Comment on essd-2021-59
Clare Boston (Referee)

Referee comment on "GIS dataset: geomorphological record of terrestrial-terminating ice streams, southern sector of Baltic Ice Stream Complex, last Scandinavian Ice Sheet, Poland" by Izabela Szuman et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2021-59-RC1, 2021

General comments

The manuscript provides details on a new GIS dataset of geomorphological mapping relating to the Baltic Ice Stream Complex of last Scandinavian Ice Sheet. This geomorphological map adds significantly to previous mapping in the region covering a larger area for a more holistic perspective on ice stream/lobe interactions, and using a higher resolution DEM to add further details to previously mapped areas. Publication of this GIS dataset will allow further interrogation of the complex set of glacial landforms in the region and enable assimilation with geomorphological mapping of other areas of the Scandinavian Ice Sheet. The dataset is therefore of value for future use. The dataset is easily accessible, of high quality and is complete. Sources of error/mis-interpretation are discussed in the manuscript. Overall, I find the manuscript well-written and supports the GIS dataset. I have very few comments to add and those below are all relatively minor points.

Specific comments

Introduction – I realise that section 6 is a ‘significance’ section, but I think you could add a sentence or two in the introduction to say why publishing the GIS dataset is important or what you hope this will help achieve/facilitate. This could perhaps also be emphasised a little more in the significance section.

Lines 44-46: It would be helpful to expand a little on how there are such large time differences if there is a lack of any data – presumably there is some data somewhere to result in these differences? You could also perhaps add a sentence as to how this new mapping could help to resolve these issues/improve understanding of BISC behaviour.

Line 119: Three operators independently mapped the study area – could you say more about how this worked – was there one operator who consistently identified more and one who consistently identified less? – if so I guess the mapping is really based on one more cautious operator. Or was it variable as to which operator did or did not recognise a feature? Was there any discussion about a landform if two operators had both mapped it
but one hadn’t? What I’m getting at is could genuine landforms have been missed (and to what extent) as a result of this rigorous process to avoid false positives?

Section 4.2 I have made a few comments below in the technical corrections relating to moraine formation and terminology. This section just needs a few minor adjustments in relation to this. As far as I can see it doesn’t affect the GIS dataset.

Technical corrections

Line 31: ‘ice sheet dynamics’

Line 44: southern margin of what? The SIS? The Baltic Sea?

Line 50 is the Kamb Ice Stream example relevant to this sentence? – is there evidence its stagnation caused a positive mass balance?

Line 123: Add ‘ice’ marginal features

Line 167: This should be ‘active recession’. Technically, moraines don’t form during recession – they only form if there is a minor advance or stillstand during overall recession.

Line 174: what is an abrupt margin defined as? Also, how do you define a stillstand or differentiate this from a terminal moraine? – is this based on available dates?

Line 176: I find the phrase ‘recessional and push moraines’ a bit strange because recessional moraines could be push moraines (or they might not be) – they are not one or the other. Recessional means that they form during overall recession, whereas push moraines relate to a genetic formation. Is there any sedimentological evidence that they are push moraines? – if not, I would be tempted to just call them recessional (this encompasses any minor advances that could form a push moraine).

Line 251: ‘interpretation of [smaller land]forms’ (also Line 264 – is ‘delicate’ the right word? – from a mountain glaciation perspective MSGL are pretty big).

7 Data availability – Is it worth saying that the dataset is best viewed in QGIS, but can be opened and manipulated within ArcGIS (or words to that effect)?

Figure 1: Any idea where the pre-local LGM ice sheet reached? Can either the LOR and LWR be added to Figure 1 and/or flow lobes B2 and B3 be added to the text after the LOR and LWR are introduced to better connect what is in the text to the study area map. Relating to the text in the figure caption – it looks like there are some streamlined bedforms outside of the dashed boxes? – e.g within the Przybylski (2008) box. I’m also struggling to follow what is meant by the final sentence of the figure caption – I assume that it means that studies of the same area have produced slightly different maps as a result of image resolution?

Figure 8 caption- one hill hole pair. Fig 8b the geometrical ridge network doesn’t look like it’s superimposed on an MSGL here? The high elevation ridge looks more like a terminal moraine or esker? Perhaps I’m just viewing it out of context.