

Figure S1. Age-Depth models of the cores ABH and ABHHX based on the CRS model

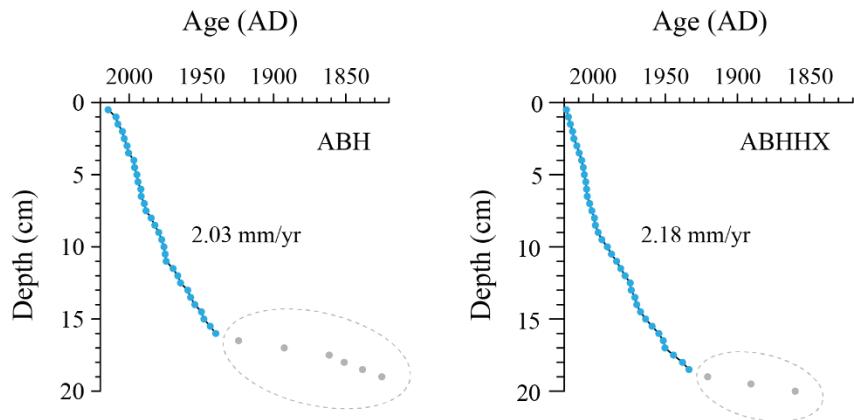
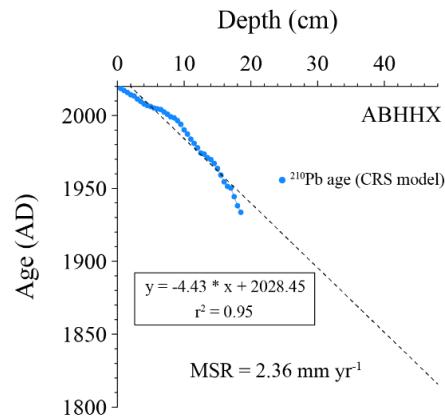


Figure S2. Linear extrapolation age of the core ABHHX



Formula (1)

$$t = \frac{1}{\lambda} \ln \frac{A_{(0)}}{A} \quad (\text{Appleby and Oldfield, 1978})$$

$\lambda$ : the decay constant of  $^{210}\text{Pb}$  ( $0.0311 \text{ yr}^{-1}$ );  $A_{(0)}$ : the total, integrated  $^{210}\text{Pbex}$  activity in the core ( $\sum^{210}\text{Pbex}$ );  $A$ : the cumulative  $^{210}\text{Pbex}$  below the level representing time  $t$ .

Formula (2)

$\text{TOC}_{\text{act.}} = \text{TOC}_{\text{mea.}} * (\text{sample weight after carbonate removal} / \text{sample weight before carbonate removal})$