

U.S. Geological Survey 2023 Update

Dustin Ethredge
ethredge@usgs.gov
719-568-2829





December 6, 2023

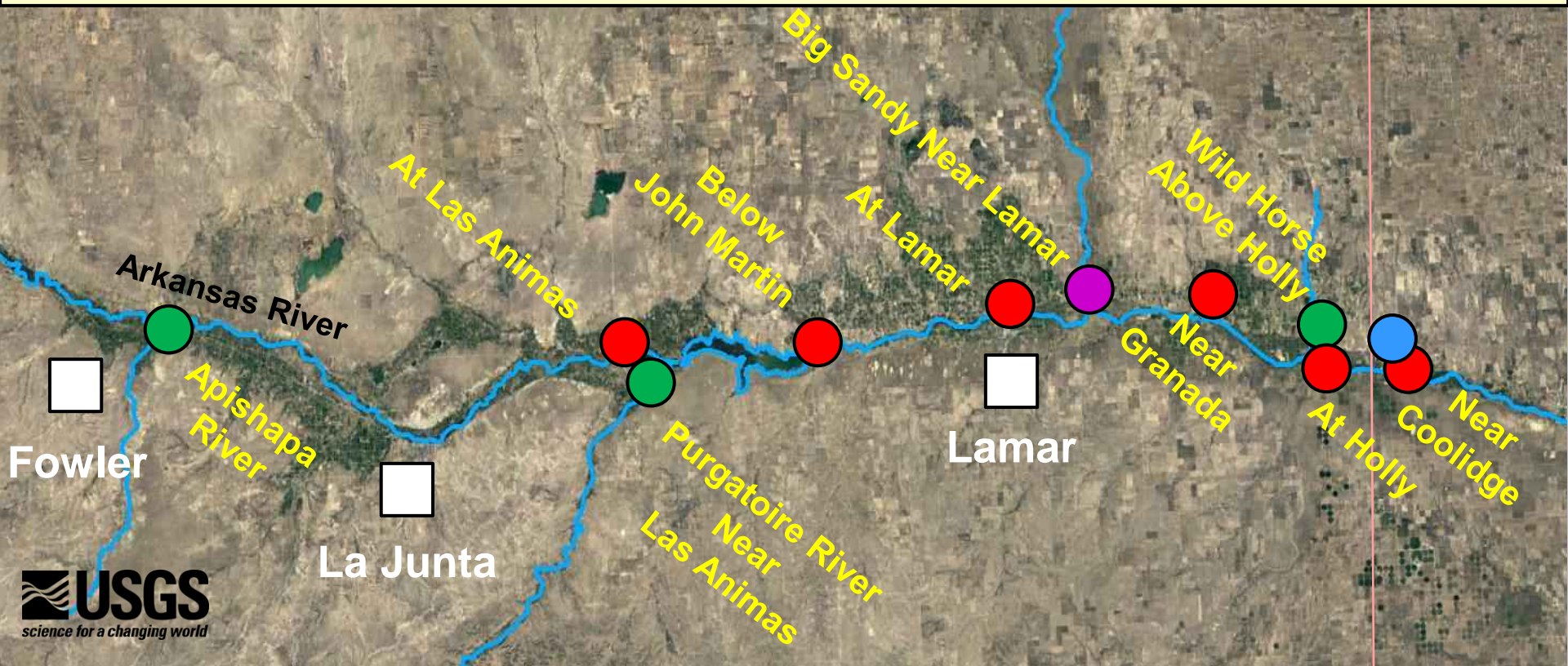
USGS Colorado Water Science Center

2023 USGS Update

- **Arkansas River at Holly, CO Streamgage**
 - Re-established January 2023
- **Measurement Planning**
 - Allocation of measurements at sites with extra funding
- **2023 High Flows**

USGS/ARCA Cooperative Streamgauge Program

-  Mainstem Arkansas Sites (6)
-  Tributary Sites (3)
-  Frontier Ditch
-  Discontinued Site: Big Sandy nr Lamar



07135500

Arkansas River at Holly, CO



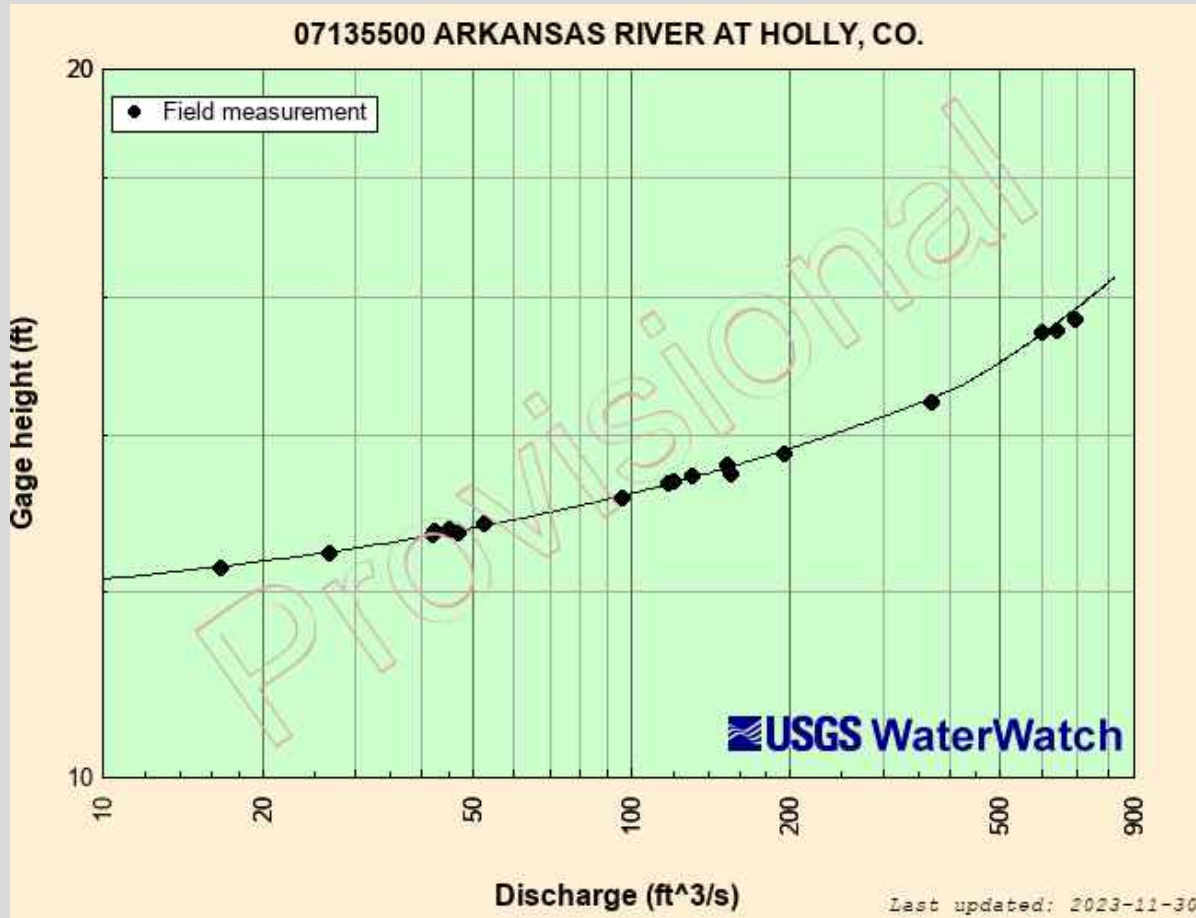
07135500

Arkansas River at Holly, CO

- Gage installed and operational January 19, 2023
 - Previously operational October 1907-September 1953
- 18 discharge measurements made between January 2023-October 2023
 - Range of measurements: 16.7 cfs to 691 cfs
 - Range of published hydrograph: 14.4 cfs to 1430 cfs (estimated)
- Peak of WY occurred on July 23, 2023
 - Peak stage of 17.11 ft
 - Site measured July 19 and July 26

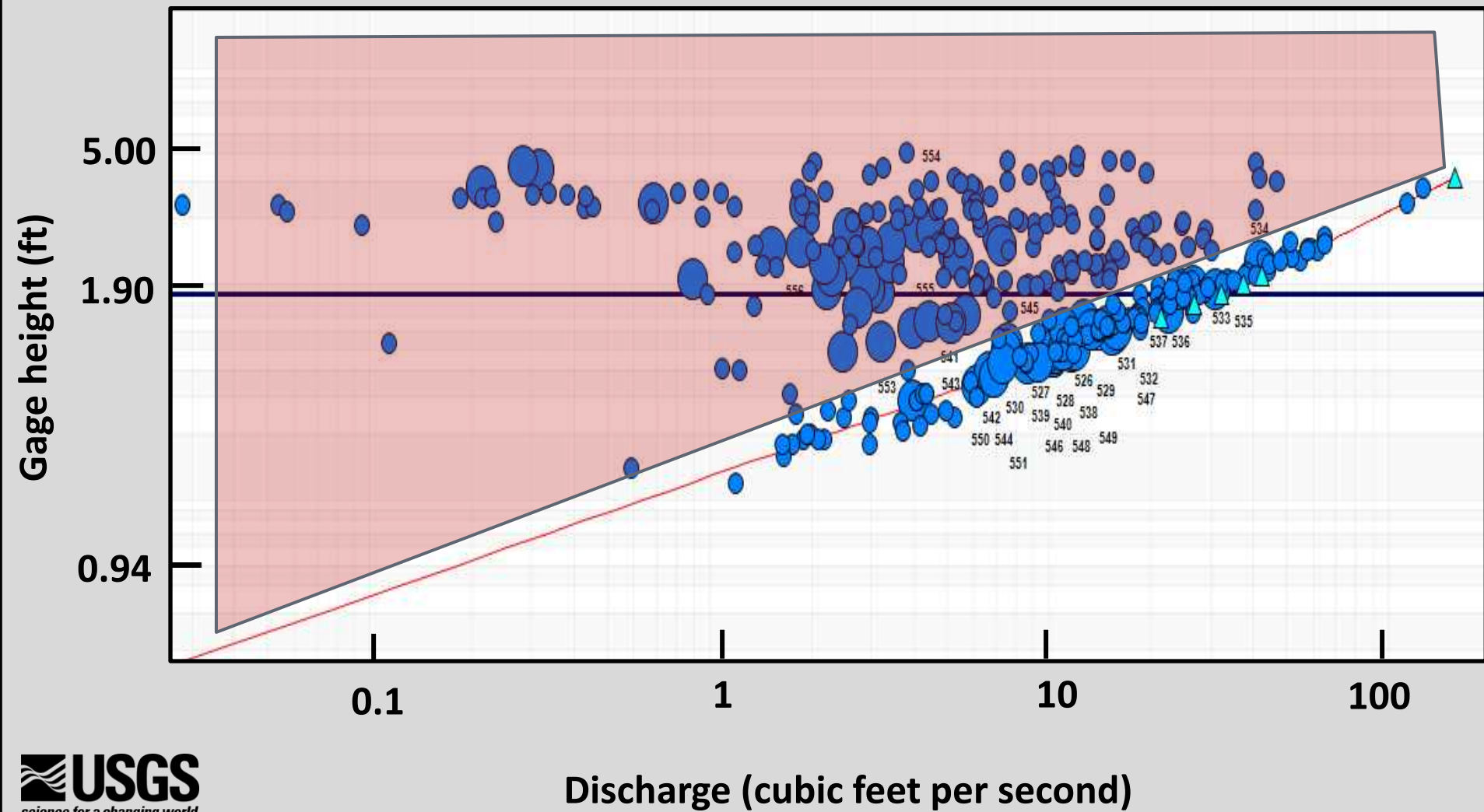
07135500

Arkansas River at Holly, CO



- Site currently rated up to a stage of 16.32 ft; 820 cfs
 - Highest measurement at 15.67 ft
 - Based on site geometry, believed to spill onto right floodplain above 16.32 ft

Big Sandy Creek near Lamar, CO



Measurement Planning

- Six USGS streamgages funded for extra discharge measurements
 - Normal measurement schedule; how many per year?
- Bi-weekly measurements through irrigation season
 - Accommodations for releases to Kansas
- Arkansas River below John Martin Reservoir stability
 - Reallocation of extra measurements to other sites
 - Increased measurements through non-irrigation season

Measurement Planning

USGS Field Measurements at ARCA Stations

November 1, 2022 - October 30, 2023

Site Number	Site Name	Irrigation Season (April 1 - October 30)	Non-irrigation Season (November 1 - March 31)	Total
07119500	Apishapa River near Fowler, CO	7	4	11
07124000	Arkansas River at Las Animas	15	5	20
07128500	Purgatoire River near Las Animas	12	6	18
07130500	Arkansas River below John Martin Reservoir	8	4	12
07133000	Arkansas River at Lamar	14	5	19
07134100	Big Sandy Creek	-	3	3
07134180	Arkansas River near Granada	14	5	19
07134990	Wild Horse Creek	8	3	11
07135500	Arkansas River at Holly	15	3	18

Extra Measurements

Reallocate Measurements

Discontinued

Measurement Planning

Planned USGS Field Measurements at ARCA Stations with Extra Funded Measurements

November 1, 2023 - October 30, 2024

Site Number	Site Name	Irrigation Season (April 1 - October 30)	Non-irrigation Season (November 1 - March 31)	Total	Change from 2023
07124000	Arkansas River at Las Animas	15	8	23	3
07128500	Purgatoire River near Las Animas	10	5	15	-3
07130500	Arkansas River below John Martin Reservoir	6	4	10	-2
07133000	Arkansas River at Lamar	15	5	20	1
07134180	Arkansas River near Granada	15	5	20	1
07135500	Arkansas River at Holly	10	8	18	0

Extra Measurements

Reallocate Measurements

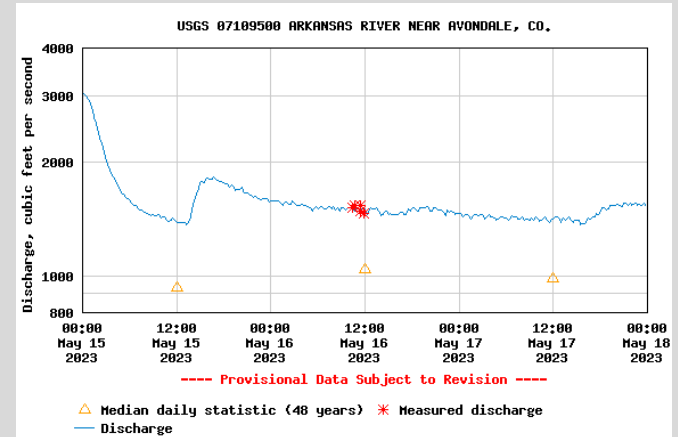
2023 High Flows

- Measurement of high flows
 - How is this done?
- Measurements made for largest June peak
- Flow patterns for Arkansas River at Las Animas

2023 High Flows

Acoustic Doppler Current Profiler (ADCP)

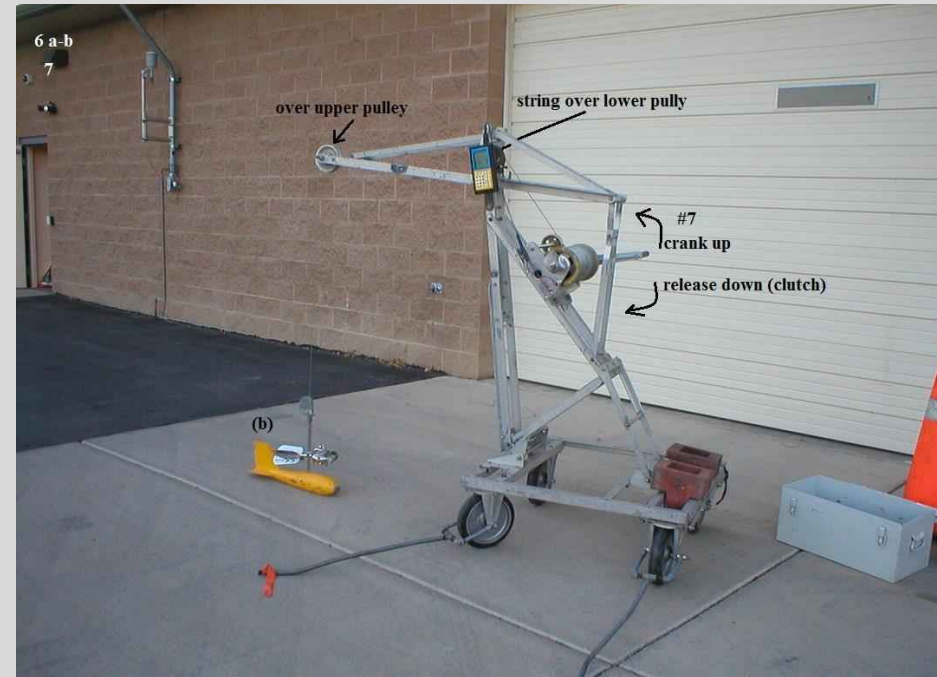
- QA/QC Procedures
- Usage and limitations



2023 High Flows

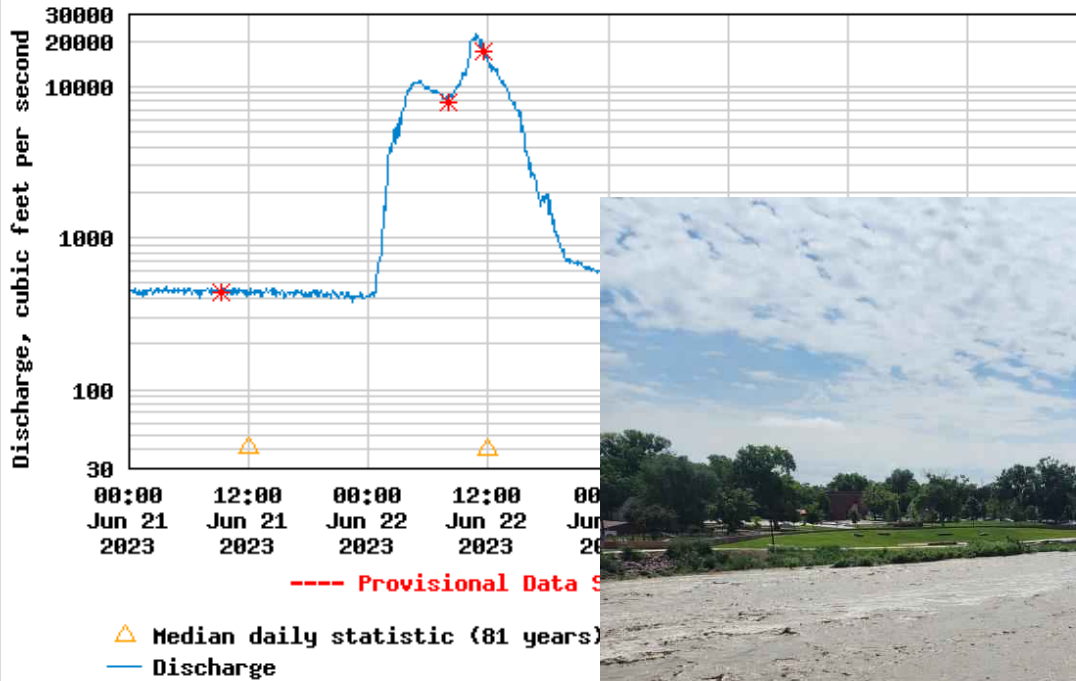
Bridge Crane

- Sounding weights and mechanical meters
- Usage and limitations



2023 High Flows

USGS 07106500 FOUNTAIN CREEK AT PUEBLO, CO.



07106500

Fountain Ck at Pueblo

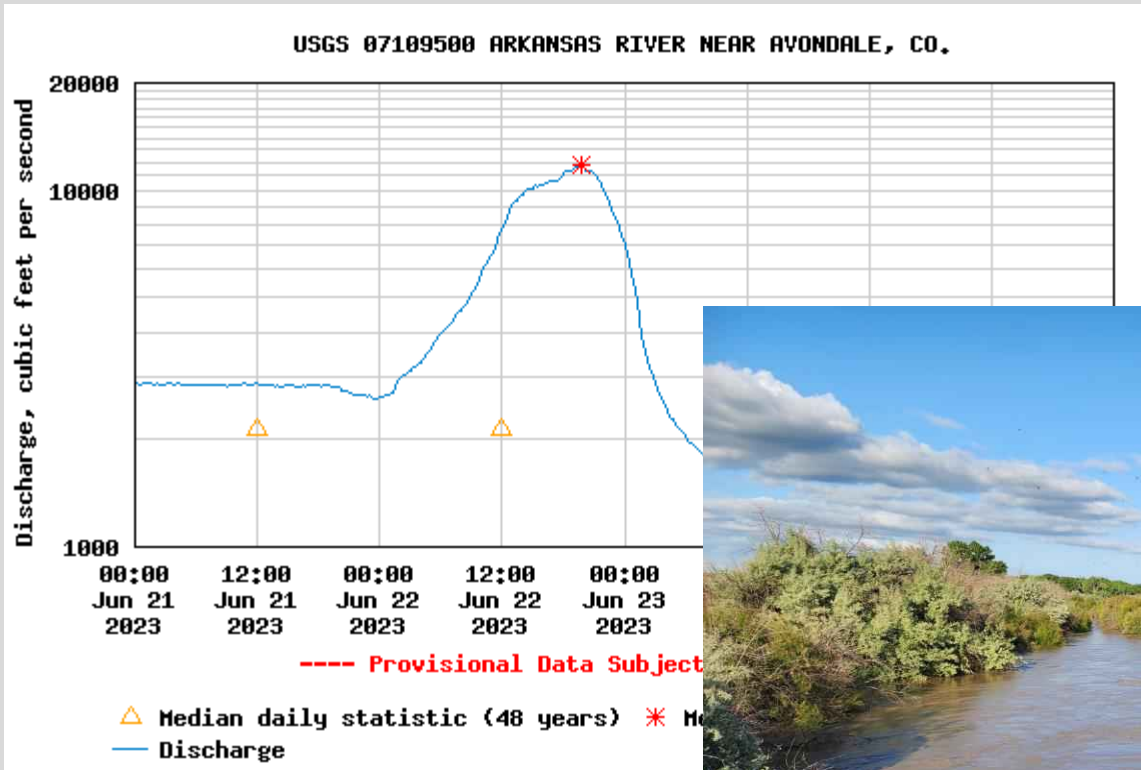
- Peak of 22,000 cfs
 - Measured 16,900 cfs



2023 High Flows

07109500 Arkansas River at Avondale

- Peak of 11,700 cfs

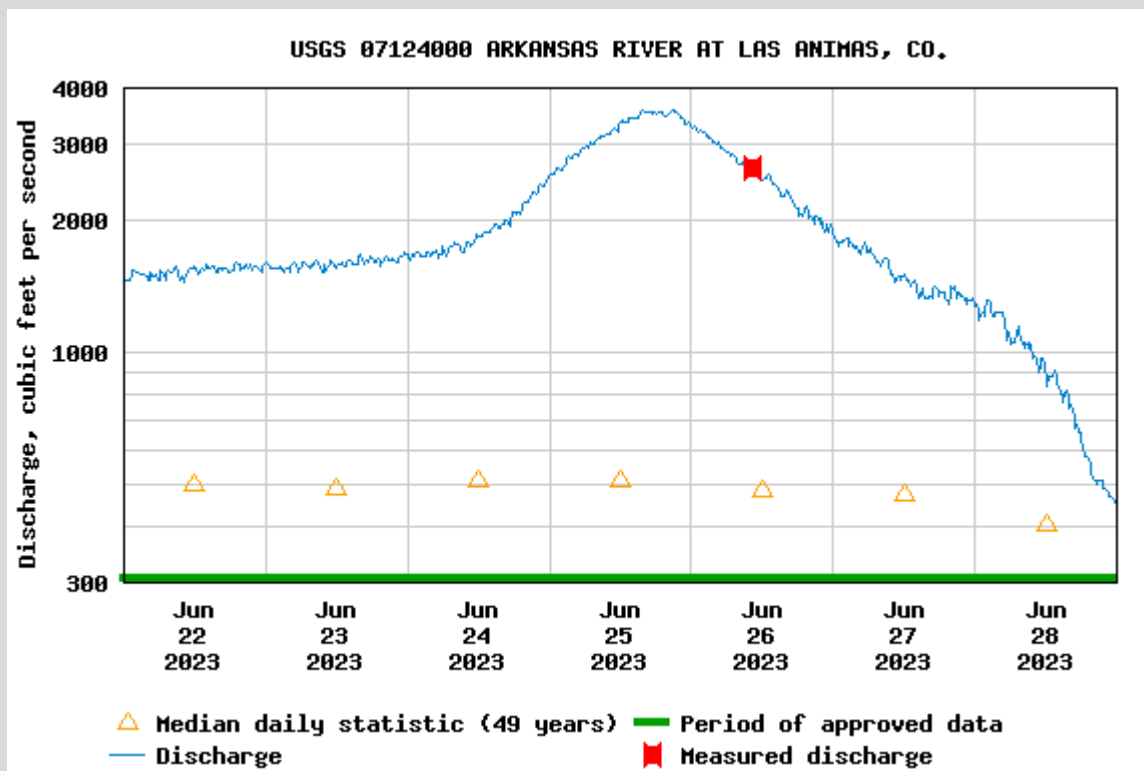


2023 High Flows

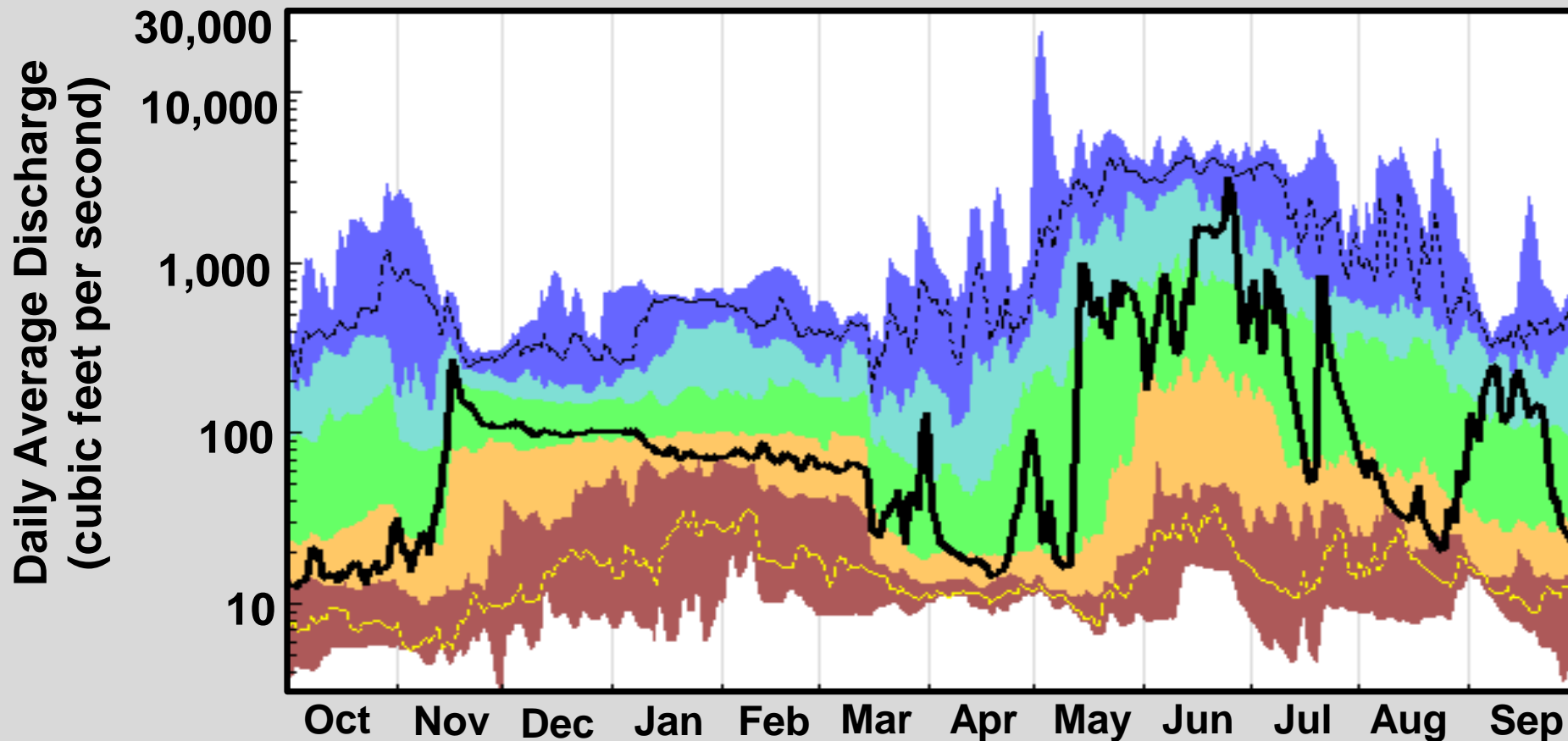
07124000

Arkansas River at Las Animas

- Peak of 3,560 cfs
- Measured 2,620 cfs

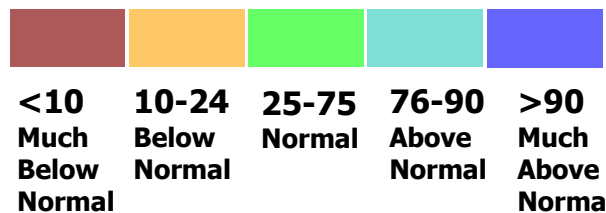


Arkansas River at Las Animas



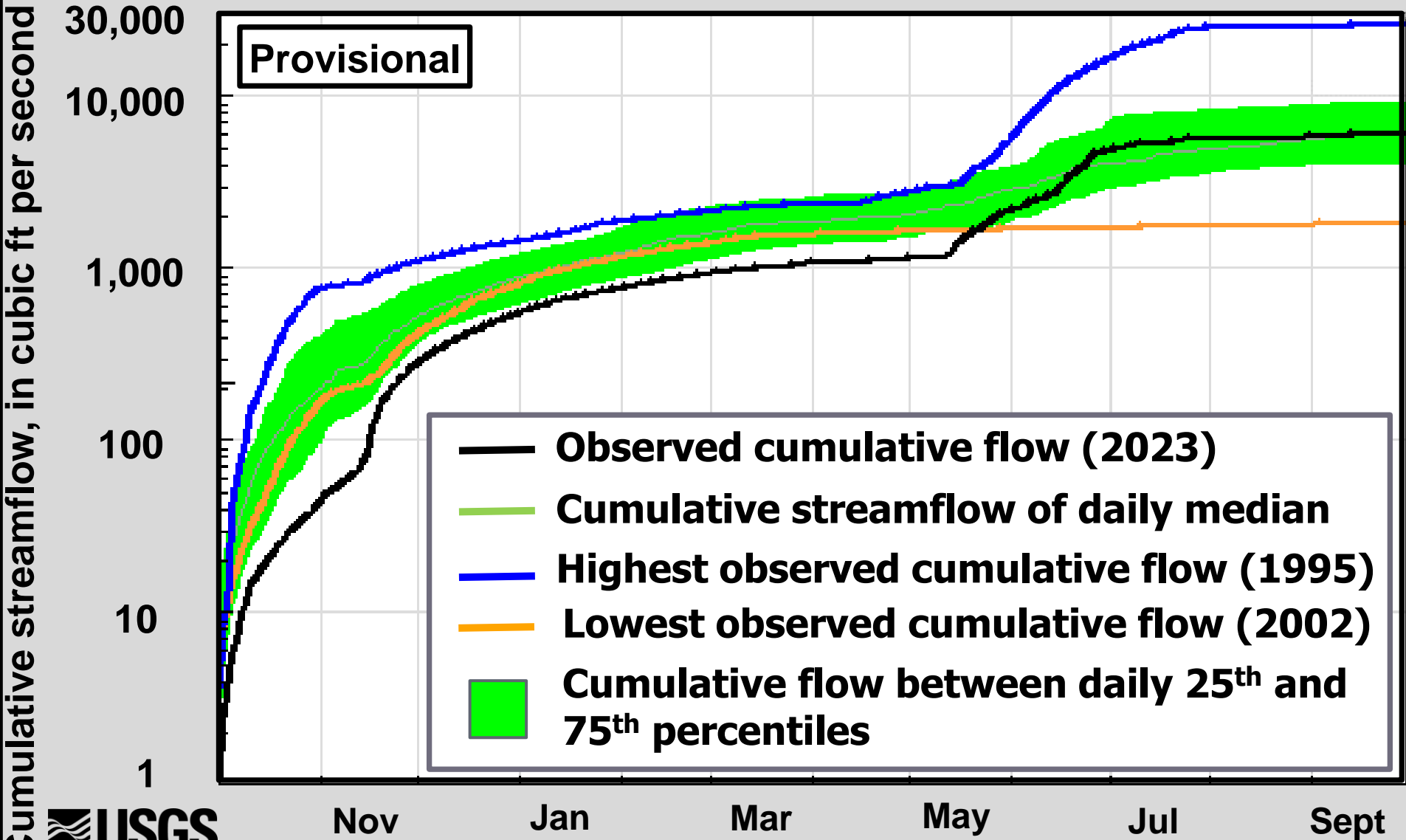
WY 2023

Percentile Classes



Arkansas River at Las Animas, CO

Cumulative Streamflow Hydrograph





Questions?