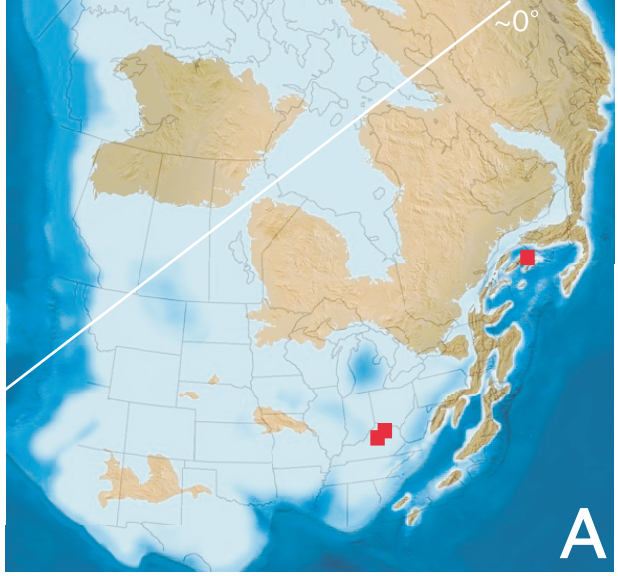
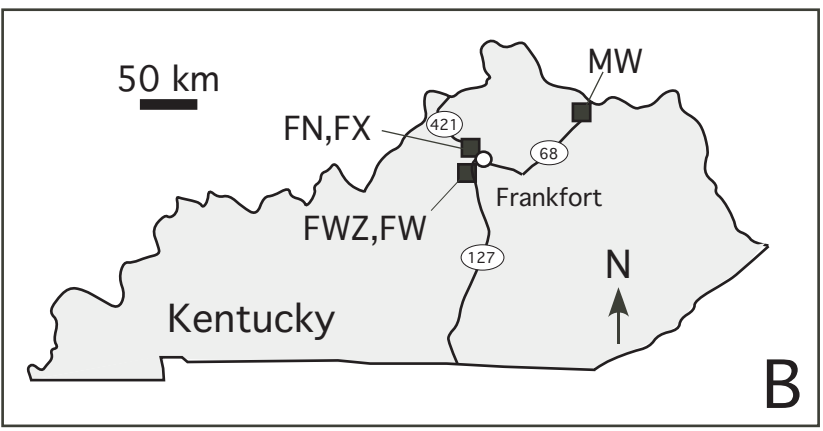
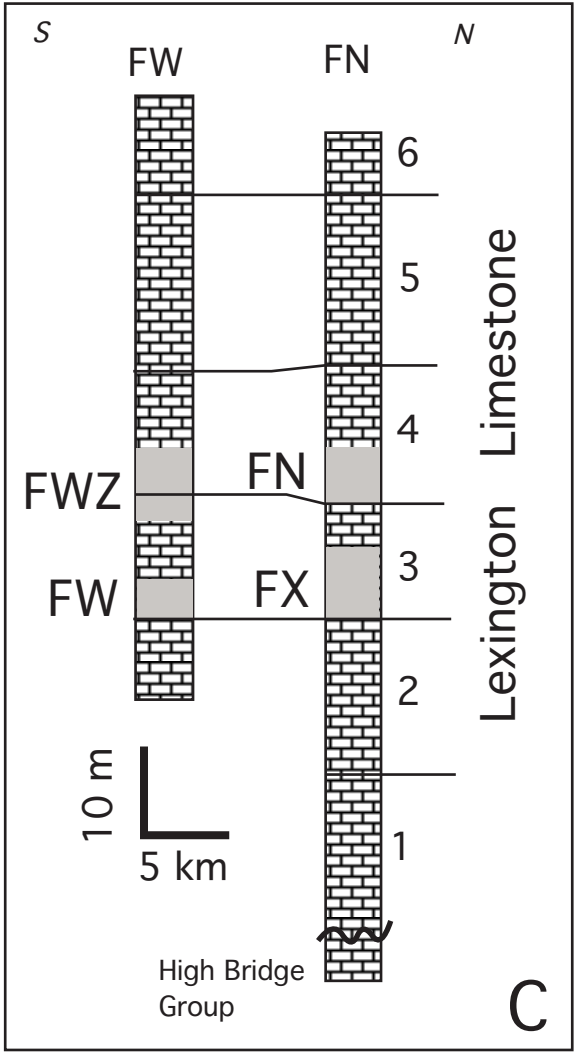
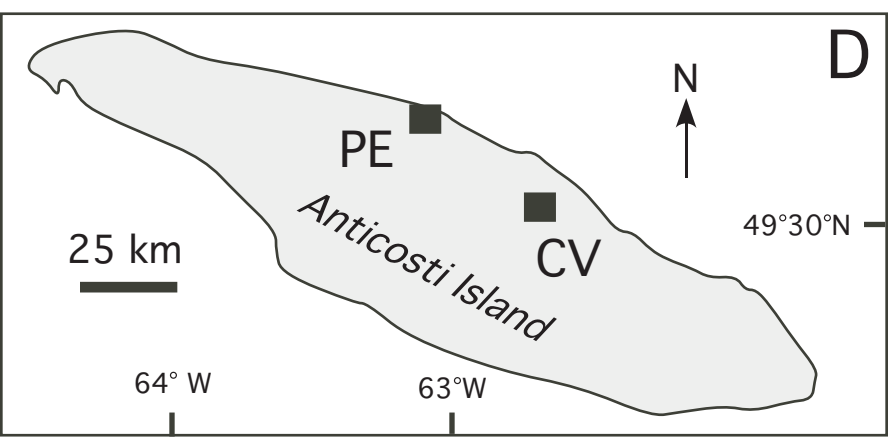
Figure DR1. A) Regional Late Ordovician paleogeography (from R. Blakey website, (http://www2.nau.edu/rcb7/). Red boxes show location of studied sections. B) Map of Kentucky showing location of studied sections along Highways 427, 127, 68. Open circle is city of Frankfort. Section locations indicated by squares; abbreviations outlined in Figure 3. C) Schematic stratigraphic columns of Lexington Limestone at locations near Frankfurt, Kentucky. Intervals outlined by numbers 1-6 indicate parasequence sets defined and correlated by Pope and Read (1997; 1998a,b). Gray shading indicates position of studied cycles within parasequence sets. D) Map of Anticosti Island, Quebec, Canada showing location (black squares) of studied sections CV and PE. E) Schematic stratigraphic column of Vaureal Formation and overlying formations showing approximate position of studied cycles (gray shading). Modified from Long, 2007.


~0°
A


50 km
MW
FN,FX
421
68
Frankfort
FWZ,FW
127
N
Kentucky
B


S
N
FW
FN
6
5
4
3
2
1
Lexington Limestone
FWZ
FN
FW
FX
10 m
5 km
High Bridge Group
C


D
N
PE
CV
Anticosti Island
25 km
49°30°N
64° W
63°W

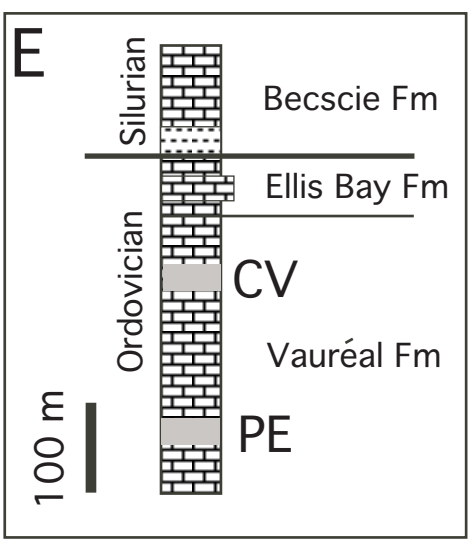

E
Silurian
Becscie Fm
Ellis Bay Fm
Ordovician
CV
Vauréal Fm
PE
100 m

Figure DR-1

Table DR1.

Sample number	Formation (mbr.)	Location	Conodont taxa	δ18O ‰ SMOW	Ag3PO4 (μg)**
FW 0.2	Lexington	HW 127, KY, east side	ramiform undifferentiated	19.1	430,450,450
FW 0.8	Lexington	HW 127, KY	ramiform undifferentiated	19.2	460,465,500
FW 1.8	Lexington	HW 127, KY	ramiform undifferentiated	19.1	480,425
FW 2.3	Lexington	HW 127, KY	ramiform undifferentiated	18.5	495,490,425
FW 2.8	Lexington	HW 127, KY	ramiform undifferentiated	18.4	450,420
FW 3.5	Lexington	HW 127, KY	ramiform undifferentiated	19.3	475,515
FW 3.9	Lexington	HW 127, KY	ramiform undifferentiated	19.1	475,485,450
FWZ ~10 m above FW					
FWZ 0.6	Lexington	HW 127, KY, west side	ramiform undifferentiated	18.36	480,500
FWZ 1.1	Lexington	HW 127, KY	ramiform undifferentiated	17.9	450,520
FWZ 1.4	Lexington	HW 127, KY	ramiform undifferentiated	17.84	490,490,500
FWZ 1.8	Lexington	HW 127, KY	ramiform undifferentiated	17.55	475,500,480
FWZ 2.4	Lexington	HW 127, KY	ramiform undifferentiated	19.44	485,480
FWZ 3	Lexington	HW 127, KY	ramiform undifferentiated	18.54	480,510,505
FWZ 4.5	Lexington	HW 127, KY	ramiform undifferentiated	17.1	490,515,490
FWZ 5.4	Lexington	HW 127, KY	ramiform undifferentiated	17.94	505,510,500
FWZ 7.9	Lexington	HW 127, KY	ramiform undifferentiated	18.07	500,510,490,510
FWZ 8.5	Lexington	HW 127, KY	ramiform undifferentiated	19.4	470,480,490
FWZ 9.1	Lexington	HW 127, KY	ramiform undifferentiated	17.48	510,510,505
FN 0.2	Lexington	HW 421, KY, west side	ramiform undifferentiated	18.8	480,480,490
FN 0.5	Lexington	HW 421, KY	ramiform undifferentiated	19.6	495,490,480
FN 0.7	Lexington	HW 421, KY	ramiform undifferentiated	19.1	460,460
FN 1.0 r	Lexington	HW 421, KY	ramiform undifferentiated	18.8	500,510,480
FN 1.0 c	Lexington	HW 421, KY	coniform undifferentiated	18.6	460
FN 1.3	Lexington	HW 421, KY	ramiform undifferentiated	19.3	475,450,480
FN 1.7	Lexington	HW 421, KY	ramiform undifferentiated	18.9	450,500,480
FN 2.1	Lexington	HW 421, KY	ramiform undifferentiated	19.6	470,450,460
FN 2.4	Lexington	HW 421, KY	ramiform undifferentiated	19.6	520,480,500
FN 3.2	Lexington	HW 421, KY	ramiform undifferentiated	19.3	440,450
FX ~15 m below FN					
FX 0.8	Lexington	HW 421, KY, east side	ramiform undifferentiated	19.08	505,500,505
FX 1.2	Lexington	HW 421, KY	ramiform undifferentiated	17.47	515,510,515
FX 1.8	Lexington	HW 421, KY	ramiform undifferentiated	18.79	490,495,490
FX 2.9	Lexington	HW 421, KY	ramiform undifferentiated	18.85	490,480
FX 3.4	Lexington	HW 421, KY	ramiform undifferentiated	16.98	490,510,510
FX 4.2	Lexington	HW 421, KY	ramiform undifferentiated	19.12	500,515
FX 4.9	Lexington	HW 421, KY	ramiform undifferentiated	19.31	500,500,520
FX 5.3	Lexington	HW 421, KY	ramiform undifferentiated	19.32	500,480

Table DR1.

MW US 68, KY, ~1.2 km west of Ohio River, north side of highway					
MW 0.5	Kope		ramiform undifferentiated	19.01	490,475
MW 1.2	Kope	US 68, KY	ramiform undifferentiated	18.29	490,490,500
MW 2.2 r	Kope	US 68, KY	ramiform undifferentiated	18.71	480,480,490
MW 2.2 c	Kope	US 68, KY	coniform undifferentiated	19.05	490,495,475
MW 3.2	Kope	US 68, KY	ramiform undifferentiated	18.67	480,480
MW 4.9	Kope	US 68, KY	ramiform undifferentiated	18.79	475,510,510,510
MW 6	Kope	US 68, KY	ramiform undifferentiated	19.26	500,480,480
MW 6.5	Kope	US 68, KY	ramiform undifferentiated	19.18	505,480,500

PE ~250 m below the Katian-Hirnantian boundary, ~7 km east of Pointe Carleton lighthouse, UTM: 20 U 522436 E; 5490879 N					
PE 4.5 r	upper Vaureal Fm	Pointe à l'Épinette	ramiform undifferentiated	19.2	450,500
PE 4.5 c	upper Vaureal Fm	Pointe à l'Épinette	coniform undifferentiated	18.8	450,475
PE 5.0 c	upper Vaureal Fm	Pointe à l'Épinette	coniform undifferentiated	18.8	480,485,490,510
PE 8.0	upper Vaureal Fm	Pointe à l'Épinette	ramiform undifferentiated	17.44	480,490
PE 11.5 m	upper Vaureal Fm	Pointe à l'Épinette	ramiform & coniform mix	19.62	385

CV ~75 m below the Katian-Hirnantian boundary, ~1km downstream from main water fall, UTM: 20 U 499105 E; 5511008 N					
CV -0.6	upper Vaureal Fm	Canyon Vaureal	ramiform undifferentiated	17.87	485,450
CV 0.2	upper Vaureal Fm	Canyon Vaureal	ramiform undifferentiated	18.46	525,530
CV 0.5	upper Vaureal Fm	Canyon Vaureal	ramiform undifferentiated	18.89	500,480
CV 1.0	upper Vaureal Fm	Canyon Vaureal	ramiform undifferentiated	20.54	500,495
CV 3.0	upper Vaureal Fm	Canyon Vaureal	ramiform undifferentiated	18.32	495,510,475
CV 3.5	upper Vaureal Fm	Canyon Vaureal	ramiform undifferentiated	19.45	500,500,510
CV 4.5	upper Vaureal Fm	Canyon Vaureal	ramiform undifferentiated	18.71	505,490
CV 5.3	upper Vaureal Fm	Canyon Vaureal	coniform undifferentiated	20.19	500,525,530
CV 6.3	upper Vaureal Fm	Canyon Vaureal	ramiform undifferentiated	19.97	500,500,500
CV 7.5	upper Vaureal Fm	Canyon Vaureal	ramiform undifferentiated	20.32	405,430
CV 8.6	upper Vaureal Fm	Canyon Vaureal	ramiform undifferentiated	19.23	520,515,460,475
CV 10	upper Vaureal Fm	Canyon Vaureal	ramiform undifferentiated	19.63	480,490,520
CV 12.8	upper Vaureal Fm	Canyon Vaureal	ramiform undifferentiated	20.32	530,500

r = ramiform
c = coniform
m = mix ramiform-coniform elements
** data plotted as average of multiple samples