

4. Clear Lake

Clear Lake is an approximately 400-acre lake lying in the upper northwest corner of the City of Forest Lake and the Upper Rice Creek Planning Region. It lies along the main stem of Rice Creek, and its outlet consists of a 42-inch CMP at 888.03 (NGVD 29) or 888.14 (NAVD 88). The ordinary high water level, as recorded by the Minnesota DNR, is 889.5 (NGVD 29). The 1981 FIS did not include a lake level analysis for Clear Lake. The DNR Lake Finder website provided lake level data for a spotty period of record from 1957-2013 (see **Figure 4a**). Due to the low number of lake level data during the years of 1957, 1985-1992, 2001-2006, and 2013, and therefore lack of confidence that the true annual maximum was captured, these years were not included in the analysis.

The maximum annual series, consisting of 33 years, was plotted on probability paper. A polynomial line was fit to the data to determine the elevations for the various recurrence intervals (see **Figure 4b**). The estimated flood elevations are shown in **Table 4a**. The 100-year flood elevation was estimated using the polynomial equation. Insufficient lake level data and information on potential overflow elevations are available to provide a reliable estimate of the 500-year flood elevation.

Table 4a: Estimated Flood Elevations for Clear Lake

Return Period	Lake Level Data Source		
	1981 FIS	DNR (used in this study) (n = 33)	
	(NGVD 29)	(NGVD 29)	(NAVD 88)*
2	--	889.7	889.9
5	--	890.2	890.3
10	--	890.6	890.7
50	--	891.4	891.5
100	--	891.7	891.9
500	--	--	--

*0.11 feet is added to NGVD 29 datum to convert to NAVD 88 datum

An additional component of this study consists of creating a non-exceedance frequency graph based on all daily measurements available (see **Figure 4c**). For Clear Lake, the period of record consists of the data found on the MnDNR Lake Finder website, which consists of 619 days of measurements, from 1957 to 2013 (see **Figure 4a**). The results are presented in **Table 4b**.

Table 4b: Daily Non-Exceedance Frequency of Lake Levels for Clear Lake

Non-Exceedance Frequency	Lake Level	
	(NGVD 1929)	(NAVD 1988)
2.5%	888.5	888.6
10%	888.6	888.7
25%	888.8	888.9
50%	889.1	889.2
75%	889.4	889.5
90%	889.7	889.8
99.5%	890.8	890.9

Clear Lake Levels (DNR LakeFinder)

◆ DNR Lake Finder ◆ Annual Max (Lake Finder)

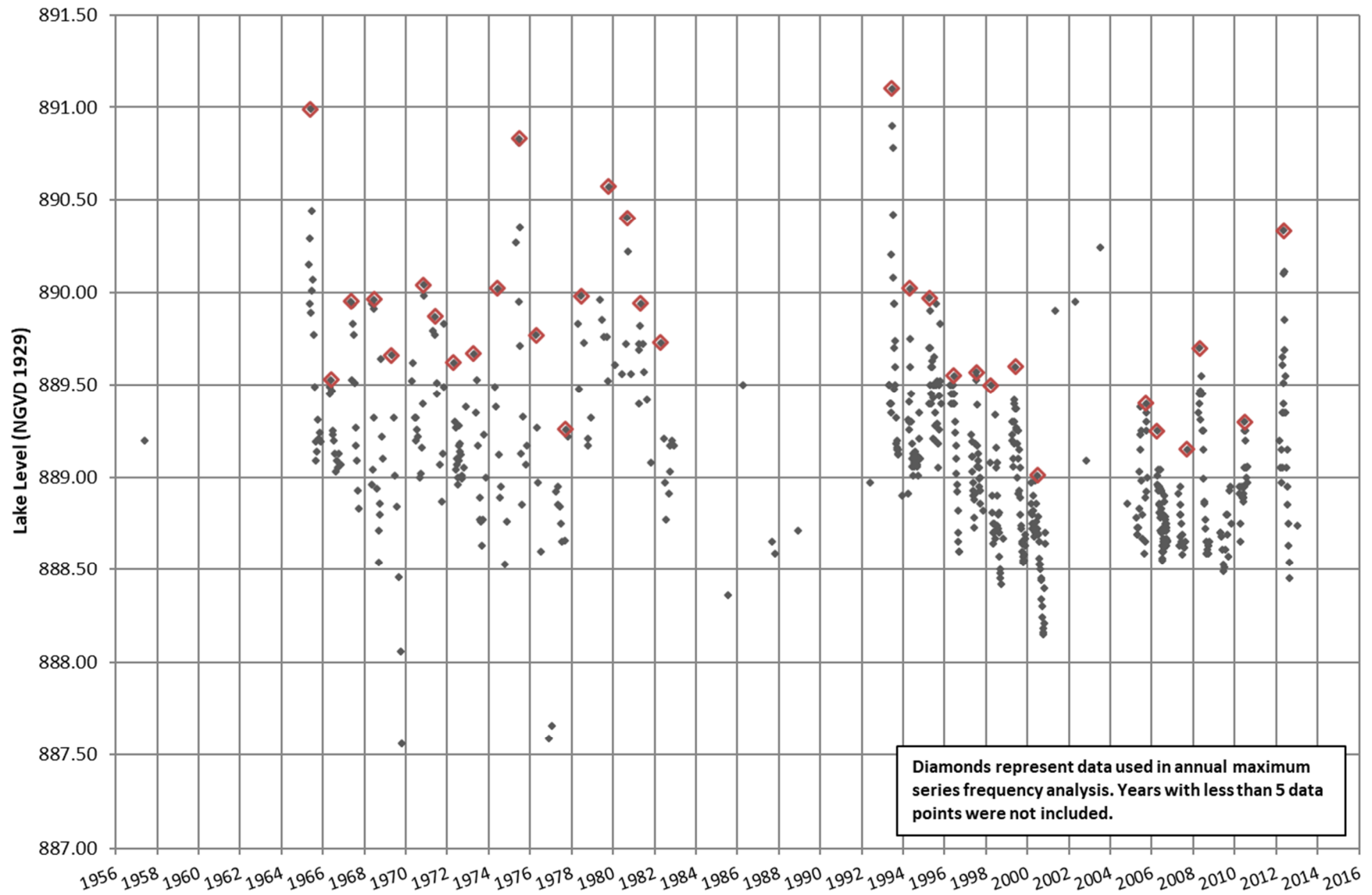
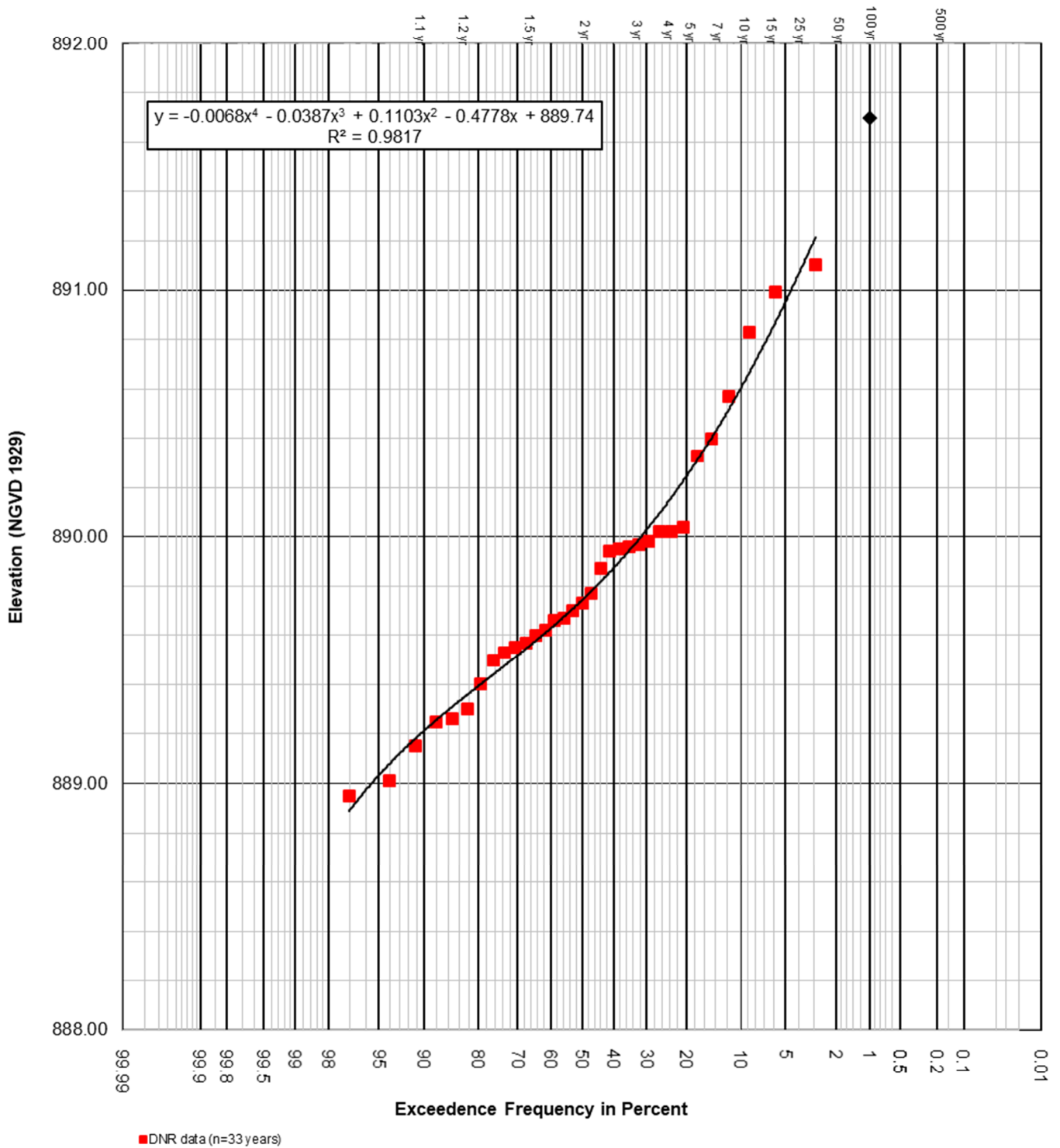


Figure 4a

Clear Lake Levels (NGVD 1929) **Maximum Annual Series Frequency Curve** **(Weibull Plotting Positions)**



Outlet:

42-inch CMP @ 888.03 (NGVD 29), 888.14 (NAVD 88)

Figure 4b

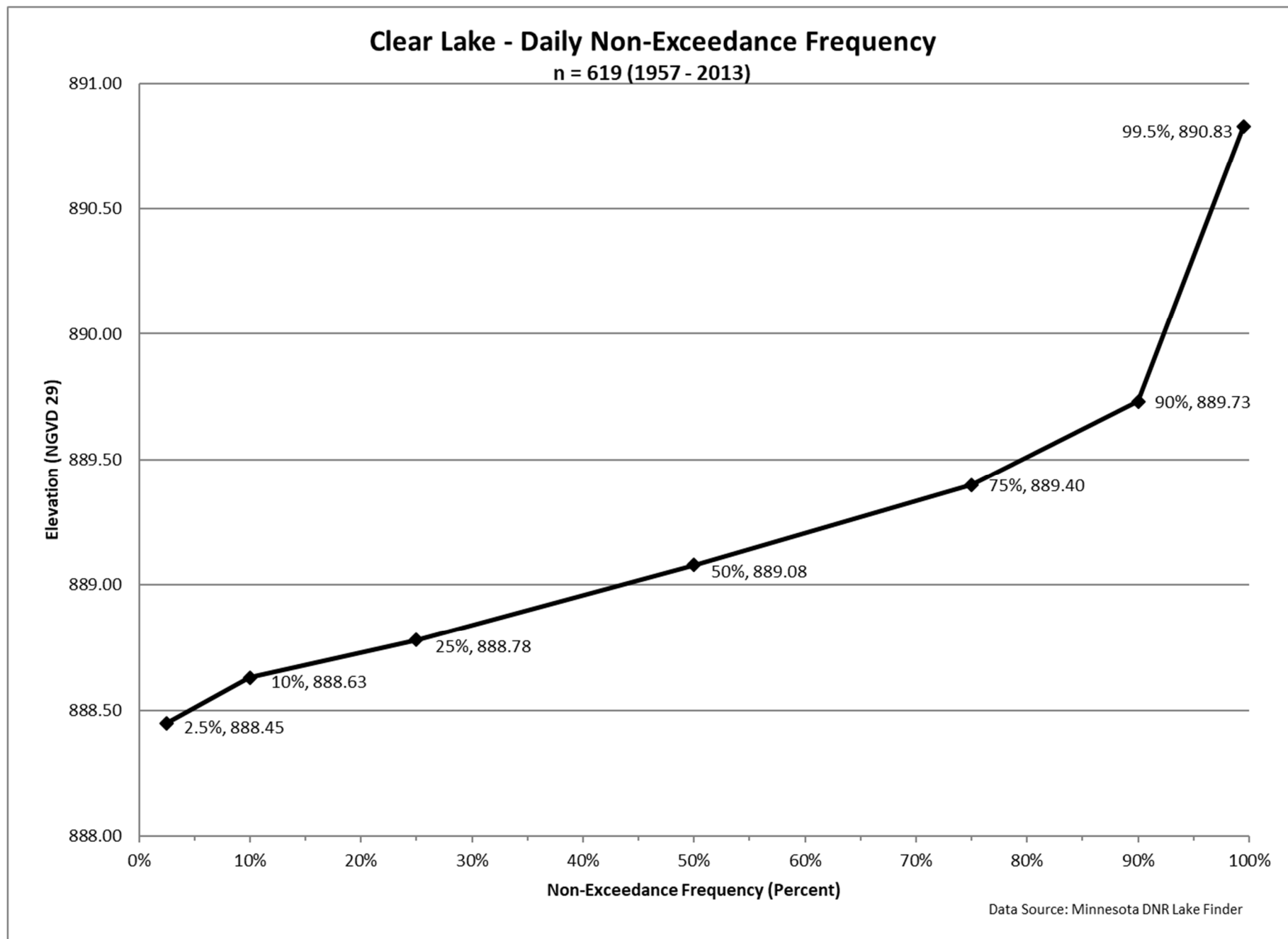


Figure 4c