



Upper Limit for Sea Level Projections by 2100

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With more than 150 million people living within 1 m of high tide future sea level rise is one of the most damaging aspects of warming climate. The latest Intergovernmental Panel on Climate Change report (AR5 IPCC) noted that a 0.5 m rise in mean sea level will result in a dramatic increase the frequency of high water extremes - by an order of magnitude, or more in some regions. Thus the flood threat to the rapidly growing urban populations and associated infrastructure in coastal areas are major concerns for society. Hence, impact assessment, risk management, adaptation strategy and long-term decision making in coastal areas depend on projections of mean sea level and crucially its low probability, high impact, upper range.

We construct the probability density function of global sea level at 2100, estimating that sea level rises larger than 180 cm are less than 5% probable. An upper limit for global sea level rise of 190 cm is assembled by summing the highest estimates of individual sea level rise components simulated by process based models with the RCP8.5 scenario. The agreement between the methods may suggest more confidence than is warranted since large uncertainties remain due to the lack of scenario-dependent projections from ice sheet dynamical models, particularly for mass loss from marine-based fast flowing outlet glaciers in Antarctica.