Humblet *et. al*, supplementary material captions

Table S1. Radiometric ages used in this study to construct the accretion curves, calculate vertical accretion (VA) rates and used for correlation with the RSL curve of Yokoyama *et al.* (2018). Asterisks indicate ages previously published in Webster *et al.* (2011). Grey shaded rows indicate samples used to define inflection points. Mbsl = metres below sea-level; mbsf = metres below sea floor.

Table S2. List of samples used to define inflection points, age and depth values of individual inflection points and vertical accretion (VA) rates associated with each segments linking inflection points. Mbsl = metres below sea-level.

Fig. S1. Distribution of coral taxa in (a) Hole 40 A; and (b) Hole 41A, as well as coral assemblages and lithologies, stratigraphic extent of Reef 2 (R2) and Reef 3a (R3a) sequences (defined in Webster *et al.*, 2018) and available radiometric ages. IS = in situ; ISX = not in situ; ISN = status unknown.

Fig. S2. Age-depth models obtained using the R-based Bayesian age-depth modelling tool *Bacon* for (a) Hole 40A and (b) Hole 41A. For Hole 40A, two distinct models are shown, one based on all dated samples (i) and the other based only on *in situ* (IS) samples (ii). Note that the two age models for Hole 40A bypass the sample dated 17.3 ka. The three panels on the right side of each graph represent, from left to right: the stability of Markov Chain Monte Carlo iterations (left), the prior (green curves) and posterior (grey curves) distributions for the accumulation rate expressed in yr/cm (middle) and memory (right). The 'memory' represents the change in accumulation rate that is permitted from one depth to another (Blaauw & Christen, 2011).

Fig. S3. Temporal variation in VA rates calculated for (a) Hole 40A and (b) Hole 41A using the visual fit method and Bayesian method. For Hole 40A, variation in VA rates based on the Bayesian method is shown for the model based on all dated samples (i) and for the model based only on *in situ* (IS) samples (ii).

Fig. S4. Illustration of lithologies, sedimentary features and biotic components of the grainstone-rudstone interval (a, core 9R-1), the lower microbialite boundstone (b-h, core 8R-1), the packstone-boundstone layer (i-j, core 7R-1) and the upper microbialite boundstone (k, core 6R-1) of Hole 40A. (a) Bioclastic grainstone-rudstone with heavily bored upper margin (triangles) containing abundant bioclasts, including bryozoans (arrows). (b) Microbialite boundstone containing a laminar *Porites* colony (po) covered by coralline algal crust (ca). (c) Microbialite boundstone with abundant *Entobia* borings (see arrows showing heavily bioeroded areas; note the middle-left arrow showing boring trace displaying larger cavities that could be a different ichnospecies of *Entobia*). (d) Microbialite boundstone with *Gastrochaenolites* boring (inset 1) and calcareous tubes, probably Serpulidae, (arrows, inset 2) above a *Pachyseris speciosa* colony (pa). (e) Detail of a thick microbialite crust with structureless fabric (insets 1 and 2). (f) Detail of a thick microbialite crust displaying crude laminations (inset 1). (g) Detail of a thick microbialite crust displaying digitations (arrows). (h) Packstone-boundstone containing calcareous tubes (Serpulidae, arrows and inset 1), cavities filled with bioclasts (black and white line) and coralline algal crusts (ca). (i) Packstone-boundstone with coralline algal crust (ca), heavily bored coral? clast (c?) and calcareous tubes, including a large Serpulidae (inset 1) encrusted by smaller tubes, probably foraminifers, i.e. nubecularids or spirillinids (arrows). (j) Detail of fossil coral colonies, i.e. *Porites* (po) and Merulinidae (me) and microbialite crust (mc). Note that the depth (in metres below sea floor, mbsf) is indicated for each core image.