

Inside Wallops

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NASA Technology Captures Massive Hurricane Waves

A hurricane's fury can be relentless, from frightening winds, to torrential rains and flooding. These storms also create enormous ocean waves that are hazardous to ships and storm surges of up to 30 feet the storms can demolish shoreline structures, erode beaches and wash out coastal roads.



NASA Photo

A post-Hurricane Katrina photograph showing the Gulf of Mexico on the left and the Mississippi Sound on the right.

NASA's Scanning Radar Altimeter (SRA), designed to take measurements of the changing wave height and structure in and around hurricanes, flew through many storms on a National Oceanic and Atmospheric Administration (NOAA) aircraft from 1998-2005. It captured unprecedented details on wave behavior that are helping improve sea height forecasts.

The SRA measures waves by sweeping a radar beam across the ocean and measuring the distance to the sea at many points. Those distances are then subtracted from the aircraft altitude to produce a sea-surface elevation map that is displayed on a monitor in the aircraft.

While the flight portion of the hurricane research program concluded with the 2005 hurricane season, the data continue to help researchers develop and improve ocean wave computer models that simulate hurricane-generated ocean wave height, dominant wavelength, and wave direction.

Computer models allow wave behavior to be predicted at times and places where there are no observations. However, actual observations from SRA are essential because "they tell us how the wave field - the height, length and direction of waves in a given area - actually varies with a hurricane's wind speed, size, and forward motion so that we can improve the performance of the models that disaster managers and structural engineers rely on for guidance," said Wayne Wright, Wallops project scientist.

Ongoing research efforts have shown that ocean wave height responds rapidly to changes in a storm's wind speed. Scientists believe the overall wave field also is driven by the size or radius of a storm's strongest winds and its forward speed. In Hurricane Katrina, the largest waves, up to 40 feet, were found near the strongest winds. In September 2004, scientists with the Naval Research Laboratory-Stennis Space Center, Bay St. Louis, Miss., measured a record-size ocean wave - a whopping 91 feet - when the eye wall of Hurricane Ivan passed over sensors in open water over the Gulf of Mexico.

"Ocean depth is another critical factor in wave height," said Edward Walsh, scientist at Wallops. "Our observations from Hurricane Bonnie indicated that as soon as the waves encountered the continental shelf - the underwater extension of the coastal plain - their length began to shorten and they became steeper. As the water became shallow, wave height plummeted."

Similarly, with Hurricane Rita in September 2005, the wave height dropped dramatically and was only 9 feet when wave energy was lost due to the shoaling of water on the continental shelf - the process in which waves coming into

shallow waters are slowed by friction and become closer together and steeper.

A storm's most massive waves usually decrease in size when they interact with the ocean's continental shelf and other land forms, like "barrier islands" that form a thin protective wall between the open sea and the mainland.

ATK Completes Successful Test for New Launch Vehicle

Alliant Techsystems (ATK) recently achieved a significant milestone in their program to design, develop, build and fly small launch vehicles. A "Pathfinder" test of the ATK Launch Vehicle (ALV X-1) verified that vehicle processing procedures and equipment were ready for live motors and flight hardware.



Photo by James Mason-Foley

The primary payload for the upcoming flight is a hypersonic boundary layer transition experiment (Hy-BoLT) sponsored by NASA's Hypersonics Project within the Fundamental Aeronautics Program.

A secondary payload consisting of a suborbital aerodynamic re-entry experiment (SOAREX) is being developed by NASA Ames Research Center.

The flight of the ALV X-1 is currently scheduled for mid-2007 from the Mid Atlantic Regional Spaceport's Launch Pad 0B on the south end of Wallops Island.

Wallops Shorts.....

Balloon Launch

A NASA scientific balloon was launched from Ft. Sumner, N.M., on September 25. The 39.57 million cubic foot balloon carried the High Energy Replicated Optics (HERO) instrument. The focusing x-ray telescope payload was to provide high sensitivity measurements of galactic and extra-galactic x-ray sources. Dr. Brian Ramsey, NASA Marshall Space Flight Center was the principal investigator. The balloon reached a maximum altitude of approximately 92,000 feet. The ensuing shallow rate of descent could not be stopped by dropping ballast and the flight was terminated. Total flight time was 6 hours, 24 minutes.

On the Range

NASA Langley Research Center's Generic Transport Model (GTM) Unmanned Aerial Vehicle (UAV) Program conducted flights from Wallops

Island on September 27 and September 28 in the presence of LaRC Program Management. Project flights included the first L1011-F2 UAV flight.

The TacSat-2, Minotaur motors for Stages 3 and 4 are scheduled to arrive this week, along with the initial group of Orbital Sciences Corporation employees from Chandler, Az., and their ground support equipment. On October 4, Wallops will hold a TacSat-2 Safety Peer Review.

Field preparation is underway on the Terrier-Black Brant sounding rocket scheduled for a nighttime launch from Wallops Island, October 11.

Field preparations also are underway at the White Sands Missile Range, N.M., for two Terrier-Black Brant sounding rockets scheduled for October 23

Occupational Safety and Health Training

Confined Space -

Training for Supervisors

October 3
8 - 4:30 p.m.
Building E-104, Room 310
Registration is due by September 15

Confined Space -

Training for Workers

October 4
8 to 11:30 a.m. or 12:30 to 4 p.m.
Building E-104, Room 310
Registration is due by September 15

The training is offered at no cost to NASA and contractor employees. To attend complete and submit a training registration request or contact Marvin Bunting at x2030 or by email: mbunting@pop200.gsfc.nasa.gov

Refresher Overhead Crane Operator Training

October 16
8:30 a.m. to 4:30 p.m.
Building N-159, Room E-208

This course satisfies the annual training requirements of the NASA Standard for Lifting Devices and Equipment for the operation of electric, manual or air driven overhead cranes and hoists at WFF.

For further information and to enroll, contact Matt Meier at x2156.

Wallops Environmental Office Seeks Help

The Environmental Office is asking for your help to prevent pollution.

If you use tin/lead or other lead containing solder or use any mercury containing devices other than fluorescent tubes in your work area, complete the following questions and email your responses to: Marianne.F.Simko.1@gsfc.nasa.gov



1. Approximately how many rolls of tin/lead or other lead containing solder do you use in a year?
2. Have you ever used or investigated using lead free solder ?
3. What types of mercury devices do you use (ex: thermometers, manometers, etc.)?
4. How often do you replace these items?
5. Have you ever replaced or investigated replacing any of your mercury containing devices with a mercury free device?

For further information contact Marianne Simko, Environmental Engineer, at x2127.

Celebrate Wallops Day October 5

Celebrate You!
Speaker Rick Allen
9:30 - 10:45 a.m.
Building D-10

Exhibits, Food, Music
11 a.m. - 1 p.m.
N-159 Hangar

Artisan/craft Demonstrations and Exhibits
Organization and Office Exhibits
Entertainment by Wallops Music Club
Food Vendors
Baked Goods by the Black History Club
Ice Cream courtesy of Computer Sciences Corporation

Storytelling
1:30 - 3 p.m.
Bldg E-2 Training Room

Hear your friends and co-workers as they share the stories of their lives and experiences.

WICC Employee Safety Committee

The Wallops Institutional Consolidated Contract (WICC) formed an Employee Safety Committee (WESC) in June 2006 to assist WICC employees in maintaining a safe and healthful work place. WESC is another method for WICC employees to report safety concerns and issues. Safety concerns will be reported and discussed at monthly meetings. Recommendations are then made to senior management for addressing hazards and improving safety.

WICC safety issues may be reported to either of the following:
Alvin Taylor at x1360 or by email: altaylor@pop200.gsfc.nasa.gov
Diane Weller at x1336 or by email: cweller@pop200.gsfc.nasa.gov

The existing reporting mechanisms for urgent safety issues remain the NASA Safety Office, Robert Nock at x2559 or by email: Robert.L.Nock@nasa.gov, WESC, your supervisor, or your Safety Officer.

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www.wff.nasa.gov
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