

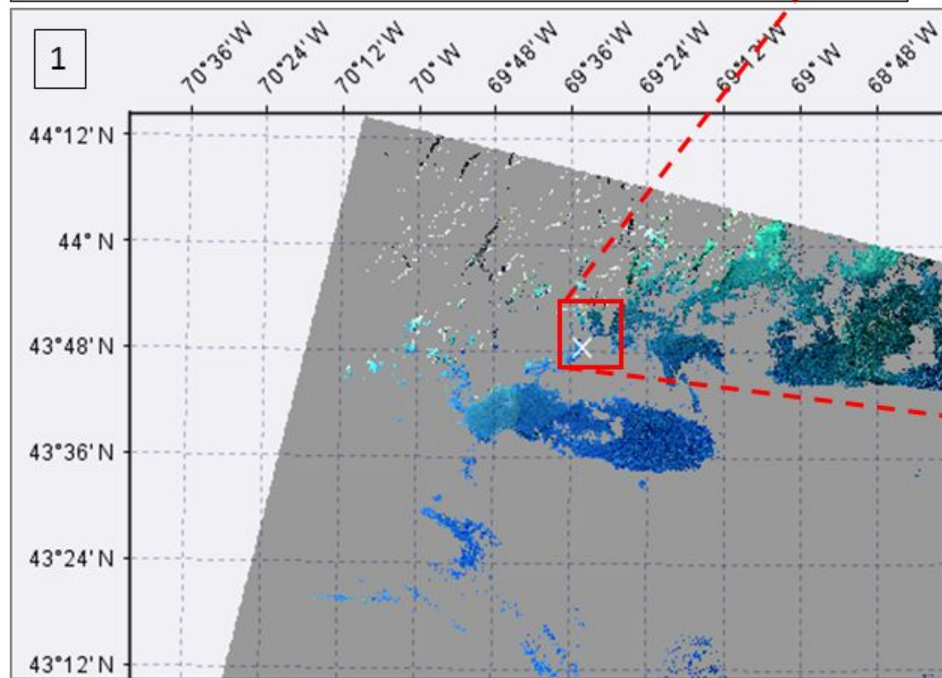
# Preliminary Cruise Results from 7/25/17 and 7/26/17



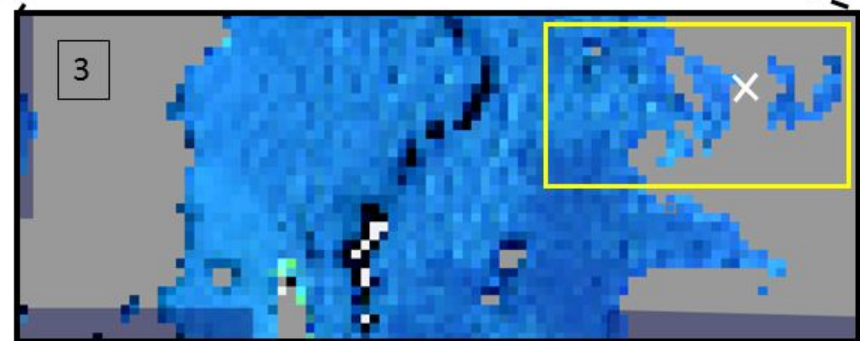
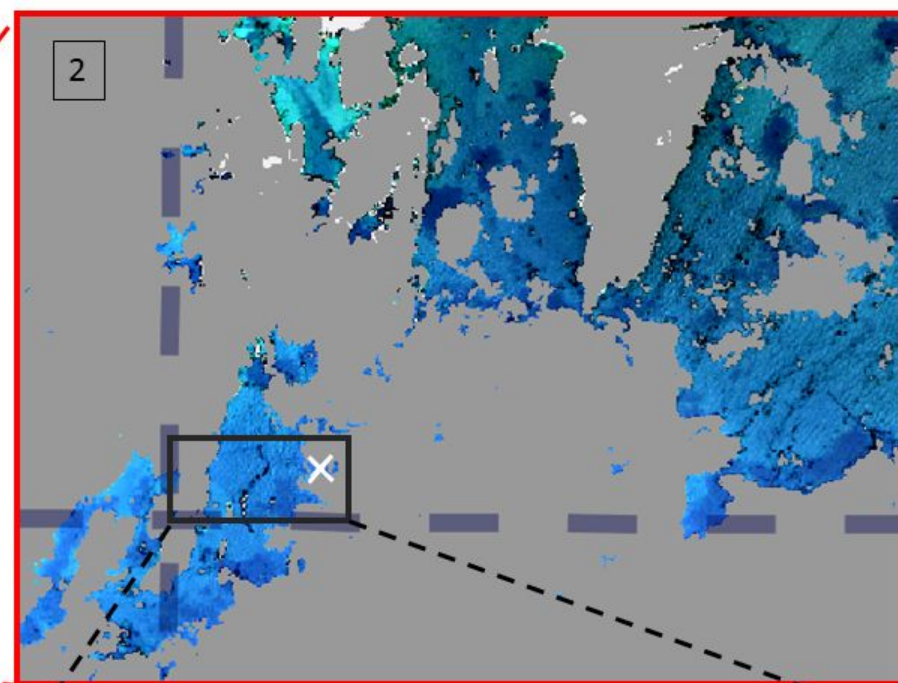
Landsat-8 Rrs imagery from July 25<sup>th</sup> (First cruise)

Boat location during overpass shown as white X

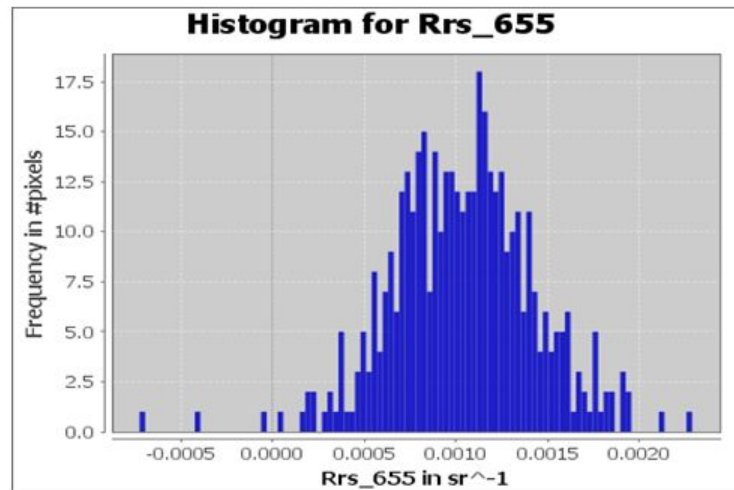
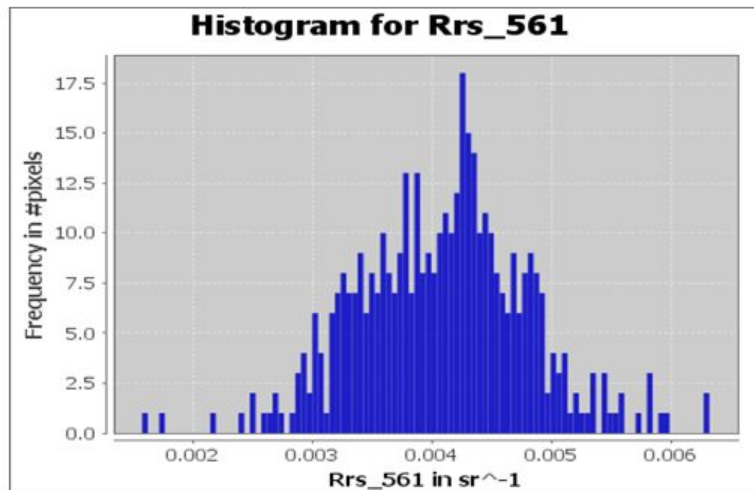
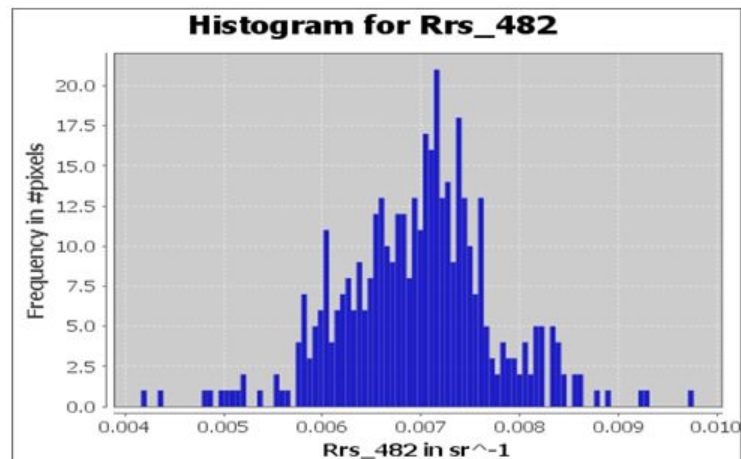
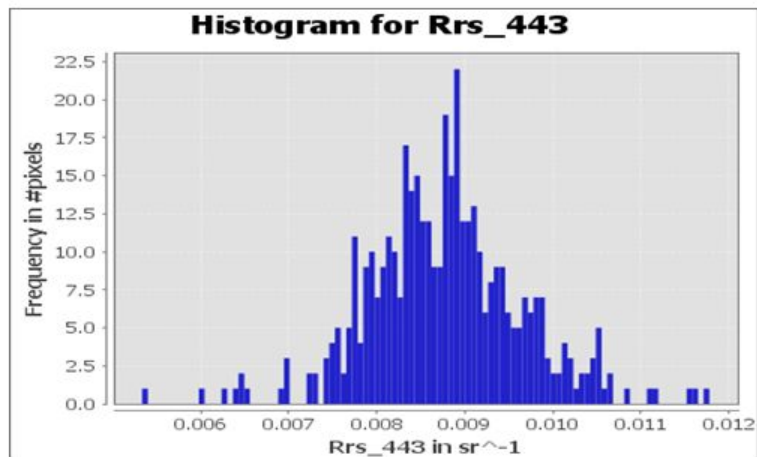
Images are RGB composites of bands 2,3,4 Rrs



Gray pixels are masked for cloud cover, white are misc. mask

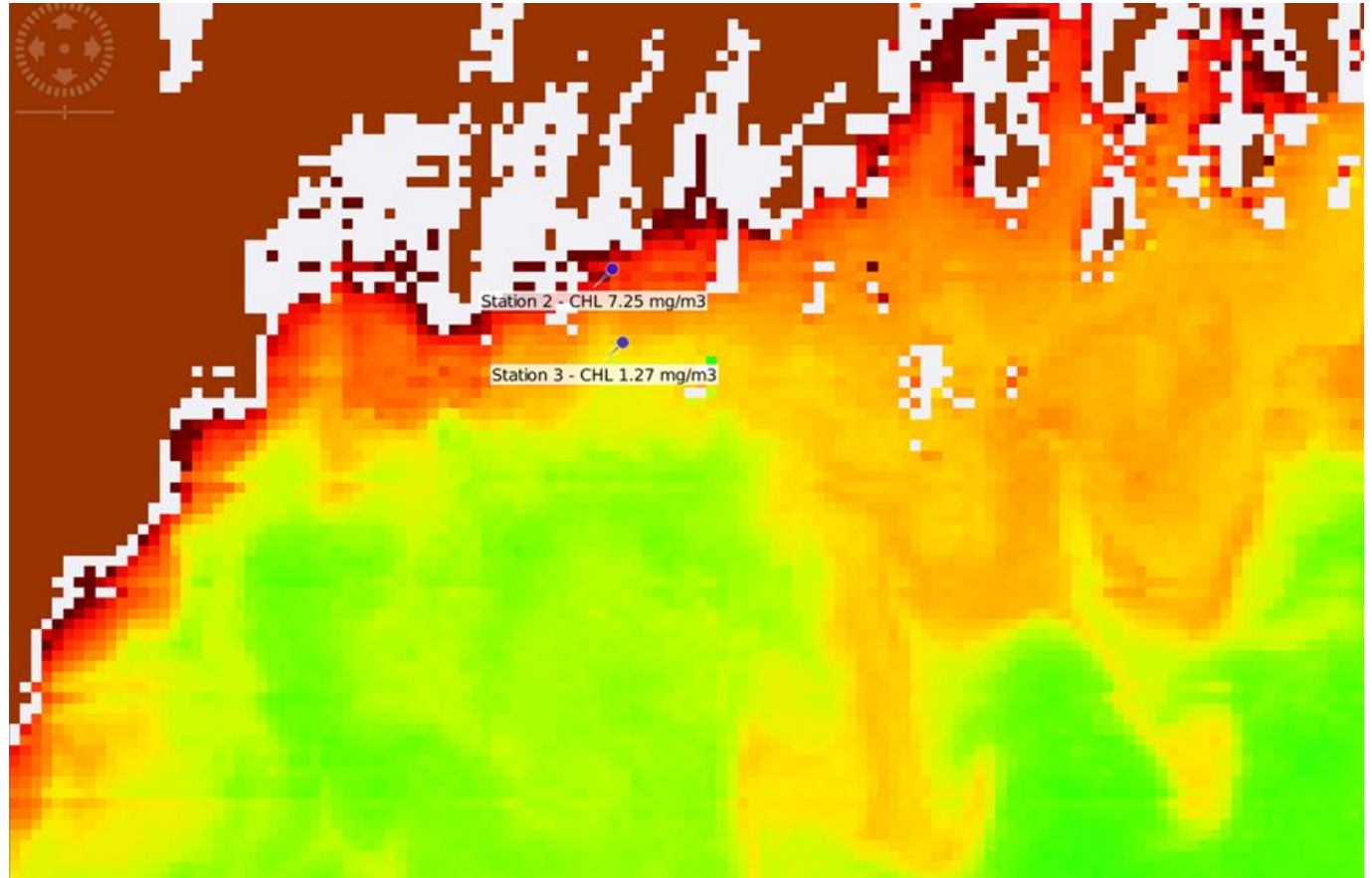


Landsat-8 Band-wise Rrs histograms from July 25<sup>th</sup> overpass (pixels from yellow rectangle on last slide )



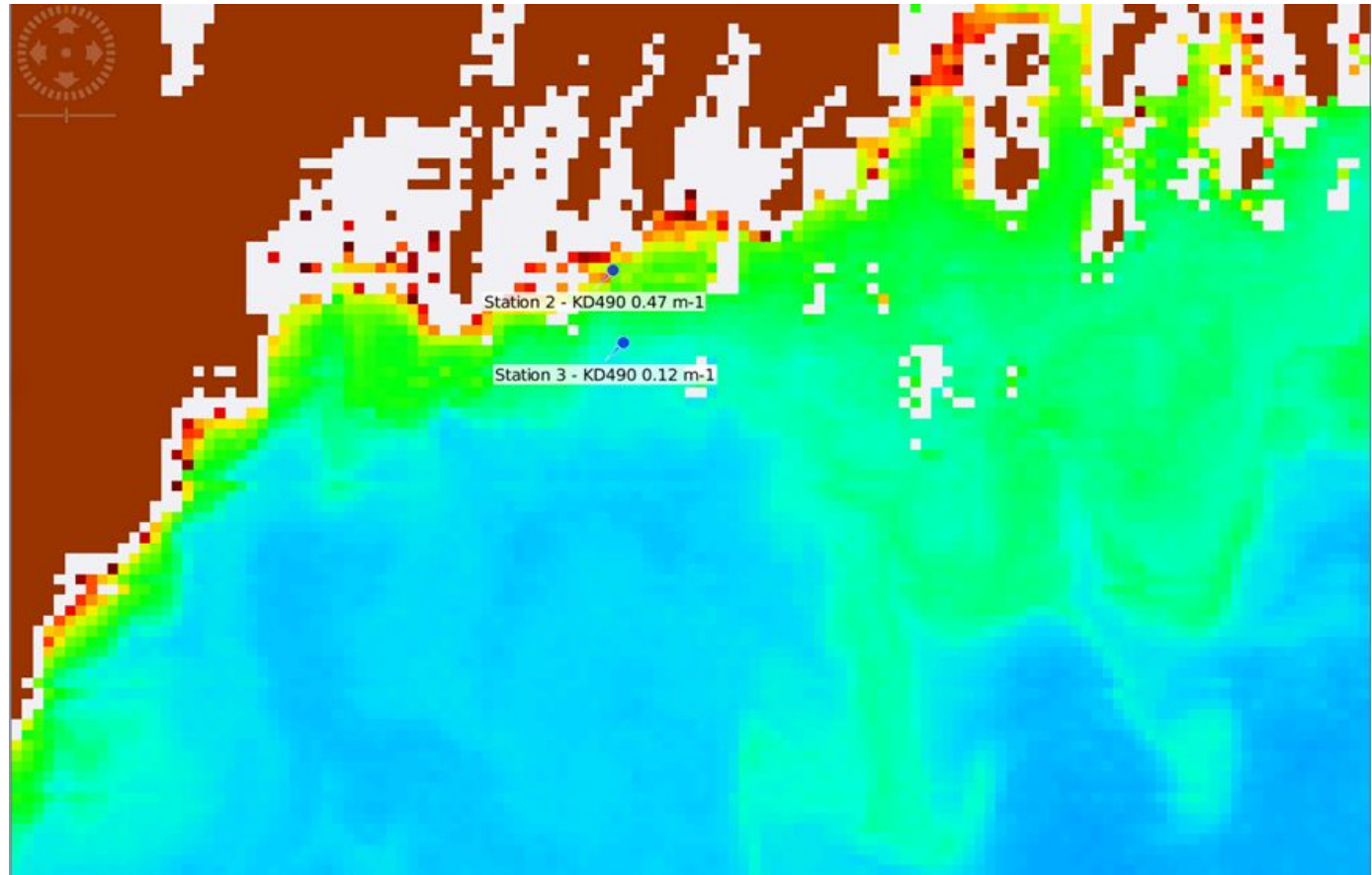
# MODIS Aqua Overpass - July 26, 2017

NASA OCx Chlorophyll a



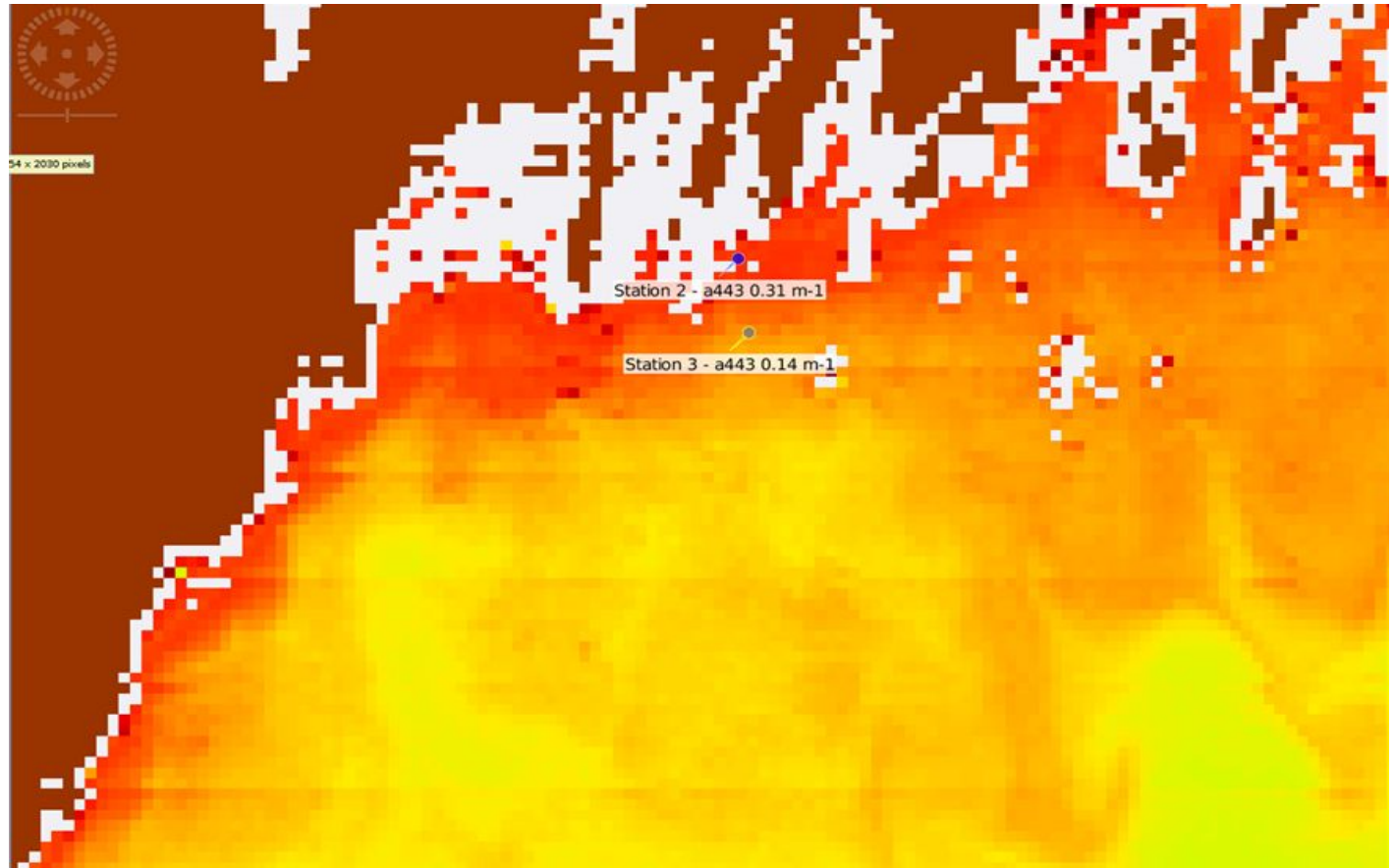
# MODIS Aqua Overpass - July 26, 2017

NASA KD490



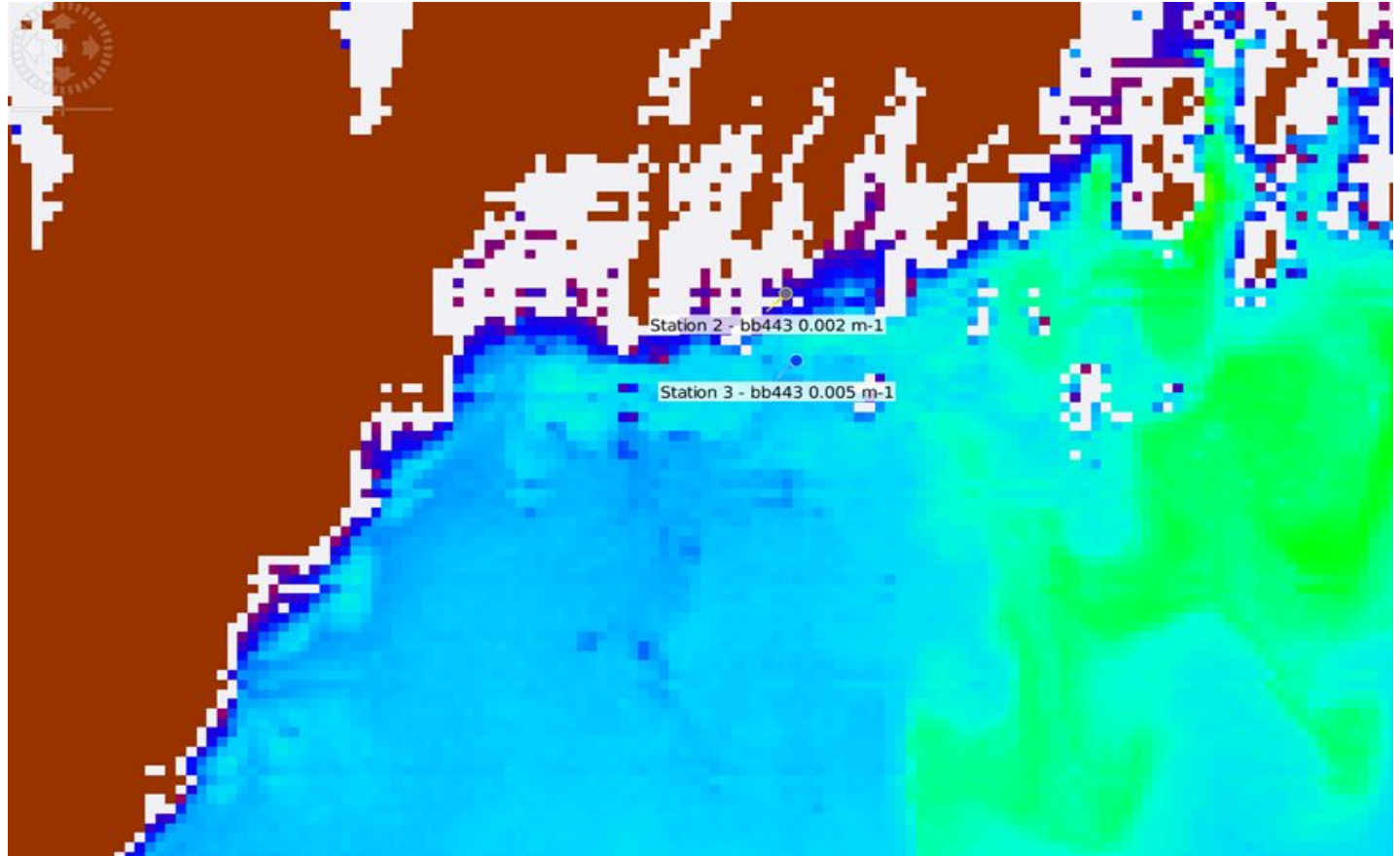
# MODIS Aqua Overpass - July 26, 2017

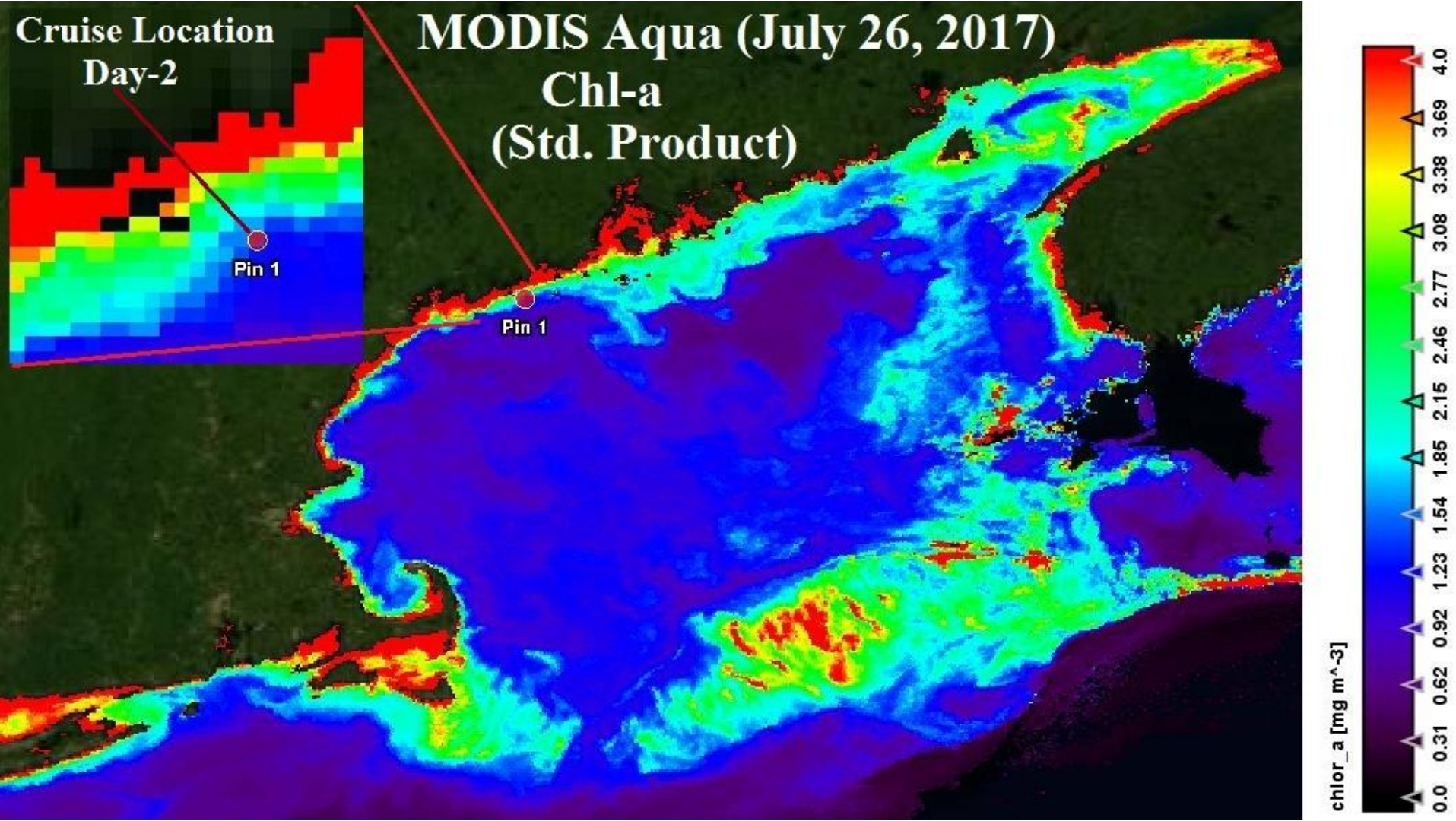
GIOP a443



# MODIS Aqua Overpass - July 26, 2017

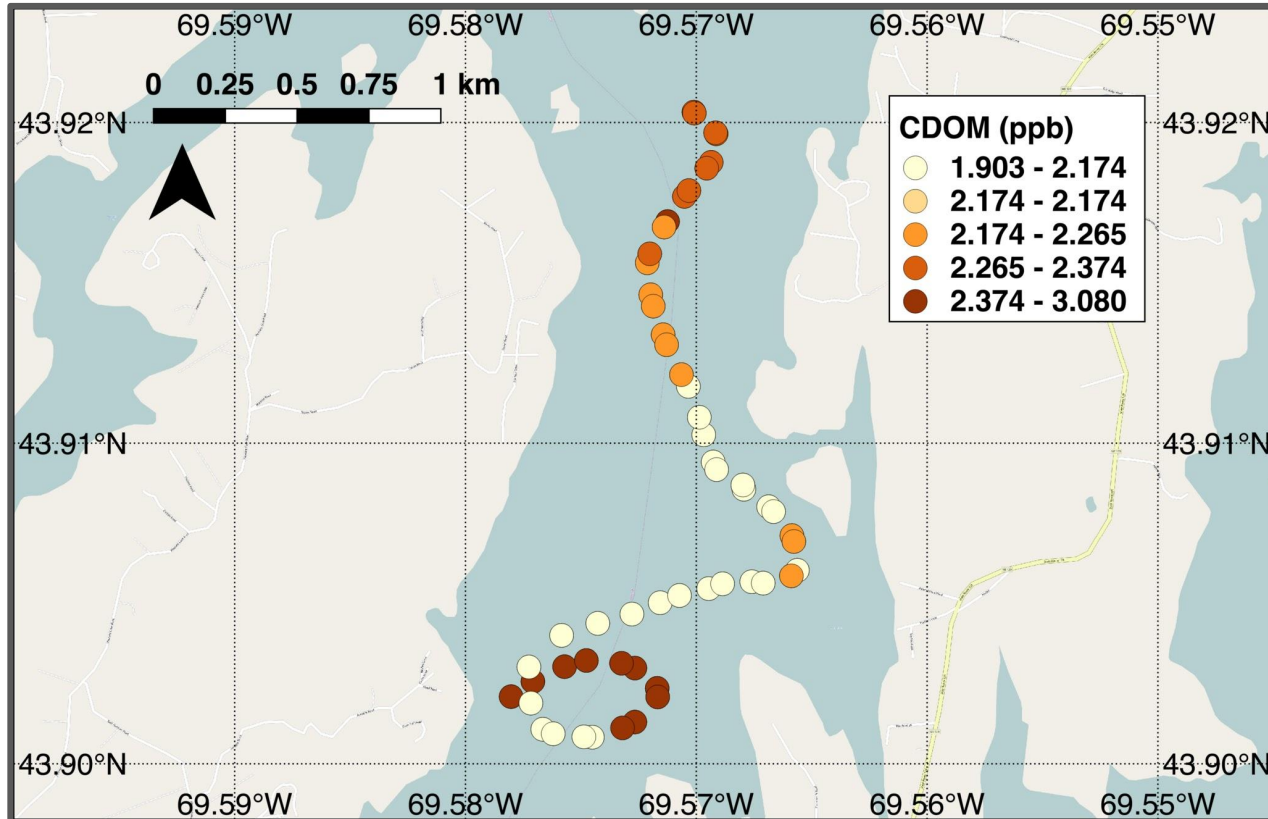
GIOP bb443





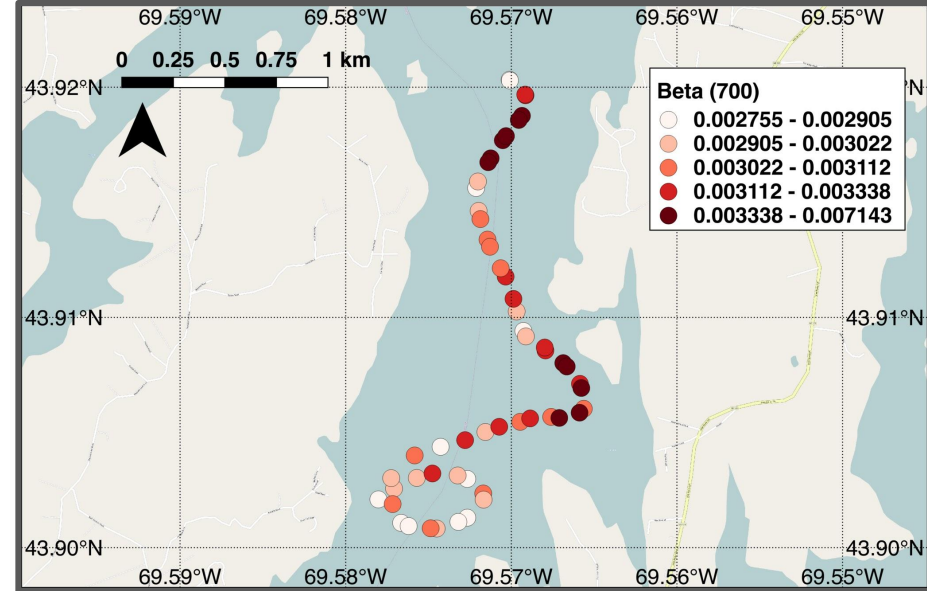
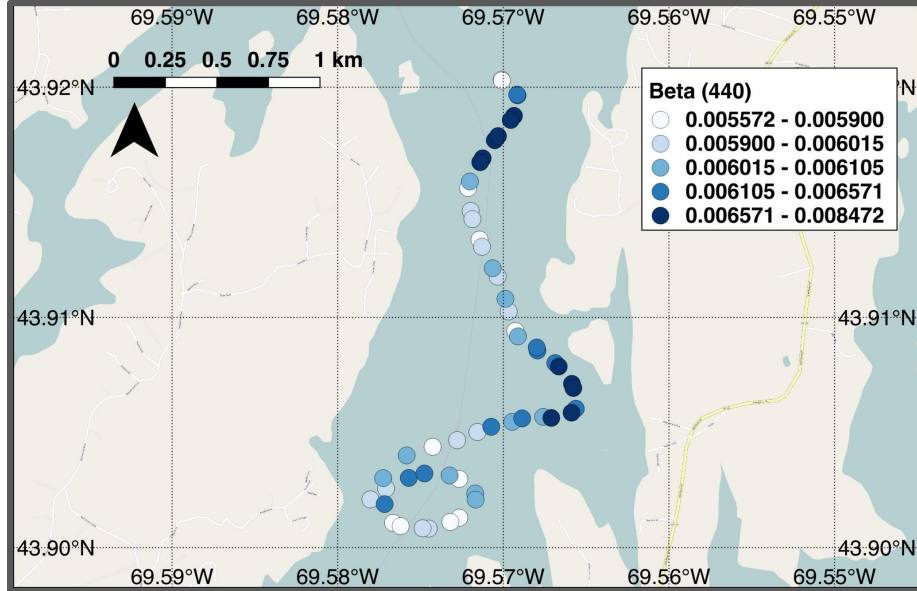


# Drifter 2 - CDOM Fluorescence (QSE)



CDOM (ppb) = **Scale Factor** \* (Output - Dark Counts)

# Drifter 2 - $\beta$ (440 nm) & $\beta$ (700 nm)

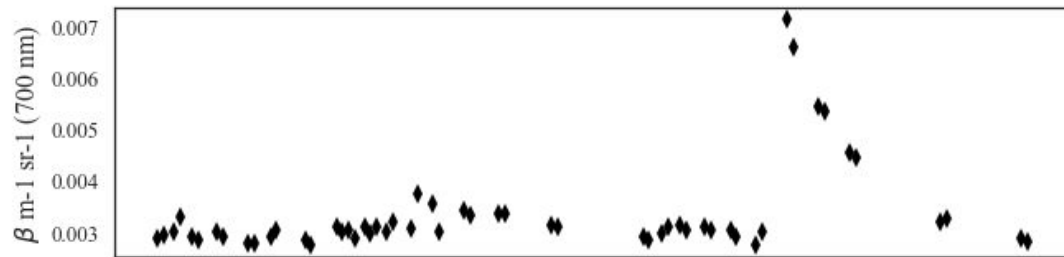
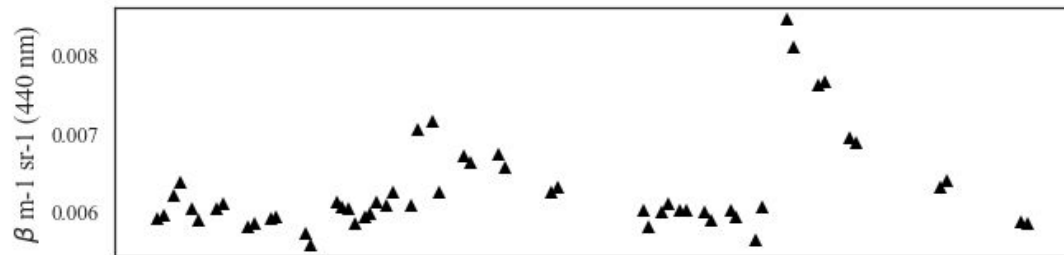


$$\beta(\theta) = (\text{signal measured} - \text{dark}) \times \text{conversion-factor}$$

Drifter 2 - July 26th



Drifter data as a time series



Drop off

11:00:00

12:00:00



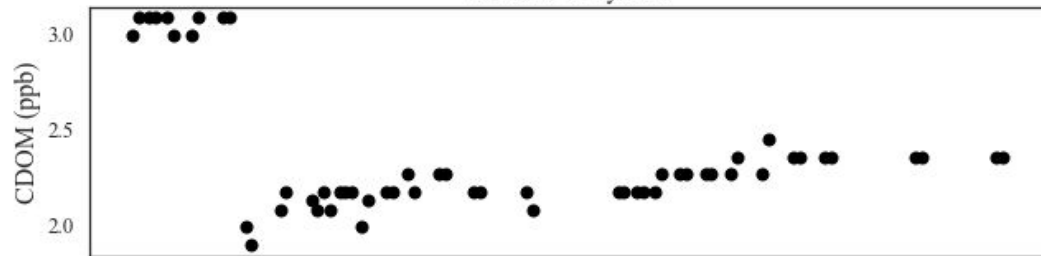
13:00:00

14:00:00

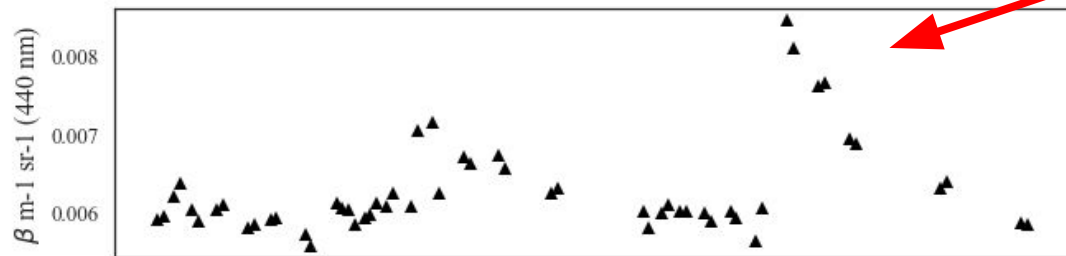
15:00:00

Pick Up

Drifter 2 - July 26th



Drifter data as a time series



Drop off

11:00:00

12:00:00



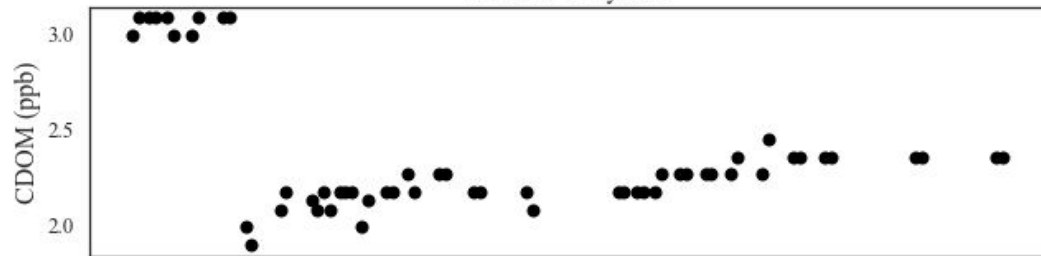
13:00:00

14:00:00

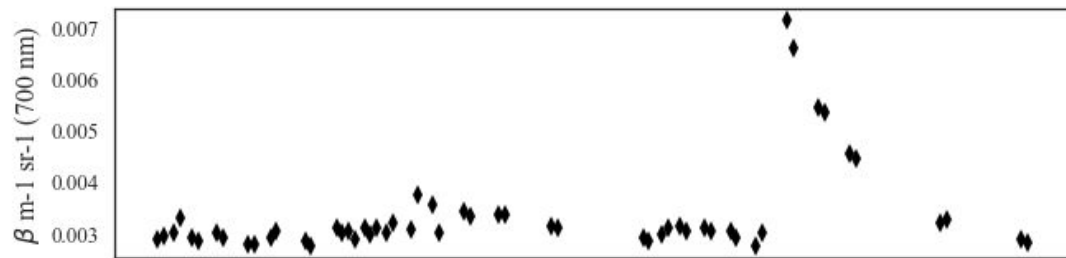
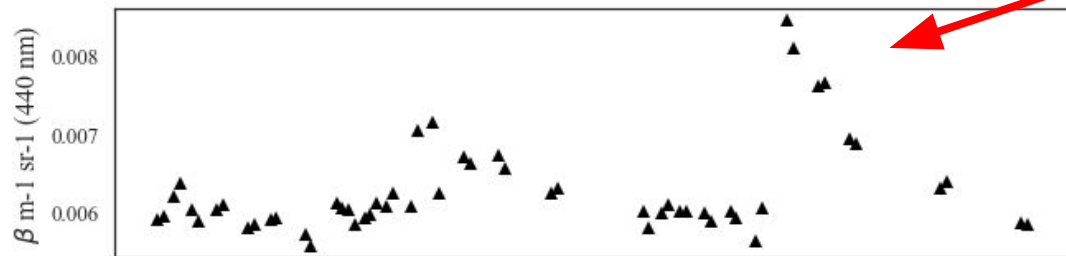
15:00:00

Pick Up

Drifter 2 - July 26th



Drifter data as a time series



Drop off

11:00:00

12:00:00



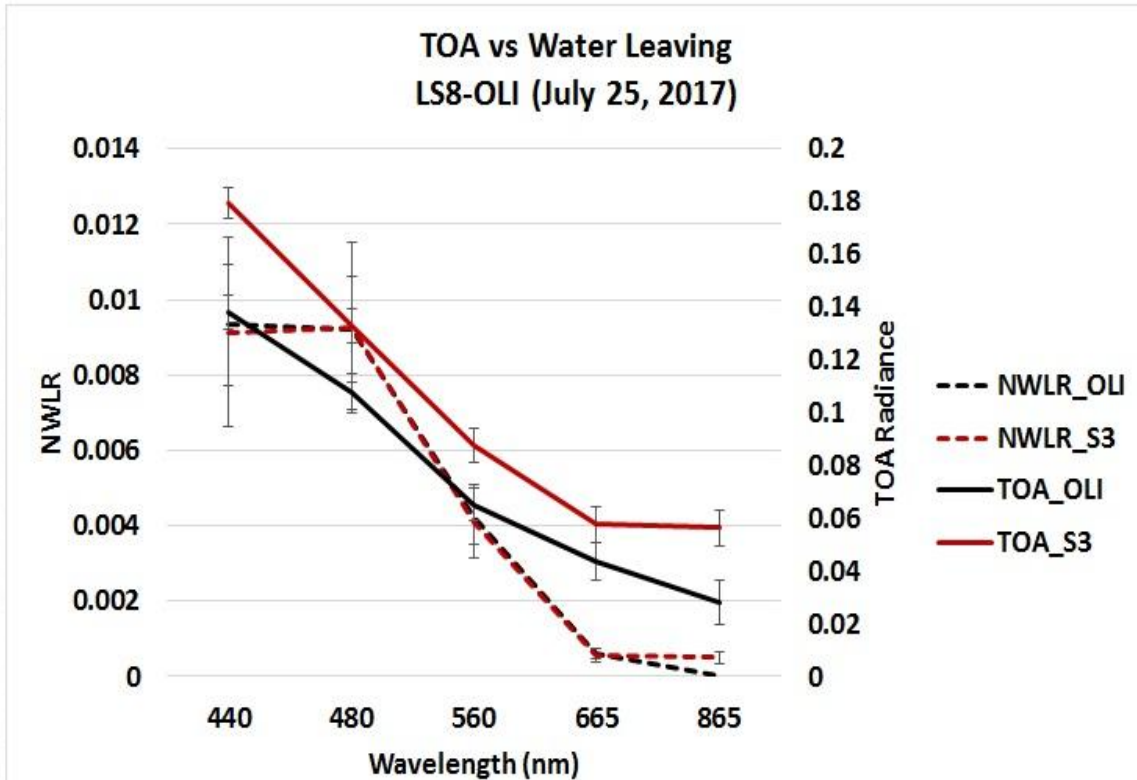
13:00:00

14:00:00

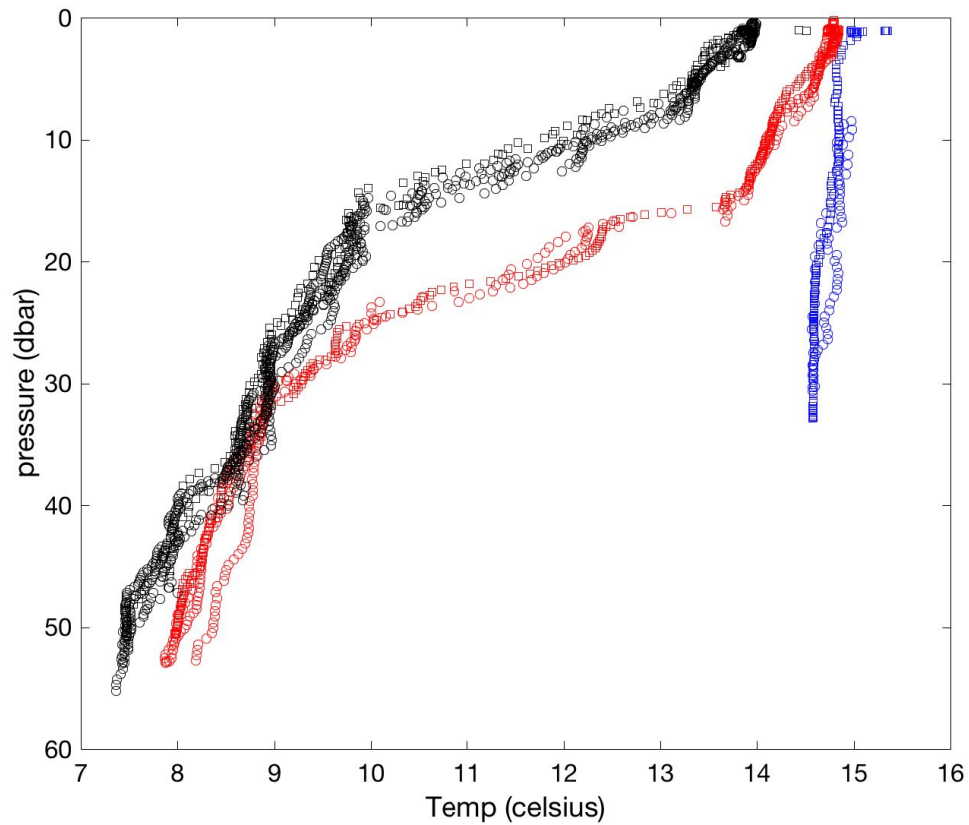
15:00:00

Pick Up

# Sentinel 3 vs LS8-OLI (July 25, 2017)



# Temperature depth profiles

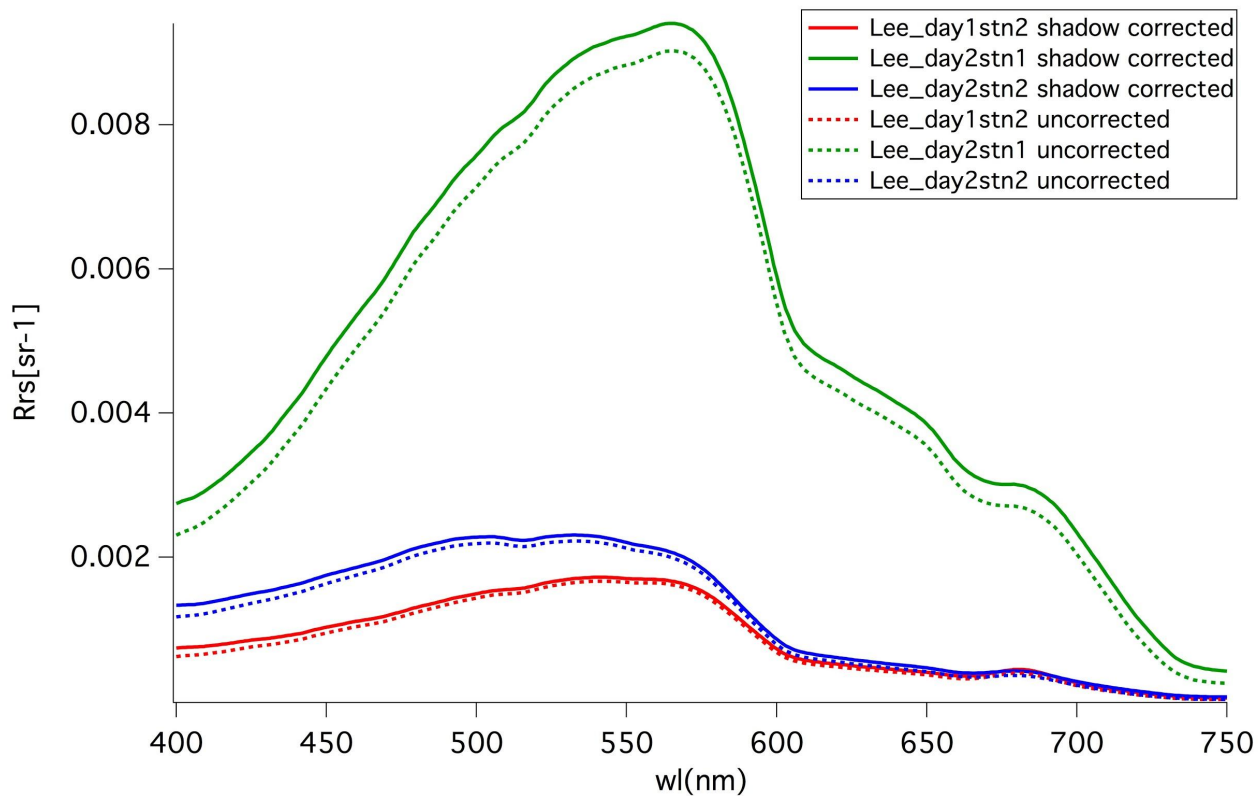


# Second Cruise report

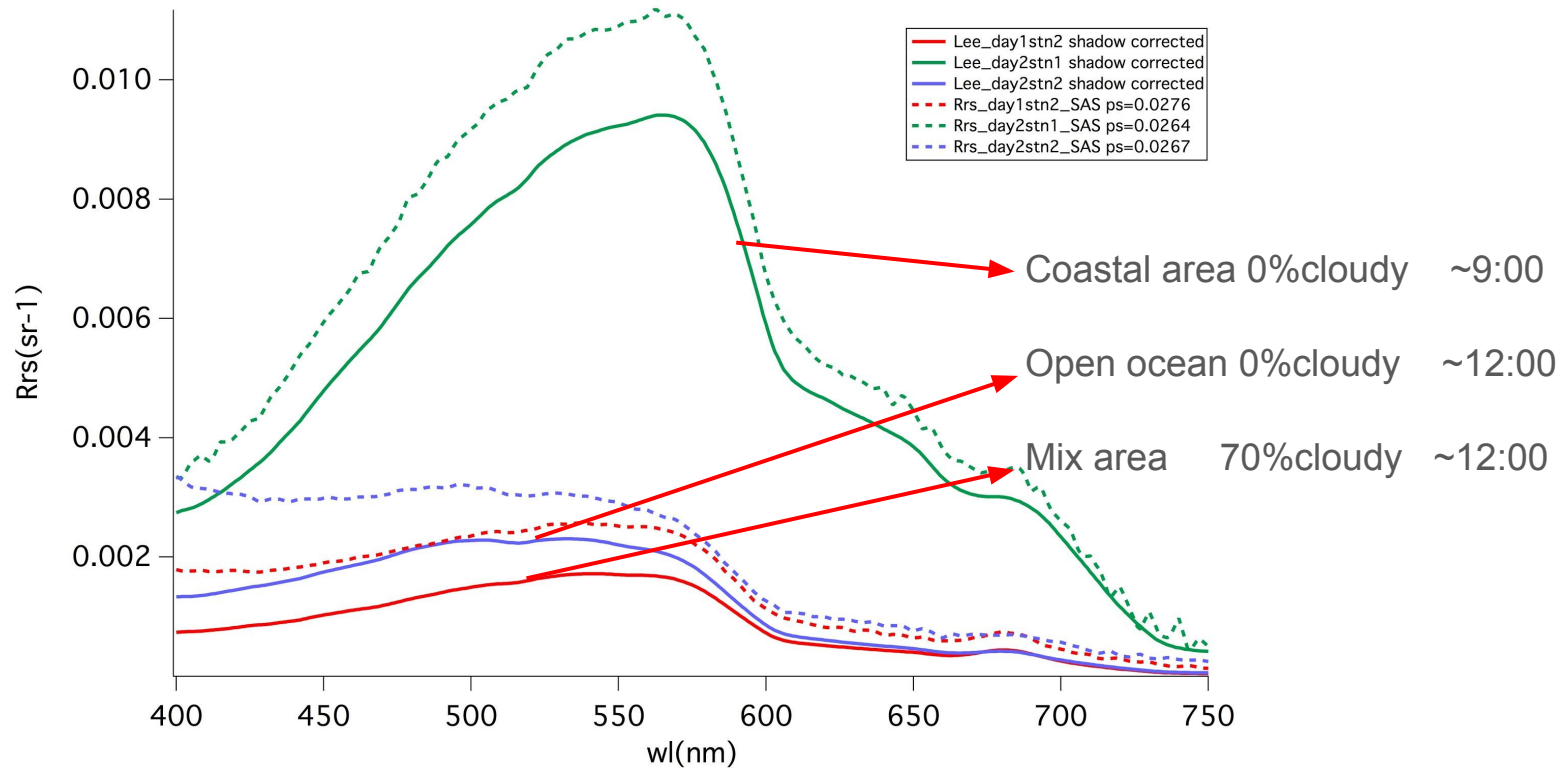




# Shadow correction of hyperPro Lee



# Hyper SAS and corrected HyperPro Lee

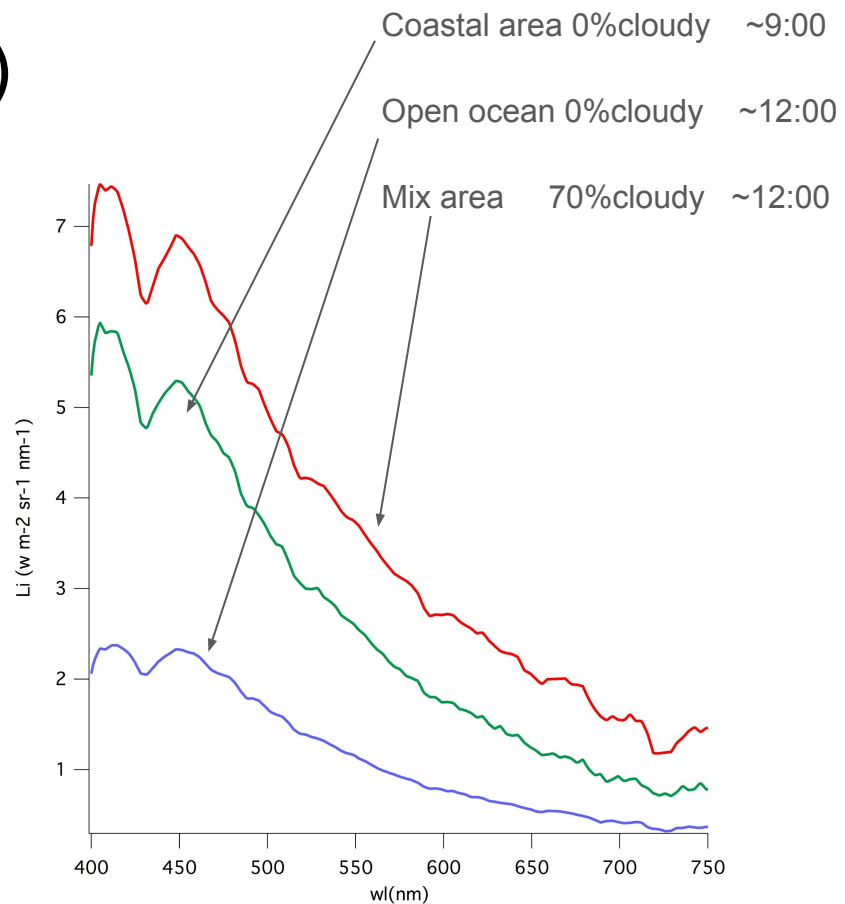
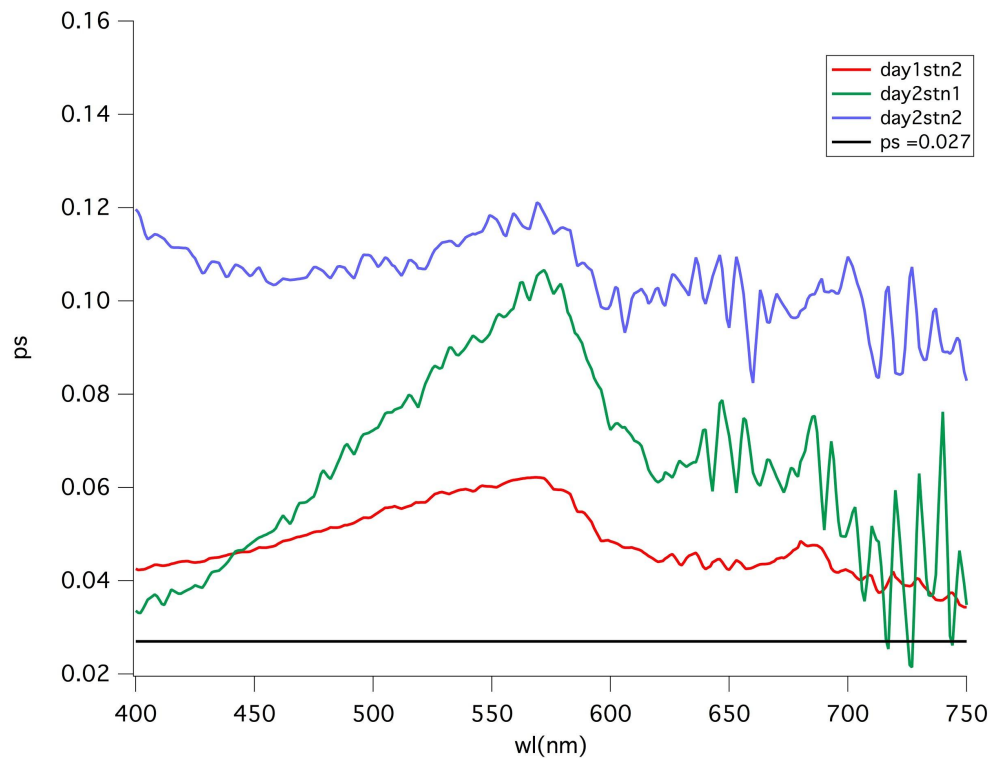


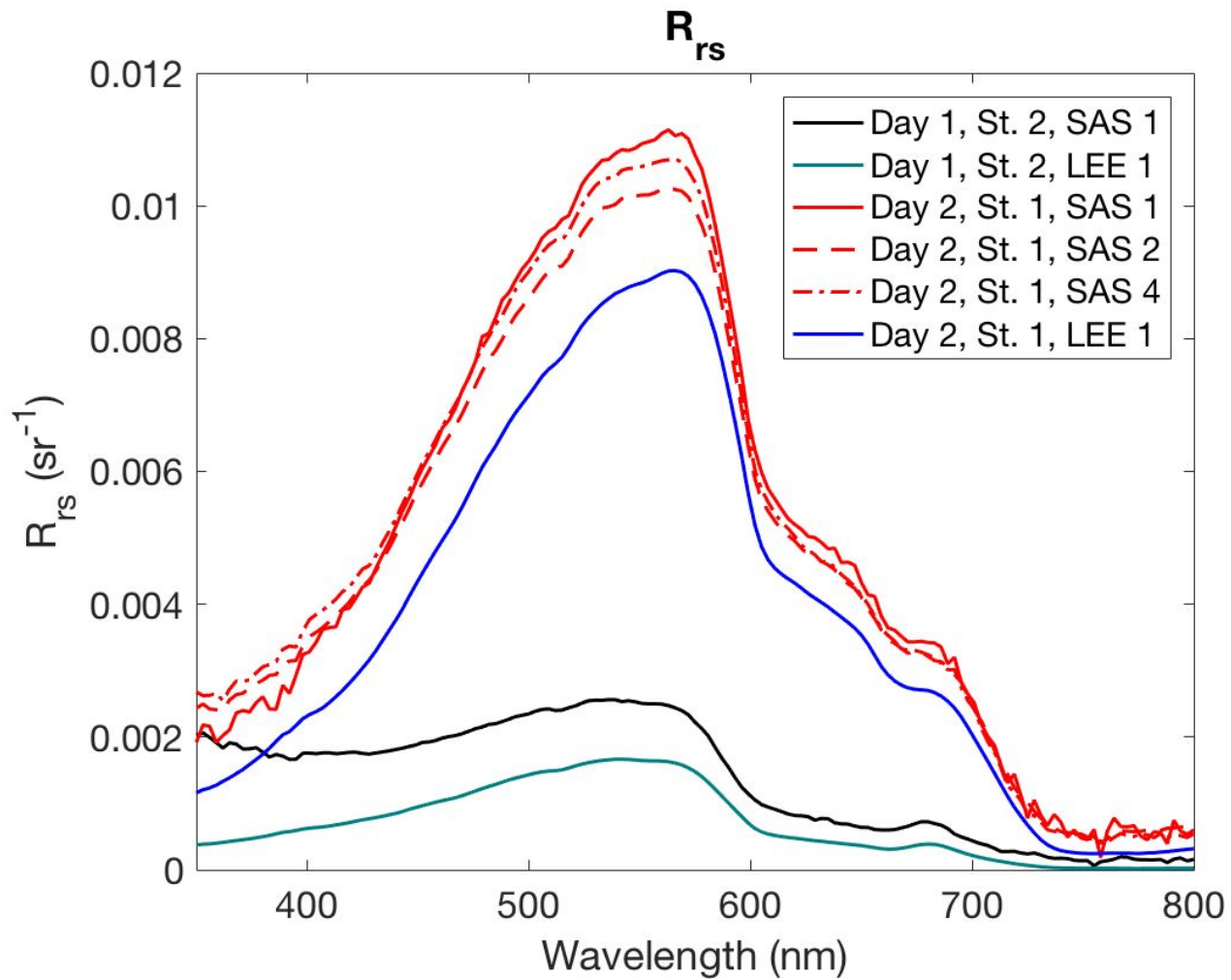
Calculate wavelength dependent ps

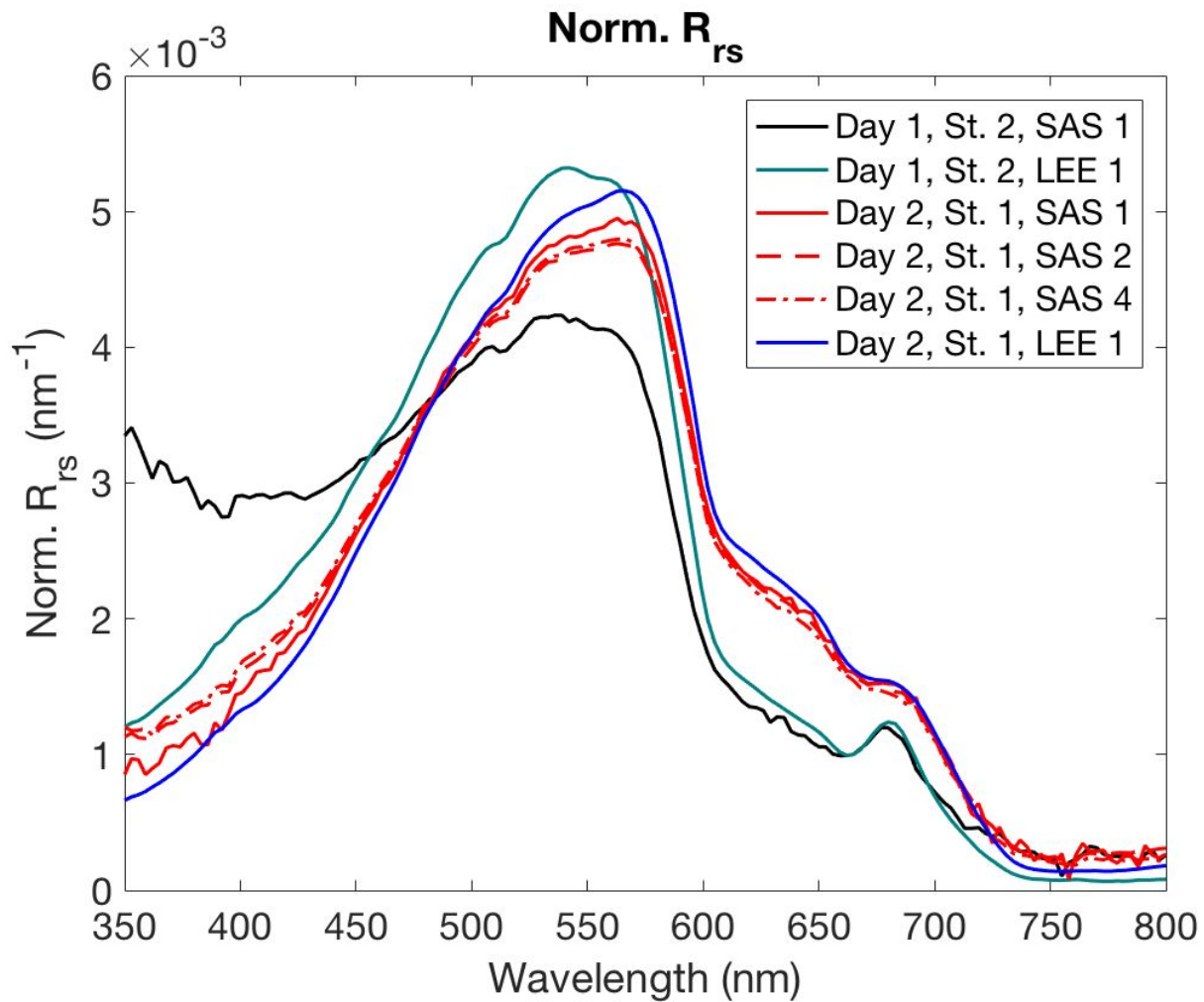
$$\bullet Rrs = \frac{Lt - ps(\lambda) * Li}{Es} = Rrs^{Lee}$$

$$\bullet \underline{ps(\lambda)} = \frac{Lt - Rrs^{Lee} * Es}{Li}$$

# Surface reflectance factor (ps)



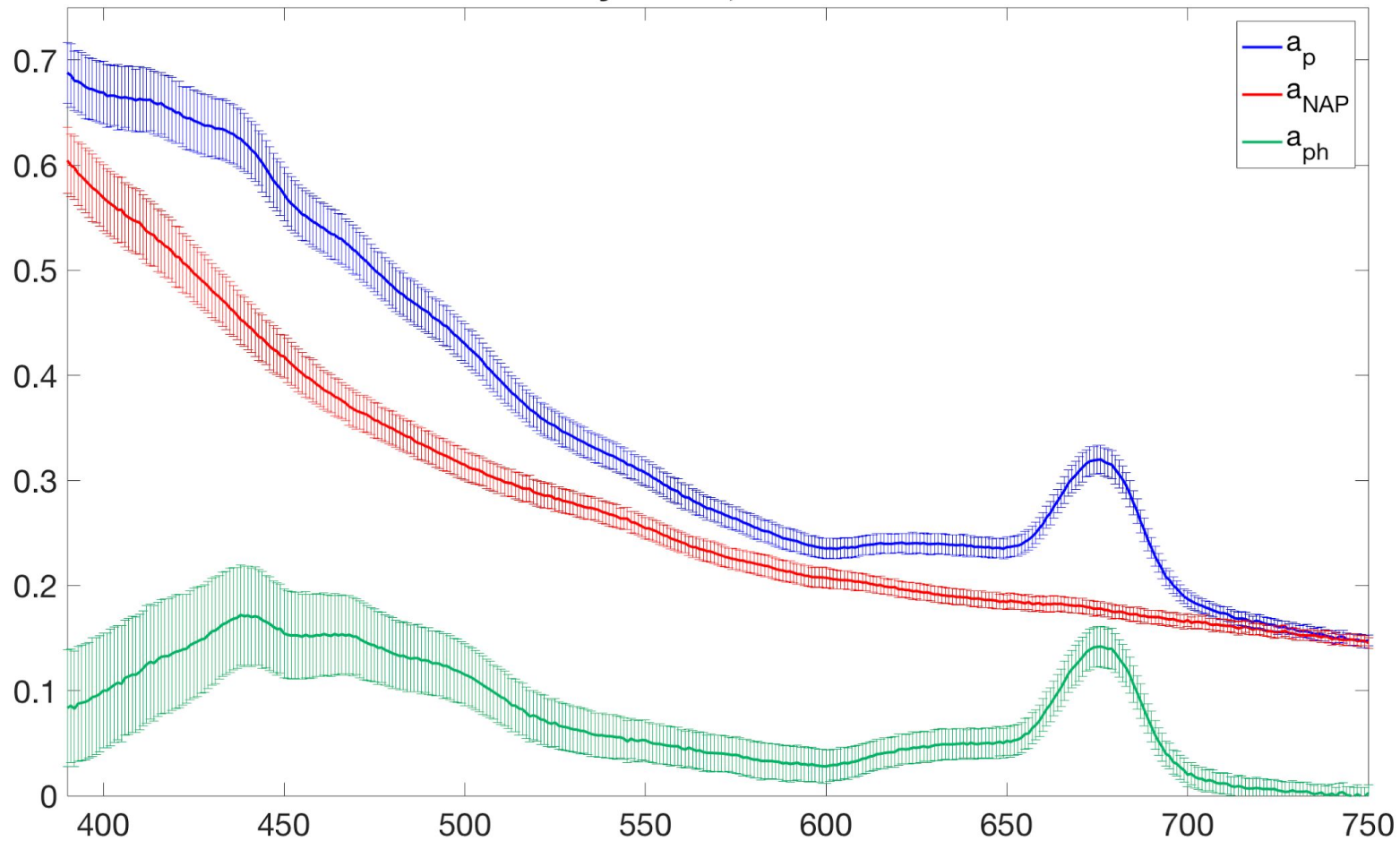




## Roesler and Perry 1995 model parameterization:

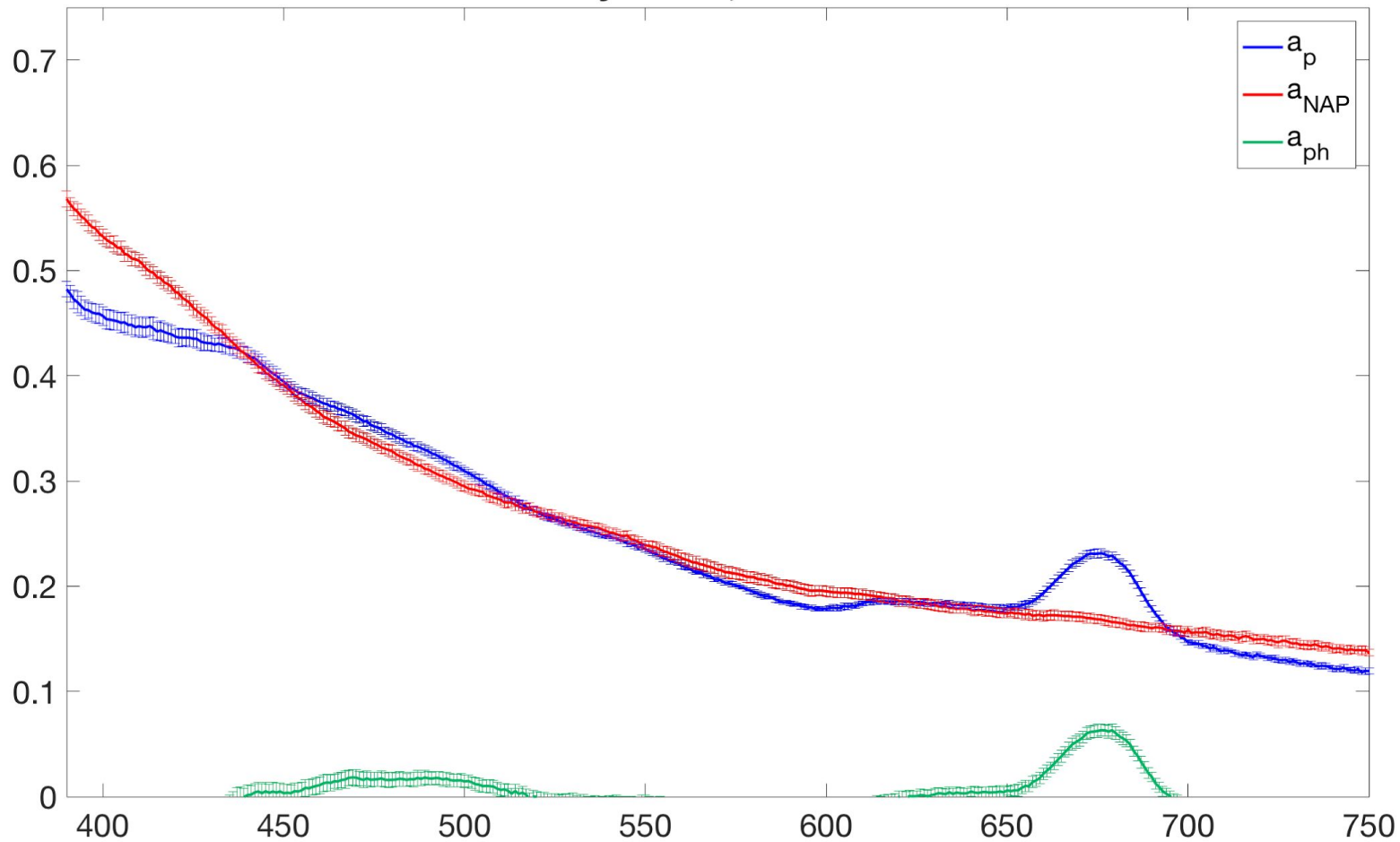
- $f/Q$  for SAS and Lee?
- Rrs (above) to rrs (below) conversion for SAS and Lee?
  - $rrs = Rrs / (0.52 + 1.7 * Rrs)$  (Lee et al. 2002)

# Day 2: 1 m, Bottle B

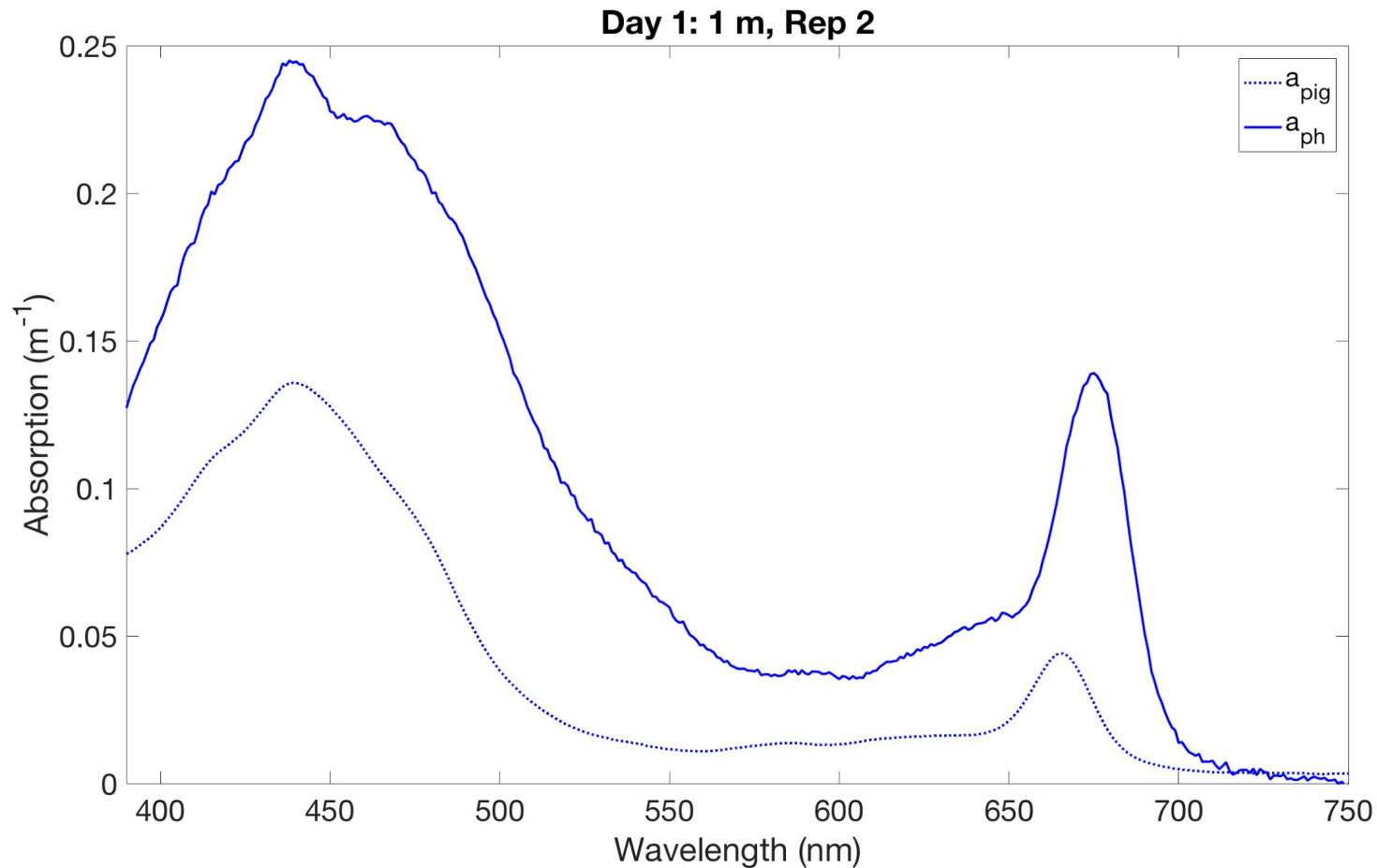




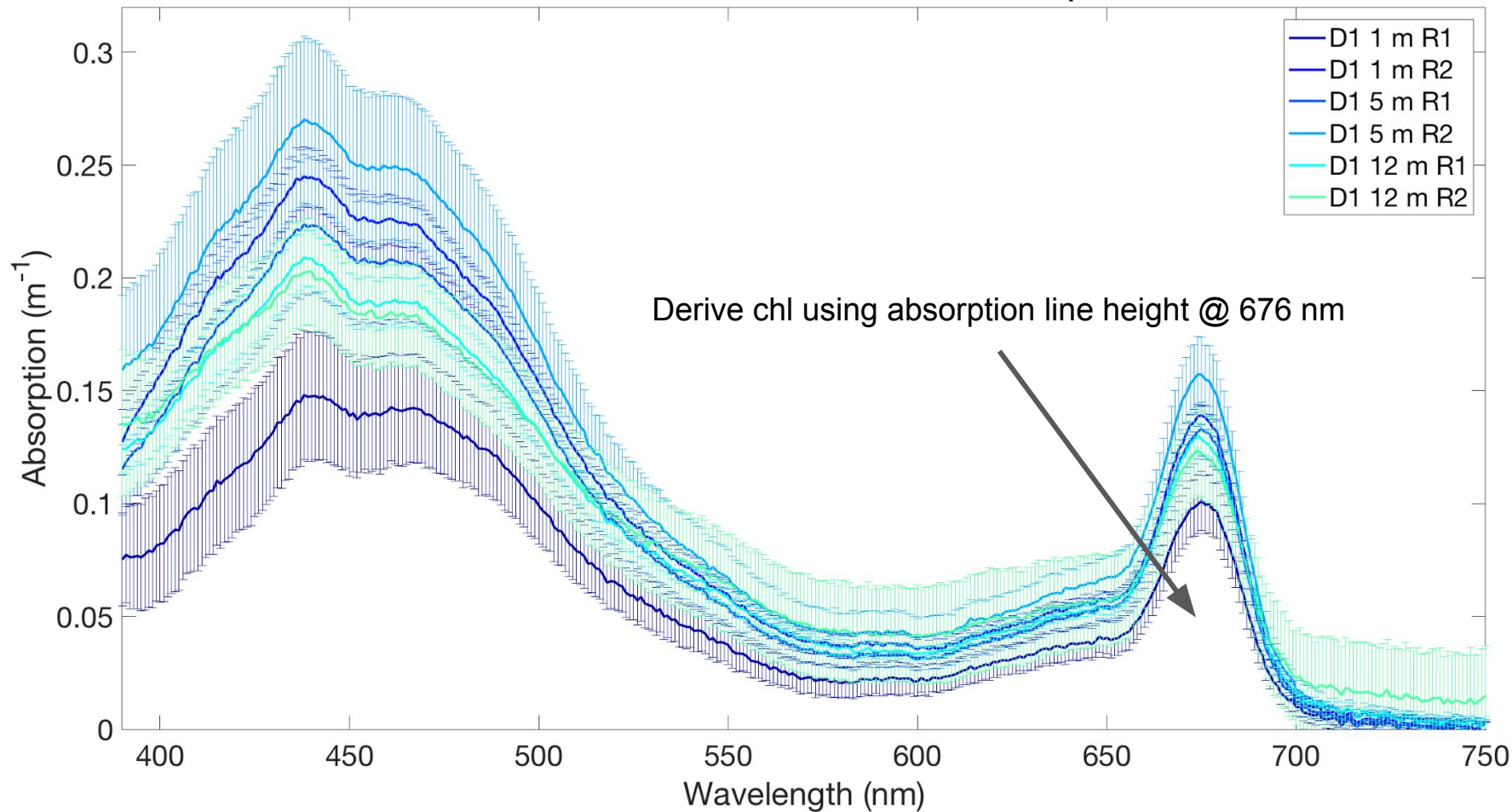
Day 2: 5 m, Bottle A



Not sure if we corrected the  $a_{\text{pig}}$  spectra in the right way? Multiplied by volume ethanol (5 mL)/volume filtered (600 mL) as discussed last week but would expect higher magnitude due to package effect

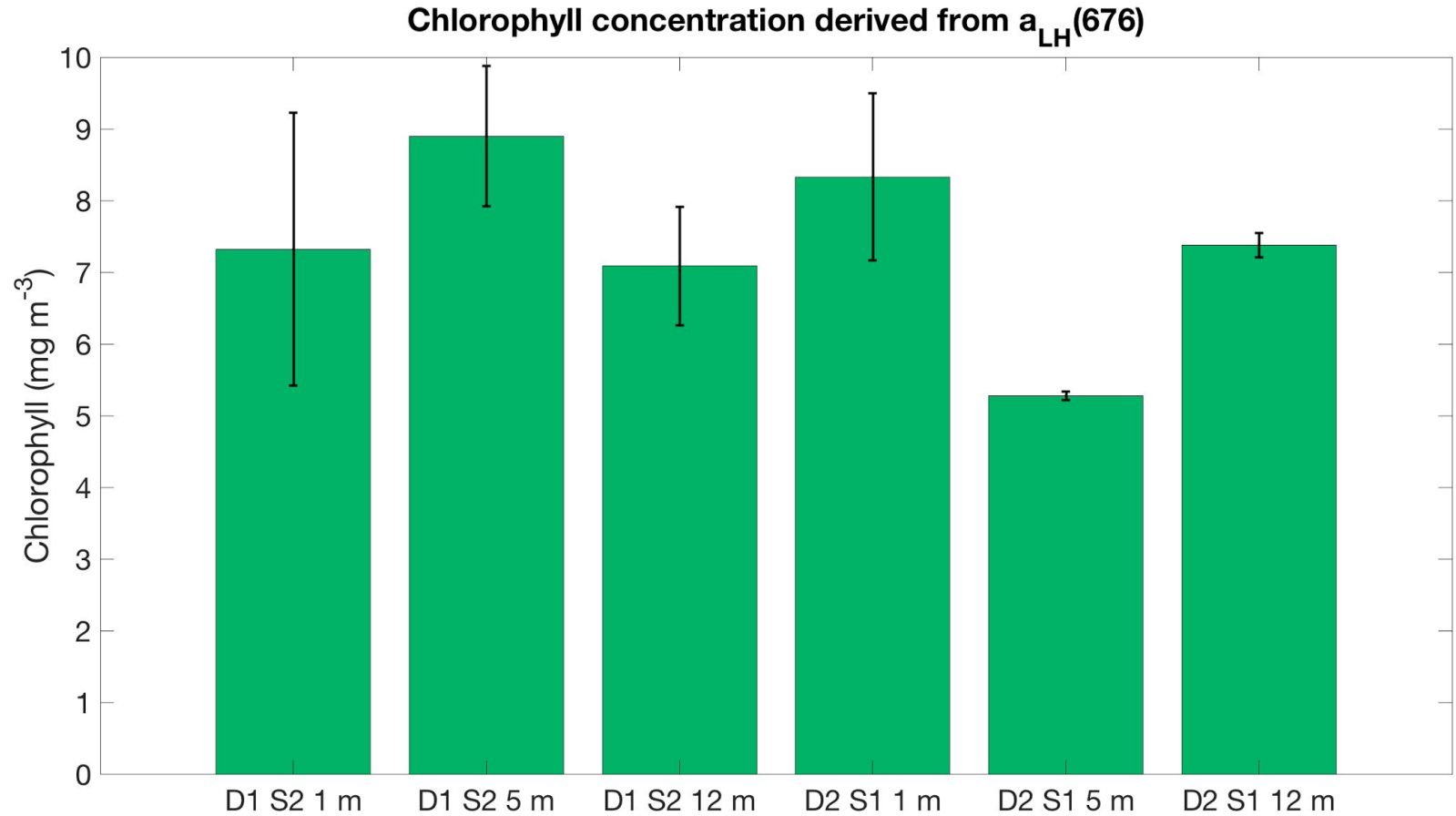


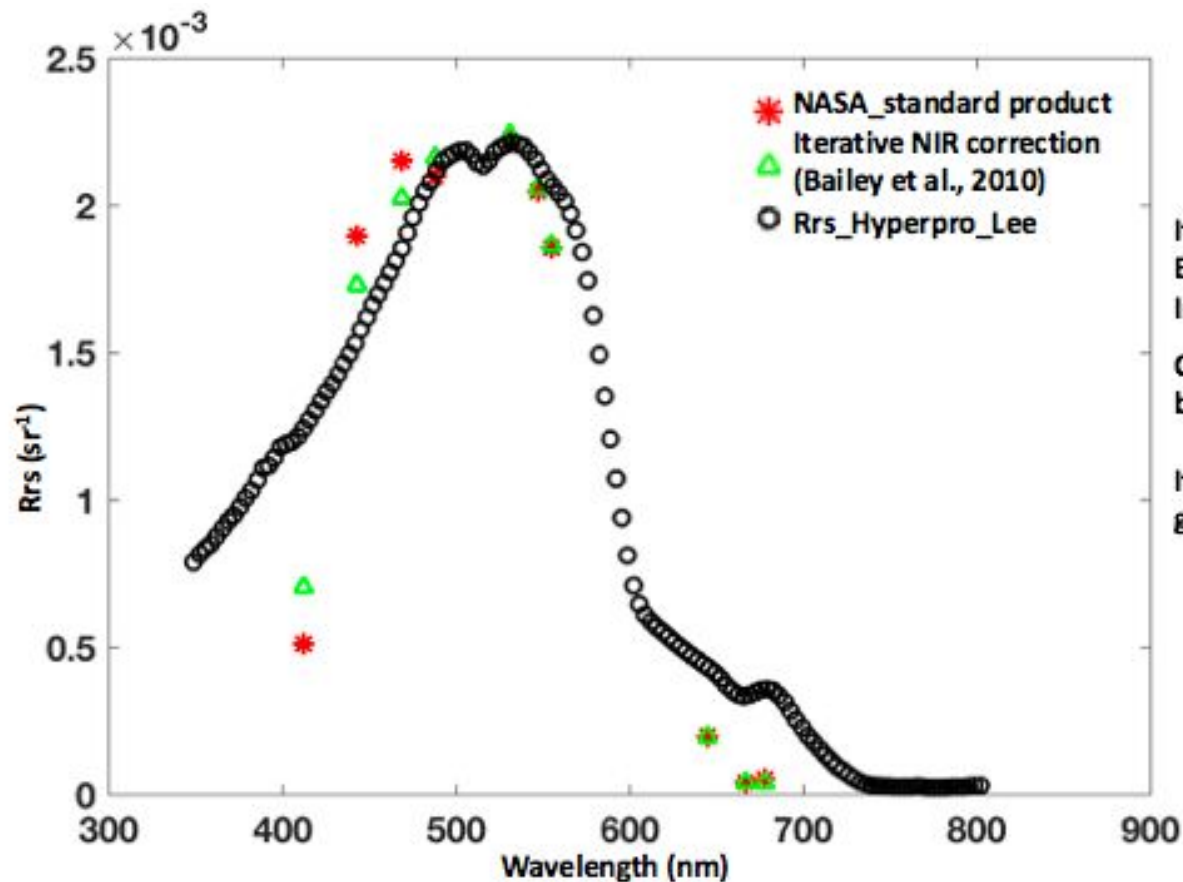
# Day 1, Station 2: phytoplankton absorption ( $a_{ph}$ ) spectra



Using the approach of Roesler & Barnard 2013

$$\text{Chl} = [\text{a}_{\text{LH}(676)} - 0.012] / 0.0104$$





Iterative NIR correction is Better than NASA\_standard product In the Gulf of Maine.

Chl-a fluorescence still can not be detected.

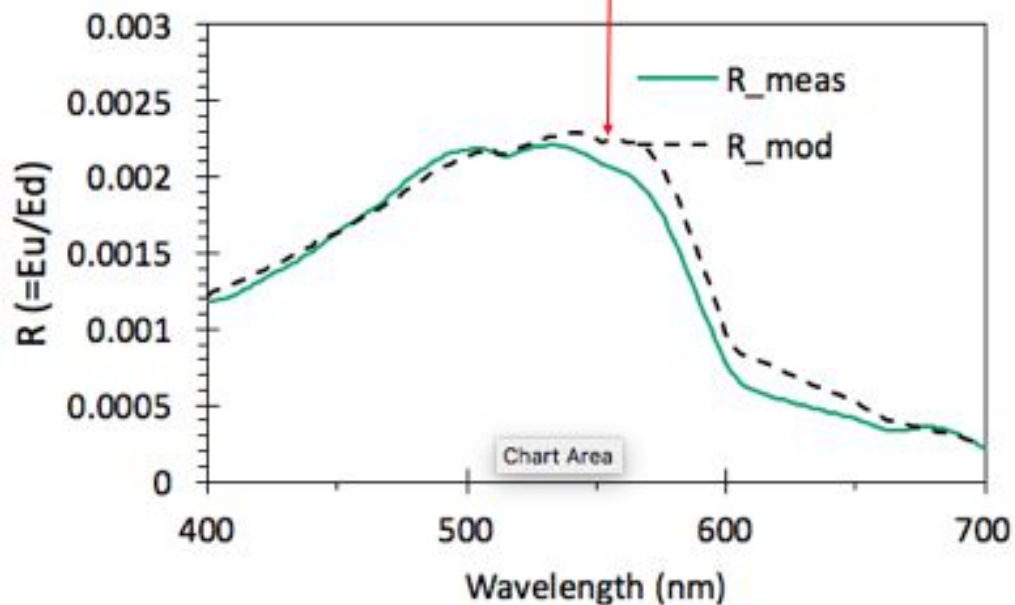
Iterative NIR correction to get IOP in Seadas.

absorption			backscattering	
S_CDOM	S_NAP	avg CDM	eta	eta
0.017	0.011	0.0145	-1	0

$a_{phy}$	$a_{cdom}$	$a_{nap}$	bb small	bb large
0.021521	0.539790	0.182102	0.000000	0.0001

Adjust shape

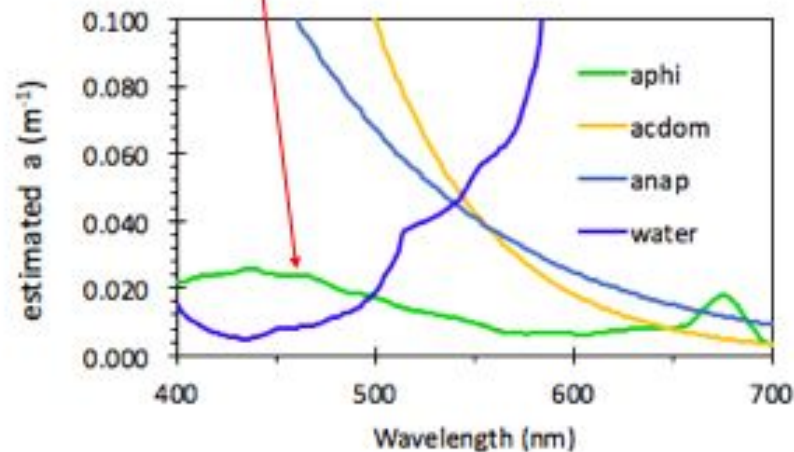
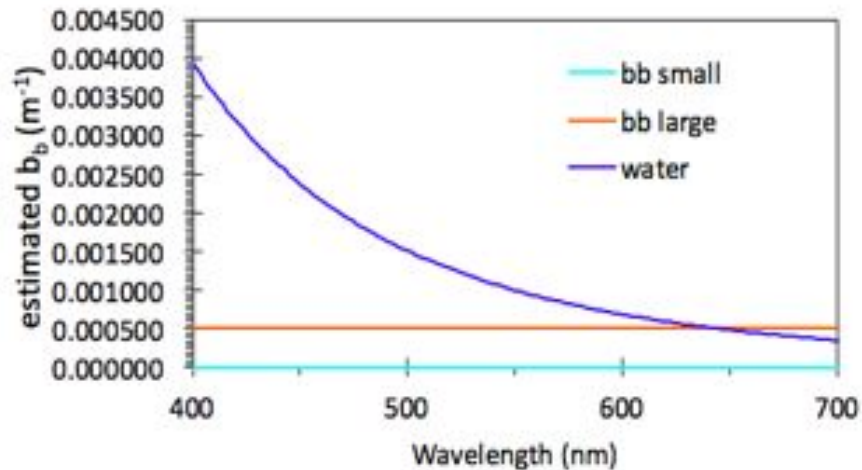
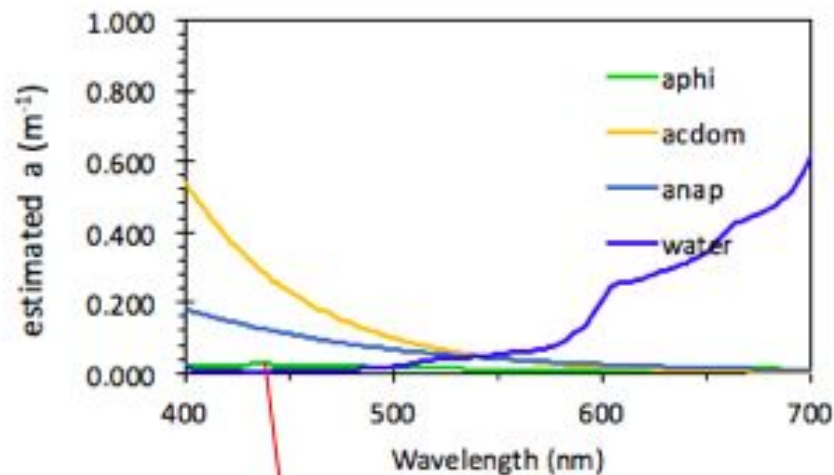
Adjust magnitude



Not include bb small in the simulation.

How to change eta?

Can eta for the bb\_large be negative?



chl(mg/m <sup>3</sup> )	1.220000	→ [Chl] from MODIS
chl_est	1.214407	

**CDOM dominated water for the last station during Cruise 2.**

**Phytoplankton absorption contribute least for the atotal.**

**Pure water dominated the back scattering.**

**The water is less turbid, the large particle dominated?**

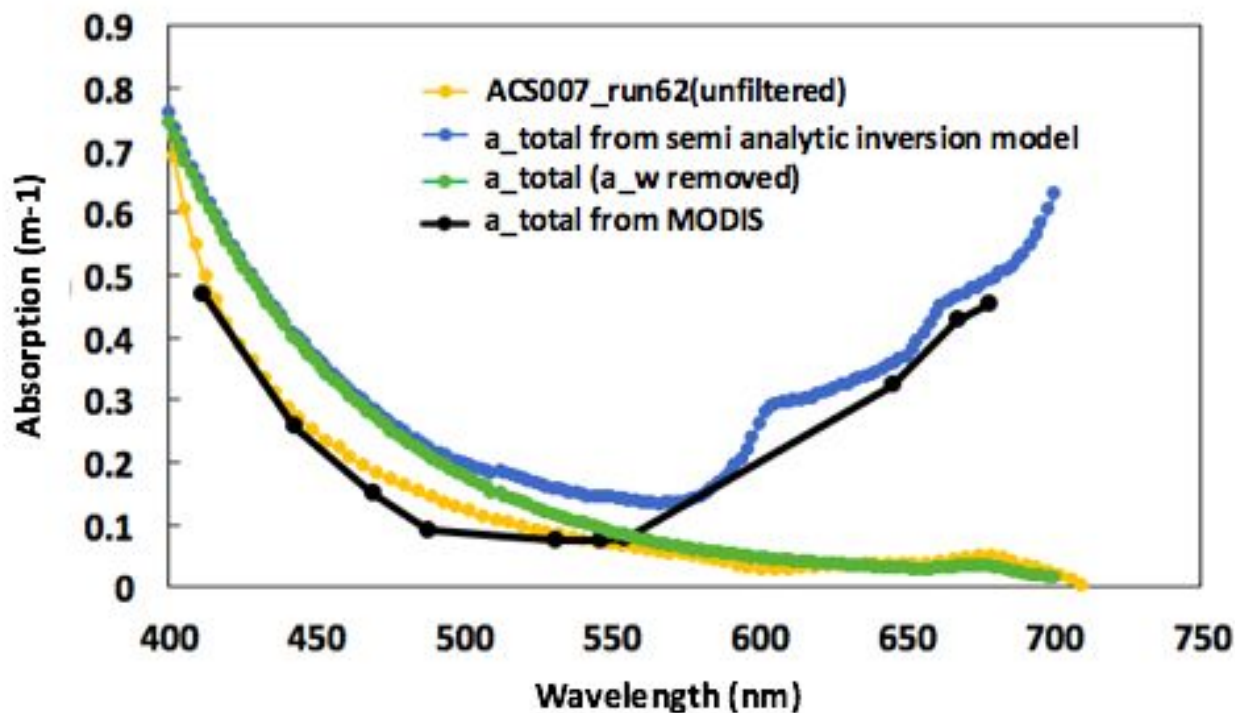
Validation for IOPS from inversion model using the optical package data

ACS007 (a tube)  
atotal (unfiltered)  
acdom (filtered)

BB9 (9 wavelength): bb

ACS haven't been completely  
processed

Inversion model result  
higher than ACS and MODIS.





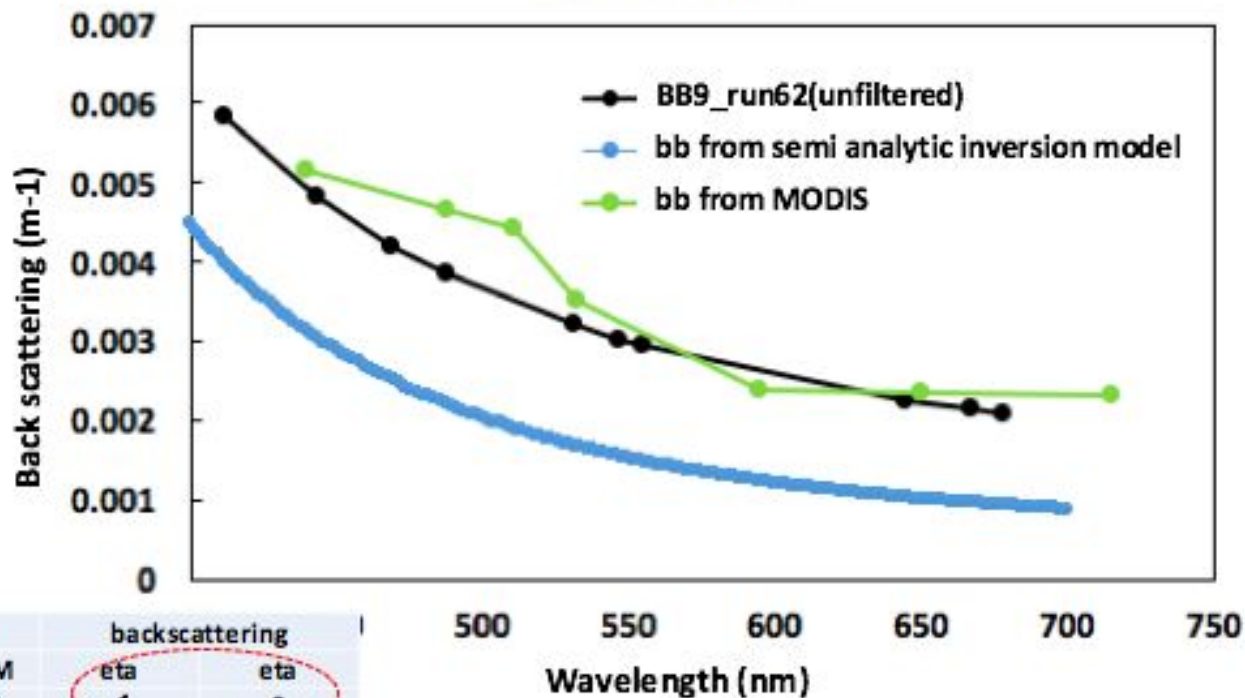
Validation for IOPS from inversion model using the optical package data

bb (bbp+bw)

Inversion model result  
lower than ACS and MODIS.

a<sub>total</sub> much higher  
bb much lower  
than in-situ

How to adjust?



absorption			backscattering	
S_CDOM	S_NAP	avg CDM	eta	eta
0.017	0.011	0.0145	-1	0