**OPTIMIZING THE ASSIMILATION AND PRE-PROCESSING OF SPACEBORNE SCATTEROMETER DATA IN THE NOAA SYSTEM AND ASSESSING THE IMPACT OF ADDING OCEANSAT-2 OSCAT**

1Li Bi, 2Sid Boukabara, 1Kevin Garrett, 1Krishna Kumar, 2Tong Zhu and 1Erin Jones

1NESDIS/STAR/JCSDA/RTI

2NESDIS/STAR/JCSDA

Abstract

We present in this study the results of enhancing the pre-processing and optimizing the data assimilation of scatterometer data, using the U.S. National Oceanic and Atmospheric Administration (NOAA) systems. The study also presents the assessment of the impacts on the analyses, on the forecasts, and on the fit-to-observations, obtained with data from the Indian OSCAT scatterometer onboard OCEANSAT-2. The aspects of the pre-processing that were revised in this study include (1) the stratified bias correction of the sea surface wind measurements, (2) the ambiguity removal, (3) the geophysical data quality control including the rain and ice contaminations, (4) the sea-ice detection and more generally the land fraction determination to avoid land- and coast- contaminated measurements, (5) the data spatial thinning approach and (6) the data-filtering based on the algorithm performances, to retain only the high quality data and exclude configurations with known deficiencies. The optimization of the scatterometer data assimilation focused on assessing the observation error that would maximize the positive impact of the data on the analyses and the forecast skills. Both assessments at global and regional scale are shown, highlighting the consistent positive impacts of assimilating OSCAT data on the NOAA system. The individual merits of optimizing the observation errors estimation on one hand and that of enhancing the pre-processing of the data on the other hand, are also identified and quantified. The optimal observation error estimation has been used in this study and it is found that the optimal observation error is consistent with the assessed quality of the data but also produces a much reduced RMS of the forecast wind speed for both intensity and direction, which leads to an increased forecast skill in terms of height and wind anomaly correlation, sea level pressure, hurricane track and intensity.