

Improving retrieval of IOPs from ocean color remote sensing through explicit consideration of the VSF

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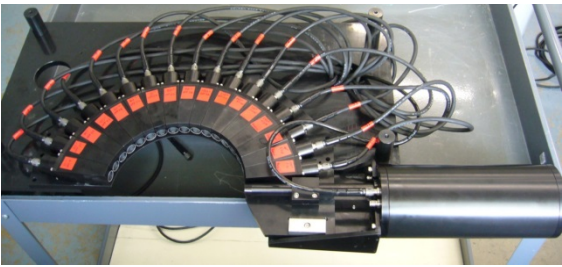


Basis: RS algorithms to derive IOPs or biogeochemical parameters have typically been implicitly based on a single VSF shape, although we know VSF shape varies.

Objective: Assess the effect of varying VSF shape on semi-analytical algorithms with a modeling effort that uses high quality data sets that include the VSF, collected from a wide range of water types.

Result: Parameterized uncertainties associated with natural VSF variability in retrievals of leading algorithms and new VSF-containing algorithms.





MASCOT

Approach

1) Analysis of shape variability for S11 and S12

- 18 global locations, +1M samples

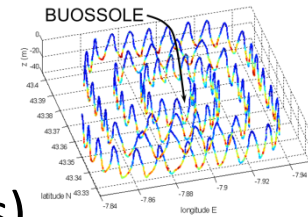
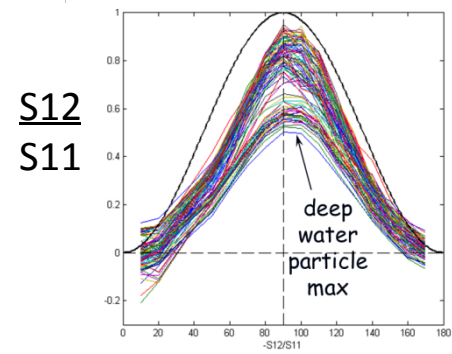
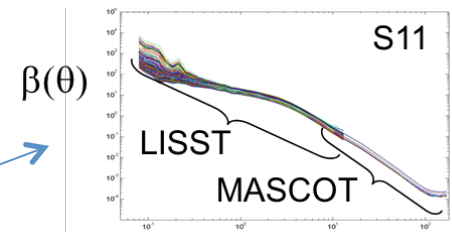
2) Rework AOP-IOP relationships that explicitly contain VSF shape into functional algorithms

- Zaneveld 1995; Jerlov 1976 $\frac{L_u}{E_{0d}} = \frac{\beta(\pi - \theta_z)}{a(1 + \bar{\mu}_\infty^{-1}) + b_b - 0.05b_f}$
- VSF shapes could be informed by polarimeter or selected from ancillary information or previous patterns (i.e., see 1)

3) Assess uncertainties in high quality data sets with closure analyses

- 3 cruises in NY Bight from 2007-2009 (rad: Hooker)
- MOBY site in 2007 (rad: McClain, Lewis, Voss, Trees)
- BUOSSOLE site in 2008 (rad: McClain, Lewis, Voss, Trees)

4) Assess uncertainties in leading semi-analytical algorithms and explicit VSF-containing algorithms with high quality data



Near term “to do”

- Reprocess highest quality data sets *using most up-to-date protocols* (see Sullivan and Twardowski...)
- Rework and invert Zaneveld (1995), Jerlov (1976)
- Start VSF shape analysis

Mid term “to do”

- Hydrolight modeling to assess closure and associated uncertainties in high quality data sets (postdoc...)



Synergies

- Zhang et al. project investigating VSF – biogeochemical linkages
- Projects assessing performance of current algorithms in the context of PACE
- Sullivan and Twardowski project improving uncertainties in IOP measurements

Thank You 