

NUTRIENTS, CHLOROPHYLL AND BACTERIAL FECAL INDICATORS IN COVES AND OPEN WATER AREAS
OF LAKE OF THE OZARKS, MISSOURI

Rebecca O'Hearn

Dr. John R. Jones, Thesis Supervisor

ABSTRACT

Urban development and use of septic tanks in porous soils of Lake of the Ozarks poses a threat to public health via leaching into drinking wells and coves used for swimming. During 2 summers, phosphorus (TP), nitrogen (TN), chlorophyll (Chl), fecal coliform (FC), *Escherichia coli* (EC), and anthropogenic indices were measured in coves and main channel sites in the Grand Glaize-Turkey Bend region. *Bacteroides thetaiotaomicron* (BT), an obligate human gut bacterium, was concurrently monitored to determine the specificity of conventional fecal indicators (FC and EC). Discharges 3-4 times the average were recorded for both summers. Relationships between anthropogenic indices and water quality variables (TP, TN, Chl, FC and EC) were not apparent, likely because of dilution. Among coves nutrients, Chl, FC and EC declined from up- to down-reservoir, which reflected basin sedimentary processes. In regression analysis of daily means, wind speed accounted for a large portion of variation in FC (69%) and EC (86%), and a rain event elevated site means for FC and EC. Alternatively, BT did not decline longitudinally, was not related to wind speed, and was not influenced by rain. Unlike TP, TN, Chl, and conventional fecal indicators, BT was positively related to a surrogate for anthropogenic activity among daily means. Factors disturbing FC- and EC-laden sediments and soil obscure anthropogenic influence. For BT, anthropogenic influence is not obscured by these environmental factors, which allows detection during circumstances when conventional fecal indicators represent other sources of bacteria.