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A multiple profile approach to the palynological reconstruction of Norse landscapes in Greenland's Eastern Settlement

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ABSTRACT

Palynological research is increasingly revealing the landscape impacts of Norse colonisation in southern Greenland. Typically, although not exclusively, these studies are from depositional environments with highly localised pollen source areas close to fjord-side centres of medieval power. In contrast, this paper presents data from Vatnahverfi, an inland district of the Eastern Settlement, and explores the emergence of a cultural landscape through three pollen sequences at variable distances from Norse farms. Two are from mires with small pollen source areas close to (<100 m) and distant from (≥1500 m) probable farming activities. The other provides a more regional signal of vegetation change, albeit one located close to a Norse settlement. *Landnám* is marked primarily through an increase in microscopic charcoal and the appearance of pollen from *Rumex acetosella*, although significant differences between profiles are noted. Close to Norse ruins, pollen productivity from grassland communities increases and woodland and scrub representation declines. Further from archaeological remains, palynologically inferred human activity is primarily characterised by decreased productivity, notably declining influx from woodland and scrub species, reflecting grazing herbivores or coppicing. Abandonment of Vatnahverfi is indicated from the late 14th to early 15th century AD.

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Introduction

In the late 8th century AD, Norse settlers, primarily from southwestern Norway, initiated a widespread expansion into the North Atlantic region, reaching the Faroe Islands around AD 825 (Jones, 1984), Iceland c. AD 870 (Vésteinsson and McGovern, 2012) and Greenland c. AD 985 (Seaver, 2010). This expansion is frequently assumed to be correlated to the Medieval Warm Period of the late 10th to early 11th centuries, when temperatures in the North Atlantic were similar to, or just below, the mean levels of the 1961–1990 interval (Vinther et al., 2010). Pastoral agriculture – centred on the rearing of cattle, sheep and goats for meat and milk (McGovern, 1985) – was introduced into pristine subarctic environments and supplemented by the hunting of wild game. Cultural landscapes supporting agricultural systems developed where people had hitherto been essentially absent (Dugmore et al., 2005; but see Church et al., 2013). Settlement in Greenland persisted until the mid-15th century AD and the reasons for abandonment continue to fuel debate (Seaver, 2010; Dugmore et al., 2012). Evidence for decreasing temperatures from the mid-14th century has traditionally been used to promote climatic change as the primary causal factor in the failure of Norse Greenland (Dansgaard et al., 1975). In recent years this explanation has become more nuanced with Dugmore et al. (2012), for instance, suggesting that the Norse Greenlanders successfully adapted to 14th century climatic change, but that these adaptations increased their vulnerability to economic change in the 15th century.

Norse settlement in the North Atlantic followed a dispersed pattern centred upon individual farm units. In southern Greenland farms were primarily situated to exploit areas of pasture and were concentrated towards the heads of the fjords which experience a longer growing season owing to a drier continental climate – with warmer summers and colder winters – than the more oceanic coastal reaches (Feilberg, 1984). The majority of farms were located along the coasts of the inner fjords, which eased access to both important routes of communication (Roussell, 1941) and the marine foods that were an integral part of Norse diet (Arneborg et al., 2012). Archeological investigations suggest that at a minimum each farm comprised a house, a byre for stalling animals, a barn for storing hay, and perhaps some subsidiary structures for storing food products (Roussell, 1941). Yet direct knowledge of the cultural landscapes created by this farming activity is limited by a lack of documentary sources pertaining to Norse Greenland. For a conceptual understanding of how the landscape was managed, it is necessary to turn to the extant societies of the North Atlantic (cf. Roussell, 1941; Albrethsen and Keller, 1986; Vésteinsson et al., 2002). In Iceland, the

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Faroes and the Norse homelands of western Norway, a system known as the infield/outfield system was well developed (Øye, 2001). The infield – or homefield – was the area within the immediate vicinity of the buildings where during the summer months hay would be grown to support the overwintering of livestock. Beyond the infield was the outfield, where animals would graze during the summer months (Borchgrevnik, 1977; Øye, 2001, 2005). The outfield was also an area where supplementary fodder and firewood resources were collected (Øye, 2005); activities often associated with subsidiary farming units such as shielings (Ledger et al., 2013).

Recent years have witnessed renewed interest in the paleoenvironmental impacts of Norse *landnám* (see Edwards et al., 2004, 2009) building on the earlier work of Fredskild (1973, 1978). With the exception of Gauthier et al. (2010), later investigations have focused on contexts with local pollen source areas (sensu Jacobsen & Bradshaw, 1981). Despite furnishing a wealth of high-resolution information on farming within the infield areas (e.g. Edwards et al., 2008, 2011a) these studies are heavily biased towards typical fjord-side farming locations.

In order to explore activities in inland areas, this paper presents three high-resolution pollen-analytical reconstructions from Vatnahverfi, an interior district of the Norse Eastern Settlement (Fig. 1). Two of these reconstructions are from mires where the relevant source area for pollen (RSAP) – defined as, 'the smallest spatial scale of vegetation that can be reconstructed from pollen records' (Sugita et al., 1999, p. 409) – is estimated to be a radius of 800–1000 m around the site, or far less (cf. Bunting and Hjelle, 2010; Bunting et al., 2013). These provide comparable, localised pictures of vegetation change that are used to examine Norse landscape impacts in both infield and outfield areas. The third profile, from a lake margin adjacent to Norse farm ruins, provides a more

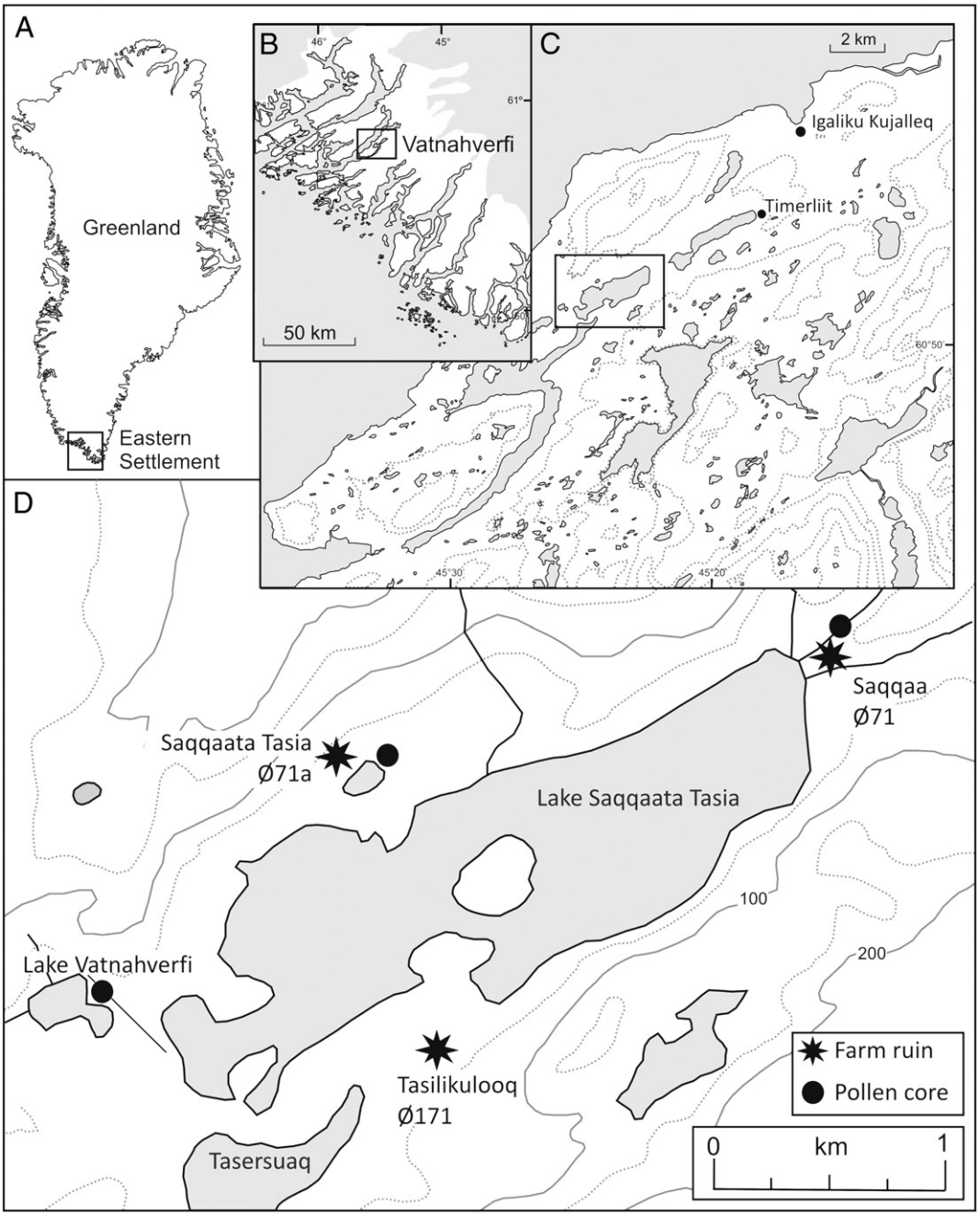

Figure 1. (A) Location of the Norse Eastern Settlement in Greenland; (B) Vatnahverfi within the Eastern Settlement; (C) Vatnahverfi; (D) the study sites within Vatnahverfi.

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