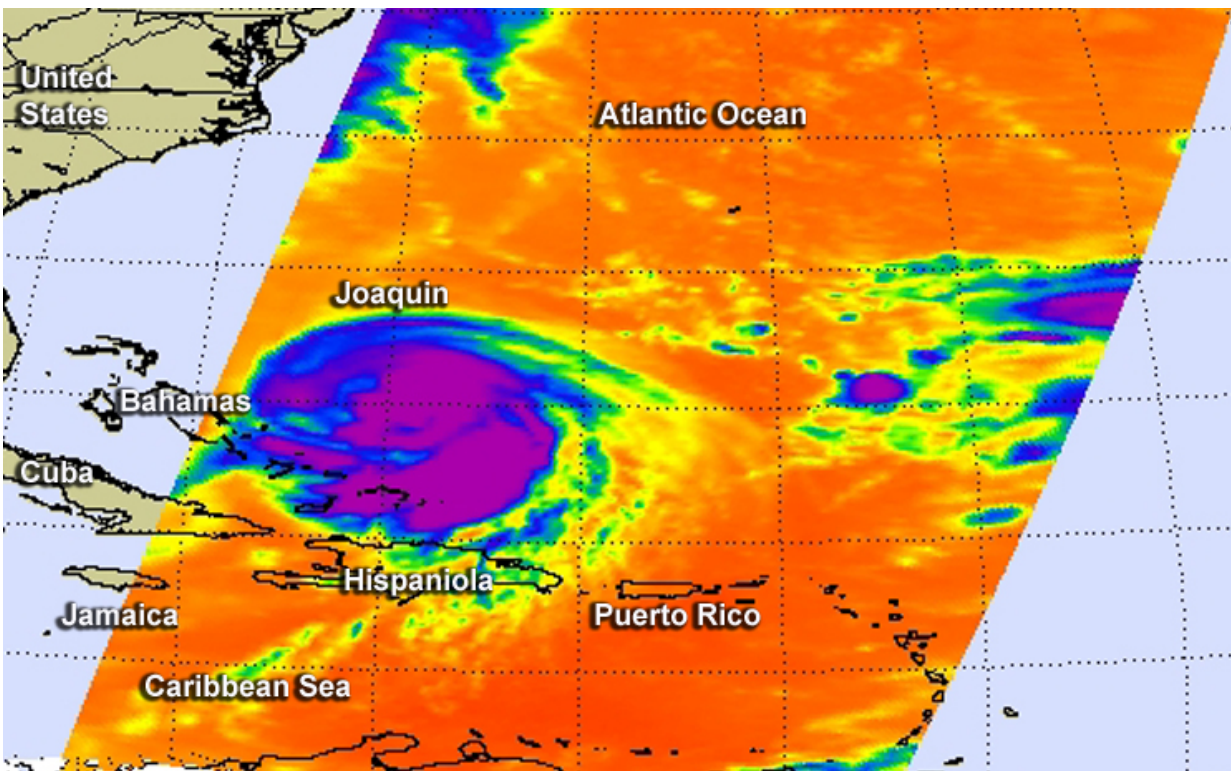


# NASA satellites gather data on Hurricane Joaquin

September 30 2015



On Sept. 30 at 2:11 a.m. EDT the AIRS instrument aboard NASA's Aqua satellite provided this infrared look at Hurricane Joaquin's strongest storms with coldest cloud tops circling the center (in purple). Credit: NASA JPL, Ed Olsen

The Global Precipitation Measurement or GPM Core satellite and NASA's Aqua satellite passed over Hurricane Joaquin and looked at

rainfall, cloud height and extent, revealing heavy rainfall and a more organized system than the previous day.

Joaquin became a [tropical storm](#) Monday evening (EDT), September 29 when it was midway between the Bahamas and Bermuda. By 8 a.m. EDT on September 30, it strengthened into a [hurricane](#) and has become the third hurricane of the Atlantic Hurricane season.

On September 30, the National Hurricane Center issued a Hurricane Warning for the central Bahamas including Cat Island, the Exumas, Long Island, Rum Cay, and San Salvador. A Hurricane Watch is in effect for the northwestern Bahamas including the Abacos, Berry Islands, Bimini, Eleuthera, Grand Bahama Island, and New Providence, but excluding Andros Island.

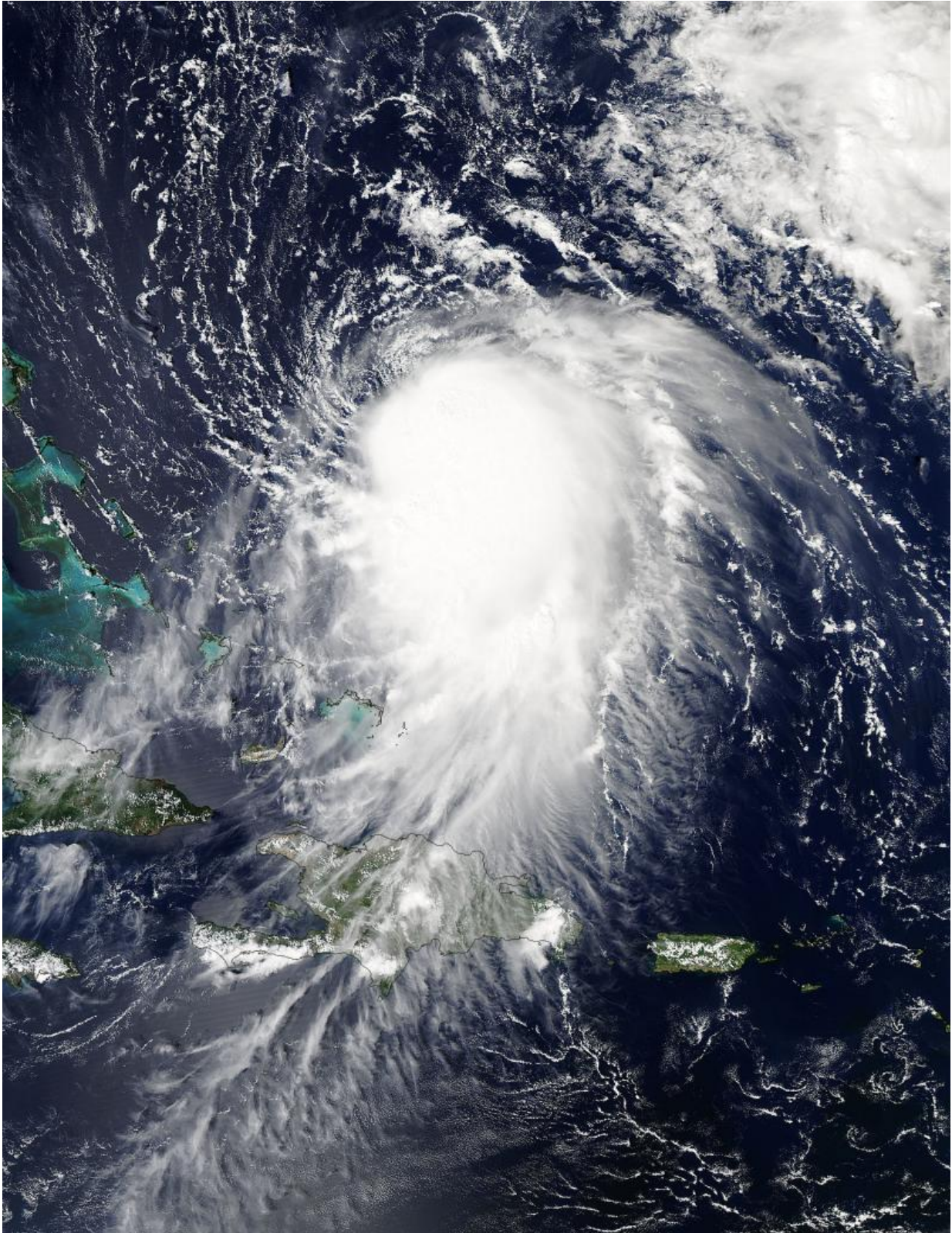
GPM captured an image of Joaquin at 21:39 UTC (5:39 p.m. EDT) on September 29 as Joaquin was moving very slowly towards the west-southwest about 400 miles east of the northwestern Bahamas. Rainfall rates were determined using two instruments aboard GPM. GPM's microwave imager (GMI) provided rainfall rates from the outer swath and Dual-frequency Precipitation Radar (DPR) space-borne precipitation radar provided data on the inner area.

At the time Joaquin had been battling northerly wind shear, which was impeding the storm's ability to strengthen. However, compared to earlier in the day, the system was beginning to gain the upper hand as the shear began to relax its grip.

"Joaquin's low-level center of circulation was located further within the cloud shield, and the rain area was beginning to wrap farther around the center on the eastern side of the storm while showing signs of increased banding and curvature, a sure sign that Joaquin's circulation was intensifying," said Steve Lang, research meteorologist at NASA's

Goddard Space Flight Center.

## **GPM Shows Intense Rain**



NASA's Aqua satellite captured this image of Joaquin near the Bahamas on Sept.

29 at 18:10 UTC (2:10 p.m. EDT). Credit: NASA Goddard MODIS Rapid Response Team

GPM showed a large area of very intense rain with rain rates ranging from around 50 to 132 mm/hour (~2 to 5 inches) just to the right of the center. This is a strong indication that large amounts of heat are being released into the storm's center, fueling its circulation and providing the means for its intensification. A 3-D view of Joaquin was created at NASA Goddard using GPM's DPR space-borne radar. Associated with the area of [intense rain](#) is an area of tall convective towers, known as a convective burst, with tops reaching up to 16.3 km (10.1 miles). These towers when located near the storm's core are a strong indication that the storm is poised to strengthen as they, too, reveal the release of heat into the storm.

At the time GPM passed over Joaquin, the National Hurricane Center reported that Joaquin's maximum sustained winds had increased to 65 mph from 40 mph earlier in the day, making Joaquin a strong tropical storm. GPM is a joint mission between NASA and the Japanese space agency JAXA.

## **Joaquin on September 30**

At 11 a.m. EDT (1500 UTC) on Wednesday, September 30, 2015 the center of Hurricane Joaquin was located near latitude 24.7 North, longitude 72.6 West. That puts the center of Joaquin about 215 miles (345 km) east-northeast of the Central Bahamas.

Joaquin was moving toward the southwest near 6 mph (9 kph). The National Hurricane Center expects Joaquin to turn toward the northwest and a decrease in forward speed on October 1. The center of Joaquin is

expected to move near or over portions of the central Bahamas tonight (Sept. 30) and Thursday (Oct. 1).

Maximum sustained winds have increased to near 80 mph (130 kph) with higher gusts and additional strengthening is expected. Joaquin could become a [major hurricane](#) during the next couple of days.

Hurricane force winds extend outward up to 35 miles (55 km) from the center and tropical storm force winds extend outward up to 125 miles (205 km). The minimum central pressure estimated from the Hurricane Hunter aircraft data is 971 millibars. For updated forecasts, watches and warnings, visit the National Hurricane Center website:

<http://www.nhc.noaa.gov>.

On Sept. 30 at 2:11 a.m. EDT the Atmospheric Infrared Sounder or AIRS instrument aboard NASA's Aqua satellite provided an infrared look at Hurricane Joaquin. AIRS data showed strongest storms with coldest cloud tops were around the center of circulation and in a thick band of thunderstorms wrapping into the center from the south. Cloud top temperatures were as cold as -63 Fahrenheit/-53 Celsius, indicative of strong storms with the potential for heavy rain.

Swells generated by Joaquin will affect portions of the Bahamas during the next few days, and will begin to affect portions of the southeastern coast of the United States by Thursday. These swells are likely to cause life-threatening surf and rip current conditions.

With the inhibiting wind shear expected to continue to diminish and the system moving over warm waters, the National Hurricane Center is forecasting Joaquin to intensify farther, possibly into a major hurricane within the next few days.

There is still some uncertainty in the forecast track. Joaquin is expected

to continue moving toward the Bahamas for the next day, taking the center very close to the islands, before turning northward ahead of an upper-level trough over the Southeast U.S. All interests should pay close attention to the latest developments from the National Hurricane Center.

Provided by NASA's Goddard Space Flight Center

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