



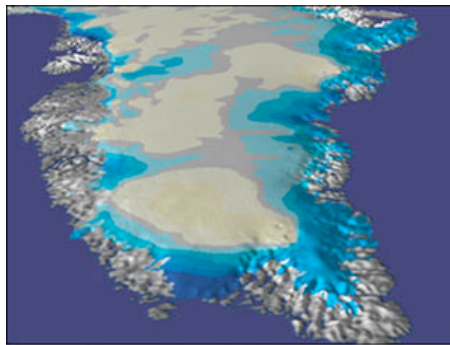
Source: [NASA/Goddard Space Flight Center](#) More on: [Global Warming](#), [Climate](#), [Geography](#), [Environmental Issues](#), [Ice Ages](#), [Weather](#)

Date: December 21, 2006

NASA Provides New Perspectives On The Earth's Changing Ice Sheets

Science Daily — It's widely documented that climate change is causing the Greenland and Antarctic ice sheets to shrink. Air temperatures in many parts of the polar regions have increased and waters that surround parts of the ice sheets have warmed up. What most do not know is that until just six years ago, we had no real way of measuring whether the ice sheets were shrinking or growing, or at what rate.

Today, advances in remote sensing, the use of highly sensitive instruments aboard satellites and aircraft, have enabled scientists to examine the mass balance of the ice sheets and to determine just where and how quickly the ice is growing or shrinking. Of particular importance is the mass balance of the ice sheet, which is the difference between how much ice it has lost versus gained over a period of time, and is a direct measure of an ice sheet's contribution to sea level rise.



Change in Ice Sheet Thickness (cm/year)
-60 -20 -2 +2 +20 +60

NASA's ICESat measures changes in the thickness of ice sheets in Greenland and in Antarctica. This image is of glacial ice along Greenland's shoreline, which is thinning rapidly up to 60 cm per year while the interior ice is thickening at a rate of only 10 cm per year. (Credit: NASA)

Ads by Google Advertise on this site

Coffee Exposed
A shocking secret coffee co's don't want you to know.
www.coffeefool.com

HeatTrak Snow Melting Mat
Eliminate snow and ice accumulation Portable Snow & Ice Melting Mats!
www.SnowSafeInc.com

Ice Age: The Meltdown DVD
The Action Heats Up & So Does The Temperature. Order Online Today!
www.FoxStore.com

Global Warming Weather
Global Warming and Warm Weather: Connected? Read Full Story.
ABCNews.com

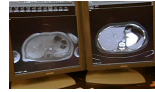
Stop Global Warming
Use Solar Energy to Stop Global Warming, Low Cost for Homes
www.JoinTheSolution.com

With increases in the number of ways researchers can now measure changes in the landscape and rate of change of the ice sheets, have also come some variations in scientific results that some may find confusing. However, a closer look tells a fairly consistent story.

"The media has reported a lot about how ice is changing, particularly in Greenland, but the numbers vary depending on the time period examined and the technique used. As a result, there may be some confusion out there about what's really happening," said Waleed Abdalati, a glacier expert and head of the Cryospheric Sciences Branch at NASA's Goddard Space Flight Center, Greenbelt, Md. "We have all these techniques and some are giving different answers than others. But what's significant is that we have the ability to even debate ice sheet measurement results at all when we could not have a few years ago. Now, we're talking about how much ice sheet shrinkage there is and how rapidly it's taking place."

Researchers now use aircraft altimetry, satellite radar and laser altimetry, radar interferometry, gravity measurements from NASA's Gravity Recovery and Climate Experiment (GRACE) mission and precise elevation change measurements from NASA's Ice, Cloud, and Land Elevation (ICESat) satellite. Each tool has its own strengths, and when used together, these technologies produce a comprehensive

Science Video News



Safer Scans for Pregnant Women

New studies by radiologists have shown that MRI can be just as accurate as CT scans at helping radiologists diagnose pathologies such as cancer, ... > [watch video](#)

Jump to: < prev | next >

University of Phoenix — ONLINE PROGRAMS —

ASSOCIATE'S
Associate of Arts in General Studies
Associate of Arts in IT / Networking

BACHELOR'S
Bachelor of Science in Business/Administration
Bachelor of Science in Business/e-Business
Bachelor of Science in Business/Finance
Bachelor of Science in Business/Marketing
Bachelor of Science in Criminal Justice Administration
Bachelor of Science in Information Technology
Bachelor of Science in Management
Bachelor of Science in Nursing

MASTER'S
Master of Arts in Education
Master of Business Administration [Click Here](#)

Related News Sections

- [Earth & Climate](#)

Related News Topics

- [Global Warming](#)
- [Climate](#)
- [Geography](#)
- [Environmental Issues](#)
- [Ice Ages](#)
- [Weather](#)

Related Science Stories

- [ICESat's Lasers Measure Ice, Clouds And Land Elevations](#)
- [NASA Survey Confirms Climate Warming Impact On Polar Ice Sheets](#)
- [Changes Tracked In Polar Ice Sheet Elevations](#)
- [NASA'S ICESat: One Billion Elevations Served](#)
- [Greenland Ice Sheet Flows Faster During Summer Melting](#)

Related Encyclopedia Articles

- [Ice sheet](#)
- [Greenland ice sheet](#)
- [Altimeter](#)
- [Antarctic ice sheet](#)
- [Ice shelf](#)
- [Ice age](#)
- [Iceberg](#)
- [Geologic temperature record](#)
- [Temperature record](#)
- [Doppler radar](#)

Related Book Reviews

- [The Changing Earth : Exploring Geology and Evolution \(with Physical GeologyNow\)](#)
- [Earth: Portrait of a Planet](#)
- [Home Safe Home](#)
- [Earth Science \(With CD-ROM\)](#)
- [Earth Science \(11th Edition\)](#)

[Science Articles](#) | [Encyclopedia](#) | [Books](#)

ICESat's Lasers Measure Ice, Clouds And Land Elevations (October 7, 2003) -- NASA's Ice, Cloud and Land Elevation Satellite (ICESat) has resumed measurements of the Earth's polar ice sheets, clouds, mountains and forests with the second of its three lasers. Crisscrossing the ... > [full story](#)

Search Archives

Find:
 > [options](#)

Find a Job

Keywords:
Location:
Job category:
 > [more](#)

Find Your Graduating Class



I graduated in:

1996
1986
1976
1966
1956

In Other News ...

Rwanda genocide mastermind goes on trial (2 hours ago)

CIA rift seen in Italian terror rendition (2 hours ago)

Rebel base falls in east Sri Lanka (2 hours ago)

look into the ice sheets' behavior that have changed the way the world thinks of climate change and its impact on ice sheets and glaciers.

Each of these provides important information for unraveling the behavior of the ice sheets, and collectively they tell a story. In Greenland, they reveal an ice sheet that is shrinking dramatically at the edges and growing at its higher interior elevations, such that there is a net loss of ice that is far greater than it was in the last decade. These losses are a result of increased melting, and faster flow at the edges, as the floating ice that surrounds parts of Greenland and buttresses some of the outlet glaciers melts.

In Antarctica, these observations tell us that the West Antarctic ice sheet is currently shrinking substantially, and has been for the last decade. They also tell a story of a second much larger ice sheet in East Antarctica that has been growing slowly. The net result in Antarctica is that the ice sheet as a whole has been shrinking, contributing to rising sea levels, and probably much more so in recent years.

"We did not appreciate in the past how the changes in ice sheets respond so quickly to changes in climate. The story these measurement techniques are all telling is that the ice sheets are shrinking more than they were 10 years ago," said Abdalati. "The borders of the ice sheets are melting in waters that are warming."

"Of the techniques for measuring ice sheet change, the laser altimetry approach of the ICESat mission is the most effective because it provides a detailed look at the overall integrated changes in the ice sheets," offered Abdalati. "And continuous observations like those by ICESat would greatly enhance our ability to understand what's really happening to the Earth's dramatically changing ice cover. The most telling comprehensive picture, however, is created when all the techniques are used together."

Note: This story has been adapted from a news release issued by NASA/Goddard Space Flight Center.

Ads by Google

Advertise on this site

CarbonNeutral Flights

Offset your CO2 emissions From as little as £1.

www.carbonneutral.com

Glacier Global Warming

The biggest source of free information on Global-Warming

global-warming.xaffix.com

Glacier Global Warming

The biggest source of free information on Global-Warming

global-warming.Findit.com

New! Search [Science Daily](#) or the entire web with Google:



[Web](#) [ScienceDaily.com](#)



NASA Survey Confirms Climate Warming Impact On Polar Ice Sheets

(March 9, 2006) -- In the most comprehensive survey ever undertaken of the massive ice sheets covering both Greenland and Antarctica, NASA scientists confirm climate warming is changing how much water remains locked in ... > [full story](#)

Changes Tracked In Polar Ice Sheet Elevations

(April 9, 2001) -- In a world that measures everything from hemlines to the speed of light, the Antarctic and Greenland ice sheets present a special challenge. Whether they are shrinking or growing has become a focus ... > [full story](#)

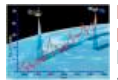


NASA'S ICESat: One Billion Elevations Served

(November 26, 2005) -- NASA's Ice, Cloud and land Elevation Satellite (ICESat) fired its one billionth laser shot earthward on Nov. 18, to obtain elevations from objects on the land, sea and in the air. ICESat measures the ... > [full story](#)

Greenland Ice Sheet Flows Faster During Summer Melting

(June 25, 2002) -- New measurements show that the flow of ice in the Greenland ice sheet has been accelerating since 1996 during the summer melt season. The results suggest that the ice sheet may be responding more ... > [full story](#)



NASA Satellites Measure And Monitor Sea Level

(July 12, 2005) -- For the first time, NASA has the tools and expertise to understand the rate at which sea level is changing, some of the mechanisms that drive those changes and the effects that sea level change may ... > [full story](#)



Radar Altimetry Confirms Global Warming Is Affecting Polar Glaciers

(March 21, 2006) -- Scientists have confirmed that climate warming is changing how much water remains locked in the Antarctic and Greenland ice sheets, according to an article published in the Journal of ... > [full story](#)

NASA Study Finds Rapid Changes In Earth's Polar Ice Sheets

(September 2, 2002) -- Recent NASA airborne measurements and a new review of space-based measurements of the thickness of Earth's polar ice sheets concludes they are changing much more rapidly than previously believed, ... > [full story](#)



Canada's Shrinking Ice Caps

(March 14, 2005) -- Recent research conducted by NASA scientists has revealed that Canada's ice caps and glaciers have important connections to Earth's changing climate, and they have a strong potential for contributing ... > [full story](#)



Scientists Get A Real 'Rise' Out Of Breakthroughs In How We Understand Changes In Sea Level

(July 18, 2005) -- For the first time, researchers have the tools and expertise to understand the rate at which sea level is changing and the mechanisms that drive that change. Sea levels rise and fall as oceans warm ... > [full story](#)

(2 hours ago)

Nazi salutes land Sweden kids in hot water (3 hours ago)

Serbia seizes heroin on Croatian border (3 hours ago)

House mulls passenger plane cargo scans (3 hours ago)

Censorship alive and well in China (4 hours ago)

Third victim added to Yonkers party probe (4 hours ago)

Natural gas smell blankets New York (4 hours ago)

Indonesia ferry raft drifted 310 miles (4 hours ago)

... more breaking news at [NewsDaily](#) -- updated every 15 minutes