NASA satellite tracking Typhoon Lupit on a march toward the northern Philippines

October 16 2009

The MODIS instrument on NASA's Aqua satellite captured an image of Typhoon Lupit heading west toward Luzon, at 12:45 a.m. EDT Oct. 16, 2009. Lupit was in the open waters of the Philippine Sea. Credit: NASA MODIS Rapid Response Team

Three instruments on NASA's Aqua satellite captured views of Typhoon Lupit on its western track toward the Philippines and are helping forecasters get an idea of its strength and behavior. Lupit strengthened quickly in 24 hours from a tropical depression to a typhoon, between October 15 and 16.

From 12:41a.m. to 12:45 a.m. EDT (12:45 p.m. Asia/Manila Time) on

October 16, NASA's Aqua satellite was capturing important data on Typhoon Lupit, so that forecasters in the U.S. Navy's Joint Typhoon Warning Center (who forecasts tropical cyclones in the Western Pacific) could make a forecast. In the Philippines, meteorologists are referring to the storm by the name "Ramil."

Aqua's Moderate Imaging Spectroradiometer (MODIS) instrument, Atmospheric Infrared Sounder (AIRS) and Advanced Microwave Sounding Unit (AMSU) instrument captured visible, infrared and microwave images of Typhoon Lupit.
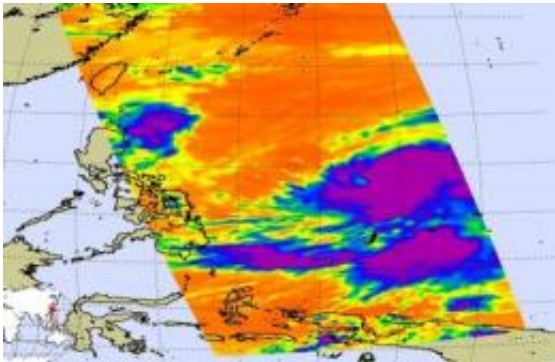
Aqua's Atmospheric Infrared Sounder (AIRS) instrument captured Lupit's (purple and blue) high thunderstorm cloud temperatures at 12:41 a.m. EDT on Oct. 16. The thunderstorm tops were colder than minus 63 Fahrenheit. The Philippines are visible to the west (left) of Lupit. Credit: NASA JPL, Ed Olsen

Infrared imagery measures temperatures and not only can it see cold, high cloud tops in tropical cyclones, but also the warm ocean waters that power the cyclones (if the sea surface temperatures are over 80F(26.6 C)). Cold cloud top temperatures provide clues about the power of the thunderstorms in a tropical cyclone. The colder the clouds are, the higher they are, and the more powerful the thunderstorms are that make up the

cyclone. Lupit's cloud temperatures were colder than minus 63 Fahrenheit (-52.78 C), indicating very cold, high, strong thunderstorms within.

The ocean waters beneath Typhoon Lupit are over 80F (26.6 C), the threshold to maintain tropical cyclones, so they're helping to strengthen the storm.

AIRS data is also coupled with data from AMSU create microwave images of storms. The AMSU image uses the radiances of the 89 GHz channel, and the cold areas in those images indicate where there is precipitation or ice in the cloud tops.

By using both the infrared and microwave satellite imagery, forecasters at the Joint Typhoon Warning Center (JTWC) were able to see inside the storm. The JTWC discussion on October 16 said "Typhoon Lupit has developed an impressive convective structure evident in a microwave image, [from 4:59 a.m. EDT] as well as in recent animated infrared imagery which shows a tightly wrapped system with a banding eye. Lupit's intensification to typhoon strength has been enabled by excellent poleward outflow into the mid-latitude westerlies."
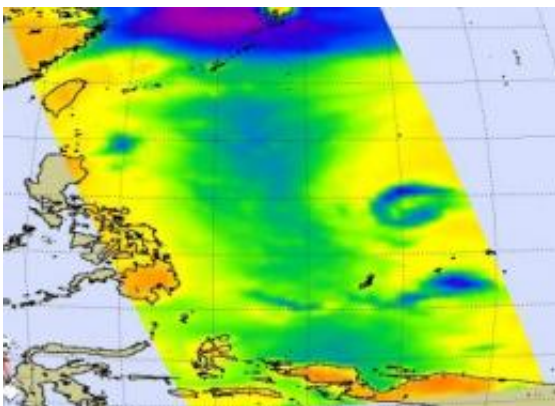
Microwave images are created when data from NASA's Aqua satellite AIRS and

AMSU instruments are combined. The cold areas in this image of Lupit from Oct. 16 (yellow-green) indicate where there is precipitation or ice in the cloud tops. The microwave image suggests cold, high thunderstorms. Credit: NASA JPL, Ed Olsen

At 11 a.m. EDT (11 p.m. Asia/Manila Time) on October 16, Typhoon Lupit's maximum sustained winds were near 74 mph. Lupit's center was 400 nautical miles (643 kilometers) north of Palau, near 14.4 North latitude and 133.8 East longitude. Lupit was moving west at 20 mph (32 km/hr) and generating 17-foot-high waves.

Over the weekend, Typhoon Lupit is expected to continue moving generally in a west-northwest direction. The northern Philippines will likely feel the first effects of Lupit by 8:00 a.m. EDT (1200 UTC, or 8 p.m. Asia/Manila Time) on October 20. Storm-weary residents in Luzon, the Philippines should make preparations over the weekend.

Source: JPL/NASA (news : web)

Citation: NASA satellite tracking Typhoon Lupit on a march toward the northern Philippines (2009, October 16) retrieved 24 April 2024 from https://phys.org/news/2009-10-nasa-satellite-tracking-typhoon-lupit.html