

## THE LOCALIZATION MAP OF AVALANCHE PHENOMENA (CLPA)

### STAKES AND PROSPECTS

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#### INTRODUCTION

After the avalanche of 10 February 1970 in Val d'Isère (39 persons killed), was decided "the establishment (...) of an inventory map of avalanches". The Localization Map of Avalanche Phenomena (CLPA) records, on a 1:25,000 scale map, the largest limits of all known avalanches having occurred in the French Alpine and Pyrenean mountains (the CLPA today covers more than half of the corresponding surface).

On 9 February 1999, an exceptional avalanche killed 12 persons in the Chamonix valley (Haute Savoie, France). The Ministry for Environment decided to renew and to pursue the observation of avalanches, in particular the CLPA, and charged Cemagref, with the cooperation of the National Forest Office (ONF) of this mission.

#### THE CLPA, AN INVENTORY MAP OF AVALANCHES

The CLPA is a descriptive map of the observed or historic phenomena, designed to inform the population on the existence of zones where avalanches had actually occurred in the past. It is not a prospective analysis as it does not take into account the potential risk considering return periods and the intensity of the avalanches in the studied zone. It is a technical informative document of particular concern to mayors and administrative and technical departments and specialists involved in natural hazard management in mountain areas.

The principles of CLPA mapping combine interpreting of past events by photo-interpretation and collecting of eye witness accounts. The objective of photo-interpretation is to identify physical traces left by past avalanches that can be used to characterize the path and sometimes the runout zone of avalanches. The photo-interpretation study remains, however, incomplete because all the necessary information is not detectable on photos or in a complementary field investigation. Therefore, eye witness accounts of inhabitants, elderly residents and mountain professionals such as forest rangers, ski patrollers, rescue services, transportation network managers, shepherds, and mountain guides can help specify the events of the last century.

All the information obtained with these persons during a field study of the entire zone is analyzed. Only the information provided by eye witnesses is precisely noted, including information from archive documents if they can be used. The protection structures built in the working zone are added.

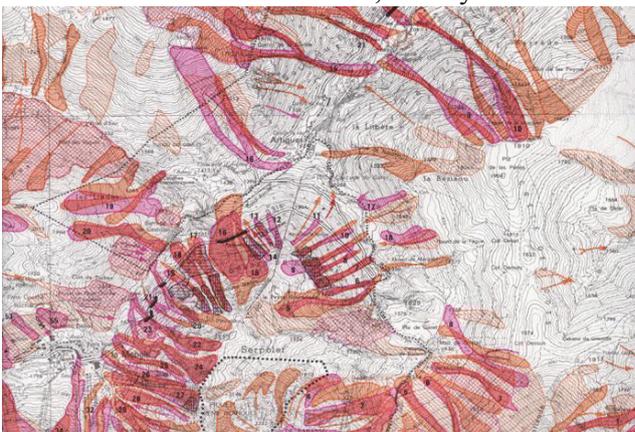


Fig. 1 CLPA map

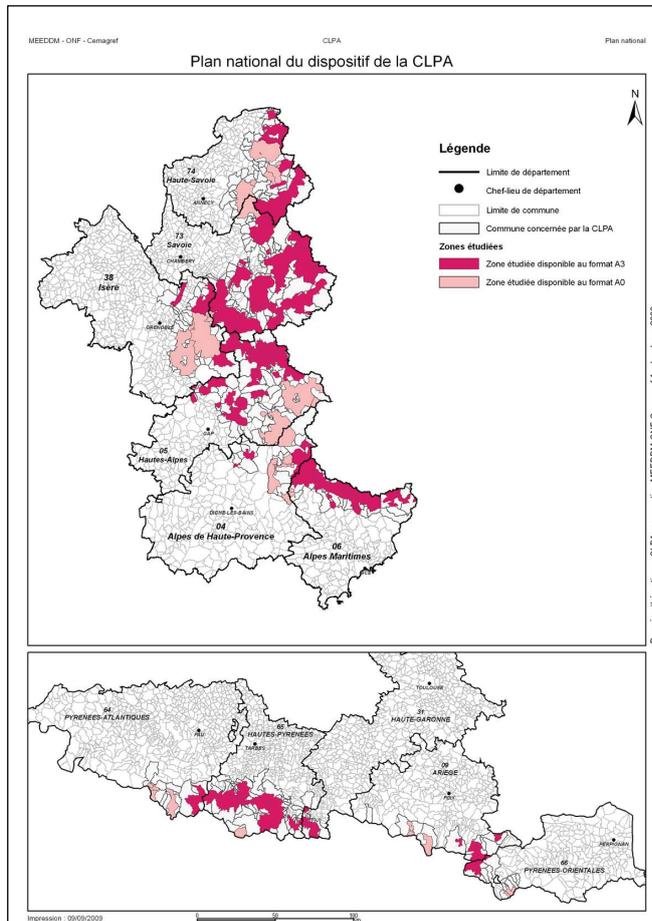
#### IMPROVE AND RENEW THE CLPA

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Since 1999, many improvements have renewed the CLPA and, by adopting more fully adapted data processing methods, introducing regular data updating, and developing wider and more appropriate data dissemination. The standards of the document's graphics were improved, clarifying the used symbols. During the field investigation, zones undergoing significant damage due to an air blast are

clearly discerned from avalanche snow deposit. In addition, the observed traces left by the avalanche run, which could not be reported during the field investigation with eye witnesses, are included in the photo-interpretation layer. Data collection and management were standardized and are now underway in the implementation of a quality approach. The data are now updated regularly. New avalanche limits based on new or larger events are recorded every year. Any eye witness account brought to Cemagref is also integrated into the CLPA once a year. The CLPA is updated 20–30 times every year. Every studied zone is also updated every 10 years. This is the opportunity to check and complete the annual updating, to find possible new avalanche limits that may not have been recorded in the annual updating, and to consistently renew all the CLPA areas. The CLPA is distributed as an atlas assembling several documents on a 1:25,000 scale map, and a collection of identification sheets concerning every avalanche identified on the map. All maps and identification sheets are available as images and GIS data on a web site [www.avalanches.fr](http://www.avalanches.fr).



**Fig. 2** CLPA map cover in 2009

## APPLICATIONS AND PERSPECTIVES

The CLPA database is unique in the world. It covers a large part of the French mountainous urbanized areas and contains rich spatially integrated information. Researches are performed to exploit this information using avalanches dynamics modelling and statistical methods in order to transfer the information to avalanche passes not covered by the CLPA.

## REFERENCES

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