Biogeosciences
Discussions

Interactive comment on "The contribution of tephra constituents during biogenic silica determination: implications for soil and paleoecological studies" *by* W. Clymans et al.

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I really enjoyed reading this paper which is novel in examining an interesting problem and crossing disciplinary boundaries to do so. I am interested in tephras and soils and palaeoecology, so this topic piqued my interest. I found the paper to be generally sound and well prepared. My comments related mainly to clarification and attention to language and terminology in places.

Some technical and language issues I raised (on an annotated MS submitted earlier) have been addressed by the authors in their revision. For example, the term 'nanocrystalline' is now used instead of 'short-range order', meaning having a crystal structure

in nanoscale size range <100 nm (this term nanocrystalline applies to allophane and ferrihydrite). Second, it was not always clear exactly which component (phase) of the tephra deposit was being analysed (typically volcanic glass, not 'tephra', which can comprise rock fragments, crystals, pumice etc in addition to glass, depending on location/circumstances), which then raised the technical issue as to normalising electon probe data or not (to sum to 100%) for glass analyses (I would say 'yes' to normalising in most cases).

The 7000-cal-year old Tuhua Tephra (erupted from Tuhua Volc Centre = Mayor Island, Bay of Plenty, New Zealand) is a great example because it is peralkaline rhyolite compositionally meaning it has very low Al and very high Na and K (as oxides), and peralkaline glass weathers rapidly (demonstrated by the Parker Index for weathering of glass from some NZ tephras).

Some new references were suggested, most of which have been adopted by the authors.

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