S5 File. Final linear mixed-effects model of the rH value.

The final optimal model was selected after a stepwise backwards model selection using the likelihood ratio test:

$$rH_{icp} \sim \alpha + Treatment_{icp} + Sediment\ depth_{icp} + Time_{icp} + Treatment_{icp} \times Sediment\ depth_{icp} + Treatment_{icp} \times Time_{icp} + Sediment\ depth_{icp} \times Time_{icp} + Treatment_{icp} \times Sediment\ depth_{icp} \times Time_{icp} + a_p + a_{c/p} + \varepsilon_{icp}, \quad \varepsilon_{icp} \sim N(0,\sigma^2)$$

rH_{icp} is the observation *i* for each sediment core *c* at each plot *p*, where *c* runs from 1 to 3, *p* from 1 to 12 and *i* is the observation for each core at the different sites that goes from 1 to 8 (the number of samplings over time).The final model above means that rH is modelled as a function of Treatment, Sediment depth, Time, and all their two and three way interactions. Treatment and Time are a categorical covariate and Sediment depth is continuous. Time was set as categorical covariate, because differences between points of time were not linear. The terms a_p and $a_{c/p}$ are random effects representing the between-plot and between-core variation and are significant (L. Ratio = 288.4, df = 1, *p*-value < 0.001, nested term: L. Ratio = 378.8, df = 1, *p*-value < 0.001). The unexplained variance ε_{ics} is assumed to be normally distributed with mean 0 and variance σ^2 considered for each sediment depth *d* separately. The intercept of the model is represented with α.