



UNIVERSITI TEKNOLOGI MARA

**DETERMINATION OF POTENTIAL AREA AFFECTED BY SEA
LEVEL RISE IN YEAR 2040 USING OPEN SOURCES DATA AND
ALTIMETER AR4 REGRESSION MODEL AT PANTAI CENANG,
LANGKAWI**

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Thesis submitted in fulfilment of requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this thesis/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Sea-level rise (SLR) is one of the major consequences of climate change. Extreme climate change may lead to sea level rise and it cause negative consequences on infrastructures. The studies on this issue are poorly conducted in rural island in west coast of peninsular Malaysia. Thus, the aim of this study is to determine the potentially affected area from sea level rise in 2040 using Landsat 8 OLI, elevation from Google application and Altimeter AR4 regression model at Pantai Cenang Langkawi. Shoreline changes were extracted using combination of threshold histogram and band rationing of Landsat 8-oli were estimated between year 2013 and 2020 along Pantai Cenang. based on the value of erosion and creation gathered, the location of highest erosion value were highlighted to estimate the surface condition using elevations data from google earth during 7 year duration. Based on the altimeter AR4 regression model data gathered, the estimation of sea level rise for year 2020 and 2040 were calculated using IDW interpolation calculation applied by NAHRIM (2010). From the estimation value of sea level rise in 2040, the nearest building on the lowers slope analyst from second objective were categorized as high risk areas to receive the impact of sea level rise in the future. It was found that, there are areas that showed minimal accretion and erosion in some parts of the study area. However, there are also high erosion effects on the certain places. As a result of analysis on the hotspot area's surface conditions, there is a low elevation area with minor range between the highest waterline and the coastline. Moreover, the water surface of Teluk Ewa port is around 5.71 meter which is calculated from MSL datum. Meanwhile the water value of prediction using IDW will be increased around 0.06 meter and 0.17 meter for years 2020 and 2040 respectively. Through the calculation of sea level increases for 2040, the area potentially be affected by the sea level rise in 2040 were approximately around 10,191.93 m². The integration Landsat 8-Oli imageries and Google Earth elevation data can be used for investigation and preliminary studies on shoreline changes detection. By Applying the prediction of sea level rise to shoreline changes map, it help to approximately identify the potential area that will impacted on sea level rise on the future.

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