



## **Global acceleration of sea-level rise at the end of the 19<sup>th</sup> century**

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Most long-term sea-level observations from tide gauges originate from Europe and North America and display evidence for a positive acceleration around 1920-1930 and a negative one around 1960. Global satellite data show a more recent acceleration of sea-level rise around 1992 to the current rate of  $\sim 3.1$  mm/yr. However, the global tide-gauge database shows inconclusive evidence of any acceleration prior to 1920, primarily due to a lack of records of sufficient length. To enhance the dataset of recent sea-level observations, this paper presents high-resolution proxy sea-level reconstructions from salt-marsh sediments using microfossils as sea-level indicators. It is shown that these reconstructions can offer useful supplements to the small data base of long observational records. Proxy records were obtained from salt marshes in the North Atlantic and the Southwest Pacific regions. Former sea-level positions were dated by a range of radiometric techniques ( $AMS^{14}C$ ,  $^{210}Pb$ ,  $^{137}Cs$ ,  $^{241}Am$ ) and by specific stratigraphic markers (e.g., pollen, tephra, Pb concentrations, Pb isotopic ratios, palaeomagnetism). Comparison with nearby tide-gauge records demonstrates that the proxy records filter out much of the interannual variability of sea-level change but are capable of reproducing accurately the (multi-)decadal trends. It appears that long-term mean rates of sea-level rise were 1.5-2 mm/yr higher during the 20<sup>th</sup> century than during the 19<sup>th</sup> century in both northern and southern hemispheres sites. This sea-level acceleration commenced between the middle 19<sup>th</sup> and the early 20<sup>th</sup> century, coincident with global temperature rise.