

## Twelve Capital Event Update: Hurricane Florence

Update – Wednesday, 12 September 2018

- Hurricane Florence, currently a category 4 major hurricane, is expected to make landfall on the east coast of the US between Friday 14 and Saturday 15 September, local time.
- There is still a high degree of uncertainty in the landfall location – the possible range currently covers several hundred kilometres and includes Charleston and Wilmington.
- This storm is likely to cause insured damage from strong winds, storm surge and inland flooding.
- Based on current modelling data and forecasts, at this pre-landfall stage, Twelve believes that Hurricane Florence could have an impact on Cat Bond and ILS funds of between 0% and 4% of NAV, for an industry loss of USD10-20bn, depending on specific fund positioning and risk levels.
- Over the past few hours, predictability for this event has deteriorated due to a coastal ridge building up. Given the uncertainty in the landfall location and intensity, the actual observed loss could vary significantly compared to the pre-landfall estimates stated above.

### Event details

Major Hurricane Florence, currently a category 4 storm in the mid-Atlantic, is at present forecast to make landfall on the east coast of the US later this week, either on Friday or Saturday, local time. Between 10 and 11 September, the storm strengthened from a tropical storm to a category 4 major hurricane.

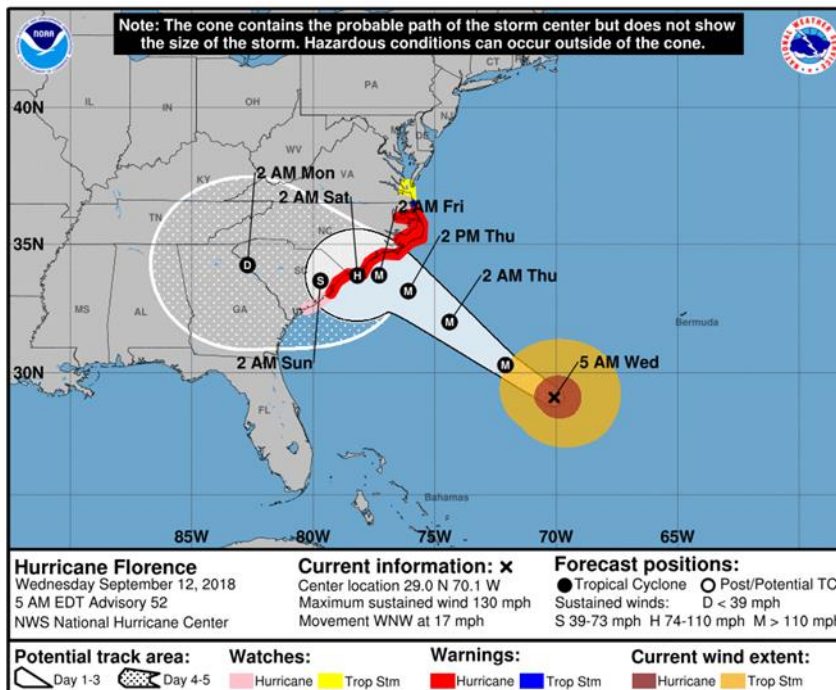


Figure 1: Hurricane Florence's probable path.

Source: Official forecast by the National Hurricane Center as at 12 September 2018.

There is still a high degree of uncertainty in the exact landfall location. At the time of writing the forecast location was trending southwards with Wilmington, North Carolina, likely to be affected, as shown in Figure 2.

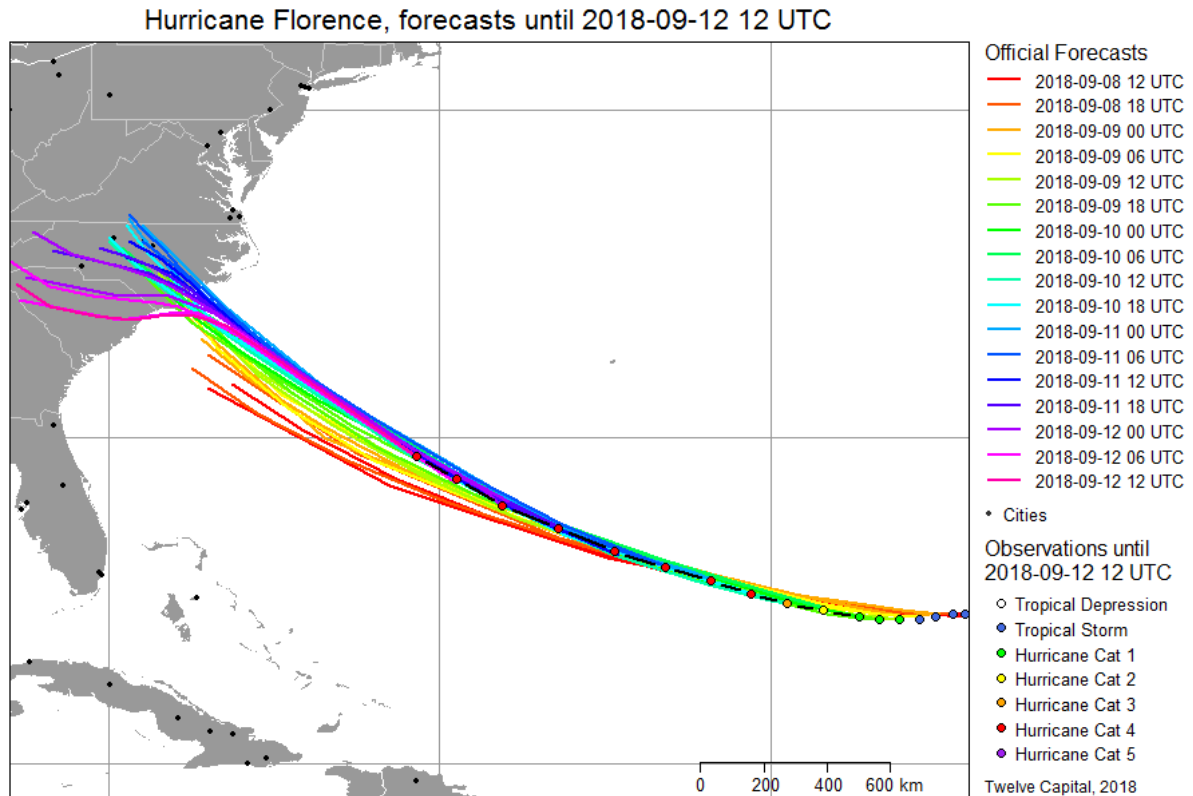


Figure 2: Landfall locations forecast for Hurricane Florence.  
Source: Twelve Capital ILS Analytics. Data: NOAA at 12 September 2018.

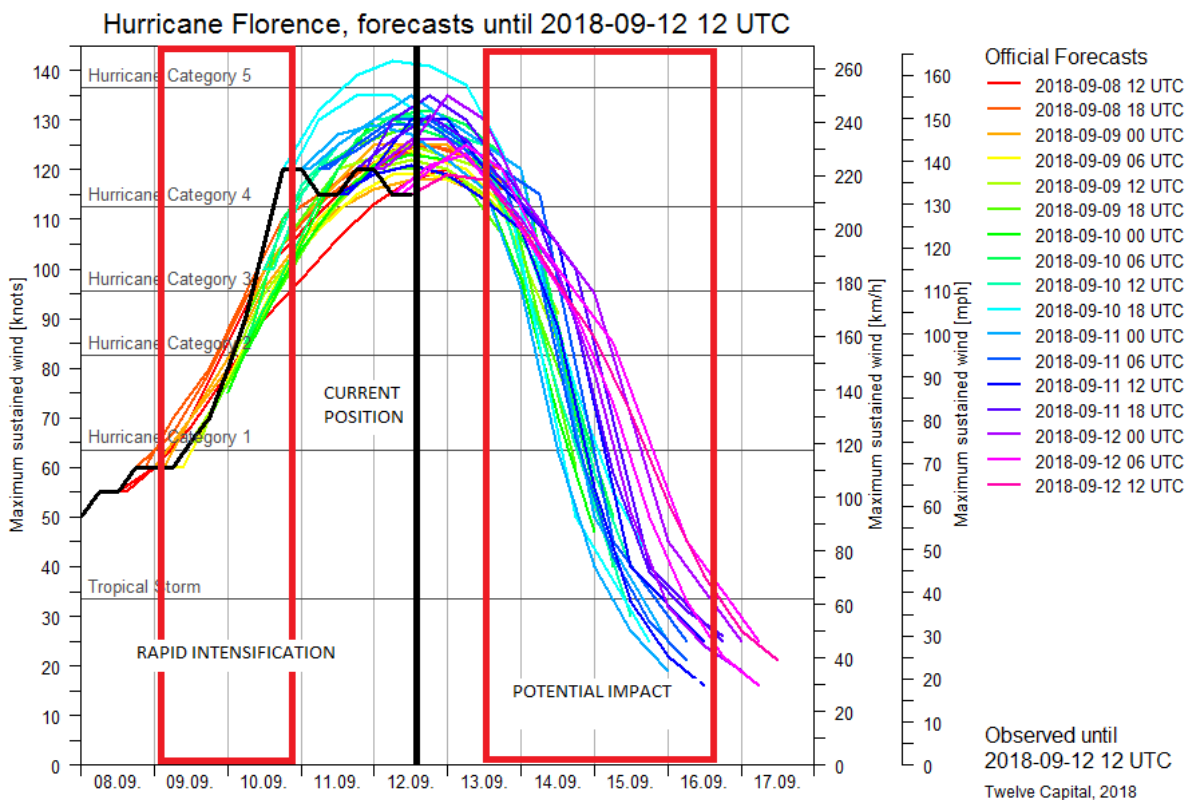


Figure 3: Hurricane Florence, forecasts of intensification and exposure.  
Source: Twelve Capital ILS Analytics. Data: NOAA as at 12 September 2018.

Sea surface temperatures remain high with little wind shear present or forecast. There is also the potential for Florence to slow down as it makes landfall, which would be likely to cause significant rainfall and flash flooding (see Figure 4) causing a significant increase in expected industry losses.



Figure 4: Rainfall forecast as at 12 September 2018.  
Source: Twelve Capital ILS Analytics. Data: NOAA as at 12 September 2018.

#### Landfall location and loss expectations

At present, AIR have provided four similar stochastic modelling events indicating potential insured industry losses between USD 11-16bn. This compares to around USD 80-93bn in insured losses from the HIM events in 2017<sup>1</sup>. This is in line with industry consensus expectations<sup>2</sup> of the insured industry loss from Hurricane Florence being in the range from USD 10bn to USD 20bn. Sea surface temperatures remain high, and little wind shear is present or forecast resulting in favourable conditions for hurricane formation/intensification.

While Figure 4 gives an idea of the rainfall forecast, the extent of damage and, therefore, losses to the industry are also likely to depend on the port and residential developments that have taken place in the region in recent years. The ultimate insured losses depend heavily on the exact track of the storm and landfall location as shown by Figure 5 below. A darker colour indicates higher industry losses, whereas the bright colours indicate lower loss numbers.

<sup>1</sup> Harvey Irma Maria (HIM) as per Aon, Munich Re, Swiss Re.  
<sup>2</sup> Industry consensus sources: RMS, AIR, JPMorgan, Enki Research.



Figure 5: AIR modelled Industry loss expectations as a function of landfall position in South/North Carolina.  
Source: Twelve Capital. Data AIR as at 12 September 2018.

**Potential impact for insurance-linked securities market**

At this stage, with landfall still days away, it remains extremely challenging to provide a base case for what the impact of Hurricane Florence might be on investors’ index-linked securities (ILS) portfolios in general, and the Twelve Capital Cat Bond funds in particular.

Several variables are explored below:

**1. Risk coverage across the Cat Bond universe**

Tropical cyclone risk in South Carolina, North Carolina and Virginia is included as a peril across many Cat Bonds. However, unlike bonds which focus purely on Floridian risk, there is currently no Cat Bond that exclusively insures such risks in South and North Carolina and Virginia. Instead, the peril is included in trigger structures that cover the whole of the US.

The number of potentially exposed Cat Bonds therefore makes up a large part of the overall Cat Bond universe with combined notionals of around USD 17bn. However, the number of Cat Bonds which can reasonably be expected to suffer write-downs as a result of Hurricane Florence is much smaller. Bonds covering the entire US, either with aggregate or occurrence triggers, typically have higher attachment levels compared to bonds covering only one specific peril in an individual state. As such, an event needs to generate substantial insured industry losses before becoming relevant for a substantial portion of the Cat Bond universe.

**2. Event loss aggregation/attachment erosion**

Hurricane Florence would be the first major event this year causing significant insured losses. Given that aggregate deductible limits across most bonds have not suffered from any erosion post their annual resets, the loss absorption capacity of these structures protecting the insured layer is near or at its annual maximum.

**3. Indemnity bonds**

Nationwide and USAA both have significant market shares in the region (around 6-8%) and, as such, indemnity Cat Bonds sponsored by these companies are at risk due to Hurricane Florence. However, as last year’s loss numbers from hurricanes Harvey and Irma have shown, market share is not a reliable indicator for ultimate net losses, as underwriting and policy details can vary substantially between companies – typically underlying portfolio exposure is not evenly distributed within a region. This uncertainty will remain for a prolonged time period well after landfall.

### Potential impact on portfolios

All portfolio impact estimates should be considered with extreme caution at this point in time. Hurricane Florence remains some distance from the coastline and could yet change course and strength significantly, resulting in ultimate net losses that may vary significantly to those stated below. Impacts would also depend on each portfolio's individual risk level and positioning.

### Hurricane Florence pre-landfall estimates – industry loss and potential portfolio impact

Industry loss (USD bn)	Estimated impact on conservative Cat Bond and ILS portfolios	Estimated impact on opportunistic Cat Bond and ILS portfolios
0 – 10bn	0.0 – 1.0%	0.0 – 1.0%
10 – 15bn	0.0 – 2.5%	1.0 – 2.5%
15 – 20bn	0.0 – 3.5%	1.5 – 4.0%
20 – 25bn	2.0 – 5.0%	2.5 – 8.0%

Table 1: Estimated industry and portfolio losses for Hurricane Florence, pre-landfall, as at 12 September 2018.  
Source: Twelve Capital based on internal estimates and modelling.

Please note that secondary valuations used to calculate fund performance are likely to differ from the actual expectation of ultimate defaults, as situations like these might result in temporary spread widening. Hence, investors should expect to see some additional levels of volatility in the near future.

### Outlook

Twelve Capital continues to monitor the situation extremely closely and will provide further updates as the situation becomes clearer, particularly post-landfall.



Figure 6: Hurricane Florence.  
Source: NASA. As at 12 September 2018.

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