National Aeronautics and Space Administration
Goddard Space Flight Center

Inside Wallops

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Researchers Study Air-Sea Gas Transfer at Wallops

Research continues to reveal more and more about how important the role is that the oceans play in Earth's climate. Satellites also are adding real-time data that will help scientist understand the relationship between the oceans and the atmosphere. One such relationship scientists are trying to better understand is the transfer of gases between the oceans and the atmosphere.

Recently 20 researchers from NASA and universities and organizations from the United States and Canada converged at the Wallops Flight Facility to run a series of experiments to better understand this interaction between the world's oceans and its atmosphere.

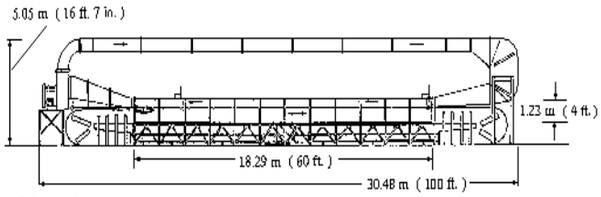
Dr. Steve Long, manager of the NASA Air-SEA Interaction Facility (commonly called the wave tank) at Wallops, said the six-week series of experiments was a culmination of two years of planning and preparation by the researchers.

The experiment, called the Flux Exchange Dynamics Study (FEDS.98), was driven by two factors. The first was the need to know "the fluxes or movements of gases, such as carbon dioxide, through the ocean-atmosphere interface, which has relevance to the role played by the oceans in global warming," Long said. The second was "how the fluxes of gases and heat through the interface depend upon the stability of the air boundary layer next to the sea surface," according to Long. This information is important in NASA's Earth observation and climate modeling efforts and for planning efforts to outline a national response to climate change.

The tests were conducted at the wave tank so they could take place in a controlled setting. Past efforts by NASA to study gas exchange have included a series of carbon dioxide measurements by the ER-2 aircraft from 1993 through 1997 and recent efforts using data from the GEOS-1 satellite to assimilate winds in modeling seasonal transport. FEDS.98 allowed these processes to be studied up close under controlled conditions that could be maintained for as long as necessary, until a complete data set was recorded.

Long said that because each process being studied was linked to gas exchange, a complete measurement run required two to three hours preparation, followed by up to eight hours of measurements. Often, two measurements per day were done, so that the facility was in use almost around the clock, seven days a week for the duration of the experiment.

During the upcoming months, data will be processed, analyzed and exchanged between team members, Long said. The results are expected to be released in journals and at scientific meetings during 1999 and 2000.



The Wave Tank

The main wind-wave-current inter-action test section is 60 feet (18.29 meters) long, 4 feet (1.22 meters) high, and 3 feet (.91 meters) wide, filled to a water depth of 2.5 feet (.76 meters), with 1.5 feet (.45 meters) remaining for air flow. The facility is capable of winds up to 50 knots (about 25 meters/sec), along with water current in either direction of about .5 knot (51 centimeters/sec) generated by pumping 100 gallons/sec through the facility's 16 inch pipes. Electronically controlled hydraulic units at both ends of the tank can generate any wave frequency or pattern up to 10 Hz.The computer control of wind, current, and hydraulic wave generating units can accurately repeat unsteady phenomena to allow its statistical study, as well as automate the facility operation. Wave tank information can be found at: **http://airsea.wff.nasa.gov/wavtank1.html**

Mars Millennium Project Launched

NASA Administrator Daniel S. Goldin joined First Lady Hillary Rodham Clinton and other officials at the Smithsonian's National Air & Space Museum on Jan. 14 to unveil the Mars Millennium Project, an official White House Millennium Council Youth Initiative.

The Mars Millennium Project is designed to challenge students across the nation to design a community yet-to-be-imagined for the planet. This interdisciplinary learning project will engage kindergarten-through-high school students in classrooms and youth groups throughout the United States.

NASA Wallops Flight Facility has accepted an invitation to participate in the Mars Millennium Project. Tony Goodyear, Teacher on Loan, Public Affairs Office, attended the kick-off ceremony.

Wallops Shorts.....

Rockets Launched

A Black Brant XII sounding rocket was successfully launched from the Andoya Rocket Range, Norway on Jan. 21. The experiment, Cleft accelerated Plasma Experimental Rocket (CAPER) will determine the source mechanisms for plasma acceleration in the topside cleft ionosphere between 1,200 kilometers (746 miles) and 1,400 kilometers (870 miles) and in the pre-noon section. The principal investigator was Dr. Paul Kintner, Cornell University. Dave Moltedo, Range and Mission Management Office (RMMO), was the payload manager.

A Black Brant XII sounding rocket was successfully launched from the Poker Flat Research Range (PFRR), AK. on Jan. 22. The Active Plasma Experiment (APEX) conducted suborbital flight experiments designed to characterize the physics related to the injection of an artifical plasma jet at ionospheric altitudes using an explosive type generator. Dr. Ching-I. Meng, John Hopkins University, was the principal investigator. Frank Lau, Sounding Rockets Program Office was the payload manager.

A Black Brant VB sounding rocket was successfully launched from the PFRR on Jan. 22. The experiment will provide information about the magnitude of the local turbulent diffusion and existence of localized hot regions with large vertical velocities and cross check the chemical release payloads and the in situ techniques on the instrumented rocket for measuring turbulent parameters. Dr. Andrew Christensen, The Aerospace Corporation, was the principal investigator. Bruce Scott, RMMO, was the payload manager.

A Taurus Orion sounding rocket was successfully launched from the PFRR on Jan. 22. The experiment will compare the in situ diffusion coefficient estimates obtained with different techniques, compare in situ and ground-based values, measure the horizontal flow gradients in and near the auroral oval and measure the gradients in the vertical velocities over the same region. Dr. Miguel Larsen, Clemson University, was the principal and Bruce Scott, RMMO, was the payload manager.

Fire Department

Wallops Fire Department personnel with Rescue 25 participated in a simulated exercise at the Crisfield-Airport on Jan. 16. "The Great Airport Adventure", sponsored by Boy Scout Troop and Cub Scout Pack 254, Crisfield, provided the scouts an opportunity to earn special badges such as emergency preparedness and first aid.

Health Hints

by Betty Jackson, R.N.

February is National Heart Month. Now is the time to get started on a regular cardiovascular exercise program.

Exercise and Heart Rate

Any activity that gets your heart pounding and your lungs working harder also will give your cardiovascular system a workout. Sitting still, your heart pumps about 65 times a minute, pushing about 1 gallon of blood throughout your body. During intense bursts of activity, your heart can beat up to 200 times and pump 6 gallons of blood per minute.

Muscles need more oxygen during exercise. As your lungs work to provide it, your heart is forced to move blood faster so your muscles are able to get enough oxygen. Pumping harder and faster makes your heart more efficient even when you aren't exercising. Full benefit to your circulatory system comes when you exercise enough to make your heart pound faster for at least 20 minutes at a time, between three and five times a week.

Keeping your circulatory system in shape by regular exercise is one of the best ways to avoid heart disease, particularly for non-smokers who eat a low-fat diet. Exercise also seems to lower cholesterol levels.

Cardiovascular activity helps flight heart disease and develop lung function. Following a regular exercise program, a little every day rather than a lot once a week, will help you sleep soundly and look fitter.

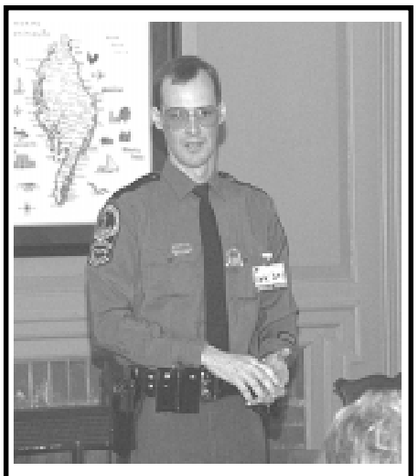
By walking briskly for between 30 and 60 minutes every day, you can reduce the risk of heart disease by 60% if you are a man and by 48% if you are a woman.

Reaching your exercise zone

Your optimal heart rate for exercise lies between 60% and 80% of the maximum rate for your age. Calculate yours with the following formula: Subtract your age from 220, multiply the result by 80% (0.8) then by 60% (0.6). The first figure is the top of your exercise intensity range, the second is the bottom. When you're fit, aim for an 85% maximum.

Monitoring your heart's activity

Monitor your heart at various times during exercise. Lightly press your index and middle fingers on the inside of your wrist to take your pulse. Alternatively, take your pulse at either side of your throat. Count your heart rate for 10 seconds, then multiply by six to give beats per minute. As your general level of fitness increases, you'll have to work harder to achieve your own safe maximum.



Trooper Ted Childress, (above) Virginia State Police, Melfa Barracks spoke to a group during a brown bag lunch on Jan. 21. Trooper Childress gave tips on "hazardous road conditions, hazardous drivers - - how to survive". *Digital photo by Rick Huey.*

New Leave and Earnings Statement For Civil Service Employees

The Financial Management Division will begin using the NASA-wide Leave and Earnings Statement this pay period. When you get your pay statement (on or about Jan. 26), it will be the new statement that the entire Agency is using.

This NASA-wide statement is consistent with an effort to consolidate unique payroll processes at each Center, and will reduce resources required for each Center to maintain its own unique statement.The new statement has all the features that were on our previous statement as well as several additional new ones.

The Leave and Earnings Statement and the detailed description document have been linked to the CFO home page at: ***http://cfo.gsfc.nasa.gov*** Click on the Financial Management Division link and look for the "NASA Leave and Earnings Statement" and "NASA Leave and Earnings Description Document" files. As you review the new form, keep in mind that this statement is Agency-wide and not all fields are applicable to GSFC employees.

Leave and Earnings Statements will continue to be mailed to you at work. Hard copies of the new form are available in the Wallops Payroll Office, Bldg. E-105. For further information call Amy Strong, x1056.

Wallops Black History Club Annual Dinner

February 13, 1999
5 p.m. to midnight
Bldg. D-10
$20 per person (donation)

Purchase tickets by Feb. 1 from Karen Downing, x2163 or Sandra Banks, x2526.

Sympathy is extended to the family of
Donald F. Vickerman
who died January 17 at Peninsula Regional Medical Center.

Vickerman retired in August 1977 as an engineering technician. He is survived by his wife, Pauline, two daughters and four grandchildren.

Scholarship Applications Available

NASA College Scholarship applications are available in the Public Affairs Office. Dependents of current or retired NASA employees and current reimbursable detailees to NASA are eligible. For further information, call Betty Flowers, x1584. Applications must be submitted by March 31, 1999.

For Sale

1990 Honda Accord LX. 4 door automatic, power stirring/brakes, power windows and door locks.Garage kept. In good condition. Call Joan Murden after 6 p.m. (757) 787-2563.

For Rent

2 story, 3 bedroom house. 1 1/2 baths, with appliances. Screen porch, deck, central air and heat. Chincoteague. $550. Available immediately. Call Karon Eichelberger, (757) 665-6220, after 6 p.m.

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