

Quaternary Stratigraphy and Placer Gold Potential of the Inner Scotian Shelf¹

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Abstract

Glacier erosion and deposition during the Pleistocene and sea level change during the Holocene produced a diverse array of landforms and sediments on the inner continental shelf of Nova Scotia. Channels and valleys adjacent to bedrock highs can be used as targets for gold exploration in the marine environment. Gold was discovered in a valley complex off Taylor Head. Visible gold was separated from several grain size fractions by a hydraulic technique. One analysis of the -0.063 micron fraction showed concentrations of 274 ppb Au.

The depositional setting off Taylor Head is similar to placer discoveries from the 'Dome' area off Country Harbour. These two valley systems have a similar stratigraphy and occur in the inner shelf to depths of 80 m. At their base, acoustic basement (Meguma Group bedrock) is overlain by a transparent, but massive acoustic unit (Unit 1) believed to be till. Unit 2, the main valley fill unit, may have a ponded or conformable depositional style, and in some areas appears to be a remnant of the Emerald Silt, a glaciomarine deposit formed during ice retreat. This unit is truncated by an unconformity which merges with incised valleys in shallower water and may represent the low-stand erosional surface. This unconformity is overlain by two landward-thickening, wedge-shaped units equivalent to the Sable Island Sand and Gravel.

Glacial erosion of lode-bearing bedrock highs during the last glacial maximum, and deposition of the resulting debris, produced an auriferous till in valleys and adjacent interfluves. Further deposition of gold-bearing debris into troughs and valleys may have occurred as proglacial meltwater plumes formed the Emerald Silt. During the Holocene transgression, gold-bearing glacial sediments in valley bottoms were redeposited in barrier systems.

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