

GLOBAL PRECIPITATION MEASUREMENT MISSION APPLICATIONS

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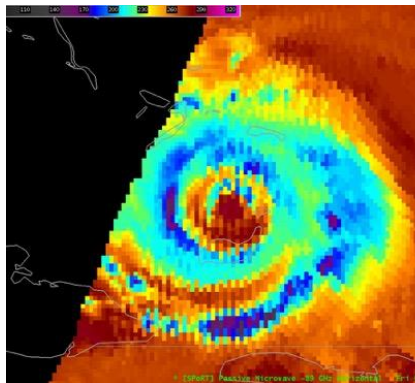


Weather, Climate and Land Surface Modeling

Satellite data play a fundamental role in our ability to monitor and predict weather systems as well as to forecast future changes to our climate and land surface. Satellite data, such as GPM's suite of products, are integrated into numerical weather prediction models that are operated by operational partners to provide and improve the observations from which the forecasts are then generated. Similarly, climate and land surface models rely on satellite observations to describe the conditions that exist today in order to project how conditions may change in the future. The Weather, Climate, and Land Surface Modeling applications area promotes the use GPM data to help monitor existing weather activity and model future behavior of precipitation patterns and climate.

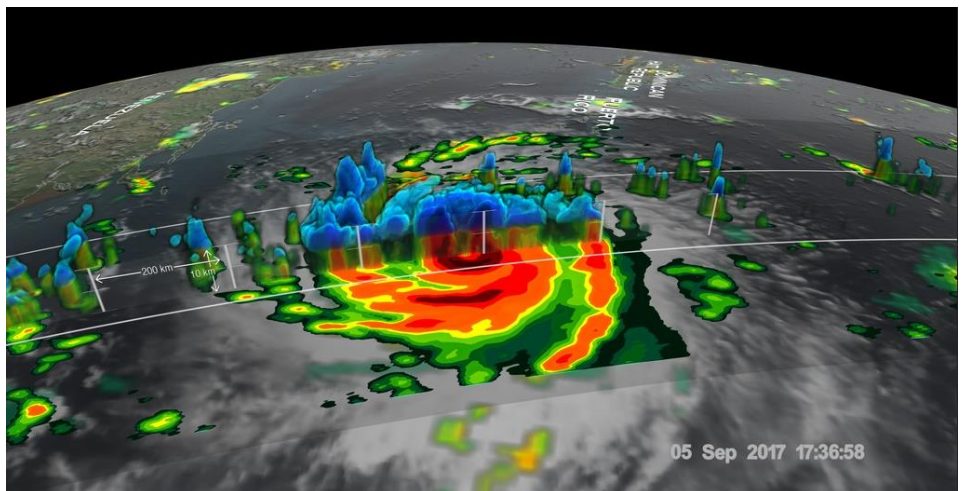
CASE STUDY: Monitoring Irma with GPM

Hurricane Irma was the strongest Atlantic basin hurricane ever recorded outside the Gulf of Mexico and the Caribbean Sea. NASA GPM's Microwave Imager (GMI) and Dual-Frequency Precipitation Radar (DPR) instruments were used to help understand the locations and intensity of heavy precipitation within Irma. Specifically, imagery from GMI was provided to NOAA's National Hurricane Center through NASA's Short-term Prediction Research and Transition (SPoRT) Center to understand the state of Irma on September 8, 2017 as it moved north of Cuba. GMI observations documented an eyewall replacement cycle, which impacts the intensity and development of the storm. The 3D view of Irma from September 5th revealed powerful storms in Irma's eyewall with estimates rates of 10.8 inches per hour.

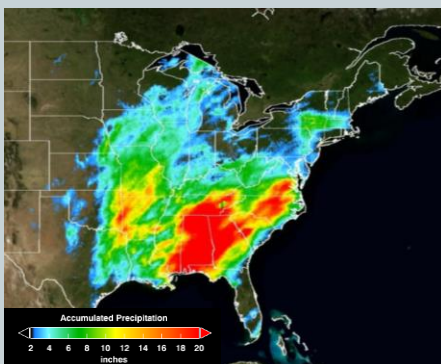


Hurricane Irma Discussion Number 37
NWS National Hurricane Center Miami FL
500 AM EDT Fri Sep 08 2017

Microwave images and data from an Air Force Reserve Hurricane Hunter aircraft (HHA) indicate that Irma is currently undergoing an eyewall replacement cycle. A recent GMI overpass showed an 50 nmi wide outer eyewall, with the inner eyewall weakening. The HHA reported peak 700-mb winds of 147 kt in the outer eyewall near 0500 UTC, and maximum SFMR winds were in the 125-130 kt range.



Images (top left) show rainfall analysis that was derived from GPM's GMI data on Sept. 8 as Irma moved north of Cuba. GPM's DPR uncloaked precipitation that was falling at a rate of more than 10.8 inches (274 mm) per hour in the solid ring of powerful storms within Irma's eye wall (bottom).



GPM satellite precipitation totals in Eastern U.S. recorded on 12/2015.

Credit: NASA, Horace Mitchell



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