Governor's Water Summit

AGENDA

Monday, August 7, 2023

Lincoln Auditorium, Idaho State Capitol

Moderated by Jeff Raybould, Chairman of Idaho Water Resource Board

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8:30 – 8:45 Welcome and Introduction Speech ..... Governor Brad Little

8:45 – 10:30 Water Supply Update..... Moderator Lt. Gov. Scott Bedke

- 2023 Surface Water Supply Conditions .....David Hoekema, IDWR
- Idaho's Groundwater Resources: State-Wide Review..... Dennis Owsley, IDWR

- Changes in Idaho's Annual Streamflow Patterns..... Chris Mebane, USGS
- Operation of Federal Reservoir Systems .....Lanie Paquin, BOR
- Idaho Collaborative Cloud Seeding Program .....Kresta Davis, Idaho Power Co.

10:30 – 10:45 Mountain Home Aquifer

- Elmore County .....Commissioner Bud Corbus

10:45—11:00 Break

11:00 —Noon Cities, Tribes, Utilities, & Developers' Perspectives .... Moderator Pat McMahon, IWRB

- Coalition of Cities .....Chris Bromley
- Veolia .....Marshall Thompson
- Nez Perce Tribe ..... Bobby Hills
- Avimor Development..... Dan Richter

Noon—1:30 Lunch – On Own

1:30—2:45 Eastern Snake Plain Aquifer ..... Moderator Marc Gibbs, IWRB

- Twin Falls Canal Company .....Jay Barlogi
- Idaho Ground Water Appropriators ..... Jaxon Higgs
- Bingham Ground Water District .....Alan Jackson
- Minidoka Irrigation District.....Dan Davidson

2:45 – 3:00 Swan Falls Agreement Minimum Flows

- Idaho Power Company..... Scott Pugrud

3:00—3:20 North Idaho..... Moderator Al Barker, IWRB

- Palouse Basin Aquifer .....Tyler Palmer, City of Moscow
- North Idaho Adjudication Update.....Shelley Keen, IDWR

3:20-3:30 Break

3:30—4:15 Treasure Valley .....Moderator Brian Olmstead, IWRB

- Boise Project Board of Control.....Bob Carter
- Water District 63 Watermaster ..... Mike Meyers

4:15 – 4:45 Wood River .....Moderator Jo Ann Cole-Hansen, IWRB

- Galena Ground Water District ..... Judd McMahan
- Big Wood-Little Wood Water Users Association .....Cooper Brossy

4:45 – 5:00 Final Thoughts and Next Steps..... Governor Little and Chairman Raybould

Catch the livestream at https://www.idahoptv.org/shows/idahoinsession/ww02/

Americans with Disabilities
The meeting will be held in person and online. If you require special accommodations to attend, participate in, or understand the meeting, please make advance arrangements by contacting jennifer.strange@idwr.idaho.gov by email or 208-287-4829 by phone.

2023 Water Supply Idaho

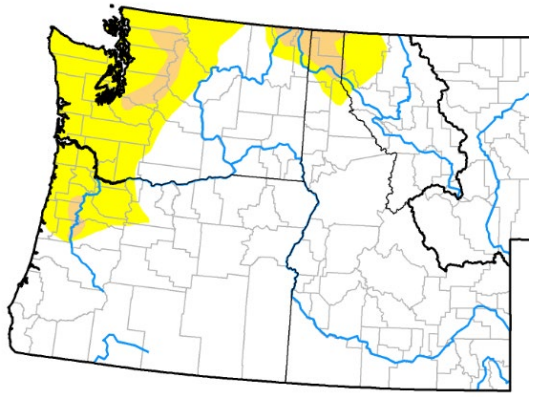
David Hoekema, Hydrologist, IDWR

Idaho Water Summit

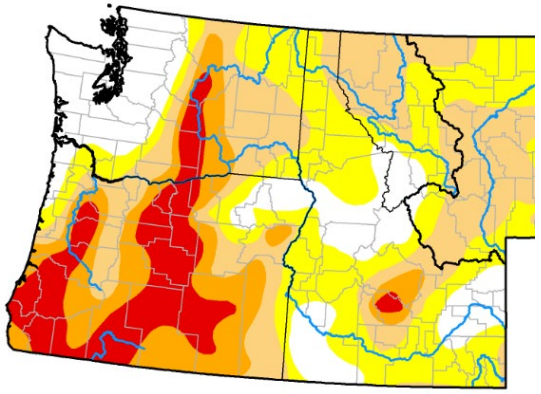
8/7/2023

Setting the stage for the 2023 Water Year

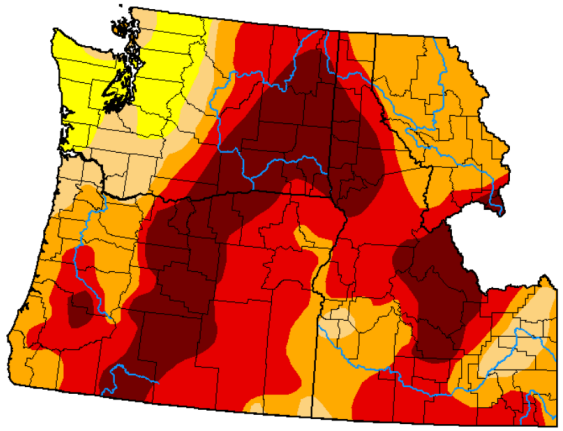
EOM September 2019



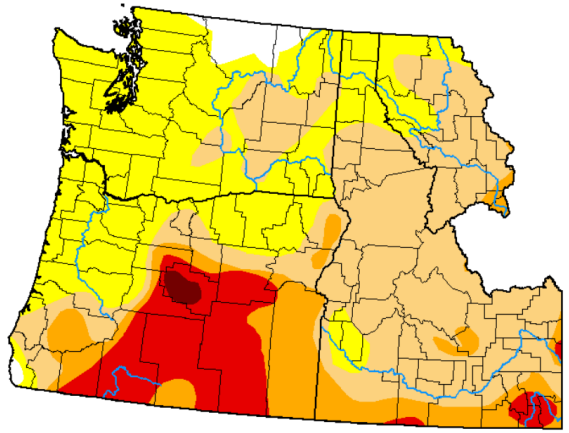
EOM September 2020



EOM September 2021



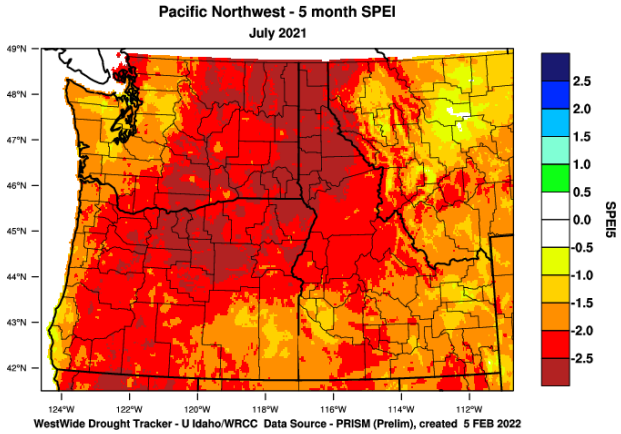
EOM September 2022

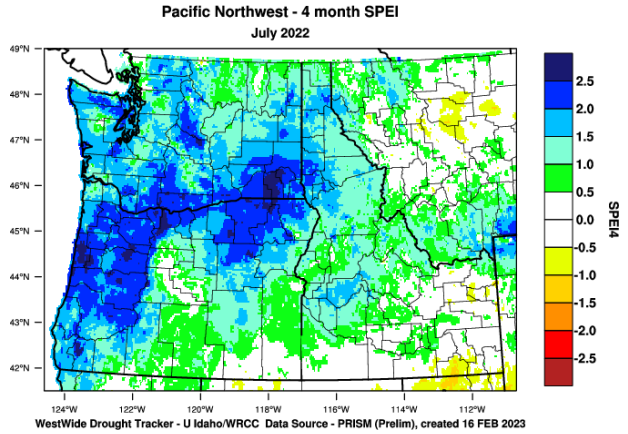


Intensity:

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

Spring Conditions →





Current Conditions 2023 Water Year

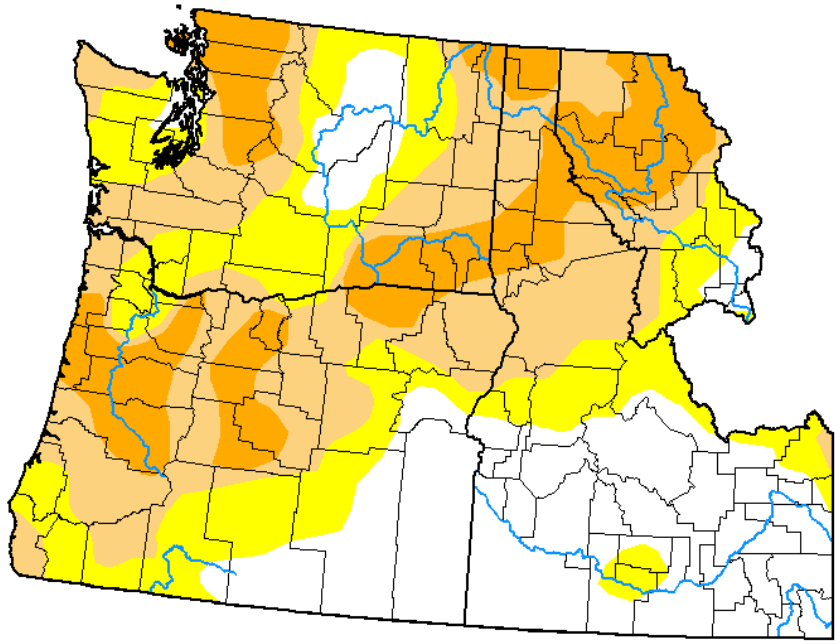
U.S. Drought Monitor

Pacific Northwest DEWS

August 1, 2023

(Released Thursday, Aug. 3, 2023)

Valid 8 a.m. EDT



Intensity:

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

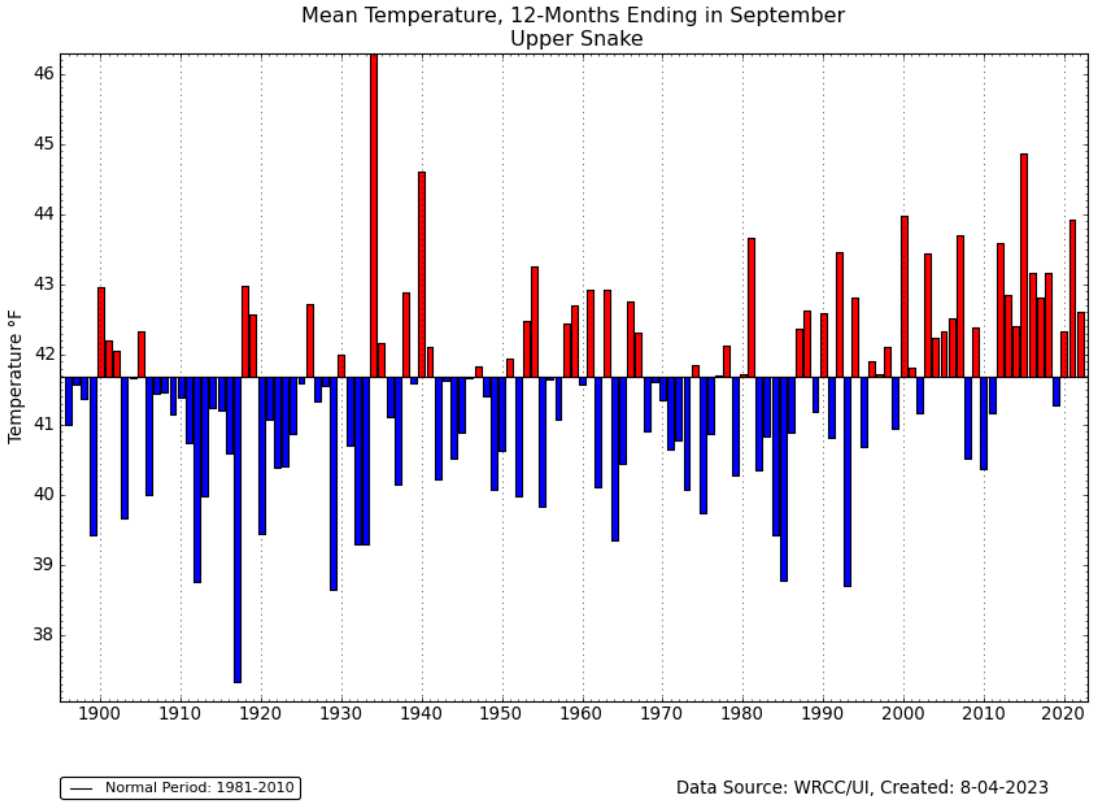
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

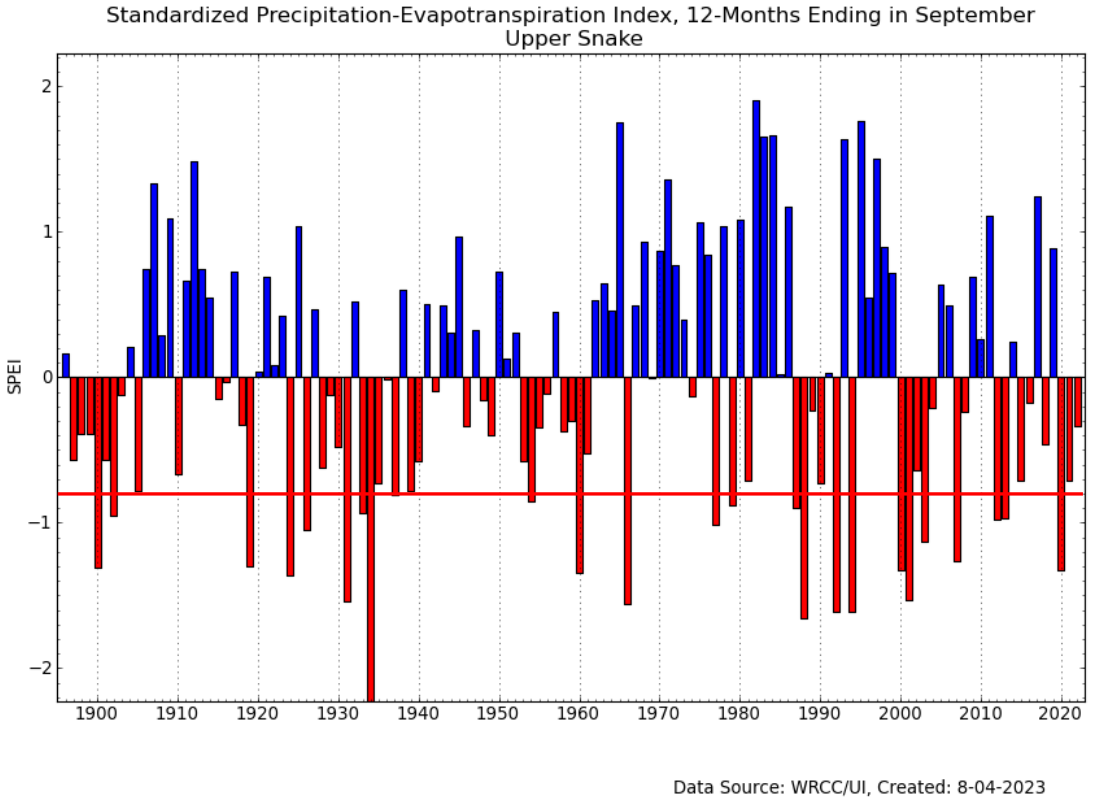
Author:

Brian Fuchs
National Drought Mitigation Center

droughtmonitor.unl.edu

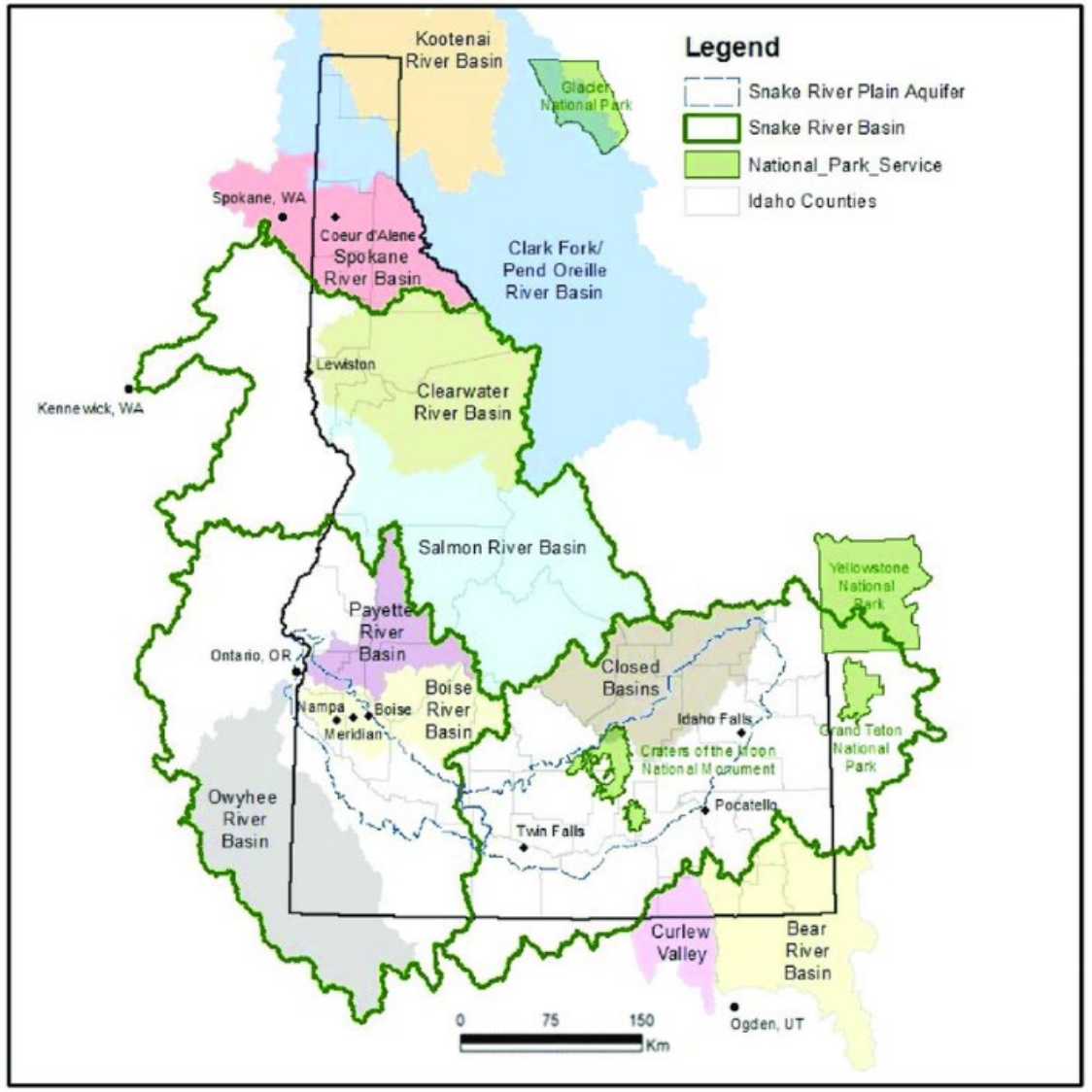
Temperature & Drought History



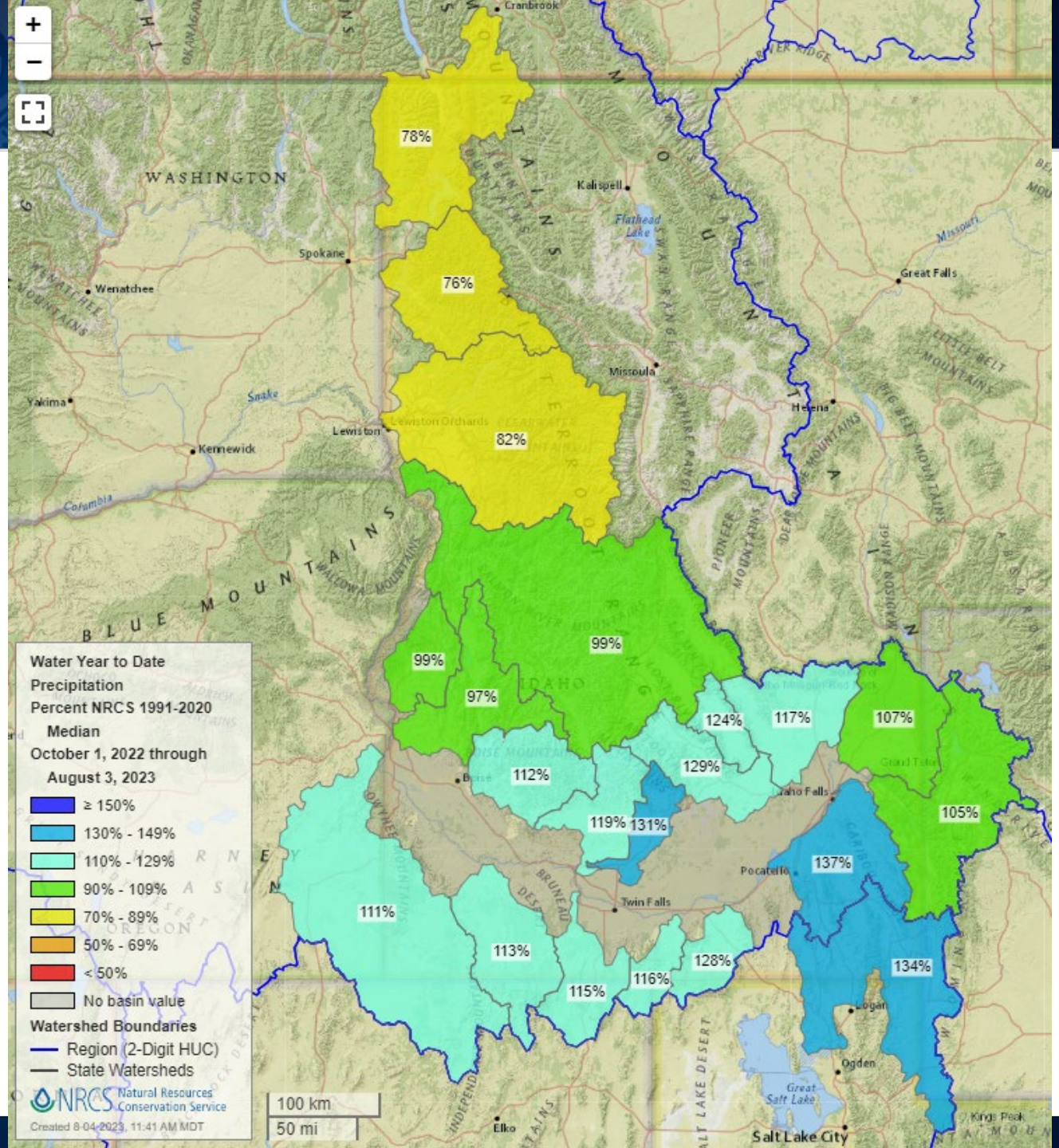


Idaho Basins

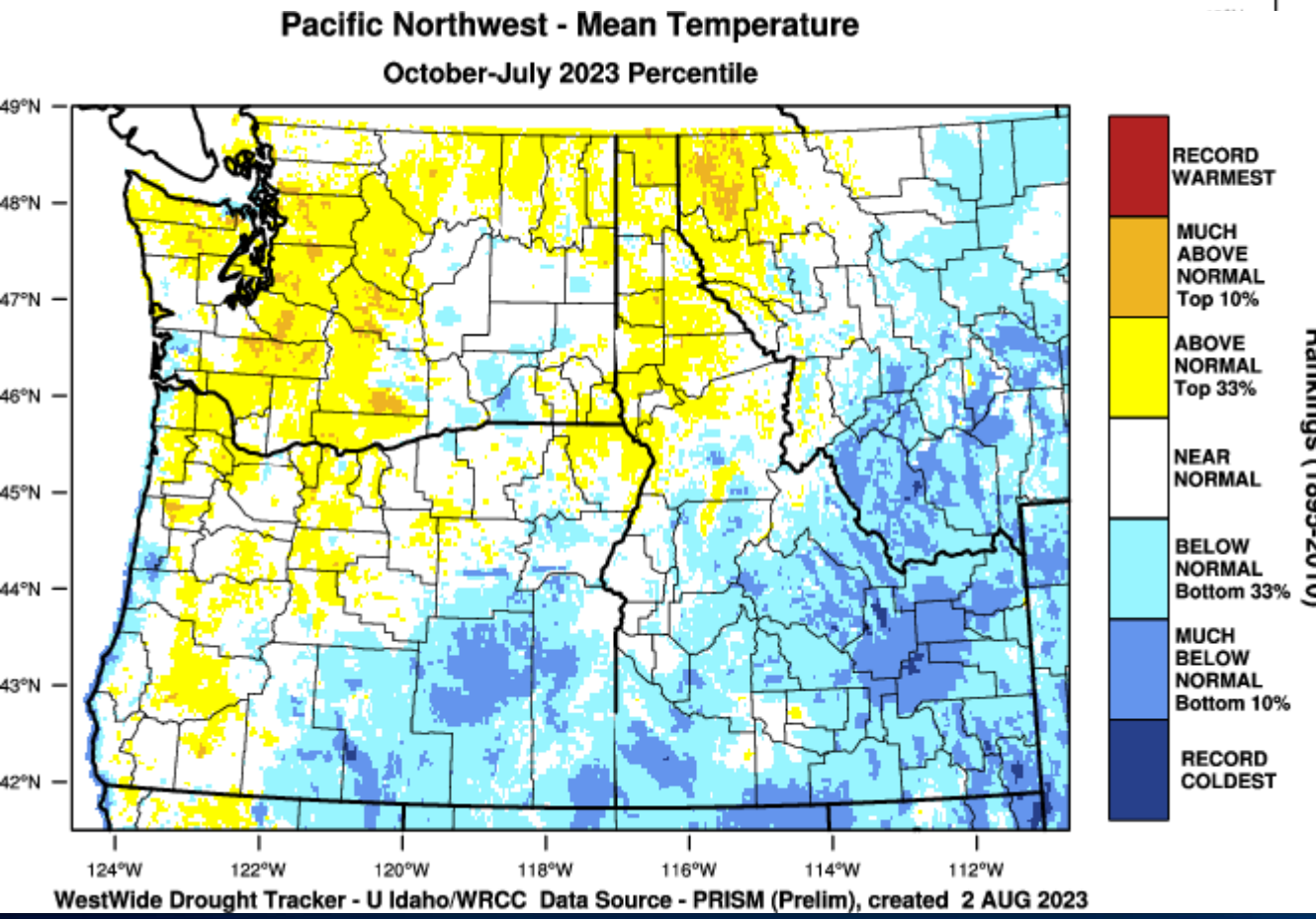
1) Kootenai
2) Pend Oreille
3) Spokane
4) Snake
5) Bear

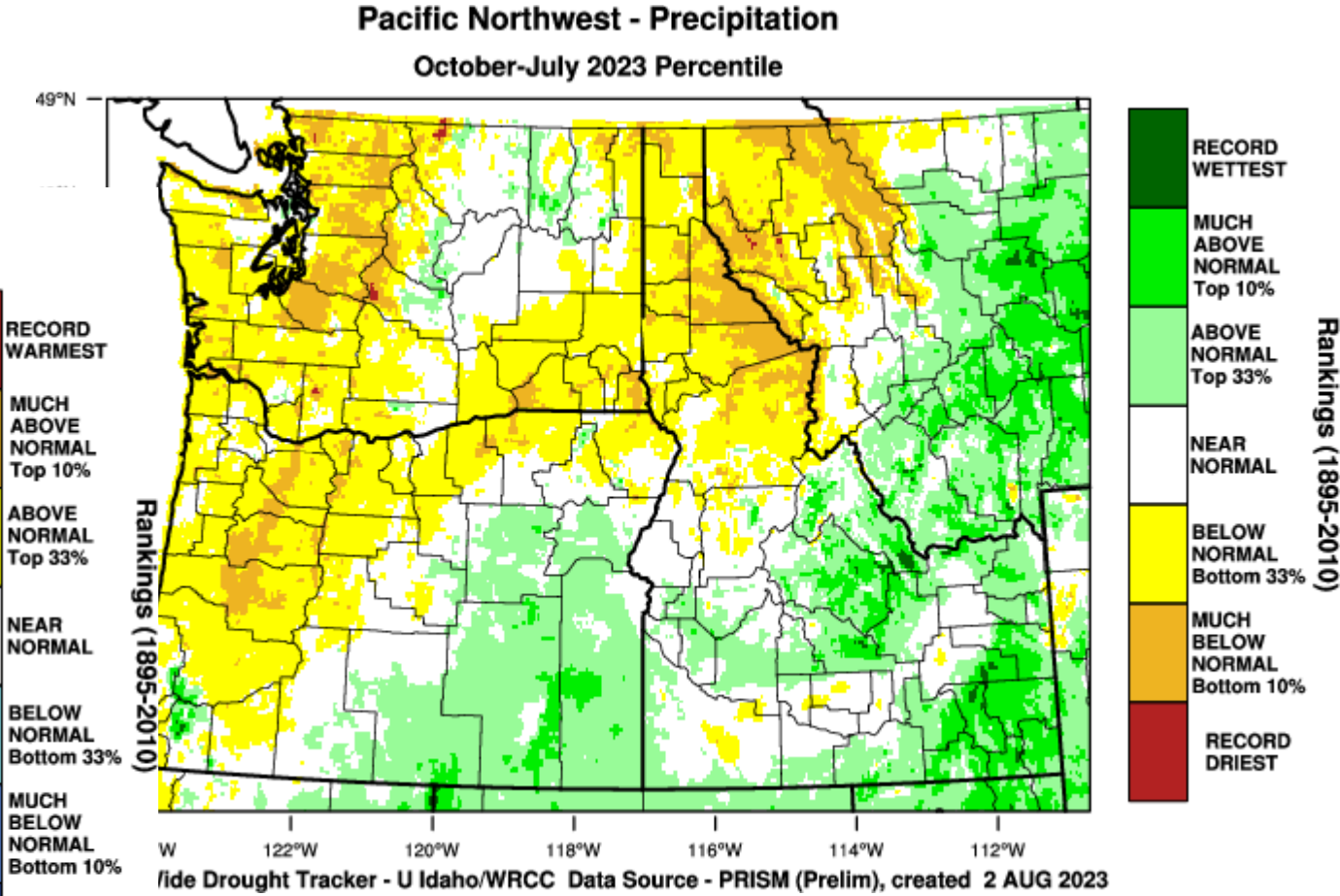


Peak Snowpack & Water-Year Precipitation

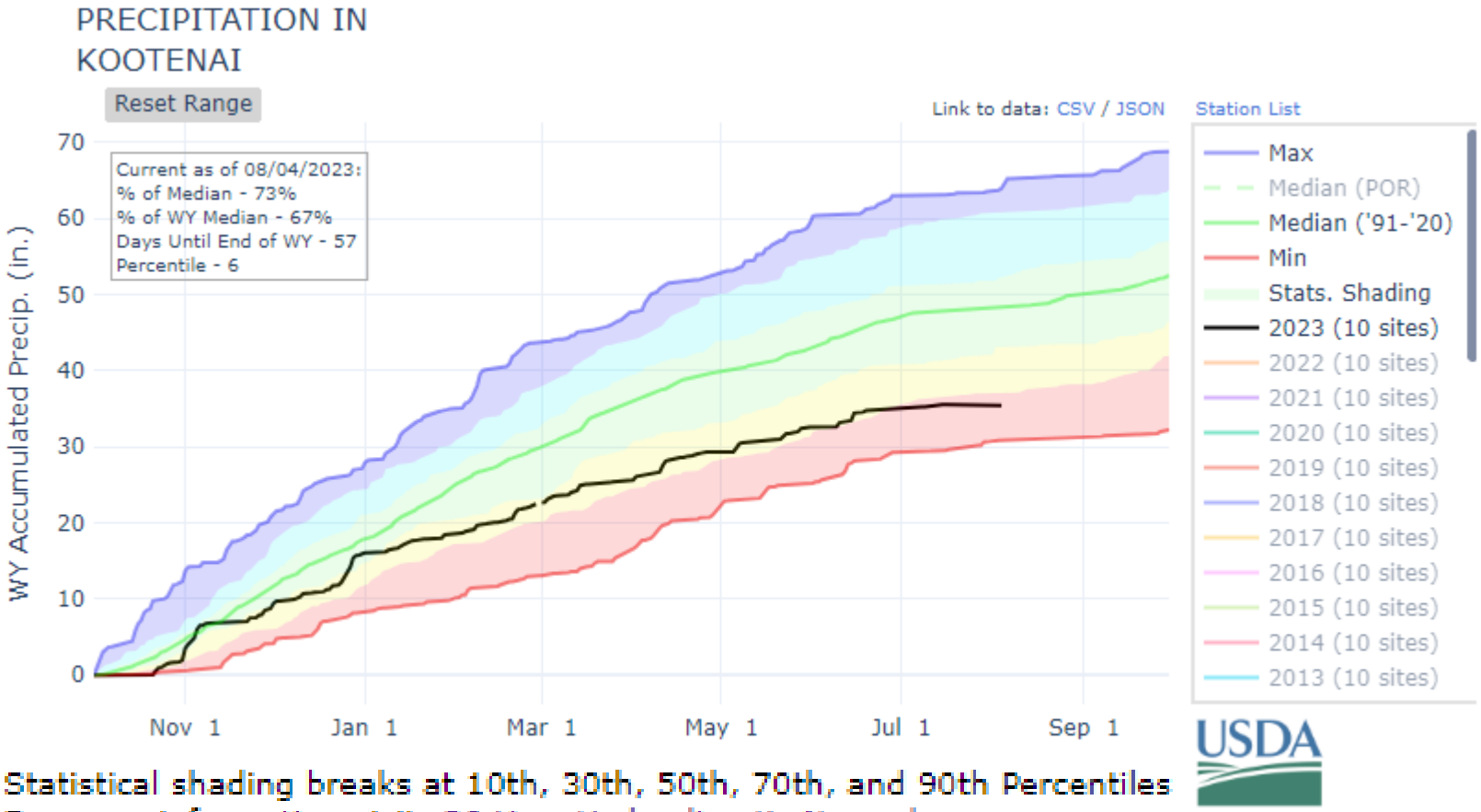


Temperature & Precipitation



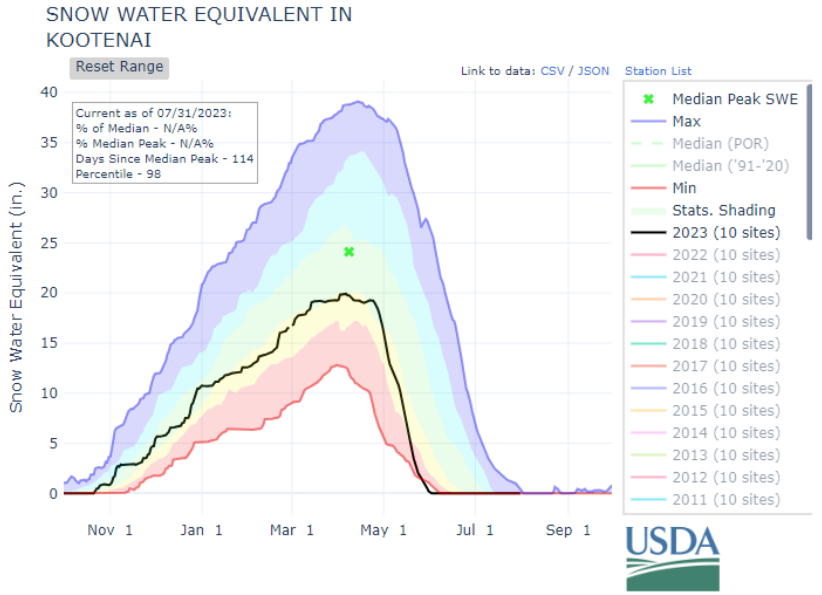


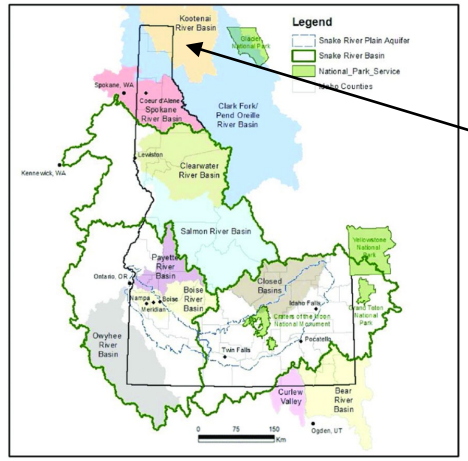
Kootenai Basin



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th Percentiles

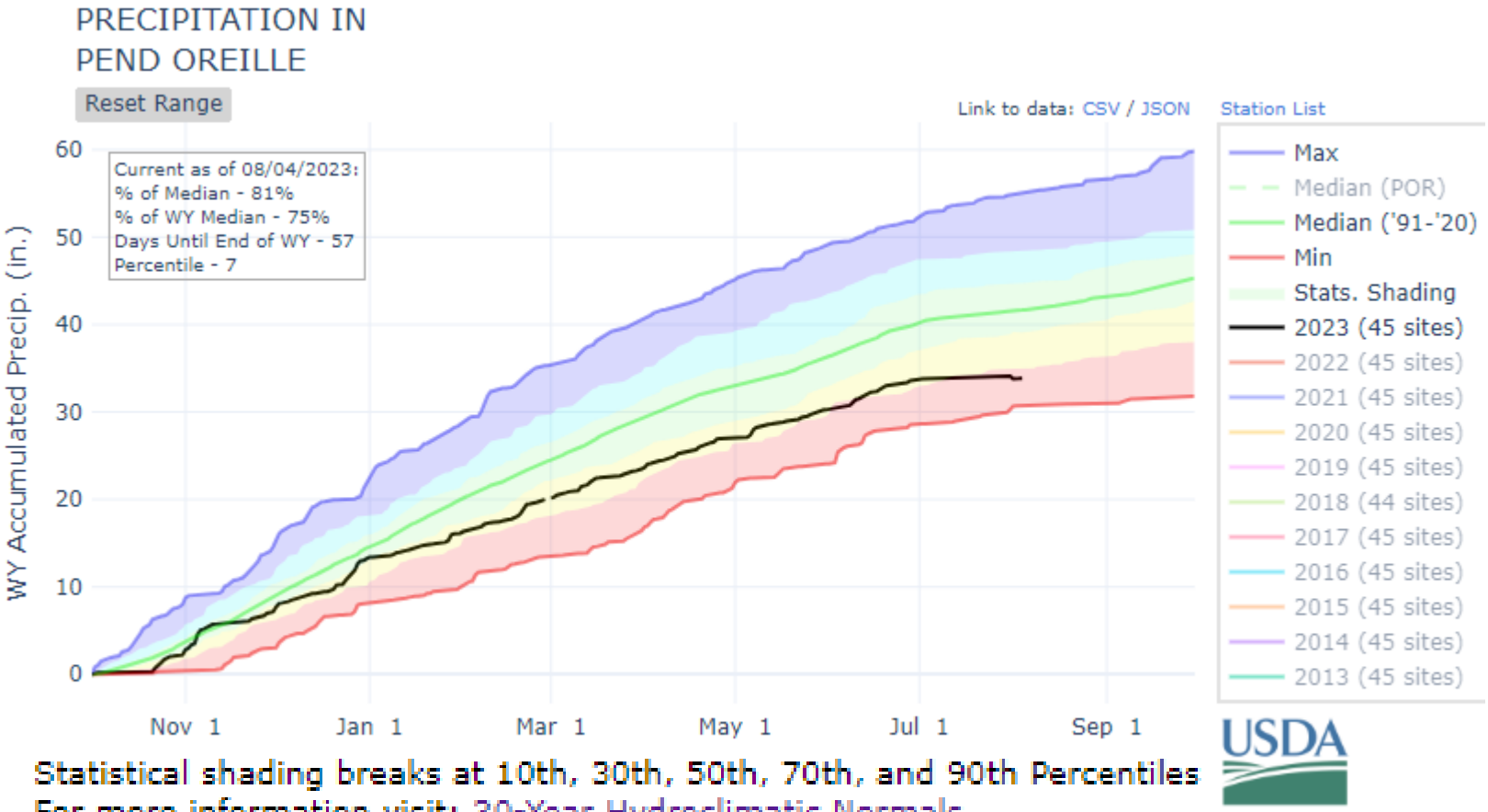
For more information visit: 30-Year Hydroclimatic Normals





Kootenai

Pend Oreille Basin



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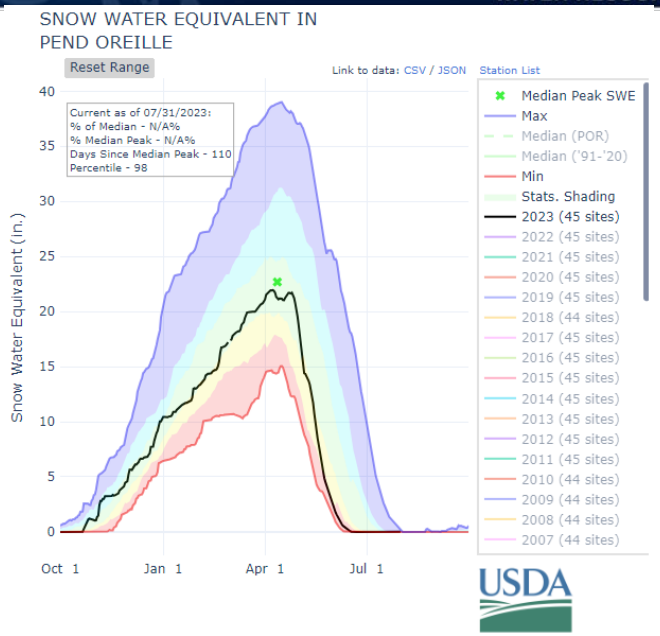

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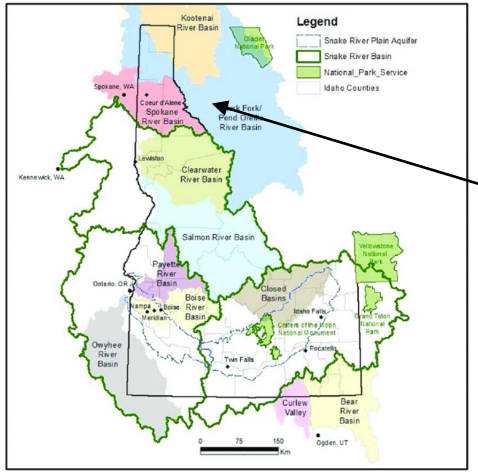
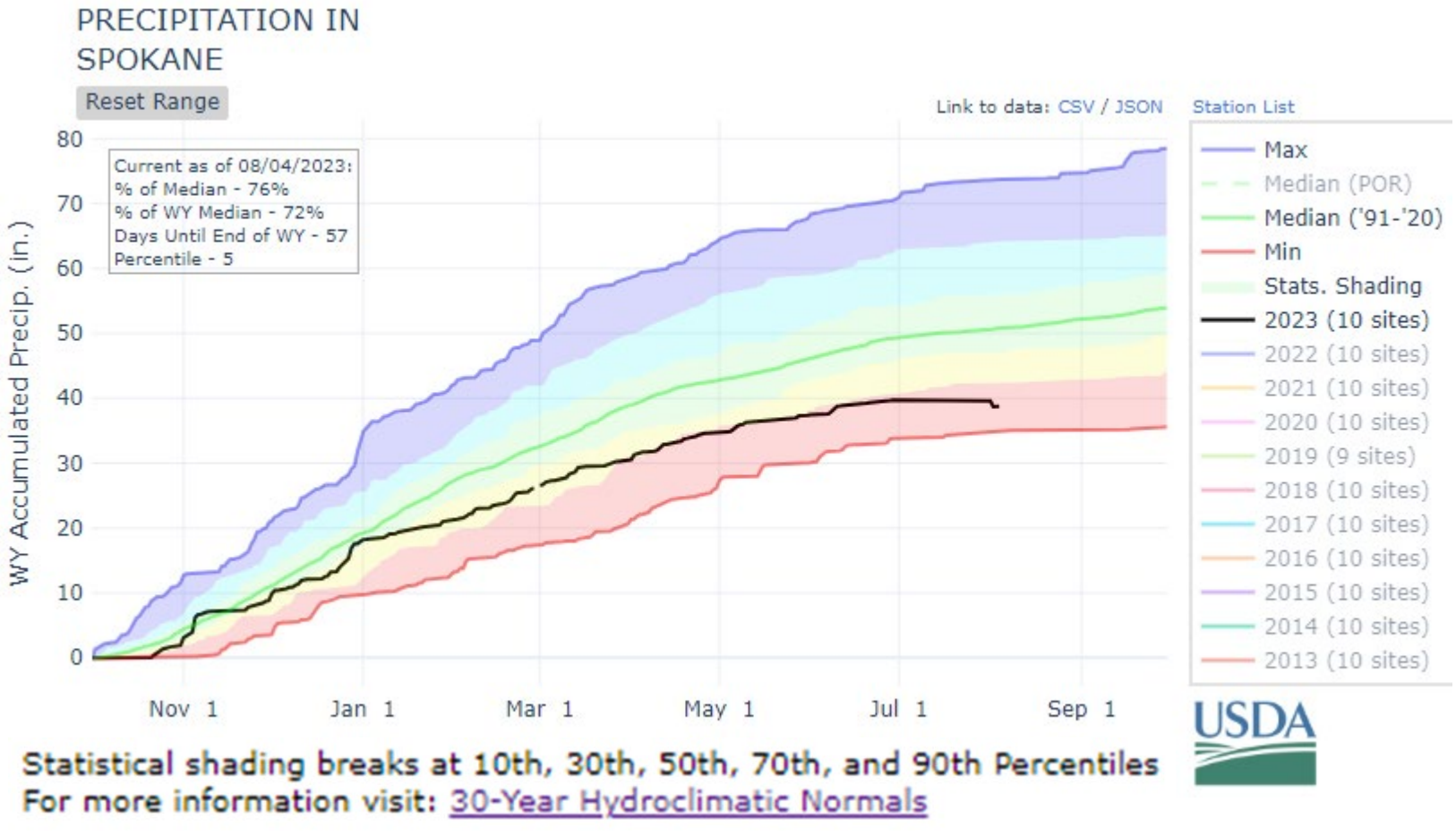
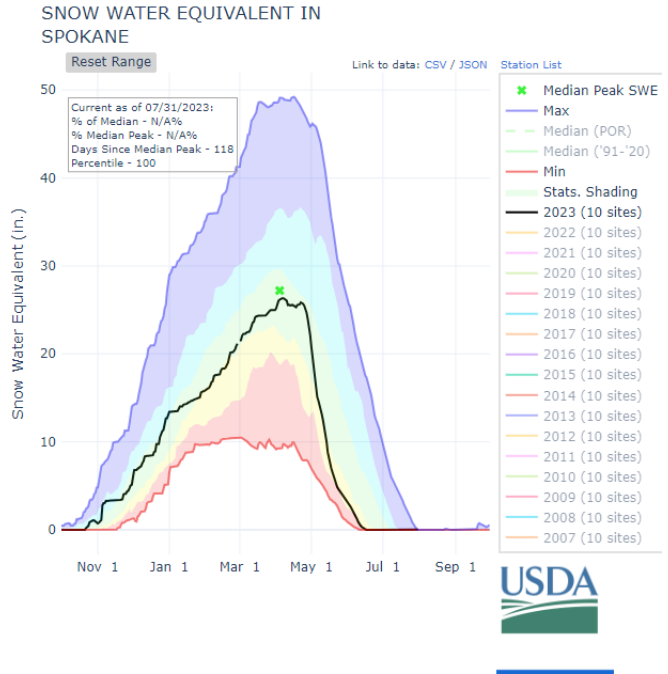
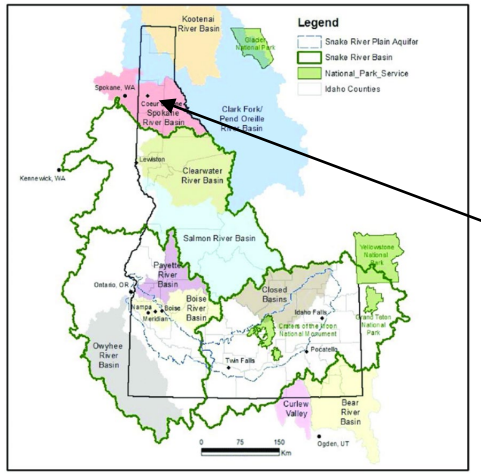


Pend Oreille

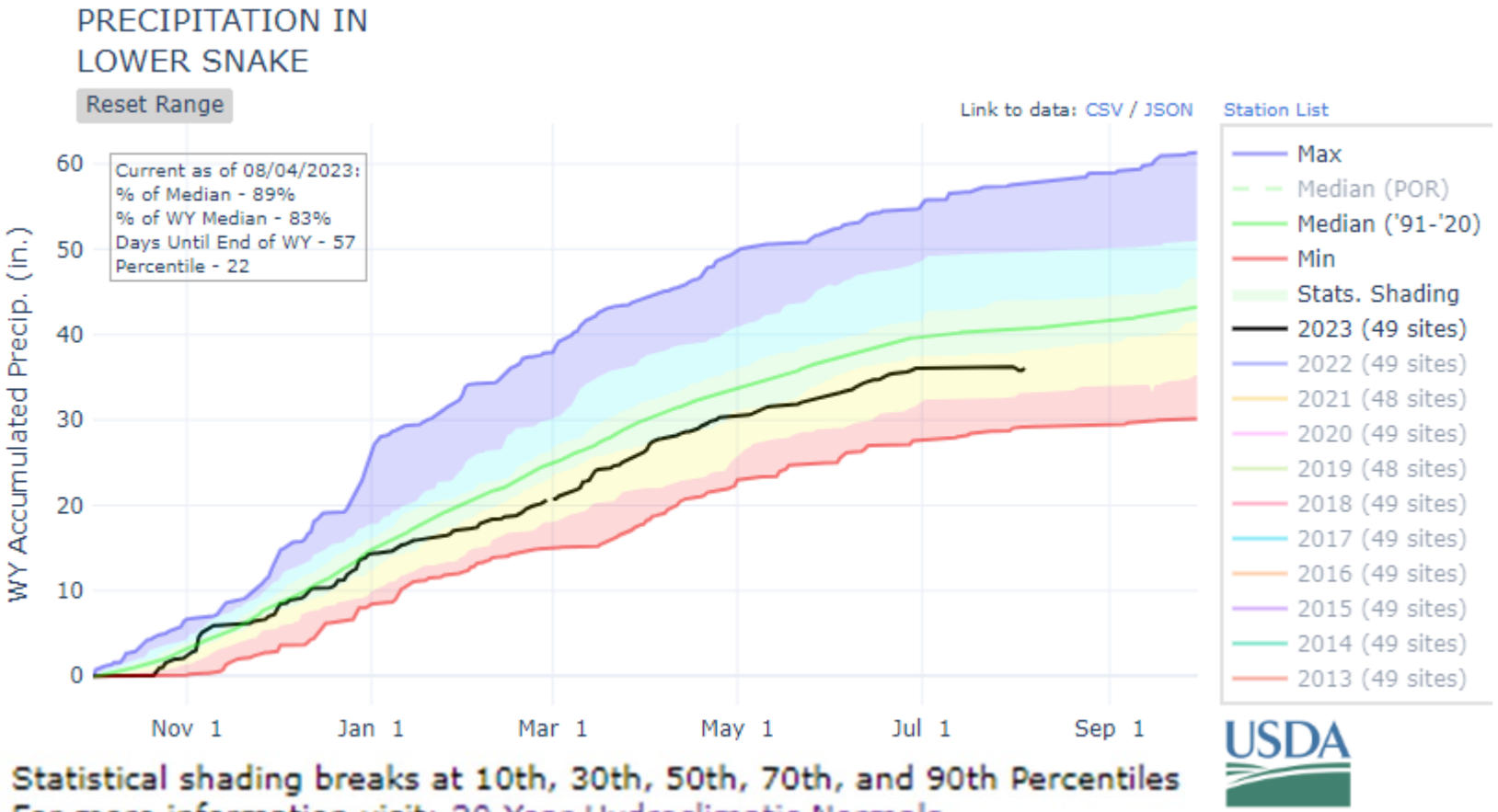
Spokane River

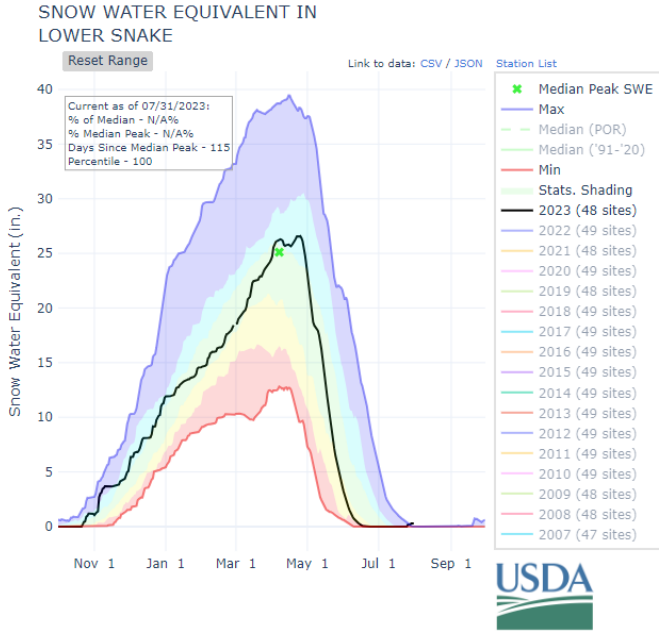






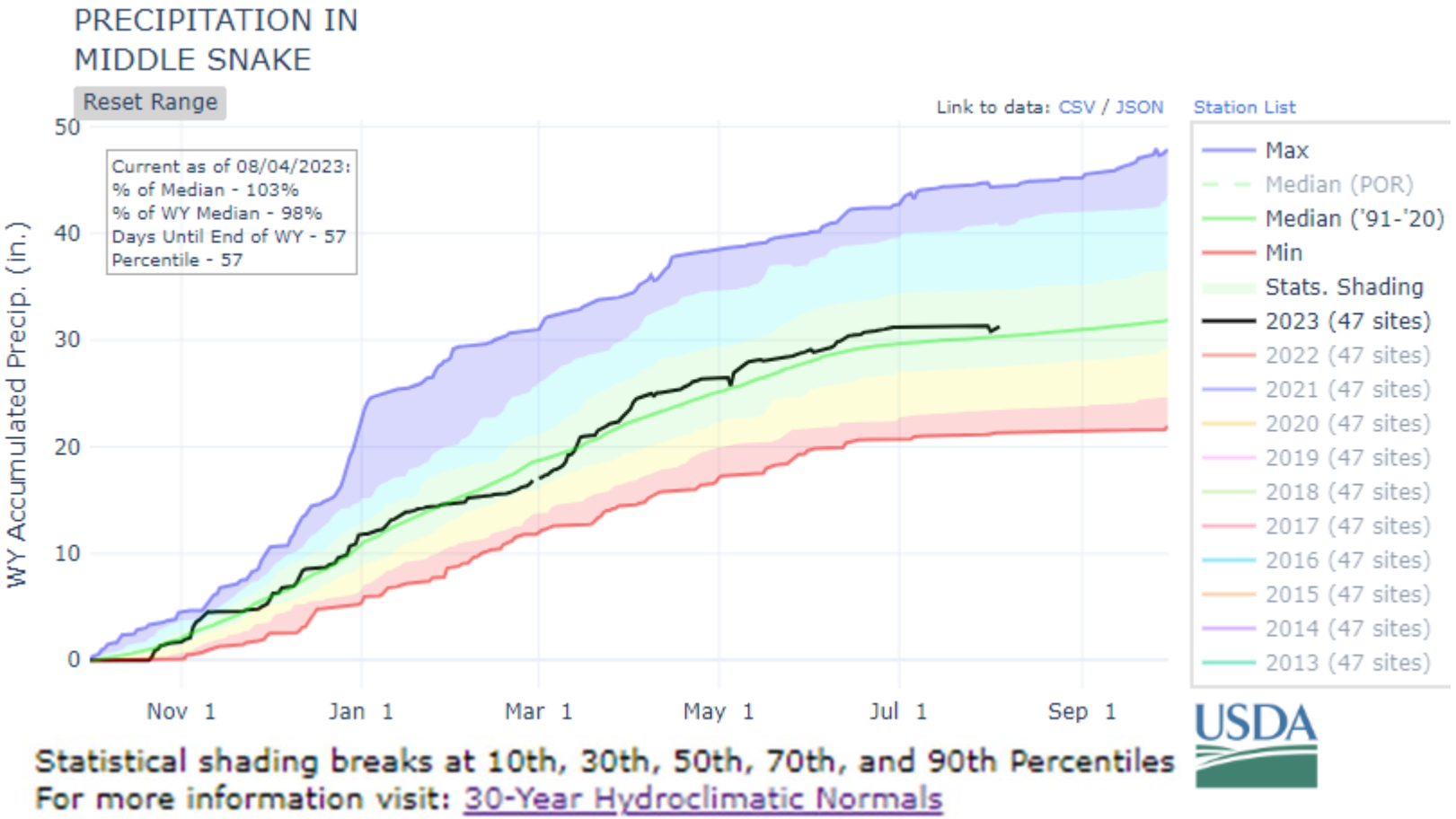
Lower Snake River

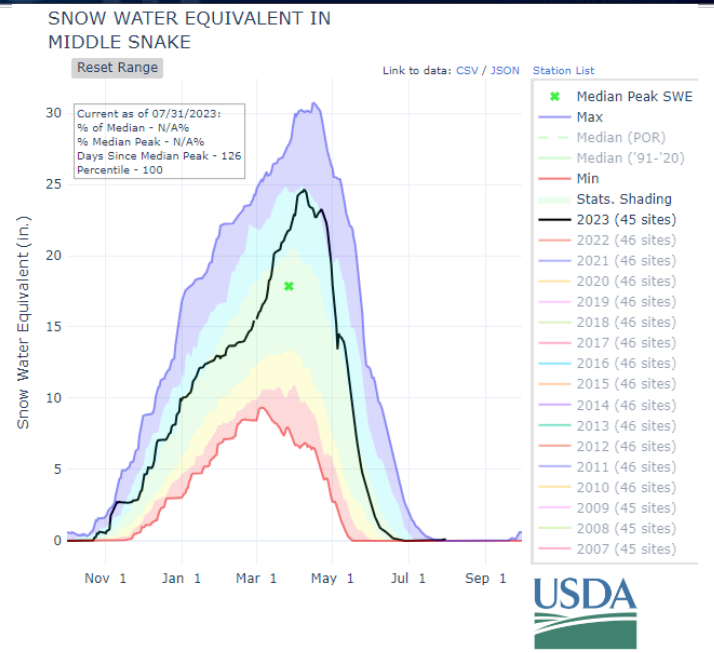


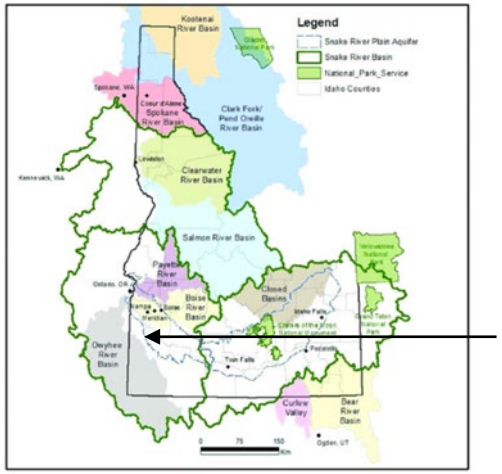


Lower Snake

Middle Snake River



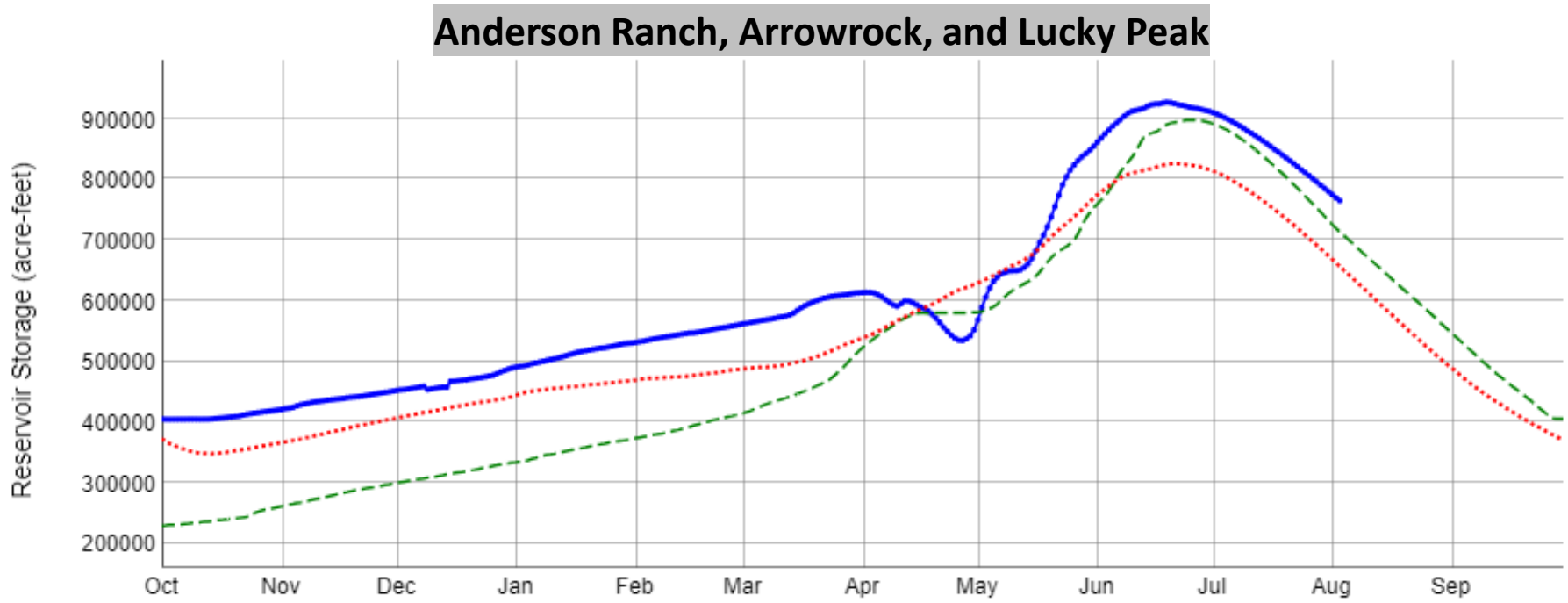




Boise River Reservoirs

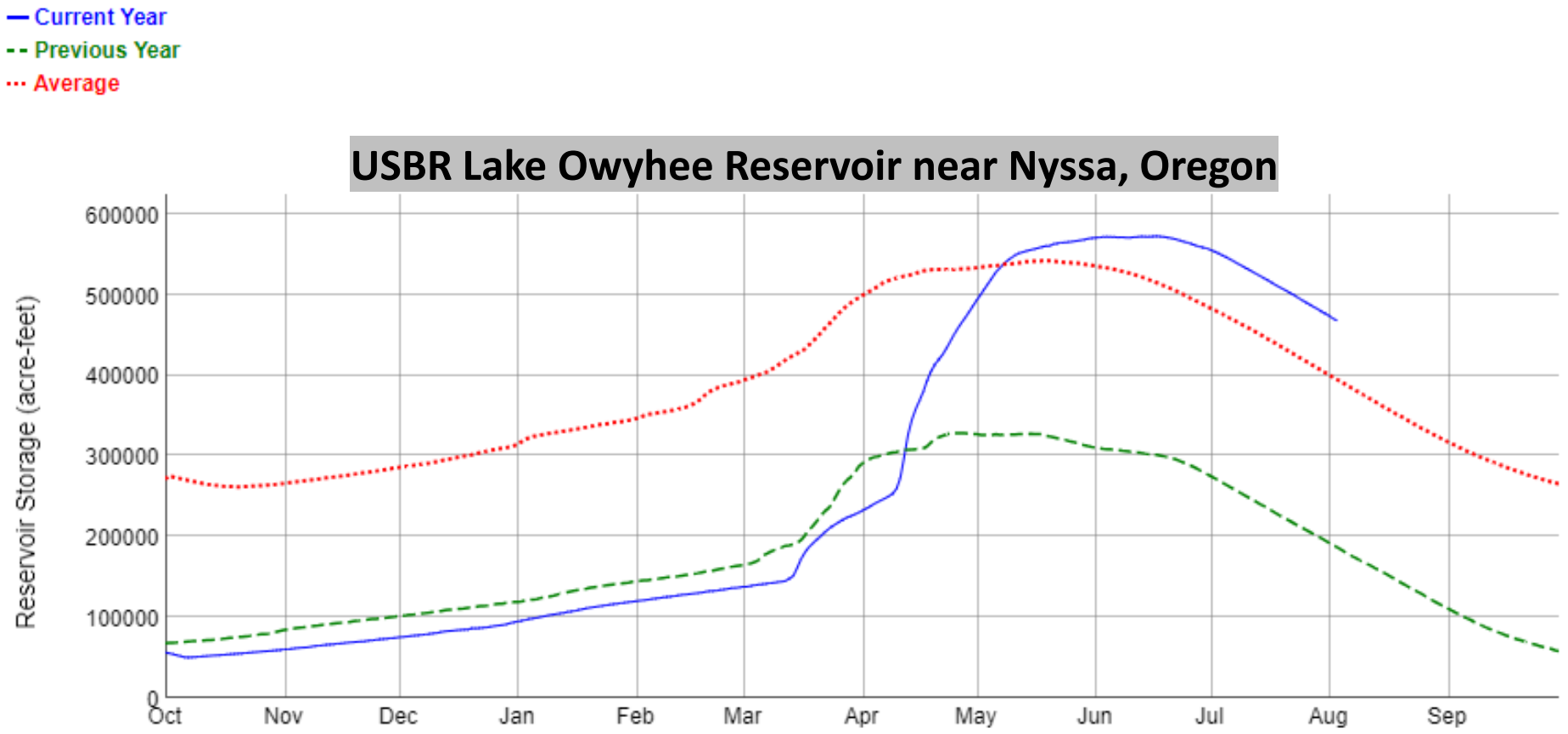
Water Year Graph

— Current Year
-- Previous Year
··· Average

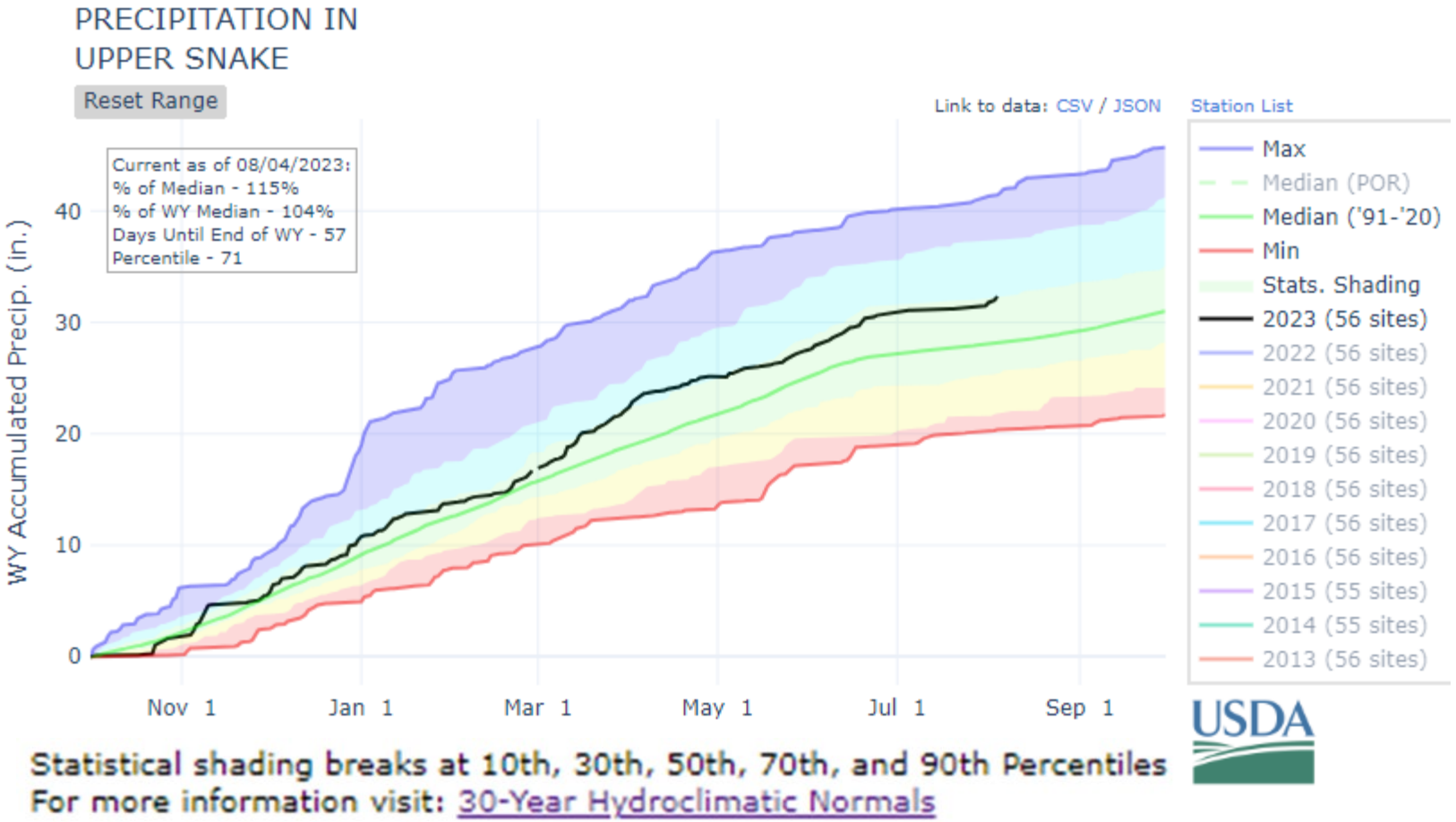


Owyhee Reservoir

Water Year Graph



Upper Snake River



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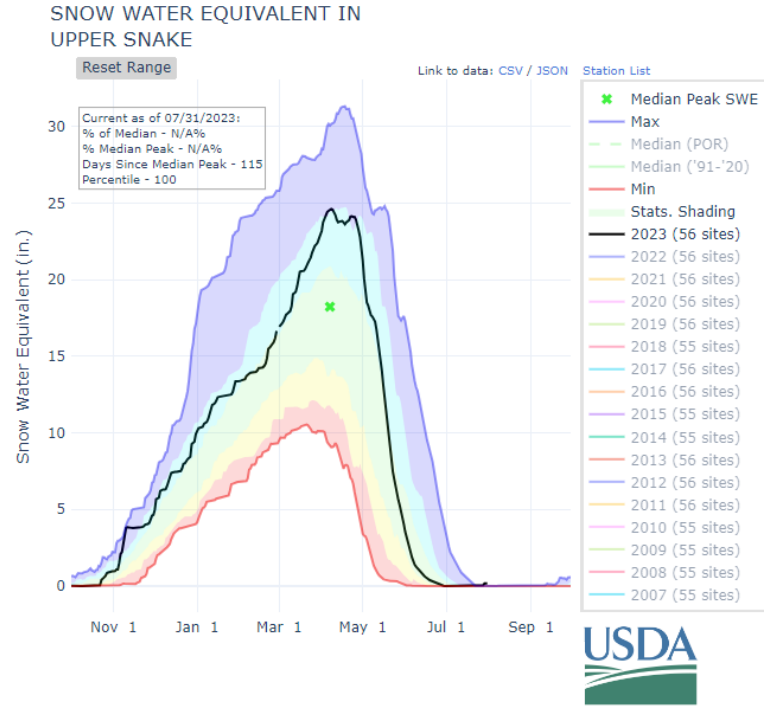
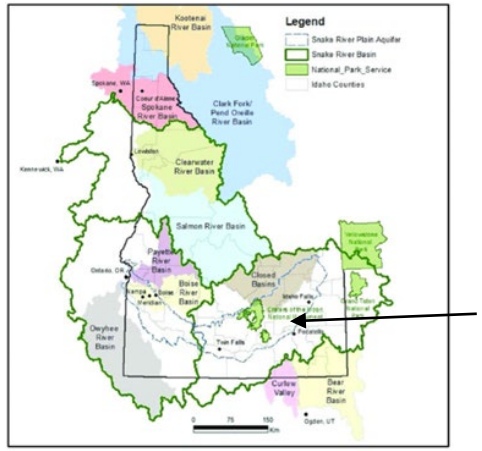
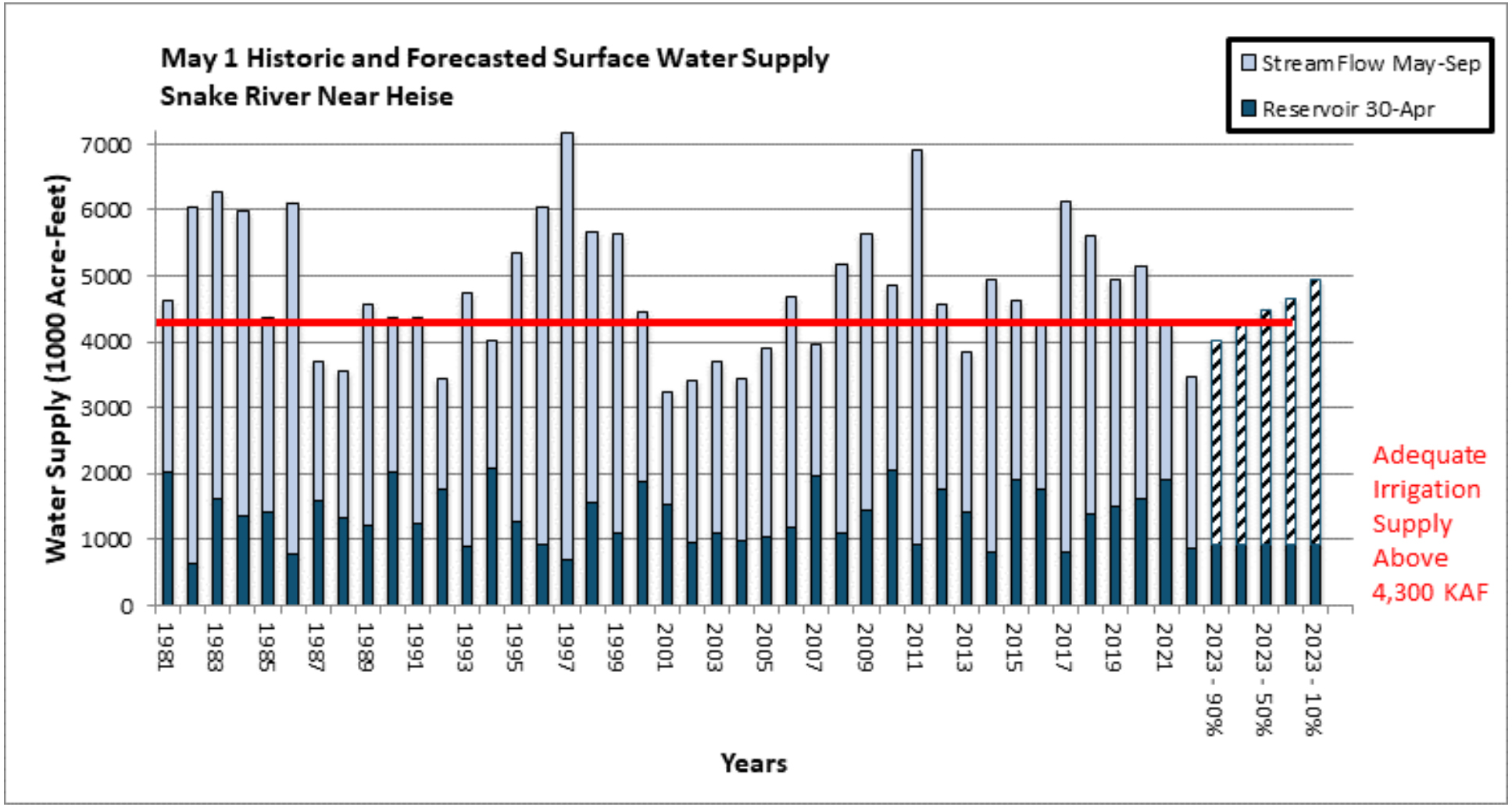




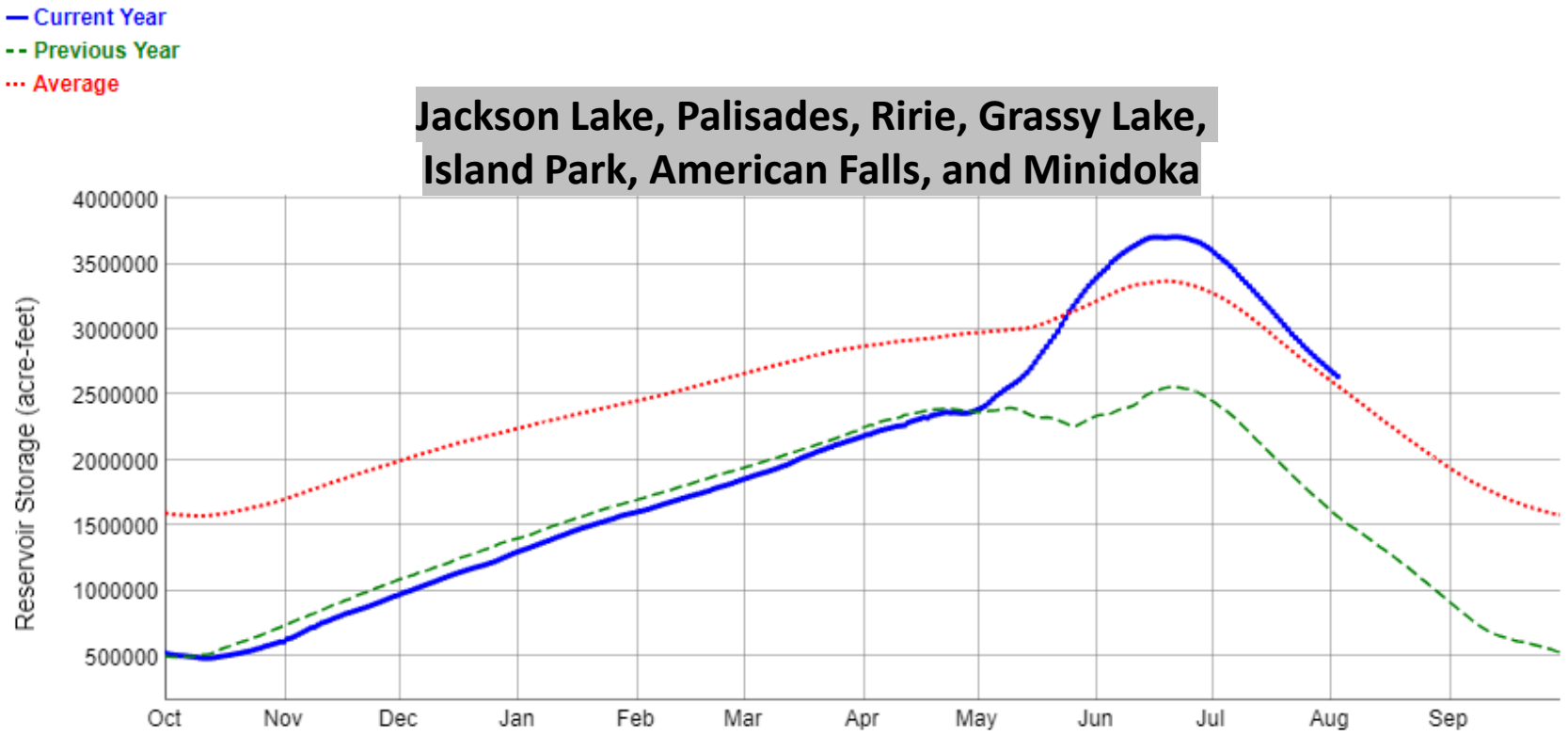
Upper Snake

Upper Snake River

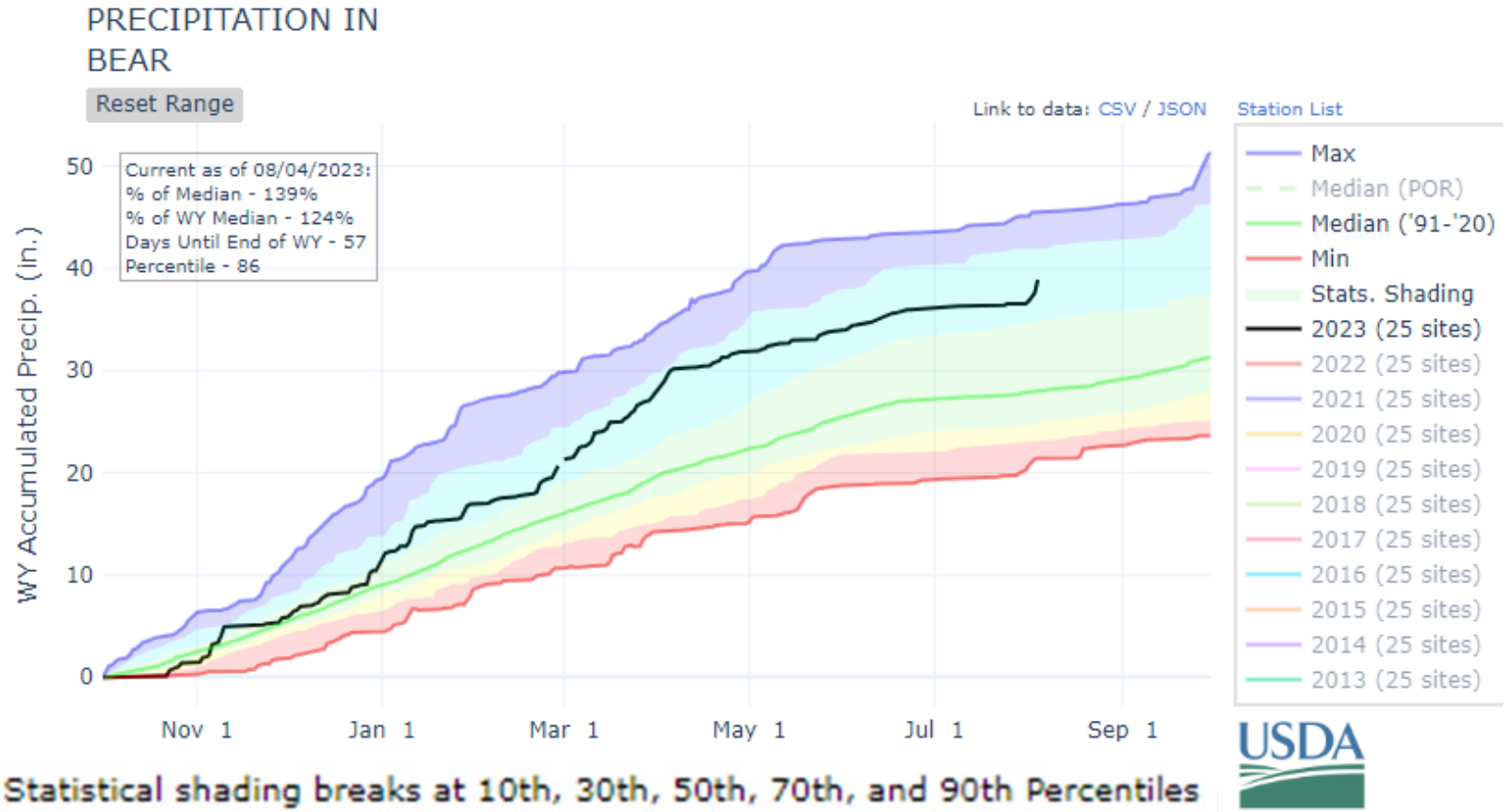


Upper Snake River

Water Year Graph



Bear River



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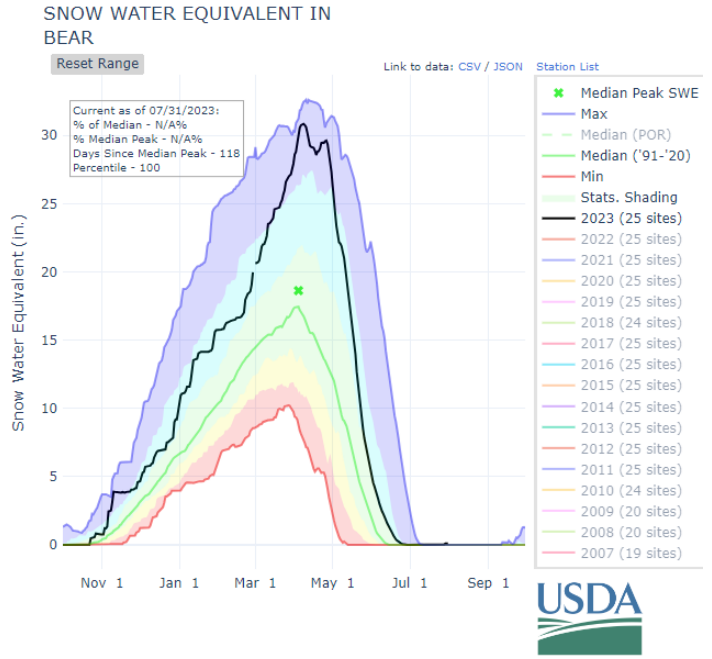
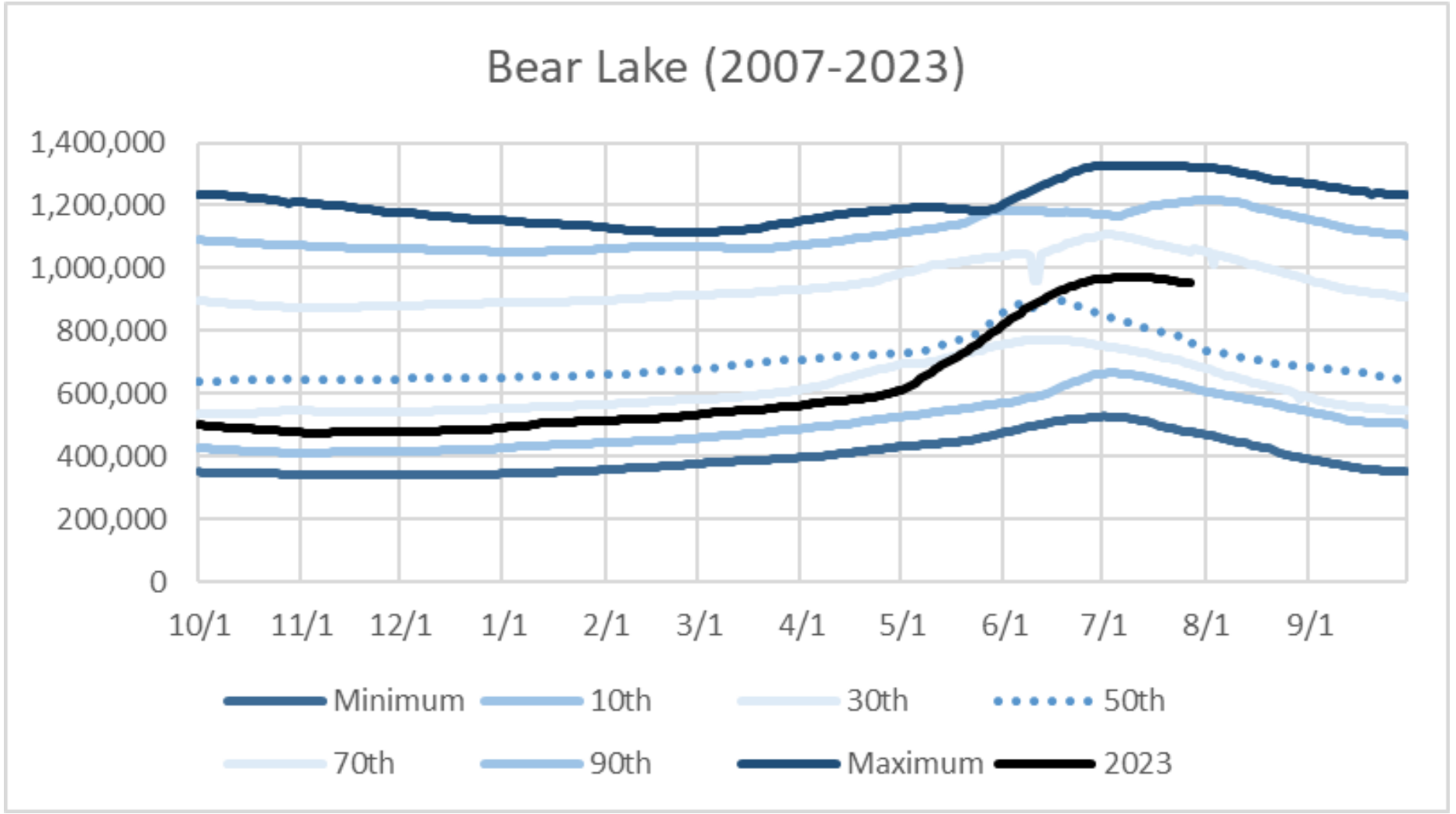
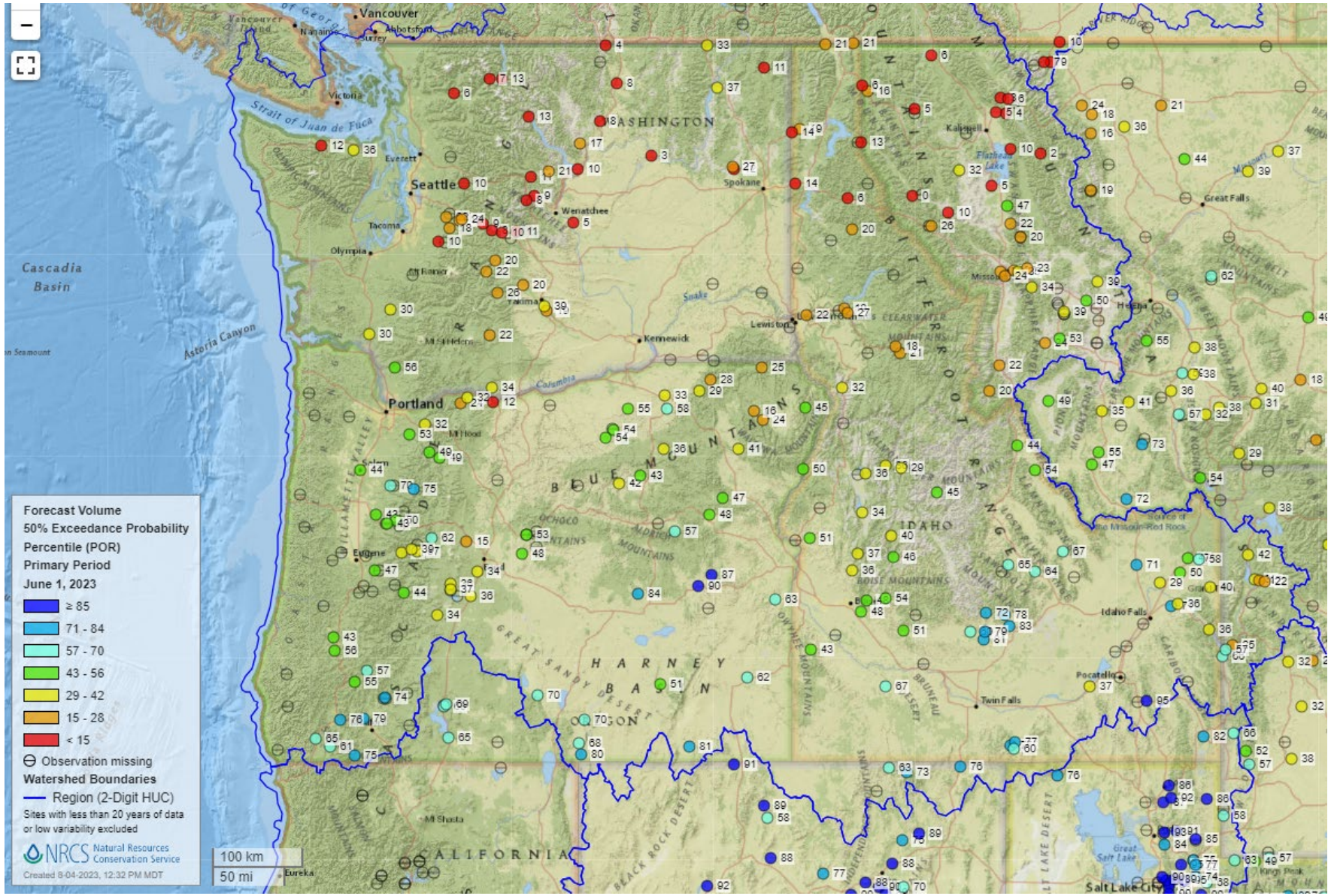


Bear Lake Reservoir Content Statistics





Drought Development northern Idaho

Drought Recovery southern Idaho

Will have a strong El Nino in 2024 winter.

Questions?

Contact:

David Hoekema
Hydrologist, IDWR
714 697-3203
David.Hoekema@idwr.Idaho.gov

Strong El Nino likely for 2024

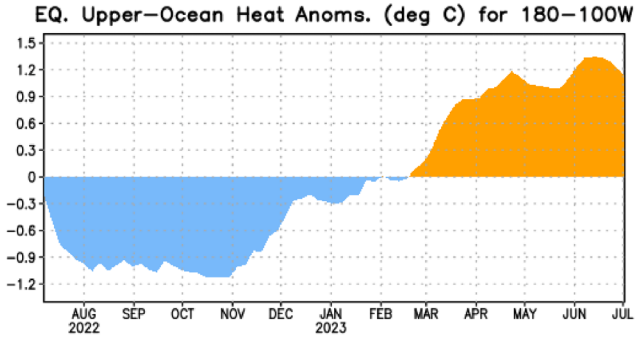


Figure 3. Area-averaged upper-ocean heat content anomaly (°C) in the equatorial Pacific (5°N-5°S, 180°-100°W). The heat content anomaly is computed as the departure from the 1991-2020 base period pentad means.

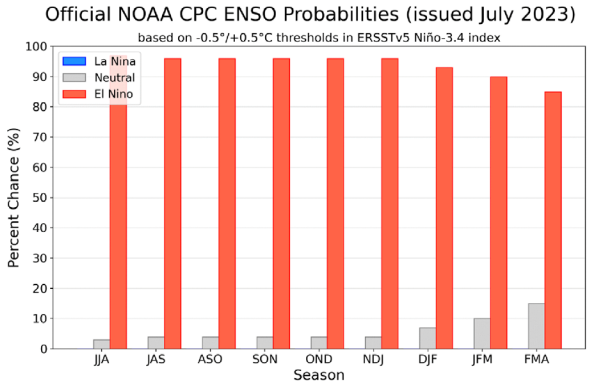


Figure 7. Official ENSO probabilities for the Niño 3.4 sea surface temperature index (5°N-5°S, 120°W-170°W). Figure updated 13 July 2023.

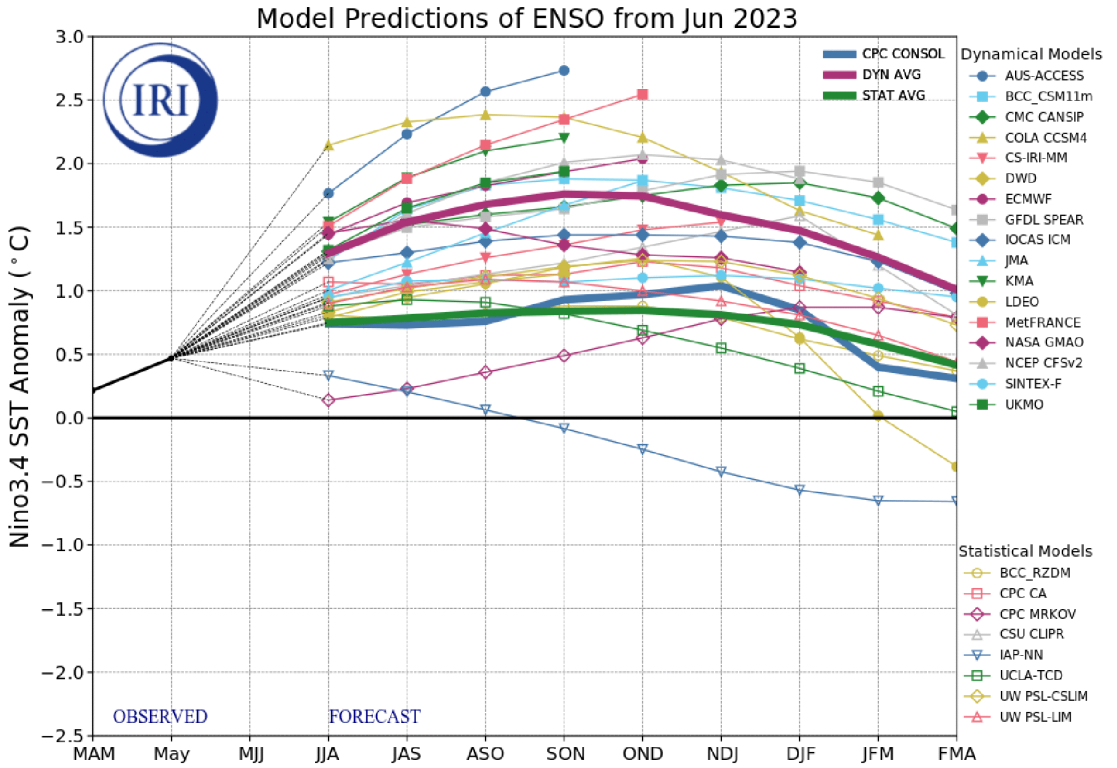


Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Figure updated 16 June 2023 by the International Research Institute (IRI) for Climate and Society.

Idaho's Ground Water Resources – Statewide Update

IDAHO DEPARTMENT OF WATER RESOURCES

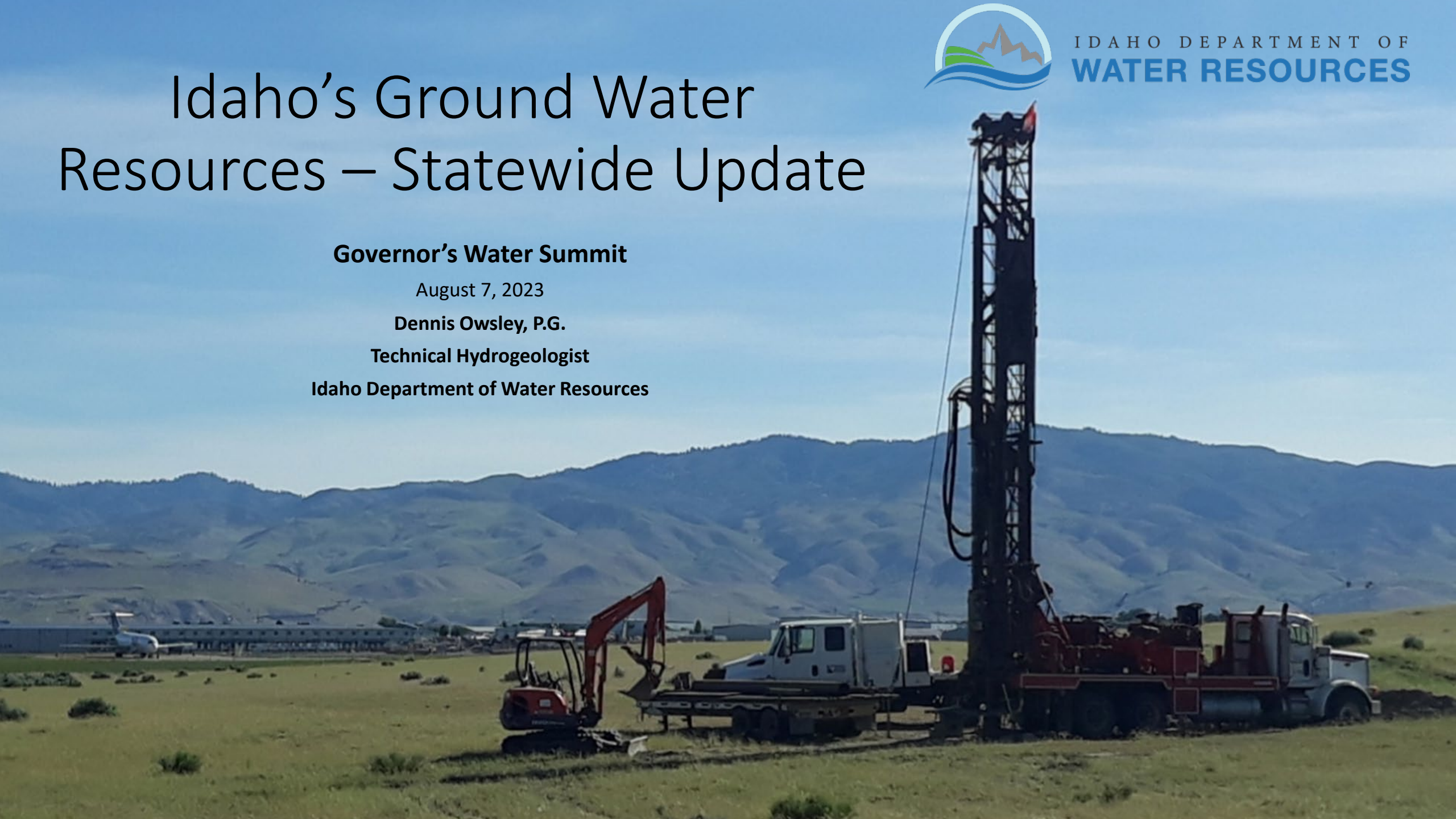
Governor's Water Summit

August 7, 2023

Dennis Owsley, P.G.

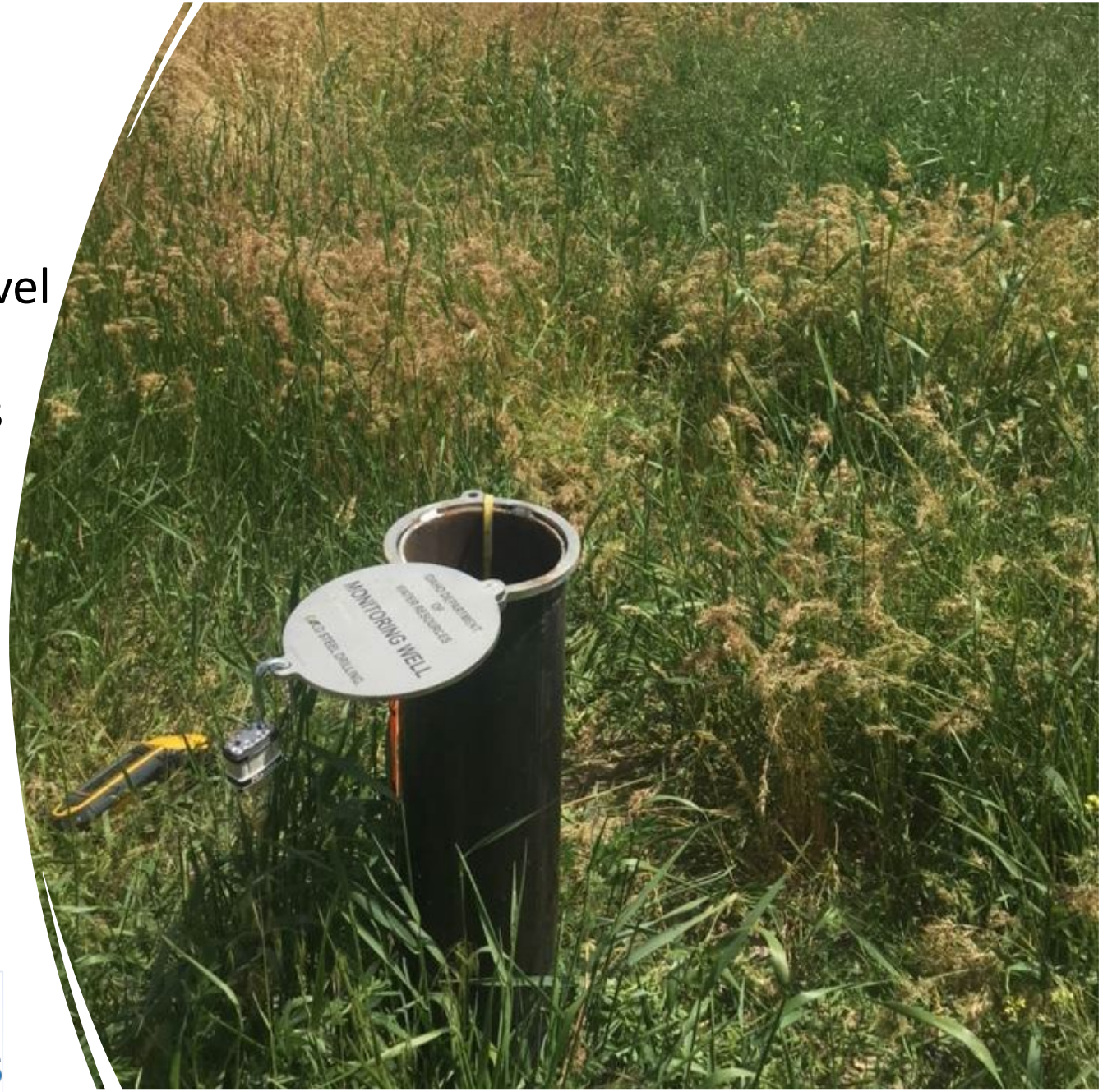
Technical Hydrogeologist

Idaho Department of Water Resources



Presentation Overview

- Statewide Ground Water Level Program
- Regional Aquifer Summaries
  - Northern Region
  - Western Region
  - Southern/Eastern Regions

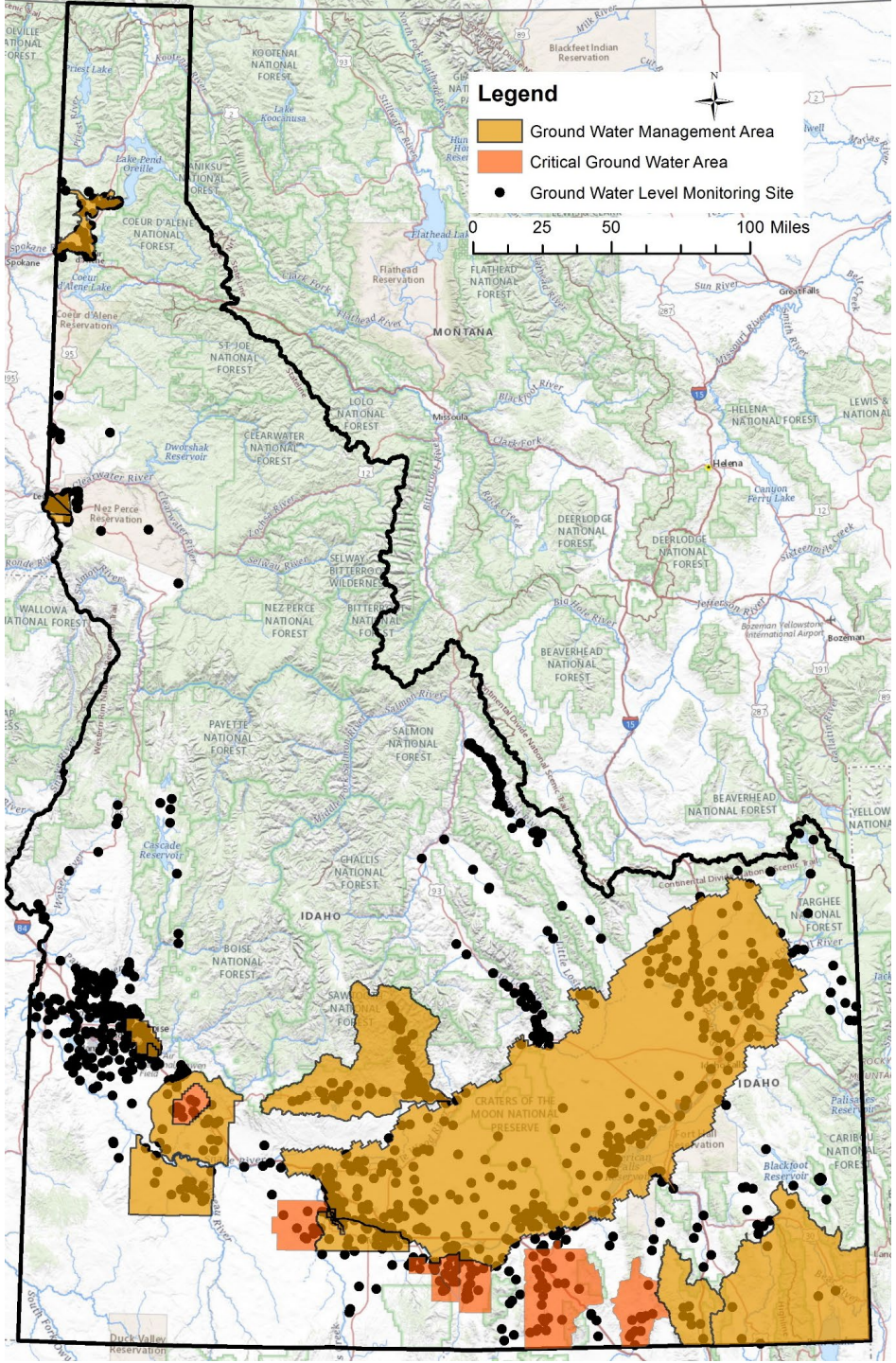


IDAHO DEPARTMENT OF
WATER RESOURCES

Statewide Ground Water Level Monitoring Program

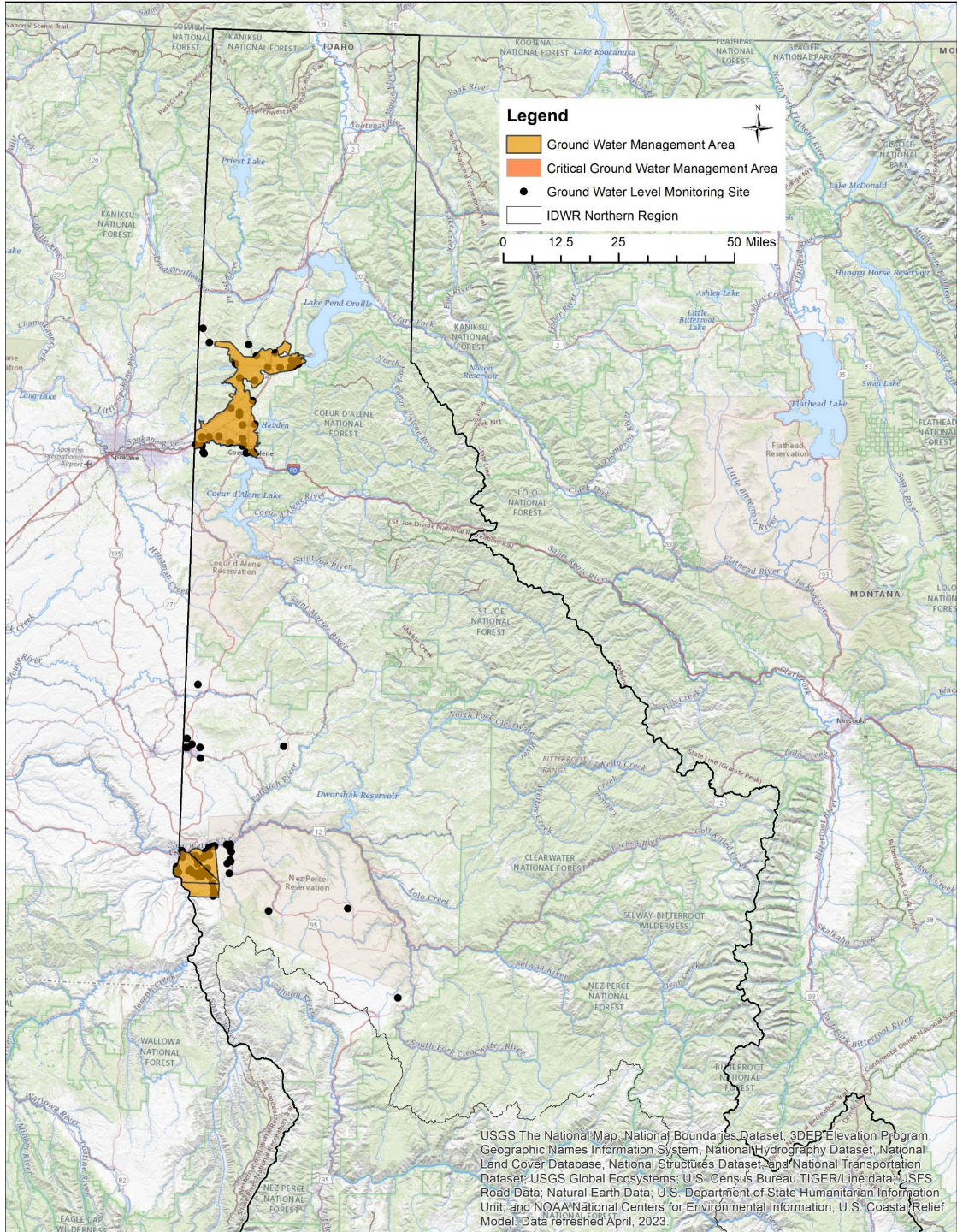
- IDWR monitors water level data in over 1,200 wells annually to:
  - Evaluate ground water trends statewide
  - Monitor areas of concern, such as ground water management areas (GWMAs) and critical ground water areas (CGWAs)
  - Support planning, **modeling**, and research projects
  - https://idwr-groundwater-data.idaho.gov/

IDAHO DEPARTMENT OF
WATER RESOURCES

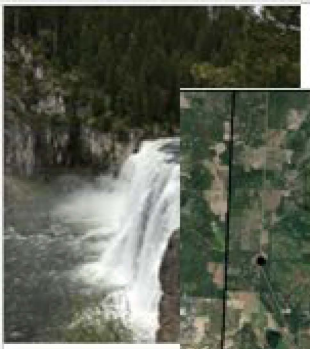


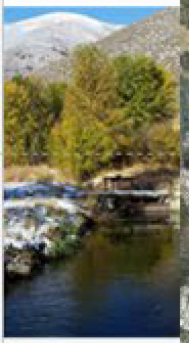
IDWR's Northern Region

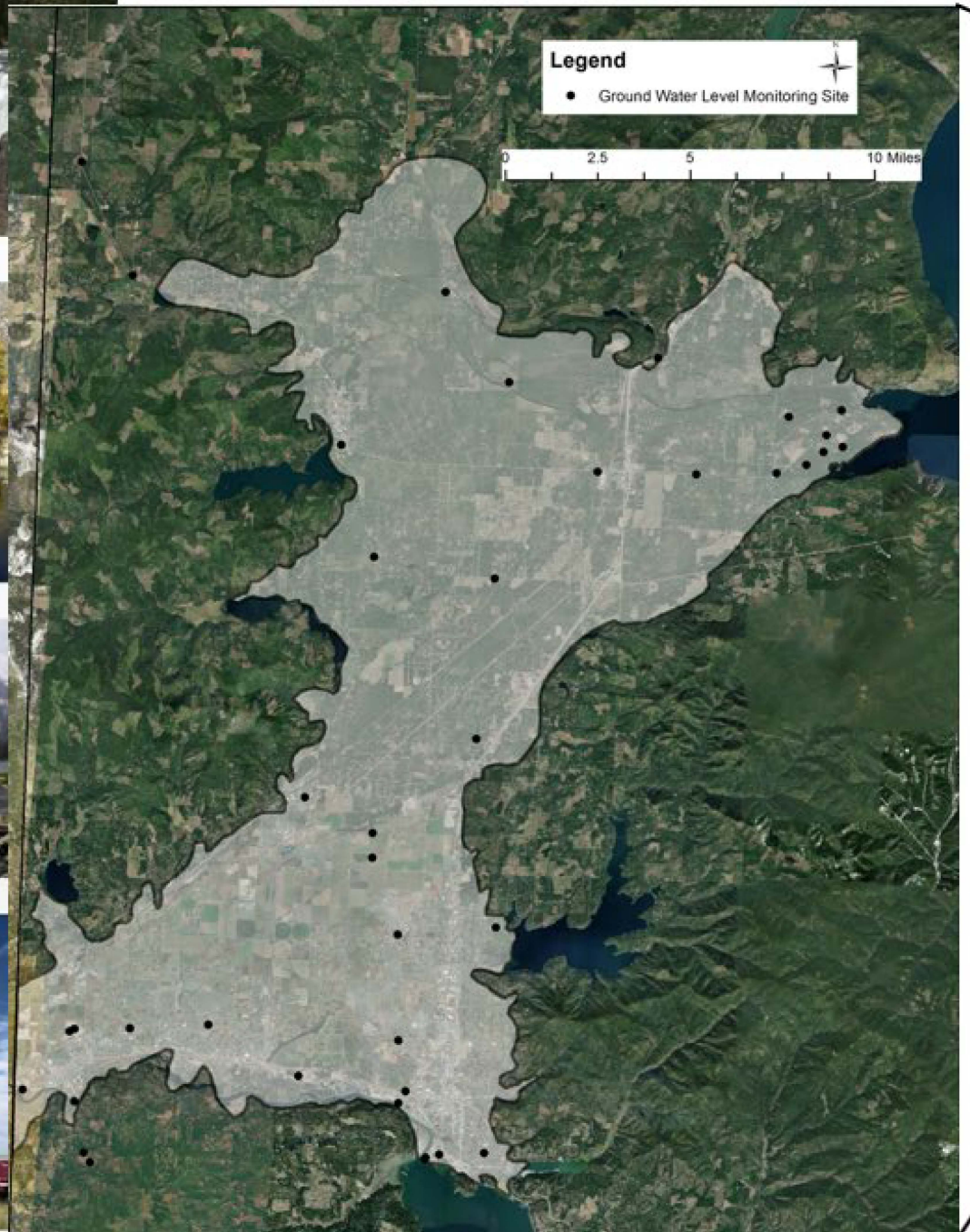
- Rathdrum Prairie Aquifer
- Moscow Basin Aquifer
- Lewiston Aquifer

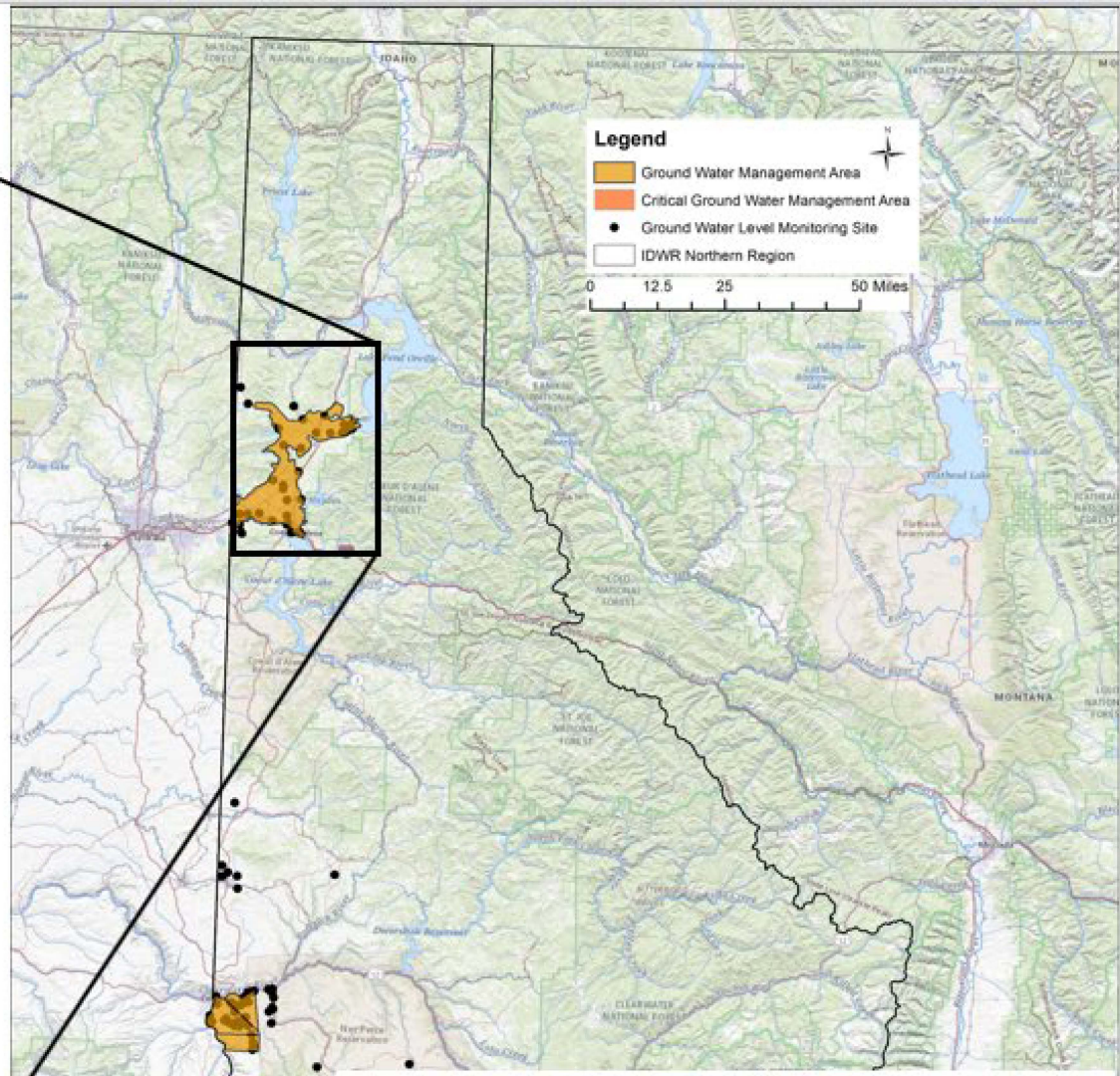


Rathdrum Prairie Aquifer



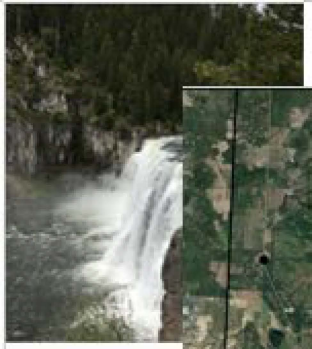


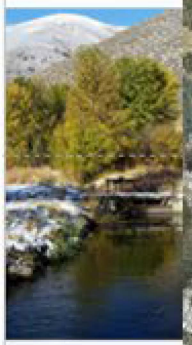


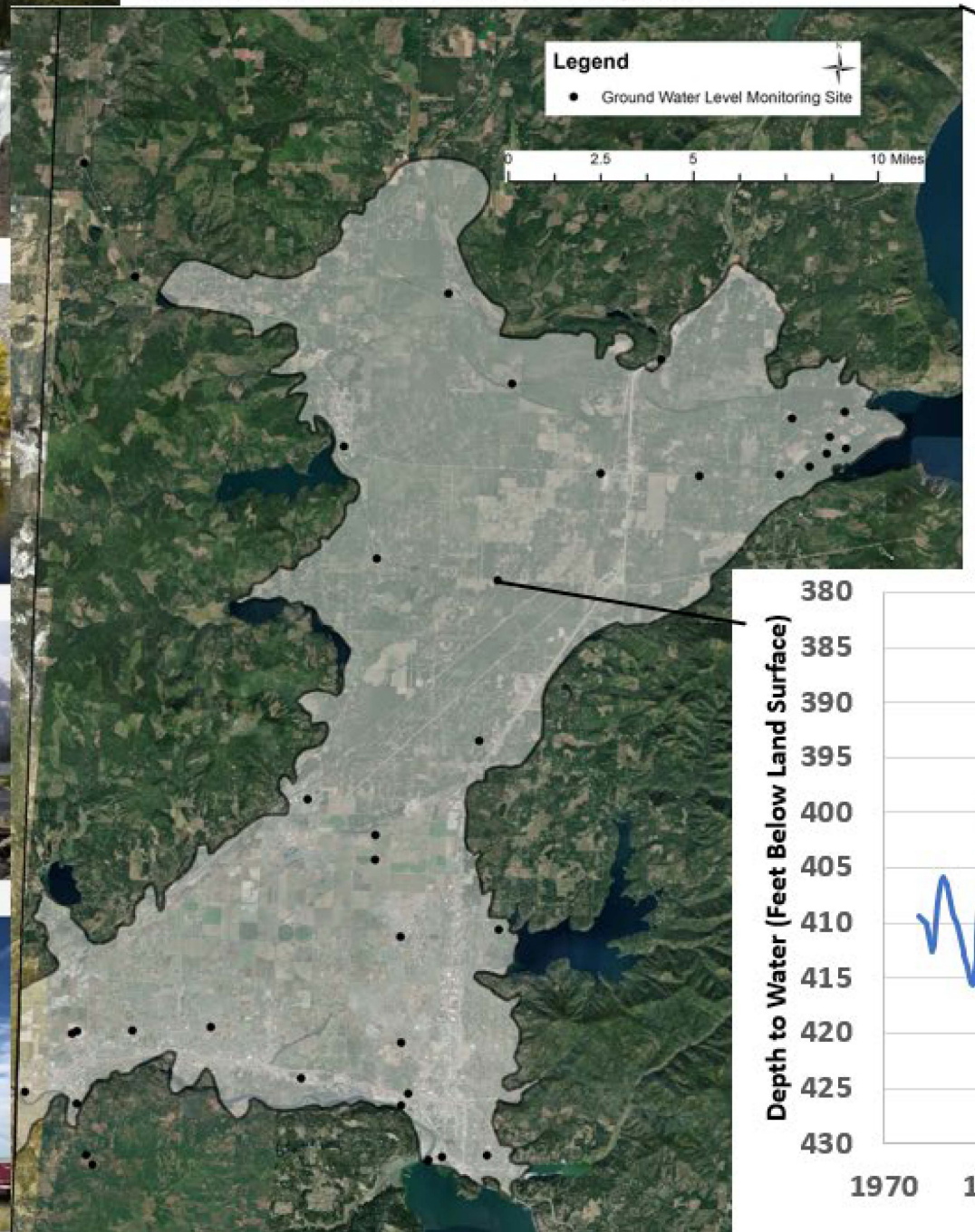


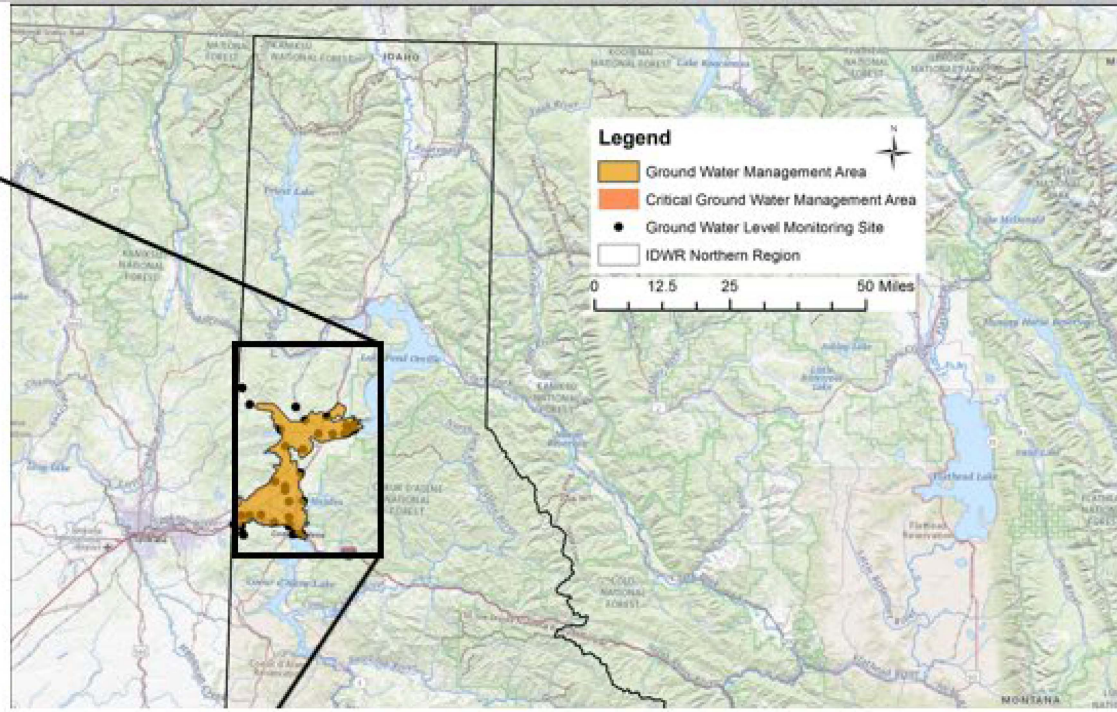
Rathdrum Prairie Aquifer
- Ground Water Management Area
- Sole Source Aquifer
- Interstate Aquifer
- Ground Water Flow Model
- Stable Water Levels

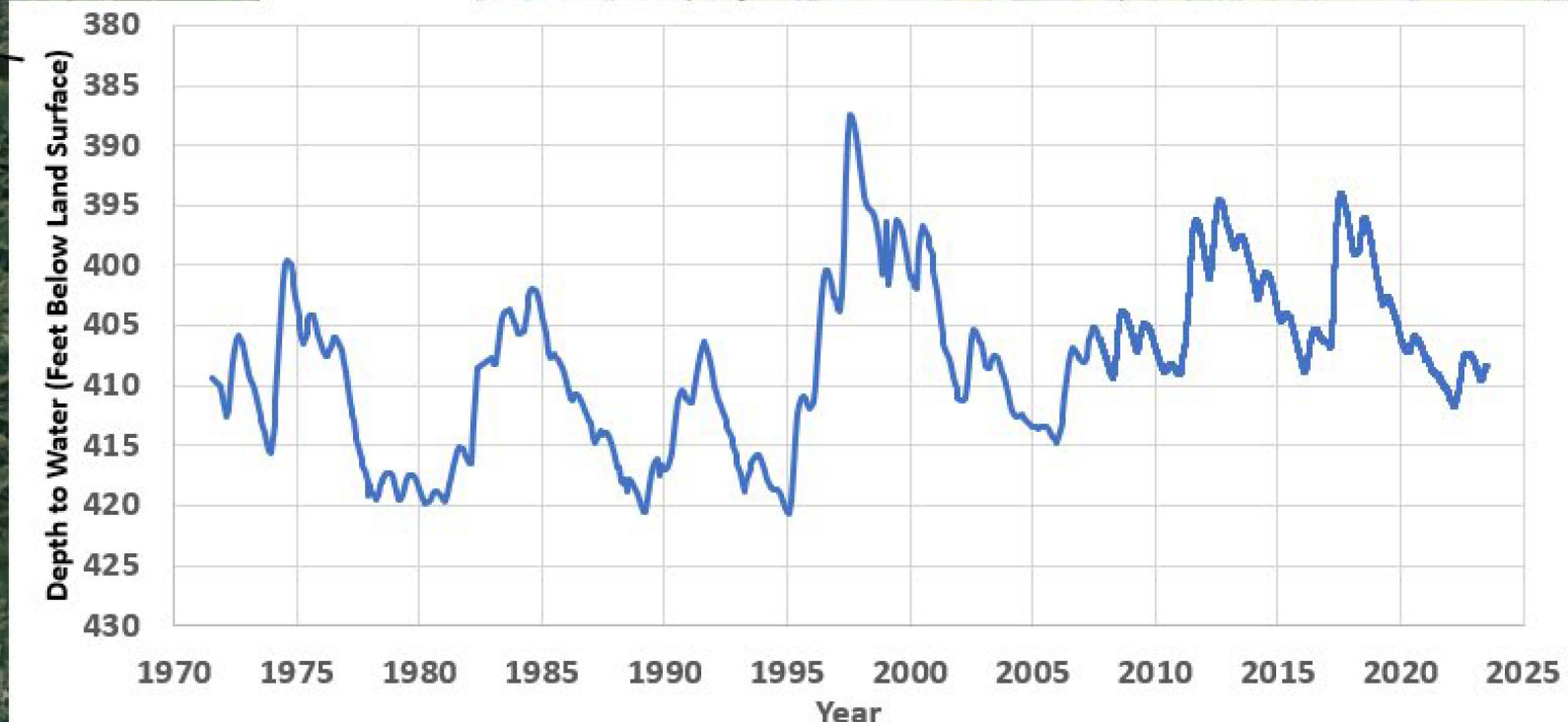
Rathdrum Prairie Aquifer



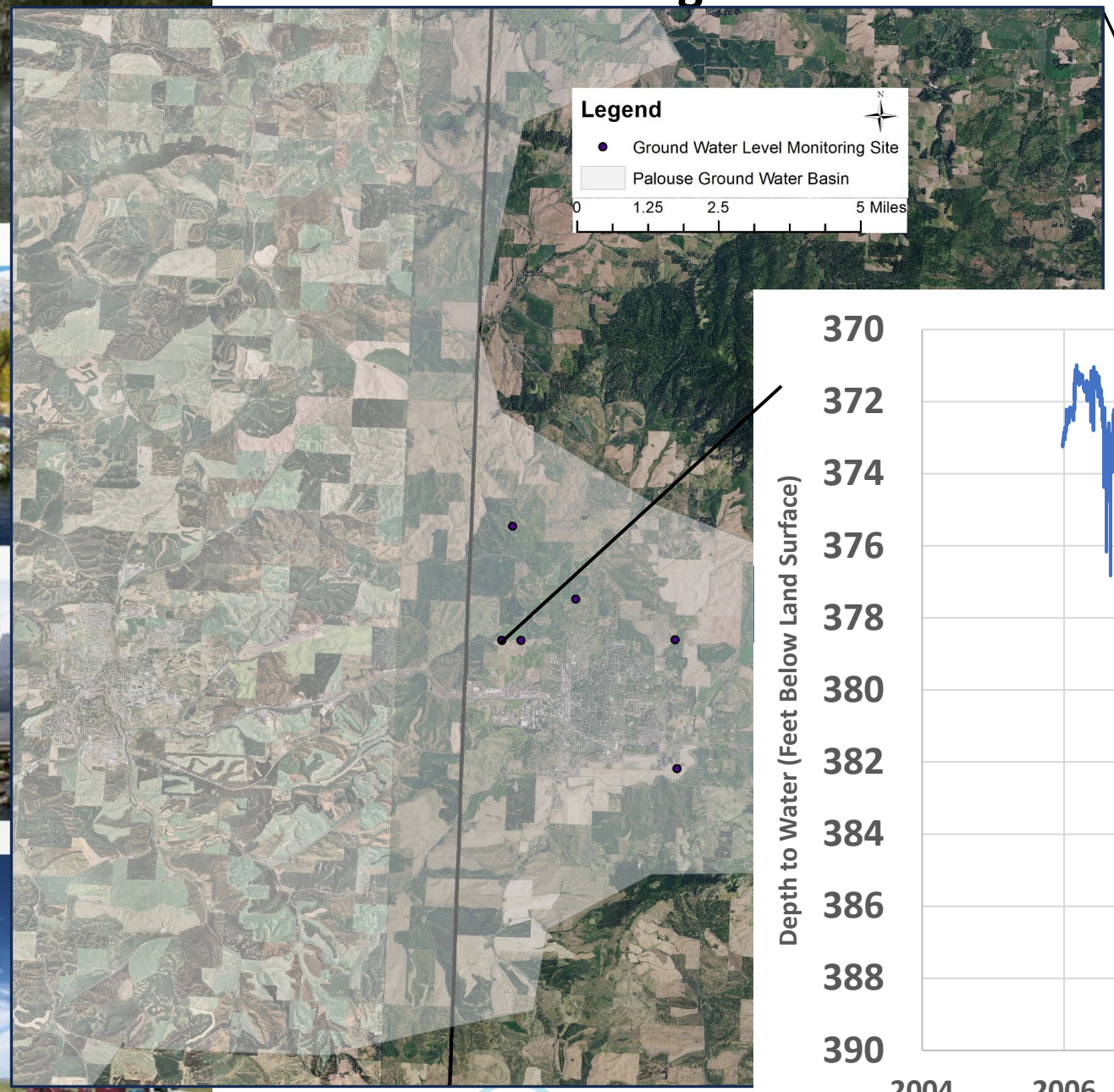


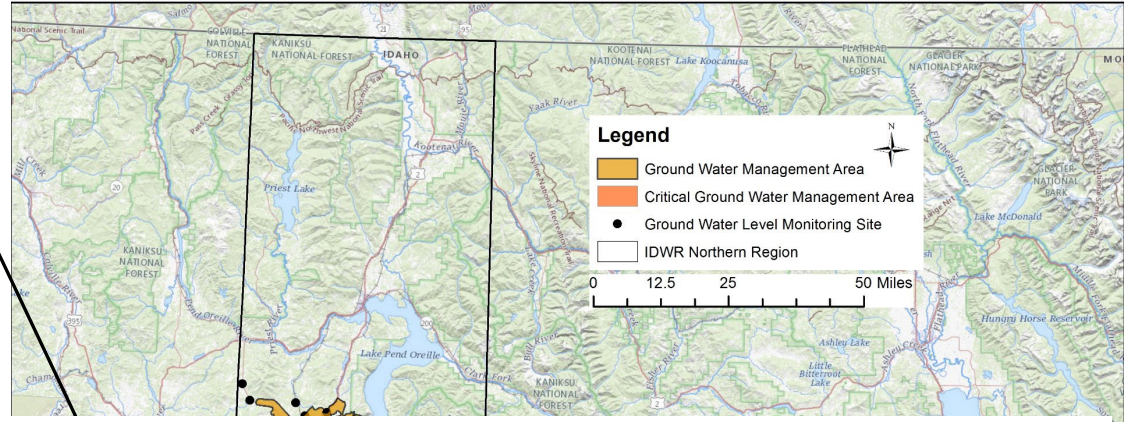


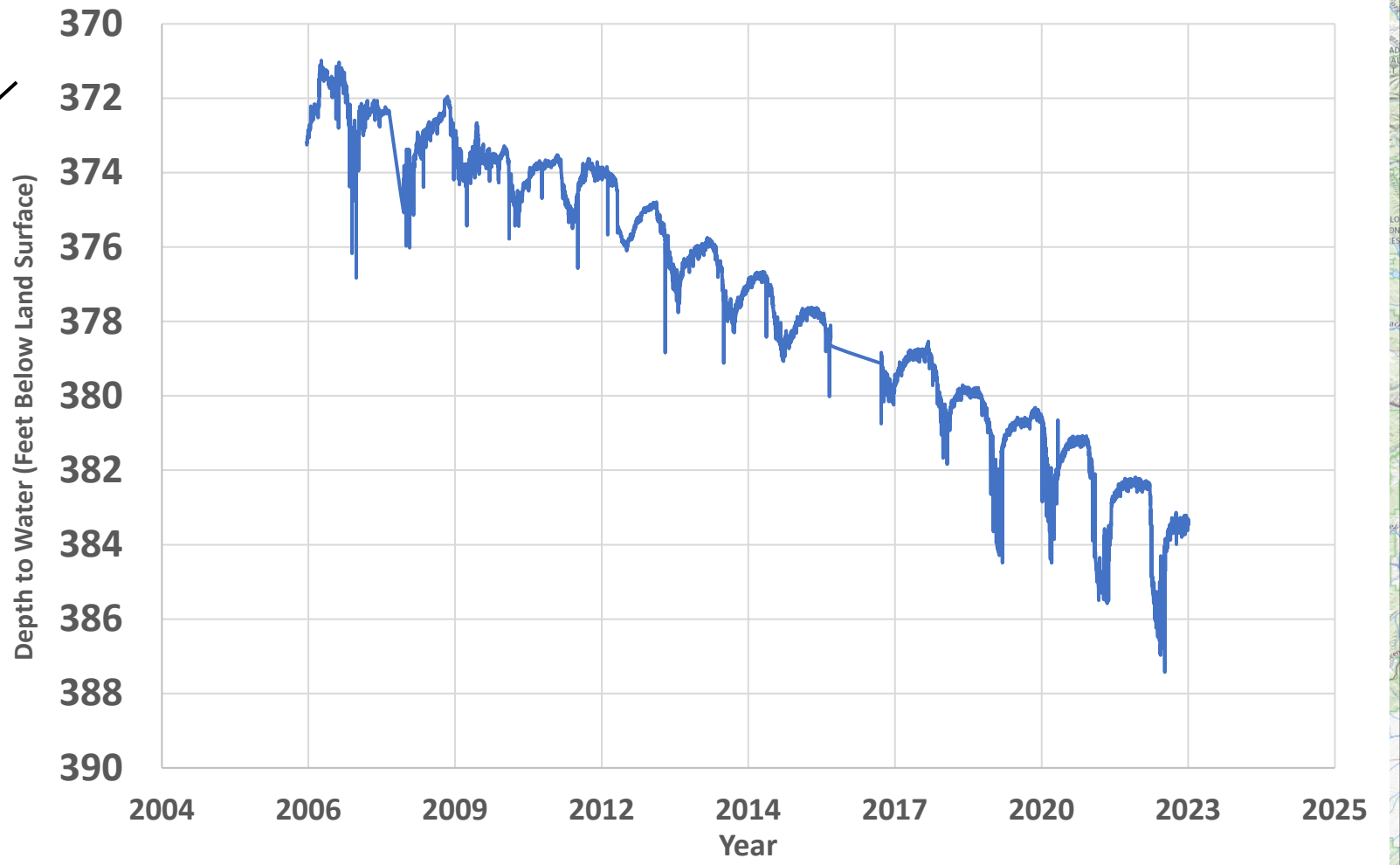




IDWR's Northern Region -- Moscow







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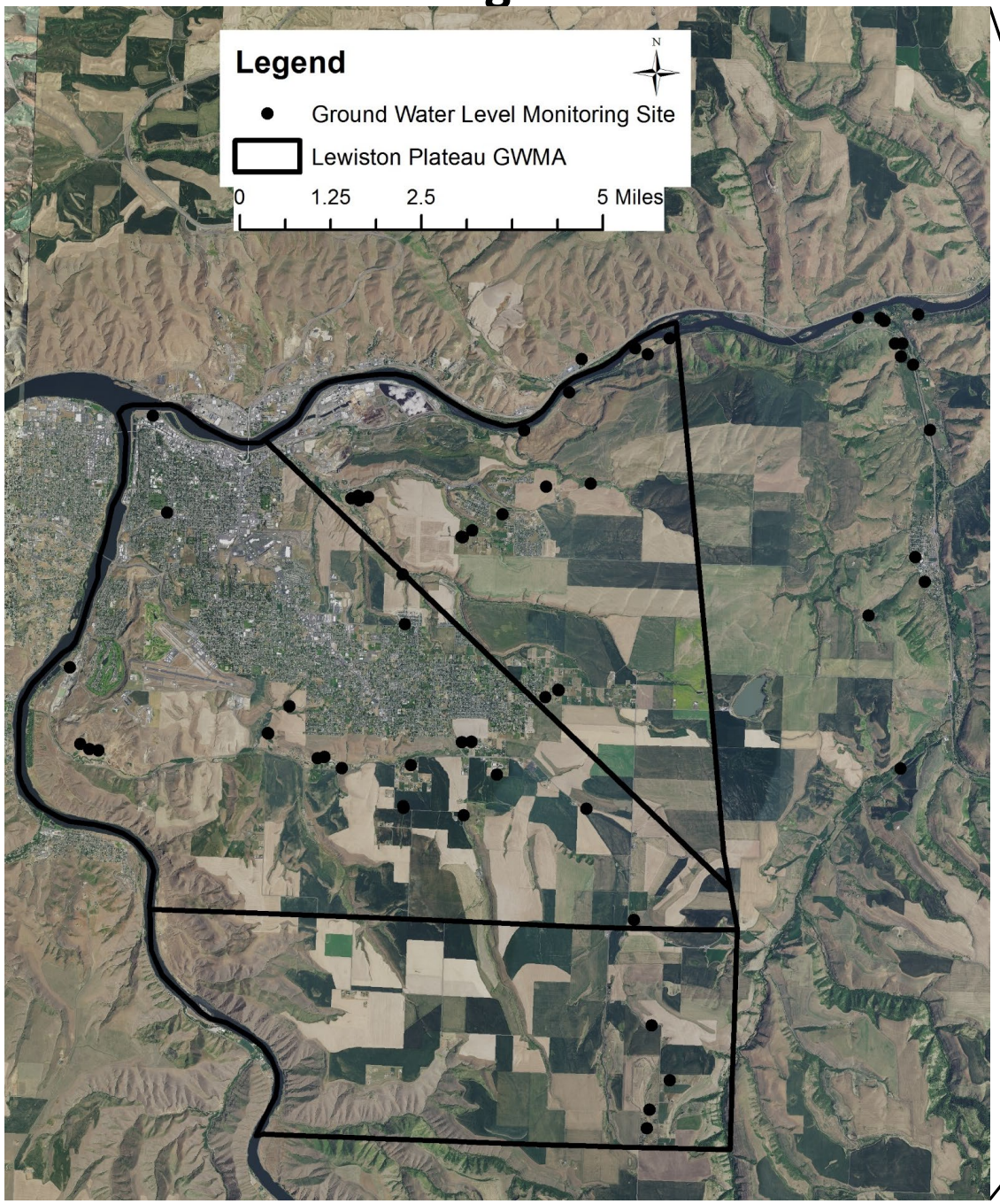
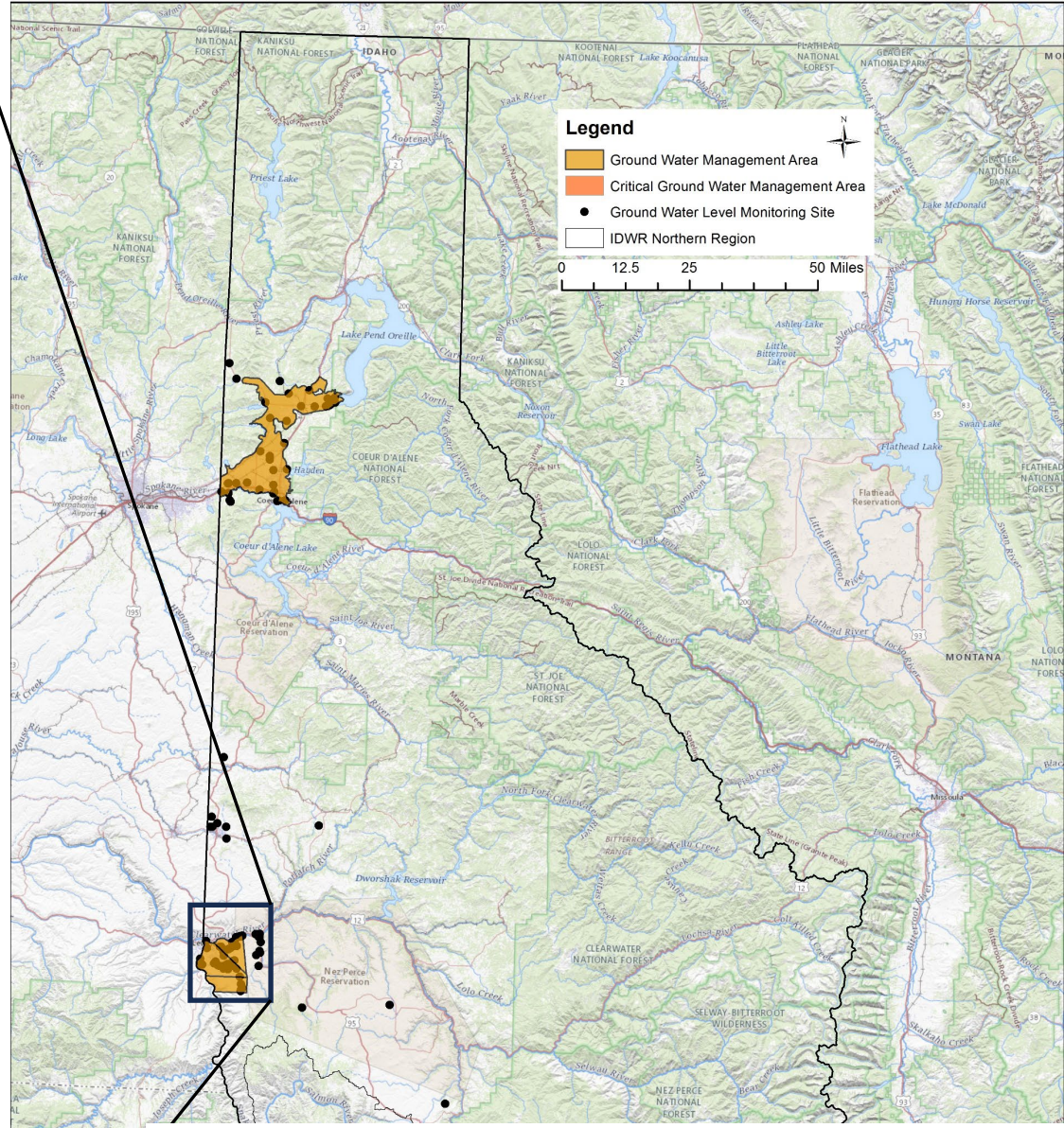
IDWR's Northern Region - Lewiston

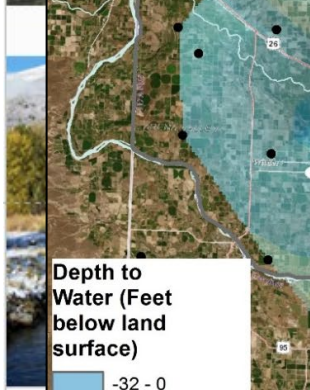


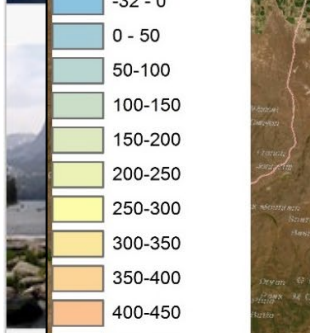


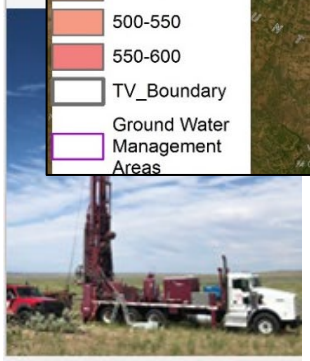
Lewiston Basin

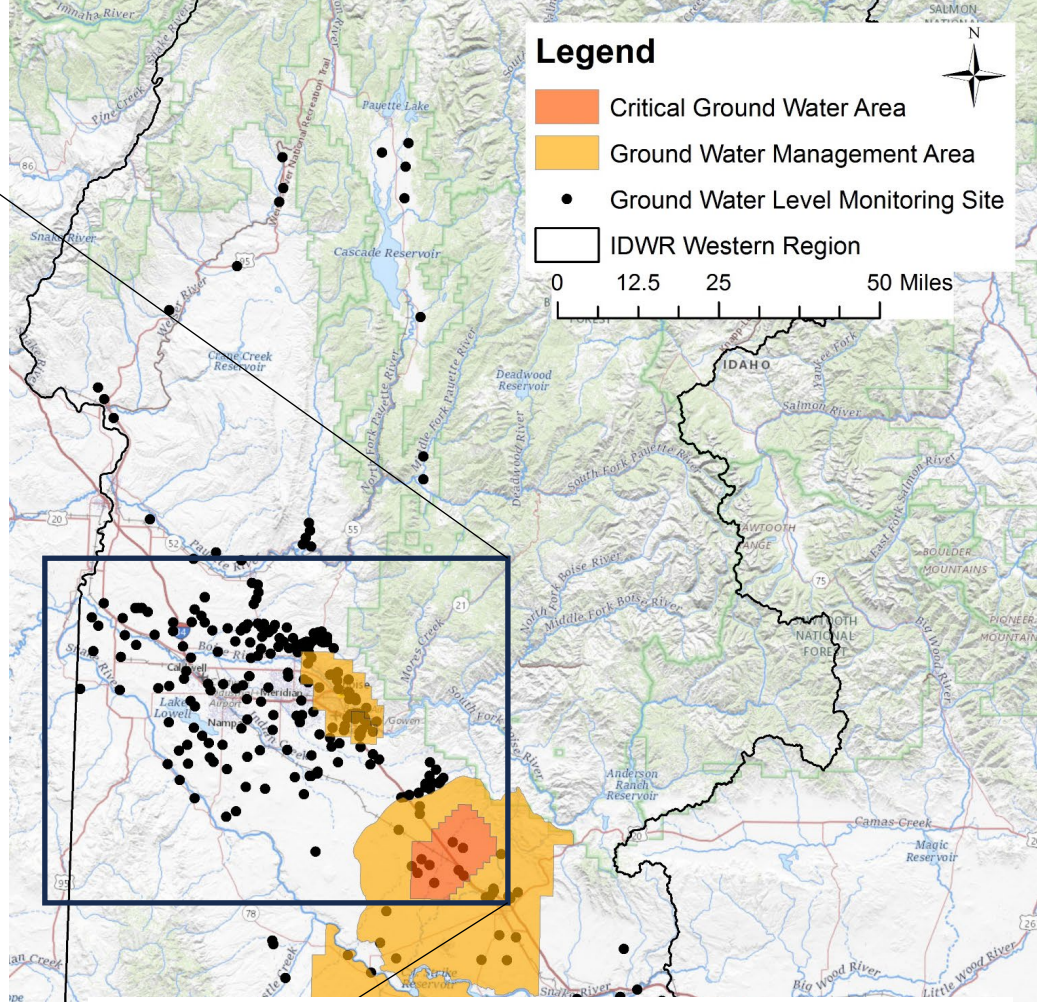
- Multiple aquifers
- Ground Water Management Area
- Variable aquifer declines

IDWR's Western Region







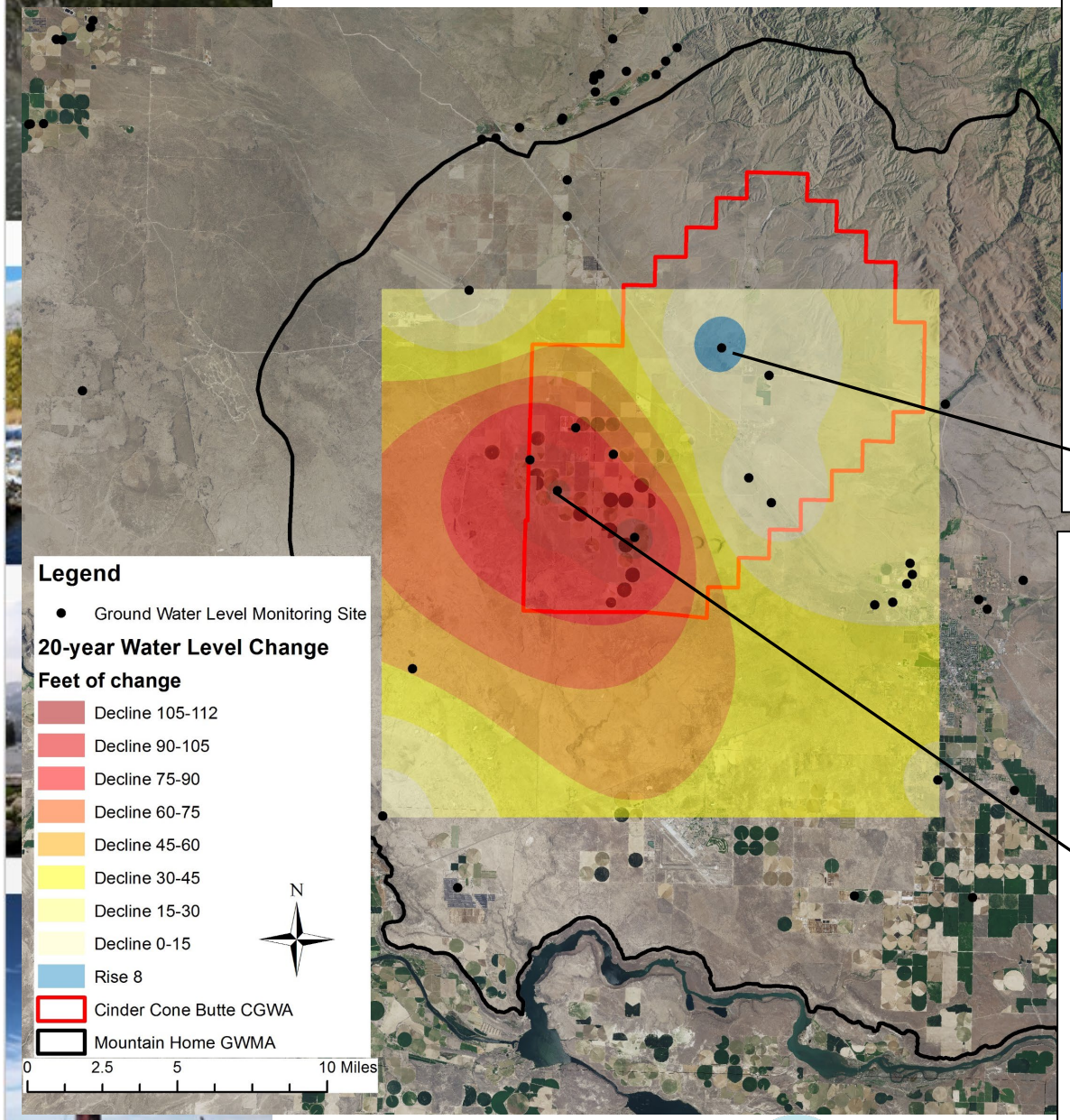


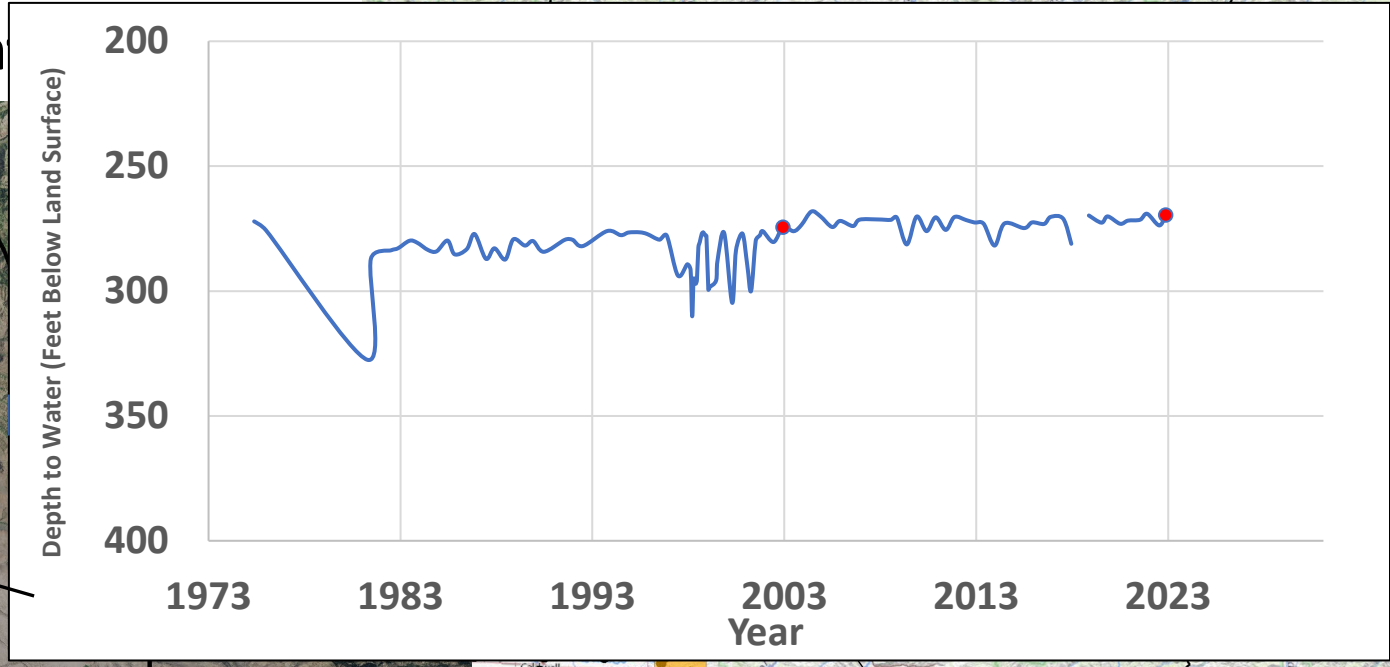
Treasure Valley

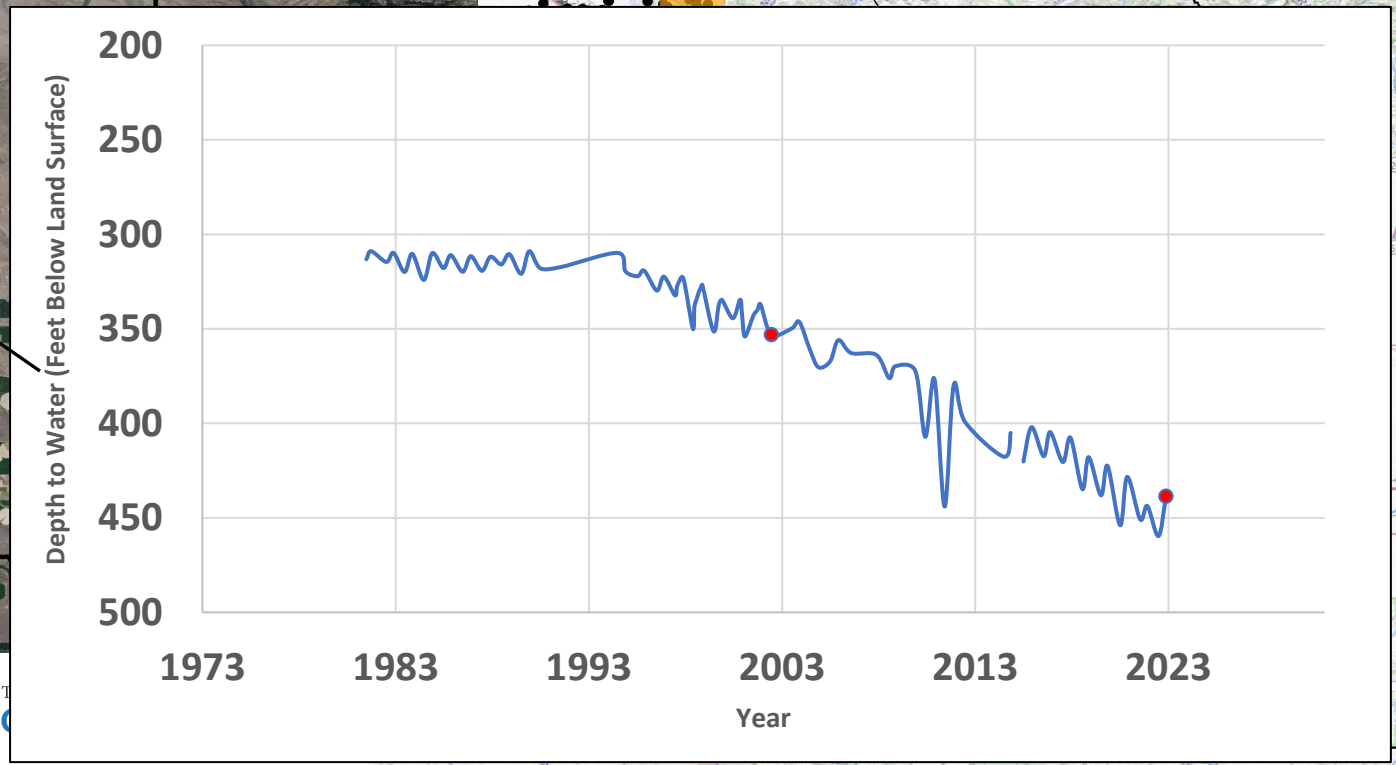
- Complex hydrogeology
- Surface water irrigation system (recharge)
- Stable (generally) water levels
- Model development

IDAHO DEPARTMENT OF WATER RESOURCES

IDWR's Western Region – Moun







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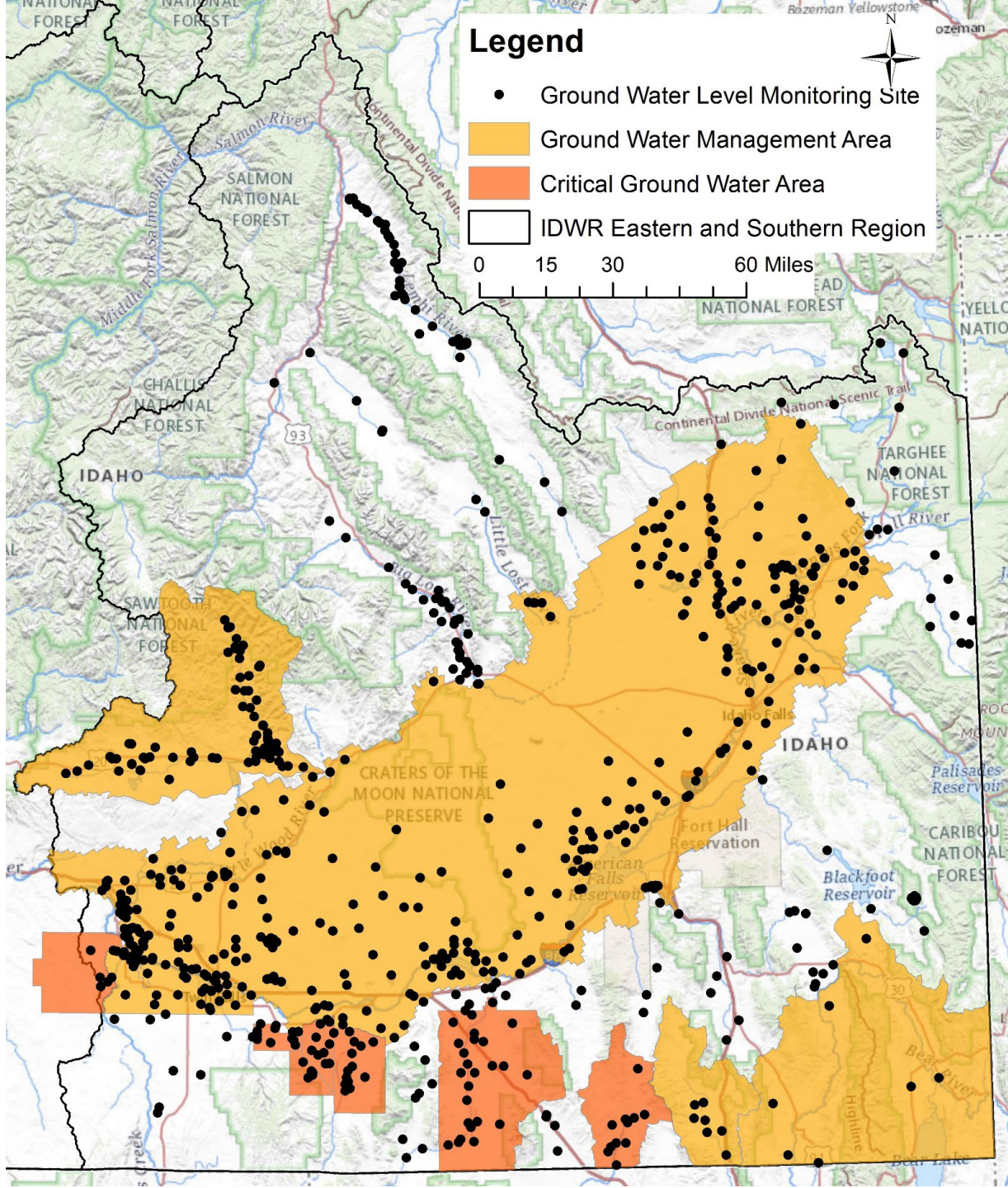
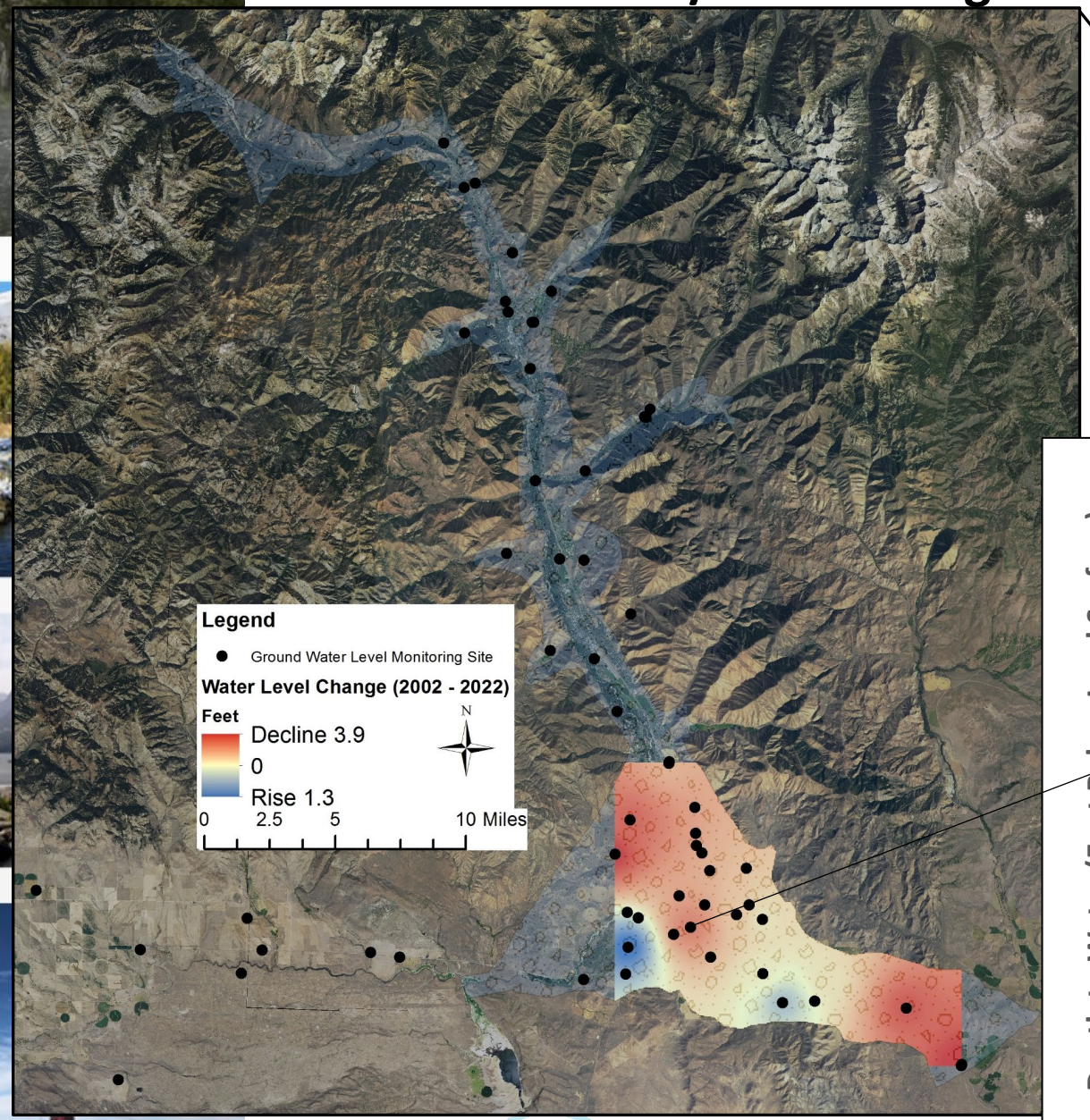
IDWR's Southern/Eastern Regions

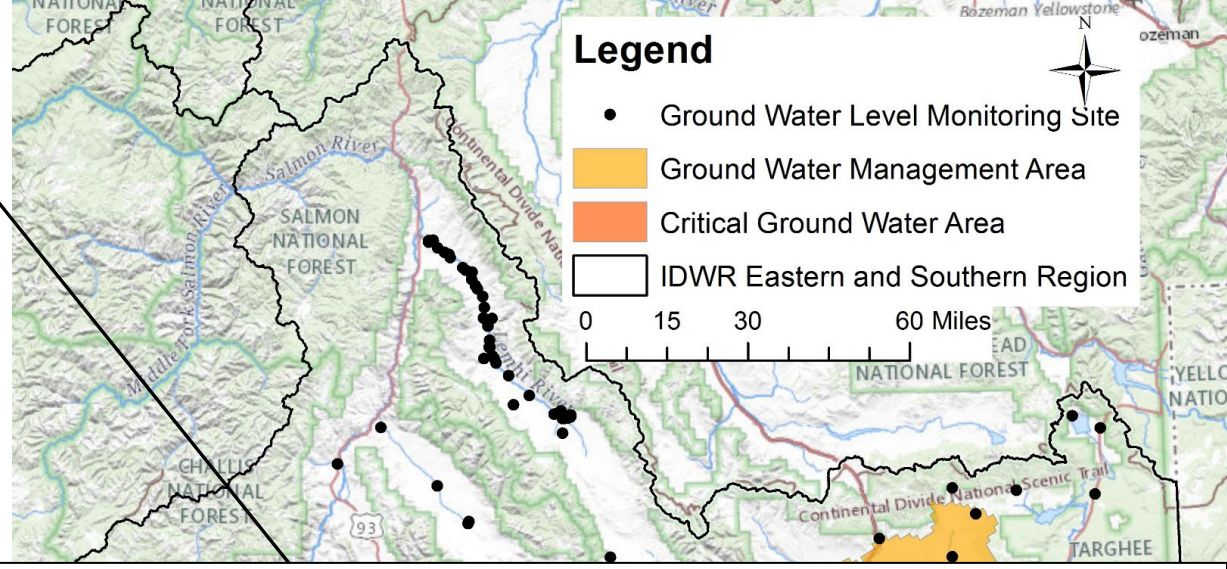
- Big Wood Valley*
- Big Lost Valley*
- Lemhi Basin
- Banbury
- Raft River*
- Oakley*
- Curlew Valley
- Malad
- Bear River
- ESPA*

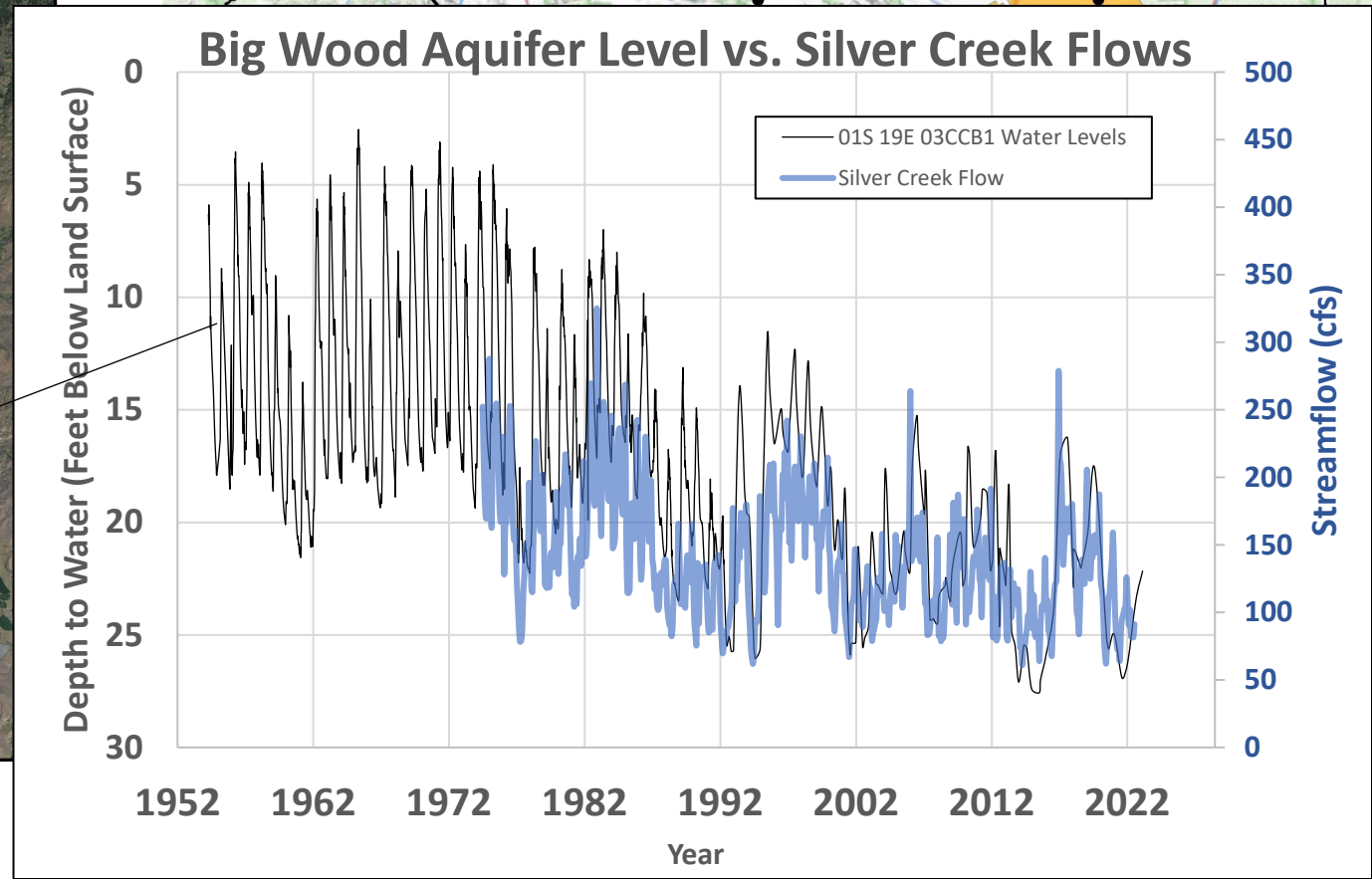
IDAHO DEPARTMENT OF WATER RESOURCES



IDWR's Southern/Eastern Regions

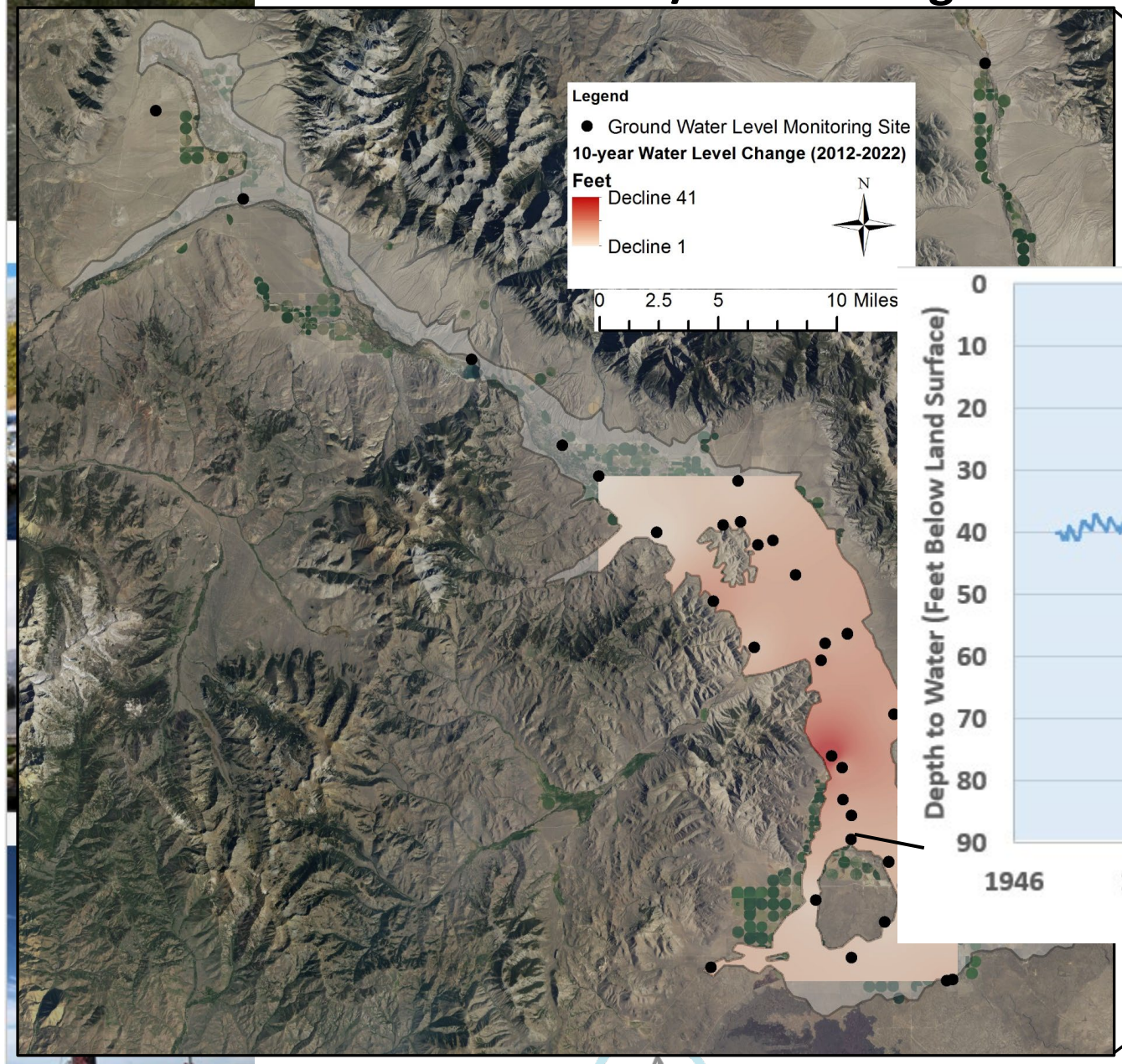


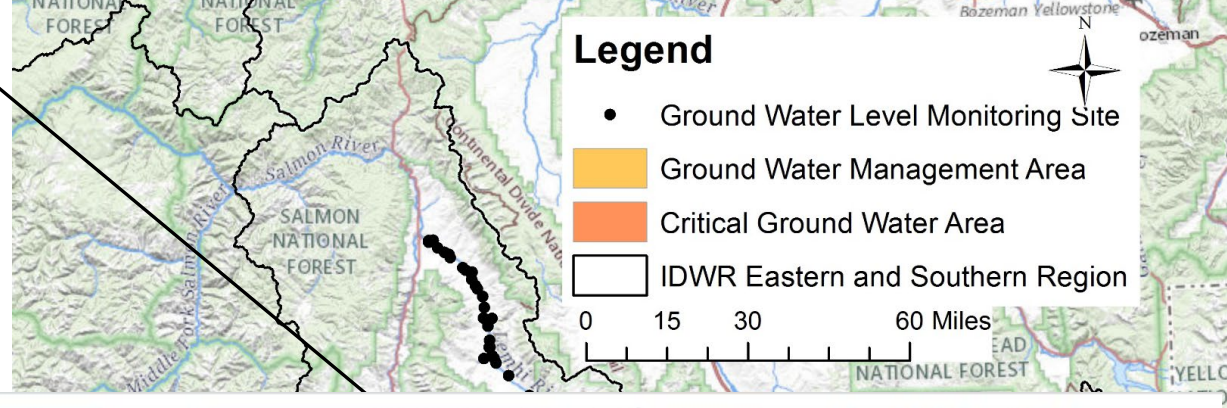


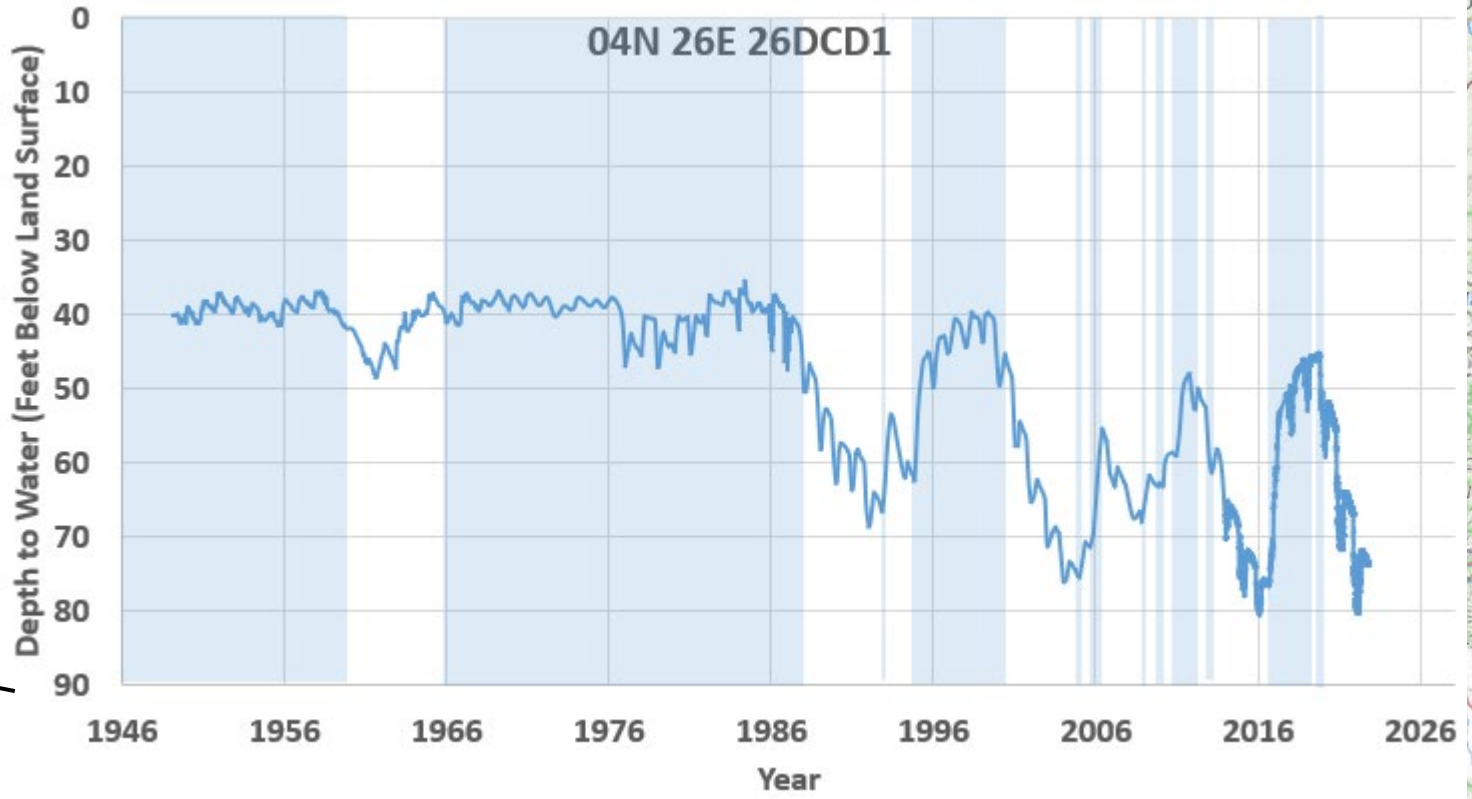


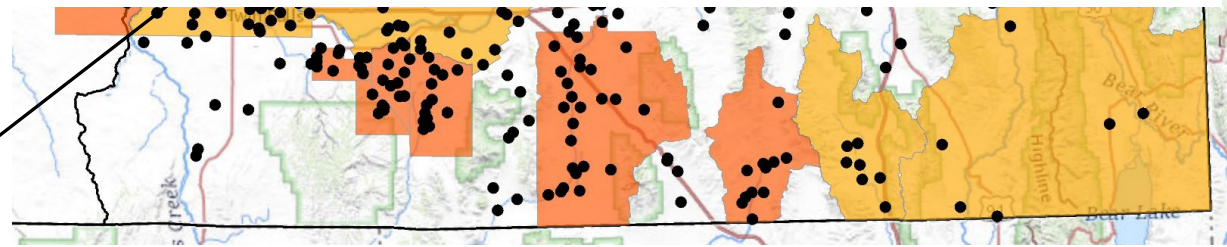
IDAHO DEPARTMENT OF WATER RESOURCES

IDWR's Southern/Eastern Regions



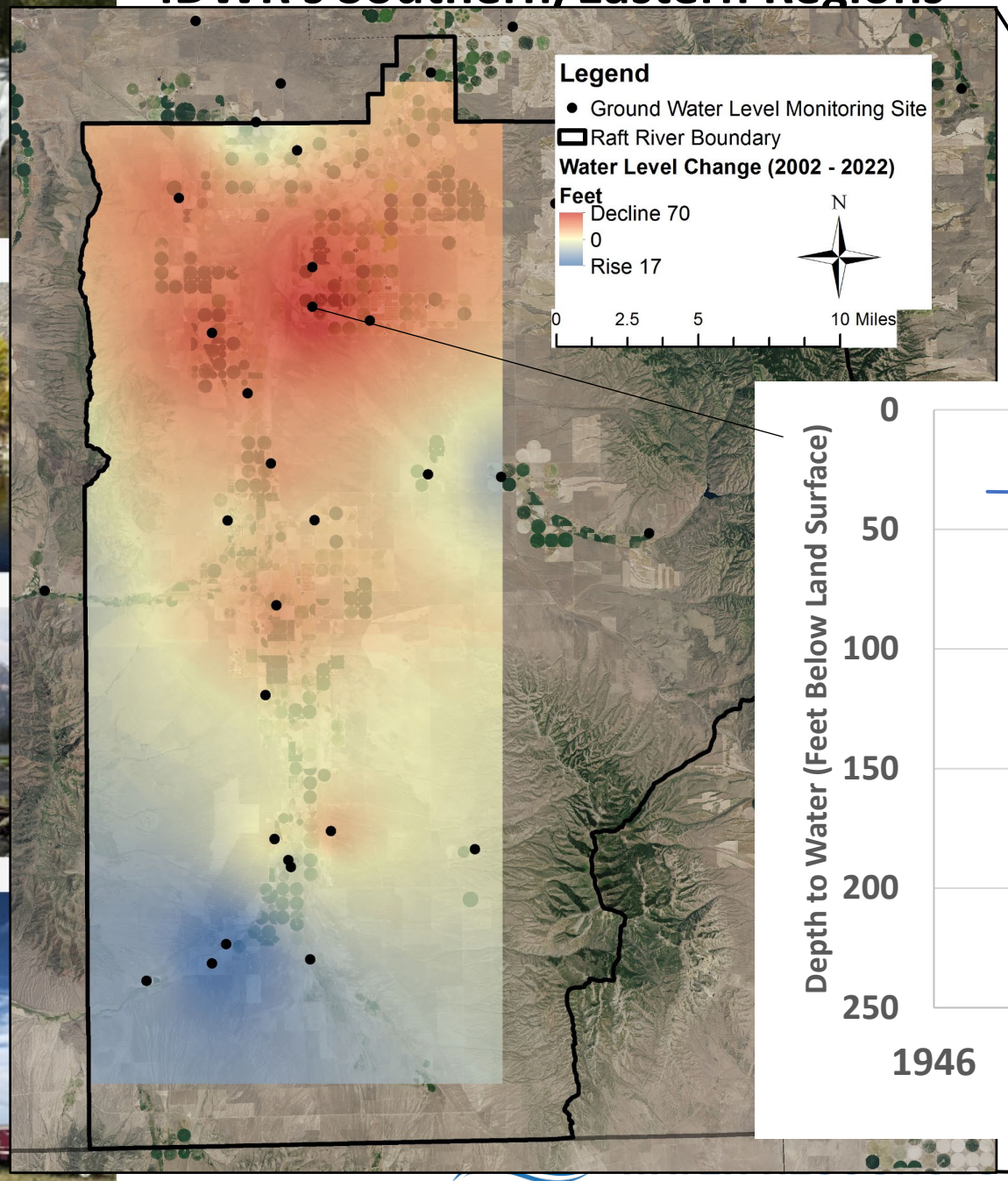


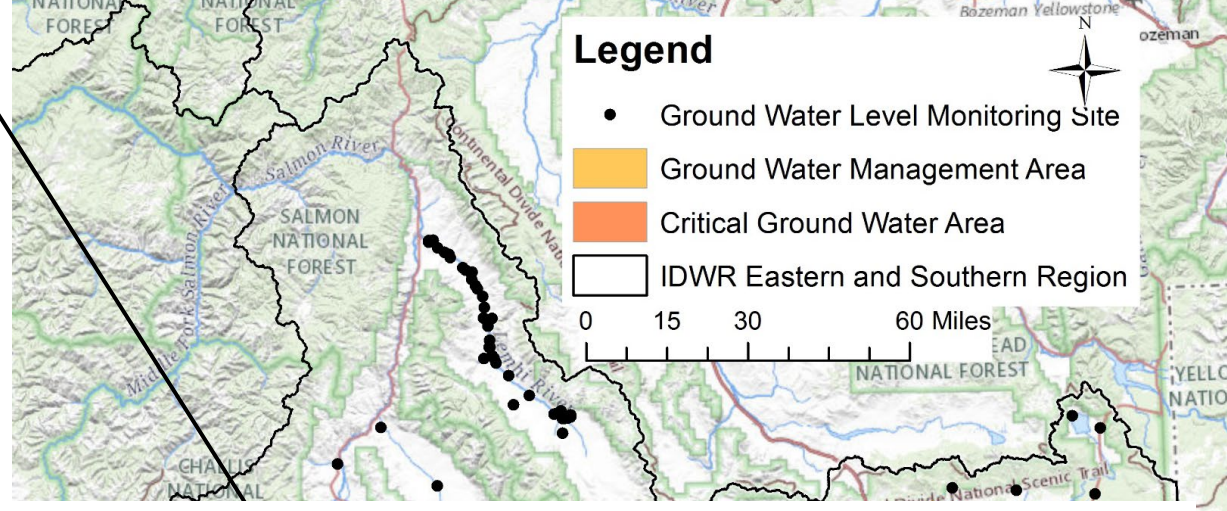


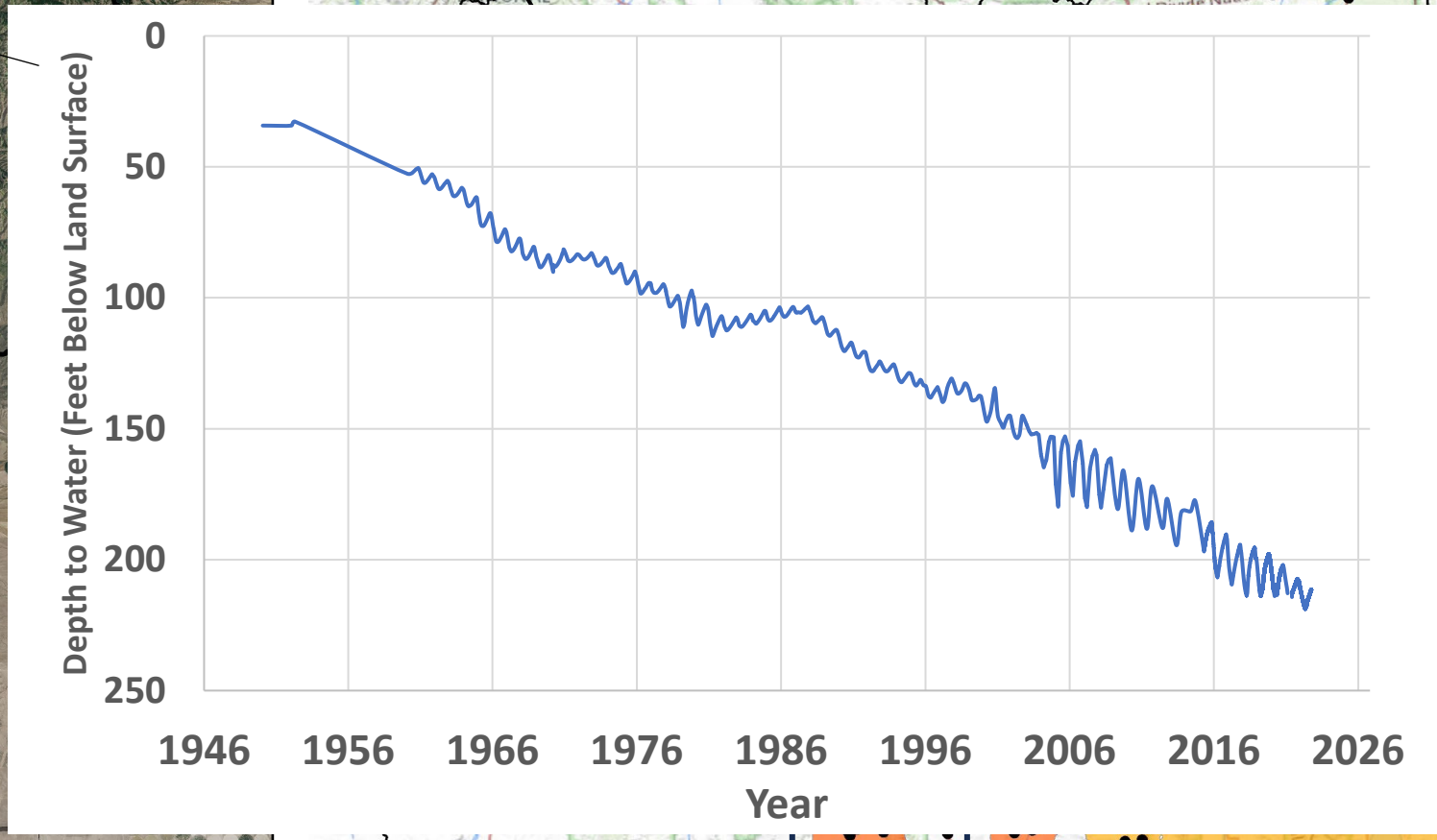


IDAHO DEPARTMENT OF WATER RESOURCES

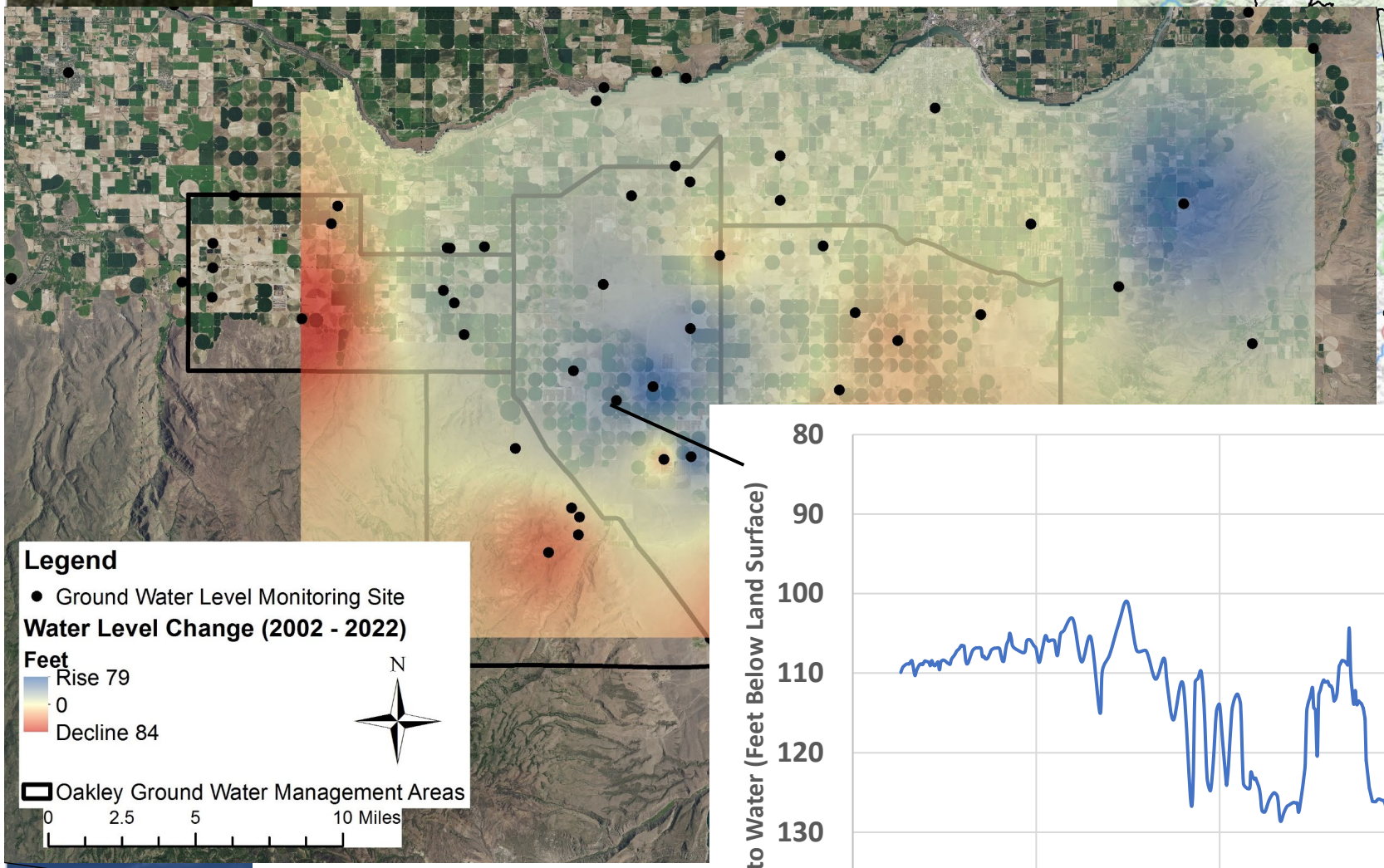
IDWR's Southern/Eastern Regions

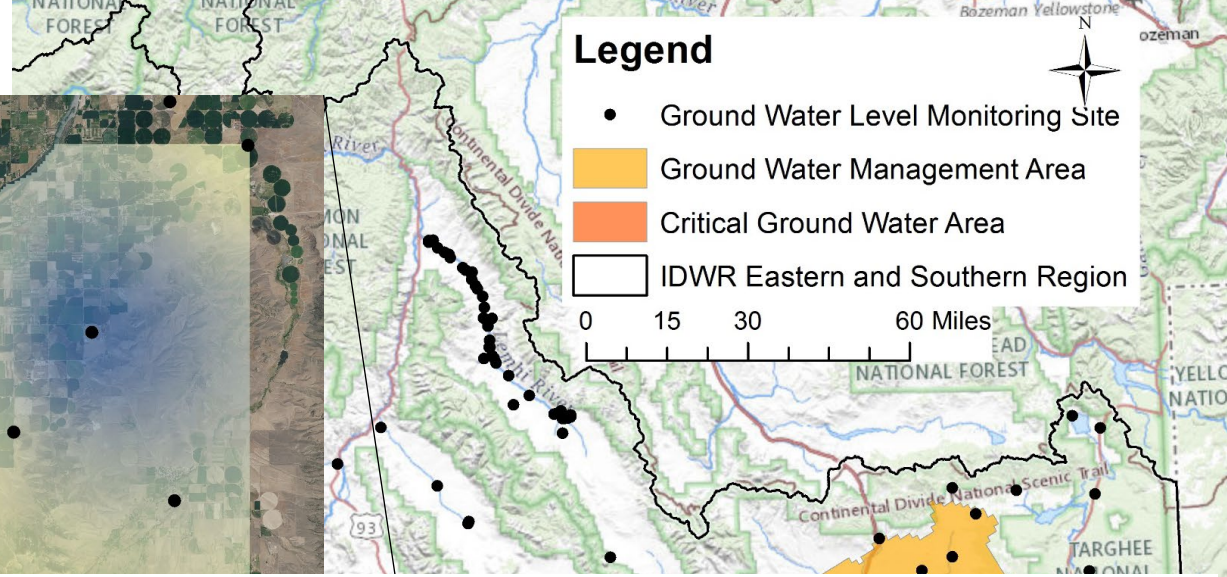


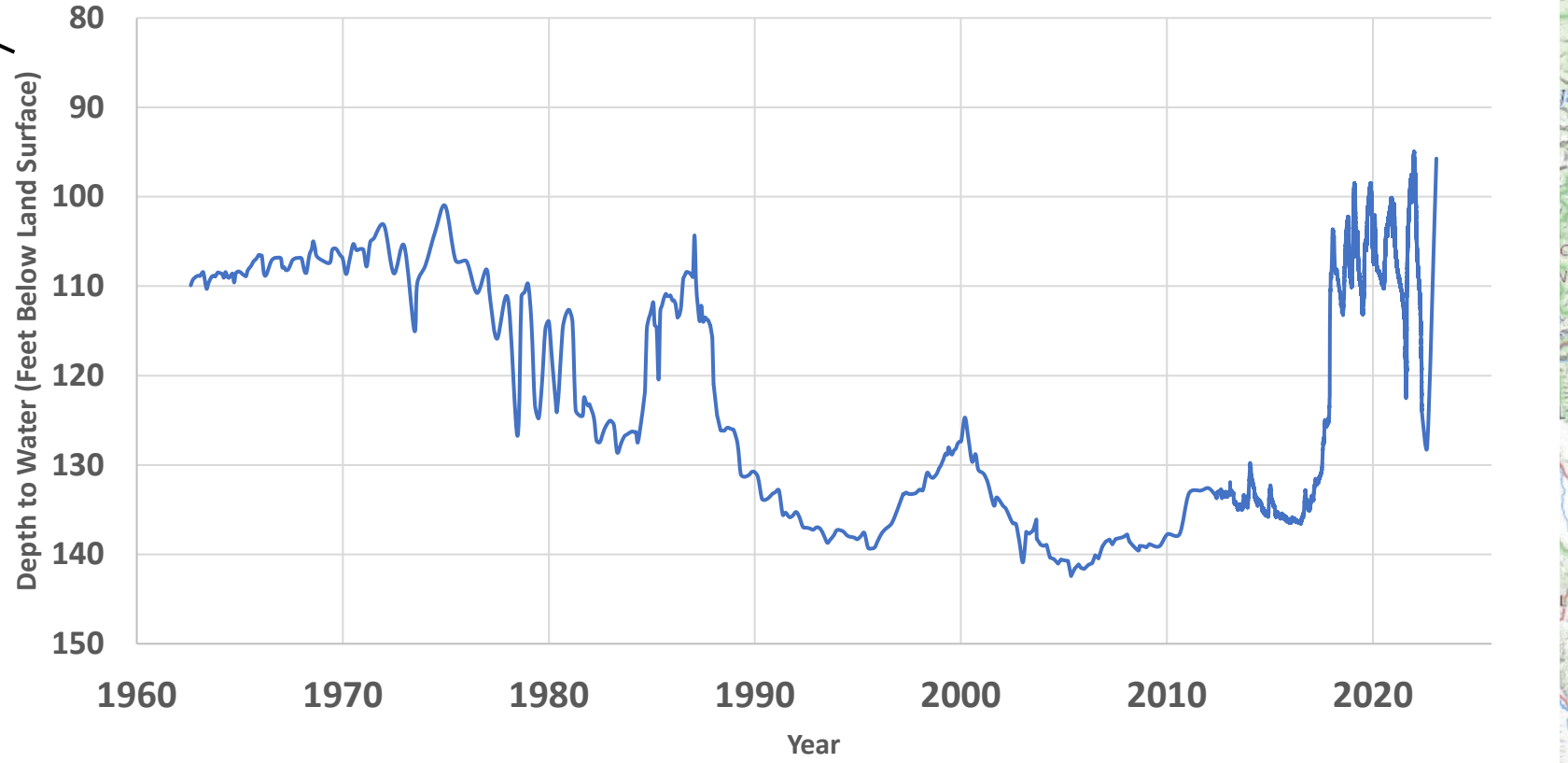


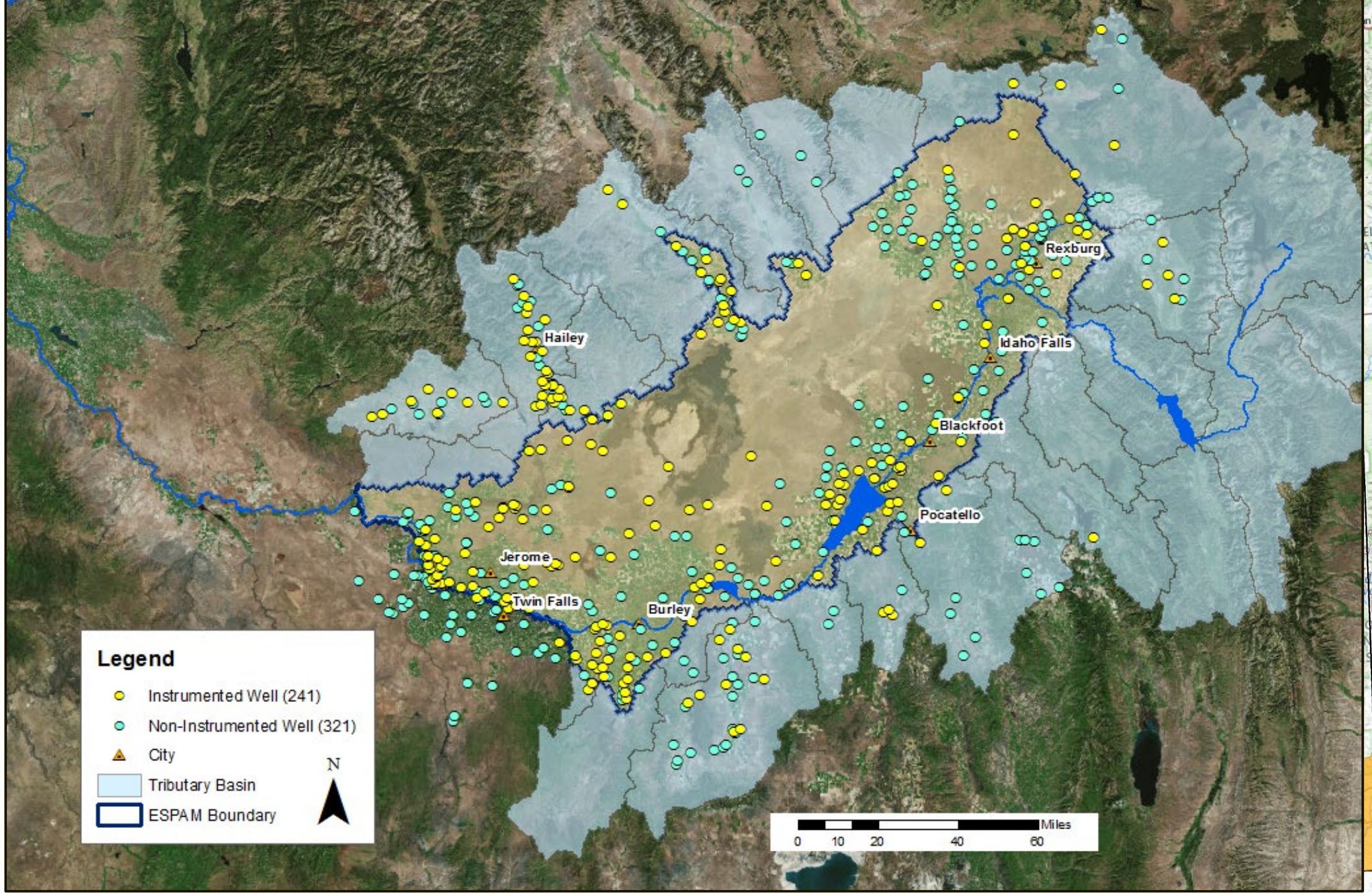


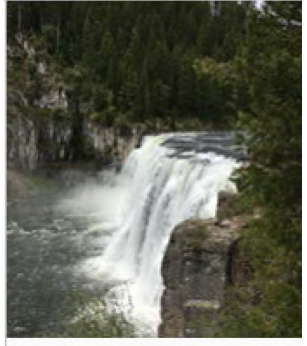
IDWR's Southern/Eastern Regions

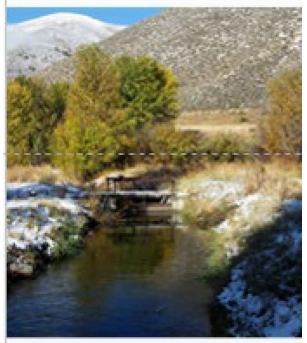


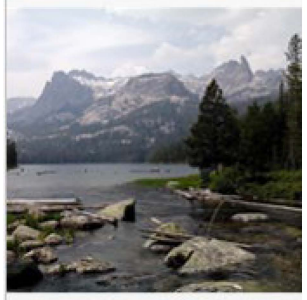


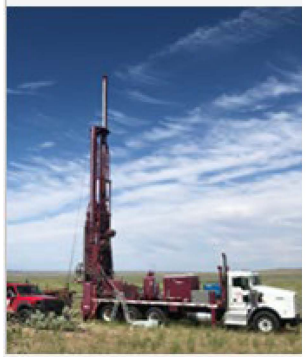



Rexburg
Hailey
Idaho Falls
Blackfoot
Pocatello
Jerome
Twin Falls
Burley
Legend
Instrumented Well (241)
Non-Instrumented Well (321)
City
Tributary Basin
ESPAM Boundary
N
Miles
0
10
20
40
60

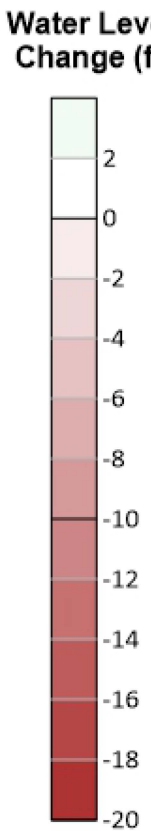


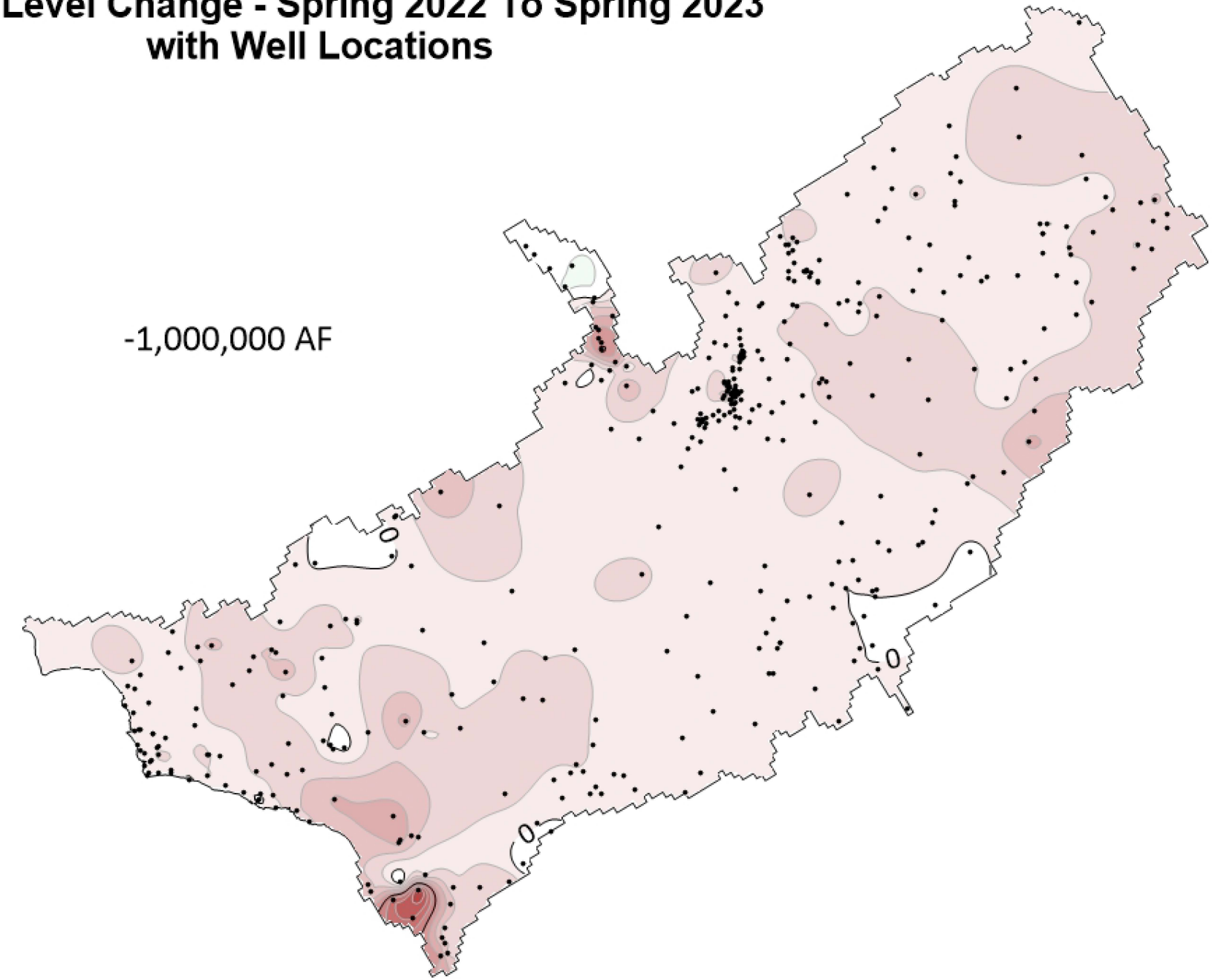


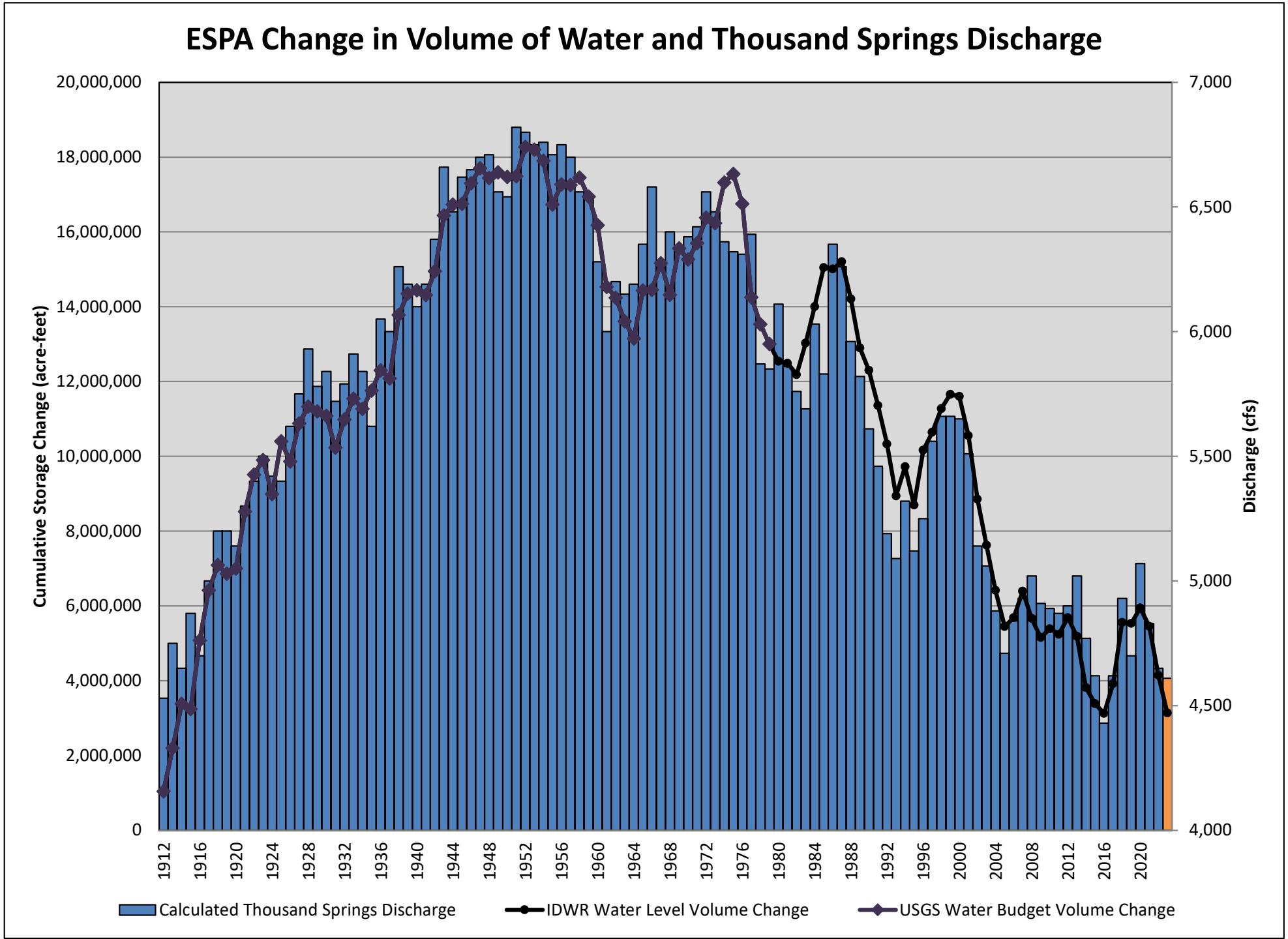




Water Level Change - Spring 2022 To Spring 2023 with Well Locations



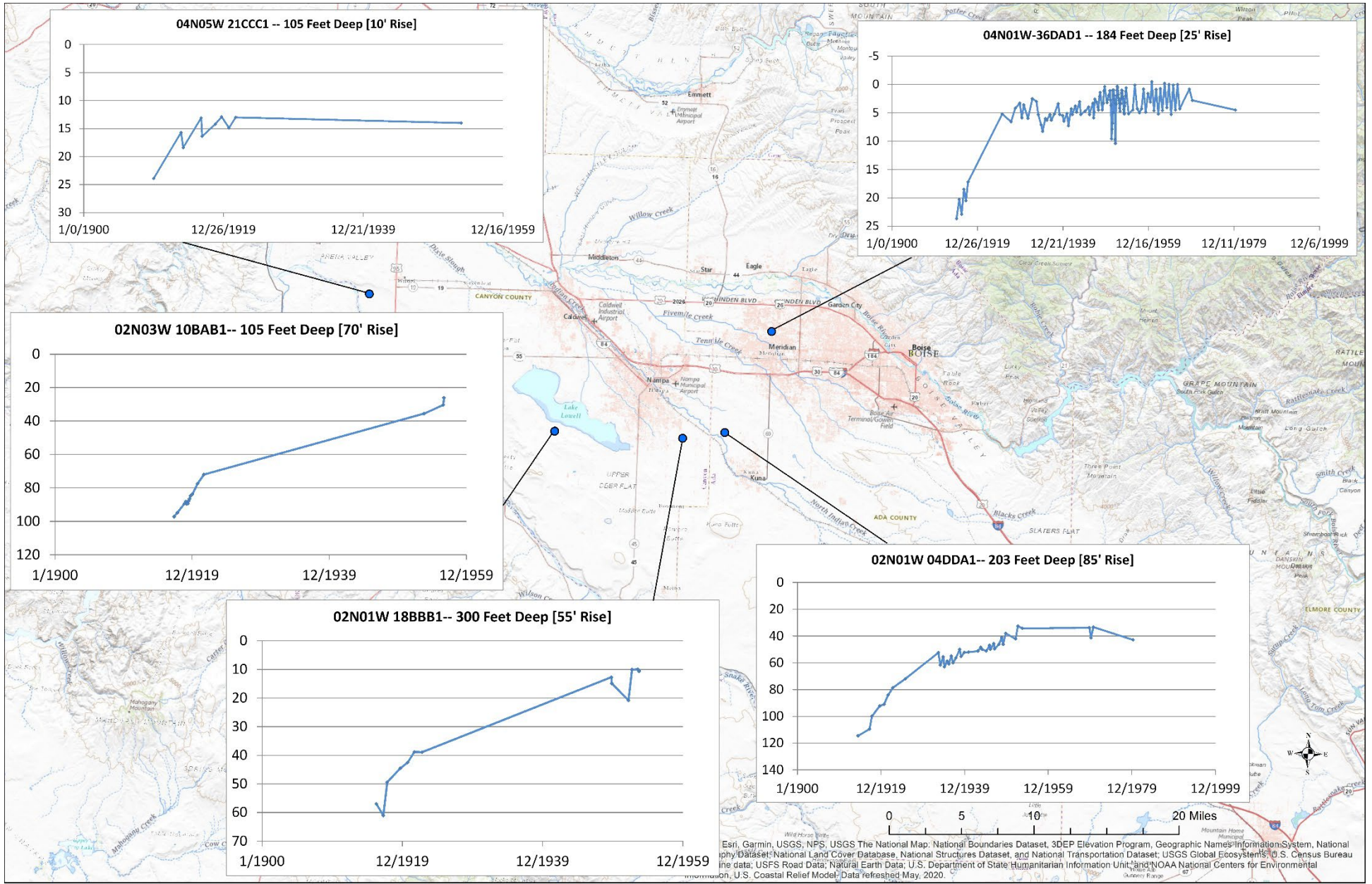


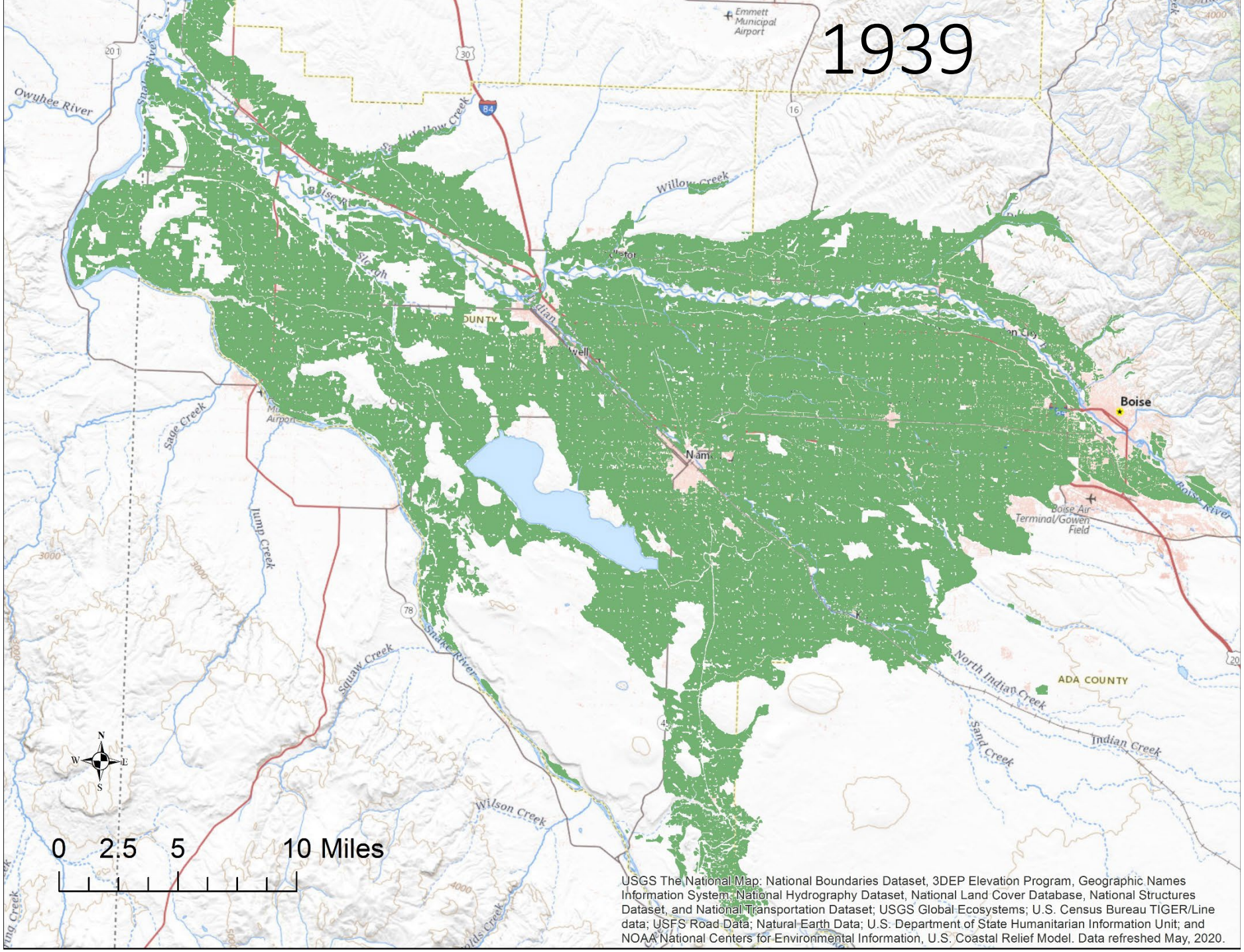

ESPA Change in Volume of Water and Thousand Springs Discharge
Cumulative Storage Change (acre-feet)
Discharge (cfs)
20,000,000
18,000,000
16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
7,000
6,500
6,000
5,500
5,000
4,500
4,000
1912
1916
1920
1924
1928
1932
1936
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
Calculated Thousand Springs Discharge
IDWR Water Level Volume Change
USGS Water Budget Volume Change

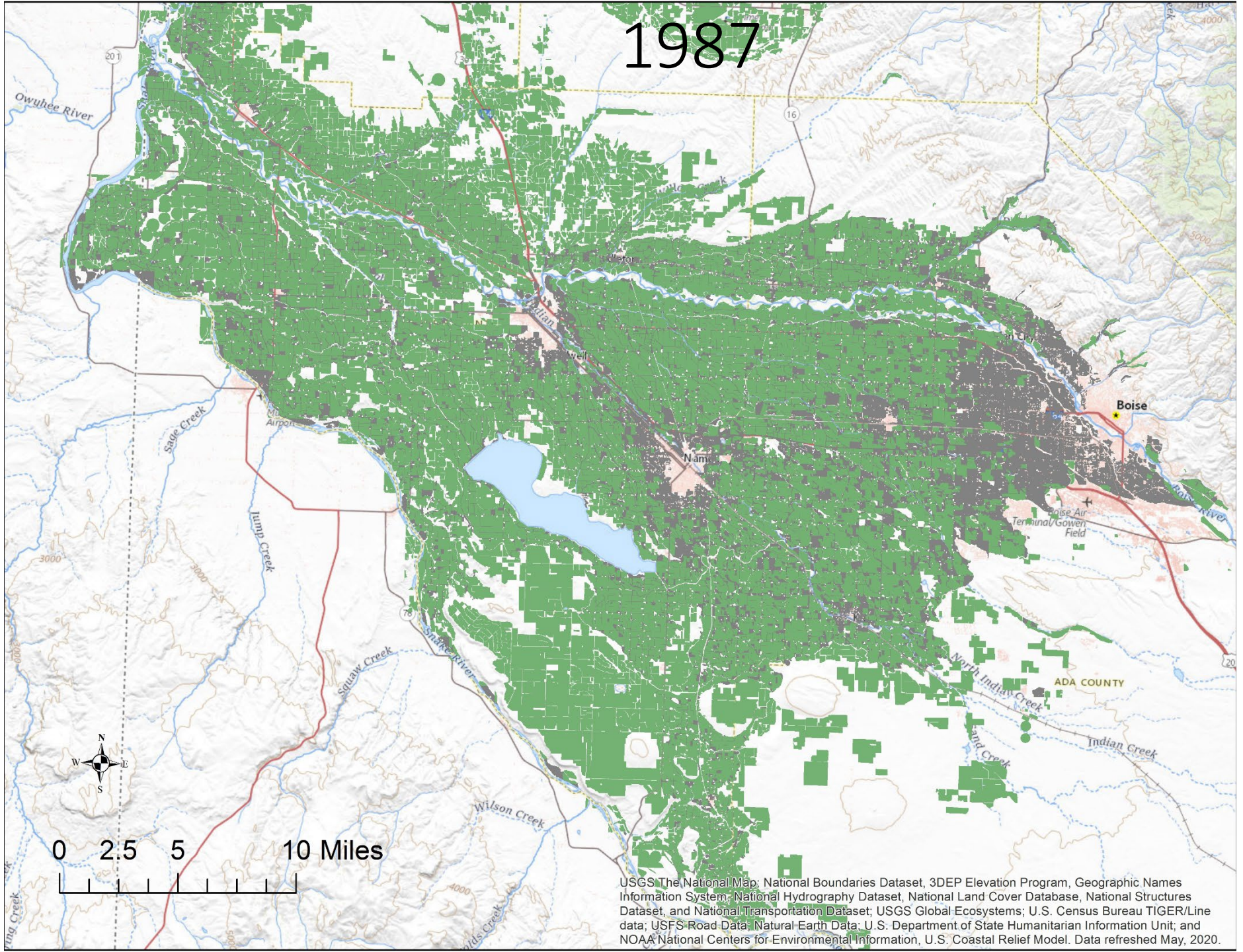
Questions?

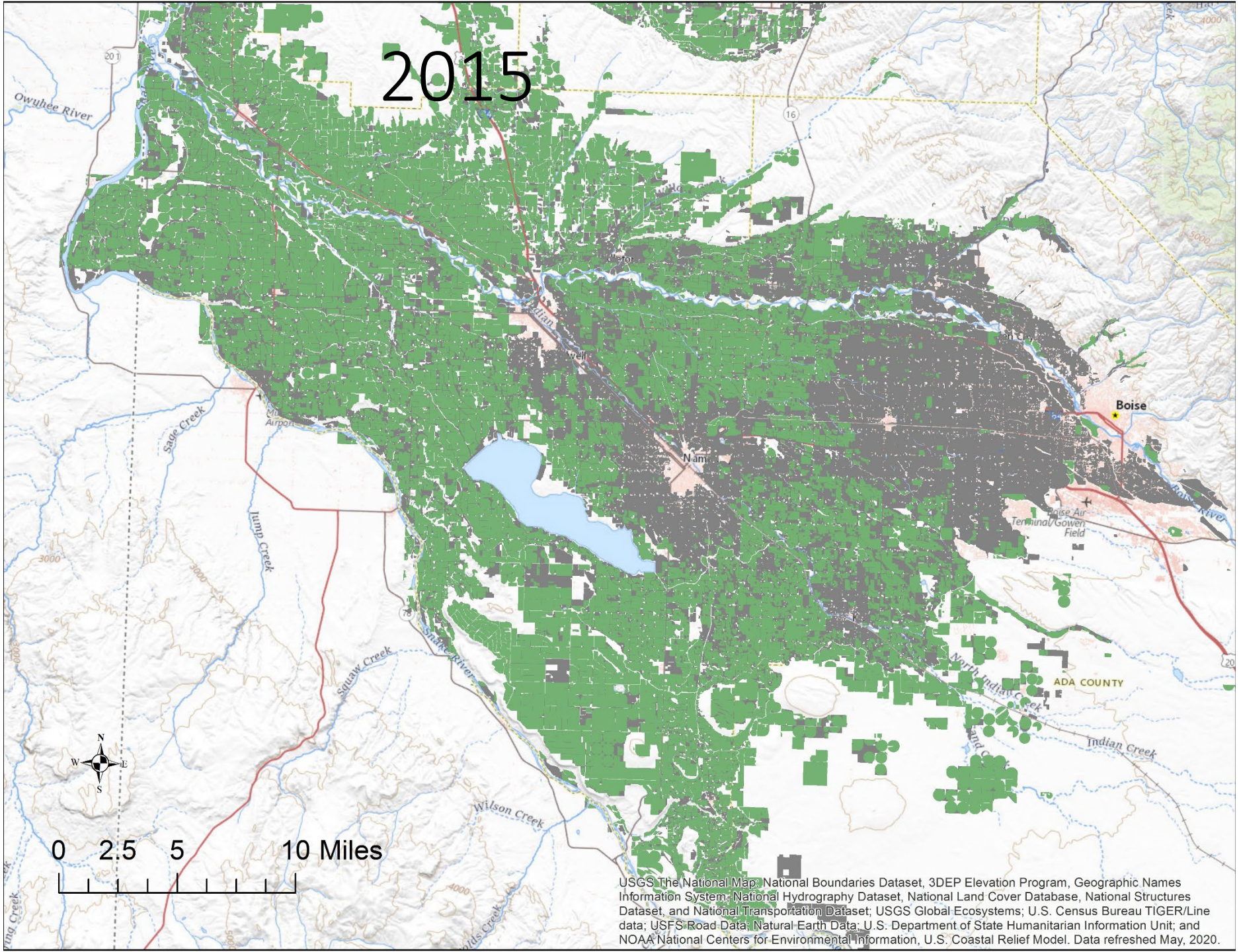
Response to irrigation

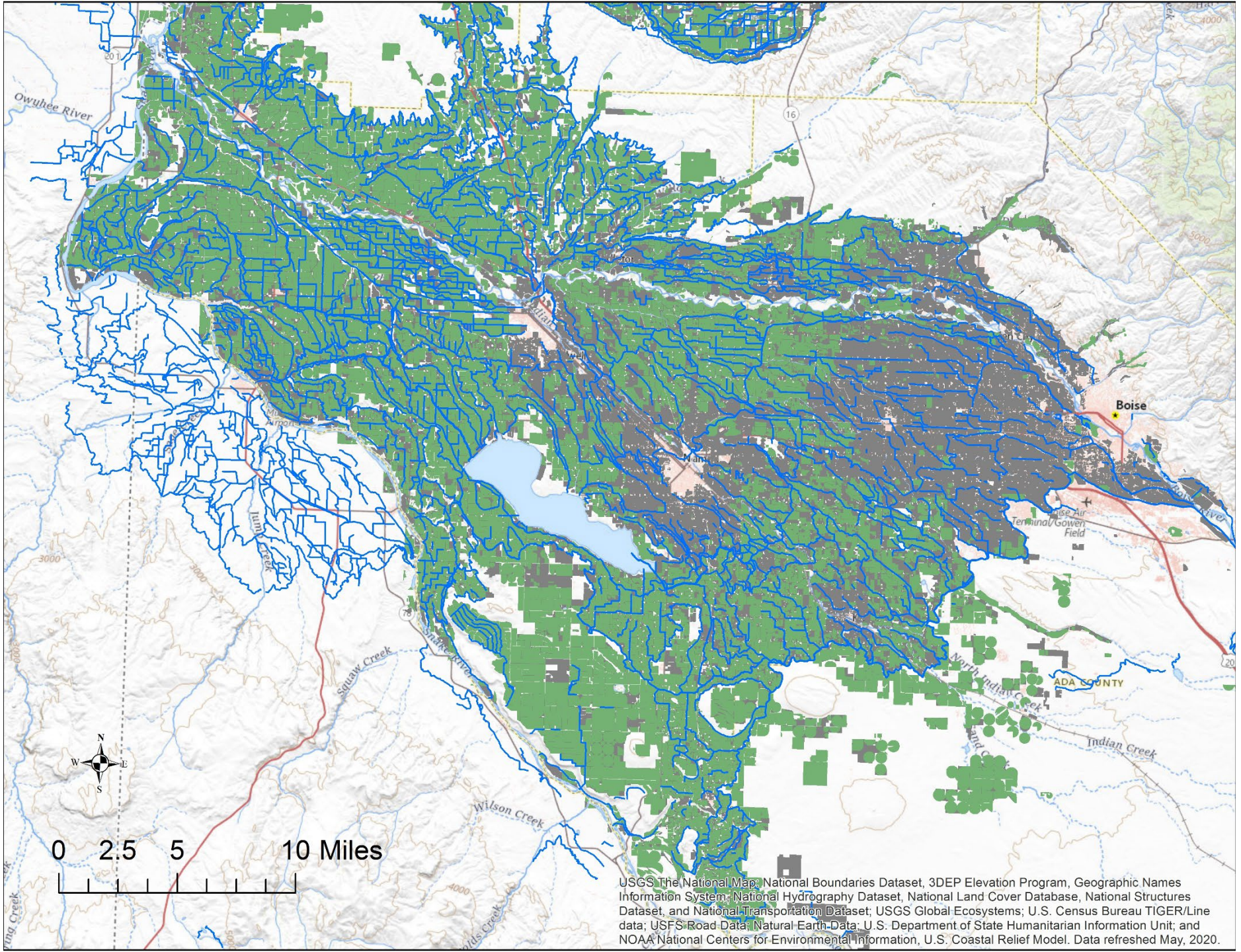
IDAHO DEPARTMENT OF WATER RESOURCES




1939
Emmett Municipal Airport
Owyhee River
Willow Creek
Sage Creek
Jump Creek
Squaw Creek
Snake River
Wilson Creek
North Indian Creek
Sand Creek
Indian Creek
Boise
Boise Air Terminal/Gowen Field
ADA COUNTY
N
W
E
S
0 2.5 5 10 Miles
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System; National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed May, 2020.

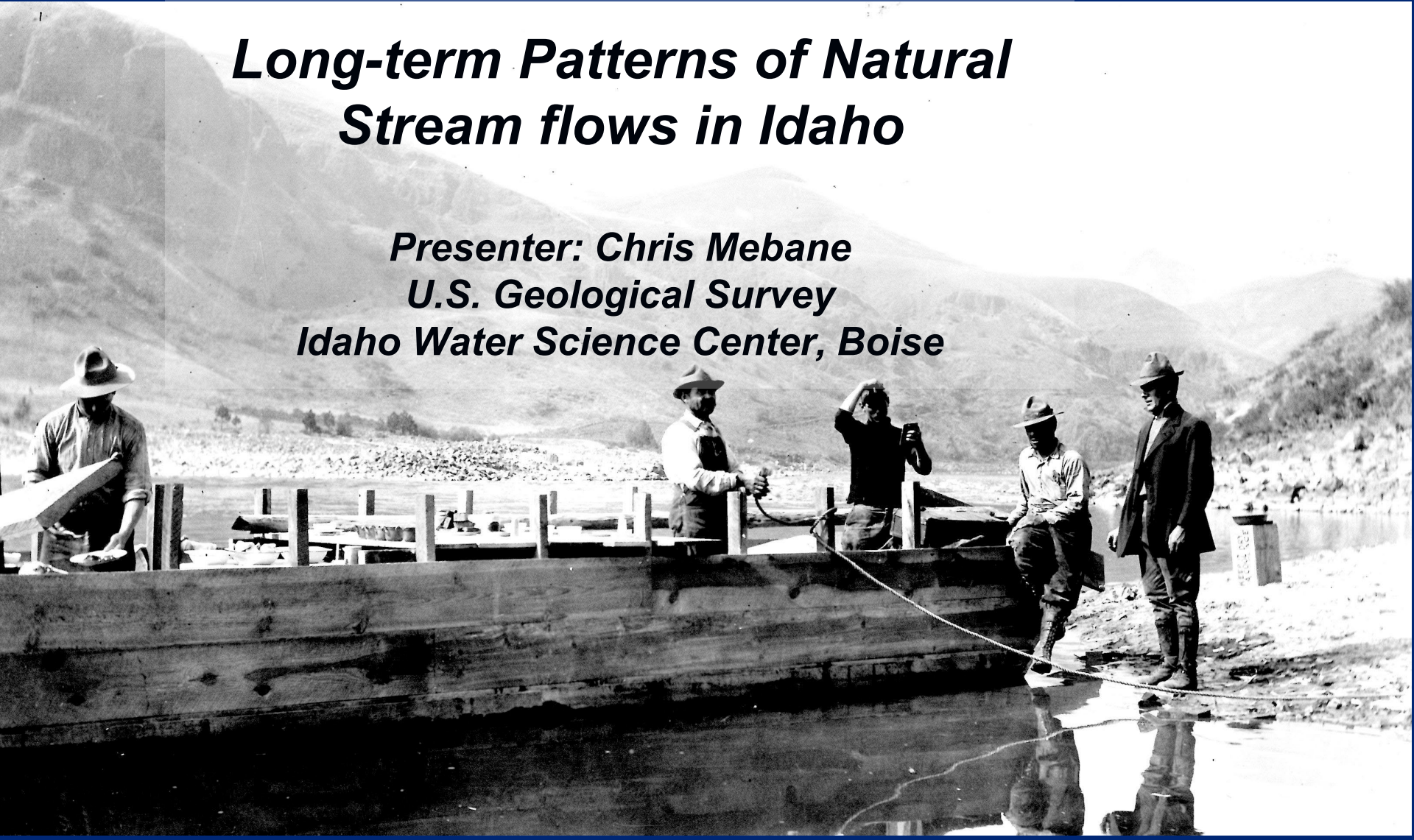

1987
Owyhee River
Sage Creek
Jump Creek
Squaw Creek
Snake River
Wilson Creek
Indian Creek
North Indian Creek
Boise
ADA COUNTY
Boise Air Terminal/Gowen Field
N
W
E
S
0 2.5 5 10 Miles
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed May, 2020.


2015
Owyhee River
Sage Creek
Jump Creek
Squaw Creek
Snake River
Wilson Creek
Indian Creek
North Indian Creek
Boise
Boise Air Terminal/Gowen Field
ADA COUNTY
N
W
E
S
0 2.5 5 10 Miles
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System; National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed May, 2020.


Owyhee River
Boise
Boise Air Terminal/Gowen Field
ADA COUNTY
Squaw Creek
Indian Creek
Wilson Creek
N
W
E
S
0 2.5 5 10 Miles
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed May, 2020.

Long-term Patterns of Natural Stream flows in Idaho

Presenter: Chris Mebane
U.S. Geological Survey
Idaho Water Science Center, Boise

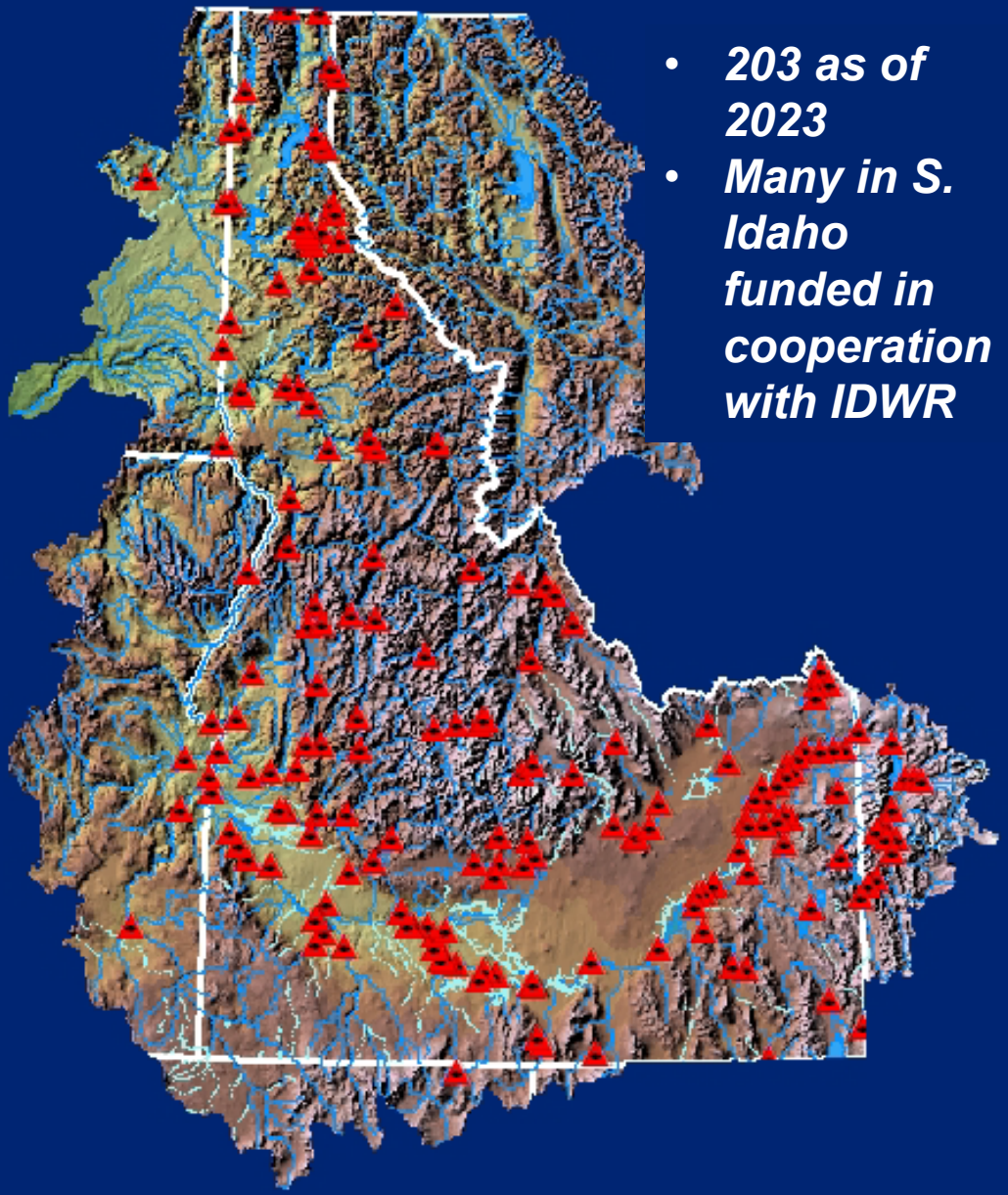


USGS measurement #1, Salmon River at White Bird, 1911

USGS science for a changing world

Presentation contains provisional analyses that could be subject to revision

Continuous Streamflow Gaging Stations Operated by the Idaho Water Science Center, U.S. Geological Survey



- *203 as of 2023*
- *Many in S. Idaho funded in cooperation with IDWR*

Boise River at Twin Springs, since 1911

1888 – Started network of systematic continuous streamflow gages

Fredrick Newell

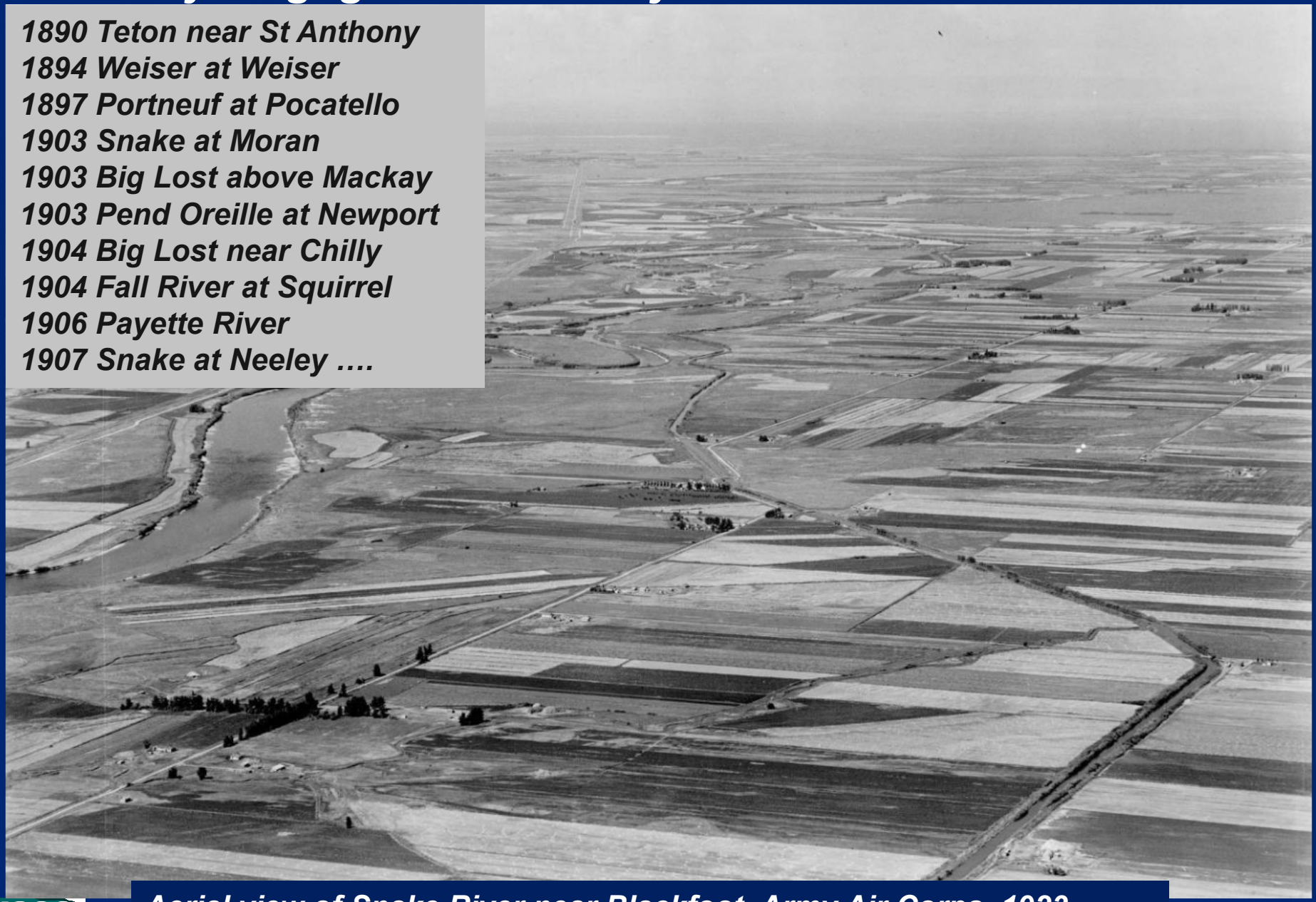
Training class #1, 1888-1889:
One of these student hydrographers, L.D. Hopson, was assigned to establish the Snake River basin gages:

Big Wood River at Hailey: Jul1889
Drowned at Idaho Falls: 24May1890

USGS science for a changing world

Presently 32 gages with >100 years of continuous records

1890 Teton near St Anthony
1894 Weiser at Weiser
1897 Portneuf at Pocatello
1903 Snake at Moran
1903 Big Lost above Mackay
1903 Pend Oreille at Newport
1904 Big Lost near Chilly
1904 Fall River at Squirrel
1906 Payette River
1907 Snake at Neeley ….



Aerial view of Snake River near Blackfoot, Army Air Corps, 1923

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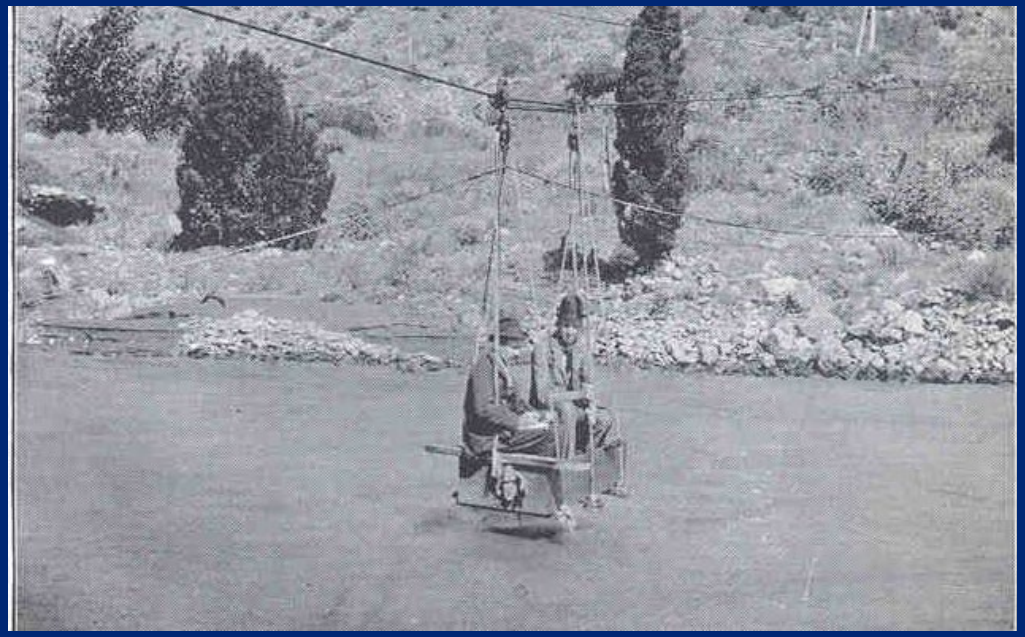
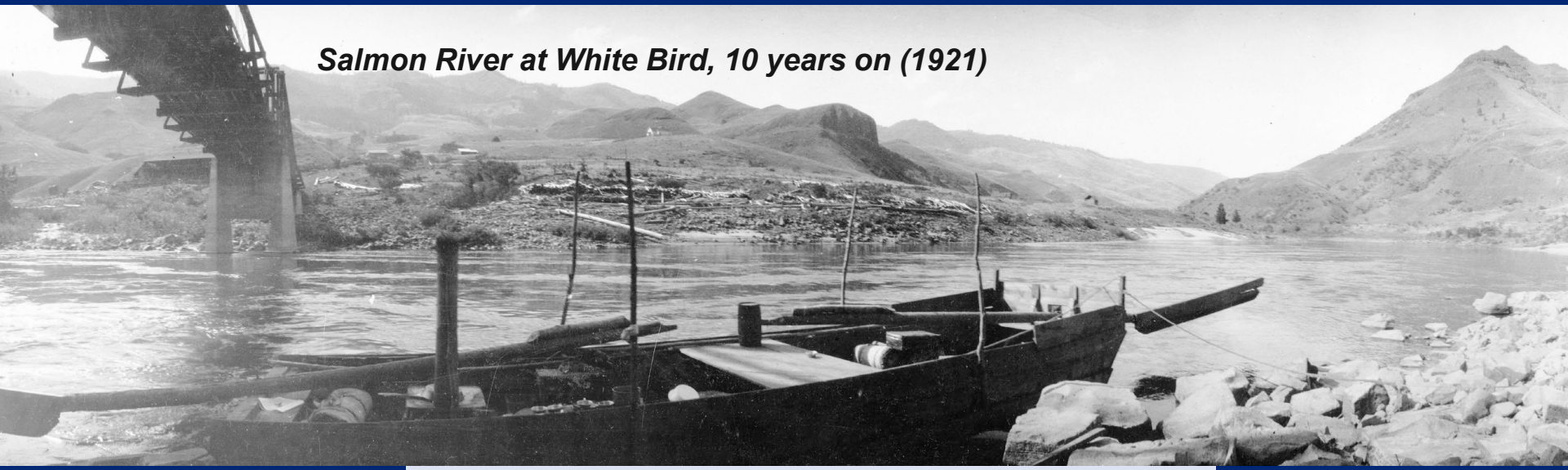
Measurements of Streamflow



Basic measurement principles are the same and old and new data are comparable

USGS
science for a changing world

Unregulated streams with long-term continuous streamflow records show climatic patterns



Salmon River at White Bird, 10 years on (1921)

Salmon River at White Bird, 99 years on (2010)

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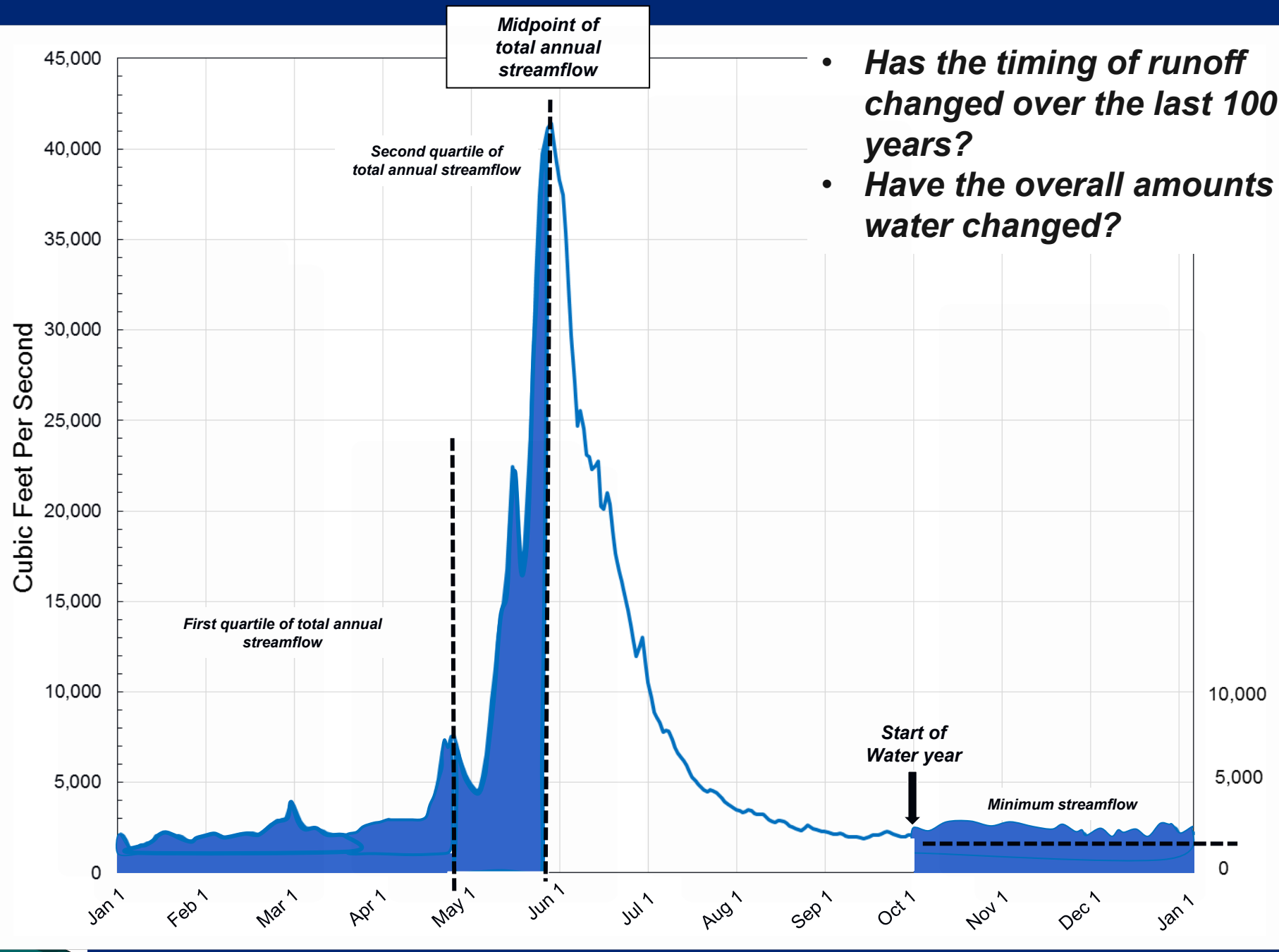


- ***Has the timing of runoff changed over the last 100 years?***
- ***Have the overall amounts o water changed?***

USGS science for a changing world

Have extreme flows gotten more extreme?

Big Wood River downstream of Bellevue (Allan Wylie, IDWR)

Salmon Falls Creek above reservoir, gaged since 1911, February 2017 flooding

Update on 5 of 26 stations trend tested for the period 1967-2007 (41 years)

- Runoff parameters evaluated
  - Annual *mean* streamflow
  - Annual *minimum* daily streamflow
  - Date of the *midpoint* of annual total streamflow volume
  - ~~Date of the *first quartile* of annual total streamflow volume discharge~~

JOURNAL OF THE AMERICAN WATER RESOURCES ASSOCIATION
Vol. 46, No. 3 AMERICAN WATER RESOURCES ASSOCIATION June 2010

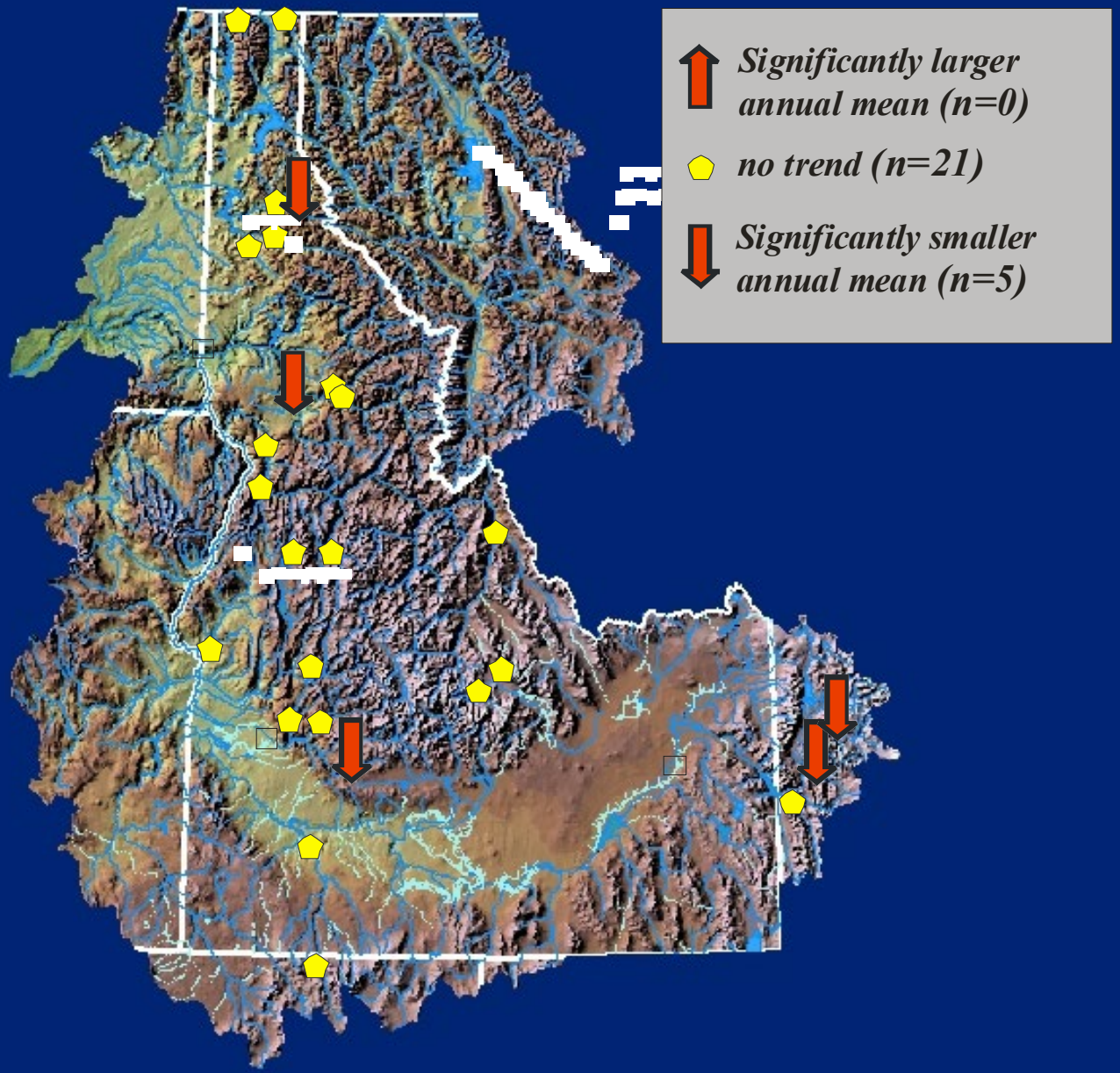
CHANGES IN PATTERNS OF STREAMFLOW FROM UNREGULATED WATERSHEDS IN IDAHO, WESTERN WYOMING, AND NORTHERN NEVADA[1]

Gregory M. Clark[2]

ABSTRACT: Recent studies have identified a pattern of earlier spring runoff across much of North America. Earlier spring runoff potentially poses numerous problems, including increased risk of flooding and reduced

Trends in annual *mean* streamflow *(p<0.10)*

Water Years 1967-2007



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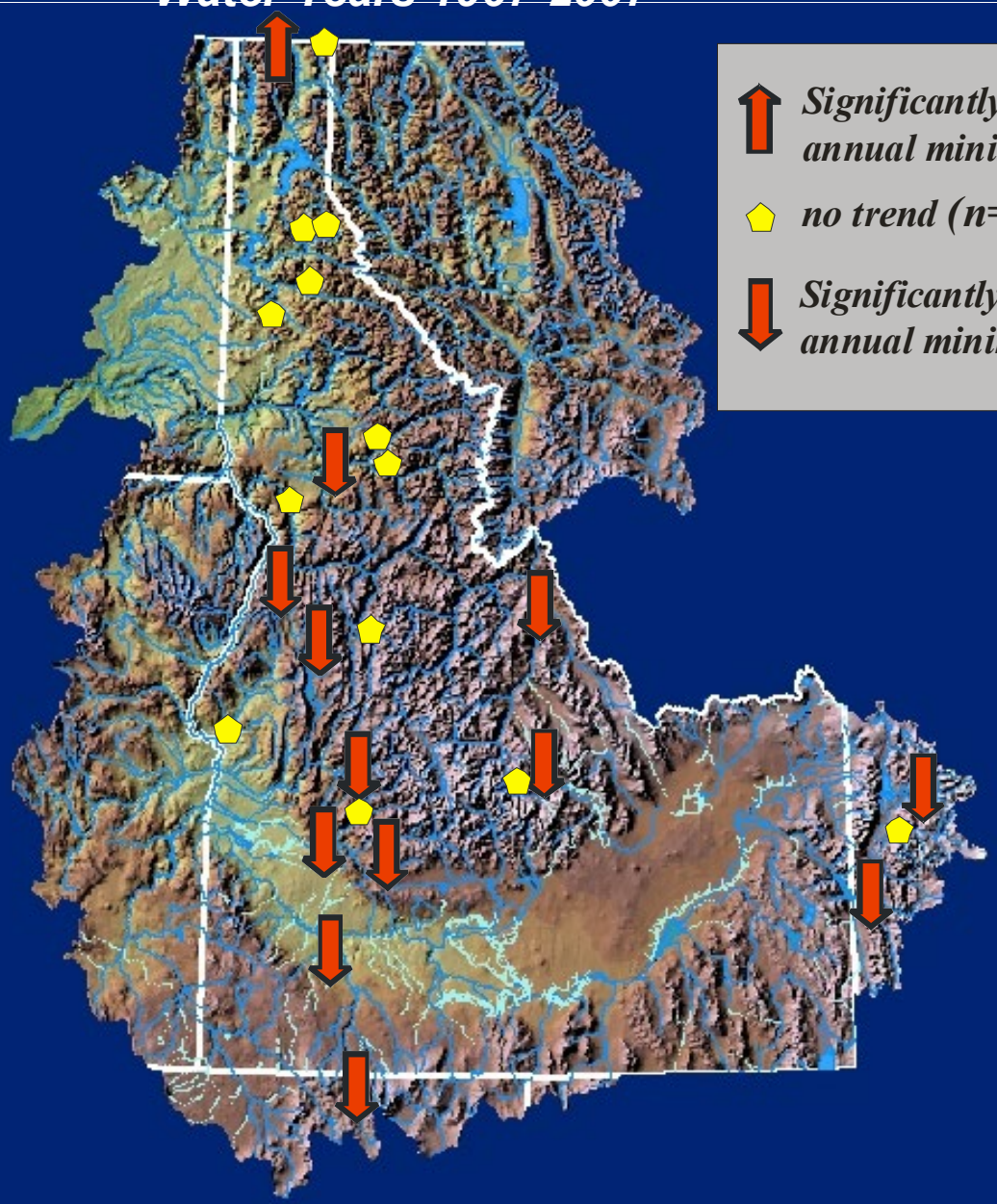
Trends in annual *minimum* streamflow *(p<0.10)*

Water Years 1967-2007



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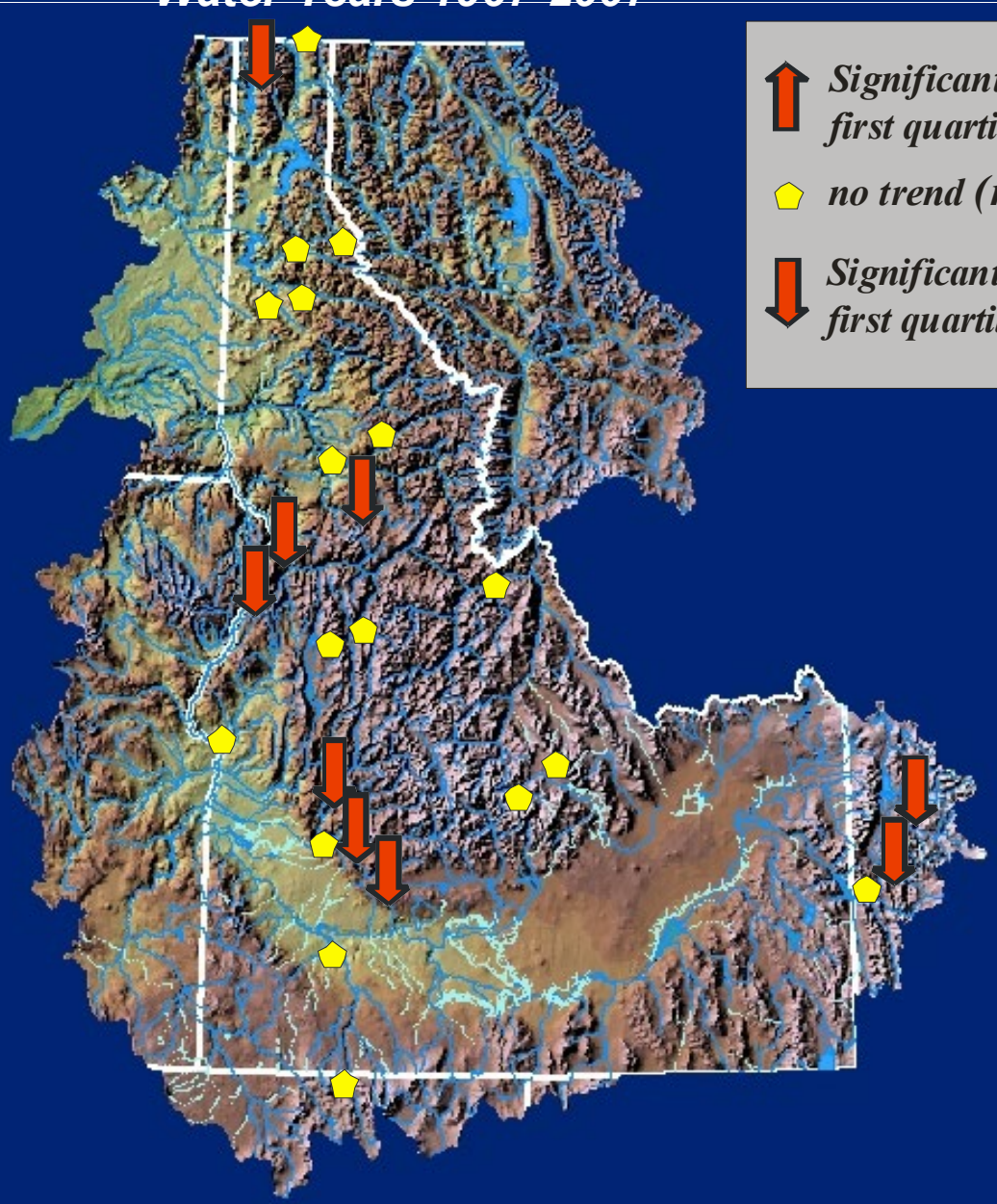
Trends in timing of first quartile of streamflow *(p<0.10)*

Water Years 1967-2007



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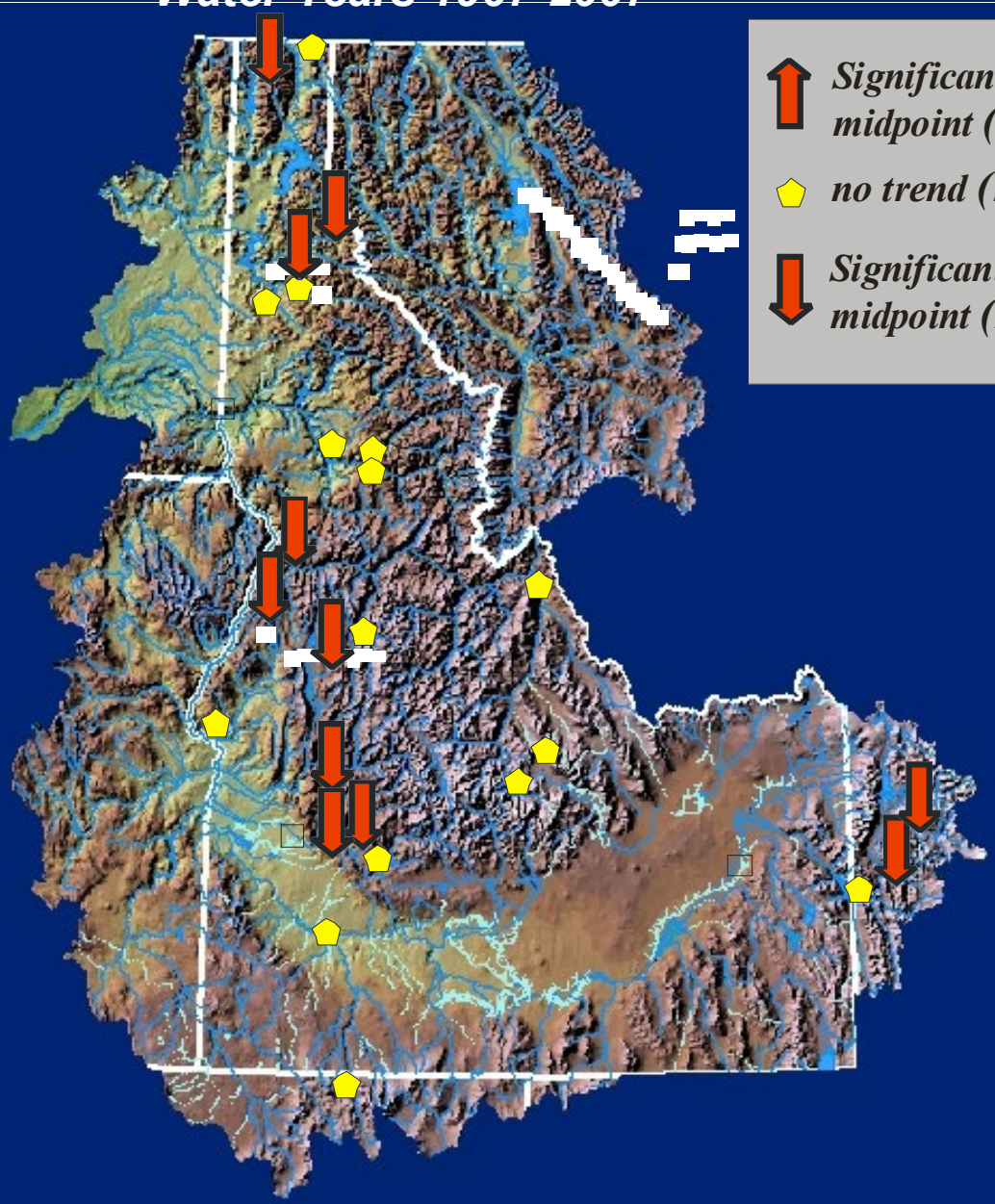
Trends in timing of midpoint of streamflow *(p<0.10)*

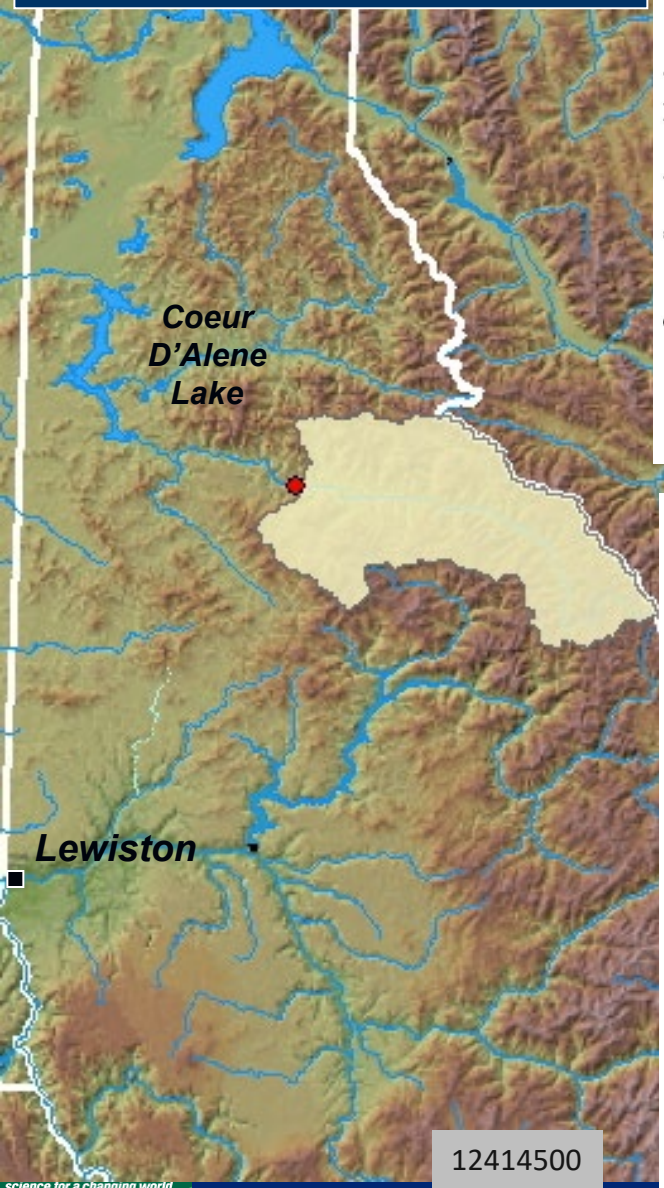
Water Years 1967-2007

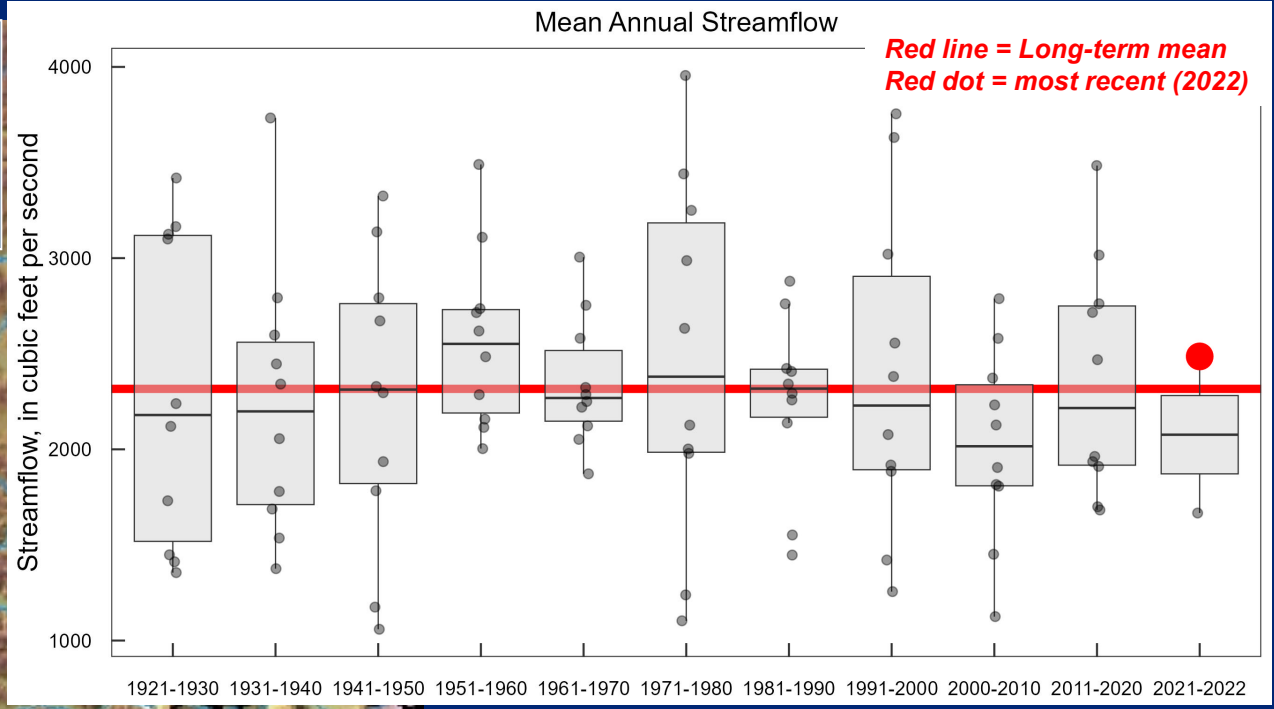


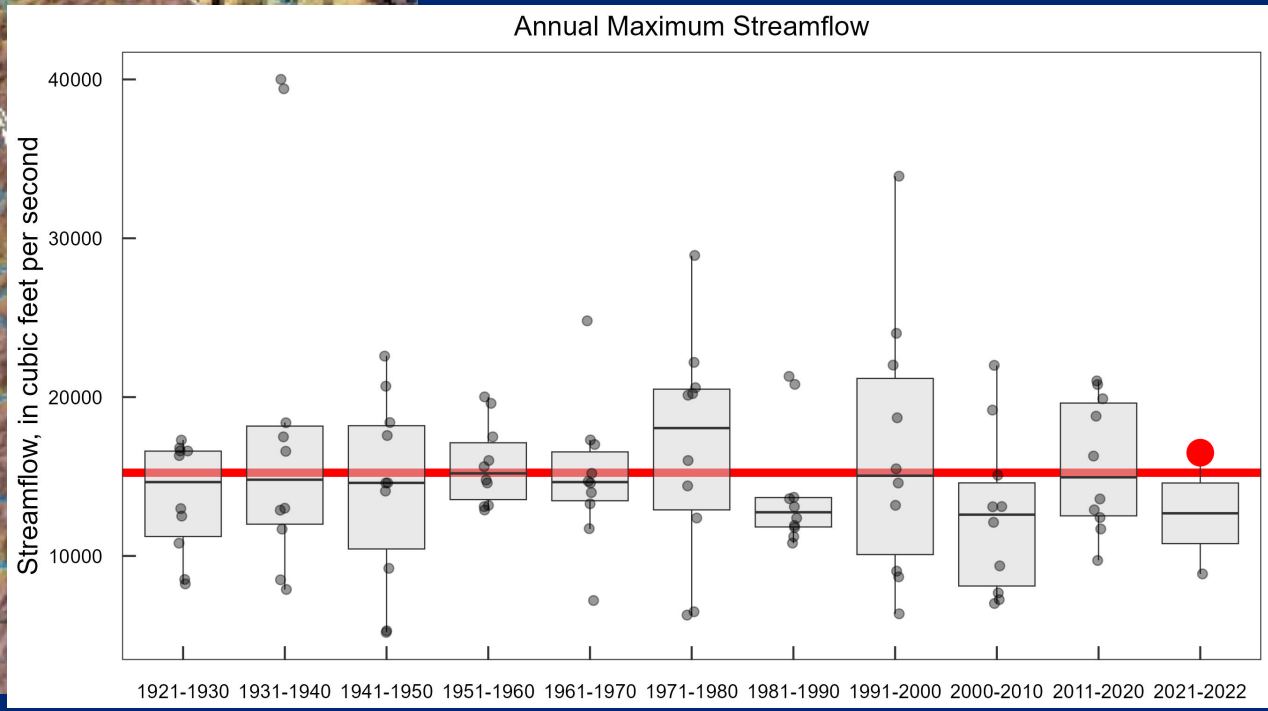
USGS science for a changing world

St. Joe River at Calder, ID

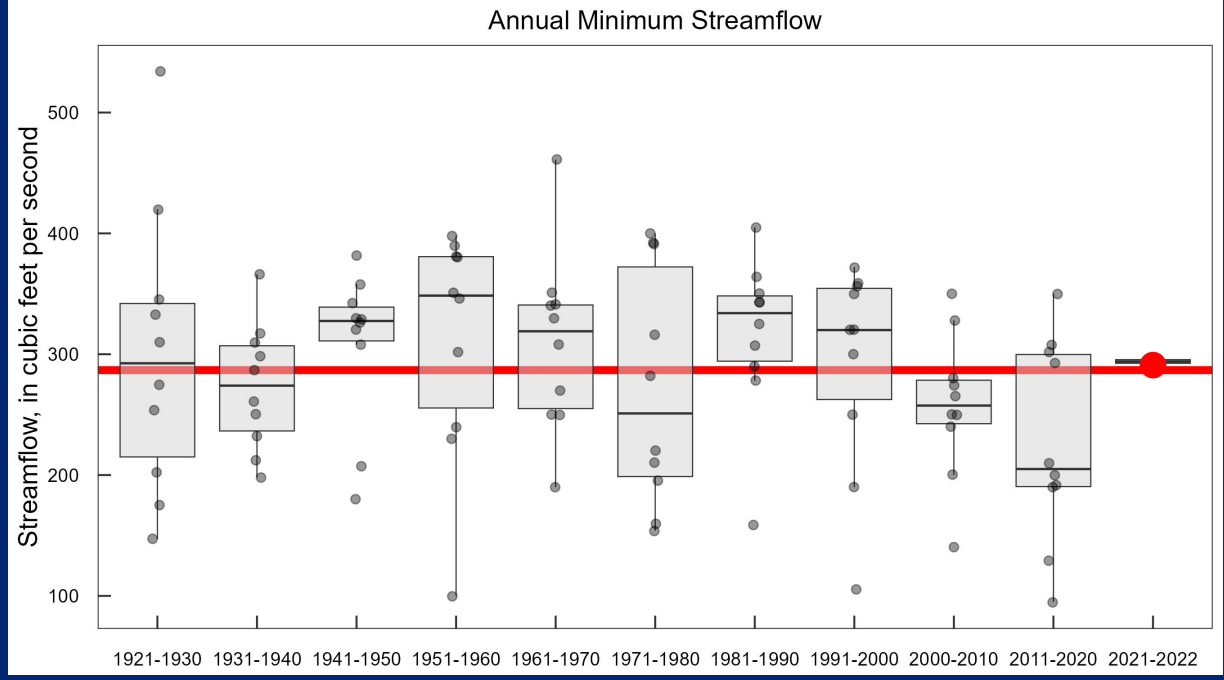
Period - 1921-2022
Basin Size - 1,030 mi²
Mean Elevation – 4550 ft

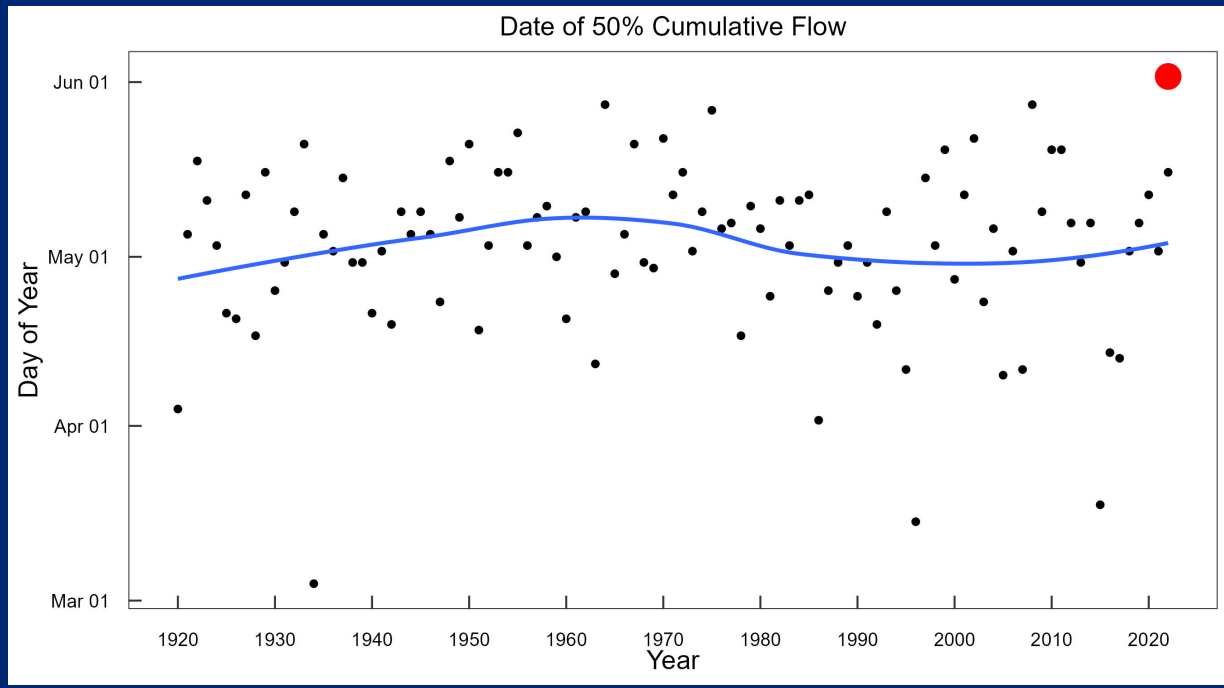






St. Joe River at Calder, ID

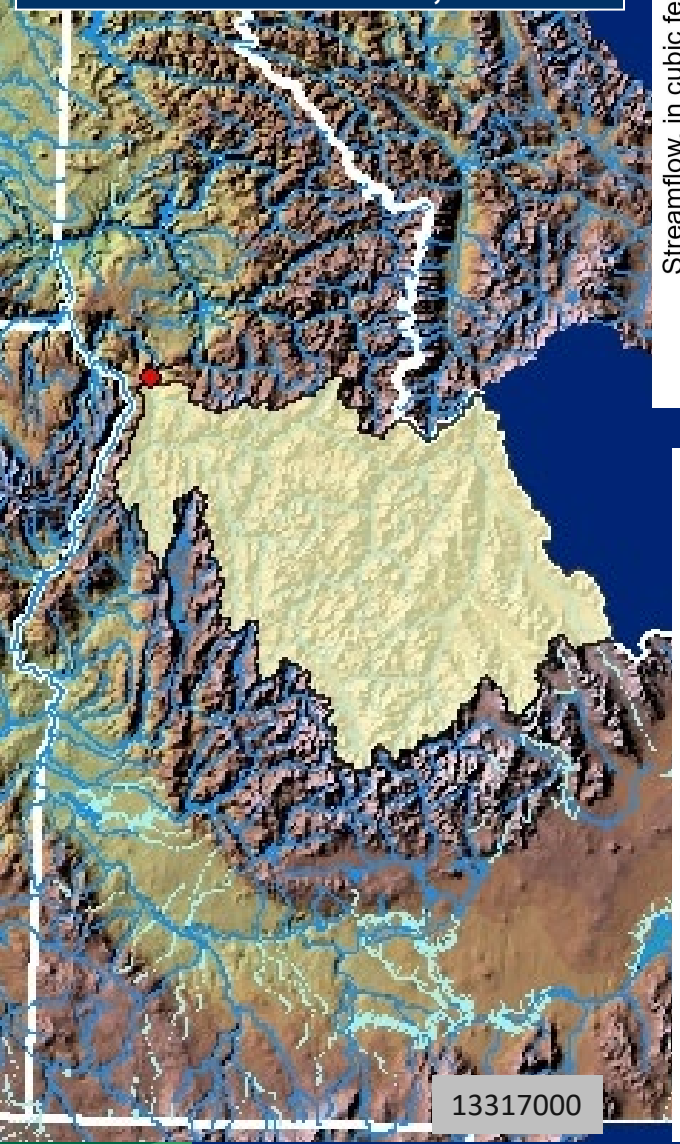


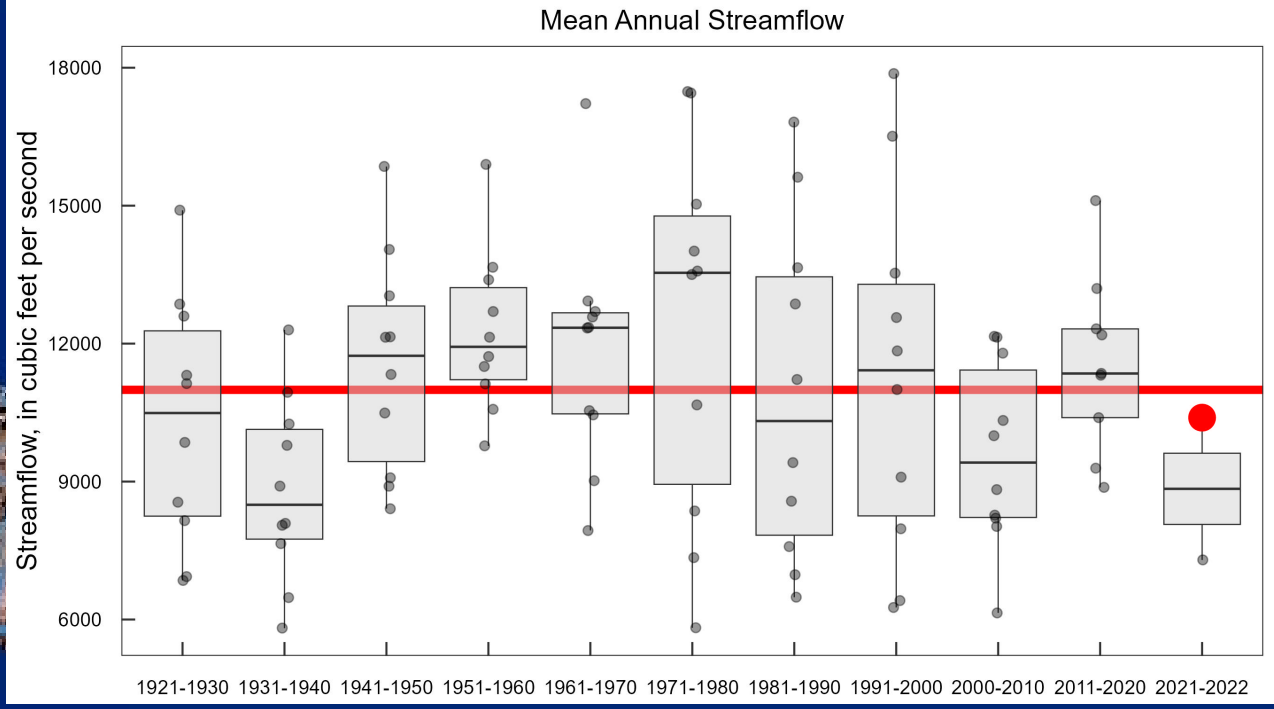


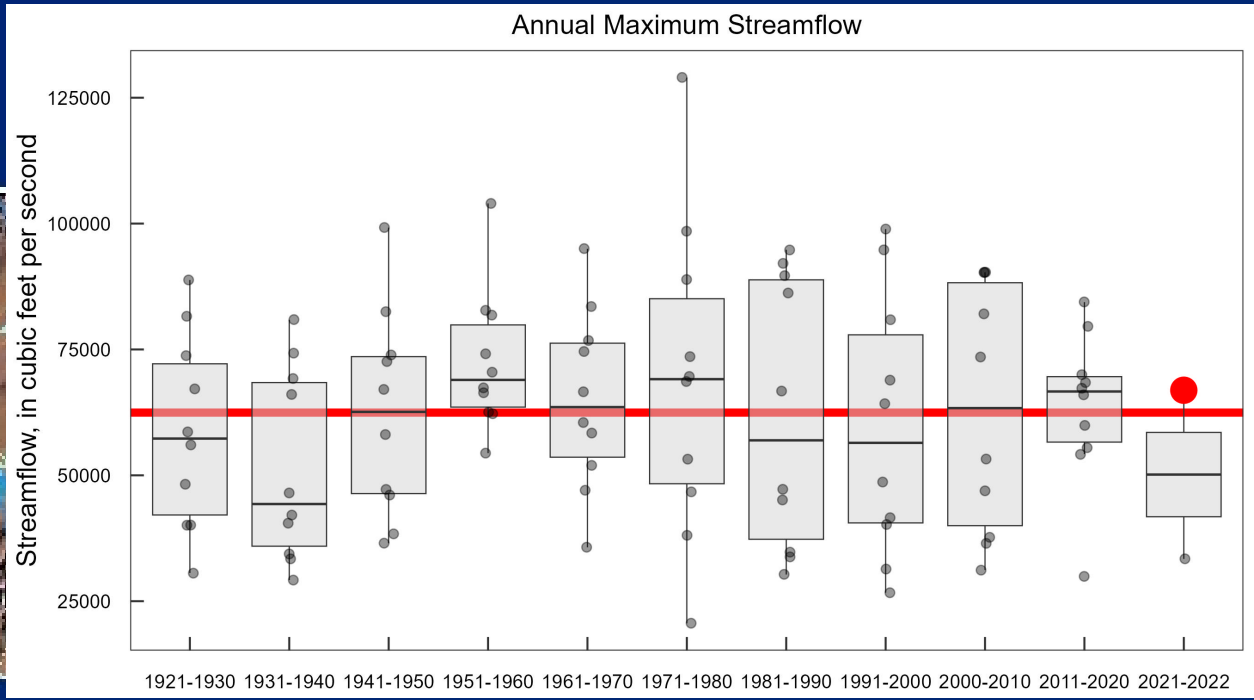
USGS science for a changing world

Salmon River at White Bird, ID

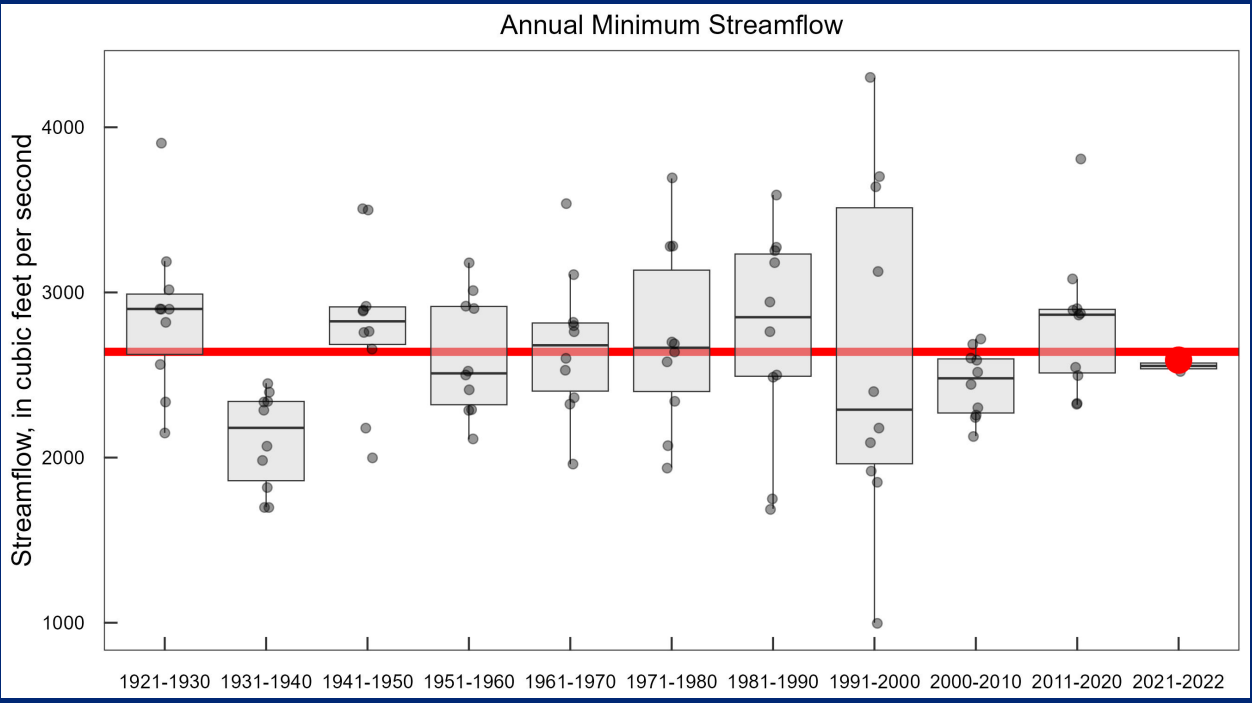
Period of record – 1911-2022
Basin size - 13,550 mi²
Mean Elevation – 6,750 ft

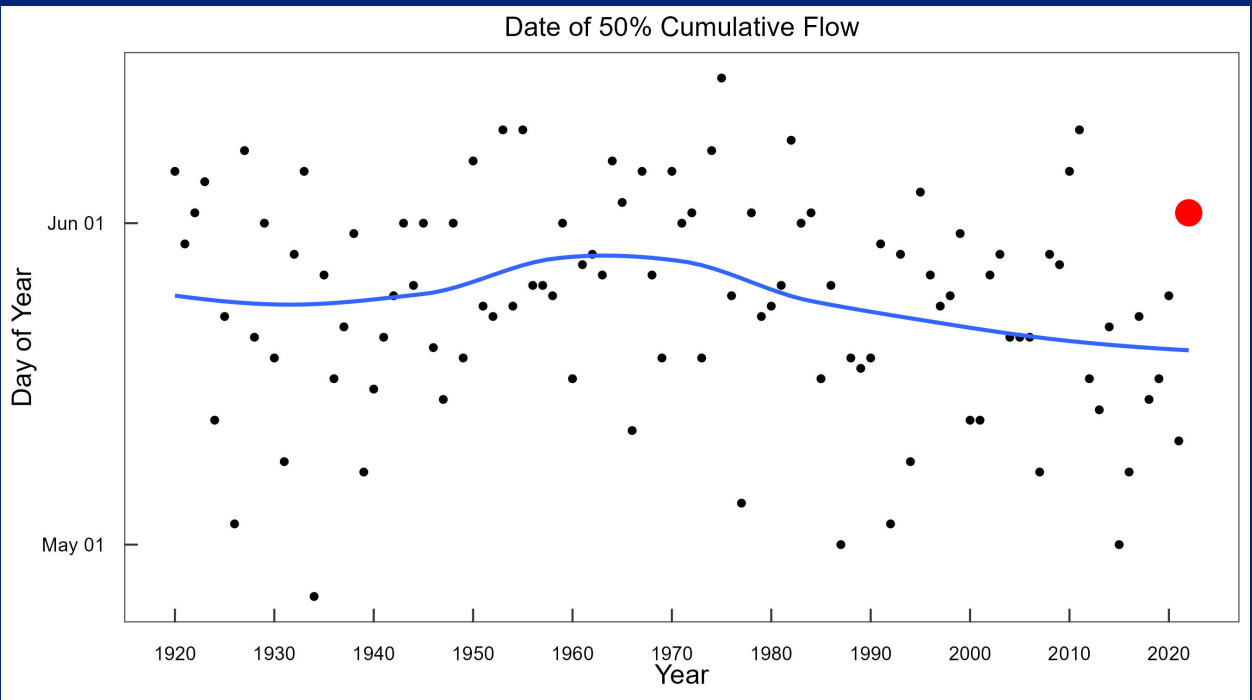






Salmon River at White Bird, ID

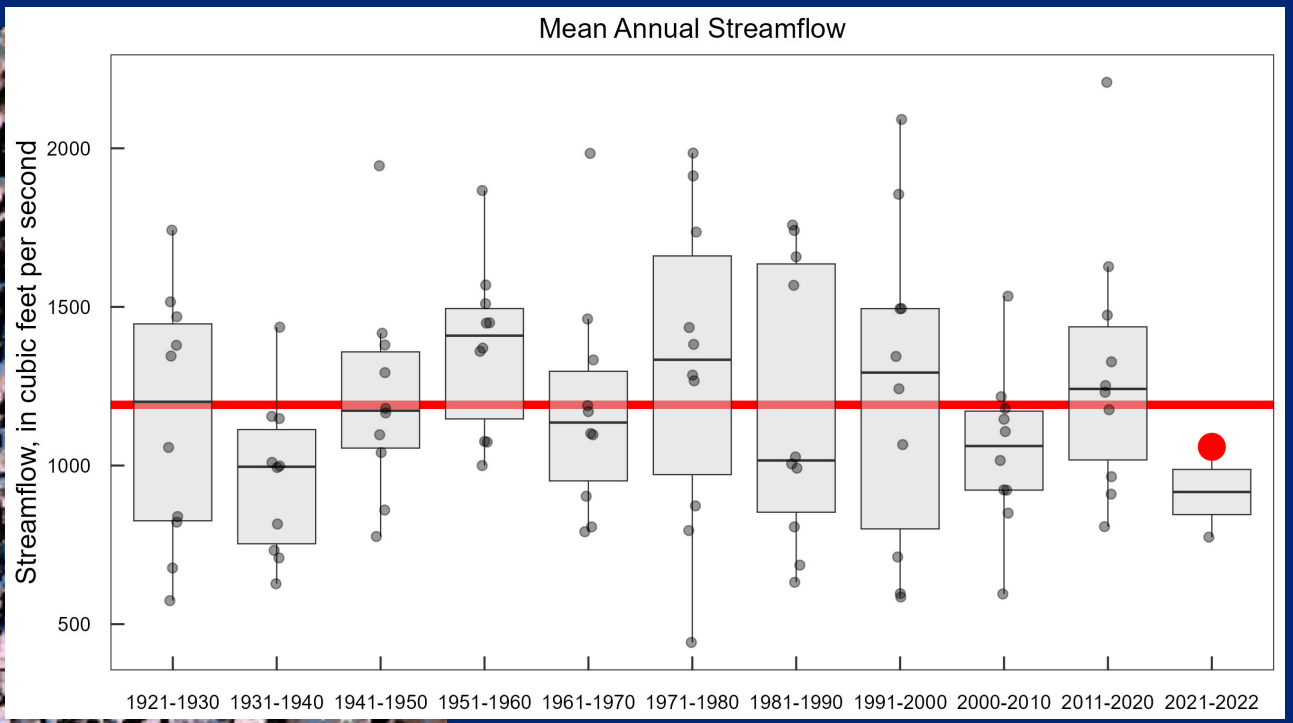


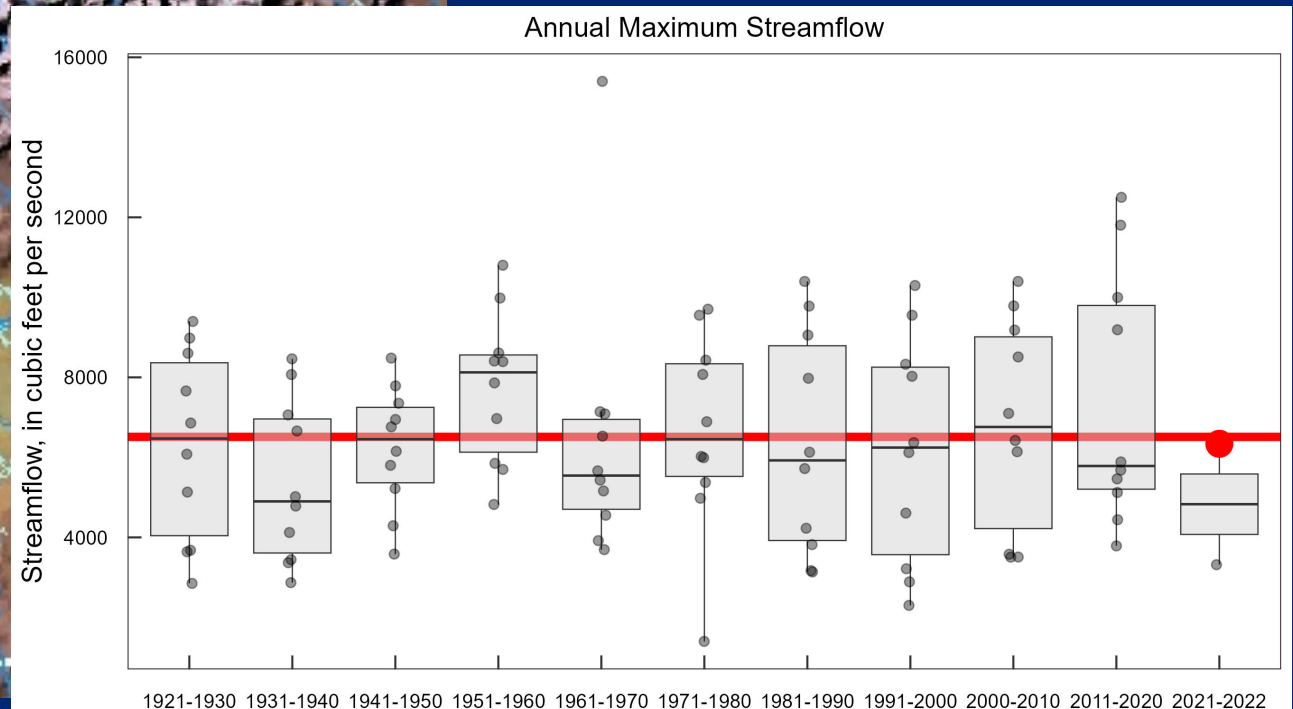


USGS science for a changing world

Boise River near Twin Springs, ID

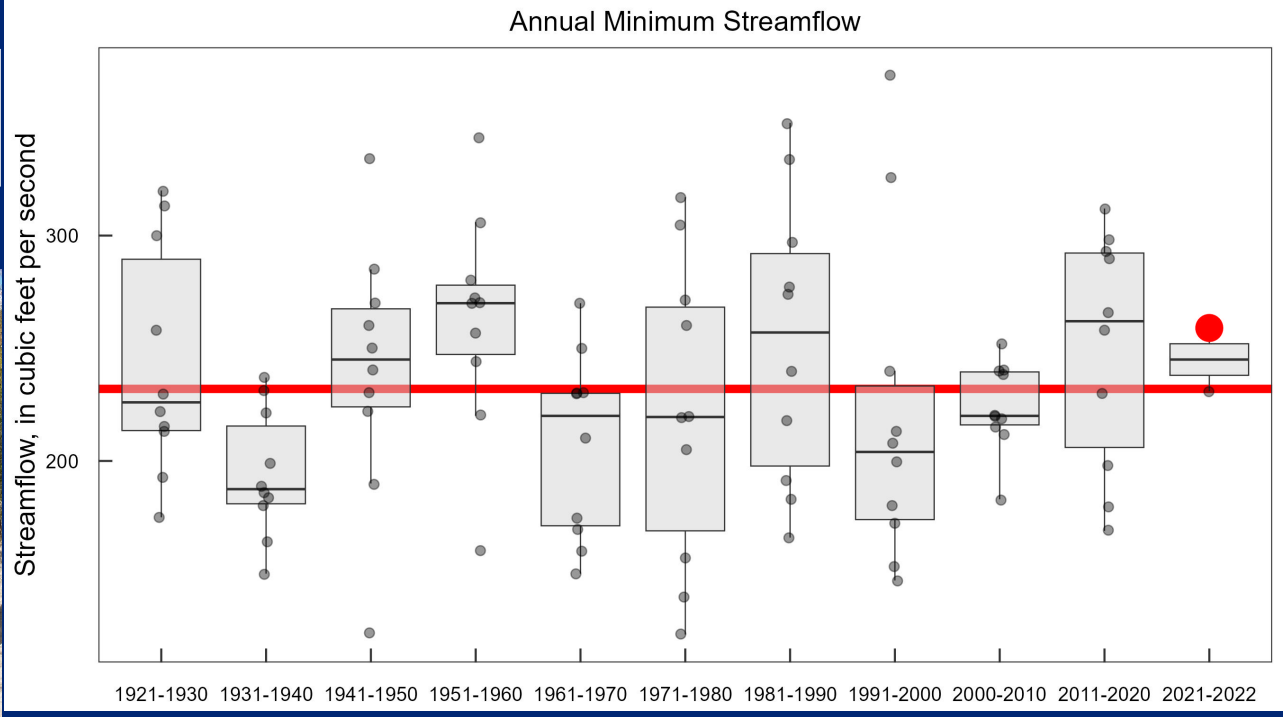
Period of record - 1912-2022
Basin size - 830 mi²
Mean Elevation – 3,260 ft

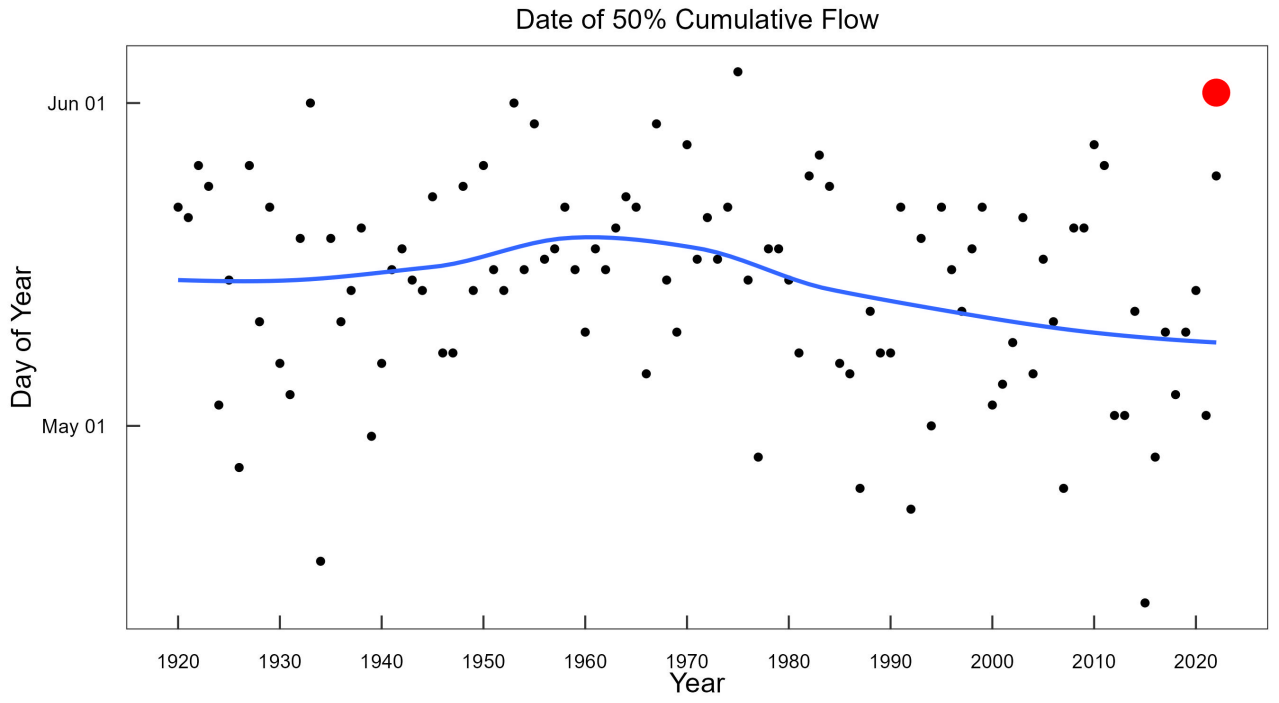




Boise River near Twin Springs, ID

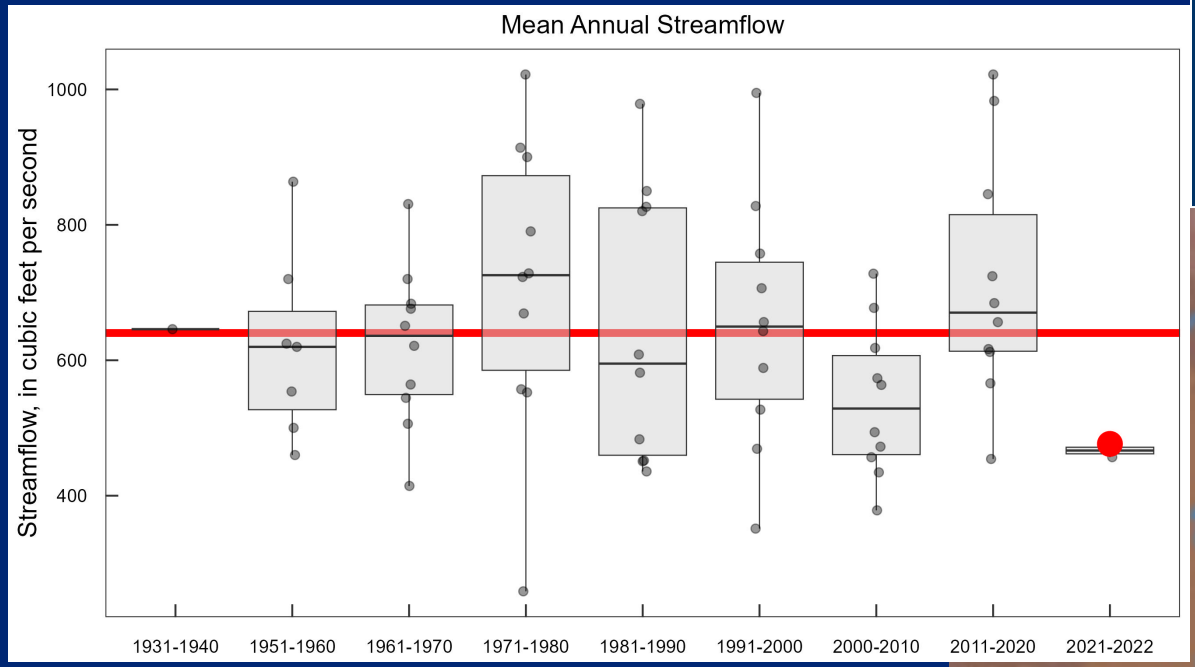
The road to Twin Springs, 1921, Boise River about 22,000 cfs

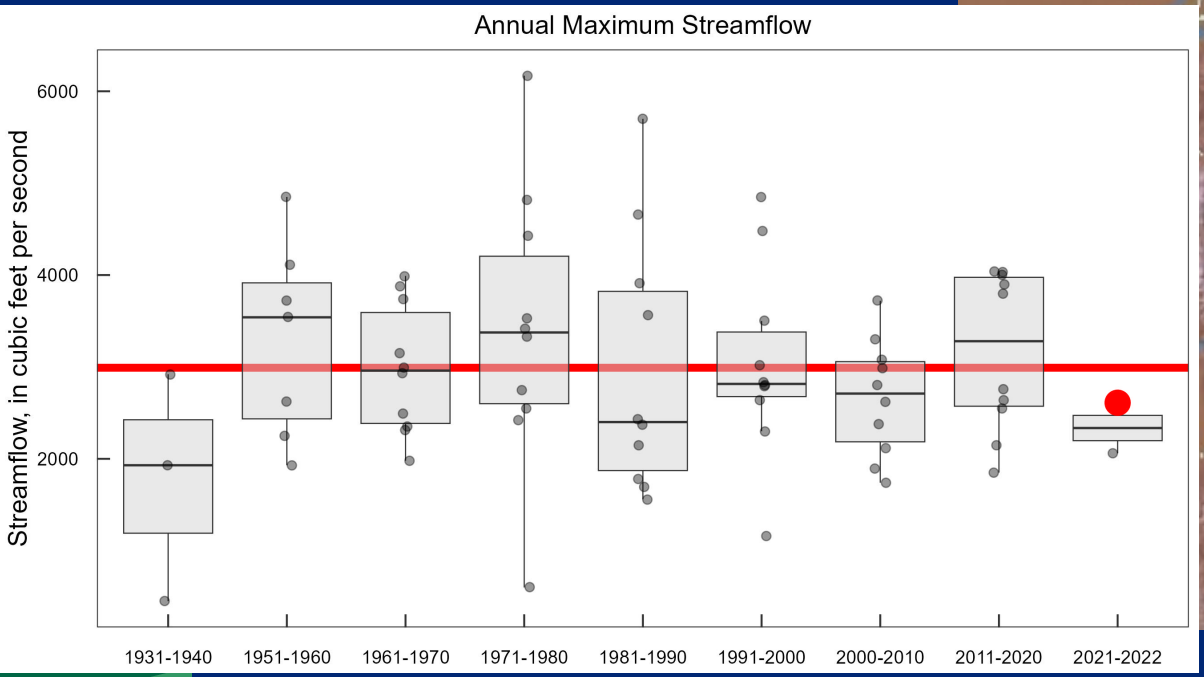




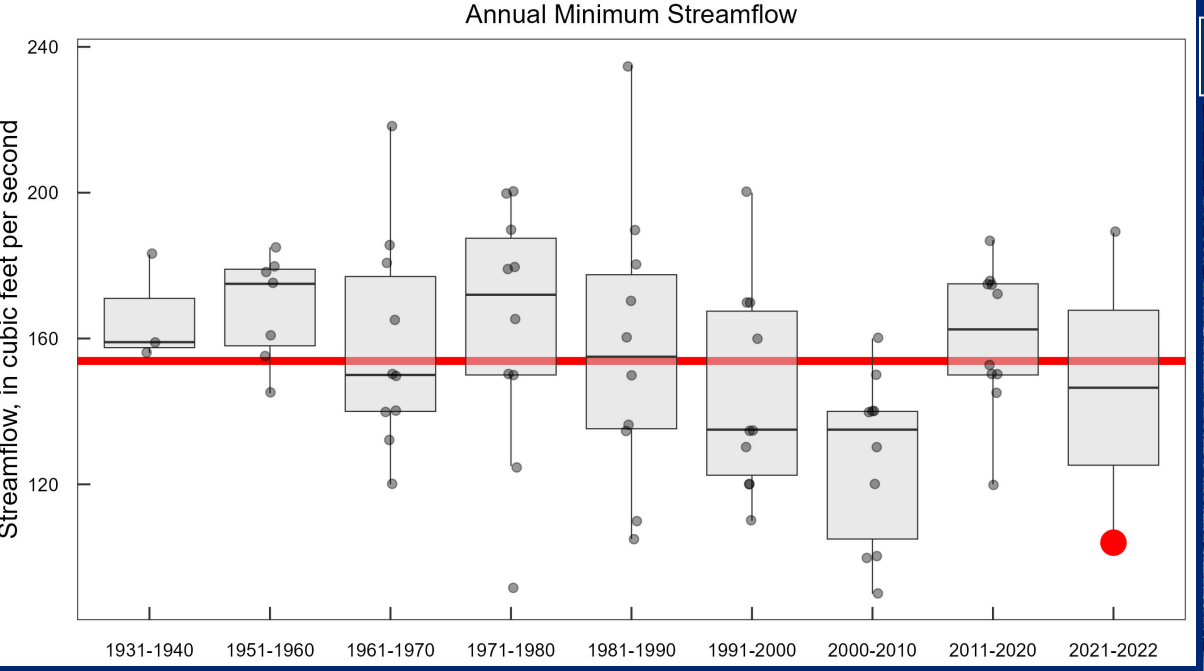
Greys River near Alpine, WY

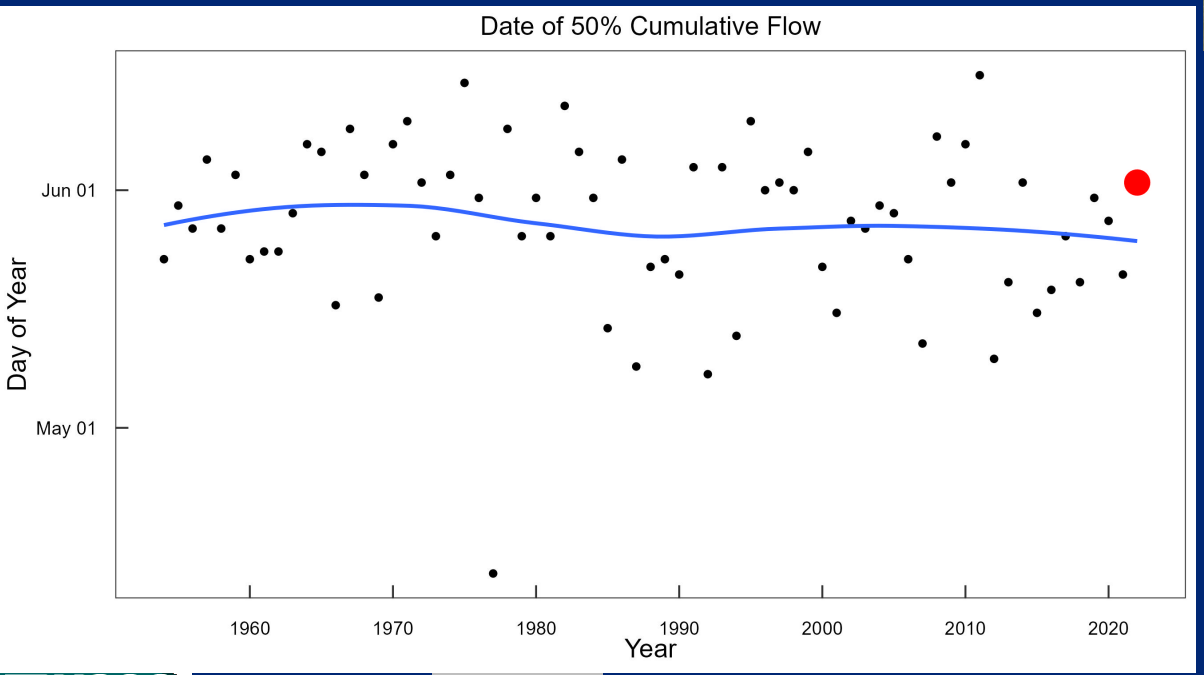
Period of record - *1917-2022 (broken)*
Basin Size - 448 mi²
Mean Elevation – 8,110





Greys River near Alpine, WY





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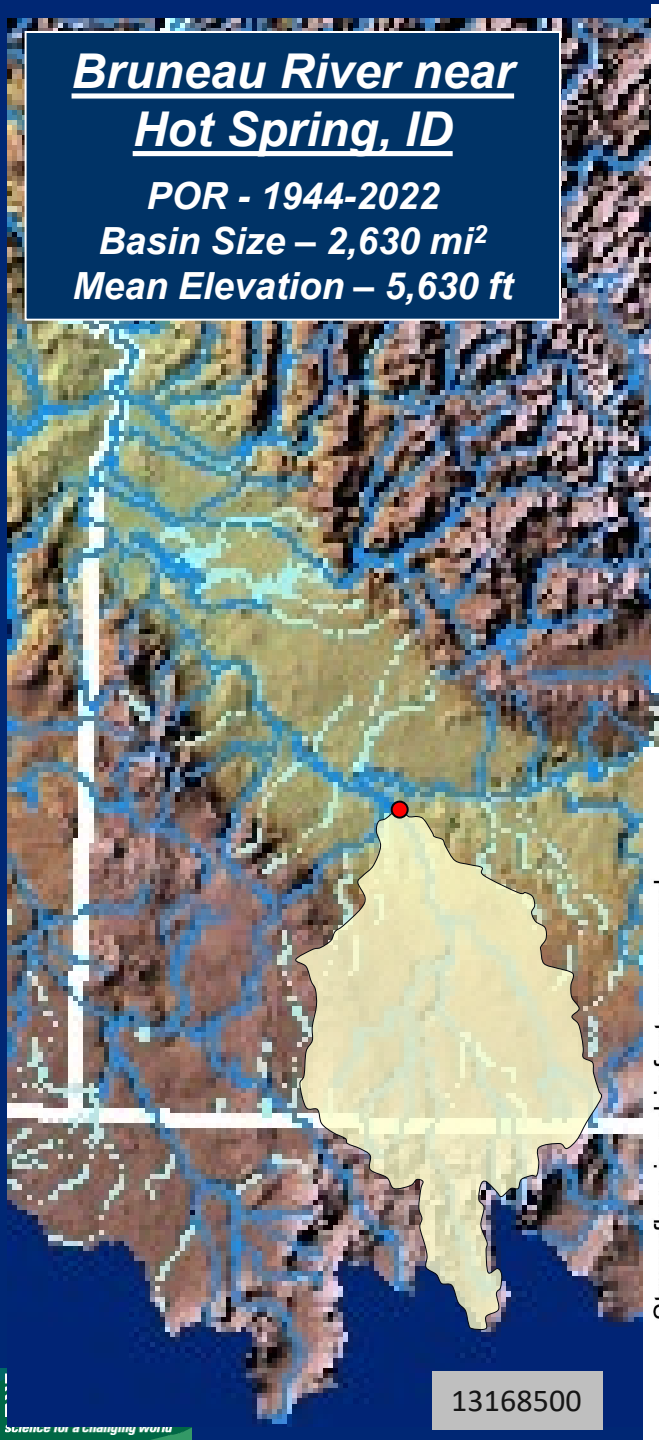
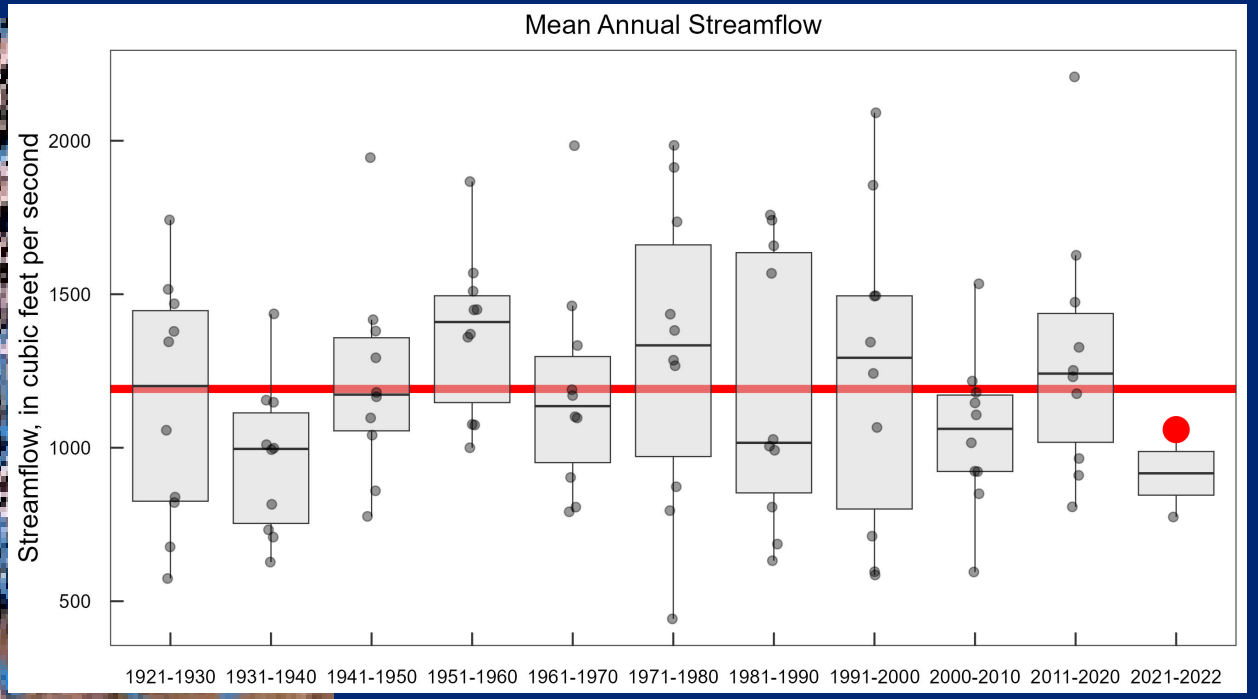
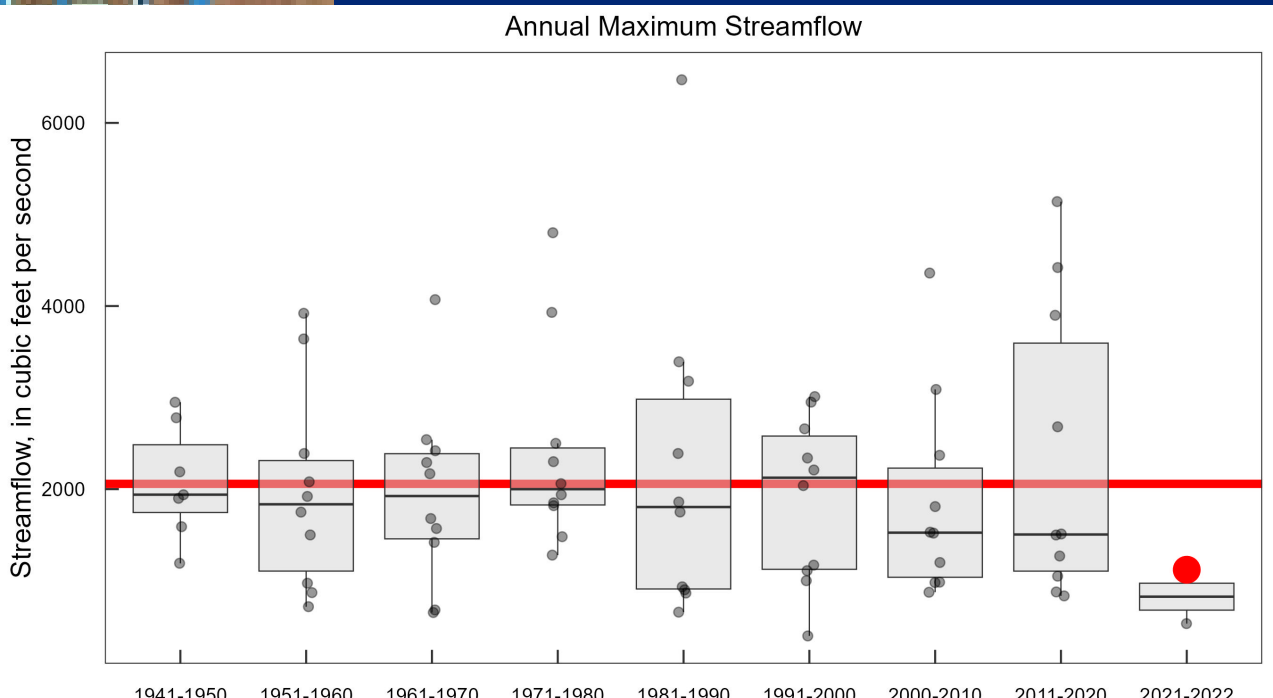
Bruneau River near Hot Spring, ID

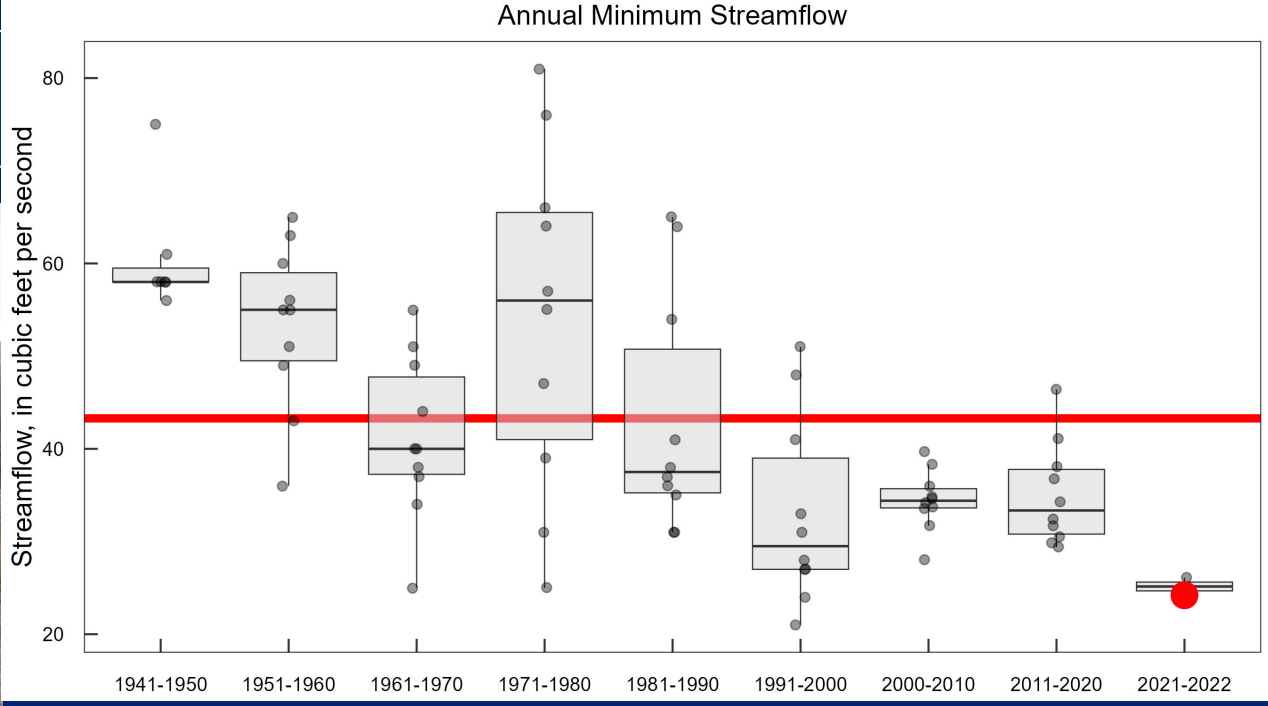
POR - 1944-2022
Basin Size – 2,630 mi²
Mean Elevation – 5,630 ft

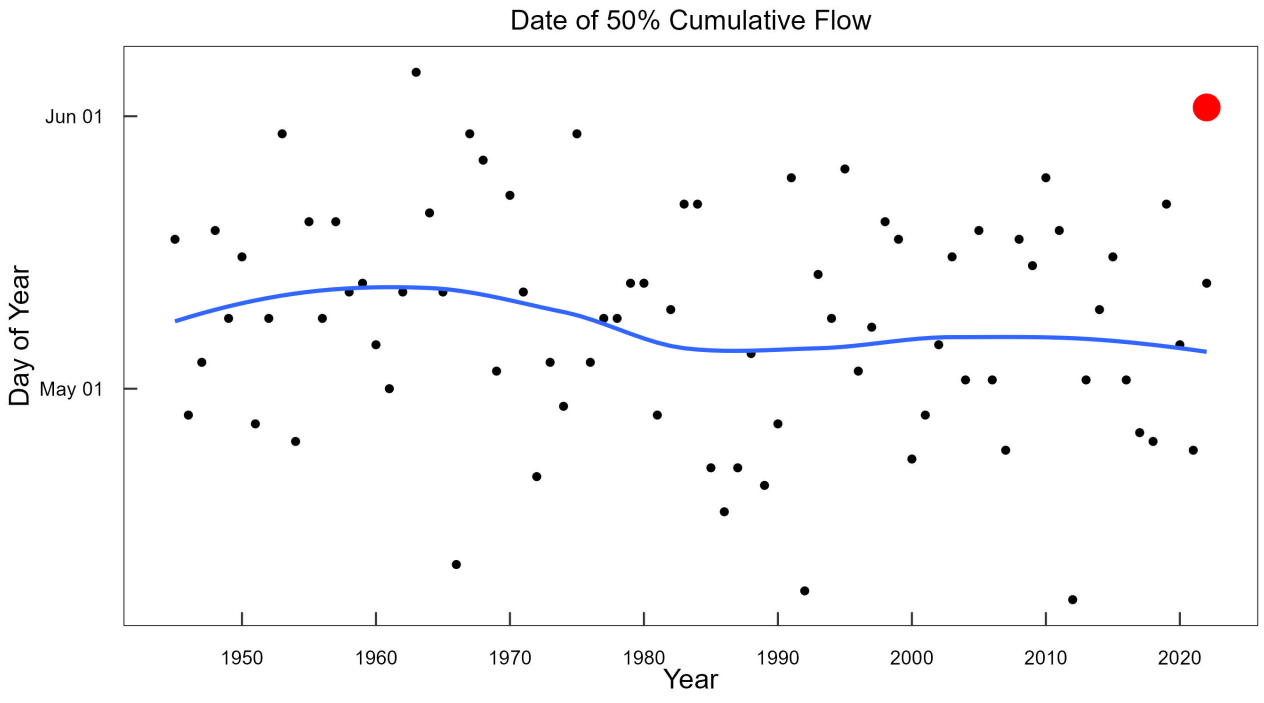






Bruneau River near Hot Spring, ID





USGS science for a changing world

Summary and General Conclusions

- As of 2007, the mid-point of the annual flows in un-regulated Idaho streams occurred about 11 days earlier than 40 years earlier
- As of 2022, in five diverse streams with long records of 70-111 years, little change in the mid-point flow timing was apparent.
- This different observation is because in the last 15 years at these streams, streamflows have been generally above long-term average conditions with respect to streamflow quantity and timing of runoff.
- The Bruneau River stands out with declining base flows

- The major pattern in these stream flows over the last 70 to 100+ years appears to be decadal climate shifts:
  - 1930s, 1990s-2000s had many warm, dry years;
  - 1940s through 1970s and 2010s tended to have cooler, wetter years

- Records from long-term gaging stations on unregulated streams are a valuable tool for examining historical changes in streamflow patterns, basin runoff characteristics, and climatic changes.

Questions

Making a stream measurement on the Gold Fork of the Payette River with trailing sheep, 1921

USGS science for a changing world

Thanks to Greg Clark for starting this, and to Austin Baldwin and Stephen Hundt, the quants who helped me with the analyses , and those who took and shared all the pictures

Idaho’s Collaborative Cloud Seeding Program

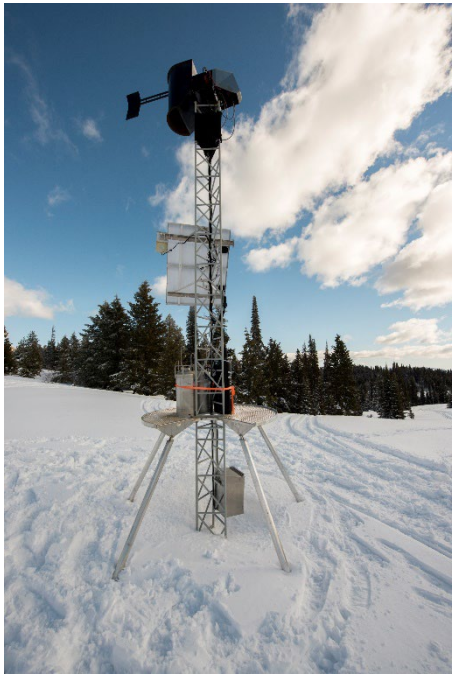
Governor’s Water Summit

Kresta Davis
Water Resources and Policy Senior Manager

August 7, 2023

IDAHO POWER

Cloud Seeding as a Water Management Tool



What is Cloud Seeding?

- Cloud seeding depends upon an **abundance of super cooled liquid (SLW) water** in the atmosphere
- Cloud seeding provides **additional efficient ice nuclei**
  - Silver Iodide released into the atmosphere creates additional ice nuclei
  - Allowing the formation of ice
- Cloud seeding has been used as:
  - Fog suppression
  - Hail suppression
  - Rainfall enhancement
  - **Snowpack enhancement**
- Snowpack enhancement utilizing orographic lift

Environmental Safety

More than 20 comprehensive studies and data reviews of the environmental affect of the use of silver iodide for cloud seeding all concur that there is **no evidence of adverse effects to human health or the environment** from the use of silver iodide for cloud seeding.

- PG&E EA – 1995, 2006
- Snowy Hydro – 2004-2014, ongoing
- Williams and Denholm – 2009
- USBR Project SkyWater – 1977, 2009, 2013
- Cardno/Entrix Geochemistry and Impacts of Silver Iodide Use in Cloud Seeding (for PG&E) – 2011
- Santa Barbara County CEQA – 2013
- BSU and Heritage Environmental: Literature Review – 2015
- Sacramento Municipal Utility District – 2017
- State of Wyoming Level III Feasibility Study Laramie Range Siting and Design Final Report – 2017
- Placer County Water Agency CEQA – 2018

Why Cloud Seed?

State Benefits of Additional Water Supply

- Greater reliability for storage and natural flow water users
- Higher reservoir carryover from year to year
- Water quality
- Improved fisheries conditions
  - Federal flow augmentation program
  - Resident fisheries
- Additional recreation opportunities
- Improved aquifer management through managed recharge and other activities
- Further supports low cost, clean hydropower
- Supports state economy and growth

Idaho Power's Cloud Seeding History

- Began investigating cloud seeding in 1993 (shareholder question)
  - Take home: Long-term water management tool
- Operational in fall of 2003 (7 generators, aircraft, assessment)
  - Completed second year of assessment and third year of operations in May 2005
- In 2008 collaborated with HC RC&D and E Idaho Counties to enhance their program
  5-year pilot project under ESPA CAMP
- In 2010 started working with WW RC&D to evaluate cloud seeding opportunities in western Wyoming
- In 2011 started working with NCAR to develop WRF model to guide and evaluate CS operations and projects
- In 2013 – contracted with Big Wood Canal Company to seed Wood River with aircraft
- WY 2015 Expansion (44 generators, 2 aircraft)
  - Boise and Wood Basin's – remote generators and aircraft seeding
  - Continued expansion in Salt and Wyoming Ranges
  - IWRB funding a grant for equipment associated with expansion
  - Water users collaborative funding annual program Operations and Maintenance
- WY 2016 Expansion
  - Additional remote generators in Central Mountains and Upper Snake (Total of 53)
  - Third aircraft added
  - IWRB collaborative funding annual program Operations and Maintenance
- WY 2021 HB 266
- WY 2023 (Current)
  - Total 57 remote generators, 3 aircraft

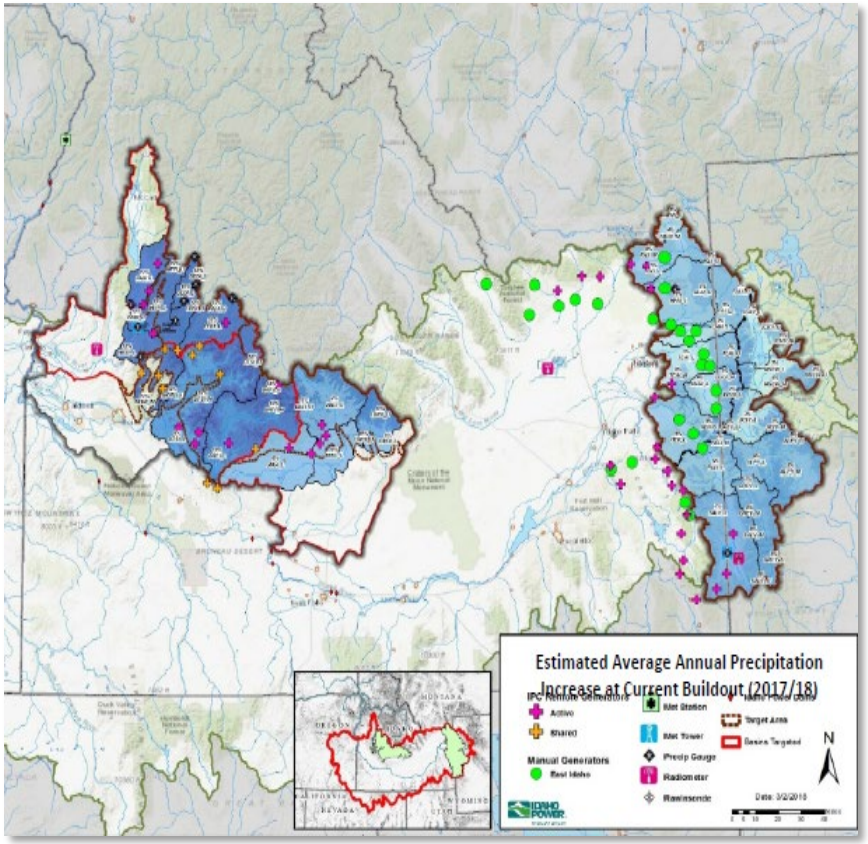
Collaborative Partnership

Policy and Strategy

Technical

Financial

Annual Benefit Estimates

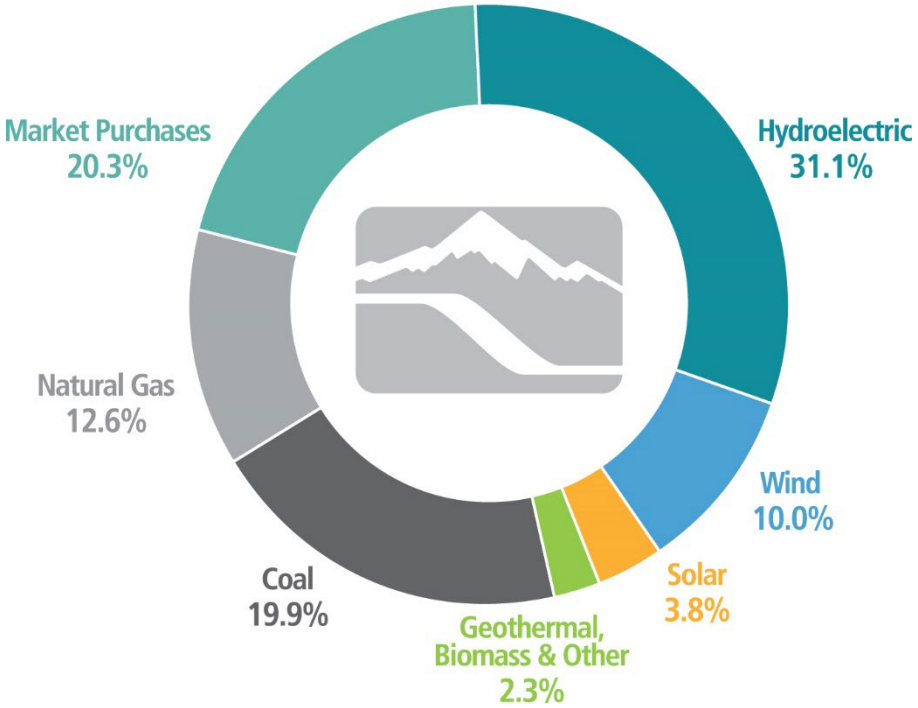


Average Annual Natural Flow Benefits

Boise Basin	270,000 acre-ft
Wood River Basin	110,000 acre-ft
Upper Snake Basin	630,000 acre-ft
Above Palisades	*460,000 acre-ft*
Henry's Fork	*170,000 acre-ft*
Payette (Idaho Power)	220,000 acre-ft
Total	**1,230,000 acre-ft**

Clean Energy

2022 Energy Mix



This shows the energy we generate from company-owned resources and energy we buy through long-term contracts with wind, solar, biomass, geothermal and small-scale hydro generators.

The mix does not represent the energy delivered to customers for two reasons.

- We participate in the wholesale energy market and sell energy to other utilities and to retail customers.
- Some of our purchased power from renewable sources comes with a Renewable Energy Credit, or REC, which we sell to keep customer prices low.

Energy Demand is Growing


Thank you!
IDAHO POWER

Governor's Water Summit

Elmore County
Commissioner Bud Corbus

August 7, 2023

Overview

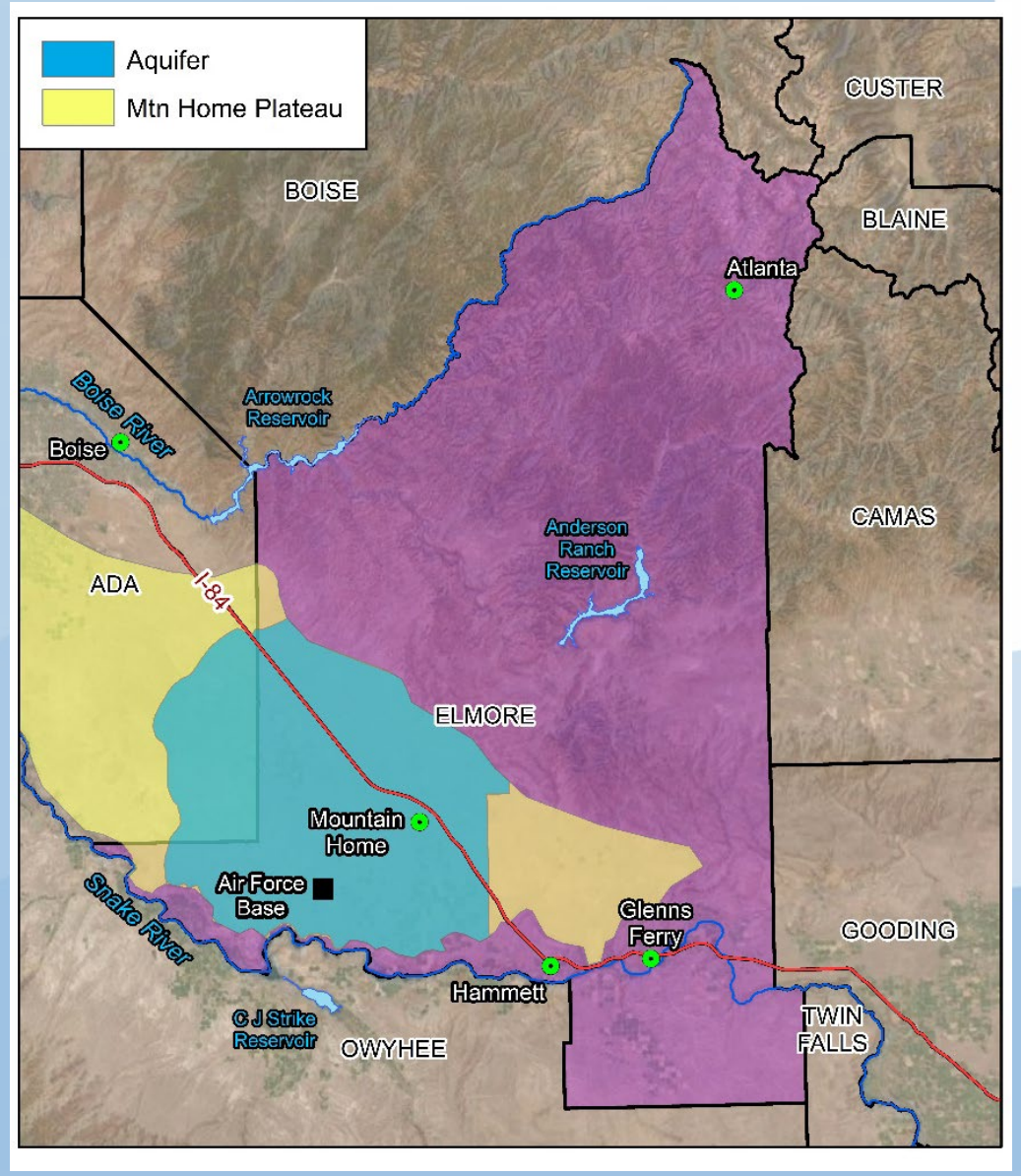
1. Profile of Elmore County
2. Water resources and uses
3. Prior proposals
4. Declining aquifer
5. Impacts to County
6. Recent/current efforts

Profile of Elmore County

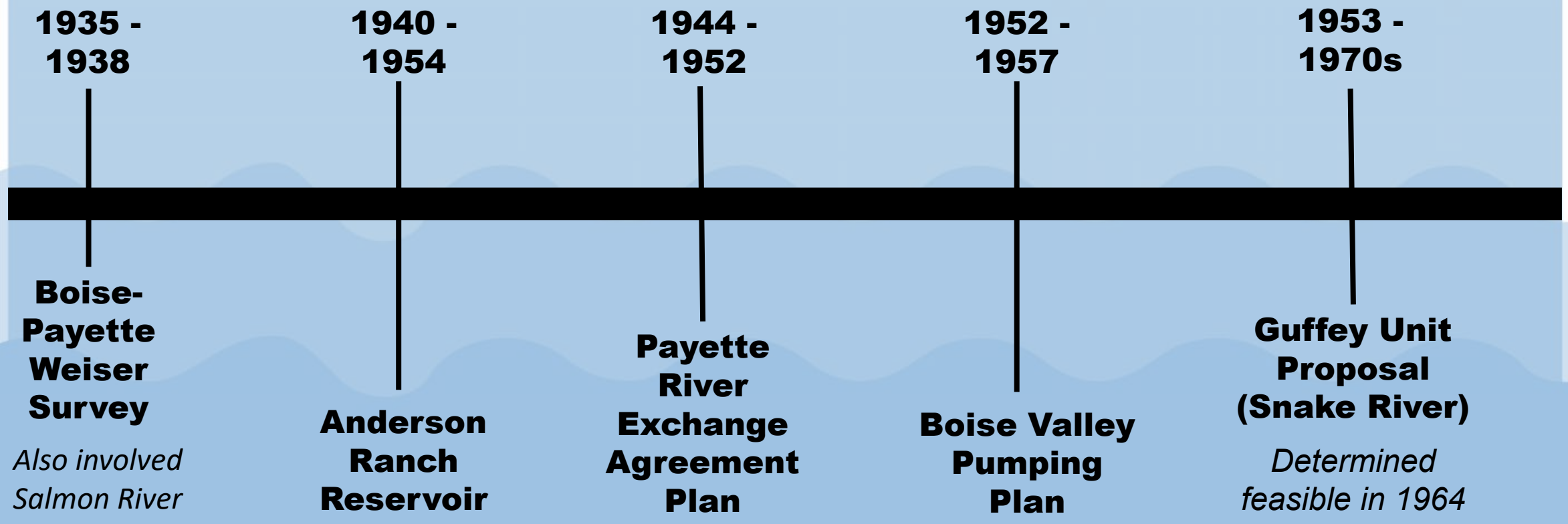
- Location/geography
- Population: 28,827 (13th of 44 counties)
- Largest city: Mountain Home (pop. 16,235)
  - Provides critical support/services for MHAFB
- Area: 3,101 sq. mi. (6th of 44 counties)
- Economic output (16th of 44 counties)
  - Agriculture
  - Mountain Home AFB
- Infrastructure
  - Interstate 84
  - Railroad

Surface Water

- Arrowrock / Anderson Ranch Reservoirs
  - Water originates in Elmore County
  - Reservoirs mostly reside in Elmore County
  - Designated for use in Treasure Valley
- Mountain Home Irrigation District
  - 4,000 acres
  - Canyon Creek, Little Camas Reservoir, Long Tom Reservoir, Mountain Home Reservoir
  - Variable supply
- Bennett Creek, Cold Springs Creek, Little Canyon Creek, etc.
  - 15,000 acres
  - Seasonal, unreliable supply
- Snake River
  - 33,000 acres
  - Reliable supply
  - Moratorium



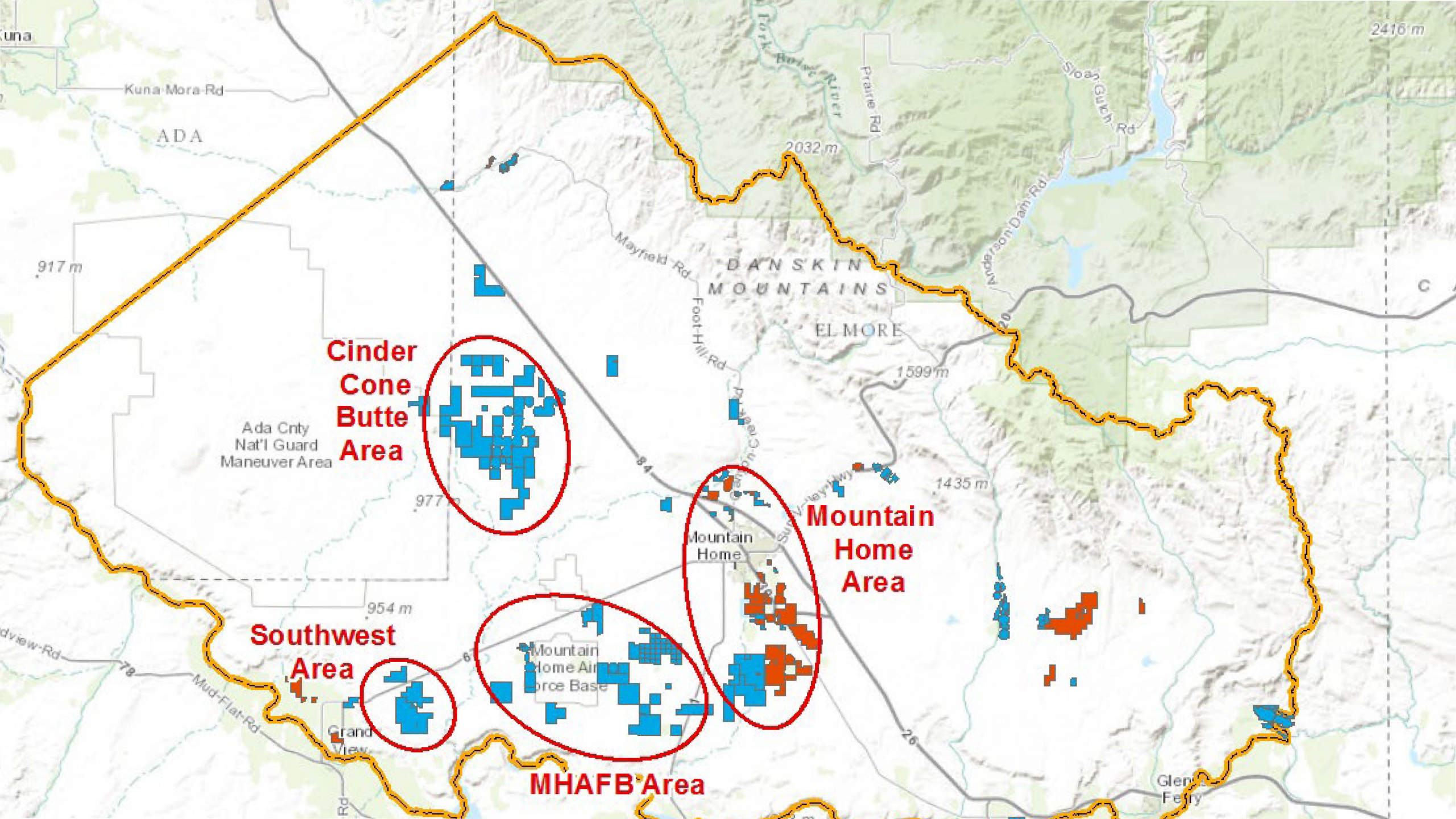
BOR Investigations Over the Years



** Several other federal and community-led projects have been proposed back to the early 1900s.*
*** Timeline not to scale.*

Groundwater Uses

- Municipal and domestic supply for Mountain Home Plateau
  - Including City of Mountain Home
  - Historically, including the MHAFB
- 18,000 acres primary irrigation
- 8,000 acres supplemental irrigation
- 80,000 acre-feet total annual use


Cinder Cone Butte Area
Mountain Home Area
Southwest Area
MHAFB Area
Kuna Mora Rd
ADA
Ada Cnty Nat'l Guard Maneuver Area
Mayfield Rd
Foot Hill Rd
DANSKIN MOUNTAINS
ELMORE
Prairie Rd
Sloan Gulch Rd
Anderson Dam Rd
Mountain Home
Mountain Home Air Force Base
Grand View
Mud Flat Rd
2416 m
2032 m
1599 m
1435 m
977 m
954 m
917 m

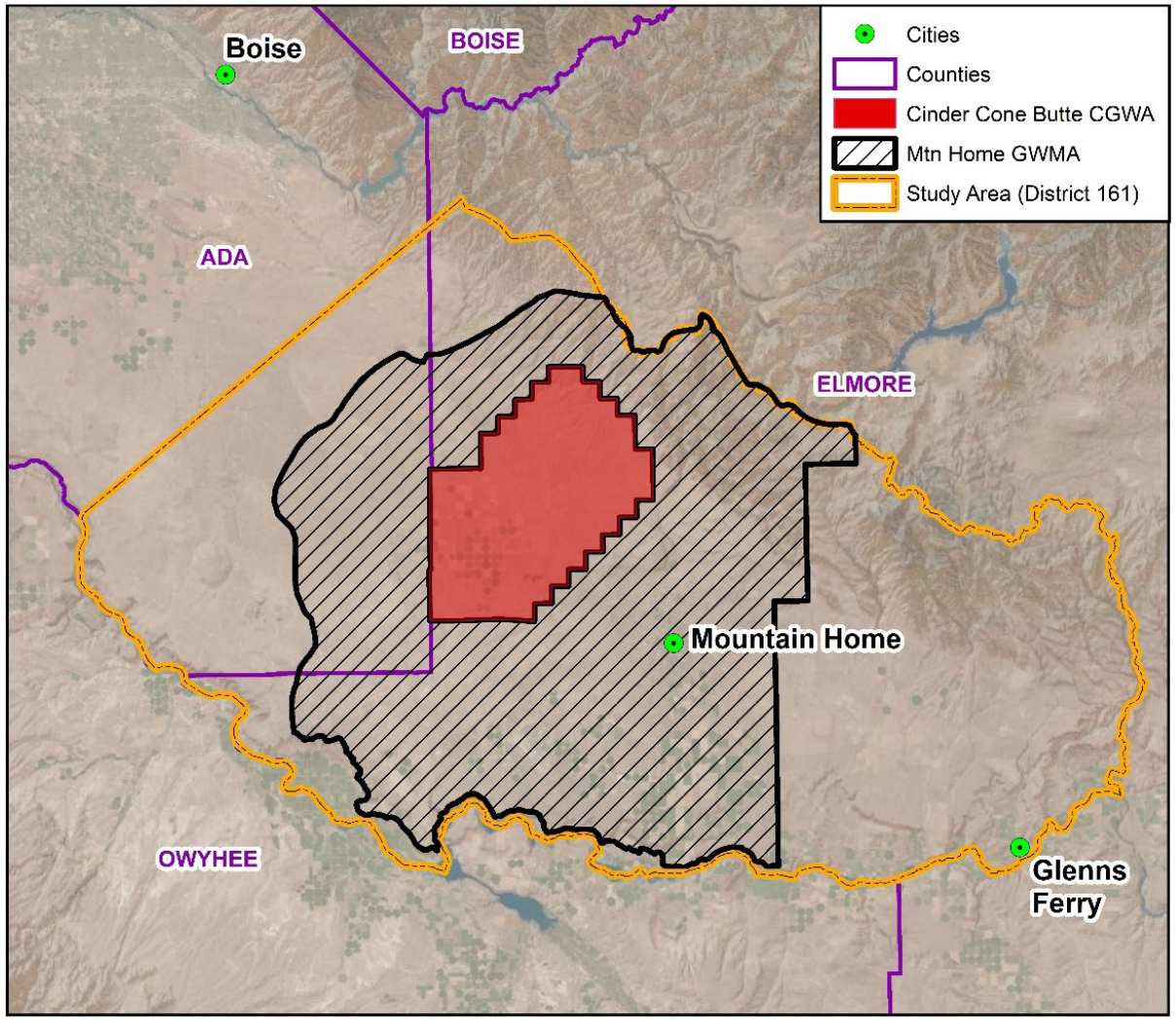
Groundwater Deficit

Annual 40,000 af deficit

80,000 af pumped
40,000 af natural recharge

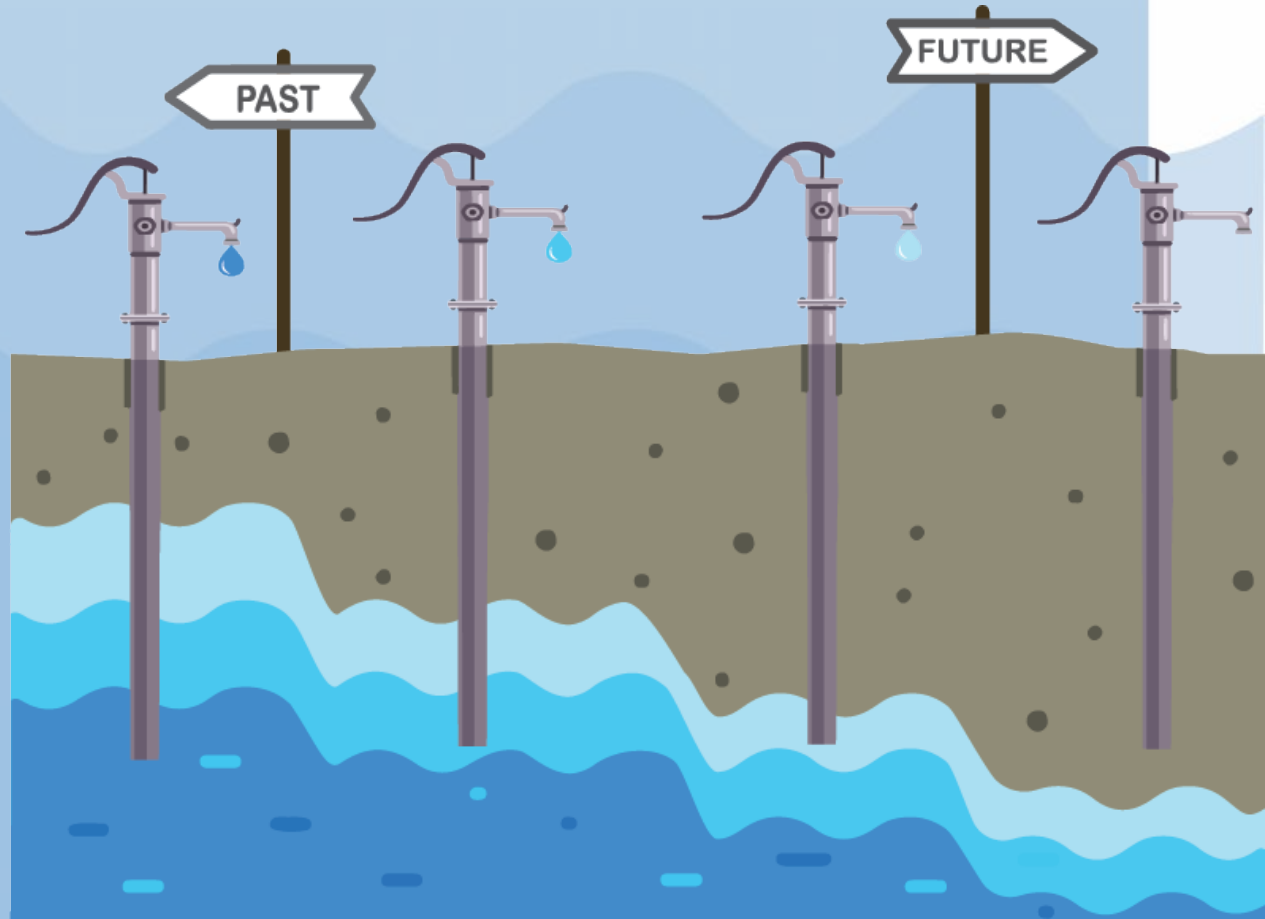
- Varies by area
  - 100 to 200 feet at Cinder Cone Butte CGWA
  - Mountain Home GWMA
    - 75 to 100 feet south of Mountain Home
    - 70 to 90 feet at MHAFB
  - No decline north of Mountain Home or near Mayfield

(af = acre-foot)

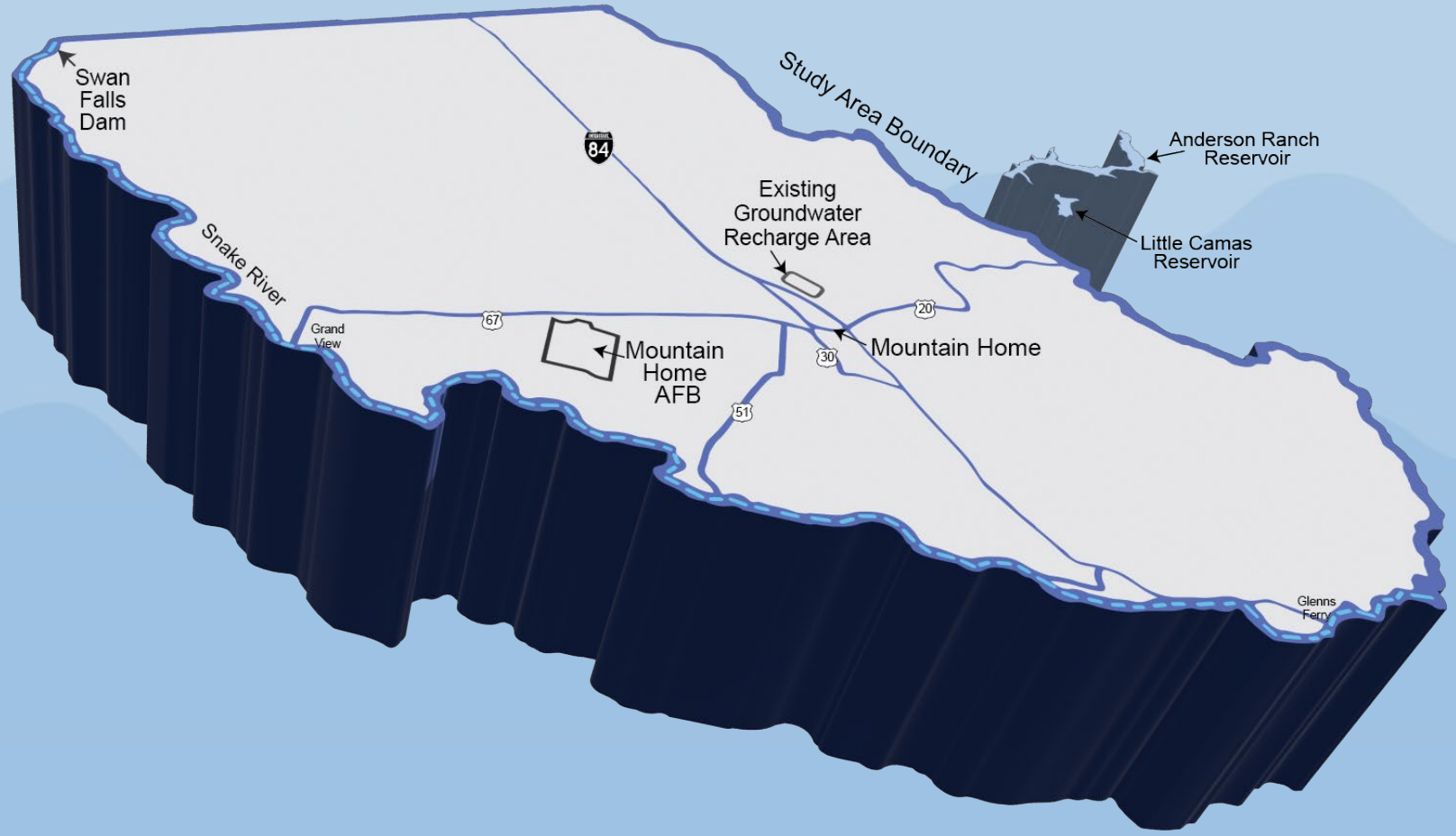


Impacts to Elmore County

- Wells have to go deeper
  - Increased drilling costs
  - Increased power costs
- Conditions for delivery call
- MHAFB at risk
- Limits economic opportunities



2017 Water Supply Alternatives Study
(County & IWRB Funded)

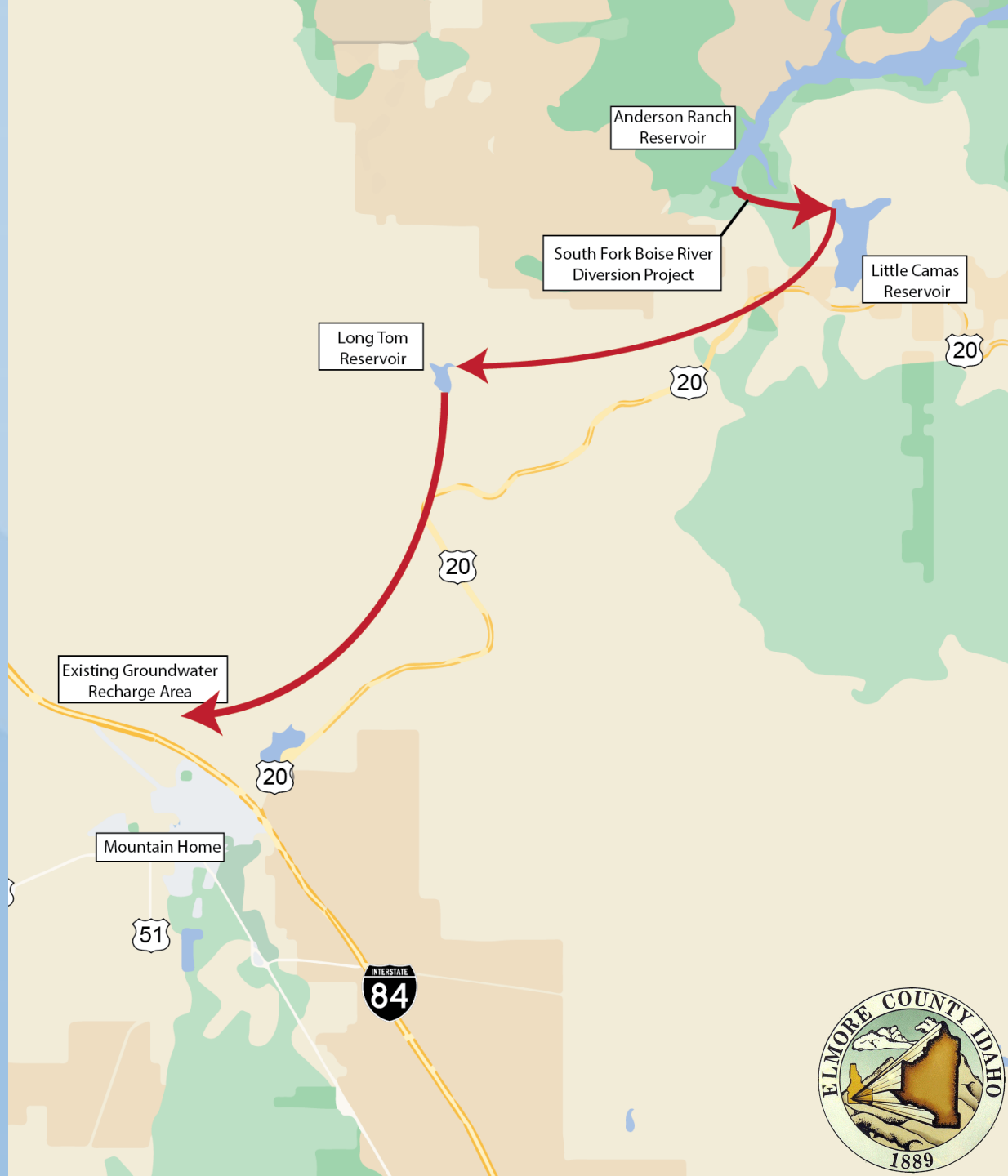


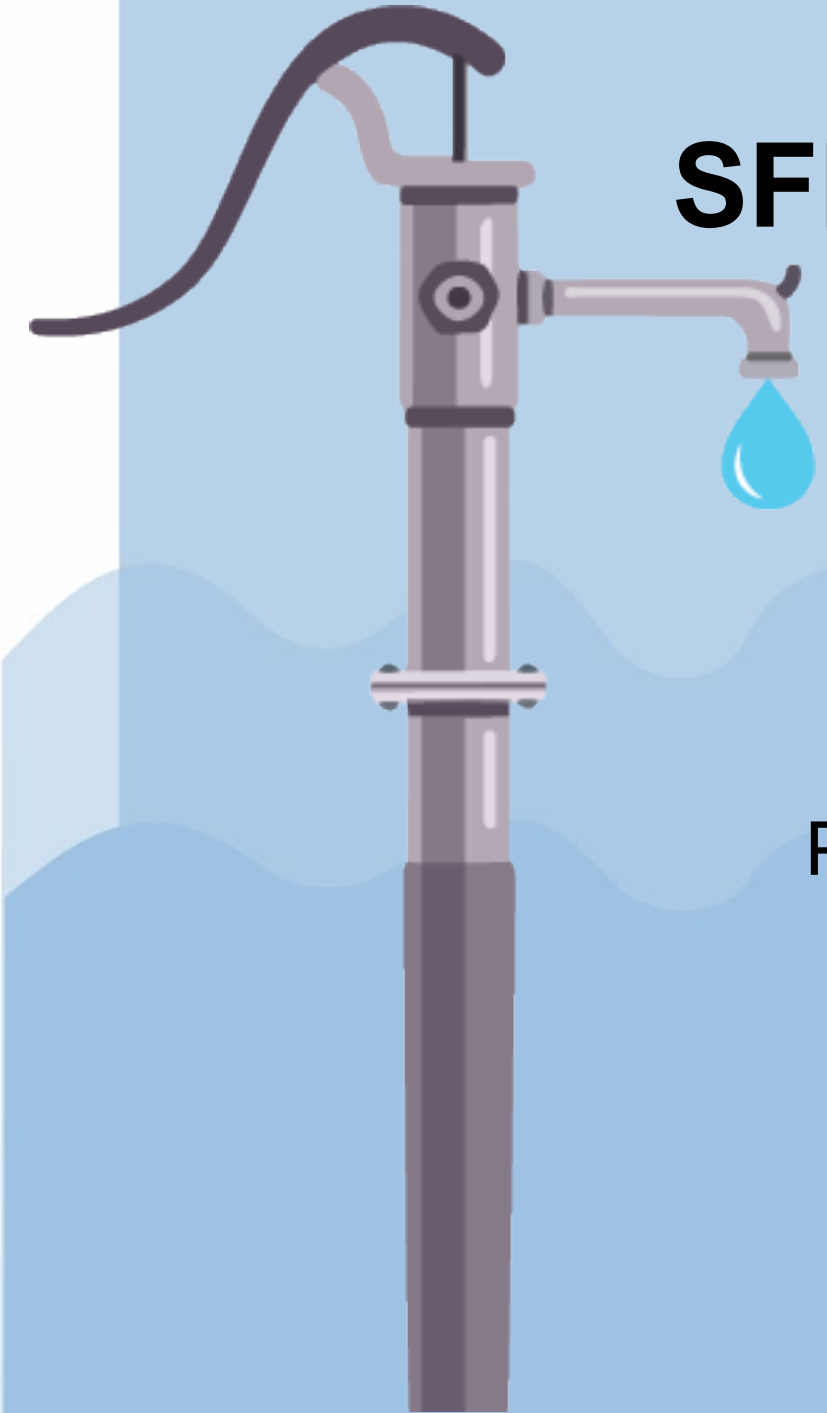
Canyon Creek Aquifer Recharge

- 200 cfs water right permit
- Facilities completed in 2019
  - Joint IWRB/County funding
  - Headgates, weirs, flow recorders
  - Use three existing gravel pits as recharge sites
- Recharge thus far
  - 2017: 4,460 AF (est.)
  - 2019: 1,403 AF
  - 2023: 912 AF

SFBR Project

- Pump Station and Pipeline from Anderson Ranch Reservoir to Little Camas Reservoir
- Permit approved for 200 cfs of floodwater for irrigation, recharge
- Canyon Creek Recharge facilities would be utilized
- More info: https://www.sfbrdiversion.com/





SFBR Project Current Actions

Preliminary Design

Pre-NEPA Fieldwork and Studies

Community Outreach and Education

SFBR Project Next Steps

- 2023
  - Complete preliminary engineering
  - Continue public education and stakeholder engagement
  - Formalize a project description for NEPA initiation
- 2024
  - Perform a seepage study on the 13-mile canal *(IWRB AIG Application Submitted)*
  - Formally initiate NEPA
  - Pursue additional water procurement
  - Develop financial and operational plans for the Project
    - Preliminary cost estimate: $30 to $40 million

Other Efforts

- Mountain Home Air Force Base Water Supply Project (IWRB/USAF)
- MHP groundwater model development (IWRB/IDWR/USGS)
- Anderson Dam raise (IWRB/BOR)
  - Only Boise Project reservoir County can access
  - Could make water available to County's SFBR Project for longer period
  - Access to storage would substantially reduce cost of SFBR Project
- Snake River Pump Station & Pipeline (Elmore County)
  - Application for 20 cfs filed with IDWR in 2017
    - Municipal use within City of Mountain Home system
    - Irrigation – replacement of GW withdrawals
    - Recharge
  - All protests resolved
- MHID Canal improvements (MHID, County, AIG app pending w/ IWRB)

Summary

- Reliable water supplies are needed to sustain the economy of the Mountain Home Plateau
- Water supplies are available from South Fork Boise River and Snake River sources
- The State of Idaho and Elmore County are working on projects to address water supply deficiencies
- Projects support viability of the Mountain Home metropolitan area, a vital support to the Mountain Home AFB
- Continued local, state, and federal support is needed

Thank You

Coalition of Cities' Views Of Conjunctive Administration

Chris M. Bromley

McHUGH BROMLEY
ATTORNEYS AT LAW, PLLC

Topics for Conversation

- **Who We Are**
- **Pertinent Administrative Actions**
- **2018 Cities Settlement Agreement**
- **Opportunities**

Who We Are

McHUGH BROMLEY
ATTORNEYS AT LAW, PLLC

Who We Are

- **Coalition of Cities**
  - **Bliss, Burley, Carey, Declo, Dietrich, Gooding, Hazelton, Heyburn, Jerome, Paul, Richfield, Rupert, Shoshone, and Wendell**
- **Idaho Falls**
- **Pocatello**

Comparative Cities Pumping Volume

- **Average Annual ESPA Irrigation Pumping**
  - **~ 1,700,000 acre-feet**
- **Average Annual ESPA Cities Pumping (2018-2022)**
  - **~ 85,000 acre-feet**
    - **~ 4% of total ESPA pumping**

Pertinent Administrative Actions

SWC Delivery Call

- 1994
  - Musser delivery call
- 1995
  - Conjunctive Management Rules promulgated
    - Process and procedure to establish material injury to water rights with nearly twenty years of decisions
- 2005 SWC Delivery Call
  - Predicted material injury in some years
  - Litigation ensued
- 2015
  - Based on court decisions, Director found increased material injury to SWC in years when injury predicted

ESPA Ground Water Management Area

- **November 2, 2016**
  - **ESPA GWMA designated by the Director**
  - **Injury to the aquifer every year, regardless of SWC irrigation needs**
    - **Fundamentally different from conjunctive administration when material injury must be found to water rights**
  - **Uncertainty led Cities to negotiate and enter into a settlement agreement with SWC and IGWA**

Wood River Curtailment

- June 28, 2021, *Final Order*
  - Director's first use of Idaho Code 42-237a.g. to initiate and order curtailment
- February 10, 2022, *Memorandum Decision and Order*
  - Director may use I.C. § 42-237a.g. to initiate a hearing
  - The *Final Order* does not comply with Idaho's prior appropriation doctrine
    - CM Rules establish definitions, process, and procedures for determining "material injury to senior water rights" in an "area of common ground water supply"
- August 25, 2023
  - IDWR's appeal will be heard by Idaho Supreme Court

2018 Cities Settlement Agreement

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Terms

- Commitment to “aquifer enhancement”
  - 7,650 afy of recharge on on a 5-year running average
- Duration
  - 35 years or 120,000 af total municipal pumping, whichever is first
- All ESPA cities may participate
- Safe harbor from delivery calls for participating cities
- Support IWRB managed recharge
- Withdraw opposition to ESPA GWMA
- Seat at the table for ESPA GWMA Management Plan

Opportunities

Opportunities

- Form of Administration Should be Predictable
  - CM Rules, GWMAs, I.C. § 42-237a.g., or something else?
- Domestic Exception and Fundamental Fairness
  - In-home use within the city v. *deminimis* well use
- WD01 Rental Pool Rules "Last to Fill"
- Ability to Have Mitigation Plans Approved Prior to Administration
- Hearing Schedules

QUESTIONS?

Chris M. Bromley

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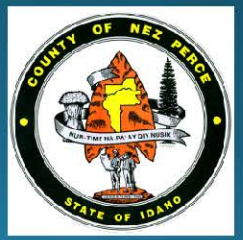
https://idaho-capital-investment-hub-vnagis.hub.arcgis.com/apps/9f3c4aa6d74d470cbdb1e501ef41865d/explore

Veolia Presentation

LEWISTON ORCHARDS PROJECT
Water Exchange and Title Transfer
From Litigation to Resolution

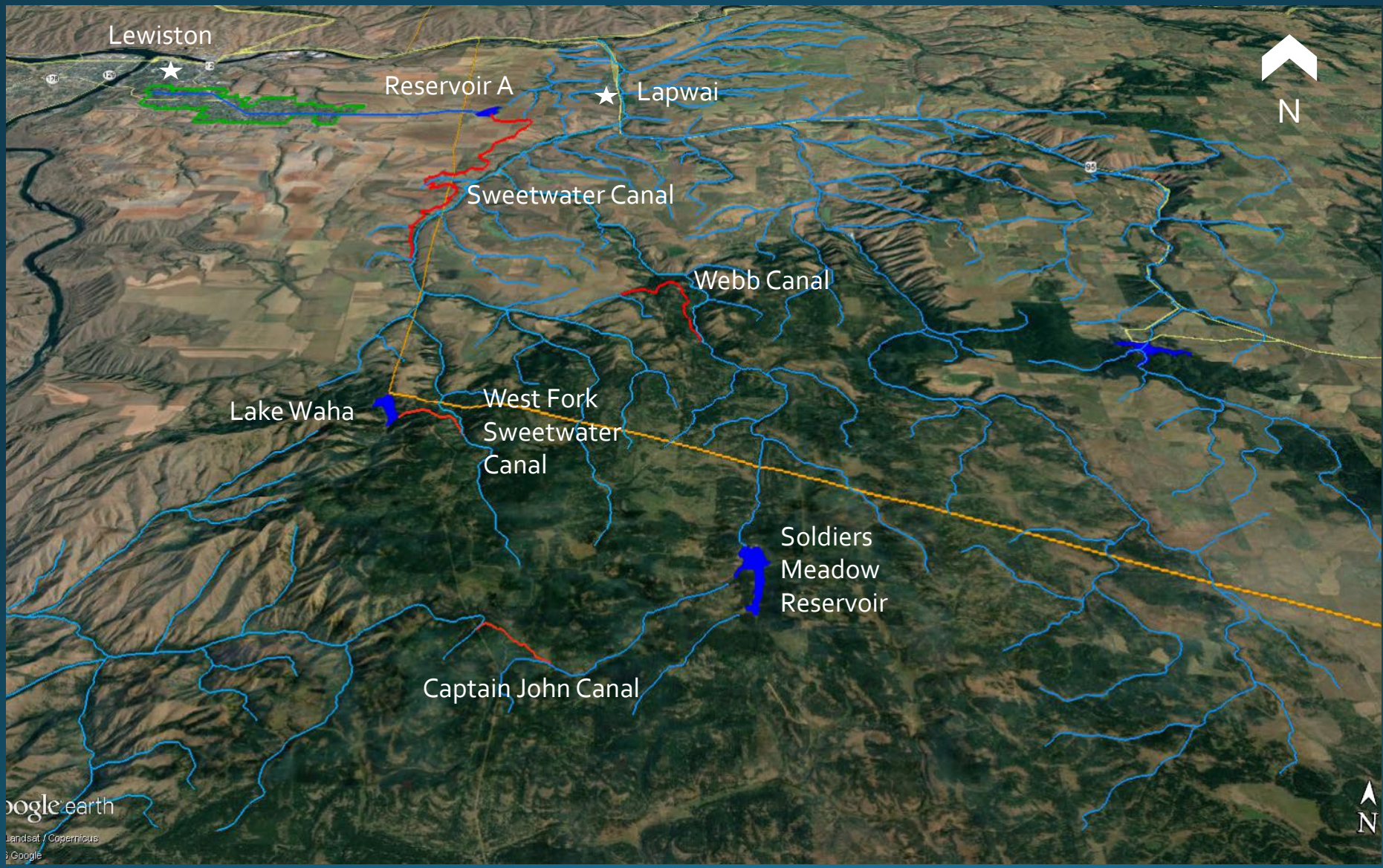
2023 Governor's Water Summit

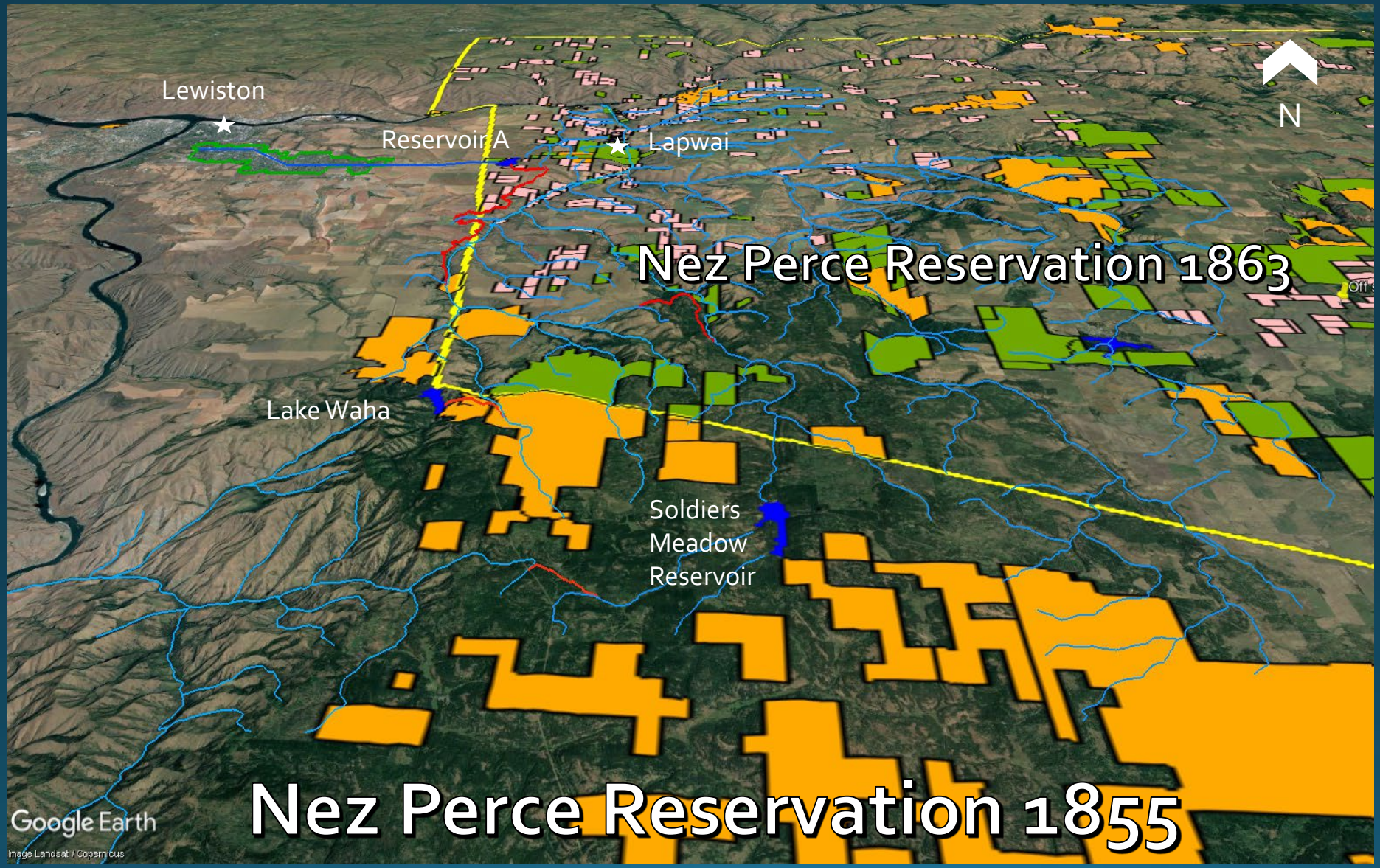
A collaborative, consensus-based effort…



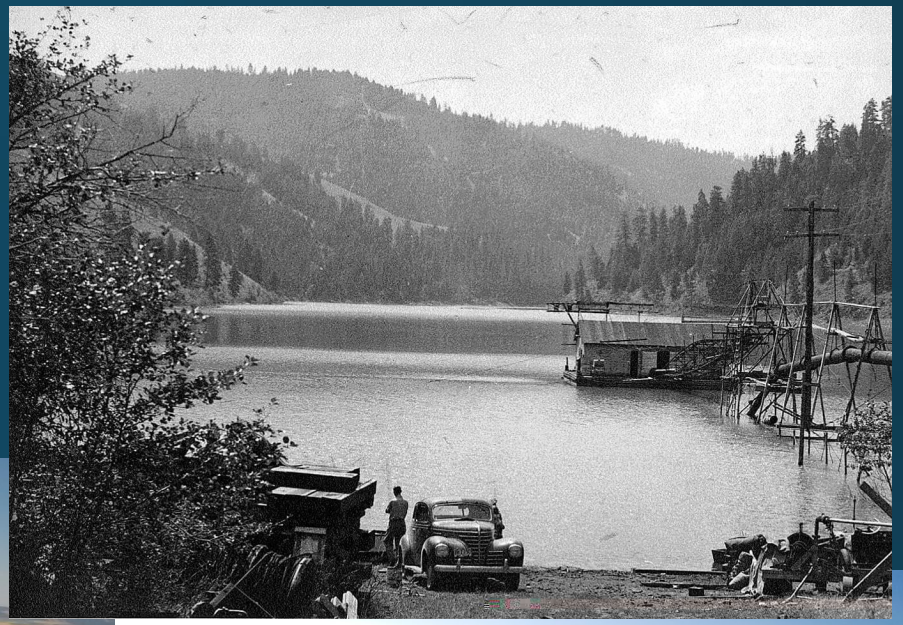
… with the support and involvement of many partners …

- Active Participants
  - Senator Crapo
  - Senator Risch
  - Congressman Fulcher
  - Congressman Simpson
- Formal letters of support for concept
  - Idaho Water Users Assoc
  - University of Idaho Waters of the West Program
  - NOAA Fisheries Northwest Region
  - Columbia River Inter-Tribal Fish Commission
  - Trout Unlimited


Lewiston
Reservoir A
Lapwai
N
Sweetwater Canal
Webb Canal
Lake Waha
West Fork
Sweetwater
Canal
Soldiers
Meadow
Reservoir
Captain John Canal
earth
Landsat / Copernicus
Google
N


Lewiston
Reservoir A
Lapwai
N
Nez Perce Reservation 1863
Lake Waha
Soldiers
Meadow
Reservoir
Nez Perce Reservation 1855
Google Earth
Image Landsat / Copernicus

The litigation



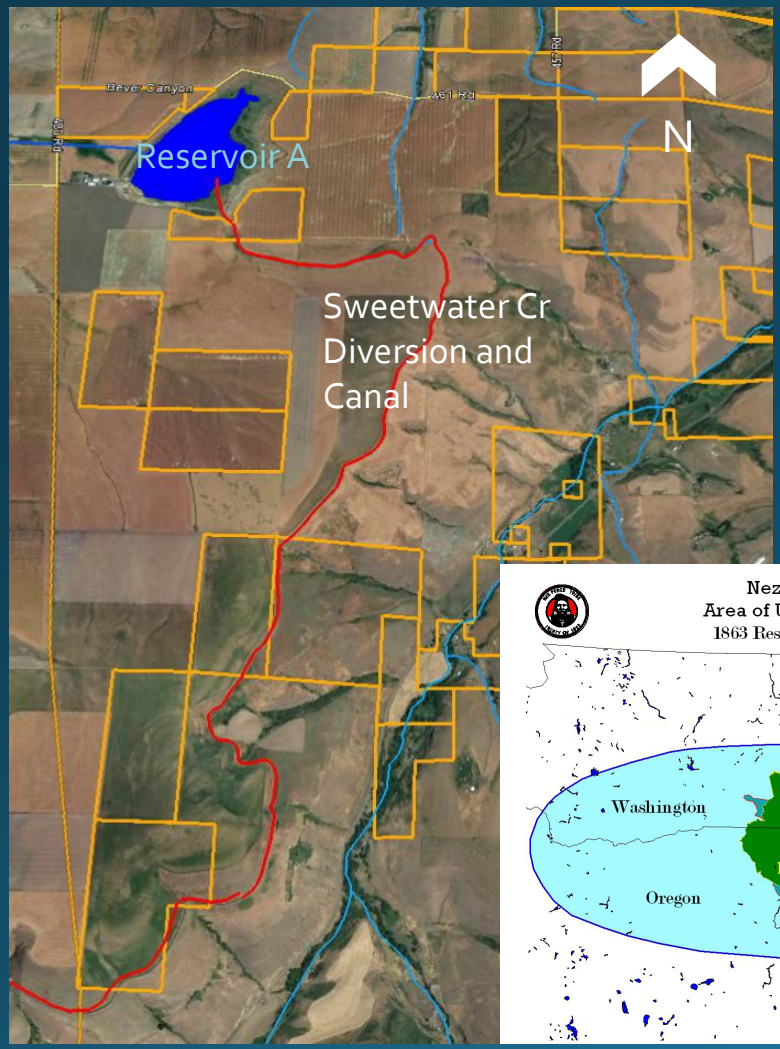
OBJECTIVES

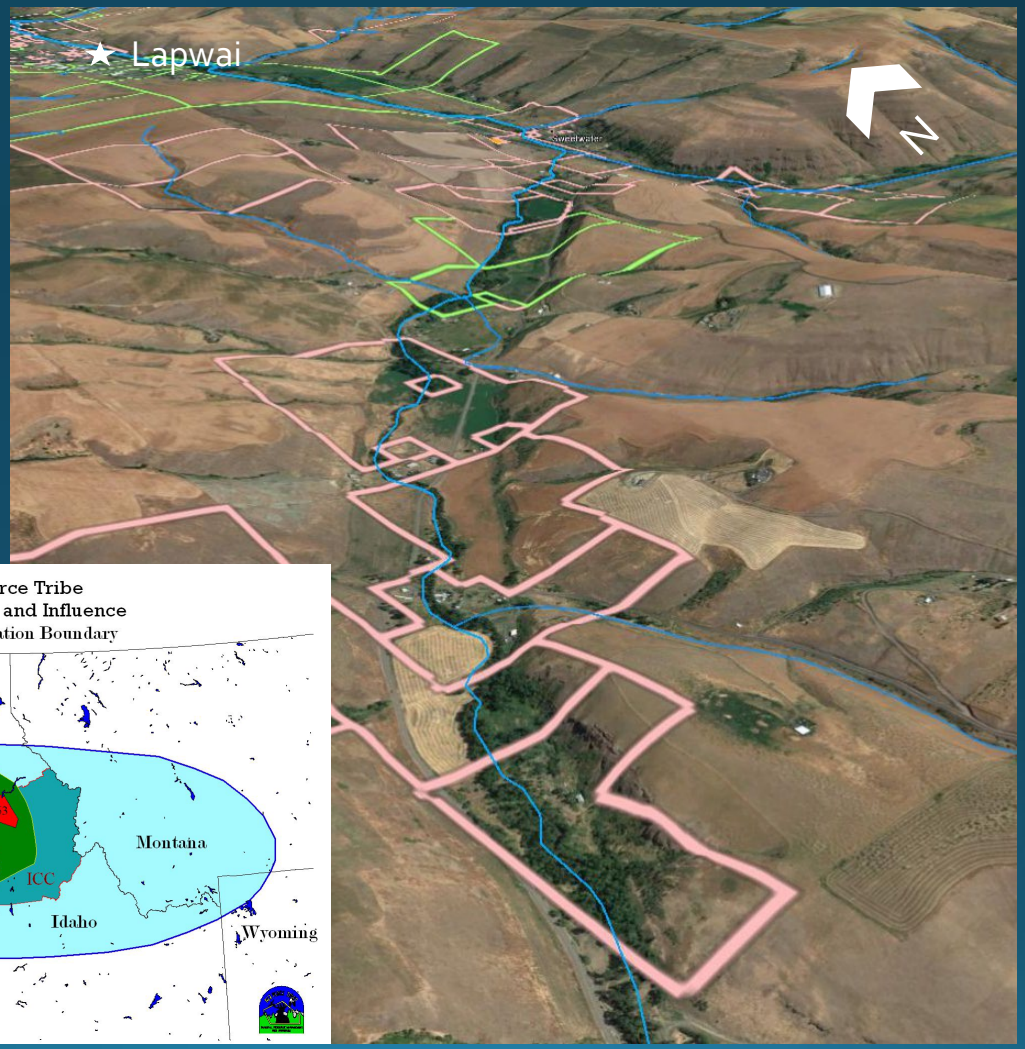
Permanently solve 3 long-standing problems with existing Lewiston Orchards Project

- (1) Inadequate water quantities, quality, and reliability for Lewiston Orchards Irrigation District.
- (2) Adverse effects on the Nez Perce Tribe and their people, including impacts to natural resources and to cultural and religious water uses, resulting from predominant location of the LOP on the Nez Perce Reservation.
- (3) Adverse effects on ESA listed Snake River A-run steelhead from the existing LOP and its location on ESA-designated critical habitat.

(1) Inadequate water quantities, quality, and reliability for Lewiston Orchards Irrigation District.

(2) Adverse effects on the Nez Perce Tribe and its people, including impacts to natural resources and to cultural and religious water uses, resulting from predominant location of the LOP on the Nez Perce Reservation.

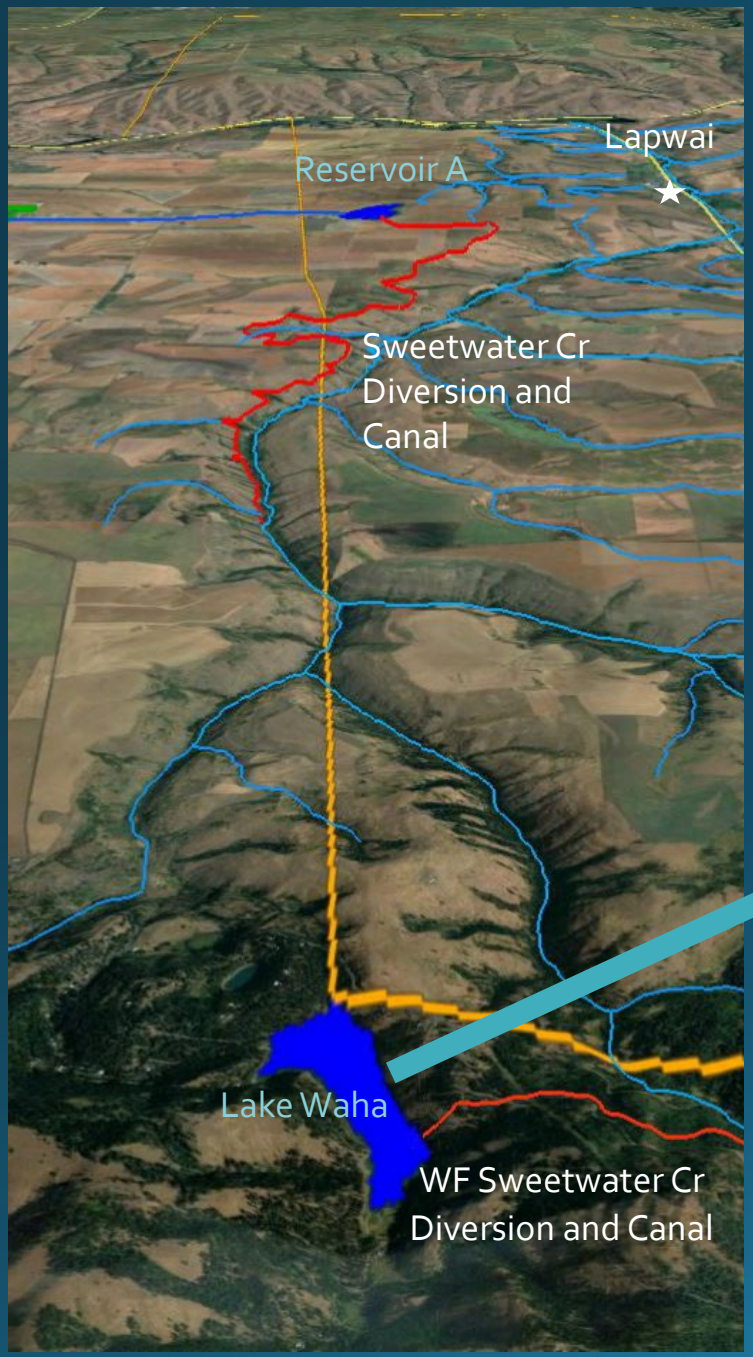


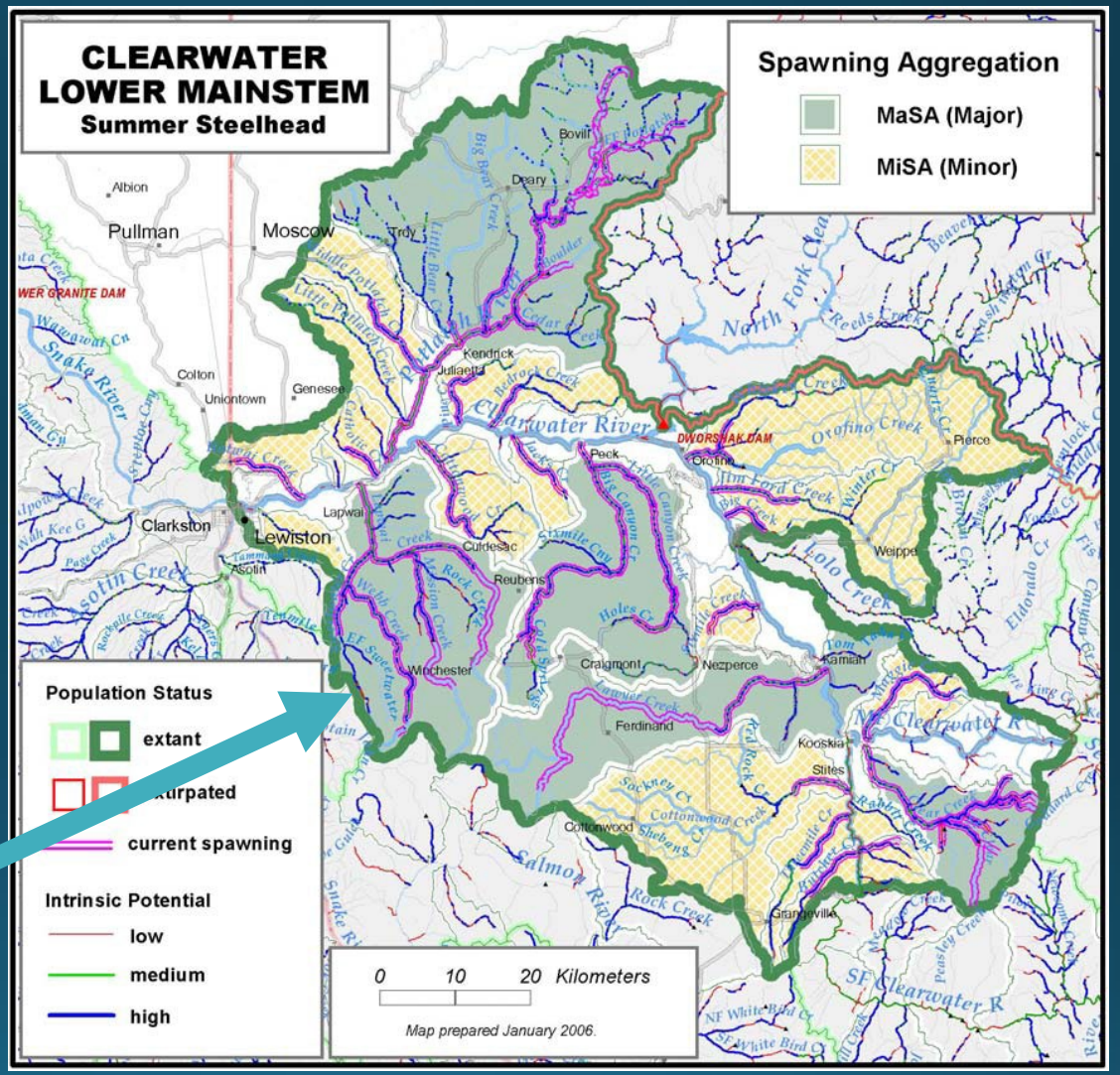


(3) Adverse effects on ESA-listed Snake River steelhead from the existing LOP and its location on ESA-designated critical habitat.

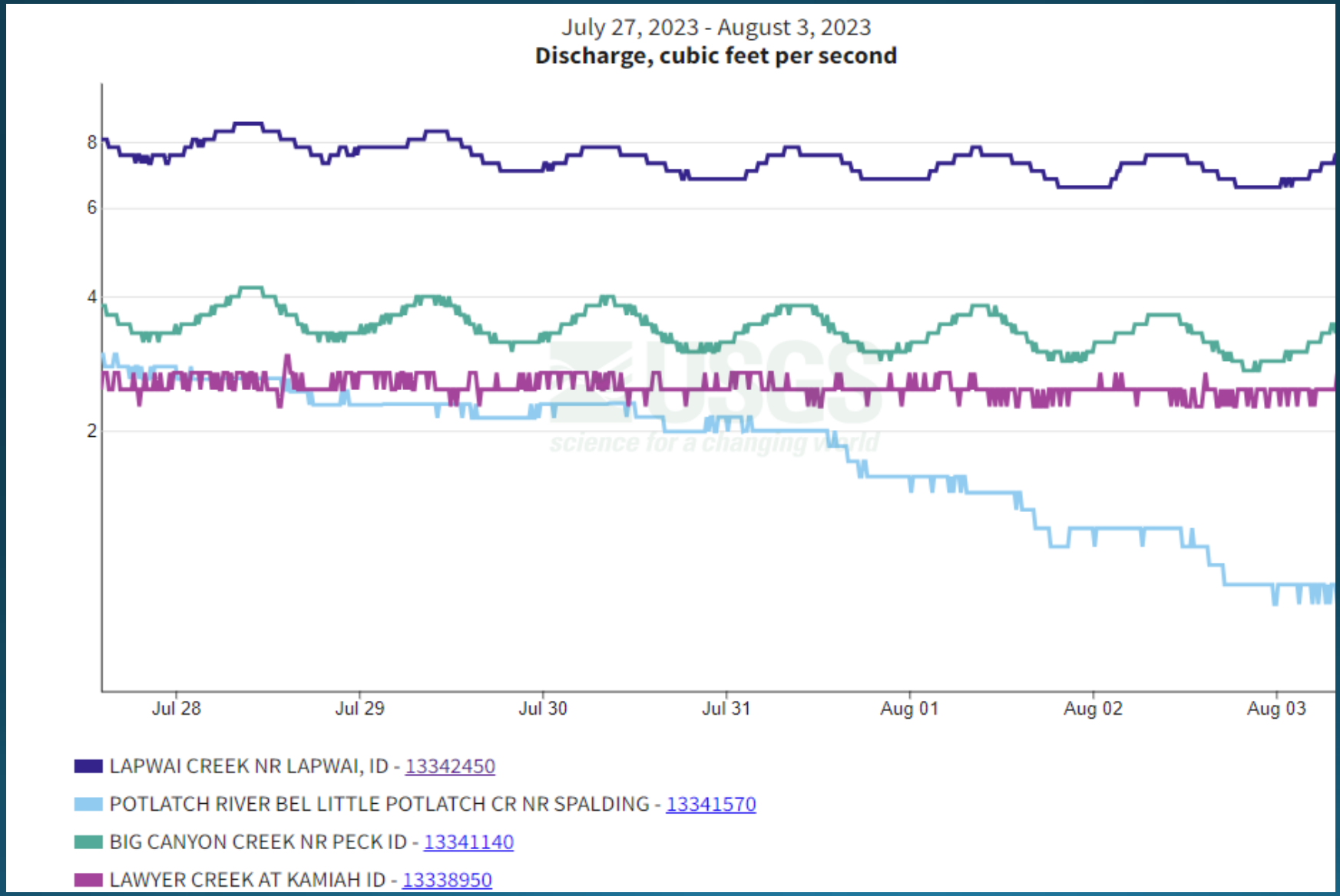
ESTIMATES OF ADULT STEELHEAD ESCAPEMENT

Spawn Year	Lapwai Total	Lapwai main-stem	Mission Creek	Sweetwater Creek
2010	636 (0.08)	408 (0.13)*	224 (0.2)	- (-)
2011	248 (0.1)	92 (0.3)	46 (0.42)	107 (0.26)
2012	- (-)	- (-)	60 (0.33)	123 (0.19)
2013	370 (0.08)	171 (0.17)	58 (0.34)	138 (0.2)
2014	374 (0.1)	108 (0.29)	115 (.25)	145 (0.23)
2015	679 (0.09)	305 (0.17)	208 (0.21)	160 (0.26)
2016	595 (0.07)	267 (0.15)	158 (0.22)	167 (0.2)
2017	233 (0.08)	115 (0.18)	63 (0.24)	53 (0.32)
2018	226 (0.09)	98 (0.18)	79 (0.2)	47 (0.3)
2019	176 (0.17)	92 (0.24)	54 (0.29)	30 (0.44)

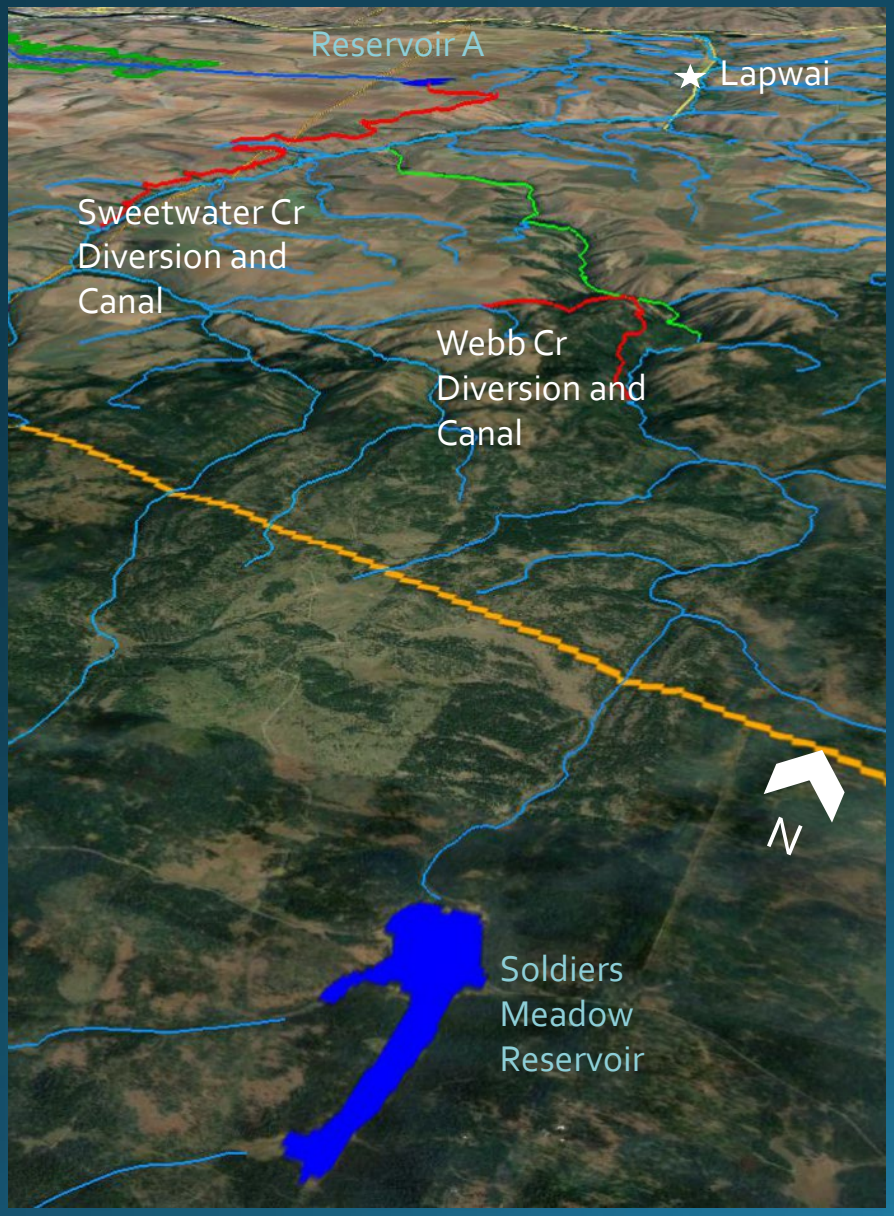

Lapwai
Reservoir A
Sweetwater Cr
Diversion and
Canal
Lake Waha
WF Sweetwater Cr
Diversion and Canal


CLEARWATER
LOWER MAINSTEM
Summer Steelhead
Spawning Aggregation
MaSA (Major)
MiSA (Minor)
Albion
Pullman
Moscow
Deary
Bovill
Troy
Kendrick
Juliaetta
Colton
Uniontown
Genesee
Clearwater River
DWORSHAK DAM
Peck
Orofino
Pierce
Clarkston
Lewiston
Lapwai
Culdesac
Reubens
Weippe
Winchester
Craigmont
Nezperce
Ferdinand
Kooskia
Stites
Cottonwood
Grangeville
Salmon River
Rock Creek
Snake River
Population Status
extant
extirpated
current spawning
Intrinsic Potential
low
medium
high
0 10 20 Kilometers
Map prepared January 2006.

2023 Flows

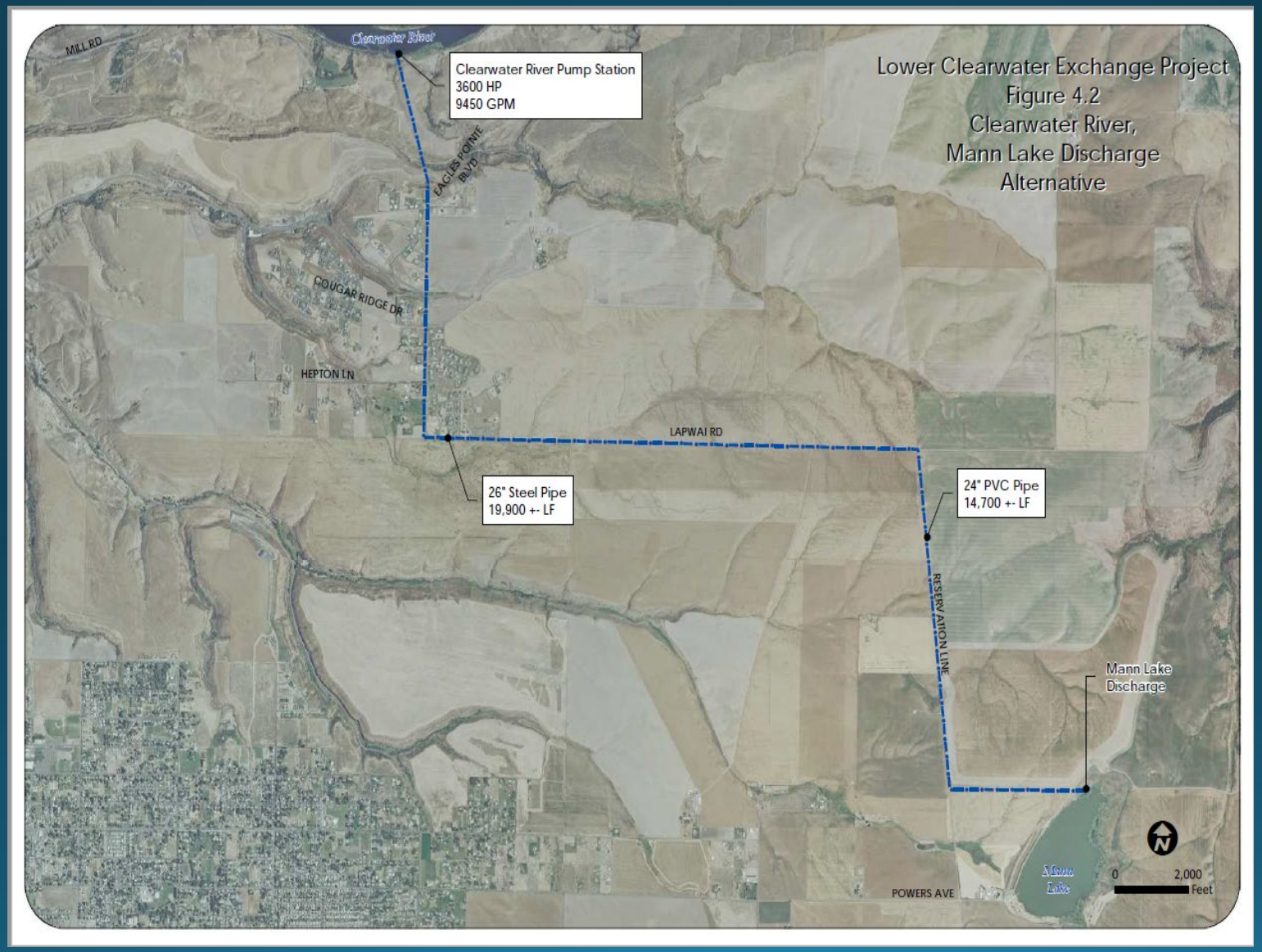

July 27, 2023 - August 3, 2023
Discharge, cubic feet per second
8
6
4
2
Jul 28
Jul 29
Jul 30
Jul 31
Aug 01
Aug 02
Aug 03
LAPWAI CREEK NR LAPWAI, ID - 13342450
POTLATCH RIVER BEL LITTLE POTLATCH CR NR SPALDING - 13341570
BIG CANYON CREEK NR PECK ID - 13341140
LAWYER CREEK AT KAMIAH ID - 13338950

Webb Creek flow benefits



The Resolution

The Resolution



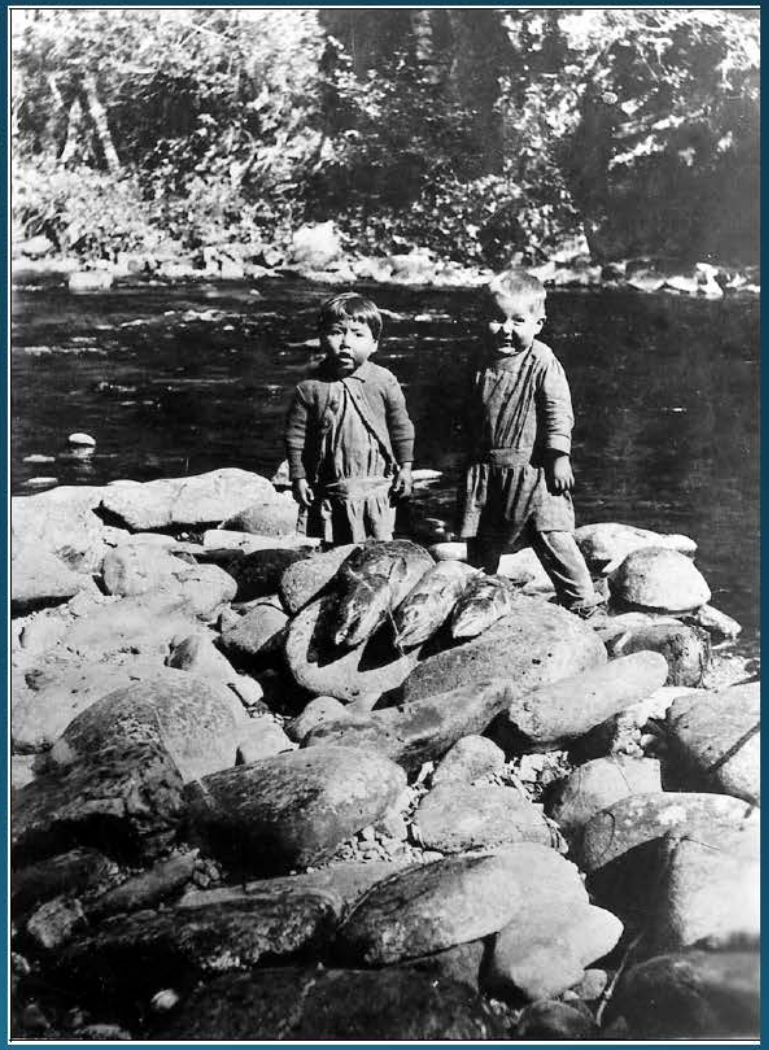
Key points moving forward

- Complete Title Transfer MOA which describes roles moving forward.
- Complete Title Transfer Agreement.
- Draft legislation.
- Determine long term legal protection of water rights.
- **Funding to complete the project.**

Acknowledgments

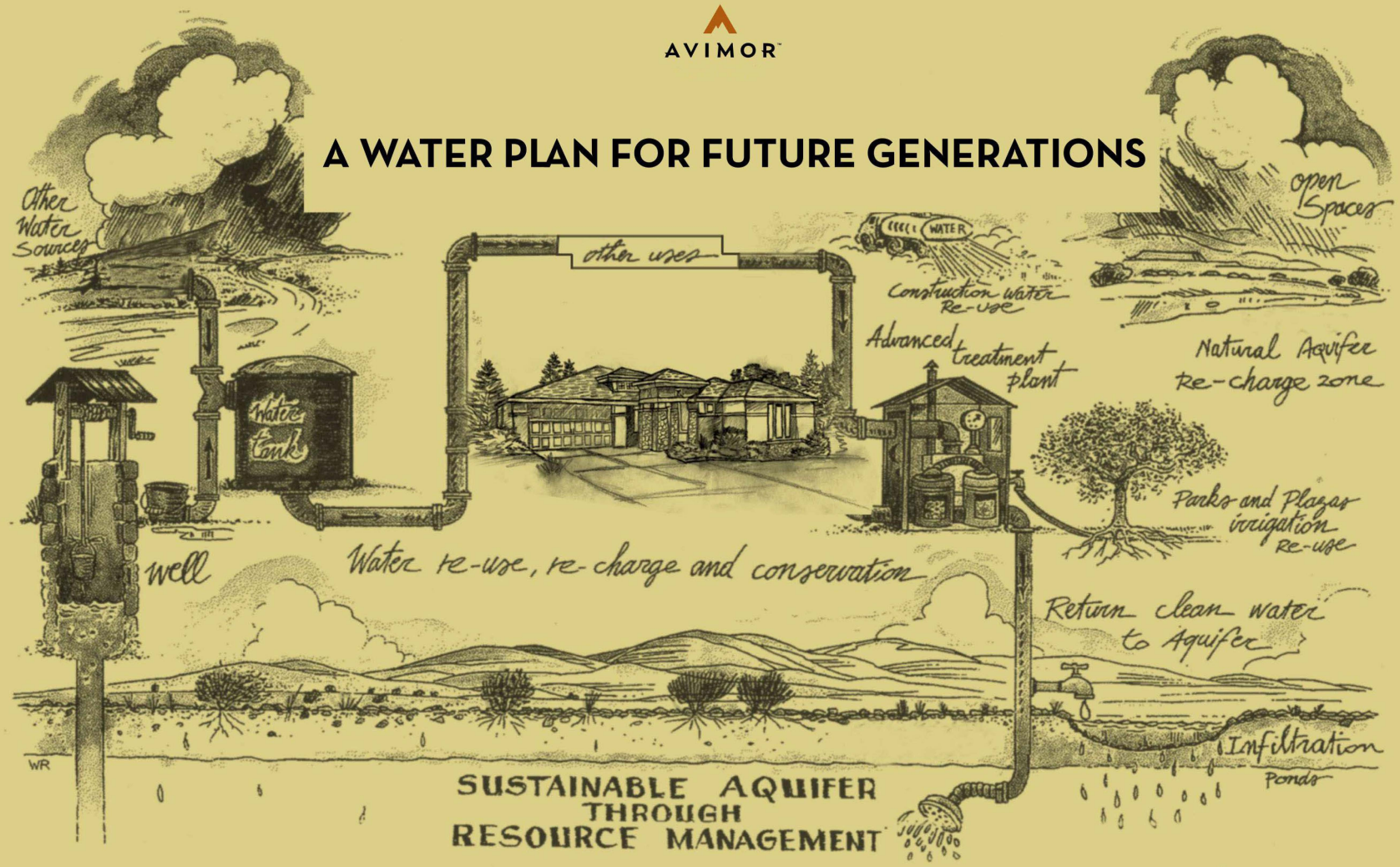
- Jerry Klemm – Lower Clearwater Exchange Project (LCEP)
- Barney Metz and Staff – Lewiston Orchards Irrigation District (LOID)
- Dave Johnson and staff – Nez Perce Tribe (NPT)
- Jennifer Carrington and staff – Bureau of Reclamation (Reclamation)
- Ken Troyer and staff – National Oceanic and Atmospheric Administration (NOAA)

Questions



AVIMOR

A WATER PLAN FOR FUTURE GENERATIONS



In Ada County, the average person uses 205 gallons of water per day, one of the highest averages in the country. At Avimor, conservation efforts will reduce the per-person average to just 100 gallons per day.

Irrigation demands account for 80% of a community's water usage. By collecting natural water, treating wastewater and storing it on site in an aquifer during the winter months, irrigation demands on outside water sources drop by more than 50%.

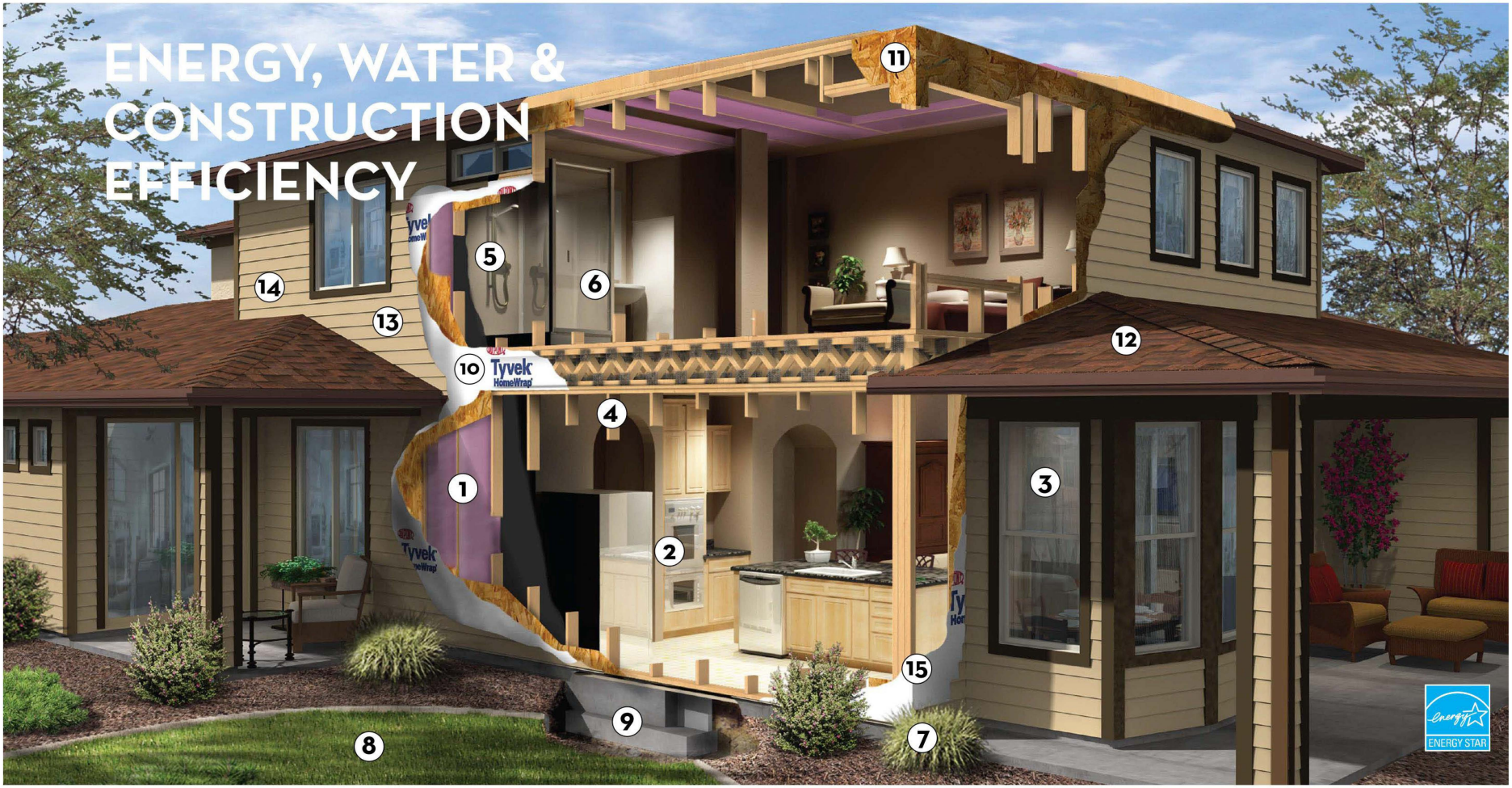
During the winter months when irrigation demands are low, reclaimed water will be stored in aquifers, also known as rapid infiltration ponds. When demands rise during the summer, the water will be pumped out and used to irrigate common areas.

HOW WATER IS RECLAIMED AT AVIMOR

To conserve resources and reduce demand on city water supplies, Avimor has its own wastewater treatment facility. Here's how water is treated:

AVIMOR

ENERGY, WATER & CONSTRUCTION EFFICIENCY



ENERGY

1 Blown-in fiberglass insulation
Blown-in insulation fills voids better, providing consistent coverage for greater comfort and energy savings.

2 Energy Star appliances
All appliances that come with Avimor homes are Energy Star rated for energy efficiency.

3 Vinyl low-E windows
Double pane, vinyl low-E windows keep your energy costs low and block out the harmful rays that can cause furnishings to fade in color.

4 2" x 6" construction
Thicker exterior walls mean more room for insulation and greater resistance to thermal transfer in summer and winter.

WATER

5 Hot water recirculation pump
This pump drastically reduces the time it takes for hot water to reach your faucet or showerhead, saving thousands of gallons per year.

6 Low-flow plumbing fixtures
These next-generation low-flow fixtures perform beautifully while keeping utility bills low.

7 Drought-resistant plants
Drought-resistant plants reduce irrigation demands and provide beautiful, natural landscaping.

8 Efficient use of turf
Strategic turf placement reduces water use.

CONSTRUCTION

9 Slab on grade
Structurally superior, this type of foundation also eliminates the need for a crawl space that can be vulnerable to mold growth.

10 Tyvek vapor barrier
This innovative material prevents moisture from infiltrating exterior walls yet is breathable so moisture within walls can escape.

11 Fully "skinned" framing
Full sheathing with oriented strand board (OSB) adds significant structural integrity and resistance to sheering forces.

12 Lifetime architectural shingles
With a lifetime warranty and a Class A fire rating, these shingles look great and help protect your home against both weather and wildfires.

13 Maintenance-free stucco
Acrylic stucco provides all the beauty of traditional stucco finishes, without the maintenance and repair issues.

14 Fiber cement siding
Far superior to pressboard siding, fiber cement siding resists water, mold, insects, even fire.

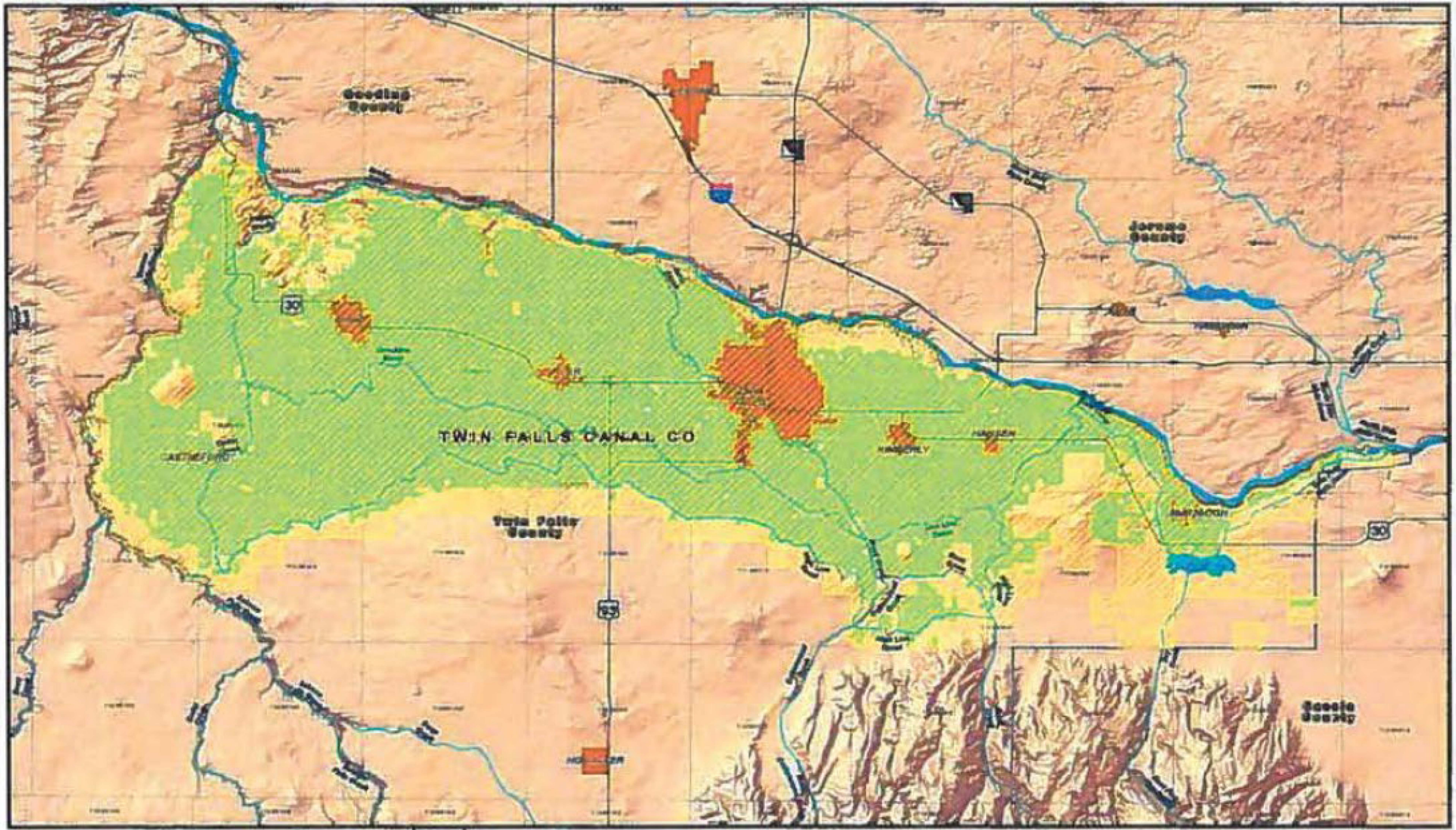
15 Minimal construction waste
Careful planning and recycling leads to just 5% construction waste, and that number is expected to drop as more conservation measures are put into place.

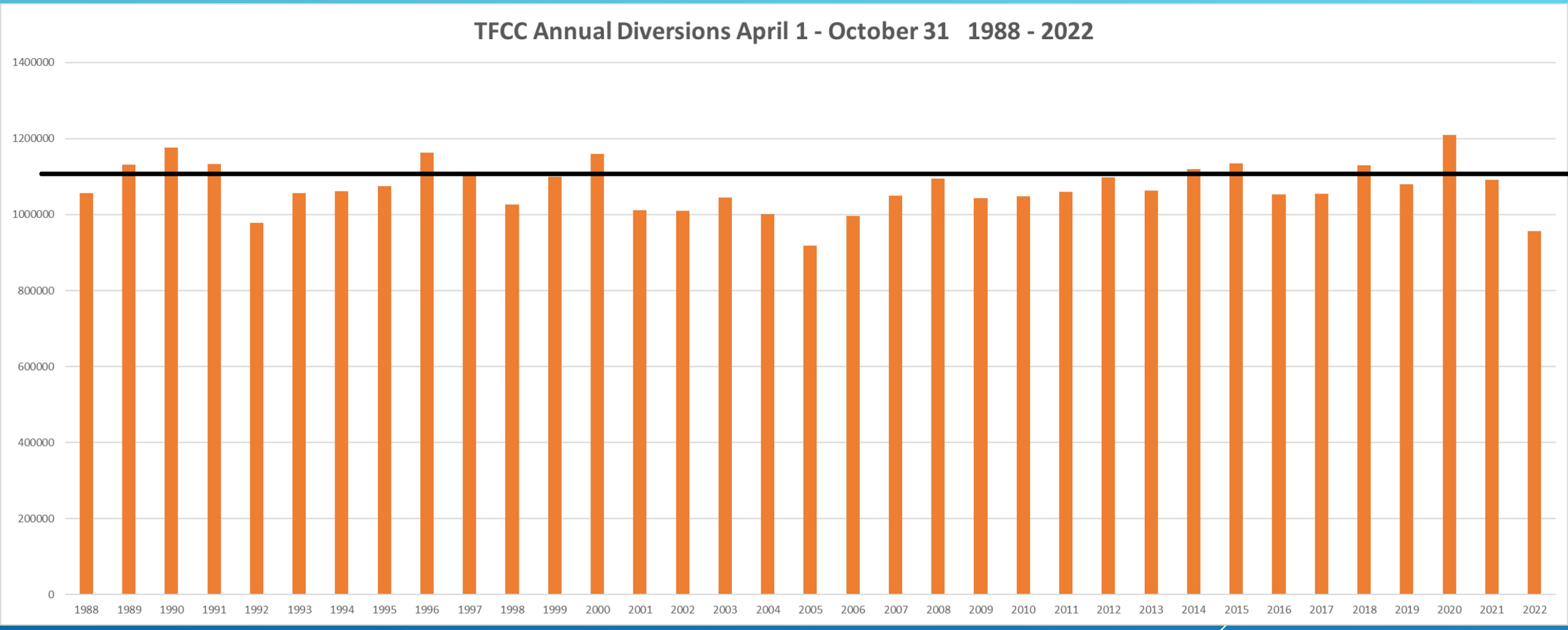
AVIMOR

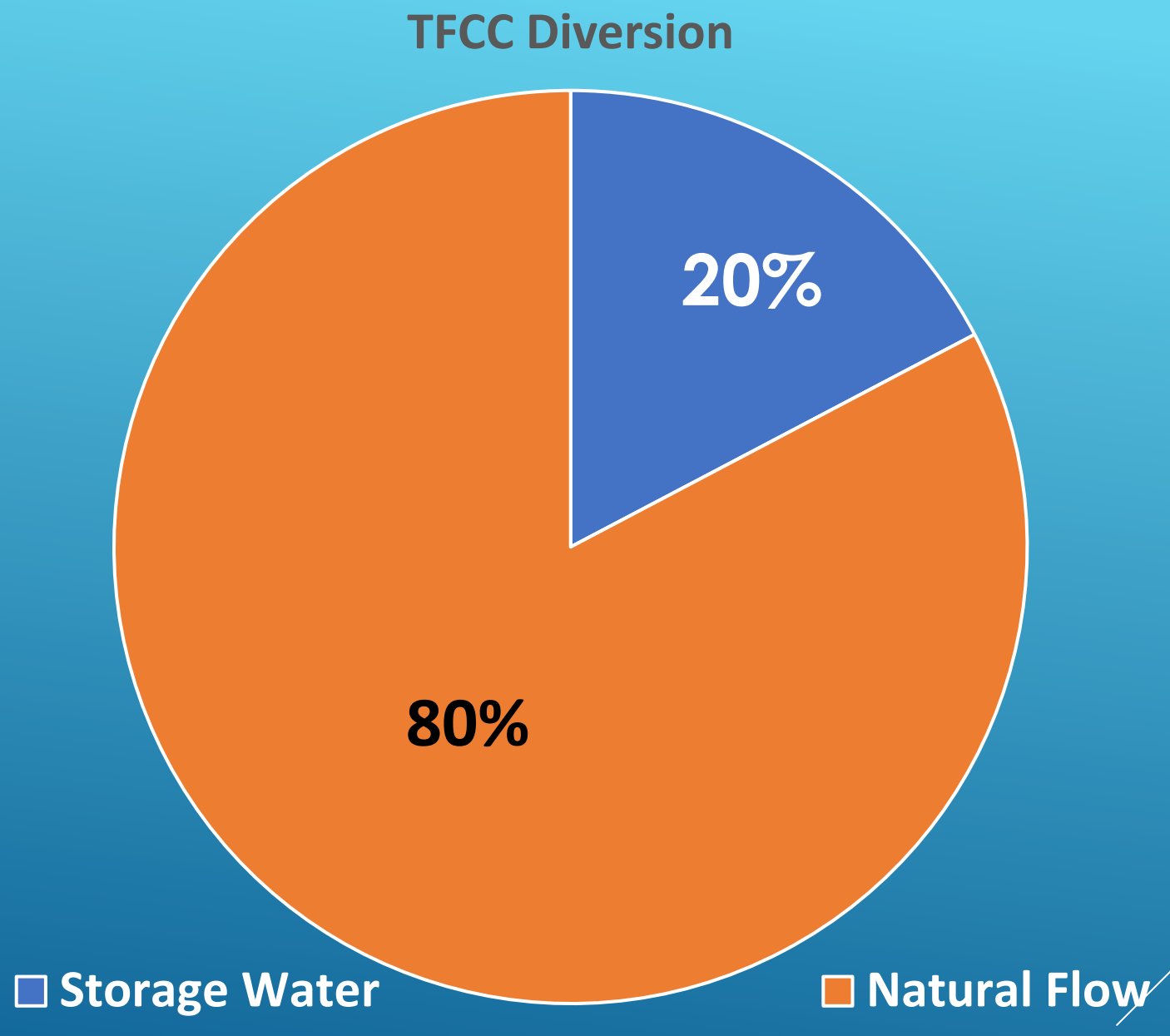
Twin Falls Canal Company

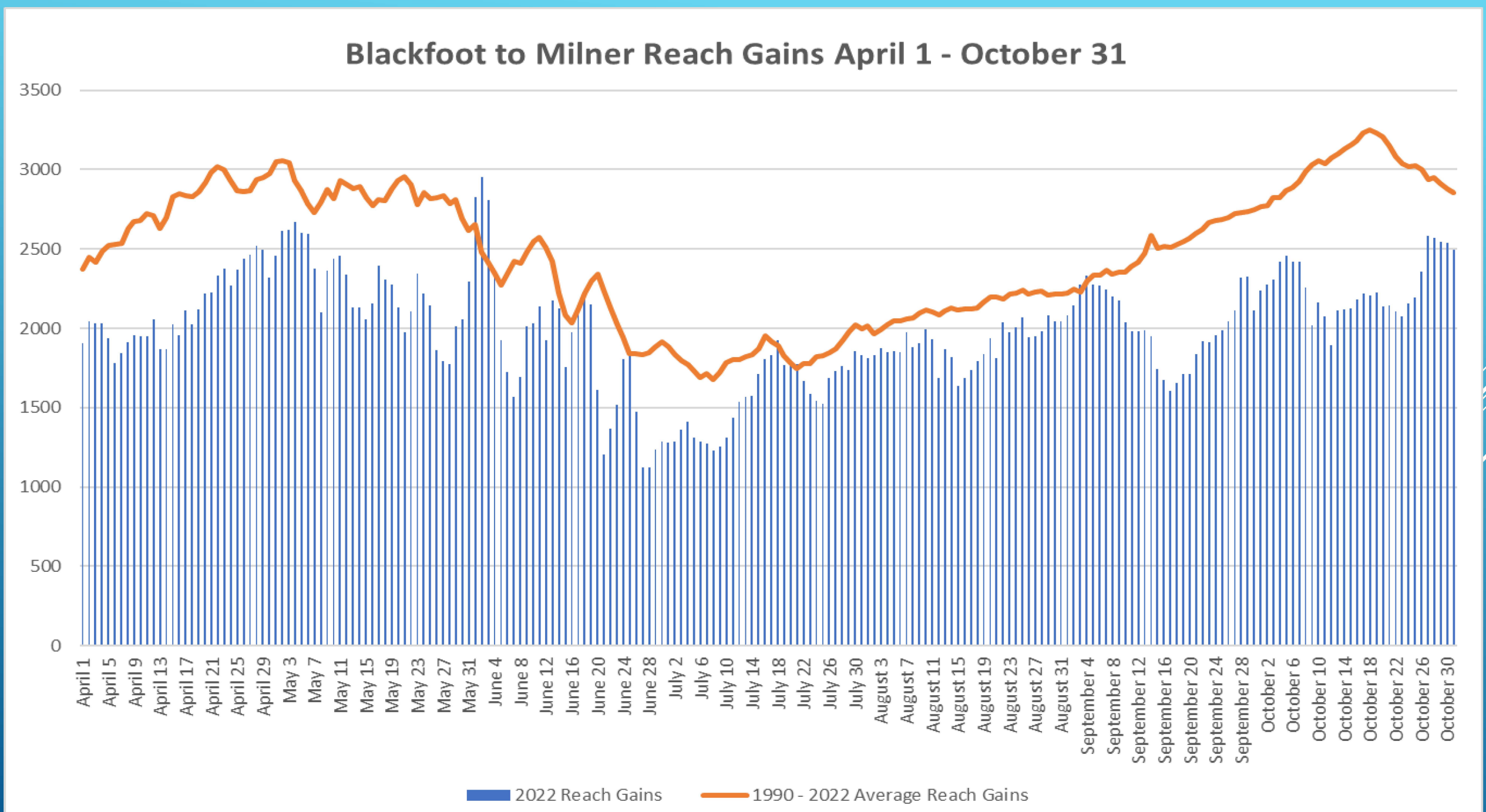
Governor's Water Summit

August 7, 2023

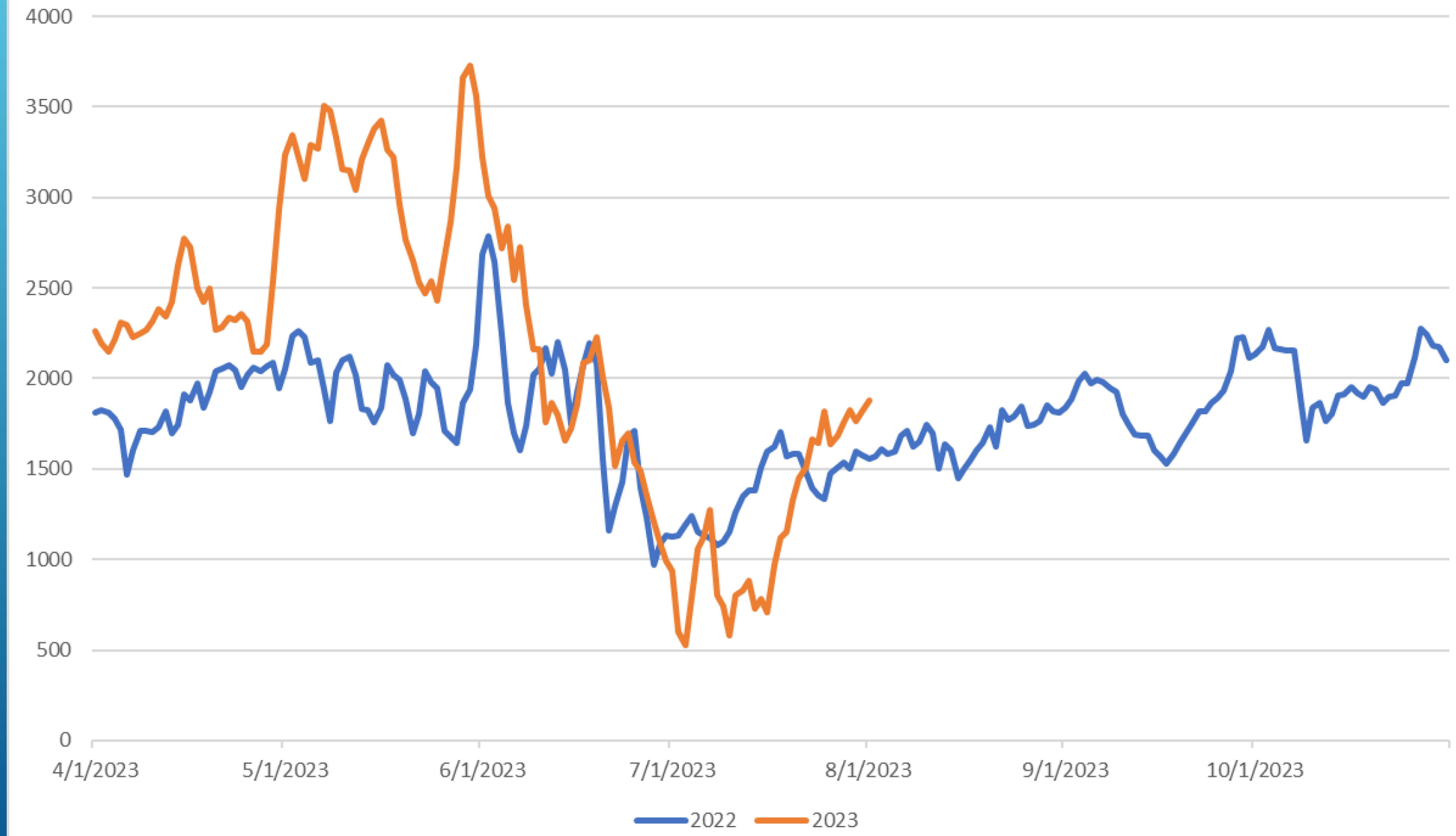

TWIN FALLS CANAL CO


TFCC Annual Diversions April 1 - October 31 1988 - 2022
1400000
1200000
1000000
800000
600000
400000
200000
0
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022

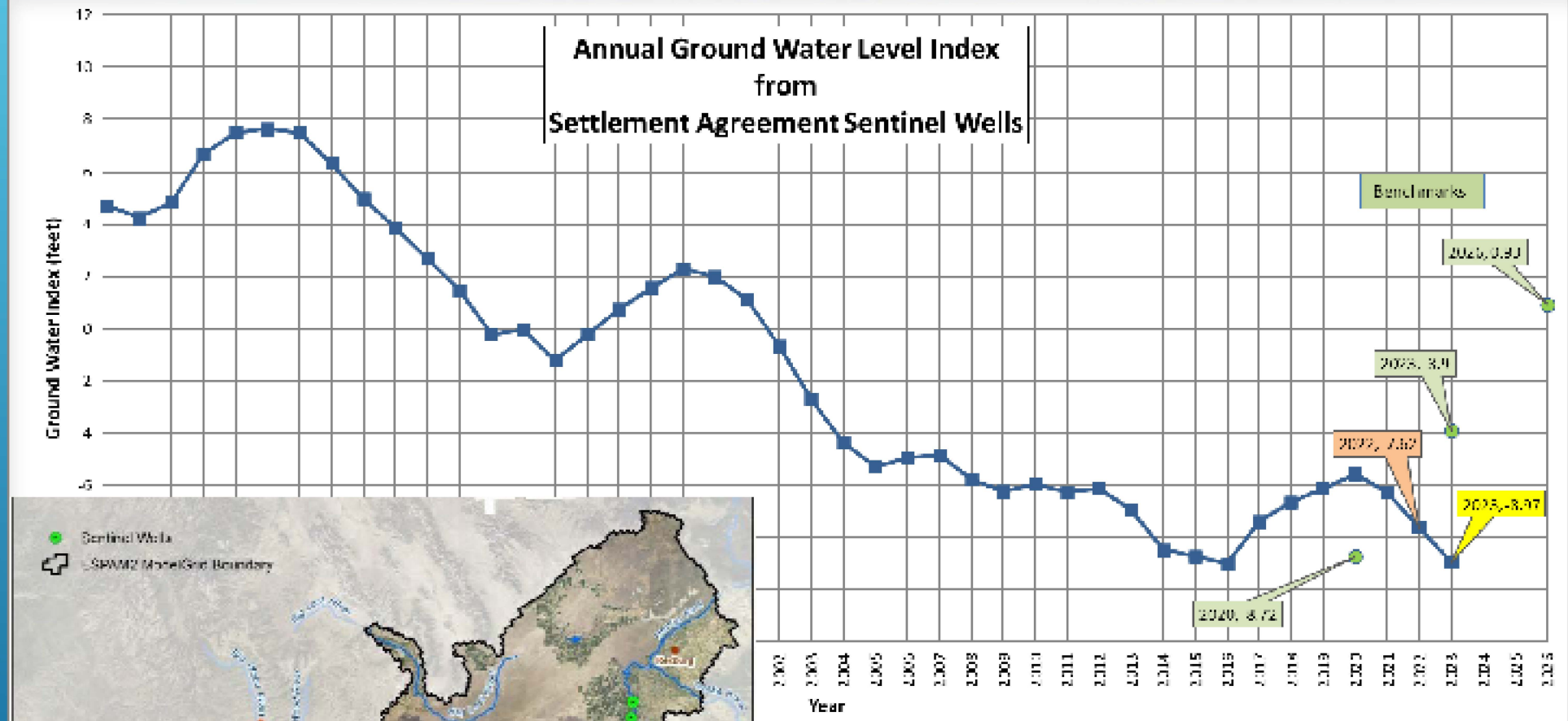

TFCC Diversion
20%
80%
Storage Water
Natural Flow

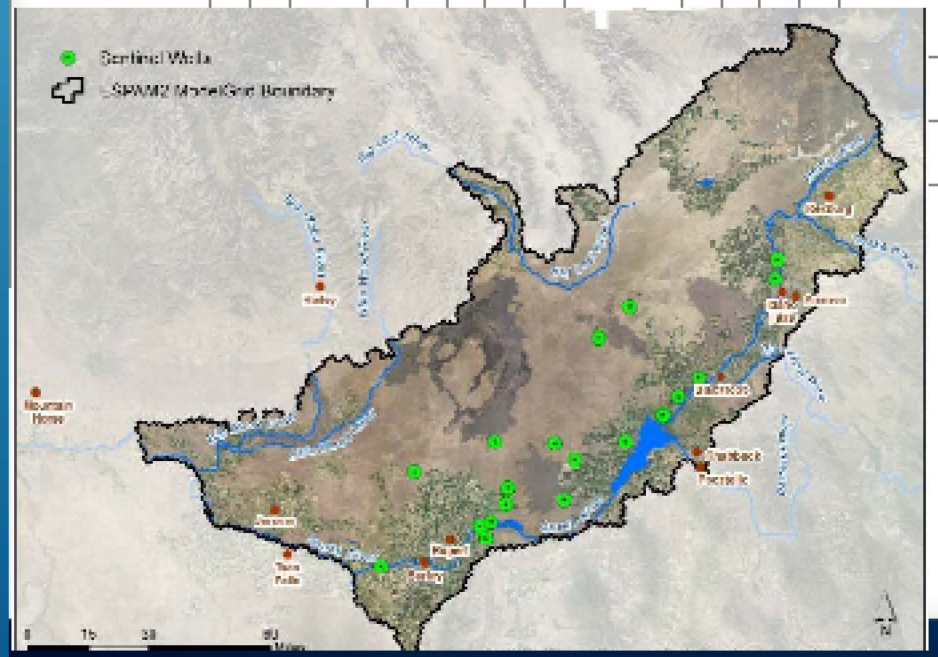

Blackfoot to Milner Reach Gains April 1 - October 31
3500
3000
2500
2000
1500
1000
500
0
April 1
April 5
April 9
April 13
April 17
April 21
April 25
April 29
May 3
May 7
May 11
May 15
May 19
May 23
May 27
May 31
June 4
June 8
June 12
June 16
June 20
June 24
June 28
July 2
July 6
July 10
July 14
July 18
July 22
July 26
July 30
August 3
August 7
August 11
August 15
August 19
August 23
August 27
August 31
September 4
September 8
September 12
September 16
September 20
September 24
September 28
October 2
October 6
October 10
October 14
October 18
October 22
October 26
October 30
2022 Reach Gains
1990 - 2022 Average Reach Gains

Reach Gain Comparison 2022 - 2023

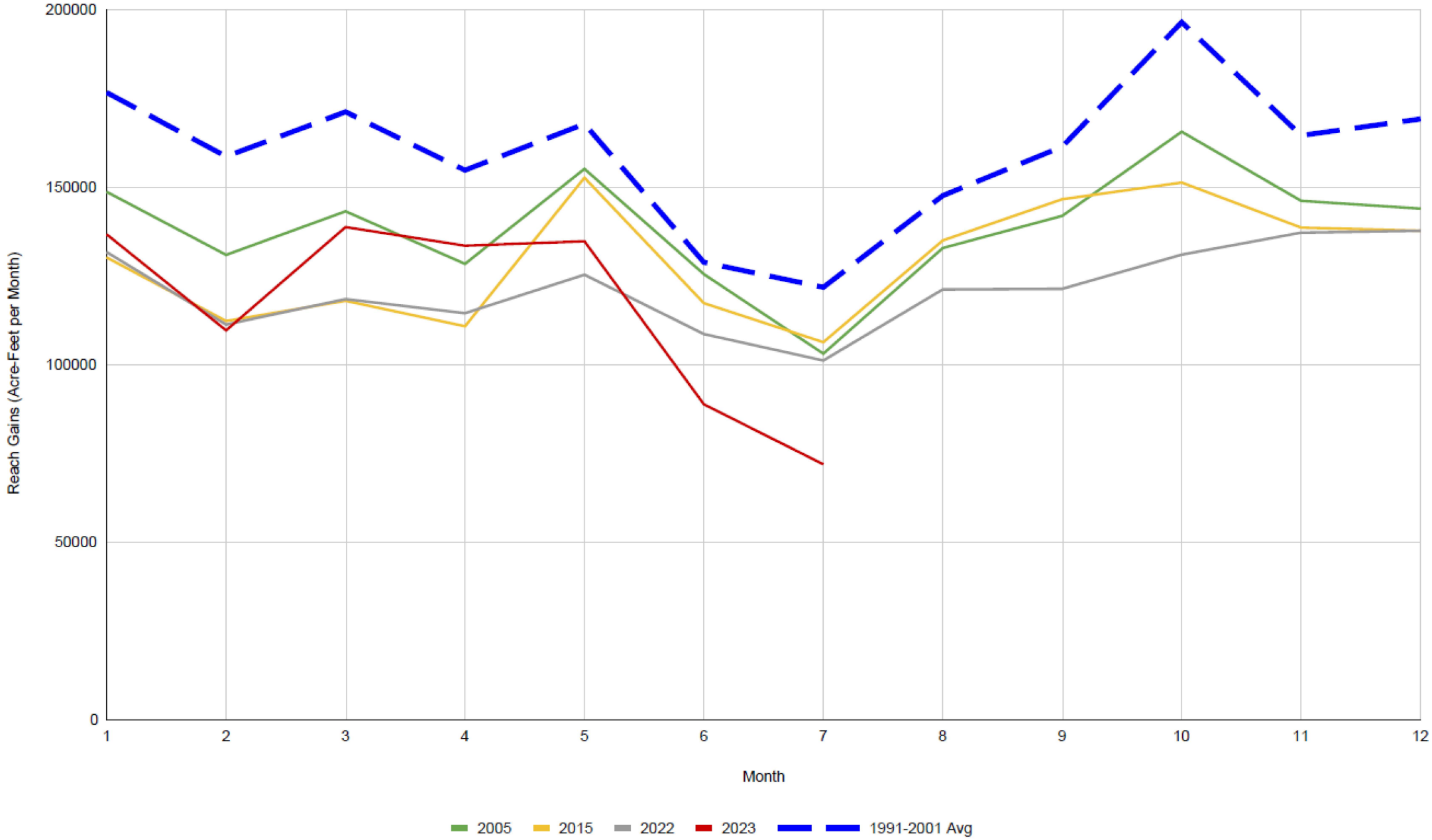


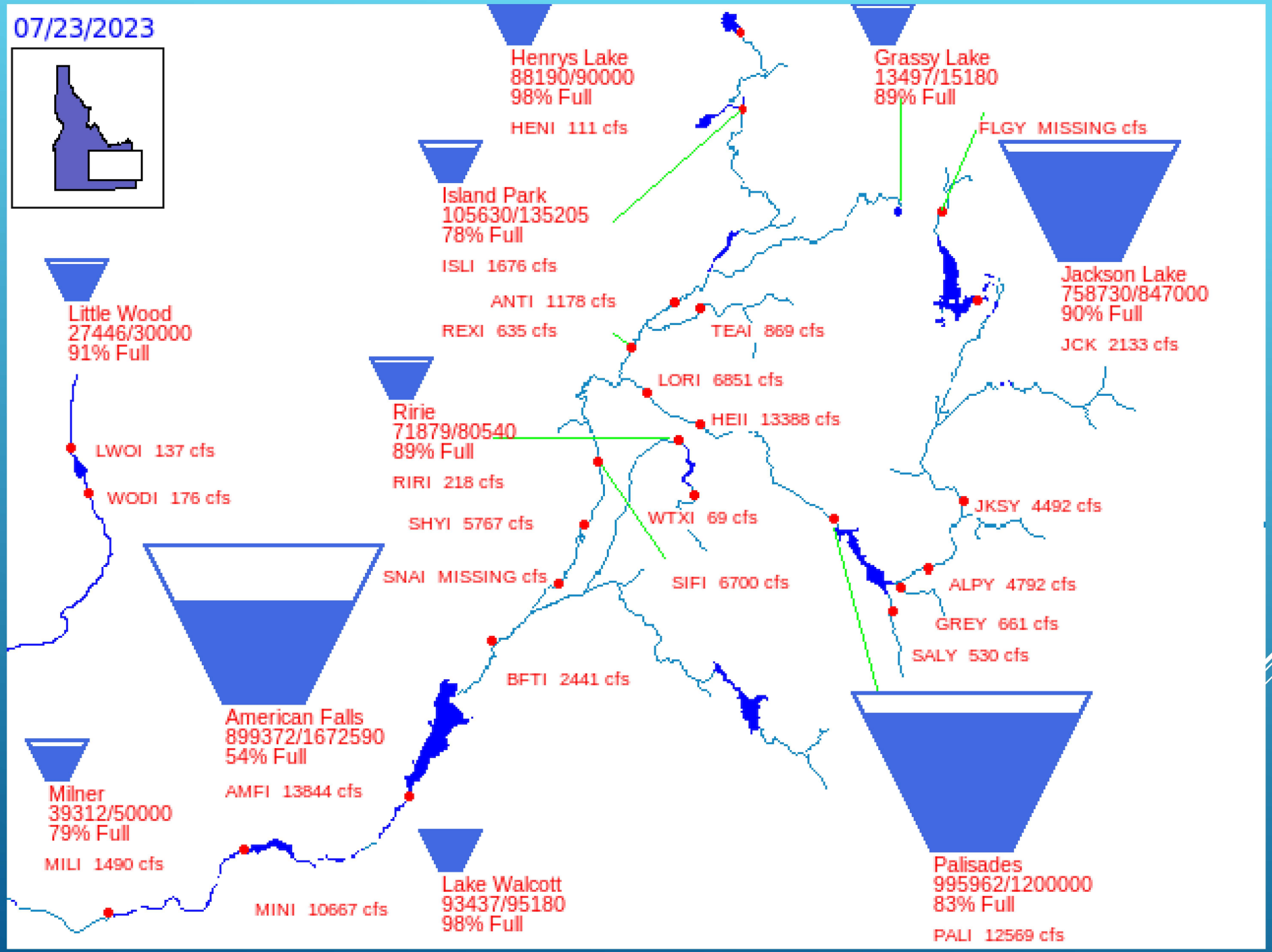
IDAHO Department of Water Resources





Near Blackfoot to Milner Monthly Reach Gains




07/23/2023
Henrys Lake
88190/90000
98% Full
HENI 111 cfs
Grassy Lake
13497/15180
89% Full
FLGY MISSING cfs
Island Park
105630/135205
78% Full
ISLI 1676 cfs
ANTI 1178 cfs
REXI 635 cfs
TEAI 869 cfs
Jackson Lake
758730/847000
90% Full
JCK 2133 cfs
Little Wood
27446/30000
91% Full
LWOI 137 cfs
WODI 176 cfs
LORI 6851 cfs
HEII 13388 cfs
Ririe
71879/80540
89% Full
RIRI 218 cfs
SHYI 5767 cfs
WTXI 69 cfs
SIFI 6700 cfs
JKSY 4492 cfs
SNAI MISSING cfs
ALPY 4792 cfs
GREY 661 cfs
SALY 530 cfs
BFTI 2441 cfs
American Falls
899372/1672590
54% Full
AMFI 13844 cfs
Milner
39312/50000
79% Full
MILI 1490 cfs
MINI 10667 cfs
Lake Walcott
93437/95180
98% Full
Palisades
995962/1200000
83% Full
PALI 12569 cfs

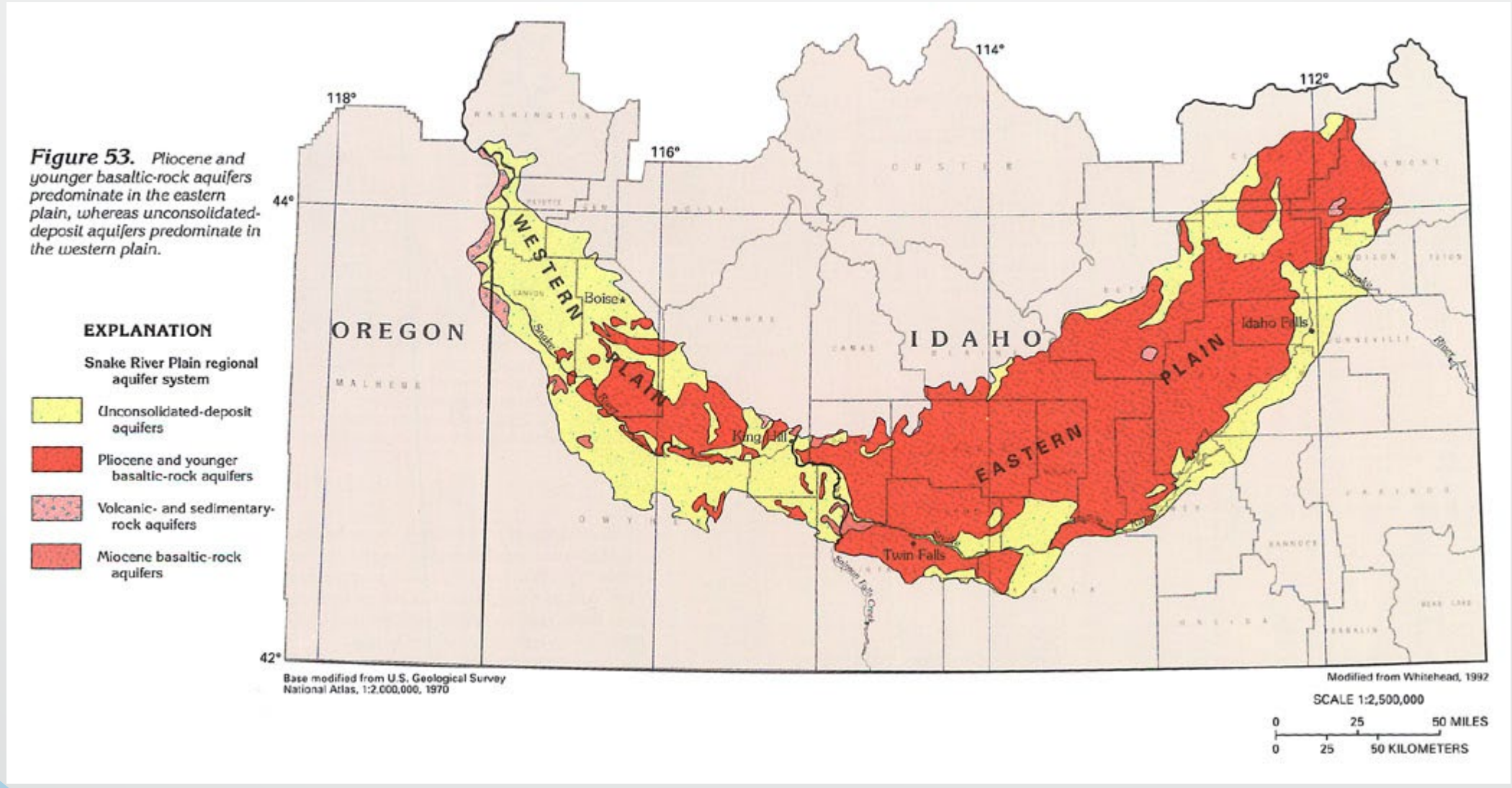
Thank You

Eastern Snake Plain Aquifer: A Question of Billions

Jaxon Higgs - IGWA

August 7, 2023

Introduction



USGS Ground Water Atlas of the United States: Idaho, Oregon, Washington. HA 730H Figure 53

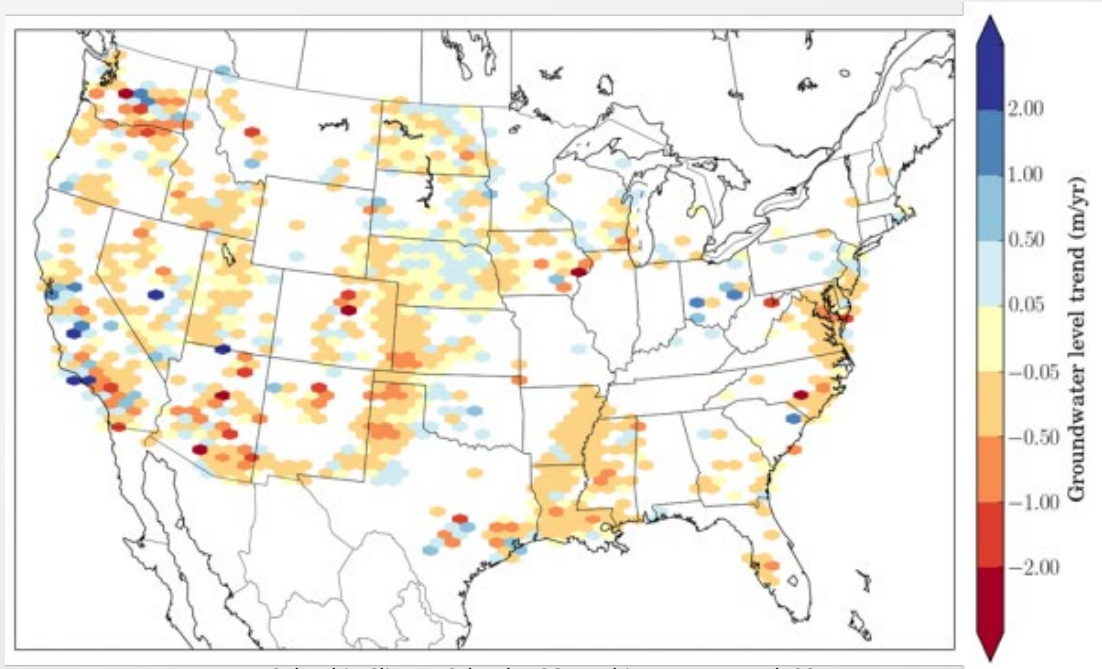
Introduction

- Eastern Snake Plain Aquifer
  - One of the most prolific aquifers in the world
    - 10,800 sq miles[1]
    - Top 1 ft contains **B**illions of gallons
  - 1,000,000 groundwater irrigated acres
    - @ $10,000/ acre = $10**B** land value
  - Other dependencies
    - Domestic/Municipal & other non-irrigation, surface water irrigation, aquaculture, power generation
    - Value? Many **B**illions of dollars
  - CAMP Documentation from 2009 states $10**B** annual revenue[1]

1. https://idwr.idaho.gov/IWRB/water-planning/CAMPs/ESPA/

Item #1- Magnitude

- Stabilization has not been done in the Western US
- Aquifers of the West –
  - Central Valley
  - Ogalala
  - All of Southwest
- We’ve got a train rolling down the hill
  - going from forward to dead stop to reverse does not happen in an instant



Columbia Climate School; USGW White Paper, March 2014

Item #2- Cost

- Recharge – flows greater than 10,000 cfs
  - Higher the flow, the fewer days it is available
- Through 2024 IWRB has or will have spent $39.7M
  - Created 2,300 cfs capacity @ $17,250/cfs
  - Recent projects roughly $50,000/cfs
- Oakley Valley project completed at $250,000/cfs
- Magic Valley & Raft River projects at $400,000/cfs
- 10k cfs at $100,000/cfs = $1**B**
- **B**illions in infrastructure (O & M not included)

- ESPA
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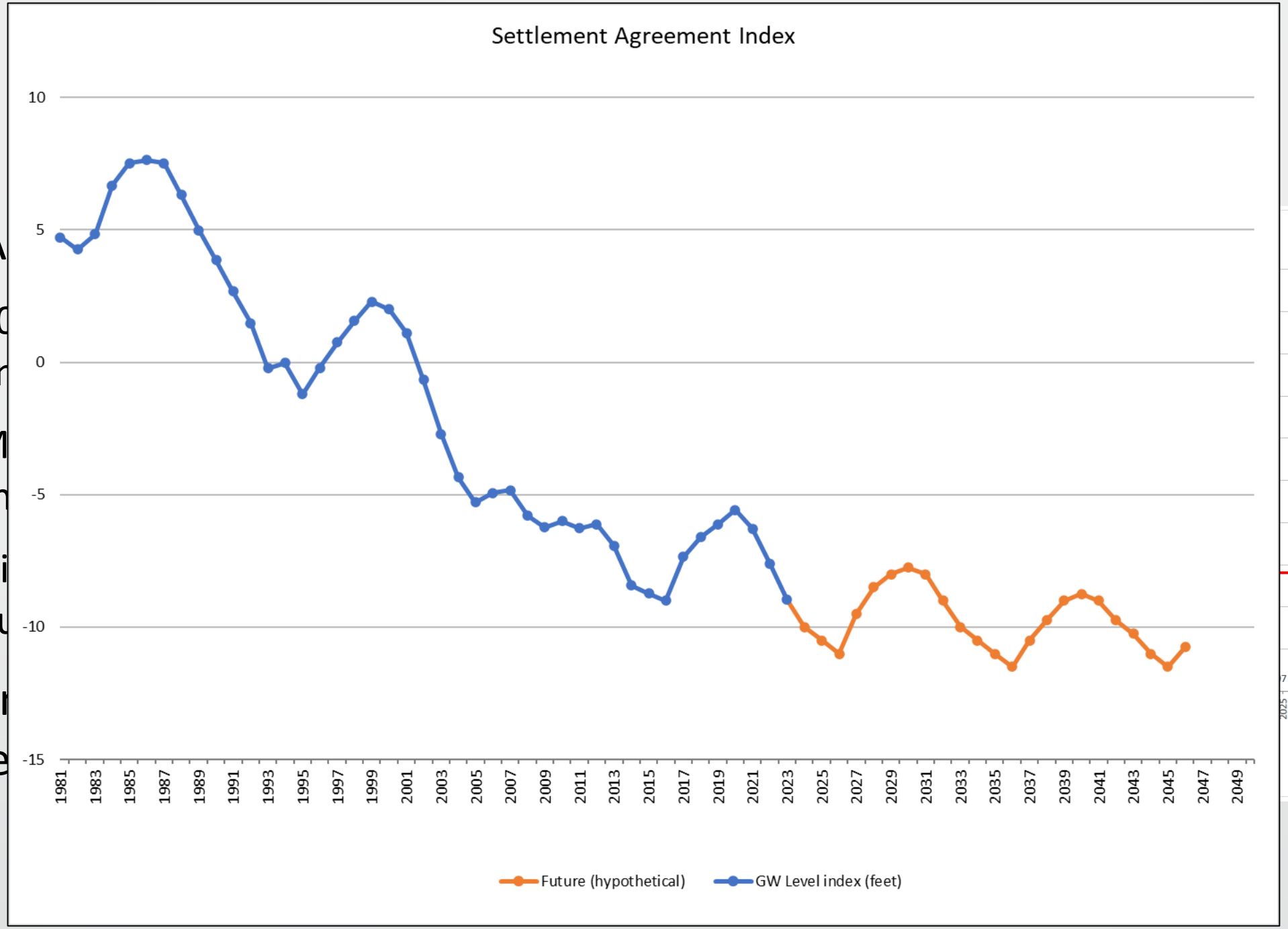
  to ge



Conclusions

- Protect the **B**illions
  - Recognize the value of water
  - Be realistic
  - Work hard
- To the State of Idaho –
  - Well done to date
  - KEEP THE MONEY COMING

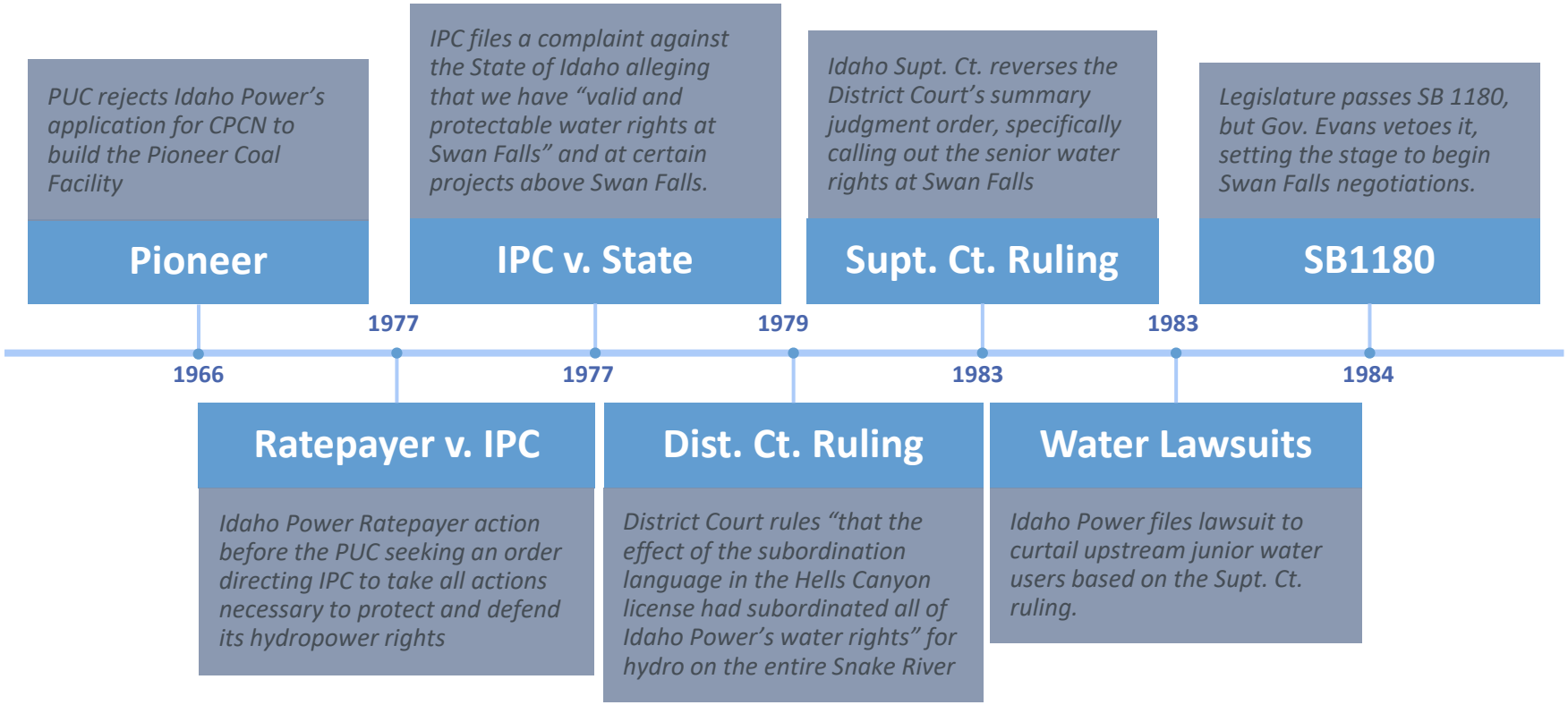
Governor’s Water Summit

Swan Falls

IDAHO POWER

History

Leading up to the Swan Falls settlement



Swan Falls Negotiations:

What Was at Stake?

- IPC:
  - 8,400 cfs of unsubordinated water rights at Swan Falls
  - Priority of ~1910 water rights
  - Swan Falls to run at historical minimum flows (4,500 cfs)
- The State/Irrigation Interests:
  - IPC can't become the "watermaster"
  - Existing (junior to 1910) and future irrigation uses

Framework for Final Resolution

- Minimum Flows of 3,900/5,600 cfs
- Creation of the Trust/Trust Water
- IPC agrees to Subordinate Trust Water subject to the terms of the Trust
- Milner Zero Flow
- Framework – Still Work to Do…

Trust Water Attributes

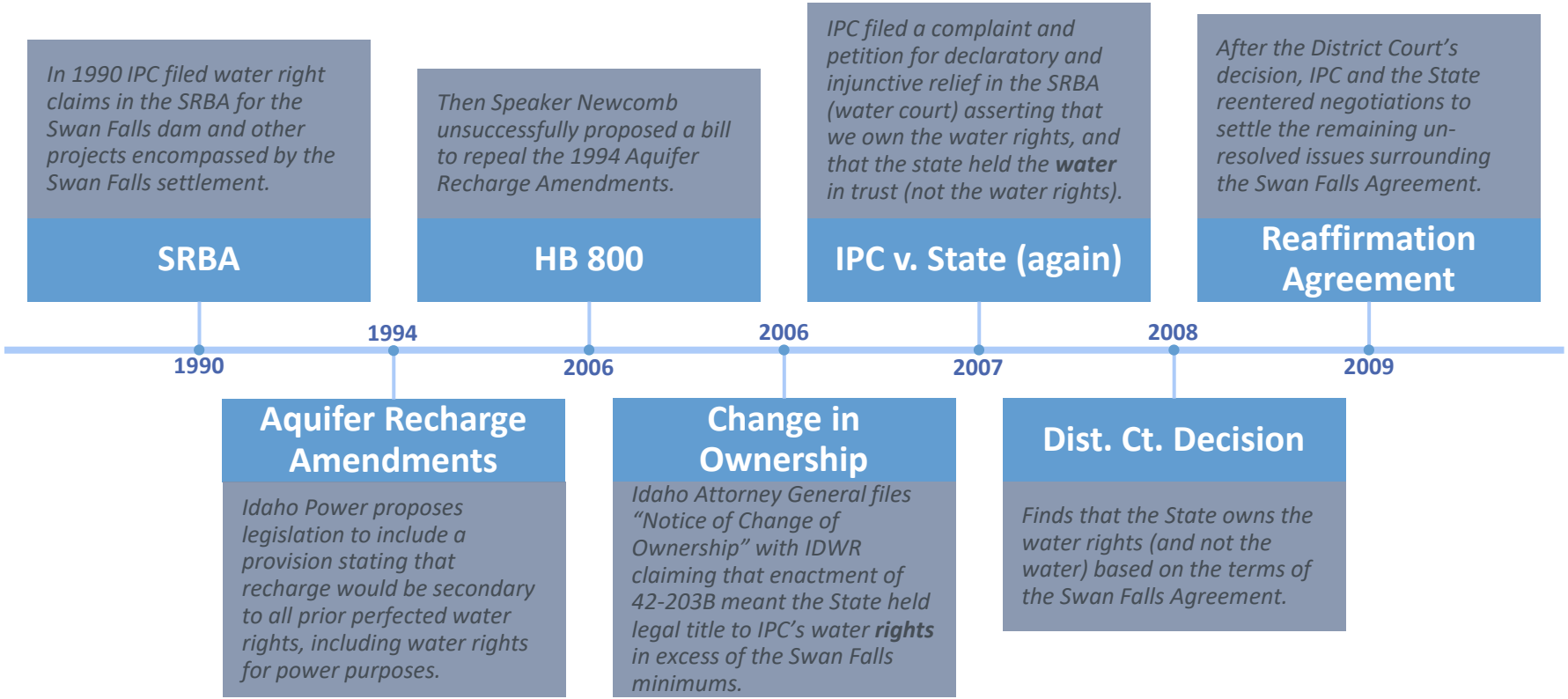
- Trust Property: IPC's water rights in excess of minimum flows
- Trustee: Held in trust by the Governor
- Beneficiary: For the benefit of IPC and the "people of Idaho"
- Implementation:
  - 20 Year Review/5 Year Review
  - State's Administration of Trust Water

Trust Water Criteria

- Rights junior to the Swan Falls Agreement – diverting water from the Trust Water area, with **priority dates junior** to the Swan Falls Agreement are considered Trust Water rights unless:
  - The water right is an A-List Right as decreed by the SRBA Court
  - The right authorizes the diversion of surface water tributary to the Snake River above Milner Dam
- Rights senior to the Swan Falls Agreement – diverting water from within the Trust Water area with **priority dates senior** to the Swan Falls Agreement are NOT considered Trust Water rights unless:
  - The water right is a B-List Right as decreed by the SRBA Court
  - The right is an enlargement right

A Little More History…

Leading up to the 2009 Swan Falls Reaffirmation



Framework Reaffirming Swan Falls

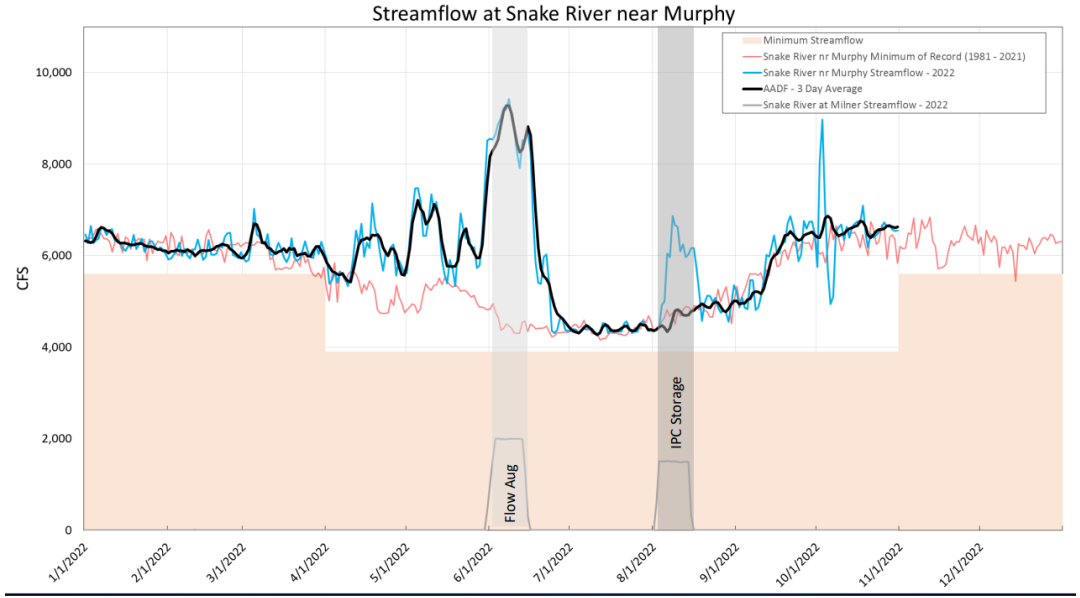
- Again, this is a framework, still work to do…

- Reaffirms the 1984 Swan Falls Agreement
  - Minimum Flows
  - Trust Water
  - Milner Zero Flow

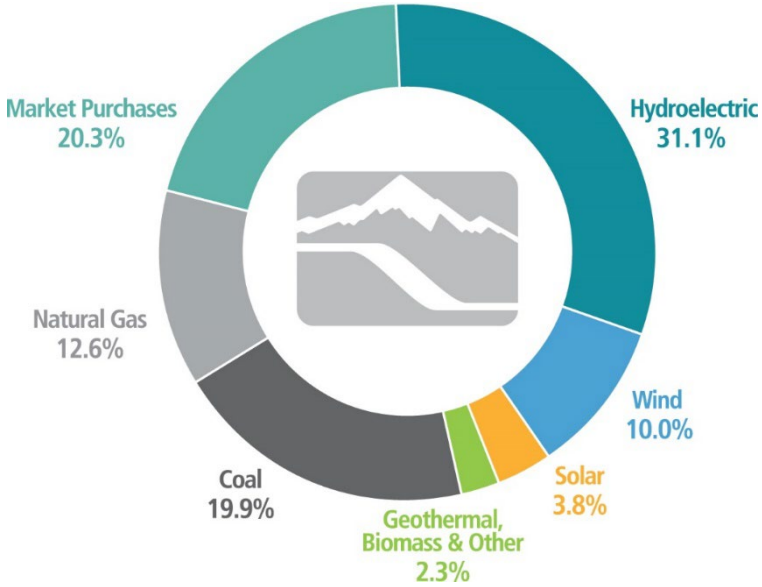
- Recharge

39 Years Later…

- 4090 Trust Water Rights issued by IDWR
  - 3531 groundwater rights
  - 539 surface water rights
- Near Historic Minimums
- 2015 Swan Falls Violation
- *Question:* How should the Trustee (Governor) manage the Trust (Swan Falls water rights) for the benefit of the beneficiaries (IPC and the people of Idaho)?



Idaho Power's 2022 Energy Mix



Idaho is one of the fastest growing states in the nation:

- IPC hit the all-time record of energy consumption in 2021.
- 2022 was IPC's lowest hydro generation year since HCC was put in service and hydro is one of its most valuable resources.
- Thanks to hydro, IPC has some of the lowest cost energy in the nation.
- IPC relies on hydropower to balance intermittent resources like wind and solar.
- Resources like coal and natural gas are shrinking because of federal regulations.

Swan Falls Implementation Group

- In article III of the Framework and subsequent MOA, the Parties agreed:
  - that it was in their "mutual long-term interest to cooperate regarding management of the water resources of the Snake River basin."
  - to cooperatively explore the resolution of various issues.
- Formed two working groups (1) Swan Falls Policy and (2) Swan Falls Technical work group
- Purpose of the Implementation group is to work through implementation of the 2009 Reaffirmation Agreement for the benefit of beneficiaries.

Governor's Water Summit

Palouse Basin Alternate Water Supply Project

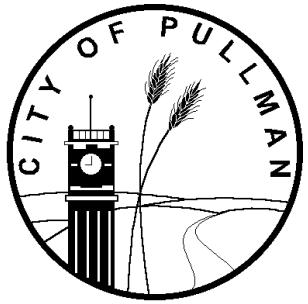
August 7, 2023

PALOUSE BASIN AQUIFER committee

PALOUSE BASIN AQUIFER committee

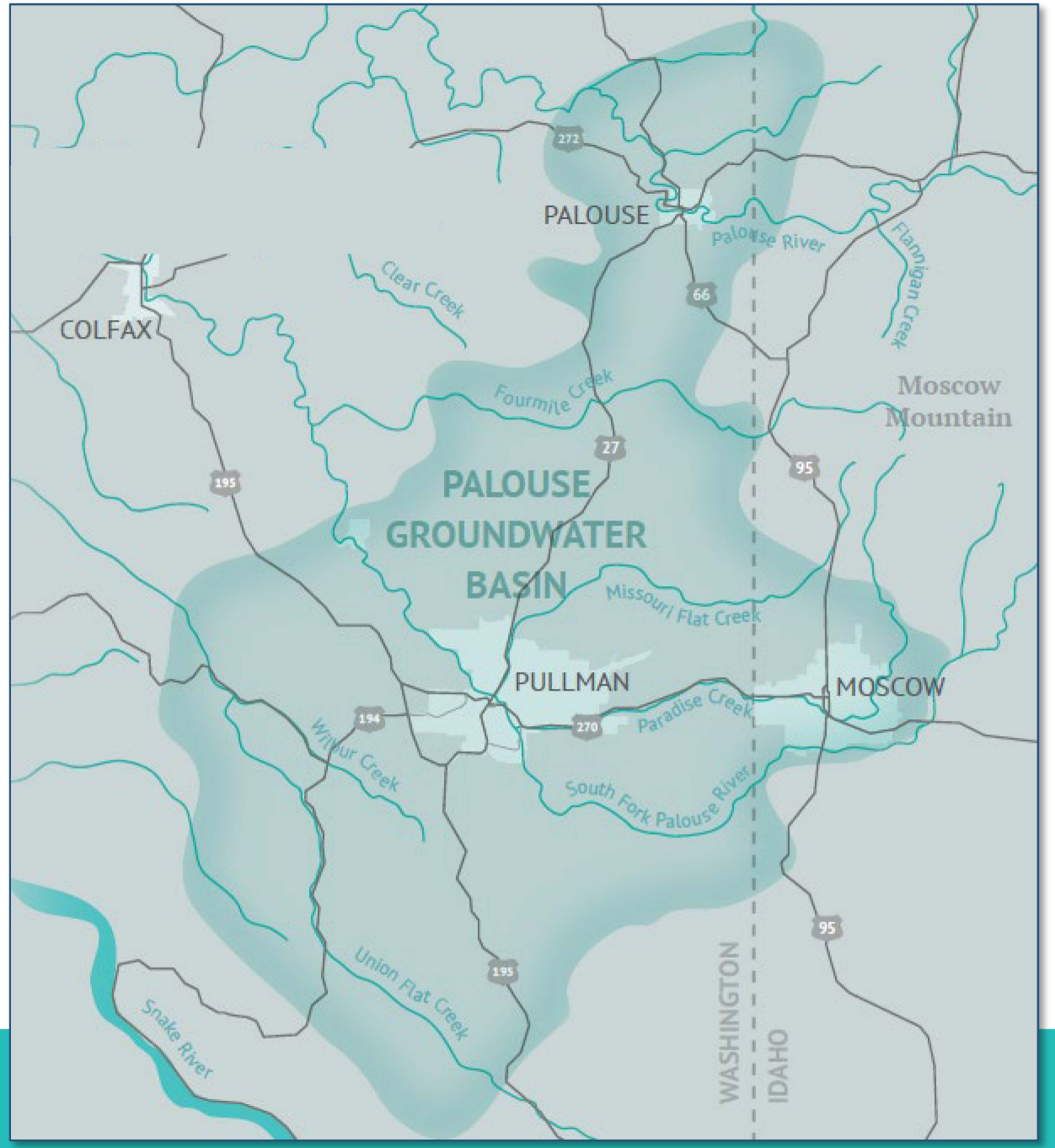
Working to ensure a long-term, quality water supply for the Palouse Basin region.

PBAC Member Entities

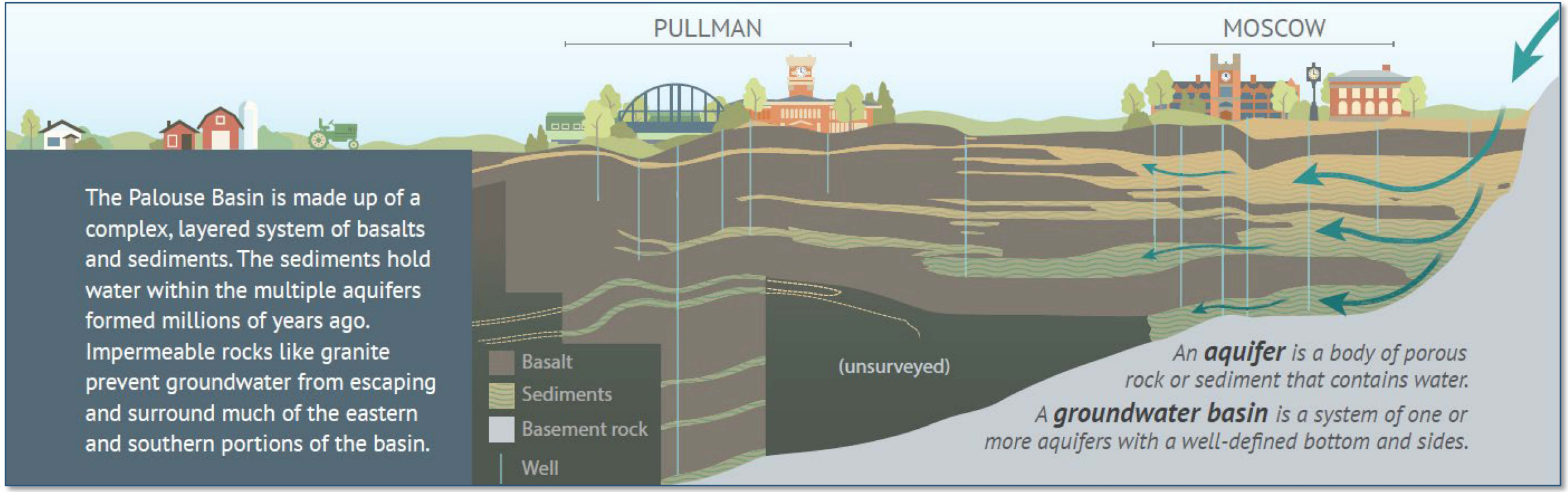


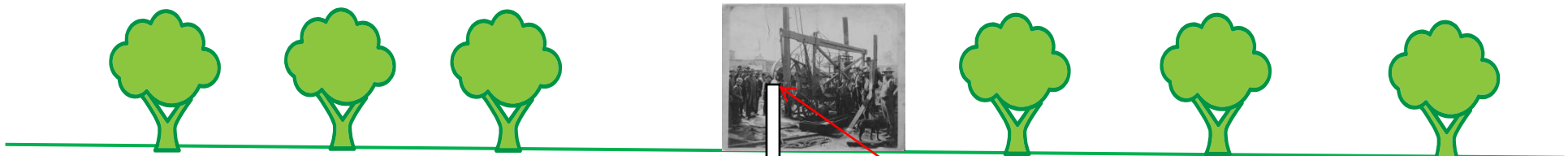
Palouse Basin

PALOUSE BASIN
AQUIFER
committee

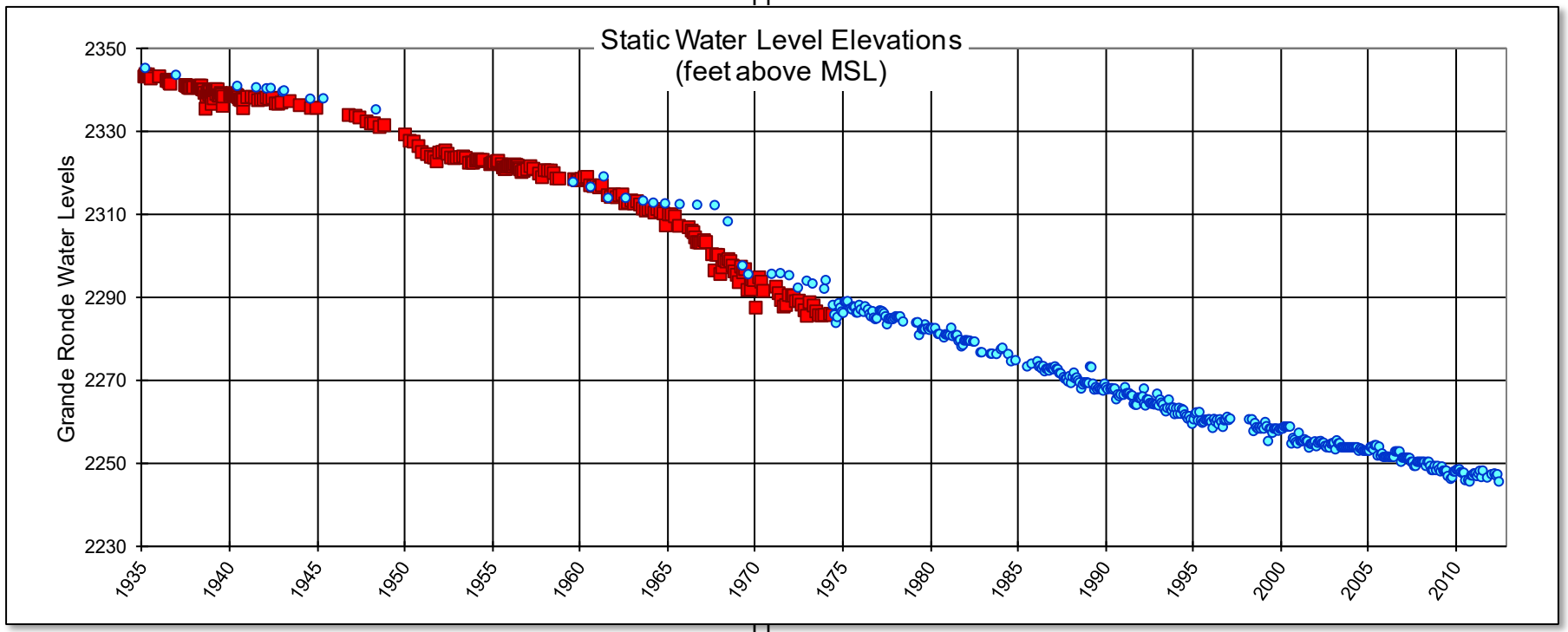


PALOUSE BASIN AQUIFER committee


PULLMAN
MOSCOW
The Palouse Basin is made up of a complex, layered system of basalts and sediments. The sediments hold water within the multiple aquifers formed millions of years ago. Impermeable rocks like granite prevent groundwater from escaping and surround much of the eastern and southern portions of the basin.
Basalt
Sediments
Basement rock
Well
(unsurveyed)
An aquifer is a body of porous rock or sediment that contains water.
A groundwater basin is a system of one or more aquifers with a well-defined bottom and sides.

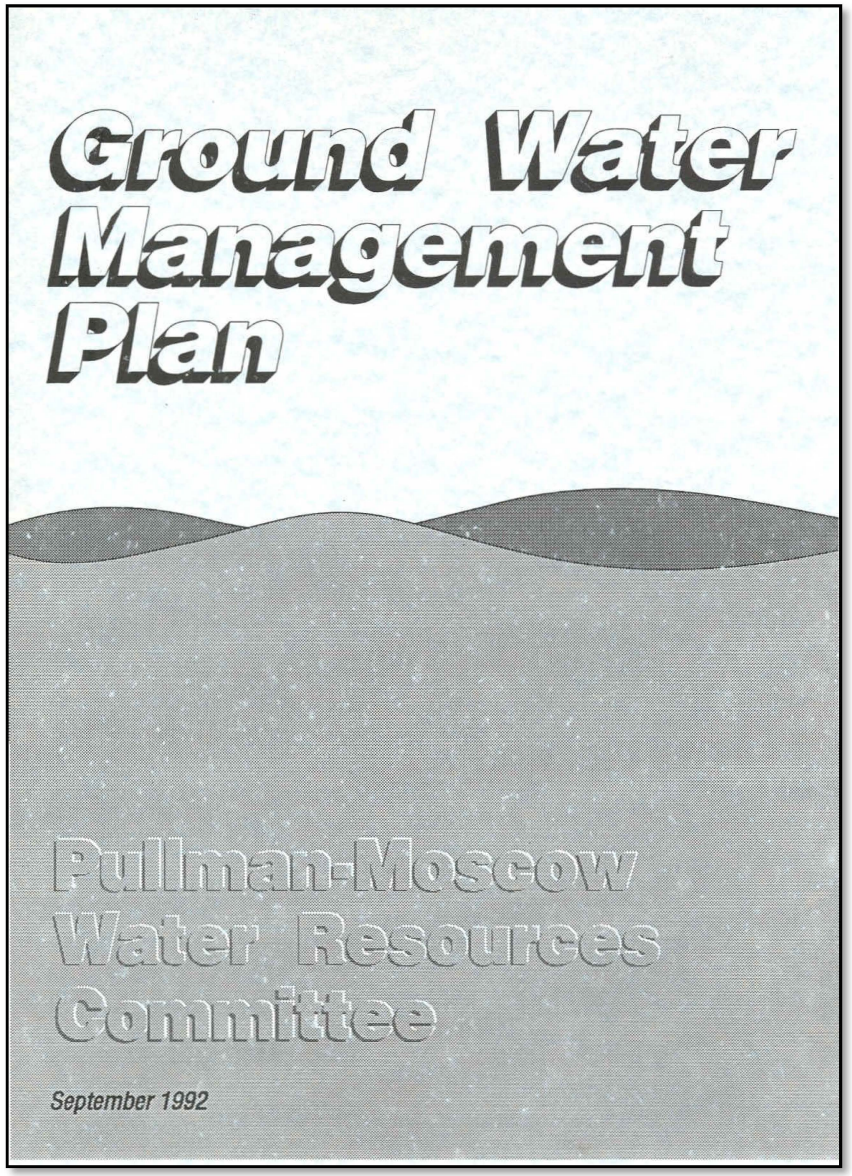


1890 Water Level

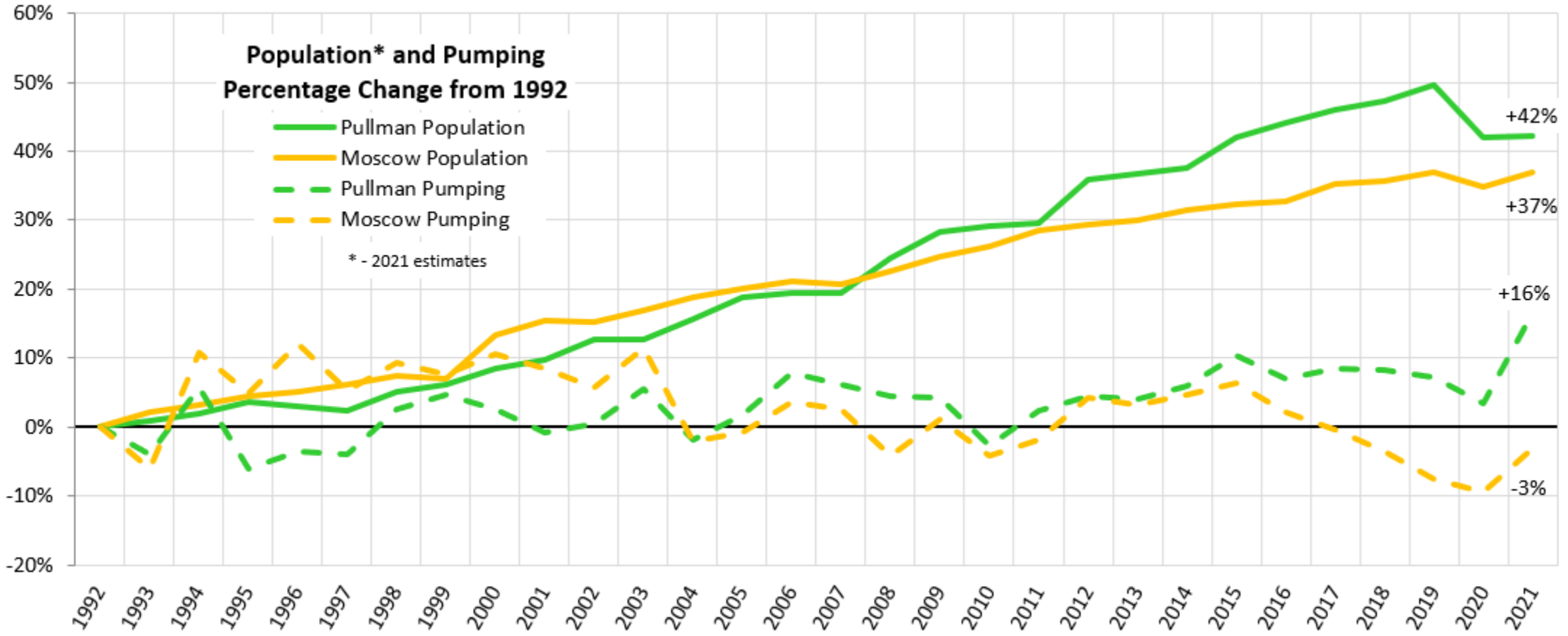


2022 Water Level

PALOUSE BASIN AQUIFER committee

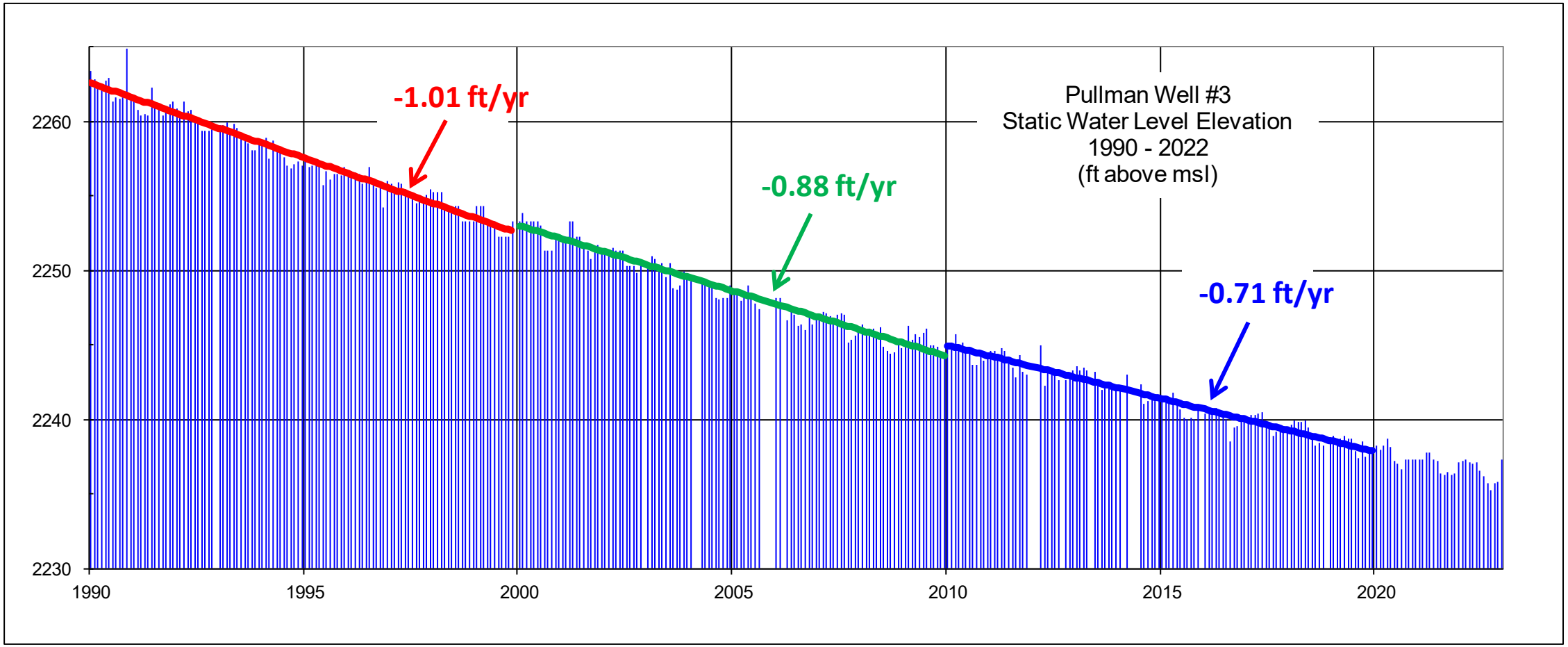

Ground Water Management Plan
Pullman-Moscow Water Resources Committee
September 1992

Pop & Pumping % Change from 1992



PALOUSE BASIN AQUIFER committee

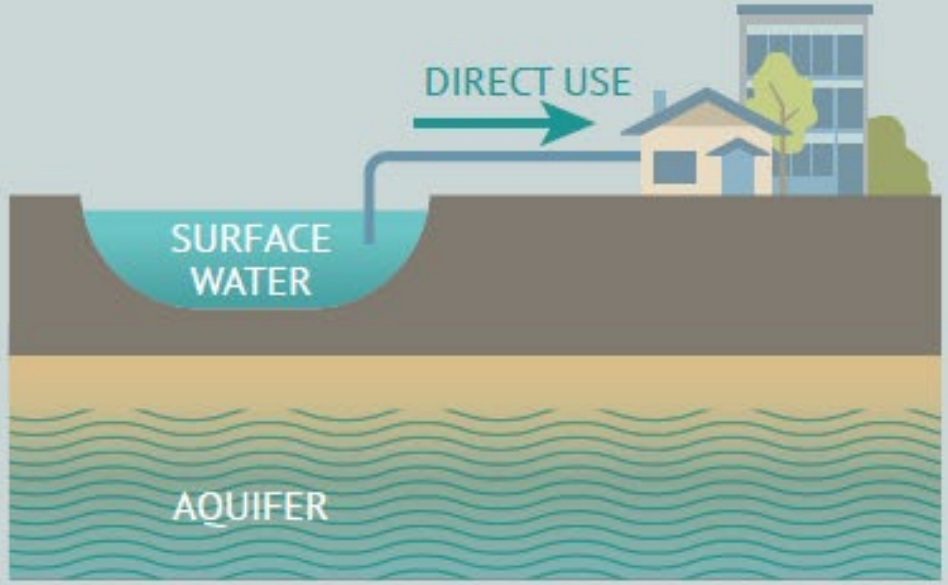
Declining Water Levels (Lower Aquifer)

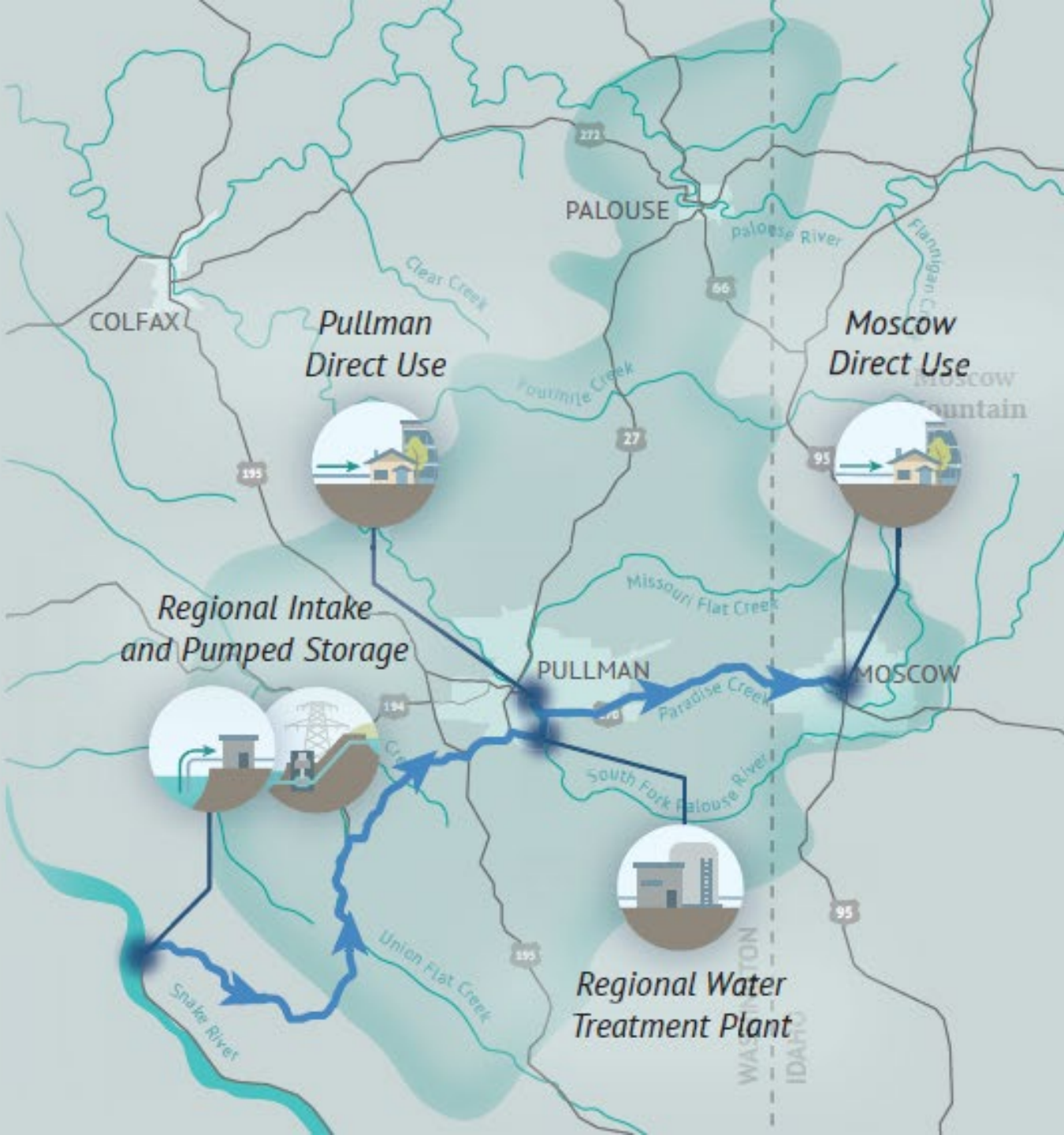


Alternative 1

Direct Use of the Snake River:
Surface water would be diverted from the Snake River and conveyed to a new regional water treatment plant. There it would be treated and conveyed into the existing municipal water system for Pullman and WSU. An additional pipeline would allow treated water to be conveyed to Idaho into the existing municipal system for Moscow and UI.

Due to the topography change from the Snake River to the Palouse region, the potential for an off-channel pumped storage reservoir and hydropower facility would be considered to help offset costs and create additional power for the region.

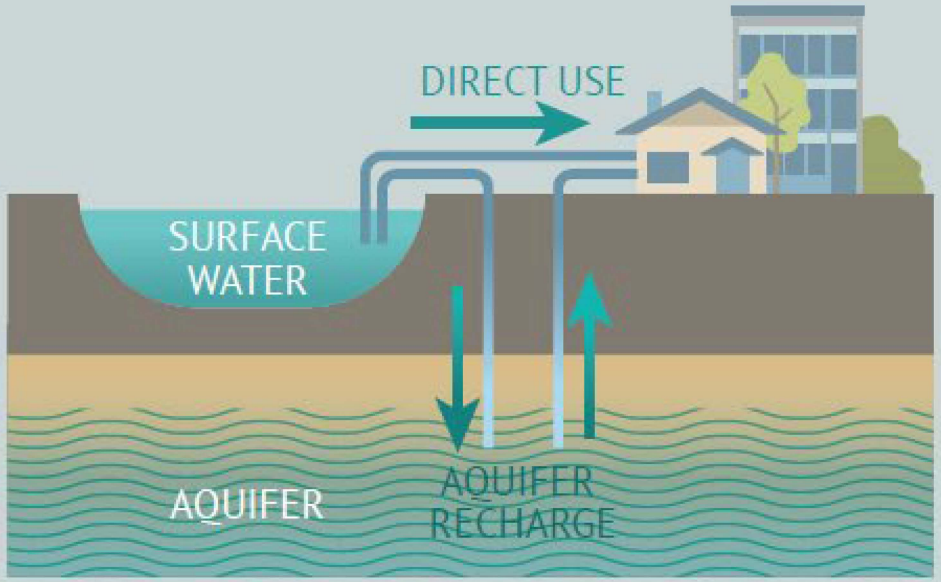


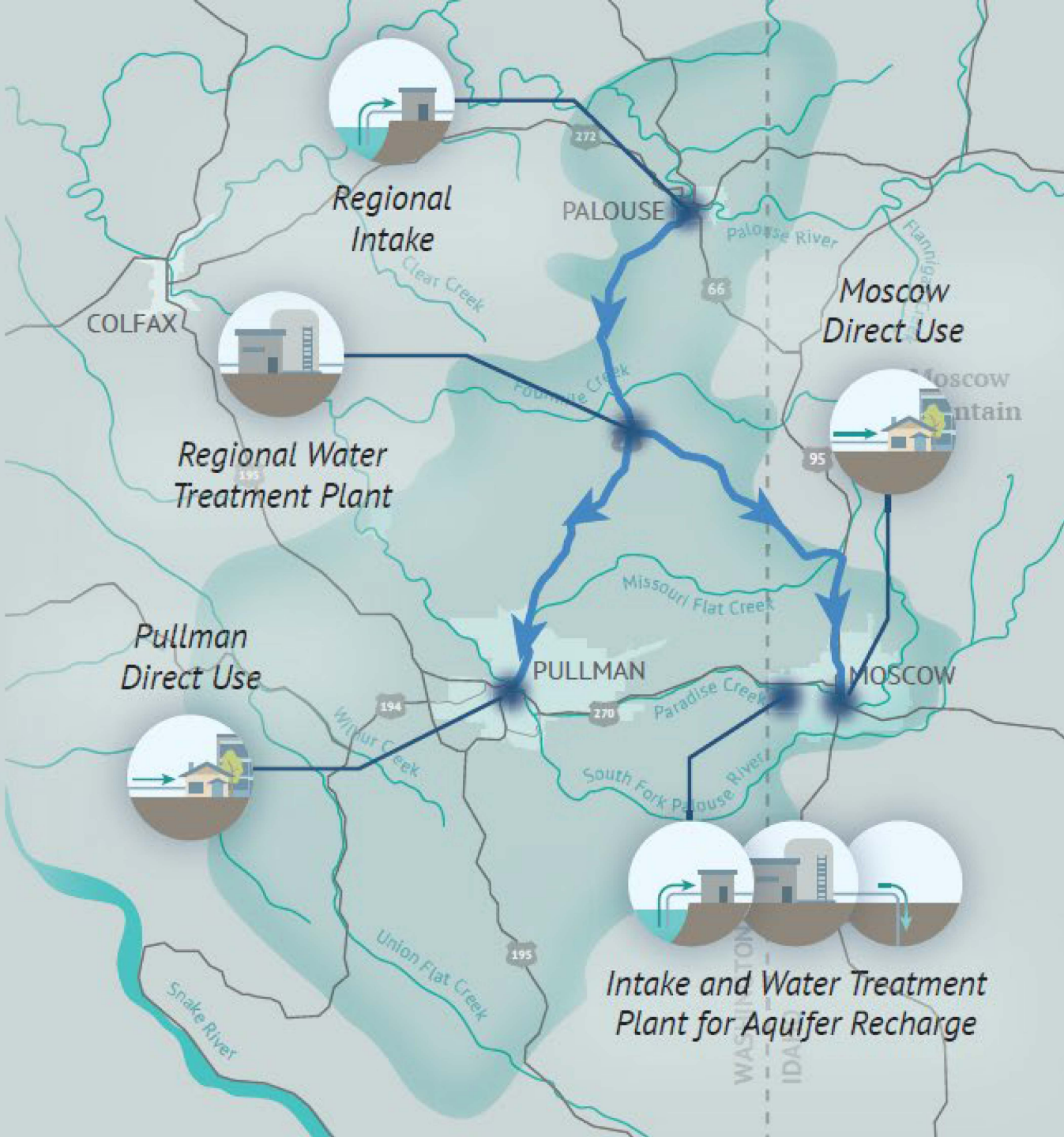


Alternative 2

Direct Use of the North Fork of the Palouse River:
Surface water would be diverted from the North Fork of the Palouse River near Palouse and conveyed to a new regional treatment plant. There it would be treated and conveyed into the existing municipal water system for Pullman and WSU. An additional pipeline would allow treated water to be conveyed to Idaho into the existing municipal system for Moscow and UI.

Aquifer Recharge from the South Fork of the Palouse River or Paradise Creek:
Surface water would be diverted from the South Fork of the Palouse River or Paradise Creek, treated, and injected into the aquifer system via recharge wells.

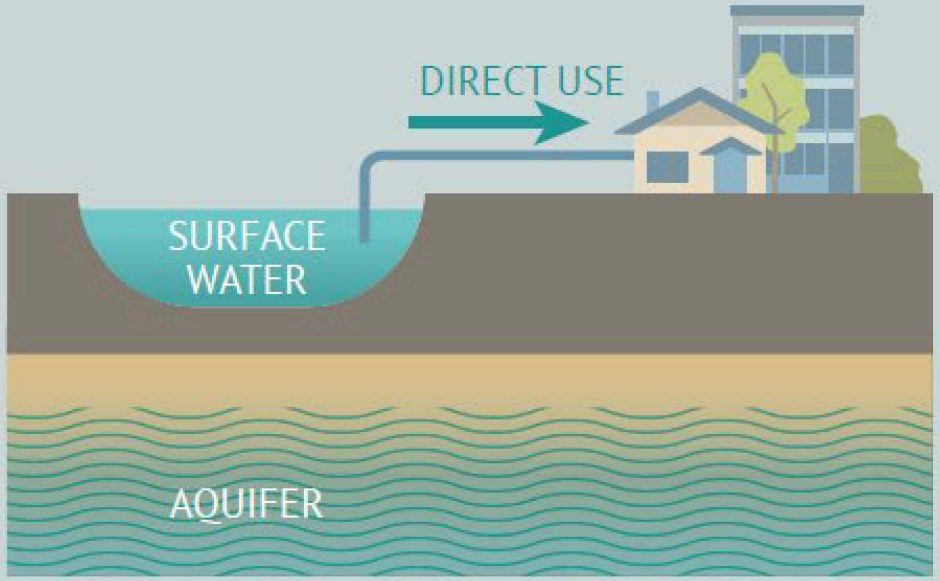


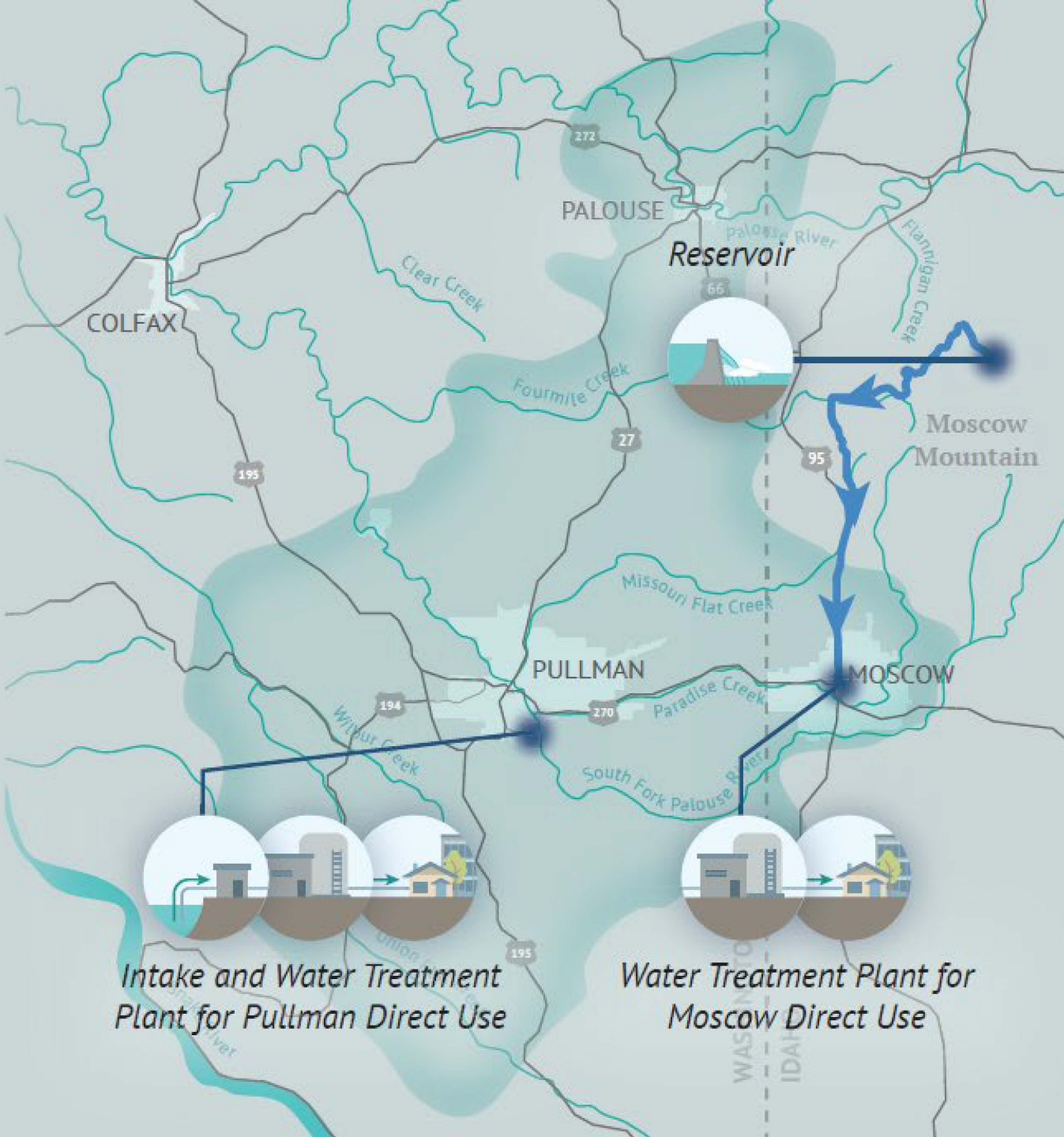


Alternative 3

Direct Use of Flannigan Creek:
Surface water from Flannigan Creek would be stored behind a new reservoir. Water would be pumped to Moscow to be treated and conveyed into the existing municipal water system for Moscow and UI.

Direct Use of the South Fork of the Palouse River:
Surface water would be diverted from the South Fork of the Palouse River, treated, and conveyed into the existing municipal water system for Pullman and WSU.





Alternative 4

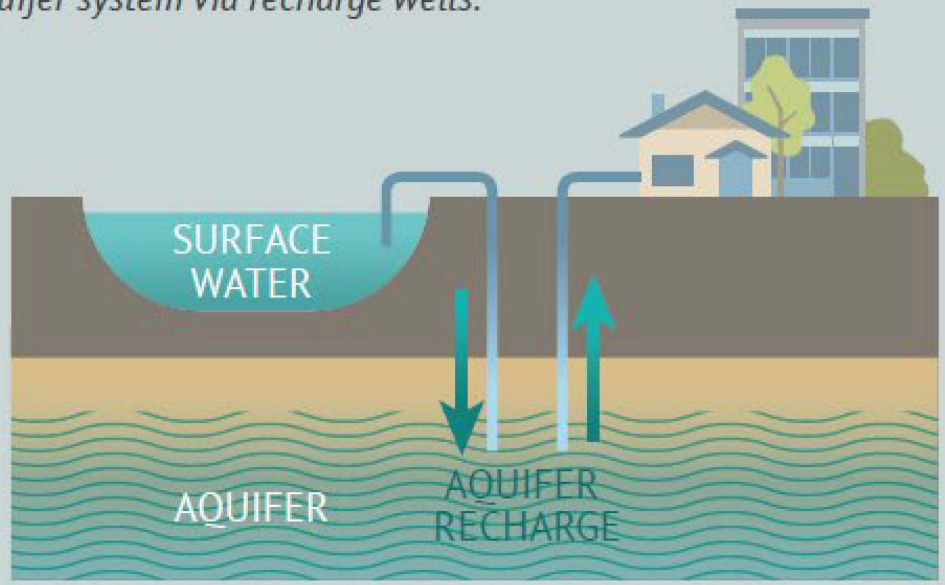
Aquifer Recharge from the South Fork of the Palouse River:
Surface water would be diverted from the South Fork of the Palouse River in Pullman, treated, and injected into the aquifer system via recharge wells.

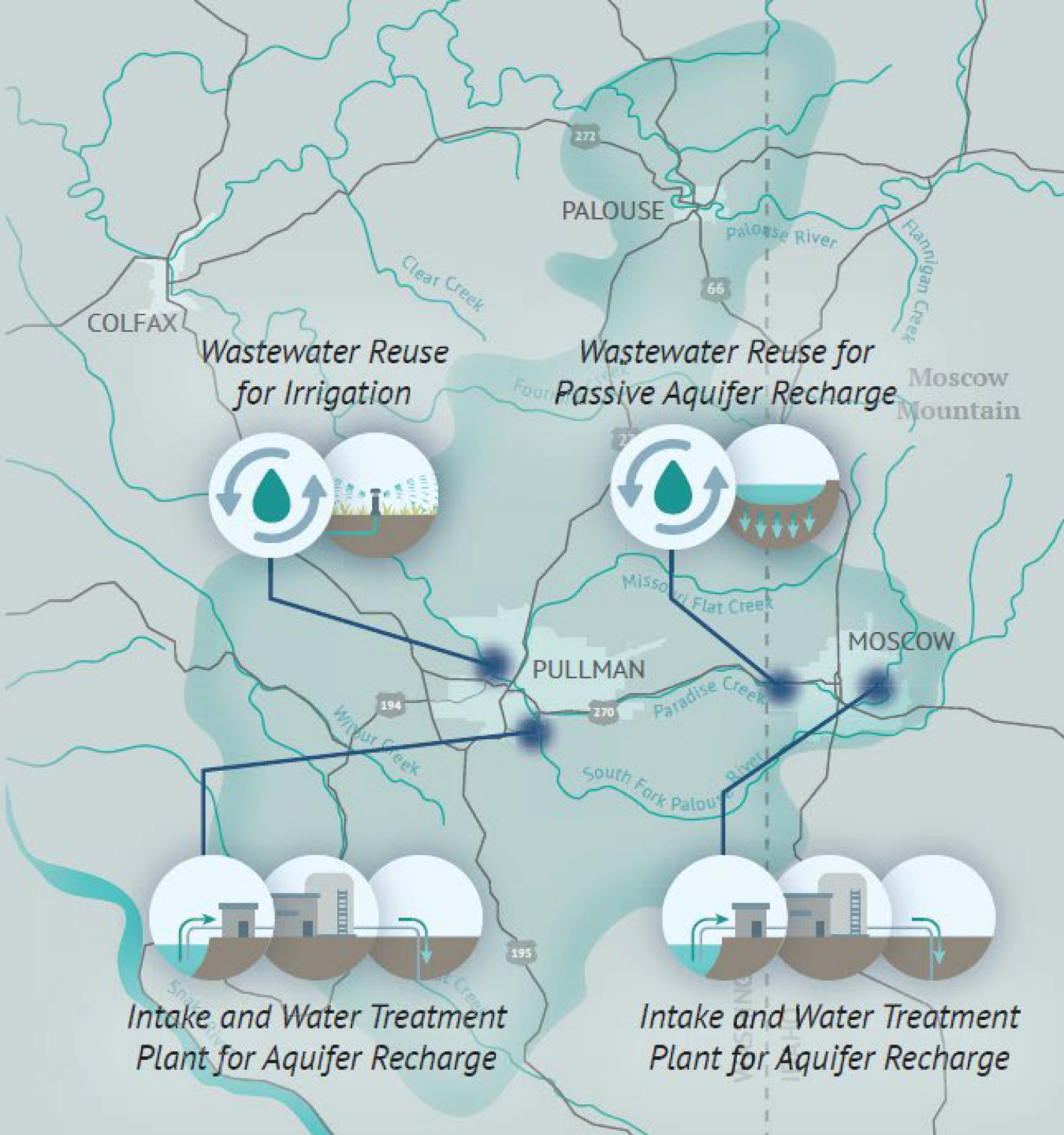
Aquifer Recharge from Paradise Creek:
Surface water would be diverted from Paradise Creek in Moscow, treated, and injected into the aquifer system via recharge wells.

Pullman Wastewater Reuse:
Using treated wastewater for irrigation in Pullman.

Moscow Wastewater Reuse:
Using treated wastewater for passive aquifer recharge in Moscow.

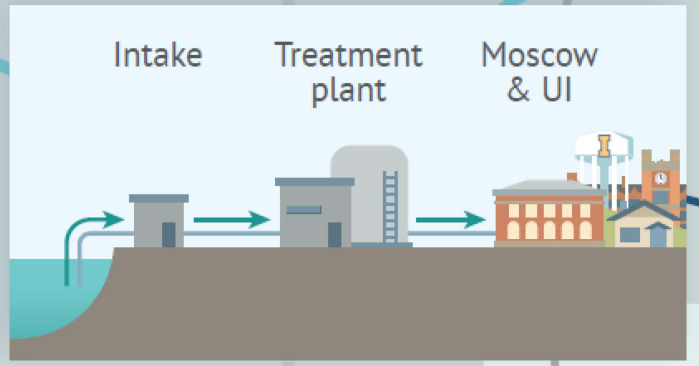
Additional Water Conservation:
Implementing conversation measures resulting in 15% less water than currently being used.





Paradise/South Fork Direct Use:

This project involves diverting water from Paradise Creek and the South Fork of the Palouse River to supply the communities of Moscow and Pullman. New facilities will collect and treat the water before directing it into existing city water systems. In addition to these direct use projects, additional conservation measures will be implemented with a goal to use 15% less water than currently being used.

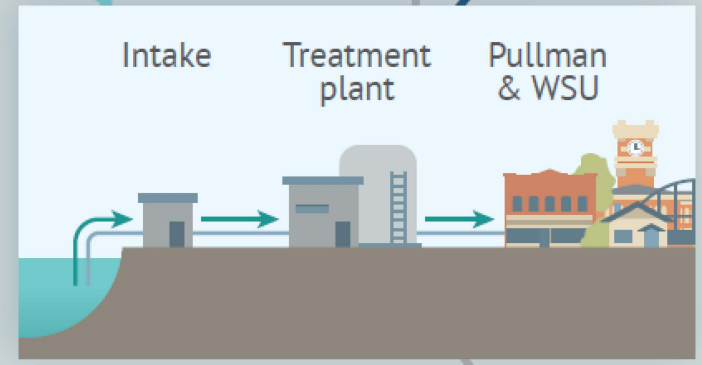


PULLMAN

Paradise Creek

MOSCOW

Direct Use of Paradise Creek
Surface water would be diverted from Paradise Creek, treated, and then conveyed into the existing municipal water system for Moscow and UI.



South Fork Palouse River

Direct Use of the South Fork of the Palouse River
Surface water would be diverted from the South Fork of the Palouse River, treated, and then conveyed into the existing municipal water system for Pullman and WSU.

Protecting our critical groundwater resources will help our communities thrive and ensure safe, reliable drinking water for generations to come.

To learn more about the Palouse Basin Aquifer System or the proposed Paradise/South Fork Direct Use project, visit palousebasin.org

PALOUSE BASIN AQUIFER committee

STAY IN TOUCH WITH US!

PalouseBasin.org

Facebook

Instagram

Twitter

YouTube

Monthly Meetings on the Third Thursdays

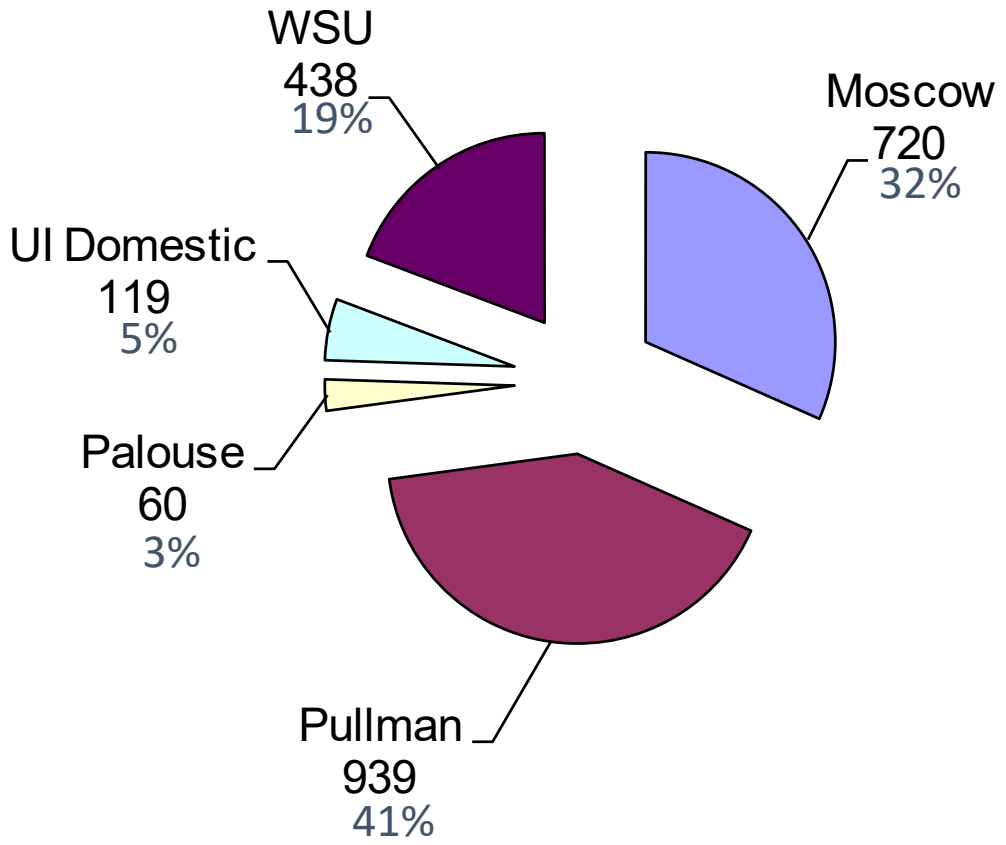
PALOUSE BASIN AQUIFER committee

Pumping Data

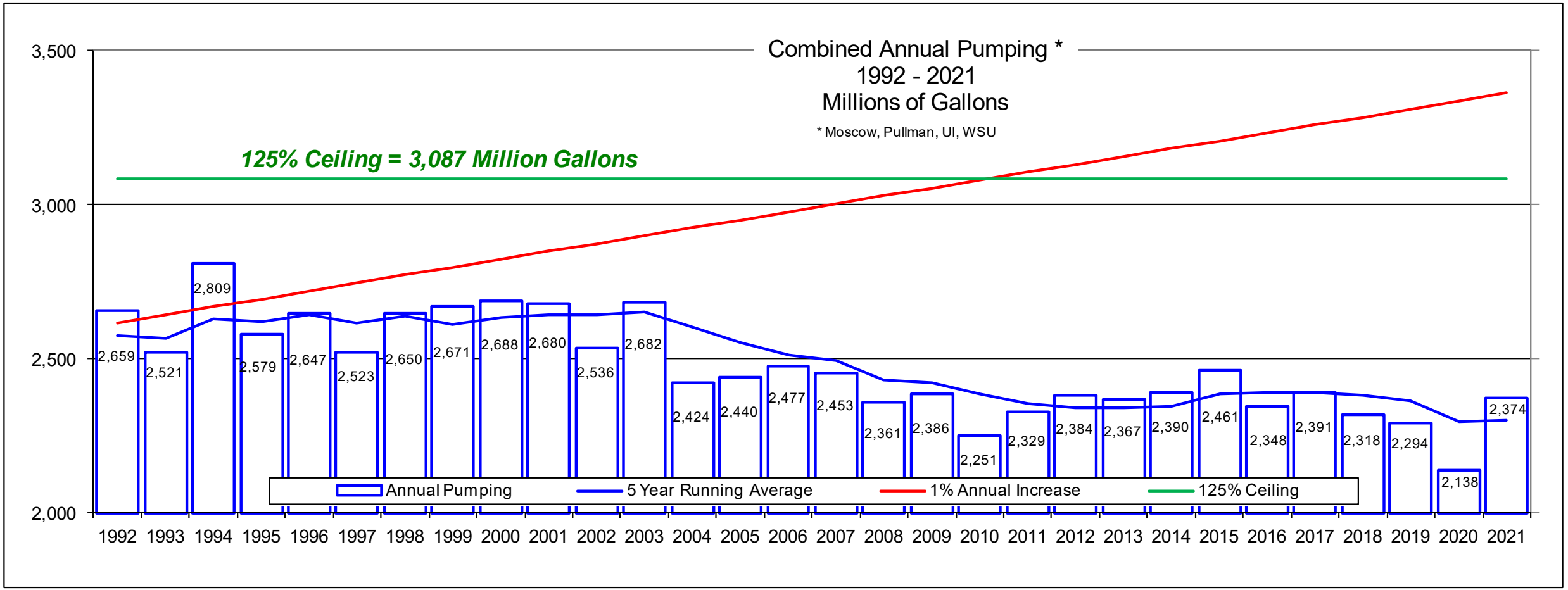
2022 Water Use

Total 2022 Pumping =

2.28 Billion Gallons

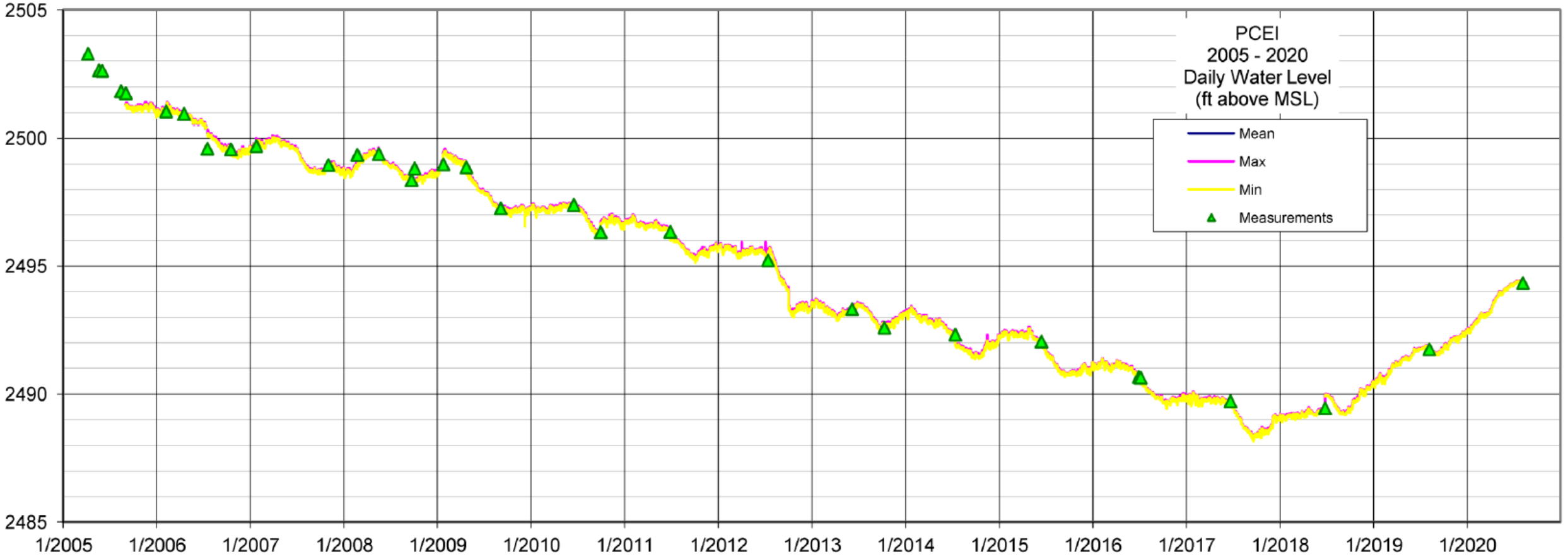


Combined Annual Pumping – 1992-2021

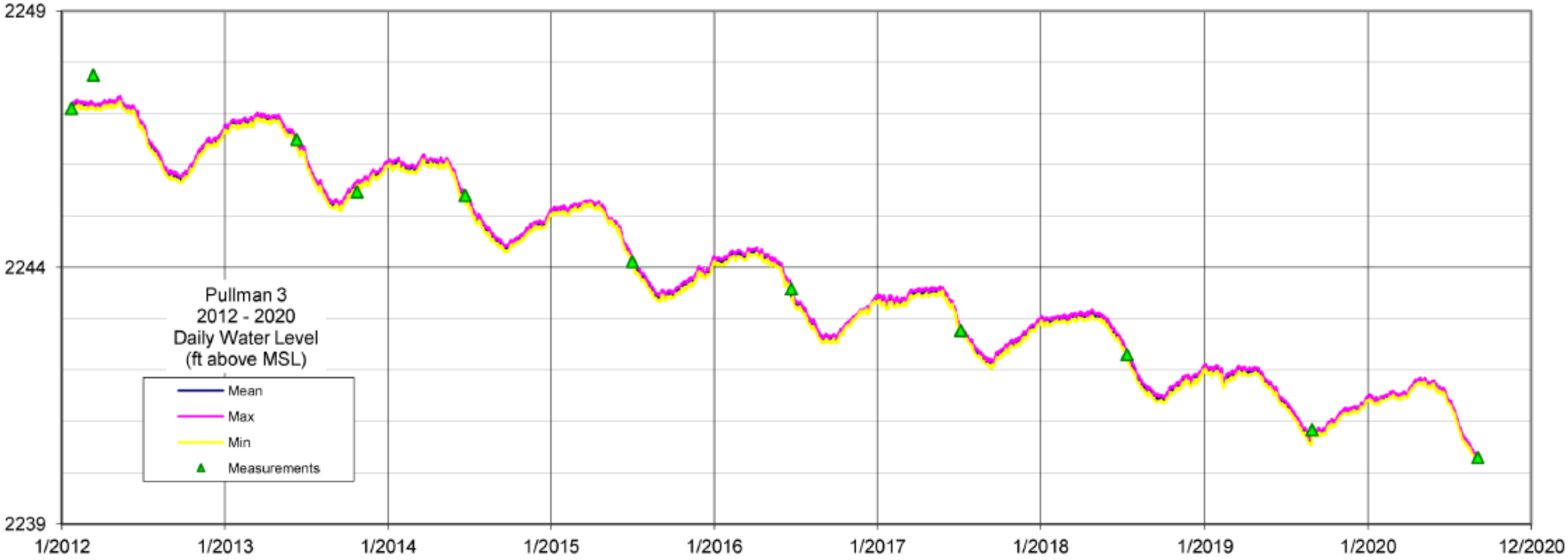


PALOUSE BASIN AQUIFER committee

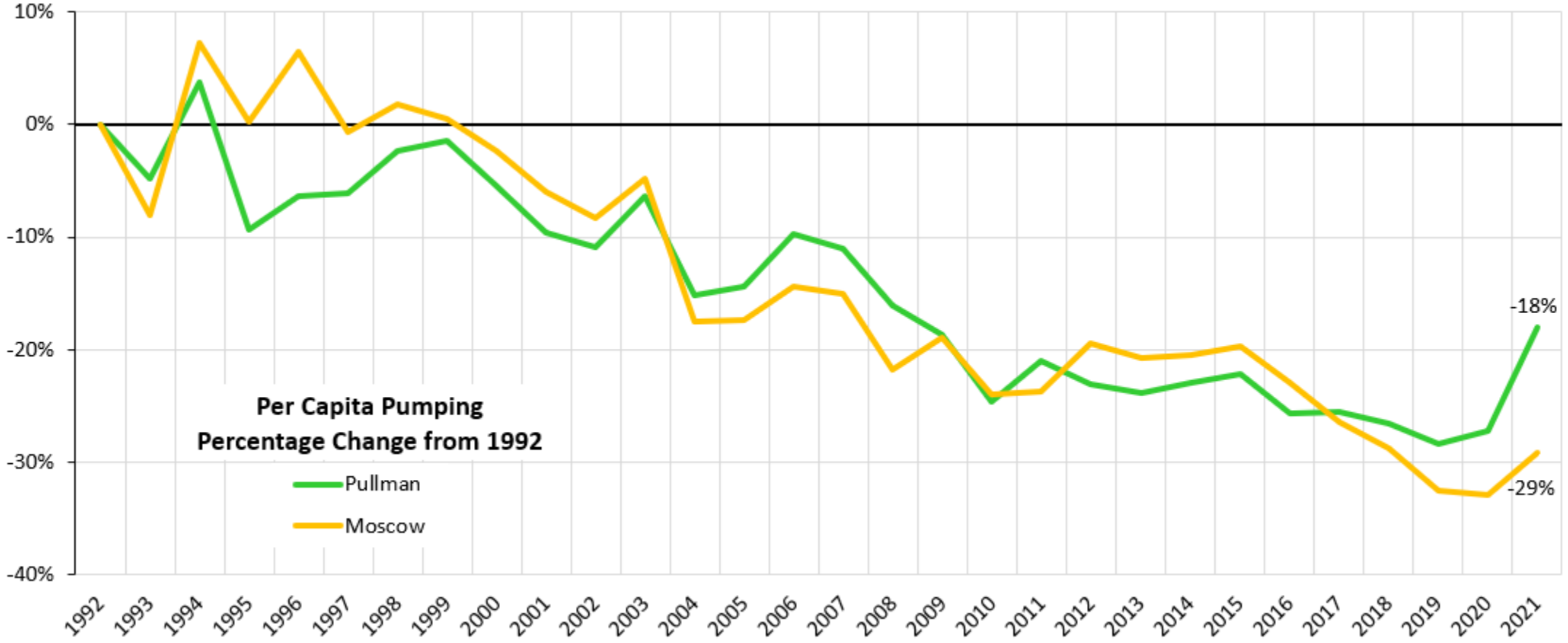
Upper Aquifer Levels



Lower Aquifer Levels



Per Capita Pumping % Change from 1992



Water Supply Alternatives

Progress in the Northern Idaho Adjudications

Shelley Keen
Idaho Dept. of Water Resources
August 7, 2023

Overview

Photo courtesy of Greg Cooksey – Senior Water Resource Agent

- Reasons for Adjudication
- Adjudication Process Overview
- Status of Northern Idaho Adjudications (NIA)
  - Phase 1 – Coeur d'Alene-Spokane River Basin
  - Phase 2 – Palouse River Basin
  - Phase 3 – Clark Fork-Pend Oreille River Basin
- Next Steps

Benefits of an Adjudication

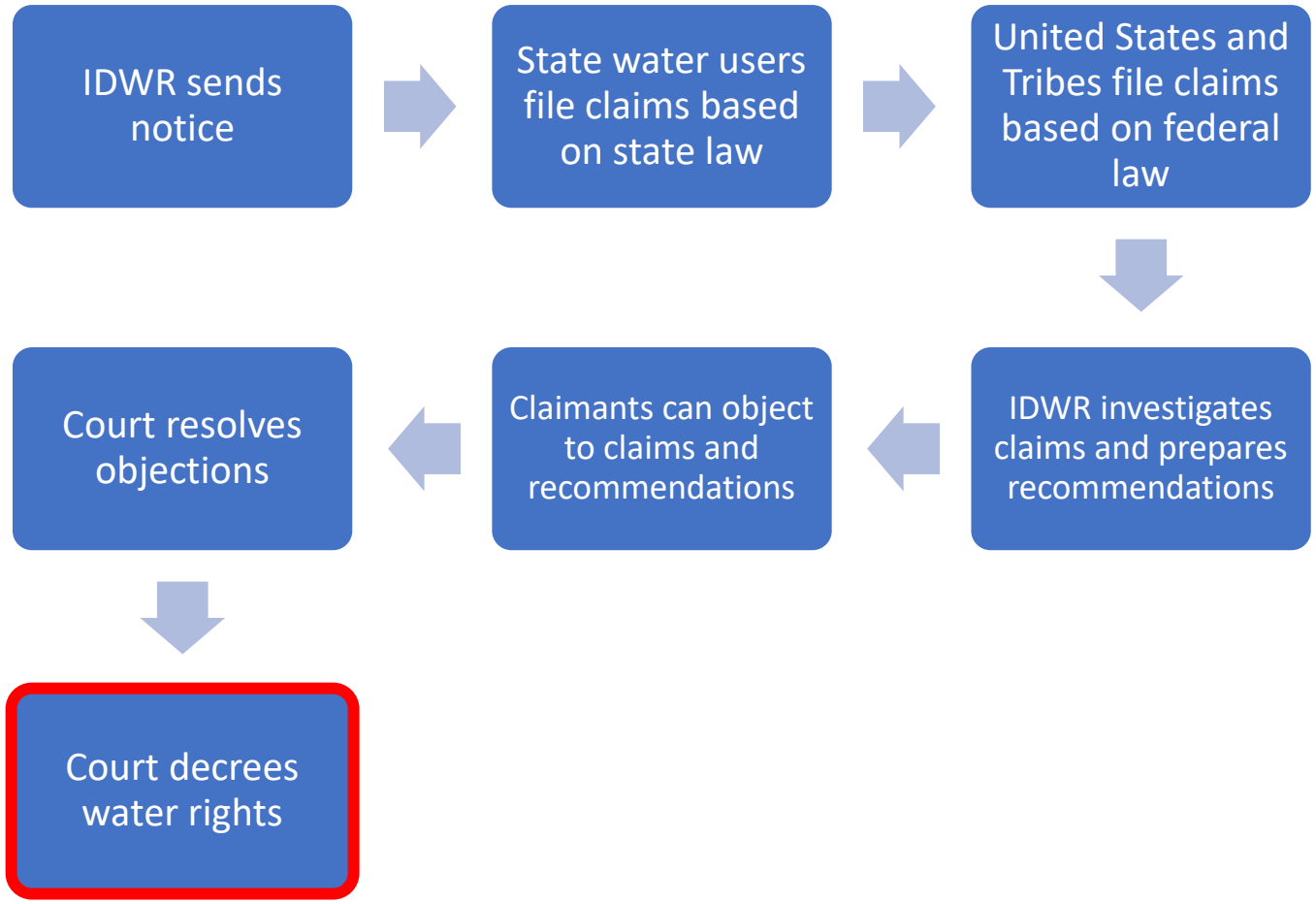
- We need to avoid uncertain outcomes in competition for finite resources
  - Supplies of surface water and ground water are not always sufficient to meet demands
  - Northern Idaho population growth puts added pressure on Idaho water resources
  - Northern Idaho shares river basins and aquifers with other states

- Adjudication reduces uncertainty by:
  - Confirming private property rights so they can be defended and administered by priority in a time of shortage
  - Recording and confirming beneficial use rights and changes to recorded rights
  - Requiring the United States to claim its water rights in state court

Adjudication Structure

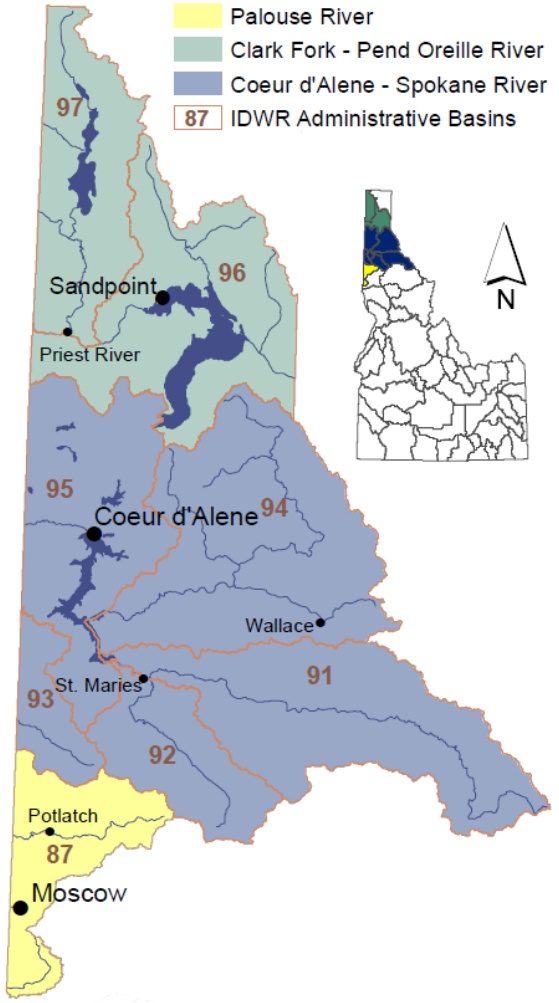
- Legislative authorization in Idaho Code § 42-1406B – passed 2006
- Administered by Idaho Water Court in Twin Falls
- Department of Water Resources is technical advisor to the court (not a party)

Adjudication Process Overview



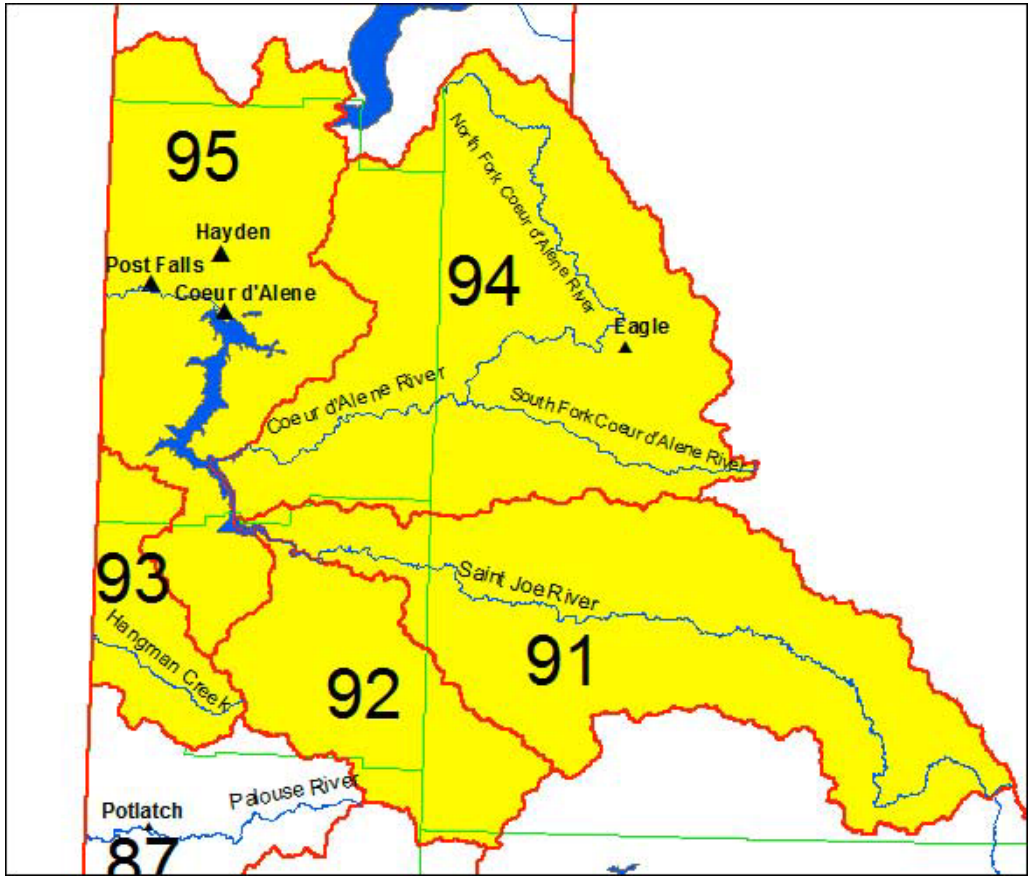
Phases of Northern Idaho Adjudication

- **Phase 1: CSRBA** – Commenced on November 12, 2008
- **Phase 2: PRBA** – Commenced on March 1, 2017
- **Phase 3: CFPRBA** – Commenced on June 15, 2021



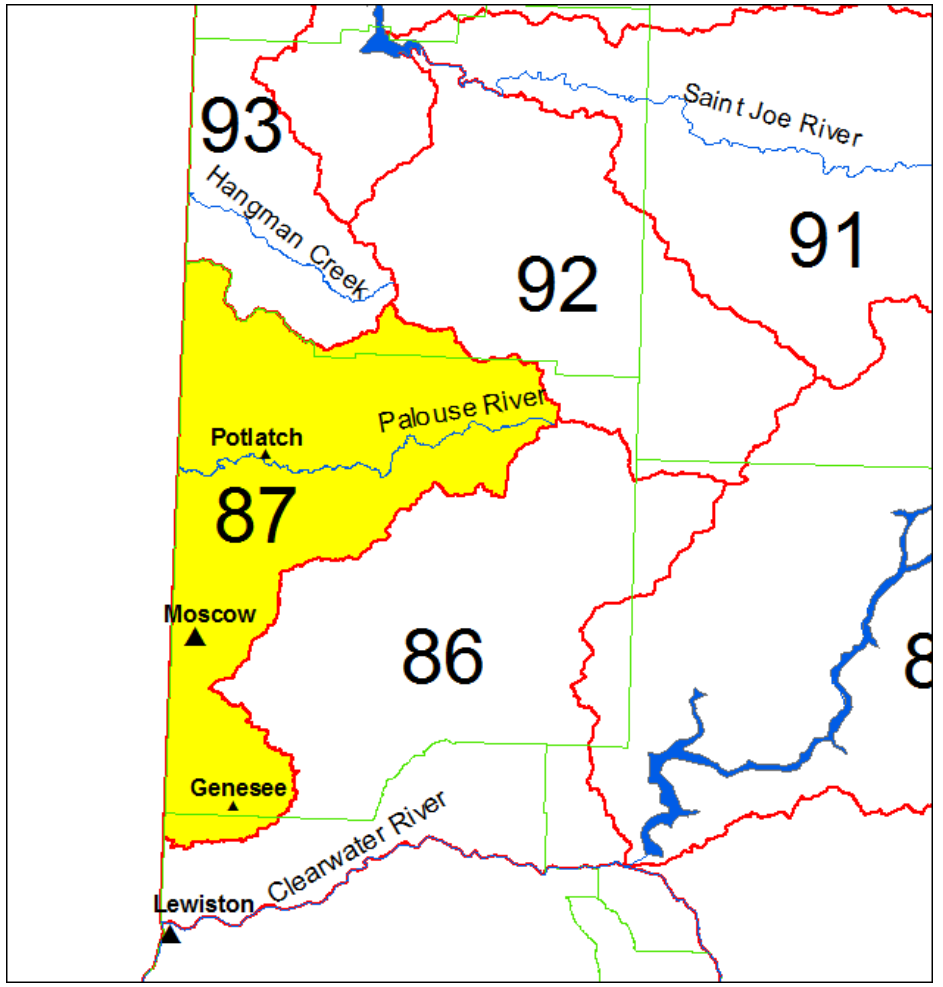
Coeur d'Alene-Spokane River Basin Adjudication (CSRBA)

- 14,266 state law based claims filed
- 13,780 state law based claims decreed
- 13 state law based claims with outstanding objections, including State of Idaho and Avista claims to water in Lake Coeur d'Alene
- 1,097 federal law based claims decreed
- 284 federal law based tribal claims with outstanding objections



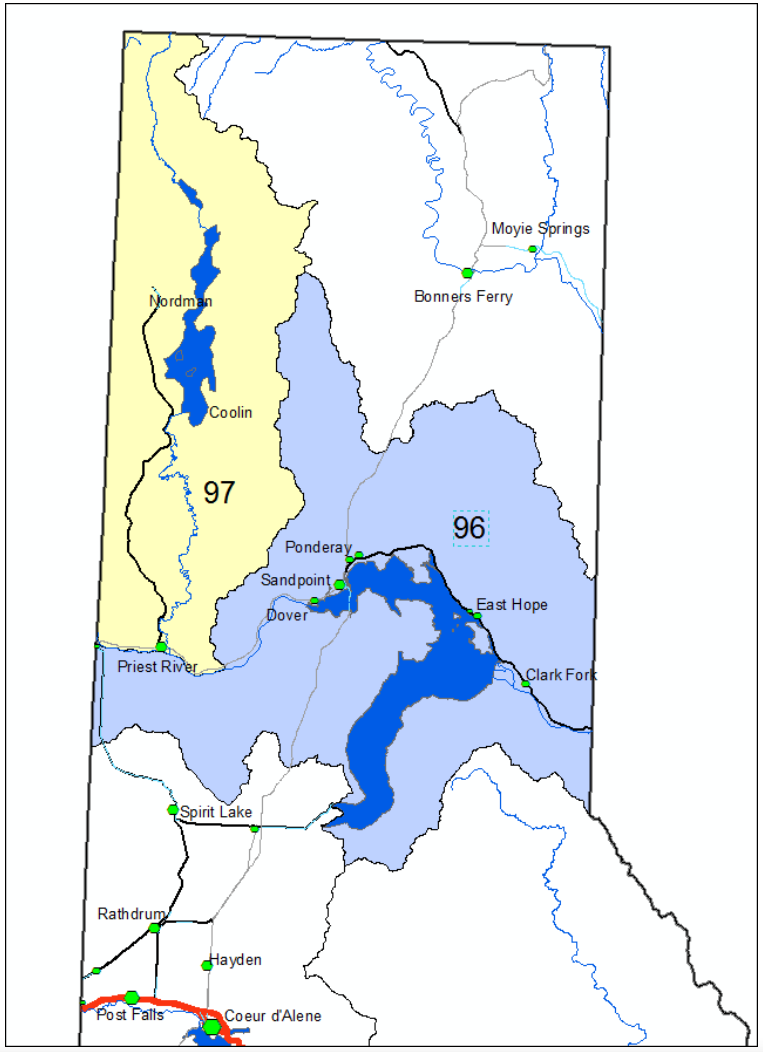
Palouse River Basin Adjudication (PRBA)

- 2,015 state law based claims received
- 1,780 uncontested state law based claims ready for partial decree
- 81 state law based claims with outstanding objections
- 206 federal law based claims with outstanding objections



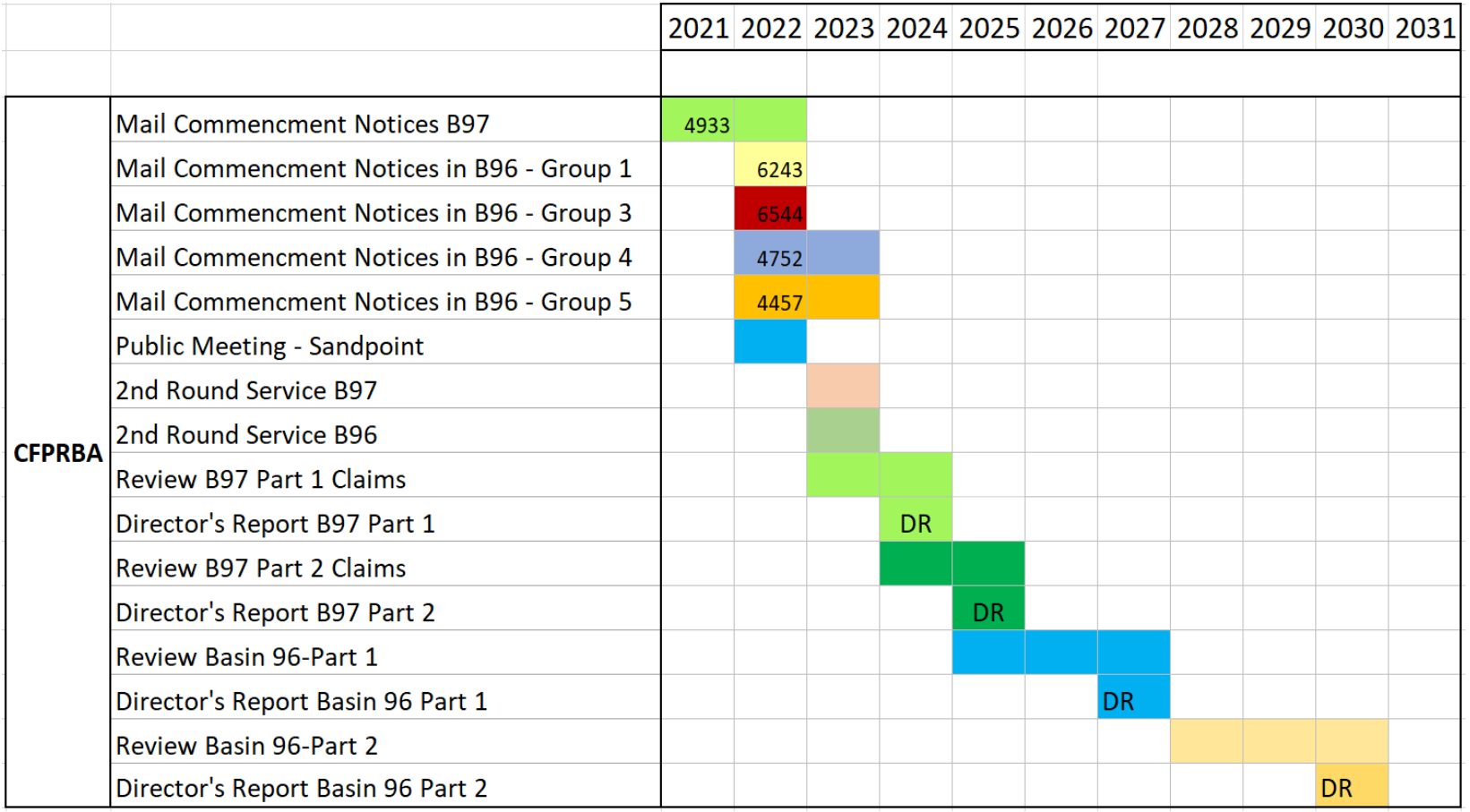
Clark Fork-Pend Oreille River Basin Adjudication (CFPRBA)

- Commencement Order issued by District Court on June 14, 2021
- Basin 96 – Clark Fork River, Lake Pend Oreille, Pend Oreille River and tributaries
- Basin 97 -- Priest Lake, Priest River and tributaries
- 7,931 state law based claims filed so far



CFPRBA Timeline

- Second round service
  - Basin 97 – August 2023
  - Basin 96 – By end of 2023
- Basin 97 Director's Reports planned for 2024 & 2025
- Basin 96 Director's Reports planned for 2027 & 2030



NIA Next Steps

- Resolve remaining claims and objections in CSRBA
- Resolve remaining claims and objections in PRBA
- Claim investigation, Director's reports, and objection resolutions in the CFPRBA
- Kootenai River Basin?

Photo courtesy of Greg Cooksey – Senior Water Resource Agent

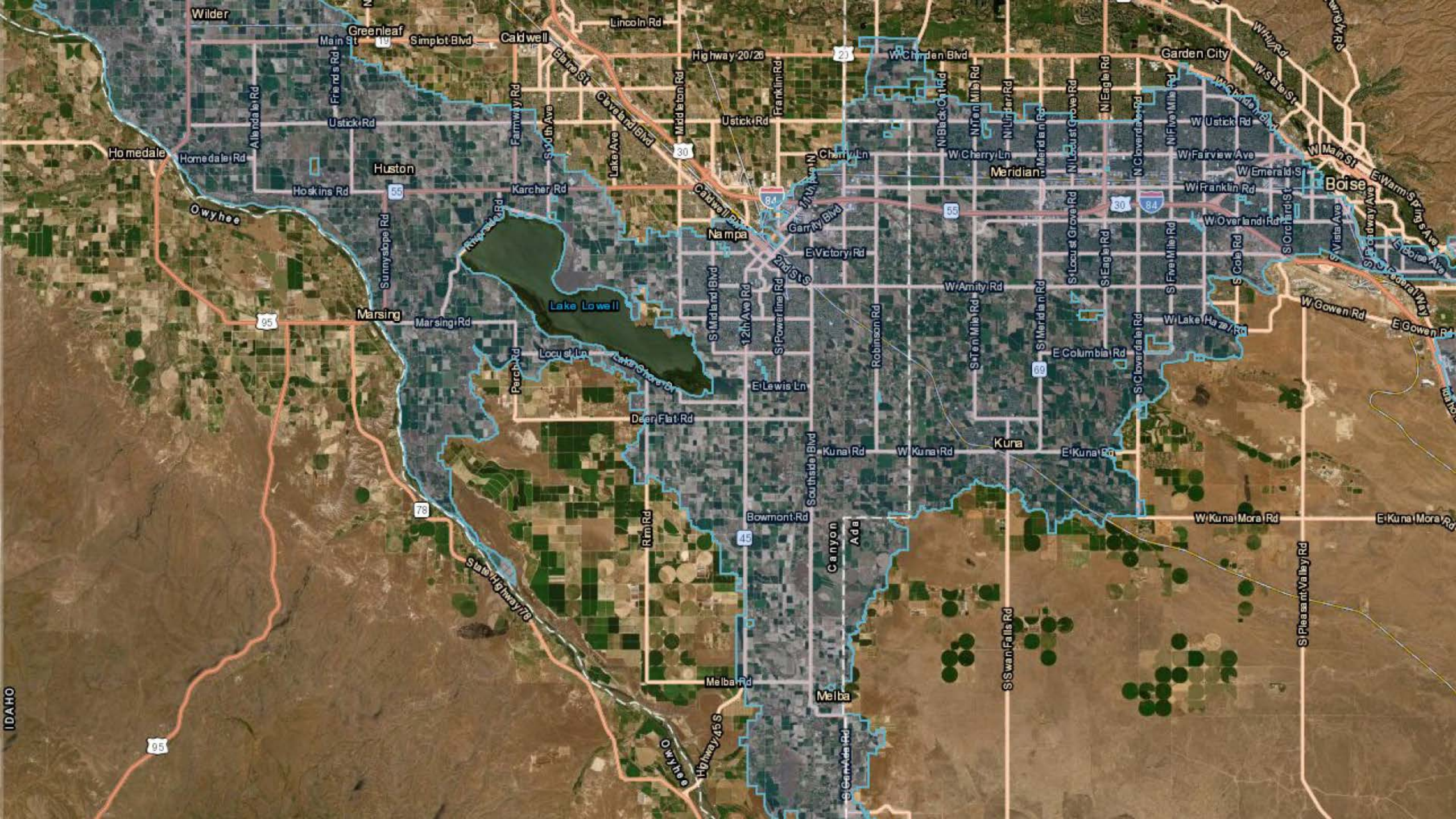
Thank you

IDAHO DEPARTMENT OF WATER RESOURCES

Shelley Keen
Regional Operations Bureau Chief
shelley.keen@idwr.idaho.gov
208-287-4947

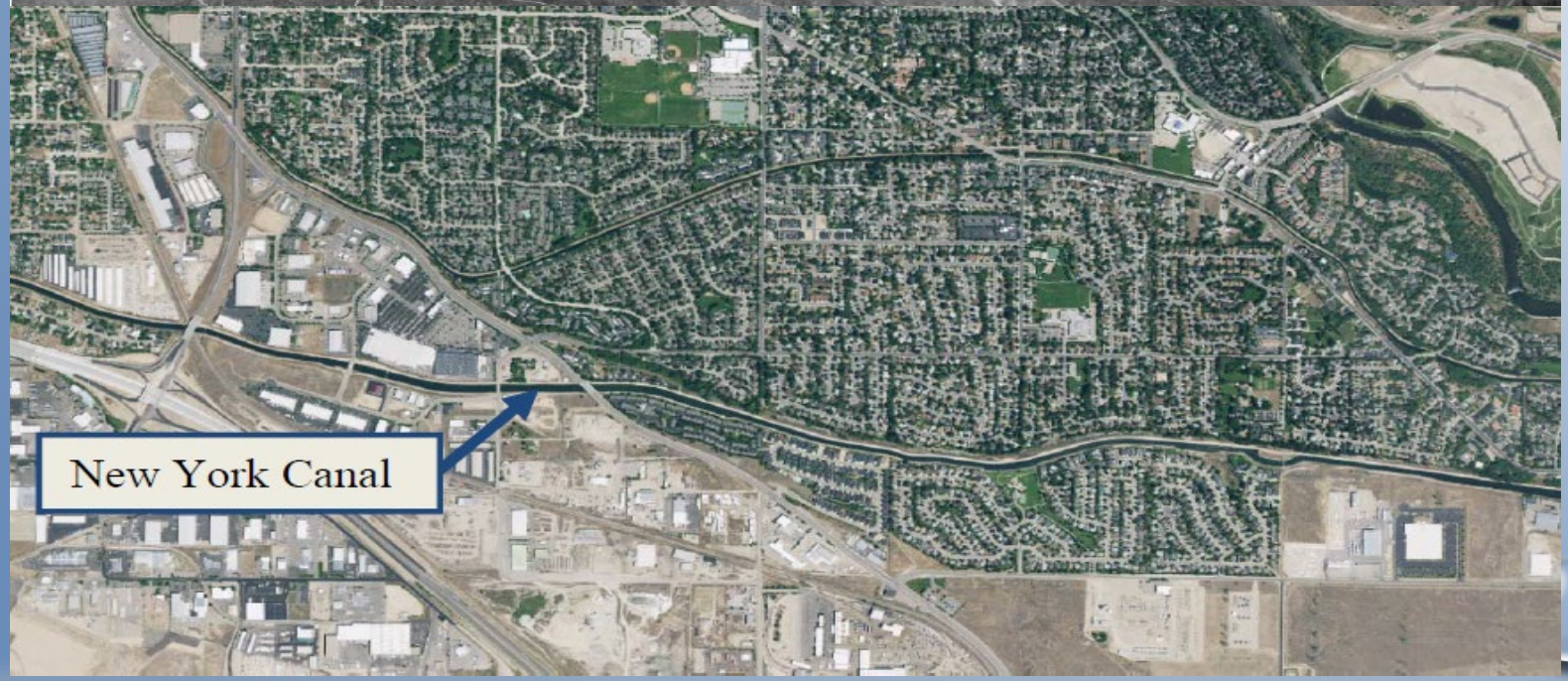
GOVERNOR'S WATER SUMMIT

AUGUST 7, 2023


Wilder
Greenleaf
Main St
Simplot Blvd
Caldwell
Lincoln Rd
Blaine St
Cleveland Blvd
Highway 20/26
Middleton Rd
Franklin Rd
Garden City
W Chinden Blvd
W State St
Ustick Rd
Allendale Rd
Farmway Rd
30th Ave
Lake Ave
N Black Cat Rd
N Ten Mile Rd
N Linder Rd
N Meridian Rd
N Locust Grove Rd
N Eagle Rd
N Cloverdale Rd
N Five Mile Rd
W Ustick Rd
Homedale
Homedale Rd
Huston
Hoskins Rd
Karcher Rd
Cherry Ln
W Cherry Ln
Meridian
W Fairview Ave
W Emerald St
W Franklin Rd
Boise
W Main St
E Warm Springs Ave
Owyhee
Caldwell Blvd
Nampa
Garrity Blvd
W Overland Rd
S Orchard St
S Broadway Ave
S Vista Ave
E Boise Ave
E Victory Rd
2nd St S
S Midland Blvd
12th Ave Rd
S Powerline Rd
Sunnyslope Rd
Lake Lowell
W Amity Rd
S Ten Mile Rd
S Meridian Rd
S Locust Grove Rd
S Eagle Rd
S Five Mile Rd
S Cole Rd
Marsing
Marsing Rd
95
Locust Ln
Lake Shore Dr
Perch Rd
Robinson Rd
W Gowen Rd
E Gowen Rd
W Lake Hazel Rd
E Columbia Rd
S Cloverdale Rd
69
E Lewis Ln
Deer Flat Rd
Kuna
Kuna Rd
W Kuna Rd
E Kuna Rd
Southside Blvd
Bowmont Rd
45
Rim Rd
78
W Kuna Mora Rd
E Kuna Mora Rd
Canyon
Ada
State Highway 78
S Swan Falls Rd
S Pleasant Valley Rd
Melba Rd
Melba
IDAHO
Highway 45 S
Owyhee
95

1939

Population - Approx. 25,000

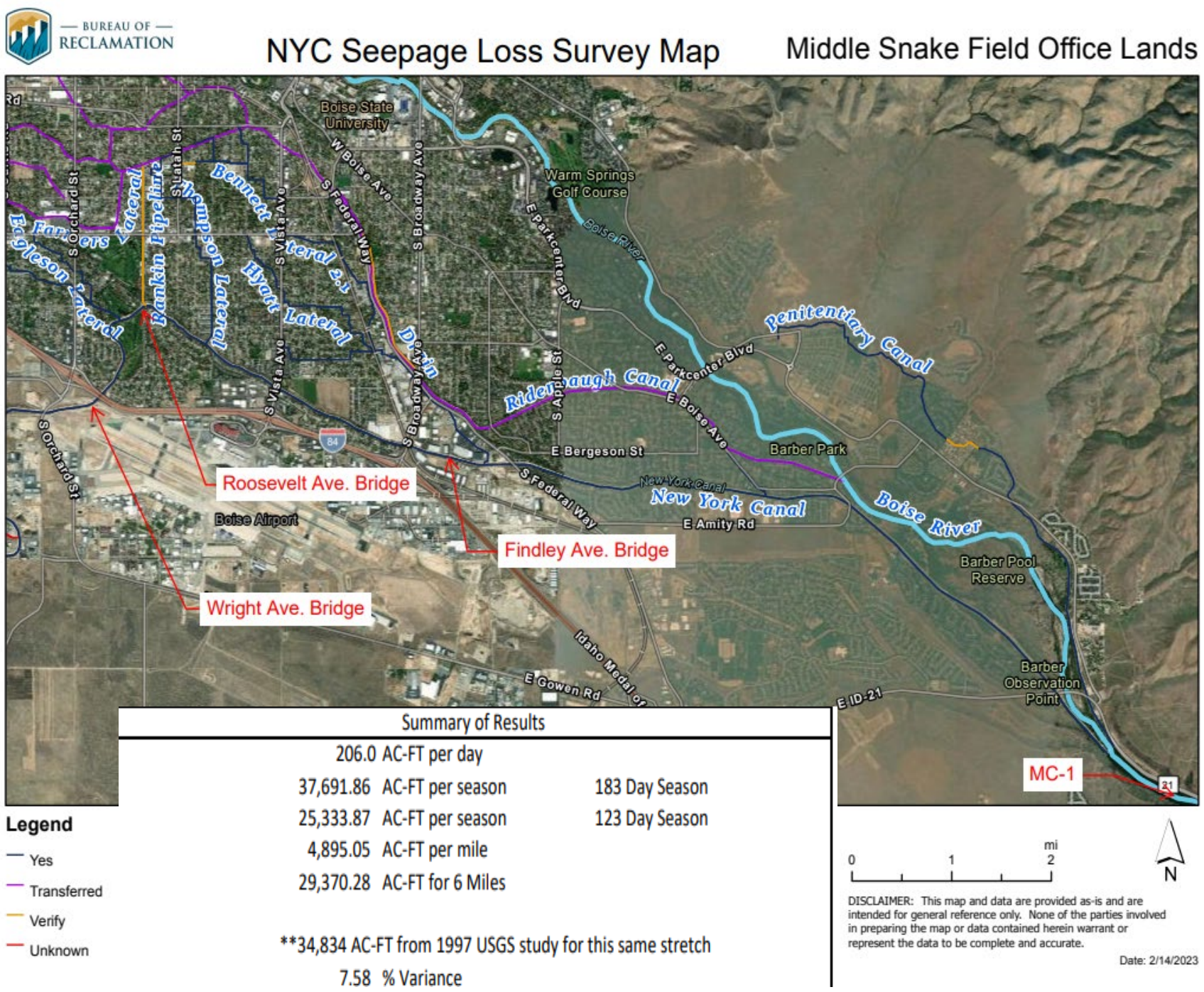


2023

Population - Approx. 240,000

Site of the1955 Canal Breach

Same Site Today



2022 – B.O.R. Study

37,691 acre-feet loss

1997 - U.S.G.S. Study

34,834 acre-feet loss


CAT
CAT
CAT


CAT
140H


24-Nov-2020
10:10 AM

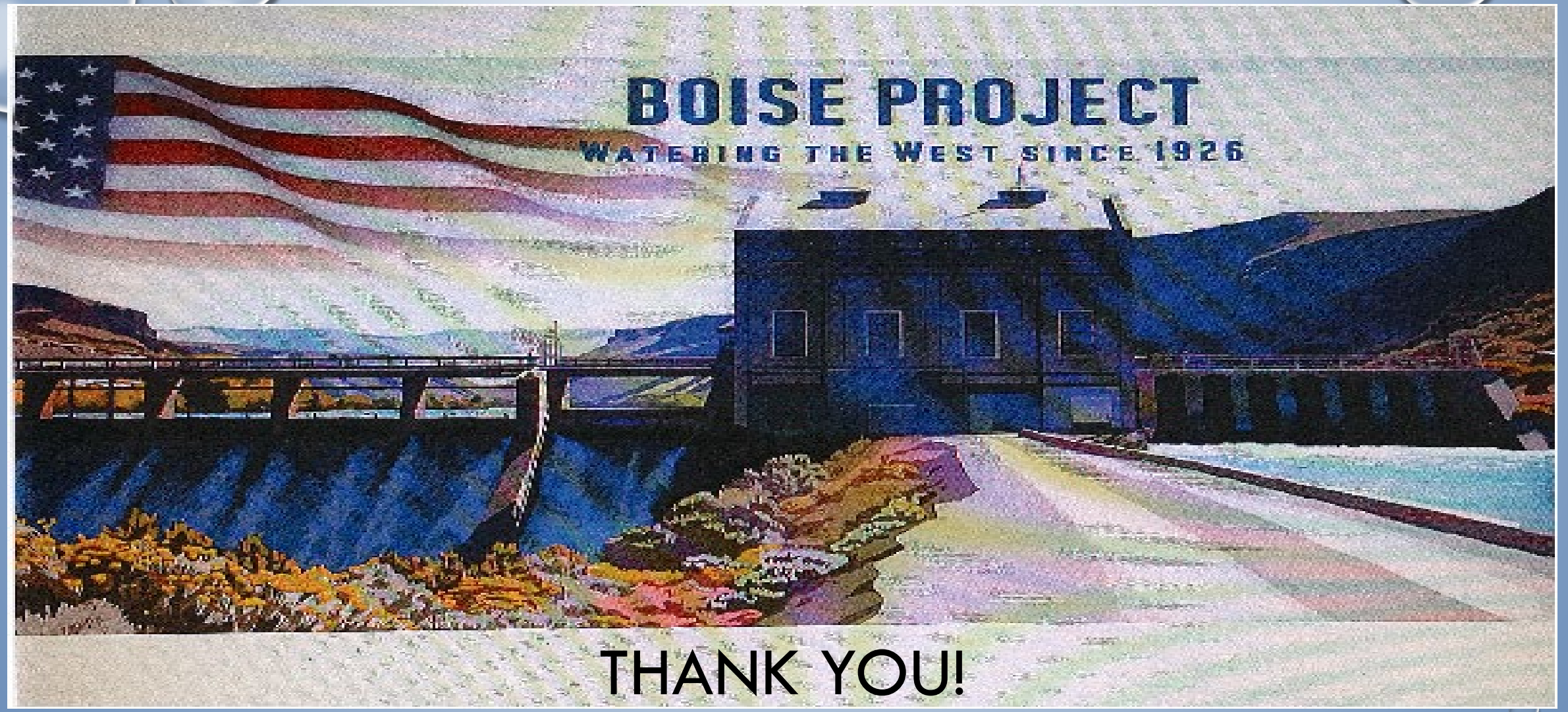
PUBLIC SAFETY

CLEAN HYDROPOWER

CONTINUED RELIABILITY/ECONOMIC IMPACT of the NEW YORK CANAL

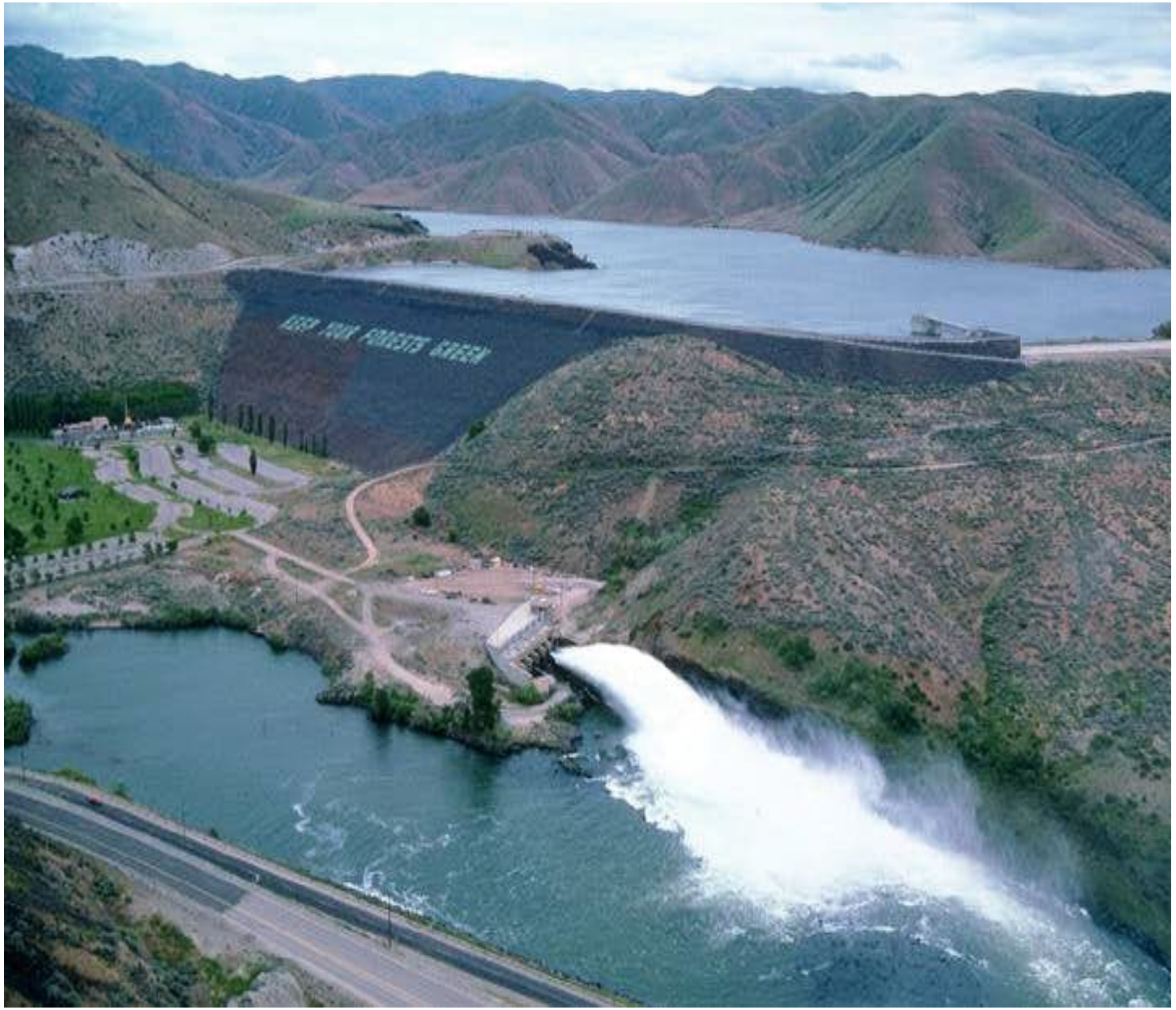
ANNUAL WATER SAVINGS

29,370.28 ac.ft.



THANK YOU!

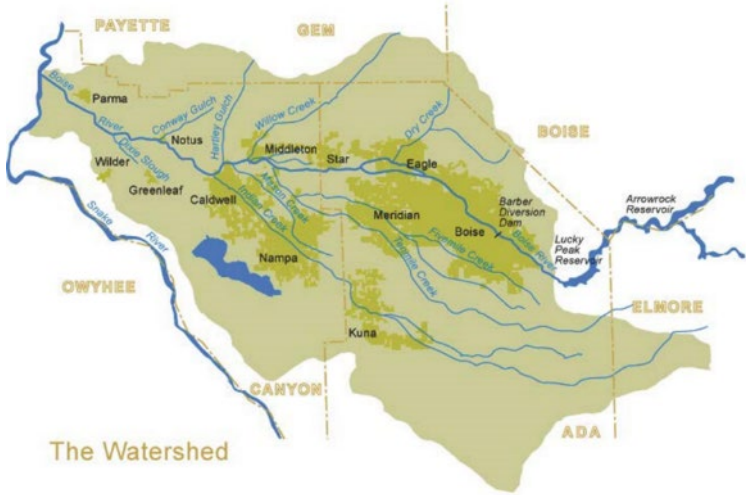
Boise Project- Board of Control
Bob Carter- Project Manager
208-344-1141



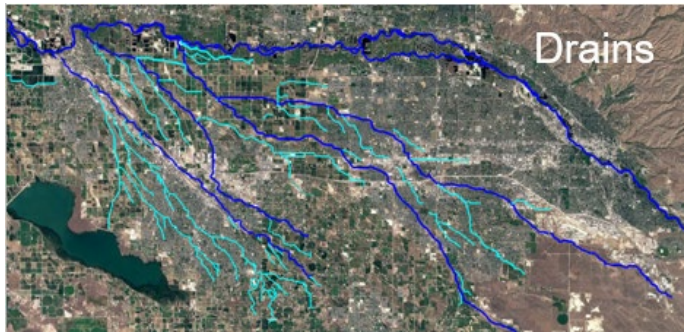
Mike Meyers

Watermaster
Water District 63

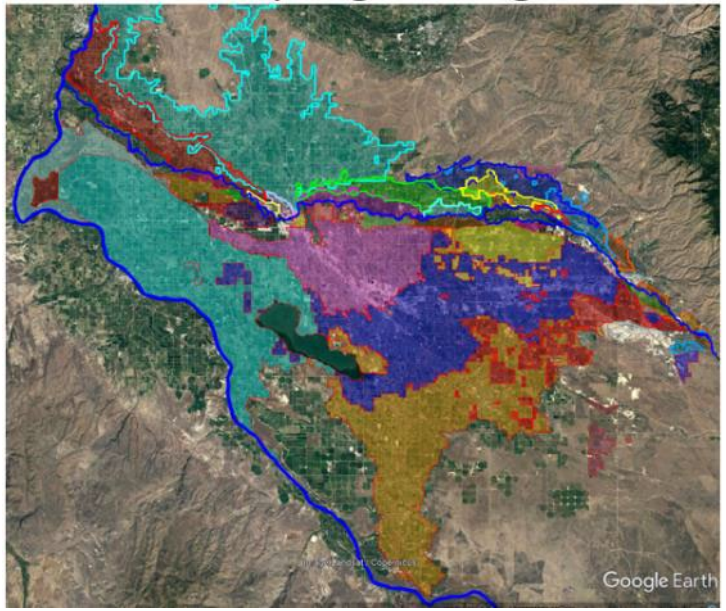
Treasure Valley Water Supply Assessment and Sustainability Project



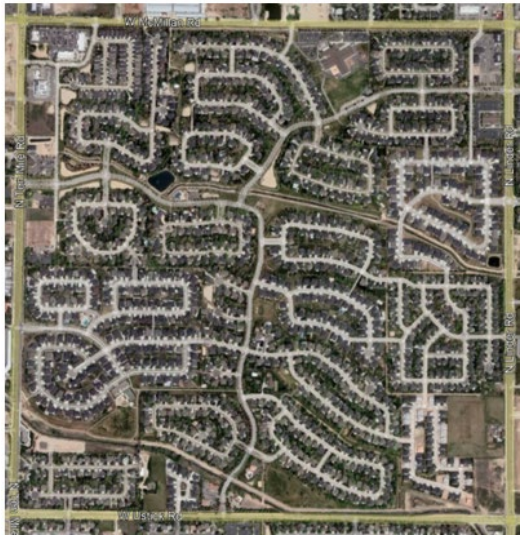
The Watershed



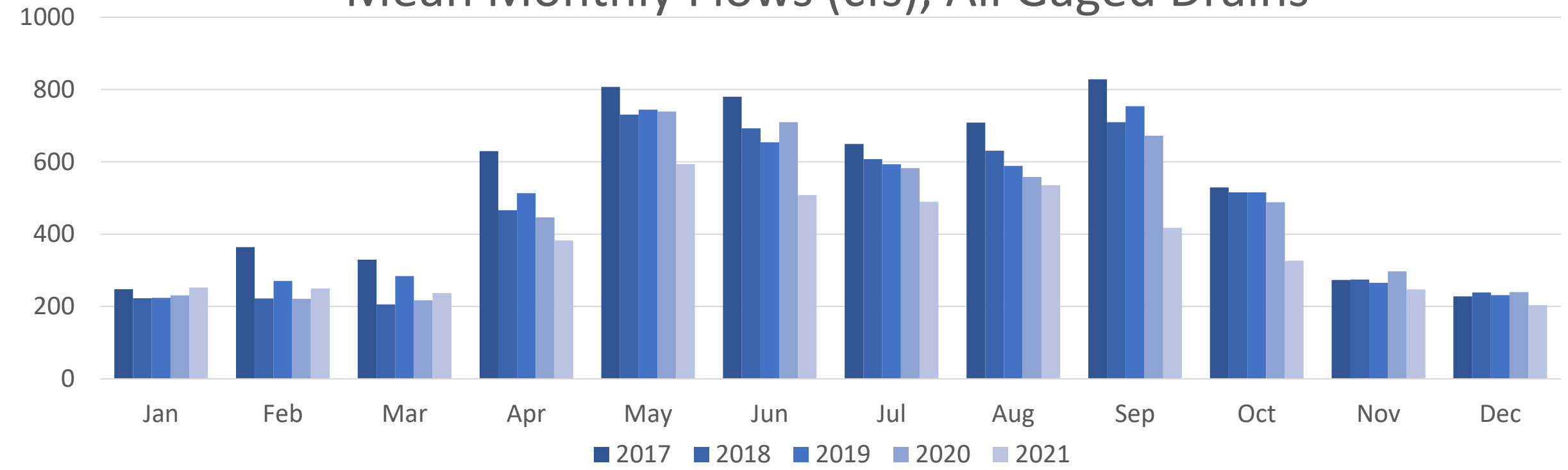
Treasure Valley Irrigation Organizations

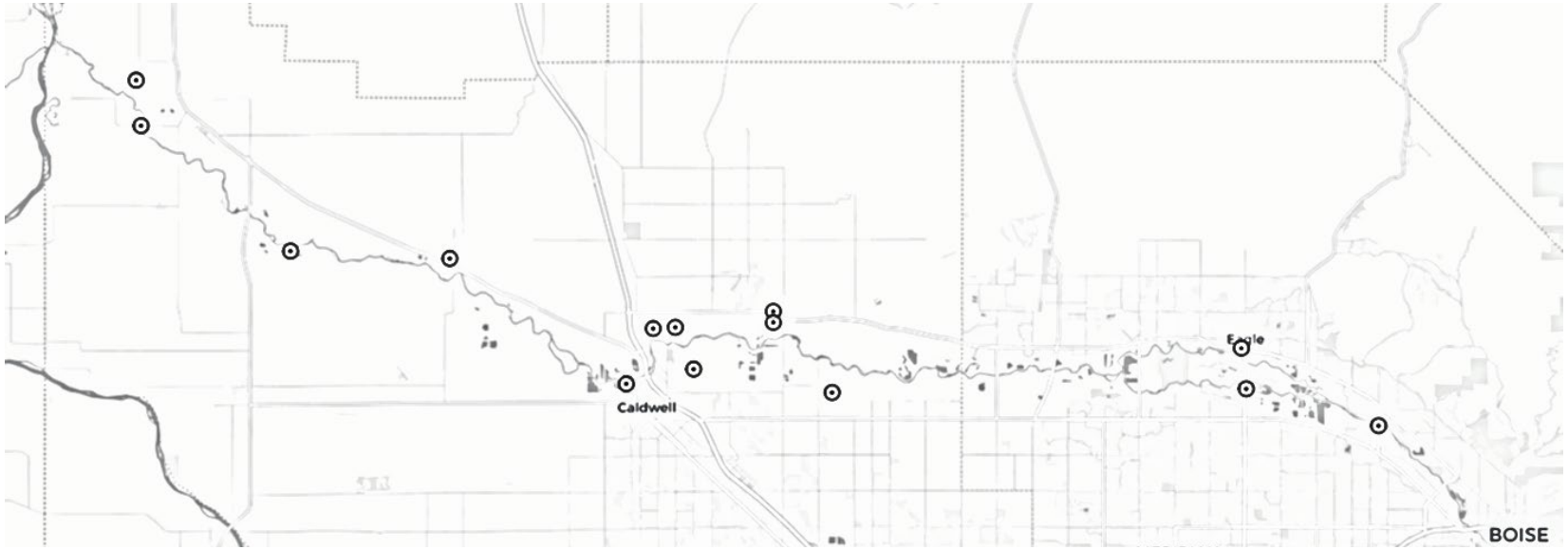


Urbanization



Mean Monthly Flows (cfs), All Gaged Drains



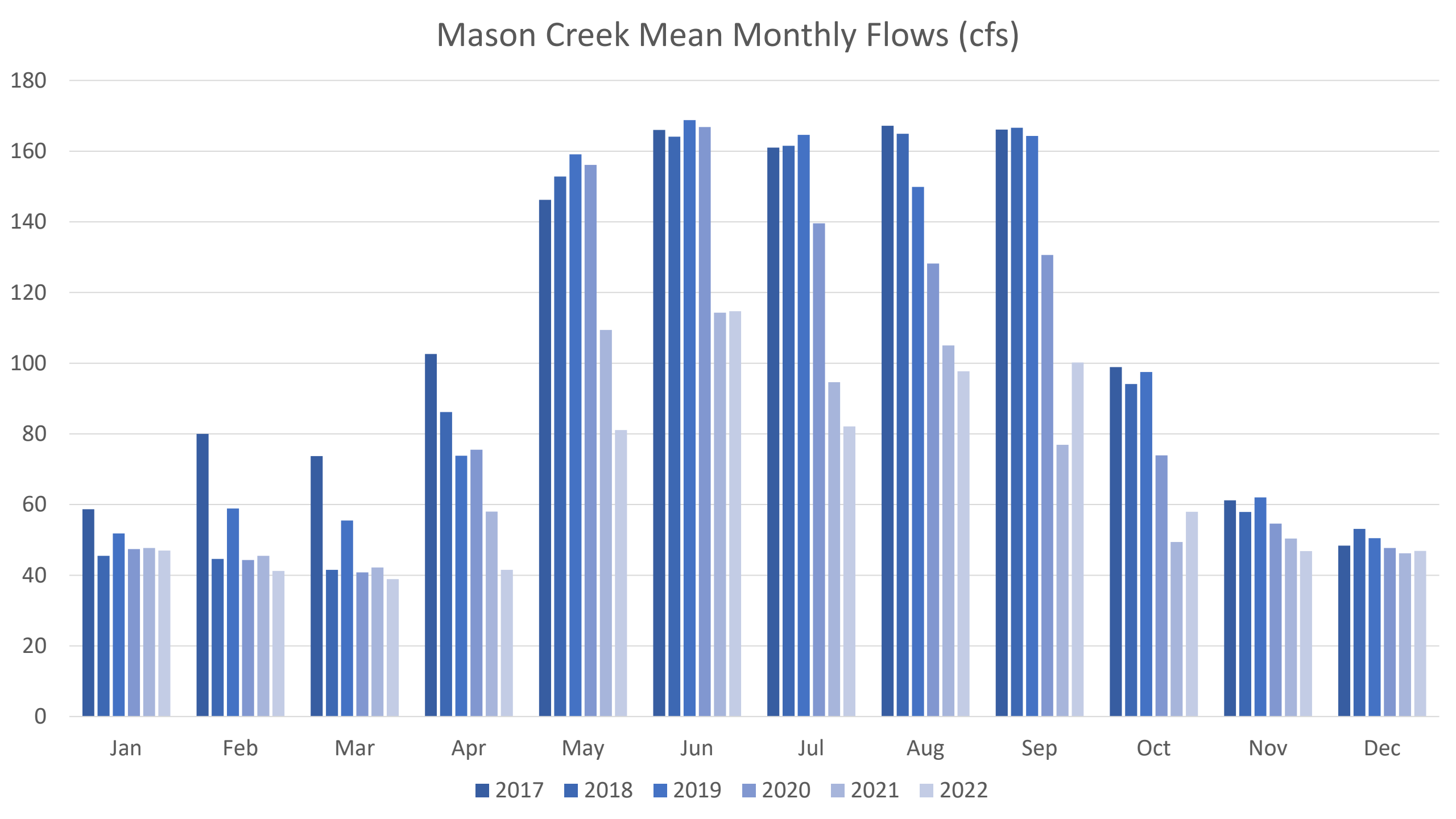


USGS Stream Flow Gages (2017-present)

Eagle Drain
Fifteen Mile Creek
Mason Creek
Mill Slough
South Middleton Drain
East Hartley Gulch
West Hartley Gulch
Conway Gulch
Dixie Drain

Why are drains important to the water supply on the Boise River?

- All of the water released from Lucky Peak only makes it to Caldwell near the freeway
- The lower river is supplied 100% from return flows from the drains and groundwater
- On average 1,300 acre-feet of water is supplied to users at and below Caldwell on a daily basis
- This is roughly 234,000 acre-feet of water in an irrigation season
- This is a quarter of our storage supply in the Boise system


Mason Creek Mean Monthly Flows (cfs)
180
160
140
120
100
80
60
40
20
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2017
2018
2019
2020
2021
2022

Boise River June 30, 2022 Low Flow

On June 30th of 2022, Water District 63 did not have enough water in the Boise River to supply the demand below Caldwell. The only reason we where able to deliver water to 5 different canal companies and farmers was that we had BOR flow augmentation water in the river. Looking at the accounting, we were approximately 150 CFS short in the river.

WATER DISTRICT 63 - BOISE RIVER FLOW ACCOUNTING (VER 2.1.2.126) - Jun 30, 2022 20221004

REACH FLOWS IN CFS		ACTUAL DATE	NATURAL FLOW	ACTUAL FLOW	RMAINING NAT FLOW	OPERATN FLOW	STORED FLOW	RESRVOIR EVAP	NATURAL FLOW DIV	TOTAL RCH DIV	REACH GAIN	LAST RIGHT
TWIN SPRINGS		Jun 30	2052.	2050.	2050.	0.	0.	0.	2.	2.	2052.	19031214
FEATHERVILLE		Jun 30	1101.	1090.	1091.	0.	-1.	0.	10.	11.	1101.	19031214
FTHRVL TO ANDERSN RANCH		Jun 30	1168.	585.	1158.	0.	-573.	22.	0.	0.	67.	19031214
ANDSN RANCH TO ARROWROCK		Jun 30	3298.	4042.	3286.	0.	755.	14.	0.	0.	78.	19031214
MORES CREEK		Jun 30	187.	182.	182.	0.	0.	0.	4.	5.	187.	19031214
ARROWROCK TO LUCKY PEAK		Jun 30	3500.	4293.	3484.	0.	809.	14.	0.	1.	15.	19031214
LUCKY PEAK TO DIVSN DAM	*	Jun 30	3430.	2181.	1628.	0.	553.	0.	1786.	2112.	-70.	19031214
DIVSN DAM TO BOISE	*	Jun 30	3430.	1730.	1180.	0.	550.	0.	448.	450.	0.	19031214
BOISE TO GLENWOOD BR		Jun 30	3274.	1320.	776.	0.	544.	0.	248.	254.	-156.	19031214
GLENWOOD BR TO MIDDLTN		Jun 30	3391.	794.	0.	250.	544.	0.	643.	644.	117.	19031214
MIDDLETON TO CALDWELL		Jun 30	3800.	721.	127.	50.	544.	0.	481.	481.	409.	19500511
CALDWELL TO NOTUS	*	Jun 30	4055.	578.	0.	50.	528.	0.	383.	398.	255.	19500511
NOTUS TO PARMA		Jun 30	4532.	764.	378.	0.	387.	0.	149.	197.	476.	20220101
								TOTALS:	4154.	4555.	4532.	

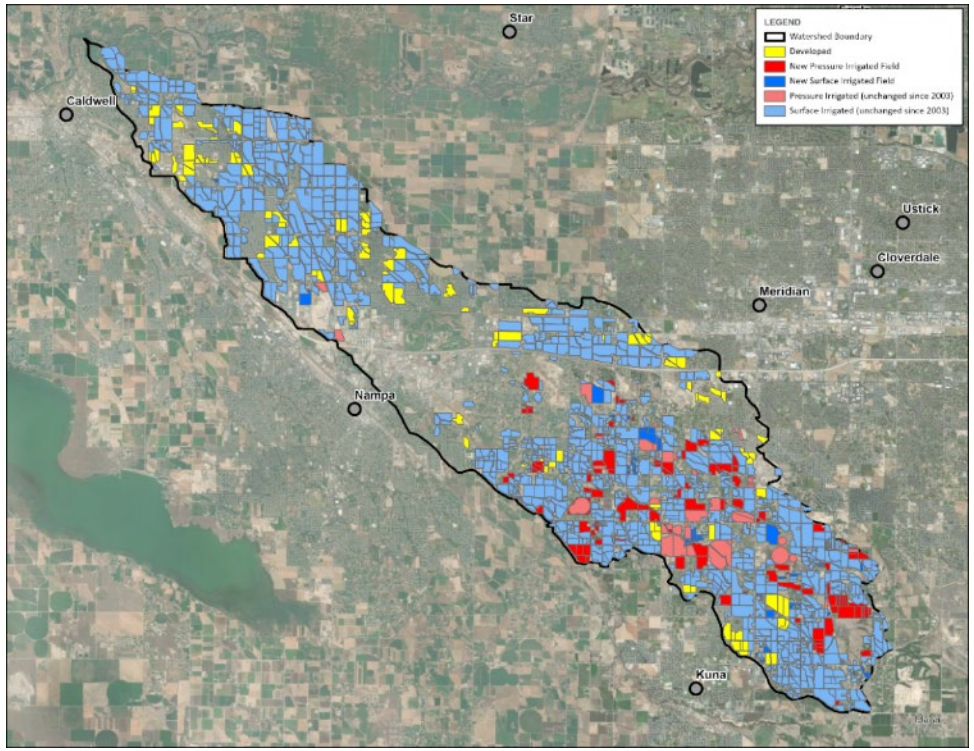
* - INDICATES FLOW ESTIMATED, NOT MEASURED

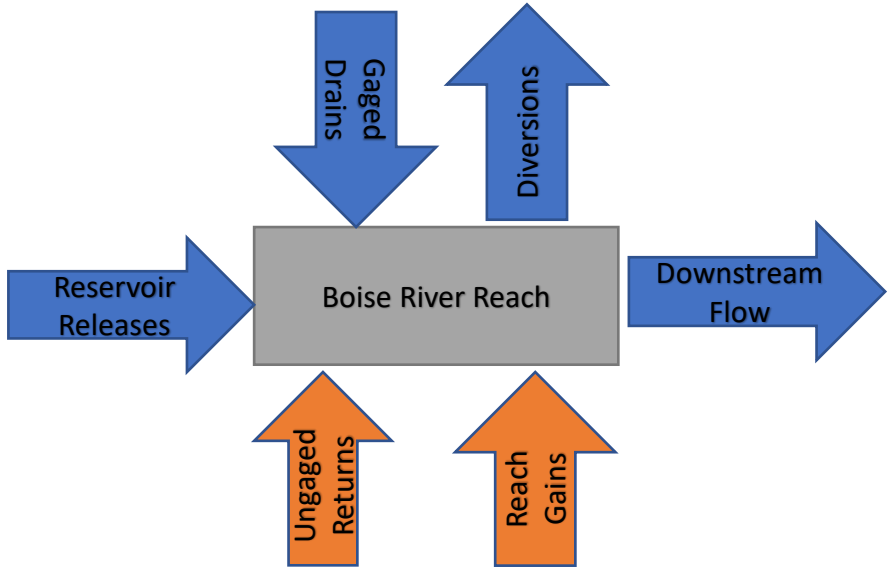
June 30, 2022

Drain	June 30 Mean Daily Flow, 2017-2022 (cfs)	June 30, 2022 Mean Flow (cfs)	Difference (cfs)
Eagle Drain	34	40	+6
Fifteen Mile Creek	103	97	-6
N Middleton Drain (Mill Slough)	38	25	-13
S Middleton Drain	71	43	-28
Mason Creek	151	75	-76
West Hartley Gulch	21	12	-9
East Hartley Gulch	55	47	-8
Conway Gulch	31	27	-4
Dixie Drain	160	135	-25
TOTAL	**664**	**501**	**-163**

Phase 1: Collect and Analyze Flow Data

- Monitor inflows and outflows within each drainshed
  - Large Drains and Subdrains
  - Diversions
  - Key Canal Crossings
  - Coordinate with water managers
  - Develop long-term plan to install and maintain network
- Develop Boise River Mass Balance
  - Measured inflows
  - Recorded diversions
  - Determine what isn't being measured
- Complete Drain Flow Trend Analysis
  - Quantify changes in drains
  - Evaluate correlation with changes in land use, management, and water use





Phase 2: Develop Tools for Better Management

- Correlate changes in land use, operations, climate, water supply availability, and groundwater to change in flows
- Evaluate flow records to quantify historic and ongoing changes
- Develop models to estimate changes as a function of influential factors
- Project changes in future drain flows and manage water delivery accordingly

Phase 3: Develop Water Supply Management and Mitigation Plan

- Alternatives Analysis
  - Surface Water Supply Management and Mitigation Alternatives
  - Groundwater Supply Management and Mitigation Alternatives
  - Water Conservation Alternatives
- Trade-off and Cost-Benefit Analysis
- Preferred Alternatives
- Implementation Plan


Big Wood and Little Wood River Systems
Hailey
Wood River Valley Aquifer System
LWR
Camas Prairie Rift Aquifer
Carey
Magic Reservoir
Silver Creek
BWR
BWCC
LWR
AFRD2
Milner Gooding Canal
BWCC
Richfield
BWCC
Gooding
Shoshone
August 2020 Imagery
Google Earth