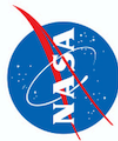


AIRCRAFT, SCIENCE AND ICEBRIDGE

NASA's Operation IceBridge (OIB) campaign used aircraft to capture large- and small-scale changes in glaciers, ice sheets, sea ice and snow cover, which satellites and ground instruments alone could not.



National Aeronautics and Space Administration

WHEN IT COMES TO MELTING ICE, IS THERE MORE THAN MEETS THE EYE?

It's no secret the poles are changing: Arctic sea ice minimums are getting smaller and maximums seem to have maxed out. Not to mention, melting glaciers mean rising seas. While important, these large-scale changes are merely the culmination of many smaller-scale processes we still don't completely understand.

In addition to bridging the gap between ICESat (2003–2009) and ICESat-2 (2018–2021)—NASA satellites that track the large-scale phenomena—OIB leveraged its aerial view to better understand the smaller-scale processes satellites can't see.

Here are three things we wouldn't know without OIB aircraft data:

- IT'S NOT JUST ICE: THE ARCTIC IS LOSING SNOW, TOO:** OIB provided the first detailed look at snow cover across the Arctic Ocean, revealing there's about 30% less snow on sea ice than previously thought. For fans of sea ice, this is not good: although cold, snow acts as an insulator, protecting sea ice from melting in the spring and summer. The lack of snow is largely attributed to the delayed formation of sea ice caused by warming seas. With nothing on which to accumulate, snow simply falls and melts into the Arctic Ocean.
- THE OCEAN FLOOR MAY HELP SLOW ADVANCING GLACIERS:** OIB data showed that areas offshore of the Thwaites Glacier in Antarctica may provide what scientists call stabilization points: basically, the glacier catches on parts of the ocean floor as it tries to flow into the sea. This new finding helps scientists better understand ice flow and will help improve sea-level predictions.
- THE GREENLAND ICE SHEET IS MORE VULNERABLE THAN WE THOUGHT:** OIB data is being used to more accurately predict the shape of surfaces trapped beneath ice. The new method—mass conservation—showed that fjords extend far deeper inland underneath the Greenland ice sheet than previously thought. This means the ice will remain in contact with warmer ocean currents as it retreats.

PLATFORM	SENSORS
DC-8	ATM • LVIS • UTIG lidars • UAF airborne scanning lidar •
P-3	DMS • GPS • KT-19 skin surface temperature sensor •
C-130	Snow Radar • Ku-Band Radar Altimeter ••
G-V	MCoRDS • Accumulation Radar •
Falcon	HICARS •• Gravimeter • Magnetometer •
B200 King Air	
Single Otter	

