Evaluation of Sub-Monthly Oceanographic Signal in GRACE "Daily" Swath Series Using Altimetry

Jennifer Bonin (1) and Himanshu Save (2)

(1) University of South Florida, College of Marine Science, St. Petersburg, FL, United States (jbonin@mail.usf.edu), (2) Center for Space Research, University of Texas at Austin, Austin, TX, United States (save@csr.utexas.edu)

An experimental "swath" update solution has been created at CSR to resolve GRACE data into a near-daily, high-spatial-resolution gravity time series with relatively low expected errors. We have previously determined that this daily GRACE series can more accurately represent the sub-monthly ocean bottom pressure, in some places, than its background de-aliasing model can. Here we will investigate over which specific areas and frequency regimes this is true. To accomplish this, we compare to along-track sea level anomaly data from the three Jason altimeters. If the GRACE swath series represents the true oceanic signal well, we expect to see small differences between it and altimetry in regions where the ocean signal is dominated by barotropic variations (ie: away from large currents). Alternatively, if the sub-monthly portion of the swath data is dominated by satellite and processing errors, then we would expect the altimetry-minus-model differences to be smaller than the altimetry-minus-GRACE differences. We wish to determine in which areas of the world and over which frequency bands GRACE can add value to both its and altimetry's de-aliasing models. Our ultimate goal is to create a better de-aliasing product for altimetry out of the combination of GRACE and an ocean model, with the model dominating at the highest frequencies, but GRACE becoming relevant at longer sub-monthly periods. Doing so will reduce aliasing errors in altimetry, thus potentially improving our understanding of many aspects of oceanography.