Verrill Canyon Formation

Verrill Canyon equivalent Formation is reached in East-Wolverine and consists primarily of grey to brown calcareous shale with few thin beds of limestone, siltstone, and sandstone. Verrill Canyon Formation is deposited in prodelta, outer shelf and continental slope settings. This shale dominated unit last through the Early Cretaceous and represents the distal equivalent of the Mohawk, Abenaki, Mic Mac, and Missisauga Formations.

Hydrocarbon occurrence: HC accumulations (oil and gas) are observed in carbonates in top Abenaki limestone in Heron; Near J147 and 137 unconformities in East-Wolverine (Figures 7; PL 4.3.1 to 4.4.2)

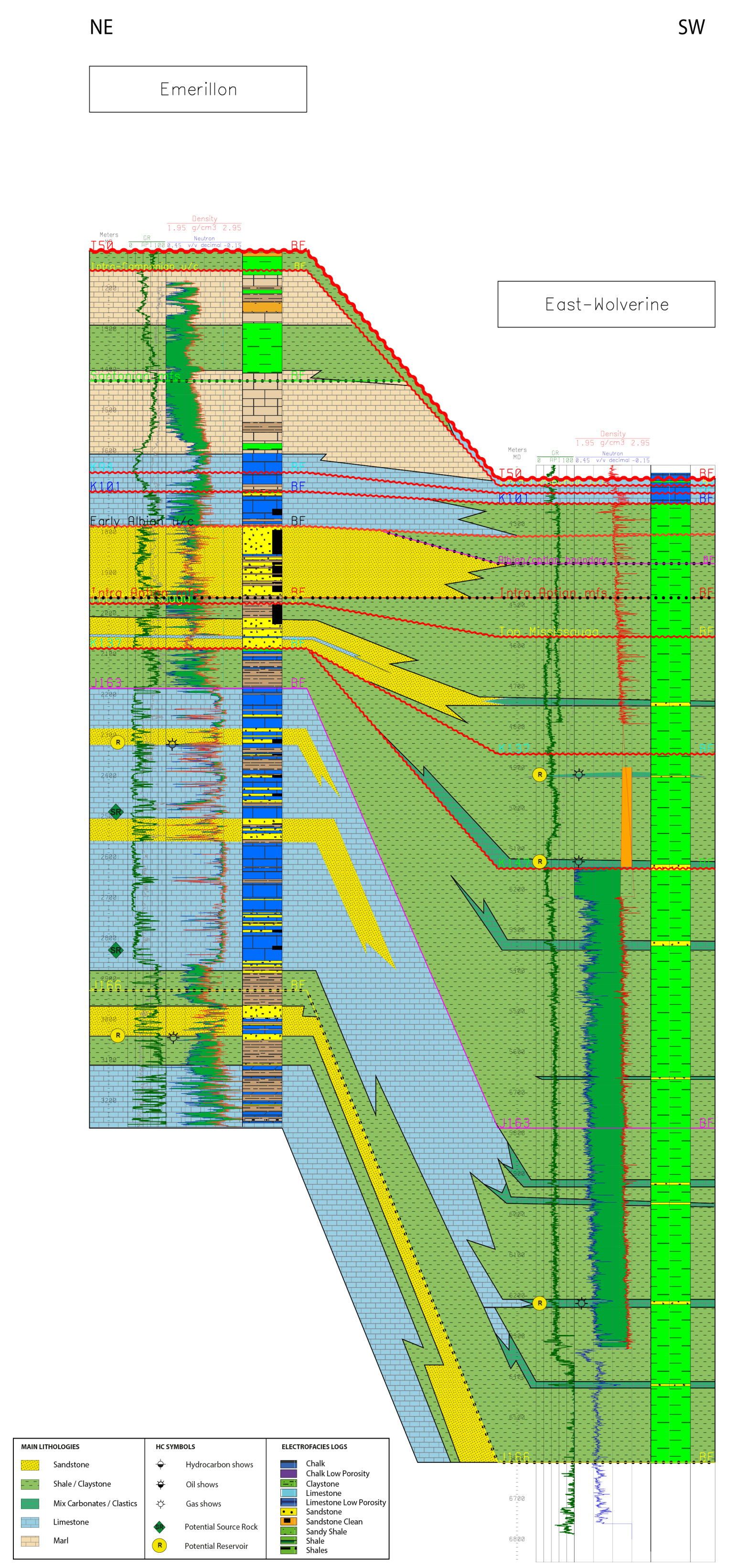


Figure 7: Correlation between Emerillon and East-Wolverine wells for the Jurassic and Cretaceous intervals showing the upslope downslope of sedimentary successions. For the Jurassic period, Emerillon sedimentary records correspond to the Abenaki succession and East-Wolverine records correspond to Verrill Canyon Fm

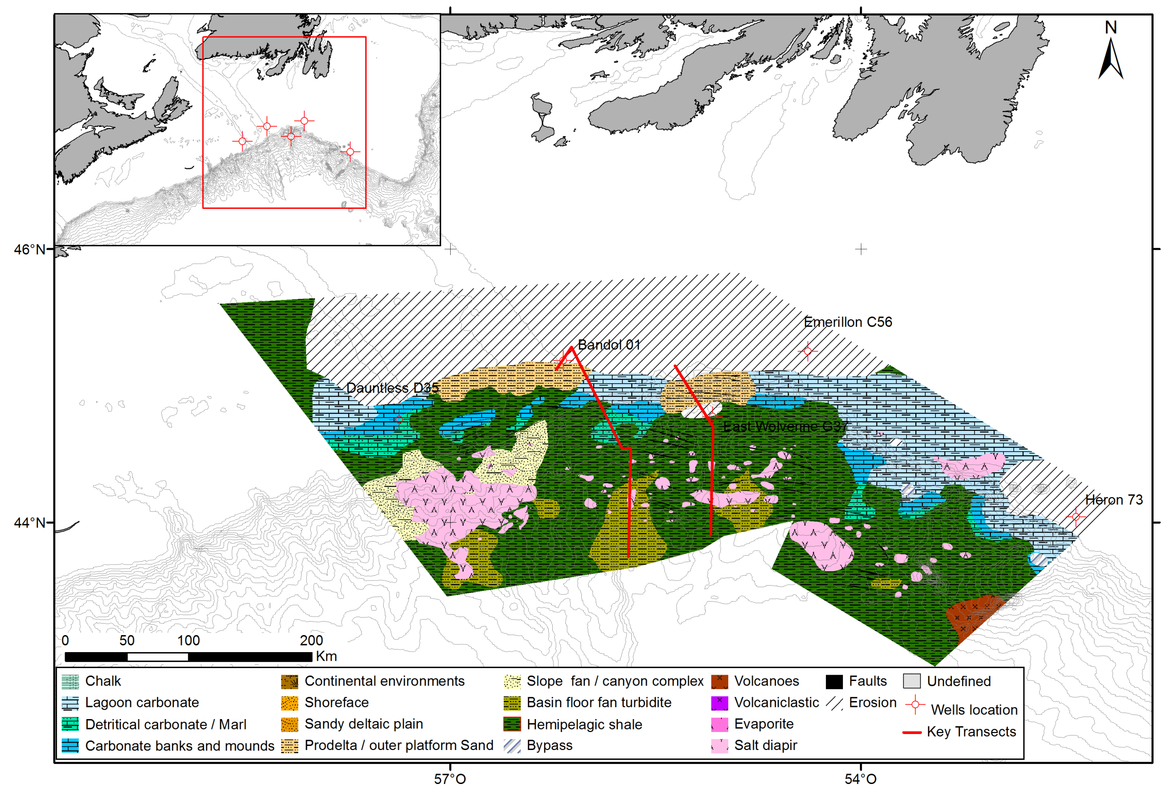


Figure 8: Gross Depositional Environment Map at J150

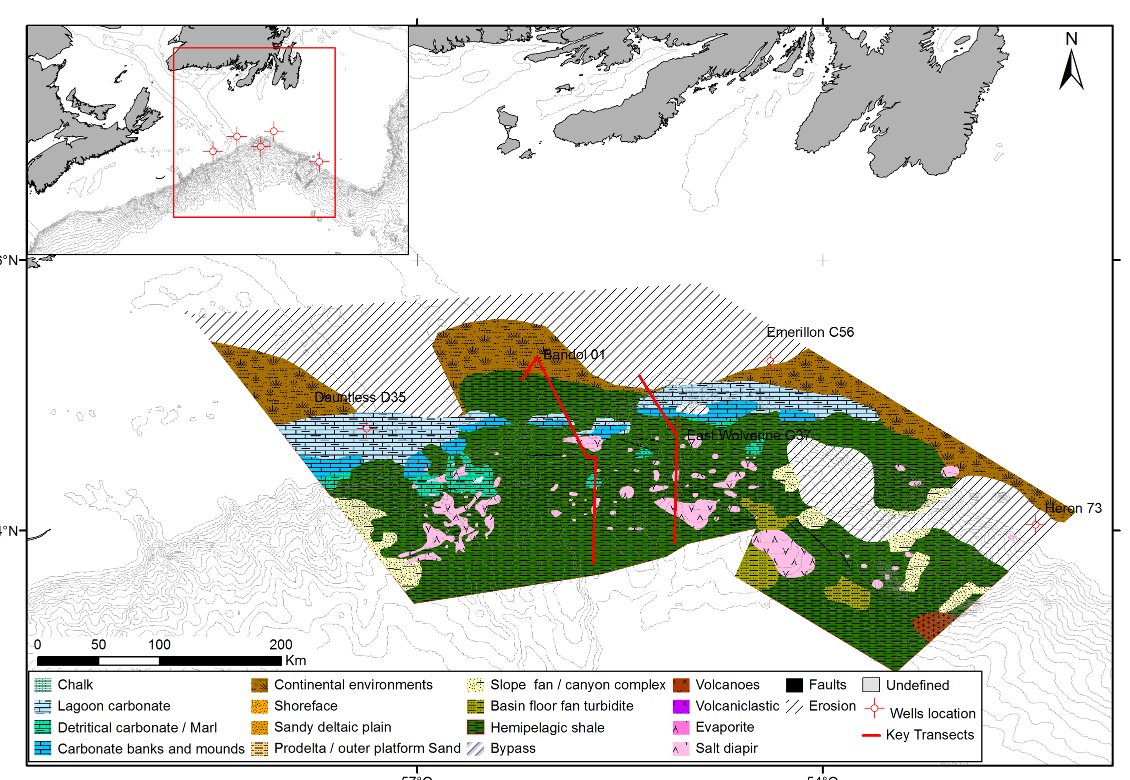


Figure 9: Gross Depositional Environment Map at K137 (Avalon Unconformity)

Avalon Unconformity

During the late Jurassic a second breakup episode occurred on the eastern Canadian margin related to the separation of Iberia and The Grand Banks. The associated uplift called Avalon Uplift developed beneath the Grand Banks and led to extensive erosion of Jurassic and older sediments. The resulting unconformity is called the Avalon Unconformity (Jansa and Wade, 1975; MacLean, et al., 1989; Wade and MacLean, 1990). The event is well recorded across the margin from Jeanne d'Arc Basin down to Scotian basin.

In the South Whale Basin the Avalon uplift stage induces a massive erosion of upper Jurassic sequences and a drastic reduction of accommodation space coupled with a tipping of sediment source northward. The impact of the Avalon uplift decreases to the Scotian Basin where more series are preserved (Figure 9; PL 4.3.1 to 4.4.2). In the Laurentian Basin, the Avalon uplift induced a significant erosion of the top Jurassic and additionally rerouted the ancestor Laurentian river to the west-southwest leading to the development of the Missisauga Fms.

Early Cretaceous Sequence (Berriasian - Barremian) J147-K130

The early Cretaceous period corresponds to the separation of Newfoundland from Europe which is at the origin of the Avalon uplift and subsequent unconformity. Both seismic and well data show a southward attenuation of the angular unconformity until Sable sub-basin where it is not visible in the lower Cretaceous strata (Wade and MacLean, 1990, PFA, 2011). This geological interval is characterized by the development of thin sandy interval to the West-Southwest and even thinner sandy units to the east-northeast corresponding to the Missisauga eq Fm (Figure 10; PL 8.4 and 8.5). Downslope deposits correspond to the upper Verrill Canyon eq Fm. This thin lower Cretaceous sequence ends with the Hauterivian MFS (K130)..

Identification

- Number of exploration wells reaching the lower Cretaceous fm: 4 wells (PL. 4.3.1 to 4.4.2; Enclosure 4.12 to 4.15)
- Formation/Members: **Missisauga** and **upper Verrill Canyon** eq Formations.
- Age:
  - Top lower Missisauga: **Berriasian (J147/K137)**
  - Middle Missisauga: **Valanginian-Hauterivian MFS (K137-K130)**
  - Top middle Missisauga: **Intra Hauterivian MFS (K130)**
- Regional top sequence seismic horizon: Intra Hauterivian MFS (**K130**).
- Chronostratigraphic cross-sections (PL. 4.3.1 and 4.4.1).
- Lithostratigraphic cross-sections (PL. 4.3.2 and 4.4.2); Geological Composite Well Logs (Enclosures 4.12 to 4.15).
- Architectural cross-sections (PL.4.51 to 4.5.4).

Description

Missisauga and upper Verrill Canyon eq Formation

In the Laurentian Basin the Missisauga Fm is not as well represented as along the Scotian margin. Missisauga Fm thickness varies significantly from South Whale basin to Sable Basin with a southward thickening trend (Figure 10; PL 8.4 and 8.5). This lateral variability correlates with the crystalline basement uplift which provides coarse-grained fluvio-detaic sediments (Pe-Piper & MacKay, 2006). Resulting sedimentary formation comprises fluvial, deltaic sands and derivative shelf sediments up to the shelf edge.

Basinward, canyons and valleys incise the slopes and basin-floor fan systems develop on the rise (Steel et al, 2003). Sediment distribution is controlled by canyon location and morphology, tectonic impact on topography and salt tectonic (Figure 9). No carbonate has been encountered for this interval in any of the wells used in the present PFA. Nevertheless, along the Sable Sub-basin western rim Missisauga progradations downlap and pinch out onto underlying Abenaki Fm are observed (Cummings, 2004).

Across the margin from South Whale Basin down to Sable basin, sediment thicknesses increase from less than few hundred meters to over 3500 m. In Heron H73 top Missisauga eq Fm corresponds to the late Albian unconformity (K101) suggesting that most of the Missisauga Fm is missing. The total Fm thickness is about 90 m and composed of metric sand beds and thin shale beds. In Emerillon and East-Wolverine the intra Hauterivian MFS is missing. This sequence is topped by the top Upper Missisauga (Figure 7 and 10; PL 4.3.1 to 4.4.2). In Emerillon the Missisauga sequence corresponds to a 80 m thick sandy unit topped by a 35 m thick shaly bed. In East-Wolverine the sequence corresponds to the Verrill Canyon eq Fm and consists essentially of 310 m of shaly deposit interrupted by a few meter thick sand beds. Bandol shows a complete middle Missisauga sequence of 140 m thick composed of a succession of metric sand and shale beds.

Hydrocarbon occurrence: No show have been described for this interval in the wells used in the present PFA

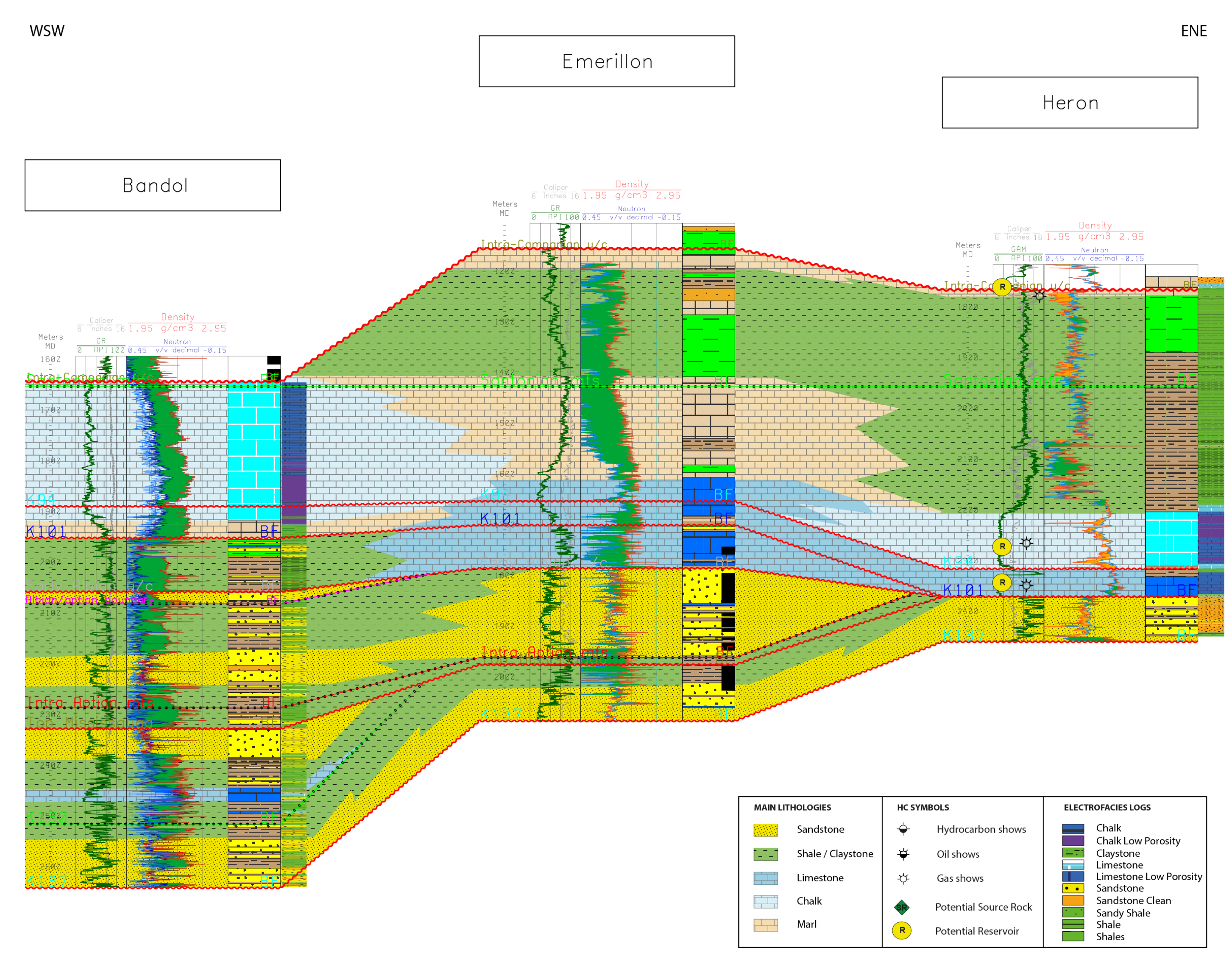


Figure 10: Sedimentary succession recorded during the Cretaceous across the shelf.

The Aptian - Cenomanian Sequence K130-K94

Identification

- Number of exploration wells reaching the Aptian - Albian Sequence : 3 wells (PL. 4.3.1 to 4.4.2 and Enclosures 4.12 to 4.15)
- Formations: **Upper Missisauga** eq Fm; **Logan Canyon** eq Fm; **Shortland Shale** eq Fm; **Albian Carbonate Fm**
- Regional top sequence: Intra Aptian MFS; Albian/Aptian boundary MFS; Early Albian unconformity; Late Albian unconformity (**K101**); Turonian/Cenomanian unconformity (**K94**)
- Chronostratigraphic cross-sections (PL. 4.3.1 and 4.4.1)
- Lithostratigraphic cross-sections (PL. 4.3.2 and 4.4.2) and Geological Composite Well Logs (Enclosures 4.12 to 4.15)
- Architectural cross-sections (PL. 4.5.1 to 4.5.4)

Description

Logan Canyon eq Formation, Shortland Shale eq and Albian Carbonate Fm

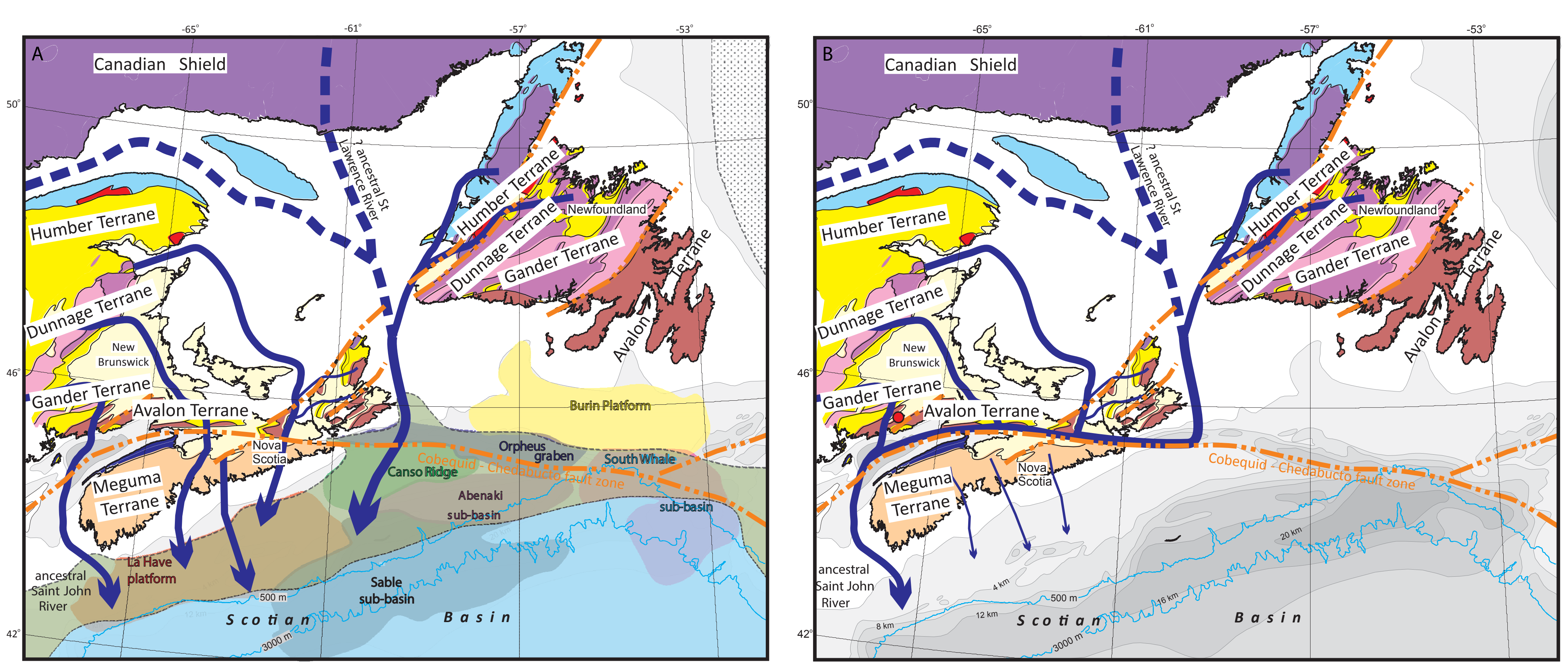
The Logan Canyon eq Fm and lateral and distal related Fms starts after the intra Aptian MFS (Figure 10; PL 4.3.1 to 4.4.2). The intra Aptian MFS is characterized by a thick dark brown to black shaly unit separating the top Upper Missisauga from the Logan Canyon eq Fm. The maximum thickness inferred from thickness map is observed between Emerillon and Heron (PL 8.6 and 8.7).

The Logan Canyon Fm is classically subdivided into four members along the Scotian Margin (Shale dominated Naskapi and Sable Fm; Sandstone dominated Cree and Marmora members) (Wade,1991b; MacLean and Wade, 1993). In the Laurentian and South Whale Basins the distinction between the different members is difficult to make because of the impact of the successive unconformities (Figure 9 and 10; PL 4.3.1 to 4.5.4). Overall, Logan Canyon eq Fm is observed in the 3 wells on the shelf with a thickening trend and shalier deposit near Bandol. Shortland Shale eq Fm is found in East Wolverine where it forms a 330 m thick unit (Figure 7; PL 4.3.1 to 4.4.2).

During Albian times, a 90 m thick preserved limestone unit is observed bordered by the early Albian unconformity and K94 (Figure 7 and 10; PL 4.3.1 to 4.4.2). This carbonate sequence is composed of coarse to fine grained bioclastics, nautiloids, crinoids and other fossil debris as well as calcareous shale and sometimes quartz grit. This suggests a shallow water environment under the influence of a distal estuarine environment. In Heron, the limestone unit is preserved after the late Albian unconformity (K101) suggesting that either carbonate banks form after the unconformity, or more likely no carbonate formation was preserved in Heron because of K101.

Overall, the Logan Fm corresponds to an estuarine and shallow marine clastic shelf environment south of Emerillon which evolved into a carbonate dominated

Figure 11: Map showing sediment sources distribution along the Scotian and South Newfoudland margin. Between early Cretaceous (A) and the late Hauterivian-early Albian the ancestral St Lawrence River migrates southward merging with the ancestral Saint-John River (Strathdee, 2012; modified from Tsikouras et al., 2011)



The Late Cretaceous to Eocene Sequence K94-T50

Identification

- Number of exploration wells reaching the Late Cretaceous to Eocene Sequence: 3 wells (PL. 4.3.1 to 4.4.2; Enclosure 4.12 to 4.15)
- Formations: **Dawson Canyon**, **Petrel**, **Wyandot**, **Ypresian Chalk**
- Age: Dawson Canyon (**Turonian to Campanian**), Petrel Member (**Turonian**), Wyandot (**Santonian-Maastrichtian**), Ypresian Chalk (**Base Eocene**)
- Regional top sequence: Ypresian unconformity (**T50**)
- Chronostratigraphic cross-sections (PL. 4.3.1 and 4.4.1)
- Lithostratigraphic cross-sections (PL. 4.3.2 and 4.4.2) and Geological Composite Well Logs (Enclosures 4.12 to 4.15)
- Architectural cross-sections (PL. 4.5.1 to 4.5.4)

Description

Dawson Canyon Formation and Petrel Member

The Dawson Canyon eq Formation consists of thick marine shales intersected by chalk and limestone layers near the early Turonian. Although the formation is found across the Scotian Shelf, the sequence of deposition appears to be diachronous from Sable Basin to South Whale Basin (Figure 12 and plate 4.3.1 to 4.4.2). To the south-west of the Scotian margin, the formation is restricted to the Turonian (See PFA 2011), whereas in the South Whale Basin it extends through the Campanian. This last observation is consistent with what has been described for Grand Banks of Newfoundland where the Dawson Canyon eq Fm lasts until the Campanian (Grant and MacAlpine, 1990). Based on wells used for this PFA study, Dawson Canyon eq Fm and Petrel member are found across the Scotian Margin up to the Grand Banks. Dawson Canyon Fm tends to increase to the South Whale Basin where it reaches a preserved thickness of about 550 m, whereas Petrel member tends to decrease from 230 m in Bandol to 100 m in Heron. In Emerillon the Dawnson Canyon eq Fm forms a 140 m thick unit between the Petrel and Wyandot Fms. The Dawson Fm and Petrel member are totally absent from East-Wolverine where only a small part of Wyandot is preserved.

Wyandot Formation

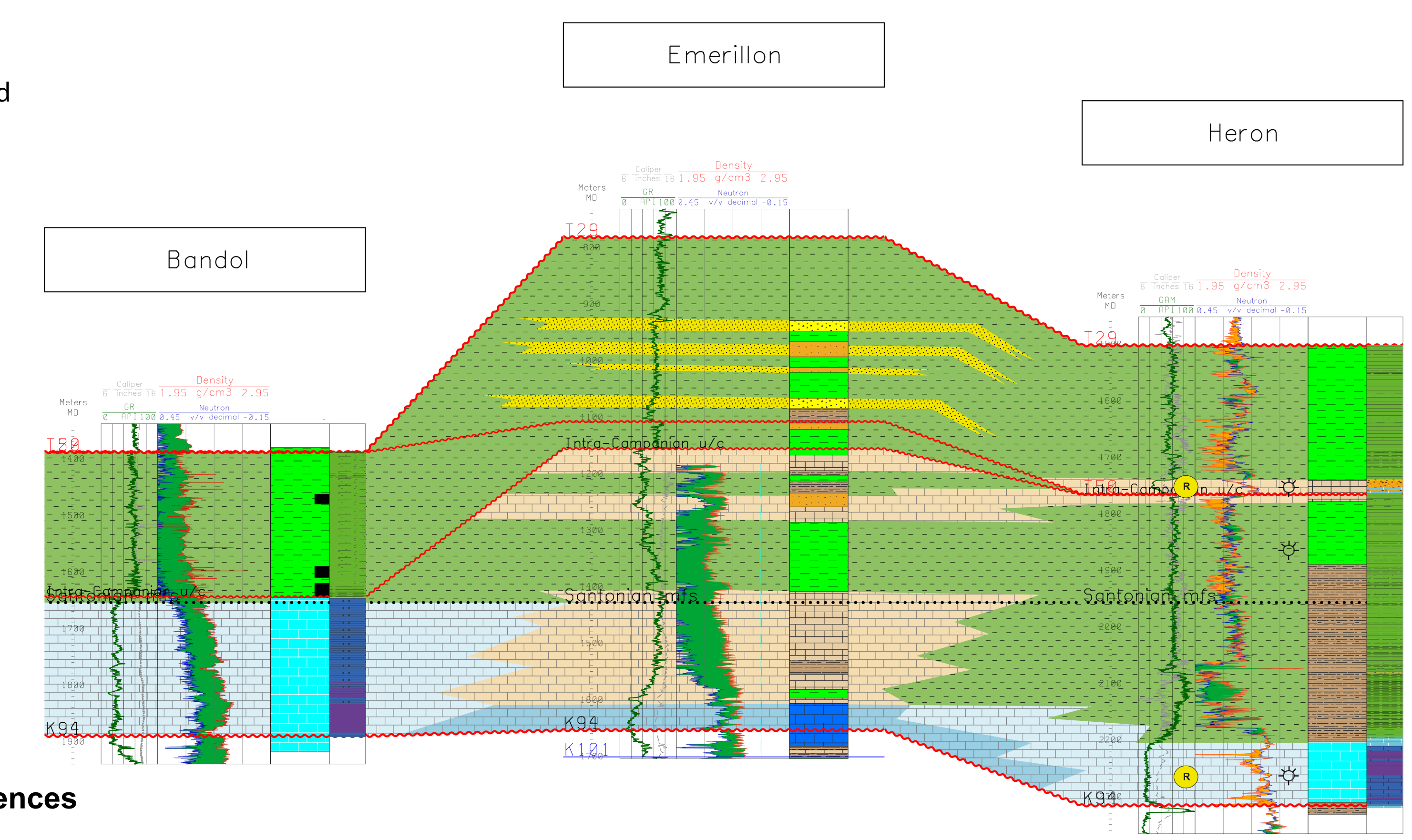
The Wyandot Formation is composed of chalk, marl and limestone (Figure 12; PL4.3.1 to 4.4.2). Formation thickness ranges from few metres in Bandol to about 250 m in Emerillon. In the latest, Wyandot corresponds mostly to marl deposits characteristic of back reef and lagoonal environment, which is coherent with the development of large reef mounds and platforms. Overall the formation is more preserved and developed to South Whale Basin. Near the outer shelf and slope, top Wyandot Formation is often marked by an unconformity overlain by Tertiary sediments. In East-Wolverine, Wyandot Fm is only few meters thick..

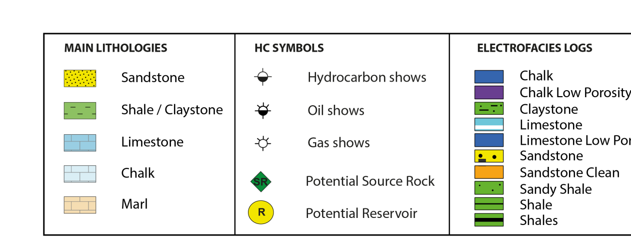
Ypresian Chalk

The Ypresian Chalk is an early Eocene Formation and composed of chalk. Around the St Laurent river outlet, the formation is nearly absent and for the rest of the margin disrupted by numerous Tertiary unconformities (Figure 12; PL 4.3.1 to 4.4.2). When preserved the chalk unit is about 100 m thick and is interpreted as formed in a deep water environment. In Emerillon the same interval corresponds to a silt-shale unit indicating a more proximal depositional environment.

Hydrocarbon occurrence (Figure 12; PL.4.3.1 to 4.4.2): Gas shows are observed at the top of the chalk for Heron; O&G shows are observed along the T50 unconformity south of Laurentian Basin.

Figure 12: Sedimentary succession recorded between the late Cretaceous and Eocene





Late Eocene to Plio-Miocene sequences

Banquereau and Laurentian Fms

Sedimentary successions between top Ypresian and latest Formation correspond to Banquereau and Laurentian Formations. The sequence corresponds to a Tertiary succession consisting in a series of downlapping or prograding sequences with a coarsening upward. In more detail, the Laurentian Formation corresponds to Plio-Quaternary progradational wedge forming, on average, over 1500 m of glaciomarine and marine sediment. The Formation is thinner on the shelf and tends to be thicker to the outer shelf and slope.

Hydrocarbon occurrence (PL.4.3.1): Gas show are observed in the Bartonian sand in Emerillon.

REFERENCES

Cummings D. C., (2004). Sedimentology and Stratigraphy of an Ancient Progradational Terrigenous Clastic Shelf Margin, Missisauga Formation (Upper Jurassic- Lower Cretaceous), Offshore Nova Scotia, Canada. PhD Thesis, University of Ottawa, Ontario, Canada.

Cummings, D.C., and Arnott, R.W.C., (2005). Growth-faulted shelf-margin deltas: a new (but old) play type, offshore Nova Scotia. Bulletin of Canadian Petroleum Geology, vol.53, no.3 (Sept. 2005), p.211-236.

Eliuk, L., (2008). Regional Setting of the late Jurassic Deep Panuke Field, Offshore Nova Scotia, Canada – Cuttings based Sequence Stratigraphy and Depositional Facies Associations Abenaki Formation Carbonate Margin. Central Atlantic Margin - Conjugate Margin Conference-Halifax 2008, p.186-208.

Enachescu, M. E.and J. R., Hogg, (2005). Exploring for Atlantic Canada's next giant petroleum discovery. CSEG recorder, p. 19-29. EnCana, (2006). Deep Panuke Offshore Gas Development Plan. Vol. 2, Halifax, Nova Scotia.

Gould, K., Pe-Piper, G., Piper, D., JW., (2010). Relationship of diagenetic chlorite rims to depositional facies in the Lower Cretaceous reservoir sandstones of the Scotian Basin. In Sedimentology (2010) 57, 587-610

Grant, A.C., MacAlpine K.D., (1990). The continental margin around Newfoundland, Chapter 6, In Geology of the Continental Margin of Eastern Canada, Geological Survey of Canada n°2, Keen, M.J. and Willians, G.L. Eds, p. 241-292.

Jansa, L.F. Pe-Piper, G., Robertson, P.B. and Freidenreich, O., (1989). Montagnais: A submarine impact structure on the Scotian shelf, eastern Canada. Geological Society of America Bulletin, vol.101, p.450-463.

Kidson, A. G., Brenton,M.,S., Brown, D. E., C., Altheim, B., (2002). Hydrocarbon Potential of the Deep Water Scotian Slope. CNSOPB Report 111p, Halifax, Nova Scotia.

Kidston, A.G., Brown, D.E., Smith B.M. and Altheim, B., (2005). The Upper Jurassic Abenaki Formation Offshore Nova Scotia: A Seismic and Geologic Perspective. Canada-Nova Scotia Offshore Petroleum Board, Halifax, 165p.

Kidson, A. G., Brenton,M.,S., Brown, D. E., Makrides, C., Altheim, B., 2007. Nova Scotia DeepwaterWells, Post Drill Analysis, 1982-2004. CNSOPB Report,181p, Halifax, Nova Scotia.

Li, G., Pe-Piper, G., Piper, D.J.W., (2012). The provenance of Middle Jurassic sandstones in the Scotian Basin: petrographic evidence of passive margin tectonics, Can. J. Earth Sci. 49: 1463–1477.

Louden, K., (2002). Tectonic Evolution of the East Coast of Canada. Canadian Society of Exploration Geophysicists "Recorder", vol.27, no.2, p.37-48.

MacLean, B.C., and Wade, J.A., (1993). Seismic Markers and Stratigraphic Picks in the Scotian Basin Wells. East Coast Basin Atlas Series, Geological Survey of Canada, 276p. Natural Resources Canada, (2009). Geology of the Scotian Margin. www.nrcan.gc.ca.

Piper, D.J.W., Pe-Piper, G. and Ingram, S.C., (2004). Early Cretaceous sediment failure in the southwestern Sable Sub-basin, offshore Nova Scotia. Bulletin of American Association of Petroleum Geologists vol.88, no.7, p.991-1006.

Piper, D.J.W., Noftall, R. and Pe-Piper, G., (2010). Allochthonous prodeltaic sediment facies in the Lower Cretaceous at the Tantallon M-41 well: Implications for the deep-water Scotian Basin. Bulletin of American Association of Petroleum Geologists vol.94, no.1, p.87-104.

Sibuet, J-C., Rouzo, S., Srivastava, S., (2012). Plate tectonic reconstructions and paleogeographic maps of the central and North Atlantic oceans, Can. J. Earth Sci. 49: 1395–1415.

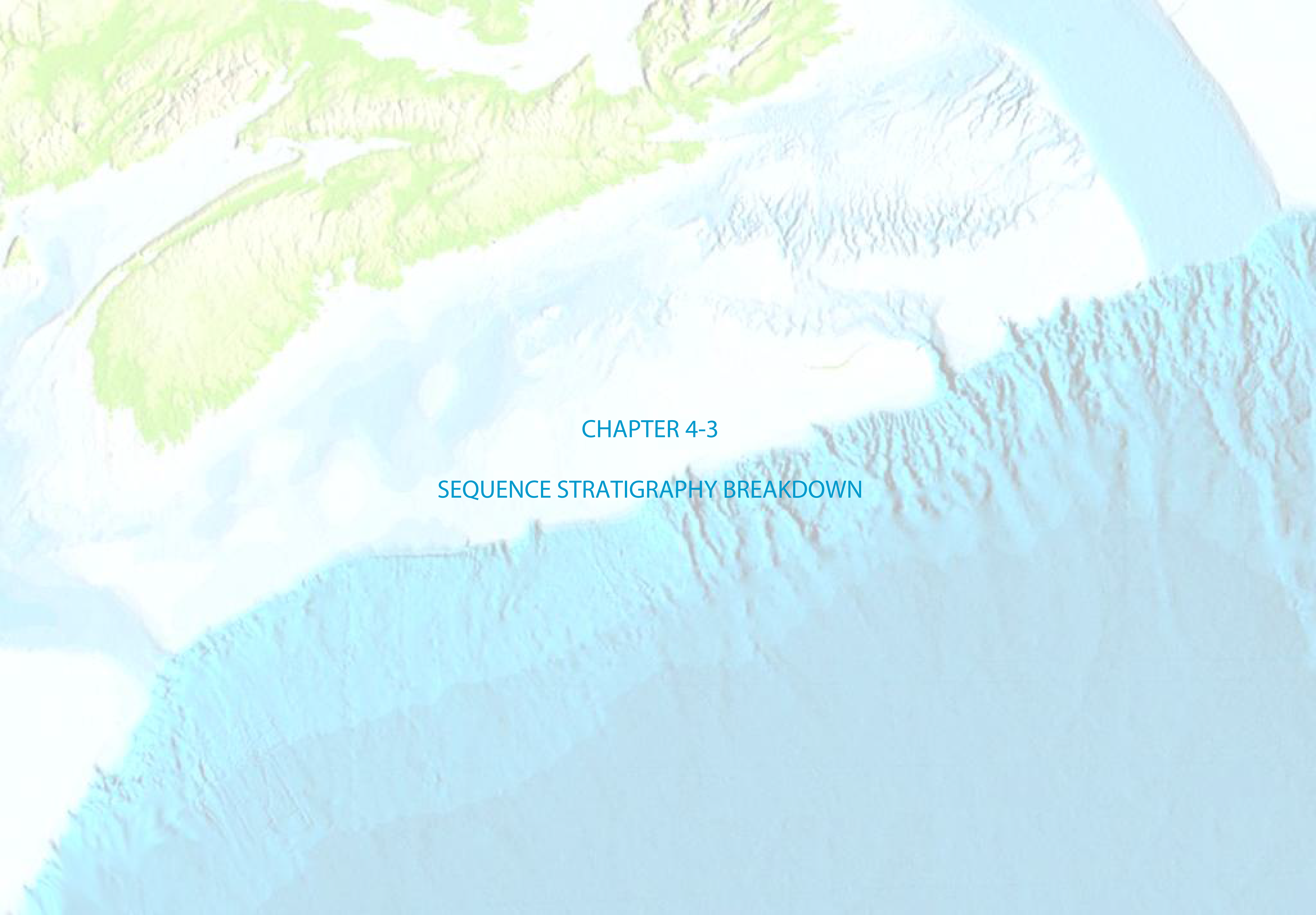
Swift, S.A., (1987b). Late Cretaceous-Cenozoic Development of Outer Continental Margin, Southwestern Nova Scotia. American Association of Petroleum Geologists Bulletin vol.71, no.6, p.678-701.

Strathdee, G., (2012). Origin and significance of clay minerals in Mesozoic shales of the Scotian Basin, Msc Thesis, Saint Mary's Univeristy, 167p.

Wade J.A. and MacLean B.C., (1990). The geology of the southeastern margin of Canada, Chapter 5. In Geology of the Continental Margin of Eastern Canada, Geological Survey of Canada n°2, Keen, M.J. and Willians, G.L. Eds, p. 167-238.

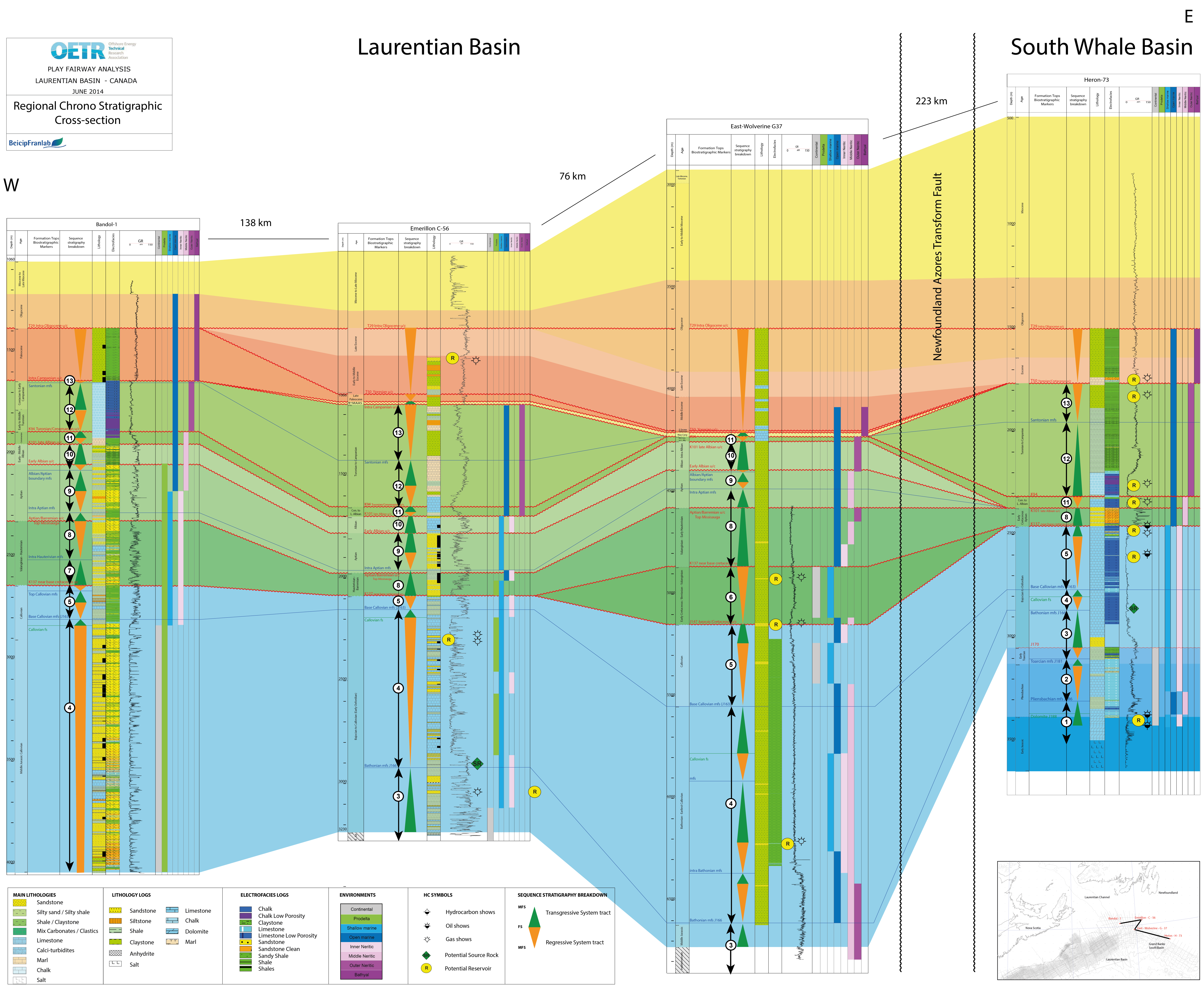
Wierzbicki, R., Dravis, J.J., Al-Aasm, I., and Harland, N., (2006). Burial dolomitization and dissolution of Upper Jurassic Abenaki platform carbonates, Deep Panuke reservoir, Nova Scotia, Canada. American Association of Petroleum Geologists Bulletin, vol.90, p.1843-1861.

Withjack, M.O.and Schlische, R.W., (2006). A Review of Tectonics Events on the Passive Margin of Eastern North America. 25th Annual Bob F. Perkings Research Conf., p203-235.



CHAPTER 4-3

SEQUENCE STRATIGRAPHY BREAKDOWN



Stratigraphic cross-section from Laurentian Basin to South Whale Basin

The stratigraphic cross-section illustrates a regional architecture of sedimentary deposits from Jurassic to Eocene interval.

Based on integration of biostratigraphy, lithological results and gama ray signature, between 9 and 12 sequences have been identified on the different wells. The sequences cover a timespan from early Jurassic to mid Oligocene, and the different sequences are associated with specific lithologies and environments.

Sequence 1 is **early Jurassic** and terminates with the **Pliensbachian MFS (J186)**. Depositional environment corresponds to the transition from continental to shallow marine under restricted condition.

Sequence 2 extends from **Pliensbachian to Toarcian MFS (J181)**. Space accommodation is driven by thermal subsidence subsequent to the North Atlantic Ocean opening. The environment corresponds to the transition from restricted shallow marine to open marine with a trend to deepening water.

Sequence 3 extends from **Toarcian to Bathonian MFS (J166)**. After the Toarcian MFS a transition from transgressive to regressive condition is observed with a paroxism at **J170** which also corresponds to the transition from Toarcian to Bajocian. No significant environmental change is observed from the previous sequence.

Sequence 4 is middle Jurassic in age and ends with the **Base Callovian MFS (J163)**. This sequence is observed in all the wells used in this study. This sequence marks the end of the regressive trend observed during the late early Jurassic. Sediment signature suggests a more continental influence with prodeltaic sediment. Depositional environment is inferred to be shallow water, which is also supported by the presence of thick carbonate units.

Sequence 5 extends from **Base Callovian MFS to Tithonian**. This time frame corresponds to a period of global transgression although classical Regression - Transgression cycles can be identify. A large part of the transgressive period is missing because of the impact of the **K147 and K137 unconformities**. On the shelf, sediments are mostly shale and carbonates associated with a shallow water environment. In deep water facies analysis suggests a shallowing trend.

Sequence 6 extends from **late Tithonian to early Valanginian**. This sequence is essentially preserved in deep water due to the impact of the **Valanginian unconformity (K137)**. This sequence marks the begining of a regressive trend. Depositional environment is inferred to be shallow water with a growing continental influence.

Sequence 7 corresponds to the **Vallanginian - Hauterivian** interval and ends with the **Intra-Hauterivian MFS (K130)**. This sequence is often missing due to the impact of successive unconformities occuring during the Cretaceous. Depositional environment corresponds to shallow water under continental influence.

Sequence 8 extends from **Hauterivian to intra Aptian** and terminates with the **intra Aptian MFS**.This sequence is found across the Laurentian Basin but largely eroded or missing in South Whale Basin. The sequence is associated to a deepening trend (inner to middle neritic) with open shallow water on the shelf.

Sequence 9 is **Aptian** of age and ends with the **Albian/Aptian boundary MFS**. This sequence is eroded in South Whale Basin and partly eroded in Laurentian Basin. This sequence corresponds to a more open marine condition with localized carbonate formations.

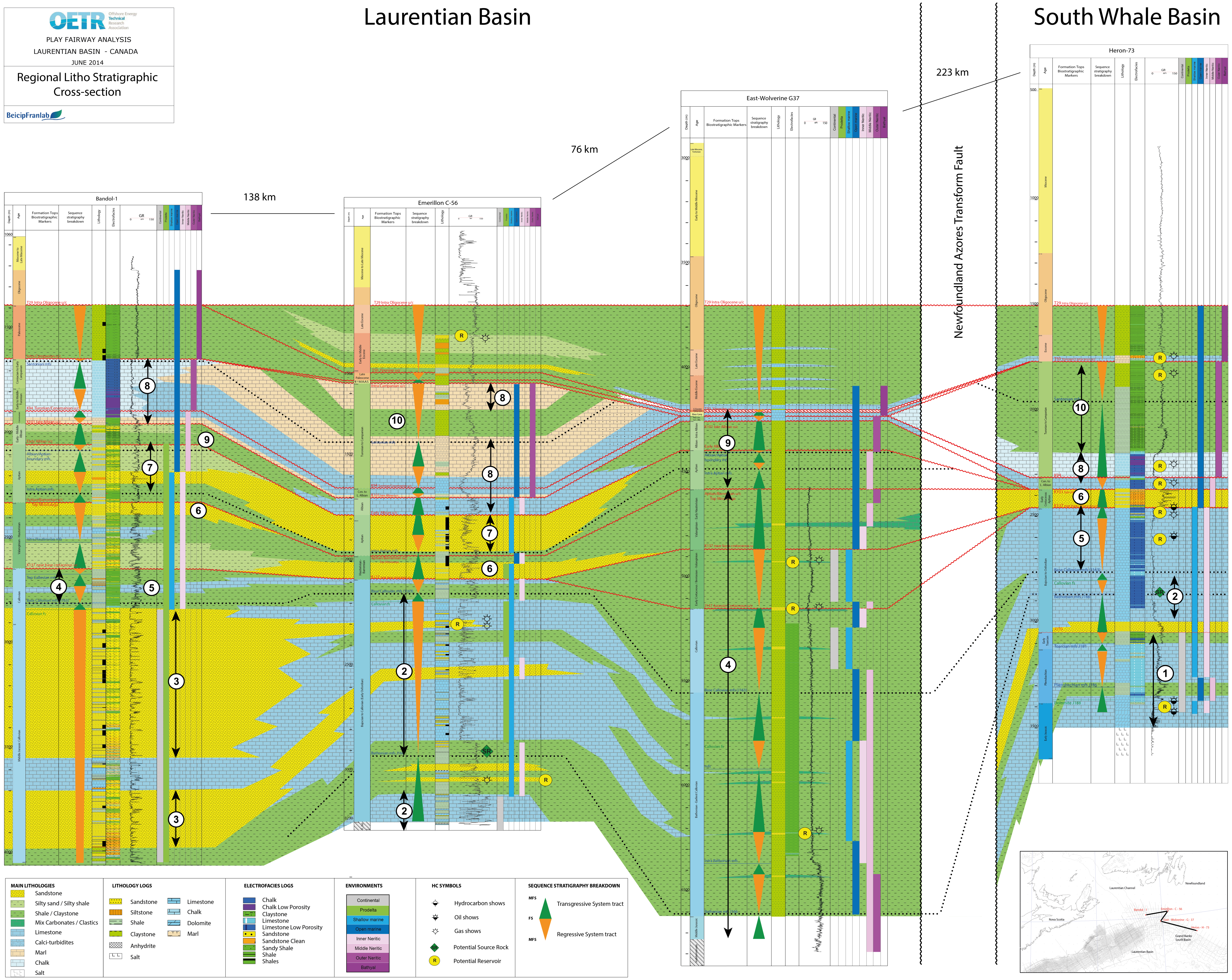
Sequence 10 is a transgressive phase occuring during the **Albian**. The sequence is partially preserved due to the late **Albian unconformity (K101)**. Resulting environment are infered to be shallow water alternating with estuary environment on the shelf.

Sequence 11 is **Cenomanian** of age. Most of the sequence is missing because of the **Turonian/Cenomanian unconformity (K94)**. Depositional environments are inner to middle neritic under open marine condition.

Sequence 12 extends from **Cenomanian to Santonian** and ends with the **Santonian MFS**. This sequence is characterized by a deepening trend in water depth which favor Chalk and Marl deposition.

Sequence 13 extends from **Santonian to Ypresian**. A significant part of the sequence is missing due to the **Ypresian unconformity (T50)**. Sedimentation occurs under deepwater condition as shown by the large distribution of Chalk and Marl.

SEQUENCE STRATIGRAPHY BREAKDOWN - Wells correlation



Stratigraphic cross-section from Laurentian Basin to South Whale Basin

The stratigraphic cross-section illustrates a regional architecture of sedimentary deposits from Jurassic to Eocene interval.

Early Jurassic starts with a thick **Dolomite** unit overlaying a salt formation. The **Dolomite** formation is topped by a thick **limestone** unit deposited from the **Pliensbachian to the Toarcian**. Its extension is restricted through time to the South Whale Basin and the E-NE part of the Laurentian Basin.

Jurassic period is mostly composed of a **mix of clastic and carbonate** sediment. To the western part of the Laurentian Basin thick laminated sandstone and mudstone successions are recorded with locally interbeded carbonate units. To the eastern part of the basin, sandstone beds are progressively replaced by interbedded oolitic limestone beds. South Whale Basin shows carbonate dominated beds with local sandstone beds.

Sedimentary formations are mostly characteristic of prodeltaic environment (where thick sandstone are observed) and shallow water environment (inner neritic) ; strong continental influence for early Jurassic sequences.

Deep water sedimentary formations (East-Wolverine) are shale dominated with punctual sandstone beds (few meters thick).

To the late Jurassic, environment evolves from outer to inner neritic environment with a trend to shallowing up and a growing continental influence when approaching the late Tithonian (K147).

Early Cretaceous starts with laminated sandstone and shale with few local carbonate units, with a trend to thick sandstone units toward Emerillon. Above the **Albian u/c** oolitic limestones are observed with a lateral change to chalk formation toward Heron.

This suggests a regressive trend followed by successive transgressions. Environments are inferred to be shallow water and coastal embayment evolving toward more open marine condition and middle neritic environment.

Late Cretaceous to Ypresian interval is characterized by chalk/marl/shale and mudstone suggesting more open marine condition and a deepening trend with neritic to bathyal condition reached at the Ypresian u/c. On the slope (East-Wolverine), mudstone dominates for most of the Cretaceous with few thin sand beds (few meters thick) replaced by detrital carbonates during the late Cretaceous (Cenomanian to Maastrichtian) times.

Ypresian to mid Oligocene interval corresponds to regressive trend with prodeltaic formation prograding over the shelf and feeding the basin with turbidites. At the Ypresian base, sedimentary sequences are largely composed of chalk and marl except near Bandol because of the impact of the intra Oligocene unconformity.The type of sedimentation quickly evolves into marine shale and prodeltaic mud in relation to the transgressive phase.

1- Ioquois equivalent Formation

2- Scatarie equivalent Formation

3- Mohican equivalent Formation

4- Verrill Canyon equivalent Formation

5- Abenaki equivalent Formation

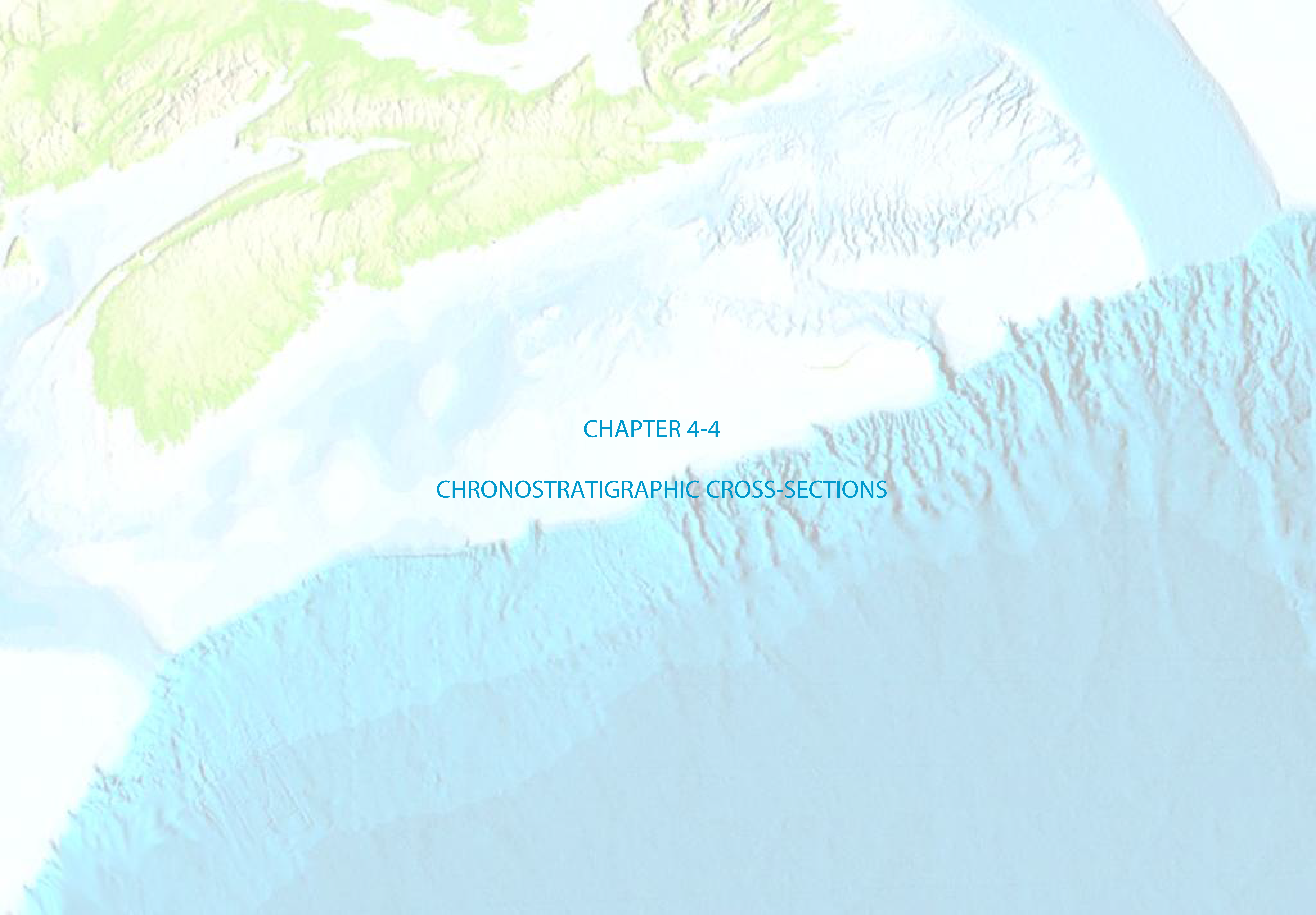
6- Missisauga equivalent Formation

7- Logan Canyon equivalent Formation

8- Wyandot / Petrel equivalent Formation

9- Shortland Shale equivalent

10- Dawson equivalent Formation



CHAPTER 4-4

CHRONOSTRATIGRAPHIC CROSS-SECTIONS