Modeling urban growth and hazard scenarios in Montego Bay, Jamaica

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Many mid-sized urban areas in Latin America and the Caribbean are undergoing rapid growth, which is resulting in inefficient use of land, increased exposure of population and resources to natural hazards, and greater expenditures on infrastructure to serve these growing cities. Spatially-explicit scenario models can provide a highly-flexible framework for comparing different urban policies and growth scenarios, which are used to project future development patterns, infrastructure construction costs, and risk estimates for a variety of hazards. In developing areas, this type of modeling approach must rely on a combination of official and publicly-available spatial datasets, remote sensing analysis, and a review of urban development plans, regulations, and consultation with local experts.

A case study of one implementation of this modeling approach is presented for Montego Bay, Jamaica. This city remains a popular tourist destination; however, outside of the coastal resort developments, housing for year-round residents has been expanding into the surrounding hillsides. Two alternative futures were considered, one in which existing policies and enforcement of regulations are maintained (the "Trend" scenario), and another which incorporates more sustainable urban planning principles (the "Smart Growth" scenario). In addition to analyzing the differences in density and urban footprint expansion between the two scenarios, vulnerability of the city's population and critical infrastructure to five natural hazards was also evaluated. The results of the analysis were used to develop a series of policy and planning recommendations, which will help to reduce sprawl, promote equity, mitigate hazard exposure, and guide investment by national government agencies and multilateral organizations.

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