



2001-2010 glacier changes in the Central Karakoram National Park: a contribution to evaluate the magnitude and rate of the “Karakoram anomaly”

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We use Landsat images to quantify recent (2001 and 2010) glacier area coverage and its change within the recently established Central Karakoram National Park, CKNP, Northern Pakistan, including Baltoro and Biafo-Ispar glaciers, at Mt. K2 toe. Trends of climate variables (1980-2009) as provided by PMD of Pakistan for low altitude stations, are investigated, to assess possible effect of climate upon glaciers within the CKNP. The work was developed in fulfillment of the SEED and PAPRIKA projects, promoted and managed by the EvK2CNR Committee, aimed to promote social development in the CKNP area, and investigate water resources in upper Indus basin. We found substantially unchanged ice cover, which is consistent with recent the literature, suggesting the presence of the so called Karakoram Anomaly. The climate data display i) a slight decrease of Summer temperatures, possibly decreasing snow and ice melt, and ii) an increase of wet days during Winter, possibly increasing the number of snowfalls, and possibly of ice shielding via snow albedo. These joint effects, together with increasing debris coverage, may have in turn contributed to unchanged glacier area, in spite of the general warming trend. Our study highlights possible underlying mechanisms of the Karakoram Anomaly, and the need for further studies of climate variables at high altitudes, including snowfall accumulation, temperature and solar radiation, to understand more accurately glacier mass budgets and evolution in this area.