

Nutrient Loading by May Storms:

The heavy rains of May 2014 and/or the heavy snows and snow melt/runoff from past winter had a huge impact on many of the Finger Lakes. This conclusion is based on water column profiles detected by CTD, secchi disk depths and nutrient analyses collected and analyzed over the last week of May 2014 by John Halfman at Finger Lakes Institute – Hobart & William Smith Colleges. See the profiles & other data below.

CTD Profiles:

The water column profiles of temperature, specific conductance, photosynthetic light intensity (PAR), fluorescence (algae), and turbidity (suspended sediment) vs. water depth collected from deep water sites from the FLI late-May 2014 survey are shown along with profiles collected at the same site at different months from last year for comparison.

Honeoye, Canandaigua, Keuka, Seneca, Cayuga, Owasco and Otisco have more or significantly more turbidity and as a result reduced light penetration into the water column during the May 2014 survey compared to any profile the previous year (a reasonably wet year). The turbidity was much smaller in Seneca Lake during earlier and subsequent cruises. It suggests that the May increase reflects the mid-May rains. In many cases the Finger Lakes also revealed increased (or significantly increased) algae concentrations. The evidence suggests that the huge rains and the associated runoff delivered huge quantities of soil to the lakes. Notably absent from this list is Skaneateles Lake, where significant time, energy and money are used to reduce the impact of runoff on the lake's ecosystem.

Secchi Disk, Nutrient and Suspended Sediment Data:

Secchi disk depths are significantly shallower and suspended sediment concentrations are significantly larger during the last week of May 2014 than mean annual data at these lakes as well (except for Honeoye and Skaneateles). These observed changes can also be attributed to the extra runoff. The runoff most likely also contributed the larger phosphate concentrations detected in these lakes this past May. The excess phosphates, the limiting nutrient in all but Honeoye, most likely stimulated the observed extra huge algal blooms. This conclusion is supported by the event dominated, watershed-scale nutrient loading issues in the region. Interestingly, nitrates and dissolved silica appear unchanged by the event.

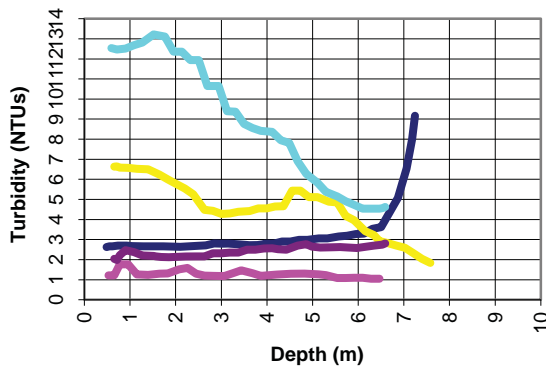
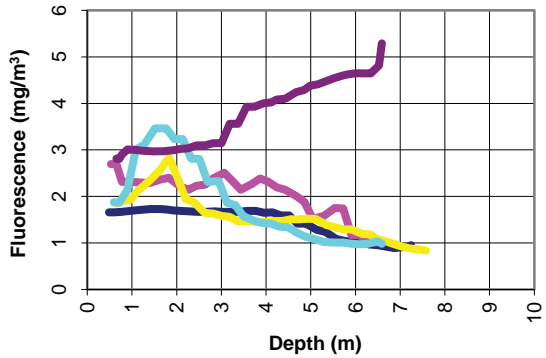
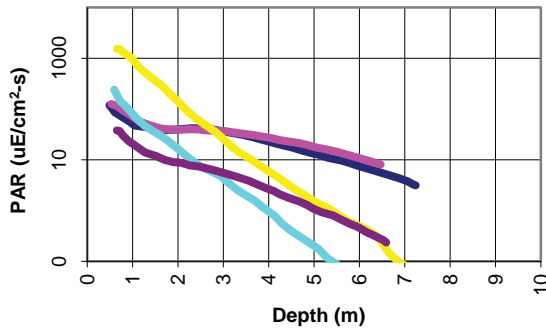
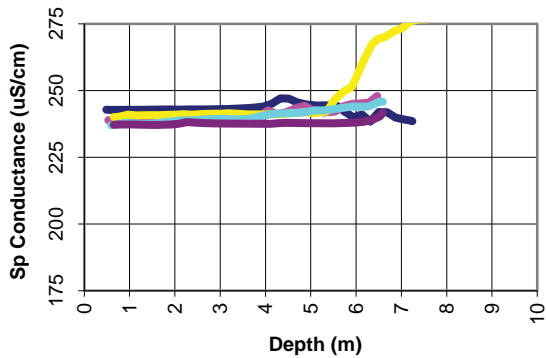
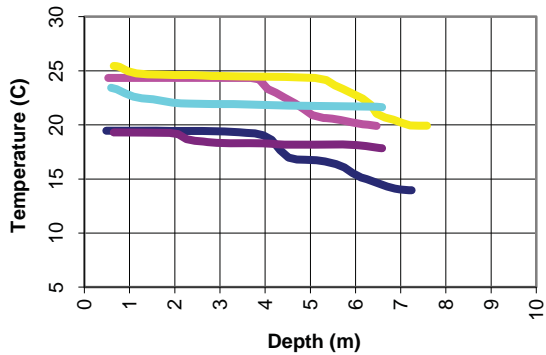
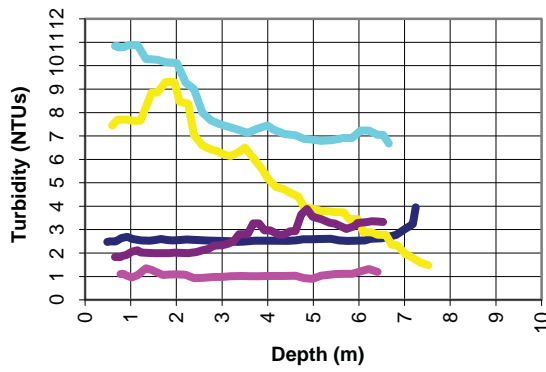
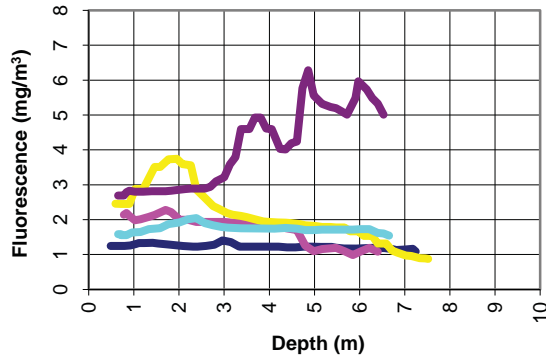
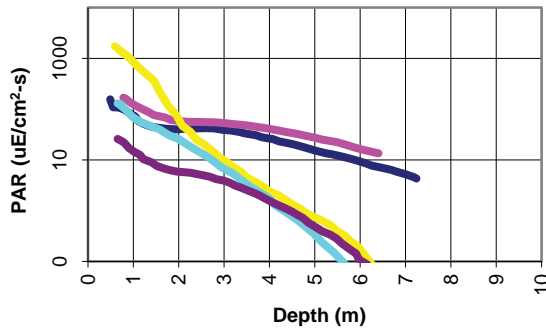
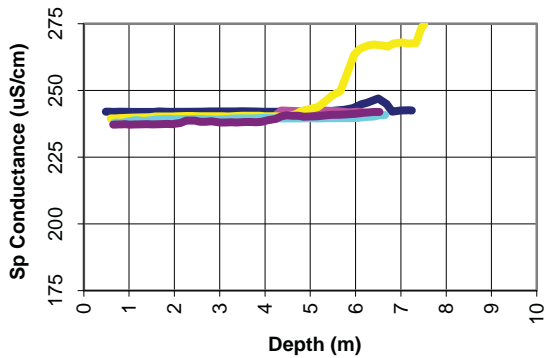
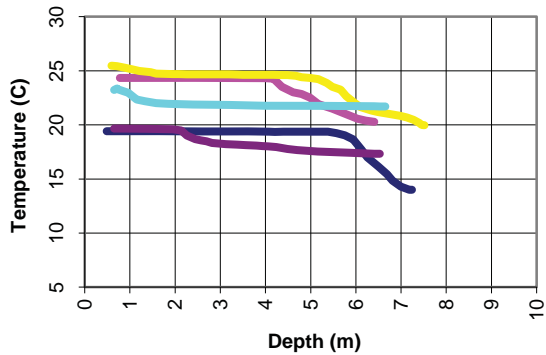
Prediction:

I predict that most of the Finger Lakes will feel the impact of this huge event for the remainder of this summer and perhaps into the years ahead as the input of extra phosphorus is incorporated into the nutrient cycle. Once extra nutrients enter an aquatic ecosystem, they typically stay for years, as aquatic nutrient cycles are very efficient at recycling.

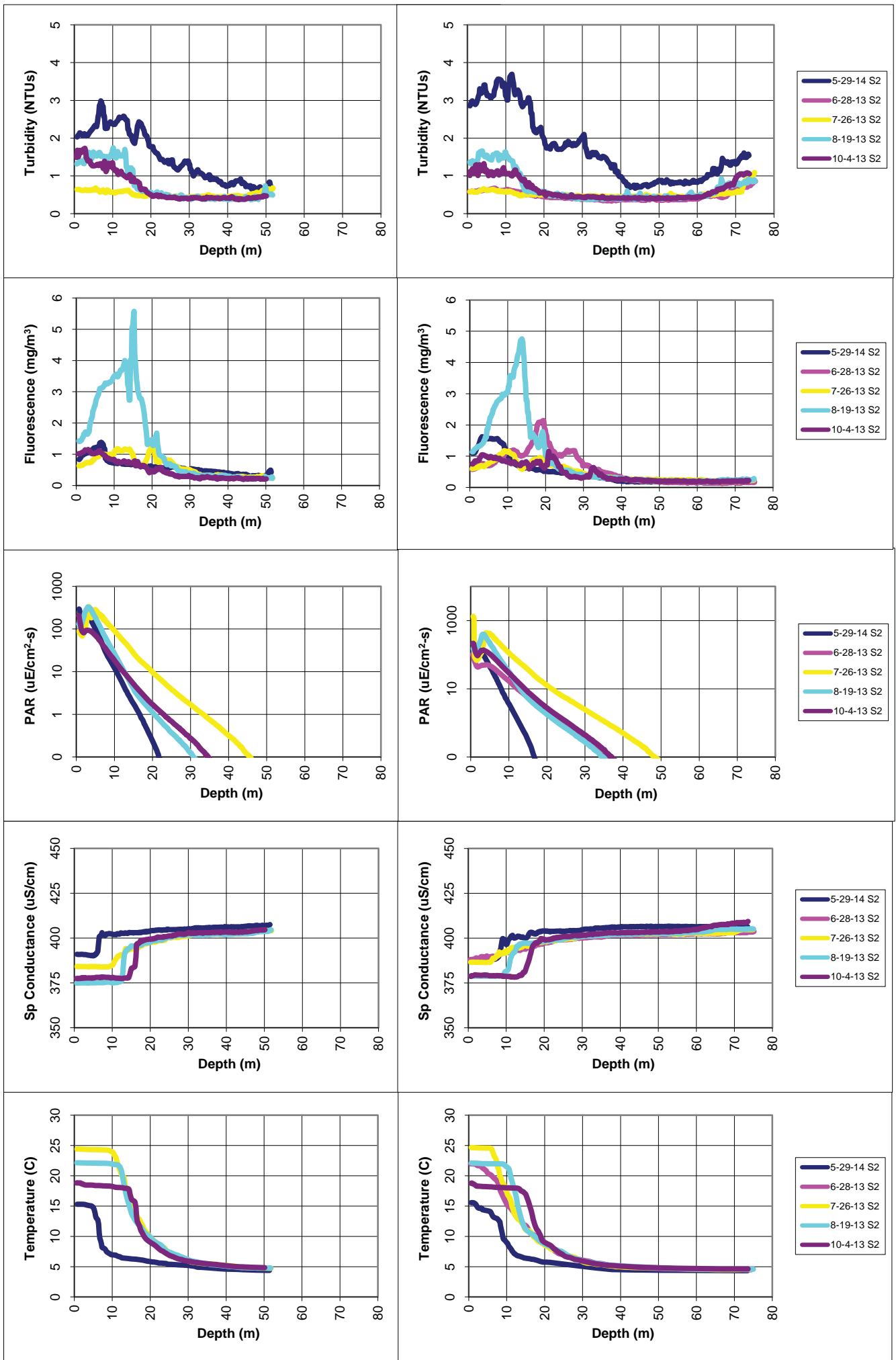
All of the Finger Lakes should follow Skaneateles's lead and take significant steps to retard nutrient rich runoff from entering their lakes to retard future and additional degradation of water quality.

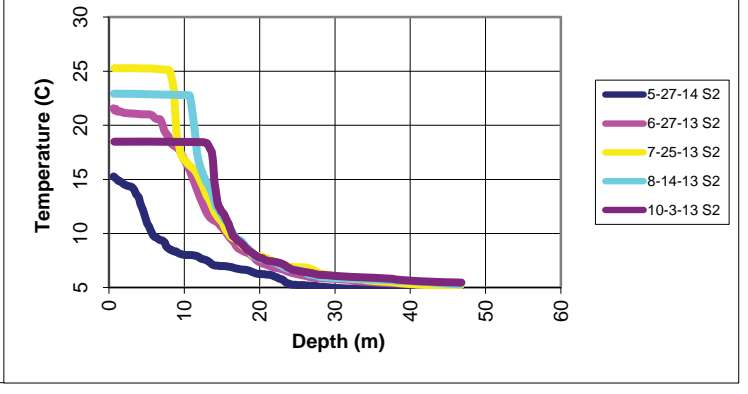
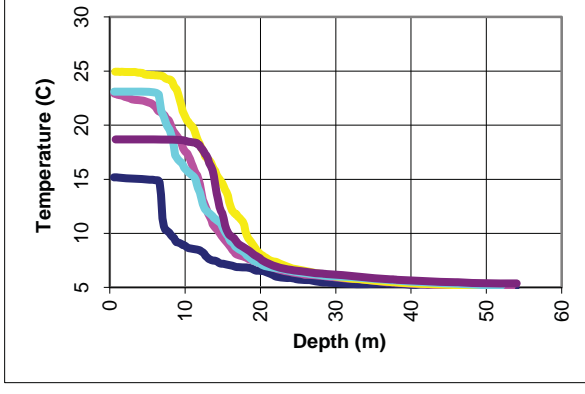
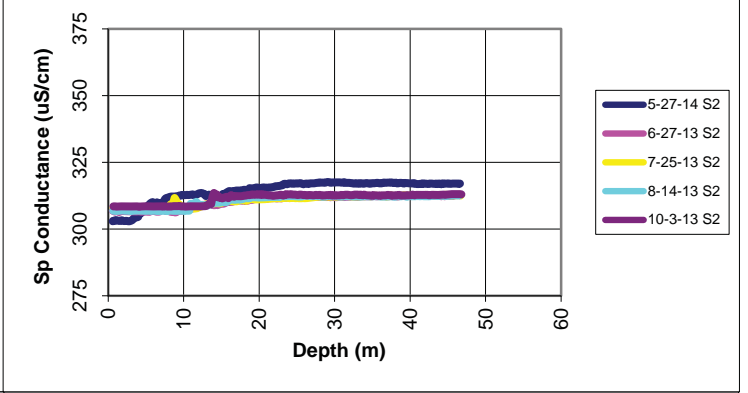
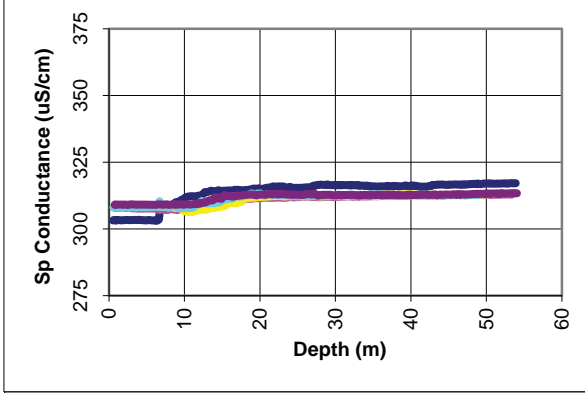
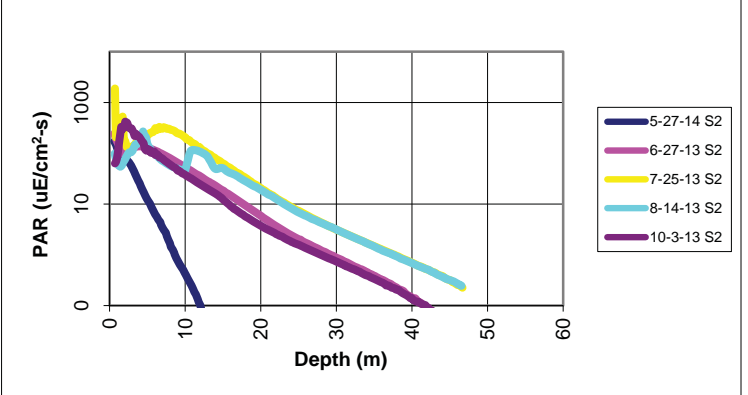
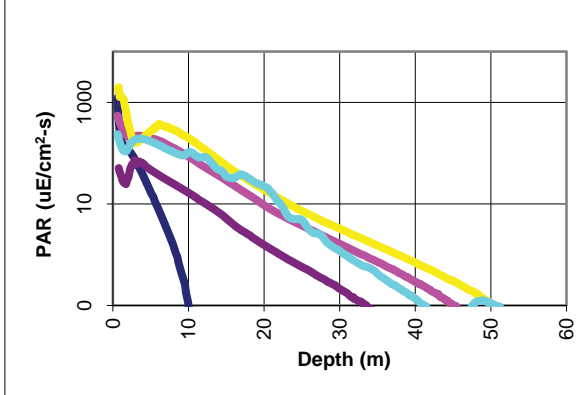
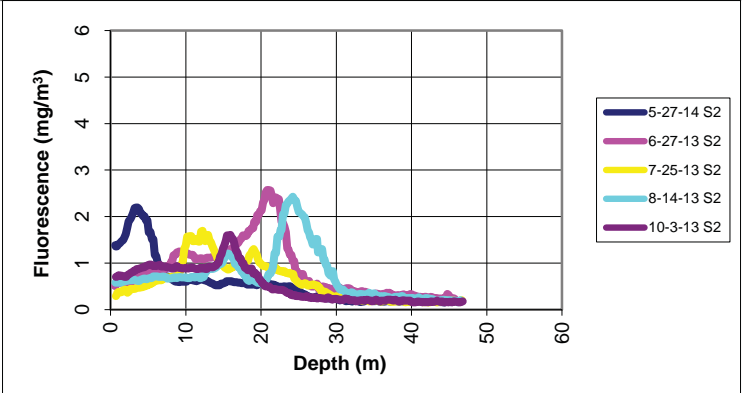
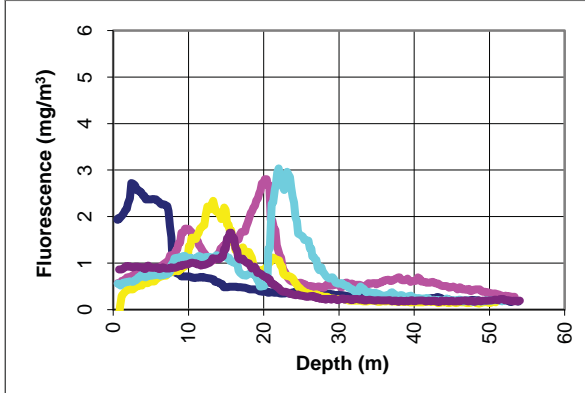
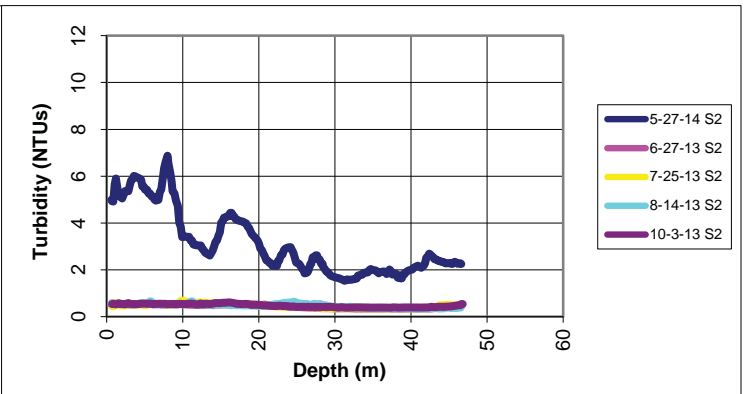
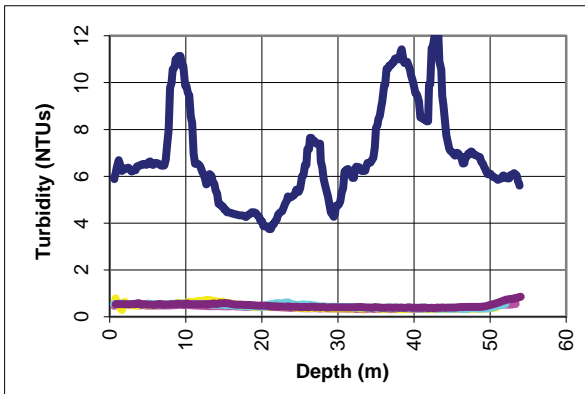
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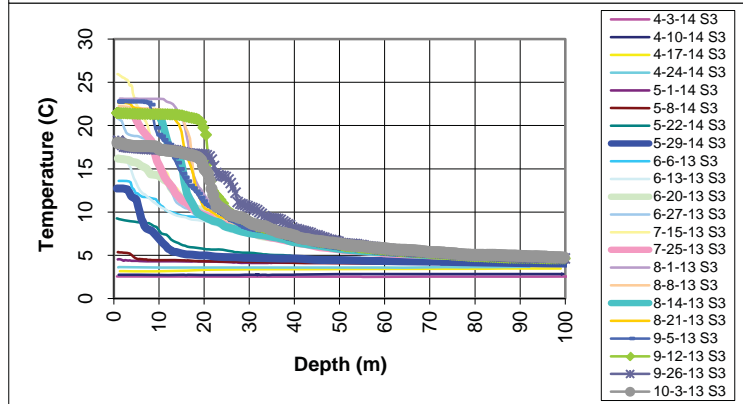
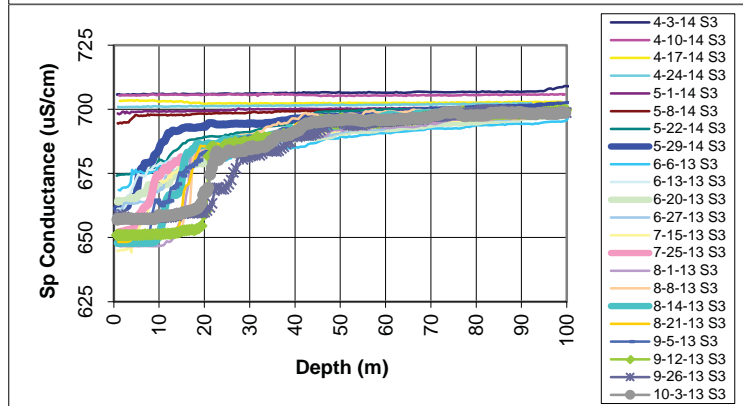
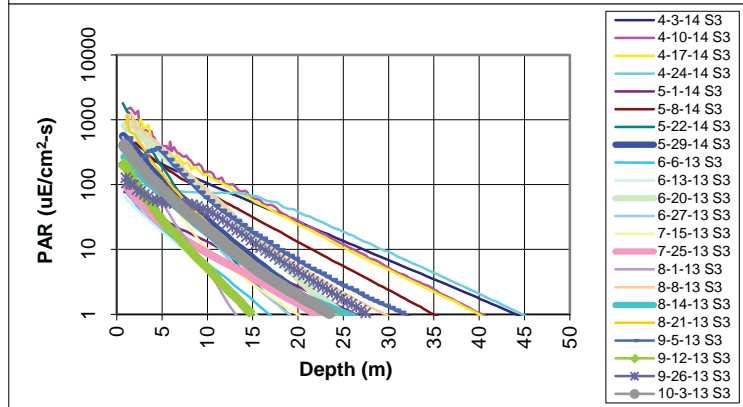
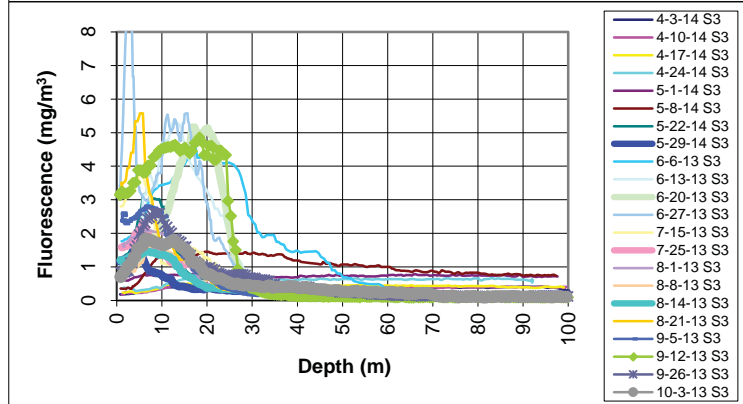
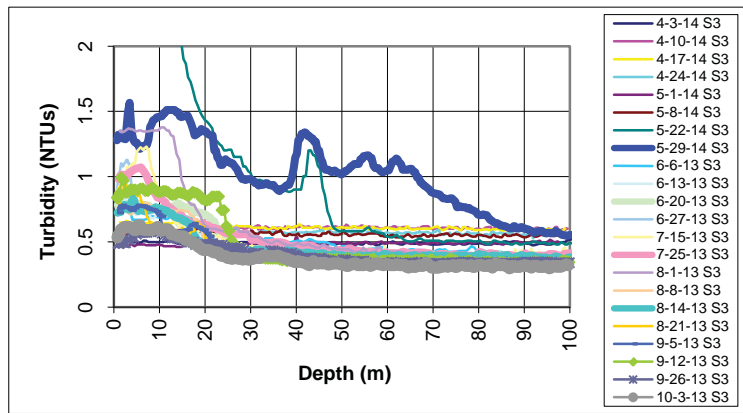
Honeoye



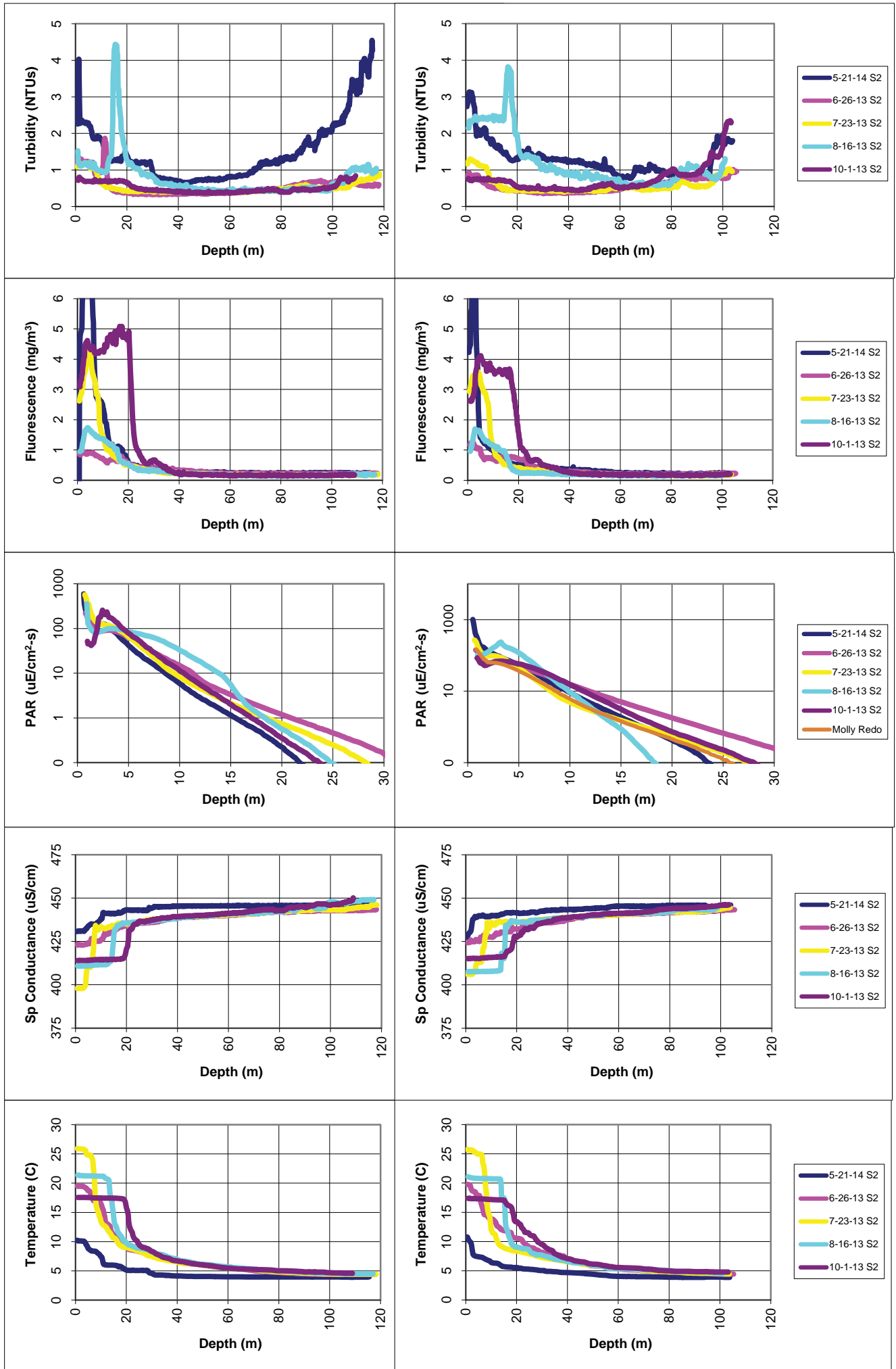
Canandaigua

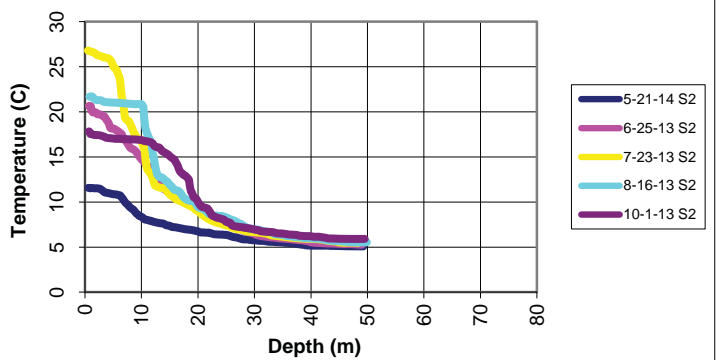
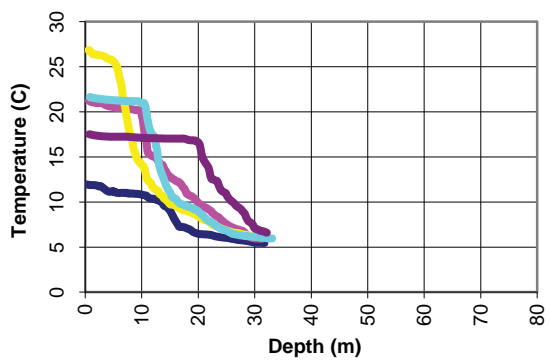
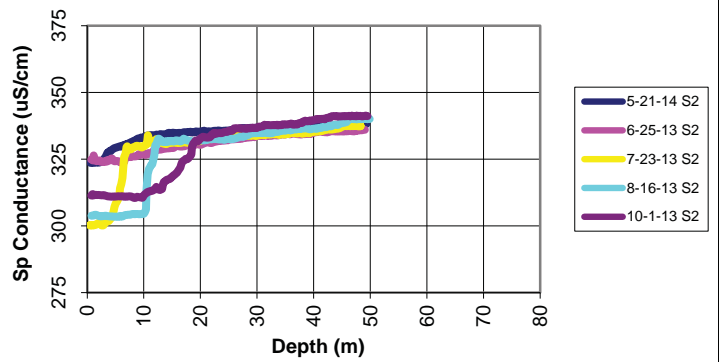
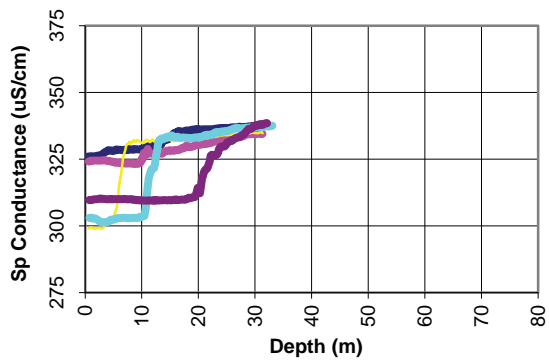
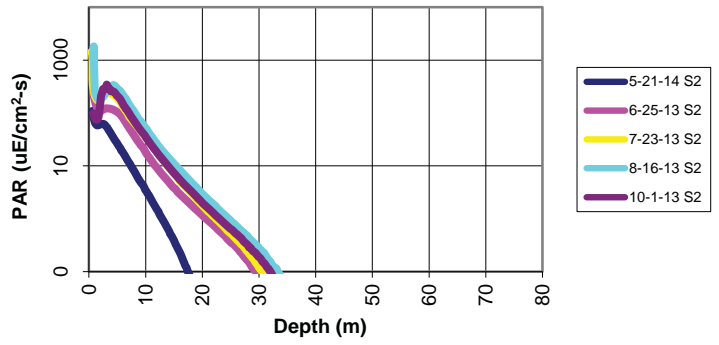
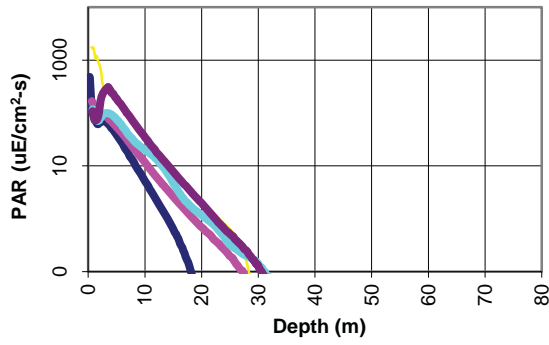
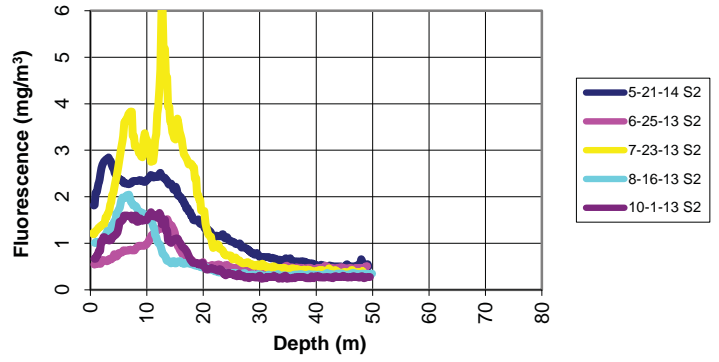
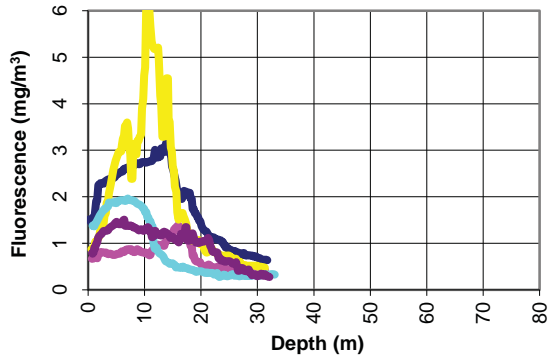
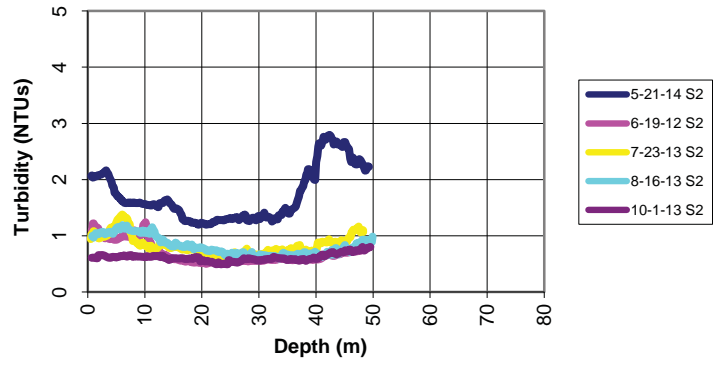
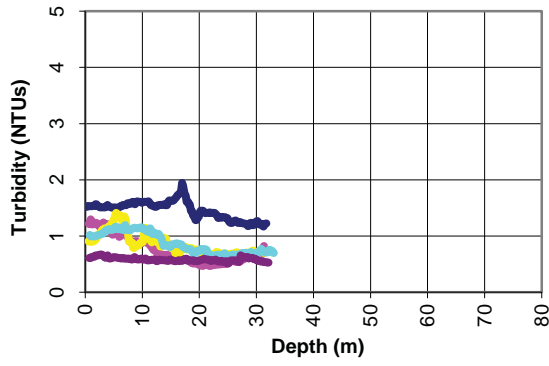




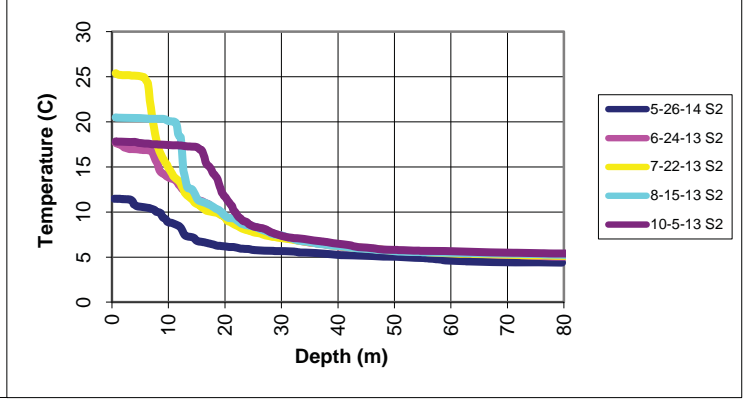
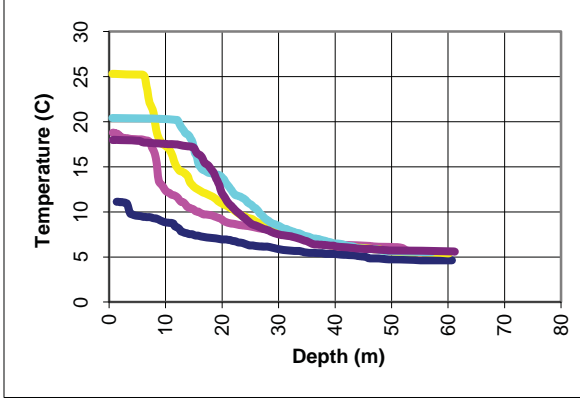
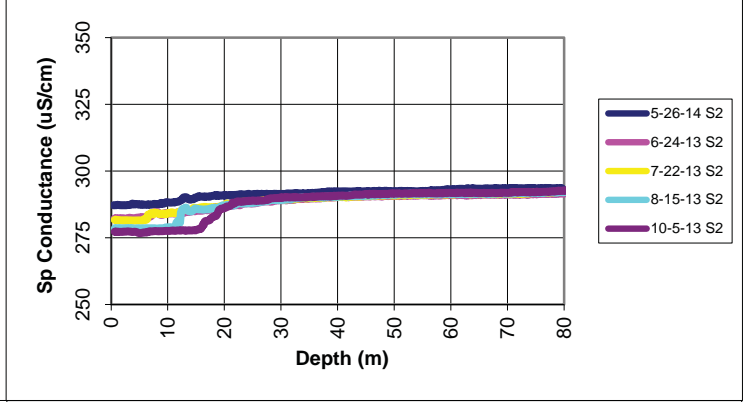
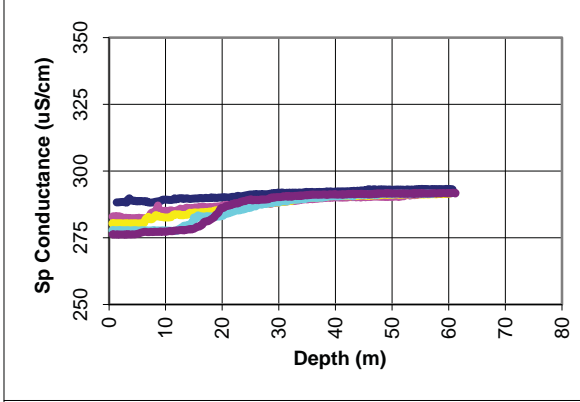
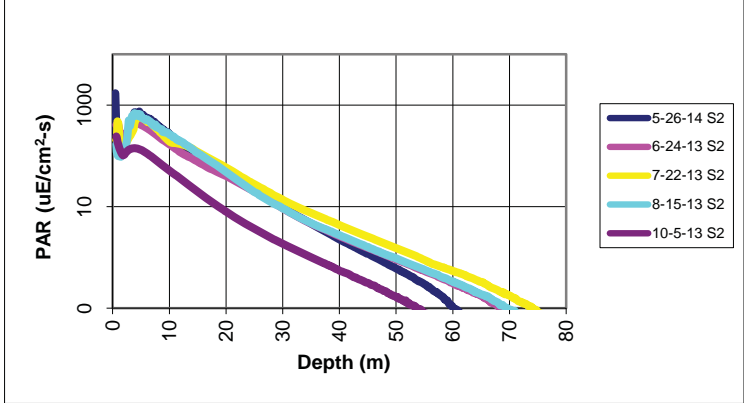
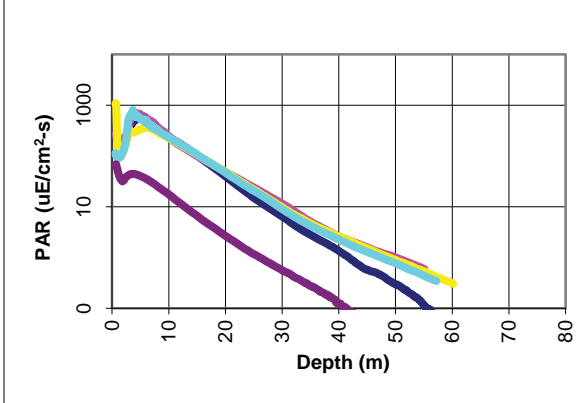
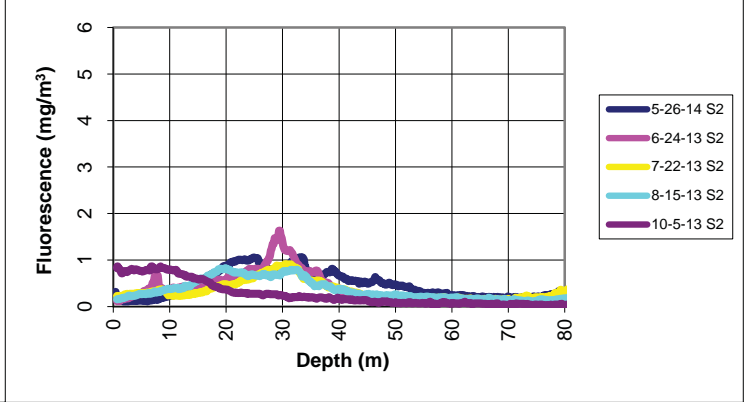
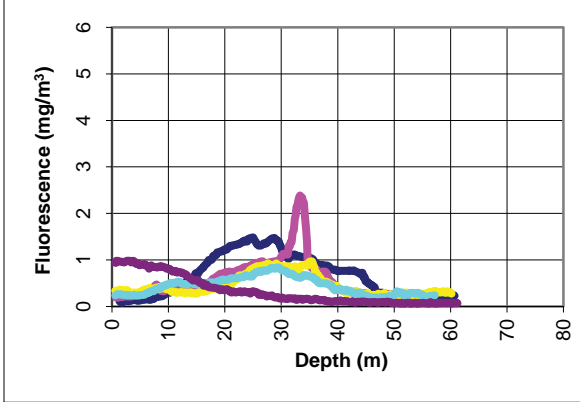
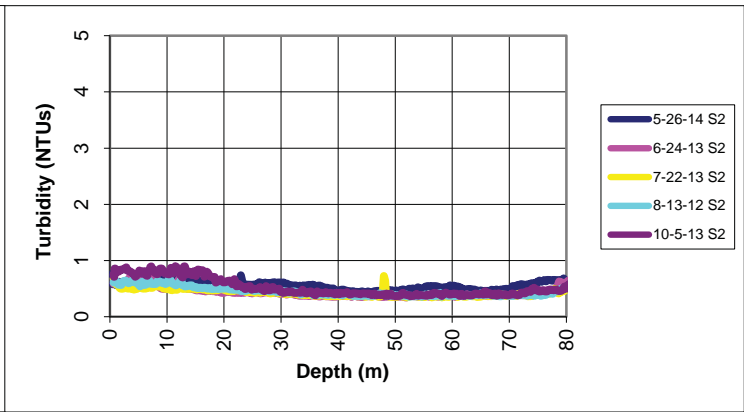
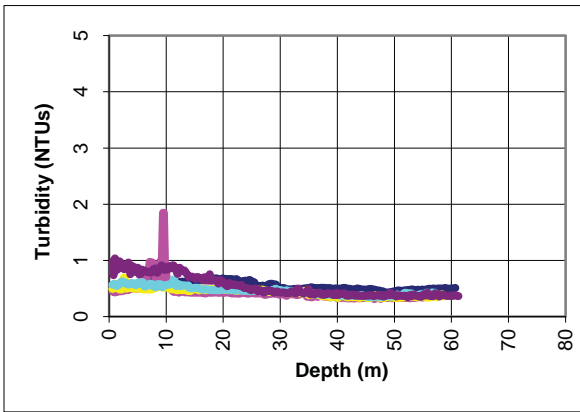


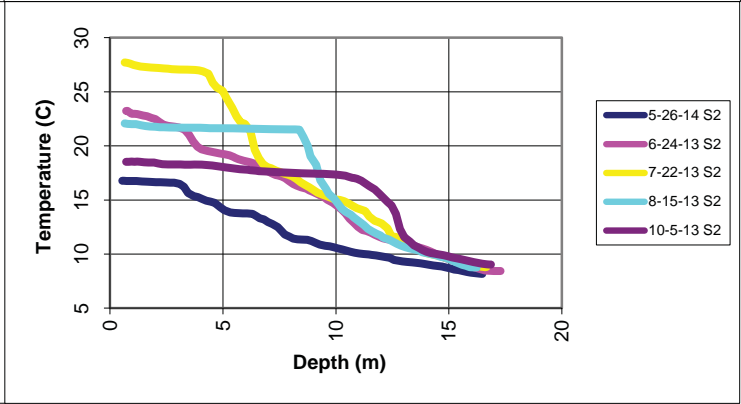
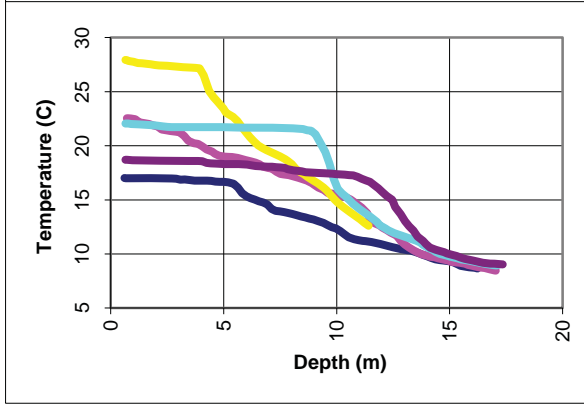
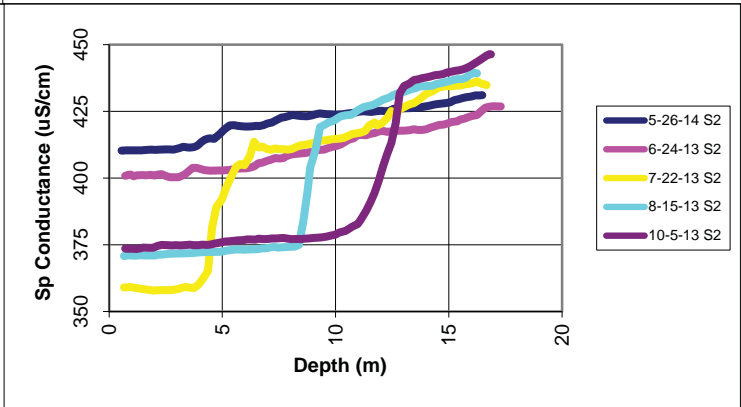
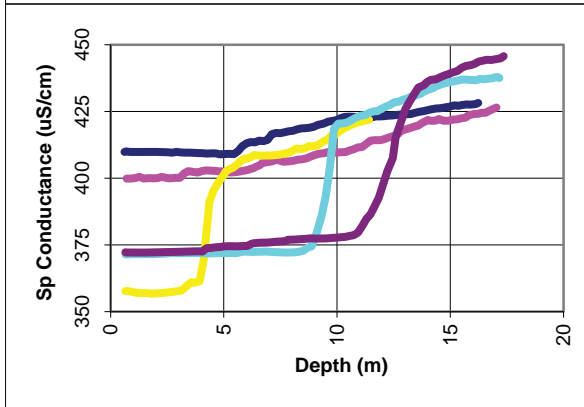
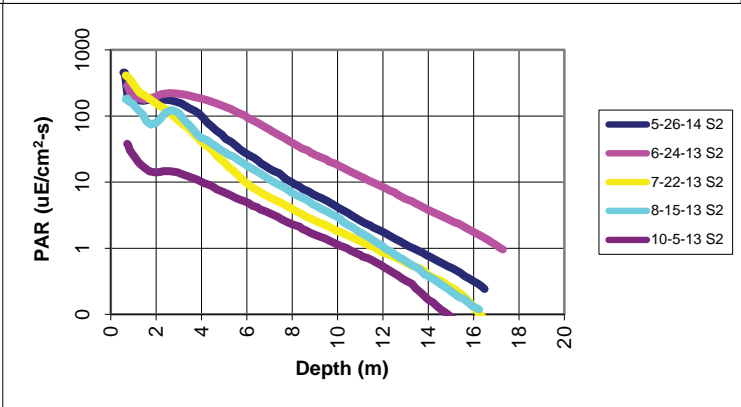
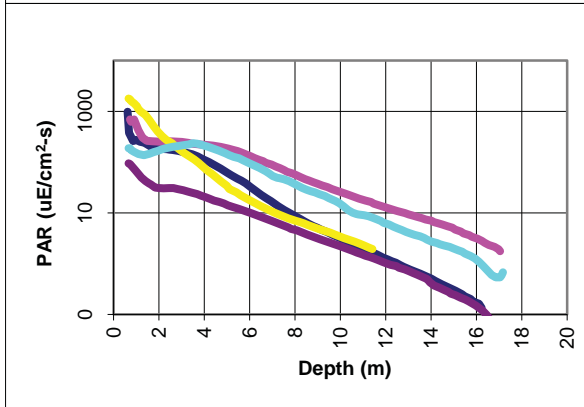
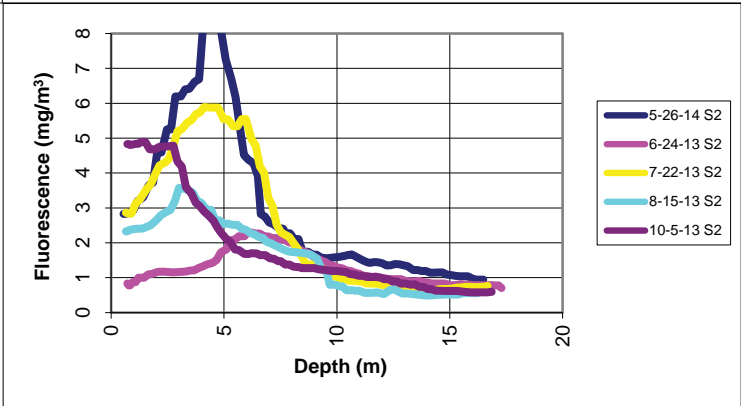
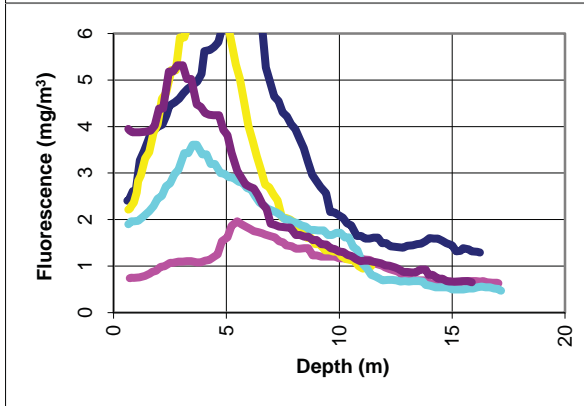
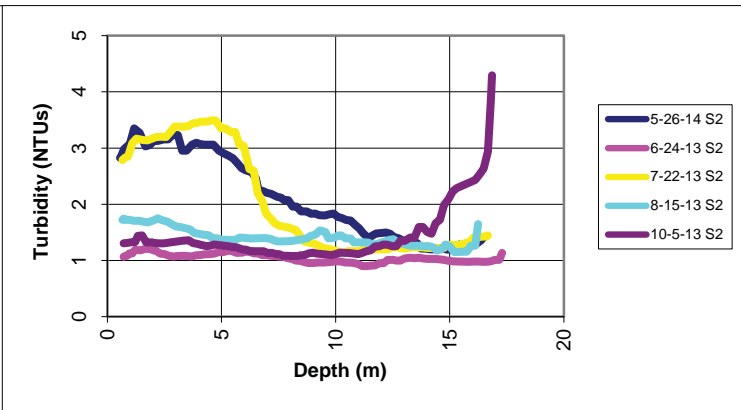
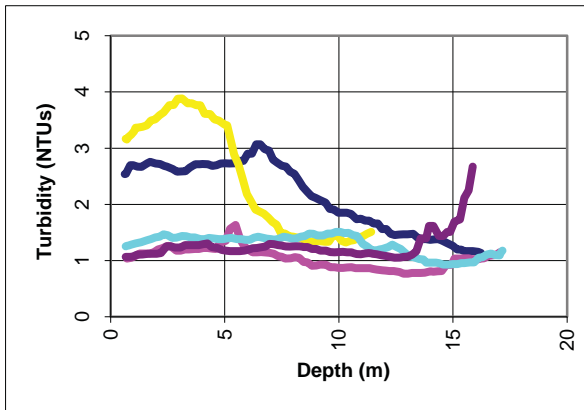
Cayuga

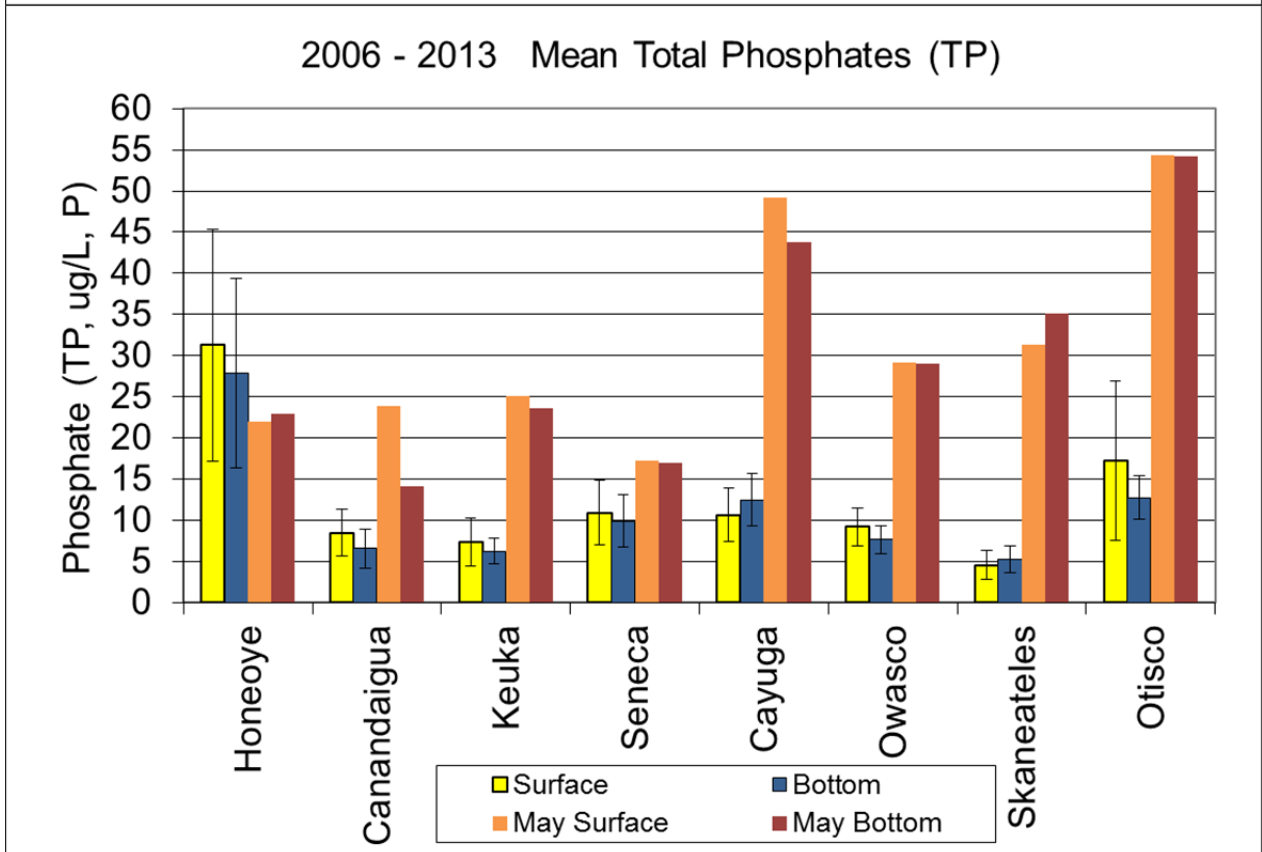
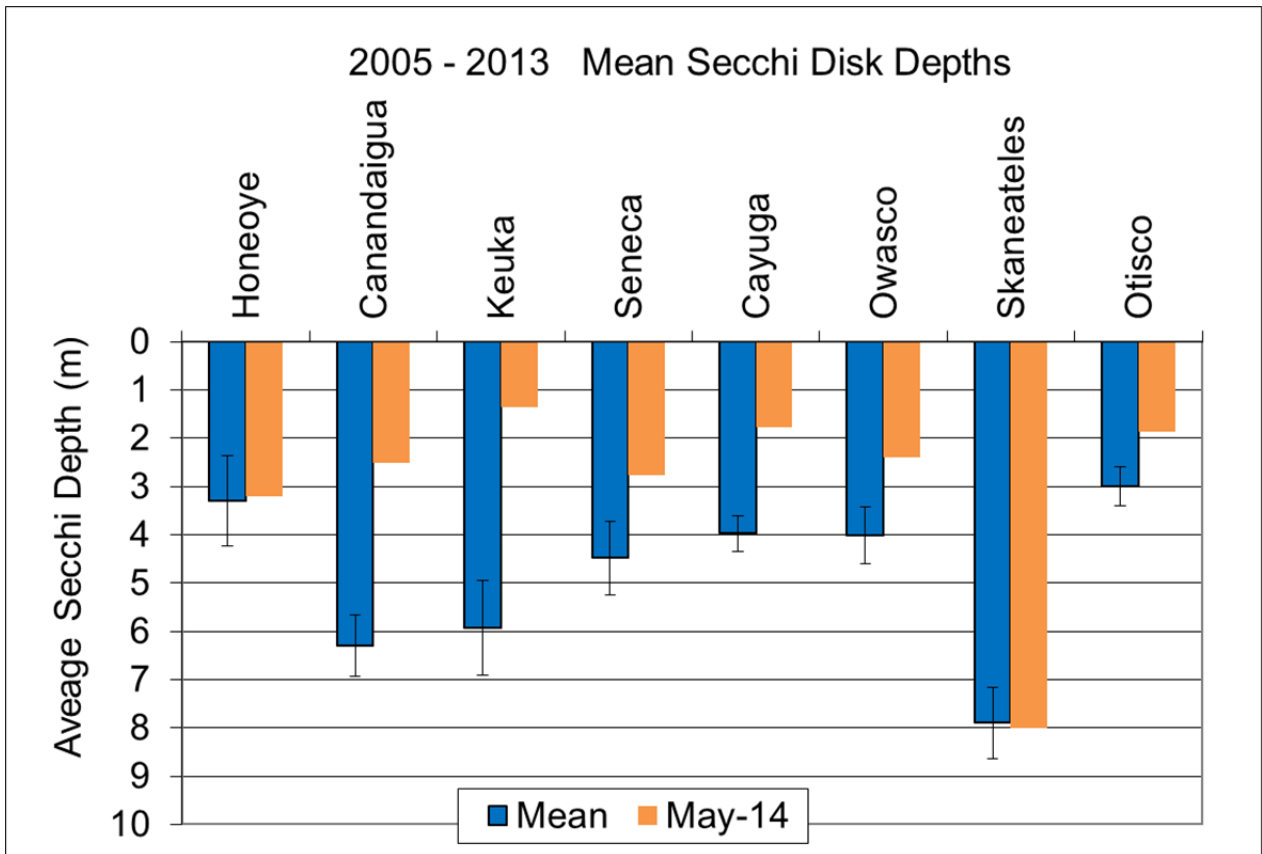




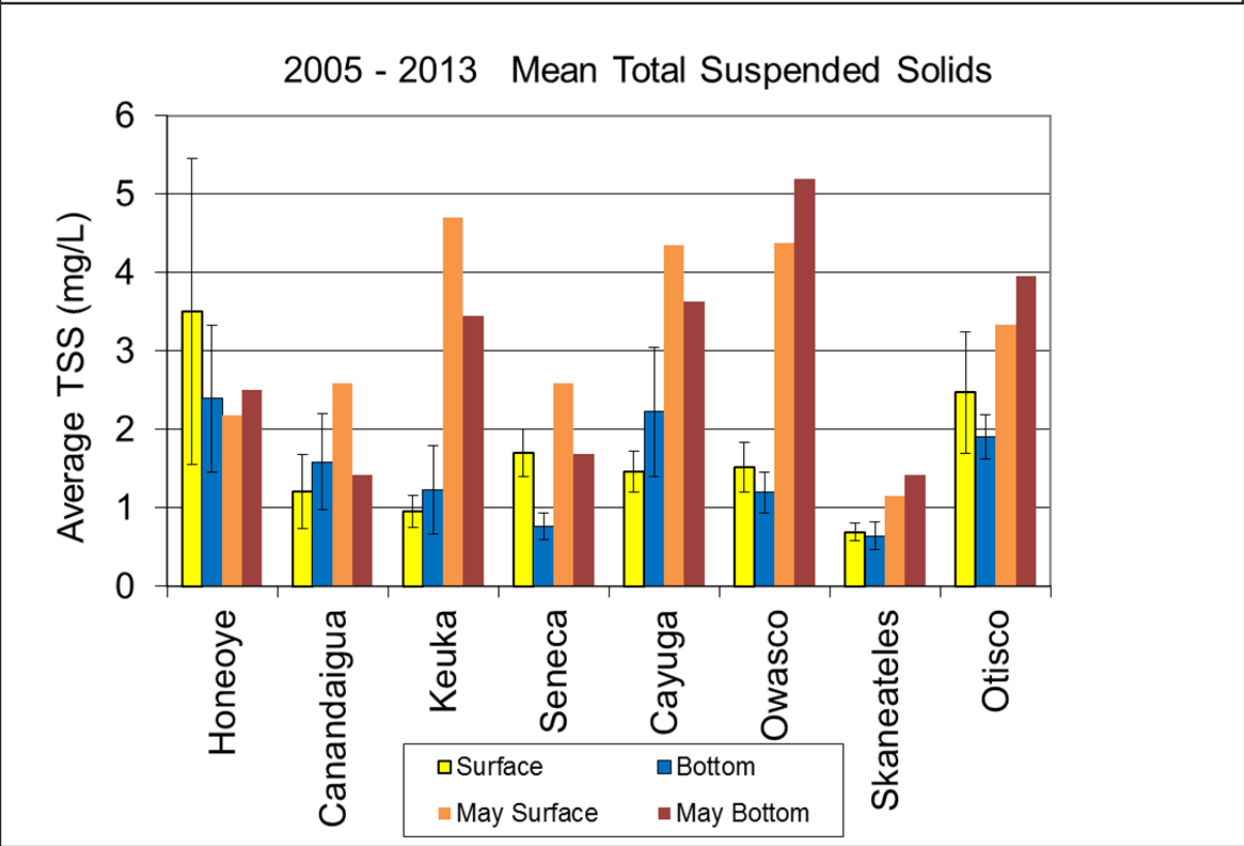
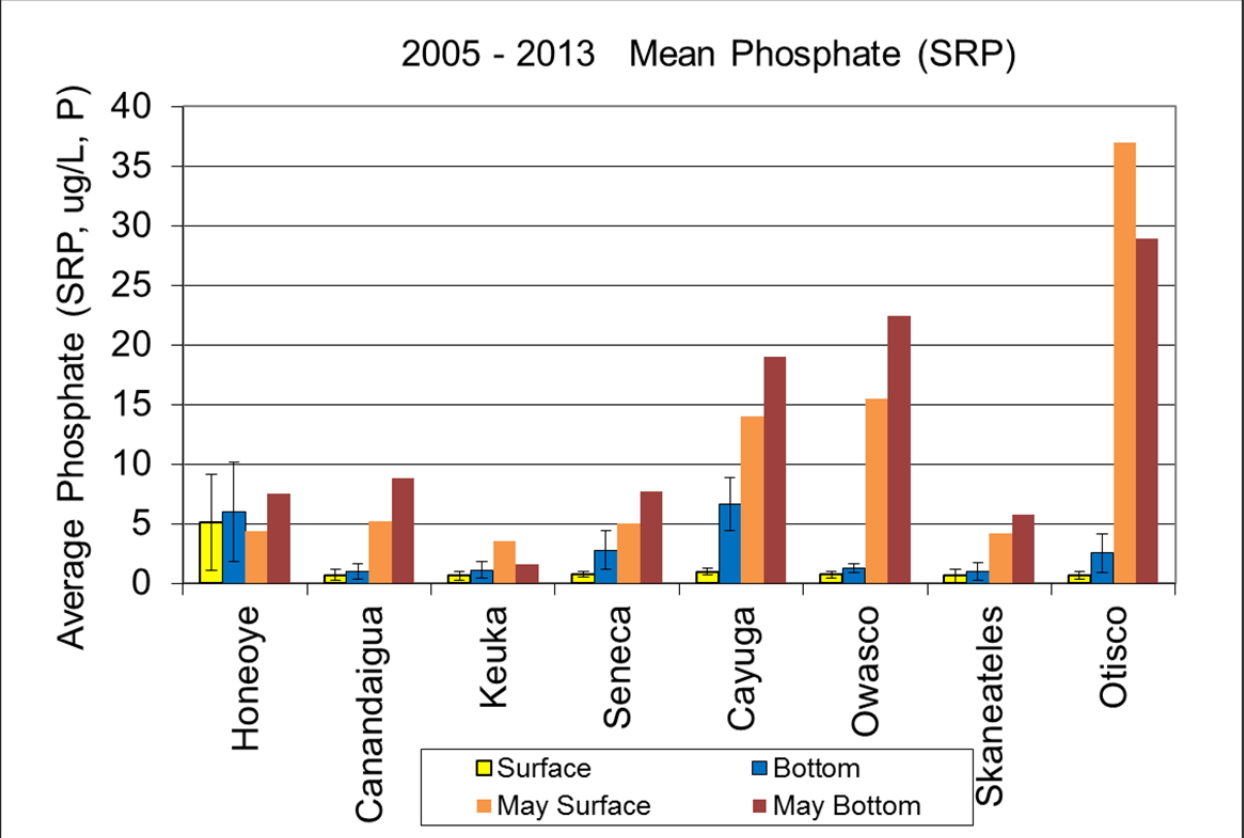
Skaneateles



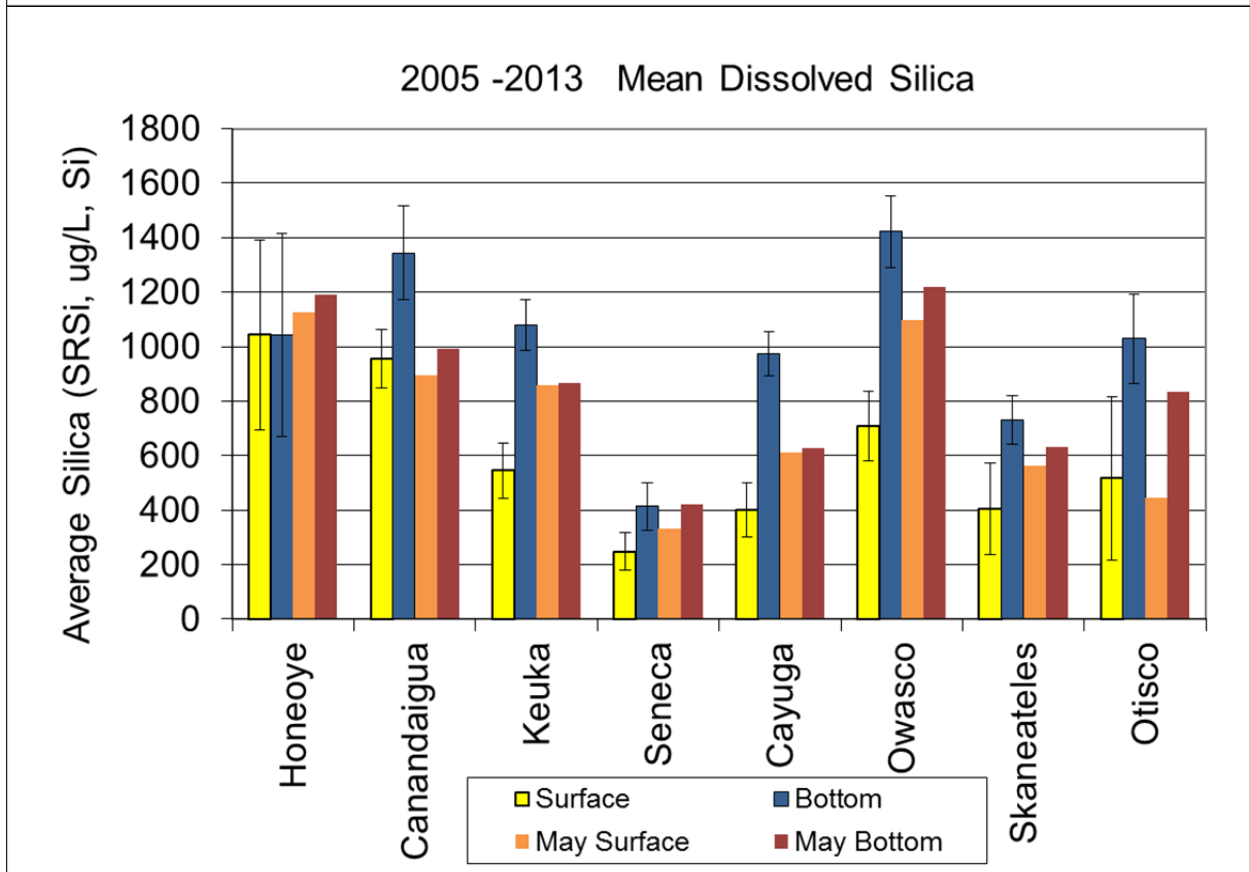
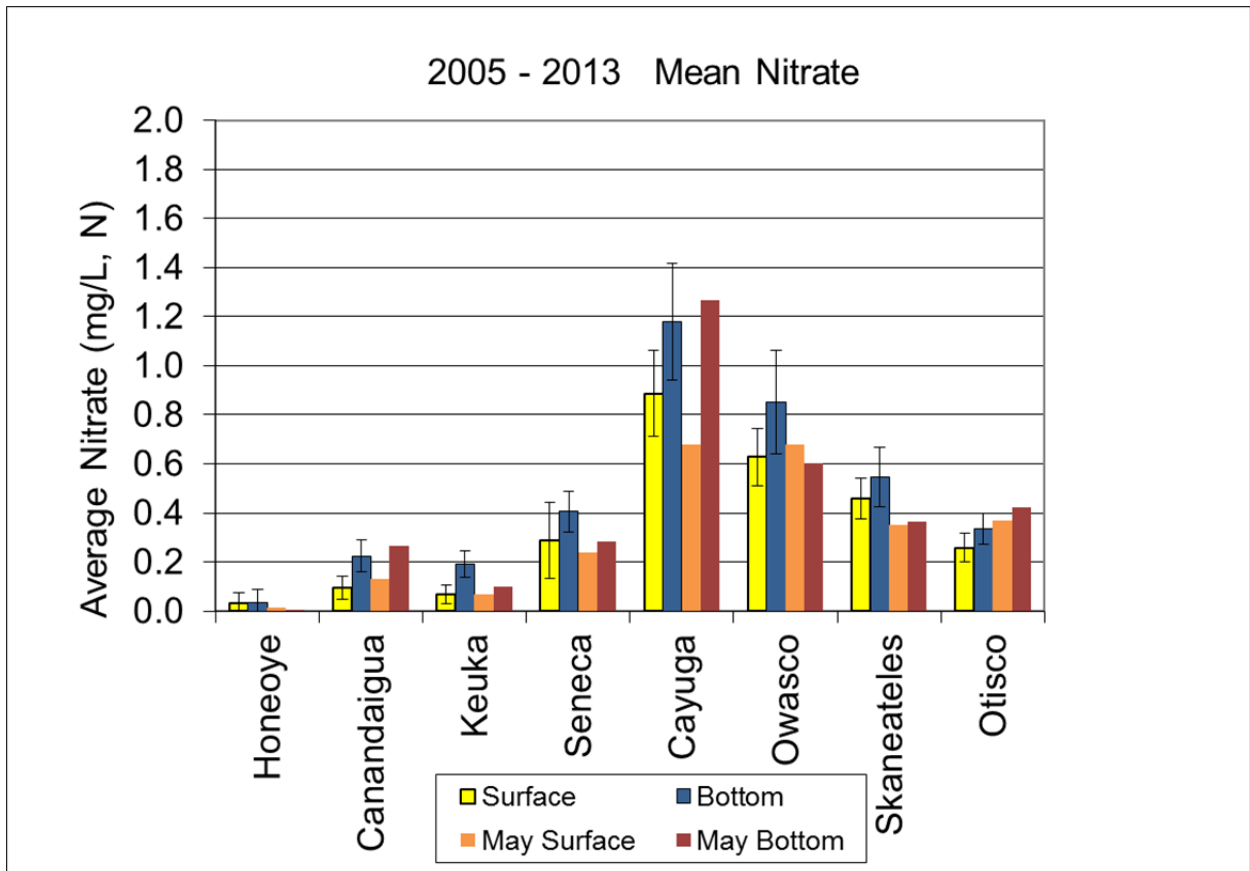




2005 – 2013 mean data ($\pm 1\sigma$) vs. May 2014 data.



2005 – 2013 mean data ($\pm 1\sigma$) vs. May 2014 data.



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