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Discussions

Interactive comment on "Evidence for spring mountain snowpack retreat from a Landsat-derived snow cover climate data record" *by* C. J. Crawford

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The author used the snow cover area data derived from Landsat images detecting the retreat of spring mountain snowpack at centennial timescales. In this study, ground-based SWE measurements were used to correct the impact of transient snowfall events on the Landsat SCA in snowmelt season. Correlation analysis was performed between Landsat SCA and surface temperature and precipitation, and spring SCA during 1901-2009 was reconstructed using the mean temperature. The method proposed in this study is valuable for reconstruction of surface parameters in the periods without remote sensing data, and is helpful for climate change research.

However, there are some issues in the SCA reconstruction section. The SCA was reconstructed by using the CRU surface temperature. The quality of the temperature

data is important for the SCA estimation. In Fig.4 of the paper, the author did not show equations of the linear fits. According to the scatterplots, it seems that an error of 1°C in the surface temperature would cause deviation of 5% in the estimated SCA. If the error of the surface temperature is large, the result of decrease of 36.2% in spring SCA since 1901 would be unreliable. Therefore, it is necessary to show the quality of the CRU temperature data and an error analysis on the SCA-temperature model. In addition, it would be better to show the linear equations in Fig.4.

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