Editors' Highlight

Annular hurricane formation

Although hurricane tracks are now predicted well, anticipating hurricane intensity remains a challenge because it is difficult to observe and model fine details of the storm's inner core. Recent observations suggest that the formation of concentric eye walls allows particularly intense storms to transform into annular hurricanes. Annular hurricanes are highly circular, intense storms that are resistant to forces that typically weaken other hurricanes. Using the Weather Research and Forecasting (WRF) model, Zhou and Wang (2009) simulated the transformation of a hurricane into an annular storm. They found that the simulated hurricane experienced three distinct stages: the formation of a secondary eye wall, the replacement of the initial eye wall with the secondary eye wall, and the formation of an annular hurricane. These stages were accompanied by changes in storm intensity, with the total transformation occurring in less than 24 hours. The authors suggest that concentric eye wall replacement is an efficient route to the formation of an annular hurricane and that the WRF model has the potential to be used to predict eye wall cycles and associated intensity changes.

View abstract

View full article

Published: 04 February 2009

Citation: Zhou, X., and B. Wang (2009), From concentric eyewall to annular hurricane: A numerical study with the cloud-resolved WRF model, Geophys. Res. Lett., 36, L03802, doi:10.1029/2008GL036854.