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Near-shore shallow water algal bloom mapping using Remote sensing tools: Challenges and opportunities

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Algal blooms in coastal water bodies are highly linked to in-land processes and delivery of nutrients by rivers and streams emptying to the vulnerable coastal areas. In-situ instrumentation has been instrumental in some areas to document the extent, seasonality and level of eutrophication. But these data are sporadic lacking the desired spatiotemporal coverages for in-depth understanding of the dynamics and linkage to the in-land process, land use/land cover change and watershed management. Remote sensing tools have proven to be useful to document the large scale mapping of algal blooms and model Chlorophyll-a using reflectance data from these sensors. One of the challenges of this approach in shallow waters is the noise due to the bottom reflectance from submerged aquatic vegetation and detritus and dissolved organic materials. In this paper, the use of Landsat, MoDIS and SeaWIFS sensors in estimating near-shore Chl-a is discussed. The challenge of bottom reflectance and improvement to discriminate the effect is also presented. The results will show cases studies for freshwater lake (Lake Okeechobee) and coastal marine environment (Florida Bay).

Key words: Algal blooms; Remote sensing; Coastal waters; Lake Okeechobee