Aplication of Geomatic Technology for Land-subsidence Mapping of Semarang Coastal City

Abstract

Several natural phenomena especially at coastal zone that later become natural disaster in our daily life, among others are flooding, high water-tide flood (known locally as "rob"), land slide, mount eruption, tsunami waves and specific natural phenomena that happened at Semarang coastal city was land-subsidence. Aims of the research are field measurement of actual land-subsidence, by means of land height differences by time and built a spatial plot and data base. Field measurement was done with measurement of land height differences by means of land-height differences based 60 Geodetic Land Height positions set by Indonesian Bireau of Land Mapping (Titik Tinggi Geodesi - Bakosurtanal) and private Bench Mark (BM) at Semarang, with its geodetic positions by GPS (Global Positioning System).

Both field and geodetic data collected was then transformed into a numeric series of data to be processed for geostatistic known as Kriging method become a raster layer data, that later used for spatial analysis using ER_Mapper 6.4 (Licensed user) and Arc_GIS software. Geodetic datum used was WGS84 on UTM map projection. Beside the field data that transformed into a arster layer data, a Spaceshuttle Radar for Terrain Model (SRTM) data for contur and 3 dimention analysis and a Landsat_ETM satellite data was also used as value added to the data (metadata).

Based on the analysis of field data measurement and spatial plot revealed that the rate of land-subsidence at Semarang coastal city ranged from 1 – 9 cm/year, widely distributed throughout the city, espescialy at the most densed populated zone. Therefore a remapping and re-evaluation of the City Spatial Planning and Regulations was inevitable.

Key words : land-subsidence, coastal zone,Semarang

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