Geophysical Research Abstracts
Vol. 15, EGU2013-6452-1, 2013
EGU General Assembly 2013

Development of a North American paleoclimate pollen-based reconstruction database application

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Recent efforts in synthesizing paleoclimate records across the globe has warranted an effort to standardize the different paleoclimate archives currently available in order to facilitate data-model comparisons and hence improve our estimates of future climate change. It is often the case that the methodology and programs make it challenging for other researchers to reproduce the results for a reconstruction, therefore there is a need for to standardize paleoclimate reconstruction databases in an application specific to proxy data. Here we present a methodology using the open source R language using North American pollen databases (e.g. NAPD, NEOTOMA) where this application can easily be used to perform new reconstructions and quickly analyze and output/plot the data. The application was developed to easily test methodological and spatial/temporal issues that might affect the reconstruction results. The application allows users to spend more time analyzing and interpreting results instead of on data management and processing. Some of the unique features of this R program are the two modules each with a menu making the user feel at ease with the program, the ability to use different pollen sums, select one of 70 climate variables available, substitute an appropriate modern climate dataset, a user-friendly regional target domain, temporal resolution criteria, linear interpolation and many other features for a thorough exploratory data analysis. The application program will be available for North American pollen-based reconstructions and eventually be made available as a package through the CRAN repository by late 2013.