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Methods for estimating future wind losses locally: A case study at Eglin Air Force Base

James Elsner[†]; Shawn Lewers; Jill Malmstadt; Thomas Jagger
[†] Florida State University, USA
Leading author: selsner@fsu.edu

The strongest hurricanes over the North Atlantic are getting stronger with the increase related to rising ocean temperature. Here we show a procedure for estimating future wind losses from hurricanes and apply it to Eglin Air Force Base along the northern coast of Florida. The methodology combines models of the statistical distributions for extreme wind speed and sea-surface temperature over the Gulf of Mexico with dynamical models for tropical cyclone wind fields and damage losses. Results show that the 1-in-100 year hurricane from the twentieth century picked at random to occur in the year 2100 would result in 36% [(13%, 76%) 90% CI] greater wind damage solely as a consequence of the projected warmer waters in the Gulf of Mexico. The methodology can be applied elsewhere along the coast with modeling assumptions modified for regional conditions.