

Interactive comment on “Short Communication: Aging of basalt volcanic systems and decreasing CO₂ consumption by weathering” by Janine Börker et al.

Anonymous Referee #1

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The contribution by Borker and co-authors explores the effect of aging of the basaltic surfaces on their CO₂ consumption by weathering. Borker et al. split the volcanic surfaces into two types: old inactive area and recent active area. They found that alkalinity fluxes from active volcanic area does not follow the classical weathering laws. The discrepancy between alkalinity fluxes calculated using published weathering laws and the observed flux is correlated to the age of the volcanic rocks (plotted here as the percentage of post-holocene volcanic rocks versus the total surface of the volcanic area).

This short contribution is interesting and deserves publication. I have the following

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questions or comments:

1) it is somehow surprising that the weathering of old basaltic surfaces does not depend on the local runoff value. The “expected” weathering law only depends on temperature, based on the plot displayed on fig 1b. Would it be useful to plot the CO₂ consumption by the weathering of old basaltic outcrop as a function of runoff ? 2) The authors implicitly assume that the young volcanic area are basaltic. This is not always the case (see for instance Rad et al., 2013, J South Am Earth Sci) . There is a possibility of bias in the present database: the old surfaces being basaltic, while the young volcanic areas can be dominated or affected by an andesitic lithology. 3) There is no discussion about the contribution of ash weathering to the alkalinity flux. Ashes released by active volcanoes may represent an important contributor to the CO₂ consumption by weathering given their high reactive surfaces and their content in glass (see for instance Sowards et al., 2018, Geosphere). I think this should discuss.

Interactive comment on Earth Surf. Dynam. Discuss., <https://doi.org/10.5194/esurf-2018-10>, 2018.

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