

Interactive comment on “Spatial linkages between coral proxies of terrestrial runoff across a large embayment in Madagascar” by C. A. Grove et al.

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Received and published: 3 May 2012

This article presents some measurements of Ba/Ca, d18O, d13C and luminescence (and Sr/Ca?) in four different coral cores over a period of 15 year. The authors compare these different proxies between them and with river discharge. This article presents interesting data, but I think that there are some places that need to be improved or that need more explanations. In particular, the authors could clarify the following points:

- First, I would like that the authors add a table with all the data, including the d18O and Sr/Ca ratios measured in the coral, and not only d18O of seawater calculated from these two parameters;
- Introduction: this part needs more description of the different proxies measured in this

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study. In particular, it would be useful the vital effects possible for each proxy. It seems that, in this study, each time that the authors cannot explain some behaviours, they attributed these effect to some vital mechanisms, but without any description of these. In contrary, in the introduction, parameters that control d18O and d13C in corals are described without any mention to vital effects (i.e. kinetic effects, pH variation at sites of calcification, CoC vs fibres, influence of metabolic CO₂...). It is now well known that all these parameters affect the record of proxies in corals and in particular their reliability. One paragraph about Sr/Ca is also needed as it was measured during this study.

- Materials and Methods: This section really needs more details, in particular "Coral geochemistry section". In many places, accuracy and reproducibility are not given. The standards used are not described (name, matrix, values??). Are they in-house reference material, international standard?? I suppose also that an error is associated to the slopes taken for d18O/T° and Sr/Ca vs T°. It should be added. Why these values were chosen? There are a lot of different slopes available in the literature for these species, so why these values?

-p 3118: I don't understand the second point of the differences in absolute values. Apparently it could be due to differences of standards used between the two techniques... So what is the accuracy of your techniques? If this is the case, how values between different labs could be done?

- It needs also some comparison with values of precedent studies.

Some other changes (more or less minor) are listed below:

P3102, L24: this is not the only species to record TE into its skeleton. This sentence should be rewritten.

P3103: The paragraph concerning the luminescence should be before all the description of the geochemical proxies

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P3104, L6: "propose" is not well chosen.

P3105: All the details described concerning the research area should be in Figure 1.

P3106: Give the range and the minimum temperature of SST.

P3108, L4-8: Place this sentence in the results section.

P3108, L14-15: I suppose that the accuracy is checked at each analytical session, and not only during this inter-laboratory comparison, 4 years ago.

P3108, L25: What are the outliers? Are they numerous?

P3109: It would be useful to have a comparison of your values with the recommended values of NBS19. 0.037 should be 0.04 %.

P3111: What is the error associated to the measurement of the salinity?

P3113: To better compare the data of the different cores, it would be better to have some graphs of the data from one versus the other core. I know that there is already the table 2 for this, but with some graphs, it will be easier to see. For the correlation coefficients, they must all be expressed as R², instead of R.

P3113, L18: R=0.50 is not a "strong" correlation.

P3115, P3116: I have a problem concerning all these sections about the variation of D18O and d13C. For me, all is within the error bars and it is impossible to deduce anything from these data (figure 6), especially for d13C. These data are, for me, over-interpreted.

Figure 2: What is d)? It is not in the caption.

Interactive comment on Biogeosciences Discuss., 9, 3099, 2012.