

Some *consequences* of the geodynamics of sea level on the biosphere. The SE Asian example

Laurent Husson (1), Anta-Clarisse Sarr (1), Anne-Morwenn Pastier (2), Pierre Sepulchre (3), Kevin Padoja (4), Mary Elliot (5), Wahyoe Hantoro (6), and Carlos Jaramillo (7)

(1) CNRS, ISTERre, Université Grenoble Alpes, France (laurent.husson@univ-grenoble-alpes.fr), (2) Géosciences Rennes, Université Rennes-1, France, (3) CNRS, Laboratoire des Sciences du Climat et de l'Environnement, France, (4) M2C, Université de Caen, France, (5) LPG Nantes, Université de Nantes, France, (6) LIPI, Bandung, Indonesia, (7) Smithsonian Tropical Research Institute, Panama

Mantle flow and subducting slabs dynamically deflect the surface of the Earth. These deflections occasionally suffice to alternatively inundate or emerge vast expanses of landmasses. This is the case in SE Asia, where geomorphological indicators attest for widespread uplift in the East, in "Wallacea" and subsidence in the West, in the very shallow Sunda platform. These movements attest for transient subduction dynamics of the Indo-Australian subduction zone. We conducted fieldwork in key areas : Sulawesi in the East, Belitung in the West. Geomorphological observations and modeling, geophysical measurements and age determinations have enable us to determine Quaternary rates of subsidence (Sunda shelf) and uplift (in Wallacea), of a few tenths of millimeters per year, faster than over longer time scales.

We hypothesize that such rates of vertical ground motion triggered by the subducting slabs, though modest, are sufficient to very efficiently impact the external spheres of the Earth. More specifically, because it is associated with modifications of the relative sea level, we propose that they critically altered diverse aspects of the biosphere. We propose that such geodynamics ultimately modulate the dynamics of the biosphere in ways as diverse as boosting reef productivity by an order of magnitude, fostering the development of the "Coral Triangle" center of biodiversity and, in a rather provocative way, even helping *Homo erectus* reach Java and large faunas cross Sundaland even during interglacial periods.