



Weekly Temperature Report

McNary Dam

August 30, 2021

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Report Period: August 20 through August 26
Report No. 2021 MCN Temperature Report 0820 to 0826 by EAS

Re: USACE Walla Walla District Biological Services: Temperature Monitoring Program at McNary Dam

Temperature monitoring at the McNary juvenile collection system began at 1200 hours on June 14 and is scheduled to continue through 0700 hours August 31. Wind speed data used in this report are from the National Weather Service station at the Hermiston Municipal Airport in Oregon. The air temperature data was obtained via an Onset temperature logger located on site at the McNary Juvenile Fish Facility (JFF). Units continued to be operated in a “sawtooth pattern” (operate every other unit) to reduce thermal stress to juvenile salmonids passing through the collection system.

Fish Collection

An estimated 545 juvenile salmonids were collected and 543 were bypassed at the McNary JFF (Table 1). There was 1 fish mortality in the sample on August 21 and in the facility on August 23.

River Conditions

Average river flow for this reporting period was 132.5 kilo cubic feet per second (kcfs) with an average spill of 19.9 kcfs (Table 1).

Temperature Logger Operations

Temperature loggers were deployed on June 14. The Onset temperature logger in gateway Unit 10 ceased operation on August 22 at 1000 hours and was replaced on August 23 at 1030 hours. The Onset temperature logger in forebay Unit 12 ceased operation on August 21 at 0930 hours and was subsequently replaced on August 22 at 1030 hours.

Weather Conditions

The weekly average air temperature from August 20 to August 26 was 69.2°F. Air temperatures ranged from a maximum of 83.7°F on August 19 to a minimum of 54.3°F on August 24 (Figure 1). Wind speeds averaged 9.8 mph with gusts of 24.2 mph (Table 1). Wind direction was predominantly West Southwest.

Water Temperatures

Average water temperatures within dam locations varied with air temperatures and wind velocities (Figure 2). The weekly average temperatures within dam locations were: 70.5°F, forebay (weekly average of eight positions); 70.3°F, gateway (weekly average of 14 positions); 70.3°F, collection channel (weekly average of positions at Units 1, 8, and 12); and 70.3°F, JFF (weekly average of the separator and sample tank “B”). Forebay Unit 1 had

the highest weekly average temperature, 70.7°F (Figure 3). The maximum temperature, 74.3°F, was recorded in forebay Unit 3 at 1730 hours on August 25.

The average weekly temperature differentials within dam locations were: 0.9°F, forebay; 0.9°F, gatewells; 0.2°F, collection channel; and 0.1°F, JFF (Figure 4). The largest temperature differential, 4.4°F, was recorded in the forebay at 1700 hours on August 25 (Unit 1 high, Unit 10 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 0.2°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 3.3°F at 1830 hours on August 25 at Unit 12 (forebay warmer than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 0.3°F. On average, the gatewells were warmer than the collection channels at Units 1 and 8. The largest temperature differential between the gatewell and corresponding collection channel location was 2.2°F at 1700 hours on August 25 at Unit 1 (gatewell was warmer than the collection channel).

Table 1
Bypass, Mortality, and River and Weather Conditions from August 20 to August 26

Date	Fish Collected	Fish Bypassed	Mortality		Avg. River Flow (kcfs)	Avg. Turbine Flow (kcfs)	Avg. Spill (kcfs)	Air Temperature (°F)		Wind Speed (mph)	
			Sample	Facility				Avg.	Max	Avg.	Max
20-Aug					142.1	117.4	19.9	73.4	83.7	10.0	17.3
21-Aug	372	371	1	0	136.0	111.4	19.9	70.2	80.2	13.0	18.4
22-Aug					130.6	106.0	19.9	69.4	79.2	10.6	19.6
23-Aug	121	120	0	1	124.0	99.5	19.8	67.5	76.7	15.6	24.2
24-Aug					131.9	107.3	19.9	64.2	75.1	5.8	12.7
25-Aug	52	52	0	0	131.5	106.8	19.9	68.9	81.5	4.9	11.5
26-Aug					131.6	106.9	19.9	71.0	81.6	8.6	16.1
Weekly Total	545	543	1	1	132.5	107.9	19.9	69.2	79.7	9.8	17.1

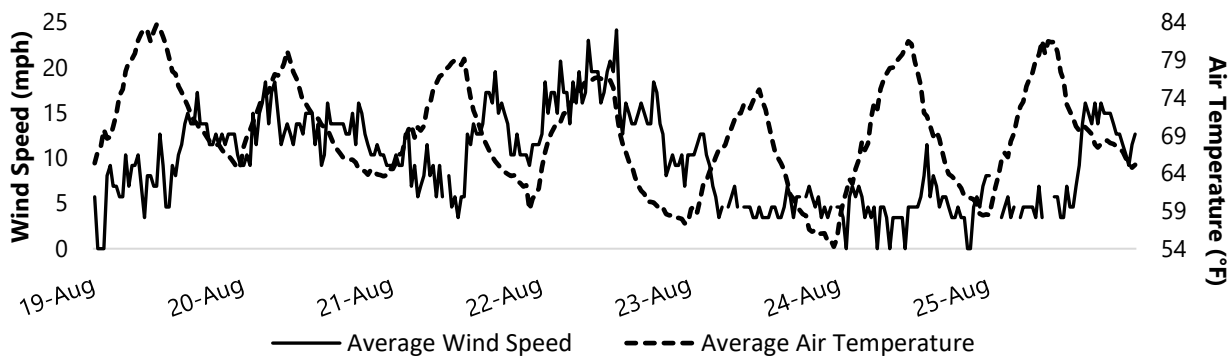


Figure 1
Average Wind Speed and Air Temperature for Each Half-Hour Interval from August 20 to August 26

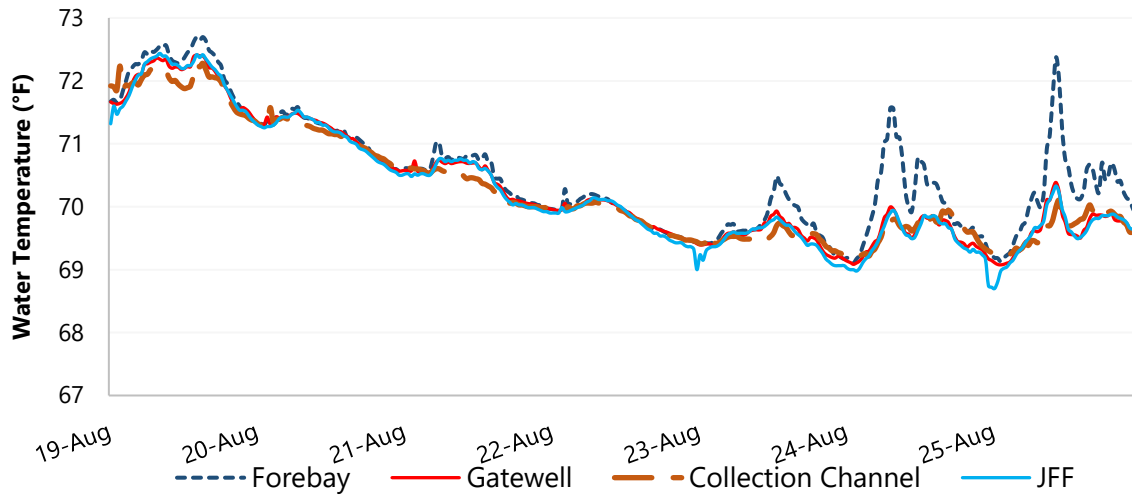


Figure 2
 Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from August 20 to August 26

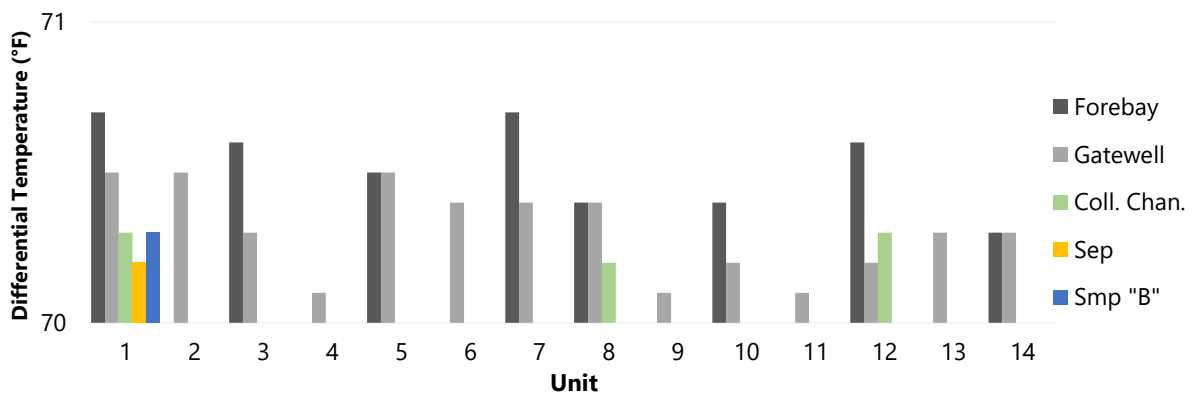


Figure 3
 Average Weekly Water Temperatures by Position for Five Dam Locations from August 20 to August 26

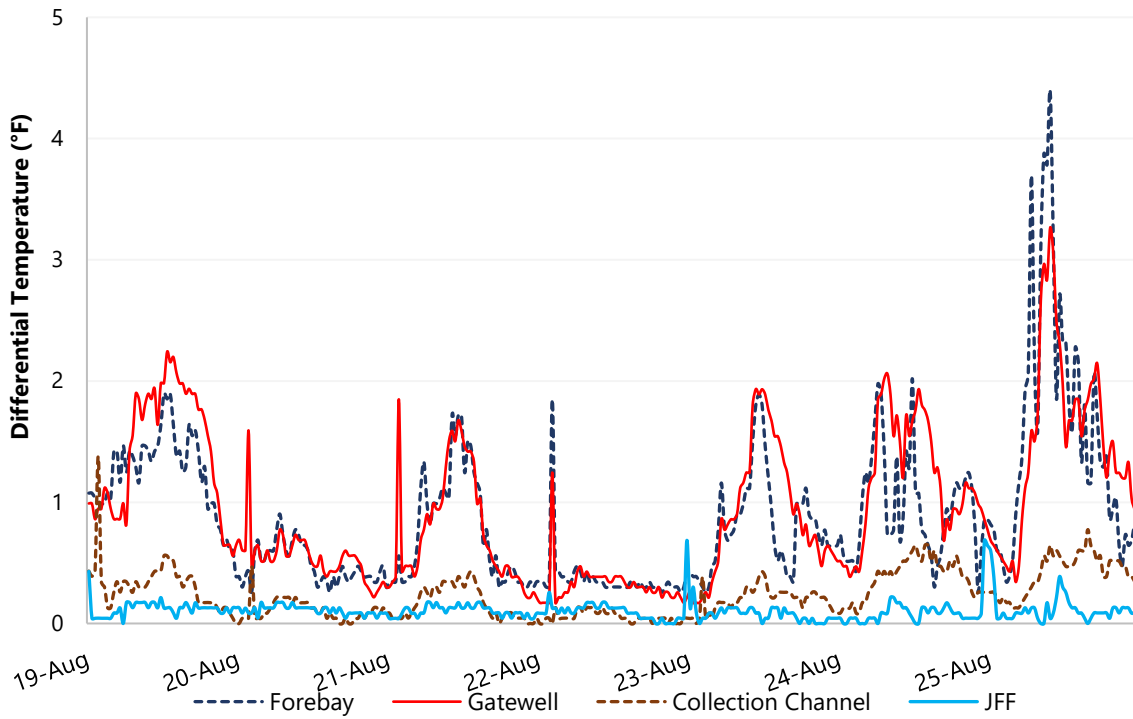


Figure 4
 Average Differential Temperatures within Four Dam Locations from August 20 to August 26

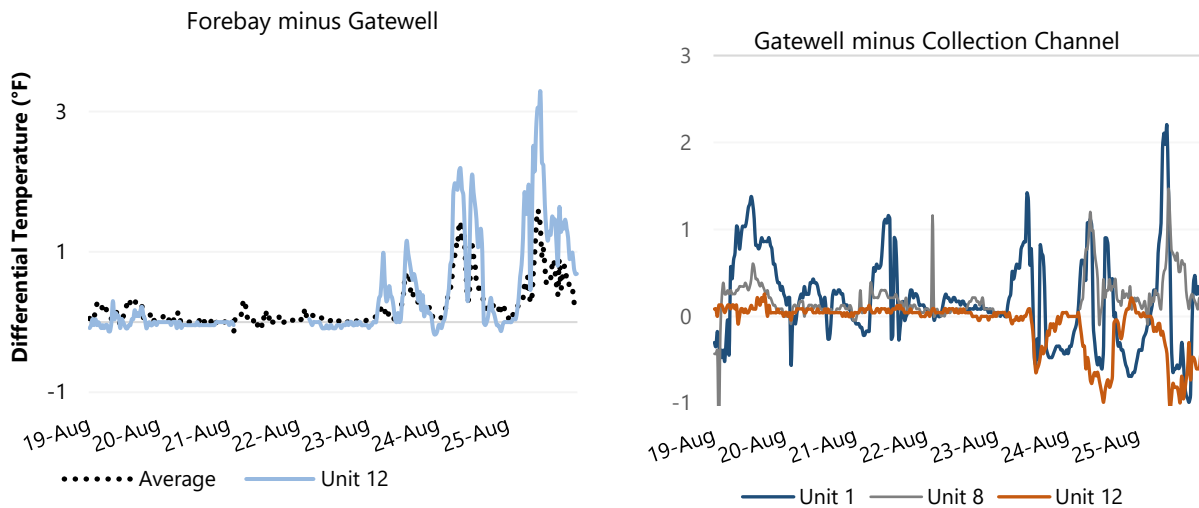


Figure 5
 Average Differential Temperatures across Three Dam Locations from August 20 to August 26