

Variability of surface temperature and melt on the Greenland Ice Sheet, 2000 – 2011

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ABSTRACT

Enhanced melting along with surface-temperature increases measured using infrared satellite data, have been documented for the Greenland Ice Sheet. Recently we developed a climate-quality data record of ice-surface temperature (IST) of the Greenland Ice Sheet using the Moderate-Resolution Imaging Spectroradiometer (MODIS) IST product -- <http://modis-snow-ice.gsfc.nasa.gov>. Using daily and mean-monthly MODIS IST maps from the data record we show maximum extent of melt for the ice sheet and its six major drainage basins for a 12-year period extending from March of 2000 through December of 2011. The duration of the melt season on the ice sheet varies in different drainage basins with some basins melting progressively earlier over the study period. Some (but not all) of the basins also show a progressively-longer duration of melt. The short time of the study period (~12 years) precludes an evaluation of statistically-significant trends. However the dataset provides valuable information on natural variability of IST, and on the ability of the MODIS instrument to capture changes in IST and melt conditions in different drainage basins of the ice sheet.