

NUTRIENTS AND CHLOROPHYLL DYNAMICS IN FORT COBB RESERVOIR

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ABSTRACT

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. The reservoir was eutrophic; near the dam mean annual TP was 72 µg/l, TN was 1200 µg/l, chlorophyll was 29 µg/l and Secchi depth was 94 cm. Uplake areas were more eutrophic. Profiles of Photosynthetically Active Radiation (PAR) and *in situ* algal bioassays indicated substantial light limitation of algal biomass especially in the lacustrine zone. 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 substantial reduction of phosphorus loading is likely to reduce chlorophyll, but at a lesser rate than in other regions.