Extending the Sea Surface Height Climate Data Record with OSTM Altimetry

B. Beckley, N. Zelensky, S. Holmes - SGT, Inc.
F. Lemoine, S. Luthcke, R. Ray – NASA/GSFC
S. Desai, B. Brown – JPL
G. Mitchum – Univ. of S. Florida
S. Labroue – CLS

The measurement of mean sea-level change from satellite altimetry requires extreme stability of the altimeter measurement system. In particular, the orbit and reference frame within which the altimeter measurements are situated, as well as the associated altimeter corrections, must be stable and accurate enough to provide robust means to estimate oceanic changes over an extended time period. This terrestrial reference frame is linked inseparably to the measurement of global mean sea level estimates from satellite altimetry and provides the context for the interpretation of the causes of current mean sea level trends. Dramatic improvements forecast in gravity field models anticipated from the GRACE Mission are currently being realized, further offering a very significant increase in orbit error, including those which are of special concern given they are geographically correlated, yet mission specific. In an effort to adhere to cross mission consistency, we have generated the full time series of orbits for TOPEX/Jason-1 and OSTM through reduced dynamic methods based on the ITRF2005 and GRACE derived gravity field in a consistent well defined ITRF2005 terrestrial reference frame. The recent release of the Jason-1 Geophysical Data Record Version C and recalibration of the TOPEX and Jason microwave radiometers also require the further re-examination of TP/Jason-1 consistencies issues. Here we present an assessment of these recent improvements to the accuracy of the TOPEX/Jason-OSTM sea surface height time series, and evaluate the subsequent impact on global and regional mean sea level estimates.