

Hurricane Sandy and Anthropogenic Climate Change

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The societal impacts of Hurricane Sandy, which made landfall along the New Jersey shore in October 2012, were historic. Immediately following this event, some asked if the event was attributable to anthropogenic climate change. Perhaps a better question is whether this type of event is made more frequent by anthropogenic climate change. Attribution of single events to climate change is extremely difficult. However, one can ask “If the synoptic pattern accompanying Hurricane Sandy had taken place in pre-industrial times, would the track, intensity, and impacts have differed?” Or, “If the synoptic pattern accompanying Hurricane Sandy were to take place 100 years in the future, how would the storm differ?”

Here, we investigate both of these questions using a simplified approach that is designed to quantify the storm-scale impacts due to global thermodynamic changes. High-resolution simulations using the WRF model are run for the event, in conjunction with GCM-derived large-scale thermodynamic changes, to determine the dynamical changes. One initial hypothesis is that the diabatically driven outflow from Sandy would be lessened in pre-industrial times, which would reduce the strength of the downstream ridge event, and result in a more eastward track of Sandy. This would serve to increase the chances of the storm moving out to sea in a pre-industrial climate. The results of this hypothesis test will be presented, along with analysis of changes in rainfall, near-surface wind speed, and other impact parameters.