

# Weekly Temperature Report McNary Dam

August 5, 2019

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Prepared by: Meaghan Wright, Anchor QEA, LLC  
Report Period: July 26 to August 1, 2019  
Report No. 2019 Anchor QEA: MCN Temperature Weekly for 0726-0801

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

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## Fish Collection

An estimated 4,772 juvenile salmonids were collected and 4,762 bypassed at the McNary Juvenile Fish Facility (JFF; Table 1), comprising 99.1% subyearling Chinook salmon, 0.7% sockeye, and 0.2% steelhead. There were 10 total facility mortalities, comprising 6 sample mortalities and 4 facility mortalities.

## River Conditions

Average river flow for this reporting period was 150,100 cubic feet per second (150.1 kcfs) with an average spill of 85.6 kcfs.

## Temperature Logger Operations

The logger in Gatewell 6 (G06) was replaced on July 29, but there was no loss of data.

## Weather Conditions

The weekly average daytime temperature for 0700 hours July 26 to 0700 hours August 1, 2019, was 70.7°F. The weekly average nighttime temperature was 83.6°F. Temperatures ranged from a maximum of 99.3°F at 1900 hours on July 26 to a minimum of 59.2°F at 0630 hours on July 26 (Figure 1).

Winds averaged 2.0 miles per hour (mph) and were predominately from the northeast. The highest average wind speed was 7.0 mph at 2930 on July 26, and the highest gusts were up to 17 mph at 2230 hours on July 26, 2300 hours on July 26, and 1330 hours on July 30.

## 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: 71.4°F, forebay (weekly average of 8 positions); 70.3°F, gatewells (weekly average of 14 positions); 70.0°F, collection channel

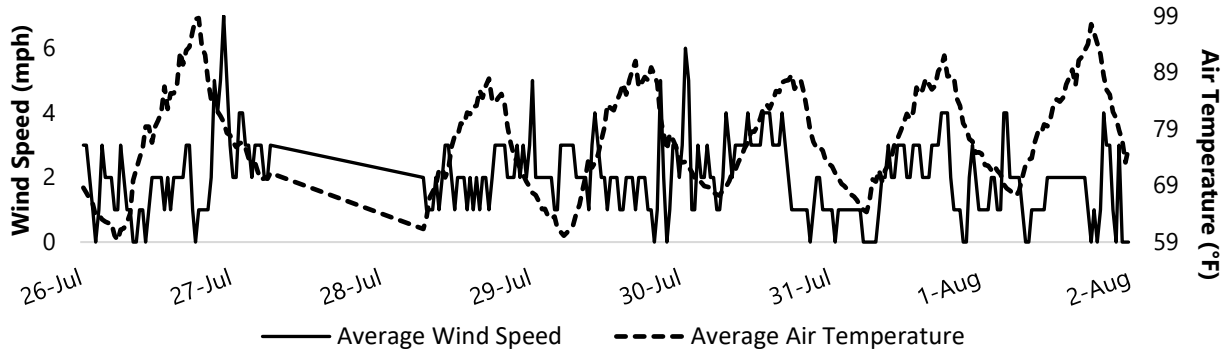
(weekly average of positions at Units 1, 8, and 12); and 70.2°F, JFF (weekly average of the separator and sample tank "B"). The forebay at Unit 1 had the highest weekly average temperature, 72.2°F (Figure 3). The maximum temperature, 77.1°F, was recorded in the forebay at 1800 hours on July 28 at Unit 14.

The average weekly temperature differentials within dam locations were: 2.3°F, forebay; 3.2°F, gatewells; 0.4°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, 7.3°F, was recorded on July 29 in the gatewells at 1800 hours (Unit 1 high, Unit 3 low).

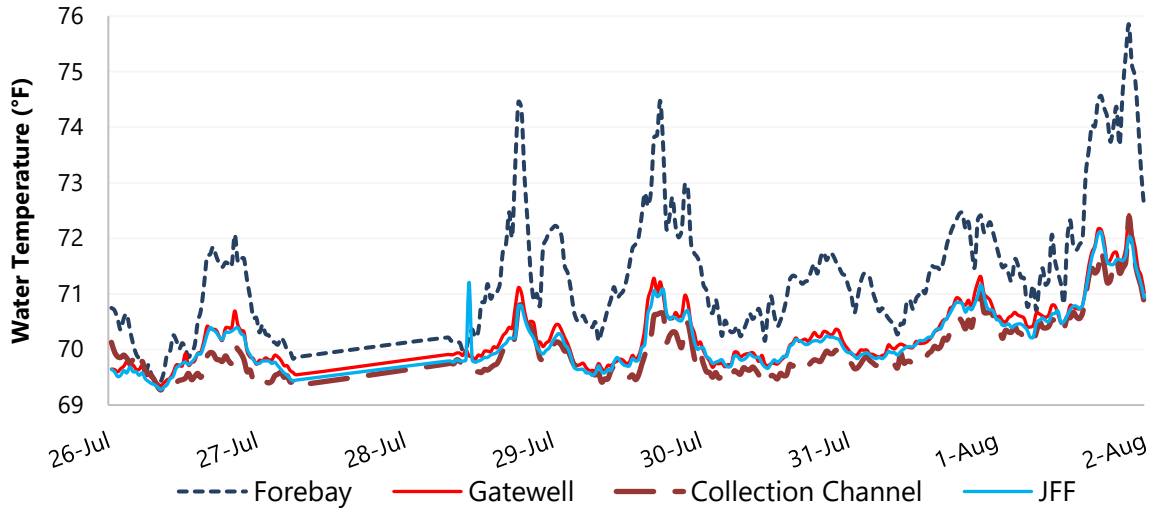
The average weekly temperature differential between the forebay and corresponding gatewell was 1.4°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 7.4°F at 1830 hours on July 28 at Unit 1 (forebay greater than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 1.2°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 5.1°F at 1800 on July 29 at Unit 1 (gatewell greater than collection channel).

**Table 1**  
**Bypass, Mortality, and River and Weather Conditions from 0700 Hours July 26 to 0700 Hours August 01**

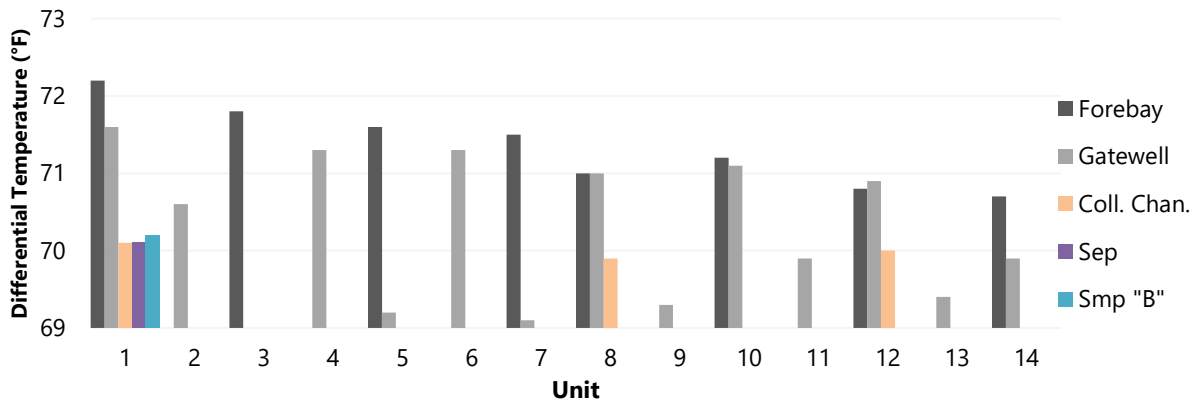
Date	Fish Collected	Fish Bypassed	Mortality		Avg. River Flow	Avg. Turbine Flow	Avg. Spill	Air Temperature		Wind Speed	
			Sample	Facility				Avg.	Max	Avg.	Max
26-Jul	1,624	1,619	3	2	157.3	62.9	89.8	77.4	99.3	1.9	7.0
27-Jul					157.1	62.7	89.7	75.7	90.3	2.3	5.0
28-Jul	1,072	1,072	0	0	129.3	50.7	73.9	75.3	91.7	2.1	5.0
29-Jul					138.9	55.1	79.2	76.7	88.8	2.4	6.0
30-Jul	1,316	1,315	1	0	148.2	59.2	84.3	77.2	92.2	1.7	4.0
31-Jul					150.4	60.1	85.6	80.1	97.6	1.5	4.0
1-Aug	760	756	2	2	169.8	68.4	96.7	79.9	97.7	1.6	4.0
<b>Weekly Total</b>	<b>4,772</b>	<b>4,762</b>	<b>6</b>	<b>4</b>	<b>150.1</b>	<b>59.9</b>	<b>85.6</b>	<b>77.1</b>	<b>78.1</b>	<b>2.0</b>	<b>5.9</b>



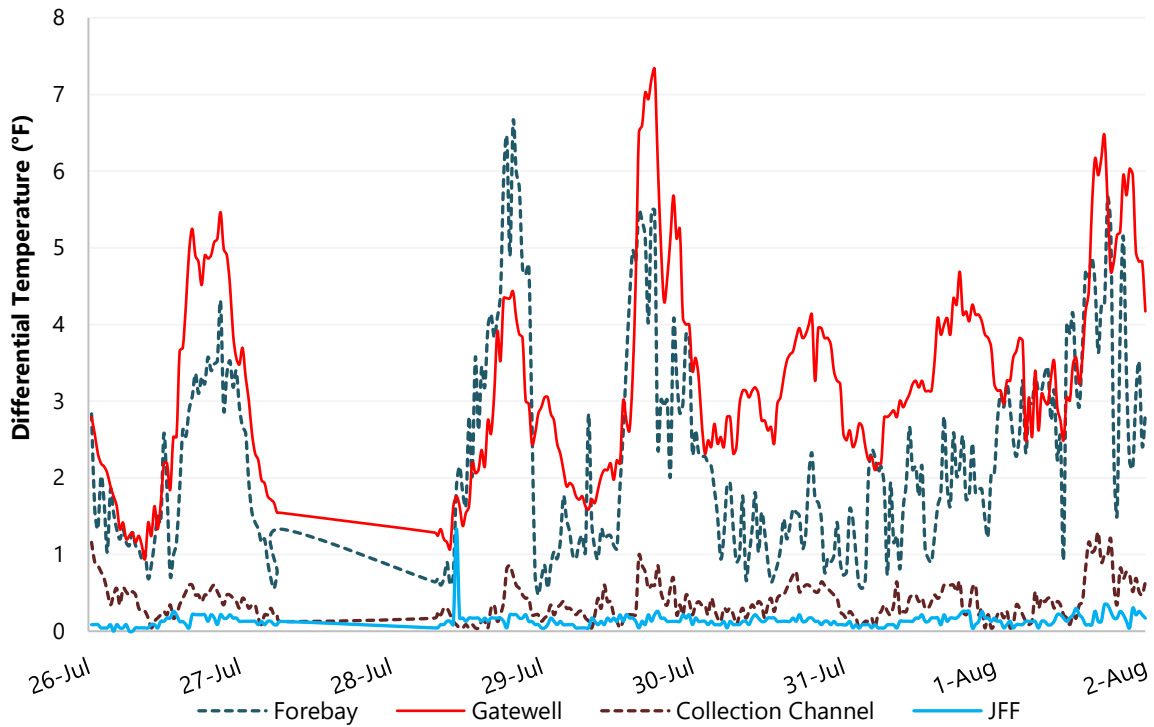
**Figure 1**  
**Average Wind Speed and Air Temperature for Each Half-Hour Interval from 0700 Hours July 26 to 0700 Hours August 01**



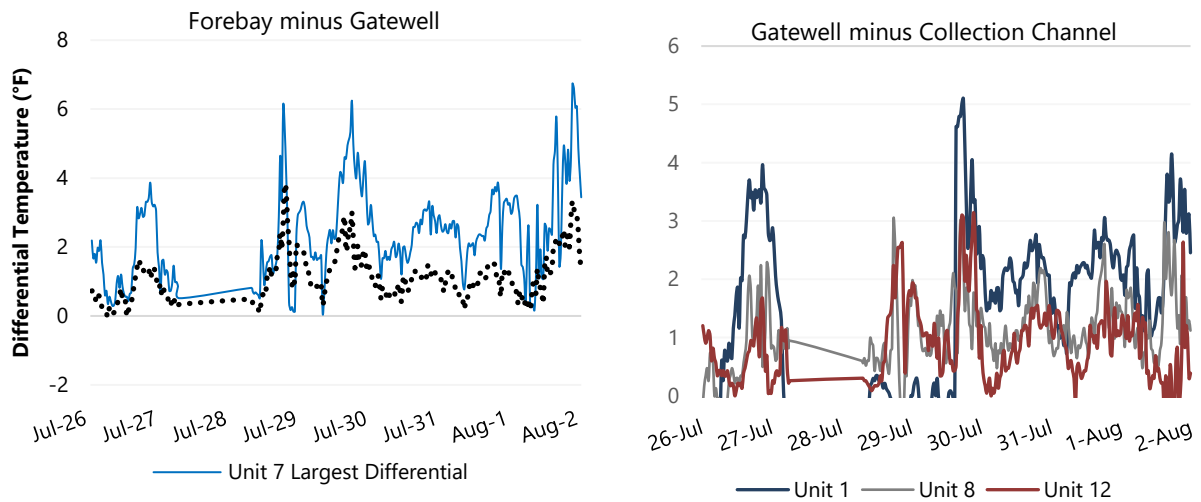
**Figure 2**  
**Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from 0700 Hours July 26 to 0700 Hours August 01**



**Figure 3**  
**Average Weekly Water Temperatures by Position for Five Dam Locations from 0700 Hours July 26 to 0700 Hours August 01**



**Figure 4**  
**Average Differential Temperatures Within Four Dam Locations from 0700 Hours July 26 to 0700 Hours August 01**



**Figure 5**  
**Average Differential Temperatures across Three Dam Locations from 0700 Hours July 26 to 0700 Hours August 01**