Interactive comment on “Meeting climate targets by direct CO$_2$ injections: What price would the ocean have to pay?” by Fabian Reith et al.

Anonymous Referee #2

Received and published: 4 April 2019

CO$_2$ emissions are increasing at an unprecedented rate into the earth’s atmosphere. By and large, global political leadership have recognized the consequences of such emissions for human kind and ecosystems. As a result, the 2015 Paris Agreement has set the target of limiting global warming to below 2°C. To achieve such a target, academicians have been discussing some unconventional methods – known as geo-engineering. To the same effect, in this study, Reith and co-workers have presented this excellent and very thorough analysis of consequences of injecting atmospheric CO$_2$ into the deep oceans. Their analysis looks robust (I am not a modeller though!).

I have just a couple of comments that might be discussed in the revised version of the manuscript:

1. I am not sure if the trade-off between the amount of CO$_2$ released back to the atmosphere in collecting CO$_2$ from the atmosphere and injecting it into the deep CO$_2$ has been considered. By which way(s) the atmospheric CO$_2$ can be collected from the atmosphere and put into the deep ocean, and how much CO$_2$ will be emitted back (through the instruments used for such huge task) to achieve both the actions. I know this might not be feasible to incorporate in the model but it needs to be discussed/mentioned.

2. Can (gas chromatographically) CO$_2$ alone be collected from the atmosphere on such a large scale? Or will CO$_2$ be part of the mixture of all the atmospheric gases and particles (aerosols)? Was the model tuned for injecting of natural air rather than only CO$_2$ into the deep ocean? How sensitive mixture would become for ocean chemistry?