Gruber et al. present measurements of nutrient concentrations and dissolved nutrient flux rates from a macro tidal reef in the Kimberley region of Australia. They compare net rates of dissolved nutrient uptake to the theoretical mass transfer-limited uptake rates. They conclude that the reef acts as a source of DIN and DIP to the water column. I find this manuscript well-written with good logic and structure. I have some comments to help improve the readability, especially for readers unfamiliar with the sequences of papers that have come from this group of authors on reef physics-biogeochemistry at this site. Overall, I would classify these comments as minor-to-moderate.

I do have one over-arching question/comment: Tallon reef, and the macrotidal Kimberley, seem like end-members on the spectrum of hydrodynamic conditions experienced on reefs. The authors do a good job referencing the Lowe and Falter (2015) paper highlighting the ubiquity of tidal-dominated reefs (even though most research has gone into studying wave-dominated systems), but how applicable do you think the results here are to other systems? Not many other systems feature large amounts of aerial exposure, asymmetric phase duration, and the massive velocities associated with drainage of the platform. How do these conditions affect the applicability of Tallon reef as a model biogeochemical system whose results can be generalized?

Here are some more detailed comments broken down by sections of the paper.

Abstract:
L15-“moderate amount”, replace with an actual quantity of nitrate

Introduction:
I recommend the authors reverse the ordering of their discussion of organic and inorganic nutrients. Since the manuscript focuses on DIN and DIP, it stands to reason that they should be discussed before the refractory DON and DOP pools. I recommend that you move the paragraph discussion inorganic nutrients (p. 2, L 10-23) ahead of the discussion of organic nutrients (p. 2, L 1-8).

Methods:

Section 2.1:
Please insert your well-worded definition of “tidal phase-averaging” from the Fig. 5 caption into p. 4, L 10-13. The current wording in this paragraph is ambiguous about whether data are averaged within the phases of a tidal cycle or across tidal cycles. The definition in the figure caption relieves this ambiguity.

Section 2.2.
How were water samples collected exactly? Did you hold the syringe at the surface and draw up the water? Or was it just above the benthos? Did you directly collect the water with the syringe? Or did you use some auto-sampler to sample the water, and then draw up into a syringe? A few more details would be helpful for conveying you’re sampling plan to readers.

Section 2.3

As it stands now, I think this paragraph could benefit for a few clarifications. First, I think the authors need to be more explicit that the J_net estimate is not for the seagrass site, nor for the coral site, but is the average flux rate along the transect moving from the seagrass to the coral site. Even though this may be obvious for people experienced in control volume approaches, I think it is less intuitive for people without control volume backgrounds. When the authors write "C_bar is the mean of concentrations at both stations", do you mean that you average C_bar between the seagrass and coral site at each time-step? If so, say so. I find the current wording confusing. Please either provide more explanation for why you use "local benthic flux" to describe the unsteadiness term on the RHS of Eq. 2. At the end of this paragraph, the authors state "… this method is described in greater detail in Gruber et al. (2017).". Is this in reference to your interpolation of advective estimates to when you have nutrient samples? I think the authors need to be clear about how the interpolation proceeds, and do so in a manner which does not require reading Gruber et al. (2017) to understand the interpolation.

Section 2.4
There is no equation for C_D (p. 6, L 3-5). Instead the authors state "…following the same approach as used in estimates of reef metabolism (Gruber et al. 2017).". Please give additional information on C_D so that interested readers could evaluate your C_D model without having to read Gruber et al. (2017).

Minor comments for the Methods:
Please add in some information about the precision of your nutrient measurements.

Please list Sc value numbers for your inorganic nutrients (or at least diffusion coefficients) (p. 6, L 1-2).

Please quantify all error terms that went into your Monte Carlo simulations (p. 6, L 30)

Results:
p. 7, L 26: Quantify changes in S due to diffusivity
p. 7, L 27: Quantify temperature effects on S (don't need a lot here, but something to give readers a sense if the error from ignoring temperature variability is on the order of 0.01%, 0.1%, 1%, 10%, etc. would be useful).

Figures:
Fig 1: Do you have example photos from the SG and CR sites that could be added to this figure to help convey the communities described in the 1st paragraph of the Methods? I think this visual representation would help readers understand the two sites.
Fig. 4: Please describe the error bars (e.g., SD, SE, 95% CI, etc.)
Fig. 5: I think it would be interesting to put dashed lines on these plots to show the range of S estimates from flume and wave-driven field system studies (p. 10, L 24-28). These would really help show that the variability in S in tidal-dominated systems is far larger than in previously studied systems.
Figs. 5 and 6: I think these two figures should be combined, and it would really help readers to see them as a multi-panel plot so that they can understand how closely the

J_MTL estimates mirror the S estimates (or alternatively, depart from each other).

Tables:
Table 1: “Number of duplicate samples”- does this mean the total number of replicates analyzed? Or the total number of unknown water samples collected, each of which were duplicated? Please clarify.
Tables 1 and 2: I think these tables can be combined. This would streamline the manuscript by reducing the number of tables (as it stands right now, Table 1 adds little unique information).

Grammar/typos:
p. 1, L 30: Correct subscripting/superscripting of NOx and NH4+
p. 7, L 24: “through” (though)