

Greenland Ice Surface Temperature *from MODIS*

National Aeronautics and
Space Administration



IST °C

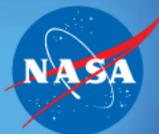


July 2012

Land 

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The images on the front show the monthly-average *ice surface temperature* (IST) of the Greenland ice sheet for July 2012 and July 2013, derived using data from NASA's Moderate Resolution Imaging Spectroradiometer (MODIS) instruments onboard the Terra and Aqua satellites. The Greenland ice

sheet—from its thin coastal edges to its two-mile-thick center—holds enough frozen water that if melted, would cause a rise in global sea level of roughly 6.6 meters (21.7 feet). In July 2012 approximately 99% of the top layer of the ice sheet melted for a short period of time—the greatest areal extent of surface melting in over 125 years. This extensive melt was caused by a ridge of warm air from the south that flowed over Greenland and persisted for a few days, causing air temperatures over large parts of the ice sheet to climb above freezing in the middle of the month. The next year, in July 2013, the Greenland ice sheet experienced some of the coldest temperatures in the MODIS record for July.

Using infrared sensors, MODIS measures the surface temperature of the ice sheet on Greenland several times a day, cloud-cover permitting. The monthly-average surface temperature in July 2012 was the warmest in the MODIS record at -4.0°C (24.8°F). In July 2013 the monthly-average surface temperature was -6.3°C (20.7°F)—one of the coldest in the MODIS record (which began in 1999 with the launch of Terra). While the extent of surface melt over Greenland can vary quite a bit from year to year, trends seen in satellite records derived from other instruments show that the mass of the Greenland ice sheet has been declining over the last several years. The resulting enhanced melting and iceberg calving has been contributing to global sea level rise.

Continued, accurate monitoring of the ice surface temperature using Earth-observing satellite instruments like MODIS will help scientists understand how climate change is affecting the Greenland ice sheet now and in the future.

Greenland Ice Sheet Surface Melt



These images compare the total amount of surface melt (red) during 2012 [left] and 2013 [right] as observed by MODIS. Nearly the entire ice sheet (99%) covering Greenland experienced some degree of melting in 2012; MODIS captured 94% of this melt, and the rest was hidden from MODIS by clouds.

For more information, visit:
modis-snow-ice.gsfc.nasa.gov

