



Using the Landscape Reconstruction Algorithm (LRA) to estimate Holocene regional and local vegetation composition in the Boreal Forests of Alaska

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Vegetation is already responding to increasing global temperatures, with shrubs expanding northwards in the Arctic in a process called “greening”. Lakes are important features within these changing landscapes, and lake ecosystems are affected by the vegetation in their catchments. Use of dated sediment archives can reveal how lake ecosystems responded to past changes over timescales relevant to vegetation dynamics (decades to centuries).

Holocene vegetation changes have been reconstructed for small lake catchments in Alaska to help understand the long-term interactions between vegetation and within lake processes. A quantitative estimate of vegetation cover around these small lakes clarifies the catchment drivers of lake ecosystem processes.

Pollen productivity is one of the major parameters used to make quantitative estimates of land cover from palaeodata. Based on extensive fieldwork, we obtained first Pollen Productivity Estimates (PPEs) for the main arboreal taxa in interior Alaska. We used the model REVEALS to estimate the regional vegetation abundance from existing pollen data from large lakes in the region based on Alaskan and European pollen productivity estimates (PPEs). Quantitative estimates of vegetation cover differ from those based on pollen percentages alone. The model LOVE will then be applied to smaller lake basins that are the subject of detailed palaeolimnological investigations in order to estimate the local composition at these sites.