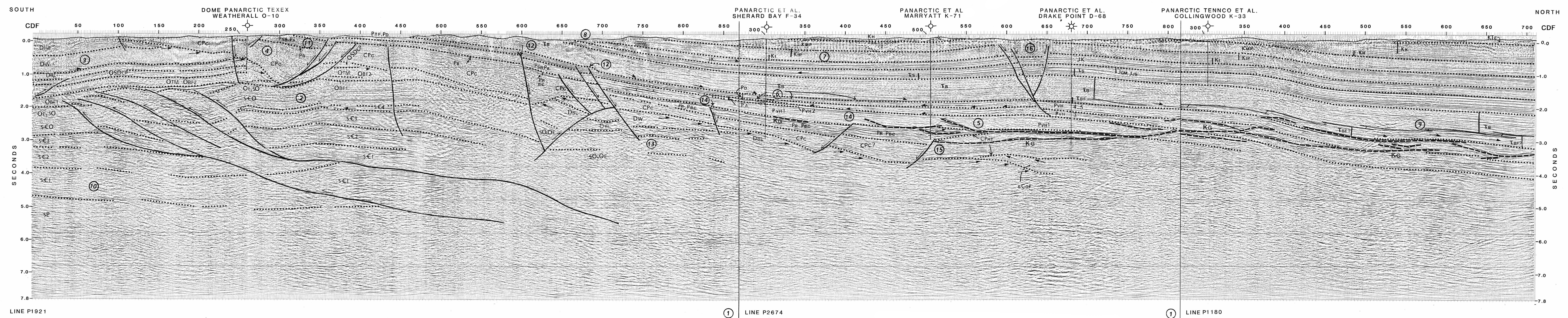
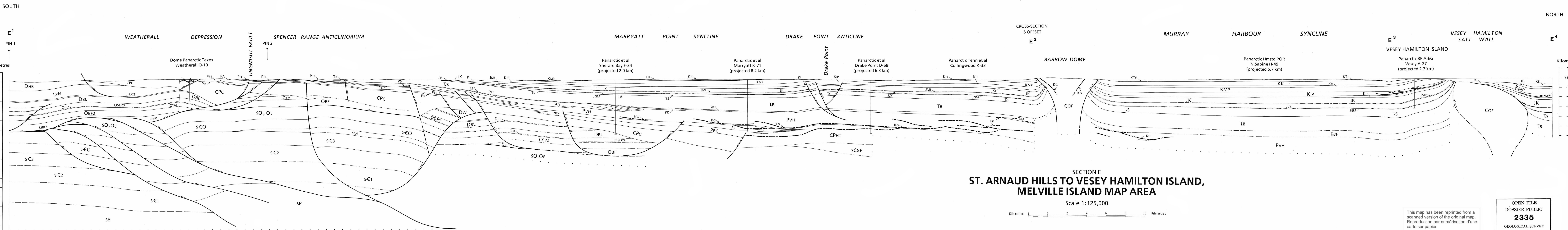


INTERPRETED SEISMIC DATA



Number on structure sections refers to accompanying marginal notes

DEFORMED STATE CROSS-SECTION



SECTION E
ST. ARNAUD HILLS TO VESEY HAMILTON ISLAND,
MELVILLE ISLAND MAP AREA

Scale 1:125,000

NOTES TO ACCOMPANY SECTION E
(Seismic lines P1921, P2674 and P1180)

Structural Features

- Although not apparent on this part of line P1921 (CDF 0 to 250) evidence of normal faulting is more obvious in this area and at this stratigraphic level on the adjacent portion of Section D (line P2185).
- Units thickness variations across the faults beneath CDF 350 and 360, line P1921 imply fault motion during deposition of (1) the CPC interval, (2) the Pst and Pst interval, and (3) probably the lower Pst and Pst interval.
- Evidence of growth faulting occurs within the Po and Pst (Degerbols and Trolld Fiord) interval at CDF 600 and between CDF 655 and 680 on line P1921. The fault below CDF 680 also displays growth in the Pst and Pst (Galine Bay and Assistance) interval.
- The strong discontinuous subhorizontal reflectors at 2300 to 3200 ms between CDF 675 and 685, line P1921, could be due to either stratigraphic impedance contrasts or impedances generated by igneous sills that are known at the same depth in younger strata to the north (see also note 15).
- Evidence of growth faulting in the lower Van Hauen (Pst) interval is found below CDF 835, line P1921, and below CDF 410, line P2674. (See also note 12.)
- Evidence of growth faulting in the Belcher Channel (Pst) and Raanes (Pst) intervals is apparent beneath CDF 510, line P2674. Intrusive sills act as prominent reflectors in this area within and beneath the lower Van Hauen Formation (Pst). The sills have intruded the upper members of the Van Hauen Formation (Pst to Pst) further north on the line of section. The elevated reflectivity of these sills has prevented penetration of deeper primary signal.
- The faults found below CDF 585 to 655, line 2674, have not been recognized at the surface. Likewise they appear to terminate down-section in the Van Hauen Formation (Pst).

Depth Conversion

- Kt: 2.1 km s⁻¹
- Ki: 2.2 km s⁻¹ (south) - 2.6 km s⁻¹ (north)
- Kst: 1.9 km s⁻¹ (south) - 2.7 km s⁻¹ (north)
- Kp: 2.3 km s⁻¹ (south) - 3.4 km s⁻¹ (north)
- Kc: 2.6 km s⁻¹ (south) - 3.2 km s⁻¹ (north)
- Jk: 2.8 km s⁻¹ (south) - 3.6 km s⁻¹ (north)
- Jst: 2.8 km s⁻¹ (south) - 3.3 km s⁻¹ (north)
- Ts: 3.6 km s⁻¹ (south) - 4.4 km s⁻¹ (north)
- Tb: 2.4 km s⁻¹ (south) - 3.8 km s⁻¹ (north)
- Tu: 4.1 - 4.6 km s⁻¹
- Pst: 4.4 - 4.6 km s⁻¹
- Pst: 3.4 km s⁻¹
- Pst: 4.1 km s⁻¹ (south) - 4.8 km s⁻¹ (north)
- Pst: 3.2 km s⁻¹
- Pst: 4.8 - 5.0 km s⁻¹
- Cpc: 3.7 km s⁻¹ (south) - 5.6 km s⁻¹ (north)
- Dst: 3.6 km s⁻¹
- Dst: 4.0 km s⁻¹
- Dst: 5.8 km s⁻¹
- Ost: 5.3 km s⁻¹
- Ost: 6.4 km s⁻¹
- Ost: 5.3 km s⁻¹
- sc: 5.7 km s⁻¹
- sc: 6.2 km s⁻¹

Method of Cross-section Construction and Restoration

Bed length measurement and balancing of the contacts above Ost¹, Ost², Ost³, and Ost⁴ between pin lines 1 and 2.

Bed length measurement and balancing of the contacts above sc¹, sc², sc³, and sc⁴ between pin lines 1 and 2.

Area measurement and restoration of Ost¹. This method assumes that horizontal shortening of Ost¹ is the same as that expressed by bed lengths of contacts above Ost¹-Ost⁴.

Results

Section length (pin 1 to pin 2 only): 27.0 km

Post-orogenic extension: 3.1 km

Pre-orogenic section length: 23.9 km

Bed length of Ost (this section): 24.8 km

Shortening of Ost (this section): 24.8 - 23.9 = 0.9 km (3.6%)

Estimated shortening in foreland: 18.0 km

Total shortening of Ost from foreland: 18.0 + 0.9 = 18.9 km (8.0%)

Bed length of Ost (this section): 31.4 km

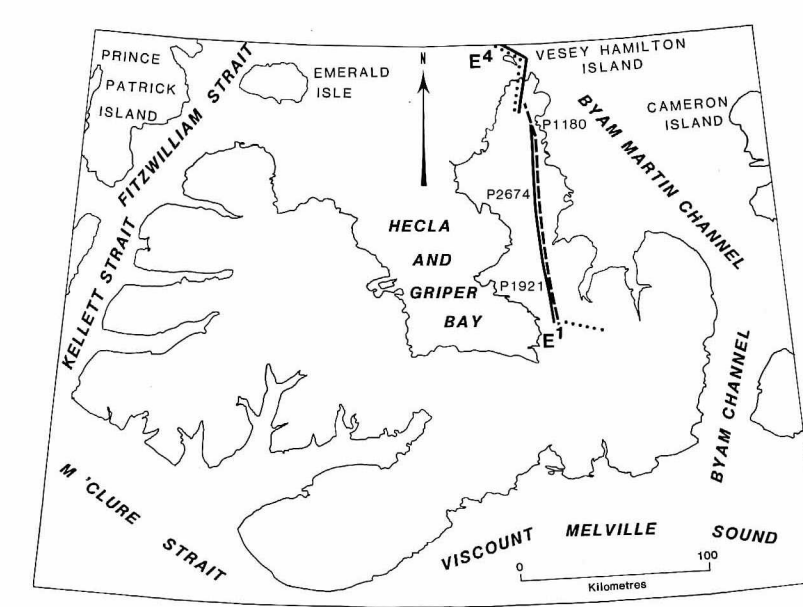
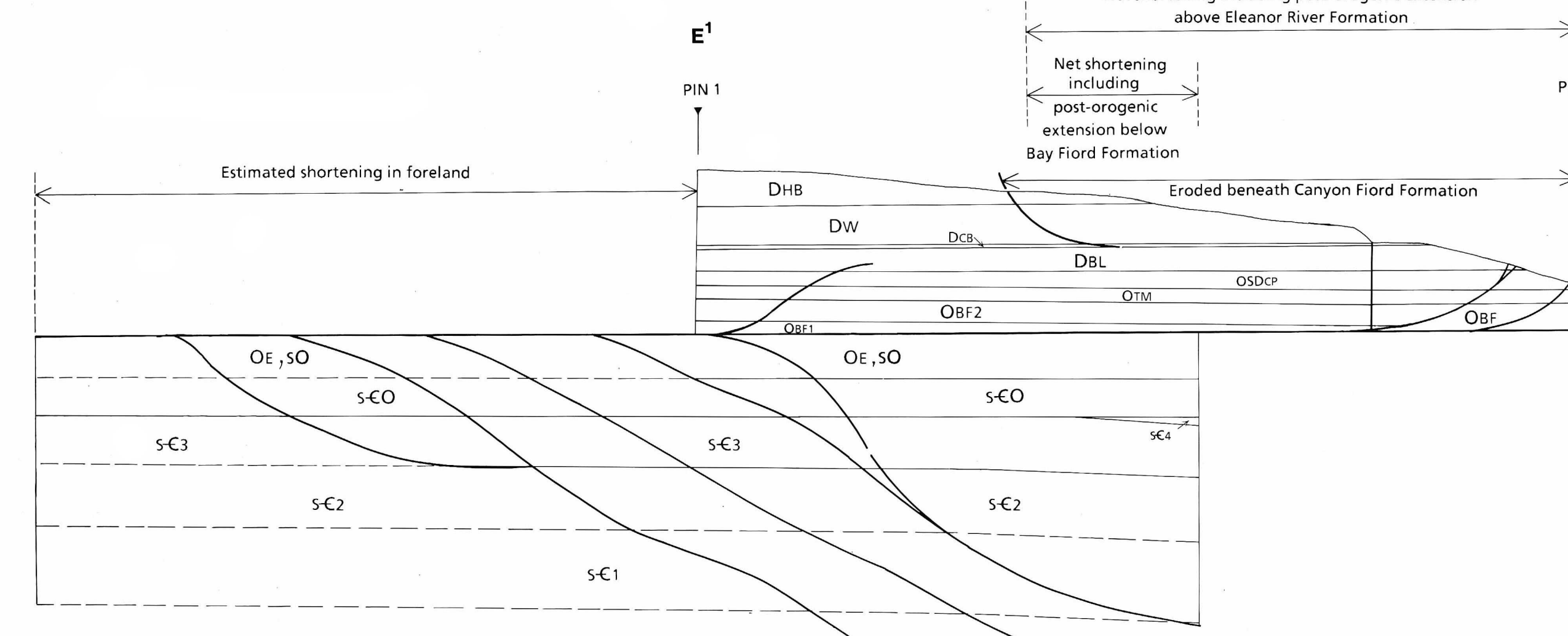
Shortening of Ost (this section): 31.4 - 23.9 = 7.5 km (23.9%)

Estimated shortening in foreland: negligible

Total shortening of Ost from foreland: 7.5 km

*Foreland shortening is carried over to this section from pin line 8 on Section D.

RESTORED STATE CROSS-SECTION



Acquisition and Processing

- All seismic lines along the section intersect at each of the physical splice points.
- The seismic interval at 1500 to 2300 ms north of CDF 200, line P1921, is only tentatively correlated with units sc³, sc⁴ and Ost¹. Unlike the equivalent interval to the south, these units are dominated by mildly divergent internal reflections. Onlap patterns at the base are associated with the basin marginal limit of unit sc⁴ (see also note 11, Section I).
- Onlapping reflections occur above the Blue Fiord (Dst) interval below CDF 50, line P1921. These patterns are associated with the transgressive Cape De Bray Formation (not shown) which in this area is a marker unit less than 100 m thick.
- Divergent reflections are associated with the Canyon Fiord (Cpc) interval between CDF 240 and 360, line P1921. Other examples occur basinward on this section. This reflection pattern, associated with one or more bounding listric faults, is evidence of sedimentation synchronous with faulting. The thick development of low velocity CPC strata in this area has caused a 200 ms velocity sag of all reflections below the top of the Eleanor River Formation (Ost).
- A strong reflection assemblage is associated with the Belcher Channel (Pst) and Raanes (Pst) formations. These two units reach their maximum thickness near the Marraytt K-71 well (CDF 506, line P2674). The units terminate down dip by apparent topographic truncation beneath the lowest member of the Van Hauen Formation (unit Pst¹). The truncation could be tectonic. Alternatively, the truncation may be an apparent one produced at the depositional limit of shallow marine carbonates where they pass laterally into an age equivalent basinal condensed interval.

Seismic Stratigraphic Features

- The seismic interval at 1500 to 2300 ms north of CDF 200, line P1921, is only tentatively correlated with units sc³, sc⁴ and Ost¹. Unlike the equivalent interval to the south, these units are dominated by mildly divergent internal reflections. Onlap patterns at the base are associated with the basin marginal limit of unit sc⁴ (see also note 11, Section I).
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