



BEAR CREEK WATERSHED

Fact Sheet 55 Evergreen Middle School Buchanan Ponds Special Study

June 13, 2016

The Bear Creek Watershed Association protects and restores water and environmental quality within the Bear Creek Watershed from the effects of land use.

Clear Creek County
 Jefferson County
 City of Lakewood
 Town of Morrison
 Aspen Park Metropolitan District
 Brook Forest Inn
 Conifer Sanitation Association
 Conifer Metropolitan District
 Denver Water Department
 Evergreen Metropolitan District
 Forrest Hills Metropolitan District
 Genesee Sanitation & Water District
 Geneva Glen
 Jefferson County School District
 Kittredge Water & Sanitation District
 Tiny Town Foundation, Inc.
 West Jefferson County Metropolitan District

Six junior watershed managers told us why it was important to look at the water quality of Buchanan Ponds: *Because they flow into other ponds and rivers, which if the ponds were polluted then all the other places that the water flows would also be polluted.* Johnathon S.

Because it helps give you a better understanding of what goes into the water and how good or bad it is; and what you need to do to fix it in order to maintain healthy water quality. Olivia F.

Because we need to know what's going into our water; further down the road we can see if it's getting more polluted and see how we can stop it. Logan G.

There are lots of pollutants causing problems. There is nutrient loading. If there are too much nutrients, then the algae start to grow more, which raises pH levels and causes plants and animals to die. Kiryn W.

Because Buchanan Ponds are part of our watershed. We drink water from our watershed. It is important to look at water quality because we have fish who live in the ponds and I want to protect them. Nicholas R.

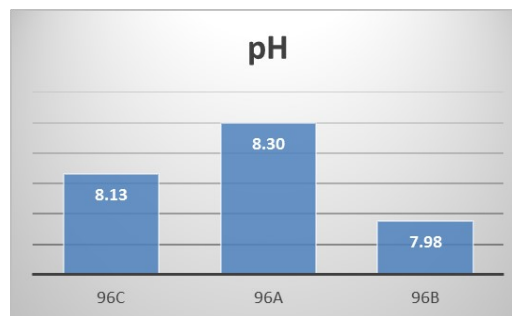
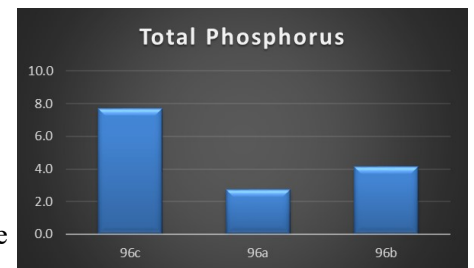
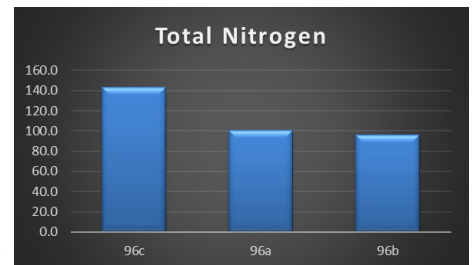
Because we could see the things that help and don't help our environment. We saw that we could help research the water conditions and other things to help improve the environment by starting with Buchanan Ponds. Lilla F.

The BCWA worked with Megan and Laura, science teachers from Evergreen Middle School, on a special water quality study at the nearby Buchanan Ponds. There were 220 students involved in the project (*BCWA WQSD05 Buchanan Ponds*). The program was divided into 4 phases: 1) an introduction presentation to the classes on healthy water quality in the Bear Creek Watershed, 2) an adventurous field trip to the monitoring sites where student made observations, took flow measurements and used a water quality multi-probe to measure water chemistry and collected water for laboratory analyses, 3) a presentation to the classes to review the various field and laboratory findings, and 4) selected junior watershed managers helped develop this report and article for the BCWA newsletter.



Field probe measurements were done at three sites for temperature, pH, dissolved oxygen, specific conductance or conductivity, and stream flow. Students collected water samples to measure total nitrogen and total phosphorus concentrations. We calculated nutrient loads and predicted how the two ponds influenced nutrients and water pH. Students make observations on conditions of sites including what things people were doing to change water quality; they found invasive plants and animals, they observed pollutants (like oil, grease, road salts, trash and sediments) and even identified a few fixes or good practices. The lack of weeds around the ponds suggest chemicals had been used to kill the weeds. Since all of the drainage systems were designed to quickly dump the stormwater into the ponds or stream, one student correctly noted that *the ponds were used to get rid of all the bad pollutants.*

The field chemistry data showed that runoff from roads, parking lots, driveways and sidewalks can pollute Buchanan Ponds. The higher than normal conductivity of the water suggested that road salts were reaching the drainage way. The study also showed how the pond ecosystems can change the water chemistry. Nutrients cause the algae and a tiny plant called *Duck Weed* in the ponds to grow and grow, which then changes the pond pH. The more algal growth, the more basic or alkaline the water becomes. If the water pH gets too high and over 9.0 then it can



harm the fish. The sun can heat up the water really fast in the ponds and if the water gets too hot for the fish, temperature becomes a pollutant. Some students found the science to be *hard*, others called it *challenging*, learning to look and see water pollutant was *way harder* and best stated – *water is important and we must protect it.*