



Inside Wallops

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Scientists Use Satellite To “Pond-Er” Melted Arctic Ice

NASA researchers and other scientists used a satellite combined with aircraft video to create a new technique for detecting ponds of water on top of Arctic sea ice. Until now, it was not possible to accurately monitor these ponds on ice from space.

Water that forms on sea ice during the summer, called a melt pond, absorbs the Sun’s energy rather than reflecting it back to space the way ice does. The balance between reflected and absorbed energy has a large effect on Arctic and global climate.

When more ponds of water form on the Arctic sea ice cover in early summer, more heat is absorbed, causing the Arctic’s sea ice cover to melt faster during the summer.

Knowledge of when and where these melt ponds form will help scientists calculate the balance of energy in the Arctic and improve their knowledge and projections of climate both regionally and globally.



Melt Ponds on Sea Ice

By using detailed aircraft video of Arctic surfaces and comparing those with coarser satellite imagery, the researchers were able to recognize rough features in the satellite data that corresponded to ponds on ice, ocean water, and unmelted sea ice.

Now, they are able to use a satellite to monitor sea ice, without the aid of the aircraft video. Satellites offer the advantages of frequent regular flyovers that cover vast areas all at once.

“Our new technique offers the possibility of determining when and mapping where these melt ponds form and would greatly aid our understanding of the Arctic heat balance,” said co-author Donald Cavalieri, a senior research scientist at NASA’s Goddard Space Flight Center (GSFC).

During spring and summer, these melt ponds cause existing sea ice to melt faster and greatly reduce the ice’s ability to reflect sunlight. This can create a positive feedback, where an increasing number of melt ponds absorbs more heat and causes sea ice cover to melt faster.

During the warmer months, melt ponds can cover up to 50 percent of the Arctic sea ice area. There may be a relationship between the fraction of melt ponds and the amount of sea ice cover at summer’s end.

Researchers know from satellite records covering the last 30-years that the Arctic sea ice cover at summer’s end has been decreasing rapidly.

This new technique to detect melt pond coverage uses NASA’s Enhanced Thematic Mapper Plus (ETM+) instrument on the Landsat 7 satellite, developed with the aid of much higher resolution video imagery from a NASA supported aircraft experiment during the summer of 2000.

By using video footage from an aircraft flight at an altitude of almost one and a half kilometers, the researchers were able to compare that higher resolution footage with Landsat 7 images passing over the same path above Baffin Bay in the Arctic on the same day. They then compared the Landsat imagery with the aircraft video. While Landsat 7 shows less detail, it covers vast areas all at once. The aircraft video allows researchers to view a 1.5 meter area in detail.

By classifying 13 high resolution images from the aircraft into areas of ocean, ice with ponds, and pond-free ice and then comparing these areas with the different wavelength bands of Landsat, the researchers were able to develop a new method to calculate the extent of open water, melt ponds, and sea ice over large areas using Landsat data by itself.

The study was funded by NASA’s Earth Science Enterprise that is dedicated to understanding the Earth as an integrated system and applying Earth System Science to improve prediction of climate, weather, and natural hazards.

Wallops Shorts..... Balloon Launches

A NASA scientific balloon was successfully launched from Ft. Sumner, N.M. on October 1. The 28.4 million cubic foot balloon carried a Balloon Borne Experiment (BESS) with superconducting solenoid. The principal investigator for the cosmic ray astrophysics payload was Dr. John Mitchell, NASA Goddard Space Flight Center. Total flight time was 4 hours, 38 minutes.

A second NASA scientific balloon was launched from Ft. Sumner on October 5. The 4 million cubic foot balloon carried a cryogenic whole air sampler. The principal investigator was Dr. Elliot Atlas, National Center for Atmospheric Research. Total flight time was 6 hours 56 minutes.

Sounding Rocket Launch

A NASA Terrier-Improved Orion sounding rocket was successfully launched from Wallops Island on October 3. Students from Pennsylvania State and Clemson Universities designed and built the payload to study the dynamic processes in the mesosphere and the transfer of energy from tropospheric processes to the mesosphere/low thermosphere regions. The Penn State student team provided a DC probe, IEC receiver, inflatable GPS sphere and a composite nosecone. The Clemson University team provided a Trimethyl Aluminum (TMA) chemical release section, a video system and Chaff release. Dr. Timothy Kane, Pennsylvania State University was the principal investigator. Dave Moltedo, NASA Range and Mission Management Office, was the project manager. The mission manager was Bill Payne, NSROC.

In the News Associated Press

“Clemson Students See Research Fly”

Thanks

The Wallops Contractors Association supplied donuts for the Morning Coffee to kick-off “American Heritage Week” activities. Thanks to our contractor organizations!



An Ice Cream Truck is among other entries in the “Shore Thing” parade on Wednesday. Pick up your coupons for free ice cream at the CSC and Swales tables on Tuesday in the N-159 Hanger from 11:30 a.m. to 2:30 p.m.

Employee Coffee and Open House in Building F-7



Berit Bland



Peter Turlington Jay Houston



Dave Wilcox



George Hayne
Magdi Said

American Heritage Week activities got underway today with a morning coffee in the newly refurbished Building F-7. Following coffee and donuts, Senior Manager John Campbell recognized the American Heritage Week team. Dave Wilcox, gave a brief overview renovations to Building F-7, inviting everyone to tour the facility which houses the Shuttle Small Payloads and Balloon Laboratories and the Compact Range Antenna Measurement Chamber.



Sandra Banks



Lisa Johnson



Bob Hickman



Mike Smolinski



Donnie Mason
John Campbell



Debbie Fairbrother



Gerry Doyon

Jim Lagarde



Compact Range Antenna Measurement Chamber

Warm and Very Wet

by Bob Steiner, Meteorologist

Compared to other parts of Virginia and Maryland, this area survived the onslaught of "ISABEL" with only minimal damage. The strongest wind recorded at the Wallops Main Base was 61 mph at 1:47 p.m. on Thursday, September 18. We recorded .8 inches of rain on the 18th and only a trace on the 19th. All in all we lucked out.

With an average temperature for the month of 70.9 degrees, we were 1.3 degrees above average for September. The warmest day was the October 2 with a reading of 87degrees. The coolest morning was the September 30 when the mercury fell to 48 degrees. No record temperatures were set or tied during the month.

Measurable rain fell on 10 days (8 days is the norm) for a total of 5.72 inches in the rain gage, which is 2.28 inches above average for September. More than .5 inches of rain fell on five days during the month. This included three days with over an inch of rain being recorded. The greatest 24 total rainfall was 1.2 inches on the September 3 and 4.

With the passing of summer we can now look forward to fall colors and cooler temperatures. Keep in mind that the official end to the hurricane season is November 30. Average daily highs at the beginning of November are near 65 degree dropping to a maximum of 50 degrees by the end of the month. Overnight lows start out in the mid to upper 40's and fall into the mid 30's by the end of the month. We can expect 2.71 inches of measurable liquid precipitation during November. Snowfall is usually less than on inch. Precipitation normally falls on eight days.



**Fire Prevention Week is
October 5 -11, 2003**

Every year, fires take lives and destroy homes, natural habitats, and livelihoods.

You are encouraged to heed the recommendations of fire safety experts by ensuring that your home is equipped with the appropriate number of properly installed and maintained smoke alarms and that your family has a fire safety and escape plans. These measures will help to prevent fires and protect our families, our communities, and our firefighters.

In the event of a fire, remember that:

- * Time is the biggest enemy and every second counts! Escape first!
- * Develop a home fire escape plan and practice it frequently.
- * In your fire escape plan, designate a meeting place outside.
- * Make sure all family members knows two ways to escape from every room.
- * Practice feeling your way out with your eyes closed.
- * Never stand up in a fire, always crawl low under the smoke.
- * Never return to a burning building for *any* reason; it may cost you your life.
- * Having a working smoke detector increases your chance of surviving a fire.

During Fire Prevention Week, remember and give thanks to our firefighters for the invaluable service they provide, risking their lives to preserve and protect our communities.

Flu Shots Available

The Health Unit has received a supply of the influenza (Flu) vaccine. Flu shots will be given to NASA civil service employees by appointment between 1:30 and 3:30 p.m. There is a required 20-minute wait in the Health Unit after receiving the vaccine.

Call the Health Unit, x1766 for further information or to schedule an appointment.

Inside Wallops is an official publication of Goddard Space Flight Center and is published by the Wallops Office of Public Affairs, Extension 1584, in the interest of Wallops employees. Recent and past issues of *Inside Wallops* may be found on the NASA Wallops Flight Facility homepage: www.wff.nasa.gov

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