BUREAU OF RECLAMATION

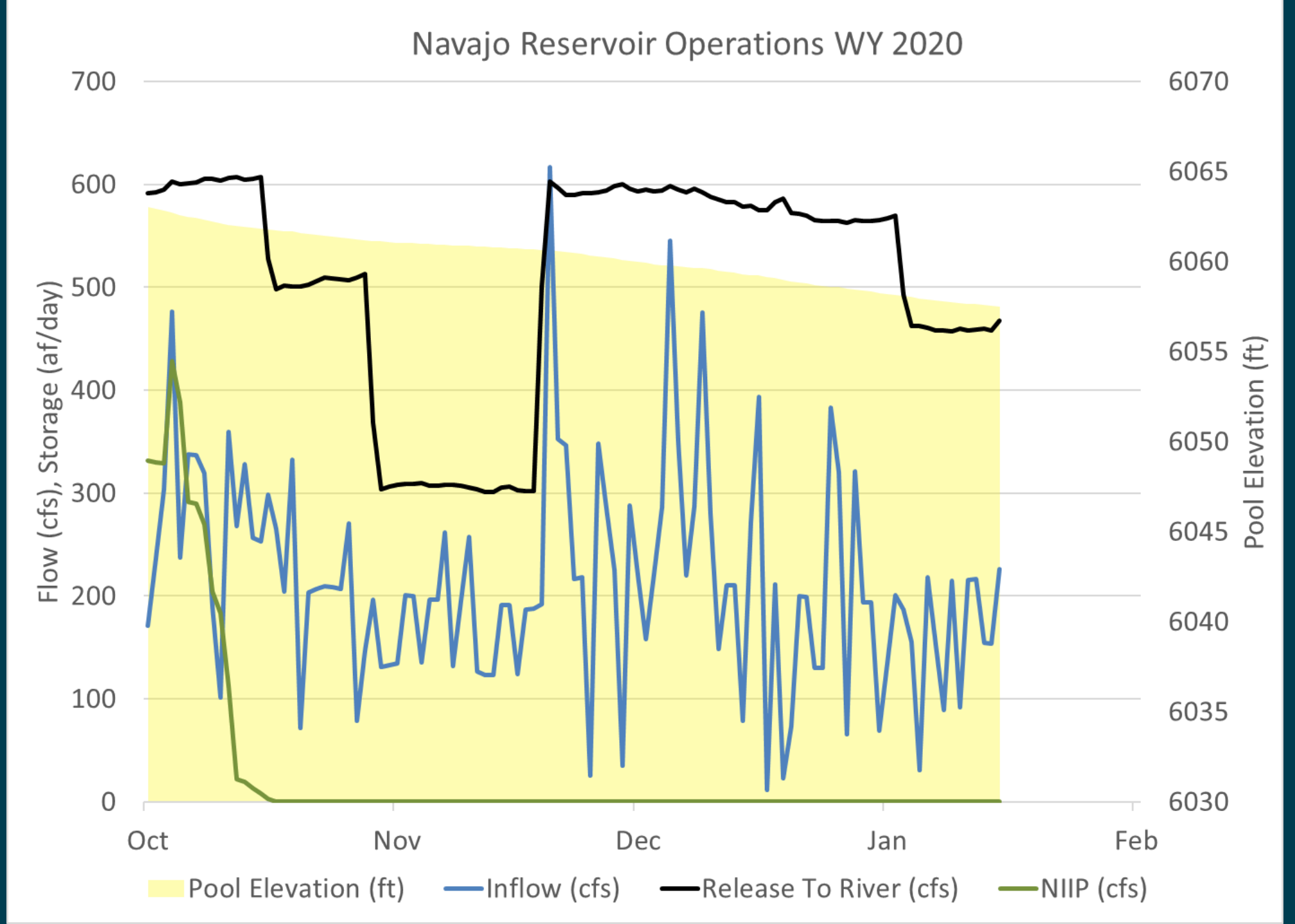
Navajo Unit Operations Coordination Meeting

January 21, 2020

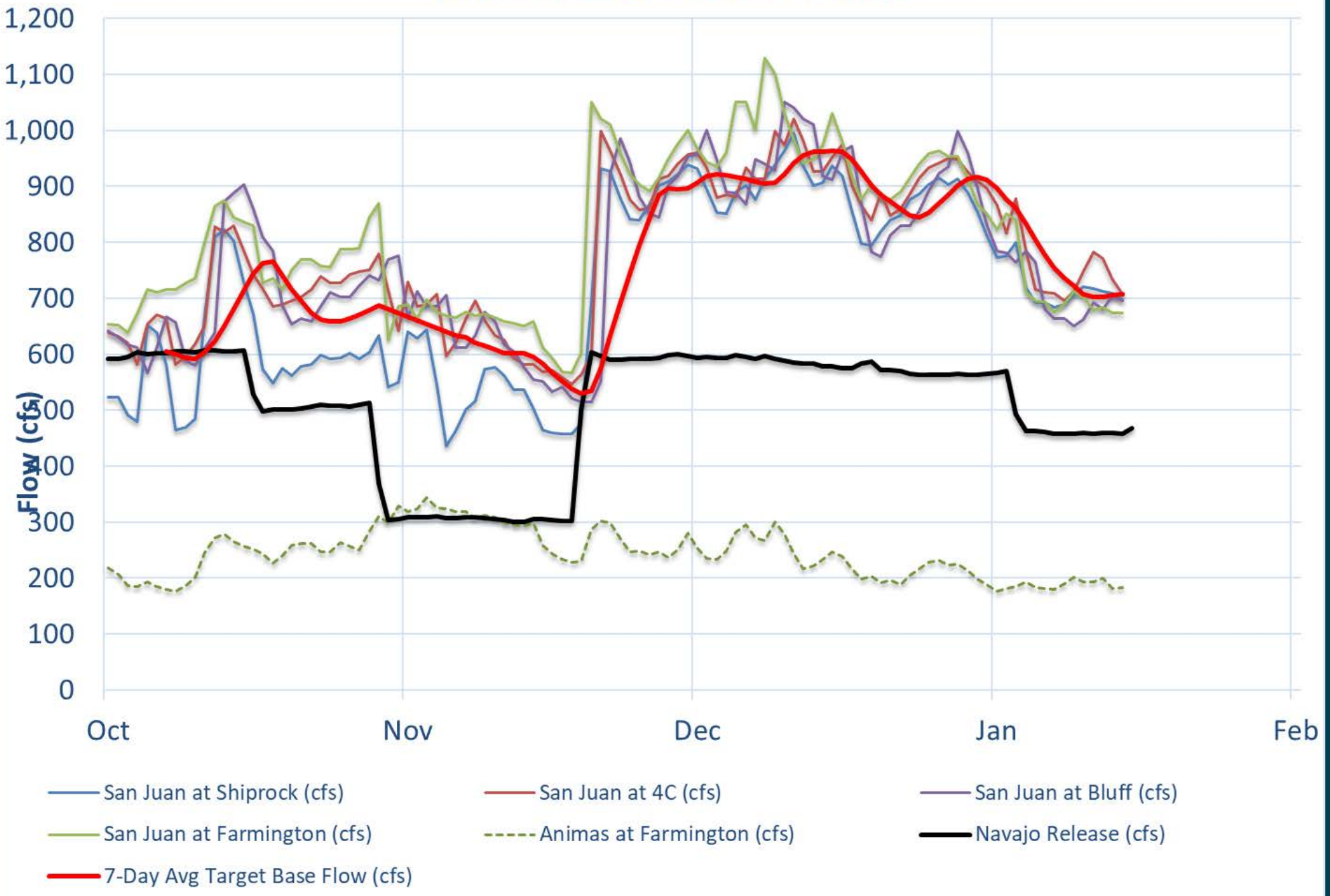
Civic Center, Farmington, NM

Agenda

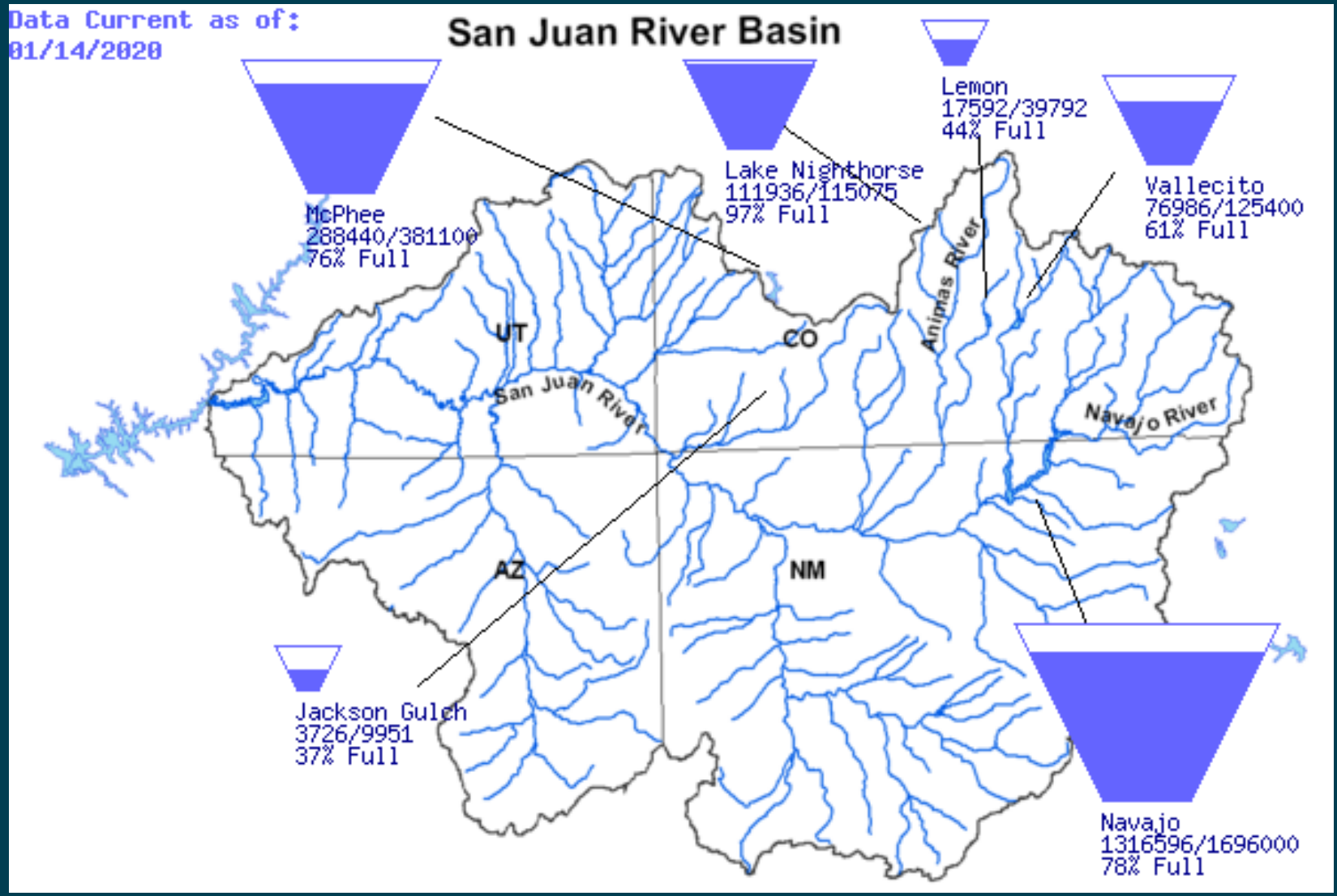
- Review of operations to date WY 2020
- Current reservoir status
- Current soil and snowpack conditions
- WY 2020 Forecasts and Proposed Operations
- Navajo Dam maintenance activities
- Reports from other entities


Navajo Reservoir Operations WY 2020
700
600
500
400
300
200
100
0
Flow (cfs), Storage (af/day)
6070
6065
6060
6055
6050
6045
6040
6035
6030
Pool Elevation (ft)
Oct
Nov
Dec
Jan
Feb
Pool Elevation (ft)
Inflow (cfs)
Release To River (cfs)
NIIP (cfs)

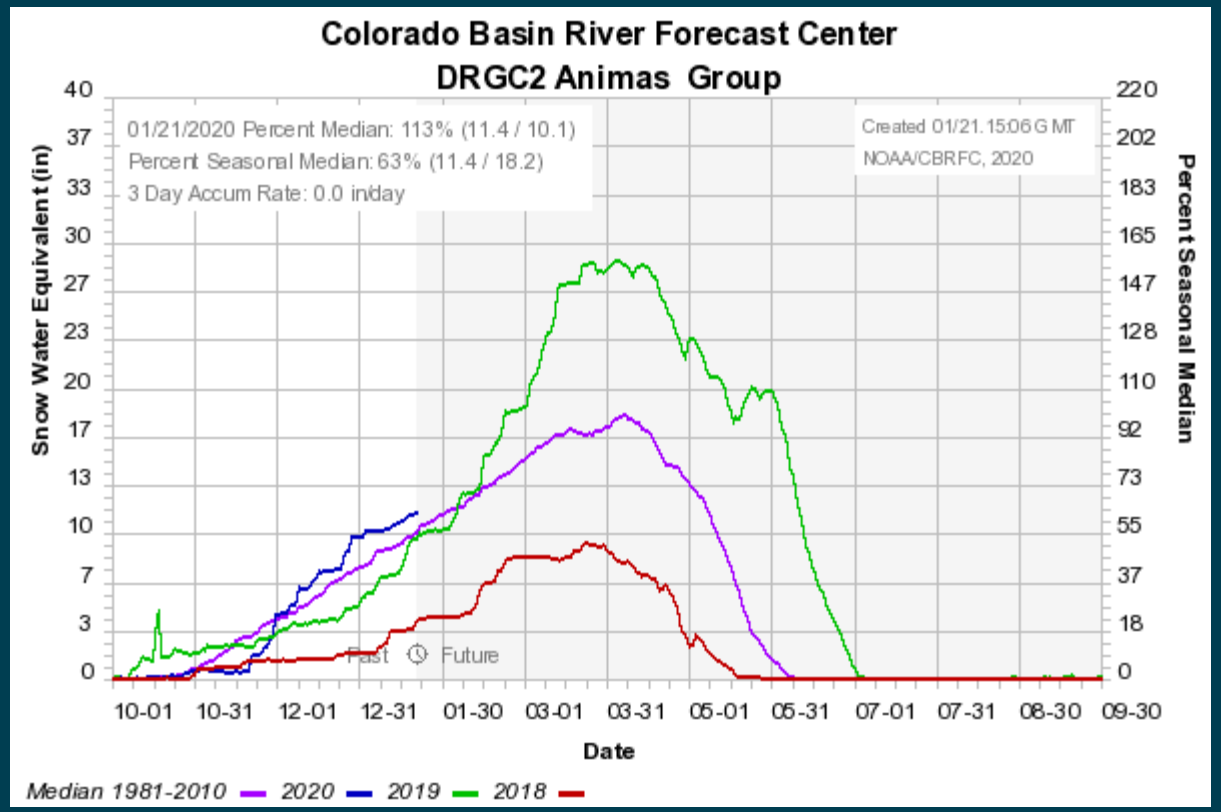
San Juan River Flows WY 2020

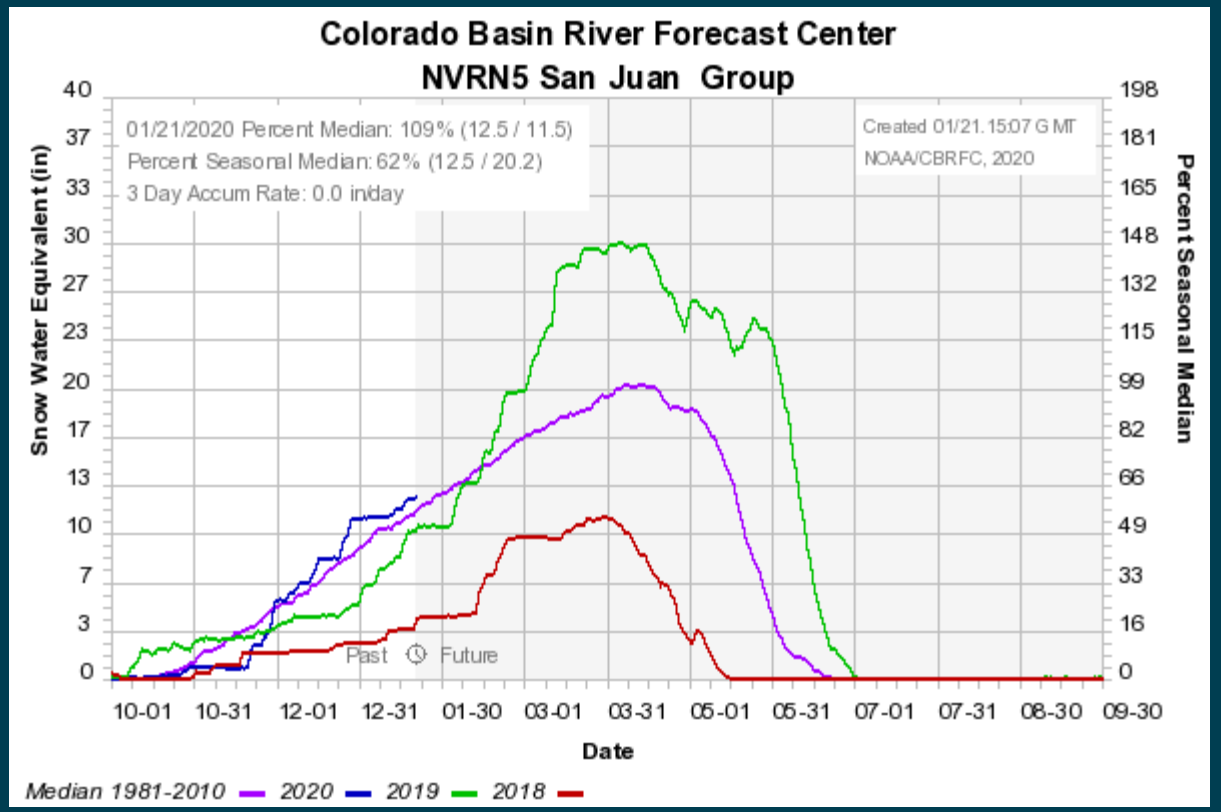


Current Reservoir Status



Current Snowpack Status





Weather Outlook

January 2020

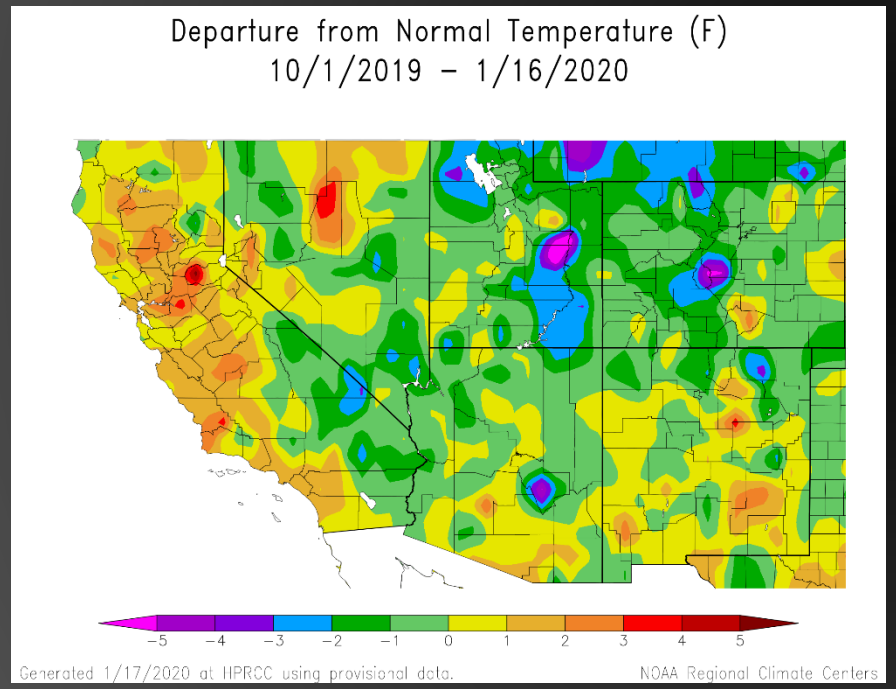
Aldis Strautins

NWS Grand Junction, CO

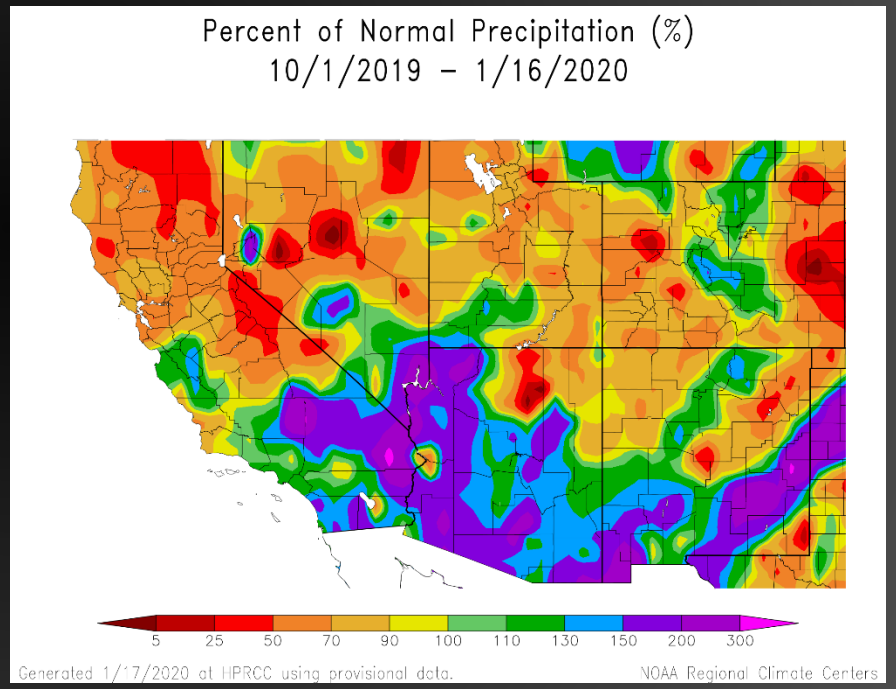
http://www.weather.gov/gjt

The Past
January 2020

Temperature
Departure from normal



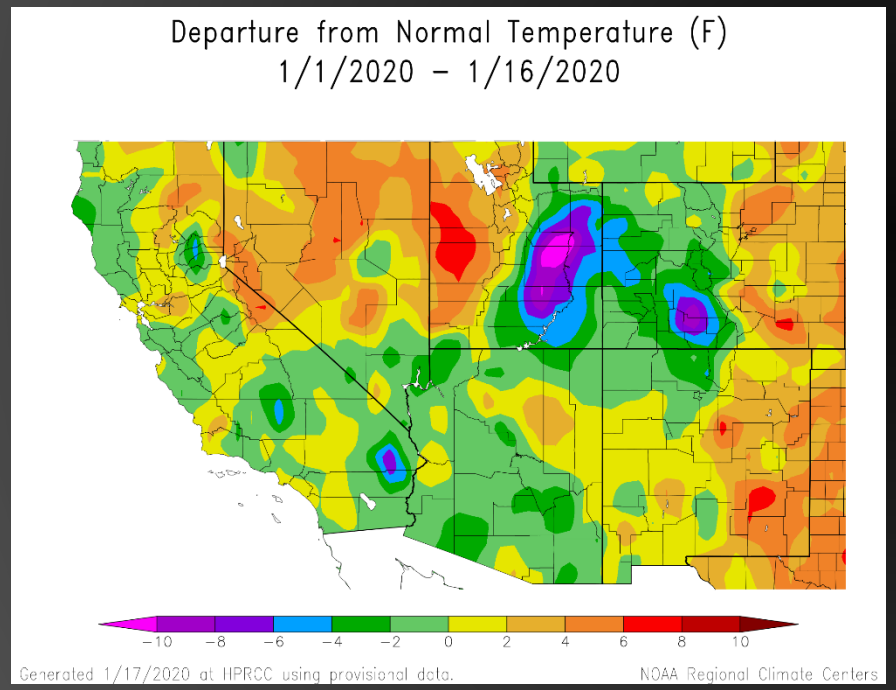
Precipitation
% of normal



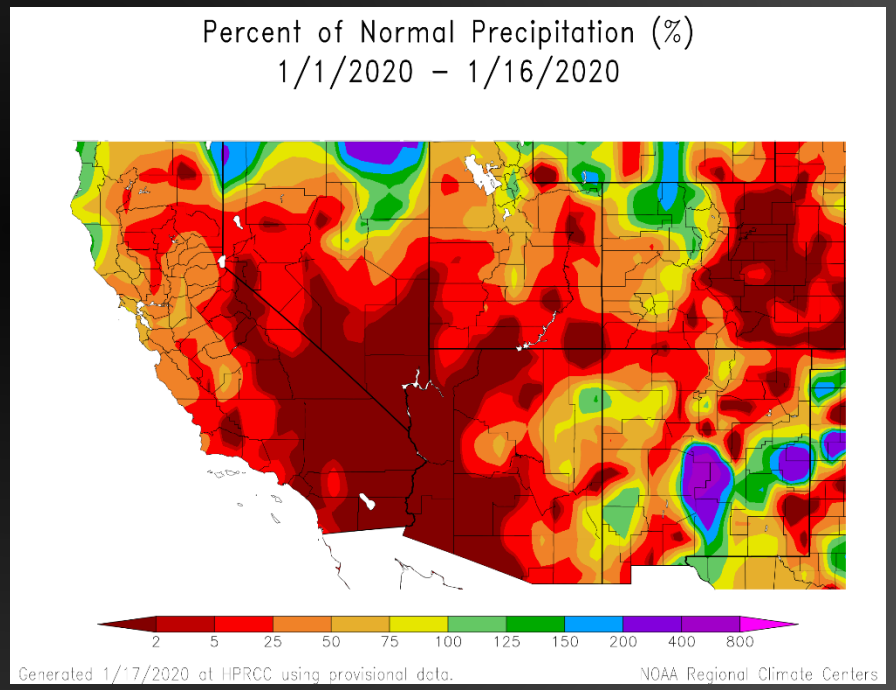
Water Year 2020

The Past
January 2020

Temperature
Departure from normal



Precipitation
% of normal

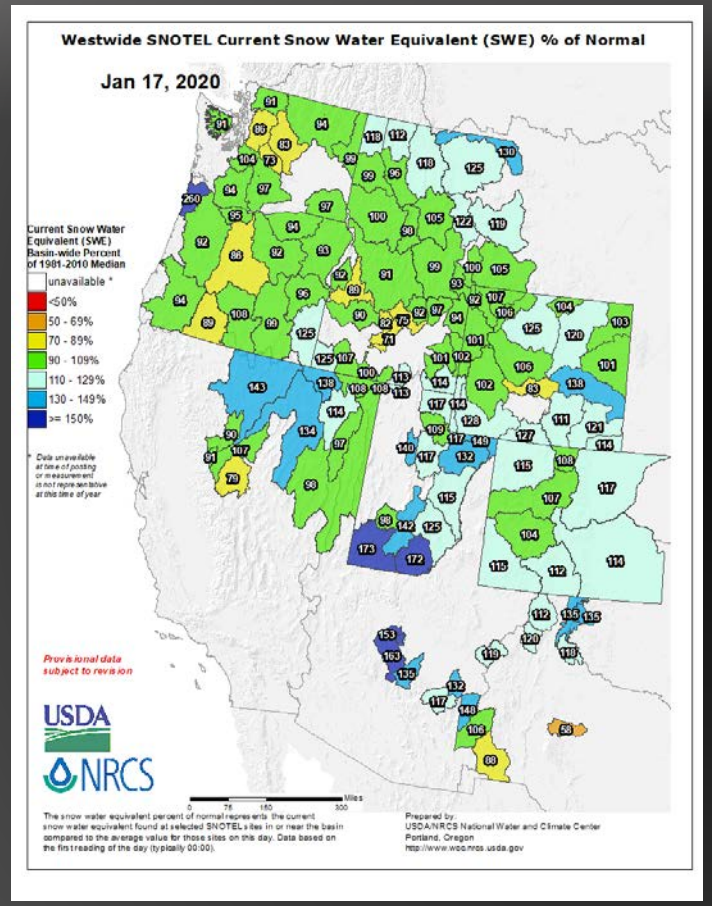


From January 1, 2020

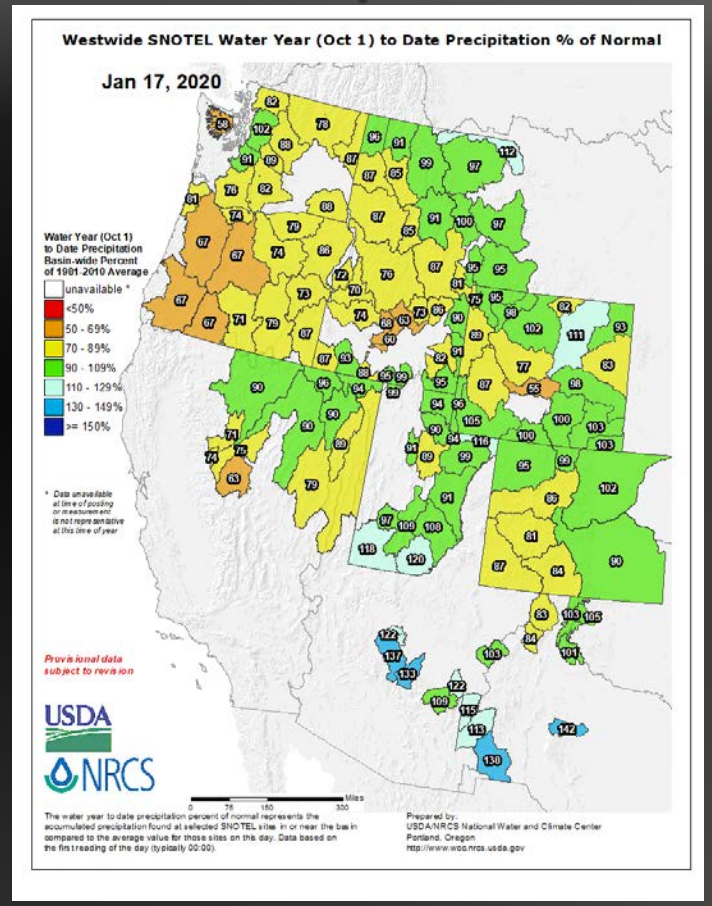
Snotel

January 2020

SWE



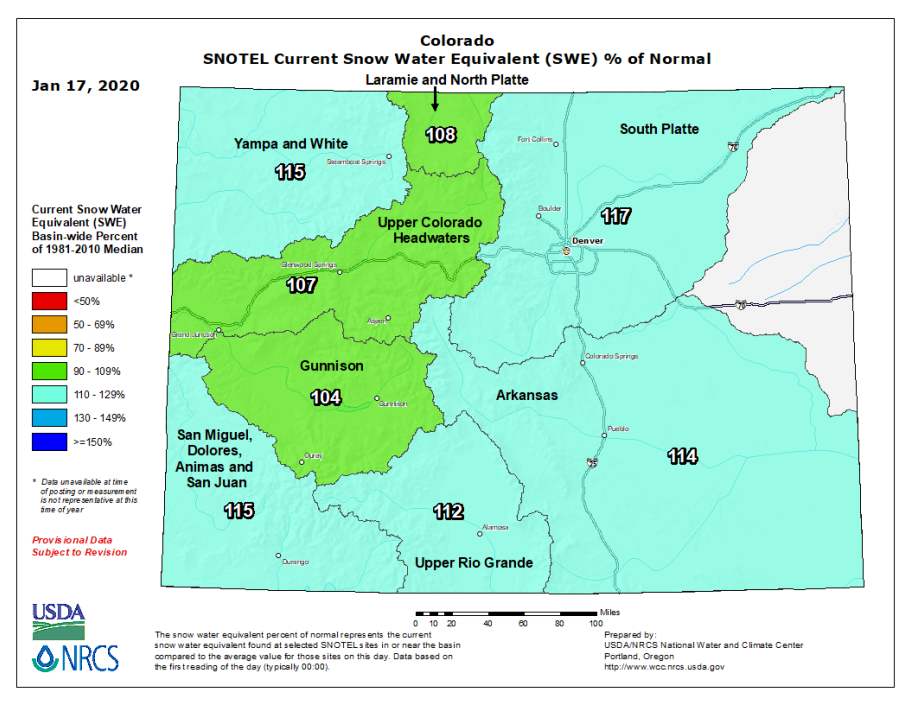
Precipitation



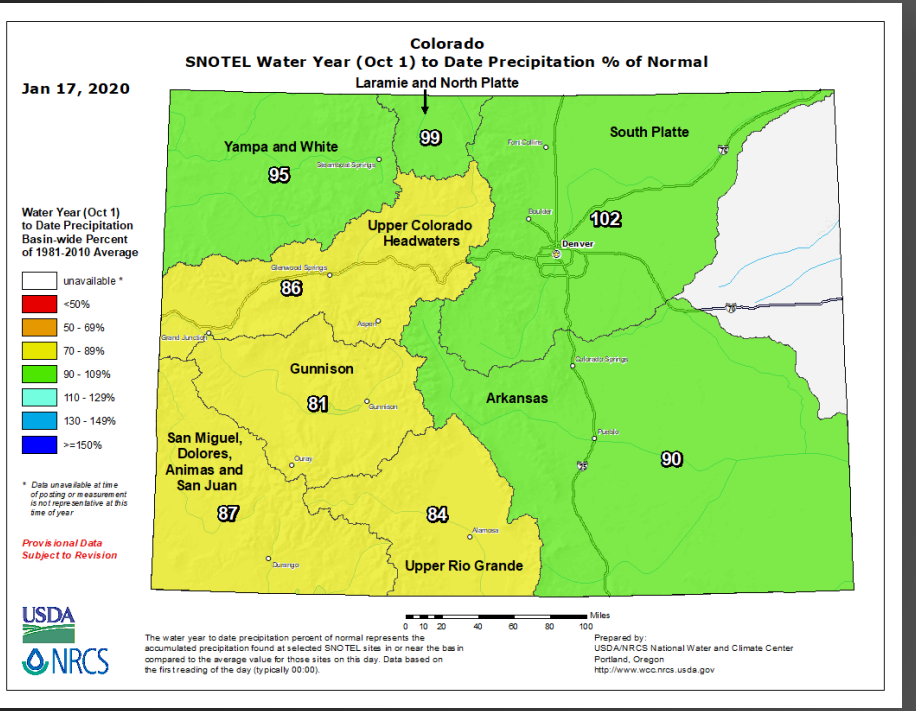
SNOTEL - Percent of Normal
Water Year 2020

Snotel
January 2020

SWE

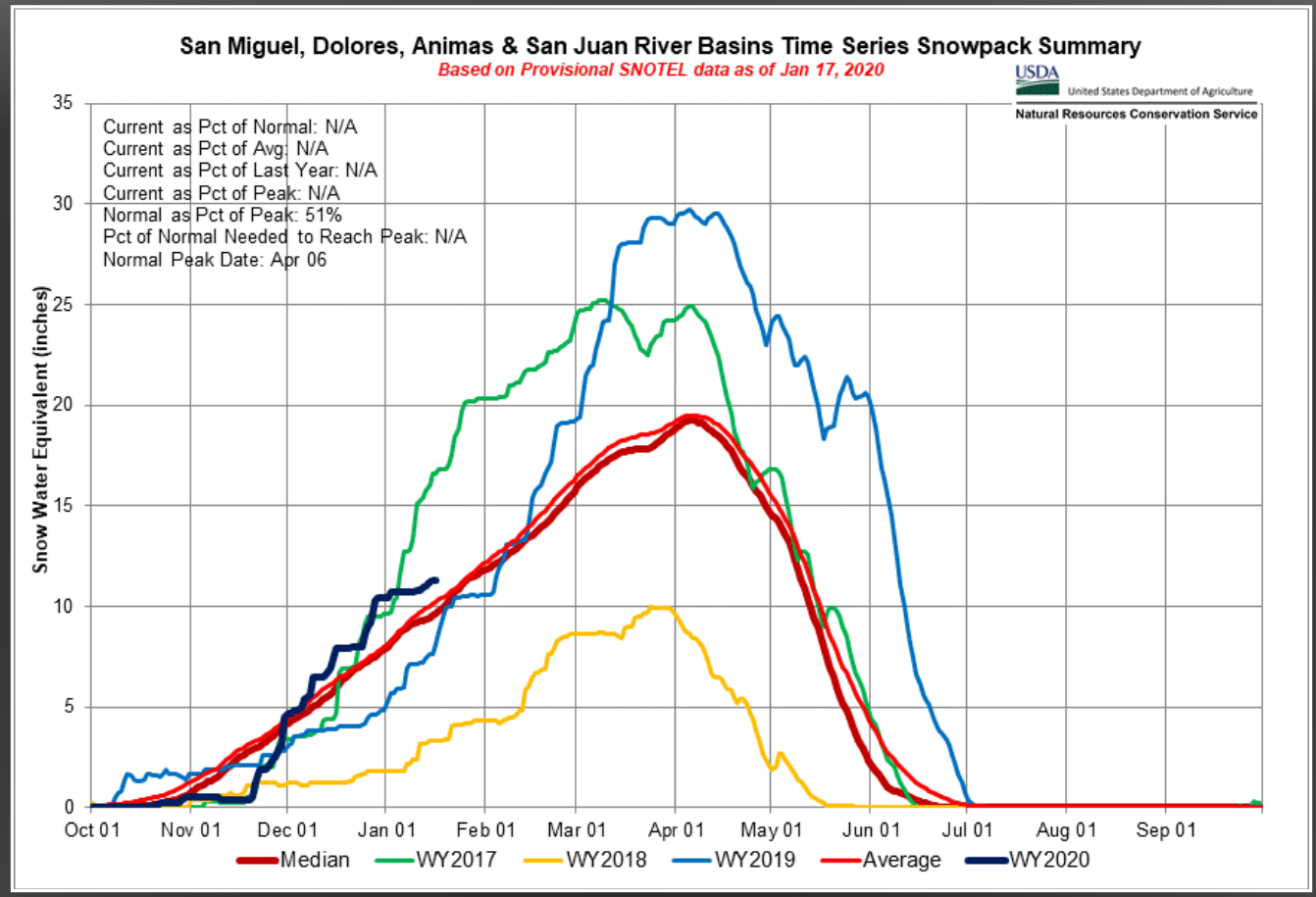


Precipitation



SNOTEL - Percent of Normal - Colorado
Water Year 2020

Snow
January 2020

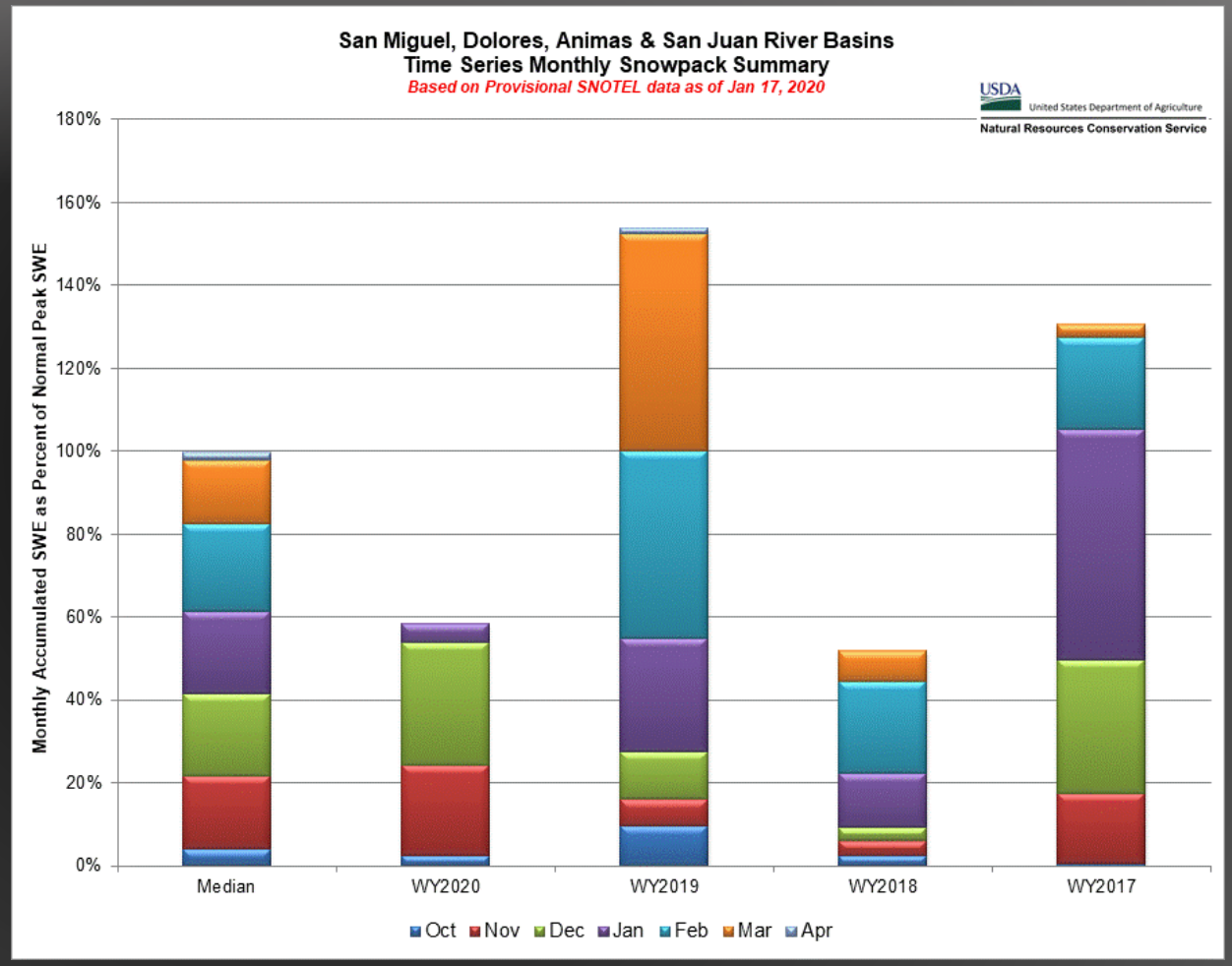


SNOTEL Snow Water Equivalent – NRCS
Southwestern Colorado

Snow
January 2020

SWE Pct of Normal
As of Jan 17

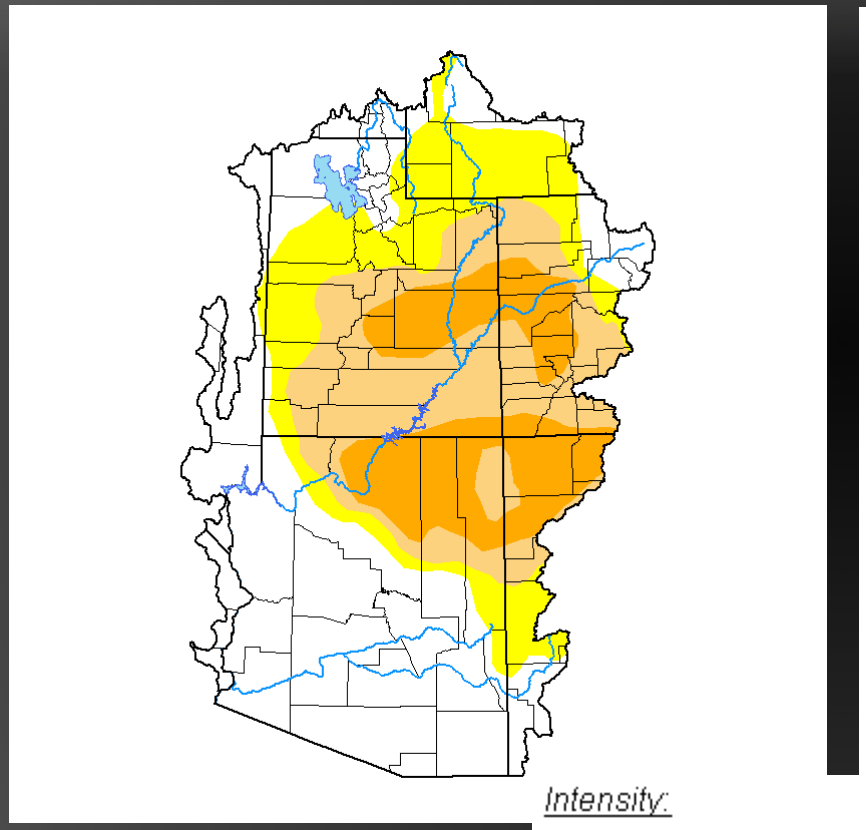
Dolores Basin: 120%
San Juan Basin: 108%
Animas Basin: 117%



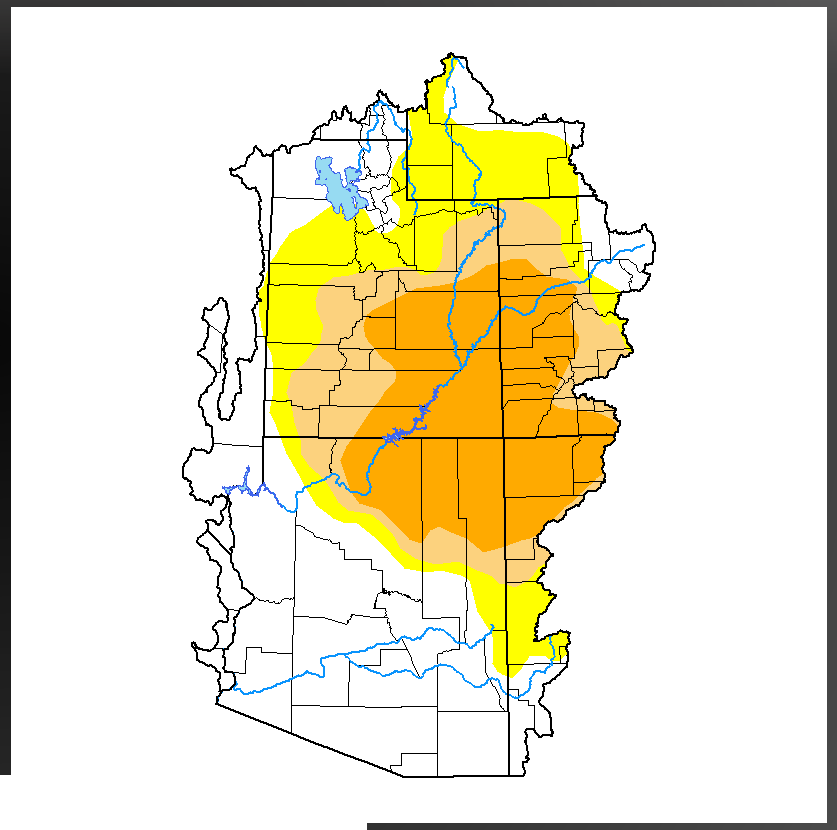
SNOTEL Snow Water Equivalent – NRCS
Southwestern Colorado

Drought
January 2020

January 14, 2020



December 31, 2019



Intensity:

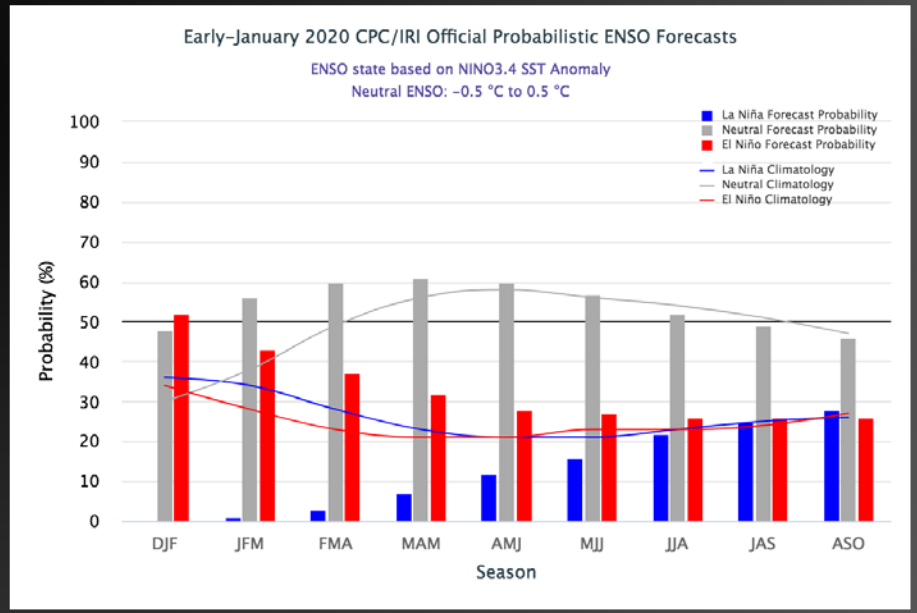
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

Drought – Monitor

ENSO
January 2020

CPC/IRI Early-Month Consensus ENSO Forecast Probabilities
(using NWS CPC classification system)

Season	La Niña	Neutral	El Niño
DJF 2020	0%	48%	52%
JFM 2020	1%	56%	43%
FMA 2020	3%	60%	37%
MAM 2020	7%	61%	32%
AMJ 2020	12%	60%	28%
MJJ 2020	16%	57%	27%
JJA 2020	22%	52%	26%
JAS 2020	25%	49%	26%
ASO 2020	28%	46%	26%



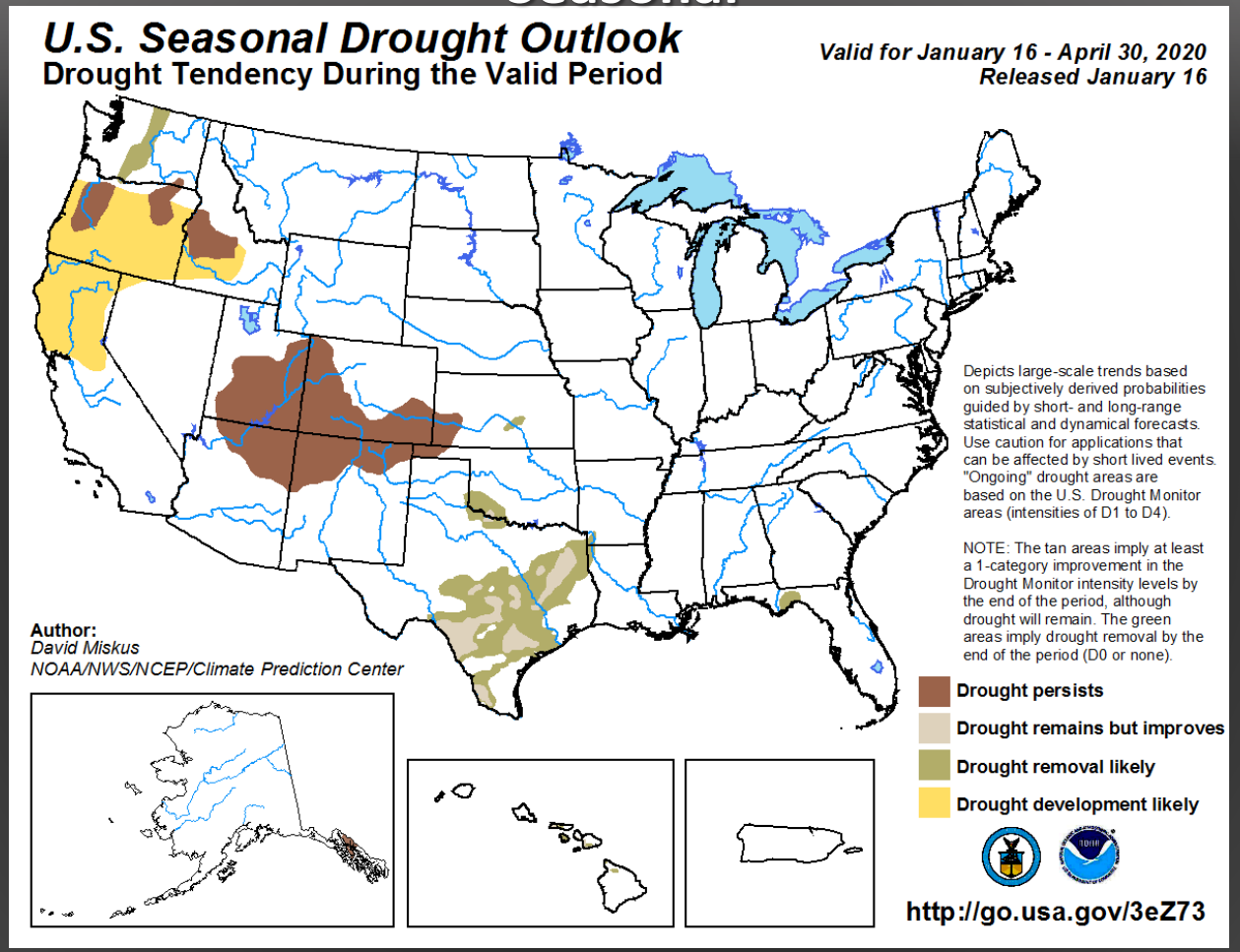
ENSO – Outlook

ENSO- Neutral remaining Neutral

Weather Outlook

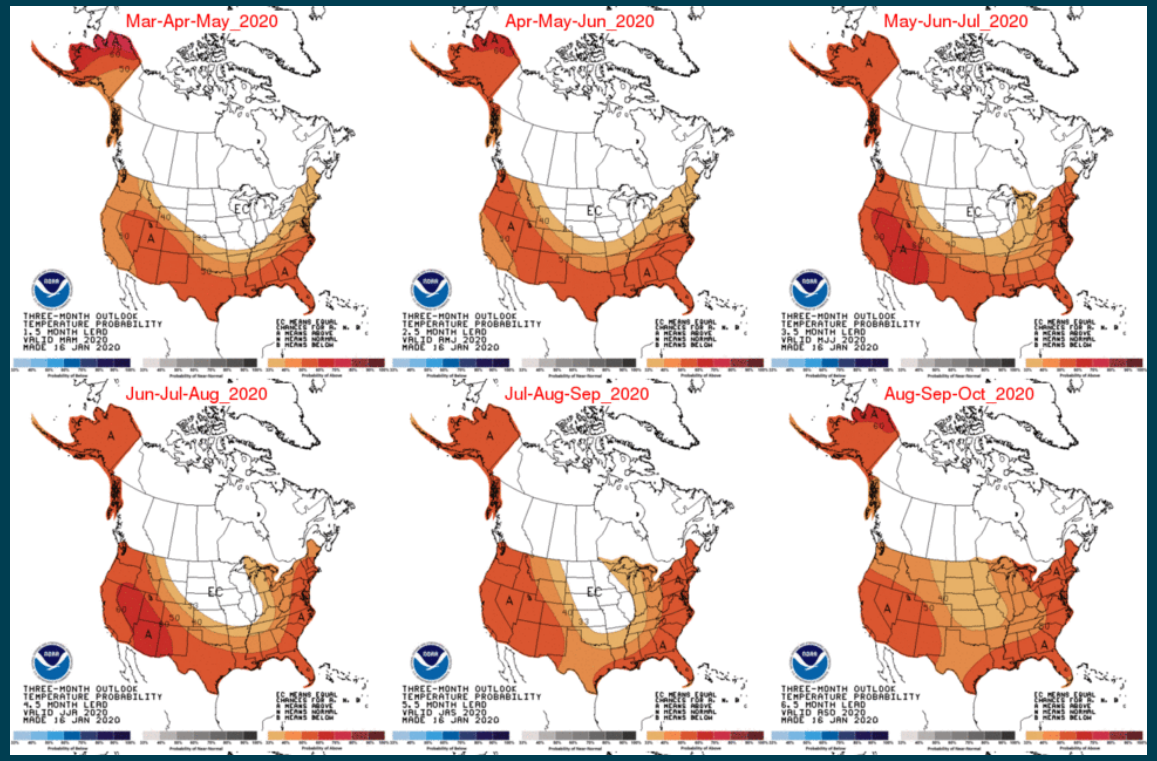
January 2019

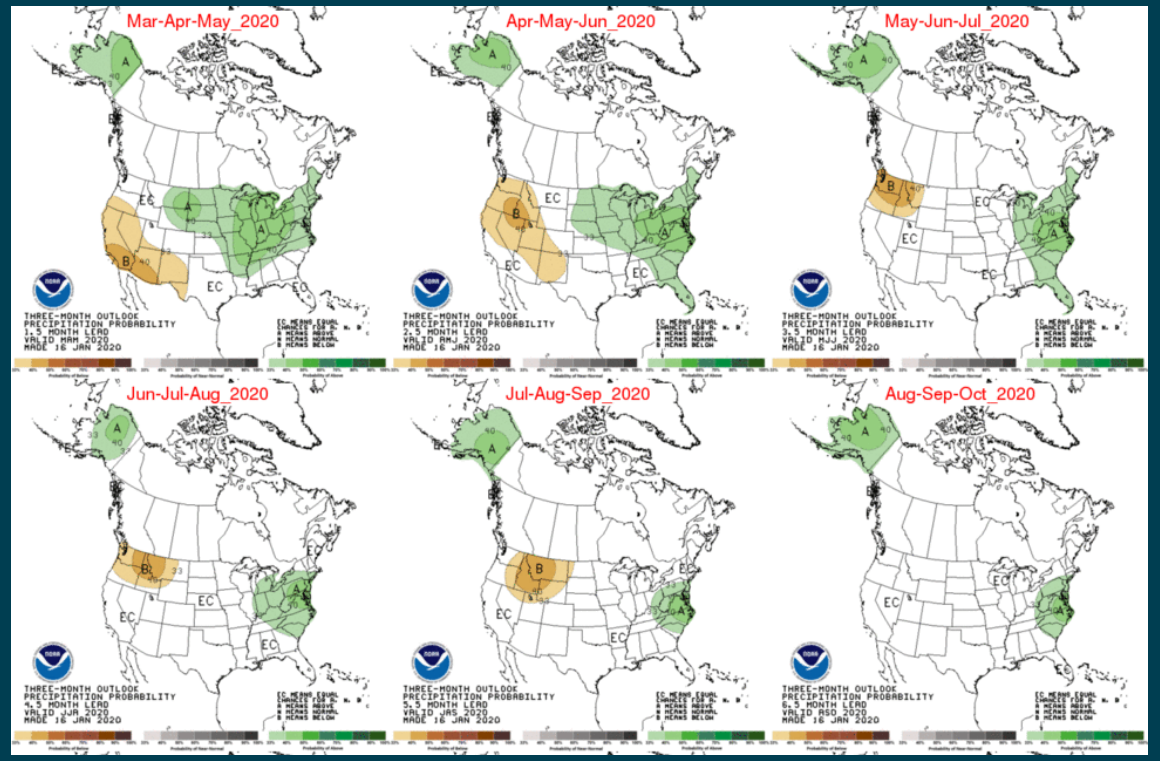
Seasonal



Drought– Outlook

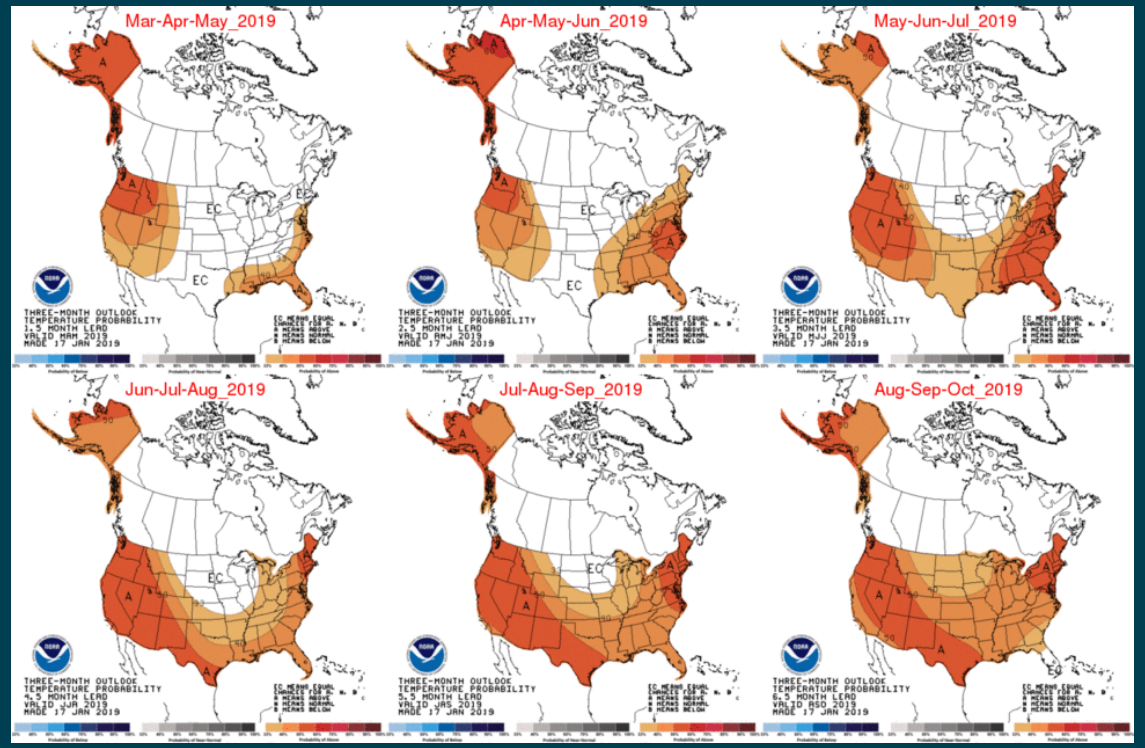
CPC Seasonal Outlook (updated Jan 16, 2020)

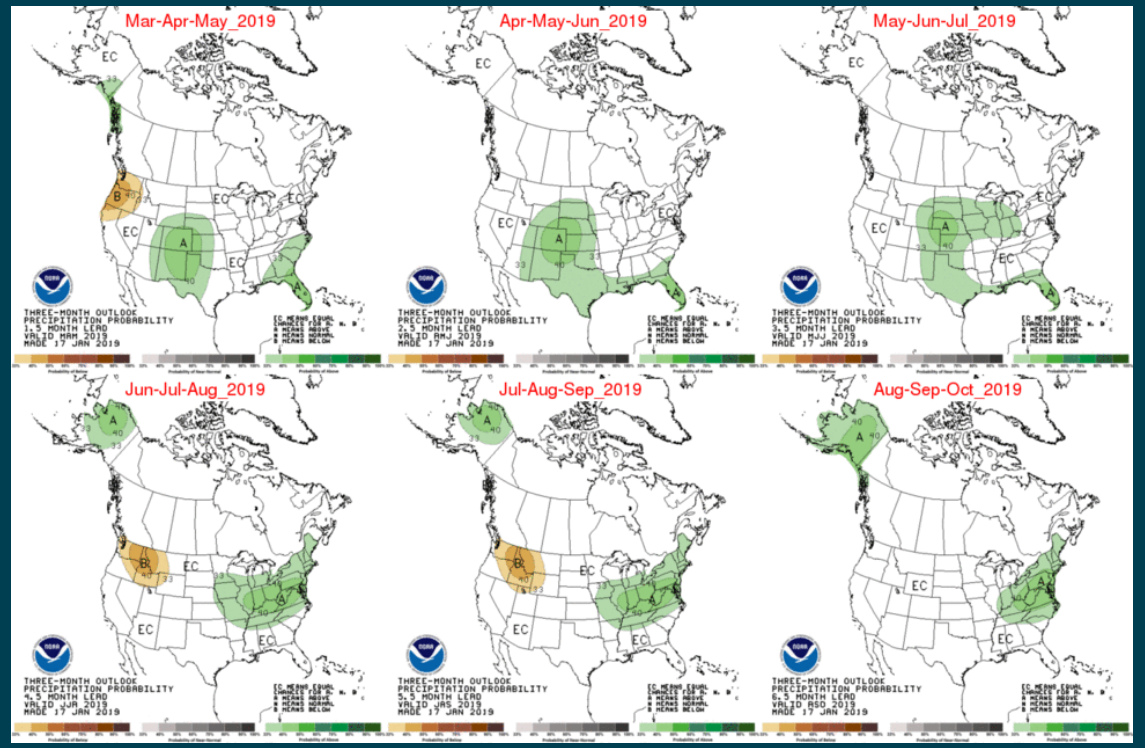




ENSO-neutral is favored through Northern Hemisphere spring 2020 (~60% chance), continuing through summer 2020 (~50% chance).

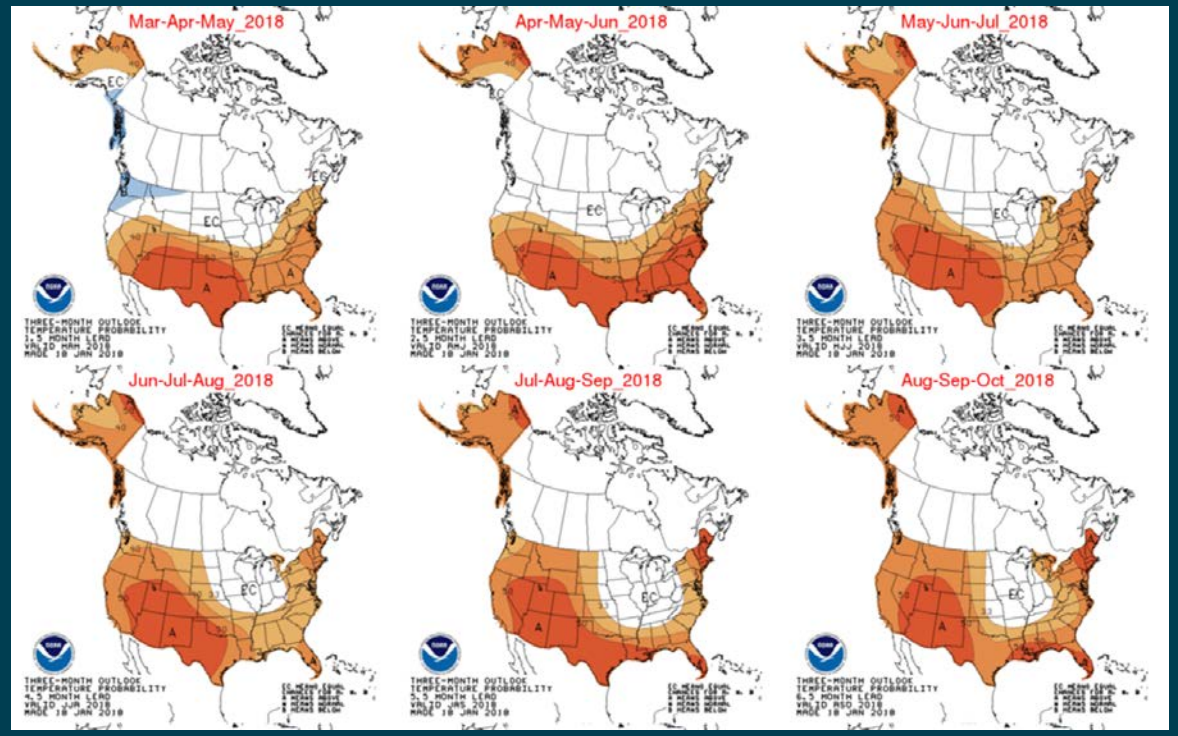
CPC Seasonal Outlook (from 2019)

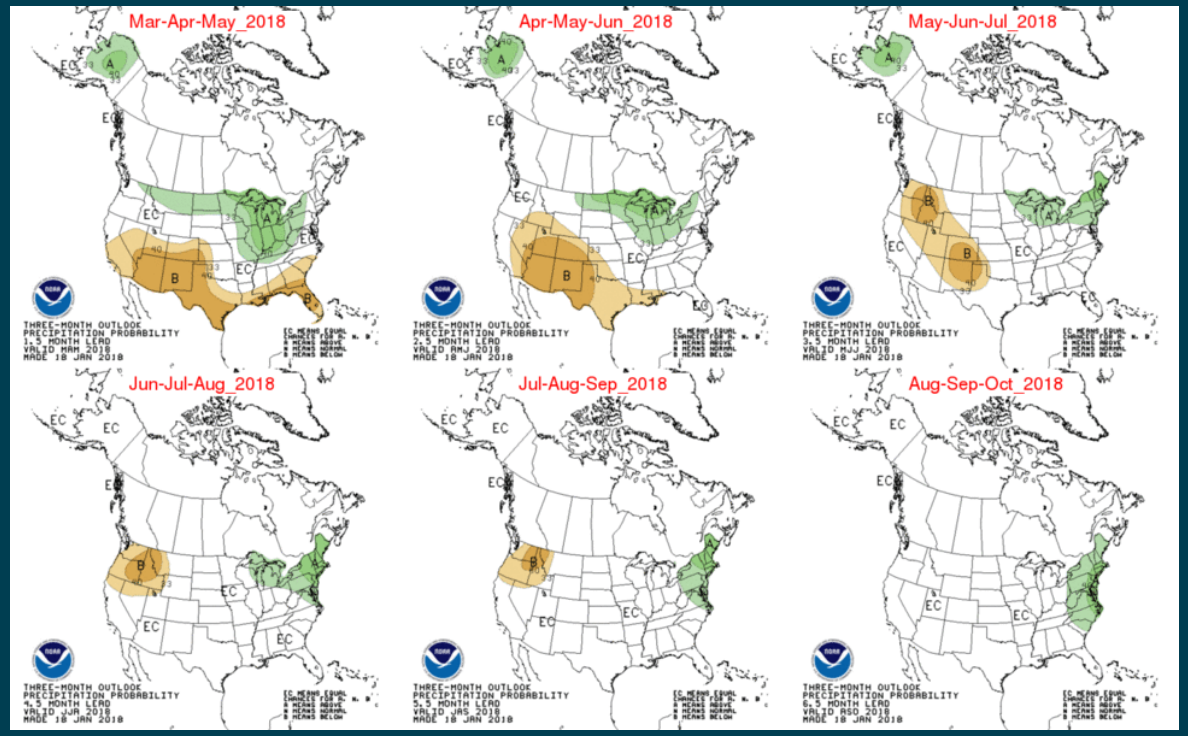




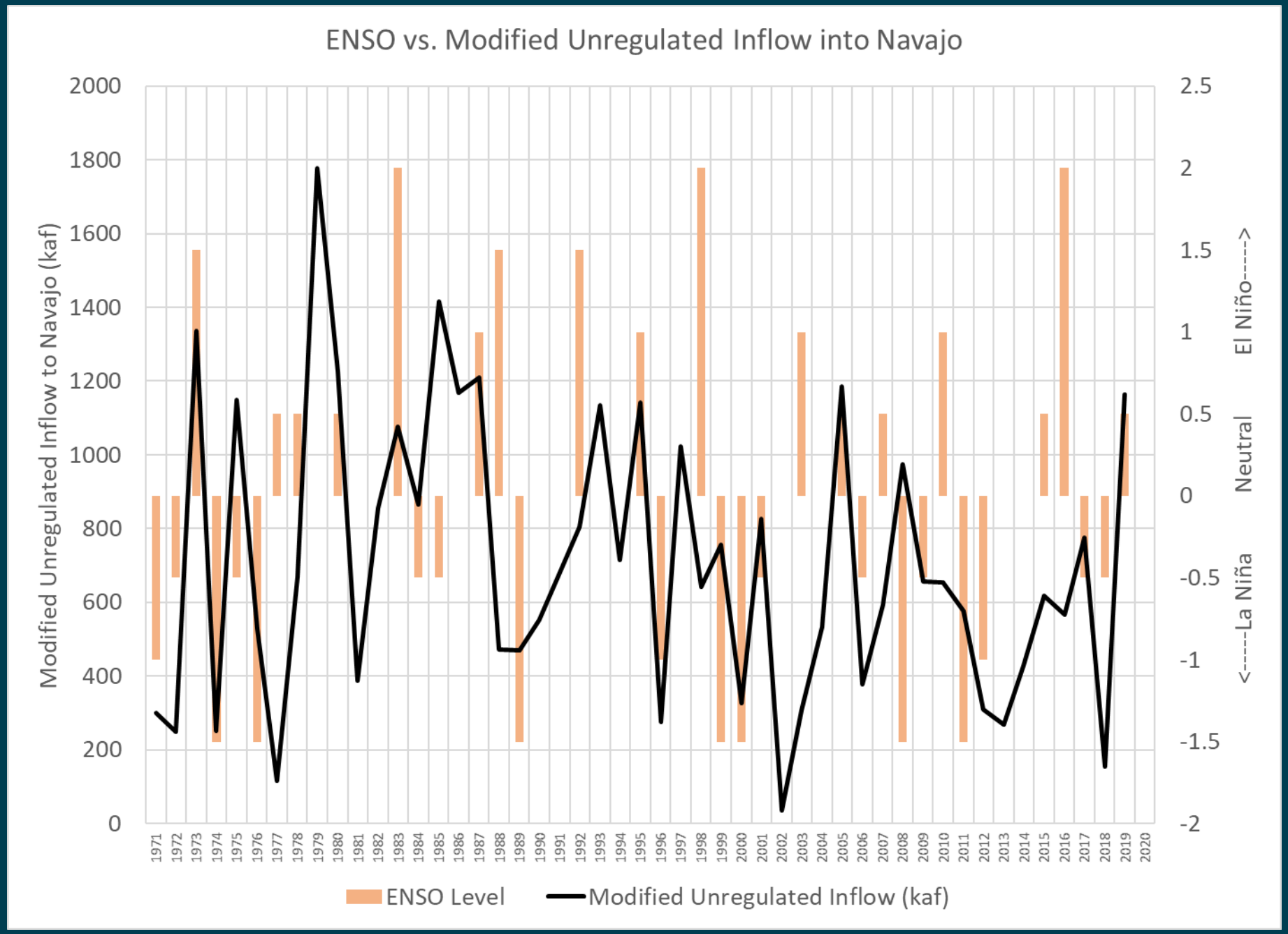
Weak El Niño

CPC Seasonal Outlook (from 2018)





Weak La Niña


ENSO vs. Modified Unregulated Inflow into Navajo
Modified Unregulated Inflow to Navajo (kaf)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
El Niño---->
Neutral
<----La Niña
1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
ENSO Level
Modified Unregulated Inflow (kaf)

Many things can affect our storm systems

- ENSO and strength
- Ocean “blob” locations
- Solar Activity
- Jet Stream characteristics
- Ocean temperature differential amplitude
- Fires in Australia
- Butterflies in Siberia

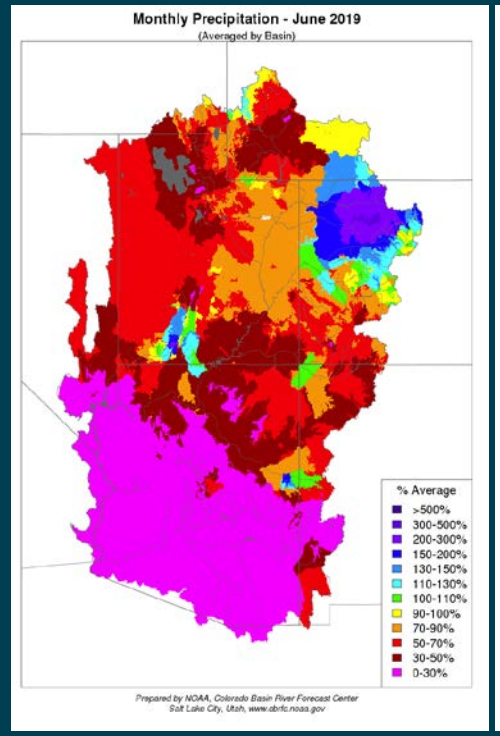
COLORADO BASIN RIVER FORECAST CENTER

NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

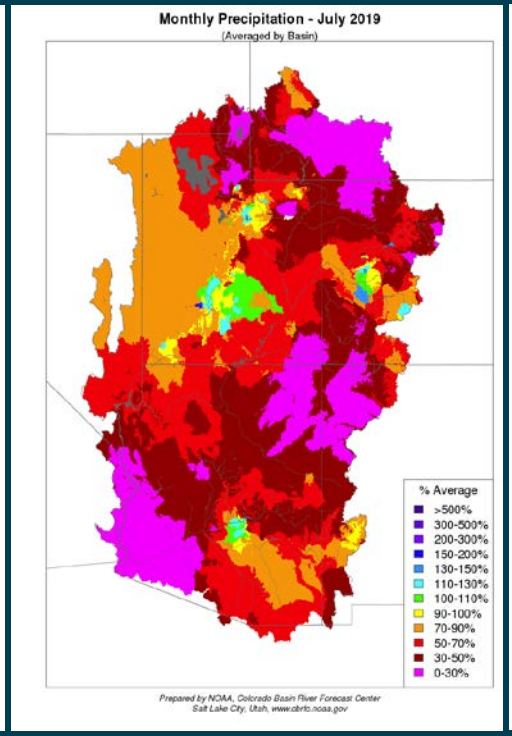
2019 Monsoon Season Review

- Coming into the monsoon season, the weather pattern featured an unusually persistent trough over the western US
- The 2019 monsoon season in the southwest US was the 9th driest and 3rd hottest on record, with records dating back to 1895
- An unfavorable mid-level weather pattern (partially caused by the waning influences of El Niño) and a decrease in tropical storm activity combined to make ***this one of the driest monsoons on record***

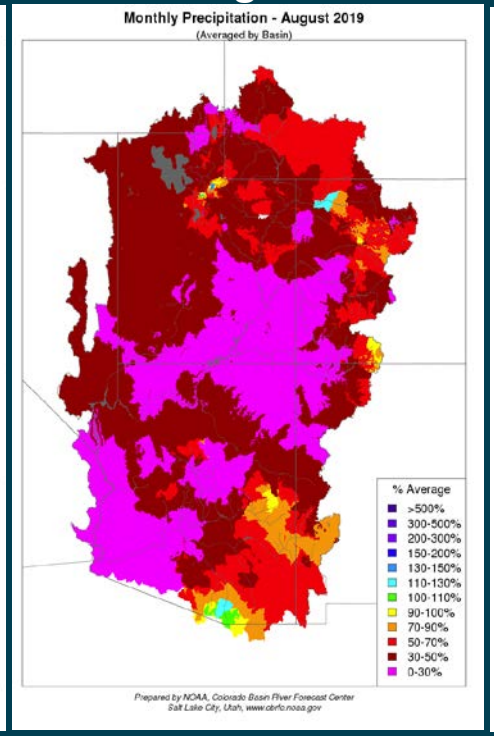
June



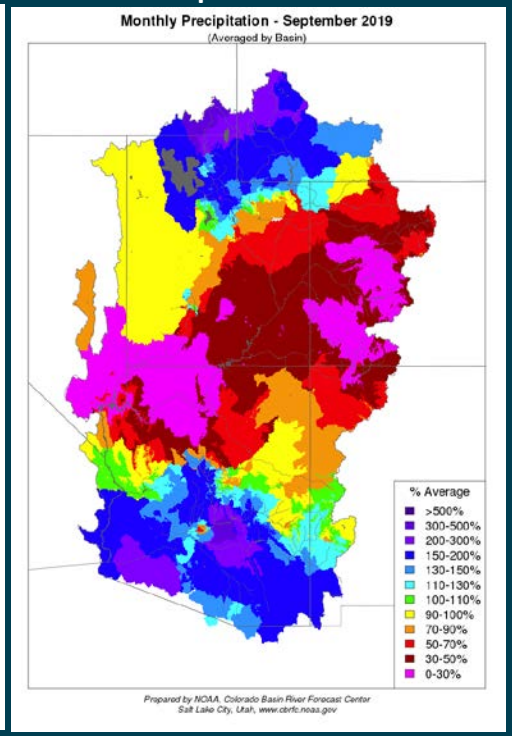
July



August



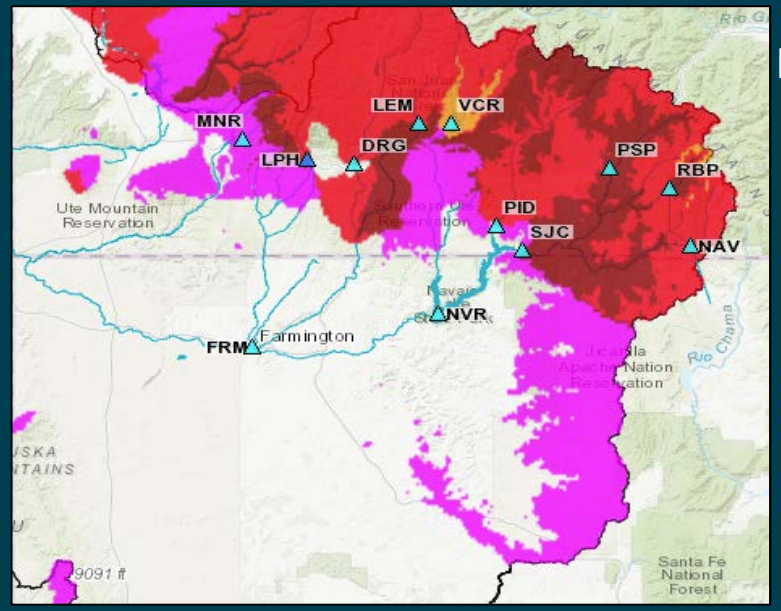
September



MODEL DRIVERS

Soil moisture conditions entering the winter season

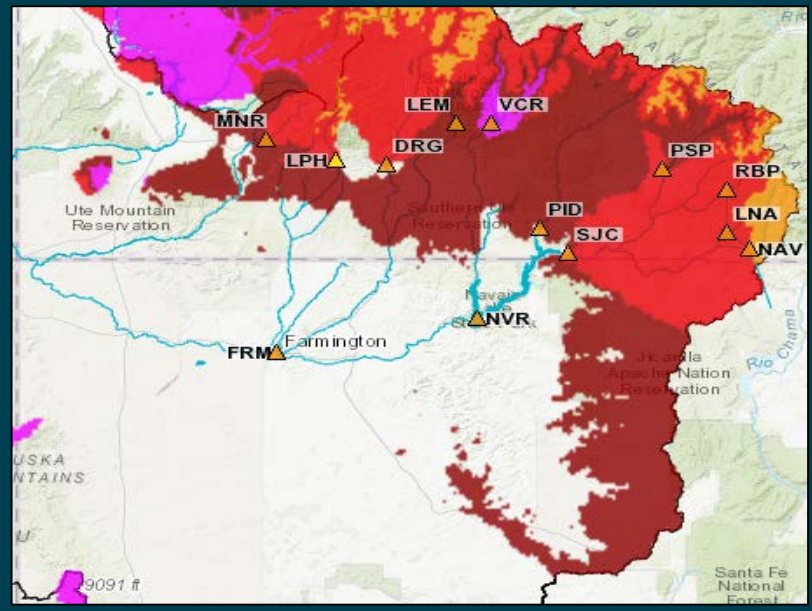
Fall 2018



Percent of normal soil moisture

70-90%
50-70%
30-50%
0-30%

Fall 2019



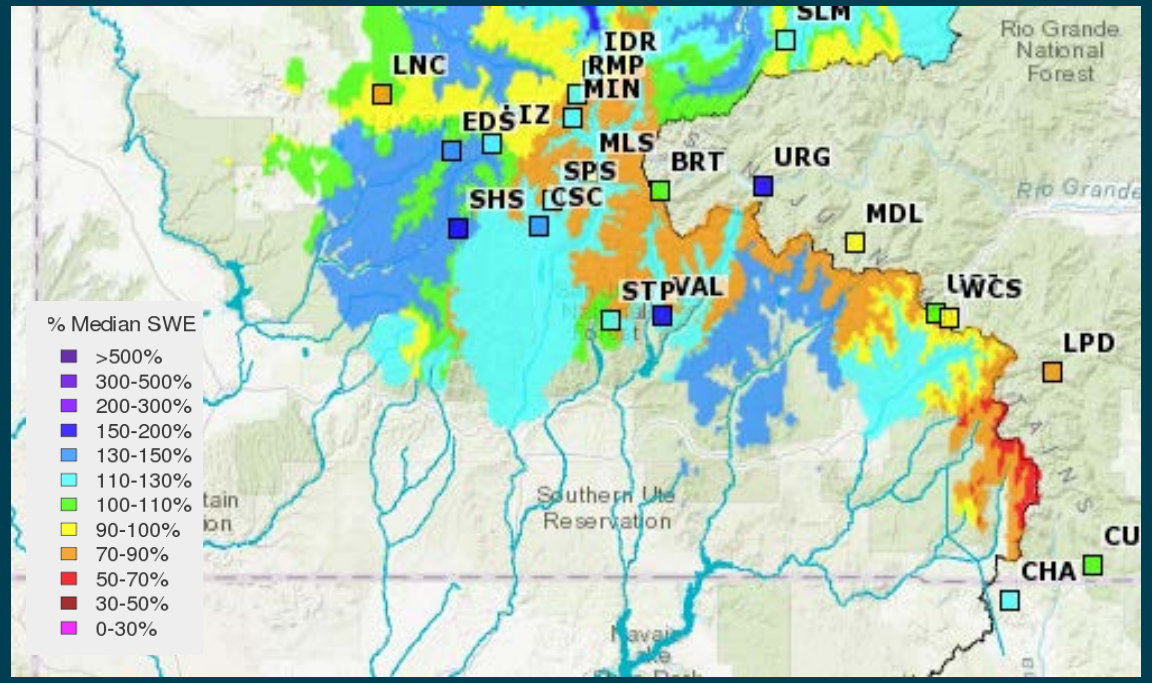
Soil moisture conditions are slightly improved compared to last year but are still much below normal due to the dry summer and fall.

COLORADO BASIN RIVER FORECAST CENTER

NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

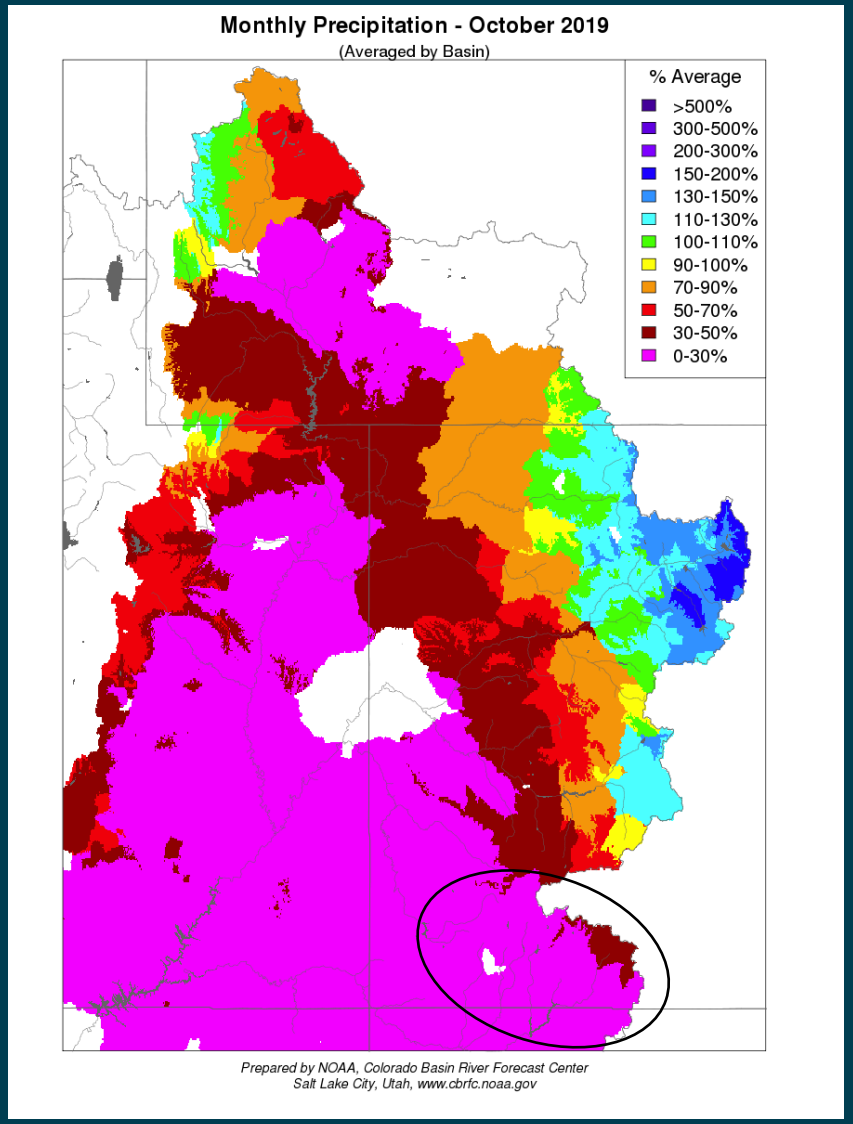
MODEL DRIVERS

January 16 2020
SNOTEL (Observed) and CBRFC (Model)



Snow conditions are near to above normal for early January.

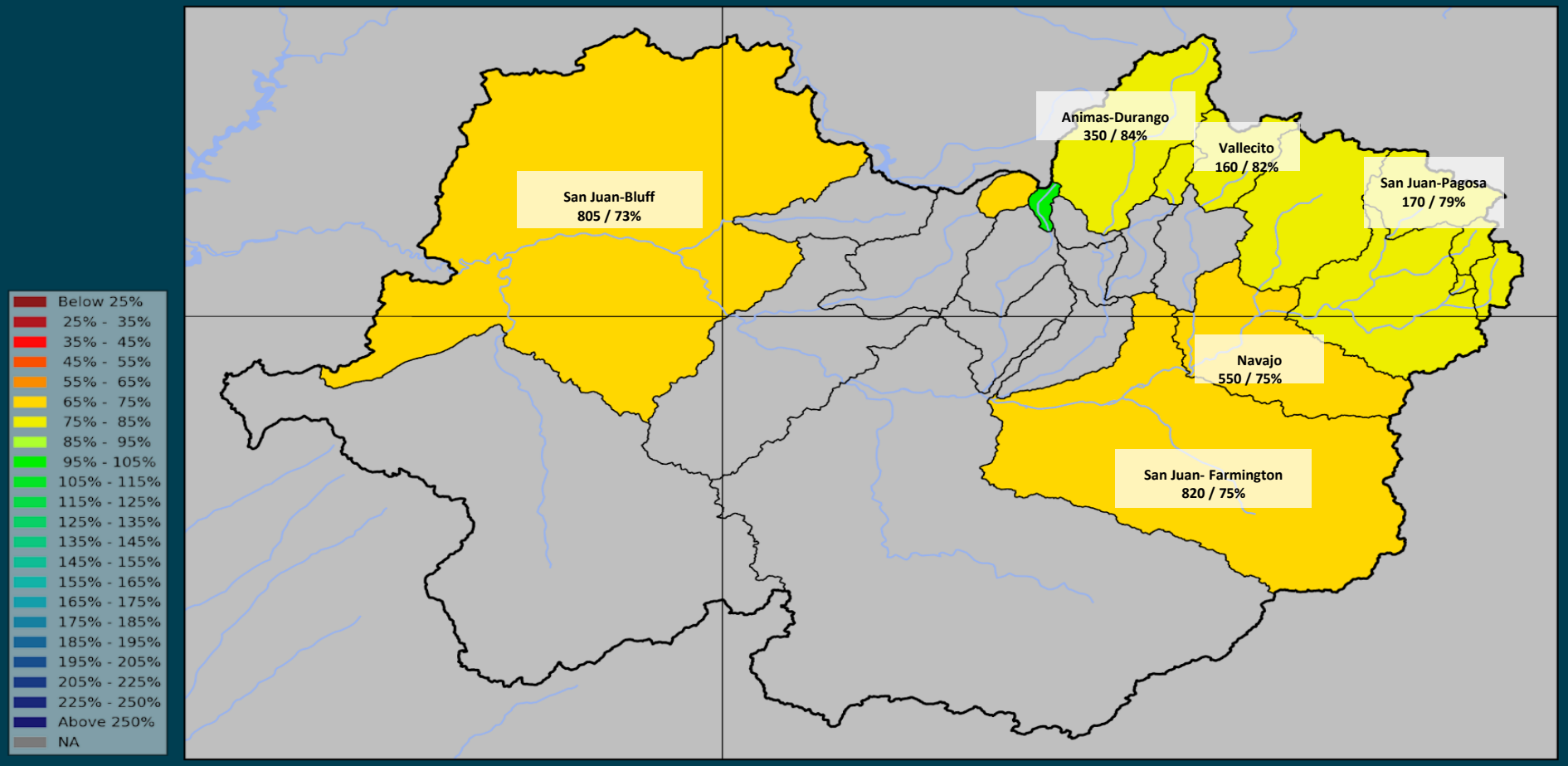
However, snow at the upper elevations is below normal due to a dry October which resulted in a slow start to the high elevation (>11k ft) snow accumulation season.



COLORADO BASIN RIVER FORECAST CENTER

NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

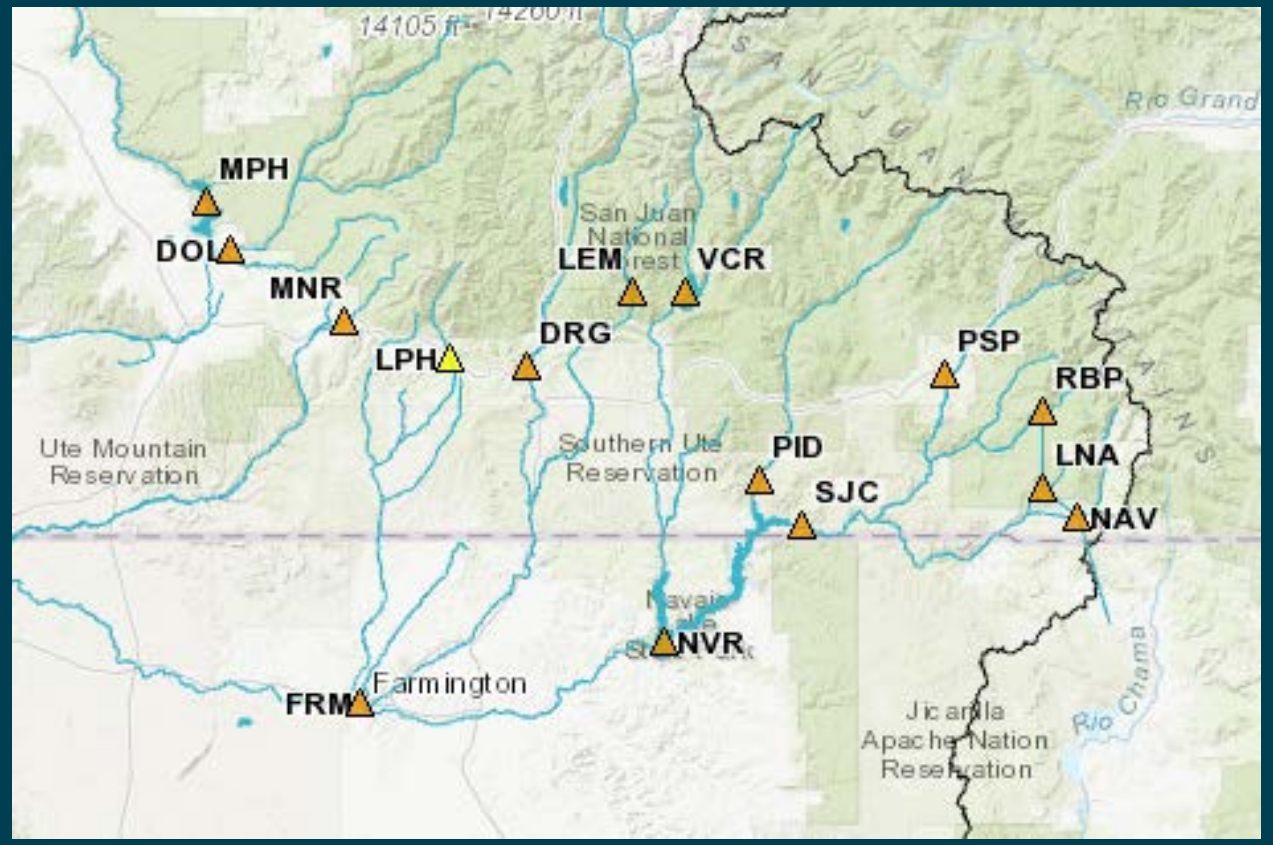
April-July Forecast (as of January 1st)
Volume in 1000's acre-feet / Percent of 1981-2010 average



Early season forecasts are below normal despite decent snow conditions due to dry soils and below normal high elevation snowpack.

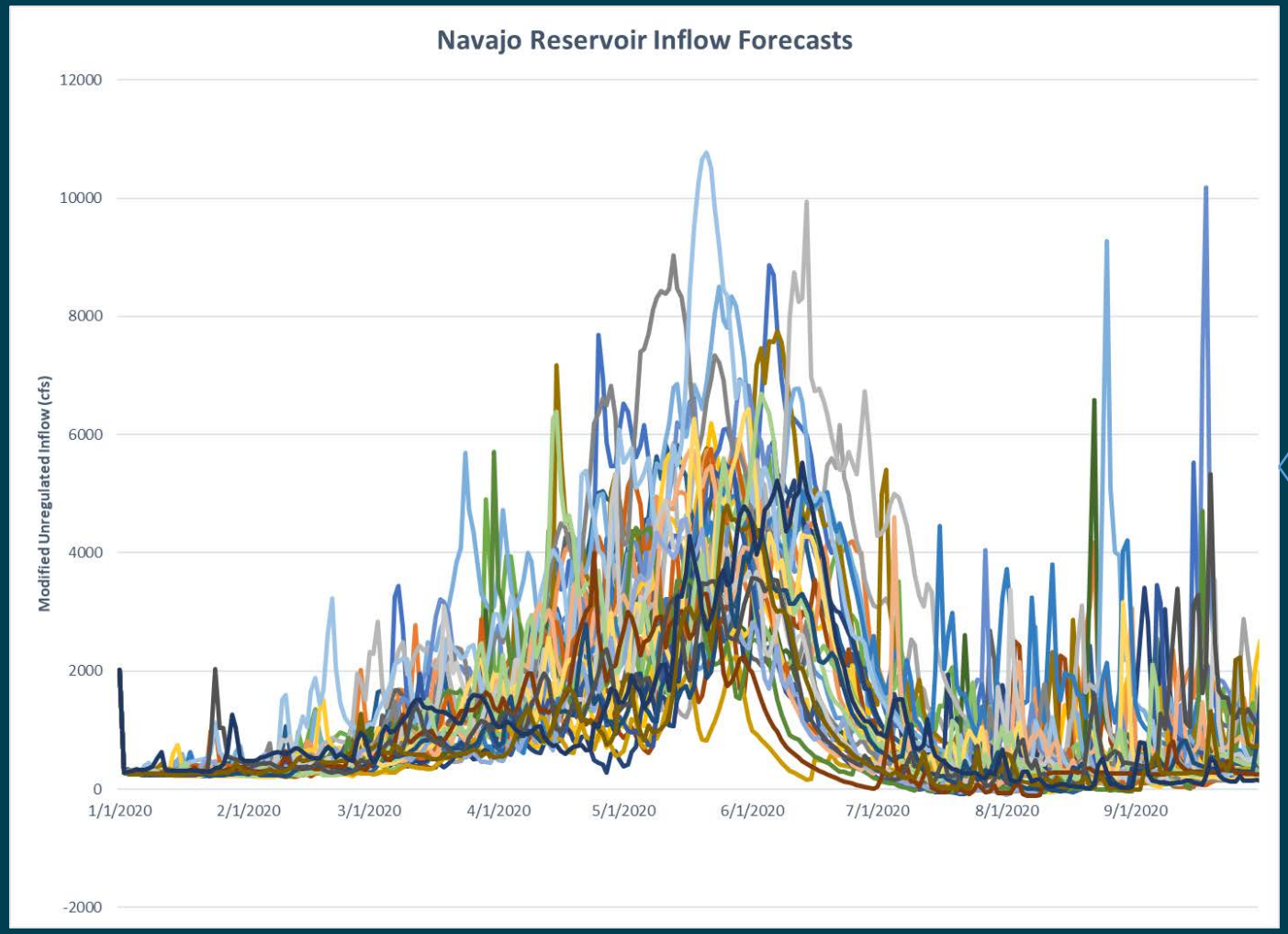
Water Supply Forecasts (April-July)

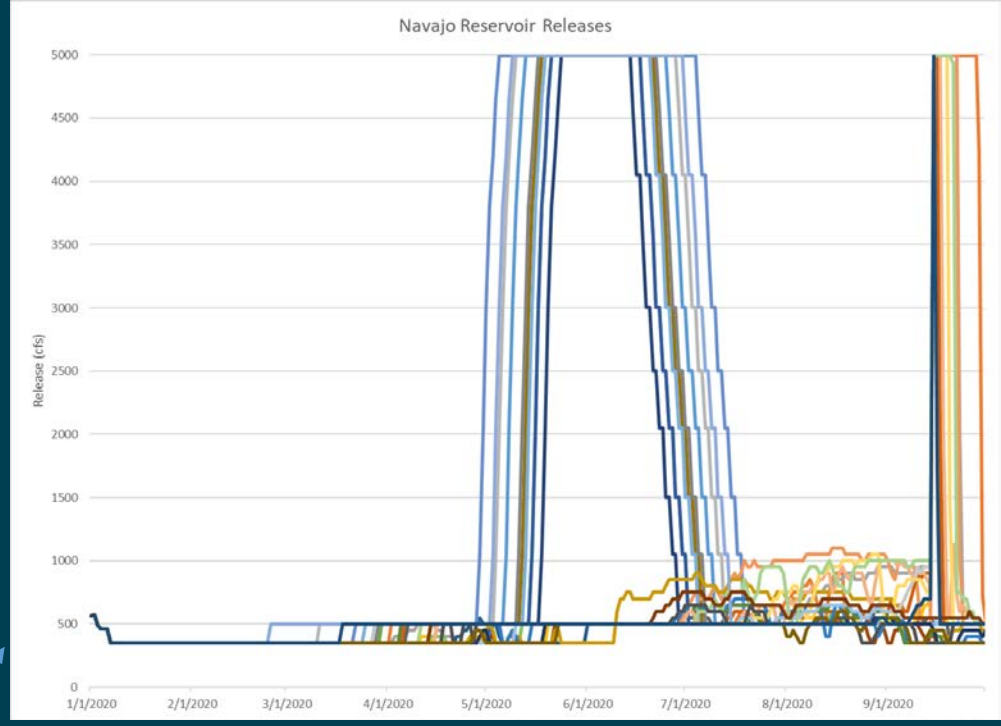
Navajo:	550kaf (75% avg)
Vallecito:	160kaf (82% avg)
Lemon:	45 kaf (82% avg)
Animas:	350 kaf (84% avg)
McPhee:	260 kaf (88% avg)
Powell:	5900 kaf (82% avg)

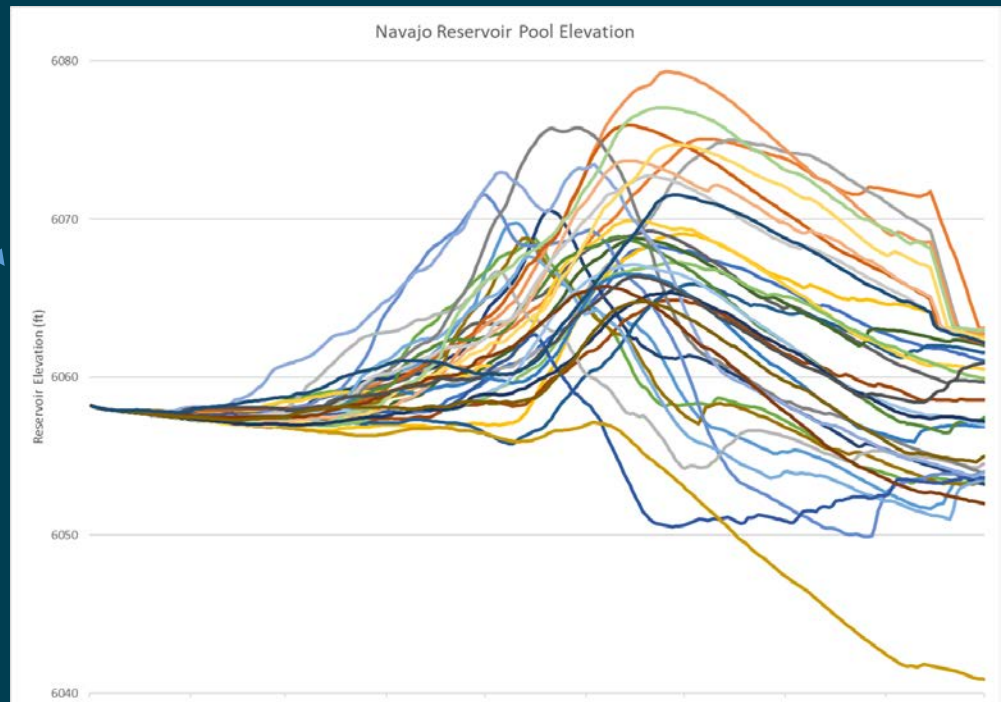


As of Jan 1, 2020

CBRFC Ensemble Streamflow Prediction (ESP) Traces



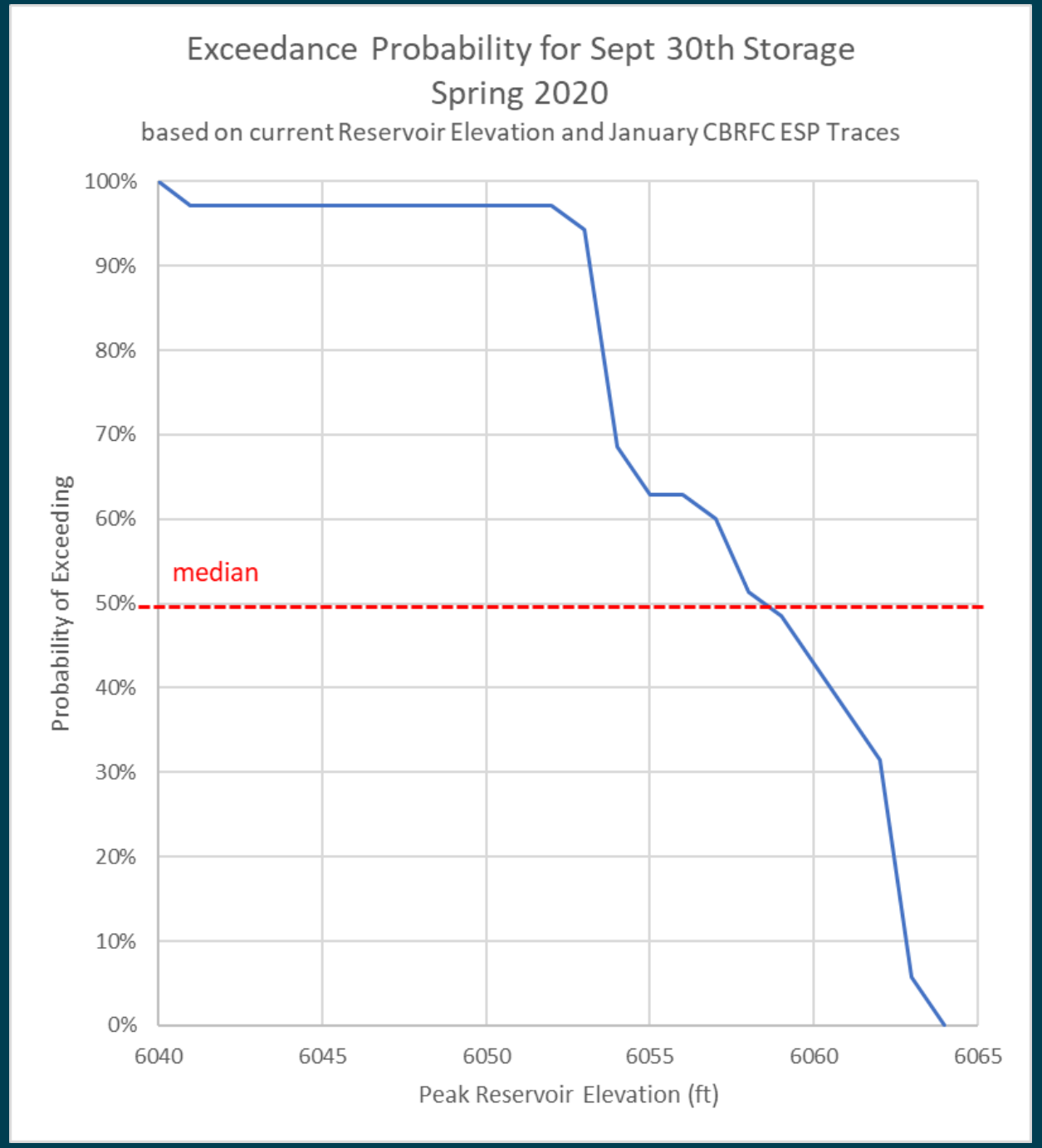




What does it mean?

Based on current storage levels and the ESP trace forecasts,

- 30% chance of SJRIP-prescribed spring peak release of at least 21 days at 5,000 cfs
- 97% chance the Sept 30th storage will be >6050 ft.
- 30% chance the Sept 30th storage will be > 6063 ft.
- Max pool elevation under any scenario was 6079 ft in the spring



Summary

Next mtg
April 21st

- Snowpack is slightly above average (109% above Navajo) but dry soils coming into the season have kept our inflow forecasts below average (Most Probable as of January 1st is 75% of average for Navajo). How much will soils impact the forecast?
- CPC outlook is showing a slight chance for drier than average conditions through the spring and a high chance for warmer than average. How accurate are these? For record years (2018, 2019, they are pretty good. For “average-ish” years, they are not very good.
- Based on current conditions (snowpack and reservoirs), and the range of forecast possibilities provided by CBRFC, there is a 30% chance for a spring peak release in 2020.

SJRIP Update

Updates for Reclamation

Reclamation Contacts:

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Ruth Swickard
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BUREAU OF RECLAMATION

Useful Links
Reclamation: www.usbr.gov/uc
USGS: water.usgs.gov/nwis
CBRFC: cbrfc.noaa.gov