

Stalagmite evidence from Belize indicating significant droughts at the time of Preclassic Abandonment, the Maya Hiatus, and the Classic Maya collapse

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Abstract

Paleoenvironmental data from a stalagmite from western Belize provide a 3300-year record of droughts that impacted the Maya civilization at least four times across a span of 1500 years, and the most sustained period of drought coincided with the collapse of Classic Maya civilization. The stalagmite, which comes from Macal Chasm in the Vaca Plateau, provides reliably dated reflectance, color, luminescence, and C and O stable isotope records for the period from 1225 B.C. to the present. The record thus encompasses the Maya Preclassic, Classic, and Postclassic periods. The Maya civilization peaked in population density and socioeconomic complexity during the Classic period extending from A.D. 25 to 900, but it declined abruptly over the years from A.D. 750 and 900. The stalagmite record indicates that a series of droughts, which collectively form the most prolonged dry interval in the 3300-year record, lasted from A.D. 700 to 1135 and thus coincided with the collapse of the Maya civilization. In addition, two earlier droughts evident in the stalagmite record coincided with the Preclassic Abandonment and the Maya Hiatus, two earlier declines in Maya civilization. A drought in the mid-1400s recorded in post-Classic documents is also evident in the stalagmite record. Collectively, these findings illustrate the dependence of Mayan civilization on water supplies and the impact of declining water resources on a vibrant civilization.

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1. Introduction

The history of the Maya civilization in Mesoamerica is divided into two periods, the Preclassic and Classic periods. The Early Preclassic period began in the

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Second Millennium B.C. and reached a pinnacle in northern Belize during the Late Preclassic period from 300 B.C. to A.D. 240. During the Classic period, from about A.D. 250 to A.D. 900, the Maya constructed impressive architecture, erected carved stone monuments (stelae), and developed a complex socioeconomic system (Chase and Chase, 1985). By A.D. 700 the Maya Lowlands supported larger numbers of people than existed anywhere else in Mesoamerica (Thompson, 1966; Adams and Jones, 1981).

Although the Maya civilization flourished for over one thousand years (Schele and Freidel, 1990), archaeological evidence suggests that the culture suffered a number of setbacks or declines of various severity and

duration. During an event known as the Preclassic Abandonment period, probably from A.D. 150 to 200, there was urban abandonment, a drop in population, or a hiatus in construction at a number of Maya centers. Also, from A.D. 534 to 593 there was a sharp reduction in the dedication of stelae and monuments in Petén, the Mayan heartland in northern Guatemala (Fig. 1). This interval, known as the Maya Hiatus, is designated as the break between the Early and Late Classic periods. Both the Preclassic Abandonment and the Maya Hiatus proved to be temporary, if serious, setbacks.

The Classic Maya civilization collapsed permanently between A.D. 750 and 900. The first sign of collapse was a reduction in dedications of monuments and stelae

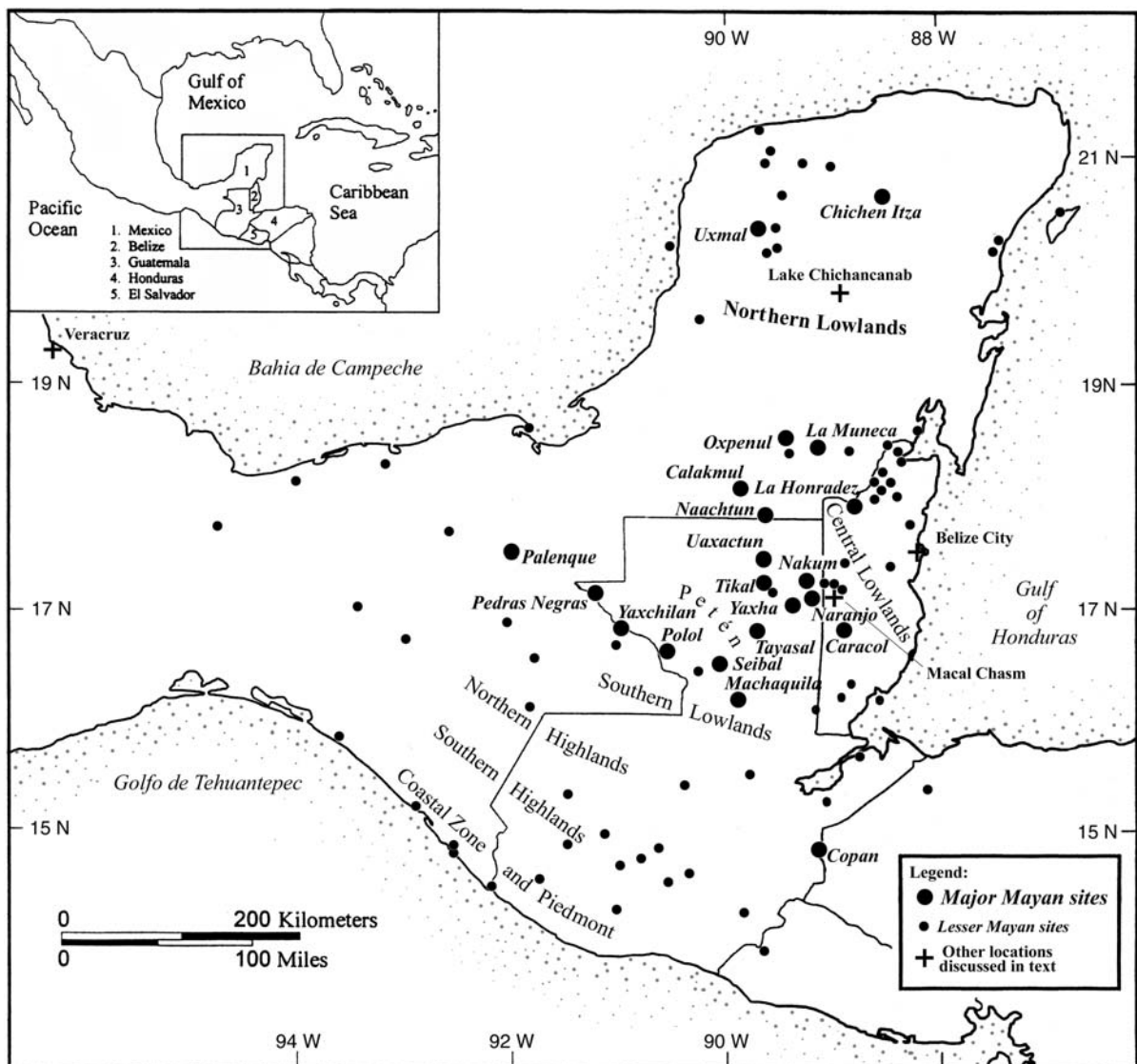


Fig. 1. Location map showing Macal Chasm and other important sites mentioned in the text.

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