Geophysical Research Abstracts,
Vol. 10, EGU2008-A-06943, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-06943
EGU General Assembly 2008

Snow melt forecasting from incomplete meteorological data

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The US National Weather Service River Forecast System (US NWSRFS)- snow accumulation and ablation model (SAA) is developed and testing for forecasting purposes over 21-year period on the medium-sized mountainous catchment, i.e. the Mesochora catchment in Central Greece, by using incomplete series of precipitation and temperature data. The SAA is a deterministic, continuous conceptual model consisting of a set of mathematical formulations, which explicitly describe the change in storage of water and heat in the snow-pack based on precipitation and temperature data at 6-hourly intervals. A combinatorial technique of a similar Thiessen method and station availability condition, including elevation correction, is adopted for areal and elevation integration of the snowmelt model input. The SAA model is applied over three elevation bands and it is calibrated concurrently with the soil moisture accounting model (SMA) rainfall-runoff model of the US NWSRFS which accepts as inputs the “rain plus melt” provided from the SAA model weighted over the three bands. For such an input modelling, the snowmelt model has been proved capable of predicting the initiation of snow accumulation in the fall and the gradual melting of the snow-pack in the winter and spring.