Assessment of changes in the seagrass-dominated submerged vegetation of tropical Chwaka Bay (Zanzibar) using satellite remote sensing

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Abstract

Spatial and temporal dynamics of submerged aquatic vegetation (SAV) cover were studied in the relatively pristine and seagrass-dominated area of Chwaka Bay, Zanzibar (Tanzania) by using satellite remote sensing. Through complementary field work the potential of the technique for change detection was verified. The general changes in SAV cover were examined using Landsat images from 1986, 1987, 1998, 2001 and 2003. Two of these images, from 1987 (Landsat TM) and 2003 (Landsat ETM+), were specifically analysed to create a map of the change in SAV cover. Overall, the general distribution of SAV stayed fairly stable over the period investigated, but the result also showed regions where significant alterations, both losses and gains, had occurred between the two years. Based on our findings and anecdotal information from local fishermen and seaweed farmers potential causative factors are discussed. It was concluded that a repeated mapping with satellite remote sensing is a suitable tool to monitor changes of seagrass and seaweed distribution in shallow tropical environments.

Keywords: Vegetation changes; Seagrass; Satellite Remote Sensing; Landsat; Chwaka Bay; Zanzibar; East African region