

Third review of Asadi et al.

"Probabilistic Spatio-temporal Seasonal Sea Ice Presence Forecasting using Sequence-to-Sequence Learning and ERA5 data in the Hudson Bay region"

The manuscript has improved a lot. The text is more readable and consistent, figures are referenced correctly, and the overall structure seems logical to me now.

I'm listing some more minor points below. In few cases, especially in the reference section, I repeat myself from previous reviews because I think you might have overlooked my comments. The biggest remaining issue in my opinion is the citation/acknowledgment of the various datasets in "Code availability" and/or "Acknowledgment" sections.

Unfortunately, the track-change document you provided is only partly helpful for my task as it sometimes pretends text would have changed even though it didn't (e.g. section 6.3) and sometimes it pretends text would not have changed even though it did (section about Code availability). It would save the reviewer quite some time if one could rely on the track-change document.

#####

21 "(Guemas et al., 2016)"
Guemas et al. (2016)

Figure 3

I'm happy to hear that you found my comments helpful. But then I'm confused that the figure is exactly the same as before...?

189 "to which are model forecasts are"
remove first "are"

189 "are compared are"
are compared to(?) is

197 "Section 2"
or more precisely: Section 2.2

226 "and if not the prediction"
and if not, the prediction

I don't understand why you sometimes use past tense in this paragraph:

342 "showed"

351 "performed"

355 "showed"

366 "bnary"
binary

368 "it can be seen during May"

"it can be seen that(?) during May". Or maybe just "Fig 13 shows"?

Figure 13

- The letter "a)" under the left panel is almost not readable. It is partly covered by the plot.
- The legend is a bit small. [Alternatively you could also mention the colors in the text in line 369, like: "... both the Basic and the(?) Augmented models (red) have a higher binary accuracy than the S2S forecasts (black)..."]

Caption of figure 13:

You removed the excessive fullstop, but you didn't add the one between "methods" and "Binary".

374 "(false negative, FN)"

Still the wrong font type for "FN".

377-378

The sentence is OK and correct now. A trick that would make it easier for the reader (in my opinion) would be to bring the word "show" earlier in the sentence so that the reader doesn't need to wait for it until the very last word. For example, "In Fig 14 X, Y and Z are shown." requires more mental capacity than "Fig 14 shows X, Y, Z ..."

371-375 Explanation of FP_rate and FN_rate

Thank you for the clarification. After a while I now got the point that you calculate the FP/FN rate in a temporal sense not in a spatial sense. Therefore you now write "in the set of forecasts" instead of "domain". Good. However, in many other occasions in this paragraph you still use the word "points", which I associate more with space than with time. As you work with daily data, could you maybe replace "point" by "day" to make the time perspective more clear? I mean, isn't the FN_rate at a certain grid point basically telling in which percentage of days the forecast of ice-presence turned out to be wrong? And similarly FP_rate tells the percentage of days in which the forecast of no-ice-presence turned out to be wrong. Right?

391 "Basic and Augmented model"

"Basic and Augmented models(?)"

396 "When ice starts to form this"

"When ice starts to form, this"

406-410 "60 day forecast" and "30 day forecast"

I would prefer "60-day forecast" like in line 406 and 408, but just do it consistently.

430 "the the median"

to the median

430 "could. be"

without fullstop. Actually the whole sentence needs to be revised.

431-433

I don't understand what you try to tell me here. Endpoints? Interior points? I think you either need to explain more, or only focus on the conclusion.

435 HadISST

This dataset has not been mentioned before in the paper. Hence it would at least be important to tell whether it is an observational or a model dataset. [Do I conclude correctly that Dirkson used HadISST2 as reference, like you use ERA5 as reference?]

444 "climate normal"

I noted this last time already. Why not "Climate Normal"?

447 "shows the Augmented model"

"shows that(?) the Augmented model"

447 "capable at"

"capable of"

449 "models have substantial improvement"

"have" sounds a bit weird. Maybe "show"?

438 "for freeze-up than break-up"

"for freeze-up than for(?) break-up"

456 "dependences"

dependencies

463 "spatial resolutions"

I would use singular .

466 "our resolution"

I know what you mean but it sounds funny. The resolution of the authors...

465-467

This sentence appears to be quite long and not too concise. I guess you basically want to say something like:

"Hence, in terms of spatial resolution, the ML approach proposed in this study is not coarser than other commonly used approaches, some of which even target marine transportation."

Code availability:

- What happened to this section?? Earlier here was text about S2S for example.
- Ice charts/Ice atlas?

Acknowledgments:

The given link for ERA5 explains how to cite ERA5 data but it is very unlikely the page from which you have downloaded the data. I think you had most of the information in your "Code availability" section last time, but it has disappeared.

References

#####

Still open from my first review:

488 "shipping" -> "Shipping" (Click on the doi-link, it really is capitalized)

517 "S., R., G.," -> The co-author is called "Graversen R"

517 "high resolution" -> "high-resolution"

517 missing issue/page number [number = {11},pages = {e2020JC016277}]

Still open from my second review:

556 Missing volume number and missing initial letter for second author:

Vitart, F., Robertson, A.W. The sub-seasonal to seasonal prediction project (S2S) and the prediction of extreme events. npj Clim Atmos Sci 1, 3 (2018). <https://doi.org/10.1038/s41612-018-0013-0>

496 Bushuk

I see that you tried to correct the DOI number but unfortunately you still have got a typo in there.

Please try again:

<https://doi.org/10.1002/2017GL073155>

And copy&paste it into a browser to make sure you get it right this time ;-)

Additional for Vitart: Make sure to also copy the doi-link I give you. The one you use links to a different paper (Vitart et al., 2017) than the one cited here.