

# SMOS & CryoSat-2 Sea Ice Data Product Processing and Dissemination Service (CS2SMOS-PDS)



## Operational News

Changes of algorithm and/or data as well as recent news of any (temporay) data gaps or degraded data:

### Blog Posts

- Blog: [Operational processing of L3 and L4 products in the Arctic ended for the 2023/24 winter season. Operational processing of Antarctic L3 SMOS sea ice product has started.](#) created by Xiangshan Tian-Kunze  
Apr 24, 2024  
[CS2SMOS-PDS](#)
- Blog: [L4 CryoSat-2/SMOS sea ice thickness processing has been resumed](#) created by Stefan Hendricks  
Mar 19, 2024  
[CS2SMOS-PDS](#)
- Blog: [L4 CryoSat-2/SMOS data production remains interrupted](#) created by Stefan Hendricks  
Mar 14, 2024  
[CS2SMOS-PDS](#)
- Blog: [L3C SMOS sea ice thickness processing has been resumed.](#) created by Xiangshan Tian-Kunze  
Mar 14, 2024  
[CS2SMOS-PDS](#)
- Blog: [Interruption of L4 CryoSat-2/SMOS operational data processing due to SMOS safe mode](#) created by Stefan Hendricks  
Feb 29, 2024  
[CS2SMOS-PDS](#)
- Blog: [Interruption of SMOS L3C data processing due to SMOS in safe mode](#) created by Xiangshan Tian-Kunze  
Feb 23, 2024  
[CS2SMOS-PDS](#)
- Blog: [Important Notice: JRA-3Q will replace the present JRA55 reanalysis at the end of January 2024. Both L3 and L4 sea ice thickness products are affected.](#) created by Xiangshan Tian-Kunze  
Jan 23, 2024  
[CS2SMOS-PDS](#)
- Blog: [L4 CryoSat-2/SMOS near real-time sea ice thickness processing started for 2023/24 winter season](#) created by Stefan Hendricks  
Oct 23, 2023  
[CS2SMOS-PDS](#)
- Blog: [ESA SMOS Online Dissemination started](#) created by Lars Kaleschke  
Oct 19, 2023  
[CS2SMOS-PDS](#)
- Blog: [2023/24 winter season: a first view at L3 SMOS sea ice thickness data \(update\)](#) created by Lars Kaleschke  
Oct 16, 2023  
[CS2SMOS-PDS](#)

## Abstract

The SMOS & CryoSat-2 Sea Ice Data Product Processing and Dissemination Service (**CS2SMOS-PDS**) ensures the automated and continuous operational generation of the **SMOS** and the merged **CryoSat-2/SMOS** Sea Ice Thickness products.

## Documentation

- [CryoSat-SMOS Merged Sea Ice Thickness](#)
- [SMOS Sea Ice Thickness](#)

## Most recent quicklooks

[Recent CS2SMOS Quicklook](#)

[Recent SMOS Quicklook](#)

## Data access

Daily SMOS and weekly merged CryoSat-2 /SMOS sea ice thickness data can be downloaded via FTP through a Web browser, a FTP client (e.g. FileZilla) or command line. The access is anonymous.

[Get data via AWI FTP](#)

Alternatively, data can be downloaded from the ESA SMOS Dissemination server by ftps and https:

[Get data via ESA FTPS and https](#)



### Info

Due to melting season, the SMOS and CryoSat-2 data processing and dissemination is **stopped** between **May** and **September**.

## How to cite the data

For the **merged CryoSat-2/SMOS sea ice thickness** data, please

1. cite:

Ricker, R., Hendricks, S., Kaleschke, L., Tian-Kunze, X., King, J., and Haas, C.: A weekly Arctic sea-ice thickness data record from merged CryoSat-2 and SMOS satellite data, The Cryosphere, 11, 1607-1623, <https://doi.org/10.5194/tc-11-1607-2017>, 2017.

2. include the following phrase into the acknowledgment:

"The production of the merged CryoSat-SMOS sea ice thickness data was funded by the ESA project SMOS & CryoSat-2 Sea Ice Data Product Processing and Dissemination Service, and data from DATE to DATE were obtained from AWI."

For the **SMOS Sea Ice Thickness** data, please

1. cite:

Tian-Kunze, X. , Kaleschke, L., Maaß, N., Mäkynen, M., Serra, N., Drusch, M., and Krumpen, T. (2014) SMOS-derived thin sea ice thickness: algorithm baseline, product specifications and initial verification, The Cryosphere , 8, 997-1018, doi:10.5194/tc-8-997-2014

2. include the following phrase into the acknowledgment:

"The production of the SMOS sea ice thickness data was funded by the ESA project SMOS & CryoSat-2 Sea Ice Data Product Processing and Dissemination Service, and data from DATE to DATE were obtained from AWI."



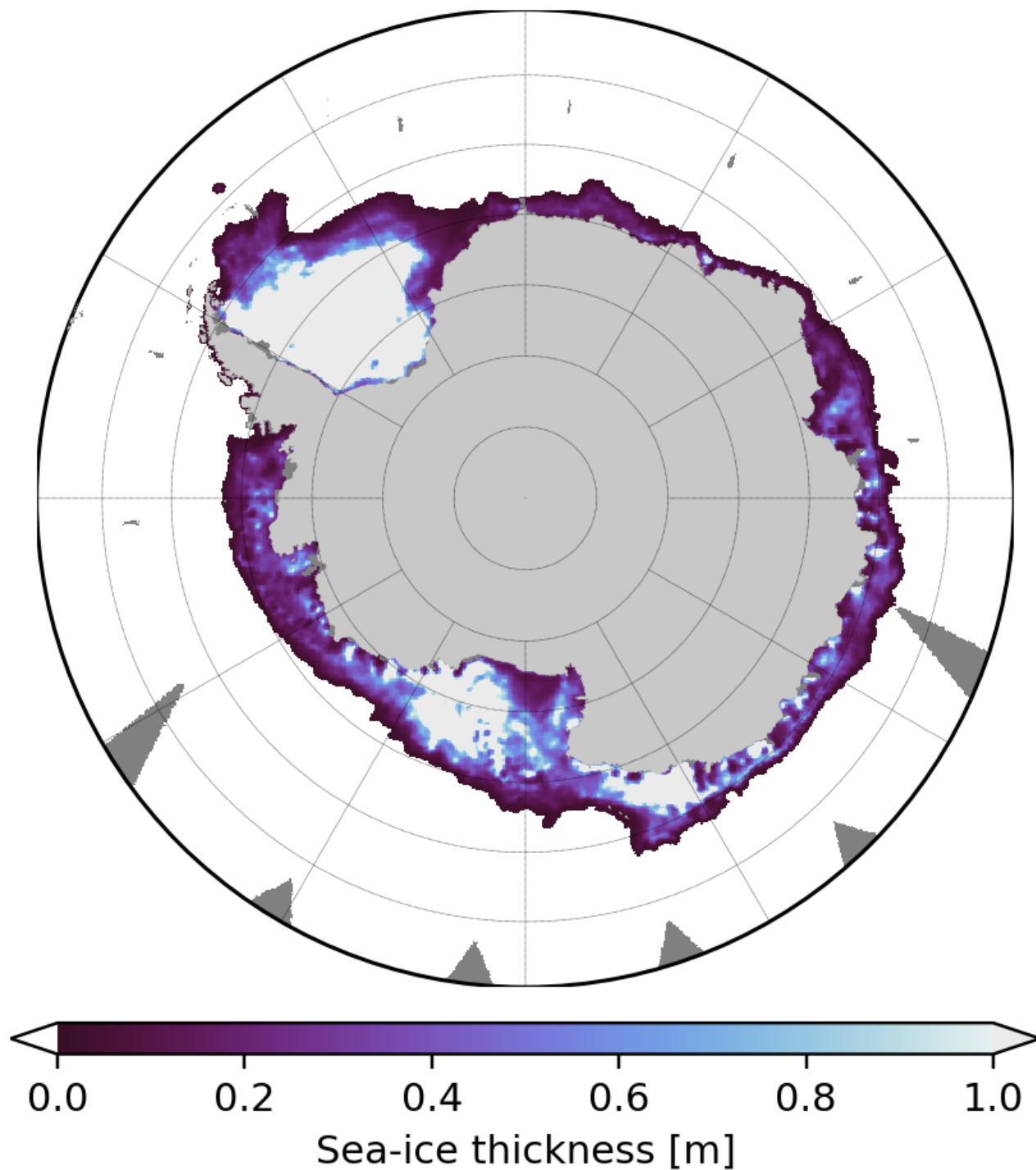
[Operational processing of L3 and L4 products in the Arctic ended for the 2023/24 winter season. Operational processing of Antarctic L3 SMOS sea ice product has started.](#)

Xiangshan Tian-Kunze posted on Apr 24, 2024

Operational processing and dissemination of L3 and L4 sea ice thickness products in the Arctic for the 2023/24 winter season ended on 15 April, 2024. Reprocessing of L4 CS2SMOS product (r product) will continue until end of May. Operational L3 SMOS data for the southern hemisphere is now available from 15 April, 2024 on for the austral winter season.

The v3.3 L3 SMOS data from 2010 to 2023 for the southern hemisphere is available under <https://ftp.awi.de> and ESA server:

<https://earth.esa.int/eogateway/news/experimental-version-of-smos-antarctic-sea-ice-thickness-product-is-now-available>



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L4 CryoSat-2/SMOS sea ice thickness processing has been resumed

[Stefan Hendricks](#) posted on Mar 19, 2024

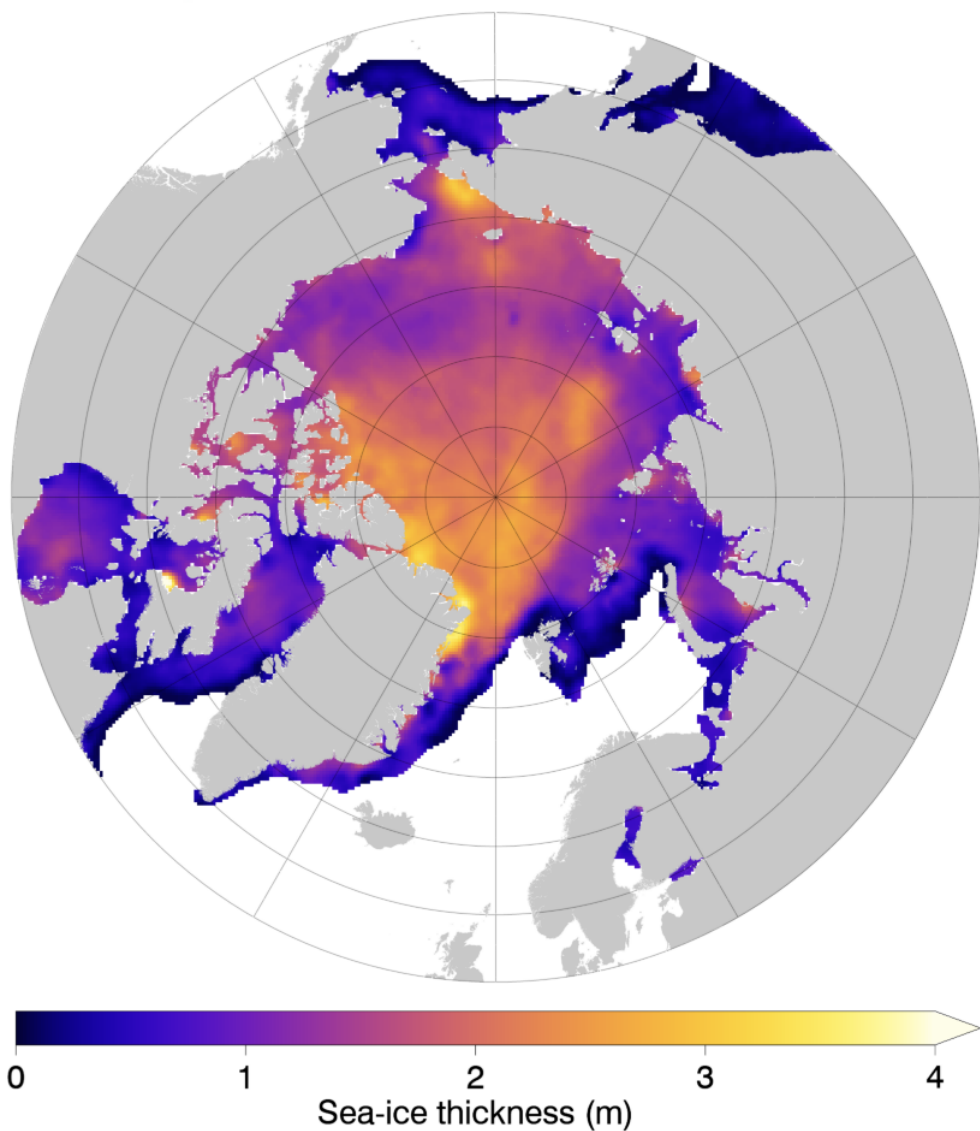
The production of L4 CryoSat-2/SMOS sea ice thickness data has been resumed on 18 Mar 2024 after enough SMOS data became available for the optimal interpolation data requirements.

The data gap currently includes data from 16 days:

|                          |                                                                      |
|--------------------------|----------------------------------------------------------------------|
| Last file before the gap | W_XX-ESA,SMOS_CS2,NH_25KM_EASE2_20240221_20240227_o_v206_01_l4sit.nc |
| First file after the gap | W_XX-ESA,SMOS_CS2,NH_25KM_EASE2_20240309_20240315_o_v206_01_l4sit.nc |



CS2SMOS 09/03/2024 - 15/03/2024



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- [cryosat2-smos](#)



[L4 CryoSat-2/SMOS data production remains interrupted](#)

[Stefan Hendricks](#) posted on Mar 14, 2024

While [L3C SMOS sea ice thickness processing has been resumed.](#), the generation of L4 CryoSat-2/SMOS will remain paused for a few more days, pending potential reprocessing of further missing days of SMOS L3C data.

The reason for this is the size of the current SMOS data gap between February 22 and March 7, 2024 (15 days). The L4 CryoSat-2/SMOS near real-time algorithm requires at least one SMOS file in the observations field (7 day period) and in background field (7 days before the observation field). With the 15 day gap either the observation field or the background field are empty and preventing a successful completion of the L4 CryoSat-2/SMOS near real-time data generation.

The situation will change in a few days, or when additional SMOS data in early March is made available.

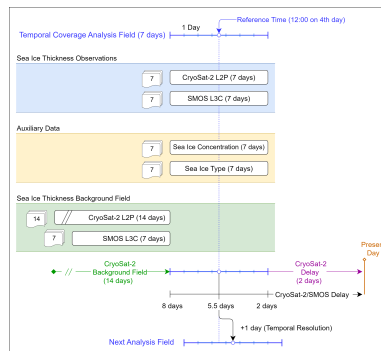


Figure: Data requirements for the L4 CryoSat-2/SMOS near real-time algorithm.

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[L3C SMOS sea ice thickness processing has been resumed.](#)

Xiangshan Tian-Kunze posted on Mar 14, 2024

Since 12 March we receive SMOS L1C data again and the L3C sea ice thickness processing has been resumed. Data from 8 to 11 March are reprocessed. Reprocessing of further missing days between 22 February and 7 March is not certain yet, which depends on the availability of SMOS L1C data.

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[Interruption of L4 CryoSat-2/SMOS operational data processing due to SMOS safe mode](#)

Stefan Hendricks posted on Feb 29, 2024

Generation of the operational (near real-time) L4 CryoSat-2/SMOS product will be temporarily discontinued from March 1st 2024 onwards due to the [In](#) [terruption of SMOS L3C data processing](#). Production will be resumed as soon as SMOS data is available again. Updated will be posted here.

The reprocessed L4 CryoSat-2/SMOS product is currently not affected.

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[Interruption of SMOS L3C data processing due to SMOS in safe mode](#)

Xiangshan Tian-Kunze posted on Feb 23, 2024

SMOS L3C sea ice thickness processing has been interrupted since 22nd February. The reason is SMOS satellite switched to safe mode. Investigations are still in progress. The processing will be resumed as soon as the situation is normalised.

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[Important Notice: JRA-3Q will replace the present JRA55 reanalysis at the end of January 2024. Both L3 and L4 sea ice thickness products are affected.](#)

Xiangshan Tian-Kunze posted on Jan 23, 2024

JRA55 reanalysis is an auxiliary data set for SMOS sea ice thickness retrieval. The update of this near real-time JRA55 data will terminate at the end of January 2024, instead, the Japanese Reanalysis for Three Quarters of a Century (JRA-3Q) will be used thereafter. The impact of this transition on L3 SMOS and L4 CS2SMOS products will be analyzed in detail after the reprocessing of the complete data in April 2024. A preliminary comparison of JRA55 and JRA-3Q temperature and its impact on L3 SMOS sea ice thickness product is shown in Figure 1. There is temperature difference up to 5K in some regions in the Arctic, which is caused by the update of sea-ice and snow schemes in JRA-3Q.

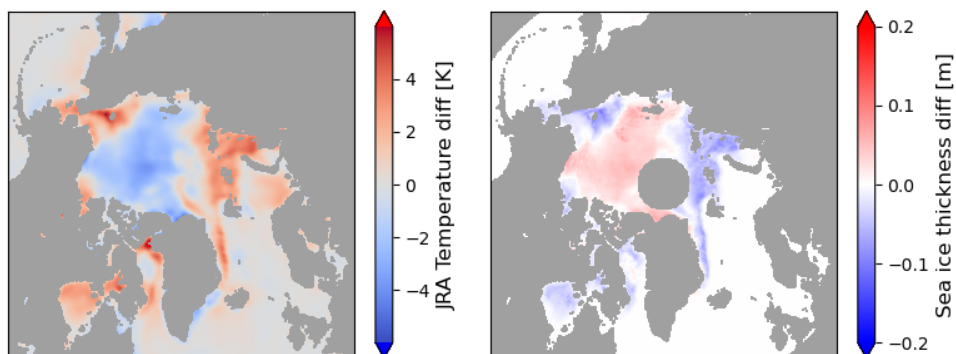


Figure 1. Temperature difference between JRA-3Q and JRA55 in December 2023 (left) and the difference in SMOS sea ice thickness caused by the transition from JRA55 to JRA-3Q for the same month (right).

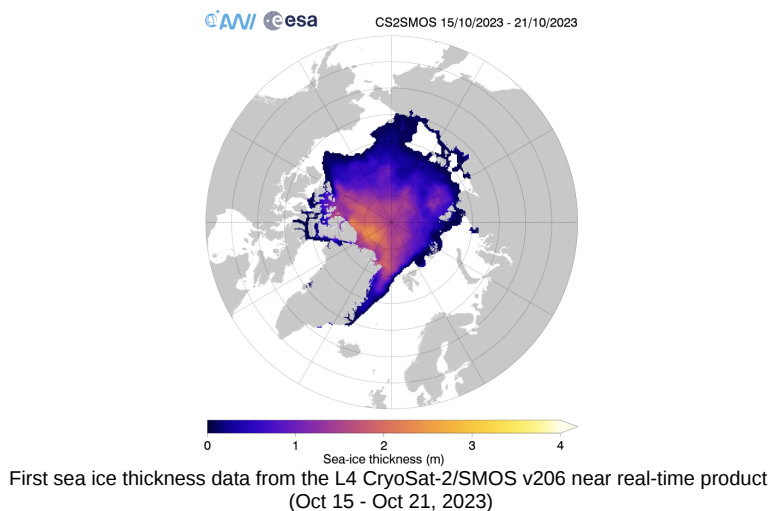
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[L4 CryoSat-2/SMOS near real-time sea ice thickness processing started for 2023/24 winter season](#)

Stefan Hendricks posted on Oct 23, 2023

Operational processing and dissemination of the L4 CryoSat-2/SMOS near real-time sea ice thickness product has been resumed for the winter season of 2023/24 with data since 15 October 2023. See [CryoSat-SMOS Merged Sea Ice Thickness](#) for updates of version 206.

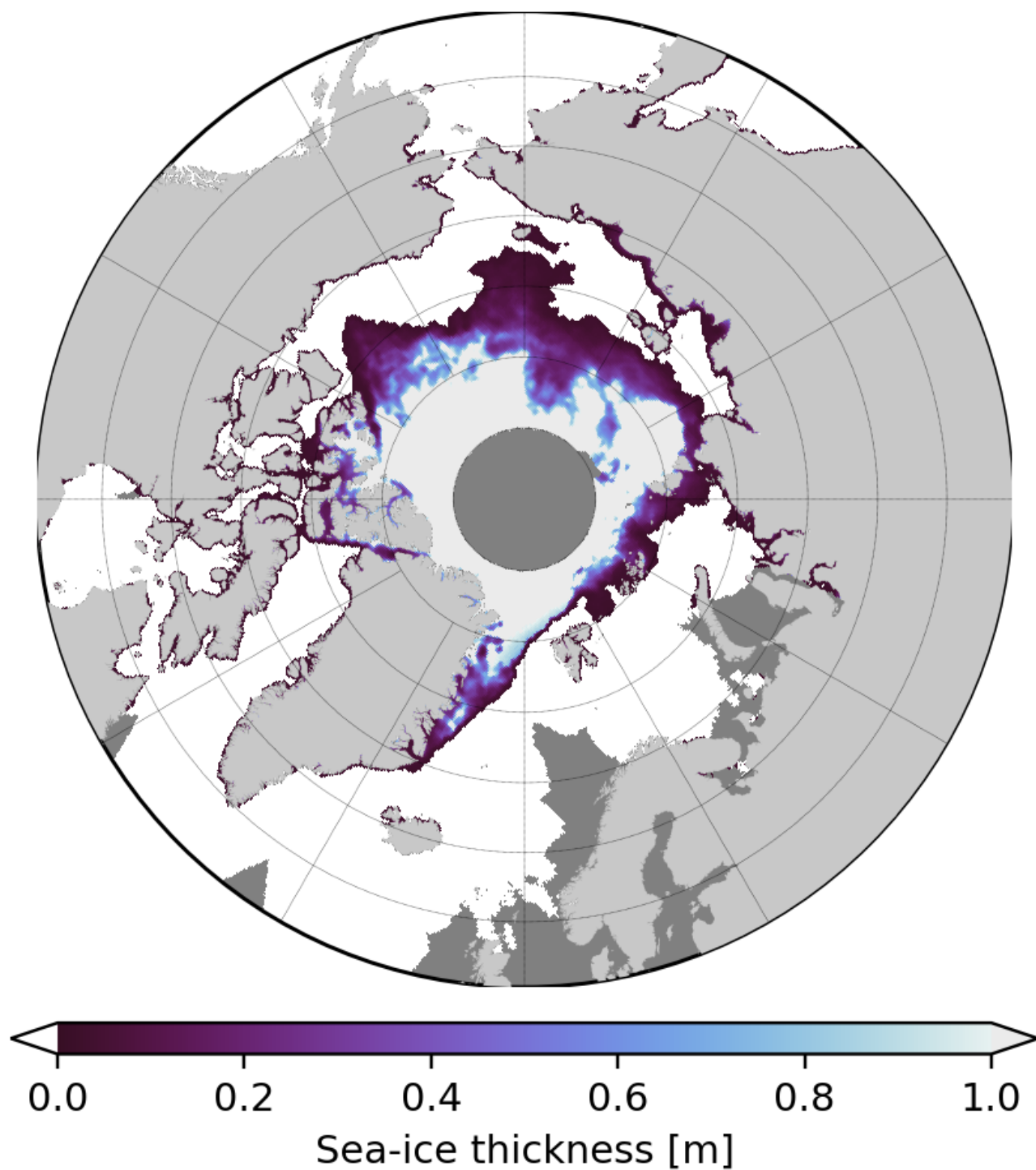


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[ESA SMOS Online Dissemination started](#)

Lars Kaleschke posted on Oct 19, 2023



The dissemination through ESA's Earth Online is running. The most recent data from October 17th show no major data gaps in the sea ice area. You can access data using the [SMOS L3 catalogue tree view](#)

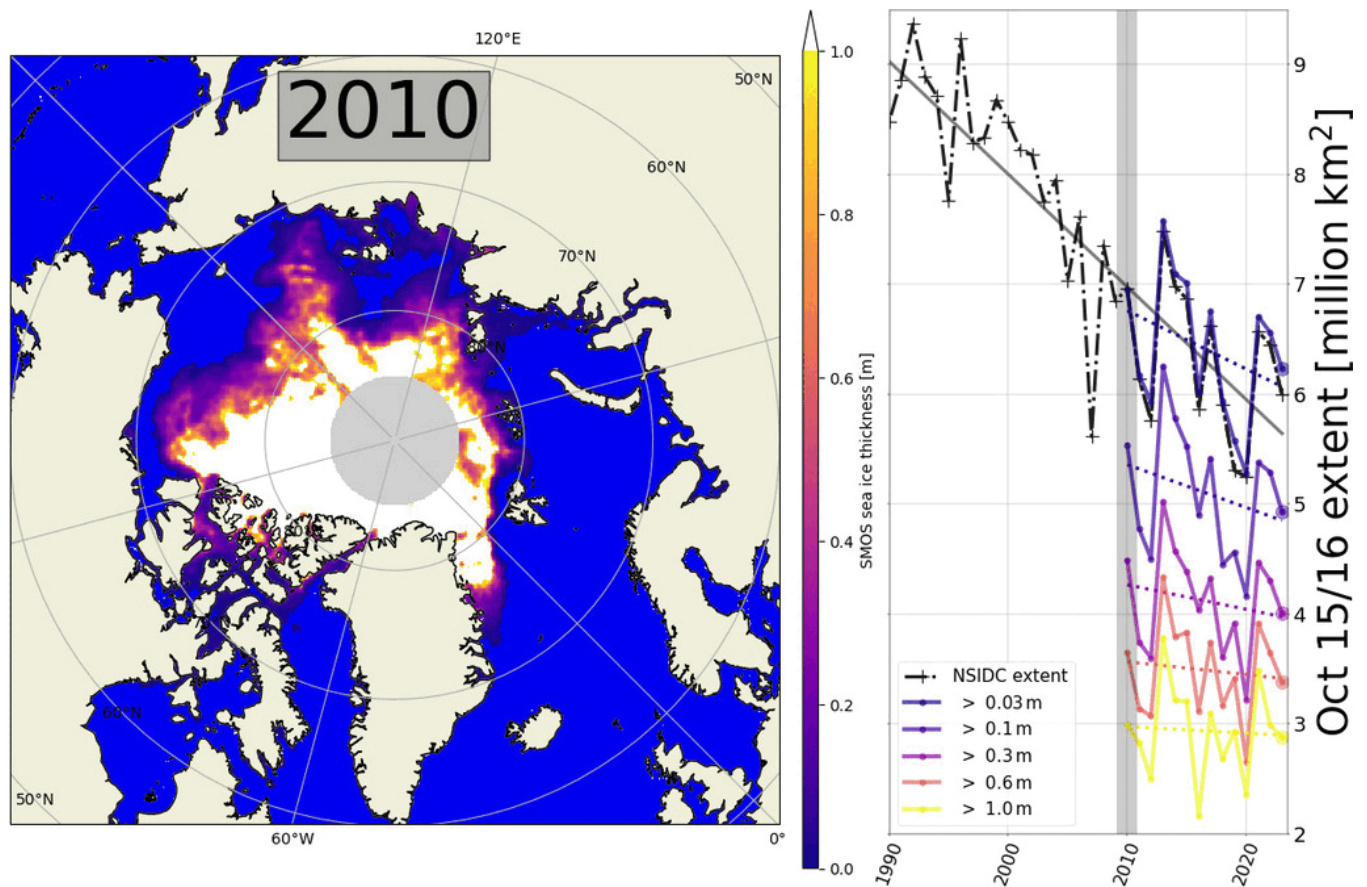
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2023/24 winter season: a first view at L3 SMOS sea ice thickness data (update)

Lars Kaleschke posted on Oct 16, 2023

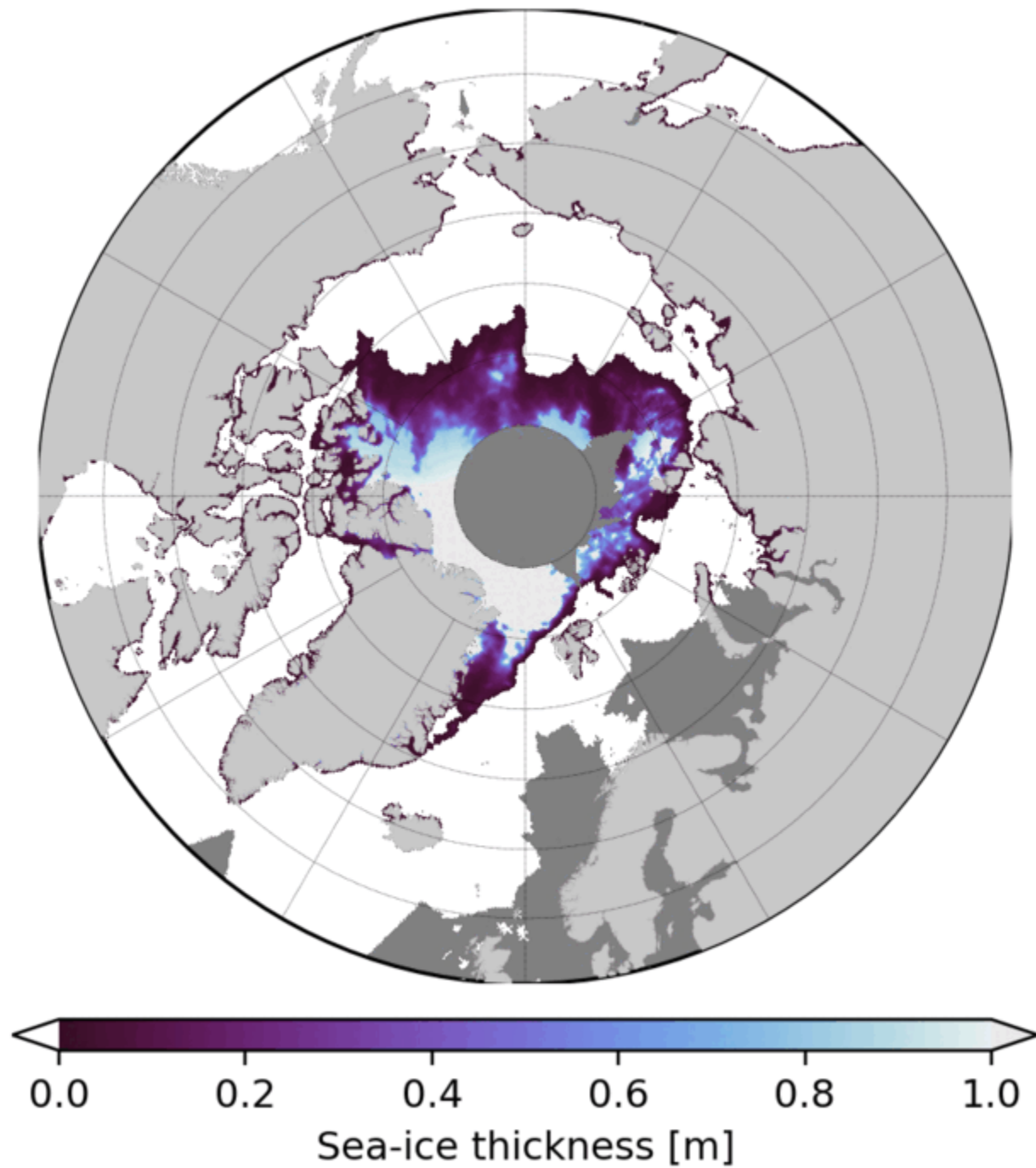
## Comparison of SMOS ice thickness extent with NSIDC sea ice index



An analysis of the first data from the Arctic freezing season shows that SMOS ice extent is lower than in the previous two years. The graph shows the SMOS ice extent for October 15 and 16, an average of two days. The data looks reasonable and is also consistent with the NSIDC sea ice extent.

Please note that missing data is filled with the average of all previous years. The gap filling was in particular necessary for the beginning of the time series for the 2010/2011 season with persistent RFI sources in the Greenland Sea (see Kaleschke and Tian-Kunze, 2021).

October 2023: RFI problems in Russian Arctic



The animation shows the SMOS sea ice thickness product in the first days of October. Data gaps (dark gray) occur primarily over the Russian parts of the Arctic Ocean. Such persistent RFI problems did not occur since the season 2010/2011.

Further analysis is required to evaluate whether it is possible to reduce data loss while maintaining data quality through improved (relaxed) RFI filtering techniques.

For more information on RFI see <https://rfi.smos.eo.esa.int/>

## References

L. Kaleschke and X. Tian-Kunze, "SMOS Sea Ice Thickness Data Product Quality Control by Comparison with the Regional Sea Ice Extent," 2021 *IEEE International Geoscience and Remote Sensing Symposium IGARSS*, Brussels, Belgium, 2021, pp. 1110-1113, doi: 10.1109/IGARSS47720.2021.9553630.

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[L3 SMOS sea ice thickness processing started for 2023/24 winter season.](#)

Xiangshan Tian-Kunze posted on Oct 16, 2023

Operational processing and dissemination of L3 SMOS sea ice thickness product has been resumed for the winter season of 2023/24 since 15 October 2023.

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[Operational processing of L3 SMOS and L4 CS2SMOS data ended for the 2022/23 winter season.](#)

Xiangshan Tian-Kunze posted on Apr 18, 2023

Operational processing and dissemination of L3 and L4 sea ice thickness products in the Arctic for the 2022/23 winter season ended on 15 April, 2023. Reprocessing of L4 CS2SMOS product (r product) will continue until end of May.

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[L3 SMOS SIT processing is resumed.](#)

Xiangshan Tian-Kunze posted on Dec 12, 2022

L3 SMOS Sea Ice Thickness data processing is resumed since 9 December. The missing L3 SMOS data have been reprocessed. From 12 December on the operational L4 CS2SMOS SIT product is no longer degraded.

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[Interruption of L3 SMOS SIT processing since 2 December, 2022. L4 CS2SMOS production degraded.](#)

Xiangshan Tian-Kunze posted on Dec 05, 2022

L3 SMOS Sea Ice Thickness processing is interrupted since 2 December due to missing JRA55 reanalysis data, which is an auxiliary input data for the SMOS SIT production. Accordingly L4 CS2SMOS production is degraded with less inputs from L3 SMOS products.

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[Missing inputs to operational CryoSat-2/SMOS sea ice thickness product](#)

Stefan Hendricks posted on Nov 10, 2022

Sea Ice Concentration data from OSI-SAF is (OSI-401-b) is currently not available due to missing DMSP SSMIS Level-1 input data:

<https://osi-saf.eumetsat.int/community/list-of-service-messages>

Daily sea ice concentration data from OSI-401-b is critical input to the CryoSat-2 sea ice product and data from the following dates is (currently) missing:

- 09 Nov 2022 CryoSat-2 I2p

The production of operational CryoSat-2/SMOS sea ice thickness data continues, but with less input data from CryoSat-2.

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