

# SEA LEVEL RISE

Understanding the past – Improving projections for the future



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**We love the coast.** Coastal regions, particularly some low-lying river deltas, have very high population densities. In excess of 150 million people live within 1 metre of high tide level, and 250 million within 5 metres of high tide. There are billions of dollars invested in coastal infrastructure immediately adjacent to the coast. Many of the world's mega cities (populations of many millions) are on the coast.

**The Oceans are changing.** Many observations show that the ocean has been changing over the last several decades. One aspect of this is a warming ocean resulting in increase of ocean volume through thermal expansion. There has also been addition of water from glacier and ice sheets and changes in storage of water on or in the land (e.g. retention of water in man-made dams and extraction of water from aquifers). These together result in changes in sea level.

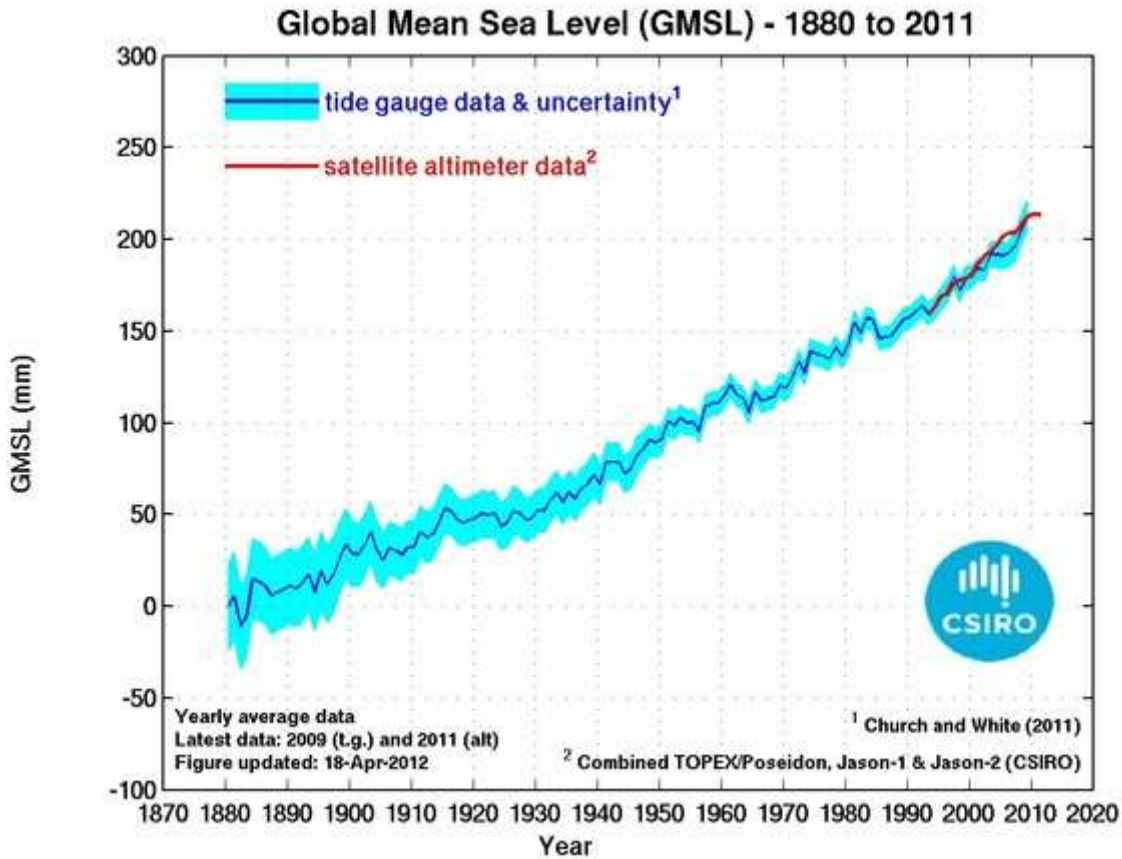
*A recent issue of the journal Science* has focused on a number of aspects of ocean change, including sea-level rise. You can view the full-text version of the editorial [here](#).

A (pdf) reprint of this editorial can be obtained from [here](#).

**This sea-level rise** is a response to increasing concentrations of greenhouse gases in the atmosphere and the consequent changes in the global climate. Sea-level rise contributes to coastal erosion and inundation of low-lying coastal regions, particularly during extreme sea level events. It also leads to saltwater intrusion into aquifers, deltas and estuaries. These changes impact on coastal ecosystems, water resources, and human settlements and activities. Regions at most risk include heavily populated deltaic regions, small islands (especially coral atolls), and sandy coasts backed by major coastal developments.

**On this web site**, we attempt to bring together information on sea level rise and its causes. We also include our estimates of global and regional sea level, links to other web pages and data sets and a list of our publications.





**Our most recent estimate of changes in global averaged sea level** since 1993 are estimated from satellite altimeter data (red) and since 1880 by combining in situ sea level data from coastal tide gauges and the spatial patterns of variability determined from satellite altimeter data (blue).

Note that error bars have not been shown for the altimeter data (red curve) for clarity, but are about  $\pm 5$  mm.

Note also that the error bars on the tide gauge-based estimate get larger in the last few years. This is because the number of gauges going in to the estimate drops off for the last couple of years because of delays getting the most recent data into the PSMSL archive, which is where we get this data from. This is simply due to the time it takes the various national archives to compile and submit the data.

[CLICK HERE](#) to download a print-quality pdf (72KB) of this figure.

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