

Modelling Sea-Level Rise in the Lisbon city coastal area, using Free and Open Source Technologies.

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ABSTRACT

Sea-level rise is a consequence of global warming and is triggered by both, natural and man-made causes. The natural causes are mainly thermal expansion of water and melting of glaciers due to increasing temperatures. Man-made causes are related with the human-induced greenhouse gases, which are intensifying the process. Coastal regions are severely affected by the current tendency of sea-level rise, in the climate change context. These regions have also different land use and land cover, are densely populated, hence are considered particularly vulnerable. Researchers have been developing and working on scenarios regarding how much sea-level will rise and on its implications on coastal areas. This paper takes in consideration different scenarios, based on literature, on sea-level rise in the Portuguese coastal city of Lisbon, and measures the consequences of such impacts in terms of affected area. The modelling for this study is based on maximizing two scenarios regarding the following georeferenced data: i) 2D vector buildings outlines data; ii) Digital Surface Model and Digital Terrain Model, obtained from LiDAR data with a resolution of 1point/m². Then, the focus will be given on the social impacts requiring other sources such as population, from census data. The objective is modelling these scenarios based on a geoprocessing work-flow using the GRASS software environment. The outcomes concerning different scenarios will be made available in open data formats, through WFS (Web Feature Source) on a WebGIS platform.

Key words: *Sea-level Rise, Coastal areas, Hydrological Modelling, GIS, FOSS.*