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Re-visiting the Huon (Papua New Guinea) coral reef terraces: high resolution topography and modeling

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Coral reef terraces (CRT) are key indicators of Quaternary sea level fluctuations, and are therefore relevant to a wide spectrum of climatic and tectonic studies. The Huon Peninsula in Papua New Guinea is a classic site, containing one of the first CRT sequences to be mapped, measured and dated in detail. Pioneering studies were limited by the available techniques to assess the large scale terrace sequence morphology, and thus to constrain spatiotemporal uplift rate variations that are key to determine past relative sea-level (RSL). We re-visit the Huon CRTs to refine tectonic uplift rates and RSL, using digital surface models calculated from 0.5m Pleiades satellite imagery. This allows us to constrain in detail both the variations in CRT elevation and tectonic deformation wavelengths. We then use coral reef models to reconstruct the sequence morphology and constrain the possible range of RSL over the past few glacial-interglacial cycles. We find that large-scale tilting of the terrace sequence is generally N-directed, which is compatible with large E-W striking splay thrust faults to the S of the Peninsula. Our analysis implies changes of several meters for RSL highstand estimates compared to previous studies. We compare our results to other terrace sequences, and discuss the potential of combining high-resolution topography with coral reef modeling to constrain RSL.

Mots-Clés : Coral reef terraces, tectonics, sea-level

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