

Earth Syst. Sci. Data Discuss., author comment AC1
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Reply on RC1

Oriane Bruyère et al.

Author comment on "Hydrodynamic and hydrological processes within a variety of coral reef lagoons: field observations during six cyclonic seasons in New Caledonia" by Oriane Bruyère et al., Earth Syst. Sci. Data Discuss.,
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Comment #1 of Reviewer #1 (in pdf file): I do suggest an extensive proofreading by a native English speaker. I will not go into detailed corrections, but many sentences (while not grammatically false) are heavy and/or blurry.

Answer to Comment #1 of Reviewer #1: Manuscript has been extensively proofread by 2 natives E.S who enhanced the quality of English sentence (~50 % of the sentences rewritten/modified). We also added our two kinds English reviewers in the acknowledgement section.

Comment #2 of Reviewer #1 (in pdf file): l.170 : which plumes ?

Answer to Comment #2 of Reviewer #1: We thank the reviewer to have noticed this imprecision. We modified the sentence as follows: "Finally, the fate of rivers plumes (from the Dumbéa, Coulée, Pirogues rivers) and their consequences on the SW lagoon were studied through biogeochemical and sedimentological studies conducted by Pinazo et al., 2004; Ouillon et al., 2004; Drouzy et al., 2019" (L178 - L180) to precise the concerned watersheds.

Comment #3 of Reviewer #1 (in pdf file): «ocean reef slope » « □ forereef », everywhere

Answer to Comment #3 of Reviewer #1: We followed the recommendation of Reviewer #1 and we modified each "ocean reef slope" to forereef word at four occurrences.

Comment #4 of Reviewer #1 (in pdf file): Top and bottom plots in Figure 1 should be separated, with separated captions

Answer to Comment #4 of Reviewer #1: We agree with this comment and we split Figure 1 into 2 separate figures. References to figures are now modified within 3.2 section that describe lagoons morphologies and sampling strategies.

Comment #5 of Reviewer #1 (in pdf file): A general instrumentation table is missing, recalling the main informations (type, dates, position, parameters, measurement timing) of all deployments in a given place.

Answer to Comment #5 of Reviewer #1: We agree with this comment of Reviewer #1 and we added a full table in appendices section giving main information about deployment. In lines 308 to 309 we added a sentence referring to the Table in supplementary (Table. A1)

Comment #6 of Reviewer #1 (in pdf file): Similarly, there is a lack for a precise list (table) of processed parameters (sea level, wave height, temperature, etc) with related processing parameters.

Answer to Comment #6 of Reviewer #1: Processed parameters now appear in Table A1 in the Appendices section (see answer of comment 5).

Comment #7 of Reviewer #1 (in pdf file): Marotte HS: how the data produced by drag-tilt bottom currentmeters can be interpreted in the presence of strong reef-induced friction and associated bottom boundary layer? My understanding is the measured data will be ok for clear sandy area, but much less reliable in the presence of coral.

Answer to Comment #7 of Reviewer #1: We thank Reviewer #1 for this comment, nevertheless Marotte HS have often been used in coral reef ecosystems (see following references: Faivre et al., 2020; Page et al., 2021; Blacka et al., 2019). These studies used Marotte HS current meter in coral reef habitats and highlighted the fact that drag-tilt current meter allow to investigate water flow inside coral environments and give and accurate temperature and velocity near the boundary contrary to standard ADCP's for example. The Marotte HS manufacturer also defends deployment in reef ecosystems to measure local current caused by reef structure, (see: <https://www.marinegeophysics.com.au/current-meter/>). Regardless, during our surveys majority of our loggers were moored on a sandy bed but this data logger can be deployed in areas that are topographically complex. We chose to work primarily with Marotte HS current meters as they are affordable and easier to deployed than ADCPs, making widespread sampling more feasible, for further surveys we recommend the use of Aquadopp Profilers, which have now acquired and hence plan to perform more accurate data in such rugose coral environment.

Comment #8 of Reviewer #1 (in pdf file): Sea level: the precise measurement of sea-level is a tricky issue. This is apparently one of the processed parameter, but nothing is said about the sea level reconstruction: vertical positioning of the sensor, compensation of drift, etc...

Answer to Comment #8 of Reviewer #1: We thank reviewer #1 for this comment and based on this we added inside the manuscript information about the sea level parameter and reconstruction, as follows: "For RBR pressure data, a barometric correction was applied with a constant atmospheric pressure (101325 bar). Because pressure sensors have all been deployed by scuba diving (sometimes in the vicinity of breaking waves, e.g., forereef) no precise vertical referencing by DGPS (Differential Global Positioning System) has been achieved. Furthermore, data have not been corrected from the long-term drifting of the sensor and, from drift due to loggers shift between legs" (lines 396 to 399).

For consistency, we decided to do not remove the long-term drifting error in pressure time series, as most pressure gauges were started using delayed start time. Thus, loggers did not record any pressure data before immersion which is a prerequisite for long-term drift compensation (e.g., Sous et al., 2020). For other processing strategies, raw data may be diffused on demand.

Comment #9 of Reviewer #1 (in pdf file): Wave height: similarly, to Sea level, there is a lack of detailed information about the reconstruction of wave features

from the measured bottom pressure.

Answer to Comment #9 of Reviewer #1: We agree with Reviewer #1 for the comment 9 and to facilitate this we added in lines 399 to 403 detailed information of the method used for the linear wave theory. We chose to use the method explained in Aucan et al., 2017 which takes a constant cut-off frequency of 0.33 and no-tail diagnostic for the highest frequencies range. We are aware that numerous methods exist to attain a reliable estimation of wave parameters and we understand that researchers may apply their own method, in this case, they may ask for the raw data files.