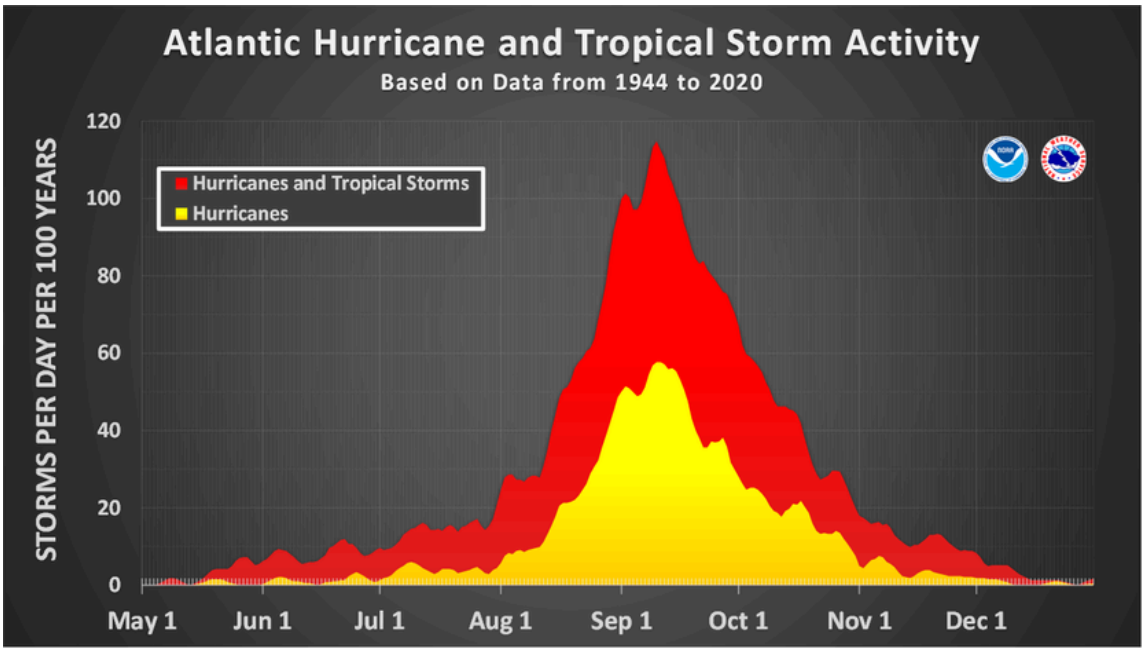
Hurricane Season in August: History and Climatology



August is a pivotal month in the Atlantic hurricane season, historically marking the beginning of the most active and dangerous period for tropical cyclone development. As sea surface temperatures rise and atmospheric conditions become more favorable, August ushers in a sharp increase in storm frequency and intensity. Understanding the climatology and historical patterns of hurricanes during this month is essential for preparedness and risk mitigation across the Atlantic Basin.

The Month of August: Factors Involved

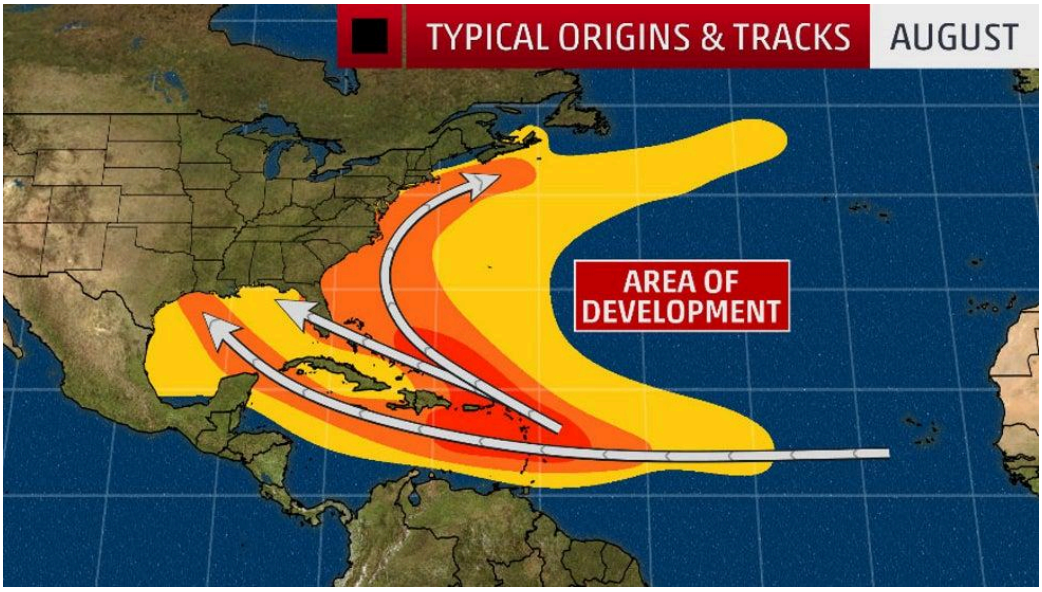
August is climatologically significant because it aligns with a culmination of optimal environmental factors for tropical cyclone formation:

- **Warm Sea Surface Temperatures (SSTs):** Much of the tropical Atlantic, Caribbean Sea, and Gulf reach SSTs above 80°F (27°C)—the threshold needed to fuel storm development.
- **Low Wind Shear:** Vertical wind shear—changes in wind speed or direction with height—tends to be lower in August, allowing storms to organize more efficiently.
- **Moist Mid-Troposphere:** A moist atmosphere supports deep convection and increases instability (i.e. thunderstorms), a critical ingredient in cyclone intensification.
- **African Easterly Waves:** These disturbances, originating from the west coast of Africa, become more frequent and better organized, often serving as the "seeds" for Cape Verde hurricanes.
- **Dry Saharan Air:** Surges of dry air into the central and eastern Atlantic Basin via Africa that normally hampers tropical development reduces in intensity in August. This allows the aforementioned easterly waves to increase moisture, which effectively induces a more favorable environment for tropical cyclone development.

Historical Hurricane Activity in August

Statistically, August accounts for a significant share of named storms, hurricanes, and major hurricanes during the Atlantic hurricane season. According to NOAA's National Hurricane Center, over 25% of all named storms form in August. Furthermore, approximately 30% of hurricanes and nearly 20% of major hurricanes (Category 3 or higher) develop during this month.

Thanks to a nice illustration courtesy of The Weather Channel (TWC), we begin to see the main "hot zones" that tropical cyclones tend to perk up from. This includes the western tropical Atlantic (part of the main development region), Caribbean, along the Gulf Stream ("Home grown" storms along the Eastern Seaboard), and as well as the Gulf.



Some of the notable hurricanes that occurred in August include:

- **Hurricane Andrew (1992):** One of the most catastrophic hurricanes in U.S. history. Andrew struck South Florida as a Category 5 storm on August 24, causing $27 billion in damage and 65 fatalities.
- **Hurricane Katrina (2005):** While it made its final landfall in early September, Katrina first developed on August 23. It became one of the deadliest and costliest hurricanes in U.S. history.
- **Hurricane Charley (2004):** A rapidly intensifying Category 4 storm that made landfall in southwest Florida on August 13, causing widespread destruction.
- **Hurricane Harvey (2017):** Though it made landfall in late August and lingered into early September, Harvey brought record-breaking rainfall to Texas, with some areas receiving over 60 inches of rain.

Geographic Trends

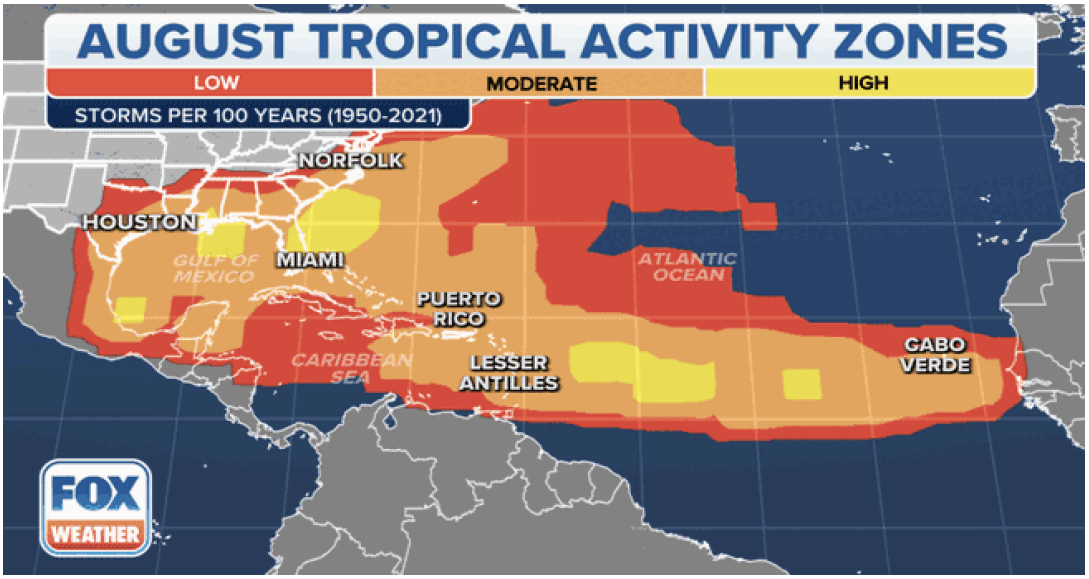
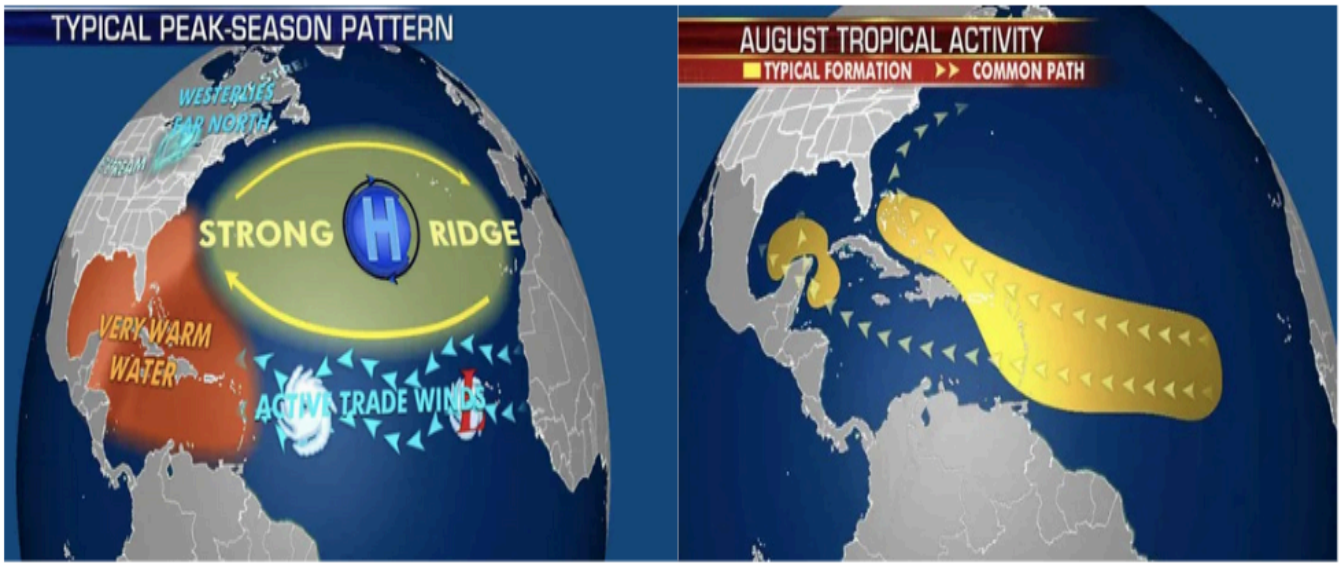


Image Courtesy of [FOX Weather]

During August, tropical cyclone genesis shifts westward. With the graphic above, visually speaking we can analyze how tropical activity tends to increase in certain regions.

- **Early August:** Storms tend to form in the Caribbean Sea or Gulf..
- **Mid-to-Late August:** The main development region (MDR) between Africa and the Caribbean becomes dominant. This is when “Cape Verde-type” hurricanes, often long-lived and intense, begin to emerge

Below is an animated illustration (via FOX Weather) of how we begin to enter into a more favorable overall hurricane environment for tropical development. The Bermuda High (a semi-permanant high pressure in the Atlantic) steers hurricanes and tropical storms westward as seen on the bottom left of the image with favorable development areas shown on the right.



Implications for Preparedness

Because August marks the start of peak hurricane season, it's a critical time for coastal communities to:

- **Review emergency plans and evacuation routes.**
- **Ensure supplies and insurance policies are up-to-date.**
- **Monitor forecasts from the National Hurricane Center and local meteorological agencies.**

With the potential for rapid intensification and long-track storms, August storms can catch the unprepared off guard. Public awareness and timely action are vital.

Conclusion

August stands as one of the most important months in the Atlantic hurricane season, with a long history of significant, often devastating tropical cyclones. The combination of warm ocean waters, favorable atmospheric conditions, and African wave activity makes it a high-risk period. As such, understanding the historical and climatological context of August hurricanes is crucial not only for scientists and meteorologists, but also for residents, emergency managers, and policy makers vulnerable to tropical system-related impacts.