

Interactive comment on “Evaluating and improving modeled turbulent heat fluxes across the North American Great Lakes” by Umarporn Charusombat et al.

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Dear Editor and Authors,

I'd like to leave some comments on this interesting study. In my opinion, its most obvious weakness is to use the satellite-derived water surface temperature to simulate sensible and latent heat fluxes. As water temperature is a sensitive variable for these simulations, the use of satellite-derived data for site-level applications may introduce large uncertainties, especially during the bad weather seasons when more data become unreliable. Second, the use of daily water temperature and half-hourly meteorological variables simultaneously may also introduce additional errors, for example,

during deep water mixing when energy balance is fast approached.

Also, the authors mention that the flux algorithm (Z98L) of the WRF model is adapted from the CLM 4.5 where Z98L assumes that the roughness length scale of momentum, z_0 , is a constant 0.001 m and the roughness length scales of momentum, temperature and humidity are the same. Actually, in the lake model of CLM4.5 (CLM-CLISSS), z_0 is updated dynamically and three roughness length scales are not equal (for frozen lakes, z_0 is fixed). Please check with Subin et al. (2012) for accuracy.

Z. M.Subin, W. J.Riley and D.Mironov (2012), An improved lake model for climate simulations: Model structure, evaluation, and sensitivity analyses in CESM1, J. Adv. Model. Earth Syst., 4, M02001, doi:10.1029/2011MS000072.

Best regards

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