

Represent Tropical Cyclone Wind Impact Areas from Wind Radii at Discrete Center Points in the National Hurricane Center HURDAT2

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National Hurricane Center (NHC) HURDAT2 database archives the center point locations and other information of tropical cyclones (TC) at discrete time intervals since 1861. From 2004, it also includes wind radii for tropical storms and hurricanes at four quadrants. This study developed a method to represent the full TC wind impact areas by computing the contiguous potential wind lateral reach between consecutive center points using a geospatial bounding polygon method. It assumes the farthest lateral wind reach at both sides of the TC track is bounded by the wind radii at the two consecutive times and the change of lateral reach in between is gradual and linear. Geodetic methods are used in the geospatial computation process as necessitated by the context and the spatial reference system. The challenges of the method implementation include numerous computational cases due to anisotropic wind radii differences between quadrants, their changes between two consecutive times, and the complexity of the geodetic methods for distance and location calculation. The solution and implementation are demonstrated with actual HURDAT2 data. The resulting wind impact areas provide a good foundation to analyze the impact of a TC in addition to using the center points or connected line path.

Organized Session Details

Is there a SINGLE day you are unavailable to present?

October 22, 2025

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