# Weekly Temperature Report
# McNary Dam

August 10, 2020

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Report Period: July 31 through August 6

Report No. 2020 EAS: MCN Dam Temperature Weekly for 0731 to 0806

**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 replacement data logger for the new weather station has been ordered and is expected to arrive the week of August 10. We will report from the new station when fully operational.

## Fish Collection

An estimated 4,379 juvenile salmonids were collected and 4,369 bypassed at the McNary Juvenile Fish Facility (JFF; Table 1), comprising mostly subyearling Chinook salmon. There were 2 sample and 8 facility mortalities.

## River Conditions

Average river flow for this reporting period was 184.4 thousand cubic feet per second (kcfs) with an average spill of 105.2 kcfs.

## Temperature Logger Operations

There was one temperature logger failure this week in Forebay Unit 8, which was replaced on August 1.

## Weather Conditions

The weekly average air temperature from July 31 to August 6 was 79.6. Temperatures ranged from a maximum of 106.4°F at 1900 hours on July 30 to a minimum of 65.6°F at 0630 hours on August 4 (Figure 1).

Winds averaged 2.7 miles per hour (mph) for the week with highest wind speed recorded on August 1 at 27.0 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: 70.9°F, forebay (weekly average of 8 positions); 70.1°F, gatewells (weekly average of 14 positions); 70.3°F, collection channel (weekly average of positions at Units 1, 8, and 12); and 70.1°F, JFF (weekly average of the separator and sample tank "B"). Forebay Unit 1 had the highest weekly average temperature, 71.5°F (Figure 3). The maximum temperature, 80.1°F, was recorded in Forebay Unit 1 at 1700 hours on August 4.

The average weekly temperature differentials within dam locations were: 2.0°F, forebay; 2.4°F, gatewells; 0.5°F, collection channel; and 0.1°F, JFF (Figure 4). The largest temperature differential, 8.8°F, was recorded in the gatewells at 1830 hours on August 4 (Unit 9 high, Units 3 and 6 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 11.3°F at 1700 hours on August 4 at Unit 1 (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 gatewell was warmer than the collection channel at Units 8 and 12. The collection channel was warmer than the gatewell at Unit 1. The largest temperature differential between the gatewell and corresponding collection channel location was 4.0°F at 1830 hours on August 4 at Unit 1 (collection channel warmer than the gatewell).

**Table 1**
**Bypass, Mortality, and River and Weather Conditions from July 31 to August 6**

| Date | Fish Collected | Fish Bypassed | Mortality | | Avg. River Flow | Avg. Turbine Flow | Avg. Spill | Air Temperature | | Wind Speed | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Sample | Facility | | | | Avg. | Max | Avg. | Max |
| 31-Jul | | | | | 198 | 80.3 | 112.9 | 86.3 | 106.4 | 2.4 | 9.0 |
| 1-Aug | 1,960 | 1,958 | 1 | 1 | 183.2 | 73.9 | 104.6 | 83.0 | 95.4 | 3.7 | 27.0 |
| 2-Aug | | | | | 191.8 | 77.7 | 109.4 | 78.3 | 93.9 | 1.9 | 10.0 |
| 3-Aug | 1,280 | 1,280 | 0 | 0 | 177.4 | 71.5 | 101.2 | 78.1 | 90.4 | 1.7 | 12.0 |
| 4-Aug | | | | | 160.6 | 64.2 | 91.8 | 76.8 | 94.0 | 2.5 | 12.0 |
| 5-Aug | 1,139 | 1,131 | 1 | 7 | 191.3 | 77.4 | 109.1 | 75.9 | 91.3 | 1.4 | 9.0 |
| 6-Aug | | | | | 188.7 | 76.3 | 107.7 | 79.1 | 92.2 | 5.4 | 11.0 |
| **Weekly Total** | **4,379** | **4,369** | **2** | **8** | **184.4** | **74.5** | **105.2** | **79.6** | **94.8** | **2.7** | **12.9** |

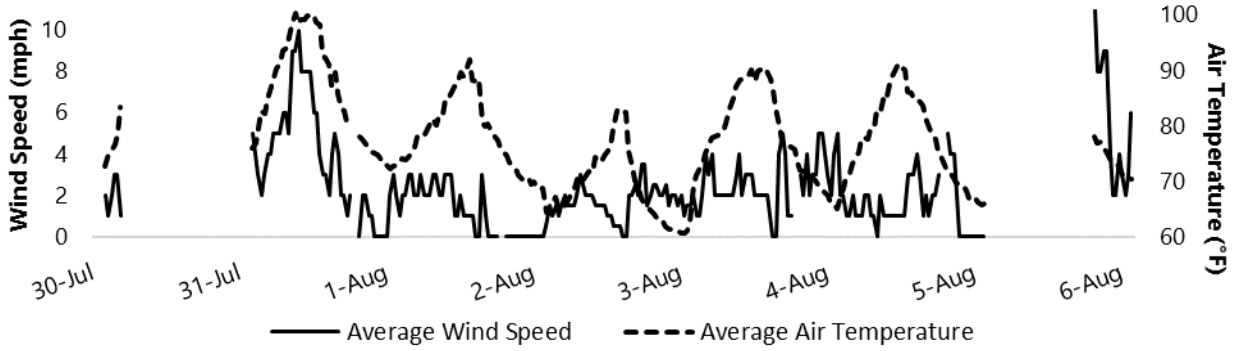


**Figure 1**
**Average Wind Speed and Air Temperature for Each Half-Hour Interval from July 31 to August 6**

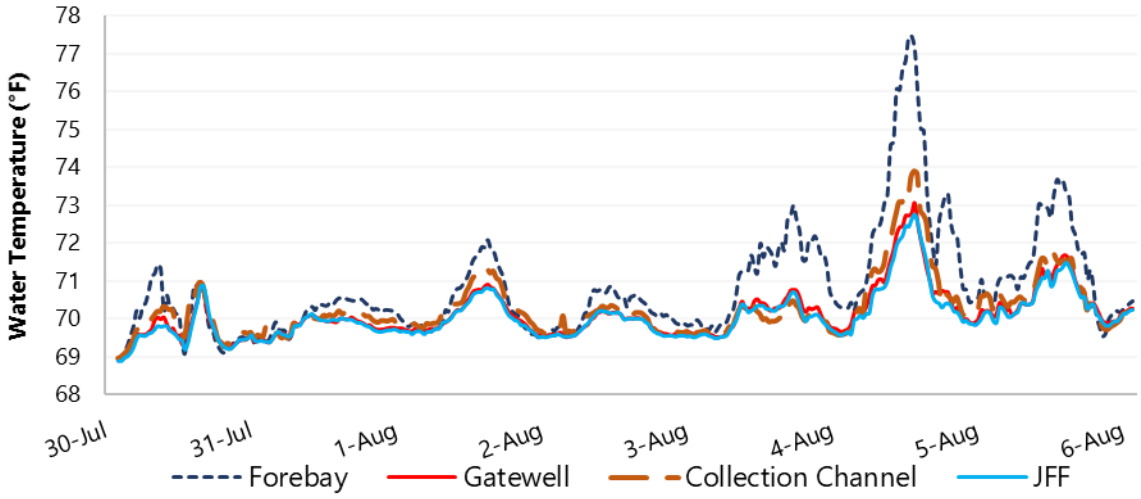


**Figure 2**
**Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from July 31 to August 6**

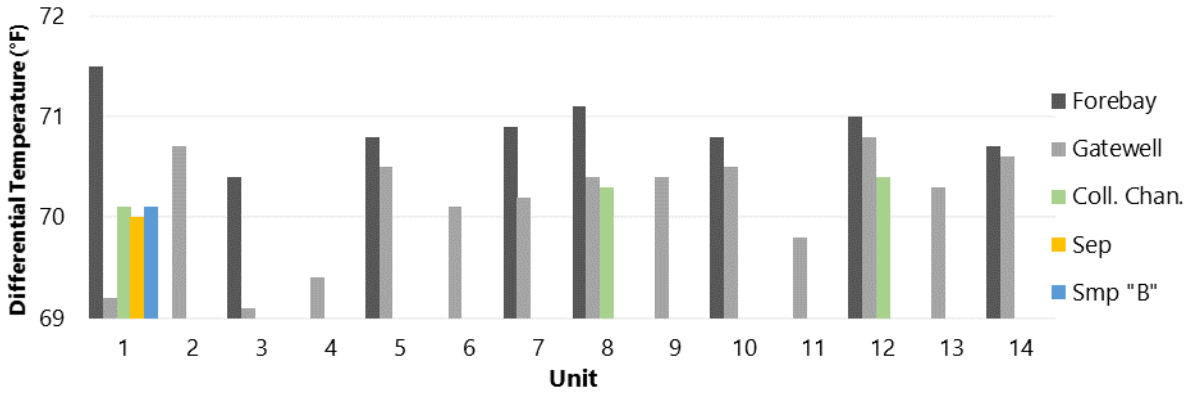


**Figure 3**
**Average Weekly Water Temperatures by Position for Five Dam Locations from July 31 to August 6**

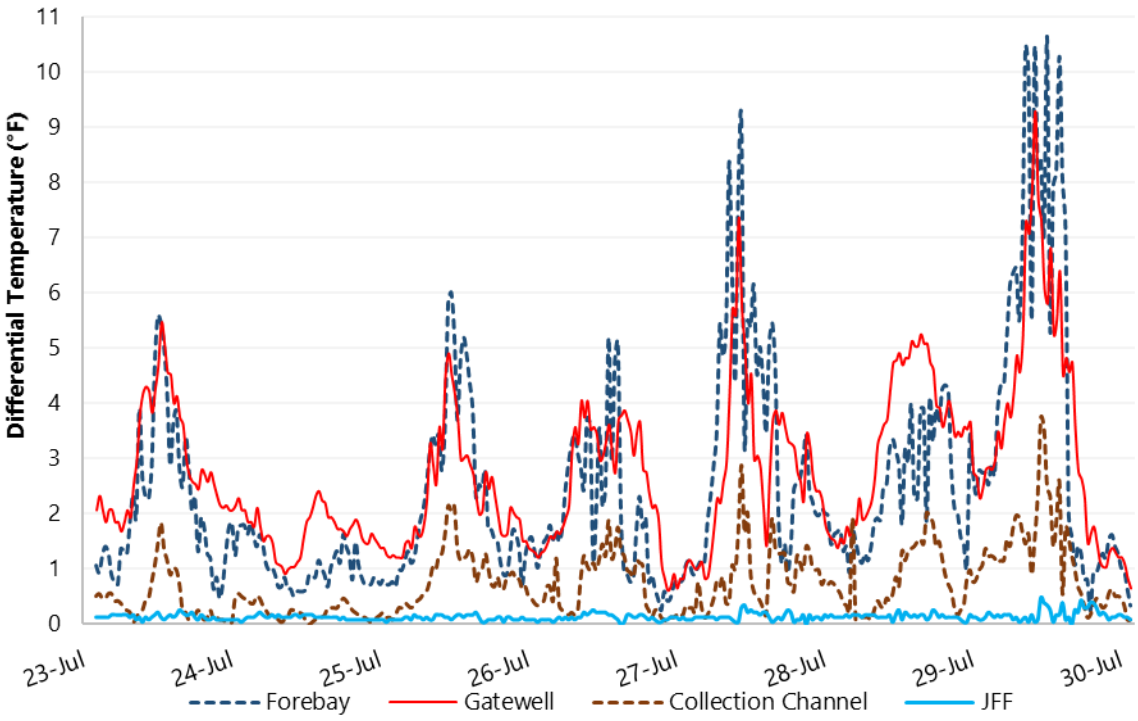


**Figure 4**
**Average Differential Temperatures Within Four Dam Locations from July 31 to August 6**

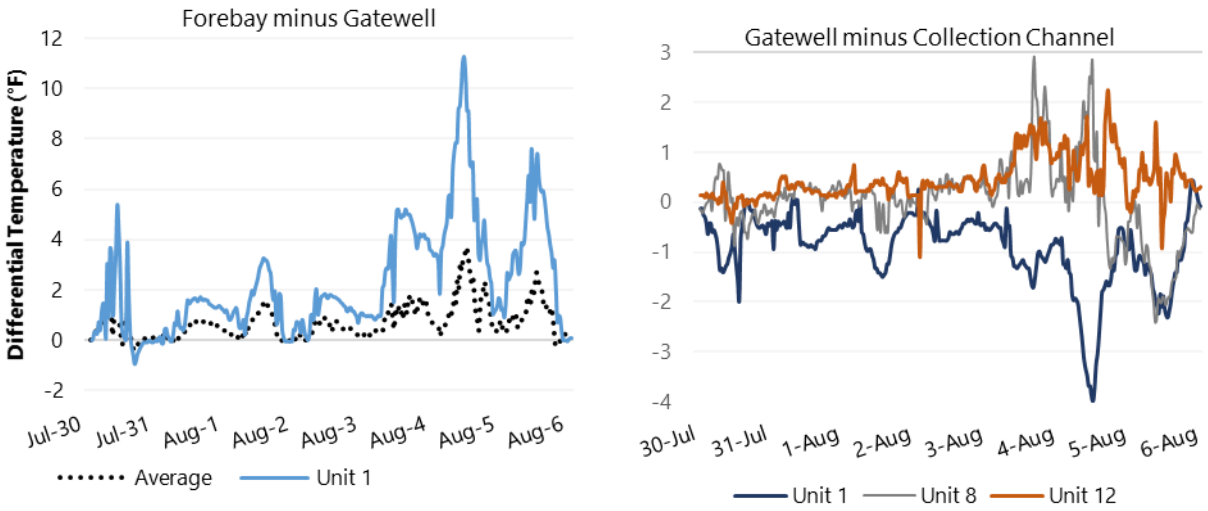


**Figure 5**
**Average Differential Temperatures across Three Dam Locations from July 31 to August 6**