

Scaling of SATURN-07 Chlorophyll data between January & July 2015

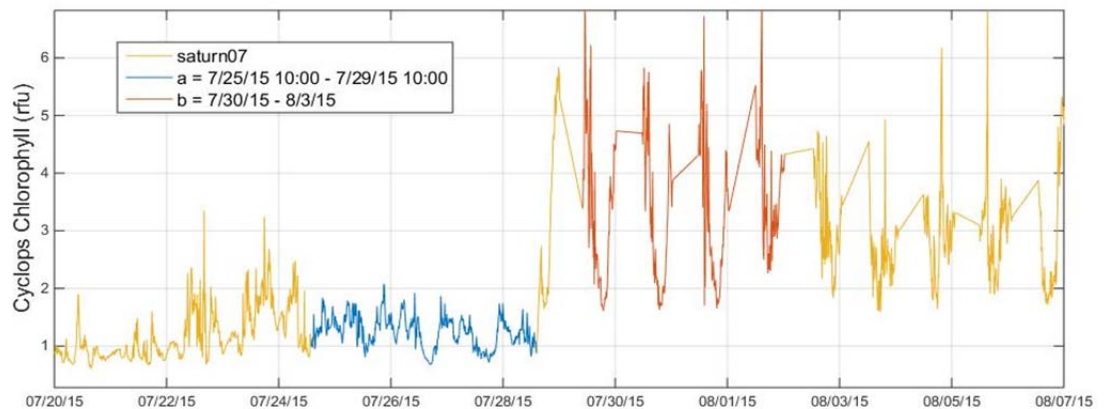
Three different Turner Designs Cyclops 7 chlorophyll fluorometers were deployed at SATURN-07 between January 2015 and February 2017:

#210-1235: 1/15/15 – 7/29/15

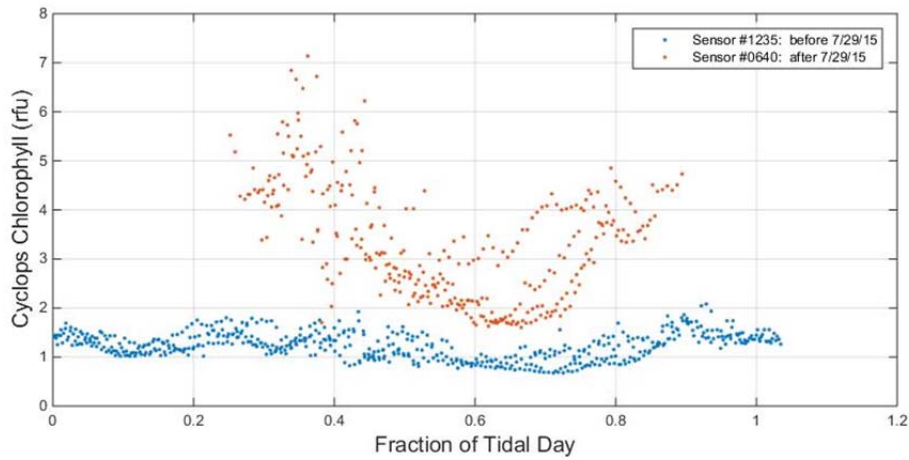
#218-0640: 7/29/15 – 1/28/16

#218-0654: 2/24/16 – current

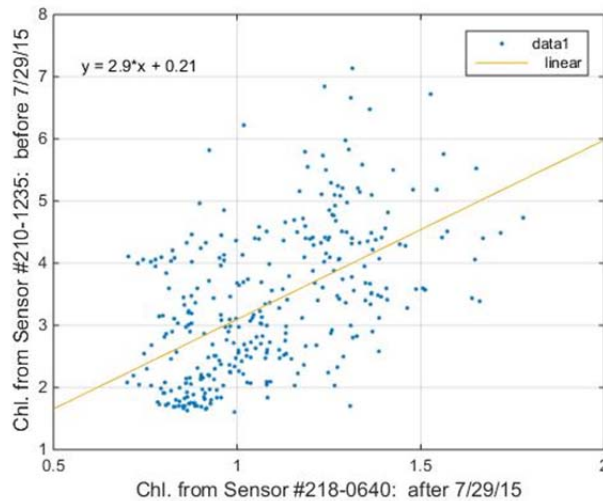
The sensor output of the first deployment was scaled differently than the output from the later sensors. In order to determine a scale factor to adjust the data to a common scale, four days of data before and after the sensor replacement were selected for comparison:



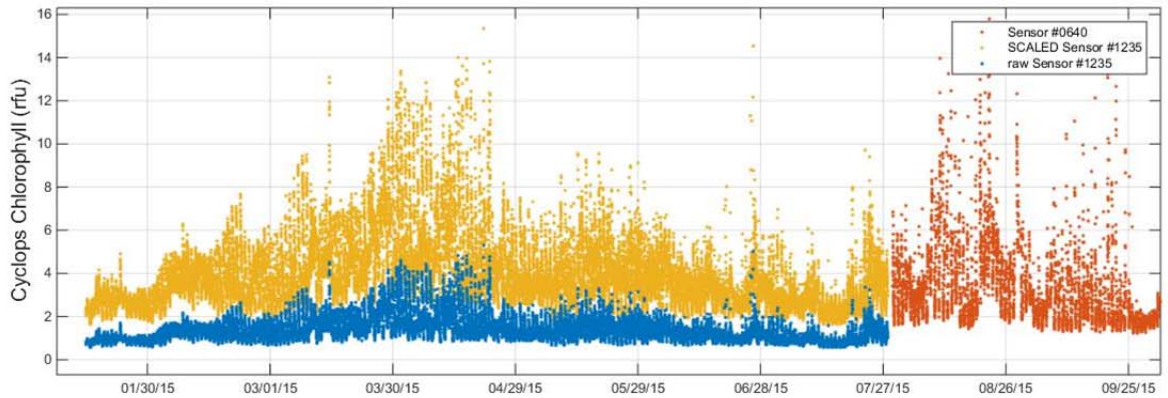
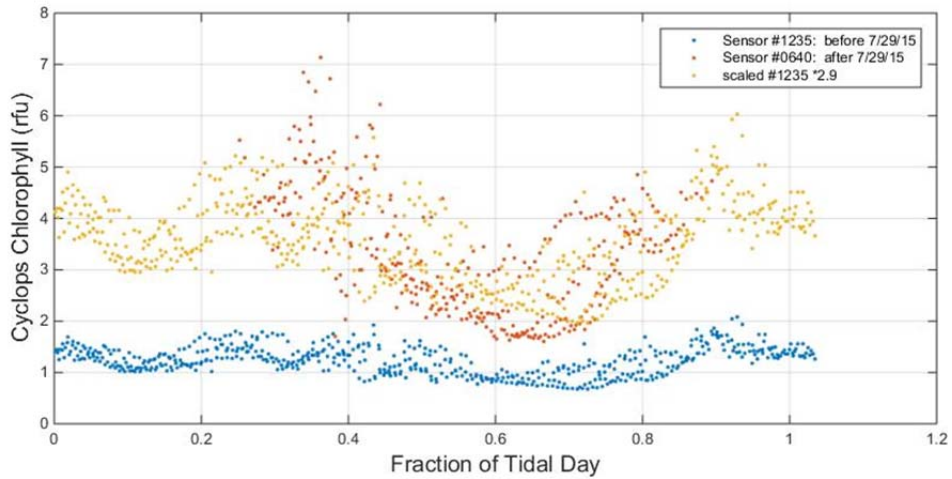
For these two time periods, the hourly average chlorophyll reading was calculated and plotted against the fraction of the tidal day:



Note that there was an issue with the second deployment (sensor #210-1235) where no data were collected during the night. These periods of missing data can be seen in the time-series data and in the lack of data for portions of the tidal day. The data plotted against the tidal day clearly reveal a difference in gain/scaling. When those same data were plotted against each other, the linear fit yielded a slope of 2.9.



Applying a scale factor of 2.9 to the data from sensor #210-1235 brings those data into reasonable alignment with data from sensor #218-0640 as can be seen in the following plots:



This adjustment brings the response of the two sensors into closer alignment to allow for better data comparison between the two deployments, but should be considered approximate. In addition, this adjustment should not be considered a sensor calibration as chlorophyll *a* is measured in relative fluorescent units only (rfu's) by the Cyclops sensors.