EGU21-6799, updated on 06 Jul 2022
https://doi.org/10.5194/egusphere-egu21-6799
EGU General Assembly 2021

Temporal and spatial considerations in data-model comparisons involving transient paleoclimatic simulations

Patrick Bartlein[1] and Sandy Harrison[2]
[1]Department of Geography, Univeristy of Oregon, Eugene, USA (bartlein@uoregon.edu)
[2]School of Archaeology, Geography and Environmental Science (SAGES), The University of Reading, Whiteknights, PO Box 227, Reading, RG6 6AB, UK.

The increasing availability of time-evolving or transient palaeoclimatic simulations makes it imperative to develop "best-practices" for comparing simulations with palaeoclimatic observations including both climate reconstructions and environmental data. There are two sets of considerations, temporal and spatial, that should guide those comparisons. The chronology of simulations can in some ways be viewed as exact, as determined by the insolation forcing, but data archiving and reporting conventions, such as reporting summaries that use the modern calendar (that leads to the long-recognized palaeo-calendar effect) can, if ignored, lead to "built-in" temporal offsets of thousands of years in such features as temperature or precipitation maxima or minima. Likewise, there are age uncertainties in time series of palaeoclimatic data that are often ignored, despite the fact that these are large during "climatically interesting times" such as the Younger Dryas chronozone. Similarly, although model resolution is increasing, there is still a mismatch in topography (and its climatic effects) between a model and the "real world" sensed by the palaeoclimatic data sources.

There are existing approaches for dealing with some of these issues, such as calendar-adjustment programs, Monte-Carlo approaches for describing age uncertainties in palaeoclimate time series, or clustering approaches for objectively defining appropriate regions for the calculation of area averages, but there is certainly room for further development. This abstract is intended to serve as platform for discussion of some of best practices for data-model comparisons in transient mode.