

***Interactive comment on “Bacteria in the global atmosphere – Part 1: Review and synthesis of literature data for different ecosystems” by S. M. Burrows et al.***

**Anonymous Referee #1**

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In this paper the authors review the available literature in order to obtain estimates of bacterial concentration in the atmosphere over a variety of surfaces that could be the sources of such organisms. Since bacterial flux estimates are not available from every type of surface, gross first guesses are provided. The paper is well written and will undoubtedly provide good basis for future work on this important topic.

The following points should be addressed before final publication: In general I find that in spite of the large number of references, there are a number of important papers that have not been mentioned. For example, many papers that deal with bacterial ice nucleation such as those by David Sands, Cindy Morris, Yankofsky and more have not

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been mentioned.

In section 2.3 the paper mentions that dead cells and even fragments can still be good CCN and IN. A reference should be given here.

In Section 3 it is mentioned that to a first approximation the effects of the meteorology on emissions can be expected to be similar to the effects on mineral dust and sea salt. I am not sure this is completely correct. Over the ocean bacteria could be released by bursting bubbles just like sea salt particles, however, over land, dust is emitted due to breaking of the soil dry upper crust, while on plants bacteria may be emitted by splashing of rain drops and by wind.

The end of Section 6 – the reports of higher concentrations emitted in the summer cannot be universal. There are places where the maximum is observed during the rainy season (such as autumn, winter or spring). In fact these may suggest a close connection with temperature and/or precipitation. This is in agreement with what the paper says in Section 7.1.

Section 7.4 – there are papers by Sands and by K. Bigg that should be mentioned.

Section 7.7 –Yankofsky et al reported that in Israel the concentrations of ice nuclei bacteria are actually highest in winter when the temperatures are lowest. However, this may not be the same for the total bacteria concentrations.

Section 8.1 – measurements of bacteria above the crops should include some of the works of David Sands in Montana.

Small error: end of Section 5 – should by “higher”.

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