Simulated Sea Surface Salinity Data from a 1/48° Ocean Model

Frederick Bingham¹, Séverine Fournier², Susannah Brodnitz¹, Akiko Hayashi², Mikael Kuusela³, Elizabeth Westbrook¹, Karly Carlin⁴, Cristina González-Haro⁵, and Verónica González-Gambau⁵
¹University of North Carolina Wilmington, Center for Marine Science, Wilmington, United States of America
(binghamf@uncw.edu)
²Jet Propulsion Laboratory, California Institute of Technology, Pasadena CA, 91109, USA
³Department of Statistics and Data Science, Carnegie Mellon University, Pittsburgh, PA 15213, USA
⁴Catlin Engineers & Scientists, Wilmington NC, 28405, USA
⁵Barcelona Expert Center and Institute of Marine Sciences (ICM-CSIC), 08003, Barcelona, Spain

In order to study the validation process for sea surface salinity (SSS) we have generated a year (November 2011- October 2012) of simulated satellite and in situ “ground truth” data. This was done using the ECCO (Estimating the Circulation and Climate of the Oceans) 1/48° simulation, the highest resolution ocean model currently available. The ground tracks of three satellites, Aquarius, SMAP (Soil Moisture Active Passive) and SMOS (Soil Moisture and Ocean Salinity) were extracted and used to sample the model with a gaussian weighting similar to that of the satellites. This produced simulated level 2 (L2) data. Simulated level 3 (L3) data were then produced by averaging L2 data onto a regular grid. The model was sampled to produce simulated Argo and tropical mooring SSS datasets. The Argo data were combined into a simulated gridded monthly 1° Argo product. The simulated data produced from this effort have been used to study sampling errors, matchups, subfootprint variability and the validation process for SSS at L2 and L3.