

Appendix D:

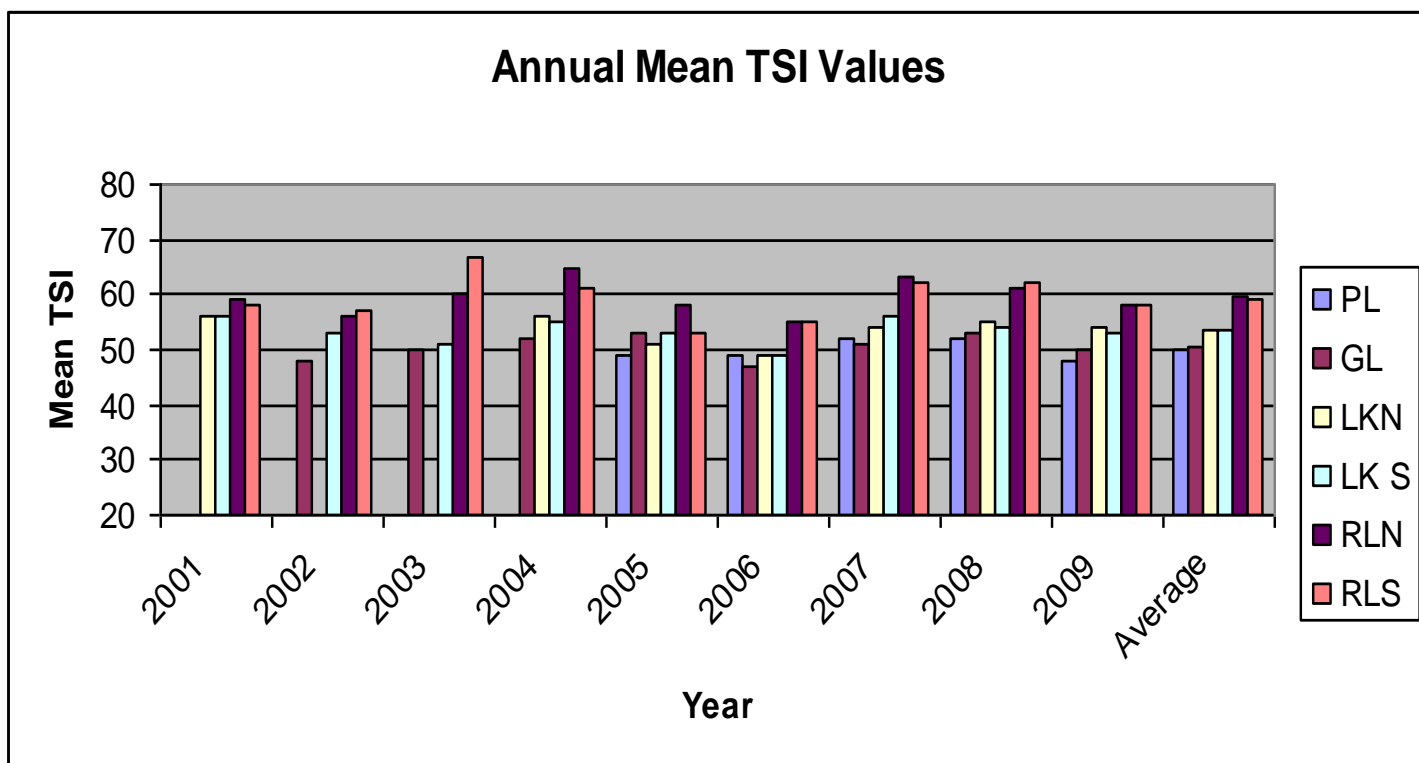
NFCRWD

2009 Lake Monitoring  
Report

## Lake Monitoring Report : 2009

Monitoring continued in 2009 on four lakes within the watershed. One site is monitored on Grove and Pirz lakes while two sites each have been historically monitored on Rice and Koronis lakes. In 2009, two additional monitoring sites were added on Rice Lake due to the TMDL study there. Site 207, sometimes referred to as Rice Lake-River, is located near where the North Fork Crow River enters and exits Rice Lake. Site 213, sometimes referred to as Rice Lake-SB, is located in the Schaumann’s Bay area of the lake.

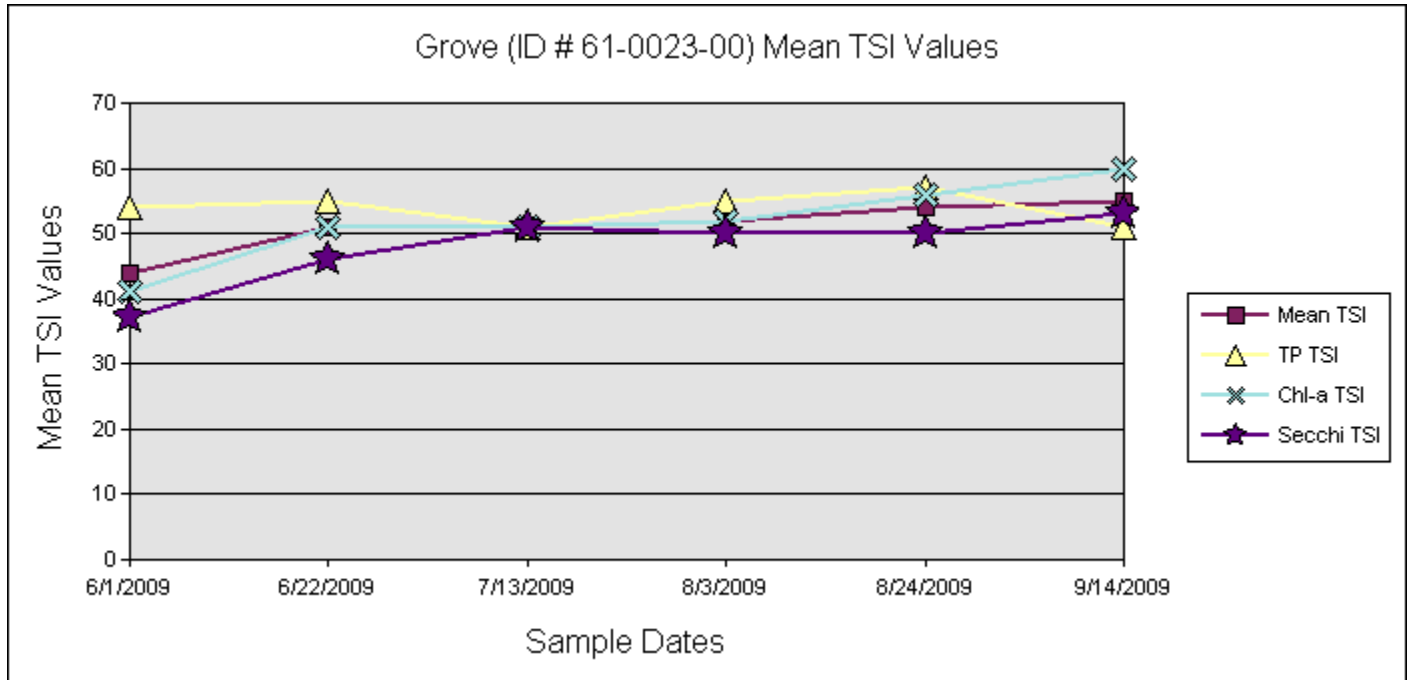
While the Watershed District’s monitoring program predates this, information is readily available for most monitoring sites starting in 2001. This chart shows the annual mean trophic status index values for the 6 historical monitoring sites. The historical average for each site is also shown, it should be noted however, that the number of samples which make up the mean does vary by site and year. Lakes with TSI values under 40 are considered oligotrophic or “clean” lakes. TSI’s of 41-50 indicate mesotrophic lakes which may have temporary algae and aquatic plant problems. In the range of 51-70 lakes are referred to as eutrophic and may have persistent algae and aquatic plant problems.



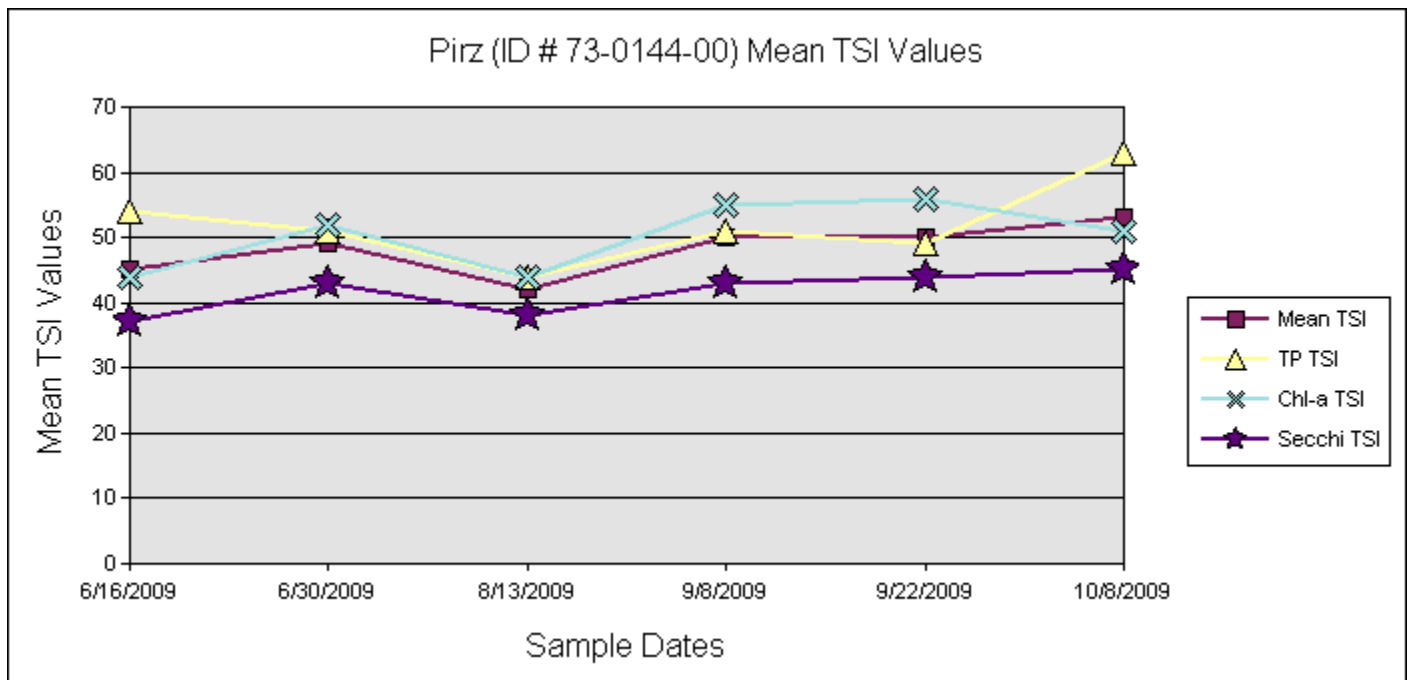
As viewed in the chart, historically most of our sample sites tend to fall in to the eutrophic category. Following are charts detailing this seasons monitoring results for each of the 8 sites sampled. These charts show TSI values for Total Phosphorus, Chlorophyll A and Secchi Disk depth as well as the average TSI value for that sampling event. One important thing to note is that the listing phosphorus impairment listing threshold for the North Central Hardwoods Forest ecoregion is >59 TSI.

Other data gathered this year included lake profiles for temperature and dissolved oxygen among other parameters which are useful in determining where and when the lake is stratifying. Deep ortho-phosphorus samples were also taken at all four sites on Rice Lake. This will be used to determine the amount of Phosphorus coming from in-lake sediment. Zooplankton, algae, and sediment core samples were taken by Wenck.

## Grove Lake

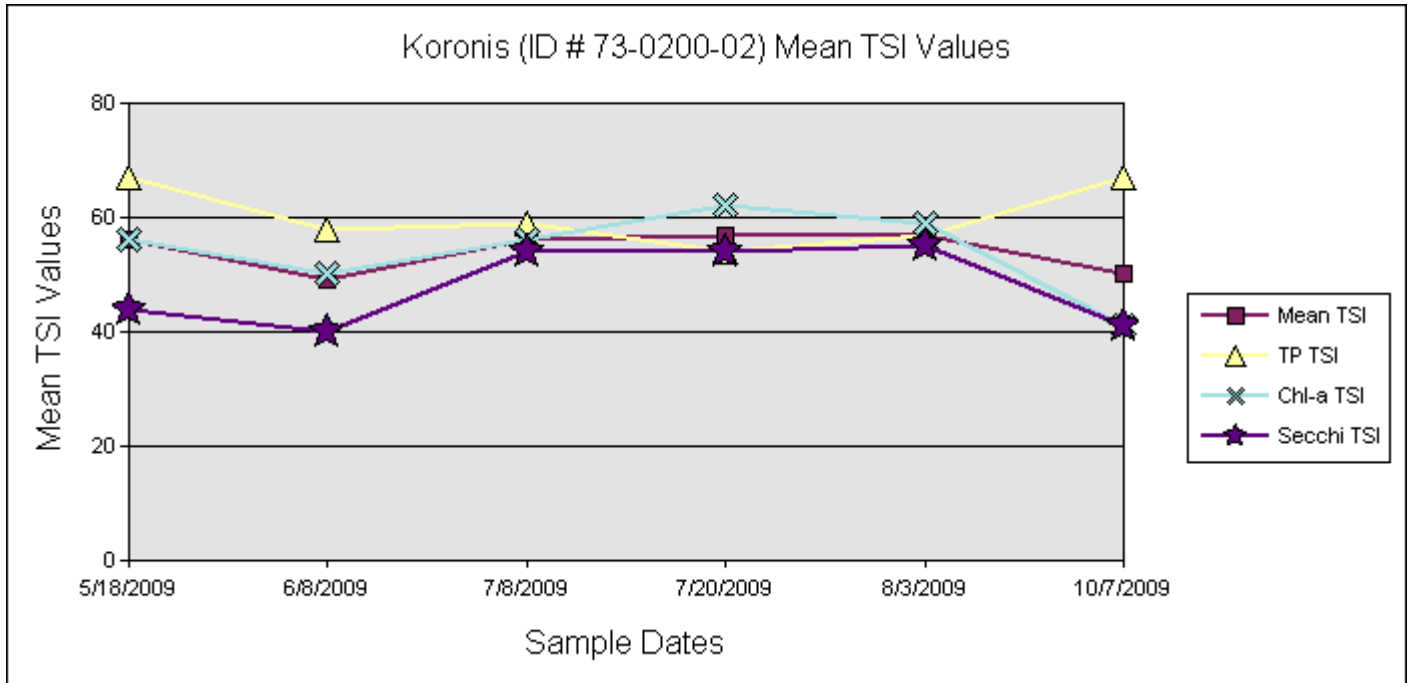


## Pirz Lake

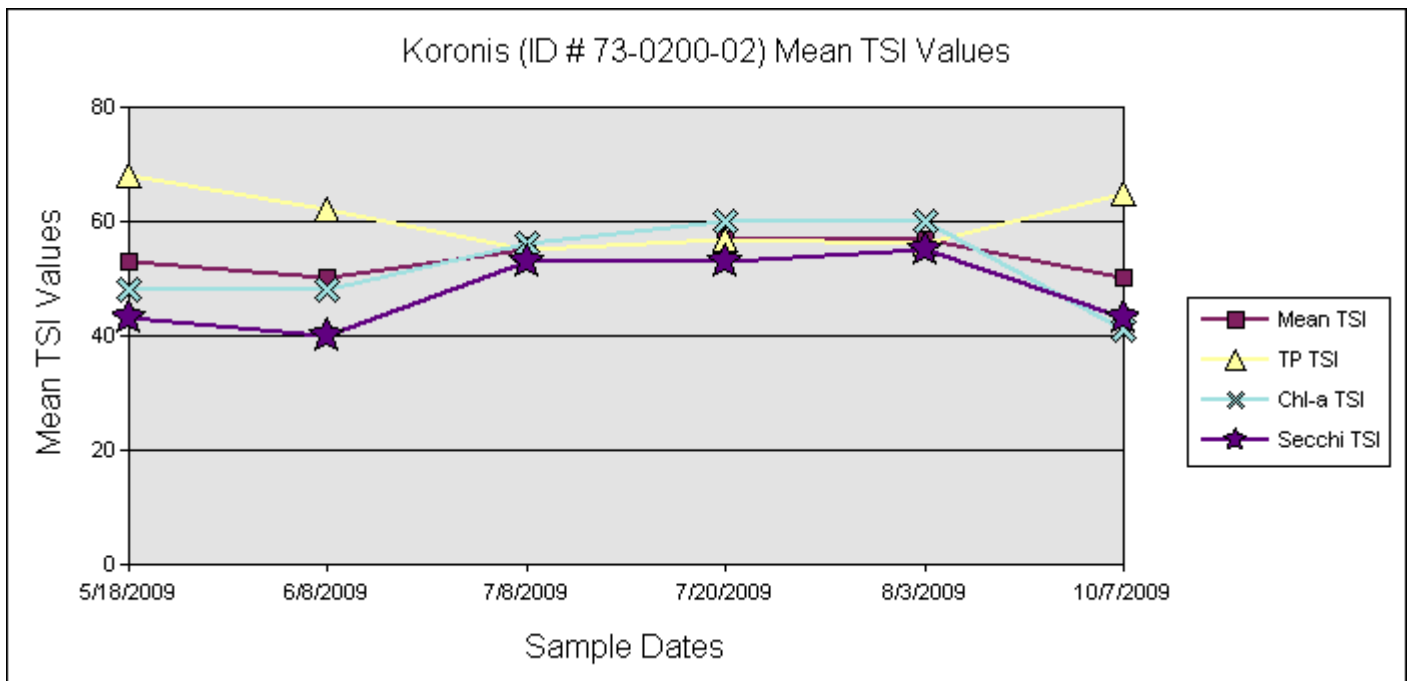


# Lake Koronis

## North Site

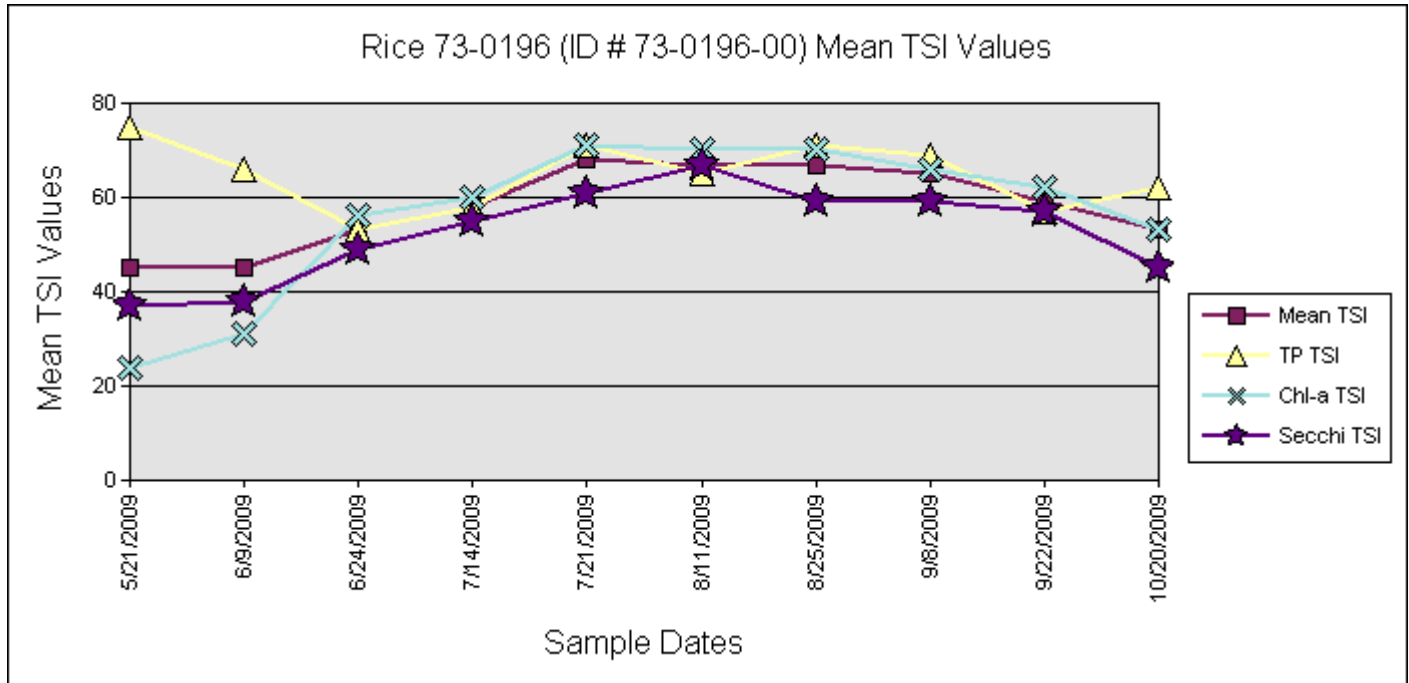


## South Site

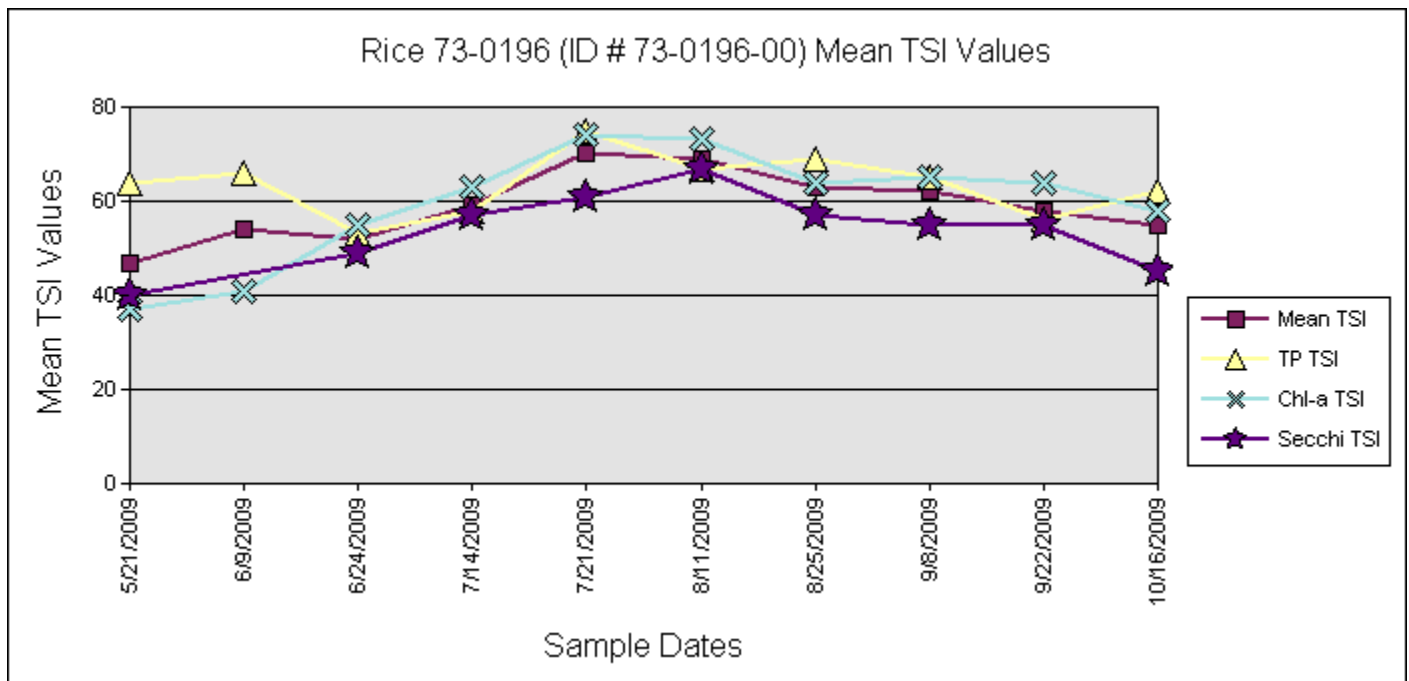


# Rice Lake

## North Site

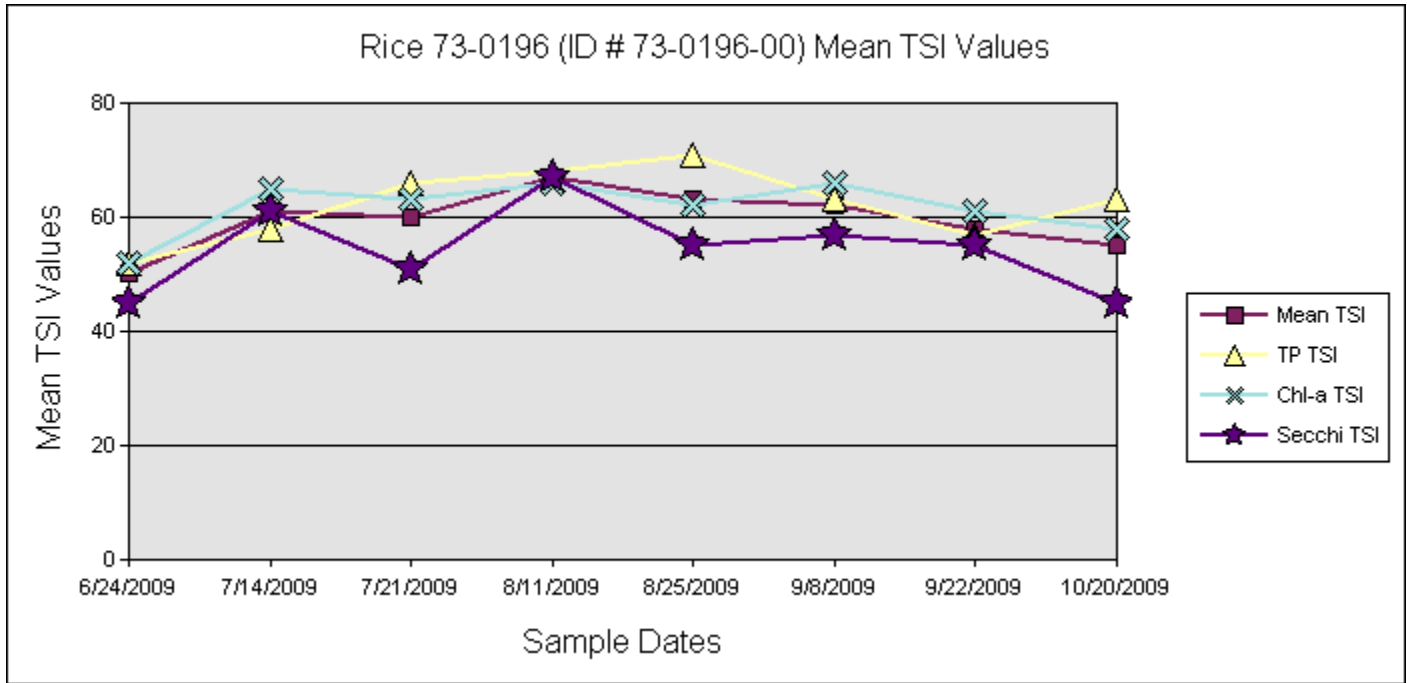


## South Site



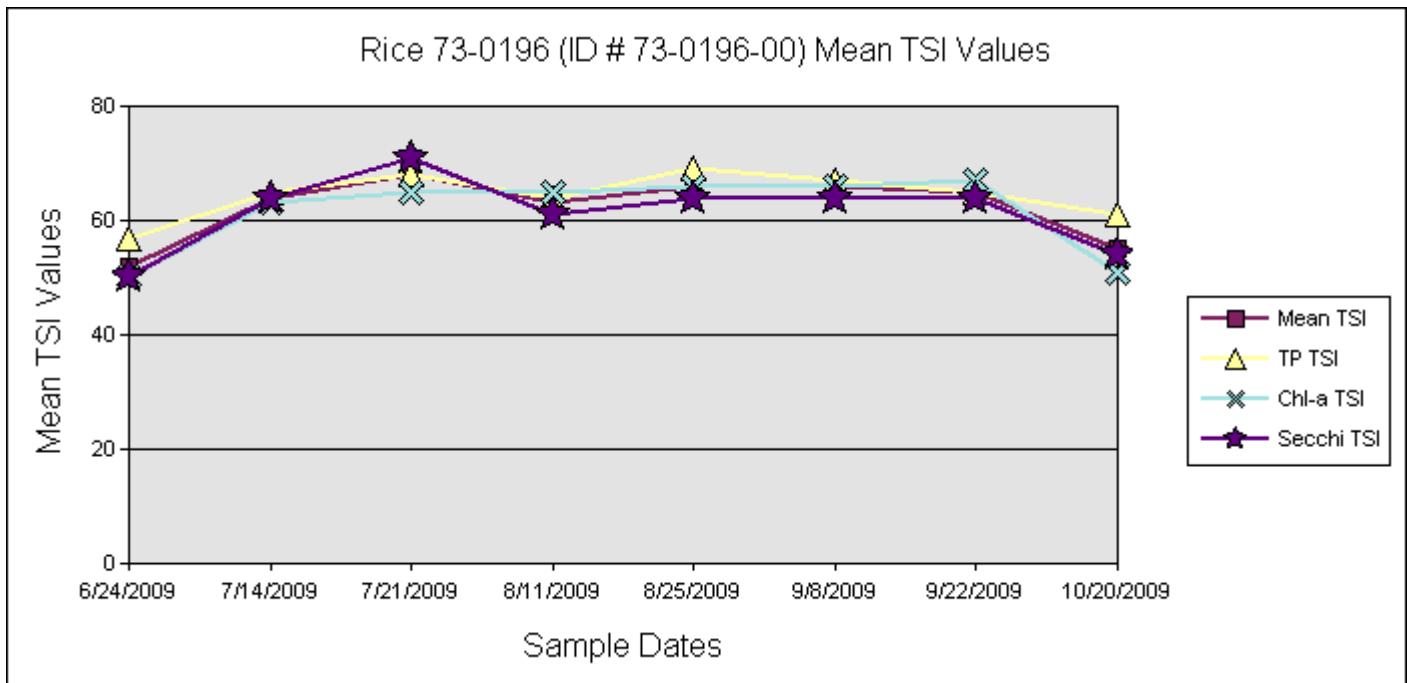
### River Site

-New site for the District in 2009. Located near where the North Fork Crow River enters and exits Rice Lake.



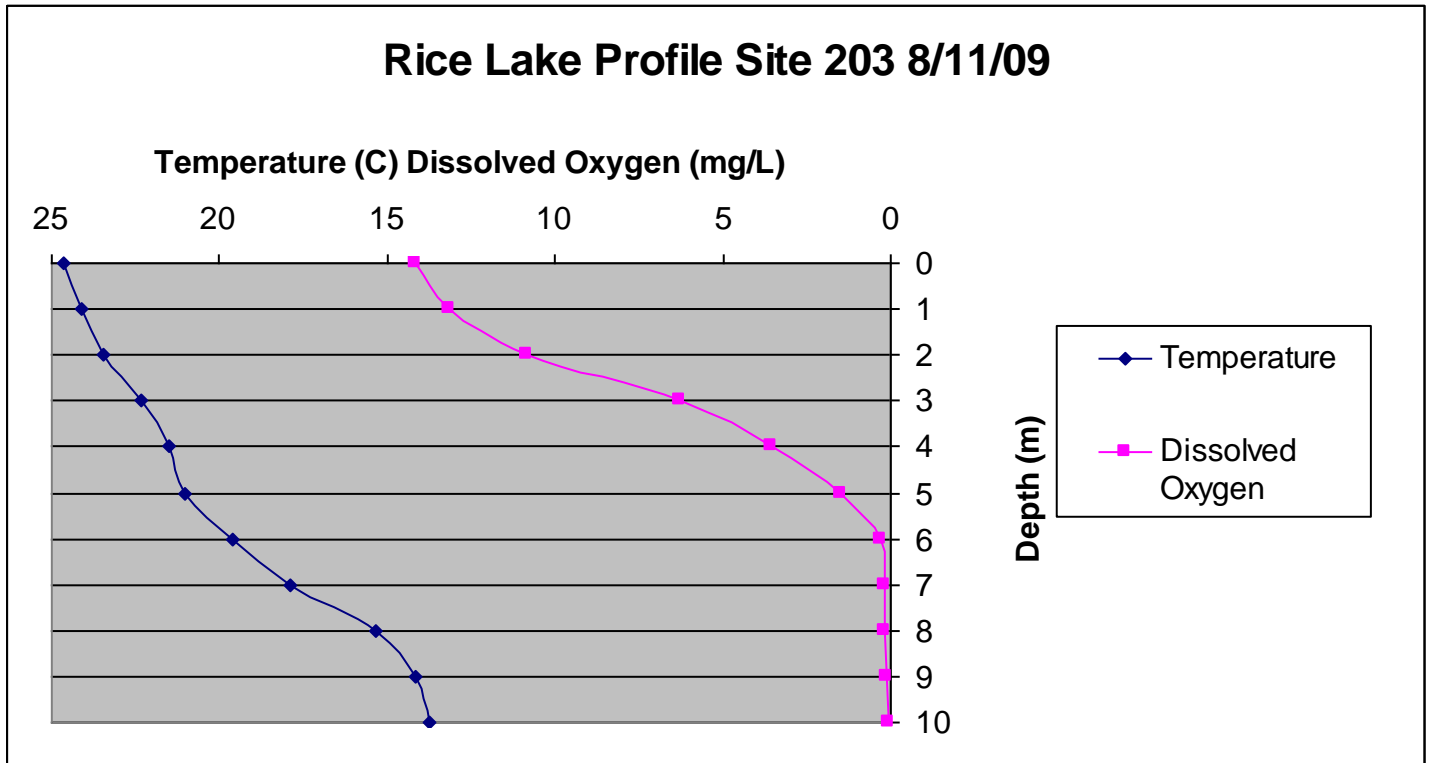
### Schaumann's Bay Site

-New site for the District in 2009. Located in the shallow bay on the Northwest side of the lake.



## Lake Profiles

Lake profiles were conducted by MPCA throughout the summer using a multiparameter sonde with a depth sensor for each of the four sites on Rice Lake. The chart below shows a sample of one of these profiles. Depth from the surface in meters is listed on the right hand side of the chart. Other parameters sampled at the same time included pH and conductivity.



## Results:

The implementation plan for the Rice Lake TMDL should give us some good direction for improving water quality there, much of which may be applicable for Koronis as well. Grove and Pirz would both be candidates for preservation projects as money and time allows.

Individual lake charts courtesy of RMB Labs.