



Overview of the CCI+SSS project

Jacqueline Boutin (1), Nicolas Reul (2), Rafael Catany (3), and Cci+sss Consortium ()

(1) CNRS, LOCEAN, Sorbonne University, PARIS, France (jb@locean-ipsl.upmc.fr), (2) IFREMER, LOPS, Toulon, France, (3) ARGANS, Plymouth, UK

Sea Surface Salinity (SSS) is an Essential Climate Variable (ECV) that plays a fundamental role in the density-driven global ocean circulation, the water cycle, and climate. The satellite SSS observation from the Soil Moisture and Ocean Salinity (SMOS), Aquarius, and Soil Moisture Active Passive (SMAP) missions have provided an unprecedented opportunity to map SSS over the global ocean since 2010 at 40-150km scale with a revisit every 2 to 3 days. This observation capability has no historic precedent and has brought new findings concerning the monitoring of SSS variations related with climate variability such as El Niño-Southern Oscillation, Indian Ocean Dipole, and Madden-Julian Oscillation, and the linkages of the ocean with different elements of the water cycle such as evaporation and precipitation and continental runoff. It has enhanced the understanding of various ocean processes such as tropical instability waves, Rossby waves, mesoscale eddies and related salt transport, salinity fronts, hurricane haline wake, river plume variability, cross-shelf exchanges. There are also emerging use of satellite SSS to study ocean biogeochemistry, e.g. linked to air-sea CO₂ fluxes.

Following the success of the initial oceanographic studies implementing this new variable, the European Space Agency (ESA) funded a new Climate Change Initiative (CCI) SSS project (2018-2020), or simply CCI+SSS project. The CCI+SSS project (2018-2020) aims at generating improved calibrated global SSS fields over 10 years period (2010-2019) from all available satellite L-band radiometer measurements, extended at regional scale to 2002-2019 from C-band radiometer measurements. It will fully exploit the ESA/Earth explorer SMOS mission complemented with SMAP and AQUARIUS satellite missions. The project gathers teams involved in earth observation remote sensing, in the validation of satellite data and in climate variability study. In this presentation we will summarize results obtained during the first year of the project, the contribution of satellite measurements for monitoring SSS and the specific objectives of the CCI-SSS project:

- a definition of the requirements for SSS ECV products relevant for the climate studies and consistent with the satellite SSS achievable performances
- an harmonization of the SSS products and of the radiative transfer models for a long term consistent and stable SSS time series
- a thorough characterization of the uncertainties of the SSS ECV ,
- an assessment of the ECV product through five case studies related to ocean climate variability and hydrological cycle
- Exchange of knowledge between the CCI+SSS team and the international community.

The ESA CCI+SSS consortium gathers scientists and engineers from various European research institutes and companies (LOCEAN/IPSL, LOPS, University of Hamburg, NOC, ICM, ARGANS, ACRI-st, ODL) and is conducted in collaboration with US colleagues from NASA and Remote Sensing System.