# Metals in lake sediments as indicators of human activities in prehistory: case study of the southeastern Baltic, Kamyshovoe Lake

## SUPPLEMENTARY INFORMATION

**Table S1.** Basic statistics for the entire sediment section under consideration: values of the selected elements, microcharcoal and MS.

|  | Mean | Median | Minimum | Maximum | 25,000th | 75,000th | Std.Dev. | Average | Quartile |
|---|---|---|---|---|---|---|---|---|---|
| Zn, ppm | 132.47 | 131.13 | 52.41 | 259.52 | 106.73 | 158.05 | 41.00 | 32.43 | 51.32 |
| Pb, ppm | 16.50 | 14.11 | 1.17 | 44.84 | 11.12 | 19.23 | 8.07 | 6.14 | 8.11 |
| Ni, ppm | 26.37 | 25.70 | 6.33 | 46.22 | 22.64 | 29.09 | 5.50 | 4.21 | 6.45 |
| Cu, ppm | 22.57 | 21.43 | 10.05 | 55.57 | 19.23 | 24.84 | 5.45 | 3.75 | 5.60 |
| Co, ppm | 7.27 | 7.16 | 0.07 | 19.38 | 4.39 | 9.84 | 3.98 | 3.16 | 5.44 |
| As, ppm | 5.70 | 4.46 | 0.02 | 16.70 | 1.69 | 9.44 | 4.43 | 3.92 | 7.75 |
| $TiO_2$, % | 0.37 | 0.34 | 0.15 | 0.72 | 0.29 | 0.43 | 0.13 | 0.10 | 0.15 |
| $TiO_2/Al_2O_3$ | 0.08 | 0.08 | 0.06 | 0.12 | 0.07 | 0.09 | 0.01 | 0.01 | 0.02 |
| $MnO/Fe_2O_3$ | 0.02 | 0.02 | 0.01 | 0.05 | 0.02 | 0.03 | 0.01 | 0.01 | 0.01 |
| Charcoal, % | 4.21 | 2.20 | 0.30 | 23.20 | 1.50 | 4.20 | 5.25 | 3.44 | 2.70 |
| MS, $*10^{-9}$, $m^3 \ kg^{-1}$ | 8.78 | 4.01 | -0.57 | 58.24 | 1.09 | 6.81 | 14.12 | 9.50 | 5.72 |

**Table S2.** The natural background values.

| Element | Relative background values |
|---|---|
| Ti | 0.18 % |
| Pb | 8.2 ppm |
| Ni | 24.8 ppm |
| Co | 2 ppm |
| Zn | 71 ppm |
| Cu | 21.4 ppm |
| As | 0.47 ppm |

**Table S3.** Basic statistics for the EF of selected elements on the background of historical periods.

|  | Medieval | | | Iron Age | | | Bronze age | | | Neolithic | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Min | Max | Av | Min | Max | Av | Min | Max | Av | Min | Max | Av |
|  | | n=26 | | | n=44 | | | n=77 | | | n=87 | |
| Zn, EF | 0.42 | 0.89 | 0.58 | 0.92 | 1.81 | 1.41 | 0.63 | 1.56 | 0.96 | 0.75 | 1.68 | 0.93 |
| Pb, EF | 0.77 | 1.89 | 1.24 | 0.59 | 2.01 | 1.21 | 0.06 | 1.60 | 0.75 | 0.30 | 2.07 | 1.01 |
| Ni, EF | 0.36 | 0.50 | 0.41 | 0.21 | 0.87 | 0.54 | 0.22 | 0.77 | 0.46 | 0.45 | 1.00 | 0.68 |
| Cu, EF | 0.31 | 0.50 | 0.40 | 0.37 | 0.89 | 0.52 | 0.23 | 0.76 | 0.46 | 0.44 | 0.99 | 0.67 |
| Co, EF | 1.08 | 2.48 | 1.73 | 0.15 | 5.88 | 2.53 | 0.20 | 3.57 | 1.72 | 0.03 | 2.95 | 1.53 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| As, EF | 2.84 | 11.78 | 6.17 | | 1.54 | 19.91 | 10.93 | | 0.17 | 13.35 | 4.79 | 0.03 | 17.32 | 3.40 |
| $TiO_2$ EF | 2.17 | 4.02 | 3.32 | | 1.19 | 2.67 | 1.86 | | 1.57 | 3.59 | 2.23 | 0.95 | 1.95 | 1.49 |
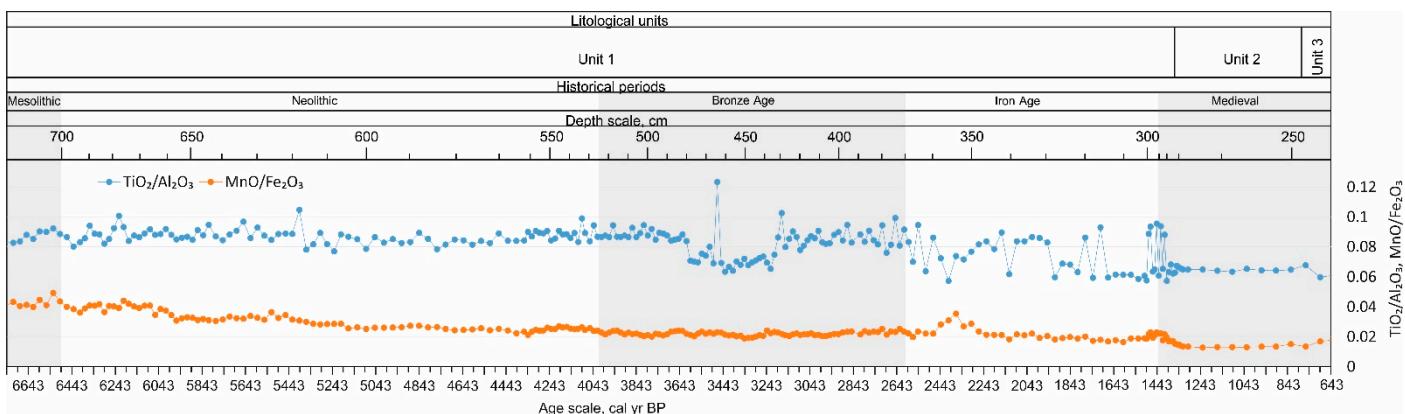


**Figure S1.** $TiO_2/Al_2O_3$ and $MnO/Fe_2O_3$ as indicatives of the weathering and redox conditions.
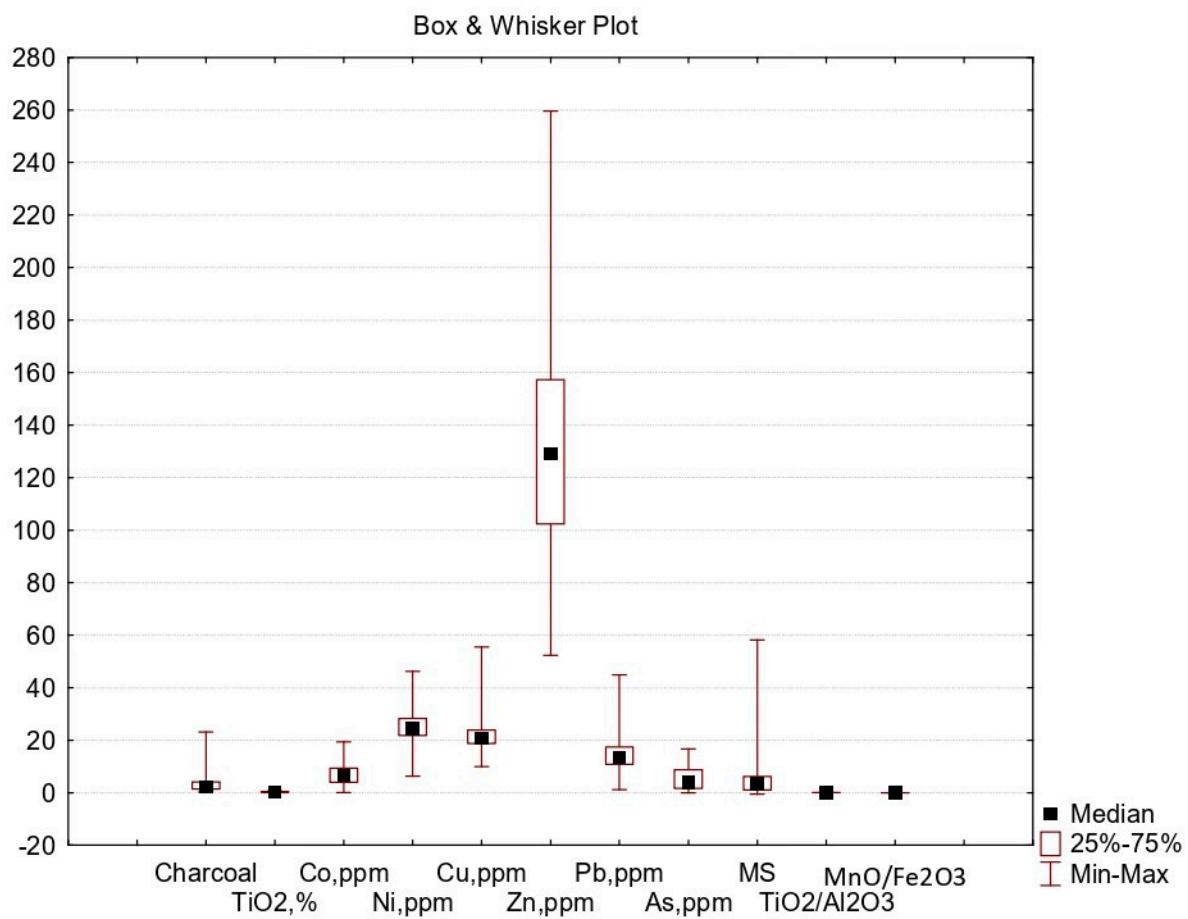


**Figure S2.** Box & Whisker Plot, mean values and the 25th and 75th percentiles. This box plot describes the central tendency of the variable in terms of the median of the values (represented by the smallest box in the plot). The spread (variability) in the variable values is represented in this plot by the quartiles (the 25th and 75th percentiles, larger box in the plot) and the minimum and maximum values of the variable (the "whiskers" in the plot).
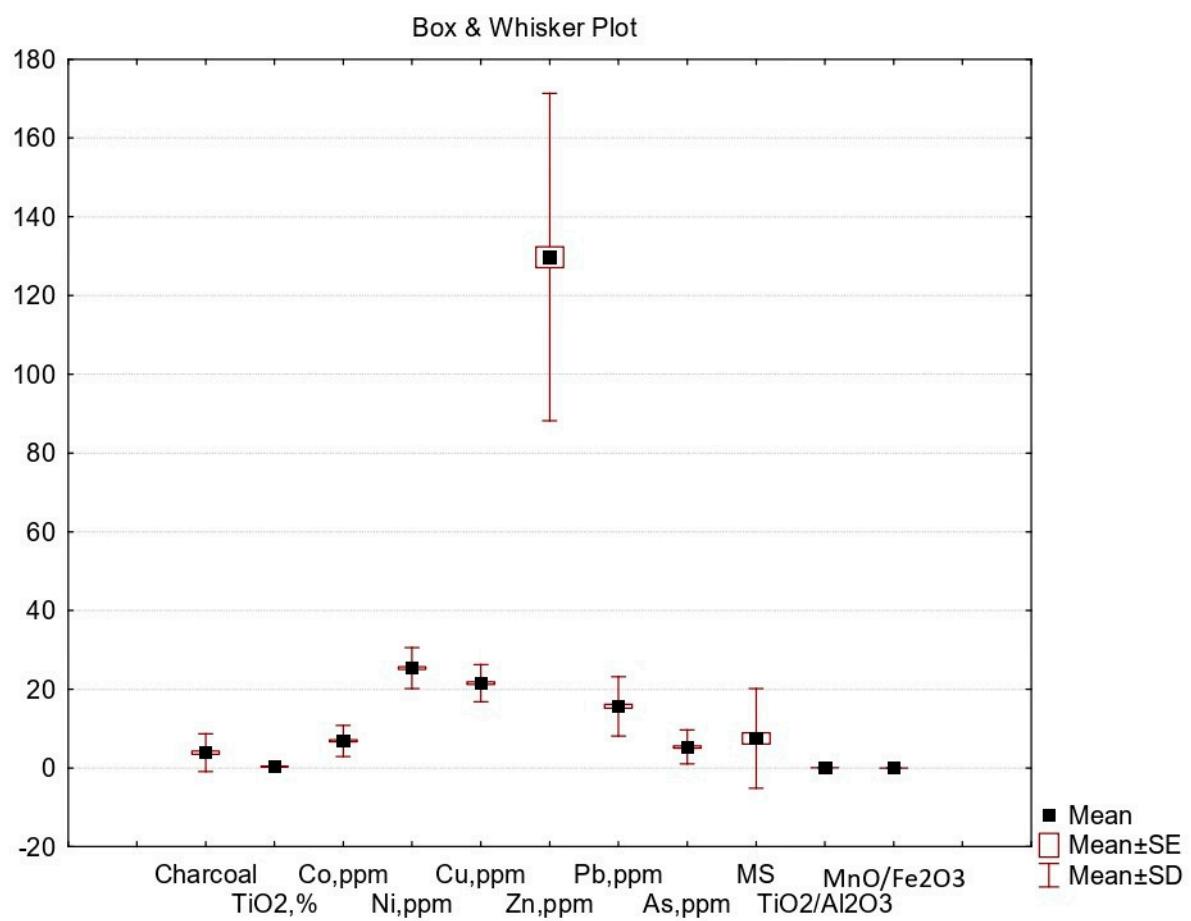
**Figure S3.** Box & Whisker Plot, mean values, SE and SD. The smallest box in the plot represents the mean (central tendency) of the variable, while the dispersion (variability) is represented by ± 1 times the standard error (large box) and ± 1 times the standard deviation about the mean ("whiskers"). .