Session: B11 Oral presentation

The 2010 melting record in Greenland and updates on the 2011 season

Marco Tedesco [†]; Xavier Fettweis; Michiel van den Broeke; Roderik van de Wal; Paul Smeets; Willem Jan van de Berg; Mark Serreze; Jason Box
[†] CUNY, USA
Leading author: mtedesco@sci.ccny.cuny.edu

In this talk we summarize the results of a combined analysis of remote sensing data, surface observations and output from a regional atmosphere model highlighting new records in 2010 for surface melt and albedo, runoff, the number of days when bare ice is exposed and surface mass balance of the Greenland ice sheet, especially over its west and southwest regions. Our findings indicate that early melt onset in spring was triggered by above-normal near-surface air temperatures which contributed to accelerated snowpack metamorphism and premature bare ice exposure, rapidly reducing the surface albedo. Warm conditions persisted through summer, with the positive albedo feedback mechanism being a major contributor to large negative surface mass balance anomalies. Summer snowfall was below average. This helped to maintain low albedo through the 2010 melting season, which also lasted longer than usual. We will also report updates on the 2011 season through the combined use of model and observation results and study how the most recent season will position in the context of the previous ~ 50 years. The melting season is starting at the time of the submission of this abstract and, therefore, we have no data but we might be able to provide a preliminary analysis by the time when the talk will be presented at the conference.