

Leonardo R. Tedeschi et al., 2017, New age constraints on Aptian evaporites and carbonates from the South Atlantic: Implications for Oceanic Anoxic Event 1a: Geology, doi:10.1130/G38886.1.

INTRODUCTION

We investigated the stratigraphic interval between 2437 and 2689 meters below sea level (mbsl) of Petrobras Well CB-3, which is located in the offshore Campos Basin (southeastern Brazil) ($22^{\circ}44'S$; $40^{\circ}40'E$). Some sediments of this basin occur onshore but most of them are offshore. The basin extends offshore to water depths greater than 3000 m, covering an area of $100,000\text{ km}^2$ (Spadini et al., 1988; Winter et al., 2007). The well was drilled in a water depth of 208 m in 1982. The studied interval is composed of rocks lying above the evaporites: 1) Shallow-water carbonates varying from wackestones to grainstones - Quissamã Formation (2689–2509 mbsl) and; 2) Interbedded marls and wackestones/mudstones deposited in a deeper water environment - Outeiro Formation between (2509–2437 mbsl). In addition, we used carbon-isotope data ($\delta^{13}\text{C}$) and total organic carbon (TOC) already published from Petrobras Wells CB-3 and CP-5 in the Campos Basin (Dias, 1998; Azevedo, 2001) and Petrobras Well X in the Santos Basin (Quintaes, 2006).

METHODS

Foraminiferal biostratigraphy

171 samples were prepared for foraminiferal biostratigraphy in the Research Center of Petrobras (CENPES). Samples underwent oil extraction in a Soxhlet apparatus, with 30% methanol and 70% chloroform, were crushed in small chips and soaked in hydrogen peroxide (H_2O_2) at 80°C in order to oxidize organic matter and disaggregate the material. After that, residues were washed under running tap water in 1.0 mm and

62 µm sieves. The dried fraction 62µm–1.0mm was passed through 125 µm and 250 µm sieves. Subsequently, some samples were reacted with acetic acid in order to separate foraminifera from the carbonate matrix and cement. Following this procedure, the specimens of both fractions were picked and analyzed for the presence of foraminifera by using a stereomicroscope with reflected light. The biostratigraphic framework used and species concepts adopted in this study follow Caron (1978), Premoli Silva and Verga (2004), Huber and Leckie (2011), Petrizzo et al. (2012), Ando et al. (2013) and Kennedy et al. (2014). Figure DR1 shows some of the species identified in Petrobras Well CB-3.

Carbon- and oxygen-isotope analysis

195 samples were analyzed for carbon and oxygen isotopes ($\delta^{13}\text{C}$ and $\delta^{18}\text{O}$) on bulk rock. 185 samples underwent oil extraction as described above. Thereafter, all samples were ground to less than 0.177mm at CENPES and analyzed at the University of Oxford (UO) and at Universidade do Estado Rio de Janeiro (UERJ). A VG Isogas Prism II mass spectrometer with an on-line VG Isocarb common acid bath preparation system was used to analyse the samples at UO, whereas a Kiel IV carbonate device coupled to Thermo Delta V Advantage mass spectrometer was used to perform analyses at UERJ. Samples were reacted with purified phosphoric acid (H_3PO_4) at 90°C in both instruments and the gas was analyzed online. Data are reported in parts per thousand (‰) relative to the Vienna Pee Dee Belemnite (VPDB) scale. The calibration was undertaken by using the IAEA CO-1 standard in both laboratories ($\delta^{13}\text{C} = 2.47\text{\textperthousand}$ and $\delta^{18}\text{O} = -2.4\text{\textperthousand}$) and its standard deviation (σ) was less than $\pm 0.07\text{\textperthousand}$ for $\delta^{13}\text{C}$ and $\pm 0.12\text{\textperthousand}$ for $\delta^{18}\text{O}$ in both laboratories. All $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ values obtained in this study are given in Table DR1. Figure DR2 shows a cross-plot of replicates within and between laboratories in order to show the good to excellent

reproducibility, in which A-coefficients are close to 1.0, B-coefficients are close to 0.0 and determination coefficients (R^2) are close to 1. Hence, analytical data are hence deemed reliable.

CAMPOS/SANTOS COMPOSITE CARBON-ISOTOPE CURVE

We have used $\delta^{13}\text{C}$ and TOC data from Petrobras Wells CP-5 (Campos Basin) and X (Santos Basin) to generate a composite curve. Because depth intervals (m) are not defined as relative to some reference level (e.g. meters below sea floor or meters below sea level: Dias, 1998, Quintaes, 2006), we have assumed that depth intervals correspond to penetrated depth during drilling operations. 106 analyses from Petrobras Well CP-5 (Dias, 1998) derived from the interval 4629–5202 meters penetrated (mp), and represent rocks stratigraphically below the evaporites of Lagoa Feia Group in the Campos Basin. Sedimentary rocks stratigraphically above 5015 mp are mainly composed of microbial carbonates (Alagoas local stage; Dias, 1998), whereas rocks below this level are from the Coqueiros Formation (Jiquiá local stage) and comprise interbedded coquinas and shales (Dias, 1998; Rodrigues, 2005, Winter et al., 2007). All analyses of CP-5 Well material were performed at the Centro de Energia Nuclear na Agricultura – University of São Paulo (CENA) (Dias, 1998). The sampling interval was usually \sim 6 meters. We also used 428 analyses of material from Petrobras Well X in the interval 4668–5952 mp that represent sediments lying stratigraphically above the evaporites of the Camburi Group in the Santos Basin. This well encountered the top of the evaporites (Ariri Formation) at 5952 mp. Sedimentary rocks stratigraphically lower than 4700 mp are shallow-water carbonates (Guarujá Formation), whereas rocks above this level are mainly deep-water carbonates, marls and shales (Itanhaém Formation) (Quintaes, 2006; Moreira et al., 2007).

The stratigraphic relationship between the wells was calculated by assuming the evaporites to be contemporaneous in both Campos and Santos Basins, based on seismic evidence (Davison et al., 2012). The bottom depth of Petrobras Well CP-5 (4629 mp), below the evaporites, was taken as 0 meters relative thickness (mrt) and the intervals between each sample were summed up to the top of the designated interval (5202 mp = 573 mrt) (Table DR2). A gap between relative depths attributed to the top of Petrobras Well CP-5 and the base of Petrobras Well X was used to represent the evaporites of up to ~2km (Davison et al., 2012). The bottom depth (5952 mp) of Petrobras Well X, above the evaporites, was taken as 2600 mrt and the intervals between each sample were summed up to the top of the designated interval (4668 mp = 3884 mrt) (Table DR4).

DISCUSSION ON DIAGENESIS

$\delta^{13}\text{C}$ data

Figure DR3 shows the cross-plot between the $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ data. There is little correlation between the different isotopic systems (coefficient of correlation (R) = 0.0309), suggesting that diagenetic effects have had little affect on $\delta^{13}\text{C}$ values. In general, carbon isotopes in carbonates, particularly of deep-water character, are relatively conservative: unlike oxygen, their concentration in pore waters in initially porous sediment is low, limiting possibilities of diagenetic exchange (e.g. Scholle and Arthur, 1980; Marshall, 1992; Jenkyns et al., 1994). In addition, $\delta^{13}\text{C}$ values do not show different patterns associated with particular carbonate facies.

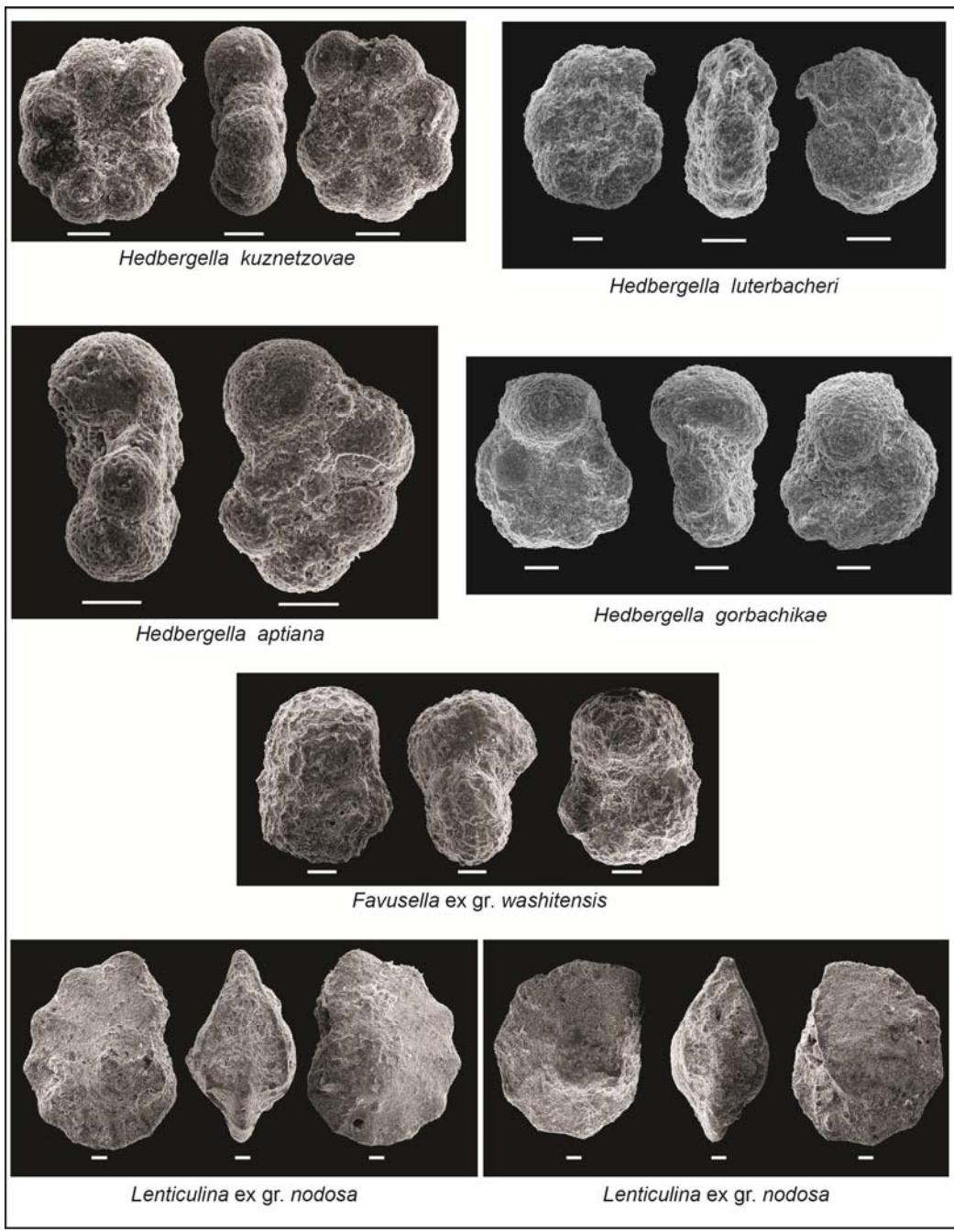


Figure DR-1 – Examples of Aptian species identified in Petrobras Well CB-3. All planktonic foraminifera are from 2500.3 mbsl and specimens of *Lenticulina* ex gr. *nodosa* are from 2505.9m. Scale bars = 50 μ m.

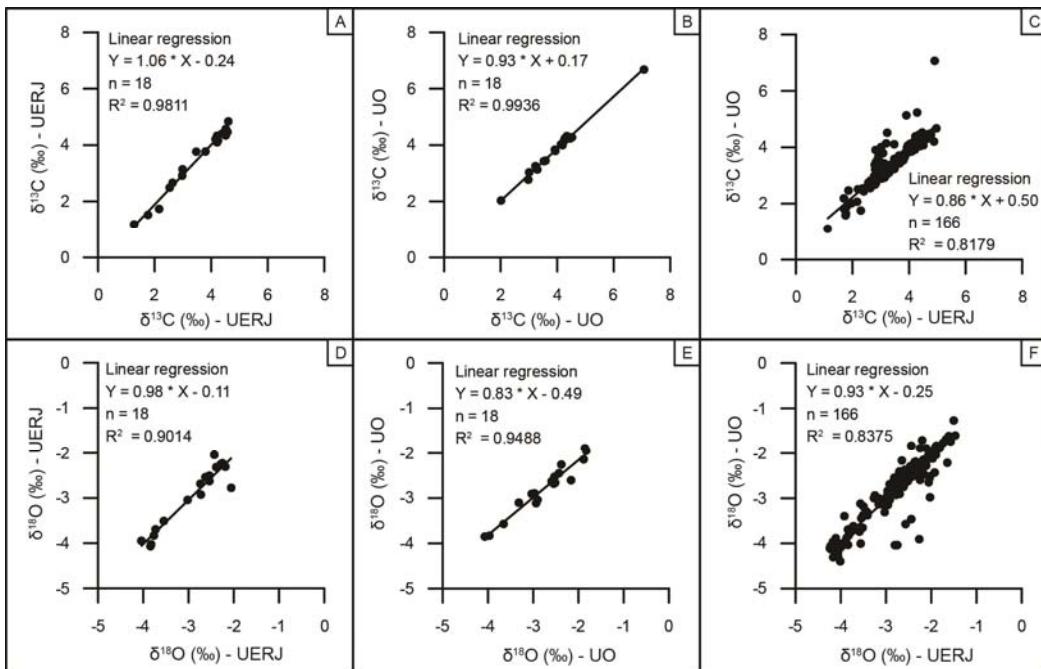


Figure DR2 – Cross-plots between replicate analyses of samples from Petrobras Well CB-3. A - $\delta^{13}\text{C}$ replicate data obtained at UERJ, B - $\delta^{13}\text{C}$ replicate data obtained at OU, C - $\delta^{13}\text{C}$ data analysed in both laboratories, D - $\delta^{18}\text{O}$ replicate data obtained at UERJ, E - $\delta^{18}\text{O}$ replicate data obtained at OU, F - $\delta^{18}\text{O}$ data analysed in both laboratories.

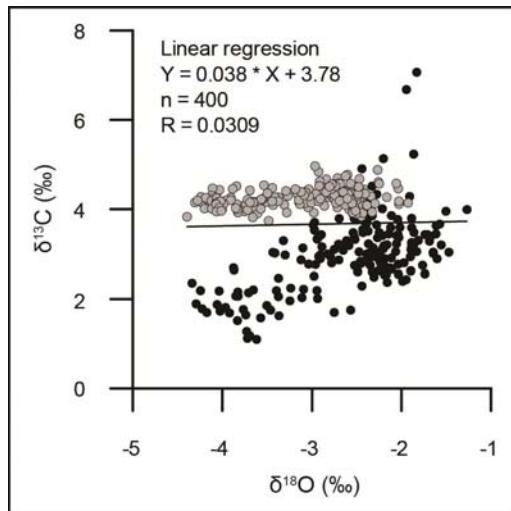


Figure DR3 – Cross-plot $\delta^{18}\text{O}$ versus $\delta^{13}\text{C}$ data from Petrobras Well CB-3. Gray – analyses below 2516.50 mbsl. Black – analyses above 2516.50 mbsl.

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Table DR1 – Carbon and oxygen stable-isotope data for bulk carbonate fraction of samples from Petrobras Well CB-3 against depth (meters below sea level - mbsl).

Also shown is the laboratories where the analyses were performed. Samples that have not undergone to oil extraction are shown in red.

Depth (mbsl)	$\delta^{13}\text{C}$ (‰)	$\delta^{18}\text{O}$ (‰)	Lab
2436.75	1.96	-3.25	UERJ
2437.25	2.19	-4.25	UERJ
2437.45	2.25	-3.24	UERJ
2438.00	2.22	-3.09	UERJ
2438.10	2.06	-3.37	UERJ
2438.60	1.18	-3.69	UERJ
2438.60	1.28	-3.73	UERJ
2439.25	2.07	-3.85	UERJ
2439.85	2.21	-3.65	UERJ
2440.26	2.36	-4.34	UERJ
2440.70	2.14	-3.71	UERJ
2441.20	1.69	-3.92	UERJ
2441.65	1.63	-3.37	UERJ
2442.00	1.89	-4.29	UERJ
2442.87	2.29	-2.44	UERJ
2443.35	1.70	-2.75	UERJ
2443.83	1.73	-4.03	UERJ
2443.83	2.16	-3.83	UERJ
2444.14	2.87	-2.70	UERJ
2444.85	3.04	-3.44	UERJ
2445.15	1.86	-3.50	UERJ
2445.55	1.70	-4.17	UERJ
2446.10	3.02	-3.41	UERJ
2446.60	1.78	-4.23	UERJ
2447.20	2.19	-2.94	UERJ
2447.70	1.12	-3.72	UERJ
2448.55	2.65	-3.87	UERJ
2449.23	1.52	-3.83	UERJ
2449.23	1.77	-3.77	UERJ
2449.70	1.76	-2.57	UERJ
2450.00	2.94	-2.79	UERJ
2450.80	3.33	-2.94	UERJ
2451.30	3.65	-2.99	UERJ
2452.00	2.94	-2.92	UERJ
2452.45	2.37	-2.16	UERJ

Depth (mbsl)	$\delta^{13}\text{C}$ (‰)	$\delta^{18}\text{O}$ (‰)	Lab
2436.75	2.03	-3.11	UO
2436.75	2.01	-2.94	UO
2441.20	2.19	-3.40	UO
2442.87	1.75	-3.46	UO
2443.35	2.18	-4.04	UO
2443.83	2.07	-3.82	UO
2444.14	2.89	-2.91	UO
2444.85	2.98	-3.30	UO
2445.15	2.47	-3.37	UO
2445.55	1.81	-3.96	UO
2446.10	3.13	-3.10	UO
2446.10	3.16	-2.89	UO
2446.10	3.30	-3.32	UO
2446.60	1.88	-4.06	UO
2447.20	2.51	-2.98	UO
2447.70	1.10	-3.62	UO
2448.55	2.69	-3.88	UO
2449.23	1.65	-3.74	UO
2449.70	1.58	-3.57	UO
2450.00	3.00	-2.82	UO
2450.80	3.38	-2.93	UO
2451.30	3.71	-2.97	UO
2452.00	3.43	-2.89	UO
2452.00	3.53	-2.97	UO
2452.45	2.55	-2.17	UO
2452.60	3.90	-2.54	UO
2453.27	4.01	-2.21	UO
2454.20	3.48	-2.43	UO
2454.70	2.82	-2.24	UO
2455.30	3.36	-2.27	UO
2456.15	2.69	-2.15	UO
2456.80	3.79	-2.70	UO
2457.65	4.52	-2.33	UO
2458.17	2.77	-3.04	UO
2458.17	2.87	-3.12	UO

Depth (mbsl)	$\delta^{13}\text{C}$ (‰)	$\delta^{18}\text{O}$ (‰)	Lab
2452.60	2.81	-2.46	UERJ
2453.27	3.01	-1.65	UERJ
2454.20	2.83	-2.42	UERJ
2454.70	2.66	-2.23	UERJ
2454.70	2.64	-2.25	UERJ
2455.30	2.84	-2.39	UERJ
2456.15	2.70	-2.18	UERJ
2456.80	3.08	-2.65	UERJ
2457.65	3.23	-2.37	UERJ
2458.17	2.76	-2.96	UERJ
2458.77	3.90	-2.37	UERJ
2459.75	3.19	-2.59	UERJ
2460.20	2.79	-2.45	UERJ
2460.60	2.40	-1.99	UERJ
2460.95	3.77	-2.51	UERJ
2460.95	3.48	-2.54	UERJ
2461.90	2.80	-2.78	UERJ
2462.80	2.91	-2.11	UERJ
2463.55	4.29	-1.91	UERJ
2464.07	4.91	-2.44	UERJ
2464.98	3.05	-2.07	UERJ
2465.25	2.56	-1.74	UERJ
2466.00	3.74	-2.38	UERJ
2466.35	2.63	-1.90	UERJ
2466.60	2.61	-2.33	UERJ
2467.90	2.49	-2.31	UERJ
2467.90	2.53	-2.19	UERJ
2469.05	3.21	-2.16	UERJ
2469.40	3.32	-2.52	UERJ
2469.50	2.77	-2.04	UERJ
2470.78	2.80	-1.97	UERJ
2471.05	3.18	-2.19	UERJ
2471.75	3.04	-1.47	UERJ
2472.15	3.13	-2.21	UERJ
2472.45	2.83	-2.46	UERJ
2472.90	3.20	-1.56	UERJ
2473.45	2.92	-2.25	UERJ
2473.45	2.98	-2.29	UERJ
2474.20	3.86	-2.11	UERJ
2474.50	3.96	-1.50	UERJ
2474.65	3.39	-1.67	UERJ
2475.15	3.60	-2.02	UERJ

Depth (mbsl)	$\delta^{13}\text{C}$ (‰)	$\delta^{18}\text{O}$ (‰)	Lab
2458.17	2.98	-2.91	UO
2458.77	5.13	-2.20	UO
2459.75	4.14	-2.37	UO
2460.20	3.38	-2.53	UO
2460.60	2.44	-1.95	UO
2460.95	4.11	-2.37	UO
2461.90	3.22	-2.70	UO
2462.80	3.65	-2.28	UO
2463.55	5.23	-1.86	UO
2464.07	6.68	-1.94	UO
2464.07	7.07	-1.83	UO
2464.98	3.41	-2.05	UO
2465.25	2.75	-1.76	UO
2466.00	3.51	-2.37	UO
2466.35	2.55	-2.03	UO
2466.60	2.61	-2.49	UO
2467.90	2.63	-2.17	UO
2469.05	3.05	-2.47	UO
2469.40	3.18	-2.62	UO
2469.50	2.67	-2.11	UO
2470.78	2.68	-2.12	UO
2471.05	3.03	-2.25	UO
2471.05	3.00	-2.35	UO
2471.05	3.01	-2.38	UO
2471.75	2.89	-1.60	UO
2472.15	2.92	-2.22	UO
2472.45	2.74	-2.52	UO
2472.90	3.04	-1.65	UO
2473.45	2.90	-2.36	UO
2474.20	3.80	-1.89	UO
2474.50	3.99	-1.27	UO
2474.65	3.28	-1.69	UO
2475.15	3.43	-2.04	UO
2475.40	3.45	-2.14	UO
2475.40	3.59	-1.89	UO
2476.05	3.23	-2.06	UO
2476.15	3.41	-2.21	UO
2477.15	3.16	-1.89	UO
2477.60	3.45	-1.61	UO
2478.20	3.00	-2.35	UO
2478.40	3.43	-1.74	UO
2482.10	3.43	-1.71	UO

Depth (mbsl)	$\delta^{13}\text{C}$ (‰)	$\delta^{18}\text{O}$ (‰)	Lab
2475.40	3.48	-2.25	UERJ
2476.05	3.37	-2.03	UERJ
2476.15	3.59	-2.12	UERJ
2477.15	3.30	-1.81	UERJ
2477.60	3.63	-1.61	UERJ
2478.20	3.14	-2.32	UERJ
2478.20	2.99	-2.39	UERJ
2478.40	3.67	-1.57	UERJ
2482.10	3.12	-2.20	UERJ
2482.60	3.10	-1.89	UERJ
2482.95	2.75	-2.35	UERJ
2483.50	3.48	-1.86	UERJ
2499.30	4.34	-2.28	UERJ
2500.30	3.23	-1.89	UERJ
2501.00	3.08	-2.32	UERJ
2501.80	3.85	-2.33	UERJ
2503.00	3.77	-2.04	UERJ
2503.00	3.80	-2.43	UERJ
2504.90	3.30	-2.61	UERJ
2505.90	4.10	-2.37	UERJ
2506.70	3.97	-2.36	UERJ
2507.70	4.06	-2.37	UERJ
2508.70	4.17	-2.47	UERJ
2510.15	4.13	-2.52	UERJ
2512.60	4.37	-2.60	UERJ
2516.50	4.12	-2.03	UERJ
2517.80	4.43	-2.61	UERJ
2518.55	4.84	-2.93	UERJ
2518.55	4.61	-2.73	UERJ
2519.80	4.40	-3.06	UERJ
2520.90	4.54	-2.73	UERJ
2521.35	4.48	-2.57	UERJ
2522.50	4.30	-3.27	UERJ
2528.40	4.46	-2.04	UERJ
2531.80	4.60	-2.73	UERJ
2533.55	4.70	-2.71	UERJ
2536.50	4.97	-2.97	UERJ
2540.32	4.44	-2.42	UERJ
2541.40	4.47	-2.78	UERJ
2541.40	4.58	-2.06	UERJ
2543.45	4.62	-2.91	UERJ
2546.08	4.41	-2.82	UERJ

Depth (mbsl)	$\delta^{13}\text{C}$ (‰)	$\delta^{18}\text{O}$ (‰)	Lab
2482.60	2.94	-1.90	UO
2482.95	2.89	-2.19	UO
2483.50	3.25	-1.89	UO
2483.50	3.23	-1.86	UO
2499.30	4.08	-2.33	UO
2500.30	3.05	-1.83	UO
2501.00	2.92	-2.28	UO
2501.80	3.67	-2.39	UO
2503.00	3.54	-2.43	UO
2504.90	3.10	-2.75	UO
2505.90	3.85	-2.37	UO
2506.70	3.87	-2.34	UO
2507.70	3.84	-2.49	UO
2508.70	3.79	-2.53	UO
2508.70	3.93	-2.53	UO
2510.15	4.02	-2.53	UO
2512.60	4.18	-2.69	UO
2516.50	3.92	-2.98	UO
2517.80	4.19	-2.63	UO
2518.55	4.44	-2.84	UO
2519.80	4.14	-3.14	UO
2520.90	4.28	-2.81	UO
2521.35	4.22	-2.63	UO
2522.50	4.19	-3.00	UO
2528.40	4.28	-2.68	UO
2528.40	4.52	-2.55	UO
2533.55	4.47	-2.72	UO
2536.50	4.67	-2.84	UO
2540.32	4.26	-2.47	UO
2541.40	4.35	-2.65	UO
2543.45	4.31	-2.88	UO
2546.08	4.14	-2.54	UO
2547.90	4.22	-2.61	UO
2549.16	4.19	-2.66	UO
2549.50	4.15	-2.66	UO
2549.50	4.24	-2.52	UO
2551.00	4.15	-2.43	UO
2552.90	4.11	-2.51	UO
2556.80	4.29	-2.34	UO
2557.90	4.21	-2.55	UO
2558.80	4.15	-2.44	UO
2559.80	4.10	-2.43	UO

Depth (mbsl)	$\delta^{13}\text{C}$ (‰)	$\delta^{18}\text{O}$ (‰)	Lab
2547.90	4.45	-2.83	UERJ
2549.16	4.36	-2.79	UERJ
2549.50	4.40	-2.65	UERJ
2551.00	4.32	-2.71	UERJ
2552.90	4.37	-2.56	UERJ
2556.80	4.61	-2.26	UERJ
2557.90	4.25	-2.64	UERJ
2558.80	4.33	-2.54	UERJ
2558.80	4.21	-2.63	UERJ
2559.80	4.25	-2.50	UERJ
2560.50	4.25	-2.47	UERJ
2561.73	4.47	-2.83	UERJ
2562.70	4.22	-2.75	UERJ
2564.00	4.14	-1.93	UERJ
2564.60	4.08	-2.39	UERJ
2566.00	4.09	-2.39	UERJ
2566.90	4.23	-2.54	UERJ
2567.30	4.21	-2.50	UERJ
2568.00	4.10	-2.63	UERJ
2568.00	4.21	-2.54	UERJ
2569.50	4.18	-2.03	UERJ
2570.30	4.31	-2.49	UERJ
2574.40	4.68	-2.47	UERJ
2575.20	4.77	-2.60	UERJ
2576.40	4.57	-2.25	UERJ
2577.15	4.57	-2.74	UERJ
2578.40	4.37	-2.73	UERJ
2579.10	4.32	-2.75	UERJ
2580.35	4.34	-2.92	UERJ
2581.50	4.41	-3.04	UERJ
2581.50	4.39	-3.02	UERJ
2582.30	4.34	-3.01	UERJ
2584.33	4.32	-3.15	UERJ
2584.75	4.45	-2.78	UERJ
2586.20	4.58	-2.70	UERJ
2587.42	4.38	-2.65	UERJ
2587.90	4.34	-3.16	UERJ
2588.25	4.35	-2.48	UERJ
2588.90	4.50	-2.48	UERJ
2589.80	4.74	-2.62	UERJ
2591.40	4.57	-2.69	UERJ
2591.40	4.52	-2.74	UERJ

Depth (mbsl)	$\delta^{13}\text{C}$ (‰)	$\delta^{18}\text{O}$ (‰)	Lab
2560.50	4.13	-2.30	UO
2561.73	4.32	-2.78	UO
2562.70	4.04	-2.72	UO
2564.00	3.84	-2.45	UO
2564.00	3.92	-2.43	UO
2564.60	3.93	-2.33	UO
2566.00	3.90	-2.50	UO
2566.90	4.00	-2.58	UO
2567.30	3.95	-2.54	UO
2568.00	3.92	-2.54	UO
2569.50	3.96	-2.51	UO
2570.30	4.13	-2.55	UO
2574.40	4.45	-2.47	UO
2575.20	4.45	-2.69	UO
2576.40	4.32	-2.63	UO
2576.40	4.34	-2.59	UO
2577.15	4.36	-2.79	UO
2578.40	4.14	-2.73	UO
2579.10	4.08	-2.86	UO
2580.35	4.19	-2.69	UO
2581.50	4.04	-3.04	UO
2582.30	4.14	-3.07	UO
2584.33	4.14	-3.01	UO
2584.75	4.18	-2.93	UO
2586.20	4.35	-2.41	UO
2587.42	4.24	-2.60	UO
2587.42	4.27	-2.16	UO
2587.90	4.11	-3.13	UO
2594.40	4.20	-3.15	UO
2595.40	4.38	-2.84	UO
2596.00	4.23	-2.91	UO
2596.00	4.45	-3.03	UO
2597.00	4.10	-3.31	UO
2610.80	3.93	-3.28	UO
2614.40	4.09	-3.43	UO
2618.20	4.54	-3.54	UO
2622.90	4.27	-3.37	UO
2625.90	3.97	-3.64	UO
2630.30	3.74	-3.48	UO
2634.20	3.91	-3.61	UO
2637.60	3.93	-3.83	UO
2641.40	3.82	-3.66	UO

Depth (mbsl)	$\delta^{13}\text{C}$ (‰)	$\delta^{18}\text{O}$ (‰)	Lab
2592.40	4.58	-2.57	UERJ
2593.55	4.56	-2.78	UERJ
2594.40	4.35	-2.96	UERJ
2595.40	4.40	-2.86	UERJ
2596.00	4.52	-2.92	UERJ
2597.00	4.29	-3.03	UERJ
2650.60	4.23	-3.52	UERJ
2651.20	4.48	-3.44	UERJ
2652.60	4.27	-3.41	UERJ
2653.10	4.16	-3.51	UERJ
2653.10	4.24	-3.55	UERJ
2654.20	3.95	-3.76	UERJ
2655.40	4.21	-3.56	UERJ
2656.00	4.18	-3.59	UERJ
2656.40	3.93	-3.83	UERJ
2657.85	4.22	-3.72	UERJ
2658.55	4.38	-3.07	UERJ
2659.70	4.22	-3.57	UERJ
2660.80	4.12	-3.84	UERJ
2661.80	4.03	-4.02	UERJ
2670.70	4.34	-4.07	UERJ
2670.70	4.52	-3.84	UERJ
2671.70	4.47	-4.11	UERJ
2672.65	4.28	-4.24	UERJ
2674.55	4.14	-4.22	UERJ
2675.40	4.26	-3.91	UERJ
2676.80	4.30	-4.12	UERJ
2677.50	4.22	-4.17	UERJ
2678.60	4.26	-4.19	UERJ
2679.40	4.36	-3.50	UERJ
2680.00	4.21	-3.95	UERJ
2680.00	4.16	-4.04	UERJ
2681.30	4.10	-4.07	UERJ
2682.20	4.51	-2.80	UERJ
2682.95	4.25	-4.06	UERJ
2684.15	4.88	-2.27	UERJ
2685.40	4.11	-3.99	UERJ
2686.25	4.16	-4.05	UERJ
2687.00	4.18	-4.02	UERJ
2688.50	4.04	-4.03	UERJ
2689.10	3.96	-4.01	UERJ

Depth (mbsl)	$\delta^{13}\text{C}$ (‰)	$\delta^{18}\text{O}$ (‰)	Lab
2644.20	4.09	-3.69	UO
2650.60	4.17	-3.65	UO
2651.20	4.41	-3.29	UO
2652.60	4.18	-3.38	UO
2653.10	4.18	-3.44	UO
2654.20	4.06	-3.66	UO
2655.40	3.99	-4.00	UO
2656.00	4.12	-3.74	UO
2656.40	3.98	-3.72	UO
2657.85	4.01	-3.57	UO
2657.85	4.15	-3.65	UO
2658.55	4.32	-3.09	UO
2659.70	4.39	-3.12	UO
2660.80	4.15	-3.69	UO
2661.80	4.12	-4.01	UO
2670.70	4.43	-4.03	UO
2671.70	4.46	-3.88	UO
2672.65	4.27	-4.11	UO
2673.50	4.42	-3.69	UO
2674.55	4.13	-4.13	UO
2675.40	4.00	-3.83	UO
2675.40	4.19	-3.97	UO
2676.80	4.23	-4.12	UO
2677.50	4.15	-4.31	UO
2678.60	4.18	-4.11	UO
2679.40	4.45	-3.18	UO
2680.00	4.19	-4.12	UO
2681.30	4.01	-4.20	UO
2682.20	4.07	-4.04	UO
2682.95	4.19	-4.28	UO
2684.15	4.20	-3.91	UO
2685.40	4.03	-3.85	UO
2685.40	4.13	-4.07	UO
2686.25	4.01	-4.12	UO
2687.00	4.11	-4.07	UO
2688.50	3.95	-4.07	UO
2689.10	3.83	-4.39	UO

Table DR2 – Compilation of carbon stable-isotope data for bulk carbonate fraction of Petrobras Wells CP-5 and X against penetrated depth (meters) and relative thickness (meters) used in this study. TOC values also shown (Dias, 1998; Quintaes, 2006).

Well	Penetrated depth (m)	Relative thickness (m)	$\delta^{13}\text{C}$ (‰)	TOC (%)	Formation
X	4668	3884	-0.29	0.2	Itanhaém
X	4671	3881	0.37	0.2	Itanhaém
X	4674	3878	0.36	0.2	Itanhaém
X	4677	3875	-0.22	0.2	Itanhaém
X	4680	3872	0.87	0.2	Itanhaém
X	4683	3869	0.90	0.2	Itanhaém
X	4686	3866	0.30	0.2	Itanhaém
X	4689	3863	-0.30	0.3	Itanhaém
X	4692	3860	0.59	0.3	Itanhaém
X	4695	3857	0.24	0.3	Itanhaém
X	4698	3854	-0.05	0.2	Itanhaém
X	4701	3851	-0.08	0.2	Guarujá
X	4704	3848	1.13	0.1	Guarujá
X	4707	3845	2.52	0.2	Guarujá
X	4710	3842	3.30	0.1	Guarujá
X	4713	3839	3.06	0.1	Guarujá
X	4716	3836	3.00	0.1	Guarujá
X	4719	3833	3.42	0.1	Guarujá
X	4722	3830	3.27	0.1	Guarujá
X	4725	3827	3.40	0.1	Guarujá
X	4728	3824	3.56	0.1	Guarujá
X	4731	3821	3.72	0.0	Guarujá
X	4734	3818	3.73	0.1	Guarujá
X	4737	3815	3.80	0.1	Guarujá
X	4740	3812	3.78	0.4	Guarujá
X	4743	3809	3.63	0.1	Guarujá
X	4746	3806	3.89	0.0	Guarujá
X	4749	3803	4.03	0.1	Guarujá
X	4752	3800	3.97	0.1	Guarujá
X	4755	3797	3.84	0.1	Guarujá
X	4758	3794	4.02	0.1	Guarujá
X	4761	3791	4.08	0.0	Guarujá
X	4764	3788	3.79	0.1	Guarujá
X	4767	3785	3.68	0.1	Guarujá
X	4770	3782	3.66	0.1	Guarujá
X	4773	3779	3.90	0.0	Guarujá
X	4776	3776	3.75	0.1	Guarujá
X	4779	3773	3.89	0.1	Guarujá
X	4782	3770	3.76	0.1	Guarujá
X	4785	3767	3.92	0.1	Guarujá
X	4788	3764	3.91	0.1	Guarujá
X	4791	3761	3.95	0.1	Guarujá
X	4794	3758	4.00	0.1	Guarujá
X	4797	3755	4.11	0.0	Guarujá

Well	Penetrated depth (m)	Relative thickness (m)	$\delta^{13}\text{C}$ (‰)	TOC (%)	Formation
X	4800	3752	3.81	0.1	Guarujá
X	4803	3749	3.65	0.2	Guarujá
X	4806	3746	3.90	0.1	Guarujá
X	4809	3743	3.77	0.1	Guarujá
X	4812	3740	3.95	0.1	Guarujá
X	4815	3737	3.76	0.1	Guarujá
X	4818	3734	3.76	0.1	Guarujá
X	4821	3731	3.54	0.1	Guarujá
X	4824	3728	3.26	0.0	Guarujá
X	4827	3725	3.68	0.1	Guarujá
X	4830	3722	3.91	0.1	Guarujá
X	4833	3719	3.83	0.1	Guarujá
X	4836	3716	3.82	0.1	Guarujá
X	4839	3713	3.84	0.0	Guarujá
X	4842	3710	3.71	0.1	Guarujá
X	4845	3707	3.87	0.1	Guarujá
X	4848	3704	3.76	0.1	Guarujá
X	4851	3701	3.90	0.0	Guarujá
X	4854	3698	3.76	0.1	Guarujá
X	4857	3695	3.50	0.1	Guarujá
X	4860	3692	3.81	0.1	Guarujá
X	4863	3689	3.73	0.1	Guarujá
X	4866	3686	3.82	0.0	Guarujá
X	4869	3683	4.05	0.1	Guarujá
X	4872	3680	4.03	0.1	Guarujá
X	4875	3677	3.93	0.1	Guarujá
X	4878	3674	3.80	0.1	Guarujá
X	4881	3671	4.19	0.1	Guarujá
X	4884	3668	3.83	0.1	Guarujá
X	4887	3665	3.66	0.2	Guarujá
X	4890	3662	3.89	0.1	Guarujá
X	4893	3659	3.79	0.1	Guarujá
X	4896	3656	3.96	0.1	Guarujá
X	4899	3653	4.02	0.1	Guarujá
X	4902	3650	3.76	0.2	Guarujá
X	4905	3647	3.80	0.2	Guarujá
X	4908	3644	3.62	0.2	Guarujá
X	4911	3641	3.64	0.1	Guarujá
X	4914	3638	3.77	0.2	Guarujá
X	4917	3635	3.80	0.2	Guarujá
X	4920	3632	3.74	0.1	Guarujá
X	4923	3629	3.88	0.1	Guarujá
X	4926	3626	3.71	0.1	Guarujá
X	4929	3623	3.71	0.1	Guarujá
X	4932	3620	3.76	0.2	Guarujá
X	4935	3617	3.79	0.1	Guarujá
X	4938	3614	3.70	0.1	Guarujá
X	4941	3611	3.74	0.2	Guarujá
X	4944	3608	3.64	0.2	Guarujá
X	4947	3605	3.81	0.2	Guarujá
X	4950	3602	3.70	0.2	Guarujá
X	4953	3599	3.70	0.2	Guarujá

Well	Penetrated depth (m)	Relative thickness (m)	$\delta^{13}\text{C}$ (‰)	TOC (%)	Formation
X	4956	3596	3.91	0.2	Guarujá
X	4959	3593	3.84	0.2	Guarujá
X	4962	3590	4.00	0.2	Guarujá
X	4965	3587	3.90	0.2	Guarujá
X	4968	3584	3.82	0.2	Guarujá
X	4971	3581	3.88	0.2	Guarujá
X	4974	3578	3.82	0.2	Guarujá
X	4977	3575	3.61	0.2	Guarujá
X	4980	3572	3.72	0.2	Guarujá
X	4983	3569	3.99	0.2	Guarujá
X	4986	3566	3.60	0.2	Guarujá
X	4989	3563	3.74	0.2	Guarujá
X	4992	3560	3.74	0.2	Guarujá
X	4995	3557	3.74	0.2	Guarujá
X	4998	3554	3.75	0.2	Guarujá
X	5001	3551	3.76	0.2	Guarujá
X	5004	3548	3.30	0.2	Guarujá
X	5007	3545	3.60	0.2	Guarujá
X	5010	3542	3.70	0.2	Guarujá
X	5013	3539	3.69	0.2	Guarujá
X	5016	3536	3.74	0.2	Guarujá
X	5019	3533	3.68	0.2	Guarujá
X	5022	3530	3.66	0.2	Guarujá
X	5025	3527	3.62	0.2	Guarujá
X	5028	3524	3.43	0.2	Guarujá
X	5031	3521	3.62	0.2	Guarujá
X	5034	3518	3.56	0.2	Guarujá
X	5037	3515	3.57	0.2	Guarujá
X	5040	3512	3.76	0.2	Guarujá
X	5043	3509	3.55	0.3	Guarujá
X	5046	3506	3.53	0.2	Guarujá
X	5049	3503	3.51	0.3	Guarujá
X	5052	3500	3.59	0.4	Guarujá
X	5055	3497	3.68	0.2	Guarujá
X	5058	3494	3.40	0.2	Guarujá
X	5061	3491	3.49	0.2	Guarujá
X	5064	3488	3.53	0.2	Guarujá
X	5067	3485	3.74	0.2	Guarujá
X	5070	3482	3.69	0.3	Guarujá
X	5073	3479	3.74	0.2	Guarujá
X	5076	3476	3.87	0.3	Guarujá
X	5079	3473	3.77	0.3	Guarujá
X	5082	3470	3.79	0.2	Guarujá
X	5085	3467	3.74	0.3	Guarujá
X	5088	3464	3.76	0.2	Guarujá
X	5094	3458	3.95	0.2	Guarujá
X	5097	3455	3.90	0.2	Guarujá
X	5100	3452	3.46	0.2	Guarujá
X	5103	3449	3.93	0.2	Guarujá
X	5106	3446	3.85	0.2	Guarujá
X	5109	3443	3.82	0.2	Guarujá
X	5112	3440	3.72	0.2	Guarujá

Well	Penetrated depth (m)	Relative thickness (m)	$\delta^{13}\text{C}$ (‰)	TOC (%)	Formation
X	5115	3437	3.83	0.2	Guarujá
X	5118	3434	3.70	0.2	Guarujá
X	5121	3431	3.66	0.2	Guarujá
X	5124	3428	3.87	0.2	Guarujá
X	5127	3425	3.75	0.2	Guarujá
X	5130	3422	3.60	0.2	Guarujá
X	5133	3419	3.60	0.2	Guarujá
X	5136	3416	3.62	0.2	Guarujá
X	5139	3413	3.58	0.2	Guarujá
X	5142	3410	3.65	0.2	Guarujá
X	5145	3407	3.58	0.2	Guarujá
X	5148	3404	3.59	0.2	Guarujá
X	5151	3401	3.35	0.2	Guarujá
X	5154	3398	3.18	0.2	Guarujá
X	5157	3395	3.44	0.2	Guarujá
X	5160	3392	3.10	0.2	Guarujá
X	5163	3389	3.09	0.3	Guarujá
X	5166	3386	3.28	0.2	Guarujá
X	5169	3383	2.98	0.4	Guarujá
X	5172	3380	2.98	0.2	Guarujá
X	5175	3377	3.21	0.2	Guarujá
X	5178	3374	2.95	0.3	Guarujá
X	5181	3371	2.85	0.4	Guarujá
X	5184	3368	3.24	0.3	Guarujá
X	5187	3365	2.91	0.4	Guarujá
X	5190	3362	3.32	0.3	Guarujá
X	5193	3359	3.48	0.5	Guarujá
X	5196	3356	3.35	0.3	Guarujá
X	5199	3353	3.19	0.2	Guarujá
X	5202	3350	2.98	0.2	Guarujá
X	5205	3347	2.97	0.3	Guarujá
X	5208	3344	2.75	0.3	Guarujá
X	5211	3341	3.41	0.2	Guarujá
X	5214	3338	3.28	0.2	Guarujá
X	5217	3335	3.22	0.2	Guarujá
X	5220	3332	3.37	0.2	Guarujá
X	5223	3329	2.76	0.2	Guarujá
X	5226	3326	3.13	0.2	Guarujá
X	5229	3323	3.40	0.2	Guarujá
X	5232	3320	3.67	0.2	Guarujá
X	5235	3317	3.51	0.2	Guarujá
X	5238	3314	3.70	0.2	Guarujá
X	5241	3311	3.80	0.2	Guarujá
X	5244	3308	3.83	0.3	Guarujá
X	5247	3305	4.01	0.2	Guarujá
X	5250	3302	4.04	0.2	Guarujá
X	5253	3299	3.86	0.2	Guarujá
X	5256	3296	3.70	0.2	Guarujá
X	5259	3293	3.53	0.3	Guarujá
X	5262	3290	3.57	0.2	Guarujá
X	5265	3287	3.65	0.2	Guarujá
X	5268	3284	3.61	0.2	Guarujá

Well	Penetrated depth (m)	Relative thickness (m)	$\delta^{13}\text{C}$ (‰)	TOC (%)	Formation
X	5271	3281	3.65	0.2	Guarujá
X	5274	3278	3.78	0.2	Guarujá
X	5277	3275	3.75	0.2	Guarujá
X	5280	3272	3.53	0.2	Guarujá
X	5283	3269	3.31	0.2	Guarujá
X	5286	3266	3.32	0.2	Guarujá
X	5289	3263	3.62	0.2	Guarujá
X	5292	3260	3.57	0.3	Guarujá
X	5295	3257	3.27	0.3	Guarujá
X	5298	3254	3.33	0.2	Guarujá
X	5301	3251	3.61	0.3	Guarujá
X	5304	3248	3.35	0.2	Guarujá
X	5307	3245	2.82	0.2	Guarujá
X	5310	3242	3.56	0.2	Guarujá
X	5313	3239	3.36	0.1	Guarujá
X	5316	3236	3.50	0.1	Guarujá
X	5319	3233	3.52	0.3	Guarujá
X	5322	3230	3.59	0.2	Guarujá
X	5325	3227	3.62	0.2	Guarujá
X	5328	3224	3.61	0.2	Guarujá
X	5331	3221	3.42	0.2	Guarujá
X	5334	3218	2.79	0.2	Guarujá
X	5337	3215	3.46	0.2	Guarujá
X	5340	3212	3.26	0.2	Guarujá
X	5343	3209	3.50	0.2	Guarujá
X	5346	3206	3.57	0.2	Guarujá
X	5349	3203	3.41	0.2	Guarujá
X	5352	3200	3.42	0.2	Guarujá
X	5355	3197	3.54	0.2	Guarujá
X	5358	3194	3.71	0.2	Guarujá
X	5361	3191	3.68	0.2	Guarujá
X	5364	3188	3.44	0.2	Guarujá
X	5367	3185	3.57	0.1	Guarujá
X	5370	3182	3.79	0.1	Guarujá
X	5373	3179	3.61	0.3	Guarujá
X	5376	3176	3.52	0.2	Guarujá
X	5379	3173	3.34	0.1	Guarujá
X	5382	3170	3.37	0.2	Guarujá
X	5385	3167	3.33	0.2	Guarujá
X	5388	3164	3.49	0.2	Guarujá
X	5391	3161	3.49	0.2	Guarujá
X	5394	3158	3.48	0.2	Guarujá
X	5397	3155	3.41	0.2	Guarujá
X	5400	3152	3.18	0.3	Guarujá
X	5403	3149	3.15	0.2	Guarujá
X	5406	3146	3.09	0.2	Guarujá
X	5409	3143	3.02	0.2	Guarujá
X	5412	3140	3.36	0.2	Guarujá
X	5415	3137	3.35	0.2	Guarujá
X	5418	3134	3.54	0.2	Guarujá
X	5421	3131	3.35	0.2	Guarujá
X	5424	3128	3.29	0.2	Guarujá

Well	Penetrated depth (m)	Relative thickness (m)	$\delta^{13}\text{C}$ (‰)	TOC (%)	Formation
X	5427	3125	3.25	0.3	Guarujá
X	5430	3122	3.46	0.3	Guarujá
X	5433	3119	3.54	0.2	Guarujá
X	5436	3116	3.33	0.2	Guarujá
X	5439	3113	3.69	0.2	Guarujá
X	5442	3110	3.60	0.3	Guarujá
X	5445	3107	3.61	0.3	Guarujá
X	5448	3104	3.68	0.2	Guarujá
X	5451	3101	3.66	0.3	Guarujá
X	5454	3098	3.17	0.4	Guarujá
X	5457	3095	3.27	0.3	Guarujá
X	5460	3092	3.47	0.3	Guarujá
X	5463	3089	3.47	0.3	Guarujá
X	5466	3086	3.56	0.3	Guarujá
X	5469	3083	2.82	0.4	Guarujá
X	5472	3080	1.74	0.3	Guarujá
X	5475	3077	2.42	0.3	Guarujá
X	5478	3074	2.79	0.3	Guarujá
X	5481	3071	2.92	0.4	Guarujá
X	5484	3068	3.22	0.2	Guarujá
X	5487	3065	3.49	0.2	Guarujá
X	5490	3062	3.12	0.2	Guarujá
X	5493	3059	3.36	0.2	Guarujá
X	5496	3056	2.99	0.3	Guarujá
X	5499	3053	3.06	0.2	Guarujá
X	5502	3050	3.22	0.3	Guarujá
X	5505	3047	3.11	0.3	Guarujá
X	5508	3044	3.01	0.2	Guarujá
X	5511	3041	2.87	0.2	Guarujá
X	5514	3038	2.93	0.2	Guarujá
X	5517	3035	3.22	0.2	Guarujá
X	5520	3032	3.34	0.2	Guarujá
X	5523	3029	3.24	0.3	Guarujá
X	5526	3026	3.34	0.2	Guarujá
X	5529	3023	3.29	0.2	Guarujá
X	5532	3020	3.20	0.2	Guarujá
X	5535	3017	3.20	0.2	Guarujá
X	5538	3014	3.23	0.2	Guarujá
X	5541	3011	3.34	0.2	Guarujá
X	5544	3008	3.20	0.2	Guarujá
X	5547	3005	3.31	0.2	Guarujá
X	5550	3002	3.22	0.2	Guarujá
X	5553	2999	3.34	0.2	Guarujá
X	5556	2996	3.40	0.2	Guarujá
X	5559	2993	3.13	0.2	Guarujá
X	5562	2990	3.06	0.2	Guarujá
X	5565	2987	2.97	0.2	Guarujá
X	5568	2984	3.02	0.2	Guarujá
X	5571	2981	3.14	0.2	Guarujá
X	5574	2978	3.08	0.3	Guarujá
X	5577	2975	3.09	0.2	Guarujá
X	5580	2972	3.26	0.2	Guarujá

Well	Penetrated depth (m)	Relative thickness (m)	$\delta^{13}\text{C}$ (‰)	TOC (%)	Formation
X	5583	2969	3.44	0.3	Guarujá
X	5586	2966	3.40	0.3	Guarujá
X	5589	2963	3.50	0.2	Guarujá
X	5592	2960	3.28	0.2	Guarujá
X	5595	2957	3.04	0.2	Guarujá
X	5598	2954	3.12	0.2	Guarujá
X	5601	2951	2.87	0.2	Guarujá
X	5604	2948	2.76	0.2	Guarujá
X	5607	2945	2.92	0.2	Guarujá
X	5610	2942	2.99	0.2	Guarujá
X	5613	2939	3.04	0.2	Guarujá
X	5616	2936	3.23	0.2	Guarujá
X	5619	2933	3.02	0.2	Guarujá
X	5622	2930	2.86	0.2	Guarujá
X	5625	2927	3.12	0.2	Guarujá
X	5628	2924	3.00	0.2	Guarujá
X	5631	2921	3.23	0.2	Guarujá
X	5634	2918	3.13	0.2	Guarujá
X	5637	2915	3.09	0.2	Guarujá
X	5640	2912	3.21	0.2	Guarujá
X	5643	2909	3.20	0.2	Guarujá
X	5646	2906	3.88	0.2	Guarujá
X	5649	2903	3.80	0.2	Guarujá
X	5652	2900	3.89	0.2	Guarujá
X	5655	2897	3.48	0.2	Guarujá
X	5658	2894	3.14	0.2	Guarujá
X	5661	2891	3.16	0.2	Guarujá
X	5664	2888	3.58	0.2	Guarujá
X	5667	2885	3.62	0.2	Guarujá
X	5670	2882	3.33	0.2	Guarujá
X	5673	2879	3.39	0.2	Guarujá
X	5676	2876	3.52	0.2	Guarujá
X	5679	2873	3.60	0.2	Guarujá
X	5682	2870	3.88	0.2	Guarujá
X	5685	2867	3.62	0.2	Guarujá
X	5688	2864	3.91	0.2	Guarujá
X	5691	2861	3.69	0.2	Guarujá
X	5694	2858	3.58	0.2	Guarujá
X	5697	2855	3.85	0.2	Guarujá
X	5700	2852	3.67	0.2	Guarujá
X	5703	2849	3.83	0.2	Guarujá
X	5706	2846	3.74	0.2	Guarujá
X	5709	2843	3.61	0.2	Guarujá
X	5712	2840	3.71	0.2	Guarujá
X	5715	2837	3.58	0.3	Guarujá
X	5718	2834	3.69	0.2	Guarujá
X	5721	2831	3.48	0.2	Guarujá
X	5724	2828	3.33	0.2	Guarujá
X	5727	2825	3.20	0.2	Guarujá
X	5730	2822	3.36	0.2	Guarujá
X	5733	2819	3.74	0.2	Guarujá
X	5736	2816	4.11	0.2	Guarujá

Well	Penetrated depth (m)	Relative thickness (m)	$\delta^{13}\text{C}$ (‰)	TOC (%)	Formation
X	5739	2813	4.13	0.2	Guarujá
X	5742	2810	3.80	0.2	Guarujá
X	5745	2807	3.68	0.2	Guarujá
X	5748	2804	3.61	0.2	Guarujá
X	5751	2801	3.31	0.2	Guarujá
X	5754	2798	3.32	0.2	Guarujá
X	5757	2795	3.83	0.2	Guarujá
X	5760	2792	4.10	0.2	Guarujá
X	5763	2789	4.03	0.2	Guarujá
X	5766	2786	4.18	0.3	Guarujá
X	5769	2783	4.26	0.2	Guarujá
X	5772	2780	4.34	0.3	Guarujá
X	5775	2777	4.26	0.2	Guarujá
X	5778	2774	4.27	0.2	Guarujá
X	5781	2771	4.02	0.3	Guarujá
X	5784	2768	4.37	0.3	Guarujá
X	5787	2765	4.56	0.2	Guarujá
X	5790	2762	4.77	0.2	Guarujá
X	5793	2759	4.17	0.2	Guarujá
X	5796	2756	4.08	0.2	Guarujá
X	5799	2753	3.42	0.2	Guarujá
X	5802	2750	3.77	0.2	Guarujá
X	5805	2747	3.98	0.3	Guarujá
X	5808	2744	3.97	0.3	Guarujá
X	5811	2741	3.53	0.4	Guarujá
X	5814	2738	3.15	0.4	Guarujá
X	5817	2735	2.69	0.9	Guarujá
X	5820	2732	2.36	0.4	Guarujá
X	5823	2729	1.48	0.9	Guarujá
X	5826	2726	2.36	0.7	Guarujá
X	5829	2723	2.89	0.4	Guarujá
X	5832	2720	2.46	1.0	Guarujá
X	5835	2717	3.36	0.8	Guarujá
X	5838	2714	3.02	0.8	Guarujá
X	5841	2711	2.80	0.9	Guarujá
X	5844	2708	2.50	1.4	Guarujá
X	5847	2705	2.66	0.9	Guarujá
X	5850	2702	2.73	1.3	Guarujá
X	5853	2699	3.12	1.0	Guarujá
X	5856	2696	3.48	0.7	Guarujá
X	5859	2693	3.72	0.4	Guarujá
X	5862	2690	3.72	0.8	Guarujá
X	5865	2687	3.94	0.5	Guarujá
X	5868	2684	4.01	0.5	Guarujá
X	5871	2681	3.88	0.6	Guarujá
X	5874	2678	3.19	0.9	Guarujá
X	5877	2675	3.22	0.8	Guarujá
X	5880	2672	3.19	0.5	Guarujá
X	5883	2669	2.19	0.8	Guarujá
X	5886	2666	1.78	0.9	Guarujá
X	5889	2663	2.51	0.8	Guarujá
X	5892	2660	2.92	0.7	Guarujá

Well	Penetrated depth (m)	Relative thickness (m)	$\delta^{13}\text{C}$ (‰)	TOC (%)	Formation
X	5895	2657	2.62	0.8	Guarujá
X	5898	2654	2.45	0.9	Guarujá
X	5901	2651	2.33	1.3	Guarujá
X	5904	2648	2.34	1.0	Guarujá
X	5907	2645	3.05	0.9	Guarujá
X	5910	2642	3.18	0.6	Guarujá
X	5913	2639	3.26	0.7	Guarujá
X	5916	2636	3.47	0.5	Guarujá
X	5919	2633	3.38	0.8	Guarujá
X	5922	2630	3.21	0.6	Guarujá
X	5925	2627	3.60	0.5	Guarujá
X	5928	2624	3.03	0.6	Guarujá
X	5931	2621	2.74	1.0	Guarujá
X	5934	2618	2.98	0.8	Guarujá
X	5937	2615	3.01	0.7	Guarujá
X	5940	2612	2.34	0.7	Guarujá
X	5943	2609	1.75	0.4	Guarujá
X	5946	2606	2.04	0.4	Guarujá
X	5949	2603	3.04	0.3	Guarujá
X	5952	2600	3.17	0.3	Guarujá
CP-5	4629	573	1.90	0.2	Macabu
CP-5	4635	567	0.21	0.2	Macabu
CP-5	4641	561	0.85	0.2	Macabu
CP-5	4647	555	0.88	0.2	Macabu
CP-5	4659	543	0.69	-	Macabu
CP-5	4665	537	1.06	0.3	Macabu
CP-5	4674	528	0.45	0.6	Macabu
CP-5	4683	519	0.47	3.3	Macabu
CP-5	4689	513	-0.38	1.0	Macabu
CP-5	4692	510	0.34	1.2	Macabu
CP-5	4695	507	0.10	1.2	Macabu
CP-5	4701	501	1.20	0.7	Macabu
CP-5	4704	498	1.40	0.6	Macabu
CP-5	4707	495	1.32	0.9	Macabu
CP-5	4713	489	1.42	0.5	Macabu
CP-5	4719	483	1.21	0.7	Macabu
CP-5	4725	477	1.26	0.3	Macabu
CP-5	4731	471	1.44	0.3	Macabu
CP-5	4737	465	1.89	0.4	Macabu
CP-5	4743	459	1.78	0.8	Macabu
CP-5	4749	453	2.17	0.4	Macabu
CP-5	4755	447	2.29	0.3	Macabu
CP-5	4761	441	1.67	1.0	Macabu
CP-5	4767	435	2.48	1.9	Macabu
CP-5	4770	432	1.78	5.4	Macabu
CP-5	4773	429	2.02	3.9	Macabu
CP-5	4776	426	2.23	3.7	Macabu
CP-5	4779	423	1.55	3.0	Macabu
CP-5	4782	420	1.76	0.7	Macabu
CP-5	4788	414	1.66	0.6	Macabu
CP-5	4794	408	1.62	0.3	Macabu
CP-5	4800	402	1.72	0.5	Macabu

Well	Penetrated depth (m)	Relative thickness (m)	$\delta^{13}\text{C}$ (‰)	TOC (%)	Formation
CP-5	4806	396	1.39	0.4	Macabu
CP-5	4818	384	1.54	0.5	Macabu
CP-5	4824	378	1.64	0.6	Macabu
CP-5	4830	372	1.83	0.5	Macabu
CP-5	4836	366	2.67	0.6	Macabu
CP-5	4842	360	2.18	0.6	Macabu
CP-5	4848	354	1.71	0.8	Macabu
CP-5	4854	348	1.83	1.2	Macabu
CP-5	4860	342	1.57	1.2	Macabu
CP-5	4866	336	1.76	1.2	Macabu
CP-5	4872	330	2.02	0.8	Macabu
CP-5	4878	324	1.81	1.3	Macabu
CP-5	4884	318	2.05	0.6	Macabu
CP-5	4890	312	1.95	0.5	Macabu
CP-5	4902	300	0.69	0.4	Macabu
CP-5	4908	294	0.58	0.4	Macabu
CP-5	4914	288	1.21	0.3	Macabu
CP-5	4920	282	1.02	0.3	Macabu
CP-5	4926	276	1.09	0.3	Macabu
CP-5	4932	270	1.44	0.3	Macabu
CP-5	4938	264	1.47	0.3	Macabu
CP-5	4944	258	1.69	0.2	Macabu
CP-5	4950	252	1.65	0.2	Macabu
CP-5	4956	246	1.26	0.2	Macabu
CP-5	4962	240	1.30	0.1	Macabu
CP-5	4968	234	1.45	0.2	Macabu
CP-5	4974	228	2.71	0.2	Macabu
CP-5	4980	222	1.84	0.2	Macabu
CP-5	4986	216	1.86	0.2	Macabu
CP-5	4992	210	1.86	2.0	Macabu
CP-5	4995	207	1.86	1.8	Macabu
CP-5	4998	204	2.08	0.5	Macabu
CP-5	5001	201	1.91	1.0	Macabu
CP-5	5004	198	2.14	1.0	Macabu
CP-5	5007	195	2.33	0.7	Macabu
CP-5	5010	192	2.30	0.9	Macabu
CP-5	5013	189	2.59	1.2	Macabu
CP-5	5016	186	0.70	-	Coqueiros
CP-5	5034	168	-0.69	-	Coqueiros
CP-5	5040	162	-0.22	-	Coqueiros
CP-5	5046	156	0.03	-	Coqueiros
CP-5	5052	150	0.12	-	Coqueiros
CP-5	5058	144	0.02	-	Coqueiros
CP-5	5064	138	-0.15	-	Coqueiros
CP-5	5070	132	0.33	-	Coqueiros
CP-5	5073	129	0.58	-	Coqueiros
CP-5	5076	126	-0.12	-	Coqueiros
CP-5	5079	123	0.63	-	Coqueiros
CP-5	5082	120	0.26	-	Coqueiros
CP-5	5088	114	-0.15	-	Coqueiros
CP-5	5094	108	0.16	-	Coqueiros
CP-5	5097	105	0.46	-	Coqueiros

Well	Penetrated depth (m)	Relative thickness (m)	$\delta^{13}\text{C}$ (‰)	TOC (%)	Formation
CP-5	5103	99	-0.50	-	Coqueiros
CP-5	5112	90	1.36	-	Coqueiros
CP-5	5115	87	0.32	-	Coqueiros
CP-5	5121	81	0.16	-	Coqueiros
CP-5	5127	75	0.12	-	Coqueiros
CP-5	5133	69	0.49	-	Coqueiros
CP-5	5139	63	0.31	-	Coqueiros
CP-5	5145	57	0.28	-	Coqueiros
CP-5	5151	51	-0.11	-	Coqueiros
CP-5	5157	45	-0.24	-	Coqueiros
CP-5	5163	39	0.40	-	Coqueiros
CP-5	5166	36	0.24	-	Coqueiros
CP-5	5172	30	-0.03	-	Coqueiros
CP-5	5175	27	0.20	-	Coqueiros
CP-5	5178	24	0.21	-	Coqueiros
CP-5	5181	21	0.46	-	Coqueiros
CP-5	5184	18	0.76	-	Coqueiros
CP-5	5187	15	1.03	-	Coqueiros
CP-5	5190	12	0.98	-	Coqueiros
CP-5	5196	6	-0.30	-	Coqueiros
CP-5	5199	3	-0.66	-	Coqueiros
CP-5	5202	0	-0.88	-	Coqueiros