

ARE RECENT WATERSHED DISTURBANCES ASSOCIATED WITH TEMPORAL AND SPATIAL CHANGES IN WATER QUALITY OF LAKE GEORGE, NEW YORK, USA?

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Abstract: Lake George, a mesooligotrophic lake, is a historically important recreational site in northeastern New York, USA. A preliminary analysis of the data, collected during 1980-1990, suggested that the indicators of primary productivity have increased, particularly in the southern basin of the lake. This change was attributed to the recent increases in the urbanization and development of the southern shorelines. The suggestion of temporal and spatial degradation in lakewater quality has caused substantial concerns among the decision makers and the public alike. The main objective of this study is to evaluate possible eutrophication of the lake by quantification of temporal and spatial trends in concentrations of total phosphorus (TP), chlorophyll *a* (Chl *a*), silica (Si), and chloride (Cl) through the use of proper statistical techniques. Results indicate no statistically significant changes in the concentrations of TP, Chl *a*, or Si in the spring or summer from 1981 to 1993. A significant temporal trend of increase in Cl concentration is, however, detected. This is perhaps the strongest evidence that the development of the Lake George watershed has affected lakewater chemistry. In spring, the concentrations of TP, Chl *a*, Si, and Cl, averaged over all 13 years, were higher in the south basin, but differences are not statistically significant (i.e., $P > 0.05$). In summer, Si was slightly but significantly lower, and Cl was nonsignificantly higher in the south basin. Significant interactions between temporal and spatial changes are detected based only on summer values of TP and Chl *a*, indicating differential trends of change for these two variables in the south and north basins during the last 13 years.

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