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LARGE GLACIER FAILURES IN THE ITALIAN ALPS OVER THE LAST 90 YEARS *SUPPLEMENTARY MATERIAL*

TABLE 1S - Main glacier failures occurred in the Italian Alps in the period 1930-2022: additional information and source of data. Events are sorted by date, from the most recent to the oldest one (Event ID). CGI code: glacier code according to the inventory of Italian glaciers (CNR-CGI, 1959); Name: name of the glacier; Sector: sector of the glacier where the failure occurred; Year, Month, Day, of the glacier failure: "00" when not known; Notes: additional information; Source: source of data and information.

Event ID	CGI code	Name	Sector	Year	month	day	Damage	Notes	Source
1	941	Marmolada	Punta Rocca	2022	07	03	Eleven people killed; eight wounded	On July 3, around 13:45, a massive avalanche was triggered by the detachment of most of a glacial body located close to Punta Rocca (3309 m a.s.l.). The scar had a width of 80 m and a height of 25 m approximately. The detached volume was estimated to be 65,000 ± 10,000 m^3. The ice and rock masses flowed down the northern slope onto the hiking trail passing below to the summit.	IRPI archives; Berthier & Gascoin, 2022
2	226	Grandes Jorasses	Whymper Serac	2020	11	12		The Whymper Serac underwent two acceleration phases (identified by the interferometric radar system and topographic monitoring) and the subsequent collapse of important portions of the glacial mass. The break-offs occurred on 18 October 2020 and 12 November 2020; the volume of the two collapses is similar and can be estimated at around 20,000 m^3 per single event. The resulting ice avalanches reached approximately 2500 m a.s.l. in both cases.	Baroni & *alii*, 2020, pp. 256-257

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3	226	Grandes Jorasses	Whymper Serac	2020	10	18		The Whymper Serac underwent two acceleration phases (identified by the interferometric radar system and topographic monitoring) and the subsequent collapse of important portions of the glacial mass. The break-offs occurred on 18 October 2020 and 12 November 2020; the volume of the two collapses is similar and can be estimated at around 20,000 m^3 per single event. The resulting ice avalanches reached approximately 2500 m a.s.l. in both cases.	Baroni & *alii*, 2020, pp. 256-257
4	225	Planpincieux	right lobe	2020	08	00		See Fig. 5	Dematteis & *alii*, 2021a
5	225	Planpincieux	right lobe	2020	07	00		See Fig. 5	Dematteis & *alii*, 2021a
6	225	Planpincieux	right lobe	2020	06	00		See Fig. 5	Dematteis & *alii*, 2021a
7	225	Planpincieux	right lobe	2020	06	00		See Fig. 5	Dematteis & *alii*, 2021a
8	219	Brenva	Gendarme Rouge Serac	2020	02	08		On 7 February 2020, Fondazione Montagna sicura reported the fracturing, acceleration and potential instability of the Gendarme Rouge Serac, in the upper Brenva Glacier basin. Thanks to the images registered by the Panomax camera of Punta Helbronner between 31 January and 7 February 2020, a clear acceleration of the serac was detected, with speeds of 50-70 cm/day, accompanied by a progressive widening of the fracture upstream of the serac. The photogrammetric analysis assessed an unstable volume of about 120,000 m^3. The entire block collapsed between 08 and 09 February 2020, with a main failure, followed by smaller detachments.	Martinet, 2020
9	225	Planpincieux	right lobe	2019	08	00		See Fig. 5	Dematteis & *alii*, 2021a
10	225	Planpincieux	right lobe	2019	07	00		See Fig. 5	Dematteis & *alii*, 2021a
11	507.1	Forni	Western	2018	10	01-10		In the first ten days of October, a considerable detachment of rocks and ice occurred below Cima Dosegù, destabilizing the entire glacial sector behind it.	Baroni & *alii*, 2019, p. 160
12	225	Planpincieux	right lobe	2018	10	23		See Table 6, volume estimate = 15,000 ± 2800 m^3	Giordan & *alii*, 2020
13	225	Planpincieux	right lobe	2018	08	00		See Fig. 9	Giordan & *alii*, 2020
14	221	Toula		2017	08	22		On 22 August the collapse of a portion of the serac area hanging on the glacier tongue generated an ice avalanche which covered the glacier front. Estimating an average thickness of 5 m, the detached volume has been estimated at around 30,000 m^3.	Baroni & *alii*, 2018, p. 147
15	507	Palon della Mare		2017	04	00		A huge ice failure occurred, generating a gigantic ice avalanche which in turn triggered a snow avalanche at the base of the rock wall. The huge mass of ice, snow and rock blocks reached the plateau above the Branca Hut. Fortunately, the area affected by the avalanche in spring is not very popular. The mass that moved was estimated to be around hundreds of thousands of cubic metres. Compared to the ice failures of the previous decades, which essentially affected the terminal tongue, the recent collapse has affected a sector located further south [Cola, 2017]. The detached ice mass had a volume between 30,000 and 50,000 m^3 [Maggioni & *alii*, 2018].	Maggioni & *alii*, 2018; Cola, 2017

Event ID	CGI code	Name	Sector	Year	month	day	Damage	Notes	Source
16	225	Planpincieux	right lobe	2017	10	10		See Table 6, volume estimate = 19,300 ± 3600 m^3	Giordan & *alii*, 2020
17	225	Planpincieux	right lobe	2017	08	29		See Table 6, volume estimate = 54,900 ± 10,000 m^3	Giordan & *alii*, 2020
18	225	Planpincieux	right lobe	2017	08	01		See Table 6, volume estimate = 37,700 ± 6900 m^3	Giordan & *alii*, 2020
19	234	Triolet		2016	07	25		On 25 July 2016 the collapse of a serac from the serac area located at 2900 m a.s.l. on the NE sector of the glacier occurred, at the base of the Sommet Central of the Aiguilles Rouges du Triolet ridge. The failure affected a considerable volume of ice which, probably also due to the presence of ice and snow in the underlying area, travelled as an ice avalanche down to the glacier front, affecting the climbing route of Preuss at the Aiguille Savoie. The avalanche covered a distance of over 700 m (plan) and reached a recently formed lake. A helicopter survey made it possible to verify that the failure only affected the serac area.	Baroni & *alii*, 2017, pp. 275-276
20	225	Planpincieux	right lobe	2016	08	14		See Table 6, volume estimate = 30,000 ± 5500 m^3	Giordan & *alii*, 2020
21	225	Planpincieux	right lobe	2015	08	14		See Table 6, volume estimate = 13,500 ± 2500 m^3	Giordan & *alii*, 2020
22	226	Grandes Jorasses	Whymper Serac	2014	09	23, 29		"The glacier broke off in two events on 23 and 29 September 2014, without reaching the valley". The reported volume is the sum of the two events.	Faillettaz & *alii*, 2016
23	225	Planpincieux	right lobe	2014	06	00		See Fig. 9	Giordan & *alii*, 2020
24	732	Cevedale		2013	00	00		The right sector of the serac zone has literally collapsed, stopping at the base of the rocky step.	Baroni & *alii*, 2014
25	259	Tza de Tzan		2012	00	00		Minimum volume estimated on the basis of an accumulation area of approximately 18,700 m^2, assuming an average ice thickness of 1 m.	Orthophoto 2012 (https://mappe.regione.vda.it/pub/geoCartoSCT/)
26	213	Miage	Glacier du Dôme	2012	06	17		Ice (and perhaps also of rock) failure occurred on 17 June 2012 between 6 and 7 pm at the confluence Glacier du Dôme - Glacier du Miage.	Gonella Hut keeper, pers. com.
27	730	Vedretta Alta dell'Ortles		2010	08	01			G. Cola, pers. com.
28	304	Lys		2010	07	29	A group of hikers was hit, without consequences	During one of the periods of greatest ablation, on 29 July 2010, a considerable detachment of ice was observed from the glacier front (which at the time plunged into a large proglacial lake): the resulting violent wave partially overwhelmed a group of hikers who were on the (lake) shore, and did not cause casualties only for a fortuitous circumstance.	Baroni & *alii*, 2011; video (https://www.youtube.com/watch?v=E-J3AqvmIDZU)
29	401	Pizzo Torrone Est		2009	08	20-ante			R. Scotti, video and photo
30	325	Belvedere	Canalone Marinelli	2007	08	12			Video
31	259	Tza de Tzan		2007	00	00		The event occurred in summer.	Video

Event ID	CGI code	Name	Sector	Year	month	day	Damage	Notes	Source
32	507	Palon della Mare	Rosole flow	2006	08	21		Detachment of the northern portion of the Rosole serac zone. The ice avalanche entrained rock (removed from the rock wall damaged by frost weathering) and also part of the deposit of the previous ice failure, which occurred in August 2002. The accumulation of the large ice avalanche, over 600 m long, covered an area of 5.8714 ha and travelled down to an altitude of 2704 m [photo in Maggioni & *alii*, 2018].	Baroni & *alii*, 2007, p. 297
33	325	Monte Rosa		2005	08	25		"On August 25th, 2005 a huge ice slab of about 1.1×10^6 m^3, overhanging the Belvedere Glacier, detached from the Monte Rosa east face, at an approximate elevation of 3,800 m a.s.l. The detached ice slab rapidly fragmented, evolving in an ice-avalanche which flowed down, eroding and entrapping debris and ice along its path. The main volume spread and stopped at the foot of the rock wall, partially filling the huge depression of the "Lago Effimero" […]. The avalanche blow reached the Zamboni hut, located more than 3 km downstream, luckily without any casualty or damage".	Tamburini & *alii*, 2013
34	225	Planpincieux	right lobe	2005	11	18-ante		An ice failure from the front of the Planpincieux Glacier, with an estimated volume between 20,000 and 30,000 m^3 […] was observed in November 2005 (the day of the event is not known); the deposit, made of ice blocks with an average size of less than 1 m^3 was channelled along the Torrent de Montitaz […] stopping at an altitude of approximately 1885 m a.s.l.	Sea Consulting, 2006
35	209	Lex Blanche		2004	05	10-16		The process consisted in the collapse of the frontal serac of the glacier (presumed date of collapse: week of 10-16 May 2004). The ice mass travelled downstream forming an evident and large lobe.	https://catastodissesti.partout.it/#, id. 5782
36	229	Frébouge		2003	07	17-20		"On 17 and 20 July 2003, several ice avalanche deposits accumulated at the bottom of the Frébouge rockwall and on the fan apex". Fig. 2 shows 3 distinct accumulation lobes: data refer to the accumulation with the longest travel path (n. 3 in the box).	Deline & *alii*, 2004
37	229	Frébouge		2002	09	18		"In September 2002, a part ($> 0.1 \times 10^6$ m^3) of the Frébouge Glacier front avalanched onto the apex of the polygenic fan. The deposit was composed of poorly-sorted, subspherical, open-work ice particles and formed a lobate front; the lateral margins are steep metric ridges, along longitudinal shear zones. Some big ice boulders rolled 100-150 m ahead the front".	Deline & *alii*, 2002
38	507	Palon della Mare	Rosole flow	2002	08	25		On August 25, 2002, without apparent warning and during the night, the ice-cold hanging front of the northern outflow of the Palon de la Mare Glacier (Rosole flow) produced a huge collapse, estimated at 60,000-80,000 m^3 of ice. The cone of ice debris covered an area of about 4 ha, reaching with the most advanced lobe the plateau above the Branca Hut. In the following weeks there were other small ice detachments.	Armando & *alii*, 2003, p. 190

Event ID	CGI code	Name	Sector	Year	month	day	Damage	Notes	Source
39	401	Pizzo Torrone Est		2000	08	11	The "Roma" path was crossed, with minor damage to hikers	The glacier shows in the centre, up close to the historic moraine, the signs of the ice detachment from the Upper Glacier on 11 August 2000, at 10.30 am, the debris of which reached the "Roma" path between the Bivacco Manzi and the Passo del Cameraccio. Fortunately, the avalanche caused only minor damage to the hikers who were passing along the path at the time. The fragments, of various sizes, even metric, are made up of multi-year firn and not of glacier ice. […] the close observation of the zone of detachment allowed to detect how the collapse did not affected the full thickness of the glacieret, but only the more superficial layers […]. The phenomenon looks similar to wet snow slab avalanches: it is possible that the snow melt water reached the underlying layer of ice, causing the detachment of the uppermost layer.	SGL, 2004
40	507	Palon della Mare	Rosole flow	1999	10	23-25		At the end of October, a few tens of thousands of cubic meters of ice failed in Val del Rosole (the accumulation is over 500 m long). At the time of detachment, the snowpack was still thin, which prevented the possible formation of a mixed ice and snow avalanche.	Armando & *alii*, 2000, p. 213; Cola & Galluccio, 2000
41	226	Grandes Jorasses	Whymper Serac	1998	06	01		"In the night between 31 May and 1 June 1998 almost the entire Whymper glacier […] sheared off. The avalanche stopped 500 m above the road into the Val Ferret. The horizontal and vertical distances were 3000 m and 2200 m respectively" [Margreth et al., 2011]. The detached mass of ice divided into two flows: one directed towards the Boccalatte Hut, the other run over the underlying serac, slipped into the channel behind the rock spur called La Tour and stopped at 500 m from the valley floor and from the houses of Pont […]. A first part had broken off in the night between 30 and 31 May [Miletto, 1998].	Margreth & *alii*, 2011; Miletto, 1998; IMAGEO, 2010
42	226	Grandes Jorasses	Whymper Serac	1997	01	24-25		"The ice avalanche following the trend of the highest part of the Grandes Jorasses Glacier travelled towards southwest, running along the Planpincieux Glacier" [Cerutti, 1997]. The serac […] fell during the night, […] without causing any damage. The collapse occurred between 11 pm on Friday [24/01/1997] and 7 am on Saturday [25/01/1997]. […] The large mass of ice shattered on the rocks below. A small part followed the path of the previous ones, towards the Boccalatte Hut. The main part, after passing the plateau, ran over the lower serac and fell into the rocky channel which is located next to the Punta de La Tour. Then divided again into two flows, stopping above the vegetation area, at 2000-2100 m of altitude [Miletto, 1997].	Margreth & *alii*, 2011; Cerutti, 1997; Miletto, 1997

Event ID	CGI code	Name	Sector	Year	month	day	Damage	Notes	Source
43	399	Orientale della Rasica		1996	09	00		At the end of August and in the following days, the collapse of the entire frontal sector occurred. […] a first detachment took place in the summer of 1995, due to an initial and partial dislocation of the forehead, which left the left lateral terminal sector without its basal support. On 31 August 1996, the collapse of this sector appears to have already been completed, while a very large transversal fracture is visible, full thickness, which affects the entire section of the main glacier tongue at about 2770 m of altitude. On 16 September 1996 it was observed that the latter collapsed completely, uncovering the bedrock on which the new front appears hanging, with serac and, at least in the centre, certainly still unstable. The fragments of ice deposited at the base of the rock step appear to have already been reworked by melting and partly covered with debris. The minimum elevation of the front thus rises by about 60 m (from the previous 2720 to the current 2780 m a.s.l.) while the linear retreat can be estimated at about 170 m. This event constitutes the most important glacial collapse documented in Lombardy in decades.	Armando & *alii*, 1997, p. 390; Lonardo & *alii*, 1998
44	226	Grandes Jorasses	Whymper Serac	1996	07	11-14		"In […] July 1996, the glacier released an ice avalanche of 24,000 m^3 [± 10,000, Sea Consulting, 2006], [which] did not reach the bottom of the valley".	Faillettaz & *alii*, 2016; SEA Consulting, 2006
45	213	Miage	Miage Lake	1996	08	09	Eleven tourists dragged into the Miage Lake	"On August 9, 1996, after a long period of heavy rain, a big ice block, with estimated volume in the range 7000-16,000 m^3, fell into the [Miage] lake provoking an anomalous water wave that involved many tourists, causing some persons to be seriously wounded".	Tinti & *alii*, 1999; Armando & *alii*, 1997, p. 378
46	226	Grandes Jorasses	Whymper Serac	1993	08	02	Eight climbers killed	At 4:15 the mountain collapsed […] overwhelm three roped parties who climb towards the summit of the Grandes Jorasses. Eight dead. […] They had set off at 2:30 from the Boccalatte Hut (2803 a.s.l.). It's 4:15. The night was warm, at 2800 m of Boccalatte Hut the water is not frozen. The detachment of the serac […] is sudden. It takes place at 4000 m a.s.l., between the Whymper and Walker peaks. Three Ligurian mountaineers standing on the rocks of the Réposoir hear the roar. They see the huge block of ice plummet three hundred meters, slamming into a granite outcrop. It breaks into blocks, the size of cars, releases an avalanche of snow and fills the Whymper channel. […] The 200-metre front of snow and ice overwhelms the climbers, scrapes the slopes. Then it falls again to the scree at the foot of the Jorasses: almost a thousand meters [Martinet, 1993]. Volume estimate: 80,000 ± 24,000 m^3 [SEA Consulting, 2006].	Faillettaz & *alii*, 2016; Armando & *alii*, 1994, p. 235; Martinet, 1993; SEA Consulting, 2006
47	507	Palon della Mare	Rosole flow	1993	03	00		Branca Hut […] well protected by an artificial embankment built after the disastrous avalanche events caused by a collapse […] in March 1993.	Armando & *alii*, 2003, p. 189

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48	20	Superiore di Coolidge		1989	07	06		"An ice avalanche (about 200,000 m^3) occurred in July 1989 from the Superiore di Coolidge Glacier on the northern side of Monviso. The descending mass, having plunged through a vertical depth of 935 m, swept up a considerable amount of morainic debris. More than 250,000 m^2 were covered with a layer of ice, snow and debris which in some places was 8-10 m thick. The avalanche travelled uphill on the opposite side of the valley, attaining a height of 50 m above the valley floor. The Monviso failure was triggered by a combination of morphological and climatic factors. No similar event was even been recorded before in the region".	Dutto & *alii*, 1991
49	507	Palon della Mare	Rosole flow	1986	02	16-18	The Branca Hut was reached, with minor damage	"The largest event occurred during wintertime in February 1986. The collapse of a portion of the hanging snout, at about 3250 m a.s.l., triggered a deep dry snow slab at about 2800 m a.s.l., originating a mixed ice/snow avalanche. Despite the pure ice avalanches, which generally stopped on the sub-flat valley, this event reached the mountain hut Branca, located at 2493 m a.s.l., causing minor damages".	Maggioni & *alii*, 2018
50	260	Grandes Murailles		1980	00	00		Huge collapse of seracs to the right of the main tongue.	Cerutti, 1981, p. 149
51	260	Grandes Murailles		1978	00	00		From observation of stereoscopic photos dating 18-11-1978.	CGI photo archive
52	754	Rosim		1977	00	00		A large ice break-off, precipitated by the seracs dominating the rock step, covered a large area of the tongue.	Zanon, 1978, p. 102; Arch. CGI, photo 754.18, F. Secchieri 09.10.1977
53	751	Fuori di Zai	Cima Ventana flow	1975	09	00		In the central area of the glacier the remains of a large ice failure/avalanche were observed, which descended from the Cima Vertana glacier flow.	Secchieri, 1976, p. 162
54	218	Freney		1974	11	00		In early November 1974, an ice avalanche fell obliquely, sweeping the right side of the large debris cone at the foot of the rock step that supports the glacier front, exactly in the direction of the iron footbridge that crosses the Miage stream, which was destroyed. The small historic moraine existing at the aforementioned walkway diverted the avalanche that crossed the valley bottom below, and partly climbed the northern slope of the large historic moraine of the right tongue of the Miage Glacier. The avalanche, the volume of which can be estimated at a few hundred thousand cubic meters of ice, knocked down dozens of conifers.	Lesca, 1976, p. 92
55	218	Freney		1971	11	00		In the first days of November (probably the 1st), a large ice avalanche occurred which, after having filled the gullies of the rock step which supports the glacier front, spread like a fan on the pre-existing debris cone located at the base of the rock step, and reached the stream that comes out of the left tongue of the Miage Glacier. This avalanche is similar to the one that occurred on the same glacier in 1956, at the beginning of the ongoing phase of glacier advance.	Lesca, 1971, p. 96

Event ID	CGI code	Name	Sector	Year	month	day	Damage	Notes	Source
56	604	Salarno		1969	00	00		Traces of a large ice failure that fell from the right side of the glacier front. The ice failures, which began in 1957, anticipate an evident advance of the Salarno Glacier tongue. The collapse of the right portion of the tongue (same zone of the 1957 detachment that occurred on 20 August), covered the signal (S1966) with rock blocks and the frontal area, where measurements are carried on, with ice blocks [Saibene, 1970].	Galluccio & Catasta, 1992, p. 303; Saibene, 1970, p. 81
57	604	Salarno		1957	09	05		The right side of the glacier flow, in the lower section of the Val Salarno head step, for a surface area of about 1 hectare and for the entire thickness of the ice (8-10 m) collapsed starting from the afternoon of 5 September 1957. The material (mainly blocks of ice) slipping and rolling on the surface of the glacier, it partly deposited there and a considerable part passed the glacier front, following and filling up the depression of the subglacial stream, almost reaching the morainic ridge built in 1921 [fig. 8].	Saibene, 1959, p. 288-289
58	218	Freney		1956	06	24-25		On the night of 24-25 [June 1956], a laud roar announced to the villagers of Visaille that something abnormal had occurred at the front of the Freney Glacier […] an extensive, white tongue of ice extended from the foot of the rock step support of the glacier front up to the Miage torrent […]. The extension of the ice avalanche accumulation was approximately 1300 m in plane projection, the maximum width of the front of approximately 250 m and a height difference of 730 m [Capello, 1959a]. In the night between 24 and 25 June 1956, a deafening roar announced that an enormous crack had been produced about 200 meters from the front, on the glacial tongue, and an enormous mass of ice had flowed downstream. However, the mass stopped about 20 meters further on: a small part of it, small compared to the whole but still conspicuous, detached from the right edge and fell below […]. The huge landslide-avalanche, of several hundred [of thousands] of cubic meters, formed a large fan that melted completely only at the end of July [Capello, 1959b]. Heavy rains in the previous days and low night temperatures. Accumulation area: 0.14 km^2.	Capello, 1959a, pp. 126-132; Capello, 1959b, p. 183, 185
59	209	Lex Blanche		1956	08	09		In 1956, for reasons that have not been ascertained - probably due to a simple phenomenon of strong cracking and gravity - an exceptional detachment of ice occurred. On 9 August, in the mid-day hours, a very large mass of frontal ice broke off: accompanied by a deafening noise, breaking down and bouncing on the various rock steps, it flowed down to the valley floor […] like a large fan-shaped accumulation [Capello, 1959b]. A few days later, a new landslide-avalanche fell over the first covering it entirely along its entire length.	Capello, 1959a, pp. 132-136; Capello, 1959b, p. 186

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60	603	Corno Salarno		1955	00	00		The frontal margin of Salarno Glacier tongue appeared buried by the remains of an enormous avalanche of ice and snow detached from the hanging front of the Corno Salarno Glacier.	Saibene, 1956, p. 163
61	226	Grandes Jorasses	Whymper Serac	1952	12	21	Houses damaged	"On 21 December 1952, after an intensive snowfall period, a huge avalanche was released below the Grandes Jorasses which destroyed a 200-year old forest and blocked the bottom of the Val Ferret over a distance of more than 1 km. The avalanche volume was estimated at more than 1 M m^3. It is not clear whether the snow avalanche was triggered by an ice avalanche from the Whymper Serac" [Failletaz & *alii*, 2016].	Capello, 1954; Faillettaz & *alii*, 2016
62	108	Superiore di Patrì		1941	00	00		Apparent strong retreat due to the amputation by ice break-off of the terminal part of the hanging front and of the north-facing flank. The large ice avalanche accumulation had been preserved at the bottom of a gully of the Money plateau, and was 700 m long and 40 m wide [Peretti, 1942]. The volume indicated is to be considered as a minimum value, and was estimated on the basis of the extent of the accumulation documented, assuming an average ice thickness of 1 m.	Peretti, 1942, p. 41
63	880	Montarso		1935	00	00		Due to the thinness of the lower part of the serac zone, the tongue of the Montarso Glacier broke at about a third of its length, thus causing an enormous ice avalanche that spread beyond the [measuring] signals [Conci, 1936]. For the morphology and extent of the glacier at the time of failure see Castiglioni, 1930, p. 153 (map) and figs. 18-19, p. 179].	Conci, 1936, p. 282; Castiglioni, 1930
64	108	Superiore di Patrì		1934	00	00		A mass of snow and ice, detached from the suspended tongue and entraining abundant debris, flowing beyond the Money Alpine pasture, reached the Valnontey torrent, where on 24 August the snow and ice accumulation was still several meters thick.	Peretti, 1935b, p. 163
65	218	Freney		1933	08	08		On August 8 (morning) a series of seracs detached from the front of the glacier and fell below. Part of the avalanche stopped on the slope between the first and second rock steps and stopped there making a bridge over the local stream, while part of the mass still overcame the lowest rock step and covered a third of the debris fan crossed by the path to the Capanna Gamba.	Capello, 1934, p. 224
66	112	Tribolazione		1933	00	00		The front of the main tongue of the Tribolazione Glacier (middle lobe), poorly fed and considerably regressed, was partly covered by an enormous mass of ice and debris, which had accumulated on the debris fan at the foot of the rock wall. [for glacier morphology at the time of the failure, see Peretti, 1935a, Figg. 20-22, Table VI].	Peretti, 1934, p. 214

Event ID	CGI code	Name	Sector	Year	month	day	Damage	Notes	Source
67	109	Coupé di Money		1931	00	00		A large detachment, which broke off in the middle of the linear front, formed an accumulation of ice and debris, filling and blocking (consequently originating a small lake) the plateau at the base of the steep rock wall on which the glacier front is hanging [for glacier morphology at the time of failure, see Peretti, 1935a, Fig. 17, Tav. V].	Peretti, 1932, p. 271
68	112	Tribolazione		1930	00	00		Almost on the axis of the main glacier lobe, a hundred meters higher than the front, a new rock outcrop appeared, due to ice failure [Peretti, 1931]. In 1930, slightly to the left of the axis of the tongue, at around 2740 m a.s.l., a large bedrock area was brought to light by repeated detachments of ice. The avalanche that was produced covered the whole fan with a new layer of ice and debris up to the forehead [Peretti, 1935a]. [for glacier morphology at the time of failure, see Peretti, 1935a, Figg. 20-22, Table VI].	Peretti, 1931, p. 216; Peretti, 1935a, p. 128