Bio-Optical Algorithms Working Group

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Topics

- **NASA FY02 Improved Algorithm Metric: C. Trees**
- **Southern Ocean Chlorophyll Algorithms: G. Mitchell**
- **Spectral Band-Pass Effects on Chlorophyll Estimates: S. Bailey & J.Werdell**
- **F/Q Bidirectionality of Ocean Reflectance (Case I,II): A. Morel**

- **Reaching the Goal of +- 35% Satellite Chlorophyll Retrieval Accuracy**
- **Improved Chlorophyll *a* Algorithm**
- **CDOM, TSS**
- **Matchup Validation of products other than Chl: CDOM**

- **Other Topics that Surfaced during Workshop Discussions:**
  - **Radiometer Self-Shading Correction (in absorption vs. scattering-dominated waters)**

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- **NASA FY02 Improved Algorithm Metric: C. Trees**
  - **Need algorithms for organic carbon-related constituents in support of Global Carbon initiatives**
  - **Algorithms for identifying functional phytoplankton Groups**

- **Southern Ocean Chlorophyll Algorithms: G. Mitchell**
  - **Southern Ocean ~ 25% of Global Ocean ...**
  - **SeaWiFS operational chlorophyll algorithm is presently underestimating a large fraction of this region by as much as a factor of 2**
  - **Explanation: Real Bio-Optical Variability (Sub-regional differences in chlorophyll-specific absorption and chlorophyll-specific backscattering)**
  - **If we use specific regional algorithms … "how do we blend across domains without drawing a line in the sea"**

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- **Spectral Band-Pass Effects on Chlorophyll Estimates: S. Bailey & J.Werdell**
  - **Recommendation: Use the Morel-Maritorena 2001 model instead of the Gordon et al. 1988 for out-of-band correction of SeaWiFS nLw's to approximate nLw from in-water radiometers used in bio-optical chlorophyll algorithms**
  - **Recommendation: SIMBIOS Project will show consequences of this change in out-of-band correction method on chlorophyll retrievals (expect that estimated chlorophyll concentrations will decrease in oligotrophic waters, relative to Repro#3 results).**
- **F/Q Bidirectionality of Ocean Reflectance: A. Morel**
  - **New BRDF (f/Q) Tables are available**
  - **Most of the updates result from the use of Morel-Maritorena 2001 model, a new particle phase function, and the inclusion of Raman scattering**
  - **Recommendation: SIMBIOS Project test new BRDF correction with new tables**

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- **Reaching the Goal of +/- 35% Satellite Chlorophyll Retrieval Accuracy**
  - **Presently, +/- 65% for *in situ* chlorophyll vs. OC4 estimates based on *in situ* Rrs. At chlorophyll concentrations < 1 mg/m3 accuracy is +/- 54%.**
  - **The anticipated improvements in SeaWiFS Repro 4 (MOBY re-calibration, spatial smoothing of band 7, etc.) will likely significantly improve the accuracy of chlorophyll retrievals**
  - **Improvements are needed in *in situ* Rrs methods**
  - **Need surface chlorophyll + Rrs + IOP's combination to discern real bio-optical from methodological sources of variability in Rrs-chlorophyll relationships.**
  - **<u>Recommendation</u>: *in situ* data from the clearest waters in the global ocean (near Easter Is.) are required for validation of current chlorophyll estimates based on ocean color sensors. Field campaigns to this area are being proposed (e.g. BIOSOPE).**
- **CDOM, TSS**
  - **We should now initiate matchup validation of products other than Chl, such as CDOM estimates from semi-analytical models.**
- **Other Topics that Surfaced during Workshop Discussions:**
  - **Radiometer Self-Shading Correction (the appropriateness of this correction in scattering-dominated waters)**