

Review of

**Prediction of monthly Arctic sea ice concentration using satellite and reanalysis data based on convolutional neural networks**

by Kim et al.

Manuscript number: tc-2019-159

**General comments:**

The paper presents a new one-month sea ice concentration prediction model using the Convolutional Neural Network deep learning approach. Output is compared to the results of a Random Forest and a simple prediction model. Models are applied to the time period from 1988 to 2017 and extreme cases of sea ice concentration decline are analysed in detail.

The subject is appropriate for TC. The title reflects the content of the paper, the abstract provides a complete summary and the paper is generally well structured. The review of existing published work is good, the number of references is appropriate.

Overall, figures and tables are clear and their captions self-explanatory. However, few figures should be improved according to specific comments below.

Especially the selection of predictors is not convincing and should be justified in more detail. Regarding the atmospheric predictors, why is FAL and v-wind necessary?

Why is a simple linear extrapolation model used for a one-month prediction?

**Specific comments:**

Figure 1: A larger font should be used in the bottom right part of the figure.

Figure 2: Results should be shown for the freeze and the melt season separately.

Figure 8, Figure 9: A larger font should be used.

**Technical corrections:**

There are numerous spelling and grammatical errors in the text, which should be eliminated.