

Deep Creek Lake Frequently Asked Questions January 2013

This paper responds to comments and questions at, and following, the November 2012 State of the Lake meeting.

Funding

1. How much does the State spend on Deep Creek Lake? Does the State make money from Deep Creek Lake? Is the Lake a “cash cow” for the State?

Deep Creek Lake is not a “cash cow” for the State. Property taxes paid to Garrett County fund the county government and, if you live in an incorporated town, that town’s government – not the State. The State invests significant sums in Deep Creek Lake that are not received directly from Deep Creek Lake residents.

Between 2009 and 2012, DNR has invested **\$4,104,778** in Garrett County in addition to Waterway Improvement Fund projects mentioned in the answer to question 5 below. This includes:

- \$303,778 for Deep Creek Lake water quality and Submerged Aquatic Vegetation monitoring,
- \$165,000 towards Phase I and II of the Sediment Plan,
- \$315,000 in State support for the Cherry Creek and Poland Run stream gages, and
- \$3,321,000 in environmental improvement projects in Garrett County.

This does not include State funding for Fisheries stocking and monitoring, Deep Creek Lake Park Service staff and projects, Natural Resources Police support, Maryland Biological Stream Survey Monitoring, non tidal stream monitoring and MDE water supply and lake level oversight.

2. Why is Deep Creek Lake not funded the same as the Chesapeake Bay?

The entire Chesapeake Bay is listed as being impaired for nutrients and sediments under the federal Clean Water Act, leading to the effort to “Save the Bay.” In comparison, Deep Creek Lake continues to be an environmentally healthy reservoir meeting federal Clean Water Act and State water quality standards. The impaired status of the Chesapeake Bay required a Total Maximum Daily Load (TMDL) that was implemented in December 2010. The TMDL mandates that Maryland, the five other Chesapeake Bay watershed States and the District of Columbia fund and implement restoration strategies to clean up the Bay by the year 2025.

3. How many of the tax dollars we pay are spent on saving the Chesapeake Bay?

The property tax that you pay to Garrett County funds the operations of the county government and, if you live in an incorporated town, that town's government. Your local property tax is not spent on saving the Chesapeake Bay.

Income, sales, and some other taxes are collected into the state's General Fund, from which \$35,141,125 was appropriated for Bay restoration in fiscal year 2012. If you divide that by the adult population of 4,481,954, the expenditure comes to an average of \$7.84 per adult.

By Maryland law the "flush fee" is \$2.50 per month (\$30/year) in Garrett County, half of the rate that is collected in parts of Maryland that drain into the Chesapeake Bay.¹ Flush fees collected from homes served by wastewater treatment plants are used to upgrade wastewater treatment plants. Flush fees collected from homes served by septic are used 60% to upgrade septic systems and 40% for farmers' cover crops.

In 2007 the Maryland General Assembly created the Chesapeake and Atlantic Coastal Bays Trust Fund to accelerate Bay restoration by focusing limited financial resources on the most effective non-point source pollution control projects.

Revenues from a very small percentage of the current tax on rental cars and motor fuel are allocated to the Trust Fund; the balance of these revenues are allocated to the State general fund. These revenues resulted in an appropriation to the Trust Fund of \$25 million in FY 2013.

4. Can Waterway Improvement Fund pay for projects in Deep Creek Lake?

Yes. The Fund pays for 100% of the cost of dredging major boating channels. Some funds can be used to assist dredging of channels for recreational boating through 50/50 matching grants or by providing loans to Waterway Improvement Tax Districts. The policies are fully described in the Waterway Improvement Fund Grants Manual.² The Waterway Improvement Fund has been available for projects in Deep Creek Lake and Garrett County. Since 1971, 80 projects amounting to **\$6,159,126** have been undertaken in the County through the Waterway Improvement Fund.

5. Are DCL boaters getting a fair share of return from the Waterway Improvement Fund?

The revenue source for the Waterway Improvement Fund is a 5% excise tax on vessel purchases. During the years 2007-2011, boat sales attributable to Garrett County contributed **\$281,898** in Vessel Excise Tax to the Waterway Improvement fund. During that same five year time span, Garrett County received the benefit of **\$562,208** in Waterway Improvement Grant money – double what was contributed in Vessel Excise Tax to the fund.

Water Quality

¹ Chapter 150 (House Bill 446) of 2012.

² The manual is available online at http://dnr.maryland.gov/boating/pdfs/WWI_Program_Manual.pdf.

6. Has water clarity in the Lake been changing over time?

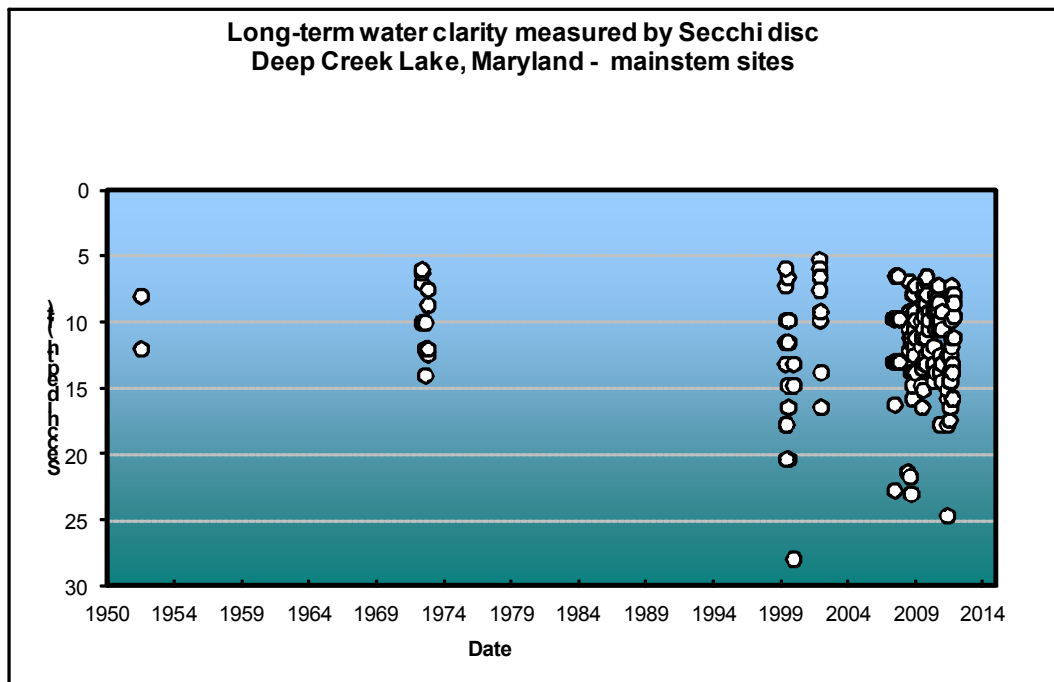
An analysis of available data shows that water clarity conditions in Deep Creek Lake are variable and that there has been little change in average conditions over the last 40 years. The recent water clarity range is similar to conditions reported in Deep Creek Lake in 1953.

A standard measure for reporting water clarity is “Secchi depth” – defined as the depth that a weighted white-and-black Secchi disk (see photo) lowered into the water disappears from view.

This simple instrument allows for quantitative and repeatable measures of water clarity that address how water clarity might be affected by water color changes or suspended particles like silt/clay and algae. Field conditions that might affect the quality of these data such as high wave action, low sun altitude and the presence of surface scums are noted on data forms.

The earliest publicly available water quality data set for Deep Creek Lake was developed in 1973 as part of the National Eutrophication Survey by the new US Environmental Protection Agency. Subsequent special monitoring studies occurred at irregular intervals until 2008 when monitoring efforts were implemented by DNR and MDE.

Site-specific water clarity data for Deep Creek Lake is limited to data sets from occasional water quality studies of the lake over the last 40 years (1973-2012). A 1953 publication provides some data showing that the water clarity range then was similar to recent results.



7. What is the cause of silt and sediment in the Lake?

Silt and sedimentation are natural processes which occur in all lakes. The most common sources of sediment are landscape runoff and shoreline erosion. Sediment delivery from the landscape ranges from the easily observed construction/ditch sediments to the often

unobserved sediments running off of lawns, streets, parking lots, stream banks, etc. A majority of the landscape sediments are transported in the tributaries which feed Deep Creek Lake, which is why sedimentation appears to be higher in the southern coves where the drainage area feeding those tributaries is larger. The sediments from shoreline erosion, and near shore lakebed erosion, can be seen during any wave event. These wave events can be natural (windy day, storms) or manmade (boat wakes). Erosion typically occurs from the top of the wave to a depth of two times the height of the wave (i.e., 1 foot wave causes erosion from lake level +1 foot to lake level -2 feet), depending on shoreline geology.

Landscape development also contributes to an increase in sediment delivery to the drainage basin due to the increase of water carrying the sediment and eroding the landscape. Impervious surfaces from parking lots, roads, concrete drainage ditches, rooftops, etc. decrease the area where water naturally returns to the earth and increases the amount of runoff to the lake which typically increases erosion.

The DCL Phase II Sediment study is designed to quantify the volume and areas of deposited sediment within Deep Creek Lake. The fieldwork for this project is complete. A thorough report is currently being written and is expected to be complete this summer. Preliminary results indicate that some coves in the southern end of the lake have accelerated sediment depositions, others have little to no sediment deposition, and still other areas are experiencing erosion. Our sediment reductions strategies will be targeted to coves where there is accelerated sediment deposition.

8. What can be done to reduce silt and sediment?

The short answer is to keep all sediment from being transported into the Lake. Typically this is performed on the landscape by increasing vegetation; reducing and protecting turned up soil; decreasing storm water channelization and runoff; and, creating sediment catchment basins for the eroded material to settle. For shoreline erosion, the natural process is to ensure the shoreline is vegetated with deeply-rooted bushes and plants. Near shore grasses also do a very good job at decreasing the energy transferred to the shoreline and capturing any eroded sediments; however, this is difficult to emplace at Deep Creek where a seasonally varying water level occurs.

The Deep Creek Sediment Study Phase II contains an outsourced component to answer this very question. DNR is working with a contractor to identify the major sediment sources within the watershed. Two “better management practice” documents will be the end result of this contract. The first will be addressed to home owners answering what each and every citizen can do within the watershed to decrease sedimentation. The other document will be written for the audience of land development managers, county agencies, and state agencies so they will have the knowledge to incorporate better sediment controls within their assigned areas of responsibility.

9. Has water temperature been changing over time?

While recent summer water temperatures in Deep Creek Lake have reached new highs, there is insufficient historical information to determine whether water temperatures have been changing over time. Air temperature is an important factor governing seasonal surface lake

temperatures – balanced against the lake’s coldwater streams and groundwater sources and the lake’s physical stratification during the summer that segregates pools of cold bottom water and warm surface water. An analysis of available water quality data shows there has been little change in average temperature conditions in Deep Creek Lake over the last 40 years. Recent surface water temperatures are similar to those reported in the lake in 1953.

Water temperatures in Deep Creek Lake are primarily controlled by natural processes – sources of cold water flowing into the lake from surface streams and groundwater, and air temperature that both imparts and removes thermal energy from the lake.

Increased air temperatures also would increase water temperatures in lake tributary streams or directly through stormwater culverts, especially during summer storms when runoff from impervious surfaces (like roadways, rooftops, parking lots and driveways) flows into streams and stormwater channels. During dry periods, the base water source to these streams is ground water, so streams will discharge cooler water to the lake during dry periods.

The earliest publicly available water quality data set for Deep Creek Lake was developed in 1973 as part of the National Eutrophication Survey by the new U.S. Environmental Protection Agency. Subsequent special monitoring studies occurred at irregular intervals until 2008 when monitoring efforts were implemented by DNR and MDE. Site-specific water temperature data for mainstem Deep Creek Lake sites is limited to data sets from occasional water quality studies of the lake over the last 40 years (1973-2012). A 1953 publication provides some data showing that the water clarity range then was similar to recent results.

10. Has bacterial contamination in the Lake been changing over time?

Bacterial levels in Deep Creek Lake are very low and there is no identifiable trend in bacterial contamination in the lake.

According to Steve Sherrard, Garrett County’s Environmental Health Director, bacterial contamination in the lake is, and has been for many years, very low. The County Health Department’s Environmental Health Program has been regularly sampling for fecal coliform bacteria (Escherichia coli) since 1965 from 21 sites around Deep Creek Lake between Memorial Day and Labor Day. Most sampling locations are in the lake’s coves and fairly near the shore so most sites likely would be sensitive to bacterial contamination from storm water runoff and the tributaries.

Results of bacteria data collected by the Health Department show that at all sites at most times, E. coli levels have consistently been well below the maximum bathing beach standard.³ When a single sampling point value has exceeded this standard, it has often been attributed to geese. If subsequent values exceed the standard, the Health Department will conduct a sanitary survey of the area.

³ The standard is 235 Colony Forming Units (CFU) for frequent full body contact for recreational water, as set forth in COMAR 26.08.02.03-3 A(1)a.

The Maryland Department of the Environment (MDE) works with local health departments to enhance beach water quality monitoring and maintains the public notification process for beach water quality in Maryland.⁴ Citizens who have a question about sanitary water quality conditions in Deep Creek Lake can contact Mr. Sherrard at 301-334-7760.

Submerged Aquatic Vegetation

11. Is submerged aquatic vegetation (SAV) good or bad?

Submerged aquatic vegetation is a vital component of the Lake ecology and as such provides many benefits to the Lake's water quality, habitat and living resources, including:

- Serving as important habitat for fish
- Improving water quality
 - Specifically improving water clarity
 - Nutrient uptake (nitrogen and phosphorous),
 - Reducing planktonic algae blooms and resulting low dissolved oxygen issues
- Sediment stabilization.

12. Has SAV in the Lake been increasing over time?

While anecdotal accounts suggest that SAV have increased in DCL over time, formal, scientifically-valid surveys have only been conducted over the last 3 years. This is a limited time-frame from which to draw conclusions, but statistical analyses of the survey data do indicate some changes. Of the six survey sites studied, a significant decrease in SAV density in Deep Creek Cove has been observed, as well as an increase in Eurasian water milfoil (EWM) frequency of occurrence in Red Run Cove. The other four survey locations, which include sites near McHenry, near Honi Honi, at the State Park in Meadow Mountain Run Cove, and at Green Glade Cove, show no significant change for SAV density or frequency of occurrence during the survey time period. Macro-algae density increased at McHenry and Deep Creek Cove and decreased in Green Glade Cove, with no significant change between 2010 and 2012 at the other three survey locations.

13. What can be done to reduce SAV in general?

Deep Creek Lake has a healthy, diverse population of SAV. DNR biologists do not advocate systemic control of SAV because SAV is an important component of a healthy lake ecosystem (see question 12 above).

With that said, there are many control options available for most species of SAV, including mechanical (harvesting, raking, benthic barriers, etc.) and chemical control. Clear articulation of the goals of control, however, are necessary in order to guide recommendations to

⁴ Information about MDE's Beaches Program and efforts to improve recreational water monitoring may be found online at: <http://www.mde.maryland.gov/programs/water/beaches/pages/beacheshome.aspx> . Notification data (advisories/closures) at beach sites in Maryland can be found during the beach season online at www.marylandhealthybeaches.com,

stakeholders and lake management, and before goals can be established stakeholders and managers need to reach a consensus regarding the future state of the lake.

14. What can be done to reduce Eurasian water milfoil?

There are many control options for Eurasian water milfoil (EWM). The most effective, proven option for the control of EWM is the use of herbicides (2,4-D controls EWM while minimizing impacts to native submerged species). DNR is developing a management plan for EWM.

15. What can be done to reduce decomposing SAV?

Decomposition is a natural phase in the life cycle of any plant, and it is an important component in the Lake ecosystem's food web. If there is a problem with decomposing SAV near a dock and you wish to remove it, it is easily raked onto shore, where it will dry out and compost within a number of days. Another option may be use of a trash-skimming vessel, similar to those used in urban areas to remove litter from waterways

Algal Blooms

16. Have algal blooms been increasing over time?

Algal blooms are usually localized areas where relatively high concentrations of aquatic, free-floating algae can be found. The location and duration of these bloom events are dependent on species of algae present, nutrient levels, the presence of grazing animals and environmental conditions. In Deep Creek Lake, observed or measured observations of algal blooms and the species involved are not routinely documented; therefore there is little quantitative bloom event data available. Routine water quality sampling intervals are not of sufficient duration and the locations of water sample sites are too widely dispersed to quantify algal bloom occurrence.

The earliest publicly available water quality data set for Deep Creek Lake was developed in 1973 as part of the National Eutrophication Survey by the new US Environmental Protection Agency. Subsequent special monitoring studies occurred at irregular intervals until 2008 when monitoring efforts were implemented by DNR and MDE.

Results show that chlorophyll (=algal) levels in the lake are low compared to sites in the Chesapeake Bay waters, but nutrient levels in those tidal waters are very high compared to Deep Creek Lake. While the figure below appears to show a recent decrease in chlorophyll in comparison to previously collected data, it should be noted that recent monitoring efforts collect more data during fall, winter and spring than most monitoring efforts which have been focused on summer season sampling.

Analysis of chlorophyll pigments provides important quantitative information about algal production in the lake, but these data and the existing monitoring system are not capable of monitoring short-term and often small algal bloom events in Deep Creek Lake.

17. What can be done to reduce algal blooms?

Eliminate nutrients (such as lawn fertilizers) flowing to the lake from nearby properties. Maintain lake buffer strip properties as a tall, natural grass to filter water flowing down open lawns to the lake (the tall grasses will also limit the ability of geese to watch for potential predators, which will cause the geese to move to other areas). Use rain gardens and landscape property to include swales that can infiltrate some overland flow.

Other Questions

18. What are the rules that affect water levels in the Lake and what agency has authority to change the rules that affect water levels in the Lake?

The rules governing releases of water from the lake by Brookfield Renewable Energy Partners L.P. are established after a full public participatory process in a State Water Appropriation and Use Permit issued by the Water Management Administration of the Maryland Department of the Environment.⁵ Condition 10 of the permit states that the Administration has the right to revise any condition or add additional appropriate conditions at any time.

19. Why was the money from selling the Buffer not spent on management of the Lake?

State law specifies the exact disposition of money received from selling real property, and does not allow it to be diverted to other purposes.⁶ Depending on the circumstances, the law requires money from property sales to be used to repay bonds, placed in a special fund that was used to purchase the property originally, or placed in the state's General Fund. The law did not allow DNR to keep any part of the money for management of Deep Creek Lake.

20. How is beach replenishment in Ocean City funded?

The purpose of the Ocean City Beach Replenishment and Hurricane Protection Project is to protect the people and infrastructure in Ocean City from storm waves and tidal surges. It was not put into place simply to nourish the beach. The beach nourishment and dunes are an alternative to groins and other structural methods of protection. Under a 50-year partnership agreement that extends until 2044, the Army Corps of Engineers performs periodic beach renourishment as needed to maintain adequate storm protection. Cost of the periodic renourishments is shared 53% by the Army Corps of Engineers, 23.5% by the State, and 11.75% each by Worcester County and the Town of Ocean City. In between the periodic renourishments the cost of annual maintenance is shared 50% by the State and 25% each by Worcester County and the Town of Ocean City.

21. When should we expect the next “State of the Lake” report and presentation?

⁵ The permit number is GA1992S009(08) and a copy of the permit is online at http://www.mde.maryland.gov/programs/Water/Water_Supply/Documents/Deep%20Creek%20Lake/brookfield%20permit-2011jun.pdf. The most recent revision of the permit was issued June 1, 2011, and is effective until April 1, 2019.

⁶ Section 10-306 of the State Finance and Procurement Article, Maryland Annotated Code.

The first two annual “State of Deep Creek Lake” meetings were held in the fall. At the November 14, 2012 meeting Secretary Griffin committed to return in July 2013 when the third phase of the Department’s sediment study is complete. The Department expects to schedule future annual “State of the Lake” meetings in July to make it more convenient for all persons with a stake in Deep Creek Lake to attend.