

Weekly Temperature Report McNary Dam

September 5, 2017

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Report Period: August 25 to August 31, 2017

Report No. MCN TEMP 17-12

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

Fish Collection

An estimated 560 juvenile salmonids were collected and 560 bypassed the McNary Juvenile Fish Facility (JFF; Table 1), comprising 100% subyearling Chinook salmon. There were 0 total facility mortalities, comprising 0 sample mortalities and 0 facility mortalities.

River Conditions

Average river flow for this reporting period was 125,800 cubic feet per second (125.8 kcfs), with an average spill of 63.1 kcfs.

Temperature Logger Operations

Temperature monitoring concluded on August 31. This is the final weekly report for the 2017 season.

Weather Conditions

The weekly average daytime temperature for 0700 hours August 24 to 0700 hours August 31, 2017, was 77.4 °F. The weekly average nighttime temperature was 69.4 °F. Temperatures ranged from a maximum of 91.2 °F at 1630 hours on August 29 to a minimum of 53.5 °F at 0530 hours on August 25 (Figure 1).

Winds averaged 0.3 miles per hour (mph) and were predominately from the west south west. The wind was highest from 1500 to 1530 hours on August 28, with winds averaging 6 mph and gusts up to 10 mph.

Water Temperatures

Average water temperatures within dam locations varied with air temperatures and wind velocities (Figure 2). The weekly average temperature within dam locations were: 71.9 °F, forebay (weekly average of 8 positions); 71.1 °F, gatewells (weekly average of 14 positions); 71.2 °F, collection channel (weekly average of positions at Units 1, 8, and 12); 71.1 °F, JFF (weekly average of the separator and

sample tank "B"); and 70.8°F, outfall pipe. The forebay at Unit 5 and Unit 14 had the highest weekly average temperature, 72.1 °F (Figure 3). The maximum temperature, 77.8 °F, was recorded in the forebay at 1500 hours on August 29 at Unit 12.

The average weekly temperature differentials within dam locations were: 1.3 °F, forebay; 1.8 °F, gatewells; 0.3 °F, collection channel; and less than 0.1 °F, JFF (Figure 4). The largest gatewell differentials were recorded between units that were operational and non-operational. The largest temperature differential, 6.0 °F, was recorded in the forebay at 1400 hours on August 29 (Unit 12 high, Unit 14 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 0.9 °F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 7.3 °F at 1530 hours on August 29 at Unit 7 (forebay greater than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 0.5 °F. On average, the gatewell was warmer than the collection channel at Unit 1, Unit 8, and Unit 12. The largest temperature differential between the gatewell and corresponding collection channel location was 2.8 °F at 1430 on August 27 at Unit 1 (gatewell greater than collection channel).

Table 1
Bypass, Mortality, and River and Weather Conditions from 0700 Hours August 24 to 0700 Hours August 31

Date	Fish Collected	Fish Bypassed	Mortality		Avg. River Flow	Avg. Turbine Flow	Avg. Spill	Air Temperature		Wind Speed	
			Sam.	Fac.				Avg.	Max	Avg.	Max
8/24-25	304	304	0	0	126.5	58.3	63.5	71.1	84.5	1.4	5.0
8/25-26					113.0	51.6	56.7	67.0	81.6	0.0	0.0
8/26-27	104	104	0	0	111.5	50.8	55.9	71.1	86.3	0.0	0.0
8/27-28					110.9	50.6	55.6	73.2	88.8	0.1	3.0
8/28-29	48	48	0	0	130.0	60.1	65.2	76.3	89.3	0.6	6.0
8/29-30					144.2	67.3	72.2	77.3	91.2	0.0	0.0
8/30-31	104	104	0	0	144.8	67.5	72.6	76.3	88.2	0.3	5.0
Weekly Total	560	560	0	0	125.8	58.0	63.1	73.4		0.3	

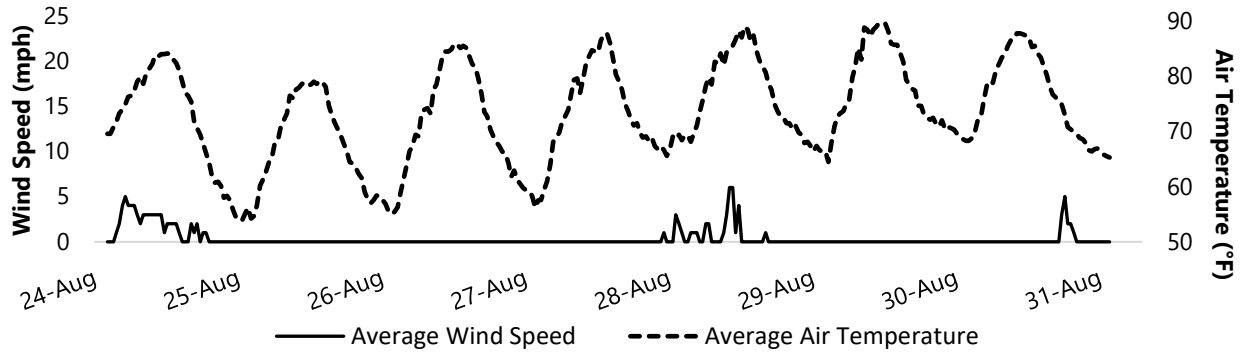


Figure 1
Average Wind Speed and Air Temperature for Each Half-Hour Interval from 0700 Hours August 24 to 0700 Hours August 31

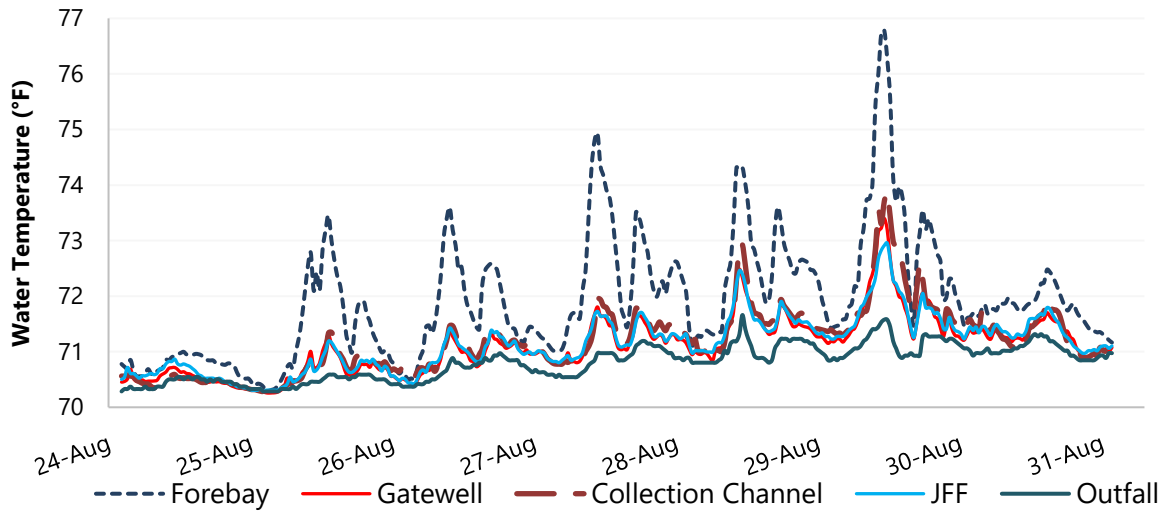


Figure 2
Average Water Temperatures for Each Half-Hour Interval for Five Dam Locations from 0700 Hours August 24 to 0700 Hours August 31

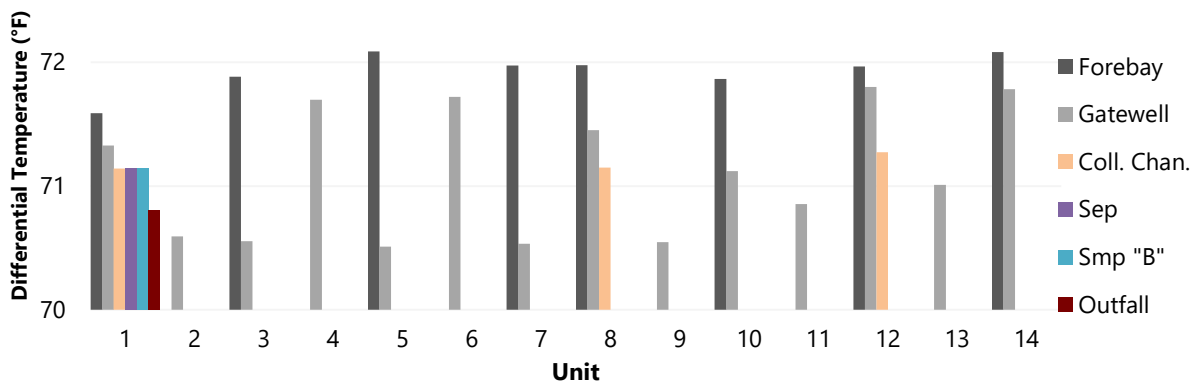


Figure 3
Average Weekly Water Temperatures by Position for Six Dam Locations from 0700 Hours August 24 to 0700 Hours August 31

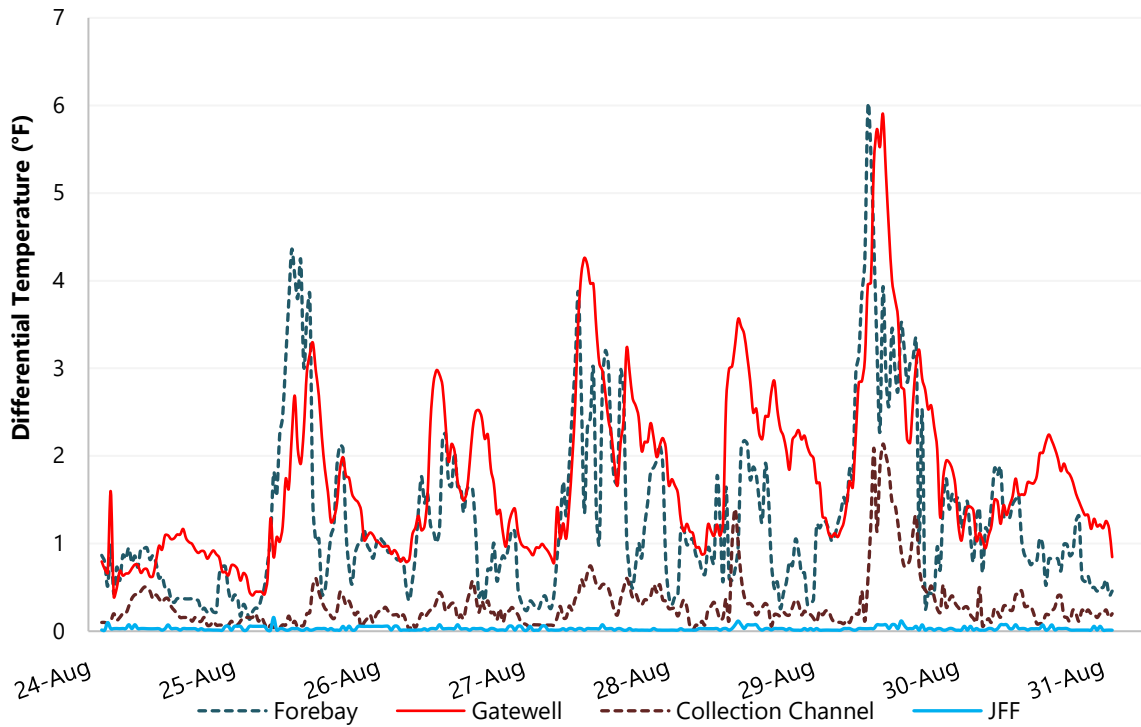


Figure 4
Average Differential Temperatures Within Four Dam Locations from 0700 Hours August 24 to 0700 Hours August 31

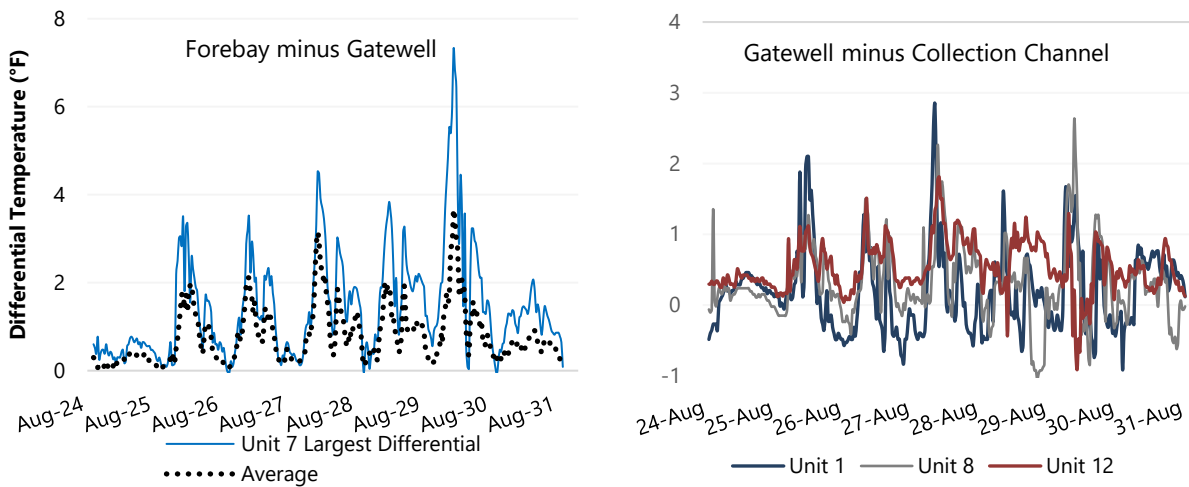


Figure 5
Average Differential Temperatures Across Three Dam Locations from 0700 Hours August 24 to 0700 Hours August 31