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Impact of the escalated tidal inundation due to land subsidence in a coastal environment

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The most prominent impact of global change is enhanced sea level Rise. This phenomenon attribute to tidal inundation in the coastal area. Besides tidal inundation, a related significant problem to many coastal areas is accelerated land subsidence. Land subsidence is the process by which the level of the ground is lowered from its previous elevation. It can be a result of natural phenomena as well as of man induced factors, or a combination of both. Semarang city, which is situated in Coastal area in Central Java Indonesia, suffering from tidal inundation and facing a land subsidence problem. The rate of subsidence in the city is varying, up to a maximum of 12 cm/yr and it is really make a problem to the population. The objective of the research reported here is to develop a Geographic Information System (GIS) model, based on raster and detail digital elevation model, which could be applied using map-based approach in which tidal inundation risks in combination with land subsidence in urban coastal area calculated. A raster based tidal inundation model has been constructed in the ILWIS GIS software using an iterative procedure. The spreading models have been constructed using scenario 0.25 m, 0.55 m. 0.75 m, 1.00 m, and 1.55 m high of water tidal. Results show that the pre-run modeled can be used to calculate the impact of the inundation on the agriculture, fishpond, build up, and other land use area.

Keyword: raster model, digital elevation model, ILWIS, and iterative process.