

## **Embayed gravel coastlines of southeastern Newfoundland: climate variation, geomorphic response, and management issues**

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Much of the coastline of southeastern Newfoundland is marked by embayments fringed with gravel deposits formed under high- to moderate-energy conditions. Although the Newfoundland economy and culture revolve around these embayments, the geomorphic response to environmental variation has not been extensively studied.

Distinctive styles of gravel coastline develop in embayments subject to different environmental conditions, particularly variations in wind activity, precipitation, and landfast seasonal ice formation. Shorelines of open embayments are markedly shore-parallel currents, producing large gravel cusps and longshore drift. Conditions vary between reflective and dissipative along these shorelines, dependent largely upon environmental variations. Interference with coastal facilities, and blockage of river outlets used by

migrating salmonids, results from shore-parallel sediment movement combined with fluctuations in fluvial discharge. In contrast, narrow and deep embayments are dominated by shore-normal transport, reflective conditions, and limited return flow to the open ocean. Cuspate structures are elongated normal to the shoreline. Locally-induced pollution tends to remain within the confines of these embayments.

Coastal management is extremely limited in Newfoundland. A lack of understanding and interest in the environmental and geomorphic factors involved in shaping the coastline, combined with jurisdictional uncertainty among levels of government and a failure to formulate comprehensive coastal management policies at all levels, has resulted in environmental problems at several locations.