



Contribution ID : 160

Type : Oral

Co-existence of nitrogen oxidation and reduction in oxygenated estuaries

Monday, 3 September 2018 17:30 (15)

Estuaries received eroded sediments from catchment with heavy anthropogenic nutrient and organic loadings serving as a bioreactor favoring intensive cycling of elements, such as nitrogen and organics. Increasing evidences showed the importance of active particle mediated aerobic-anaerobic metabolisms in estuary and coastal waters, however, little is known about the production of N₂O, a strong greenhouse gas, in such environment due to technological difficulty. By using multiple isotope labeling technique, we investigated potential nitrogen transformation pathways contributing to N₂O production in two estuaries in Southeast of China along a wide DO gradient. We found nitrogen oxidation and reduction processes co-existed and both actively contributed to N₂O production. Particle mediated aerobic-anaerobic metabolisms accounted for such co-existence. Moreover, the bulk production N₂O and the fractional contribution of reduction pathway to N₂O were negatively correlated with DO and nutrient concentrations. Our results demonstrated that eutrophication and deoxygenation synergistically promote N₂O production in turbid and eutrophic estuarine systems that might induce enhancing feedback to global warming.

Position

Senior Scientist

Affiliation

State Key Laboratory of Marine Environmental Science, Xiamen University, China

Email Address

wanxh@xmu.edu.cn

Are you a SFB 754 / Future Ocean member?

No

Primary author(s) : Dr WAN, Xianhui (State Key Laboratory of Marine Environmental Science, Xiamen University, China)

Co-author(s) : Dr SHENG, Hua-Xia (State Key Laboratory of Marine Environmental Science, Xiamen University, China); Dr DAI, Minhan (State Key Laboratory of Marine Environmental Science, Xiamen University, China); Dr ZHANG, Yao (State Key Laboratory of Marine Environmental Science, Xiamen University, China); Mrs XU, Min (State Key Laboratory of Marine Environmental Science, Xiamen University, China); Mrs ZHENG, Zhenzhen (State Key Laboratory of Marine Environmental Science, Xiamen University, China); Mrs LIU, Li (State Key Laboratory of Marine Environmental Science, Xiamen University, China); Dr KAO, Shuh-Ji (State Key Laboratory of Marine Environmental Science, Xiamen University, China)

Presenter(s) : Dr WAN, Xianhui (State Key Laboratory of Marine Environmental Science, Xiamen University, China)

Session Classification : 08 Coastal Systems: From Understanding to Management

Track Classification : 08 Coastal Systems: From Understanding to Management