



Supplement of

Brief communication: Towards defining the worst-case breach scenarios and potential flood volumes for moraine-dammed lake outbursts

Adam Emmer et al.

Correspondence to: Adam Emmer (adam.emmer@natur.cuni.cz, aemmer@seznam.cz)

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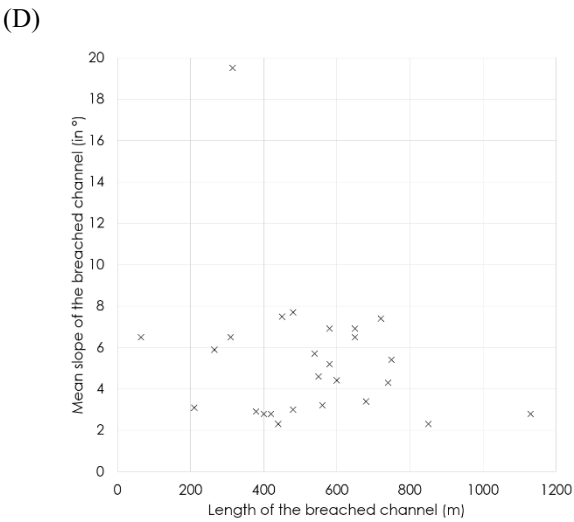
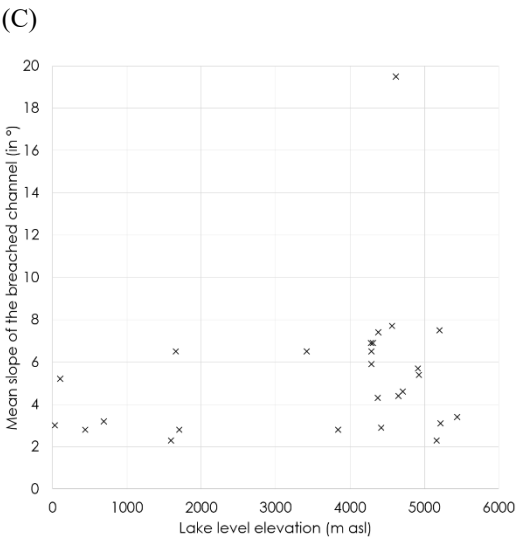
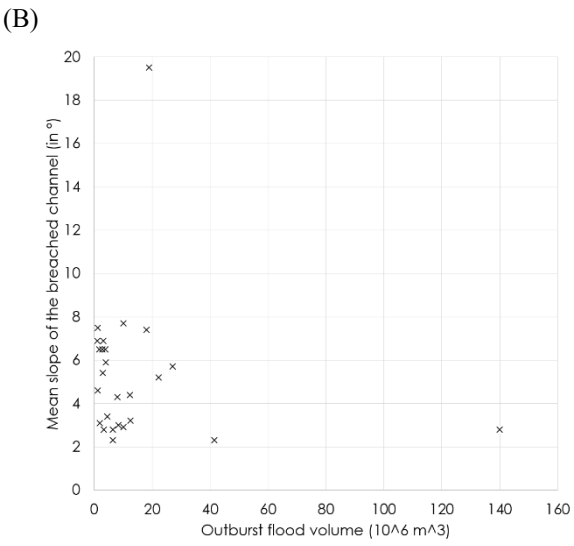
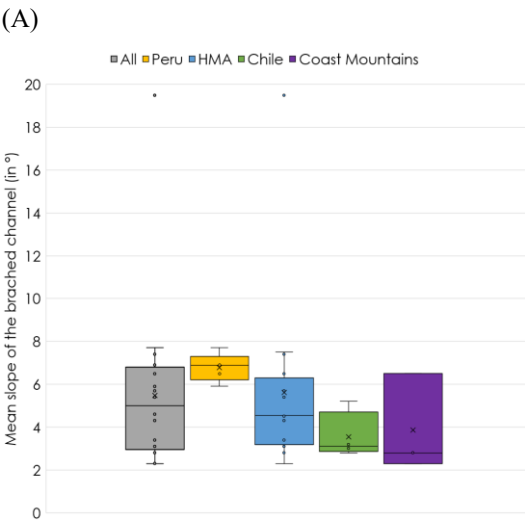
Table S1: The list of analysed events, measured and calculated characteristics.

RGi region in which the GLOF occurred	Major mountain unit/range in which the GLOF was located	Source location of the GLOF	Name of the outburst source lake	Material of the impounding dam	Reported date of GLOF	Y coordinate	X coordinate	Breached channel slope	Total volume released during outburst	Elev. lake level	DEM	Reference
Low Latitudes	Low-latitude	Peru	Jancuarish	moraine	1950-10-20	-8.86	-77.67	5.9	4.00	4290 ALOS		Emmer, 2017
Low Latitudes	Low-latitude	Peru	Artesoncocha	moraine	1951-10-28	-8.98	-77.64	6.5	2.80	4288 ALOS		Emmer, 2017
Low Latitudes	Low-latitude	Peru	Tulpacuraj	moraine	1953-03	-9.42	-77.34	6.9	3.10	4283 ALOS		Emmer, 2017
Low Latitudes	Low-latitude	Peru	Palcacocha	moraine	1941-12-13	-9.39	-77.38	7.7	10.00	4566 ALOS		Margill et al., 2020
Southern Andes	Patagonia	Chile	Engaño Lake	moraine	1977-03-11	-46.45	-72.97	3.2	12.50	689 SRTM		Anticona et al., 2015
Southern Andes	Patagonia	Chile	Cerro Largo	moraine	1989-03-16	-46.96	-73.26	2.8	140.00	436 SRTM		Burton et al., 2022
Western Canada	S Coast	Canada	Nostetuko Lake	moraine	1983-07-19	51.21	-124.41	2.3	6.50	1594 CDEM		Kershaw et al., 2005
Western Canada	S Coast	Canada	Queen Best Lake	moraine	1997-08-12	51.25	-124.52	2.8	6.50	1701 CDEM		Kershaw et al., 2005
Asia, South East	E Himalaya	China	Rejeco	moraine	-	27.97	88.89	3.4	4.58	5444 SRTM		Ven et al., 2019
Asia, South East	E Himalaya	Nepal	Naguna Pokhari	moraine	1980-06-23	27.87	87.87	5.4	3.00	4926 SRTM		Ives et al., 2011
Asia, South East	E Himalaya	China	Gumbixima-Cho	moraine	1940-07-10	27.85	88.92	4.4	12.40	4650 SRTM		Nie et al., 2018
Asia, Central	S and E Tibet	China	Damenhai Co	moraine	1964-09-26	29.87	93.04	3.1	2.00	5216 SRTM		Doornik and Qinghuo, 1994
Asia, South East	E Himalaya	China	Zhongzangbo	moraine	1981-07-11	28.07	86.07	19.5	18.90	4615 SRTM		Ives et al., 2011
Asia, South East	E Himalaya	Nepal	Dig Tsho	moraine	1985-08-04	27.87	86.59	4.3	8.00	4373 SRTM		Doornik and Qinghuo, 1994
Asia, South East	Hengduan	China	Guangleco	moraine	1988-07-14	29.47	96.50	2.8	3.30	3837 SRTM		
Asia, South East	E Himalaya	Nepal	Tam Pokhari	moraine	1998-09-03	27.74	86.85	7.4	18.00	4377 SRTM		Ives et al., 2019
Asia, Central	Inner Tibet	China	Chongbaxia Tsho/	moraine	2001-08-06	28.21	89.75	5.7	27.10	4915 SRTM		Ven et al., 2019
Asia, Central	S and E Tibet	China	Jinwuco	moraine	2020-06-26	30.36	93.63	2.9	10.00	4422 Zheng et al., 2021		Zheng et al., 2021
Asia, South East	E Himalaya	India	South Ukonk Lake	moraine	2023-10-03	27.91	88.20	2.3	41.40	5166 Sartor et al., 2025		Sartor et al., 2025
Asia, Central	W Tien Shan	Kazakhstan	No2, No3	moraine	1973-07-15	43.07	77.08	6.5	3.80	3421 SRTM		Medeu et al., 2022
Low Latitudes	Low-latitude	Peru	Artesoncocha	moraine	1951-07-06	-8.98	-77.64	6.9	1.13	4306 SRTM		Emmer, 2017
Western Canada	S Coast	Canada	Kattasine Lake	moraine	1971 - 1973	51.18	-124.88	6.5	1.70	1658 CDEM		Claque and Evans, 2000
Asia, South East	E Himalaya	Brutan	Kuongram Gam Tsho	moraine	1990-1991	28.09	90.33	4.6	1.22	4711 SRTM		Ven et al., 2019
Asia, South East	C Himalaya	China	-	moraine	1995-1996	28.66	85.48	7.5	1.17	5203 SRTM		Ven et al., 2019
Southern Andes	Patagonia	Chile	Covadonga	moraine	1997/1998	-55.18	-69.59	3.0	8.3	28 SRTM		Izquierre et al., 2025
Southern Andes	Patagonia	Chile	Fouque	moraine	2018	-55.19	-69.58	5.2	22.2	100 SRTM		Izquierre et al., 2025

Table S2: Supplementary input data for the calculations presented in Table 1.

Lake	Total flood volume (m3)	Reference	Area (m^2)	Toe eleation (m asl)	Crest elevation (m asl)	Outflow (m)	max beach depth (m)	PFV (m^3)
Galong co	469000000	Yang et al., 2023	5630000	5023	5073	530	22.3	125334740
Gepan Gath	12600000	Worni et al., 2013	784400	4068	4095	400	6.1	4757870
	12600000		1050000	4068	4095	400	6.1	6368898
Lower Barun	179000000	Sattar at al 2021	2250000	4456	4542	878	40.0	90110318
Lumding	5200000	Fujita et al., 2013	1310000	4810	4837	451	3.4	4449394
Thorthomi	56380000	Osti et al., 2023	3350000	4410	4460	502	23.7	79486622
	56380000		1410000	4410	4460	502	23.7	33455563
Pho gl 148	33700000	Fujita et al., 2013	630000	5020	5082	350	43.7	27519922
Mang gl 270	8300000	Fujita et al., 2013	210000	5280	5320	280	25.3	5322646

Fig. S1: Mean slope of the breached channels (A) and their relation to outburst volume (B), elevation (C) and the length of the breached channel (D).



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