conferenceseries.com

World Congress on

GIS & Remote Sensing

August 01-03, 2016 New Orleans, Louisiana, USA

From field measurements to synoptic mapping: Upscaling coral reef structural complexity using close-range digital photogrammetry and satellite imagery

Javier Leon University of the Sunshine Coast, Australia

Our understanding of Earth surface processes is rapidly advancing as geospatial technologies such as close-range digital photogrammetry become more accessible and affordable. Coral reef habitat structural complexity influences key physical and ecological processes, ecosystem biodiversity, and resilience. However, measuring structural complexity underwater is not trivial and researchers have been searching for accurate and cost-effective methods that can be applied across spatial extents for over 50 years. Here, we present and discuss the advantages and limitations of a readily available and cost-effective method for measuring coral reef habitat structure using close-range digital photogrammetry. Ultra-high spatial resolution digital terrain model (DTM) and orthophoto mosaics (mm scale) were produced using consumer grade digital cameras and off-the-shelf 'Structure-from-Motion' (SfM) algorithms. Areas of approximately 200 m2 were surveyed across two shallow coral reef flats in the Great Barrier Reef, Australia. The precise terrain data were used to calculate spatially-explicit structural complexity maps which were then used to upscale measurements across habitat zones using unmanned aerial vehicle-derived and satellite-borne imagery. The proposed methodology and results were deemed highly appropriate for data collection, processing and analysis workflows to generate very-high spatial resolution DTMs, orthophoto mosaics and structural complexity maps of shallow and energetic coral reefs.

jleon@usc.edu.au

The application of the GIS and IDW interpolator on the evaluation of environmental impacts on different matrixes and regions

Renata Coura Borges Instituto Nacional de Tecnologia, Brazil

The Geographic Information Systems (GIS) are powerful computational tools, which allow the performance of complex analysis by integrating data from multiple sources and creating geo-referenced databases. Due to its wide range of applications, including topics such as agriculture, forestry, environment, cartography, urban registers, among others. There are at least three major ways to use GIS: as a tool for map production; as support for phenomena spatial analysis; and as a geographic database. The method of Inverse Distance Weighting interpolation (IDW) estimates the values of unsampled points by averaging the values of surrounding sampled points. This study aims to show the GIS application capacity on the environmental field through the use of IDW interpolation, the spatial distribution of lead (Pb) and nickel (Ni) in of Cunha Canal Watershed and West of Guanabara Bay-RJ, by building thematic maps for identification of the possible leach of rare earth elements on the phosphogypsum stacks in Imbituba-SC and also provide radionuclide distribution in soils maps of Fundão Island-RJ. Specific analytical techniques were used, Guanabara Bay was analyzed with the Optical Emission Spectrometry with Inductively Coupled Plasma; Imbituba and Fundão Island were analyzed with Gama Spectrometry. Using the IDW and GIS, high efficiency maps were generated to clearly inform the contamination which occurred in different evaluated areas of study in this work.

renatacouraborges@hotmail.com