# Weekly Temperature Report
# McNary Dam

July 12, 2021

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Report Period: July 2 through July 8

Report No. 2021 MCN Dam Temperature Weekly Report 0702–0708 by EAS

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

Temperature monitoring at the McNary juvenile collection system began at 1200 hours on June 14 and is scheduled to continue through 0700 hours on August 31. Wind speed data used in this report is from the National Weather Service station at the Hermiston Municipal Airport in Oregon. The air temperature data was obtained via an Onset temperature logger located on site at the McNary Juvenile Fish Facility (JFF). Due to elevated river temperatures, the “sawtooth pattern” (operate every other unit) unit operation mode begun on June 30 continued through this report period to reduce thermal stress to juvenile salmonids passing through the collection system.

## Fish Collection

An estimated 30,001 juvenile salmonids were collected and 29,990 bypassed at the McNary JFF (Table 1). Weekly fish mortalities were 5 in the sample and 6 in the facility.

## River Conditions

Average river flow for this reporting period was 186.0 kilo cubic feet per second (kcfs) with an average spill of 106.3 kcfs.

## Temperature Logger Operations

Temperature loggers were deployed on June 14. Temperature loggers in Forebay 7 and 14 were replaced on July 7 and 4.

## Weather Conditions

The weekly average air temperature from July 2 to July 8 was 79.5°F. Air temperatures ranged from a maximum of 98.4°F on July 5 to a minimum of 65.7°F on July 8 (Figure 1). Wind speeds averaged 10.8 mph with gusts to 28.8 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: 70.3°F, forebay (weekly average of eight positions); 69.5°F, gatewells (weekly average of 13 positions); 69.7°F, collection channel (weekly average of positions at Units 1, 8, and 12); and 69.4°F, JFF (weekly average of the separator and sample tank “B”). Forebay Unit 3 had

the highest weekly average temperature, 70.8°F (Figure 3). The maximum temperature, 79.8°F, was recorded in Forebay Unit 3 at 1730 hours on July 6.

The average weekly temperature differentials within dam locations were: 2.3°F, forebay; 3.4°F, gatewells; 0.8°F, collection channel; and 0.2°F, JFF (Figure 4). The largest temperature differential, 9.7°F, was recorded in the gatewells at 1800 hours on July 6 (Unit 13 high, Unit 6 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 1.0°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 11.6°F at 1730 hours on July 6 at Unit 3 (forebay warmer than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 1.0°F. On average, the gatewells were warmer than the collection channels at Units 1 and 12. The largest temperature differential between the gatewell and corresponding collection channel location was 3.6°F at 2030 hours on July 5 at Unit 8 (collection channel was warmer than the gatewell).

**Table 1**
**Bypass, Mortality, and River and Weather Conditions from July 2 to July 8**

| Date | Fish Collected | Fish Bypassed | Mortality | | Avg. River Flow | Avg. Turbine Flow | Avg. Spill | Air Temperature | | Wind Speed | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Sample | Facility | | | | Avg. | Max | Avg. | Max |
| 2-Jul | 9,200 | 9,198 | 1 | 1 | 196.4 | 79.5 | 112.2 | 76.9 | 90.4 | 13.5 | 18.4 |
| 3-Jul | | | | | 218.7 | 89.1 | 124.9 | 78.8 | 95.3 | 8.6 | 15.0 |
| 4-Jul | 7,150 | 7,150 | 0 | 0 | 193.4 | 78.1 | 110.6 | 80.2 | 96.0 | 10.7 | 16.1 |
| 5-Jul | | | | | 169.3 | 67.9 | 96.7 | 79.6 | 90.4 | 12.8 | 21.9 |
| 6-Jul | 7,901 | 7,894 | 2 | 5 | 171.9 | 69 | 98.2 | 80.8 | 98.4 | 8.5 | 17.3 |
| 7-Jul | | | | | 183.1 | 73.8 | 104.6 | 82.1 | 96.0 | 4.2 | 8.1 |
| 8-Jul | 5,750 | 5,748 | 2 | 0 | 169.2 | 67.5 | 97.1 | 78.0 | 88.7 | 17.6 | 28.8 |
| **Weekly Total** | **30,001** | **29,990** | **5** | **6** | **186.0** | **75.0** | **106.3** | **79.5** | **93.6** | **10.8** | **17.9** |

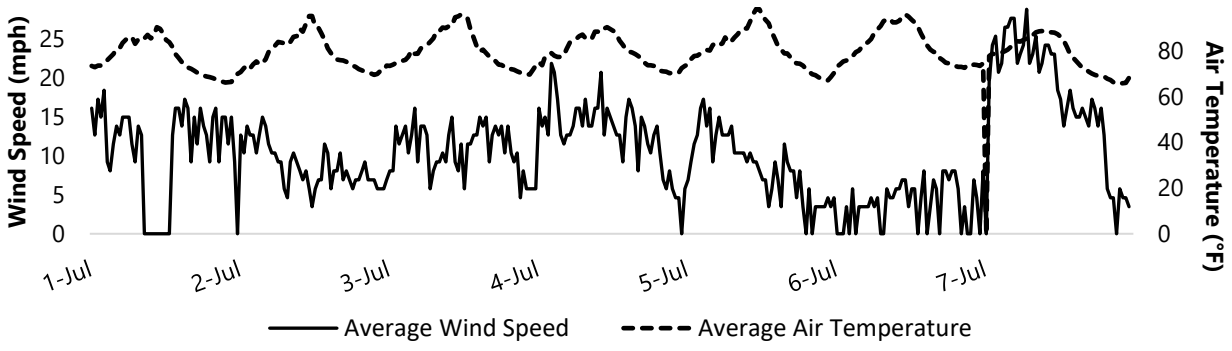


**Figure 1**
**Average Wind Speed and Air Temperature for Each Half-Hour Interval from July 2 to July 8**

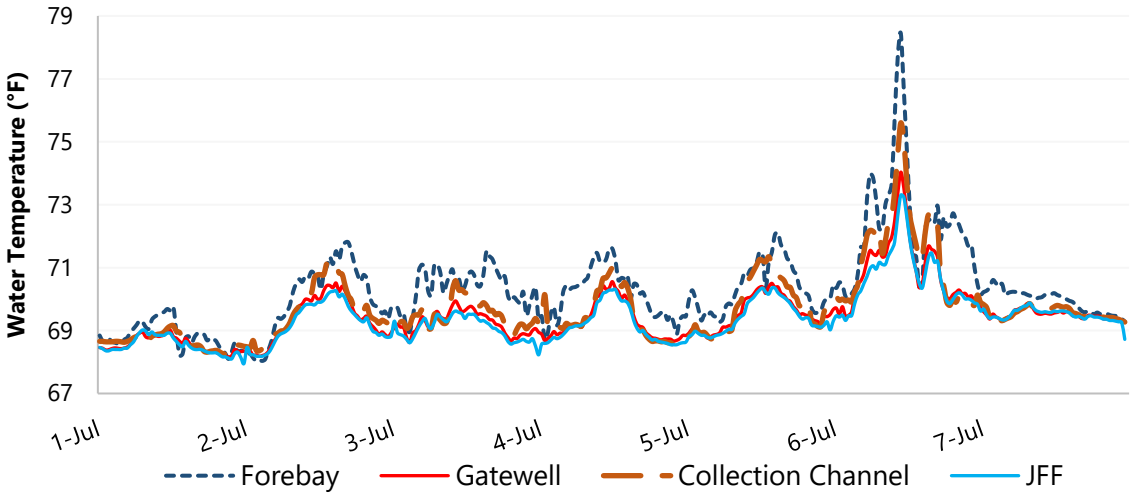


**Figure 2**
**Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from July 2 to July 8**

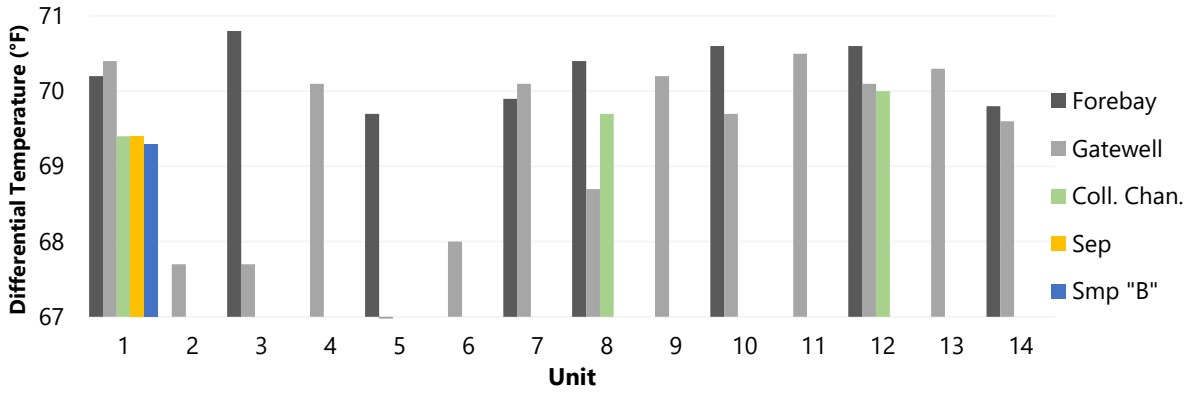


**Figure 3**
**Average Weekly Water Temperatures by Position for Five Dam Locations from July 2 to July 8**

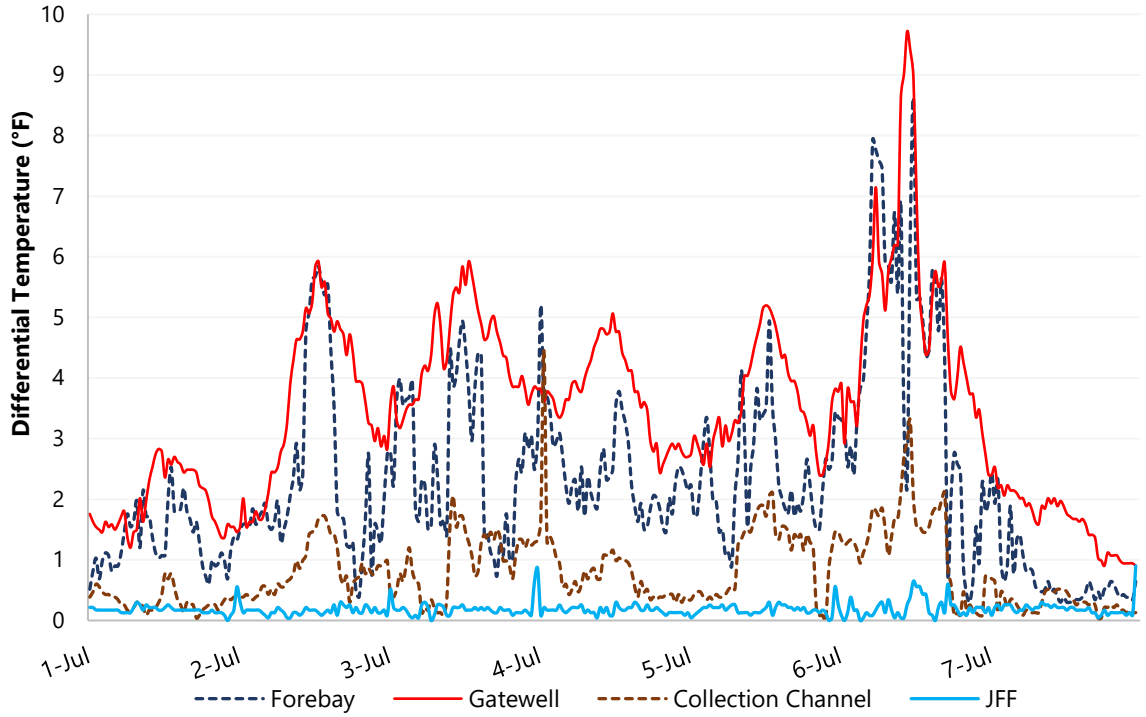


**Figure 4**
**Average Differential Temperatures within Four Dam Locations from July 2 to July 8**

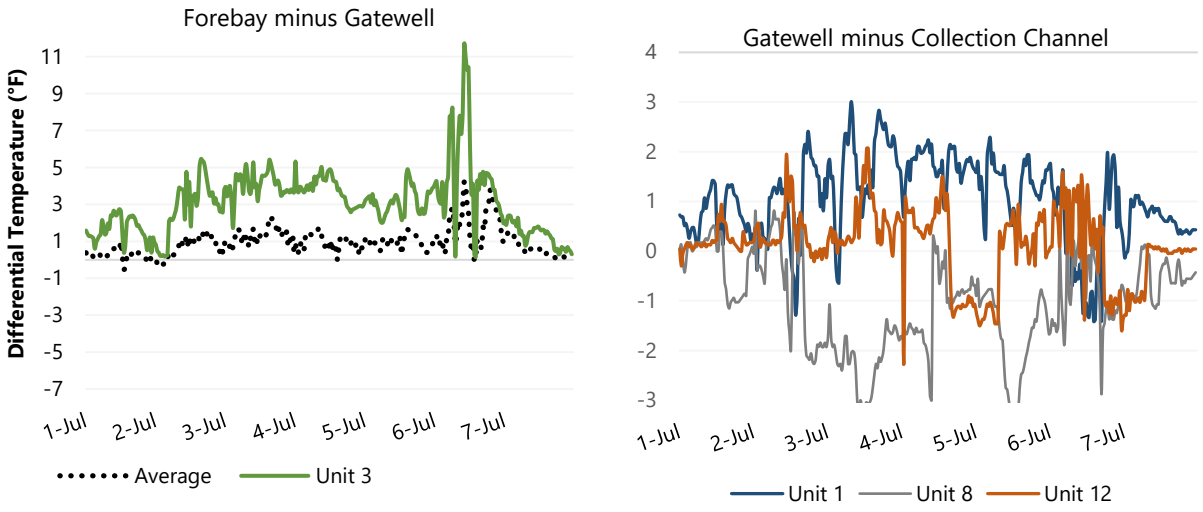


**Figure 5**
**Average Differential Temperatures across Three Dam Locations from July 2 to July 8**