

Interactive comment on “The Relationship between Tropical Cyclone Activity, Nutrient Loading, and Algal Blooms over the Great Barrier Reef” by Chelsea L. Parker et al.

Anonymous Referee #1

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Review on bg-2017-23 This study evaluates the effects of tropical cyclones, either directly by sediment re-suspension or by indirectly by the rainfall and river discharge, on phytoplankton in the surface waters of the Great Barrier Reefs. It is an important issue in oceanography and coral reef protection and well within the purview of BG. However, there are many flaws and ambiguities that the conclusions can be made, I do not recommend a publication on the current version.

General comments: 1. The accuracy or uncertainty of the remotely sensed chlorophyll a concentration in this study area should be quantitatively evaluated. According to Udy et al. (2005), the correlation between the remotely sensed chlorophyll a concentrations and the field in situ measurements in this area seemed insignificant. If the

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remotely sensed chlorophyll a concentration can not represent the ground-true values, any statistics based on the former should not be accepted.

2. Since the affected area by a tropical cyclone is limited, it is better to evaluate the effects of the tropical cyclone event-by-event, but not taking the GBR as a whole. For example, considering two tropical cyclones with the same intensity, size, moving speed, etc., one that passes over a catchment area and thus induces a stronger river plume should have a stronger effect than the other one that propagated far away from the major rivers. Moreover, if the tropical cyclone-induced rainfall and river discharge are so important, there should have a gradient with the decreasing effect of the tropical cyclone with the increasing distance leaving from the land. Many studies have shown that the inshore chlorophyll a concentrations are generally higher in the wet season than in the dry season, but the seasonal difference may become insignificant in the offshore areas.

Specific comments: 1. P2, L8-19: At the first few days, in addition to the stimulated phytoplankton growth by the input nutrients, the elevated chlorophyll a concentrations in the surface waters may be, at least partly, from the vertical mixing which brings the high-level chlorophyll waters in the lower layer to the surface waters.

2. P2, L17-19: I don't think the sediment loading has to be collinear with chlorophyll a concentration. Although the nutrient loading may be associated with the sediment loading and this may stimulate the phytoplankton growth, the reduced light intensity associated with the sediment loading may limit the phytoplankton growth.

3. P3, L28-33: In those exemplified coastal regions (e.g. the Chesapeake Bay), the accuracy and uncertainty of the remotely sensed chlorophyll a concentrations have been evaluated extensively.

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