Geophysical Research Abstracts
Vol. 16, EGU2014-14785, 2014
EGU General Assembly 2014

Global Paleo-elevation predictions for Phanerozoic based on tectonics

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We present a new paleo-elevation model that follows a theoretical approach, and test it with depositional environment data. This model forms an alternative to existing paleo-topography models based on paleo-environmental and geomorphological data, which attain high resolution locally but lack constrains over part of the globe and geological time. Paleo-topography is predicted through time based on physical rules derived from lithospheric plate cooling and statistics on present-day topography. The developed method converts a 2D plate reconstruction model with defined plate boundaries to a 3D model featuring paleo-topography and bathymetry. This approach is relatively crude but has the advantage of being applicable anywhere on the globe and at any geological time. Such a model is a strong base for global paleo-climatic and source to sink studies. lt has been applied globally for the entire Phanerozoic on the plate reconstruction model developed at the University of Lausanne. Comparison of predicted paleo-topographies with depositional environmental data is encouraging. For applicability on basin scale and higher resolution climate modeling, the synthetic topography can be fine-tuned based on the data at place with sufficient coverage.