

THE EFFECT OF WATER TRANSPARNCY FLUCTUATION ON DIATOM ASSEMBLAGES OF LAKE ANNIE, FLORIDA

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Lake Annie is a monomictic, subtropical lake in Florida that exhibits a multi-decadal oscillation in water transparency. Previous research examined a rare 35+ year limnological monitoring record to show that transparency is controlled by influx of colored dissolved organic carbon (DOC) driven by the Atlantic Multidecadal Oscillation (AMO) that controls the region's rainfall. The AMO oscillates between a cool phase, where the mean rainfall is less than the long-term mean, and a warm phase, where the mean rainfall is higher than the long term mean and more variable among years. Lake Annie's water clarity is clearer in an AMO cool phase because of lower water column DOC concentrations that produce secchi depth ranges from 3-8 meters, in contrast to AMO warm phases when high DOC concentrations reduce the secchi depth range to 1-5 meters. Monthly phytoplankton samples were taken during an AMO warm phase, from 2006 to 2018, when secchi depth ranged from <1 to over 6 meters, reflecting highly variable regional rainfall. Our goal was to determine the effect of intra- and interannual fluctuations in water transparency on phytoplanktonic diatom assemblage composition. A strong relationship between diatom assemblage composition and transparency would allow us to develop a transfer function to reconstruct a longer (500 year) record of water transparency in Lake Annie to help resolve the role of the AMO in driving Florida's paleoclimate.