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# Weekly Temperature Report
# McNary Dam

July 24, 2017

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Report Period: July 14 to July 20, 2017

Report No. MCN TEMP 17-6

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

## Fish Collection

An estimated 102,400 juvenile salmonids were collected and 102,394 bypassed the McNary Juvenile Fish Facility (JFF; Table 1), comprising 100% subyearling Chinook salmon. There were 6 total facility mortalities, comprising 2 sample mortalities and 4 facility mortalities.

## River Conditions

Average river flow for this reporting period was 202,100 cubic feet per second (202.1 kcfs), with an average spill of 101.3 kcfs.

## Temperature Logger Operations

All loggers were operational this week.

## Weather Conditions

The weekly average daytime temperature for 0700 hours July 6 to 0700 hours July 13, 2017, was 78.8 °F. The weekly average nighttime temperature was 71.8 °F. Temperatures ranged from a maximum of 93.6 °F from 1630 to 1700 on July 15 to a minimum of 57.0 °F at 0700 hours on July 17 (Figure 1).

Winds averaged 1.2 miles per hour (mph) and were predominately from the north. The wind was highest at 1830 and 2000 hours on July 15, with winds averaging 14.0 mph and gusts up to 27 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: 70.1 °F, forebay, (weekly average of 8 positions); 69.5 °F, gatewells, (weekly average of 14 positions); 69.6 °F, collection channel, (weekly average of positions at Units 1, 8, and 12); 69.5 °F, JFF, (weekly average of the separator and sample tank "B") and 68.5°F outfall pipe. The forebay at Unit 8 had the highest weekly

average temperature, 70.4 °F (Figure 3). The maximum temperature, 78.5 °F, was recorded in the forebay at 1630 hours on July 14 at Unit 5.

The average weekly temperature differentials within dam locations were: 1.9 °F, forebay; 2.6 °F, gatewells; 0.5 °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, 8.2 °F was recorded in the gatewells at 1530 hours on July 14 (Unit 11 low, Unit 1 high).

The average weekly temperature differential between the forebay and corresponding gatewell was 0.8 °F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 6.8 °F at 1430 hours on July 14 at Unit 1 (forebay greater 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 Unit 8 and Unit 12, and cooler than the collection channel at Unit 1. The largest temperature differential between the gatewell and corresponding collection channel location was 3.6 °F at 1430 on July 14 at Unit 1 (gatewell low, collection channel high).

**Table 1**
**Bypass, Mortality, and River and Weather Conditions from 0700 Hours July 6 to 0700 Hours July 13**

| Date | Fish Collected | Fish Bypassed | Mortality | | Avg. River Flow | Avg. Turbine Flow | Avg. Spill | Air Temperature | | Wind Speed | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Sam. | Fac. | | | | Avg. | Max | Avg. | Max |
| 7/13-14 | 36,600 | 36,600 | 0 | 0 | 215.3 | 102.7 | 107.9 | 77.0 | 92.7 | 0.7 | 11.0 |
| 7/14-15 | | | | | 227.5 | 108.7 | 114.1 | 77.8 | 92.1 | 0.3 | 2.0 |
| 7/15-16 | 25,000 | 24,999 | 1 | 0 | 196.2 | 93.1 | 98.5 | 77.5 | 93.6 | 3.8 | 14.0 |
| 7/16-17 | | | | | 176.4 | 83.3 | 88.5 | 70.1 | 83.0 | 1.5 | 9.0 |
| 7/17-18 | 18,700 | 18,696 | 1 | 3 | 195.6 | 93.0 | 97.9 | 70.1 | 84.3 | 0.3 | 3.0 |
| 7/18-19 | | | | | 209.4 | 99.8 | 104.9 | 75.8 | 88.2 | 0.4 | 3.0 |
| 7/19-20 | 22,100 | 22,099 | 0 | 1 | 194.4 | 92.3 | 97.4 | 77.2 | 91.0 | 1.2 | 7.0 |
| **Weekly Total** | **102,400** | **102,394** | **2** | **4** | **202.1** | **96.1** | **101.3** | **75.3** | | **1.2** | |

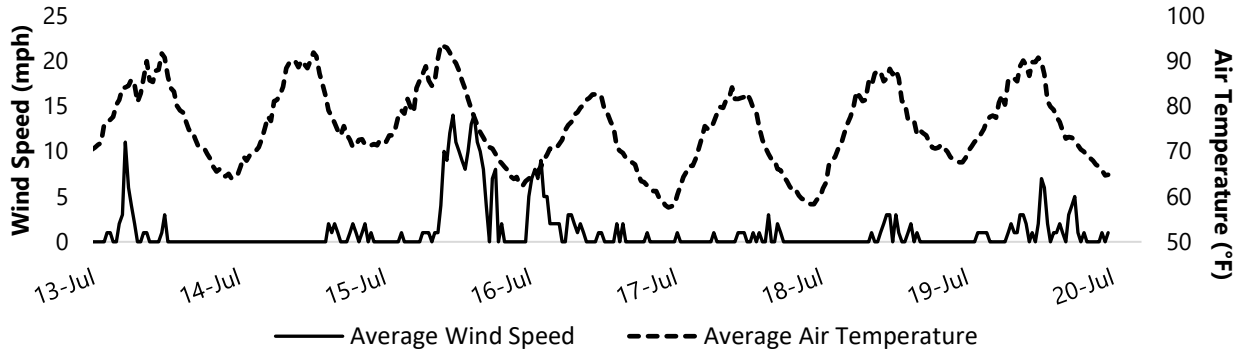


**Figure 1**
**Average Wind Speed and Air Temperature for Each Half-Hour Interval from 0700 Hours July 13 to 0700 Hours July 20**

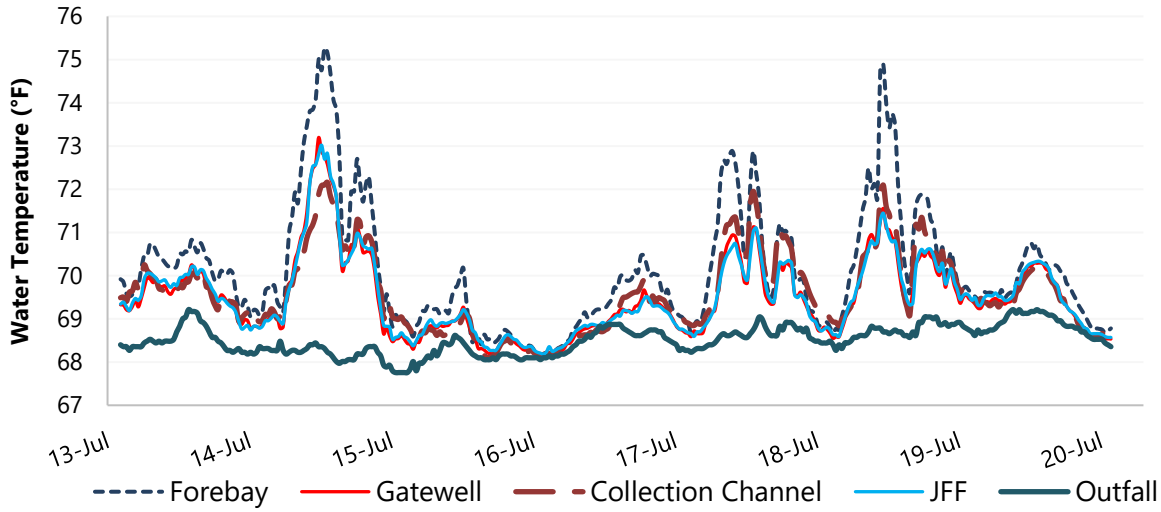


**Figure 2**
**Average Water Temperatures for Each Half-Hour Interval for Five Dam Locations from 0700 Hours July 13 to 0700 Hours July 20**

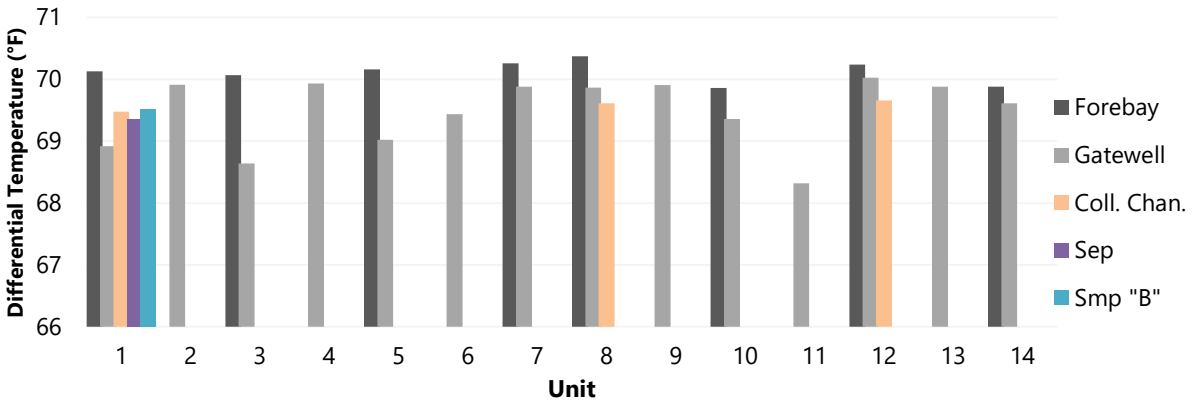


**Figure 3**
**Average Weekly Water Temperatures by Position for Five Dam Locations from 0700 Hours July 13 to 0700 Hours July 20**

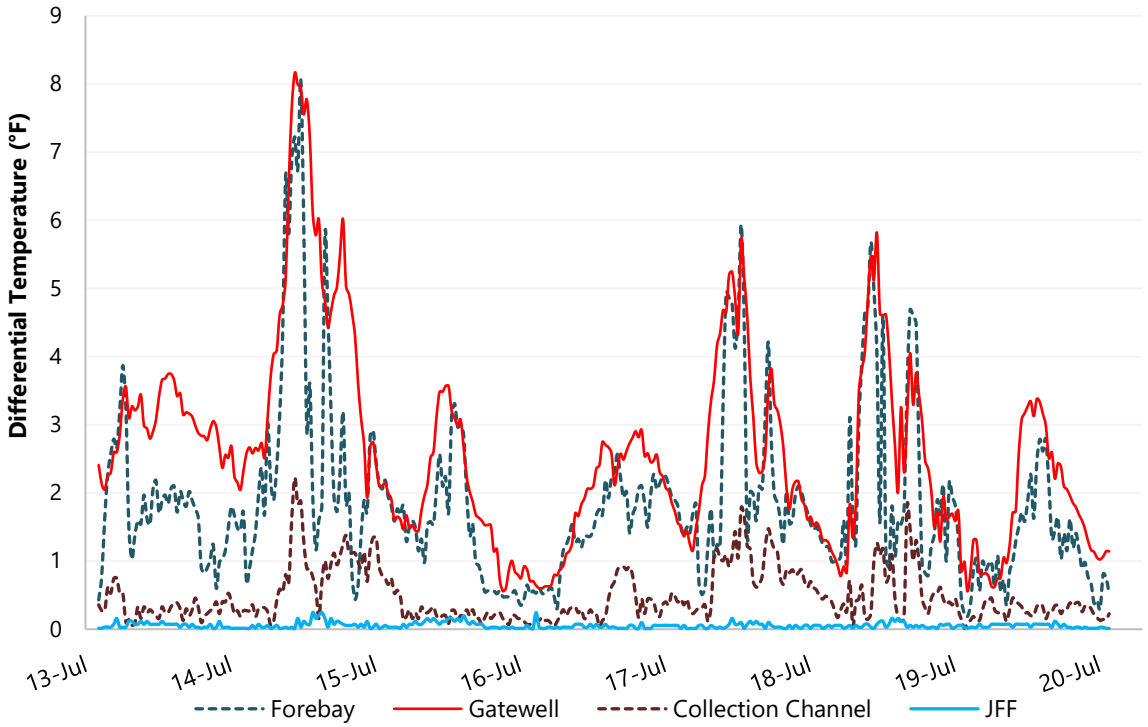


**Figure 4**
**Average Differential Temperatures Within Four Dam Locations from 0700 Hours July 13 to 0700 Hours July 20**

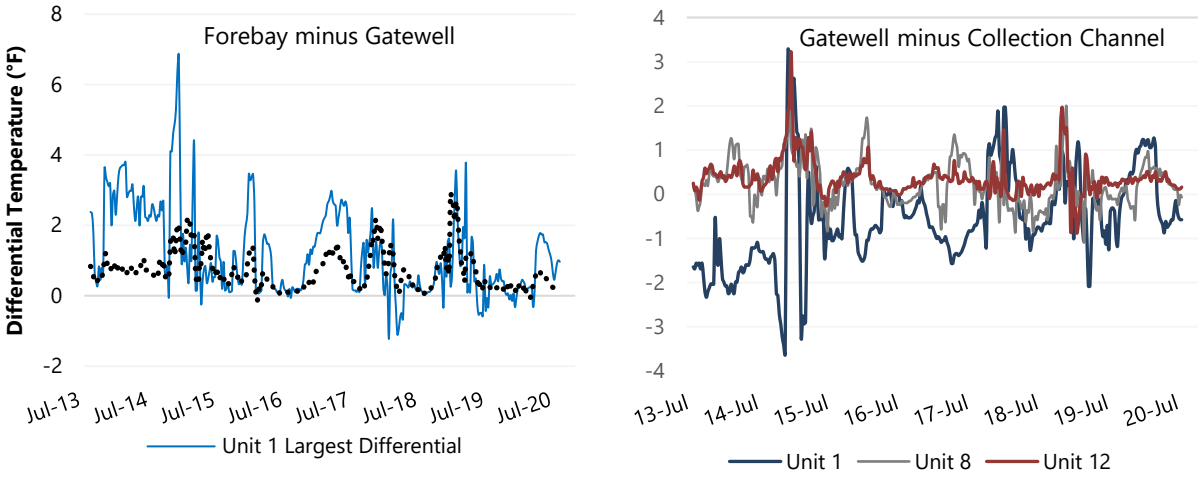


**Figure 5**
**Average Differential Temperatures Across Three Dam Locations from 0700 Hours July 13 to 0700 Hours July 20**