
We evaluate the effects of land-use change since c.1890 on Little Lake Jackson in south-central Florida, USA. The lake currently is alkaline despite the prevalence of acidic lakes in the region. Watershed soils are acidic and poorly drained, but are underlain by limestone bedrock. Limnetic pH inferences, based on weighted-averaging tolerance regression of sedimented diatoms, indicate that Little Lake Jackson became significantly alkalized during the 1900s. Two driving forces that appear to be responsible for water-quality change are increased ionic loading and increased nutrient loading. Golf courses and residential lawns in the watershed receive substantial applications of lime, fertilizer, and irrigation with alkaline waters from deep wells, some of which reaches the lake in channelized runoff. Stormwater runoff and septic leachate also contribute to nutrient and solute loading. Sedimentary total P accumulation increased 5-fold and total N accumulation increased 3-fold since c. 1890. $\delta^{15}$N values suggest agricultural and septic sources for N loading. Sedimented pigments, inferred limnetic chlorophyll $\alpha$ values, and $\delta^{13}$C values of organic matter indicate that increased primary productivity occurred. Surface and subsurface inflow is nutrient-rich but low in hardness. Increased cation deposition in sediments indicates that ionic input might have reduced the lake’s natural resistance to alkalization. Lake waters remain low in ionic content, which suggests that the addition of base from carbonate sources is not responsible for all of the observed alkalization. Acid neutralization might have been facilitated by phosphate loading that led to increased base generation through greater nitrate assimilation. Inadvertent alkalization might occur commonly in regions where poorly buffered lakes are subject to significant ionic and nutrient loading from agriculture, turfgrass, and septic sources in their watersheds.