

Public Abstract

First Name: Benjamin

Middle Name: Cedar

Last Name: Lakish

Adviser's First Name: John

Adviser's Last Name: Jones

Co-Adviser's First Name:

Co-Adviser's Last Name:

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Title: NUTRIENTS AND CHLOROPHYLL DYNAMICS OF FORT COBB RESERVOIR

Nutrients from increasing human population and activity have created increased algal biomass and led to degradation of lakes and reservoirs. Models predicting algal biomass from phosphorus concentrations have become widely accepted. Nitrogen, light and morphology have also been shown to limit algal biomass and regional departures from phosphorus limitation are common. It is useful to experimentally test the factors limiting algal biomass in a region or individual lake because global models may not represent local conditions. Fort Cobb Reservoir, a 16.6 km² waterbody located in Caddo County, Southwestern Oklahoma was sampled for nutrients and chlorophyll approximately bimonthly from June 2000 to July 2002 and intermittently from March 2003 to July 2004. Results were compared to nationwide, Midwestern and statewide models predicting algal biomass. Phosphorus, nitrogen, light, zooplankton and sediment concentration were manipulated in 1 liter cubitainers (in situ algal bioassays) to test which factors were most important for controlling algal biomass. Vertical profiles of Photosynthetically Active Radiation (PAR) and in situ algal bioassays indicated substantial light limitation of algal biomass especially near the dam. Ratios of TN: TP and in situ algal bioassays suggest that phosphorus was secondarily limiting in the springtime and nitrogen in summer and fall. Data from other Oklahoma reservoirs indicated nitrogen and light limitation were more common than phosphorus limitation. The reservoir contains more phosphorus than 83%, more nitrogen than 94% and more chlorophyll than 98% of other reservoirs in the state. Results indicate that reduction of phosphorus loading is likely to reduce chlorophyll, but at a lesser rate than in other regions