

Review of the manuscript entitled “Tidal variability of nutrients in a coastal coral reef system influenced by groundwater” by Wang et al. (BG 2017 - 156)

Nitrification has been considered to be a two-step process consisting of ammonia oxidation (ammonium to nitrite) followed by nitrite oxidation (nitrite to nitrate), and each step is carried out by different microbes. Not much data are available on the rates of nutrient uptake at the low concentrations of nutrients occurring naturally in reef waters. Predictions of sustainable uptake/release rates in the natural environment based on uptake from enriched seawater with submarine groundwater discharge are questionable without detailed measurements and models. In this manuscript measurement of nitrite, nitrate without ammonia are reported which will not provide a complete picture in the absence of microbial processes that controls the DIN make up in estuarine/coral system. Corals may be capable of adaptive changes in uptake kinetics dependent on nutrient availability. However, the rate of nitrogen acquisition appears to be influenced on a diel cycle, presumably due to depletion of photosynthetic products during the night. Towards this, the manuscript is not strong in presenting the results and conclusions. It is, however, necessary to acknowledge the controversy and to address the potential biases associated with the choices made in the calculations.

Almost 80% of SGD, calculated using the salinity difference between time-series station CT and the close seawater station, contributes very little increase nutrient concentrations and attributed due to biological processes as mentioned in the text. This contradicts the sentence on Page 3 line 25. What is the concentration of silicate, phosphate and nitrogen species in the river water and groundwater? Including this information will improve the reliability of the data discussed.

I believe this manuscript is an important contribution to the field, however, much editing is needed before publication.

The specific comments are listed below:

Page 4 line 11: Prove volume of seawater

Page 4 line 19: Too simplistic. Delete this sentence.

Page 5 line 2: Delete “using Microsoft Excel (2007)”

Page 5 line 28: Check the values and correct the sentence.

Page 6 line 23: spelling! Write 'vertical' instead of 'verticle'

Page 8 line 3: Therefore we propose.... Not clear. Rewrite the sentence.

Page 8 line 15: During the flood tide.... This sentence is not clear. Rewrite it.

Page 8 line 20: The slope and constant values quoted in the equations 2 to 3 of section 4.2 are with more than significant digits of the salinity and nutrient concentrations used for getting them. Also you should include error on these values to show whether they are significantly different beyond the precision of measurement of the nutrients. Also correct them in Fig. 8. Delta P bio values are especially not different from the precision of measurement.