



## Hurricane Irma – KCC Flash Estimate

Based on high resolution storm surge, inland flooding, and wind models, KCC estimates that the total insured loss (including US and Caribbean) from Hurricane Irma will be \$25 billion.

Breakdown of Insured Loss (\$ Billions)	
US	18
Caribbean	7
<b>Total</b>	<b>25</b>

Estimates include losses to buildings, other insured structures, contents, business interruption, and autos. Estimates do not include crop or NFIP losses.

### Irma Highlights

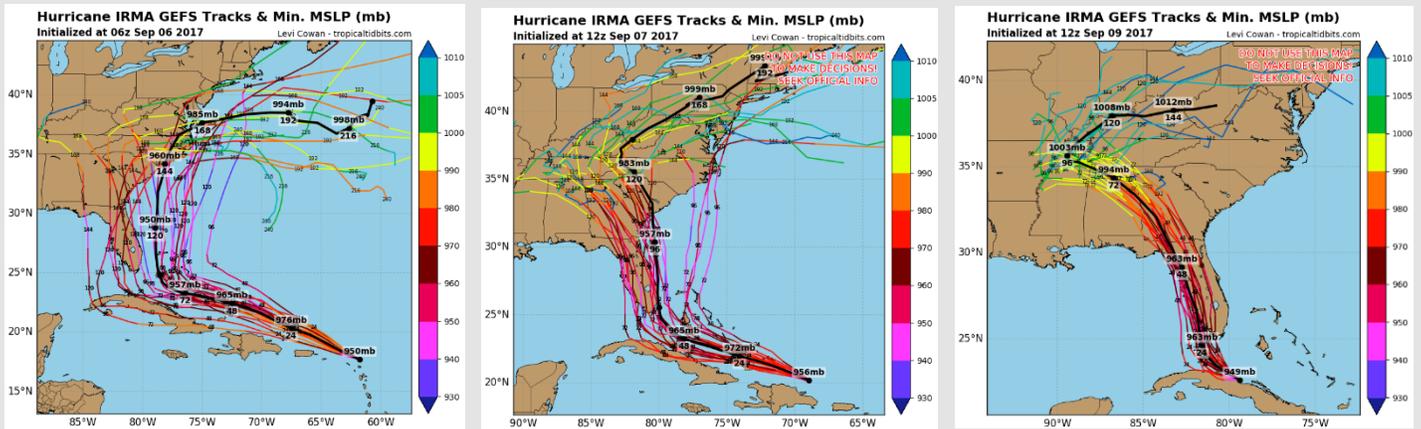
- Second Category 4 hurricane to make landfall in the US in less than a month, and first Category 4 landfall in Florida since Charley (2004)
- Strongest hurricane to impact the Bahamas since Hurricane Andrew (1992), and strongest ever to hit the Leeward Islands
- Peak wind speeds of 185 mph, while not a record, make Irma one of the strongest historical storms in the North Atlantic
- Peak winds lasted for a record-breaking 37 hours throughout most of Irma's track through the Caribbean

### Meteorological History

Irma formed as a tropical storm on August 30 in the eastern Atlantic and rapidly intensified to a Category 5 hurricane by September 5<sup>th</sup> when it passed over the northern Leeward Islands. Irma directly passed over Barbuda, St. Martin, and the British Virgin Islands before moving north of Puerto Rico and tracking close to Turks and Caicos. Irma remained a Category 5 storm until September 8, when wind speeds began to weaken as Irma made landfall in Cuba.

While Irma stayed on a consistent path through the Caribbean, the NHC projected tracks for the US moved from the east coast to the west coast of Florida over the course of three days. The images below show how the projected tracks from the Global Ensemble Forecast System (GEFS), which runs 21 different weather models and projects the mean (black line), changed over time.

## GEFS Ensemble for Hurricane Irma



On September 7, the NHC projected a Florida landfall near downtown Miami as a strong Category 4 hurricane. This was worst projected track for this storm and would have caused insured losses exceeding \$150 billion—predominantly driven by strong winds.

As the projected track shifted west, Hurricane Irma became more likely to be a storm surge event. The west coast of Florida is highly susceptible to storm surge flooding, and according to the KCC report “Most Vulnerable US Cities to Storm Surge Flooding,” Tampa/St. Petersburg tops the list as determined by property losses for the 100 year hurricane.

On September 10, Irma was downgraded to a Category 3 storm before turning north towards Florida. Irma regained some strength when it moved over the warm waters near the Keys and before it made landfall across Cudjoe Key with wind speeds of 130 mph. Irma made a second landfall in the US at Marco Island a little after 3 PM with wind speeds of 115 mph.

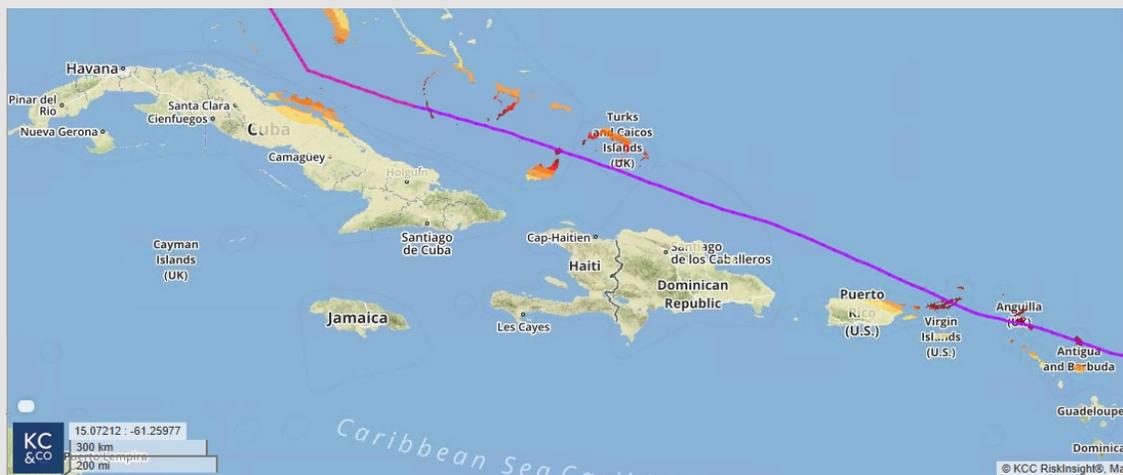
The center of Irma remained mostly inland as the storm tracked parallel to Florida’s west coast. This resulted in less storm surge than initially predicted and rapid weakening due to land interaction. However, because Irma’s winds extended farther east over the Atlantic, storm surge flooding occurred along the east coast which had not been initially anticipated.

Irma weakened into a tropical depression on Monday, September 11, over western Georgia, and finally dissipated on September 13.

## Impacts in the Caribbean

Irma devastated several islands in the Caribbean, most notably St. Martin, Barbuda, Anguilla, and the British Virgin Islands. KCC estimates over 50 percent of property value was destroyed on the most impacted islands. Puerto Rico was spared the worst of Irma because the storm tracked north of the island and the eyewall was compact. Only the northeast corner of Puerto Rico experienced hurricane force winds.

**Irma’s Track Through the Caribbean**



## Impacts in the US

Hurricane Irma caused the most devastation in the Keys, particularly to the east of the Cudjoe Key landfall. These areas experienced the full brunt of 130 mph winds along with significant flooding.

Because Irma weakened significantly after crossing Cudjoe Key and before impacting the southwestern coast, the storm surge was much less significant in Naples, Fort Myers, and Tampa than initially feared. Even the wind damage turned out to be relatively minor after the second landfall due to the rapid storm decay. Direct wind impacts were mostly limited to mobile homes, light structures, signage, and spotty roof and window damage. Except for in the Keys, major structural damage for the most part was caused by falling trees.

While Irma’s winds after landfall were lower than expected, tropical storm force winds impacted almost all of Florida, and hurricane force winds extended 80 miles from the storm center. This means the low-level wind damage was widespread throughout the state, and minor wind damage also occurred in Georgia, Alabama, and South Carolina along with inland flooding.



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Surprisingly, many areas along the east coast were impacted by storm surge caused by large bands of wind extending into the Atlantic Ocean.

In several locations, including Jacksonville and Charleston, peak storm surge coincided with high tide which, along with heavy rain, produced significant inland flooding. Jacksonville's St. Johns River reported record water levels of almost six feet, and downtown Charleston was flooded with rivers overflowing when sea levels rose to 10 feet. Rainfall accumulation exceeded 11 inches in Jacksonville, and eight inches in Charleston.

Of the \$18 billion of insured loss in the US, the majority is in Florida, followed by Georgia, South Carolina, and Alabama.