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On a goodness-of-fit between theoretical hypsometric curve and its empirical equivalents derived for various depth bins from 30 arc-second GEBCO bathymetry

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The poster reports ongoing investigations into hypsometric curve modelling and its implications for sea level change. Numerous large-scale geodynamic phenomena, including global tectonics and the related sea level changes, are well described by a hypsometric curve that quantifies how the area of sea floor varies along with depth. Although the notion of hypsometric curve is rather simple, it is difficult to provide a reasonable theoretical model that fits an empirical curve. An analytical equation for a hypsometric curve is well known, but its goodness-of-fit to an empirical one is far from perfect. Such a limited accuracy may result from either not entirely adequate theoretical assumptions and concepts of a theoretical hypsometric curve or rather poorly modelled global bathymetry.

Recent progress in obtaining accurate data on sea floor topography is due to subsea surveying and remote sensing. There are bathymetric datasets, including Global Bathymetric Charts of the Oceans (GEBCO), that provide a global framework for hypsometric curve computation. The recent GEBCO bathymetry – a gridded dataset that consists a sea floor topography raster revealing a global coverage with a spatial resolution of 30 arc-seconds – can be analysed to verify a depth-area relationship and to re-evaluate classical models for sea level change in geological time. Processing of the geospatial data is feasible on the basis of modern powerful tools provided by Geographic Information System (GIS) and automated with Python, the programming language that allows the user to utilise the GIS geoprocessor.