

Title

Application Geography Information System (GIS) to determine flooding area caused by
sea levels rising in coastal area of Viet Nam
Case study in Quang Ngan commune, Central Viet Nam

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Abstract: Climate change and the impact have being one of the top concerns of all countries worldwide. According to a report by the World Bank (2009), Vietnam is one of the five countries predicted to be among the most affected by climate change due to its long coastlines, the high concentration of population and economic activity in coastal areas, and a heavy reliance on agriculture, natural resources and forestry. According to climate change scenarios officially approved for Vietnam by the Vietnamese Minister of Natural Resource and Environment in June 2006 (MONRE, 2009), the climate in regions throughout the country will change significantly. By the end of the century, average temperatures are projected to increase between 1.9⁰C and 3.6⁰C. While rainfall is said to decrease in the dry season it is expected to increase during the rainy season, leading to a growing risk of floods and water shortages. Sea level is projected to rise between 65 cm to one meter compared to the period 1980 - 1999 (MONRE, 2009). Future sea level rise caused by climate change would disrupt the physical processes, economic activities, and social systems in coastal regions. Based on three scenario of sea level rise which are given by the Vietnamese Minister of Natural Resource and Environment (MONRE, 2009), this paper will use ArcGIS 9.2 and MapInfo software in building Digital Elevation Model-DEM and inundate maps of the research area, estimating and forecast area of land area in coastal area flooded by sea level rise with scenario A1F1 (An emphasis on fossil – intensive or High Emission Scenario) and B1 (Low Emission Scenario) for other temporal milestone.

The results of study reveals that according to the lowest scenario, 63 cm sea level rising in 2100 flooding area is 16.77 hectares in which the total of agricultural land is 3.6 hectares, the forest land is 7.01 hectares, the residence land is 2.7 hectares and the others are 3.46 hectares. Meanwhile, the highest scenario, 94 cm sea level rising in 210 flooding area is 38.00 hectares in which forest land, especially protection forest land will be most severely affected is 17.90 hectares, agricultural land is 8.52 hectares. Coping with climate change, adapt to change scenarios sea level rising needs to apply appropriate measures to improve the production of agricultural land use, distribute crops and animals in the area, suggestion some land use types to adapt to climate change is happening and sea level rising scenarios. The results of the research could be used to support the duties of land use planning more reasonably. Simultaneously this is an important content in building a strategy to cope with climate change in coastal area in the coming time.

Keyword: Sea level rise, climate change, scenario, Geography Information System, flooded map