



## **Anthropogenic forcing of the warming oceans and sea level rise**

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Changes in thermosteric sea level at decadal and longer time scales respond to anthropogenic forcing and natural variability of the climate system. Disentangling these contributions is essential to quantify the impact of human activity in the past and to anticipate thermosteric sea level rise under global warming. Climate models, fed with radiative forcing, display a large spread of outputs with limited correspondence with the observationally based estimates of thermosteric sea level during the last decades of the 20th century. Here we extract the common signal of climate models from CMIP5 using a signal-to-noise maximizing EOF technique for the period 1950-2005 and use it to compute the fraction of the observed thermosteric sea level rise of anthropogenic origin. Our results match the observed trends, improving the widely used approach of multi-model ensemble averaging. We conclude that 80% of the observed global thermosteric sea level trend in the upper 700m since 1970 is induced by human activity.