Monday, October 8
Poster Session 1
16:00–18:00

Poster 244

TINDER FOR THE OCEAN: AN INTUITIVE, SIMPLE, AND EFFECTIVE SPECTRAL MATCHING ALGORITHM FOR OCEAN COLOR

The optical classification of ocean/lake water using the full spectrum of remote sensing reflectance (RRS) can be used to optimally quantify and visualize how similar water bodies are related across time and space in terms of optical properties. Unfortunately, many spectral classification techniques applied to ocean color RRS (e.g. PCA, EOF, hierarchical clusters, fuzzy c-means, etc.) yield dimensionless modes or regionally specific results which 1) require the user to build relationships with large training datasets, and 2) are challenging to interpret without some a priori knowledge of the data. Here, we propose methodology to employ a universal, unsupervised classification system by which to summarize RRS data with a quantitative and mappable output. The simple weighted average of the RRS wavelengths, constrained by the relative intensity of each channel, outputs an Apparent Visible Wavelength (in units of nm). This tool is a simple and robust way for users to visualize and quantify trends in spectral RRS in terms of its apparent dominant color, which, inherently relates to a specific spectral shape and a unique combination of absorption and scattering properties. We statistically quantify errors and correlations on a global scale, over multi- and hyper-spectral datasets, and further demonstrate its utility in spatio-temporal analyses (e.g. where on the globe are changes in RRS spectral shape occurring and exactly how is it changing?). The simplicity of the algorithm demonstrates a potential utility for enhancing water-type classifications, semi-analytical inversions, decision-trees, functional type distinction, algorithm blending, quality control checks, as well as empirical algorithm development.

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