

## **Historical and modern marine surface temperatures: improved analyses and estimation of uncertainties**

David Parker<sup>1</sup>, Nick Rayner<sup>1</sup>, Philip Brohan<sup>1</sup>, Chris Folland<sup>1</sup>, Jen Hardwick<sup>1</sup>, Elizabeth Kent<sup>2</sup>, Simon Tett<sup>1</sup> and Michal Vanicek<sup>1</sup>.

<sup>1</sup>Hadley Centre, Met Office, Bracknell, UK

<sup>2</sup>Southampton Oceanography Centre, UK

E-mail: david.parker@metoffice.com

We have created new analyses of marine surface temperatures spanning the last 150 years, using the new International Comprehensive Ocean Atmosphere Dataset (ICOADS). This dataset provides much better coverage than previously available, especially in the 1850s and 1910s. However, uncertainties remain in the analyses owing to sampling and measurement errors and, most importantly, imperfections in the bias-corrections applied to the data to ensure a homogeneous time series for climate change studies. We discuss these sources of uncertainty, the construction of the analyses, and the methods used to assign estimates of uncertainty to each gridded temperature.

We also present some analyses of climate variability and change since the 1850s, including uncertainties in global and regional averages due to data gaps as well as to the abovementioned uncertainties. Where appropriate, the new time series are compared to those published in the Third Assessment Report of the Intergovernmental Panel on Climate Change.