

Maritime-continent coastal region as land-sea-air triple boundary layer and bio-anthroposphere

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Imbalance of radiative processes determining climate is compensated by atmospheric-oceanic circulations and latent heating. The latent heat generated mainly by equatorial cumulonimbus clouds concerns both overheating and circulation pumping. Since the equatorial atmosphere is almost free from Coriolis force making cyclones, the diurnal-cycle sea-land heat contrast is the most principal mechanism to generate cumulonimbus and thus rainfall. The earth's longest coastline of Indonesian maritime continent (IMC) generates the largest regional rainfall and latent heat controlling the global climate (Yamanaka et al., 2018, *Prog. Earth Planet. Sci.*, **5**(21), 1-28). Massive fresh water sustains the biosphere with biodiversity over the peatland of major islands of the IMC, which also concern the carbon cycle through making peats and coals as geologically long-term reservoirs. We homo sapiens originated from the tropical Africa and evacuated to the temperate zone, where coexistence with other species was easier and thus proliferation and civilization were achieved with making the tropics a field for grabbing both alive and fossilized bio-resources. On one hand, the human population is governed by the rain water for survival, agricultural and industrial use. On the other hand, the human activity after the industrial revolution has been consuming the fossil fuels, and has been modifying the peatland for plantations, which release massive greenhouse gases. Such interactions are being studied mainly in the eastern coast of Sumatra and the southern coast of Kalimantan, under an interdisciplinary project (RIHN Tropical Peatland Society Project, 2017-21). Based on rainfall variabilities of mesoscale (with radars, and as functions of coastal distance), intraseasonal to interannual scales (based on operational data) and interdecadal to centennial scales (by historical data rescue), we may discuss a "saturation" of anthroposphere in the tropical coastal region such as the IMC peatland.

Keywords: coastal region, sea-land breeze and monsoon circulations, hydrologic cycle, bio-anthroposphere, maritime-continent peatland