Weekly Temperature Report
McNary Dam

August 24, 2020

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Report Period: August 14 through August 20

Report No. 2020 EAS: MCN Dam Temperature Weekly for 0814 to 0820

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 was not found to be fully operational and a replacement console is currently on order.

Fish Collection

An estimated 1,860 juvenile salmonids were collected and 1,842 bypassed at the McNary Juvenile Fish Facility (JFF; Table 1), all of which were subyearling Chinook salmon. There were 18 mortalities. Fish sample processing was limited to two of three possible sample days (August 15 and 19) this week because of problems with the cleaning brush system and dewatering valve in the Juvenile Fish Collection Channel.

River Conditions

Average river flow for this reporting period was 156.6 thousand cubic feet per second (kcfs) with an average spill of 37.5 kcfs.

Temperature Logger Operations

There were no temperature logger failures this week.

Weather Conditions

The weekly average air temperature from August 14 to August 20 was 77.4°F. Air temperatures ranged from a maximum of 101.3°F at 1830 hours on August 15 to a minimum of 58.2°F at 0500 hours on August 14 (Figure 1). Wind speeds averaged 4.7 miles per hour with the highest wind speed recorded on August 18 at 31.0 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: 69.9°F, forebay (weekly average of 8 positions); 69.4°F, gatewells (weekly average of 14 positions); 69.2°F, collection channel (weekly average of positions at Units 1, 8, and 12); and 69.4°F, JFF (weekly average of the separator and sample tank “B”). Forebay Units 3 and 5 had the highest weekly average temperature, 70.1°F (Figure 3). The maximum temperature, 75.9°F, was recorded in Forebay Unit 3 at 2000 hours on August 18.

The average weekly temperature differentials within dam locations were: 1.8°F, forebay; 2.4°F, gatewells; 0.5°F, collection channel; and 0.2°F, JFF (Figure 4). The largest temperature differential, 6.6°F, was recorded in the gatewells at 2030 hours on August 18 (Unit 6 high, Unit 2 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 0.7°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 6.8°F at 2000 hours on August 14 at Unit 8 (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 gatewells were warmer than the collection channel at Units 1, 8, and 12. The largest temperature differential between the gatewell and corresponding collection channel location was 3.9°F at 1800 hours on August 18 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
14-Aug					140.8	55.7	80.4	68.7	89.9	2.3	14.0
15-Aug	208	208	0	0	156.3	80.2	71.4	71.5	92.2	1.1	8.0
16-Aug					153.6	128.2	20.7	78.0	101.3	1.3	12.0
17-Aug					163.3	140.1	20.7	79.6	90.8		
18-Aug					161.7	132.7	24.3	83.5	97.8	5.2	31.0
19-Aug	1,652	1,634	18	0	162.2	133.1	24.4	81.9	96.8	9.2	22.0
20-Aug					158.1	133.1	20.3	78.8	92.5	9.2	16.0
Weekly Total	**1,860**	**1,842**	**18**	**0**	**156.6**	**114.7**	**37.5**	**77.4**	**94.5**	**4.7**	**17.2**

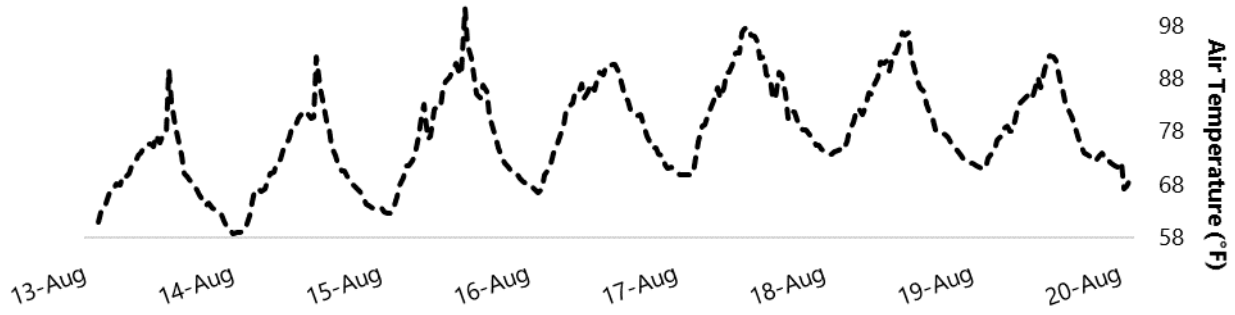

Figure 1
Average Air Temperature for Each Half-Hour Interval from August 14 to August 20

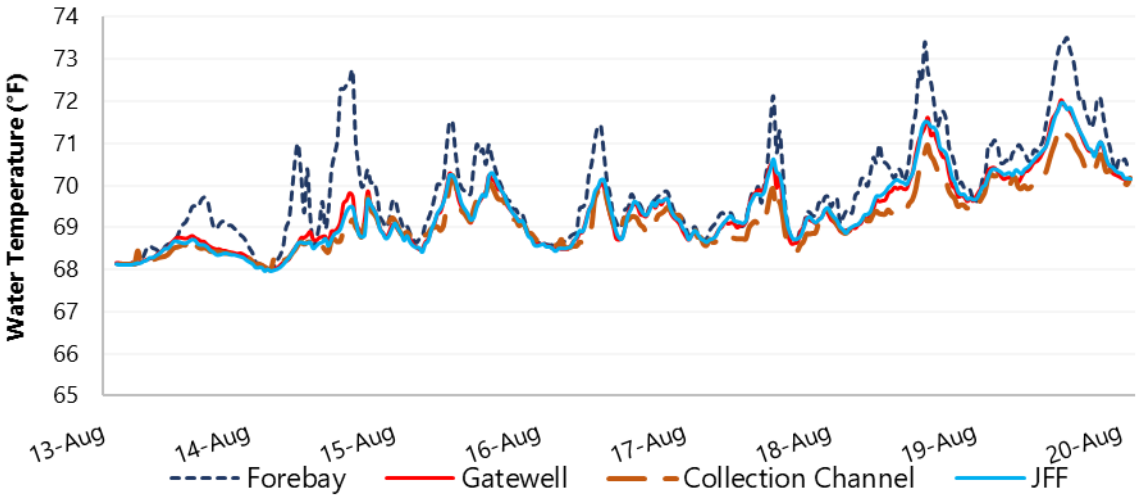

Figure 2
Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from August 14 to August 20

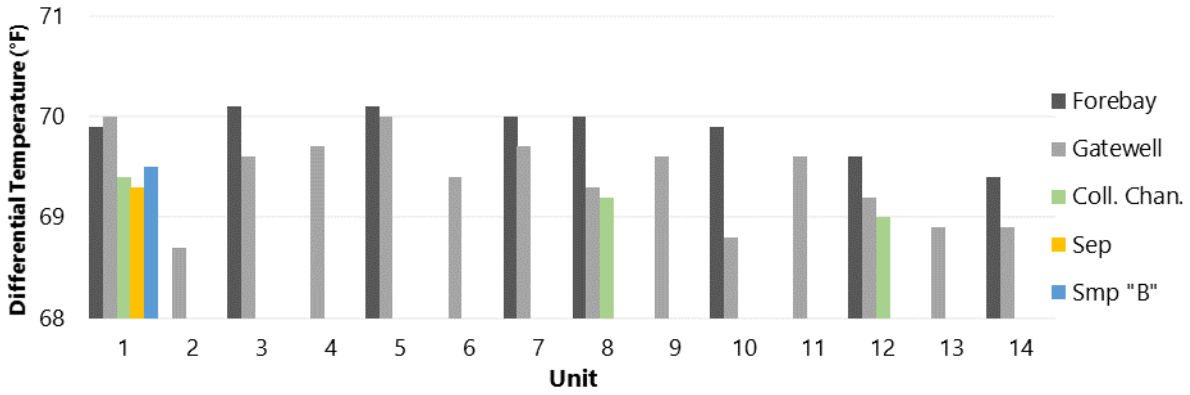

Figure 3
Average Weekly Water Temperatures by Position for Five Dam Locations from August 14 to August 20

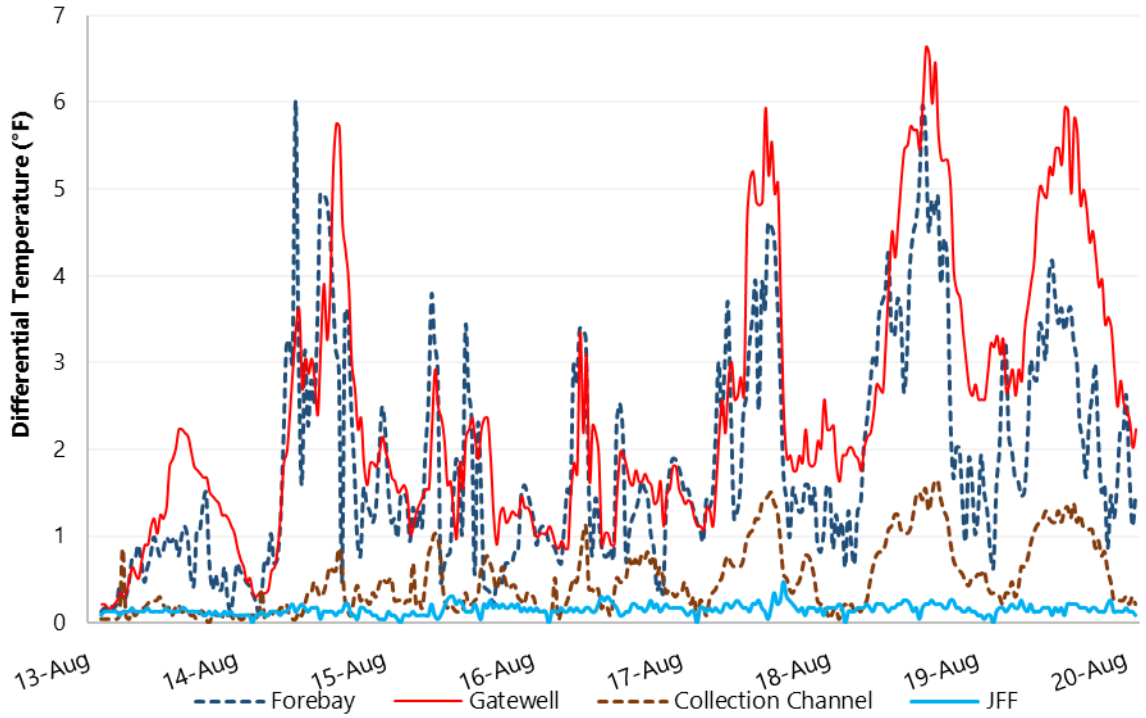

Figure 4
Average Differential Temperatures within Four Dam Locations from August 14 to August 20

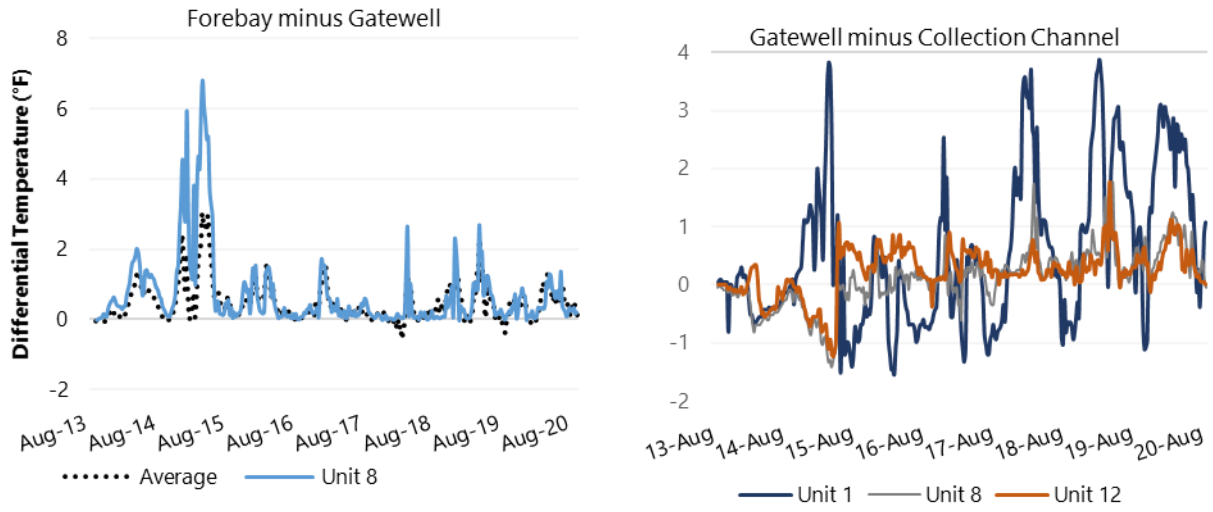

Figure 5
Average Differential Temperatures across Three Dam Locations from August 14 to August 20