

Why has an acceleration of sea level rise not been observed during the altimeter era?

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We now have a 19-year time series of precision sea level measurements from the TOPEX/Poseidon, Jason-1, and Jason-2 altimeter missions. Over this time period, global mean sea level has been rising at an average rate of 3.2 ± 0.4 mm/year. However, with the exception of interannual variations due to ENSO processes, there has been little change in the long-term trend, with no evidence for an acceleration of sea level rise in the altimeter record. The purpose of this presentation is to explore possible explanations for this fact and try to reconcile them with the observational record. The observational record includes not only the aforementioned altimeter record, but also the tide gauge record of sea level change, the GRACE record of changes in polar ice mass (which suggest mass loss is accelerating), and the in situ oceanographic measurements of temperature, salinity, etc. that allow an estimate of thermosteric sea level change. Observations of energy movement through the Earth system also provide another clue to interpreting the recent observations of sea level change. Together, these data sets provide insight into how the Earth is responding to climate variations, and what this may portend for sea level in the future.