CONTROL ID: 1485362

TITLE: Historical Snow Cover and Water Resources Change in central Asia

ABSTRACT BODY: Seasonal snow cover is a vital source of river runoff in arid and semi-arid regions of central Asia. Decrease of seasonal snow cover is one of the major consequences of climate change in central Asia. To quantify the historical snow cover change, its relationship to global and regional atmospheric processes, and its impact on water resources, a new database for cryospheric research in central Asia has been created in Asiacryoweb.org. It serves a data portal for snow cover, glacier, meteorology, hydrology and ice core data in central Asia, as well as a platform for further research collaborations.

We analyze the historical snow cover change using data derived from AVHRR and MODIS images in 1986 - 2008. The results suggest that the snow cover extent in central Asia has declined significantly in general. We found significant decrease of seasonal snow cover in alpine regions surrounding major mountains (Tienshan, Pamir and Altai-Sayan) in summer; while in winter, northern part of Kazakhstan Steppe, mountains in Altai-Sayan and peripheral regions of Tienshan and Pamir mountains have seen significant strong increase of snow cover. Analysis of the relationship between snow cover extent and climate pattern indices shows a significant negative relationship between snow cover in Pamir mountains and Altai-Sayan mountains with Eastern Atlantic Pattern, and a significant negative relationship between snow cover in northern Aral-Caspian desert, Tienshan and the East Atlantic / West Russia pattern. And the Polar / Euraisa Pattern has a positive relationship with snow in Kazakhstan Steppe, Pamir, and Tienshan. The changing snow cover regime will affect not only the amount but also the timing of available water melting from snow.

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AUTHORS/INSTITUTIONS: H. ZHOU, E. Aizen, V.B. Aizen, Department of Geography, University of Idaho, Moscow, ID;

SPONSOR NAME: Hang ZHOU

CONTACT (E-MAIL ONLY): zhou3833@vandals.uidaho.edu