

Title: Legacy effects of sea-level fluctuations over the Late Quaternary on present-day island biodiversity

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Abstract (242 words): Oceanic islands are dynamic entities: they emerge and submerge; they shrink and expand; they split and merge. Over evolutionary timescales, changes in island geography are driven by geologic processes and sea-level fluctuations. During the Late Quaternary, climatic oscillations have resulted in major fluctuations in sea-level and, correspondingly, changes in island area and archipelago configuration. The Paleo Islands and Archipelago Configuration (PIAC) database contains sea-level driven changes in paleogeography over the Late Quaternary of 178 islands in 27 archipelagos worldwide. This online database shows that for most of the Late Quaternary, islands were larger than today, and less isolated. Such dynamics of island geography in the past are crucial for understanding present-day biodiversity and evolutionary patterns on oceanic islands. Many studies exploring this relationship have focussed on the exceptional and short-lasting conditions of the Last Glacial Maximum (LGM). We expect that the more recurrent and persistent archipelago configurations over the Late Quaternary left a stronger imprint on insular biodiversity patterns. Therefore, we analysed the influence of archipelago configuration at different sea-level stands in the past on present-day richness of land snails and flowering plants in 53 volcanic oceanic islands from 12 archipelagos worldwide. We found that sea-level driven changes in archipelago configuration have left a strong imprint on endemic species richness patterns in both taxonomic groups. Our findings highlight that reconstructions of sea-level driven changes in island geography over the Late Quaternary can provide an important contribution to current ecological and evolutionary questions.