



COLORADO

Division of Water Resources

Department of Natural Resources

2017 Annual Report



Maybell Irrigation Canal, Water Division 6

“Principles like adherence to the law and preventing injury can coexist with our efforts to act cooperatively with water users to creatively address needs and provide for the best beneficial use of water.”

Kevin Rein
State Engineer



As I complete the initial year of my time as State Engineer and Director of the Division of Water Resources, I take a look around at the challenges DWR has as water administrators. We experienced change in 2017, but 2017 was not unique. Those that have been with DWR for many years, decades for some, have seen dramatic changes in that time. But even those that have just begun their careers with DWR know that change is just part of our jobs. I'm encouraged that for DWR, the prospect of change is not daunting. Instead, it is inviting as we use our tools to react to it.

As I write this, I am also writing an article about DWR's role in implementing the 1969 Water Right Determination and Administration Act. In 2019, we in Colorado will celebrate the 50th anniversary of that important legislation. My work on that article reminds me that since the 1880's, and certainly in 1969, our legislature has entrusted our office with the important job of allocating a scarce resource among the demands of diverse water users

Many things have changed since the 1880's. The climate and hydrology that influence where and when the water is available changes from year to year, and gradually over time. The type of use Coloradans enjoy from this public resource changes. The technology and infrastructure we use to capture, divert, apply, distribute, measure, and account for the use of water has changed dramatically and the pace of that change continues to accelerate. But the direction that comes from our constitution; statutory law, including the 1969 Act; case law; and other guidance that is critical to our water administration is solid and, while occasionally modified, is reliably constant.

With that, our work would seem simple. We should apply the letter of the law, which we understand well. Our foundation is prior appropriation and DWR does a good job of employing that principle in everything we do. However it becomes more difficult

for us when we are presented with competing principles: maximization of beneficial use and prevention of injury. Those concepts are important to Colorado water users as well as DWR in our role as water administrators and in this time of accelerating change, reconciling those competing principles can be even more challenging. Colorado places increased importance on maintaining flows in rivers, preserving our agricultural economy and culture, getting the most use of water that is subject to compacts while not risking our compliance efforts, and providing for growing municipal and industrial needs that are a part of our state's economy, just to name a few.

I see that we have used, and will continue to use our firm guidance to address change with balance. Principles like adherence to the law and preventing injury can coexist with our efforts to act cooperatively with water users to creatively address needs and provide for the best beneficial use of water. I'm reminded of my visits to division offices and how much I learn from our field staff about what they do to work with water users daily; lending their expertise to help water users accomplish their needs while still faithfully applying the law. That is good water administration that allows DWR and Colorado water users to continue to adapt to change.

This report is a reflection of the role DWR plays in Colorado's water use. It reflects not only the critical nature of our responsibilities, but also the volume of work we do. Our success starts with the field staff and their water allocation and continues with the things many of us do to support that administration. Our organization is held in high regard by the public, the legislature, and ourselves. I am confident that as we continue to see change, our foundation of principled water administration along with our ability to apply balance to our work will ensure that we continue to help Coloradans use water in a way that reflects the values of our state.





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Programs

- Dam Safety
- Hydrographic & Satellite Monitoring
- Hydrogeological Services
- Interstate Compacts
- Modeling & Decision Support Systems
- Water Supply
- Water Administration
 - Field Offices

Mission

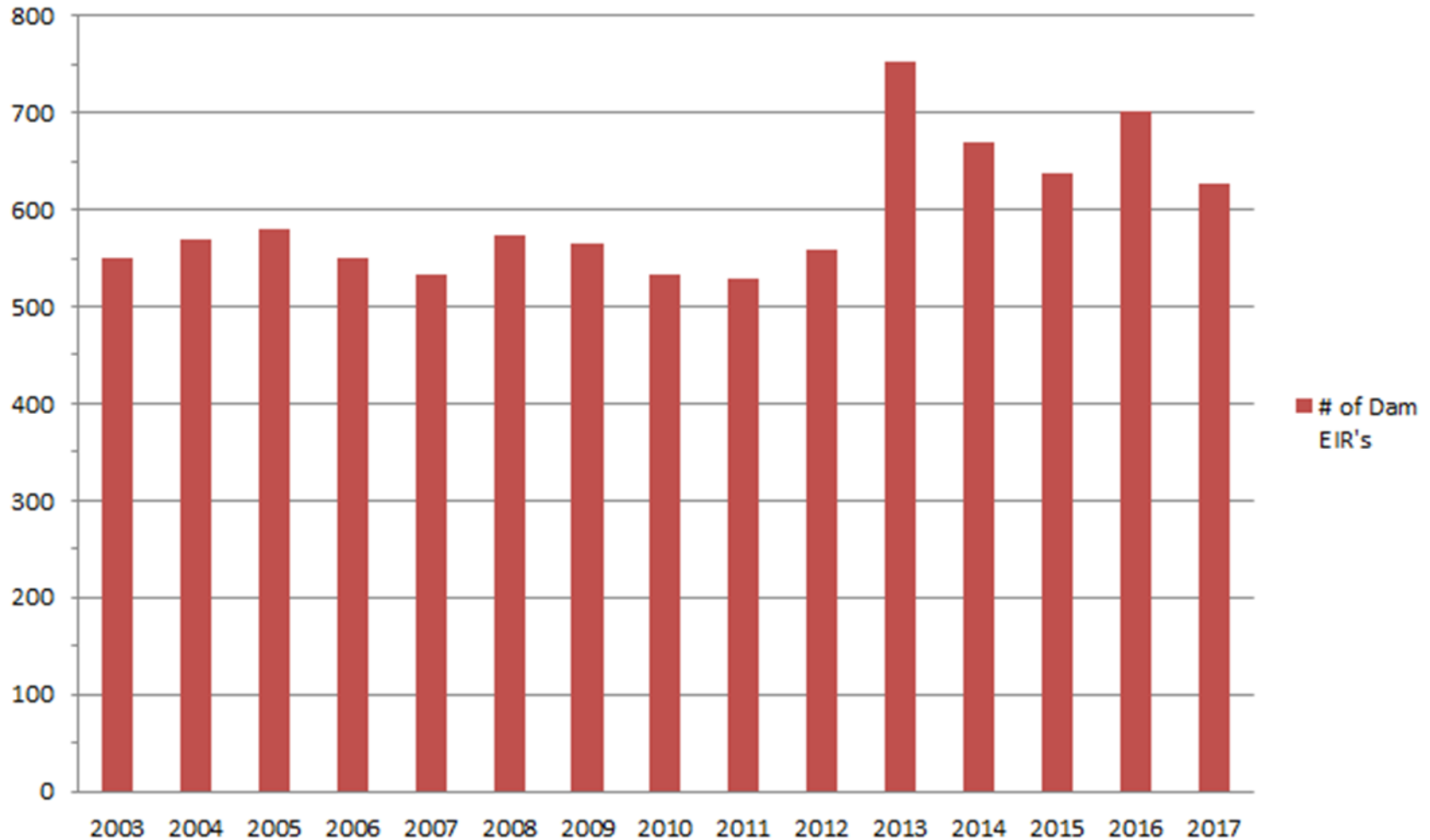
- To provide competent and dependable distribution of water in accordance with statutes, decrees and interstate compacts.
- To ensure public safety through safe dams and properly permitted and constructed water wells.
 - To maintain and provide accurate and timely information concerning water.
- To promote stewardship of all human, fiscal and natural resources.
- To serve the public through the generation of creative solutions to problems.
 - To help the public understand complex water issues.
 - To promote stability in the use of the state's limited water resources.
- To apply modern technology to its greatest advantage.

Dam Inspections



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Historical # of EIR's Per Calendar Year



100% High and Significant Hazard dams

Emergency Action Plan Tracking

EAP Analysis 2016 & 2017

	4/17/2017 Summary		4/15/2018 Summary	
HH Dams	419		426	
EAP - Yes	408	97%	420	99%
EAP -No	11	3%	6	1%
HH Age < 5yrs	304	73%	310	73%
HH IM Maps	338	81%	361	85%
HH IM SHP	235	56%	258	61%
SH Dams	305		299	
EAP - Yes	294	97%	288	96%
EAP -No	10	3%	11	4%
SH Age < 5 yrs	161	53%	156	52%
SH IM maps	176	58%	176	58%
SH IM SHP	82	27%	87	29%

26% High, 11% Sig updated

Design Review

DESIGN REVIEW AND CONSTRUCTION PROJECT ACTIVITY SUMMARY - 2017

DESIGN REVIEW ACTIVITY	NO. (2015)	NO. (2016)	NO. (2017)	ESTIMATED DOLLAR VALUE
Received	49	44	41	\$47,227,826
Approved	45	59	41	\$45,044,354
Const. Started	34	41	40	\$23,093,019
Const. Completed	34	43	29	\$19,372,203
As-Builts Accepted	32	45	52	\$77,073,543
Total Projects	116	120	106	\$152,042,106

Hydrographic & Satellite Monitoring Program



ADCP Highline Installations

- DWR Hydrographic and Satellite Monitoring Branch collects, analyzes, and presents accurate, high quality 'real time' flow and storage data in Colorado rivers, streams, creeks, canals, ditches and reservoirs to support the water rights administration mission of DWR.
- Hydrographers in each Division office around the State operate and maintain a system of 626 gaging stations on these watercourses and diversion structures
- Performed 4,855 streamflow measurements to maintain stage-discharge relationships at gaging stations and assist in support of the historic streamflow record.
- The Satellite-linked Monitoring System (SMS) provides the Division of Water Resources, other State and federal entities, the water user community and the public at large with access to real-time streamflow and storage data from gaging stations across the State of Colorado.
- Approximately 50 DCPs are replaced annually with the goals of improving the quantity and quality of data used to manage and administer water throughout the State of Colorado.
- The Branch develops historic streamflow records at a subset of stream gage locations in coordination with other State and federal entities and the water user community.

Hydrogeological Services

- **Staff assistance**
 - Aquifer determinations ▶ 569 (+35%)
 - Aquifer hydraulic properties ▶ 26 (+86%)
 - Recharge Pond Reviews (HB 1013) ▶ 5
- **Board of Examiners Support**
 - Variances to Well Construction Rules ▶ 123 (+18%)
- **Groundwater Monitoring Program** ▶ 1,243 wells
- **Permit Cond. Amendments** ▶ 222 (+25%)
- **Well Inspections** ▶ 855 (+7%)
- **Complaints/Violations** ▶ 29 (+21%)
- **Nontributary Initial Determinations** ▶ 4 (-50%)
- **Colorado Oil & Gas Conservation Commission Reviews** ▶ 16 (-6%)



Interstate Compacts

Republican River Compact

Permanent CCP authorization received in August of 2016

- 100% credit for augmentation
- 25,000 acre reduction in S. Fork Basin

Harlan County Lake Resolution

Finalized accounting through 2015 in May of 2017

Rio Grande

TX v NM & CO Original No. 141

Special Master Report in 2016

Supreme Court Hearing Jan. 2018 allowed US to become a party

New Special Master Appointed

Colorado River

Work continued on Upper Basin Consumptive Use Calculation process (Phase 3) includes:

Weather data

Data, storage, processing, QA/QC

GIS data availability

Remote Sensing methods comparison



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Modeling & Decision Support Systems

- **Statewide** - Lease Fallow Tool Version 7: Included new ASCE calibrated datasets for Division 1 and TR21 datasets for the West Slope. Open CDSS collaborative software project management approach initiated.
- **Denver Basin Groundwater Model** - Issue with 64 bit compatibility resolved and new version is available on web site.
- **Arkansas River Basin Support** - Development of the ArkDSS has begun. H_I Model updates included evaluation of presumptive depletion factors, intensive quality control of CoAgMet station data, irrigated acreage analysis and changes in model code to modify how water stored in Section II accounts owned by LAWMA are modeled.
- **Rio Grande Basin Decision Support System (RGDSS)** - Rio Grande Rules (15CW3024) trial support continued during 2017. Work on Phase 7 of the RGDSS Ground- water Model included updates to the RGDSS datasets, processes and models, plus it extends the end date of model input from 2010 to 2017.



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Water Supply Branch



- Analyzed and approved 169 general Substitute Water Supply Plans (SWSPs) and 65 SWSPs for gravel pits
- Reviewed, analyzed, and provided 562 comments to Colorado counties regarding the water supply for proposed subdivisions and other land use actions
- Received and acted on 6,545 well permit applications and processed 638 Monitoring Hole Notices, 13,104 Changes in Ownership/address, 3,942 Well Construction and Test Reports, and 3,398 Pump Installation Reports
- Issued 11 final permits, 95 determinations of water rights, 25 change application approvals and five replacement plans in designated basins.
- New well permit evaluation tool launched June 1, 2017 (“HBDMC Permit Tool”). Replaced old Well. Eval. Tool.

South Platte River Basin, Water Division 1



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- The South Platte mainstem began moving off of free river at noon on June 10, 2017 and ended June with the entire main stem under call by June 30. All of Division 1 remained under varying calls through the end of August 2017. Of note, from June 30 through the end of the period the Julesburg flows were below the 120 cfs that triggers curtailment of Colorado water rights junior to June 14, 1897 in Water District 64 under the South Platte River Compact. Curtailment under the compact also occurred from the start of September through September 16.
- 2017 saw continuing implementation of the South Platte Well Measurement Rules and the Ground Water Well Team conducting approximately 70 well measurement device verification field tests, inventory of more than 700 wells, and field inspection of more than 375 wells filed as inactive in accordance with the Rules.
- The Republican River Well Team continued their efforts of administering the Republican River Basin Groundwater Measurement Rules (Rules) in 2017, including conducting approximately 200 well measurement device verification field tests, inventory of approximately 800 wells, and field inspection of approximately 140 wells filed as inactive in accordance with the Rules. The Republican River Well Team assisted with Well Tester certification training classes, and conducted in-field one-on-one recertification of approximately 30 certified well testers.

South Platte Irrigated Acres Comparison

Year	Total AC	% of 1956 acres	AC -Diff from 1956
1956	982506		
1976	1016795	103.5	34289
1987	987150	100.5	4644
2001	910518	92.7	-71988
2005	838107	85.3	-144399
2010	857732	87.3	-124774
2015	809256	82.4	-173250



Arkansas River Basin, Water Division No. 2



- Hydrological conditions resulted in 2017 as being an above average year in the basin
- Winter storage accumulation at the end of the Pueblo Winter Storage Program storage period on March 14, 2017 was 130,961 a.f., or 13.7% less than was stored in the previous year and 1.7% less than the previous 20 year average
- Overall irrigation well pumping in 2017 was below average since Colorado's Amended Use Rules for well pumping went into effect in 1996
- Cannabis industry water administration issues continued to be time consuming (2,140 related work hours). However, a moratorium placed in effect in Pueblo County on licenses seems to be leveling off the number of new grow operations.
- Sixteen new Augmentation Plans were decreed during 2017, bringing the total to 671 plans within Div. 2
- Colorado remained in compliance with Arkansas River Compact



The Rio Grande, Water Division No. 3



- 2017 saw for the first time in nine years an above average snowpack (120% of average)
- Colorado was close on its Rio Grande Compact delivery obligations for 2017, with a total of approximately 400 acre-feet of debit at the end of the year
- Trial held in January/February 2018 over the Ground Water Use Rules.
- Subdistricts are gearing up to meet Use Rule requirements by late 2019, early 2020.
- Texas v. New Mexico and Colorado (Original #141) continues before the US Supreme Court.



The Gunnison River Basin, Water Division No. 4



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- Snowpack conditions reached 122% of normal for the season, and improvement from 2016.
- Inflow to the Aspinall Unit (Blue Mesa, Morrow Point and Crystal Reservoirs) as of May 1, 2017 was 126% of the 30-year median seasonal peak. Peak flow at the Whitewater stream gage was 14,040 c.f.s.
- 344 exempt well permits were issued during the 2017 water year, up significantly from 2016 (274). This continues an upward trend over the last few years.



Redlands Power Canal Co. Diversion



The Colorado River Basin, Water Division No. 5

- The 2017 Irrigation Year began with near average stream flows, and near average reservoir carryover storage. Storage in the basin's major reservoirs began the water year at 105% of average on September 30, 2016. The water year ended at 107% of average storage on September 30, 2017. The table below depicts a comparative end-of-water year storage for Division Five's largest reservoirs.
- Coordinated Reservoir Operations did occur in 2017 for the third consecutive year. Bypassed inflows began on June 1, 2017 and continued through June 14, 2017. Accounting for the various delivery times the flows in the critical reach were enhanced from June 4th through June 16th. Accounting for transit losses the maximum peak enhancement was on June 9th at 2,700 cfs. The actual peak at the Colorado River at Palisade gage did occur during this enhancement on June 10th at 14,900 cfs, which included 2,465 cfs of CROS operations. Total deliveries (bypasses less transit losses) for 2017 were 33,560 acre-feet.

- Well permitting increased. Total permits issued for both exempt and nonexempt new and replacement wells in 2017 also increased with 619 permits issued compared to 512 permits issued during 2016. There was 1 geothermal permit application and permit issued in 2017.



Roaring Fork River, Grottos Cascades



The Yampa and White River Basins, Water Division No. 6

Water administration in water year 2017 was as usual with calls placed in the typical areas.

Despite above median snowpack in February and March, streamflows were above average at only one of the below reported gauges, the North Platte near Northgate gauge.

The Division Engineer in August 2017 requested no well permits be issued in over-appropriated basins on lots less than 35 acres within Routt County. On Feb. 1 State Engineer provided a solution to begin issuing permits once again.

Under Article XIII (a) of the Upper Colorado River Compact, the State of Colorado will not cause the flow of the Yampa River at the Maybell gauge to be depleted below an aggregate amount of 5,000,000 acre-feet for any period of ten consecutive years. The annual runoff for water year 2017 at this gauge was 985,190 acre-feet and the ten year (2008 to 2017) aggregate flow was 11,771,560 acre-feet, well above the requirements under Article XIII (a).



Rafting the Yampa

Releases were made from Elkhead Creek Reservoir between August 17, 2016 and October 8, 2016 for a total of 5,000 acre-feet. This release was made for the purpose of in-river fish habitat, river flow maintenance and enhancement under the Upper Colorado River Endangered Fish Recovery Implementation Program.

Animas and La-Plata River Basins

Water Division No. 7



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- 2017 Water Year was a normal pattern, with runoff close to average with a peak in June.
- Most reservoirs were able to fill completely in 2017, including McPhee Reservoir. Long Hollow Reservoir did not fill, but reached a volume of 2,932 acre-feet (AF) on June 12, surpassing the 769 AF volume reached in 2016.
- Releases made to the Dolores River in late March from McPhee Reservoir created additional storage and provided downstream boating opportunities among other benefits. A peak release of 4,000 cubic feet per second (cfs) made in early May 2017 lasted approximately 4 days. And releases less than 4,000 cfs continued through late June. On June 9, 2017
- There were 169 well permits issued in Division 7 in calendar year 2017. Of these, 137 were exempt well permits, 17 were non-exempt well permits, and 15 monitoring well permits were processed in the Durango office. There were also 35 non-exempt well permits, 16 monitoring well permits, 13 monitoring holes, and 29 Oil and Gas (Coal Bed Methane) well permits processed through the Denver office.



Lake Nighthorse



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For detailed field office and branch reports please visit
“Publications & Reports” located on our website at: water.state.co.us