

Leesville Lake Water Quality Newsletter



Left: piece of hydrilla found in Leesville Lake. Right: hydrilla (bottom of the picture) compared to curly leaf pondweed (top), also found in Leesville. Both pictures courtesy of Dr. Tom Shahady

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Hydrilla in Leesville Lake

On his most recent data sampling in August, Dr. Shahady saw clumps of hydrilla near Mile Marker 13 and Mile Marker 16. Hydrilla has also been found in Smith Mountain Lake, Claytor Lake, and Lake Anna. There are several hypotheses currently being examined, one is hydrilla spread to Leesville Lake near the Smith Mountain dam. This pumpback water from Smith Mountain Lake is believed to have caused the clumps of hydrilla seen in August.

Originating in Asia and Africa, hydrilla is becoming a nuisance to lakes across the U.S. Also known as waterhyme, Florida elodea, and waterquirl, this invasive species can live in waters up to 20' deep. The stems can elongate up to one inch until they reach the water's surface, where they branch out. Hydrilla is spread 4 ways: fragmentation, tubers, turions, and seeds. Fragmentation is the largest culprit in spreading the plant because pieces of hydrilla can hide in cracks and crevices throughout boats, lines, and equipment. Hydrilla is not only unpleasant for swimming, but it also affects boat engines, water quality for other native plants, machinery, and the overall economic outcome of a community that relies on a lake.

There are multiples ways one can try to eliminate hydrilla, the most efficient being grass carp. Sterile grass carp eat the excess vegetation that hydrilla produces, however, the carp must be distributed by a professional with a permit. If the grass carp were to be released into other environments, they could potentially damage the ecosystem. Claytor Lake had a hydrilla problem and released 6,000 grass carp in 2011 and 3,200 in 2012. The Tri-County Lakes Association released 6,000 sterile grass carp into Smith Mountain Lake, which resulted in controlling the hydrilla spread. As of the current year, there have been no additions to Smith Mountain Lake in regards to grass carp, for the carp released three years ago are anticipated to control invasive the plants.

Late Summer Doldrums

As summer comes to an end, there are changes happening all around us, specifically in the lake. The word doldrums is used to describe stagnation, or a period of inactivity. Due to the end of the growing season on Leesville Lake, the water becomes more mixed than it was during the summer and the plankton (tiny microscopic plant and animal life) begin a period of winter inactivity. So how does this impact water quality? First off, the water cools and the plankton starts to die. This die off in plankton feeds bacteria which consume the dissolved oxygen in the water (turn to pg. 3 for more information on dissolved oxygen). When there is not enough movement in the water, there is a decrease in dissolved oxygen and in terms of water quality, this is not the best month due to the stagnant water. Along with very little rain this summer, the water might not be looking good come this early fall and creates stressful living conditions for aquatic life.

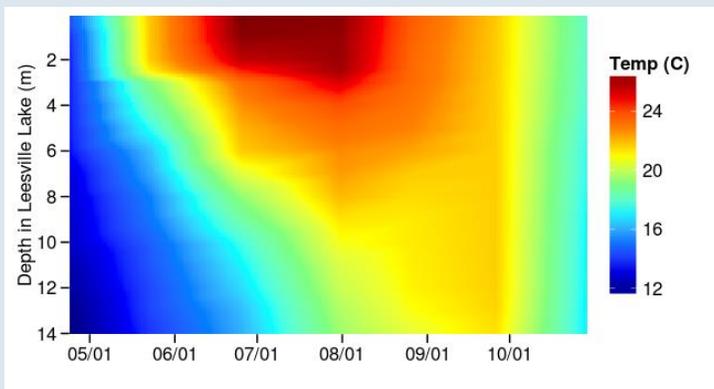


*Leesville Lake,
September 26, 2016*

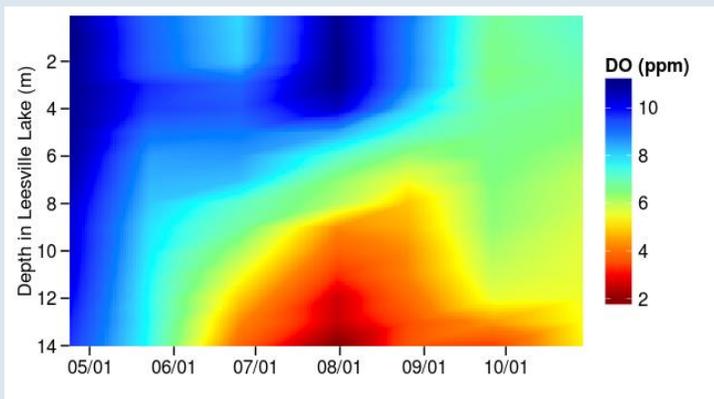
Parameter of the Month **Dissolved Oxygen**

For September’s parameter of the month, we will be discussing Dissolved Oxygen. Dissolved oxygen is as simple as it sounds-it’s the amount of dissolved oxygen in the water. Even though Dissolved Oxygen (DO) is unseen, DO is a very important factor in the health of water. Creatures that live in all bodies of water survive on DO, so a decrease in DO could lead to the body of water to die, which is called eutrophication. When bacteria in the water consume oxygen from decaying organic matter, it decreases the amount of oxygen in the water. For this example, think of a pond or a lake that does not move as much as a stream or fast flowing river. There usually is more organic debris floating around a lake therefore, there is more DO in the fast moving waters than the stagnant lakes and ponds.

Dissolved Oxygen numbers vary in certain conditions and temperatures. The amount of DO in a body of water depends on the season. For example, there is a higher concentration of DO in the winter and early spring when the water is cold and a lower concentration of DO in the summer and early fall when the temperatures are warmer. All of this is due to the fact that cold water can hold more DO than warm water can.



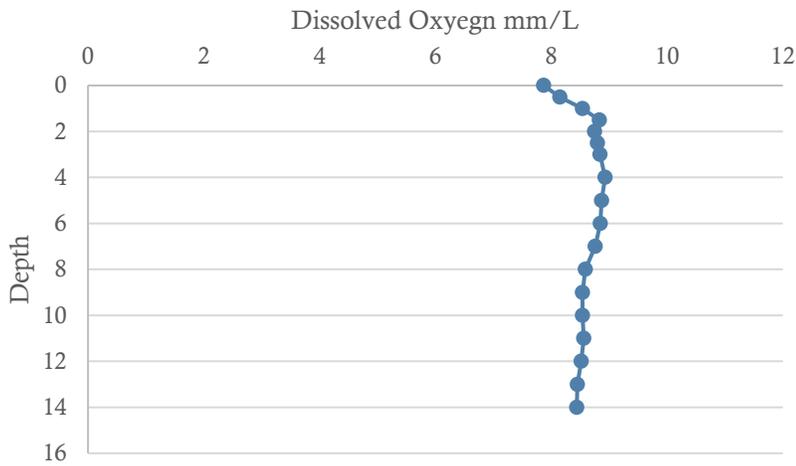
This graph depicts the rise in temperature through the months at Leesville Lake. From mid-June to late August, the temperature at a depth of around 2 meters is higher than 24 (C), or 75 (F).



This graph depicts the amount of dissolved oxygen during certain months in relation to the depth. From mid-June to late October, the dissolved oxygen is fairly low.

Monthly Water Quality Report

April-Dissolved Oxygen

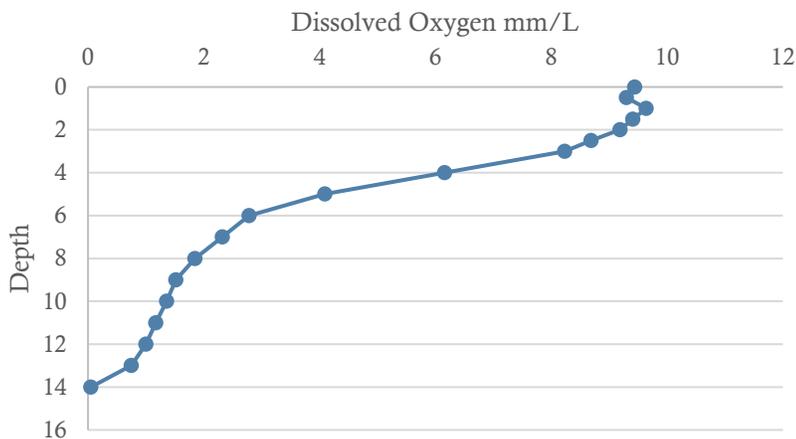


As mentioned in the parameter of the month, dissolved oxygen in the amount of oxygen present in the water. Some factors that affect dissolved oxygen are the volume and velocity of water flow i.e. the difference between a pond and a mountain stream. Another factor is the season, cold water can hold more dissolved oxygen meaning that dissolved oxygen is higher in the winter than in the summer.

These two graphs show the dissolved oxygen rates for the Dam. Overall, there was more dissolved oxygen in water in the month of April than there was in August.

Above: Even though there appears to be a lot of variation, the minimum DO was 7.87 and the maximum was 8.44, meaning that there wasn't a large variation in the amount of DO.

August-Dissolved Oxygen



Above: There was a large variation in DO for August, with the minimum being 0.05 and the maximum being 9.44.

Water Quality Research Members



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.

Email: shahady_t@lynchburg.edu

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!

Email: golos_a@lynchburg.edu



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 contracts that met mission requirements.. During his time off he enjoys hiking, running, kayaking, photography, reading, and helping others.