1 Supplementary material

1.1 Tables

Numbers between brackets in the following tables refer to the number of considered elements according to the line or column attribute.

Table 1: Distribution of event location according the three Swiss geomorphologic-climatic regions and according event processes.

Geomorphologic-climatic region	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Average
Jura (98)	19%	0%	3%	6%	0%	15%	12%
Swiss Plateau (371)	57%	4%	42%	6%	0%	79%	44%
Alps (377)	24%	96%	55%	88%	100%	6%	44%
Total (846)	100%	100%	100%	100%	100%	100%	100%

Table 2: Distribution of event location according event processes.

Event location	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Average
Town (151)	15%	0%	9%	1%	0%	6%	18%
Village (261)	46%	14%	12%	6%	13%	4%	31%
Forest (185)	4%	46%	38%	58%	13%	13%	22%
Unforest (249)	0%	6%	5%	12%	69%	0%	29%
Total (846)	100%	100%	100%	100%	100%	100%	100%

Table 3: Distribution of slope angle according event processes.

Slope angle	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Average
0°-10° (339)	62%	17%	12%	5%	6%	68%	40%
10°-20° (257)	31%	43%	29%	19%	38%	28%	30%
20°-30° (131)	4%	23%	33%	31%	38%	2%	15%
30°-40° (85)	2%	12%	21%	26%	19%	0%	10%
40°-50° (26)	0%	4%	4%	14%	0%	2%	3%
50°-60° (6)	0%	0%	1%	4%	0%	0%	1%
60 and more (2)	0%	0%	1%	1%	0%	0%	0%
Total (846)	100%	100%	100%	100%	100%	100%	100%

Table 4: Distribution of events importance according event processes.

Location of process origin	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Average
Small[1] (804)	100%	78%	96%	24%	81%	100%	95%
Middle[2] (33)	0%	19%	3%	43%	19%	0%	4%
Large[3] (9)	0%	3%	1%	33%	0%	0%	1%
Total (846)	100%	100%	100%	100%	100%	100%	100%

[1] Small event: volume <10 m^3.
[2] Middle event: volume between 10-2000 m^3.
[3] Large event: volume > 2000 m^3.

Table 5: Distribution of distances of the process origin types processes according event processes.

Distance of the process origin	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Average
Near[1] (185)	0%	52%	33%	6%	100%	35%
Far[2] (146)	100%	11%	43%	94%	0%	39%
Unknown (95)	0%	37%	24%	0%	0%	26%
Total (426)	100%	100%	100%	100%	100%	100%

[1] Near: 0-50 m from the track.
[2] Far: > 50 m from the track.

Table 6: Distribution of location of process origin according event processes.

Location of process origin	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Average
Above track (339)	100%	60%	89%	100%	100%	80%
Below track (29)	0%	14%	2%	0%	0%	7%
Unknown (58)	0%	26%	9%	0%	0%	14%
Total (426)	100%	100%	100%	100%	100%	100%

Table 7: Rainfall [mm] during the natural hazard events on the Swiss transportation network during from 2012 to 2016.

Rainfall* [mm]	Flood	Debris flow	Landslide	Rockfall	Avalanche	Other	Average
Event day	22	14	17	5	4	4	17
Cum. last 5 days[1]	49	32	57	27	32	15	45
Cum. last 10 days[1]	76	55	88	52	46	36	71
Daily rain avg last 5 days[2]	10	6	11	6	6	3	9
Daily rain avg last 10 days[2]	7	5	9	5	5	4	7
Max daily rain last 5 days[3]	30	21	32	15	18	11	27
Max daily rain last 10 days[3]	33	26	36	20	21	15	30
Abs max daily rain[4]	100	65	154	42	13	39	-
Abs max daily rain last 5 days[4]	154	75	154	77	140	39	-
Abs max daily rain last 10 days[4]	154	75	154	109	140	39	-

* Average by event processes except for absolute values (last three lines of the table).

[1] Cumulative rainfall of the 5 and respectively 10 days ago from the event day.

[2] Daily rainfall average of the 5 and respectively 10 days ago from the event day.

[3] Maximum daily rainfall of the 5 and respectively 10 days from the event day.

[4] Absolute maximum rainfall recorded (i.e. for one event) of the event day, the 5 and respectively 10 days from the event day.

Table 8: Monthly distribution of events according event processes.

Year	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Average
January (27)	0%	4%	4%	15%	6%	0%	3%
February (65)	0%	1%	6%	6%	19%	81%	8%
March (26)	1%	0%	2%	13%	50%	2%	3%
April (28)	2%	0%	6%	7%	0%	2%	3%
May (107)	13%	10%	16%	15%	0%	2%	13%
June (253)	41%	16%	29%	7%	0%	8%	30%
July (210)	31%	51%	19%	8%	0%	2%	25%
August (35)	4%	12%	4%	1%	0%	2%	4%
September (14)	1%	6%	2%	2%	0%	0%	2%
October (14)	1%	0%	1%	10%	0%	0%	2%
November (58)	6%	0%	9%	11%	6%	2%	7%
December (9)	0%	0%	1%	4%	19%	0%	1%
Total (846)	100%	100%	100%	100%	100%	100%	100%

Table 9: Distribution of transport mode according event processes.

Transport mode	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Total
Road (747)	53%	9%	20%	10%	1%	7%	100%
Railway (99)	27%	2%	42%	20%	4%	5%	100%

Table 10: Distribution of road classes according event processes.

Road classes	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Average
Highway (34)	7%	0%	2%	1%	10%	2%	5%
Motorway (2)	0%	0%	1%	0%	0%	0%	0%
Major transit road (99)	11%	8%	11%	36%	36%	6%	13%
Regional road (94)	11%	7%	18%	18%	9%	8%	12%
Urban road (426)	65%	37%	48%	38%	36%	82%	57%
Minor road (72)	4%	42%	15%	4%	9%	2%	10%
Forest or land trail (20)	2%	6%	5%	5%	0%	0%	3%
Total (747)	100%	100%	100%	100%	100%	100%	100%

Table 11: Distribution of railway classes according event processes.

Track class	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Average
National (29)	37%	0%	32%	30%	0%	0%	29%
Regional (66)	56%	100%	68%	70%	100%	60%	67%
Tram (4)	7%	0%	0%	0%	0%	40%	4%
Total (99)	100%	100%	100%	100%	100%	100%	100%

Table 12: Distribution of track sinuosity according event processes.

Sinuosity	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Total
Straight Line (175)	29%	6%	11%	9%	0%	35%	21%
Near Wide Curve (30)	2%	14%	2%	4%	0%	4%	4%
Wide Curve (265)	14%	55%	49%	44%	80%	35%	31%
Near Tight Curve (39)	2%	3%	8%	14%	0%	4%	4%
Tight Curve (40)	4%	9%	3%	6%	0%	13%	5%
Unknown* (297)	49%	13%	27%	23%	20%	9%	35%
Total (846)	100%	100%	100%	100%	100%	100%	100%

*Localisation at communal level.

Table 13: Distribution of track intersection according event processes.

Sinuosity	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Total
No intersection (319)	15%	61%	55%	71%	73%	56%	38%
Near intersection (158)	23%	12%	16%	6%	7%	31%	19%
In intersection (72)	13%	14%	2%	0%	0%	4%	8%
Unknown* (297)	49%	13%	27%	23%	20%	9%	35%
Total (846)	100%	100%	100%	100%	100%	100%	100%

*Localisation at communal level.

Table 14: Distribution of possibility of deviations according event processes.

Possibility of deviation	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Total
Large (342)	63%	17%	15%	8%	0%	52%	40%
Middle (190)	21%	7%	32%	17%	7%	33%	23%
Small (102)	7%	6%	13%	32%	66%	4%	12%
Any (212)	9%	70%	40%	43%	27%	11%	25%
Total (846)	100%	100%	100%	100%	100%	100%	100%

Table 15: Distribution of track damage according event processes.

Damage level	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Total
No closure (149)	34%	0%	1%	3%	6%	4%	18%
Closure (483)	60%	35%	50%	50%	81%	96%	57%
Partial damage (143)	1%	39%	37%	39%	13%	0%	17%
Total destruction (53)	1%	26%	12%	8%	0%	0%	6%
Unknown damage (18)	4%	0%	0%	0%	0%	0%	2%
Total (846)	100%	100%	100%	100%	100%	100%	100%

Table 16: Distribution of damage and impact on vehicle according event processes.

Damage and impact type on vehicle	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Total
No damage (803)	98%	93%	96%	89%	80%	89%	95%
Vehicle damage: direct impact[1] (25)	1%	7%	1%	7%	7%	7%	3%
Vehicle damage: indirect impact[2] (18)	1%	0%	3%	4%	13%	4%	2%
Total (846)	100%	100%	100%	100%	100%	100%	100%

[1] Direct impact: a vehicle is directly reach by a hazard.

[2] Indirect impact: a vehicle collides an event mass already fallen on the track.

Table 17: Distribution of injury and death importance according event processes.

Injury and death	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Total
No damage on people (828)	99%	96%	98%	93%	100%	98%	98%
Injury (15)	1%	4%	1%	5%	0%	2%	2%
Death (3)	0%	0%	1%	2%	0%	0%	0%
Total (846)	100%	100%	100%	100%	100%	100%	100%

Table 18: Distribution of deviation length on roads according event processes.

Deviation length	Flood (231)	Debris flow (21)	Landslide (115)	Rockfall (56)	Avalanche (11)	Other (46)	Mean
1 km (146)	51%	28%	11%	9%	0%	11%	31%
2-5 km (84)	17%	38%	16%	4%	0%	39%	18%
6-9 km (45)	10%	10%	9%	7%	0%	15%	10%
10-20 km (116)	16%	5%	44%	31%	12%	31%	25%
25-50 km (41)	4%	5%	9%	18%	50%	2%	7%
60-90 km (15)	1%	0%	4%	11%	0%	0%	3%
100-200 km (27)	1%	14%	7%	15%	25%	2%	5%
250-350 km (6)	0%	0%	0%	5%	13%	0%	1%
Total (480)	100%	100%	100%	100%	100%	100%	100%

Table 19: Cost values estimation by square meter for the cost evaluation according event importance, damage level and transport mode.

Damage level [EUR]	Cost by m^2, small event, road	Cost by m^2, middle event, road	Cost by m^2, large event, road	Cost by m^2, small event, train	Cost by m^2, middle event, train	Cost by m^2, large event, train
No closure	5	5	5	5	5	5
Closure	85	130	170	300	340	385
Partial damage	255	300	340	470	510	555
Total destruction	850	890	980	1065	1105	1145
Unknown damage	130	170	215	255	300	340

Table 20: Direct damage costs distribution according events types

Damage level [EUR]	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Total
	Annual cost [EUR]						
No closure (149)	12665	340	85	765	255	170	14280
Closure (483)	514250	71400	262650	160650	28900	107950	1145800
Partial damage (143)	25500	127500	425000	227800	40800	0	846600
Total destruction (53)	72250	459850	528700	246500	0	0	1307300
Unknown damage (18)	45900	0	0	0	0	0	45900
Annual cost [million €]	0.67	0.66	1.22	0.64	0.07	0.11	3.36
Avg. cost by event	8000	47800	31700	33100	21900	10200	19900

Table 21: Annually distribution of events according event processes.

Year	Flood (420)	Debris flow (69)	Landslide (192)	Rockfall (96)	Avalanche (16)	Other (53)	Average
2012 (60)	5%	3%	7%	17%	25%	2%	7%
2013 (99)	11%	10%	16%	14%	6%	2%	12%
2014 (173)	20%	10%	30%	20%	25%	0%	20%
2015 (245)	25%	49%	22%	17%	25%	77%	29%
2016 (269)	38%	28%	24%	33%	19%	19%	32%
Total (846)	100%	100%	100%	100%	100%	100%	100%

1.2 Key words

Table 22: Key words (in red) used in the Google Alerts to create the database.

English	French	German	Italian
avalanche	avalanche	Lawinne	valanga
bad weather	intempéries	Unwetter	
flood		Hochwasser	
hail	grêle	Hagel	
heavy rainfall	forte pluies	Heftige Regen	
ice avalanche		Eislawine	
inundation		Überflutung	
inundation	inondation	Überschwemmung	
landslide	glissement de terrain	Erdrutsch	frana
landslide		Hangrutsch	
landslide		Hachrutsche	
landslide		Rüfeniedergang	
landslip	glissement	Rutschung	
mountain	pan de montagne		
mud	boue	Schlamm	
mudflow	coulée de boue	Schlammlawine	
mudslide		Erdlawine	
pirock	caillou	Stein	massi
rockfall		Bergsturz	
rockfall		Felsabbruch	
rockfall	éboulement	Felsbrock	
rockfall	écroulement	Felsbrocken	
rockfall		Felssturz	
rockslide	chute de blocs	Steinschlag	cadono sassi
scree		Geröll	
scree	éboulis	Schutt	
storm	tempête	Sturm	
thunderstorm	orage	Gewitter	
under water	sous l'eau		
wind	vent	Wind	

1.3 Database attribute

Figure 1: Attributes of the database.

Attributes of the UNIL database of natural hazard events affecting the Swiss transportation network (2012-2016)

Number of attributes: 172

Category	EventID	Date																	
Attribute	EventID	D_IDdate	D_Year	D_Month	D_Day	D_MonthWeek	D_DayName	D_Season	D_Hour	D_HourPrecise	D_DayPart	D_IDDay	D_IDEventSameDay	D_SameClimLongPeriod	D_SameClimShortPeriod	MuenichRe
Description	Unique ID for each event	Unique ID for each event containing the date	Year of the event	Month of the event	Day of the event	Month divided into 4 quarters	Name of the day of the event	Season of the event	Hour of the event hourly rounded	Hour of the event	Day part of the event	Unique ID for each event day (same ID when >1 event per day)	Unique ID for event occured the same day	Long time period in which the event is included	Short time period in which the event is included	Period given by MünichRe in which the event is included
Unit	-	y m d XX	year	month	day	-	-	-	h:m:s	h:m:s	-	y m d	-	y.m.d-y.m.d	y.m.d-y.m.d	y.m.d-y.m.d
Exemple	431	20150504000	2015	5	4	5-1	Monday	Spring	10:00:00	10:15:00	Morning	20150504	2	2015.04.27-2015.07.25	2015.04.27-2015.05.07	2014.06.03-2014.06.12
Comment	-	-	From 2011 to 2015	-	-	First quarter (1) of the 5th month (5)	Useful to categorise business day and weekend	-	-		5 parts: morning, afternoon, evening, night and unknown	Allow to recognise the day when with several events	The maximal ID by event day gives the nb of events during this day			From MuenichRe yearly natural catastrophes analysis
Source	-	-	Online article	Online article	Online article	Online article	Online article	Online article	Online article	Online article	Online article	-	-	-	-	MünichRe
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Number of attributes: 15

71

Category	Location												
Attribute	L_Canton	L_Commune	L_Detail	L_Precision	L_SitGeo	L_OriSlope	L_Urbanity	L_Slope	L_SlopeRound	L_Lanscape			
Description	Canton where occurs the event	Commune where occurs the event	Detail to help the location	Precision of the location	Geographical situation of the event	If slope: orientation of the slope	Urbanity of the event	Slope angle average in an 25 meter radius around the event	Slope angle rounded to the nearest ten	Lanscape of the event locaiotn			
Unit	-	-	-	-	-	-	-	[°]	[°]				
Exemple	Valais	Bagnes	-	Accurate	Slope	North-East	Forest	13	13	Dry mountainous landscape of western central Alps			
Comment	-	-	-	Three levels of accuracy: accurate, middle and communal accuracy	Four classes: plain, ridge, slope and valley bottom	Nine classes: north, north-east, south-east, south, south-west, west, noth-west and any slope	Seven classes: mountain, forest, country, hamlet, village, agglomeration and town	From 0 ° to 56°	From 0 ° to 60°	36 types			
Source	Online article	Online article	Online article	Online article and map	Map	Map	Map	GIS	GIS	GIS			
	17	18	19	20	21	22	23	24	25	26			

Number of attributes: 21

LOCATION														
L_Areas	L_Area_reg	L_MN03_X	L_MN03_Y	L_MN03_Z	L_MN95_X	L_MN95_Y	L_MN95_Z	L_WGS84_Lo	L_WGS84_La	L_WGS84_Z
Areas of the event location	Regional area of the location	X coordinates in CH1903 coordinate system	Y coordinates in CH1903 coordinate system	Z coordinates in CH1903 coordinate system	X coordinates in CH1903+ coordinate system	Y coordinates in CH1903+ coordinate system	Z coordinates in CH1903+ coordinate system	Longitude in WGS84 coordinate system	Latitude in WGS84 coordinate system	ALtitude in WGS84 coordinate system
		[m]	[m]	[m]	[m]	[m]	[m]	[°]	[°]	[m]
Alpine region	Alps	588456	98247	1377	2588455	1098247	1377	7.289538659	46.03566307	1431
5 types: Alpine region, Swiss plateau, Tabular Jura, Folded Jura and Independent	3 types: Jura, Plateau and Alps	-	-	-	-	-	-	-	-	-
GIS	Map	GIS	GIS	GIS	GIS	GIS	GIS	GIS	GIS	GIS
27	28	29	30	31	32	33	34	35	36	37

Event characterization														
Category	Event characterization													
Attribute	E_Type	E_TypePrec	E_UpDownst	E_UpDownst Risk	E_Provenan	E_Volume	E_Masse	E_Width	E_Importan	E_Other	E_PictureName	E_Picture
Description	Type of natural hazard event	Precise type of natural hazard event	Origin up or downstream of the natural hazard event	Origin up, downstream or only risk of the event	Estimation of the distance of the event origin	Volume of the event	Masse of the event	Width of the event mass on the track	Importance of the event	Other information	Picture name of the event	Picture
Unit	-	-	-	-	[m] or -	[m^3]	[kg]	[m]	-	-	-	-
Exemple	Landslide	Landslide	-	-	-	-	-	-	Small	-	20150504 00.jpg	-
Comment	6 types: rockfall, debris flow, landslide, avalanche, flood, other	8 types: rockfall, debris flow, landslide, avalanche, flood, hail, snowdrift, falling tree	3 classes: upstream, downstream and unknown	4 classes: upstream, downstream , risk (no event, only preventive closure) and unknown	3 classes: near (few meters to 10 meters, far (> 10 m) or prevention (only proventive closure)	Estimation of the failed volume on the track of the event	Masse of the event (only for rockfall)	-	3 classes: small, middle, big (huge event)	-	-	-
Source	Online article	Online article	Online article	Online article	Online article	Online article	Online article	Online article	Online article	Online article	Online article	Online article or field visit
	38	39	40	41	42	43	44	45	46	47	48	49

Track caracterization Number of attributes: 17

Category	Track caracterization																
Attribute	T_Type	T_TrainClasses	T_RoadClasses	T_MajorMin	T_Closure	T_DetailClosure	T_ClosureDuration	T_ClosureDurationRound	T_Deviation	T_DistDev	T_DistDevRound	T_DevDetai	T_PossDevi	T_PopDirAf	T_PopIndAf	T_Sinuosity	T_crossing
Description	Distinction between road and railway	Classes of the affected train tracks	Classes of the affected road tracks	Simplified classification of track importance	Track closure or not	Detail of the track closure	Time of track closure in hours	Ronded time of track closure in hours	Deviation or not	Distance of the deviation path	Rounded distance of the deviation path	Deviation detail	Capacity to have other deviation paths	Population directly affected by the track closure	Population indirectly affected by the track closure	Sinuosity og the affected track	Crossing near of the event or not
Unit	-	-	-	-	-	,	[h]	[h]	-	[km]	[km]	-	-	-	-	-	-
Exemple	Road	White	White	Minor	Yes	-	23	24	-	8	10	-	Large	Any	Small	NSC	NO
Comment	2 types: road or railwa	3 classes: national, regional, tram	8classes: highway, semi-highway, red, yellow, white, white dash and black	2 classes: minor and major	Three classes: yes, no, unknown	-	-	-	2 classes: yes or no	-	-	-	4 classes: large, middle, small, any	5 classes: very large, large, middle, small, any	5 classes: very large, large, middle, small, any	6 types: Straight Line, Wide Curve, Tight Curve, Near Wide Curve, Near Tight Curve	4 types: IN a crossing, NEAR a crossing, NO crossinf in the area and unknown (not enough location accuravy
Source	Online article	Map	Map	Map	Online article	Online article	Online article	Online article	Map	Map	Map	Map	Map	Map	Map	Map	Map
	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66

Damage Number of attributes: 11

Category	Damage										
Attribute	D_Form	D_Injured	D_InjuredNb	D_Death	D_DeathNb	D_Vehicule	D_ImpactTy	D_VehiType	D_VehiNb	D_TrackDetail	D_Infras_type
Description	Form of track damage	Injured people?	Number of injured people	Killed people?	Number of killed people	Damage to vehicle	Type of impact between vehicle and event	Type of damaged vehicle	Number of damaged vehicle	Detail of track damage	Type of instrastructure damage
Unit	-	-	-	-	-	-	-	-	-		-
Exemple	?	No	-	No	-	No	-	-	-		-
Comment	6 classes: ? (unknown), NC (no closure), C (closure due to sedimentation), P (partial damage), T (total destruction), and not studied	2 types: yes or no	-	2 types: yes or no	-	2 types: yes or no	Three types: no impact, direct impact or indirect impact	-	-		-
Source	Online article	Online article	Online article	Online article	Online article	Online article	Online article	Online article	Online article		Online article
	67	68	69	70	71	72	73	74	75	76	77

Weather Number of attributes: 68

Category																			
Attribute	M_Meteo	M_Sun	M_Sun_avg_5d	M_Sun_avg_10d	M_Sun_max_5d	M_Sun_max_10d	M_Sun_min_5d	M_Sun_min_10d	M_Rain	M_Rain_5d_cum	M_Rain_10d_cum	M_Rain_max_daily_5d	M_Rain_max_daily_10d	M_Rain_avg_daily_5d	M_Rain_avg_daily_10d	M_Storm_near	M_Storm_near_sum_5d	M_Storm_near_sum_10d	M_Strom_near_max_daily_5d
Description	Rain information for a given time period	Percentage of sun during the event day	Percentage of sun of the last 5 days from event	Percentage of sun of the last 10 days from event	Maximum percentage of sun of the last 5 days from event	Maximum percentage of sun of the last 10 days from event	Minimum percentage of sun of the last 5 days from event	Mixmum percentage of sun of the last 10 days from event	Rain the event day	Cumulative rain of the last 5 days from event	Cumulative rain of the last 10 days from event	Maximum daily rain of the last 5 days from event	Maximum daily rain of the last 10 days from event	Average daily rain of the last 5 days from event	Average daily rain of the last 10 days from event	Number of near storms the event day	Number of near storms of the 5 days days from event	Number of near storms of the 10 days days from event	Maximum daily number of near storms of the 5 days from event
Unit		%	%	%	%	%	%	%	mm	mm	mm	mm	mm	mm	mm	-	-	-	-
Exemple	-	4	29.4	34.1	77	98	0	0	0.2	28.7	38.4	19.9	19.9	5.74	3.84	0	0	0	0
Comment	Only for som events	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Near storm: <3 km around the weather station	Near storm: <3 km around the weather station	Near storm: <3 km around the weather station	Near storm: <3 km around the weather station
Source	Sturmarchiv	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss
	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96

Weather

M_Strom_near_max_daily_5d	M_Strom_near_max_daily_10d	M_Storm_far	M_Storm_far_sum_5d	M_Storm_far_sum_10d	M_Strom_far_max_daily_5d	M_Strom_far_max_daily_10d	M_Storm_all	M_Storm_all_sum_5d	M_Storm_all_sum_10d	M_Strom_all_max_daily_5d	M_Strom_all_max_daily_10d	M_Temp_min	M_Temp_min_5d	M_Temp_min_10d	M_Temp_max	M_Temp_max_5d	M_Temp_max_10d	M_Temp_avg	M_Temp_avg_5d
Maximum daily number of near storms of the 5 days from event	Maximum daily number of near storms of the 10 days from event	Number of far storms the event day	Number of far storms of the 5 days days from event	Number of far storms of the 10 days days from event	Maximum daily number of far storms of the 5 days from event	Maximum daily number of far storms of the 10 days from event	Number of all storms the event day	Number of all storms of the 5 days days from event	Number of all storms of the 10 days days from event	Maximum daily number of allstorms of the 5 days from event	Maximum daily number of all storms of the 10 days from event	Minimum temperature the event day	Minimum temperature the last 5 days from event	Minimum temperature the last 10 days from event	Maximum temperature the event day	Maximum temperature the last 5 days from event	Maximum temperature the last 10 days from event	Average temperature the event day	Average temperature the last 5 days from event
-	-	-	-	-	-	-	-	-	-	-	-	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
0	0	0	0	2	0	1	2	3	10	1	5	7	1	-3	14	14	15	10	7
Near storm: <3 km around the weather station	Near storm: <3 km around the weather station	Far storm: >3 km around the weather station	Far storm: >3 km around the weather station	Far storm: >3 km around the weather station	Far storm: >3 km around the weather station	Far storm: >3 km around the weather station	-	-	-	-	-	-	-	-	-	-	-	-	-
MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss
96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115

M_Temp_avg_10d	M_Temp_min_Corr	M_Temp_min_5d_Corr	M_Temp_min_10d_Corr	M_Temp_max_Corr	M_Temp_max_5d_Corr	M_Temp_max_10d_Corr	M_Temp_avg_Corr	M_Temp_avg_5d_Corr	M_Temp_avg_10d_Corr	M_Temp_amp_Corr	M_Temp_amp_5d_Corr	M_Temp_amp_10d_Corr	M_Wind_avg
Average temperature the last 10 days from event	Corrected minimum temperature the event day	Corrected minimum temperature the last 5 days from event	Corrected minimum temperature the last 10 days from event	Corrected maximum temperature the event day	Corrected maximum temperature the last 5 days from event	Corrected maximum temperature the last 10 days from event	Corrected average temperature the event day	Corrected average temperature the last 5 days from event	Corrected average temperature the last 10 days from event	Ttemperature amplitude the event day	Temperature amplitude the last 10 days from the event	Temperature amplitude the last 5 days from the event	Average wind speed the event day
[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[km/h]
7	9	3	-1	16	16	17	12	9	9	9	12	15	8
-	Correction with height difference bewteen weather station and event location with lapse rate of -0.65 °C for + 100m altitude	Correction with height difference bewteen weather station and event location with lapse rate of -0.65 °C for + 100m altitude	Correction with height difference bewteen weather station and event location with lapse rate of -0.65 °C for + 100m altitude	Correction with height difference bewteen weather station and event location with lapse rate of -0.65 °C for + 100m altitude	Correction with height difference bewteen weather station and event location with lapse rate of -0.65 °C for + 100m altitude	Correction with height difference bewteen weather station and event location with lapse rate of -0.65 °C for + 100m altitude	Correction with height difference bewteen weather station and event location with lapse rate of -0.65 °C for + 100m altitude	Correction with height difference bewteen weather station and event location with lapse rate of -0.65 °C for + 100m altitude	Correction with height difference bewteen weather station and event location with lapse rate of -0.65 °C for + 100m altitude	-	-	-	-
MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss
116	117	118	119	120	121	122	123	124	125	126	127	128	129

M_Wind_avg_5d	M_Win_avg_10d	M_Wind_max	M_Wind_max_5d	M_Wind_max_10d	M_Wind_dir	M_Win_dir_5d	M_Win_dir_10d	M_Snow	M_Fresh_snow	M_Fresh_snow_5d	M_Fresh_snow_10d	M_Accronym_Stn_Weath	M_Alt_Stn_Weath	M_Diff_Alt_Stn_Weath_Event	M_Dist_Stn_Weath
Average wind speed the 5 last days from event	Average wind speed the last 10 days from event	Maximum wind speed the event day	Maximum wind speed the 5 last days from event	Maximum wind speed the last 10 days from event	Average wind direction the event day	Average wind direction the last 5 days from event	Average wind direction the last 10 days from event	Snow cover height the event day	Fresh snow cover height the event day	Fresh snow cover height the 5 last days from event	Fresh snow cover height the 5 last days from event	Accronym of the used weather station	Altitude of the used weather station	Altitude difference between the weather station and the even location	Distance between the weather station and the even location
[km/h]	[km/h]	[km/h]	[km/h]	[km/h]	[°]	[°]	[°]	[cm]	[cm]	[cm]	[cm]	-	[m] a.s.l.	[m]	[km]
9	10	32	38	46	47	48	63.9	0	0	0	0	ZER	1638	-261	36
-	-	-	-	-	0° = North, 90° = East, 180° = South, 270° = West	0° = North, 90° = East, 180° = South, 270° = West	0° = North, 90° = East, 180° = South, 270° = West	-	-	-	-	-	-	-	-
MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss	MeteoSwiss
130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145

Geology Number of attributes: 11

Category	Geology										
Attribute	G_watershed	G_Geol	G_Tecto_f	G_Geol_f	G_Tec1_f	G_Tec2_f	G_Tec3_f	G_Acquifer	G_Hydrogeology	G_Productivity	G_Geology
Description	Watershed on the event			Geology	Tectonic 1	Tectonic 2	Tectonic 3	Aquifer	Hydrogeology	Productivity of the event field	General geology
Unit	-	-	-	-	-	-	-	-	-	-	-
Exemple	RHONE	er	pi	Gneiss et micaschistes (y compris migmatites et phyllites; princ. metasediments)	Nappes de socle cristallin penniques moyennes	Nappe du Mont-Fort	-	Aquifer reservoirs in coherent rocks	Sparsely productive aquifer reservoirs in non-karstified, cracked and porous coherent rocks	Variable productivity	Sericite gneiss
Comment	-	-	-	-	-	-	-	-	-	-	-
Source	Swisstopo	Swisstopo	Swisstopo	Swisstopo	Swisstopo	Swisstopo	Swisstopo	Swisstopo	Swisstopo	Swisstopo	Swisstopo
	146	147	148	149	150	151	152	153	154	155	156

Source Number of attributes: 16

Category	Source															
Attribute	Source1	Source2	Source3	Source4	Source5	Source6	Source7	Source8	Source9	Source10	Source11	Source12	Source13	Source14	Source15	Source16
Description	Source 1 for the event	Source 2 for the event	Source 3 for the event	Source 4 for the event	Source 5 for the event	Source 6 for the event	Source 7 for the event	Source 8 for the event	Source 9 for the event	Source 10 for the event	Source 11 for the event	Source 12 for the event	Source 13 for the event	Source 14 for the event	Source 15 for the event	Source 16 for the event
Unit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exemple	https://www.rts.ch/info/suisse/6749453-le-chablais-et-le-bas-valais-restent-en-etat-d-alerte-face-aux-pluies.html	http://www.24heures.ch/vaud-regions/riviera-chablais/A-Monthey-les-secours-sont-prets-a-evacuer-les-riverains-de-la-Vieze/story/22490259	http://www.24heures.ch/suisse/geneve-subit-grande-crue-arve-1935/story/10943703	http://www.24heures.ch/vaud-regions/monthey-reveille-soulagee-evacuation-300-personnes/story/19307318	http://www.lenouvelliste.ch/articles/valais/canton/inondation-a-st-gingolph-temoignages-du-president-et-de-restaurateurs-378561	https://www.letemps.ch/Page/Uuid/b0e525de-f0c0-11e4-8a43-4ad205b10b56/Les_eaux_en_furie_dans_toute_la_Suisse	http://www.arcinfo.ch/articles/regions/neuchatel-et-littoral/inondations-a-cornaux-et-a-lignieres-378552	http://www.romandie.com/news/Le-Chablais-fortement-touche-par-les-inondations/589780.rom	http://www.rts.ch/info/suisse/6749453-inondations-et-rivieres-en-crue-apres-les-fortes-pluies-.html	http://www.24heures.ch/suisse/suisse-romande/certaines-routes-valaisannes-fermees-cause-deluge/story/27182180	https://www.rfj.ch/rfj/Actualite/Region/20150501-La-Roche-Saint-Jean-a-deux-doigts-de-l-inondation.html	http://www.20min.ch/ro/news/romandie/story/25748211	-	-	-	-
Comment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Source	Google Alerts	Google Alerts	Google Alerts	Google Alerts	Google Alerts	Google Alerts	Google Alerts	Google Alerts	Google Alerts	Google Alerts	Google Alerts	Google Alerts	Google Alerts	Google Alerts	Google Alerts	Google Alerts
	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172

1.4 Open access maps

1.4.1 Database on Google Maps

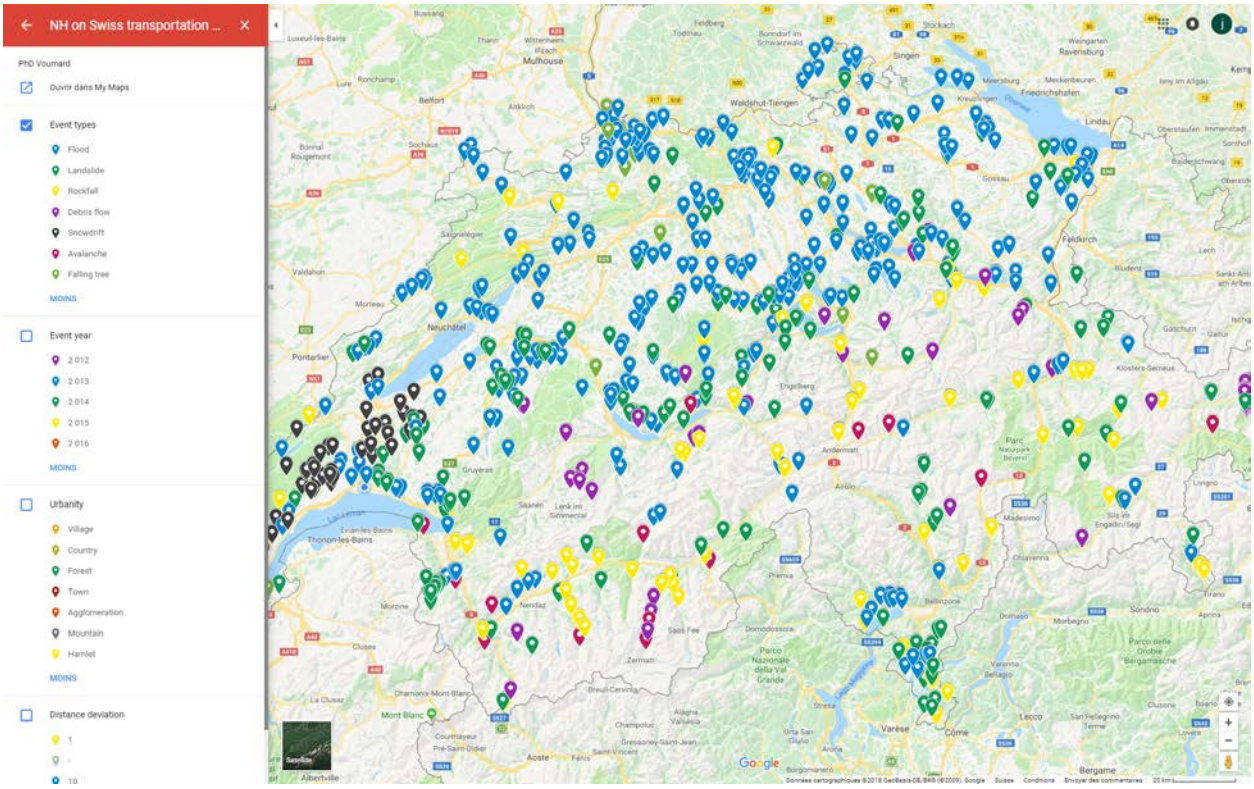

Figure 2: Database on Google Maps.

Available at (last access: 25 January 2018) :

https://www.google.ch/maps/@46.7199391,7.1246016,8z/data=!4m2!6m1!1s1qtu6LEYum-7ghpPg9WWzWwgPHYA?hl=fr

1.4.2 Database on ArcGIS online

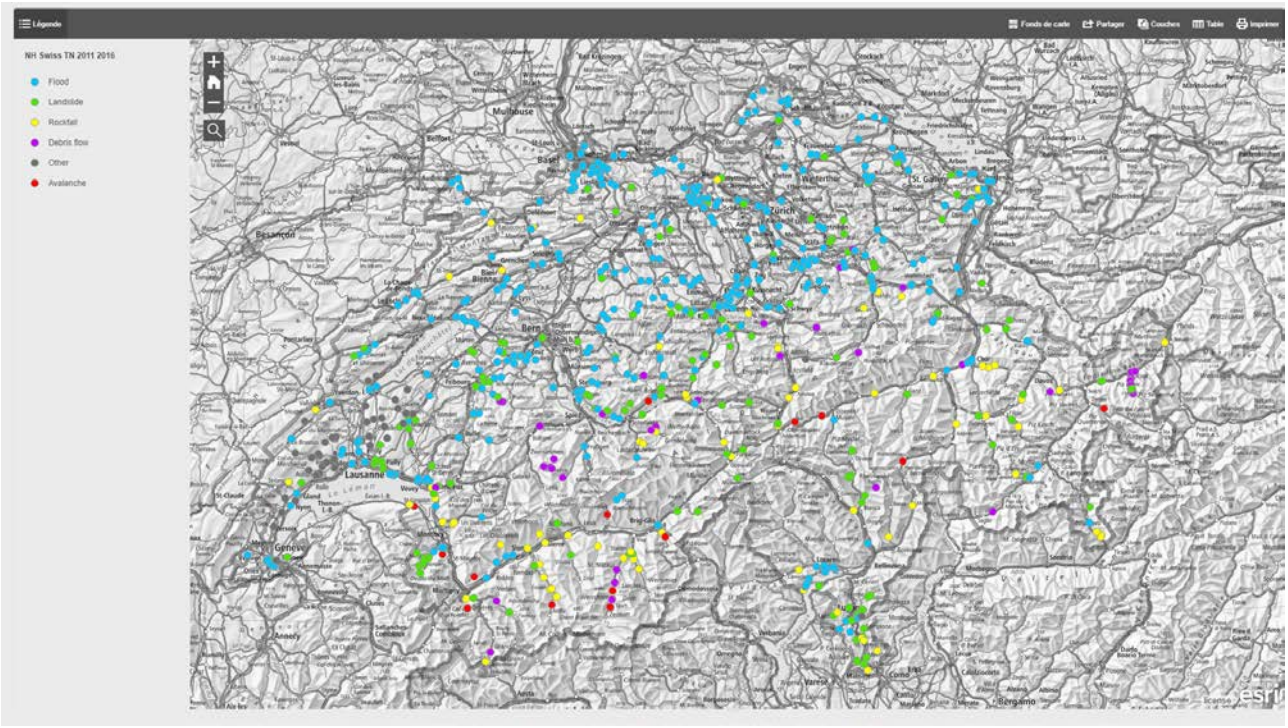

Figure 3: Database on ArcGIS online.

Available at (last access: 25 January 2018):

http://unil.maps.arcgis.com/apps/MapTools/index.html?webmap=34ee3eb719a647889abd34175969d781, last access: 25 January 2018