Weekly Temperature Report
McNary Dam

August 3, 2020

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Report Period: July 24 through July 30

Report No. 2020 EAS: MCN Dam Temperature Weekly for 0724 to 0730

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 new weather station has been installed and we are currently troubleshooting technical errors. We will report from new station when fully operational.

Fish Collection

An estimated 17,520 juvenile salmonids were collected and 17,498 bypassed at the McNary Juvenile Fish Facility (JFF; Table 1), comprising mostly subyearling Chinook salmon. There were 13 sample and 9 facility mortalities.

River Conditions

Average river flow for this reporting period was 190.7 thousand cubic feet per second (kcfs) with an average spill of 108.8 kcfs.

Temperature Logger Operations

There was one temperature logger failure this week in Forebay Unit 8, which was replaced on July 28. Gatewell Unit 5 had fish screens in place on July 29 and a temperature logger was installed and began operating at 1030 hours.

Weather Conditions

The weekly average daytime temperature for July 24 to July 30 was 80.9°F. The weekly average nighttime temperature was 72.7°F. Temperatures ranged from a maximum of 100.6°F at 1730 hours on July 28 to a minimum of 57.7°F at 0500 hours on July 25 (Figure 1).

Winds averaged 3.2 miles per hour (mph) for the week with highest wind speed recorded on July 25 at 26.0 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: 69.8°F, forebay (weekly average of 8 positions); 69.2°F, gatewells (weekly average of 14 positions); 69.3°F, collection channel (weekly average of positions at Units 1, 8, and 12); and 69.0°F, JFF (weekly average of the separator and sample tank “B”). Forebay Unit 12 had the highest

weekly average temperature, 70.3°F (Figure 3). The maximum temperature, 78.8°F, was recorded in Forebay Unit 1 and Unit 5 at 1500 hours on July 29.

The average weekly temperature differentials within dam locations were: 2.5°F, forebay; 2.7°F, gatewells; 0.7°F, collection channel; and 0.1°F, JFF (Figure 4). The largest temperature differential, 10.6°F, was recorded in the forebay at 1700 hours on July 29 (Unit 1 high, Unit 3 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 1.0°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 10.7°F at 1500 hours on July 29 at Units 1 and 5 (forebay warmer than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 0.6°F. On average, the gatewell was warmer than the collection channel at Units 8 and 12. The collection channel was warmer than the gatewells at Unit 1. The largest temperature differential between the gatewell and corresponding collection channel location was 3.3°F at 1530 hours on July 29 at Unit 8 (gatewell warmer than the collection channel).

Table 1
Bypass, Mortality, and River and Weather Conditions from July 24 to July 30

Date	Fish Collected	Fish Bypassed	Mortality		Avg. River Flow	Avg. Turbine Flow	Avg. Spill	Air Temperature		Wind Speed	
			Sample	Facility				Avg.	Max	Avg.	Max
24-Jul	8,220	8,214	4	2	197.9	79.6	112.9	65.9	70.8	2.8	12.0
25-Jul					182.2	73.5	104	71.2	84.8	4.4	26.0
26-Jul	4,580	4,572	3	5	191.1	77.5	109	70.9	84.7	2.7	11.0
27-Jul					188.2	76.1	107.4	76.9	94.2	2.3	16.0
28-Jul	2,780	2,776	2	2	186.4	74.6	106.3	80.6	94.0	3.2	11.0
29-Jul					191.2	77.4	109.1	84.5	100.6	2.5	11.0
30-Jul	1,940	1,936	4	0	197.6	80.1	112.8	76.5	85.2	4.2	7.0
Weekly Total	**17,520**	**17,498**	**13**	**9**	**190.7**	**77.0**	**108.8**	**75.2**	**87.8**	**3.2**	**13.4**

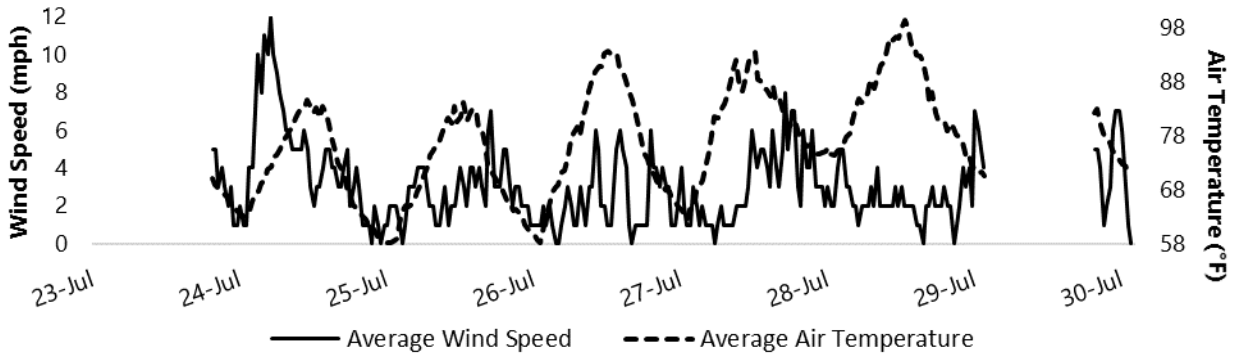

Figure 1
Average Wind Speed and Air Temperature for Each Half-Hour Interval from July 24 to July 30

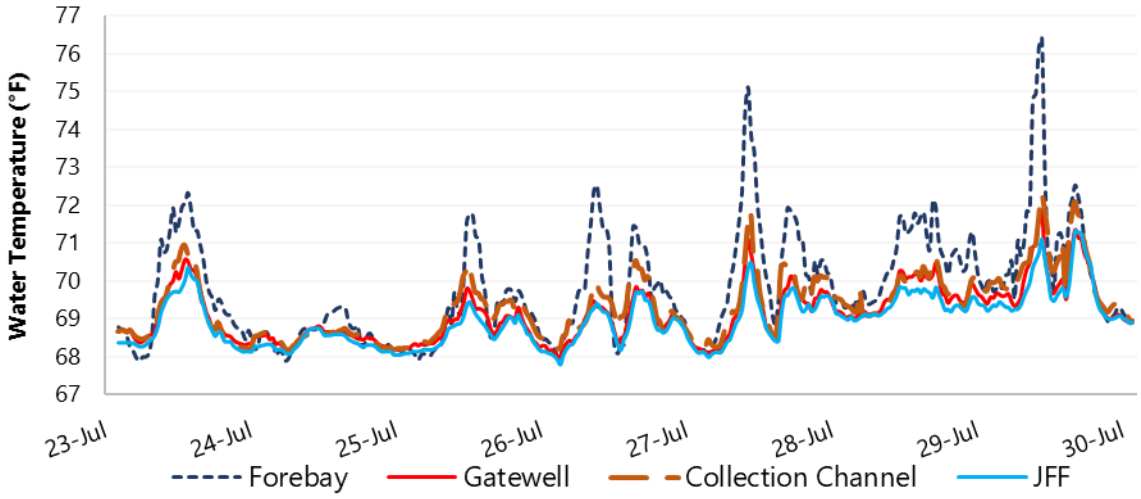

Figure 2
Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from July 24 to July 30

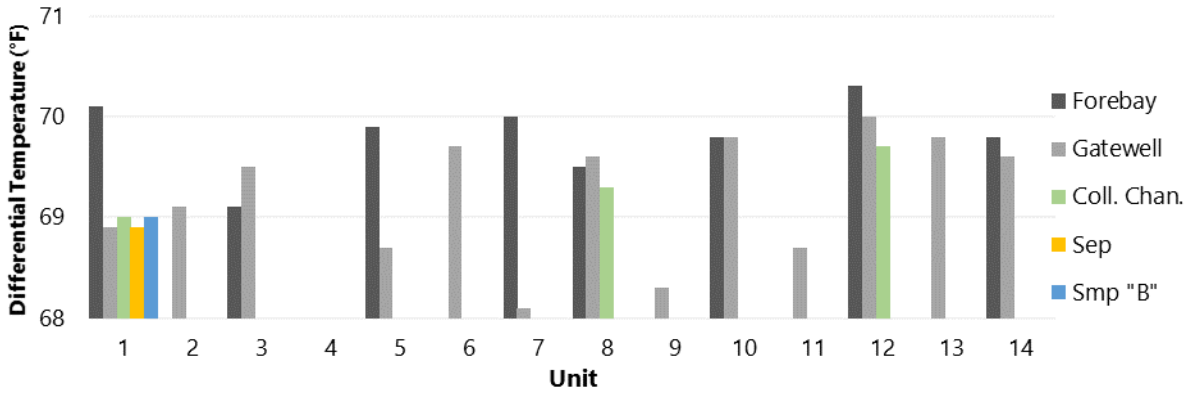

Figure 3
Average Weekly Water Temperatures by Position for Five Dam Locations from July 24 to July 30

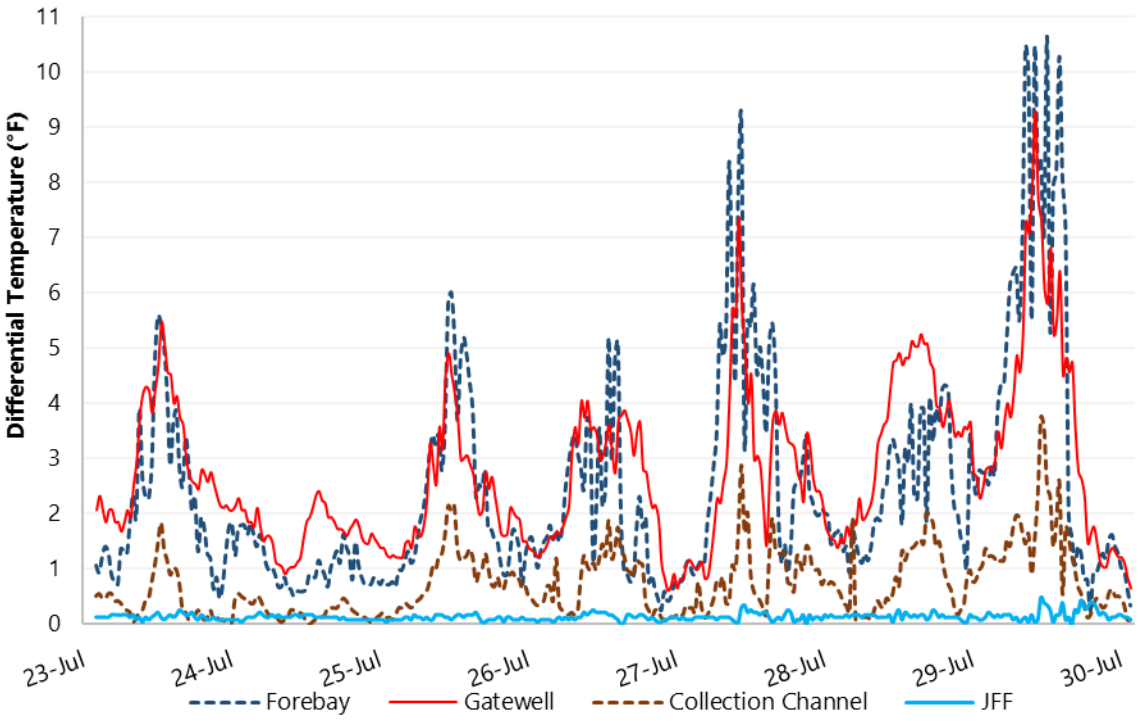

Figure 4
Average Differential Temperatures Within Four Dam Locations from July 24 to July 30

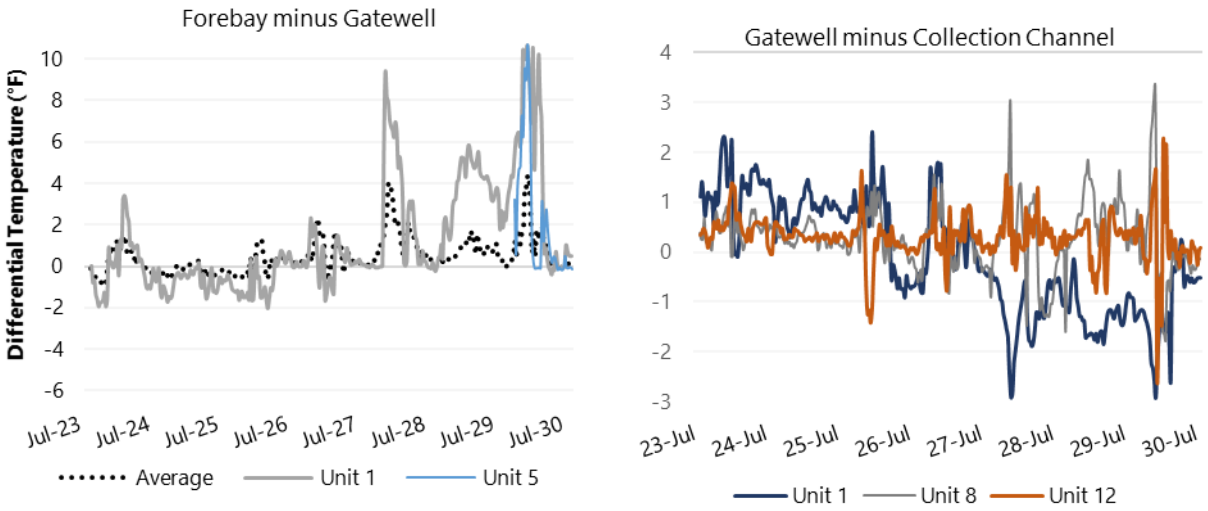

Figure 5
Average Differential Temperatures across Three Dam Locations from July 24 to July 30