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6000-year records of relative sea-level change from south Florida

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Paleo-sea-level records are important for determining the contribution of local- to regional-scale drivers to projections of future relative sea-level (RSL) change. We produced RSL histories spanning the last ∼6000 years from two sites in the lower (Snipe Key) and upper (Swan Key) Florida Keys, USA, locations extremely vulnerable to future sea-level rise where the relative contributions of drivers of RSL change are poorly known. We reconstructed paleo mangrove elevations in cores of mangrove peat that were dated primarily using radiocarbon. At Snipe Key, RSL rose by ∼5.1 m during the past ∼5900 years compared to ∼6.8 m at Swan Key during the past ∼6000 years. Rates of RSL rise were highest (1-2 mm/yr) from 6000 to 4000 years ago and slowed to 0-1 mm/yr during the last four millennia. The RSL difference between sites, which are separated by ∼160 km, is opposite from the spatial pattern expected from differential GIA, which would cause Holocene RSL rise to be greater at Swan Key than at Snipe Key. We explore the influence of additional local- to regional-scale processes that may have driven differences in RSL between the two study sites as well as other regional RSL records, including non-stationary tides, sediment compaction, regional variations in hydroclimate, and the dynamic response of the Florida Current and Gulf Stream to climatic-induced changes to Atlantic Meridional Overturning Circulation (AMOC) and an associated weakening/strengthening of the Gulf Stream.