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Reconstructing global grids of oceanic and continental lithospheric thickness

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We present a series of reconstructed global grids of lithospheric thickness in 1 Ma timesteps from the Early Cretaceous to present, as an application of a novel workflow to reconstruct the estimated past geographic location of elements on a dataset based on a plate kinematic model. Global geodynamic modelling relies on increasingly detailed boundary constraints such as, for example, crustal and lithospheric thickness or heat flow. Our methodology utilises the GPlates open-source software and a set of paleo-oceanic age-grids to reconstruct any geospatial raster data back in time kinematically, that is, structures that exist at the present day are directly rotated without attempting to model their evolution. The resulting unstructured grid is interpolated into a raster by using an adjustable tension continuous curvature surface gridding algorithm. We show the overall pre-breakup configuration and subsequent lithospheric evolution of a set of conjugate passive margins from the Late Jurassic/Early Cretaceous to the present.