Thank you to both reviewers, brief response below in blue text highlighting the changes made as requested

Reviewer2:
Excellent job responding to my comments. The manuscript is much improved in my view. The changes to Section 3.2 are particularly helpful. My only comment that I don't feel was fully addressed was on the IMS reference for the NSIDC product. As there is a recommended citation, with a DOI, I feel that that should be used, not just the website address for the product. The recommended citation is:

U.S. National Ice Center. 2008, updated daily. IMS Daily Northern Hemisphere Snow and Ice Analysis at 1 km, 4 km, and 24 km Resolutions, Version 1. [Indicate subset used]. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. doi: https://doi.org/10.7265/N52R3PMC. [Date Accessed].

I'll leave it to the editor to decide how strictly to enforce this, but in my view, citation with DOIs should always been done when available. This greatly improves proper recognition for the data producers and increases discoverability by readers.

Thank you, this citation has already been used in the references, however we have now modified the text to reflect that directly.

Reviewer 3
Review of tc-2021-52
Recent changes in Pan-Arctic sea ice, lake ice, and snow on/off timing
Dauginis and Brown

General comments
The study presents a thorough look at sea ice, lake ice and snow cover trends over the Arctic, as seen by IMS 24 and 4 km products. Regional as well and Pan-Arctic trends are discussed. While individual trends of each of these parameters have been examined in previous works, the novelty of the paper lies in assessing these together with a common methodology and format. Interconnections as well as the relevance of air temperature and downwelling longwave radiation to the detected trends are analyzed. Referencing seems to be thorough and accurate, although I note some cases where more recent work could be used.
In my view the authors have provided a satisfactory response to concerns brought up after the original submission. Although I did not review the original work, I have no other major issues to note. My only major gripe is with Section 3 which is very long but perhaps this cannot be helped. Some minor suggestions and typos are listed below.

Minor/editorial comments
1. line 33: “Derksen et al., 2012” (typo)
Now correctly listed, Derksen et al. 2012

2. line 66: some more recent work on SWE retrieval from PWM could be cited, e.g. Mudryk et al., 2015; Larue et al., 2017; Pulliainen et al., 2020

Thank you, kept the older Derksen et al reference and added in Mudryk et al and Pullianinen et al

3. lines 82-84: The moderate temporal coverage of SAR systems is an old criticism and disregards recent advancements (e.g. Sentinel-1, RCM, and many commercial SAR providers). e.g. your citation of Howell et al. (2019) used only RadarSat-1 and -2. New systems naturally cannot help with historical trends, but it should somehow be acknowledged that the situation has much improved especially regarding contemporary sea ice monitoring in the Arctic.

Agreed. Reference to improved SAR coverage through RCM in particular was at one point in the manuscript, but appears to have been removed through our various edits – sentence now revised to:

SAR estimates of snow and ice cover provide the highest spatial resolution compared to other products, and while previously limited by the moderate temporal resolution, narrow swath width, and limited image availability across the Arctic (Brown et al. 2014; Howell et al. 2019), recent advances through additional sensors (e.g. Radarsat Constellation Mission, Sentinal-1) have much improved both temporal and spatial coverage as well as data availability.

4. line 88: you cite IMS as an "alternative approach to snow and ice mapping". However, I'd argue IMS combines many of the previously described approaches, adding human interference and interpretation in the mix. Some other wording could be used in order not to confuse a potential future non-expert reader?

Revised to: "A combined approach to snow and ice mapping is possible with the use of …"

5. line 192: "All data were"
Corrected, thanks

6. line 452; "correlations" (typo)
Corrected, thanks

7. line 452 (and 488, maybe elsewhere): "downwelling longwave radiation" (radiation was missing). Maybe introduce an acronym? The term is used quite frequently.

LW↓ is selected for 'downwelling longwave radiation at the surface' and now used throughout (with the exception of figures and tables where the full wording was left for completeness).

8. Figures 4 and 5: All panels with temporal trends except Fig 4c and f show the timeline between 1997 and 2019. I would suggest adjusting the x-axis in Fig 4c&f to match the other

panels, despite the lack of data on FOW/WCI and FO/CIC prior to 2004. It would make comparing the figures easier and highlight that the temporal span in Fig4c/f is indeed shorter.

Very good point, figure axes have now been modified to match the rest.