

Uncertainties in corrections applied to marine temperature data to account for changing measurement practices

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We apply corrections to monthly anomaly fields of (a) SST, to account for the effect on measurements of changing methods for collecting sea water (b) night marine air temperature (NMAT), to account for the effect of the changing height of the observing platform through the record and (c) NMAT, to correct for periods of non-standard measurement or shipping practice, e.g. between 1939 and 1945 and in the nineteenth century around the Suez Canal. All these corrections act to bring the affected data into line with those from a modern reference period and all are uncertain to some degree. Here we quantify that uncertainty, using documentary evidence and experiments to test the effects on the corrections of the likely limits of the assumptions made. Uncertainties in bias corrections make the largest contribution to the overall uncertainty in global mean marine temperatures, because of both their magnitude and the covariance between grid boxes.