

Avi Putri Pertiwi, German Aerospace Center (DLR), Germany, ***Coastal turbid zone detection using Sentinel-2 imageries on Google Earth Engine cloud platform.*** Co-Authors: Dimosthenis Traganos and Chengfa Benjamin Lee, German Aerospace Center (DLR), Germany

The lack of clarity in turbid coastal waters interferes with the light attenuation and hinders remotely-sensed studies in aquatic ecology such as coastal habitat and bathymetry mapping. Turbid water column corrections can be applied on areas with seasonal turbidity by performing multi-temporal analysis, however, on regions where the water is constantly turbid—or only shows subtle changes in turbidity variation through time—different approaches are needed. This study aims to extract these turbid zones on optically shallow coastal waters that can be used to improve the aforementioned studies. We selected the Guinea-Bissau, Tunisia, and west Madagascar coastlines as our study areas and applied three different methods for the turbid zone detection: Otsu's method, linear spectral unmixing, and Random Forest supervised classification on Google Earth Engine as an end-to-end process. Based on our experiments, the Random Forest supervised classification works relatively well on all study regions with good overall accuracies (ranging from 88-06%) and F1-scores (0.87-0.96). However, turbid zone detection is highly site-specific as it mainly depends on the materials of the suspended materials as well as the environmental characteristics of the site. This experiment can be performed hand-in-hand with other aquatic remote sensing studies—where one can mask out the turbid zone and focus the work on the clear water regions—as well as for studies in ecology, and for decision makers to decide on focus area to rehabilitate the water quality, as it enables incentives for conservation, restoration, and carbon crediting of stable benthic habitats.