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Geoscientific Instrumentation Methods and Data Systems Discussions

Interactive comment on "The surface temperatures of the earth: steps towards integrated understanding of variability and change" *by* C. J. Merchant et al.

C. J. Merchant et al.

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We thank the reviewers for their thoughtful and thorough reviews, and are delighthed that our paper was received positively.

The reviewers made a number of specific comments, which we address here.

Reviewer 1: Recommendation 2.4: The "edge-lands" considerations may also apply to other transition zones, for example the Sahel (= Arabic for "coast") where vegetation transitions rapidly between desert and savannah.

Reply: We agree that there are many transition zones between different land types that need to be better characterised. This is implied in Recommendation 2.3 where we mention "geographical and land-cover context". However, in recommendation 2.4 we have focused mainly on "edge-lands" between different kinds of temperatures that are traditionally retrieved by different communities with different algorithms (for example LST and SST). We therefore feel that it is not appropriate to include the Sahel or other land cover type transitions in this particular recommendation 2.4.

Reviewer 1: Recommendation 3.4: Figure 2 has LSAT as a guide on adjustments to LST whereas the text on page 314-315, and Table 1, has LST as a guide on adjustments to LSAT. I expected the latter, but could it work both ways using LSAT reference sites (9.3, 9.4)?

Reply: We meant "LST to validate adjustments of LSAT timeseries", as the text and the table state correctly, but we made an error when copying/shortening this recommendation for the figure. We have corrected the figure.

Reviewer 1: Recommendation 8.1: Urge nations to fulfil their responsibilities for data release under WMO Resolution 40 (https://www.wmo.int/pages/about/Resolution40_en.html).

Reply: We added a sentence at the end of R 8.1: "We also note that the World Meteorological Organization (WMO) has commited "itself to broadening and enhancing the free and unrestricted1 international exchange of meteorological and related data and products" and has urged member states to "increase the volume of data and products" in its Resolution 40 (World Meteorological Organization, 1995)."

Reviewer 1: Conclusions: Your Recommendations are a good application of many of the Global Climate Observing System Climate Monitoring Principles (http://www.wmo.int/pages/prog/gcos/index.php?name=ClimateMonitoringPrinciples) which apply to both in situ and satellite data.

Reply: This is a good suggestion. We feel a better place to refer to the GCOS Principles is the introduction rather than the conclusions, so we added the following sentence to the introduction: "Our recommendations can also be seen as a concrete application of many of the Global Climate Observing System (GCOS) Climate Monitoring Principles (GCOS, 2003)."

Technical/minor corrections:

Reviewer 1: Page 311 line 21: change "insufficiently specified" to "unrepresentative local" to capture the thrust of Hall et al. (2008).

Reply: Changed to "unrepresentative locally".

Reviewer 1: Page 312 line 24: remove duplicate "and". Reviewer 2: I have found only one such error on page 312, line 24, where at the end of the line one 'and' should be deleted.

Reply: Corrected (also in table 1).

Reviewer 1: Page 314 line 11: Schneider and Hook (2010) don't mention MODIS.

Reply: It was an oversight on our part that the MODIS work was published in different paper by the same team (Schneider et al. 2009), which is referenced in Schneider and Hook (2010). To avoid ambiguity, we now also added the reference to Schneider et al (2010) here.

Reviewer 1: Page 317 line 5: remove duplicate "temperature", also in Table 1. Rec. 4.3.

Reply: Corrected.

Reviewer 1: Page 319 line 2: "temperatures" should be "temperature", also in Table 1 Rec. 5.1.

Reply: Corrected.

Reviewer 1: Page 319 line 28: what is meant by "similar measures"?

Reply: We changed it to "and other interactions intended to improve the provision and exploitation of uncertainty information".

Reviewer 1: Page 322 line 27: I tried to check the Kerr (2004) citation but the closest I found was Kerr, Y.H., Lagouarde, J. P., Nerry, F. and Ottlé, C., Land surface temperature retrieval: Techniques and applications: Case of the AVHRR, in Thermal remote sensing in land surface processes, D. A. Quattrochi and J. C. Luwall, Editors. 2004, CRC Press: Boca Raton Fl. p. 33-109. I only gained access to limited parts of this book: the index mentions MODIS but not SEVIRI, VIIRS or GOES-ABI, so is Kerr (2004) a different article?

Reply: The reviewer found the correct book chapter; unfortunately it seems the co-authors and other details of the reference were lost during production, which we have now corrected. The reviewer is right that the sentence was ambiguous. Kerr et al. don't discuss all these sensors specifically, but the split window methods on which the retrieval is based. To make this clearer, we now changed the sentence to:

"Kerr et al. (2004) focus on a comparative overview of existing split window methods. LST standard products from MODIS, SEVIRI, VIIRS and future GOES-R ABI sensors are based on these methods (with the effect of view angle explicitly represented by an additional term in the retrieval algorithms used for VIIRS and ABI)."

Reviewer 1: Page 326 line 24: "research" should be "reference".

Reply: We have corrected it to "US Climate Reference Network".

Reviewer 1: Page 327, line 26: The text beginning "Relationships. . ." is more connected to R10.2 than to R10.1.

Reply: We have moved the paragraph to Recommendation 10.2.

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., 3, 305, 2013.