

Supporting Information for ”Genesis and architecture of sequences of Quaternary coral reef terraces: insights from numerical models”

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Additional Supporting Information (Files uploaded separately)

1. Captions for Movies S1 to S5
2. REEF code

Movie S1: Hawaii

This movie is realised over the past 550 ky. It shows the development of the 5 terraces of the Hawaiian. Reefs emerged during glacial periods are reoccupied during the next transgression, except during transgressions fast enough to drown the reef and initiate the development of a new terrace (i.e. MIS 7e, 7c, 5e). The movie also shows the *keep-up* or

catch-up regime of the reef during minor transgressions and sea-level stands (i.e. MIS 11, 7c, 3), minor regressions (i.e. MIS 11).

Movie S2: Wangi-Wangi

This movie is realised over the past 1.5 My in order to produce the antecedent foundations controlling reef growth during the last eleven isotopic stages. It shows the reoccupation of the past reefal units leading to the development of the composite T1 terrace. It also shows the initiation of the barrier during MIS 7e, its resistance to marine erosion during the following regressions and its reoccupation during the next transgressions (MIS 7c, 7a, 6, 5e, 5c, 5a and 1).

Movie S3: Reference case for stationary scenario

This movie is realised over the 1.5 My for our reference case, in a stable scenario (Fig. 7). It shows the development of the few terraces by the reoccupation of the former reefal units during each transgressions. It also shows the seaward progression of the reef over the reefal units constructed during glacial periods and clastic sediments (shaded areas).

Movie S4: Reference case for subsiding scenario

This movie is realised over 800 ky for our reference case in an uplifting scenario ($U = -1\text{mm};\text{yr}^{-1}$, Fig. 7). In this case, subsidence shifts previous reefal units and prevails many reoccupations. Several barriers are initiated before MIS 11, when rates of sea-level rise are sufficiently low to compete with the maximum effective reef growth rate. The fast rate of transgression during MIS 5e and 1 does not allow initiation of barriers and lead to the sudden drowning of the reef. Reoccupations of former reefal units lead to the development of few wide drowned terraces.

Movie S5: Reference case for uplifting scenario

This movie is realised over 1.5 My for our reference case in an uplifting scenario ($U = 1mm;yr^{-1}$, Fig. 7). Uplift shifts previous reefal units and prevails most of the reoccupations. This leads to the development of several narrow terraces, mainly monogenic.