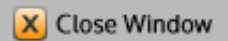




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CONTROL ID: 1490648**TITLE:** The impact of pan-Arctic snow cover recession on frozen soil heat content

ABSTRACT BODY: Warming of the land surface at high latitudes has attracted considerable scientific attention, in part due to the potential for releases of carbon to the atmosphere at warmer temperatures. As an indicator of changes in the land surface energy budget, soil heat content (SHC) arguably provides a more complete understanding of high latitude surface warming than do soil temperatures, which are influenced by surface air temperature (SAT) as well as snow cover extent (SCE). Using the Variable Infiltration Capacity (VIC) land surface model forced with gridded climate observations, we are able to reproduce observed spatial and temporal variations of SCE and SHC over the pan-Arctic land region over the last half-century. On the basis of the SCE trends derived from NOAA satellite observations in 5° latitude bands from April through June for the period 1972-2006, we define a snow covered sensitivity zone (SCSZ), as well as a snow covered non-sensitivity zone (SCNZ) and a non-snow covered zone (NSCZ) for North America and Eurasia. In order to assess the impact of pan-Arctic snow cover changes and further identify the relative roles of snow cover recession and increasing SAT on changes in SHC, we explore long-term trends in SHC, SCE, and SAT and their corresponding correlations in NSCZ, SCSZ and SCNZ for both North America and Eurasia. We find that SHC changes in North America during late spring and early summer are dominated by snow cover recession rather than increasing SAT, whereas over Eurasia from April through June, SAT has the greatest influence and reduced SCE plays a secondary role in the changes of SHC, which mainly result from increased SAT during the summer of the previous year.

CURRENT SECTION/FOCUS GROUP: Global Environmental Change**CURRENT SESSION:** GC019. Environmental, Socio-economic and Climatic Change in Northern Eurasia and Their Feedbacks to the Global Earth System**INDEX TERMS:** [0736] CRYOSPHERE / Snow, [0702] CRYOSPHERE / Permafrost, [0768] CRYOSPHERE / Thermal regime, [0740] CRYOSPHERE / Snowmelt.**AUTHORS/INSTITUTIONS:** X. Shi, D.P. Lettenmaier, Civil & Envir Engineering, University of Washington, Seattle, WA;**SPONSOR NAME:** Xiaogang Shi**CONTACT (E-MAIL ONLY):** xiaogang@uw.edu**TITLE OF TEAM:**

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