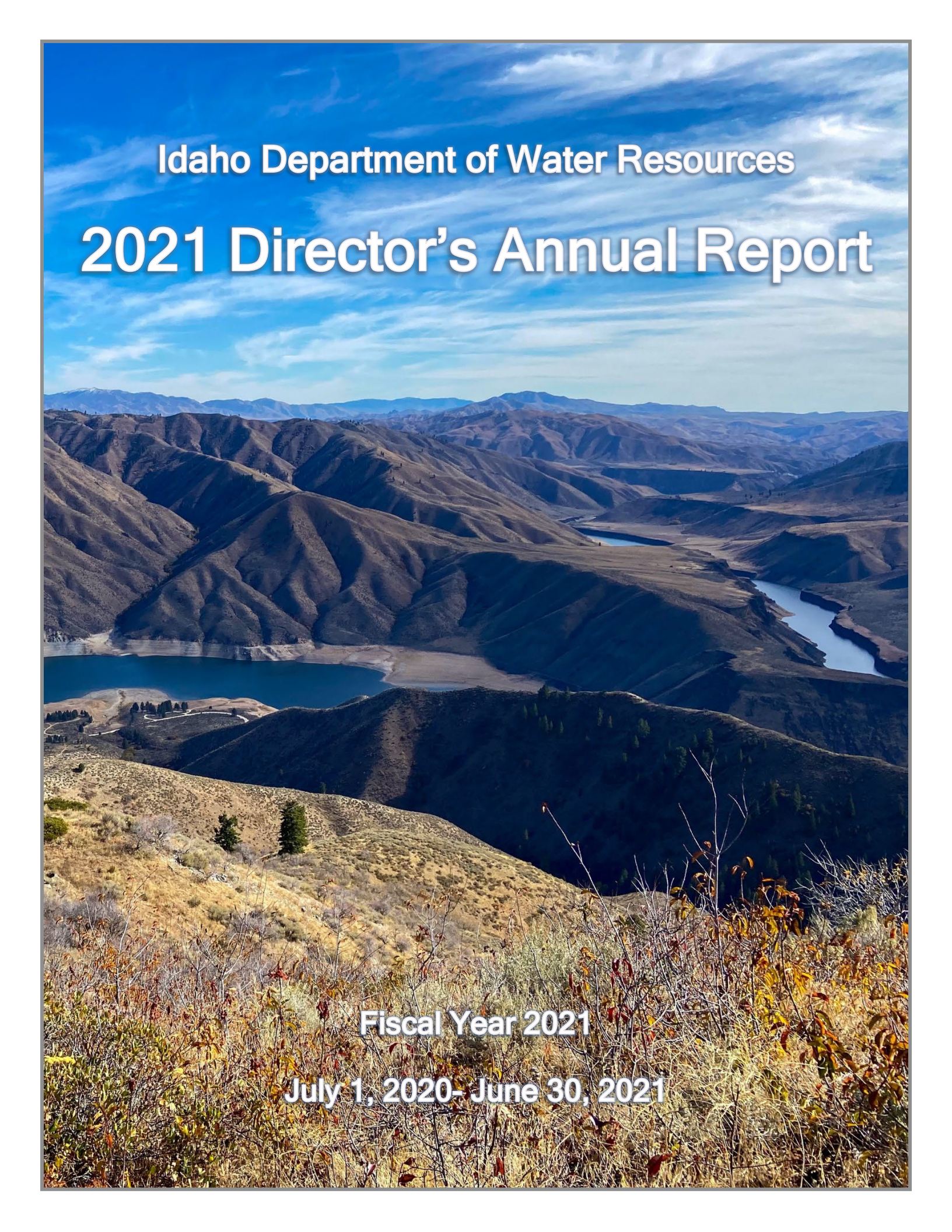




Idaho Department of Water Resources

2021 Director's Annual Report

Fiscal Year 2021

July 1, 2020- June 30, 2021



IDAHO DEPARTMENT OF **WATER RESOURCES**

The Idaho Department of Water Resources (IDWR) Director's Annual Report fulfills the requirement of Idaho Code §42-1704:

“The director [of the Idaho Department of Water Resources] shall make and render to the governor, annually, or oftener, if required, full and true reports of the work performed by the department, which reports shall contain any recommendations he may have to make in reference to legislation affecting the department.”

This report is an overview of the Idaho Department of Water Resources' programs, activities, and accomplishments during the 2021 Fiscal Year (FY2021), which began on July 1, 2020 and ended on June 30, 2021.

For more information on the activities and programs presented in this Annual Report, see IDWR's website at: <https://idwr.idaho.gov/>

Cover photo of Arrowrock Reservoir, Photo courtesy of Mathew Weaver, IDWR

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AGENCY OVERVIEW

IDWR MISSION

To serve the citizens of Idaho by ensuring that water is conserved and available for the sustainability of Idaho's economy, ecosystems, and resulting quality of life.

IDWR VISION

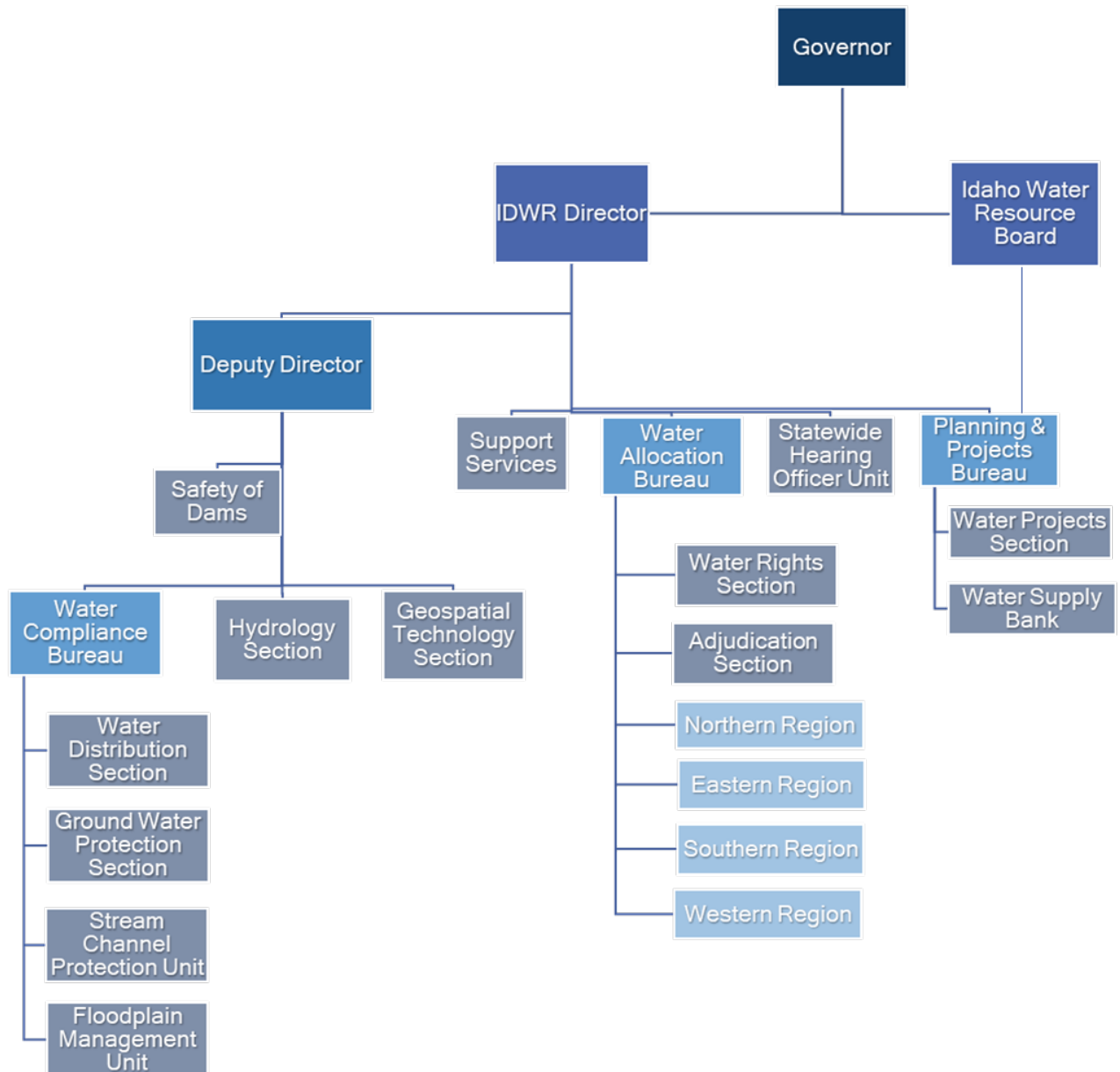
To achieve excellence in water management through innovation, efficiency, planning, and communication.

Director - Gary Spackman (2009 - present)

Deputy Director - Mathew Weaver (2013 - present)

IDWR data collection site on Canyon Creek with Lemhi Mountains in the background. Photo courtesy of John Loffredo, IDWR.

ORGANIZATION CHART



IDWR FISCAL YEAR 2021 HIGHLIGHTS

Ongoing COVID-19 restrictions and public health concerns created challenges for IDWR staff in performing many interactive public work duties. Employees focused efforts on water administration duties, improving data quality and upgrading equipment, water infrastructure projects planning, water district support, and website development.

Agency Wide

- ✓ IDWR launched its new website in July. Through FY2021, staff from each section, selected to be website content managers, worked with Access Idaho and the Office of Technology and Information Services (OITS) to migrate IDWR's old website to its new WordPress platform. IDWR website content managers developed skills in website development, editing, and management. In-house website management has eliminated long wait times to upload important and time sensitive material to the IDWR website and has reduced resource demand on OITS.

Water Allocation Bureau

- ✓ IDWR staff worked with OITS and Access Idaho to develop and create an online claim filing platform. The online application enables an efficient filing process for both the water user and IDWR. IDWR received the first online application for permit in August.
- ✓ The Commencement Order for the Clark Fork-Pend Oreille River Basins Adjudication (CFPRBA) was issued in June. IDWR began taking claims in September and anticipates at least 9,000 claims in the CFPRBA.
- ✓ In April, IDWR mailed preliminary recommendations for claims filed in the Palouse River Basin Adjudication. The Director's Report was filed in August and included recommendations for 1,987 state-based claims and recommendations for 197 federal based claims.

Water Compliance Bureau

- ✓ IDWR formed the Big Wood Ground Water Management Advisory Committee to facilitate solutions to water supply challenges among surface and groundwater water users in the Big Wood and Little Wood River drainages. In May 2021, the Director initiated an administrative proceeding under Idaho Code §42-237a.g to determine if water would be available to fill ground water rights within the Wood River Valley south of Bellevue during the 2021 irrigation season.
- ✓ Distribution staff worked with the Attorney General's Office to develop policy and procedures that would allow annual water district meetings to be conducted virtually.

Water Resource Board and Planning & Projects Bureau

- ✓ The Idaho Water Resource Board allocated \$70 million in funding to priority water infrastructure projects. An additional \$50 million in funding was appropriated by the Idaho Legislature and approved by Gov. Brad Little for major infrastructure projects statewide.

- ✓ In April, construction of the new 1,500 ft breakwater and deepening of the Thorofare channel at Priest Lake was completed. Construction on a new outlet dam will resume winter 2021/2022 and is expected to be completed no later than June 2022.

Hydrology Section

- ✓ Hydrology staff working on the Eastern Snake Plain Surface Water Monitoring Network made significant improvements and upgrades to data collection equipment, stations, and software that reduced or eliminated costly monthly subscriptions, prolonged the life of equipment, and improved the accuracy of data collected.

Geospatial Technology Section

- ✓ GTS staff digitized paper Flood Insurance Rate Maps (FIRM) for 46 towns and cities in 17 counties. This project improves stakeholders access to FIRMs and enables stakeholders to perform analysis on and plan for response activities in flood hazard areas.
- ✓ In FY2021, GTS staff continued to develop and publish critical NRT METRIC data for all major irrigated areas on the Snake River Plain. The capability of the department to internalize the annual development of NRT METRIC data will save the department approximately \$125K-\$200K per year.

IDAHO WATER YEAR IN REVIEW

Water Year (WT-YR) 2021 (October 2020 through September 2021) saw one of the most dramatic climatic shifts between winter and spring precipitation in Idaho within the 126-year PRISM precipitation & temperature record (<https://prism.oregonstate.edu/>). The only year with a drier spring occurred in 1924. On April 1, the snowpack in Idaho basins averaged 87% of normal (for the period from 1991 to 2020). On that date, the NRCS predicted that the April- July runoff volume would be 83% of normal. However, Idaho's exceptional spring drought decimated the WT-YR 2021 forecasts, and the actual runoff averaged only 54% of normal—a drop of 29%.

At the beginning of the water year, water experts expected that 2021 would be a good water year, as La Nina conditions had developed across the tropical Pacific Ocean. A La Nina typically weakens the jet stream pushing Pacific Ocean storms inland into the Pacific Northwest of the United States. Polar outbreaks also tend to bring colder than normal weather. The cool and wet weather generated by this weather pattern typically results in above average snowpack across Idaho. However, the snowpack of 2021 on April 1 was just a little below normal, not quite meeting the expectations of a La Nina winter. While less than expected, the snowpack

combined with robust reservoir carryover (113% of average) from 2020 resulted in a low probability of water supply shortages, except in a small region in the central mountains of Idaho.

It was clear at the start of the 2021 irrigation season that drought would likely intensify in the Big Wood, Little Wood, and Big Lost River basins (located in Blaine, Custer, and Butte counties).

These basins experienced significant snowpack/precipitation deficits in 2020, but a cooler than normal start to the summer (especially July) helped stretch limited water supplies throughout most of the 2020 season. However, Magic Reservoir and Mackay Reservoir were left with minimal carryover at the end of the 2020 irrigation season.

Precipitation

While wintertime precipitation was near normal, and February precipitation was quite a bit above normal, precipitation nearly stopped from March until a monsoonal event ended the dry streak on the evening of July 31. Total annual average precipitation for WT-YR 2021 was 17.2 inches statewide, the fifth driest year on record.

Precipitation from March 1 to July 31 averaged only 4.7 inches, or 45% of the March-July average. Typically, precipitation in the March to July period represents 40% of the annual total, but it was only 27% in WT-YR 2021. Not since 1924, when only 4.24 inches of precipitation fell statewide, had Idaho experienced a drier March to July period. The severity of the spring precipitation drought is shown by county in [Figure 1](#). On April 1, 23% of the state was designated as being in drought by the United States Drought Monitor (USDM) with only 4% designated as severe drought or worse.

By September 28, the entire state was designated as being in drought with 91% of the state designated as being in severe drought or worse, and 24% of the state designated as exceptional drought—the most intense category of drought. The heart of the drought was focused in the Big Wood, Big Lost, and Lemhi basins as well as Camas Prairie and the Palouse region of northern Idaho (See [Figure 2](#)).

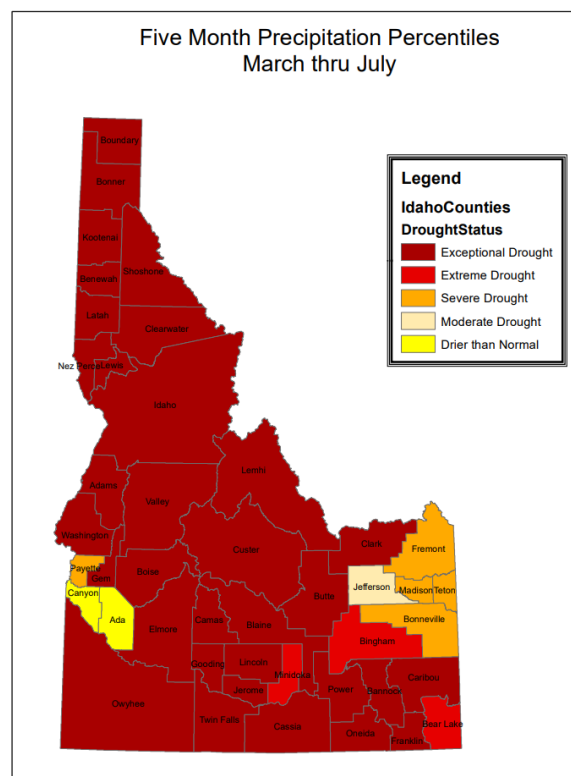


Figure 1 Drought as represented by precipitation percentiles in the State of Idaho from March-July 2021.

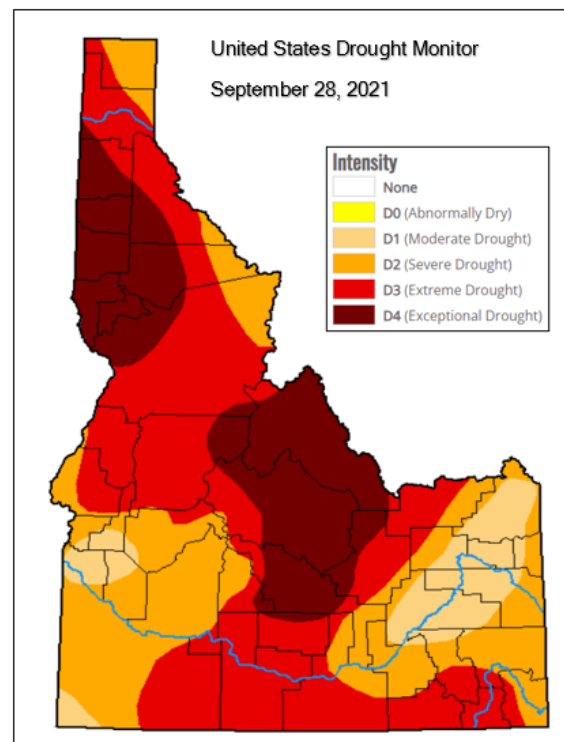


Figure 2 The designated drought categorization for Idaho on September 28, 2021, by the United States Drought Monitor.

Temperature

A significant factor exacerbating the impact of drought on Idaho in 2021 was the intense heat that struck the Pacific Northwest in the early summer of 2021. Thankfully, Idaho did not experience the Las Vegas-like temperatures recorded in parts of Oregon, Washington, and British Columbia. Still, the combined daily average temperature of June and July was the hottest on record in Idaho. The new record daily average temperature for June and July was 2.25°F greater than the previous record set in 2007. The spread between the 2nd and 10th hottest June and July on record is only 2.01°F. The period of record for June and July temperatures going back to 1895 is shown below in [Figure 3](#).

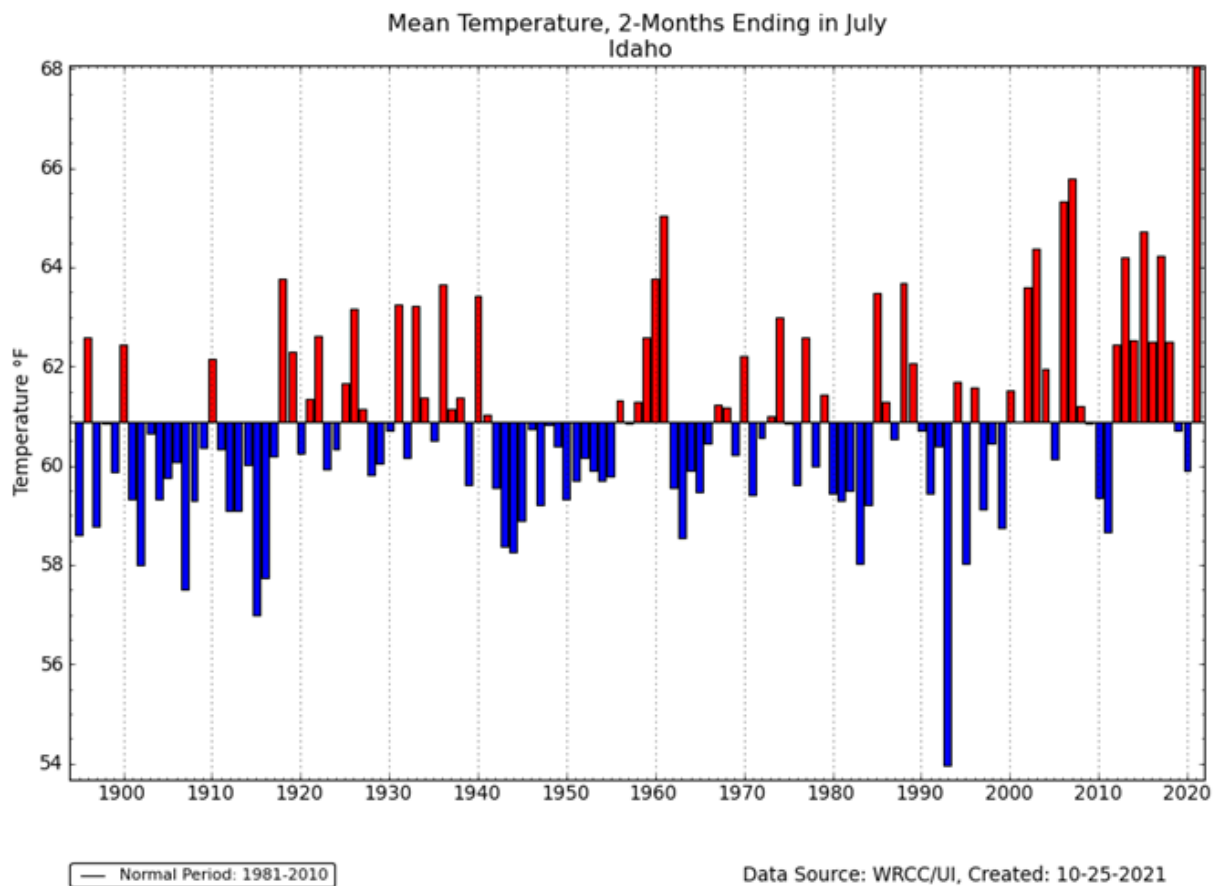


Figure 3 The statewide daily average temperatures from June 1 to July 31 for Idaho from 1895-2021. The new temperature record is 68.07° F.

Surface Water Supplies and Drought Categories

At the beginning of the irrigation season on April 1, it was clear that the extreme drought in the Pioneer Mountains of Central Idaho would intensify. Snowpack in the Big Wood River was only 78% of normal, the Little Wood was 66% of normal, and the Big Lost was 67% of normal. Throughout the rest of the state, the reservoir storage combined with snowpack predicted an adequate water supply for a good irrigation season. However, the lack of spring precipitation caused an unexpected drought to sweep across the state. In most regions water supplies came close to satisfying water demand, but the reservoir system was severely depleted by September 30. [Table 1](#) below shows an analysis of water supply conditions (March 31 reservoir content plus April-September runoff) extending back to 1956 and displays drought categories by basin.

[Table 1](#) Drought categories by basin.

Basin	Water Supply Percentile	Drought Categorization
Big Lost	0.0	Exceptional Drought
Big Wood	0.0	Exceptional Drought
Boise	10.7	Moderate Drought
Little Wood	0.0	Exceptional Drought
Oakley	20.0	Moderate Drought
Owyhee	12.3	Moderate Drought
Payette	12.3	Moderate Drought
Salmon Tract	15.3	Moderate Drought
Upper Snake	26.1	Drier than Normal

Drought Impacts

Idaho's spring drought of 2021 devastated dry land agriculture and irrigated areas where significant water shortages occurred. [Table 2](#) on the opposite page compares crop yields from 2020 and 2021 for key crops impacted by the drought. Because some of these crops are grown in both irrigated and non-irrigated regions of the state, the yield loss in non-irrigated regions is likely more severe than the state averages.

Table 2 Statewide Yield Comparison 2020 & 2021.

Crop	Units	2021 Yield	2020 Yield	2021/2020
Barley	bu/acre	89	110	81%
Chickpeas	lb/acre	800	1,510	53%
Hay (non-Alfalfa)	tons/acre	1.7	2.5	68%
Lentils	lb/acre	920	1,300	71%
Oats	bu/acre	72	102	71%
Peas	lb/acre	1,760	2,500	70%
Wheat	bu/acre	67.6	96.7	70%

Data in Table 2 comes from the National Agricultural Statistics Service (https://www.nass.usda.gov/Statistics_by_Subject/index.php?sector=CROPS).

Water Year 2022 Outlook

Water Year 2022 began with a very wet October with precipitation statewide estimated at 169% of normal. The mountain precipitation in the Big Wood, Little Wood, and Big Lost basins recorded by the NRCS SNOTEL network were 260%, 329%, and 260% of normal, respectively. If cold weather will freeze the soils, that when the snow melts in the spring, the saturated soils impede infiltration, and promote more efficient spring runoff. However, it should be noted that the drought is far from over. To recover from drought, Idaho will need an above average snowpack this winter.

At the beginning of water year 2022, La Nina conditions are again developing in the tropical Pacific Ocean. Statistically, this means there is a good probability that the snowpack will be above normal in northern Idaho, hopefully alleviating the exceptional drought in the Camas Prairie and Palouse. However, historically, all consecutive La Nina years have been drier than the previous La Nina year from the Salmon River southward.

There is no known mechanism behind this phenomenon, but this pattern has repeated itself five times in the 37 years since 1984. Figure 4 on the following page shows the average snowpack for all Idaho basins south of and including the Salmon River basin on April 1, for each of the five consecutive La Ninas. Figure 4 shows that the average annual snowpack of consecutive La Nina winters is below average for all basins. If this phenomenon repeats itself in 2022, drought is likely to continue for another year throughout southern Idaho.

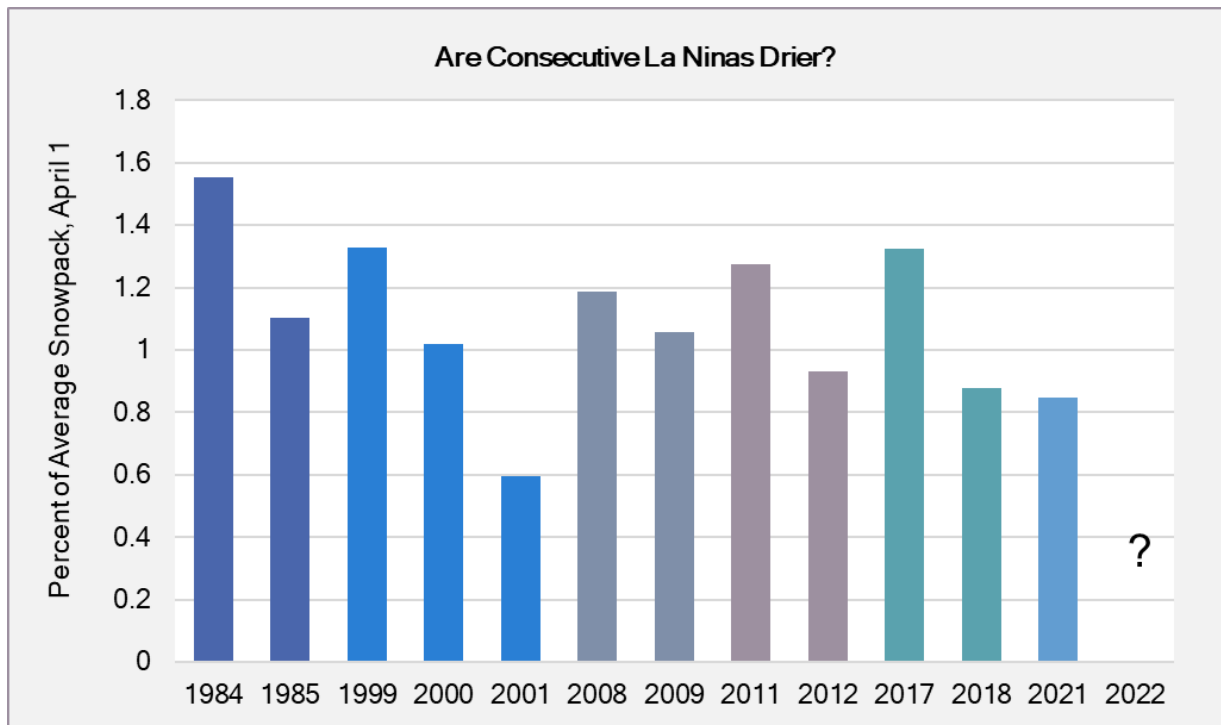


Figure 5 Since 1984, the snowpack during consecutive La Nina winters has declined from the previous year's snowpack. In the figure above, La Nina conditions are defined by the Oceanic Nino Index (ONI) for the October, November, December (OND) period.

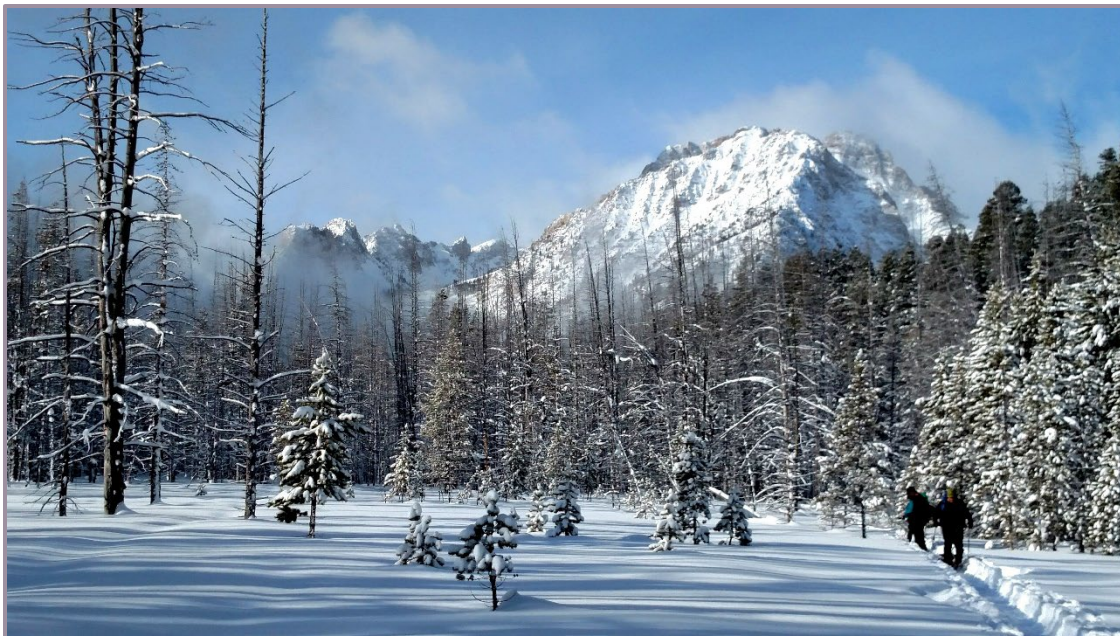


Figure 4. IDWR staff enjoy the snow on a sunny day in the Sawtooth Mountains area. Photo courtesy of Denise Lauerman, IDWR.

WATER ALLOCATION BUREAU

The Water Allocation Bureau addresses all administrative water right proposals and recommends elements of water rights during water right adjudication. The Allocation Bureau consists of the Water Rights Section, Adjudication Section, and oversees IDWR Regional Offices.

Water Allocation Bureau Chief - Shelley Keen

Outlet control at Louie Lake. Photo courtesy of Mathew Weaver, IDWR.

WATER RIGHTS SECTION

The Water Rights Section (Water Rights) oversees all aspects of water right permitting, licensing, and transferring. Water Rights also archives all current state water right records in hard copy and digital formats and maintains a water rights database. Water Rights employees work out of the State Office in Boise and the four regional offices. Water Resource Agents and Technical Records Specialists process applications for:

- New water rights (applications for permit)
- Water right transfers and exchanges
- Ownership changes
- Water right licenses
- Temporary water uses
- Temporary changes of water rights

In FY2021, the number of incoming applications to the Water Rights Program remained similar to previous years. Since FY2012, IDWR has exerted effort to effectively reduce its pending workload and processing time. The overall pending workload continues to decrease as staff members concentrate on completing older Applications for Permit and Water Right Licenses. Like FY2019, an increase in transfer activity in eastern Idaho offset additional efforts to reduce the transfer backlog. Drought declarations in multiple counties diverted resources as staff members completed temporary changes to cover the drought.

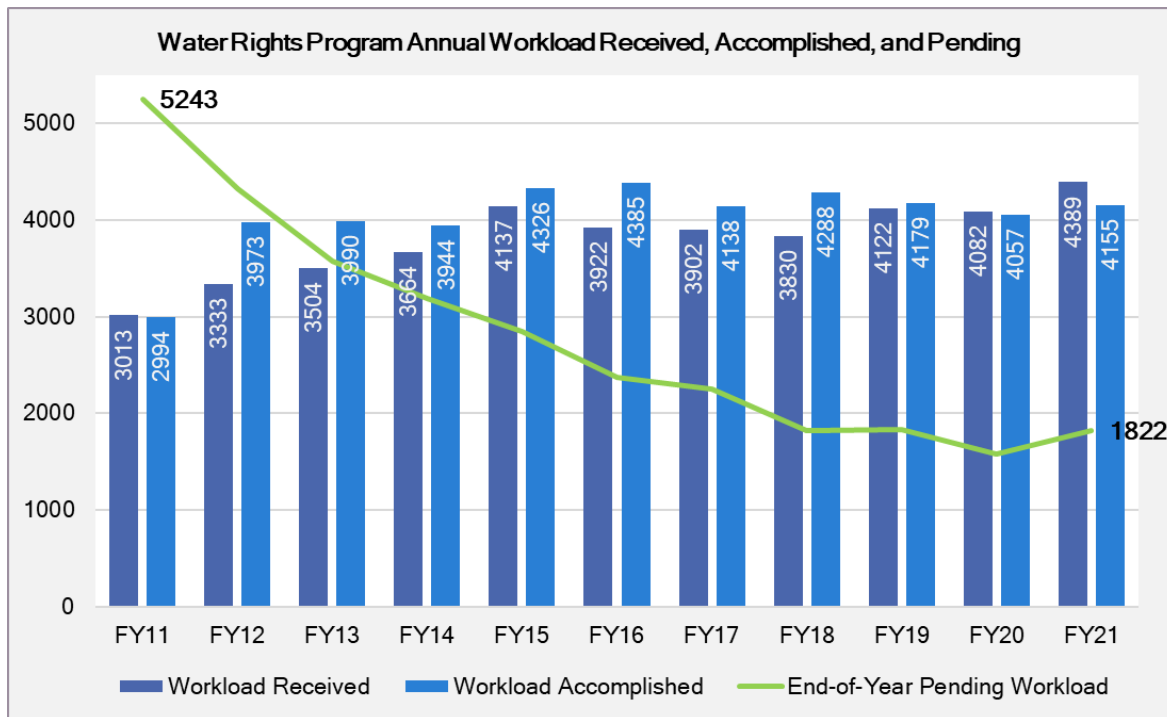


Figure 6 shows the sum of permits, transfers, ownership changes, licenses, leases, and rentals received and processed by IDWR's Water Rights program.

Applications for Permit

Applications for permit seek water rights for new beneficial uses of water and are the first step to acquire a water right license. The number of applications for permit is an indicator of economic activity in Idaho. In FY2021, IDWR received 523 Applications for Permit, up nearly 12% from last year. IDWR staff completed 509 applications, leaving a pending workload of 363 applications. Pending, protested applications for permit are included in the end of year workload and were reduced by 13% in FY2021.

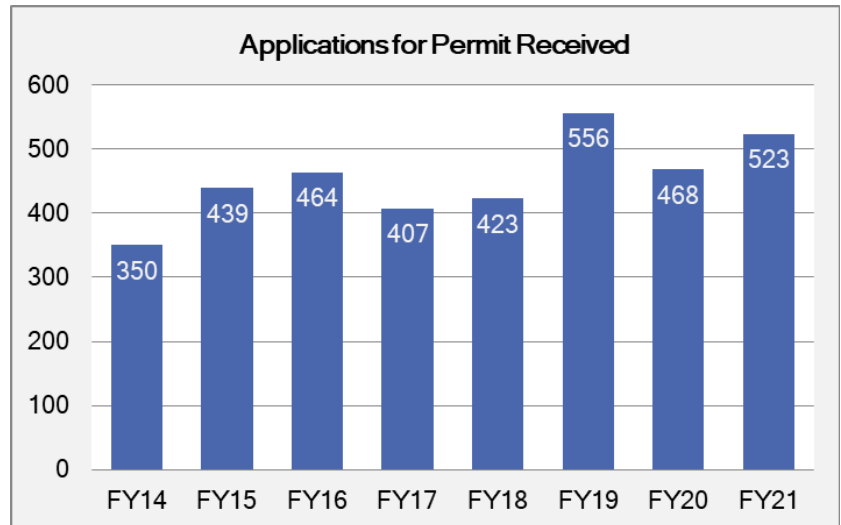


Figure 7 Total annual applications for permit received by IDWR's Water Rights Section.

Transfer Applications

A transfer application proposes to change an element of an existing water right, such as the place of use or nature of use. Transfers reconfigure existing water rights where new water rights cannot be issued and are significant in the eastern and southern parts of Idaho. Like applications for permit, transfer applications are indicators of economic activity. The number of new transfer applications received in FY2021 increased by 14% compared to the previous fiscal year. In FY2021, IDWR received 279 transfer applications and resolved 291 transfer applications. Most transfer activity came from eastern Idaho. Water Rights staff's steady output in transfer processing resulted in a small (7%) decline in end-of-year pending workload. Figure 8 on the following page illustrates transfer application history.

Water Right Licensing

A water right license confirms the elements of a new water right and establishes the water right as real property. Water right licenses increase property value and are security to lenders and investors for operating loans or investment capital. In the past, IDWR assigned water right licensing a lesser priority compared to the processing of applications for permit, applications for transfers, and Water Supply Bank rentals. As a result, in 2011, the unresolved licensing workload grew to 3,500. In the same year, the Idaho Supreme Court ruled that a water right does not become real property until IDWR issues a license. This ruling resulted in a renewed urgency to complete the licensing process and eliminate the backlog.

Since 2012, Allocation staff reduced the water right license backlog by 15% on average each year. In FY2021, 412 water right license were issued and additional efforts in processing licenses reduced the backlog to 581. (See Figure 9 on the following page).

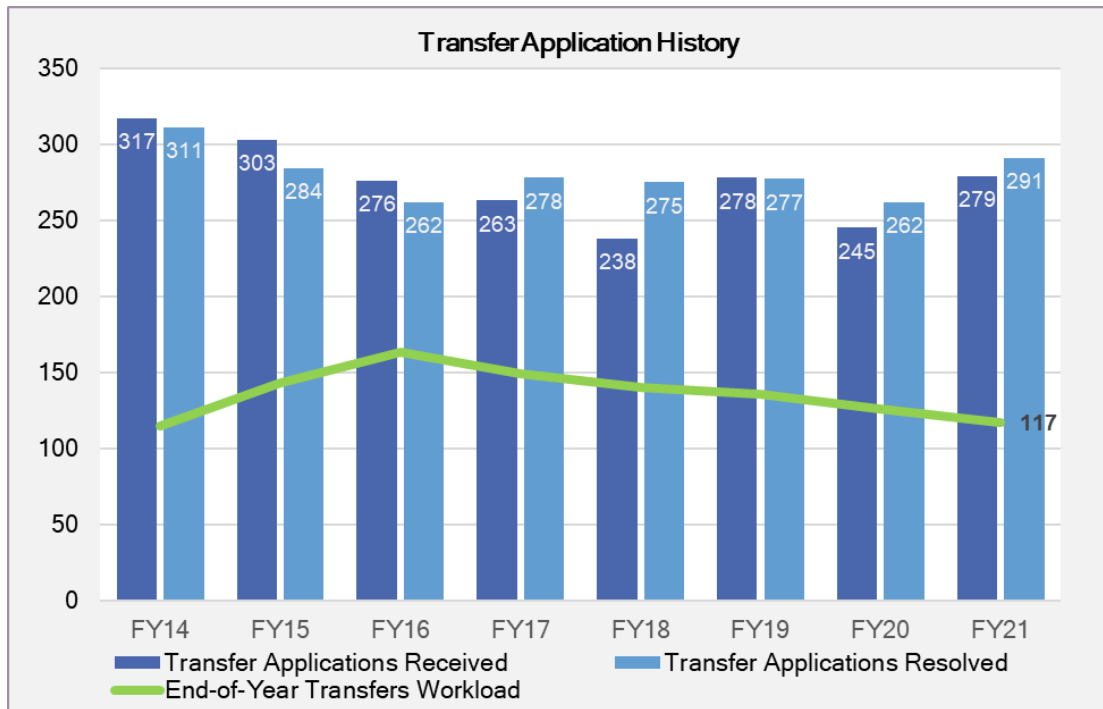


Figure 8. Despite relative high numbers of transfer applications filed in FY2019 and FY2021, the end-of-year workload has declined for five consecutive years.

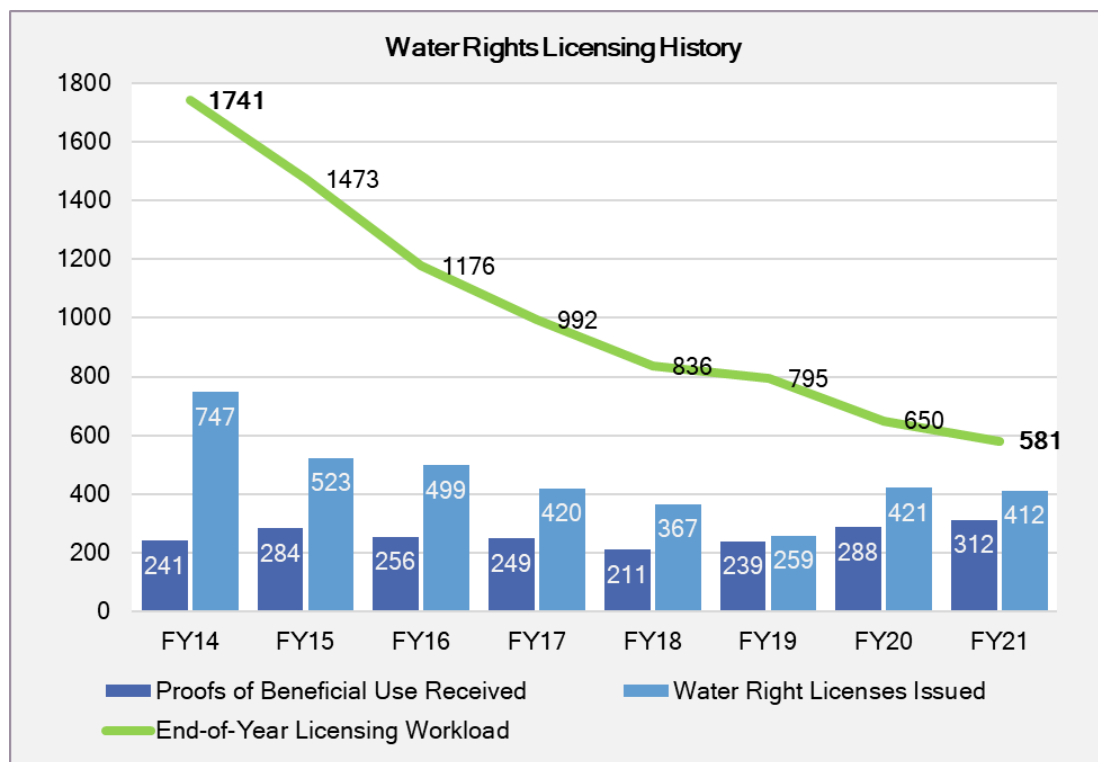


Figure 9 shows the annual number of proofs of beneficial use received, water rights license issued, and the remaining year end workload. Allocation staff have issued 3,684 water right licenses since FY2014.

Ownership Changes

Maintaining current water right ownership records is critical to water right administration. Current ownership records enable IDWR to communicate with water users about matters affecting their water rights, such as organizing new water districts, holding water district meetings, establishing ground water management areas, and responding to delivery calls. Water right ownership changes represent real property transactions. The steady increase in the number of ownership change requests over the last five years aligns with increased activity in Idaho's real estate market. Figure 10 on the following page shows the number of water right ownership change requests received by the Water Rights Section since FY2014. In FY2021, IDWR received 2,931 applications for ownership changes, a nearly 6% increase from the previous year. Staff completed 2,581 ownership changes, leaving a pending workload of 645 change applications.

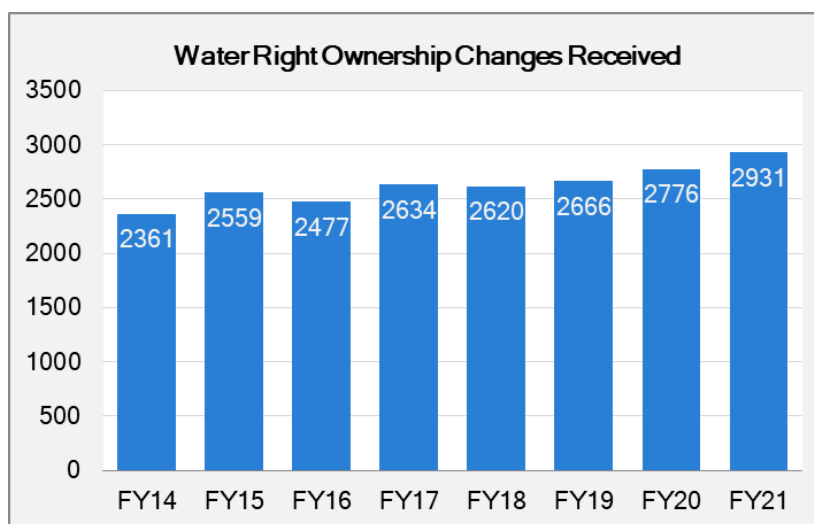


Figure 10 shows the annual total of water right ownership changes received by IDWR's water rights section.

Temporary Approvals & Changes

Originally, temporary approvals were used for short-term projects with a maximum allowance of five acre-feet of water annually. The 2017 Legislature changed Idaho Code § 42-202A to remove the annual volume restriction for temporary approvals that proposed flood damage prevention, ground water recharge, and ground water or surface water remediation. In the years that followed, there was a substantial increase in the number of temporary approvals issued by the Department. In FY2021 IDWR issued 157 temporary approvals.

In addition to temporary approvals, IDWR will grant temporary changes to existing water rights to allow water users to adjust their water use to meet drought conditions. In FY2021, twenty counties issued drought declarations that resulted in 24 temporary water right changes. While negligible in wet years, this program can require substantial effort from IDWR staff in dry years, requiring IDWR to temporarily divert resources from other programs, such as water right licensing.

ADJUDICATION SECTION

A general adjudication of water rights determines, by court decree, the existing water rights within a river basin and officially records them. When initiating an adjudication, Idaho courts have prioritized the determination of non-de minimis water rights and allowed the adjudication of de minimis domestic and stockwater uses to be deferred. Following the completion of an adjudication of non-de minimis water rights, IDWR will have a compilation of water rights in the basin and can deliver water to users who are entitled to the water when disputes about use and delivery arise. Additionally, the water right compilation roughly estimates total water use in a basin. By more accurately estimating total water use in Idaho, IDWR can also estimate how much water is available for future development of water resources. IDWR's FY2021 adjudication efforts are described below.

Coeur d'Alene- Spokane River Basin Adjudication (CSRBA) - North Idaho Adjudication Phase 1

- ✓ In April 2021, IDWR submitted the Spring 2021 Director's Report of Late and Miscellaneous Claims for Water Rights, that contained 33 late or miscellaneous claim recommendations. Additionally, 345 unclaimed water rights in Basin 95 are recommended to be disallowed.
- ✓ As of October 2021, IDWR has submitted 13,152 claims in the CSRBA. The court has decreed 12,079 claims, with 1,073 remaining claims pending court action.

Palouse River Basin Adjudication (PRBA) - North Idaho Adjudication Phase 2

- ✓ In April 2021, IDWR mailed 1,928 preliminary recommendations in preparation of the Director's Report. As a result of the preliminary mailing, Adjudication staff received 800 Notice of Error reply's agreeing with the recommendation and logged over 130 telephone calls and in office meetings with customers.
- ✓ In August 2021, IDWR prepared and mailed the Director's Report for water rights claimed in the PRBA. The Director's report included 1,987 state-based claims (1,894 active and 93 disallowed) and recommendations for 197 federal based claims. The deadline to object is January 10, 2022.
- ✓ In FY2021, IDWR received 66 additional PRBA state claims and prepared 1,016 preliminary recommendations.

Clark Fork- Pend Oreille River Basin Adjudication (CFPRBA) - North Idaho Adjudication Phase 3

- ✓ In June 2021, The Idaho Water Adjudications Court issued an order to Commence the CFPRBA. IDWR immediately prepared the first group of commencement notices to be mailed to property owners in Basin 97.
- ✓ In July 2021, the United States Department of Justice filed an appeal to the CFPRBA commencement order.
- ✓ Despite the pending appeal, in September 2021, IDWR mailed the first of six commencement mailing groups to roughly 5,000 property owners. The department anticipates 9,000 claims and the final Director's Report on the CFPRBA is anticipated in 2030.

Bear River Basin Adjudication (BRBA)

- ✓ In June 2021, The Idaho Water Adjudications Court issued an order to Commence the Bear River Basin Adjudication. On July 27, 2021, the United States Department of Justice filed an appeal to the commencement order. IDWR is cautiously taking steps to prepare for claims taking in the BRBA upon resolution of the appeal filed by the United States. IDWR expects 14,000 claims in the BRBA.

Snake River Basin Adjudication (SRBA)

The SRBA was (and remains) the largest water rights adjudication conducted in the country. The Final Unified Decree was issued in the SRBA on August 26, 2014. IDWR continues to work with the SRBA court to process deferred domestic and stockwater claims.

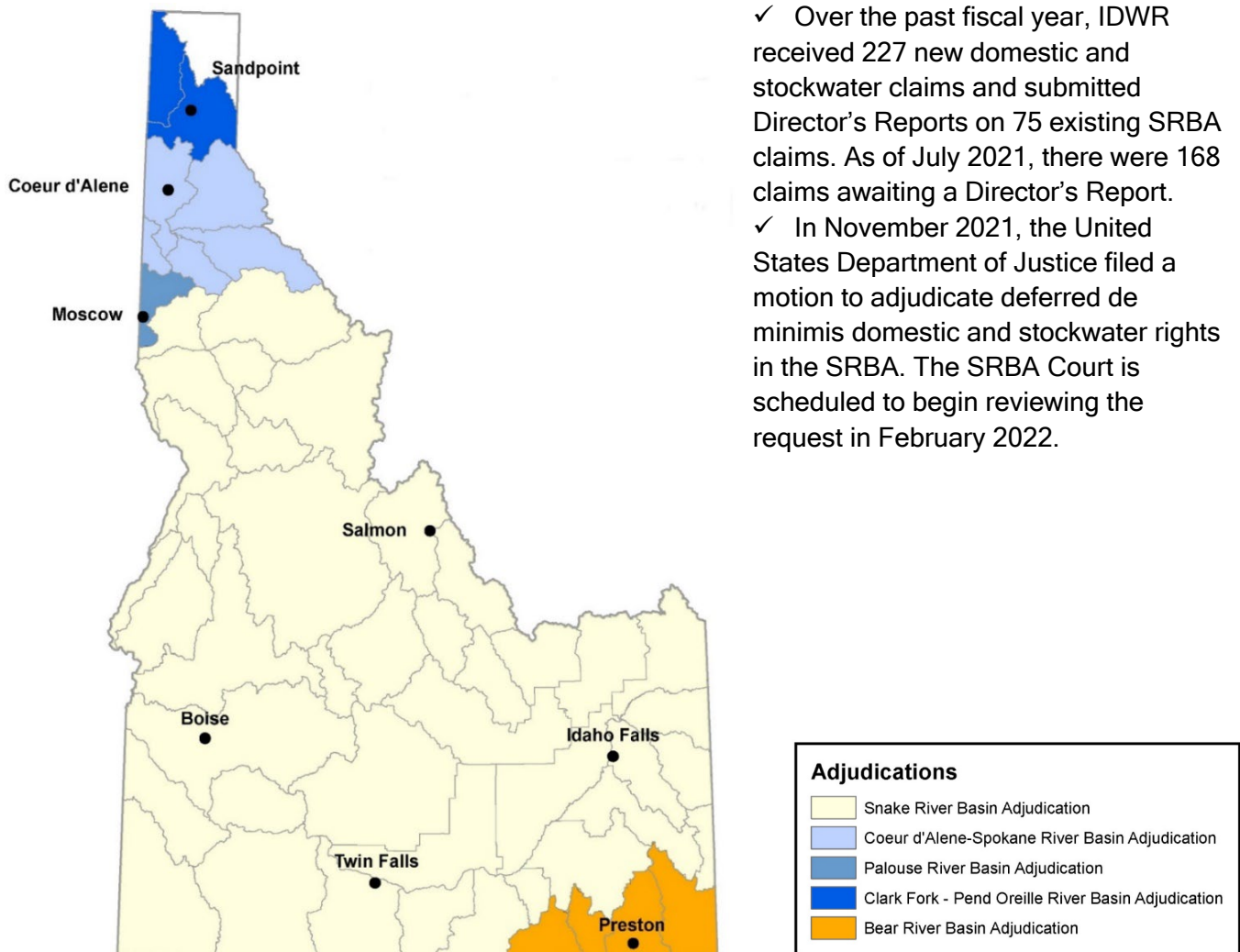
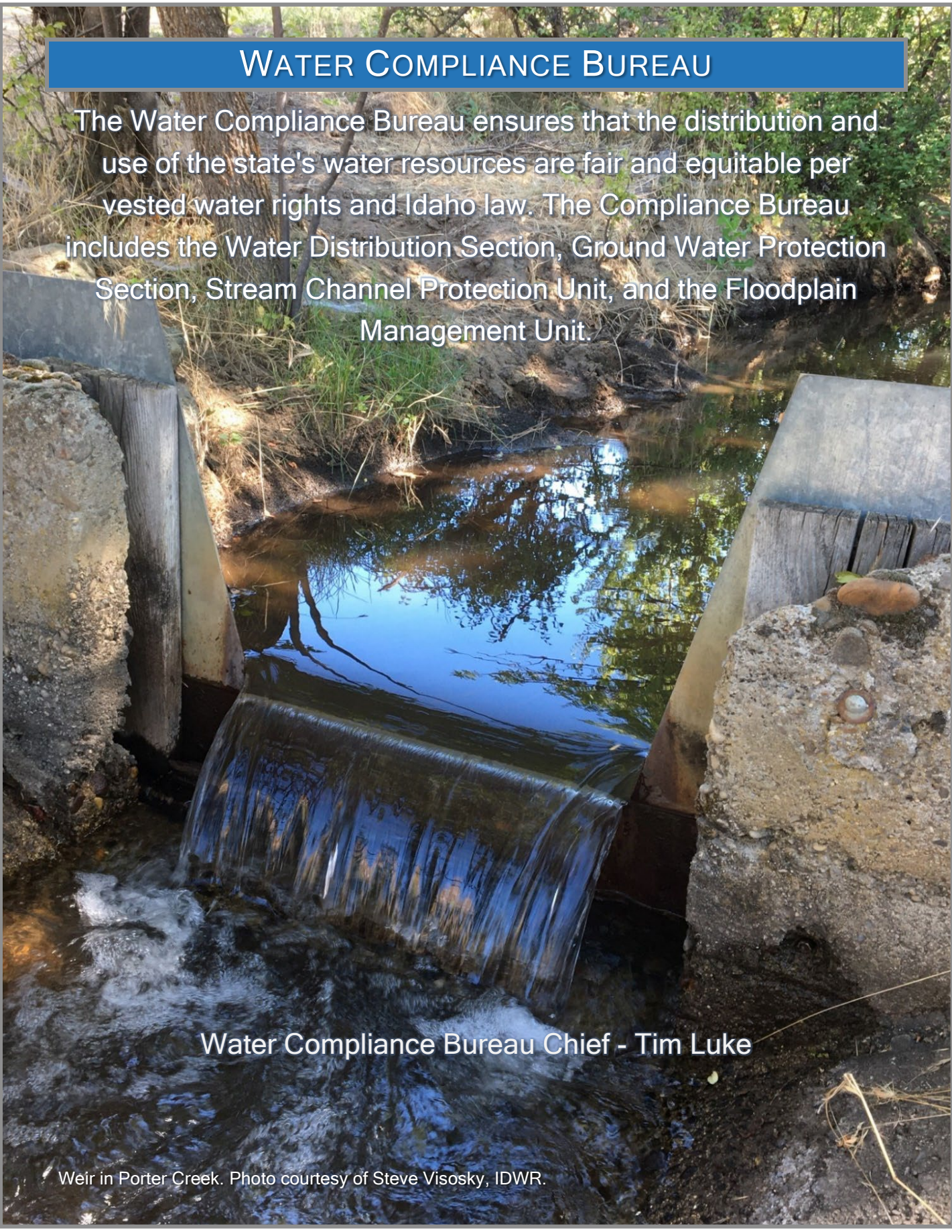


Figure 11 illustrates the location of adjudication efforts in Idaho's administered basins.



WATER COMPLIANCE BUREAU

The Water Compliance Bureau ensures that the distribution and use of the state's water resources are fair and equitable per vested water rights and Idaho law. The Compliance Bureau includes the Water Distribution Section, Ground Water Protection Section, Stream Channel Protection Unit, and the Floodplain Management Unit.

Water Compliance Bureau Chief - Tim Luke

Weir in Porter Creek. Photo courtesy of Steve Visosky, IDWR.

WATER DISTRIBUTION SECTION

The Water Distribution Section supervises the distribution of water to water users, especially when there is insufficient water to satisfy all water rights. The Water Distribution Section has two programs to fulfill this responsibility. The Water Measurement Program supports the control and measurement of water diversion systems. The Water Districts Program assists water districts, water measurement districts, and ground water districts.

Water Measurement Program

The Water Measurement Program establishes, maintains, and implements state water measurement and reporting standards. Staff members work directly with water districts and water measurement districts to implement measurement requirements and programs. There were no new water measurement districts or measurement orders established in FY2021. IDWR issued several measurement orders in 2018 and 2019, and Water Distribution staff focused their efforts there.

Three new flow meters were tested and approved in FY2021. Water Distribution staff continue to refine the process associated with third-party testing of flow meters for inclusion on IDWR's List of Approved Closed Conduit Flow Meters. Consistent and coordinated evaluation of test results is critical to IDWR's flow meter certification program.

Water Districts Program

The Water Districts Program implements Idaho Code §42-604, which requires IDWR to create state water districts for public streams or water supplies for which the courts have decreed water rights. Idaho Code also authorizes IDWR, through the Water Districts Program, to revise the boundaries of existing districts, combine two or more districts, and abolish districts, if necessary.

Nearly 100 active water districts and sub-districts exist across Idaho. Some districts include thousands of water users and others only a handful. Regardless of size, each active water district employs a watermaster who oversees water distribution within the district. The primary responsibility of all Idaho watermasters is to ensure waters of the State of Idaho are diverted and distributed to users in adherence to Idaho water law and the prior appropriation doctrine. The watermaster's primary duties are daily water distribution, record keeping, measurement, and general district management.

The IDWR Water Districts Program supports and supervises water districts and watermasters with the following activities:

- Creating new water districts or combining, modifying, or abolishing existing districts to facilitate improved water measurement and delivery.
- Advising water districts on proper district operation.
- Training watermasters through publications and one-on-one or group training sessions.
- Mailing notices, updating water user information databases, and assisting in water delivery disputes.

In FY2021, State restrictions on in person meetings and public health concerns related to COVID-19 prompted water distribution staff to work with the Attorney General's office to develop guidance for virtual water district meetings. Idaho Code §42-605 requires water districts to hold an annual meeting with their water users to manage administrative matters and, if necessary, adopt resolutions that assure or improve the distribution of water in the district. Water district meetings are also subject to Idaho Code, Title 74, Chapter 2, Idaho Open Meetings Law, which require at least one voting member or the watermaster of the water district to be present at the designated meeting location. In FY2021, staff were able to host 21 virtual water district meetings and four advisory committee meetings.

Typically, water distribution staff members conduct in-person group training sessions for watermasters. Extreme drought conditions across the state increased demand on IDWR staff members' time, and ongoing COVID-19 restrictions made planning and delivering training sessions difficult. As a result, IDWR did not conduct in-person training sessions in FY2021. Instead, staff members trained or assisted watermasters individually across the state, continuing to reference and train from the Water District Operations Manual, a comprehensive IDWR technical reference for water districts, IDWR appointed watermasters, and other water district officials. Distribution staff trained or assisted watermasters in water districts 29D, 29H, 36A, 37O, 45A, 45F, 65D.

GROUND WATER PROTECTION SECTION

The Ground Water Protection Section regulates well construction and well driller licensing in Idaho via four programs: Well Construction Program, Underground Injection Control Program, Geothermal Resources Program, and Driller Licensing Program.

Well Construction Program

The Well Construction Program supervises the construction, modification, and abandonment (decommissioning) of all non-geothermal wells, including domestic, commercial, irrigation, municipal, industrial, and monitoring wells.

The overall number of well construction permits issued has steadily increased over the last five years. A surge in growth and development across the state, particularly new home construction, has contributed to this increase. Over 80% of well construction permits issued each year are for domestic use wells. In FY2021, the department received over 4,700 applications for well construction permit, a 15% increase from the previous year (see [Figure 12](#) on the following page). There was a 28% increase in well construction permit applications between May and June of 2021, likely due to drought and ongoing development that creates high demand for replacement wells. IDWR staff inspected 23.4% of newly drilled wells in FY2021.

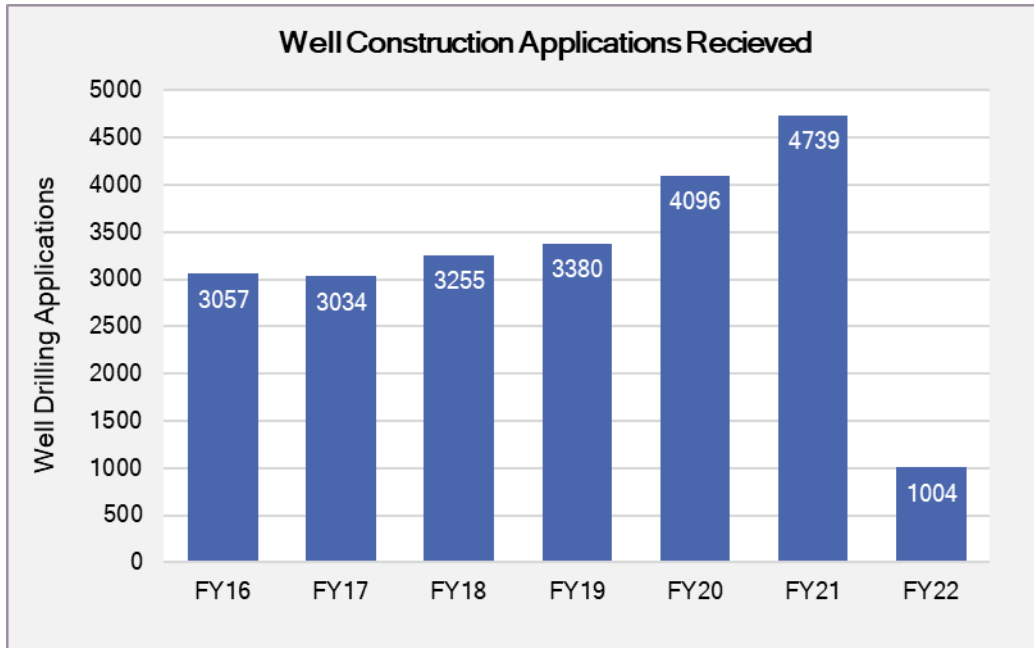


Figure 12 shows the number of well construction applications received annually by IDWR.

Driller Licensing Program

The Driller Licensing Program regulates the licensing of well drillers. The program is consistent with the Well Driller Licensing Rules (IDAPA 37.03.10), which establish the requirements and procedures for obtaining and renewing authorization to drill wells. Driller Licensing Program staff review and process licensing applications, organize and present required continuing education seminars, and coordinate well driller annual license renewal.

IDWR renews driller and operator licenses every two years, with roughly half of the total state licenses renewed in alternating years. The total number of active driller and operator licenses has been relatively constant for the past five years.



Figure 13 IDWR's ground water protection staff inspect well construction activities across the state of Idaho. Photo courtesy of Scott Potter, IDWR.

Underground Injection Control Program

The Underground Injection Control (UIC) program, delegated to IDWR by the US Environmental Protection Agency (EPA) in 1985, regulates the construction, operation, and abandonment (decommissioning) of all injection wells in Idaho. Injection wells are used to dispose of or store excess stormwater, agricultural water, and facility heating/cooling water. There are currently over 21,000 injection wells on record with IDWR. Approximately 18,000 are shallow wells, less than 18 ft. deep, and remaining wells are 18 ft. deep or more.

During FY2021, UIC staff approved and processed 525 new and renewal applications for injection wells, approximately 50% more applications than in FY2020. Before approving construction, modification, or continued use of an injection well, UIC staff members review the application, conduct a field visit (if necessary), and publicly notices the project.

ENFORCEMENT UNIT

The Enforcement Unit ensures consistency in regulatory activities prescribed by state law. The unit works with regional office employees to resolve complaints and violations in all IDWR regulatory programs statewide: water rights, water distribution, well driller licensing, well construction, stream alteration, suction dredge mining, underground injection control, and safety of dams. The Enforcement Unit coordinates or initiates enforcement activities, including addressing complaints from the public, conducting investigations, issuing notices of violation (NOV), and conducting compliance conferences to resolve violations. The Enforcement Unit consists of one dedicated Program Coordinator.

Investigations

In FY2021, the number of enforcement complaints and cases investigated increased by 20% compared to the previous two fiscal years. Enforcement staff investigated 102 new cases in FY2021. The new cases originated from various sources, including public complaints, watermaster referrals, and IDWR discoveries. IDWR resolved or closed 151 cases in FY2021, both new cases and unresolved cases from previous years. IDWR issued a Notice of Violation (NOV) in 12 of the 151 cases and resolved all 12 NOVs by executing consent agreements with NOV recipients to ensure future compliance. IDWR collected a total of \$28,458 in penalties in FY2021. Most penalties collected were associated with the unauthorized use of water. [Figure 14](#) on the following page illustrates IDWR's enforcement activities in FY2021.

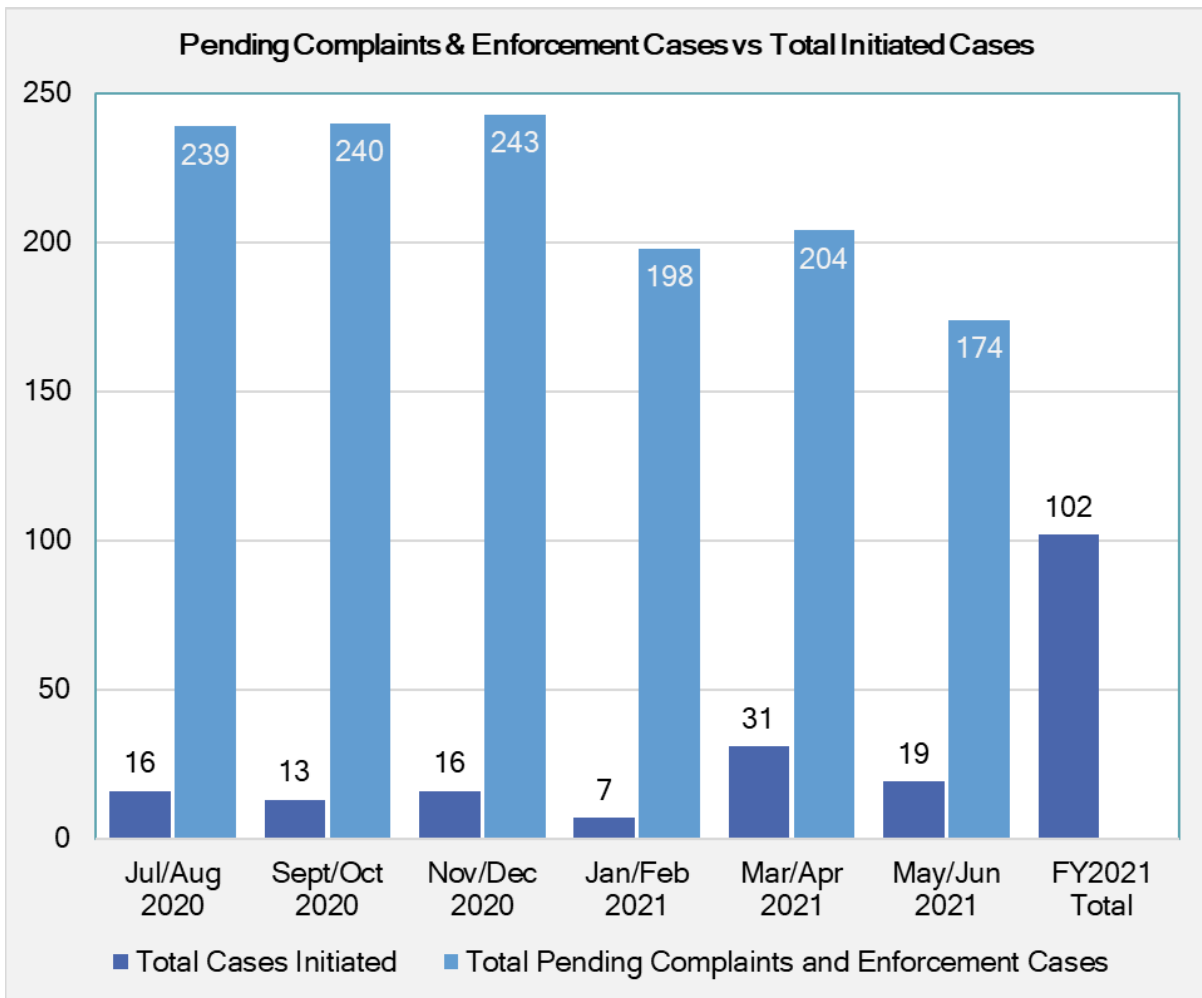


Figure 14 The chart above shows the number of informal and formal enforcement cases or actions (represented in light blue) that were opened at some time in history and are still reflecting a pending status in the enforcement database. The Total Cases Initiated (dark blue bars) are a subset of the Total Pending Complaints and Enforcement Cases.

STREAM CHANNEL PROTECTION UNIT

The Stream Channel Protection Unit evaluates potential alterations to stream channels to protect fish and wildlife habitat, aquatic life, recreation, aesthetic beauty, and water quality. Under Idaho Code §42-3801 and the Idaho Stream Channel Protection Act requirements, the Stream Channel Protection Unit approves or denies proposed work inside the ordinary high-water mark (generally, the streambed and stream bank) of a continuously flowing stream.

Stream Channel Protection permits are issued for two different types of applications: Joint Application for Stream Channel Alteration Permits (Joint Application for Permits) and Letter Permit for Recreational Mining (Letter Permit).

Joint Application for Stream Channel Alteration Permits

IDWR developed the Joint Application for Permits form and process in conjunction with the Idaho Department of Lands and the US Army Corps of Engineers because these agencies also have jurisdictional permitting programs related to the protection of streams and wetlands. An applicant can complete a single application and submit copies to each agency for subsequent approval. The Stream Channel Protection Unit generally issues a decision within 60-90 days (the timeline varies depending on the project's complexity and the number of parties affected by the project).

The Stream Channel Protection Unit received 324 Joint Applications for Permit in FY2021, approximately 20% less than the number of applications received in the last two years. The decrease in applications is likely attributed to drier conditions over the past year with little to no flood events that otherwise result in an uptick of stream projects. For example, the spike in FY18 applications is a result of flooding activity in the spring of 2017. IDWR issued 234 stream channel alteration permits in FY21. The variation in applications received and permits issued represents withdrawn applications, IDWR denial, and applications where no permit was required.

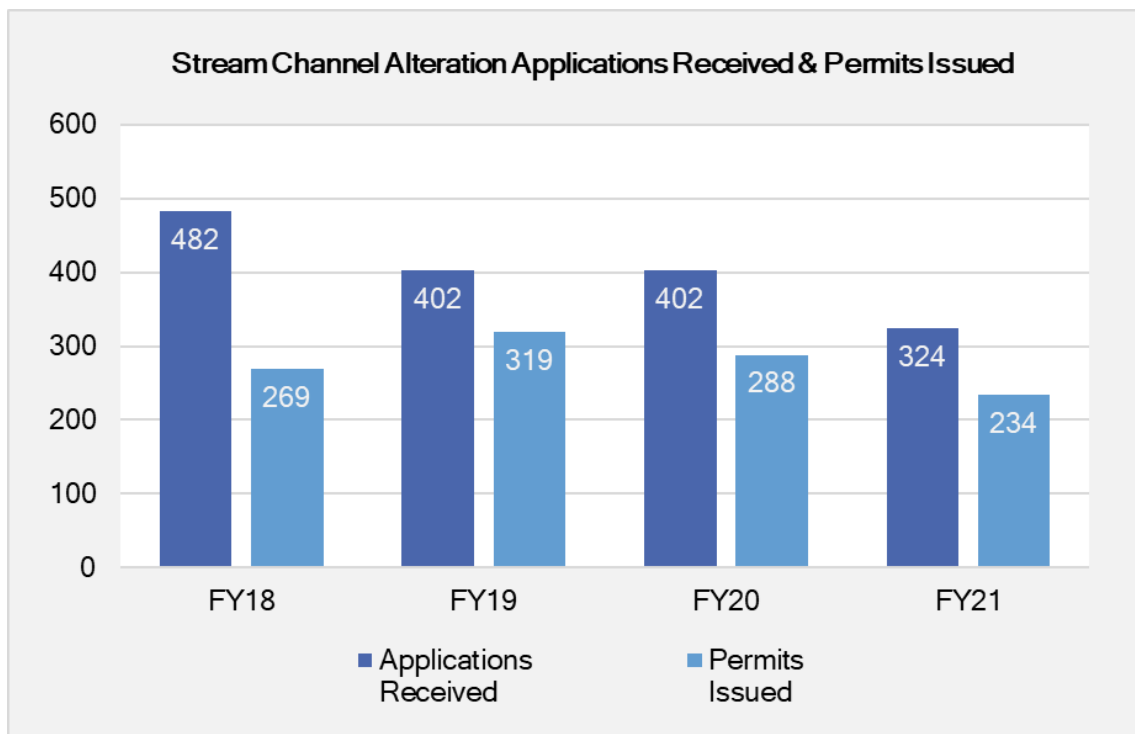


Figure 15 shows the recent annual number of stream channel alteration applications received and stream channel alteration permits issued by IDWR.

Letter Permit for Recreational Mining

The Stream Channel Protection Act regulates the use of recreational mining equipment in perennial streams. IDWR requires miners to obtain a Letter Permit from IDWR before altering any portion of the streambed. Completed and signed letter permits are considered authorized by IDWR upon receipt of the permit and fee. By signing the letter permit, the applicant acknowledges they have read and understood the Recreational Mining Stream Channel Alteration instruction booklet and will act in compliance with the stated instructions and rules. In FY2021, IDWR issued 343 Recreational Mining Letter permits.

FLOODPLAIN MANAGEMENT UNIT

The Floodplain Management Unit is a single employee unit administered by the State National Flood Insurance Program (NFIP) Coordinator. The State NFIP Coordinator administers the NFIP via the Community Assistance Program - State Support Services Element (CAP-SSSE), a cooperative agreement grant from FEMA. The Floodplain Management Unit hosted 11 floodplain-related workshops throughout the state in FY2021. This is a much lower number of workshops than previous years, still due to COVID-19 related travel restrictions. The workshops ensure flood loss reduction goals of the NFIP are met, build state and community floodplain management expertise and capability, and leverage state knowledge and expertise in working with communities. The workshops also fulfill the requirements of Idaho Code §§ 46-1020 through 46-1024.

The NFIP has two programs, the Regular program and the Emergency program. In the Regular program communities are required to implement comprehensive floodplain management and are entitled to federal flood insurance. Within the Regular program is a voluntary incentive program called the Community Rating System (CRS). Communities may participate in the CRS program when they have exceeded NFIP's minimum requirements in the Regular program. Under the Emergency program, a community is required to adopt minimum floodplain management standards and limited flood insurance coverage is available. Communities are converted to the Regular program upon completing a Flood Insurance Study (FIS) and issuance of Flood Insurance Rate Maps (FIRMs), or a determination that the community has no special flood areas.

At the end of FY2021, there were 174 Idaho communities participating in the Regular program and three communities participating in the Emergency program. Currently, 13 communities have adopted standards above the NFIP minimum requirements and participate in the CRS program.

SAFETY OF DAMS PROGRAM

IDWR regulates 400 water storage dams and approximately 20 mine tailings impoundment structures in Idaho, with a focus on public safety. The Safety of Dams program is overseen by IDWR's Deputy Director and program staff operate in four regional offices. The Western Region office in Boise manages the program's efforts.

Statutory language currently defines all dams subject to regulation by height, storage capacity, and hazard potential. The hazard classification assigned to each dam represents the potential consequences of a sudden failure and uncontrolled release of water. Hazard is divided into three broad categories: Low, Significant, and High. Determining the proper hazard classification for new and existing dams is an important responsibility, especially in those geographic areas that are experiencing rapid growth and downstream development.

Safety of Dams Program duties include:

- Reviewing and approving design plans and specifications for dam construction and repair.
- Inspecting both new and existing dams.
- Issuing storage authorization Certificate(s) of Approval for water and mine tailings impoundments that meet or exceed prescribed safety guidelines.
- Consulting with dam owners and county emergency personnel to ensure emergency action/operation plans are accurate and up to date.
- Offering engineering recommendations within the scope of established program duties.
- Documenting and archiving design information related to dams, mine tailings structures, and other related water storage projects.

Dam Inspections

IDWR inspects dams every one to five years depending on hazard classification, physical condition, and the dam's history of recommended maintenance and repair. Regular inspection and careful design review of construction plans and specifications fulfill the requirements of Idaho Code §42-1712, §42-1715, and §42-1217, and help ensure life and property are protected from a catastrophic dam failure. IDWR prioritizes inspections of dams and reservoirs having the most significant perceived impact to life and property.

In FY2020, IDWR received a FEMA grant to fund preliminary risk analysis and subsequent cost/benefit evaluation for nine of the non-federal high hazard potential dams in Idaho. FEMA requires grant recipients to include high hazard potential dams in the recipient's State Hazard Mitigation Plan. To satisfy the requirement, IDWR's Geospatial Technology Section developed dam inundation spatial data sets and maps for each high hazard dam and submitted to the Office of Emergency Management for the State Hazard Mitigation Plan. IDWR has contracted with an engineering company to perform risk analysis before prioritizing projects designed to retrofit, repair, and rehabilitate structures representing the highest risks in Idaho.

IDWR staff have inspected 577 dams in Idaho since FY2016. Inspections were down in FY2020 due to personnel turnover in two regional offices and challenges related to the COVID-19

pandemic. In FY2021, staff inspected 93 dams. Emergency Action Plans were outdated prior to the end of FY2020, again due to personnel issues. IDWR assigned an additional staff member to work with dam owners to improve the percentage of updated emergency action plans. At the end of FY2021, approximately 63% of emergency action plans for high hazard dams were up to date.



Figure 16. Hells Canyon Dam, one of the 400 dams regulated and inspected by IDWR. Photo courtesy of Erik Boe, IDWR.

IDAHO WATER RESOURCE BOARD

The Idaho Water Resource Board has eight members, appointed by the governor to four-year terms. The Board is the agency directed in Idaho's constitution to formulate and implement a state water plan. The constitutional amendment which established the Board was passed in 1964.

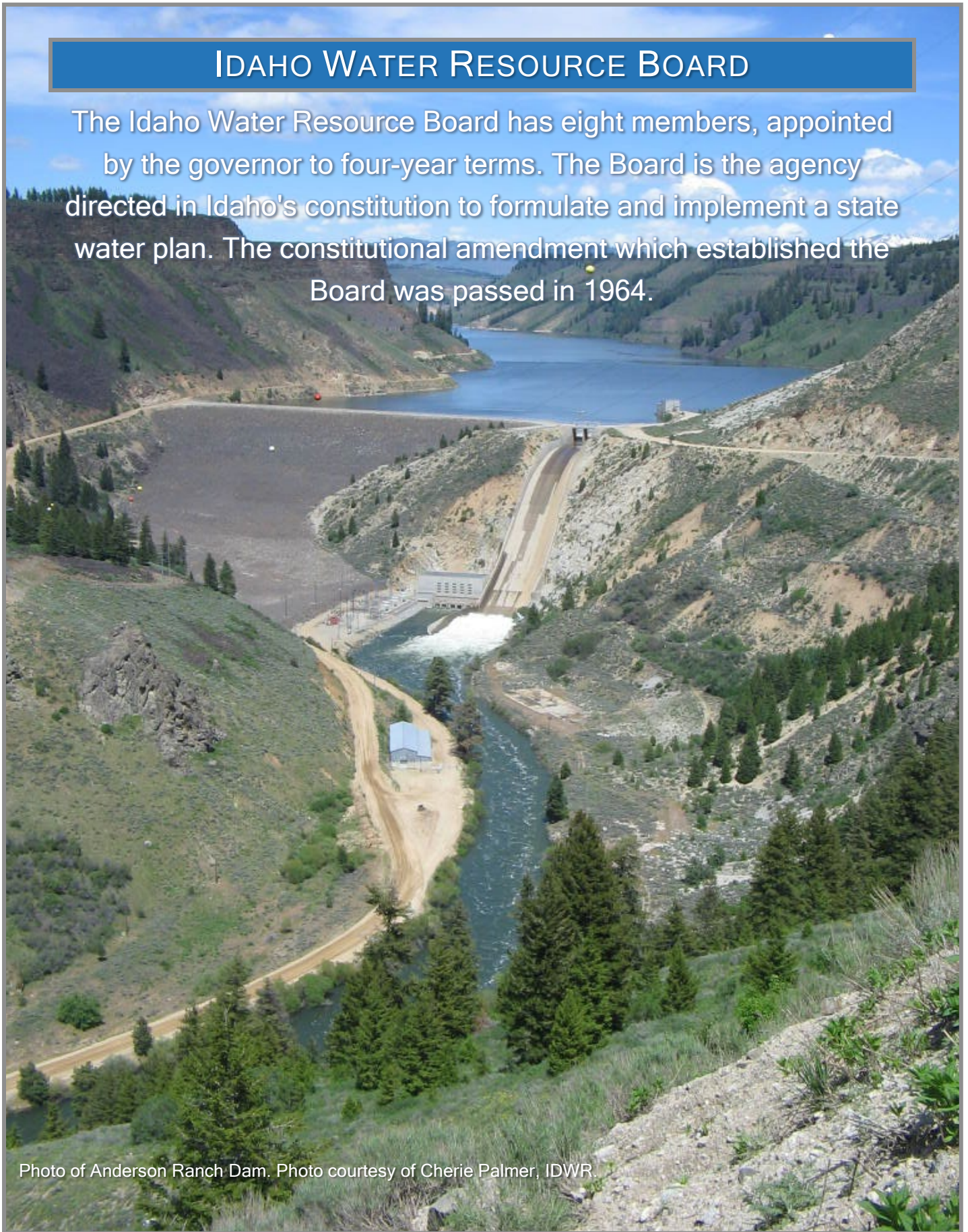


Photo of Anderson Ranch Dam. Photo courtesy of Cherie Palmer, IDWR.

IDAHO WATER RESOURCE BOARD

In 1965 the Idaho legislature created the Idaho Water Resource Board (IWRB or Board) as a separate agency with their own staff. In 1974 the Board and the existing Department of Water Administration were combined to form the present Idaho Department of Water Resources.

The Board has specifically mandated functions and responsibilities. The director supports the Board as needed and assigns IDWR employees to help carry out its duties. IDWR and the Board interact in a level working relationship. The Board establishes long-term vision and policy and implements water projects on behalf of the state. The IWRB and IDWR also collaborate on court appeals, administrative rules adoption, policy development, water bank administration, and water right negotiations with the Federal government and Indian Tribes. Current members of the IWRB are Jeff Raybould, Chairman; Roger Chase, Vice Chairman; Jo Ann Cole-Hansen, Secretary; Peter Van Der Meulen, Albert Barker, Dale Van Stone, Dean Stevenson, and Brian Olmstead.

Programs

The Board's programs are divided into general categories of planning for Idaho's future water needs and putting projects and programs in place to meet those future water needs. The Board holds several state monetary accounts in trust for funding water projects and improvements within the state.

Table 3 on the following page lists projects authorized by the IWRB in FY2021 and includes several projects intended to support the Water Sustainability and Aquifer Stabilization Initiative. The list does not reflect ongoing projects authorized before FY2021.



Table 3. IWRB Authorized Project List FY2021.

Tier 1 Projects	Estimated Project Cost
Mountain Home Air Force Base Sustainable Water Project	\$30,000,000
Anderson Ranch Reservoir Enlargement	\$90,000,000
Large Upper Valley ESPA Aquifer Recharge Project	\$75,000,000
Aging Water Infrastructure Repair Fund	\$50,000,000
Cloud seeding infrastructure in additional basins	\$8,000,000
Lewiston Orchards Exchange Project	\$35,000,000
Total Tier 1	\$288,000,000
Tier 2 Projects	Estimated Project Cost
Bear Lake Additional Storage	\$15,000,000
Mountain Home Aquifer Water Supply	\$50,000,000
Governors Salmon Work Group Projects	\$80,000,000
New York Canal Lining	\$50,000,000
Raft River Pipeline	\$30,000,000
Total Tier 2	\$225,000,000
Tier 3 Projects	Estimated Project Cost
Lemhi Basin Aquifer Recharge	\$5,000,000
Lost Valley Reservoir Enlargement	\$50,000,000
Palouse Basin Aquifer Water Supply	\$70,000,000
Community Water Supply Projects	\$50,000,000
Flood Management Grant projects	\$5,000,000
Water quality projects statewide	\$30,000,000
Water Management Account & Secondary Aquifer Fund	\$100,000,000
Municipal water re-use projects	\$20,000,000
Total Tier 3	\$330,000,000
Grand Total	\$843,000,000

PLANNING & PROJECTS BUREAU

The Planning and Projects Bureau is responsible for overseeing and administering large-scale initiatives on behalf of the IWRB.

These initiatives include the State Water Plan, water project development and funding, minimum stream flows, natural and recreational river designations, comprehensive basin and aquifer planning, and coordination of the Water Supply Bank.

Planning & Projects Bureau Chief - Brian Patton

Ground based cloud seeding station. Photo courtesy of Idaho Power.

WATER PROJECTS SECTION

The Planning & Projects Bureau implements and manages projects approved by the Board. IWRB is charged with implementing several water sustainability projects across the state, including managed recharge of the Eastern Snake Plain Aquifer (ESPA), the Anderson Ranch Reservoir Enlargement, the Priest Lake Water Management Project, the Mountain Home Air Force Base Sustainable Water Project, Cloud Seeding and others.

Anderson Ranch Reservoir Enlargement

This project is a partnership between the IWRB and the US Bureau of Reclamation (BoR) under the federal Water Infrastructure Investment for the Nation (WIIN) Act. The project intends to expand Anderson Ranch Reservoir storage by 29,000 AF. In December 2020, the Secretary of Interior determined the project to be feasible. The FY2021 Appropriations Legislation secured \$12.88 million in WIIN Act funding for the project. The IWRB and BoR participated in cost-share contract negotiations through summer 2021. The IWRB agreed to fund the non-federal share of upfront capital cost as required by the WIIN Act and signed the final Cost-Share Agreement with the BOR in November 2021. To satisfy WIIN Act requirements, the Board and BoR will initiate the project final design this December with on-site activities expected before the end of 2021. The Anderson Ranch Reservoir enlargement project is expected to be completed by 2028.

Managed Recharge of the Eastern Snake Plain Aquifer (ESPA)

Since 2015, when management of the ESPA began in earnest, approximately 2.2 million acre-feet have been added to storage in the ESPA. IWRB recharge efforts and other management actions have increased the total outflow from Thousand Springs by approximately 850 cfs, and increased the Sentinel Well Index by about 3.5 ft. The success of managed recharge in the ESPA has encouraged the Board to evaluate and develop recharge plans for the upper and lower valley ESPA.

In FY2021, recharge efforts ended sooner than in previous years due to early demand for irrigation water as a direct result of lower-than-normal snowpack during winter 2020-2021. During the 2020-2021 recharge season, the IWRB recharged 130,463 acre-feet into the ESPA, a significantly lower amount than in previous years. Despite the dry year, recent development of additional recharge sites enabled the Board to recharge a considerable amount of water to the ESPA. Compared to a similar snowpack year in 2015/2016, the Board recharged only 75,000 acre-feet to the ESPA at one site, Milepost 31. This year, recharge occurred at two new sites, the MP29 site off the Milner-Gooding Canal and the Wilson Canyon site off the Northside Canal (See [Figure 16](#)).

Mountain Home Air Force Base Sustainable Water Project

In cooperation with the US Air Force, this project will deliver an ongoing water supply for the Mountain Home Air Force Base (Base) while replacing Base withdrawals of the declining Mountain Home Aquifer. In May 2021, the project MOU was executed between the Board, the Governor's Office, and the US Air Force. The Board's monetary contribution to the project will fund the construction of a pipeline from CJ Strike Reservoir to the Base and the Air Force will

fund construction for a water treatment facility. The Board and Air Force will begin contract negotiations and clarify project schedules beginning fall of 2021. The Mountain Home Air Force Base project is expected to be complete by January 2026.

Priest Lake Water Management Project

This project intends to better manage water in Priest Lake to keep the lake full, maintain flows downstream in the Priest River, and provide for ongoing navigation access to Upper Priest Lake. Construction to build a new 1,500 ft breakwater and deepen the Thorofare channel began winter of 2020-2021 and was complete in April 2021. Construction of the Priest Lake outlet dam is expected to be complete in spring of 2022.



Figure 17 Wilson Canyon recharge site. The underlying fractured geology of the Wilson Canyon area enables significant infiltration of surface water to the aquifer below. Photo courtesy of IDWR Planning & Projects Bureau.

ONGOING PLANNING AND PROGRAMS

The IWRB is responsible for planning for the conservation, development, use, and management of water resources in the state of Idaho. Planning is accomplished through three primary programs.

- Idaho State Water Plan - Contains policies that are the guiding framework for water resources in Idaho.
- Comprehensive Basin Planning - Inventorying and assessing regional water resources in a specific river basin, waterway, aquifer, or geologic areas so that the values are protected.
- Comprehensive Aquifer Planning - Addressing future water needs and proactively avoiding conflicts over competing water needs in the future.

Cloud Seeding

In 2009, cloud seeding was identified as an aquifer stabilization and recovery strategy in the ESPA Comprehensive Management Plan and draft Treasure Valley Comprehensive Management Plan. Recognizing the program will be a unique and innovative opportunity to support sustainable water supplies, the 2021 Idaho Legislature passed House Bill (HB) 266, creating Chapter 43 on Cloud Seeding and giving the IWRB authority to authorize, develop, and sponsor cloud seeding projects in Idaho. The Board approved \$417,000 in funding for FY2021 cloud seeding operation and maintenance costs and will work with Planning staff in FY2022 to develop a statewide assessment, develop criteria and processes for authorization of cloud seeding programs, and begin the process of building out of the program. Cloud seeding season begins November 1st and operations in the Bear River Basin are expected to begin December 2021.

Water Transaction Program

The Water Transaction program is implemented in the Upper Salmon River Basin. The program secures water needed for ESA-Listed fish recovery while keeping the irrigated agriculture-based economy intact. The Water Transaction program uses permanent acquisitions, leases, investments in efficiency, and other market-based incentives that enable and assist landowners who wish to restore flows to existing habitat. Since the program's inception in 2003, it has restored over 682 cfs of flow to tributaries that provide habitat for endangered and threatened fish species. The Bonneville Power Administration funds the majority of the program.



Figure 18 Chinook Salmon in Marsh Creek. Photo courtesy of Amy Cassel, IDWR.

WATER SUPPLY BANK

The Idaho Water Resource Board has the authority to operate the Idaho Water Supply Bank (WSB or Bank). The Bank's purpose is to encourage the highest beneficial use of water, provide sources of adequate water supplies to benefit new and supplemental water uses, and accrue a source of funding for improving efficiency of water user facilities. The Bank is essentially a water exchange market, operated by the IWRB to assist in marketing the water rights of natural flow and storage water in Idaho reservoirs. It is a mechanism by which water rights that are not being used can be made available for use by others through the lease and rental process.

Bank operations require a collaboration between the Planning and Allocation Bureaus at IDWR. A Water Supply Bank Coordinator and Specialist, housed in the Planning Bureau, oversee and administer the program on behalf of the Board. Allocation staff members assist in program operations by processing lease and rental applications. The WSB is funded by lease application fees and a 10% administrative surcharge on rental transactions. In FY2021, IDWR received 124 rental applications and 219 lease applications.



Figure 19 Storm clouds over Pahsimeroi Valley where local water users participate in the Board's Water Transaction program. Photo courtesy of Amy Cassel.

HYDROLOGY SECTION

The Hydrology Section collects, stores, and analyzes hydrologic data for IDWR and the state of Idaho, supporting the administration, management, planning, and protection of the state's water resources.



Hydrology Section Manager - Sean Vincent

Egin recharge site and monitoring station. Photo courtesy of Tito Sanabria, IDWR.

HYDROLOGY SECTION

IDWR hydrologists support watermasters and water districts in the administration and delivery of water by accounting for the delivery of reservoir storage and natural streamflow according to Idaho's water right priority system. For planning purposes, Hydrology staff members develop and operate ground water flow models of major aquifers and maintain a river and reservoir system operations model of the Snake River. The data, models, and programs run by the Hydrology Section predict water supply for the upcoming irrigation season, plan for improved utilization of water resources, and quantify the effects of drought, recharge, and pumping on aquifer water levels and river flows. FY2021 Hydrology Section highlights are listed below.

Aquifer Recharge Program

The Hydrology Section assisted with recharge site characterization efforts by estimating changes in the volume of groundwater stored within the Eastern Snake Plain Aquifer.

Bear Lake Project

Hydrology staff presented the results of an analysis that was performed by the Tri-State and PacifiCorp Modeling Group to the IWRB at the 2021 May Work Session in Boise. The analysis was performed with the newly developed Joint Bear River Planning Model to evaluate the impacts of proposed changes to the operation of Bear Lake.

Big Wood River Ground Water Management Area (BWRGWMA)

Hydrology Section staff conducted data analyses and gave presentations to the BWRGWMA Advisory Committee in support of the development of a management plan for the Ground Water Management Area. At the request of the Director, Hydrology Staff also helped to prepare a set of hydrologic observations for the benefit of the Advisory Committee.

Department of Energy Supplemental Environmental Project

Hydrology Section staff continued work on two Supplemental Environmental Project (SEP) grants from the US Department of Energy at the Idaho National Laboratory.

The SEP #2 grant has two components: 1) ground water quality characterization on the eastern Snake Plain, and 2) a study of surface and ground water resources in the Big Lost River basin. Activities during FY2021 included overseeing the drilling and sampling of 10 new monitoring wells on the eastern Snake Plain along with well drilling, borehole geophysics, stream gage installation, seepage surveys, and groundwater quality sampling in the Big Lost River basin.

The SEP #3 grant involves characterizing the hydrogeology of the Raft River basin. SEP #3 tasks completed by Hydrology Section staff during FY2021 included: 1) collecting and analyzing water chemistry samples from more than 100 groundwater, surface water, and spring monitoring sites, 2) expanding the surface water monitoring network to include three new gage locations, 3) updating the irrigated lands dataset to cover the entire study area, and 4) reviewing and interpreting 470 well logs to help develop a 3D geologic model.

Eastern Snake Plain Aquifer (ESPA) Model

Hydrology Section staff completed recalibration of the ESPA model and the Eastern Snake Hydrologic Modeling Committee (ESHMC) voted unanimously to approve the new model at the October 28, 2020 meeting. The new model extends the model calibration period through 2014 along with incorporating several new design features. Hydrology staff also completed a predictive uncertainty analysis and presented results at the May 4, 2021 meeting.

The new version of the ESPA model was recently applied by staff to determine pumping curtailment dates for the methodology that was established in response to the Surface Water Coalition delivery call. The new version of the ESPA model was also applied to evaluate the impacts of IWRB-sponsored aquifer recharge, private recharge and groundwater pumping reductions undertaken, as part of the 2015 settlement agreement between the Surface Water Coalition and the Idaho Ground Water Appropriators.



Figure 20. IDWR Hydrologist, Collin Macheel, prepares to take water level measurements at Station #10 along the Little Wood River. Photo courtesy of Tito Sanabria.

Eastern Snake Plain Surface Water Monitoring Network

Due in part to travel restrictions, most effort exerted on the eastern Snake Plain surface water monitoring network during last year was focused on data quality improvements and equipment upgrades at existing data collection sites. Here are some of the improvements:

- ✓ Completed vertical control surveys to verify sensor accuracy and establish offsets at sites in the Aberdeen Springfield, Egin Bench, Burley Irrigation District, and Twin Falls Canals Company service areas.

- ✓ Converted the telemetry at the Blue Lakes spring gaging site from cellular to spread spectrum radio. The conversion reduces long-term operational costs because there is no monthly fee for radio.
- ✓ Wrote, tested, and deployed new data logger programs across the Burley Irrigation District and Twin Falls Canal Company networks to reduce sensor run-times (by a factor of ~10) and prolong sensor life.
- ✓ Replaced the Windows 7 data collection server at the Fort Hall Reservation with a Windows 10 server to comply with new Office of Information Technology Services (OITS) requirements. Also installed and configured updated LoggerNet data collection software, RTMC PRO diagnostics software, and a new FTP power shell script. The RTMC and FTP script updates allow for automated quality control alarms and real-time data review over the State of Idaho's FTP server.
- ✓ Upgraded sensors and implemented monitoring protocol improvements at the Wood River Station #10 and #54 gages sites. The improvements made at these critical monitoring sites increase the reliability and quality of streamflow data and decrease maintenance requirements.
- ✓ Replaced the power supply equipment at the Rock Creek at Poleline Drive monitoring site with a larger charge controller and larger solar panel to accommodate low light conditions in winter months. The new configuration will reduce long-term operational costs by increasing battery life.
- ✓ Installed a new stilling well at the Rock Creek at Register Rock site to eliminate previous sensor reliability issues including fouling, siltation, and vertical shifting. The new configuration should prolong the sensor operational life.
- ✓ Upgraded 12 cellular hubs from 3G to 4G technology with the new RV-50 cellular modems which provide faster data transfer, higher security, and more stable signal quality. IDWR is now in compliance with Verizon Wireless' security protocol.
- ✓ Worked with OITS to perform Aquarius Database software updates after the first of the year. Also wrote custom Application Programming Interface (API) calls to alert staff in the event of an improper data classification setting or an exceedance of the current software license maximum site limit (250 sites).

Hydrologic Data Collection

An essential and ongoing project for both state and regional office staff is the data collection program. Last year, Hydrology Section employees monitored more than 1,500 sites statewide.

Swan Falls Technical Working Group and Forecast Tool

The flow rate in the Snake River at the Murphy gage below Swan Falls dam dropped below the historical minimum of record on June 23, 2021. As a result, there was an unusually high level of interest this summer on the Adjusted Average Daily Flow (AADF) computations that are performed by Hydrology Section staff and distributed via email to members of the Swan Falls Technical Working Group (TWG), IDWR management, and the Idaho Water Resource Board. In addition to providing AADF updates throughout the low-flow period, Hydrology staff maintained the AADF webpage on the IDWR website ([AADF-calcs](#)), presented computations and flow forecasts at meetings of the TWG in February, May, and June, and started documenting the

tasks necessary to update the Swan Falls Forecast Tool with response functions from the latest version of the Eastern Snake Plain Aquifer Model. Finally, Hydrology staff worked with stakeholder representatives in the Swan Falls Technical Working Group to develop documentation for the Swan Falls Forecast Tool. The tool is used to predict the flow rate in the Snake River at the Murphy gaging station during the late irrigation-season using surface water supply indices and groundwater level measurements from the previous season.

Treasure Valley Ground Water Flow Model

IDWR held quarterly meetings of the Treasure Valley Modeling Technical Advisory Committee to solicit input on model development from stakeholder representatives. The five-year model development project is a collaboration between IDWR and the United States Geological Survey (USGS). The project is jointly funded by the Idaho Water Resource Board and the USGS.

Water District 02 Surface Water Monitoring Network

Hydrology Section staff installed two VHF radio to cellular hubs at the War Eagle and Schiermeier sites to replace the privately owned, Grandview cell tower. This improvement eliminated the annual site rental fee of approximately \$10K. These two cellular hubs now handle data collection and transmission to Boise for over 20 sites in the area surrounding CJ Strike Reservoir. Staff also upgraded the omnidirectional antenna at the Indian Hills VHF repeater site and rerouted the telemetry links from the Glens Ferry area sites to the upgraded repeater.



Figure 21. IDWR Hydrologist, David Hoekema, gathers water measurements under close supervision of a curious local, in Big Bend Ditch at the State Fish Hatchery. Photo curtesy of David Hoekema, IDWR.

Water right accounting

Accounting of storage and natural flow water rights was challenging last year because natural flow rates were below normal and computerized accounting storage space did not completely fill in any of the basins. Accounting staff spent considerable time responding to requests from water users for reservoir allocation and priority date projections. Accounting work done by Hydrology staff during FY2021 includes:

- ✓ Completed final accounting for the 2020 irrigation season and presented the results at the water district 11, 34, 63, and 65 annual meetings.
- ✓ Implemented rotation credit for Water District 34.
- ✓ Tested the new version of the Boise River basin water right accounting that includes water rights with points of diversion in the tributaries above Lucky Peak Dam.
- ✓ Coordinated with the Office of Information Technology Services and Water District 01 personnel to have the storage program for the Upper Snake River basin translated from Fortran to C#.



GEOSPATIAL TECHNOLOGY SECTION

Idaho Code §39-120 designates IDWR as the state's leader for natural resource Geographic Information Systems (GIS). Using GIS software, the Geospatial Technology Section delivers expertise, applications, data, and analyses to support all IDWR programs.

Geospatial Technology Section Manager - Linda Davis

Photo of Sweetwater Creek Drainage, south of Lapwai, Idaho. Photo sourced from 2019 NAIP imagery ([usda.gov](https://www.usda.gov/naip/)), courtesy of Linda Davis, IDWR.

GEOSPATIAL TECHNOLOGY SECTION

GIS software tools assist IDWR employees in analyzing and assessing water rights, determining IDWR administrative boundaries, locating wells, and collecting field data with mobile devices. Nearly all IDWR's data has a spatial component. The Geospatial Technology Section (GTS) supports spatial data creation and analyses, and creates tools, maps, and applications used within IDWR and by the public.

The GTS is also specifically tasked with maintaining the Environmental Data Management System (EDMS), a repository of ground water quality data for the state of Idaho. The EDMS supports ground water programs among multiple state agencies.

In addition to day-to-day support, GTS staff work on small to large-scale GIS projects to assist the Department. GTS staff members also develop and support data access tools for the public. Below is a summary of projects completed, initiated, and ongoing in FY2021.

Bear River Basin Digitizing

Idaho, Utah, and Wyoming are members of the Bear River Compact. A goal of the Compact is to accomplish an equitable apportionment of the waters of the Bear River among the compact states. An amended Bear River compact was ratified by congress in 1980 and established depletion amounts to which states were entitled. At an interval as determined by the Bear River Commission, a review of changes in depletions due to new irrigation development, supplemental irrigation, and municipal and industrial uses is determined. To support depletion analysis, a digital GIS layer consisting of irrigated, semi-irrigated, and non-irrigated lands is required. GTS staff members used remotely sensed data and coordinated with the states in the Bear River Compact to create a digital land use layer. This digital land use layer is used by hydrologists, technical staff, and commission members in determining depletion amounts.

CTP Grant

Currently, 17 rural counties and 46 cities in Idaho rely on paper Flood Insurance Rate Maps (FIRMs) to identify flood hazard areas in their respective communities. The ability to identify flood hazards in local communities precedes all flood risk management. Flood hazard data are used in all phases of emergency management in the State of Idaho, including planning, preparedness, response, and recovery. Paper FIRMs are challenging to work with and are often omitted from analysis or response activities due to accessibility issues. Digitizing known flood hazard areas from paper FIRMs allows floodplain administrators, local communities, property owners, lending institutions, and the general public to have greater access to delineated flood hazard extents. The project will convert paper FIRMs to digital maps for 46 cities and unincorporated areas affecting 17 counties, and representing about 25% of all communities in Idaho. The digital data is available through IDWR's GIS Mapping and Data Hub, as downloadable data, an interactive map, and as a web service that can be added to existing GIS applications.

Eastern Snake Plain Aquifer Landuse

Like the Treasure Valley digitizing effort, this project will create GIS layers of irrigated, semi-irrigated, and non-irrigated lands in the ESPA. The ESPA Landuse digitizing effort is an ongoing effort that requires multiple years of data. The GIS layers are also useful for water right processing, transfers, legal matters, and water use assessment. The digitizing effort covers all or portions of Bannock, Bingham, Blain, Bonneville, Butte, Camas, Cassia, Clark, Custer, Elmore, Fremont, Gooding, Jefferson, Jerome, Lincoln, Madison, Minidoka, Power, and Twin Falls counties.

Irrigated lands for 2012 to 2017 are completed within the ESPA. GTS staff are developing an automated method of determining irrigated land through random forest modeling. Random forest modeling is an ensemble learning method for classification that operates by constructing a multitude of decision trees at training time. The GTS group is working to determine a faster method of delineating irrigated and non-irrigated land within the ESPA by using remotely sensed data from Sentinel and Landsat satellites, and training data of known irrigation status.

Evapotranspiration (ET) NRT

IDWR and the University of Idaho (U of I) worked from 2000 to 2005 under a grant from NASA to develop procedures for mapping ET from Landsat data and applying ET data to water resource problems. The Mapping EvapoTranspiration using high Resolution and Internalized Calibration (METRIC) energy balance model computes and maps ET using Landsat images. Landsat Imagery is essential for METRIC because it is the only operational satellite that collects thermal data and has a pixel size small enough to map individual agricultural fields. Landsat thermal data are a critical part of the model and needed to compute the surface temperature required in ET computations. IDWR uses Landsat-based evapotranspiration data in hydrology, water resources planning, and water administration.

In FY2020, IDWR initiated a two-year process, in partnership with the U of I, to internalize annual development of NRT METRIC data for all major irrigated areas on the Snake River Plain. In 2021, IDWR has been working to independently develop and publish these critical data sets for its use and public use. This new capability will save the Department approximately \$125K - \$200K per year.

USGS Water Use Data and Research (2018 Funding)

The GTS received funding from the Jet Propulsion Laboratory to collaborate with the Oregon Water Resources Department, the Washington Department of Ecology, and the Desert Research Institute to:

- Review consistent ET summary information throughout the Columbia River Basin,
- Improve ET data accessibility and useability by summarizing field-level ET data for irrigated lands at field and watershed scales, and
- Gain Agency confidence in OpenET, NASA-based ET and irrigation status information.

GTS staff currently processes METRIC ET data for department use. With the funding from the Jet Propulsion Laboratory, GTS staff will compare IDWR METRIC ET data with OpenET Models and create a summary report on the findings. GTS staff will also review and work with the OpenET team on improving the NASA generated irrigated land classifications, and will test OpenET data in water management activities.

USGS Water Use Data and Research (2019 Funding)

In 2019, the Geospatial Technologies Section again received funding through the USGS Water Use Data and Research program for a project called "Consolidating the Display and Transferability of Water Use Measurement Data at IDWR." The project aims to combine data access to three different water measurement data systems and applications:

- Water Measurement Information System (WMIS)
- Diversion Data Application (DWRCentral)
- AqualInfo (telemetered data)

Ground and surface water measurement data is now available to the public from three separate and disparate applications at a one-stop web mapping application. Work was completed on the second phase of the project to reference measurement location to the National Hydrography Dataset (NHD) to:

- Spatially enable measurement locations;
- Share those locations by submitting this data to the USGS for inclusion in the NHD Linked Data Registry and,
- Explore the use of trace tools, or develop custom tools, to correlate measurement locations and points of diversion.

WrEdit Upgrade

WrEdit is a custom extension to ArcMap used by a large portion of IDWR employees to access, update, and edit spatial data associated with business processes and workflow programs. WrEdit also delivers easy access to base layers such as parcels, imagery, and public land survey data. Through an extensive programming process, GTS staff updated WrEdit to an "Add-in," which allows for updates to WrEdit without the need for an installer. In FY2021, GTS staff updated many legacy design elements to embrace standard technologies and modern best practices.

FINANCE & ADMINISTRATION

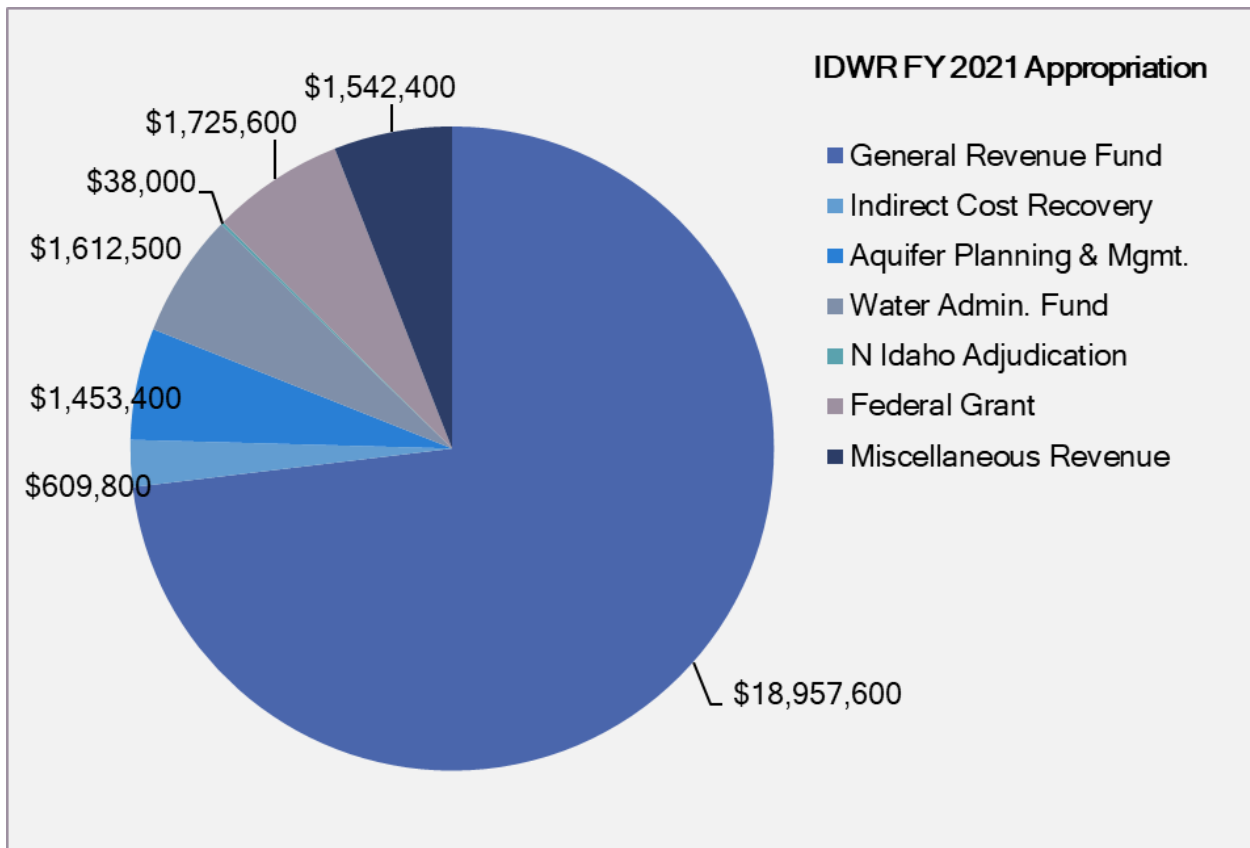


Photo courtesy of Mathew Weaver, IDWR.

FINANCIAL SUMMARY

In FY2021, seventy-three percent of IDWR's budget came from the State of Idaho General Fund. IDWR dedicated funds and federal funding sources made up the remaining twenty-eight percent.

The graphs below show IDWR's FY2021 appropriations and expenditures. IDWR's annual appropriation does not include the three funds continuously appropriated to the Idaho Water Resource Board; the graphs do not include information relating to these three funds. [Figure 22](#) shows the increase in IDWR's contract dollars since FY2016.



[Figure 22](#). IDWR Appropriation for FY2021

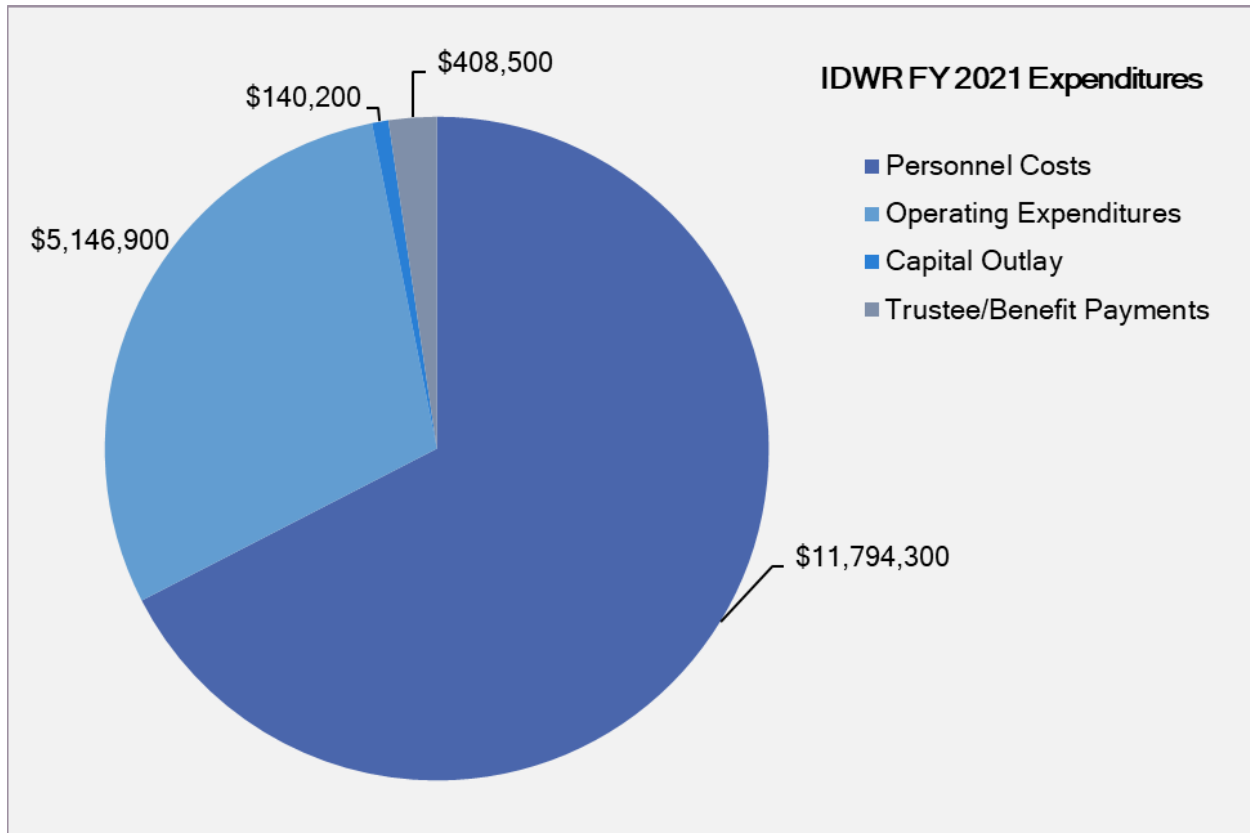


Figure 23. IDWR Expenditures for FY2021

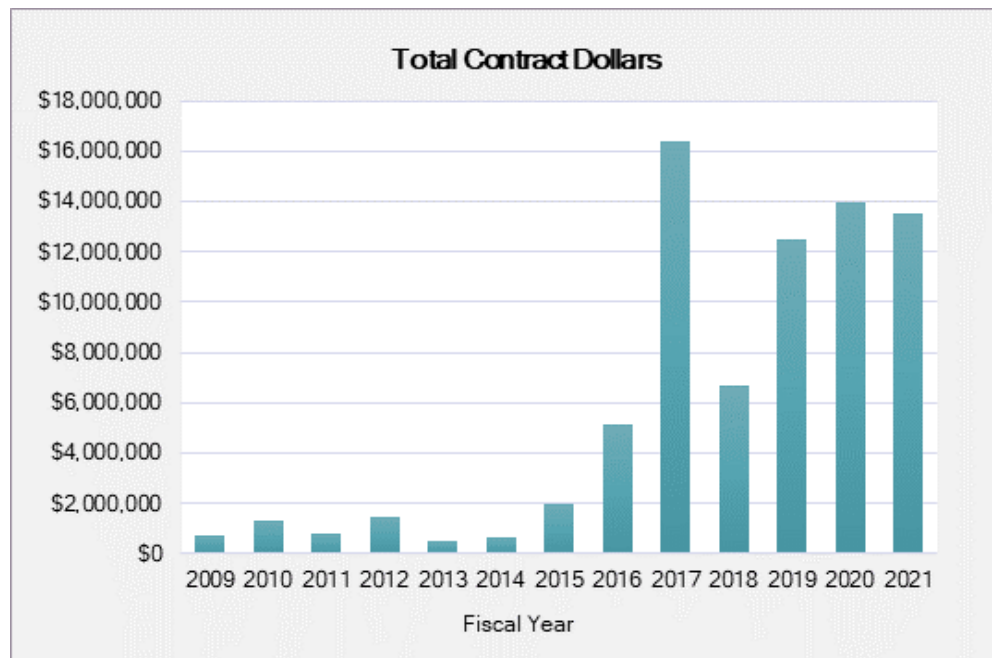


Figure 24 illustrates the sharp increase in IDWR's total contract dollars beginning in FY2016.

RULEMAKING

Administrative actions of IDWR and IWRB are governed by Idaho Administrative Code, Chapter 37. All administrative rules are presented for authorization and negotiated rulemaking as part of the IDWR and IWRB's plan to review each rule every five years consistent with the Governor's Zero-Based Regulation Executive Order 2020-01. In 2020, the Legislature adjourned without passing a "going home bill" that would reauthorize all of Idaho's administrative rules. As a result, the IDWR and IWRB adopted all fee rules as temporary rules to ensure effectiveness of the fee rules. To maintain on-going authorization, the Temporary Fee Rules were also published as Proposed and Pending Rules and submitted to the Idaho Legislature for review during the 2021 session. In 2021, the Legislature again adjourned without passing a "going home bill" that would reauthorize all of Idaho's administrative rules. The IDWR and IWRB will work to reestablish the Temporary Fee Rules as permanent rules by again publishing them as Proposed and then as Pending Rules and submitting to the 2022 Idaho Legislature for review and approval. In FY2021, IDWR held four negotiated rule making meetings for public participation and comment on IDAPA 37.01.01 Rules of Procedure and IDAPA 37.03.07.61 Stream Channel Alteration Rule 61 (Minimum standards for suction dredges and non-powered sluice equipment).

DIRECTOR'S RECOMMENDATIONS

Each year, a portion of the annual report is dedicated to the Director's recommendations for the year ahead. As in previous years, IDWR continues to face staffing and funding challenges. Many of the recommendations below are similar or identical to recommendations made in FY2020.

Director Gary Spackman

Photo courtesy of Mathew Weaver, IDWR.

Long-Term Funding for Water Projects

In the FY2019 Annual Report, the Director stated: "The State of Idaho must adopt and execute a steady source of long-term funding for water projects." As suggested in the FY2020 Annual Report, the 2021 Idaho Legislature appropriated \$50 million of state funds to the Idaho Water Resource Board for water projects. The 2022 Idaho Legislature appears poised to appropriate at least another \$250 million for legacy water projects in Idaho. This funding is a visionary action by the Idaho Legislature to fund necessary ongoing and future water projects in the state of Idaho.

If Idaho will continue to construct and operate water projects to protect and sustain its water resources, Idaho can likely avoid water shortages in the future. In addition, as stated in a past annual report (FY2019): "[I]n a future interstate dispute about water, the amount of water allocated to the state of Idaho might be diminished if other [downstream] states have more fully developed their water resources."

Employees to Address Workload

During FY2021, workloads increased across nearly all Department programs. These additional workloads are being borne by an employee count that has remained approximately static since 2009.

The FY2020 Annual Report stated: "The state cannot expect water managers to timely perform these duties when the increase in activity overwhelms reasonable gains in efficiency."

During FY2021, IDWR presented a compelling case to the Governor's Office and to key members of the Legislature that the extra duties and responsibilities assigned to IDWR and the Idaho Water Resource Board must be accompanied by staffing numbers to complete the increasing number and magnitude of tasks assigned. The Governor's Office supported IDWR's request in its FY2023 proposed budget to add 15 additional full-time positions to various IDWR programs. These additional employees would address increases in IDWR core responsibilities workload and increases in Water Board activities assigned by the Idaho Legislature.

During the fall of 2021, the Director met with many legislators across Idaho to present IDWR's proposed FY2023 budget. Although outside of the FY2021 reporting period, on January 19, 2021, the Director presented the proposed budget to the Idaho Legislature's Joint Finance and Appropriation Committee. Graphs and Tables depicting additional IDWR workload were presented to legislators and are found in this report (See [Figure 6](#), [Figure 10](#), [Figure 12](#), [Table 3](#), and [Figure 22](#)).

Employee Compensation

The following language from the FY2020 remains pertinent:

IDWR is confronted with increasing scrutiny of its technical and legal analysis and processes. In the 1980s, two-page orders containing minimal to no technical analysis were commonplace. Now, IDWR's orders must exhaustively analyze technical and legal issues. Even then, most orders are challenged through the

courts. Contested cases are also more common and require trained hearing officers to conduct a competent hearing, insulate themselves for objectivity and fairness, and write defensible decisions. In short, the work of IDWR is less clerical or ministerial and more technical and scientific every year. The Department must be able to hire and retain competent staff to complete IDWR's ever more complex workload. The value of these staff cannot be underestimated. More liberal funding of salaries for the technical and scientific positions upon whom IDWR heavily depends is vital.

Establish Alternative Process for Resolving Conjunctive Management Disputes

The FY2021 Annual Report stated:

IDWR has convened an advisory committee for the Wood River Ground Water Management Area. The advisory committee is tasked with developing and proposing a ground water management plan for approval by the director pursuant to Idaho Code § 42-233a. The approval of a ground water management plan has the potential to replace delivery call litigation, to avoid the harsh outcomes of litigation, including possible curtailment of junior priority water rights, and to avoid the associated costs of such litigation.

The development of solutions to address conjunctive management disputes through a ground water management plan can hopefully be employed in other water basins. In December 2020, a ground water management area designation for the Eastern Snake Plain Aquifer ("ESPA") was finalized. The director intends to form a ground water advisory committee for the ESPA and charge the committee with the task of developing and recommending a management plan that would both (1) recognize previous activities conducted according to a settlement agreement and (2) temporarily supplant legal processes established as a result of previous conjunctive management litigation.

Finally, water users in the Big Lost River Basin have petitioned the director to designate a ground water management area in the Big Lost River Basin. If a ground water area is designated, the same process may be employed to address conjunctive management concerns.

The Wood River Ground Water Management Area Advisory Committee met approximately bi-weekly from October 2020 through April of 2021. Each meeting lasted three hours or more. Despite myriad meetings and presentation of significant technical information and other supporting information, the ground water users and surface water users did not reach an agreement for a management plan that would mitigate for depletions to surface water rights caused by ground water pumping.

Because of significant drought conditions, IDWR determined senior priority surface water rights could be injured by depletions to surface water streams caused by ground water pumping. The Director asserted authority under Idaho Code §42-237a.g and initiated a contested case to determine whether ground water rights and surface water rights should be jointly administered.

After conducting a hearing in June 2021, the Director issued a curtailment order on June 28, 2021 requiring curtailment of junior priority ground water rights. The Director's order prompted additional negotiations, a short-term settlement was executed, and a longer-term management plan may finally be negotiated.

The many lengthy and arduous negotiations to offer an acceptable management plan were largely unsuccessful. Only after a curtailment order was issued were the affected parties willing to seriously negotiate a solution.

Future formation of ground water management area advisory committees to negotiate a mutually agreeable ground water management plan may not be an efficient method of managing ground water and surface water for the ground water management area. Perhaps when the joint management of ground water and surface water is at issue, the Director should first initiate a contested case under Idaho Code §42-237a.g and determine depletions to senior surface water users caused by ground water withdrawals. Depending on the exigencies created by existing water conditions, the Director could allow some limited time for negotiations prior to issuing a curtailment order. During a time when regulation must be expeditious, allowing additional time for negotiation may not be possible.

Bear River Adjudication

The 2020 Idaho Legislature authorized the commencement of the Bear River Adjudication to adjudicate all water rights within the Bear River Basin. The 2021 Idaho Legislature appears poised to appropriate money to finance the adjudication. The Bear River Adjudication will be an approximate ten-year effort and cost about one million dollars per year.

As stated previously, in June 2021, the Adjudication Court issued an order authorizing the commencement of the Bear River Adjudication. The federal government subsequently appealed the commencement order. Nonetheless, IDWR should hire personnel and open a remote office FY2022 to be ready for notifying water users and to begin taking claims.

-Director Gary Spackman

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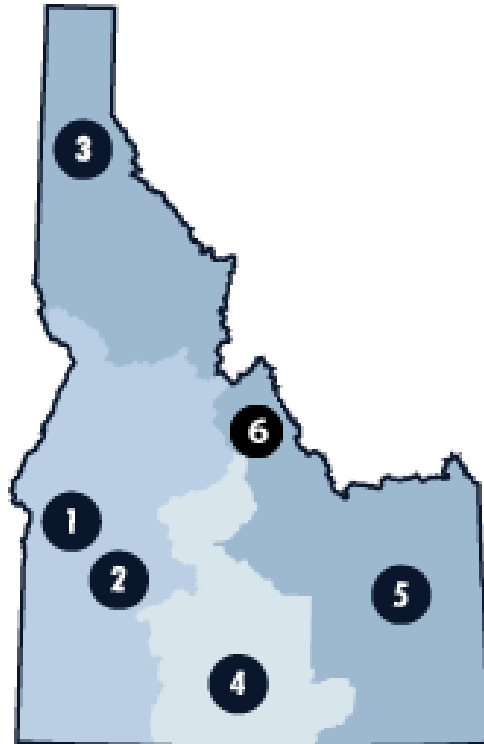
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IDAHO DEPARTMENT OF
WATER RESOURCES

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Idaho sunset. Photo courtesy of Denise Lauerman, IDWR.