

## **2. Baldwin Lake**

Baldwin Lake is an approximately 220-acre lake lying in both the City of Lino Lakes and in the City of Circle Pines. It lies along the main stem of Rice Creek downstream of Rice Lake. Rice Creek enters the lake on the north and exits to the south. The lake levels are controlled by a natural channel outlet at elevation 877.35 (NGVD 29). The ordinary high water elevation, as recorded by the Minnesota DNR, is 883.1 (NGVD 29).

The 1981 FIS provides no annual maximum series of lake levels for Baldwin Lake, but instead provides the results of a previous Circle Pines Flood Insurance Study. That study used the reservoir routing methods of TR-20 and stage discharge relationships developed using HEC-2.

The DNR Lake Finder website provides lake level data for a spotty period of record from 1956-2013 (see **Figure 2a**). The same gage is used for both Baldwin Lake and upstream Rice Lake, which is located on the southeast (left upstream) abutment on Trunk Highway 49 over the channel between the two lakes. Both current hydraulic modeling<sup>1</sup> and historical documentation<sup>2</sup> suggests that the two lakes are equalized under most conditions. Therefore, for this study, the same lake level data has been used for both Rice Lake and Baldwin Lake. The analysis of Rice Lake is in Section 12 of this report, and contains the same results as this section. Note on **Figure 2a**, that data is recorded by the DNR for Rice Lake starting in 1986, but data is recorded on a regular basis for Baldwin Lake starting in 1970. However, the 1981 FIS lists additional annual high water levels for Rice Lake collected by the St. Paul Water Utility over the period from 1951 to 1979. The 1981 FIS annual maximum levels were assumed in this study for this time frame.

The maximum annual series, consisting of 42 data points, was plotted on probability paper, and a polynomial line was fit to the data to determine the elevations for the various recurrence intervals (see **Figure 2b**). The estimated flood elevations are shown in **Table 2a**. 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.

---

<sup>1</sup> "Rice Creek HEC-RAS Model Report," 2010, performed under District-wide Modeling.

<sup>2</sup> 8-30-1966 Division of Waters Director letter referenced in "Final Hydrologic Report, City of Lino Lakes, Anoka County, Minnesota," from May 7, 1980 (prepared by Toltz, King, Duvall, Anderson and Associates).

**Table 2a: Estimated Flood Elevations for Baldwin Lake**

Return Period	Lake Level Data Source		
	1981 FIS (TR-20 model)	Lake Level Results Identical to Rice Lake Analysis (Section 12) (n = 42)	
	(NGVD 29)	(NGVD 29)	(NAVD 88)*
2	--	882.3	882.5
5	--	883.4	883.6
10	883.7	884.2	884.4
50	884.8	886.0	886.1
100	885.2	886.8	887.0
500	886.0	--	--

\*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 2c**). For Baldwin 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 2b: Daily Non-Exceedance Frequency of Lake Levels for Baldwin 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

## Baldwin Lake Levels (NGVD 1929)

◆ DNR Lake Finder

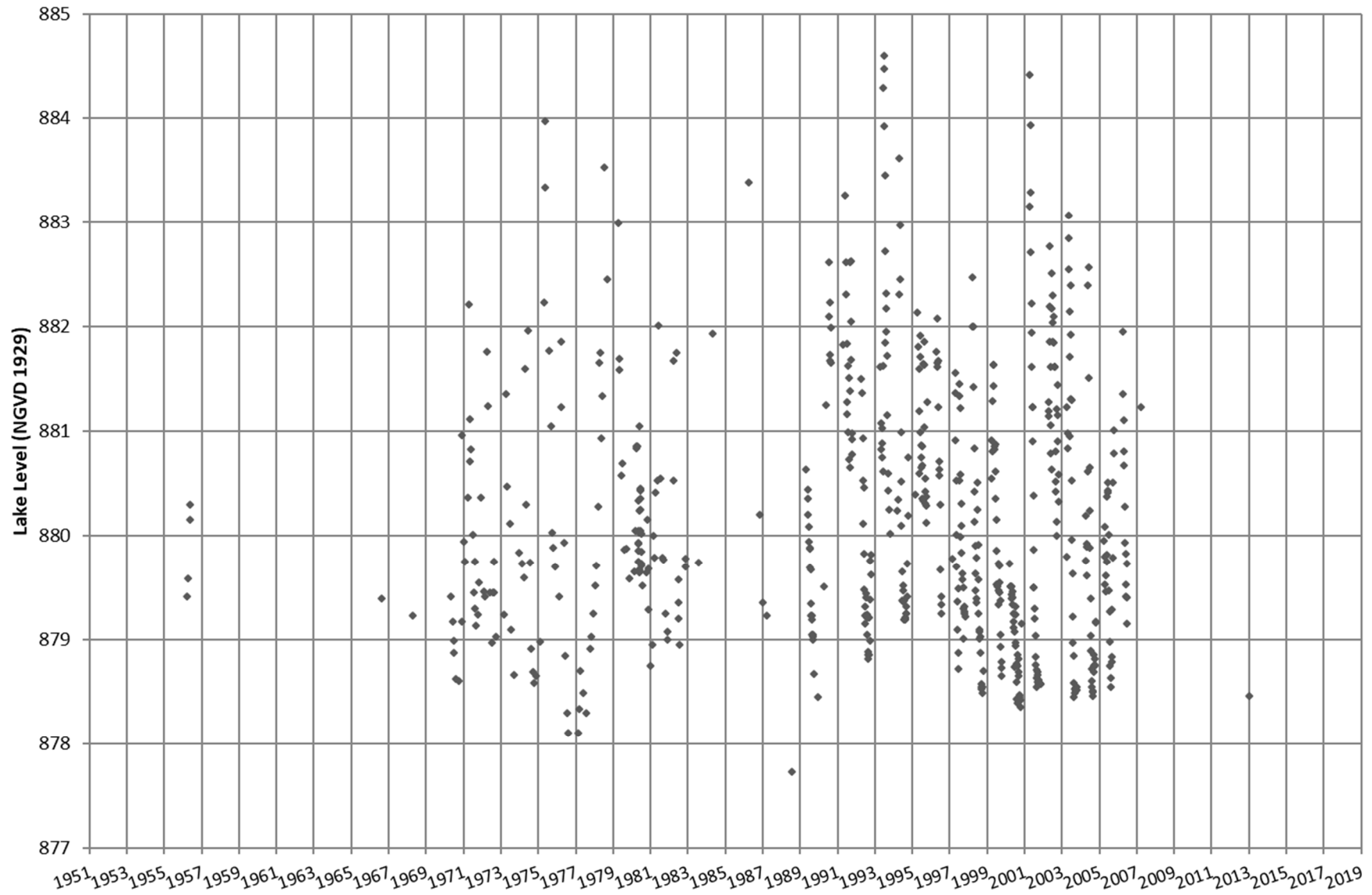
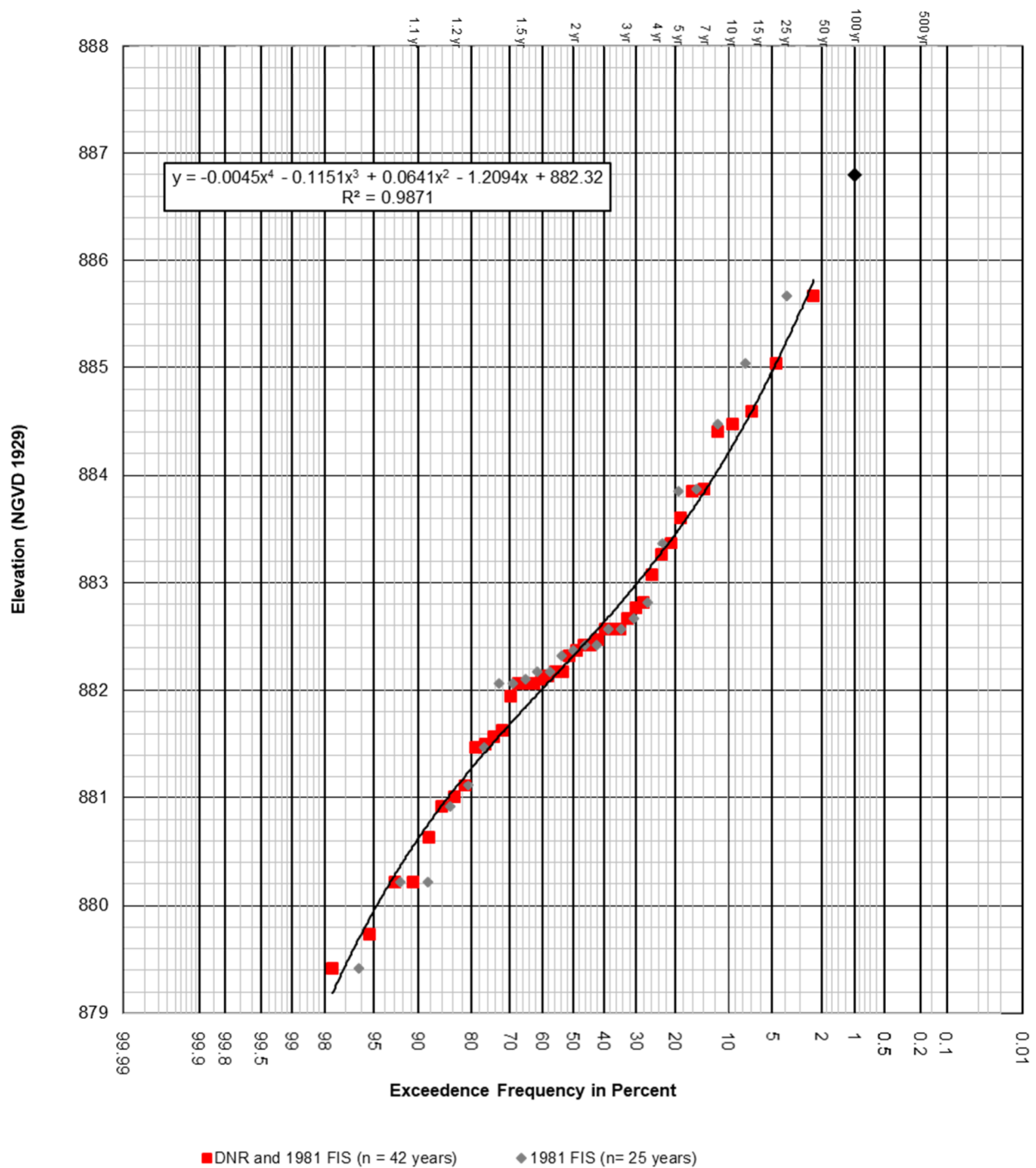


Figure 2a

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



## **Outlet:**

Natural Channel @ 877.35 (NGVD 29), 877.50 (NAVD 88)

**Figure 2b**

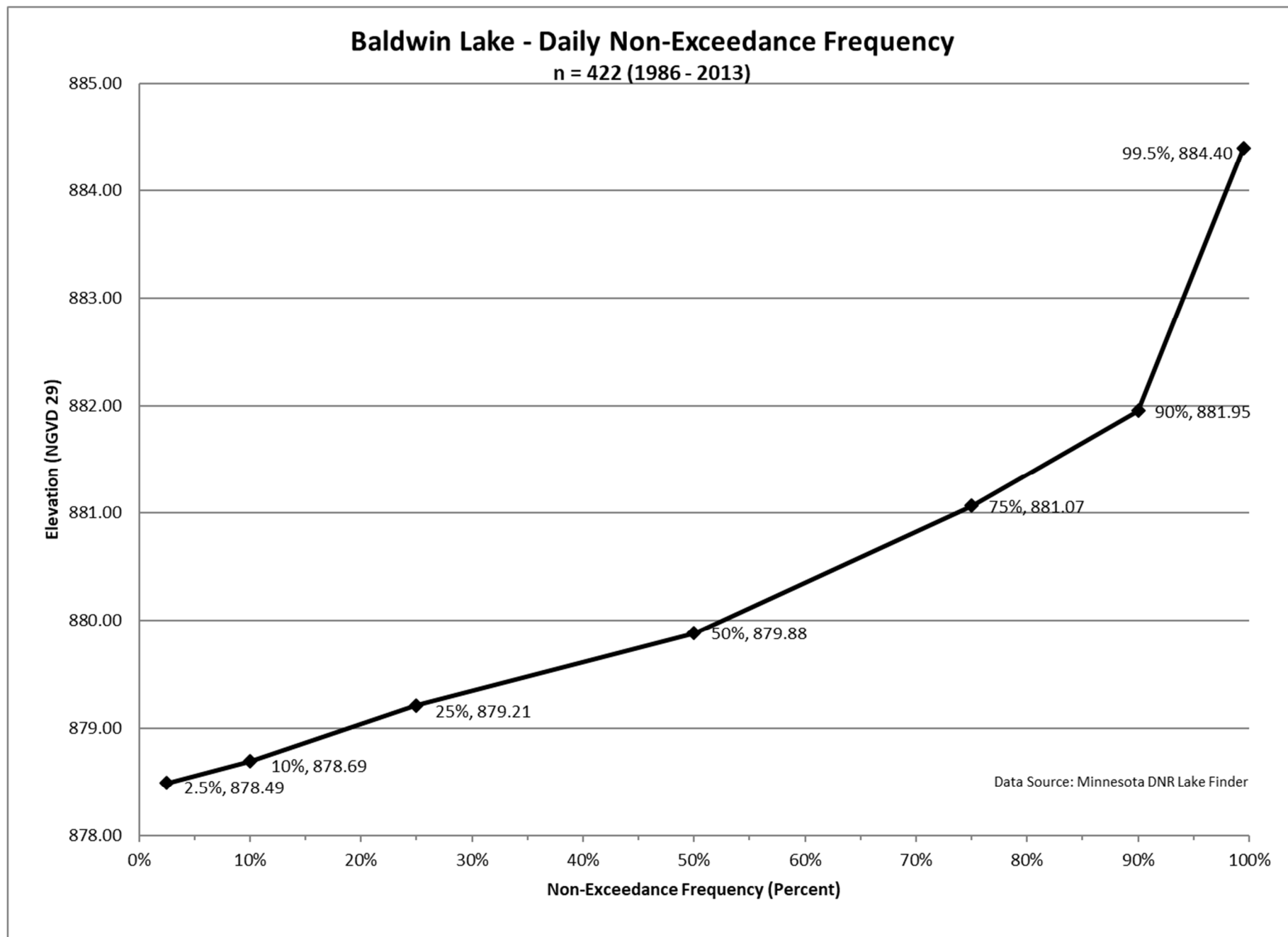


Figure 2c