A CLIMATOLOGY OF TROPICAL CYCLONE-INDUCED TORNADOES IN THE FLORIDA KEYS

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SYNOPSIS

The Florida Keys are home to a vulnerable population at risk to the hazards associated with tropical cyclones. These hazards include storm surge, damaging winds, flooding rains, and tornadoes. On occasion, tornadoes associated with tropical cyclones have caused numerous injuries and extensive property damage in the Florida Keys.

Climatological descriptions of the frequency and variation of hazardous weather events are important to a wide variety of groups, including weather forecasters, emergency managers, insurance companies, and the public.

Several tropical cyclone tornadoes have affected Florida Keys communities since the late 1990s, and a scrutiny of this particular hazard of the tropical cyclone environment is timely.

Tropical cyclone tornado reports in the Florida Keys were examined, summarized, and compared with the larger climatologies in the literature.

Results from this investigation are intended to be used by severe weather forecasters and local emergency managers so that they may integrate knowledge of this hazard into their diagnostic routines and mitigation and preparedness activities, respectively.

List of tropical cyclone tornadoes by date, tropical cyclone, and impact location (below).

All tropical cyclone center locations near tornado time (below).


Polar coordinate plot of tornadoes with respect to TC center relative to true north (above). Range marks at intervals of 100 km.

WHAT DID WE LEARN?

► 61% all tropical cyclone tornadoes in the Florida Keys between 1950 and 2009 were associated with cyclones of less than hurricane intensity.
► The data revealed a bimodal spatial distribution with respect to radial distance from the cyclone center.
► Tropical cyclone centers of circulation associated with tornadoes were tightly clustered over the southeastern Gulf of Mexico; no centers occurred east of -80.5 west longitude.
► Over a third (35%) of tornadoes occurred during the two-hour period between 1600 and 1800 EST (2100-2300 UTC).
► Over half (62%) of the tornado reports examined are associated with poleward-moving tropical cyclones of Caribbean origin.