

Interactive comment on “The CO₂ exchange of biological soil crusts in a semiarid grass-shrubland at the northern transition zone of the Negev desert, Israel” by B. Wilske et al.

Anonymous Referee #2

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The authors studied the effects of moisture on biological soil crust CO₂ exchange. They found that the frequency of precipitation is important for crust to have a positive carbon balance. CO₂ fixation (uptake) by crusts compensated for soil CO₂ loss via respiration during the winter time when plants are not active. Rain was more important than dew for stimulating crust CO₂ exchange. The study is interesting in that the authors examine the response of crusts to pulse frequency and the seasonal dynamics of crust physiological activity. I think it's also interesting that they explored the significance of dew for crust activity. They state that in situ field measurements are rare, but I disagree; I think there have been several studies that have conducted field measurements of crust physiological responses to rainfall. Nonetheless, crust studies

are still fairly rare, so I support the publication of this paper in this journal. I only have a few comments (see below).

-The authors need to introduce what BSC are in the first line of the introduction. - Rather than using the terms “CO2 deposition”, I think it’s better to use “CO2 uptake”. Deposition makes it sound like particulate matter is falling on the ground. -What is the “poikilohydric feature” specifically? -In situ field studies of crust response to precipitation have been done, so there needs to be better framing of the objectives. -The authors state that a lot of studies (in situ) are done on loose substrate but their site has a high sand content. -I’m not sure that the paired measurements of bare soil and crusted soil really capture the true crust CO2 flux. The crust will affect the soil beneath so the crust + soil flux from the crusted soil is likely crust + crust affected soil + soil CO2 flux. I suggest a statement about this caveat.

Interactive comment on Biogeosciences Discuss., 5, 1969, 2008.

BGD

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