RECLAMATION

Managing Water in the West

March 2019 Henry's Fork Watershed Council
Bureau of Reclamation - Upper Snake Field Office
Water Supply and Operations Update

U.S. Department of the Interior
Bureau of Reclamation

Presentation Outline

Observed Conditions

- ***-Current Reservoir Storage and Operations to Date***
- ***-Temperature***
- ***-Precipitation***
- ***-Streamflow***

Water Supply Forecast

- ***-Methodology and Antecedent Conditions***
- ***-Current Snowpack and Analog Year Comparisons***
- ***-Climate Outlook and Uncertainty***
- ***-BOR Runoff Volume Forecast and Expected Range***

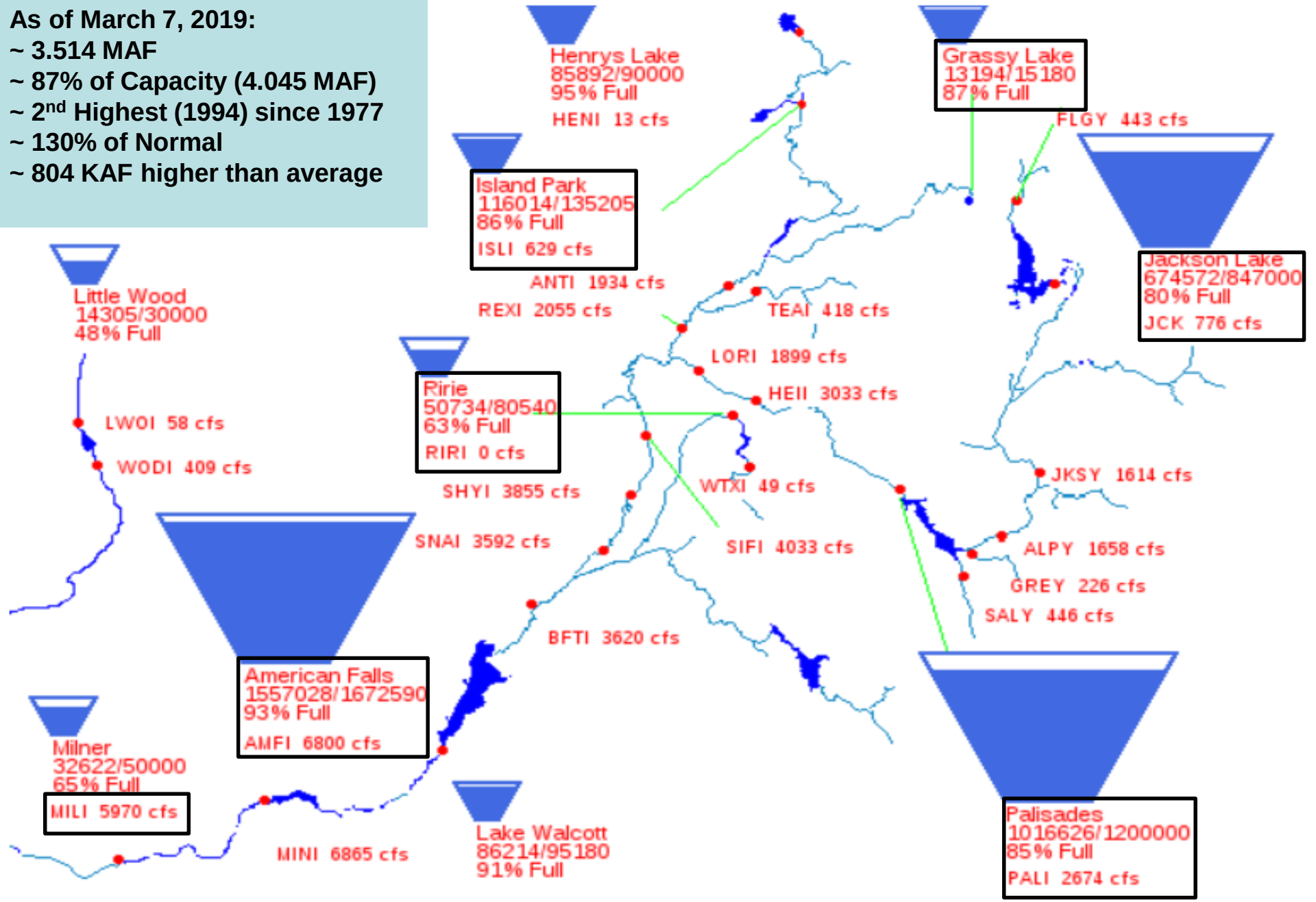
Projected Reservoir Operations

- ***-Operational Approach***
- ***-Projected Reservoir Operations***

Summary and Questions

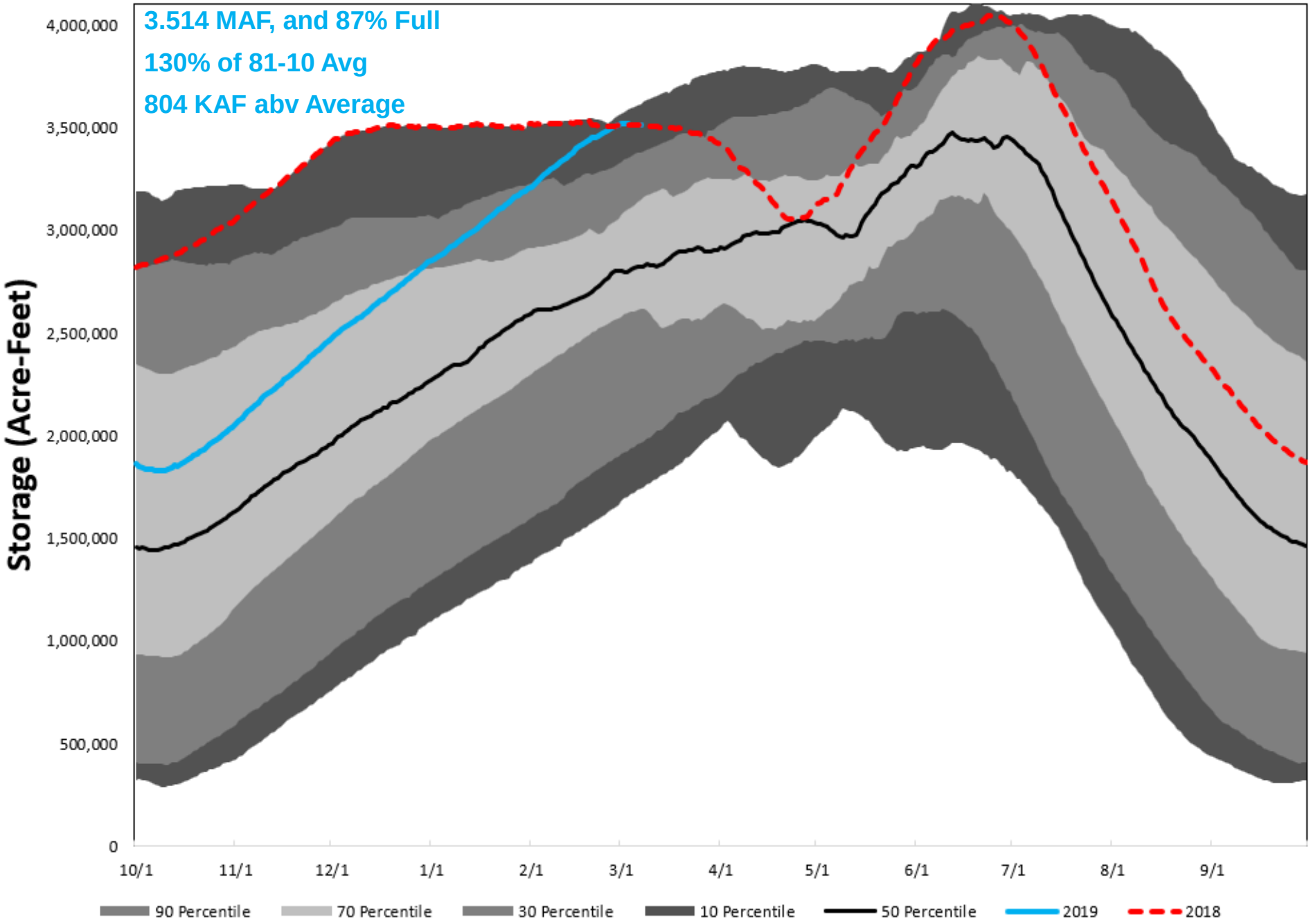
RECLAMATION

As of March 7, 2019:
~ 3.514 MAF
~ 87% of Capacity (4.045 MAF)
~ 2nd Highest (1994) since 1977
~ 130% of Normal
~ 804 KAF higher than average

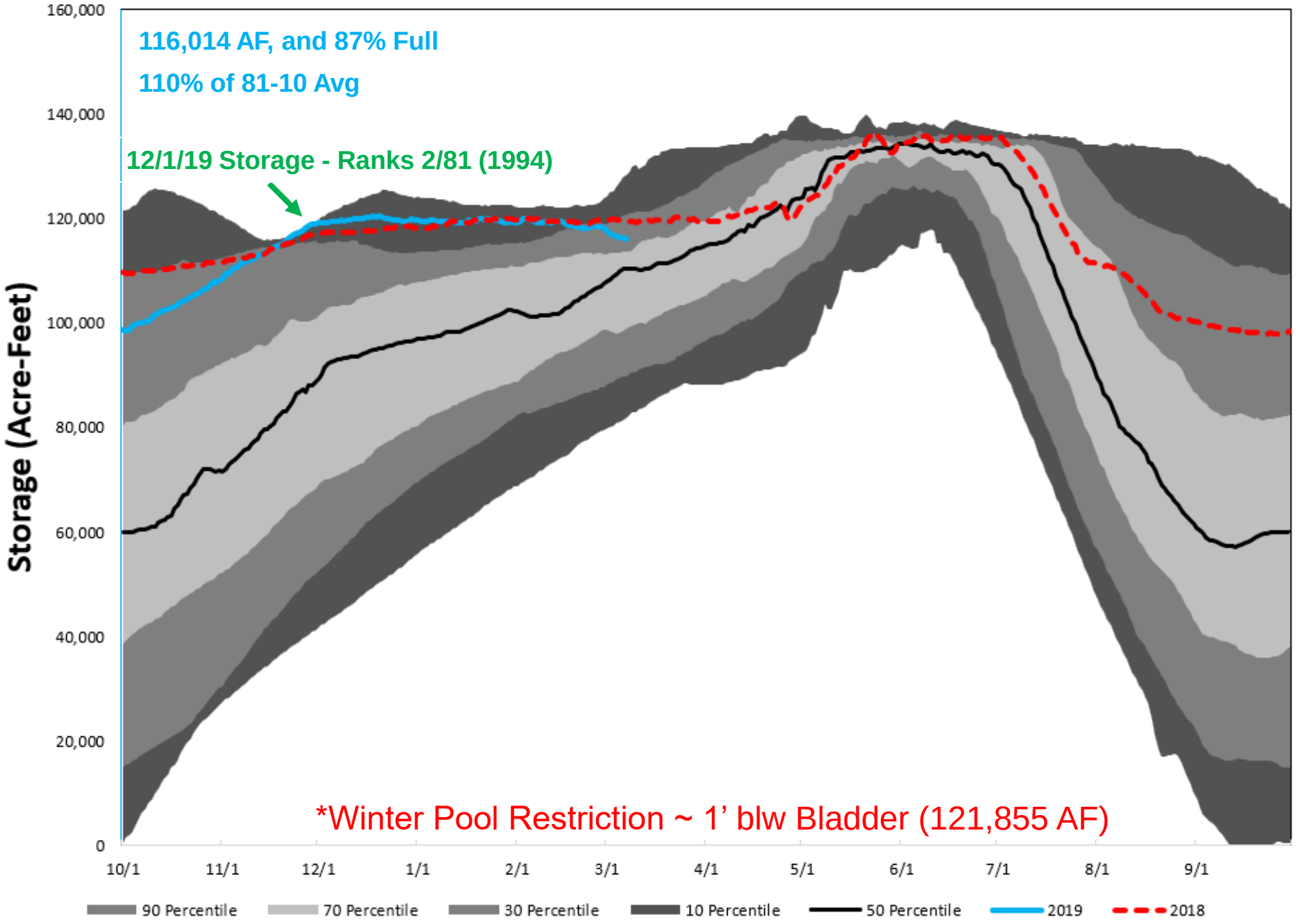


PROVISIONAL DATA - Subject to change

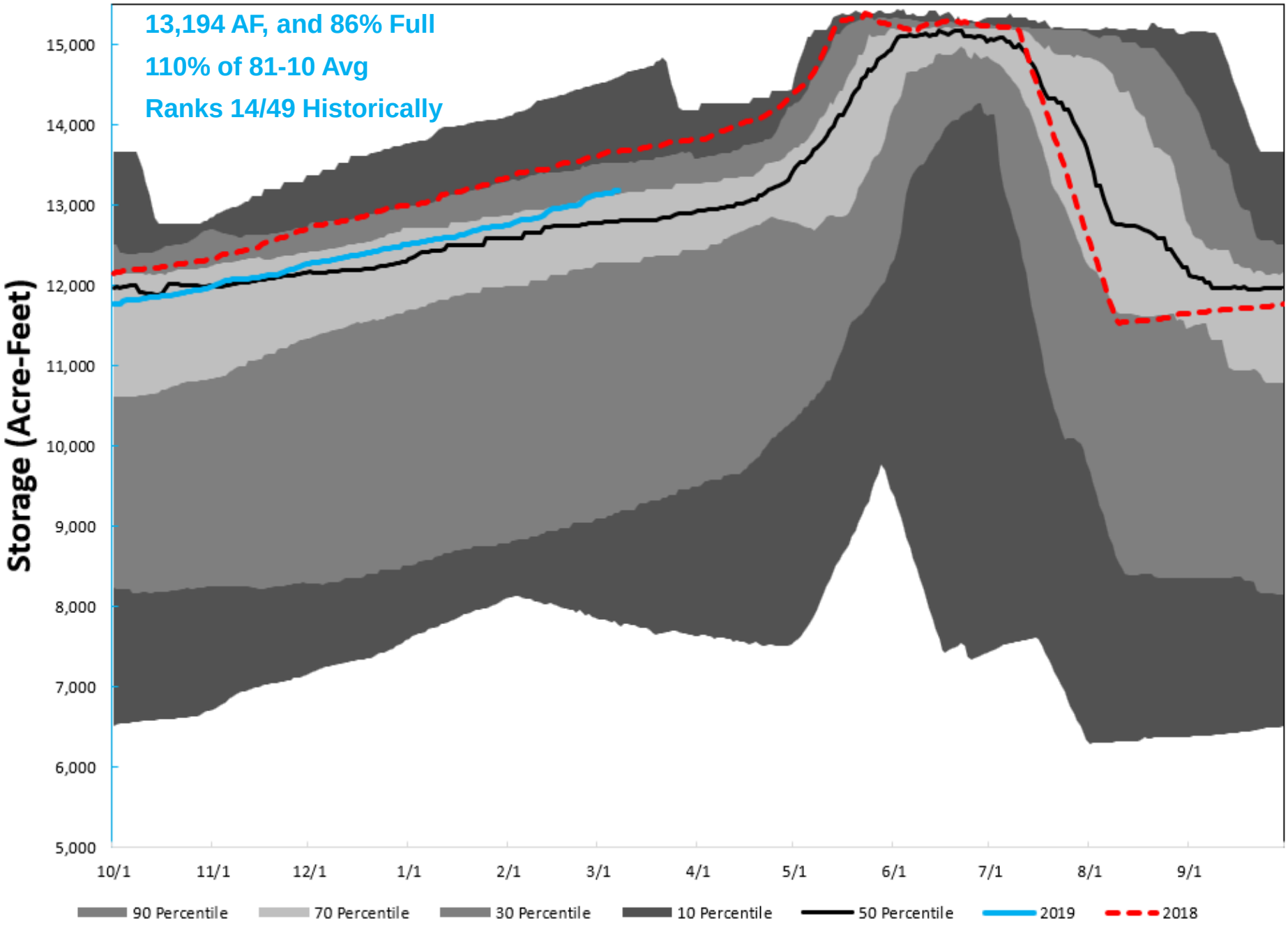
Upper Snake Reservoir System Total Storage (Acre-Feet)



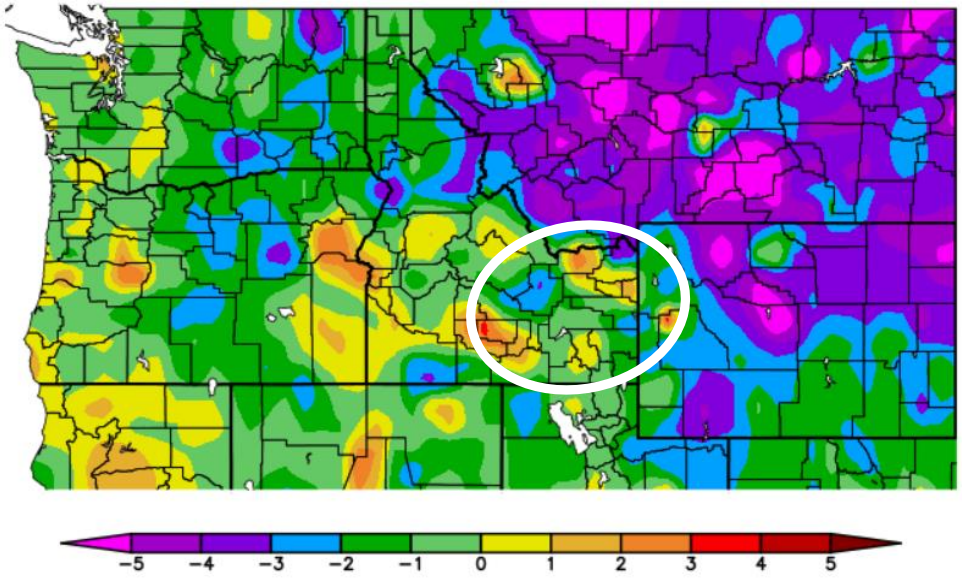
Island Park Reservoir Storage (135,205 Acre-Feet)



Grassy Lake Reservoir Storage (15,200 Acre-Feet)



Departure from Normal Temperature (F)
10/1/2018 – 3/9/2019



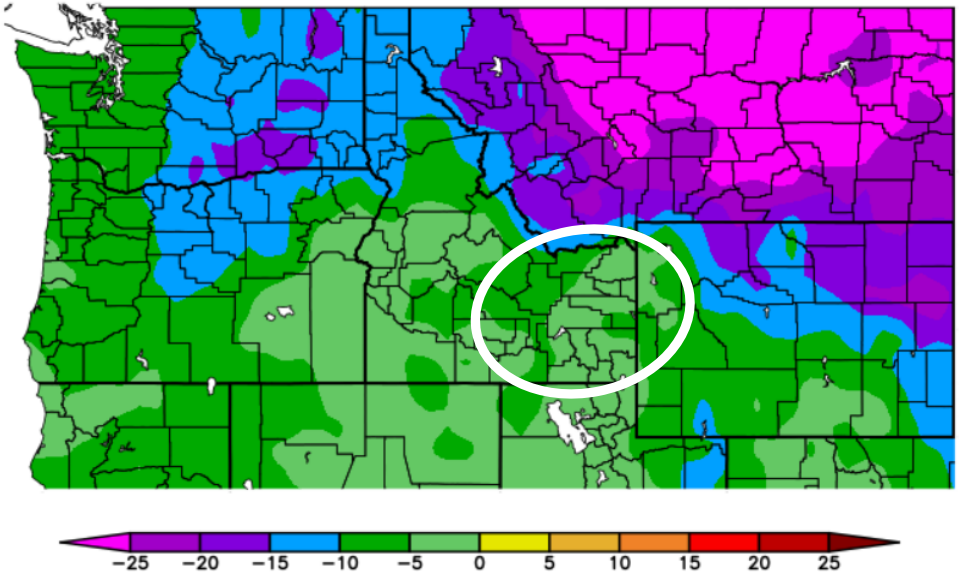
Generated 3/10/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

Observed Climate Conditions

Temperatures
Water Year to Date
30 Days Previous

Departure from Normal Temperature (F)
2/8/2019 – 3/9/2019

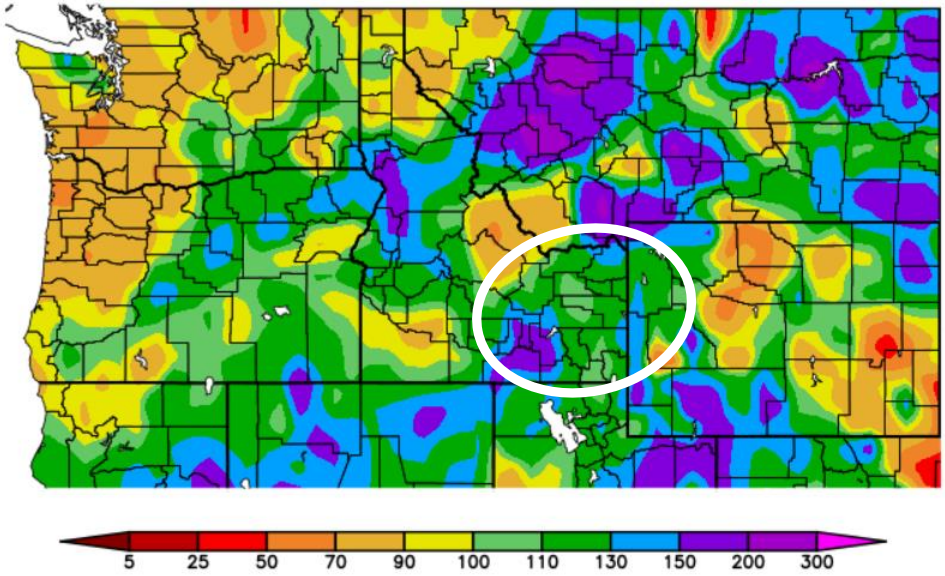


Generated 3/10/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

Overall
Cooler than “Normal” for most

Percent of Normal Precipitation (%)
10/1/2018 – 3/9/2019



5 25 50 70 90 100 110 130 150 200 300

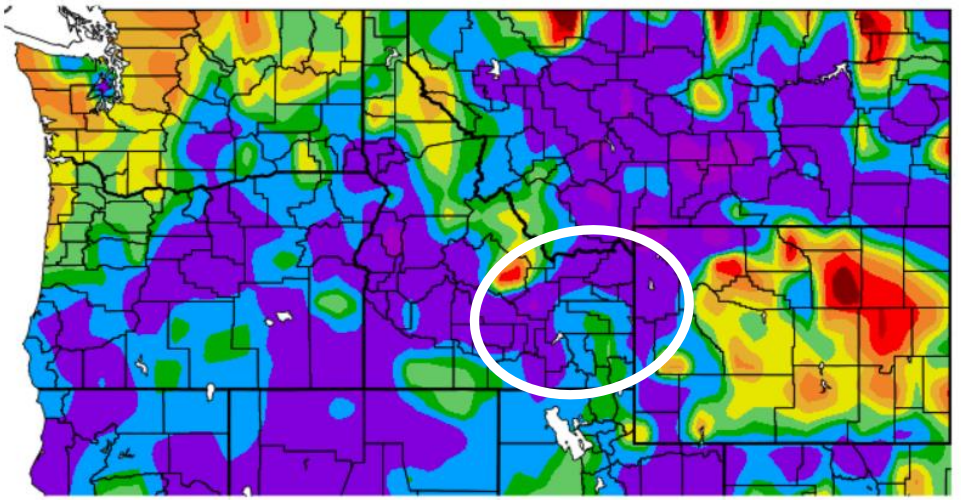
Generated 3/10/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

Observed Climate Conditions

Precipitation
Water Year to Date
30 Days Previous

Percent of Normal Precipitation (%)
2/8/2019 – 3/9/2019



2 5 25 50 75 100 125 150 200 400 800

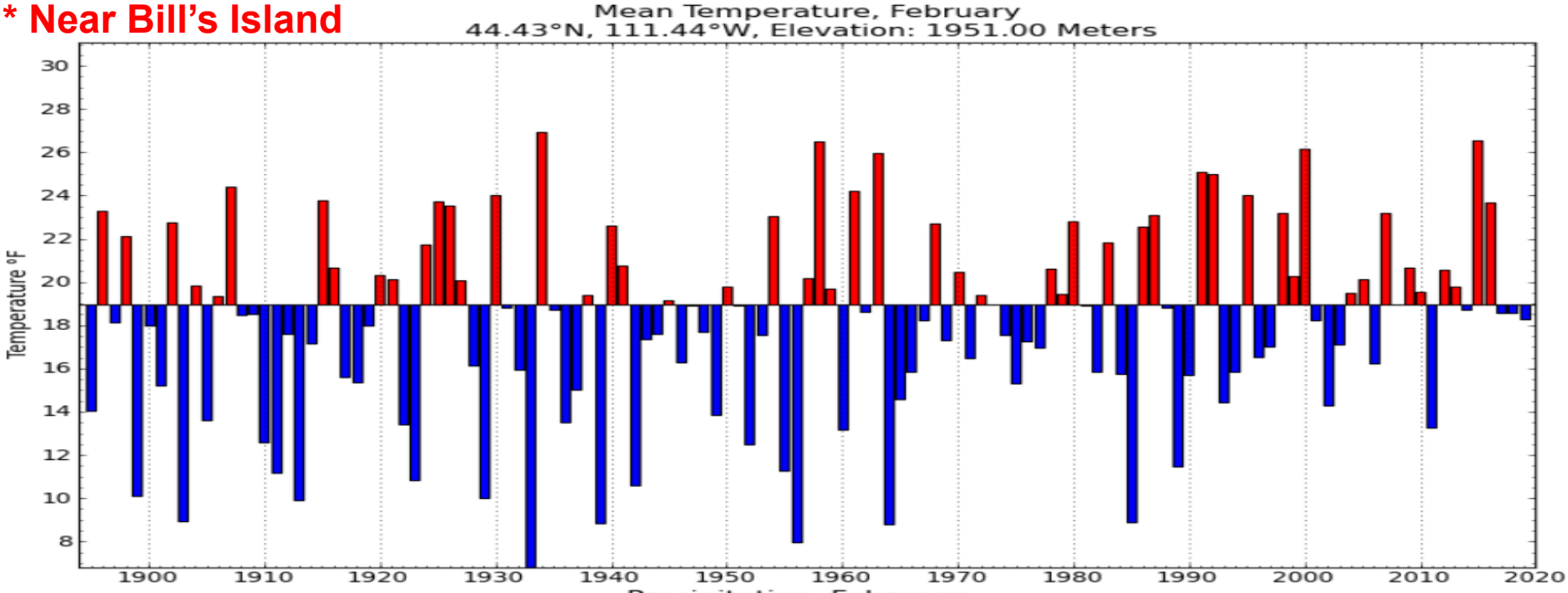
Generated 3/10/2019 at HPRCC using provisional data.

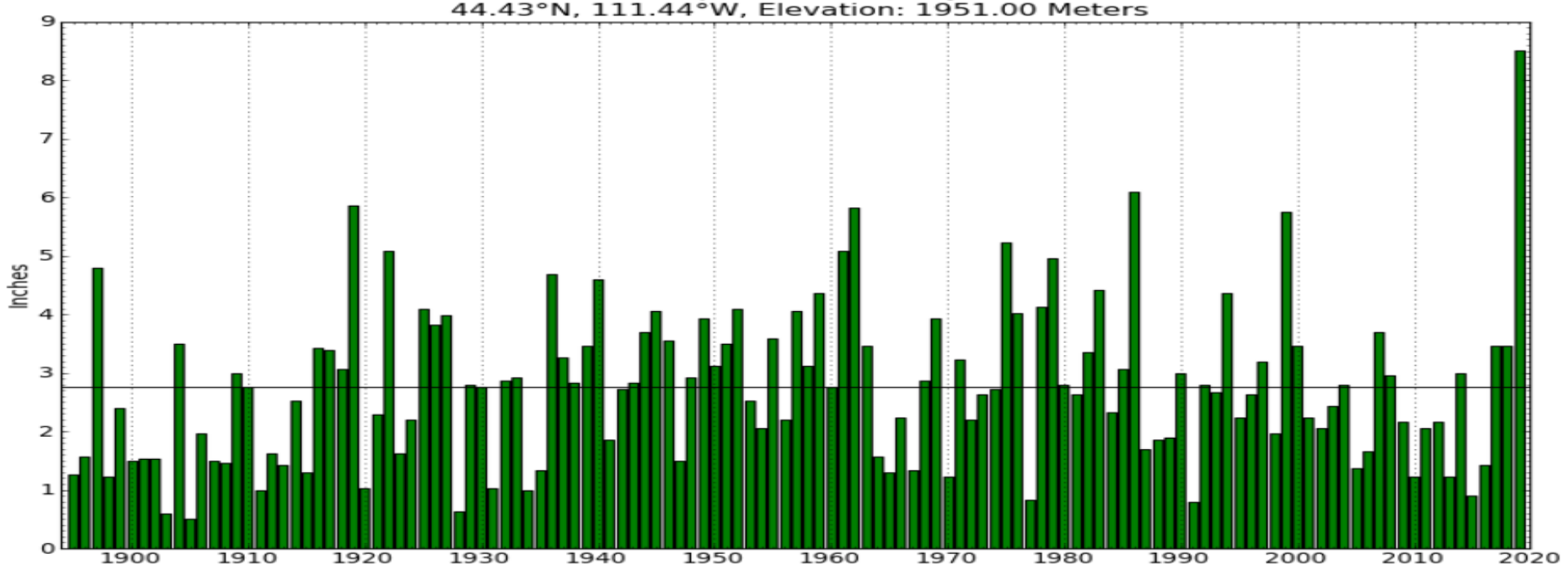
NOAA Regional Climate Centers

Monthly Summary

Oct: Near Normal
Nov: Above
Dec: Well Below
Jan: Below
Feb: Well Above
To Date: ~110-130%

* Near Bill's Island





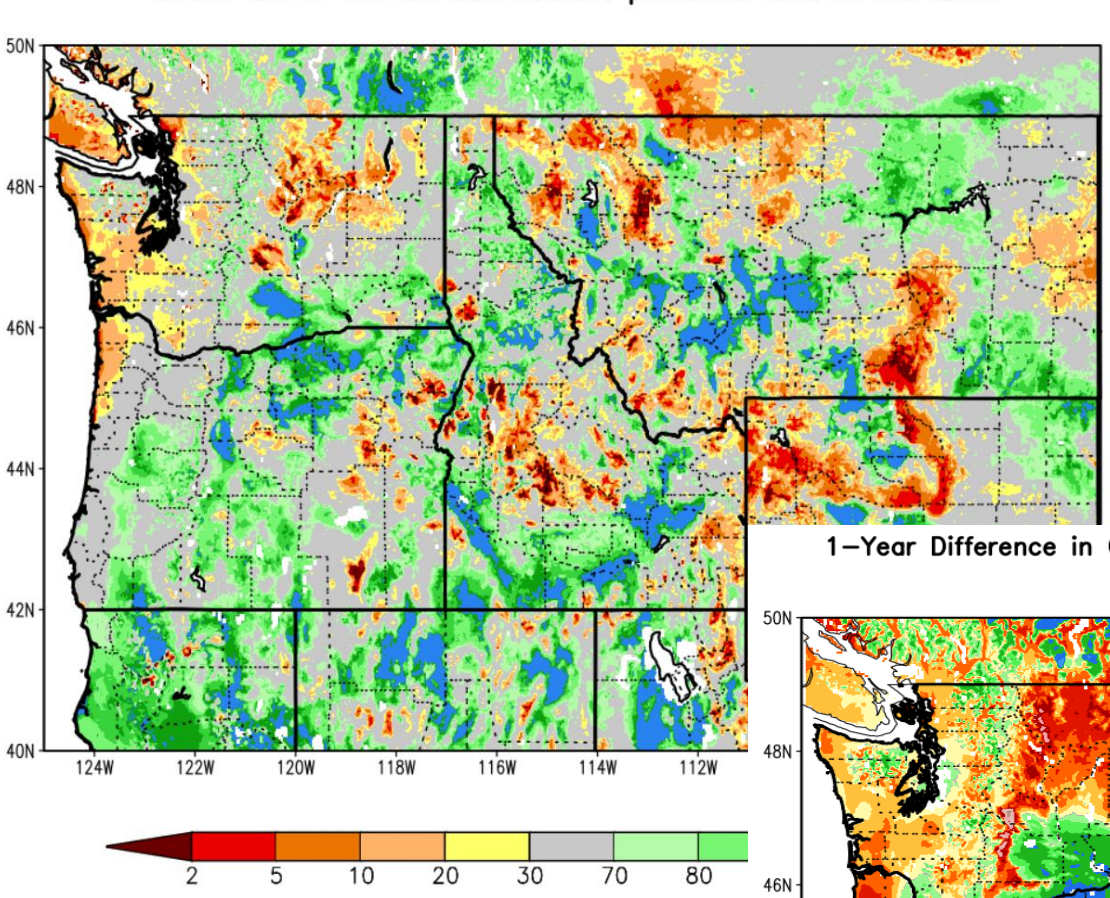
February

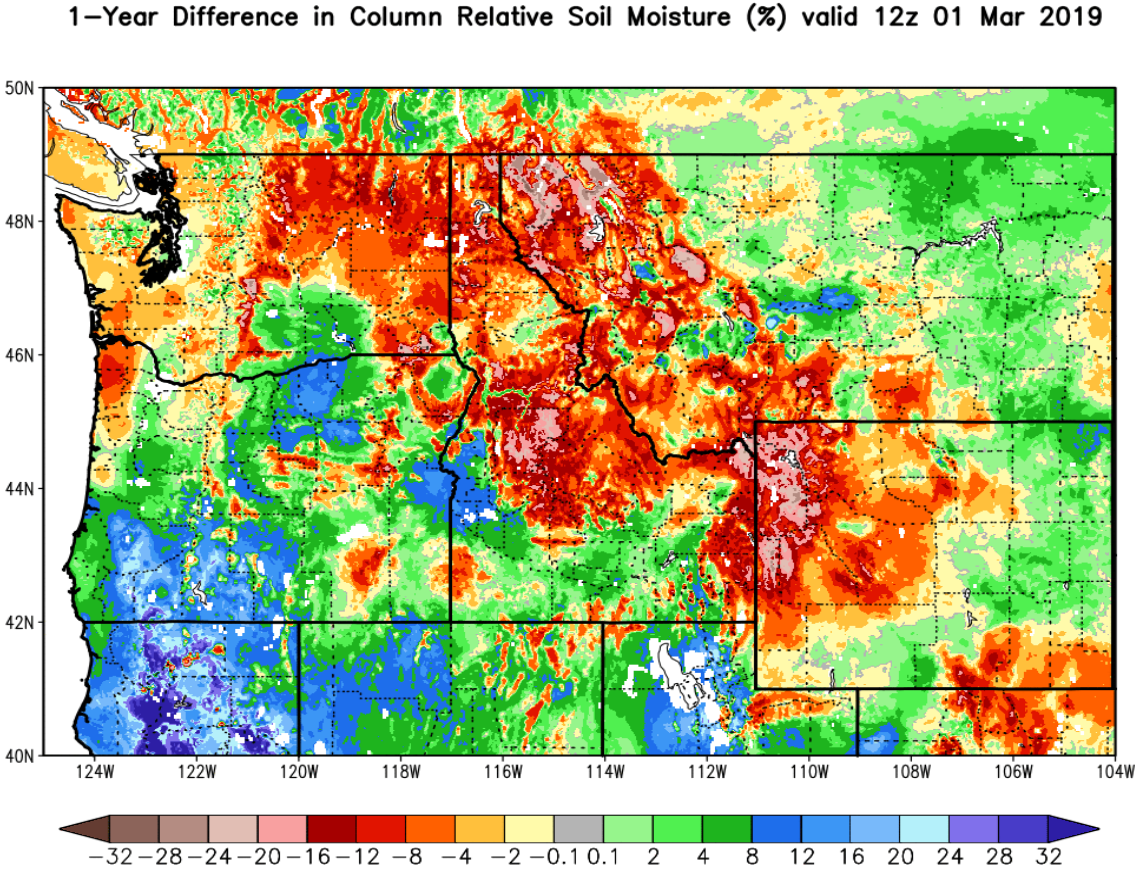
Location	Total	Ranking	Record
Pocatello Airport	19.1"	5th	30.5"(2004)
Island Park	105.6"	1st	78.0"(1949)
Bern	30.0"	5th	47.0"(2014)
Driggs	26.6"	4th	30.5"(1910)
Idaho Falls KIFI	22.2"	2nd	25.5"(1949)
Ketchum	76.2"	1st	74.0"(1938)
Mackay	26.0"	2nd	27.5"(1938)
Picabo	34.0"	1st	30.5"(1975)
Preston	6.2"	8th	23.1"(2011)
Richfield	17.0"	7th	35.0"(2008)
St. Anthony	30.0"	4th	40.1"(1949)
Stanley	57.0"	2nd	64.0"(1986)
Swan Valley	26.0"	1st	21.0"(1976)

NATIONAL WEATHER SERVICE

Snowfall Rankings

Water Supply Outlook
-Antecedent Conditions

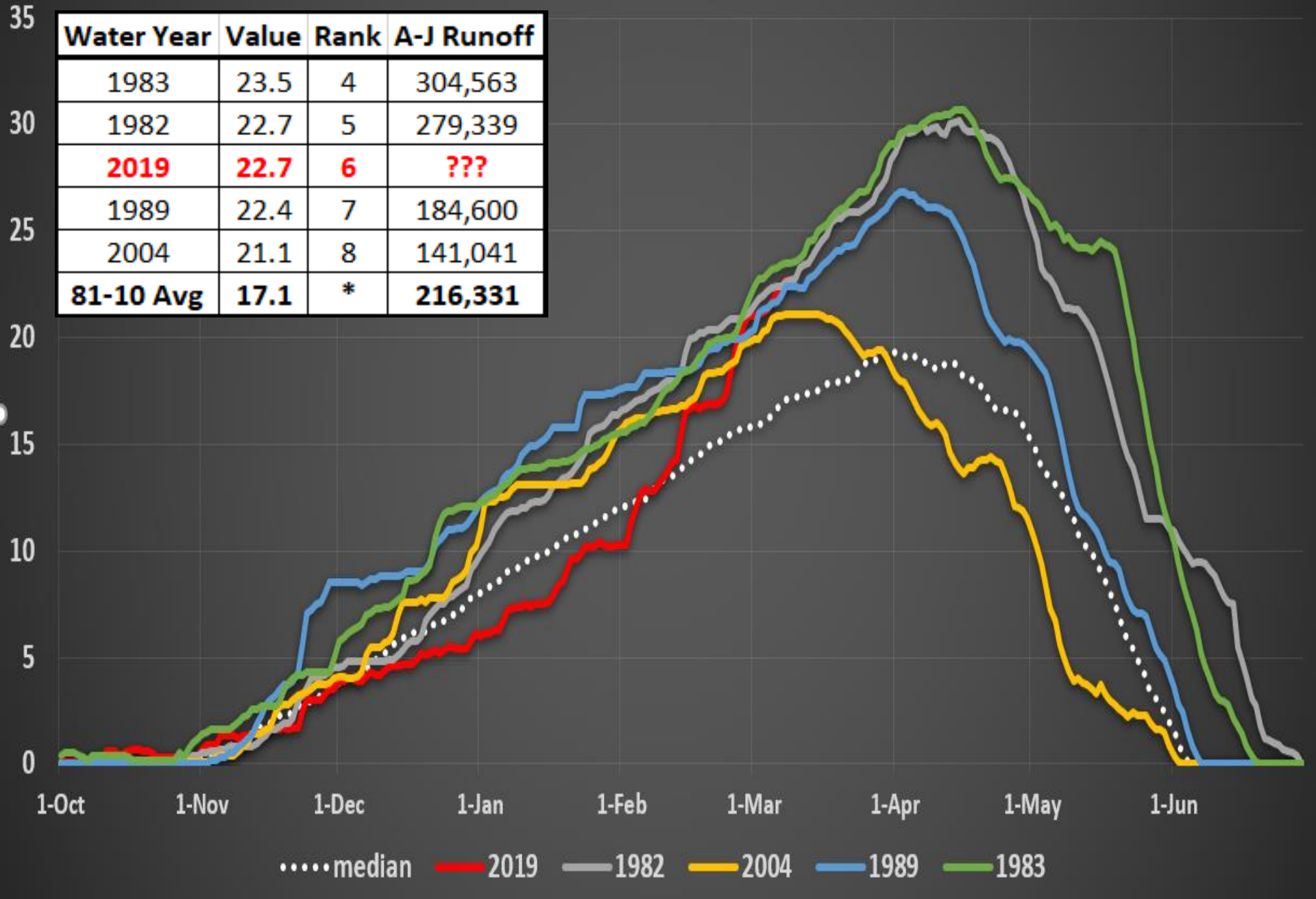




-Overall drier to near normal
-Mountain areas lagging 2018

ISL SNOTEL Composite (Crab, Grassy, White, Whiskey, Island Park)

Water Year	Value	Rank	A-J Runoff
1983	23.5	4	304,563
1982	22.7	5	279,339
2019	**22.7**	**6**	**???**
1989	22.4	7	184,600
2004	21.1	8	141,041
81-10 Avg	**17.1**	*	**216,331**



NOHRSC/RFC Modeled and Observed Snowpack Analysis

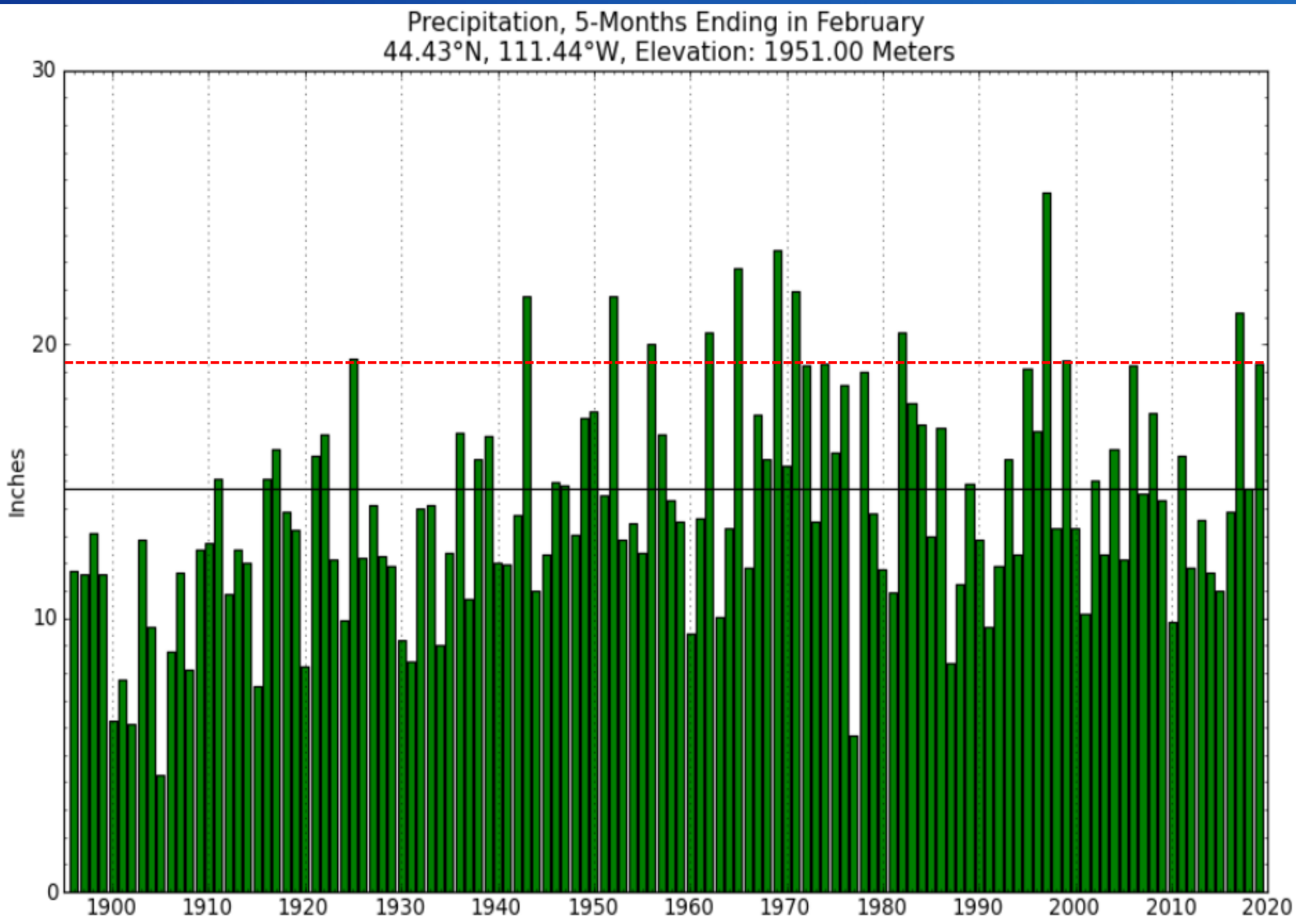
Snow Model Summary

NWRFC Model Parameters				NWRFC Model Simulations								NOHRSC	
ID	Elev Range (feet)	SI	AccMax (inches)	Date	SWE (inches)	Pct Avg	SWE Avg 1981-2010 (inches)	SWE Max 1981-2010 (inches)	SWE Min 1981-2010 (inches)	Snow Cover Extent	Snow Line (feet)	SWE (inches)	Snow Cover Extent
IPDI1IL	6270-6500	393.66	-----	03-11	13.59	135 %	10.1	18.7	3.5	1.00	6270	15.3	0.96
IPDI1IU	6500-10020	23.62	-----	03-11	19.63	120 %	16.4	34.5	7.3	1.00	6500	21.3	1.00
Simulated Basin Average						*125 %*							

Snow Station Summary

ID	Name	Distance (miles)	Elevation (feet)	Date	SWE	Pct Avg	SWE Avg 1981-2010	Snow Depth (inches)	Snow Density	Pct Curr Peak	Pct Avg Peak
ISPI1	ISLAND PARK	0	6290	03-11	19.3	138 %	14.0	--	--	99 %	133 %
WYSM8	WESTYELLOWSTONE	11	6700	03-11	14.0	132 %	10.6	52	27 %	99 %	127 %
WSKM8	WHISKEY CREEK SNOTEL	3	6800	03-11	18.1	127 %	14.3	69	26 %	98 %	113 %
SHCM8	SHORT CREEK SNOTEL	1	7000	03-11	5.5	115 %	4.8	25	22 %	96 %	98 %
LVRM8	LAKEVIEW RIDGE SNOTEL	5	7400	03-11	8.8	94 %	9.4	33	27 %	99 %	81 %
WHEI1	WHITE ELEPHANT	0	7710	03-11	32.7	134 %	24.4	107	31 %	99 %	118 %
MPLM8	MADISON PLATEAU SNOTEL	3	7750	03-11	26.2	125 %	21.0	89	29 %	100 %	109 %
BEVM8	BEAVER CREEK SNOTEL	0	7850	03-11	18.0	119 %	15.1	68	26 %	99 %	98 %
BLBM8	BLACK BEAR SNOTEL	0	7950	03-11	40.3	116 %	34.6	125	32 %	100 %	102 %
TPEM8	TEPEE CREEK SNOTEL	0	8000	03-11	14.2	126 %	11.3	54	26 %	99 %	104 %
CRRM8	CARROT BASIN SNOTEL	1	9000	03-11	25.8	113 %	22.8	92	28 %	99 %	89 %
Observed Basin Average						*122 %*					

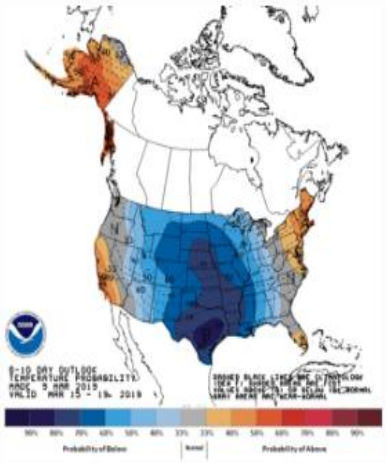
PRISM Modeled PRECIP: October 1 – Feb 28



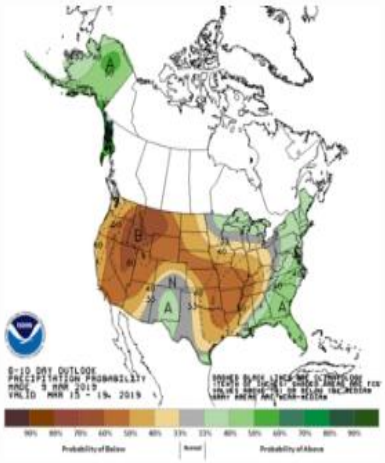
As of Mar 9

Long Range Outlook from the Climate Prediction Center

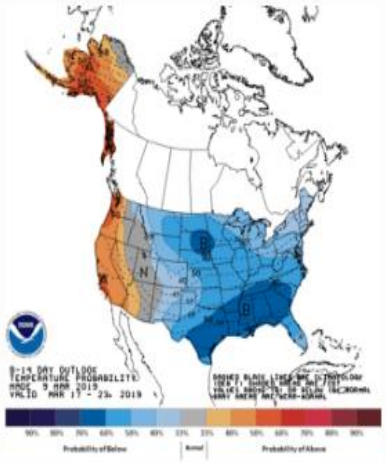
NOAA CPC 6 to 10 Day Temperature Probability Outlook



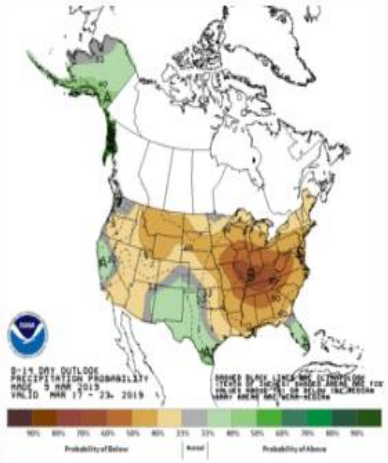
NOAA CPC 6 to 10 Day Precipitation Probability Outlook



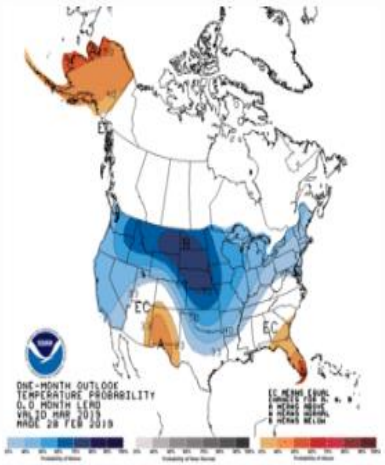
NOAA CPC 8 to 14 Day Temperature Probability Outlook



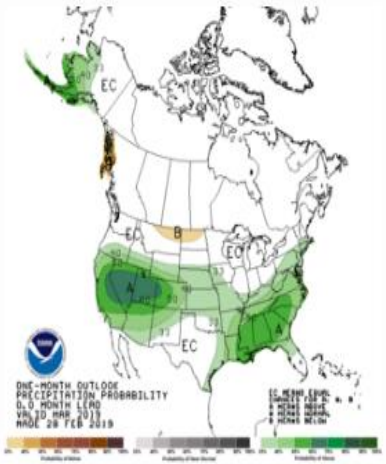
NOAA CPC 8 to 14 Day Precipitation Probability Outlook



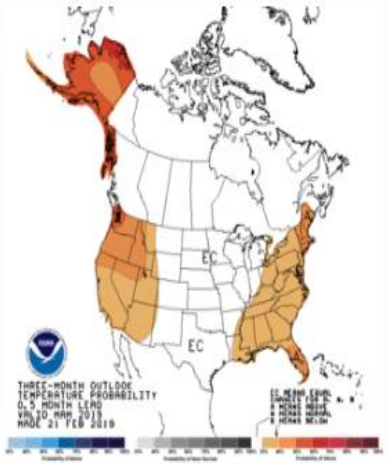
One Month Outlook - Temperature Probability



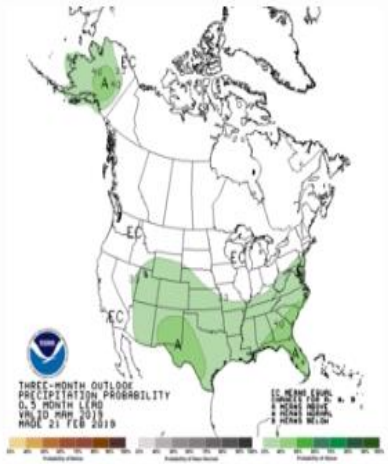
One Month Outlook - Precipitation Probability



Three Month Outlook - Temperature Probability



Three Month Outlook - Precipitation Probability

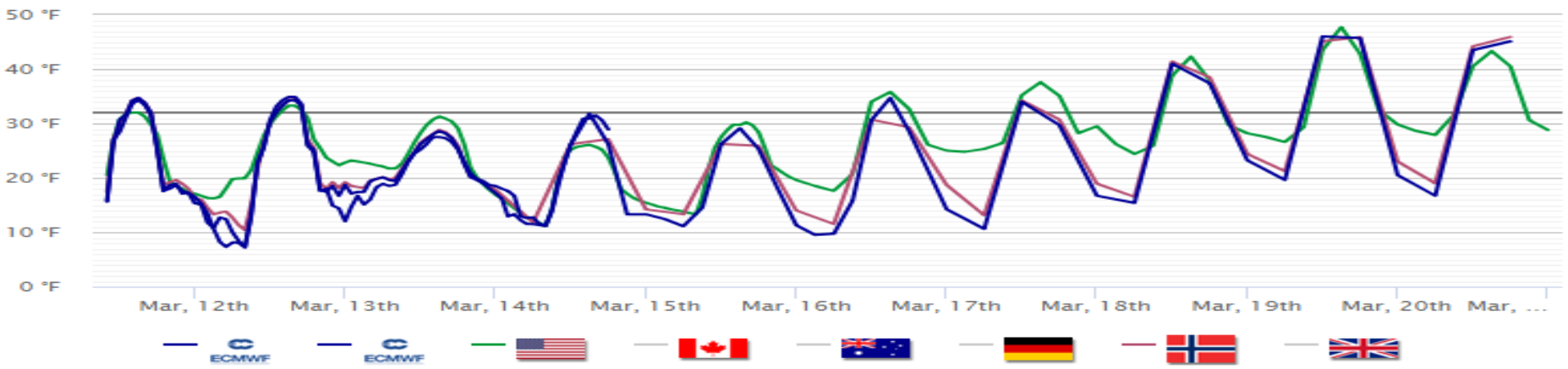


Forecast XL *(model comparison)* for Island Park

Next 2-3 days | Next 10 days

Temperature | Pressure | Precipitation | Wind

Temperature

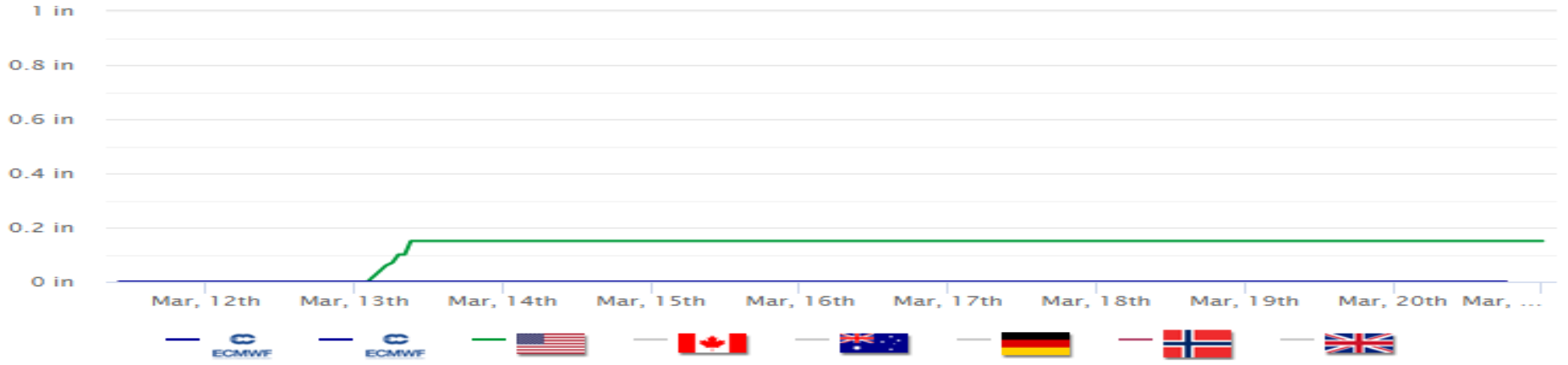


Forecast XL *(model comparison)* for Island Park

Next 2-3 days | Next 10 days

Temperature | Pressure | Precipitation | Wind

Accumulated precipitation



All times in forecast are in local time (MDT)

CURRENT MONTHLY FORECAST SUMMARY
MAR 1, 2019

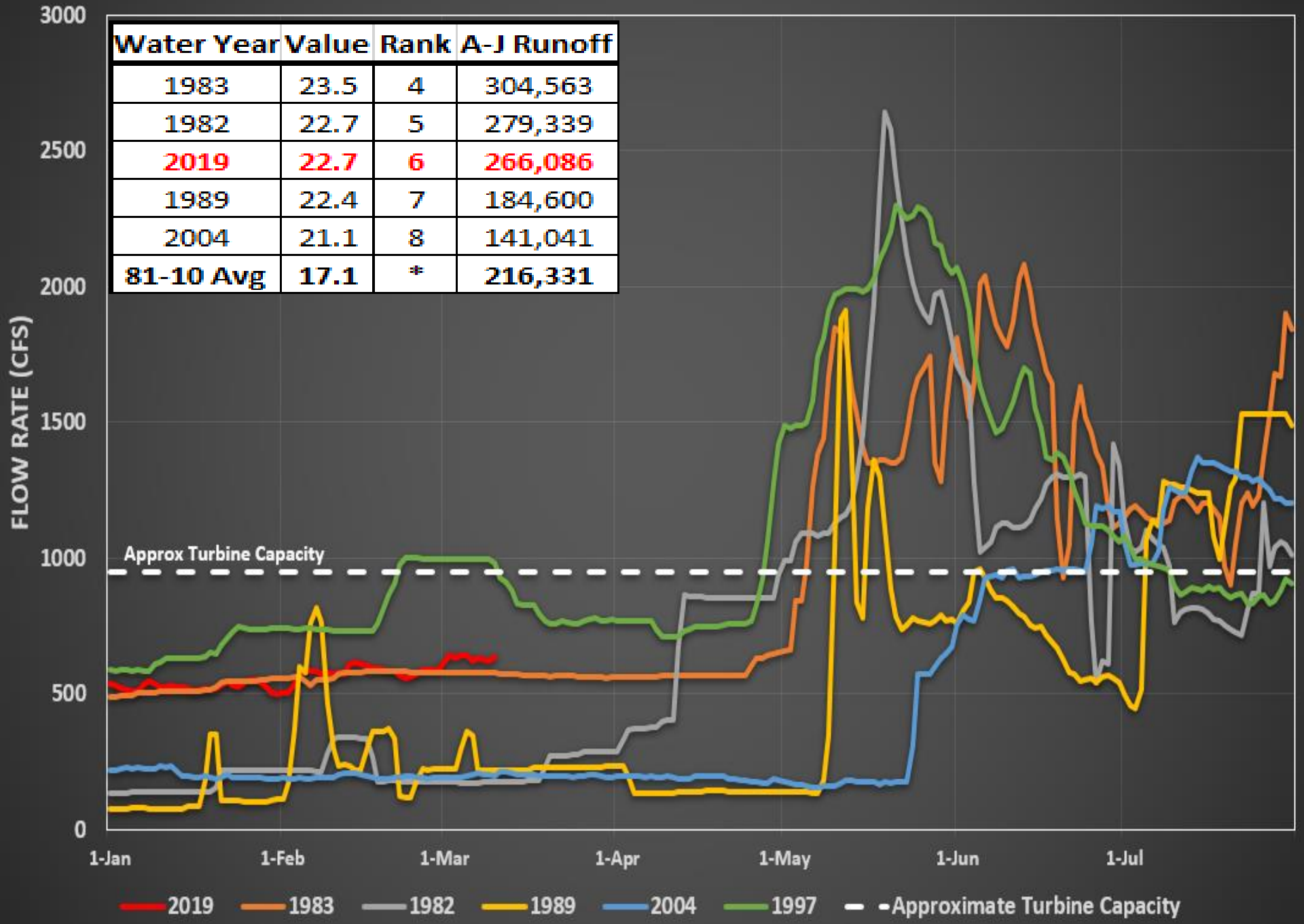
FORECAST POINT	FORECAST PERIOD	1981-2010 AVERAGE (KAF)	NORMAL SUBSEQUENT FORECAST (KAF)	NORMAL SUBSEQUENT PERCENT NORMAL
*** HEISE	MAR-JUL	3440	3620	105%
* JACKSON LAKE	MAR-JUL	797	854	107%
^ * ISLAND PARK	MAR-JUL	246	302	123%
* TETON	MAR-JUL	404	410	101%
*** RIRIE	MAR-JUN	68	76	112%
*** LITTLE WOOD	MAR-JUL	86	140	162%

^Adjusted Island Park to April-July: 266,086 AF

* PCA Forecast
** PCA & MLR Average
*** Coordinated with USACE

Island Park Discharge: Snow Analog Years

Water Year	Value	Rank	A-J Runoff
1983	23.5	4	304,563
1982	22.7	5	279,339
2019	22.7	6	266,086
1989	22.4	7	184,600
2004	21.1	8	141,041
81-10 Avg	17.1	*	216,331



Operational Approach: Resource (asset) Management

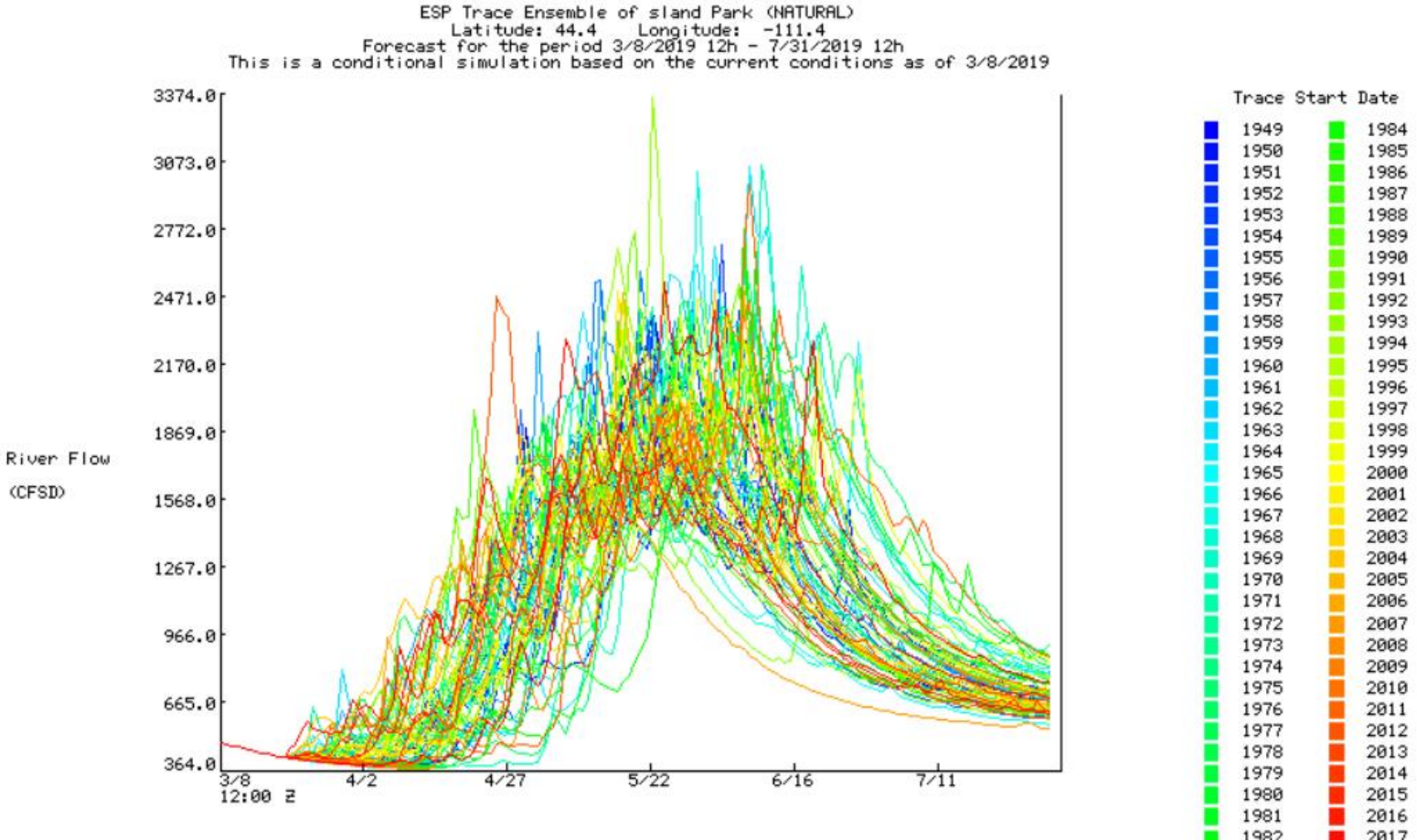
-Model Inputs: ESP Traces or Straight Analog Years scaled to forecast range

-ESP traces attempt to apply analog temp/precip/SM to current conditions

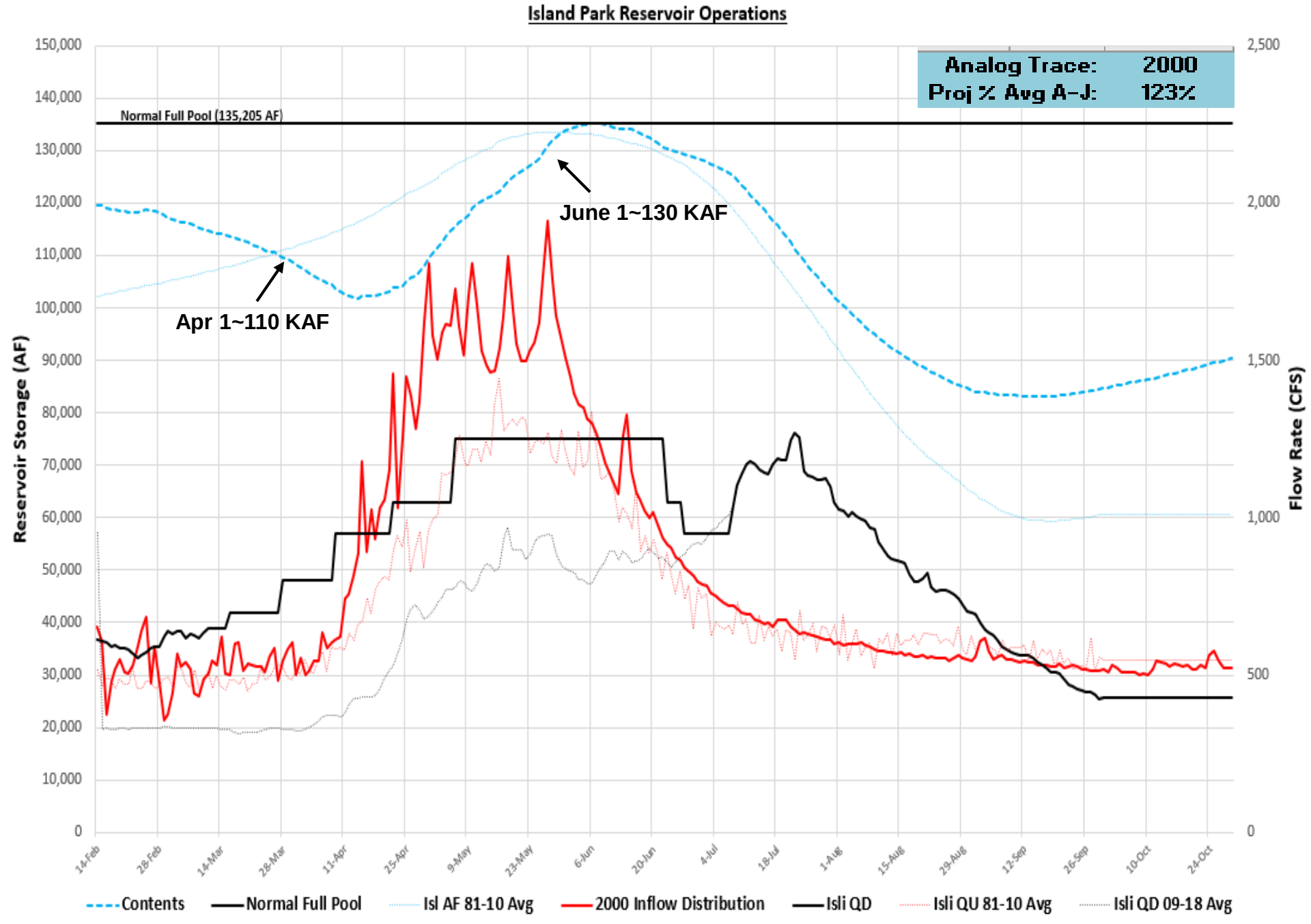
Considerations: Congress Authorized Purposes and Consequential Uses

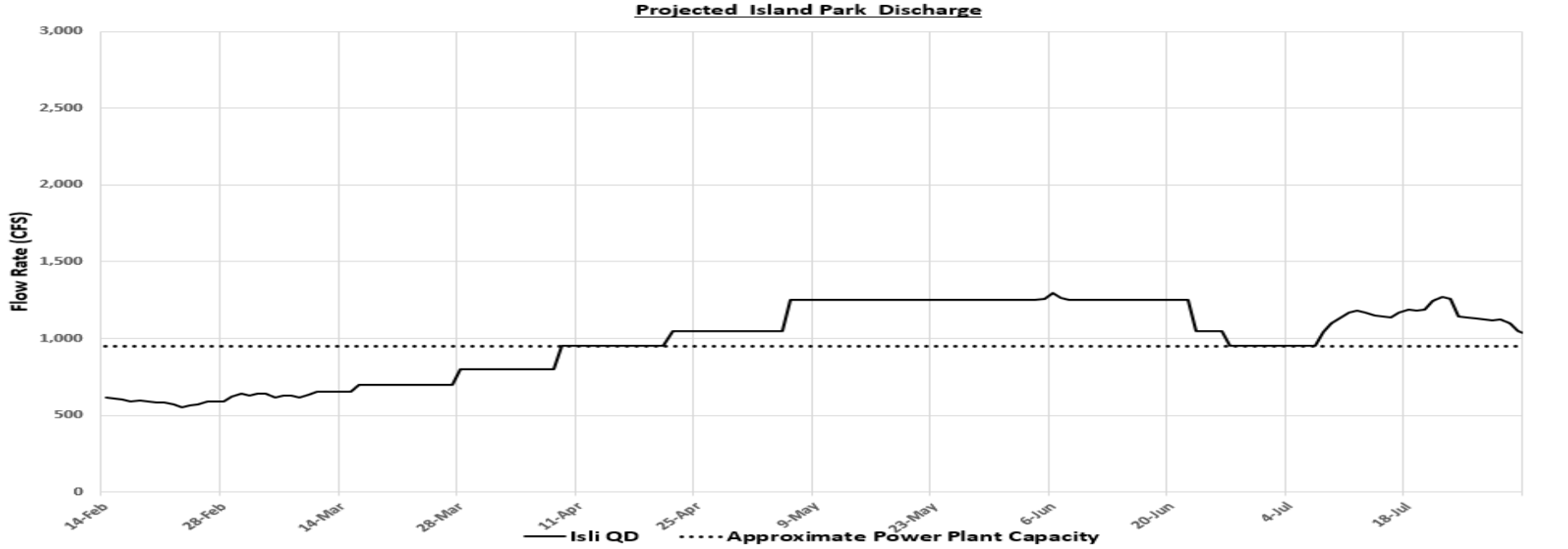
Operational Intent: Incremental Operations

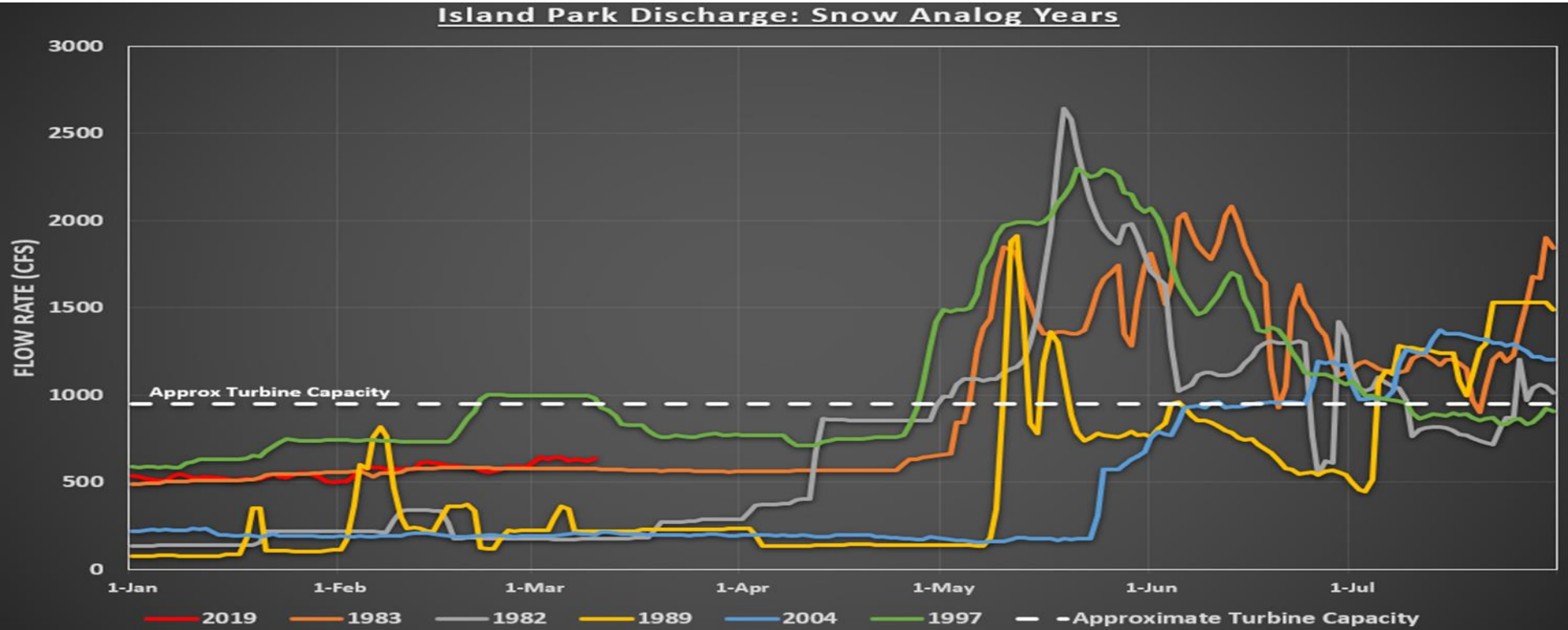
- Risk-probability based decision making to appropriately optimize purposes.



Example of Projected Operations: 2000 ESP (Near Normal Inflow Distribution)




Projected Island Park Discharge
Flow Rate (CFS)
3,000
2,500
2,000
1,500
1,000
500
0
14-Feb
28-Feb
14-Mar
28-Mar
11-Apr
25-Apr
9-May
23-May
6-Jun
20-Jun
4-Jul
18-Jul
Isli QD
Approximate Power Plant Capacity


Island Park Discharge: Snow Analog Years
FLOW RATE (CFS)
3000
2500
2000
1500
1000
500
0
Approx Turbine Capacity
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
2019
1983
1982
1989
2004
1997
Approximate Turbine Capacity

Upper Snake River Operations Summary

- **South Fork**
  - Jackson Lake – Increased release from winter flow (~450 cfs) to 800 cfs to manage reservoir levels. Expected to draft prior to runoff.
  - Palisades – Release has been increased to 3,500 cfs to manage reservoir levels. Expected to draft prior to runoff.
  - Ririe – Potentially a historic snowpack. Evaluating best operations to manage runoff.

- **Henry's Fork**
  - Henry's Lake -Request best estimate of future operations from managing entity.
  - Island Park's –Incremental operations to provide time to analyze basin conditions
  - Grassy Lake –Expected to fill and observe above normal discharge this spring. April-May time frame is being considered to initiate an operational release

- **Lower System**
  - American Falls – Currently releasing approximately 7,000 cfs to manage reservoir level.
  - Minidoka Dam/Lake Walcott – Currently being maintained near summer operating levels to optimize hydraulic head for generation.
  - Milner – Current discharge is approximately 6,000 cfs, which is comprised of approximately 5,200 cfs through Idaho Power facilities, and 800 cfs of bypass. This spring will be a good time to visit Shoshone Falls near Twin.
  - Recharge – Minidoka release plus reach gains equals ~ 7,200 cfs, minus Milner Release ~ 6,000 cfs, amounts to approximately 1,200 cfs of recharge in the lower valley.

RECLAMATION

2019 WaterSMART Funding Opportunities

Reclamation currently has four WaterSMART funding opportunities open.

Cooperative Watershed Management Program
Announced October 10, 2018.
Applications are accepted through February 20th at 4pm MDT (has been extended from February 1st).
Link: https://www.grants.gov/web/grants/view-opportunity.html?oppId=309496

Applicants can request up to $300K for projects that to implement on-the-ground watershed management projects, collaboratively developed by members of a watershed group, that will address critical water supply needs, water quality concerns, and restoration needs, helping water users meet competing demands and avoid conflicts over water.
Eligible applicants include established watershed groups as defined in the Section 6001(5) of the Cooperative Watershed Management Act (Act) that also meet the requirements outlined in Section 6002(c)(2)(A)(iv) of the Act, and are located in the Western United States or United States Territories.

Water and Energy Efficiency Grants
Announced January 31, 2019.
Applications are accepted through March 19th at 4pm MDT.
Link: https://www.grants.gov/web/grants/view-opportunity.html?oppId=312533

Applicants can request up to $1.5M (an increase from recent years) for projects that conserve and use water more efficiently; increase the production of hydropower; mitigate conflict risk in areas at a high risk of future water conflict; enable farmers to make additional on-farm improvements in the future, including improvements that may be eligible for Natural Resources Conservation Service (NRCS) funding; and accomplish other benefits that contribute to water supply reliability.
Eligible applicants include states, tribes, irrigation districts, water districts, and other organizations with water or power delivery authority in the 17 Western United States.

Drought Resiliency

Applications are accepted through Wednesday March 27th at 4pm MDT.
Link: https://www.grants.gov/web/grants/view-opportunity.html?oppId=312255

Applicants can request up to $750K for projects that increase flexibility for water managers through system modifications and improvements, and development of alternative water supplies, among other projects to mitigate the impacts of future drought.
Eligible applicants include states, tribes, irrigation districts, water districts, and other organizations with water or power delivery authority in the 17 Western United States.

Small-Scale Water Efficiency Projects
Applications are accepted through Wednesday April 24th at 4pm MDT.

Link: https://www.grants.gov/web/grants/view-opportunity.html?oppId=312233
Applicants can request up to $75K for small-scale water efficiency projects supported by planning efforts led by the applicant.
Eligible applicants include states, tribes, irrigation districts, water districts, and other organizations with water or power delivery authority in the 17 Western United States.

2019 Upper Snake Annual Windshield Snow Survey

Talus Slope (EL. 7697ft.)

1998

1999

2009

- May 23rd
  - Public meeting at the 49'er Inn, 5:30 PM, 49'er Inn Conference Room
- May 24th
  - Travel through Grand Teton National Park and Yellowstone National Park to observe remaining snow in the watershed

A block of rooms has been reserved at the 49'er Inn for the night of Thursday, May 23rd. The room rate is $99.00, plus tax. **Please contact the 49'er Inn no later than Thursday, May 16th to ensure your room reservation.** The 49'er Inn can be reached at 307-733-7550; please reference confirmation number 45N658. Additionally, please RSVP with Darrin Fredrickson, at 208-678-0461 extension 17 or dfredrickson@usbr.gov with the following information:

- Facility/Organization representing
- Total number of people who will participate in the snow survey on the 24th
- Whether you would like us to provide transportation, and preferred pick-up location
- Whether you will join us for lunch on May 23rd in Idaho Falls

Contact Darrin Fredrickson (Reclamation) for more information

For More Information

Snake River Area Office

- Roland Springer - Area Manager
  208-383-2246
  rspringer@usbr.gov

Upper Snake Field Office

- Ryan Newman – Assistant Area Manager
  208-678-0461 (x34)
  rnewman@usbr.gov
- Brian Stevens – (Acting) Water Ops Group Manager (x46) bstevens@usbr.gov
- Jeremy Dalling - Water Ops Hydrologist (x25)
  jdalling@usbr.gov
- Darrin Fredrickson - Water Ops Staff Assistant (x17)
  dfredrickson@usbr.gov

Snake River Operations Web Sites

- Upper Snake water information site - http://www.usbr.gov/pn/hydromet/uppersnake/index.html
- USBR HydroMet - http://www.usbr.gov/pn/hydromet/
- Northwest River Forecast Center - http://www.nwrfc.noaa.gov/rfc/
- NRCS SNOTEL Data - http://www.id.nrcs.usda.gov/snow/

RECLAMATION