

## PROPOSAL TO REDEFINE THE QUATERNARY

In the revised geological time scale (GTS2004) Lourens *et al.* propose to extend the Neogene System (Period) up to the present, thereby making the Quaternary System (= Pleistocene + Holocene Series) redundant. See Figure 1.

Here I propose that the Quaternary be redefined as a Subsystem (Subperiod) of the Neogene, and that its base be defined at the base of the Pliocene Gelasian Stage at 2.6 Ma (GSSP ratified – Rio *et al.* 1998. *Episodes* 21, 82.). After recent discussions by the ICS executive, in consultation with the IUGS executive, they have requested that the various formal stratigraphic groups of ICS and the International Union for Quaternary Research (INQUA) be asked to consider the proposal.

In support of the proposal for a Quaternary Subsystem (Subperiod), I note the following:

1. There is overwhelming support from INQUA members, who I have talked with, to retain the Quaternary as a formal chronostratigraphic unit.
2. There is precedence for naming Subsystems in the GTS, specifically the Mississippian and Pennsylvanian Subsystems of the Carboniferous.
3. Redefinition of the Quaternary will make use of an existing GSSP (Gelasian Stage).
4. Decoupling the base of the Quaternary from the Plio-Pleistocene boundary (1.8 Ma) would, I believe, bring an end to the long-running arguments over the position of the Plio/Pleistocene boundary.
5. A majority of INQUA members appear to favour a “long” Quaternary (2.6 Ma) over a “short” Quaternary (1.8 Ma). In essence, the preference for a “long” Quaternary reflects perceived continuity of character over that time. For example, around 2.6 Ma, Chinese loess deposition becomes widespread and is substantially different in character to the underlying Red Clay (e.g. Ding *et al.* 1997. *Quaternary International* 40, 53).
6. Around 2.6 Ma, deep sea oxygen isotope records show the culmination of a series of cycles of increasing glacial intensity, also associated with the first major inputs of ice rafted debris to the North Atlantic. For many this marks the beginning of the “Quaternary ice ages”. It also marks a change from precession-dominated to obliquity-dominated climate forcing.

In summary, the extension of the Neogene System (Period) upwards provides an ideal opportunity to redefine the Quaternary, as a Subsystem (Subperiod) of the Neogene. The proposal for a Quaternary Subsystem is consistent with popular usage, does not require a new GSSP, and will end the arguments about the Plio/Pleistocene boundary.

This proposal has been circulated, via the INQUA Executive, to all INQUA members for discussion. Comments are welcome from all interested stratigraphers.

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*PRESENT*

*PROPOSED*

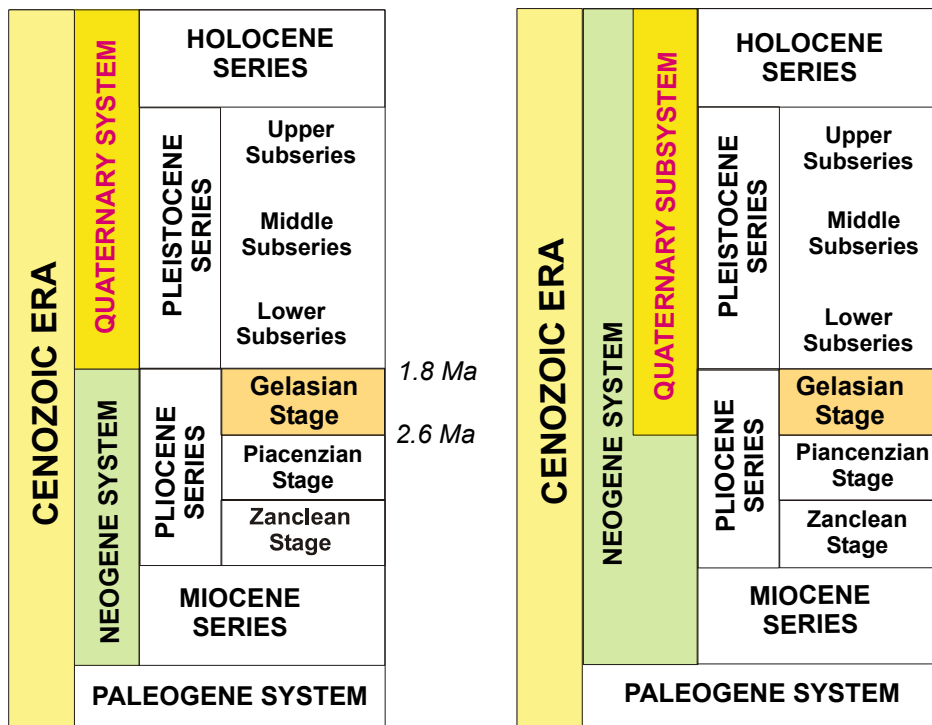


Figure 1 –Chronostratigraphic units of the Cenozoic Era illustrating the proposed redefinition of the Quaternary.