

Interactive comment on “Controls of Caribbean surface hydrology during the mid- to late Holocene: insights from monthly resolved coral records” by C. Giry et al.

Anonymous Referee #2

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Review of the paper by Giry et al entitled as "Controls of Caribbean surface hydrology during the mid- to late Holocene: insights from monthly resolved coral records" Authors studied corals taken from Bonaire in southern Caribbean sea to reconstruct seasonal to multidecadal variability of hydrology during the mid- to late-Holocene. Caribbean ocean is an important area for providing moisture to the atmosphere as well as high sea surface temperature that related to ENSO and Atlantic meridional ocean circulation. Combining both oxygen isotopes as well as Sr/Ca measurements, authors successfully extract the history of surface salinity changes during the last 6 ka. They attribute the salinity variations due to the wind induced low salinity water advection from Orinoco river to the sites. The results also was compared with Coupled climate model.

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Coral is an strong climate archives because of its very high time resolution records thus can provide seasonal records. This is very useful to understand low latitude climate system. The data cover most of Holocene period reasonably thus this should be published for publication after revisions will be made. Unlike their original paper (Giry et al., 2012 EPSL), central proxy in the present manuscript is $\delta\text{-d}18\text{O}$ that was derived from combination with Oxygen isotope and Sr/Ca based SST. By looking at their figure 2, it seems that Sr/Ca reasonably represents SST. However Sr/Ca variations are seems too large to be explained by temperature variations. Also if one look at the modern corals, most recent corals have lowest SST albit global warming trend have been still continued. Therefore authors are advised to discussed more details about the validity of individual component that is used for the equation to derive $\delta\text{-d}18\text{O}$ before further discussing the hydrological interpretations. Since it is located the place where upwelling is observed so they should discuss also possibility the way to distinguish it using proxies.

Though it contains many datasets in the manuscript, they should have more focused discussions. What extend have they been improved the understanding Caribbean and/or low latitude climate using the new hydrological history deduced from the present work needs to be explained more explicitly. Introduction should be reorganized in particular the section where they discussed the glacial-interglacial changes in Caribbean sea since their target is much shorter timescale (seasonal). Similarly Results and Discussion sections are able to be reduced and concised. Comparison to the climate model need to be expands otherwise they can omit the section. They also need to discuss other papers that dealing with mid-Holocene corals for similar types of previous studies. it would be better if they can address more details why the current data supports the idea that cold water advection from Orinoco river is the best way to explain the proxy behavior and why present work successfully detected those (because of model resolutions? data time resolutions? etc).