## Summary of Data

Water quality sampling occurred at six sites within the Lake Glenville watershed on 12/10/25. All sites were located as close as possible to sites sampled in previous monitoring years; the location for the Glenville Creek sample was again sampled downstream at its standard location. A very light rain had occurred in the early morning prior to sampling on 12/10/25, the area received 0.2 inches of rain on 12/04/25 and 12/05/25, and 0.08 inches on 12/08 (Figure 1). Stream flows were normal base flow. The suite of parameters sampled included water temperature, dissolved oxygen (DO), pH, specific conductivity, turbidity, fecal coliform, E.coli, ammonia, nitrite/nitrate, phosphate, and alkalinity.

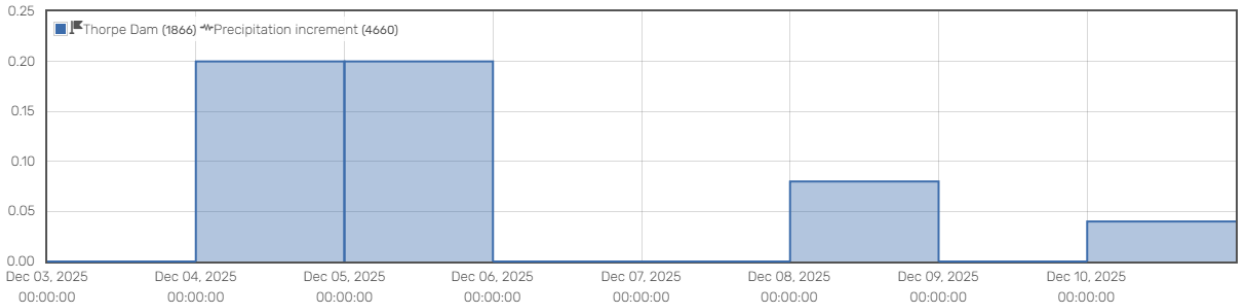



*Figure 1. Precipitation for the week of sampling.*

**Turbidity was less than 6 NTU for all sites**. The state standard for North Carolina streams that carry the Trout Waters (Tr) designation is that turbidity shall not exceed 10 NTU. Pine Creek, Mill Creek, Norton Creek, Hurricane Creek, and Cedar Creek all carry the Tr classification. Glenville Creek is too small to be classified under this system. The regional Volunteer Water Information Network (VWIN) mean is 11.4 NTU.

Dissolved oxygen is the amount of oxygen dissolved in water. The concentration of dissolved oxygen in surface water is affected by temperature and has both a seasonal and a daily cycle. Cold water can hold more dissolved oxygen than warm water. In winter and early spring, when the water temperature is low, the dissolved oxygen concentration is high. In summer and fall, when the water temperature is high, the dissolved oxygen concentration is often lower. Dissolved oxygen is important for ecological health as most aquatic organisms need oxygen to survive and grow. Some species, such as trout and stoneflies, require high DO levels (>6 mg/L) for survival, and trout show improved reproductive health when DO levels are above 10 mg/L. **Dissolved oxygen concentrations for the sampling event ranged between 10.2 mg/L in Glenville Creek and 11.5 mg/L in Cedar Creek.**

An increase in observed acidity had been a concern over the course of a few samplings in both the tributaries to Lake Glenville and the lake itself. However, during the most recent tributary samplings pH values have settled around the regional VWIN mean (7.1). As has been stated previously, acidic waters are not uncommon for high elevation streams in the area. Depths to

bedrock are shallow with thin soils and rock types do not have a mineralogy that buffers groundwater as it moves through the ground and remerges in the streams. However, there are anthropogenic sources which can increase the acidity in streams to levels which are unhealthy for trout (below 5.0). High elevation areas of eastern Tennessee and western North Carolina receive elevated rates of atmospheric acid deposition in comparison with other areas on the east coast, resulting in increased episodic stream acidification events, adding to the acidification of soil and surface waters. Episodic stream acidification occurs when heavy rain downpours bring increased acidic deposition to soils and water bodies, resulting in periods of increased stream flow and decreased water pH.

The issue of acidity is complicated by the fact that rain is, on average, much more acidic in the summer than in the winter. Continued monitoring of acidity will help increase awareness of any potential problems. It is important to note that although the effects of the issue are felt locally, it originates at a regional, continental scale and is not a "stand-alone" problem. It relates intimately to energy, land use, urban, transport, and other socioeconomic issues.
**On 12/10/25 pH values ranged from 6.9 to 7.4, with one outlier of 7.7 at Pine Creek. Although it's impossible to know with limited information, it is possible this is a result of lime application to fields int the drainage of Pine Creek.**

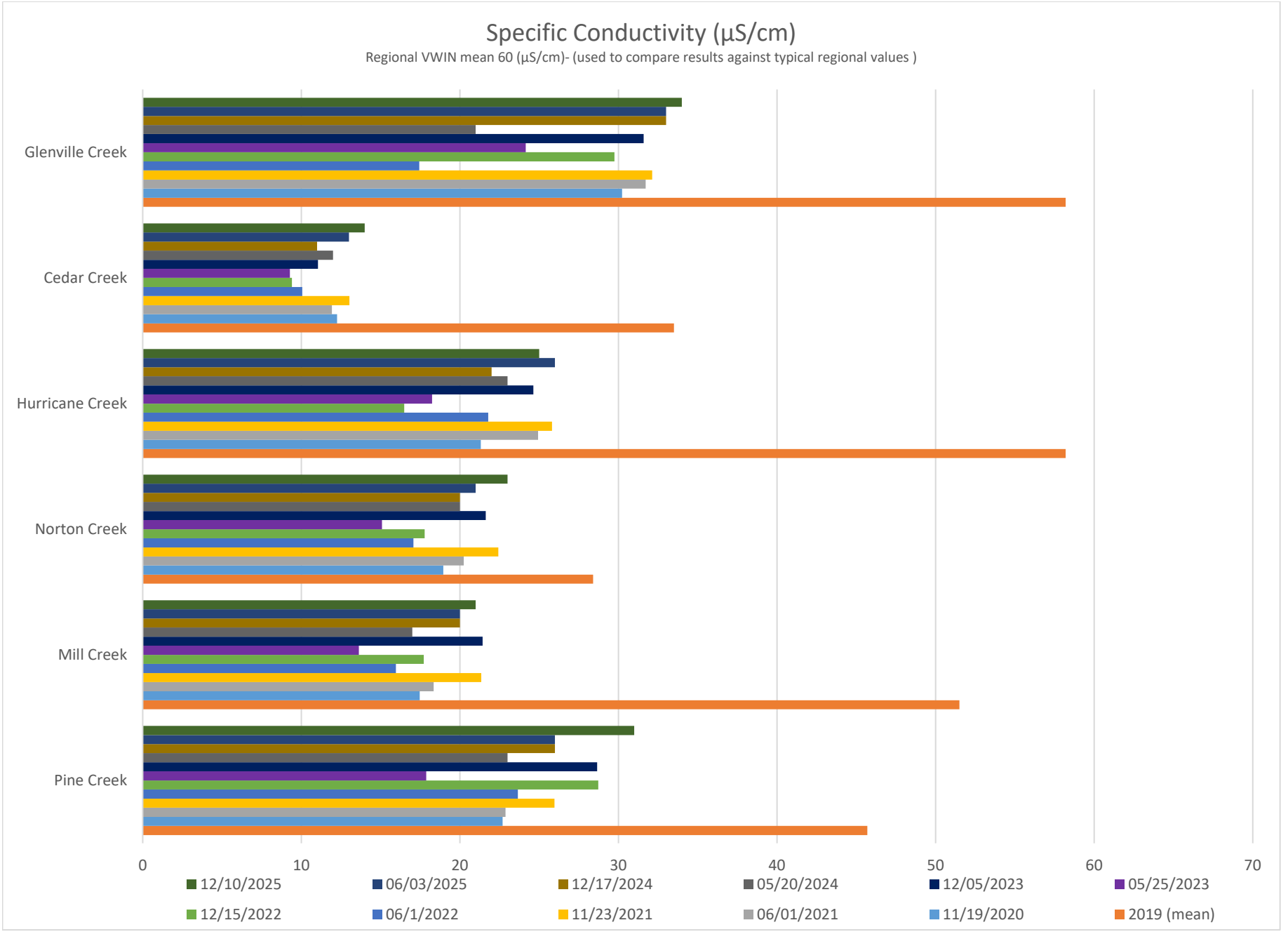
Ammonia concentrations were in line with those previously observed at all the sampled locations**. Ammonia values ranged from 0.03 mg/L to 0.06 mg/L**. All streams were under the Regional VWIN mean of 0.09 mg/L. Ammonia is produced by bacterial decomposition of organic matter that accumulates in stream sediment; therefore, we would expect to see higher ammonia values following rainfall events relative to periods of drought.

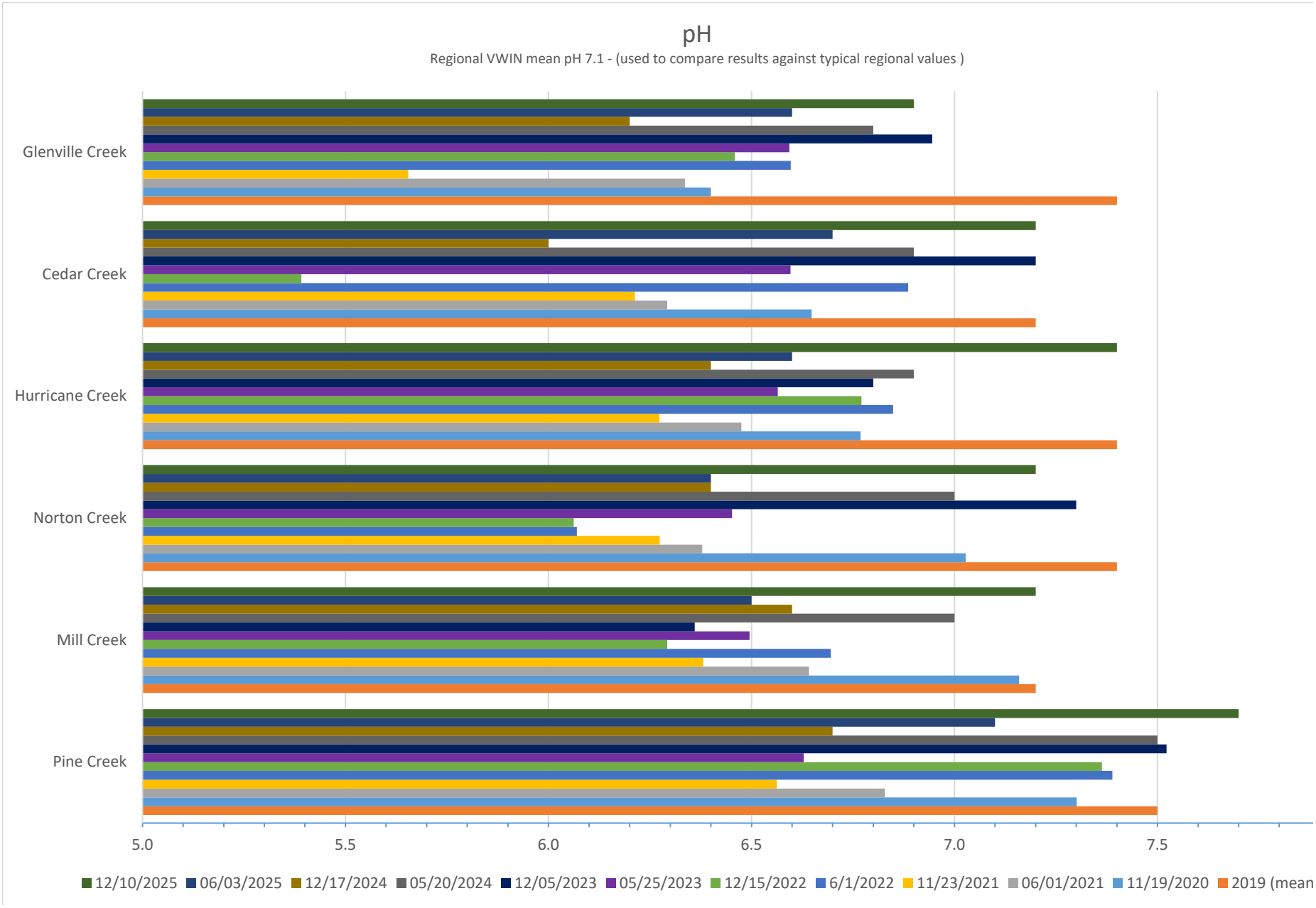
**Nitrite/Nitrate-Nitrogen concentrations were very low, ranging between 0.1 mg/L and 0.2 mg/L**, well below the regional VWIN average of 0.5 mg/L. **Phosphorus concentrations ranged from 0.1 mg/L to 0.03 mg/L**. The regional VWIN average for phosphorus is 0.02 mg/L. Grass fertilizers and livestock are a frequent source of phosphorus. Once in the stream and lake system, rainfall can disturb the sediments, resulting in internal loading of previously deposited phosphorus.

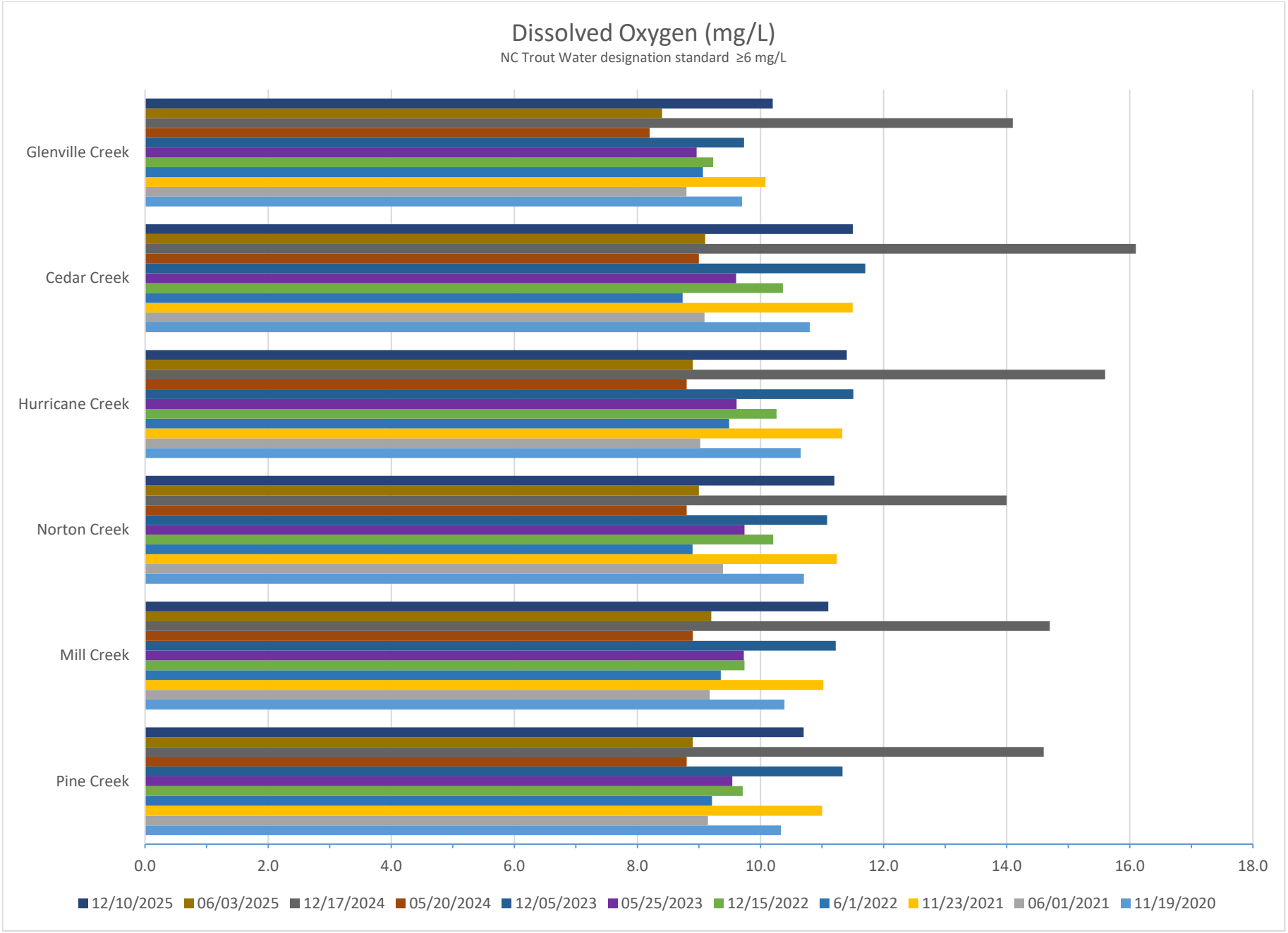
Under state rules, fecal coliform in fresh waters "shall not exceed a geometric mean of 200 colony forming units (CFU)/100 mL based upon at least five consecutive samples examined during any 30-day period, nor exceed 400 CFU/100 mL in more than 20 percent of the samples examined during such period.". As such, any single sample is difficult to compare to the state standard, but as a rule of thumb low numbers are good and numbers exceeding 200 CFU/100 mL are bad. However, violations of the state standard are expected during heavy rainfall events and may be caused by uncontrollable nonpoint source pollution. Nonpoint source pollution comes from contaminants that end up on the ground naturally or from human activity. Rainwater and snowmelt pick up these contaminants as it washes over yards, sidewalks, driveways, parking lots, and fields and deposits them into lakes and streams as nonpoint source pollution. Common sources of nonpoint source pollution in the Lake Glenville watershed could include:

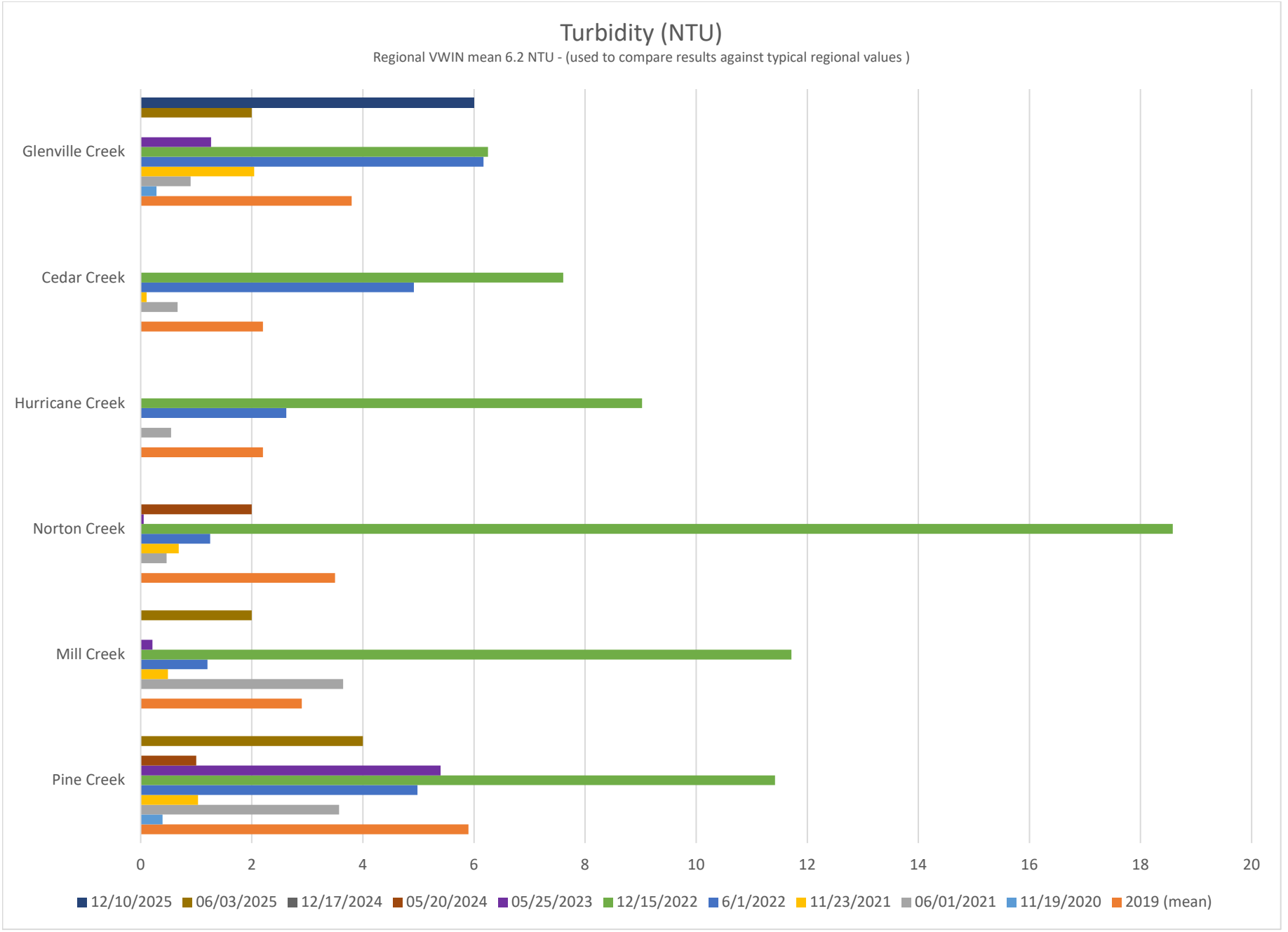
- animal production operations and feedlots;
- agricultural activities;
- stream bank and shoreline erosion;
- timber harvesting;
- land development;
- on-site sewage disposal units;
- atmospheric deposition.

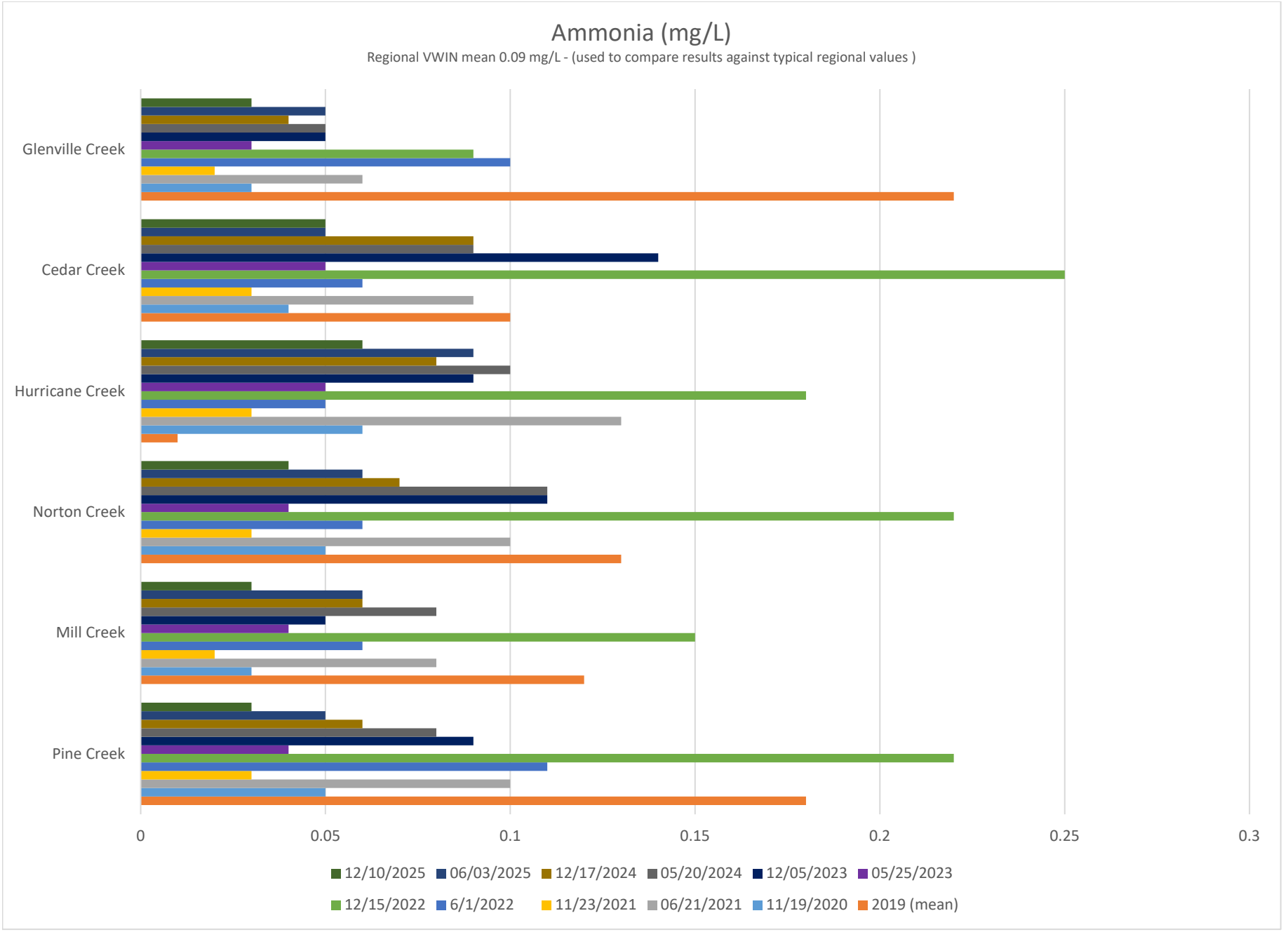
**Fecal coliform concentrations ranged from 3 CFU/100 mL in Hurricane Creek to 81 CFU/100 mL in Pine Creek. The E. Coli bacteria concentration in Pine Creek was 199 Most Probable Number (MPN).**

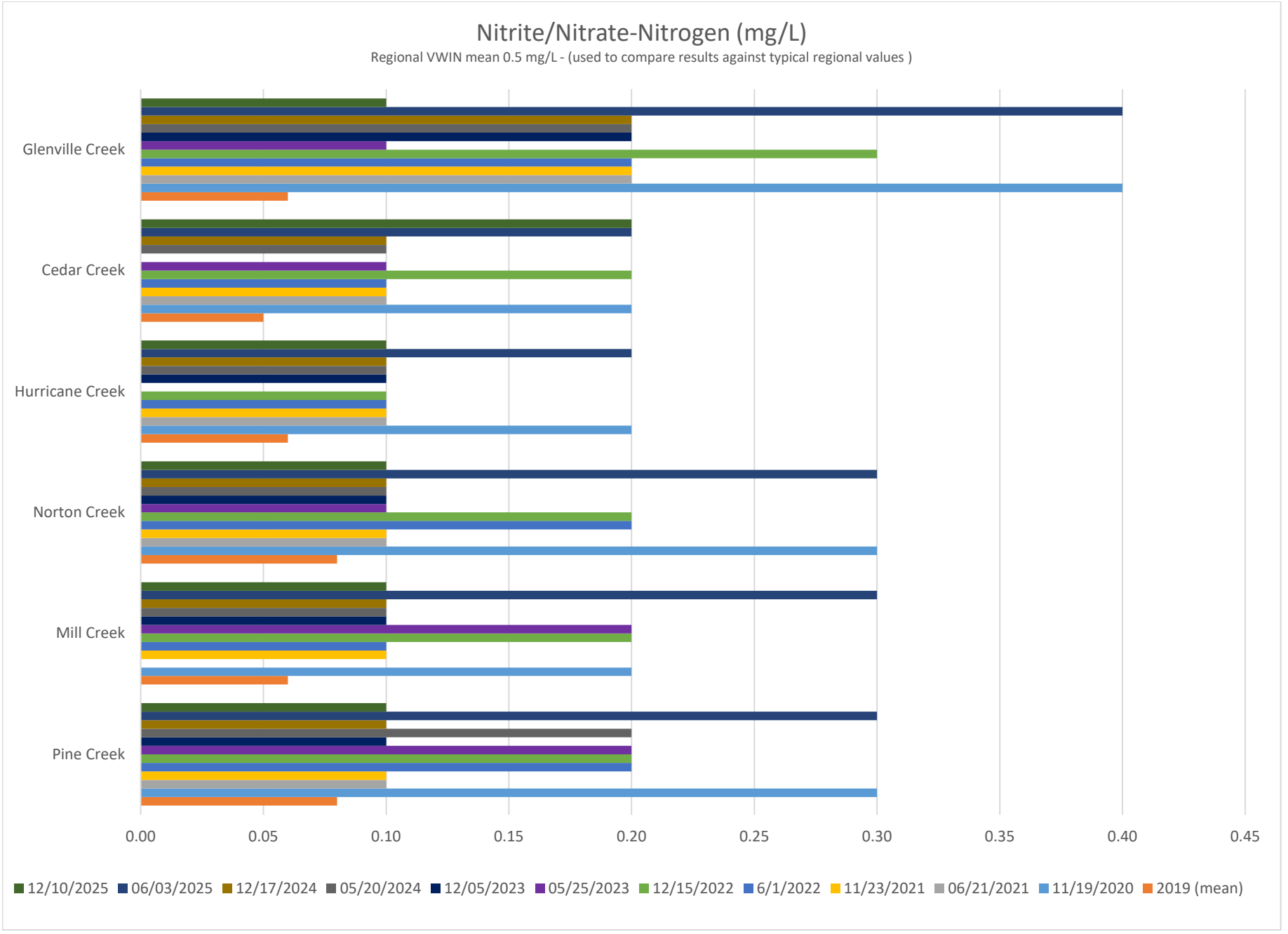

Specific Conductivity (µS/cm)
Regional VWIN mean 60 (µS/cm)- (used to compare results against typical regional values )
Glenville Creek
Cedar Creek
Hurricane Creek
Norton Creek
Mill Creek
Pine Creek
0
10
20
30
40
50
60
70
12/10/2025
06/03/2025
12/17/2024
05/20/2024
12/05/2023
05/25/2023
12/15/2022
06/1/2022
11/23/2021
06/01/2021
11/19/2020
2019 (mean)

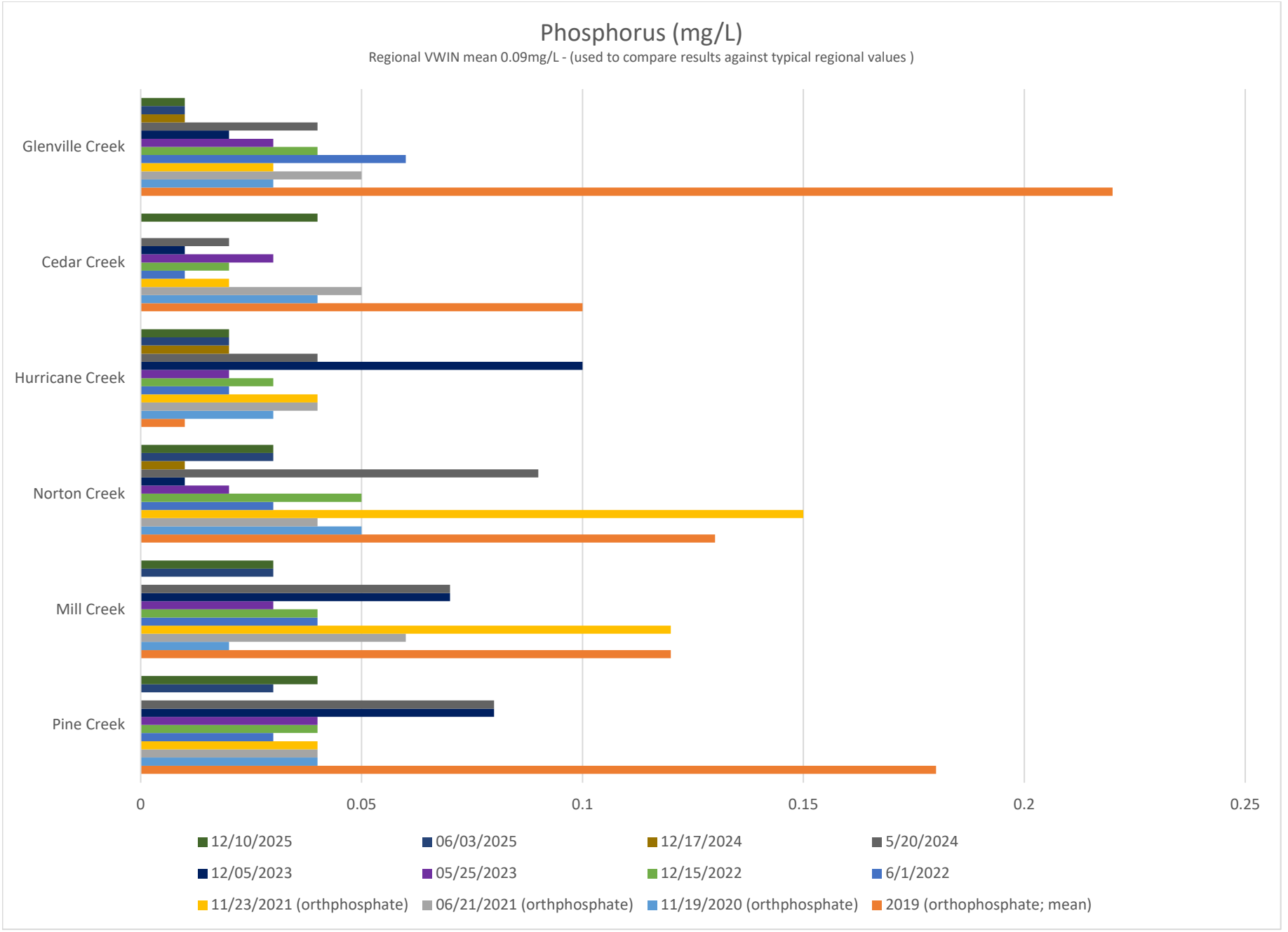

pH
Regional VWIN mean pH 7.1 - (used to compare results against typical regional values )
Glenville Creek
Cedar Creek
Hurricane Creek
Norton Creek
Mill Creek
Pine Creek
5.0
5.5
6.0
6.5
7.0
7.5
12/10/2025
06/03/2025
12/17/2024
05/20/2024
12/05/2023
05/25/2023
12/15/2022
6/1/2022
11/23/2021
06/01/2021
11/19/2020
2019 (mean

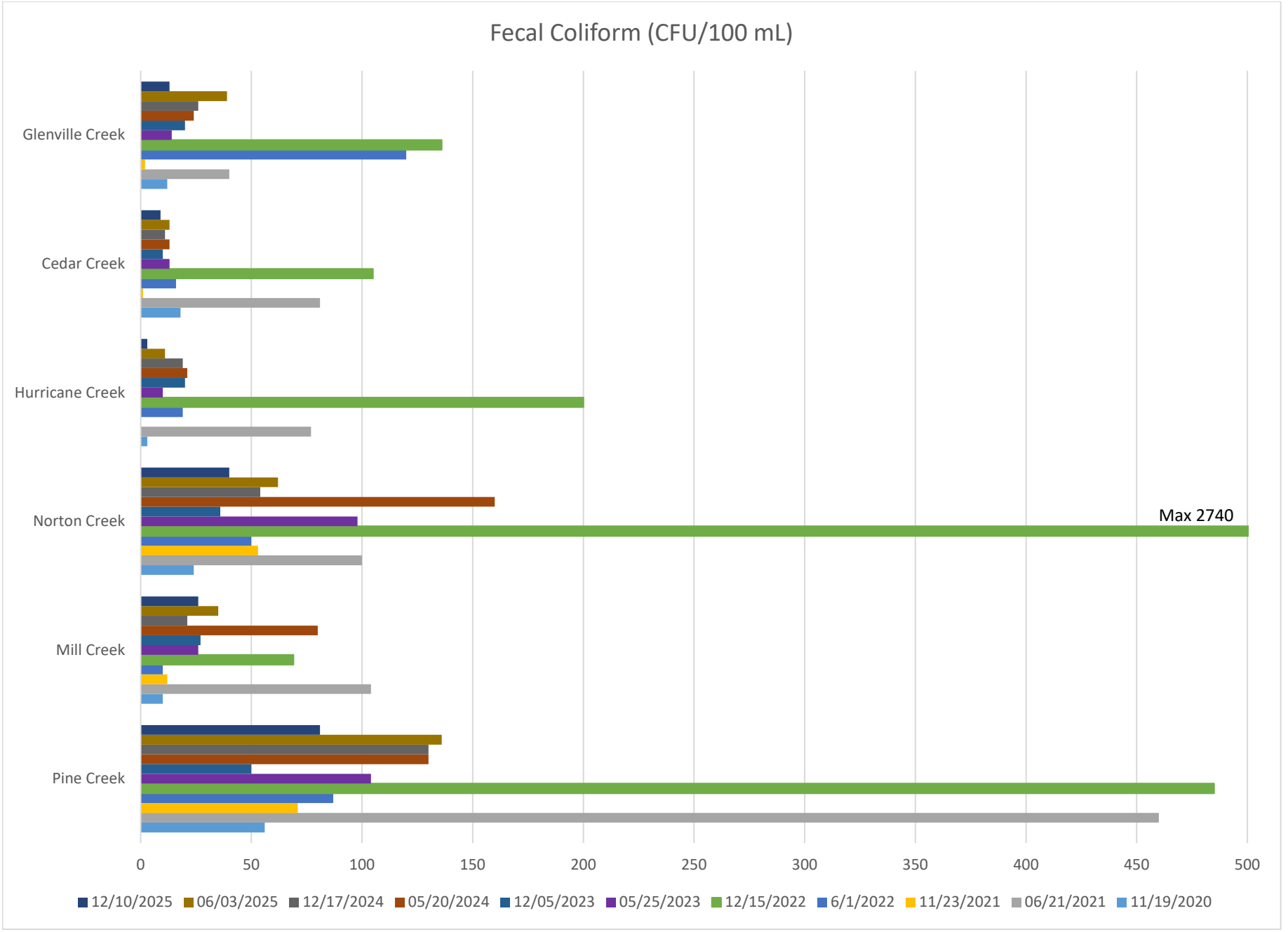

Dissolved Oxygen (mg/L)
NC Trout Water designation standard ≥6 mg/L
Glenville Creek
Cedar Creek
Hurricane Creek
Norton Creek
Mill Creek
Pine Creek
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
12/10/2025
06/03/2025
12/17/2024
05/20/2024
12/05/2023
05/25/2023
12/15/2022
6/1/2022
11/23/2021
06/01/2021
11/19/2020

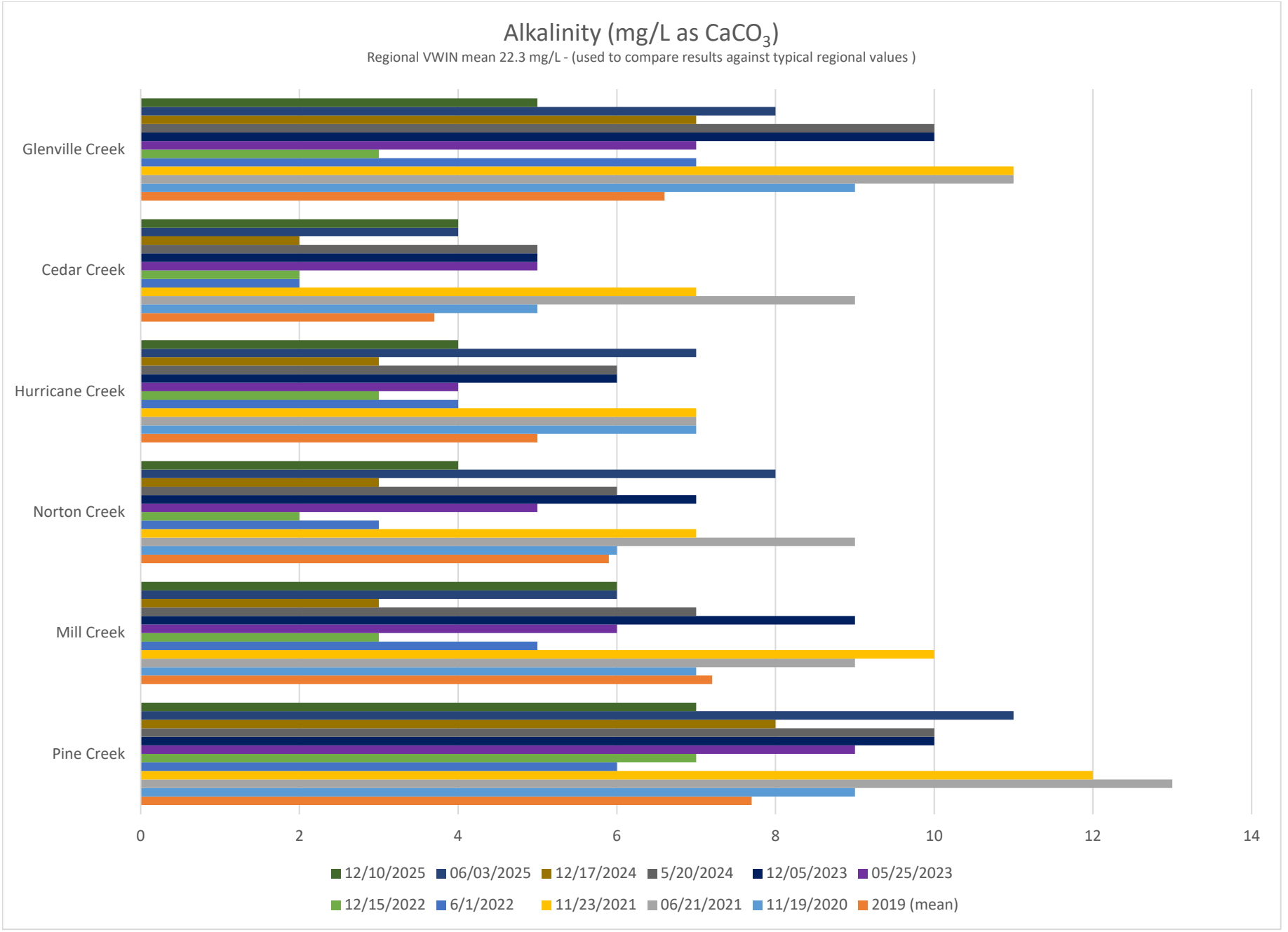

Turbidity (NTU)
Regional VWIN mean 6.2 NTU - (used to compare results against typical regional values )
Glenville Creek
Cedar Creek
Hurricane Creek
Norton Creek
Mill Creek
Pine Creek
0
2
4
6
8
10
12
14
16
18
20
12/10/2025
06/03/2025
12/17/2024
05/20/2024
05/25/2023
12/15/2022
6/1/2022
11/23/2021
06/01/2021
11/19/2020
2019 (mean)

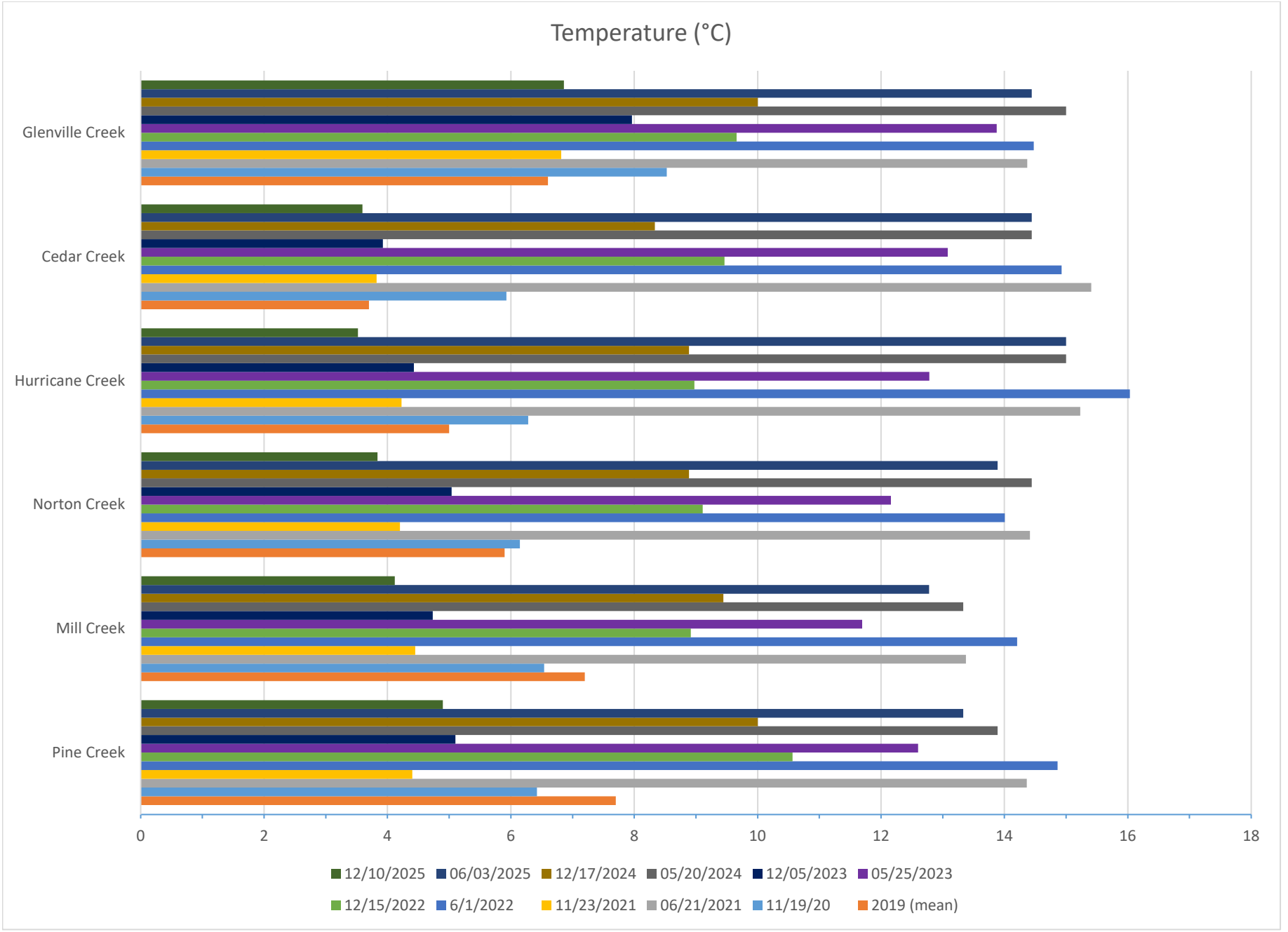

Ammonia (mg/L)
Regional VWIN mean 0.09 mg/L - (used to compare results against typical regional values )
Glenville Creek
Cedar Creek
Hurricane Creek
Norton Creek
Mill Creek
Pine Creek
0
0.05
0.1
0.15
0.2
0.25
0.3
12/10/2025
06/03/2025
12/17/2024
05/20/2024
12/05/2023
05/25/2023
12/15/2022
6/1/2022
11/23/2021
06/21/2021
11/19/2020
2019 (mean)


Nitrite/Nitrate-Nitrogen (mg/L)
Regional VWIN mean 0.5 mg/L - (used to compare results against typical regional values )
Glenville Creek
Cedar Creek
Hurricane Creek
Norton Creek
Mill Creek
Pine Creek
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
12/10/2025
06/03/2025
12/17/2024
05/20/2024
12/05/2023
05/25/2023
12/15/2022
6/1/2022
11/23/2021
06/21/2021
11/19/2020
2019 (mean)


Phosphorus (mg/L)
Regional VWIN mean 0.09mg/L - (used to compare results against typical regional values )
Glenville Creek
Cedar Creek
Hurricane Creek
Norton Creek
Mill Creek
Pine Creek
0
0.05
0.1
0.15
0.2
0.25
12/10/2025
06/03/2025
12/17/2024
5/20/2024
12/05/2023
05/25/2023
12/15/2022
6/1/2022
11/23/2021 (orthphosphate)
06/21/2021 (orthphosphate)
11/19/2020 (orthphosphate)
2019 (orthophosphate; mean)


Fecal Coliform (CFU/100 mL)
Glenville Creek
Cedar Creek
Hurricane Creek
Norton Creek
Mill Creek
Pine Creek
Max 2740
0
50
100
150
200
250
300
350
400
450
500
12/10/2025
06/03/2025
12/17/2024
05/20/2024
12/05/2023
05/25/2023
12/15/2022
6/1/2022
11/23/2021
06/21/2021
11/19/2020


Alkalinity (mg/L as $CaCO_3$)
Regional VWIN mean 22.3 mg/L - (used to compare results against typical regional values )
Glenville Creek
Cedar Creek
Hurricane Creek
Norton Creek
Mill Creek
Pine Creek
0
2
4
6
8
10
12
14
12/10/2025
06/03/2025
12/17/2024
5/20/2024
12/05/2023
05/25/2023
12/15/2022
6/1/2022
11/23/2021
06/21/2021
11/19/2020
2019 (mean)


Temperature (°C)
Glenville Creek
Cedar Creek
Hurricane Creek
Norton Creek
Mill Creek
Pine Creek
0
2
4
6
8
10
12
14
16
18
12/10/2025
06/03/2025
12/17/2024
05/20/2024
12/05/2023
05/25/2023
12/15/2022
6/1/2022
11/23/2021
06/21/2021
11/19/20
2019 (mean)

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Regional VWIN mean - used to compare results against typical regional values | | | | | | | | | | | |
| | *Reporting limit | | | | | | | | | | | |
| | | NH3 | NO2/NO3 | Phosphorous | Dissolved Oxygen | Specific Conductivity | pH | Turbidity | Fecal coliform | E.Coli | Temperature | Alkalinity |
| | | mg/L | mg/L | mg/L (as PO4) | mg/L | µS/cm | | NTU | CFU | MPN | °F | mg/L |
| | | 0.09** | 0.5** | n/a | NC Trout Water | 60** | 7.1** | 6.2** | | | | $CaCO_3$ |
| | | 0.02* | 0.1* | 0.02* | designation standard ≥6 mg/L | | | | | | | |
| Pine Creek | 12/10/2025 | 0.03 | 0.1 | 0.04 | 10.7 | 31 | 7.7 | <1 | 81 | 199 | 41 | 7 |
| Mill Creek | 12/10/2025 | 0.03 | 0.1 | 0.03 | 11.1 | 21 | 7.2 | <1 | 26 | 39 | 39 | 6 |
| Norton Creek | 12/10/2025 | 0.04 | 0.1 | 0.03 | 11.2 | 23 | 7.2 | <1 | 40 | 61 | 39 | 4 |
| Hurricane Creek | 12/10/2025 | 0.06 | 0.1 | 0.02 | 11.4 | 25 | 7.4 | <1 | 3 | 4 | 38 | 4 |
| Cedar Creek | 12/10/2025 | 0.05 | 0.2 | 0.04 | 11.5 | 14 | 7.2 | <1 | 9 | 2 | 38 | 4 |
| Glenville Creek | 12/10/2025 | 0.03 | 0.1 | 0.01 | 10.2 | 34 | 6.9 | 6 | 13 | 26 | 44 | 5 |