

## Paleoclimatic change, disaster history and the urbanscape transitions in Athens

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Past abrupt climate changes on millennium time scales have received wide attention among natural and social scientists, also because of today's rapid climate changes and their extensive impacts on our society. In the eastern Mediterranean area, coherent patterns and synchronous events in history suggest obvious links between urban development and climate forcing. The city of Athens as the origin of ancient Greek civilization experienced many periods of prosperity and decay. Though the transitions were mostly dominated by wars and power changes between empires, severe climate events and natural disasters may also considerably have shaped the process of Athens' development. Among natural disasters, earthquake, tsunami, flood and wildfire were the main forces that stressed the development of Athens. To recover from and respond to these disaster impacts, the city was thereafter developed in ways that either changed the ever existed city patterns or guided sensitive areas to specific directions, which could have transformed the urbanscape gradually. However, the possibility that these transitions may have been responses/resilience strategies triggered by abrupt climate events has so far hardly been explored.

With extensive literature review, existing archaeological records and paleoclimate reconstruction modelling results, this study analyzes the large scale climate variations, related environment changes in mesoscale, aiming at setting into context the local natural disasters in Athens and its surrounding areas during the Holocene period. The study treats a number of important climate events in the area and urban transitions of the city, of which the integration of all these elements and insights from recent analysis throw some new light on understanding the forcing-transition process. Preliminary results indicate unclear link of climate forcing and urban transition over the whole city, but a few signs of possible linkages were recognized at specific blocks of Athens. Along with the population growth and land sprawl, more areas and more sections of the city were becoming susceptible to climate events and increased consideration of disasters in their development. The findings have significance for our in-depth understanding of the ancient city construction and development, as well as for the future urban development in facing of global climate change.

Keywords: Climate change, natural disasters, urban transition, Holocene, Athens