

Fondazione Montagna sicura - Courmayeur

«The PrévRiskHauteMontagne Project : from knowledge to resilience improvement in the population »

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Alpine Glaciology Meeting – Zurich, 2-3rd February 2017

Objectives of the project

The PrévRiskHauteMontagne Project concerns the Alpine Regions of **Aosta Valley**, **Haute-Savoie**, **Wallis** and **Piedmont**, where the glacial and periglacial environment is very often in close relationship to the population.



1) Better understand glacial and periglacial risks that concern local communities

(Research actions)

2) Improve the resilience of local communities with a better understanding of risks linked to high mountain environment

(Communication actions)

WP 3

WP 3.1 Improving knowledge about **permafrost** and related risks.

WP 3.2 Study of **hanging glaciers** dynamics and monitoring.

WP 3.3 **Snow Bridges** experimental study.



3.1.1 Improvement of existing permafrost monitoring sites

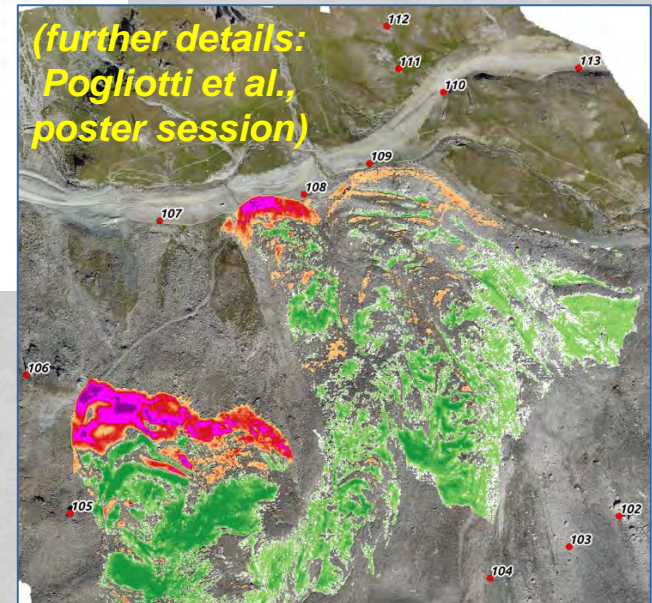


Rocciamelone south ridge 3130m



- Surface velocities (monthly drone, GNSS)
- Internal temperatures (two 15m deep boreholes)
- Internal structures (repeated geophysical soundings)

Delta DTM (2016/10-2012/10)

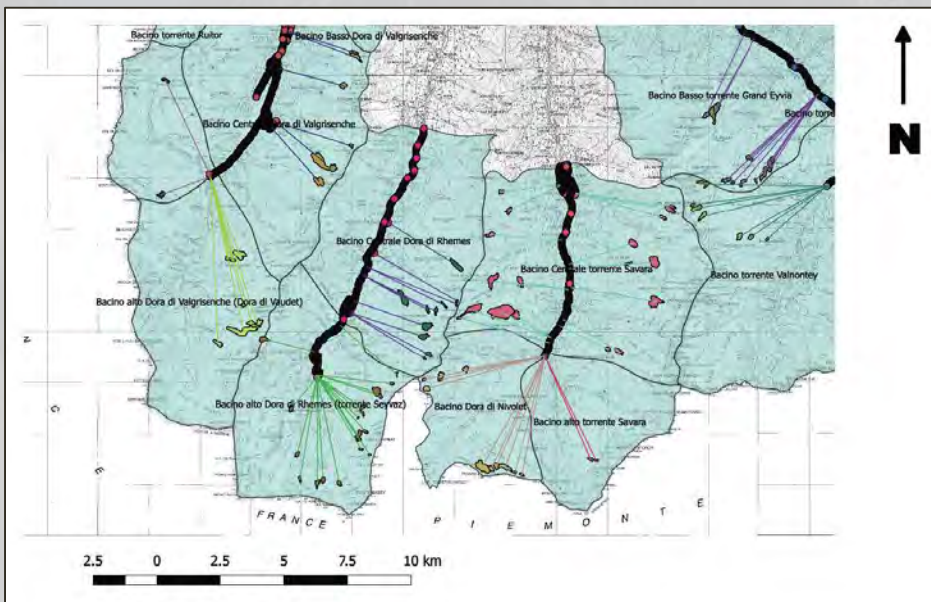


Gran Sommetta Rock Glacier

WP 3.1.2 Detailed study of a potentially hazardous Rock Glacier

Individuation of potentially hazardous Rock Glaciers

1. Regional **inventory** of Rock Glaciers; selection of a) Active Rock Glaciers with mean PFidx > 0,45
2. **GIS** Analysis: subdivision in drainage basins, individuation of urbanization (Roads Layer + Urban areas)



3. Computation of decreasing distances

4. Comparison of the first 40 results to **Risknet** project manual analysis

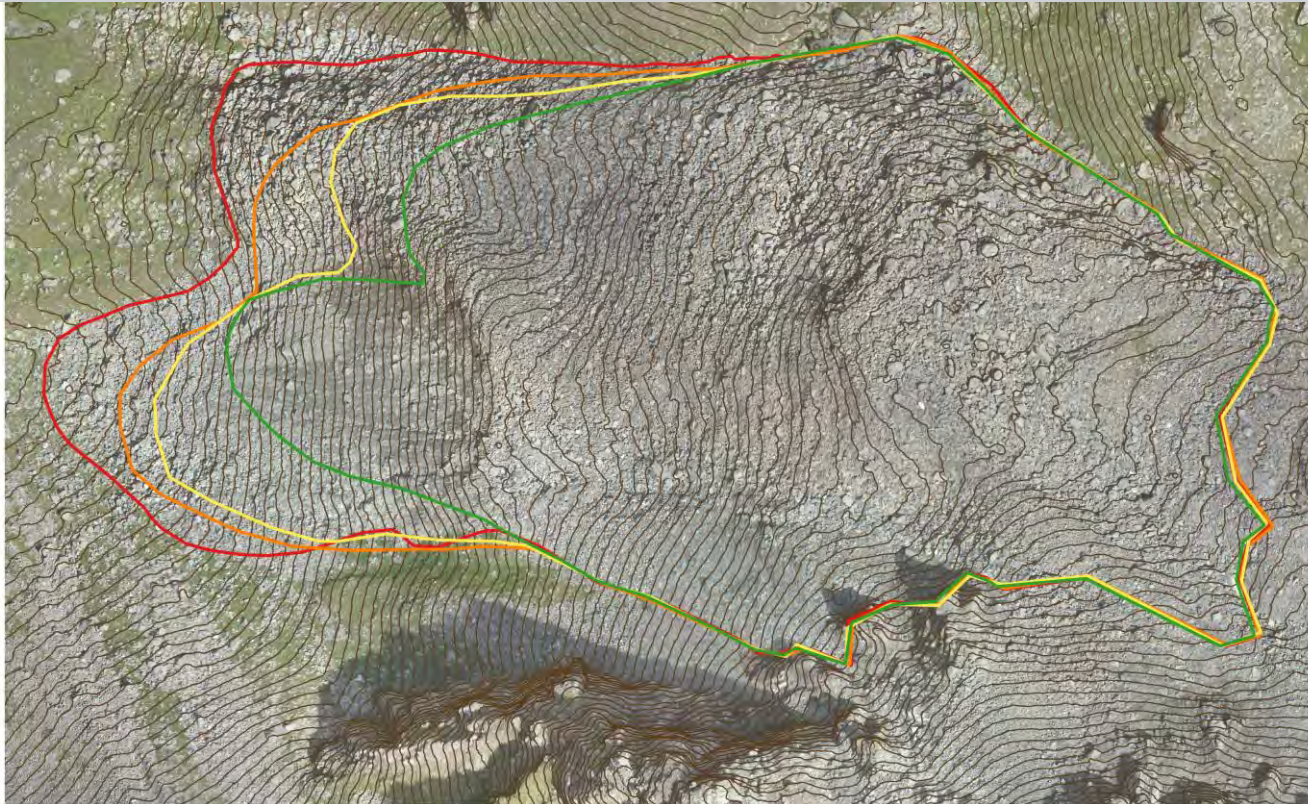
Good match: 87,5% of RiskNet sites individuated in the GIS analysis

Research Actions

3.1.2 Detailed study of a potentially hazardous Rock Glacier



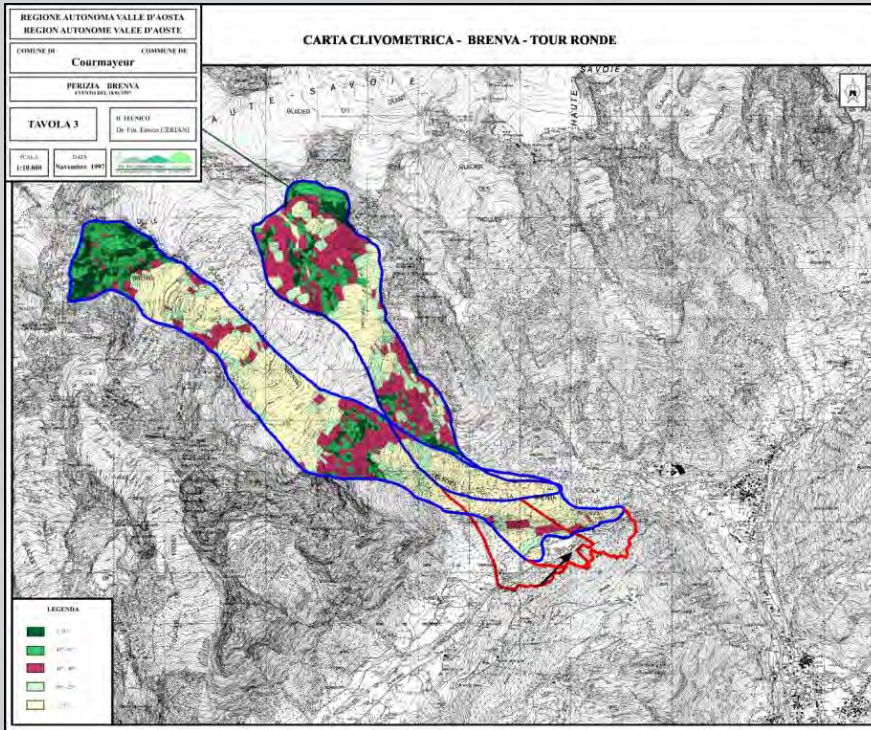
Evolution of Rock Glacier extension from 1988 to 2016



Legenda

- Arpisson RG outline 1988
- Arpisson RG outline 2005
- Arpisson RG Outline 2014
- Arpisson RG outline 2016
- 2 m contour

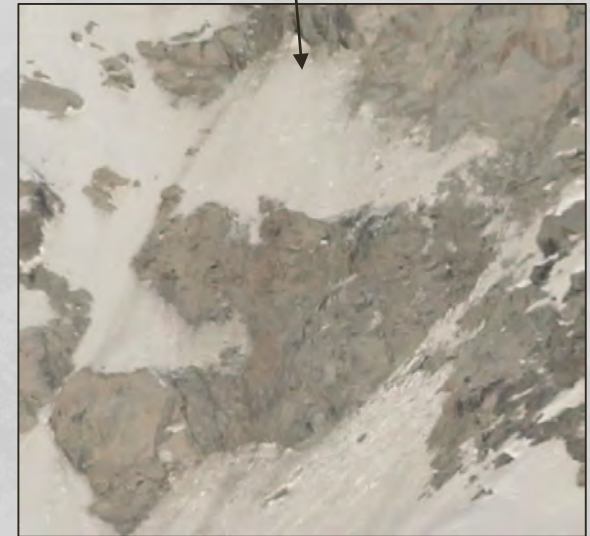
3.2 Hanging Glacier/Rockwall monitoring via high definition automatic camera



Elaboration of an Expert report on avalanche scenarios by SLF - Davos



Identification of possible indicators of slope instability

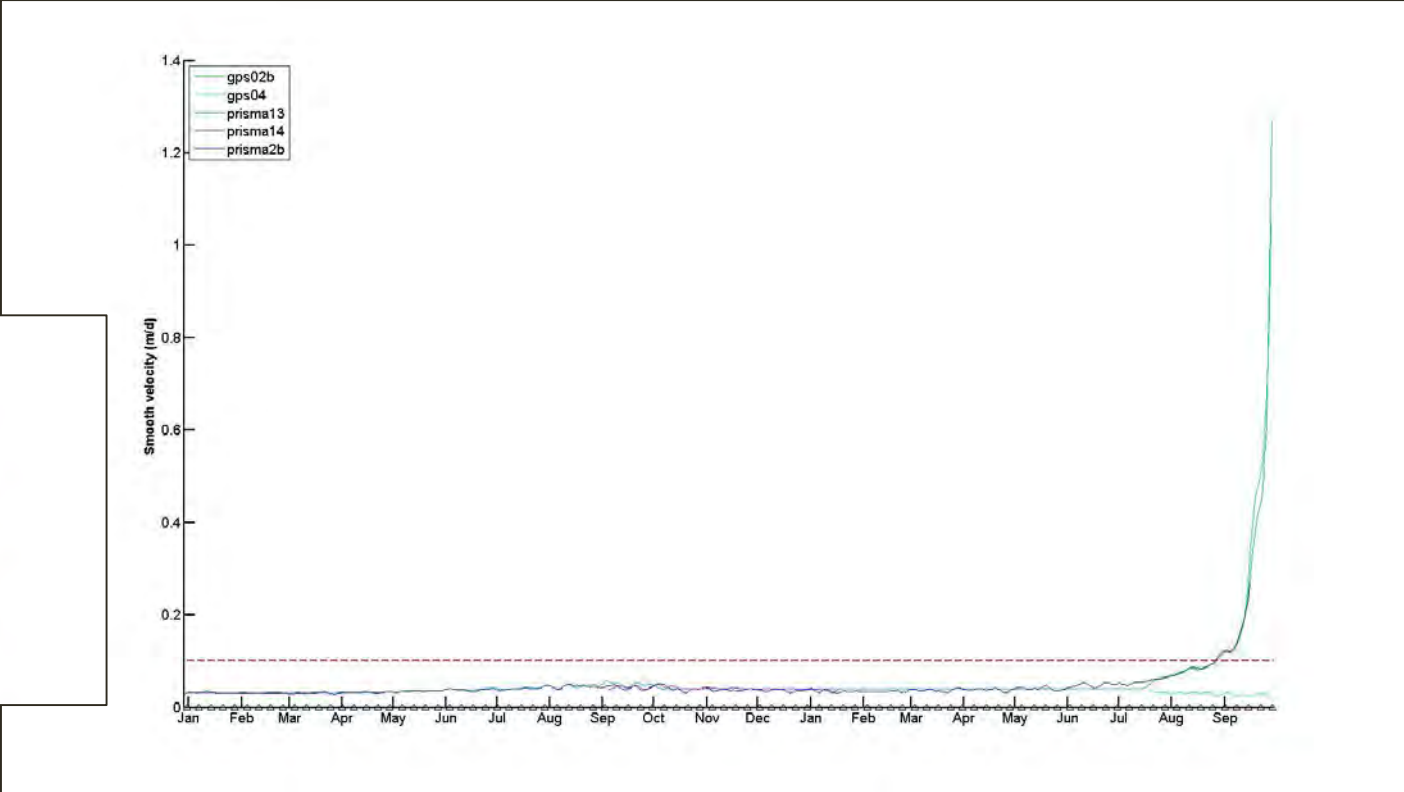


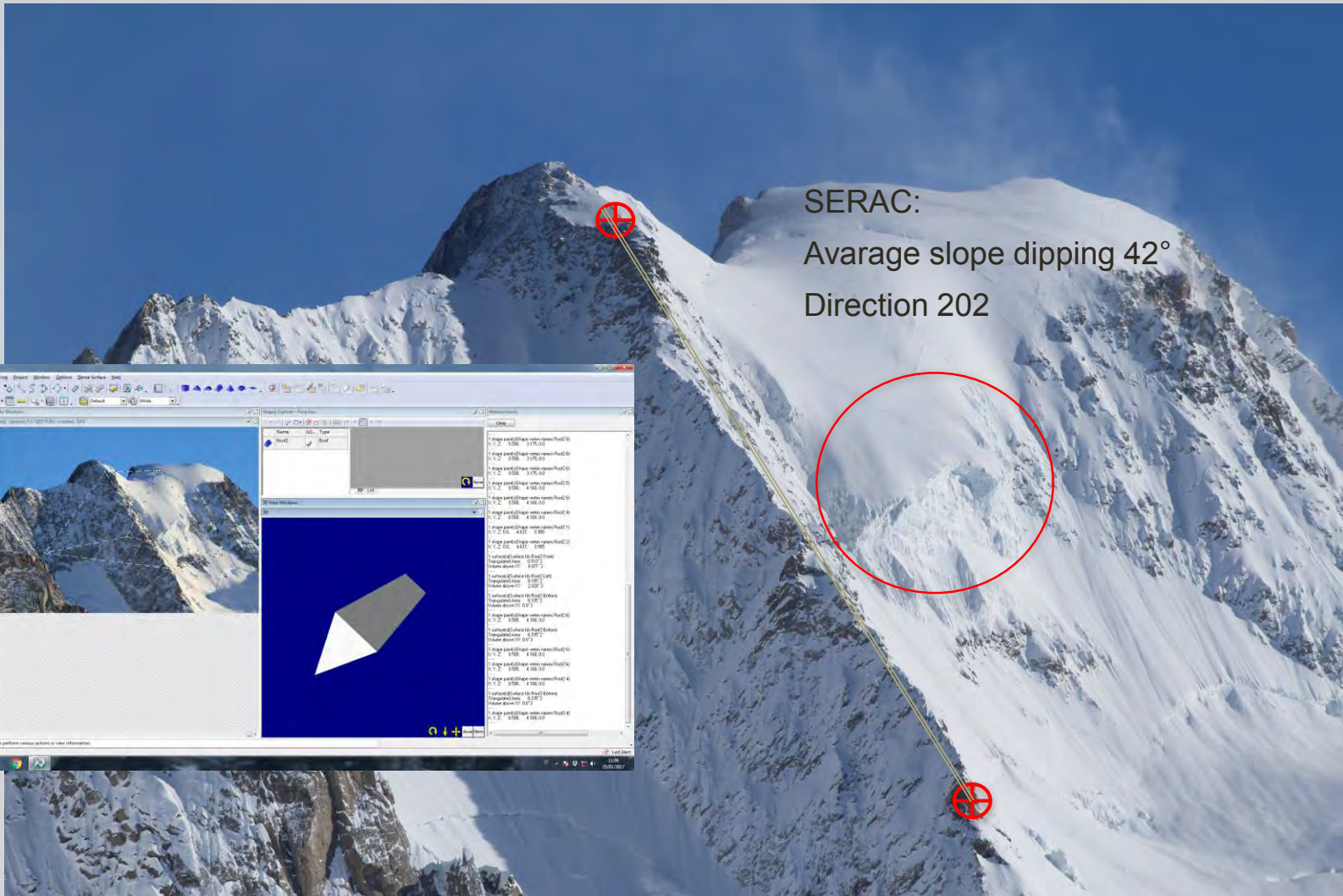
September 2016
 Rockwall Collapse
 (35.000 m³)

Stable rockwall

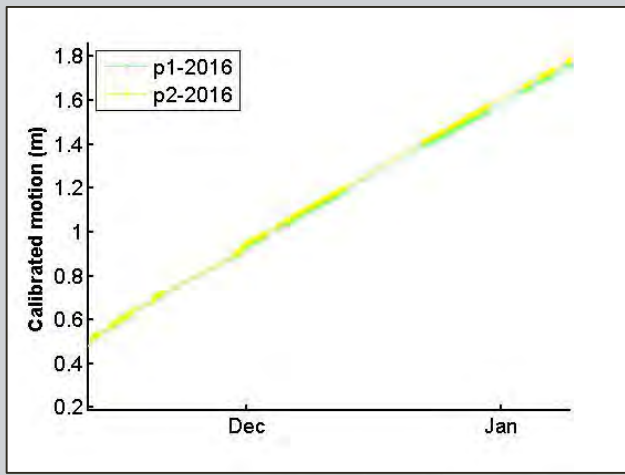
Minor Rockfalls

Hanging Glacier of Grandes Jorasses monitoring

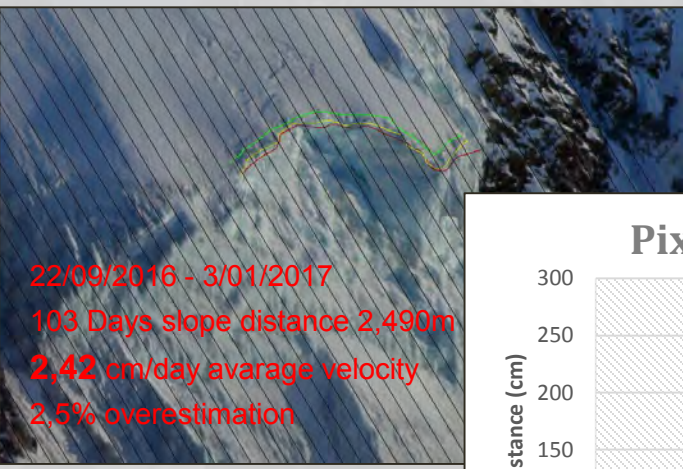
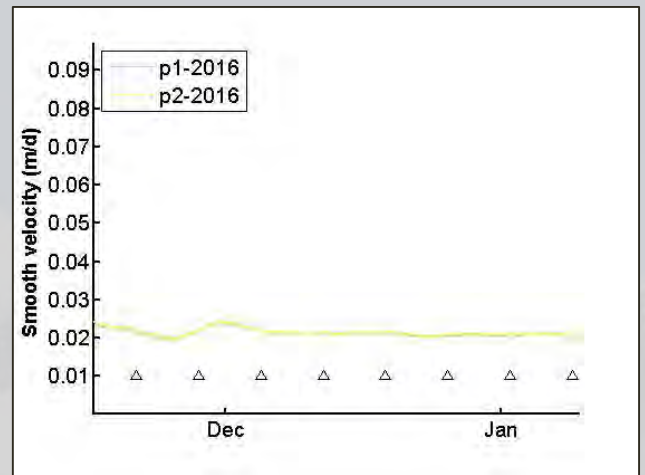




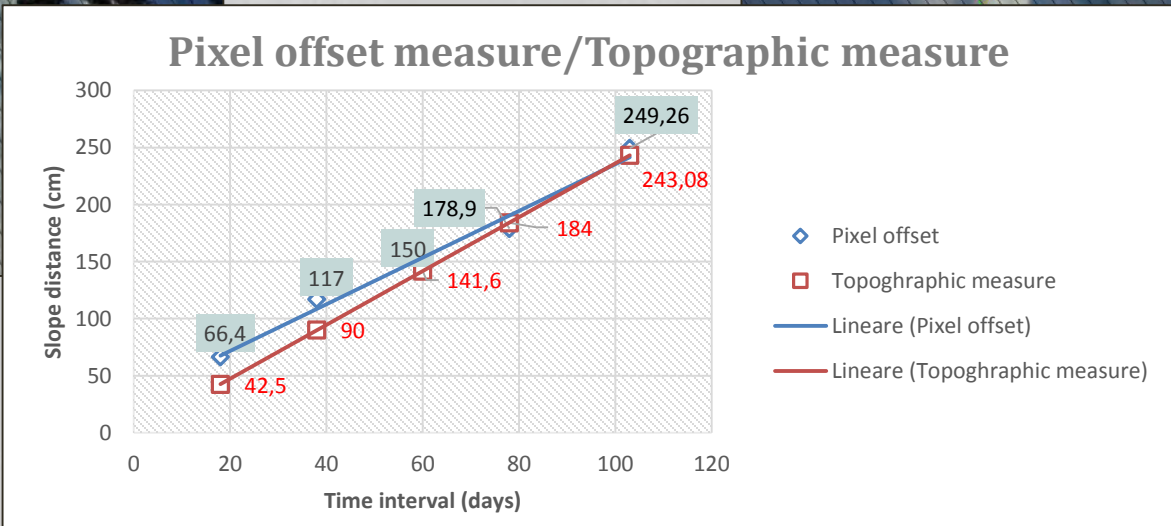
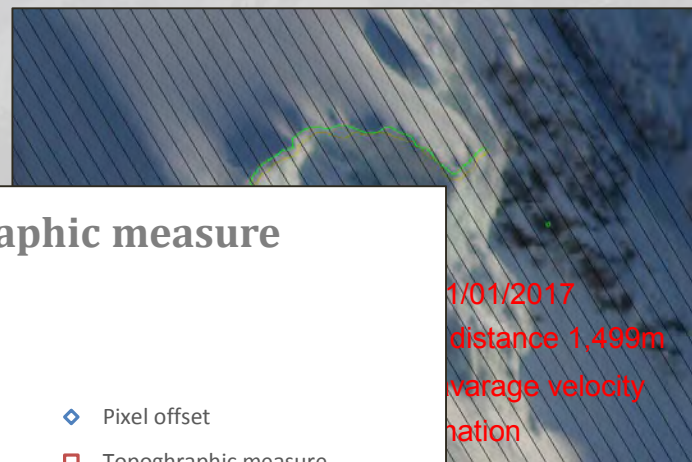
Movements on camera pixel motion Vs. Leica topographic measures



12/11/2016 - 9/01/2017
 58 Days slope distance 1,367m
2,36 cm/day average velocity



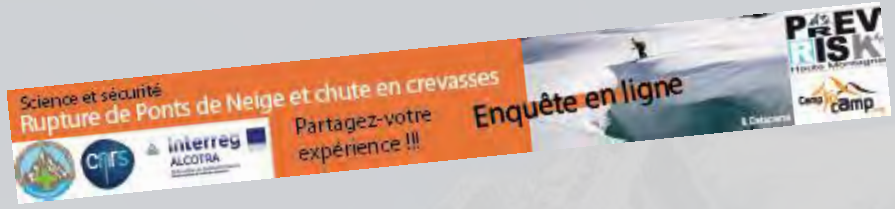
Measure of mean pixel offset
 of serac edge on 25 pixel
 intervals grid



22/09/2016 - 3/01/2017
 103 Days slope distance 2,490m
2,42 cm/day average velocity
 2,5% overestimation

1/01/2017
 distance 1,499m
 average velocity
 overestimation

3.3 Snow Bridges experimental study



Data processing in progress but models already validated

Afficher le site en | fr | et | de | it | es | pt | hu
 CampCamp

Enquête transfrontalière « Rupture des ponts de neige sur glacier et gestion des risques »
 Index des items • Discussions générales • Enquête transfrontalière « Rupture des ponts de neige sur glacier et gestion des risques » • News items

18/03/2016 09:47:45
 Éditeur: GBAFF • Borgne

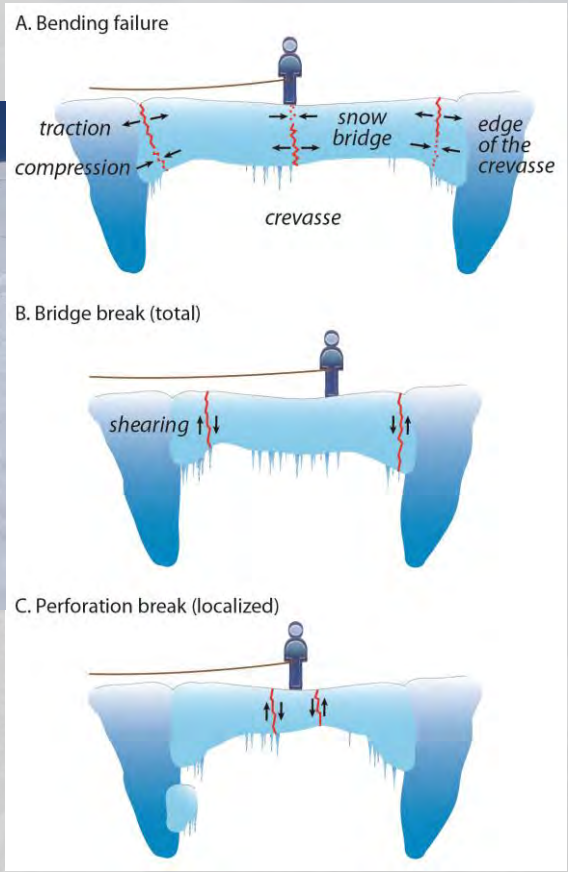
Membres
 Contact

Cette étude a deux objectifs principaux :
 - Meux comprendre la structure des ponts de neige et les mécanismes de ruptures ;
 - Connaître les sites les plus accidentogènes, les raisons des accidents et la gestion du risque par les alpinistes, dans la but d'améliorer les actions de prévention.
 Une étude préliminaire avait été menée sur la base d'un premier questionnaire en 2014. Un grand merci à ceux qui y ont contribué. Après analyse des réponses, je me permets de me tourner vers la communauté des alpinistes et des amateurs pour préciser les résultats à travers deux nouveaux questionnaires : l'un sur les cas d'accidents, l'autre sur la gestion des risques (10 + 5 min).

Questionnaire 1 sur la rupture des ponts de neige (10 minutes) :
[http://www.surveylab.com/s/7u+T8E0U5Wv0uTC.../13799406E-](#)

Questionnaire 2 sur la gestion du risque de chute en crevasses (5 minutes) :
[http://www.surveylab.com/s/7u+T8E0U5Wv0uTC.../13799406E-](#)

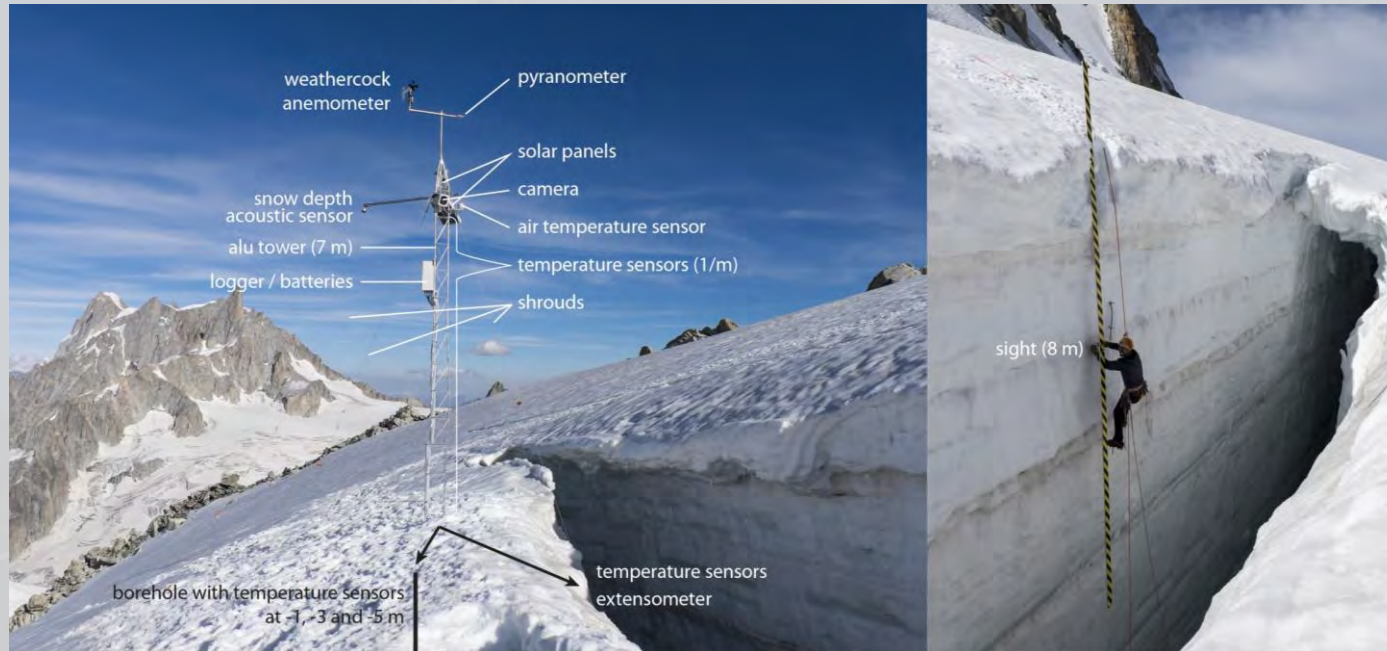
Le site CampCamp.org s'adresse également à l'écotourisme en montagne. Si insistez plus fortement sur les décisions prises par les alpinistes et sur les causes humaines des accidents, n'hésitez pas à copier ces infos dans la Base SBAC de **risques, incidents et accidents sur camptocamp.org**, en cliquant sur [ce lien](#).
 Dernière mise à jour par : GBAFF (2016)



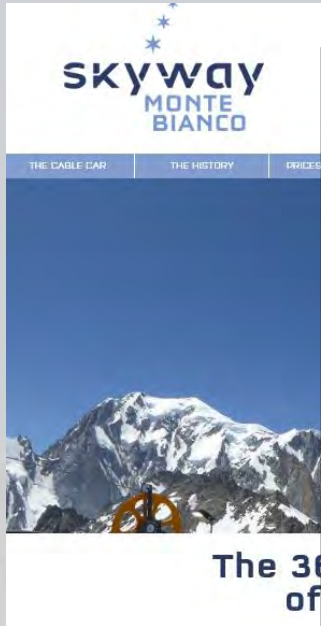
NOM DU QUESTIONNAIRE	QUESTIONS	RAPPORTS	RÉPONSES	STATUT	DATE
Questionnaire 2 sulla gestione del rischio della caduta in crepaccio (5 minuti) :	20 Questions	1 Rapport	90 Réponses	0 24h Ouvert	20/04/2016
Questionnaire 1 sulla rottura dei ponti di neve (10 minuti)	47 Questions	1 Rapport	86 Réponses	0 24h Ouvert	18/04/2016
Questionnaire (2) sur la gestion du risque de chute en crevasse (~ 5 min.)	21 Questions	1 Rapport	207 Réponses	0 24h Ouvert	18/03/2016
Questionnaire (1) sur la rupture des ponts de neige (~ 10 min.)	46 Questions	1 Rapport	188 Réponses	0 24h Ouvert	10/03/2016

3.3 Snow Bridges experimental study

Monitoring the construction and evolution of a snow bridge throughout a hydrological year



Why communication actions?



Communication Actions



- **Glacier workshops:** Campaign to raise awareness in the population of the risks in the high mountain environment through field activities framed by alpine guides (summer 2016). La Chamoniarde Association (Chamonix-France)

- **Mountain safety exhibition:** (event held in Breuil Cervinia on the 20 and 21st August 2016). Valtournenche municipality.

- **Conferences** on mountain rescue for the wide public. La Chamoniarde.

- **Avalanche transceiver training sites:** realization of 4 permanent sites.



Communication Actions

- Uniformation of **mountain signage**

- **Educationals** for professionals:
 - Refuge owners and keepers;
 - Journalists;
 - Professionals (geologists, engineers);
 - Touristic Operators.



Thank you for your
attention!