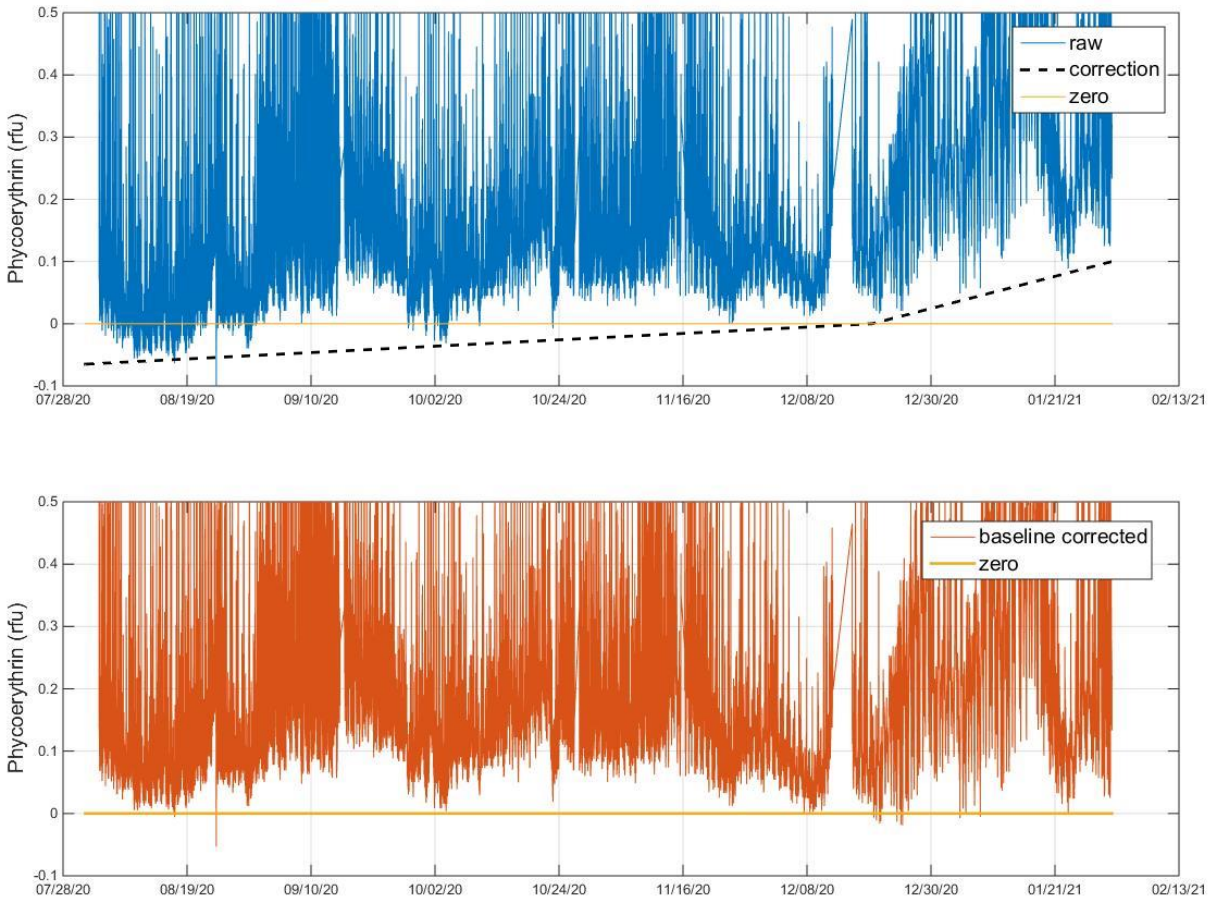
SATURN-03 Phycoerythrin Quality Control (8/1/20 - 3/1/21)

Correction for Drift:

First, the data were corrected for instrument drift and offset of the baseline. This drift was quantified using in-situ DI water readings as well as visual inspection of the data. The drift corrections (Figure 1.) effectively 'zeroed' the baseline.

Figure 1. Raw Phycoerythrin data from SATURN-03 (all depths). The uncorrected data are shown in blue in the top plot with the dashed line showing the drift correction value subtracted from the raw data. The corrected data are shown in orange in the second plot. In both plots the zero line is plotted in yellow for reference.



Correction Details: The value subtracted from the data were calculated as the linear interpolation between the following timepoints and offsets:

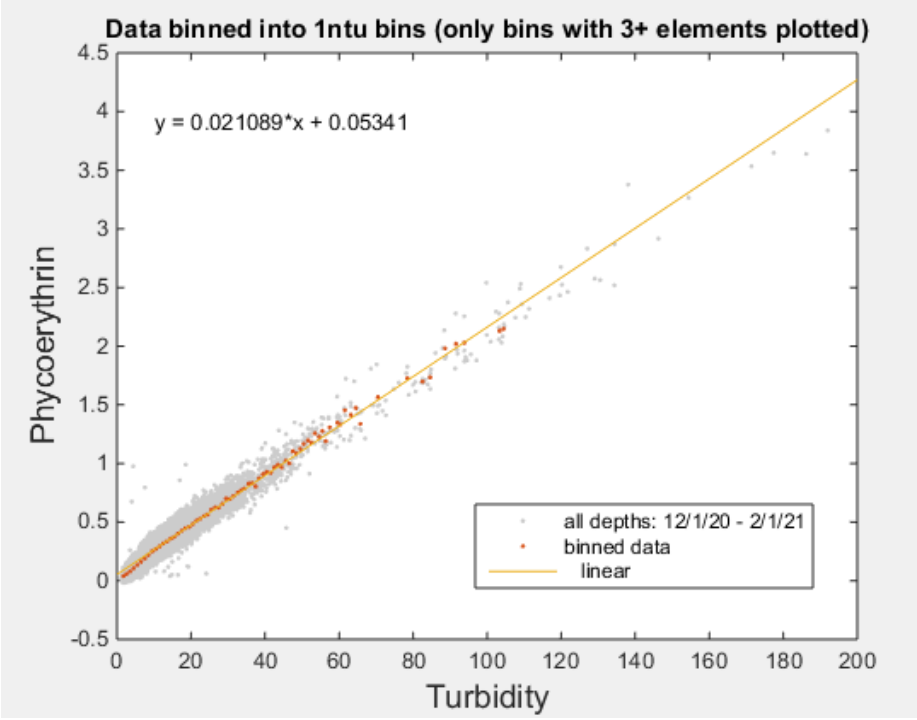
- 8/1/20, -0.65 rfu
- 12/20/20, 0 rfu
- 3/1/21, 0.1 rfu

Correction for Turbidity Artifact:

The correction for the signal due turbidity is calculated as the linear fit of phycoerythrin vs. turbidity in a population of points not associated with chlorophyll:

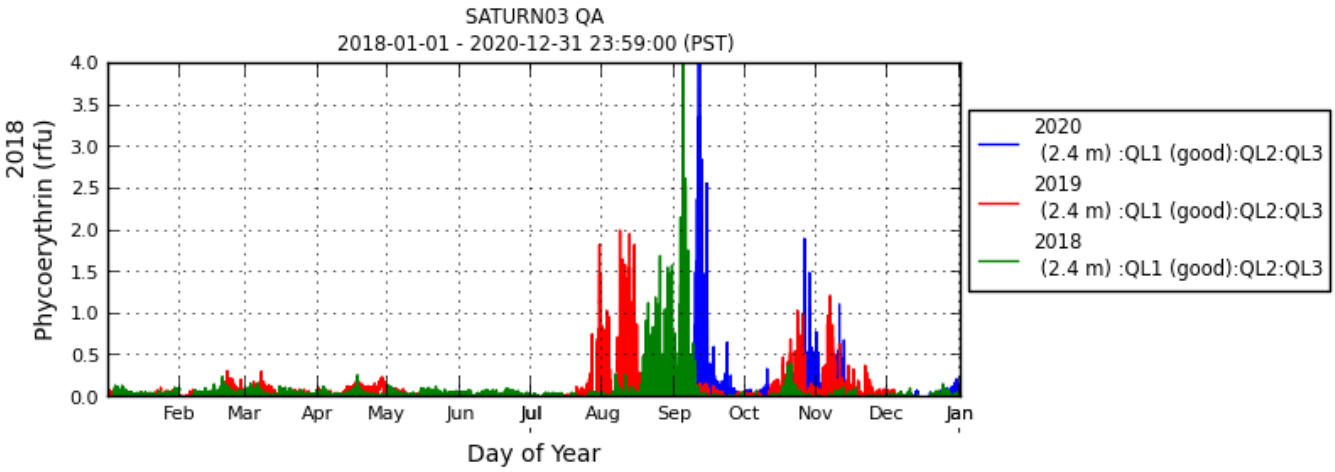
- Corrected PE = raw PE - turbidity artifact
- Corrected PE = raw PE - (turbidity * slope of fit + intercept of fit)

The drift-corrected data were used to calculate the turbidity artifact. Data after 12/1/20 were used to calculate this fit to ensure that the only PE signal present was due to turbidity artifact. The data were binned into 1ntu turbidity bins and the average PE value calculated. The linear fit of the average PE values was used as the turbidity correction for the entire deployment:



Corrected PE = raw PE - (turbidity * 0.0211 + 0.0534)

The resulting quality-controlled data show a phycoerythrin peak on 9/10/20-9/11/20 and a smaller peak later in the fall. The following figure plotted with the CMOP data explorer (http://www.stccmop.org/datamart/observation_network/dataexplorer), shows the 2020 quality controlled phycoerythrin data (in blue) relative to previous years:



http://amb6400b.stccmop.org/ws/product/offeringplot_ctime.py?handlegaps=true&series=doytime,saturn03.240.A.Phycoerythrin.phycoeryth.PD2:g:pg:s&ylim=phycoeryth,0,4&width=8.54&height=2.92&starttime=2018-1-1%200:00&endtime=2020-12-31%2023:59