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Interactive comment on "Effect of elevated CO$_2$ on the dynamics of particle attached and free living bacterioplankton communities in an Arctic fjord" *by* M. Sperling et al.

Anonymous Referee #2

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The paper describes the bacterial community composition in mesocosms subjected to different CO2 levels. The free-living and the attached bacterial community composition has been analyzed using ARISA. Overall, there were no changes in the free-living bacterial community composition due to the different CO2 levels detectable but there were some changes in the attached community towards the end of the experiment when also higher concentrations of organic matter in the elevated CO2 treatments were measured. The overall goal of the study was deciphering changes in the bacterial community composition in these mesocosm experiments performed in 2010. The method of choice was ARISA which is a fingerprinting technique with some advantages over TRFLP and DGGE but essentially they are all very similar in terms of resolution. The

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main drawback of the paper is that the authors didn't use next generation sequencing for this purpose. It would have been resulted in orders of magnitude higher resolution and at the same time estimates of evenness would also have been obtained more reliably than with ARISA. This major methodological drawback limits, of course, also the overall scientific merit of the paper. As such, it is just another paper on this timely subject with doubts remaining on the validity of the conclusions drawn. Besides this major method-issue, the paper is well written and illustrated with informative figures. Some slight English editing is required, though.

Interactive comment on Biogeosciences Discuss., 9, 10725, 2012.

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