UNIVERSITI TEKNOLOGI MARA

SHORELINE CHANGE ANALYSIS USING GEOSPATIAL APPROACH AT TOK JEMBAL BEACH, KUALA TERENGGANU, TERENGGANU

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ABSTRACT

The coastline is the boundary between sea water and land where it constantly changes dynamically and interact with each other, usually caused by erosion and accretion events. Coastal areas also one of the most crucial and important area in each country. Kuala Terengganu is one area which was subjected to the critical erosion. Erosion's problem in Malaysia is due to the dynamic process, change in sea level and human activities. Therefore, it is necessary to monitor shoreline of Kuala Terengganu. Remote sensing data and GIS software will be very useful tools to analyse, visualize and map a change of shoreline. The objectives of this research are: 1) To detect the change pf shoreline at Tok Jembal beach between year 2016 and 2021 by using Landsat 8 imagery; 2) To define the rate changes of the shoreline at study area using the DSAS method; and 3) To produce the shoreline change map for year 2016 to 2021 for the study area by using ArcGIS. This study was intended about the shoreline changes analysis at Tok Jembal beach shoreline by using satellite imagery data and geospatial techniques to determine the rates of shoreline changes and to produce the map of shoreline changes at the study area. Digital image which is Landsat 8 OLI between year 2016 and 2021 will be used in this study for the statistical measurement by DSAS to estimate the rate of changes on Tok Jembal beach. ArcGIS extension which is Digital Shoreline Analysis System (DSAS) will be used to calculate the shoreline changes. The results of average EPR in 2016-2021, the average erosion value was -5.28 m/year and the average of accretion value was 12.35 m/year. Identification results from 2016 to 2021 Tok Jembal coastline experienced more accretion than erosion.

TABLE OF CONTENT

CHAPTER ONE
INTRODUCTION

1.1 Research Background

Shoreline is well-defined as the line where land and water surface meet at a certain elevation (Selamat et al., 2019). Coastal zones are tremendously important for countries with very populated coastal areas. Thus, there is a fear about future, mainly on the state of their natural resources, which provide life support and chances for commercial growth and tourism (Elnabwy et al., 2020). Malaysia coastal zones are situated between the latitudes 1^{O} and 7^{O} north and longitudes 107^{O} and 119^{O} east. It consists of West Malaysia and the East Malaysia that is separated by the South China Sea with a shoreline length approximately 4,809 km. Peninsular Malaysia is surrounded by the South China Sea on the east and the straits of Malacca on the west with a shoreline length of approximately 2,031 km.

Figure 1.1: Malaysian Coastline. *source:* http://www.water.gov.my/

As stated by Mokhtar et al., (2019), the Malaysian coastline is rich in coastal resources and natural biodiversity. The coastal areas support a significant amount of the population, accounting for over 70% of the total. It is the centre of socioeconomic movement such as urbanization, ports, oil and gas extraction, transportation and communication, fisheries and