

Arkansas River Basin



US Army Corps
of Engineers®
Albuquerque District

2019 Water Management and Civil Works Activities

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1. General

During Water Year 2019 (1 November 2018 – 31 October 2019), activities of the U.S. Army Corps of Engineers (USACE), Albuquerque District, in the Arkansas River Basin consisted of water operations, operations and management, civil works, flood risk management, regulation under Section 404 of the Clean Water Act, and wildfire response and post fire flooding concerns.

2. Water Management Operations

In 2019, the Arkansas River Basin snowmelt runoff was above normal throughout the entire basin. As of May 1st, the basin wide snowpack was above average at 127% of median with the Upper Arkansas Basin reporting 137% of median and the Purgatoire River Basin reporting 205% of median.



Figure 1: Trinidad Lake, 2017. USACE photograph

a. Trinidad and John Martin Dam and Reservoir Elevation Area Capacity Tables

In an effort to update the elevation area capacity (EAC) tables for both John Martin Reservoir and Trinidad Lake, bathymetric surveys were conducted in 2017 and 2018, respectively. Due to the increased accuracies in terrain mapping provided by Multi-Beam Sonar (bathymetry) and LiDAR (2015 for Trinidad and 2016 for John Martin), higher values are consistently observed for perimeter, area, and volume summaries due to improved accounting. The new method establishes a baseline for future comparisons to more accurately measure sedimentation movements and volumes. The updated surveys shows there is no impact to the flood control capacity for both projects. The new EAC tables were implemented for both reservoirs on 1 November 2019.

Based on the information obtained from the 2017 bathymetry and 2016 LiDAR, 85,216 acre-feet of sediment has been deposited in John Martin Reservoir. The average annual deposition rate is approximately 1136 acre-feet per year. There have been 18 sediment surveys completed since 1944. There were two completed in the 1940s, six in the 1950s, three in the 1960s, 1972, two in 1980s, two in 1990s, 2009 and 2017.

Five sediment surveys have been completed since 1977 for Trinidad Reservoir. They were completed in 1986, 1994, 1997, 2009 and 2018. Based on sediment surveys, total accumulated sediment (1977 to 2018) is 6,733 acre-ft with an average rate of

about 164 acre-ft per year. Total reserved space for sediment in Trinidad Lake is 39,000 acre-feet.

b. Trinidad Dam and Reservoir

For Water Year 2019, elevation started at 6181.9 ft with storage of 18,780 acre-ft and ended at 6182.3 ft with storage of 19,058 acre-ft. Storage peaked at 25,374 acre-feet (elevation of 6190.7 ft) on 16 July 2019. The maximum daily inflow was 420 cfs on 2 July and the maximum daily release was 481 cfs on 26 June 2019. The total inflow for Trinidad Reservoir was 63,814 acre-ft and total outflow was 60,350 acre-ft. USACE did not operate for flood control at Trinidad Dam and Reservoir in 2019.

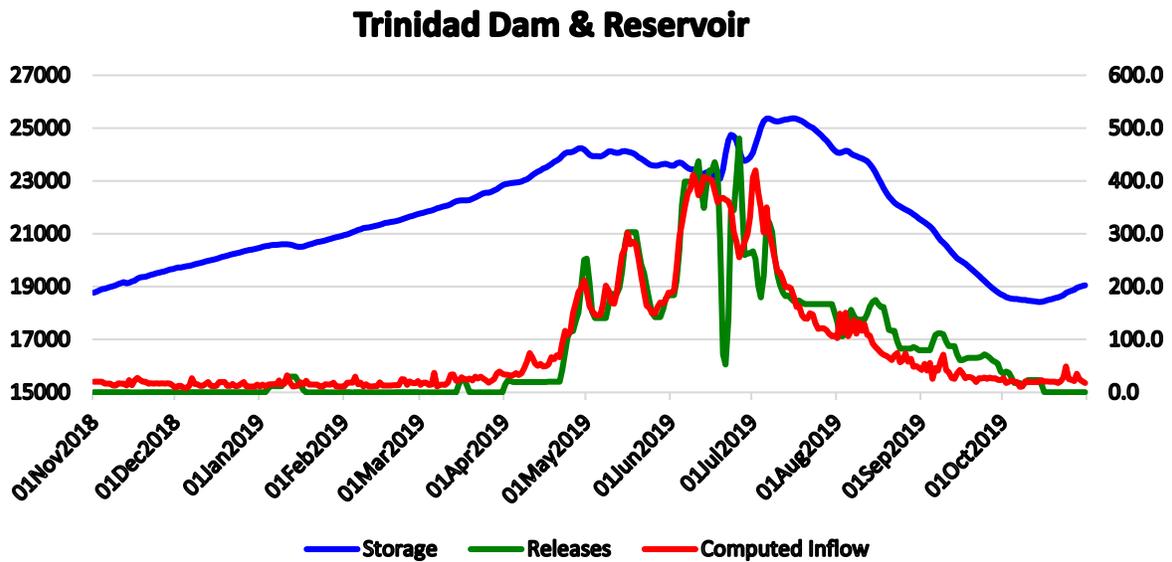


Figure 2: 2019 Trinidad Dam and Reservoir Water Operations

c. John Martin Dam and Reservoir

For Water Year 2019, elevation started at 3828.7 ft with storage of 133,126 acre-ft and ended at 3817.20 with storage of 70,389 acre-ft. Storage peaked at 176,951 acre-feet (elevation of 3,834.8 ft) on 14 April July 2019. The maximum daily inflow was 1,899 cfs on 21 June and the maximum daily release was 1,439 cfs on 2 July 2019. The total inflow for John Martin Reservoir was 231,980 acre-ft and total outflow was 260,385 acre-ft. USACE did not operate for flood control at John Martin Dam and Reservoir in 2019.

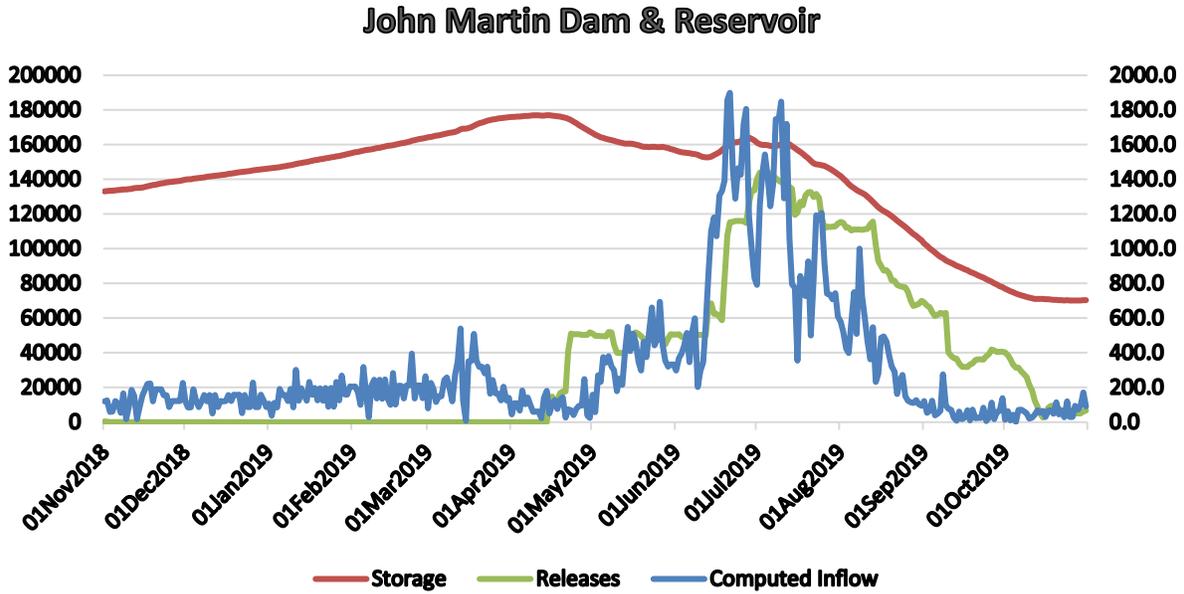


Figure 3: 2019 John Martin Dam and Reservoir Water Operations

On 15 August 2019, the John Martin Dam and Reservoir Tabletop Exercise was conducted in accordance with frequency requirements provided by ER 1110-2-1156 - every 2 years for John Martin Dam. The tabletop exercise provided a forum to communicate project risk to stake holders along the Arkansas River while a scenario allowed participants to practice actions to take in the event of an emergency at the dam. Emergency managers from Lamar, CO, Bent County, CO, Hamilton County, KS and Dodge City, KS attended the exercise. John Martin staff provided a tour of dam to stakeholders after the exercise.



Figure 4: Assessing downstream communities



Figure 5: USACE and Stakeholders coordinate flood procedures and coordination

3. Operations and Maintenance

a. Trinidad Dam and Reservoir

During 2019, several projects were completed at Trinidad Dam and Reservoir as described below:

- a. New riprap was placed on the upstream face of the embankment where the original riprap had been degraded. The original riprap was not durable enough to withstand wave-action forces. This project placed a band of new, durable granite in the range where lake elevations were at the time of construction. Ultimately, the goal is to overlay the entire upstream face of the dam depending on funding and lake level.

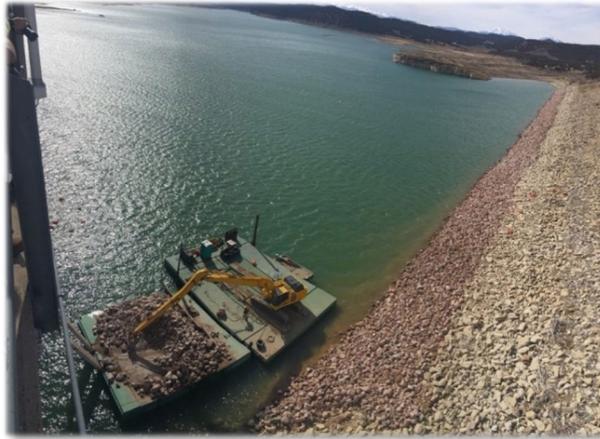


Figure 6: Barges and excavator being used to transport and place riprap on upstream slope.

- b. A slope stabilization project was completed to protect banks adjacent to the south shore area from erosion during high lake elevations. The Project involved a considerable amount of earthwork. The slopes were reinforced with compacted earth material then covered with concrete matting which contains geotextile fabric. Disturbed areas, due to construction, were seeded with native mix.



Figure 7: flexible concrete matting used for slope stabilization adjacent to the south shore.

b. John Martin Dam and Reservoir

During 2019, operations and maintenance projects were completed at John Martin Dam and Reservoir as described below:

- a. For the first time since dam construction was complete, the stilling basin was emptied and all accumulated sediment was removed. The total amount of removed sediment was approximately 55,000 cubic yards. The emptied stilling basin allowed for inspection of all baffle blocks, concrete, and over 2,000 drain holes. The baffle blocks were in exceptional condition. Some minor spalling on the concrete was repaired. All drain holes were found to be partially clogged and were cleaned. Proper functioning drain holes allow water pressure beneath the dam to be relieved and decreases the buoyant forces. The project was completed on time (27 March 2019) and did not impact the start of the irrigation season.

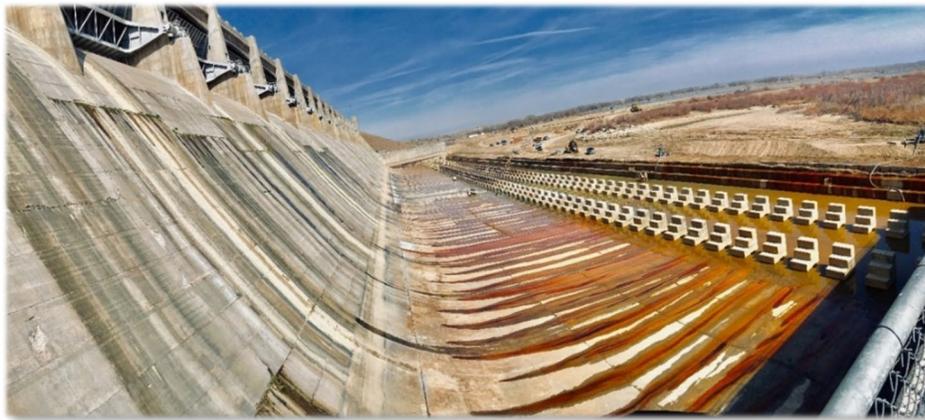


Figure 8: Stilling basin emptied, all sediment removed, and drain holes functioning properly.



Figure 9: Stilling basin being filled.

4. Civil Works

a. Continuing Authorities Program

The Continuing Authorities Program (CAP) is a group of nine legislative authorities under which the Secretary of the Army, acting through the Chief of Engineers, is authorized to plan, design, and implement certain types of water resources projects without additional project-specific congressional authorization. USACE had two active CAP projects in the Arkansas River Basin in 2019.

Section 205

Section 205 of the 1948 Flood Control Act, as amended, provides authority to USACE to plan and construct small flood damage reduction projects that have not been specifically authorized by Congress.

Section 206

Section 206 of Water Resources Development Act (WRDA) 1996 provides authority to USACE for aquatic ecosystem restoration projects in areas unrelated to existing USACE water projects. USACE had no active Section 206 projects in the Arkansas River Basin in 2017, however, two requests were received from the City of Colorado Springs in 2018. These projects remain in the request pending funding to start feasibility studies.

The requested projects occur along Spring Creek near Pikes Peak Avenue and at Shooks Run. The projects would result in restoration of stream and riparian structure and function to include habitat improvement, stabilized stream morphology and sediment management

Section 14

Section 14 of the 1946 Flood Control Act, as amended, provides authority for USACE to plan and construct emergency stream bank protection projects to protect endangered highways, highway bridge approaches, public facilities such as water and sewer lines, churches, public and private nonprofit schools and hospitals, and other nonprofit public facilities.

USACE has requested a new start Section 14 along North Douglas Creek located in the City of Colorado Springs, CO, immediately east of I-25 and west of the confluence with Monument Creek. The project would stabilize 1,100 linear feet of North Douglas Creek that severely eroded during 2013 and 2015 Flood Events and continues to erode with normal flow events. Erosion has damaged the major drainage culvert under I-25 and Sinton Road. If the erosion and bank failure continues, the roadway infrastructure could be damaged and impact the major north-south highway in Colorado.

A new start Section 14 project with the Fremont Sanitation District, Fremont County, was initiated in the summer of 2019. The objective of the project is to repair and prevent further erosion of the south bank of the Arkansas River to protect the District's wastewater main and the adjacent Canon City Area Recreation and Parks District recreation trail.



Figure 10: Erosion along south bank of Arkansas River in Fremont County.

b. Investigations Program

The USACE Investigations Program includes specifically authorized studies for comprehensive solutions to large complex problems relating to flooding, ecosystem restoration, loss of land and property, floodplain management, and watershed planning and analysis. The Investigations program consists of two phases: the feasibility study phase, and the pre-construction engineering and design (PED) phase. The feasibility study is used to investigate the Federal interest, engineering feasibility, economic justification and environmental acceptability of a recommended water resources project, and results in a feasibility report. The feasibility report is the document on which congressional authorization for PED and Construction is based. During the pre-construction engineering and design phase, development of the first construction contract bidding package can be completed while waiting for congressional construction authorization. If the project is authorized for construction by Congress, USACE and the project sponsor can move forward with the remaining detailed design and construction. USACE had no active Investigations or Construction projects in the Arkansas River Basin in 2019.

5. Flood Risk Management Program

USACE established the National Flood Risk Management Program (FRMP) in May 2006 to integrate and synchronize USACE activities, both internally and with counterpart activities of the Department of Homeland Security, Federal Emergency

Management Agency (FEMA), other Federal agencies, state organizations, and regional and local partners and stakeholders. The USACE Levee Safety Program was authorized in WRDA 2007 and established by the National Levee Safety Act of 2007. The Inspection of Completed Works/Rehabilitation Program (ICW/RP) is the USACE program that provides for the inspection and rehabilitation of Federal and non-Federal flood risk management projects within the ICW/RP (PL8499). For 2019, no active projects in the ICW/RP were removed from the program based on inspection.

The National Levee Database (NLD) is used to track both USACE and Non-USACE levee system inventory and other flood risk management features. The NLD is viewable to the public through the following internet link; <https://levees.sec.usace.army.mil/#/>. The database contains pertinent information (length, height, crest width, etc.) concerning levee systems as well as flooding risk information for the systems. The database viewer uses both an interactive text search and graphical search functions to locate levee systems of interest.

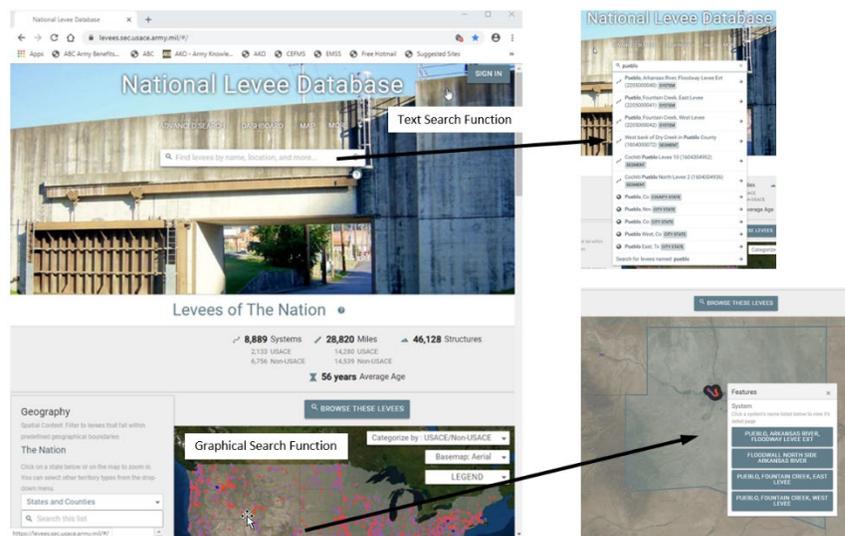


Figure 11: NLD Search Functions

An additional component of FRMP is the Silver Jackets Program, which is part of the National Flood Risk Management Program. The Silver Jackets Program proposes establishing an interagency team in each state with a representative from FEMA, USACE, the State National Flood Insurance Program Coordination Office, and the State Hazard Mitigation Office as standing members and lead facilitators. The lead FRMP Manager for the formation of the Silver Jackets Program in Colorado and the Arkansas River Basin resides in the USACE Omaha District, and the Albuquerque District performs a support role.

The Colorado Silver Jackets team was officially created in 2013. The team consists of four USACE Districts that include the Sacramento, Albuquerque, Kansas City, and Omaha Districts. The State of Colorado is represented by the Colorado Water Conservation Board as well as the Colorado Department of Homeland Security. FEMA

Region 8 is also part of the State team. USACE had no active Silver Jackets projects in 2019 within the Arkansas River Basin.

6. Regulatory Program

The USACE has regulatory authority under Section 404 of the Clean Water Act for the discharge of dredged or fill material into waters of the United States. The Albuquerque District, Southern Colorado Office (SCO) reviewed a total of 155 activities in the Arkansas River Basin during Water Year 2019, including 87 activities authorized under general (Regional or Nationwide) permits and 1 activity authorized under a Standard Individual Permit. General permits are activity-specific permits that are used to authorize projects that result in minimal adverse impacts on the aquatic environment. Standard Individual Permits are required for activities having more than minimal adverse impacts and/or for activities that do not meet the terms and conditions of a general permit.

Persons or agencies who are planning to conduct work in any waterway in the basin are advised to contact SCO at 201 W. 8th Street, Suite 350, Pueblo, Colorado 81003 or telephone 719-744-9119. Information, including all public notices, is also available on the USACE Albuquerque District web home page at: <https://www.spa.usace.army.mil/Missions/Regulatory-Program-and-Permits/>

7. Emergency Management Coordination

Public Law 84-99 provides USACE with the authority to assist state and local governments before, during, and after flood events. In the Arkansas River Basin, USACE works with the State of Colorado Division of Homeland Security and Emergency Management and the Colorado Water Conservation Board to prepare for flood fight activities in years with significant snowpack and spring snowmelt runoff.

Spring Creek Fire

The 2018 Spring Creek Fire burn scar (107,967 acres) is near the communities of La Veta, and Walsenburg in Huerfano County, CO. The burn scar created an unusual and imminent threat of flooding and debris flows. This fire created a burn scar which will have potential long-term impacts to the watershed. The flood threat potential from the burn scars has been significantly increased from the pre-fire to post-fire conditions as a result of the denuded watershed with reduced infiltration and increased runoff. The Albuquerque District's Readiness and Contingency Operations Office (RCO) and Hydraulics and Hydrology (H&H) at the request from the Colorado Division of Homeland Security and Emergency Management (CDHSEM) provided technical assistance by performing hydrologic and hydraulic watershed modelling. The Albuquerque District's H&H group has completed the modeling and a report and briefing of the results was given to the CDHSEM and the Recovery Team. Based on the 100 Year Event model results, it is expected that approximately 7,240 cfs would be entering the town of Walsenburg from Cucharas River and approximately 10,650 cfs

would be entering town of La Veta from Middle Creek and Cucharas River. In addition the RCO and H&H provided sandbag training for the communities of La Veta and Walsenburg.

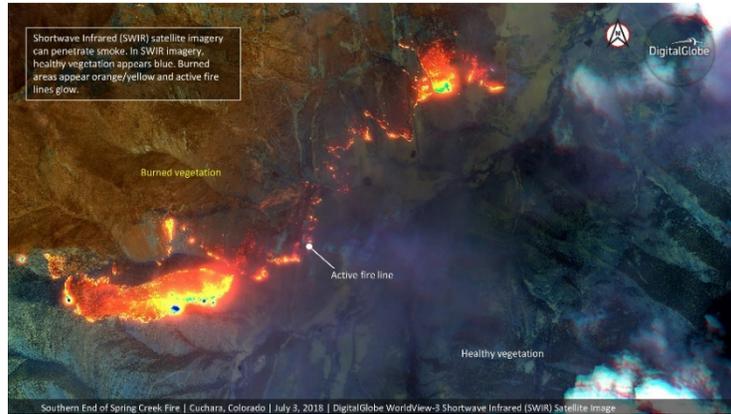


Figure 12: Spring Fire

Assistance can be obtained by contacting the U.S. Army Corps of Engineers, Albuquerque District, Readiness and Contingency Operations Office, 6200 Jefferson Street NE, Albuquerque, New Mexico 87109-3435 or telephone 505-342-3686 during our normal business hours between 7 am and 4 pm, weekdays.