

IPA Action Group Rock glaciers inventories and kinematics

Workshop I - Definition of the baseline concepts Toward standard guidelines for inventorying rock glaciers

23 to 27 September 2019 – Evolène (CH)

General outline





General information

- **Held in Evolène, 23 to 27 September 2019.**
- **42 participants - 14 countries - 4 continents.**
- **3 days of excursions.**
 - Scientific discussions around concrete examples regarding issues to be solved during the working sessions of the workshop.
- **2 days of sessions:**
 - 4 common sessions:
 - > Generalities, discussions around almost agreed aspects.
 - > Presentations given by AG members regarding selected topics.
 - 3 working sessions:
 - > Selected aspects which have been subject to discussion in the comment on V1.0 or during the excursions.
 - > Prepare a proposition for adoption by the next common session.
- **On request, all documentation regarding excursions and working sessions (working document) can be provided.**



Presentations

Presentations were given by IPA AG members to highlight some issues and served as an input for discussions to be held during the workshop.

Risks and Opportunities of a Rock Glacier Inventory.

(Lukas Arenson)

- What controls a rock glacier,
- Questions to solve for,
- Rock glacier dynamics,
- Properties of Ice and Frozen Soil

Evaluating sources of uncertainty and variability in rock glacier inventories. (<https://doi.org/10.1002/esp.4674>)

(Francesco Brardinoni, Riccardo Scotti, Rudi Sailer and Volkmar Mair)

- Quantify uncertainty and variability in rock glacier inventories compiled by different operators from remote sensing imagery
- Provide ranges of variability
- Impact on data compute from a rock glacier inventory (e.g. water storage potential)

The (Rock) Glacier Inventory of Argentina.

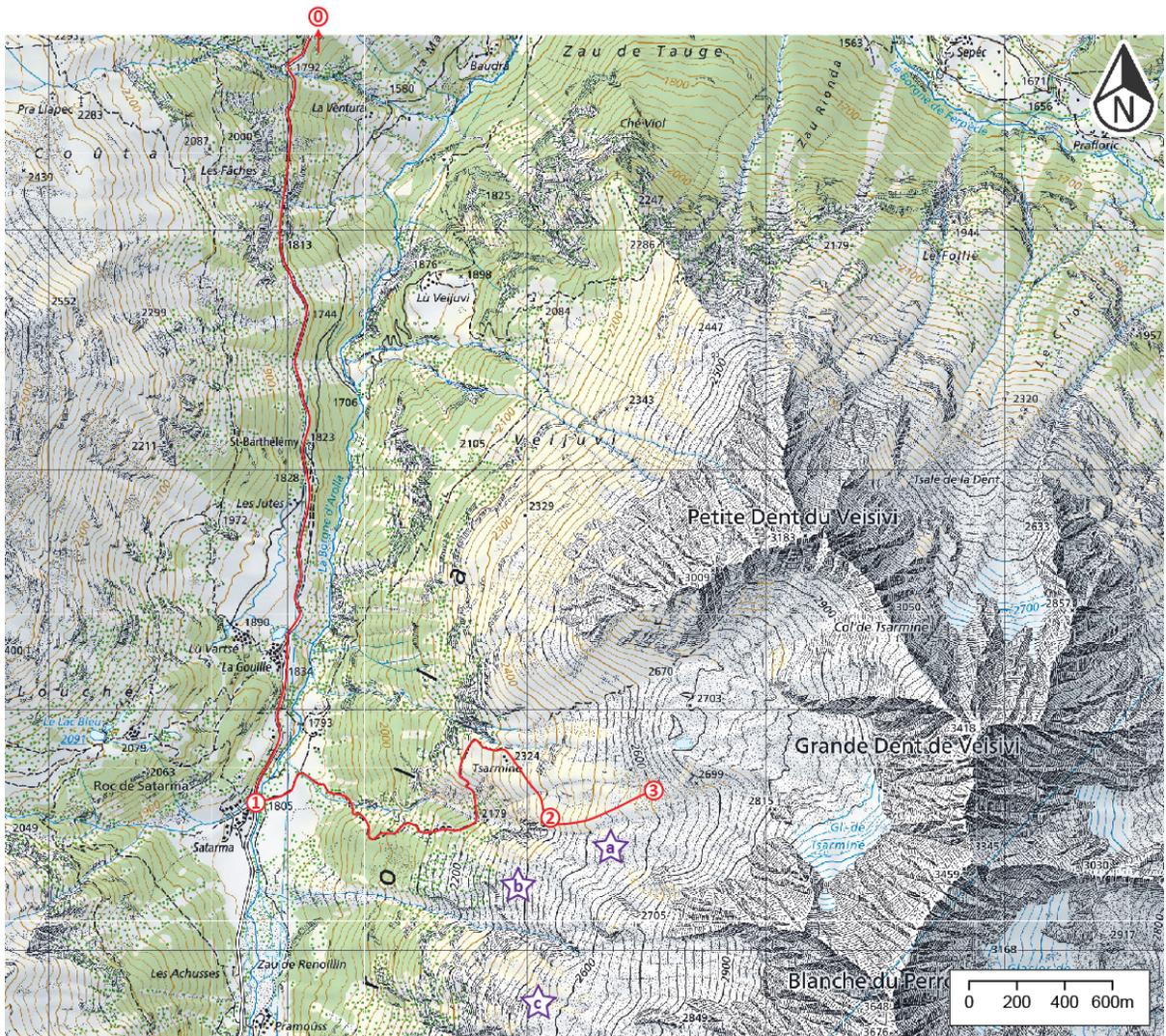
(www.glaciaresargentinos.gob.ar)

(Lukas Ruiz)

- Insight of the national (rock) glaciers inventory of Argentina,
- Methodology used,
- Web interface,
- How the database was built (implementation, variables, etc.)

Excursion I

Tsarmine rock glacier / Perroc landslide



Planning of the excursion

0. Departure by minibus from Chalet La Niva (Evolène) to Satarma
1. Satarma (1805 m.a.s.l.): departure by foot to the Tsarmine's webcam
2. Tsarmine's webcam
 - Viewpoint on the ongoing erosion of the Tsarmine rock glacier front
3. Tsarmine viewpoint
 - Tsarmine rock glacier (a)
 - Perroc Landslide (b)
 - Perroc rock glacier (c)
1. Way back to Satarma
0. Back to Evolène by minibus



Excursion I

Tsarmine rock glacier / Perroc landslide

Topics covered during the excursion

What is a rock glacier inventory inventorying ?

Minimal size → How to define a minimal size and thickness ? Need a clear definition.

Activity ?

Activity classes → Presence of vegetation and lichen indicators ?

Inventory approach → Geomorphological / optical / kinematical lead to different results ?

Prior knowledge of the operator → Different results

Excursion I

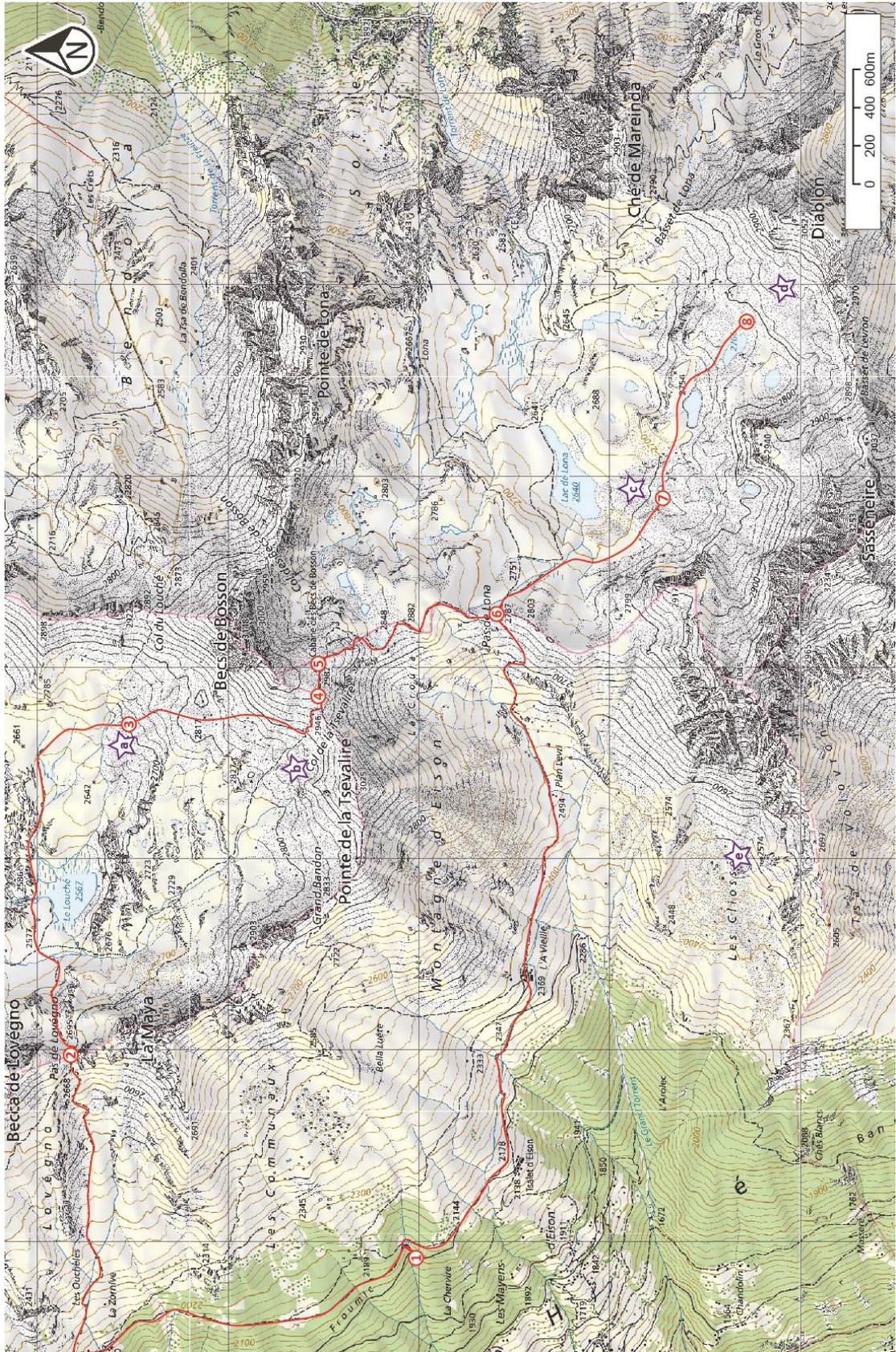
Tsarmine rock glacier / Perroc landslide





Excursion II

Becs-de-Bosson / Lona



Excursion II

Becs-de-Bosson / Lona

Planning of the excursion

Day 1 – Haut vallon de Réchy

0. Departure by minibus from Chalet La Niva (Evolène) to l'A-Vieille parking
1. l'A-Vieille parking (m.a.s.l.): departure by foot to the Lovegno pass
2. Lovegno pass
3. Becs de Bosson rock glacier (a)
4. Tsavolire pass and Tsavolire rock glacier (b)
5. Becs de Bosson mountain hut

Day 2 – Lona bassin

5. Departure from the Becs de Bosson hut
6. Lona pass
7. Lona rock glacier (c)
8. Diablon rock glacier (d)
6. Lona pass : Les Cliosses rock glacier (e)
1. l'A Vieille parking
0. Back to Evolène by minibus





Excursion II

Becs-de-Bosson / Lona

Topics covered during the excursion

What is a rock glacier inventory inventorying ?

Object types → What is a RG? RG vs push-moraine.

Rock glacier morphological (sub-)units

Single vs. multi-unit rock glaciers

How to define a unit ? → Terminology? Polymorphic: multi-lobe, multi-root, multi-unit (i.e. generation).

Connection to upslope unit

Talus or Glacier forefield (Becs-de-Bosson) → how much is historical situation included? Currently only discussed for active RGs.

Activity ?

Activity vs. velocity → 2 separate classifications: activity defined on 1) geomorphological (incl. visual indicators) and 2) kinematical data

“Destabilisation” → Terminology? Included as activity class or separate attribute?

Outlining ?

Front, lateral margins, rooting zone → develop ‘rules’; use certain and inferred indicators; problematic upper outline is dependent on landform type and upslope connection.



Sessions program

Thursday 26 September - Morning

Common session A

- *Purpose of standardized guidelines - Motivations for inventorying rock glaciers*
- *Link between kinematics and climate*
- *Inventories achievement (how to perform an inventory)*
- *Rock glacier inventory Argentina*
- *Organization of Working session I*

Working session I

I.1 **Technical definition of rock glaciers** (Chaired by Jeannette Noetzli + Benjamin Lehmann)

- a) *Technical definition of rock glaciers – geomorphological criteria, minimum size of identification*
- b) *Minimum thickness or driving stress, definition of permafrost creep*
- c) *Are alaskian FDLs (frozen debris lobes) to be included in a rock glacier inventory ?*

I.2 **Rock glacier unit(s)** (Chaired by Cécile Pellet + Nina Jones)

- a) *Do we have to define rock glacier(s) sub-units ?*
- b) *How ? (generations, connection to upslope unit, ...)*
- c) *Differentiation of treatment between single-unit and multi-unit rock glacier ?*

I.3 **Connection to the upslope unit** (Chaired by Riccardo Scotti + Julie Wee)

- a) *Acceptance to the categories of connection to the upslope unit (if needed)*
- b) *How to deal with the episodic occurrence of a glacier (or an ice patch) in the rooting zone of a glacier (talus connected or glacier forefield connected) ?*



Sessions program

Thursday 26 September - Afternoon

Common session B

Summaries and results of Working session I discussions
Organization of Working session II

Working session II

II.1 **Definition of the rock glacier boundary** (Chaired by Line Rouyet)

- a) Treatment of the rooting zone*
- b) Specifically defined for each category of upslope connection*

II.2 **Differentiation between rock glaciers and debris-covered glaciers** (Chaired by Sergio Faria + Yan Hu)

II.3 **Rock glacier activity** (Chaired by Andreas Kellerer + Dominik Amschwand)

- a) Activity vs. velocity ?*
- b) Keeping the classical definition or adapting it ?*
- c) How to deal with rock glacier destabilization ?*



Sessions program

Friday 27 September - Morning

III.1 Inventorying strategy

(Chaired by Francesco Brardinoni + Mario Kummert)

III.2 Practical concepts for assessing activity

(Chaired by Line Rouyet + Alessandro Ciccoira)

III.3 Guidebook : structure and content

(Chaired by Sebastian Vivero + Hanne Hendrickx)

III.4 Implementation : how to proceed ?

(Chaired by Lukas Arenson + Dario Trombotto)

+ Additional small groups worked on unfinished topics of WSI and WSII.



Sessions program

Friday 27 September / Afternoon / Closing ceremony

- Establishment of a provisory international committee* for the achievement of the guidelines, guidebook and implementation phase, namely:

Xavier Bodin (EDYTEM, France)
Francesco Brardinoni (University of Bologna, Italy)
Reynald Delaloye (University of Fribourg, Switzerland)
Christophe Lambiel (University of Lausanne, Switzerland)
Shelley MacDonell (CEAZA, Chile)
Lucas Ruiz (IANIGLA, Argentina)

*The participation to this committee is open. If you want to join it, take contact with rockglacier-ipa@unifr.ch

- Planning of next phases:

Timeline to V3 (open to comment) and V4 (final) of Baseline concepts.

Next workshop for Task I (practical guidelines and implementation phase) -> proposition from Argentina (L.Ruiz), 2022 ? To be discussed and confirmed in the coming year.

- Presentation of Task II – ECV oriented – Workshop II (February 2020) (Chloé Barboux)

- IPA Action Group phase II (2020-2022) ? -> Yes

- General conclusions and workshop closing

Additional pictures



Working time !





Raclette time !



Nap time !



Thanks to all participants !

