Weekly Temperature Report
McNary Dam

July 27, 2020

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Report Period: July 17 through July 23

Report No. 2020 EAS: MCN Dam Temperature Weekly Report for 0717 to 0723

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. A new weather station was installed on July 23 and will be programmed soon.

Fish Collection

An estimated 34,152 juvenile salmonids were collected and 34,140 bypassed at the McNary Juvenile Fish Facility (JFF; Table 1), comprised of mostly subyearling Chinook salmon. There were 9 sample and 3 facility mortalities.

River Conditions

Average river flow for this reporting period was 203.9 thousand cubic feet per second (kcfs) with an average spill of 116.4 kcfs.

Temperature Logger Operations

There was one temperature logger failure this week in the Sample Tank, which was replaced on July 20.

Weather Conditions

The weekly average daytime temperature for July 17 to July 23 was 81.6°F. The weekly average nighttime temperature was 73.6°F. Temperatures ranged from a maximum of 101.1°F at 1900 hours on July 21 to a minimum of 62.1°F at 0530 hours on July 18 (Figure 1). Vantage Pro Weather Station air thermometer malfunctioned during this week and will be replaced.

Winds averaged 2.5 miles per hour (mph) for the week with highest wind speed recorded on July 17 at 23.0 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: 68.4°F, forebay (weekly average of 8 positions); 67.6°F, gatewells (weekly average of 13 positions); 68.0°F, collection channel (weekly average of positions at Units 1, 8, and 12); and 67.5°F, JFF (weekly average of the separator and sample tank “B”). Forebay Unit 10 had the highest weekly average temperature, 69.4°F (Figure 3). The maximum temperature, 78.9°F, was recorded in the Forebay Unit 7 at 1600 hours on July 21.

The average weekly temperature differentials within dam locations were: 3.2°F, forebay; 3.6°F, gatewells; 1.0°F, collection channel; and 0.2°F, JFF (Figure 4). The largest temperature differential, 11.8°F, was recorded in the forebay at 1630 hours on July 19 (Unit 7 high, Unit 3 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 10.4°F at 1830 hours on July 19 at Unit 3 (forebay warmer than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 0.7°F. On average, the gatewell was warmer than the collection channel at Units 1 and 12. The collection channel was warmer than the gatewells at Unit 8. The largest temperature differential between the gatewell and corresponding collection channel location was 3.7°F at 1430 hours on July 19 at Unit 1 (gatewell warmer than the collection channel).

Table 1
Bypass, Mortality, and River and Weather Conditions from July 17 to July 23

Date	Fish Collected	Fish Bypassed	Mortality		Avg. River Flow	Avg. Turbine Flow	Avg. Spill	Air Temperature		Wind Speed	
			Sample	Facility				Avg.	Max	Avg.	Max
17-Jul					223.9	91.5	127.6	77.9	91.0	2.5	23.0
18-Jul	10,002	9,997	3	2	207.6	84.2	118.6				
19-Jul					189.8	76.6	108.5	73.6	87.5	2.8	11.0
20-Jul	8,900	8,896	4	0	192.1	77.8	109.6	78.2	96.8	2.5	10.0
21-Jul					201.2	81.7	114.8				
22-Jul	15,250	15,247	2	1	208.6	84.6	119.0	82.0	101.1	2.2	20.0
23-Jul					204.0	82.9	116.4				
Weekly Total	**34,152**	**34,140**	**9**	**3**	**203.9**	**82.8**	**116.4**	**77.9**	**94.1**	**2.5**	**16.0**

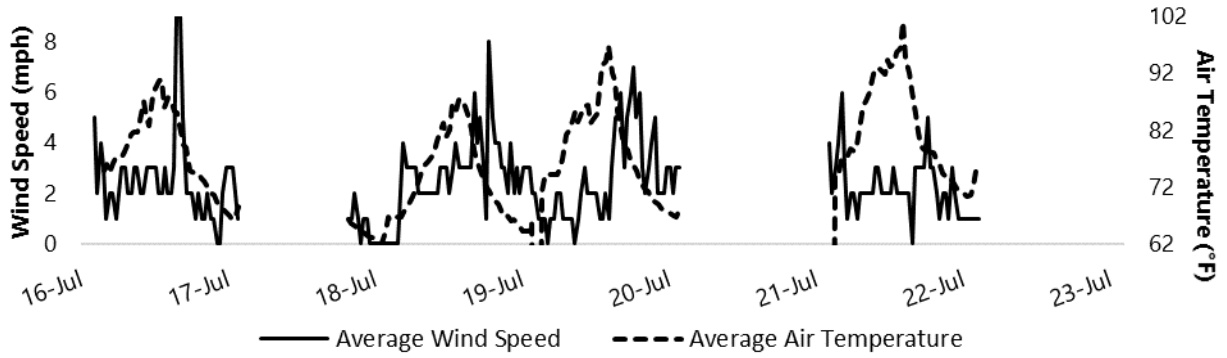

Figure 1
Average Wind Speed and Air Temperature for Each Half-Hour Interval from July 17 to July 23

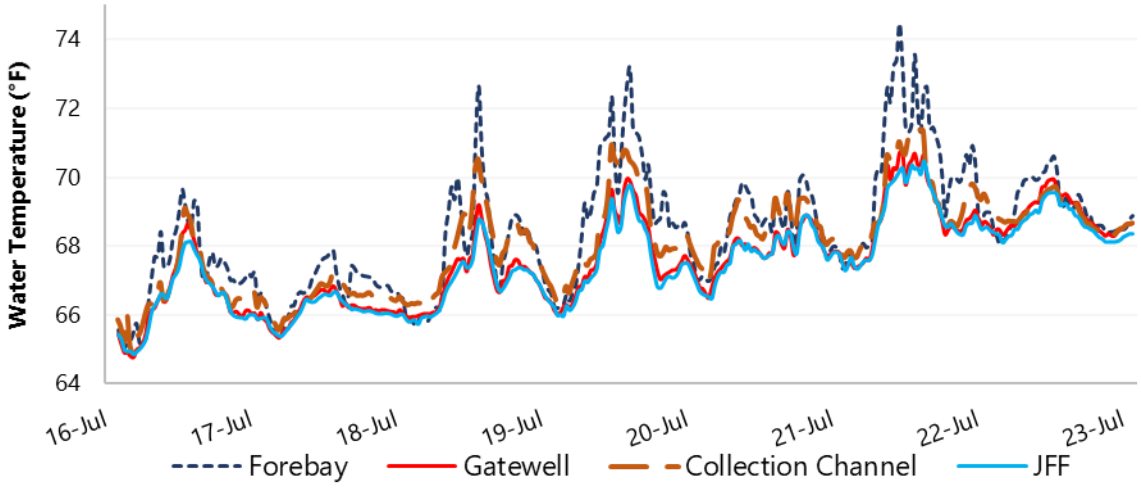

Figure 2
Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from July 17 to July 23

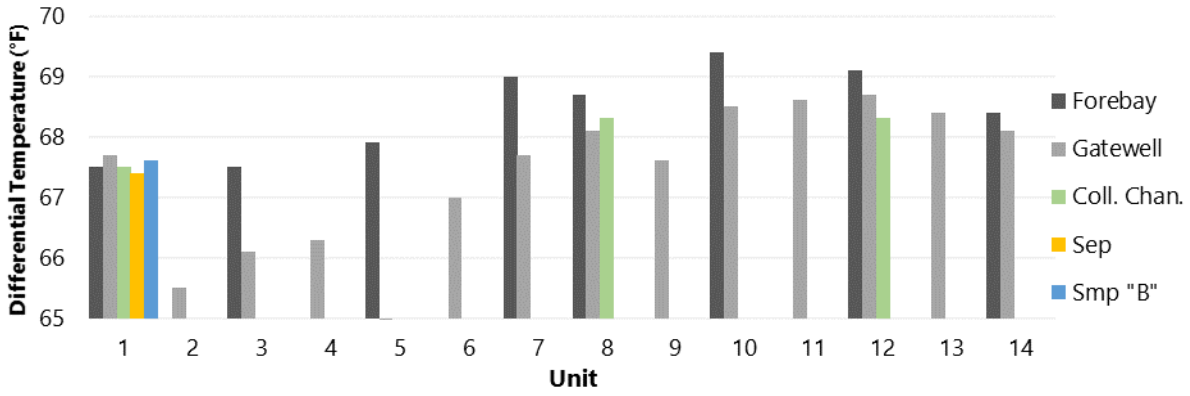

Figure 3
Average Weekly Water Temperatures by Position for Five Dam Locations from July 17 to July 23

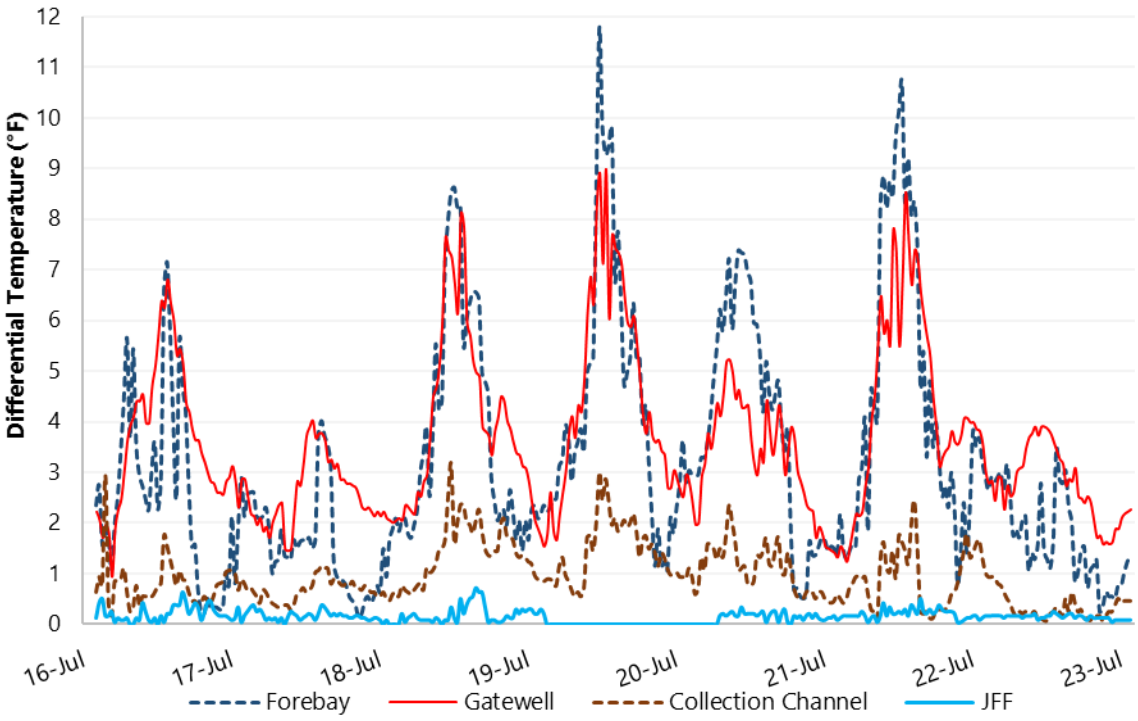

Figure 4
Average Differential Temperatures Within Four Dam Locations from July 17 to July 23

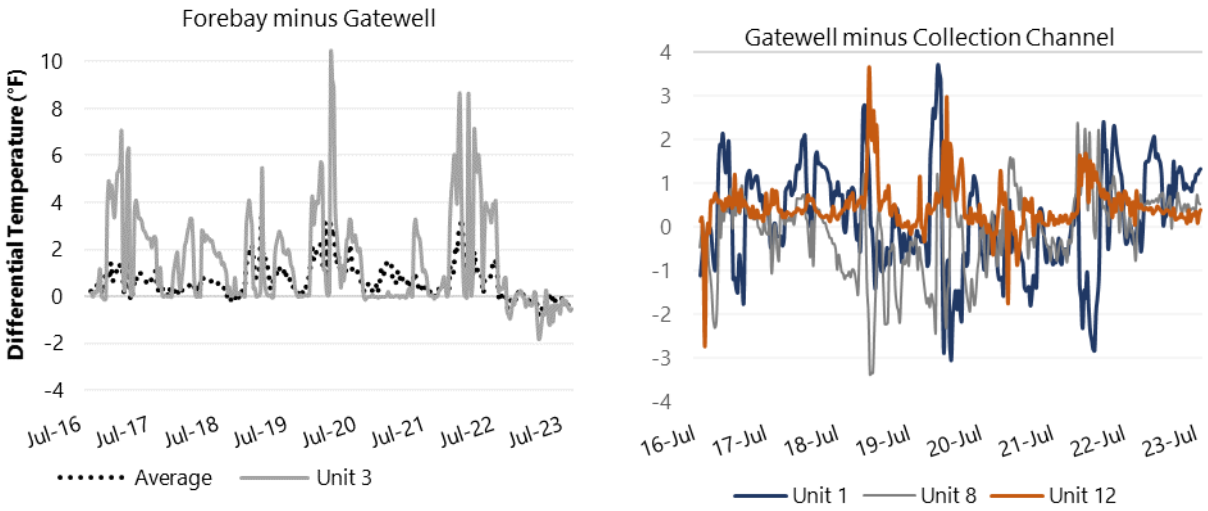

Figure 5
Average Differential Temperatures across Three Dam Locations from July 17 to July 23