



Utah Water Assessment & Conditions Monitoring (Drought Webinar)

The meeting will begin shortly



Thank you to our contributors



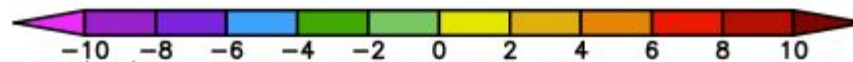
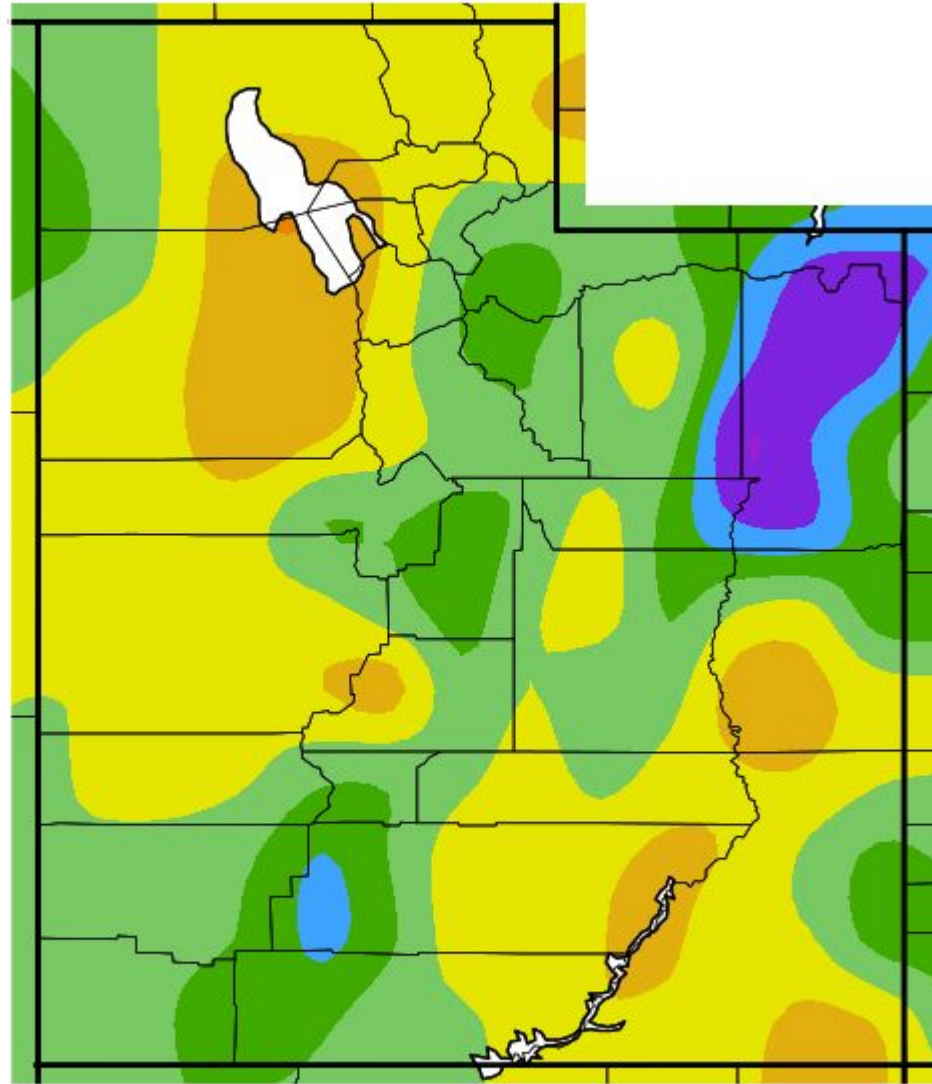


Utah Water Assessment & Conditions Monitoring Webinar

January 10, 2023

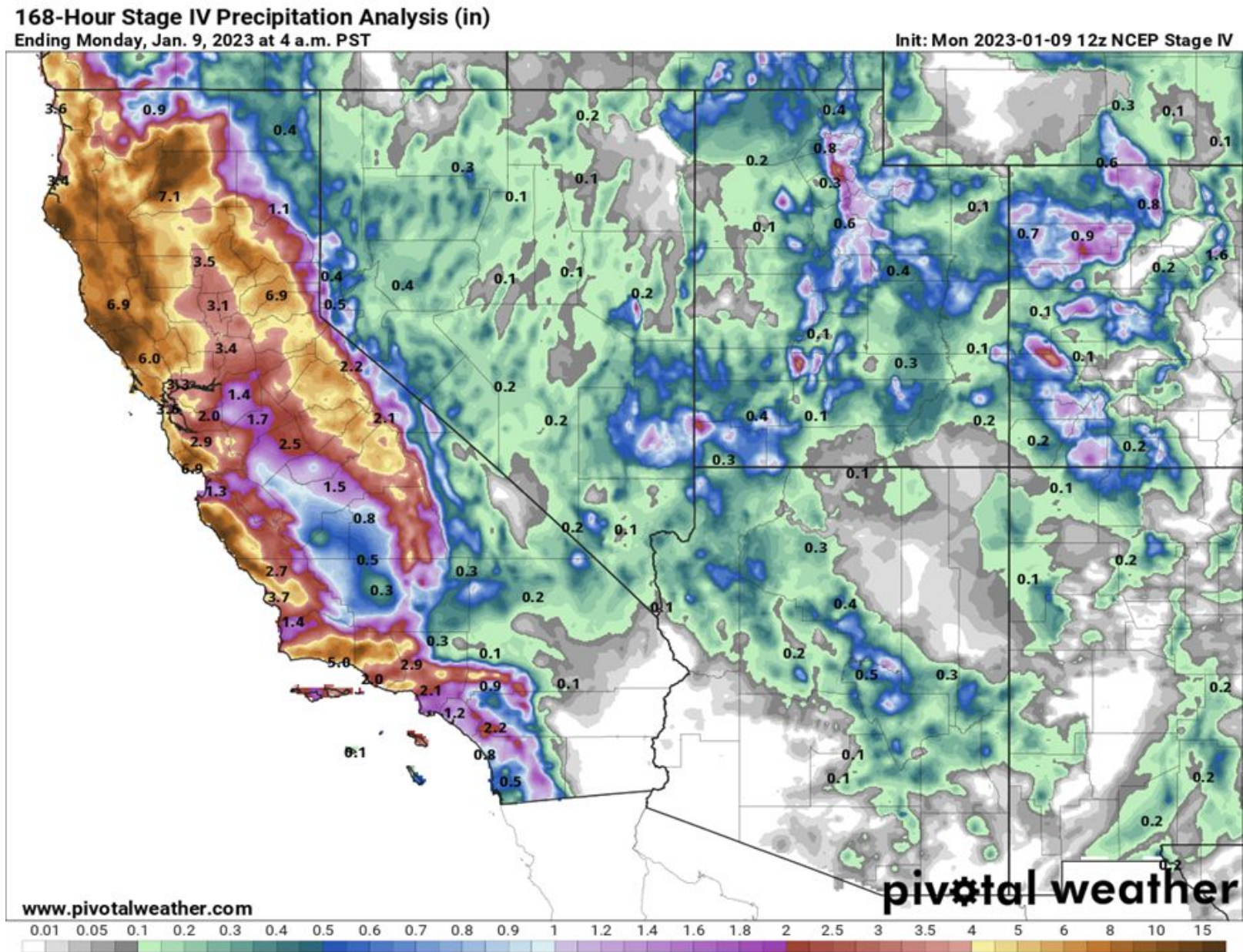
Temperature 7 day history

Av. Max. Temperature dep from Ave (deg F)
12/11/2022 – 1/9/2023

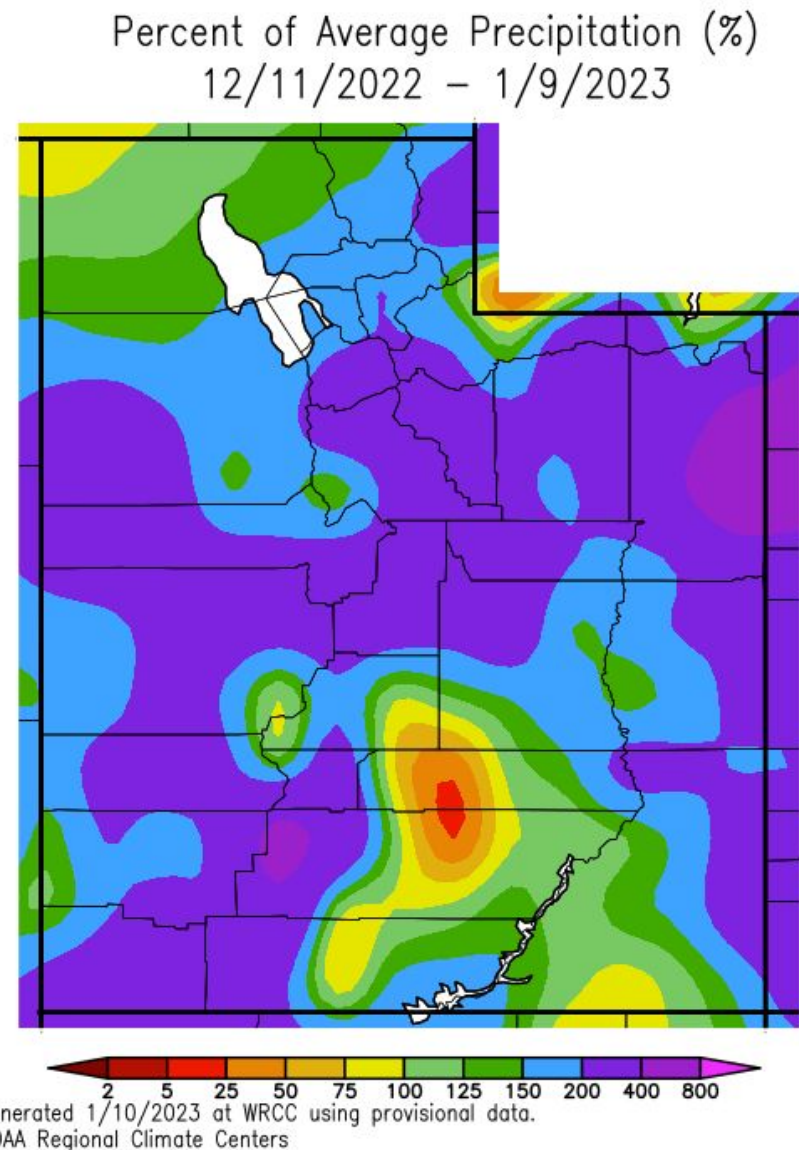
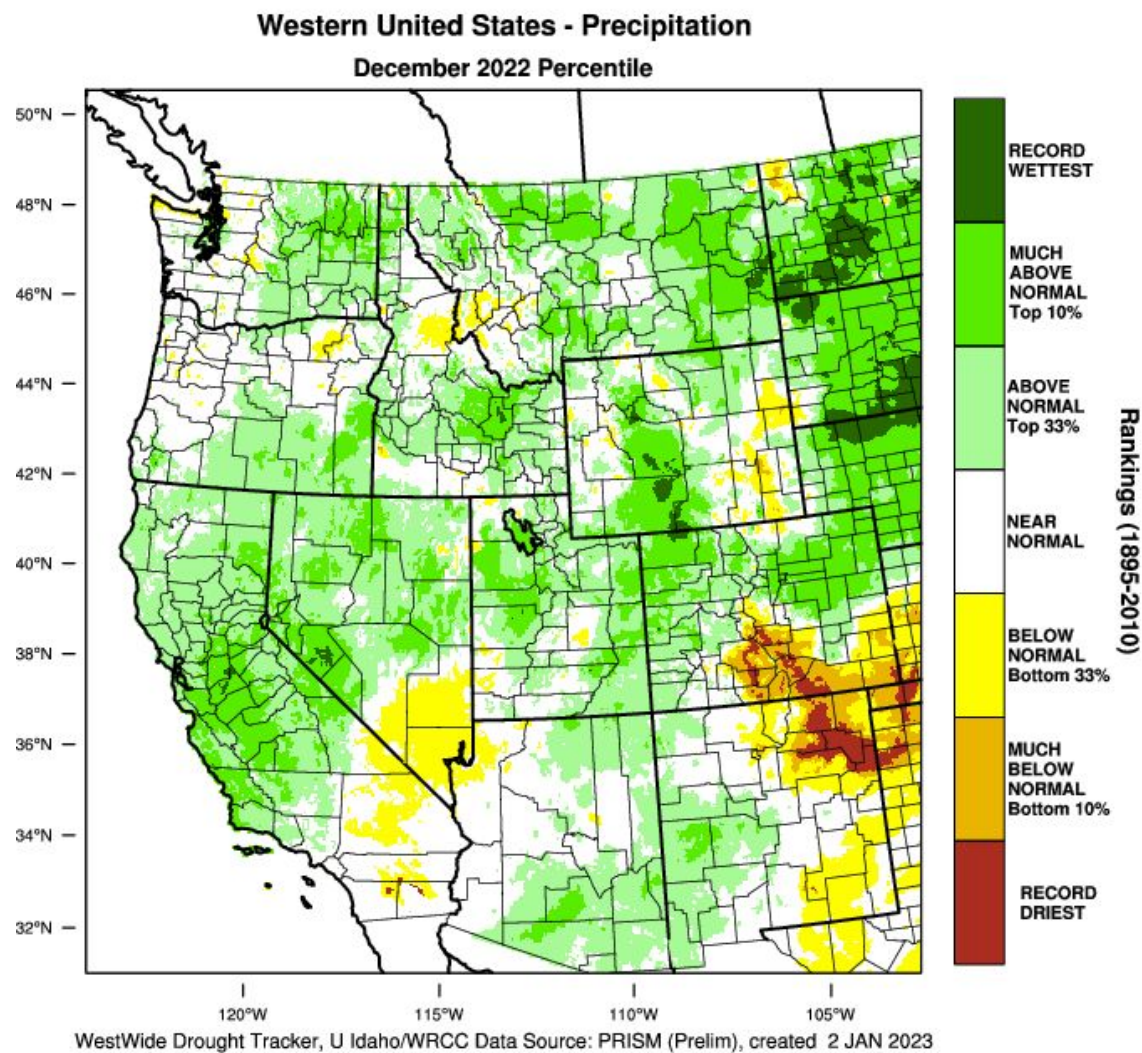


Generated 1/10/2023 at WRCC using provisional data.
NOAA Regional Climate Centers

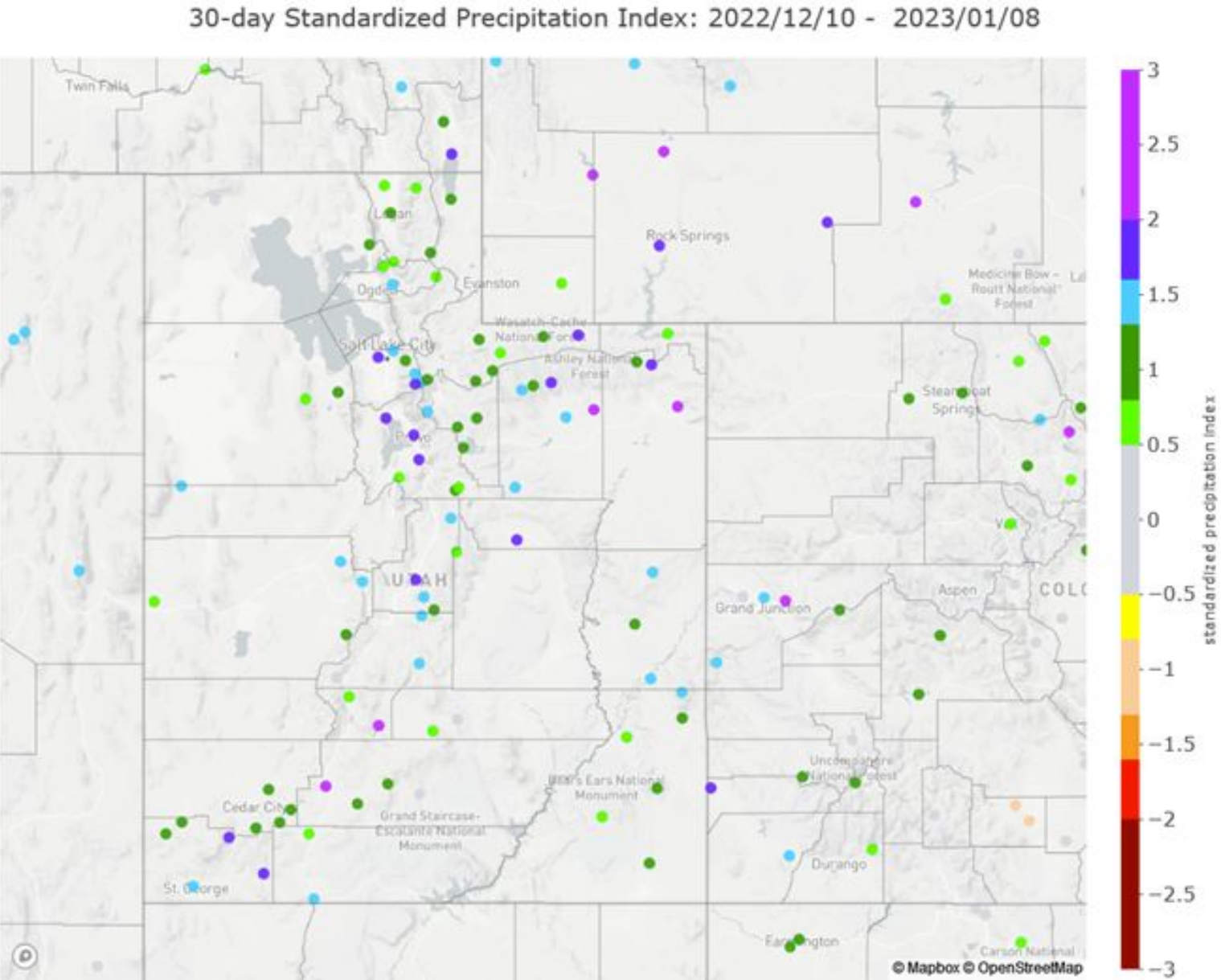
Precipitation 7 day history



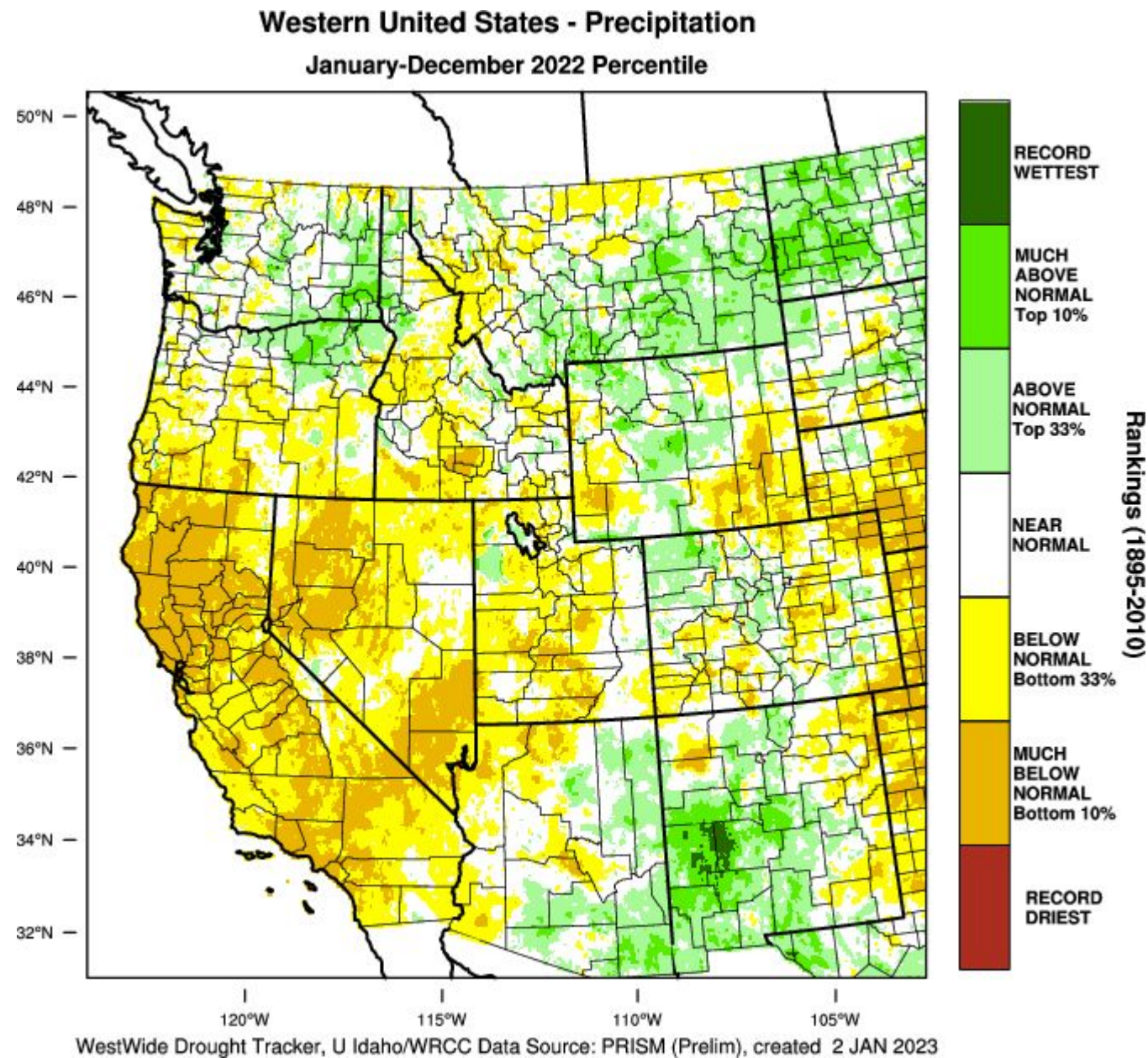
30-day Precipitation



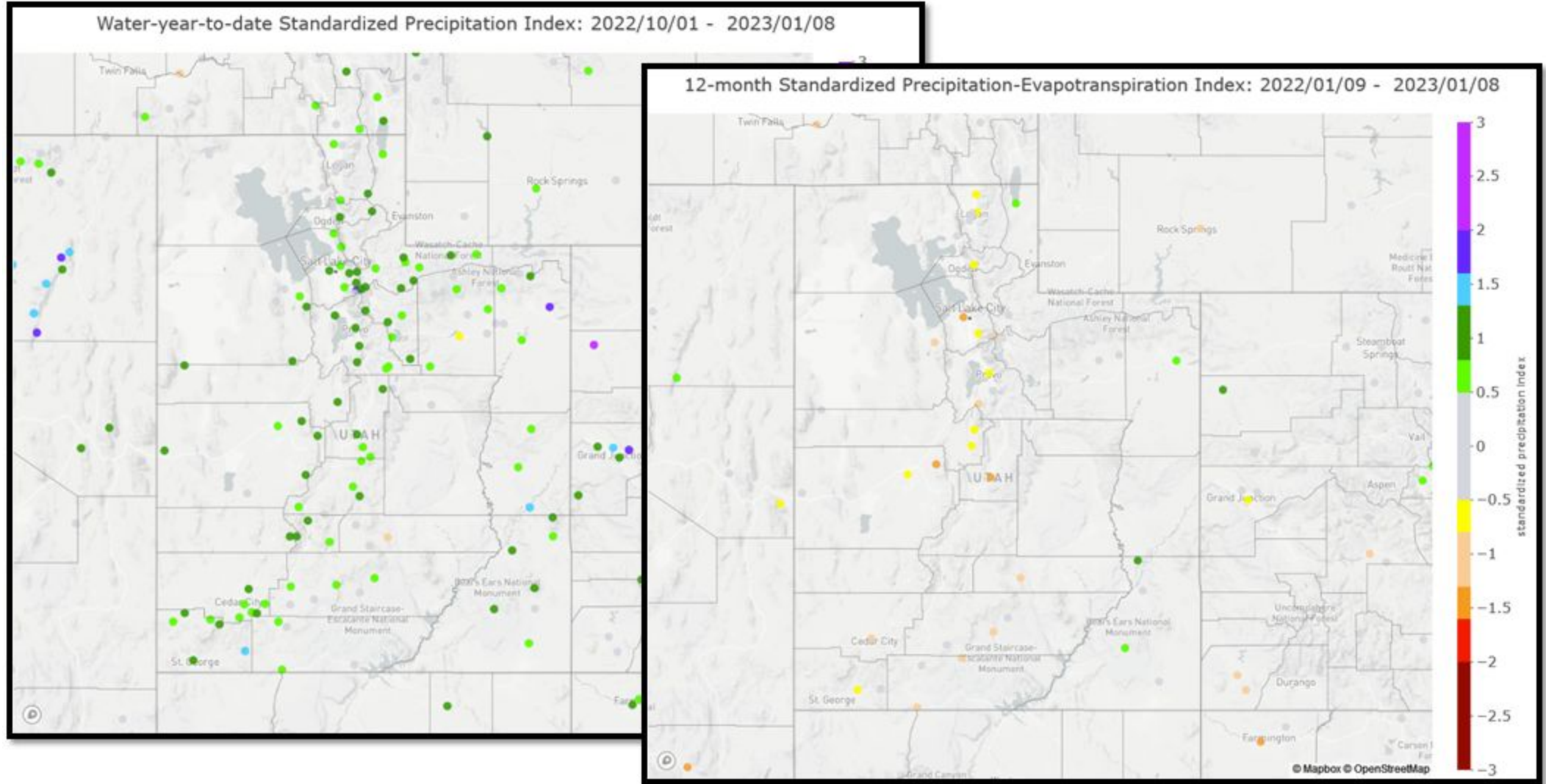
30-day Standardized Precipitation Index (SPI)



2022 Precipitation

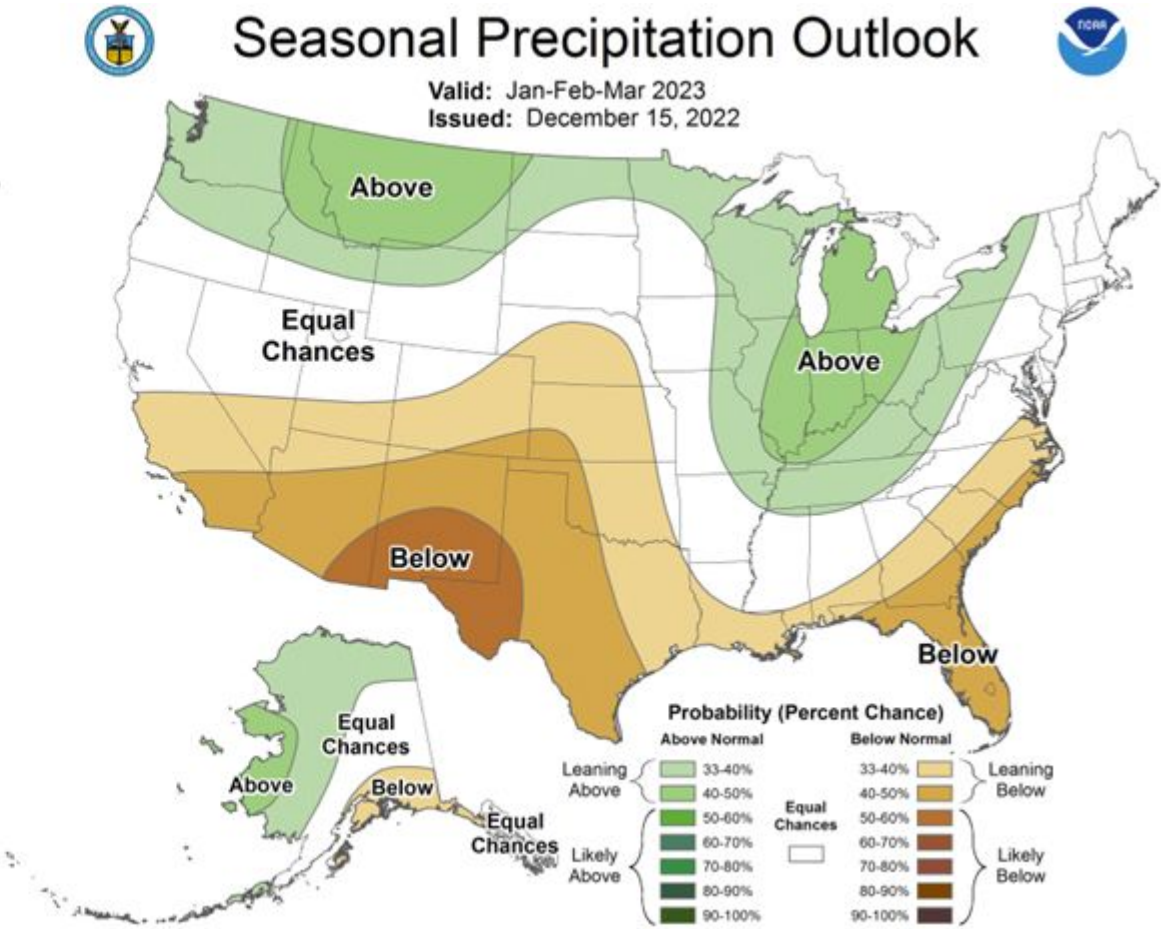
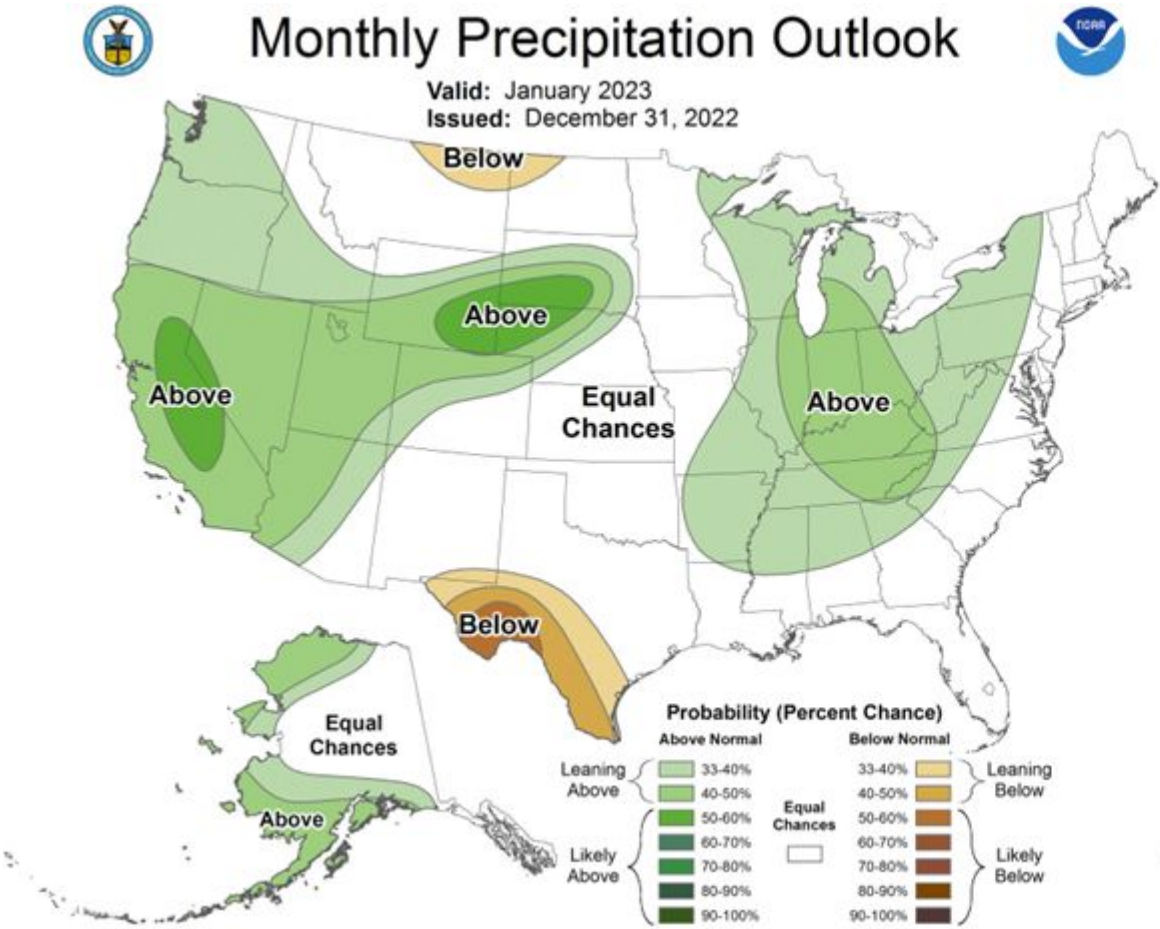


SPI (Water-year-to-date & 12-month)



Agency - Utah Climate Center
Presenter - Jon Meyer

Climate Prediction Center Outlook (January + Jan.-March)

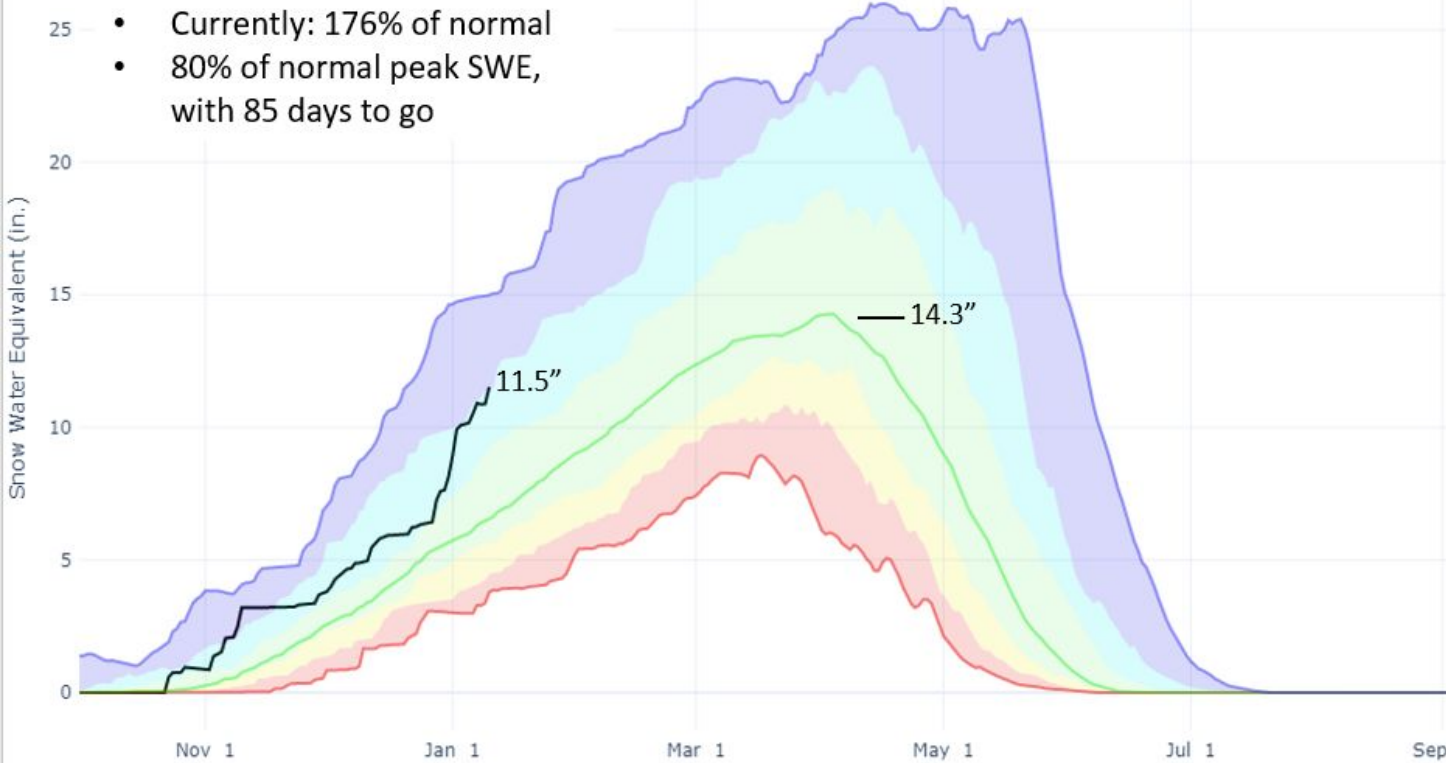


Statewide SWE

SNOW WATER EQUIVALENT IN STATE OF UTAH

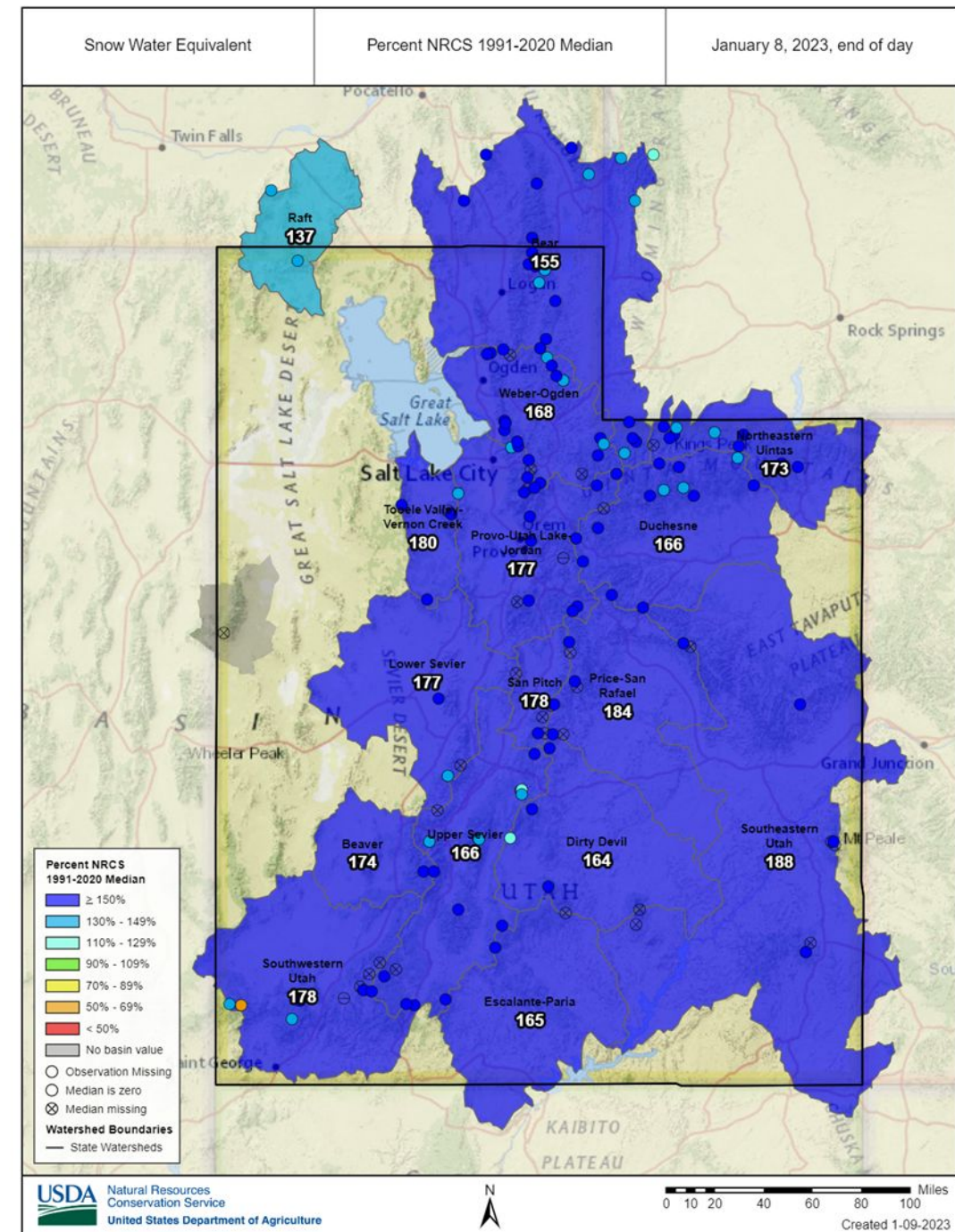
Reset Range

Link to data

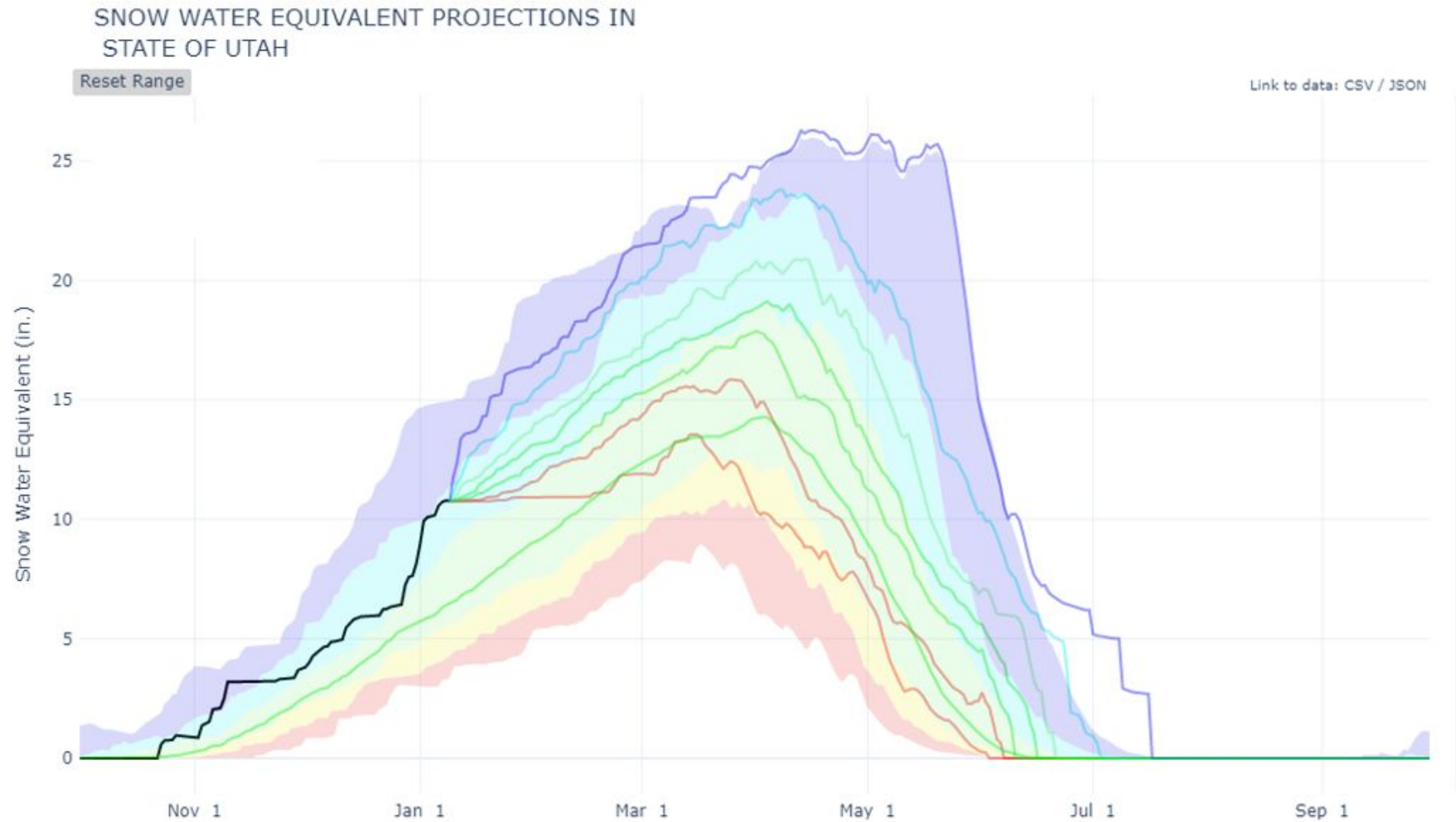


- Only 2.8" to go to reach 'normal' peak SWE

Agency - NRCS Snow Survey
Presenter - Jordan Clayton



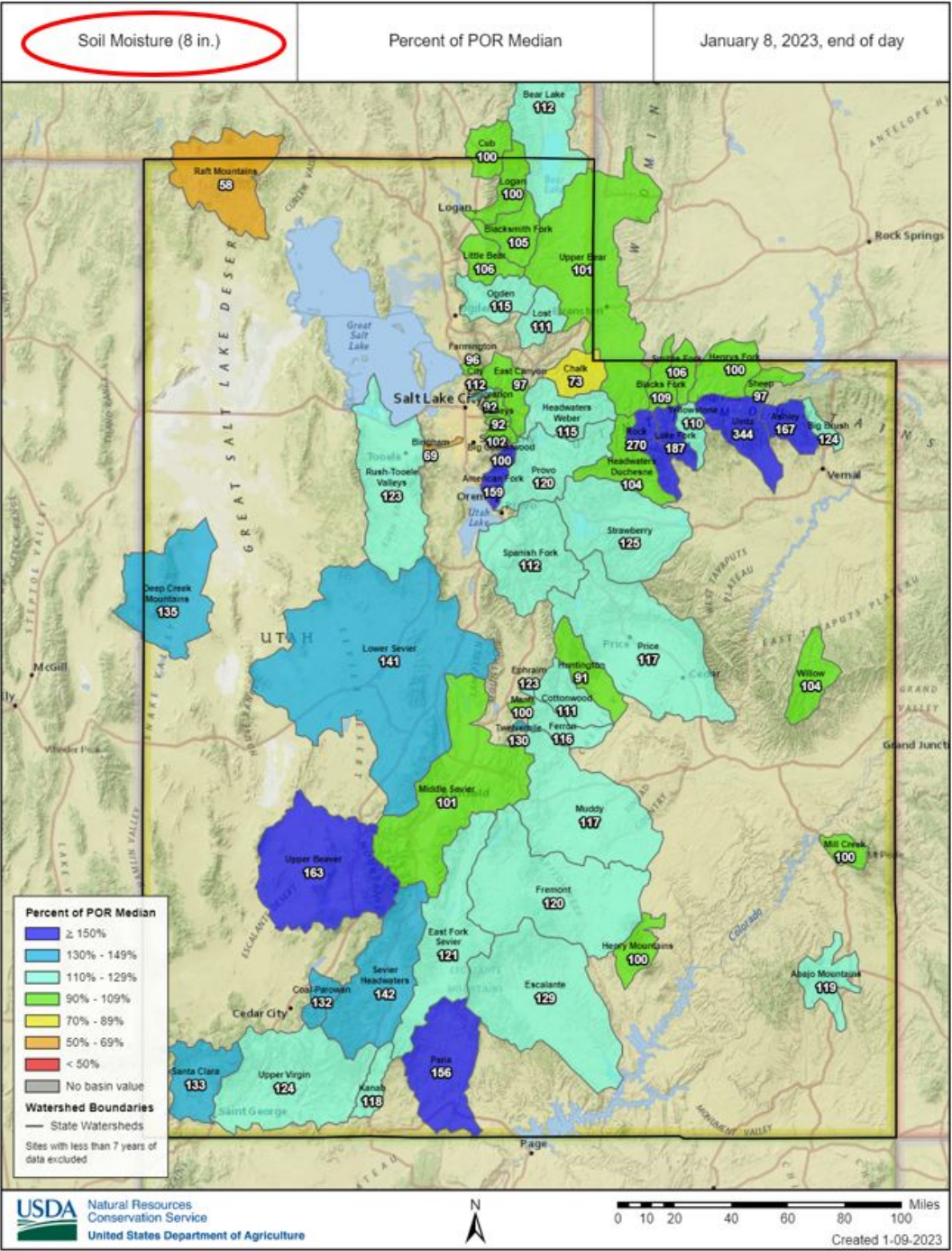
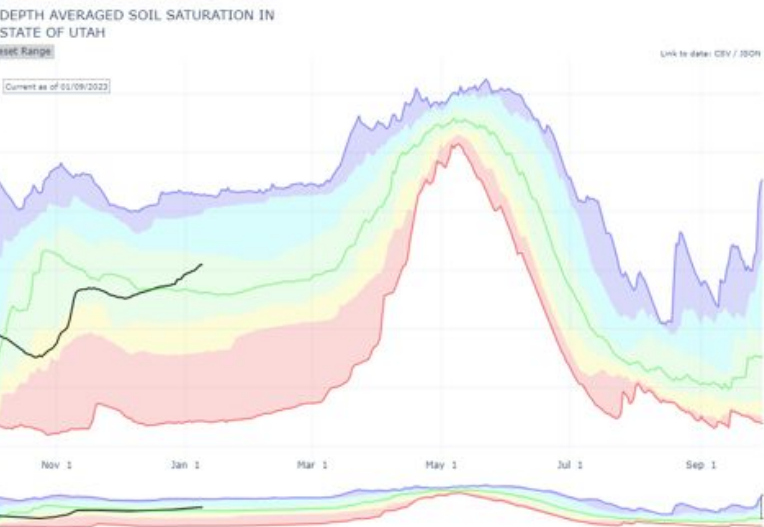
Statewide SWE: projections



- Range of possible outcomes, from below normal to new record winter
- **Most probable max statewide SWE:**
 - **19.6" on April 4th → would be 137% of normal**

Soil moisture

- *above normal moisture*
- *sets us up well for snowmelt runoff*



Agency - NRCS Snow Survey
Presenter - Jordan Clayton

Discussion: implications of SWSI > 50% ?

- snowmelt predicted to substantially replenish reservoirs and surface water systems in those basins
- would be better than 50% of observations over last 30 years
- **remove those basins from drought status?**
 - exceptions would be Provo, Upper Sevier, Lower Sevier, San Pitch, & Bear watersheds

January 1, 2023 | Surface Water Supply Index (SWSI)

Basin or Region	Reservoir Storage ¹ (KAF) ²	Apr-July Forecast (KAF) ²	Forecast + Storage (KAF) ²	SWSI ³	Percentile ⁴ (%)	Similar Years
Bear	372.0	133.0	505.0	-1.7	30	[2007, 2010]
Woodruff Narrows	13.5	135.0	148.5	1.18	64	[2008, 2016]
Little Bear	9.7	52.0	61.7	1.04	62	[1993, 2009]
Ogden	43.3	135.0	178.3	0.76	59	[1993, 1994]
Weber	198.9	415.0	613.9	1.33	66	[1993, 2019]
Provo	646.0	118.0	764.0	-3.61	7	[2004, 2016]
Western Uintas	153.0	65.0	218.0	0.38	55	[2010, 2022]
Eastern Uintas	22.7	123.0	145.7	0.38	55	[1996, 2010]
Blacks Fork	7.7	100.0	107.7	1.52	68	[1985, 2014]
Smiths Fork	5.6	30.0	35.6	1.93	73	[1996, 2005]
Price	12.6	52.0	64.6	1.14	64	[1987, 2017]
Joes Valley	29.8	58.0	87.8	0.57	57	[1993, 2010]
Ferron Creek	7.7	38.0	45.7	0.38	55	[2001, 2008]
Moab	1.7	4.0	5.7	1.46	68	[1994, 2017]
Upper Sevier	33.3	56.0	89.3	-0.95	39	[1997, 2017]
San Pitch	0.0	17.0	17.0	-0.57	43	[1993, 2017]
Lower Sevier	20.3	70.0	90.3	-2.84	16	[2003, 2016]
Beaver River	4.3	35.0	39.3	1.14	64	[1987, 1988]
Virgin River	30.1	59.0	89.1	1.56	69	[2001, 2006]

¹ End of Month Reservoir Storage; ² KAF, Thousand Acre-Feet; ³ SWSI, Surface Water Supply Index; ⁴ Threshold for coloring: >75% Green, <25% Red

- SWSI values combine forecasted streamflow and current reservoir conditions.
- Percentiles are compared to 30 year average SWSI values.
- **14 of 19 total basins projected to exceed 50th percentile (greater than median)**

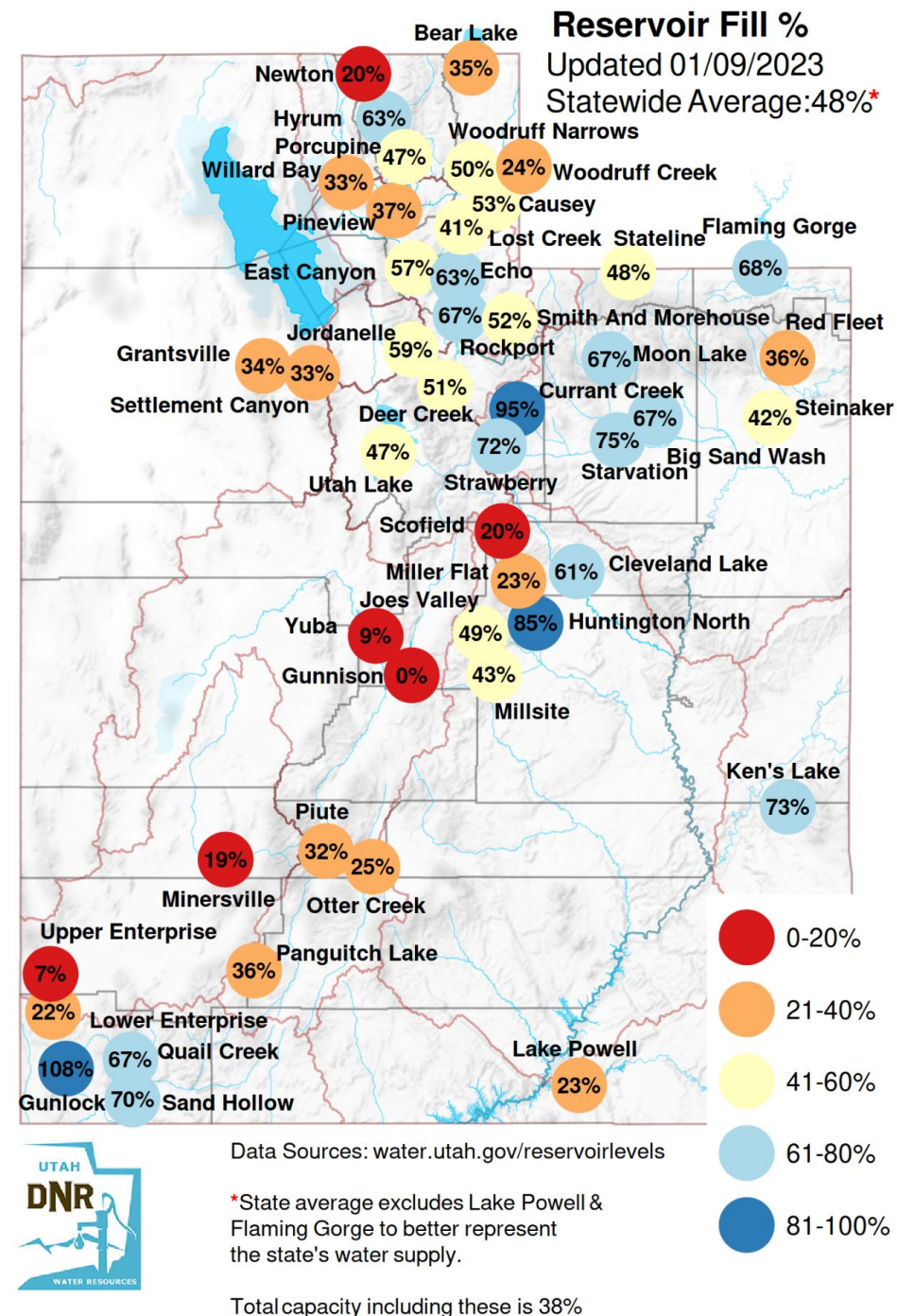
Reservoir Levels

Current: 48%

Last Year: 47%

Median: 58%

December 1, 2022: 44%

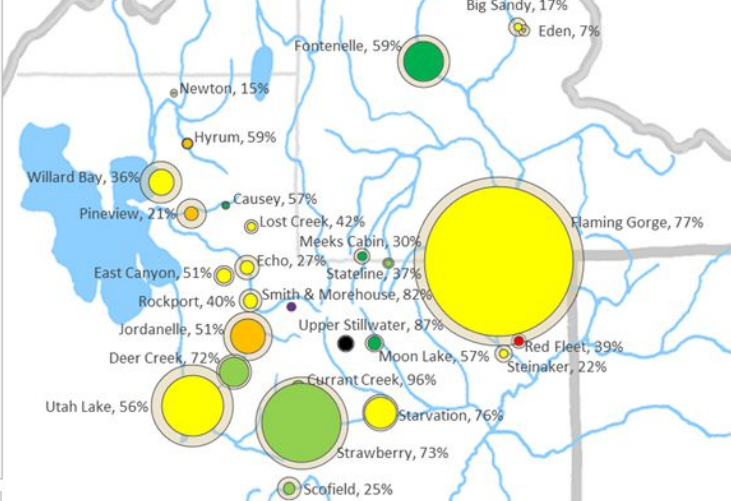
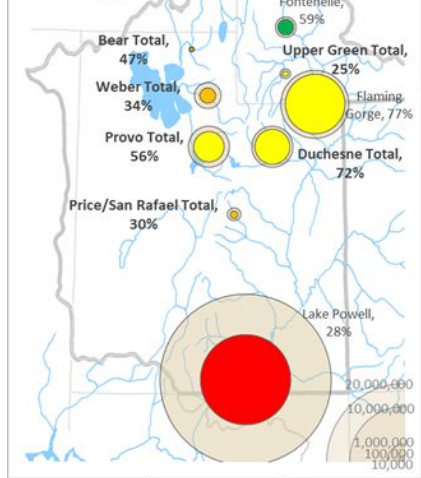


Reservoir Storage

1/1/2022

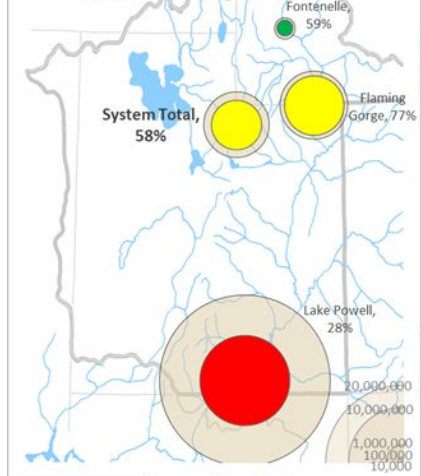
Basin Storage

1/1/2022



System Storage

1/1/2022



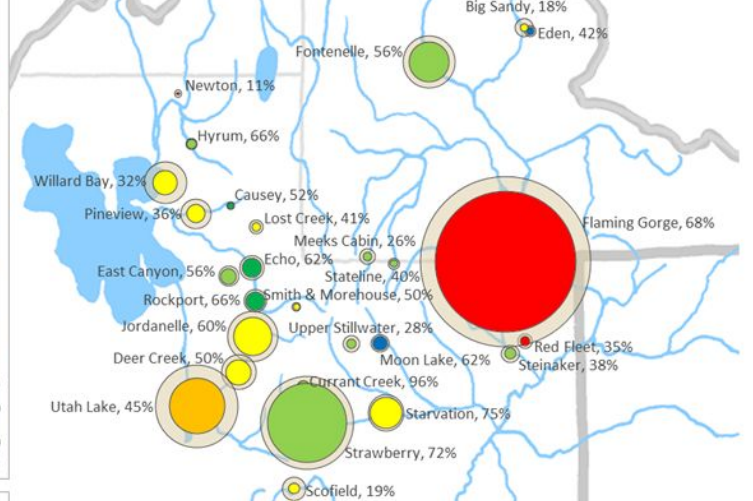
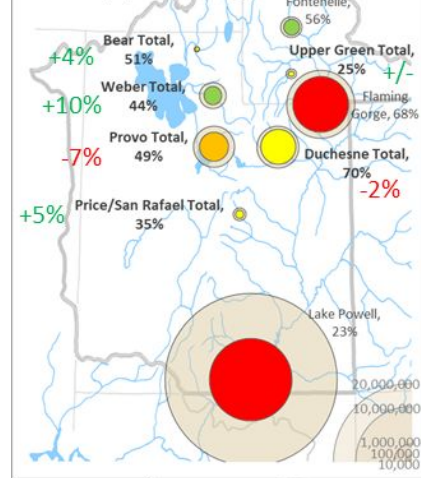
Agency - BOR
Presenter - Gary Henrie

Reservoir Storage

1/1/2023

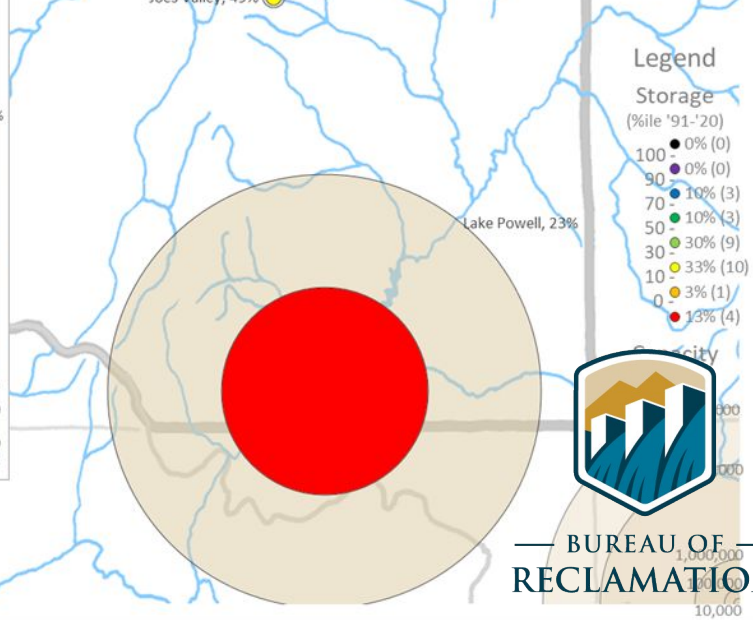
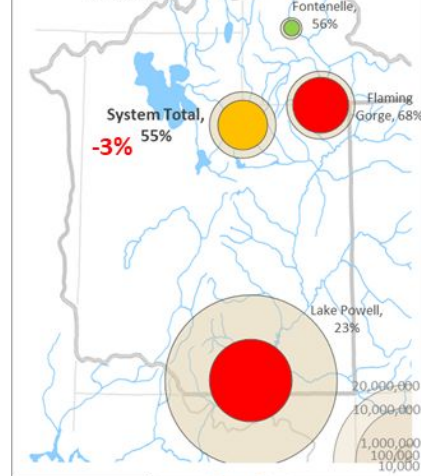
Basin Storage

1/1/2023



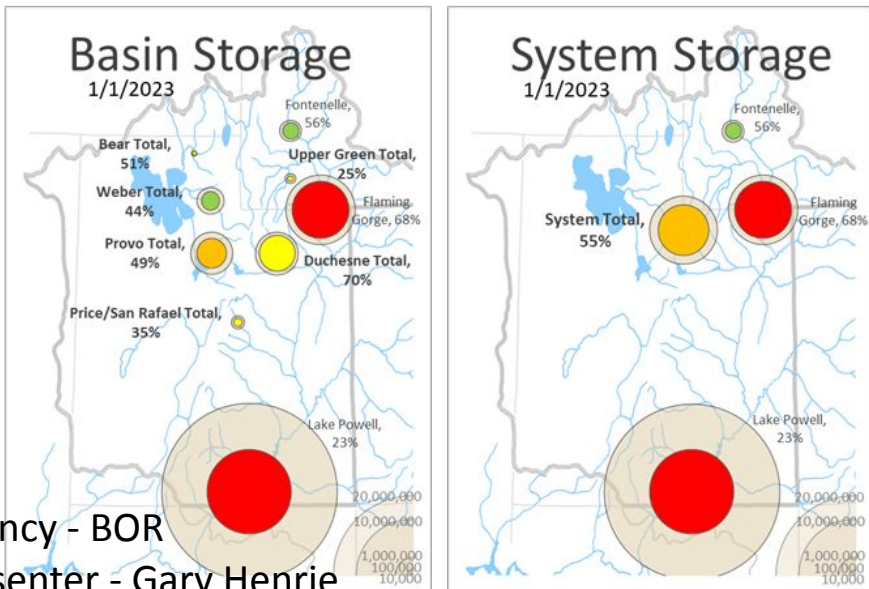
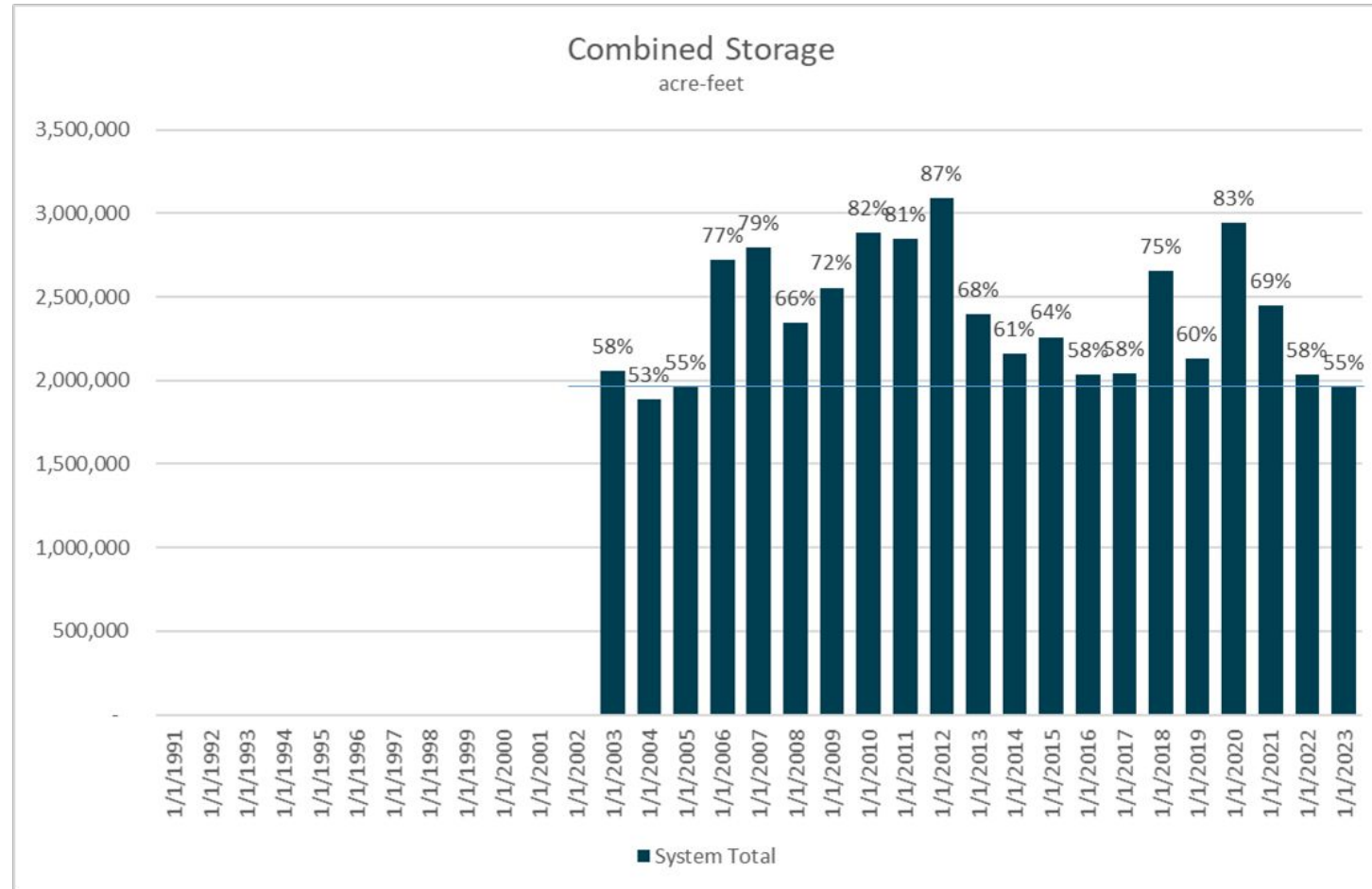
System Storage

1/1/2023



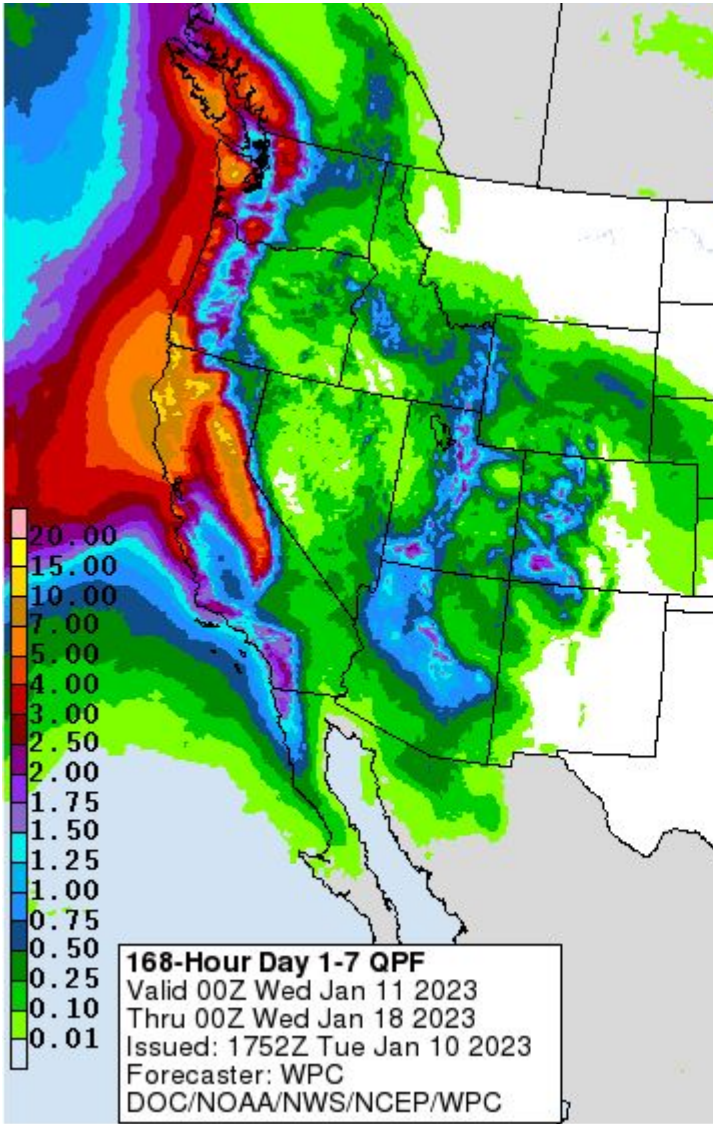
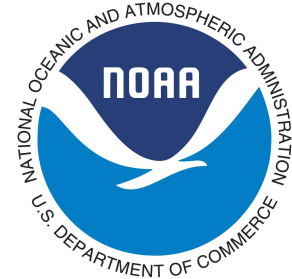
Recent History

- January 1st storage data is available for all reservoirs back to 2003
- The total storage for all reservoirs (live capacity, exc. Fontenelle, Flaming Gorge, and Lake Powell) **has not been this low since 2004 and 2005! Not even 2012-2016 got this low.**
- Provo basin storage (Jordanelle, Deer Creek, & Utah Lake) has only been lower in 2017.



Agency - BOR
Presenter - Gary Henrie

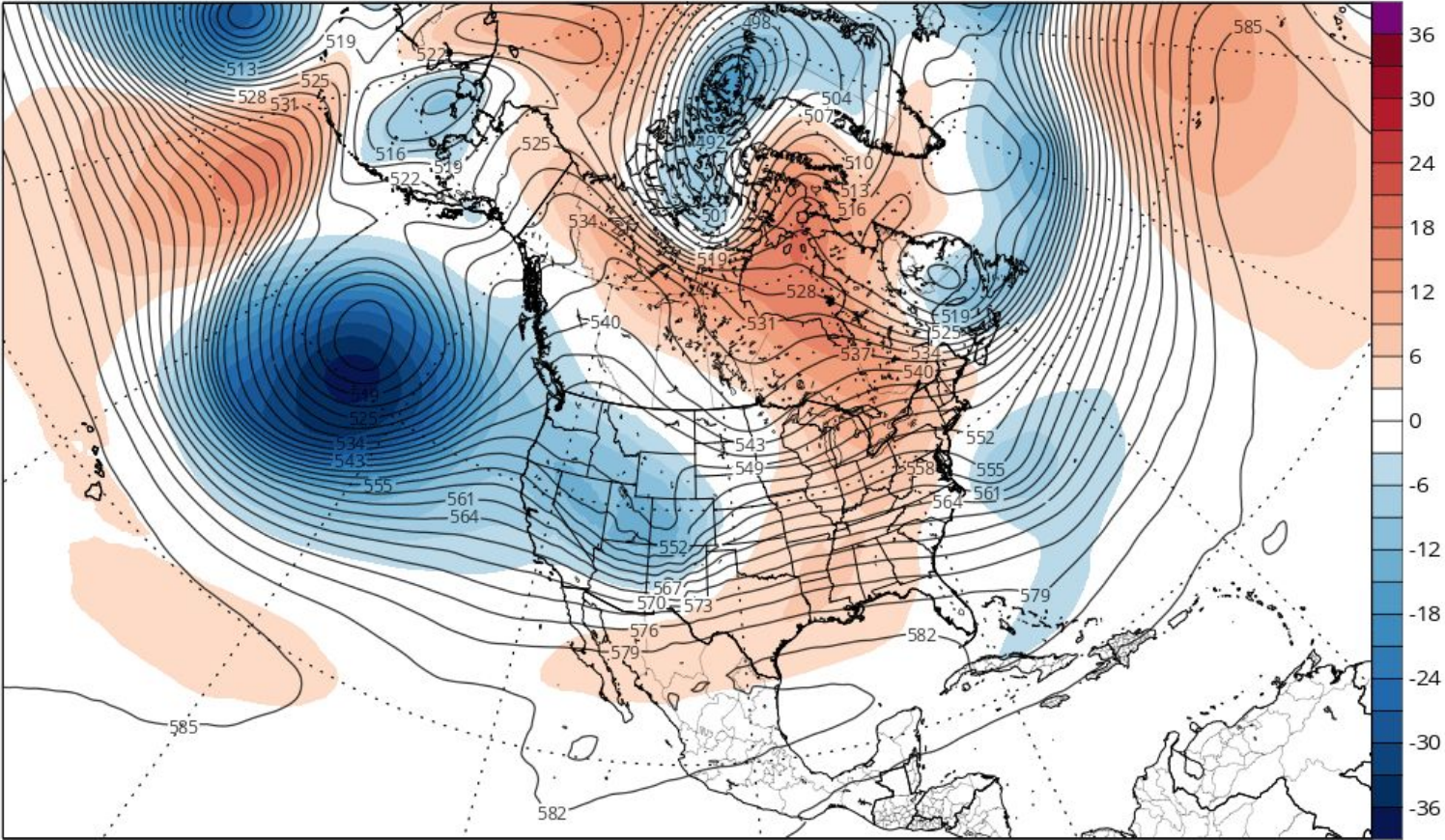
Weather Forecast Office Utah Day 1-7 Outlook



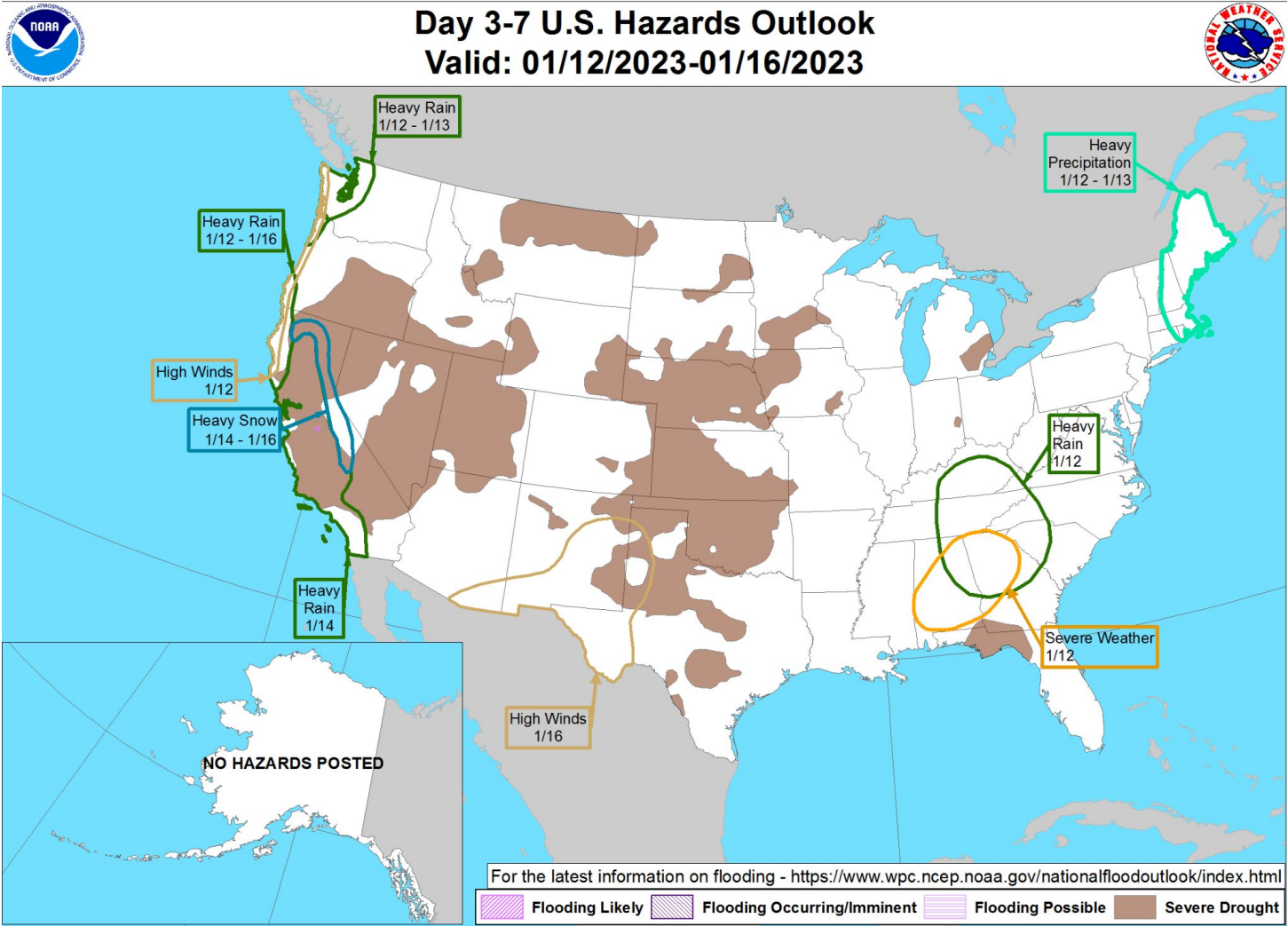
GEFS 500mb Geopotential Height & Anomaly (dam) (based on CFSR 1981-2010 Climatology)

Init: 12z Jan 10 2023 Forecast Hour: [24] valid at 12z Wed, Jan 11 2023

TROPICALTIDBITS.COM



Weather Prediction Center U.S. Day 3-7 Hazards Outlook



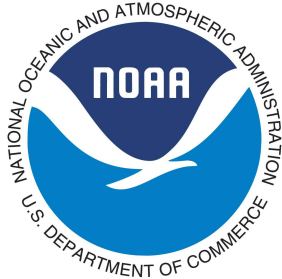
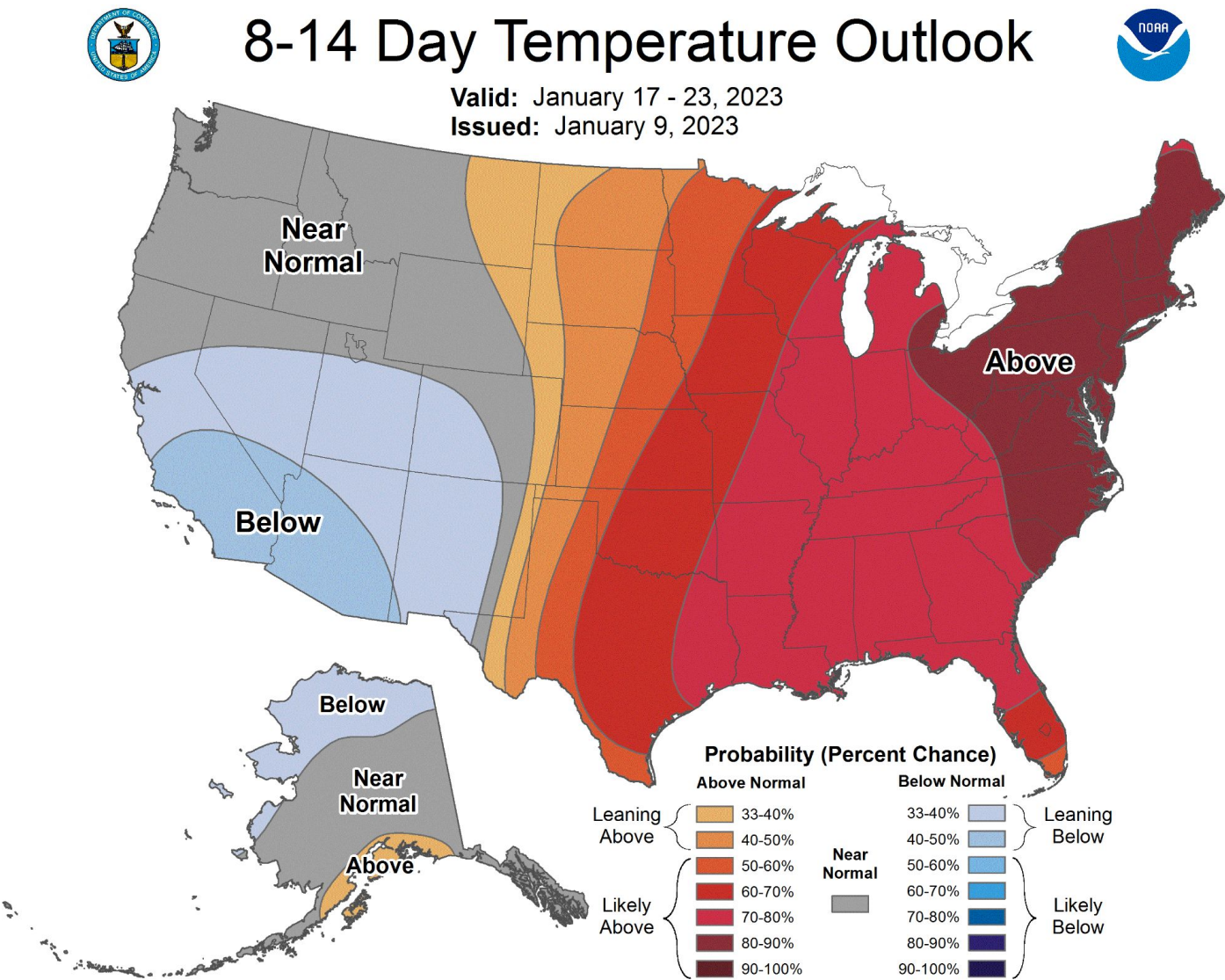
Weather Prediction Center

Made: 01/09/2023 3PM EST

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Climate Prediction Center 8 to 14 Day Outlooks - Temperature



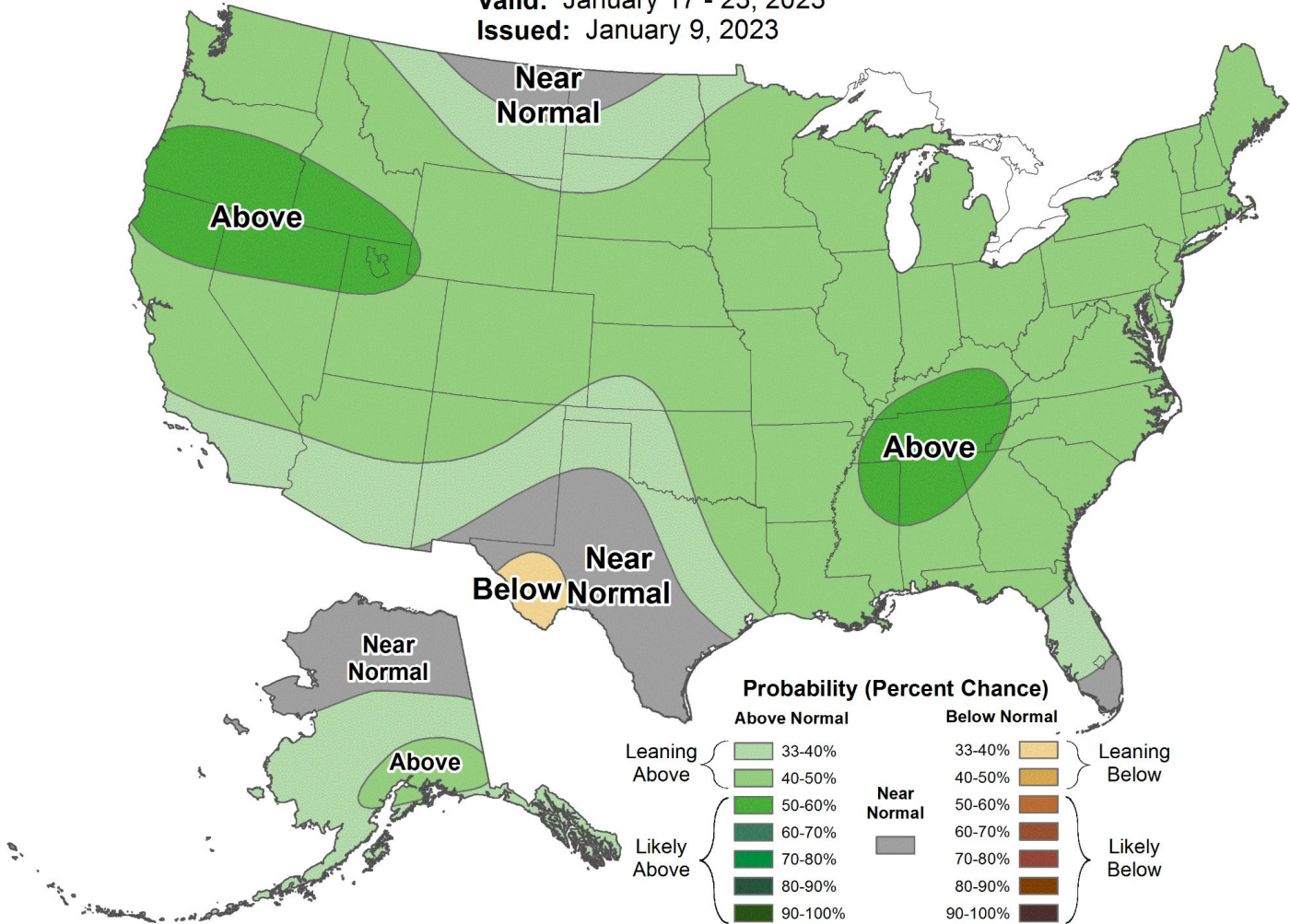
Climate Prediction Center 8 to 14 Day Outlooks - Precipitation



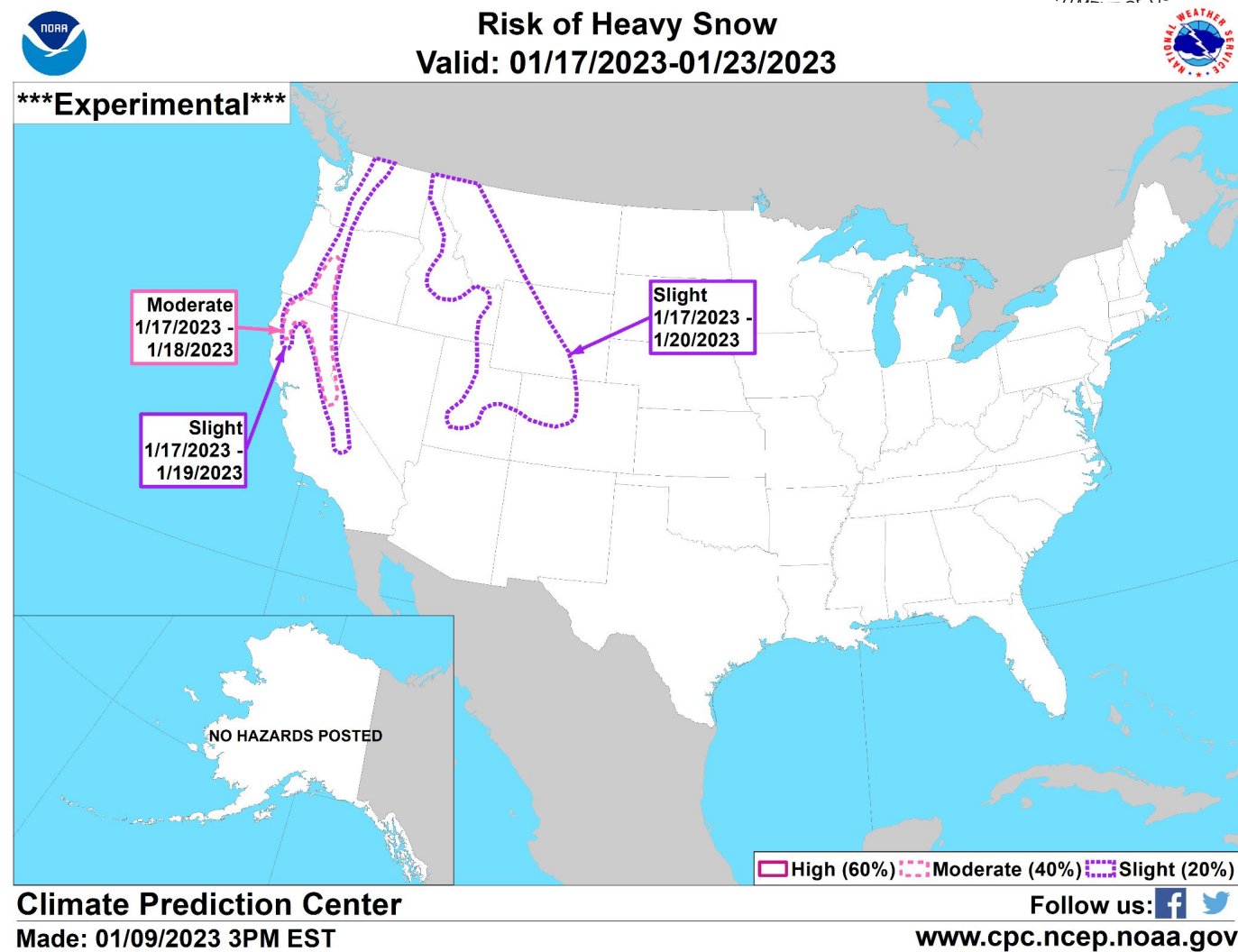
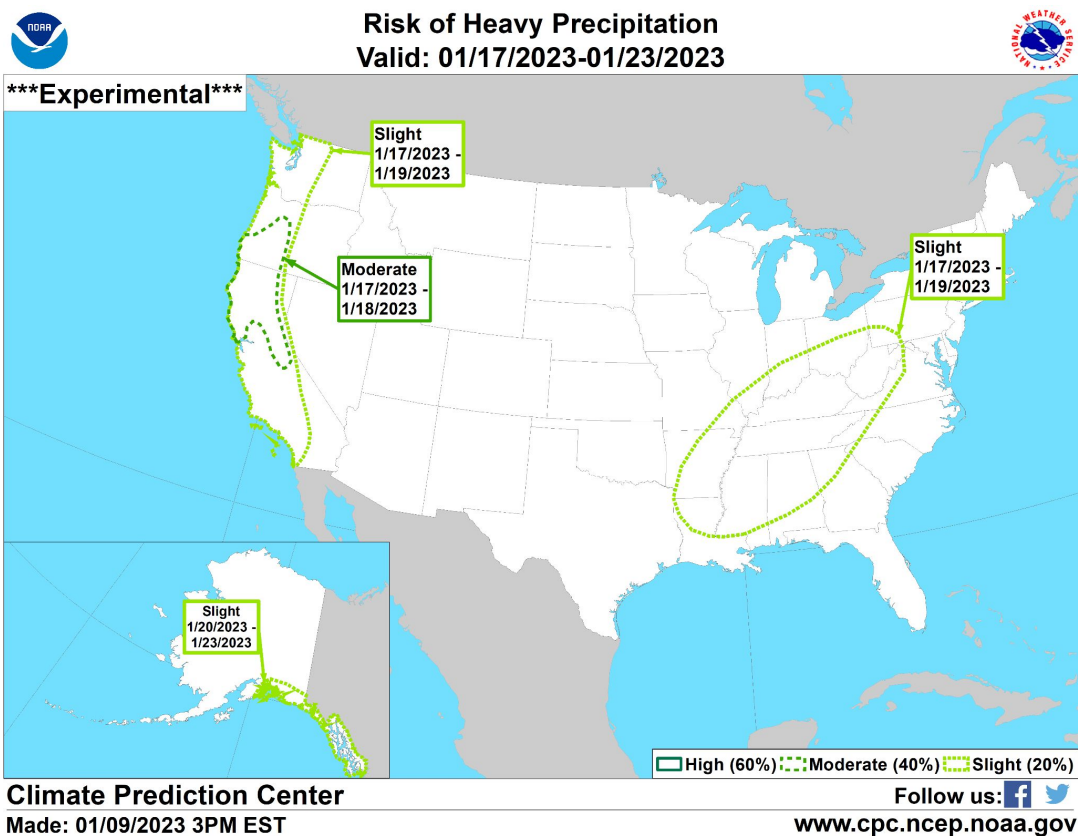
8-14 Day Precipitation Outlook



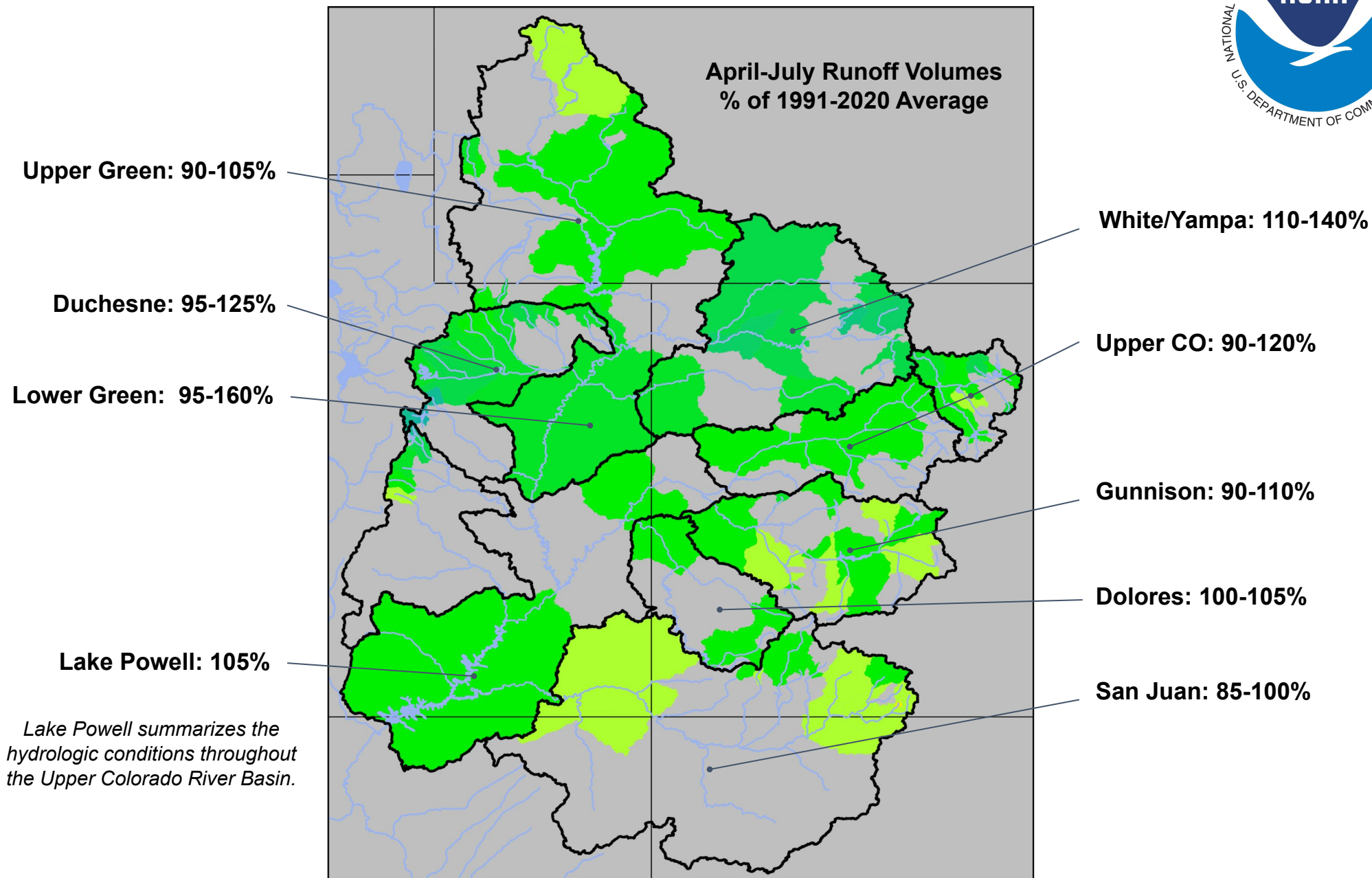
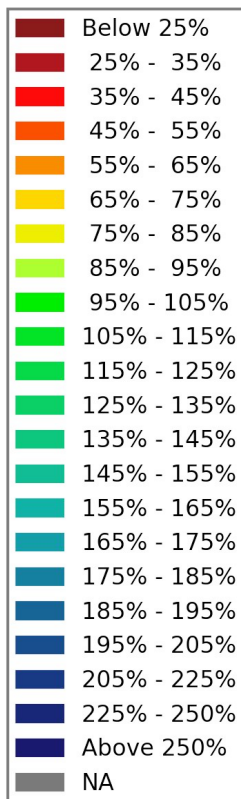
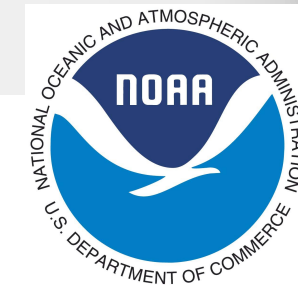
Valid: January 17 - 23, 2023
Issued: January 9, 2023



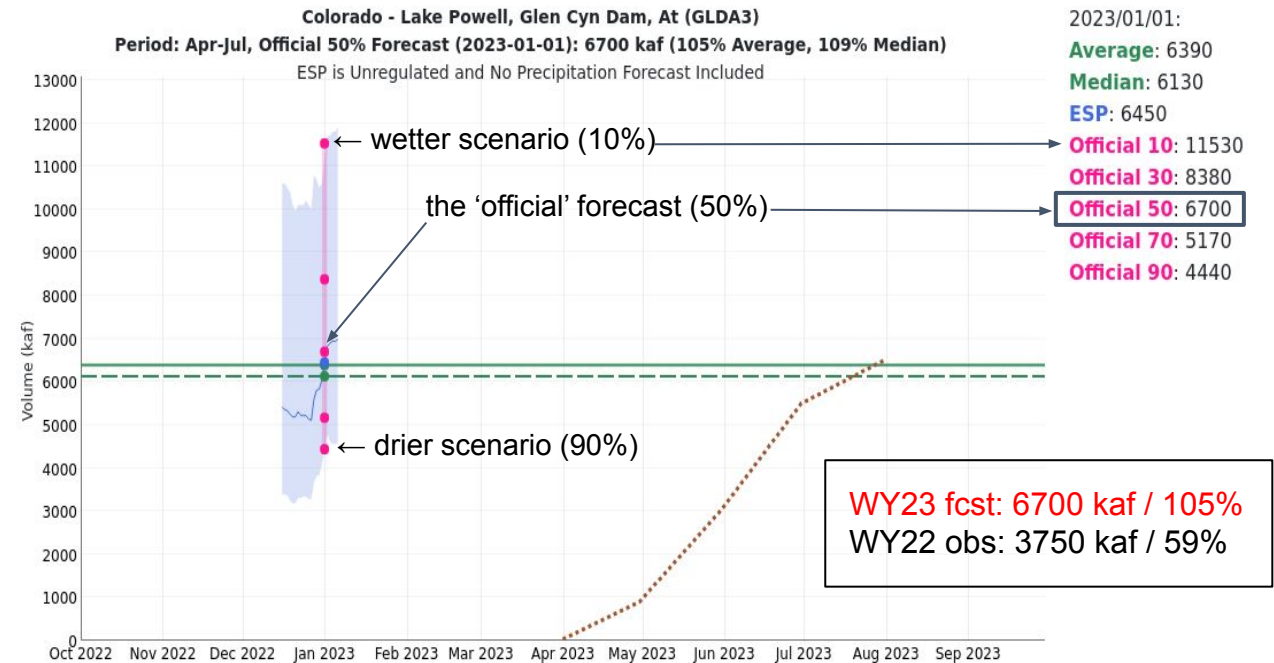
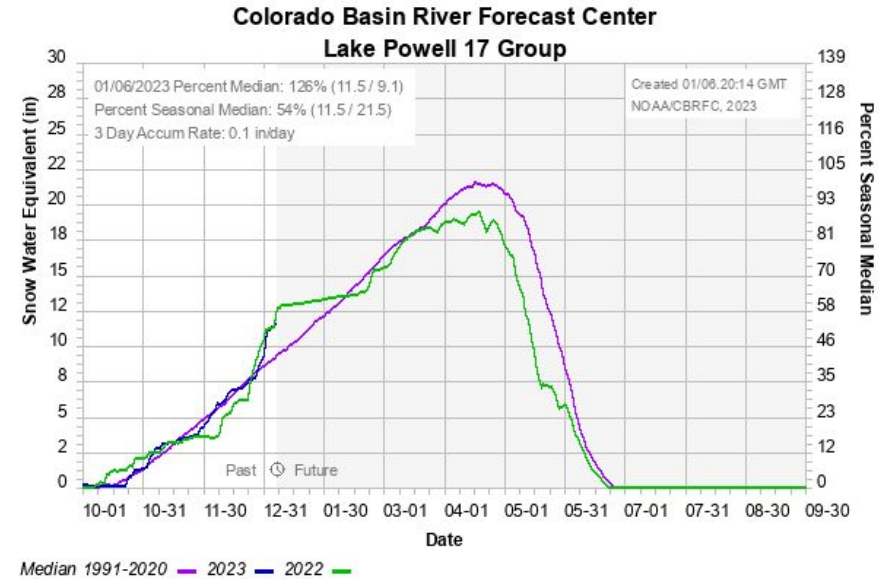
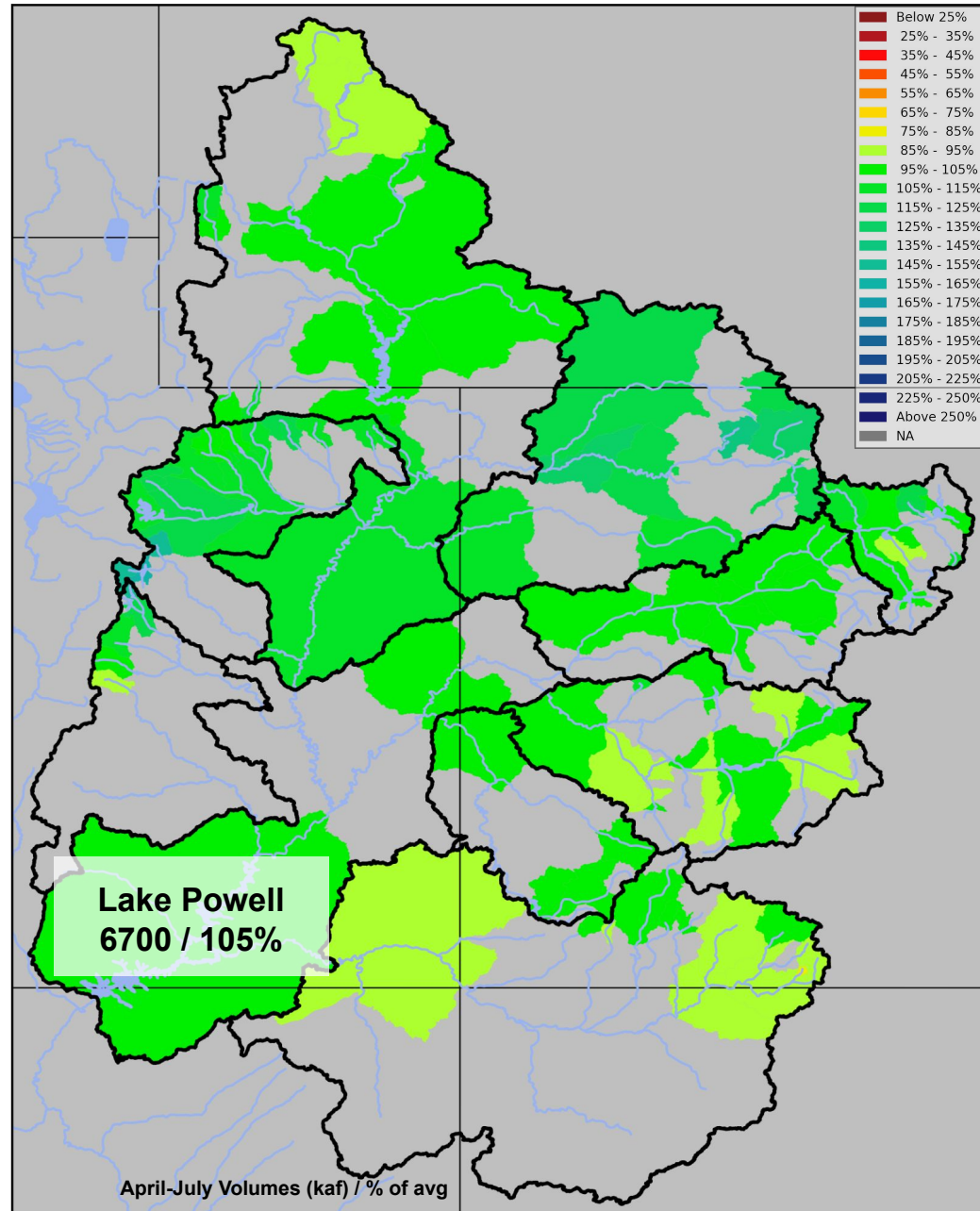
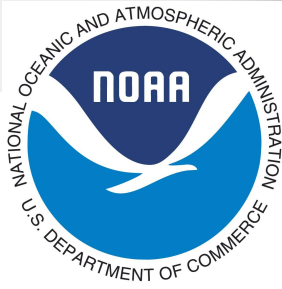
Climate Prediction Center U.S. Week-2 Hazards Outlook



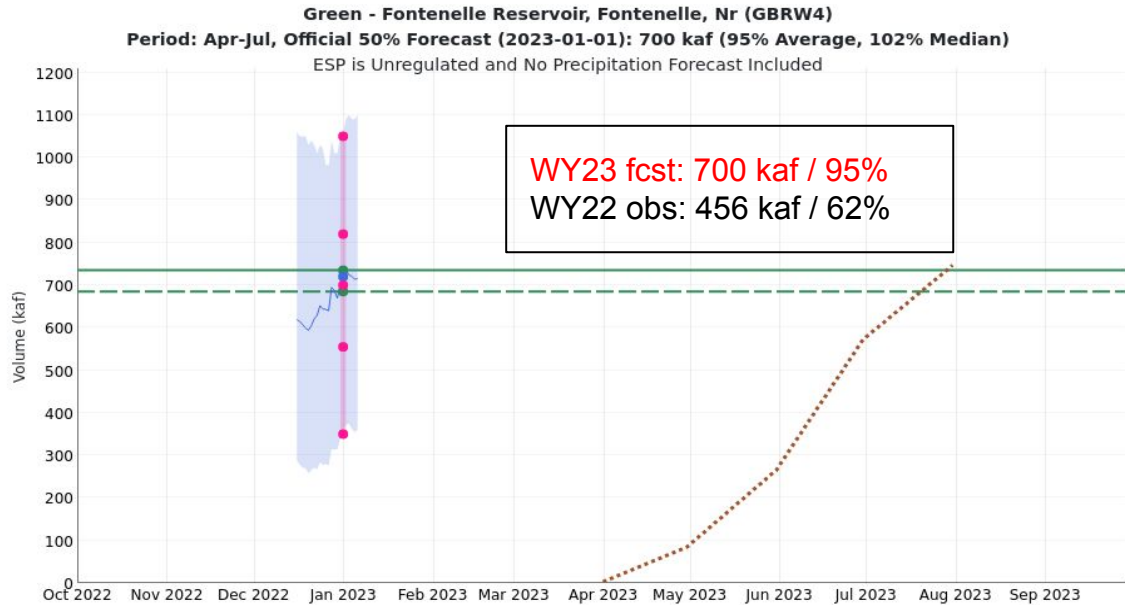
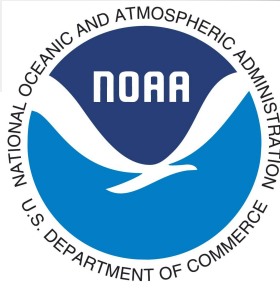
Jan 1st Water Supply Forecasts: Upper Colorado



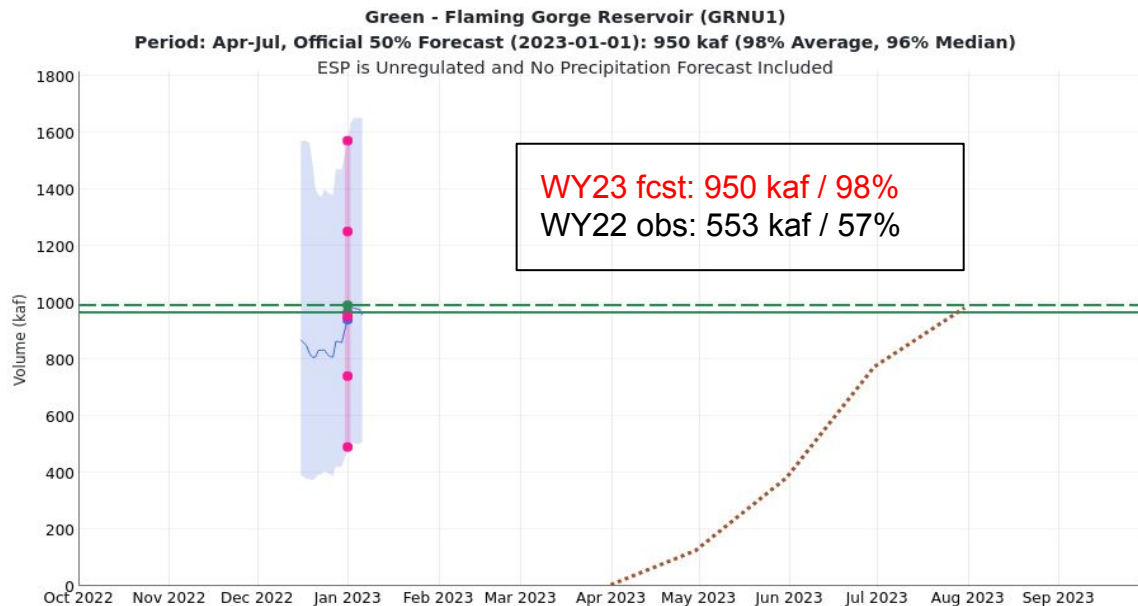
Jan 1st Water Supply Forecasts: Upper Colorado (Lake Powell)



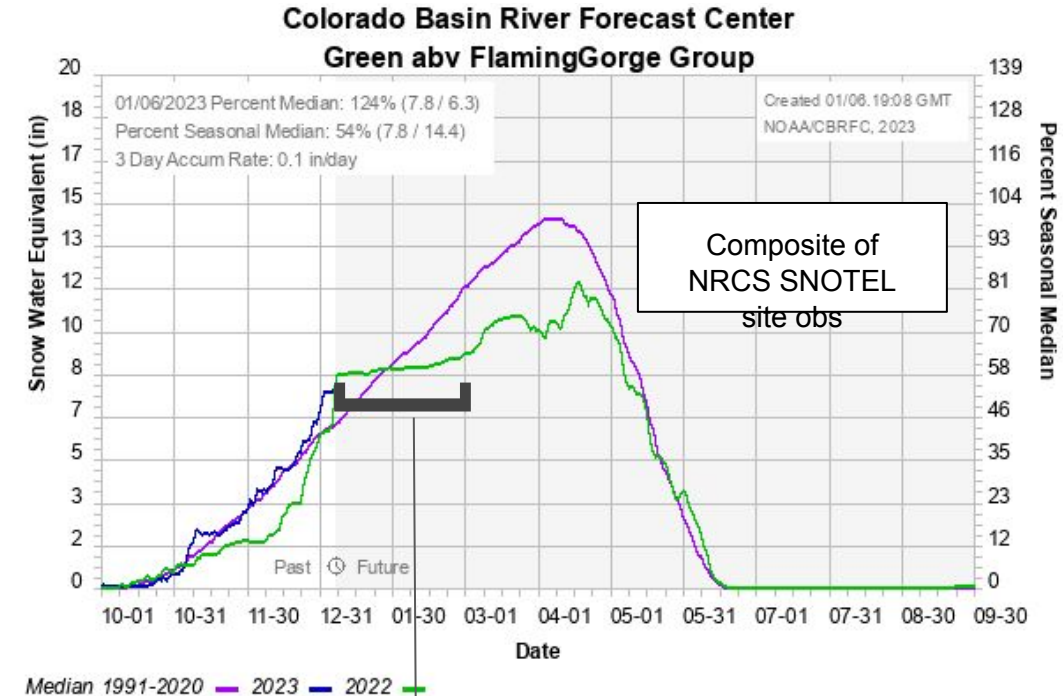
Upper Green Water Supply Forecasts & Snow Conditions



2023/01/01:
Average: 735
Median: 685
ESP: 720
Official 10: 1050
Official 30: 820
Official 50: 700
Official 70: 555
Official 90: 350



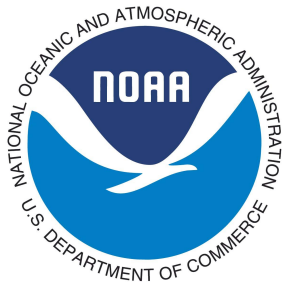
2023/01/01:
Average: 965
Median: 990
ESP: 939
Official 10: 1570
Official 30: 1250
Official 50: 950
Official 70: 740
Official 90: 490



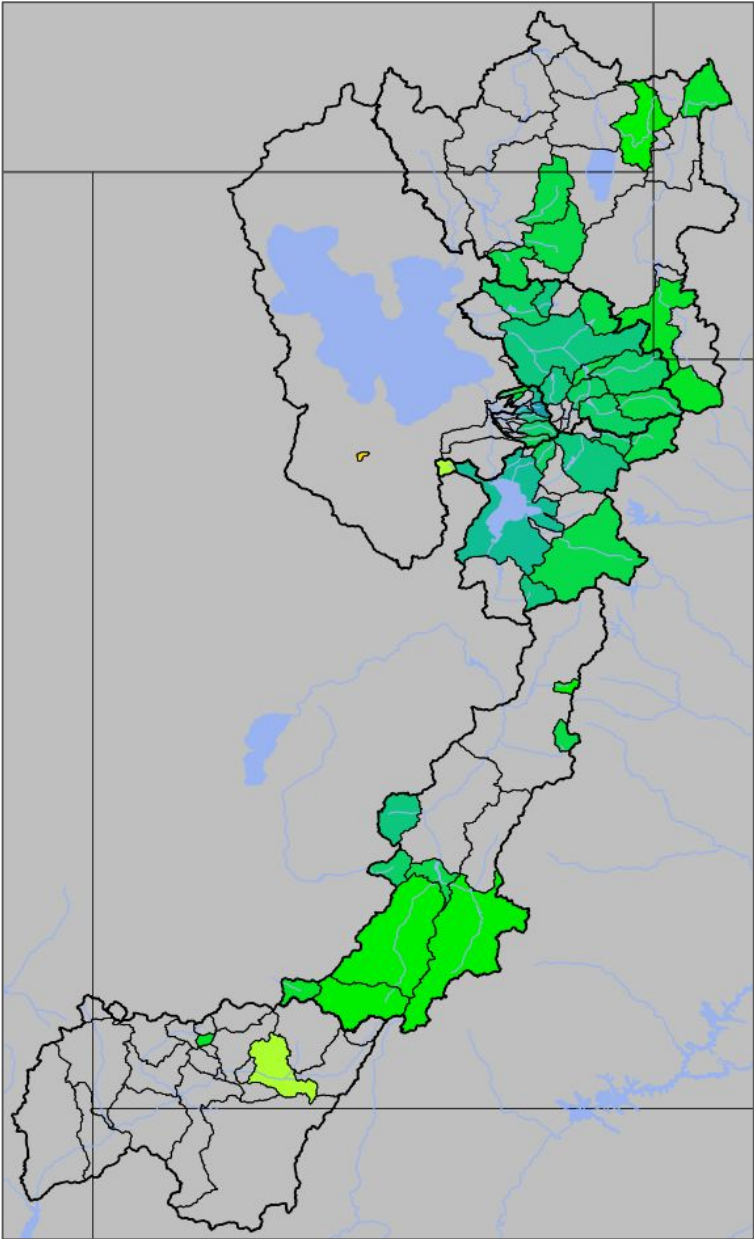
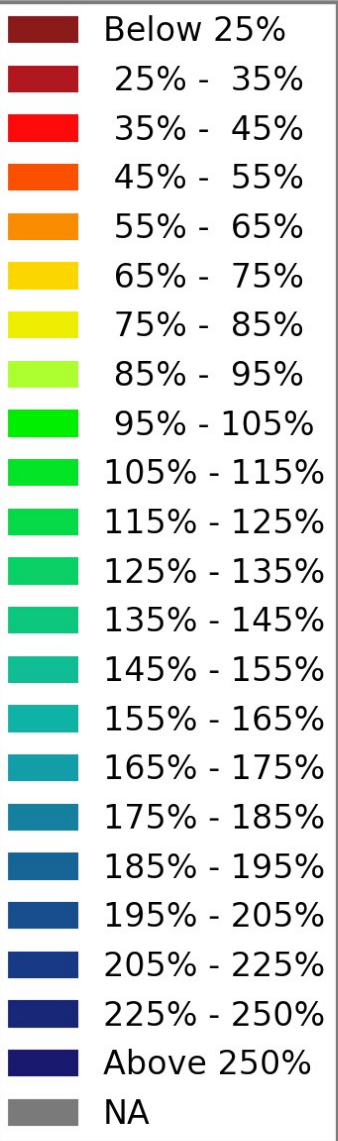
Very dry Jan/Feb 2022 across the region.

Precipitation ranked in the bottom five at most SNOTEL sites across Utah, southwest Wyoming, and western Colorado during Jan/Feb/Mar.

Utah Water Supply Forecasts - Overview



Percent of
Average

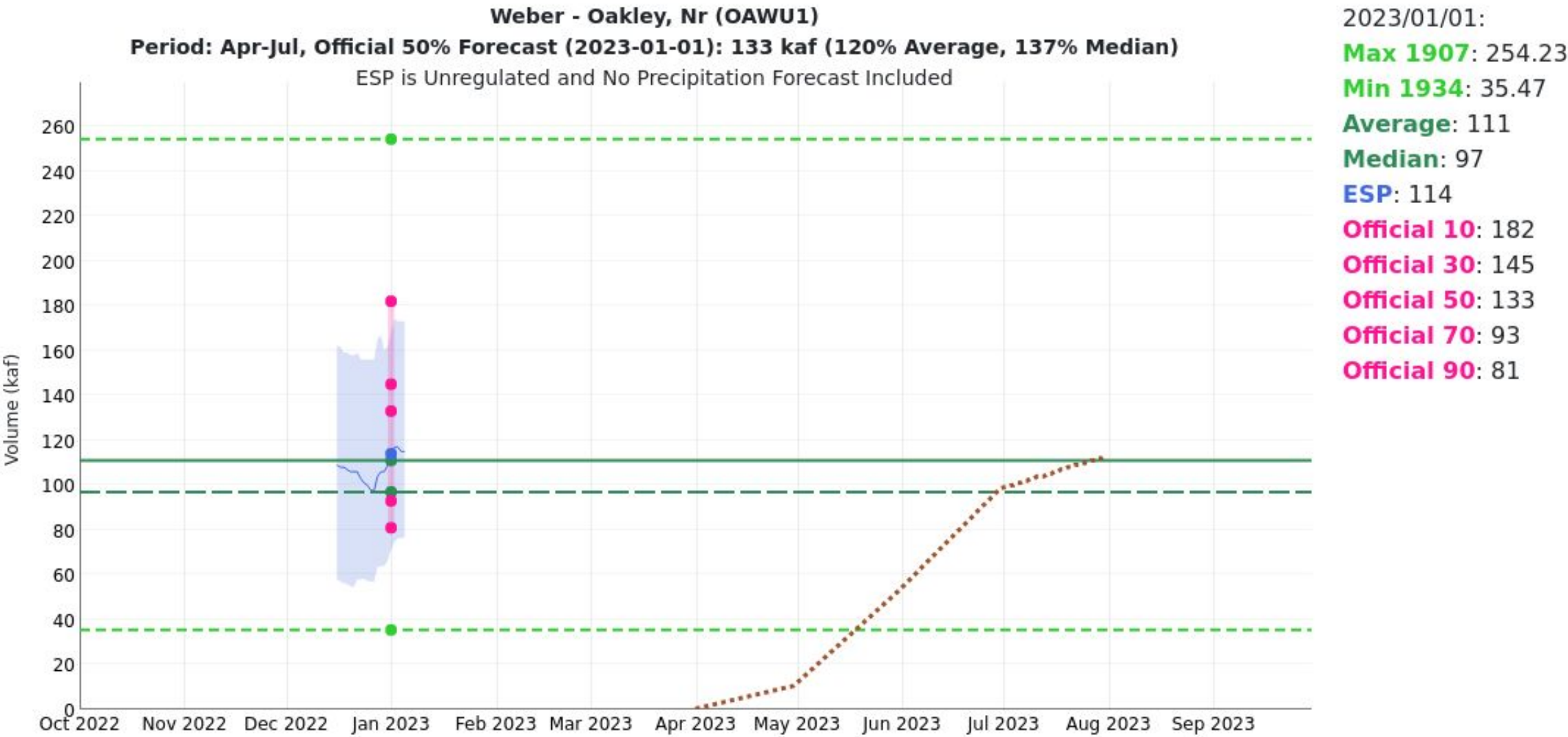
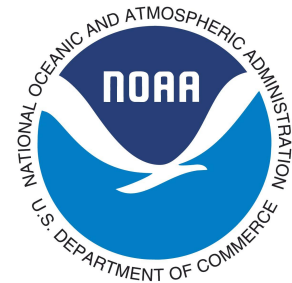


- January 1 forecast for April-July volume
- April-July forecast streamflow volumes are in percent of 1991-2020 average.

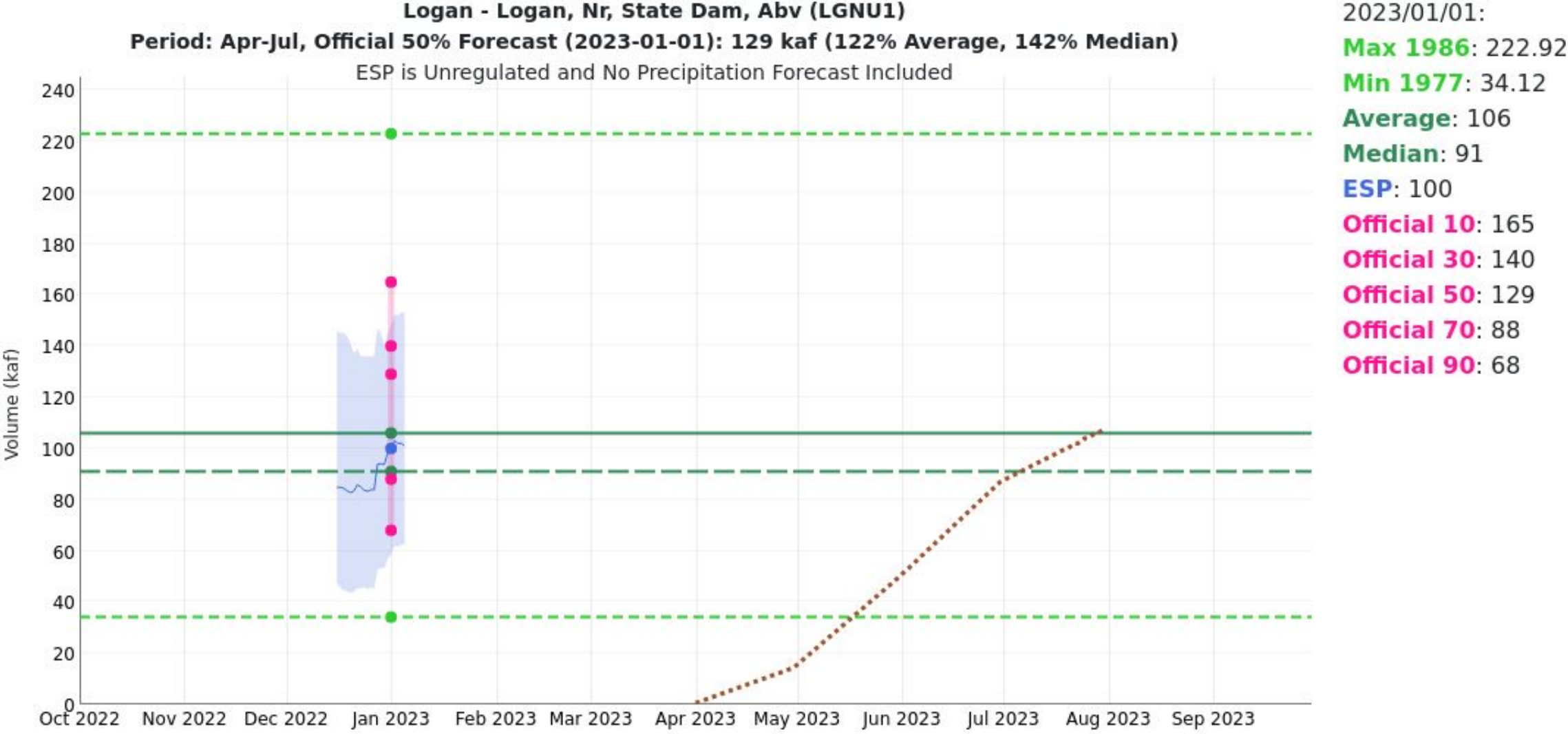
Median forecasts by forecast group.

Weber	130%
Bear	110%
Six Creeks	135%
Provo / Utah Lake	125%
Sevier	110%
Duchesne	110%
Virgin	100%

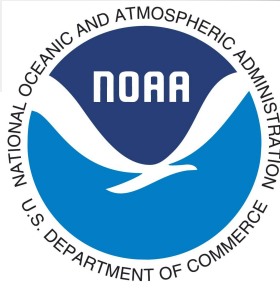
Utah Water Supply Forecasts - Weber



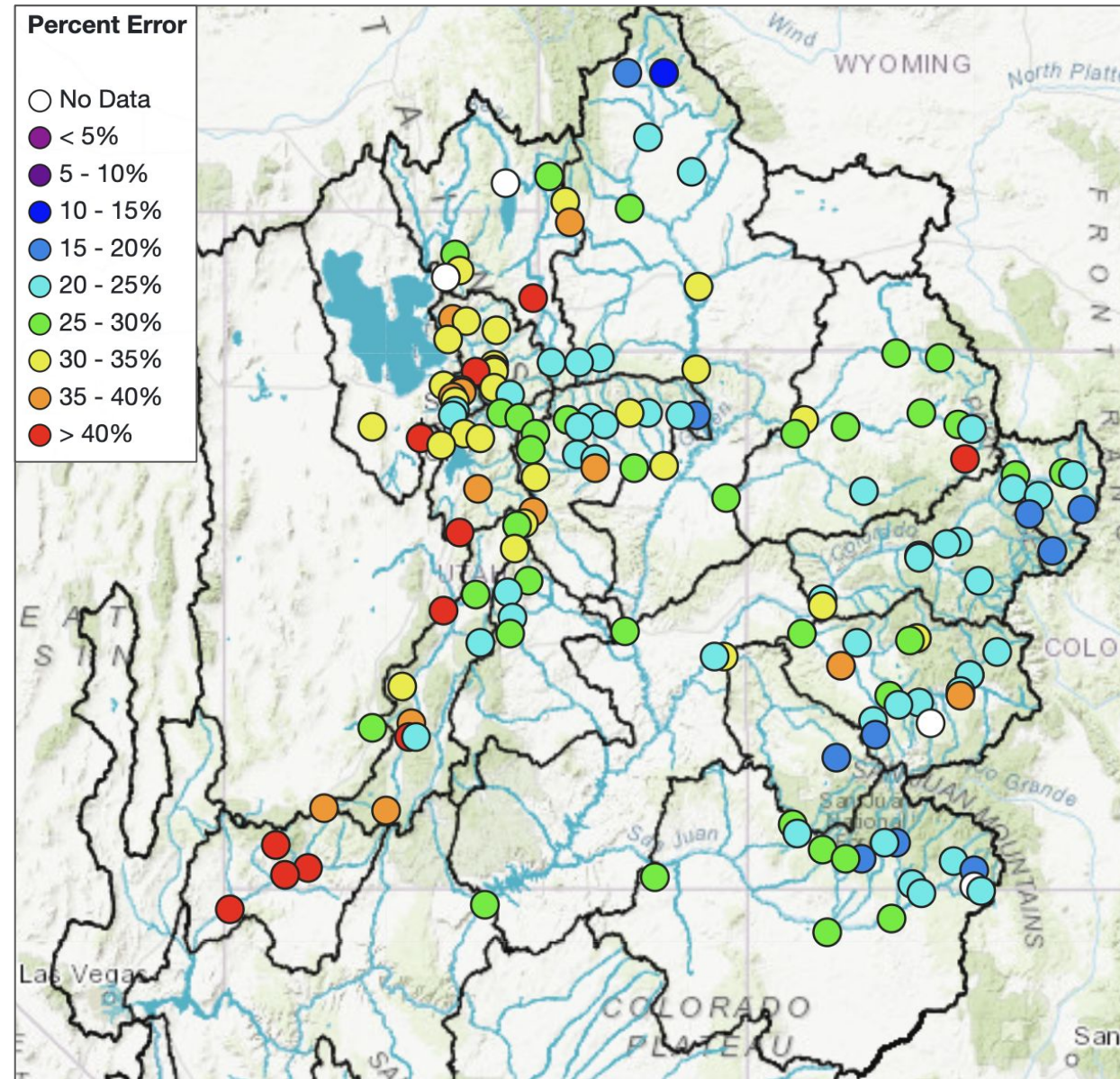
Utah Water Supply Forecasts - Bear



Historical Forecast Verification



January Forecast Error: April-July Volume



Location

Error

Avg January Forecast

Green River - Warren Bridge	19%
Fontenelle Reservoir	28%
Yampa River - Deerlodge	28%
Blue River - Dillon Reservoir	19%
Colorado River - Cameo	21%
Blue Mesa Reservoir (Gunnison)	23%
McPhee Reservoir (Dolores)	25%
Navajo Reservoir (San Juan)	25%
Lake Powell	27%
Virgin River at Virgin	44%

Error tends to decrease each month into the spring

Where Forecasts are Better:

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

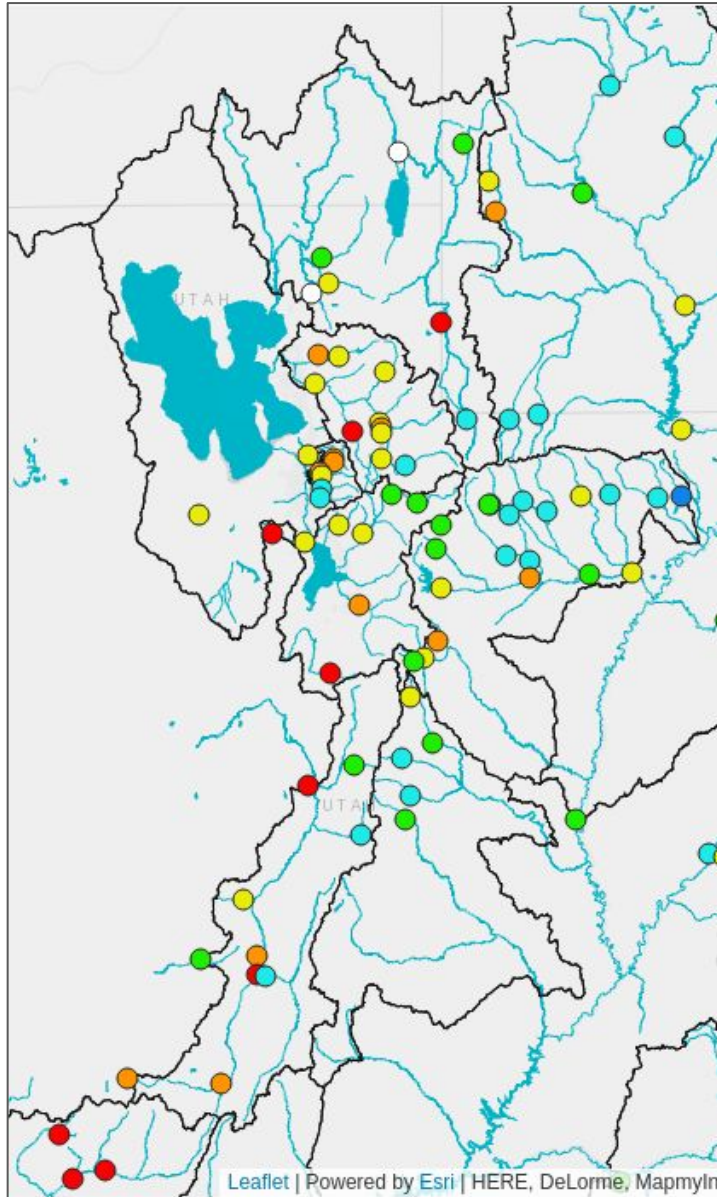
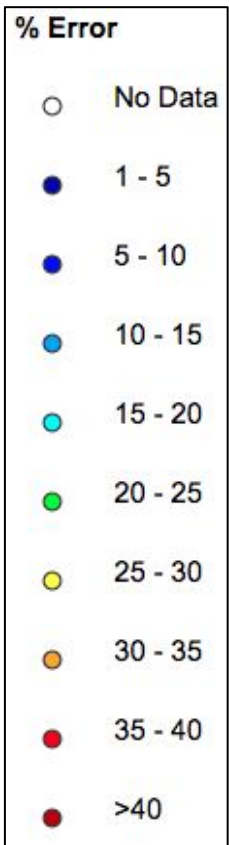
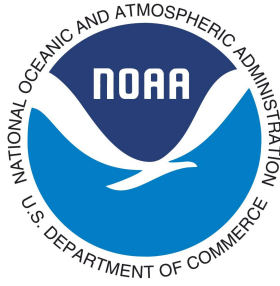
Where Forecasts are Worse:

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

Future weather is the primary source of early season water supply forecast error/uncertainty.

Historical Forecast Verification

January Forecast Error: April-July Volume



Location

Jan 1 Forecast Error

BEAR - UTAH-WYOMING STATE	21%
BEAR - WOODRUFF NARROWS	40%
LOGAN - LOGAN- NR	27%
WEBER - OAKLEY- NR	23%
WEBER - ROCKPORT RES	30%
BIG COTTONWOOD CK	21%
PROVO - WOODLAND- NR	25%
PROVO - DEER CK RES	33%
VIRGIN - VIRGIN	44%

Error tends to decrease each month into the spring

Where Forecasts are Better:

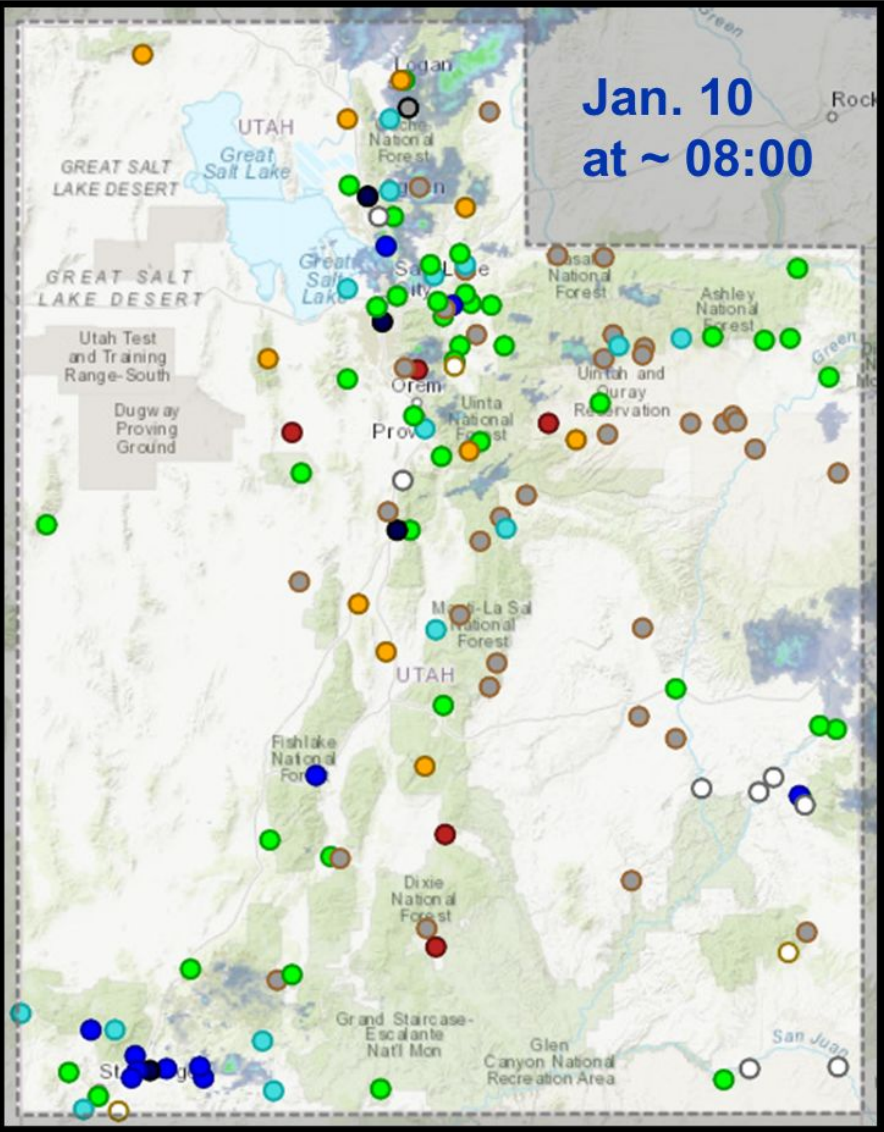
- Headwaters
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- Lower elevations (rain or early melt)
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
Future weather is the primary source of early season water supply forecast error/uncertainty.

Current Streamflow Conditions



National Water Dashboard

*Sites must have at least 10 years of streamflow record to be ranked on this graphic

Day-of-Year Status	# Gages	% Gages
All-time high for this day-of-year	5	3.6% 
Much above normal for this day-of-year	11	8.0% 
Above normal for this day-of-year	16	11.7% 
Normal for this day-of-year	42	30.7% 
Below normal for this day-of-year	10	7.3% 
Much below normal for this day-of-year	5	3.6% 
All-time low for this day-of-year	0	0.0%
Not ranked - insufficient record	11	8.0% 
Not ranked - no measurement	32	23.4% 
Not ranked - stream not flowing	3	2.2% 
Not ranked - no recent measurement	2	1.5% 

Streamflow: Status

Above flood stage

All-time high for this day

Much above normal

Above normal

Normal

Below normal

Much below normal

All-time low for this day

Not flowing

Not ranked

Measurement flag

Recent measurement unavailable

100th percentile (maximum)

>90th percentile

76th – 90th percentile

25th – 75th percentile

10th – 24th percentile

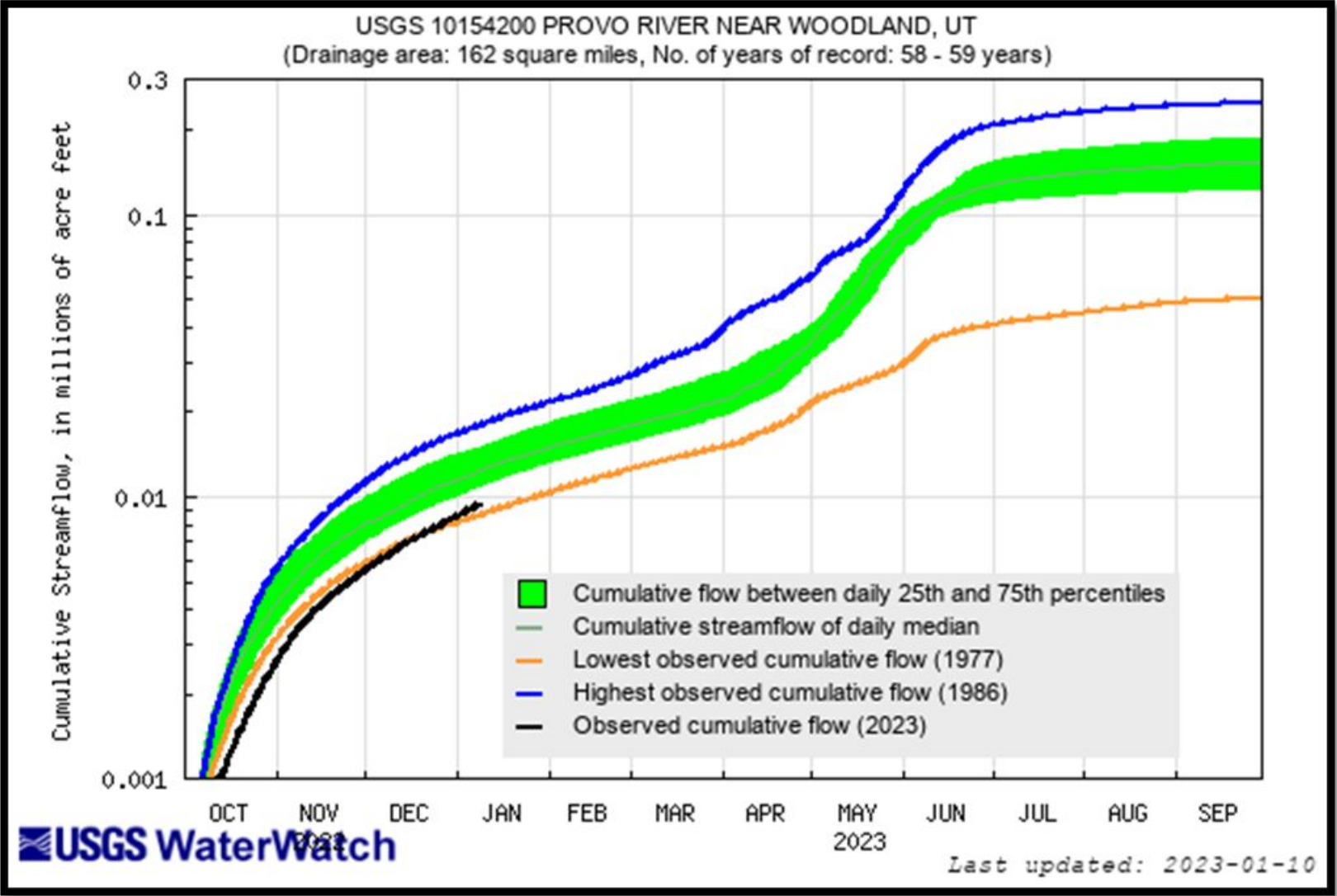
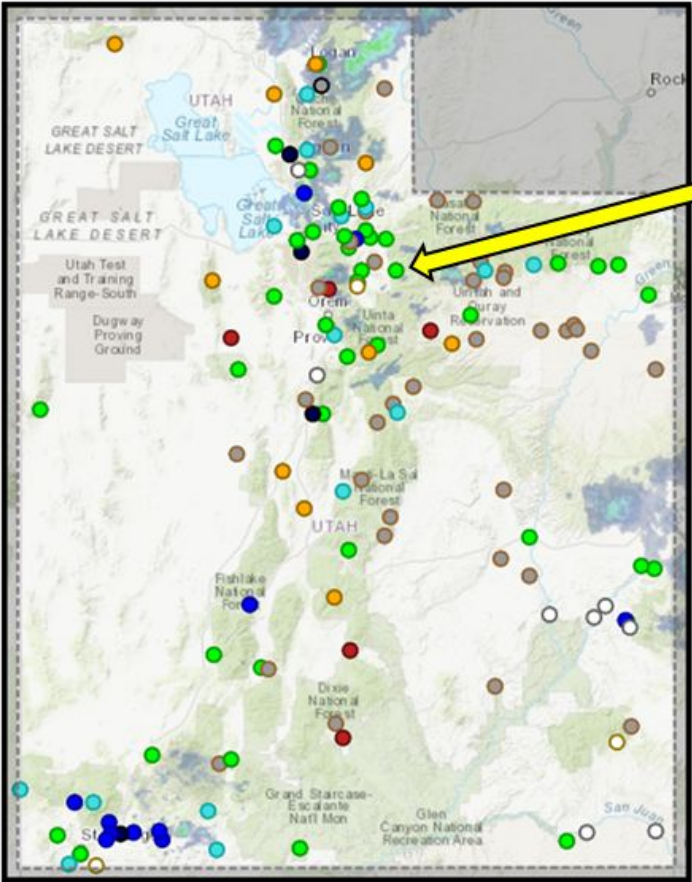
<10th percentile

0th percentile (minimum)

Provisional data, subject to revision

Agency - USGS Utah WSC
Presenter - Ryan Rowland

Streamflow at Selected Gages

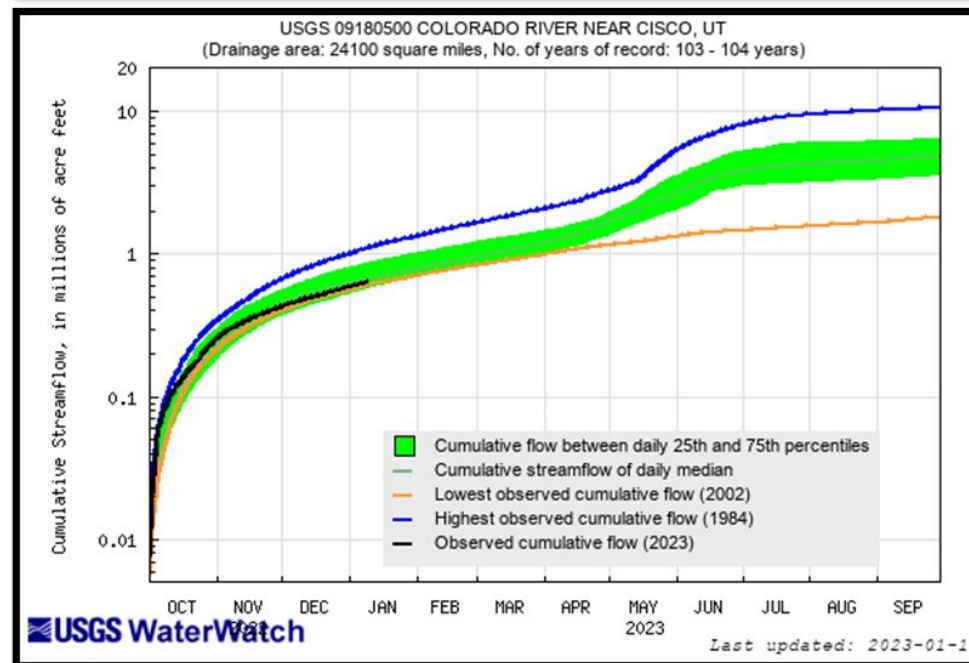
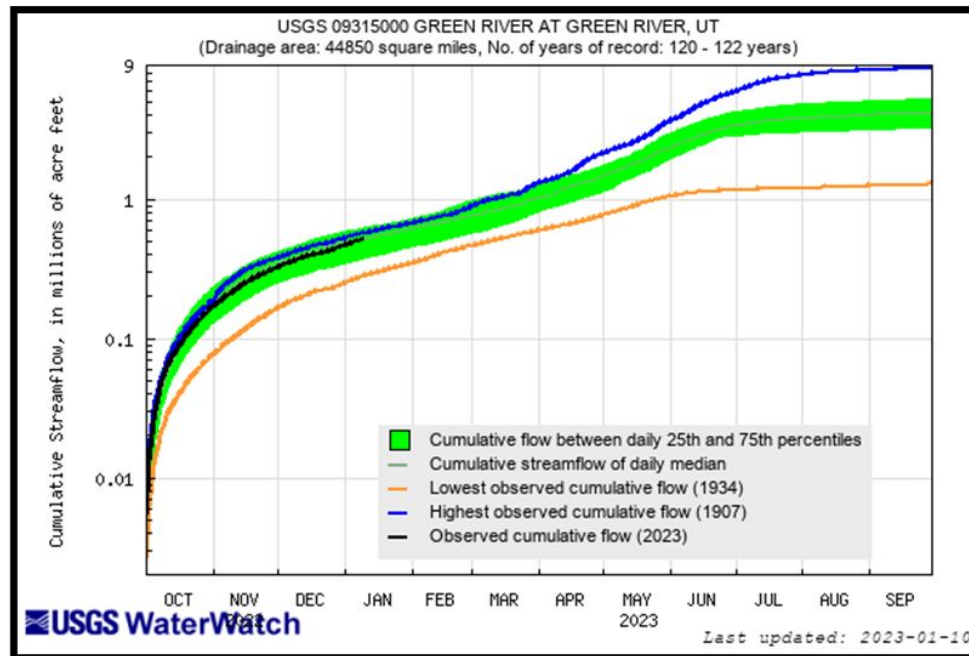
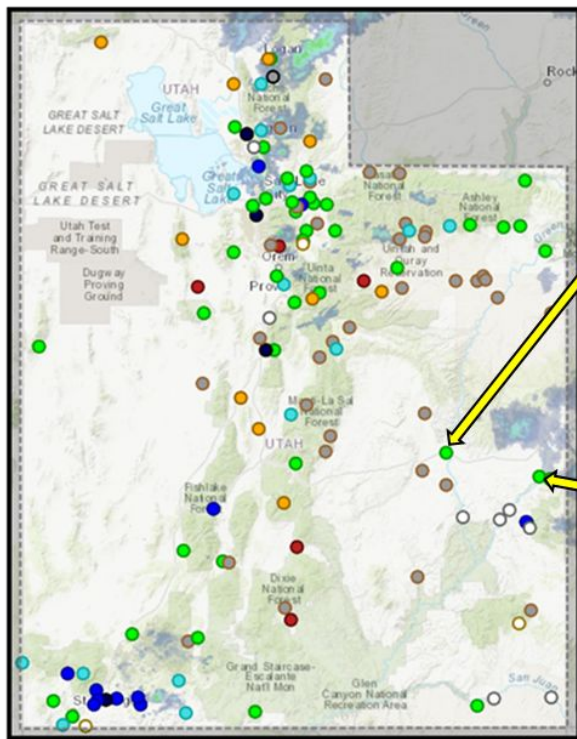


Provisional data,
subject to revision

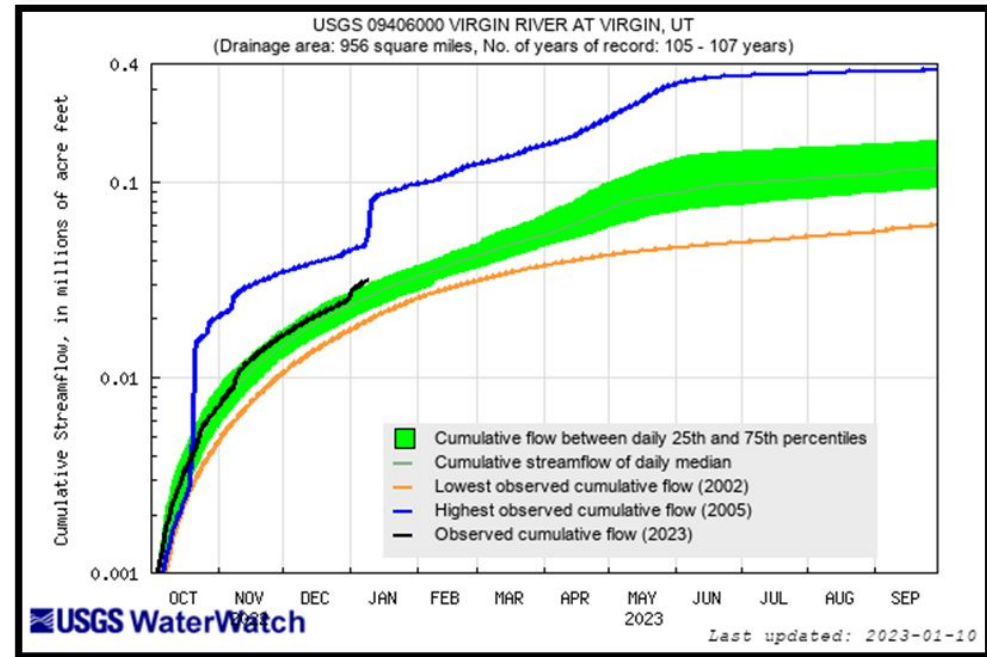
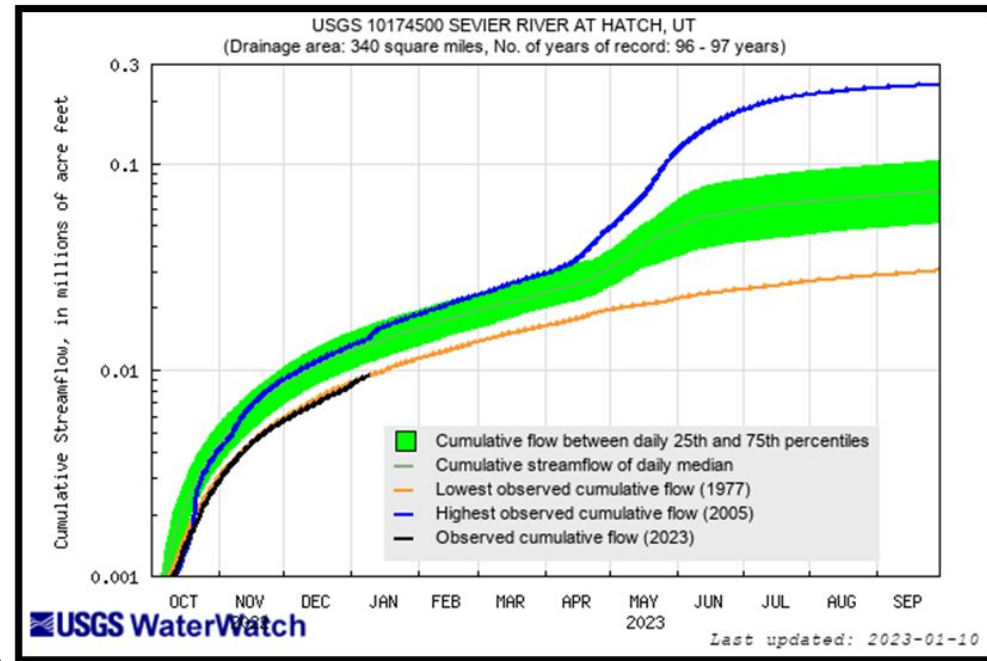
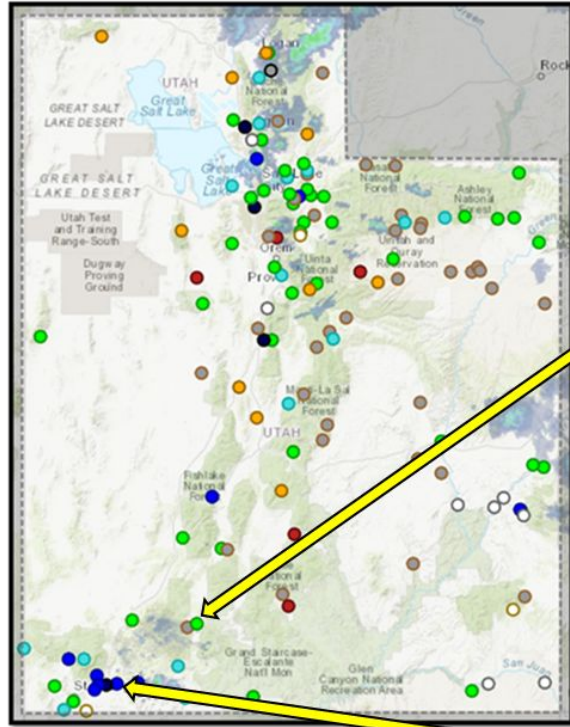
Agency - USGS Utah WSC
Presenter - Ryan Rowland



Streamflow at Selected Gages



Streamflow at Selected Gages

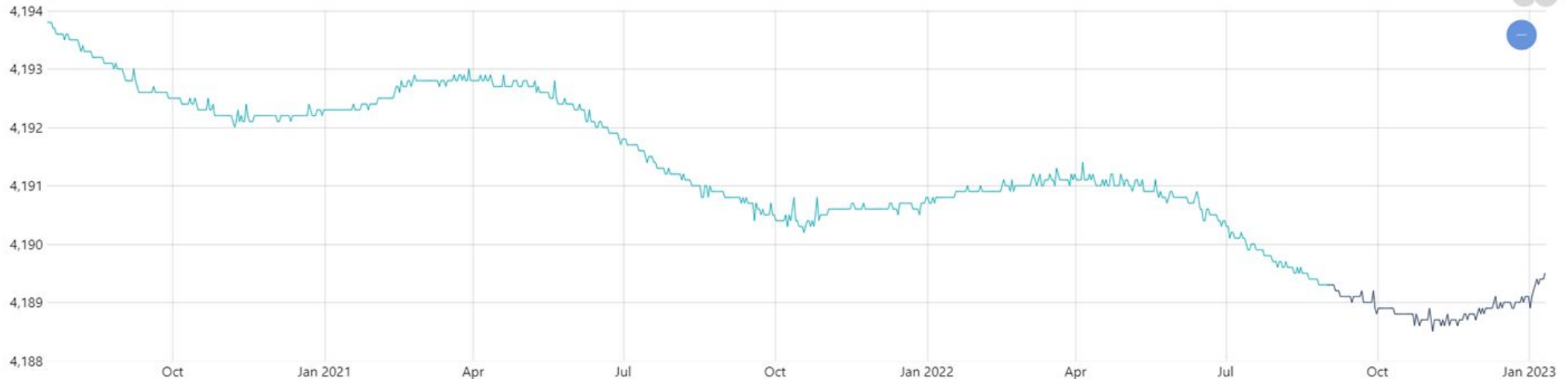


Provisional data, subject to revision

Great Salt Lake Water Surface Elevation - South Arm

Great Salt Lake Hydro Mapper

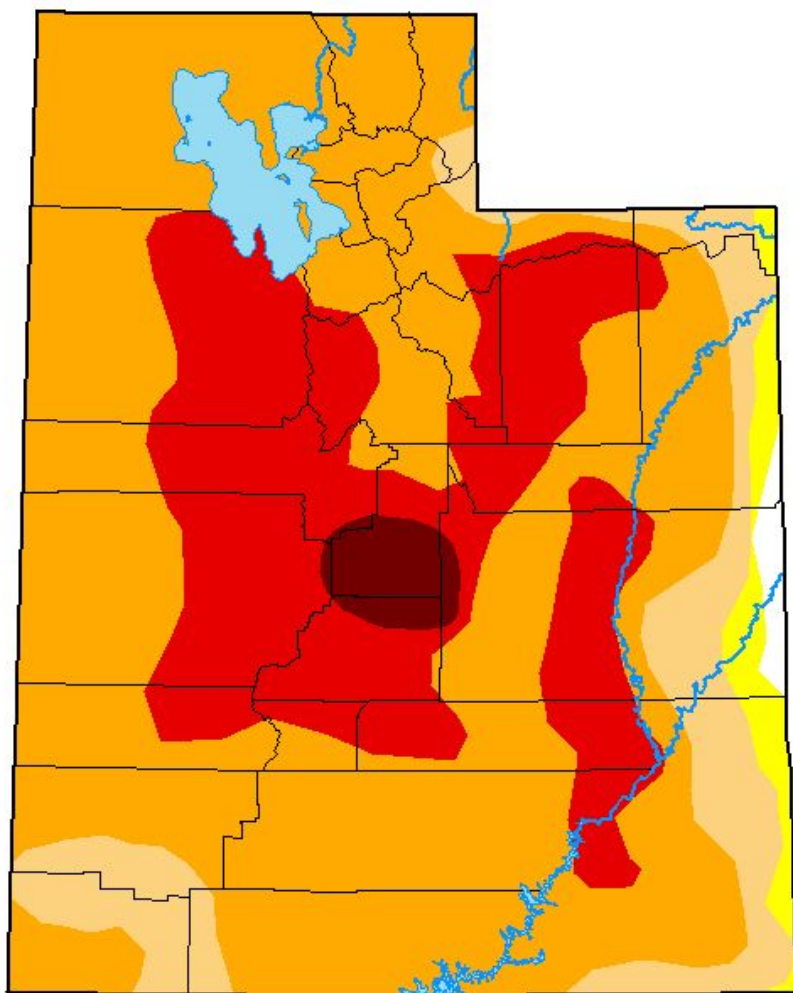
USGS Gaging Station 10010000 and USGS Gaging Station 10010024



- ❑ Mean daily value 1/10/2023 = 4,189.4'
- ❑ Mean daily value 11/3/2022 = 4,188.5'
(potential new historic low for south arm)

Provisional data, subject to revision

U.S. Drought Monitor Utah



January 3, 2023
(Released Thursday, Jan. 5, 2023)
Valid 7 a.m. EST

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Brad Pugh
CPC/NOAA



droughtmonitor.unl.edu

