



**REPORT TO REGIONAL WATER SUPPLY COMMISSION
MEETING OF WEDNESDAY, NOVEMBER 7, 2012**

SUBJECT **WATER QUALITY TRENDS IN SOOKE LAKE RESERVOIR IN AUGUST AND SEPTEMBER 2012**

ISSUE

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

BACKGROUND

Physical Parameters

Water Levels In September, the water level in Sooke Lake Reservoir dropped slightly below the levels observed in September 2010 and 2011 (**Figure 1**).

Water Temperature. The water temperature remained below the long-term average throughout August and into early September (**Figure 2**). Similar to the trend in 2011, the water temperature rose slightly above the long-term average in late September (**Note:** The small circles on the chart show the extent of water temperature variation in previous years.)

Water Clarity

Turbidity. During August and September, the turbidity in Sooke Lake Reservoir continued to remain well below the 1.0 NTU turbidity limit and was slightly better (lower) than the 10-year average. This was very similar to the turbidity observed in 2010 and 2011 (**Figure 3**).

Water Transparency. Similar to turbidity, throughout August and September, the transparency of the water in Sooke Lake Reservoir continued to be much better (clearer) than the 10-year average (**Figure 4**) and better than in 2010 and 2011. 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 August and September, 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 similar to levels observed in 2010 and 2011 (**Figure 5**). *E. coli* concentrations remained low throughout August and September and well below the USEPA limit to remain an unfiltered supply (see insert in **Figure 5**).

Nutrients

Phosphorus. In August and September, the total phosphorus level in both the north and south basins of Sooke Lake Reservoir continued to remain lower than the long-term average and were similar to levels observed in 2010 and 2011 (**Figures 6 and 7**).

Nitrogen. In August and September, the total nitrogen levels in both the south and north basins were lower than the 10-year average (**Figures 8 and 9**) and broadly lower than the levels in 2010 and 2011.

Chlorophyll-a

In August and September, chlorophyll-a concentrations were lower than the 10-year average throughout Sooke Lake Reservoir (**Figures 10-12**) and broadly similar to the levels in 2010 and 2011. 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

Gymnodinium spp. (a dinoflagellate) and *Dinobryon bavaricum* (a golden-brown alga) concentrations gradually declined in August, reaching lowest levels by mid-month. In late August, the algal community shifted to *Dinobryon divergens* throughout Sooke Lake Reservoir. The concentration of *Dinobryon divergens* continued to increase throughout September but absolute values were within the range observed in past years and below the concentration that would produce a discernible odor. Overall algal productivity throughout Sooke Lake Reservoir was low during this period and there were no algal associated water quality issues.

CONCLUSION

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

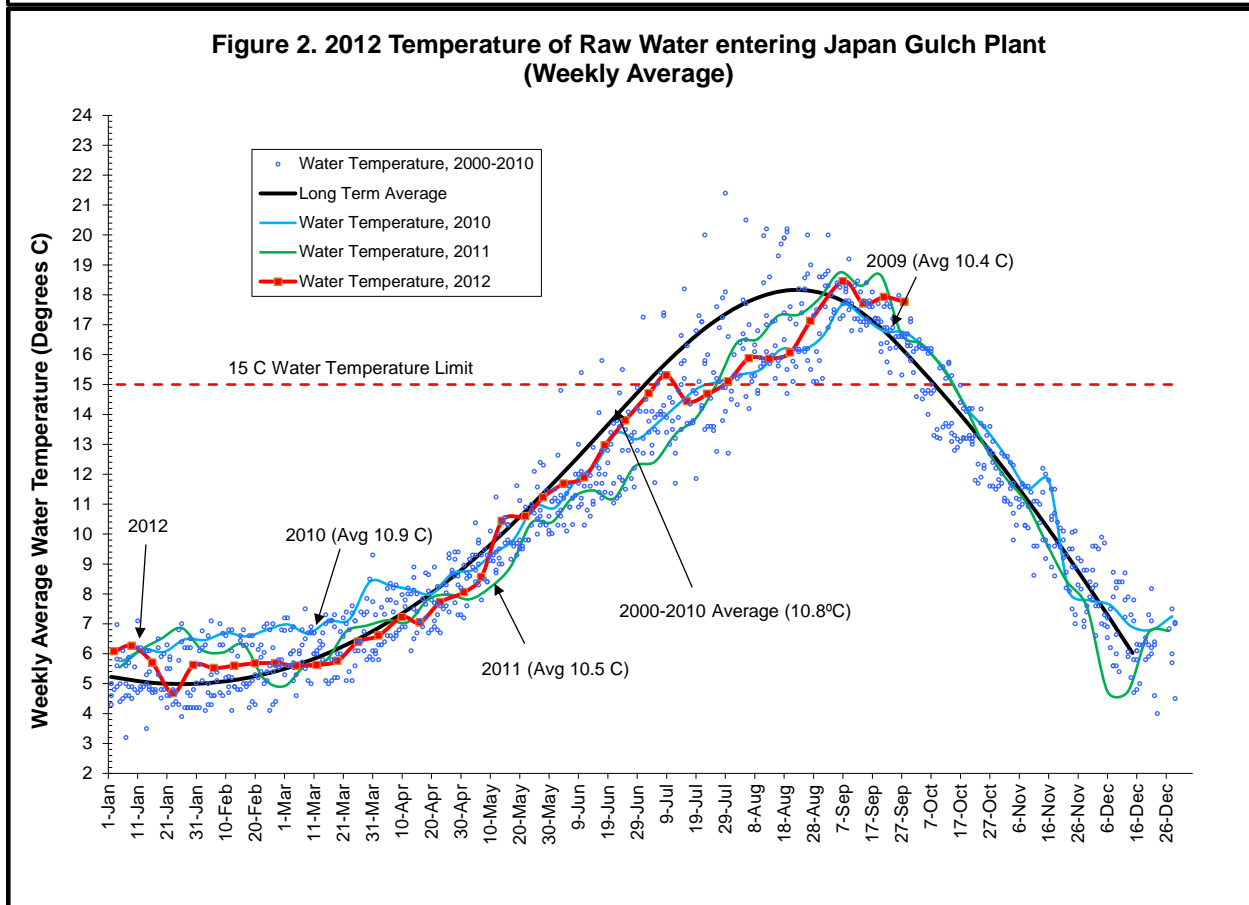
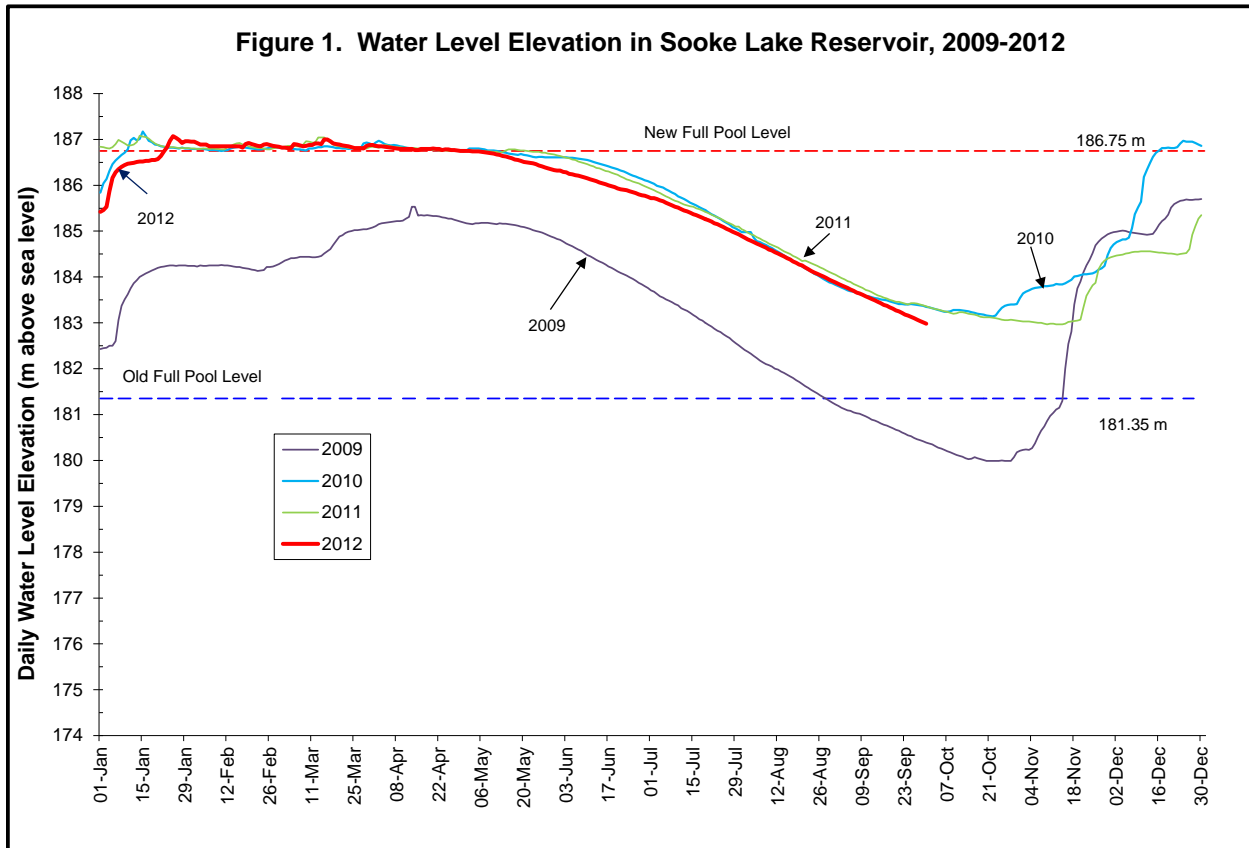
RECOMMENDATION

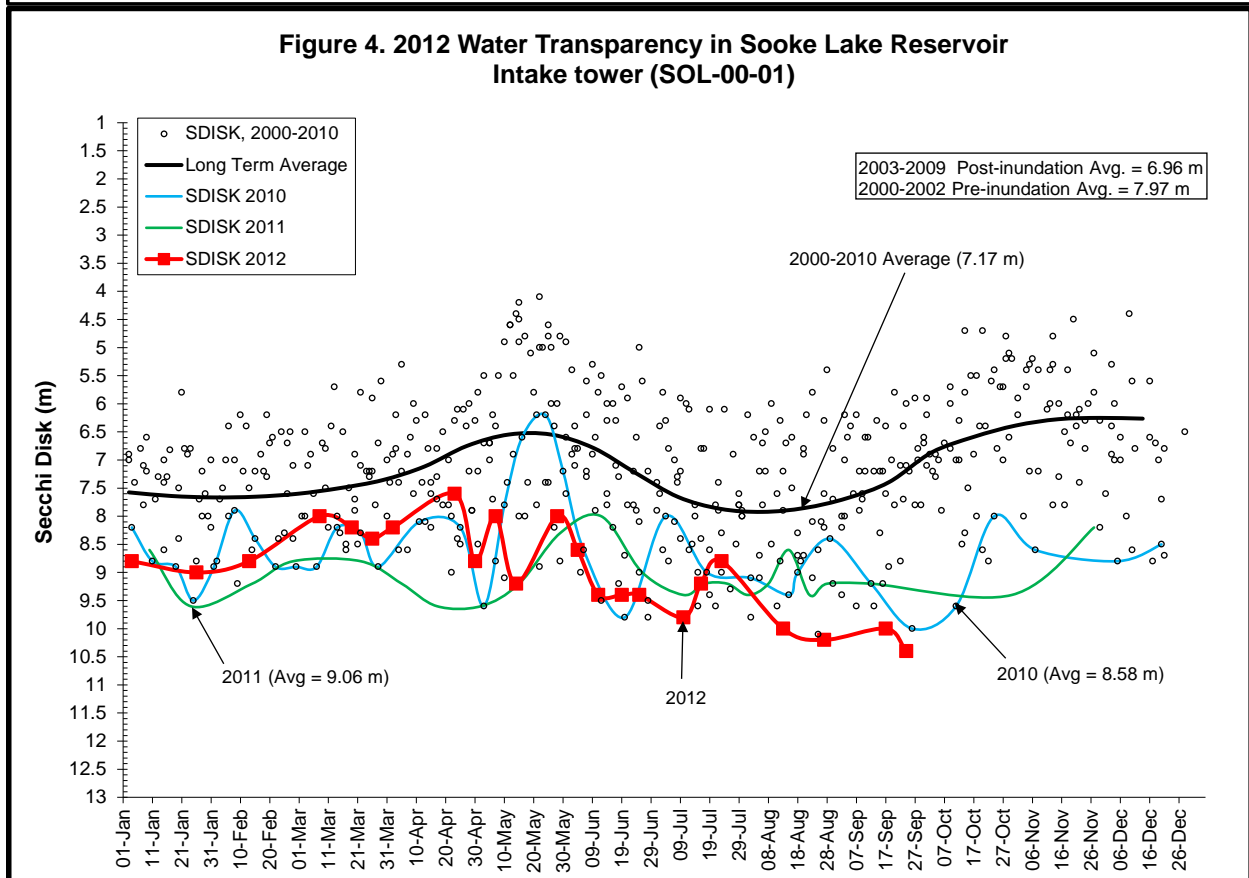
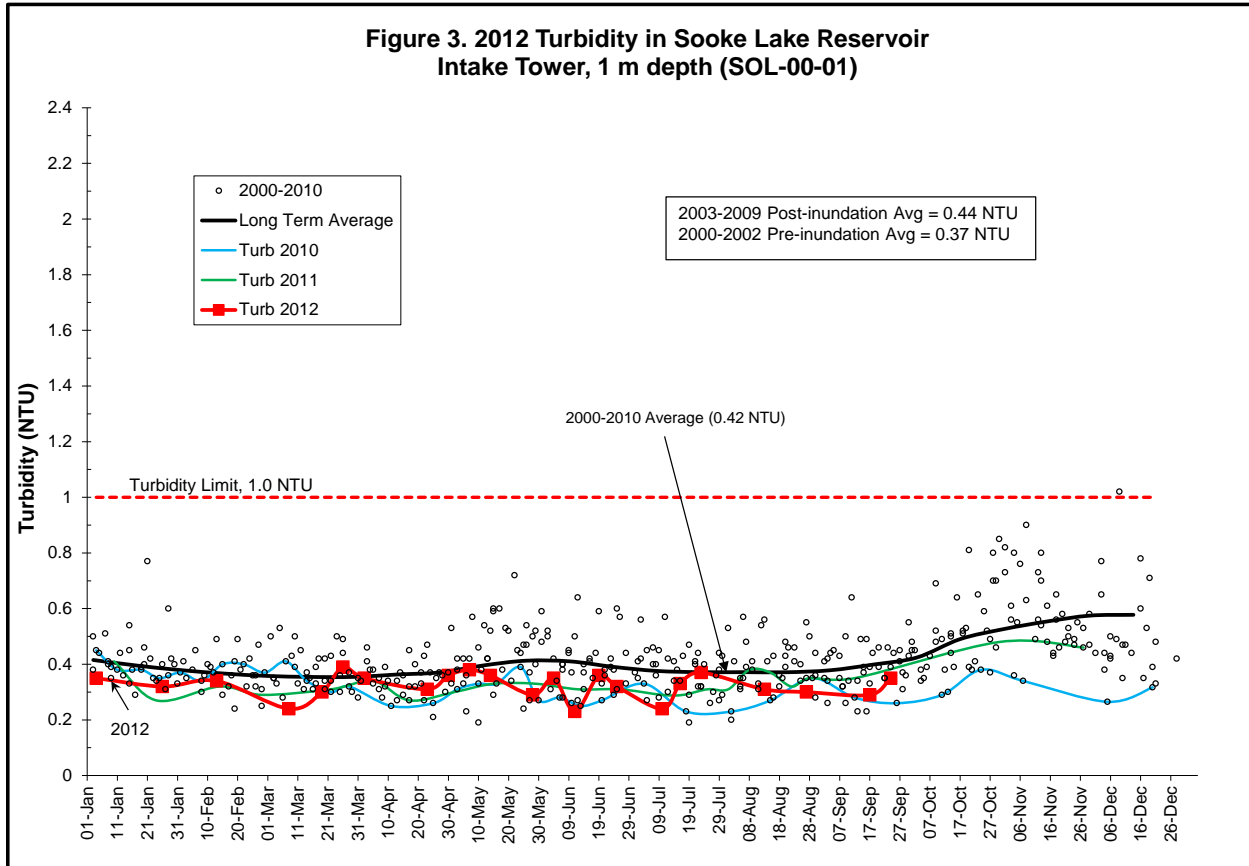
That the Regional Water Supply Commission receive this report for information.

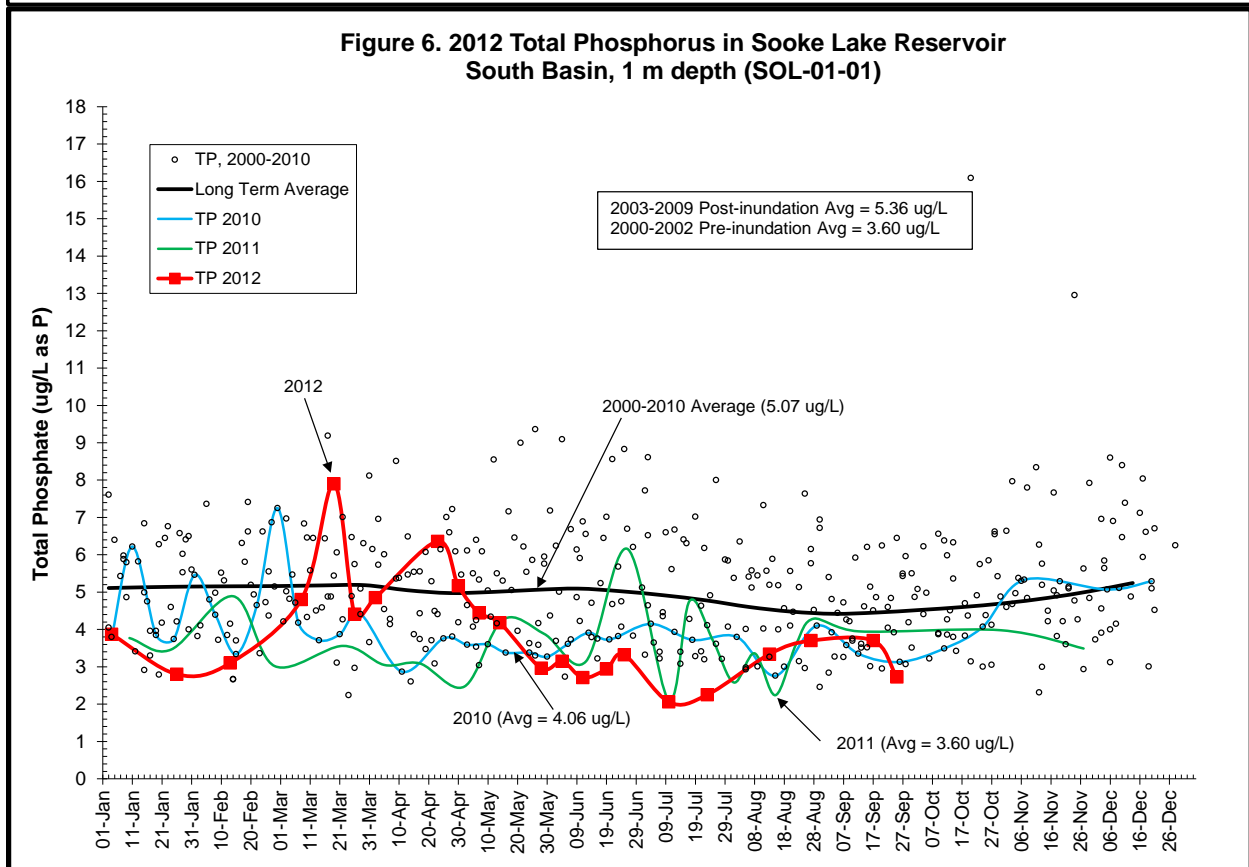
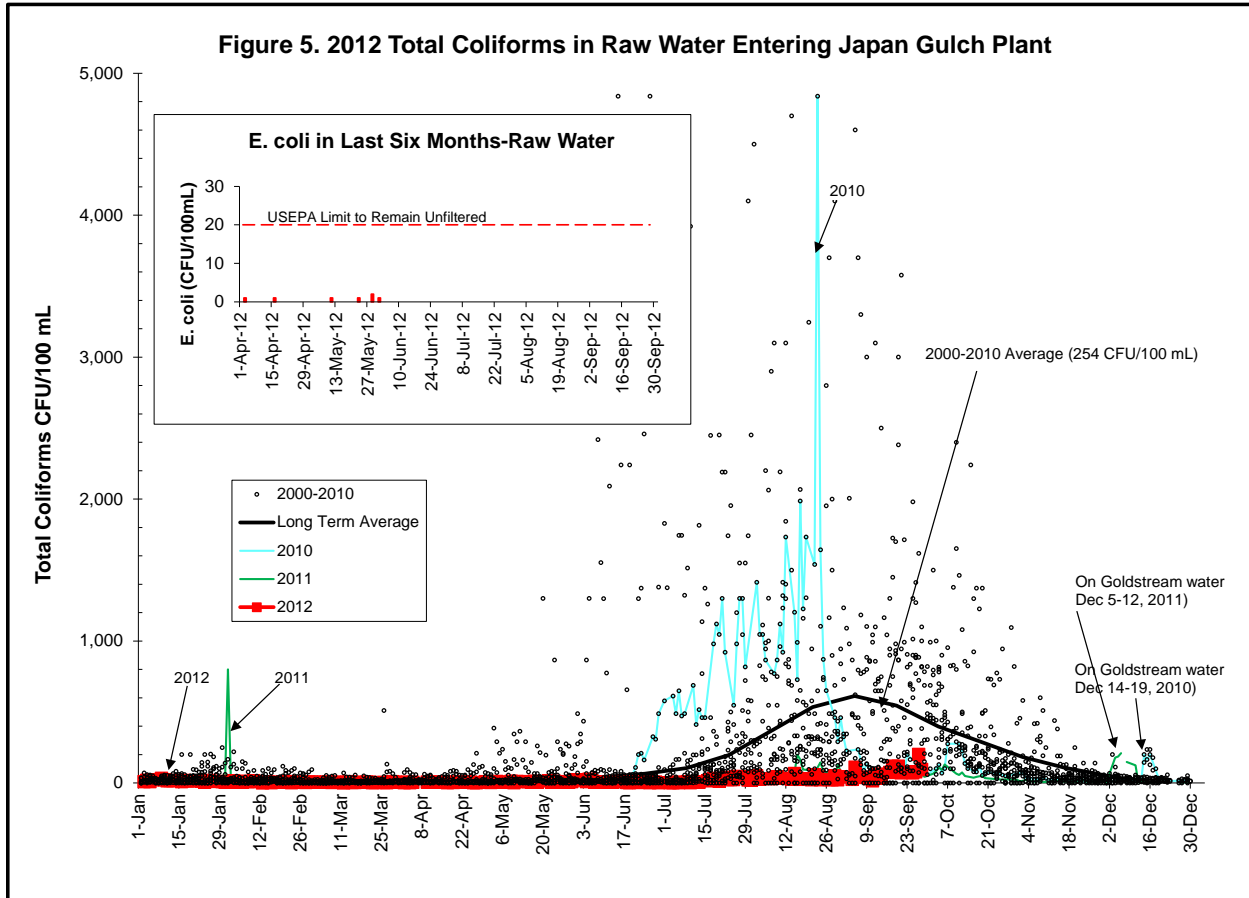
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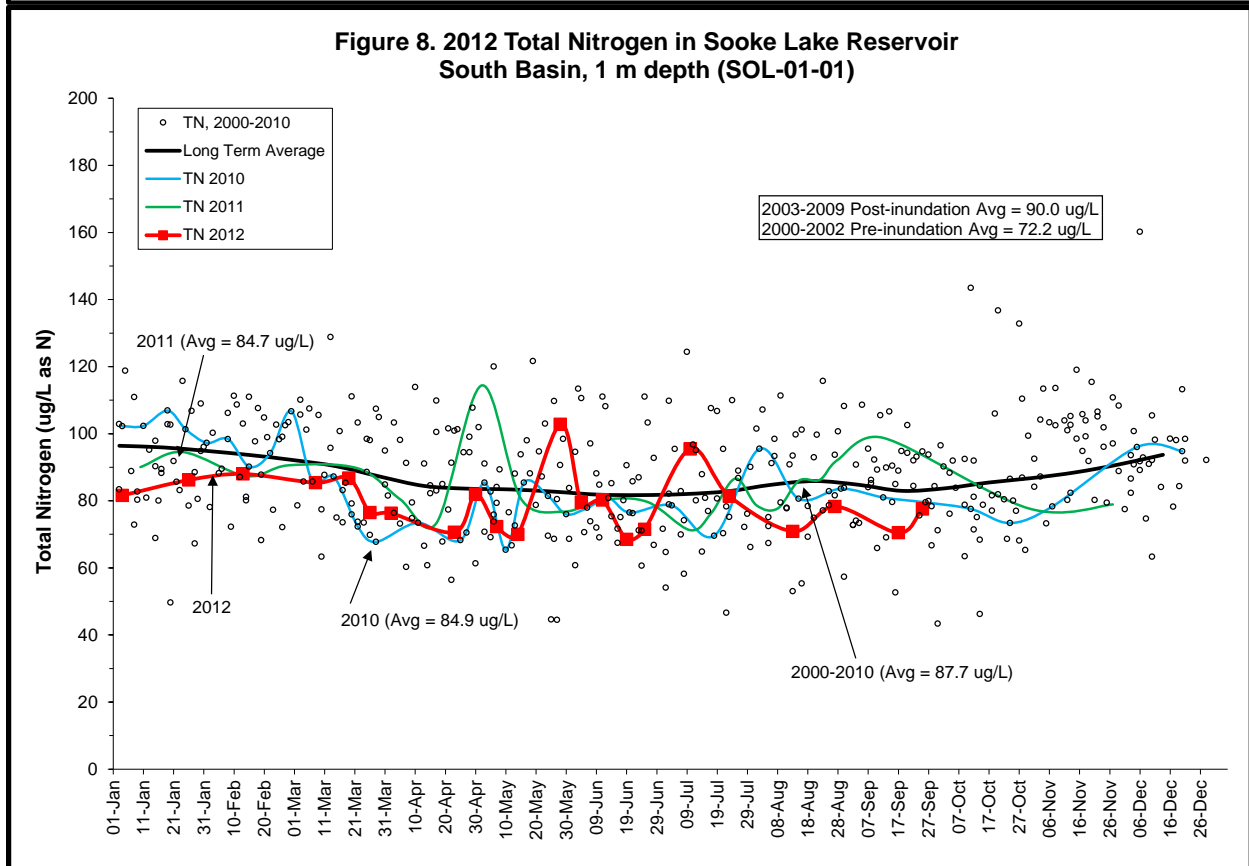
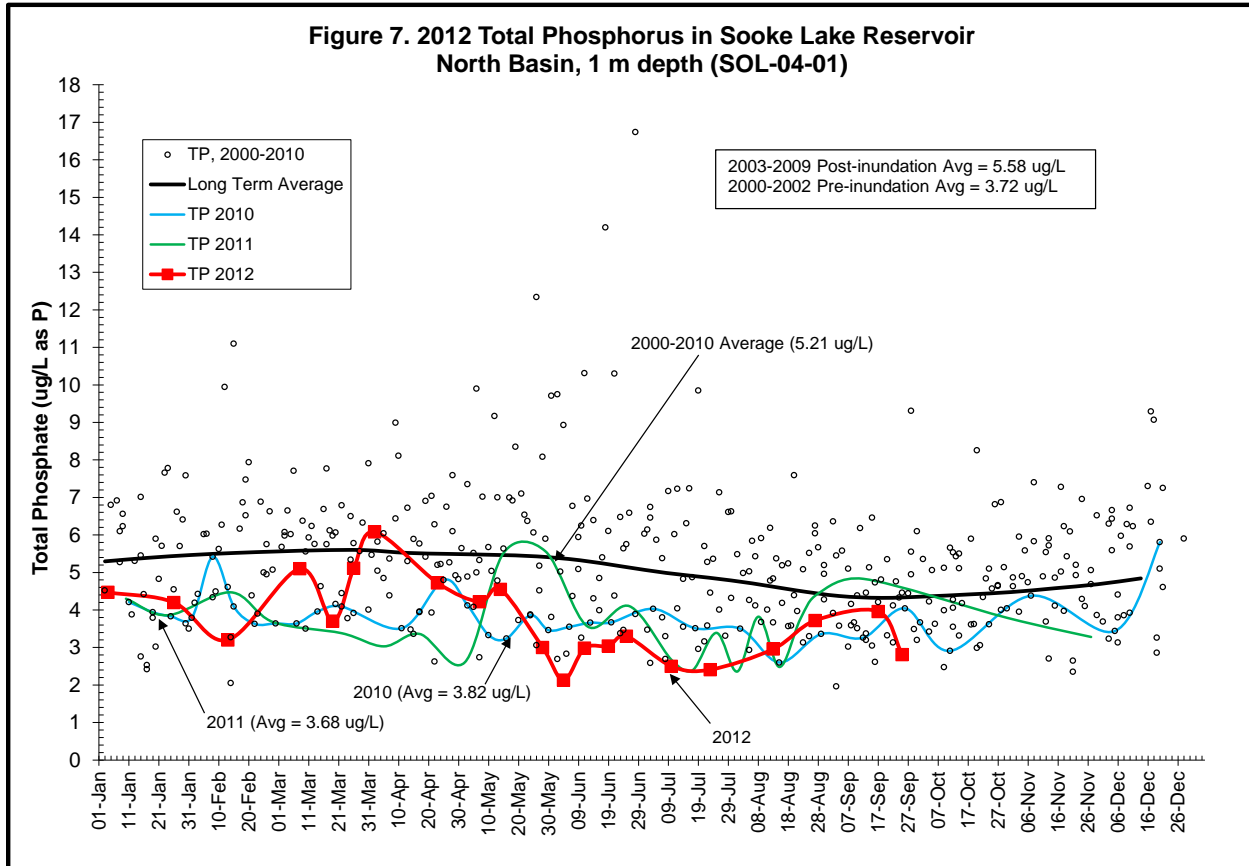
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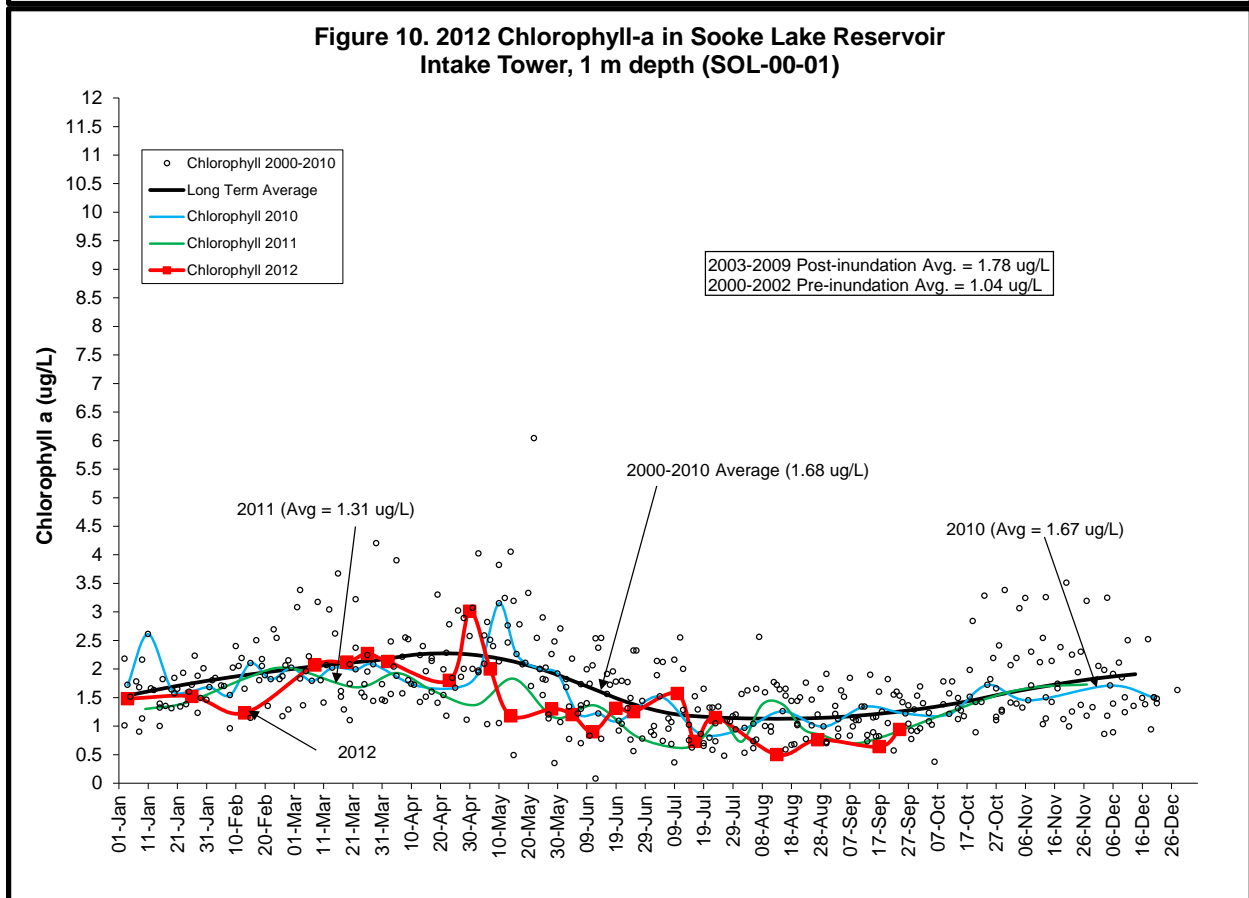
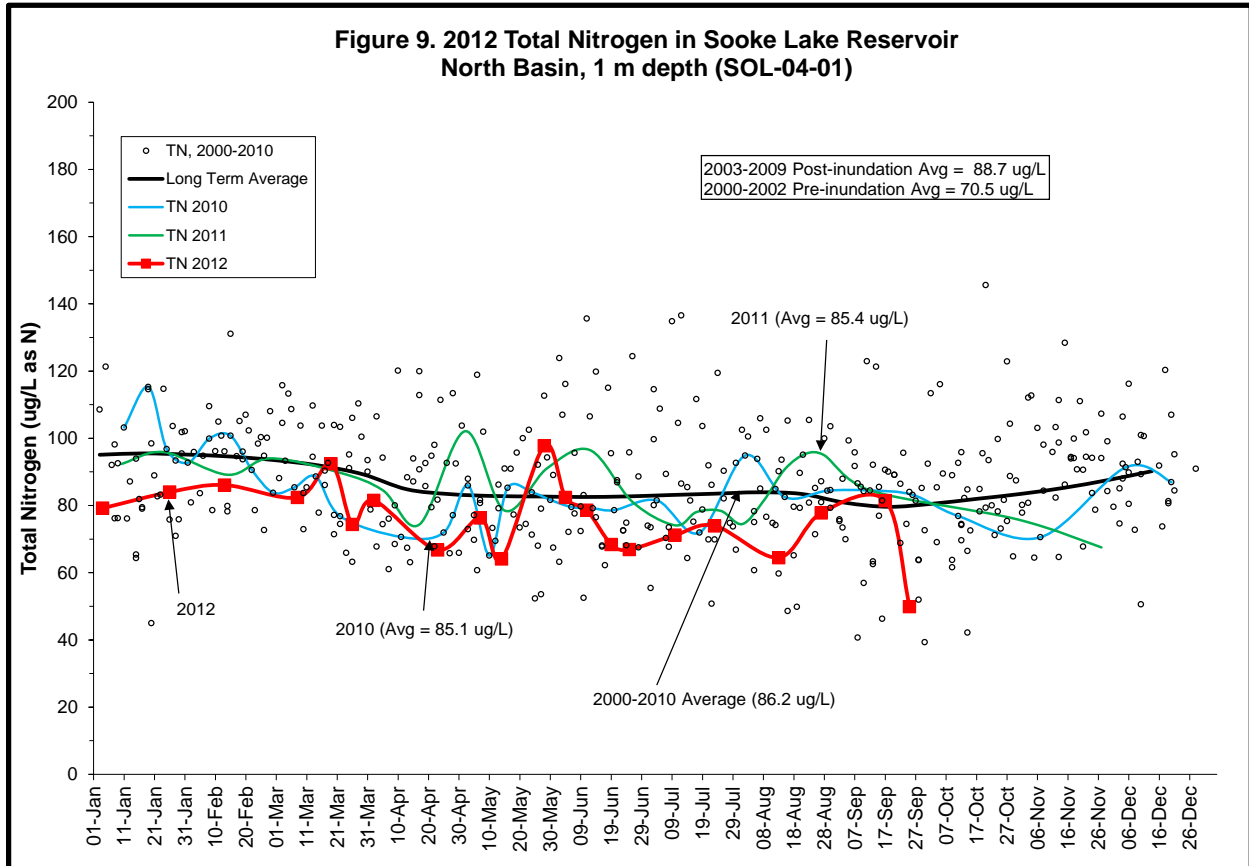


Figure 11. 2012 Chlorophyll-a in Sooke Lake Reservoir Intake Tower, 5 m depth (SOL-00-05)

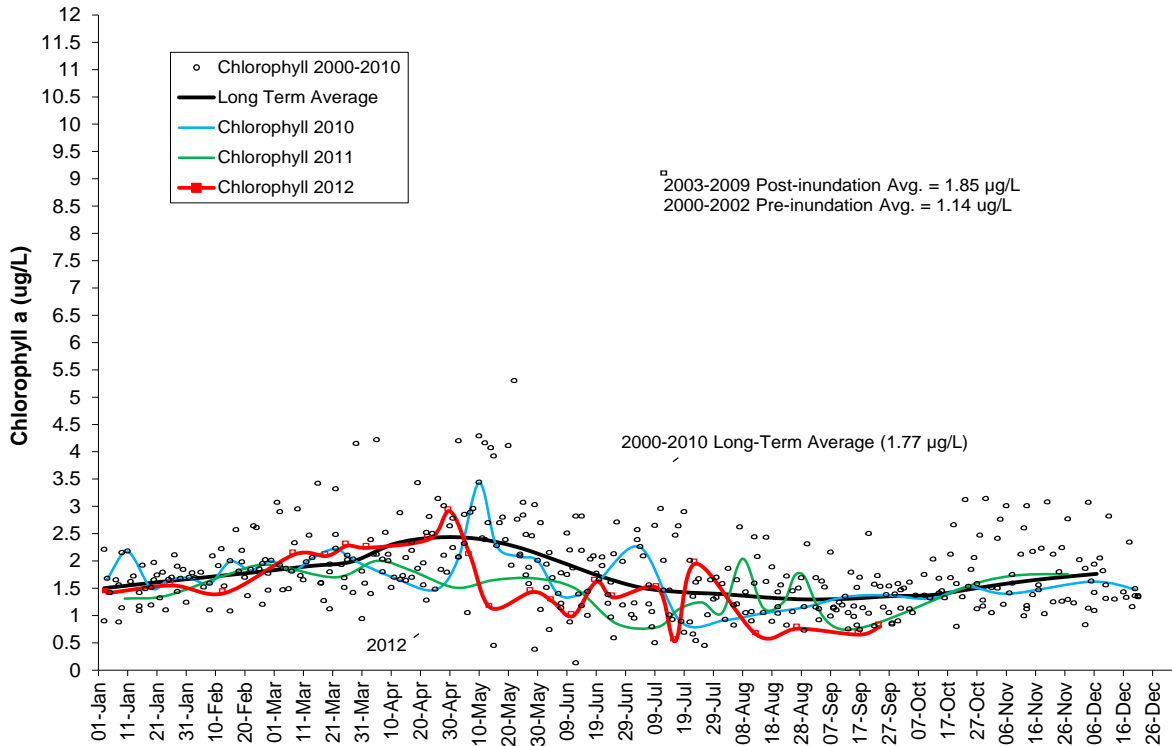


Figure 12. 2012 Chlorophyll-a in Sooke Lake Reservoir Intake Tower, 10 m depth (SOL-00-10)

