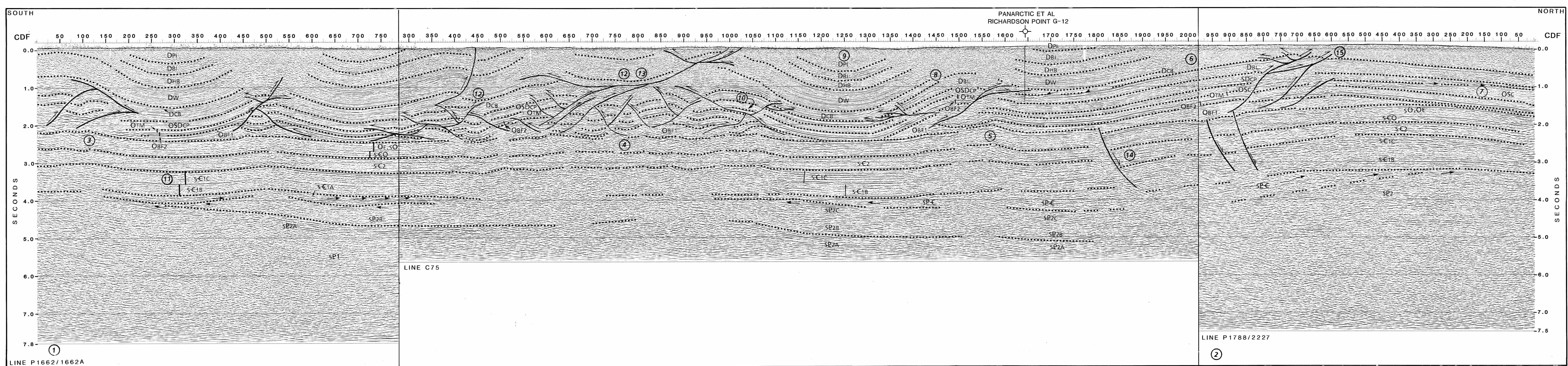
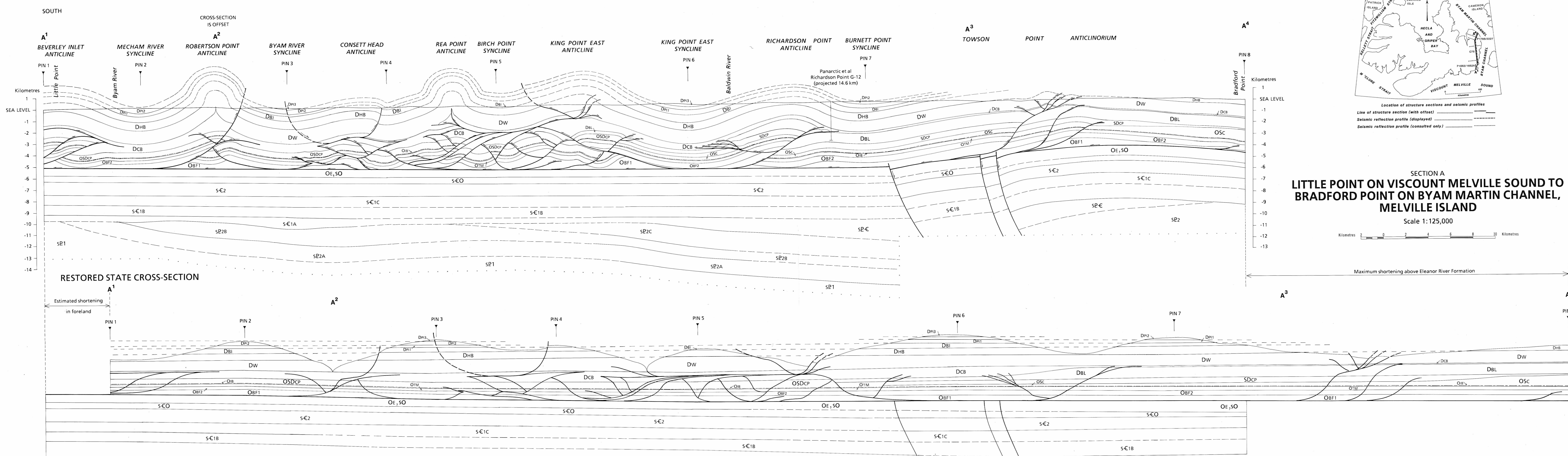


INTERPRETED SEISMIC DATA

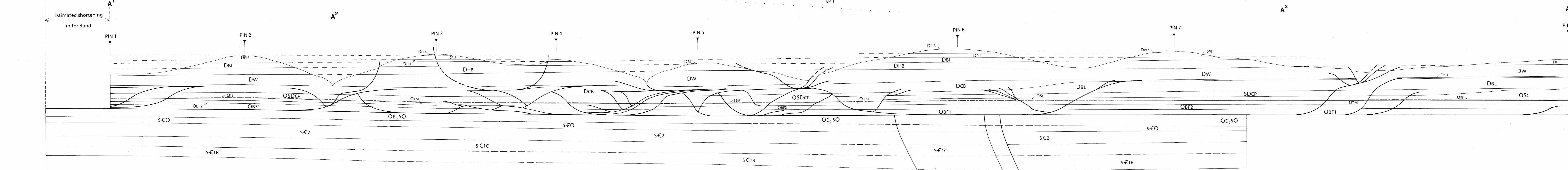


Number on structure sections refers to accompanying marginal notes

DEFORMED STATE CROSS-SECTION



RESTORED STATE CROSS-SECTION



NOTES TO ACCOMPANY SECTION A
 (Seismic lines P1662/1662A, C75, and P1788/2227)

Acquisition and Processing

- Lines P1662 and P1662A have been blended after stacking and before migration. Renumbering of CDF traces was executed after blending. The blend intersection is at CDF 530.
- Lines P1788 and P2227 have been blended after stacking and before migration. Renumbering of CDF traces was executed after blending. The blend intersection is at CDF 585.
- Diffractions at the south end of line P1662/1662A were not entirely eliminated by time migration. Line of section is 20° away from orthogonal to structure.
- Break-up of reflectors below 2400 ms and between CDF 1075 and CDF 400 of line C75 is attributed to large lateral velocity variations and complex structure higher in the section.
- There are 250 ms of residual velocity pull-up below the top of the Eleanor River (O₁) reflector at CDF 1575, line C75. Regional apparent dip is to the south below the Bay Fiord (O₁). Over migration hyperbolae are also present in this area and become increasingly prominent deeper in the section.
- Reduced data quality extending from surface to depth between CDF 1925 and 2025, line C75, is attributed to a 50% reduction in the fold of the stacked traces.

Seismic Stratigraphic Features

- An example of hummocky and chaotic internal reflection character occurs in unit O₂ on line P1788/2227 north of CDF 575. Onlapping reflections mark the overlying transgressive base of unit SDC₁. The internal patterns of unit O₂ are interpreted to be generated by an organic build-up of basin edge carbonates of Silurian and/or Upper Ordovician age. The carbonates are interpreted to pass laterally into basinal and basin slope deposits immediately to the south of this location.
- The Blue Fiord (D₁) thins dramatically in a southerly direction between CDF 1525 and CDF 1250 on line C75. The thickness of the overlying Cape De Bray Formation (DC₁) and the height of the clinoform reflectors in the Cape De Bray increases to the south in the same area. The thinned portion of the Blue Fiord is interpreted to have been deposited on the local basin slope. The Cape De Bray has subsequently prograded into and filled the basin. Maximum paleowater depth is readily calculated.
- An excellent example of the seismic character of the Devonian clastic wedge, including all formations from the Cape De Bray to Parry Islands formations, occurs between CDF 1125 and 1450 on line C75.
- The medial reflection typical of the upper Bay Fiord interval (O₁) is absent in the overthrust structure between CDF 975 and 1075, line C75.
- Unit S₁ is nearly reflection free along line P1662/1662A. Continuous parallel reflections increase progressively in the unit to the north along the line of section. In contrast unit S₁ and S₂ are more extensively reflection free.

Structural Features

- Thrust ramps have apparently occupied bedding plane clinoforms in the Cape De Bray Formation (DC₁) at three locations on line C75. The topset strata represent an upper detachment level.
- The near surface syncline beneath CDF 650 to 850, line C75, marks an unusual number of thrusts and complex geology below the Cape De Bray Formation (DC₁). The importance of the Cape De Bray as a zone of ductile flow is well defined along much of line C75, CDF 275 to 1150.
- An extensional growth fault can be interpreted in unit S₁ near CDF 1850, line C75. Alternatively, thickening of S₁ could arise from lateral movements on this steeply-dipping fault.
- Faults are common at the surface between CDF 600 and 800 on line P1788/2227. Kinematic data indicate that both thrusts and sinistral strike slip faults are present within the Blue Fiord (D₁).

Depth Conversion

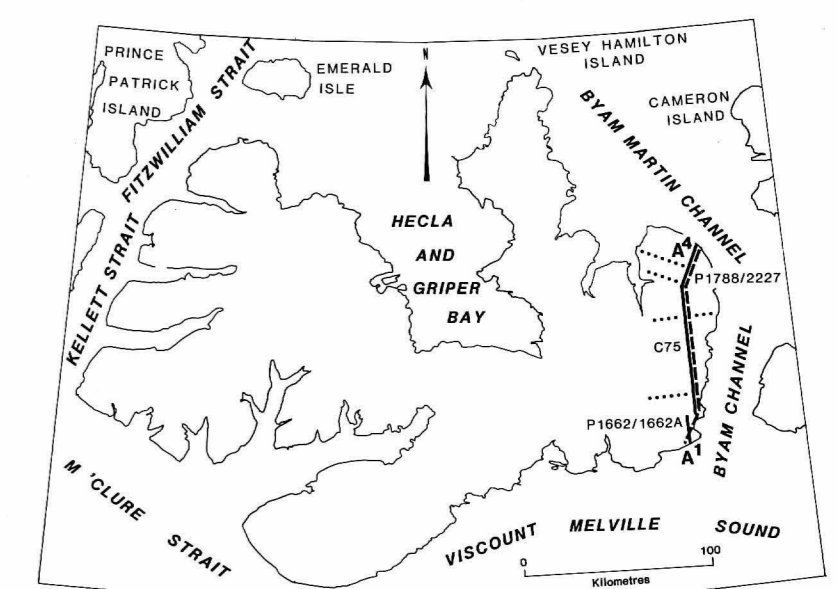
- D₁: 3.3 km s⁻¹ (south) to 3.6 km s⁻¹ (north)
 D₂: 4.3 km s⁻¹
 D₃: 4.2 km s⁻¹
 D₄: 3.9 km s⁻¹
 OSD₁: 5.0 km s⁻¹ (south) to 5.7 km s⁻¹ (north)
 O₁, O₂, O₃, OSD₂: 6.1 km s⁻¹ (south) to 5.0 km s⁻¹ (north)
 O₄, O₅: 6.4 km s⁻¹
 O₆: 5.3 km s⁻¹
 S₁-O₁: 5.7 km s⁻¹
 S₁-O₂: 6.2 km s⁻¹

Method of Cross-section Construction and Restoration

Bed length measurement and balancing of the contacts above O₁, O₂, O₃, O₄, O₅ and OSD₁ between pairs of adjacent pin lines.
 Bed length measurement of the contacts above O₆ and D₁.
 Area measurement and restoration of O₁, D₁, D₂, D₃, D₄, and D₅ between pairs of adjacent pin lines. This method assumes that horizontal shortening of units O₁, D₁, and D₂-D₅ is the same as that expressed by bed lengths of contacts above O₁-OSD₁.

Results

Section length: 106.1 km
 Bed length of O₁ (this section): 128.8 km
 Shortening of O₁ (this section): 128.8 - 106.1 = 22.7 km (17.6%)
 Estimated shortening in foreland*: 5.7 km
 Total shortening of O₁ from foreland: 22.7 + 5.7 = 28.4 km (11.1%)
 Bed length of O₂ (this section): 106.1 km
 Shortening of O₂ (this section): <0.1 km
 Estimated shortening in foreland*: 1.9 km
 Total shortening of O₂ from foreland: <0.1 km
 Deformed state bed length of D₁: 113.3 km
 Apparent shortening of D₁ (this section): 113.3 - 106.1 = 7.2 km (6.3%)
 Estimated apparent shortening in foreland*: 1.9 km
 Total apparent shortening of D₁ from foreland: 7.2 + 1.9 = 9.1 km (8.1%)
 Range of assumed tectonic thickening of D₂-D₅ (approximate): 10 - 23%
 *Foreland shortening is carried over to this section along the axial trace of Liddon Gulf Syncline from pin line 2 on Section C.



SECTION A
LITTLE POINT ON VISCOUNT MELVILLE SOUND TO
BRADFORD POINT ON BYAM MARTIN CHANNEL,
MELVILLE ISLAND
 Scale 1:125,000

Maximum shortening above Eleanor River Formation

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