Alpine glaciation in Nova Scotia and Newfoundland: Who'd a thought?

Gerald D. Osborn[1], Ian S. Spooner[2], and Douglas H. Clark[3]

1. Department of Geology and Geophysics, The University of Calgary, Calgary, AB T2N 1N4, Canada <osborn@geo.ucalgary.ca> ¶ 2. Department of Geology, Acadia University, Wolfville, NS B4P 2R6, Canada <ian.spooner@acadiau.ca> ¶ 3. Department of Geology, Western Washington University Bellingham, WA 98225 U.S.A. <Doug.Clark@wwu.edu>

Alpine glacial features have long been known to exist in the highlands of Cape Breton Island and western Newfoundland; however, little is known of their age or mode of formation. A study of these features underway will attempt to address some of the issues noted below. In Gros Morne National Park, lateral moraines, rock glaciers, cirque tarns, and cirque moraines have been noted in guidebooks and regional maps. Preliminary investigations in 2001 indicated that these features are more complex than previously thought. In the Trout River Gorge an irregular bench previously mapped as a lateral moraine modified by rock glacierization may not be. The clasts at the level of the alleged moraine are angular, unstriated, and entirely or almost entirely of local lithologies; it is at least as plausible that all the debris lining the valley side is derived from rockfall on the higher slopes, reworked in places by rock glacierization. Lobate forms, most prominent below the Punchbowl cirque moraine and in the Penman's Brook drainage, have been described variously as rock glaciers and gelifluction lobes in guidebook articles. The features are probably fossil valley-wall rock glaciers possibly fed by snow/debris avalanches more snow-rich in early Spring and more debris-

rich into the Summer. Depressions behind terminal ridges suggest that rock glacierization was not entirely due to interstitial ice. The Punchbowl Cirque moraine has generated much interest and has been variously suggested to be Little Ice Age (LIA), Neoglacial, or "?Late Wisconsinan" in age. Headwall weathering and thickness of colluvium suggest a pre-LIA age. A pre-LIA Neoglacial age is conceivable, but Neoglacial moraines apparently do not occur in isolation from LIA moraines in the closest alpine area in which such moraines have been mapped, the Torngat Mountains of Labrador. The moraine could be latest Pleistocene in age, but that interpretation conflicts with other interpretations that ice extended to the coast at about that time. This moraine is a good candidate for cosmogenic dating.

Cirques, tarns, and cirque moraines have been previously identified in the Codroy Valley, southwestern Newfoundland; however, their age is not well established. In the Cape Breton Highlands, Nova Scotia, cirques are also common and have been described as late Wisconsinan in age. The headwalls of these cirques have been deeply incised by stream erosion, unlike late Wisconsinan cirques in western mountain ranges, which may indicate that the cirques are older than previously thought. This study demonstrates that further work, including lake coring, is required to better understand these features and place them in context with existing models of regional glaciation.