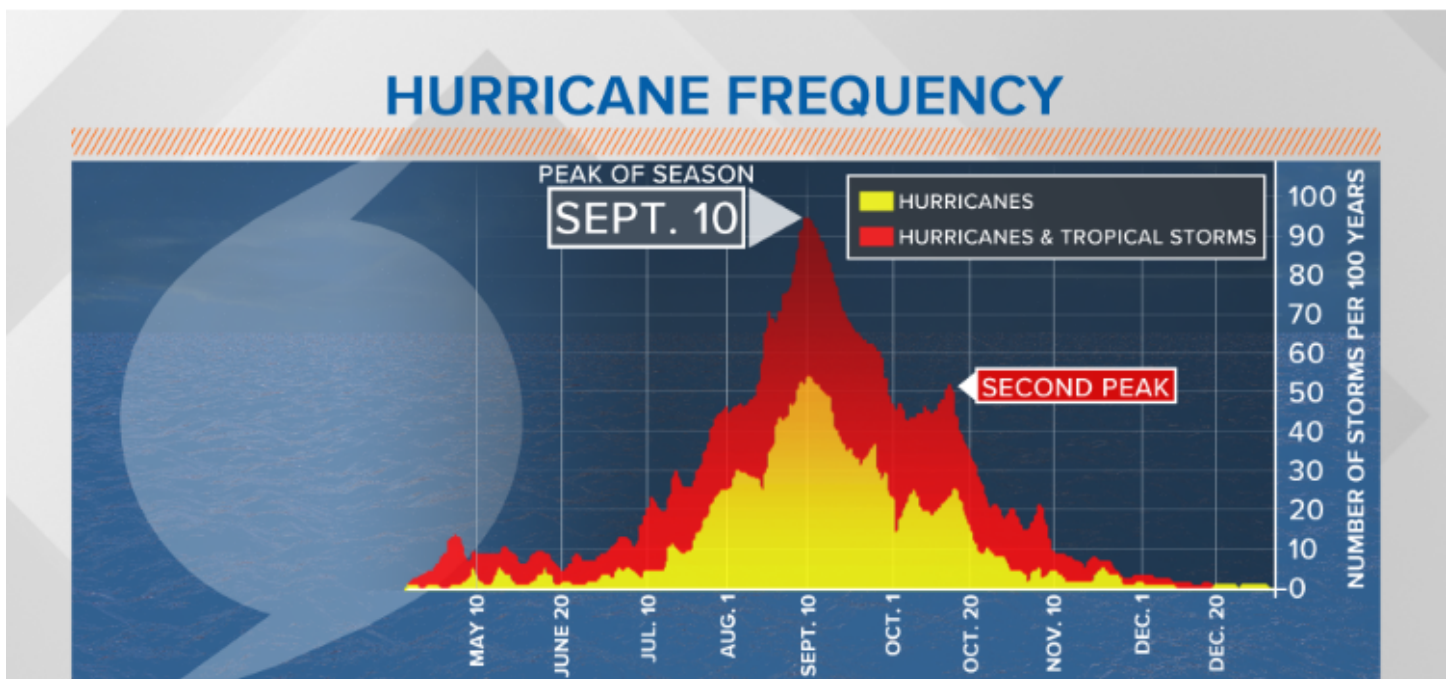


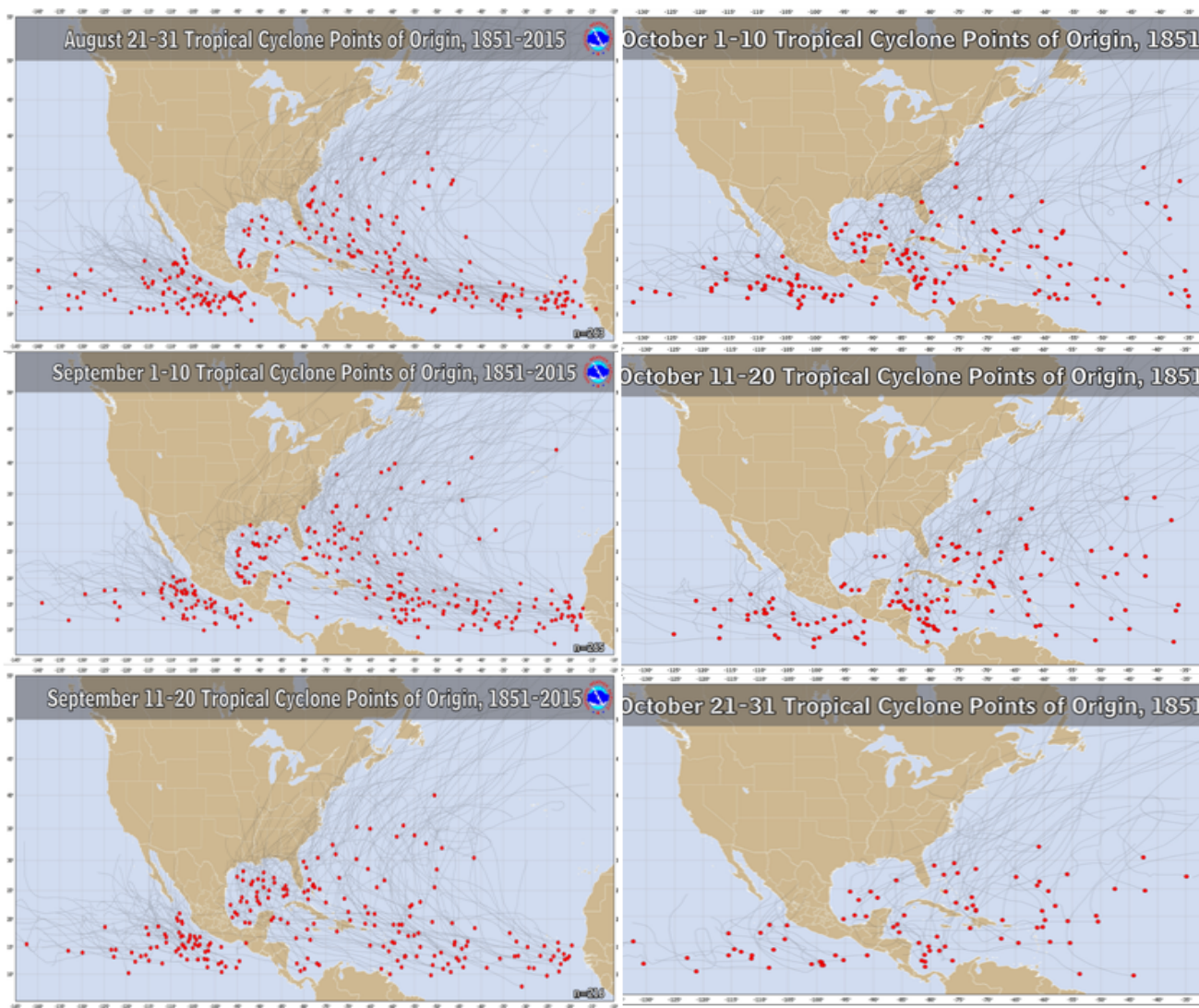
Why The Second “Peak” During Hurricane Season in Fall?

As we enter the month of October during hurricane season, eyes begin to shift to the Caribbean Sea and Gulf of Mexico, and away from the Tropical Atlantic. We’re entering the final stretch where it has been coined a “season within a season” as we’re now officially in the fall season. We call this the “second peak” in terms of tropical storms and hurricanes. Pointed out nicely in this graphic by [WTSP](#), we see that apparent spike during the month of October.



As a visually appealing comparison and clear distinction from the [National Hurricane Center’s climatology](#) points-of-origin, let’s compare the main hurricane season peak from October’s spike. By August and through September (first column on the left), we typically see the classic Cabo Verde origin hurricanes where robust

tropical waves propagate off Africa and enter the Main Development Region (MDR). From there, if environmental conditions are favorable, we'll see those waves turn into major hurricanes as they cross the Atlantic basin. We see the high-density cluster clear as day in the Eastern Atlantic, along with other clusters spanning the MDR. However, in the next column (October), notice the stark difference in the lack of red dots in the MDR and increase in the Western Atlantic and Caribbean Sea.



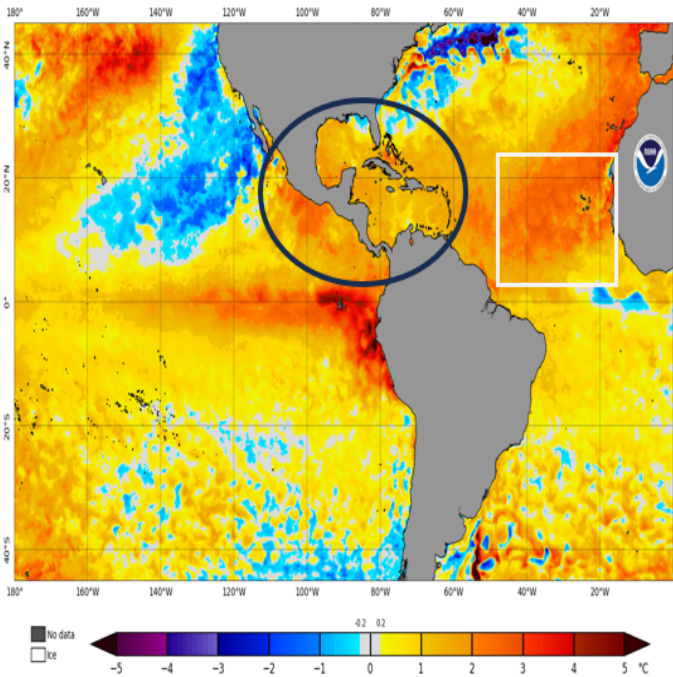
What are the main reasons for this? First, there in general doesn't mean there can't be major hurricanes emanating from Africa as tropical disturbances continue to roll off from Africa, but essentially these Easterly waves do peter out by this time of year. Second, it's because environmental conditions are modified and

altered as we enter the astronomical fall season. It's due to both dynamic and thermodynamic changes that these tropical waves encounter and manifest as we go from the MDR to the Caribbean.

1. Wind shear – From May into late July or so, wind shear tends to be climatologically stronger across the Caribbean and Gulf. By September and October, wind shear abates across this region making for favorable conditions all things being equal.
2. Sea Surface Temps – Over the span of June to September, all that warmth in the eastern Atlantic and MDR cools for a few reasons. First, tropical cyclones and disturbances utilize a lot of that heat causing upwelling (i.e., cooler water from below shifting to the surface). Second, induced wind shear from the north causes periodic evaporation (trade winds) that over the span of several months, naturally takes a toll.
3. Time of year – As the not-so-distant winter season lurks on the horizon and inherent lack of solar insolation due to the changing of season, the eastern Atlantic naturally cools regarding the air temperature.

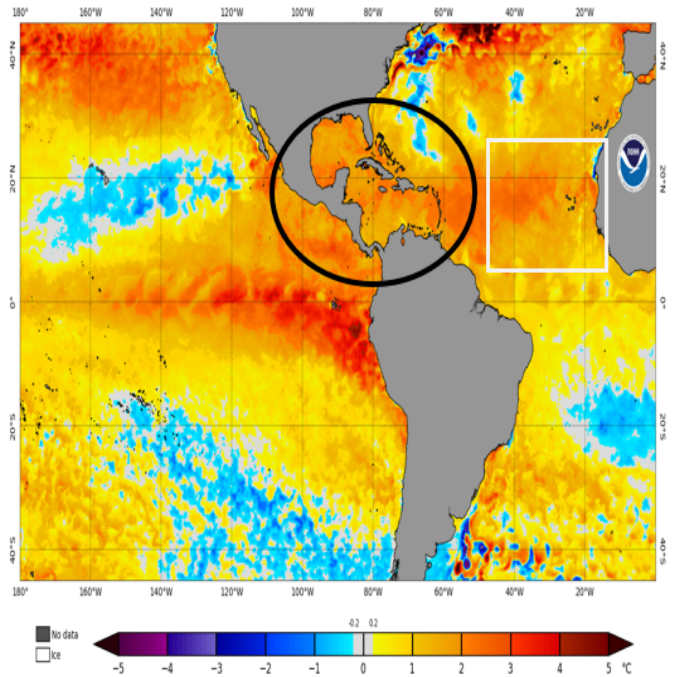
Below, [NOAA](#) sea surface temperature graphics contrast June 20th to September 20th of this year. Outlined in dark is the Caribbean, Western Atlantic, and Gulf while in the white box reveals the MDR and Eastern Atlantic. Right away, you'll notice a reversal over the span of three months pertaining to the surface temperature. We've seen an increase across the Caribbean and surrounding regions, while the Eastern Atlantic cooled. This region also happens to hold one of the deeper and more significant warmest thermocline depths due to its proximity to the Equator and the warm Caribbean Current.

NOAA Coral Reef Watch Daily 5km SST Anomalies (v3.1) 20 Jun 2023



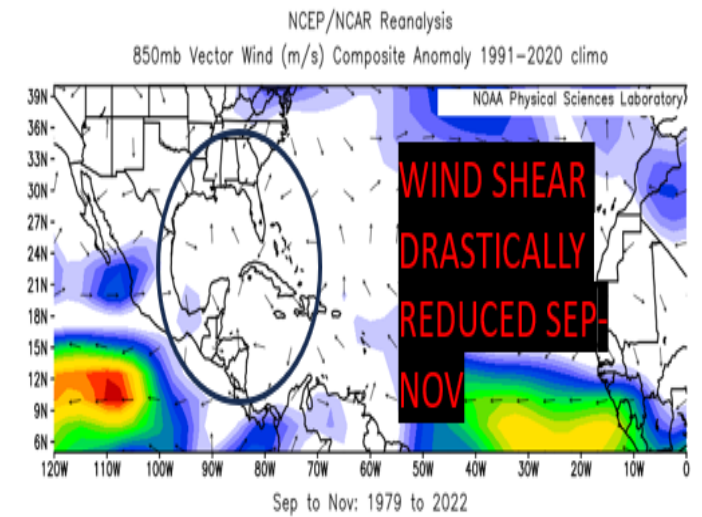
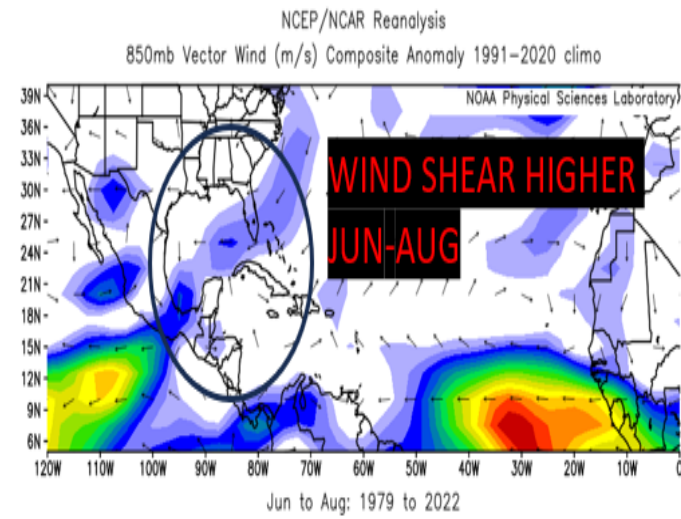
JUNE 20TH

NOAA Coral Reef Watch Daily 5km SST Anomalies (v3.1) 20 Sep 2023

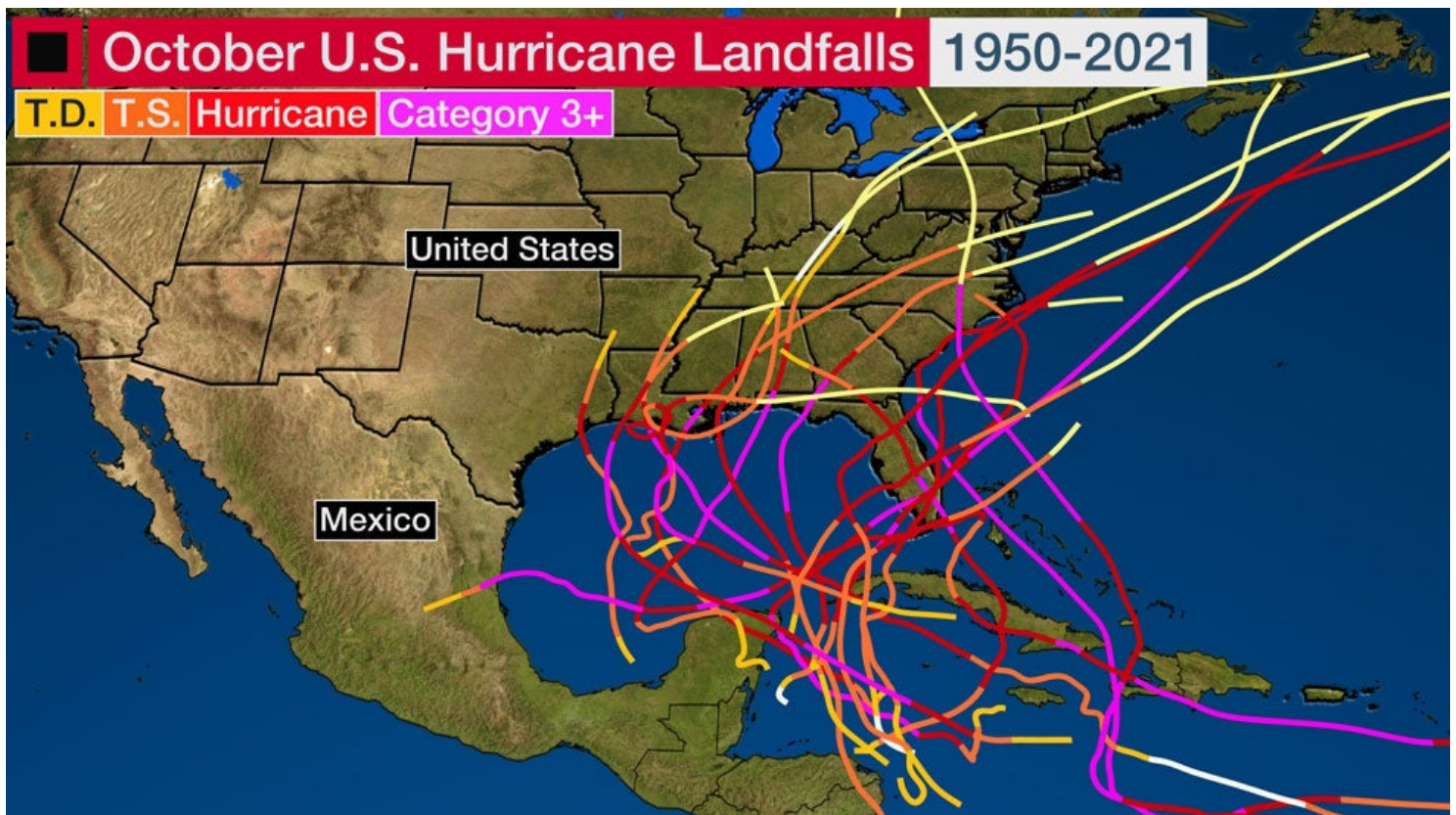


SEPT. 20TH

To show the wind shear evolution from June to November via [NCEP/NCAR reanalysis](#), we illustrate in a trimonthly period to convey the gradual change over the course of six months. From 1979-2022 (negating interseason factors like ENSO), notice how wind shear lessens from the summer to fall months across the Caribbean and Western Atlantic. With the combination of lessened wind shear and warm sea surface temperatures during this time of year for this general basin, this is why we tend to observe this second spike. Do note, not every hurricane season is the same of course as there are other variables at play implying that during peaks it may not live up to expectations, but from a climate perspective this is what our observations show.



It's fact from history that October has featured infamous hurricanes. Hurricane Michael (2018 – one of the most devastating cyclones in the Gulf since 2010); Hurricane Wilma (2005 – happens to hold the record for the most intense Atlantic hurricane) and hurricanes' Matthew, Delta, and Zeta (2016) - all of which are relatively recent. Statistically, for states like Florida, October is the most dangerous month in terms of landfalling hurricanes. In fact, according to [The Washington Post](#), since 1950 out of 112 hurricanes that struck Florida, 38 have occurred in October. As we see below from the [National Weather Service](#), the “hot zones” are now directed across the Gulf states and the Caribbean Islands.



Despite eclipsing the climatological main peak of hurricane season (September 10th), any resident that lives along the Gulf and Atlantic coasts should remain on alert and be prepared regardless for any tropical threat. This is especially true as we enter a favorable timeframe over the next few weeks. On average, according to NOAA, statistically a hurricane forms every year in October. By November, we'll see activity really ramp down as we propel deeper toward the winter season. However, it still doesn't mean hurricanes can't form in November. Since 1861, three hurricanes have made landfall in the U.S. during November. No matter what, it's wise to always remain on guard!