

# Last Glacial Maximum (LGM) to Present Day Sea Level Change for Sunda Land Based on Geological Research, Tide Gauges and Satellite Data



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The Pleistocene Sunda land since 2.2. Ma has recorded many glacial and inter-glacial sea level cycles. From the LGM to the mid Holocene, sea level rose from about -125 m to about +5 m above present day sea level. After the high stand, this region generally experienced a regression phase which is evident from many regressive tract geomorphologic features visible on coastal areas today.

Past sea level change for Sunda land since LGM is examined from researches done on this subject from a localized study to the generalized Sunda sea level curve. As for present day or modern sea level change, this paper presents the current sea level change trend with the focus on the heterogeneity of sea level change in the Sunda shelf area that implied not just eustatic factor but differential crustal movement (tectonic factor) which further challenge the notion that Sunda shelf has been stable since early Pleistocene.

Tide gauge data of varying data lengths from 26 stations (Figure 1) and satellite altimetry data from Topex/Posidon and Jason mission were analysed using simple

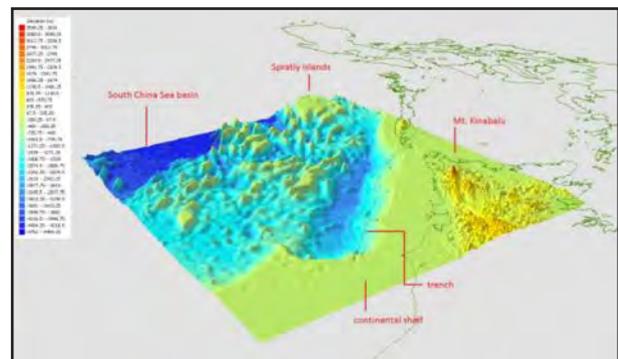
regression after GIA adjustments were made. While a general trend of sea level rise of varying rates could be inferred, several areas indicated sea level drop probably caused by uplifting. However, the use of modern sea level measurements must take into account short term signals such as thermal expansion due to SST changes resulting from ENSO, water density changes, storm surges and hydrodynamics that form part of sea level records.

An interesting point to note from the results is that while North Borneo region (Figure 2) is still experiencing uplifting, its SLR trend is higher than the central part of Sunda land. This could be due to a more active tectonics, sea level change oscillations or hydrodynamics or other reasons worthy of discussions.

The potential impact of present day sea level rise on human is discussed also. Since the advent of mankind and consequent extensive occupation of coastal plains susceptible to the impact of sea level changes, SLR is fast becoming an issue in the light of anthropogenic induced global warming not just globally but also among South East Asian nations.



**Figure 1:** Tide Gauges (Source: adapted from PSMSL, GLOSS, UHSLC and Google Earth).



**Figure 2:** North Borneo DTM (Source: EdlicSathiamurthy & NOAA).