



## Postglacial relative sea-level histories along the Northeastern Canadian coastline

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We assembled a database of Relative Sea Level (RSL) data points from the northeastern coast of Canada (i.e. from the Hudson Bay to the border with the USA). We re-assessed 1095 radiocarbon dated samples following the updated protocols to produce 397 sea-level index and 698 sea-level limiting points from raised beaches, isolation basins, intertidal and marine deposits and archaeological indicators. Our comprehensive and quality-controlled RSL database allowed for the reconstruction of the postglacial evolution of 33 regions of northeastern Canada providing new basin-scale insights into the processes driving RSL changes in the last  $\sim 16$  ka. The combination of a database of sea level index points with an innovative empirical-Bayesian spatio-temporal statistical model provided new insights into rates and magnitude of the spatially-variable GIA which dominated the postglacial RSL evolution in this sector of the North America. A continuous postglacial RSL fall is observed at latitudes  $\geq \sim 50^\circ$  N with higher rates (up to 35 mm a) recorded in the southeastern portion of Hudson Bay. At lower latitudes, the evolution is non-monotonic with a RSL that dropped to a spatially variable early-Holocene lowstand followed by a mid-Holocene highstand and, eventually, by the gradual drop to the present mean sea level. This pattern was observed in the St Lawrence corridor and in part of Newfoundland. At the margin of the former ice-sheet (i.e. New Brunswick, Nova Scotia and eastern Newfoundland), our data delineate a continuous RSL rise, at least through the whole Holocene. These records are marked by a rapid rise of RSL during the early Holocene, with the highest rates in the eastern regions (up to  $\sim 17$  mm a) followed by a significant slowdown in the mid Holocene (average rates  $\leq \sim 9$  mm a). RSL slowed further during the late Holocene, with average rates  $< 2$  mm a. Finally, our database allowed the identification of some regions, like the Labrador coast and part of St Lawrence corridor, where further investigations are required to better constrain RSL evolution and y improve our ability to assess the variability of RSL along the eastern Canadian coast.