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Interactive comment on "Application of remote sensing and GIS for detection of long-term mangrove shoreline changes in Ca Mau, Vietnam" *by* V. Tran Thi et al.

Anonymous Referee #2

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un párrafo o sección de la evaluación sobre la calidad general del documento de debate ("observaciones generales")

This study is interesting in a local, regional and global scale. Their goals are fully achievable with the tools and programs for aerophotogrammetry (Landsat, DSAS version 4.2), the statistics performed as well as the applied time series. The results are explained through the analysis of the origin of sediments and the causes of the erosion. However, because of the large variations found in the geomorphology, it could be convenient to deepen on how these results could be useful for the management of the Vietnamese coastal resources. For the treatment of these large variations as management tools one could think in treating each litoral segment separately. The authors

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list techniques that are variations of the linear and nonlinear modeling. For instance, although it may be truth that Otsu (1979) methods remains one of the most cited for thresholding, several better can be found and the authors might have tested some of them. However, admittedly, the results would not change substantially. The number of transects (1129) and the distances between them are suitable, as well as the periods to assess geomorphological changes, and the calculations and layout of the coastal baseline for reference. The inventory and study of the current social reality were built based on surveys of aged people, experienced in the region who knew firsthand the changes studied. The authors acknowledge as an added value of their research that the specific history of the study area makes it difficult to compare their mangrove ecosystems with others elsewhere. It is undisputed that each site has its own characteristics, and that of Vietnam stand out. However, this claim is not without exaggeration and, since the conclusions are not very far from those of Alatorre et al. (2011), Berlanga-Robles & Ruiz-Luna (2011), Chen et al. (2013), Giri et al. (2011), Heumann (2011), Kovacs et al. (2011), Kuenzer et al. (2011), Nascimento et al. (2013), Péron et al. (2013), among others, the contrast could increase the added value of the results. The destruction of mangroves by misguided social problems (e. g. "over-capacity in aquaculture and capture fisheries") certainly need to be addressed, but attempts to manage mangrove ecosystems that are frustrated by policy, legislative and regulatory complexity, confusion, contradiction and conflict are common to many developing countries. The commentary on the Vietnamese institutions that manage mangroves is interesting and should be read and studied by all their bureaucrats. The same authors has published a paper with a slightly modified title (Tran Thi, V., Phan Nguyen, H., Dahdouh-Guebas, F., & Koedam, N. (2012). Application of remote sensing and GIS for detection and prediction of long-term seaward mangrove changes in Ca Mau, Vietnam. VLIZ Special Publication, 57, 180) and the research group has -at least- another paper on the very same topic (Tran Thi, V., Minh, T. L., Van Dam, T., Dahdouh-Guebas, F., & Koedam, N. (2012). Evolution of mangrove area in a war and land use change affected region of Vietnam (Ca Mau) over a 60 year period. VLIZ Special Publication,55, 84). The title

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is clear, it helps to determine the importance of the manuscript as a relevant tool for the research and management of coastal resources in other latitudes. The abstract clearly shows the importance of research , methods and the used tools, as well as the most telling results of the erosion and accretion processes along the Ca Mau coast, Vietnam. It is a scientific and relevant document that combines efforts to collect, process and analyze digital and field information for reading the litoral changes for an extended period. The multitemporal analysis of natural and anthropogenic changes affecting the mangrove forests and the management of digital information are appropriate, although atmospheric corrections of images could reduce noise. Although not clear enough in the text, one can presume that the authors considered very well how to manage the procedures and tests the different resolutions and the availability of one or more images for several parts of the coastline (Table 3). The authors determined the changes in the Ca Mau coast over time, caused by coastal erosion and accretion, which may be important to make decisions for conservation and recovery of coastal ecosystems. Clearly all calculations made of the variables considered are relevant for reading the coastal dynamic and for the implications of anthropic interventions and natural phenomena during the evaluation period and for the future. As for the references, although it is true that the number is often limited by every journal, the authors may consider -as noted above- revisiting and incorporating some of the following papers: Alatorre, L. C., Sánchez-Andrés, R., Cirujano, S., Beguería, S., & Sánchez-Carrillo, S. (2011). Identification of mangrove areas by remote sensing: The roc curve technique applied to the northwestern mexico coastal zone using landsat imagery. Remote Sensing, 3(8), 1568-1583. Berlanga-Robles, C. A., & Ruiz-Luna, A. (2011). Integrating remote sensing techniques, geographical information systems (GIS), and stochastic models for monitoring land use and land cover (LULC) changes in the northern coastal region of Nayarit, Mexico. GIScience & Remote Sensing, 48(2), 245-263. Chen, C. F., Son, N. T., Chang, N. B., Chen, C. R., Chang, L. Y., Valdez, M., ... & Aceituno, J. L. (2013). Multi-Decadal Mangrove Forest Change Detection and Prediction in Honduras, Central America, with Landsat Imagery and a Markov Chain Model. Remote Sensing,

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5(12), 6408-6426. Giri, C., Long, J., & Tieszen, L. (2011). Mapping and monitoring Louisiana's mangroves in the aftermath of the 2010 Gulf of Mexico oil spill. Journal of Coastal Research, 27(6), 1059-1064.Ha, T. T. P., & van Dijk, H. (2013). Fishery livelihoods and (non-) compliance with fishery regulationsâĂŤA case study in Ca Mau Province, Mekong Delta, Viet Nam. Marine Policy, 38, 417-427. Ha, T. T. P., van Dijk, H., & Visser, L. (2014). Impacts of changes in mangrove forest management practices on forest accessibility and livelihood: A case study in mangrove-shrimp farming system in Ca Mau Province, Mekong Delta, Vietnam. Land Use Policy, 36, 89-101. Ha, T. T. P., van Dijk, H., Bosma, R., & Sinh, L. X. (2013). Livelihood capabilities and pathways of shrimp farmers in the Mekong Delta, Vietnam. Aquaculture Economics & Management, 17(1), 1-30. Ha, T. T. T., Bush, S. R., Mol, A. P., & van Dijk, H. (2012). Organic coasts? Regulatory challenges of certifying integrated shrimp–mangrove production systems in Vietnam. Journal of Rural Studies, 28(4), 631-639. Ha, T. T. T., van Dijk, H., & Bush, S. R. (2012). Mangrove conservation or shrimp farmer's livelihood? The devolution of forest management and benefit sharing in the Mekong Delta, Vietnam. Ocean & Coastal Management, 69, 185-193. Heumann, B. W. (2011). Satellite remote sensing of mangrove forests: Recent advances and future opportunities. Progress in Physical Geography, 35(1), 87-108. Kovacs, J. M., Liu, Y., Zhang, C., Flores-Verdugo, F., & de Santiago, F. F. (2011). A field based statistical approach for validating a remotely sensed mangrove forest classification scheme. Wetlands Ecology and Management,19(5), 409-421. Kuenzer, C., Bluemel, A., Gebhardt, S., Quoc, T. V., & Dech, S. (2011). Remote sensing of mangrove ecosystems: A review. Remote Sensing, 3(5), 878-928. Nascimento Jr, W. R., Souza-Filho, P. W. M., Proisy, C., Lucas, R. M., & Rosenqvist, A. (2013). Mapping changes in the largest continuous Amazonian mangrove belt using object-based classification of multisensor satellite imagery. Estuarine, Coastal and Shelf Science, 117, 83-93. Péron, C., Chatelet, A., Gensac, E., & Gardel, A. (2013). Mud bank migration from remote sensing and bathymetric data: The example of the Kourou River Estuary, French Guiana, South America. Journal of Coastal Research, 65, 558-563. P. 20048 (l 14). The high level of erosion (33,24 m yr-

1) calls attention. P 20052 (l 5). The authors use ArcGis 9.3, but today a 10.2 version is available which might be easier to use, offer better analysis capabilities and allow finer comparison with other groups results. P. 20052 (l 12-14). This methodology seems to be good for not overestimate vegetation cover. p. 20059. (l 6-7). The explanation of the results (in terms of erosion in some places and sedimentation in others) is clear and satisfactory.

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