New release of the SMOS SSS product for the Arctic region

We are pleased to announce the publication of the **new** dedicated **Arctic Ocean SMOS Sea Surface Salinity (SSS)** products produced at BEC (DOI: https://doi.org/10.20350/digitalCSIC/16251). This new SMOS **(v4)** data set has been created under the **ESA ARCTIC+SSS CCN project** (contract Nº 4000125590/18/I-BG).

The retrieval of satellite SSS in polar regions is challenging due to several technical difficulties, such as the low sensitivity of L-band radiometry to salinity on cold waters, the contamination of the radiometric signal close to sea ice and the scarcity of in-situ measurements, which limits the validation of the new products .

In this context, we have developed algorithm improvements from the level 0 to level 3 for the generation of this dedicated SSS product. The main improvements are:

- to use the Nodal Sampling technique (González-Gambau et al., 2016) to avoid contamination close to ice edges (allowing the reduction of the radiometric errors very significantly),
- modification of the Debiased non-Bayesian retrieval method (Olmedo et al., 2017) to correct systematic biases as a function of the distance to sea ice, and
- the annual reference has been modified to WOA2023.

This product has been extensively validated through the comparison to in-situ measurements from Argo, drifters, ICES data, marine mamals, thermosalinographs on board opportunity ships and other in situ measurements available in the Pi-MEP platform (Salinity Pilot-Mission Exploitation Platform). The validation of BEC ARCTIC v4 SSS results in: (i) the spatial and temporal variability is consistent with those of in situ

datasets with an RMS between 0.3 and 0.7 psu depending on the region, (ii) there is an improvement on RMS (of about 20-25%) and correlation versus the previous version (BEC ARCTIC v3.1) , being more significant nearer than 100 km from ice edges and coast, (iii) there is a significant increase (about 30-40%) on the number of retrievals near the ice edges, (iv) the product describes more properly the freshwaters from rivers runoff.

This product has been shown to be suitable for understanding rapid changes in the last years in the Arctic and to compute the freshwater content and fluxes in the region.

Please, be aware we will keep the former version in our sFTP for 3 months, then it will be discontinued and available on request to smos-bec@icm.csic.es.

Temporal extension of the current global BEC L3 and L4 SSS products

We are pleased to release the **temporal extension** of the **current global BEC L3 and L4 SSS products** for the period **January 2020 to May 2021**. This new release has been created as part of the European Marine Observation and Data Network Physics (EMODnet Physics) project – EASME/EMFF/2020/3.1.11/Lot4/SI2.838612.

The new time series comprises almost 11 years (2011- mid 2021). A detailed explanation of the algorithm can be found in Olmedo et al. 2021. The performance of the new products for the years 2020 and 2021 when compared with Argo floats are included in the updated BEC Global SSS Products Description .

Please, do not hesitate to contact us in case you have any question or comment at smos-bec@icm.csic.es. Your feedback is most welcome!

Enjoy the products!

The BEC team
http://bec.icm.csic.es

New release of Europe SMOS L4 Soil Moisture at 1 km

SSS Arctic product version 2 is available

SMAP SSS provided by REMSS: v1.0 vs v2.0

Preliminary validation of 8-day SMAP L3 Salinity product V1.0

Experimental SMOS Mediterranean SSS products now available at CP34-BEC

Preliminary SMOS SSS in the Mediterranean

New service available: Singularity Analysis

Global Land products available!