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The rate of global mean sea level rise (GMSLR) has accelerated during the last two centuries, from a rate of order tenths of mm/yr during the late Holocene, to about 1.7 mm/yr since 1901. Ocean thermal expansion and glacier melting were the dominant contributors to 20th century GMSLR, with relatively small contributions from the Greenland and Antarctic ice sheets. Process-based models suggest that the larger rate of rise since 1990 results from increased radiative forcing (both natural and anthropogenic) and increased ice-sheet outflow, induced by warming of the immediately adjacent ocean. Confidence in projections of global mean sea level rise has increased since the AR4 because of improved physical process-based understanding of observed sea level change, especially in recent decades, and the inclusion of future rapid ice-sheet dynamical changes, for which a quantitative assessment could not be made on the basis of scientific knowledge available at the time of the AR4. By 2100, the rate of GMSLR for a scenario of high emissions (RCP8.5) could approach the average rates that occurred during the last deglaciation, whereas for a strong emissions mitigation scenario (RCP2.6) it could stabilize at rates similar to those of the early 21st century. In either case, GMSLR will continue for many subsequent centuries. Although there has been much recent progress, projections of ice-sheet change are still uncertain, especially beyond 2100. Future sea level change will not be globally uniform, but models still exhibit substantial disagreement in projections of ice mass loss and ocean dynamics, which are the main influences on the pattern. Uncertainty in projections of future storminess is a further obstacle to confident projection of changes in sea level extremes.
OSTS session
Science Results from Satellite Altimetry