

Response to Short Comment 1 (Stefan Hendricks)

The paper "Assessment of Contemporary Satellite Sea Ice Thickness Products for Arctic Sea Ice" is an interesting study on the consistency of different Arctic sea-ice thickness products from CryoSat-2 and other Earth Observation data sets. I however want to shortly point out a potential irregularity that I have noticed in Figure 5. This figure shows the increase of mean thickness in the Arctic Basin for the different products and I cannot reproduce the growth curves of the merged CryoSat-2/SMOS (cs2smos) product as shown in Figure 5. While the general magnitude seems correct, there is significant noise on the cs2smos curve with irregular decreases of monthly mean thicknesses in the Winter growth season.

I do not observe this behaviour when I compute mean Arctic Basin sea ice thickness with the weekly merged CryoSat-2/SMOS thickness product (version 1.4) and it also has not been observed in previous publications (e.g. Ricker et al, 2017). I have attached two figures illustrating my version of the mean thickness curve and the respective region definition for the Central Arctic Basin. My suggestion to the authors is to verify their methodology and amend the figure and conclusions derived from it if needed.

Best Regards, Stefan Hendricks

Ricker, R., S. Hendricks, F. Girard-Ardhuin, L. Kaleschke, C. Lique, X. Tian-Kunze, M. Nicolaus, and T. Krumpen (2017), Satellite-observed drop of Arctic sea ice growth in winter 2015–2016, *Geophys. Res. Lett.*, 44, 3236–3245, doi:10.1002/2016GL072244.

Arctic Basin

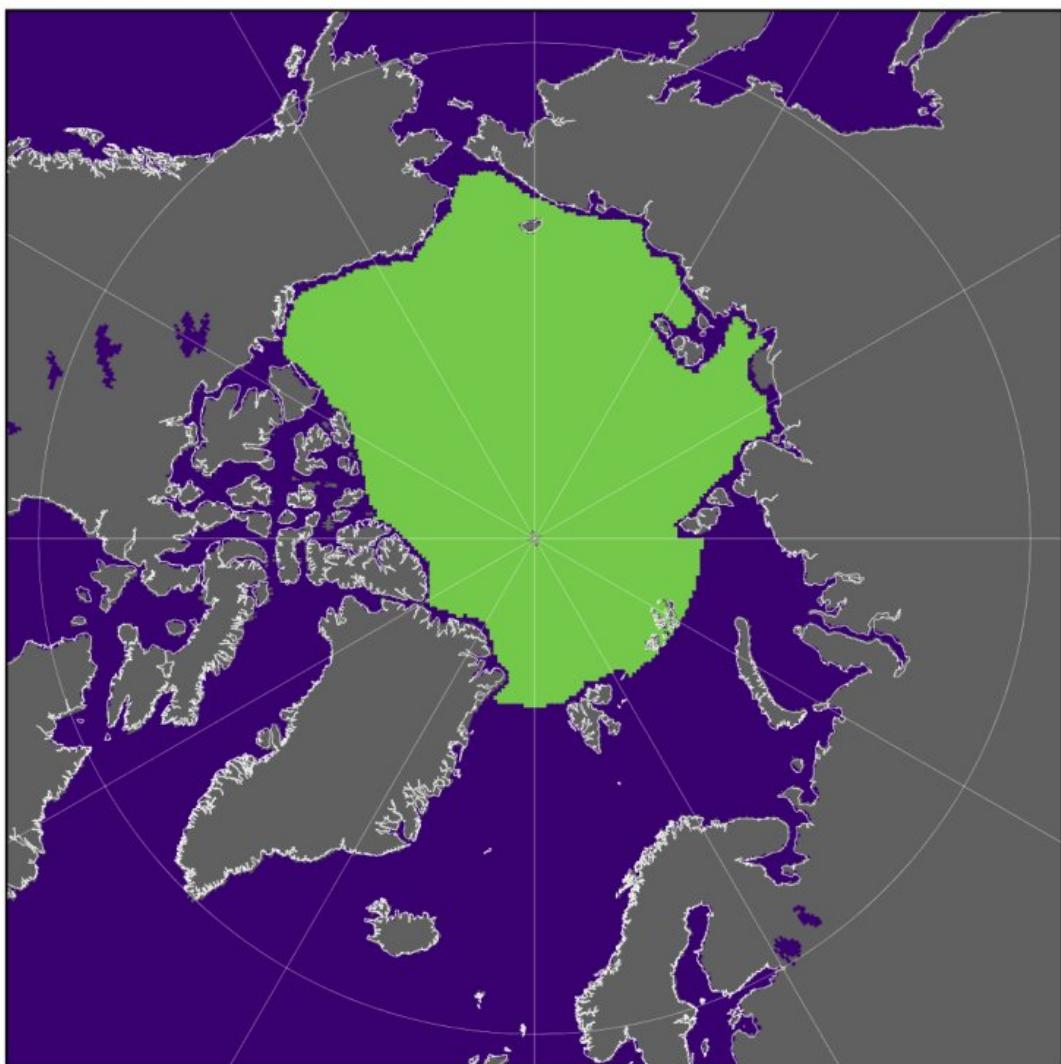


Fig. SC1.1 Mask for the Arctic Basin (green area indicates area for computing mean sea-ice thickness)

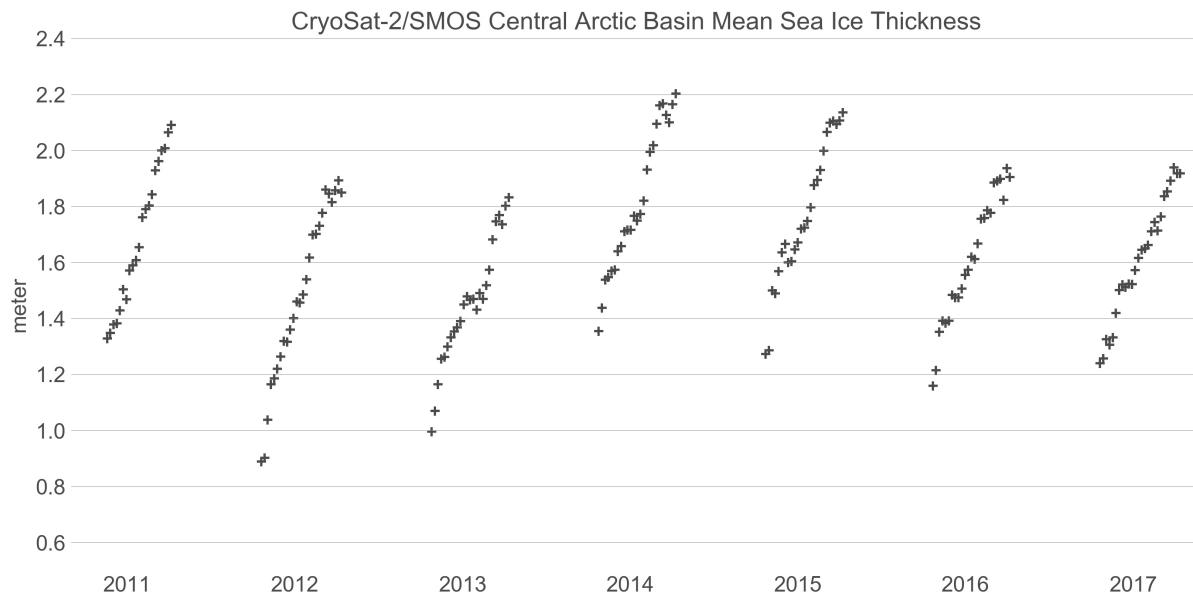


Fig. SC1.2 Mean sea-ice thickness time series in the Arctic Basin from merged CryoSat-2/SMOS data (version 1.4)

We thank Dr. Hendricks for this comment and for catching this issue. The peculiarities identified within the CS2SMOS data product were due to an error that occurred during the data transfer process at our end. Upon review, we found that many of the CS2SMOS product data files were only partially complete. We have downloaded the CS2SMOS data product again and we can now confirm we get the same results as you provide (see Figure SC1.3). We have revised all of the tables and figures throughout the manuscript so that they now contain the updated and complete CS2SMOS data product.

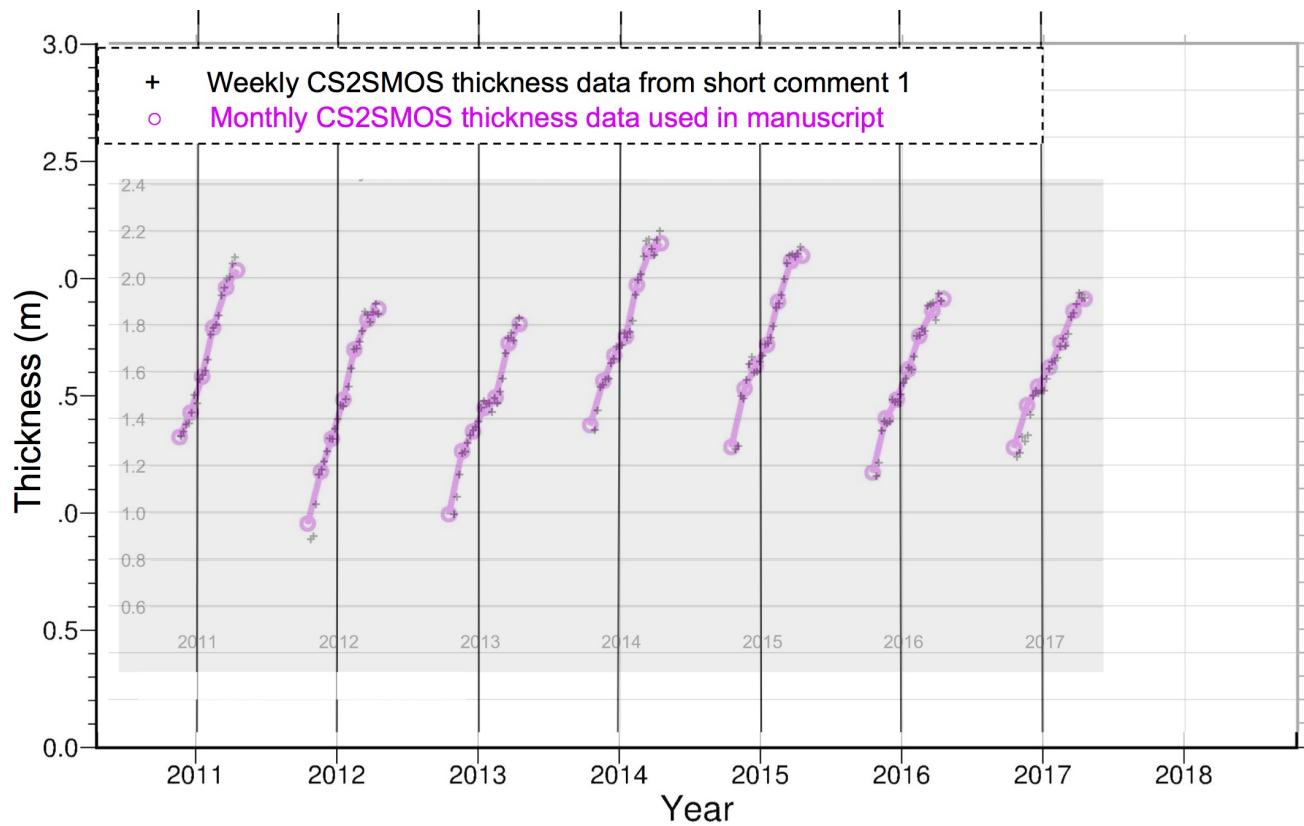


Fig. SC1.3 Comparison of weekly CS2SMOS thickness data (as provided in SC1. 2) overlaid on the monthly averaged CS2SMOS ice thickness data, based on the revised version of the CS2SMOS data product now used throughout the manuscript. The monthly averages are now fully consistent with the weekly CS2SMOS data as shown in SC1.2. Monthly data are averaged over the central Arctic (regions 1-6), consistent with the region shown in Figure SC1.1.