Effect of artificial structures on shoreline profile of Selingan Island, Sandakan, Sabah, Malaysia

ABSTRACT

Selingan Island off Sandakan, Sabah is a famous turtle nesting ground and a part of the Turtle Islands Park (TIP) within the Coral Triangle region of Malaysia. This small island faces the serious problem of beach erosion that is reducing the turtle nesting area. Sabah Parks deployed stone revetments in 2005, followed by placement of reef balls at the southern part of the Selingan Island in 2007 for protecting the shoreline. The objective of this study was to determine the effectiveness of these measures for shoreline protection. Shoreline changes were determined from satellite images, beach profiling and field observations. Satellite images from 2010 to 2016 were obtained from Google Earth Pro analyzed to examine the changes in the shape and size of the island with QGIS software. Beach profiling was performed in December 2017 at three sites and compared with the condition in 2011. The findings indicated that the shape of the island was squeezed towards the east where the reef balls were located. The size of the island has not changed much in 9 years after the deployment of the reef balls, but a high volume of sediments accumulated at the south due to the presence of shoreline protection. Generally, the man-made structures in Selingan Island are effective in trapping the sediment and providing more nesting area for turtles. It is recommended that the shoreline dynamics of the island should be regularly monitored for better understanding of the changes and taking appropriate actions.