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Effect of climate change over land-falling hurricanes at the Yucatan Peninsula

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Tropical cyclones generated in the North Atlantic and the Eastern Pacific are a constant hazard for Mexico. Along with increased vulnerability towards tropical cyclones because of population growth and new coastal infrastructure developments, there is possible increased exposure to tropical cyclones due to global warming and its effect on landfall rates and intensity. The Yucatan Peninsula has the highest landfall rates of major category hurricanes in Mexico so that the characterization of tropical cyclones hazards from global warming is a critical issue for strategic planning. We present an assessment of the global warming effect on tropical cyclones at the Yucatan Peninsula, based on synthetic tropical cyclones driven by atmospheric models (reanalysis and five different General Circulation Models-GCMs). Using such events, we provide an assessment of the future climate of tropical cyclones making landfall in the Yucatan peninsula, under the climate change scenario RCP 8.5. Results show that the Yucatan Peninsula will be more susceptible to tropical cyclone landfalls in the future climate, with stronger intensities and more frequent events undergoing rapid intensification, having important risk implications. The results indicate the need to consider the public policy implications for Mexico and Yucatan, to provide the mechanisms to cope with this future scenario. As the current status quo of coastal development in Yucatan increases the vulnerability to the future scenario, an awareness campaign is needed to enforce regulations and implement policies that build resilience towards climate change.