Biogeosciences Discussions

Biogeosciences Discuss., referee comment RC1
https://doi.org/10.5194/bg-2021-310-RC1, 2021


# Comment on bg-2021-310

Anonymous Referee #1

Referee comment on "Drought recorded by Ba/Ca in coastal benthic foraminifera" by Inda Brinkmann et al., Biogeosciences Discuss., https://doi.org/10.5194/bg-2021-310-RC1, 2021

This is a very good study aiming to develop benthic foraminifera as a proxy of drought using Ba/Ca ratios within the foraminiferal test. Living foraminifera have been sampled from two sites from a fjord at the Swedish west coast during three different seasons (Sept 2018, Feb 2019, June 2019) while a severe drought with reduced runoff occurred in 2018. Two species have been used for trace element analysis (*Bulimina marginata* and *Nonionellina labradorica*). The manuscript is well structured and written. Figures and tables are of high quality, and supplementary material is made available. I only have some few specific comments.

Line 1: The resulting Ba/Ca ratios reflect both river discharge and drought. Perhaps the title should be altered to "River discharge and drought recorded in..."

Line 52: The review by Howe et al. (2010) is not specifically on benthic foraminifera. It would be beneficial to have one to two additional references here specifically on foraminifera, e.g. Murray (2006), ISBN 0521828392.

Lines 244-246: Ba/Ca ratios represent river discharge 30 or 60 - 90 days ago. Are there other factors causing this than foraminiferal growth and lag in the transport of Ba/Ca? What about hydrological fluctuations of the river or other environmental factors?

Lines 260-261: "... with generally lower Ba/Ca in the outer-fjord site during 2018 (Fig. 3)". The values are relatively similar between sites for *N. labradorica*? Please make describe this in the text instead of using "generally".

Line 382-405: In the section on implications, it would be beneficial to evaluate the

possible effects of the lag of 30 or 60-90 days between the river discharge and the Ba/Ca ratios when establishing paleorecords of river discharge and possibly drought.