

Arabic records allow past climate to be reconstructed

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Baghdad became the most prosperous place at the time, and the center of international trade and agricultural development. Credit: Domínguez-Castro et al.

Corals, trees and marine sediments, among others, are direct evidence of the climate of the past, but they are not the only indicators. A team led by Spanish scientists has interpreted records written in Iraq by Arabic historians for the first time and has made a chronology of climatic events from the year 816 to 1009, when cold waves and snow were normal.

The Arabic historians' records chronologically narrate social, political and religious matters, and some of them mention [climate](#). A study led by researchers from the University of Extremadura (Spain) has focused on ancient meteorological notes of the Iraqi city of Baghdad.

"We have recovered an interesting chronology of climatic events, such as

droughts, floods, rain, frost, heat and cold waves as well as strong winds during the period between 816-1009 in the areas now known as [Iraq](#) and [Syria](#)" Fernando Domínguez-Castro, lead author and researcher in the Physics department at the University of Extremadura, informed SINC.

This study, which has been published in the *Weather* journal, highlights a high number of cold waves. "The period between 902 and 944 had a high number if we compare them to current weather data. Examples of this are the six snowfalls that occurred in that period, whilst in our era, we only know of one snowfall in Baghdad on 11 January 2008" Domínguez-Castro highlights.

More cold days due to volcanic eruptions

The research team was especially surprised by the "unexpected" drop in temperatures in July 920. According to the documents analysed, the people of Baghdad had to come down from their roofs (where they would usually sleep in the summer) and go inside their houses and even use blankets. The temperatures could have dropped 9°C compared to the current average for the month of July.

"It is difficult to identify the cause of this drop in temperature, but it could be due to a volcanic eruption the year before, as it is common for summer temperatures to drop in these cases" the expert points out and says that during some of those nights in July 920, temperatures did not exceed 18°C.

There were two significant volcanic eruptions during that period, which could be the cause of the cold waves, "although there is a lot of doubt surrounding the dates", the researcher states. One of those was the Ceboruco volcano (Mexico), around 930, and the other was the Guagua Pichincha (Ecuador), around 910. Nonetheless, "more evidence is necessary to confirm this hypothesis" the expert warns.

The research shows that during the first half of the tenth century, the cold climatic events in Baghdad were more frequent and more intense than today. Although in the Iraqi city only two days with temperatures below 0°C were registered between 1954 and 2008, there were at least six very cold days in a 42 year period in the tenth century.

According to the researchers, "the Arabic records are very useful for reconstructing the climate in eras and places about which we know very little". Thanks to the synergy of humans and science 'robust climate information' has been extracted" they conclude.

Baghdad, the centre of the empire

In 762, Abu Ja'far Abdallah al-Mansur, the second Abbasid Caliph (the second Islamic dynasty), founded the city of Baghdad and established it as the capital of the empire. The city soon became the most prosperous place at the time, and the centre of international trade and agricultural development, which attracted a growing population.

Historians of the era debated reasons as to why the Caliph gave so much importance to Baghdad. As well as its strategic location between the Tigris and Euphrates rivers, the city had good weather conditions.

"There was plenty of water, the weather was very warm in the summer, very cold in the winter, and moderate in spring and autumn," Al-Ya`qubi described, author of a geographical treatise in 891.

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