



Weekly Temperature Report

McNary Dam

August 31, 2020

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Report Period: August 28 through August 31
Report No. 2020 EAS: MCN Dam Temperature Weekly for 0828 to 0831

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

Temperature monitoring at the McNary juvenile collection system began at 0700 hours on June 14 and is scheduled to continue through 0700 hours August 31. The replacement console for the new weather station arrived August 28. Currently troubleshooting communications between the weather station and the site computer. A portion of the wind speed data used in this report is from the National Weather Service station at the Hermiston Oregon airport. The air temperature data was obtained via an Onset temperature logger located onsite at the McNary Juvenile Fish Facility (JFF).

Fish Collection

A total of 28 juvenile salmonids (subyearling Chinook salmon) were collected and bypassed at the McNary JFF (Table 1). Fish sampling was not conducted on August 29 due to a malfunction of the dewatering valve in the collection channel. Sampling on August 31 was from 0030 hours to 0830 hours because of potential fish mortality with increased water temperature.

River Conditions

Average river flow for this reporting period was 137.8 thousand cubic feet per second (kcfs) with an average spill of 20.1 kcfs.

Temperature Logger Operations

There was one temperature logger failure this week at Gatewell 6 on August 30 and it was not replaced.

Weather Conditions

The weekly average air temperature from August 28 to August 31 was 70.8°F. Air temperatures ranged from a maximum of 88.3°F at 1830 hours on August 27 to a minimum of 58.0°F at 0600 hours on August 30 (Figure 1). Wind speeds averaged 7.1 mph with gusts to 25.0 mph (Table 1).

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 70.4°F, forebay (weekly average of 8 positions); 70.1°F, gatewells (weekly average of 14 positions); 70.1°F, collection channel (weekly average of positions at Units 1, 8, and 12); and 70.1°F, JFF (weekly average of the separator and sample tank "B"). Forebay Unit 1 had the highest

weekly average temperature, 70.8°F (Figure 3). The maximum temperature, 74.3°F, was recorded in Forebay Unit 3 at 1630 hours on August 28.

The average weekly temperature differentials within dam locations were: 1.3°F, forebay; 1.7°F, gatewells; 0.3°F, collection channel; and 0.1°F, JFF (Figure 4). The largest temperature differential, 4.6°F, was recorded in the gatewells at 1800 hours on August 27 (Unit 1 high, Unit 2 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 0.3°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 3.4°F at 1630 hours on August 28 at Unit 1 (forebay warmer than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 0.4°F. On average, the gatewells were warmer than the collection channels at Units 1, 8, and 12. The largest temperature differential between the gatewell and corresponding collection channel location was 2.5°F at 1800 hours on August 27 at Unit 1 (gatewell was warmer than the collection channel).

Table 1
Bypass, Mortality, and River and Weather Conditions from August 28 to August 31

Date	Fish Collected	Fish Bypassed	Mortality		Avg. River Flow	Avg. Turbine Flow	Avg. Spill	Air Temperature		Wind Speed	
			Sample	Facility				Avg.	Max	Avg.	Max
28-Aug					142.6	117.9	20	71.7	88.3	4.7	8.0
29-Aug					145.3	120.5	20.1	72.1	85.0	5.0	8.0
30-Aug					132.6	107.7	20.2	71.1	84.2	10.0	23.0
31-Aug	28	28	0	0	130.5	105.7	20.1	69.4	76.8	8.6	25.0
Weekly Total	28	28	0	0	137.8	113.0	20.1	70.1	83.6	7.1	16.0

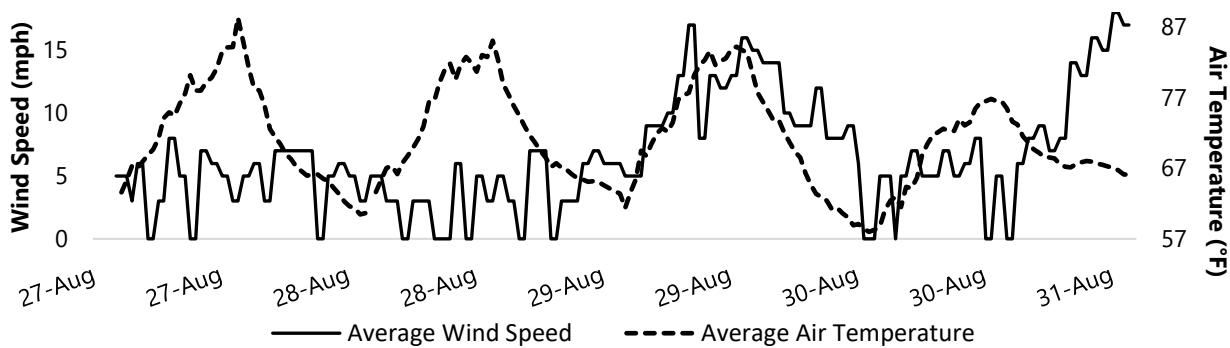


Figure 1
Average Wind Speed and Air Temperature for Each Half-Hour Interval from August 28 to August 31

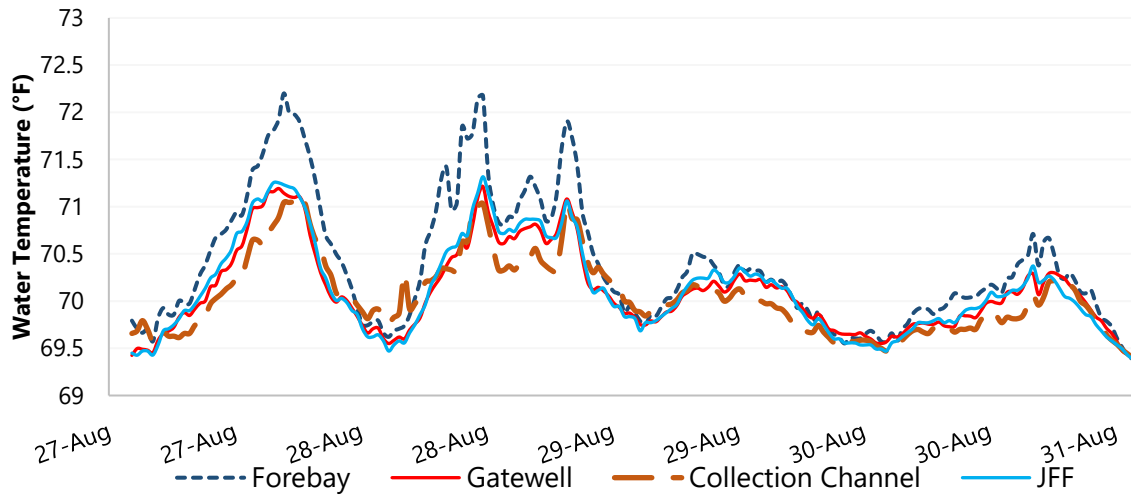


Figure 2
 Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from August 28 to August 31

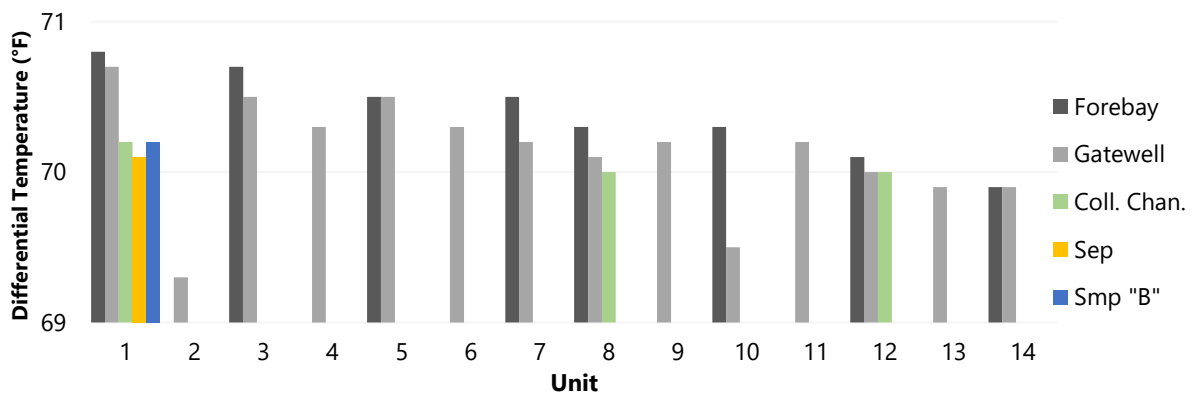


Figure 3
 Average Weekly Water Temperatures by Position for Five Dam Locations from August 28 to August 31

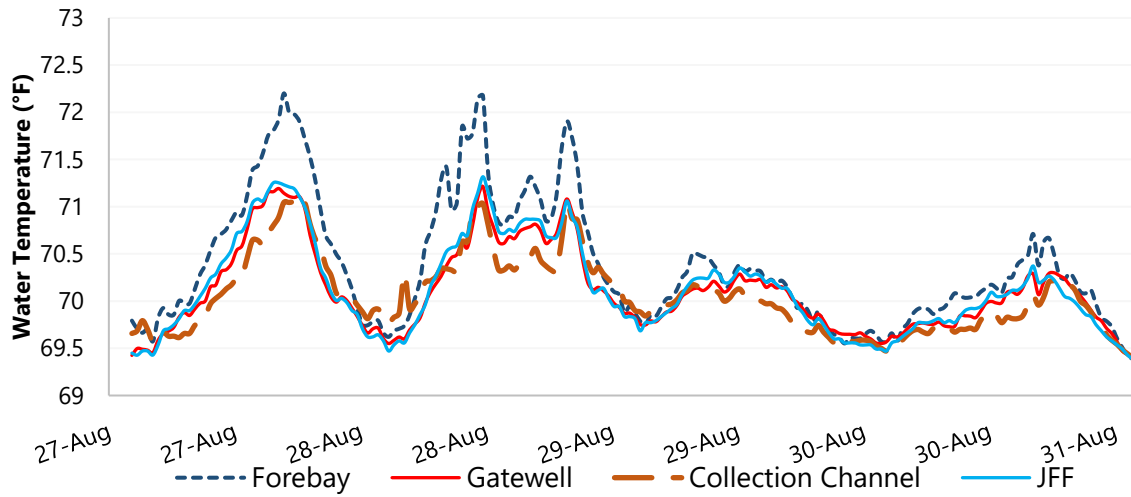


Figure 4
 Average Differential Temperatures within Four Dam Locations from August 28 to August 31

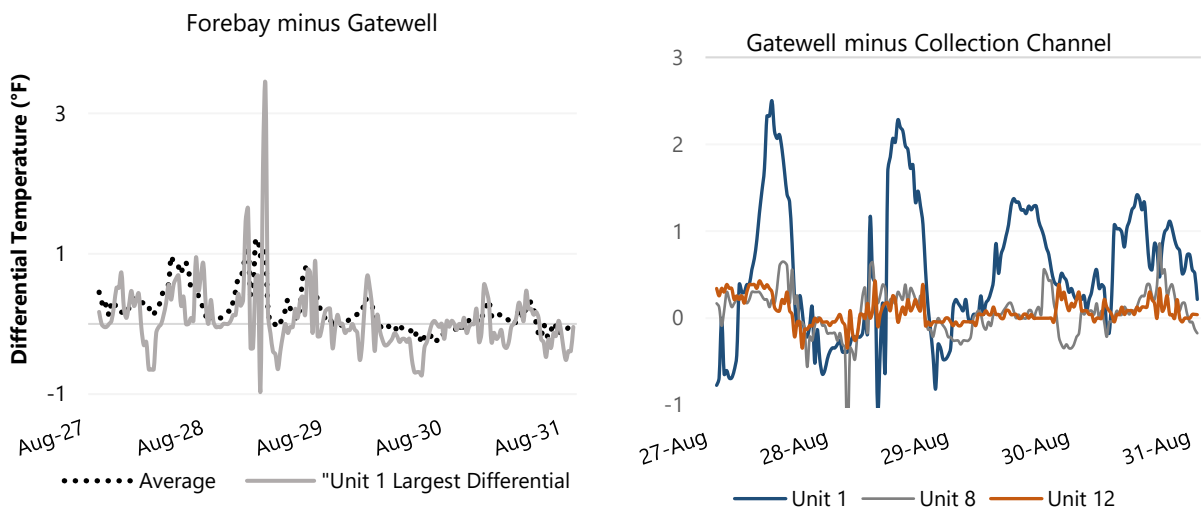


Figure 5
 Average Differential Temperatures across Three Dam Locations from August 28 to August 31