

Summer Project 2017/2018

Linking paleoclimate to surface process modelling to understand Australian landscape evolution

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Surface process modeling, capturing erosion, sediment transport and deposition through time, is our primary tool to understand long-term landscape evolution, coastline change and “source to sink” links between the regions where sediments originate from to where they are deposited. As continents move across latitudinal climate belts through geological time, and as global climate is changing between greenhouse and icehouse conditions, regional precipitation undergoes enormous change. Annual rainfall is the primary driver of erosion; therefore, modelling spatio-temporal changes in precipitation needs to be coupled with landscape models.

This project is designed to carry out test model runs to connect the recently developed [pyATOM](#) software to [pyBadlands](#), both open-source community codes. pyATOM is a fast, low-complexity climate modelling code that is designed to predict precipitation through time based on sets of paleogeographic input grids, while pyBadlands models erosion and sediment transport. The paleo-precipitation output grids will be used as boundary conditions for Badlands. The new workflow will be tested on modelling Australia’s erosion history since the Jurassic Period. The project is part of the [Australian Research Council and industry-supported Basin Genesis Hub](#), and will lead to further research opportunities.

Prerequisites:

GEOS1001/1901 or GEOS1003/1903 and GEOS2124/2921 or GEOS2115/2915