

NASA Storm Hunters Continue to Study Data From Hurricane Dennis

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NASA researchers and their partners in the Tropical Cloud Systems and Processes (TCSP) mission in Costa Rica observed a phenomenon July 8-9 - the disruption of Hurricane Dennis over island terrain, and its subsequent return to savage life once it returned to warm Atlantic waters.

NASA scientists and the National Oceanic and Atmospheric Administration (NOAA) watched during the night of July 8 as Dennis, a powerful Category 4 hurricane with a well-defined eye, passed over Cuba. The interaction with Cuba's mountainous terrain severely disrupted the eye of the storm, causing Dennis to degrade to a Category 2 hurricane. The NASA ER-2 weather plane was in place to observe the re-emergence of the eye over warm waters north of the land mass.

NASA's third mission to fly over Dennis began early on July 9, lasting more than seven hours. The objective was to sample Dennis from stratospheric heights of about 65,000 feet. A primary goal of the TCSP research mission is to fly missions into the same storm on consecutive days, enabling scientists to monitor the often rapidly changing intensity and structure of a hurricane, particularly when it crosses land.

The NASA aircraft made four passes over the eye of Dennis. Each pass was oriented west-to-east, and the entire flight pattern was shifted every half hour to move northwest with the storm, keeping the ER-2 above the center of the hurricane. Remote sensors on the aircraft used microwave energy to probe the inside of the eye wall clouds, measuring vertical air

currents and the amount of ice contained in the highest thunderstorm clouds, as well as the level of electrical activity. These three elements -- upward air speed, ice and lightning -- are all indicators of a hurricane's intensity.

Data gathered during the fourth mission to study Dennis is expected to reveal how its inner core circulation rebounded from Category 2 above Cuba to a deadly Category 4 when it returned to the sea. In the crucial hours after departing Cuba, Dennis regained strength so rapidly that even veteran forecasters participating in the mission were amazed.

TCSP scientists continue to monitor the tropics for the development of tropical cyclones from innocuous, wave-like disturbances and whirls in the atmosphere. One key question scientists hope to answer is whether tropical cyclones develop in isolation in the eastern Pacific, or require a wave disturbance, or "seedling," to enter from the western Atlantic.

The fifth flight mission, which was scheduled to start July 15, is designed to investigate the conditions in the eastern Pacific that set the stage for rotation and tropical thunderstorms interacting to create a hurricane.

The 28-day TCSP mission is sponsored by NASA's Science Mission Directorate at NASA Headquarters in Washington. The primary goal of the mission is to document "cyclogenesis" in action -- the interaction of temperature, humidity, precipitation, wind and air pressure that creates ideal birthing conditions for tropical storms, hurricanes and related phenomena.

TCSP participants include NOAA-HRD, five NASA centers, 10 American universities and partner agencies in Costa Rica.

For more information about TCSP on the Web, visit:

tcsp.nsstc.nasa.gov/tcsp

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