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Supplement of

Pliocene expansion of C₄ vegetation in the Core Monsoon Zone on the Indian Peninsula

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Table S1. Inorganic analyses of major, trace, and rare earth element concentrations for 30 bulk sediment samples at Site U1445 and additional samples from other sites in the Bay of Bengal for reference. For methods see Appendix A or details in Dunlea et al. (2015).

Table S2. Analyses of 57 bulk sediment samples from Site U1445 for bulk calcium carbonate, total organic carbon, total carbon, total acidified nitrogen, carbon isotopes of the total organic carbon, and the designation of visually lighter versus darker samples at similar depths.

Table S3. Hydrogen isotopes and carbon isotope analyses of leaf wax fatty acids extracted from 57 samples at Site U1445. Measurements from fatty acid chainlengths C₂₆, C₂₈, and C₃₀ are reported with their standard deviation. The correction for C₃-C₄ physiological differences in the hydrogen isotopes of C₃₀ fatty acids is reported, estimating C₃ vegetation as having a $\delta^{13}\text{C}$ of -35.4 ‰ and C₄ vegetation as -21.4‰.

Supplemental Table S1

| Exp | Site | Hole | Core | Type | Sect | W | Top | Bot | Depth | Age | Si | Al | Ti | Fe | Mn | Ca | Mg | Na | K | P | Li | Be | Sc | V | Cr | Co | Ni |
|----------------|-------|-------------------|------|------|------|---|------|------|----------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|------|-------|-------|------|-------|
| | | | | | | | | | mbsf, CSF-A | Ma | wt. % | wt. % | wt. % | wt. % | wt. % | wt. % | wt. % | wt. % | wt. % | wt. % | ppm | ppm | ppm | ppm | ppm | ppm | ppm |
| Mahanadi River | S3 | Bulk | | | | | | | | | 29.0 | 7.0 | 0.6 | 3.6 | 0.0 | 0.7 | 0.5 | 0.5 | 2.2 | 0.0 | 29.5 | 2.8 | 15.6 | 101.8 | 100.3 | 13.3 | 43.5 |
| Mahanadi River | S3 | Coarse Grain Size | | | | | | | | | 31.5 | 5.7 | 0.4 | 2.7 | 0.1 | 0.7 | 0.3 | 0.9 | 2.8 | 0.0 | 17.0 | 2.1 | 8.6 | 58.6 | 46.7 | 17.8 | 25.6 |
| NGHP Exp. 01 | 19 | A | 33 | X | CC | | 16 | 24 | 253.56 | 6-10Ma | 25.3 | 9.3 | 0.5 | 4.9 | 0.0 | 0.9 | 1.5 | 1.4 | 2.6 | 0.1 | 80.8 | 3.7 | 17.5 | 137.9 | 136.9 | 17.8 | 67.6 |
| NGHP Exp. 01 | 19 | A | 36 | X | CC | | 34 | 51 | 282.34 | 6-10Ma | 24.7 | 8.3 | 0.4 | 4.0 | 0.0 | 2.7 | 1.3 | 1.4 | 2.3 | 0.1 | 72.9 | 3.1 | 16.9 | 129.8 | 140.3 | 16.3 | 65.7 |
| NGHP Exp. 01 | 19 | A | 38 | X | CC | | 22 | 33 | 301.82 | 6-10Ma | 25.1 | 9.3 | 0.5 | 4.8 | 0.0 | 1.3 | 1.5 | 1.4 | 2.5 | 0.0 | 84.4 | 3.5 | 17.9 | 137.0 | 138.7 | 16.4 | 64.6 |
| NGHP Exp. 01 | 16 | A | 1 | H | 1 | | 38 | 40 | 0.38 | | 21.4 | 8.1 | 0.7 | 7.1 | 0.1 | 1.9 | 1.9 | 2.4 | 1.8 | 0.1 | 49.5 | 2.1 | 24.4 | 189.3 | 154.4 | 28.8 | 77.1 |
| NGHP Exp. 01 | 16 | A | 1 | H | 4 | | 29 | 31 | 4.79 | | 22.2 | 8.6 | 0.6 | 6.2 | 0.0 | 1.4 | 1.8 | 2.1 | 2.1 | 0.1 | 62.3 | 2.5 | 20.9 | 138.0 | 151.8 | 22.0 | 73.8 |
| NGHP Exp. 01 | 16 | A | 2 | H | 2 | | 4 | 6 | 8.54 | | 16.7 | 6.0 | 0.4 | 4.3 | 0.0 | 11.2 | 1.6 | 1.7 | 1.6 | 0.1 | 44.6 | 1.8 | 15.0 | 104.9 | 112.3 | 17.2 | 62.4 |
| NGHP Exp. 01 | 16 | A | 2 | H | 3 | | 6 | 8 | 10.06 | | 18.5 | 6.7 | 0.5 | 5.2 | 0.0 | 6.5 | 1.6 | 1.9 | 1.8 | 0.1 | 53.9 | 2.0 | 18.9 | 140.2 | 138.6 | 20.2 | 73.0 |
| NGHP Exp. 01 | 16 | A | 2 | H | 4 | | 98 | 100 | 12.48 | | 18.4 | 7.0 | 0.5 | 5.7 | 0.0 | 6.3 | 1.6 | 1.8 | 1.8 | 0.1 | 59.8 | 2.1 | 17.1 | 124.9 | 136.6 | 18.7 | 75.9 |
| NGHP Exp. 01 | 16 | A | 2 | H | 6 | | 48 | 50 | 14.98 | | 17.7 | 6.6 | 0.5 | 4.8 | 0.0 | 9.1 | 1.5 | 1.6 | 1.8 | 0.1 | 49.5 | 2.0 | 15.3 | 122.7 | 120.2 | 19.0 | 64.1 |
| NGHP Exp. 01 | 16 | A | 3 | H | 2 | | 4 | 6 | 18.04 | | 21.4 | 8.3 | 0.6 | 6.0 | 0.0 | 2.8 | 1.7 | 2.0 | 2.0 | 0.1 | 74.2 | 2.3 | 21.7 | 158.1 | 159.2 | 21.4 | 74.8 |
| NGHP Exp. 01 | 16 | A | 3 | H | 4 | | 6 | 8 | 21.06 | | 21.1 | 8.0 | 0.5 | 6.5 | 0.0 | 3.7 | 1.6 | 1.8 | 2.1 | 0.1 | 67.3 | 2.4 | 19.1 | 141.9 | 127.4 | 21.3 | 72.8 |
| NGHP Exp. 01 | 16 | A | 3 | H | 7 | | 49 | 51 | 25.49 | | 22.2 | 8.4 | 0.7 | 6.3 | 0.0 | 2.3 | 1.8 | 1.7 | 2.2 | 0.1 | 62.7 | 2.5 | 21.4 | 179.0 | 152.9 | 26.4 | 73.3 |
| 353 | U1444 | A | 6 | H | 4 | W | 108 | 110 | 51 | 0.2 | 33.0 | 6.6 | 0.4 | 3.1 | 0.1 | 2.0 | 1.2 | 1.7 | 2.3 | 0.1 | 31.6 | 3.0 | 10.7 | 68.5 | 67.0 | 10.9 | 30.4 |
| 353 | U1444 | A | 12 | H | 3 | W | 60 | 62 | 98 | 0.4 | 19.3 | 7.4 | 0.4 | 5.1 | 0.4 | 7.5 | 1.6 | 1.4 | 2.0 | 0.1 | 63.2 | 2.6 | 18.6 | 122.6 | 131.5 | 43.1 | 146.1 |
| 353 | U1444 | A | 15 | X | 4 | W | 81 | 83 | 123 | 1.2 | 22.1 | 8.3 | 0.5 | 5.0 | 0.2 | 5.5 | 1.7 | 1.3 | 2.3 | 0.1 | 80.1 | 2.7 | 17.9 | 153.9 | 141.0 | 31.1 | 123.2 |
| 353 | U1444 | A | 17 | X | 4 | W | 14 | 16 | 142 | 2.6 | 23.8 | 7.5 | 0.4 | 4.4 | 0.1 | 4.7 | 1.5 | 1.2 | 2.3 | 0.0 | 72.8 | 3.4 | 14.5 | 159.0 | 133.6 | 31.3 | 156.6 |
| 353 | U1444 | A | 19 | X | 4 | W | 20 | 22 | 161 | 3.5 | 22.1 | 8.8 | 0.5 | 5.2 | 0.1 | 4.1 | 1.7 | 1.5 | 2.1 | 0.1 | 85.7 | 2.9 | 18.3 | 166.3 | 151.2 | 29.7 | 113.2 |
| 353 | U1444 | A | 24 | F | 3 | W | 51 | 53 | 208 | 3.65 | 34.7 | 5.0 | 0.4 | 2.8 | 0.1 | 2.1 | 0.9 | 1.6 | 1.8 | 0.1 | 24.8 | 2.6 | 9.3 | 52.7 | 46.9 | 7.6 | 19.6 |
| 353 | U1444 | A | 31 | X | 3 | W | 74 | 76 | 267 | 3.75 | 26.2 | 10.0 | 0.5 | 4.9 | 0.1 | 0.9 | 1.9 | 1.3 | 3.4 | 0.1 | 82.3 | 4.3 | 17.2 | 148.4 | 131.4 | 18.7 | 52.9 |
| 353 | U1444 | A | 33 | X | 4 | W | 90 | 92 | 288 | 5.0 | 18.9 | 7.4 | 0.4 | 4.3 | 0.1 | 10.4 | 1.2 | 1.2 | 1.7 | 0.0 | 70.8 | 2.5 | 16.5 | 121.9 | 116.7 | 28.0 | 89.5 |
| 353 | U1445 | A | 1 | H | 5 | W | 23 | 25 | 6.23 | 0.04 | 19.7 | 6.9 | 0.4 | 4.1 | 0.1 | 8.0 | 1.9 | 1.9 | 2.1 | 0.1 | 56.4 | 2.4 | 13.0 | 112.0 | 100.4 | 24.0 | 69.0 |
| 353 | U1445 | A | 2 | H | 6 | W | 40 | 42 | 14.8 | 0.11 | 21.5 | 8.4 | 0.4 | 5.2 | 0.1 | 2.9 | 1.8 | 3.0 | 2.3 | 0.1 | 76.8 | 3.0 | 15.7 | 109.9 | 108.2 | 22.0 | 70.7 |
| 353 | U1445 | A | 3 | H | 4 | W | 30 | 32 | 21.2 | 0.16 | 17.1 | 6.4 | 0.4 | 3.9 | 0.1 | 11.1 | 1.6 | 1.4 | 2.1 | 0.1 | 46.0 | 2.1 | 12.3 | 98.4 | 97.1 | 25.7 | 66.3 |
| 353 | U1445 | A | 4 | H | 4 | W | 115 | 117 | 31.57 | 0.24 | 24.4 | 9.3 | 0.5 | 5.3 | 0.1 | 1.2 | 1.7 | 1.8 | 2.7 | 0.0 | 89.9 | 3.3 | 19.5 | 145.2 | 123.6 | 23.4 | 77.3 |
| 353 | U1445 | A | 5 | H | 4 | W | 105 | 107 | 40.86 | 0.31 | 21.3 | 7.7 | 0.4 | 4.6 | 0.2 | 4.9 | 1.8 | 1.7 | 2.3 | 0.1 | 66.7 | 2.5 | 16.3 | 121.1 | 116.6 | 27.2 | 82.0 |
| 353 | U1445 | A | 6 | H | 4 | W | 77 | 79 | 50.02 | 0.39 | 21.4 | 7.4 | 0.5 | 4.3 | 0.2 | 6.7 | 1.7 | 1.5 | 2.4 | 0.1 | 58.7 | 2.4 | 14.1 | 128.3 | 101.5 | 38.3 | 82.0 |
| 353 | U1445 | A | 7 | H | 4 | W | 98 | 100 | 59.49 | 0.47 | 22.5 | 8.8 | 0.5 | 5.0 | 0.1 | 2.6 | 1.8 | 1.5 | 2.4 | 0.1 | 78.9 | 2.9 | 18.8 | 148.5 | 125.2 | 26.8 | 89.0 |
| 353 | U1445 | A | 9 | H | 4 | W | 110 | 112 | 77.54 | 0.62 | 21.9 | 8.2 | 0.4 | 5.0 | 0.1 | 4.8 | 1.8 | 1.4 | 2.4 | 0.1 | 67.8 | 2.6 | 17.3 | 137.4 | 118.8 | 27.4 | 97.3 |
| 353 | U1445 | A | 11 | H | 4 | W | 61 | 63 | 96.82 | 0.79 | 23.5 | 9.0 | 0.5 | 5.2 | 0.1 | 3.0 | 1.7 | 1.5 | 2.7 | 0.1 | 84.5 | 3.3 | 18.2 | 144.3 | 114.9 | 22.2 | 74.5 |
| 353 | U1445 | A | 13 | H | 4 | W | 69 | 71 | 116.31 | 0.98 | 23.7 | 9.0 | 0.5 | 5.0 | 0.1 | 2.4 | 1.7 | 1.6 | 2.5 | 0.0 | 81.0 | 3.0 | 18.1 | 132.0 | 116.9 | 21.4 | 72.6 |
| 353 | U1445 | A | 15 | H | 4 | W | 76.5 | 78.5 | 135.755 | 1.17 | 23.3 | 8.5 | 0.5 | 5.3 | 0.1 | 2.7 | 1.8 | 1.8 | 2.5 | 0.1 | 79.4 | 2.9 | 17.3 | 143.7 | 112.1 | 32.7 | 102.9 |
| 353 | U1445 | A | 17 | H | 4 | W | 133 | 135 | 155.24 | 1.36 | 24.3 | 9.0 | 0.5 | 4.9 | 0.1 | 1.0 | 1.9 | 2.1 | 2.6 | 0.1 | 89.7 | 3.2 | 18.7 | 153.4 | 121.5 | 24.6 | 90.0 |
| 353 | U1445 | A | 19 | H | 4 | W | 78 | 80 | 173.35 | 1.55 | 21.6 | 7.4 | 0.4 | 4.5 | 0.1 | 4.8 | 1.7 | 1.6 | 2.0 | 0.1 | 75.6 | 2.5 | 15.7 | 110.9 | 118.8 | 20.4 | 75.4 |
| 353 | U1445 | A | 20 | H | 4 | W | 90 | 92 | 183.13 | 1.66 | 24.1 | 8.7 | 0.5 | 5.3 | 0.1 | 1.5 | 1.7 | 1.6 | 2.4 | 0.1 | 87.7 | 2.9 | 19.4 | 143.9 | 128.0 | 24.0 | 88.5 |
| 353 | U1445 | A | 21 | H | 4 | W | 43 | 45 | 192.36 | 1.79 | 24.0 | 8.8 | 0.5 | 5.0 | 0.1 | 1.6 | 1.7 | 1.7 | 2.5 | 0.1 | 86.4 | 2.9 | 17.5 | 129.9 | 116.7 | 24.0 | 74.8 |
| 353 | U1445 | A | 22 | H | 4 | W | 88 | 90 | 201.6 | 1.92 | 24.4 | 8.1 | 0.4 | 4.8 | 0.1 | 1.4 | 1.6 | 1.7 | 2.3 | 0.1 | 80.8 | 2.7 | 17.0 | 116.2 | 110.9 | 20.2 | 79.8 |
| 353 | U1445 | A | 24 | H | 4 | W | 35 | 37 | 219.72 | 2.14 | 22.7 | 9.1 | 0.5 | 5.4 | 0.1 | 1.5 | 1.6 | 2.0 | 2.4 | 0.1 | 92.1 | 3.1 | 18.4 | 141.5 | 125.4 | 32.4 | 96.0 |
| 353 | U1445 | A | 25 | X | 4 | W | 38 | 40 | 229.21 | 2.24 | 23.5 | 9.6 | 0.5 | 5.3 | 0.1 | 1.2 | 1.7 | 1.2 | 2.4 | 0.1 | 95.9 | 3.1 | 19.3 | 141.6 | 124.2 | 19.4 | 79.3 |
| 353 | U1445 | A | 28 | X | 5 | W | 94 | 96 | 260.1 | 2.45 | 23.9 | 9.6 | 0.5 | 5.0 | 0.1 | 0.6 | 1.6 | 1.6 | 2.4 | 0.0 | 105.8 | 3.4 | 19.3 | 147.7 | 130.1 | 24.3 | 100.6 |
| 353 | U1445 | A | 31 | X | 4 | W | 43 | 45 | 287.37 | 2.68 | 25.7 | 7.9 | 0.4 | 4.6 | 0.1 | 1.1 | 1.4 | 1.9 | 2.2 | 0.0 | 81.4 | 3.0 | 16.3 | 121.2 | 118.4 | 25.0 | 79.3 |
| 353 | U1445 | A | 34 | X | 4 | W | 66 | 68 | 316 | 2.93 | 23.2 | 8.8 | 0.5 | 4.6 | 0.1 | 2.6 | 1.7 | 1.8 | 2.3 | 0.1 | 88.6 | 3.1 | 18.6 | 151.6 | 120.0 | 27.2 | 81.7 |
| 353 | U1445 | A | 37 | X | 4 | W | 35 | 37 | 338 | 3.12 | 23.4 | 8.5 | 0.5 | 5.4 | 0.1 | 1.8 | 1.5 | 1.7 | 2.1 | 0.1 | 89.5 | 2.9 | 17.4 | 147.2 | 131.9 | 24.0 | 97.4 |
| 353 | U1445 | A | 41 | X | 2 | W | 7 | 9 | 369 | 3.35 | 25.2 | 7.5 | 0.4 | 4.6 | 0.1 | 2.1 | 1.4 | 1.6 | 2.2 | 0.1 | 80.2 | 3.1 | 16.1 | 121.4 | 112.0 | 19.1 | 93.1 |
| 353 | U1445 | A | 46 | X | 4 | W | 11 | 13 | 412 | 3.64 | 25.3 | 9.2 | 0.5 | 4.8 | 0.1 | 1.1 | 1.6 | 1.7 | 2.7 | 0.0 | 93.1 | 3.7 | 18.3 | 137.6 | 114.8 | 18.6 | 62.5 |
| 353 | U1445 | A | 52 | X | 4 | W | 53 | 55 | | | | | | | | | | | | | | | | | | | |

| Cu | Zn | Rb | Sr | Y | Zr | Nb | Mo | Sn | Sb | Cs | Ba | La | Ce | Pr | Nd | Sm | Eu | Gd | Tb | Dy | Ho | Er | Yb | Lu | Hf | Ta | Pb | Th | U | |
|-------|-------|-------|--------|------|-------|------|------|-----|-----|------|-------|------|-------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-----|-----|
| ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm |
| 34.0 | 64.8 | 142.2 | 121.5 | 52.3 | 164.5 | 22.9 | 0.5 | 3.3 | 0.5 | 5.8 | 729.6 | 67.6 | 127.1 | 13.9 | 50.0 | 9.8 | 1.9 | 8.4 | 1.2 | 7.1 | 1.3 | 3.6 | 3.5 | 0.5 | 4.3 | 2.5 | 29.9 | 35.9 | 3.7 | |
| 20.5 | 42.0 | 149.9 | 152.5 | 19.7 | 131.0 | 14.9 | 0.5 | 2.0 | 0.3 | 3.8 | 946.9 | 37.5 | 73.1 | 7.1 | 25.8 | 5.0 | 1.3 | 4.2 | 0.6 | 3.6 | 0.7 | 1.9 | 1.9 | 0.3 | 3.2 | 1.0 | 29.7 | 16.1 | 2.0 | |
| 56.4 | 119.2 | 169.2 | 124.5 | 24.9 | 78.4 | 16.4 | 1.4 | 4.4 | 1.2 | 12.7 | 532.3 | 36.7 | 77.5 | 8.1 | 29.5 | 5.9 | 1.2 | 5.2 | 0.8 | 4.4 | 0.9 | 2.4 | 2.3 | 0.4 | 2.4 | 1.1 | 30.9 | 18.6 | 3.6 | |
| 58.5 | 117.6 | 147.5 | 195.0 | 25.8 | 71.5 | 14.9 | 1.0 | 3.6 | 1.0 | 10.5 | 439.8 | 34.7 | 69.7 | 7.9 | 28.7 | 5.8 | 1.2 | 5.2 | 0.8 | 4.5 | 0.9 | 2.5 | 2.4 | 0.4 | 2.3 | 1.0 | 25.7 | 15.3 | 4.5 | |
| 50.5 | 111.0 | 145.1 | 130.5 | 23.1 | 70.4 | 15.5 | 1.6 | 4.2 | 1.0 | 12.1 | 515.1 | 35.3 | 72.7 | 8.0 | 29.2 | 5.8 | 1.2 | 4.8 | 0.7 | 4.1 | 0.8 | 2.2 | 2.2 | 0.3 | 2.4 | 1.1 | 27.3 | 16.9 | 4.0 | |
| 97.7 | 95.3 | 91.2 | 116.6 | 23.7 | 93.2 | 13.8 | 1.0 | 2.7 | 0.8 | 5.4 | 199.5 | 25.5 | 55.8 | 6.2 | 23.6 | 5.2 | 1.2 | 4.9 | 0.8 | 4.4 | 0.9 | 2.3 | 2.2 | 0.3 | 3.0 | 0.9 | 15.2 | 9.7 | 2.6 | |
| 65.9 | 99.4 | 112.0 | 123.1 | 20.2 | 85.6 | 14.7 | 1.0 | 3.0 | 0.9 | 6.8 | 270.1 | 27.3 | 58.6 | 6.4 | 23.7 | 5.0 | 1.1 | 4.4 | 0.7 | 3.7 | 0.8 | 2.0 | 1.9 | 0.3 | 2.5 | 0.9 | 18.2 | 12.7 | 3.9 | |
| 51.5 | 76.6 | 86.6 | 1026.1 | 18.8 | 74.5 | 10.9 | 1.0 | 2.0 | 0.9 | 5.0 | 280.9 | 24.7 | 48.9 | 5.7 | 21.1 | 4.3 | 0.9 | 3.9 | 0.6 | 3.3 | 0.7 | 1.8 | 1.7 | 0.3 | 2.0 | 0.7 | 13.5 | 9.6 | 5.5 | |
| 68.9 | 94.5 | 98.3 | 390.1 | 20.4 | 94.1 | 12.4 | 2.0 | 2.3 | 1.3 | 5.7 | 307.2 | 25.1 | 48.9 | 5.8 | 21.5 | 4.5 | 1.0 | 4.2 | 0.6 | 3.6 | 0.7 | 2.0 | 1.9 | 0.3 | 2.6 | 0.8 | 15.0 | 9.7 | 5.7 | |
| 59.9 | 89.0 | 104.0 | 351.0 | 18.1 | 78.0 | 12.3 | 4.2 | 2.3 | 1.3 | 6.0 | 370.0 | 24.6 | 50.2 | 5.6 | 20.4 | 4.2 | 0.9 | 3.8 | 0.6 | 3.3 | 0.7 | 1.8 | 1.7 | 0.3 | 2.1 | 0.8 | 15.8 | 10.1 | 5.8 | |
| 54.7 | 78.1 | 94.3 | 1028.5 | 18.9 | 80.6 | 12.7 | 0.9 | 2.5 | 0.9 | 5.7 | 286.9 | 29.2 | 54.8 | 6.4 | 23.2 | 4.6 | 1.0 | 4.1 | 0.6 | 3.4 | 0.7 | 1.8 | 1.7 | 0.3 | 2.2 | 0.8 | 15.9 | 10.3 | 4.8 | |
| 74.4 | 102.5 | 110.7 | 189.1 | 19.6 | 90.2 | 13.3 | 0.9 | 2.7 | 0.9 | 6.5 | 343.5 | 26.4 | 55.4 | 6.2 | 22.7 | 4.7 | 1.1 | 4.3 | 0.7 | 3.7 | 0.8 | 2.0 | 1.9 | 0.3 | 2.5 | 0.8 | 17.7 | 11.2 | 5.1 | |
| 63.2 | 96.2 | 121.6 | 228.4 | 20.2 | 84.4 | 14.0 | 1.5 | 2.9 | 1.1 | 7.0 | 405.5 | 29.2 | 59.9 | 6.7 | 24.7 | 5.0 | 1.1 | 4.4 | 0.7 | 3.8 | 0.8 | 2.0 | 1.9 | 0.3 | 2.4 | 0.9 | 18.9 | 13.1 | 5.0 | |
| 81.6 | 107.4 | 119.4 | 162.7 | 22.2 | 87.6 | 15.8 | 1.0 | 3.2 | 0.9 | 6.7 | 312.8 | 33.2 | 68.6 | 7.5 | 27.5 | 5.6 | 1.2 | 5.0 | 0.8 | 4.2 | 0.8 | 2.2 | 2.0 | 0.3 | 2.7 | 1.0 | 19.5 | 13.7 | 3.7 | |
| 17.3 | 55.6 | 138.5 | 171.6 | 25.6 | 22.2 | 14.0 | 0.4 | 4.1 | 0.4 | 6.8 | 406.7 | 44.3 | 86.4 | 9.8 | 35.3 | 7.0 | 1.2 | 5.8 | 0.9 | 4.7 | 0.9 | 2.4 | 2.2 | 0.3 | 0.7 | 1.1 | 20.8 | 18.0 | 2.3 | |
| 130.5 | 140.2 | 120.4 | 403.4 | 25.8 | 74.0 | 11.9 | 0.9 | 2.8 | 1.9 | 7.8 | 857.1 | 30.0 | 65.9 | 7.0 | 25.8 | 5.5 | 1.2 | 5.0 | 0.8 | 4.3 | 0.9 | 2.4 | 2.3 | 0.4 | 2.0 | 0.8 | 30.4 | 12.0 | 2.3 | |
| 108.4 | 146.1 | 134.6 | 307.9 | 21.7 | 69.6 | 12.6 | 0.6 | 3.3 | 1.5 | 8.8 | 846.5 | 29.9 | 61.5 | 6.9 | 25.1 | 5.1 | 1.1 | 4.6 | 0.7 | 3.9 | 0.8 | 2.1 | 2.1 | 0.3 | 1.9 | 0.9 | 23.8 | 12.0 | 2.6 | |
| 87.3 | 138.7 | 140.4 | 283.5 | 24.9 | 82.4 | 14.2 | 1.2 | 3.5 | 2.1 | 9.2 | 735.4 | 30.0 | 75.3 | 7.2 | 27.1 | 5.9 | 1.2 | 5.1 | 0.8 | 4.3 | 0.9 | 2.4 | 2.3 | 0.4 | 2.3 | 1.0 | 26.1 | 13.9 | 3.0 | |
| 149.3 | 143.9 | 81.0 | 290.0 | 27.6 | 78.0 | 13.3 | 0.6 | 3.2 | 2.5 | 8.3 | 851.1 | 28.7 | 63.0 | 6.9 | 26.2 | 5.8 | 1.3 | 5.4 | 0.8 | 4.8 | 1.0 | 2.6 | 2.5 | 0.4 | 2.2 | 0.9 | 30.1 | 12.0 | 2.1 | |
| 9.6 | 47.1 | 104.1 | 130.4 | 34.2 | 31.6 | 15.1 | 0.3 | 3.9 | 0.5 | 5.7 | 316.0 | 72.3 | 118.3 | 14.8 | 53.6 | 10.4 | 1.5 | 8.2 | 1.2 | 6.2 | 1.2 | 3.1 | 2.9 | 0.5 | 1.0 | 1.3 | 16.6 | 30.8 | 4.1 | |
| 51.0 | 109.3 | 181.9 | 134.3 | 25.6 | 60.4 | 18.7 | 0.4 | 6.1 | 1.1 | 15.6 | 547.2 | 33.0 | 79.4 | 8.0 | 28.9 | 6.0 | 1.2 | 5.3 | 0.8 | 4.5 | 0.9 | 2.5 | 2.4 | 0.4 | 1.8 | 1.4 | 41.5 | 18.1 | 3.1 | |
| 226.1 | 143.9 | 113.7 | 635.9 | 25.6 | 67.4 | 11.1 | 0.4 | 2.9 | 1.2 | 7.7 | 647.7 | 30.0 | 59.5 | 6.9 | 25.4 | 5.4 | 1.2 | 5.0 | 0.8 | 4.3 | 0.9 | 2.4 | 2.3 | 0.4 | 1.8 | 0.8 | 31.9 | 11.6 | 2.0 | |
| 44.5 | 96.2 | 124.6 | 543.8 | 17.8 | 63.4 | 13.6 | 1.2 | 3.1 | 1.6 | 8.3 | 430.8 | 29.0 | 60.9 | 6.8 | 25.3 | 5.0 | 1.0 | 4.1 | 0.6 | 3.3 | 0.7 | 1.8 | 1.6 | 0.2 | 1.8 | 0.9 | 24.9 | 13.2 | 3.9 | |
| 42.8 | 103.3 | 150.8 | 201.7 | 19.1 | 65.8 | 14.5 | 1.8 | 3.8 | 1.1 | 10.4 | 576.5 | 33.4 | 72.7 | 7.8 | 28.5 | 5.5 | 1.1 | 4.5 | 0.7 | 3.7 | 0.7 | 1.9 | 1.8 | 0.3 | 1.9 | 1.0 | 23.9 | 16.4 | 3.7 | |
| 44.7 | 84.1 | 97.1 | 1545.9 | 19.7 | 60.9 | 11.6 | 0.6 | 2.4 | 1.5 | 5.8 | 413.5 | 27.4 | 55.8 | 6.4 | 23.7 | 4.7 | 1.0 | 4.1 | 0.6 | 3.5 | 0.7 | 1.9 | 1.8 | 0.3 | 1.7 | 0.8 | 18.4 | 11.6 | 4.2 | |
| 70.5 | 131.6 | 169.6 | 122.1 | 22.8 | 76.7 | 16.2 | 1.1 | 4.2 | 1.7 | 11.0 | 480.2 | 37.4 | 80.0 | 8.6 | 31.7 | 6.2 | 1.2 | 5.1 | 0.8 | 4.3 | 0.8 | 2.3 | 2.2 | 0.3 | 2.2 | 1.1 | 27.5 | 18.4 | 3.7 | |
| 53.8 | 124.3 | 129.1 | 330.8 | 21.8 | 73.1 | 13.6 | 1.3 | 2.8 | 3.0 | 7.7 | 493.3 | 31.9 | 68.3 | 7.5 | 27.8 | 5.6 | 1.1 | 4.8 | 0.7 | 4.0 | 0.8 | 2.2 | 2.1 | 0.3 | 2.1 | 0.9 | 22.7 | 14.0 | 3.6 | |
| 49.3 | 103.1 | 125.8 | 461.7 | 21.8 | 72.4 | 15.1 | 1.1 | 3.0 | 2.0 | 7.4 | 509.8 | 36.2 | 78.1 | 8.2 | 30.7 | 6.0 | 1.2 | 4.9 | 0.8 | 4.0 | 0.8 | 2.1 | 2.0 | 0.3 | 2.0 | 1.0 | 27.7 | 15.8 | 3.2 | |
| 60.3 | 131.5 | 149.1 | 201.5 | 22.7 | 78.0 | 16.1 | 1.5 | 3.4 | 3.1 | 9.0 | 478.6 | 36.3 | 76.4 | 8.3 | 30.1 | 5.8 | 1.2 | 5.0 | 0.7 | 4.2 | 0.8 | 2.2 | 2.1 | 0.3 | 2.2 | 1.0 | 24.2 | 16.3 | 2.5 | |
| 63.9 | 123.5 | 128.9 | 277.1 | 20.9 | 76.9 | 14.1 | 1.0 | 2.9 | 2.7 | 7.7 | 367.9 | 30.4 | 63.5 | 7.0 | 25.9 | 5.1 | 1.1 | 4.5 | 0.7 | 3.8 | 0.8 | 2.1 | 2.0 | 0.3 | 2.1 | 0.9 | 22.2 | 13.3 | 4.0 | |
| 61.7 | 112.9 | 172.3 | 208.0 | 24.3 | 73.7 | 16.9 | 0.8 | 4.3 | 1.4 | 11.5 | 491.0 | 36.8 | 77.6 | 8.5 | 30.9 | 6.0 | 1.2 | 5.1 | 0.8 | 4.4 | 0.9 | 2.4 | 2.3 | 0.3 | 2.1 | 1.1 | 27.2 | 17.3 | 4.8 | |
| 60.1 | 107.4 | 150.4 | 181.6 | 23.6 | 78.2 | 16.0 | 1.5 | 3.6 | 1.5 | 9.6 | 557.0 | 37.0 | 77.6 | 8.4 | 30.9 | 6.1 | 1.2 | 5.1 | 0.8 | 4.4 | 0.9 | 2.3 | 2.2 | 0.3 | 2.2 | 1.1 | 24.8 | 16.5 | 3.7 | |
| 69.9 | 145.6 | 149.0 | 184.3 | 23.7 | 71.2 | 14.9 | 2.0 | 3.7 | 2.5 | 9.8 | 573.9 | 32.6 | 69.6 | 7.5 | 27.6 | 5.5 | 1.2 | 4.8 | 0.7 | 4.1 | 0.8 | 2.2 | 2.2 | 0.3 | 2.0 | 1.0 | 25.5 | 14.9 | 4.5 | |
| 88.8 | 172.5 | 159.9 | 123.3 | 21.5 | 71.7 | 15.5 | 2.5 | 4.0 | 2.8 | 10.8 | 606.7 | 33.0 | 70.5 | 7.7 | 28.4 | 5.6 | 1.2 | 4.7 | 0.7 | 4.0 | 0.8 | 2.1 | 2.0 | 0.3 | 2.0 | 1.0 | 31.0 | 16.1 | 4.0 | |
| 58.6 | 109.0 | 119.6 | 258.9 | 20.7 | 75.4 | 13.4 | 5.4 | 2.9 | 1.7 | 7.7 | 618.2 | 30.6 | 64.9 | 7.1 | 26.2 | 5.2 | 1.1 | 4.6 | 0.7 | 3.9 | 0.8 | 2.1 | 2.0 | 0.3 | 2.1 | 0.9 | 23.0 | 14.2 | 6.7 | |
| 82.5 | 125.2 | 146.5 | 135.5 | 23.2 | 88.7 | 15.5 | 1.6 | 3.5 | 1.8 | 9.3 | 594.9 | 38.6 | 81.0 | 8.9 | 32.4 | 6.3 | 1.2 | 5.2 | 0.8 | 4.3 | 0.8 | 2.2 | 2.1 | 0.3 | 2.4 | 1.0 | 27.3 | 19.3 | 4.1 | |
| 63.4 | 116.8 | 153.9 | 144.9 | 23.0 | 80.1 | 16.4 | 1.4 | 3.9 | 2.0 | 10.1 | 600.6 | 40.0 | 86.5 | 9.0 | 32.7 | 6.3 | 1.2 | 5.2 | 0.8 | 4.3 | 0.9 | 2.3 | 2.2 | 0.3 | 2.2 | 1.1 | 28.3 | 18.9 | 3.8 | |
| 68.0 | 114.9 | 138.3 | 133.8 | 21.2 | 66.0 | 14.2 | 3.2 | 3.4 | 1.5 | 9.2 | 571.0 | 31.1 | 67.4 | 7.0 | 25.7 | 5.1 | 1.1 | 4.4 | 0.7 | 3.8 | 0.8 | 2.1 | 2.1 | 0.3 | 1.8 | 1.0 | 25.3 | 15.0 | 4.6 | |
| 65.6 | 124.9 | 155.8 | 150.7 | 24.9 | 81.2 | 16.4 | 1.5 | 3.9 | 2.4 | 10.4 | 632.3 | 37.2 | 79.4 | 8.5 | 31.0 | 6.2 | 1.3 | 5.2 | 0.8 | 4.5 | 0.9 | 2.4 | 2.4 | 0.4 | 2.2 | 1.1 | 29.1 | 17.6 | 4.6 | |
| 61.7 | 104.2 | 154.2 | 133.8 | 25.2 | 76.3 | 17.2 | 1.9 | 3.7 | 1.5 | 9.6 | 621.8 | 41.8 | 88.6 | 9.4 | 33.8 | 6.6 | 1.4 | 5.5 | 0.8 | 4.7 | 0.9 | 2.5 | 2.4 | 0.4 | 2.1 | 1.2 | 27.3 | 19.2 | 3.3 | |
| 65.8 | 119.3 | 158.0 | 109.6 | 23.1 | 82.9 | 16.5 | 1.2 | 4.2 | 2.4 | 10.8 | 624.6 | 38.2 | 83.3 | 8.8 | 32.0 | 6.3 | 1.3 | 5.3 | 0.8 | 4.5 | 0.9 | 2.3 | 2.2 | 0.3 | 2.3 | 1.1 | 28.7 | 19.7 | 4.5 | |
| 59.1 | 112.7 | 136.7 | 121.7 | 21.6 | 57.4 | 12.8 | 2.2 | 3.7 | 1.7 | 9.6 | 630.1 | 29.8 | 67.4 | 6.8 | 24.7 | 5.0 | 1.1 | 4.3 | 0.7 | 3.8 | 0.8 | 2.2 | 2.2 | 0.4 | 1.8 | 0.9 | 25.4 | 14.6 | 4.9 | |
| 84.5 | 122.1 | 140.8 | 200.0 | 25.4 | 72.1 | 14.8 | 2.1 | 3.9 | 1.8 | 10.2 | 627.5 | 33.8 | 72.4 | 7.7 | 28.3 | 5.7 | 1.2 | 5.1 | 0.8 | 4.4 | 0.9 | 2.4 | 2.4 | 0.4 | 2.0 | 1.0 | 31.3 | 16.4 | 4.4 | |
| 77.3 | 140.5 | 134.8 | 154.3 | 20.8 | 72.2 | 14.5 | 2.6 | 3.6 | 2.7 | 9.3 | 554.9 | 30.9 | 69.1 | 7.0 | 25.7 | 5.1 | 1.1 | 4.4 | 0.7 | 3.8 | 0.8 | 2.0 | 1.9 | 0.3 | 2.0 | 1.0 | 26.2 | 17.2 | 3.8 | |
| 80.7 | 115.7 | 140.0 | 160.1 | 24.6 | 72.0 | 14.0 | 11.9 | 4.0 | 1.4 | 10.8 | 603.3 | 31.9 | 68.0 | 7.4 | 27.3 | 5.5 | 1.1 | 4.9 | 0.7 | 4.1 | 0.9 | 2.3 | 2.3 | 0.4 | 2.1 | 1.0 | 28.7 | 16.8 | 6.0 | |
| 65.6 | 124.3 | 175.8 | 130.1 | 22.6 | 73.4 | 16.3 | 0.9 | 5.0 | 1.4 | 14.2 | 618.1 | 35.8 | 74.3 | 8.3 | | | | | | | | | | | | | | | | |

Supplemental Table S2

| Exp | Site | Hole | Core | Type | Sect | W | Top | Bot | Depth | Age | CaCO ₃ | Total Organic C | Total Carbon | Total N, acidified | $\delta^{13}\text{C}$, TOC | Color |
|-----|-------|------|------|------|------|---|-----|-----|-------------|------|-------------------|-----------------|--------------|--------------------|-----------------------------|------------------|
| | | | | | | | | | mbsf, CSF-A | Ma | wt.% | wt.% | wt.% | wt.% | per mil | relative to pair |
| 353 | U1445 | A | 1 | H | 1 | W | 41 | 43 | 0.41 | 0.00 | 1.93 | 1.11 | 1.34 | 0.11 | -20.02 | Light |
| 353 | U1445 | A | 1 | H | 1 | W | 93 | 95 | 0.93 | 0.01 | 3.61 | 1.39 | 1.82 | 0.14 | -20.30 | Dark |
| 353 | U1445 | A | 1 | H | 5 | W | 23 | 25 | 6.23 | 0.04 | 26.81 | 1.64 | 4.86 | 0.16 | -17.23 | No Pair |
| 353 | U1445 | A | 4 | H | 1 | W | 100 | 102 | 26.9 | 0.20 | 11.04 | 1.59 | 2.91 | 0.16 | -17.90 | Dark |
| 353 | U1445 | A | 4 | H | 2 | W | 120 | 122 | 28.6 | 0.21 | 10.62 | 0.69 | 1.96 | 0.08 | -18.22 | Light |
| 353 | U1445 | A | 7 | H | 4 | W | 92 | 94 | 59.43 | 0.47 | 9.35 | 1.41 | 2.54 | 0.13 | -16.93 | Dark |
| 353 | U1445 | A | 7 | H | 4 | W | 112 | 114 | 59.63 | 0.47 | 7.02 | 1.15 | 1.99 | 0.12 | -17.79 | Light |
| 353 | U1445 | A | 10 | H | 1 | W | 95 | 97 | 83.85 | 0.68 | 2.88 | 0.94 | 1.29 | 0.12 | -19.23 | Light |
| 353 | U1445 | A | 10 | H | 3 | W | 41 | 43 | 85.88 | 0.70 | 5.42 | 1.51 | 2.16 | 0.13 | -18.98 | Dark |
| 353 | U1445 | A | 11 | H | 4 | W | 61 | 63 | 96.82 | 0.80 | 9.21 | 0.72 | 1.83 | 0.08 | -18.33 | No Pair |
| 353 | U1445 | A | 12 | H | 8 | W | 37 | 39 | 111.22 | 0.93 | 3.83 | 1.43 | 1.89 | 0.15 | -18.52 | Dark |
| 353 | U1445 | A | 13 | H | 1 | W | 88 | 90 | 112.28 | 0.94 | 4.09 | 1.08 | 1.57 | 0.12 | -18.56 | Light |
| 353 | U1445 | A | 16 | H | 1 | W | 70 | 72 | 140.6 | 1.22 | 3.07 | 1.02 | 1.38 | 0.11 | -18.31 | Light |
| 353 | U1445 | A | 16 | H | 2 | W | 65 | 67 | 141.81 | 1.23 | 1.72 | 1.38 | 1.58 | 0.16 | -19.28 | Dark |
| 353 | U1445 | A | 19 | H | 1 | W | 70 | 72 | 169.1 | 1.51 | 2.68 | 1.06 | 1.38 | 0.12 | -18.89 | Light |
| 353 | U1445 | A | 19 | H | 4 | W | 78 | 80 | 173.35 | 1.55 | 11.80 | 2.24 | 3.66 | 0.21 | -17.88 | Dark |
| 353 | U1445 | A | 22 | H | 1 | W | 30 | 32 | 197.2 | 1.86 | 2.39 | 1.84 | 2.12 | 0.19 | -19.67 | Light |
| 353 | U1445 | A | 22 | H | 2 | W | 93 | 95 | 199.33 | 1.89 | 4.86 | 1.90 | 2.48 | 0.21 | -18.19 | Dark |
| 353 | U1445 | A | 22 | H | 4 | W | 88 | 90 | 201.6 | 1.92 | 4.32 | 1.96 | 2.48 | 0.20 | -17.90 | No Pair |
| 353 | U1445 | A | 25 | X | 1 | W | 41 | 43 | 225.51 | 2.20 | 4.95 | 1.86 | 2.45 | 0.20 | -18.54 | Dark |
| 353 | U1445 | A | 25 | X | 3 | W | 12 | 14 | 227.5 | 2.22 | 5.33 | 1.15 | 1.79 | 0.12 | -17.13 | Light |
| 353 | U1445 | A | 28 | X | 1 | W | 104 | 106 | 255.24 | 2.42 | 3.83 | 2.16 | 2.62 | 0.22 | -17.39 | Dark |
| 353 | U1445 | A | 28 | X | 1 | W | 138 | 140 | 255.58 | 2.42 | 3.74 | 1.89 | 2.34 | 0.17 | -16.52 | Light |
| 353 | U1445 | A | 31 | X | 1 | W | 59 | 61 | 283.89 | 2.65 | 1.97 | 1.50 | 1.74 | 0.17 | -18.48 | Light |
| 353 | U1445 | A | 31 | X | 3 | W | 40 | 42 | 286.41 | 2.67 | 7.76 | 1.55 | 2.48 | 0.15 | -18.49 | Dark |
| 353 | U1445 | A | 34 | X | 1 | W | 19 | 21 | 310.89 | 2.89 | 13.81 | 2.08 | 3.73 | 0.20 | -19.18 | Light |
| 353 | U1445 | A | 34 | X | 2 | W | 53 | 55 | 312.64 | 2.91 | 1.98 | 2.60 | 2.84 | 0.23 | -18.63 | Dark |
| 353 | U1445 | A | 37 | X | 4 | W | 82 | 84 | 338.75 | 3.12 | 3.58 | 1.21 | 1.64 | 0.15 | -20.39 | Light |
| 353 | U1445 | A | 37 | X | 5 | W | 53 | 55 | 339.97 | 3.13 | 3.50 | 1.44 | 1.86 | 0.16 | -19.84 | Dark |
| 353 | U1445 | A | 41 | X | 1 | W | 117 | 119 | 368.57 | 3.35 | 3.29 | 2.73 | 3.13 | 0.23 | -19.09 | Light |
| 353 | U1445 | A | 41 | X | 2 | W | 11 | 13 | 368.93 | 3.35 | 3.63 | 3.32 | 3.76 | 0.26 | -18.51 | Dark |
| 353 | U1445 | A | 41 | X | 3 | W | 88 | 90 | 371.22 | 3.37 | | | | | | No Pair |
| 353 | U1445 | A | 44 | X | 4 | W | 61 | 63 | 396.06 | 3.53 | 1.57 | 0.61 | 0.80 | 0.08 | -19.83 | Light |
| 353 | U1445 | A | 44 | X | 4 | W | 136 | 138 | 396.81 | 3.53 | 3.88 | 1.01 | 1.48 | 0.12 | -20.15 | Dark |
| 353 | U1445 | A | 47 | X | 5 | W | 84 | 86 | 422.01 | 3.70 | 8.07 | 0.67 | 1.64 | 0.10 | -20.63 | Light |
| 353 | U1445 | A | 48 | X | 1 | W | 8 | 10 | 423.48 | 3.71 | 5.04 | 1.33 | 1.93 | 0.15 | -19.42 | Dark |
| 353 | U1445 | A | 51 | X | 4 | W | 74 | 76 | 451.55 | 3.87 | 6.88 | 0.80 | 1.62 | 0.10 | -21.47 | Dark |
| 353 | U1445 | A | 51 | X | 6 | W | 135 | 137 | 454.63 | 3.89 | 3.85 | 0.39 | 0.85 | 0.06 | -21.64 | Light |
| 353 | U1445 | A | 51 | X | 8 | W | 6 | 8 | 455.77 | 3.90 | 3.26 | 0.39 | 0.78 | 0.07 | -21.04 | No Pair |
| 353 | U1445 | A | 55 | X | 4 | W | 15 | 17 | 482.78 | 4.07 | 4.24 | 1.08 | 1.59 | 0.13 | -19.68 | Dark |
| 353 | U1445 | A | 55 | X | 5 | W | 69 | 71 | 484.82 | 4.08 | 3.52 | 0.39 | 0.81 | 0.06 | -19.74 | Light |
| 353 | U1445 | A | 59 | X | 2 | W | 57 | 59 | 512.37 | 4.27 | 3.80 | 1.11 | 1.57 | 0.14 | -19.79 | Dark |
| 353 | U1445 | A | 59 | X | 3 | W | 12 | 14 | 513.43 | 4.28 | 7.32 | 0.88 | 1.76 | 0.11 | -19.70 | Light |
| 353 | U1445 | A | 62 | X | 4 | W | 133 | 135 | 541.21 | 4.53 | 8.94 | 0.98 | 2.05 | 0.11 | -20.02 | Dark |
| 353 | U1445 | A | 62 | X | 5 | W | 68 | 70 | 542.06 | 4.53 | 4.47 | 0.42 | 0.96 | 0.07 | -20.49 | Light |
| 353 | U1445 | A | 66 | X | 1 | W | 106 | 108 | 568.46 | 4.84 | 4.17 | 0.90 | 1.40 | 0.11 | -19.92 | Dark |
| 353 | U1445 | A | 66 | X | 2 | W | 90 | 92 | 569.81 | 4.86 | 7.32 | 0.40 | 1.28 | 0.06 | -20.45 | Light |
| 353 | U1445 | A | 66 | X | 4 | W | 60 | 62 | 572.53 | 4.89 | 4.03 | 0.98 | 1.47 | 0.12 | -19.13 | No Pair |
| 353 | U1445 | A | 69 | X | 1 | W | 25 | 27 | 595.05 | 5.19 | 3.97 | 0.66 | 1.14 | 0.09 | -20.86 | Dark |
| 353 | U1445 | A | 69 | X | 1 | W | 148 | 150 | 596.28 | 5.20 | 3.88 | 0.39 | 0.85 | 0.07 | -21.24 | Light |
| 353 | U1445 | A | 71 | X | 7 | W | 63 | 65 | 623.54 | 5.59 | 6.71 | 0.78 | 1.58 | 0.09 | -20.97 | Light |
| 353 | U1445 | A | 72 | X | 1 | W | 90 | 92 | 624.8 | 5.61 | 9.26 | 0.93 | 2.04 | 0.11 | -19.61 | Dark |
| 353 | U1445 | A | 75 | X | 4 | W | 62 | 64 | 654.8 | 6.08 | 5.08 | 1.57 | 2.18 | 0.15 | -20.28 | Dark |
| 353 | U1445 | A | 75 | X | 4 | W | 121 | 123 | 655.39 | 6.09 | 1.91 | 0.93 | 1.16 | 0.11 | -20.05 | Light |
| 353 | U1445 | A | 76 | X | 4 | W | 79 | 81 | 664.72 | 6.25 | 3.35 | 1.38 | 1.78 | 0.15 | -20.57 | No Pair |
| 353 | U1445 | A | 76 | X | 5 | W | 28 | 29 | 665.33 | 6.26 | 5.19 | 0.54 | 1.16 | 0.08 | -21.92 | Light |
| 353 | U1445 | A | 76 | X | 5 | W | 73 | 75 | 665.78 | 6.26 | 3.66 | 0.72 | 1.16 | 0.09 | -21.42 | Dark |

Supplemental Table S3

| Exp | Site | Hole | Core | Type | Sect | W | Top | Bot | Depth | Age | δD , C26 | std δD , C26 | δD , C28 | std δD , C28 | δD , C30 | std δD , C30 | $\delta^{13}C$, C26 | std $\delta^{13}C$, C26 | $\delta^{13}C$, C28 | std $\delta^{13}C$, C28 | $\delta^{13}C$, C30 | std $\delta^{13}C$, C30 |
|-----|-------|------|------|------|------|---|-----|-----|-------------|------|---------------------|-------------------------|---------------------|-------------------------|---------------------|-------------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|
| | | | | | | | | | mbsf, CSF-A | Ma | ‰ | ‰ | ‰ | ‰ | ‰ | ‰ | ‰ | ‰ | ‰ | ‰ | ‰ | ‰ |
| 353 | U1445 | A | 1 | H | 1 | W | 41 | 43 | 0.41 | 0.00 | -151.73 | 0.47 | -157.68 | 1.98 | -156.62 | 1.03 | -26.72 | 0.07 | -28.09 | 0.07 | -28.11 | 0.02 |
| 353 | U1445 | A | 1 | H | 1 | W | 93 | 95 | 0.93 | 0.01 | -153.03 | 0.29 | -162.74 | 3.84 | -150.81 | 0.40 | -26.46 | 0.17 | -27.94 | 0.09 | -27.96 | 0.14 |
| 353 | U1445 | A | 1 | H | 5 | W | 23 | 25 | 6.23 | 0.04 | -141.93 | 1.86 | -143.37 | 3.13 | -141.05 | 1.00 | -23.37 | 0.05 | -22.42 | 0.13 | -22.45 | 0.13 |
| 353 | U1445 | A | 4 | H | 1 | W | 100 | 102 | 26.9 | 0.20 | -139.98 | 0.89 | -148.12 | 4.27 | -147.09 | 3.03 | -24.26 | 0.07 | -23.95 | 0.01 | -23.98 | 0.03 |
| 353 | U1445 | A | 4 | H | 2 | W | 120 | 122 | 28.6 | 0.21 | -133.87 | 1.55 | -146.27 | 4.68 | -131.69 | 2.10 | -24.04 | 0.10 | -23.87 | 0.13 | -23.90 | 0.02 |
| 353 | U1445 | A | 7 | H | 4 | W | 92 | 94 | 59.43 | 0.47 | -137.66 | 1.81 | -145.95 | 1.63 | -142.85 | 0.55 | -24.26 | 0.08 | -24.11 | 0.01 | -24.14 | 0.02 |
| 353 | U1445 | A | 7 | H | 4 | W | 112 | 114 | 59.63 | 0.47 | -130.70 | 2.28 | -140.82 | 2.17 | -131.13 | 3.42 | -23.25 | 0.02 | -23.52 | 0.08 | -23.55 | 0.00 |
| 353 | U1445 | A | 10 | H | 1 | W | 95 | 97 | 83.85 | 0.68 | -152.29 | 1.78 | -155.26 | 3.44 | -159.16 | 3.27 | -25.25 | 0.07 | -26.05 | 0.06 | -26.07 | 0.03 |
| 353 | U1445 | A | 10 | H | 3 | W | 41 | 43 | 85.88 | 0.70 | -148.73 | 1.49 | -155.95 | 1.96 | -149.26 | 6.34 | -26.26 | 0.04 | -26.73 | 0.09 | -26.76 | 0.04 |
| 353 | U1445 | A | 11 | H | 4 | W | 61 | 63 | 96.82 | 0.80 | -128.00 | 3.11 | -135.51 | 3.88 | -125.67 | 4.38 | -23.60 | 0.06 | -23.91 | 0.01 | -23.94 | 0.20 |
| 353 | U1445 | A | 12 | H | 8 | W | 37 | 39 | 111.22 | 0.93 | -149.03 | 1.31 | -158.62 | 1.53 | -164.55 | 1.48 | -25.05 | 0.03 | -24.97 | 0.07 | -25.00 | 0.02 |
| 353 | U1445 | A | 13 | H | 1 | W | 88 | 90 | 112.28 | 0.94 | -136.62 | 0.30 | -144.92 | 0.98 | -136.14 | 1.09 | -24.53 | 0.01 | -24.67 | 0.05 | -24.70 | 0.01 |
| 353 | U1445 | A | 16 | H | 1 | W | 70 | 72 | 140.6 | 1.22 | -142.15 | 1.61 | -153.11 | 1.28 | -150.62 | 0.56 | -25.08 | 0.08 | -25.28 | 0.06 | -25.30 | 0.05 |
| 353 | U1445 | A | 16 | H | 2 | W | 65 | 67 | 141.81 | 1.23 | -147.43 | 2.84 | -153.46 | 3.84 | -158.88 | 5.61 | -25.36 | 0.02 | -26.26 | 0.09 | -26.29 | 0.07 |
| 353 | U1445 | A | 19 | H | 1 | W | 70 | 72 | 169.1 | 1.51 | -148.96 | 2.27 | -153.25 | 2.80 | -160.43 | 2.75 | -25.76 | 0.02 | -27.05 | 0.04 | -27.07 | 0.07 |
| 353 | U1445 | A | 19 | H | 4 | W | 78 | 80 | 173.35 | 1.55 | -136.60 | 1.11 | -142.02 | 3.22 | -141.73 | 5.66 | -23.53 | 0.05 | -23.85 | 0.08 | -23.88 | 0.05 |
| 353 | U1445 | A | 22 | H | 1 | W | 30 | 32 | 197.2 | 1.86 | -141.35 | 2.29 | -145.42 | 2.00 | -155.34 | 7.42 | -24.16 | 0.03 | -25.03 | 0.01 | -25.05 | 0.05 |
| 353 | U1445 | A | 22 | H | 2 | W | 93 | 95 | 199.33 | 1.89 | -143.90 | 1.08 | -139.71 | 0.48 | -148.99 | 6.32 | -22.99 | 0.01 | -23.22 | 0.03 | -23.25 | 0.13 |
| 353 | U1445 | A | 22 | H | 4 | W | 88 | 90 | 201.6 | 1.92 | -145.68 | 1.83 | -143.63 | 0.09 | -155.25 | 0.89 | -22.88 | 0.07 | -23.13 | 0.05 | -23.16 | 0.06 |
| 353 | U1445 | A | 25 | X | 1 | W | 41 | 43 | 225.51 | 2.20 | -141.33 | 2.15 | -149.27 | 2.71 | -166.48 | 4.28 | -22.86 | 0.08 | -22.95 | 0.04 | -22.98 | 0.01 |
| 353 | U1445 | A | 25 | X | 3 | W | 12 | 14 | 227.5 | 2.22 | -144.88 | 2.91 | -147.08 | 2.77 | -149.81 | 3.50 | -23.16 | 0.18 | -23.59 | 0.03 | -23.62 | 0.01 |
| 353 | U1445 | A | 28 | X | 1 | W | 104 | 106 | 255.24 | 2.42 | -138.11 | 3.14 | -142.83 | 5.34 | -157.13 | 2.66 | -23.37 | 0.34 | -22.72 | 0.27 | -22.75 | 0.37 |
| 353 | U1445 | A | 28 | X | 1 | W | 138 | 140 | 255.58 | 2.42 | -149.31 | 1.56 | -151.96 | 2.61 | -159.70 | 2.09 | -22.81 | 0.10 | -22.42 | 0.14 | -22.45 | 0.20 |
| 353 | U1445 | A | 31 | X | 1 | W | 59 | 61 | 283.89 | 2.65 | -146.93 | 1.43 | -151.08 | 2.00 | -162.03 | 9.28 | -23.24 | 0.10 | -23.57 | 0.10 | -23.60 | 0.01 |
| 353 | U1445 | A | 31 | X | 3 | W | 40 | 42 | 286.41 | 2.67 | -145.32 | 2.10 | -148.70 | 2.12 | -147.90 | 11.51 | -25.22 | 0.12 | -25.04 | 0.10 | -25.07 | 0.03 |
| 353 | U1445 | A | 34 | X | 1 | W | 19 | 21 | 310.89 | 2.89 | -149.87 | 1.63 | -155.34 | 1.67 | -158.31 | 0.38 | -25.05 | 0.11 | -25.56 | 0.19 | -25.59 | 0.10 |
| 353 | U1445 | A | 34 | X | 2 | W | 53 | 55 | 312.64 | 2.91 | -145.28 | 3.31 | -153.61 | 0.88 | -159.28 | 3.47 | -23.65 | 0.14 | -24.14 | 0.05 | -24.17 | 0.04 |
| 353 | U1445 | A | 37 | X | 4 | W | 82 | 84 | 338.75 | 3.12 | -149.87 | 3.48 | -155.06 | 0.77 | -162.80 | 1.78 | -23.56 | 0.06 | -25.12 | 0.08 | -25.14 | 0.07 |
| 353 | U1445 | A | 37 | X | 5 | W | 53 | 55 | 339.97 | 3.13 | -151.54 | 4.50 | -160.89 | 2.58 | -170.93 | 2.70 | -24.32 | 0.03 | -25.48 | 0.05 | -25.50 | 0.11 |
| 353 | U1445 | A | 41 | X | 1 | W | 117 | 119 | 368.57 | 3.35 | -130.77 | 2.33 | -151.26 | 0.46 | -158.58 | 0.97 | -22.52 | 0.05 | -23.62 | 0.04 | -23.65 | 0.02 |
| 353 | U1445 | A | 41 | X | 2 | W | 11 | 13 | 368.93 | 3.35 | -140.24 | 0.67 | -157.94 | 1.43 | -153.53 | 1.58 | -23.14 | 0.07 | -24.12 | 0.04 | -24.15 | 0.02 |
| 353 | U1445 | A | 41 | X | 3 | W | 88 | 90 | 371.22 | 3.37 | -145.85 | 0.58 | -147.95 | 0.70 | -153.74 | 1.40 | -23.14 | 0.04 | -24.07 | 0.04 | -24.10 | 0.07 |
| 353 | U1445 | A | 44 | X | 4 | W | 61 | 63 | 396.06 | 3.53 | | | | | | | -25.55 | 0.04 | -26.25 | 0.05 | -26.27 | 0.02 |
| 353 | U1445 | A | 44 | X | 4 | W | 136 | 138 | 396.81 | 3.53 | -140.30 | 2.98 | -146.67 | 4.56 | -156.81 | 2.19 | -25.16 | 0.03 | -26.57 | 0.01 | -26.59 | 0.01 |
| 353 | U1445 | A | 47 | X | 5 | W | 84 | 86 | 422.01 | 3.70 | -152.00 | 1.45 | -158.51 | 2.48 | -169.11 | 3.31 | -26.06 | 0.10 | -27.90 | 0.10 | -27.92 | 0.17 |
| 353 | U1445 | A | 48 | X | 1 | W | 8 | 10 | 423.48 | 3.71 | -139.20 | 2.12 | -150.46 | 0.62 | -160.79 | 2.02 | -25.59 | 0.26 | -26.12 | 0.09 | -26.14 | 0.20 |
| 353 | U1445 | A | 51 | X | 4 | W | 74 | 76 | 451.55 | 3.87 | -165.27 | 0.27 | -166.48 | 1.81 | -174.20 | 2.84 | -26.67 | 0.01 | -28.52 | 0.01 | -28.54 | 0.03 |
| 353 | U1445 | A | 51 | X | 6 | W | 135 | 137 | 454.63 | 3.89 | -167.70 | 14.07 | -166.00 | 13.27 | -165.73 | 19.03 | | | | | | |
| 353 | U1445 | A | 51 | X | 8 | W | 6 | 8 | 455.77 | 3.90 | -165.28 | 1.10 | -164.92 | 3.11 | -167.31 | 3.11 | | | | | | |
| 353 | U1445 | A | 55 | X | 4 | W | 15 | 17 | 482.78 | 4.07 | -143.20 | 1.73 | -146.78 | 0.82 | -154.59 | 1.89 | -24.63 | 0.10 | -26.06 | 0.06 | -26.08 | 0.11 |
| 353 | U1445 | A | 55 | X | 5 | W | 69 | 71 | 484.82 | 4.08 | -143.99 | 2.88 | -150.25 | 0.44 | -147.29 | 10.15 | | | | | | |
| 353 | U1445 | A | 59 | X | 2 | W | 57 | 59 | 512.37 | 4.27 | -148.85 | 1.68 | -153.56 | 0.41 | -160.90 | 0.94 | | | | | | |
| 353 | U1445 | A | 59 | X | 3 | W | 12 | 14 | 513.43 | 4.28 | -144.53 | 1.79 | -150.71 | 3.93 | -153.98 | 1.67 | -23.96 | 0.09 | -25.37 | 0.04 | -25.40 | 0.25 |
| 353 | U1445 | A | 62 | X | 4 | W | 133 | 135 | 541.21 | 4.53 | -150.33 | 2.70 | -157.17 | 1.35 | -163.73 | 2.45 | -24.67 | 0.20 | -25.38 | 0.09 | -25.40 | 0.21 |
| 353 | U1445 | A | 62 | X | 5 | W | 68 | 70 | 542.06 | 4.53 | -163.90 | 0.32 | -172.06 | 0.35 | -172.96 | 2.48 | | | | | | |
| 353 | U1445 | A | 66 | X | 1 | W | 106 | 108 | 568.46 | 4.84 | -148.84 | 1.54 | -155.75 | 1.73 | -156.34 | 3.24 | -23.71 | 0.05 | -24.64 | 0.11 | -24.67 | 0.07 |
| 353 | U1445 | A | 66 | X | 2 | W | 90 | 92 | 569.81 | 4.86 | -159.16 | 2.82 | -173.90 | 2.17 | -179.29 | 3.23 | | | | | | |
| 353 | U1445 | A | 66 | X | 4 | W | 60 | 62 | 572.53 | 4.89 | -136.66 | 5.40 | -147.46 | 1.63 | -148.37 | 1.60 | -23.11 | 0.03 | -24.29 | 0.03 | -24.32 | 0.02 |
| 353 | U1445 | A | 69 | X | 1 | W | 25 | 27 | 595.05 | 5.19 | -152.54 | 0.59 | -154.11 | 1.14 | -154.99 | 1.51 | -24.27 | 0.07 | -27.12 | 0.12 | -27.14 | 0.19 |
| 353 | U1445 | A | 69 | X | 1 | W | 148 | 150 | 596.28 | 5.20 | -169.76 | 0.90 | -174.34 | 2.31 | -173.60 | 2.02 | | | | | | |
| 353 | U1445 | A | 71 | X | 7 | W | 63 | 65 | 623.54 | 5.59 | -159.87 | 0.48 | -164.74 | 3.41 | -168.14 | 2.88 | -26.43 | 0.14 | -27.20 | 0.00 | -27.23 | 0.05 |
| 353 | U1445 | A | 72 | X | 1 | W | 90 | 92 | 624.8 | 5.61 | -148.30 | 2.22 | -157.45 | 0.66 | -163.92 | 3.54 | -24.30 | 0.02 | -24.25 | 0.08 | -24.28 | 0.01 |
| 353 | U1445 | A | 75 | X | 4 | W | 62 | 64 | 654.8 | 6.08 | -147.43 | 2.92 | -154.77 | 3.26 | -161.95 | 0.56 | -24.36 | 0.17 | -24.73 | 0.19 | -24.75 | 0.08 |
| 353 | U1445 | A | 75 | X | 4 | W | 121 | 123 | 655.39 | 6.09 | -156.62 | 2.43 | -161.57 | 1.27 | -174.29 | 1.94 | -24.87 | 0.07 | -24.64 | 0.02 | -24.67 | 0.05 |
| 353 | U1445 | A | 76 | X | 4 | W | 79 | 81 | 664.72 | 6.25 | -151.91 | 1.60 | -154.79 | 1.42 | -161.89 | 3.20 | -25.27 | 0.06 | -25.51 | 0.02 | -25.54 | 0.09 |
| 353 | U1445 | A | 76 | X | 5 | W | 28 | 29 | 665.33 | 6.26 | -154.48 | 3.70 | -164.14 | 3.46 | -165.42 | 0.64 | -26.13 | 0.14 | -27.19 | 0.21 | -27.21 | 0.08 |
| 353 | U1445 | A | 76 | X | 5 | W | 73 | 75 | 665.78 | 6.26 | -147.26 | 1.05 | -156.95 | 2.15 | -157.90 | 1.77 | -27.92 | 0.01 | -29.17 | 0.07 | -29.18 | 0.06 |