

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

**C. Crawford**

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Received and published: 16 July 2013

The author appreciates Anonymous Reviewer #2's time and effort to review this manuscript. That said, the review provided was perplexing to the author as the tone and dismissive nature of the review was discouraging. Even so, the author has attempted to address the reviewer's concerns. Please find the author's responses to specific reviewer comments below including changes to the manuscript where appropriate.

Reviewer: While the study interesting and adds some value to the literature regarding snow cover trends as well as western North American climate variability and change it

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is not a significant advancement. The author never makes a compelling case for the Landsat snow cover data and to correlate this with only a long term temperature record doesn't add too much value. Author Response: 'Who' or 'what' determines a significant advancement in science? Neither the author nor the manuscript uses this language. Please describe a dataset or provide a published research paper(s) that point out that this work is not worthwhile.

Reviewer: A major issue with this reviewer stems from a lack of information regarding the snow cover record, something the author calls a climate data record but provides little evidence that it adheres to such qualifications. How is the dataset generated? How much cloud contamination interferes with assessments? How does the long lapse between overpasses impact the ability to generate an accurate depiction of snow cover loss? Author Response: Satellite climate data records are not new here. There is supporting literature elsewhere. Each of the reviewer's concerns is addressed in Crawford et al. (2013) published in Remote Sensing of Environment. A full discussion on the snow cover CDR and quality control is provided. Not all information can be provided. It is common to reference a preceding paper that describes the data, methods, and possible applications. Despite this, the author has added pertinent information on data to the revised manuscript.

Reviewer: It appears that the snow cover loss is a percent or so during the 20th century to near percent. Is this truly significant? Author Response: The SCA estimate is a ratio of visible SCA to land surface area (see Crawford et al. 2013). If this is incorrect, how does the reviewer propose to examine long-term trends in SCA? Is the reviewer suggesting that spring temperatures are not increasing? This SCA reconstruction is intended to provide a window into SCA variability over time. How significant the trend is, remains to be seen (ask the people who manage freshwater), but statistically speaking, the trend is occurring over 100+ years per the satellite/ground-based calibration.

Reviewer: The author is encouraged to reconsider whether the snow extent data derived from the Landsat imagery is worthy of being utilized in such a study. Author

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Response: Historical and archived data use is always important. Can the reviewer suggest where else this type of satellite data, resolution, and timescale would originate from?

Reviewer: If they are confident that the answer is yes, then they are encouraged to justify this further within the text and further explain the significance of their results.

Author Response: The author can see Crawford et al. (2013) for more rationale and justification. Often times, it takes several research papers to establish confidence. This manuscript is only one piece of the justification.

Reviewer: They might also consider “localizing” the region of their study within the title.

Author Response: This is a good suggestion. The author will consider revising the title for fidelity to the study.

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Interactive comment on The Cryosphere Discuss., 7, 2089, 2013.