

North Atlantic Hurricane Season – 2020 Forecast August Update

17 August 2020

Executive summary:

- The June forecast predicted an above average active hurricane season driven by the following dominant signals;
 - Sea surface temperatures (SSTs) anomalously warm across the Atlantic basin.
 - SST patterns in the Pacific Ocean indicative of a potential La Niña event before the end of the season.
 - Precipitation and convection patterns in line with a strong West African Monsoon (WAM).
- All three signals remain dominant and the mean August forecast has risen to 18.7 named storms in the basin, compared to 17.6 predicted in June. Note this update does not explicitly account for observed early season activity and is based on an update to climate signals only.
- At regional level 8.1 named storms are forecast to originate from the Main Development Region (MDR), compared to 8 forecast in June. A total of 5.1 are expected from the Gulf region compared to 4.4 in June. The East Coast Region is expected to produce 5.5 named storms compared to 5.1 forecast in June.
- The June forecast also highlighted the potential for steering flow patterns and wind shear conditions during the peak season to act as a natural protective barrier lowering the rate of US landfalls. While this is still expected to broadly be the case, the strength of the signal has decreased. As a result the August mean forecast has risen to 1.6 US landfalls for MDR systems and 2.3 for storms originating from the Gulf region.

Expected hurricane season activity continues to be above average

The early June forecast is refined, accounting for the evolution of global climate patterns in June-July (Figure 1). This August update reflects a trend towards a more active signal from the main climate indicators but does not explicitly include the record-breaking early season activity observed so far this year. Currently eleven named storms have already been observed in the North Atlantic basin compared to an expected value of approximately three for this time of year. Storm activity is expected to be higher than the short term climatology (15.3 between 2000-2019) with 18.7 storms predicted, up from the June forecast of 17.6. The increased skewness in risk is evident in Figure 1 where the predicted level of risk for basin wide storm count is further shifted to more extreme values.

The Main Development Region (MDR) is again forecast to have the largest deviation from the 2000-2019 mean with 8.1 named storms expected, relative to the mean of 6. MDR activity is a key area of focus for potential insurance risk. Hurricanes emanating from this region have more chance of intensifying over warmer sea surface temperatures and therefore have a higher impact potential. Model classification regions are given in Figure 2.

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The Gulf region is now forecast to expect 5.1 named storms, relative to 4.4 in the June forecast, compared to a 2000-2019 mean of 3.7.

Storms that form in the East Coast region still have a forecast expected value lower than the 2000-2019 mean with 5.5 storms forecast, compared to 5.1 forecast in June, relative to the 2000-2019 mean of 5.6.

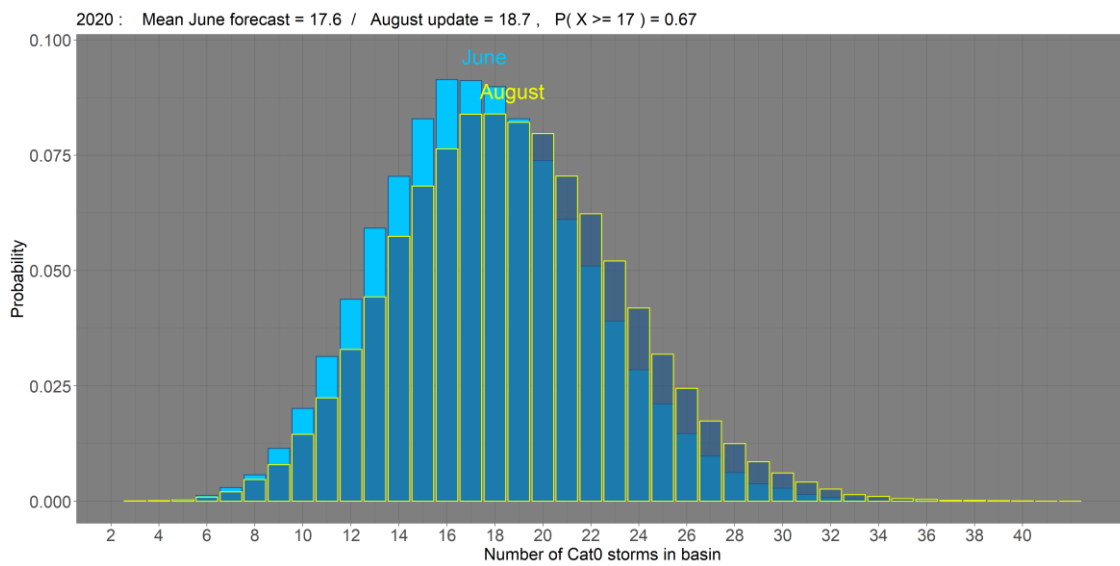


Figure 1: Comparison of the 2020 June forecast predicted risk distribution of basin wide count with the August update. Source: reask.



Figure 2: Model region classifications. Source: reask and Twelve Capital.

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Table 1: Hurricane season 2020 August forecast. All figures are rounded to one decimal place. Source: reask, IBTrACS.

Metric	Region	Climatology		June Forecast		August Forecast	
		1979-2019	2000-2019	Mean	High confidence interval	Mean (change since June)	High confidence interval
Count	North Atlantic Basin	12.1	15.3	17.6	[14-21]	18.7 (+6.25%)	[15-22]
	Main Development Region	4.6	6	8	[5-10]	8.1 (+1.25%)	[5-10]
	Gulf/West Caribbean	2.9	3.7	4.4	[2-5]	5.1 (+15.9%)	[3-6]
	East Coast	4.6	5.6	5.1	[3-6]	5.5 (+7.8%)	[4-7]
Landfalls	Main Development Region	1	1.3	1.4	[1-2]	1.6 (+14.3%)	[1-2]
	Gulf/West Caribbean	1.7	2	2.2	[1-3]	2.3 (+4.5%)	[1-3]
	East Coast	1	1.1	1	[0-1]	1 (-)	[0-1]

Sea Surface Temperatures (SSTs)

Global anomalies of SSTs for the month of July 2020 (Figure 3) are consistent with the patterns observed in the June forecast with two main signals responsible for the forecast of high activity in the North Atlantic basin:

- Anomously warm water temperatures are present in most of the North Atlantic basin providing favourable conditions for hurricane formation and intensification.
- The patterns of anomalously cold water temperatures in the central/east Pacific (i.e. “the cold tongue”) are more pronounced than in the June forecast, increasing the chances of a La Niña event forming during the season. This prompted the Australian Bureau of Meteorology to upgrade its outlook from “Inactive” to “La Niña watch” since our June release. The emergence of a La Niña event would favour hurricane activity by limiting vertical wind shear.

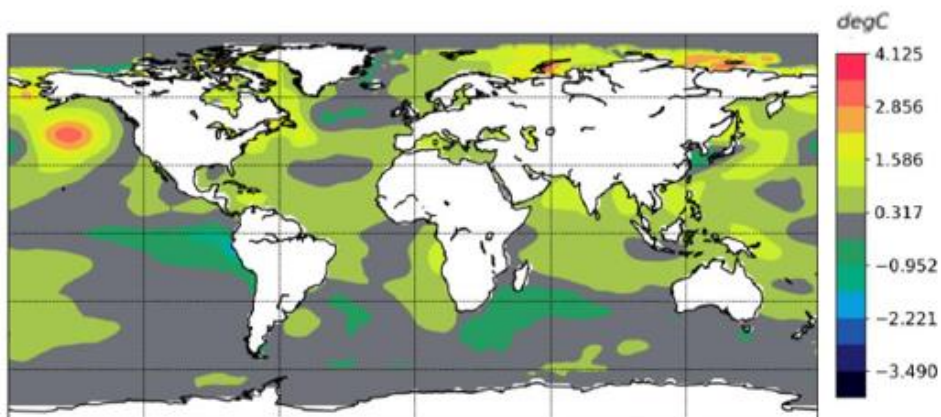


Figure 3: July anomalies in sea surface temperatures with respect to the 1979-2019 climatology. Source: reask.

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West African Monsoon (WAM)

All predictors tracking global precipitation and convection patterns at the end of May pointed towards a very active WAM season. This trend is maintained when looking through to the August forecast with strong positive anomalies in precipitation over West Africa (Figure 4). This, coupled with negative anomalies south of the equator, indicates a northern shift of the intertropical convergence zone (ITCZ) and favours activity in the main development region (MDR).

An active WAM acts to increase the frequency and intensity of African easterly waves increasing the potential for tropical cyclone genesis over the deep tropics. A high number of such waves have already travelled across the tropics in July and that trend is expected to persist through the second half of August and September.

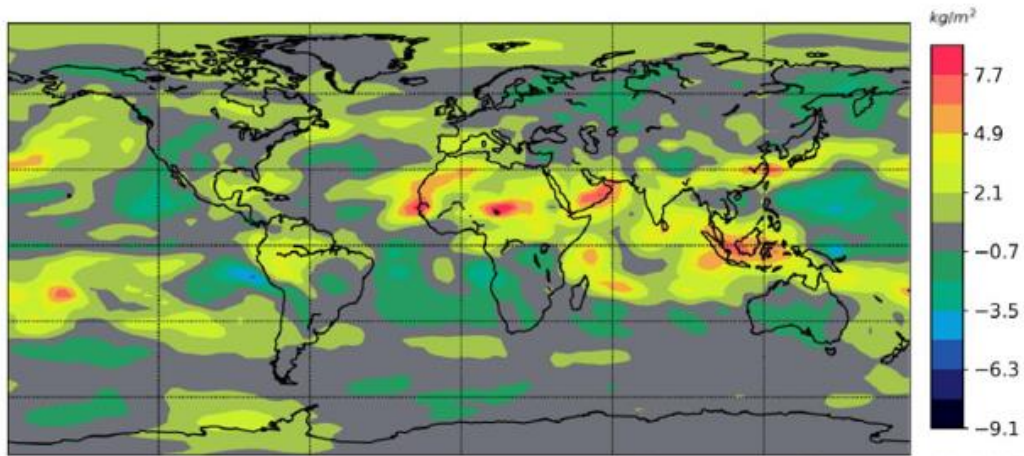


Figure 4: May - July anomalies in precipitation water content with respect to the 1979-2019 climatology. Source: reask.

Landfall risk more pronounced than June forecast but still lags increase in activity

Beyond named storm activity, the state of the steering flow and wind shear patterns in August-October are key to assessing potential US landfall risk. The June forecast identified 2010 as a likely analogue year when assessing the key predictors for landfall risk. While 2010 still remains a good analogue year, the updated levels of landfall predictors have trended slightly above those observed in 2010.

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Twelve Capital and reask – co-operation

Since June 2018, Twelve Capital and reask have worked closely together to further the development of hurricane forecasting tools by using machine learning. Both parties believe that advancements in technology and computing power can enhance ILS investment management.

reask is a catastrophe analytics specialist providing global solutions for tropical cyclone risk management and forecasting. reask is based in Sydney with its team of experts in risk analysis, machine learning and high-performance computing. Their team has vast experience in natural catastrophe modelling having developed their expertise from previous engagements at RMS, Willis Re and other specialised firms.

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