Weekly Temperature Report
McNary Dam

August 31, 2020

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Report Period: August 21 through August 27

Report No. 2020 EAS: MCN Dam Temperature Weekly for 0821 to 0827

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 console for the new weather station will arrive August 28. A portion of the wind speed data used in this report is from the National Weather Service station at the Hermiston Oregon airport. The air temperature data was obtained via an Onset temperature logger located onsite at the McNary Juvenile Fish Facility (JFF).

Fish Collection

An estimated 2,190 juvenile salmonids (subyearling Chinook salmon) were collected and 2,176 bypassed at the McNary JFF (Table 1). There were 14 subyearling mortalities. Fish sampling was limited to midnight to 0800 hours on two of the four sample days this week (August 25 and 27) because of potential fish mortality with increased water temperature.

River Conditions

Average river flow for this reporting period was 147.4 thousand cubic feet per second (kcfs) with an average spill of 20.1 kcfs.

Temperature Logger Operations

There was one temperature logger failure this week at Collection Channel 8, and it was replaced on August 26.

Weather Conditions

The weekly average air temperature from August 21 to August 27 was 74.1°F. Air temperatures ranged from a maximum of 91.4°F at 1830 hours on August 25 to a minimum of 61.0°F at 0630 hours on August 23 (Figure 1). Wind speeds averaged 6.1 mph with the highest wind speeds recorded on August 22 at 24.0 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 70.8°F, forebay (weekly average of 8 positions); 70.3°F, gatewells (weekly average of 14 positions); 70.3°F, collection channel (weekly average of positions at Units 1, 8, and 12); and 70.4°F, JFF (weekly average of the separator and sample tank “B”). Forebay Units 3, 5, and 7 had the highest weekly average temperature, 71.0°F (Figure 3). The maximum temperature, 76.6°F, was recorded in Forebay Unit 3 at 1730 hours on August 26.

The average weekly temperature differentials within dam locations were 1.5°F, forebay; 1.8°F, gatewells; 0.3°F, collection channel; and 0.1°F, JFF (Figure 4). The largest temperature differential, 6.9°F, was recorded in the forebay at 1730 hours on August 26 (Unit 3 high, Unit 14 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 0.6°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 4.6°F at 2030 hours on August 25 at Unit 10 (forebay warmer than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 0.4°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 2.8°F at 1900 hours on August 25 at Unit 1 (gatewell was warmer than the collection channel).

Table 1
Bypass, Mortality, and River and Weather Conditions from August 14 to August 20

Date	Fish Collected	Fish Bypassed	Mortality		Avg. River Flow	Avg. Turbine Flow	Avg. Spill	Air Temperature		Wind Speed	
			Sample	Facility				Avg.	Max	Avg.	Max
21-Aug	1,320	1,312	8	0	161.8	137.0	20.1	76.6	89.3	7.1	14.0
22-Aug					164.2	139.4	20.1	76.6	87.8	9.2	24.0
23-Aug	630	625	5	0	154.8	130.0	20.1	71.8	91.2	4.8	17.0
24-Aug					154.4	129.4	20.3	72.9	87.6	4.0	8.0
25-Aug	140	140	0	0	131.3	106.6	20.1	75.5	89.4	8.5	18.0
26-Aug					124.9	100.2	20.1	73.6	91.4	5.5	13.0
27-Aug	100	99	0	1	140.5	115.8	20.0	71.4	83.6	3.8	8.0
Weekly Total	**2,190**	**2,176**	**13**	**1**	**147.4**	**122.6**	**20.1**	**74.1**	**88.6**	**6.1**	**14.0**

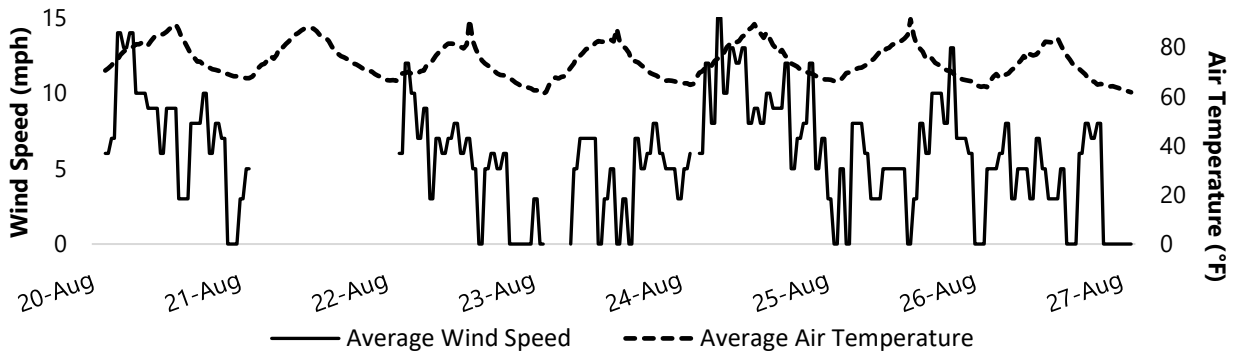

Figure 1
Average Wind Speed and Air Temperature for Each Half-Hour Interval from August 21 to August 27

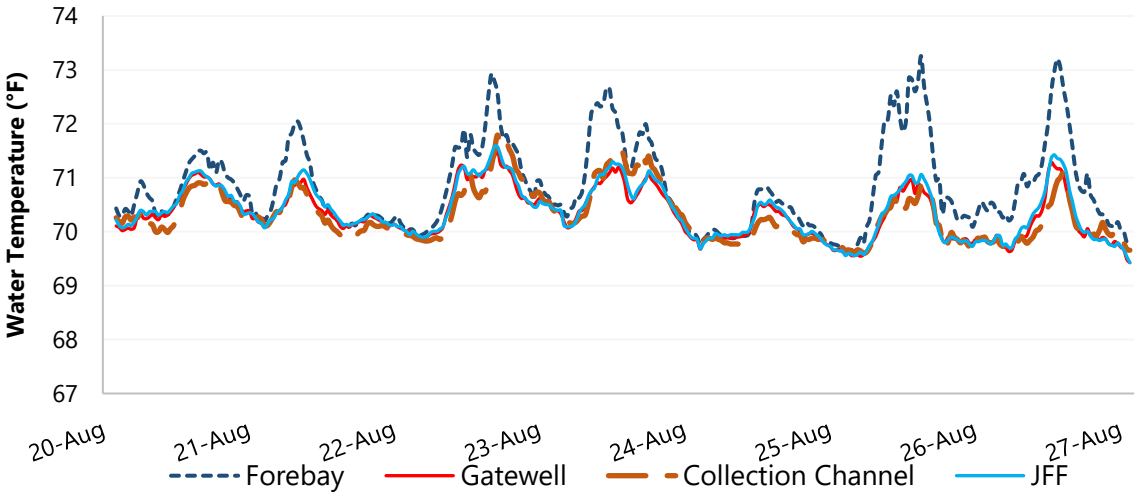

Figure 2
Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from August 21 to August 27

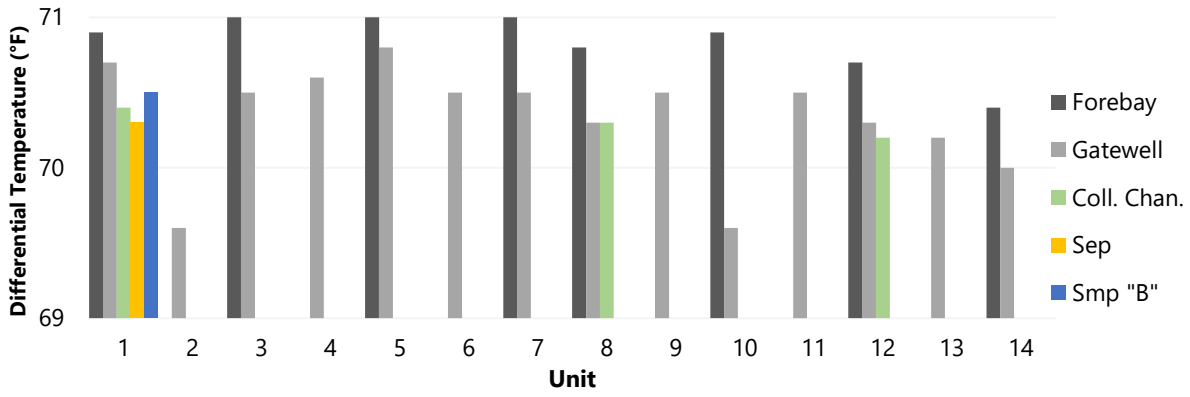

Figure 3
Average Weekly Water Temperatures by Position for Five Dam Locations from August 21 to August 27

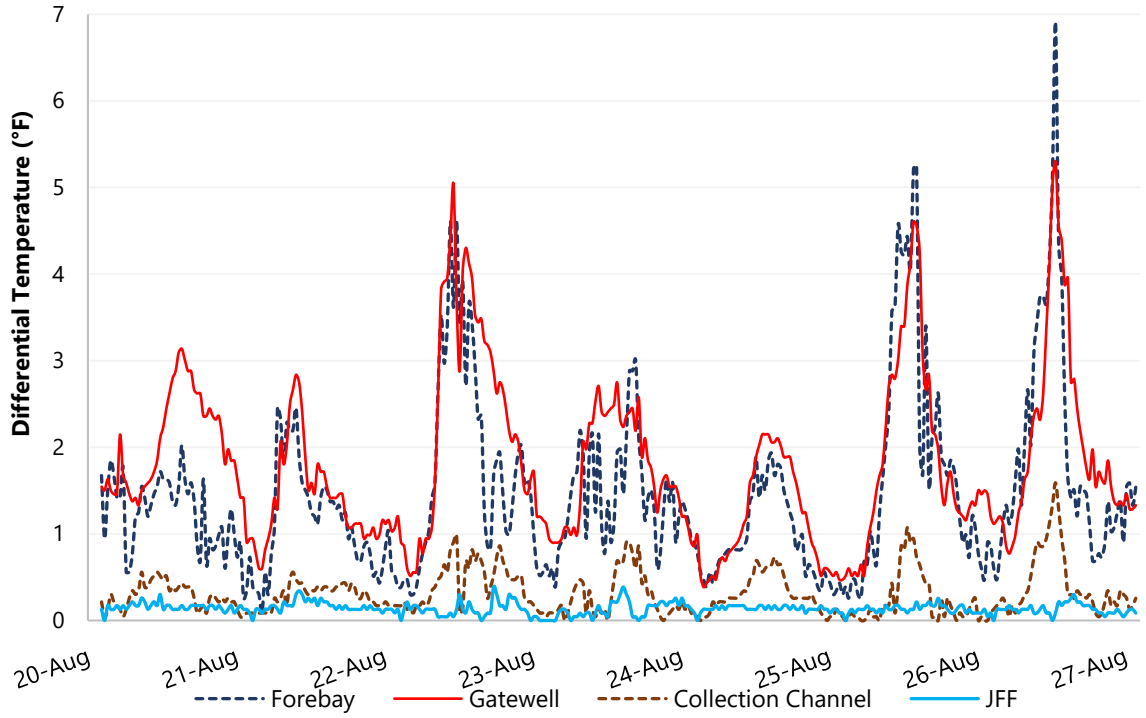

Figure 4
Average Differential Temperatures within Four Dam Locations from August 21 to August 27

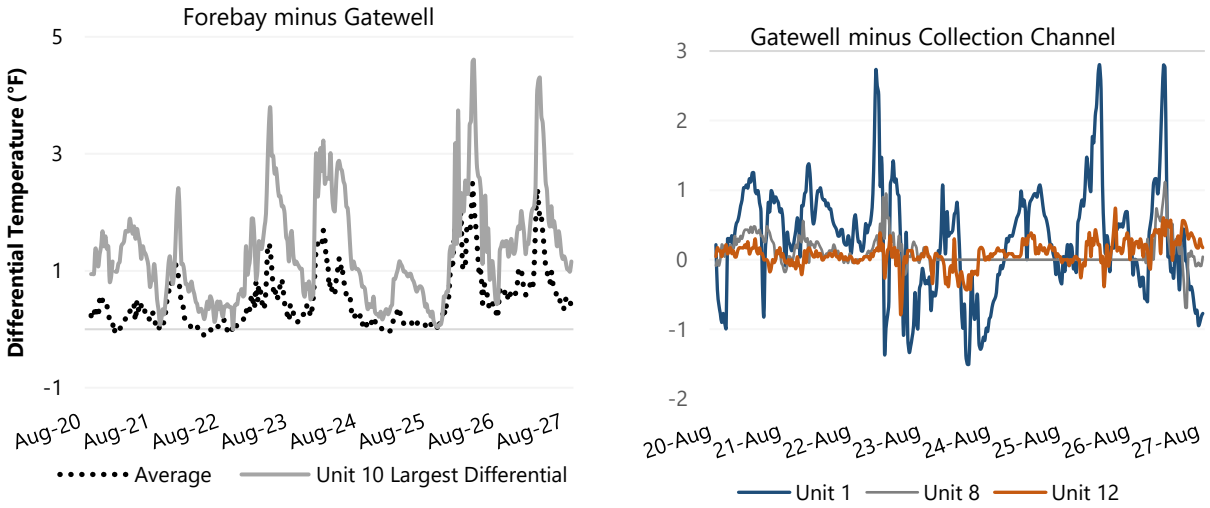

Figure 5
Average Differential Temperatures across Three Dam Locations from August 21 to August 27