

12. Rice Lake

Rice Lake is located along the main stem of Rice Creek, within the City of Circle Pines, and is within the Middle Rice Creek Planning Region of the District. It has a surface area of approximately 598 acres. Rice Creek enters the lake on the north and exits to the south. Rice Lake is situated between Marshan Lake and Baldwin Lake. Rice Lake discharges into an open channel at elevation 876.75 (NGVD 29) or 876.90 (NAVD 88)¹. The ordinary high water level, as recorded by the Minnesota DNR, is 883.1 (NGVD 29). Reshanau Lake, located to the east, is connected to Rice Lake by a 42-inch RC pipe and a large wetland area between the two lakes.

In the 1981 FIS, annual high water elevations were determined from historic lake levels from 1951 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 1986-2013 (see **Figure 12a**). Due to the low number of lake level data, 1986, 1987, 1990, and 2007 to 2013 were not included in the analysis.

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 42 years, was plotted on probability paper, and a polynomial line was fit to determine the elevations for the various recurrence intervals (see **Figure 12b**). The estimated flood elevations are shown in **Table 12a**. 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 12b**. The difference in results shown in **Table 12a** 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.

¹ HEI Survey from 4/1/2010

Table 12a: Estimated Flood Elevations for Rice Lake

Return Period	Lake Level Data Source		
	1981 FIS	DNR (used in this study) (n = 42)	
	(NGVD 29)	(NGVD 29)	(NAVD 88)*
2	--	882.3	882.5
5	--	883.4	883.6
10	884.4	884.2	884.4
50	885.6	886.0	886.1
100	886.0	886.8	887.0
500	886.9	--	--

*0.15 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 12c**). For Rice Lake, the period of record consists of the data found on the MnDNR Lake Finder website, which consists of 422 days of measurements, from 1986 to 2013 (see **Figure 12a**). The results are presented in **Table 12b**.

Table 12b: Daily Non-Exceedance Frequency of Lake Levels for Rice Lake

Non-Exceedance Frequency	Lake Level	
	(NGVD 1929)	(NAVD 1988)
2.5%	878.5	878.6
10%	878.7	878.8
25%	879.2	879.4
50%	879.9	880.0
75%	881.1	881.2
90%	882.0	882.1
99.5%	884.4	884.5

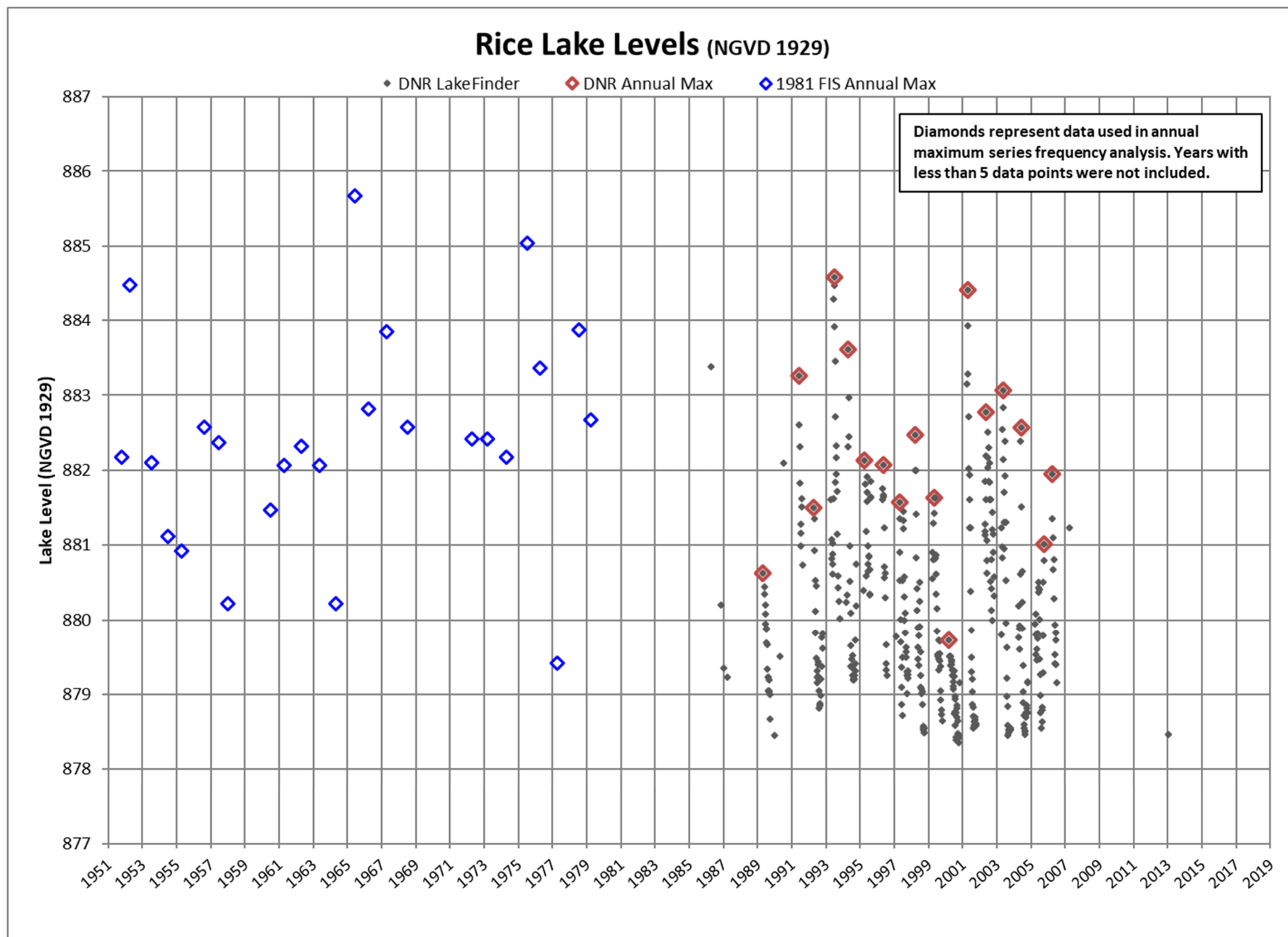
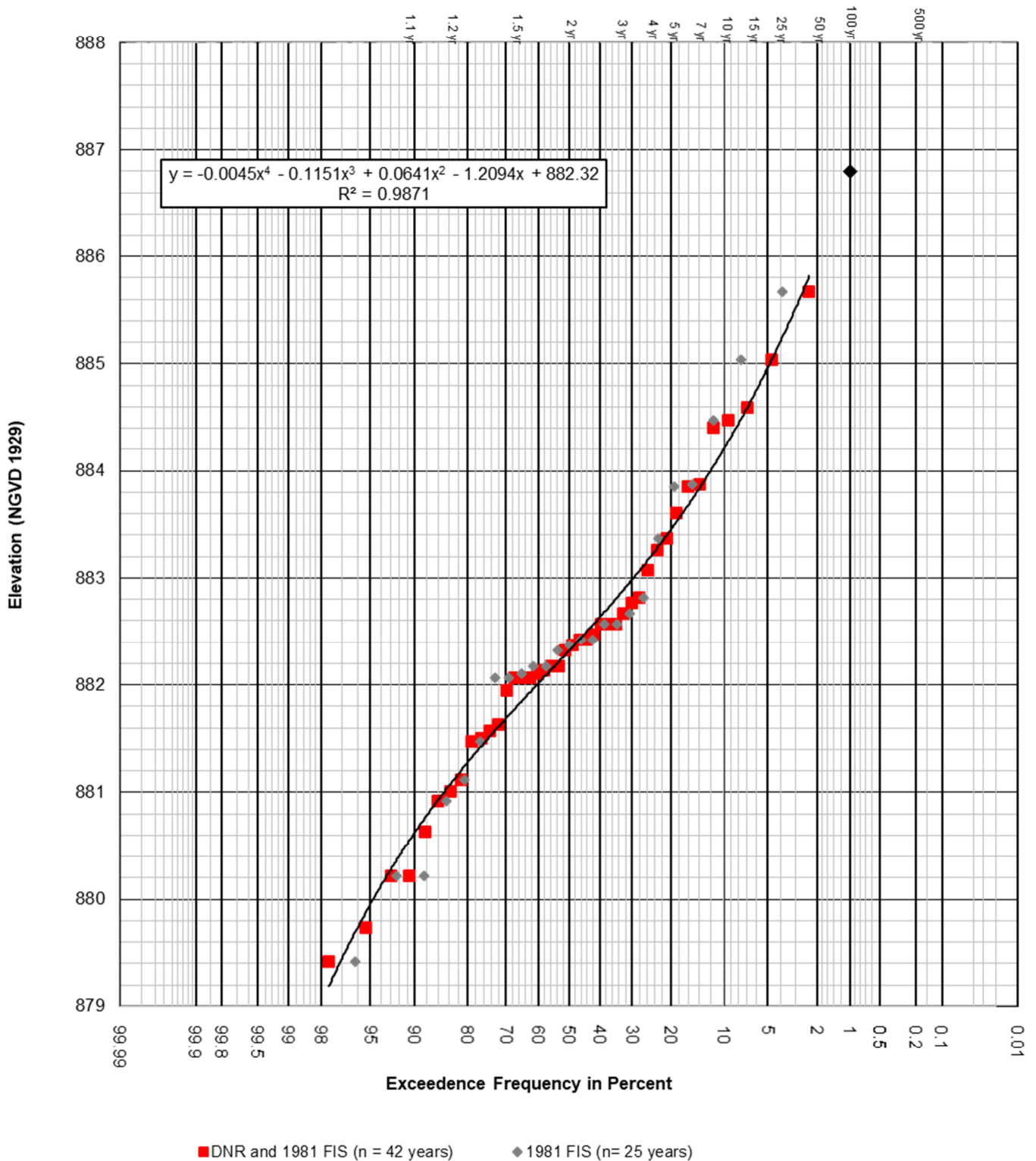


Figure 12a

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



Outlet:

Natural Channel @ 876.75 (NGVD 29), 876.90 (NAVD 88)

Figure 12b

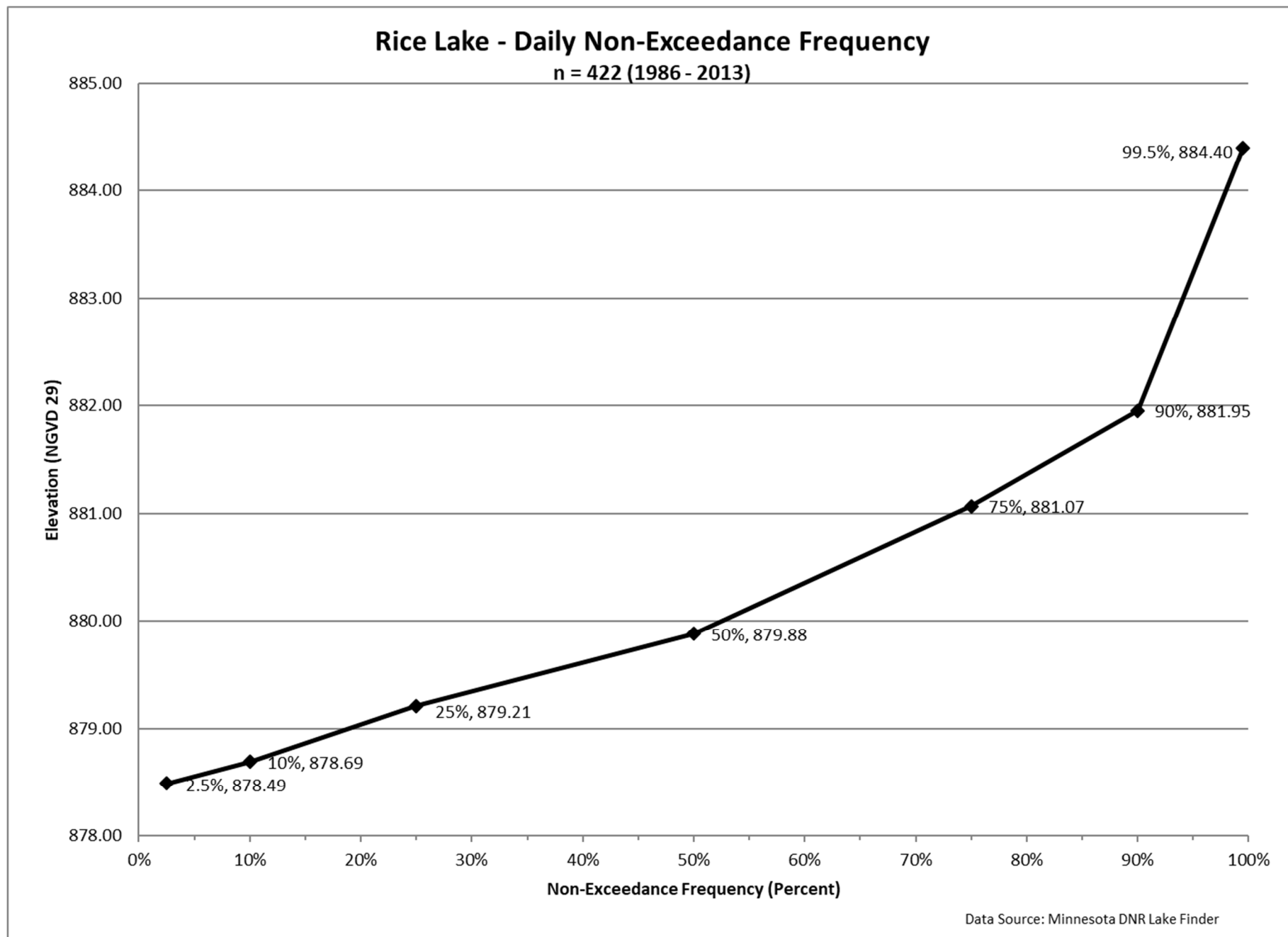


Figure 12c