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Examining the Sensitivity and Impact of Anthropogenic Climate Change on North Atlantic Major Hurricane Landfall Drought and Activity

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North Atlantic projections of major hurricane landfall drought with increased anthropogenic forcing were derived from the Geophysical Fluid Dynamics laboratory (GFDL) High Resolution Global Dynamical Model (HiFLOR; 25-km grid) and an analysis of the recent 12-year major hurricane landfall drought (2006-2017) was completed. First, in order to effectively analyze the sensitivity of the major hurricanes to the coastline, 6 different "buffers" (0km-500km) were developed by utilizing QGIS software, extending the coastline by their respective distances. All simulations (observational and modeled) are performed with all buffer distances. Observational data is taken from 1900-2015, so all other simulations are taken in 116 year moving means. With regards to the HiFLOR model, a "control run" is completed with an 1860 simulation running for 1200 years that does not take anthropogenic climate forcing into account, while an additional 1990 simulation is completed running 300 years that that factors in post-industrialization. Frequency and duration of major hurricane drought is collected, and the 1860 "control" surpasses the 1990 simulation with a higher frequency of longer lengths of drought period, regardless of buffer distance. This demonstrates that anthropogenic forcing is not a factor with increased major hurricane drought length, and could potentially increase the frequency of MHL.

Biography

Emma Levin is a research intern at the Geophysical Fluid Dynamics Laboratory. Hiroyuki Murakami is an associate research scholar at Princeton University and the Geophysical Fluid Dynamics Laboratory.

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