Melchin et al. Figure S1

International correlation of Late Ordovician stratigraphic sequences, chemostratigraphy & biostratigraphy

SI Figure 1. International correlation of Late Ordovician stratigraphic sequences, chemostratigraphy & biostratigraphy based on data from the recent literature. Superscripts attached to the locality names refer to the numbered data sources listed below. Timescale based on GTS2012 (Cooper & Sadler 2012, Melchin et al. 2012). Hirnantian shaded light blue and narrow deep orange band in the mid Hirnantian corresponds to the mid Hirnantian interglacial age. See text for further discussion.

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Supp data tables1-4.xlsx

TABLE S1. CARBON AND NITROGEN ISOTOPE, % CALCITE, % TOTAL ORGANIC CARBON (TOC) & % TOTAL NITROGEN (TN) DATA FROM TRURO, CANADIAN ARCTIC

Meterage	Calcite	TOC	TN	$\delta^{13}C_{carb}$	$\delta^{18}O_{carb}$	$\delta^{14}C_{org}$	$\delta^{15}N_{TN}$
m	wt.%	wt.%	wt.%	(‰, V-PDB)	(‰, V-PDB)	(‰, V-PDB)	(‰, AIR)
30.0	70.4	1.4	0.041	-1.59	-7.92	-29.87	2.05
31.8	59.3	1.9	0.050	-0.16	-4.80	-29.94	1.84
34.3	93.5	0.2	0.012	0.54	-5.34	-29.24	0.50
35.8	88.8	0.4	0.023	-0.47	-9.58	-29.61	1.56
36.9	90.8	0.1	0.014	0.55	-6.34	-29.83	1.08
37.2	80.2	0.5	0.015	0.65	-5.99	-30.27	2.32
39.0	76.9	0.8	0.038	-0.26	-6.35	-30.23	0.98
40.2	82.8	0.4	0.012	0.04	-6.20	-30.15	2.07
41.3	98.3	0.1	0.003	-0.52	-5.17	-29.85	1.52
41.6	78.5	1.1	0.048	-1.50	-6.28	-30.09	1.55
43.7	67.5	2.9	0.113	0.21	-5.47	-29.98	0.81
44.7	96.0	0.2	0.010	-1.24	-7.59	-29.46	1.67
45.5	92.6	0.4	0.017	0.34	-5.27	-30.25	1.34
45.7	31.7	3.3	0.135	0.90	-5.84	-29.73	0.91
46.0	70.8	3.5	0.091	0.61	-5.74	-30.47	0.44
46.2	29.2	4.5	0.155	0.75	-5.28	-28.01	1.29
46.4	22.6	12.1	0.247	0.56	-5.24	-27.13	0.67
46.5	41.4	4.9	0.177	1.26	-7.20	-27.45	1.73
46.6	46.4	1.8	0.094	1.00	-6.56	-27.24	2.51
46.8	57.9	0.7	0.049	1.63	-6.33	-27.77	2.56
47.0	73.0	0.7	0.035	1.38	-7.43	-27.72	3.11
47.5	44.6	0.7	0.065	0.82	-5.05	-28.45	3.81
47.9	49.1	0.8	0.064	0.53	-5.07	-28.62	3.37
48.4	51.7	0.8	0.063	0.61	-5.12	-28.66	3.38
49.1	77.4	0.8	0.040	0.27	-5.27	-28.64	1.38
49.4	50.8	1.9	0.103	0.29	-5.31	-27.93	1.41
49.6	21.3	8.3	0.300	0.31	-5.47	-29.57	0.18
50.0	8.7	4.9	0.179	-1.24	-6.31	-30.43	0.41
51.0	17.7	4.3	0.158	-1.46	-5.84	-30.36	0.45
51.5	21.0	5.4	0.185	-0.97	-6.25	-30.34	0.47
52.0	61.3	4.8	0.174	-1.28	-5.26	-29.94	0.87
52.5	57.3	3.8	0.143	-1.48	-4.83	-30.34	0.88

TABLE S2. CARBON AND NITROGEN ISOTOPE, % CALCITE, % TOTAL ORGANIC CARBON (TOC) & % TOTAL NITROGEN (TN) DATA FROM ELEANOR LAKE, CANADIAN ARCTIC

Meterage	Calcite	TOC	TN	$\delta^{13}C_{carb}$	$\delta^{18}O_{carb}$	$\delta^{14}C_{org}$	$\delta^{15}N_{TN}$
m	wt.%	wt.%	wt.%	(‰, V-PDB)	(‰, V-PDB)	(‰, V-PDB)	(‰, AIR)
49.50	92.7	0.26	0.013	-0.01	-3.28	-29.67	1.19
50.00	57.4	1.39	0.045	-1.18	-7.54	-30.07	1.04
50.50	80.1	2.51	0.067	-0.82	-7.59	-30.46	1.00
51.00	58.0	1.50	0.039	-0.58	-7.56	-30.25	0.50
51.50	83.7	1.64	0.043	-0.40	-7.35	-30.55	0.53
52.00	86.4	0.53	0.023	-0.37	-3.24	-29.95	1.22
52.50	88.5	0.32	0.015	-0.13	-3.20	-30.46	1.21
52.90	56.6	1.28	0.007	-1.60	-11.66	-26.68	-
53.00	94.8	0.13	0.007	-0.06	-3.42	-29.71	1.21
53.50	81.3	1.04	0.035	-1.25	-6.49	-30.29	0.72
54.00	87.9	0.51	0.022	-0.68	-5.72	-30.06	0.72
54.50	97.6	0.12	0.005	-2.09	-8.72	-30.35	-0.41
54.90	98.4	0.10	0.004	-0.63	-8.06	-29.30	0.76
55.00	33.2	9.46	0.273	0.77	-4.96	-28.53	0.13
55.10	51.3	3.43	0.123	0.68	-6.32	-28.31	0.51

55.20	48.5	6.26	0.192	2.19	-4.04	-27.61	0.55
55.30	62.0	0.31	0.028	0.48	-9.36	-26.34	2.34
55.35	70.6	0.09	no data	1.69	-5.77	-24.05	no data
55.40	79.6	0.06	0.010	-0.07	-6.20	-24.85	3.79
55.60	78.4	0.11	0.010	0.75	-6.19	-25.12	2.94
55.80	67.0	0.09	no data	1.51	-4.91	-23.88	no data
55.90	64.6	0.08	0.020	1.53	-5.14	-24.21	3.38
56.20	55.6	0.07	no data	1.25	-3.52	-24.54	no data
56.40	53.4	0.05	0.030	1.17	-4.12	-25.23	2.98
56.80	49.8	0.05	0.020	0.61	-4.61	-24.43	3.34
56.55	56.6	0.09	no data	0.62	-3.90	-25.97	no data
56.65	53.8	0.08	no data	0.34	-4.41	-24.88	no data
56.90	63.1	0.05	no data	0.69	-3.64	-24.71	no data
57.00	37.0	0.06	no data	0.43	-4.55	-25.54	no data
57.20	44.5	0.05	0.020	0.88	-4.24	-26.31	3.4
57.40	36.6	0.25	0.030	1.50	-4.57	-28.55	2.22
57.50	38.7	0.33	0.020	0.88	-4.96	-28.30	3.45
57.55	10.9	0.43	0.050	-3.01	-13.92	-29.26	3.86
57.60	29.0	2.14	0.080	-3.98	-14.23	-28.62	2.32
57.70	57.9	1.25	0.030	0.10	-6.59	-29.05	2.34
57.80	20.2	3.21	0.140	-0.34	-7.73	-29.41	0.54
57.90	no data	11.94	no data	no data	no data	-29.83	no data
58.00	32.6	9.65	0.340	-2.05	-12.94	-30.27	0.39
58.10	no data	2.97	no data	no data	no data	-30.13	no data
58.20	no data	6.18	no data	no data	no data	-30.22	no data
58.30	8.6	7.24	0.250	-1.04	-10.37	-30.44	0.23
58.70	28.3	4.45	0.160	-0.11	-8.45	-30.65	0.23
59.00	41.9	3.73	0.130	1.77	-7.17	-30.74	0.48

TABLE S3. CARBON AND NITROGEN ISOTOPE, % CALCITE, % TOTAL ORGANIC CARBON (TOC) & % TOTAL NITROGEN (TN) DATA FROM CAPE PHILLIPS SOUTH, CANADIAN ARCTIC

Meterage	Calcite	TOC	TN	$d^{13}C_{carb}$	$d^{18}O_{carb}$	$d^{14}C_{org}$	$d^{15}N_{TN}$
m	wt.%	wt.%	wt.%	(‰, V-PDB)	(‰, V-PDB)	(‰, V-PDB)	(‰, AIR)
25.4	81.3	0.3	0.015	-0.74	-6.11	-28.89	1.98
25.5	64.9	1.0	0.043	-0.34	-5.59	-28.48	0.73
25.6	9.5	11.1	0.409	1.24	-6.48	-29.02	-0.71
25.8	71.9	2.1	0.066	0.67	-5.00	-29.21	-0.57
26.0	91.1	2.2	0.060	0.72	-5.70	-29.32	-1.17
26.3	81.3	2.1	0.071	1.43	-5.87	-29.39	-0.12
26.5	19.6	19.6	0.620	1.29	-9.70	-29.24	-1.34
26.8	17.4	6.7	0.272	-0.94	-8.10	-29.73	-0.32
27.0	91.6	2.4	0.050	0.59	-5.17	-30.20	-1.55
27.3	54.6	6.3	0.249	0.41	-6.67	-30.31	-0.57
27.5	95.0	1.7	0.046	-1.06	-6.06	-30.49	-0.90
27.8	16.5	9.1	0.358	-1.50	-6.59	-30.48	-0.21
28.0	95.1	1.9	0.033	-0.91	-6.67	-30.50	-1.57
28.3	15.2	11.6	0.392	-0.52	-7.53	-30.42	-0.90
28.5	90.7	1.5	0.049	-0.69	-5.43	-30.73	-1.18
28.8	55.1	2.7	0.085	0.34	-5.34	-30.72	-1.69
29.0	95.4	1.1	0.026	-1.67	-5.83	-30.76	-1.61
29.3	41.1	2.1	0.139	-0.22	-10.00	-30.69	-0.51
29.5	66.5	1.0	0.025	-0.36	-5.76	-30.89	-1.75
29.8	88.8	1.5	0.032	-0.97	-5.64	-30.90	-1.40
30.0	56.9	1.3	0.045	-0.47	-5.11	-30.74	-0.84
30.5	97.0	0.7	0.017	-5.17	-6.51	-30.99	-0.87
31.0	85.5	1.3	0.054	-0.71	-5.41	-30.18	0.35

31.5	98.3	0.2	0.010	-1.06	-5.37	-30.82	-1.47
32.0	86.2	2.1	0.067	-1.34	-5.63	-30.71	-1.37
32.5	93.5	2.1	0.034	-0.83	-5.46	-30.89	-1.29
33.0	82.0	4.2	0.047	-0.35	-5.61	-30.52	-0.68
33.5	99.9	0.0	0.000	-0.08	-5.37	-30.30	-0.40
34.0	89.8	2.6	0.067	-1.65	-6.68	-30.28	-0.87
34.5	92.2	1.4	0.046	-0.98	-6.85	-30.36	-0.65
35.0	88.9	0.9	0.022	-0.54	-5.92	-30.25	-0.82
36.0	84.4	3.3	0.081	-0.54	-6.83	-30.42	-0.77
36.5	87.3	1.7	0.023	-0.38	-6.23	-30.22	-0.66
37.0	70.5	2.0	0.036	0.03	-7.44	-30.12	-0.35
38.0	89.4	0.6	0.033	-0.34	-6.31	-30.32	-0.79
38.5	65.8	1.3	0.070	-0.30	-7.25	-29.96	-0.34
39.0	83.4	1.3	0.042	0.67	-7.73	-30.24	0.65
39.5	97.6	0.4	0.014	-0.32	-6.42	-30.50	0.34
40.0	90.1	1.0	0.032	1.23	-6.06	-30.13	1.33
40.5	97.7	0.2	0.008	-1.41	-5.60	-30.35	0.32
41.0	96.4	0.2	0.007	-1.92	-6.65	-29.64	0.55
41.5	92.3	0.2	0.014	0.05	-5.75	-29.13	2.87
41.7	19.9	5.3	0.163	-1.49	-2.92	-29.86	-1.26
42.0	60.3	6.0	0.142	-1.50	-6.39	-30.04	-1.43
42.5	94.6	0.2	0.016	0.41	-5.02	-30.62	-1.10
43.0	6.5	4.8	0.319	-0.33	-6.31	-29.99	-1.45
43.5	56.4	5.6	0.136	-2.10	-6.09	-30.07	-1.58
43.7	97.4	0.3	0.010	-2.38	-5.41	-29.58	-0.42
44.2	43.9	5.7	0.152	0.31	-5.61	-30.22	-1.25
44.6	99.7	0.1	0.002	-1.99	-5.70	-29.48	0.80
45.2	93.5	0.3	0.021	-0.38	-5.62	-29.22	2.64

TABLE S4. CARBON & NITROGEN ISOTOPE, % TOTAL ORGANIC CARBON (TOC) & TOTAL NITROGEN (TN) DATA FROM LEVIN AND ZADNÍ TŘEBÁŇ SECTIONS, CZECH REPUBLIC

sample number	Meterage m	Calcite wt.%	TOC wt.%	TN wt.%	$d^{13}C_{carb}$ (‰, V-PDB)	$d^{18}O_{carb}$ (‰, V-PDB)	$d^{14}C_{org}$ (‰, V-PDB)	$d^{15}N_{TN}$ (‰, AIR)
Levin (samples from 2008 interpolated into 2006 measured section								
2006-33	29.00	10.20	0.18	N not measured for 2006 samples			-26.62	N not measured for 2006 samples
2006-32	28.00	9.74	0.15		isotopes in carbonate		-27.34	
2006-31	27.10	11.16	0.15		not measured		-27.68	
2006-30	26.10	7.69	0.17				-27.30	
2006-29	25.10	6.93	0.19				-27.65	
2006-28	24.10	8.30	0.15				-27.29	
2006-27	23.10	7.02	0.17				-27.40	
2006-26	22.10	12.62	0.17				-27.71	
2006-25	21.10	8.01	0.20				-27.40	
2006-24	20.05	10.85	0.16				-27.45	
2006-23	19.15	5.65	0.19				-27.50	
2006-22	18.00	7.52	0.16				-27.69	
2006-21	17.00	9.51	0.19				-27.31	
2006-20	16.00	6.00	0.19				-27.44	
2006-19	15.00	6.12	0.16				-27.89	
2006-18	14.00	12.07	0.16				-27.89	
2006-17	13.00	10.34	0.16				-27.61	
2006-16	11.90	6.76	0.22				-27.85	
2006-15	10.90	11.42	0.18				-28.33	
2008-50	10.54	5.38	0.30	0.052			-29.00	3.26
2008-49	10.23	5.68	0.47	0.066			-29.51	3.15

2008-48	9.99	4.24	0.40	0.067		-29.10	3.05
2008-47	9.90	6.47	0.35	0.051		-29.07	3.15
2006-14	9.90	5.38	0.30			-28.53	
2008-46	9.35	11.16	0.26	0.028	upper diamictite bed	-28.15	3.36
2008-45	8.80	6.54	0.20	0.027		-27.91	3.64
2008-44	8.22	9.48	0.20	0.015		-28.04	4.06
2008-43	7.80	7.98	0.19	0.028		-27.83	3.35
2006-13	7.40	5.09	0.18			-27.88	
2008-21	7.39	6.31	0.25	0.054		-28.71	3.48
2008-22	7.29	5.94	0.30	0.061		-29.01	3.27
2008-23	7.06	4.35	0.26	0.053		-29.16	3.29
2008-24	6.83	5.91	0.27	0.050		-28.67	3.37
2008-25	6.60	5.28	0.37	0.056		-28.69	2.82
2006-12	6.50	7.90	0.27			-28.48	
2008-26	6.37	4.79	0.29	0.055		-28.74	3.51
2008-27	6.15	4.59	0.33	0.050		-28.81	3.45
2008-28	5.92	8.35	0.32	0.052		-28.67	3.62
2008-29	5.69	4.73	0.32	0.052		-28.70	3.25
2006-11	5.50	4.14	0.26			-28.77	
2008-30	5.46	3.97	0.38	0.057		-29.08	3.21
2008-31	5.23	9.06	0.27	0.055		-28.92	2.91
2008-32	5.01	6.93	0.33	0.045		-28.76	2.25
2008-33	4.78	7.52	0.32	0.054		-29.03	3.14
2008-34	4.55	6.21	0.41	0.066		-29.22	2.73
2006-10	4.50	5.24	0.40			-28.78	
2008-35	4.49	6.99	0.32	0.044		-27.98	2.94
2008-36	4.46	16.40	0.21	0.027	lower diamictite bed	-28.17	3.40
2008-37	4.32	6.53	0.35	0.059		-28.39	2.88
2008-38	4.07	9.42	0.39	0.049		-22.53	2.99
2006-9	4.00	5.60	0.24			-26.33	
2008-39	3.92	8.76	0.23	0.045		-25.85	2.93
2008-40	3.82	8.53	0.22	0.045		-27.68	2.75
2008-41	3.57	9.21	0.24	0.046		-27.68	2.75
2008-42	3.45	12.75	0.22	0.051		-27.17	3.15
2006-8	3.40	8.50	0.16			-25.73	
2008-1	3.32	12.47	0.21	0.058		-28.05	2.89
2006-1	3.20	22.40	0.10			-26.03	
2008-2	3.20	21.04	0.16	0.047		-26.97	2.98
2008-3	3.13	52.66	0.12	0.029		-25.91	3.12
2006-2	3.10	60.79	0.07		Pernik Bed	-27.18	
2008-4	3.07	51.72	0.11	0.031		-27.95	3.29
2006-3	3.00	7.09	0.07			-25.34	
2008-5	3.00	12.23	0.13	0.049		-25.31	3.01
2008-6	2.94	5.94	0.10	0.063		-29.32	2.95
2008-7	2.81	9.31	0.19	0.060		-29.34	3.06
2006-4	2.60	7.24	0.12			-25.58	
2008-8	2.57	10.85	0.20	0.063		-29.35	3.00
2008-9	2.32	6.41	0.15	0.065		-29.61	2.90
2008-10	2.07	6.29	0.13	0.058		-27.15	2.81
2006-5	2.00	4.30	0.12			-26.57	
2008-11	1.82	5.29	0.17	0.063		-26.10	2.71
2008-12	1.58	16.39	0.23	0.047		-29.45	2.87
2008-13	1.33	5.94	0.19	0.056		-28.08	2.72
2008-14	1.08	5.32	0.15	0.062		-29.59	3.12
2006-6	1.00	4.65	0.11			-27.46	
2008-15	0.83	4.45	0.17	0.065		-29.45	3.16
2008-16	0.58	4.33	0.16	0.066		-29.49	3.08
2008-17	0.34	3.38	0.20	0.069		-29.49	3.50

2008-18	0.09	3.59	0.21	0.061		-29.47	3.08
2006-7	0.00	3.97	0.11			-28.57	
2008-19	-0.53	6.73	0.17	0.051		-28.12	2.93
2008-20	-1.15	5.06	0.16	0.067		-29.59	3.36
Zadní Třebáň							
2008-7	7.80	2.91	0.18	-	Upper Diamictite Bed	-27.53	-
2008-6	7.10	3.21	0.19	-		-27.48	-
2008-1	6.55	3.21	0.14	-		-27.86	-
2008-2	6.46	4.89	0.27	0.051		-28.53	2.09
2008-3	6.30	6.36	0.25	0.052		-27.48	2.56
2008-4	6.05	5.66	0.29	0.059		-28.37	3.20
2008-5	5.90	5.67	0.25	0.054		-28.25	3.59
2008-8	5.70	5.83	0.31	0.063		-28.33	3.39
2008-9	5.50	5.36	0.28	0.052		-28.30	2.60
2008-10	5.30	4.78	0.28	0.050		-28.13	2.56
2008-11	5.10	6.43	0.26	0.059		-28.28	3.22
2008-12	4.90	5.95	0.30	0.060		-28.14	3.41
2008-13	4.70	5.24	0.36	0.066		-28.02	3.35
2008-14	4.55	6.47	0.29	0.062		-29.04	2.38
2008-15	4.50	7.46	0.28	0.052	Lower Diamictite Bed	-27.70	3.53
2008-16	4.42	4.64	0.25	0.047		-28.17	3.80
2008-17	4.38	3.66	0.21	-		-28.45	-
2008-18	4.32	5.70	0.25	0.044		-27.46	2.48
2008-19	4.20	5.32	0.25	0.056		-28.05	3.38
2008-20	4.00	6.02	0.25	0.054		-27.93	3.64
2008-21	3.80	4.53	0.23	0.048		-27.98	3.38
2008-22	3.60	5.12	0.23	0.044		-27.98	2.47
2008-23	3.40	5.53	0.23	0.049		-27.75	3.56
2008-24	3.20	6.35	0.28	0.046		-27.73	2.51
2008-25	3.00	6.26	0.21	0.052		-27.29	3.93
2008-26	2.80	5.13	0.29	0.064		-27.55	2.92
2008-27	2.60	5.15	0.28	0.067		-27.62	3.48
2008-28	2.40	5.70	0.29	0.067		-27.58	3.28
2008-29	2.20	4.68	0.39	0.070		-28.40	3.28
2008-30	2.00	6.78	0.35	0.064		-28.37	3.87
2008-31	1.95	8.33	0.26	0.056	prob. fault repeat #32-33	-27.70	3.35
2008-38	1.88	4.84	0.23	0.057	*Chondrites* bearing bed	-27.66	2.36
2008-32	1.85	8.97	0.17	0.061	*Mucronaspis* beds	-27.98	3.01
2008-33	1.83	8.76	0.19	0.063	*Mucronaspis* beds	-27.86	2.90
2008-34	1.80	10.40	0.24	0.064	top Pernik Bed with *M. ojsuensis*	-27.77	3.02
2008-35	1.75	50.80	0.14	0.029	burrowed calc mdst Pernik	-28.50	2.76
2008-36	1.60	50.35	0.12	0.030	lower Pernik	-28.24	3.28
2008-37	1.55	6.86	0.18	0.058		-28.28	3.20
2008-39	1.50	17.18	0.19	0.052		-28.48	3.10
2008-40	1.30	5.05	0.17	0.056		-28.66	3.08
2008-41	1.10	7.00	0.17	0.044		-28.42	2.87
2008-42	0.90	7.93	0.17	0.062		-28.57	3.27
2008-43	0.70	5.84	0.15	0.059		-28.88	2.86
2008-44	0.50	5.94	0.17	0.064		-28.84	3.11
2008-45	0.30	17.30	0.22	0.058		-28.82	2.86
2008-46	0.00	4.97	0.18	0.064		-28.72	3.04

- below limit for accurate measurement