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ITEM 9

RWSC 2013-02

REPORT TO REGIONAL WATER SUPPLY COMMISSION
MEETING OF WEDNESDAY, FEBRUARY 6, 2013

SUBJECT **WATER QUALITY TRENDS IN SOOKE LAKE RESERVOIR IN NOVEMBER AND DECEMBER 2012**

ISSUE

To provide information on the water quality conditions observed in Sooke Lake Reservoir during November and December 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 increased steadily throughout November and December and on Dec 25, about 1 month earlier than last year, rose to full pool. The reservoir continued to spill at year's end.

Water Temperature. The water temperature throughout November and early December was similar to the long-term average. The temperatures rose in mid-December above 2011 values and above the long-term average (**Figure 2**). (**Note**: The small circles on the chart show the extent of water temperature variation in previous years.)

Water Clarity

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

Water Transparency. Similar to turbidity, the transparency of the water in Sooke Lake Reservoir in November and December continued to be much better (clearer) than the 10-year average (**Figure 4**) and was broadly similar to that in November and December 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 November and December, 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, except for early December (Dec 03-07) when the water from the Goldstream River system was used as the source water (**Figure 5**). Except for Dec 03-07, *E. coli* concentrations remained low throughout November and December and below the USEPA limit to remain an unfiltered supply (see insert in **Figure 5**).

Nutrients

Phosphorus. In November and December, the total phosphorus level in both the north and south basins of Sooke Lake Reservoir continued to remain lower than the 10-year average and were similar to or slightly lower than levels observed in November and December in 2010 and 2011 (**Figures 6 and 7**).

Nitrogen. In November and December, 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 November, 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. In December, chlorophyll-a concentrations in the reservoir rose to a level similar to or slightly higher than the long term average. 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

Overall algal productivity throughout Sooke Lake Reservoir was low in November and December and there were no algal associated water quality issues.

CONCLUSION

The water quality tests conducted for Sooke Lake Reservoir in November and December, 2012 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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Figure 1. Water Level Elevation in Sooke Lake Reservoir, 2009-2012

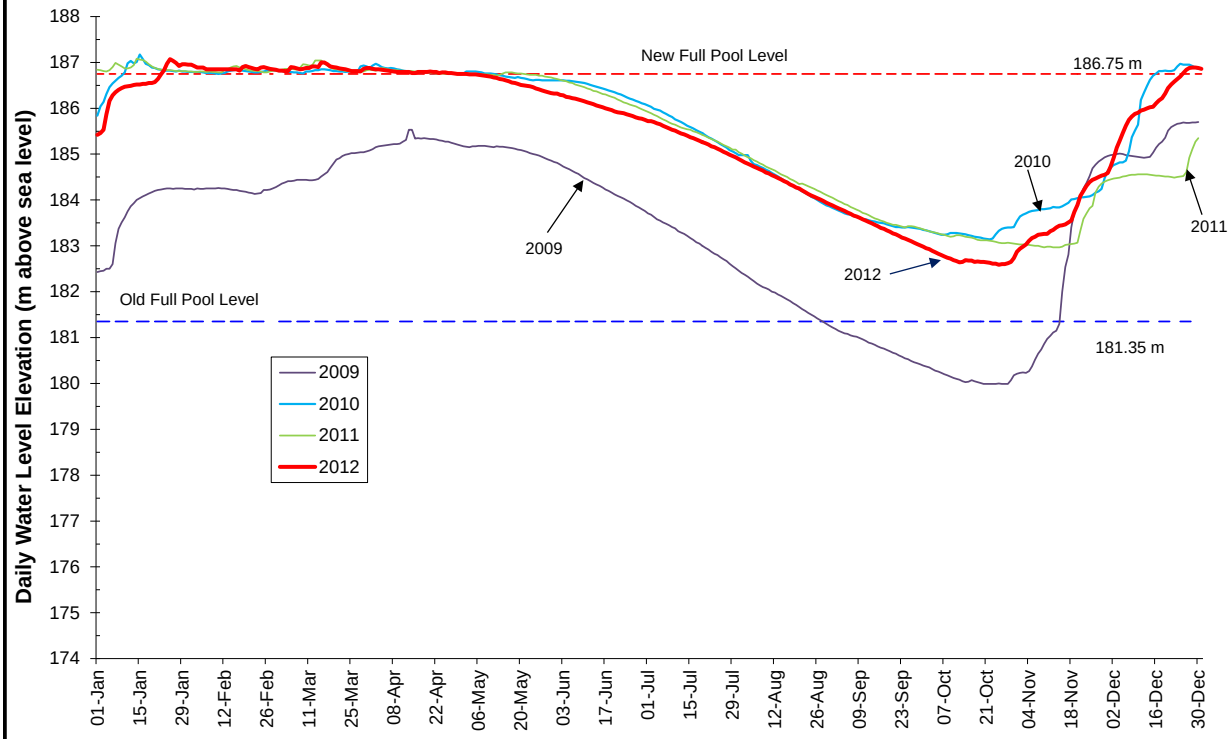

Figure 2. 2012 Temperature of Raw Water entering Japan Gulch Plant (Weekly Average)

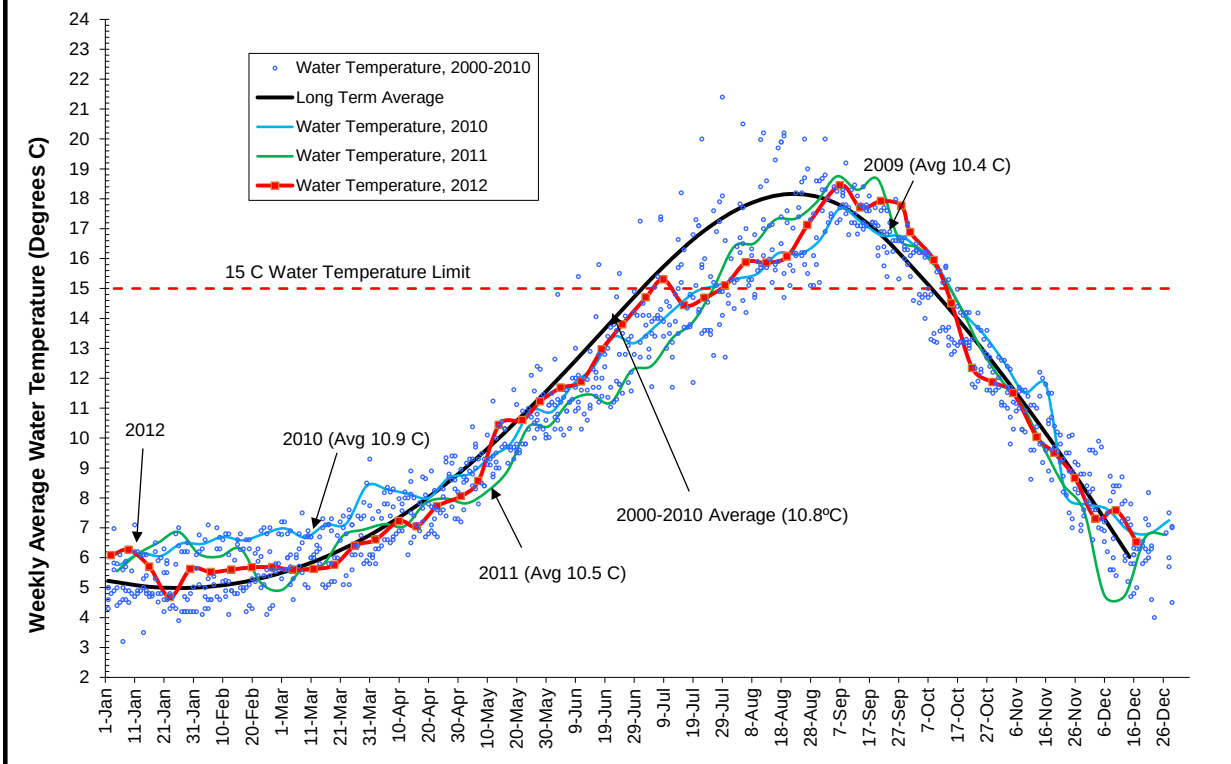

Figure 3. 2012 Turbidity in Sooke Lake Reservoir Intake Tower, 1 m depth (SOL-00-01)

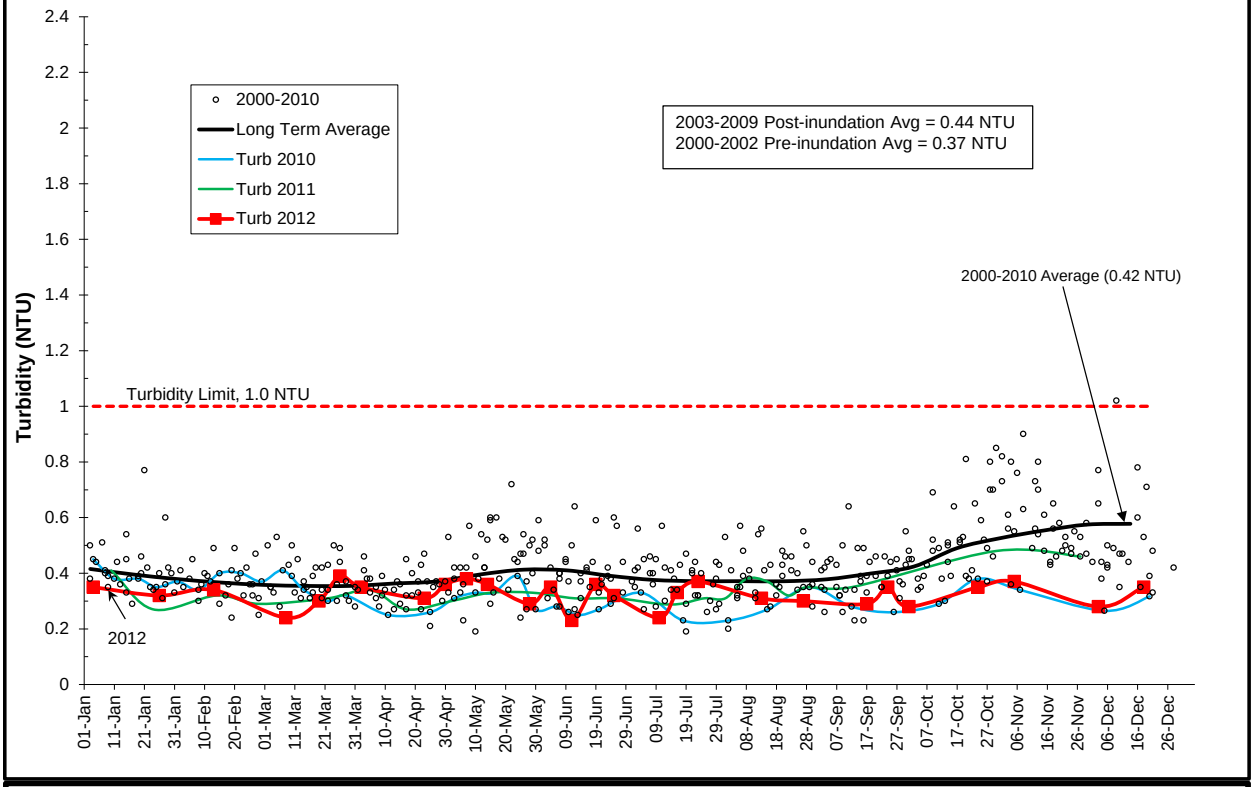

Figure 4. 2012 Water Transparency in Sooke Lake Reservoir Intake tower (SOL-00-01)

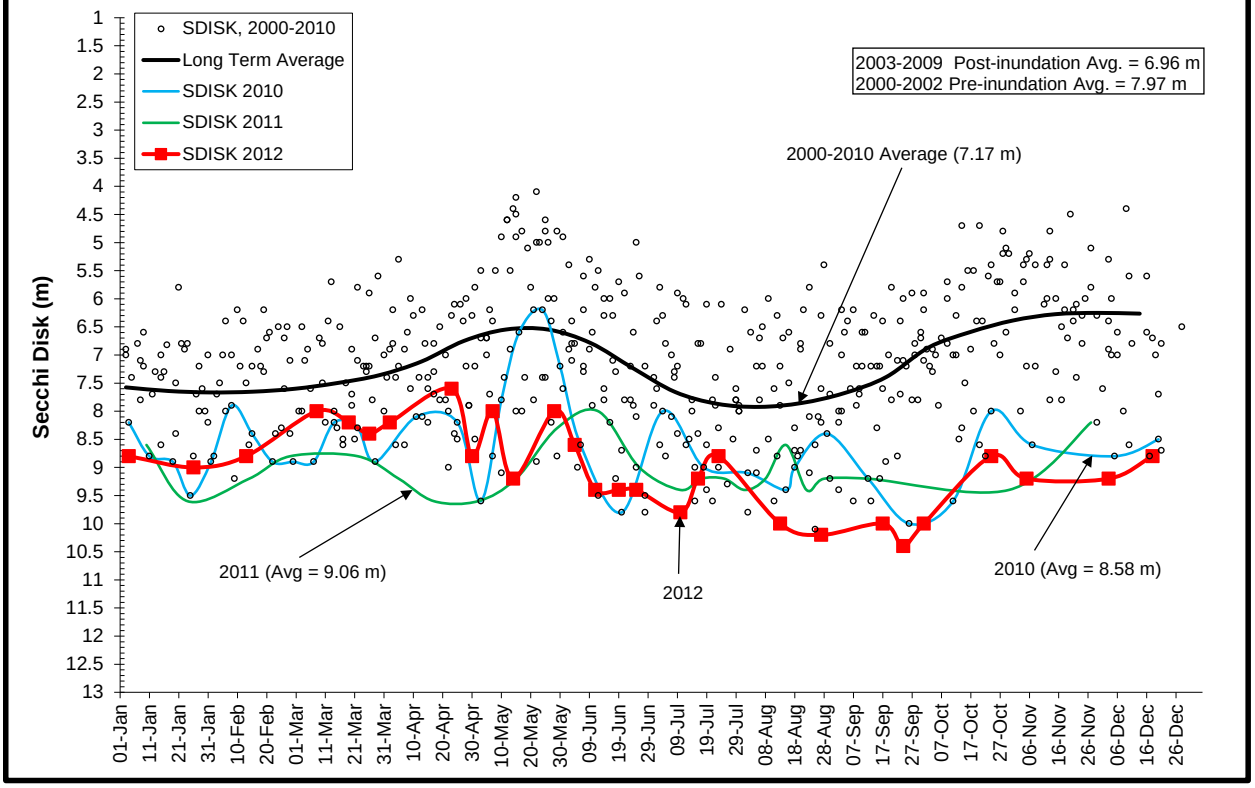

Figure 5. 2012 Total Coliforms in Raw Water Entering Japan Gulch Plant

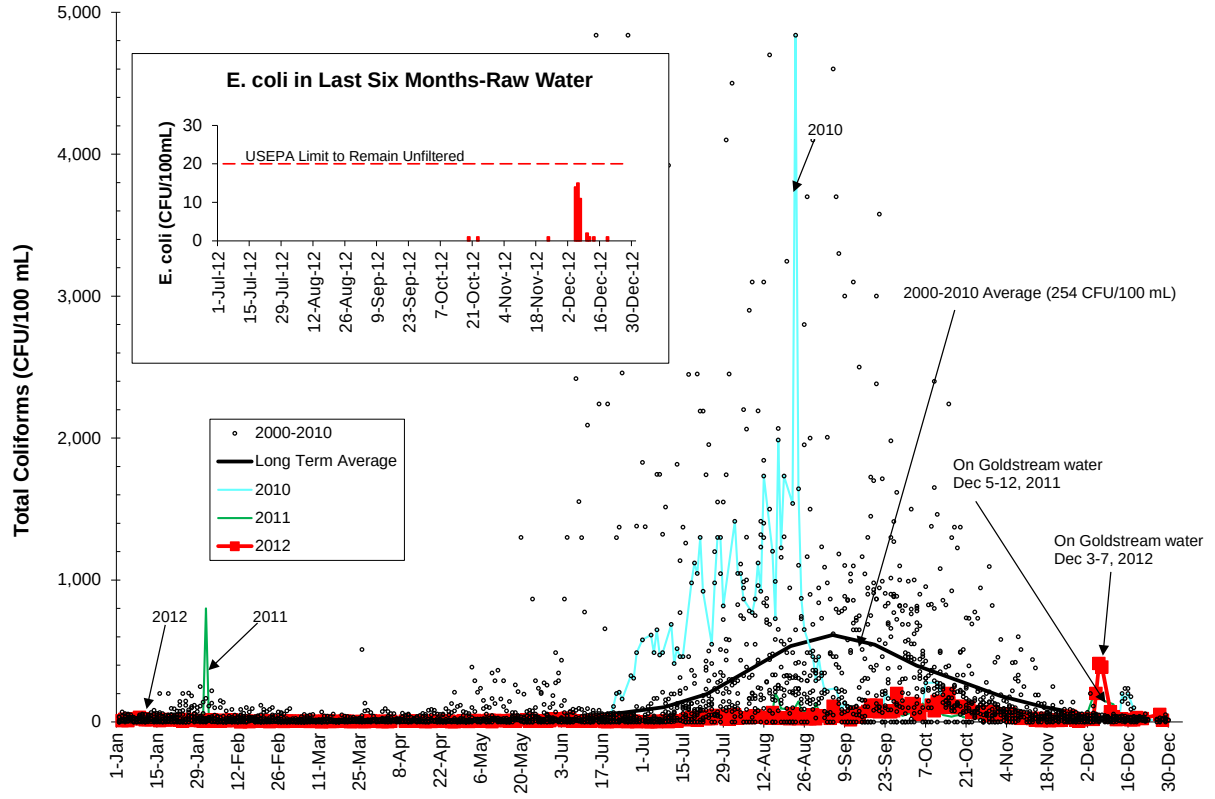

Figure 6. 2012 Total Phosphorus in Sooke Lake Reservoir South Basin, 1 m depth (SOL-01-01)

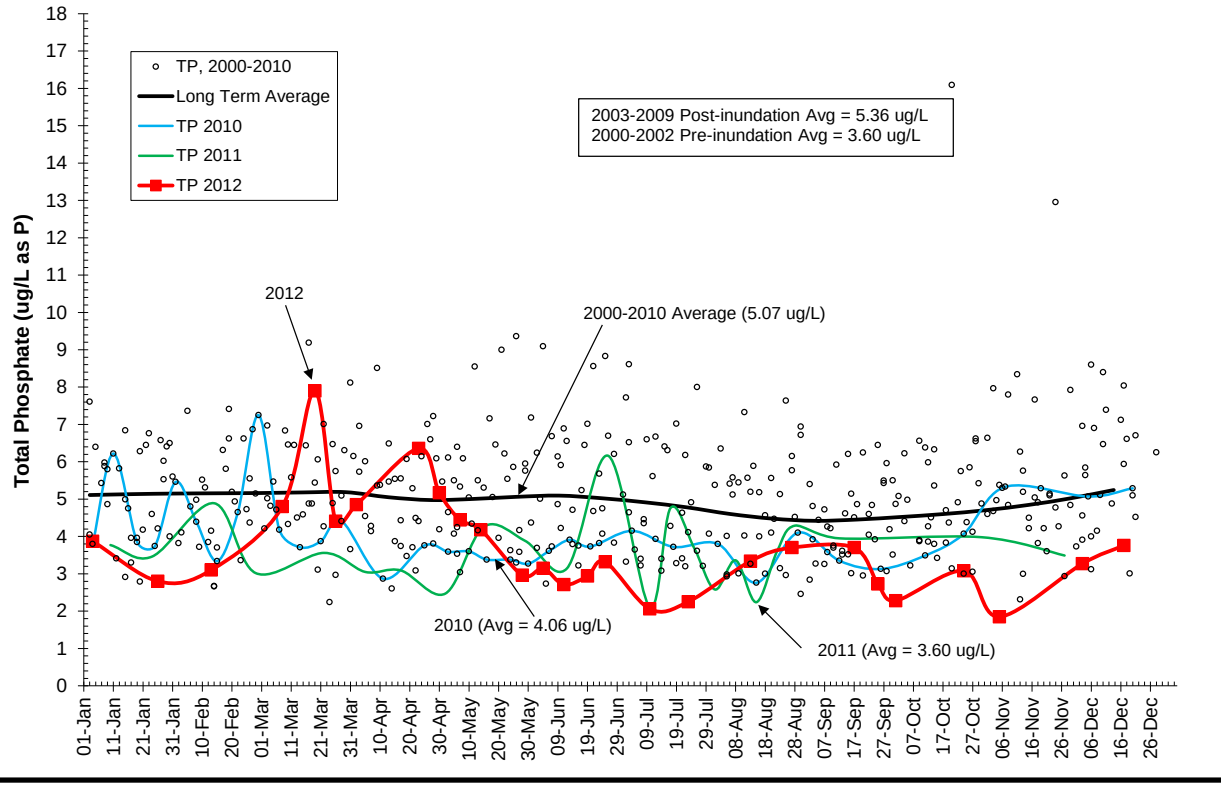

Figure 7. 2012 Total Phosphorus in Sooke Lake Reservoir
North Basin, 1 m depth (SOL-04-01)

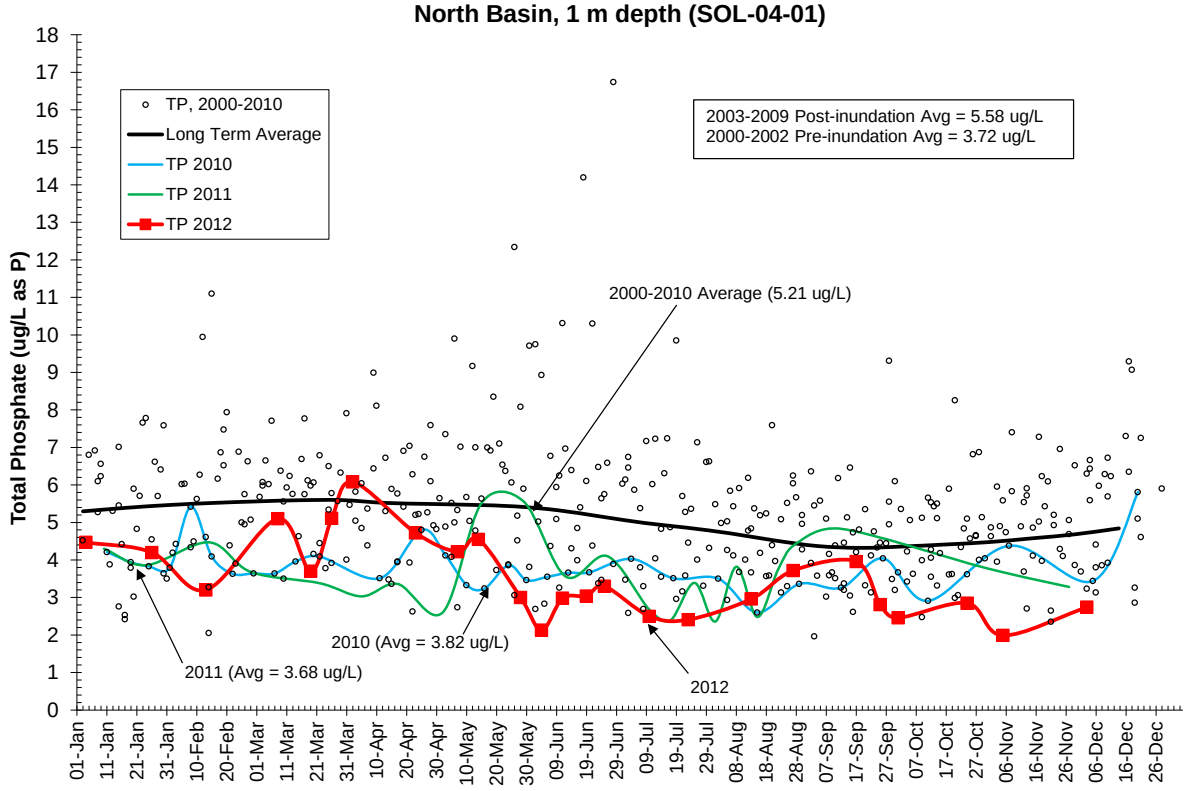

Figure 8. 2012 Total Nitrogen in Sooke Lake Reservoir
South Basin, 1 m depth (SOL-01-01)

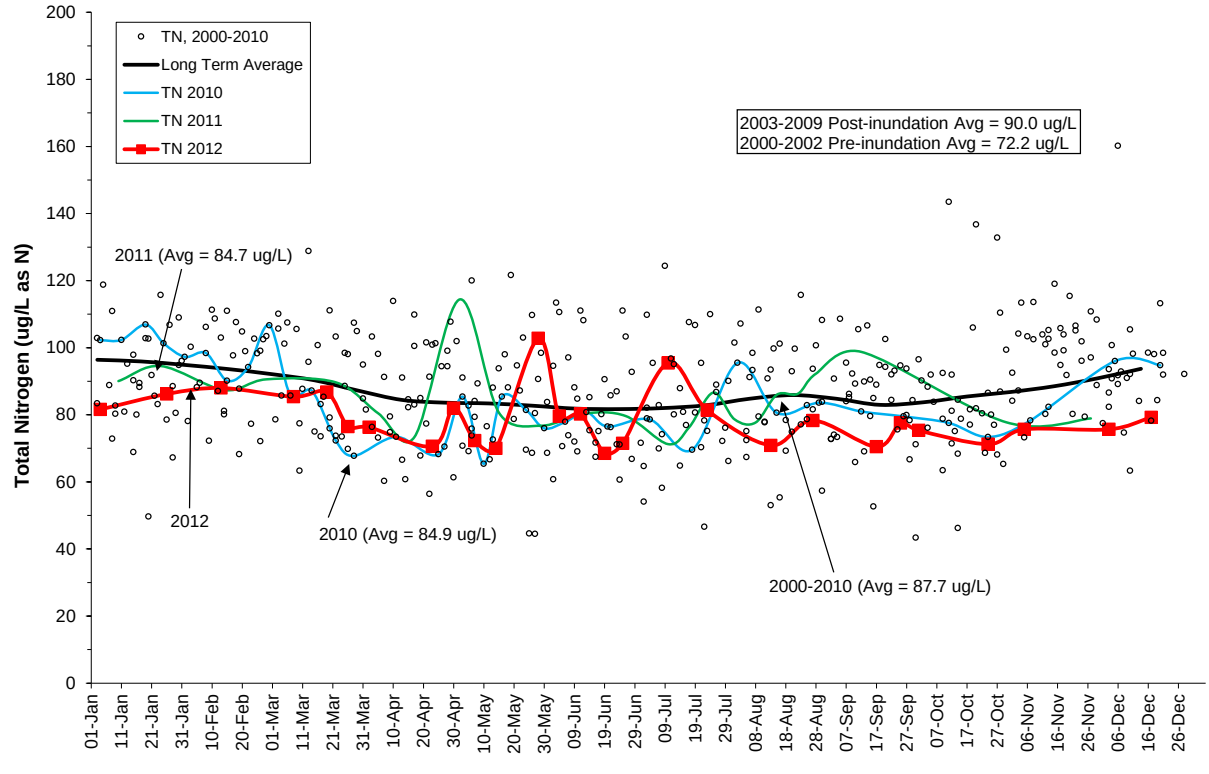

Figure 9. 2012 Total Nitrogen in Sooke Lake Reservoir North Basin, 1 m depth (SOL-04-01)

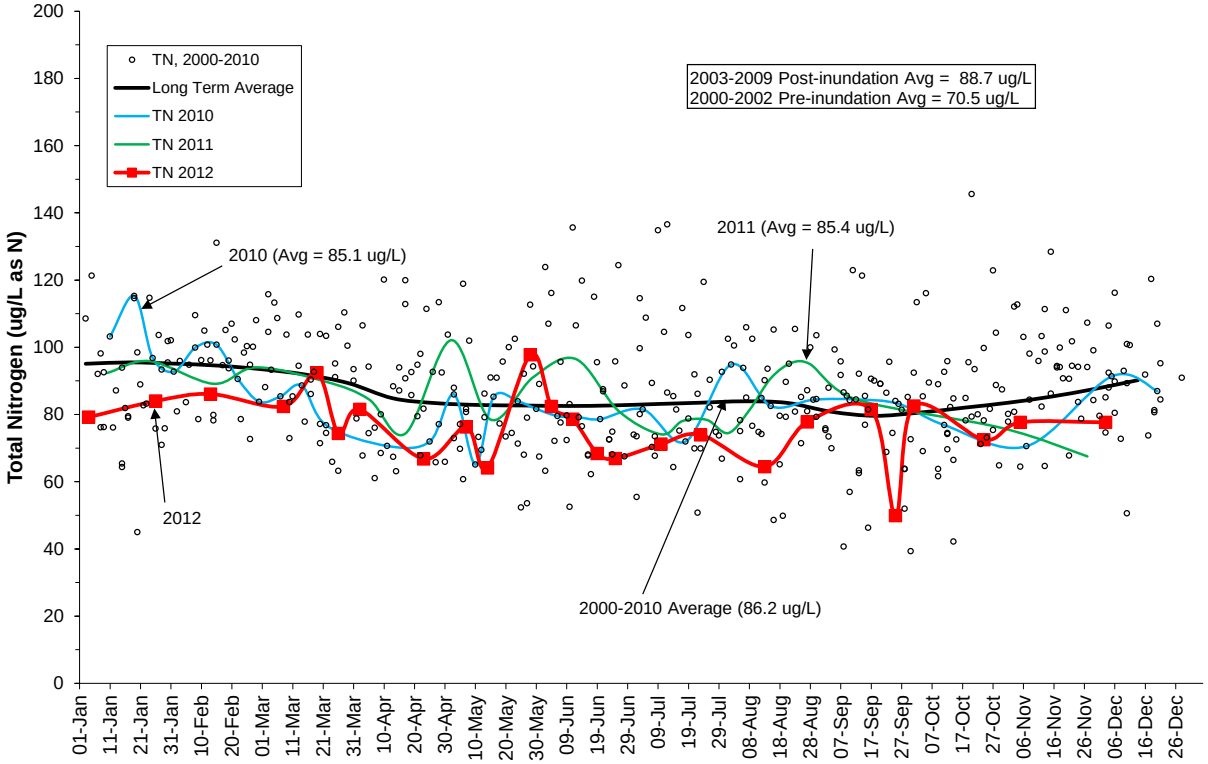

Figure 10. 2012 Chlorophyll-a in Sooke Lake Reservoir Intake Tower, 1 m depth (SOL-00-01)

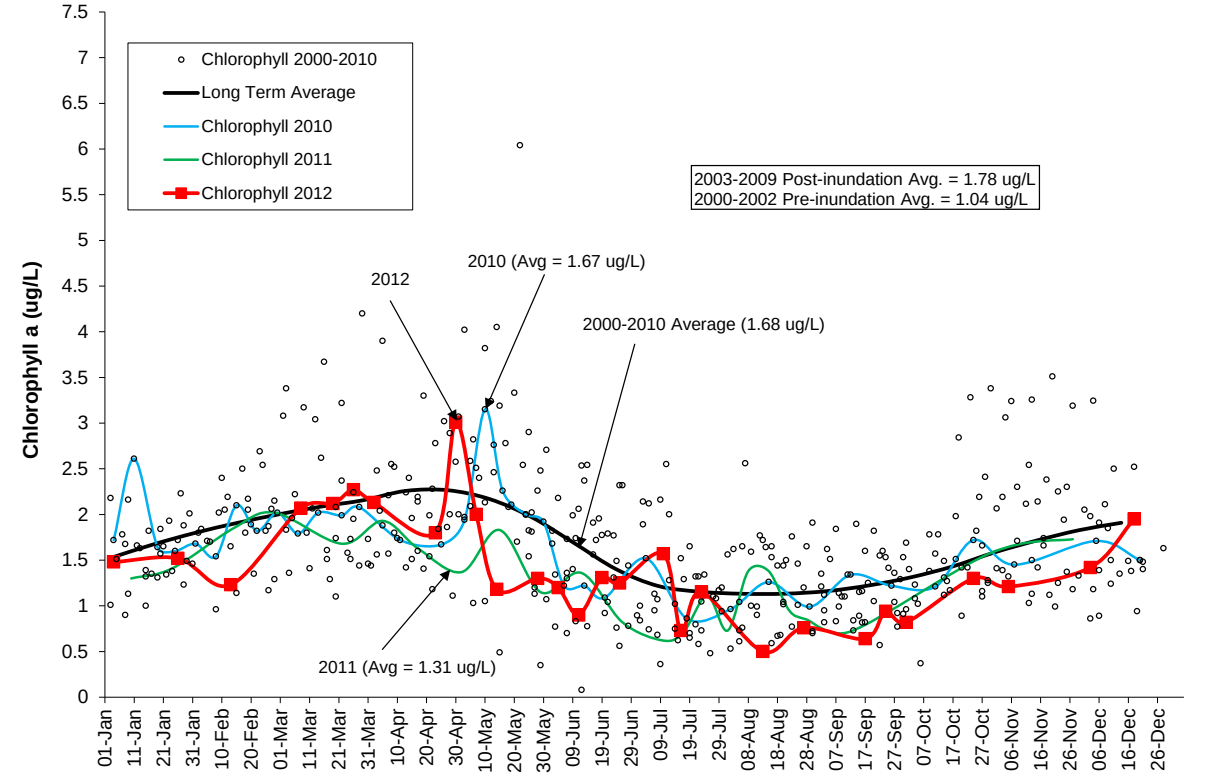

Figure 11. 2012 Chlorophyll-a in Sooke Lake Reservoir Intake Tower, 5 m depth (SOL-00-05)

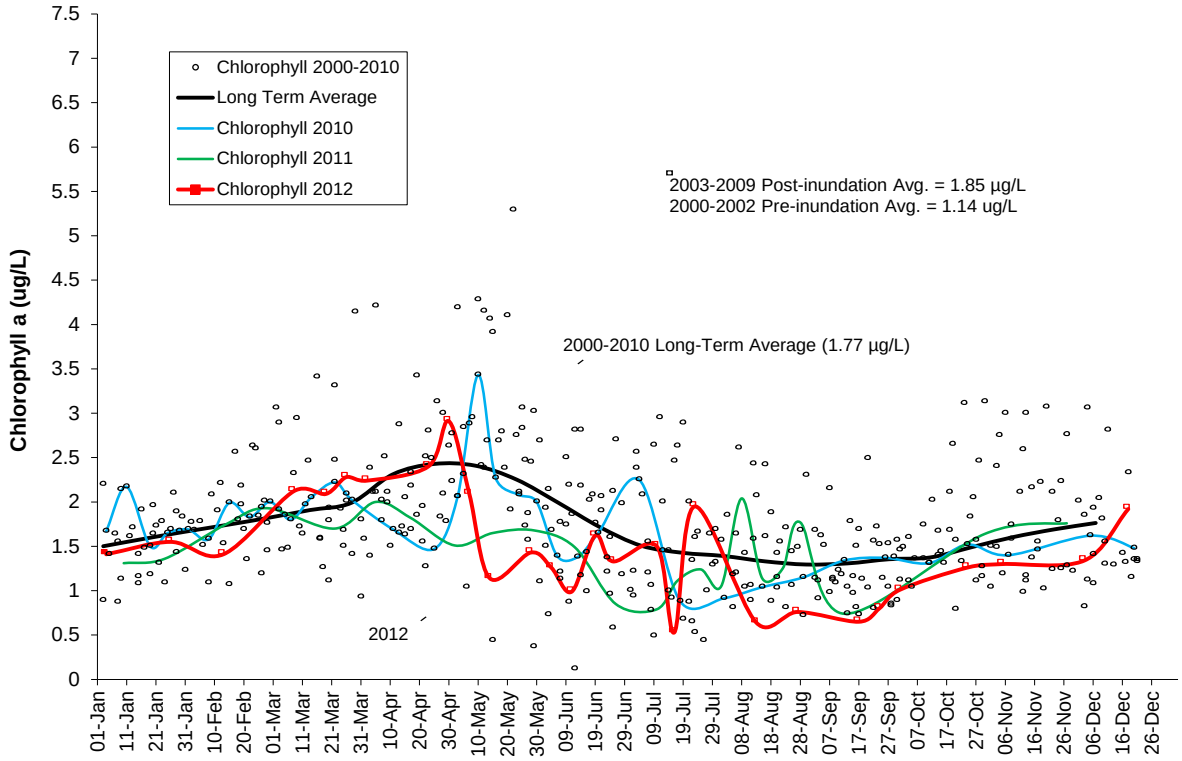

Figure 12. 2012 Chlorophyll-a in Sooke Lake Reservoir Intake Tower, 10 m depth (SOL-00-10)