

OCEAN OPTICS XXIV

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Wednesday, October 10

Poster Session 3

16:00–18:00

Poster 51

COASTAL AND INLAND WATER PIXELS EXTRACTION ALGORITHM (WIPE) FROM HIGH SPATIAL RESOLUTION OPTICAL SENSORS OLI/LANDSAT 8 AND MSI/SENTINEL-2

Identification of water pixels over natural water bodies is a prerequisite step prior to applying algorithms dedicated to estimation of bio-optical properties of surface waters from spatial remote sensing observations. This is particularly important for high spatial resolution observations such as those delivered by OLI on Landsat-8 or MSI on Sentinel-2. In the frame of this study, we developed a two-step algorithm (referred to as WiPE) dedicated to the extraction of water pixels for OLI and MSI. In contrast to other approaches based on the top of atmosphere (TOA) reflectance, this algorithm uses the Rayleigh corrected TOA reflectance, $\rho_{rc}(\lambda)$, as input parameter allowing the spectral signature of each object to be better characterized. The first step, based on the $\rho_{rc}(\lambda)$ spectral shape analysis of each object, allows water pixels to be discriminated from clouds, vegetation, barren land, and constructions. The second step, in which the $\rho_{rc}(\lambda)$ spectra are transferred into the Hue-Saturation-Value space, greatly improves the detection of cloud shadow over waters. This second step, based on the processing of the whole image, does not require any knowledge on the position and altitude of clouds. This algorithm has been successfully tested for OLI and MSI images collected over a broad range of aquatic environments. WiPE, specifically designed for the extraction of water pixels, generally shows better performance over turbid waters than the standard algorithm (Fmask).

Dat Dinh, Space Technology Institute, dndat.gis@gmail.com

Loisel Hubert, ULCO, Hubert.Loisel@univ-littoral.fr

duforet lucile, ULCO, lucile.duforet@univ-littoral.fr