Thursday, October 11
Poster Session 4
10:30–12:00

Poster 132

REMOTE SENSING OF RIVERINE SURFACE REFLECTANCE WITH SENTINEL-2A AND LANDSAT-8 IMAGERY IN GOOGLE EARTH ENGINE

Atmospheric correction remains a major source of uncertainty in the retrieval of inland water properties from space. While increasing radiometric and spatial sensor resolution allows us to observe the earth at even finer spatial and temporal scales, the fidelity of surface reflectance retrievals over rivers remains mainly untested. Here we evaluate surface reflectance products derived from NASA's Landsat-8 and ESA's Sentinel-2A satellites. We compare surface reflectance from the Landsat-8 Surface Reflectance Code (LaSRC) to those produced by two aquatic techniques: SeaDAS and ACOLITE. Using Google Earth Engine for analysis, we then validate remote sensing reflectance and consequent chlorophyll-a and turbidity estimates using field data collected over two major global rivers: the Columbia and the Amazon. For sites where radiometric data was available, both terrestrial and aquatic approaches show strong correlations with in situ measurements. LaSRC produced a brighter spectra than aquatic methods with an average bias across sensors of 0.009 sr^{-1} . That gap was almost 75% larger for Sentinel-2 spectra, where the average difference was 0.02 sr^{-1} compared to the 0.004 sr^{-1} difference observed in Landsat-8. Both terrestrial and aquatic methods were able to estimate surface reflectance within <15% mean absolute percent difference of field measurements. While satellite surface reflectance showed a strong correlation with field measurements in most cases with mean absolute percent errors ranging from 1.6 - 13%, uncertainties for bio-optical algorithms were higher (15 - 30%), suggesting more work needs to be done constraining uncertainties in Rrs estimates and bio-optical algorithm products in rivers.

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