NASA Researchers Studying Tropical Cyclones

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NASA hurricane researchers are deploying to Costa Rica next month to investigate the birthplace of eastern Pacific tropical cyclones. They will be searching for clues that could lead to a greater understanding and better predictability of one of the world's most significant weather events – the hurricane.

As scientists and coastal residents brace for another potentially challenging hurricane season, NASA is launching the Tropical Cloud Systems and Processes (TCSP) mission. TCSP is a month-long research effort primarily intended to document "cyclogenesis," the birth of tropical storms, hurricanes and related phenomena.

Researchers will monitor oceanic thunderstorms to study why some systems develop into tropical cyclones and some do not. Researchers feel the data is vital to understanding how such weather systems evolve and travel. The data also could support development of a more accurate and timely warning system to help safeguard property and lives. A team of atmospheric scientists, engineers and aircraft personnel will take up residence in San Jose, Costa Rica during July. The NASA team will work with the National Oceanic and Atmospheric Administration (NOAA) and Costa Rican Centro Nacional de Alta Tecnologia (CENAT). The team will conduct ground-based and airborne studies to measure the buildup and behavior of tropical storm systems on Costa Rica's east and west coasts.

Missions will be flown over the region using NASA's ER-2 and NOAA's

WP-3D Orion aircraft and with unmanned aerial vehicles (aerosondes). The unmanned flights will be managed in conjunction with the University of Colorado at Boulder. The airborne experiments will collect temperature, humidity, precipitation, and wind information related to tropical cyclones and other phenomena that often lead to development of more powerful storms at sea. The field operations will also take advantage of several NASA and NOAA satellites.

NASA and the Instituto Meteorologico Nacional of Costa Rica also will launch a series of RS-92 series, balloon-borne probes (sondes), to measure humidity and other data related to tropical storm origins.

"Costa Rica is an ideal location for this research," said Dr. Ramesh Kakar, Weather Focus Area leader for NASA's Science Mission Directorate. A vast number of tropical storms and hurricanes impacting the eastern Pacific are spawned near the small Central American nation's western coast.

"In the Atlantic, cyclogenesis often occurs off the western coast of Africa, or sufficiently far out over the ocean that long-duration science flights are extremely difficult," Kakar said. "In the eastern Pacific near Costa Rica, however, it is possible to study the genesis process from formation of the initial disturbance until, in some cases, it grows into a hurricane over a more compact geographical region."

Researchers also will be able to take advantage of their proximity to the Caribbean and the western Gulf of Mexico, studying tropical systems off Costa Rica's eastern shores during more mature phases of development.

"This experiment is significant for two reasons," said Robbie Hood, an atmospheric scientist at the Marshall Space Flight Center, Huntsville, Ala. She is one of three lead scientists for the project in Costa Rica. "We will have an opportunity to take a closer look at the factors contributing

to the initiation and intensification of tropical cyclones which are still somewhat mysterious processes for researchers and operational forecasters. We will also be examining what are the best combinations of satellite and aircraft technologies to improve how hurricanes are monitored and predicted," she said.

"Building on a quarter century of ever improving spaceborne observations of the Earth, we are entering an exciting new era. It will be using information collected by satellites and uninhabited aerial vehicles to the best advantage for improved weather prediction and other societal benefits," Hood said.

The new study continues NASA's successful Convection and Moisture Experiment (CAMEX) research series, conducted from 1998 to 2001 with NOAA. TCSP participants include NOAA's Hurricane Research Division, five NASA centers, 10 American universities and partner agencies in Costa Rica.

For more information about TCSP on the Web, visit:
www.nasa.gov/vision/earth/look … /hurricane_2005.html
tcsp.nsstc.nasa.gov/tcsp
www.aoml.noaa.gov/hrd/

Source: NASA