**Thurston County Water Resources**

**Technical Memorandum #7**

Prepared by

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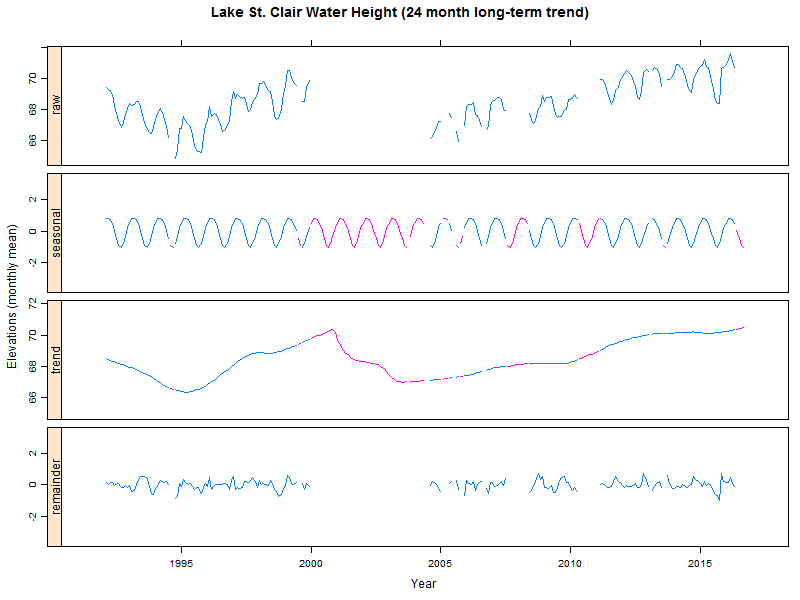
Lake St. Clair Water Elevation  
1992-2016

# Goal

Improve the understanding of the water elevation at Lake St. Clair, both independent of and with respect to precipitation.

# Results

Lake St. Clair water elevation displays a clear annual cycle, rising during the wet season and lowering during the dry season by about 2 feet over the course of the year. It is also strongly effected by long-term trends that account for at least as much of the variation in elevation as the seasonal variation. These long term trends have varied going back to 1992, but since at least 2005 the overall trend has been an increase in water level of about 3 feet.



Water elevations in Lake St. Clair also follow historical precipitation patterns. Since 2008 water elevations have closely tracked a combination of 0.5 and 3.25 cumulative precipitation values. This means that with an approximately 80% accuracy, lake elevations from that period can be predicted by looking at both the total rainfall over the approximately three year period preceding the date, and the total rainfall over the approximately six month period preceding the date.

# Methods

## Software

This analysis was conducted in R 3.3.1 (RStudio 1.0.44, plus packages dplyr, ggplot2, readr, stlplus, zoo); QGIS 2.14; Excel 2013; and Notepad++ 7.1.

## Data

## Analysis

# Conclusions and Recommendations