Quaternary International xxx (2017) 1–13

Contents lists available at ScienceDirect

Quaternary International

journal homepage: www.elsevier.com/locate/quaint

Holocene fluvial and anthropogenic processes in the region of Uruk in southern Mesopotamia

Jaafar Jotheri [a, *], Mark Altaweel [b], Akihiro Tuji [c], Ryo Anma [d], Benjamin Pennington [e], Stephanie Rost [f], Chikako Watanabe [g]

[a] Department of Archaeology, University of Al-Qadisiyah, Al-Diwaniyah, Iraq
[b] University College London, Institute of Archaeology, 31-34, Gordon Square, London WC1H 0PY, UK
[c] Department of Botany, National Museum of Nature and Science, 4-1-1, Amakubo, Tsukuba-shi, Ibaraki 305-0005, Japan
[d] Faculty of Life and Environmental Sciences, Tsukuba University, 1-1-1, Tennoudai, Tsukuba, Ibaraki 305-8572, Japan
[e] Geography & Environment, University of Southampton, University Road, Southampton SO17 1BJ, UK
[f] Oriental Institute, University of Chicago, 1155 E 58th St, Chicago, IL 60637, USA
[g] Faculty of International Studies, Osaka Gakuin University, 2-36-1 Kishibe-Minami, Suita-shi, Osaka 564-8511, Japan

ARTICLE INFO

Article history:
Received 23 April 2017
Received in revised form
2 November 2017
Accepted 18 November 2017
Available online xxx

Keywords:
Floodplain
Palaeochannels
Settlements
Avulsions
Aggradation
Geoarchaeology

ABSTRACT

For decades, it has been unclear as to how the world's first cities, in southern Mesopotamia, not only arose in a fluvial environment but also how this environment changed. This paper seeks to understand the long-term fluvial history of the region around Uruk, a major early city, in relation to water-human interactions. This paper applies geomorphological, historical and archaeological approaches and reveals that the Uruk region in southern Mesopotamia had been under the influence of freshwater fluvial environment since the early Holocene. It further demonstrates how canals and long-term human activities since the mid Holocene have been superimposed on the natural river channel patterns. Fieldwork has been conducted to ground-truth features identified applying remote sensing techniques. Five sediment cores were analysed to elucidate palaeoenvironmental changes. Radiocarbon ages for organic samples suggest that the oldest sediment layers, at a depth of 12.5 m, are from the Early Holocene, while results from diatom analyses imply that the whole sediment column was deposited in a freshwater environment. Intensive networks of palaeochannels and archaeological sites within the study area have been reconstructed and these networks have been divided into four different time intervals based on changes in channel courses. The first is from the early 4th to the late 1st millennium BCE; the second is from the late 1st millennium BCE to the middle 2nd millennium CE; the third lasted from after the Islamic period until the 1980s; the fourth is from the 1980s until the present. Key results include evidence for freshwater environments and favourable settlement conditions had already formed by the 8th millennium BCE. The favourable settlement environment resulted in stable (long-lived) canals between the 4th millennium BCE and 1st millennium CE. A significant settlement and irrigation expansion occurred in the early 1st millennium CE. Major abandonment ensued in the late 1st millennium CE and lasted until the mid 2nd millennium CE.

© 2017 Elsevier Ltd and INQUA. All rights reserved.

1. Introduction

In the present study, we discuss changes in the riverine landscape in an area around the archaeological site of Uruk, often considered the world's first city, established in the 4th millennium BCE (Adams, 1981). The site and region are located in southern Mesopotamia, modern-day southern Iraq (Fig. 1). Despite the significance of this site, very little is known about the long-term hydrology of the area and the interactions between societies and their environment in the region that helped shape the rise and continuity of the city. This work shows how human impact has played a leading role in governing both the ancient and more recent geomorphology of the region around Uruk. The results are also used to show how the landscape has imposed changing conditions on the development of a major urban centre in southern Mesopotamia. The data collected also provide a perspective on the nature and

* Corresponding author.
E-mail address: jaafar.jotheri@qu.edu.iq (J. Jotheri).

https://doi.org/10.1016/j.quaint.2017.11.037
1040-6182/© 2017 Elsevier Ltd and INQUA. All rights reserved.

Please cite this article in press as: Jotheri, J., et al., Holocene fluvial and anthropogenic processes in the region of Uruk in southern Mesopotamia, Quaternary International (2017), https://doi.org/10.1016/j.quaint.2017.11.037

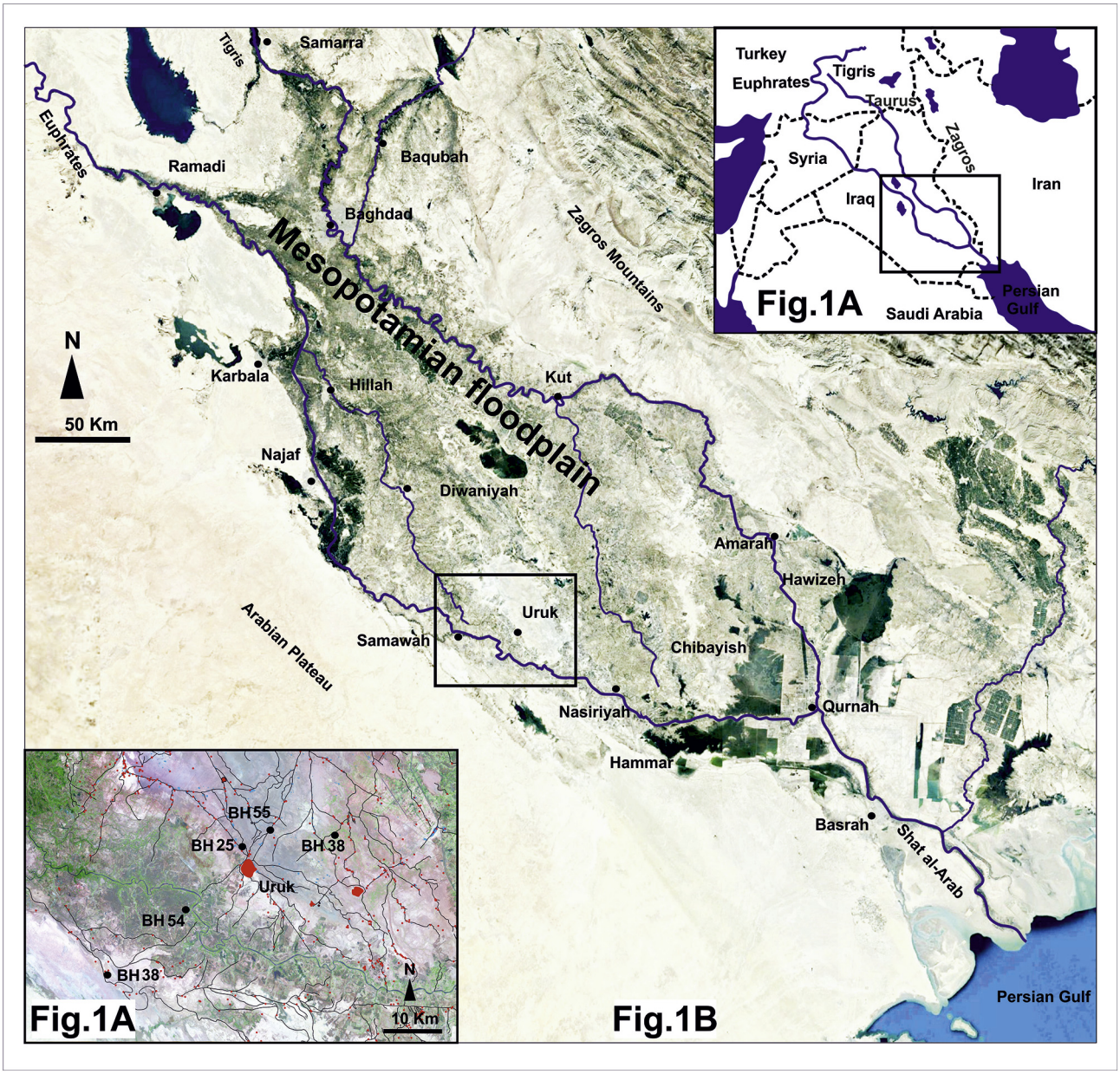

Fig. 1. Location map showing the Uruk region within the floodplain of the Tigris and Euphrates of Southern Mesopotamia.

upstream extent of the mid Holocene transgression in Iraq.

The issues discussed in this paper centre around two main themes: first, the depositional environment – whether it is a riverine freshwater or saltwater tidal depositional environment; second, the role of human activities in the Mesopotamian floodplain that affected the stability or instability of settlement and environment in this region during the investigated periods, spanning from the 4th millennium BCE until the present.

2. Geology of the southern Mesopotamian floodplain

The Mesopotamian region represents the foreland basin to the Zagros belt (Baltzer and Purser, 1990; Garzanti et al., 2016), with the Tigris and Euphrates rivers as axial drainage systems passing along this basin from northwest to southeast (Fig. 1). Both rivers originate in Turkey, where they receive a large supply of water from rainfall and snowmelt from the Taurus Mountains. The Euphrates rises out of the mountains of north central Turkey; the Tigris drains the mountains of eastern Turkey, northwest Iran and northern Iraq (Fig. 1). The two rivers then meander through valleys in Turkey, Syria and Iraq until they enter the Mesopotamian floodplain (Fig. 1). The Tigris mainly occupies the eastern part of the floodplain while the Euphrates occupies the western side. They converge in the marshland area north of Basrah to form the Shatt-al-Arab, which then enters the Persian Gulf (Fig. 1). The upper catchment has a Mediterranean climate with hot, dry summers and cold, wet winters. Rainfall decreases gradually towards the south from about 1000 mm/yr in the Taurus Mountains to about 300 mm/yr near the Syrian–Turkish border, 150 mm/yr in Syria, and only 75 mm/yr in southern Iraq (Bozkurt and Sen, 2011).

The discharge of both rivers fluctuates from year to year, depending on the amount of precipitation and meltwater, whilst also being subject to an annual cycle, with the highest monthly discharge during April and May at the time of peak snowmelt

Please cite this article in press as: Jotheri, J., et al., Holocene fluvial and anthropogenic processes in the region of Uruk in southern Mesopotamia, Quaternary International (2017), https://doi.org/10.1016/j.quaint.2017.11.037

Download English Version:

https://daneshyari.com/en/article/7449108

Download Persian Version:

https://daneshyari.com/article/7449108

Daneshyari.com