Geophysical Research Abstracts
Vol. 12, EGU2010-104-1, 2010
EGU General Assembly 2010

Kriging estimation of Snow Water Equivalent at different dates within the Adamello Park of Italy

Bibiana Groppelli and Daniele Bocchiola
Politecnico di Milano, DIIAR, Milano, Italy (bibiana.groppelli@polimi.it)

Spatial estimation of Snow Water Equivalent SWE at six different dates from February 1st to June 1st during thaw is tackled using kriging from a sparse network of 14 snow stakes with density within the Adamello Natural Park of Italy, for the period 1967-2009. Second order statistics of SWE are evaluated and linked to geomorphological features. Then, the covariance of the SWE field within is studied, necessary for kriging, and its regularization provided based upon geomorphic attributes. Seasonal dependence of the covariance of the SWE field is observed, that must be taken into account for optimal estimation. Then, a Kriging procedure based upon the so obtained covariance fields is developed and cross-validated. Kriged SWE maps are then produced at the six dates for sample years, to demonstrate use of the method. Snow Cover Area SCA from MODIS® satellite is used to constrain SWE estimation within snowed areas. The procedure provides well estimated, least variance SWE values and it is relatively simple and fast because it uses only information of geomorphology of the area. Snow cover during thaw is reasonably well represented. The so obtained maps can be used for spatial estimation of SWE within the investigated region for water availability conjectures, for constraining hydrological models simulating runoff at thaw, as well as for ecological conjectures upon snow cover related species within the park.