

Stream Water Chemistry Report Summary

Stream Name: Judges Creek

Water Chemistry Parameters	Observed Value		Standard
	2013	2014	
Total Suspended Solids	38.91 ± 5.83 mg/L	28.70 ± 6.30 mg/L	< 11.2 mg/L
Alkalinity	237.50 ± 9.69 mg/L	241.67 ± 10.47 mg/L	< 224.83 mg/L
Chloride	7.09 ± 0.81 mg/L	9.27 ± 0.88 mg/L	
Total Phosphorus	0.05 ± 0.02 mg/L	0.07 ± 0.02 mg/L	< 0.01 - 0.03 mg/L
Chlorophyll a Content	0.75 ± 0.12 mg/L	0.72 ± 0.13 mg/L	
Temperature	14.20 ± 1.56 C	12.46 ± 1.56 C	< 25.15 C
pH	7.93 ± 0.19	7.84 ± 0.12	Between 6.5-8.5
Conductivity	0.35 ± 0.03 spc	0.47 ± 0.03 spc	
Dissolved Oxygen	7.17 ± 0.58 mg/L	7.95 ± 0.55 mg/L	> 6.0 mg/L
Total Organic Nitrogen	0.576 ± 0.07 mg/L	0.658 ± 0.07 mg/L	< 1.1mg/L

Judges Creek appears to be one of the most disturbed sites monitored, with the highest total phosphorus and total suspended solid concentrations reported. Comparing the 2013 and 2014 seasons there is no discernible difference in total phosphorus levels when sample variability is taken into account (i.e. ± 0.02 mg/L), although there is a marginally decrease in total suspended solid levels. Cattle exclusion systems were installed at this site during the 2014 growing season and were fully functional by October 2014. Comparing the water chemistry of October 2013 to October 2014, we find that many parameters that indicate human disturbance decrease in 2014. Specifically, total suspended solids, total phosphorus, chlorophyll a content and total organic nitrogen are all lower in October 2014; however, long term monitoring of this site with the cattle excluded is needed to confirm this trend is not simply natural variation.

The total organic nitrogen at this site is consistently well within the guidelines given to maintain healthy aquatic ecosystems and to prevent nuisance vegetation growth. The average total organic nitrogen at this site increased between 2013 and 2014, although the cause of this change is not clear. It is most likely due to changes in land use activity, such as increased fertilizer application or above average cottage use. Increases in nutrients like nitrogen and phosphorus, often increase chlorophyll *a* content in streams; however, there is no discernible increases in chlorophyll *a* at this site, despite the decrease in phosphorus and nitrogen levels in 2014. High levels of chlorophyll *a* can indicate enhanced algal growth. The export and continued growth of these algae to downstream aquatic systems could cause an algal bloom; an event that decreases habitat quality by lowering dissolved oxygen concentration and increasing light attenuation. Judges Creek has the highest potential of having a downstream algal bloom, as it has phosphorus and chlorophyll *a* levels consistently well above the reference site.