Point-by-point response to comments. Line numbers refer to the original submitted version.

Section	Line number (original version)	Changes made
	N/A	Added title page with title and author names and affiliations
Abstract	1	Changed “evolution” to “development” in title
	4	Changed name (“Hoe”) to initial (“H.”) for consistency with name format for other authors
	14	Changed “increase with future climate warming” to “continue with ongoing climate change”
	16-17	Reworked sentences for clarification.
	18	Revised “will reach its maximum extent around 2110” to “is estimated to reach its maximum extent within the next one to two centuries”
	22	Deleted “significantly,” added “popular,” and modified to “displacement waves that could exit the lake as GLOFs"
	23-25	Revised to emphasize novel topic of study, contribution of bathymetry field data, and broader application to other sites in Iceland and worldwide.
Introduction and aims	27-28	Changed “future climate warming” to “ongoing climate change”
	35	Deleted “permafrost thaw” and moved it later in sentence as “permafrost degradation and thaw”
	37-38	Added references Krautblatter et al. (2013); updated Deline et al. (2015) to Deline et al. (2021)
	38-42	Split sentence into two
	51	Changed “climate warming” to “atmospheric temperature rise”
	59	Changed “twentieth” to “20th” for format consistency throughout manuscript
	74-78	Revised sentences to emphasize that this study provides a first order estimate rather than exact years of glacier/lake development; novel contribution to field (i.e. first assessment of this hazard in Iceland); and broader applications of study to future research and other sites in Iceland and worldwide.
Study area and background	82-83	Added details about former glacier connection to Breiðamerkurjökull.
	83	Added referenced figure number
	86	Changed “reaching up to…” to “reaching maximum depths of…”
	95 (Fig. 1)	Fig. 1: updated 1C by deleting extra “N;” improving clarity with labels and formatting; adding glacier terminus positions (combined with Fig. 2); and changing terminus position color scheme to a continuous scale. Figure checks out on Coblis Color Blindness Simulator, as recommended by NHESS (https://www.color-blindness.com/coblis-color-blindness-simulator/).
	98	Updated Fig. 1C caption to reflect new data sources (combined with Fig. 2)
Methods	113	Changed to “in vertical and horizontal directions”

	114	Added information about sound velocity and temperature profile measurement uncertainty.
	141	Updated “climate warming” to “atmospheric warming”
	139-143	Revised to explain the two additional glacier terminus retreat rates we have added to provide a range of realistic future glacier scenarios based on climate and topographic conditions.
	144 (Fig. 2)	Deleted Fig. 2 and added historic glacier terminus positions to Fig. 1C instead
	150	Deleted “manually”
	156	Added an assumption for future lake development: “terminus retreat will continue linearly at the 2000-2021 rate and the…”
	158	Added a sentence to explain assumption of negligible lake sedimentation in volume calculations.
	159 (Fig. 3)	Revised figure: changed lake outlines to continuous scale color scheme; improved label formatting; added black line to show that white area in lower right corner is not ocean but simply edge of map imagery. Figure checks out on Coblis Color Blindness Simulator, as recommended by NHESS (https://www.color-blindness.com/coblis-color-blindness-simulator/).
	161	Added map coordinate system to figure caption
	168	Added Matthew et al. (2024) (paper published since initial manuscript submission)
	169-177	Clarified explanations of measured parameters, mainly to reflect that H/L ratio and angle of reach are slightly modified to reflect estimated future lake surface elevation instead of lowest point of the mass movement deposit.
	183 (Fig. 4)	Edited figure to show: bedrock extending beneath glacier and lake; glacier-lake contact; horizontal and vertical distances above lakeshore/lake surface (in addition to glacier terminus/surface); line extending from angle of reach to lakeshore no longer intersects glacier.
Results	188	Minor revisions to wording.
	189	Changed “125” to “123”
	190 and 192	Revised “up to” “a maximum depth of”
	196 (Fig. 5)	Edited figure by: estimating glacier terminus position time steps for two additional retreat rates at three points; improving label formatting; changing terminus positions to darker color and showing them for the entire terminus (simplified from two colors to differentiate between land- and lake-terminating glacier); added black line to show that white area in lower right corner is not ocean but simply edge of map imagery. Figure checks out on Coblis Color Blindness Simulator, as recommended by NHESS (https://www.color-blindness.com/coblis-color-blindness-simulator/).
	197	Updated figure caption to: add map coordinate system; explain two additional terminus retreat rates.

	212-213	Switched order of "volume" and "surface area" to ensure consistency throughout manuscript.
	213-215	Edited uncertainty values to adjust significant figures (corresponds to changes in Table 1).
	215-217	Revised wording to clarify how uncertainties were estimated.
	219-220	Revised sentence structure and wording to clarify what is meant by "other datasets" (those obtained through radio-echo sounding surveys and weighted rope point measurements)
	223-226 (Fig. 6)	Figure and caption revised to include future lake surface area and volume estimates for two additional terminus retreat rates.
	227-229 (Table 1)	Colored cells removed in Table 1 to comply with journal formatting; table caption also updated to reflect this. Edited number of significant figures in uncertainty values for lake surface area and volume measurements.
	234	"Evolution" changed to "development" to emphasize first order estimate (instead of more exact prediction of future evolution)
	240	Changed "30 m" to "25 m"
	241-246	Revised this section to clarify how lake surface area and volume uncertainties were measured and to describe estimated future lake development under the two additional glacier terminus retreat rates.
	249	Added "large" to describe mass movements.
	255-257	Small revisions to clarify Fig. 7 caption.
	259 and 263	Added reference to Fig. 7
	259-263	Revised to reflect: two additional estimated terminus retreat rates; mass movement scenarios given that high topographic potential zones at Miðaftanstindur and Eyðnatindur extend beneath the 2021 glacier surface and will reach to the lakeshore in future.
	269	Updated maximum H/L ratio and angle of reach (according to revised calculations shown in Table 2).
	270-273 (Table 2)	Edited Table 2 by: removing colored table cells to comply with journal formatting; recalculating "horizontal distance from zone to lakeshore" for Eyðnatindur to 0 (given that high topographic potential zone will extend to lakeshore after glacier retreat); updating "H/L ratio from zone to lakeshore" for Miðaftanstindur (L becomes 650; H/L becomes 0.92; angle of reach becomes 43˚) to reflect future extension of high topographic potential zone; removing the rows for "angle of reach" and combining them with the "H/L ratio" rows since they are different expressions of the same parameter; adding the row "horizontal distance between highest and lowest zone boundaries" for "maximum future lake extent." Also updated table caption to reflect these changes.
Discussion	284-285	Reworded to "…have applied area-related statistics or models to estimate lake volumes" and added two reviewer-suggestions citations (Muñoz et al., 2020 and Gantayat et al., 2024a).
	291	Minorly changed wording from "This illustrates…" to "Our results illustrate…"

	296-298	Reworded sentences to shift emphasis from uncertainty source to what sonar surveys show.
	299	Changed “future climate warming” to “future atmospheric warming”
	306	Added a brief discussion of the impacts of channel incision lowering the lake surface elevation below 5 m a.s.l., thus allowing seawater intrusion up the river to the lake.
	308	Added “surface mass balance” as an additional contributing factor to glacier retreat and advance rates.
	310	Expanded discussion to include addition of two other estimated terminus retreat rates, clarifying how we selected them, how results can be interpreted, and why this approach is more appropriate for the study than ice flow models.
	313	Expanded discussion to address potential future climate conditions and uncertainties in Iceland (with relevant citations) and how they might impact glacier retreat rates.
	323	Changed “uncertainty” to “factor” to reduce emphasis on uncertainties/ errors.
	332	Expanded discussion on which factors are currently known and unknown to estimate glacier calving rate and flotation potential (with relevant, reviewer-recommended citations) and why there are too many unknowns to accurately estimate these values for Fjallsjökull.
	335-339	Updated wording to reflect incorporation of two additional terminus retreat rates.
	339	Added a brief summary of conclusions and certainty in glacier and lake development results.
	341-343	Minor rewording to clarify sentence.
	343	Expanded discussion to explain lack of comprehensive geological and structural mapping at Fjallsjökull (with two citations of regional studies that illustrate this), listed additional methods that could reveal information on mass movements (with relevant citations from other global sites), and discussed how this information could inform future studies on mass movements (i.e. failure plane locations; volume estimates).
	343	Minor rewording to clarify sentence.
	353 (Fig. 8)	Edited figure by: changing “~2120” title to “after glacier retreat from lake” to emphasize first order estimate of timing rather than exact year; extending two high topographic potential zones to lakeshore in “after glacier retreat” scenario; updating arrows with travel distance and substrate for Eyðnatindur in “after glacier retreat” scenario; improving label formatting; adding black line to show that white area in lower right corner is not ocean but simply edge of map imagery.
	354-355	Updated figure caption to reflect figure edits; added map coordinate system.
	362	Added citation for Hermanns et al. (2015)
	365	Added sentence to explain high topographic potential zone extension beneath 2021 glacier surface at Miðaftanstindur and Eyðnatindur.

	370	Added sentence explaining potential of additional methods to model mass movement travel across glacier surface (with relevant citations of studies that do this) and specifying unknown parameters at Fjallsjökull that prevent accurate application of these methods.
	371-373	Reworded to emphasize that glacier and lake development timeline is a first order estimate (i.e. order of magnitude of decades or centuries) rather than an exact year, as well as to include range of projected scenarios based on three retreat rates.
	373 and 378	Edited based on updated information that high topographic zone at Eyðnatindur will extend all the way to the lakeshore after glacier retreat.
	378, 384, 405, and 427	Removed "around 2110" to emphasize that timeline is a first order estimate rather than an exact year.
	393-394	Added Dai et al. (2020), Hilger et al. (2018), and Haeberli et al. (2017) to references.
	400	Added Kershaw et al. (2005) and Geertsema et al. (2022) to references.
	400-403	Removed "overhanging valley glacier" and "ice overhang" to clarify terminology and simplify statement to only refer to potential avalanche from ice fall on glacier.
	416-419	Expanded discussion to specify which factors are known and unknown in estimating displacement wave propagation dynamics and runup height; added Harbitz et al. (2014) to citations.
	448 (Fig. 9)	Edited Fig. 9: improved labels; darkened color of terminus position for clearer viewing; marked extended high topographic potential zones at Miðaftanstindur and Eyðnatindur after future glacier retreat; updated Fig. 9C photo to show lake outlet and Route 1 bridge; added black line to show that white area in lower right corner is not ocean but simply edge of map imagery.
	449-453	Updated figure caption to reflect figure edits; added map coordinate system.
	454-466	Incorporated paragraph into a new section: "5.5. Future research directions and broader implications." Reworked text to describe in more detail how our study results (namely multibeam sonar bathymetric data) can inform additional research, with relevant citations that have used these approaches. Added a paragraph on the broader application of this study to sites like Fjallsárlón that lack input datasets required for more comprehensive risk assessments such as GAPHAZ (2017), especially those in the Arctic and subarctic where mass movement-triggered GLOFs are an understudied but emerging hazard.
Conclusions	469	Edited uncertainty values to adjust significant figures (corresponds to changes in Table 1).
	470-473	Minor edits to improve wording.
	477-484	Reworked paragraph to explain approach using linear retreat rates rather than ice flow models, include results of two additional glacier terminus retreat rates to provide a range of realistic future scenarios, and emphasize

		that glacier/ lake development timeline should be interpreted as a first order approximation rather than an exact year.
	482	Changed “climate warming” to “atmospheric temperature rise”
	490	Edited sentence to emphasize that glacier/lake development timeline should be interpreted as a first order approximation rather than an exact year.
	491	Changed wording to reflect future extension of high topographic potential zone all the way to the lakeshore.
	497	Added “the”
	502	Changed “as climate warming continues” to “with ongoing climate change”
	502-504	Minor edits to clarify wording in sentence.
	504-506	Reworked sentences to emphasize role of study as an initial assessment at an understudied site, broader applications to other Arctic and subarctic regions, and how study lays the foundation for additional methods and approaches.
References	676	Added Allen et al. (2022a)
	574	Added Bosson et al. (2023)
	578	Added Brown et al. (1982)
	599	Added Cathala et al. (2024)
	627	Added Dai et al. (2020)
	632	Changed Deline et al. (2015) to Deline et al. (2022) (updated edition)
	694	Added Friðriksson (2014)
	694	Added GAPHAZ (2027)
	694	Added Gantayat et al. (2024a)
	694	Added Gantayat et al. (2024b)
	754	Added Helgason and Duncan (2001)
	763	Added Hermanns et al. (2015)
	770	Added Hilger et al. (2018)
	822	Added Krautblatter et al. (2013)
	877	Added Matthew et al. (2024)
	906	Added Muñoz et al. (2020)
	906	Added Noël et al. (2022)
	979	Added Schaub et al. (2016)
	990	Added Somos-Valenzuela et al. (2015)
	1006	Added Storrar et al. (2017)
	1018	Added Svennevig et al. (2024)
	1024	Added Vieli (2021)
	1044	Added Wieczorek et al. (2007)
	1048	Added Worni et al. (2013)
	1060	Added Zheng et al. (2021)
General	All figures	Removed black outline around figures; expanded figures to match width of text

	All figure references in text	Revised throughout manuscript to account for deletion of Fig. 2.
	All figures	Figures check out on Coblis Color Blindness Simulator, as recommended by NHESS (https://www.color-blindness.com/coblis-color-blindness-simulator/).