

Orogens and global landform, revisited through an analysis of digital elevation model

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This presentation shows statistical relationship between the ages of continental crust and two topographical parameters: elevation and relief both of which derived from a global DEM (Figures 1 and 2). Although the term "orogeny" is tricky because different meanings are put on by different researchers, if we accept the definition that the orogeny is processes growing upper continental crusts along the convergent boundaries of plates, megascale landform is primarily explained by isostatic uplift and following erosion. From this point of view, reeducation is required for geography teachers in Japanese high schools, because they are largely confused about orogeny and orogens.

Keywords: Orogen, Megascale landform, Digital elevation model (DEM), Geographic education

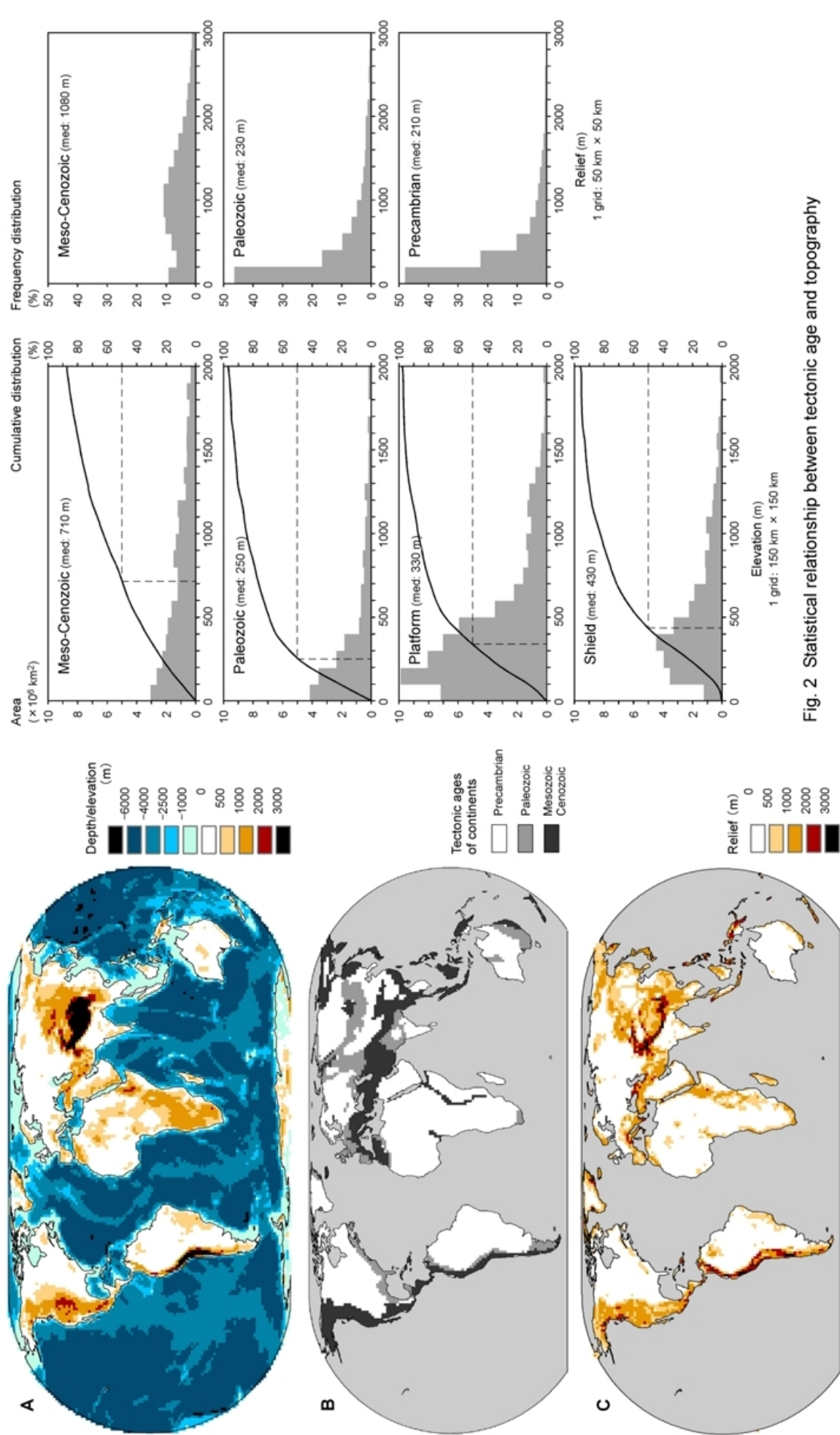


Fig. 1 Global elevation (A), tectonic ages (B) and relief (C). A grid size is 150 km x 150 km.

Fig. 2 Statistical relationship between tectonic age and topography

Data source:
Amante, C. and Eakins, B.W. (2009) ETOPO1 1 Arc-Minute Global Relief Model: Procedures, Data Sources and Analysis, NOAA Technical Memorandum NESDIS NGDC-24.
Artemieva, I.M. (2006) Global $1^{\circ} \times 1^{\circ}$ thermal model TC1 for the continental lithosphere: Implications for lithosphere secular evolution. *Tectonophysics*, 416, 245-277.
Laske, G. and Masters, G. (1997) A global digital map of sediment thickness. *EOS Trans. AGU*, 78, F483.

