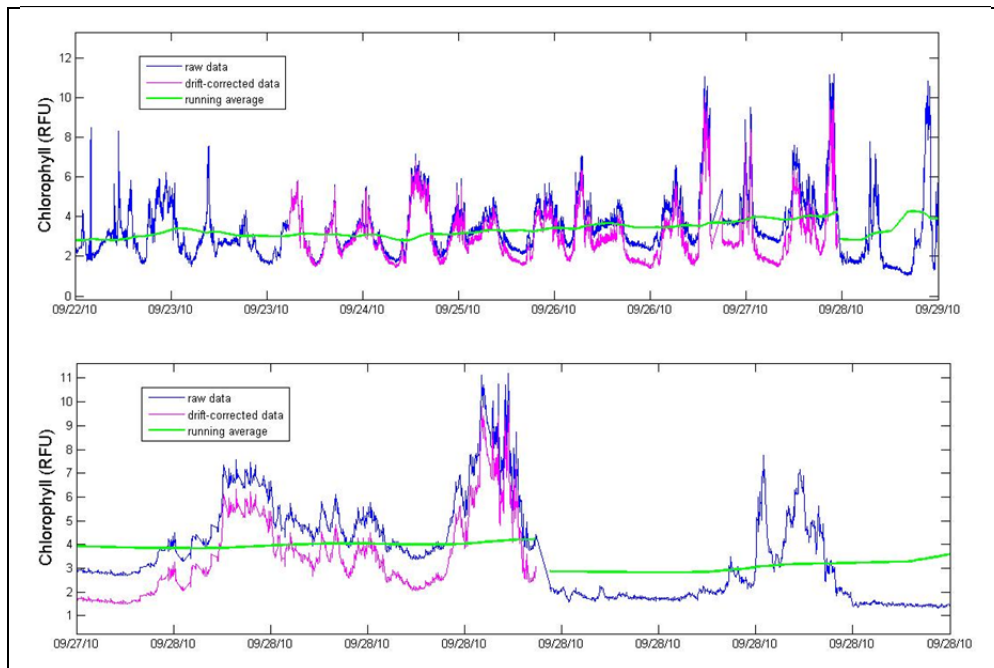


SATURN-03 Chlorophyll Sensor Fouling



<i>Details</i>	
Fouling Start:	9/24/10 00:00
Fouling End:	9/28/10 11:00
Post-cleaning end-point:	9/28/10 11:10
Maximum Fouling:	1.345 rfu

Protocol for estimating extent of sensor fouling and generating an approximate correction when there are not DI water offset measurements (SATURN-03):

A shift in the data resulting from the removal of fouling is sometimes seen after the chlorophyll sensor has been cleaned. Cleaning times are examined and if a shift in the data is observed, the extent of fouling is estimated and a correction developed. Because the correction assumes that the drift was linear and that the fouling did not affect the slope of the sensor response, only the offset, the correction should be considered approximate at best and the data used with caution. The following steps describe the fouling correction protocol:

- Perform a ‘backward’ running moving average prior to the point of sensor cleaning (fouling end point) and a ‘forward’ running moving average following the point of cleaning (post-cleaning end-point), shown in green on the plots above
 - a span of 5000 data points (or around 14 hours) was used
 - points during cleaning are avoided
- The difference between the chlorophyll average value before and after cleaning is used as the estimate of maximum fouling.
- The onset of fouling is the point where the baseline appeared to begin drifting upward (estimated visually) and the end of fouling is the point of cleaning.
- Drift is assumed to be linear, so the correction for fouling (to be subtracted from the raw chlorophyll value) is the linear interpolation between 0 at the estimated onset of fouling and the maximum fouling at the point of sensor cleaning.
- The corrected chlorophyll data are shown in pink on the plots above.

Additional Note:

The previous protocol was developed for correcting SATURN-04 data. The more dynamic nature of SATURN-03 can make this approach problematic. However, the results of this simpler approach were in close agreement with a more complex evaluation that took into consideration salinity and used the phytoflash F_o data.