

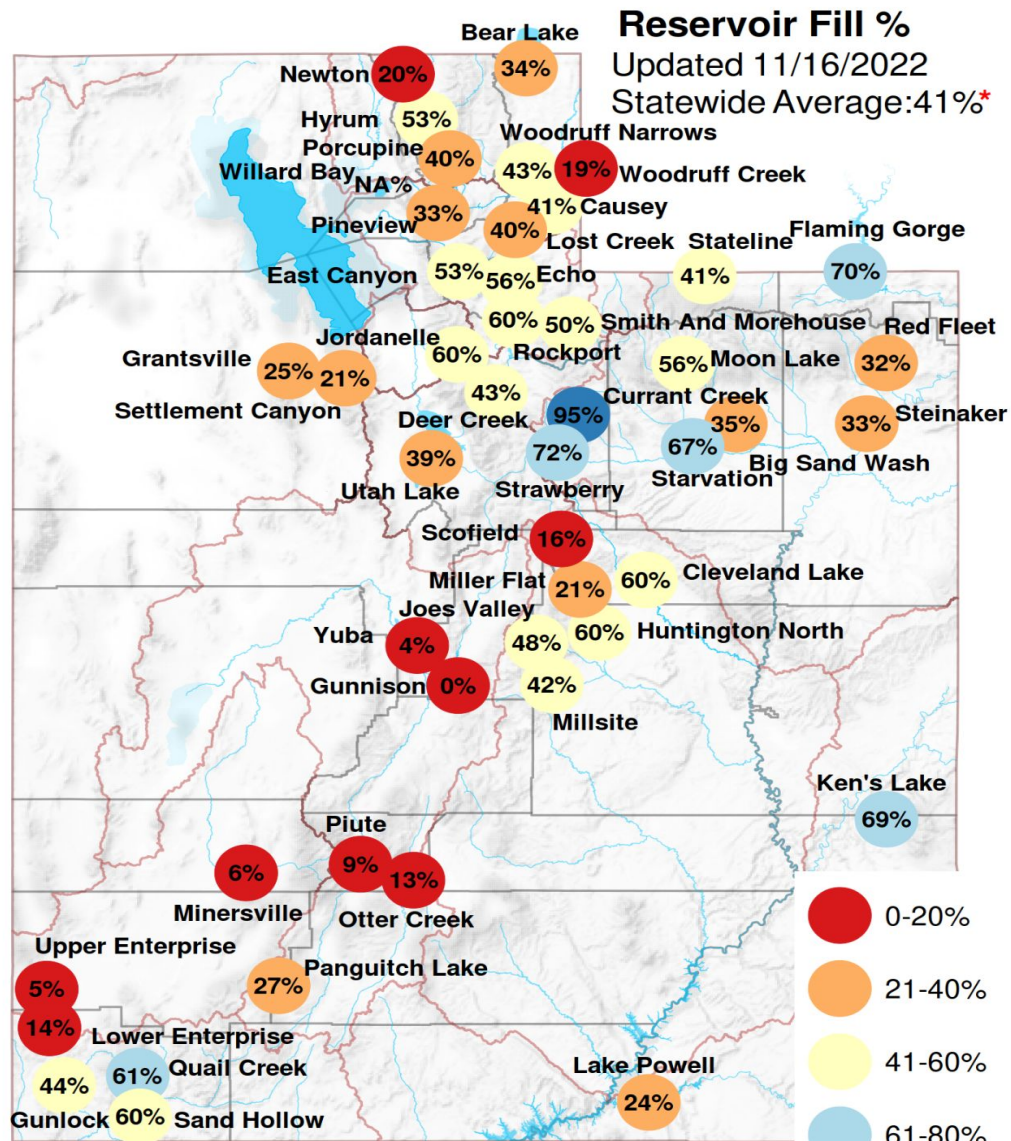
Natural Resources, Agriculture, and Environment Interim Committee
November 16, 2022

Regional Water Conditions

Joel Ferry | DNR Executive Director



Reservoir Levels



Data Sources: water.utah.gov/reservoirlevels

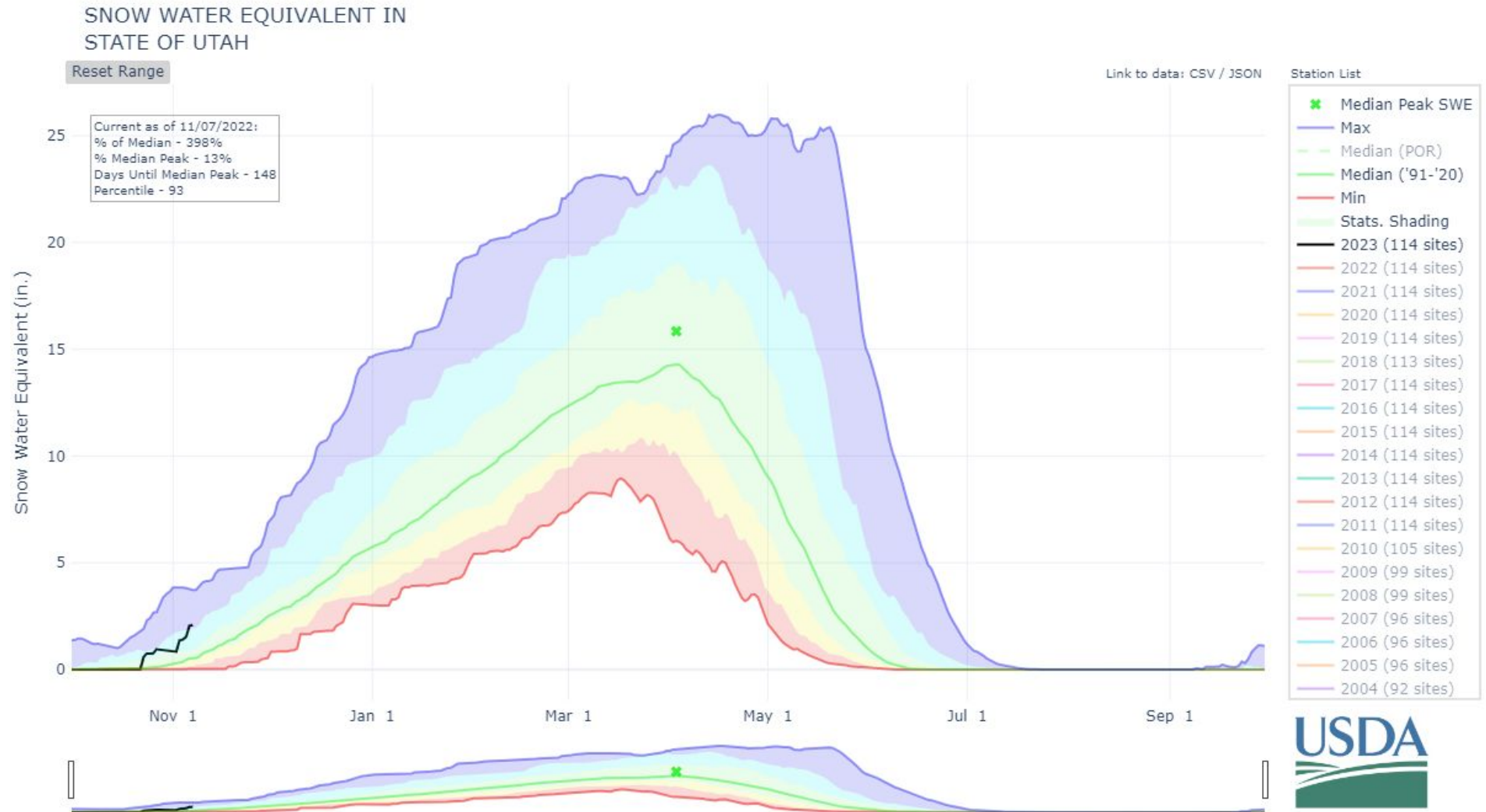
*State average excludes Lake Powell & Flaming Gorge to better represent the state's water supply.

Total capacity including these is 35%



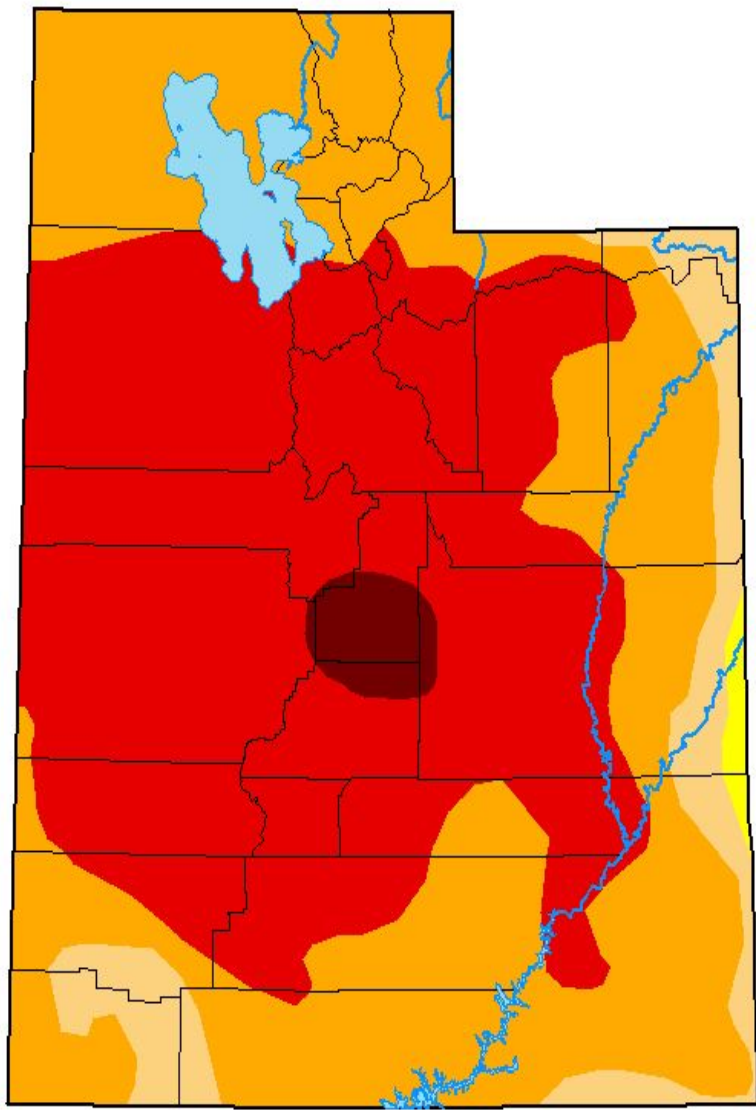
Snowpack

- Great start
- Long way to go
- One excellent year still won't pull us out of drought



Utah

Drought Monitor



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	99.38	92.28	51.72	1.91
Last Week <i>11-01-2022</i>	0.00	100.00	99.38	93.86	51.72	1.91
3 Months Ago <i>08-09-2022</i>	0.00	100.00	100.00	99.60	79.12	4.07
Start of Calendar Year <i>01-04-2022</i>	0.00	100.00	100.00	93.70	34.01	0.00
Start of Water Year <i>09-27-2022</i>	0.00	100.00	100.00	95.73	56.39	3.63
One Year Ago <i>11-09-2021</i>	0.00	100.00	100.00	99.52	78.72	9.69

Intensity:

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

Brian Fuchs
 National Drought Mitigation Center



droughtmonitor.unl.edu

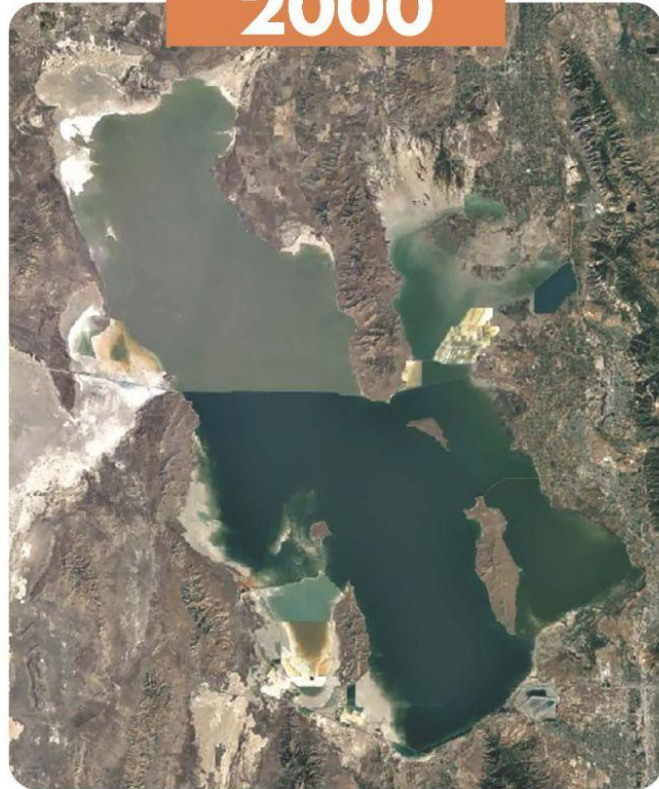


GREAT SALT LAKE ELEVATION

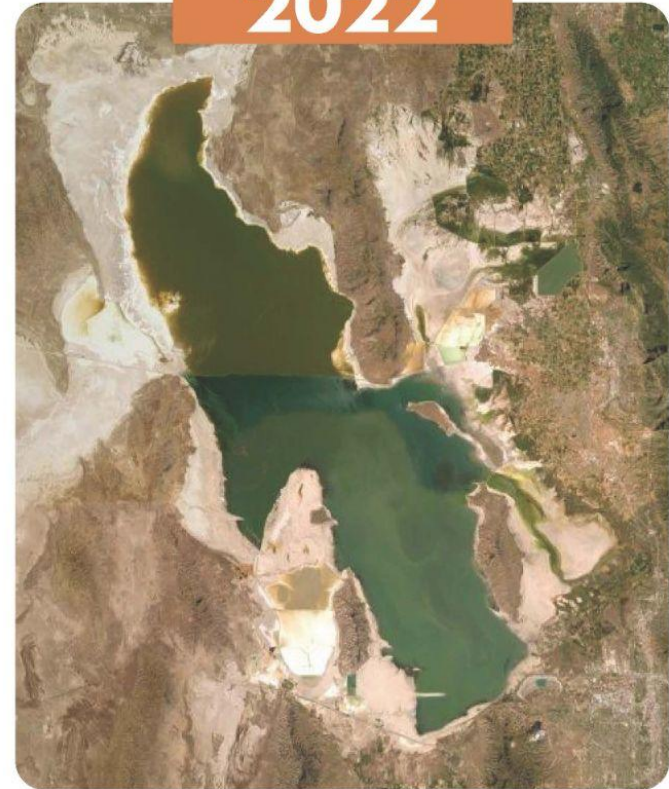
1986



2000



2022



RECORD HIGH

4211.65 FEET



AVERAGE

4202.2 FEET



RECORD LOW*

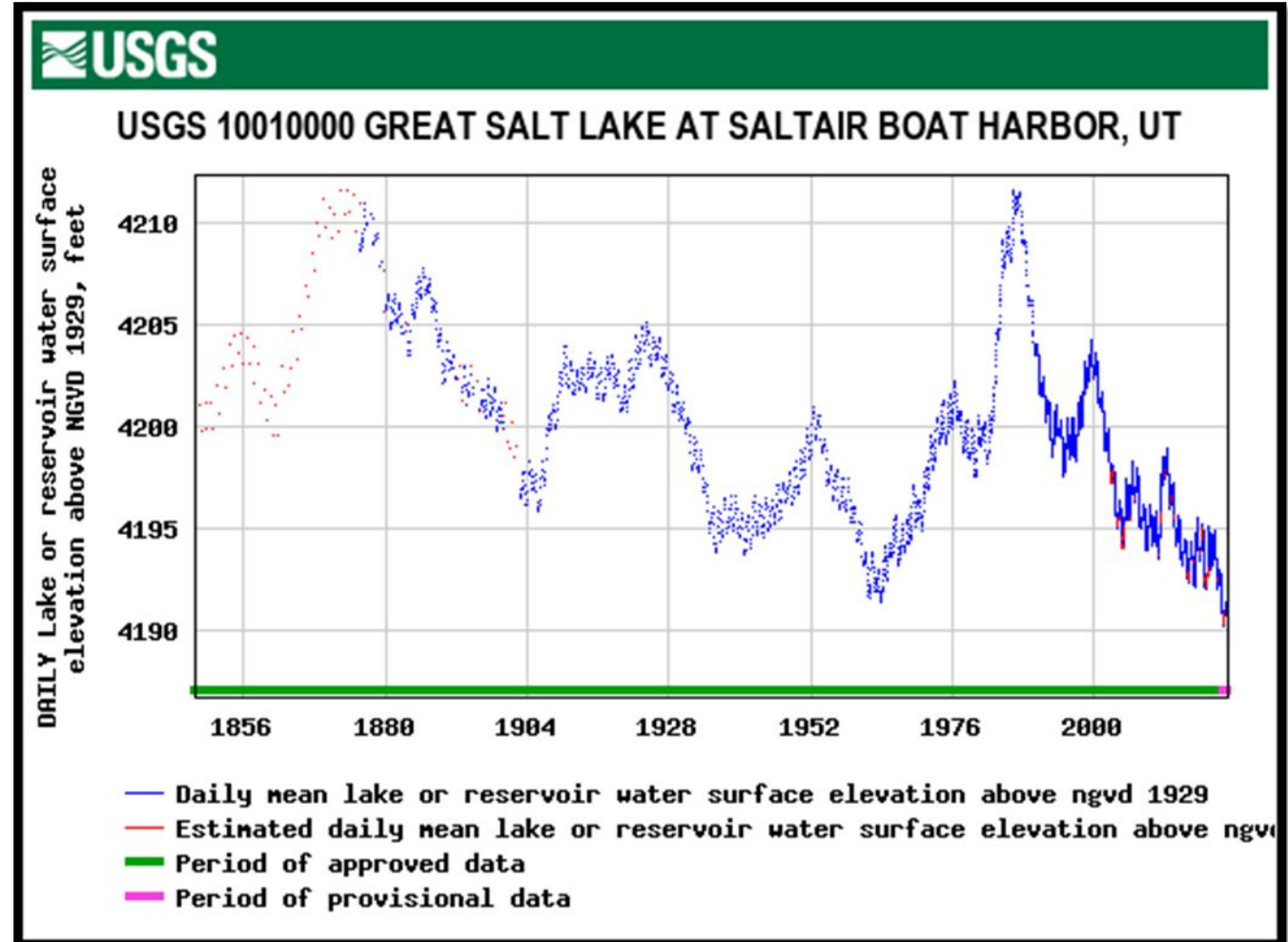
4188.8 FEET

*AS OF NOVEMBER 2022

Great Salt Lake Elevations

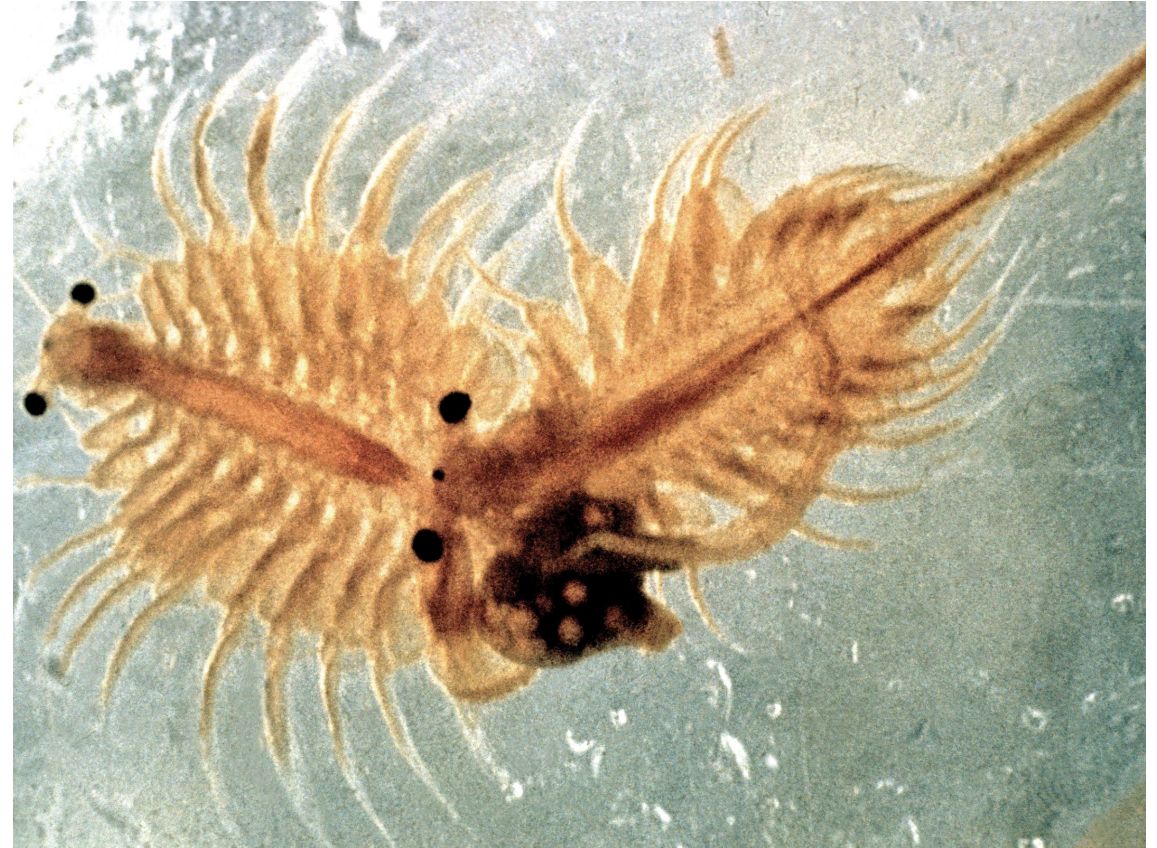
- Today – 4,188.8
- Max – 4,211.6
- Min – 4,188.6* (provisional data)
- Measuring since 1847
- 2 feet lower than this time last year

* *USGS will declare a new low after reviewing provisional data*



Great Salt Lake Salinity

- 12-16% ideal salinity range for the ecosystem to thrive
 - microbialites
 - brine flies
 - brine shrimp
- Problems occur when salinity is over 18%
- Currently, between **18.5% to 19.4%**



Salinity Impacts

- We are seeing impacts
 - Low water = lost habitat
 - Exposed microbialites
 - Lack of brine flies
 - Fewer birds
- We are NOT past the point of no return



Proclamation Closing GSL Basin

- Governor issued a proclamation suspending new water right appropriations within the basin (11-3-22)
- Pauses further appropriations of surface water and groundwater that are tributary to GSL
- Allows for existing water rights and applications to be used and developed while promoting more efficient use of the existing supply



Causeway Breach Modification

- FFSL & Water Resources partnered to raise the causeway berm 4 feet in July
- Prevents heavy brine from the hyper-saline north arm from flowing into the productive south arm
- Breach modification yielded immediate results



Further Potential Action

- Prevent bi-directional flow from north to south arm by completely filling the causeway breach
- Allow freshwater inflows to benefit south arm



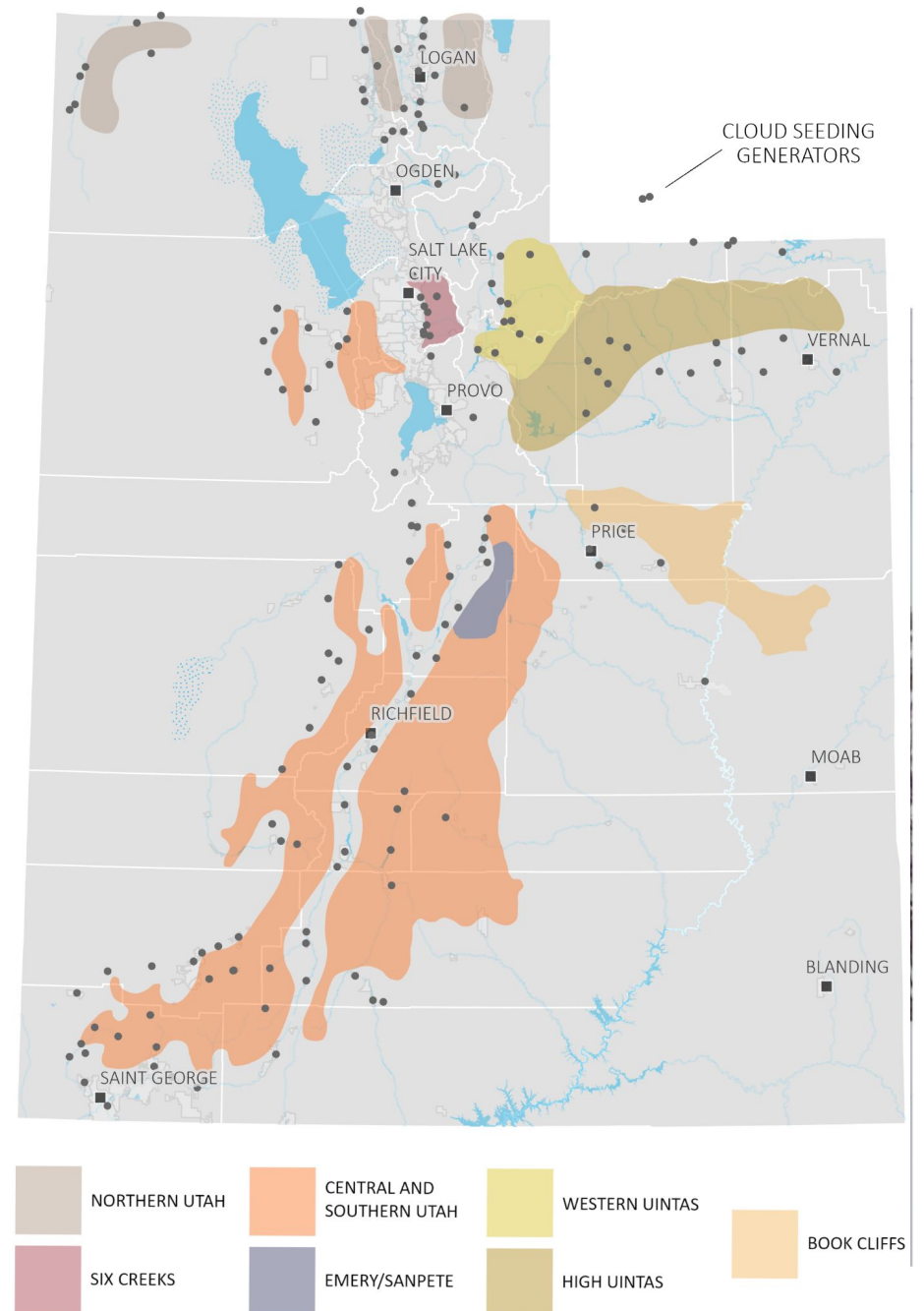
Cloud Seeding

- Utah's been cloud seeding since the 1950s
- Increases precipitation between 5-15%
- Low-cost, low-risk non-structural method to increase water supplies in target areas
- Currently, the Legislature funds up to \$350,000 annually as a match with local water districts



Increased Cloud Seeding

- Increase cloud seeding areas
 - Currently have 7 and would like to expand to 10
 - About 160-180 generators in use
- Increased funding could incorporate aircraft to target areas
- \$5 million one time; \$2.2 million ongoing



Potential Ag Water Contributions

- Pay farmers to fallow fields and allow water to flow to the lake
 - Estimated contributions up to 200,000 acre-feet
 - One to three years
 - Establish a rainy day fund to compensate farmers for water in dry years



Great Salt Lake

- After continuing to drop to new lows all summer, GSL is starting to slowly rise
- Usually rises about 2 feet with spring runoff – increased about 1 foot in 2021 and 2022
- Receding levels impact air quality, snowpack, economy, wildlife, and overall quality of life
- Working on a number of solutions to get more water to the lake
 - Conservation is making an impact
 - \$40 million Water Trust is taking shape
 - Agricultural optimization and secondary metering efforts are underway



Potential Costs of a Drying Lake

- **\$1.69 – 2.17 billion in potential costs annually**
 - Lost mineral extraction: \$1.3 billion
 - Mitigation (for dust, etc.): \$192 to \$610 million
 - Lost recreation: \$81 million
 - Lost brine shrimp industry: \$67 million
 - Health costs (dust): \$7-22 million
 - Lost ski days (reduced snow): \$6-10 million



THANK YOU



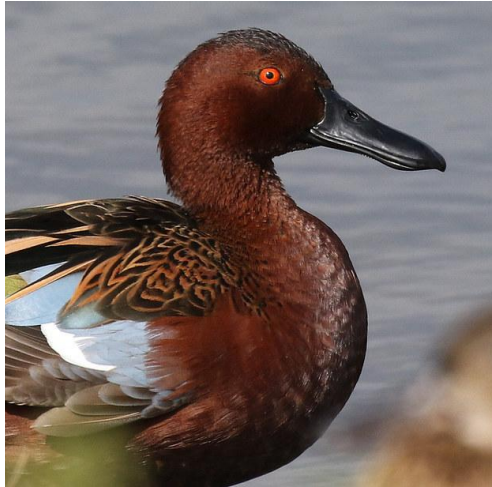
DIVISIONS



OFFICES

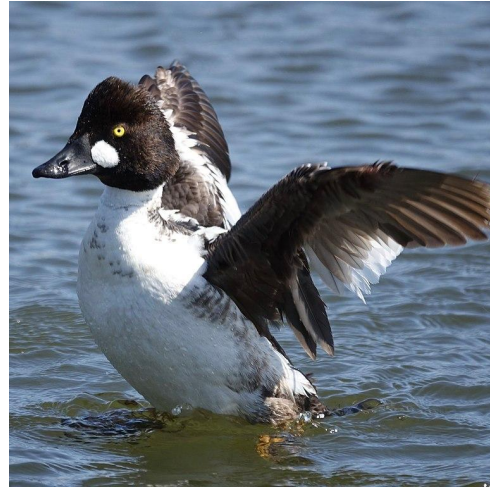


10 Million Birds Rely on the Lake



Cinnamon Teal

60% of the North American breeding population relies on the GSL



Common Goldeneyes

GSL has the largest inland wintering population of goldeneyes



Tundra Swans

The peak count of Tundra Swans can reach 60,000 while they stop here during migration



Snowy Plover

21% of North America's breeding population is found on the lake

Produces All the Magnesium in the U.S.

- U.S. Magnesium produces **all** the primary magnesium in the U.S. and 14% of the world's supply
- Used in beverage cans, aircraft, computers, car parts, stadium benches



Largest Sulfate of Potash Producer in the World



- Compass Minerals produces sulfate of potash, a specialty fertilizer for high-value crops like nuts and fruit
- Largest sulfate of potash producer in the world

40% of the World's Brine Shrimp Eggs

- Great Salt Lake Brine Shrimp Coop provides 40% of the world's brine shrimp eggs
- Used as food for aquaculture



Lithium from GSL Powers Batteries



Ecological Significance

- 10 million birds visit GSL annually
- Critical link in Pacific Flyway for over 330 bird species
- 80% of Utah's wetlands
- Microbialite structures



Estimated Total Economic Impact

Statistic	Direct Economic Effect	Indirect Economic Effect	Induced Economic Effect	Total Economic Effect
<u>Total Economic Output (millions of 2010 \$)</u>				
Recreation Sector	74.6	27.8	33.5	135.8
Industrial Sector (Mineral)	685.2	217.7	227.9	1,130.8
Aquaculture (brine shrimp eggs)	33.9	8.0	14.8	56.7
<i>TOTAL ALL SECTORS</i>				<i>1,323.3</i>
<u>Total Labor Income (millions of 2010 \$)</u>				
Recreation Sector	25.7	9.2	10.8	45.7
Industrial Sector	168.3	67.1	73.7	309.2
Aquaculture (brine shrimp eggs)	12.3	3.2	4.8	20.2
<i>TOTAL ALL SECTORS</i>				<i>375.1</i>
<u>Total Employment (Full and Part-time Jobs)</u>				
Recreation Sector	1,217	236	310	1,764
Industrial Sector	1,967	1,288	2,112	5,368
Aquaculture (brine shrimp eggs)	373	63	138	574
<i>TOTAL ALL SECTORS</i>				<i>7,706</i>

Water development

- GSL is 11' lower than it would have been if water wasn't diverted for agricultural, industrial, urban and impounded wetland uses
- The 11' drop is a 48% reduction in lake volume
- Future development could decrease lake levels by an additional 8' and expose hundreds of miles of lakebed



*2015, USU, DWRe

Potential costs of a drying lake

- Decrease in elevation = Increased costs
 - Extent of that cost depends on different lake levels
- Reduced lake access
- Increased salinity
- Increased dust
- Reduced snowpack
 - Lake effect snow
 - Dust on snow



Consequences of drying lakes around the world



Aral Sea, Kazakhstan and Uzbekistan

*2019, AECOM

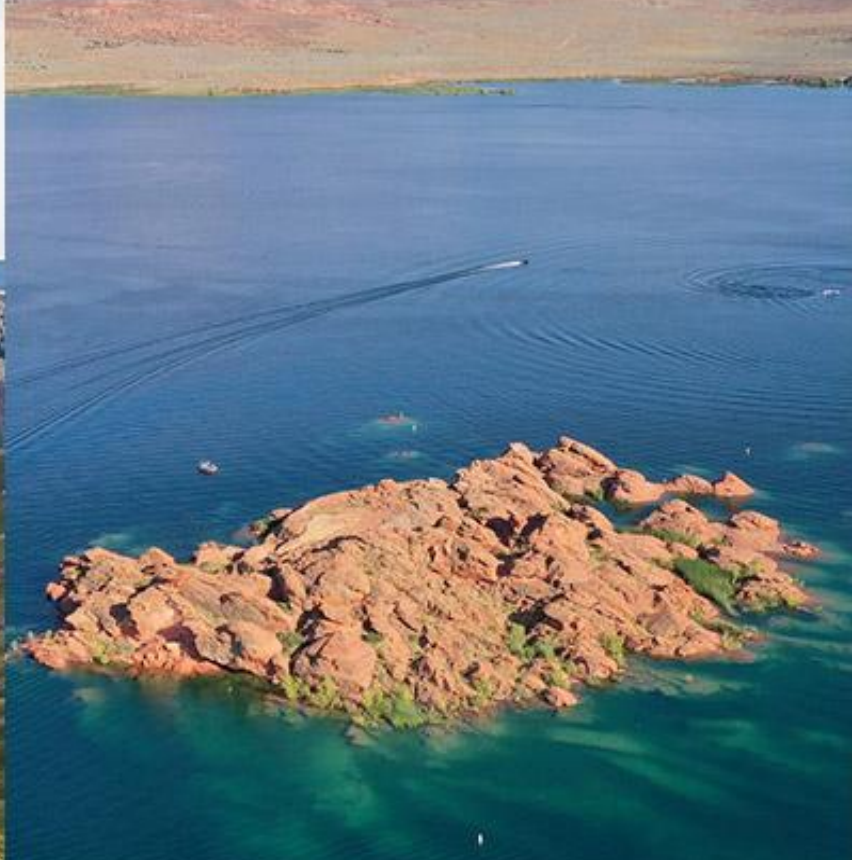
“Drying of saline lakes around the world costs billions of dollars in economic losses and mitigation efforts and causes severe harm to human health and the environment.” –Great Salt Lake Advisory Council



Owens Lake circa 1900



Owens Lake Dust Storm 2016



THANK YOU

DIVISIONS



OFFICES

