

Water Year 2022 Review

Rob Van Kirk, Henry's Fork Foundation

Henry's Fork Watershed Council, October 11, 2022



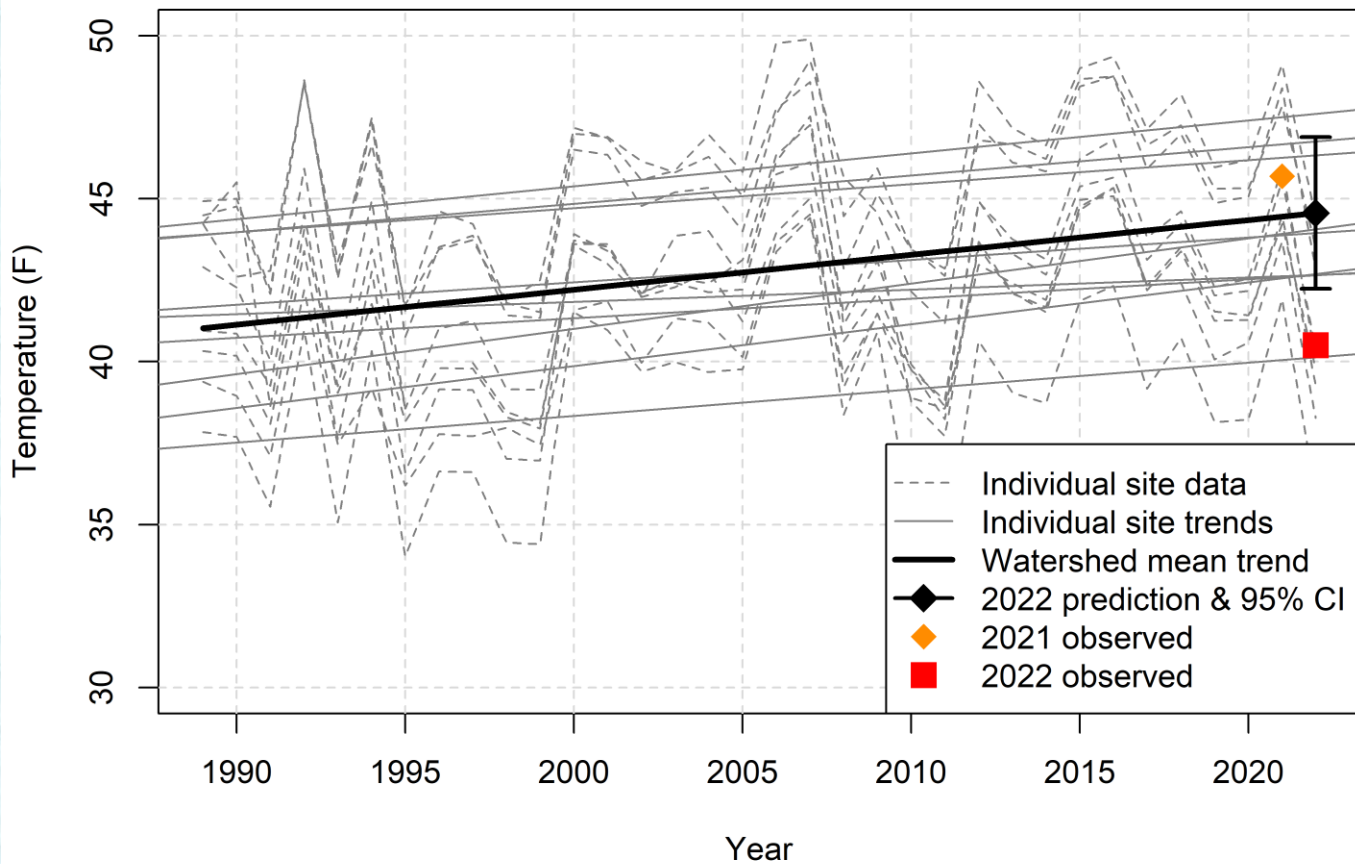
Outline

- Climate and drought
- Natural flow
- Irrigation management
- Reservoir management
- Observations vs. April 1 predictions (throughout)
- WaterSMART applied science grant project update

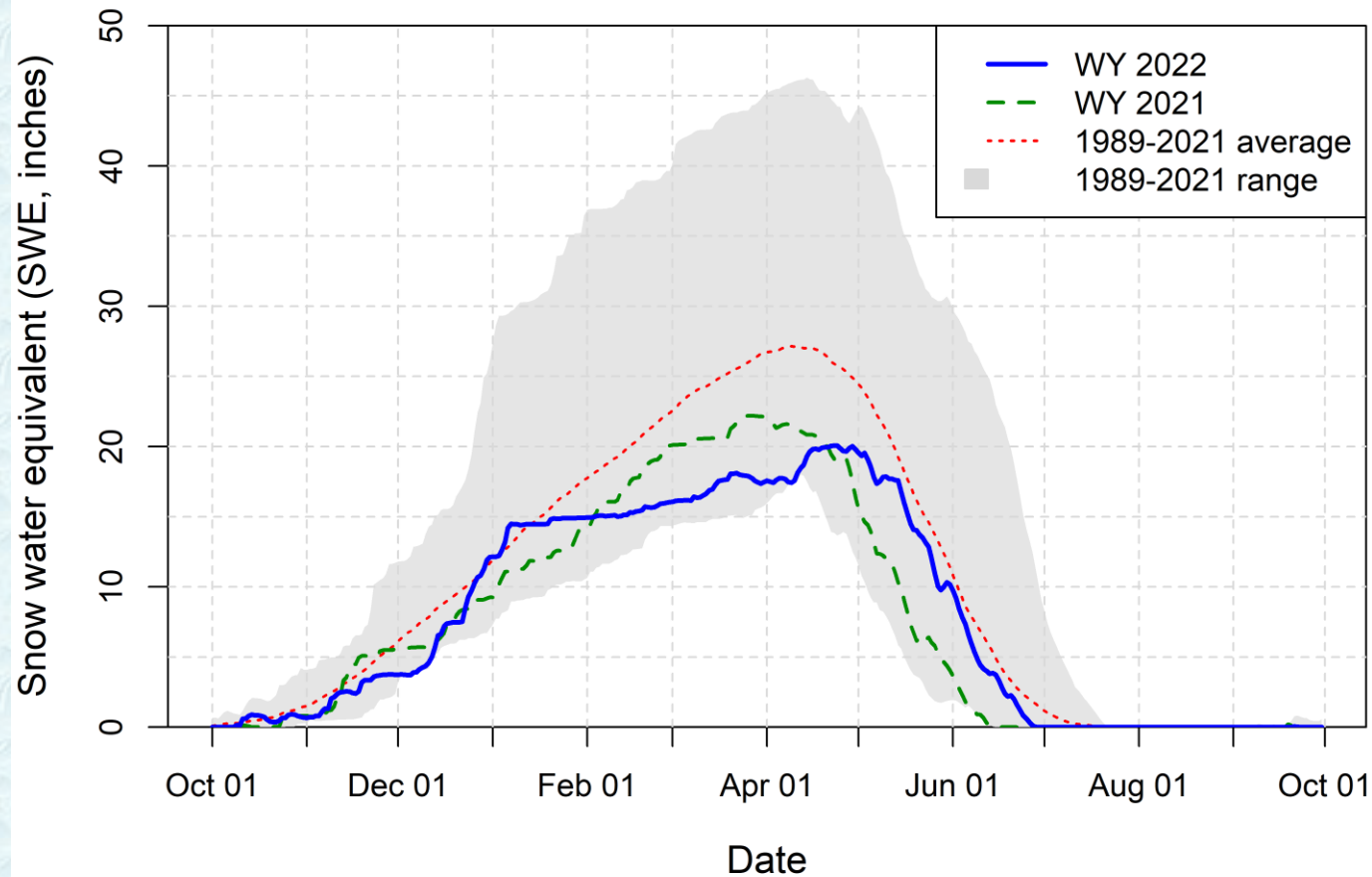
Climate and Drought Summary

- “Snow drought”
 - **Snow Water Equivalent**: 29% below average
 - Precipitation: 9% below average
- Cool spring
 - 2.3 degrees cooler than average at SnoTel stations
 - 4.0 degrees cooler than expected
- Late snowmelt
 - SWE peaked 12 days later than average
 - SWE peaked 29 days later than in 2021
- July-September temperature highest on record
- Short-term drought improvement
- Medium-term drought worsens
- Long-term drought continues

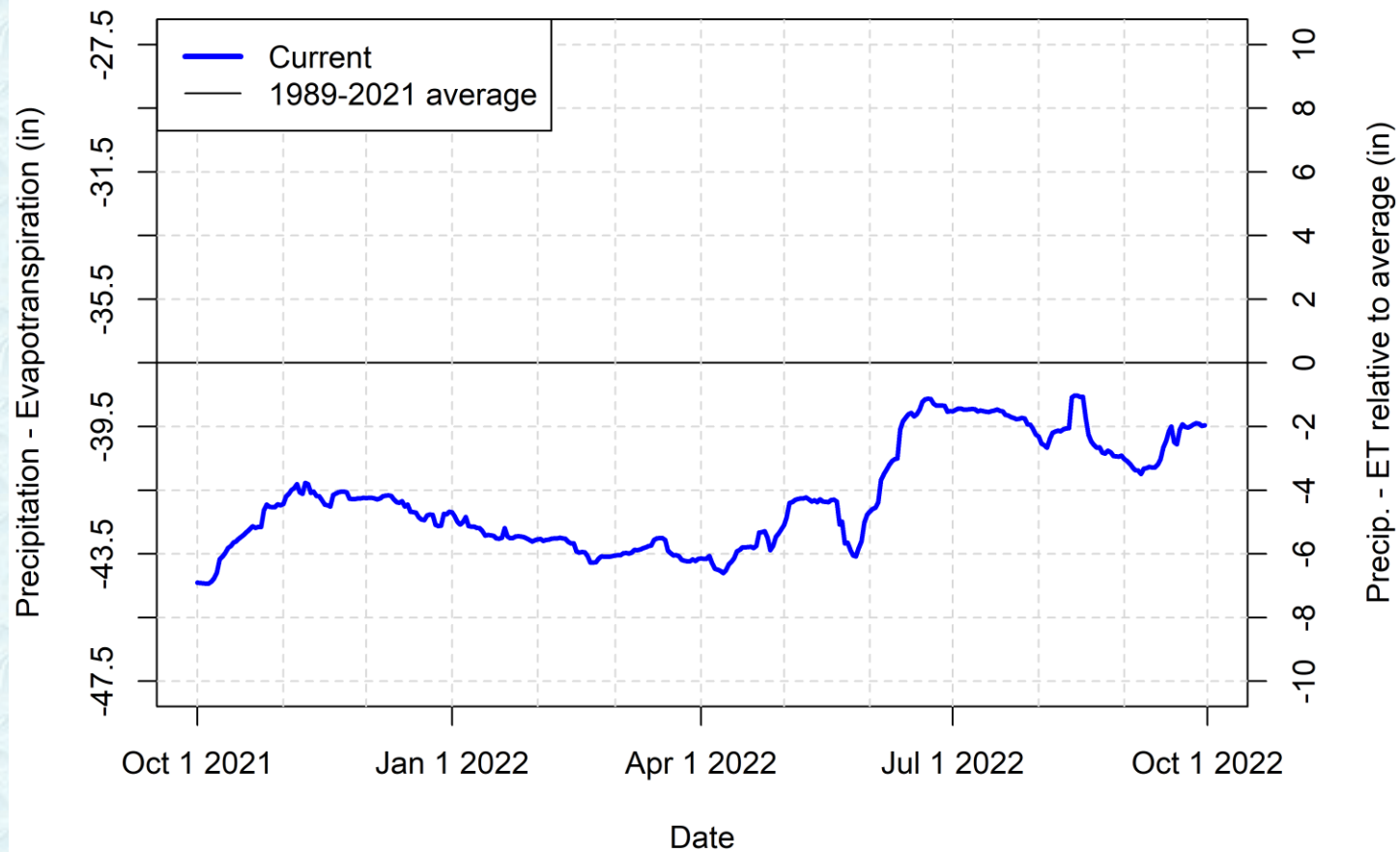
Mean April-June Temperature at HF Watershed SnoTel Sites



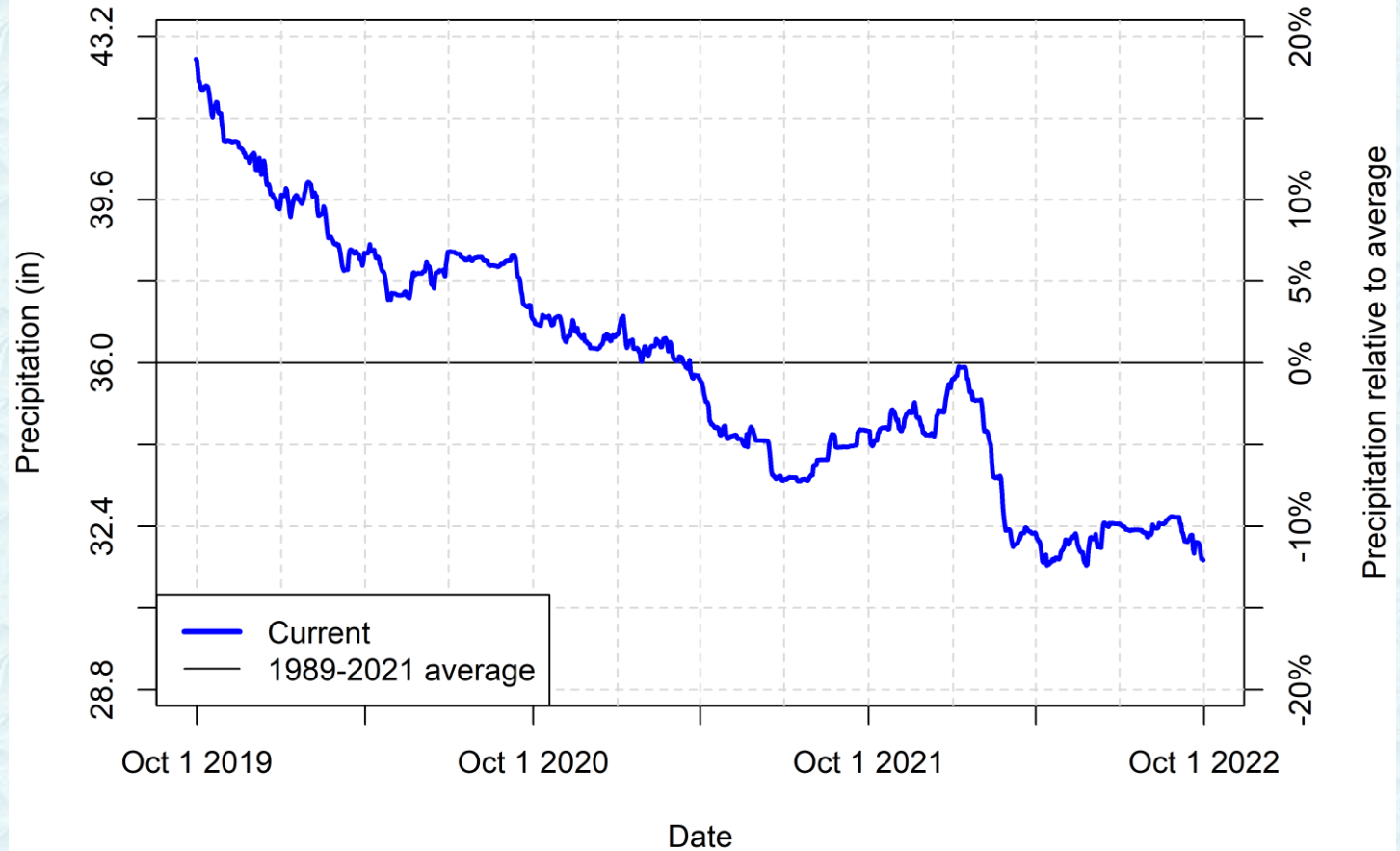
Henry's Fork Watershed Mean SWE Accumulation Oct 01 2022



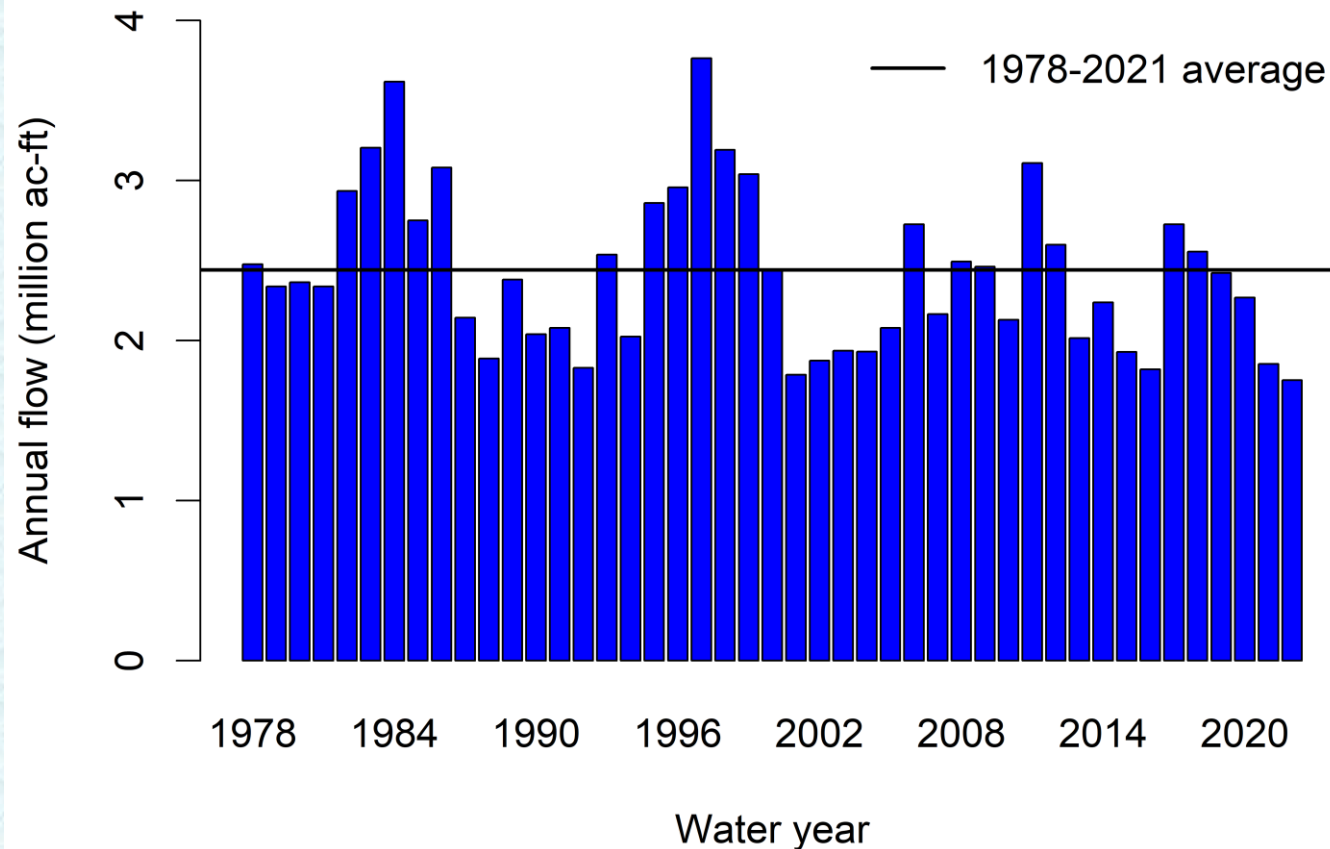
One-year Cumulative Agricultural Moisture Availability



Three-year Average Annual Watershed Precipitation



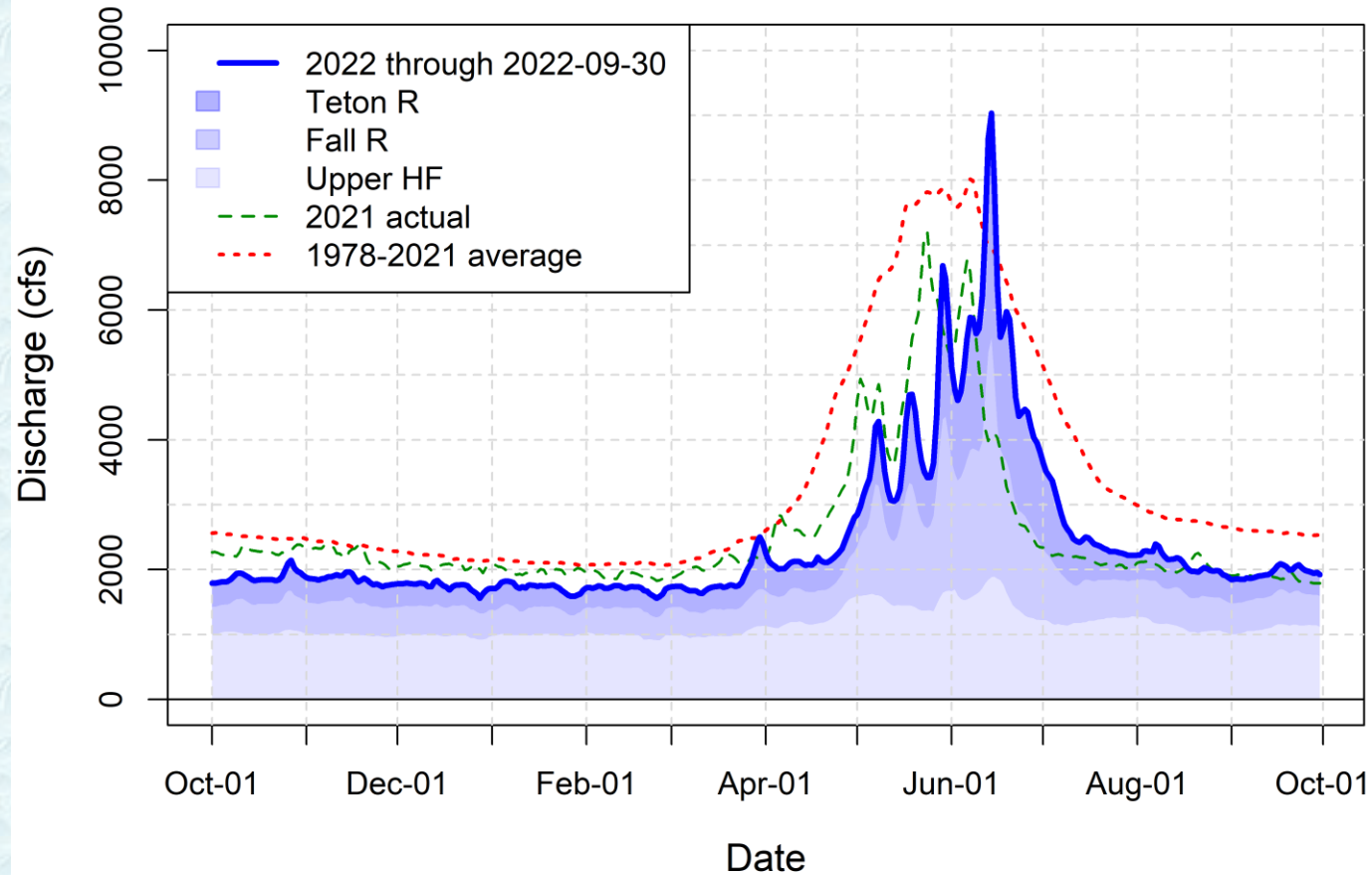
Henry's Fork Watershed Annual Natural Flow



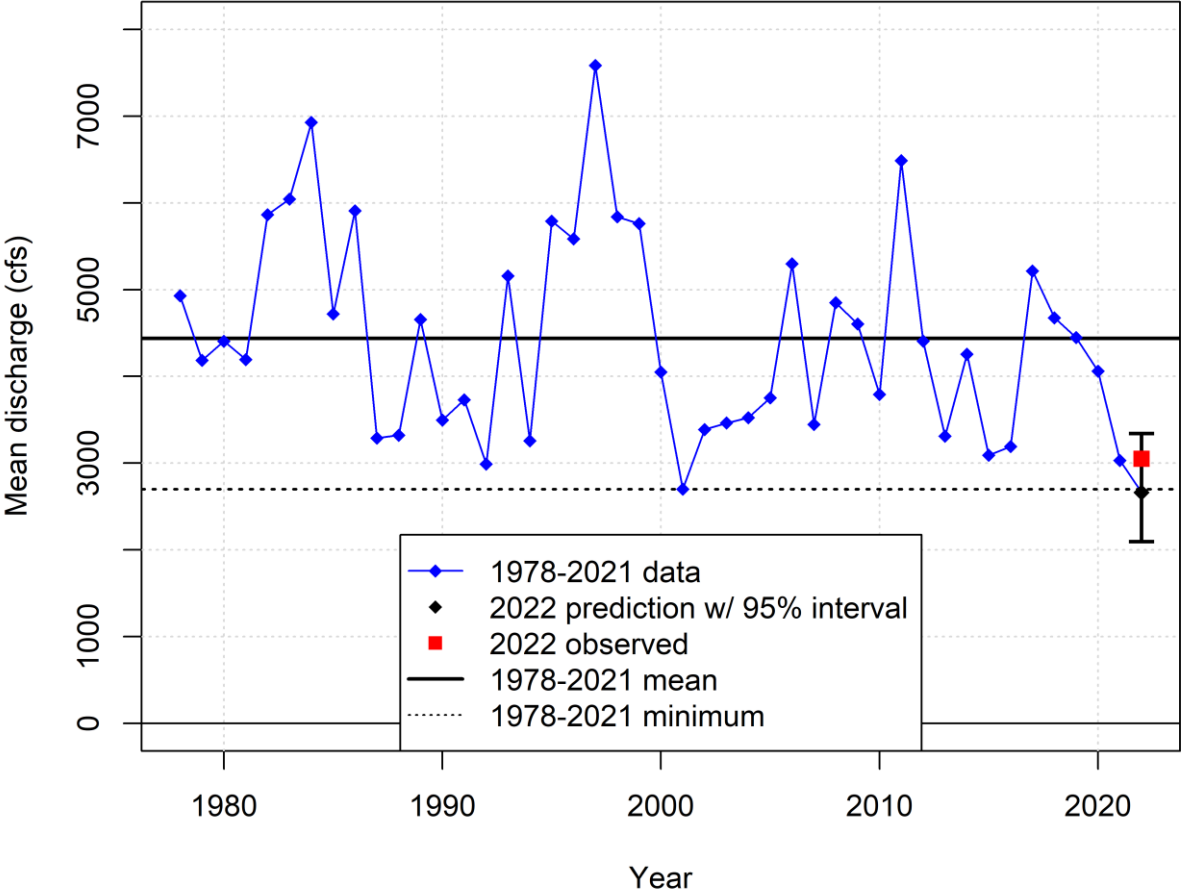
2022:

- 72% of average
- Lowest in 1978-present record

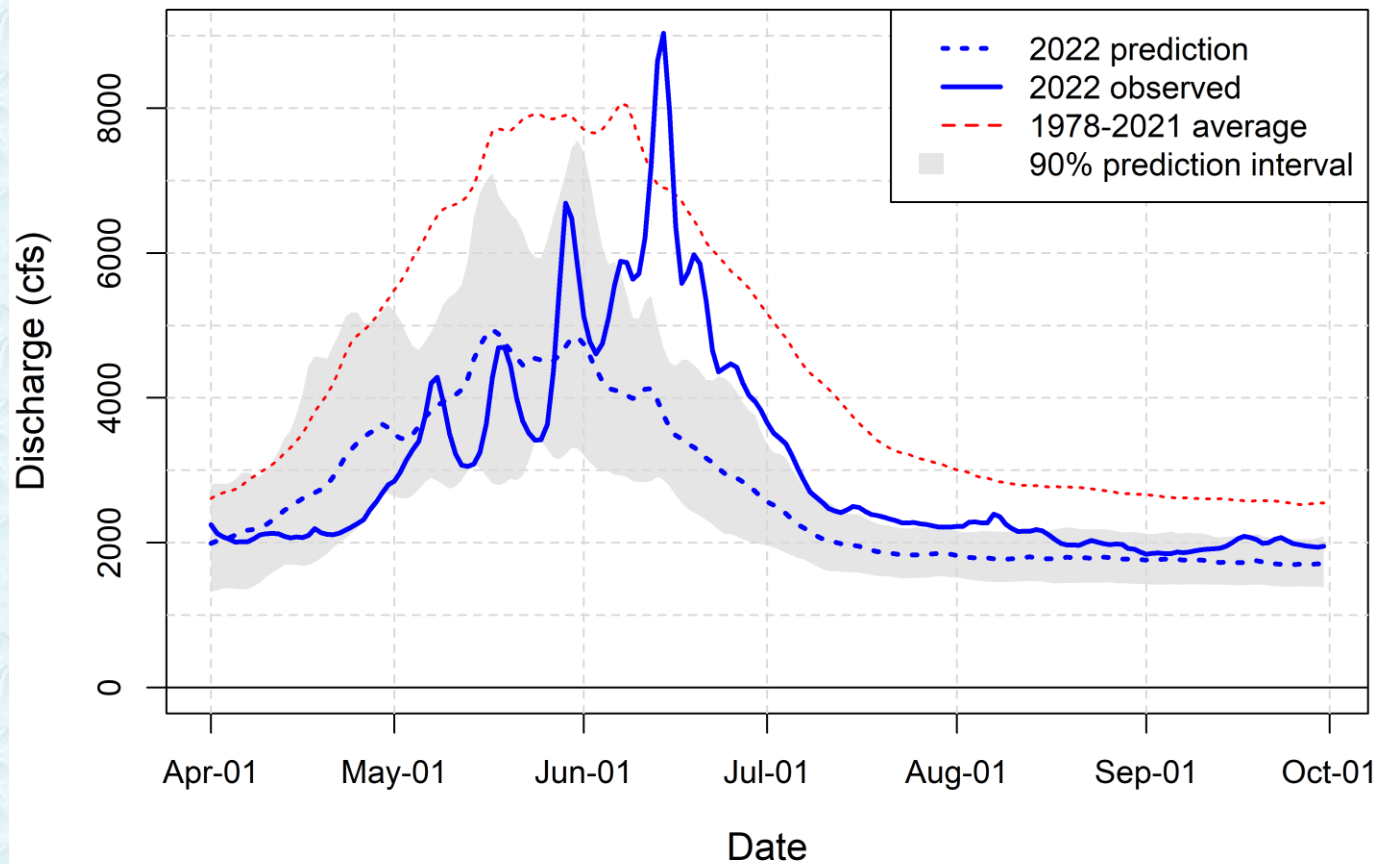
Henry's Fork Total Natural Flow (Water Supply)



Apr-Sep Henry's Fork Watershed Natural Flow



Henry's Fork Watershed Natural Flow



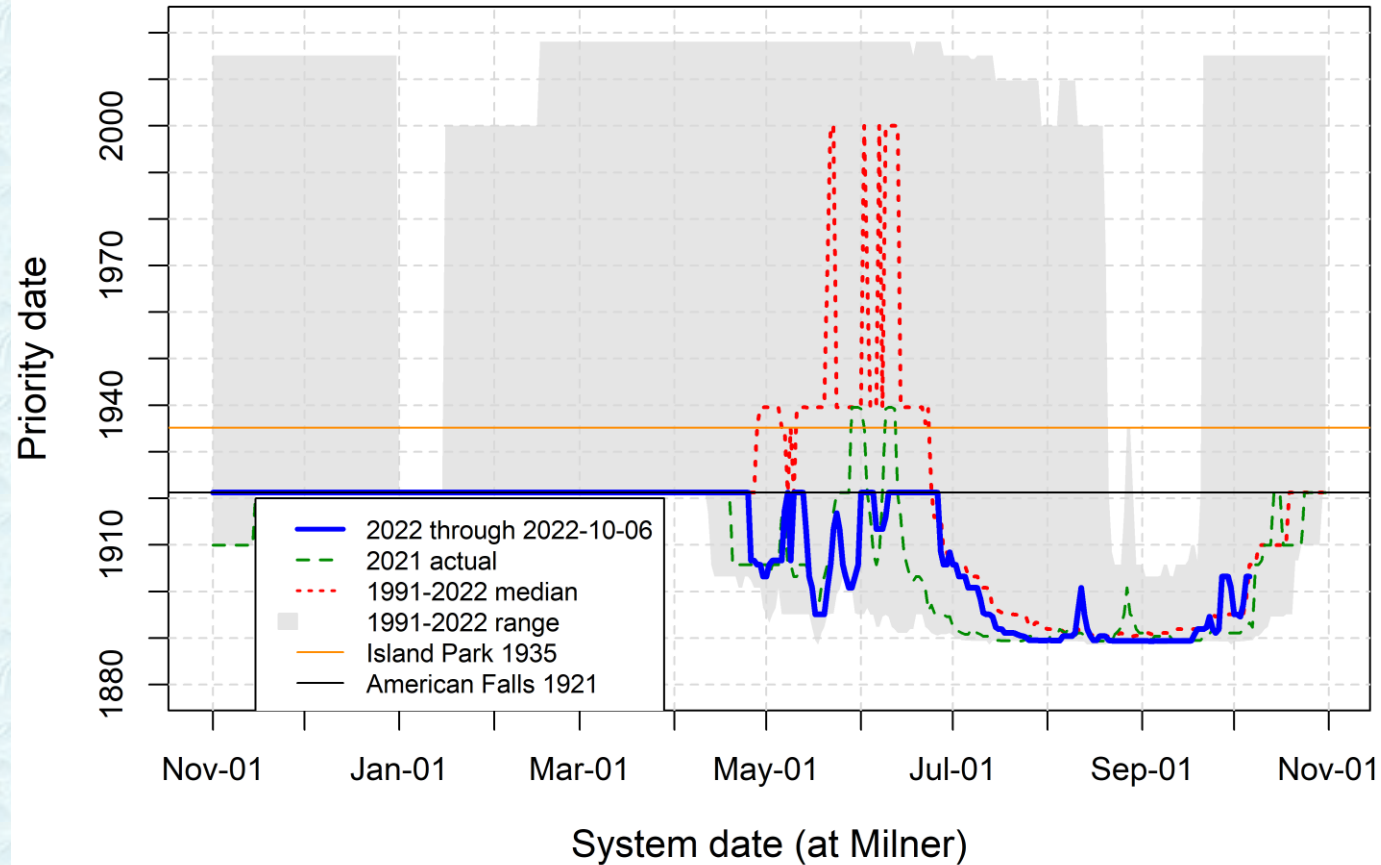
Irrigation (subject to change)

Administrative water availability

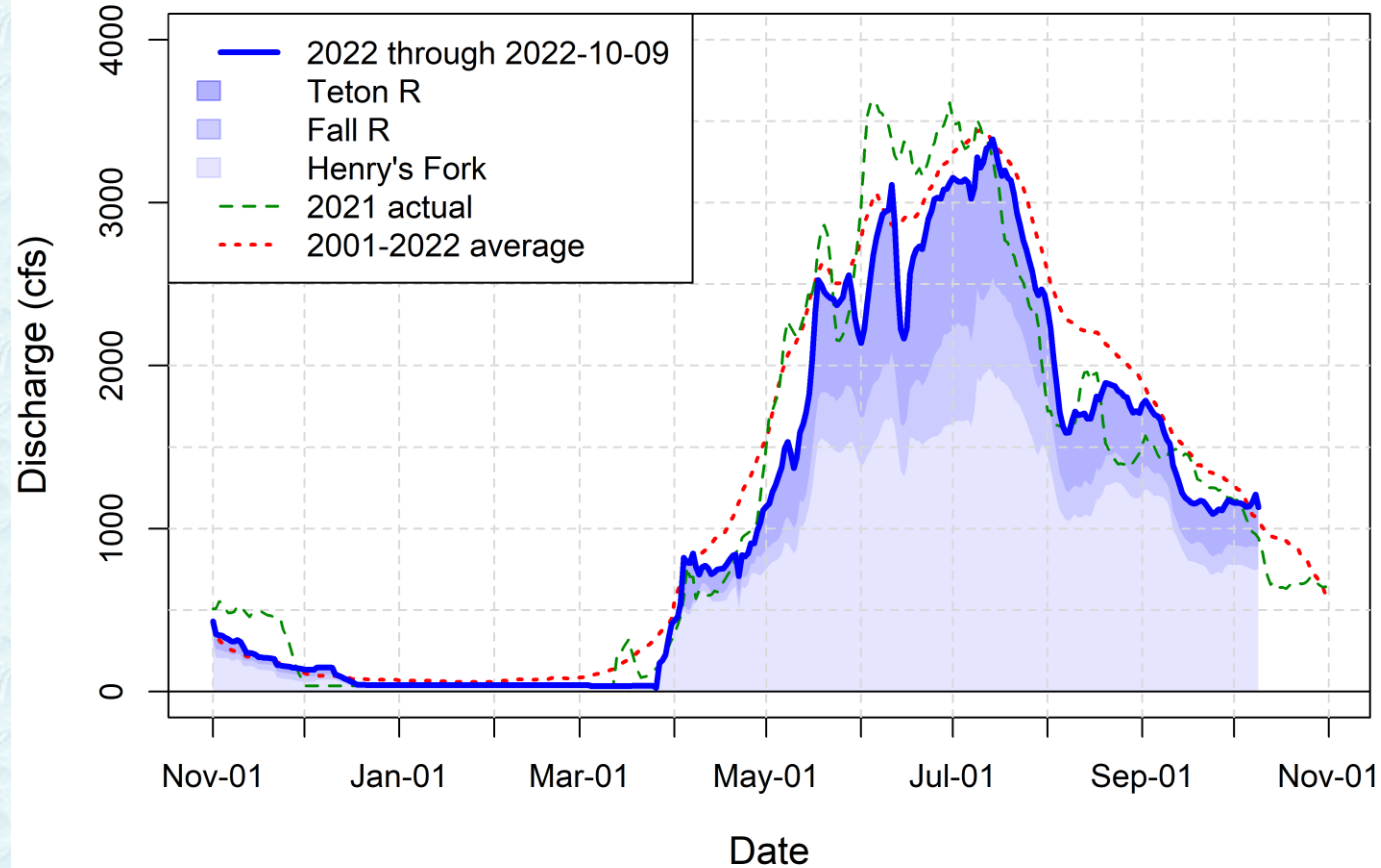
- Fremont-Madison: 66% of storage allocation
- North Fork Reservoir Company: 83% of storage allocation
- Natural-flow priority at St. Anthony first dropped to 1895-11-05 on July 13, vs. July 16 on average

	2022	2021	2001-2021 average
April-Sept. Diversion	702,437 ac-ft (87% ave)	748,713 ac-ft (93% ave)	805,537 ac-ft
Crosscut Canal delivery	27,777 ac-ft (77% ave)	34,959 ac-ft (97% ave)	36,065 ac-ft
Teton R. Exchange wells	26,296 ac-ft (191% ave)	26,200 ac-ft (190% ave)	13,759 ac-ft

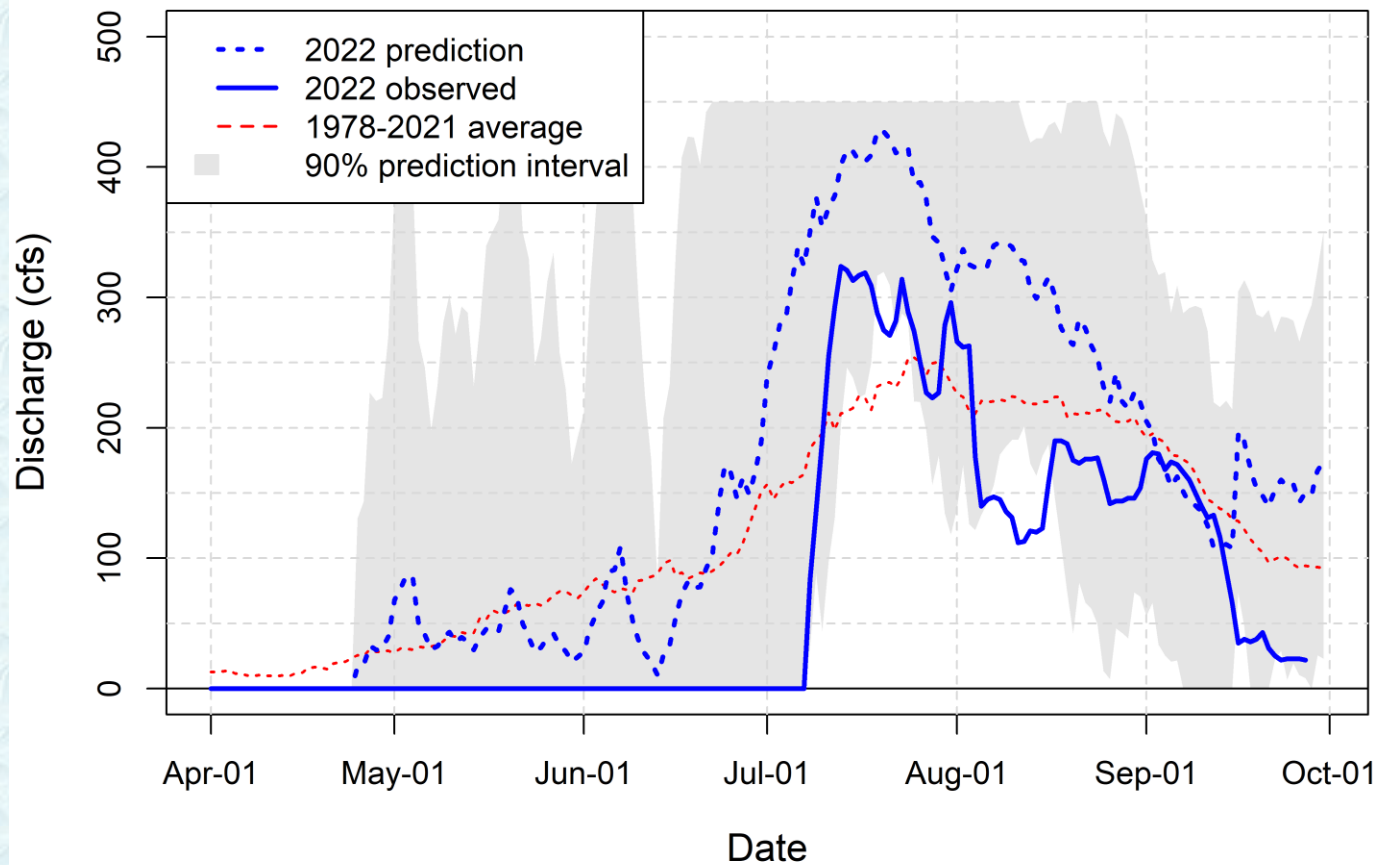
Water Right Priority in HF at St. Anthony



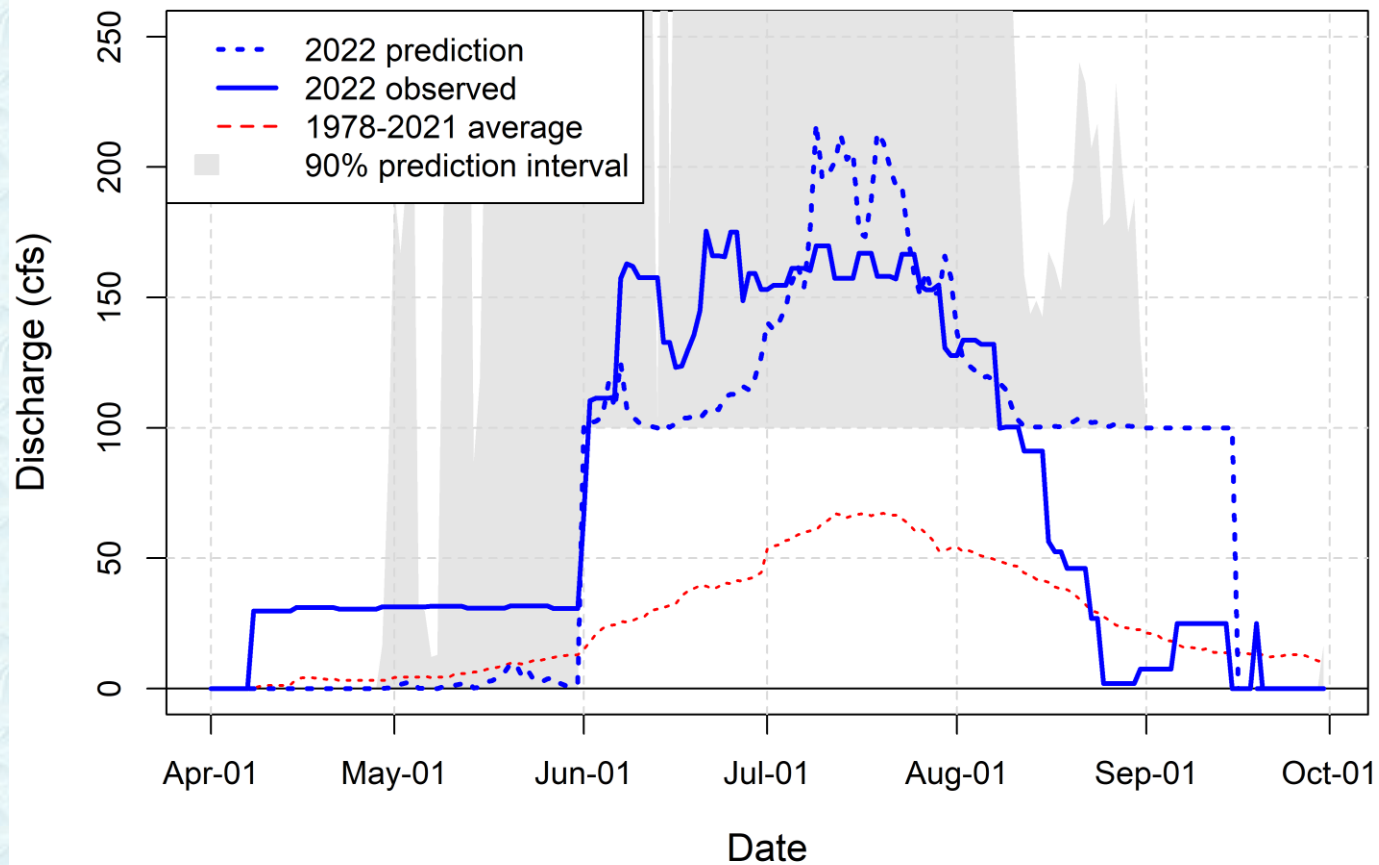
Henry's Fork Watershed Total Diversion



Crosscut Diversion to Teton River (Accounting)



Teton River Exchange Pumping



Reservoir and System Management

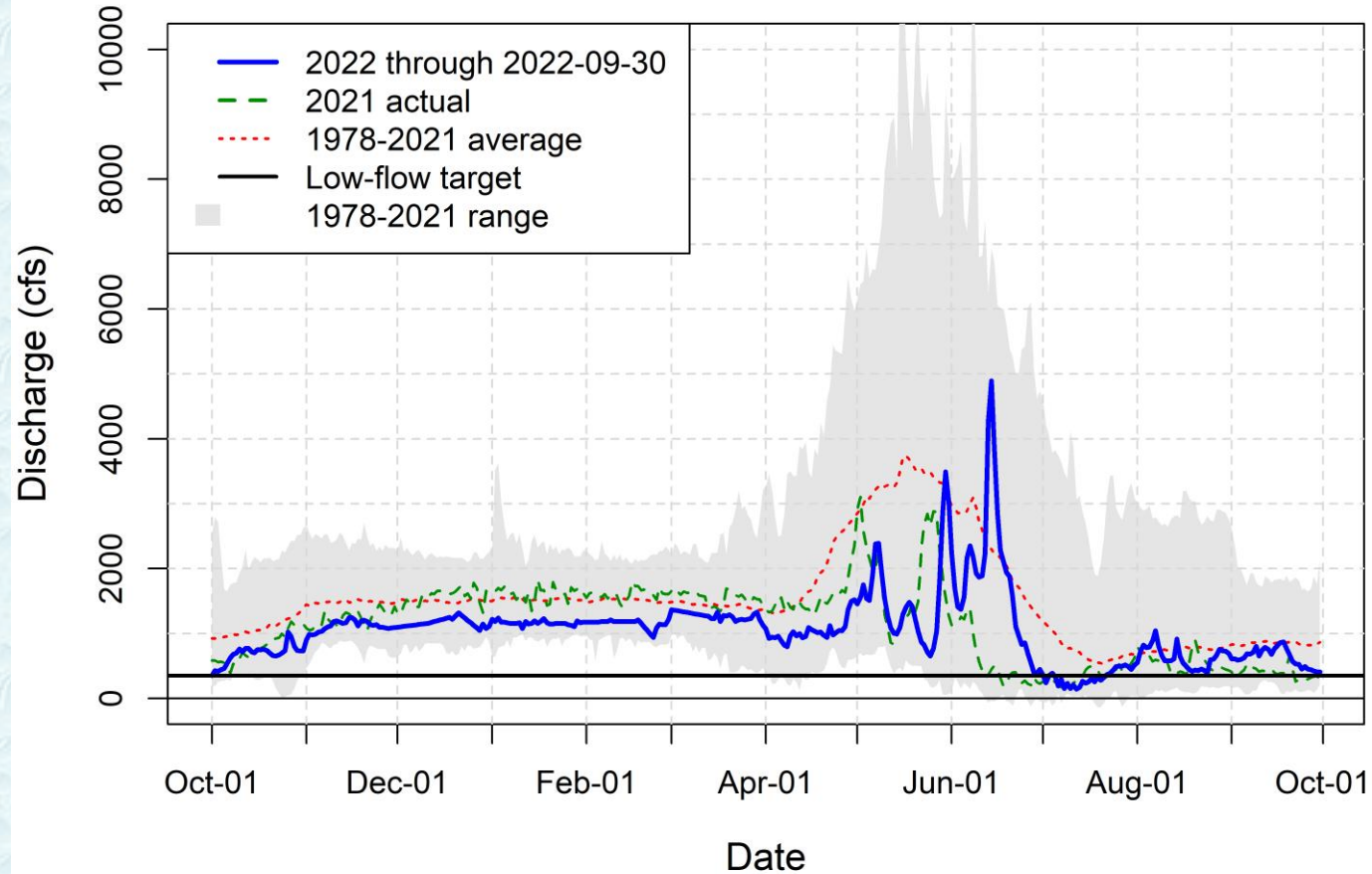
Lower-watershed streamflow targets during reservoir draft

- 350 cfs in HF downstream of all diversions...except
- Water sent to American Falls August 24 – September 19
- 0 cfs in NF Teton downstream of Teton Island Feeder
- Just enough in SF Teton to meet Rexburg Irrigation needs
- Stability in flows

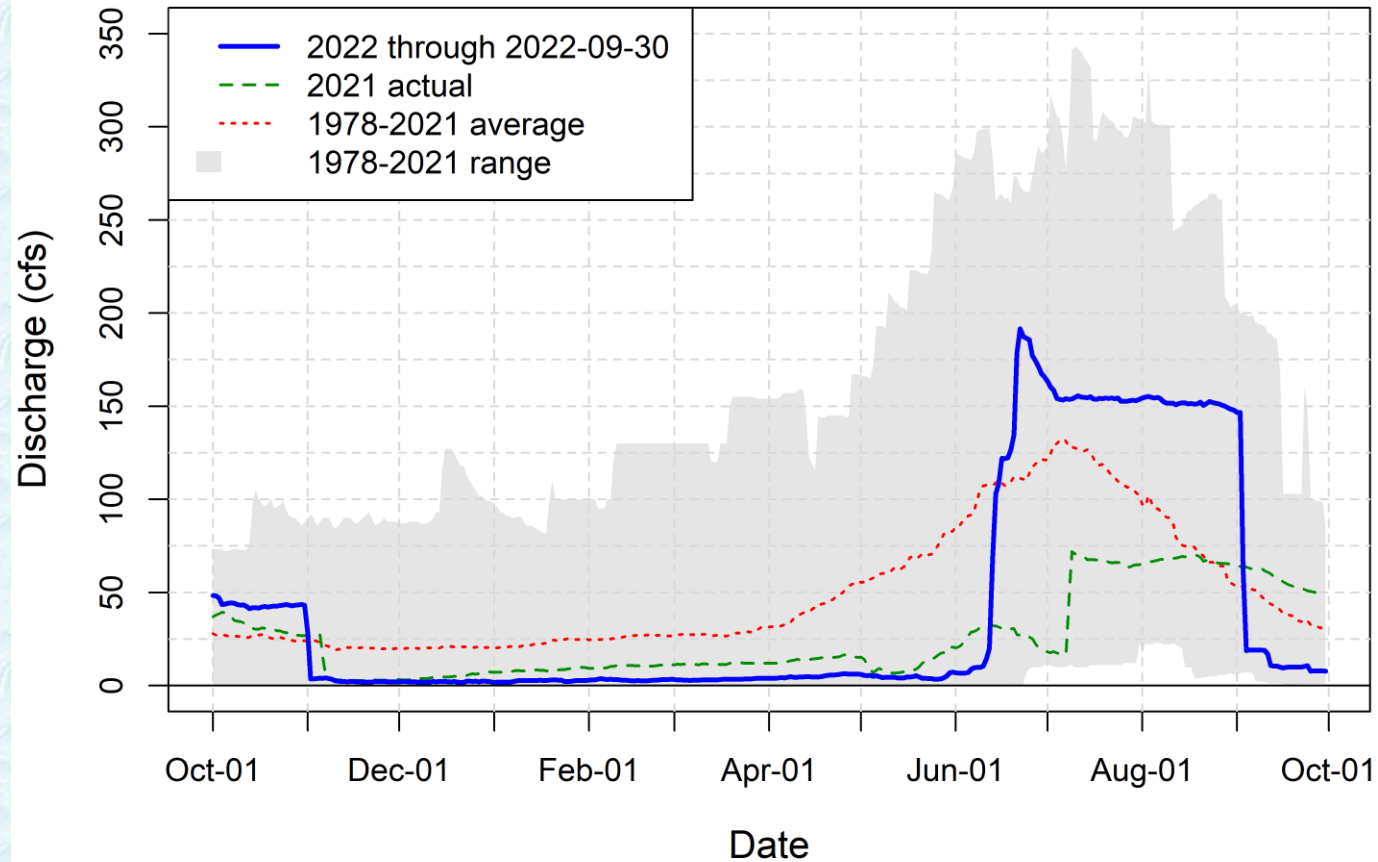
Streamflow and variability during Island Park Reservoir draft

	2022	2021
Lower Henry's Fork	536 cfs (40% CV; 4 days < 200 cfs)	427 cfs (35% CV; 3 days < 200 cfs)
SF Teton River	115 cfs (100% CV)	120 cfs (127% CV)

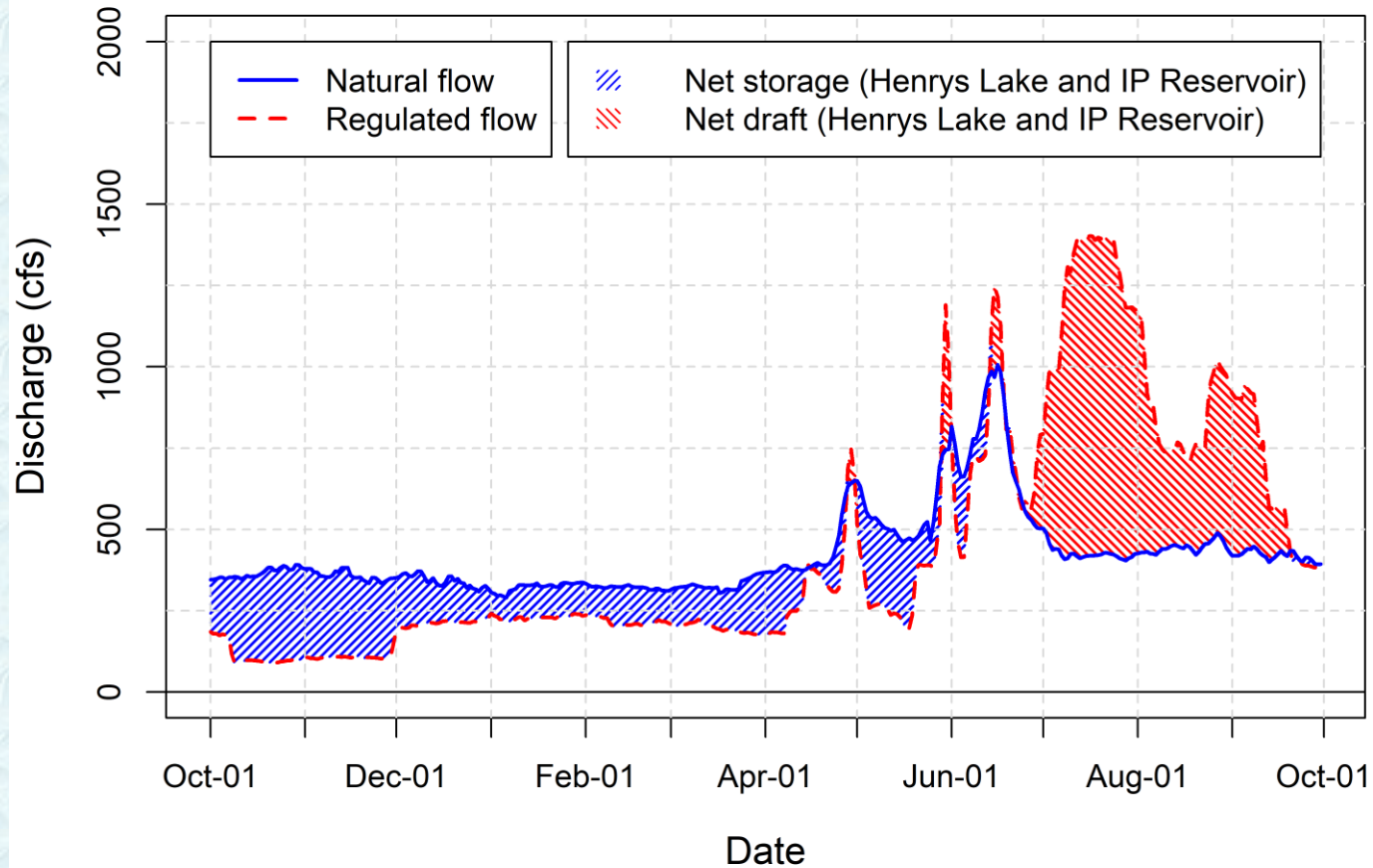
Henry's Fork Downstream of all Diversions



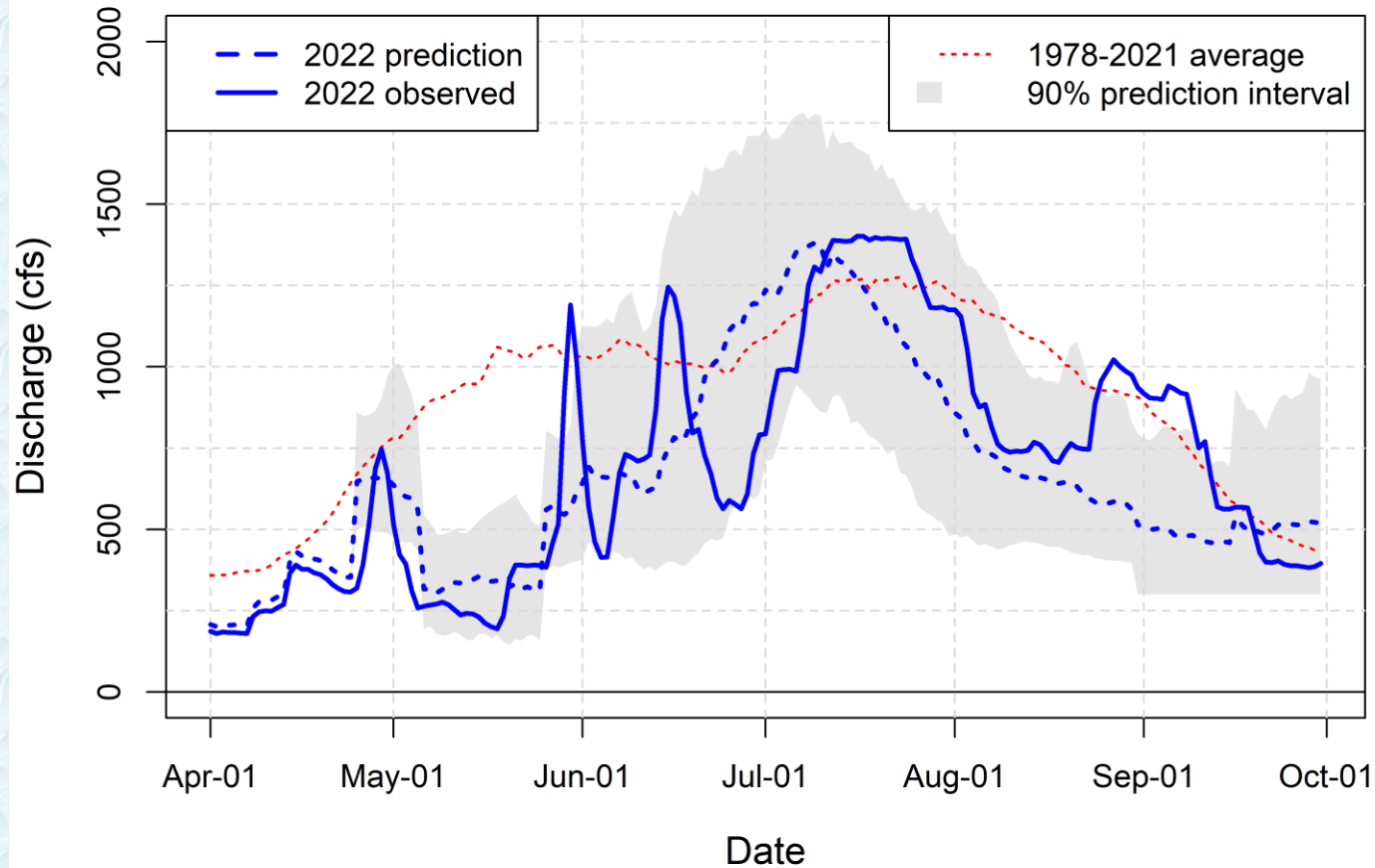
Outflow from Henry's Lake



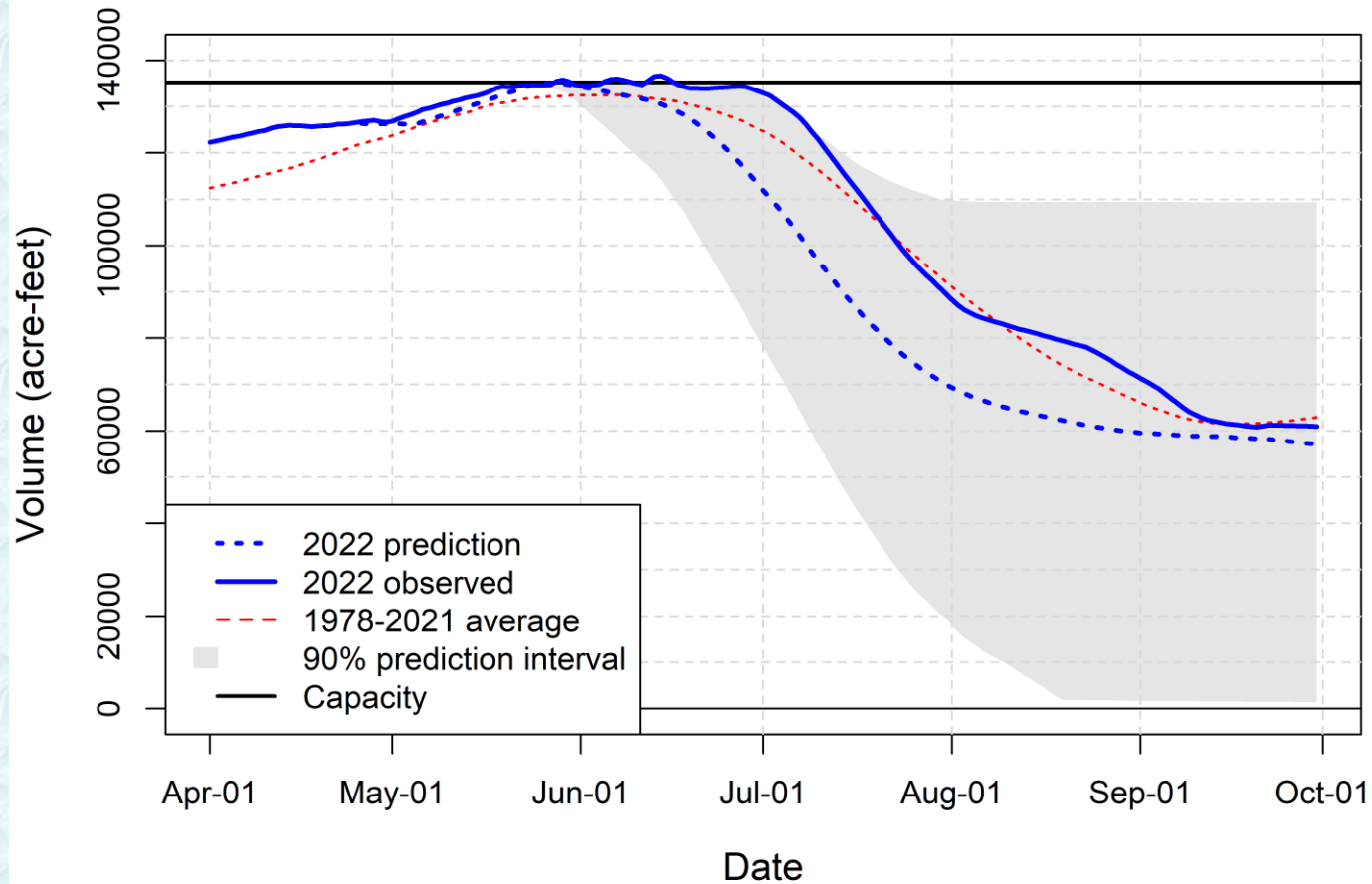
Flow in Henry's Fork at Island Park Dam



Outflow from Island Park Reservoir

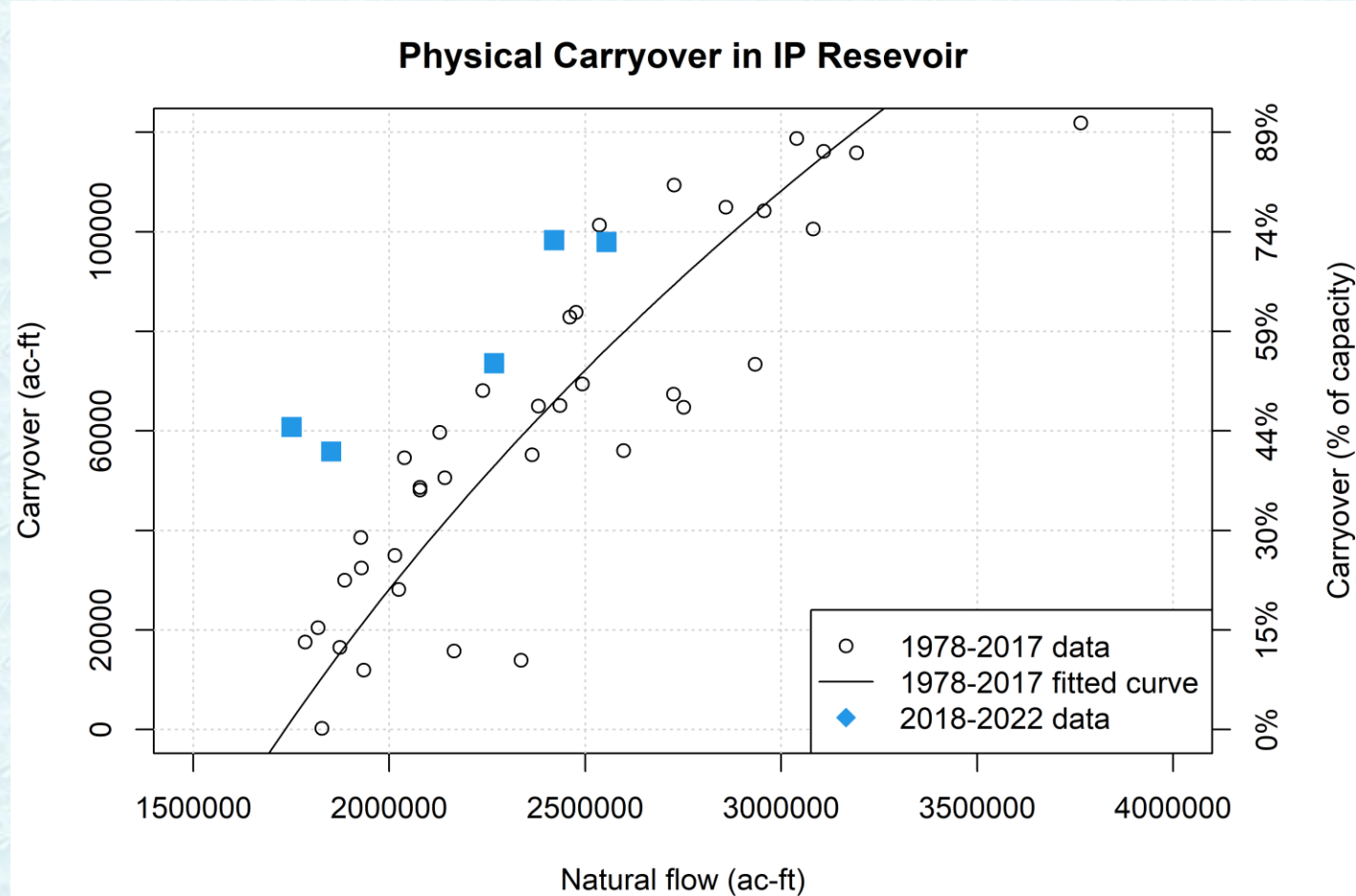


Island Park Reservoir Volume



Factors Affecting IP Reservoir Carryover

1. Watershed total natural flow (79% of variability explained)
2. Total diversion (an additional 3%)
3. Streamflow in lower Henry's Fork (an additional 3%)

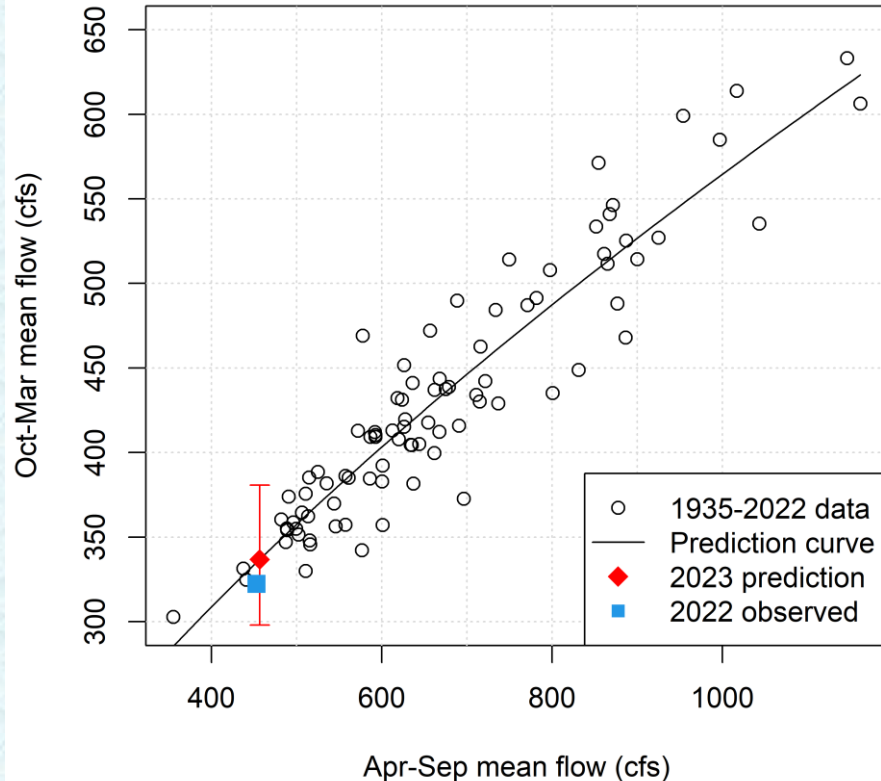


End-of Season IP Reservoir Content

Water year	Physical end-of-season carryover (ac-ft)			Subsequent winter outflow (cfs)		
	Observed	Expected	Difference	Observed	Expected	Difference
2018	96,963	85,670	12,293	560	405	155
2019	98,323	73,196	25,127	532	361	171
2020	73,581	56,442	17,139	370	308	62
2021	55,860	29,086	26,773	220	144	76
2022	60,791	17,199	43,593	220 (forecast)	99	121
2018-2022 average	77,104	52,319	24,985	380	263	117
1978-2017 average	58,059			356		

Island Park Reservoir Fill Strategy

Oct-Mar Henry's Lake to Island Park inflow



- Reduce outflow to 100 cfs until Dec. 1
- Increase outflow Dec. 1, hopefully high enough for power plant to operate
- Target fill to 126,000 ac-ft by ice-off

HFF WaterSMART Applied Science Grant

Year-2 Accomplishments

- Compiled Teton Valley GW model inputs
- Installed Buffalo River real-time stream gage
- Moved all hydrologic data to cloud storage
- Successfully moved some computing to cloud server
- More progress on lower HF GW-SW model (Morrisett)
- Stakeholder work sessions on optimization model (Morrisett)
- Developed hydrologic data website template



Henry's Fork Foundation

Navigate to another
HFF scientific website:

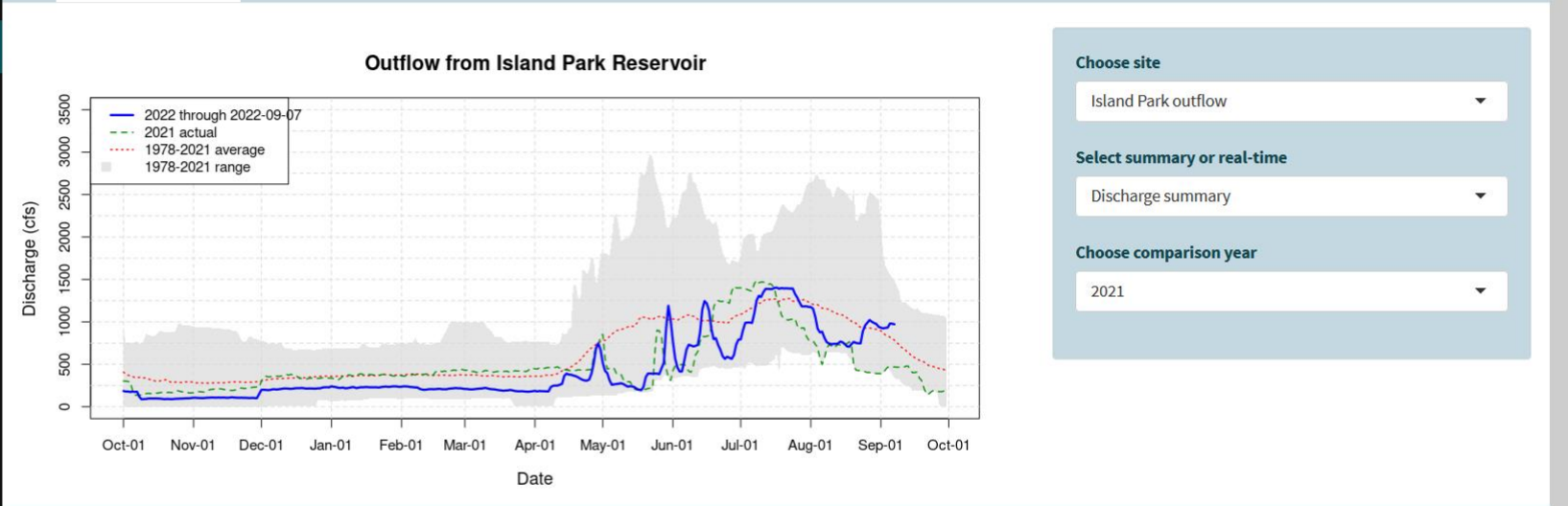
Water Supply

Water Quality

Hatch Timing

Water Supply of the Henry Fork Watershed

- Streams & Reservoirs
- Diversions & Accounting
- Current Report
- Climate
- Map
- Data Download



Choose site

Island Park outflow

Select summary or real-time

Discharge summary

Choose comparison year

2021



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