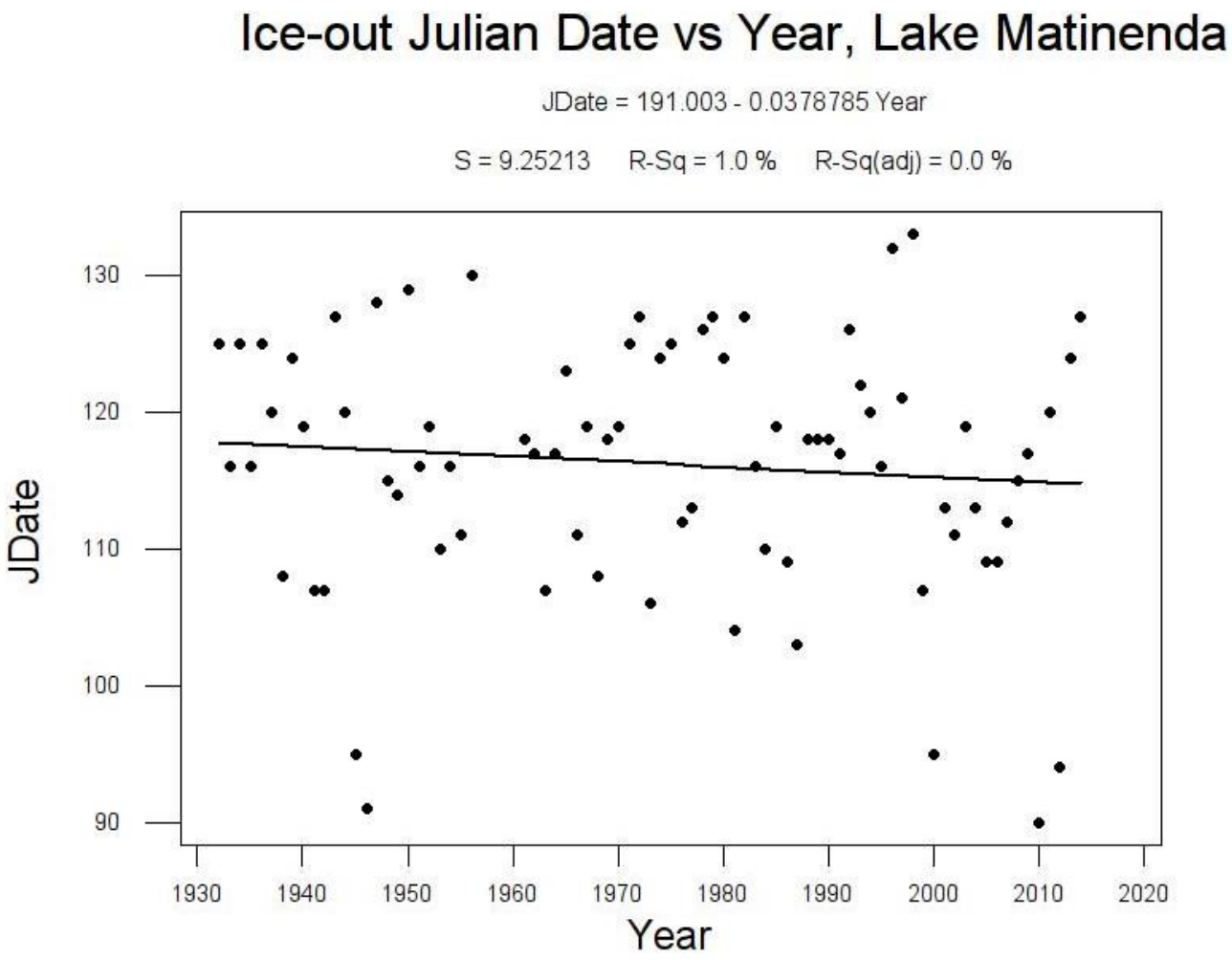
Ice-Out Dates, 1932-2014 for Lake Matinenda, Blind River ON P0R 1B0 Canada

Since 1932, ice-out dates have been recorded by several cottagers at Lake Matinenda, (46.311750N Lat, 832.96367 W Lon , at the boat Landing). Ice-out describes the time during ice break up when it is possible to travel by boat from Butterfield Narrows to the Landing at the southern end of the lake (definition, Ray Sholberg). Using this 82 year record, we asked the question: "Over time, Is there a warming trend and does the ice-out date occur earlier in the spring?" Although ice-out dates are highly variable from year to year, the answer is a qualified 'maybe yes'.

We thank the cottagers who had the forethought to collect the data: Ray Sholberg, Bob Henderson, and other unknown persons. Statistical analyses by Sam Bledsoe. Definition: Julian day 1 is January 1, Julian day 32 is February 1, etc.

The first graph plots ice-out dates against years. This decreasing linear (straight line) trend shows that there is a long term trend toward earlier ice-out dates, but only ~1.2 hours/year,! The year-to-year variability swamps the variability due to this trend. The R-square is only 1.0%.



To understand better any long term trend, we analyzed the data smoothed by taking ten-year averages and fitting a cubic equation instead of a straight line. The cubic equation can reveal curves in a trend, if it exists, whereas the straight-line model is more limited in its analysis.

You can see that the cubic model curves downward much more sharply in recent years than does the downward trend of the straight line model. There have been both upward and downward trends in ice-out over the 82 year data set. The current downward trend in ice-out date (i.e. earlier dates) is about 1 day earlier each year, much faster than the 1 hour per year trend shown by the simpler straight line model. With an R-sq of 50.0%, the cubic equation model accounts for about ½ of the total data variability, whereas the linear model mimics less than 2%. However, though the recent (2000-2014) trend toward earlier ice-out dates is much stronger than the 80-year trend, it's not strong enough to make it possible to predict yearly ice-out date more accurately than the +/- 40-day window in which it has always occurred.

Note that the ice-out dates are extremely variable and only about 1/2 of the variation can be explained simply by time. Other factors contribute significantly to the extreme year to year variability. We continue to search for additional climatic data (such as average monthly low temperatures and winter precipitation) to help explain the variability in ice-out dates.