REVIEWER 1

The authors present a curated compilation of geochronologic data that help constrain the late Quaternary history of the Iceland Ice Sheet. The data is exclusively geochronologic constraints; i.e., there are no interpretations of landforms or mapping of ice margin retreat through time, but efforts such as these are critical initial steps to creating accurate reconstructions of ice retreat through time (as the authors point out in the "Vision and future research" section), among other uses. Compilation efforts such as these are invaluable for providing robust and reliably filtered constraints for ice sheet, climate, and Earth System models that can be used to assess model performance and accuracy. It appears that while the authors highlight several geographic regions around Iceland where additional constraints are needed, there is a critical mass of currently available observations around Iceland that make these efforts to curate the data timely. I have a minor philosophical disagreement around the use of the term "database" when presenting a curated compilation of data with interpretations about data quality that the authors may wish to address. The manuscript is well-written and presented, figures are of general high quality, and the compiled data are available in a straight-forward excel spreadsheet with sufficient information for reproducibility. I support publication of this manuscript and compiled data after minor revisions.

- Joe Tulenko

We greatly appreciate Joe Tulenko's time and consideration reviewing our curated database manuscript and his general support of our efforts. His comments have helped improve the clarity of the description, which is important for users, and provided valuable suggestions for future development. Below, we respond to each comment individually in italics.

General comments:

My only overall general comment on this manuscript is the use of the term database; in my view, a database cannot contain any interpretations about data quality. The authors present a rigorous ranking and quality assurance process that I agree is necessary and valuable, but because of this, I see their product as a curated dataset as opposed to a database. I would encourage the authors to consider referring to their product as a curated dataset, but this is a minor consideration.

We appreciate this suggestion and highlighting this important distinction. We have edited the term to "curated database" accordingly.

Line-by-line comments:

line 54: revise "To date, a range of models of been developed…"
Edited.

Line 143: here and elsewhere when describing the CREp online calculator, it is important to note that the authors are using the development version (https://crep-dev.otelo.univ-lorraine.fr/#/init) that includes Cl-36, not the stable version of CREp (https://crep.otelo.univ-lorraine.fr/#/). Users may be confused when going to the main CREp landing page only to find no option for calculating Cl-36 exposure ages. I recommend adding a link and/or a brief statement in this section.
This is a good point to clarify and appreciate the suggestion. We have clarified this in Section 2.3, accordingly.

Table 2/Section 2.3: It takes important and careful interpretation based on experience to generate these criteria for data quality that I would encourage the authors to expand on for the benefit of readers. For example, why specifically are mollusc 14C ages given less weight compared to 14C ages from other sources? Perhaps the authors could briefly expand on and explain the relevance of some/all their criteria as a guide for potential data users in this section.
We appreciate this comment and have now expanded on some of the criteria from Table 2 in Section 2.

Line 273 (and as demonstrated in Figure 2 & Figure 3): it is indeed interesting that there are more, slightly older/less reliable terrestrial radiocarbon ages compared to marine radiocarbon ages, which the authors attribute to contamination from older carbon and then cite Brader et al., 2015. The citation is useful, but I might encourage the authors to briefly expand on where the old, contaminate carbon on land is coming from and why that appears to be less of an issue for the marine realm.
We appreciate this point and opportunity to clarify. The stratigraphically old dates from terrestrial samples are from bulk or humic acid fraction 14C dates, which incorporate carbon from multiple sources (e.g., lakes and soils). On the other hand, the marine dates are largely derived from macrofossils (e.g., mollusc shells). While the data is too limited to understand where the old carbon is from for terrestrial samples and not speculated on in the cited studies, it is possibly from small amounts of residual Last Interglacial carbon preserved beneath the Icelandic Ice Sheet and deposited into the lakes during the last deglaciation. These old carbon dates on land are also associated with very low carbon content (e.g., Brader et al., 2015), so it only takes a very small amount of old carbon to skew the age. The marine macrofossils that are reliable are from unbroken shells that were likely deposited in situ. The marine 14C ages that are stratigraphically too old are derived from broken shells within diamictons, that likely reflect reworking of the sediment during past ice sheet expansion during the last glacial period. These old marine C14 dates are flagged and commented on accordingly in the curated database. We will clarify this in the revised text with an slightly expanded discussion of terrestrial 14C dates in Section 2.1.

Line 276: minor detail, but technically exposure ages (at least exposure ages using the online exposure age calculator) are standardized to the date of collection or 2010 CE if date of collection is not specified. So the use of “ka BP” is slightly inaccurate since they are not standardized to 1950. I suggest simply using ka when reporting exposure ages.
We appreciate picking this up and have edited the text accordingly.

Line 292/Figure 4: same comment for line 276 for x-axis title.
Edited.

Line 300 (and paragraph starting at Line 413): more of a curiosity than actionable comment, but I am curious why the data coverage is relatively sparse in the SE portion of Iceland? Perhaps useful/cautionary information for future data collectors if there are specific reasons/challenges for collecting data in that region?
This is a good point. We are unaware of any specific reasons for data scarcity beyond lack of time and funding to complete that research. One possibility may be the occurrence of jökulhlaups (glacier outburst floods), although these events have recurring flood routes meaning that there are indeed areas not impacted by these sorts of geologic hazards. In any case, we are hoping to improve this through new data collection in the coming years and encourage other researchers so as well.

Line 305: revise “that constrain the spatial footprint off past ice limits” to “that constrain the spatial footprint of past ice limits”?
Revised.

Line 320/Figure 5: check grey color used to map troughs and the box in the legend, they don’t appear to be the same shade.
Double-checked and greys are the same. The darker blue ocean around the legend box and lighter blue/white around the troughs may be causing the odd visual. Thanks for pointing this out though.

Line 357-342: this is important context for readers that want to re-calculate Cl-36 exposure ages and is much appreciated. I agree that differences in calibration data used across the various calculators, and whether the calibration lithologies are geochemically representative of Iceland rocks likely explains the majority of the age discrepancies. Encouraging readers to utilize calibration datasets that are geochemically representative of their data and/or data curated here will likely produce more reliable Cl-36 exposure ages/interpretations in the long run.
This is a good point and we appreciate the opportunity to clarify. We are reluctant to explicitly state that a particular calculator is preferable over others, but agree that acknowledging the flexibility of CREp in this regard is worthy of pointing out for the reader. We have added a sentence in the text to clarify.

Section 4 Vision and Future Work: just a note that efforts such as the ICE-D project (ww.ice-d.org) are attempting to create more dynamic pipelines for serving geochronologic constraints useful in data compilations such as these, large data analyses, and data model comparison efforts. The authors may consider utilizing ICE-D resources for future versions of this product if useful.
This is an excellent point and would be excited to include the current TCN data in ICE-D. We’ll be in touch!

Line 436: small note on Ghub, it is not a certified data repository (e.g., AGU or other agency approved), and Ghub personnel encourage users to register Zenodo DOIs for their resources hosted on the platform. Zenodo will likely provide a more reliable, persistent DOI for archiving than Ghub, which is primarily useful for data discoverability.
We appreciate this comment! We have now registered ICEland-1 at Zenodo as well and have included the DOI in the Data Availability section. We have left the dataset at Ghub to assist in data discoverability.