Biogeosciences Discuss.,
doi:10.5194/bg-2015-633-RC2, 2016

Biogeosciences Discussions

Interactive comment on "A 150-year record of phytoplankton community succession controlled by hydroclimatic variability in a tropical lake" *by* K. A. Yamoah et al.

Anonymous Referee #2

Received and published: 21 March 2016

Review comments for Yamoah et al., A 150-year record of phytoplankton community succession controlled by hydroclimatic variability in a tropical lake. (MS No. bg-2015-633)

The authors presented a data set of lipids abundances, compound specific hydrogen isotope, bulk carbon and nitrogen isotopes, and DNA from a sediment core, to investigate decadal variations in phytoplankton communities in a ∼150 year of a tropical lake. Although the authors make an effort to establish a new methodology to evaluate the ecological changes in the lake by these biological and chemical analyses, this paper is rather descriptive and spotty discussion, and lacks the in-depth discussion. As long as the authors presented a lot of data set, I think that the authors should comprehensively

discuss the lake environment rather than picking up the specified topic. Therefore, in my opinion, a substantial revision is required to make this MS suitable for publication in BG.

Detailed comments: Page 3, line 11: Meaning of the terms "external" and "internal" ecosystem should be specified. Page 5, line 14: Please describe the depth (m) of the sampling location, the "deepest part". Page 5, lines 19-22: I suggest to tone down this part. Robador et al 2015 did not give you off-handed support nor the guarantee for storing sampled sediments without froze them for days. Organic compounds and its isotope compositions can very likely be affected. "Such" temperatures needs to be specified. page 5, line 22: It would be better to remove the word "biogeochemical". Page 6, lines 3-5: Descriptions of the standard materials for carbon and nitrogen isotope analysis (e.g. working standards) should be included. Page 6, lines 16-29: It will be better to cite original papers for the method. Page 7, lines 10-25: For the delta-D analysis, please present at least one set of IRMS chromatogram from analyzed sample. For the compound specific isotope analysis, especially for the δD, single-peak baseline separation of targeted compound is essential to get reliable data. It will be better to cite original papers for the analytical method. Page 9, line 10-12: Specify the reason to compare sedimentation rates between a lake and a near -by estuary? The two aquatic fields have completely different physical natures, I failed to see the reason or the necessity for their sedimentation rates should be in the same range. Page11 Sec.4.1: The description of the data trend is rather difficult to understand. Please indicate specific unit name or age from each figures when discussing. Unclear description made it difficult to follow the thread of your discussion. (e.g. p.11 line 22, "the second half of the last century in Figure 3" can be addressed by year) Page 11, lines 17-23: This part fails to convince the readers, as some of the discussion seems to be contradictive. I think to drew this conclusion, the d15N variation in surrounding watersheds, substrate nitrogen, actual values of phytoplankton and N-fixing cyanobacteria should be considered and discussed. Especially, when the lake is small and easily affected by surrounding environments. The same thing can be said about the discussion regarding

d13C trends. The reason why the low C/N ratio can be the direct indication to the sift in dominant plankton from diatoms to cyanobacteria should be addressed, too. Page 12 Sec.4.2: Recently, Chikaraishi et al. (2012) reported that the terrestrial insects have long-chain n-alkanes (C21–33) with lighter δD (-195 $\pm$ 16‰ abundantly. Does this affect some of your discussion in this section, as the contribution of insect-derived n-alkanes can be one of the reasons for the negative sift in δD records? Supplement page5 sec 4.3: The English is difficult to understand. Table S1: Please address units for S, O2, P. Figure S1: Captions should explain all the symbols or lines in the figure. Please remove excess notes.

Interactive comment on Biogeosciences Discuss., doi:10.5194/bg-2015-633, 2016.