Weekly Temperature Report
McNary Dam

July 18, 2022

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Report Period: July 08 through July 14
Report No. 2022 MCN Temperature Report 0708–0714 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 69,801 juvenile salmonids were collected and 69,785 were bypassed at the McNary JFF (Table 1). There were 16 fish mortalities in the sample for the reporting period.

River Conditions

Average river flow for this reporting period was 272.5 kilo cubic feet per second (kcfs) with an average spill of 147.3 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 75.6°F. Air temperatures ranged from a maximum of 107.6°F on July 11 to a minimum of 61.3°F on July 11 (Figure 1). Wind speeds averaged 8.1 mph with gusts of 18.4 mph (Table 1). Wind direction was predominantly from the west.

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); 64.3°F, gatewell (weekly average of 14 positions); 64.5°F, collection channel (weekly average of positions at Units 1, 8, and 12); and 64.4°F, JFF (weekly average of the separator and sample tank “B”). Forebay Unit 12 had the highest weekly average temperature, 65.5°F (Figure 3). The maximum temperature, 72.4°F, was recorded in forebay Unit 8 at 14:00 hours on July 11.

The average weekly temperature differentials within dam locations were: 2.4°F, forebay; 2.2°F, gatewells; 0.7°F, collection channel; and 0.06°F, JFF (Figure 4). The largest temperature differential, 7.6°F, was recorded in the forebay at 1400 hours on July 11 (Unit 8 high, Unit 14 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 0.9°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 9.0°F at 1400 hours on July 11 at Unit 8 (forebay warmer than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 0.44°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 2.14°F at 1800 hours on July 12 at Unit 1 (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
8-Jul	12,801	12,798	1	2	264.2	108	151.5	75.3	99.2	7.1	11.5
9-Jul	0	0	0	0	279.3	115.1	159.5	75.4	97.1	10.7	18.4
10-Jul	22,500	22,499	1	0	285.4	117	163.7	75.6	100.2	8.3	13.8
11-Jul	0	0	0	0	268.5	110.2	153.7	78.2	107.6	6.2	11.5
12-Jul	8,300	8,297	3	0	271.2	131	135.5	78.5	97.4	5.4	11.5
13-Jul	0	0	0	0	272.8	132.7	135.3	78.9	106.1	10.4	16.1
14-Jul	26,200	26,191	9	0	266.3	129.5	132.1	67.2	71.3	6.2	11.5
Weekly Avg	**9971.6**	**9969.3**	**2.0**	**0.3**	**272.5**	**120.5**	**147.3**	**75.6**	**97.0**	**7.8**	**13.5**

Table 1
Bypass, Mortality, and River and Weather Conditions from July 8 to July 14

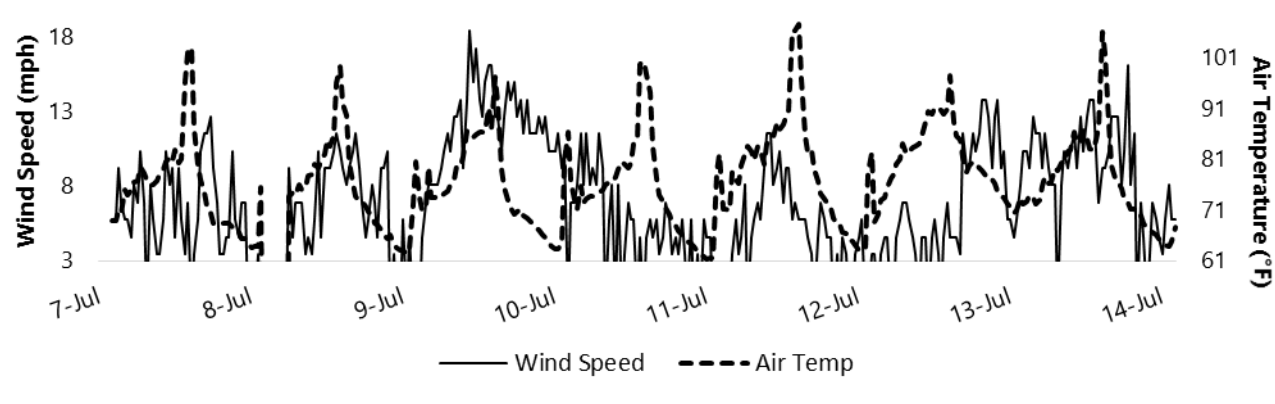

Figure 1
Average Wind Speed and Air Temperature for Each Half-Hour Interval from July 8 to July 14

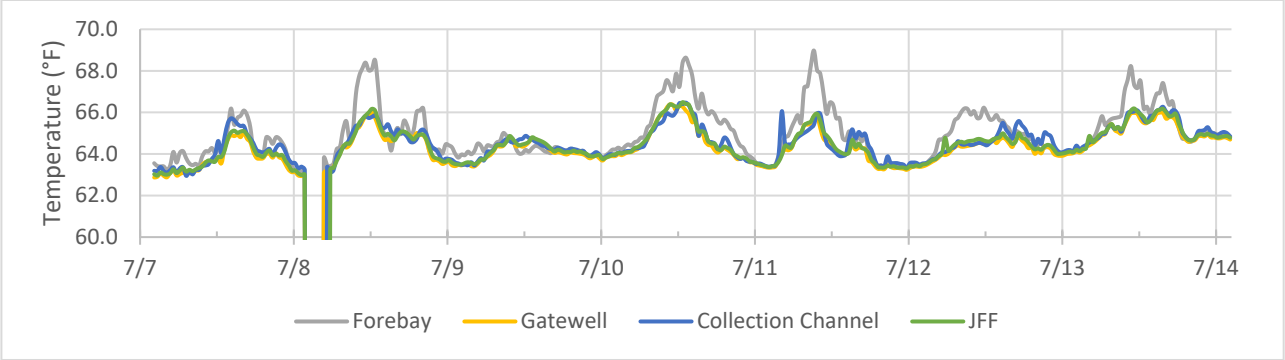

Figure 2
Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from July 8 to July 14

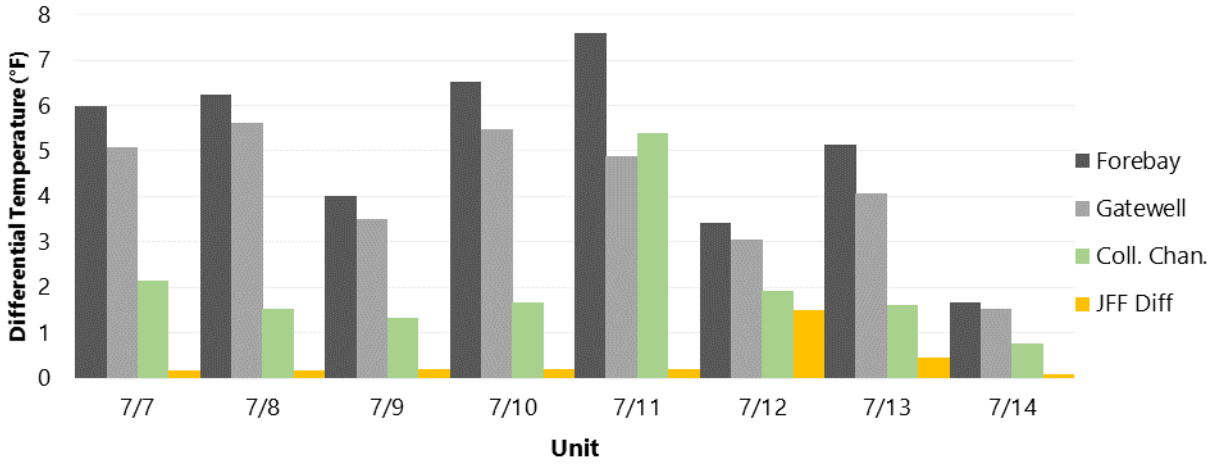

Figure 3
Average Weekly Water Temperatures by Position for Five Dam Locations from July 8 to July 14

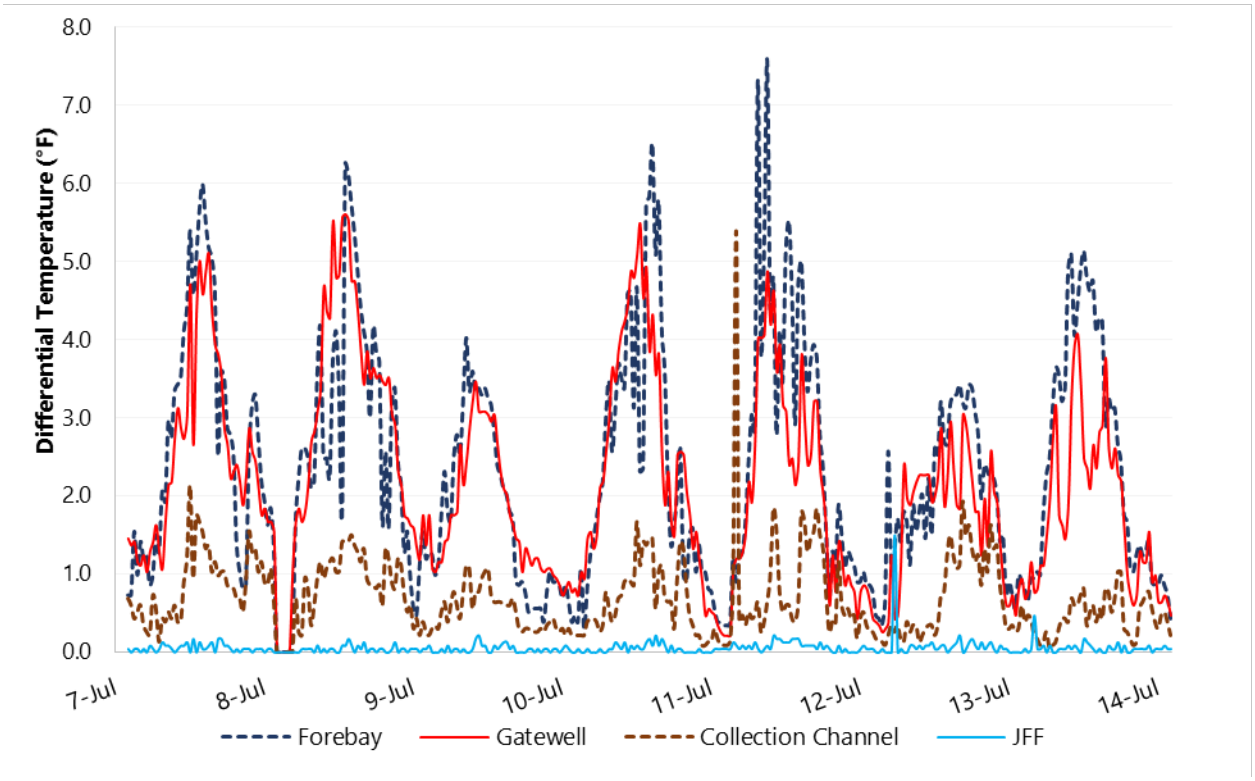

Figure 4
Average Differential Temperatures within Four Dam Locations from July 8 to July 14

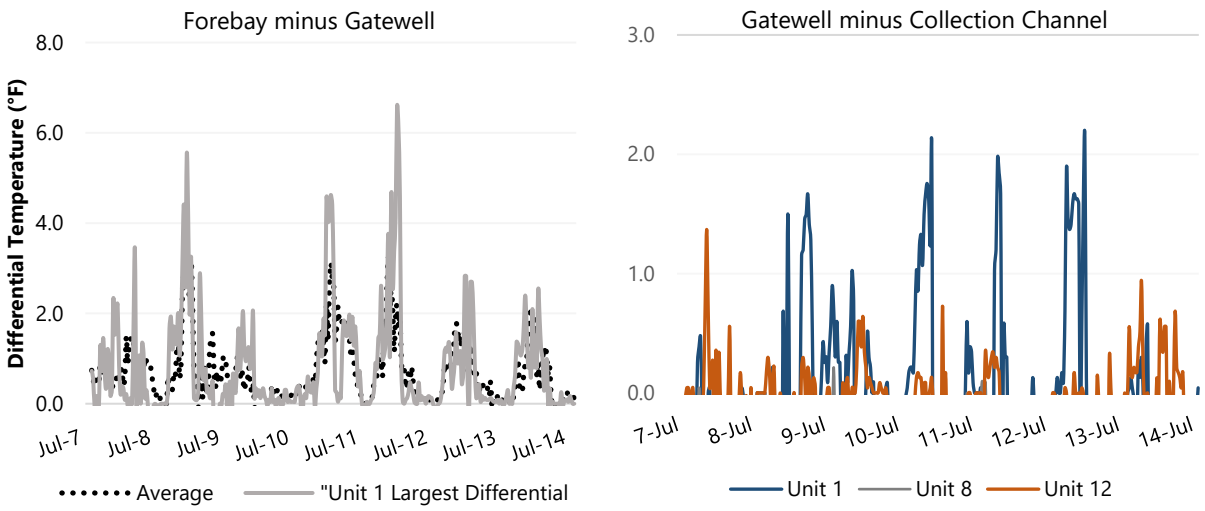

Figure 5
Average Differential Temperatures across Three Dam Locations from July 8 to July 14