Interpraevent 2012

Design: Nicole Sardat, Irstea - Centre de Grenoble

23rd to 26th April 2012
Grenoble - France

12th Interpraevent Congress

Protection of living spaces from natural hazards

Grenoble 2012
INTERPRAEVENT

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Preface

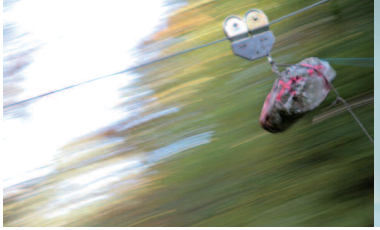
Interpraevent – both the society itself and the congress – stands for a meeting of people coming from science and practice in the field of "protection from natural hazards". The aim of the forum for experts from science, technology and administration was – and still is today – to analyze causes and to draw up plans for protection. Following the European flood disasters in the mid 1960ies, the society was founded in 1968 in Klagenfurt (Austria). Today, many private institutions and regions in the alpine area, as well as Japan and Taiwan, are member of Interpraevent. Topics, which the international network of experts has been dealing with for more than 40 years, are still up-to-date because the exchange of knowledge beyond borders, organisations and societies is supported.

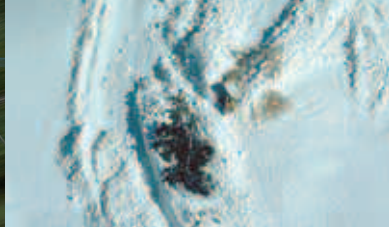
We all – and not only the anonymous "society" – constantly increase our demands on land use and mobility. At the same time, our demands on security and personal integrity become increasingly greater. To reduce risk we mostly try to reduce the hazard. But often we forget that risk can also be decreased by reducing damage potential (goods, which are within an endangered area). By an active participation every single person can help to improve the situation.

Traditionally Interpraevent congresses are simultaneously translated into the four languages English, French, Italian and German. But one tradition will be over: the different groups of natural hazards as floods, rock-fall, torrents and avalanches will not be treated separately anymore due to their different processes. Due to the topic of the authors congress submissions we will mix up processes and assign them to the special sector within the integral risk management. We would like to achieve that we easier get over national borders within natural hazards management and that real integral acting happens based on integral understanding.

Kurt Rohner
President
of Interpraevent

Didier Richard
Head of the local organising committee (Irstea, Grenoble)





International Research Society Interpraevent

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Organising Committee

Didier Richard	Irstea Grenoble
Frédéric Berger	Irstea Grenoble
Alexandra Fitzgerald	Irstea Grenoble
Alain Pilaud	Président SAEM Alpexpo

Specialized exhibition INTERPRAEVENT 2012

The 2012 INTERPRAEVENT congress will take place at the same time as the SAM – Salon de l'aménagement durable en montagne – a reference international meeting for sustainable land use planning in mountain areas where mountain security equipment as well as equipment related to the INTERPRAEVENT congress can be presented.

Information on the trade fair is available at:
www.alpexpo.com

sam 2012
MONDIAL DE L'AMÉNAGEMENT DURABLE EN MONTAGNE
WORLD EXHIBITION OF SUSTAINABLE MOUNTAIN DEVELOPMENT
WELTMESSE FÜR NACHHALTIGE RAUMPLANUNG UND ANLAGEN IN BERGGEBIETEN
25 TO 27 APRIL / AVRIL 2012
ALPEXPO GRENOBLE FRANCE

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Arrival

Place

ALPEXPO - Parc Evénementiel de Grenoble
Avenue d'Innsbruck – BP 2408
38034 Grenoble cedex 2 / France
Tel +33(0)4 76 39 66 00

By train:
High Speed Train (TGV)
Grenoble-Paris 3 hours - 7 trains every day
(other TGV from Lille, Nantes)
TGV : Tel 36 35 - www.sncf.com

By Air:
Lyon-St-Exupéry airport www.lyon.aeroport.fr: 50 mn drive
Tel + 33 (0) 826 800 826
Airport Grenoble-St-Geoirs: 30 mn drive
Tel + 33 (0) 4 65 48 48 www.grenoble.aeroport.fr
Airport Genève-Cointrin www.gva.ch: 2 hours drive
Tel: + 41 (0) 22 798 20 00
Air France : Tel 0820 820 820 www.airfrance.fr

By car:
Take Rocade Sud (coming from A48 Lyon-Grenoble or A41 Genève-Chambéry-Grenoble or A49 Valence-Grenoble) exit ALPEXPO.

From downtown / Grenoble train station:
Tramway line A, direction Echirolles:
Denis Papin, Stop Pôle Sud Alpexpo
Bus: Line 13, Stop Alpexpo
www.semitag.com

Programm

Sunday, 22nd April 2012

17:00-20:30 Conference Registration

Monday, 23rd April 2012

08:00 Conference Registration
09:30 Opening

10:00 Coffee break

Keynote Lectures
Moderated by Kurt Rohner (AT)

10:30 Bertrand Lefebvre, National Delegate to Natural Hazards and RTM actions (Restauration des Terrains en Montagne) (F)
The restoration of mountain terrains: evolution of the stakes, the missions and the RTM Service around a public policy

11:10 Kenneth Hewitt, Professor Emeritus, Dept. of Geography and Environmental Studies, Cold Regions Research Centre, Wilfrid Laurier Univ., Waterloo, Ontario (CA)
Societal dimensions of preventive and precautionary approaches to mountain land hazards

11:50 Dörte Aller, Responsible for the sector natural Risks - Building Insurance of the Canton of Zurich
Secure and insure – key factors to the Swiss integrated natural hazards risk management

12:30 Lunch




Session I – Data acquisition and modelling (Block 1)
Moderated by Johannes Hübl (AT)

14:00 Andreas Zischg (CH/I)
Consideration of permafrost and permafrost degradation in natural hazards assessment

14:20 Ting-Chi Tsao (TW)
Debris flow risk ranking and management – a case study in Taiwan

14:40 Peter Lamovec (SI)
Flash floods and peak discharge estimation

15:00 Oldrich Navratil (FR)
High-frequency monitoring of debris flows in the French Alps

15:20 Arnold Studeregger + Wilfried Ertl (AT)
Importance of meteorological measurement data for avalanche risk assessment

15:40 Coffee break

Session I – Data acquisition and modelling (Block 2)
Moderated by Niki Beyer Portner (CH)

16:00 Nicolas Lafarge (FR)
Monitoring and modelling of Lahar flows at Semeru volcano (Java, Indonesia)

16:20 Ghazi Al-Rawas (OM) + Robert Kirnbauer (AT)
Rainstorm characteristics in Oman and Austria

16:40 Marietta von Pfuhlstein (CH)
The new Flaz river – 8 years later. An exceptional project and its monitoring

17:00 Mohamed Naaim + Stephane Roudnitska (FR)
2D modelling of an exceptional historical avalanche for designing deflecting dams: The case of La Sache avalanche at les Brevières in Tignes (Savoie, France)

17:20 Bernhard Kohl (AT)
A contribution to the harmonization of deterministic and statistical flood estimation methods

17:40 Coffee break

18:00 Organizational announcements for the excursions

18:30-21:30 Video session
Moderated by Andreas von Poschinger (DE) and Robert Kirnbauer (AT)

Tuesday, 24th April 2012

08:00-18:00 Excursions

20:00 Gala dinner

Wednesday, 25th April 2012

Session I – Data acquisition and modelling (Block 3)
Moderated by Dominique Laigle (FR)

08:30 Catherine Berger (CH)
Debris flow simulation at Illgraben, Switzerland, using RAMMS

08:50 Perry Bartelt (CH)
Integral hazard management using unified software environments

09:10 Jérôme Dubois (CH)
NOMOS - High definition 2D model for flooding hazard assessment

09:30 Matthias Granig (AT)
A dynamic approach to evaluate the dense and powder snow avalanche model "samos-at"

09:50 Jean-Marc Tacnet (FR)
Uncertainty in natural hazards numerical modelling: application of a hybrid approach to debris-flows simulation

10:10 Coffee break

Session II – Hazard mapping and non-structural measures
Moderated by Matjaž Mikoš (SI) and Jean-Marc Tacnet (FR)

10:40 Bruno Mazzorana (IT)
Advanced scenario-based hazard analysis in practice: hydrodynamics and stochastic processes

11:00 Taro Uchida (JP)
Assessment for susceptibility of deep catastrophic landslide induced disasters in Japan

11:20 Frédéric Berger (FR)
Rockfall modelling and risk zoning: a case study in the French Alps using geomatics, airborne laser scanning, 2D & 3D runout models

11:40 Raffaele Rocco (IT)
Standard methodology to study debris flow hazard and risk mitigation in alpine basins

12:00 Sabina Steiner (CH)
Joint Information Platform for Natural Hazards in Switzerland

12:20 Lunch Break

Session III – Structural measures and environmental protection effects (Block 1)
Moderated by Florian Rudolf-Miklau (AT)

14:00 Bernd Kister (CH)
Analysis of torrent protective structures as a basic element of the hazard mapping process

14:20 Martin Detert (CH)
Drift wood retention to minimize flood risk for the city of Zurich - physical experiments

14:40 Tamara Ghilardi (CH)
Flood risk management of the Avançon river

15:00 Stefan Margreth (CH)
Handling of stone walls and earth terraces in avalanche starting zones

15:20 Ueli Gruner (CH)
Integral rock fall protection in Adelboden (Bernese Oberland)

15:40 Coffee break

Session III – Structural measures and environmental protection effects (Block 2)
Moderated by Hideaki Marui (JP)

16:10 Francesco Comiti (IT)
Preventing wood-related hazards in mountain basins

16:30 Markus Holub (AT)
Reducing vulnerability to mountain hazards by local structural protection

16:50 Olivier Marco (FR)
Reliability of avalanche protection structures

17:10 Franck Bourrier (FR)
Full scale field tests on rockfall impacting trees felled across the slope
17:30 Ratko Ristić (RS)
Torrential floods in Serbia - man made and natural hazard

17:50 Break

18.00-20.30 Poster session
Moderated by Bruno Mazzorana (IT) and Joe Schneider (AT)

Thursday, 26th April 2012

Session IV – Intervention and recovery
Moderated by Paolo Simonini (IT)

08:30 Roland Claudet + Philippe Bouvet (FR)
Expert assessment of avalanche risk for local avalanche prediction and crisis management
08:50 Julien Jadot (FR)
How to determine quantities and characteristics of waste produced by floods. Key elements and outlines for a methodology
09:10 Martin Buser (CH)
Local natural hazards advisors for civil staff units
09:30 Franziska Schmid (CH)
Towards an optimised early warning - developments in Switzerland
09:50 Tanja Prešeren (SI)
Contingency planning oriented hazard mapping

10:10 Coffee break

Session V – Risk governance and policies (Block 1)
Moderated by Hans Kienholz (CH)

10:40 Michael Bründl (CH)
"Econome-Railway" a new calculation method and tool for comparing the effectiveness and the cost-efficiency of protective measures along railways
11:00 Andreas Rimböck (DE)
Integral torrent development concepts
11:20 Norbert Sereinig (AT)
New tools to plan and evaluate participatory flood risk management
11:40 Hans-Heini Utelli (CH)
Risk concept for natural hazards on national roads - methodology and first experience
12:00 Lukas Hunzinger (CH)
Sharing the costs for protective measures based on a risk analysis

12:20
Student Poster Award ceremony

12:30 Lunch Break

Session V – Risk governance and policies (Block 2)
Moderated by Markus Stoffel (CH)

14:00 Rainer Höhne (DE)
OPTIMETH – contribution to an optimal usage of methods for describing torrential processes

14:20 Marco Baumann (CH)
Risk dialogue on natural hazards

14:40 Maria Papathoma Köhle (AT)
A new vulnerability function for debris flow - The importance of physical vulnerability in alpine areas

15:00 Martin Klose (DE)
Economic loss by landslides. Development of an empirical calculation model with regional application to German subdued mountains

15:20 Clemens Pfurtscheller (AT)
The costs of natural hazards in alpine environments

15:40 – 16:00 Closing ceremony

Excursions

Excursion 1

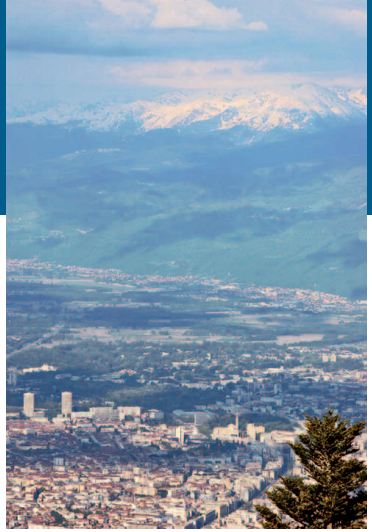
Romanche valley - Oisans
Excursion route: Grenoble – Séchilienne – Bourg-d'Oisans – Grenoble

The Romanche valley can be regarded as a major alpine site with respect to mass-driven phenomena. This appears clearly at the very beginning of the valley, at the famous Séchilienne site. This site exemplifies an extended rock mass instability mechanism with deep cracks that can be observed at the surface. Several scenarios assess the volume of removable materials reaching several tens of millions of cubic meters. The one-day trip will first focus on the Séchilienne site, with emphasis given to the most prominent instability features. After this first part, depending on the weather conditions and the presence of snow on the road, a visit of the Vaujany and Lac Blanc sites (located upstream) will be proposed.
The Col du Lac Blanc experimental site provides a variety of snow-related phenomena.
On the way to the site, we will also stop at the Saint-Antoine torrent in Bourg-d'Oisans, in the high basin where a number of substantial collapses have occurred.

Excursion 2

Full-scale avalanche test site at Lautaret Pass
Excursion route: Grenoble – Bourg-d'Oisans – La Grave – Lautaret Pass – La Grave – Bourg-d'Oisans – Grenoble

The Lautaret full-scale avalanche test site is owned by Irstea Research Institute and is known to avalanche specialists for its long experimental history, dating back to 1973. Different avalanche paths are located on the south-eastern slope of Chaillol Mountain (2600 m a.s.l. max) near Lautaret Pass (2058 m a.s.l). A reinforced-concrete shelter for data acquisition is located between two of the main avalanche paths. In path No. 1, a strong concrete anchor was built specifically to facilitate experiments. In avalanche path No. 2, a 4.0-m-high tripod support is located in the path. Small to medium avalanches occur at a sufficient frequency (up to three or four every winter). Avalanche flows are generally dense, wet or dry, with sometimes a small but fast powder cloud (or saltation layer). The dense part is usually less than 1 m thick. The run-out distance is 500–800 m with an average gradient of 36°. Typical released volumes vary from 500 to 10,000 m^3 and the maximum front speed can reach 30–40 m/s. These characteristics make this site particularly advantageous for experiments on infrastructures and avalanche impacts, as well as avalanche dynamics. Path N°. 1 is dedicated to studies of avalanche impact pressure on structures. A 1-m^2 plate is supported by a steel beam embedded in the ground and placed normal to the avalanche direction. Strain gauges are placed on the beam's reinforced foot in the maximum momentum zone and a slide system makes it possible to locate the plate exactly at the surface of the initial snowcover prior to avalanche release. Impact pressure is reconstructed from strain gauge data. The flow velocity is measured from correlation of a high-frequency IR sensor signal. Path N°. 2 is dedicated to avalanche dynamics. Pressure and flow velocity are recorded along the avalanche height on the 4-m-high tripod. The visit will focus on these two measurement devices.



Excursion 3

Isère River floods in the Grésivaudan valley
Excursion route: Grenoble area – Grésivaudan valley

Upstream from Grenoble, the Isère River flows in the wide Grésivaudan valley, overlooked by the Belledonne and Chartreuse mountains. The Grenoble metropolitan area and all of the valley towns have therefore long been exposed to flooding from the Isère. Substantial containment and drainage works in the alluvial plain have been conducted since the historic 1859 flood. This 1859 flood, whose return period was estimated at 200 years, is the design flood, used for the Isère Amont development project. Its flow in Grenoble is 1480 m^3/s.
Strong urbanization at the valley bottom has considerably increased this zone's vulnerability. Many of the Isère's lateral tributary torrents add a local torrential threat to the lower basin sectors.
The excursion will present various measures taken to manage flood risk in the Grésivaudan valley: hydraulic studies and structures, risk zoning, maintenance, dyke improvement, bank protection works, and a flood prediction system.

Excursion 4

Manival torrent
Excursion route: Grenoble – Saint-Ismier – Grenoble

The Manival torrent is a very active debris-flow torrent located near Grenoble. Entrenched in the eastern flank of the Chartreuse Mountains, it has constructed a large alluvial fan in the Isère River valley, recognized as one of the largest in the French Alps. Bedrock is composed of highly fractured, alternating sequences of Jurassic marls and limestones. The close proximity to Grenoble promoted a massive urbanization of the fan, where residential areas have dramatically grown over the last 40 years. To prevent the propagation of debris flows on the fan, a large sediment trap was built in the upper catchment. In 2008, an intensive monitoring program was initiated to better understand the complex sediment transfer in the catchment, from the sources to the sediment trap. A debris-flow monitoring station has recently been deployed, and intensive topographic surveys using terrestrial and airborne lidar provide insight into the geomorphic response of the torrent. The objective of the excursion is to present the history of the torrent-control works in the catchment, the present-day hazards mitigation management, and associated problems related to sediment management, as well as the observations derived from the recent monitoring program. The visit will be organized by Irstea Grenoble and the RTM department of the Isère department, in charge of the torrent's management.

Excursion 5

Taconnaz avalanche path
Excursion route: Grenoble – Chamonix – Grenoble

The Taconnaz avalanche path is located between the municipalities of les Houches and Chamonix, in the upper part of the Arve valley, Haute-Savoie, France. It is more than 80% covered by a glacier. The immensity of its starting areas, its length (7 km), its altitude drop (3000 m), the avalanche frequency (88 records over one century), the avalanche types (dense and mixed), the number of at-risk structures located in its run-out zone, and its huge and complex defence structure system make this path an exceptional site to visit. From a technical point of view, avalanche forecasting is not suitable because of the triggering induced by Seracs, which accounts for up to 30% of the recorded avalanches. In terms of prevention, both hazard zoning and passive defence structures have been used. An expert assessment conducted by Irstea required the use of recent advances in extreme events statistics to determine the reference event and the use of physical and numerical modelling to design a defence structure system in a run-out area that remains relatively steep.

Excursion 6

Bioengineering for torrential erosion control; landslide observatory

Excursion route: Trièves region; Grenoble – Roissard – Saint-Laurent-en-Baumont – Grenoble

This excursion will cross the Trièves region, a large clayey plain encircled by great alpine mountains, submitted to frequent mass movements and torrential events.

Bioengineering employs the techniques and strategies using plants for soil erosion control and management. It aims at achieving objectives of restoration, rehabilitation and reallocation of eroded areas.

France has longstanding experience in this field, most particularly in torrent and gully restoration. Erosion problems appeared in France in the nineteenth century, due to deforestation and overgrazing. Land degradation was responsible for floods, debris flows and mudflows, especially in mountainous areas. Laws were therefore established in 1860 to combat erosion, and the Restauration des Terrains en Montagne (RTM) department was created to lead restoration actions. Operations for ecological restoration of degraded catchments have been carried out since 1880. Different techniques have been used: civil engineering used in torrents was combined with bioengineering used in small gullies.

Nowadays, the know-how of this land restoration department and many private companies has gained recognition throughout France. In 2009, a French association of bioengineering for soil erosion control (AGéBio) was created. Its aim is to promote the use of soil bioengineering techniques in France, on various types of terrain (torrential catchments, river and lake banks, slopes, cultivated soils, ski pistes, etc.) and in various regional conditions with their specific climatic, ecological and socio-economic issues.

During this excursion, we will visit two torrential catchments where old and current bioengineering structures have been built: fascines, wattle fences, small terraces, etc. Research tests are also carried out to increase our knowledge on the efficiency of such techniques. We will also visit important landslide sites.

Excursion 7

Natural Hazard Prevention Plan, trajectographic simulation model, and protection structure test
Excursion route: Grenoble – Veyrier-du-Lac – Grenoble

The town of Veyrier du Lac, located on the shores of Annecy Lake in the Haute-Savoie department, is 7 km downstream of a cliff. The main risk that threatens the town's property and inhabitants is generated by rockfalls and boulder falls. From 2008 to 2009, the Natural Hazard Prevention Plan was revised following several events, fortunately without consequence. This was the first Natural Hazard Prevention Plan in France using a three-dimensional trajectographic simulation tool taking into account the action of the forest vegetation. The 20 January 2009 event validated the results of the simulations. Based on these results, a protection structure (a barricade) was sized.
This excursion includes a presentation in the town hall of the simulation works, a visit of the site concerned by the 20 January 2009 event, and a visit of the barricade.

Excursion 8

Rockfall protection structures: net fence testing facility and innovative rock-shed
Excursion route: Grenoble – Montagnole – Arly Gorge / Champagny-en-Vanoise – Grenoble

This excursion is devoted to passive rockfall protection structures. First, we will visit the testing facility recently built by IFFSTAR (formerly LCPC) to perform real-scale tests on rockfall protection works. This facility is most particularly used to test net fences, for their approval within the ETAG 27 framework. The equipment allows dropping 20 T boulders from a height of up to 45 m. A full visit of the facility is planned, together with a real-condition test.
Then a particular type of rockfall protection gallery will be visited. This rock-shed is made of a reinforced concrete slab held up by specially designed supports that act as a type of expendable fuse to absorb high rock-fall energy. Compared to more classical galleries, the impact energy is not dissipated by a cushion layer but by these fuses. Depending on site accessibility, the visit will examine either the Arly gorge or the Champagny-en-Vanoise rock-shed.

Excursion 9

Drôme Valley

Excursion route: Grenoble – Crest – Valdrôme – Grenoble

During the 19th century, the Drôme River was a very active aggrading braided river draining an overgrazed and deforested upland catchment. Most of its tributaries were active torrents prone to intense debris-flow activity and bedload transport. To prevent flooding risks related to aggradation in the main valley, an ambitious program of reforestation and torrent-control works started in the 1860s. At the same time, the population in the catchment started to decrease, as well as the agricultural pressure on the landscape. Spontaneous reforestation progressively took place, with a strong effect on hillslope erosion. The sediment supply from the torrents dramatically decreased concomitantly with intense gravel mining in the main valley. The Drôme River is now an incised single-thread river along most of its course, a situation which generates new problems related to sediment and river channel management (destabilization of bridges, groundwater table lowering, and loss of aquatic habitats).

The first objective of the excursion is to present the long-term history of the Drôme River sediment management and the complex but necessary conciliation between natural hazard prevention and environmental protection and restoration in the French Alps.

The excursion also includes the visit of a marteloscope set up in a pine stand in Valdrôme (Drôme department). A marteloscope is a quadrat on which all the trees were mapped with a tree growth model as well as a trajectographic simulation model to account for the action of trees. With these data and tools, virtual tree marking can be carried out and proposals for sylvicultural management can be tested and analysed, so assist forest managers and make those in charge of natural hazards aware of the protective role played by mountain forests.

The excursion will give the opportunity to visit scenic landscapes of one of the most preserved French alpine valleys, in a specific context of climatic transition between continental and Mediterranean influences. The Drôme valley is also famous for its specific wine production and local products from organic agriculture.

Excursion 10

Natural risks management in the Maurienne valley
Excursion route: Grenoble – Modane (several stops in the Maurienne valley)

The Maurienne valley is an alpine valley, approximately 130 km long, drained by the Arc river. It is a major axis of international communication between France and Italy, with a railway track crossing the Frejus railway tunnel (inaugurated in 1871) and a motorway (inaugurated in 2003) connected to the Frejus road tunnel (inaugurated in 1980), not to mention the high-speed railway project between Lyon and Turin. Consequently, a large share of the goods transiting between France and Italy uses infrastructures present in the Maurienne valley. Even if their presence is tending toward decline, heavy industries, attracted in the early twentieth century by the presence of hydro-power plants, are still present in the Maurienne valley. Tourism activity has developed mainly over the last 40 to 50 years, after the creation of the Vanoise national park (1963) and the development of several ski resorts.

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