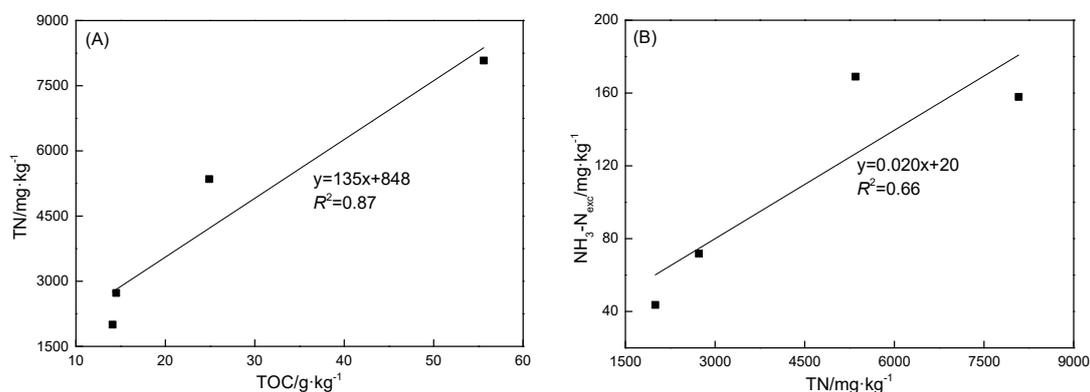
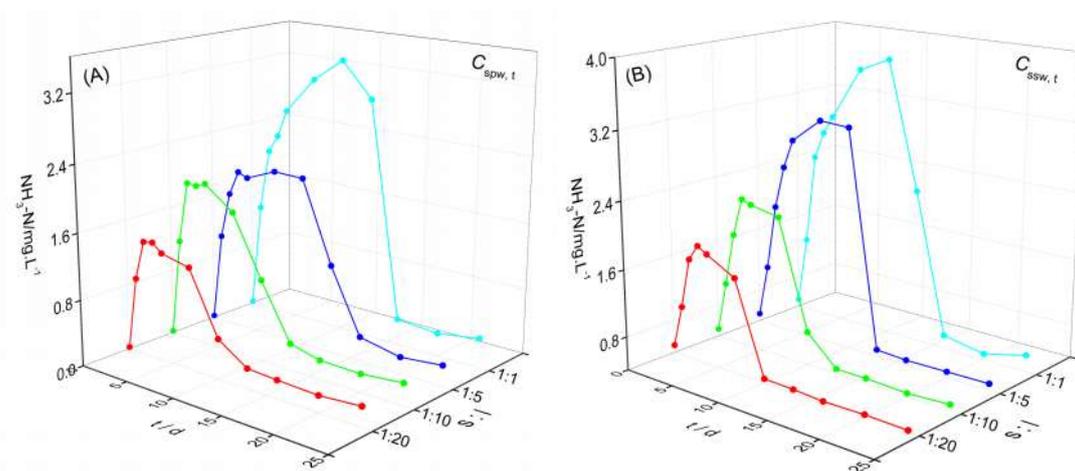


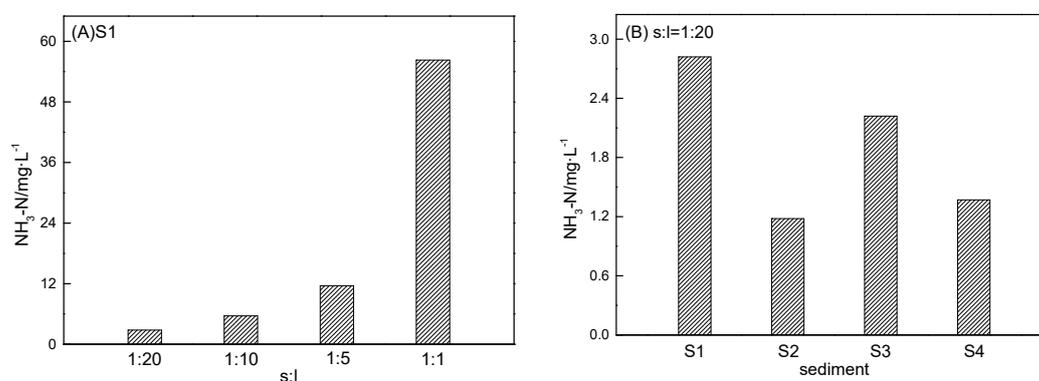
## Supplementary Material



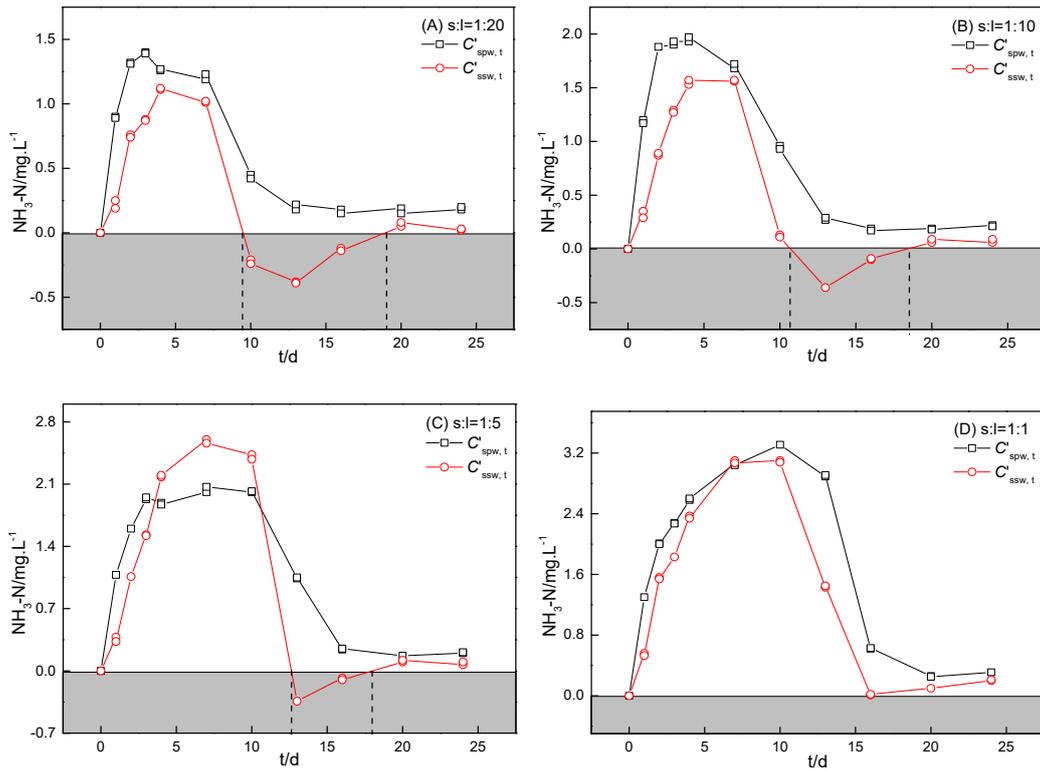
**Figure S1.** Relationship between TOC (A) and  $\text{NH}_3\text{-N}_{\text{exc}}$  (B) of the four selected sediments and TN in the sediments. TN is the total nitrogen content. TOC is the total organic carbon content.  $\text{NH}_3\text{-N}_{\text{exc}}$  is the exchangeable ammonium nitrogen content.



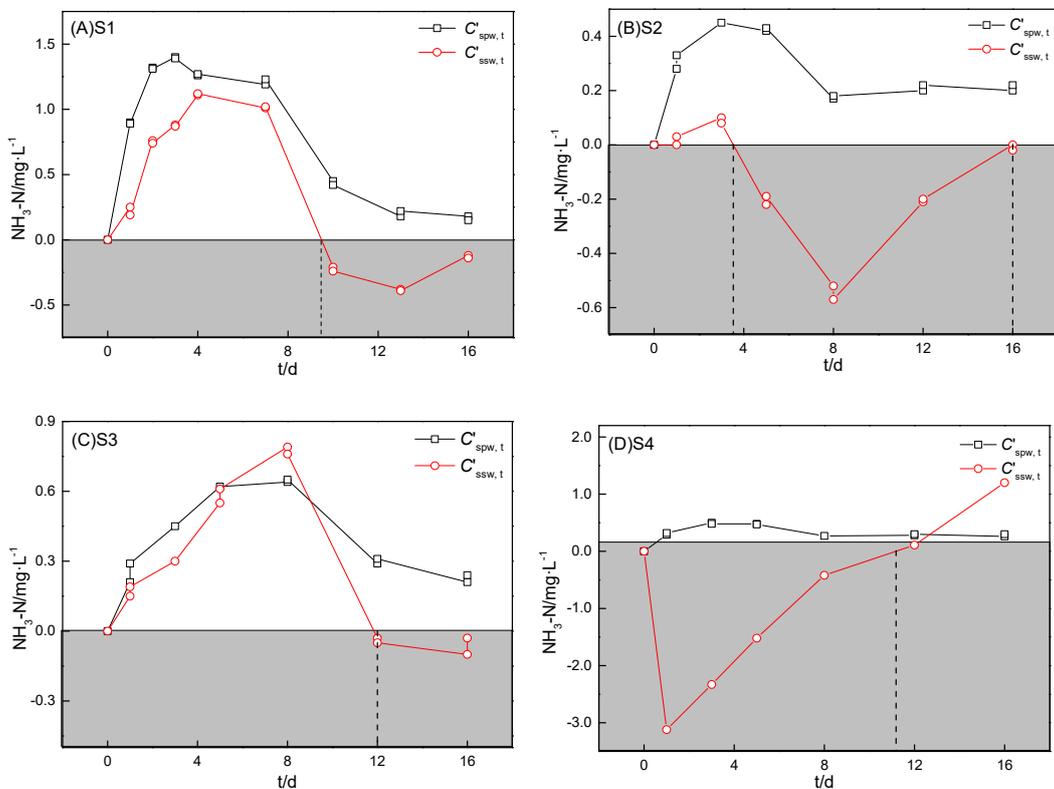
**Figure S2.** The kinetics of ammonium with sediment (S1) incubation at different sediment-to-water ratios in ultrapure water ( $C_{\text{spw},t}$ ) and sample water ( $C_{\text{sw},t}$ ). The controls were the kinetics of ammonium incubation in ultrapure water ( $C_{\text{pw},t}$ ) and sample water ( $C_{\text{sw},t}$ ) without sediments.



**Figure S3.** Ammonium concentration in ultrapure water-sediment incubation system at different sediment-to-water ratios (A) and four sediments (B) by calculating.



**Figure S4.** The intrinsic kinetics of ammonium in the sediment (S1) incubation at different sediment-to-water ratios in ultrapure water ( $C_{spw,t}$ ) and sample water ( $C_{ssw,t}$ ). The sediment-to-water ratios for (A), (B), (C) and (D) were 1:20, 1:10, 1:5 and 1:1, respectively.  $C_{spw,t}$  and  $C_{ssw,t}$  are the difference between  $C_{spw,t}$  and  $C_{pw,t}$ ,  $C_{ssw,t}$  and  $C_{sw,t}$  respectively.



**Figure S5.** The intrinsic kinetics of ammonium in the four sediments incubation in ultrapure water ( $C_{spw,t}$ ) and sample water ( $C_{ssw,t}$ ). The sediment-to-water ratio was 1:20 for four sediments (S1–S4).  $C_{spw,t}$  and  $C_{ssw,t}$  are the difference between  $C_{spw,t}$  and  $C_{pw,t}$ ,  $C_{ssw,t}$  and  $C_{sw,t}$  respectively.