



A worst case extreme sea levels along the global coastline by 2100

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We calculate the magnitude of a worst case scenario for extreme sea levels along the global coastline by 2100. Our worst case scenario for extreme sea levels is a combination of sea surface height associated with storm surge and wave (100-year return period, the 95th percentile), high tide (the 95th percentile) and a low probability sea level rise scenario (the 95th percentile). We show that by 2100 extreme sea levels have a 5% change of exceeding 4.2 m (global coastal average), compared to 2.6 m during the baseline period (1980-2014). Up to 90% of increases in magnitude of extreme sea levels are driven by future sea level rise, compare to 10% associated with changes in storm surges and waves. By 2030-2040 the present-day 100-year return period for extreme sea levels would be experienced at least once a year in tropical areas. This 100-fold increase in frequency will take place on all global coastlines by 2100. Future changes in magnitude and frequency of extreme sea levels undermine the resilience of coastal communities and ecosystems, considering that sea level rise will increase the magnitude, frequency of extreme sea levels and will reduce the time for post-event recovery.