Wednesday, October 10
Poster Session 3
16:00–18:00

Poster 159

CAPTURING COASTAL WATER CLARITY VARIABILITY WITH LANDSAT 8 AND CITIZEN SCIENCE

Coastal water clarity changes on varying temporal and spatial scales due to fluctuating weather and climate patterns and increasing human activity along coastlines. Systematic observations are required to assess how aquatic habitats will be impacted by dynamic coastal water clarity changes. This study combines Secchi disk depths (ZSD) collected by Massachusetts Water Resources Authority, Buzzards Bay Coalition, Provincetown Coastal Center for Studies, and the Narragansett Bay Commission citizen scientists with Landsat 8 (L8) derived ZSD to locally validate Lee et al. (2016) L8 ZSD algorithm for Boston Harbor (MA, US), Buzzards Bay (MA, US), Cape Cod Bay (MA, US), and Narragansett Bay (RI, US). From 2013-2016, 37 clear sky L8 images were selected and 13 of the 37 L8 images occurred on days when citizen scientists measured ZSD. The same day validation provided good agreement for Buzzards Bay (N = 25, RMSE = 1.03 m, R^2 = 0.65) and Cape Cod Bay (N = 15, RMSE = 0.94 m, R^2 = 0.71). Poor agreement was found for Boston Harbor (N = 45, RMSE = 1.38 m, R^2 = 0.01) and not enough same day matchups were found for Narragansett Bay. The good agreement for Boston Harbor and Cape Cod Bay allowed for the applicaiton of the ZSD algorithm to L8 images to create high spatial water clarity maps. The validation and creation of water clarity maps exhibits how citizen scientist and L8 measurements can be used in tandem to capture spatio-temporal changes in water clarity.

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