

**Project Name** | Weather Station Monitoring Program**Date** | 2/12/2026**To / Contact info** | BCWD Board of Managers**Cc / Contact info** | Karen Kill, District Administrator**From / Contact info** | Mike Majeski, Conservation Biologist**Regarding** | 2025 Weather Summary

## Background

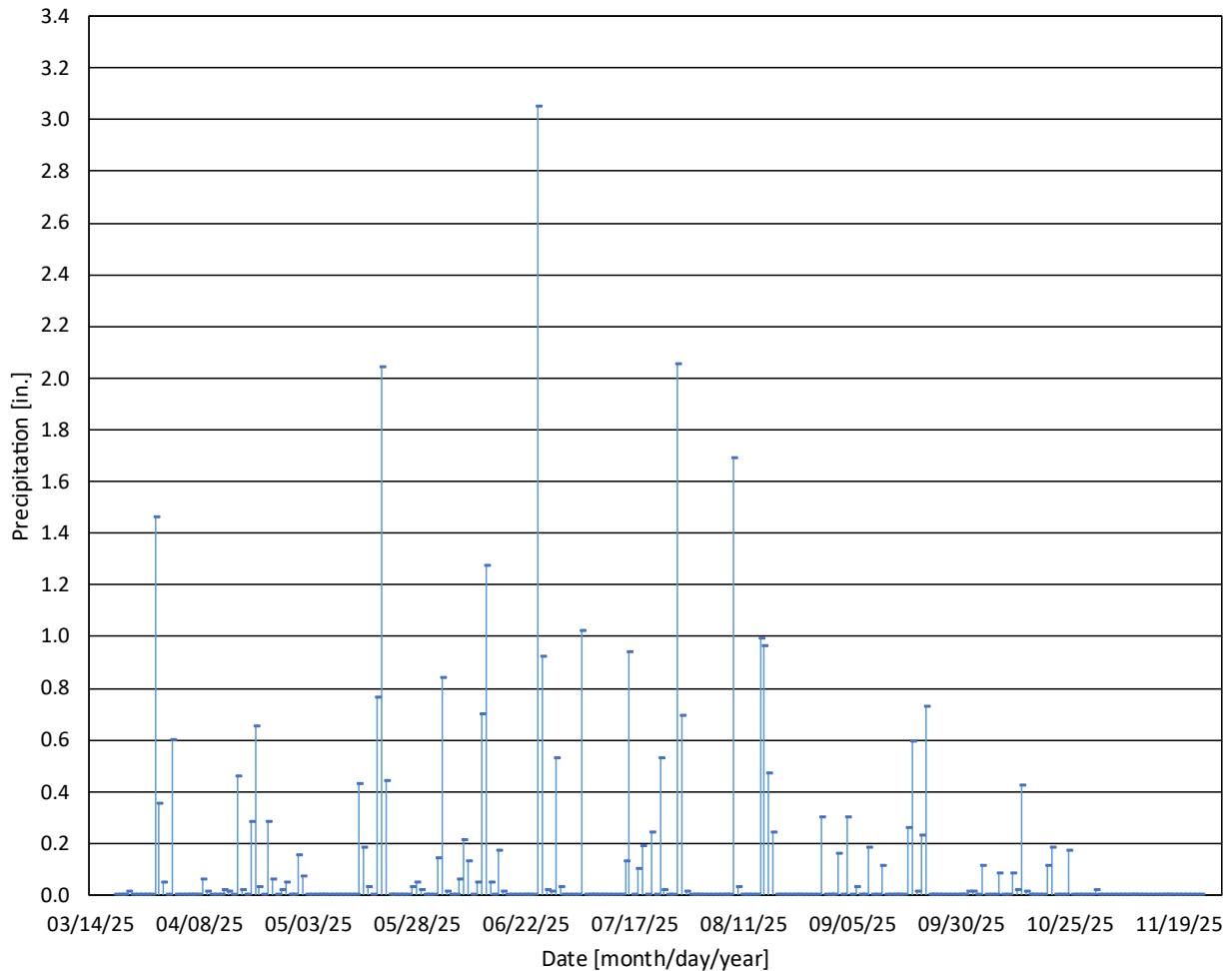
The BCWD weather station has been in operation since 2012. Each season, the weather station is installed on top of the vegetated berm at the Stillwater Public Works Facility and collects the following data: precipitation, air temperature, relative humidity, dew point, solar radiation, wind speed, gust speed, and wind direction. The weather station is programmed to collect data from spring through fall each season and is removed during the winter months. This information is being collected to support a variety of District programs such as hydrologic and hydraulic model upgrades and calibration (which require 15-minute precipitation data), thermal modeling efforts, and other projects including the Settlers Glen iron-enhanced sand filter, THPP, and the Biological Monitoring Program. The weather station data is also routinely shared with the Washington Conservation District (WCD).

The objective of this memorandum is to summarize temperature and precipitation data recorded in 2025 and how the data relates to temperatures recorded in Brown's Creek, particularly in the Brown's Creek gorge where cool and coldwater dependent species occur including rainbow darter, brown trout, and several macroinvertebrate species that have specific thermal and dissolved oxygen requirements to survive (e.g., stoneflies).

## 2025 Weather Summary

The BCWD weather station was installed at the Stillwater Public Works Facility (latitude: 45°03'49.86", longitude: 92°51'21.05") on March 20, 2025, and was removed on November 24, 2025. During this timeframe, a total of 31.24" of precipitation was recorded, including seven rain events exceeding one inch (Figure 1). Above average monthly precipitation occurred in May (+0.62", total of 4.20"), June (+3.44", total of 8.20"), and July (+1.23", total of 5.92"). Dry periods occurred in April, August, September, and October and resulted in below average precipitation totals for those months: April (-0.32", total of 2.55"), August (-0.24", total of 4.68"), September (-0.98", total of 2.60"), and October (-1.38", total of 1.22"). Notable dry periods over the course of the monitoring season included: Apr 3-16 (0.10" in 14 days), Sept. 23-Oct. 11 (0.21" in 19 days), and Oct. 26-Nov 24 (0.02" in 30 days).

Air temperatures recorded at the weather station fluctuated above and below the average high and low temperatures throughout the monitoring season, and there were 12 days when the maximum air temperature exceeded 90°F (Table 1 and Figure 2). Since 2017, there have been five monitoring seasons when air temperatures have exceeded 90°F for 12 or more days, which resulted in WOMP water



**Figure 1. Daily precipitation recorded by the BCWD weather station (March 20 - November 24, 2025).**

temperatures exceeding 70°F between 0-8 days per year. However, in 2025, WOMP water temperatures exceeded 70°F on 21 days which is the most since 2012 when the weather station monitoring program began. This is notable since several aquatic species in Brown’s Creek require cold water temperatures to survive and reproduce. For example, brown trout can become physiologically stressed when water temperatures exceed 65°F, and young trout may stop feeding when water temperatures exceed 71°F (personal comm. MNDNR Fisheries).

There are multiple factors that influence instream temperatures that require detailed analysis beyond the scope of this project; however, the data summarized in Table 1 suggest that in the absence of large beaver dams in the creek, a combination of warm air temperatures with concurrent precipitation events appear to have a greater effect on instream temperatures than warm air temperatures alone. For example, since 2012, 2021 had the greatest number of days above 90°F and the warmest nights (nights when the low air temperature was above the average low), yet there was only one day when water temperatures exceeded 70°F at the WOMP station that year. 2021 was also the second driest year (from May 1-Sept.1) since the

**Table 1. Air and water temperature trends for Brown's Creek during warm weather months (May 1-September 1, 2012-2025)**

Year	# days with max. air temp above 90° F	# nights with low air temp above average low [°F]	Average low air temp. above average low [°F]	# days when WOMP water temp. exceeded 70°F	Total precip. May 1-Sept 1 [in.]	Total precip. [in.] on days when WOMP water temp. exceeded 70°F
2012	20	43	5.10	21	17.26	5.28
2013	12	34	4.74	11	17.31	2.12
2014	0	25	4.64	7	21.28	0.10
2015	2	25	3.37	4	21.14	1.55
2016	12	38	3.79	10	20.80	4.96
2017	9	16	3.27	0	17.12	N/A
2018	18	45	4.58	8	15.84	3.10
2019	5	15	2.02	1	22.93	0.83
2020	15	42	4.20	8	21.68	3.14
2021	34	33	7.03	1	12.14	0
2022	16	30	4.69	1	13.30	0
2023	24	34	4.03	0	9.26	N/A
2024	4	29	3.51	0	25.76	N/A
2025	12	33	4.56	21*	23.00	4.46

\*data influenced by a large beaver dam that was present throughout the monitoring season downstream of Manning Avenue

weather station was installed in 2012. Conversely, the years that had greater precipitation totals during warm weather periods had the greater number of days when the WOMP water temperature exceeded 70°F. Since the inception of the weather station monitoring program, 2023 had the second most days above 90°F but was also the driest year (from May 1-Sept.1), and WOMP water temperatures never exceeded 70°F at any point during that monitoring season. It should be noted that since 2012, 2025 was the only monitoring season when a large beaver dam was present downstream of Manning Avenue. This dam backup up water upstream of Manning Avenue, and WCD staff recorded elevated water temperatures at all stream crossings between Manning Avenue and McKusick Road.

## Recommendations

Although beaver dams have been beneficial in the headwaters area of Brown's Creek and within the tributaries upstream of the Diversion Structure, it is recommended the large beaver dam downstream of Manning Avenue be removed in the spring of 2026 to reduce elevated water temperatures as recorded in 2025 to protect the coldwater resources in Brown's Creek. Since the beaver dam occurs on private property (Costa, Figure 3), BCWD staff will need permission from the landowner to remove the dam.

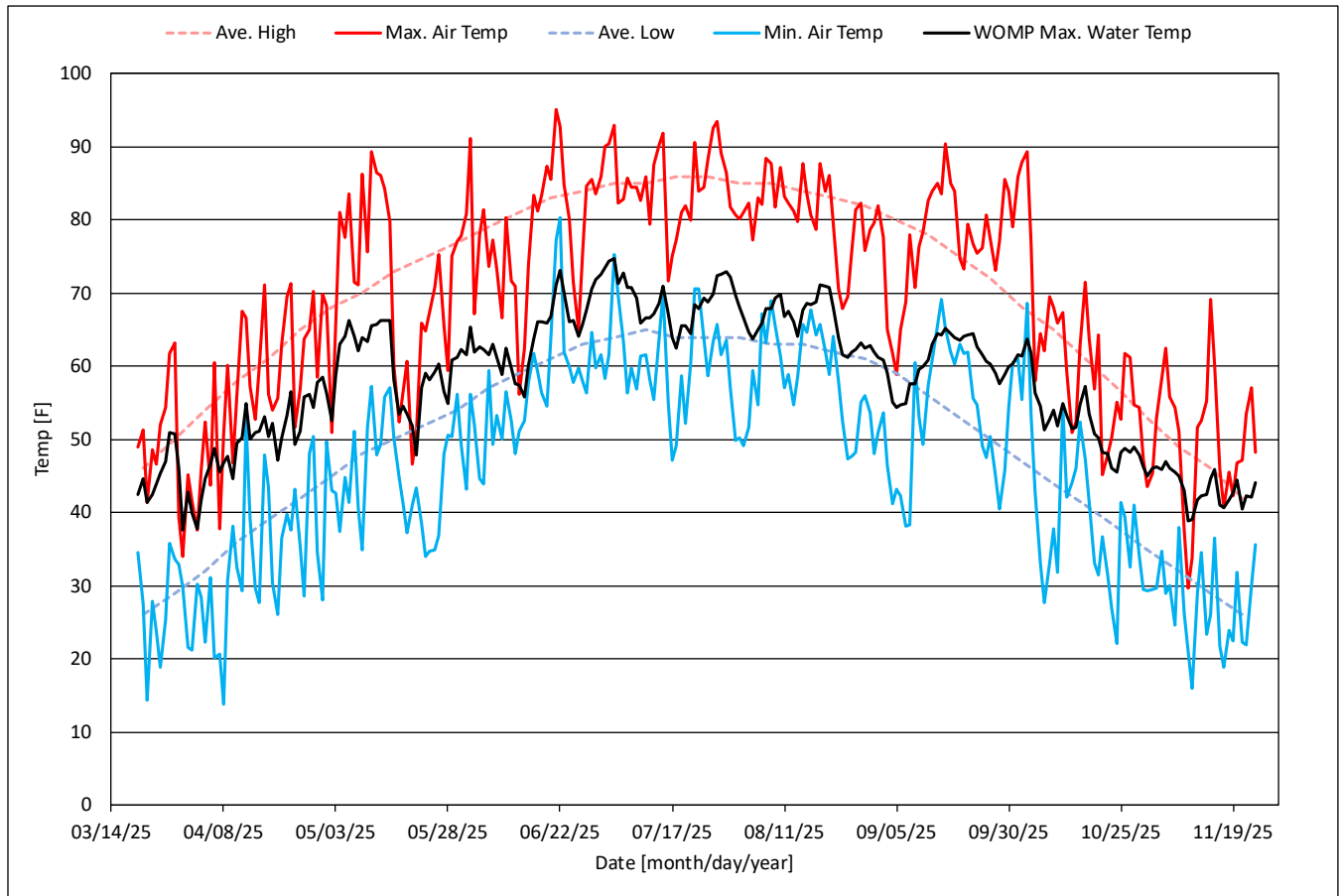


Figure 2. Daily maximum and minimum temperatures recorded by the BCWD weather station and WOMP daily maximum water temperatures recorded by the WCD/ Met Council. Average air temperature data source: <https://weather.com/weather/monthly/l/45.067273,-92.854033>

### Weather Station Maintenance

During the monitoring season, the weather station was visited periodically to download data and check for sensor fouling. All weather sensors were inspected in the fall of 2025, and no upgrades or replacements are needed at this time.

### 2026 Scope of Services

The following outlines the costs associated with equipment preparation, precipitation gauge calibration, data collection, and reporting for the 2026 monitoring season (March to November). All data collected will be forwarded to the Washington Conservation District and other entities as requested.

Task	Hours	Estimated Cost
Precipitation Calibration & Installation of Weather Station, End of Season Removal, Mileage	6	\$1,450
Monthly Download of Data (6 months)	5	\$1,120
Data QA/QC, Report, Data Storage	6	\$1,350
Expenses	N/A	\$260*
<b>TOTALS</b>	<b>17</b>	<b>\$4,180</b>

\* Includes the cost for sensor replacement if needed in 2026 (temp/ humidity or pyranometer sensor)

**Requested Action**

1. Approve this scope of services from account number 957-0000 to operate the BCWD weather station in 2026.



Figure 3. Location of the large beaver dam in the Costa wetland.