INTRODUCTION

Caddo Lake, located in northeastern Louisiana and northwestern Texas, is a popular recreational area for water-based activities such as boating, fishing, and swimming. The lake sits at a point of confluence for several small Louisiana communities surrounding the lake. The Louisiana Environmental Quality Council (1998) estimated that the lake is used for various purposes, including both fishing and navigation. The lake is the largest natural lake in Texas and the second largest natural lake in Louisiana.

The purpose of this report is to present the results of the bathymetric survey and the results of vertical profiles of physical and chemical-related properties, including depth, temperature, specific conductance, dissolved oxygen, pH, and volume. The bathymetric data were used to create a bathymetric map of the lake, and the results of vertical profiles were used to determine the physical and chemical properties of the lake.

Description of Study Area

Caddo Lake (Fig. 1), which is about 50 miles northeast of Shreveport, Louisiana, is located in northeastern Caddo Parish, Louisiana, and western Marion County, Texas. The lake has an area of 106,985 acres, a maximum depth of 4.3 feet, and a mean depth of 2.8 feet. The lake has a drainage area of 2,744 square miles, and its elevation is 167.58 feet above sea level. The lake is fed by water from the Red River and other smaller tributaries. Water from the Red River enters the lake at Site 2, and water from other tributaries enters the lake at Site 1.

The lake is divided into several sections, including the Northern Basin, the Central Basin, and the Southern Basin. The Northern Basin is the largest section of the lake and is located in the northeastern part of the lake. The Central Basin is the second largest section of the lake and is located in the central part of the lake. The Southern Basin is the smallest section of the lake and is located in the southwestern part of the lake. The bathymetric survey was conducted in the Northern Basin, which is the most productive and deepest part of the lake.

BATHYMETRY

Bathymetric data for Caddo Lake were collected during August 1998 and September 1998. The bathymetric survey was conducted using a digital survey fathometer, and the data were exported to ARC/INFO for drawing lines of equal depth of water and for creating a bathymetric map of the lake. The bathymetric map was produced using geographic information systems (GIS), and lines of equal depth of water were drawn on the map.

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PHYSICAL AND CHEMICAL-RELATED PROPERTIES

Data on physical and chemical-related properties were collected at three sites during the bathymetric survey: Site 1, Site 2, and Site 3. Site 1 is located in the northeastern part of the lake, Site 2 is located in the central part of the lake, and Site 3 is located in the southwestern part of the lake. The data were collected using a Secchi disk, a pH meter, and a temperature probe.

The water temperature at Site 1 was 88°F, and the water temperature at Site 2 was 84°F. The water temperature at Site 3 was 82°F. The water temperature at Site 1 was higher than the water temperature at Site 2 and Site 3 because Site 1 is closer to the sun. The water temperature at Site 3 was lower than the water temperature at Site 1 and Site 2 because Site 3 is further from the sun.

The specific conductance varied slightly; shallow-water specific conductance ranged from 143 to 137 S/cm (microsiemens per centimeter) near the surface, and varied only slightly with depth. The specific conductance was highest near the surface and decreased slightly with depth. The specific conductance was highest near the surface and decreased slightly with depth.

REFERENCES


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U.S. Department of Transportation and Development, Office of Transportation and Development, For direction and assistance regarding this study, contact the National Wildlife Research Center of the U.S. Geological Survey, Lake Apopka, Florida, for providing background and photographs.


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Bathymetric Survey and Physical and Chemical-Related Properties of Caddo Lake, Louisiana and Texas, August and September 1998

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