

Benthic Reflectance IOCCG Report – Chapter ideas

- I. Overview of measurement theory and methods
 - a. Theory
 - i. AOP
 - ii. BRDF
 - b. Field methods
 - c. Laboratory methods
- II. Sediment
 - a. Types
 - b. Wet vs. dry
 - i. New Radiative Theory from Fournier
 - c. Algal films
 - d. Methods
 - i. Uncertainties
 - ii. Best practices
- III. Hard substrate
 - a. Tropical Corals – morphology and 3D aspects summarized.
 - i. Shallow
 - ii. Intermediate
 - b. Cold corals
 - i. Deep sea
 - c. Minerals
 - i. Shallow
 - ii. Deep sea
 - d. Methods
 - i. Uncertainties
 - ii. Best practices
- IV. Canopies and algal mats
 - a. Seagrass
 - i. Different 3D models here described Zimmerman and Hedley
 - b. Kelp
 - c. Macroalgae mats
 - d. Methods
 - i. Uncertainties
 - ii. Best practices
- V. Environmental Influences on Measurements
 - a. Glint and hot-spot effects
 - b. Air-sea Interface and field measurements
 - i. Wave flicker, Wave variability in downwelling measurements,
 - c. Turbidity impacts
 - i. When is it too high to approximate R_B
 - d. Plaque usage above and underwater (bubbles form underwater, etc..)
 - e. Self-Shading
 - f. Interaction with seafloor (creating plumes)

- g. Best practices
- VI. Representation of benthic reflectance in models:
 - a. Use of “ideal” endmember in a model
 - i. pores, shadows, detritus, films, etc.. –
 - ii. spectral dependence
 - iii. Impact of “ideal” on inversion models
 - 1. bathymetry
 - 2. water-column IOPS – e.g., particulate backscattering (TSM) retrievals
 - b. 3-Dimensionality of corals
 - i. Shading and Solar Zenith Angle and Shading Influences
 - c. Representing BRDF
 - i. When is it important and when is it not.
 - d. Scaling up from point to pixel
 - e. Recommended practices
- VII. Endmember Libraries and Metadata Requirements
 - a. Data formats and Identification (CMECS)
 - b. Standardized metadata required
 - c. Environmental Field Template
 - i. Minimum
 - ii. Ideal
 - d. Database template
 - i. SeaBASS templates (CMECS)
 - ii. Specchio
- VIII. Measurements with New Technology
 - a. Fluid Lensing
 - b. Kayaks
 - c. Drones
 - d. Submersibles
 - e. High resolution satellites