

## ***Interactive comment on “Strengthening of the Somali upwelling during the Holocene and its impact on southwest monsoon rainfall” by D. Balaji et al.***

### **Anonymous Referee #1**

Received and published: 29 September 2017

In this paper, Balaji et al., use the biogenic silica flux from the Somali upwelling area to reconstruct regional climate over the last 18.5 ka. I found the data/results relatively straight forward but the results were slightly over-interpreted in conjunction with other datasets. I think part of the issue might be resolved in annotating the figures with specific intervals better (e.g. YD and BA).

One of my major concerns is using TEX86 values as sea surface temperature in an upwelling region. TEX86 values record variable temperatures in upwelling regions (see Hertzberg et al., EPSL 2016). TEX86 essentially records subsurface conditions in upwelling regions so interpreting the Huguët et al., 2006 record purely as sea surface

C1

temperature is incorrect. I would recommend excluding this temperature record from the regional climate discussion. This would change the discussion section significantly. In particular, much of the YD and BA discussion hinges on the TEX86 record.

For comparisons for specific events like the YD and BA, I have some concerns about the age models. Many of the regional records are relatively low resolution. Are the age models, and frankly the sampling resolution, adequate to make regional interpretations for the YD and BA? I think annotating these specific intervals on the figures would help the reader and the authors evaluate these interpretations.

Could the authors clarify the selective preservation within the upwelling region (Lines 125-135)? In addition to the upwelling diatoms being more heavily silicified, presumably the flux of diatoms to the sediment during upwelling when nutrients are abundant also enhances their preservation? I'm not certain how the authors determined the preservation efficiency in the core. Is this based on the types of diatoms within the sediment?

Minor comments:

Please refer the reader to the specific figure (or figures) within the text. Figures should be labeled with region (e.g. Western Ghats) in addition to the author.

Line 15: “positive to negative” is ambiguous. Could you make this sentence a little more clear? Line 25: SST not defined.. write out sea surface temperature Lines 170-175: I think it would be best to start this line of argument with the colder SSTs in the LGP are related to global cooling and not a change in upwelling strength Line 175: use suggested instead of envisaged Line 188: I don't see a reduction in temperatures during the B/A Lines 209-201: I don't see this pronounced SST decrease in the Mg/Ca SST records, this is a TEX signal? Lines 231-235: I would recommend omitting this impact statement