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Rates of sea level change in the Arctic Ocean and decadal variability

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Like many other manifestations of climate change, sea level rise is already a problem in the arctic regions. Many scientists and engineers expect the effects of sea level rise to be profound and costly along the Arctic Ocean coasts. In 2009, the sea level along the Siberian coastline has significantly decreased relative to 2008. The current rate of sea level rise in the Arctic Ocean estimated based on nine tide gauge stations for 1954-2009 is 2.6 ± 0.45 mm yr^{-1} (after correction for glacio-isostatic adjustment). The changing sea level rise tendency may be due to the substantial change in the wind-driven ocean circulation regime (less anticyclonic) and/or due to steric effects associated with the reduction of surface ocean warming and freshening rates in 2009 relative to previous years (2003-2008). With continuing arctic warming and sea ice declines it is expected that sea level will continue rising and storms with storm surges will be stronger and more frequent and coastal communities now struggling with erosion will see shoreline retreat accelerate. On the other hand, the Arctic Ocean has a strong interannual and decadal scale natural variability and sea level changes in the next decade remain uncertain.