

In the Seneca Lake Historical Chloride scatterplot, chloride levels are recorded using data entry points of Jolly, Halfman, and others, with years ranging from 1900-2000 as the independent variable and chloride concentrations ranging from 0-250 ppm as the dependent variable. Jolly's data entries begin in 1904, one or two every five years then a larger amount of entries from 1920-1928; there's a gap from 1928-1943 then a dramatically larger amount from 1965-1975 with fewer data points from 1982-1988. Data point entries from 1900-1965 have 1-4 points whereas 1965-1975 has 10-12 points; Jolly's entries stretch across the majority of the x-axis. The first entry in 1994 lies at 50 ppm, rises steadily (with an outlier in 1943 at 200 ppm) and jumps to around 175 ppm in 1970. Chloride concentrations may have been a more obvious observation and Jolly only tracked it when necessary; there's no clear pattern in the timing of data entry. Halfman's data entries begin in 2001 with a large block of entries, logged in only 5-7 years and the frequency of data logging is much greater than Jolly's, exclusively from 2000-2020, each year with multiple entries, only in the last five years of a century-long study. Data points begin at 125 ppm in 1963, rise to 175 ppm in 1975 and decline to 125 ppm by the end of the century. Data entries for 'Other' sources begin in 1964 with one single entry, the next at 1976, and the last three to four at 1995 and 1999; only one entry is logged per year. These entries lie on the far end of the x-axis, few and far in between and data points stay within the range of 107-160 ppm. Although Halfman and 'others' recorded a similar high of chloride concentrations between the years 1965 and 2020, Jolly observed a slower rise in Chloride concentrations tracking data within a larger time frame and demonstrating a consistency in entries that was missing in the two other sources.

In the Cayuga, Skaneateles, Hemlock & Canadice scatterplot, chloride levels among four Seneca Lakes are recorded using data entry points from each lake with years ranging from 1900-2000 as the independent variable and chloride levels ranging from 0-150 ppm as the dependent variable. Canadice Lake data is logged less frequently than other lakes, with as few as a dozen points; entries began in 1925 at 12 ppm and continued to 35 ppm in 2010 with gaps of up to 20 years in between points. All points are under 35 ppm, indicating relatively low chlorine concentrations in Canadice Lake. Hemlock data points range from the years 1918-2010 with chloride levels as high as 31 ppm and as low as 5 ppm. Logged data points increase in frequency from 1982-2009, but are consistent along the x-axis, only inconsistent from 1945-1956. Similar to Canadice Lake, Hemlock chloride levels remain under 35 ppm. Skaneateles data points begin in 1905 with multiple entries reaching as high as 22 ppm and end in 1973 within a similar chloride range of 13 ppm and multiple entries. There are multiple gaps in the set, the most obvious being from 1924 to 1955. Skaneateles, like Canadice and Hemlock, has chloride levels under 30 ppm. Drastically different, Cayuga Lake has chloride levels ranging from 32 ppm to 145 ppm between the years 1907 to 2010. Each year with data has multiple points with a large cluster between 1907 and 1924 in the 32-75 chloride ppm range as well as between 1962 and 1973 in the 75-130 chloride ppm range, each cluster containing few outliers. Chlorine levels from this lake are significantly higher than the other three, in a completely different bracket along the y-axis.

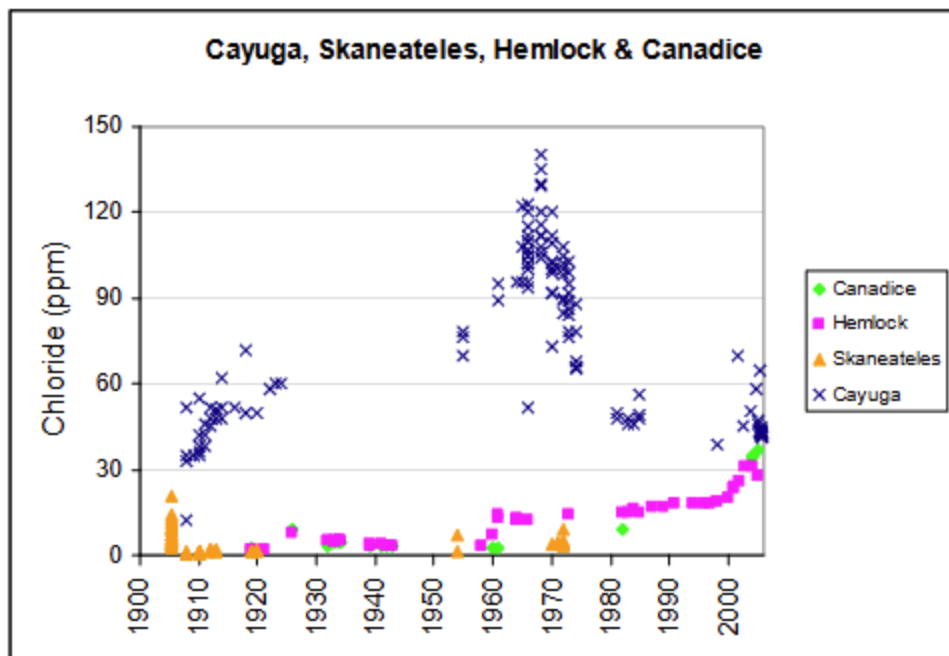
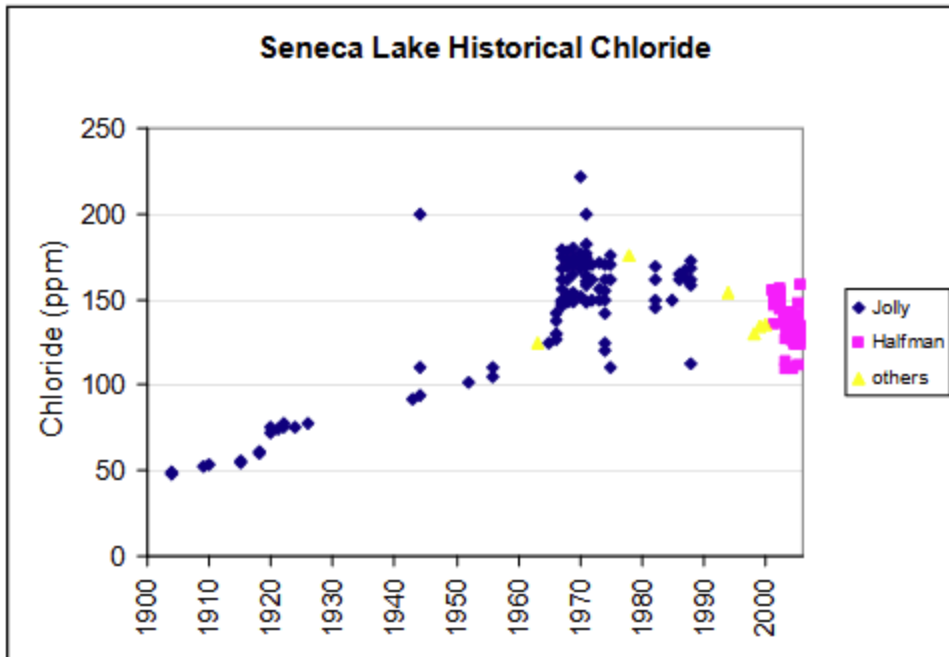


Fig. 31. Historical chloride data in Seneca and Cayuga Lakes (Jolly, 2005, 2006), and in Canadice, Hemlock and Skaneateles Lakes (Sukeforth and Halfman, 2006).