



Lake Mapping: A Critical Component of Lake Management

Properly maintained lakes add incredible value to your property or community. There's just something about being near or looking over peaceful water that captures our attention. Some lakes grow beautiful mirrors of our South Carolina landscape. Often those mirrors are surrounded by aquatic plants, or covered by aquatic plants, or clouded by mud and silt from runoff. In many cases our lakes and lagoons function as storm-water depositories, assisting with drainage and storage of surface waters delivered via impervious surfaces, storm drains, lawns, and greens or fairways. In general many of our lakes and lagoons function as needed, receiving runoff, absorbing nutrients and contaminants, and passing surface waters on to the next recipient such as ground water, natural, or man-made drainage corridors.

Typically what managers are left to deal with either directly or indirectly is deposited into our lakes and lagoons. Nutrients and sediment account for many of the challenges associated with maintaining the function and aesthetics of our lakes. For this discussion we'll focus on sediment as it is the bed for many nutrients and the one physical factor that is the root of many lake-related problems.

Whether you have a new lake or an old one, you will have to address sedimentation. The ultimate fate of a lake is to fill in and become a wetland. The design, flow regime, orientation, and soil type will influence the rate of transition. Many lakes will take 50 to 100 years for this to occur. In the sandhills, coastal plain, or on a poorly designed site, problematic sedimentation will occur in 10 - 20 years, sometimes sooner.

A valuable tool for designing new lakes and for monitoring sedimentation rates in established lakes is the use of bathymetric mapping. Bathymetric mapping provides a clear and accurate baseline measurement of depths and contours. This data can be used to measure volume, acreage, and to plot depth contours for the entire water body. For example, the area or acreage within a particular lake that will be susceptible to aquatic plant growth can be calculated and delineated on the appropriate contours. Sources for sediments such as storm water drains, sock or french drains, roadway crossings, creeks, or pipes that connect lake systems can be identified and baseline depths identified for monitoring.

Proper design on the front end is paramount to minimizing long-term costs for lake management. For new lake designs, all of the design criteria required by appropriate permitting agencies as well as the end users can be incorporated into a bathymetric design. If your new lake is for multiple uses, such as boating, fishing, or wildlife observation, components can be built into the design to meet these needs. Much like building a home, having all the necessary parts of a lake construction project up front allows for accurate budgeting and engineering protocol.

After the design comes proper stabilization of shoreline soils immediately post construction. Sloughing of unstabilized shorelines creates immediate problems with undesirable aquatic plant growth. Depending on the desired shoreline slopes, effective stabilization can prove to be quite a challenge despite the many options available. Lake use also needs to be considered as boating traffic even at low speeds can erode new shorelines quickly.

At some point sediment removal or dredging will be needed, either large scale (embayments or creek:lake confluence areas) or small scale (upland erosion points, storm drains). Whether your lake is relatively new or twenty years old, bathymetric mapping allows accurate monitoring of these areas. And when it's time to embark on an expensive dredging project, bathymetric mapping can be used to calculate how much sediment needs to be removed to meet depth, slope, and drainage parameters for a given site. This information helps immensely when gathering bids for sediment removal. Also, when dredging is complete, a follow-up survey can be done to insure dredging was completed to specifications. Mapping results can also be added to your GIS database which adds a critical layer for environmental monitoring.

We are called to address many lake management challenges. The root of many of these challenges is either directly or indirectly related to sedimentation. While often the tools available to reduce sedimentation rates are limited, bathymetric mapping provides clear and accurate data that allows managers to monitor, repair, and prepare for challenges down the road. And if fishing is a part of your lake use, anglers will enjoy having a bathymetric map to use in their quest for the big one.