
Effect of sedimentation on Relative Sea Level (RSL) and subsidence in the Ayeyarwady delta Region (Myanmar).

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Résumé

The Ayeyarwady (aka Irrawaddy) river in Myanmar is the fourth greatest river in the world in terms of sediment discharge (370 Mt/yr). Today, most of the sediment discharge (210 Mt/yr) of the river is accumulated at the delta front. Remaining sediments and sediments from other rivers like Thalween (180 Mt/yr) and Sittang (50 Mt/yr) are deposited in the Martaban depression at the south-east end of the delta. The Ayeyarwady delta, as many delta plains is expected to sink due to sediment load. We compute the subsidence rate associated to the Holocene sediment load by producing a sedimentation model and computing the isostatic effect.

Cores, Sub-bottom echo-sounding Chirp profiles, dated paleo shorelines were compiled to build a regional sedimentary model since the LGM. Regarding uncertainties on sedimentation and earth's model, we have built up endmember sedimentation scenarios.

We have resolved the sea level equation and calculated subsidence in the area. This resolution was performed using a newly developed code based on the theory of Dalca et al., (2013). This theory is Based on the Love theory, a spherically symmetric earth model and including shoreline migration and geometry of grounded marine based ice. We selected one preferred 1D earth's model (thin lithosphere) according to the regional tectonic setting.

We explored several Earth models with lithosphere thickness varying from 32 to 60 km and mantle viscosity varying from 10^{20} to 10^{22} Pa.s.

We obtain a first estimation of RSL rise and of subsidence in the Ayeyarwady delta region. For the last 500 years, total subsidence (including the effect of ice, sediment and water) in the Martaban depression is 1.1 mm/yr (+0.8/-0.3 mm/yr). The effect of sediment load increases Relative Sea Level estimation along the coast line as crucial consequences for better management of coastal area.

Mots-Clés: Relative Sea level, LGM, Sediment Isostasy

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