



Reconstructing the spatial variability of post-settlement environmental change in northeast Iceland: a comparative approach

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Attempts to reconstruct past human-environment interactions are complicated by the multiple drivers that force ecological and landscape change. At a single site, these drivers will show temporal patterns as underlying environmental conditions and the intensity of human activities vary. However, across multiple sites environmental gradients will influence an area's baseline conditions before settlement and may impact the susceptibility of landscapes to the onset of human activity. In marginal areas, for example, where ecosystems exist in close proximity to their climatic tolerances, small elevation changes may significantly affect the vulnerabilities of ecosystems and landscapes. Attempts to understand these spatial differences are often complicated by chronological uncertainties, hindering conclusive comparative work.

Iceland presents an almost unrivalled opportunity to build a regional understanding of pre- and post-settlement environmental change. Settlement occurred in the 9th Century AD, providing opportunities to reconstruct baseline environmental conditions against which subsequent changes can be assessed. The abundance of well dated tephra layers in sedimentary archives permits smaller chronological uncertainties when comparing data across large distances. Iceland also contains a relatively simple subarctic flora, with *Betula pubescens* as the primary tree species and potential resource at settlement. Iceland, therefore, presents a model case study for understanding environmental changes, the associated signals observable in palaeoenvironmental archives and the processes responsible. This may prove relevant to regions with a more complex settlement history.

This paper will present new multiproxy data from the Mývatnssveit region, northeast Iceland. Palaeoenvironmental conditions will be reconstructed using palynological, sedimentological and geochemical proxies in order to assess vegetation, landscape stability and lake ecosystem changes from three lake sites over the last 3000 years. These sites span a 30km transect with an elevation change of 350m and represent a range of Icelandic environments, from the lowlands to upland areas on the edge of the interior desert. These data will examine the role of underlying environmental conditions on landscape change after human settlement. In particular, the hypothesis that cooler upland sites were less able to tolerate the additional stresses of human settlement than lowland sites resulting in more significant ecosystem change and landscape degradation will be tested. This represents a methodological advance in the region, and significantly expands knowledge of the nature of post-settlement environmental change in a complex and dynamic area.