

Stream Water Chemistry Report Summary

Stream Name: Black Creek (Reference Site)

| Water Chemistry Parameters | Observed Value | | | | | Standard |
|--------------------------------------|----------------|----------------|----------------|----------------|----------------|-----------------|
| | 2013 | 2014 | 2015 | 2016 | 2017 | |
| Total Suspended Solids (mg/L) | 6.48 ± 1.05 | 3.53 ± 0.96 | 2.37 ± 2.15 | 3.11 ± 3.32 | 2.34 ± 1.83 | N/A |
| Alkalinity (mg/L) | 179.86 ± 16.18 | 158.92 ± 17.45 | 169.35 ± 65.72 | 182.79 ± 48.75 | 226.93 ± 59.02 | N/A |
| Chloride (mg/L) | 6.86 ± 0.50 | 6.58 ± 0.54 | 7.72 ± 2.13 | 5.51 ± 2.13 | 5.66 ± 1.98 | |
| Total Phosphorus (mg/L) | 0.01 ± 0.004 | 0.02 ± 0.004 | 0.01 ± 0.005 | 0.01 ± 0.005 | 0.01 ± 0.002 | < 0.01 - 0.03 |
| Chlorophyll a Content (mg/L) | 0.33 ± 0.05 | 0.18 ± 0.06 | 1.02 ± 1.42 | 1.33 ± 0.90 | 0.61 ± 0.40 | |
| Temperature (°C) | 15.15 ± 1.39 | 12.46 ± 1.39 | 14.90 ± 4.00 | | | N/A |
| pH | 7.93 ± 0.37 | 8.01 ± 0.23 | 7.68 ± 0.47 | | | Between 6.5-8.5 |
| Conductivity (spc) | 0.263 ± 0.02 | 0.307 ± 0.02 | 0.297 ± 0.09 | | | |
| Dissolved Oxygen (mg/L) | 6.17 ± 0.57 | 7.24 ± 0.58 | 6.97 ± 2.26 | | | > 6.0 |
| Total Organic Nitrogen (mg/L) | 0.56 ± 0.04 | 0.52 ± 0.04 | 0.46 ± 0.17 | 0.64 ± 0.14 | 0.52 ± 0.14 | < 1.1 |
| Caffeine (µg/L) | | | 0.013 ± 0.000 | | | |

As the reference stream, the water quality at Black Creek indicates natural year-to-year variation in water chemistry within the Six Stream Monitoring Program. Across the five years we have observed significant, but natural changes in total suspended solids, total organic nitrogen, and to chlorophyll a values. In the case of total suspended solids, 2013 had statistically higher values than any subsequent year ($P = 0.005$). The 2013 total suspended solids value was 56% greater than the mean value of the four subsequent years combined. This indicates that any decreases in total suspended solids observed at agriculturally impacted sites in subsequent should be interpreted with caution, as this decline may reflect natural variation in the system.

Total organic nitrogen levels also significantly varied at Black Creek across the sampling years. In 2016 total organic nitrogen levels statistically peaked ($P = 0.035$). Specifically, total organic nitrogen values in 2016 were statistically greater than 2015, and trending above all other sample years. Chlorophyll a levels increased at Black Creek in tandem with the nitrogen levels, with the highest values reported in

2016 as well ($P = 0.002$). These trends contrast with total phosphorus values, which had no statistically significant variation across the years at this site ($P = 0.517$), indicating this measurement has little natural year-to-year variation.