Weekly Temperature Report
McNary Dam

July 11, 2022

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Report Period: July 01 through July 07
Report No. 2022 MCN Temperature Report 0701–0707 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 0700 hours on June 14 and will 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 Hobo probe at the JFF.

Fish Collection

An estimated 76,502 juvenile salmonids were collected and 76,498 were bypassed at the McNary JFF (Table 1). There were 4 fish mortalities in the sample for the reporting period.

River Conditions

Average river flow for this reporting period was 286.5 kilo cubic feet per second (kcfs) with an average spill of 161.3 kcfs (Table 1).

Temperature Logger Operations

Temperature loggers were deployed on June 14. All temperature loggers performed normally.

Weather Conditions

The weekly average air temperature from July 1 to 7 was 73.2°F. Air temperatures ranged from a maximum of 109.4°F on July 1 to a minimum of 59.3°F on July 5 (Figure 1). Wind speeds averaged 7.5 mph with gusts of 21.9 mph (Table 1). Wind direction was predominantly from the north.

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: 63.3°F, forebay (weekly average of eight positions); 62.8°F, gatewell (weekly average of 14 positions); 62.9°F, collection channel (weekly average of positions at Units 1, 8, and 12); and 62.9°F, JFF (weekly average of the separator and sample tank “B”). Forebay Unit 12 had the highest weekly average temperature, 64.0°F (Figure 3). The maximum temperature, 72.9°F, was recorded in forebay Unit 12 at 20:00 hours on July 1.

The average weekly temperature differentials within dam locations were: 2.1°F, forebay; 1.8°F, gatewells; 0.6°F, collection channel; and 0.04°F, JFF (Figure 4). The largest temperature differential, 11.8°F, was recorded in the forebay at 1900 hours on July 1 (Unit 10 high, Unit 7 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 0.7°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 9.6°F at 1830 hours on July 1 at Unit 8 (forebay warmer than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 0.34°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 2.74°F at 1600 hours on July 1 at Unit 12 (gatewell was warmer than the collection channel).

Date	Fish Collected	Fish Bypassed	Mortality		Avg. River Flow	Avg. Turbine	Avg. Spill	Air Temperature		Wind Speed	
			Sample	Facility				Avg.	Max	Avg.	Max
1-Jul	0	0	0	0	348.7	132.1	211.9	74.3	109.4	5.5	12.7
2-Jul	28,202	28,201	1	0	308.1	128.8	174.7	72.1	83.9	7.7	19.6
3-Jul	0	0	0	0	288.7	124.1	159.9	72.5	97.6	11.9	21.9
4-Jul	23,300	23,298	2	0	257.1	105.9	146.5	71.5	93.9	8.3	13.8
5-Jul	0	0	0	0	265.7	122.7	138.3	71.2	82.5	5.8	10.4
6-Jul	25,000	24,999	1	0	275.7	123.3	147.7	75.6	100.9	6.2	15.0
7-Jul	0	0	0	0	261.3	106.4	150.2	75.4	103.1	7.0	12.7
Weekly Avg	**10928.9**	**10928.3**	**0.6**	**0.0**	**286.5**	**120.5**	**161.3**	**73.2**	**95.9**	**7.5**	**15.2**

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

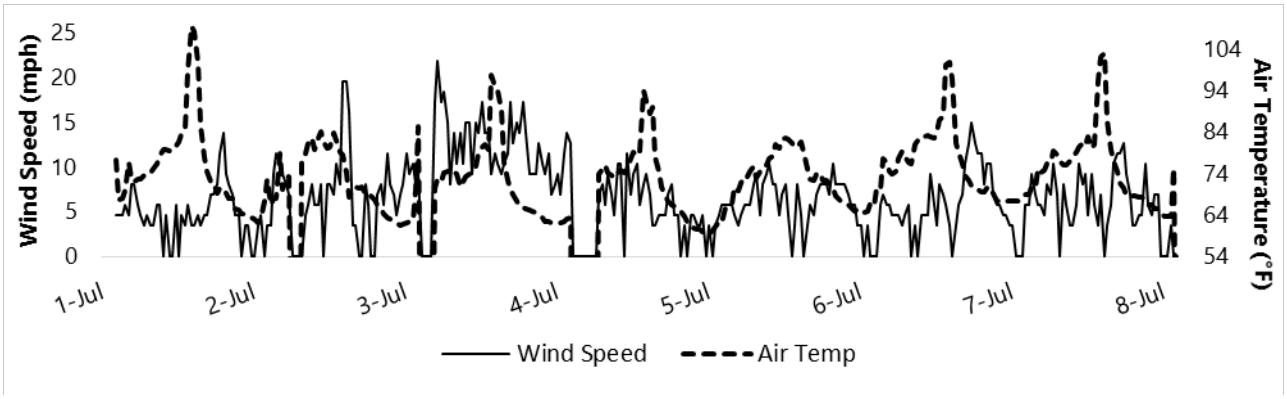

Figure 1
Average Wind Speed and Air Temperature for Each Half-Hour Interval from July 1 to July 7

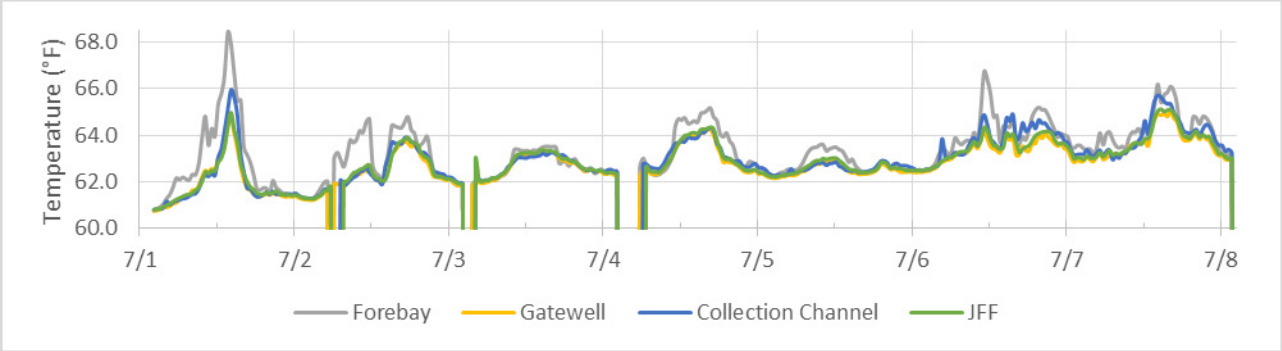

Figure 2
Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from July 1 to July 7

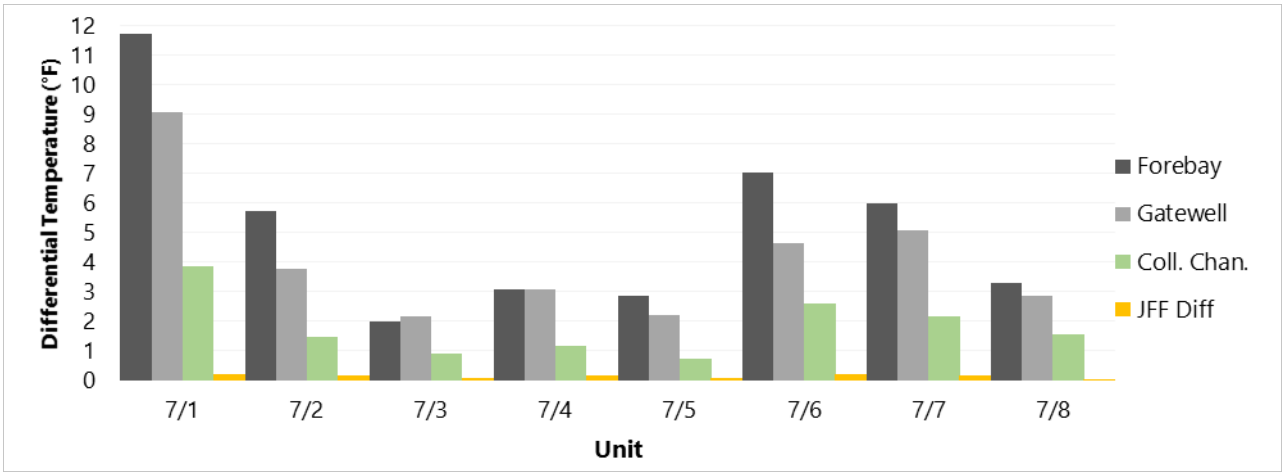

Figure 3
Average Weekly Water Temperatures by Position for Five Dam Locations from July 1 to July 7

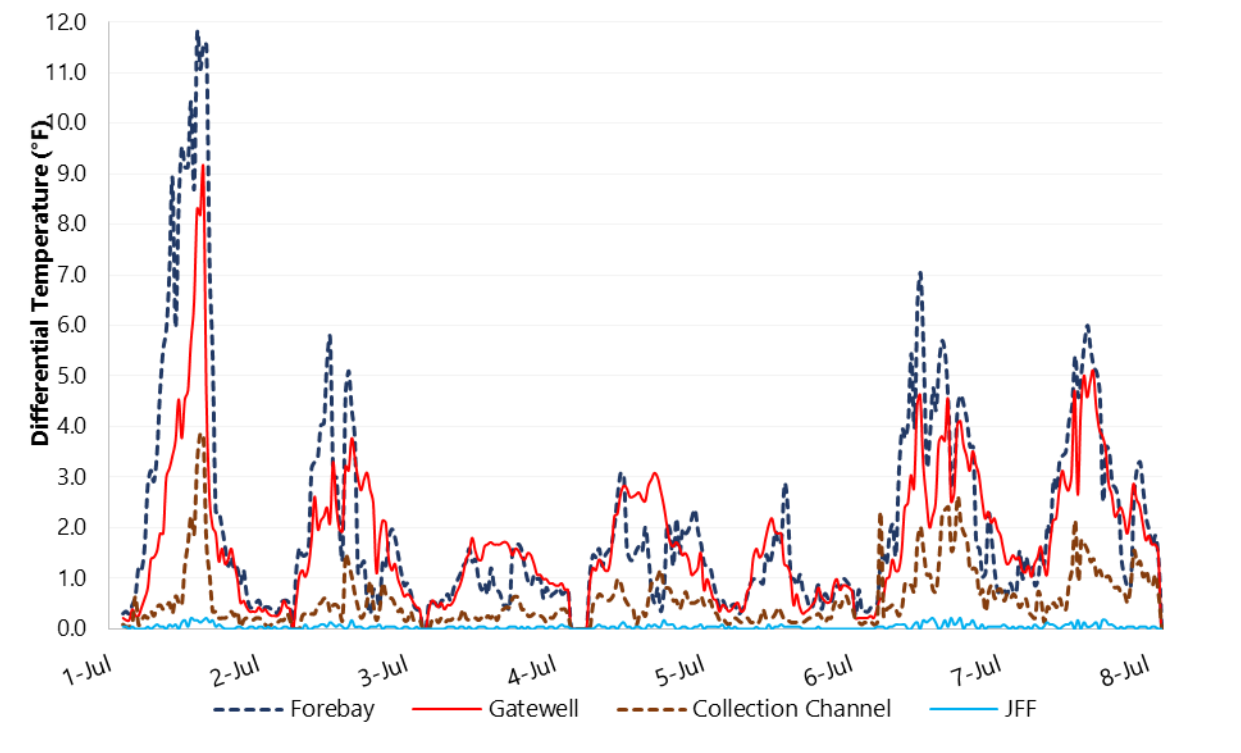

Figure 4
Average Differential Temperatures within Four Dam Locations from July 1 to July 7

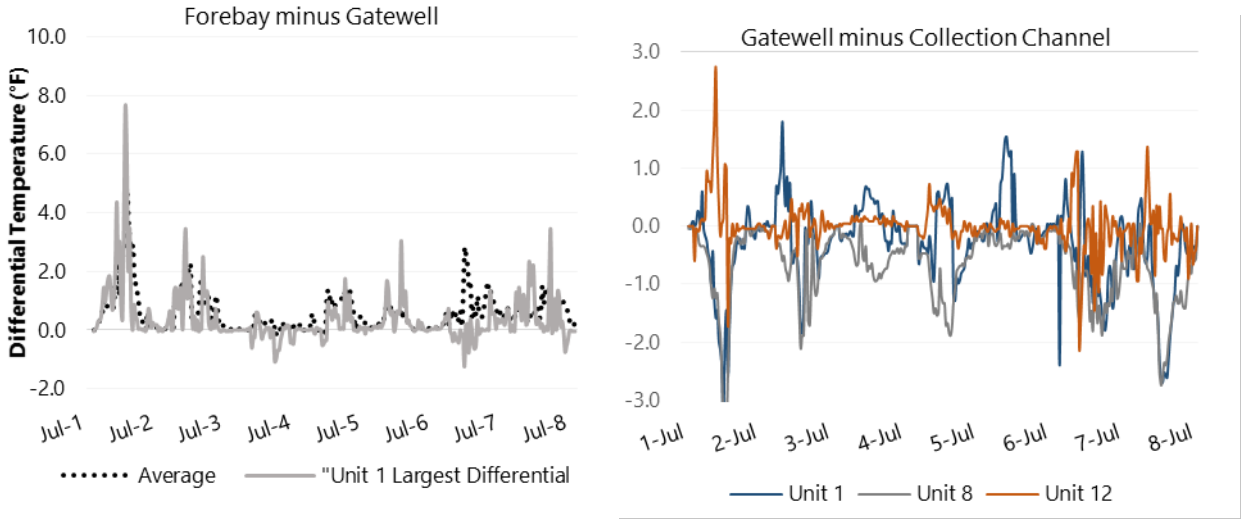

Figure 5
Average Differential Temperatures across Three Dam Locations from July 1 to July 7