

STATE OF NEVADA  
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES  
DIVISION OF WATER RESOURCES

Carson City



View of Pyramid Lake, July 17, 1968.

*Photo by USAF*

## WATER RESOURCES—INFORMATION SERIES

### REPORT 20

RECONNAISSANCE BATHYMETRY OF PYRAMID LAKE, WASHOE COUNTY, NEVADA

By

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Prepared cooperatively by the  
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View of Pyramid Lake, March 28, 1968.

*Photo by P. A. Glancy*



**INTRODUCTION**

Pyramid Lake, about 30 miles northeast of Reno, Nev., is the terminal water body of the Truckee River system. The principal inflow to the lake is from the Truckee River; local drainage around the lake contributes little. There is no outlet stream; therefore the only outflow is by evaporation. Considerable interest in the lake has developed in recent years because it is an important feature in the management of water in the Truckee and Carson River systems, and because of its potential as a recreation area. An important tool in the evaluation of Pyramid Lake from a management and recreation standpoint is an adequate physiographic and hydrologic survey. This report was prepared under the general direction of G. F. Worts, Jr., district chief of the Geological Survey's Water Resources Division in Nevada.

**HISTORY**

The earliest written record of Pyramid Lake is the diary of John C. Fremont, who encircled the lake in January 1844. The next record is that by King (1878), who visited the lake in 1867 and 1871. Russell (1885) surveyed the lake in August-September 1882. From records of these early visits and other evidence, the lake at that time, under natural conditions, covered about 140,000 acres (220 square miles), and its stage fluctuated perhaps as much as 20 feet between wet and dry periods (A. M. Piper, U.S. Geol. Survey, oral commun., 1968). Diversions from the Truckee River for irrigation began about 1860, and they were accelerated considerably following construction of the Truckee Canal in 1905 (fig. 1). The canal diverts water from the Truckee River to Lahontan Reservoir on the Carson River. Although some of this water is used for irrigation in the Forney area, most is stored in Lahontan Reservoir for use in the Newlands project near Fallon. U.S. Bureau of Reclamation records show that an average of about 250,000 acre-feet per year was diverted into Truckee Canal during the period 1905-68.

Altitudes of the level of Pyramid Lake from 1867 to 1968, taken from the U.S. Geological Survey records, are shown in figure 2. From 1909 to 1968 the lake level declined from an altitude of 3,889 feet to 3,789 feet above sea level, or 80 feet in 59 years.

**BATHYMETRIC SURVEY**

With the exception of a few fathometer surveys made by the Nevada Fish and Game Commission in the 1950's, the only previous systematic survey of Pyramid Lake was made by Russell in 1882 (1885, p. 9). For the present survey, section corners and east-west section lines were used to locate accurately the present shoreline and control points for the fathometer survey grid. A boat-mounted recording fathometer was used to obtain cross-sectional profiles of the lake bottom. Twenty-three cross-sectional profiles were run in an east-west direction at one-mile intervals. One long profile was run roughly north-south from The Needle Rocks to Anaho Island. Additional fathometer soundings were made around The Needle Rocks, Anaho Island, The Pyramid, the mouth of the Truckee River, and several beach areas along the west shore. The boat was operated at a constant speed on all profiles, and was kept on line by transit crews on both shores, which were in radio contact with the boat. Hand soundings were made as checks on fathometer readings at 6, 25, 68, 282, and 322 feet.

Aerial photography was obtained to provide details on the present shoreline configuration. Altitudes in this report are expressed in feet above mean sea level (datum of 1929, adjustment of 1956), referenced to U.S. Coast and Geodetic Survey benchmark N-21 at 3,940.29 feet altitude.

The fathometer profiles and aerial photographs were used to contour the lake bottom.

**LAKE AREA AND VOLUME**

Tables 1 and 2 and figure 3 may be used to obtain the area and volume of the lake at given altitudes. Below altitude 3,789 feet, lake area and volume are based on the bathymetric survey; above altitude 3,802 feet, they are based on planimetry of U.S. Geological Survey topographic maps at scales of 1:24,000 and 1:62,500 by A. M. Piper. Area and volume data have been extended to altitude 3,880 feet, which is approximately the highest recorded lake level.

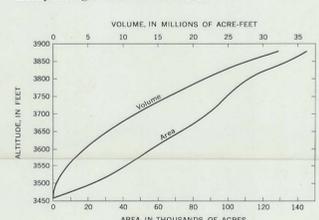


FIGURE 3.—Area and volume of Pyramid Lake.

**PYRAMID AND ANAHO ISLANDS**

As Pyramid Lake recedes, the effect on some of its prominent features is quite noticeable. Pyramid Island, for which the lake is named, is no longer an island but is now connected to the east shore by a narrow neck of land. Anaho Island, which is a National Wildlife Refuge, has been the nesting grounds for much of the bird life in the area. As the lake recedes, Anaho Island grows larger; and if the recession continues, it will soon be connected to the east shore much like Pyramid Island. In May, 1968, the width of the channel between Anaho Island and the east shore was 1,350 feet and its maximum depth was 27 feet.

TABLE 1.—Area of Pyramid Lake.  
(thousands of acres)

Altitude (feet)	0	1	2	3	4	5	6	7	8	9
3,880	144.3									
3,870	142.4	142.6	142.8	143.0	143.2	143.4	143.6	143.8	144.0	144.2
3,860	139.0	139.4	139.8	140.2	140.5	140.9	141.2	141.5	141.8	142.1
3,850	134.3	134.5	134.8	135.1	135.3	135.6	135.8	136.1	136.3	136.6
3,840	129.1	129.6	130.1	130.7	131.2	131.7	132.2	132.8	133.3	133.8
3,830	123.8	124.3	124.9	125.4	125.9	126.4	127.0	127.5	128.0	128.6
3,820	118.6	119.1	119.6	120.1	120.7	121.2	121.7	122.2	122.8	123.4
3,810	114.7	115.1	115.4	115.8	116.2	116.6	117.0	117.4	117.8	118.2
3,800	111.3	111.6	111.9	112.3	112.6	112.9	113.3	113.7	114.0	114.4
3,790	108.2	108.5	108.8	109.1	109.4	109.7	110.0	110.3	110.7	111.0
3,780	105.9	106.1	106.3	106.6	106.8	107.0	107.2	107.4	107.7	108.0
3,770	103.7	103.9	104.1	104.4	104.6	104.8	105.0	105.2	105.5	105.7
3,760	101.5	101.7	101.9	102.2	102.4	102.6	102.8	103.0	103.2	103.5
3,750	99.5	99.7	99.9	100.2	100.4	100.6	100.8	101.0	101.2	101.5
3,740	97.1	97.3	97.5	97.8	98.0	98.2	98.4	98.6	98.8	99.1
3,730	94.9	95.1	95.3	95.6	95.8	96.0	96.2	96.4	96.7	96.9
3,720	92.4	92.6	92.8	93.1	93.3	93.5	93.8	94.0	94.2	94.4
3,710	90.3	90.5	90.8	91.0	91.2	91.4	91.7	91.9	92.1	92.4
3,700	87.8	88.0	88.3	88.5	88.8	89.0	89.3	89.6	89.8	90.0
3,690	85.2	85.5	85.7	86.0	86.2	86.5	86.8	87.0	87.3	87.6
3,680	82.6	82.9	83.1	83.4	83.6	83.9	84.2	84.4	84.7	84.9
3,670	79.9	80.2	80.4	80.7	81.0	81.2	81.5	81.8	82.1	82.3
3,660	76.6	76.9	77.3	77.7	77.9	78.2	78.5	78.9	79.2	79.6
3,650	73.1	73.4	73.8	74.2	74.5	74.8	75.2	75.6	75.9	76.2
3,640	69.4	69.8	70.1	70.5	70.9	71.2	71.6	72.0	72.4	72.7
3,630	65.7	66.1	66.4	66.8	67.2	67.6	68.0	68.3	68.7	69.0
3,620	62.1	62.5	62.8	63.2	63.6	64.0	64.3	64.6	65.0	65.3
3,610	58.9	59.2	59.5	59.9	60.2	60.5	60.9	61.1	61.5	61.8
3,600	55.7	56.0	56.3	56.7	57.0	57.3	57.6	57.9	58.3	58.6
3,590	52.5	52.8	53.1	53.5	53.8	54.1	54.4	54.7	55.1	55.4
3,580	49.7	50.0	50.3	50.6	50.9	51.1	51.4	51.7	52.0	52.2
3,570	47.0	47.3	47.5	47.8	48.1	48.4	48.6	48.9	49.2	49.4
3,560	44.5	44.8	45.0	45.3	45.6	45.9	46.2	46.4	46.7	47.0
3,550	41.4	41.7	42.0	42.3	42.6	42.8	43.1	43.4	43.6	43.9
3,540	38.4	38.7	39.0	39.3	39.6	39.9	40.2	40.5	40.8	41.1
3,530	35.1	35.4	35.8	36.1	36.4	36.8	37.1	37.4	37.7	38.1
3,520	31.5	31.9	32.2	32.6	32.9	33.3	33.7	34.0	34.4	34.7
3,510	27.6	28.0	28.4	28.8	29.2	29.6	29.9	30.3	30.7	31.1
3,500	23.0	23.5	23.9	24.4	24.8	25.3	25.8	26.2	26.7	27.1
3,490	17.5	18.0	18.6	19.2	19.7	20.2	20.8	21.4	21.9	22.4
3,480	11.8	12.4	13.0	13.6	14.1	14.6	15.2	15.8	16.4	16.9
3,470	5.9	6.5	7.1	7.7	8.3	8.8	9.4	10.0	10.6	11.2
3,460		1.0	1.6	2.1	2.7	3.2	3.7	4.3	4.8	5.4
3,450										

TABLE 2.—Volume of Pyramid Lake.  
(thousands of acre-feet)

Altitude (feet)	0	1	2	3	4	5	6	7	8	9
3,880	32,020									
3,870	29,180	30,730	30,870	31,010	31,160	31,300	31,440	31,590	31,730	31,870
3,860	25,180	25,230	25,460	25,600	25,740	25,880	26,020	26,160	26,300	26,440
3,850	21,310	21,540	21,690	21,840	22,000	22,160	22,320	22,480	22,640	22,800
3,840	18,490	18,620	18,750	18,880	19,010	19,140	19,270	19,400	19,530	19,660
3,830	15,220	15,350	15,480	15,600	15,730	15,850	15,980	16,110	16,240	16,360
3,820	12,010	12,130	12,250	12,370	12,490	12,610	12,730	12,850	12,970	13,090
3,810	8,850	8,960	9,070	9,180	9,290	9,400	9,510	9,620	9,730	9,840
3,800	5,750	5,850	5,950	6,050	6,150	6,250	6,350	6,450	6,550	6,650
3,790	2,620	2,710	2,800	2,890	2,980	3,070	3,160	3,250	3,340	3,430
3,780	1,550	1,560	1,570	1,570	1,580	1,580	1,590	1,590	1,600	1,600
3,770	1,500	1,510	1,520	1,520	1,530	1,530	1,540	1,540	1,550	1,550
3,760	1,450	1,460	1,470	1,470	1,480	1,480	1,490	1,490	1,500	1,500
3,750	1,400	1,410	1,420	1,420	1,430	1,430	1,440	1,440	1,450	1,450
3,740	1,350	1,360	1,370	1,370	1,380	1,380	1,390	1,390	1,400	1,400
3,730	1,300	1,310	1,320	1,320	1,330	1,330	1,340	1,340	1,350	1,350
3,720	1,250	1,260	1,270	1,270	1,280	1,280	1,290	1,290	1,300	1,300
3,710	1,200	1,210	1,220	1,220	1,230	1,230	1,240	1,240	1,250	1,250
3,700	1,150	1,160	1,170	1,170	1,180	1,180	1,190	1,190	1,200	1,200
3,690	1,100	1,110	1,120	1,120	1,130	1,130	1,140	1,140	1,150	1,150
3,680	1,050	1,060	1,070	1,070	1,080	1,080	1,090	1,090	1,100	1,100
3,670	1,000	1,010	1,020	1,020	1,030	1,030	1,040	1,040	1,050	1,050
3,660	950	960	970	970	980	980	990	990	1,000	1,000
3,650	900	910	920	920	930	930	940	940	950	950
3,640	850	860	870	870	880	880	890	890	900	900
3,630	800	810	820	820	830	830	840	840	850	850
3,620	750	760	770	770	780	780	790	790	800	800
3,610	700	710	720	720	730	730	740	740	750	750
3,600	650	660	670	670	680	680	690	690	700	700
3,590	600	610	620	620	630	630	640	640	650	650
3,580	550	560	570	570	580	580	590	590	600	600
3,570	500	510	520	520	530	530	540	540	550	550
3,560	450	460	470	470	480	480	490	490	500	500
3,550	400	410	420	420	430	430	440	440	450	450
3,540	350	360	370	370	380	380	390	390	400	400
3,530	300	310	320	320	330	330	340	340	350	350
3,520	250	260	270	270	280	280	290	290	300	300
3,510	200	210	220	220	230	230	240	240	250	250
3,500	150	160	170	170	180	180	190	190	200	200
3,490	100	110	120	120	130	130	140	140	150	150
3,480	50	60	70	70	80	80	90	90	100	100
3,470	20	30	40	40	50	50	60	60	70	70
3,460	10	15	20	20	30	30	40	40	50	50
3,450	5	7	10	10	15	15	20	20	25	25

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Russell, I. C., 1885, Geological history of Lake Lahontan, a Quaternary lake of northwestern Nevada: U.S. Geol. Survey monograph 11, 288 p.

**EXPLANATION**  
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