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Journal of Remote Sensing & GIS

Editorial

# Recent Advancements in Remote Sensing and GIS

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## EDITORIAL

Remote sensing may be a critical tool for the observation of those systems on commensurate spatial scales. This Research Topic looks at coastal applications of remote sensing for research project and applications, along with side the challenges related to acquiring and using these data. This non-exhaustively includes observations of water column constituents (e.g., phytoplankton pigments, species composition, suspended organic and inorganic particles); sea surface temperature (SST) and sea surface height (SSH); watershed evapotranspiration, soil moisture, and land cover/land use; wetland emergent vegetation, submerged aquatic vegetation, and coral reefs. Existing and planned remote sensing instruments, with a spread of spectral, spatial, temporal, and radiometric ranges and determination, are offering new views on coastal systems. Articles during this Topic explore the newest interdisciplinary research, and consider how this technology can guide future development and utilization of coastal aquatic remote sensing resources (in situ, airborne, and satellite) and better inform public policy.

Use of high resolution remote sensing to: monitor, model, and optimize water and nutrient use efficiencies; diagnose within-field variations in surface characteristics and vegetation function on a routine basis; optimize crop production via spatially explicit management practices

Evaluation and integration of proximal sensors for spatial irrigation and fertility management

Synergistic cross-platform (e.g., geostationary, polar-orbiting, unmanned aerial vehicles) approaches to reinforce monitoring capacity, spatiotemporal resolution, and retrieval robustness from field to continental scales

Integration of remote sensing, process modeling, and machine learning to advance agricultural monitoring and management

Monitoring and management of climate induced impacts on crop functioning and yield

Integration of short-term climate projections or meteorology for improved crop yield monitoring and prediction

Integrated cloud-based agricultural monitoring systems to deliver informed decision support, early warning and directed location-specific management in near real-time.

Some of the innovative research topics by the Eminent author in our Journal is

Hameid et al, describes the Accuracy Assessment of Spatial Interpolation Methods to Derives DEMs of Small Islands with Relative Topographic Variations which explains about the responding to Climate Change in Small Island Developing States (SIDS), accurate Digital Elevation Model (DEM) can support the ocean level Rise (SLR) scenarios and sequenceit is impacts on coastal zone for correct adaptation. The DEM accuracy may vary to a particular degree following different interpolation algorithms and therefore the data acquisition method. Indeed, numerous mathematical interpolation methods have been developed on spatial interpolation for topographic information densification and DEM restitution. The aim of this study focuses on the accuracy assessment of high spatial resolution DEM (at 2.5 m pixel size) regenerated from high topographic contour lines map at scale of 1:5,000 applying four different interpolation algorithms. Three deterministic methods were considered including the IDW with variable and fixed parameters, the Spline with regular and tension conditions, and the Natural Neighbor. While, for stochastic methods, the ordinary and simple Kriging were analyzed according to the semi-variogram adjustment considering five mathematical functions: Stable, Circular, Spherical, Exponential and Gaussian. For validation purposes, a datasets of 400 ground control points (GCPs) uniformly distributed over the study site, to cover all the existing altitude classes, were used. These were measured using Differential Global Position System (DGPS) with ± 1 cm and ± 2 cm for planimetric and altimetric accuracies, respectively. The results obtained show that ordinary and simple kriging methods, based on the exponential function, achieved a similar DEMs restitution with the best RMSE (± 0.65 m), which proved to be less than the tolerance or the total deviation (± 0.78 m). Consequently, these two Kriging methods are more accurate for DEM production for small island applications such as the evaluation of coastal zones vulnerability

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**Received:** July 15, 2020; **Accepted:** July 29, 2020; **Published:** August 05, 2020

**Citation:** Li S (2020) Recent Advancements in Remote Sensing and GIS. J Remote Sens GIS. 9:e113. DOI: 10.35248/2469-4134.20.9.e113

to SLR, flooding, detection of topographic features and hydrological modeling.