Leesville Lake Water Quality Newsletter

Issue 5

Left: Sediment and debris laden area of Leesville Lake near the Pigg River. Right: Much more clear water, not far from Smith Mountain Lake Dam. Both photos were taken on the same day.

Inside This Issue

Photo of Toler Bridge

Swimming in the Blue Jewel

There have been questions as to whether or not it is safe to swim in Leesville Lake. As a general rule of thumb, swimming in in The Blue Jewel not recommended shortly after heavy thunderstorms because the runoff carries soil and sediment into the lake, raising various nutrient and bacteria levels.

The confluence where the Pigg River joins Leesville Lake (*photo above; top left*) is typically the location with the poorest water quality, and it is not recommended to swim around this area. The area surrounding Toler Bridge (*photo; left)* also tends to have higher bacteria and turbidity (more on turbidity on page 3) due to its close proximity to the Pigg River.

Water quality tends to improve the further you move away from the Pigg River confluence, so it is recommended to swim in areas that have clear-looking water.

Is It Safe To Eat The Fish?

Blue Channel Catfish – Ictalurus punctatus(Photo Courtesy of Chesapeake Bay Foundation)

The short answer is, yes, the fish in Leesville Lake are safe to eat. As covered in the June 2016 newsletter, although certain strains are potentially harmful, *E. coli* is not the evil, dangerous bacterium that they are made out to be. In fact, the FDA does not have a maximum limit of *E. coli* that may be present in fish prepared to be consumption, but they do offer some suggestions when it comes to preparing fish in a sanitary manner.

First, it is crucial to both clean and cook the fish thoroughly. The fish should also not be prepared in the same area as other food being prepared, and hands and any surfaces in contact with the fish should be carefully cleaned. As long as these rules are followed and the fish is thoroughly cooked, the fish from Leesville Lake should be perfectly fine for consumption.

Parameter of the Month

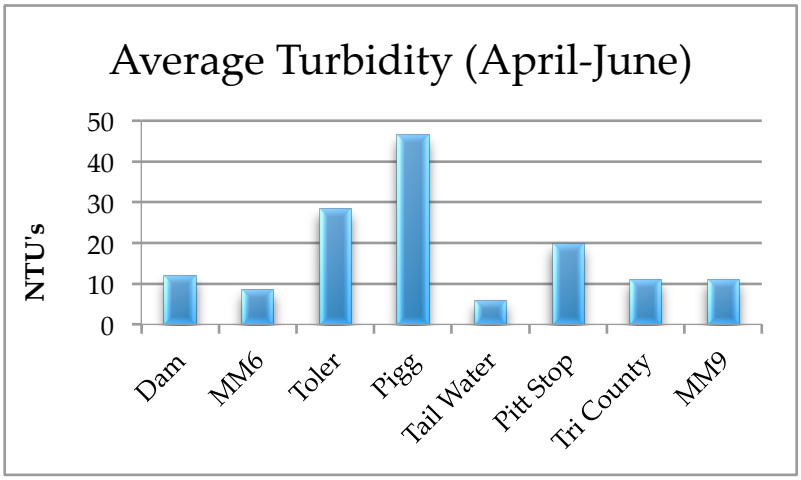
Turbidity

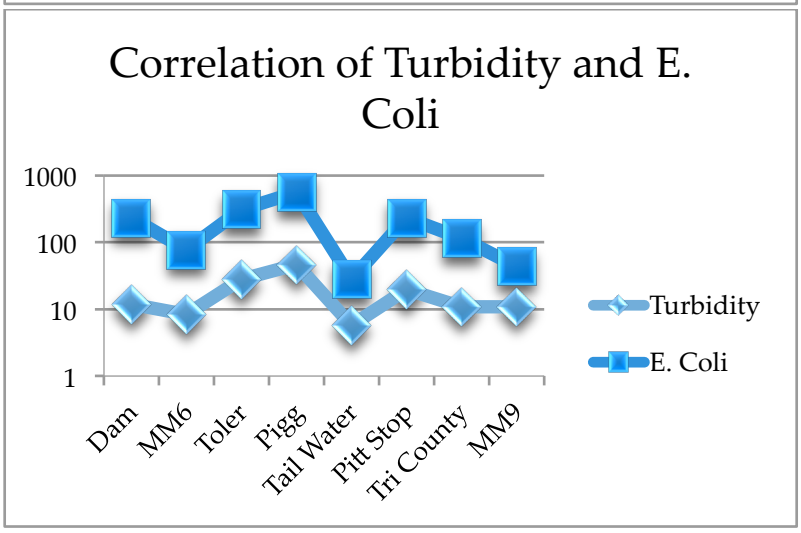
The Pigg River with high turbidity entering into much clearer waters of Leesville Lake

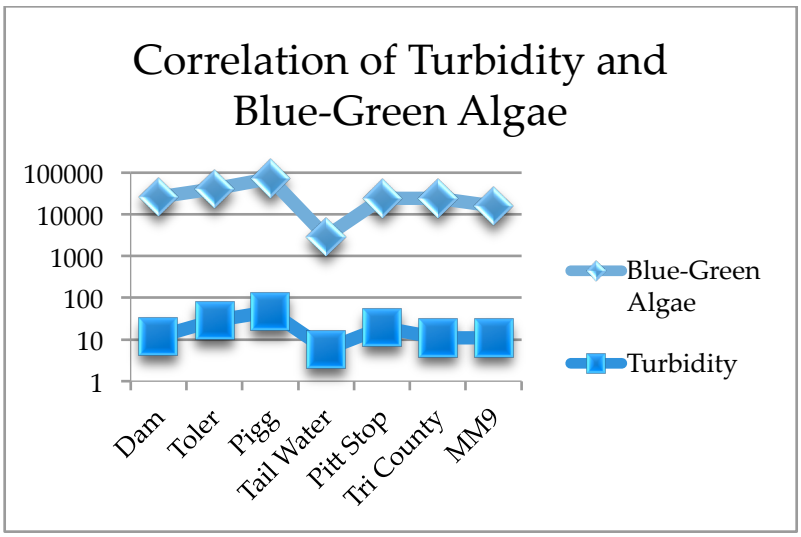
For June's parameter of the month, we will be discussing turbidity. Turbidity is essentially a measure of water clarity, which is affected by how much algae or sediment is suspended within the water. Although these suspended particles may be present in great numbers, they are invisible to the naked eye. Turbidity is measured in NTU's, or Nephelometric Turbidity Units, either by a very simple device called a secchi disk, or by using a sophisticated device called a nephelometer (sometimes called a turbidimeter). Very murky or cloudy water would suggest a high turbidity measure, and less light can penetrate to lower depths of the water column in cloudy water compared to clear water. This ultimately results in a decrease of photosynthetic activity of aquatic plants, which can further compound water quality issues by decreasing the amount of oxygen in the water.

There are two different types of turbidity measures: algal and non-algal. Algal turbidity a measure of how dense algae growth is within the water sample. The more algae and phytoplankton present, the less light can penetrate the water column and reach aquatic plants. If water clarity remains poor for an extended period, these aquatic plants will not survive, which can negatively impact fish and macroinvertebrate populations that rely on these plants for habitat and food.

High turbidity levels also impact a fish's ability to absorb dissolved oxygen, or DO, the importance of which was covered in the September issue. Non-algal turbidity is caused by sediment reaching streams and waterways, usually by erosion and runoff, but sediment that has previously settled can also be stirred up from the bottom and become re-suspended in the water, decreasing the clarity. As mentioned on the sidebar of the next page in the water quality report, there is also an important relationship between turbidity and bacteria levels.







Bacteria and Turbidity

As mentioned above, turbidity is a measure of water clarity, which is directly related the amount of suspended particles in the water. Essentially, there is an electrical charge on these particles that causes bacteria, such as *E. coli*, to tightly cling to these particles due to a property called cation exchange capacity. So if the water looks muddy or murky, there is a good chance that bacteria levels are elevated in these areas, and it is not recommended to swim in locations that the water appears to be muddy, cloudy, or murky. The portions of Leesville Lake closest to Smith Mountain Lake and the Pigg River tend to have the murkiest water, while areas further away generally have better water clarity, and are probably the best areas of the lake to swim, especially after a recent storm.

Dr. Thomas Shahady has been conducting water quality research at Leesville Lake since 2006. He is an Environmental Science professor at Lynchburg College, and teaches a variety of freshwater ecology courses. He received his BS in Biology at Guilford College, MSP.H. in Environmental Biology at UNC School of Public Health, and PhD in Zoology at North Carolina State University. He has had experience with the EPA and North Carolina Departments of Environmental and Natural Resources. His research interests are in aquatic ecology, lake management, and environmental compliance.

Anna Golos is a new member to the Water Quality Project. She is a junior at Lynchburg College, studying Environmental Studies with a minor in Psychology. Her plan is to continue working for Dr. Shahady this 2016-2017 school year. She will be managing the water quality newsletter for the year, hoping to bring some basic understanding of what the research purpose is, and what the monthly findings are. Feel free to email her with any questions or suggestions!

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Anthony Capuco, aka Tony, has lived at Leesville Lake for 3 years. After receiving his BA in Biology from Hobart College, he went forward to pursue a PhD in Mammalian Physiology from Cornell University. He then had a 30-year career as a research scientist with the USDA-Agricultural Research Service as a lactation and cell biologist. He has been a member of the water quality committee for 3 years. Tony likes spending time woodworking, swimming, golfing, and time with family and friends.

Dave Waterman is a new member to both Leesville Lake, moving here a little over a year ago, and the water quality project. Before joining the Leesville Lake community Dave received his BS in Economics at Northeastern University, which led to his career working for an electric company called National Grid. He recently began engaging in the water quality project volunteering with the TLAC Environmental Committee. During his off time he is a voracious reader, enjoys swimming and boating, and daily walks and hikes.

Mike Gooden is a new member of the Leesville Lake Water Quality Committee. Before settling into the cabin his wife, Margy, and himself built in 2010, he received his Bachelor's degree in Chemistry of the University of Maryland at Baltimore County. He then worked at the National Institute of Standards and Technology from July 2007 to June 2016, acting as a liaison between the technical staff and the contracting office to generate contacts that met mission requirements.. During his time off he enjoys hiking, running, kayaking, photography, reading, and helping others.