Excerpts from **Report of State Geologist – Twenty Fifth Annual Report (1900)**, by W. S. Blatchley, State Geologist, for the Indiana Department of Geology and Natural Resources. Assistants included W. C. Zaring, Indianapolis, Supervisor of Oil Inspection and J. C. Leach, Kokomo, Supervisor of Natural Gas Inspection. This book is a study of northern region lakes in Steuben, LaGrange, Noble, Whitley, Elkhart, Kosciosko, Fulton, Marshall, St. Joseph, LaPorte, and Starke Counties. It contains information ranging from marl deposits (for possible use in concrete production) and coal production reports including wages paid, and names and injury types of mine workers of the day. Along with its own studies, the book references reports from Richard Owen's Geological Reconnaisance of Indiana (1859) and W. H. Thompson's Fifteenth Annual State Geologists Report (1885).

LAKE MAXINKUCKEE – MARSHALL COUNTY

Topography of the Lake Bed – In studying the bed of the lake over 1,200 soundings were made. They were taken along 23 different lines, which were located with reference to fixed lines and points in the U. S. survey. They were made at intervals of 10 to 15 oar strokes. The length of an oar stroke of course varied, but for a given line they would be practically the same. Knowing the length of the line and the number of soundings the average distance between soundings was easily worked out, and the locations may be regarded as fairly accurate. While tracing out the outlines of bars and deep holes several hundred soundings were made between the lines mentioned. The soundings were made during the summers of 1897-1898 and 1899, at intervals as the wind and other circumstances were favorable. In sounding along the established lines we used piano wire and a wheel of known circumference. In work on the bars a sounding pole 13 feet in length was used. Much of the lake bed is covered with a very fine mud which made it difficult to tell just where the water stopped and the bed began. But in spite of this and other difficulties, the accompanying map* gives a fairly correct idea of the topography of the lake bed. On the east and west line, through the center of sections 21 and 22, just east of the center of the lake we found water 85 to 89 feet deep. We heard about much deeper water but could not find it. There is only a small area of this deepest water, about 18 or 20 acres, but it is just north of the center of some 300 acres of deep water, water from 40 to 80 feet in depth. This body of deep water is near the geographical center of the lake and includes nearly all the water that is over 40 feet in depth. In this central mass toward the southwest there is a detached body of water over 60 feet deep, and there are two similar bodies of water over 50 feet deep, one north and the other south. In the southern part of the lake there is a small area of 40-foot water and there are two small areas of 40-foot water in the northwestern part of the lake. Fully one-half the area of the lake is shallow water, 10 feet or less in depth. These areas of shallow and deep water are very irregular in outline, and the connecting slopes are sometimes gradual, but often very abrupt, so that the surface of the lake bed is quite as varied and irregular as the surface of the surrounding country.

Thoughts on History of Lake Formation – The body of water, nearly three times longer than wide, suggests the idea that an old preglacial drainage channel was possibly the origin of the lake bed. Kettle holes are numerous on both sides of the lake, forming prominent features of the moraine, and they seem to be the rational explanation of the lake bed. The original bed may have been a number of kettle holes, and the surface was doubtless sand and clay and gravel. But changes have occurred. The shallow parts have been modified by waves and currents and floating ice. The remains of the plants and animals living in the lake have contributed materials to the lake bed and so have the forests and other vegetation around the lake.

Distribution of Soils and Vegetation – Along the shore near the marshes, bogs and inlets there is some soil and considerable vegetation. Where the banks are abrupt and gravelly or clayey, soil and vegetation are both scanty. Almost everywhere from a depth of one or two feet out to a depth of six or eight feet the same conditions prevail. On the east large areas in this zone are almost devoid of vegetation, but on the north, west and south the bed of the lake in this zone is well covered with a stunted growth of lime-encrusted chara, with occasional plants of (common pondweed) and (Great Bulrush). From six to eight feet to 20 or 25 feet the white mud or marl forms a soil, and 12 to 15 different species of plants abound, generally forming a rank growth. The zone of shallow water is swept clean of all fine material, whether mud or marl. This seems to have been done by undertow currents caused principally by the winds. Westerly winds are more common and are generally stronger than other winds, and on the east, where such winds would make the stronger current, we find the hard gravel bed reaching out into much deeper water than on the other sides of the lake.

Wind, Air and Water Temperature Research – During the summer of 1899, from June 27th to September 6th, inclusive, I noted the direction of the wind 223 times, morning, noon, and night, as follows: Easterly 90, westerly 31, northerly 34, southerly 47, calm 21. During the summer months the easterly winds prevail, but during the year the westerly winds prevail and are in general stronger than the winds from the other quarters. The westerly winds probably account for the broader, barren zone on the east, while the winds from other quarters cause currents over lesser areas on the other sides of the lake. It seems possible that differences of temperature between the shallow and deep water, while seldom more than two or three degrees, might also cause currents toward the deeper water strong enough to move fine materials. On July 29th, 1899, when the lake was quite, I found a bottom temperature of 77 F. in shallow water and 79 in water seven feet deep. On the 30th it was 76 in the shallow water and 79 in the deeper water.

On September 1st, 1899, it was 77 in shallow water and 79 ½ in the deeper water. This difference of temperature would not cause a very vigorous current, but it might do something. The difference in temperature between the surface and bottom of the deeper portions of the lake is much greater, the bottom temperature in summer being 47 to 50 F., while the surface gets as warm as 77 to 80.

A few of the temperature observations taken in different months on the air and water are as follows:

	On West Side of Lake	6 a.m.	2 p.m.	8 p.m. (Degrees Fahrenheit)
7/28/1899	Air	74	83	81
	Water, 18 inches	78	84	82
7/29/1899	Air	77	81	72
	Water, shallow	77	87	80
7/30/1899	Air	62	75	73
	Water, shallow	74	82	78
7/31/1899	Air	69	77	75
	Water, shallow	75	84	80
8/01/1899	Air	68	83	77
	Water, shallow	76	82	79
8/05/1899	Air	70	76	74
	Water, shallow	79	82	80
8/06/1899	Air	71	80	76
	Water, shallow	75	80	78

Comparable recordings should be taken during the summer of 2009 (110 year comparison)

	Ice (inches)	Air (Deg.Fahr.)	Water Surface	Water Bottom
11/24/1898		20	40	
11/26/1898		5	35	
11/27/1898		20	34	
12/07/1898		16	32	
12/08/1898		5	32	
12/09/1898	3	10	32	
12/14/1898	7 ½	5	32	34
01/04/1899	8	0	32	34
01/08/1899	6	30	33	34
01/29/1899	10	13	32	34 ½
01/30/1899	10 ½	0	32	33
01/31/1899	11	9	32	34
02/01/1899	11 ½	8	32	35
02/02/1899	12	10	32	34
02/10/1899	16	20	33	36
02/13/1899	18	8	32	35
02/15/1899	18	19	32	34
02/27/1899	15	16	36	39
03/11/1899	10	50	33	38

Comparable data exists for most of these dates from various sources (2008-2009) including Purdue's AUV. Assemble for final reports.

*This map is in the Lake Maxinkuckee Environmental Council office. Plans are to have copies made.