Geophysical Research Abstracts, Vol. 7, 01521, 2005
SRef-ID: 1607-7962/gra/EGU05-A-01521

Studies of the mass balance of glaciers on Spitsbergen with surface albedos derived from MODIS images

W. Greuell (1), K. Melvold (2) and J. Kohler (3)

(1) Institute for Marine and Atmospheric Research Utrecht, Utrecht University, (2) Norwegian Water Resources and Energy Directorate, (3) Norwegian Polar Institute (e-mail: w.greuell@phys.uu.nl, fax: +31 30 2543163)

We have collected daily MODIS (MODerate Resolution Imaging Spectroradiometer) images of a part of Spitsbergen (Svalbard) for five consecutive summer seasons (2000-2004). After selecting cloud-free images, the surface albedo is retrieved with a procedure that includes all of the essential processing steps. Satellite-derived albedos turn out to match ground-based data obtained on Kongsvegen very well. Thus, the satellite-derived albedos seem to be 'valid'. Following a method that has been successfully applied to parts of Vatnajökull and a part of the Greenland ice sheet in earlier studies, the 'satellite-derived mass balance' is computed from the satellite-derived albedos. The 'satellite-derived mass balance' is then compared to direct stake measurements of the mass balance. The satellite data are also used to monitor temporal and spatial variations in ice albedo for various glaciers in the region. The gained knowledge can be used for improving parameterisations of the albedo in mass balance models.