

LIMNOLOGY OF OXBOW LAKE WETLAND IN TRISTATE AREA (Ohio, Kentucky, Indiana, USA) AND  
ITS CONSERVATION

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Oxbow lakes(formed by river cut-off) are a common and often highly productive floodplain feature of major rivers around the world. The Great Miami River, which has its source in mid-Ohio, has substantial wetland development before its union with the Ohio River. Due to the annual flooding event many water bodies undergo substantial limnological changes. We were interested in characterizing the limnology of a naturally originated oxbow lake and several artificially created gravel pits. From early spring flooding until the separation of the water bodies in early May the entire floodplain was covered in water. Water level fluctuations in all water bodies were approximately three meters annually. During the growing season, Oxbow remained fairly shallow(<1m) while the gravel pits were relatively deep(3-9m) and stratified during the summer. Dissolved oxygen level at Oxbow was consistently lower(4-7 mg/l) than other water bodies (9-12mg/l) while all water bodies were turbid (Oxbow: Secchi depth 7cm, others: 50cm). Primary productivity at Oxbow was about 2 times higher than other water bodies(Oxbow:1010±760 mgC/m<sup>3</sup>/h, North Pond:580±470, n=9 for both sites at the surface). The algal biomass in Oxbow lake remained approximately ten times higher than any other water bodies(Oxbow:110±80 Chl a ug/l North Pond:13±12,n=13 for both sites). Study sites in the area other than Oxbow were found to be limnologically similar with the exception of lake stratification pattern. In 1985, a private conservation group, Oxbow Inc. was formed to protect the wetland from developers. This group works closely with other state and federal agencies(e.g., Hamilton County Park District) to protect the wetlands. Currently, the majority of the Ohio side of the wetland is protected through land easement and a small portion of the Indiana side(land surrounding Oxbow Lake) is protected by Oxbow Inc. Once Oxbow Inc. gains more control over the wetland through land easement or direct purchase, they can develop a protection plan to plant trees at periphery of the water bodies, construct a dam to raise water levels, and increase a buffer zone between land water-interface to reduce nutrient loading.