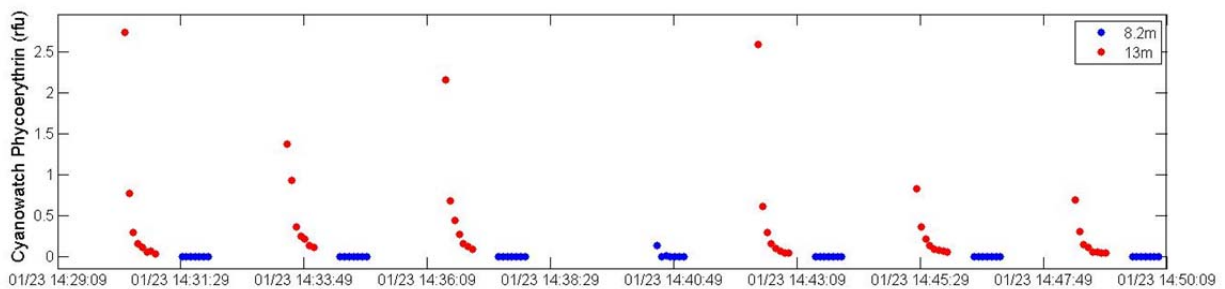


SATURN-03 Phycoerythrin

Filter for periods of Noise in CyanoWatch Data: August, 2012 – February 2013

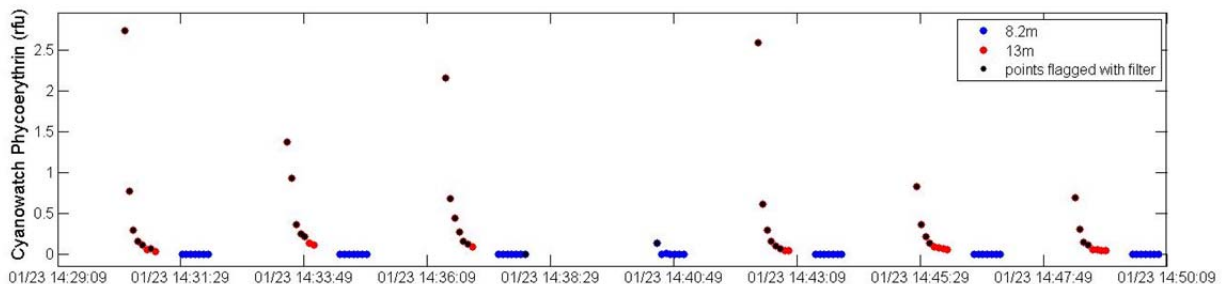
The Phycoerythrin sensor at SATURN-03 was replaced in mid-August, 2012 with a CyanoWatch, another model of phycoerythrin fluorometer from Turner Designs. This new sensor was selected because it has a better design for our flow through system at SATURN-03. It also has a much reduced turbidity artifact and no artifact at low turbidity levels.

During the winter months of 2012/2013 the data from this sensor had episodes of noise which were associated with readings not fully stabilized at one or more depths. This seemed to be particularly true when one of the depths was not pumping. In the following figure about 30 minutes of data are shown where the station is alternating between 8.2m and 13m (there are no data for 2.4m during this time). As can be seen, the 13m data are still stabilizing when the data are being recorded for this depth.

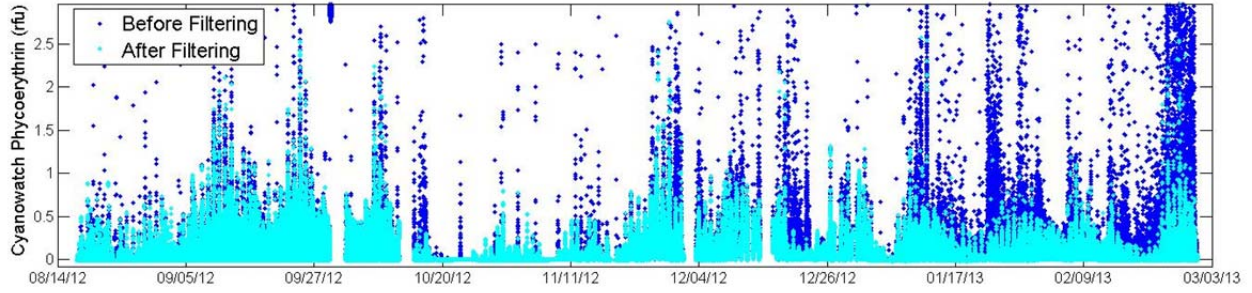


When the turbidity correction is applied to these data, there are still large PE signals in the winter/spring months that are due to this noise.

A simple filter was applied to the data in an attempt to flag some of this data. Where the difference between consecutive points was greater than 0.02 RFU, the first of these points was flagged as QL4. This approach occasionally flagged a single point that should not have been flagged, however the effect of this flagging was not significant on the overall values for those pumping periods. The following figure shows which points in the above plot were flagged by the filter:



The following figure shows the entire data set before and after the filter was applied:



The turbidity correction was then applied to the filtered data. The following figures show the turbidity corrected data when the correction is applied to the data without filtering first (top plot) and the turbidity corrected data when the data are first filtered as described above (bottom plot):

