Geophysical Research Abstracts,
Vol. 11, EGU2009-3939, 2009
EGU General Assembly 2009

Understanding sea level change over the last half century and its implications for the future

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Sea level has been rising at close to the upper end of the IPCC Third Assessment Report (and AR4) projections. Despite the importance of sea-level rise, the last two IPCC reports have not been able to satisfactorily close the se-level budget. Here, we present updated estimates of the observed rate of rise from both satellite altimeter and in situ observations. We will build on recent progress in closing the sea-level budget and compare the observed rise to the sum of updated estimates of the contributions for the 20th century simulations and the projections starting from 1990. We will begin to explore the implications of these comparisons for projections to 2100 and for the cryospheric and deep-ocean contributions.

In principle, the regional pattern of sea-level trends can be used to infer cryospheric contributions, but a consensus of robust estimates has not yet been reached. Model projections of the regional distribution of sea-level rise differ significantly between different climate models and currently there is no clear basis for favouring one particular model or sea-level rise distribution. We will attempt to test if the ocean thermal expansion estimates and cryospheric contributions can explain the observed and modeled time-varying sea-level distribution and trends.