

Recorded temperatures in the North Atlantic European margin: where is the crisis?

Rui Pena dos Reis

Geosciences Centre of the University of Coimbra and Department of Earth Sciences, Faculty of Sciences and Technology, University of Coimbra (Polo II), Rua Sílvio Lima, 3030-790 Coimbra, Portugal; penareis@dct.uc.pt

The North Atlantic European margin, where a W-E atmospheric circulation combined with a dominant N-S oceanic current creates an open wide system, is strongly influenced by the oceanic heat distribution. Inland historic temperature data are of major relevance to assess regional changes in the region since the mid-1600 (Central England Temperature, Fig. 1), when systematic instrumental records began. A correlation between the atmospheric CO² concentrations and the recorded temperatures since the beginning of the industrial revolution is currently admitted. Nevertheless, this idea is controversial considering the published data and the steady nonlinear background increase in CO² since the nineteenth century. The nonlinear rise of the CO² concentration reflects the sum of industrial emissions contribution, strongly growing since the 50s of last century and the natural background increase, which run at least, from the eighteenth century. The non-anthropogenic concentration increase is similar to the slow and regular temperature rise (0.3 C°/100 years in England (Fig. 1) and 0,5-0,7 C°/100 years in Portugal (Fig. 2).

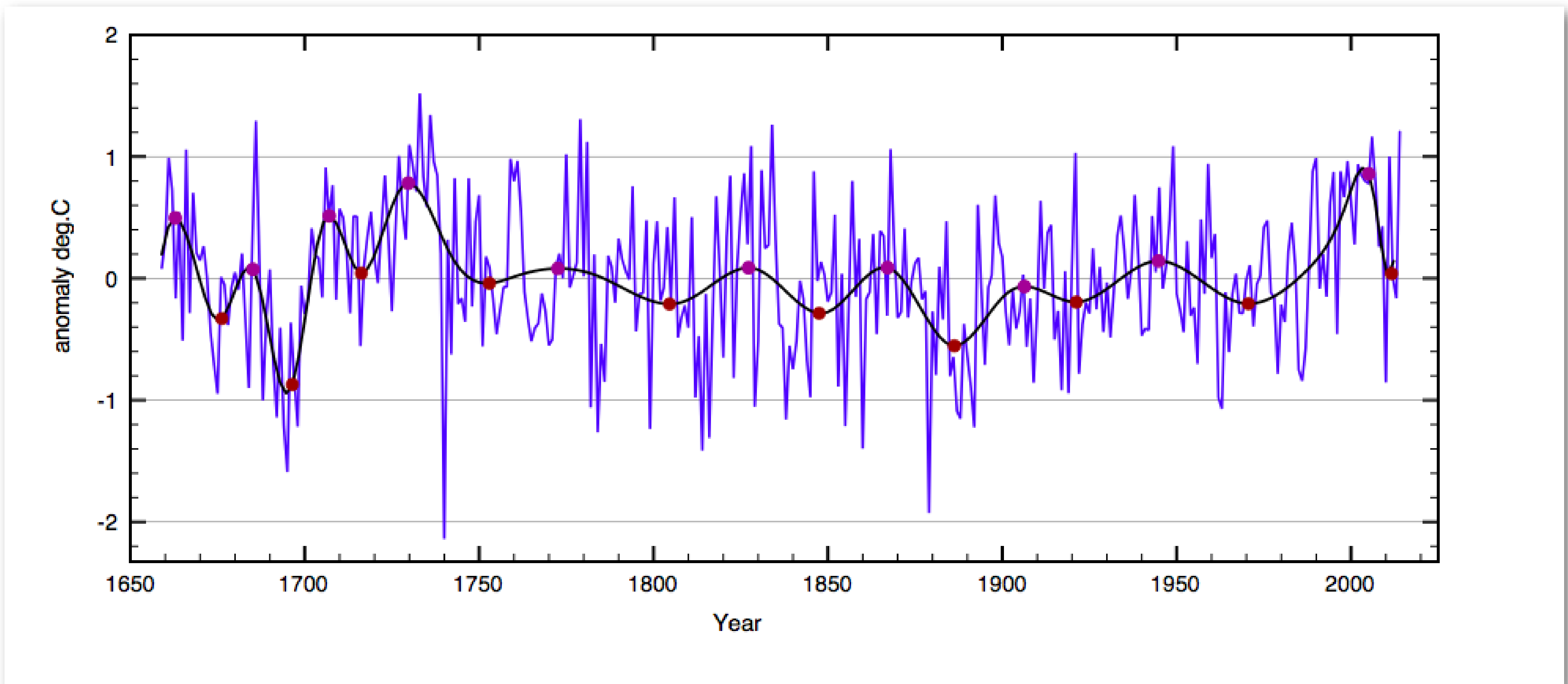


Figure 1 – Central England Temperature record *cf* <http://clivebest.com/blog/?p=6385>

The data set published by the IPMA - Portuguese Institute of the Sea and Atmosphere (Fig. 2) shows, for different Portuguese cities from North to South, a yearly average temperature variation since 1860. Positive anomalies are detected around the 19-20 centuries boundary, close to 1930, and during the 40-50 and 80-90 decades. There is a small and steady temperature increase, without any visible tendency change, during the last 50 years, when compared with the previous 90 years that was eventually caused by the CO₂ concentration increase as a result of industrial activity.

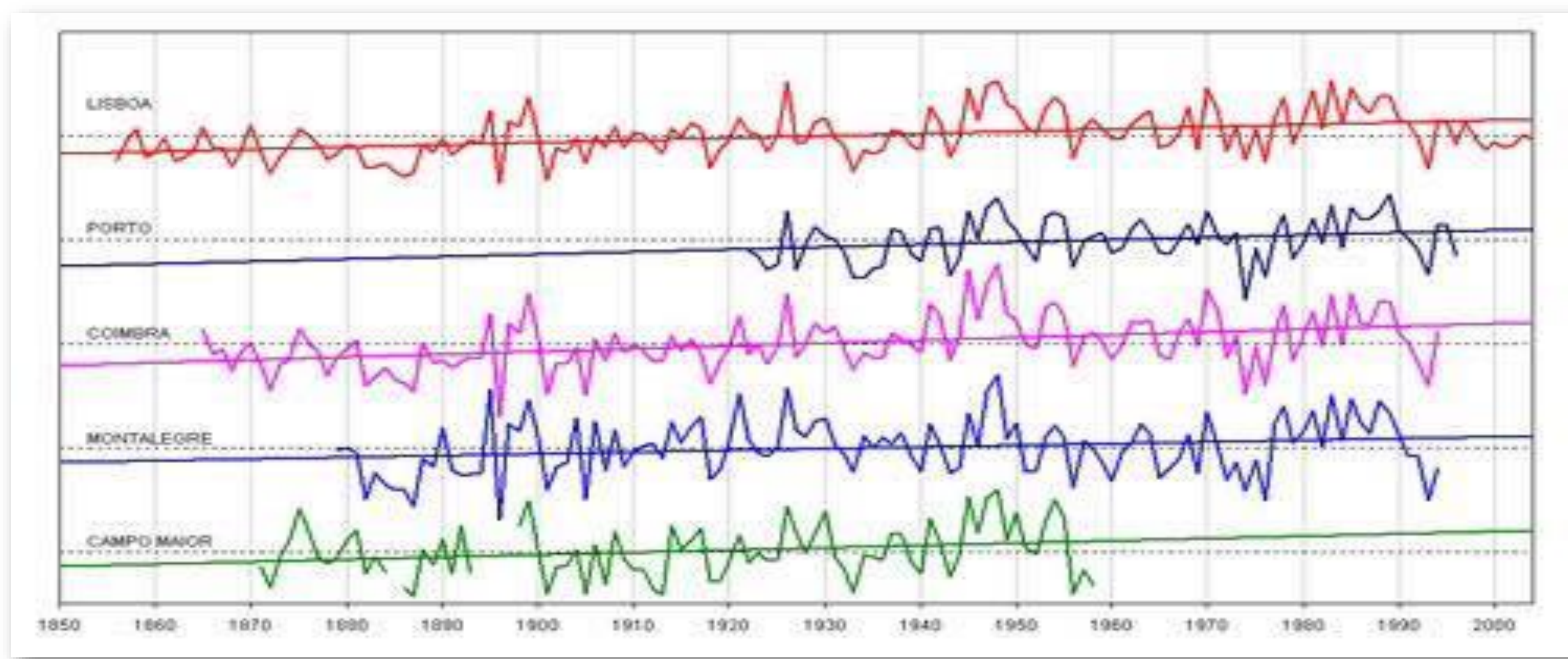


Figure 2 – Temperature record of five cities in Portugal since 1860 *cf*. <https://www.ipma.pt>

The presented data does not reflect any clear temperature change from the second half of the twentieth century, when there was a significant increase in anthropogenic emissions of CO². This evidence can be due to the recorded temperature rise do not depend significantly on the increasing anthropogenic emissions, following a long-scale variation pattern that is not related to CO² concentrations. The question is if this is a regional or a global climatic pattern.