Geophysical Research Abstracts,
Vol. 10, EGU2008-A-00504, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-00504
EGU General Assembly 2008

Snow cover monitoring in the Northern Patagonia Icefield using MODIS satellite images (2000 – 2006)

P. Lopez (1), P.Sirguey (2), Y. Arnaud (3), B. Pouyaud (1) and P. Chevallier (1)

(1) Institut de Recherche pour le Développement (IRD), Great Ice, Maison de Sciences de l'Eau. 300, avenue du Professeur Emile Jeanbrau 34095 Montpellier France, (2) Global Land Ice Measurements from Space (GLIMS) New Zealand Office, School of Surveying, University of Otago. PO Box 56, Dunedin, New Zealand, (3) Institut de Recherche pour le Développement (IRD), Great Ice, Laboratoire de Glaciologie et Géophysique de l'Environnement. 54, rue Molière 38402 - Saint Martin d'Hères cedex, France

The snow cover of the Northern Patagonia Icefield (NPI) was monitored applying the Normalized Difference Snow Index (NDSI) and the Red/NIR band ratio to 134 Moderate Resolution Imaging Spectroradiometer (MODIS) images captured between 2000 and 2006. The results show that the snow cover extent of the NPI fluctuates a lot in winter, in addition to its seasonal behaviour. The minimum snow cover extent of the period (3,600 km^2) was observed in March 2000 and the maximum (11,623 km^2) in August 2001. We found that temperature accounts for approximately 76% of the variation of the snow cover extent over the entire icefield. We also show two different regimes of winter snow cover fluctuations corresponding to the eastern and the western sides of the icefield. The seasonality of the snow cover on the western side was determined by temperature rather than precipitation, while on the east side the seasonality of the snow cover was influenced by the seasonal behaviour of both temperature and precipitation. This difference can be explained by the two distinct climates: coastal and continental. Since limited meteorological data are available in this region, our investigation confirmed that the change in snow cover is an interesting climatic indicator over the NPI providing important insights in mass balance comprehension. Since snow and ice were distinguished, snow cover fluctuations can be associated to fluctuations in the snow accumulation area of the NPI. In addition, days with minimum snow covers of summer season can be associated to the period in which

Equilibrium Line Altitude (ELA) is the highest.