Spatial and temporal heterogeneity of physical and chemical variables for an endorheic, shallow water body: Lake Pátzcuaro, Mexico

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With 3 figures and 2 tables

Abstract: Homogeneity of water quality in a shallow endorheic lake in Mexico, Lake Pátzcuaro, was studied through the analysis of 13 physical and chemical variables at 10 sampling stations monthly between January 1998 and January 1999. Principal components analysis associated most temporal and spatial variance with two variables: total residue and conductance. Spatial analysis discriminated between limnetic and littoral areas, and among shallow stations. Temporal analysis segregated four time intervals: cold/dry, warm/dry, rainy, and highest rainfall. Even though Lake Pátzcuaro is a continuous warm polymictic lake, our results show its environmental heterogeneity; the lake is a physical and chemical mosaic.

Key words: Environmental heterogeneity, endorheic, tropical lake, Michoacán, chlorophyll-a, nutrients, tecto-volcanic, warm polymixis, circadiomixis.

Introduction

LIMÓN et al. (1989) state that most research on tropical lakes concerns lakes of the equatorial region (0° to 15° N and S latitude). Between these lakes and the intensively investigated lakes of the temperate region is a circumglobal belt, typically arid, where few limnological studies have been conducted. Closed-lake basins typical of semi-arid zones are well represented in the Mesa Central of Mexico (ALCOCER & ESCOBAR 1996, ALCOCER et al. 2000), but limnological studies on these shallow lakes have been poorly developed outside Lake

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