Using spatial analysis of marine habitats to inform conservation planning in Pate Island - Kiunga seascape

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Mapping is widely used to showcase the current status and changes in the indicator variable overtime and facilitate decision-making process. In this study spatial analysis was applied to identify priority sites experiencing significant changes in marine habitats to inform management intervention and conservation planning. Using data available from previous coral reef surveys conducted between 1999-2008 in Pate Island - Kiunga seascape, we used categorical indicator values on coral reef habitats to identify sites that required management or conservation intervention. The change in the indicator value was weighed and ranked based on expertise opinion and the summarized data exported to a geographical information system (GIS) platform (ArcMap 10.3) for a weighted overlay analysis. A degradation heat map was then produced for each sites based on the overall weight and the output layer superimposed on Kenya administrative and conservation boundary for spatial interpretation and identification of sites warranting management intervention. The spatial analysis of coral cover and algae at 15 sites indicated an increase in coral cover in six sites and a significant loss at three sites. There was a dynamic increase of algal cover in all sites. One site (Chole) emerged as a site with healthy conditions showing high coral cover and low algal cover thus recommended for conservation. Sites requiring monitoring intervention were concentrated in the northern part of Kiunga and priority was recommended for establishment of additional monitoring sites in the southern parts of Pate Island. Spatial and temporal analysis of mangrove using remote sensing data also indicated a decline in mangrove cover over the last two decades (1995-2014).