



# **1 Strategy to delineate potentially affected areas by Hurricane using a GIS approach**

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In the last decade, statistical modelling of hurricane in potentially affected areas by GIS has become a major topic of research. Despite some basic approach based on the “weight of evidence”, some unsolved questions are still under discussion. The disastrous effects of hurricanes on coastal communities are well known, and there is a need to better understand the causes and the hazards contributions of the different events related to hurricane like storm surge, floods and high winds. The selected approach was to determine a sudden onset zoning from a set of available attributes that are considered to govern the hazard while we examine the influence of each individual events that produce the final hazard along the coastline. To assess the coastal susceptibility, important parameters include topography, bathymetry, storm track into coast proximity, and river network. For all this parameters, key attributes based on SRTM and bathymetry data are the river network delineation based on the Strahler methodology, the slope data, and coastline bathymetry identification. Complementary data for the final model includes existing density rain dataset, elevation datasets for selected

coastal drainage basins, and existing hurricane tracks inventories together with hurricane structure model (different buffers related to the Saffir - Simpson scale in a GIS environment). The hazard results was then overlaid with population data in the overall assessment of coastal hazard risk. The approach, which made use of a number of available global data sets, was then validated on a regional basis using past experience on hurricane frequency study over an area that covers both developed and developing countries in the Caribbean region. The final output of the research was the development of a multi-hazard model that incorporate statistical decision-science techniques.