



[Home](#)
 [Atmosphere](#)
 [Sea Ice](#)
 [Ocean](#)
 [Land](#)
 [Greenland](#)
 [Biology](#)

Greenland

J. E. Box¹, J. Cappelen², D. Decker¹, X. Fettweis^{3,6}, T. Mote⁴, M. Tedesco⁵ and R. S. W. van de Wal⁶

¹Byrd Polar Research Center, The Ohio State University, Columbus, Ohio

²Danish Meteorological Institute, Copenhagen, Denmark

³Department of Geography, University of Liège, Liège, Belgium

⁴Department of Geography, University of Georgia, Atlanta, Georgia

⁵Department of Earth and Atmospheric Sciences, City College of New York, New York, New York

⁶Institute for Marine and Atmospheric Research Utrecht, Utrecht University, Utrecht, The Netherlands

October 19, 2010

Summary

Greenland climate in 2010 is marked by record-setting high air temperatures, ice loss by melting, and marine-terminating glacier area loss. Summer seasonal average (June-August) air temperatures around Greenland were 0.6 to 2.4°C above the 1971-2000 baseline and were highest in the west. A combination of a warm and dry 2009-2010 winter and the very warm summer resulted in the highest melt rate since at least 1958 and an area and duration of ice sheet melting that was above any previous year on record since at least 1978. The largest recorded glacier area loss observed in Greenland occurred this summer at Petermann Glacier, where 290 km² of ice broke away. The rate of area loss in marine-terminating glaciers this year (419 km²) was 3.4 times that of the previous 8 years, when regular observations are available. There is now clear evidence that the ice area loss rate of the past decade (averaging 120 km²/year) is greater than loss rates pre-2000.

Coastal surface temperatures

A clear pattern of exceptional and record-setting warm air temperatures is evident at long-term meteorological stations around Greenland (Table GL1). For instance:

- Nuuk (64.2°N along Greenland's west coast): Year 2010 summer, spring, and winter 2009/2010 were the warmest on record since record keeping began in 1873.
- Aasiaat (69.0°N along Greenland's west coast): It was the warmest month of May and August, and the warmest winter, spring, 2nd warmest summer and the warmest year (July 2009-August 2010) since record keeping began in 1951.
- Narsarsuaq (61.2°N in southern Greenland): It was the warmest month of May, and the warmest winter, spring and the warmest year (July 2009-August 2010) since record keeping began in 1951.
- Thule AFB, Pituffik (76.5°N along Greenland's west coast): It was the warmest spring (March-May) on record, which began in 1961.

Table GL1. 2010 Greenland station surface air temperature anomalies by season, relative to 1971–2000.