Digital Elevation Modelling using relative sea level and deformed shorelines for reconstruction of Late Wisconsinan and Holocene paleogeography of fhe Atlantic Canada and Great Lakes regions

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Isostatic recovery of the earth's crust (lithosphere) during and since retreat of the Laurentide Ice Sheet has resulted in differential uplift of over 250 m over the past 11,000 years in the Great Lakes basin. This uplift continues today. Compiled lake-level data were contoured as isobases and applied as adjustments to digital elevation models (DEMs) of present topography and bathymetry to reconstruct palaeogeography at various times from 11.2 to 7.5 ka BP. The DEMs originate from a series of 30-arc second grids and provide high quality resolution for representation of regional-scale palaeo-terrain. Shoreline migration is easily visualized by comparing successive maps of reconstructed topography. In Atlantic Canada, isostatic rebound, forebulge migration, eustatic sea-level rise, and other effects have resulted in temporal and spatial variations in relative sea level (RSL) during and after retreat of Laurentide and associated glaciers. In this case, the modern DEM was adjusted using two sets of empirical RSL data, which differed with respect to the RSL history of the Baie des Chaleurs region. The reconstructed palaeogeographies of the southern Gulf of St. Lawrence at 9 ka BP contrast greatly. These reconstructions and comparisons in the Great Lakes and Atlantic regions help focus future research in geographic areas where critical observations can be made to improve the understanding of regional-scale postglacial earth history.