

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

Scientists at Remote Sensing Systems (RSS, <http://www.remss.com> ^[2]), using the experience acquired with the Aquarius mission are developing the necessary algorithms to retrieve sea surface salinity from brightness temperature provided by the SMAP radiometer team.



[1] Amazon, Niger and Congo discharges over the Atlantic Ocean as measured by SMAP

Recently, RSS has released version 1.0 (BETA) SMAP Level 3 Ocean Surface Salinities. The data can be accessed through the [RSS web site](#) ^[3] or [FTP server](#) ^[4] and it is

described in [[Meissner et al., 2015](#) ^[5]]. Their Level 3 salinity product has worldwide coverage and correspond to 8-day and monthly averages. The 8-day average field, centered on each day, starts on April 4, 2015 and ends at November 15, 2015.

A preliminary comparison of the 8-day L3 product with ARGO profiles and the World Ocean Atlas (WOA13) climatology has been performed by BEC team over the zones indicated on the map below.



[6] Zones under study (click to enlarge image)

The largest salinity anomalies are located close to the coast. Although this fact, by itself, does not indicate that the coastal salinity values are bad, it is an indication that they must be used with caution. Inspection of some coastal zones reveals that SMAP L3 salinity values should be reliable beyond 50 km off shore. Differences against Argo data display large

oscillations when all matchups are used. These oscillations disappear when matchups closer than 50 km from the coast are not taken into account. Therefore, it is advisable to use data beyond 50 km offshore.

In general, at the equatorial and middle latitudes zonal oceans, differences against Argo present a stable behaviour. As the RSS team has pointed out [[Meissner et al., 2015](#) ^[5]], high Northern latitudes (>40°N) have a significant fresh biases showing two different regimes in standard deviation (April-August and August-November). A fresh bias is also observed to a lesser extent in high Southern latitudes.



[7] Mean of the difference between L3 product and ARGO profiles



[8] Standard deviation of the difference between L3 products and ARGO profiles

Singularity exponents (see [this post](#) ^[9] for additional information) reveal that 0.5×0.5 degree products constructed from the original 0.25×0.25 degree contain a rich structure. In this case currents like Gulf Stream, Antarctic Circumpolar, South Equatorial or the Amazon plume structure are clearly visible indicating that their SSS product is geophysically consistent.

See technical note [[Martinez et al., 2015](#) ^[10]] for additional information

Acknowledgement

SMAP data are produced by Remote Sensing Systems and sponsored by the NASA Ocean Salinity Science Team. They are available at www.remss.com ^[2]

References

<http://www-remss.com/missions/smap> ^[3].

<http://cp34-bec.cmima.csic.es/doc/BEC-TN.2015.03.pdf> ^[11]