



## LOSS ASSESSMENT FOR HURRICANE IRMA Third report (09/09/2017)

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Hurricane Irma developed on August 30 of 2017 near the Cape Verde Islands on the western African coast. 24 hours later after its formation it became a Category 2 hurricane. On September 4, Hurricane Irma strengthened into a Category 4 hurricane, with winds of 130 mph. Irma continued deepening and became a Category 5 hurricane by September 5, with winds of 175 mph. On September 6, the center of Irma made landfall along the northern coast of the island of Barbuda at peak strength (185 mph) and made successive landfalls on Saint Maarten and the British Virgin Islands. At the time of computation Hurricane Irma was moving north along the north coast of Cuba and was expected to reach the Florida Keys on September 10 and move along the southeast coast of Florida.

## 1 HAZARD

The hazard was computed with the hurricane track reported by the Tropical Cyclone Guidance Project by NCAR's Research Applications Laboratory with coordinates, wind speed, and pressure data from <u>August 31</u> to <u>September 9</u> and with a 3-day forecast obtained from the NHC. The Figure 1 shows the path followed by the hurricane.



Figure 1. Hurricane Irma, track and category





After computation, a hazard map with wind speed reaching <u>367 km/h</u> was obtained<sup>1</sup>. The hazard map is presented in the Figure 2.



Figure 2. Hurricane Irma hazard map

## 2 EXPOSURE

For risk assessment, the exposure from the Global Assessment Report 2015 with a 5x5 kilometer resolution was used and 18 countries from the Caribbean, and the states of Florida and Georgia were included in the calculations. The exposure elements for the United States in this model were reduced for computation purposes.

<sup>&</sup>lt;sup>1</sup> This is the wind speed for 3-seconds gusts. Be careful when comparing it to the one reported as the cyclone maximum wind speed, which is generally averaged in 1 minute.







Figure 3. Exposure from GAR15 for affected area in the Caribbean and the United States

The countries included are St. Lucia, Martinique, Dominica, Guadeloupe, Montserrat, Antigua and Barbuda, St. Kitts and Nevis, US Virgin Islands, Jamaica, Dominican Republic, Puerto Rico, Haiti, Anguilla, British Virgin Islands, Cayman Islands, Cuba, The Bahamas, Turks and Caicos Islands and the United States. The total exposed value is \$55.8 billion dollars and the following table shows the exposed values for each one of the listed countries.

Country name	Exposed Value		
Country hame	[USD Million]		
Anguilla	\$ 865.50		
Antigua and Barbuda	\$ 6,257.29		
British Virgins Islands	\$ 3,849.50		
Cayman Islands	\$ 8,554.03		
Cuba	\$ 174,919.00		
Dominica	\$ 2,027.94		
Dominican Republic	\$ 202,173.00		
Guadeloupe	\$ 41,119.10		





Country name	Exposed Value		
Country hame	[USD Million]		
Haiti	\$ 28,268.60		
Jamaica	\$ 70,711.40		
Martinique	\$ 39,559.90		
Montserrat	\$ 158.42		
Puerto Rico	\$ 259,030.00		
St Kitts and Nevis	\$ 4,112.06		
St Lucia	\$ 3,361.85		
The Bahamas	\$ 45,743.70		
Turks and Caicos Islands	\$ 1,049.28		
United States	\$ 54,922,500.00		
Florida	\$ 2,625,660.00		
Georgia	\$ 1,345,320.00		
Virgin Islands	\$ 5,344.44		

## **3 ESTIMATED LOSSES**

This table shows the general results for the area affected by Hurricane Irma. The expected loss from this model is \$89,421 million dollars, which is equivalent to a 1.6% relative loss for the entire area affected by the hurricane.

Results				
Exposed value	<b>USD</b> Million	\$ 55,819,605.01		
Expected loss	<b>USD</b> Million	\$	89,421.58	
	‰	1.60		

According to the results presented on the map the most significant losses are observed on Antigua and Barbuda, Anguilla, British Virgin Islands and Turks and Caicos.







Figure 4. Expected loss (relative to exposed value)

The table below presents aggregated results by country. The major economic losses are observed in the state of Florida with an expected loss of \$75,273 million dollars, Puerto Rico with an expected loss of \$7,649 million dollars and the British and US Virgin Islands with an expected loss value of \$2,465 and \$1,337 million dollars respectively. These values represent a 28.6‰, 29.53‰, 640.50‰ and 250.30‰ in expected losses relative to the exposed value for each of the countries mentioned above (in the case of Florida is the expected loss relative to the exposed value of the state).

The major losses, relative to the total exposed value of the country, are presented on Anguilla, British Virgin Islands, Turks and Caicos, US Virgin Islands and St. Kitts and Nevis.





0	Expected Loss	Expected Loss
Country name	[USD Million]	[‰]
Anguilla	555.15	641.42
Antigua and Barbuda	374.16	59.80
British Virgins Islands	2,465.60	640.50
Cayman Islands	-	0.00
Cuba	926.04	5.29
Dominica	-	0.00
Dominican Republic	42.84	0.21
Guadeloupe	41.79	1.02
Haiti	0.52	0.02
Jamaica	-	0.00
Martinique	-	0.00
Montserrat	1.50	9.48
Puerto Rico	7,649.07	29.53
St Kitts and Nevis	464.60	112.98
St Lucia	-	0.00
The Bahamas	4.07	0.09
Turks and Caicos Islands	284.11	270.77
United States	75,274.31	1.37
Florida	75,273.67	28.67
Georgia	0.64	0.00
Virgin Islands	1,337.72	250.30

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