



EGUsphere, community comment CC1
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Comment on egusphere-2022-612

Ruud van der Ent

Community comment on "Local moisture recycling across the globe" by Jolanda J. E. Theeuwes et al., EGU sphere, <https://doi.org/10.5194/egusphere-2022-612-CC1>, 2022

Dear authors,

I am happy to see that regional recycling at the global scale gets some renewed attention. However there are a couple of points I wish to bring to your attention:

- what's the reason to call your metric 'local' recycling? Isn't it just regional recycling for grid cells of 0.5 arcdegree x 0.5 arcdegree?

- I find the novelty somewhat overstated. As far as I understand the novelty is simply the fact that you calculate regional recycling on a higher resolution grid than other global studies, but the conceptual calculation is very old (see reference list in van der Ent and Savenije (2011) for example).

- a gridcell of 0.5 arcdegree in let's say Stockholm is two times smaller in area than a gridcell around the equator

- moreover, that same grid cell is 3 times smaller in length in east-west direction, and, therefore the dominant wind direction is rather influential on its value.

- in other words, the regional recycling metric or LMR is scale and shape dependent and as such its values cannot be compared from region to region.

- the search for a relation between LMR and other quantities that do not suffer from the scale and shape dependency (precipitation, evaporation, CAPE, biomes etc.) is therefore fundamentally skewed.

- In Van der Ent and Savenije (2011) I had a suggested alternative metrics, which actually have local meaning for the recycling process, which are the local length scale of precipitation recycling and the local length scale of evaporation recycling. Surely these also rely on a few assumptions, but they do not suffer (or at least to a much more limited extent) from the scale and shape dependency. Please consider this approach or think of a better way to make your metrics scale and shape independent.