



REPORT TO REGIONAL WATER SUPPLY COMMISSION
MEETING OF WEDNESDAY, SEPTEMBER 5, 2012

SUBJECT **WATER QUALITY TRENDS IN SOOKE LAKE RESERVOIR IN JUNE AND JULY 2012**

ISSUE

To provide information on the water quality conditions observed in Sooke Lake Reservoir during June and July 2012 and compare these data with those from previous years and long-term averages.

BACKGROUND

Physical Parameters

Water Levels. The water level in Sooke Lake Reservoir reached full pool on January 23, 2012, about one month later than in 2010 (**Figure 1**) and remained at full pool until the end of April. As in previous years, the water level dropped throughout the months of May to July, and remained at a slightly lower level when compared to that in 2010 and 2011.

Water Temperature. The water temperature remained below the long-term average throughout June and July (**Figure 2**) similar to 2010 and 2011. (**Note:** The small circles on the chart show the extent of water temperature variation in previous years.)

Water Clarity

Turbidity. During June and July, the turbidity of the water in Sooke Lake Reservoir was similar to or slightly better (lower) than the 10-year average. The turbidity remained well below the 1.0 NTU turbidity limit (**Figure 3**).

Water Transparency. Similar to turbidity, throughout June and July the transparency of the water in Sooke Lake Reservoir continued to be better (clearer) than the 10-year average (**Figure 4**) and similar to recent years. The transparency of the water is continuing to return to the very clear water observed prior to raising the water level in the reservoir.

Bacteria

Total Coliform Bacteria. In June and July, the total coliform concentrations in the raw source water entering the Japan Gulch Disinfection Plant from Sooke Lake Reservoir continued to be well below the 10-year average and slightly below levels observed in 2010 and 2011 (**Figure 5**). *E. coli* concentrations remained low throughout June and July and well below the USEPA limit to remain an unfiltered supply (see insert in **Figure 5**).

Nutrients

Phosphorus. In both the north and south basins, the total phosphorus has remained lower than the long-term average since May and lower than 2010 and 2011 through June and July (**Figures 6 and 7**).

Nitrogen. In June, the total nitrogen levels in both the south and north basins were lower than the 10-year average (**Figures 8 and 9**). However, in July, there was a brief increase in nitrogen levels in the south basin, although the level returned one similar to the long-term average toward the end of July. In the north basin throughout July, the nitrogen levels remained lower than those of the long term average, 2010, and 2011.

Chlorophyll-a

In June and July, chlorophyll-a concentrations were broadly similar to the 10-year average throughout Sooke Lake Reservoir (**Figures 10-12**). These concentrations are relatively low for a surface water reservoir and reflect the normally low levels of nutrients (especially phosphorus) in this water body.

Algae

Asterionella formosa and *Tabellaria fenestrata* (both diatoms) continued to dominate the Sooke Lake Reservoir algal community throughout June and July. *Asterionella formosa* concentrations, which were higher than average throughout April and May, declined to average values during this period. In mid-late July, *Gymnodinium* spp. (a dinoflagellate) and *Dinobryon bavaricum* (a golden-brown alga) increased in relative abundance but remained within concentrations observed in past years.

CONCLUSION

The water quality tests conducted for Sooke Lake Reservoir in June and July continue to show good quality source water with no water quality issues.

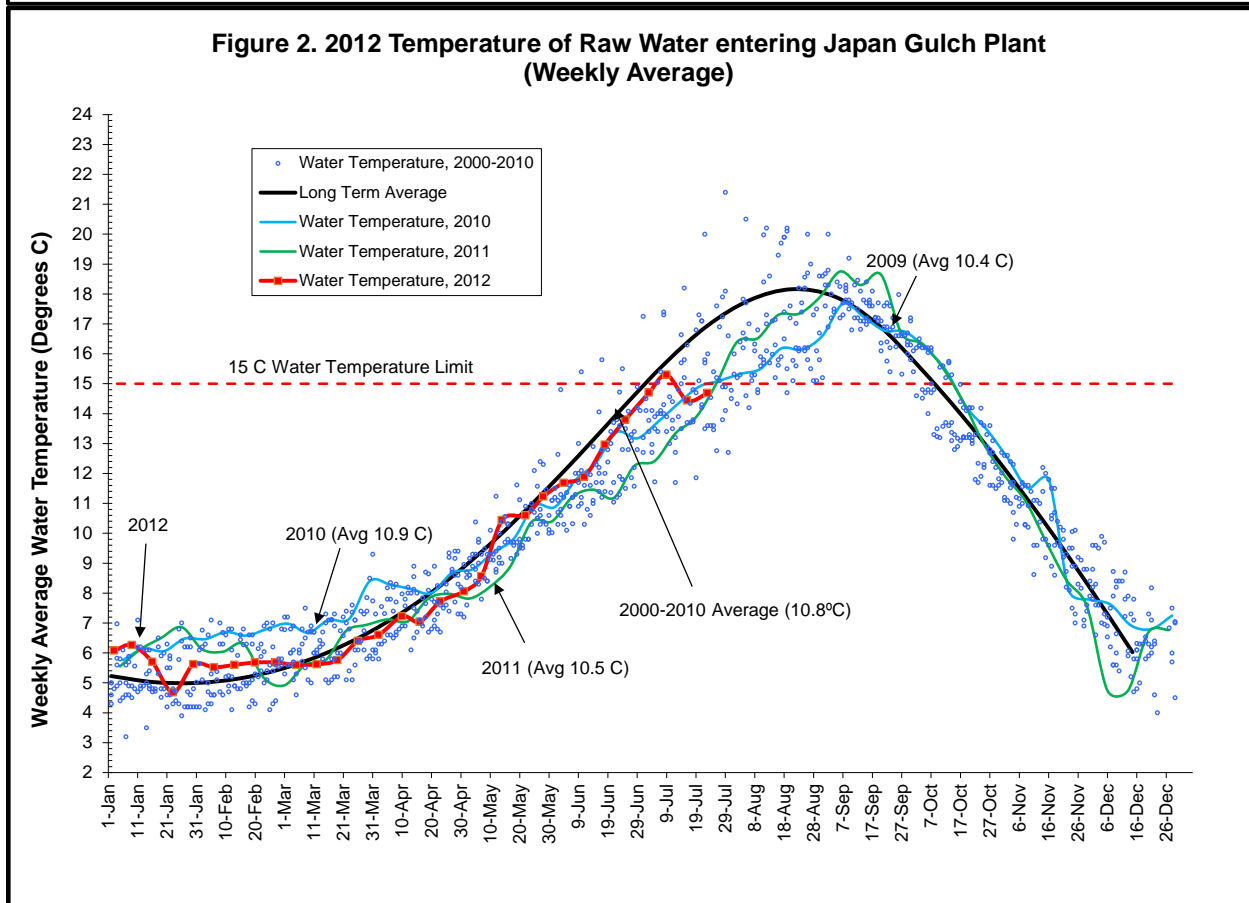
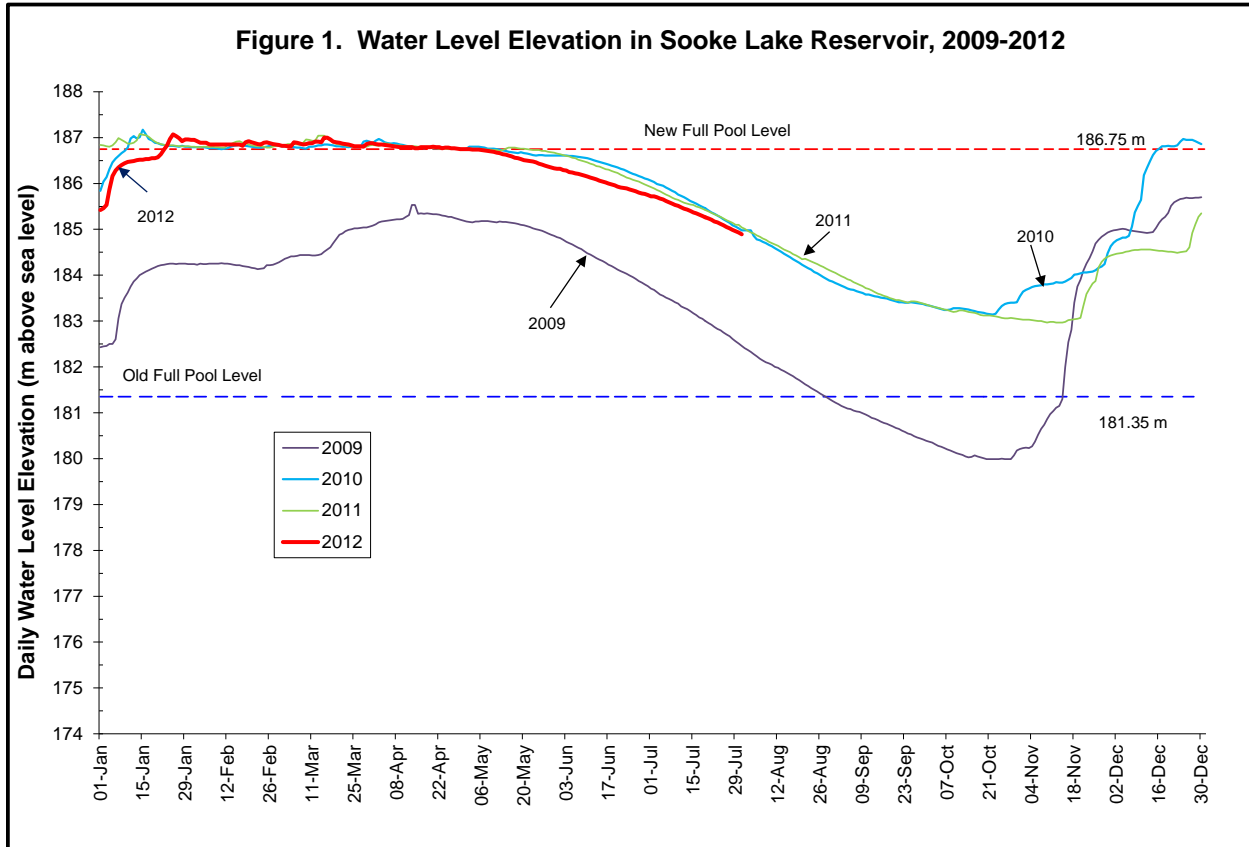
RECOMMENDATION

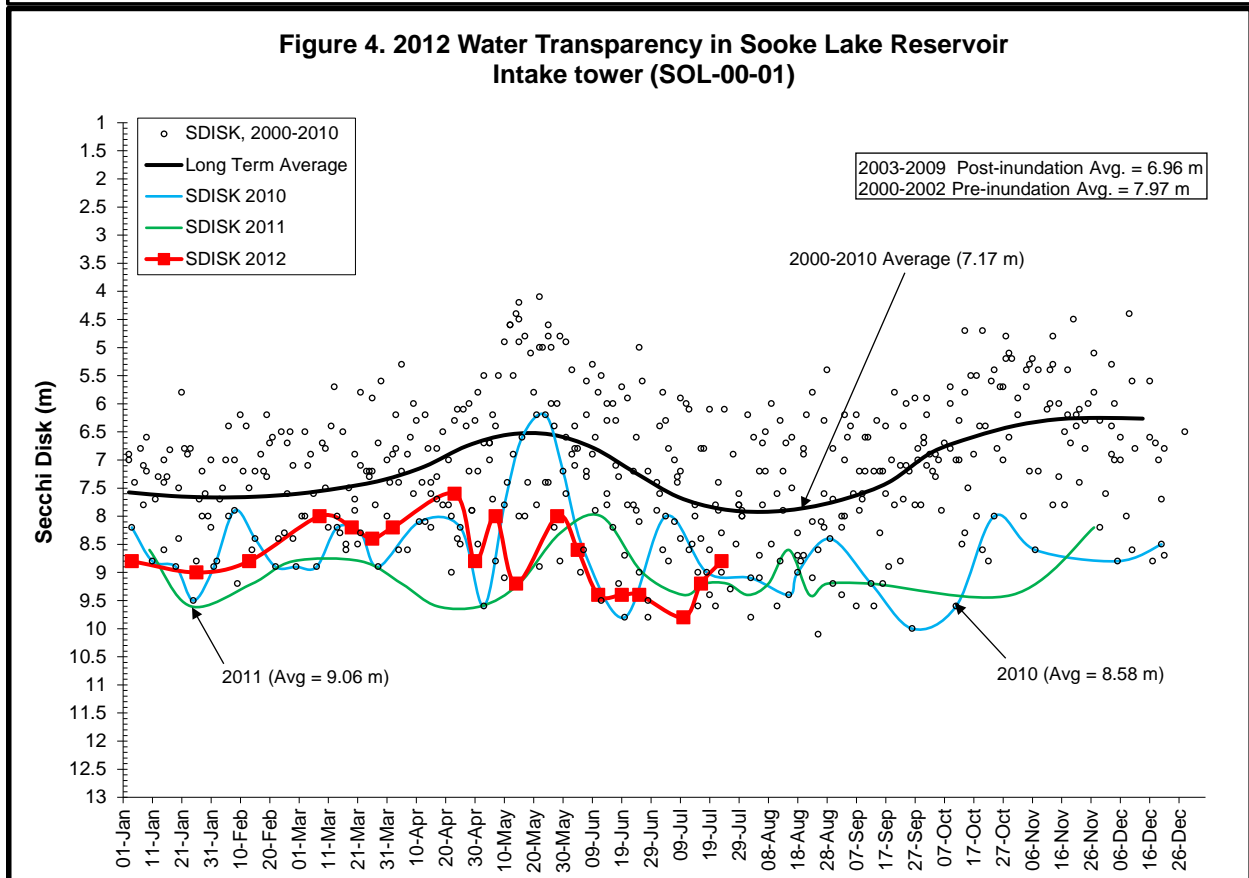
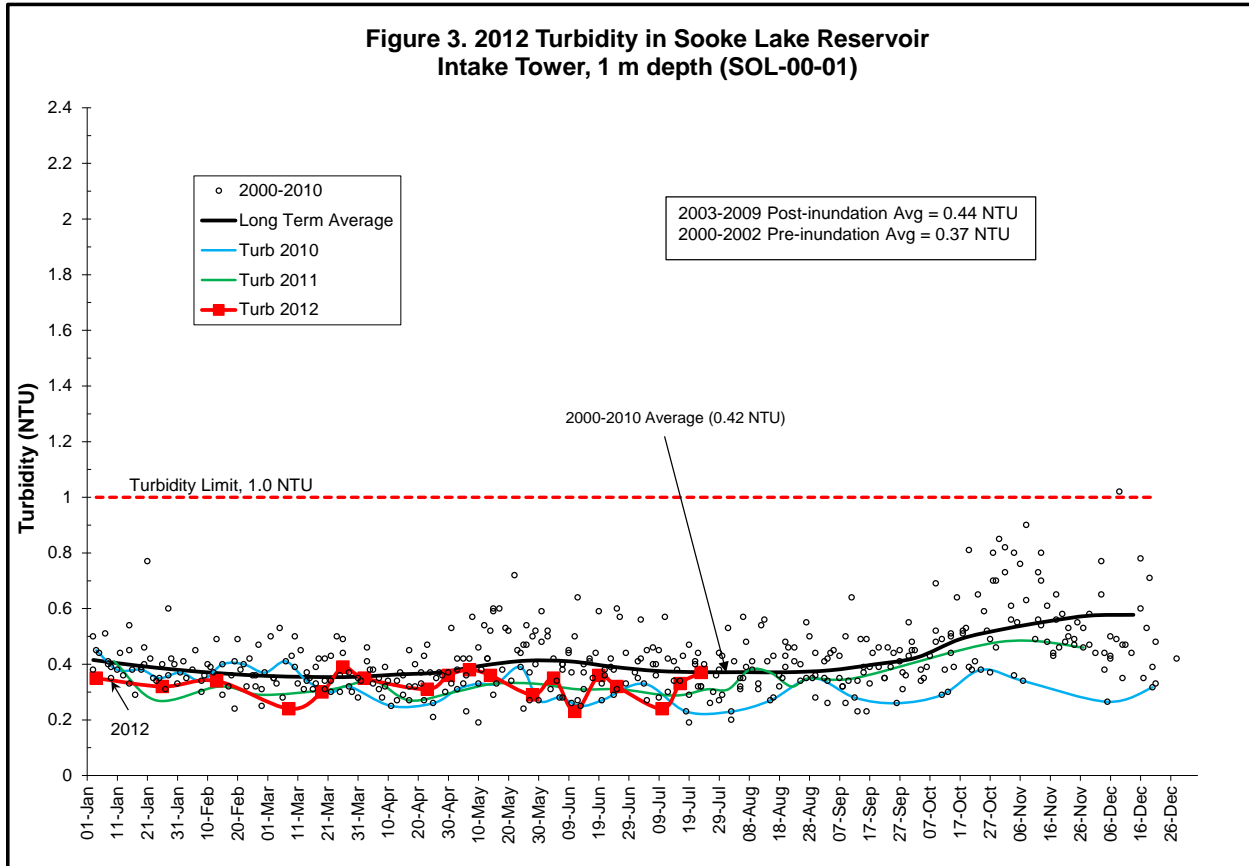
That the Regional Water Supply Commission receive this report for information.

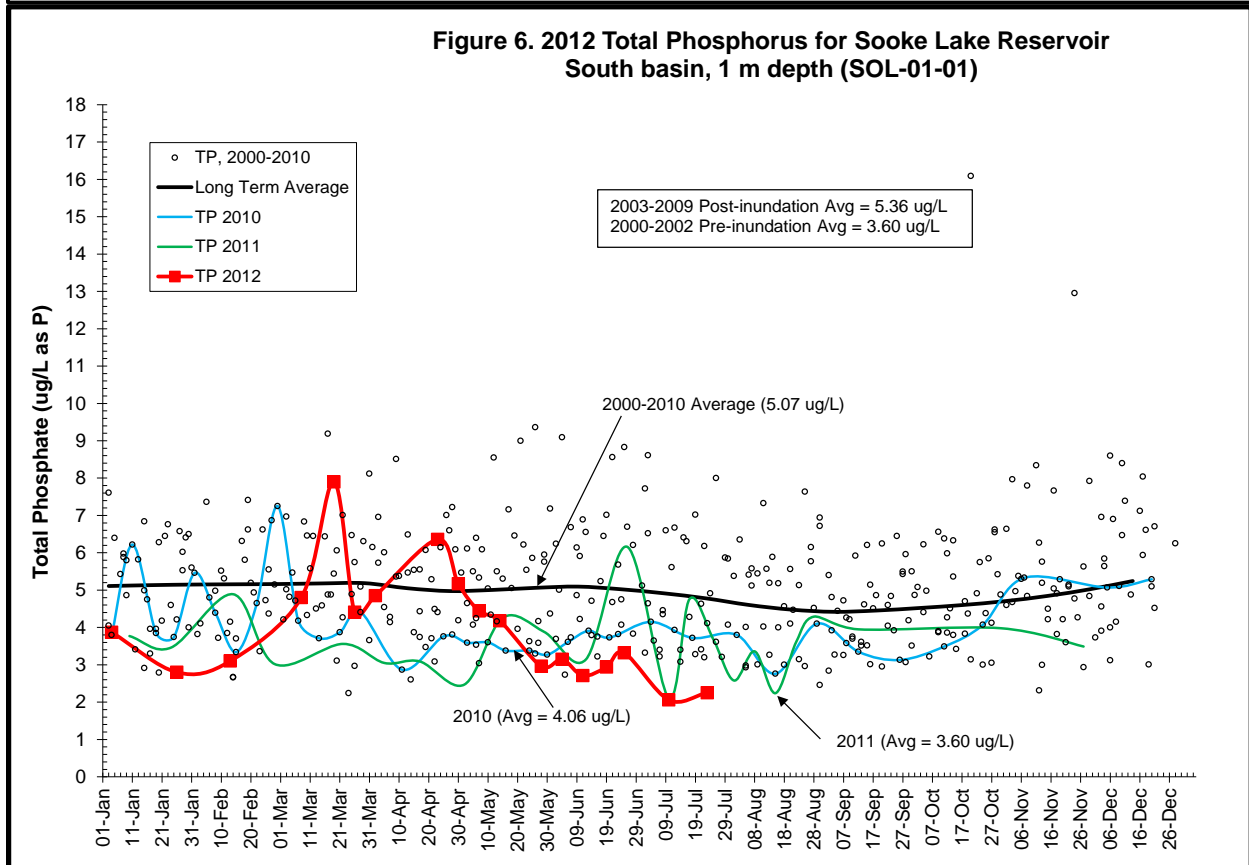
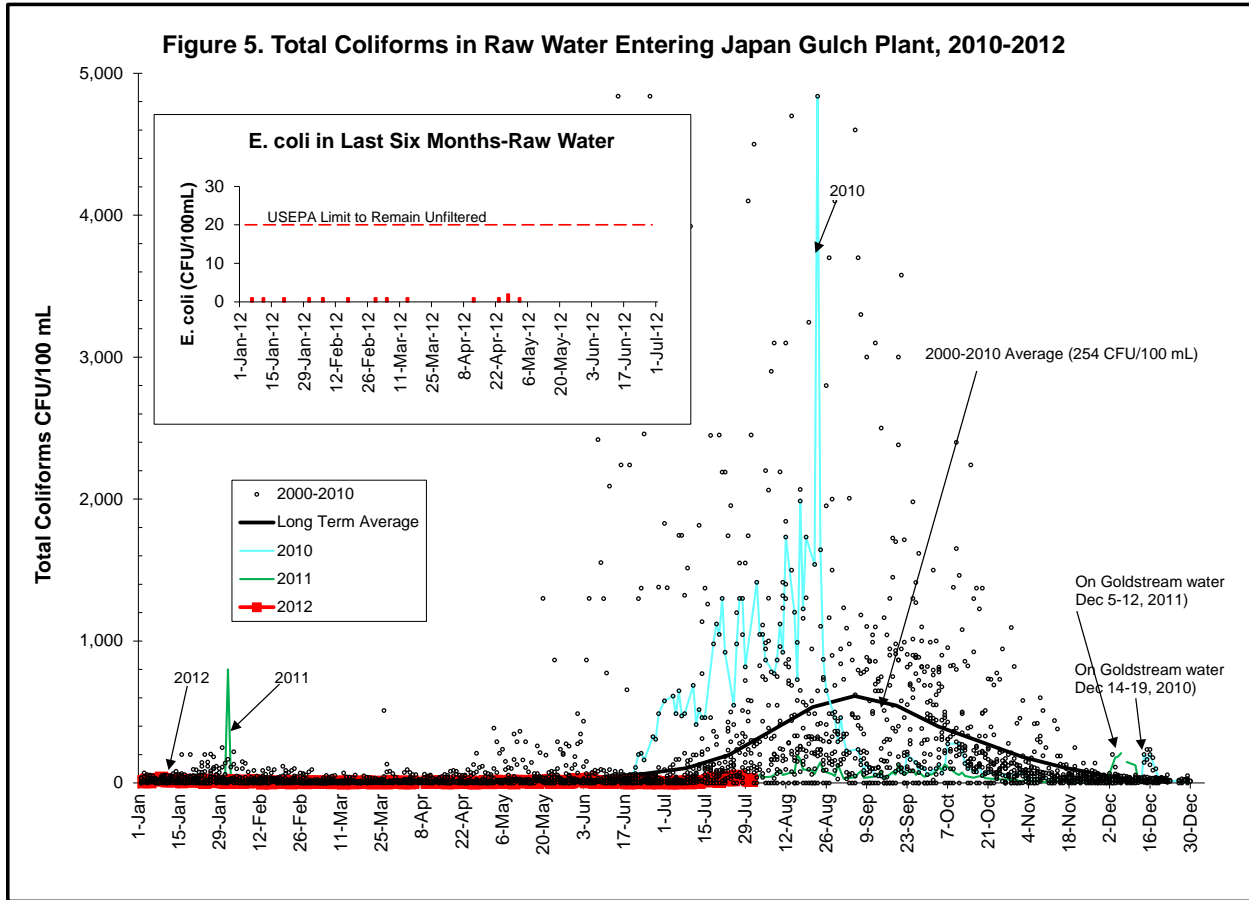
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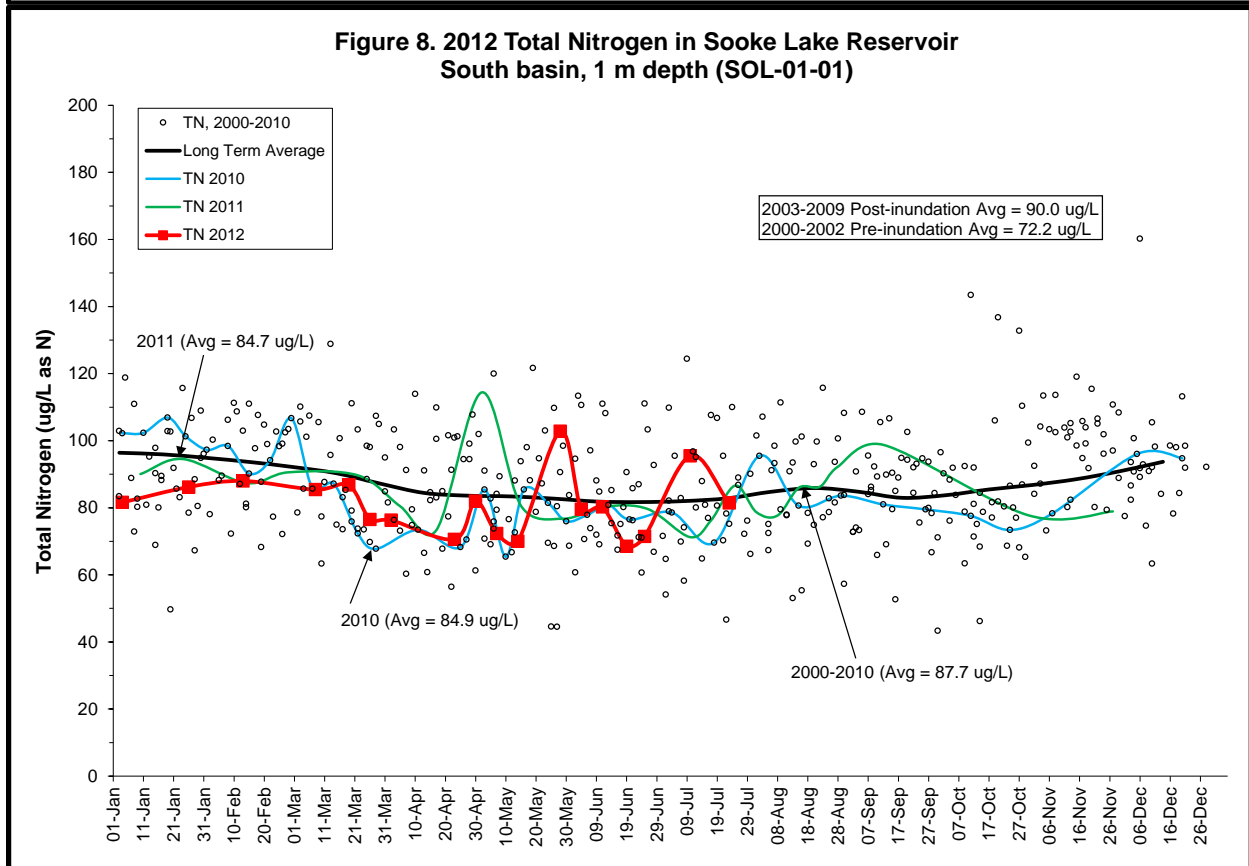
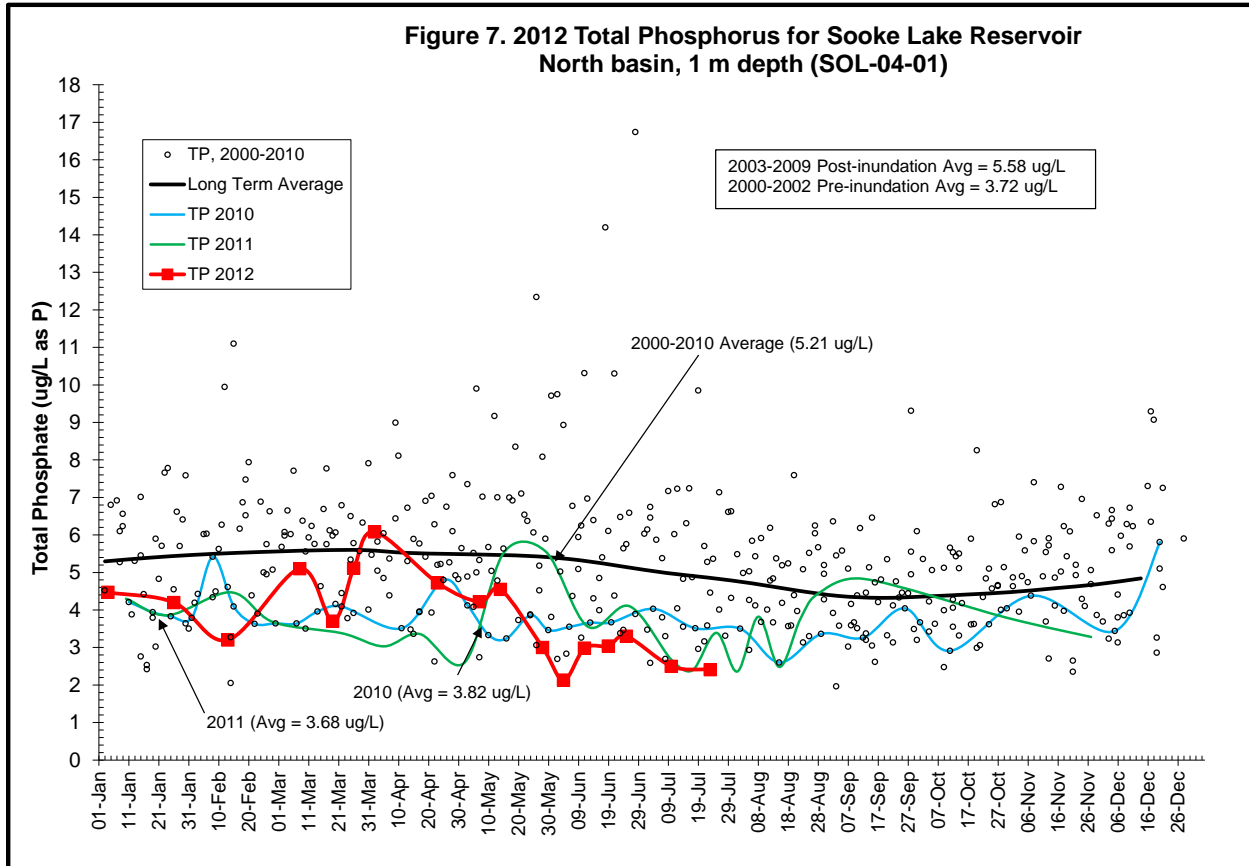
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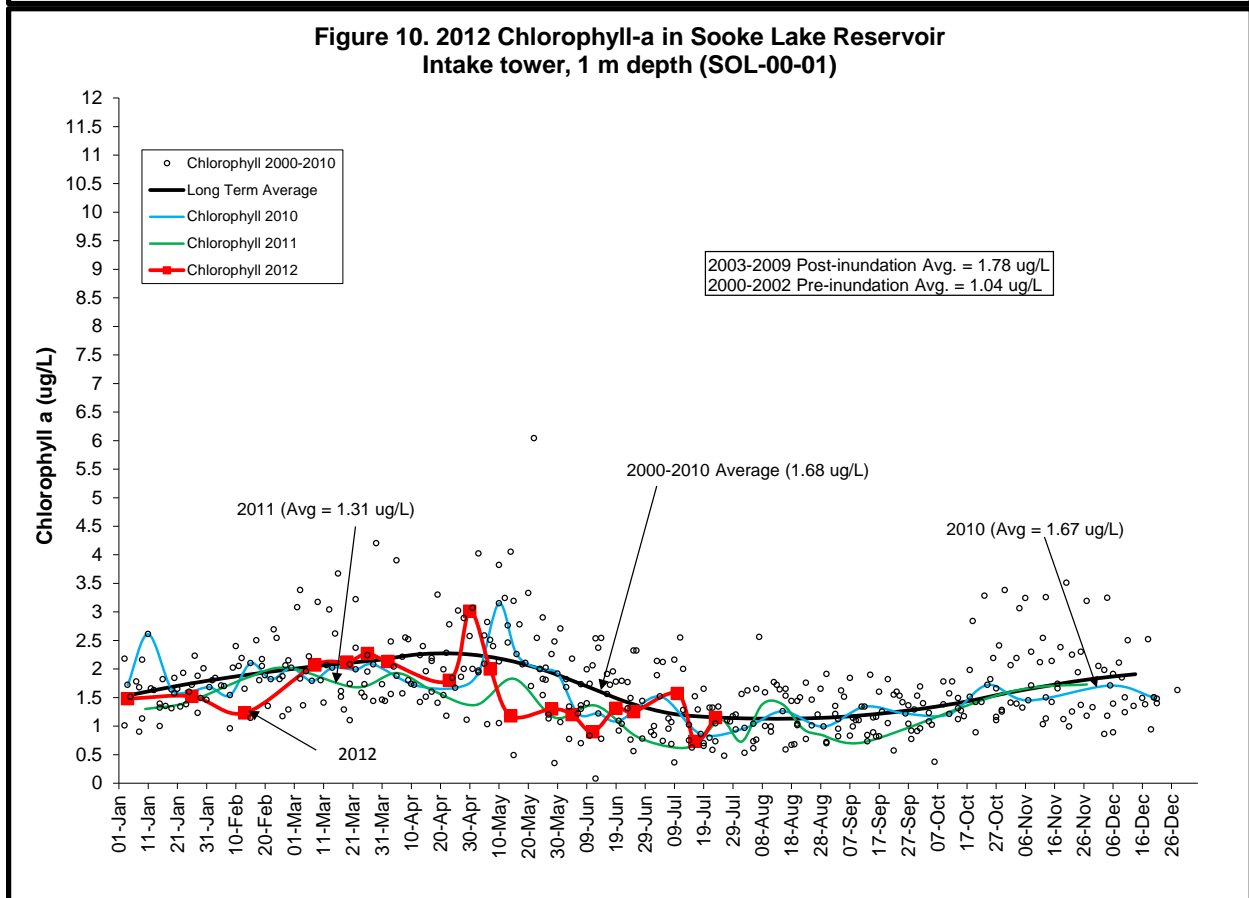
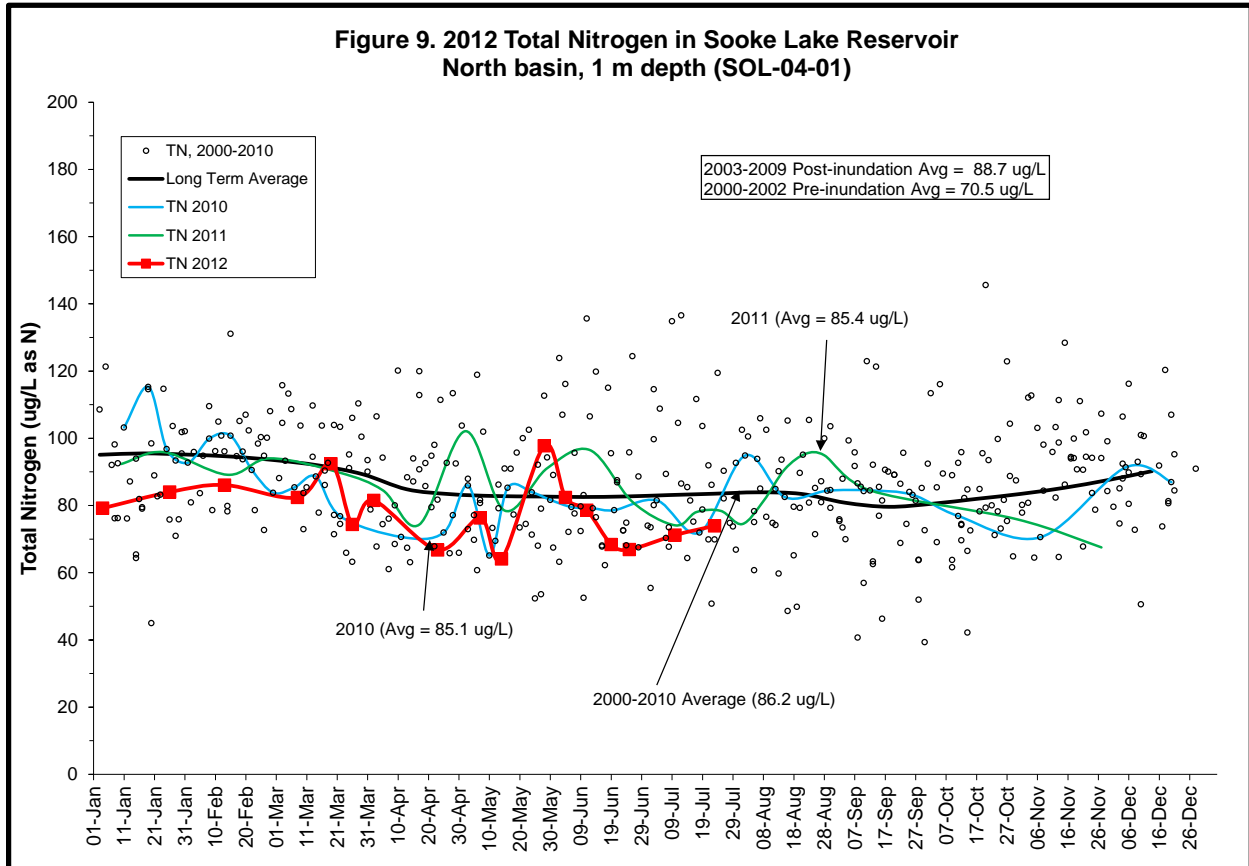


Figure 11. 2012 Chlorophyll-a in Sooke Lake Reservoir Intake tower, 5 m depth (SOL-00-05)

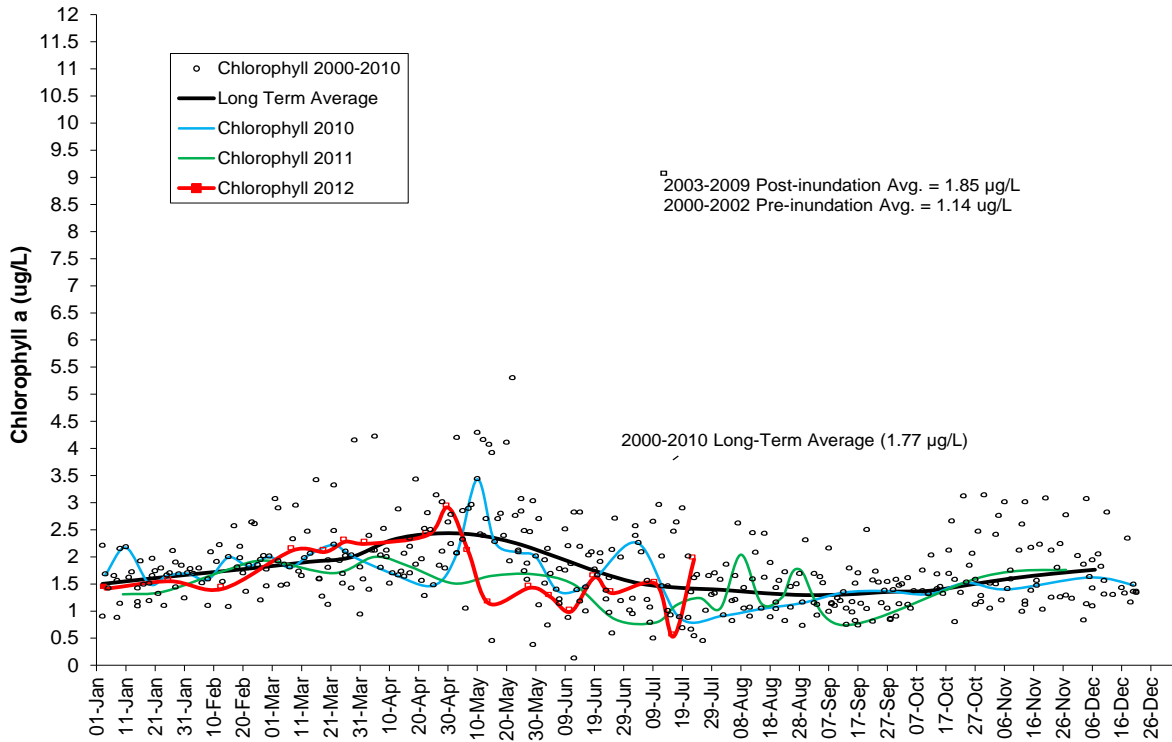


Figure 12. 2012 Chlorophyll-a in Sooke Lake Reservoir intake tower, 10 m depth (SOL-00-10)

