

2022 ARCA ENGINEERING COMMITTEE MEETING

ARKANSAS RIVER BASIN REPORT

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7 December 2022

Lamar, CO



US Army Corps
of Engineers®

John Martin Dam & Reservoir



Trinidad Dam & Lake





TOPICS

- Compact Year 2022 Water Management
- USACE Water Quality Monitoring
- John Martin Water Control Manual Updates
- Forecast Informed Reservoir Operation (FIRO)
- Civil Works Project Authorizations
- Operation and Maintenance



Arkansas River Basin

Albuquerque District
Fryingpan-Arkansas
Pueblo
John Martin
Trinidad
KANSAS
COLORADO
NEW MEXICO

US Army Corps of Engineers,
Albuquerque District

2022 Water Management
and Civil Works Activities



COMPACT YEAR 2022 WATER MANAGEMENT

Basin Wide Summary



Snowpack and Streamflow (May 1, 2022 Forecast)

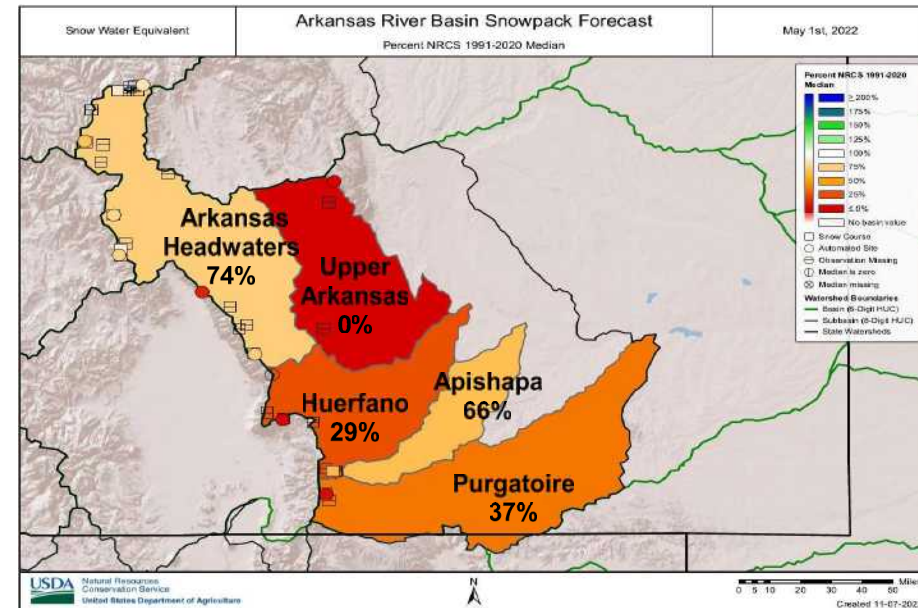
- Upper Arkansas Basin Snowpack – 74% of median
- Purgatoire River Basin Snowpack – 37% of median
- Basin Wide Average – 66% of median

Arkansas River Basin May 1 st Most Probable Snowmelt Runoff Forecast (50% Exceedance)				
Measurement Location	Snowmelt Runoff (x 1,000 Acre-Feet)		Percent of Median	
	May Forecast	Actual	May Forecast	Actual
Arkansas River above Pueblo (April – July)	250	177.5 ¹	77%	55%
Purgatoire River at Trinidad (April – July)	10	7 ²	34%	24%
John Martin Dam and Reservoir (April – July)	82.4 ³	60.75 ²	65% ³	48%

¹ Data Source: Colorado Division Water Resources

² Data Source: U.S. Army Corps of Engineers

³ National Weather Service inflow forecast for Arkansas at Las Animas



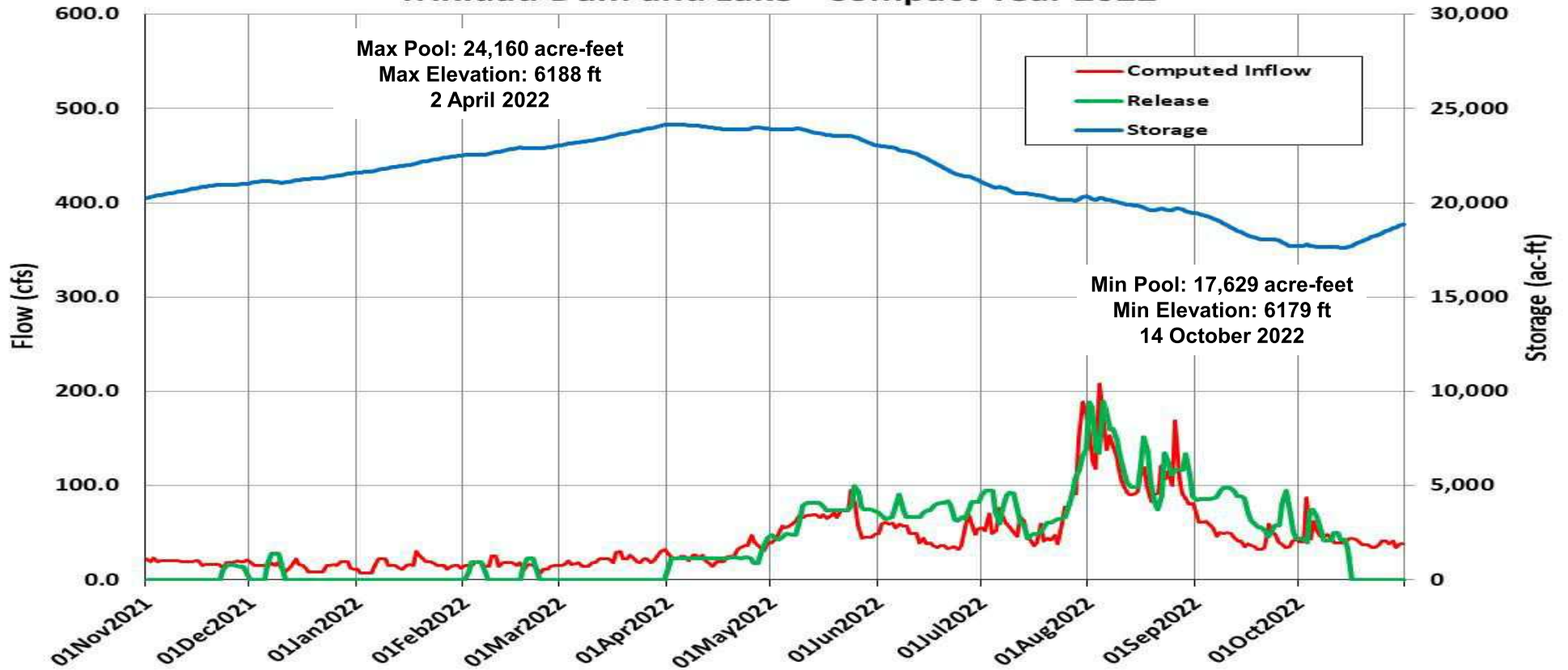


COMPACT YEAR 2022 WATER MANAGEMENT

Trinidad Dam and Lake



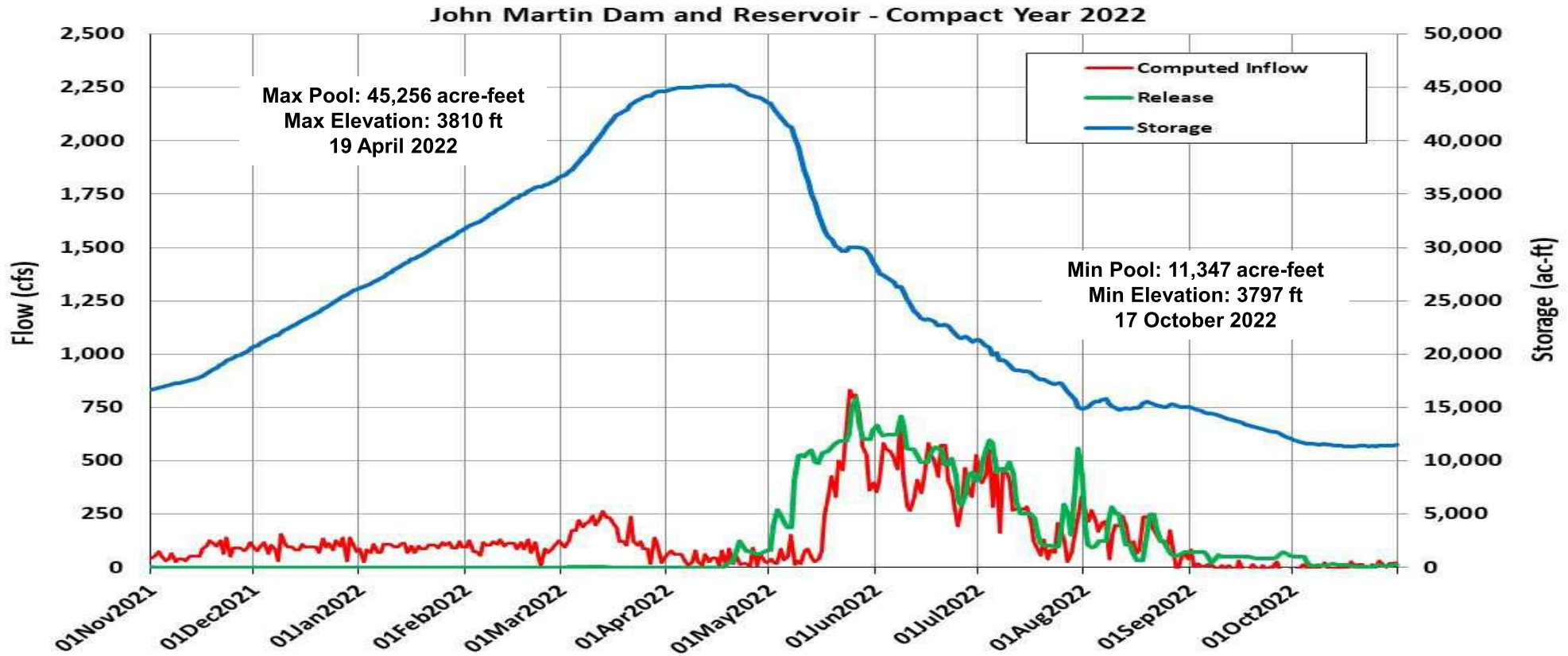
Trinidad Dam and Lake - Compact Year 2022





COMPACT YEAR 2022 WATER MANAGEMENT

John Martin Dam and Reservoir





ARKANSAS WATER QUALITY MONITORING



● Reservoir Stations (2012 – Current)

Monthly during ice-free period

– Vertical profiles

Temperature

Dissolved oxygen

– Surface measurements

Turbidity

pH

Specific conductance

– Secchi depth

– Zebra and quagga mussel (June-October)

▲ Riverine Stations (2020 – 2025)

– 15-minute interval

Water Temperature

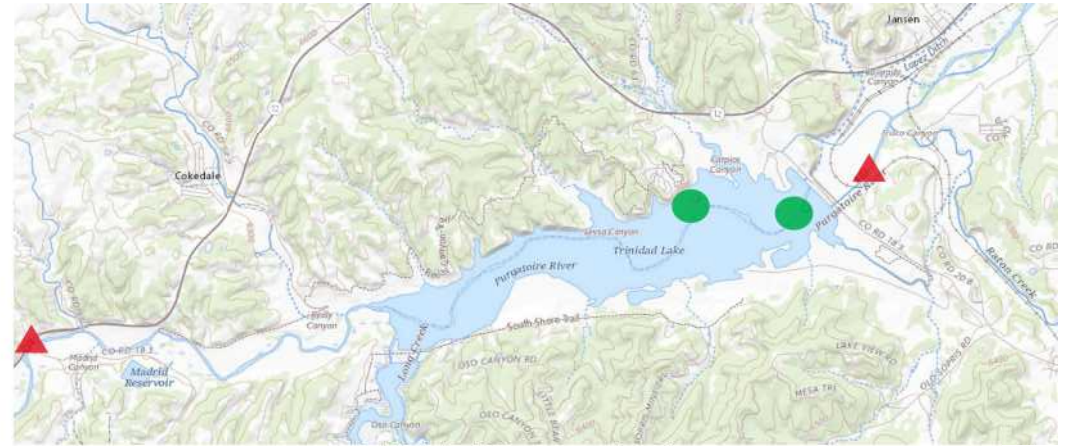
Dissolved oxygen

Turbidity

pH

Specific conductance

– Monthly anions/cations and total suspended sediment



Trinidad Dam and Lake



John Martin Dam and Reservoir



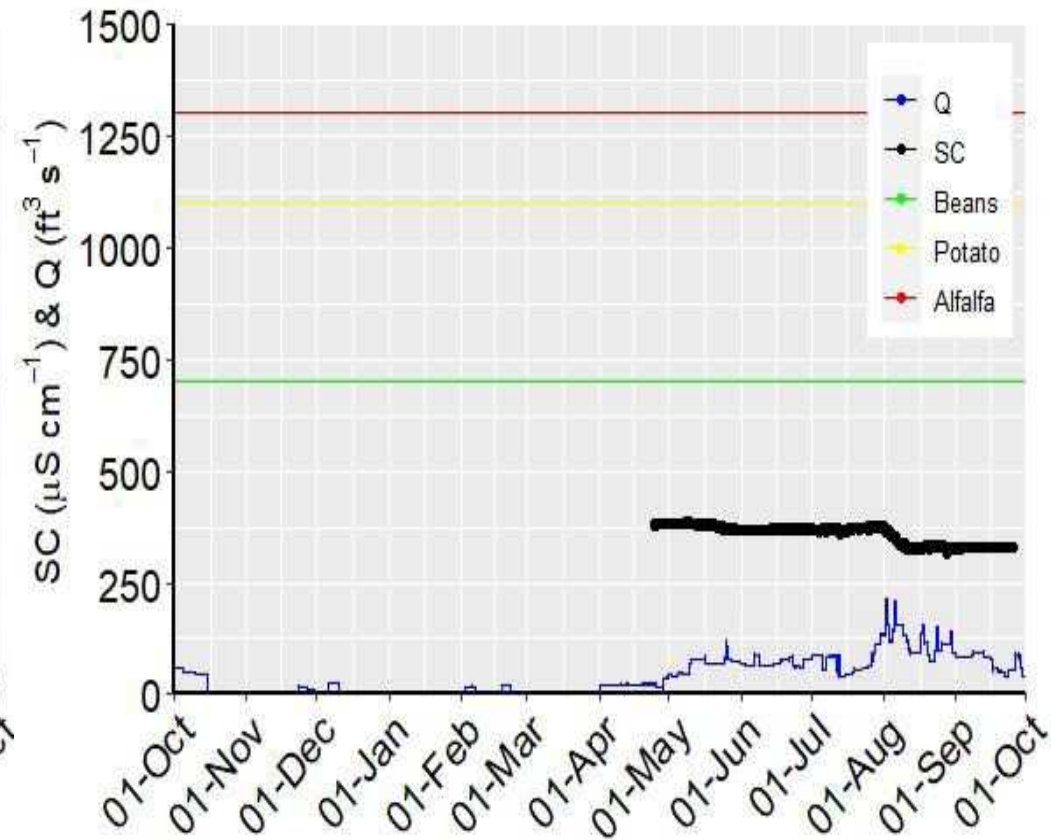
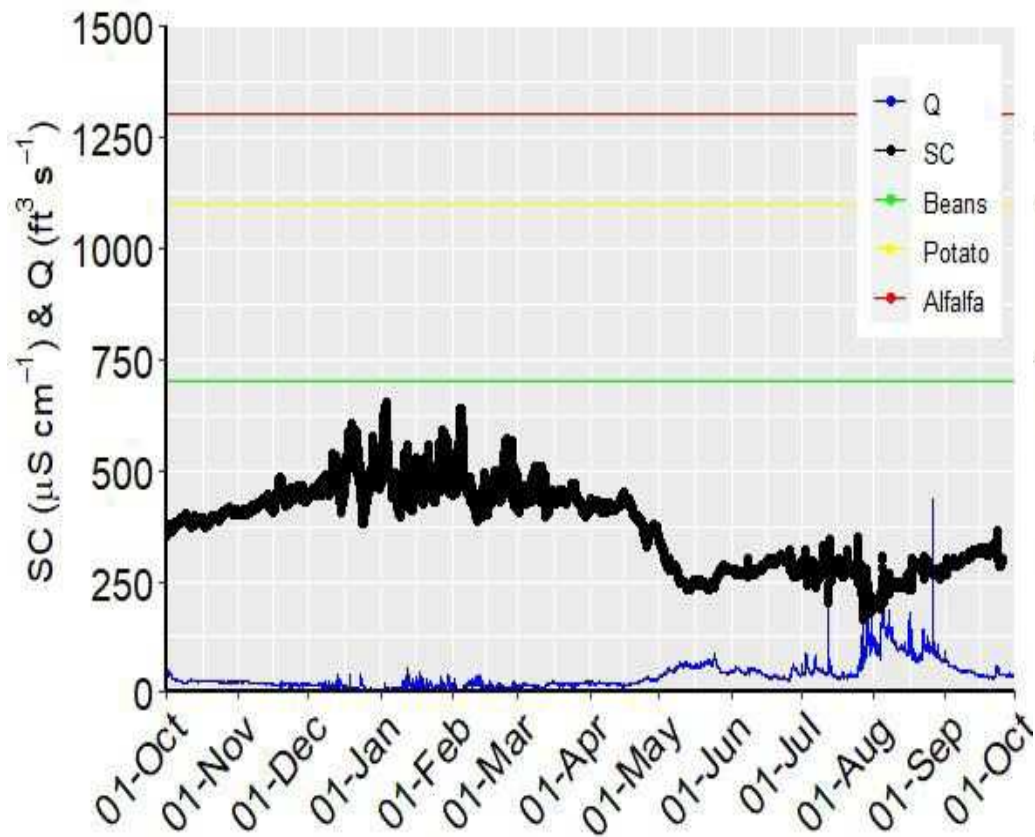
ARKANSAS WATER QUALITY MONITORING DATA



2022 Discharge, Specific Conductance, and Crop thresholds

Upstream of Trinidad dam (Madrid Gauge)

Downstream of Trinidad Dam





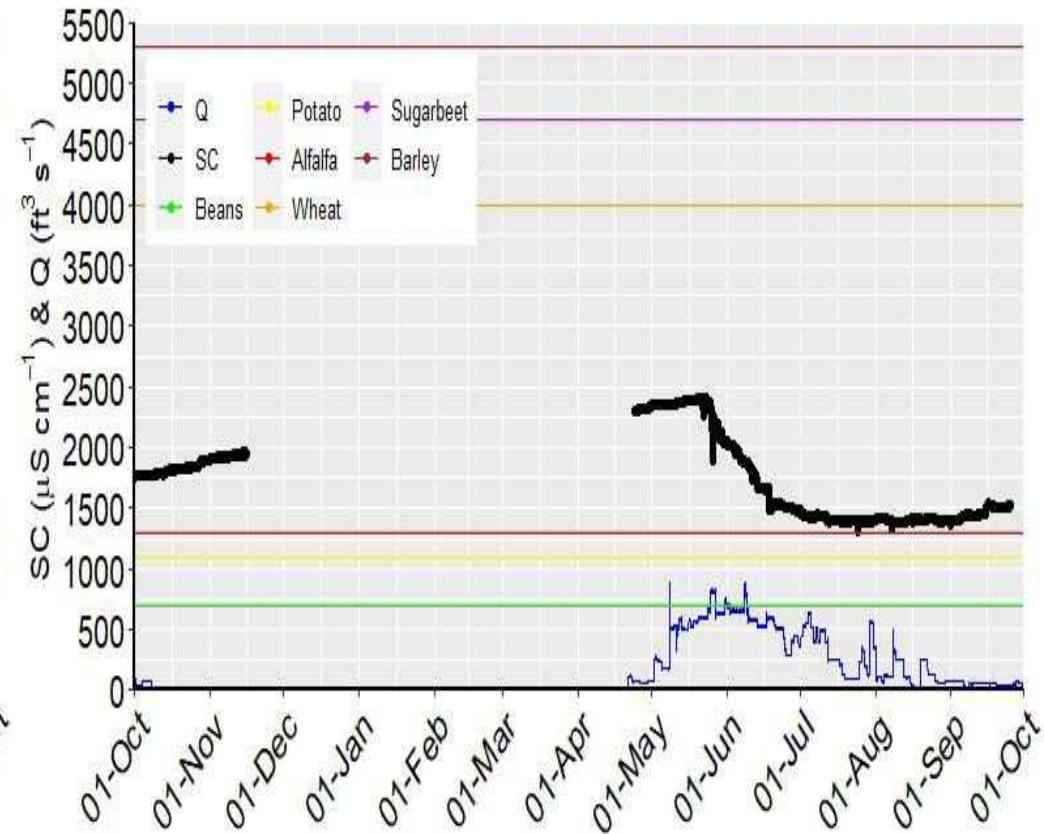
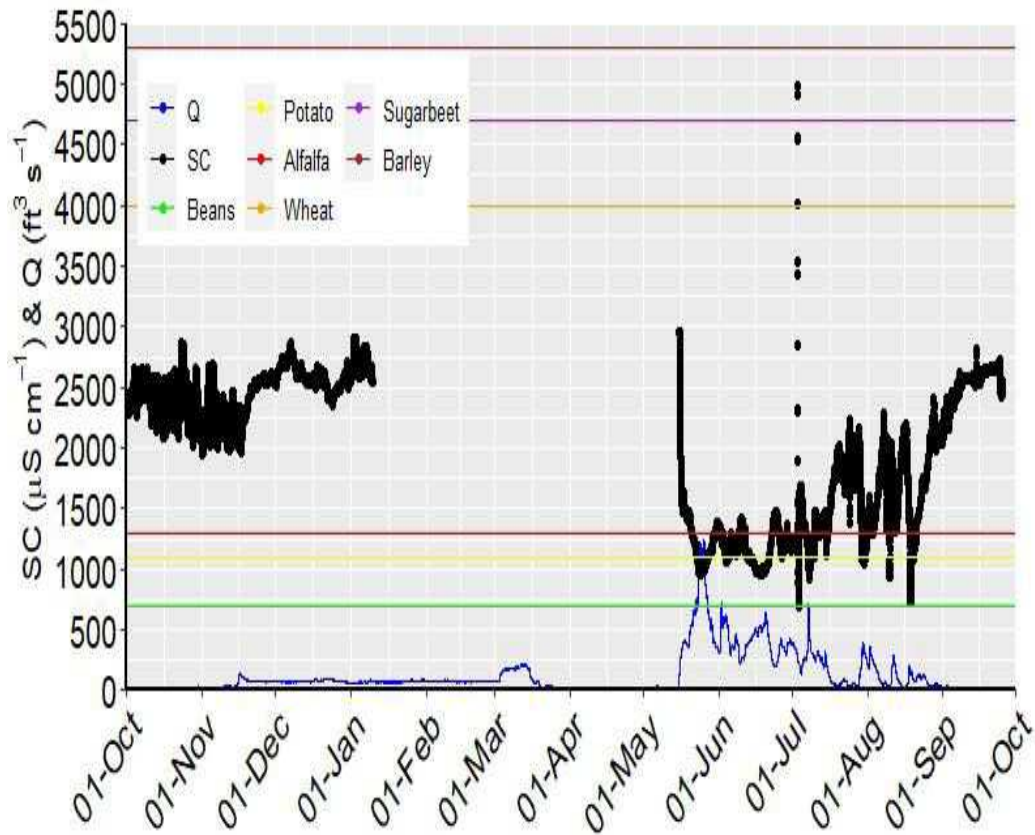
ARKANSAS WATER QUALITY MONITORING DATA



2022 Discharge, Specific Conductance, and Crop thresholds

Upstream of John Martin dam

Downstream of John Martin Dam





JOHN MARTIN WATER CONTROL MANUAL UPDATES

Purpose: to conform a project's operation to its authorizing legislation, to criteria defined in USACE reports prepared in the planning and design of the project, and applicable congressional acts.

1. Introduction
2. Description of the Project
3. History of Project
4. Watershed Characteristics
5. Data Collection and communication network
6. Hydrologic Forecast
7. Water Control Plan
8. Effect of Water Control Plan
9. Water Control Management

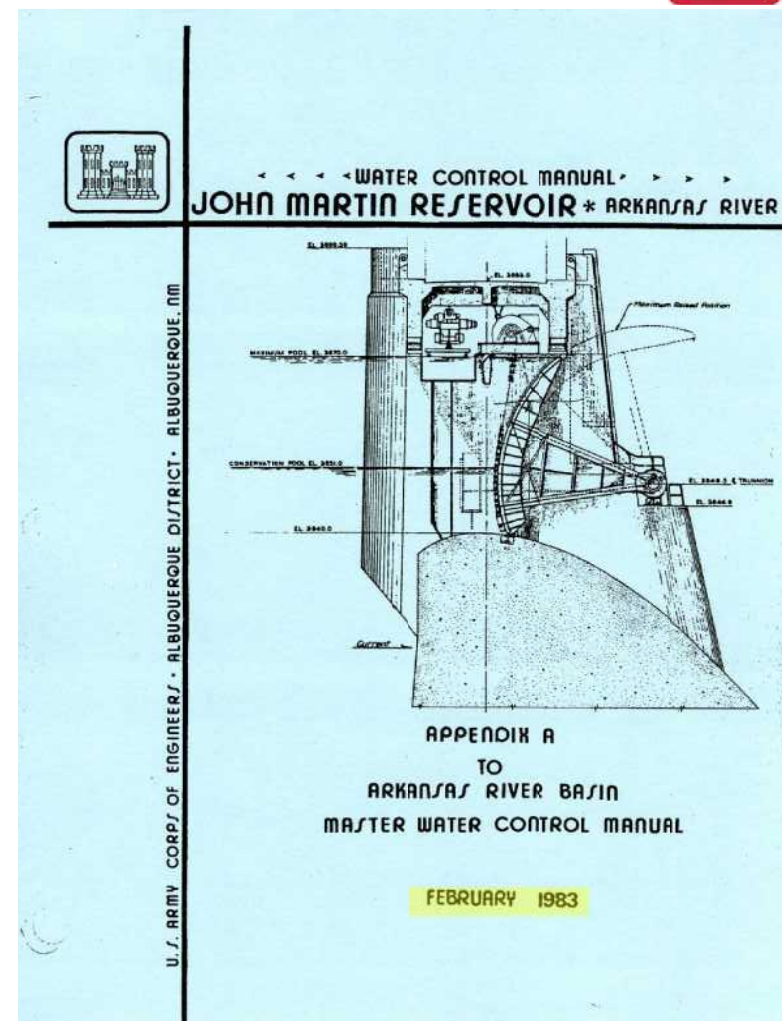
Tables

Exhibits

Plates

Environmental compliance will be conducted

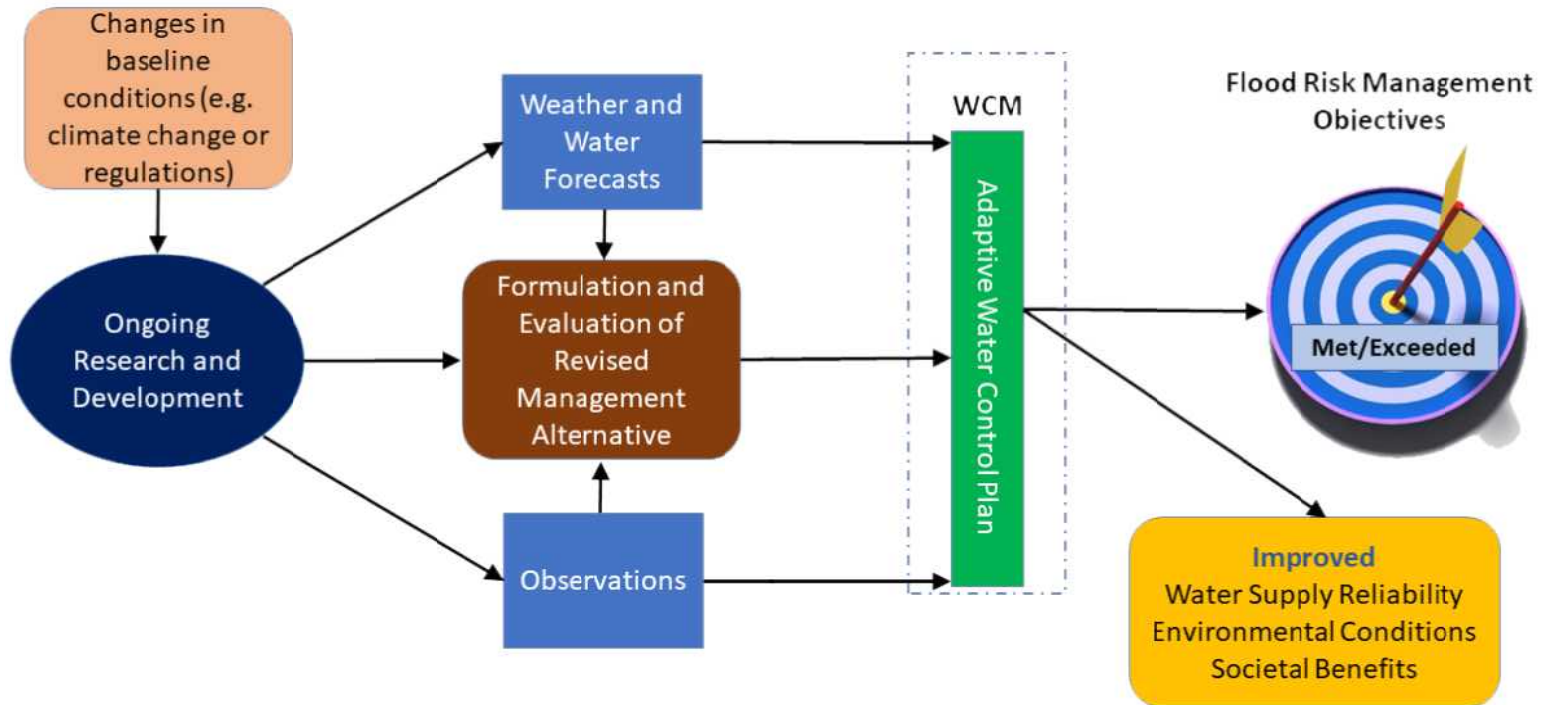
Expected to be completed by December 2024





FORECAST INFORMED RESERVOIR OPERATION (FIRO)

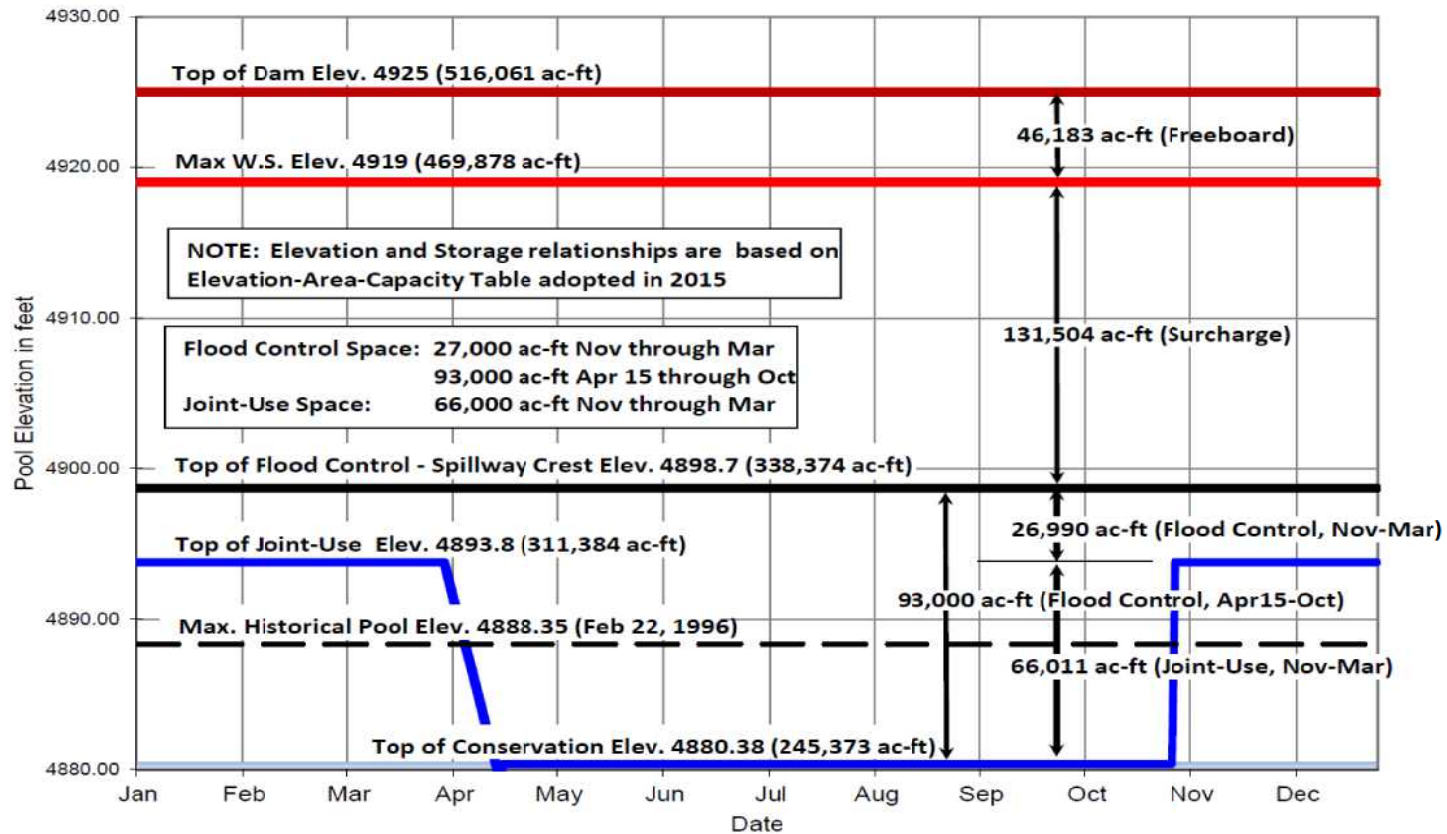
FIRO Model for Adaptive Water Control Manuals





FORECAST INFORMED RESERVOIR OPERATION

Pueblo Reservoir Required Seasonal Flood Space Diagram





CIVIL WORKS PROJECTS AUTHORIZATIONS



Project Process:

Feasibility Study
Design and Construction

Cost Sharing:

Study – 50/50 after \$100K
Design/Construction – 65/35

Request Assistance:

Send request letter to
Planning Branch Chief,
USACE, Albuquerque
District

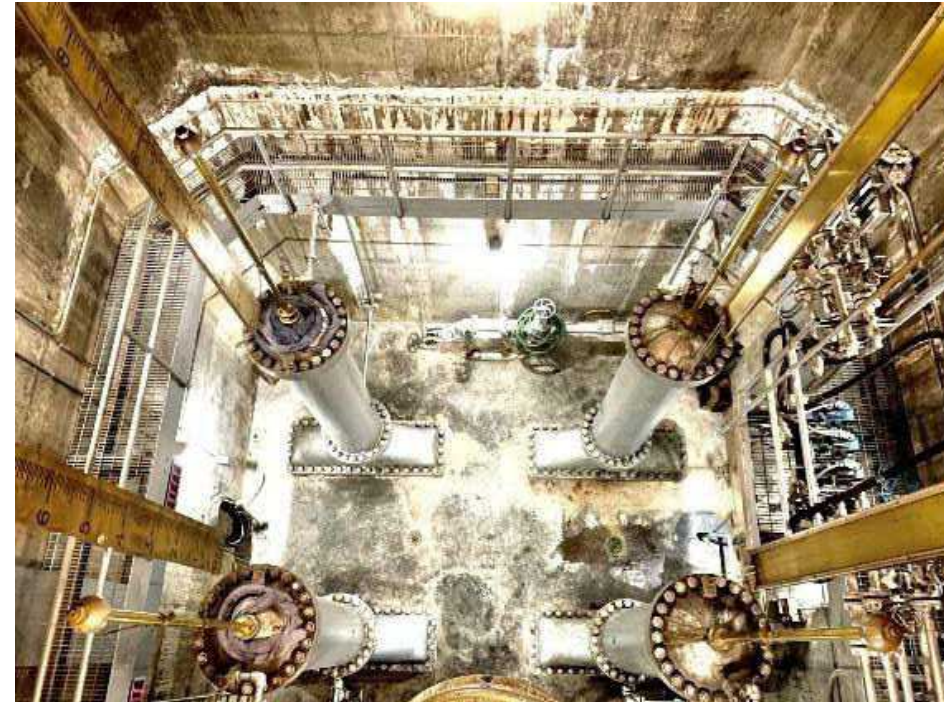
Authority	Purpose
Section 14: Flood Control Act of 1946, as amended	Streambank and shoreline erosion protection of public works and non-profit public services
Section 205: Flood Control Act of 1948, as amended	Small Flood control projects
Section 206: Flood Control Act of 1948, as amended	Aquatic ecosystem restoration unrelated to Corps projects
Section 208: Flood Control Act of 1954, as amended (amends Section 2, Flood Control Act of August 28, 1937)	Removal of obstructions, clearing channels for flood control
Section 1135: Water Resources Development Act of 1986, as amended	Project modifications for existing Corps project or area degraded by Corps project, to restore aquatic habitats for fish and wildlife



TRINIDAD OPERATIONS AND MAINTENANCE



- A new sump pump and high-water alarm was installed in the dam tower.
- The packing glands were replaced on the two pairs of service and emergency gates.
- A new heater was installed in the dam tower
- FY23
 - Continued work on the upstream embankment riprap
 - Intake tower radio communications installation
 - Outlet bank protection





JOHN MARTIN OPERATIONS AND MAINTENANCE



Grouting gallery sump pump

- Additional repairs were made to the sump pump system.

Field investigation

- Vibrating wire piezometers were installed to measure uplift pressures beneath the concrete portion of the dam.

Dredging project

- Samples were taken upstream of the dam to aid in design of a confined disposal facility for sediments removed by the dredging project
- Dredging and diving operations in the fall/winter on 2023/24.

FY23

- Bridge and Tainter Gates Structural Inspections are scheduled for FY23





QUESTIONS / DISCUSSION

