

## ***Interactive comment on “The fate of lake ice in the North American Arctic” by L. C. Brown and C. R. Duguay***

**Anonymous Referee #2**

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General Comments:

With the Canadian Lake Ice Model (CLIMo) driven by gridded input data from the regional climate model CRCM the authors created a gridded data set for lake ice characteristics and its possible future change (taking two realizations of the CGCM based on the IPCC scenario A2 into account). The study covers Northern America (North of 58 degrees). From my point of view this study is a valuable contribution to the assessment of the possible changes in sea ice over North America. However, it has to be seen in context with other similar studies to broaden our view on the variations and uncertainties in predicted future climate change. I am missing a few more details on the driving regional model CRCM (see specific comments below).

Specific Comments:

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1. From the text it is not clear: Does CLIMo use the lake mask (or land sea mask) of CRCM?
2. 15-40% of the Canadian land area is covered by lakes. Are there lakes in each of the CRCM?
3. How does CRCM account for lakes? If there is no lake model included in CRCM, what temperature does it uses for the lake surface temperature? Does CRCM account for fraction of lakes in a grid cell, i.e. tile approach?
4. Maybe a figure showing the lake fraction of the grid cells could be informative?
5. The abbreviation BU/FU in Tab. 1 is not defined (or did I overlooked it?)

Technical corrections:

Page 1789, line 16 typo: tendencay -> tendency

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Interactive comment on The Cryosphere Discuss., 5, 1775, 2011.