Repair for VOCCO Coastal Products
Evaluation of the IDPS (VOCCO) ocean color products in Coastal regions

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Objectives:

- Define Limitations of the present IDPS VIIRS processing for ocean color in high scattering waters (VOCCO failures)
- Evaluate the impact of negative radiance in high Scattering waters for VOCCO
- Demonstrate how VIIRS IDPS products can be improved
- Show need for a DR to be established for the NIR processing

Atmospheric correction:

- Correctly partitioning the contribution of various atmospheric components from the total radiance signal is necessary to retrieve confident ocean measurements (Lu):

$$Lt(\lambda) = Lr(\lambda) + La(\lambda) + Lu(\lambda)$$

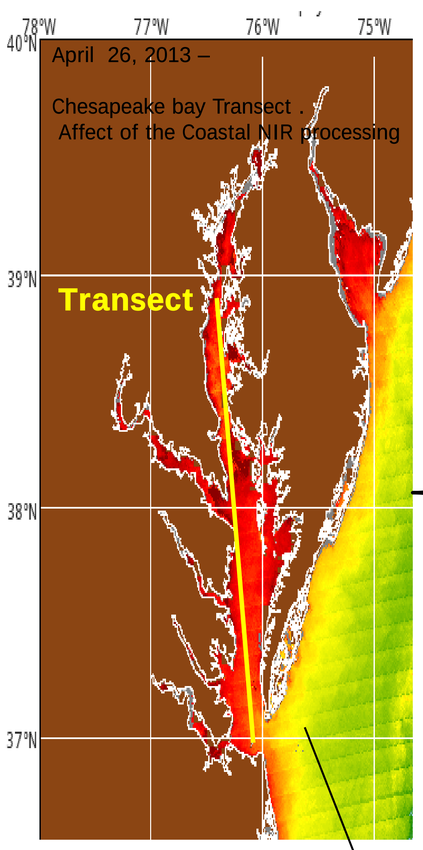
Lt: Total; Lr: Rayleigh; La: Aerosol; Lu: Ocean

Black Water Assumption *Atmospheric correction Assumption*

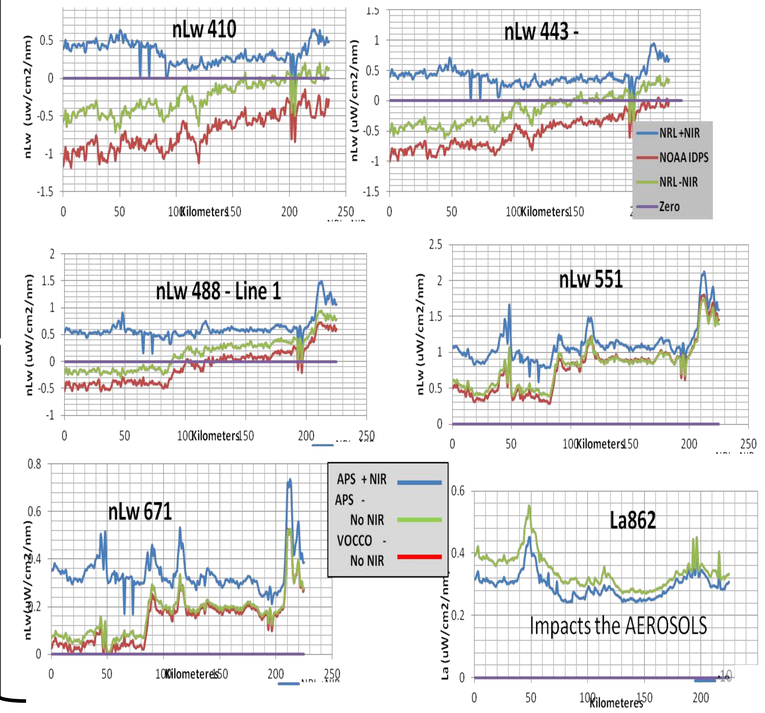
$$La_{(865)} = Lt_{(865)} - Lr_{(865)} - Lu_{(865)} \rightarrow 0$$

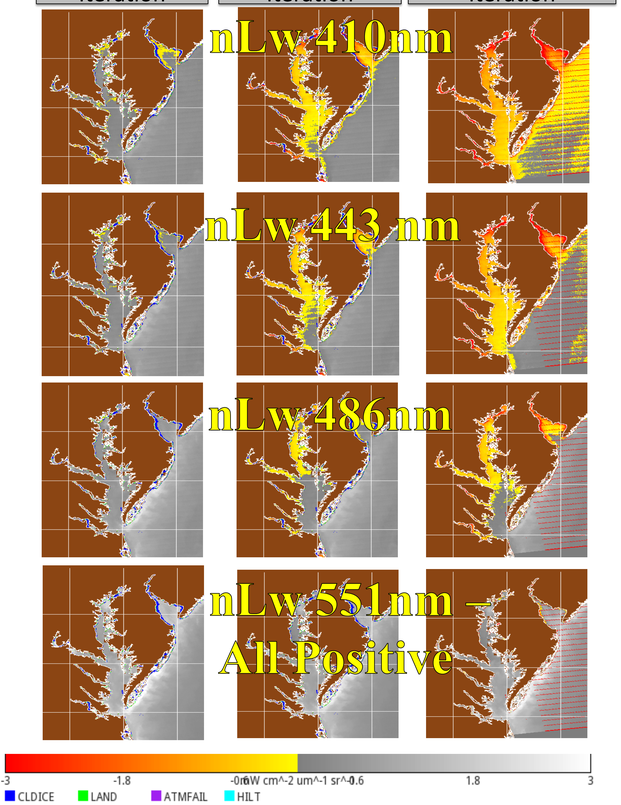
In high scattering water the Lu 865 > 0

- Black pixel assumption violations can be handled using an "iteration" or Coastal NIR processing procedure
- Uses the spectral water backscattering to derive the Lu(865)

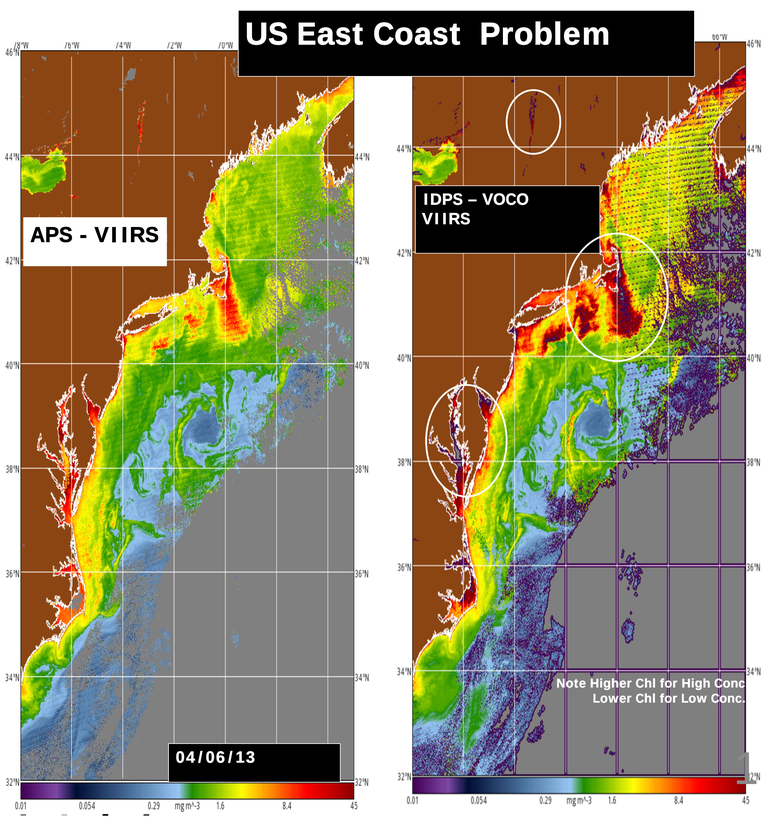


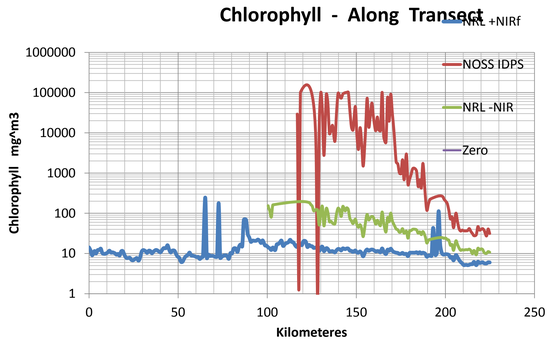
Evaluation of Coastal NIR implementation
Chesapeake Bay Transect
NASA, NOAA, and NAVY processing



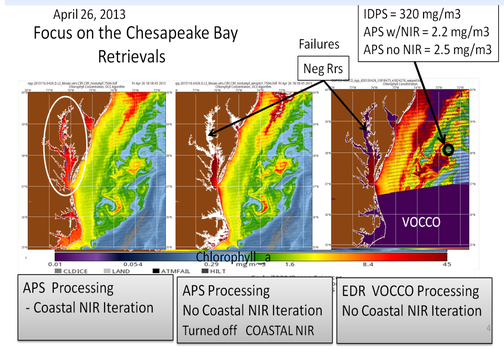


Impact of "non-zero" nLw 865 on coastal products





Evaluation of the IDPS VOCCO ocean products Failures

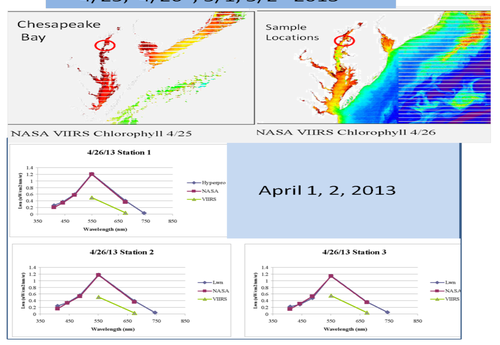


Validation of NIR Coastal Products

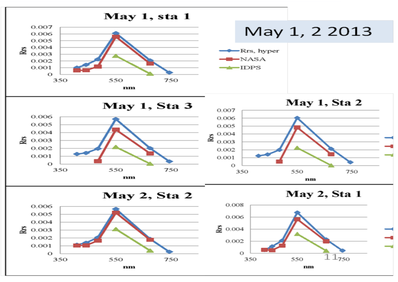
STAR Coastal Data sets
Upper Chesapeake Bay (Mike Ondrusek)

Validation of the Coastal IR using NASA and APS processing

4 Cruises show similar results
4/25, 4/26 , 5/1, 5/2 2013



Results
April 25,26 6 , May 1,2 – Matchup
VOCCO 410, 440, 488 Negative
nLw(555) ~ 56% low
nLw(672) ~ 89% low



Summary: It Works - Major Improvement

Black Water assumption and Coastal NIR Affects coastal and Shelf waters

a) Produces Negative or "NO" nLw retrievals
   Greater in 410 , 443, 488
b) Produces reduced values in "certain areas"
c) Impacted the Aerosol (La) atmospheric correction removal
d) Impacts - Lower nLw (radiances) and Higher Chlorophyll values
e) Accounts for differences of VIIRS and MODIS products
f) Results in VIIRS not meeting Ocean requirements.