Relative sea level changes in Atlantic Canada - observed vs. theoretical

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To date we have obtained relative sea level curves from 14 locations in eastern Canada. We have attempted to cover the broad spectrum sea level environments encountered in a former ice margin area.

Quinlan and Beaumont (1981) have proposed an earth model that would predict relative sea level changes following deglaciation. In an ice margin area such as eastern Canada, they propose 4 sea level "zones": Zone A - emergence only, Zone B - emergence followed by late submergence, Zone C - early emergence followed by submergence, and Zone D - submer-

gence only. These zones are based on movement of a peripheral forebulge resulting when the ice load forced mantle material to the ice margin area. When the ice disappears this forebulge decays in a wave-like fashion causing the above zones with Zone D being the farthest from the ice center and outside the bulge and the other zones occurring progressively inward as the bulge migrates with time inwards.

To translate these zones into what we observe, Quebec, which has experienced only emergence subsequent to deglaciation, is in Zone A. The Zone A-B boundary probably occurs at the Gaspé Peninsula where virtually no change in RSL is presently occurring. Zone B is represented here by S.W. New Brunswick and western P.E.I., and possibly all the curves from the Bay of Fundy - it appears that emerged features occur all around the Bay of Fundy. Zone C is represented by Chebogue, eastern shore (where we have evidence of early emergence), and eastern P.E.I. Sable Island is the only curve we could obtain that represents a Zone D area - most Zone D areas will occur offshore and are therefore difficult to obtain curves for.

Quinlan and Beaumont suggest two possible configurations - a maximum ice model (from Peltier and Andrews, 1976) and a minimum ice model (from Grant 1977). Our observations suggest that neither is correct, with the boundaries occurring between the two limits; however, the maximum model (modified by Quinlan and Beaumont) appears to align most closely with the observations.