

BAMS SOTC 2007 Chapter 5, The Poles

External review and response of chapter editor (in italics)

Review of Chapter 5

I have read both the Arctic and Antarctic sections of the report, and I find them to be comprehensive summaries of recent variations in the two polar regions. In some cases there may be a little too much detail, there are also some instances of repetition and less-than optimal sequencing, but the diagnostic interpretations are reasonable and balanced. The following are minor suggestions for improvement of the presentation:

Arctic

P. 2, lines 59-60: Given the role of the winds in the extraordinary retreat of the sea ice during the summer of 2007, it would seem preferable to show the summer sea level pressure anomaly field rather than (or in addition to) the December-May SLP anomaly field in Figure 5a2-3a (p. 37).

Response: Added the summer SLP anomaly to the winter one in Fig 5a2-3a. To be consistent, added the corresponding summer air temperature figure as well. This necessitated a few words on why the summer SAT anomaly is close to zero, when the later fall anomaly is quite large and extensive, as the section author mentions. Added these to the figure caption.

Also removed some redundancy and grouped the descriptions of winter and summer together, for a more compact presentation.

P. 2, line 65: Suggest modifying to "... IPCC climate model simulations performed with increasing greenhouse gas concentrations".

Response: Modified as suggested.

P/ 3, lines 71-71: Figure 5a3-1 does not show advection of Beaufort Sea ice toward Fram Strait. Especially in the winter plot, the motion is toward the Canadian Archipelago. This is an important distinction because the ice will not be "flushed out of the Arctic Ocean" if it is advected toward or into the Canadian Archipelago.

Response: Removed the reference to sea ice being flushed out of the Arctic Ocean. Other data sources show that indeed transport through Fram St. was unusually high throughout the year, but the section conveys enough without adding other sources.

Page 3, line 91" Suggest adding "...for each year" after "Also shown is the September-mean ice edge" in caption of Figure 5a3-2.

Response: Modified as suggested.

Page 5, lines 149-150: Figure 5a3-3 does not show that the northwest part of the region is much saltier ... than 50 years ago”. If the figure is right, then some additional explanation is necessary.

Response: Corrected wording of text.

Page 5, lines 157-159: It seems that a cyclonic circulation regime would advect a signal eastward, not westward, around the Arctic Ocean’s periphery.

Response: Corrected wording of text.

Page 7, lines 208-210: Could add a comment that the seasonality of the observed sea ice retreat is consistent with the model results (projections) mentioned here.

Response: Added comment as suggested.

Fig. 5a4-4: The scale of the y-axis (Perennial ice extent) should start at 0. The figure over-dramatized the decline in its present form.

Response: We are unable to regenerate the figure in time to meet the deadline for submission. After review with colleagues and with the section author, reached agreement that the decline in perennial sea ice this decade, nearly triple that of the 1970s-90s, is so large that it will appear ‘dramatic’ regardless of the axis. A scale that started at zero might be even more dramatic, because it would emphasize how close perennial ice is to zero.

Page 8, bottom: A key issue with the increase of NDVI is whether it represents a transition of vegetation types or just denser vegetation due to a longer growing season (which is consistent with the springtime warming over the regions showing the NDVI increase). There should be a comment on this critical point in Section 5.a.5.1.

Response: Added a short paragraph, including a reference on transition from tundra to shrubs on the North Slope.

Page 11, line 344: If the total discharge indeed reached a historical maximum (i.e., a new record) in 2007, then the data point for 2007 should be included in Figure 5a5-4.

Response: Rejected. The 2007 value is “preliminary”, and the record qualified by “possibly”, so we do not believe it appropriate to add it to the figure.

Pages 13-14: Table 5.a.6.1 seems like excessive detail. Perhaps it could be summarized with the inclusion of all the details.

Response: The table was shortened to include only the seasonal anomalies.

Page 15: The table on this page (apparently erroneously given the same table number, 5.a.6.1, as the table on p. 13-14) needs a reference or other indication of the source.

Figures 5a6-1 and 5a6-2 also need references to indicate the source of the information.

[Response: The sources were added to the captions.](#)

Antarctic

In general, the Antarctic section seems to be more compactly presented. In a long, fact-stuffed report such as this, conciseness is to be commended.

P. 23, line 739: The meaning of “ozone activity” should be clarified. As near as I can tell, it refers to the depletion of ozone by low-temperature heterogeneous chemical processes.

[Response: This has been clarified by editing the sentence.](#)

P. 24-25: The first two paragraphs of Section 5.b.3 (and also Figure 5b3-1) seem like excessive detail. We don't really need all those station summaries, especially when the six stations are a selected subset of the entire set. (The extreme events described in the last two paragraphs of this section are interesting and worth including).

[Response: We retained the figure and about half of the text because station data are fundamental to a report like this and help bring the larger atmospheric circulation patterns to a level that is easier for a non-scientist reader to appreciate. The commentary on the Peninsula data helps explain the complicated weather there that is something of a hot topic now. I trimmed the text to remove anything that was obvious by simply looking at the figure. Also, I asked the section editor to make reporting anomalies for these particular stations a regular feature in years to come, so that weather anomalies for the stations will be touchstones.](#)

P. 28, lines 885-889: Need to clarify the meaning of the red and blue colors in Figure 5b6-1.

[Response: A clarification was added to the figure caption.](#)

P. 30-32: This section on Ozone Depletion could use some reordering of paragraphs in order to make the presentation more effective. First, paragraphs 3 and 5 (lines 957-962 and 978-985) should be combined or presented sequentially, preferably immediately after the present line 950. In addition, the information in the final four lines (1004-1007) belongs earlier in the text, perhaps immediately after the present line 955.

Response: Thank you for the suggestions; the section was edited accordingly.