

Homogeneity Assessment of Trinidad and Tobago's Surface Air Temperature Data

Reynold J. Stone

Department of Food Production, Faculty of Food and Agriculture, The University of West Indies, St Augustine,
Trinidad and Tobago, West Indies; E-mail: Reynold.Stone@sta.uwi.edu

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Abstract: A homogeneity assessment of the annual mean maximum and minimum surface air temperature data series for Trinidad (Piarco International Airport, 1946-2011) and Tobago (A.N.R Robinson International Airport, 1970-2011) was undertaken to determine whether the data series are suitable in their current form for use in climate change studies. Four statistical change point detection tests were employed, namely, the standard normal homogeneity test, the Buishand range test, the Pettitt test and the Von Neumann ratio test. Statistically significant ($p < 0.01$) change points were detected by all four tests in the four data series. It is concluded that the available surface air temperature data at these two stations are inhomogeneous thereby rendering the data unsuitable in their current form for use in climate change studies. The data must first be homogenised before they could be used to reliably detect changes and trends in the broader-scale climate. It is recommended, therefore, that the stations' histories be constructed using all the relevant available metadata and that at least two reference stations be established to assist with the data homogenisation process.

Keywords: Surface air temperature, climate change, change point detection tests, homogeneity assessment