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Climate regime shifts in paleoclimate time series from the Yucatán Peninsula: from the Preclassic to Classic period

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It has been widely accepted by the paleoclimate and archaeology communities that extreme climate events (especially droughts) and past climate change played an important role in the cultural changes that occurred in at least some parts of the Maya Lowlands, from the Pre-Classic (2000 BC to 250 AD) to Post-Classic periods (1000 to 1521 AD) [1, 2]. In particular, a large number of studies suggest that the decline of the Maya civilization in the Terminal Classic Period was greatly influenced by prolonged severe drought events that probably triggered significant societal disruptions [1, 3, 4, 5]. Going further on these issues, the aim of this work is to detect climate regime shifts in several paleoclimate time series from the Yucatán Peninsula (México) that have been used as rainfall proxies [3, 5, 6, 7]. In order to extract information from the paleoclimate data studied, we have used a change point method [8] as implemented in the R package strucchange, as well as the RAMFIT method [9]. The preliminary results show for all the records analysed a prominent regime shift between 400 to 200 BCE (from a noticeable increase to a remarkable fall in precipitation), which is strongest in the recently obtained stalagmite (Itzamna) delta18-O precipitation record [7].

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