

# The contribution of the Vendée Globe Race to improved ocean surface information. A validation of the remotely sensed salinity in the sub-Antarctic zone



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## Motivation

The **Vendée Globe** is the world's most famous solo, **non-stop unassisted sailing race**. The Institute of Marine Sciences (ICM-CSIC) and the Barcelona Ocean Sailing Foundation (FNOB), decided to **install MicroCAT to the One Ocean One Planet boat**. The skipper Didac Costa completed the round trip around the World in 97 days, from **November, 8th of 2020 to February 13th of 2021**, recording data of surface temperature and conductivity every 30 seconds during navigation.

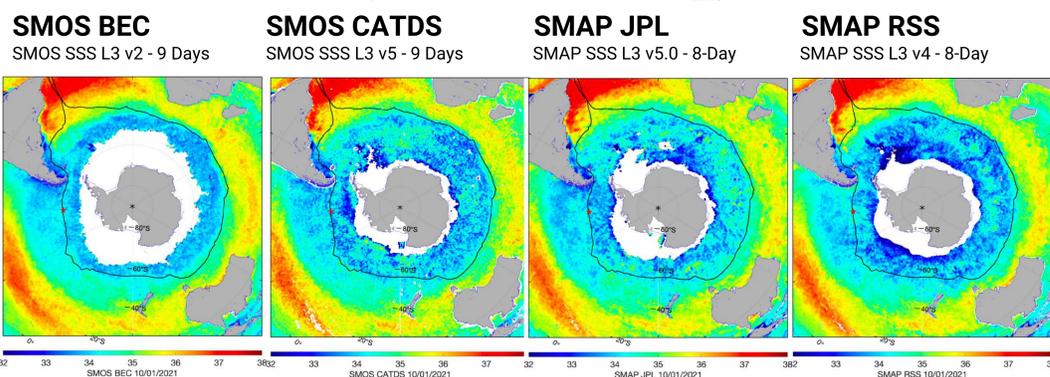
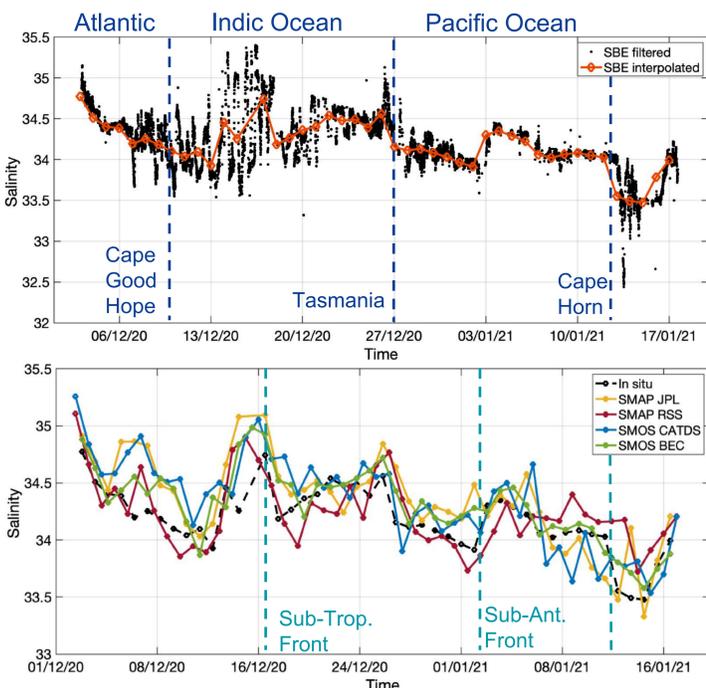


Detail of the Sea-Bird SeaCat temperature and salinity sensor that was installed onboard the One Ocean One Planet boat.

## Validation of satellite SSS south of 40°S

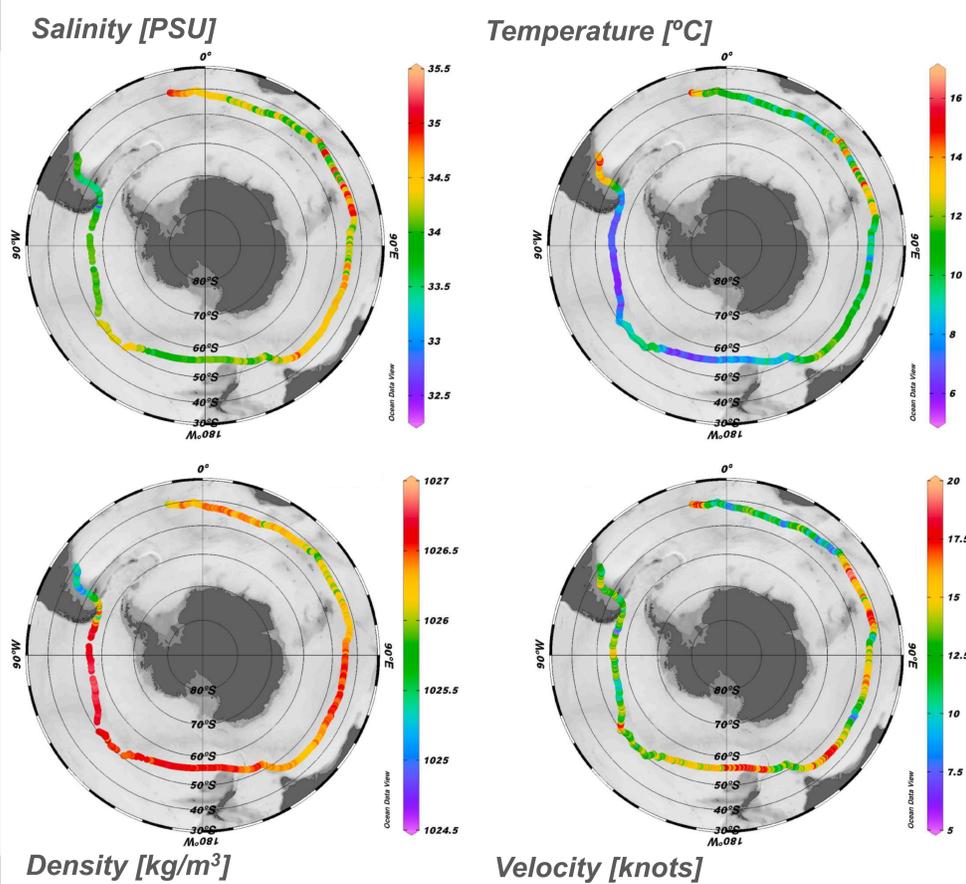
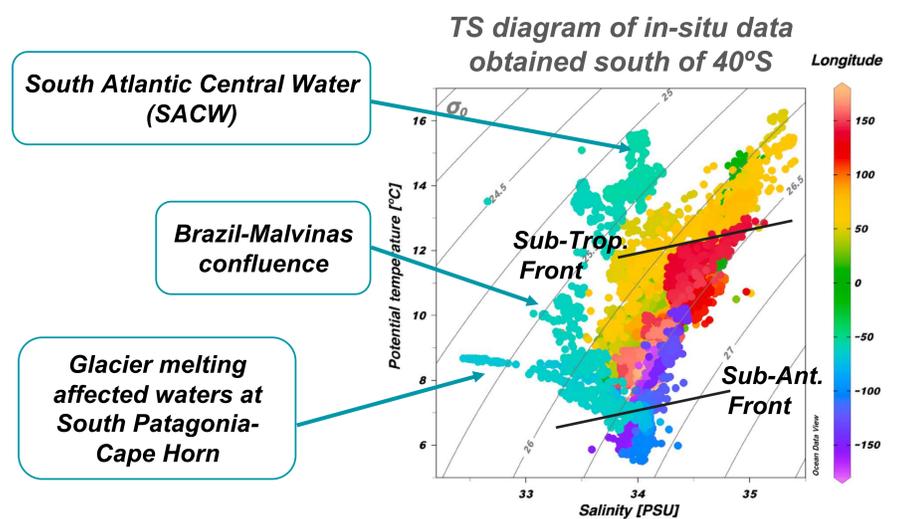
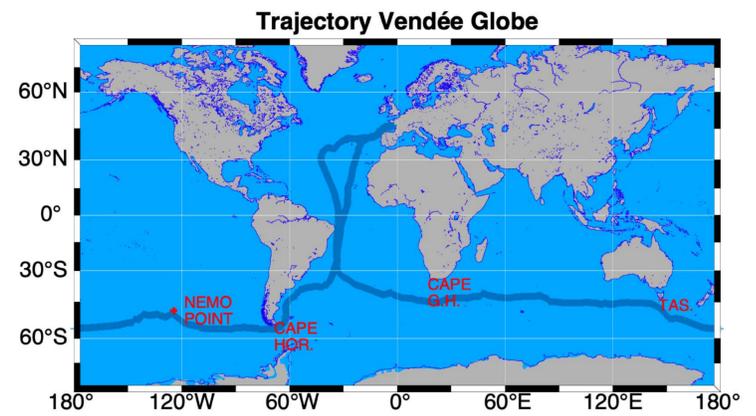
**High-frequency sampling of in-situ SSS data** measured by the boat south of 40°S allows to observe the **mesoscale variability undetected at remote sensed SSS** which is provided at spatial grid of 0.25° / 25 km

The **large scale SSS variability** measured by in-situ (sub-Antarctic and sub-tropical fronts, glacier melting) is **properly detected by all the satellite products**.



## In-situ data

More than half of the ship's **trajectory was lying on sub-Antarctic zone**, between the sub-tropical and polar fronts. The trajectory samples the **Southern Patagonia** (affected by glacier melting), **Brazil-Malvinas confluence**, the Nemo Point (the farthest point in the ocean from any land), the **Southern Pacific Ocean** and the **whole Southern Indian Ocean**, where the polar front is in its northernmost position.



## Summary and conclusions

- The present contribution on ocean surface data gathered within the Vendée Globe has been successfully used to validate satellite Sea Surface Salinity products provided by ESA and NASA SSS missions for the Southern Ocean.
- The study reveals the interest of data recording efforts through competing boats in the periodic round world races to contribute to the ocean scientific knowledge.
- These results are a new step to analyze the evolution of ocean salinity in sub-Antarctic zones and the impact of changes in the ice extent around the Antarctica.
- In-situ filtered data are available on demand by contacting the BEC Support Desk: [smos-bec@icm.csic.es](mailto:smos-bec@icm.csic.es)

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