



Weekly Temperature Report McNary Dam

July 3, 2022

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Report Period: June 23 through June 29

Report No. 2023 MCN Temperature Report 0623–0629 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 on 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 juvenile fish facility (JFF). Figure 4 includes the date of June 30, 2023, so data accumulation from June 23 to June 29, 2023, does not flatline.

Fish Collection

An estimated 52,251 juvenile salmonids were collected and 52,243 were bypassed at the McNary JFF (Table 1). There were 8 fish mortalities in the sample for the reporting period.

River Conditions

Average river flow for this reporting period was 155.9 kilo cubic feet per second (kcfs) with an average spill of 89.3 kcfs (Table 1).

Temperature Logger Operations

Temperature loggers were deployed on June 14. All temperature loggers performed normally; initial programming, data inconsistency within probes, and data accumulation have been resolved. Probes in Gatewells 12, 13, and 14 were removed and deployed in the Collection Channel locations 13 and 14. In addition, Forebay 5 temperature logger was deployed in Forebay 6 location, and the addition of Forebay 11 was included due to USDA monitoring equipment and USACE construction.

Weather Conditions

The weekly average air temperature from June 23 to 29 was 74.8°F. Air temperatures ranged from a maximum of 92.0°F on June 29 to a minimum of 57°F on June 23 (Figure 1). Wind speeds averaged 5.9 mph with gusts of 11.3 mph (Table 1). Wind direction was predominantly north by south.

Water Temperatures

Average water temperatures within dam locations varied with air temperatures and wind velocities (Figure 2). The weekly average temperature across all dam locations was 68.9°F, forebay temperature (weekly average of eight

positions) was 67.3°F, gatewell temperature (weekly average of 14 positions) was 65.4°F, collection channel temperature (weekly average of positions at Units 1, 8, 12, 13, and 14) was 64.2°F, and JFF (weekly average of the separator and sample tank B) was 66.0°F. Forebay Unit had the highest weekly average temperature, 68.2°F (Figure 3). The maximum temperature, 66.9°F, was recorded in gatewell Unit 11 at 1700 hours on June 27.

The average weekly temperature differentials within dam locations were 3.7°F, forebay; 4.8°F, gatewells; 1.2°F, collection channel; and 0.2°F, JFF (Figure 4). The largest temperature differential, 11.5°F, was recorded in the gatewell at 1900 hours on June 23 (Unit 1 high, Unit 3 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 1.8°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 10.9°F at 1830 hours on June 26 at Unit 8 (forebay warmer than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 1.7°F. On average, the gatewells were warmer than the collection channels at Units 1, 8, 13, 12 and 14. The largest temperature differential between the gatewell and corresponding collection channel location was 6.1°F at 2000 hours on June 26 at Unit 1 (gatewell was warmer than the collection channel).

Table 1
Bypass, Mortality, and River and Weather Conditions from June 23 to June 29

Date	Fish Collected	Fish Bypassed	Mortality		Avg. River Flow	Avg. Turbine Flow	Avg. Spill	Air Temperature		Wind Speed	
			Sample	Facility				Avg.	Max	Avg.	Max
23-Jun		0	0	0	167.3	69.9	92.7	73.4	86.5	6.5	11.5
24-Jun	17,350	17,346	4	0	167.7	67.6	95.4	71.8	87.4	5.3	10.4
25-Jun	0	0	0	0	148.3	49.6	94	73.0	88.1	5.9	13.8
26-Jun	9,100	9,099	1	0	138.6	49.8	84.1	75.5	90.1	4.7	9.2
27-Jun	0	0	0	0	150	64.2	81.1	76.3	90.0	7.2	13.8
28-Jun	25,801	25,798	2	1	163	71.9	86.4	76.9	89.8	6.9	11.5
29-Jun	0	0	0	0	156.4	60.1	91.6	76.6	92.0	5.0	9.2
Weekly Total	52,251	52,243	7	1	155.9	61.9	89.3	74.8	89.1	5.9	11.3

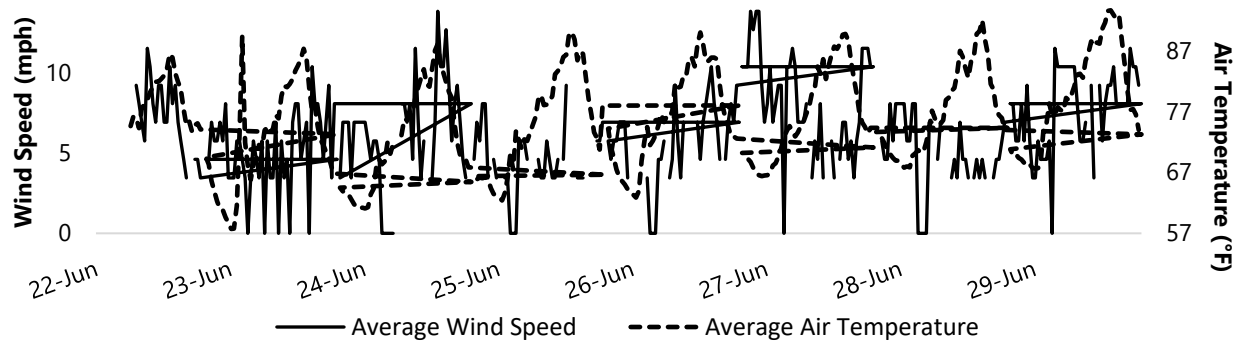


Figure 1
Average Wind Speed and Air Temperature for Each Half-Hour Interval from June 23 to June 29

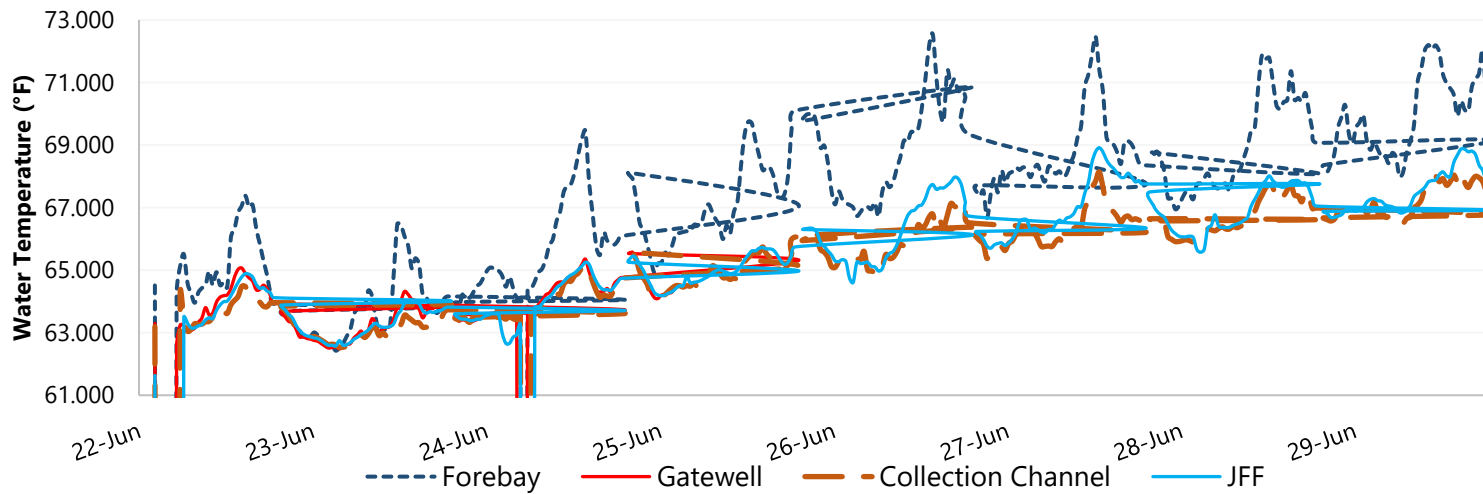


Figure 2
Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from June 23 to June 29

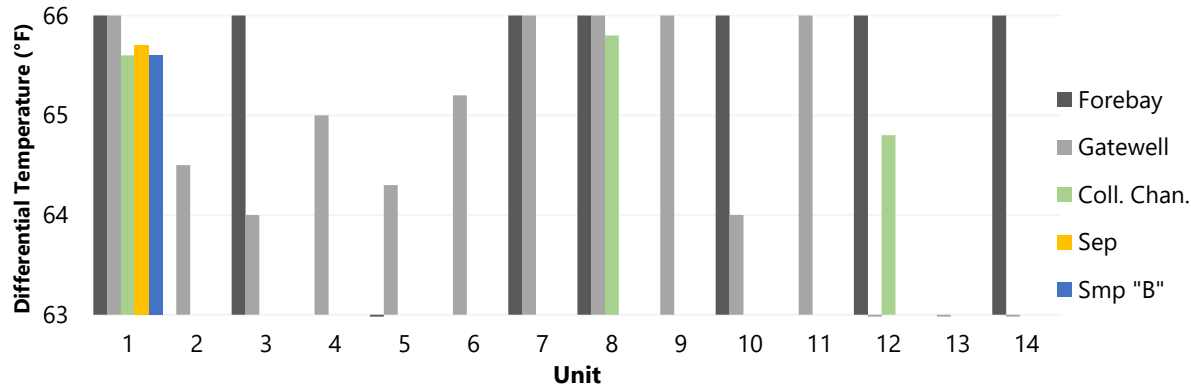


Figure 3
Average Weekly Water Temperatures by Position for Five Dam Locations from June 23 to June 29

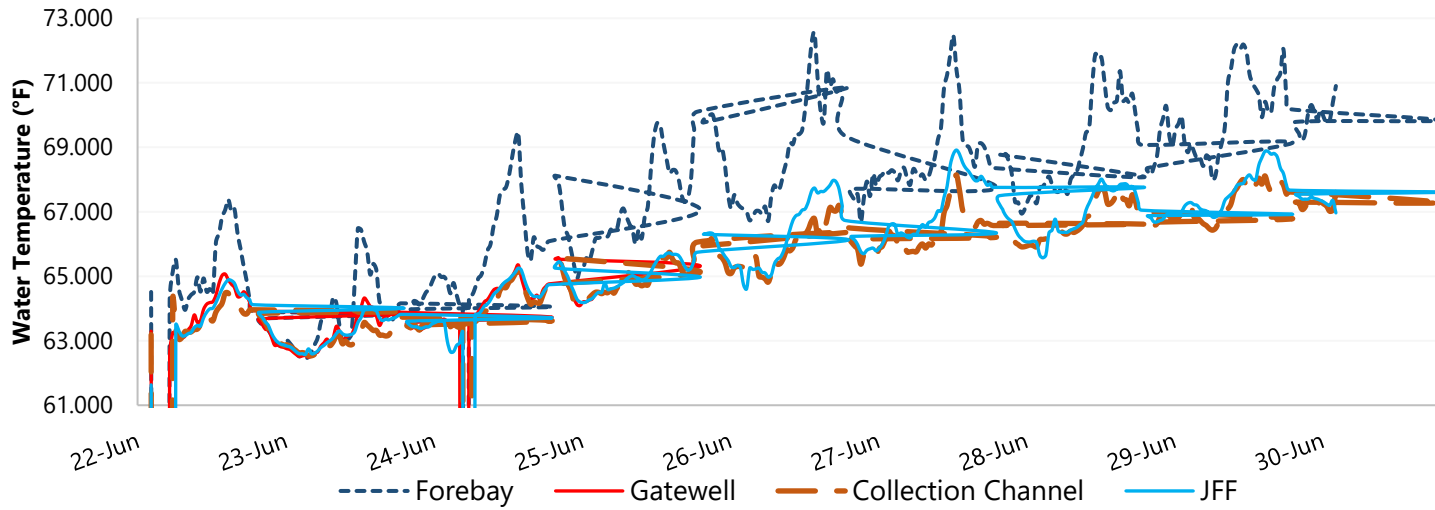


Figure 4
Average Differential Temperatures within Four Dam Locations from June 23 to June 30

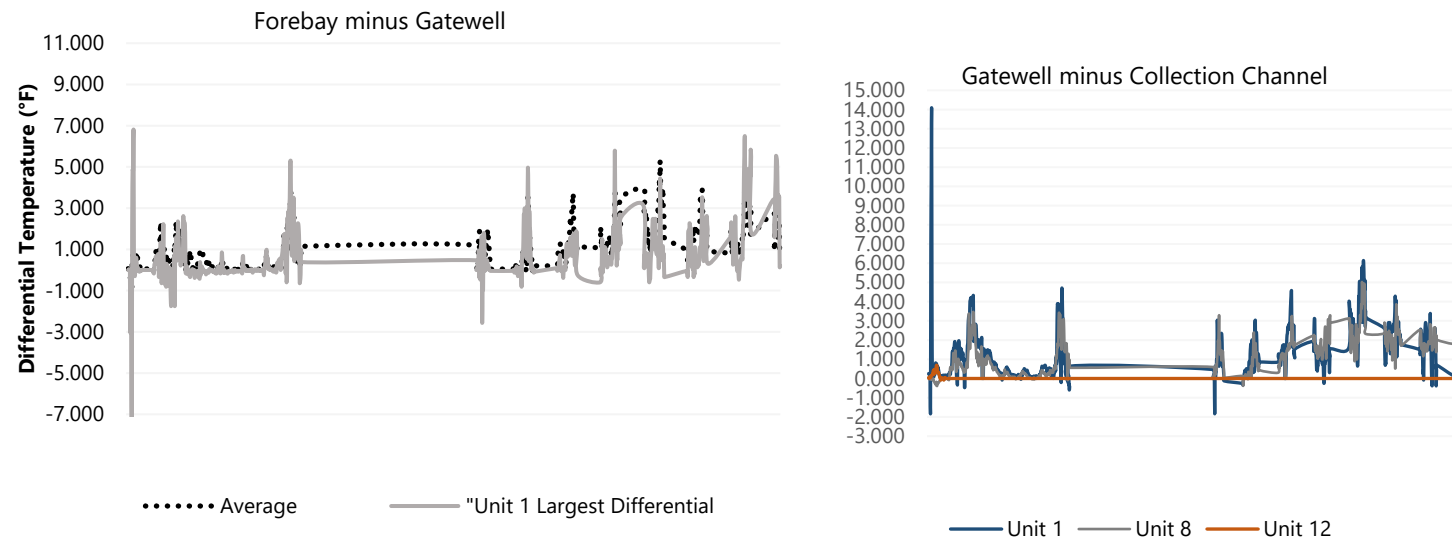


Figure 5
Average Differential Temperatures across Three Dam Locations from June 23 to June 29