Séminaire International de Paléontologie, Évolution, Paléoécosystèmes et Paléoprimatologie
Salle 410, bât. B35 (3ème étage, aile nord)

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Reconstruction of African paleogeography between 30 Ma and 1 Ma: setting the boundary conditions for eco-evolutionnary models.

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Raphaël Tournier

Doctorant

ISTerre, Université de Grenoble

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Large eco-evolutionary studies require realistic and dynamic environmental frameworks, used both as a spatial background and as stress variables (e.g., geographic barriers, water availability, resource distribution, and environmental stability). In this context, we reconstruct the environmental evolution of continental Africa over the past 30 million years using a multi-layered modelling approach. The resulting paleogeography integrates several geodynamic components, including mantle-driven dynamic topography, crustal tectonics history, plate tectonic motions, and volcanic eruptive dynamics. Combining these elements allows us to produce an elevation model for Africa since 30 Ma, continuous in space and time. This elevation model is then also used as a boundary condition for climatic and physiographic simulations, generating a more comprehensive representation of past environments.

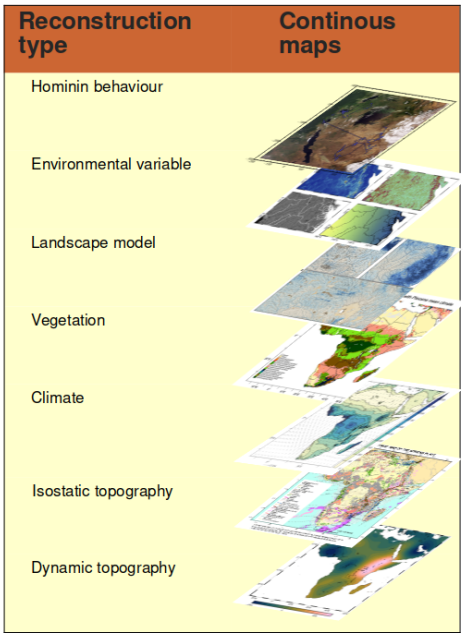

Fig1 : A multilayered deductive workflow

I then evaluate the spatial and temporal accuracy of these reconstructions by confronting them with field-based evidence. This assessment identifies the scales at which the models are most robust, informing which interrogation can be explored with confidence. It also highlights where the reconstructions correspond with geological, paleoenvironmental, and paleontological data, and where their precision may require refinement.

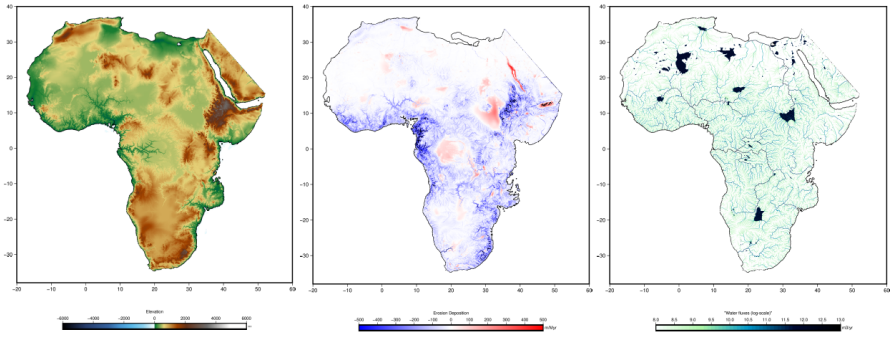

Fig2 : Landscape evolution model on continental Africa at 10Ma.

In the future, these maps and simulations will be continuously updated and will provide the framework for studying the dispersal, morphological and behavioral changes of Cenozoic faunal communities in Africa, notably early hominids. They will offer a coherent spatio-temporal context for evaluating how environmental changes may influence evolutionary pathways.