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Big & Little Myers Lake Trophic States and Eutrophication

Lakes are often categorized according to their Trophic Status. Trophic Status is a measure of nutrient richness and productivity (i.e., the ability to grow plants and animals). Lakes in different trophic categories also differ in a variety of other characteristics important to lake users and lake managers. Commonly used Trophic Status categories include: Oligotrophic, Mesotrophic, Eutrophic and Hypereutrophic. These may be further subdivided into intermediate categories, such as meso-oligotrophic, to describe lakes that have characteristics in between those of the major categories.

Trophic State Index (TSI) values are used to describe the trophic status of individual lakes. Indices typically rank lakes from 1 to 100, based on such parameters as Secchi disk depth, total phosphorus concentrations, and chlorophyll levels.

Characteristics Typical of Different Trophic States

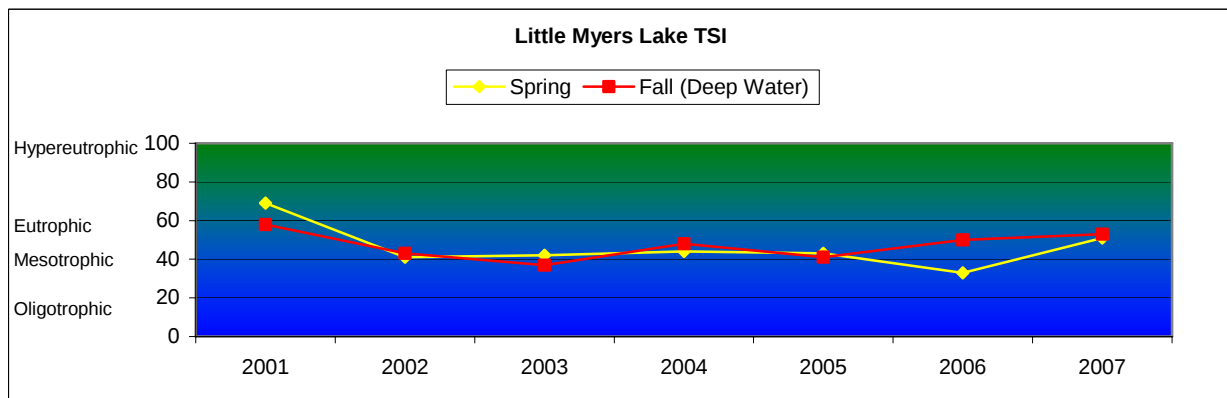
	Oligotrophic	Mesotrophic	Eutrophic	Hypereutrophic
Water Clarity	excellent	Good	fair-poor	very poor
Nutrients	low	Moderate	high	very high
Algae	few	Moderate	blooms likely	severe blooms probable
Plants	few	Moderate	abundant	few, in shallows
Fishery	cold water possible	cold water possible	warm water only	rough fish often dominate

Oligotrophic Lakes have low nutrient levels, clear water and low productivity. High dissolved oxygen levels in cooler bottom waters allow the survival of cold water fish.

Mesotrophic Lakes have moderate nutrient levels, clear water and moderate productivity. Rooted plants may be abundant. Moderate dissolved oxygen levels in cooler bottom waters allow the survival of cold water fish.

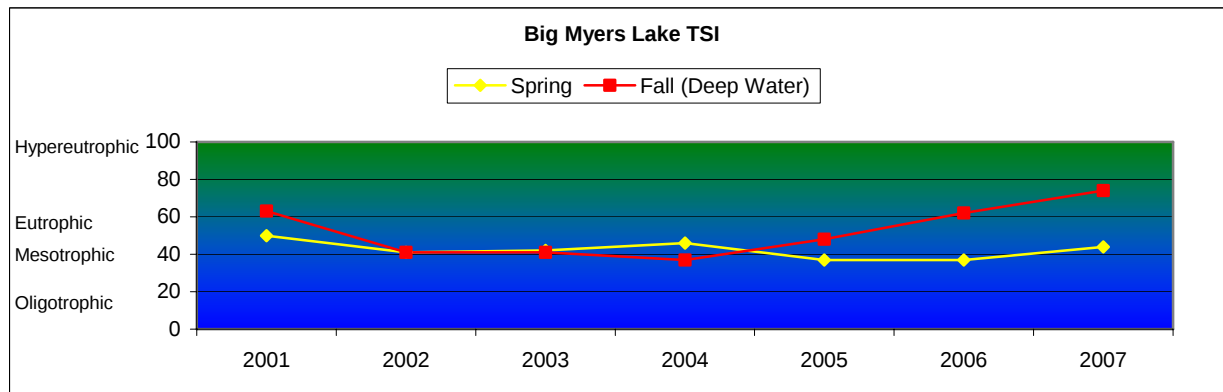
Eutrophic Lakes have high nutrient levels, turbid water and high productivity. Algal blooms are likely and may sometimes be severe. Rooted plants may be very abundant. Dissolved oxygen is depleted from bottom waters, restricting fish populations to warm water species.

Hypereutrophic Lakes have very high nutrient levels, extremely turbid water, and very high algal productivity. Severe blooms of noxious blue-green algae are likely. High turbidity and luxuriant growth of filamentous algae restrict rooted plant growth. Turbidity tolerant plant species (e.g., sago pondweed, Eurasian watermilfoil, curly leaf pondweed) may persist in shallow areas. Periods of dissolved oxygen depletion may restrict fish populations to rough fish species (e.g. carp, mudminnows, etc.).

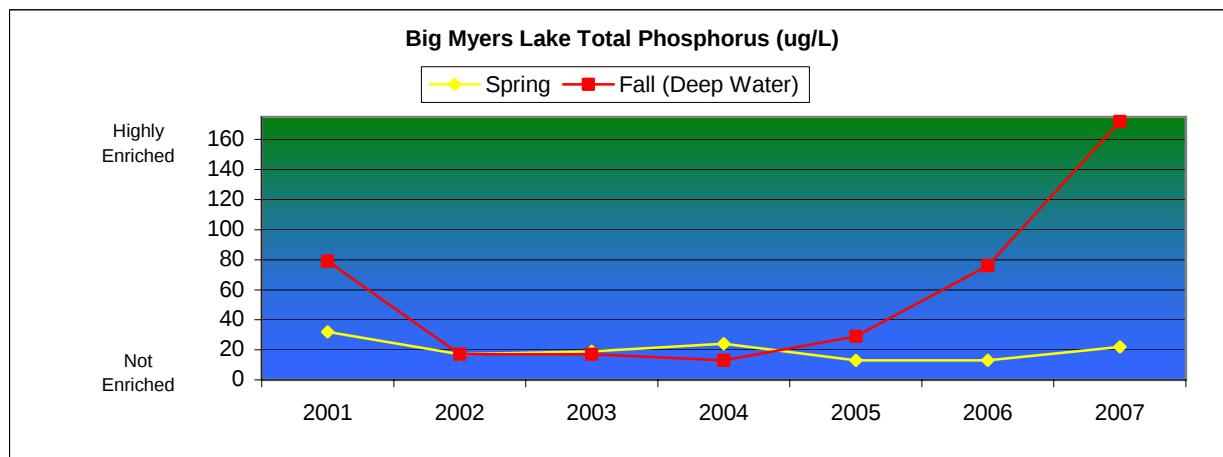
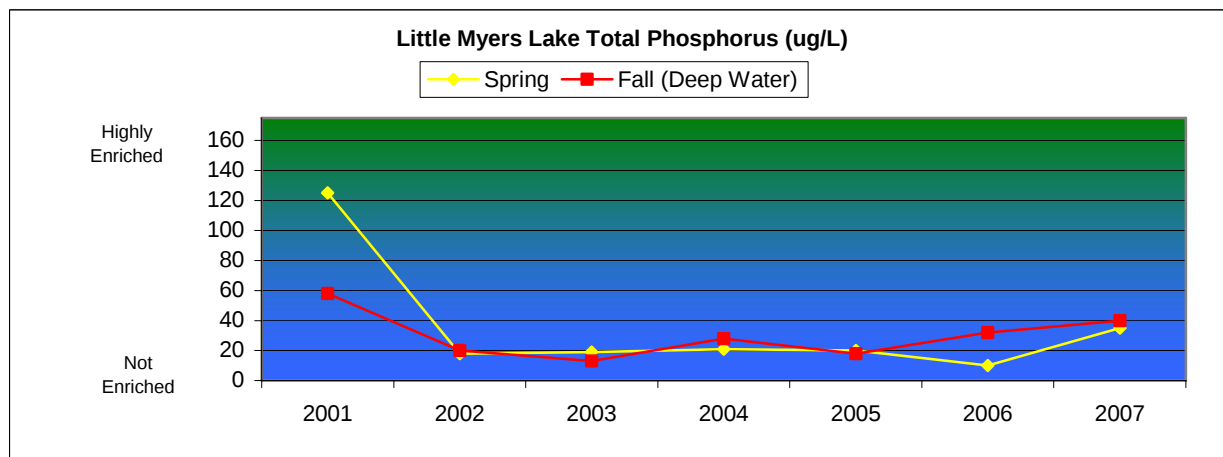




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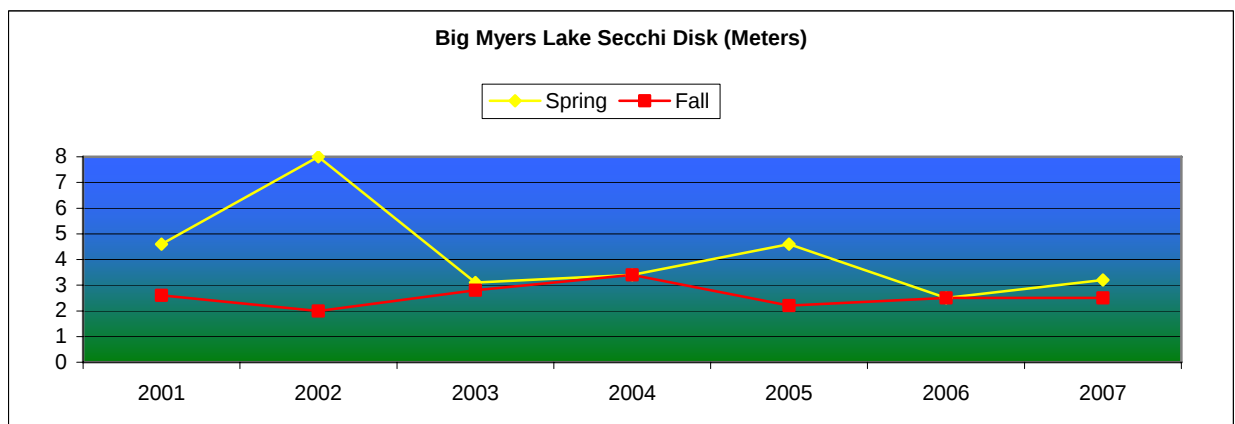
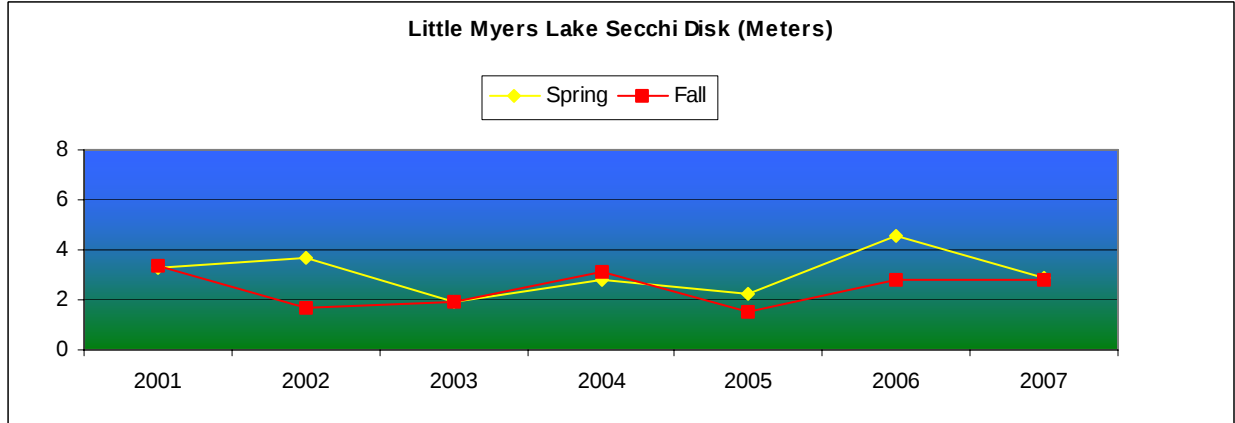
Total Phosphorus measures the total (organic and inorganic, dissolved and particulate) amount of phosphorus in the water. Phosphorus is usually the plant nutrient (i.e., fertilizer) that controls the amount of algal growth in lakes and ponds. Most Midwestern lakes have more phosphorus and more algae than is desirable, so lower values are generally better, though very unproductive water bodies typically support little fish production.





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Secchi Disk is a measure of water clarity, determined by measuring the depth to which a black and white reflective disk can be seen from the surface. Larger numbers represent greater water clarity.



Conclusions

Big & Little Myer Lakes are continually ageing. As lakes continue to accumulate nutrients the aquatic ecosystems' can change. Eutrophication is the process by which lakes are enriched with nutrients, increasing the production of rooted plants and algae growth (ageing). Cultural eutrophication is the rapid ageing of a lake caused by human activities. Lakeshore property owners should be encouraged to use phosphorus-free fertilizers on lawns and other areas that drain into Myer Lakes. Lakeshore residents should also be encouraged to manage their waterside landscapes according to the recommendations outlined in publications on this topic available from the MSU Extension. Once a lake has an accumulation of nutrients it is almost impossible to improve water quality beyond current conditions. Therefore, the goal of the Myer Lake Association should be to slow down the cultural eutrophication of the lakes by creating stability over time of the mentioned water quality parameters. As the graphs above illustrate, stability overall is currently being achieved on both the lakes.