**Supplementary Information**

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SI Fig. 1.—Leiosphere size variation at Big Creek (BCLK).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Bed** | **Mo (ppm)** | **U (ppm)** | **TOC (wt. %)** | **Abundance**  **(OWM / mg macerate)** | **Adjusted Abundance**  **Abundance \* TOC / 100** |
| WCUK 147 | 76.6 | 14.2 | 4.05 | 3311 | 134.22 |
| WCUK 87 |  |  | 5.64 | 3437 | 194.00 |
| WCUK 32 | 21.1 | 6.6 | 5.06 | 3408 | 172.30 |
| WCUK 23 | 31.9 | 6.1 | 3.38 | 4270 | 144.11 |
| WCUK 20 | 29.2 | 6.7 | 2.93 | 3638 | 106.59 |
| WCUK 0 | 12.7 | 3.8 | 0.41 | 322 | 1.33 |
|  |  |  |  |  |  |
| WCLK 74 |  |  | 5.31 | 301 | 15.97 |
| WCLK 66 | 86.2 | 8 | 10.32 | 125 | 12.88 |
| WCLK 58 | 54.9 | 7.8 | 5.87 | 130 | 7.66 |
| WCLK 53 | 61.7 | 8.5 | 4.85 | 793 | 38.44 |
| WCLK 33 | 53.5 | 10 | 0.29 | 0 | 0 |
| WCLK 0 | 20 | 2.6 | 0.06 | 0 | 0 |
|  |  |  |  |  |  |
| BCLK 10 |  |  | 0.26 | 0 | 0 |
| BCLK 7.5 |  |  | 0.28 | 152 | 0.32 |
| BCLK 6.5 |  |  | 0.21 | 172 | 2.32 |
| BCLK 5.8 | 0.8 | 2.3 | 1.35 | 152 | 0.49 |
| BCLK 5.0 | 1.2 | 2.2 | 0.69 | 413 | 2.86 |
| BCLK 4.6 |  |  | 0.13 | 0 | 0 |
| BCLK 4.3 |  |  | 0.2 | 221 | 0.44 |
| BCLK 4.0 | 2.4 | 2.5 | 0.34 | 67 | 0.23 |
| BCLK 3.6 |  |  | 0.49 | 100 | 0.49 |
| BCLK 3.3 |  |  | 1.52 | 471 | 7.18 |
| BCLK 3.0 | 1.6 | 3.2 | 0.46 | 69.15 | 0.32 |
| BCLK 2.6 |  |  | 2.4 | 1767.56 | 42.4 |
| BCLK 2.3 |  |  | 2 | 2645.36 | 53.00 |
| BCLK 2.0 | 2.3 | 2.5 |  | 2428.98 | 63.27 |
| BCLK 1.9 |  |  | 2.6 | 1615.33 | 18.21 |
| BCLK 1.6 |  |  | 1.13 | 1019.44 | 11.41 |
| BCLK 1.3 |  |  | 1.12 | 712.58 | 4.33 |
| BCLK 1.0 | 1.8 | 3.2 | 0.61 | 0 | 0 |
| BCLK 0.5 |  |  | 0.2 | 31.63 | 0.09 |
| BCLK 0.0 | 2.9 | 4.1 | 0.28 | 0 | 0 |

SI Table 1.— Trace metal, TOC and abundance data.



WCLK

WCLK

WCUK

WCUK

BCLK

BCLK

OWMs / mg macerate

OWMs / mg macerate

OWMs / mg macerate

meters

SI Fig. 2.—OWM abundance / mg macerate (A-C) and TOC measurements (D-F) for WCLK, WCUK and BCLK.