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Realising consilience: How better communication between archaeologists, historians and natural scientists can transform the study of past climate change in the Mediterranean

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ABSTRACT

This paper reviews the methodological and practical issues relevant to the ways in which natural scientists, historians and archaeologists may collaborate in the study of past climatic changes in the Mediterranean basin. We begin by discussing the methodologies of these three disciplines in the context of the consilience debate, that is, attempts to unify different research methodologies that address similar problems. We demonstrate that there are a number of similarities in the fundamental methodology between history, archaeology, and the natural sciences that deal with the past ("palaeoenvironmental sciences"), due to their common interest in studying societal and environmental phenomena that no longer exist. The three research traditions, for instance, employ specific narrative structures as a means of communicating research results. We thus present and compare the narratives characteristic of each discipline; in order to engage in fruitful interdisciplinary exchange, we must first understand how each deals with the societal impacts of climatic change. In the second part of the paper, we focus our discussion on the four major practical issues that hinder communication between the three disciplines. These include terminological misunderstandings, problems relevant to project design, divergences in publication cultures, and differing views on the impact of research. Among other recommendations, we suggest that scholars from the three disciplines should aim to create a joint publication culture, which should also appeal to a wider public, both inside and outside of academia.

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1. Introduction

This paper offers a discussion of the theoretical and practical issues involved in collaboration among the natural sciences and the humanities (or, the social sciences, as is the case for much archaeological research), focused on the study of human perceptions and actions in relation to climate and environmental change in the past. With growing interest in the interplay between climate, environmental change and society, there has been considerable discussion about these issues over the course of the last several decades and the number of papers published in this field is steadily increasing. Early descriptive efforts to correlate societal change with environmental and climate changes were hampered by lack of precise chronologies (e.g., Piperno et al., 1991; Núñez et al., 2002; Berglund, 2003), or by the fact that the data on climate and society were derived at a far distance from each other (e.g., Cullen et al., 2000; Haug et al., 2003). This resulted in considerable uncertainties with regard to the actual causal relations between different social and natural phenomena. Recent contributions have benefitted from more precise dating techniques and an increased understanding of the complex and non-linear couplings between human societies, environment and climate (e.g. Butzer, 2005, 2008, 2012; Cooper and Peros, 2010; Westerberg et al., 2010; Büntgen et al., 2011; Mercuri et al., 2011; Kennett et al., 2012; McCormick et al., 2012; Turner and Sabloff, 2012; Kaniewski et al., 2013; Haldon et al., 2014; Lane et al., 2014; Luterbacher and Pfister, 2015; see also the contributions published in this special issue of the *Quaternary Science Review*). However, one can still observe the persistent tendency in several contributions to oversimplify the social or natural processes, to focus on one-sided explanations, or to be based on observations of authors representing just one or two fields. This is not least the case when it comes to the Mediterranean region.

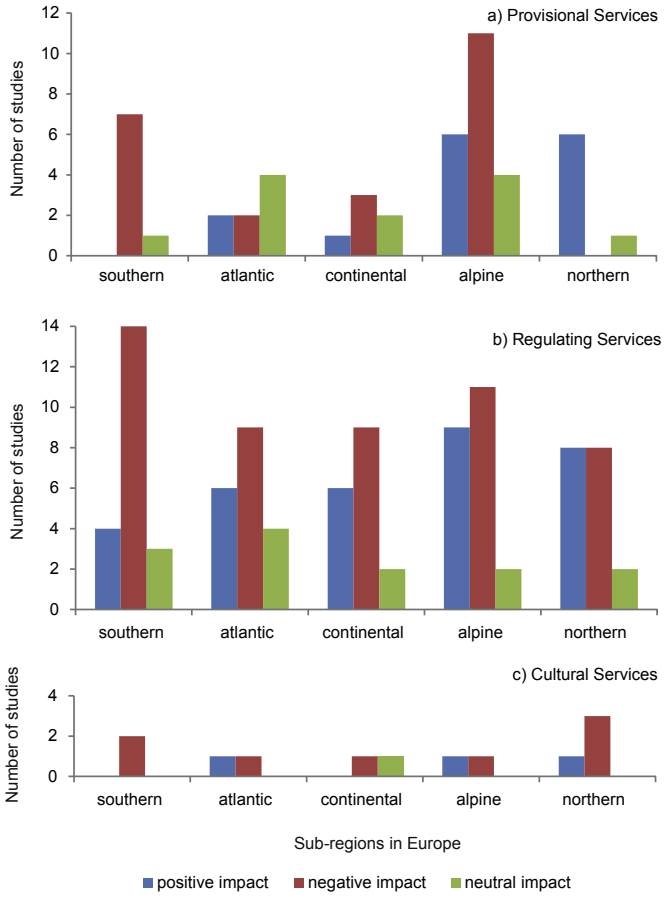

Fig. 1. Assessment of the impacts of climate change on ecosystems services in sub-regions of Europe (adapted from Kovats et al., 2014, 1288–1289). The European part of the Mediterranean region forms the southern sub-region. Provisional services include e.g. production of food, livestock, bioenergy and timber; regulating services include for instance climate regulation, biodiversity and water quality regulation; cultural services include for example tourism, recreation and cultural heritage.

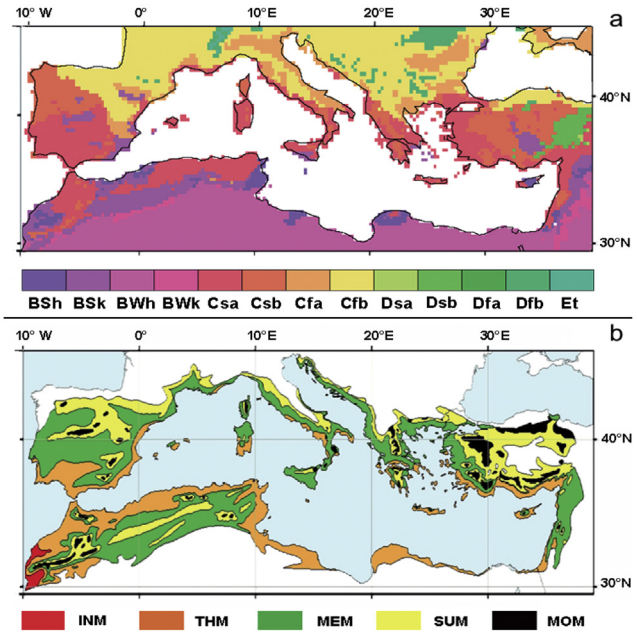

Fig. 2. Climate and vegetation types in the Mediterranean (from Sadori et al., 2013, modified). a) Köppen climate types in the Mediterranean region: subtropical steppe (BSh), midlatitude steppe (BSk), subtropical desert (BWh), midlatitude desert (BWk), Mediterranean climate with hot/warm summer (Csa/b), humid subtropical with no dry season (Cfa), maritime temperate (Cfb), humid continental with hot/warm summer (Dsa/b), continental with dry hot/warm summer (Dfa/b), and tundra (Et) (from Lionello, 2012, modified). b) Types of Mediterranean vegetation: infra-Mediterranean (INM), Thermo-Mediterranean (THM), Meso-Mediterranean (MEM), Sub-Mediterranean (SUM), Mountain-Mediterranean (MOM) (from Quézel & Médail, 2003, modified).

The present article originates from a multi-disciplinary meeting of scientists, archaeologists and historians interested in problematising and integrating the diverse views on the role that climate has played within Mediterranean societies of both the recent and remote past (Holmgren et al., 2014). The first part of the article consists of an outline of the methodological prerequisites and potential foundations of interdisciplinary collaboration, its second part is devoted to the existing challenges that may hinder communication between archaeology, history, and those disciplines within the natural sciences that deal with the past ("palaeoenvironmental sciences"); it concludes by proposing a series of possible solutions to these problems.

It is not a coincidence that this methodological review is produced by a group of scholars involved in the study of the Mediterranean domain. Over the past several years, there have been renewed efforts at demonstrating the exceptional character of this large region in terms of its combined natural and human history (cf. Braudel, 1949, for a classic view; Horden and Purcell, 2000, 2006; Grove and Rackham, 2003; Tabak, 2008; Broodbank, 2013; Harris, 2013; Goffredo and Dubinsky, 2014). During the last 10,000 years, the Mediterranean, and in particular its eastern part, has had an