Atmos. Chem. Phys. Discuss., 11, C157–C158, 2011
www.atmos-chem-phys-discuss.net/11/C157/2011/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Lake breezes in the southern Great Lakes region and their influence during BAQS-Met 2007" *by* D. M. L. Sills et al.

Anonymous Referee #2

Received and published: 10 February 2011

Lake Breezes in the southern Great Lakes region and their influence during BAQS-Met 2007

General Comments:

Overall, this paper provides additional insights into the identification and characterization of lake breeze in the southern Great Lakes region through moderately dense mesoscale observations and high resolution numerical weather prediction model outputs analyses. Observations and model comparisons of the lake breeze appear to be encouraging. The fact that the authors are reporting here significantly more incidence of lake breezes than that of previous studies may be related to the definition emphasis here on lake breeze fronts. What the impact of such findings on air quality in the domain is not clear. In the introduction and motivation section, it is stated that this

article addresses the scientific hypothesis that local meteorological processes such as lake-breeze circulations exert a considerable influence on air quality in the study region but this aspect is hardly addressed specifically in the paper. It is important to get some indication of how often the same air mass moves between the land and water, i.e. quantification of lake breeze recirculation patterns. From an air quality perspective, it is also important to quantify the relative contribution of local sources (including that associated with re-circulation lake breeze patterns) to regional and background sources contributions from long-range transport into the domain on high ozone days. These aspects should be expanded upon in the paper.

Specific Comments:

The use of LT for time designation throughout the text and in some figures should be replaced by the more formal notation, LST (Local Standard Time)

Page 11, Line 19-24: The manual lake breeze identification process described here is somewhat problematic in terms of reproduce bility and needs to be made more objective.

Page 17, Line 9: The occurrence of lake breeze with synoptic wind speeds up to 22.6 m s-1 seems to be unusually high. Could a lake breeze occur under such strong geostrophic winds aloft?

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 3579, 2011.