

General comments:

This paper focused on the lake ice mapping in the Old Crow Flats using a temporal deep learning approach from the C-band SAR time series. Lake ice maps labeled as floating ice, bedfast ice, or land Flats were created from 1993 to 2021. The created ice-map dataset could be a reference for future ice dynamics analysis. So, it is an important and interesting issue. In this paper, however, the lake ice dynamics analysis was too simple. This work can be published after some minor revisions. However, some methods, expressions and the lake ice dynamic analysis need to be clarified before considering publication. Thus, I want to recommend that the paper be published after a few (minor) modifications.

Specific comments:

1. In the paper, the main purpose was to detect the bedfast ice and the floating ice. The two types ice was the top topic in this paper, so detail information on these is needed. In the introduction, the difference between bedfast ice and floating ice was not mentioned a lot. Please make a supplement to the bedfast ice and floating ice in the different effects on the lake and climate.
2. Could the TempCNN can recognize the lake from the land when there is no ice in the lake? In this paper, it is deemed the land and lake ice are seamlessly connected. Did ice fully cover lakes during the study period?
3. Lake ice simulation is another key work in your paper. But the process of the simulation was not clear. It seems unreasonable to make the parameters unchanged as the land in the northern part and southern part are different.
4. The figure captions are not so clear. Some lines and background lack details to make the figure hard to understand.

Technical corrections:

Table 1: The dataset is not consistent because of the lack of data from 1996/1997 to 1998/1999. Please give detailed information about it.

Figure 1. please point out what the different color areas represent.

Figure 3. what' s the dashed red line represent for?

Line 140 “which cover the time period between 1992 to 2021.” ; line 14 “Canada over the 1993 to 2021 period” ; Please unify the time of data for the paper: it’ s better to unify the time as 1992/1993 to 2020/2021.

Line 250: please make an explanation about the interpolation of the SAR stacks.

Line 268: “lake depth was specified as 2m” , is it reasonable, as the average depth of lakes in OCF is 1.5m.

Line 422:” Performing change detection between the first (1993) and the last years of the dataset (2021), reveals a transition of 51 km<sup>2</sup> from bedfast to floating ice regime. However, 172 km<sup>2</sup> of floating ice shifted to a bedfast state.” How to detect the exchange between the bedfast ice and floating ice?

Table 5: maybe you can add a “total ice area (bedfast ice + floating ice)” list to the table. The fraction trends analysis is better to company with an area trends analysis.