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Tornadic Behavior Related to Land-Falling Tropical Cyclones in the United States

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The 2004 and 2005 North Atlantic hurricane seasons were among the most active and economically devastating for the United States, during which 18 tropical cyclones (TCs) made landfall. These TCs were analyzed using the International Best Tracks Archive for Climate Stewardship (IBTrACS) and Local Storm Reports (LSR) datasets to determine whether they produced tornadoes within a preferred quadrant and distance from the center of circulation of the TC. The land-falling TCs were tracked and analyzed through their weakening stages with tornado reports being classified based on the strength of the TC at the time of occurrence. Tornado reports were not included after the TC was classified as extratropical in the IBTrACS dataset. Over half of all tornado reports occurred when the TCs were rated at or below tropical storm strength. As expected, the northeast quadrant was the most dominate area where tornadic activity occurred. In addition, there were three distinct peaks in tornadic activity at distances of 75-100nm, 175-200nm, and 325-375nm from the center of the circulation. Another emphasis of this work used NEXRAD data to determine the best method of identifying potential tornadic storms within land-falling TCS. The most reliable radar product for the three TCs investigated was velocity couplets.

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Jaclyn Ritzman is a senior meteorology major at Valparaiso University. Research was done through the Ernest F. Hollings Scholarship at the National Climatic Data Center (NCDC) in Asheville, NC. Deke S. Arndt is the chief of the Climate Monitoring Branch at NCDC. Michael C. Kruk works for STG, Inc. in Asheville, NC and is a member of the Coastal Climate Team.

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