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Weekly Temperature Report
McNary Dam

September 3, 2019

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Report Period: August 23 to 29, 2019

Report No. 2019 Anchor QEA: MCN Temperature Weekly for 0823-0829

Re: **USACE Walla Walla District Biological Services: Temperature Monitoring Program at McNary Dam**

Fish Collection

An estimated 388 juvenile salmonids were collected and 388 bypassed at the McNary Juvenile Fish Facility (JFF; Table 1), comprising 100.0% subyearling Chinook salmon. There were 0 total facility mortalities.

River Conditions

Average river flow for this reporting period was 125,000 cubic feet per second (125.5 kcfs) with an average spill of 67.4 kcfs.

Temperature Logger Operations

On August 28, the temperature logger for forebay 8 failed to record any data. After consulting with the biologist at McNary, the logger was not replaced for the final 3 days of recording (August 29 to 31).

Weather Conditions

The weekly average daytime temperature for 0700 hours August 15 to 0700 hours August 22, 2019, was 79.0°F. The weekly average nighttime temperature was 68.3°F. Temperatures ranged from a maximum of 91.7°F at 1700 hours on August 27 to a minimum of 54.3°F at 0530 hours on August 27 (Figure 1).

Winds averaged 2.6 miles per hour (mph) and were predominately from the east. The highest average wind speed was 11.0 mph at 1330 on August 24, and the highest gusts were up to 33 mph at 1630 hours on August 21.

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: 71.6°F, forebay (weekly average of 8 positions); 71.0°F, gatewells (weekly average of 14 positions); 70.7°F, collection channel (weekly average of positions at Units 1, 8, and 12); and 70.9°F, JFF (weekly average of the separator and sample tank "B"). The forebay at Unit 1 had the highest weekly average temperature, 72.0°F (Figure 3). The maximum temperature, 75.6°F, was recorded in the forebay at 1530 hours on August 26 at Unit 7.

The average weekly temperature differentials within dam locations were: 15°F, forebay; 1.9°F, gatewells; 0.2°F, collection channel; and 0.1°F, JFF (Figure 4). The largest gatewell differentials were recorded between units that were operational and non-operational. The largest temperature differential, 4.8°F, was recorded on August 26 in the gatewells at 1530 hours (Unit 1 high, Unit 14 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 0.8°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 4.7°F at 1630 hours on August 26 at Unit 7 (forebay greater than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 0.8°F. On average, the gatewell was warmer than the collection channel at Units 1, 8, and 12. The largest temperature differential between the gatewell and corresponding collection channel location was 3.1°F at 1800 on August 23 at Unit 1 (gatewell greater than collection channel).

Table 1
Bypass, Mortality, and River and Weather Conditions from 0700 Hours August 23 to 0700 Hours August 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-Aug	172	172	0	0	142.5	57.6	80.2	70.6	82.9	2.4	6.0
24-Aug					148.4	59.0	84.7	74.8	87.7	2.0	5.0
25-Aug	124	124	0	0	111.1	50.5	55.9	75.3	87.6	3.4	11.0
26-Aug					96.0	50.8	40.5	71.9	84.7	2.6	7.0
27-Aug	48	48	0	0	118.3	50.7	62.9	70.9	85.6	2.1	4.0
28-Aug					130.0	51.2	74.1	74.0	91.7	2.3	5.0
29-Aug	44	44	0	0	128.6	50.9	73.3	77.4	90.5	3.0	6.0
Weekly Total	**388**	**388**	**0**	**0**	**125.0**	**53.0**	**67.4**	**73.7**	**74.5**	**2.6**	6.5

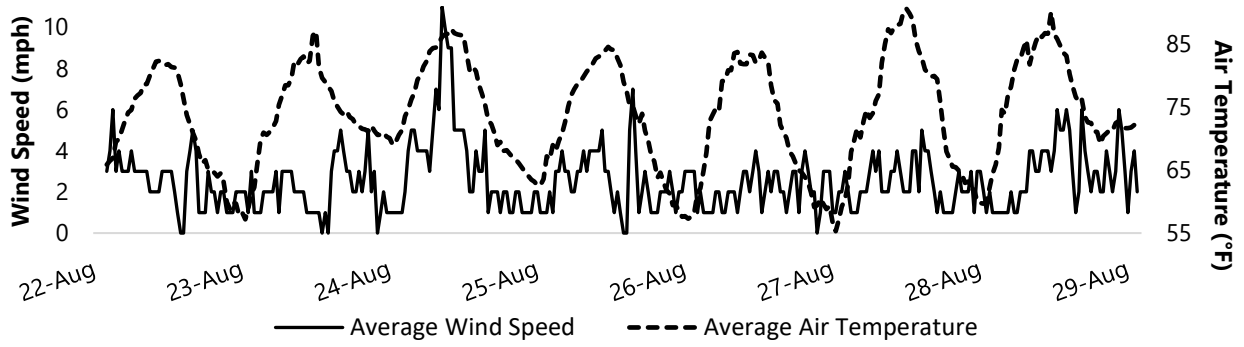

Figure 1
Average Wind Speed and Air Temperature for Each Half-Hour Interval from 0700 Hours August 23 to 0700 Hours August 29

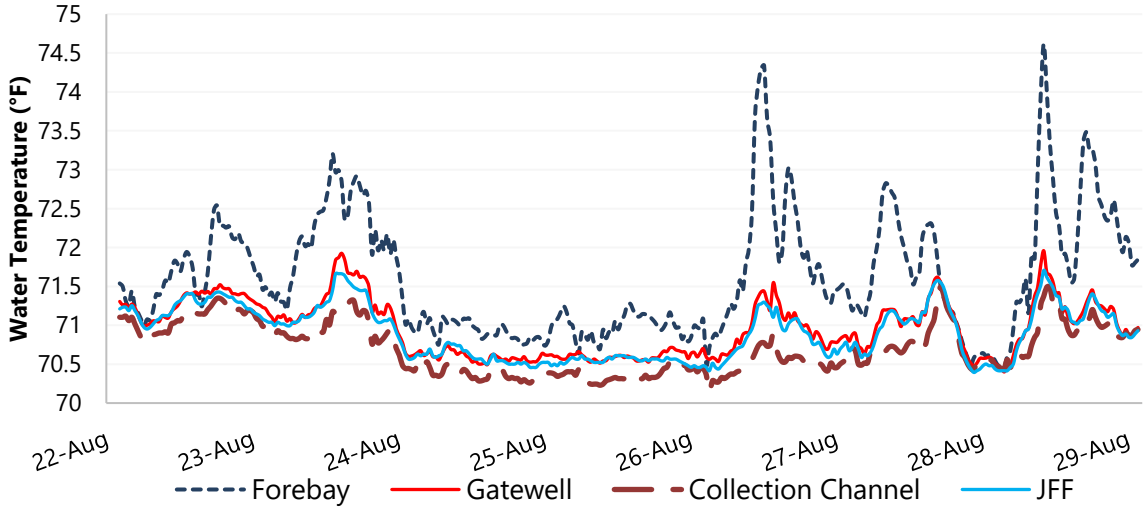

Figure 2
Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from 0700 Hours August 23 to 0700 Hours August 29

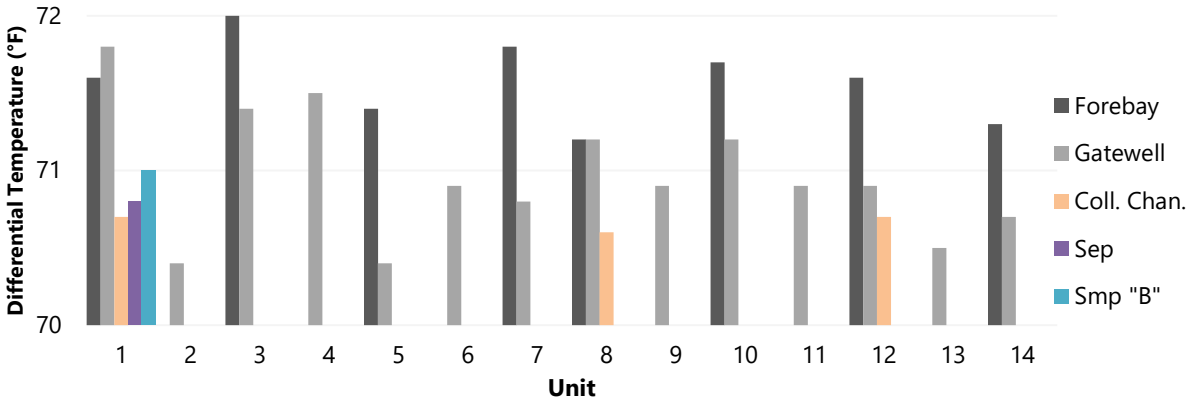

Figure 3
Average Weekly Water Temperatures by Position for Five Dam Locations from 0700 Hours August 23 to 0700 Hours August 29

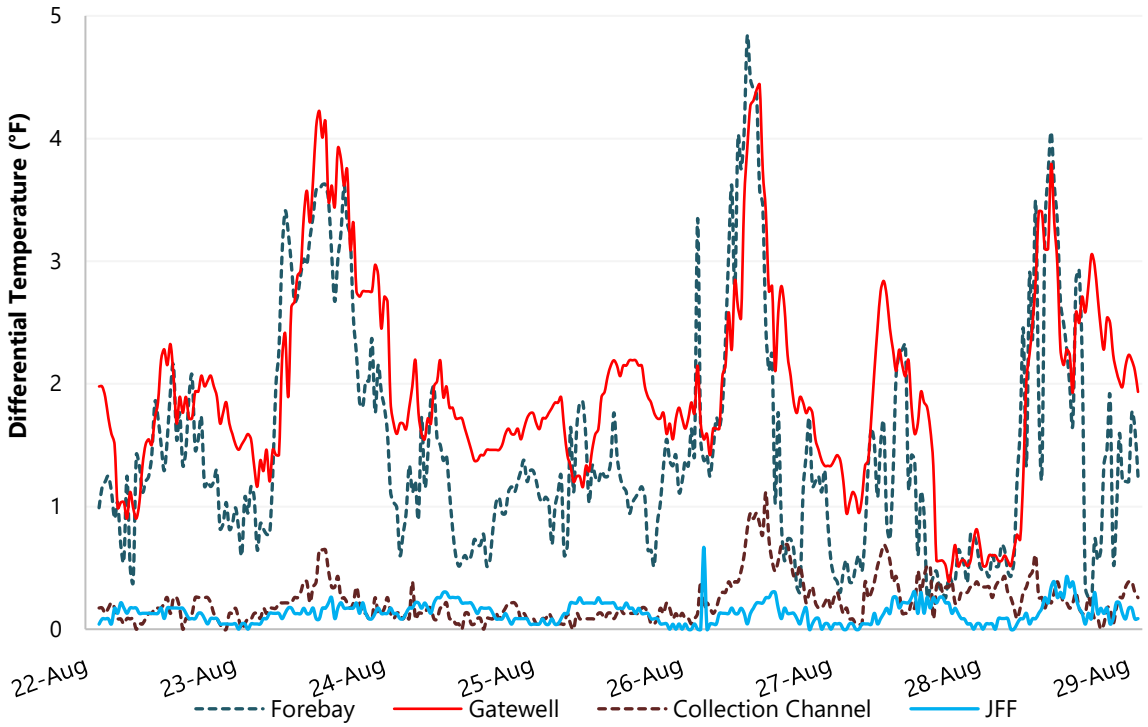

Figure 4
Average Differential Temperatures Within Four Dam Locations from 0700 Hours August 23 to 0700 Hours August 29

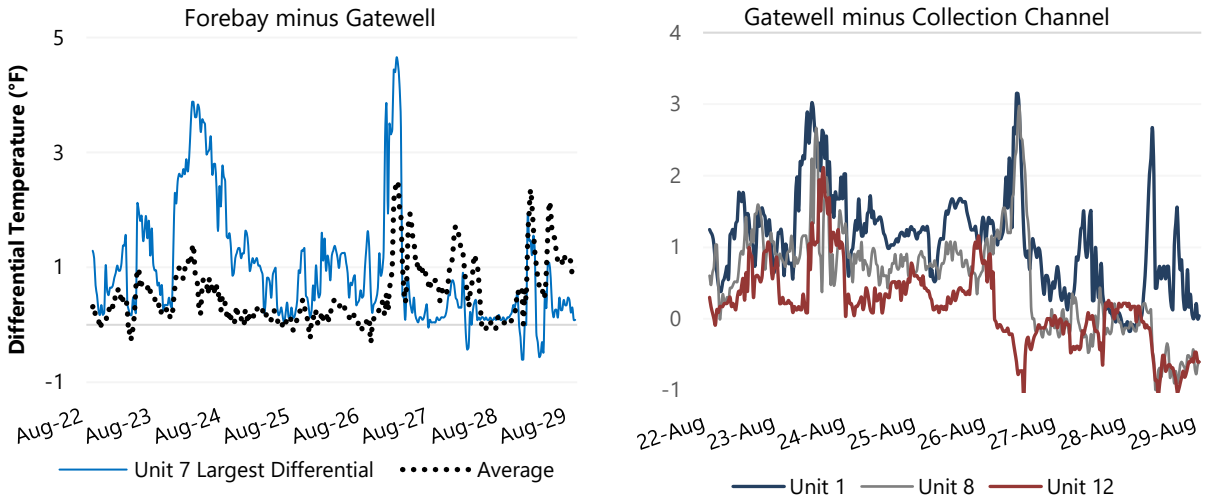

Figure 5
Average Differential Temperatures across Three Dam Locations from 0700 Hours August 23 to 0700 Hours August 29