

## ***Interactive comment on “A long-term Northern Hemisphere snow cover extent data record for climate studies and monitoring” by T. W. Estilow et al.***

### **Anonymous Referee #1**

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#### General remarks

This NH snow cover extent dataset, archived by the NOAA NCDC, is well known, trusted and widely used. Some improvements have been applied concerning the grid accuracy, metadata and the documentation. The manuscript itself does a fair job in describing the data set and provides a basic analysis of the data, but its main added value is of course the fact that it is a citable peer-reviewed article. Given the fact that the data set is already well known, well tested and used, one cannot expect much more from the article itself. The methods and materials are described in sufficient detail in the article and on the available website, and the data, updated monthly, will no doubt

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continue to be widely used in the future. I therefore recommend acceptance of this manuscript with minor changes.

The manuscript does not provide a sufficiently clear account of uncertainties. There are some publications specifically to this issue (e.g. Brown and Robinson, Northern Hemisphere spring snow cover variability and change over 1922–2010 including an assessment of uncertainty, doi:10.5194/tc-5-219-2011 ... at least one of the authors knows that paper well anyway). So please provide some assessment of uncertainties (in addition to that fact that you mention that the October trend is very probably spurious).

The data set web site is very clear and complete, the metadata are clean and complete, the data set (one netcdf file) is readily downloadable in a widely used format. I wish every data set was that well documented and easy to use.

#### Specific points

- The dataset qualifier is only given in the abstract of the article. I think that technically the abstract should not contain additional information that is not given in the main body of the article. so please consider providing the DOI also in the main body of the article.
- P. 670, L. 18: "The annual and interannual variability of the cryosphere are characterized by changes in hemispheric sea ice and snow cover extent. . .": Glacier and ice sheet (surface) mass balance also has substantial (inter) annual variability (but OK, it's less directly visible)
- P. 670, L. 20: "They are important factors in detecting climate change". Rather: "important indicators of climate change"?
- P. 670, L. 22: "According to IPCC Assessment Report 4 (Anisimov et al., 2007; McBean et al., 2005). . ." I suggest citing the AR5 (why should one cite the AR4 today for something that has been known for long?), plus some very old modeling studies that show this (possibly even go back to Manabe&Wetherald 1975, or Manabe&Stouffer that

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is cited a bit later).

- P. 670, L.25. polar amplification. Today, people rather speak about Arctic Amplification.

- P.671, L. 14. Bates&Privette give their maturity matrix in supplementary information that is a bit hard to find (in particular the link provided in their article to the supplementary information does not work). Could you please say in a few words what the value of 3 in that matrix means for the different aspects? By the way, level 3 means that changes to the data can be subject to some moderate changes if I understand correctly. Could you please be a bit more specific on what kind of changes might be expected in the future, what is planned, etc.? (besides monthly updates of course)

- There is quite some redundancy between section 2 (Historical description) and 3 (Data set description). For example, the information about the 89x89 grid already appears in section 2. There is some possible contradiction concerning the 42% threshold. Section 2 gives the impression that this was derived from a "comparison between the two datasets" (P. 672, L.20), that is, probably from some statistic analysis, while Section 3 (P.674, L.20) states that the 42% threshold is used in an automated process. This is not clear clear to me

- In section 2, a graphic summarizing the main phases of the history of this data set (sort of a timeline) might be useful.

- In section 3, you might consider including the very useful Data Flow Diagram that is available from the NOAA data set web site (attached here for your convenience)

- Section 3: It is not clear to me how mountain regions are treated. Are they treated as snow-covered as soon as there is snow somewhere on the mountain tops in the pixel?

- P. 674, L. 22: Is there any hope the missing months can be recovered from other satellite sources? (probably not, we are talking about data from the 60s and early 70s)

- P.674, L.26 and Figure 3: Strictly speaking, the January maximum is not apparent

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from the figure, because december and february are not shown.

- P. 675, L1: "The CDR product includes refinements to the NH SCE CDR grid." This is a bit confusing. To me, the new data set version is NH SCE, and it's a NOAA CDR. . .

- P.675, Line 4 and following: The grid business with the change from 89x89 to 88x88 grid points is also somewhat repetitive

- P. 675, L. 25 and following. What are the reasons for large errors in three longitude and latitude coordinates? I would imagine these coordinates to come from a simple formula that is either right or wrong.

- P. 676, Line 6. "SCE area values have been calculated in a consistent manner for over two decades" Maybe specify these are the last two decades (if I understand correctly)

- P.676, Line 18: How trustworthy is the August 1968 minimum? It immediately follows a missing month. Could it be affected by missing data?

- P. 676, bottom: Does that interpretation of a step change in 1987 hold statistically, for example if a change point analysis was used ?

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Interactive comment on Earth Syst. Sci. Data Discuss., 7, 669, 2014.

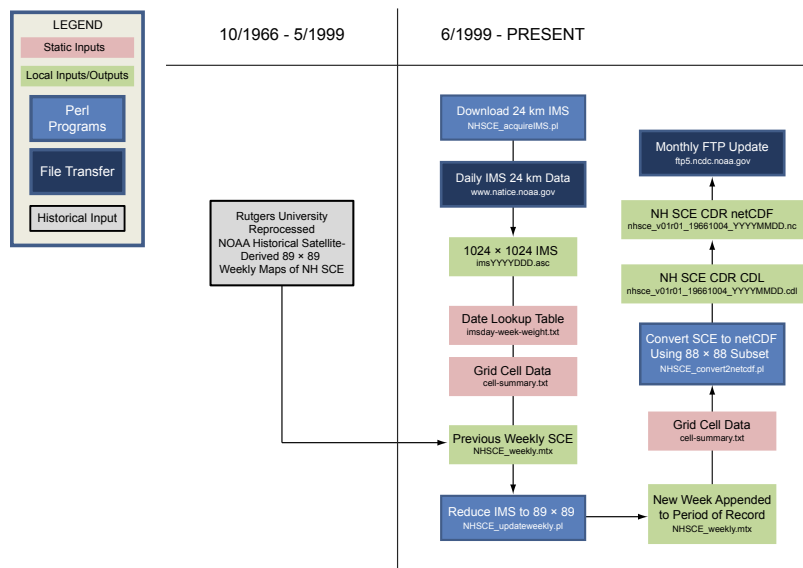


Fig. 1.