

Leesville Lake Water Quality Newsletter



Photograph of debris build up along shoreline, near the Leesville Lake Dam.

Photographs by Jade Woll and Leesville Lake Association.

Inside This Issue

Page 1	Leesville Lake vs. Debris
Page 2	Leesville Lake Annual Beautification Day
Page 2,3	Curly Leaf Pondweed
Page 4	Parameter of the Month
Page 5	Monthly Water Quality Report
Page 6	Water Quality Project Members

Leesville Lake vs. Debris

Debris is the remains of anything broken down or destroyed. Specifically, aquatic debris and litter according to the Litter and Debris article by Longwood University, is any manufactured or processed solid waste that enters the aquatic environment from any source. Debris can come from a variety of sources such as litter, storm drains, landfills, sewer overflows, trees, heavy rains, and floods. Leesville Lake experiences a variety of these sources from the neighboring counties whose creeks and streams flow directly into the lake. During large storming events it can be expected to have an influx of debris due to the increase of runoff from the neighboring counties.

Originally lake members were in charge of debris control and removal, but in 2010 AEP has principle responsibilities for debris removal at both Smith Mountain Lake and Leesville Lake. The AEP takes over debris removal if it creates safety hazards, interferes with public access to recreation facilities, or if it results in adverse aesthetic impacts. There is a debris removal committee on the Leesville Lake Association, which provides community members with a report form to alert AEP of debris that needs to be removed.

It is essential to be aware of debris and learn about different ways the community can help remove it. Debris can be very hazardous to not only the community, but the wildlife as well. Debris can potentially add chemicals into the water, impacting the organisms that live in the lake. Additionally

Continue to bottom left of pg. 3



Curly Leaf Pondweed

The curly leaf pondweed is an aggressive non-native aquatic plant found throughout the continental U.S, except in Main and South Carolina. It was introduced to the US from Europe, and has since been causing issues in many freshwater bodies of water. Their blue-green oblong leaves and spaghetti like stems grow in dense canopies on the waters surface, outcompeting local fauna.

Due to the curly leaf pondweeds life cycles, they are strong competitors against native plants. Curly leaf pondweed can reproduce by seed, but mainly reproduces through the production of dormant vegetative propagules called turions, which look like small greenish-brown pinecones.

Although the curly leaf pondweed grows during the winter months, while most others plants are dormant, it can create serious issues during the spring and summer months. Having the ability to grow in extreme conditions such as low light and low temperatures, the curly leaf pondweed can out compete many native species that would die in such a harsh environment.

Additionally the curly leaf pondweed can grow as deep as 15 feet, which allows it to outcompete shorter native plants by covering them and blocking out sunlight.

<http://mtweed.org/wp-content/>



Leesville Lake Annual Beautification Day

Leesville Lake Association sponsors an annual Beautification Day, during which volunteers from the community work with AEP and Association Sponsors to remove debris from the lake. According to Tony Capuco, multiple locations on the lake are used as sites for offloading debris into dumpsters for subsequent removal.

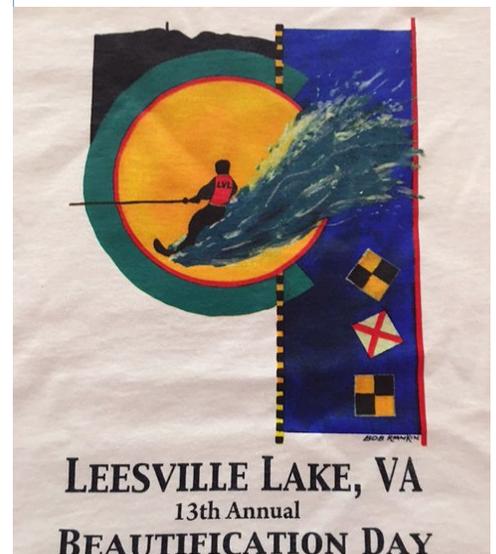
This annual one-day effort makes a noticeable difference in the lake. Large amounts of debris are removed, making the lake cleaner and safer for community members. Not only does this help clean up the lake, “it brings our members and supporters together in a common effort to improve lake cleanliness and safety” said Tony Capuco.

During the remainder of the year AEP is in charge of removing debris

According to the Water Quality Committee the past year has been particularly challenging for debris removal.

There was record volume of rain during the fall, combined with clear cutting of trees in areas near the take, led to a huge influx of debris from the Pigg River into Leesville Lake.

*Shirt from Beautification Day



This year has allowed community members to band together and work with AEP barge staff to clean local areas of the shoreline. The Leesville Lake Association is considering ways to encourage

And expand these efforts throughout the season.

Beautification Day is a step forward in initiating community involvement, which will continue to help Leesville Lake.



http://bioweb.uwlax.edu/bio203/2010/mixdorf_hann/testingpg

Curly Leaf Pondweed

One of the largest issues curly leaf pondweed creates is during the spring and summer months. During this time many native species are beginning to reproduce and grow. Due to the curly leaf pondweeds growth in the winter month, it begins to decay by mid-summer. This increase in decaying material can cause extremely low oxygen conditions in small pockets of the lake, which will cause much of the wildlife and vegetation to die out. Additionally, the decomposition of the curly leaf pondweed will cause high levels of nutrients to be released from the leaves, triggering algal blooms.

Recreationally the curly leaf pondweed can cause damage to boats as well as limit swimming in certain areas. Due to the curly leaf pondweeds ability to grow in such thick dense patches it can cause swimmers to get caught in it as well as make it difficult for boats to drive into those areas. This eventually results in a reduction of recreational activities for the lakes community.

The Leesville Lake association has a board dedicated to invasive vegetation, and helps control the issues. It is important that the community report siting's of the curly leaf pondweed to the committee, so they are able to remove it and are aware of its location.

Information provided by:

http://www.in.gov/dnr/files/CURLYLEAF_PONDWEED.pdf



Leesville Lake vs. Debris continued from pg. 1:

Animals can ingest debris as well as have their habitat destroyed. Vegetation can also be impacted because of the debris blocking sunlight, which is necessary for survival. Debris such as damaged tree limbs or partially submerged logs could potentially injure swimmers and boaters. This form of debris can also be extremely hazardous because, although it may seem like a small twig floating, there could be a large log underneath the waters surface that is not visible to boaters or swimmers. This could cause boat propellers and motors to break, as well as injure swimmers who were unaware of the large debris.



Parameter of the Month Conductivity

For August's parameter of the month, we are going to learn a little bit about our friend Conductivity. Correct me if I am wrong, but not many know about our good pal Conductivity and I am here to introduce you all!

Conductivity shows the capacity for water to carry electrical currents. Dissolved inorganic solids (things that do not consist or derive from living matter) can carry positive or negative charges that will influence Conductivity. So for example, last parameter of the month was our good friend TP. For a brief reminder TP stands for Total Phosphorous, which shows nutrient levels in the

water. When there is an increase of TP you can expect to see an increase in Conductivity as well. They have become pretty good partners over the past years, and once you start to see an increase in one you can expect to see an increase in the other. This is not always true though; sometimes Conductivity is a loner and can increase all by itself without TP. But whenever you see an increase in TP, an increase in Conductivity isn't to far behind.

The great thing about having Conductivity as a friend is that it is consistent. It's that right hand man, that go to bud, that one friend you can count on. This is because Conductivity does not typically fluctuate once its range is established in a body of water. So once you begin sampling you can learn rather quickly what to expect when it comes to Conductivity levels. Don't get me wrong there are times that Conductivity just does its own thing, but everyone has the right to rebel every once and awhile, right? Just like any rebelling teenager (although it may take some time) you will eventually find out what is causing Conductivity to break the norm. Some of the main factors that can influence Conductivity are temperature, geology, and discharge. When you see Temperature walk in the room and it's feeling hot, that's a sign to expect Conductivity to increase.

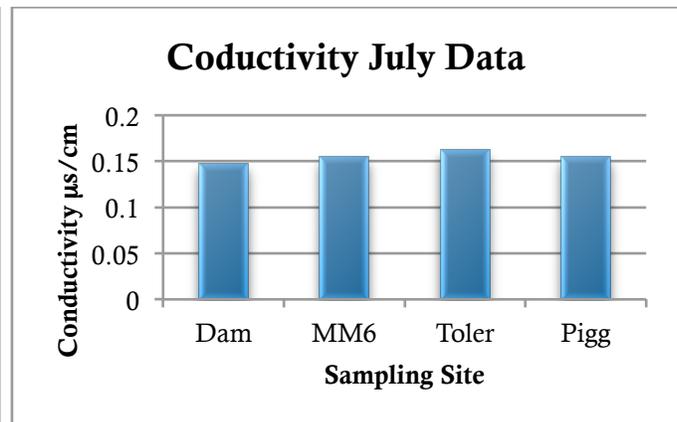
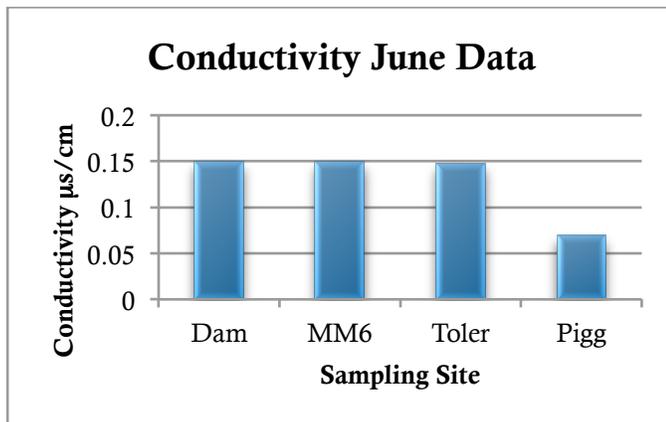
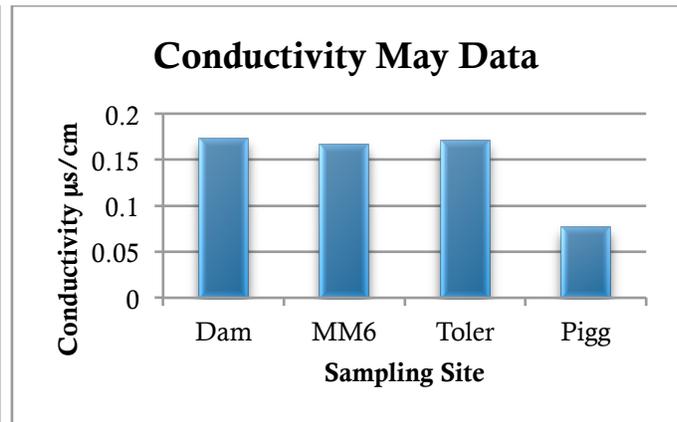
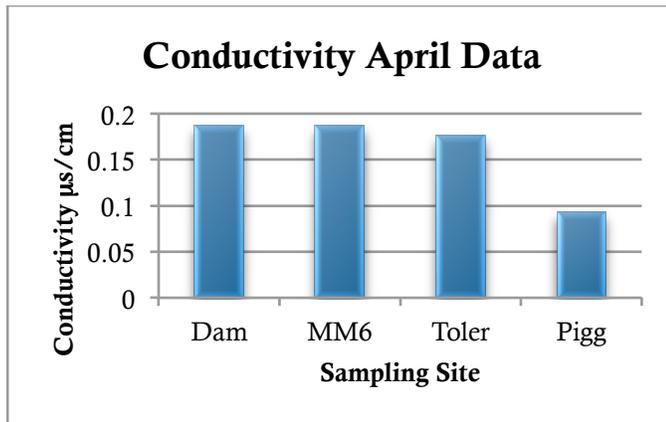
But overall Conductivity is a good parameter to let you know if something is really going wrong. Because it is so consistent sudden changes can show that something is off in the lake. To clarify, when I say sudden changes if there is a huge increase of Conductivity then the previous month there is most likely something that is causing that problem. There could be a leak in a septic tank, and increase of rainfall pushing in large sediment loads, or other sources of pollution that could input inorganic solids into the lake.

So if you are to take one thing from this meet and greet, just remember that Conductivity is that life long friend who will always let you know when something is just not right.



This photograph shows Pigg Rive running into Leesville Lake carrying a huge amount of sediment. In this scenario you would expect Conductivity to increase or decrease? (Increase)

Monthly Water Quality Report



As stated before in the parameter of the month, conductivity shows the capacity for water to carry electrical currents. Dissolved inorganic solids that carry positive and negative charges influence conductivity. Additionally, temperature, geology, and discharge that flow into streams are other factors that influence conductivity. Once established, a body of water's range of conductivity does not typically fluctuate. So, when there are noticeable differences in readings there can be a source of discharge or pollution that has entered the water.

The data above supports that there is little variation of conductivity levels at each site over the 4-month sampling period. There are slight fluctuations in the Dam when comparing April and May data to June and July, but this could be due a variety of factors. Increased rainfall during April and May could have led to heavy discharge of water into the lake, or increased rainfall could have led to a dispersal of the solids lowering the conductivity during June and July. Additionally, the hydrology of the lake could potentially affect the conductivity because of the constant movement of water back and forth, stirring up sediment.

The greatest difference you can see is at Pigg during July. When comparing all four months, July conductivity levels shoot up. This is most likely due to the heavy rains that were received in July, pushing loads of sediment into the Pigg River. It is typical for Pigg to be a shallow more sediment filled site, which would influence conductivity levels. Overall the sites show consistent levels of conductivity and show no points of concern.

Water Quality Research Members



Dr. Thomas Shahady has been conducting water quality research at Leesville Lake since 2006. He is a 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.

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Jade Woll is a new member to the Water Quality Project. She is a recent graduate of Lynchburg College, with a BS in Environmental

Science and a minor in Photography. Her plan is to continue working for Dr. Shahady this summer, move to Pensacola, FL. for a forestry conservation program on the Naval Base, and pursue a graduate degree the following year. She will be managing the water quality newsletter for the summer, 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: woll_j@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 contacts that met mission requirements.. During his time off he enjoys hiking, running, kayaking, photography, reading, and helping others.