

## Structure and tectonic setting of the Port au Port Peninsula, western Newfoundland: Implications for Humber Zone tectonics and Acadian versus Taconian overthrust events

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The Cambro–Ordovician carbonate platform of the Humber zone, western Newfoundland, has traditionally been interpreted as structurally autochthonous to parautochthonous. Our recent reinterpretation of 1970's–vintage offshore multi-channel seismic data (Stockmal and Waldron, 1990, *Geology*, 18, pp. 765–768) coupled with mapping on the Port au Port Peninsula (Waldron and Stockmal, 1991, *CJES*, 28, December) suggests instead that the platform is substantially allochthonous, perhaps on the order of several tens of kilometres. The Appalachian structural front in western Newfoundland, in the vicinity of the Port au Port Peninsula and the Bay of Islands, is characterized by a triangle zone or tectonic wedge of “Acadian” (post–Pridolian) age. Transported rocks within the triangle zone include rocks of the Humber Arm Allochthon, remnants of the Middle Ordovician clastic foreland succession, the Cambro–Ordovician platform succession, and crystalline Grenvillian basement. Our interpretation of the structural geology of Port au Port Peninsula has been aided substantially by the construction of six serial cross sections, constrained in part by the limited

marine seismic data set. Our preferred interpretation involves: (1) relatively early Taconian normal–sense reactivation of a major Iapetus rift-phase(?) basement–cutting east–dipping normal fault and associated antithetic faults; (2) emplacement of the Humber Arm Allochthon above the resultant half–graben which was infilled with Goose Tickle Group foreland clastics; (3) Acadian thrust–sense reactivation of the major normal fault with concomitant development of a structural triangle zone at the active deformation front; (4) eastward “out–of–sequence” stepping of the triangle zone upper detachment; and (5) relatively minor normal and strike–slip dismemberment along probable Carboniferous faults. The implied duplication of the passive margin succession and its underlying basement is apparently consistent with the recently acquired Lithoprobe East Vibroseis data set. By virtue of known stratigraphic and structural relationships between the carbonate platform and the southern edge of the Long Range massif, a substantially allochthonous platform succession implies a substantially allochthonous Long Range Inlier.