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Changes in global upper-ocean heat content over the last half century and comparison with climate models

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The ocean is the primary heat storage reservoir in the climate system. Thus a critical component of understanding climate change and of testing of models is knowledge of the time variations (global average and regional distribution) of ocean heat content. Here, we present updates of our previous estimates of global upper ocean heat content annual anomalies from 1961 to 2008. These updates will allow for spatial and instrumental biases in the historical data base and include improved upper-ocean heat content estimates from recent Argo data. We will compare these estimates, both the trends and the variability, with model from the WCRP CMIP3 archive (as used for the IPCC AR4), both the 20th century simulations and also the projections starting from 1990. We will begin to explore the implications of these comparisons for future projections.