Response Letter to Associate Editor

Dear Prof. Perran Cook,

Thank you for your additional comments to further improve our manuscript. Please find below our specific responses to your comments.

Editor's comment	Our response
Line 124 – 5.000 or 5‰ ? NEW: Line 123	We labeled with $^{15}NH_4^+$ and $^{15}NO_3^-$ to get a final enrichment of 5,000‰ in the sediment core. We changed the point to a comma: "The label addition was calculated aiming for a maximum enrichment of 5,000 ‰ in substrates."
Line 214 – Please elaborate why the requirements for the IPT were not met. New: Line 213 - 214	The isotope pairing technique is a widely used method to asses contributions of NO_3^- reducing processes, where labeled $^{15}NO_3^-$ (99.9 atom%) is initiated to the overlying water to permit the production of ^{15}N-N_2. We labeled with much lower $^{15}NO_3^-$ (5,000 ‰ in the overlying water of the sediment core) to calculate the gross nitrification rates and to be inside the measuring range of the used IRMS. The enrichment of $^{15}NO_3^-$ is too low to measure any ^{15}N-N_2 species. We rewrote the section: "…were not met because the labeled $^{15}NO_3^-$ in the overlying water is too low to measure any ^{15}N-N_2 species."
Line 204 as for the ammonification, (not likewise to…) NEW: Line 202	We rewrote the sentence as you mentioned.

Kind regards,

Alexander Bratek, Justus van Beusekom, Andreas Neumann, Tina Sanders, Jana Friedrich, Kay-Christian Emeis and Kirstin Dähnke