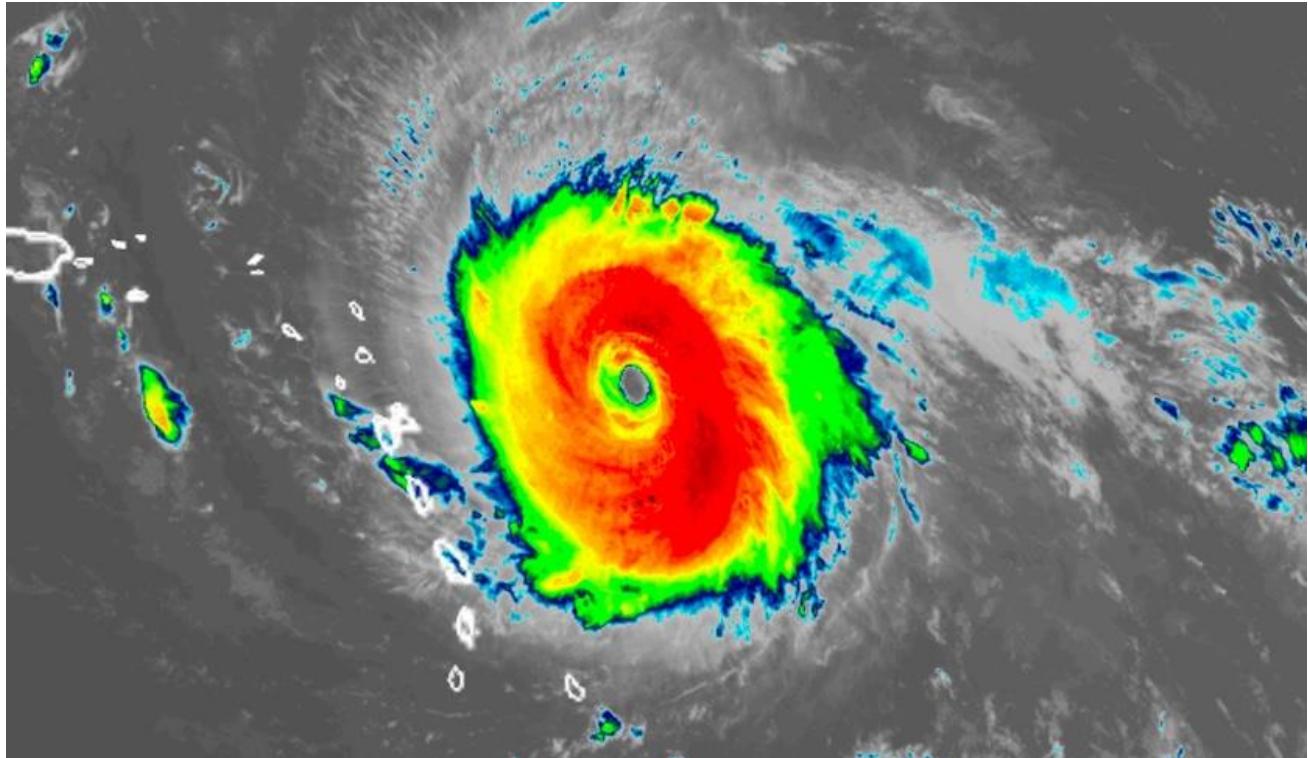


Category 5 Irma the 5th Strongest Atlantic Hurricane on Record

Dr. Jeff Masters · September 5, 2017, 10:13 AM EDT



Above: Infrared-wavelength [or visible-wavelength] GOES-16 satellite image of Category 5 Hurricane Irma as of Tuesday, September 5, 2017. Image credit: [RAMMB / CIRA@CSU](#).

Hurricane Irma intensified into an extremely dangerous high-end Category 5 storm with top sustained winds of 180 mph [on Tuesday morning](#), putting it among the strongest Atlantic hurricanes ever observed. Irma's winds are the most powerful ever measured in an Atlantic hurricane north of the Caribbean and east of the Gulf of Mexico. Measurements from Hurricane Hunter aircraft found peak winds of close to 180 mph, well above the 157-mph threshold for Category 5 strength. At 11:07 am EDT, a dropsonde in Irma's eye measured a central pressure of 927 millibars, 4 mb lower than the previous pass, so Irma is still strengthening.

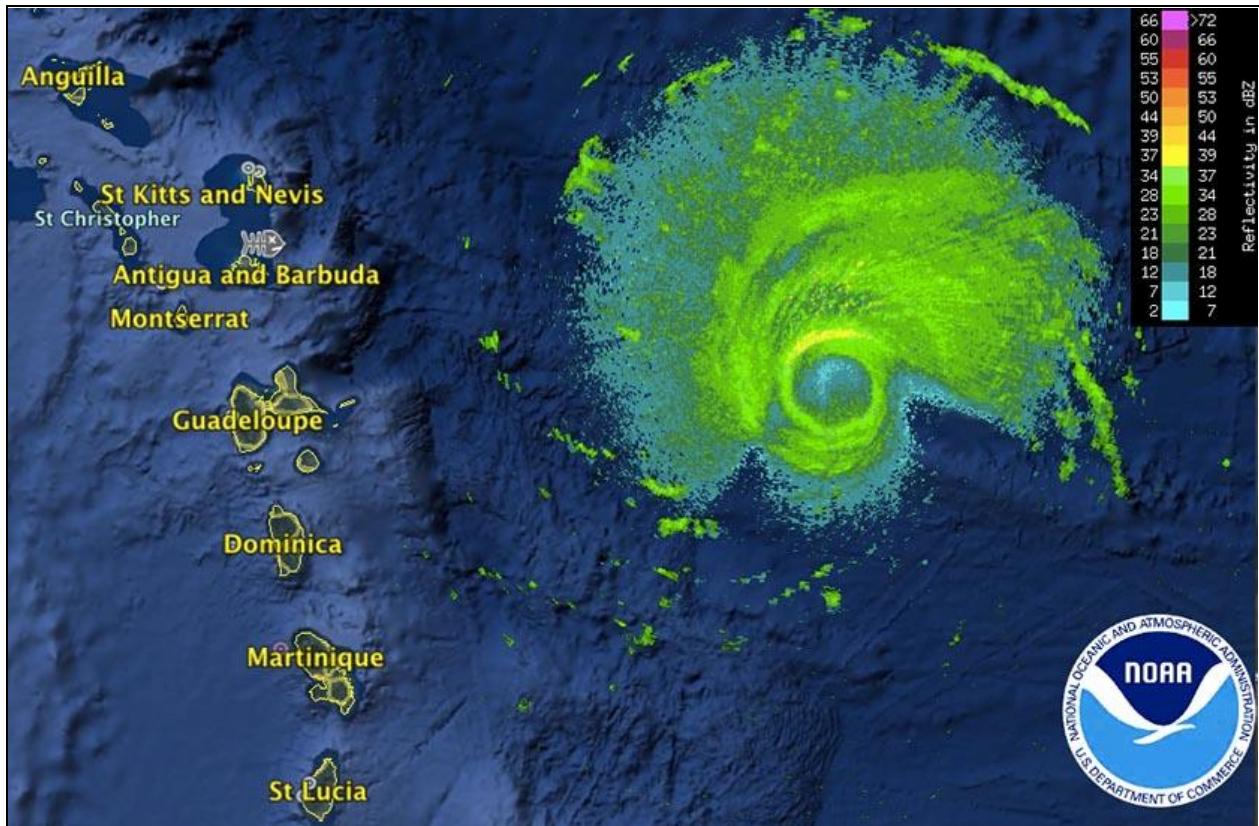


Figure 1. Radar image of Irma from NOAA hurricane hunter aircraft N42RF, taken at approximately 7 am EDT Tuesday, when the aircraft first observed Category 5 winds. Image credit: [Tropicalatlantic.com](#) and Google Earth.

Irma is poised to deliver a punishing blow to the northern Lesser Antilles Islands on Tuesday night and Wednesday. As of 11 am EDT Tuesday, Hurricane Warnings were in effect for the northern Leeward Islands, the U.S. and British Virgin Islands, and Puerto Rico. Tropical storm-force winds are expected to spread into the Lesser Antilles on Tuesday night, reaching the Virgin Islands on Wednesday morning, Puerto Rico on Wednesday afternoon, and the Dominican Republic on Thursday morning (Figure 2). As of 8 am EDT, most of southern Florida, Cuba, and The Bahamas were in the 5-day cone of uncertainty for Irma.

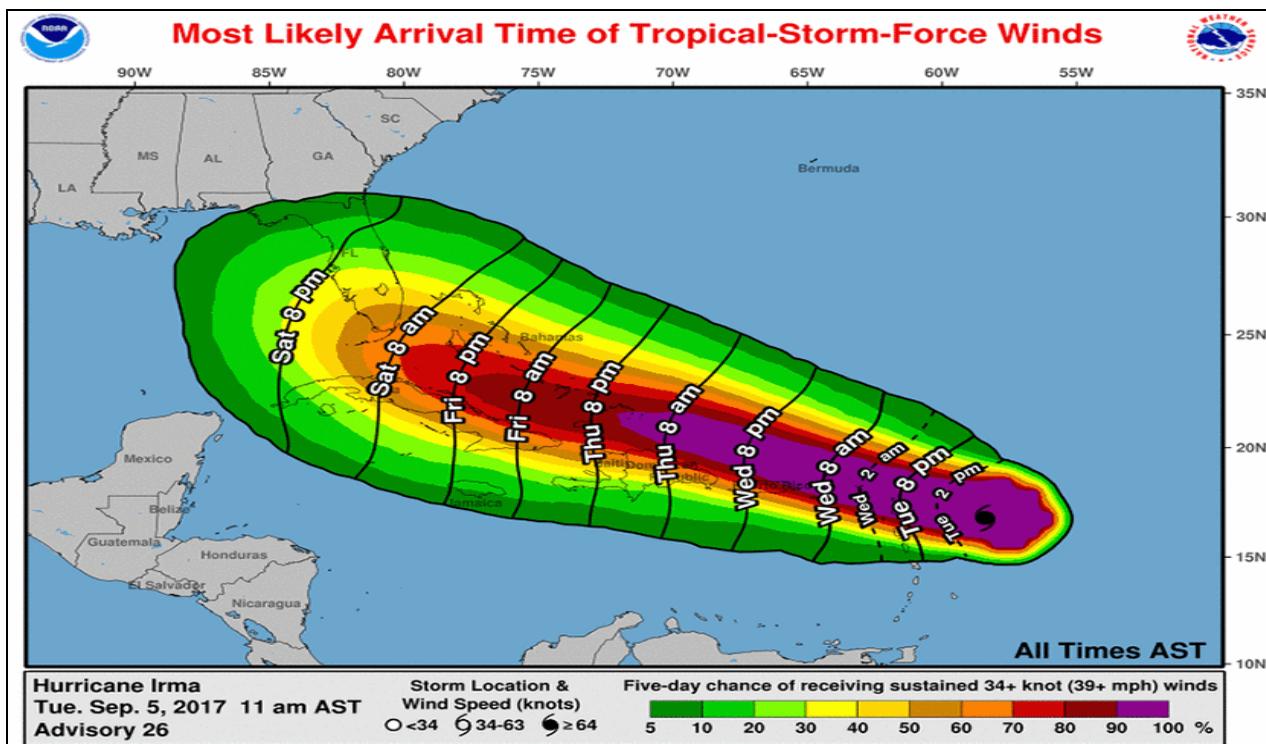


Figure 2. Most likely arrival time of tropical-storm-force winds from Irma, as of the 11 am EDT Tuesday, September 5, 2017 advisory from NHC.

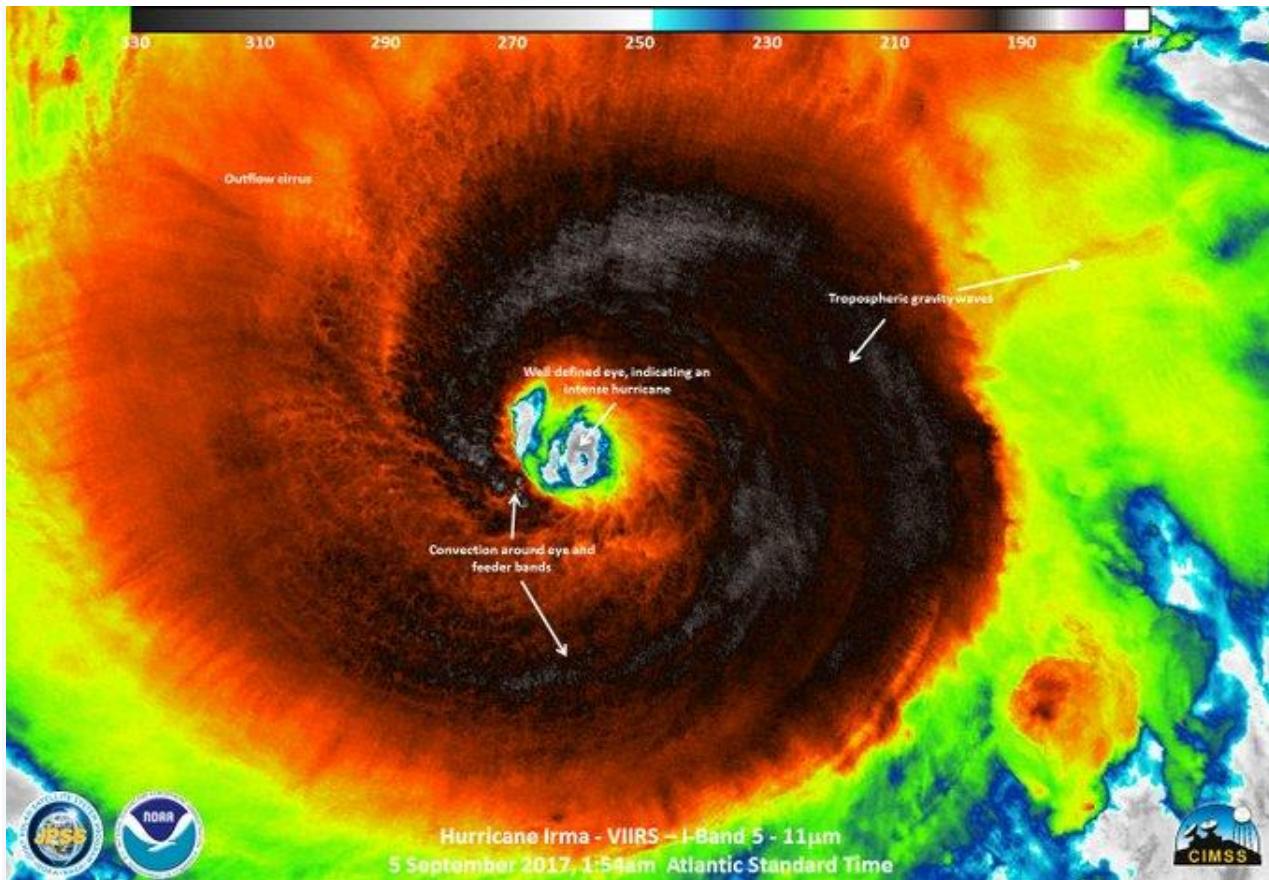
Satellite images on Tuesday morning showed a spectacular hurricane with a large eye surrounded by extremely intense eyewall thunderstorms with very cold cloud tops, indicating that they extended high into the atmosphere. Irma had excellent upper-level outflow on all sides. Conditions were favorable for even more strengthening, with wind shear a low 5 – 10 knots. Sea surface temperatures (SSTs) were a very warm 29.5°C (85°F), and the total heat content of the ocean was a high 60 kilojoules per square centimeter, giving the storm plenty of heat energy to fuel intensification. The surrounding atmosphere has been steadily moistening, as seen on precipitable water imagery, with a mid-level relative humidity near 55%, according to the 12Z Tuesday analysis from the SHIPS model. The eye of Irma was just beginning to be seen on Martinique radar.

Intensity forecast for Irma

According to Dr. Phil Klotzbach, Irma is tied with Rita (2005) and Mitch (1998) as the fifth strongest hurricane in Atlantic records going back to 1851, based on maximum wind speed. Irma is the first Atlantic hurricane outside of the Caribbean and Gulf of Mexico known to attain 180-mph sustained surface winds. The lowest central pressure measured outside the Caribbean and Gulf was 919 mb in Hurricane Gloria (1985), versus Irma's most recent central pressure of 927 mb, but Irma could end up breaking this record as well. The highest winds of any Atlantic hurricane are 190 mph, set by Hurricane Allen (1980), and Irma may approach that record.

For the next five days, wind shear, SSTs, and ocean heat content will remain very favorable for development, with Irma passing over slightly warmer waters of 29.5 - 30°C (85 - 86°F) later this week. Mid-level relative humidity is predicted to slowly rise, reaching 65% by the end of the week. We can expect one or more eyewall replacement cycles (ERCs) this week, which will act to temporarily weaken the hurricane by perhaps 10 mph, followed by re-intensification.

Three of our four most reliable intensity models—the HWRF, COAMPS-TC, and LGEM—predicted in their Tuesday morning runs that Irma would be a Category 4 or 5 hurricane with 130 - 160 mph winds through Saturday, and the [official NHC forecast](#) of a Category 4 or 5 hurricane for the remainder of the week looks reasonable. The only major impediment to Irma's strength would appear to be interaction with land; a close pass or direct hit on Hispaniola or Cuba could potentially damage or destroy the hurricane's inner core and knock it down to Category 2 or 3 strength.



The NOAA-NASA Suomi NPP satellite took this infrared snapshot of the powerful, Cat. 5 [#HurricaneIrma](#) earlier this morning, Sept. 5, 2017. [10:22 AM - Sep 5, 2017](#)