



Influence of sea level rise on societal vulnerability to hurricane storm-surge hazards: Sarasota County, Florida USA.

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Planning for climate change requires local decision makers to balance growth and development with community resilience to natural hazards amidst a changing landscape. The challenge is especially difficult in coastal communities where planning for significant growth projections is often balanced with planning for the constant threat of extreme events (e.g., hurricanes), and sea level rise due to climate change. Sea level rise presents new challenges for coastal planners by introducing a chronic hazard that can also serve to alter the reach of contemporary geophysical hazards such as hurricanes. Although the potential for hurricanes under current climatic conditions continue to threaten coastal communities, there is concern that climate change enhanced sea level rise could influence the likelihood or impacts of future hurricanes. While research on the frequency and intensity of future hurricanes is still under debate, consensus is emerging that climate change may result in fewer tropical cyclones but yield hurricanes with increasing intensities and precipitation totals. Understanding if and how climate change may influence future hurricanes are critical questions as coastal communities develop long-term comprehensive land use plans to accommodate the continual increase in populations. To examine the potential effect of sea level rise on community vulnerability to future hurricanes, we utilized a GIS based methodology to assess variations in socioeconomic exposure in Sarasota County, FL, to contemporary hurricane storm-surge hazards and to storm-surge hazards enhanced by sea level rise scenarios. Research results indicate the perspective addition of sea level rise to contemporary category 1 and 2 hurricanes will cause societal exposure to be equal to or greater than the next higher contemporary Saffir-Simpson hurricane category. Results also identify similar trends in terms of storm surge inundation exposure with movement up the Saffir-Simpson scale. Analysis indicates that significant portions of the population, economic activity, and critical facilities are in contemporary and future hurricane storm-surge hazard zones. A review of GIS modeling results coupled with an examination of Sarasota County Florida's 2050 comprehensive land use plan, suggests efforts to manage future growth of residential, economic, and infrastructure development in Sarasota County may increase societal exposure to hurricane storm-surge hazards by constricting growth to the hurricane hazard zones. We examine the interaction of current and future geophysical stressors with coastal, long-term land-use planning by reporting the results of a one-day community workshop held on July 8, 2008 in Sarasota County, Florida, that included focus groups and participatory mapping exercises. This interactive, collaborative approach provided the opportunity to combine geographically-specific, scientific knowledge on natural hazards and climate change with local viewpoints and concerns. Results from these stakeholder activities demonstrate that stakeholders understood the need to increase community resilience to contemporary hurricane storm-surge hazards but there was an increased urgency to explore adaptation strategies after augmenting these zones with potential sea level rise scenarios.