**Bromine as indicator of sources of lacustrine sedimentary organic matter in paleolimnological studies**

**Sergio Ribeiro Guevaraa,\*, Andrea Rizzoa,b, Romina Dagaa,b, Natalia Williamsa,b, Stefania Villac**

**a Laboratorio de Análisis por Activación Neutrónica, Centro Atómico Bariloche,**

**CNEA, Av. Bustillo km 9.5, 8400 Bariloche, Argentina**

**b Centro Científico Tecnológico – CONICET – Patagonia Norte, Argentina**

**c Universidad Nacional de Río Negro, Argentina**

**Supplementary Material**

\* Corresponding author: Centro Atómico Bariloche, Av. Bustillo km 9.5, 8400 Bariloche, Argentina. Tel. +54 294 4445106. e–mail:

**Table S1 Lake Morenito sedimentary sequence**

**Bromine, rubidium, and organic matter concentrations; Br:OM and OM:Rb ratios**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| depth  (mg cm-2) | depth  (cm) | bromine  (μg g-1) | organic matter  (wt%) | rubidium  (μg g-1) | Br:OM  ratio | OM:Rb  ratio |
| 0.0728 | 0.5 | 18.5 ± 1.7 | 24.1 ± 1.2 | 29.8 ± 9.5 | 0.7664 | 0.8101 |
| 0.3621 | 1.5 | 15.7 ± 1.5 | 20.1 ± 1.0 | 24.0 ± 6.9 | 0.7811 | 0.8375 |
| 0.6718 | 2.5 | 12.2 ± 1.1 | 18.26 ± 0.92 | 32.8 ± 7.9 | 0.6681 | 0.5567 |
| 1.3848 | 4.5 | 15.8 ± 1.4 | 11.14 ± 0.56 | 21.7 ± 6.0 | 1.4183 | 0.5134 |
| 1.7629 | 5.5 | 19.7 ± 1.6 | 10.22 ± 0.51 | 17.7 ± 2.3 | 1.9276 | 0.5774 |
| 2.1272 | 6.5 | 17.9 ± 1.6 | 13.62 ± 0.68 | 21.1 ± 7.1 | 1.3106 | 0.6470 |
| 2.5544 | 7.5 | 9.5 ± 1.1 | 5.92 ± 0.29 | 19.8 ± 9.1 | 1.6047 | 0.2990 |
| 3.0429 | 8.5 | 14.4 ± 1.5 | 2.40 ± 0.12 | 24.9 ± 8.4 | 5.9792 | 0.0964 |
| 3.5244 | 9.5 | 16.6 ± 1.6 | 3.70 ± 0.19 | 21.2 ± 7.3 | 4.4865 | 0.1745 |
| 3.9130 | 10.5 | 12.4 ± 1.3 | - | 19.5 ± 5.6 | - | - |
| 6.4273 | 14.5 | 14.4 ± 1.4 | 11.00 ± 0.55 | 29.1 ± 9.4 | 1.3091 | 0.3780 |
| 6.8208 | 15.5 | 18.3 ± 1.7 | 14.58 ± 0.73 | 26.3 ± 6.0 | 1.2551 | 0.5544 |
| 7.2520 | 16.5 | 18.4 ± 1.8 | 11.70 ± 0.59 | 25.5 ± 6.6 | 1.5727 | 0.4597 |
| 7.6997 | 17.5 | 16.3 ± 1.4 | 10.78 ± 0.54 | 24.0 ± 7.9 | 1.5121 | 0.4492 |
| 8.1882 | 18.5 | 14.1 ± 2.0 | 8.88 ± 0.45 | 28.9 ± 7.2 | 1.5878 | 0.3073 |
| 8.7027 | 19.5 | 11.5 ± 1.6 | 6.62 ± 0.34 | 36.4 ± 7.2 | 1.7296 | 0.1819 |
| 9.2773 | 20.5 | 11.9 ± 1.9 | 3.24 ± 0.16 | 30.3 ± 7.5 | 3.6743 | 0.1069 |
| 10.2701 | 21.5 | 4.31 ± 0.67 | 2.72 ± 0.14 | 71.6 ± 9.3 | 1.5846 | 0.0380 |
| 12.4797 | 23.5 | 7.46 ± 0.83 | 6.32 ± 0.32 | 29.1 ± 9.7 | 1.1806 | 0.2171 |
| 13.4645 | 24.5 | 11.2 ± 1.6 | 8.66 ± 0.44 | 25.5 ± 6.6 | 1.2938 | 0.3395 |
| 14.2639 | 25.5 | 4.20 ± 0.46 | 6.70 ± 0.34 | 19.8 ± 5.2 | 0.6269 | 0.3384 |
| 16.4056 | 26.5 | 12.7 ± 1.7 | 4.64 ± 0.23 | 24.8 ± 6.3 | 2.7387 | 0.1870 |

**Table S2 Lake Moreno, Llao Llao bay, sedimentary sequence**

**Bromine, rubidium, and organic matter concentrations; Br:OM and OM:Rb ratios**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| depth  (mg cm-2) | depth  (cm) | bromine  (μg g-1) | organic matter  (wt%) | rubidium  (μg g-1) | Br:OM  ratio | OM:Rb  ratio |
| 0.1001 | 0.5 | 25.3 ± 2.1 | 14.92 ± 0.75 | 46.5 ± 3.9 | 1.696 | 0.3208 |
| 0.3008 | 1.5 | 17.5 ± 1.5 | 12.33 ± 0.62 | 46.1 ± 5.1 | 1.419 | 0.2675 |
| 0.7887 | 3.5 | 12.0 ± 1.1 | 8.75 ± 0.44 | 45.3 ± 6.1 | 1.371 | 0.1933 |
| 1.0193 | 4.5 | 12.2 ± 1.1 | 8.35 ± 0.42 | 36.0 ± 5.6 | 1.461 | 0.2319 |
| 1.9393 | 7.5 | 9.95 ± 0.94 | 7.78 ± 0.39 | 40.0 ± 2.2 | 1.279 | 0.1946 |
| 2.2379 | 8.5 | 6.78 ± 0.98 | 4.13 ± 0.21 | 36.3 ± 5.5 | 1.644 | 0.1136 |
| 4.2770 | 12.5 | 9.43 ± 0.83 | 7.16 ± 0.36 | 49.1 ± 4.2 | 1.317 | 0.1459 |
| 4.5867 | 13.5 | 9.54 ± 0.54 | 7.58 ± 0.38 | 49.2 ± 4.6 | 1.259 | 0.1540 |
| 5.9151 | 17.5 | 12.1 ± 1.2 | 8.73 ± 0.44 | 54.3 ± 5.9 | 1.390 | 0.1608 |
| 6.1809 | 18.5 | 9.21 ± 0.84 | 7.82 ± 0.39 | 55.7 ± 5.7 | 1.178 | 0.1404 |
| 6.5441 | 19.5 | 7.68 ± 0.67 | 4.53 ± 0.23 | 57.5 ± 4.9 | 1.700 | 0.0787 |
| 9.4768 | 23.5 | 8.70 ± 0.66 | 6.30 ± 0.32 | 32.9 ± 2.2 | 1.381 | 0.1915 |
| 11.4809 | 27.5 | 9.39 ± 0.70 | 7.51 ± 0.38 | 38.3 ± 3.5 | 1.251 | 0.1960 |
| 11.8307 | 28.5 | 8.77 ± 0.72 | 6.82 ± 0.34 | 37.2 ± 3.3 | 1.286 | 0.1834 |
| 12.2454 | 29.5 | 6.70 ± 0.53 | 5.84 ± 0.29 | 33.8 ± 3.0 | 1.147 | 0.1728 |
| 12.7095 | 30.5 | 4.95 ± 0.39 | 3.98 ± 0.20 | 26.7 ± 2.6 | 1.243 | 0.1491 |
| 15.2780 | 34.5 | 9.37 ± 0.58 | 7.20 ± 0.36 | 46.3 ± 3.3 | 1.302 | 0.1555 |
| 15.6644 | 35.5 | 8.95 ± 0.72 | 6.69 ± 0.34 | 41.9 ± 3.0 | 1.338 | 0.1596 |
| 16.0385 | 36.5 | 9.90 ± 0.80 | 8.44 ± 0.42 | 49.5 ± 4.1 | 1.174 | 0.1704 |
| 16.3449 | 37.5 | 9.81 ± 0.76 | 8.95 ± 0.45 | 43.3 ± 3.0 | 1.096 | 0.2068 |

**Table S3 Lake Escondido sedimentary sequence**

**Bromine and organic matter concentrations; Br:OM ratio**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| depth  (mg cm-2) | depth  (cm) | bromine  (μg g-1) | organic matter  (wt%) | Br:OM  ratio |
| 0.0674 | 0.5 | 16.4 ± 1.4 | 22.5 ± 1.2 | 0.7290 |
| 0.1819 | 1.5 | 19.7 ± 1.6 | 23.8 ± 1.2 | 0.8286 |
| 0.2693 | 2.5 | 6.74 ± 0.96 | 22.1 ± 1.1 | 0.3056 |
| 0.3585 | 3.5 | 11.10 ± 0.91 | 17.00 ± 0.85 | 0.6523 |
| 0.4618 | 4.5 | 13.3 ± 1.2 | 15.92 ± 0.80 | 0.8356 |
| 0.5756 | 5.5 | 9.72 ± 0.98 | 17.58 ± 0.88 | 0.5529 |
| 0.8905 | 8.5 | 10.4 ± 0.98 | 15.19 ± 0.76 | 0.6846 |
| 0.9898 | 9.5 | 17.8 ± 1.5 | 20.8 ± 1.0 | 0.8545 |
| 1.4921 | 13.5 | 14.9 ± 1.2 | 15.13 ± 0.76 | 0.9847 |
| 1.5949 | 14.5 | 19.0 ± 1.5 | 19.21 ± 0.96 | 0.9891 |
| 1.6820 | 15.5 | 17.3 ± 1.4 | 21.5 ± 1.1 | 0.8037 |
| 1.7626 | 16.5 | 18.5 ± 1.5 | 21.6 ± 1.1 | 0.8571 |
| 1.8571 | 17.5 | 15.4 ± 1.3 | 17.48 ± 0.87 | 0.8808 |
| 1.9855 | 18.5 | 8.04 ± 0.77 | 9.15 ± 0.46 | 0.8791 |
| 2.1239 | 19.5 | 8.23 ± 0.74 | 10.62 ± 0.53 | 0.7748 |

**Table S4 Lake El Trébol sedimentary sequence**

**Bromine and organic matter concentrations; Br:OM ratio**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| depth  (mg cm-2) | depth  (cm) | bromine  (μg g-1) | organic matter  (wt%) | Br:OM  ratio |
| 0.0451 | 1.0 | 23.1 ± 2.1 | 31.5 ± 1.6 | 0.7341 |
| 0.1380 | 2.7 | 20.4 ± 1.8 | 26.8 ± 1.4 | 0.7621 |
| 0.2909 | 4.2 | 15.0 ± 1.3 | 18.38 ± 0.90 | 0.816 |
| 0.4746 | 5.8 | 15.5 ± 1.3 | 22.7 ± 1.1 | 0.6842 |
| 0.6438 | 7.0 | 15.9 ± 1.4 | 24.3 ± 1.2 | 0.6552 |
| 0.8081 | 8.0 | 14.0 ± 1.2 | 22.6 ± 1.2 | 0.6206 |
| 0.9641 | 9.0 | 14.3 ± 1.2 | 20.7 ± 1.1 | 0.6922 |
| 1.0890 | 10.0 | 17.5 ± 1.6 | 27.2 ± 1.4 | 0.6444 |
| 1.1852 | 11.0 | 14.6 ± 1.7 | 22.6 ± 1.2 | 0.6452 |
| 1.2881 | 12.0 | 19.5 ± 1.7 | 28.4± 1.4 | 0.6874 |
| 1.3873 | 13.0 | 16.5 ± 1.6 | 28.1 ± 1.4 | 0.5864 |
| 1.5031 | 14.0 | 9.56 ± 0.98 | 14.60 ± 0.73 | 0.6550 |
| 1.6485 | 15.0 | 10.6 ± 1.5 | 13.86 ± 0.69 | 0.7649 |
| 1.7866 | 16.0 | 11.8 ± 1.2 | 25.5 ± 1.3 | 0.4623 |
| 1.9029 | 17.0 | 9.12 ± 0.90 | 17.43 ± 0.87 | 0.5231 |
| 1.9948 | 18.0 | 17.1 ± 1.5 | 30.3 ± 1.5 | 0.5649 |
| 2.0753 | 19.0 | 14.5 ± 1.3 | 24.9 ± 1.3 | 0.5829 |
| 2.1866 | 20.0 | 11.5 ± 1.2 | 18.83 ± 0.94 | 0.6108 |
| 2.3343 | 22.0 | 9.33 ± 0.77 | 13.75 ± 0.69 | 0.6788 |

**Table S5 Lake Portezuelo sedimentary sequence**

**Bromine and organic matter concentrations; Br:OM ratio**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| depth  (mg cm-2) | depth  (cm) | bromine  (μg g-1) | organic matter  (wt%) | Br:OM  ratio |
| 0.3062 | 0.9 | 10.35 ± 0.79 | 14.85 ± 0.74 | 0.6968 |
| 0.5119 | 1.5 | 10.34 ± 0.79 | 14.73 ± 0.74 | 0.7020 |
| 0.8200 | 2.5 | 11.01 ± 0.73 | 14.58 ± 0.73 | 0.7550 |
| 2.3006 | 5.5 | 10.03 ± 0.74 | 13.59 ± 0.68 | 0.7380 |
| 2.6425 | 6.5 | 11.10 ± 0.83 | 14.15 ± 0.71 | 0.7846 |
| 2.9843 | 7.5 | 11.38 ± 0.85 | 14.29 ± 0.71 | 0.7962 |
| 3.2994 | 8.5 | 10.88 ± 0.80 | 14.35 ± 0.72 | 0.7584 |
| 3.6041 | 9.5 | 11.14 ± 0.82 | 14.26 ± 0.71 | 0.7812 |
| 3.9069 | 10.5 | 12.42 ± 0.91 | 14.38 ± 0.72 | 0.8638 |
| 4.2033 | 11.5 | 12.23 ± 0.92 | 14.44 ± 0.72 | 0.8467 |
| 4.5114 | 12.5 | 11.67 ± 0.91 | 13.82 ± 0.69 | 0.8445 |
| 4.8114 | 13.5 | 10.86 ± 0.91 | 13.64 ± 0.68 | 0.7957 |
| 5.1136 | 14.5 | 10.60 ± 0.85 | 13.28 ± 0.67 | 0.7985 |
| 5.4352 | 15.5 | 10.89± 0.88 | 13.40 ± 0.67 | 0.8128 |
| 5.7375 | 16.5 | 11.10 ± 0.88 | 13.35 ± 0.67 | 0.8316 |
| 6.0532 | 17.5 | 9.88 ± 0.78 | 12.73 ± 0.64 | 0.7760 |
| 6.3966 | 18.5 | 10.72 ± 0.89 | 13.35 ± 0.67 | 0.8025 |
| 6.7453 | 19.5 | 11.02 ± 0.92 | 13.65 ± 0.68 | 0.8068 |
| 7.0993 | 20.5 | 10.65 ± 0.85 | 13.81 ± 0.69 | 0.7710 |
| 7.4208 | 21.5 | 9.26 ± 0.72 | 14.39 ± 0.72 | 0.6436 |
| 7.7629 | 22.5 | 10.05 ± 0.75 | 17.56 ± 0.88 | 0.5722 |
| 8.1175 | 23.5 | 10.50 ± 0.81 | 15.03 ± 0.75 | 0.6984 |
| 8.4561 | 24.5 | 10.95 ± 0.81 | 15.17 ± 0.76 | 0.7219 |
| 8.8136 | 25.5 | 10.73 ± 0.81 | 15.06 ± 0.76 | 0.7126 |
| 9.1760 | 26.5 | 10.46 ± 0.78 | 15.93 ± 0.80 | 0.6566 |
| 9.5432 | 27.5 | 9.36 ± 0.70 | 14.49 ± 0.73 | 0.6462 |
| 9.9310 | 28.5 | 8.05 ± 0.70 | 14.62 ± 0.73 | 0.5507 |
| 10.3611 | 29.5 | 6.76 ± 0.53 | 14.43 ± 0.72 | 0.4681 |
| 10.7979 | 30.5 | 8.59 ± 0.70 | 16.11 ± 0.81 | 0.5334 |
| 11.2103 | 31.5 | 9.30 ± 0.73 | 15.94 ± 0.80 | 0.5834 |
| 11.5943 | 32.5 | 9.02 ± 0.70 | 15.71 ± 0.79 | 0.5741 |
| 11.9065 | 33.5 | 12.97 ± 0.92 | 18.90 ± 0.95 | 0.6861 |
| 12.1543 | 34.5 | 14.0 ± 1.1 | 20.16 ± 1.0 | 0.6936 |
| 12.3809 | 35.5 | 14.3 ± 1.1 | 21.1 ± 1.1 | 0.6757 |
| 12.6045 | 36.5 | 14.5 ± 1.1 | 20.5 ± 1.0 | 0.7096 |
| 12.8282 | 37.5 | 13.7 ± 1.1 | 19.43 ± 0.97 | 0.7051 |
| 13.0568 | 38.5 | 13.42 ± 0.94 | 19.16 ± 0.96 | 0.7002 |
| 13.2875 | 39.5 | 14.0 ± 1.1 | 19.58 ± 0.98 | 0.7140 |
| 13.5267 | 40.5 | 13.4 ± 1.1 | 19.14 ± 0.96 | 0.7010 |
| 13.7700 | 41.5 | 14.2 ± 1.1 | 19.86 ± 0.99 | 0.7135 |
| 14.0157 | 42.5 | 13.4 ± 1.1 | 19.33 ± 0.97 | 0.6939 |

**Table S5 Continue**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| depth  (mg cm-2) | depth  (cm) | bromine  (μg g-1) | organic matter  (wt%) | Br:OM  ratio |
| 14.2680 | 43.5 | 12.29 ± 0.86 | 18.77 ± 0.94 | 0.6550 |
| 14.5217 | 44.5 | 10.64 ± 0.76 | 17.54 ± 0.88 | 0.6068 |
| 14.8066 | 45.5 | 9.68 ± 0.71 | 16.30 ± 0.82 | 0.5939 |
| 15.0897 | 46.5 | 7.99 ± 0.56 | 15.86 ± 0.79 | 0.5040 |
| 15.3370 | 47.5 | 9.84 ± 0.69 | 16.97 ± 0.85 | 0.5799 |
| 15.5868 | 48.5 | 9.23 ± 0.65 | 17.41 ± 0.87 | 0.5303 |
| 15.8620 | 49.5 | 8.89 ± 0.64 | 15.41 ± 0.77 | 0.5772 |
| 16.1269 | 50.5 | 6.96 ± 0.50 | 14.25 ± 0.71 | 0.4885 |
| 16.3749 | 51.5 | 7.22 ± 0.52 | 13.99 ± 0.70 | 0.5164 |
| 16.6106 | 52.5 | 7.66 ± 0.57 | 14.53 ± 0.73 | 0.5268 |
| 16.8474 | 53.5 | 9.68 ± 0.73 | 15.78 ± 0.79 | 0.6135 |
| 17.1061 | 54.5 | 12.55 ± 0.91 | 18.66 ± 0.94 | 0.6727 |
| 17.3654 | 55.5 | 13.6 ± 1.1 | 19.72 ± 0.99 | 0.6900 |
| 17.6360 | 56.5 | 14.3 ± 1.1 | 19.04 ± 0.95 | 0.7491 |
| 17.9106 | 57.5 | 12.67 ± 0.94 | 18.97 ± 0.95 | 0.6676 |
| 18.1959 | 58.5 | 11.45 ± 0.84 | 17.91 ± 0.90 | 0.6392 |
| 18.4957 | 59.5 | 9.43 ± 0.69 | 16.50 ± 0.83 | 0.5716 |
| 18.7712 | 60.5 | 9.96 ± 0.77 | 17.31 ± 0.87 | 0.5749 |
| 19.0088 | 61.5 | 12.36 ± 0.87 | 19.33 ± 0.97 | 0.6394 |
| 19.2050 | 62.5 | 14.32 ± 0.92 | 20.7 ± 1.1 | 0.6905 |

**Table S6 Lake Futalaufquen sedimentary sequence**

**Bromine and organic matter concentrations; Br:OM ratio**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| depth  (mg cm-2) | depth  (cm) | bromine  (μg g-1) | organic matter  (wt%) | Br:OM  ratio |
| 0.1180 | 0.3 | 8.77 ± 0.78 | 4.83 ± 0.24 | 1.8164 |
| 0.6003 | 1.5 | 13.5 ± 1.1 | 9.42 ± 0.47 | 1.4333 |
| 0.8680 | 2.5 | 10.65 ± 0.98 | 8.29 ± 0.41 | 1.2842 |
| 1.1825 | 3.5 | 10.55 ± 0.89 | 8.47 ± 0.42 | 1.2451 |
| 1.5006 | 4.5 | 8.74 ± 0.77 | 7.57 ± 0.38 | 1.1546 |
| 1.8331 | 5.5 | 8.20 ± 0.97 | 6.81 ± 0.34 | 1.2035 |
| 2.7422 | 7.5 | 8.11 ± 0.69 | 6.56 ± 0.33 | 1.2372 |
| 3.1160 | 8.5 | 8.78 ± 0.77 | 8.16 ± 0.41 | 1.0757 |
| 3.4924 | 9.5 | 10.15 ± 0.89 | 8.12 ± 0.41 | 1.2501 |
| 3.8873 | 10.5 | 9.40 ± 0.74 | 8.33 ± 0.42 | 1.1281 |
| 4.2880 | 11.5 | 9.44 ± 0.73 | 8.72 ± 0.44 | 1.0828 |
| 5.3173 | 13.5 | 8.32 ± 0.59 | 6.75 ± 0.34 | 1.2321 |
| 5.7776 | 14.5 | 7.97 ± 0.58 | 7.39 ± 0.37 | 1.0787 |
| 6.2805 | 15.5 | 6.38 ± 0.61 | 7.13 ± 0.36 | 0.8950 |
| 6.6670 | 16.3 | 5.50 ± 0.45 | 6.09 ± 0.30 | 0.9026 |
| 8.3408 | 18.5 | 10.13 ± 0.78 | 6.78 ± 0.34 | 1.4945 |
| 8.8700 | 19.5 | 8.48 ± 0.63 | 6.61 ± 0.33 | 1.2824 |
| 9.3652 | 20.5 | 7.75 ± 0.74 | 6.51 ± 0.33 | 1.1909 |
| 9.8981 | 21.5 | 5.45 ± 0.44 | 6.04 ± 0.30 | 0.9018 |
| 10.5328 | 22.5 | 4.12 ± 0.38 | 5.56 ± 0.28 | 0.7405 |
| 11.2516 | 23.5 | 3.17 ± 0.40 | 3.58 ± 0.18 | 0.8861 |
| 18.6959 | 30.5 | 6.50 ± 0.49 | 6.01 ± 0.30 | 1.0814 |
| 19.3487 | 31.5 | 7.26 ± 0.51 | 6.90 ± 0.34 | 1.0528 |
| 19.9815 | 32.5 | 8.01 ± 0.66 | 6.98 ± 0.35 | 1.1473 |
| 20.5738 | 33.5 | 6.86 ± 0.56 | 6.65 ± 0.33 | 1.0317 |
| 21.2032 | 34.5 | 7.31 ± 0.58 | 6.92 ± 0.35 | 1.0566 |
| 21.8229 | 35.5 | 7.02 ± 0.61 | 7.08 ± 0.35 | 0.9912 |
| 22.4174 | 36.5 | 7.24 ± 0.59 | 6.90 ± 0.34 | 1.0494 |
| 23.0216 | 37.5 | 8.40 ± 0.59 | 7.22 ± 0.36 | 1.1638 |
| 23.6125 | 38.5 | 6.23 ± 0.54 | 6.53 ± 0.33 | 0.9537 |
| 24.1851 | 39.5 | 6.30 ± 0.50 | 6.46 ± 0.32 | 0.9756 |
| 24.7926 | 40.5 | 6.45 ± 0.52 | 6.35 ± 0.32 | 1.0152 |

**Table S6 Continue**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| depth  (mg cm-2) | depth  (cm) | bromine  (μg g-1) | organic matter  (wt%) | Br:OM  ratio |
| 25.4088 | 41.5 | 6.58 ± 0.54 | 7.15 ± 0.36 | 0.9207 |
| 26.0079 | 42.5 | 6.42 ± 0.52 | 6.48 ± 0.32 | 0.9902 |
| 26.6179 | 43.5 | 5.79 ± 0.51 | 6.98 ± 0.35 | 0.8301 |
| 27.2143 | 44.5 | 6.22 ± 0.50 | 7.03 ± 0.35 | 0.8851 |
| 27.7917 | 45.5 | 7.57 ± 0.61 | 7.37 ± 0.37 | 1.0278 |
| 28.3338 | 46.5 | 7.78 ± 0.61 | 7.83 ± 0.39 | 0.9940 |
| 28.8695 | 47.5 | 7.67 ± 0.58 | 6.86 ± 0.34 | 1.1184 |
| 29.4889 | 48.5 | 7.13 ± 0.59 | 6.68 ± 0.33 | 1.0668 |
| 30.0982 | 49.5 | 7.75 ± 0.71 | 6.77 ± 0.34 | 1.1445 |
| 30.7099 | 50.5 | 6.54 ± 0.53 | 6.56 ± 0.33 | 0.9973 |
| 31.3924 | 51.5 | 5.94 ± 0.50 | 6.51 ± 0.33 | 0.9120 |
| 32.0547 | 52.5 | 7.39 ± 0.58 | 7.21 ± 0.36 | 1.0248 |
| 32.7094 | 53.5 | 7.28 ± 0.58 | 6.56 ± 0.33 | 1.1094 |
| 33.4190 | 54.5 | 6.24 ± 0.55 | 5.18 ± 0.26 | 1.2040 |
| 34.1050 | 55.5 | 6.89 ± 0.51 | 9.15 ± 0.46 | 0.7533 |
| 34.7158 | 56.5 | 7.33 ± 0.63 | 10.02 ± 0.50 | 0.7319 |
| 35.336 | 57.5 | 8.47 ± 0.65 | 8.76 ± 0.44 | 0.9669 |
| 35.8798 | 58.5 | 8.07 ± 0.62 | 8.35 ± 0.42 | 0.9662 |
| 36.3318 | 59.5 | 8.47 ± 0.63 | 6.88 ± 0.34 | 1.2314 |
| 36.8549 | 60.5 | 8.09 ± 0.63 | 6.04 ± 0.30 | 1.3405 |
| 37.4895 | 61.5 | 5.69 ± 0.53 | 5.58 ± 0.28 | 1.0199 |
| 38.2125 | 62.5 | - | 4.49 ± 0.22 | - |
| 38.8967 | 63.5 | 5.86 ± 0.49 | 6.25 ± 0.31 | 0.9370 |
| 39.5299 | 64.5 | 6.54 ± 0.54 | 5.95 ± 0.30 | 1.0993 |
| 40.2267 | 65.5 | 6.09 ± 0.49 | 5.55 ± 0.28 | 1.0967 |
| 40.8771 | 66.5 | 6.39 ± 0.49 | 6.45 ± 0.32 | 0.9911 |
| 41.6051 | 67.6 | 6.97 ± 0.54 | 6.45 ± 0.32 | 1.0805 |
| 42.2122 | 68.6 | 6.33 ± 0.49 | 6.82 ± 0.34 | 0.9279 |
| 42.7274 | 69.5 | 5.77 ± 0.44 | 6.25 ± 0.31 | 0.9231 |
| 43.3980 | 70.5 | 5.16 ± 0.37 | 6.00 ± 0.30 | 0.8603 |
| 44.0901 | 71.5 | 5.35 ± 0.42 | 5.95 ± 0.30 | 0.8987 |
| 44.7803 | 72.5 | 5.44 ± 0.42 | 6.33 ± 0.32 | 0.8594 |
| 45.4027 | 73.5 | 6.00 ± 0.44 | 6.44 ± 0.32 | 0.9311 |
| 46.0255 | 74.5 | 5.83 ± 0.42 | 6.30 ± 0.32 | 0.9250 |
| 46.6580 | 75.5 | 6.97 ± 0.50 | 6.39 ± 0.32 | 1.0901 |
| 47.2372 | 76.5 | 6.83 ± 0.50 | 6.63 ± 0.33 | 1.0297 |
| 47.7467 | 77.5 | 6.85 ± 0.48 | 6.55± 0.33 | 1.0455 |
| 48.4100 | 78.5 | 6.95 ± 0.53 | 6.24 ± 0.31 | 1.1131 |

**Table S7 Lake Traful sedimentary sequence**

**Bromine and organic matter concentrations; Br:OM ratio**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| depth  (mg cm-2) | depth  (cm) | bromine  (μg g-1) | organic matter  (wt%) | Br:OM  ratio |
| 0.0838 | 0.5 | 16.1 ± 1.4 | 9.53 ± 0.48 | 1.6891 |
| 0.3482 | 1.5 | 11.5 ± 1.1 | 6.26 ± 0.31 | 1.8385 |
| 0.6763 | 2.5 | 10.72 ± 0.91 | 5.75 ± 0.29 | 1.8655 |
| 1.0335 | 3.5 | 11.87 ± 0.99 | 5.62 ± 0.28 | 2.1125 |
| 1.4232 | 4.5 | 7.46 ± 0.83 | 4.65 ± 0.23 | 1.6046 |
| 1.7802 | 5.5 | 5.05 ± 0.70 | 3.94 ± 0.20 | 1.2821 |
| 2.1955 | 6.5 | 6.22 ± 0.66 | 4.11 ± 0.21 | 1.5137 |
| 2.5984 | 7.5 | 7.79 ± 0.82 | 4.78 ± 0.24 | 1.6309 |
| 2.9754 | 8.5 | 7.94 ± 0.88 | 5.19 ± 0.26 | 1.5305 |
| 3.3650 | 9.5 | 9.89 ± 0.98 | 5.41 ± 0.27 | 1.8296 |
| 3.7287 | 10.5 | 11.2 ± 1.2 | 5.96 ± 0.30 | 1.8807 |
| 4.1259 | 11.5 | 8.34 ± 0.94 | 5.30 ± 0.26 | 1.5744 |
| 4.5506 | 12.5 | 8.01 ± 0.98 | 5.76 ± 0.29 | 1.3909 |
| 4.9845 | 13.5 | 8.78 ± 0.98 | 5.66 ± 0.28 | 1.5522 |
| 5.4063 | 14.5 | 10.00 ± 0.98 | 6.78 ± 0.34 | 1.4741 |
| 5.8227 | 15.5 | 11.6 ± 1.2 | 7.21 ± 0.36 | 1.6095 |
| 6.2660 | 16.5 | 11.01 ± 0.97 | 7.55 ± 0.38 | 1.4589 |
| 6.6815 | 17.5 | 9.44 ± 0.91 | 7.05 ± 0.35 | 1.3382 |
| 6.9965 | 18.5 | 10.72 ± 0.98 | 7.04 ± 0.35 | 1.5236 |
| 7.2708 | 19.5 | 10.26 ± 0.95 | 7.52 ± 0.38 | 1.3639 |