

Lake Water Quality Monitoring

Nearshore, shallow water sites continued to be the focus of lake wide water quality monitoring in 2018. Fifty monitoring sites were narrowed down to 29 sites by July. Scientists began collecting water samples at select nearshore locations for the purpose of determining the amount of nutrients and suspended solids (sediments) in the water. Sites continued to be monitored using a multi-parameter meter to record water quality parameters such as temperature, conductivity, pH, dissolved oxygen, depth, chlorophyll and turbidity. Additionally, water clarity was measured using a secchi disk to measure light attenuation through the water column. 2018 marked the second year where continuous monitoring meters were used to supplement water quality monitoring efforts. The meters were used primarily in coves and tributaries to record water quality data autonomously and continuously and capture the impacts of natural and human induced events on water quality. Spring and fall deployment focused on capturing the impacts of storm events in the lake’s tributaries. Summer deployments focused on trying to capture impacts of boat activity on shoreline erosion. Meters were often deployed in pairs, with the goal of understanding how water quality changes spatially over time. While historic monthly water quality data (2009-2018) is available online at [www.eyesonthebay.dnr.maryland.gov/dcl/](http://www.eyesonthebay.dnr.maryland.gov/dcl/DeepCreekLake.cfm)

[DeepCreekLake.cfm](http://www.eyesonthebay.dnr.maryland.gov/dcl/DeepCreekLake.cfm), for the various water quality parameters including nutrient concentration, the 2017-2018 continuous water quality monitoring data is not yet available online. Scientists instead are using that data to understand the variability that exists in these shallow water coves and direct future monitoring efforts.

Deep Creek Lake Conditions
Eyes On Deep Creek Lake
EyesOnTheBay.net

<u>Water Quality For:</u>	<u>Parameters:</u>
Fishing Boating Swimming Lake Health Aquatic Vegetation	Water Temperature Dissolved Oxygen Water Clarity Algae and more...
<u>Special Features:</u>	
Data Visualization & Download Tools Historical Results Since 2009 How the Lake is Doing: Status & Reports Submerged Aquatic Vegetation Reports	
	
For further information: Twitter: @eyesonthebay Facebook: Eyes on the Bay Email: eyesonthebay.dnr@maryland.gov Phone: 410-260-8630	
eyesonthebay.dnr.maryland.gov/dcl/DeepCreekLake.cfm	
	Maryland Department of Natural Resources Larry Hogan, Governor Mark Belton, Secretary
	

Pictured above: Highlights of the “Eyes on Deep Creek Lake” website

Hydrilla Treatment and Monitoring

2018 was the fifth consecutive year of herbicide treatment using Flouridone (trade name SONAR) to treat the invasive aquatic plant, *Hydrilla verticillata*. The herbicide was used to treat 14 zones around the lake, 4 separate times throughout the summer months (June-August). The treatment was successful and no living hydrilla could be found at any of the fourteen sites by the end of August 2018. Additionally, no new beds of hydrilla were found outside of the treatment zones during the 2018 growing season. The herbicide treatment is selective for hydrilla and works to inhibit the plants ability to photosynthesize and produce chlorophyll (green pigment visible in plants). Hydrilla plants under herbicide treatment will turn pinkish white, and ultimately die (see adjacent photo).

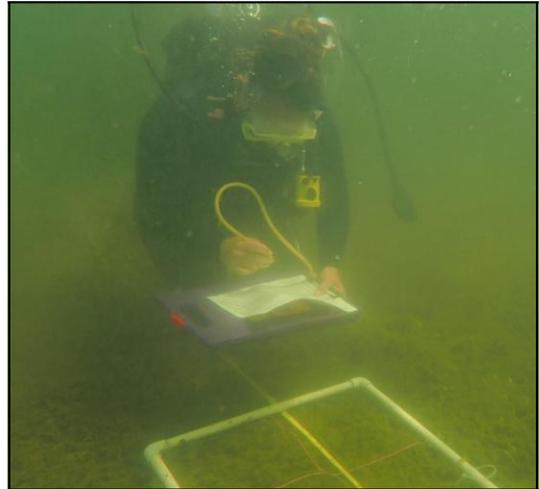


Pictured above: fragment of hydrilla plant showing signs of “bleaching”

Aquatic invasive species prevention and education, coupled with early detection and monitoring continue to be of paramount importance in the control of hydrilla populations and prevention of new aquatic invasive species introductions. Hydrilla is one of many aquatic invasive species that threatens the ecology of the lake and highlights the need for boat owners to exercise good stewardship practices and properly clean and disinfect their boats, trailers, and any gear before launching and after leaving any water body. For more information about the herbicide treatment please <http://dnr.maryland.gov/publiclands/Pages/western/deepcreeknrma.aspx>.

Submerged Aquatic Vegetation (SAV) Monitoring

In 2018, the Department completed the ninth year of SAV related monitoring. This monitoring includes two primary efforts: the annual SAV underwater transect survey (done at a total of 8 sites around the lake), and the annual SAV shoreline survey whereby the entire 68 mile shoreline of the lake is surveyed. Both efforts are aimed at providing baseline SAV data capable of detecting changes in the plant community over time. The 2018 underwater transect survey included the 8 historic locations but additionally included 4 additional locations found within the near-shore water quality monitoring coves. The four new locations (Cherry Creek Cove, Blakeslee Cove, Poland Run Cove and Paradise Cove) were added in 2017 to better link SAV data to water quality data and provide better spatial coverage lake-wide. Over time, scientists hope to be able to better understand the relationship between water quality and SAV data.



Pictured above: Scientist conducting underwater SAV transect monitoring

The 2018 season was a very wet and rainy. Lake levels remained higher than normal throughout most of the summer months and likely impacted the results of the September shoreline survey. The 2018 findings won't

be available until Spring 2019 however scientists are seeing some differences in plant populations emerging among sites, with the southern end of the lake generally showing less SAV abundance and diversity, compared to the middle and northern end of the lake. Future SAV monitoring will help determine whether changes in SAV diversity and abundance are due to physical and/or chemical characteristics. Diverse, native SAV communities are important, not only because they provide essential habitat for fish and bugs but they are also more capable of surviving episodic events or disturbance than single species communities. Monitoring SAV communities is similar to a "canary in a coal mine" in that any long term changes in SAV populations can be an indication of changing water quality conditions, thus highlighting the need for further investigation.

Pilot Zebra Mussel Monitoring Program

Due to the increased threat of zebra mussels (*Dreissena polymorpha*) and findings of two infected boats during 2016 and 2017 voluntary boat inspections at Deep Creek Lake, the Department initiated a pilot Zebra Mussel Monitoring Program in 2018. This consisted of a combination of visual surveys and water quality monitoring at various locations throughout the lake to check for the presence of zebra mussels and determine if water quality in the lake is suitable for zebra mussel colonization. No zebra mussels were found in Deep Creek Lake during any of the visual surveys. Water quality samples to determine zebra mussel habitat suitability were collected in May, July and October 2018 and results will be summarized in the year end report; likely available in spring 2019. Funding for this year's effort was jointly provide by Brookfield Renewable Energy (the owners of the dam), the Deep Creek Lake Watershed Foundation and the Department.



Pictured left: Zebra mussels and quagga mussels found in a Carroll County quarry in 2018; both species of mussels are highly feared aquatic invasive species

Aquatic Invasive Species Prevention and Education

For the 5th consecutive year, the Department hired boat launch stewards to offer voluntary boat inspections at the Deep Creek Lake State Park boat ramp. The stewards monitor the boat ramp from Memorial Day weekend through Labor Day 2018 and are an essential part of helping to educate visitors and locals alike about the threat of aquatic invasive species and prevent additional introductions into Deep Creek Lake. Additionally, they collect valuable data that helps managers quantify the number of infected boats attempting to launch onto Deep Creek lake and where those boats are originating. While the percentage of boats carrying organic matter has varied over time, it remains less than 5%. While a low percentage, it still under scores the need for continued prevention and education.

Year	Number of Launch Stewards	Number of Vessels Inspected	Number of vessels with organic matter	Number of vessels carrying AIS
2013	NA	NA	NA	NA
2014	2	1066	23	not specified
2015	5	2256	41	not specified
2016	6	3824	22	9
2017	5	3866	127	13
2018	4	3682	115	4

Pictured above: Summary of launch steward data collected from 2014-2017.

Other Efforts

Tributary Monitoring: The Deep Creek Lake Natural Resource Management Area (DCL NRMA) continued working with US Geological Survey (USGS) to monitor the flow and quality of water of three tributaries (Cherry Creek, North Glade Run and Arrowhead Run) coming into DCL. The goal of this is to determine the quantity of water entering DCL as well as assess the quality of water coming in based on the amount of sediments and nutrients entering the lake from these streams. This data can help managers understand how the watershed affects the quality of receiving waters and possibly identify sub-watersheds in need of additional study. The USGS gage data is available real-time at:

Cherry Creek <https://waterdata.usgs.gov/usa/nwis/uv?03075905>

North Glade https://waterdata.usgs.gov/nwis/uv?site_no=03075825

Arrowhead https://waterdata.usgs.gov/nwis/uv?site_no=03075850

2018 Goose Hunt: On Monday November 19-Wednesday November 21, 2018 three locations on Deep Creek Lake and four locations on Broadford Lake were open for a permitted goose hunt. Results of the hunt should be available at the Policy Review Board Meeting on January 7, 2019.

Upcoming DCL Public Meetings:

January 7th, 2019– Next Policy Review Board (PRB) Meetings - Open to the public.

Contact Information: For more information concerning the Department of Natural Resources monitoring activities at Deep Creek Lake, contact Julie Bortz at Julie.bortz@maryland.gov. Julie serves as the Department’s representative to the Deep Creek Lake Watershed Management Plan Administrative Council.