Put here the article(s) you submitted as deliverable(s) of Alcantara

Remote Sens. **2014**, *6*, 1-x manuscripts; doi:10.3390/rs60x000x

remote sensing

ISSN 2072-4292

www.mdpi.com/journal/remotesensing

Article

Assessing the accuracy of algorithms to determine the extent of aquatic plants: NDVI slicing vs. Spectral unmixing

Elijah K Cheruiyot [1,2,*], Collins Mito [2], Massimo Menenti [1], Ben Gorte [1], Roderik Koenders [1] and Nadia Akdim [1]

[1] Department of Geoscience and Remote Sensing, Delft University of Technology, P.O. Box 5048, 2600 GA Delft, The Netherlands; M.Menenti@tudelft.nl; B.G.H.Gorte@tudelft.nl; roderikk@gmail.com; nadia.akdim@yahoo.fr.

[2] Department of Physics, University of Nairobi, P.O. Box 30197, 00100 Nairobi, Kenya; ekcheru@gmail.com; collins@uonbi.ac.ke

* Author to whom correspondence should be addressed; ekcheru@gmail.com; Tel. / Fax: +254 20 4442067 / 4449902.

Received: / Accepted: / Published:

Abstract: Changes in the status of aquatic vegetation in inland waters occur rapidly and requires satellite data with large swath and high acquisition frequency to monitor it. This kind of data is often associated with low spatial and spectral resolution. Occasionally, high resolution data is required to assess the quality of aquatic vegetation map products obtained with low resolution data. In this paper, we evaluate the classification quality of vegetation density maps obtained with low resolution MERIS data (300 m) using two mapping methods; on the one hand Normalized Difference Vegetation Index (NDVI) empirically scaled to three levels, and on the other hand Linear Spectral Unmixing (LSU). We use as reference the classification results obtained with a higher resolution Landsat-7 ETM+ data (30 m), acquired almost simultaneously with MERIS. Scaled NDVI reports better classification performance with a binary classified reference (83.4%), than with a scaled NDVI reference (74%). On the other hand LSU reports lower performance with binary classified reference (RMSE = 0.31), than with reference obtained with LSU (RMSE = 0.11). When a higher resolution image is used as reference, its treatment is crucial to the interpretation of reported accuracies.

Keywords: accuracy assessment; spectral unmixing; scaled NDVI; aquatic vegetation; MERIS; Landsat; Lake Victoria