

ELS2014 –The Earth Living Skin: Soil, Life and Climate Changes

EGU – SSS Conference

Bari | Italy | 22 – 25 September 2014

ELS2014-151

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## **Screening variability and change of soil moisture under wide-ranging climate conditions: snow dynamics effects**

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Soil moisture influences and is influenced by water, climate and ecosystem conditions in the landscape. This paper couples snow storage-melting dynamics with an analytical approach to model screening of landscape-scale, long-term soil moisture variability and change in a changing climate. This coupling enables assessment of both spatial differences and temporal changes across a wide range of different hydro-climatic conditions and has here been applied to two major Swedish hydrological basins, Norrström and Piteälven. These are located along a steep temperature gradient and have experienced different hydro-climatic changes over the time period of study, 1950-2009. Spatially, the average intra-annual variability of soil moisture differs considerably between the basins due to their large temperature-related differences in snow dynamics. With regard to temporal change, however, the long-term average state and intra-annual variability regime of soil moisture have not changed much in response to the actual hydro-climatic changes experienced so far within each basin.