



16th Meeting of the European Avalanche Warning Services (EAWS), Grenoble

Results of the 16th Meeting of the European Avalanche Warning Services (EAWS) Grenoble, September 15th-16th 2011

Organization: Cécile Coleou (F), Pierre Etchevers (F) and their team of Météo-France and ANENA (**Thanks!**)

Participants: ⇔ www.avalanches.org (internal area – actualized till Nov. 20th 2011)

Minutes: Patrick Nairz (AWS Tyrol, Chair of the EAWS-Working Group), Cécile Coléou, Pierre Etchevers (Météo-France) with contributions of Chantal Gendre, Ingrid Etchevers, Gérald Giraud, Daniel Goetz, Laurent Mérindol and Jean-Marie Willemet (Météo-France).

6 Sessions:

- *Opening:* Joint session 16th conference of EAWS and 40th Anniversary ANENA
- *Session 1:* Use of avalanche danger scale
- *Session 2:* Collecting data for avalanche forecasts
- *Session 3:* The provision of information to practitioners
- *Session 4:* Additional tools for forecasters
- *Session 5:* Collaboration between avalanche warning services, institutions, agencies and public users

Opening session:

The session was common to the 16th EAWS meeting and the ANENA (Association Nationale pour l'Etude de la Neige et des Avalanches) 40th anniversary. The EAWS group and historic was presented, as well as the review and prospects of ANENA.

Session 1: Use of avalanche danger scale

Avalanche Size Description:

Presentations:

Patrick Nairz (A) proposed to adapt the EAWS avalanche size classification. Changes concern the columns “runout classification” (size 1 to 3) and “path length and volume” (use of a *typical* length instead of a *maximum* one in each class)

Krister Kristensen (N) presented the run out ratios (α - β -model) for an additional characterisation of avalanche sizes.

Points of discussion:

- The names (especially size 1 and size 2) cause sometimes problems to the public (underestimation of the size of the small avalanches in the current

language). A definition of the names used in the danger scale is needed. The names won't be changed.

- Further pictures in the glossary will be included.
- The column "typical mass" won't be used.
- α - β -model is a good additional tool for describing the path length.
- There is no direct correlation between avalanche size / avalanche danger level!
- Subjective influences are not of interest (a small avalanche will be defined the same in the Alps, the Pyrenees and the Tatras).

Size	Name	Runout classification	Damage potential classification	Typical path length and volume
Size 1	Sluff	Snow relocation with minimal danger of burying (danger of falling)	Relatively harmless to people	10 m, 100 m³
Size 2	Small Avalanche	Stops at the end of a slope	Could bury, injure or kill a person	100 m, 1.000 m³
Size 3	Medium Avalanche	Traverses flat parts (considerably below 30°) over distances of less than 50 m	Could bury and destroy a car, damage a truck, destroy a small building or break a few trees	500 m, 10.000 m³
Size 4	Large Avalanche	Traverses flat parts (considerably below 30°) over distances >50m and can reach valley ground	Could bury and destroy a railway car, large truck, several buildings or a piece of forest	1-2 km, 100.000 m³
Size 5	Very large Avalanche	Reaches valley ground. Largest snow avalanche known	Could gouge the landscape. Disastrous damage potential possible	~3 km, > 100.000 m³

Decisions:

- Avalanche Warning Services will internally discuss about those changes (see table above).
- Further proposals / changes have to be reported the latest **till November 20th 2011** to lawine@tirol.gv.at. Afterwards eventually further discussion in the Working Group (WG). The avalanche size classification will be translated and published on www.avalanches.org

The question of presented travel advice

Presentations:

Patrick Nairz (A) "Unification of the travel advice". Some European AWS use an additional column "travel advice" in their avalanche danger scale. Patrick Nairz gave a review of the different columns of travel advice in Italy, Tyrol, Austria, Cataluña, Switzerland, Germany and Canada.

Krister Kristensen (N) presented the various target users of the avalanche forecast. He proposed a

Travel Advice	
	Avoid all avalanche terrain.
	Very dangerous avalanche conditions. Travel in avalanche terrain not recommended.
	Dangerous avalanche conditions. Careful snowpack evaluation, cautious route-finding and conservative decision-making essential.
	Heightened avalanche conditions on specific terrain features. Evaluate snow and terrain carefully; identify features of concern.
	Generally safe avalanche conditions. Watch for unstable snow on isolated terrain features.



description of typical consequences/actions at different danger levels concerning each target user group.

Points of discussion:

- The travel advice (as part of the danger scale) doesn't have to do anything with recommendations in the avalanche bulletin (which should only be used rarely for inexperienced people)!
- Adaption of the travel advice is optional.
- Each AWS should discuss with the main target users (guides, recreationalists,...)
- Avalanche Warning Services can interact.

Decisions:

- Harmonization of the travel advice will be discussed in the WG.

Matrix and typical situations. Pattern, what next?

Presentations:

Rudi Mair and Patrick Nairz (A): AWS Tyrol used 10 decisive danger patterns already during the recent winter-season with excellent feed-back. In the daily bulleting there are selected up to 3 patterns. Avalanche patterns improve the quality of avalanche bulletins. The patterns have been published in the book "lawine. 10 entscheidenden Gefahrenmuster erkennen." (13.000 sold books last winter) as well on the website of the AWS Tyrol: <http://lawine.tirol.gv.at>.

Thomas Stucki (CH): The Swiss AWS also used a pattern method. 4 typical patterns are defined (new snow, snow drift accumulation, wet snow and old snow pack). 1-3 patterns are used in the description of the danger situation. The information pyramid is used, so the main pattern is highlighted. The method is published in the documentation "Caution Avalanche".

Points of discussion:

- Very good feedback from Tyrolean and Swiss users. References to the patterns in the bulletin were also appreciated.
- The other AWS expressed an interest in this new approach. Most of them would like to evaluate the use of patterns before establishing them as a standard in avalanche forecast.
- Additional comment: Bavarian Matrix has been adapted (avalanche size 5) -> newest version till Nov 20th 2011 on: www.avalanches.org -> Basics

Decisions:

- Harmonization of patterns (total amount, patterns/day, part of info-pyramid) will be discussed in the WG.
- The use of patterns is optional.

Danger levels

Presentations:

Mauro Valt (I) presented the main features of danger levels in the Alps. Some of his results: more accidents occur at the beginning of winter season and also more on



Monday. The fatalities are concentrated during critical situations and also specific snow cover structure. In Italy, the snowshoe-hikers are more often involved in avalanche fatalities.

Carles Garcia (E) exposed the use of danger levels in Catalan Pyrenees. The annual evolution of the danger level is similar to the amount of fresh snow and there are no trends in the use of the different levels. Then *Cécile Coléou (F)* presented a proposal for the comparison of avalanche danger levels. There seems to be need of common criteria and also for spatial definitions of comparison. The WG could discuss the first draft and results.

Gilles Brunot (F) checked the development of the danger levels between March 24th till 28th 2010. The main purpose was to point out the problems with the consistency of danger levels between adjacent countries.

Points of discussion:

- Coherence of the bulletin between adjacent AWS. More communication between services is needed. Time constraint of the publication of the bulletin could be an additional difficulty for harmonization.
- Statistics on avalanche danger levels seem useless to some services, except at a regional scale.

Decisions:

- AWS will continue to collect data of interesting situations.
- Statistics should be concentrating on a regional basis (inclusion of B. Matrix and patterns).
- Communication and data-exchange between adjacent Avalanche Warning Services will be improved for even better coherence of our bulletins.

Session 2: Collecting data for avalanche forecasts

Field observation methods: Main data source, interpretation

Presentations:

Mark Diggins (GB): Source of data are Met Office info from the past 12 hours, snowprofiles at not fixed locations and field trips to assess spatial variability. These data are put online. Met Office specific area information is then used to provide avalanche hazard forecast which is published on SAIS website and sent to agencies.

Patrick Nairz (A): Field observation methods are always based on the same principles: weak layers/interfaces and their spatial variability; crucial is the location of the test site; you only get a good overview if you have lots of snow-profiles and data from stability tests (RB, CT, ECT; PST) in different regions, aspects and high-levels.

Tomasz Nodzyński (PL): presented maps of the weather observation network in Polish Tatra Mountains (7 stations) and of the snow measurements network (4 points). All these observations are concentrated in Krakow nivological section and managed by Geliniv program. Avalanche information is collected in the same department by observers and mountain professionals and monitored in a GIS database.



Daniel Goetz (F): main data sources: automatic and human observation and also field human occasional measurements; interpretation: on one side directly by avalanche forecasters and on the other side by the operational snow modelling SAFRAN-Crocus-Mepra.

Thomas Stucki (CH): From November till April (min) about 200 observers provide daily data, concerning the weather, snow and avalanche conditions (including snow profiles, stability tests, etc.). This information is then transmitted from the field to SLF-Davos by logging on PC/Laptop (IFKIS information system) or iPhone (mAvalanche program).

Igor Chiambretti (I): field observation methods consist in: avalanche activity, surveyor activity, Rutschblock test and ram profile. A surveyor is a mountain professional, who plans outdoor excursions (depending on avalanche hazard rating) for measurements (snow cover settlements, avalanche releases, stability tests, ram profile). There is also real-time infrasound avalanche activity detection. The rating should also be evaluated by comparing the results of the ram profile with AINEVA's classification of profiles (16 types of ram profile). Data exchange between AWS need an encoding standard, which is already partially achieved via CAAML.

Stability tests – reliance for forecasters?

Presentations:

Igor Chiambretti (I): ECT (Extended Column Test) versus RB (Rutschblock test) - first results 280 side-by-side tests on both unstable and stable slopes were done during winter 2010/11 in different places of the Italian Alps. The comparison shows that 41 % of the tests indicate equal ECT and RB classes of stability, 32 % ECT class of stability greater than the RB class, and 27 % lower. In conclusion, despite a not large enough number of comparisons, in relation with the complexity of Italy's areas, these preliminary results suggest that ECT could become a tool as good as RB. As a proposal and discussion, the definition of an encoding standard for transcribing ECT's results (via CAAML) and a comparison table between the different types of stability tests are exposed.

Thomas Stucki (CH): RB (Rutschblock) is the standard test used by the observers. The most common stability tests are the CT (Compression Test) and ECT (Extended Column Test). A new test the "hasty pit" was experimented in 2011/12. It is a fast snow profile without ramsonde, grid, magnifier and thermometer and transmitted by iPhone. Comparison ECT-RB-CT provides conclusions: ECT differentiates well stable from unstable slopes and gives similar false alarms and false stable prediction; two adjacent ECT will classify 87 % of the slopes with accuracy of about 90 %; two different types of stability tests adjacent to each other will identify the same critical failure layer in more than 50 % of the cases.

Points of discussion:

- Field observation methods have common points but also distinctness in the practice (organization, parameters, transmission) and the interpretation of the measurements.



16th Meeting of the European Avalanche Warning Services (EAWS), Grenoble

- Stability tests are good tools for forecasters. Stability test interpretation is difficult. An isolated test is not relevant. You need additional information and lots of stability tests.
- Crucial are representative testing-spots.
- Comparison were carried out between different tests (ECT, RB,...) : the different tests appear to be complementary. No general recommendation is done by EAWS concerning the use of stability tests.

Session 3: The provision of information to practitioners

Communicating to the public / avalanche bulletin

Communication to the public / feedback from surveys

Presentations:

Christine Pielmeier (CH) presented the new Avalanche Bulletin for Switzerland which will be used (with lots of maps and icons) from winter 2012-2013 on. The info is provided via the system of the info-pyramid and adapted to new media (internet and smartphone). An automatic system of translation in French, Italian and English was set up.

Mauro Valt (I) presented the Italian work to improve the Avalanche bulletin despite strong budget problems. Firstly, the homogenization of Avalanche Bulletin continues for all regions in Alps and Apennines. They are being testing automatic translation.

Flavio Berbenni (I) proposed to associate a weight with the danger level for each box of the Bavarian Matrix. He asked an evaluation by AWS/WG.

Karl Klassen (CDN) proposed a public avalanche information for selected trips with incorporating terrain features (slope, slope shape, forest density).

Marti Gloria (E): Surveys of users: Web and social networks gain importance

Marc Diggins(GB): Surveys of users: Web and social networks gain importance; the practitioners who answered are mainly men between 31-45 years old. How to reach young people?

Points of discussion:

- in Sweden, Canada, GB and Austria some AWS already use social networks like facebook or twitter to exchange infos.
- Info-pyramid is European standard and widely used.

New media

Presentations:

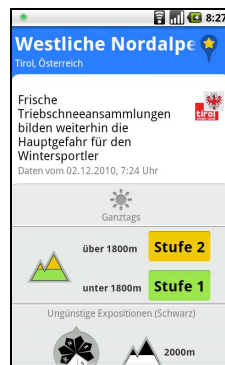
Christine Pielmeier (CH) presented "White Risk mobile" avalanche information for iPhone. The links to a e-learning tool and new avalanche bulletin are the future steps of this application.

Patrick Nairz (A) presented SnowSafe, the mobile solution for spreading our avalanche bulletins. SnowSafe can be **used by all EAWS! It's free of charge!**



16th Meeting of the European Avalanche Warning Services (EAWS), Grenoble

SnowSafe app works on Android and iPhone and is based on CAAML. We worked on an easy-going way to create CAAML with php-scripts (more details just below -> CAAML).



Points of discussion:

- Our app SnowSafe (www.snowsafesafe.at) can be used by all EAWS (free of charge). We just need your report in CAAML-format (see below).
- The use of “old” communication means (fax, teletext,...) was discussed: Are they still needed ?
- Some AWS mention that they already use new media (chat, blogs, facebook, twitter, ...). EAWS should use our standards also with those new media (info-pyramid, everywhere the same infos,...)

Decisions:

- EAWS tries to use new media like facebook, twitter, blogs, podcast, RSS,... This is / will be an excellent way to reach young people!

CAAML

Presentations:

Pascal Haegeli (CAN) won the challenge of a 10 minutes CAAML course for avalanche forecasters. CAAML is an XML (eXtensible Markup Language) grammar for encoding of observations related to avalanche safety. The goal of CAAML is to facilitate the electronic exchange of avalanche safety information. (See some of the details, links and contacts in his presentation)

Points of discussion:

- CAAML guarantees an easy internal and external data exchange and supports the development of unified apps (e.g. SnowSafe www.snowsafesafe.at). It is useful for visualization of danger levels, snow profiles, avalanche accidents,...
- Documentation “for beginners”: <http://lwd.tirol.gv.at/downloads/tutorial.pdf>
- Abstract for a quick overview: <http://lwd.tirol.gv.at/downloads/ISSW.pdf>
- The WG will work on a unified visualization of avalanche danger levels which will be depicted on www.avalanches.org. A *.php-script helps all Avalanche Warning Services to create CAAML rather easily. More details:



16th Meeting of the European Avalanche Warning Services (EAWS), Grenoble

http://lwd.tirol.gv.at/downloads/caaml_adaptation_package_v1.zip Please contact Tobias Knothe from "courage mobile" knothe@courage-mobile.com in case of questions!

- WG will work on a unified visualization of snow-profiles.
- WG will work on a unified visualization of avalanche accidents
- WG will coordinate the development of CAAML-based, multilingual, online snow-profile-programs. WG also tries to harmonize the development of converters.
- A CAAML-Working-Committee has been installed to ensure the long-term viability and sustainability of the CAAML initiative. Up to now the following agencies have expressed interest in participating in the Working-Committee:

Canadian Avalanche Association (CAA)

Canadian Avalanche Centre (CAC)

Parks Canada

European Avalanche Warning Services (EAWS)

WSL Swiss Federal Institute for Snow and Avalanche Research SLF

Tyrolean Avalanche Warning Service

Colorado Avalanche Information Centre (CAIC, AAA)

International Association of Cryospheric Sciences (IACS)

AINEVA

Details: Contact Ian Tomm (CAC): itomm@avalanche.ca

For any additional information, contact Pascal Haegeli (pascal@avisualanche.ca) rather sooner than later !

Decisions:

- EAWS encourages the use of CAAML in order to improve and facilitate exchanges between different services. A comprehensive, up-to-date documentation is available on www.caaml.org.

www.avalanches.org

Presentations:

Bernhard Zenke (D) and *Patrick Nairz (A)* presented the website www.avalanches.org and its evolution. Several proposals to expand the content (mainly "Basics" and "EAWS intern" sections): update of addresses and links, meeting reports, photos of meetings, etc

Points of discussion:

- AWS Tyrol checks the links of the European map before winter starts.
- AWS Tyrol will develop a new design for winter season 2012-13. Internal area will be improved.

Decisions:

- Bulletin-related data (see Organizations) have to be actualized at least before each winter-season. Each AWS has to check his data the latest **till November 20th 2011** and send an e-mail (also when data are o.k.!) to lawine@tirol.gv.at.



- Due to the fact that some Avalanche Warning Services still use different versions of our basic information (e.g. Avalanche Danger Scale, Matrix), Glossary) the EAWS are encouraged to link directly to www.avalanches.org -> Basics.
- New content will be included (results of meetings, historical review, ...)

Additional information (given after the meeting):

Only for internal use:

NEW access to internal area on www.avalanches.org :

User: **eaws**

Password: **2012**

Session 4: Additional tools for forecasters

Database management, models, future / new developments

Presentations:

Patrick Nairz (A): LDW.net is a powerful application of the AWS Tyrol, which is used for visualization of snow and avalanche related data including data-management of pictures and addresses.

Mauro Valt (I): Yeti is an Italian complete system to manage snow profiles including penetrometers and snow observations. Mobile phone is used to insert manual data or import file. Then, files (*.pdf or *.jpeg) are sent by ftp and a complete web tool is used to display all the data. Yeti is already fully compatible with xml standard and AINEVA is updating it to CAAML.

Christine Pielmeier (CH): The SLF presented a mobile avalanche information system for Switzerland. The mountain guides provide and receive different information via iPhones. Information is sent during their trips.

Gerald Spreitzhofer (A) presented METGIS high resolution mountain weather forecasts for avalanche warning services. This software combines a meteorological and geographical information system with a specific focus on snow and mountain areas with efficient downscaling procedures of meteorological forecast fields and easy-to-use graphical user interface.

Piotr Drzewiecki (PL) showed the implementation and adaptation of the French Safran/Crocus/Mepra chain in the Tatra mountains.

Gérald Giraud (F) presented the integration of the snow drift modeling into the SCM chain using a 1D snow drift model named Sytron. After a first test of use by avalanche forecasters in the Isere department, the integration in the operational chain is expected in 2013/14.

Grant Statham (CA) gave the last presentation of this session about a new avalanche forecasting and public bulletin system in Park's Canada using new formats for public avalanche bulletins and new methods for avalanche forecasting. Mobile and web technology are used.



Session 5: Collaboration between avalanche warning services, institutions, agencies and public users

Presentations:

Maciej Karzynski (P) presents the Poland AWS which works in Tatra mountains for 60 years. The Institute of Meteorology and Water Management leads research activity, field observations and avalanche forecasting. It has had collaborations with several European AWS and has worked with the numerical models Safran-Crocus-Mepra for some years. It has developed several collaborations with other polish institutes (mountain rescue, meteorological office,...).

Paola Dellavedova (I) presents the system that is used by Bolzano and Val d'Aoste AWS to get observations from mountain guides. It is based on a simple contract with 25 mountain guides who provide a very simple set of data via SMS (location and 7 parameters with a 0-1-2 code; fresh snow, snowdrift, tracks,...), 600 to 800 SMS sent by winter. In addition, 20 selected mountain guides provides a very detailed set of observations (snow profiles, stability, tests, photos ...) on some identified survey itineraries requested by the forecaster.

Thomas Stucki (CH) presents OWARNA (Optimised warnings and alerting from natural hazards in Switzerland). This communication system includes all natural hazards occurring in Switzerland, including avalanches. Information and alerting of the public uses standard tools of communication (a 5-level scale as for avalanche, GIS maps, a common web site, a joint information platform GIN ...) and is particularly well adapted in the case of combination of natural hazards.

Mark Diggins (UK) presents the way of using information from mountain practionners in Scotland. The public can report avalanches using a web interface. The reports are checked by SAIS forecasters and put online.

Arnold Studeregger (A) presents the results of an online survey from the Styria AWS. 845 people participated to the survey: most of them were experimented mountaineers older than 30 years. The question that raises now is how to reach young people.

Engeset Rune (NO) presents the Norway AWS under development. A 2-year test has been done, with a bulletin production twice a week. An important work was done in several domains like forecast publishing and procedure, field observer procedures, network and reporting system, AWS network, snow models, collaboration and funding.

Alexis Mallon (F) acts as a representative of IFMGA-UIAGM (International Federation of Mountain Guides Associations – Union Internationale des Associations de Guides de Montagne). One objective of the IFMGA is to move towards the harmonization of technical guides training. His presentation focused on the use of snow and weather information by the mountain guides. He stressed that guides are very demanding users of avalanche bulletins. He particularly emphasized the fact that the guides frequently cross the borders of countries (or regions). He wishes a perfect harmonization of our products as well our bulletins in adjacent regions. By using standardized icons, maps, graphs we are on an excellent way to reduce barriers of language. The readability of the bulletins can still be improved. Guides would also be interested if the bulletin contained a meteorological history for the previous days.

He also gave his point of view on travel advice in the avalanche bulletin. Alexis is divided on this issue because this travel advice should be tailored to the public about



avalanche bulletins, the public is not homogeneous. It should also be remembered that in case of accident, the weight of the avalanche bulletin is very important.

IFMGA is entirely in favor of strengthening cooperation between guides and avalanche forecasters. This cooperation should be coordinated in all the European countries. New media opens up exciting possibilities.

Points of discussion:

Questions and comments were numerous. These include:

- Discussion returns on interpretation of risk level that seems different from one country (region) to another. This reinforces the need for exchanges between forecasters from different countries.
- Some participants have the feeling that the guides training have great differences from one country to another. Alexis mentions that IFMGA has worked on this issue and that the base of the training is now common (minimum number of training days, common program parts, ...)
- Alexis supports the insertion of the forecaster doubts in the bulletin, the human factor (level of uncertainty, ...) should be transcribed in the bulletin.
- Even if the travel advice was linked to the level of risk, Alexis is embarrassed with it because the risk level should not freeze the guide's opportunities to do their job. Some participants consider that travel advice is not (should not be) intended for guides. They are not very interesting except for a beginner audience.
- Local and Regional Forecast: avalanche bulletins are done at a regional scale, adaptation to local conditions is difficult. The guide may feel a contradiction between the bulletin and local conditions due to the difference of scale. The guide should use local information (from the field, other professionals,...) to adapt the risk level.
- The SLF has set up a feedback by the guides to the avalanche forecasters. This collaboration is very interesting. Again, the main problem is the potential gap between the local and regional information.
- Following the Swiss example (2 years of experience), the information exchange between guides and forecasters should be generalized.

Decisions:

- Alexis Mallon agrees to intensify the collaboration between IFMGA and EAWS; IFMGA will be included in Working Group in order to work on the following topics:
 - * field-information from guides to AWS (content, tools) (Swiss example),
 - * feed-back from guides about EAWS products
 - * situations with different risk levels in adjacent regions
 - * discussion about use and content of the travel advices



Session 6: Conclusions and objectives of the working group

Our process of harmonization is going on. The Working Group and AWS will deal with open issues which are presented in this document and highlighted again here...:

- avalanche size
- travel advice
- patterns
- statistics
- communication
- new media
- CAAML
- www.avalanches.org
- collaboration with mountain guides

Next conference: Catalonia 2013

Closing session :

In the end EAWS and ANENA presented their results and decisions. Thanks again to Météo-France and ANENA for the perfect organization!