Barrier overwash and washover sedimentation Aspy Bay, Cape Breton Island

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Storm overwash is an important process affecting the modern Aspy Bay barrier system and washover sediments form a major component of the barrier deposit. Overwash occurs as a unidirectional episodic nonuniform surge when wave uprush overtops the berm. Due to rapid infiltration, many overwash flows do not reach the lagoon; however, interstitial or surface ice in winter may prevent infiltration, increasing the frequency and extent of overwash. Where extensive overtopping occurs, washover transport forms sheet-like deposits; elsewhere the overwash is laterally confined and the washover sediments form channel fills terminating in thin fans or deltas. Although the distribution of washover channels on the 4-km barrier fronting North Aspy Pond remained essentially fixed over a 3-year interval 1966-1969, major changes in the location and morphology of washover features occurred between each of four sets of air photos taken in 1939, 1947, 1953 and 1966. The proportion of total barrier length subject to overwash remained relatively constant at 46-52% over the 30-year interval spanned by the photographs. Scour-fill sequences were monitored in two washover channels during October-November 1981 to determine the relative importance of overwash and wind transport. Reworking of washover sediments by strong winds directed both on- and offshore was not a significant factor in the evolution of the channels during the study period. On the other hand gravel lag deposits in some areas of the barrier backshore are attributed to aeolian deflation of washover sediments. Four storms during the 2-month field program generated overwash scour and fill events that resulted in deposition of composite distal-thinning washover units with a maximum observed thickness of 263 mm. Washover sediments are predominantly subparallel-laminated sands dipping 1.5–1.9° toward the lagoon. The thickness of individual sedimentation units ranges from order 10^0 to 10^1 mm. Some units appear to exhibit inverse textural grading consistent with a grain-flow transport process. Small inbri-

cate groupings and isolated clasts of pebble- and cobble-size material are common but not abundant in the washover sands. Critical boundary shear stress for the coarsest particles if of the order of 10^1-10^2 N m^{-2}, allowing for an overloose condition at entrainment. Extreme distal washover deposits include planar cross-stratified foreset sand units up to 200 mm thick. It is assumed that primary structures of washover fans deposited on winter ice in the lagoon are not preserved in the final deposit after breakup.