

Interactive comment on “Nitric oxide (NO) in the Bohai and Yellow Seas” by Ye Tian et al.

Ye Tian et al.

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Received and published: 18 November 2018

1. The last sentence in the abstract seems spurious and unsubstantiated, because there was no part of the manuscript that reported research finds on NO_x emissions from ships.

In our manuscript of Page 7 line 20-25, we compared the NO emission of the Yellow Sea and the Bohai Sea to the atmosphere based on our observation (7.6×10^7 g N month⁻¹) with the satellite-derived average NO_x emission estimate (about 1.3×10^{10} g N month⁻¹) reported by Ding et al., 2018. Because Ding et al.'s (2018) estimate is dominated by the NO_x emissions from ships' diesel engines, thus we concluded that the oceanic NO emissions to the atmosphere were negligible compared to anthropogenic NO_x sources such as emissions from ships.

2. Judging from the distribution patterns of NO flux and the wind speed (Figure 5),

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one would expect an important inference and conclusive statement in the abstract and discussion. Previous investigators (Anifowose AJ, Sakugawa H. 2017. Determination of Daytime Flux of Nitric Oxide Radical (NO₂) at an Inland Sea-Atmospheric Boundary in Japan. *J Aquat Pollut Toxicol.*, 1:2) reported wind speed as an important factor governing NO flux at the air-sea interface.

Yes, wind speed was an important factor governing NO flux at the air-sea interface judging from the distribution patterns of NO flux and the wind speed. We will supplement it in the abstract and discussion of revised manuscript and cite this reference of Anifowose and Sakugawa (2017).

3. The analytical methods on the measurements of NO concentration and during irradiation experiments (photoformation rate) are not explicit enough. I understand that the authors referred to Liu et al. (2017), there is need for them to report detailed analytical procedures in the manuscript.

Thank you for your comment. We will supplement the analytical methods on the measurements of NO concentration and during irradiation experiments in revised manuscript.

4. In view of comment 3 above, one would ask the precious question as to whether the measured concentration of NO during the irradiation experiment was steady-state concentration, even when the NO scavenging rate constant in the seawater (during the experiment) remained unknown?

During the irradiation of sunlight, production and consumption of NO occurs simultaneously in seawater bulk, for example, radicals from CDOM can scavenge NO, and thus the measured concentration of NO was a net value of NO production.

5. I think there should be comprehensive correlation plot (and its discussion in the manuscript) of relationship between NO and NO₂ (a major NO source). While it is true that the authors presented Figure 3 to reflect this, we only have very scanty data

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plotted.

In this study, NO surface concentrations did not show any statistically significant relationship with NO₂- throughout the whole area, and similar variations of salinity, NO surface concentrations, and NO₂-concentrations was found only from station B65 to station B70 where affected by the outflow of the Huanghe River in the southern BS (Figure 3). The photochemical production of NO was also affected by pH, temperature, irradiation density, concentration of CDOM, etc. besides NO₂- concentration. Therefore, a comprehensive correlation might be difficult to obtain by in situ observation.

6. Page 2, Line 1: 10 % should be 10%. This should be applicable in other relevant places in the manuscript.

We will correct them as suggested. Thank you for your suggestion.

7. Page 3: we have interchangeable use of “h” and “hour(s)”. The authors should stick to “h” preferably.

We decide to stick to “h” as suggested.

8. Page 6, Line 29: “0.00 × 10⁻¹¹ molL⁻¹s⁻¹” should be “not detectable”

We will correct it as suggested.

9. Page 7: The statement between Lines 8 and 9 should read “. . .but would also generate reactive oxygen species like O₂•⁻, ROO• and other OH-related radicals, which in turn, would efficiently scavenge NO. . .”

We will revise it as suggested. Thank you for your suggestion.

10. Page 7, Line 17: 24h should be 24 h 11. Page 10, Line 19: 13(4), 1-31 were repeated in the reference

We will correct them as suggested. Thank you for your comments and suggestions.

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2018-446>, 2018.