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Circumpolar trends in snow cover and albedo from daily satellite data.

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Model based studies have long pointed to the potential positive feedback between warming in polar regions and decreasing surface albedo due to shorter periods of snow and ice cover. Satellites have successfully been used to derive daily estimates of surface albedo in these regions. However, in-situ snow and ice cover measurements are spatially too sparse and do not have sufficient spatial coverage to provide reliable comparisons to satellite based albedo measurements. Satellite based measurements have documented gross trends but have, until now, been limited to either coarse spatial or temporal sampling from microwave and optical sensors respectively. This has so far limited our ability to quantify the derivative of albedo versus snow/ice cover during the relatively short melt period.

We first present a new data set of daily snow and inland ice/cover maps at between 1km (western Arctic) and 4km (circumpolar) spatial resolution extending from 1982 to present generated as part of the Government of Canada's contribution to the International Polar Year. This dataset, derived from NOAA-AVHRR sensors, exhibits similar levels of agreement ($>$85%) with in-situ measurements as recent MODIS products only available in cloud free periods. Trends in snow melt timing over land in the Arctic, between 1982 and 2005, are presented for the circumpolar region with an emphasis on their variability as a function of land cover. The snow/ice cover data are matched with existing daily albedo maps derived from AVHRR to quantify trends in the derivative of snow cover with albedo over land regions in the Arctic. Ongoing work to im-

prove the spatial resolution of this analysis through the use of recent satellite sensors such as MODIS and MERIS are discussed.