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**A conceptual model of horse mussel reef  
formation, Bay of Fundy, Canada**

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Horse mussel reefs (bioherms) in the inner Bay of Fundy continue to be the focus of study. Research indicates that populations grow fastest on sand with bioherms, closely followed by those growing on gravel/scallop bed; the slowest growing are found on gravel/cobble and mottled gravel geological provinces. Multibeam bathymetric and backscatter data have been collected in an area of mussel reefs in the central part of the Bay where they were first discovered. The data indicates that the mussel reefs largely occur on the eastern side of small glacial ridges of the seabed and form a variety of single and multiple, long and short reefs that rise above the seabed up to 3 m high. They are associated with sand in transport at the seabed in a variety of bedforms. A conceptual model of formation and location has been developed that considers sediment transport, current velocity and turbulence, well-mixed water masses, seabed morphology, and sediment distribution.

The presence of limited amounts of sand in transport as well as the location of minor morphological features (glacial till ridges) is critical for reef formation. As the horse mussels become gradually surrounded by sand, upward growth is promoted and successive generations of horse mussels build on top of the older and dead shells. The location of the reefs on the east side of the ridges results from ridge vortices that are formed during flood conditions on the eastern side as spiral vortices with horizontal axis. This provides increased seston to the back ridge regions with associated lower velocity water flows that would encourage the formation of the horse mussels reefs.