

Global scale paleo-landscape evolution model

Landscape & catchments dynamic, paleo-elevations, erosion/deposition...

Tristan Salles, EarthCodeLab, University of Sydney

Since the '90s, many software have been designed to estimate long-term catchment dynamic, drainage evolution as well as sedimentary basins formation in response to various mechanisms such as tectonic or climatic forcing. These models rely on a set of mathematical and physical expressions that simulates sediment erosion, transport and deposition and can reproduce the first order complexity of Earth's surface geomorphological evolution.

Yet, we were still missing a tool to evaluate global scale evolution of Earth surface and its interaction with the atmosphere, the hydrosphere, the tectonic and mantle dynamics. Recently we designed the goSPL model (gospl.readthedocs.io) to address this gap. It can be used to better characterise many aspects of the Earth system ranging from the role of atmospheric circulation on physical denudation, from the influence of erosion and deposition of sediments on mantle convection, from the location and abundance of natural resources to the evolution of life.

In this talk, I will present how this model could be used to evaluate paleo-elevation reconstructions and improve our understanding of past Earth evolution in a quantifiable way.

