

LAKE LEVELS SUBCOMMITTEE
WATER BUDGET REPORT No. 5
22 April 2014

A water budget will afford the users of the waters of Deep Creek Lake an equitable allocation of the resource. A budget addresses supply and demand. The top five feet of the lake between elevations 2457 and 2462 retains the usable supply of water. The demands are power generation, base flow for the Youghiogheny River, whitewater rafting, water temperature in the river (TER), and recreational use of the lake. In 2012 about 2 feet of water from the lake went through the power plant between June and August. Of that amount 1 foot was for the temperature enhancement protocol. The lake levels were below the lower rule band beginning at the end of June through the rest of the summer. A management plan would afford an equitable distribution of the resource.

Maryland Department of the Environment through Appropriation Permit GA1992S009(08) controls the releases to meet these demands. The permit controls power generation by requiring the maintenance of a schedule of water levels to assure the recreational use of the resource. The limits of the levels are the subject of the rule bands. Certain whitewater releases are not subject to the lower rule band, and the TER's are not subject to the lower rule band at all. A water budget could avoid violations of the lower rule band.

By the end of April the stage of the lake should be near the upper rule band. Three hour whitewater releases begin in the middle of April on Fridays. A three hour whitewater release lowers the lake by 0.04 feet. Assuming that the operator makes the scheduled releases, 2.7 feet of water from the lake is required for the whitewater season.

The flow and temperature part of the permit is directed to the preservation of the aquatic life in the river. Fisheries depend on the health of this resource. The flow and temperature in the river as measured by the Hoyes gage (03076100) could control both the minimum flow and the temperature enhancement releases. USGS needs to add temperature measurement capability to the Hoyes gage. The bypass pipe has the capability to release 40 cfs, which is equal to the minimum flow requirement. When the water temperature in the river rises quickly in summer the flows are lower. When the river temperature at the Hoyes gage reaches 22.5°C the bypass should be opened enough to maintain that temperature, or opened to 40 cfs at the operator's discretion. The temperature from the bypass is between 12 and 13 degrees Celsius. Mixing the bypass with the base flow will maintain a temperature below 25 degrees Celsius in the river, and afford minimum flows as well. The power company could extend the bypass pipe across the stream, with graduated orifices to distribute the bypass water across the river flow. The goal is to have an effective protection for the fish in the river.

It is a given that the whitewater community will not be able to use the modified temperature enhancement releases. The water saved in the lake will enhance the water levels there and afford more opportunities for the power company to manage their discretionary releases. The discretionary releases will last longer than the one or two hour releases under the current protocol, which has a greater than thirty-five percent failure rate for 2011 and 2012.

Evaporation for the month of June may be 5.8 inches, or 0.19 inches/day; July may be 5.98 inches, or 0.19 inches/day; and may be 5.36 inches for August, or 0.17 inches per day.

On the supply side, the rate of stage increase when the plant is not in operation is a measure of the recharge. The operator can also measure recharge rate during the releases by doing a mass balance. The recharge rate lags the rainfall. The operator could determine the recharge rate and use it as a predictive model for the amount of storage required above the lower rule band on a weekly basis.

Another element necessary for the implementation of the water budget is an accurate stage-storage model for Deep Creek Lake. The Maryland Geologic Survey has recognized this need and is taking steps to create it.

Deeper water in the lake during the summer will inhibit the growth of SAV by lowering the bottom temperature and increasing the depth of water the sunlight must penetrate to reach the bottom. Not having the stage of the lake vary so much over the summer will reduce the amount of sediment transport from the shoreline to offshore.

The water budget is simply water in minus water out is equal to the change in storage. Monitoring the inflow and outflow is a management plan. Most years the water budget will only be an exercise. It would have had no role to play in 2011 or 2013. Changes to the TER will not only protect the Fisheries, but will save water for all of us. The power company will have more freedom to make releases when it is most profitable to them, and they will probably last more than two hours. Proper application of the water budget during the dry years will afford water for the scheduled whitewater releases, evaporation, the modified TER's, and keep the water levels above the lower rule band.