Reviews, and response to reviews, of the essay on:

Snow

Reviewer #1

		10. Snow
Page No.	Line No.	Comment
58	1785	June alone doesn't quite cover "spring"! See next comment. The authors are not suggesting that June does cover spring. They are saying that the June snow cover extent anomaly in North America was the fourth lowest on record.
59	1819	Onlu Eurasia for May and June shows reduction. The editors note that line 1819 is on p. 58. The text has been modified to make it clear that it is the May and June anomalies that show a continued reduction from the historical mean.
59	1827	Are these note from published work? Please cite. The editors note that line 1827 is on p. 58, and believe that the reviewer is referring to the linear trend values in Table 3. The data in the table are an update of previously published work (Derksen and Brown, 2012) and this is now indicated in the table caption.
61	1879	What is the accuracy of these data. From field experience in spring 2013 it seems that Scandicnavia /Norway and Greenland is off by quite a deal. The editors note that line 1879 is on p. 60, and believe that the reviewer is referring to the snow depth anomalies in Figure 34. The authors' response to the reviewer's comment is: "Like all gridded snow depth products, there are uncertainties in the CMC analysis. It is produced from in situ observations and a simple snow model, so the primary sources of uncertainty are related to (1) the representativeness of point snow depth observations with respect to the entire grid cell, and (2) performance of the snow model in observation sparse regions. Of relevance to Scandinavia, issue (1) can be a particular problem in alpine terrain, and issue (2) can be an issue in regions of Maritime climate (due to uncertainty in snow/rain partitioning, snow aging, etc.). Intercomparisons with other datasets have shown the CMC dataset accurately captures regional scale variability in snow depth but it's possible that there is uncertainty in Scandinavia over a given season." The editors are satisfied with the author's response and consider no further action to be necessary.

General comments: Please provide reference in captions for all figures References have been added for those figures that have been published elsewhere.

Reviewer #2

		10. Snow
Page No.	Line No.	Comment
58	1816	This sentence is quite difficult to read as it includes a lot of information (with all the parentheses). Maybe it can be rephrased? The editors note that the sentence has been improved in two ways. First, the reference in parentheses to the 1981-201 reference period has been

58	1816	This sentence is quite difficult to read as it includes a lot of information (with all the parentheses). Maybe it can be rephrased? The editors note that the sentence has been improved in two ways. First, the reference in parentheses to the 1981-201 reference period has been deleted, as it was already provided in the figure caption. Second, the information about the CDR being maintained at Rutgers University and described in Brown and Robinson has been moved to the figure caption.
58	1824	Please refer to the figure as "see Fig. 3 in the essay on *Air Temperature*" rather than Overland et al., 2013 (or include reference if it refers to another publication). The editors thank the reviewer for spotting that this reference to another essay is inconsistent with how it's been done elsewhere. The reference has been corrected to match all other such references.
61	1884	Please insert "°"between 60 and N

General comments: This gives a great and well-structured overview on snow cover extent, snow cover duration and snow depth for the different sectors of the Arctic. I have only very few minor comments.

Reviewer #3

		10. Snow
Page No.	Line No.	Comment

General comments: The editors note that no general comments were provided. Nor did the reviewer provide any specific comments in the table.

Reviewer #4

		10. Snow
Page No.	Line No.	Comment
57	1810	"The rate of depletion is strongly influenced by air temperature (which is controlled largely by large scale atmospheric circulation and incoming solar radiation). Monitoring and understanding the interplay between SCE and SWE is vital to addressing the impacts of variability and change in Arctic terrestrial snow cover". Of course snow melting depends on air temperature, but incoming solar radiation can determine the beginning of melting itself even under air temperatures below 0^0C, decreasing of surface albedo, and acceleration of melting. Also it is not so evident relation between SCE and SWE. The phrase "and secondary influences such as incoming solar radiation and cloud feedbacks." has been added to acknowledge the influence of other facts on snow melt. As regards SCE and SWE, the authors are not attempting to suggest that they are related. Rather, they're saying that both must be considered when assessing impacts of snow cover variability and change.
58	1825	It have not sense to compare snow cover losses in June with shrinking of sea ice in September. There are different mechanisms of snow and drifting sea ice melting, including drift. The text has been modified in an attempt to avoid the impression that

58	1825	It have not sense to compare snow cover losses in June with shrinking of sea ice in September. There are different mechanisms of snow and drifting sea ice melting, including drift. The text has been modified in an attempt to avoid the impression that authors are comparing the rates of snow loss and sea ice loss. Rather, they're pointing out that another component of the cryosphere is also changing rapidly.
58	1820	It has not sense to refer to temperature anomalies reported in the essay on *Air Temperature* (**Fig. 3**, Overland et al., 2013), because that figure shows strong spatial variability of air temperature at 925 mb. The text has been clarified to point out that the SCE anomalies are consistent with the temperature anomalies, in that the negative SCE anomalies over Eurasia are coincident with warmer than normal temperatures, while the positive April and May SCE anomalies over the North American Arctic are coincident with colder than normal temperatures. Regarding the 925 mb temperature issue, the following sentence has been added to the *Air Temperature* essay to make it clear that the maps show temperature just above the surface, and why this approach is chosen: "Temperature analyses are from slightly above the surface layer (at 925 mb level) that emphasizes large spatial patterns rather than local features." In most cases the 925 mb patterns are nearly identical to those at 1000 mb. Even if there were local strong inversions, which would influence the temperatures at the 1000 mb level, the Report Card is

General comments: It would be better take into account the comments above for improvement of chapter, which is interesting in total.

Reviewer #5

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General comments: The editors note that no general comments were provided. Nor did the reviewer provide any specific comments in the table.

Reviewer #6

		10. Snow
Page No.	Line No.	Comment

General comments: The editors note that no general comments were provided. Nor did the reviewer provide any specific comments in the table.