

Ancient Arabic writings help scientists piece together past climate

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Ancient manuscripts written by Arabic scholars can provide valuable meteorological information to help modern scientists reconstruct the climate of the past, a new study has revealed. The research, published in *Weather*, analyses the writings of scholars, historians and diarists in Iraq during the Islamic Golden Age between 816-1009 AD for evidence of abnormal weather patterns.

Reconstructing climates from the past provides historical comparison to modern weather events and valuable context for [climate change](#). In the natural world trees, ice cores and coral provide evidence of past weather, but from human sources scientists are limited by the historical information available. Until now researchers have relied on official records detailing [weather patterns](#) including air force reports during WW2 and 18th century ship's logs.

Now a team of Spanish scientists from the Universidad de Extremadura have turned to Arabic documentary sources from the 9th and 10th centuries (3rd and 4th in the Islamic calendar). The sources, from historians and political commentators of the era, focus on the social and religious events of the time, but do refer to abnormal [weather events](#).

"Climate information recovered from these ancient sources mainly refers to [extreme events](#) which impacted wider society such as [droughts](#) and floods," said lead author Dr Fernando Domínguez-Castro. "However, they also document conditions which were rarely experienced in ancient Baghdad such as hailstorms, the freezing of rivers or even cases of snow."

Baghdad was a centre for trade, commerce and science in the ancient Islamic world. In 891 AD Berber geographer al-Ya'qubi wrote that the city had no rival in the world, with hot summers and cold winters, climatic conditions which favored strong agriculture.

While Baghdad was a cultural and scientific hub many ancient documents have been lost to a history of invasions and civil strife. However, from the surviving works of writers including al-Tabari (913 AD), Ibn al-Athir (1233 AD) and al-Suyuti (1505 AD) some meteorological information can be rescued.

When collated and analysed the manuscripts revealed an increase of cold events in the first half of the 10th century. This included a significant drop of temperatures during July 920 AD and three separate recordings of snowfall in 908, 944 and 1007. In comparison the only record of snow in modern Baghdad was in 2008, a unique experience in the living memories of Iraqis.

"These signs of a sudden cold period confirm suggestions of a temperature drop during the tenth century, immediately before the Medieval Warm Period," said Domínguez-Castro. "We believe the drop in July 920 AD may have been linked to a great volcanic eruption but more work would be necessary to confirm this idea."

The team believes the sources show Iraq to have experienced a greater frequency of significant climate events and severe cold weather than today. While this study focused on Iraq it demonstrates the wider potential for reconstructing the climate from an era before meteorological instruments and formal records.

"Ancient Arabic documentary sources are a very useful tool for finding eye witness descriptions which support the theories made by climate models," said Domínguez-Castro. "The ability to reconstruct past climates provides us with useful historical context for understanding our own climate. We hope this potential will encourage Arabic historians and climatologists to work together to increase the [climate](#) data rescued from across the Islamic world."

More information: F. Dominguez-Castro, J. M. Vaquero, M. Marin, M. C. Gallego, R. Garcia-Herrera, "How useful could Arabic documentary sources be for reconstructing past climate," *Weather*, Wiley-Blackwell, [DOI: 10.1002/wea.835](https://doi.org/10.1002/wea.835)

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