Topics (T)
Understanding and Predicting the Climate Change for our Planet (1)

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WHAT THE 30 YEAR SATELLITE ALTIMETRY RECORD OF SEA LEVEL CHANGE IS TELLING US ABOUT THE FUTURE

Abstract

Satellite altimetry measurements over the last 30 years have provided a valuable climate data record of how the oceans are responding to climate change. The spatial and temporal resolution of this climate data record provide much more insight than could be obtained from tide gauge measurements alone. The record is now long enough that we can begin to identify the forced response to due greenhouse gases and aerosols and better understand how sea level will change in the future. Global mean sea level change is an excellent barometer of how much heat is being absorbed by the oceans and how much water is being added to the oceans from melting ice. Together with satellite gravity measurements of ice mass change over the last 20 years, the global sea level budget is pretty well understood from satellite observations. However, observations of regional sea level change are also providing insight into what is driving the regional patterns of thermosteric sea level change and what that portends for the future. The phenomena driving these patterns are complex, but it's largely due to ocean heat uptake and the redistribution of this heat via the ocean circulation and its modification by the atmospheric winds. The insight provided by the satellite observations provide pathways to the successful prediction of future regional sea level patterns independent of climate model projections. We will discuss some of the early results from these data-driven projection techniques.