Weekly Temperature Report
McNary Dam

August 17, 2020

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Report Period: August 7 through August 13

Report No. 2020 EAS: MCN Dam Temperature Weekly for 0807 to 0813

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 data logger for the new weather station arrived August 13. Installation completed and testing is in process.

Fish Collection

An estimated 796 juvenile salmonids were collected and 784 bypassed at the McNary Juvenile Fish Facility (JFF; Table 1), comprising mostly subyearling Chinook salmon. There were 6 sample and 6 facility mortalities.

River Conditions

Average river flow for this reporting period was 164.2 thousand cubic feet per second (kcfs) with an average spill of 93.8 kcfs.

Temperature Logger Operations

There were two temperature logger failures this week in the Sample Tank and Collection Channel Unit 12, which were replaced on August 7 and August 9.

Weather Conditions

The weekly average air temperature from August 7 to August 13 was 72.4°F. Temperatures ranged from a maximum of 95.0°F at 1830 hours on August 10 to a minimum of 56.4°F at 0530 hours on August 7 (Figure 1).

Winds averaged 3.1 miles per hour (mph) for the week with highest wind speed recorded on August 7 at 34.0 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: 70.0°F, forebay (weekly average of 8 positions); 69.4°F, gatewells (weekly average of 14 positions); 69.3°F, collection channel (weekly average of positions at Units 1, 8, and 12); and 69.4°F, JFF (weekly average of the separator and sample tank “B”). Forebay Unit 1 had the highest weekly average temperature, 70.4°F (Figure 3). The maximum temperature, 76.9°F, was recorded in Forebay Unit 12 at 1530 hours on August 10.

The average weekly temperature differentials within dam locations were: 1.4°F, forebay; 1.9°F, gatewells; 0.3°F, collection channel; and 0.2°F, JFF (Figure 4). The largest temperature differential, 7.8°F, was recorded in the forebays at 1530 hours on August 10 (Unit 14 high, Unit 3 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 0.8°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 8.5°F at 1530 hours on August 10 at Unit 12 (forebay warmer than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 0.5°F. On average, the collection channel was warmer than the gatewell at Units 1, 8, and 12. The largest temperature differential between the gatewell and corresponding collection channel location was 4.3°F at 1830 hours on August 10 at Unit 12 (collection channel warmer than the gatewell).

Table 1
Bypass, Mortality, and River and Weather Conditions from August 7 to August 13

Date	Fish Collected	Fish Bypassed	Mortality		Avg. River Flow	Avg. Turbine Flow	Avg. Spill	Air Temperature		Wind Speed	
			Sample	Facility				Avg.	Max	Avg.	Max
7-Aug	564	554	4	6	166.7	66.8	95.2	69.5	81.6	7.1	34.0
8-Aug					173	69.5	98.8	69.8	81.6	1.8	9.0
9-Aug					166.7	66.8	95.2	72.7	86.0	1.5	10.0
10-Aug					157.4	62.9	89.9	72.1	86.8	2.2	8.0
11-Aug					169.3	68.0	96.6	77.1	95.0	2.1	8.0
12-Aug					172.7	69.5	98.5	77.2	91.1	4.1	25.0
13-Aug	232	230	2	0	143.8	57.0	82.1	68.4	81.4	3.1	9.0
Weekly Total	**796**	**784**	**6**	**6**	**164.2**	**65.8**	**93.8**	**72.4**	**86.2**	**3.1**	**14.7**

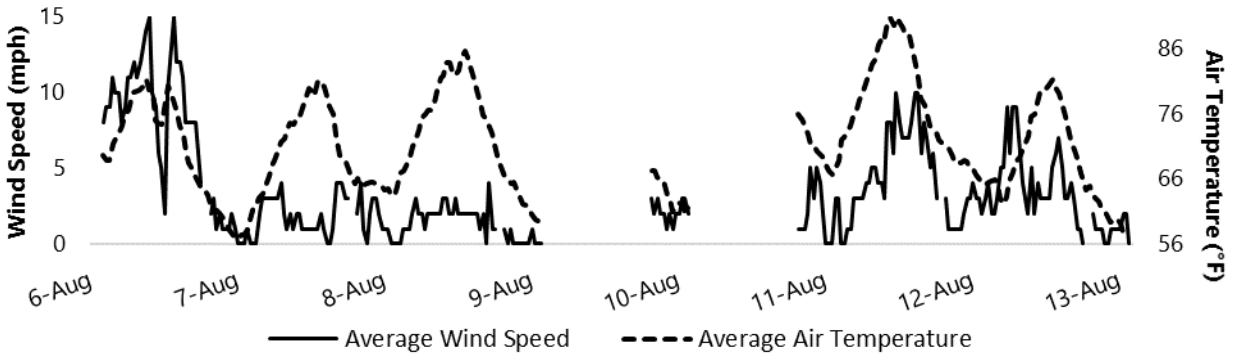

Figure 1
Average Wind Speed and Air Temperature for Each Half-Hour Interval from August 7 to August 13

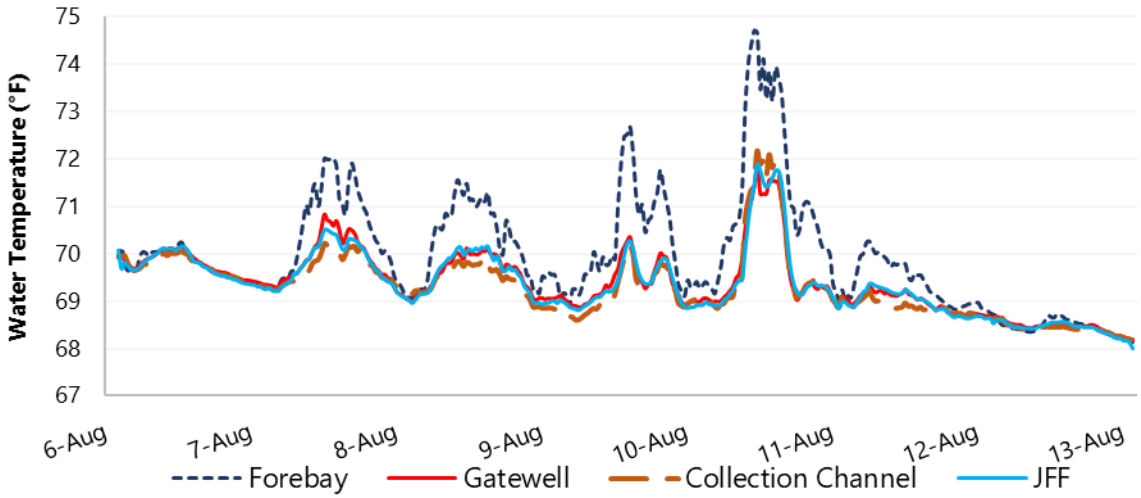

Figure 2
Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from August 7 to August 13

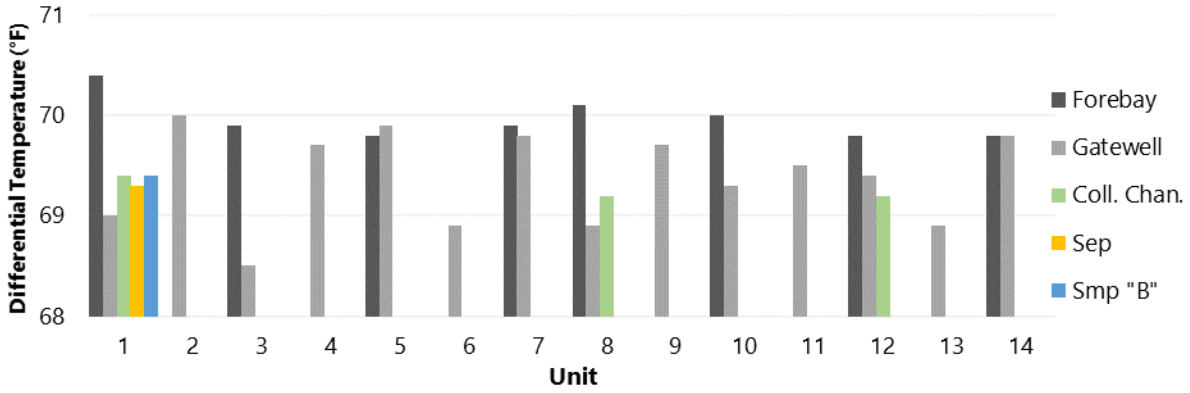

Figure 3
Average Weekly Water Temperatures by Position for Five Dam Locations from August 7 to August 13

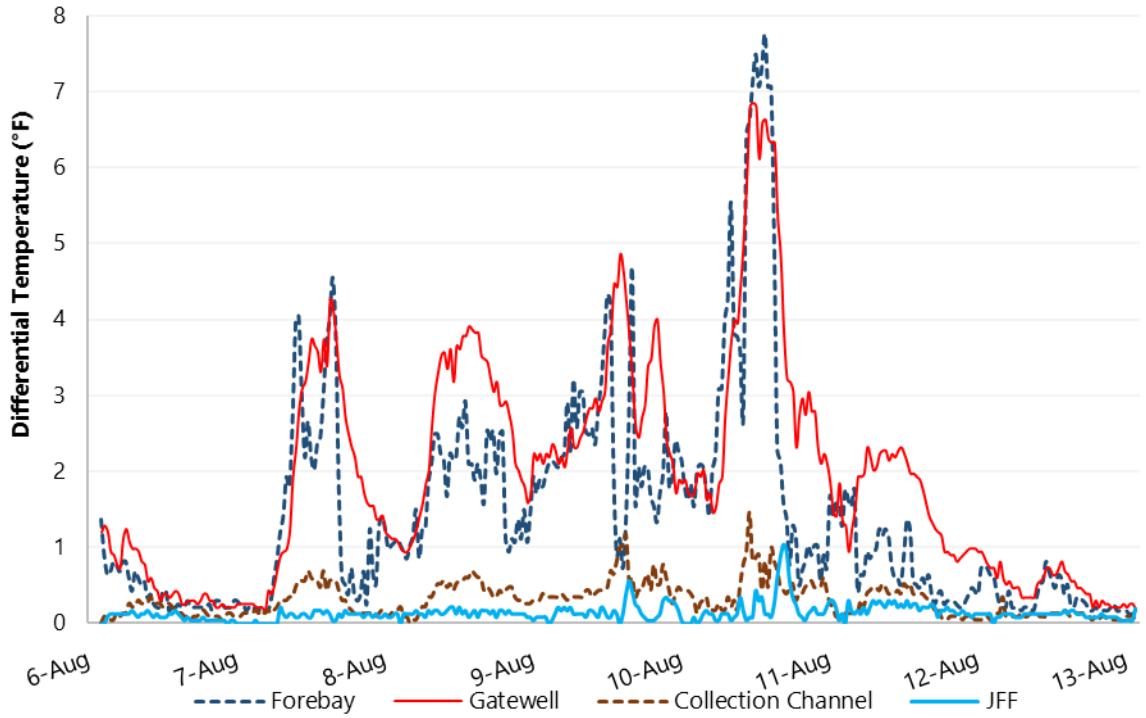

Figure 4
Average Differential Temperatures Within Four Dam Locations from July 31 to August 6

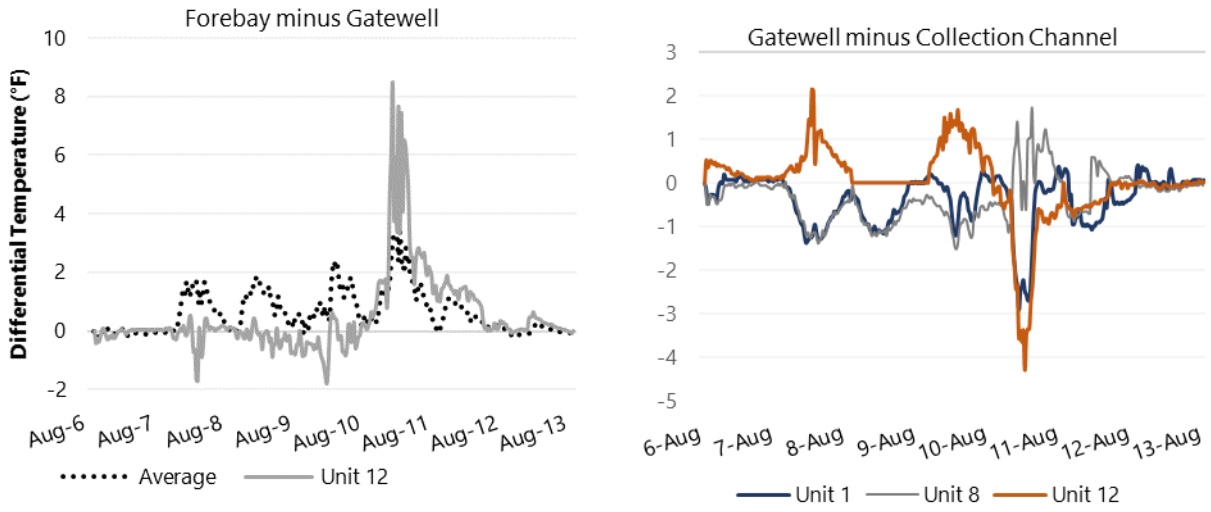

Figure 5
Average Differential Temperatures across Three Dam Locations from August 7 to August 13