The minimum extent of snow patches as a climatic indicator - use of high resolution Landsat 7 Band 8 for single band, snow-cover classification

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With the launch of Landsat 7 a new band was added to the Landsat Enhanced Thematic Mapper (ETM^+). The new band 8 covers wavelengths from 0.52µm to 0.92µm and extends over band 2 (0.525 - 0.605µm), band 3 (0.630 - 0.690µm) and band 4 (0.750 - 0.900). The high resolution with a pixel length of 15m makes band 8 interesting for high spatial resolution analysis. Documentation of glacier advances or retreats is only one of many possible applications in glaciology. This project investigated the use of band 8 as a precise tool to obtain remotely the size and shape of permanent snow patches in the mountainous area west of Abisko (Sweden).

In the employed supervised classification areas covered by shadows were classified separately from non-shadowed areas. Supervision of the classification was based on ground-truthing consisting of photographic mapping of the snow cover in the study area. The results from this single band classification were compared to the results from the Normalized Difference Snow Index (NDSI) and two false colour images using once band 7, 4 and 1 and second band 5, 4 and 2. The comparison of the different approaches showed good results and support the possibility of using the band 8 from Landsat 7 images for snow classification.