

BACKGROUND

In Oklahoma, development and implementation of a comprehensive wetland monitoring program is a high priority. Wetland-focused projects recently conducted in the state include development of a probabilistic monitoring design, creation of an interactive wetland mapping system, development of procedures to evaluate use attainability in wetlands, and development of indices of biotic integrity using different biotic assemblages. The majority of this work has focused on closed depressional wetlands, although Oklahoma's wetland resources include a number of other important wetland types.

Oxbow systems are unique natural lakes/wetlands that have not been assessed in Oklahoma. These systems are unique in that they have attributes of both lakes and wetlands. Oxbow systems provide several key ecosystem services such as floodwater retention, nutrient and sediment retention, nursery grounds for fish, and habitat for local and migratory waterbirds, amphibians and macroinvertebrates. Although oxbow systems are highly variable in their physical and chemical characteristics, many of these systems are considered wetlands because they have relatively shallow depths, large amounts of sediments and nutrients, characteristic riparian and emergent plant assemblages, and seasonal hydroperiods.

These systems form when a U-shaped meander is cut off from the main portion of river by process of erosion and deposition. Erosion occurs as sediment is scoured from the outer bank of the meander. As erosion is occurring sediment is deposited on the inner bank of these bends. The area of deposition is called a "point bar." **Figure 1** shows this process occurring in two areas – bend A and bend B. This process continues, causing bend A and bend B to move closer to one another. Eventually the two bends meet forming a bypass of the meander. In time, deposition of sediments will cause the meander to be essentially cut off from the rest of the river. This new cut-off portion forms a lake that often exhibits a distinctive "bow" shape. Sometimes a small connection is kept between the oxbow and the river called a "tie-channel." This allows for an exchange of water and sediments. These tie channels can remain active for hundreds to thousands of years (Rowland and Dietrich, 2005). However, not all oxbows exhibit tie channels. Often oxbows only receive water from its parent river by seepage, rainfall, runoff, and during times of high flow.

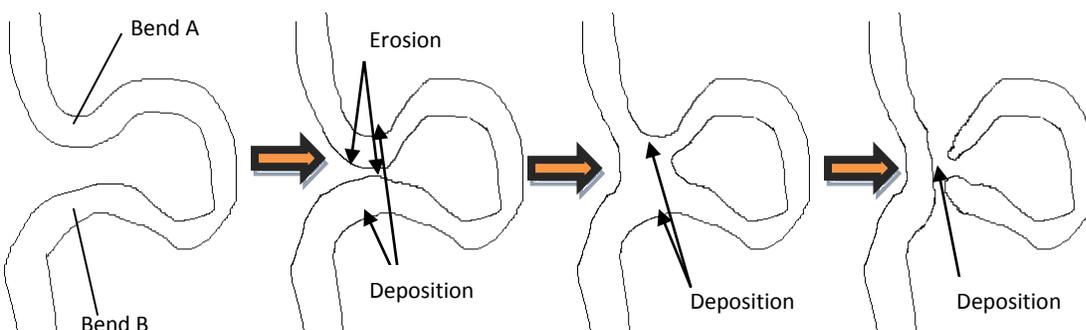


Figure 1: Oxbow formation showing erosional and depositional processes in a meander over time.