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What is Rapid Intensification? Contradictory Predictions for Hurricane Irma (Download PDF)

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The range of possibilities presented by the forecast models more than a week before Hurricane Irma spread from Mexico to Canada- those were quite inaccurate. Irma was designated a tropical storm but later strengthened into a large Category 3 hurricane, with winds of 115 mph.

Image of Name of Hurricanes

Rapid Intensification

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- Explosive strengthening is known as “rapid intensification, ” defined by the National Hurricane Center, US as having its wind speed increase at least 30 knots (35 mph) in 24 hours.
- Similarly, Hurricane Harvey underwent rapid intensification just before it made landfall - strengthening from a tropical storm into a Category 4 hurricane.

Cape Verde Hurricane

- Irma was “Cape Verde hurricane”
- These are hurricanes forming in the far eastern Atlantic, near the Cape Verde Islands, then move across the Atlantic.
- Cape Verde storms frequently become some of the largest and most intense hurricanes- Hurricane Hugo, Hurricane Floyd, and Hurricane Ivan.

Role of Wind Shear

- A strong high-pressure ridge north of Irma, over the Atlantic steered the storm west limiting the wind shear in the upper levels of the atmosphere.
- Wind shear prevents storms from forming or gaining strength.
- Limiting the wind shear allowed the storm to grow so quickly

Conflicting Forecast from European Model (ECMWF) and American GFS

- Irma unfortunately had some major differences in predictions from some of the key meteorological models.
- The European model, or ECMWF, and the American GFS model also had differences with Hurricane Sandy with ECMWF correctly predicted a landfall in the Northeast nearly a week ahead, while the GFS continually kept the storm offshore in what became a major black eye for the US weather-modeling industry.
- GFS had Irma taking a more northerly track that curves to the north before it reaches the Caribbean, thus making a US landfall much less likely.
- ECMWF predicted a much stronger ridge or Bermuda High (than the GFS) forcing the Irma west, whereas the GFS predicted a weaker ridge and a more rightward, parabolic track

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