

### **13. Rondeau Lake**

Rondeau Lake is a 275 acre lake located in on the northern limits of the City of Lino Lakes, within the District's Upper Rice Creek Planning Region. Inflow to Rondeau Lake is through several county and judicial ditches. The lake discharges into Rice Creek through a 36-inch x 49-inch RC arch pipe at elevation 884.40 (NGVD 29) or 884.54 (NAVD 88).

In the 1981 FIS, annual high water elevations were determined from historic lake levels from 1954 to 1979 from the St. Paul Water Utility. The measured data is no longer available, but the selected annual maximums are provided in the 1981 report. The DNR Lake Finder website provided lake level data for a spotty period of record from 1986-2021 (see **Figure 13a**). Due to only one data point collected in 1986 and 2010, these years were eliminated.

For this study, the maximum annual water levels listed in the 1981 FIS were merged with the maximum annual water levels determined from data collected from the DNR Lake Finder. The complete maximum annual series, consisting of 52 years, was plotted on probability paper, and a polynomial line was fit to determine the elevations for the various recurrence intervals (see **Figure 13b**). The estimated flood elevations are shown in **Table 13a**. 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.

Both the maximum annual series used in the 1981 FIS analysis and the combined data are plotted on **Figure 13b**. The difference in results shown in **Table 13a** are the result of both a different maximum annual series (length of data set) and the fact that in the 1981 study, a straight line was fitted through the points, as opposed to the graphically fitted line in this study.

An additional component of this study consists of creating a non-exceedance frequency graph based on all daily measurements available (see **Figure 13c**). For Rondeau Lake, the period of record consists of the data found on the MnDNR Lake Finder website, which consists of 956 days of measurements, from 1954 to 2021 (see **Figure 13a**). The results are presented in **Table 13b**.

**Table 13a: Estimated Flood Elevations for Rondeau Lake**

Return Period	Lake Level Data Source		
	1981 FIS (n=23)	DNR (used in this study) (n = 52)	
	(NGVD 29)	(NGVD 29)	(NAVD 88)*
2	--	886.5	886.6
5	--	886.9	887.0
10	887.2	887.1	887.2
50	887.9	887.4	887.5
100	888.06	887.5	887.7
500	888.12	--	--

\*0.14 feet is added to NGVD 29 datum to convert to NAVD 88 datum

**Table 13b: Daily Non-Exceedance Frequency of Lake Levels for Rondeau Lake**

Non-Exceedance Frequency	Lake Level	
	(NGVD 1929)	(NAVD 1988)
2.5%	884.7	884.9
10%	885.3	885.4
25%	885.5	885.7
50%	885.9	886.0
75%	886.2	886.4
90%	886.5	886.6
99.5%	887.2	887.3

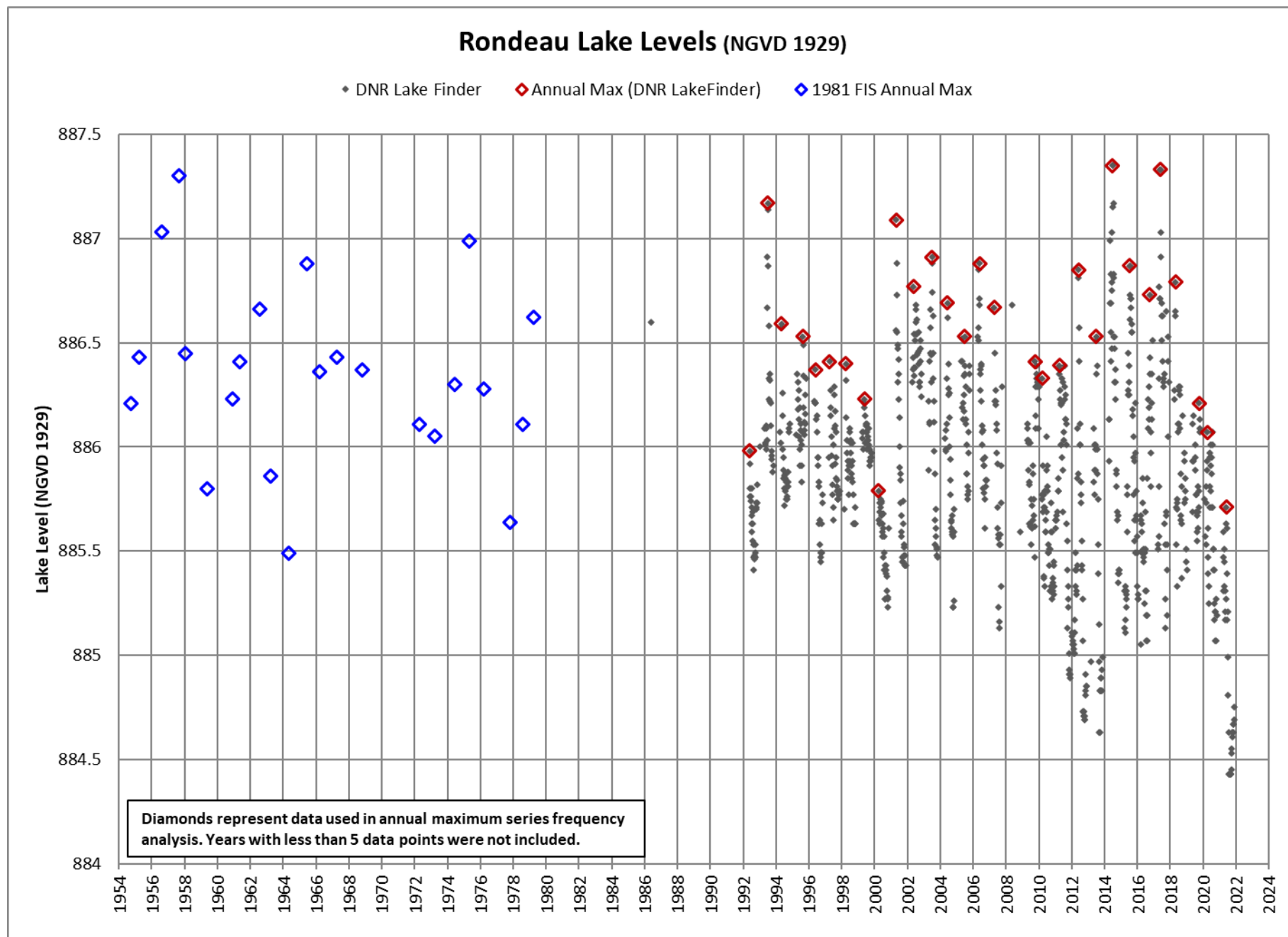
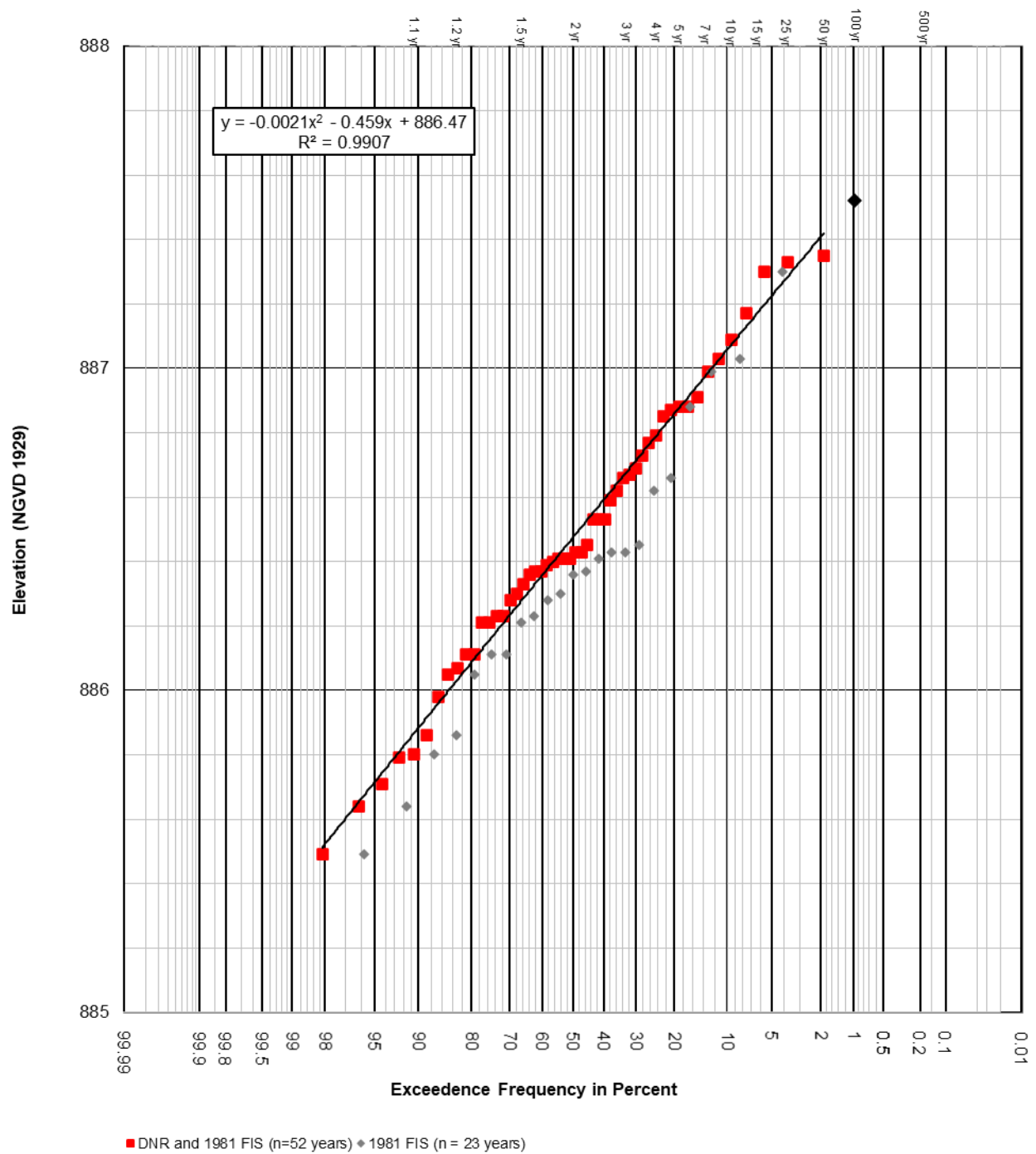


Figure 13a

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



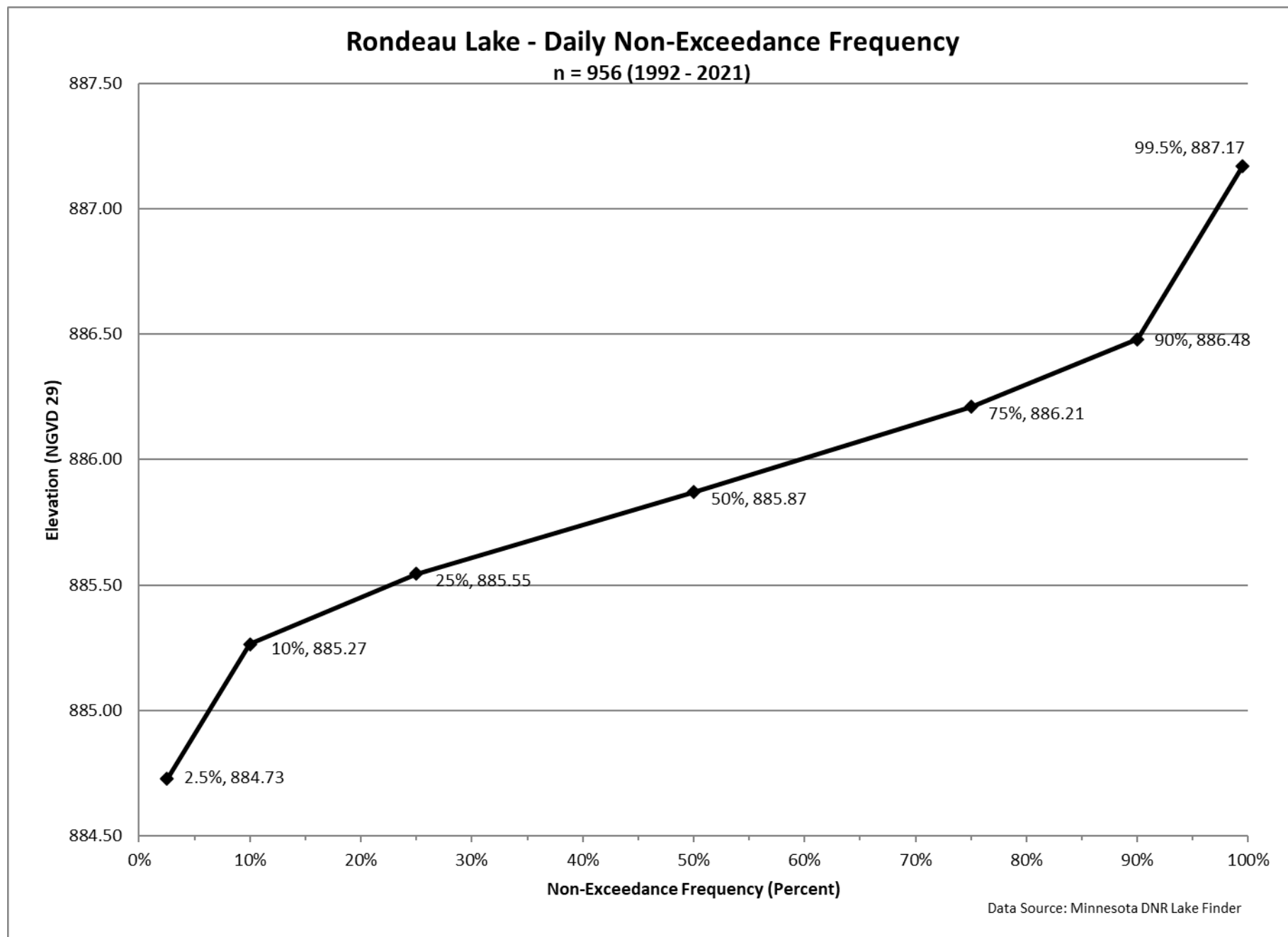


Figure 13c