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Environmental controls on modern chironomid faunas from NW and W Iceland: implications for reconstructing climate change

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Chironomid training sets frequently show mean summer temperatures to be the most significant variable in explaining faunal distribution. Predictive powers of these models are strong, and some validation has been undertaken against instrumental datasets, as well as against climate changes throughout the Younger Dryas chronozone. Modelling changes during the Holocene, however, becomes more problematic as temperature changes were of a lower magnitude than during the Younger Dryas, and other factors, notably changes in pH, nutrients, substrate, lake depth and dissolved oxygen can also affect chironomid communities. Separating the effects of these factors on subfossil sequences is a major task for palaeoecologists, and impacts upon the choice of training sets/transfer functions that are used for data evaluation.

We present a chironomid training set from NW and W Iceland. The main environmental controls on chironomid communities are substrate (identified through losson-ignition) and temperature. We will discuss the role of using temperature monthly averages and tritherms to model chironomid community distribution, as well as other environmental controls. The Icelandic midge training set is used to reconstruct temperatures for recent and early Holocene change within Iceland, and the results are compared with reconstructions from other chironomid temperature transfer functions. The ability to reconstruct temperatures accurately from an island such as Iceland using these approaches will also be discussed.