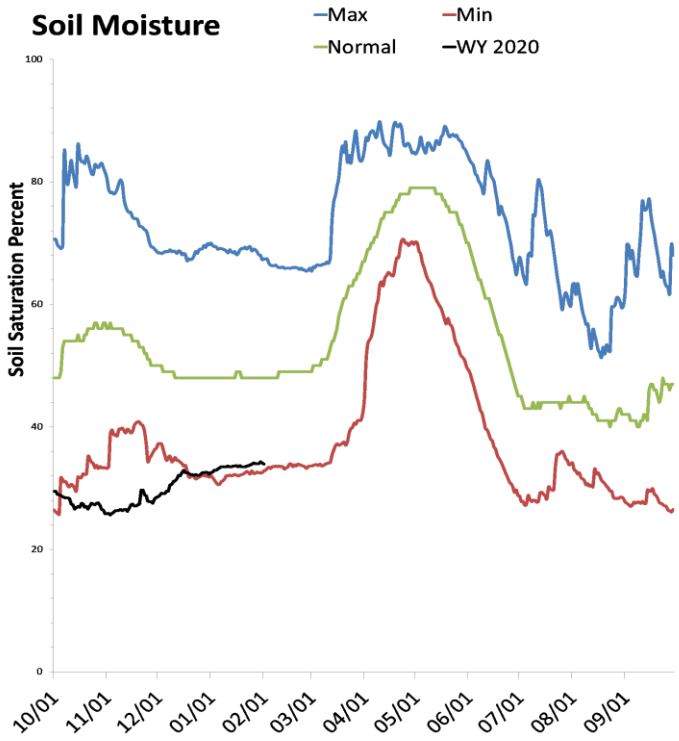
Southeastern Utah

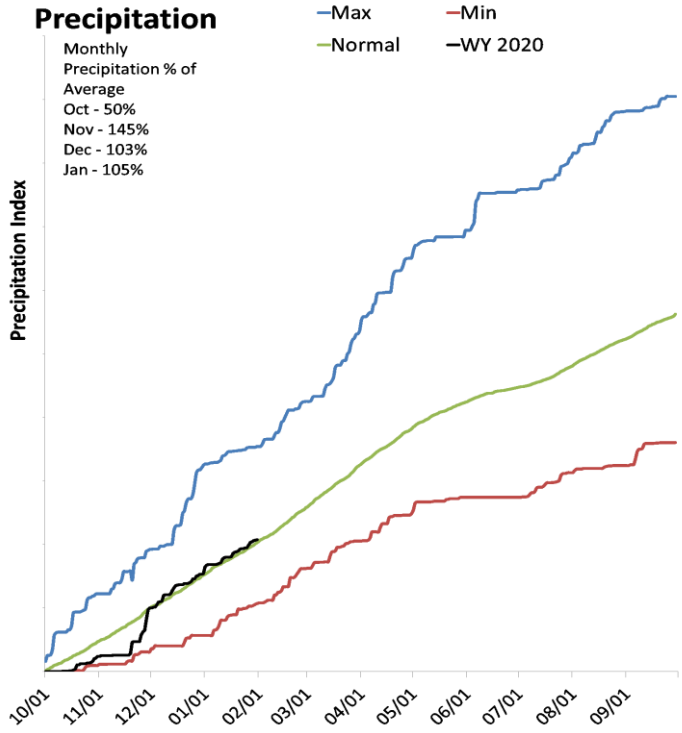
Dirty Devil Basin

February 1, 2020

Snowpack in the Dirty Devil Basin is above normal at 116% of normal, compared to 111% last year. Precipitation in January was near average at 105%, which brings the seasonal accumulation (Oct-Jan) to 102% of average. Soil moisture is at 34% compared to 40% last year. Forecast streamflow volumes range from 89% to 99% of average.







SNOTEL Data

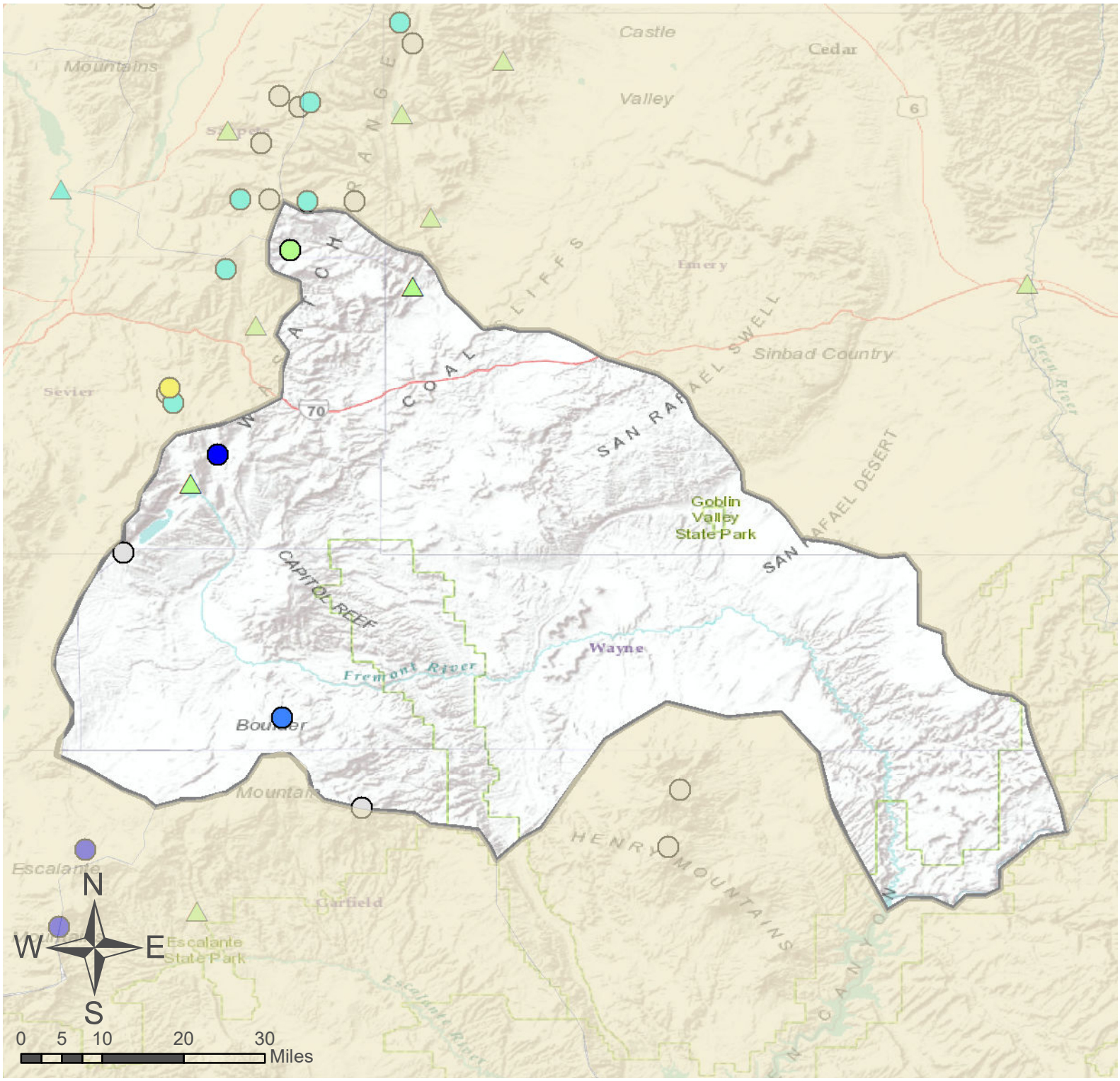
Data Current as of: 2/6/2020 11:18:31 AM

Dirty Devil
Streamflow Forecasts - February 1, 2020

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Dirty Devil	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Muddy Ck nr Emery								
	APR-JUL	10.5	14.6	17.8	89%	21	27	19.9
Seven Mile Ck nr Fish Lake								
	APR-JUL	3.9	5.7	7.2	99%	8.8	11.4	7.3

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Muddy Creek	3	108%	107%
Fremont River	3	127%	116%
Henry Mountains	0		



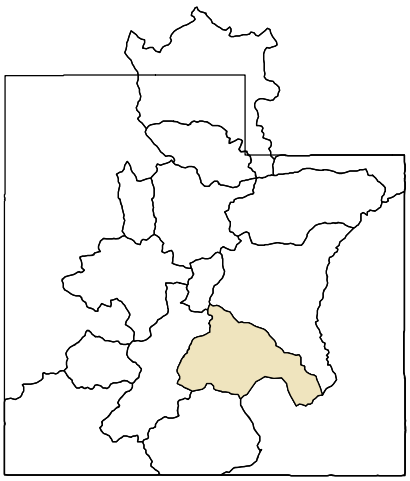
Dirty Devil Basin

SNOTEL Site

Forecast Point

% of Normal

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



As of February 1, 2020:

116% of Normal SWE

102% of Normal Precipitation

105% of Normal Precipitation Last Month

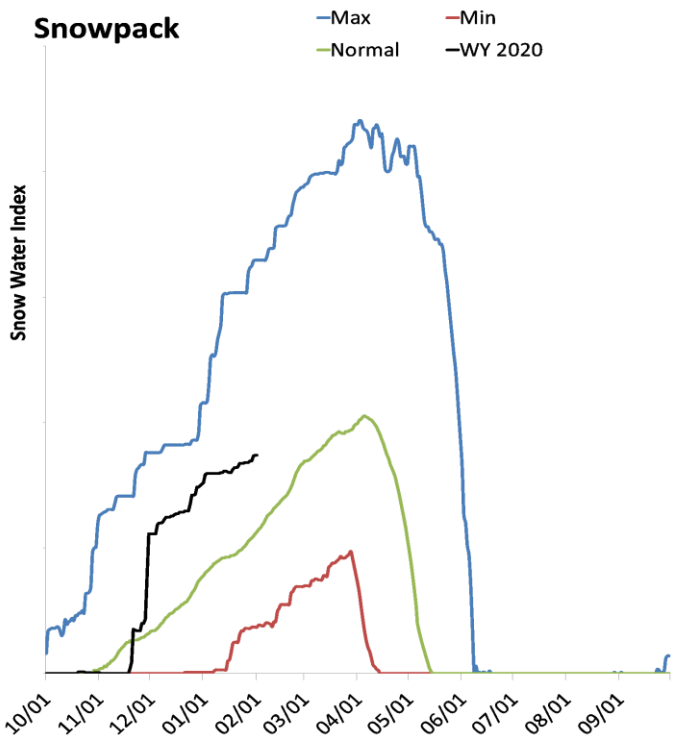
34% Saturation Soil Moisture

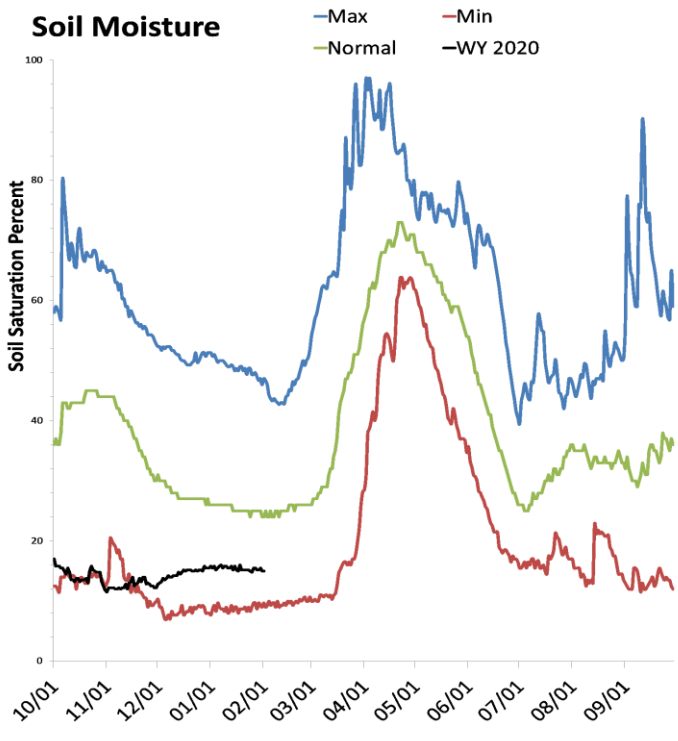
Dirty Devil Basin

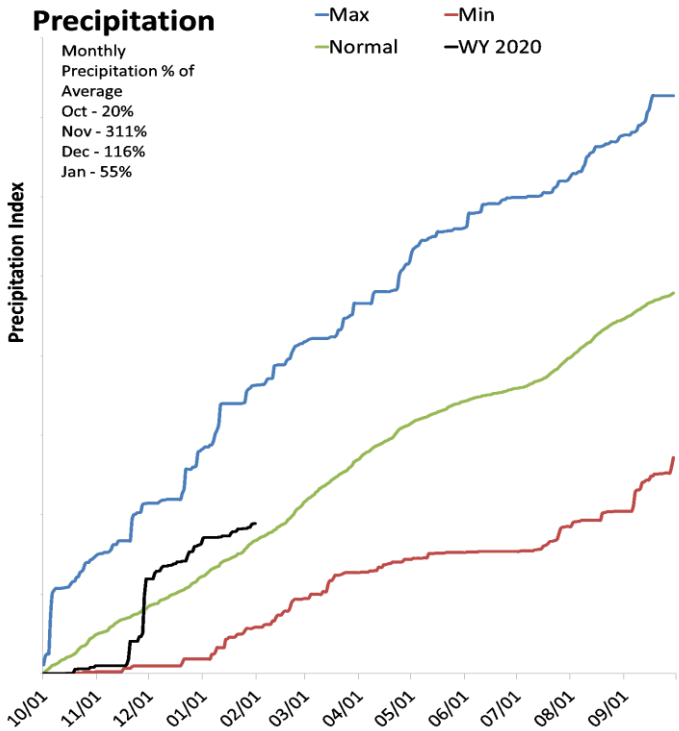
Escalante River Basin

February 1, 2020

Snowpack in the Escalante River Basin is much above normal at 154% of normal, compared to 83% last year. Precipitation in January was much below average at 55%, which brings the seasonal accumulation (Oct-Jan) to 112% of average. Soil moisture is at 15% compared to 19% last year. The forecast streamflow volume for Pine Creek is 108% of average.







SNOTEL Data

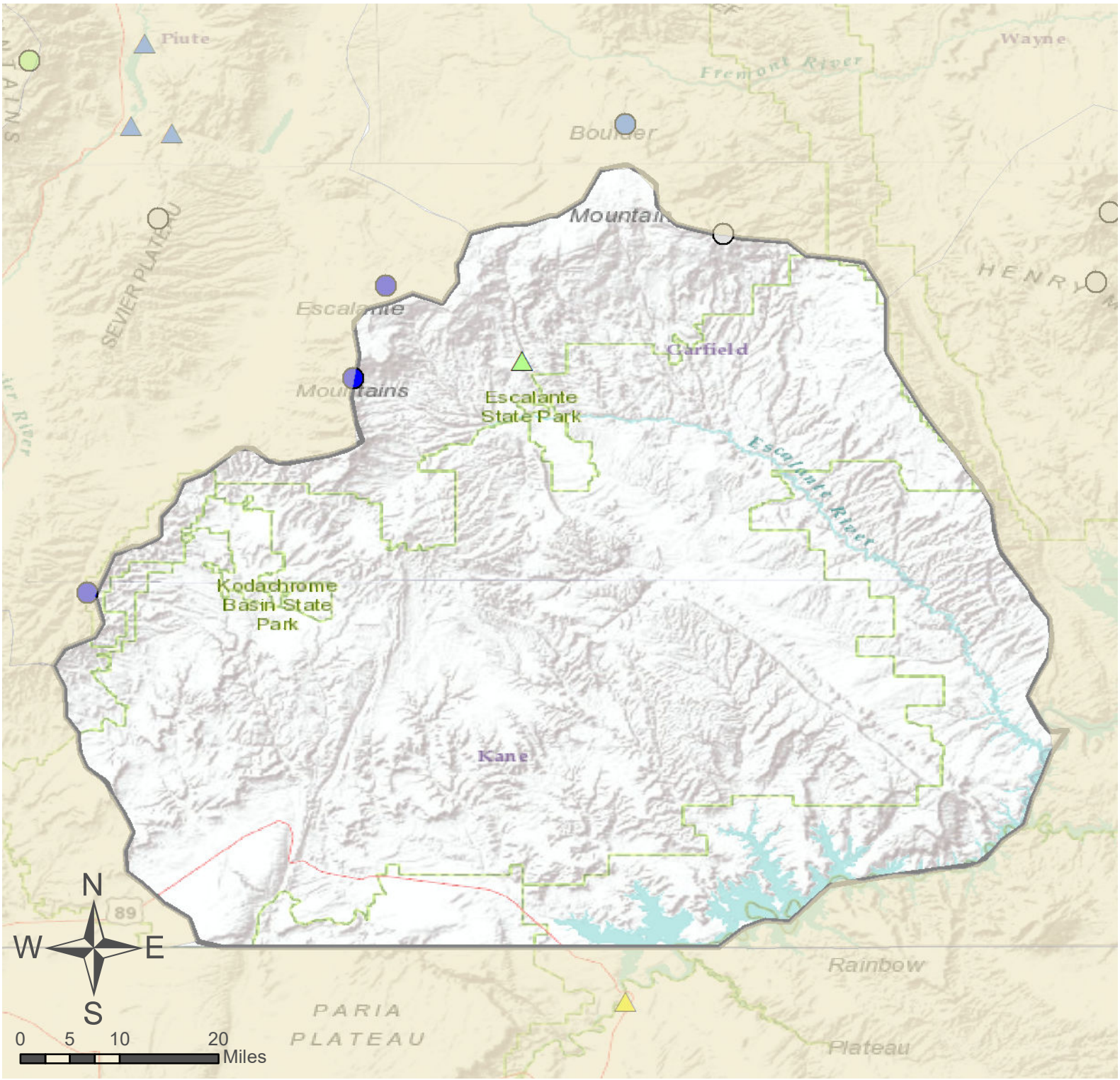
Data Current as of: 2/6/2020 11:19:18 AM

Escalante River
Streamflow Forecasts - February 1, 2020

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Escalante River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Pine Ck nr Escalante								
	APR-JUL	1.15	1.96	2.6	108%	3.4	4.7	2.4

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Escalante River	3	154%	83%
Paria River	2	167%	101%



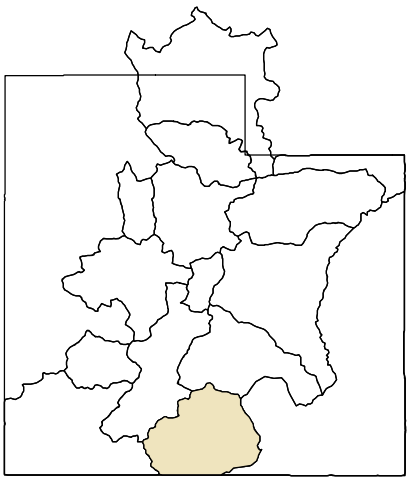
Escalante River Basin

SNOTEL Site

Forecast Point

% of Normal

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



As of February 1, 2020:

154% of Normal SWE

112% of Normal Precipitation

55% of Normal Precipitation Last Month

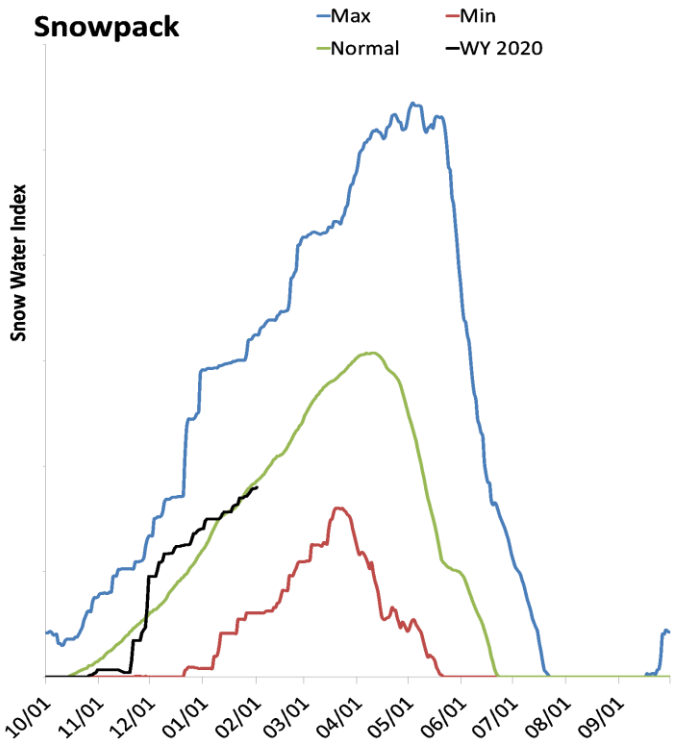
15% Saturation Soil Moisture

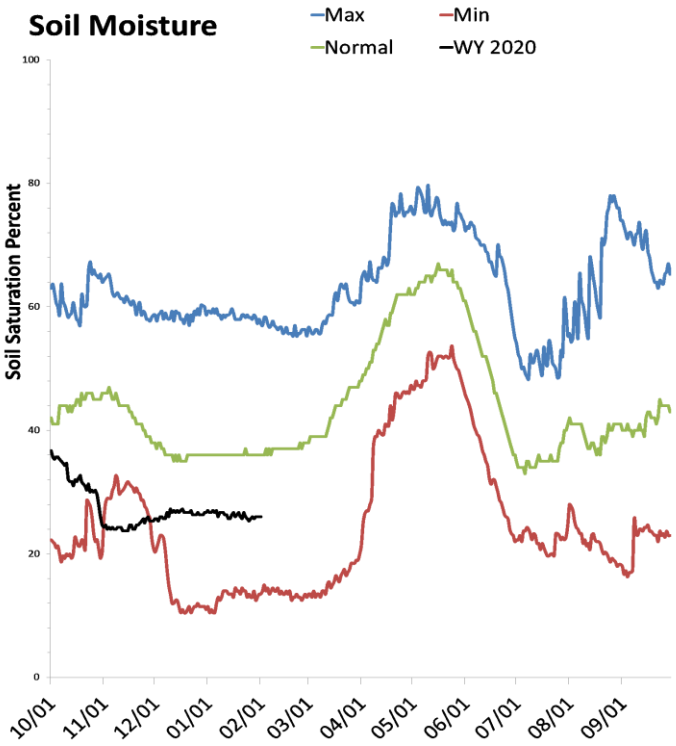
Escalante River Basin

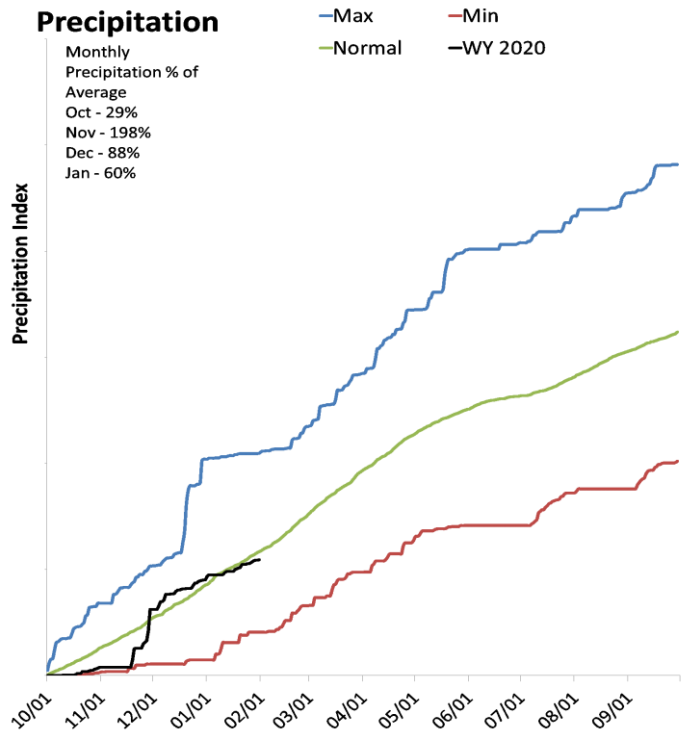
Beaver River Basin

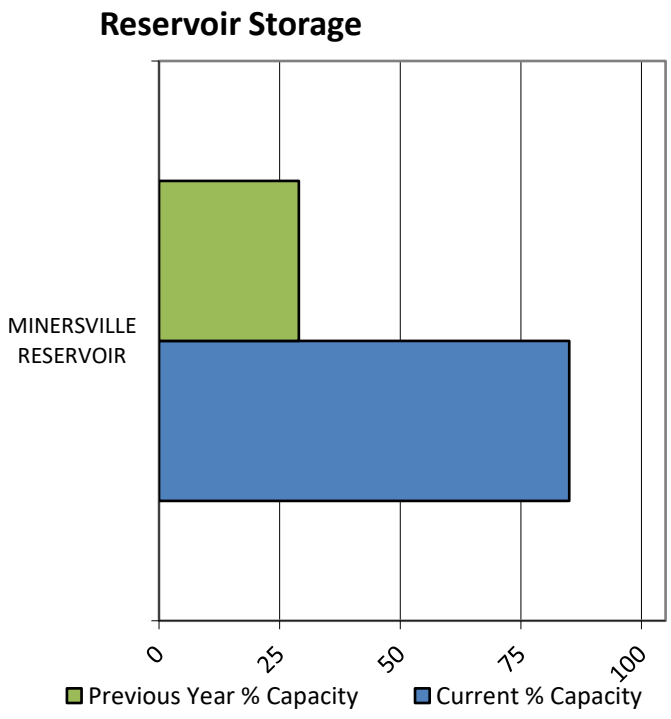
February 1, 2020

Snowpack in the Beaver River Basin is near normal at 97% of normal, compared to 107% last year. Precipitation in January was much below average at 61%, which brings the seasonal accumulation (Oct-Jan) to 93% of average. Soil moisture is at 26% compared to 40% last year. Reservoir storage is at 85% of capacity, compared to 29% last year. The forecast streamflow volume for the Beaver River is 112% of average. The surface water supply index is 76% for the Beaver River.









SNOTEL Data

Data Current as of: 2/6/2020 11:19:12 AM

Beaver River
Streamflow Forecasts - February 1, 2020

Beaver River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Beaver R nr Beaver								
	APR-JUL	13.9	23	29	112%	35	44	26

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2020	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Minersville Reservoir	19.8	6.7	13.4	23.3
Basin-wide Total	19.8	6.7	13.4	23.3
# of reservoirs	1	1	1	1

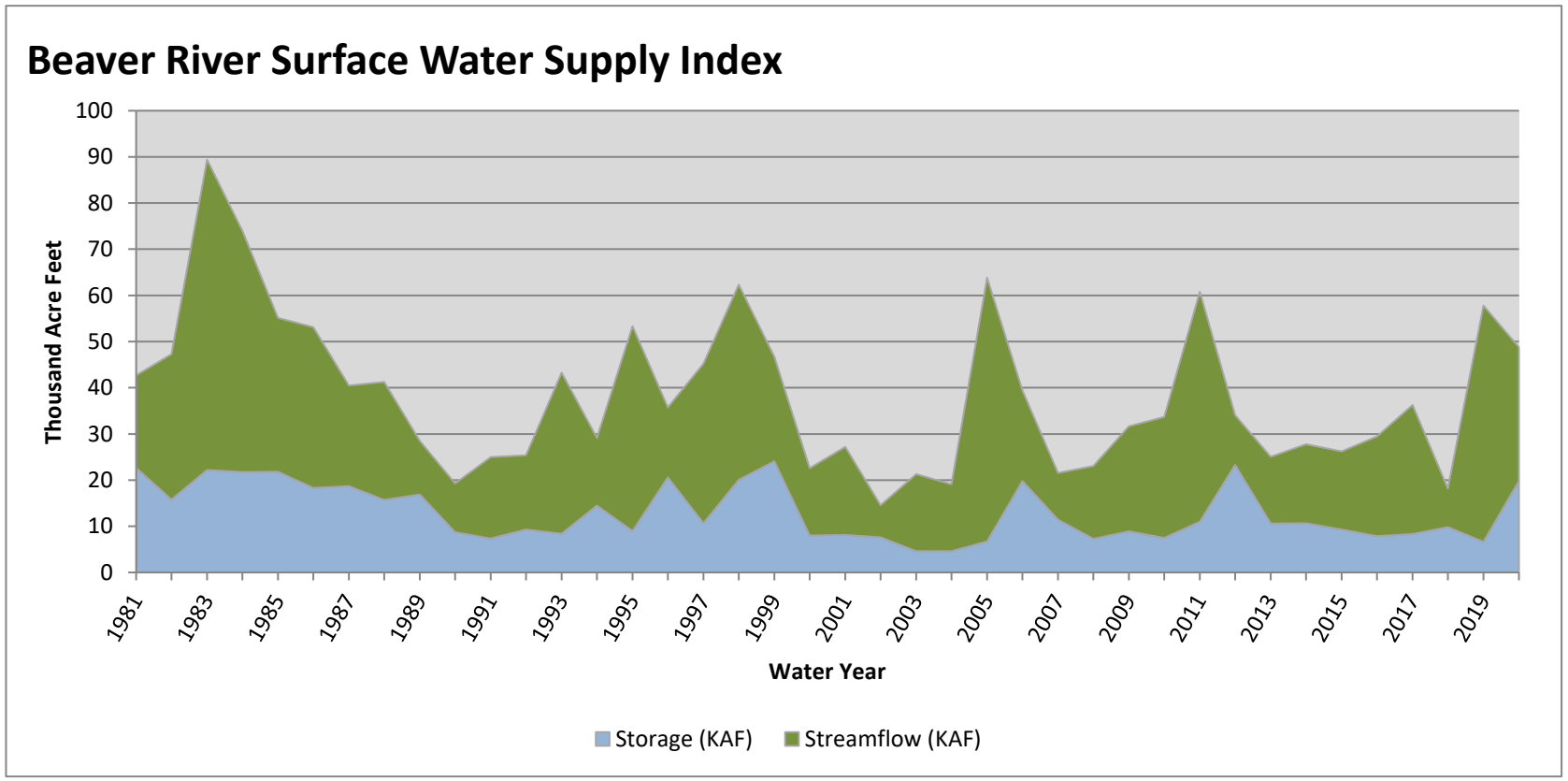
Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Beaver River	3	97%	107%

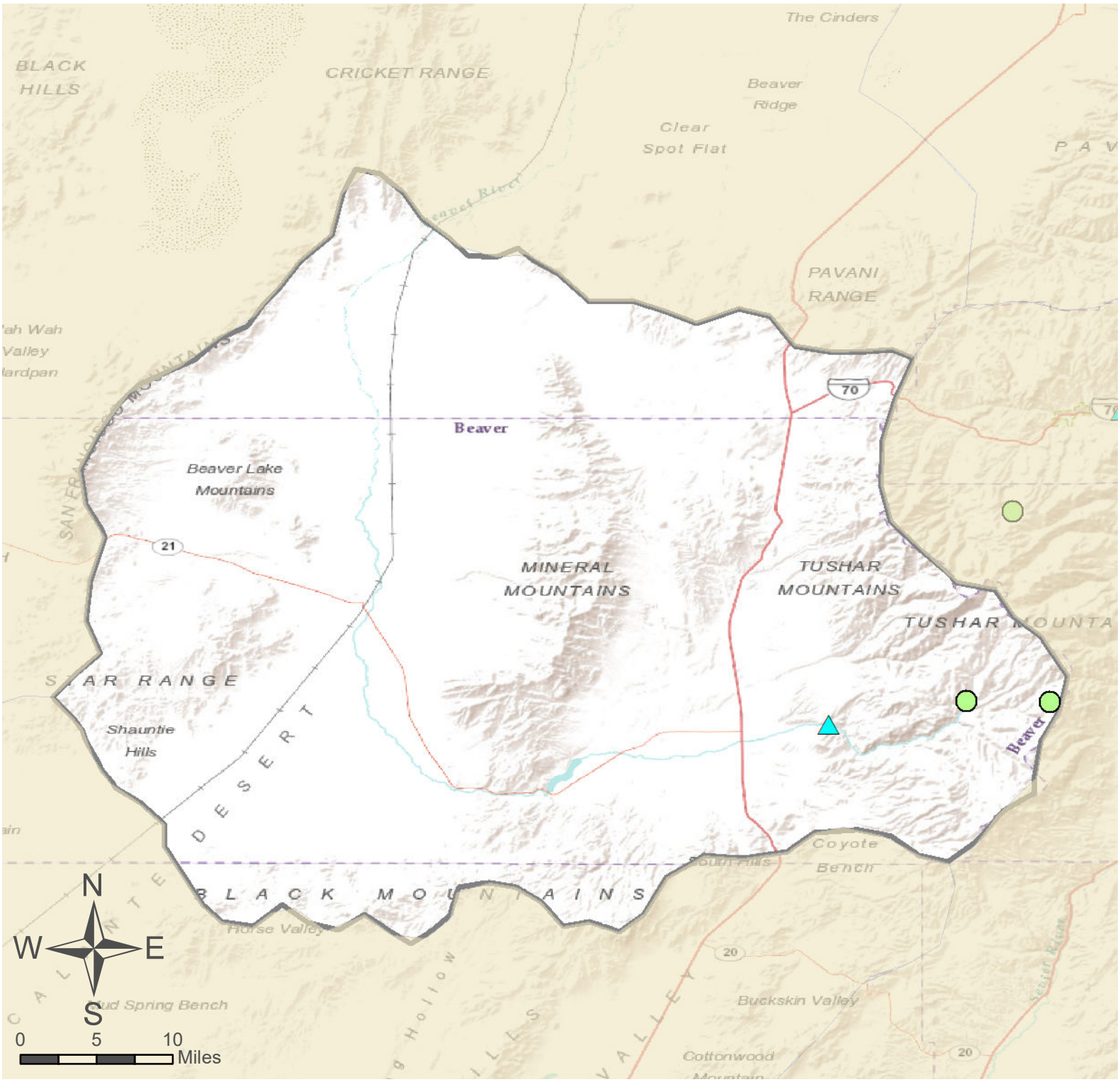
February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Beaver River	**19.80**	**29.00**	**48.80**	**76**	**2.13**	**99, 82, 86, 95**

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





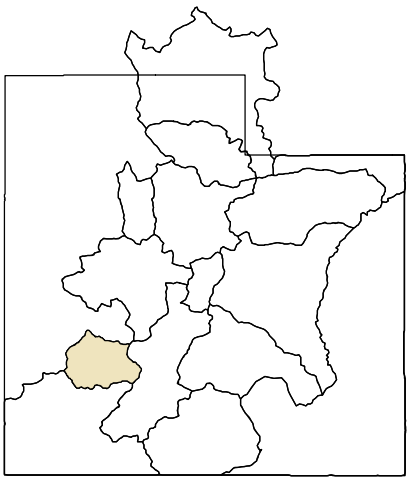
Beaver River Basin

SNOTEL Site

Forecast Point

% of Normal

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



As of February 1, 2020:

97% of Normal SWE

93% of Normal Precipitation

61% of Normal Precipitation Last Month

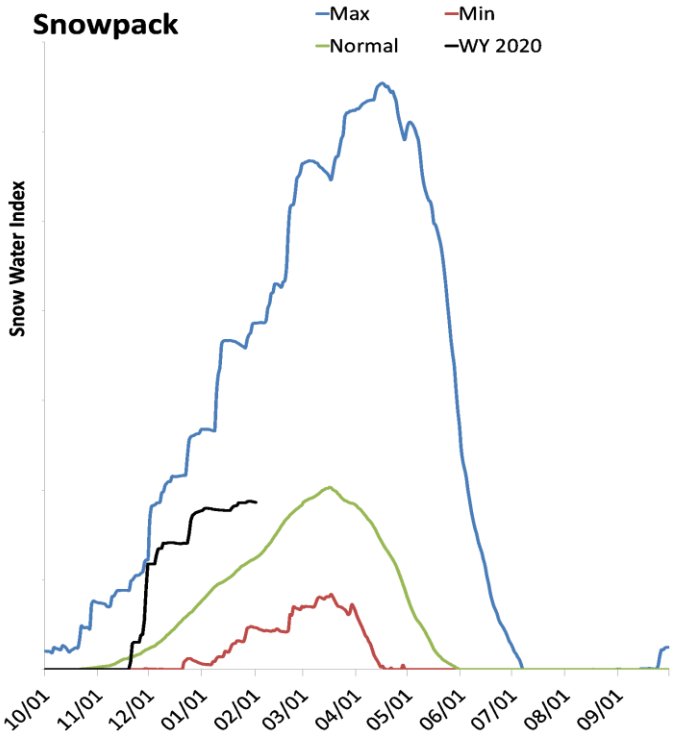
26% Saturation Soil Moisture

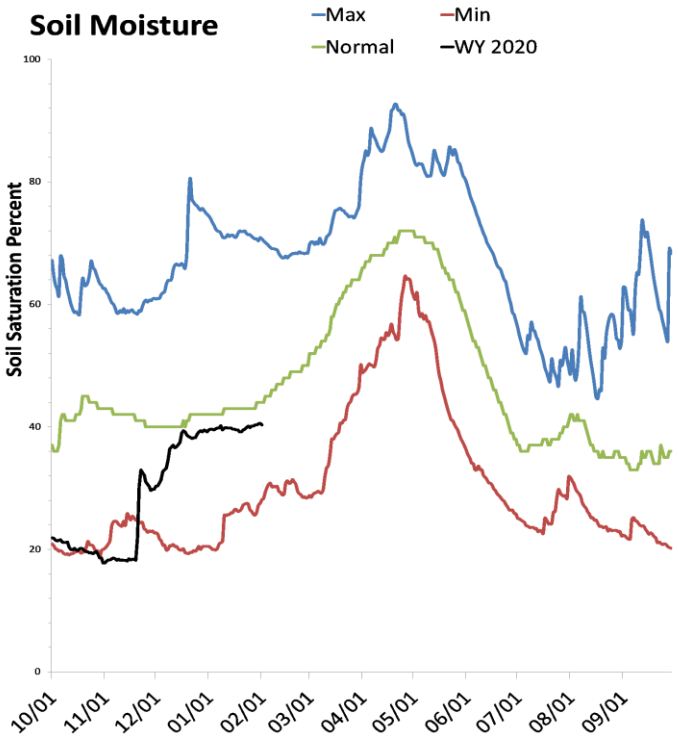
Beaver River Basin

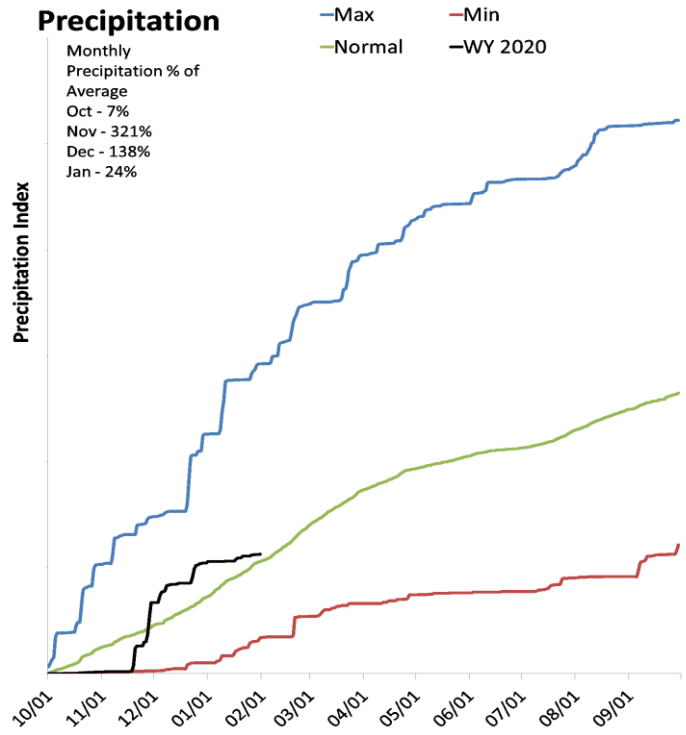
Southwestern Utah

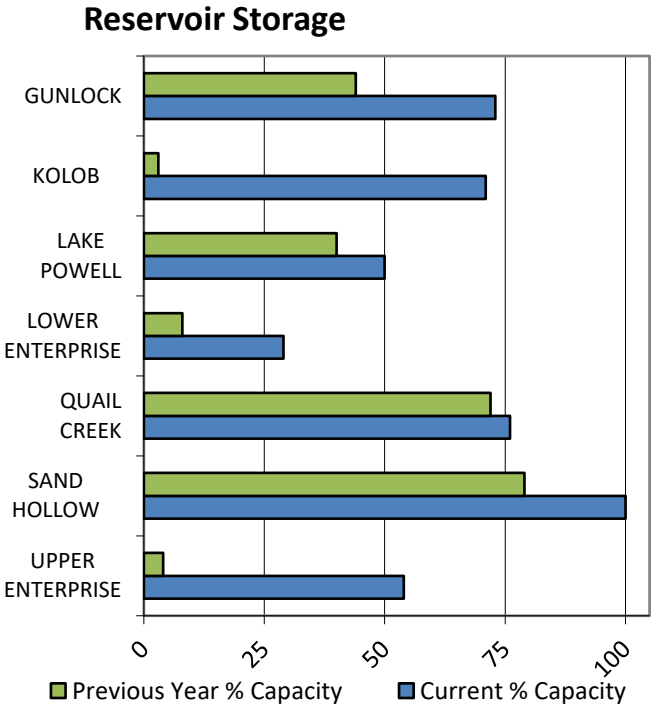
February 1, 2020

Snowpack in the Southwestern Utah is much above normal at 149% of normal, compared to 110% last year. Precipitation in January was much below average at 24%, which brings the seasonal accumulation (Oct-Jan) to 106% of average. Soil moisture is at 40% compared to 45% last year. Reservoir storage is at 51% of capacity, compared to 40% last year. Forecast streamflow volumes range from 80% to 119% of average. The surface water supply index is 69% for the Virgin River.









SNOTEL Data

Data Current as of: 2/6/2020 11:19:26 AM

Southwestern Utah
Streamflow Forecasts - February 1, 2020

Southwestern Utah	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Lake Powell Inflow [2]	APR-JUL	3160	4610	5750	80%	7020	9110	7160
Virgin R nr Hurricane	APR-JUL	11.1	42	63	100%	84	115	63
Virgin R at Virgin	APR-JUL	33	49	63	109%	78	103	58
Santa Clara R nr Pine Valley	APR-JUL	2.2	3.8	5.2	104%	6.8	9.5	5
Coal Ck nr Cedar City	APR-JUL	12	18.3	23	119%	27	33	19.4

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2020	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Powell	12280.7	9629.2	17338.0	24322.0
Lower Enterprise	0.8	0.2	0.6	2.6
Upper Enterprise	5.4	0.4	3.1	10.0
Kolob Reservoir	4.0	0.2		5.6
Gunlock	7.6	4.6	6.5	10.4
Sand Hollow Reservoir	49.8	39.5		50.0
Quail Creek	30.4	28.8	26.0	40.0
Basin-wide Total	12324.8	9663.2	17374.2	24385.0
# of reservoirs	5	5	5	5

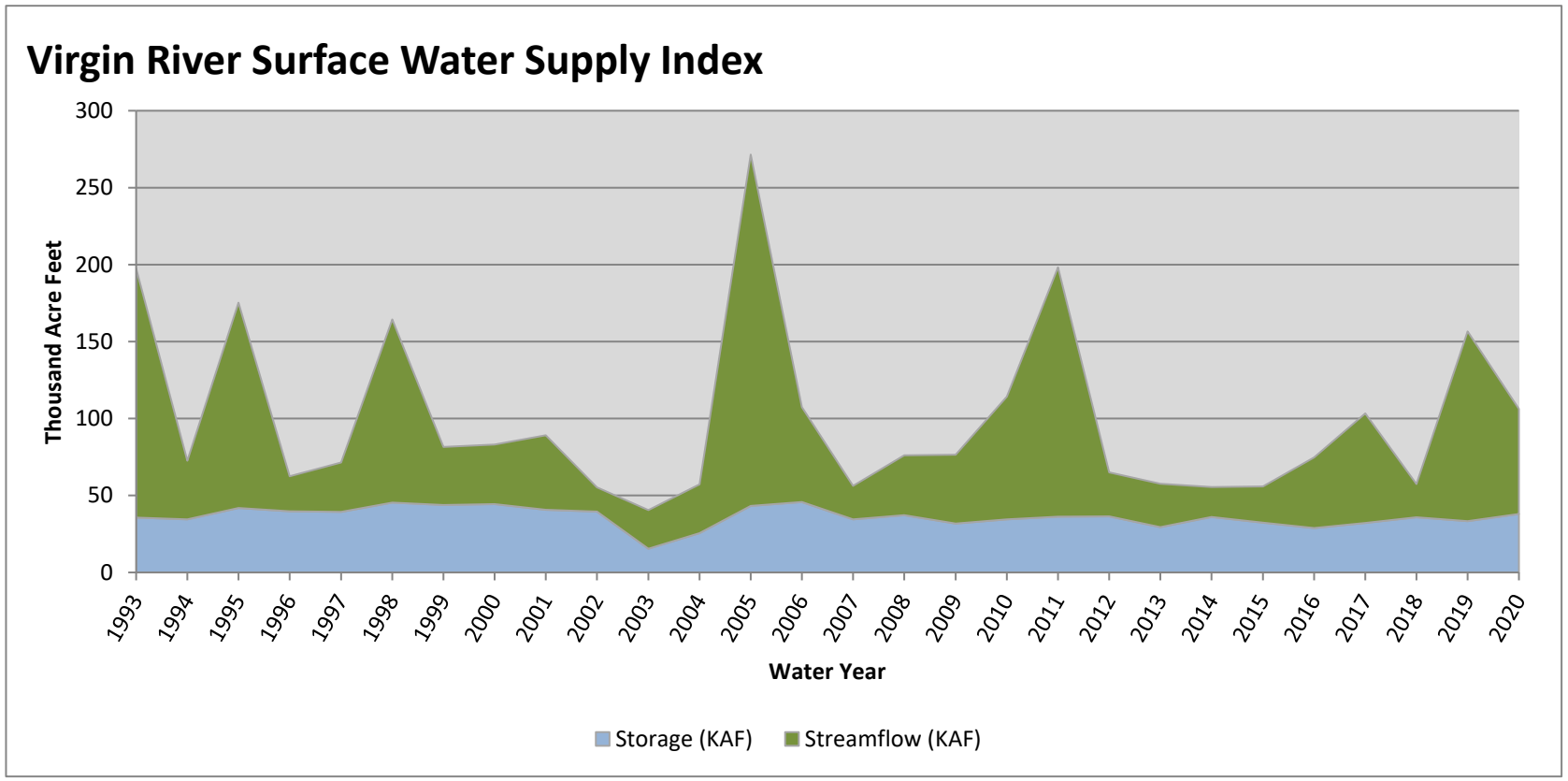
Watershed Snowpack Analysis February 1, 2020	# of Sites	% Median	Last Year % Median
Upper Virgin	8	144%	115%
Lower Virgin	2	137%	131%
Coal Parowan Creeks	4	144%	97%

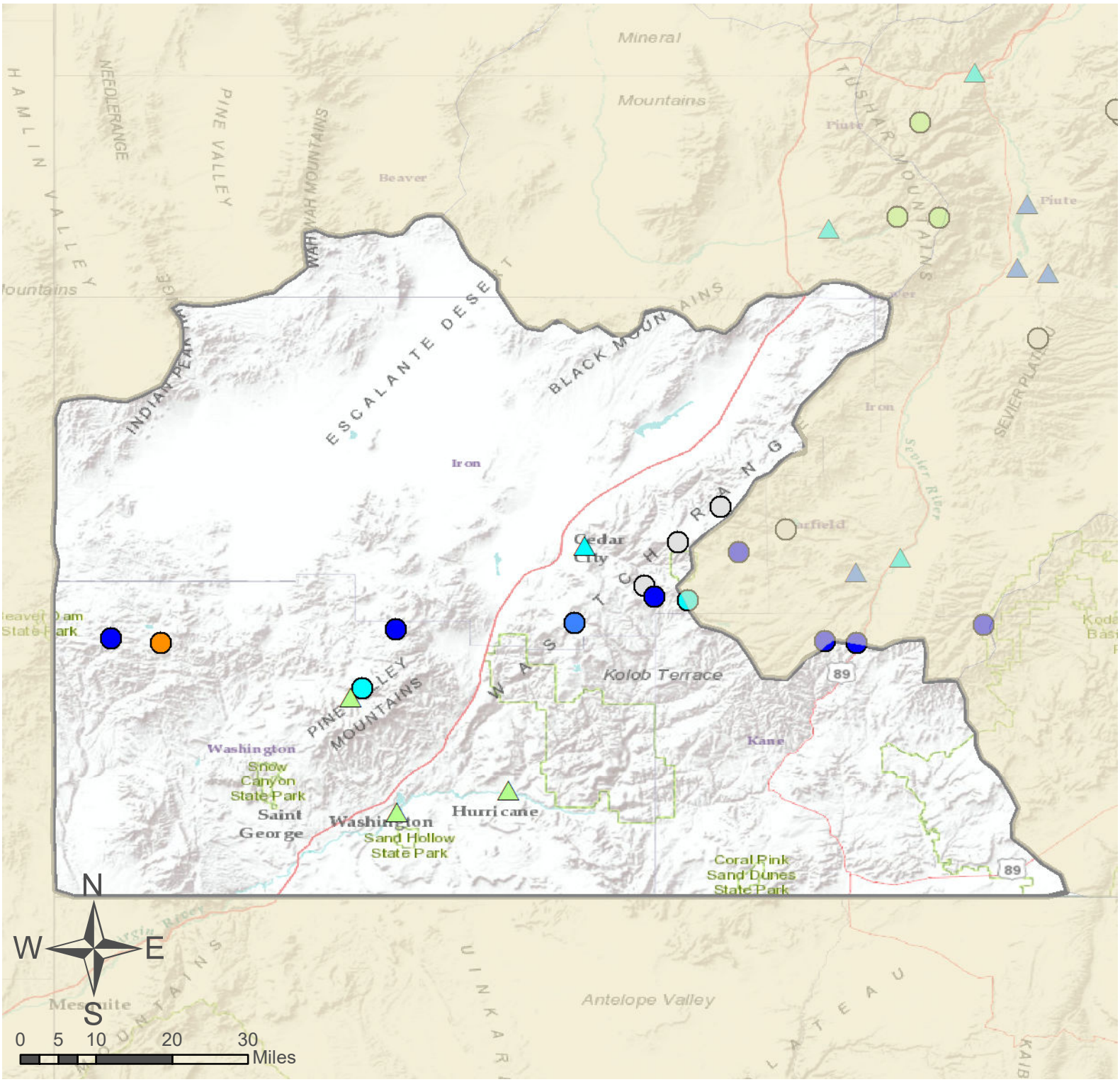
February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Virgin River	**37.99**	**68.20**	**106.19**	**69**	**1.58**	**01, 17, 06, 10**

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





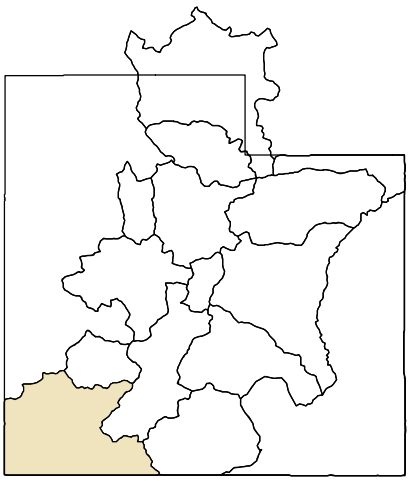
Southwestern Utah

SNOTEL Site

Forecast Point

% of Normal

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



As of February 1, 2020:

149% of Normal SWE

106% of Normal Precipitation

24% of Normal Precipitation Last Month

40% Saturation Soil Moisture

Southwestern Utah

February 1, 2020

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF ^	*KAF ^*	*KAF ^*	*%*		
Bear River	**912.3**	**170.0**	**1082.3**	**76**	**2.13**	**11, 00, 82, 18**
Woodruff Narrows	**50.6**	**115.0**	**165.6**	**63**	**1.12**	**05, 16, 82, 19**
Little Bear	**9.8**	**46.0**	**55.8**	**59**	**0.72**	**08, 93, 09, 96**
Ogden River	**75.9**	**120.0**	**195.9**	**63**	**1.12**	**96, 09, 95, 85**
Weber River	**356.3**	**335.0**	**691.3**	**71**	**1.73**	**17, 95, 96, 99**
Provo River	**1232.3**	**96.0**	**1328.3**	**74**	**2.01**	**10, 00, 96, 12**
Western Uinta	**171.2**	**115.0**	**286.2**	**80**	**2.54**	**99, 19, 82, 97**
Eastern Uinta	**28.1**	**67.0**	**95.1**	**34**	**-1.32**	**15, 07, 91, 88**
Blacks Fork	**10.1**	**100.0**	**110.1**	**66**	**1.32**	**15, 14, 85, 93**
Smiths Fork	**5.8**	**29.0**	**34.8**	**66**	**1.32**	**01, 05, 87, 96**
Price River	**51.5**	**32.0**	**83.5**	**73**	**1.93**	**95, 99, 97, 98**
Joe's Valley	**47.3**	**53.0**	**100.3**	**63**	**1.12**	**08, 17, 96, 99**
Ferron Creek	**7.2**	**35.0**	**42.2**	**49**	**-0.1**	**87, 03, 01, 08**
Moab	**2.0**	**4.3**	**6.3**	**71**	**1.72**	**94, 97, 92, 11**
Upper Sevier	**108.9**	**92.0**	**200.9**	**83**	**2.74**	**87, 85, 84, 95**
San Pitch	**1.6**	**17.0**	**18.6**	**41**	**-0.71**	**17, 93, 10, 07**
Lower Sevier	**124.9**	**110.0**	**234.9**	**59**	**0.71**	**89, 88, 05, 82**
Beaver River	**19.8**	**29.0**	**48.8**	**76**	**2.13**	**99, 82, 86, 95**
Virgin River	**38.0**	**68.2**	**106.2**	**69**	**1.58**	**01, 17, 06, 10**

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

What is a Surface Water Supply Index?

The Surface Water Supply Index (SWSI) is a predictive indicator of total surface water availability within a watershed for the spring and summer water use seasons. The index is calculated by combining pre-runoff reservoir storage (carryover) with forecasts of spring and summer streamflow which are based on current snowpack and other hydrologic variables. SWSI values are scaled from +4.1 (abundant supply) to -4.1 (extremely dry) with a value of zero (0) indicating median water supply as compared to historical analysis. SWSI's are calculated in this fashion to be consistent with other hydroclimatic indicators such as the Palmer Drought Index and the Precipitation index.

Utah Snow Surveys has also chosen to display the SWSI value as well as a PERCENT CHANCE OF NON-EXCEEDANCE. While this is a cumbersome name, it has the simplest application. It can be best thought of as a scale of 1 to 99 with 1 being the drought of record (driest possible conditions) and 99 being the flood of record (wettest possible conditions) and a value of 50 representing average conditions. This rating scale is a percentile rating as well, for example a SWSI of 75% means that this years water supply is greater than 75% of all historical events and that only 25% of the time has it been exceeded. Conversely a SWSI of 10% means that 90% of historical events have been greater than this one and that only 10% have had less total water supply. This scale is comparable between basins: a SWSI of 50% means the same relative ranking on watershed A as it does on watershed B, which may not be strictly true of the +4 to -4 scale.

For more information on the SWSI go to: www.ut.nrcs.usda.gov/snow/ on the water supply page. The entire period of historical record for reservoir storage and streamflow is available.

Issued by

Matt Lohr
Chief
Natural Resources Conservation Service
U.S. Department of Agriculture

Released by

Emily Fife
State Conservationist
Natural Resources Conservation Service
Salt Lake City, Utah

Prepared by
Snow Survey Staff:
Jordan Clayton, Data Collection Officer
Troy Brosten, Assistant Supervisor
Kent Sutcliffe, Soil Scientist
Dave Eiriksson, Hydrologist
Doug Neff, Electronic Technician

YOU MAY OBTAIN THIS PRODUCT AS WELL AS CURENT SNOW, PRECIPITATION, TEMPERATURE AND SOIL MOISTURE, RESERVOIR, SURFACE WATER SUPPLY INDEX, AND OTHER DATA BY VISITING OUR WEB SITE @:
https://www.nrcs.usda.gov/wps/portal/nrcs/main/ut/snow/

Snow Survey, NRCS, USDA
245 North Jimmy Doolittle Road
Salt Lake City, UT 84116
(385) 285-3118

Utah Water Supply Outlook Report

Natural Resources Conservation Service
Salt Lake City, UT