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Progressive improvement of Aquarius Sea Surface Salinity Products

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Sea surface salinity (SSS) products from NASA's Aquarius satellite mission (June 2011-June 2015) have had four public releases from Versions 2 to 5, with the last one released in December 2017. These products have been widely used to study ocean processes and their linkages with climate variability and the water cycle. They have also been used to constrain ocean model/assimilation and improve seasonal-to-interannual prediction. This presentation focuses on an assessment of the level-3, monthly gridded Aquarius SSS from different versions by comparing them with monthly gridded near-surface salinity products based on Argo measurements. The assessment describes the consistency of the Aquarius SSS products with the Argo products for the time mean values as well as the temporal anomalies on various spatial and temporal scales. The results demonstrate the progressive improvement of Aquarius SSS quality for the different releases. In particular, the global root-mean-squared difference (RMSD) and standard deviation (STD) of Aquarius Version-5 SSS with respect to the Argo products are approximately 0.18 and 0.14 psu on 1-degree scale. On 10-degree scales, the RMSD and STD with respect to Argo products are both smaller than 0.1 psu. For large-scale (10-degree or larger) non-seasonal anomalies, the consistency with Argo products is better than 0.05 psu. Since these statistics also include the sampling and mapping errors of the gridded Argo products, the accuracies of the Aquarius SSS are actually better than aforementioned RMSD and STD values.