A reappraisal of postglacial uplift, south shore of the St. Lawrence estuary, Québec

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The south shore of the St. Lawrence estuary is a non-conforming area in respect to theoretical models of postglacial isostatic recovery or relative sea-level changes. According to models (Quinlan and Beaumont, 1981, 1982; Peltier, 1987), the area considered should have experienced a rapid submergence tied to the ice sheet withdrawal followed by a continued and progressive isostatic uplift. Proposed a decade ago, the theoretical model of Quinlan and Beaumont fitted well with the existing isostatic curves. There was, however, no data available for the period from 9.5 to 2.5 ka, a gap that has been documented since. Presently, field data from many localities (over one hundred ^{14}C dates) indicate (1) a rapid isostatic recovery (85% of the crustal readjustment had occurred by 9.5 ka); (2) a low sea-level (at least 5 m and possibly 10 m lower than today) occurring between 7 and 6 ka; (3) a re-submergence of 8-10 m between 5.8 and 4 ka, followed by a new uplift or lowering of sea-level. The events which occurred in the period 4 ka to present day are not yet entirely clear and fully understood. However, this interval was characterized first by a period of erosion (Micmac cliff) and then by a period of sedimentation (Mitis terrace, ±6 m a.s.l.), dated circa 2,000 years B.P. The new isostatic curve

or relative sea level changes during the Holocene differ from the predicted models. This type of curve shows that a double transgression-regression event is not exclusive to the St. Lawrence estuary for similar curves exist also for areas in Norway, Greenland and Spitsbergen. Therefore, this curve should be taken into account when drawing of future theoretical models of postglacial isostatic coastal recovery or Holocene fluctuations of relative sea level.