

Summary of Water Year 2019

Rob Van Kirk, Henry's Fork Foundation

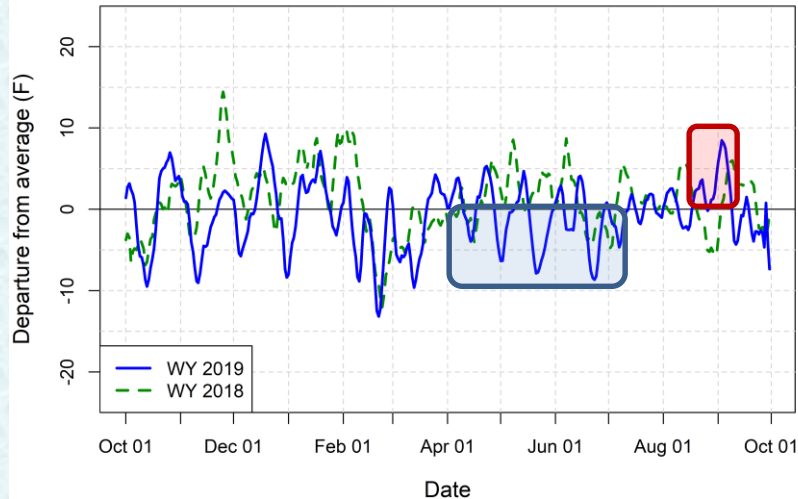
Henry's Fork Watershed Council, October 22, 2019



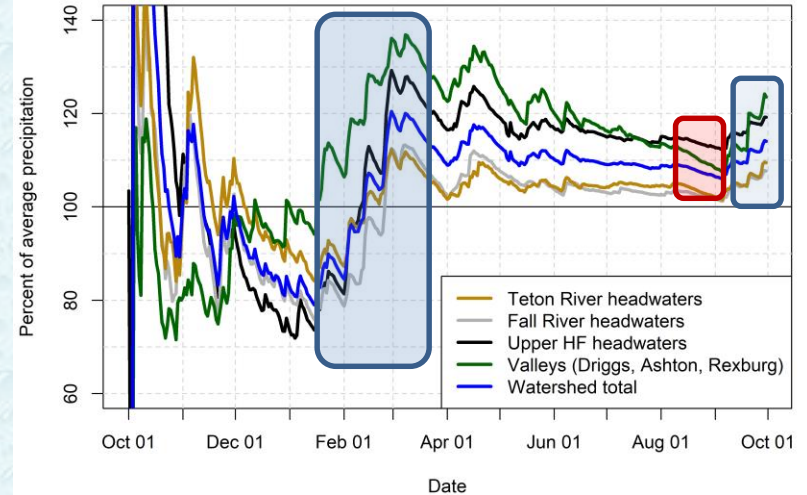
Climate

- Mean temperature average, but April-June 2 degrees colder than average
- Record February snow: 78% of average SWE to 120% in 27 days
- Warm, dry spell: August 11 to September 5
- Heavy September precipitation: 106% of average to 114% in 25 days

HF Watershed 7-day Temperature, Departure from 1989-2018 Average



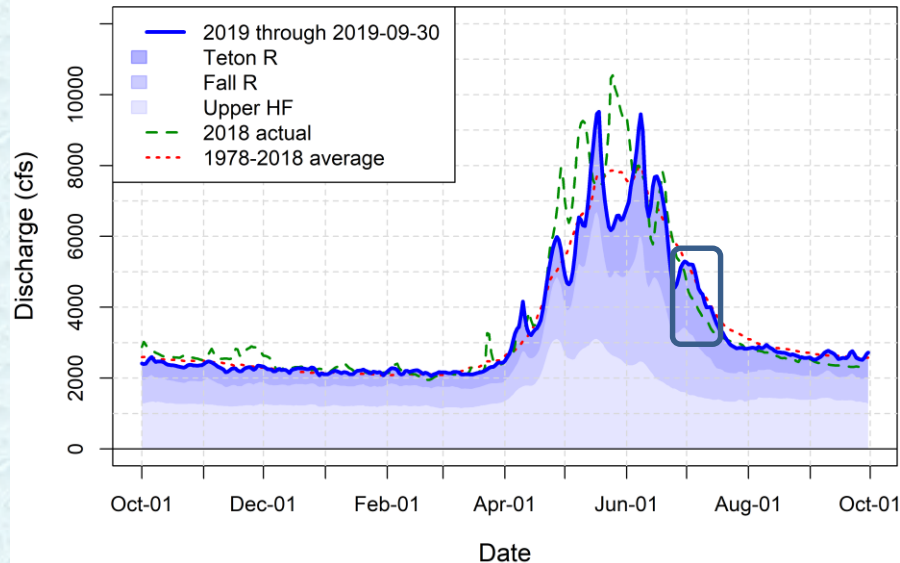
Henry's Fork Watershed Water-year Precipitation, Tue Oct 01 2019



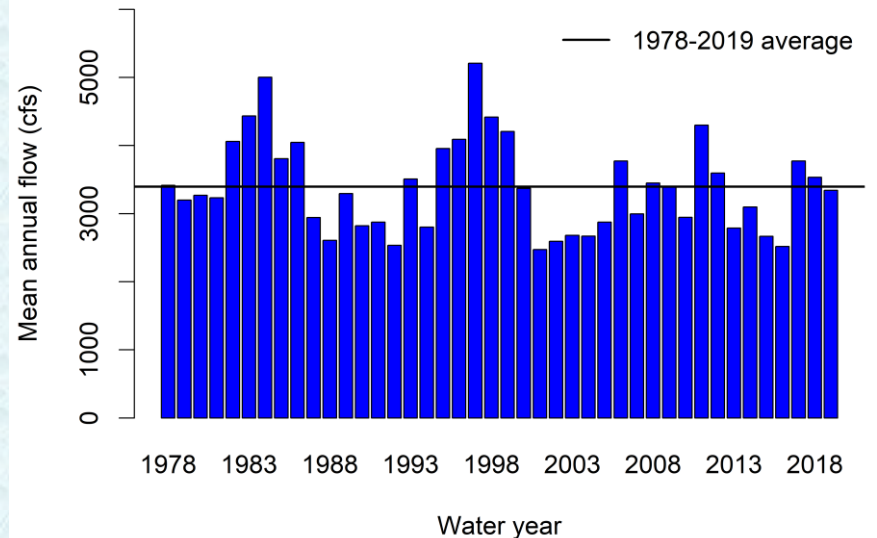
Natural Streamflow

- 98% of average; 21st out of past 42 years
- Snowmelt in Fall and Teton rivers lasted into July

Henry's Fork Total Natural Flow (Water Supply)

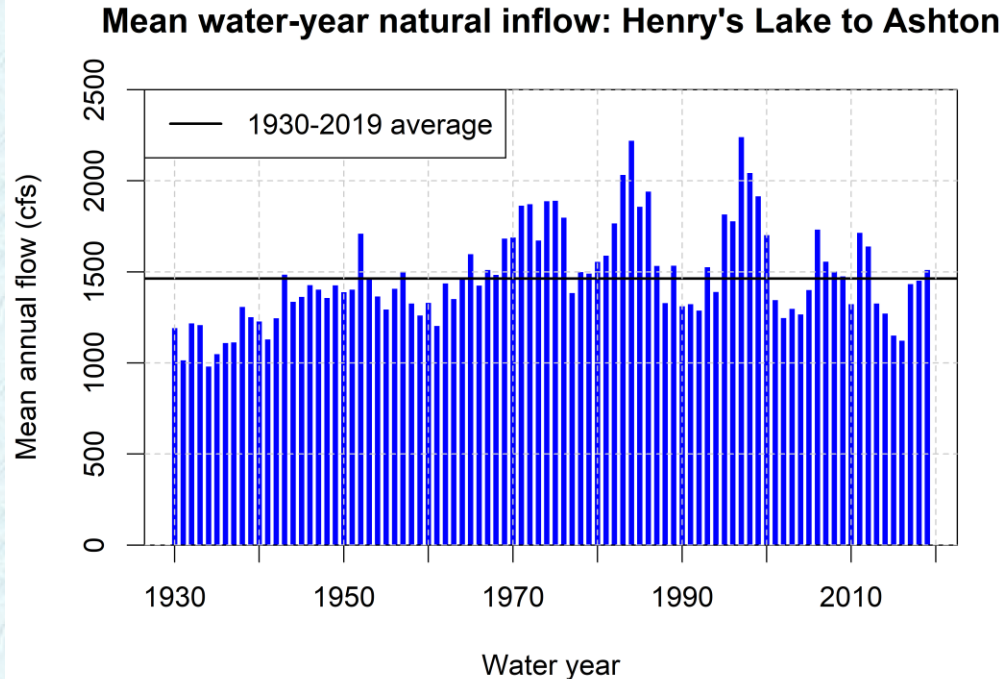


Mean natural flow, Watershed total (Upper HF + FR + TR)



Natural Streamflow

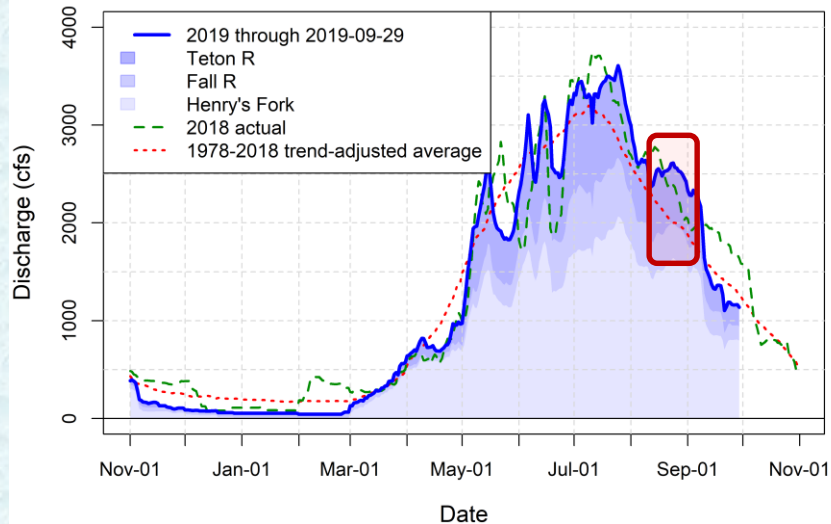
- More uniformly distributed across subwatersheds than in recent years
- Upper HF above 1930-2019 average for first time since 2012



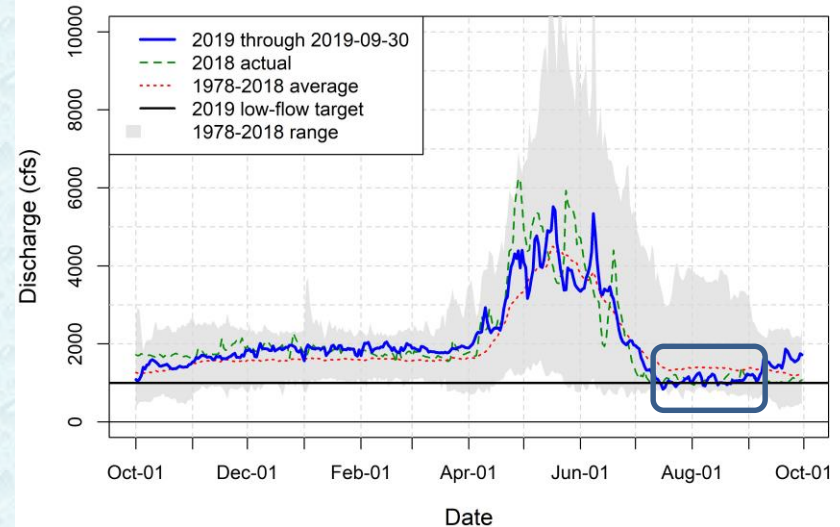
Irrigation Management

- Diversion average over year but 120% of average mid-August to Sept. 9
- Crosscut Canal delivery to Teton River: July 18 to Sept. 8
- Grassy Lake drafted July 13 – August 16: reduced IP outflow by 65 cfs
- HF at St. Anthony target: 1,000 cfs; actual: 1,070 cfs

Henry's Fork Watershed Total Diversion

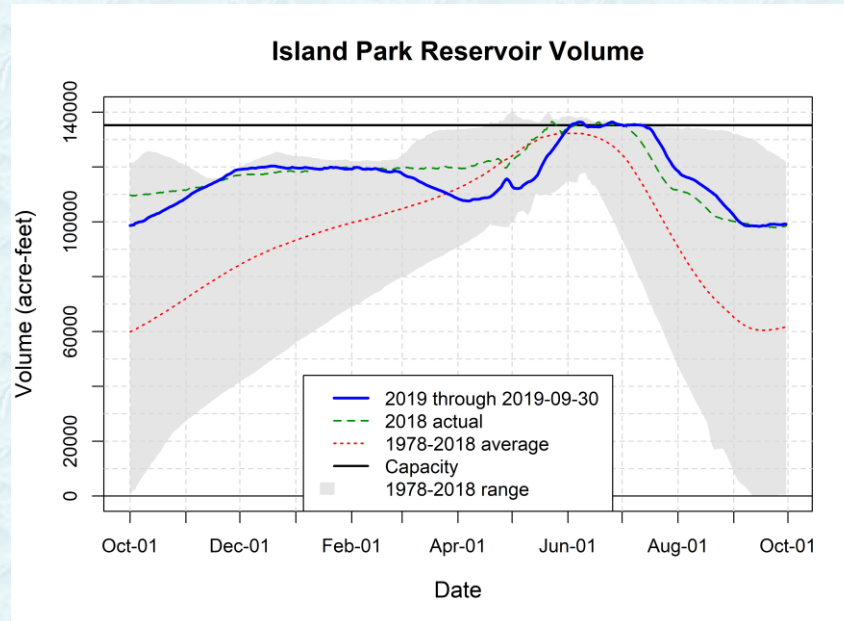


Henry's Fork at St. Anthony



Island Park Reservoir Management

- Drafted 13 days less than average: saved 6,300 ac-ft (32 cfs winter flow)
- Meeting St. Anthony target saved 14,663 ac-ft (75 cfs winter flow)
- Reservoir ended season 73% full, versus 46% full on average
- Winter flow will be 500-550 cfs versus 351 cfs average



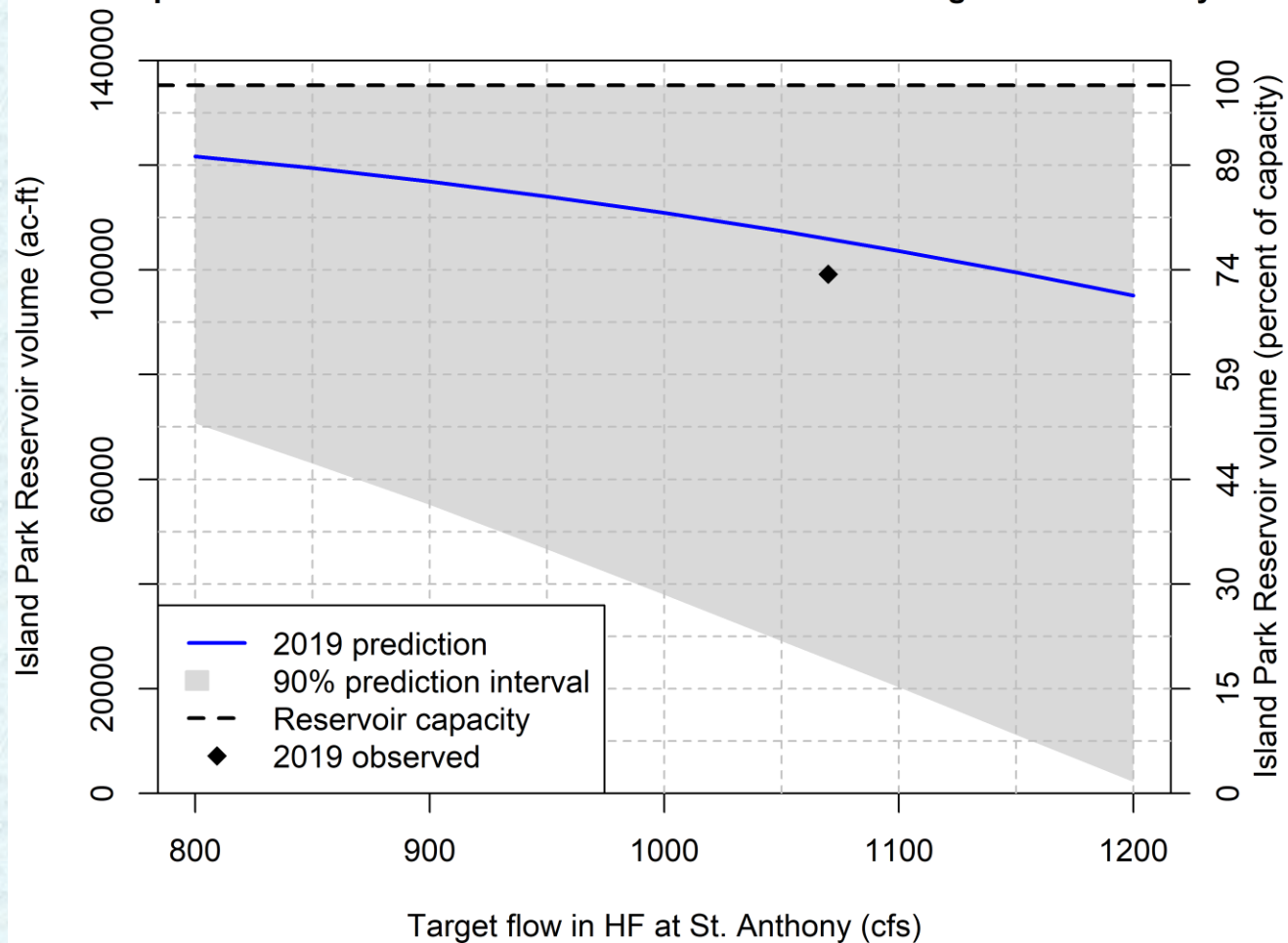
HFF Predictive Model Performance?

Summer 2019 Predicted versus Observed Hydrologic Parameters

Parameter	Predicted value	Observed value	Difference	
April-September watershed-total natural flow	1.74 M ac-ft	1.61 M ac-ft	8.1%	✓
April-June temperature at SnoTel sites	44.5°F	42.4°F	2.1°F	✗
June 30 outflow from Island Park Dam	700 cfs	776 cfs	-8.6%	✓
First date on which Crosscut Canal > 100 cfs	7-Jul	18-Jul	-11 days	✗
Start of Island Park Reservoir draft	3-Jul	12-Jul	-9 days	✗
Mean July-August outflow from IP Reservoir	853 cfs	873 cfs	-2.3%	✓
Peak summer outflow from IP Reservoir	1099 cfs	1230 cfs	-10.6%	✓
Last date on which Crosscut Canal > 100 cfs	9-Aug	8-Sep	-30 days	✗
Peak outflow from IP Reservoir after August 15	792 cfs	1020 cfs	-22%	✗
Sep 30 Island Park Reservoir content*	105,886 ac-ft	99,188 ac-ft	6.8%	✓

*Given observed streamflow at St. Anthony

Sept. 30 IP Reservoir Volume vs. Summer-time Flow Target at St. Anthony



Does precision management make a difference?

Top Five Three-Year Sequences of IP Reservoir Carryover since 1978

Years	Mean Reservoir Carryover		Mean Water Supply	Mean winter flow
	acre-feet	%full	(% of average)	(cfs)
1997-1999	119,063	88%	136%	674
1996-1998	114,167	84%	135%	677
1995-1997	110,478	82%	130%	644
2017-2019	102,395	76%	105%	530
1998-2000	101,772	75%	118%	577

This will get even better with remote-controlled gates and improved predictive models and data, hopefully funded with USBR WaterSMART grants!

*Ashly Loibman (Colgate University) and
Christina Morrisett (Utah State
University) prepare FMID's Acoustic
Doppler Current Profiler to measure
streamflow in lower Henry's Fork.*

