Assessment of Revised TOPEX/Jason Global and Regional Mean Sea Level Estimates Referenced to ITRF2014

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Abstract: The terrestrial reference frame is the foundation for both the determination and interpretation of Earth's motion, especially for data from an orbiting satellite. The accuracy of the estimates is as important as the consistency with which the orbits are computed, and into the estimate of the errors for global mean sea level (GMSL). The recent launch of Jason-3 offers the possibility of continuing GMSL monitoring into the next decade, so we offer to provide a comparison TOPEX/Jason mean sea level estimates referenced to the International Terrestrial Reference Frame (ITRF2014) for the entire satellite mission. The data analysis is performed using a new release of the International Terrestrial Reference Frame (ITRF2014) and we compare our estimates for the time span covered in the release. We find a consistent picture of the relative contribution of the land and the ocean to the global mean sea level rise. The results are consistent with previous studies and provide a useful tool for understanding the dynamics of sea level change.

Improved Orbit Determinations based on ITRF2014 for TOPEX/Poseidon, Jason-1, 2, & 3 Altimetry

Global and Regional Mean Sea Level Estimates Referenced to ITRF2014

Ocean Mass Budget Accounting

Revised estimates of GMSL based on reprocessed TOPEX altimetry

Regional Sea Level Trend Differences

Global MSL change (top) and regional sea level changes (bottom). The revised TOPEX and Jason-2 sea surface height time series are consistent with global mean sea level estimates by Moritz (2008), and Jamar et al. (2014). The revised TOPEX data are consistent with the reprocessed TOPEX data by Nowlin et al. (2013). The revised TOPEX data are consistent with the reprocessed TOPEX data by Nowlin et al. (2013).