



## MINUTES

### BEAR RIVER COMMISSION ANNUAL MEETING ONE HUNDRED THIRTY-EIGHTH COMMISSION MEETING APRIL 20, 2021

## BEAR RIVER COMMISSION

226 South 200 West  
Farmington, Utah 84025-2407  
801-292-4662

CHAIR  
Jody Williams

IDAHO  
COMMISSIONERS  
Gary Spackman  
Kerry Romrell  
Curtis Stoddard

UTAH  
COMMISSIONERS  
Todd Adams  
Blair Francis  
Charles W. Holmgren

WYOMING  
COMMISSIONERS  
Greg Lanning  
Adrian Hunolt  
Tim Teichert

ENGINEER-MANAGER  
Don A. Barnett

**I. Call to order** – The annual meeting of the Bear River Commission was called to order by Chairwoman Jody Williams at 1:37 p.m. on Tuesday, April 20, 2021. This was the one hundred thirty-eighth meeting of the Commission, which was held again on a web platform due to the continuing pandemic. Williams noted that the Records and Public Involvement Committee and the Operations Committee met earlier in the day and the Water Quality Committee met the previous day. Chair Williams and Don Barnett then detailed those who were in attendance at the meeting. Mark Ipsen was serving as alternate to Commissioner Kerry Romrell. An attendance roster is attached to these minutes as Appendix A.

Williams then addressed the agenda for the meeting. There were no changes made to the agenda and it was approved by vote of the Commission. A copy of the agenda is attached to these minutes as Appendix B.

**II. Approval of minutes of last Commission meeting** – Williams asked if there were any changes to the draft minutes of the previous Commission meeting held on November 17, 2020. Commissioner Spackman suggested two small changes to the minutes. A motion was made to adopt the minutes as edited. The motion was seconded and unanimously approved by the Commission.

**III. Commission business – Election of Officers** – Chairwoman Williams explained that in the annual meeting of the Commission held in April, the Commission considered any changes to the Commission officers. A motion was made to retain the officers as currently constituted for another year. A vote was taken, and the Commissioners unanimously approved the motion.

**IV. Reports of Secretary and Treasurer** – Commissioner Adams asked Randy Staker to discuss the 2021 expenditures to date. Staker reported that between what was carried over from FY2020 and what had been collected to that point in 2021, there was a balance of \$287,892.12. Total expenses for the current fiscal year up to that point were \$121,384.42, leaving a cash balance of \$166,507.70, with just a little over two months remaining in the fiscal year. The remaining amount in the operating budget was \$24,466.58. Commissioner Adams then addressed the budget for FY2021. The total income was about \$289,000. The beginning balance was \$142,883 and the income was about \$290,000. Expenditures budgeted for the current fiscal year were \$145,851, which leaves a carryover of about \$143,600. As can be seen, the carryover is

decreasing. The Management Committee talked about potentially raising dues by FY2024. He noted that there would be a 3 percent increase in stream gaging from FY2022 to 2023, as well as a 3 percent escalation for the personal services contract and the clerical component. A motion was made to accept the Treasurer's report. The motion was seconded and unanimously approved. Another motion was made to approve the 2022 budget as presented. The motion was unanimously approved. (The financial statements and budget are attached to these minutes as Appendix C).

Commissioner Spackman expressed appreciation to Randy Staker, Todd Adams and Don Barnett for their efforts to take care of the finances and oversee the workings of the Commission.

Adams reported that Barnett was currently involved in moving the location of their offices and suggested that the change of address be made in the upcoming yearly contract and that the new address be made available to those involved with the Bear River Commission.

**V. 2021 Water Supply Outlook** – Troy Brosten reported on the 2021 water supply outlook (see Appendix D). He commented that the snowpack could have been quite a bit better. The area of the Bear River was at 70 percent of average. He pointed out the SNOWTEL sites in the basin indicating their respective snow/water equivalent (SWE) at each site. He reported that the Lower Basin was only at 65 percent, with the Upper Basin at 74 percent. He went on to report the SWE at specific locations. Looking at projections for Bear River as a whole, he reported that the snow would just be coming off and would probably melt out within the region at about the normal time of year, but without accumulating the peak SWE that would be seen in a normal year. He said that it would probably peak out in the Bear River Basin at around 70-80 percent of normal.

Brosten pointed out the depth of the soil saturation in recent years and noted that 2021 was in record dry soil conditions going into the water year. This can really affect the efficiency of the snowpack as it comes off. It is likely to see lower than normal flows for the rivers in the runoff season. He showed a graph of streamflow forecasts in the various areas, which ranges from about 25 percent to 60 percent. Brosten also noted that the reservoir storage was down in most of the reservoirs. Brosten ended his presentation with a look at the weather pattern going forward which seemed to indicate a dry and warm summer starting out.

**VI. Bear River modeling effort** – Jake Serago gave a report on the Bear Lake Storage Analysis that he and others have been working on for some time. This effort was prompted by joint water applications for storing water in Bear Lake submitted in 2018 by the Utah Division of Water Resources and Idaho Water Resources Board. After these applications were submitted, the executives from the three states and PacifiCorp got together to discuss it and decided that they would like some more information before making a decision about the storage applications. They commissioned a group of modelers from all three states and PacifiCorp to help provide that information. The main purpose of the study was to try to quantify additional volume that could have been stored in Bear Lake from 1980 to 2018 by making a few changes to flood control operations. As can be seen in Serago's ppt (Appendix E), there were a number of study questions they were trying to address. Serago noted that as a result of this study, there have been no changes to existing policies or recommendations for new policies. In the study they made no consideration or assumptions about how the additional storage water would be used. The model will be extremely useful because they can do things with the model that would be impossible or too expensive or take too much time to do in reality. The value of the model as a tool makes it possible to explore the various scenarios. They are very pleased with the quality of the data produced. Additional graphs and notes are included in Appendix E.

**VII. Water Quality Committee report** – John Mackey gave the report from the Water Quality Committee meeting held the previous day. He mentioned that all of the states were anticipating a very busy season of water quality monitoring and testing for the coming year, playing some catch-up from lost time the previous year. He was happy to report that the states of Utah and Idaho, in their last legislative sessions, received some incentive funding that was awarded for agricultural improvements. Idaho received an allocation of a million dollars for their agricultural Best Management Practices Program, which should help to improve water quality. Utah also received some funding which was allocated to their Agricultural Voluntary Incentive Program and to support nutrient management plans and protect water quality. They were really excited about that. All three states were busy playing catchup towards the ambient monitoring programs. Mackey noted that as the weather warms up, they are seeing more harmful algal blooms or harmful cyano bacteria blooms. He was happy that the reports seemed to show that Bear Lake is not having this problem. The water quality there seems to be fantastic.

Mackey commented on two important collaborative monitoring efforts underway between the states for the Bear River watershed. He noted that they are into their third year of water quality monitoring in five tributaries, as well as five associated locations in the Lake proper using water quality platforms or buoys in the Lake. This is a joint effort between Utah and Idaho. The results from that study will be wrapped into a report which is expected to be out in December 2022 and reported to the Commission in 2023. The second important cooperative monitoring effort involves sampling water sources in the HUCs in the Central and Upper Bear River. They are monitoring water chemistry at 50 sites. All three states are involved in this effort.

The Water Quality Committee also heard an update on the USGS platforms at Bear Lake. This is a five-year program involving two buoys, one at a fixed location and the other which moves around each year. Mackey noted that they were in the fourth season of collecting water quality data which allows for the creation of diagrams showing conditions in the Lake over time and over depth. The effort is expected to be completed and reported by December 2022. In September 2022 the buoys will be removed from the Lake. There has been a lot of discussion about whether or not the efforts should be extended beyond 2022. Funding would be a factor to consider. This has been a valuable tool. The committee also discussed the USGS State Park Marina real time gage and whether support for this gage should likewise extend beyond 2022.

Other items discussed included the Water Quality Strategic Plan. They are reasonably satisfied with the plan and will finish it up and be prepared to present it to the Commission for adoption at their fall meeting. Mitch Poulsen mentioned continued concern about a development on the east side of Bear Lake with septic tanks close to the Lake. It has been an issue for a long time. David Cottle from Bear Lake Watch mentioned their concern over declining Cisco numbers. The committee also talked about the memorial for Jack Barnett at the Lake. Bear Lake Watch was planning to set up a “go fund me” account to wrap up the remaining funds needed for the memorial.

**VIII. Records & Public Involvement Committee report** – Charles Holmgren reported on the meeting of the Records & Public Involvement Committee. They had an update on USGS gages. PacifiCorp data has been added to the USGS website at Bear Lake going back to 1904, which is extremely valuable. They learned about the Utah Water Science website, a USGS site. They also heard about data regarding stream flows in the State of Utah and how it can be accessed. There were a number of streams in the Bear River Basin running at very low levels as compared to other years. He noted that Water Quality continues to fund the gaging system at 20 percent of the gage costs. The

committee also heard about the platforms at Bear Lake and how funding will cease to be available. The TAC is reviewing that and will report back to the Commission with their recommendation on continuing that program. They discussed the possibility of having a tour during the summer in the Franklin County Idaho area from Oneida to the state line at the Utah/Idaho border. They also talked about the 21<sup>st</sup> Biennial Report and what they might include on the cover of the report. They considered having a picture of Jack Barnett on the cover and some kind of a memorial within the report honoring him. As the Commission offices were going to move to a different location, there was a discussion about the possibility of digitizing the materials in the Commission library for the preservation and protection of those documents. Marcelle Shoop with Audubon shared with Don Barnett a Journal of Hydrology study of the reconstruction of Bear River streamflow using tree ring data for 1200 years.

**IX. Operations Committee report** – Adrian Hunolt noted that the Operations Committee met earlier in the day, with the alternate Commissioner, Mark Ipsen, sitting in for Commissioner Kerry Romrell. Hunolt asked Sam Swartz to make the report to the Commission. Swartz noted that Don Barnett talked about opening up a discussion with water users in the Upper Division about water distribution for the 2021 growing season as they were anticipating an extremely dry year. Kevin Payne gave the reservoir status, explaining that Woodruff Narrows was at 47 percent and would probably not be filling or spilling during the year. There was a discussion of the 2021 water distribution in the Central Division. The snowpack was not looking good, but better than anywhere else in the Basin. Barnett believed that the Central Division would see a call in early June. Connely Baldwin gave an update on the Bear Lake storage allocations and anticipated river operations. They were expecting river calls to begin in the first or second week of May. Regarding depletions estimates, the TAC had been holding monthly meetings and discussing a number of topics essential to the depletions estimate efforts. The Operations Committee then reviewed a portion of the Compact history related to water levels at Mud Lake and Bear Lake. Barnett explained the holding back of water in Mud Lake which prevents equalization between the two lakes and a lower elevation in Bear Lake which would impact the 5911 ft. elevation trigger for upstream storage. In order to anticipate the true elevation of Bear Lake under Compact terms, a formal procedure was put in place by the Commission which lays out the process for mathematically allowing waters in Mud Lake to flow into Bear Lake. This is the Bear Lake equivalency table. This table could make the difference of a week or two in starting upstream storage. Each state then gave an update on water use proposals of interest.

Connely Baldwin then addressed storage allocation in 2021 and PacifiCorp operations. Some of his information had already been discussed. The summary for water year 2020 had not changed since the last report. Moving on to water year 2021, he noted that there were no high-runoff management releases. However, the Bear Lake elevation on March 31, 2020 was 5916.78 feet. He reviewed some of the operational notes and other historical Bear Lake information having to do with ice-over in Bear Lake. Baldwin's information is attached as Appendix F.

**X. Technical Advisory Committee report** – Kevin Payne reported that the TAC has continued to meet about monthly since the last Commission meeting to work on updating the depletion estimates. There has been some good progress on this. As part of this the TAC has been looking at updating the reservoir evaporation rates and has explored several different methods. Estimating Industrial depletions were in the final stages and reports for each state were being submitted.

On March 9<sup>th</sup> the TAC met and received comments regarding environmental and watershed health issues which may affect the overall management of the Bear River System. Anne Neville and Marcelle



Shoop from Nature Conservancy and Audubon presented an updated version of a proposal for a Climate Vulnerability Assessment Study. They have been working with the Western Water Assessment Group and a representative of their group also attended the meeting. This topic was reviewed by the TAC and ultimately decided to pass this information along to each of the state Management Committee members for further direction. Connely Baldwin with PacifiCorp gave information on efforts to review and potentially update the area capacity table for Mud Lake. The current area capacity curve is based on data obtained in 2016. The area capacity information is used among other things to determine water held in storage in Mud Lake and is used to determine the equivalent elevation on Bear Lake. The TAC continues to look at other items such as stream gages, new water right filings, the biennial report and any other items brought to their attention.

**XI. Management Committee report** – Todd Adams reported that the Management Committee met the previous day. They went over the budget and finances and the funds received from the Water Quality agencies. They talked about the potential tour from Oneida to the state line area to be held in late summer. The Management Committee discussed the proposed climate vulnerability assessment. The Commission does not typically fund these outside types of studies. They believe that the modeling that is happening with the three states and PacifiCorp, as well as some climate change scenarios, will be added to an improved model with time. He indicated that at this time the Commission would not be involved in the funding proposed vulnerability assessment. Adams noted that the next Commission meeting had been planned for November 16<sup>th</sup>, but they would like to move the meeting to November 23<sup>rd</sup> and have it in person at Utah's DNR location with a hybrid option. There was a motion to approve the suggestion to meet on November 23<sup>rd</sup> as indicated. The motion passed.

**XII. Engineer-Manager's report** – In addition to the moving of the Commission offices, Don Barnett reported that Donna Keeler, who has served the Commission for more than a decade, was planning to retire fairly soon. He commented on all the various tasks she took care of and expressed his appreciation to Donna for her service to the Commission over many, many years.

Commissioner Williams also expressed her appreciation to Donna and gave her personal thanks and gratitude for everything she had done for the Commission and for her ongoing professionalism.

**XIII. State Reports – Idaho** – Commissioner Spackman reported on two items. The first was that adjudication in Idaho of water rights authorizing diversion of beneficial use from the Bear River and tributaries had been funded and authorized earlier by the Idaho Legislature. That funding will be effective on July 1, 2021. Unless there is a legal hitch, they anticipate claims taking some time in 2022. The second item was that the Idaho Legislature, with the Governor's signature, had approved the Department's budget. Along with that, the Legislature placed \$50M in the coffers of the Idaho Water Resource Board for water projects across the state. They anticipate that there will be some additional money placed in the Water Resources Board's funds during the next legislative session. Consequently, there are some real opportunities for water infrastructure development in the State of Idaho over the next few years.

**XIII. State Reports – Utah** – Commissioner Adams spoke about the dry and extra warm conditions in Utah. He noted that the Great Salt Lake is getting close to setting a new record low. They are hoping that they do not hit that record, but that is how the trend is looking. Some good news is that the Utah Legislature also provided some funding for small secondary grants in counties of the first and second class throughout the State of Utah. They are looking to receive these funds on the first of July. He noted that, like Idaho, there is a possibility to receive some special infrastructure funding

and the Legislature will be determining where that money will go. They have made a couple of requests for that. Adams also reported that they are very close to having their next version of the state water plan out, and they hope to have that ready by June or July.

**XIII. State Reports – Wyoming** – Commissioner Lanning commented that there seems to be a theme related to the weather, as Wyoming is also experiencing the hot and dry scenario. He noted that Wyoming had been going through some painful budget reductions over the last year which is affecting their operations. The good news in Wyoming is that through all the budget discussions, their water development arm has continued to be funded about the same as they have in the past for water development projects, so that should be close to business as usual in Wyoming. He commented that Wyoming is “open” and they appreciate all guests and tourists who come to enjoy their state.

**XIV. Other** – Claudia Cottle from Bear Lake Watch gave thanks to those in the Bear River/Bear Lake watershed, and the Commission particularly, for all the considerations that have come to the attention and thoughts on Bear Lake. They have made great progress in the past 20 years and they are looking for opportunities to get together at a Bear Lake/Mud Lake symposium sometime soon. She commented that they will continue to watch over the ways to shepherd the near-shore water quality and shoreline management issues that are heading toward critical stages.

Randy Budge from the Bear River Water Users Association commented that the Association is doing well. They hosted the Bear Lake Preservation Advisory Committee meeting earlier in the month. As a group, they remain keenly interested and intend to actively participate in the Bear River Basin adjudication in Idaho. They are concerned, as everyone else, about the impending drought conditions and the water supply outlook. He noted that the Association’s members are mindful of the need of conservation and will do what they can to conserve. They are also taking interest and an active role in the two pending permit applications in Idaho and Utah filed by the two states attempting to secure a water right for additional storage in the Lake.

Marcelle Shoop commented that on behalf of the National Audubon Society and the Nature Conservancy, she wanted to thank both the TAC and operating committees for considering the proposal to undertake something like a workshop to assess whether or not they would be interested in doing a climate vulnerability assessment for the Bear River watershed. She noted that it would be great if they could at least ask for the assistance of state agency folks to help them connect with the right state agencies so they could continue that conversation.

**XV. Next Commission meeting** – Chairwoman Williams noted on the screen that the agenda was revised to show that the next Commission meeting would be held on November 23<sup>rd</sup> at Utah DNR.

Commissioner Spackman brought to the Commission’s attention that he did not remember addressing the need to ask the committee chairs if they would be willing to remain in their positions for an extra year. This would involve Commissioner Holmgren for the Records and Public Involvement Committee and Commissioner Hunolt for the Operations Committee. This would also involve Kevin Payne as Chair of the Technical Advisory Committee. A motion was made to this effect and the vote was unanimous.

A motion to adjourn the Commission meeting was made and approved. The meeting was then adjourned.

# **ATTENDANCE ROSTER**

## **BEAR RIVER COMMISSION ANNUAL MEETING**

Virtual Meeting  
April 20, 2021

### **IDAHO COMMISSIONERS**

Gary Spackman  
Curtis Stoddard  
Mark Ipsen (Alternate)

### **WYOMING COMMISSIONERS**

Greg Lanning  
Adrian Hunolt  
Tim Teichert  
Kevin Payne (Alternate)

### **FEDERAL CHAIR**

Jody Williams

### **UTAH COMMISSIONERS**

Todd Adams  
Charles Holmgren  
Blair Francis  
Ryan Merrill (Alternate)

### **ENGINEER-MANAGER & STAFF**

Don Barnett  
Jacob Barnett  
Donna Keeler

### **OTHERS IN ATTENDANCE**

#### **IDAHO**

Matt Anders, Department of Water Resources  
David Hoekema, Department of Water Resources  
James Cefalo, Department of Water Resources  
Ethan Geisler, Department of Water Resources  
Josh Hanks, Water Master

#### **UTAH**

Teresa Wilhelmsen, State Engineer  
Will Atkin, Division of Water Rights  
Skyler Buck, Division of Water Rights  
Jake Serago, Division of Water Resources  
Randy Staker, Division of Water Resources  
John Mackey, Division of Water Quality

#### **WYOMING**

Mike Johnson, State Engineer's Office  
Travis McInnis, State Engineer's Office  
Sam Swartz, State Engineer's Office

#### **OTHERS**

Connely Baldwin, PacifiCorp Energy  
Buffi Morris, PacifiCorp Energy  
John Mabey, Outside Counsel for PacifiCorp  
Troy Brosten, NRCS Snow Survey  
Ryan Rowland, USGS

Dwight Slauch, U.S. Bureau of Reclamation  
Trevor Nielson, Bear River Canal Company  
Mike Dunphy, Bear River Migratory Bird Refuge  
Claudia Cottle, Bear Lake Watch  
Randy Budge, Bear River Water Users  
Jim DeRito, Trout Unlimited  
Ann Neville, The Nature Conservancy  
Marcelle Shoop, National Audubon Society

**PROPOSED AGENDA  
ANNUAL COMMISSION MEETING**

**April 20, 2021**

**Convene Meeting:** 1:30 p.m.

**Chair:** Jody Williams

- |       |  |               |
|-------|--|---------------|
| I.    | Call to order  | Williams      |
|       | A. Welcome of guests and overview of meeting                       |               |
|       | B. Approval of agenda  |               |
| II.   | Approval of minutes of last Commission meeting (November 17, 2020) | Williams      |
| III.  | Commission business  | Williams      |
|       | A. Election of Officers  |               |
|       | B. Other   |               |
| IV.   | Reports of Secretary and Treasurer                                 | Adams/Staker  |
|       | A. 2021 expenditures to date                                       |               |
|       | B. 2022 budget approval  |               |
|       | C. Other   |               |
| V.    | 2021 Water Supply Outlook  | Brosten       |
| VI.   | Bear River modeling effort   | Serago/others |
| VII.  | Water Quality Committee report                                     | Mackey        |
| VIII. | Records & Public Involvement Committee report                      | Holmgren      |
| IX.   | Operations Committee report  | Hunolt        |
|       | A. Committee meeting   |               |
|       | B. Storage allocation in 2021                                      | Baldwin       |
|       | C. PacifiCorp operations   | Baldwin       |
| X.    | Technical Advisory Committee report                                | Payne         |
| XI.   | Management Committee report  | Adams         |
| XII.  | Engineer-Manager's report  | Barnett       |
| XIII. | State reports  |               |
|       | A. Idaho   | Spackman      |
|       | B. Utah  | Adams         |
|       | C. Wyoming   | Lanning       |
| XIV.  | Other  | Williams      |
| XV.   | Next Commission meeting (Tuesday, November 16, at ????)            | Williams      |

**Anticipated adjournment:** 4:30 p.m.

BEAR RIVER COMMISSION  
STATEMENT OF INCOME AND EXPENDITURES

FOR THE PERIOD OF July 1, 2020 to April 15, 2021

INCOME	CASH ON HAND	OTHER INCOME	FROM STATES	INCOME
Cash Balance 07-01-20	142,883.66			142,883.66
State of Idaho			45,000.00	45,000.00
State of Utah			45,000.00	45,000.00
State of Wyoming			45,000.00	45,000.00
Water Quality		9,447.61		9,447.61
Interest on Savings		560.85		560.85
 TOTAL INCOME TO				
15-Apr-21	142,883.66	10,008.46	135,000.00	287,892.12

DEDUCT OPERATING EXPENSES

	APPROVED BUDGET	UNEXPENDED BALANCE	EXPENDITURES TO DATE
Stream Gaging/Bear Lake Gage/USGS Contract	45,910.00	-	45,910.00
Bear Lake Gage/USGS			
 SUBTOTAL	45,910.00	-	45,910.00
 EXPENDED THROUGH COMMISSION			
Personal Services BIWC	71,032.00	11,838.70	59,193.30
Travel (Eng-Mgr)	1,200.00	1,048.38	151.62
Office Expenses	1,600.00	486.22	1,113.78
Printing Biennial Report	1,000.00	309.70	690.30
Treasurer Bond & Audit	1,400.00	1,300.00	100.00
Printing	1,600.00	1,514.60	85.40
Realtime Web Hosting	8,400.00	1,179.01	7,220.99
Clerical	9,209.00	2,289.87	6,919.03
Tour	2,500.00	2,500.00	-
Contingency	2,000.00	2,000.00	-
 SUBTOTAL	99,941.00	24,466.58	75,474.42
 TOTAL EXPENSES	145,851.00	24,466.58	121,384.42
 CASH BALANCE AS OF 04/15/2021			166,507.70

BEAR RIVER COMMISSION  
DETAILS OF EXPENDITURES

FOR PERIOD ENDING April 15, 2021

908	BIWC	18,790.81
909	StoneFly Tech	1,800.00
910	BIWC	6,231.07
911	USGS	45,910.00
912	StoneFly Tech	3,600.00
913	BIWC	9,795.94
914	BIWC	19,421.50
915	VOID	
916	BIWC	7,350.39
917	VOID	
918	StoneFly Tech	1,820.99
919	C N A SURETY	100.00
920	BIWC	6,563.72

TOTAL EXPENDITURES	121,384.42
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BANK RECONCILIATION

Cash in Bank per Statement 04/15/21	12,393.07
Plus: Intransit Deposits	
Less: Outstanding Checks	
Total Cash in Bank	12,393.07
Plus: Savings Account-Utah State Treasurer	154,114.63
CASH BALANCE AS OF 04/15/21	166,507.70

**BEAR RIVER COMMISSION**

**APPROVED BUDGET FY2021, PPROPOSED BUDGET FY2022 & FY2023**

	FY2021 APPROVED BUDGET	FY2022 PROPOSED BUDGET	FY2023 PROPOSED BUDGET
	<b>-INCOME-</b>	<b>-INCOME-</b>	<b>-INCOME-</b>
BEGINNING BALANCE	142,883.66	143,612.66	140,229.66
IDAHO	45,000.00	45,000.00	45,000.00
UTAH	45,000.00	45,000.00	45,000.00
WYOMING	45,000.00	45,000.00	45,000.00
WATER QUALITY	9,580.00	9,867.00	10,163.00
INTEREST ON SAVINGS	2,000.00	2,000.00	2,000.00
TOTAL INCOME	<hr/> 289,463.66	<hr/> 290,479.66	<hr/> 287,392.66
	<b>-EXPENDITURES-</b>	<b>-EXPENDITURES-</b>	<b>-EXPENDITURES-</b>
STREAM GAGING-U.S.G.S. BEAR LAKE GAUGE/USGS	45,910.00	47,902.00	49,339.00
PERSONAL SERVICES CONTRACT	71,032.00	73,163.00	75,358.00
TRAVEL	1,200.00	1,200.00	1,200.00
OFFICE EXPENSES	1,600.00	1,600.00	1,600.00
BIENNIAL REPORT	1,000.00	1,000.00	1,000.00
TREASURER'S BOND & AUDIT	1,400.00	1,400.00	1,400.00
PRINTING	1,600.00	1,600.00	1,600.00
REALTIME WEB HOSTING	8,400.00	8,400.00	8,400.00
CLERICAL	9,209.00	9,485.00	9,770.00
TOUR	2,500.00	2,500.00	2,500.00
CONTINGENCY	2,000.00	2,000.00	2,000.00
TOTAL EXPENDITURES	<hr/> 145,851.00	<hr/> 150,250.00	<hr/> 154,167.00
	<hr/> 143,612.66	<hr/> 140,229.66	<hr/> 133,225.66





United States Department of Agriculture

## Bear River Basin Water Supply Outlook

April 20, 2021



Troy Brosten  
NRCS Snow Survey

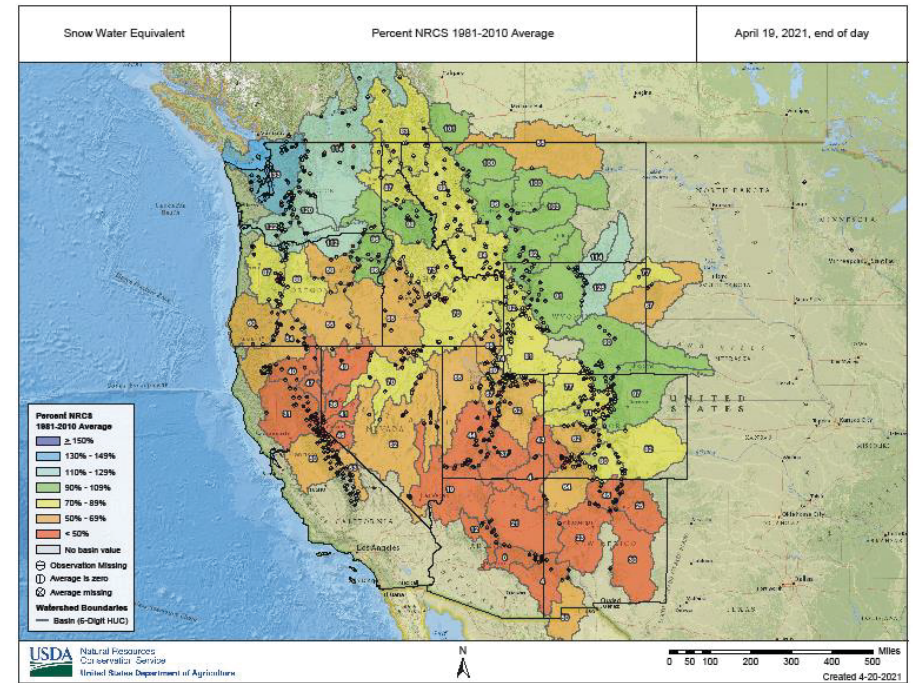
Phone: 385-285-3114  
Email: [troy.brosten@ut.usda.gov](mailto:troy.brosten@ut.usda.gov)



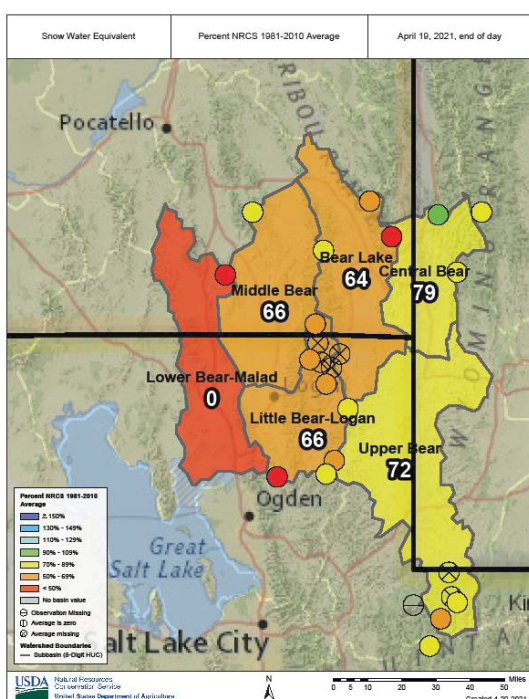
Natural  
Resources  
Conservation  
Service

[www.ut.nrcs.usda.gov/snow](http://www.ut.nrcs.usda.gov/snow)

USDA



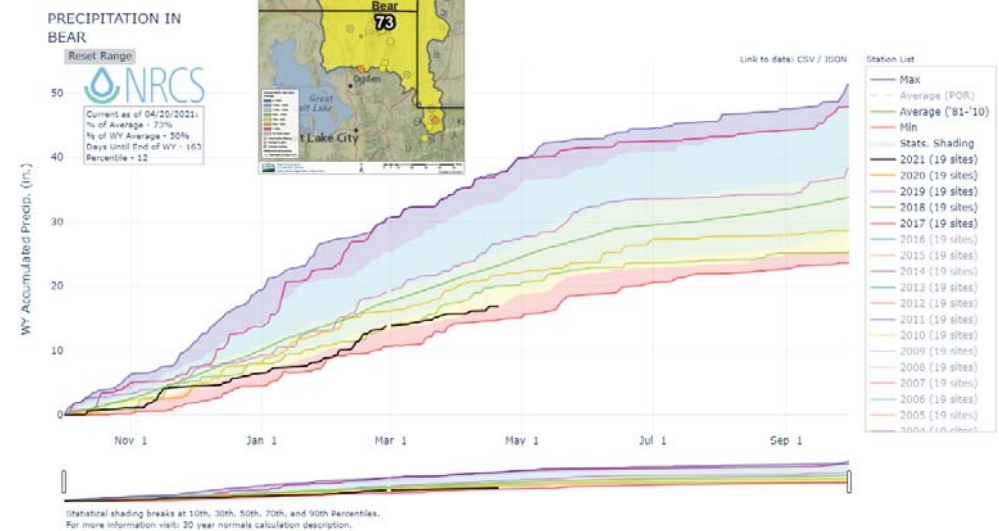
United States Department of Agriculture



BEAR RIVER COMMISSION MEETING  
April 20, 2021



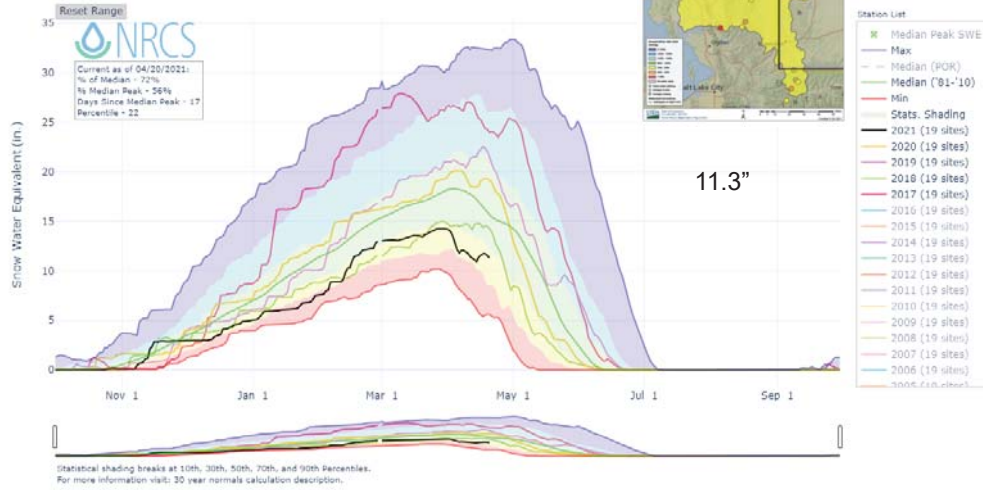
United States Department of Agriculture



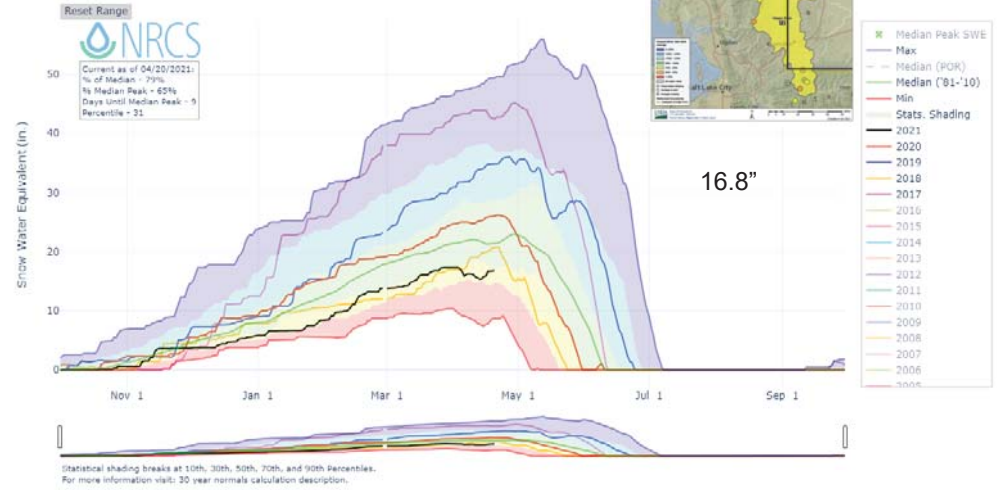
Appendix D  
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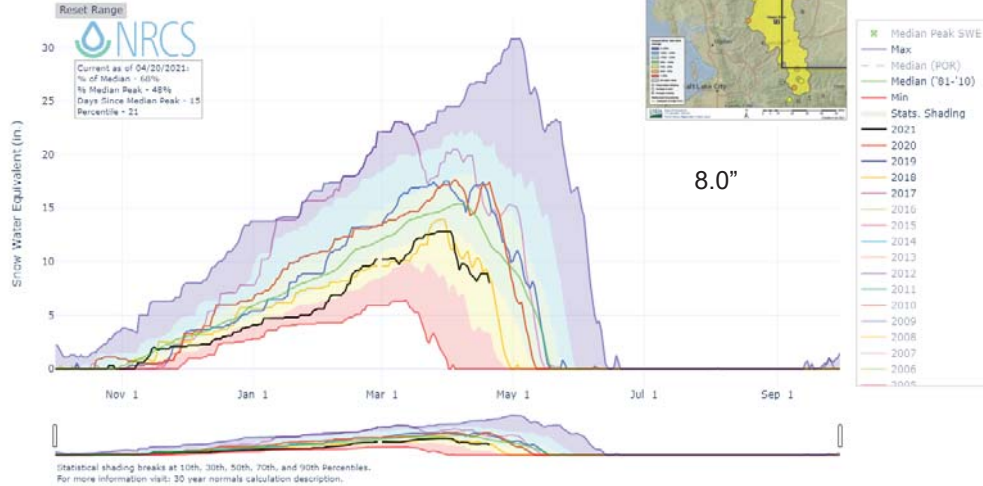
# SNOW WATER EQUIVALENT IN BEAR



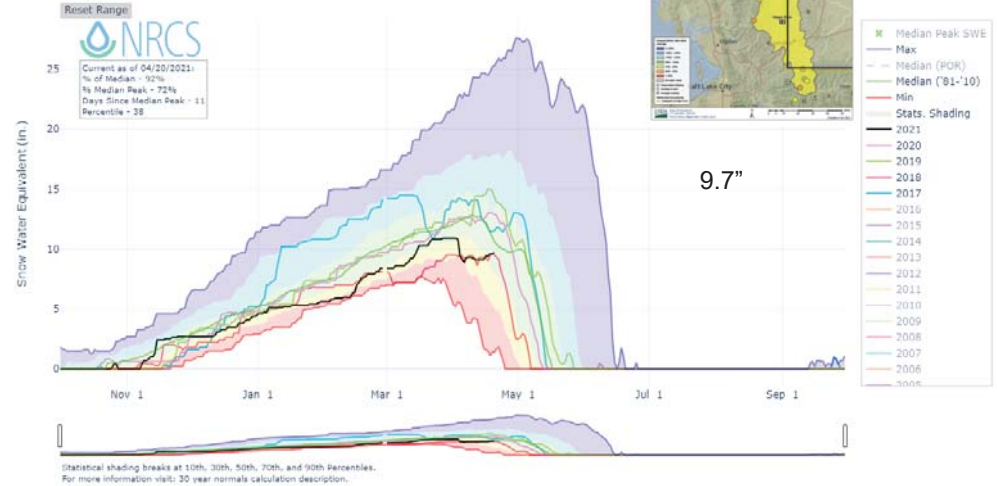
# SNOW WATER EQUIVALENT AT TRIAL LAKE

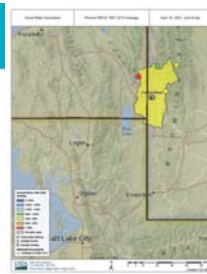


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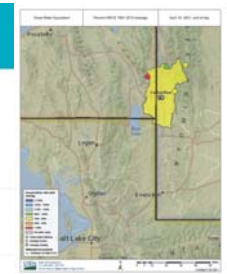
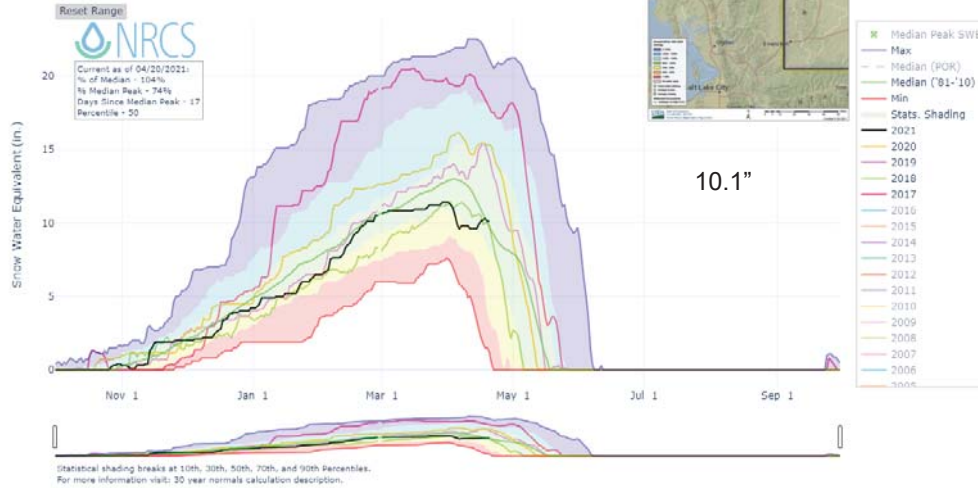


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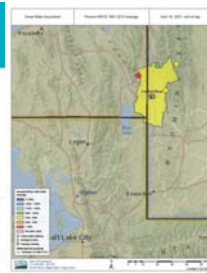
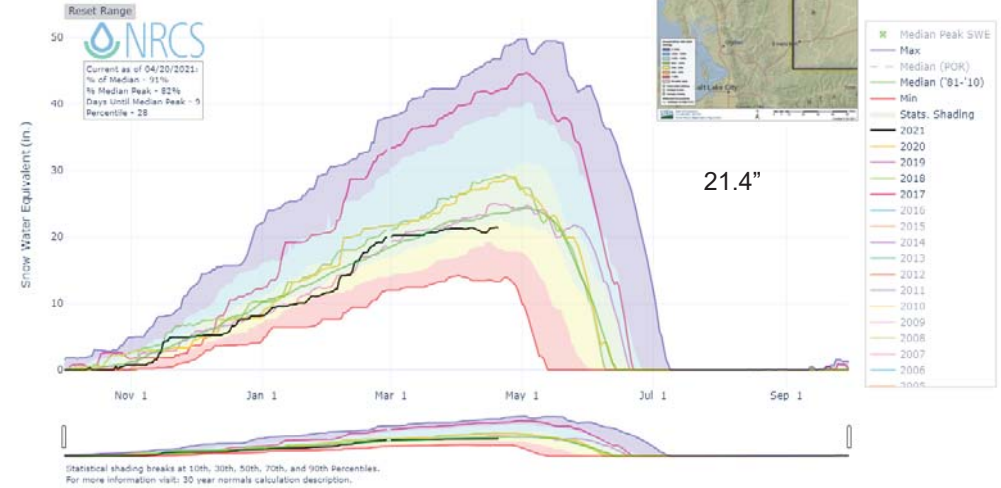




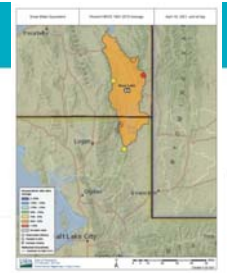
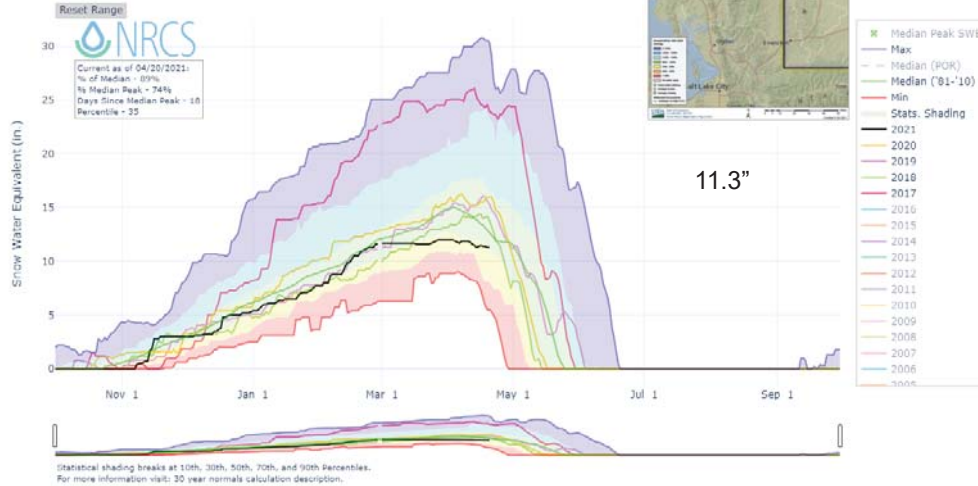
### SNOW WATER EQUIVALENT AT SALT RIVER SUMMIT



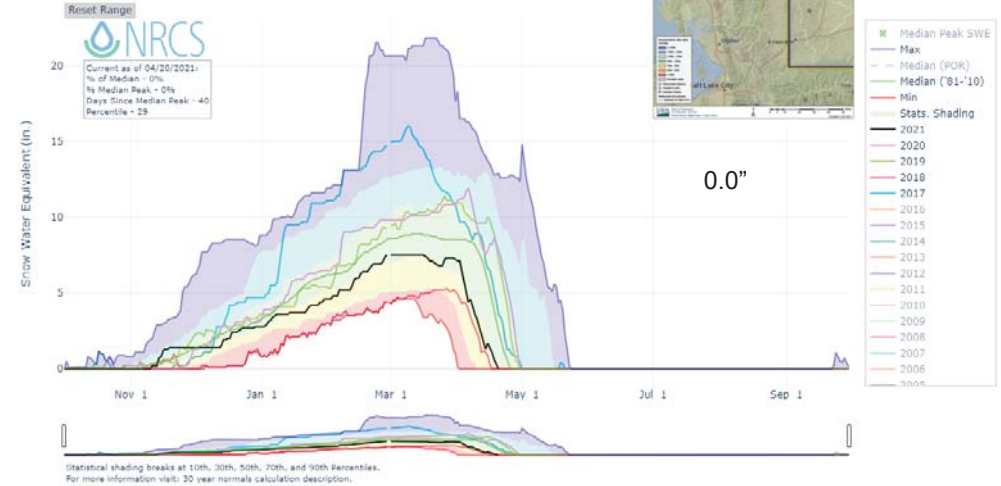
### SNOW WATER EQUIVALENT AT SPRING CREEK DIVIDE



### SNOW WATER EQUIVALENT AT KELLEY R.S.



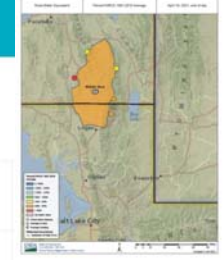
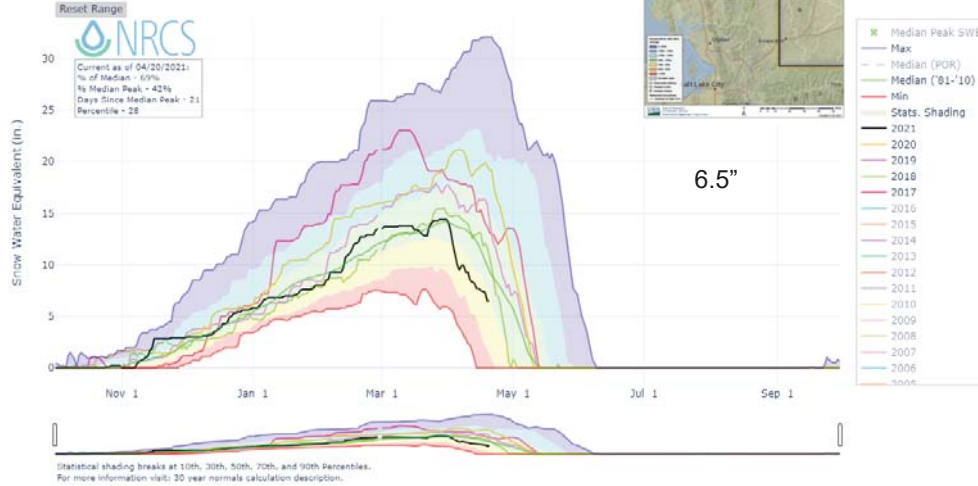
### SNOW WATER EQUIVALENT AT GIVEOUT



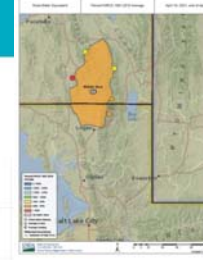
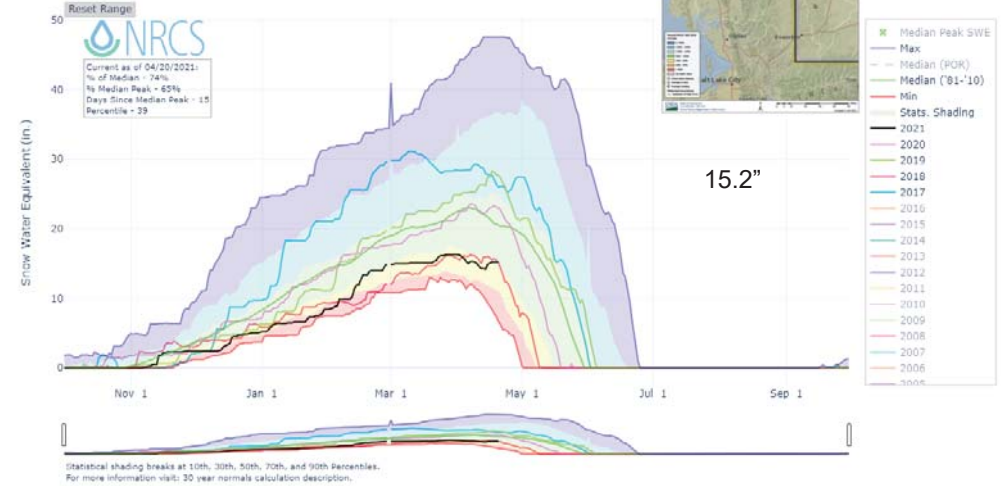




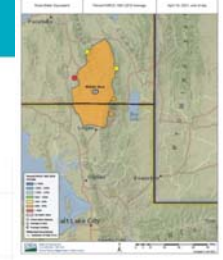
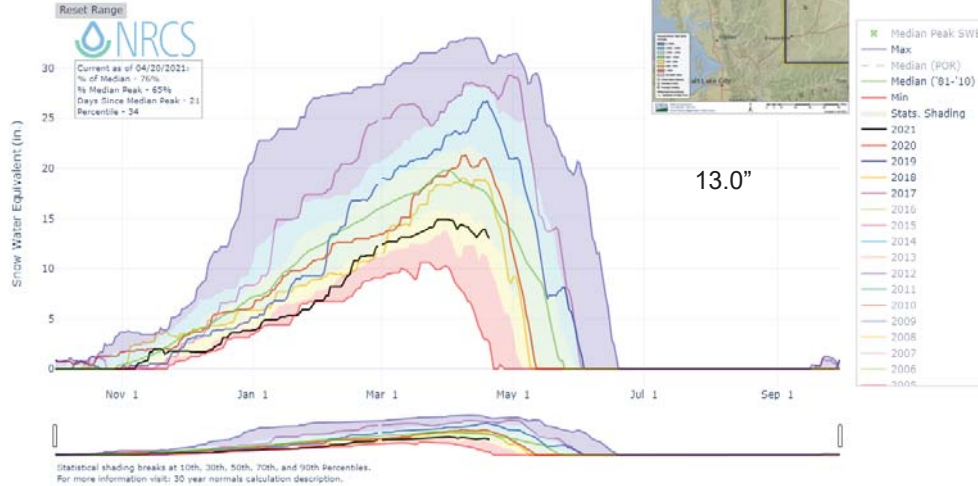
### SNOW WATER EQUIVALENT AT SLUG CREEK DIVIDE



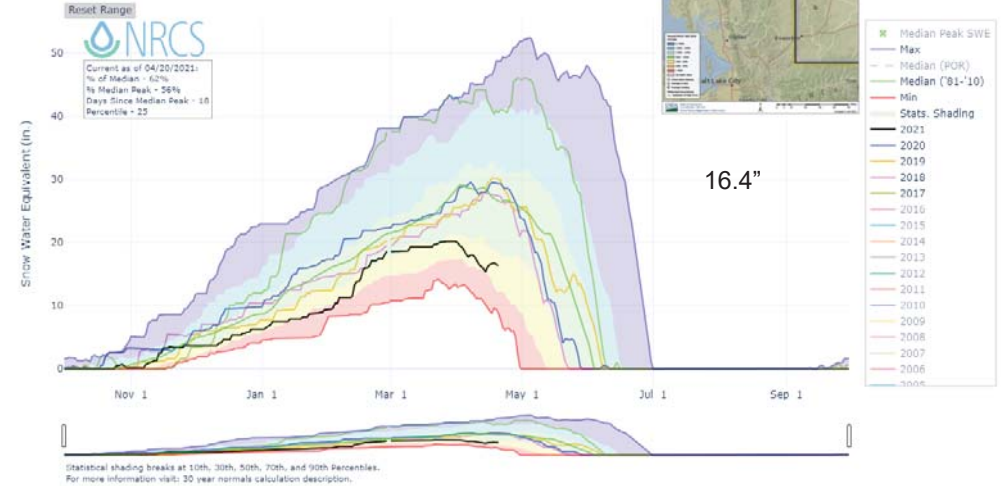
### SNOW WATER EQUIVALENT AT EMIGRANT SUMMIT

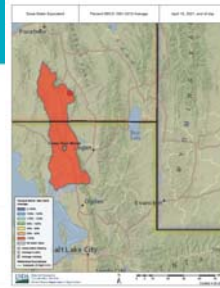


### SNOW WATER EQUIVALENT AT SEDGWICK PEAK

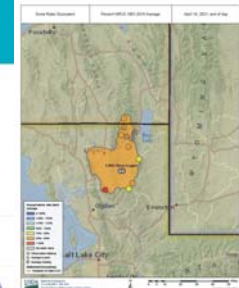
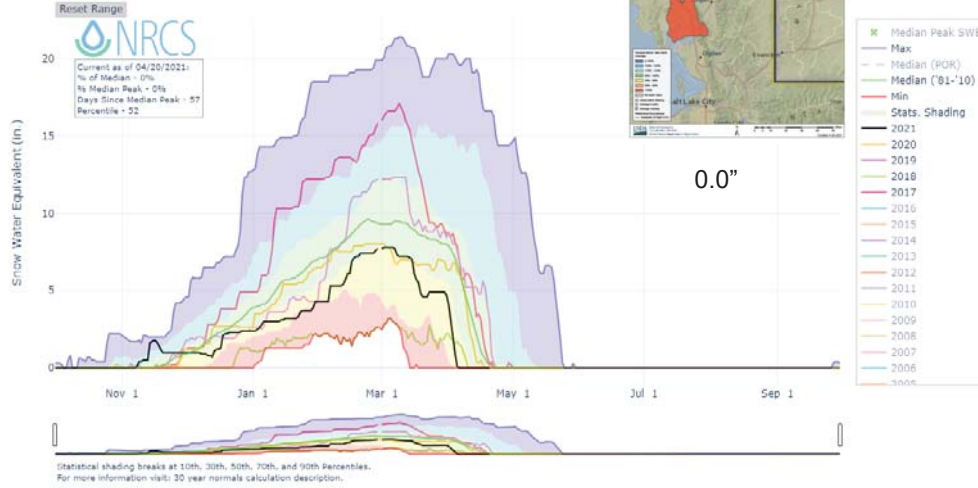


### SNOW WATER EQUIVALENT AT FRANKLIN BASIN

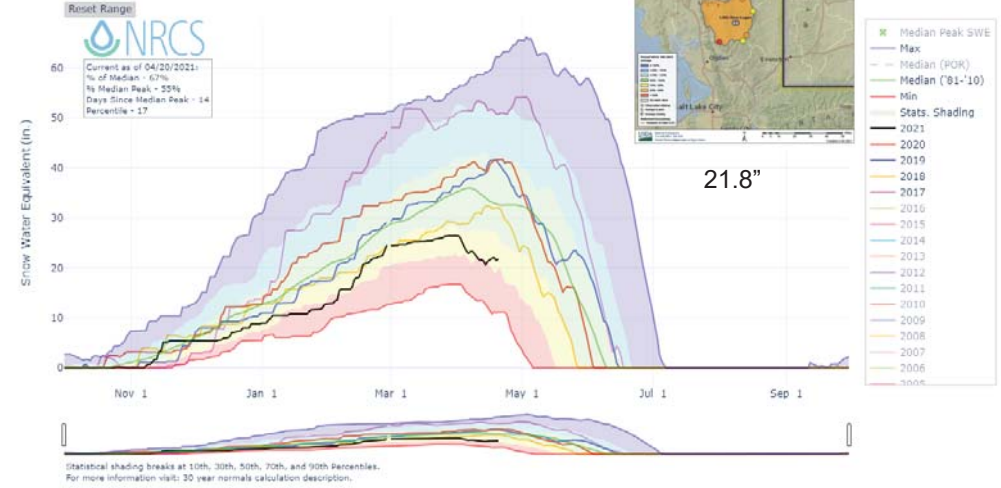




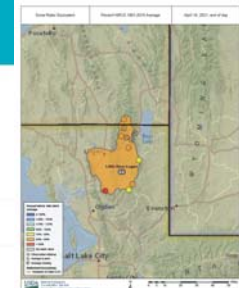
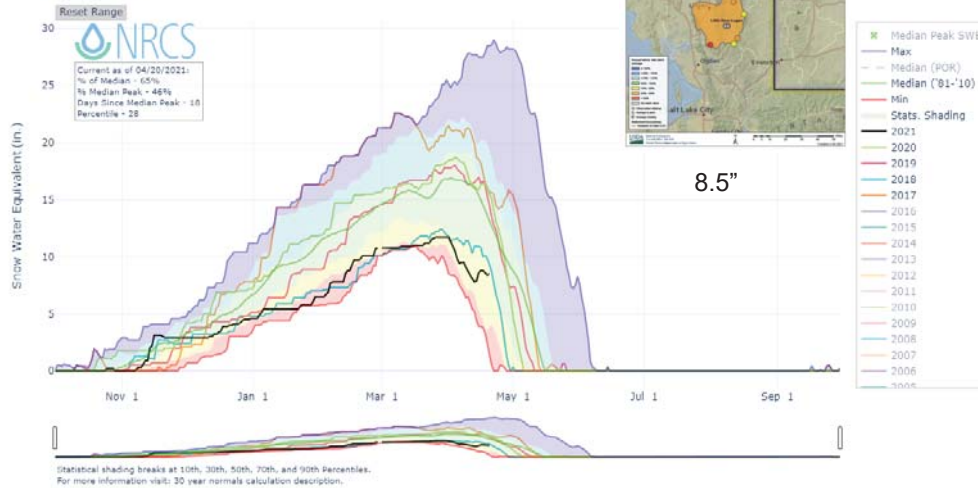
### SNOW WATER EQUIVALENT AT OXFORD SPRING



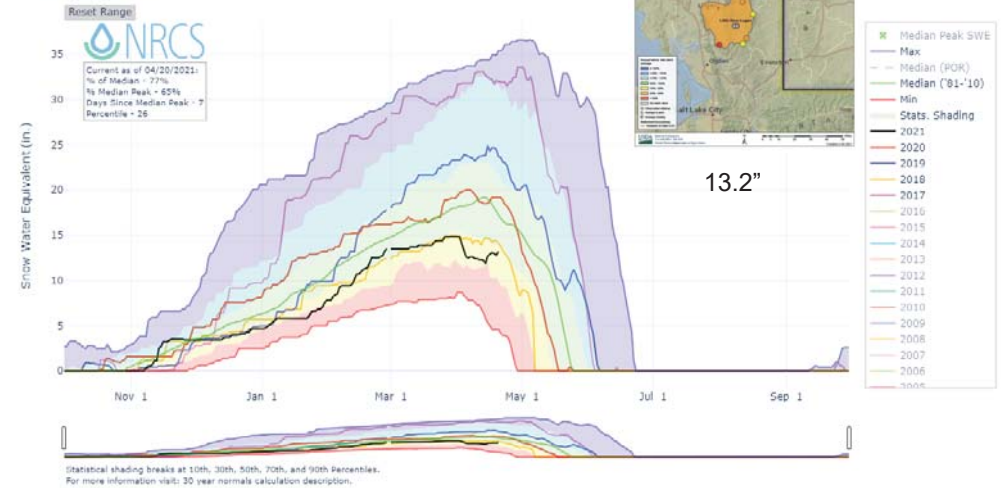
### SNOW WATER EQUIVALENT AT TONY GROVE LAKE



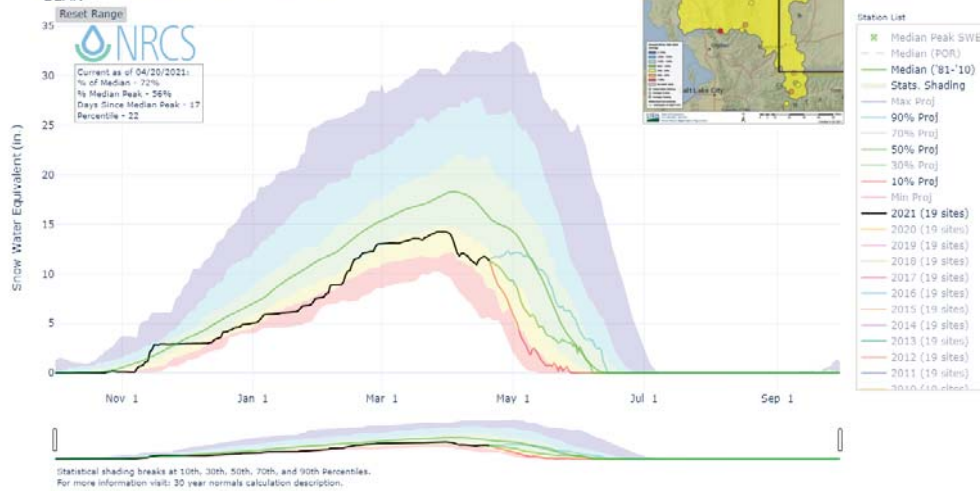
### SNOW WATER EQUIVALENT AT TEMPLE FORK



### SNOW WATER EQUIVALENT AT BUG LAKE

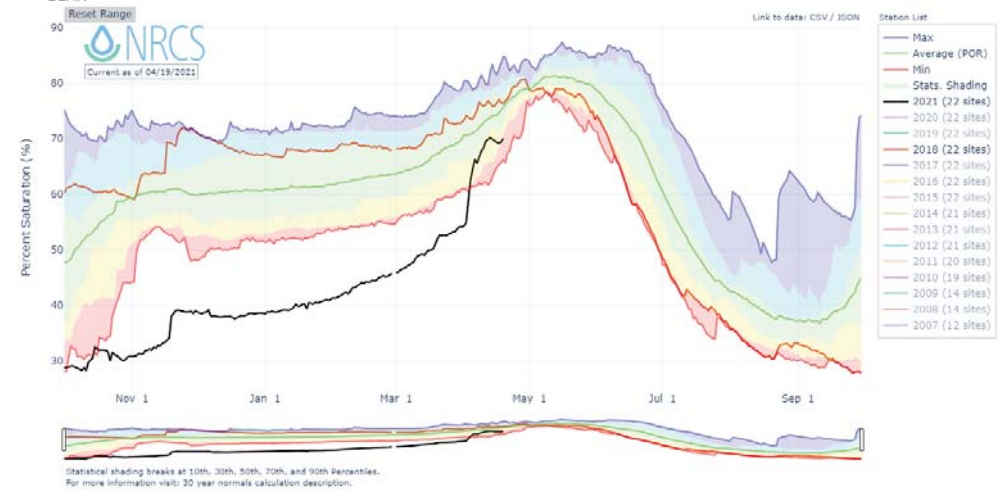


## SNOW WATER EQUIVALENT PROJECTIONS IN BEAR



Natural  
Resources  
Conservation  
Service

## DEPTH AVERAGED SOIL SATURATION IN BEAR



Natural  
Resources  
Conservation  
Service

Data Current as of: 4/5/2021 1:03:32 PM

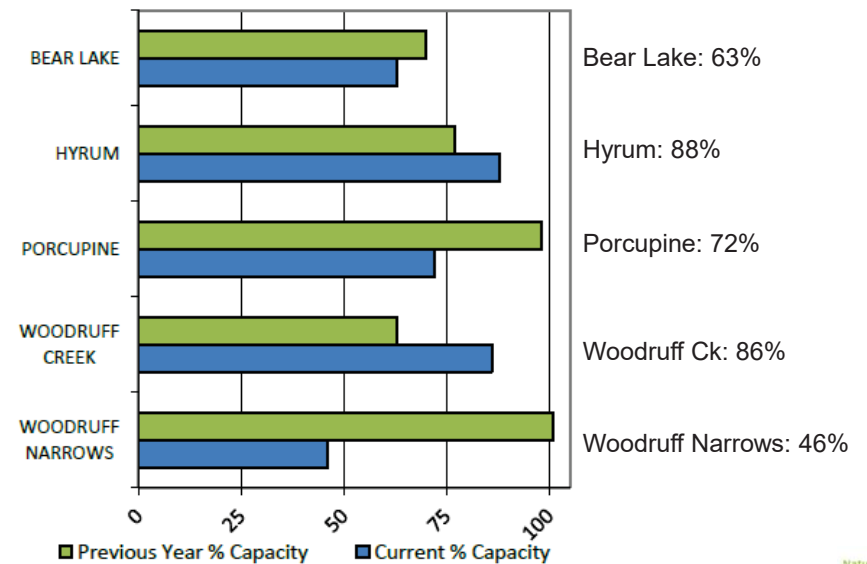
## Bear River Streamflow Forecasts - April 1, 2021

Forecast Period	Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						30yr Avg (KAF)
	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Bear R nr UT-WY State Line	37	56	69	62%	82	101	112
Bear R ab Resv nr Woodruff	41	63	77	63%	92	113	123
Big Ck nr Randolph	4.8	22	47	39%	77	122	121
Smiths Fk nr Border	1.28	16.2	49	38%	82	130	128
Bear R bl Stewart Dam	0.08	0.34	1	26%	2.1	3.6	3.8
Little Bear at Paradise	35	49	59	66%	69	84	89
Logan R nr Logan	43	60	71	68%	83	99	104
Blacksmith Fk nr Hyrum	3.7	16.5	52	28%	94	157	183
	4.1	18.4	58	28%	106	176	205
	1.35	4	11.2	25%	18.4	29	45
	36	52	63	57%	74	90	111
	1.29	7	15.5	36%	24	37	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

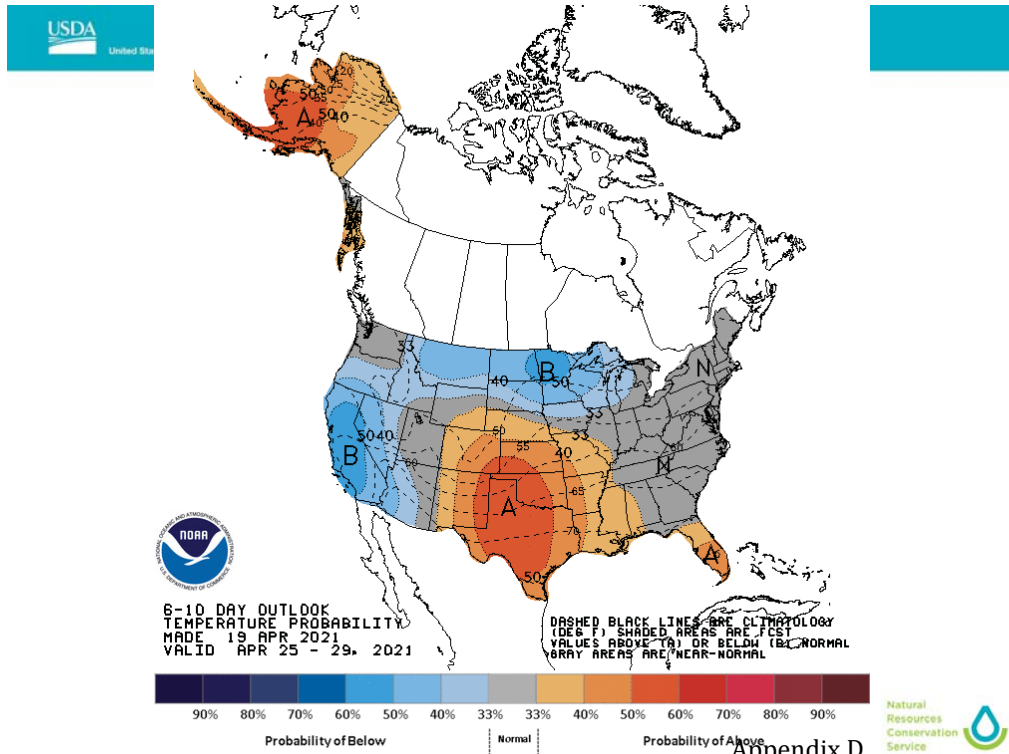
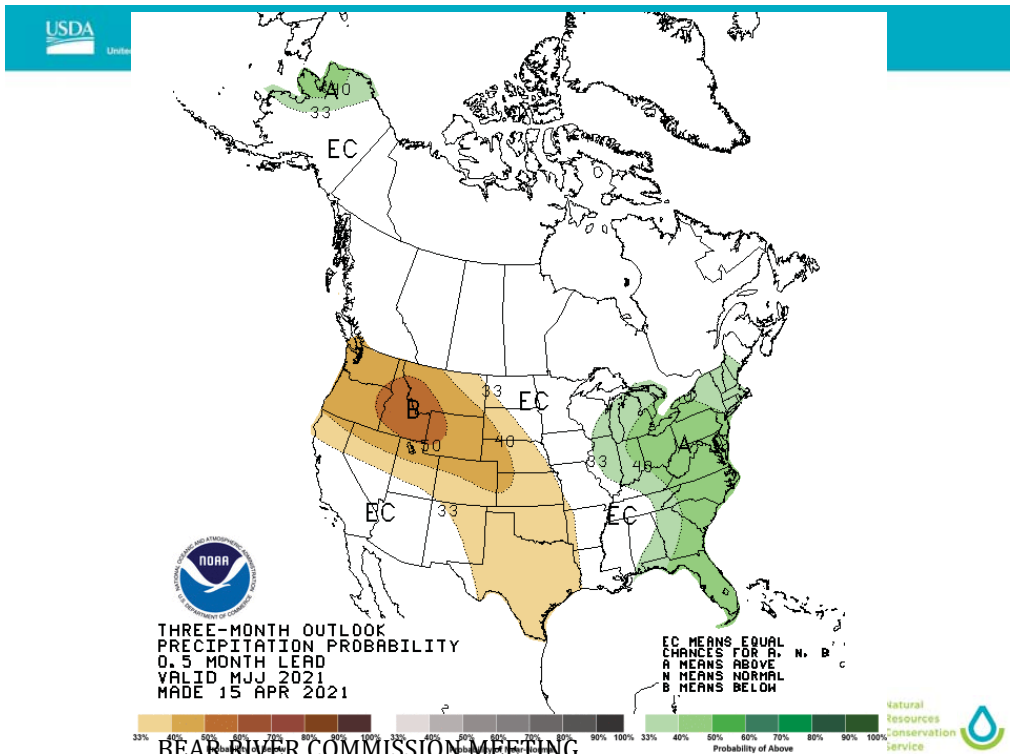
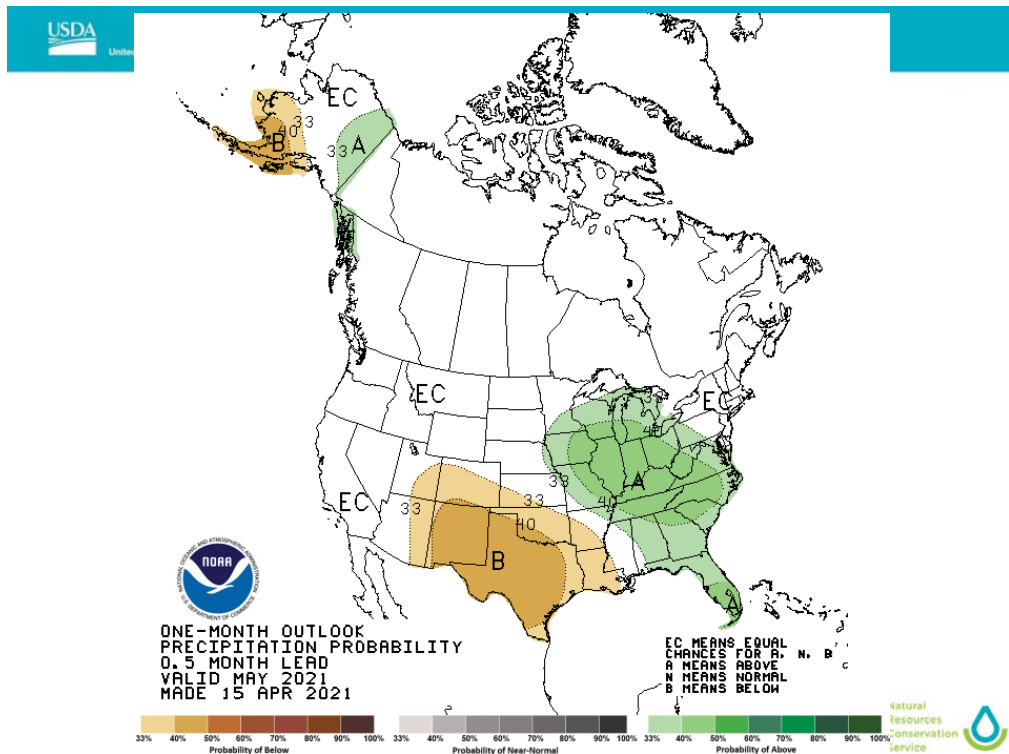
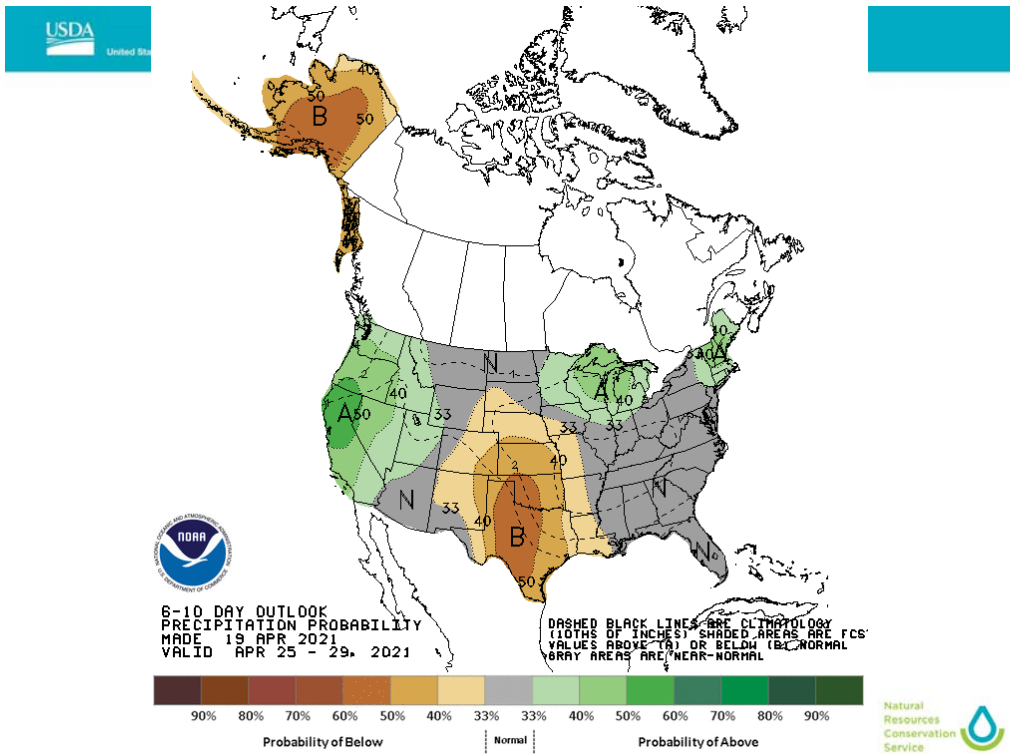
Natural  
Resources  
Conservation  
Service

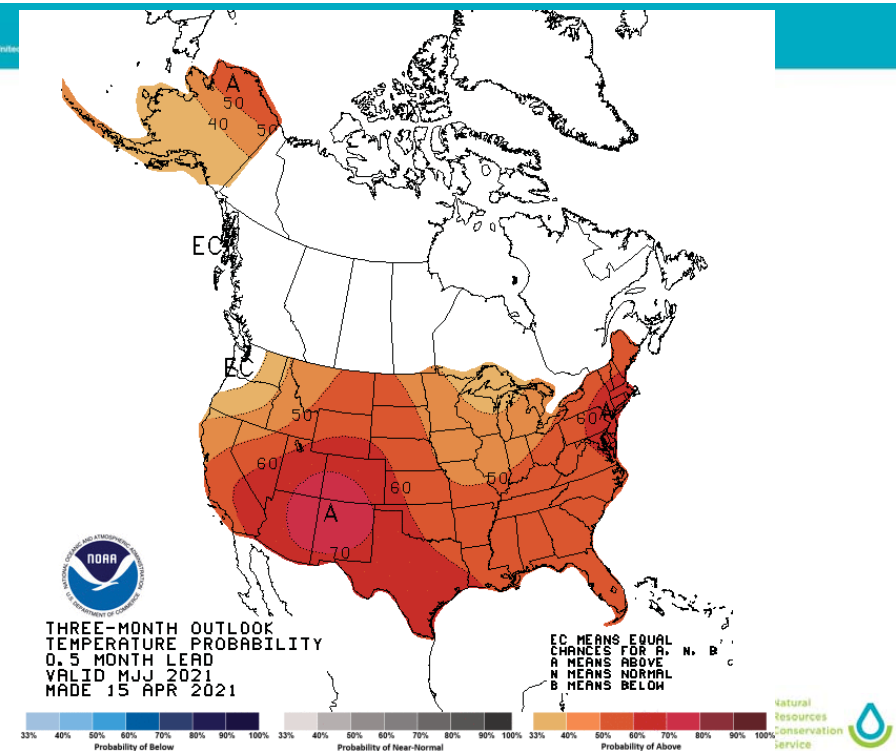
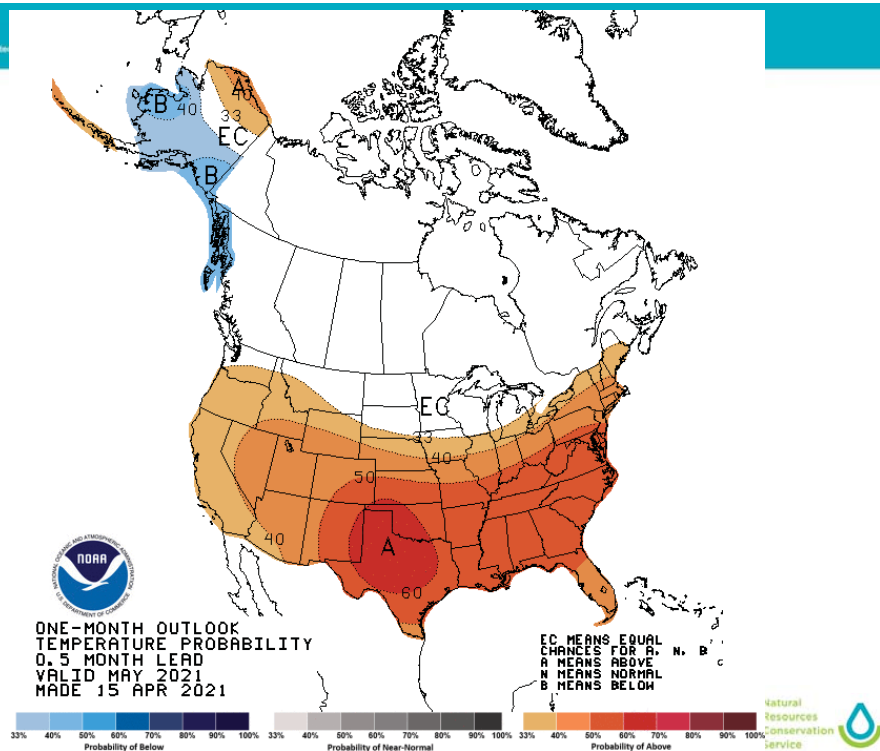
## Reservoir Storage



Natural  
Resources  
Conservation  
Service







## Summary

1. Snowpack has peaked and is melting off.
2. Below normal snowpack conditions.
  1. Snowpack peak normal was ~79%.
3. Soil moisture was at record low going into WY21.
  1. Currently increasing will meltout.
4. Reservoirs at 63% compared to 72%.
5. Forecast streamflow range from 25% - 68% of average.
6. Expect below normal streamflow due to below normal snowpack and dry soils.



# Bear Lake Storage Analysis

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Connely K. Baldwin, PacifiCorp  
David J. Hoekema, Idaho Department of Water Resources  
Ethan T. Geisler, Idaho Department of Water Resources  
Carlyle Burton, Utah Division of Water Resources  
David W. Neumann, Center for Advanced Decision Support for Water and  
Environmental Systems, University of Colorado, Boulder



A summary of the report "Impacts on Bear Lake Storage under Alternative High-Runoff Management Operations"

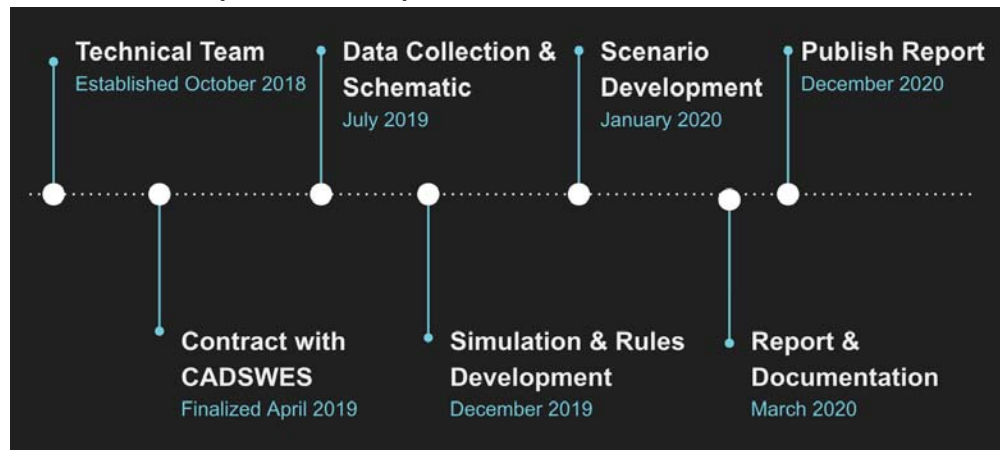
## Purpose of Study

- Quantify the volume of additional water that could have been stored in Bear Lake from 1980 – 2018 by adjusting flood control target elevations and downstream flow constraints
  - \***No policies have been set on use of additional storage**
  - \*\***No new uses of the additional storage have been considered**

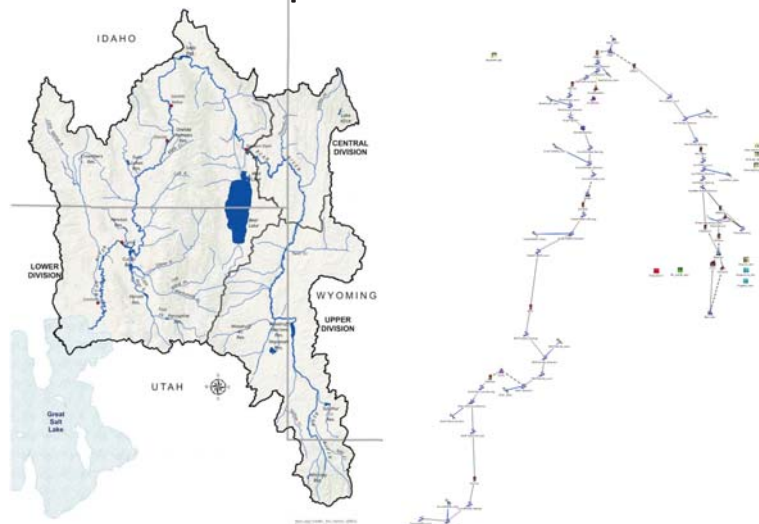
## Study Questions in Phase 1

- How often could Bear Lake have stored additional water?
- What volume of additional storage could have been stored?
- How would Gentile Valley have been impacted?
- How would inflows to Bear Lake from the Bear River have changed?
- How would the 5911.0 elevation have been impacted?
- How would additional storage in Bear Lake have impacted Great Salt Lake?

## Timeline (Phase 1)



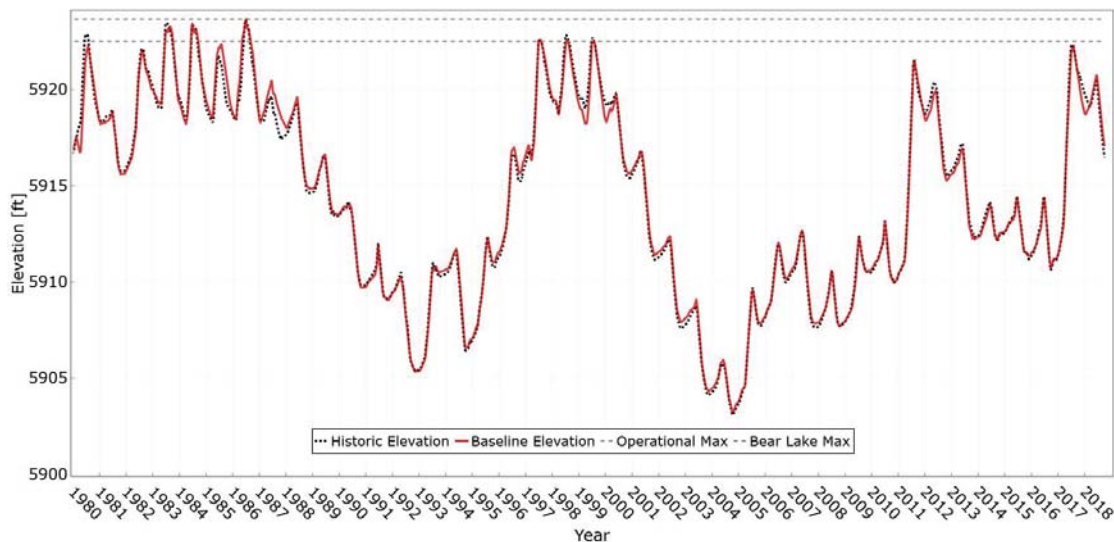
## Model Developed for Lower Division



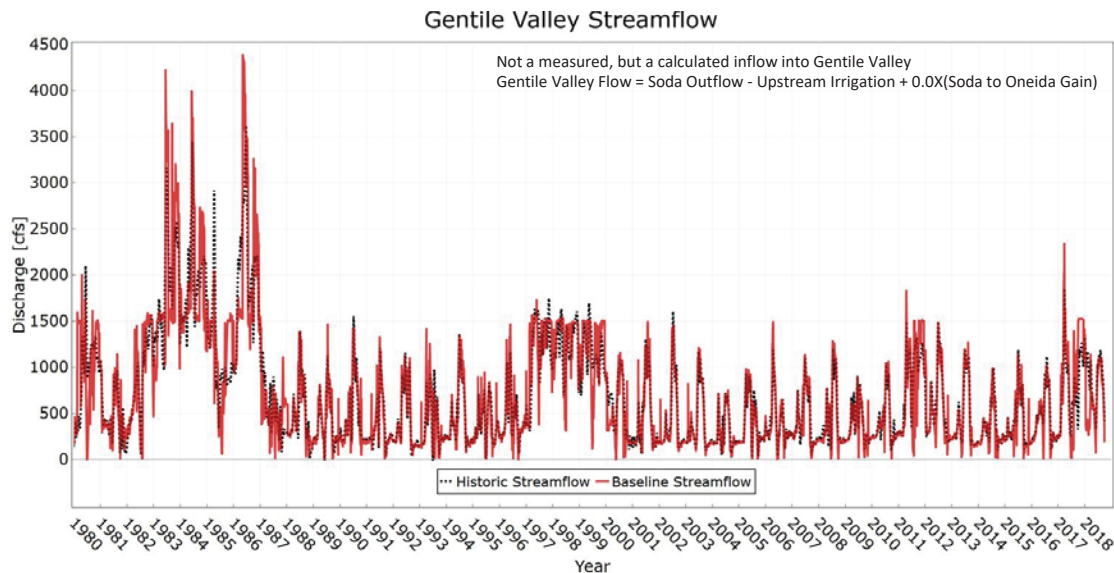
## Data Sources

- Time Period (WY 1980 to 2018)
- Data Sources
  - Rainbow Inflow
  - USGS Streamflow
  - PC reservoir content
  - Historic Irrigation Use
  - Hydrologic Inflow to Bear Lake
  - Reach Gains (based on historic streamflow, reservoir content, and irrigation use)
- Rules (model code) control operations of the Bear Lake / Mud Lake Complex

## Model Calibration: Bear Lake



## Model Calibration: Gentile Valley



## Baseline Scenario

- High-runoff management factors:
  - Pre-runoff Target Elevation (PTE)
  - Gentile Valley Target Maximum Flow (GVtmf)
- Bear Lake operations informed by runoff forecasts
  - Default PTE:** 5918 feet (*August to December*)
  - Range PTE:** 5916 to 5920 feet (*January to March*)(FIRO)
  - Spring Fill Target:** 5922.5 feet
  - Ordinary High Water Mark (OHWM):** 5923.65 feet
  - Gentile Valley Target Maximum Flow (GVtmf):** 1500 cfs

## Scenarios Analyzed

PTE <sub>a</sub> (feet)	Scenario Default PTE	Scenario Indices GVtmf (cfs)			
		1,500	2,000	2,600	3,000
+3.5	5,921.5	37	38	39	40
+3.0	5,921.0	33	34	35	36
+2.5	5,920.5	29	30	31	32
+2.0	5,920.0	25	26	27	28
+1.5	5,919.5	21	22	23	24
+1.0	5,919.0	17	18	19	20
+0.5	5,918.5	13	14	15	16
0.0	5,918.0	9*	10	11	12
-0.5	5,917.5	5	6	7	8
-1.0	5,917.0	1	2	3	4

Scenarios	9	22	31	35	36	
Default PTE	5918.0	5919.5	5920.5	5921.0	5921.0	[ft]
Max PTE	5920.0	5921.5	5922.5	5923.0	5923.0	[ft]
Min PTE	5916.0	5917.5	5918.5	5919.0	5919.0	[ft]
Target Fill	5922.5	5922.5	5922.5	5923.0	5923.0	[ft]
GVtmf	1500	2000	2600	2600	3000	[cfs]
OHW	5923.65 ft					



## Simulation Methods

**No policy for additional storage use defined at this time.**

**No new demands have been included, only includes historical uses.**

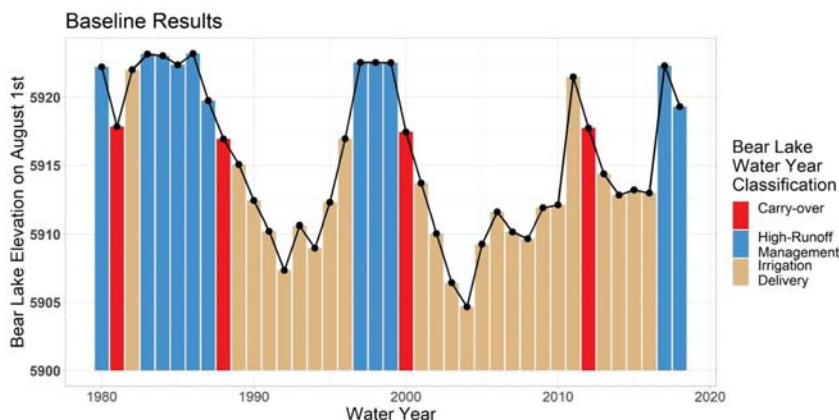
**Continuous Simulation**--the additional storage is carried over from year to year

**Yearly Simulation**--the reservoir is reset to the Baseline each August (removes additional storage from the reservoir)

\*Results from both methods used perfect streamflow forecasts

**Question:** When is Additional Storage Available?

**Answer:** When entering into a drought cycle.





## Question: How Much Additional Storage?

Answer: In carryover years, 58,000 ac-ft per 1-foot increase in PTE.

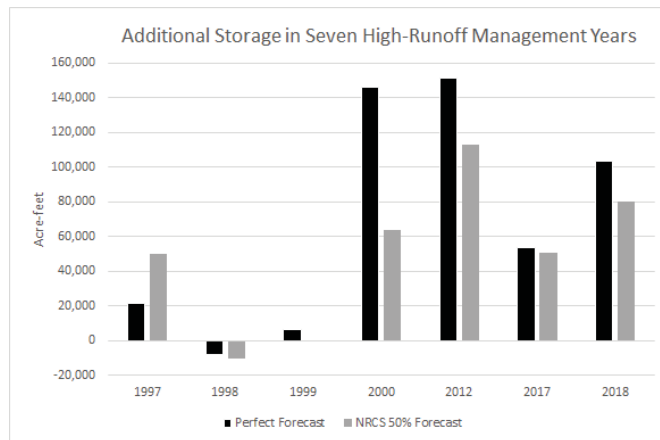
Bear Lake - Average additional volume on August 1st for carry-over years (TAF)					
PTEra (ft.)	Scenario Default	GVtmf			
		1500	2000	2600	3000
3.5	5921.5	197	197	197	197
3.0	5921.0	168	168	168	168
2.5	5920.5	138	138	138	138
2.0	5920.0	111	111	111	111
1.5	5919.5	84	84	84	84
1.0	5919.0	57	57	57	57
0.5	5918.5	31	28	28	28
0.0	5918.0	0	-7	-7	-7
-0.5	5917.5	-25	-39	-40	-40
-1.0	5917.0	-46	-71	-72	-72

TAF (thousand acre-feet)



## Question: How do forecasts affect storage?

Perfect vs. Imperfect(actual)



Scenario 31

## Question: What is the impact on Gentile Valley?

Answer: Have to pass more flow through the valley.



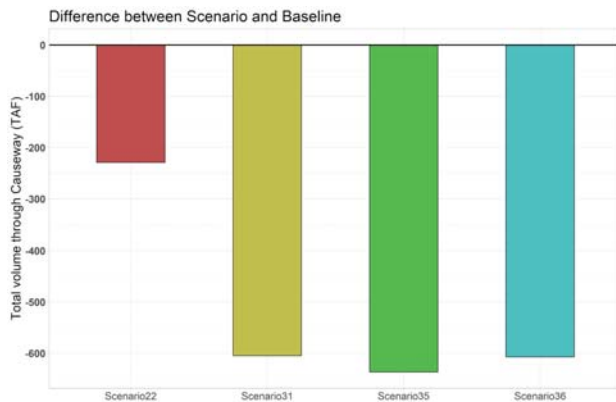
Gentile Valley									
PTEra (feet)	Scenario Default PTE	Number of years with winter (Jan-Mar) peak flow above baseline peak and well above target threshold.				Number of years with spring (Apr-Jul) peak flow above baseline peak and well above target threshold.			
		GVtmf				GVtmf			
		1,500	2,000	2,600	3,000	1,500	2,000	2,600	3,000
3.5	5,921.5	4	1	0	0	6	4	4	3
3.0	5,921.0	3	1	0	0	4	3	1	0
2.5	5,920.5	3	1	0	0	4	2	0	0
2.0	5,920.0	0	0	0	0	5	2	0	0
1.5	5,919.5	0	0	0	0	5	0	0	0
1.0	5,919.0	0	0	0	0	5	0	0	0
0.5	5,918.5	0	0	0	0	4	0	0	0
0.0	5,918.0	0	0	0	0	0	0	0	0
-0.5	5,917.5	0	0	0	0	0	0	0	0
-1.0	5,917.0	0	0	0	0	0	0	0	0

**Question:** What is the impact on Bear Lake inflows?



**Question:** What is the impact on Bear Lake inflows?

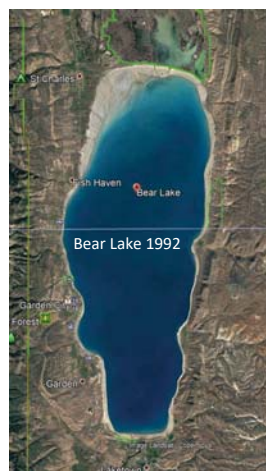
**Answer:** Less inflow from Mud Lake to Bear Lake (higher lake).



**Question:** How is the 5911.0 elevation impacted?

**Answer:** Bear Lake would stay above 5911.0' for longer periods.

Bear Lake - Additional years above 5,911 feet from baseline (equivalent elevation).					
PTEra (feet)	Scenario Default PTE	GVtmf (cfs)			
		1,500	2,000	2,600	3,000
3.5	5,921.5	8.6	8.6	8.6	8.6
3.0	5,921.0	7.4	7.2	7.2	7.2
2.5	5,920.5	5.9	5.8	5.8	5.8
2.0	5,920.0	5.0	4.9	4.9	4.9
1.5	5,919.5	4.3	4.1	4.1	4.1
1.0	5,919.0	3.6	3.1	3.0	3.0
0.5	5,918.5	2.0	1.6	1.4	1.4
0.0	5,918.0	0.0	-0.5	-0.6	-0.6
-0.5	5,917.5	-1.1	-2.4	-2.4	-2.4
-1.0	5,917.0	-2.5	-4.0	-4.0	-4.0





**Question:** How would Great Salt Lake be impacted

**Answer:** The cumulative loss to GSL over 39 years:

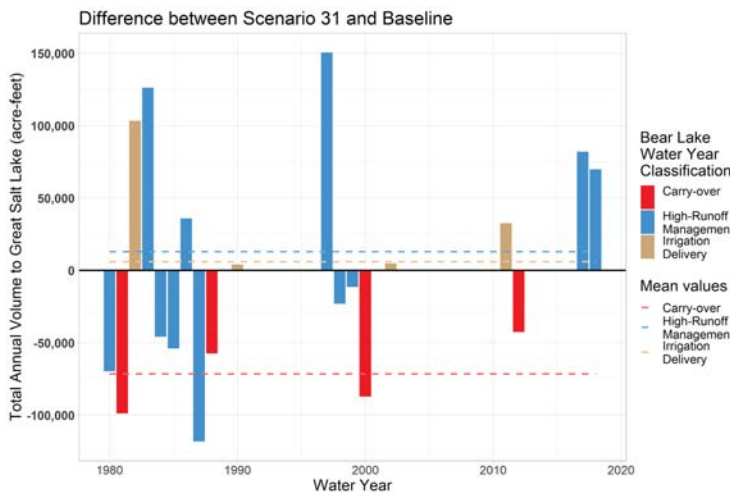
Change in total flow to GSL (TAF)					
PTEra (ft.)	Scenario Default	GVtmf			
		1500	2000	2600	3000
3.5	5921.5	-1711	-1684	-1683	-1682
3.0	5921.0	-1256	-1221	-1196	-1192
2.5	5920.5	-816	-739	-683	-674
2.0	5920.0	-687	-631	-576	-558
1.5	5919.5	-518	-458	-380	-362
1.0	5919.0	-338	-219	-145	-126
0.5	5918.5	-178	12	110	123
0.0	5918.0	0	278	375	384
-0.5	5917.5	132	500	571	575
-1.0	5917.0	249	695	758	761



Yearly Simulation method assumes complete consumptive use of all additional storage water.  
This is not going to happen.

**Question:** How would Great Salt Lake be impacted

**Answer:** The timing of flows to GSL would change some years



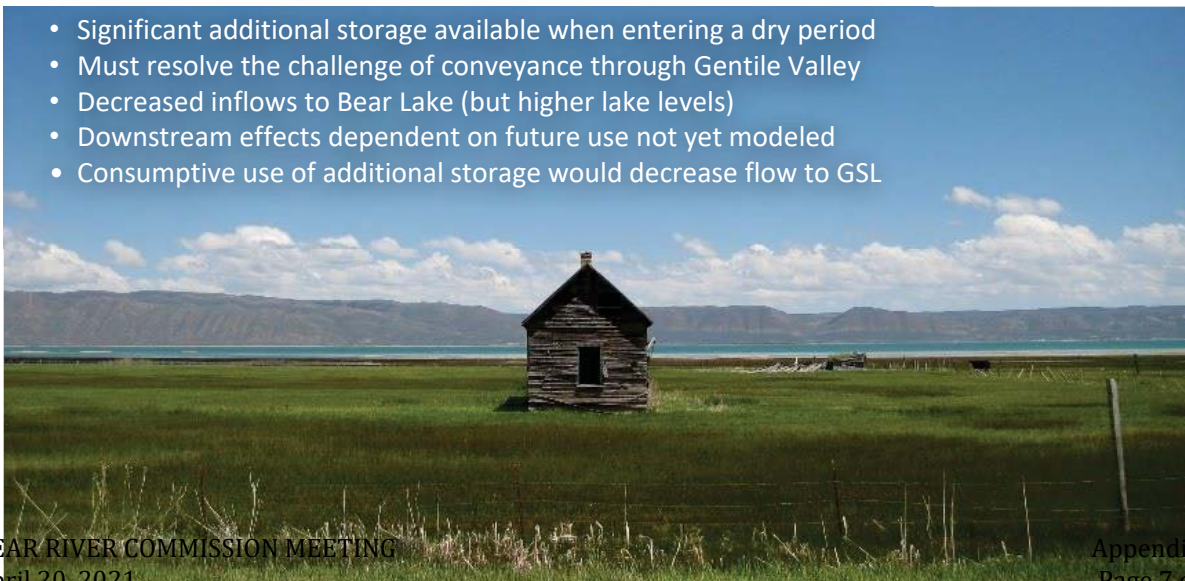
If additional storage remained in Bear Lake...

- No overall change to volume
- Change in timing

Continuous Simulation method assumes No consumptive use of additional storage water.

## Summary of Results

- Significant additional storage available when entering a dry period
- Must resolve the challenge of conveyance through Gentile Valley
- Decreased inflows to Bear Lake (but higher lake levels)
- Downstream effects dependent on future use not yet modeled
- Consumptive use of additional storage would decrease flow to GSL



# Modeling Recommendations

- Continue cooperative development, maintenance, and refinement
- Model updates and potential studies
- Continue stakeholder engagement



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# SUMMARY OF WATER YEAR 2020 BEAR LAKE OPERATIONS

Date	Hydrologic Information/Event	Contents (% of Full) Discharge (% of Normal)
10-01-19	Bear Lake Beginning Elevation - 5,917.89 ft.	1,018,257 af (72%)
11-04-19	Bear Lake Low Elevation - 5,917.84 ft. (see note 1)	1,014,802 af (71%)
	Rainbow Inlet Canal Discharge	208,000 af (79%)
	Bear River Discharge Below Stewart Dam	2,600 af
	Bear Lake Net Runoff (Computed Total Inflow less Lake Evaporation)	180,000 af (56%)
07-07-20	Bear Lake High Elevation - 5,919.46 ft.	1,127,305 af (79%)
	Outlet Canal Releases: 11/18 - 3/31; 6/1 - 10/4 (126 days irrigation releases)	281,000 af
07-16-20	Outlet Canal Maximum Release - 1,700 cfs	
	Bear Lake Storage Release (see note 2, irrigation release 116,100 acre-feet)	145,000 af
09-30-20	Bear Lake Ending Elevation - 5,916.35 ft.	912,473 af (64%)
	Bear Lake Settlement Agreement "System Loss" Volume	28,900 af

Notes:

1 Low contents prior to start of storage.

2 Net irrigation storage release from Bear Lake, subtracting Rainbow inflow and the decreed adjustment for the natural yield of Bear Lake and Mud Lake area. Includes system loss volume.

3 Due to uncontrolled flow from (welcome) rain events. Whenever water flows below Cutler during the irrigation season any storage water in the system at Cutler is the first water out. Natural flow goes to irrigators.

## Current Status

Daily average Bear Lake elevation for April 18, 2021 was 5916.91 feet. There is 100 cfs in the Rainbow Inlet Canal. The Bear Lake Outlet Canal is closed. Previous seasonal low elevation was 5916.07 feet, which occurred on November 14, 2020.

## Summary of Water Year 2020

The Bear Lake Irrigation Storage Allocation for 2020 was 245,000 acre-feet. Runoff was below normal, with Bear Lake net runoff at 180,000 acre-feet (56% of normal). High runoff management releases were made from November 18, 2019 through March 31, 2020. The Bear Lake Outlet Canal was opened for irrigation releases on June 1 and shut on October 4.

## Water Year 2021 Operations

No high-runoff management releases were made this year. However, the Bear Lake elevation on March 31, 2020 was 5916.78 feet, within the PacifiCorp Target Elevation range of 5916-5920. The Bear Lake Irrigation Storage Allocation for 2021 is 245,000 acre-feet. Based on official forecasts and local Bear Lake watershed net inflow, Bear Lake is estimated to peak mid-May around 5917.5 feet.

## Operational Notes

- *Bear River Black Canyon Recreational Water Releases* – Events have been occurring as usual so far this year. Due to unique operations circumstances and the desire of American Whitewater, the last event of the spring season was moved to occur the weekend after Labor Day.
- *Oneida Reservoir* – In August, Oneida reservoir will be partially drawn down to facilitate boat ramp repairs and extension at the Maple Grove Campground.

## Historical Bear Lake Ice-Over Data and Interesting Features

As a one-time addendum, information about historical Bear Lake ice-over occurrence shared with the Bear Lake Preservation Advisory Committee was requested to also be presented to the Bear River Commission.

Since 1923, the dates when (or if) Bear Lake completely froze over and thawed have been recorded. Bear Lake is judged to have "frozen over" when from a high viewpoint (such as the Logan Canyon overlook) there is no visible open water on the lake. From 1923 to 1999, PacifiCorp personnel made the observations. Since 2000, Scott Tolentino, Utah Division of Wildlife Resources, has kept the record up to date.

The two figures below summarize the occurrence and dates of ice-over/thaw and reveal 3 interesting features of the data. Figure 1 shows the freeze and thaw dates as vertical blue lines with the bottom of the line showing the freeze date and the top of the line showing the thaw date. A grey dot indicates years the lake did not freeze over completely. The orange/red lines show the moving average of the freeze and thaw dates for 10-year/30-year windows (for years the lake froze over). The right axis shows average and earliest freeze/thaw date statistics. One interesting feature is the slight tendency for earlier thaw dates (downward slope of the orange 10-year moving average window). However, preliminary analysis indicates this trend is not statistically significant.

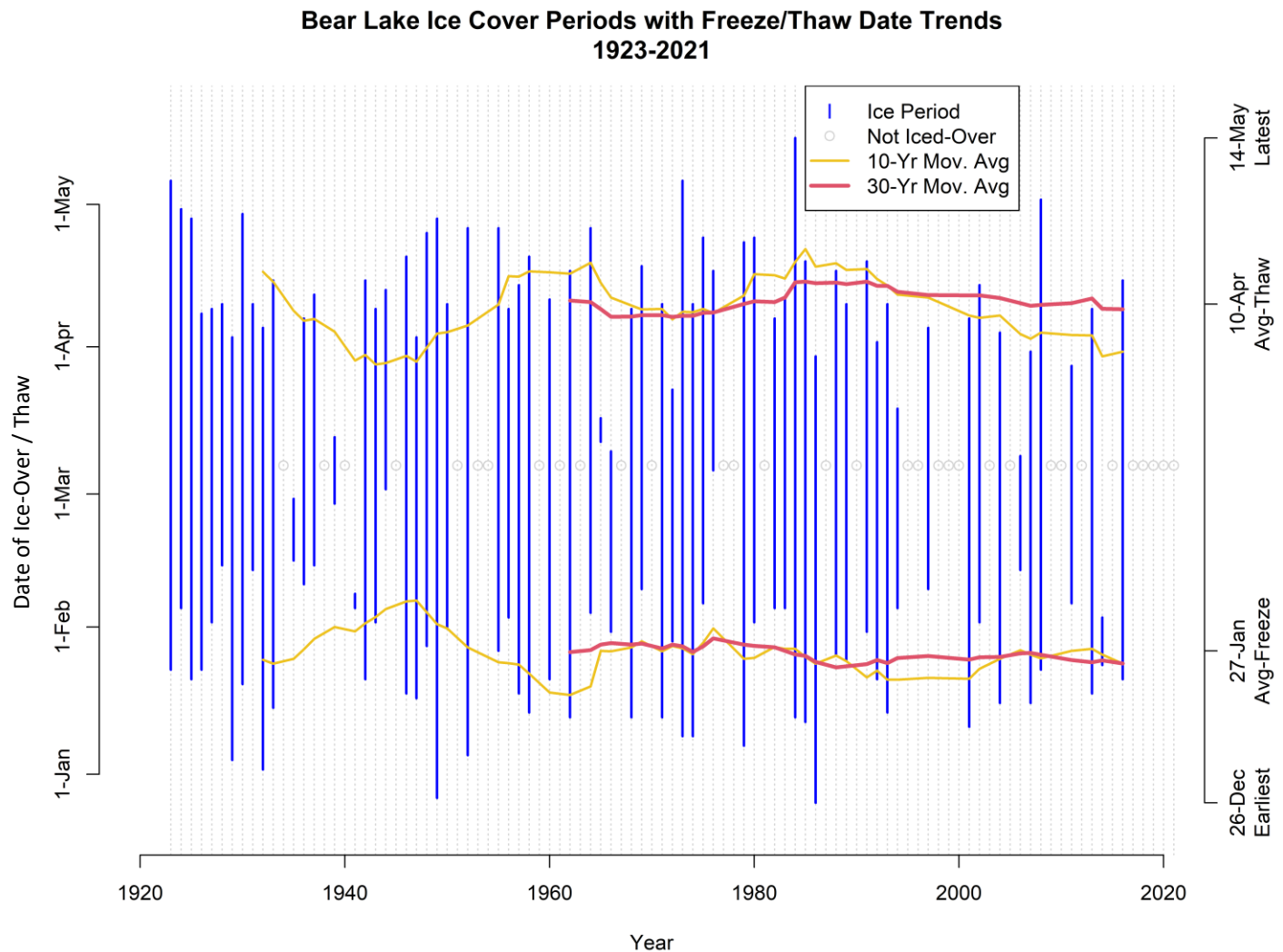


Figure 1. Bear Lake ice cover historical record showing freeze/thaw dates (vertical blue lines) and moving average of freeze/thaw dates (orange and red lines). Grey dots indicate years the lake did not ice over. (The rare December freeze-over dates occurred in the previous calendar year but are plotted to align with the year of thaw).

Figure 2 shows the “probability” or fraction of years in certain periods that the lake completely froze over. The blue tick marks at the top indicate years the lake froze over. The grey tick marks at the bottom indicate years the lake did not freeze over. The horizontal light blue dashed line shows the full period of record freeze-over fraction of 66%, about 2 out of every 3 years. The orange/red lines show the 10-year/30-year moving window fractions of freeze-over years. The second interesting feature is the recent tendency for the lake to freeze over less often, with only 3 out of the last 10 years achieving complete freeze-over (2012-2021). The last interesting feature of the data is that Bear Lake has not frozen over in any of the last 5 years (2017-2021), which is the first time this has occurred in this record. This is indicated by the five open grey circles in Figure 1 and the 5 grey tick marks at the bottom right of Figure 2.

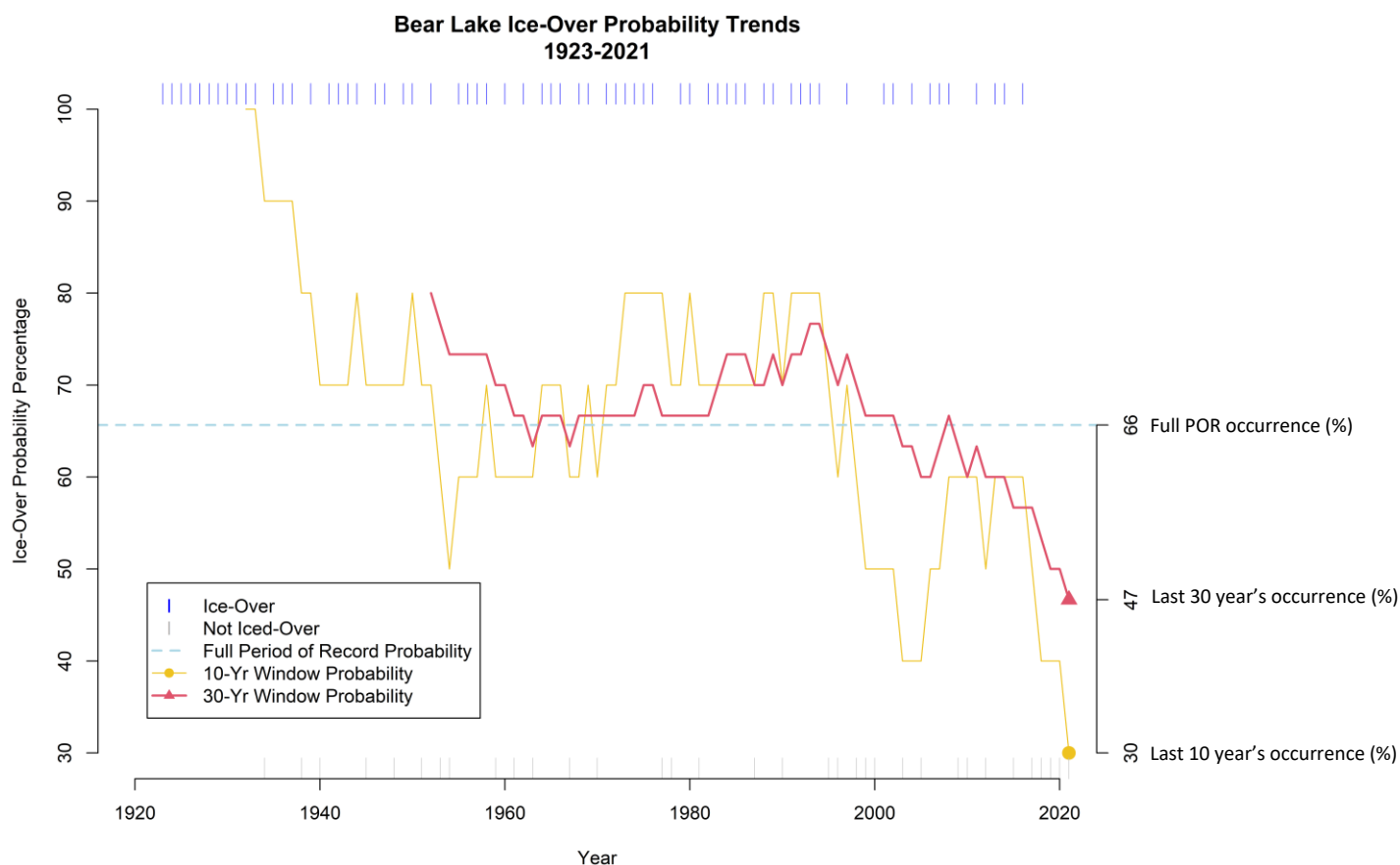


Figure 2. Bear Lake ice-over historical observed occurrence (or "probability"), calculated as the fraction of years the lake iced-over within the period indicated (full period of record, 30-year moving window, 10-year moving window). The right axis emphasizes the most recent moving average percentages of occurrence.