



## **Persistent global sea-level rise acceleration since the 1970s**

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Several studies have attempted to reconstruct 20th century global mean sea level (GMSL) from sparse tide-gauge records to understand whether the recent high rates obtained from satellite altimetry are part of a longer-term acceleration. Analyses, however, have thus far not used a technique that can simultaneously calculate accurate trends and variability from both satellite altimetry and tide-gauge records. Here we present a significantly improved hybrid sea-level reconstruction from 1900-2015 that combines previous techniques only at timescales where they perform best. We find an acceleration of unprecedented persistence (during the 20th century) in GMSL starting in the late 1970s and demonstrate that Indo-Pacific and South Atlantic sea-level variability explains  $\sim 80\%$  of the rate changes. In particular, we detect an acceleration hotspot in the South Pacific north of  $50^{\circ}\text{S}$ , which resembles the dynamic imprint of increasing Southern Ocean westerly winds also observed in forced climate model simulations. This result indicates a steric initiation of the recent GMSL acceleration coinciding with sustained greenhouse gas emissions since the 1970s.