



Weekly Temperature Report McNary Dam

July 10, 2023

Prepared by: Matt Paulsen, Environmental Assessment Services

Report Period: June 30 through July 6

Report No. 2023 MCN Temperature Report 0630–0706 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).

Fish Collection

An estimated 52,755 juvenile salmonids were collected and 52,726 were bypassed at the McNary JFF (Table 1). There were 29 fish mortalities during the reporting period.

River Conditions

Average river flow for this reporting period was 148.8 kilo cubic feet per second (kcfs) with an average spill of 84.8 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 78.4°F. Air temperatures ranged from a maximum of 98.5°F on June 30 to a minimum of 60.3°F on July 4 (Figure 1). Wind speeds averaged 5.7 mph with gusts of 17.3 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 69.1°F, forebay temperature (weekly average of eight positions) was 70.6°F, gatewell temperature (weekly average of 14 positions) was 68.6°F, collection channel

temperature (weekly average of positions at Units 1, 8, 12, 13, and 14) was 68.2°F, and JFF (weekly average of the separator and sample tank B) was 68.5°F. Forebay Unit 1 had the highest weekly average temperature, 71.6°F (Figure 3). The maximum temperature, 77.1°F, was recorded in Forebay Unit 6 at 1900 hours on July 1.

The average weekly temperature differentials within dam locations were 3.4°F, forebay; 5.0°F, gatewells; 1.0°F, collection channel; and 0.2°F, JFF (Figure 4). The largest temperature differential, 10.4°F, was recorded in the gatewell at 1830 hours on July 1 (Unit 5 high, Unit 3 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 2.0°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 9.0°F at 2030 hours on July 2 at Unit 3 (forebay warmer than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 1.9°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 5.5°F at 2300 hours on July 2 at Unit 1 (gatewell was warmer than the collection channel).

Table 1
Bypass, Mortality, and River and Weather Conditions from June 30 to July 6

Date	Fish Collected	Fish Bypassed	Mortality		Avg. River Flow	Avg. Turbine Flow	Avg. Spill	Air Temperature		Wind Speed	
			Sample	Facility				Avg.	Max	Avg.	Max
30-Jun	8,400	8,400	0	0	156.9	62.7	89.5	80.8	98.5	9.7	17.3
1-Jul	0	0	0	0	147.7	54.5	88.6	76.8	92.5	8.5	17.3
2-Jul	8,000	7,998	2	0	151.3	61.3	85.3	76.1	88.3	5.3	10.4
3-Jul	0	0	0	0	140.8	51.6	84.6	77.0	89.0	6.6	12.7
4-Jul	11,551	11,548	1	2	141.2	56.0	80.5	77.3	91.6	4.6	9.2
5-Jul	0	0	0	0	147.7	62.2	80.8	79.4	94.0	4.9	10.4
6-Jul	24,804	24,780	15	9	156.3	67.2	84.4	81.4	96.6	5.2	10.4
Weekly Total	52,755	52,726	18	11	148.8	59.4	84.8	78.4	98.5	6.4	17.3

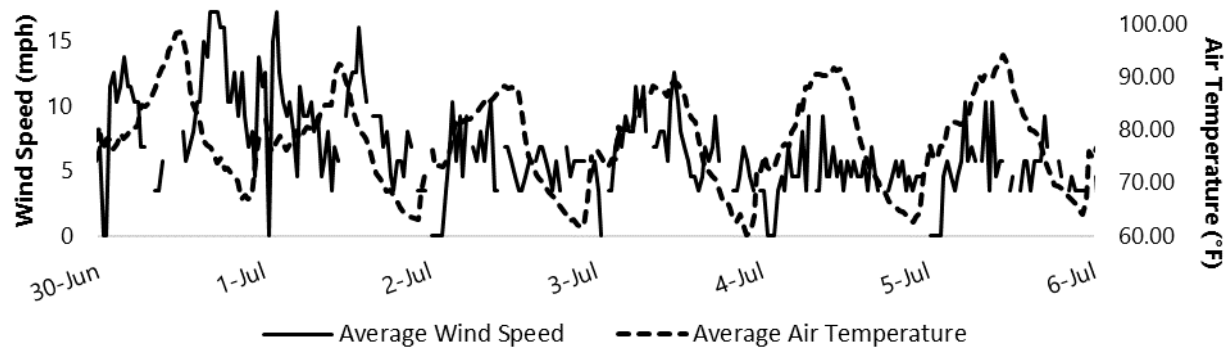


Figure 1
Average Wind Speed and Air Temperature for Each Half-Hour Interval from June 30 to July 6

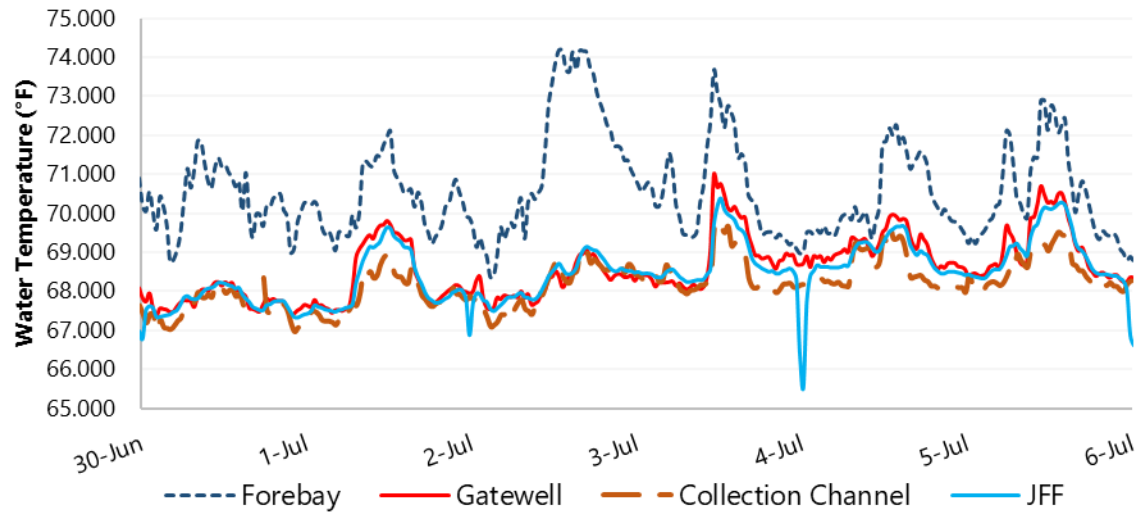


Figure 2
Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from June 30 to July 6

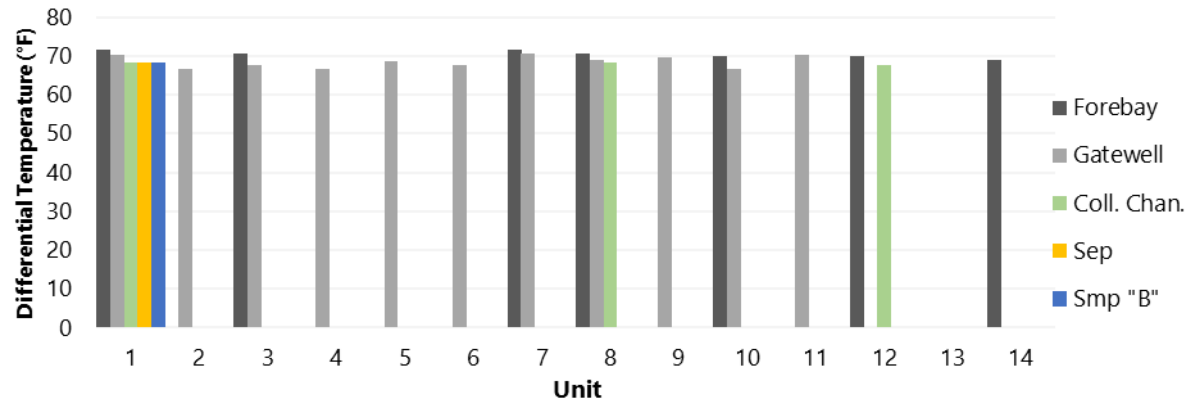


Figure 3
Average Weekly Water Temperatures by Position for Five Dam Locations from June 30 to July 6

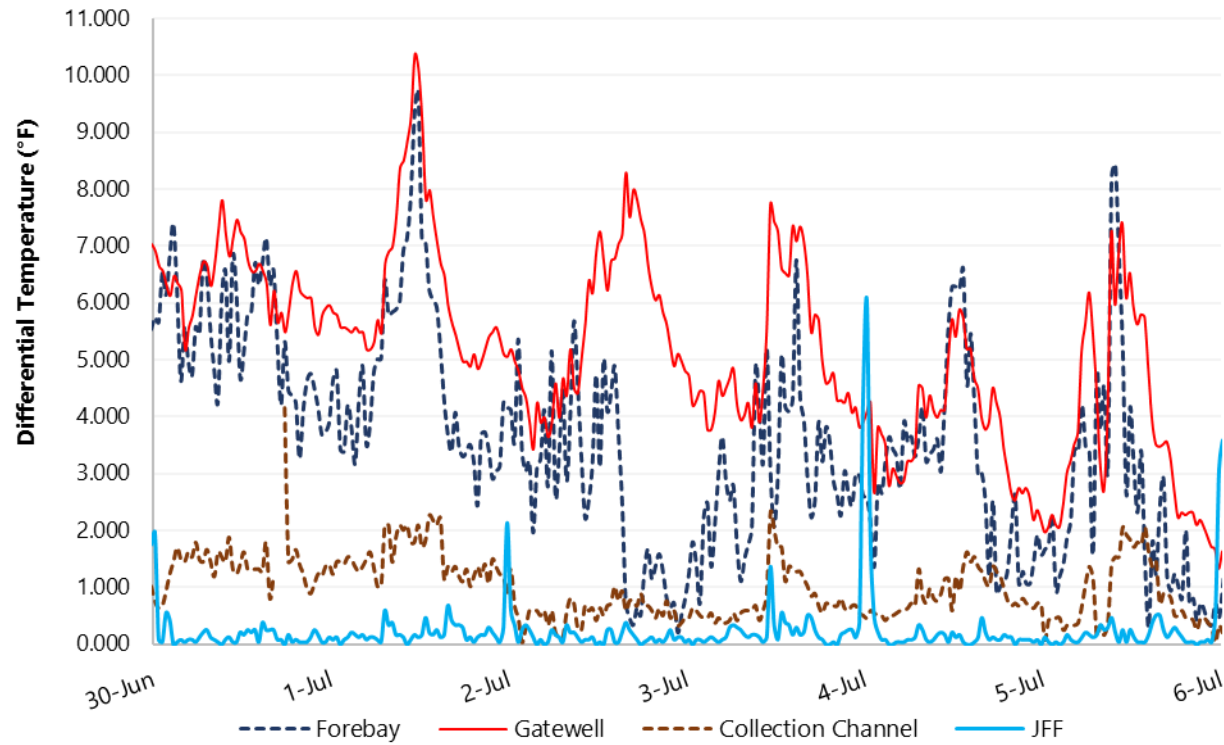


Figure 4
Average Differential Temperatures within Four Dam Locations from June 30 to July 6

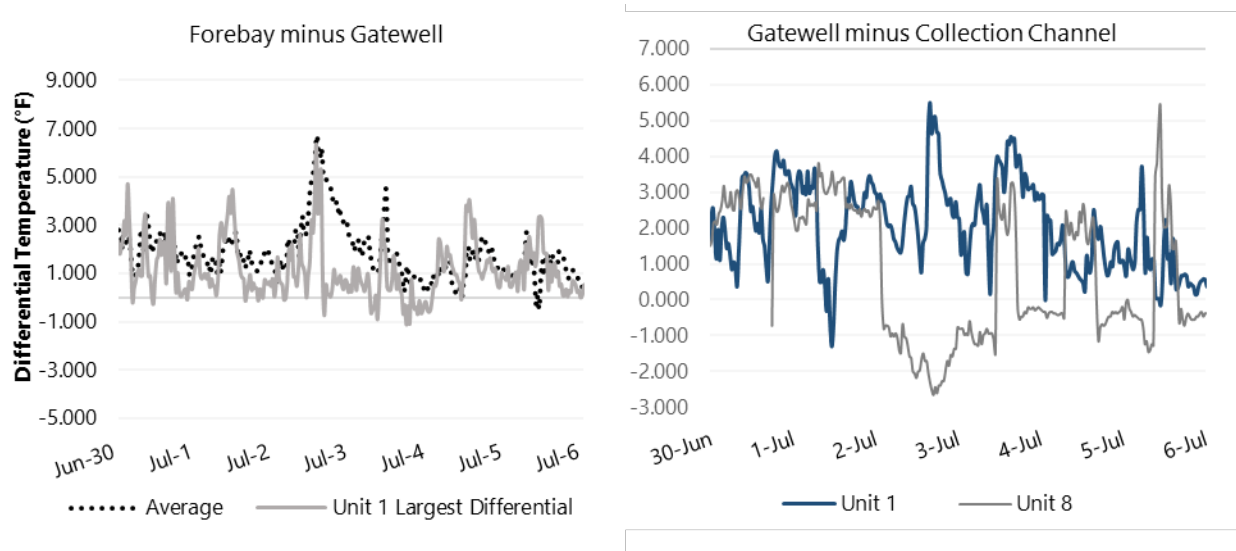


Figure 5
Average Differential Temperatures from June 30 to July 6