Sixberry Lake:
Protecting an Oligotrophic Lake from Anthropogenic Eutrophication

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Sixberry Lake is found in the Jefferson County portion of the Indian River Lakes region of New York State. It is a deep, cold, and oligotrophic lake with a number of ground water springs supplying it. The watershed contains little development and so the lake has not suffered from noticeable anthropogenic eutrophication as other lakes in the region have. The majority of the development in the watershed are summer or 3 season camps (Jefferson County Dept. of Planning) and all rely on septic systems for wastewater treatment and disposal. A potential threat to Sixberry Lake's waters is in these septic systems as the shores surrounding the Lake are fairly steep and composed of soils with very limited suitability for conventional soil-based septic systems (USDA, NRCS). It is recommended that the stakeholders take proactive measures to protect the water quality before noticeable problems develop, which may be costlier and more difficult to fix.

The Trophic State of the Lake

Sixberry Lake participated in the Citizens Statewide Lake Assessment Program (CSLAP) between 2001 and 2004. Based on data collected during those years, the Lake is considered oligotrophic. Year round monitoring of Sixberry Lake began October 2014 and will assess if the trophic status of the Lake has shifted since 2004.

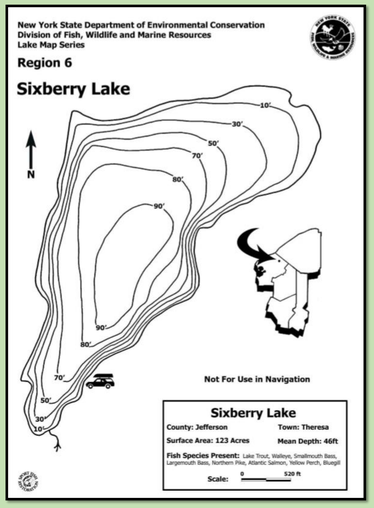
Oligotrophic Lake
- Lower levels of nutrients (<10 ug/L of phosphorus)
- Low biological productivity (<2 ug/L of Cholorophyll a)
- High water clarity (>5 meter Secchi Disk Depth)
- Little to no depletion of dissolved oxygen in bottom waters during the summer

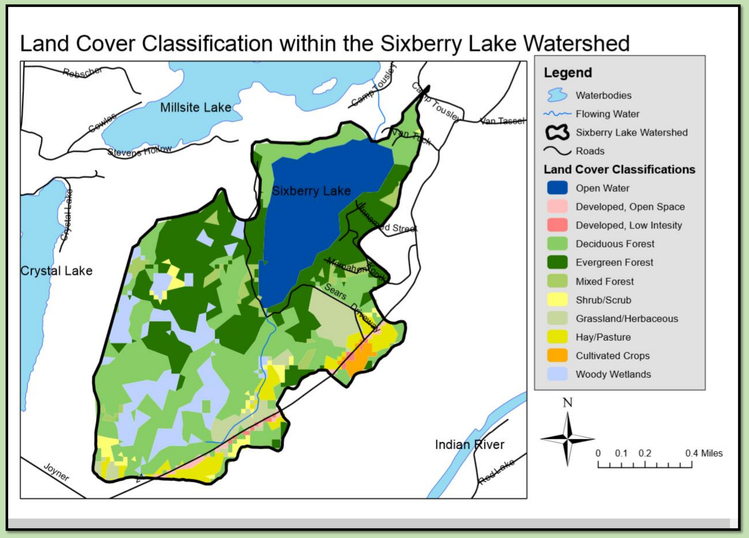
Mesotrophic Lake
- Moderate level of nutrients (10-20 ug/L of phosphorus)
- Moderately productive (2-8 ug/L of Cholorphyll a)
- Moderate levels of water clarity (2-5 meter Secchi Disk Depth)

Eutrophic Lake
- Higher level of nutrients (>20 ug/L of phosphorus)
- High levels of biological productivity (>8 ug/L of Chlorophyll a)
- Low water clarity (2 m Secchi Disk Depth)

Past Data from Sixberry Lake: 5 ug/L of phosphorus, 1.2 ug/L of Chlorophyll a, 6.8 m Secchi Disk Depth

The Lake and Its Watershed

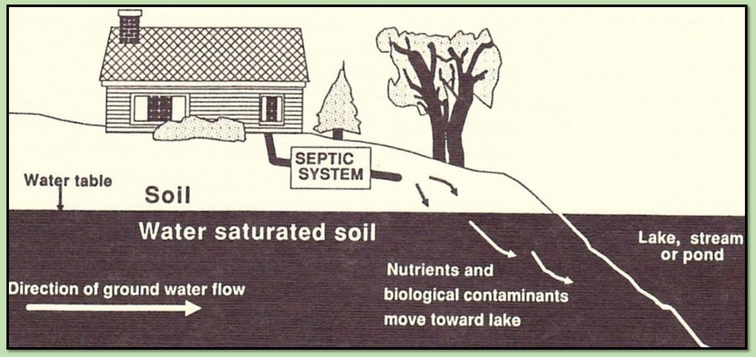


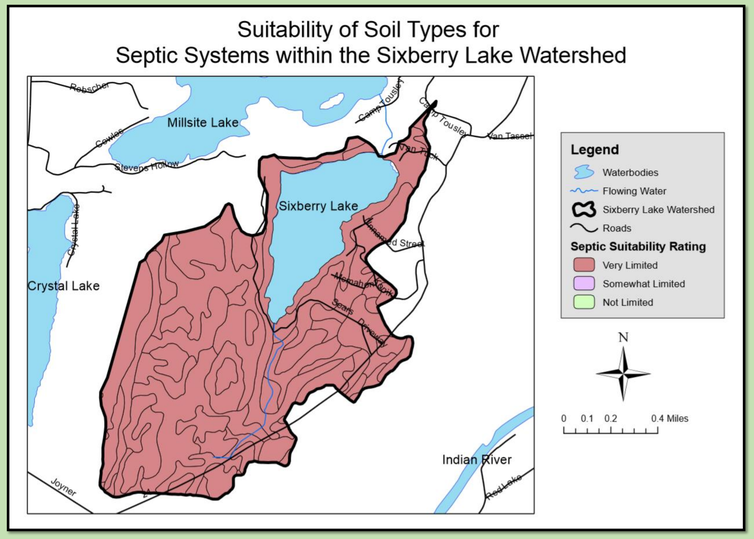


Types of land cover within a watershed can inform us of the potential amounts of nutrients and sediments that could run-off into a waterbody. Developed areas tend to have more impermeable surfaces, which leads to more runoff Agricultural areas often serve as additional sources of nutrients. They bring more nutrients in from outside the watershed (i.e. as fertilizer) than they export in product (i.e. produce or milk). The excess imports contribute to nonpoint source loading of phosphorus and nitrogen.

References:
- Meyer, A., M. Keith, J. Saumier, and M. Shortlidge. 2013. *Your Septic System: Considerations for Shoreline Property Owners.* Ithaca, NY: Cornell Cooperative Extension.
- USDA/NRCS- National Geospatial Center Of Excellence. 2011. *2011 National Land Cover Dataset (NLCD).* U.S. Department of Agriculture, Natural Resources Conservation Service.
- USDA/NRCS- National Geospatial Center Of Excellence. 1995. *USDA-NRCS Soil Survey Geographic (SSURGO).* U.S. Department of Agriculture, Natural Resources Conservation Service.
- NYFOLA and NYSDEC. 2005. *2004 Interpretive Summary, New York Citizens Statewide Lake Assessment Program (CSLAP): Sixberry Lake.* Albany, NY: NY Federation of Lake Addociations and NYS Department of Environmental Conservation.

Septic Systems and Sixberry Lake





Septic systems treat household wastewater. The primary treatment occurs within an underground tank connected to the house. After the treated wastewater leaves the tank it is spread across an underground layer of soil. From there, the wastewater travels down through the soil and bacteria in the soil continue to "clean" the wastewater. Soil type is very important when building a septic system as it determines how well the water will be "cleaned" before it travels underground to a nearby waterbody. Soil type suitability for septic systems is determined by evaluating a number of criteria. These include: depth to bedrock; how fast water travels down through the soil; depth to water table.