

Interactive comment on “Controls on open water evaporation” by R. J. Granger and N. Hedstrom

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Summary: In this short paper, the authors investigate factors controlling evaporation from Crean Lake and Landing Lake in western and northern Canada. They review the three conditions necessary for evaporation to occur and then provide meteorological observations taken at these sites both on land and over water to infer the principal controls on lake evaporation. On a daily timescale, they find no relationship between net radiation and the latent heat flux over water; however wind speed and, to a lesser degree, land-water temperature contrast, are shown to significantly affect lake evaporation. Atmospheric stability near the surface is demonstrated to be out-of-phase over land and open water, imposing some control on wind speeds and hence lake evaporation.

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Overall this is an interesting paper that requires minor revisions prior to publication. The authors may wish to consider the following comments in submitting a revised manuscript to the journal:

General Comments:

1) A short table summarizing the seasonal climate at both sites would provide useful reference information to the reader. For instance, what are the average air temperatures, relative humidities and wind speeds at both sites? Given the importance of winds on evaporation at both locations, the addition of wind roses would also be useful.

2) There seems to be a considerable amount of overlap between this paper and another manuscript submitted to the same journal under the title “Modelling hourly rates of lake evaporation”. For instance, several of the figures and results appear to match between the two papers. The authors need to justify why two separate publications are necessary to report their findings, particularly given this overlap.

Specific Comments:

1) p. 2714, line 25: Is there a threshold vertical temperature difference (say $\pm 10^{\circ}\text{C}$) used to establish the stability of the air near the surface? Are the diurnal variations in stability for land and water out of phase throughout the summer, or just for the two days shown in Figure 2?

2) P. 2715, line 5: It should be clear in the text that the results presented in Fig. 3 are for Crean Lake only. Do similar results hold for Landing Lake?

3) P. 2715, line 10: Change text from “wind’s speed” to “wind speed”.

4) P. 2715, line 26: It is stated that evaporation is more highly correlated to net radiation at various timescales for Landing Lake. Does average fetch also play a role here?

5) P. 2716, line 6: Why is Fig. 6 referenced before Fig. 5?

6) P. 2716, Equations (2) and (3): What are the values of coefficients b and c during

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neutral atmospheric conditions?

7) P. 2721, Fig. 1: A reference map of Canada showing the two study sites would be helpful. Please show either longitudes/latitudes on the maps and/or the cardinal directions. What do the contours on this map represent?

8) P. 2722, Fig. 2: Are the dates/times in UTC or local time?

9) P. 2723, Fig. 3: Can you add the probability values and number of samples used for the statistical analyses be added in these four panels (as in Fig. 4 as well)? Do similar results hold for Landing Lake? Do the latent heat fluxes depend on fetch as well?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 2709, 2010.

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