Biogeosciences
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Interactive comment on "Environment Gradient related Dissimilatory Nitrate Reduction to Ammonium in Huangmao Sea Estuary: Rates and Community Diversity" *by* Ran Jiang et al.

Anonymous Referee #1

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This is a fairly direct study that reports potential rates of dissimilatory nitrate reduction to ammonium (DRNA) in the HSE sediments in China, where the nitrite reductase nrfA gene is determined to infer spatial variation in nitrate ammonifier community structure. A main finding is the potentially widespread occurrence of DNRA and geographical separation of DNRA bacteria community in the study region. While the data in this study might add to our understanding of the complex N cycle in natural environments, there are multiple major issues that render the current form of manuscript unsuitable for the journal of Biogeosciences.

The first issue is a lack of strong research motivations. While the Introduction briefly

reviews the background about DNRA and previous work, it lacks a rational development of research questions, motivations, or working hypotheses. The authors should stress more in the Introduction on what the key unaddressed questions are after reviewing the previous work (e.g., page 2, lines 13-30; page 3, lines 3-7), why they are important, and how the results from the HSE/PRE region would help resolve these unknowns. One way to improve is to start off with a bigger picture of N cycle/unknows (rather than a description of the HSE region), followed by an overview of previous work on DRNA that subsequently leads to major research questions, and then justification on the choice of PRE sites (not just because "there is lack of study . . . from PRE"). Note that the fact that there hasn't been any study in the PRE region is by itself not an attractive incentive because most audiences would probably not be familiar or interested in PRE or HSE region in particular, unless such environment is unique for this kind of research and can provide new insights.

The second major issue is the presentation of data. The manuscript is written in a data-reporting style with very little discussion on the data. The authors are expected to place their results in the context of the existing literature and synthesize their findings into lucid scientific story that advances our understanding of N cycle in a broader sense (i.e., not just for the PRE region). A "real" Discussion section is currently missing from the manuscript. Another issue with data presentation is that most figures are of low quality and it is very difficult to read the number, text, or color (e.g., Figs. 2, 3, 4, 5, 7, 8).

The last issue is the frequent improper uses of English and language that need to be checked thoroughly throughout the manuscript. A few examples are given below.

Other comments Page 1 line 15: Please specify "nitrogen pollutants" and "characteristics of terrestrial pollutant export".

Line 16: The readers would probably not understand what the "continuous-flow systems" is until they read the methods.

Line 17: English. I would suggest replacing "accordingly" with "the corresponding" throughout the manuscript.

Line 25: English. Insert "in" after "located"

Line 27: English. "As the marine..." This sentence has grammatical issues; please rephrase.

Page 2 Line 2: English. "From which the good...". This should be a clause that follows the previous sentence; please check the grammar.

Line 5: English suggestion: change "forming" to "converted to"

Line 13: English. Delete "of" and "were"

Page 3 Line 7: English. Remove "the" from "there are the"

Line 8: The authors could elaborate the geographic and climatic differences between HSE and other study sites (ECS and YRE); that will help justify the choice of the HSE for this study.

Line 19: English. Insert "is" before "refereed"

Line 24: English. Insert "in" after "located"

Page 4 Line 1: English. Replace "transported" with "transport"

Line 12: "and so on". Please list all the sampling time points.

Page 6 Line 12: Please specify the "sea water quality standards, GB3097-1997".

Line 14: What are "the standard four level" and "80% datas"?

Page 7 Line 2: "17000 cl-1 mg/L". Please use the more common unit for salinity (e.g., Practical Salinity Unit) in the manuscript.

Lines 3-26: The presentation is quite descriptive. Same issue is found on page 8. It's partially because the presentation of data is frequently referred to specific sites

C3

(e.g., C1, C7, C11), which have limited meanings to the general audience. Just as an example, a description of "higher XX rates were found at Stns 1, 2, 3..." is less interesting/meaningful than a description of "higher XX rates were found in lower-salinity regions (such as Stn1, Stn2, Stn3)". I strongly suggest to separate the Results section from the Discussion section.

Line 22: English. "rates significantly among". Please check the grammar.

Line 23: English. "locate" should be in past tense.