GESCHÄFTSBEREICH LEBENSMINISTERIUM.BAYERN.DE

7th EUREGEO

Bologna | Italy | june 12th - 15th 2012

Bavarian Environment Agency

THE 3-REGIONS WORKING GROUP

SLOPE INSTABILITIES (SlopeIn)

COMMON LANGUAGE, COMPARABLE HAZARD MAPPING AND SHARED EXPERIENCES ACROSS EUROPE

The 3-Regions Working-Group SlopeIn:

History:

1992:

Start of the informal collaboration between the Geological Surveys of Emilia-Romagna, Catalonia and Bavaria in the fields of the Earths Science and Information Systems.

→ Organisation of conferences in Bologna (1994), Barcelona (1997), Munich (2000) and Bologna (2003)

Regione Emilia-Romagna

IGC Institut Geològic de Catalunya

Bavarian Environment Agency

The 3-Regions Working-Group SlopeIn:

History:

November the 19th, 2004:

Based on this collaboration programme an **Agreement Protocol** was signed between:

Regione Emilia-Romagna

Generalitat de Catalunya

Free State Bavaria

The 3-Regions Working-Group SlopeIn:

History: November the 19th, 2004

Freistaat Bayern RegioneEmiliaRomagna Generalitat de Catalunya

AGREEMENT PROTOCOL

between

FREISTAAT BAYERN

and

REGIONE EMILIA-ROMAGNA

and

GENERALITAT DE CATALUNYA

Date 19.11.04

BAYERN	EMILIA-ROMAGNA	CATALUNYA
Dr. Werner Schnappauf	**Prof. Mariopluigi Bruschini**	**Prof. Joaquim Nadal i Farreras**
Bayerischer Staatsminister für Umwelt, Gesundheit und Verbraucherschutz	Assessore Difesa del Suolo e della Costa Protezione Civile	Conseller de Política Territorial i Obres Públiques

Regione Emilia-Romagna

Generalitat de Catalunya
www.gencat.cat

Bayerische Staatsregierung

The 3-Regions Working-Group SlopeIn:

History: November the 19th, 2004

Main one main target of the **Agreement Protocol**:

"assess hazards, minimising risks and maximising awareness to enhance sustainable development and quality of life"

The 3-Regions Working-Group SlopeIn:

History:

Following:

2006:

Organisation of the conference in Barcelona

2009:

Organisation of the conference in Munich

The 3-Regions Working-Group SlopeIn:

History:

At the last conference in Munich 2009 the Organising Committee decided to implement different working groups in order to strengthen the collaboration in particular areas of interest of the three regions.

One working group was called **"Land Instabilities".**

Slope Instabilities Working Group

SlopeIn

The SlopeIn Working Group:

Members:

Marta González, Institut Geològic de Catalunya, mgonzalez@igc.cat

Giovanni Bertolini, Servizio Geologico, Sismico e dei Suoli Regione Emilia Romagna,
GBertolini@regione.emilia-romagna.it

Karl Mayer, Bavarian Environment Agency, Karl.Mayer@lfu.bayern.de

Results of the collaboration of SlopeIn:

European AdaptAlp Project

(Adaptation to climate change in the Alpine space)

Multilingual glossary for landslides.

Minimum Requirements for the creation of hazard maps and methodologies.

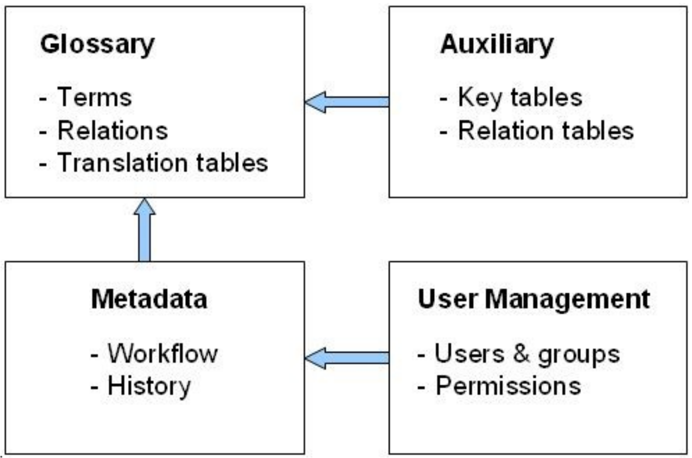
Results of the collaboration of SlopeIn:

AdaptAlp

- Bavarian Environment Agency
- Land Kärnten (Dep. Environment)
- Federal Office for the Environment (Swiss)
- Geological Survey of Slovenia
- Institut Geologic de Catalunya (Spain)
- Servicio Geologico, Sismico e del Suoli (Emilia-Romagna, Italy)
- Office National des Forets (RTM)
- Britisch Geological Survey

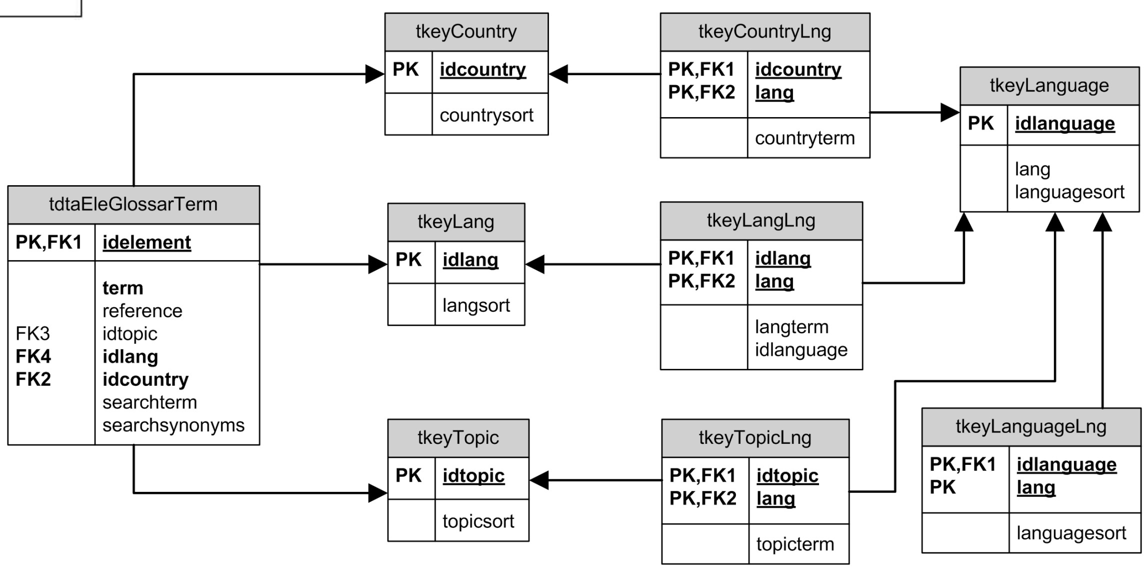
Development of a multilingual glossary for geological hazards

Development of a multilingual glossary for geological hazards



Overview of the database model components

Auxiliary tables



For filling the Glossary with contents *SlopeIn* took the responsibility for Catalan, Spanish, German and Italian language

	DE				FR			EN		
id	term	definition	reference	topic	same	similar	direct	same	similar	direct
2080	Hauptrutschmasse	Gesamter Rutschkörper der primären Hangbewegung.	LfU Bayern	Rutschungsmerkmale	1080			3080		
2081	Rutschungsfuß	Unterster Teil des Rutschkörpers.	LfU Bayern	Rutschungsmerkmale	1081			3081		
2082	Stirnwulst	Wulst am Rutschungsfuß.	LfU Bayern	Rutschungsmerkmale	1082			3082		
2083	Gleitbahn	Bewegungsbahn von Rutschprozessen.	LfU Bayern	Rutschungsmerkmale	1083			3083		
2084	Bergsturz	Hangbewegung mit großem Volumen und hoher Dynamik, die oftmals dafür sorgt, dass die Massen am Gegenhang weit aufbranden. Volumen > 1.000.000m³.	LfU Bayern	Sturzprozess	1084			3084		
2085	Blockschlag	Periodisches Sturzereignis von einzelnen, kleineren Festgesteinspartien mit einer Blockgröße von > 1m³	LfU Bayern	Sturzprozess	1085				3085	
2086	Felssturz	Abstürzen ganzer Felspartien, Volumen 10-1.000.000m³, die Dynamik ist deutlich geringer als beim Bergsturz. Im Gegensatz	LfU Bayern	Sturzprozess		1086			3086	
2087	Steinschlag	Periodisches Sturzereignis von einzelnen, kleineren Festgesteinspartien bis hin zur Blockgröße. Volumen 0-10m³.	LfU Bayern	Sturzprozess	1087				3087	
2088	Doline	Relativ engräumige, mehr oder weniger runde Hohlformen an der Erdoberfläche als Folge der Auflösung von Sulfat-, Chlorid- oder Karbonatgesteinen durch über Klüfte versickernde Oberflächenwässer.	LfU Bayern	Subrosionsprozess	1088			3088		
2089	Uvala	\"Zusammenwachsen\" von mehrerer Dolinen zu einer größeren Senke	LfU Bayern	Subrosionsprozess	1089			3089		
2090	Dolinenfeld	Anhäufung mehrerer Dolinen.	LfU Bayern	Subrosionsprozess	1090			3090		
2091	Erdfall (Vorgang)	Erdfälle bilden sich infolge unterirdischer Lösung/Ausspülung durch den plötzlichen Einsturz der Erdoberfläche und bilden Trichter- oder Schlotformen, die bei oft nur geringer Tiefe einen Durchmesser von Dezimetern bis zu Zehnermetern aufweisen. Erdfallgebiete sind in ihrer Ausdehnung meist bekannt, doch kann der einzelne Erdfall sowohl zeitlich als auch örtlich kaum vorhergesagt werden. Man findet sie in Gruppen; mitunter sind sie auch perlschnurartig aneinander gereiht.	LfU Bayern	Subrosionsprozess	1091			3091		

The Glossary:

Glossar

This glossary aims at an international harmonization by providing the user with a selection of official terms used by the geological agencies in a specific country and by setting relations to synonymous terms employed in other countries. Terms with (*) at the end are not used in the selected source language but are translated literaly to understand the meaning.

1. select language

source language

DEU | SUI | AUT | FRA | ITA | SVN | ESP | GBR | CAT

target language

DEU | SUI | AUT | FRA | ITA | SVN | ESP | GBR | CAT

2. select term

A B C D E F G H I K L M P R S T U

- Debris cone/debris fan
- Debris cone/debris fan
- Debris fall/Rock fall
- Debris Flow
- Depression
- Depression/hollow
- Doline field/Doline karst
- Dormant landslide

The Glossary:

Glossar

Dieses Glossar dient der internationalen Begriffsharmonisierung im Bereich Hangbewegungen und Gefahrenkartierung für geologische Prozesse. Es stehen Begriffe zur Auswahl, die in den jeweiligen Regionen und Ländern von den Geologischen Diensten offiziell benutzt werden. Für nicht direkt übersetzbare Begriffe werden Synonyme mit Erläuterungen angegeben. Begriffe mit (*) am Ende werden in der gewählten Ausgangssprache nicht verwendet, sind aber wörtlich übersetzt, um die Bedeutung verständlich zu machen.

1. Sprachen wählen

Ausgangssprache

DEU SUI AUT FRA ITA SVN ESP GBR CAT

Zielsprache

DEU SUI AUT FRA ITA SVN ESP GBR CAT

2. Begriff auswählen

A B D E F G H I K L M N P R S T U V Z

- Abflusslose Senke
- aktive Maßnahmen
- Aktuelle Hangbewegung
- Anbruch
- Auslöser

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3. Definition

Begriff	Übersetzung Zielsprache CAT
Aktuelle Hangbewegung Hangbewegung die zum Zeitpunkt der Aufnahme aktiv oder bezüglich ihres Alters für die Untersuchungen relevant war. Quelle: LfU Bayern	**Moviment actiu** Massa rígida de sòl o d'un bloc rocós en un vessant que es mou a l'actualitat. Quelle: IGC

Legende: Synonym, Ähnlicher Begriff, Wörtliche Übersetzung

3. definition

term	translation target language CAT
Active landslide Landslide was moving at time of observation (field visit) or when reported and entered into database (reported occurence) source: BGS	**Moviment actiu** Massa rígida de sòl o d'un bloc rocós en un vessant que es mou a l'actualitat. source: IGC

legend: synonym, similar term, literally translation

The Glossary:

Terms which are used in the Geological Surveys of the

Glossar

Dieses Glossar dient der internationalen Begriffsharmonisierung im Bereich Hangbewegungen und Gefahrenkartierung für geologische Prozesse. Es stehen Begriffe zur Auswahl, die in den jeweiligen Regionen und Ländern von den Geologischen Diensten offiziell benutzt werden. Für nicht direkt übersetzbare Begriffe werden Synonyme mit Erläuterungen angegeben. Begriffe mit (*) am Ende werden in der gewählten Ausgangssprache nicht verwendet, sind aber wörtlich übersetzt, um die Bedeutung verständlich zu machen.

1. Sprachen wählen

Ausgangssprache

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Zielsprache

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2. Begriff auswählen

A B D E F G H I K L M N P R S T U V Z

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legend: synonym · similar term · literally translation

Harmonisation of terminology and definitions for different maps

Harmonisation of terminology and definitions for different maps

Because of the inconsistent usage of terms and definitions the comparability of susceptibility, hazard and risk maps is very difficult.

This fact could cause understanding problems.

Therefore three common definitions for three main types of maps were elaborated inside a Workshop held in Munich at December 2010.

Harmonisation of terminology and definitions for different maps

Definitions

Landslide Susceptibility Map Level 1

Landslide Susceptibility Map Level 2

Landslide Hazard Map

Harmonisation of terminology and definitions for different maps

Landslide Susceptibility Map Level 1

A Landslide Susceptibility Map (Level 1) is used for the first identification of areas showing conflicts of interests or areas under suspicion to be hazardous. It is a map created on objective, scientific criteria with information on hazard susceptibility, which are not analysed, identified and localised in detail. With empirical, statistical or deterministic methods these maps show the basic disposition for the development of landslides. In general only the potential detachment zone of the landslides is shown and no classification of different hazard levels (probability and intensity) is done.

Harmonisation of terminology and definitions for different maps

Landslide Susceptibility Map Level 2

A Landslide Susceptibility Map (Level 2) is used for the first identification of areas showing conflicts of interests or areas under suspicion to be hazardous. It is a map created on objective, scientific criteria with information on hazard susceptibility, which are analysed, identified and localised. With empirical, statistical or deterministic methods these maps show the basic disposition for the development of landslides. In general the whole process areas of the landslides and the propagation areas are shown (potential detachment and runout zone) and no classification of different hazard levels (probability and intensity) is done.

Harmonisation of terminology and definitions for different maps

Hazard Map

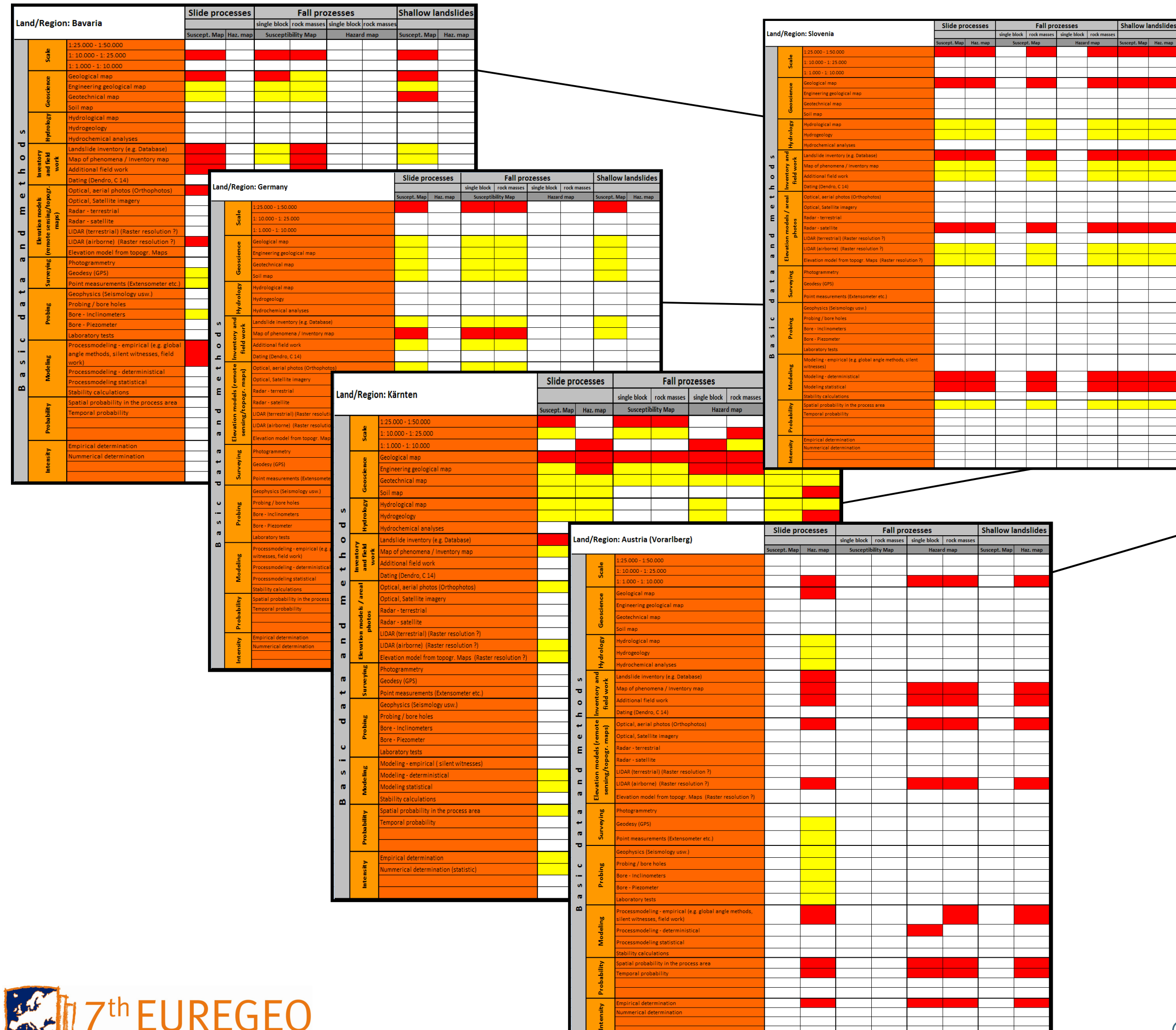
A Landslide Hazard Map builds the base for urban land use planning and the development and the costing of protective measures. It is a map created on objective, scientific criteria with information to hazard, which are analysed, identified and localised in detail. With empirical, statistical or deterministic methods in general the whole process areas of the different types of landslides, including the propagation areas are considered (potential detachment and runout zone) and a classification of different hazard levels based on probability and intensity is done.

Comparison of the different maps in our countries

(Based on the "new" definitions)

Country	Process	Landslide Suscep. Map (L1)	Landslide Suscep. Map (L2)	Hazard Map
Germany (Bavaria)	slide		Susc Map (1:25.000)	
	fall		Susc Map (1:25.000)	
	shallow landslides		Susc Map (1:25.000)	
Austria (WLV)	slide			Hazard Zone Map (1:2.000)
	fall			Hazard Zone Map (1:2.000)
	shallow landslides			Hazard Zone Map (1:2.000)
Austria (GBA and Carinthia)	slide	Susc Map (1:25.000-50.000)		Hazard Zone Map (1:1.000-1:10.000)
	fall	Susc Map (1:25.000-50.000)		Hazard Zone Map (1:1.000-1:10.000)
	shallow landslides	Susc Map (1:25.000-50.000)		Hazard Zone Map (1:1.000-1:10.000)
Switzerland	slide		Susc Map (1:10.000-1:50.000)	Hazard Map (1:2.000-1:10.000)
	fall		Susc Map (1:10.000-1:50.000)	Hazard Map (1:2.000-1:10.000)
	shallow landslides		Susc Map (1:10.000-1:50.000)	Hazard Map (1:2.000-1:10.000)
Great Britain (BGS)	slide	Susc Map (1:10.000-1:50.000)		
	fall			
	shallow landslides	Susc Map (1:10.000-1:50.000)		
Italy (Arpa Piemonte)	slide		Atlas of Hydrogeological Risk (1:10.000)	
	fall		Atlas of Hydrogeological Risk (1:10.000)	
	shallow landslides		Atlas of Hydrogeological Risk (1:10.000)	
Italy (South Tyrol)	slide			Hazard Plan (1:5.000-1:10.000)
	fall			Hazard Plan (1:5.000-1:10.000)
	shallow landslides			Hazard Plan (1:5.000-1:10.000)
Italy (Emilia Romagna)	slide		Susc Map (1:10.000)	
	fall			
	shallow landslides	Susc Map (1:10.000)		
Spain (Catalonia)	slide		Geological Risk Prevention Map (1:25.000)	
	fall		Geological Risk Prevention Map (1:25.000)	
	shallow landslides		Geological Risk Prevention Map (1:25.000)	
Slovenia	slide	Susc Map (1:250.000)	Hazard Map (1:25.000) in progress	
	fall	Susc Map (1:250.000)	Hazard Map (1:25.000) in progress	
	shallow landslides	Susc Map (1:250.000)	Hazard Map (1:25.000) in progress	
France	slide	Plan for Prevention of Natural Hazard (1:25.000)	Plan for Prevention of Natural Hazard (1:10.000)	
	fall	Plan for Prevention of Natural Hazard (1:25.000)	Plan for Prevention of Natural Hazard (1:10.000)	
	shallow landslides	Plan for Prevention of Natural Hazard (1:25.000)	Plan for Prevention of Natural Hazard (1:10.000)	

Minimum requirements for susceptibility and hazard maps



Evaluation of the requirements in every particular country

Minimum requirements for susceptibility and hazard maps

		Slide processes			Fall prozesses						Shallow landslides			Details
		Landslide Susceptibility Map		Hazard Map	Landslide Susceptibility Map				Hazard map		Landslide Susceptibility Map		Hazard Map	
					single block		rock masses		single block	rock masses				
		Level 1	Level 2	Haz. map	Level 1	Level 2	Level 1	Level 2	Hazard map		Level 1	Level 2	Haz. map	
Geologycal maps and derivated	Geological map													use of geological maps and all deviated products
Landslide inventory in the broadest sense	Landslide inventory (e.g. Database/ Inventory Map)													landslide inventory in the broadest sence
	Field work (Investigation/Validation)													including field investigation and validation
Elevation models /areal photos	Elevation model													
	Optical, aerial photos (Orthophotos)													
	LIDAR (terrestrial)													
	LIDAR (airborne)													
	Elevation model from topogr. Maps													
Modeling in the broadest sense (slides can be found by field investigaton)	Modeling				D	D+P	D	D+P	D+P	D+P	D	D+P	D+P	modeling in the broadest sence. Slide process areas can be found by field investigation
	Modeling - deterministical				D	P			P	P	D	D+P	D+P	
	Modeling - statistical				D						D	D+P	D+P	
	Modeling - empirical				D	D	D	D+P	D	D+P				
Probabilpty (spatial and temporal probability must be unified in a matrix.	Spatial probability in the process area													spatial and temporal probability must be unified in a matrix. Information can be qualitative
	Temporal probability													
Intesity (Information can be qualitative)	Empirical determination													Information can be qualitative

D = Disposition Model (Detachment Zone)

P = Process Model (Runout Zone)

Basic data or method is mantatory

One out of several methods must be used

Minimum requirements for susceptibility and hazard maps

Publications:

AdaptAlp
Adaptation to Climate Change in the Alpine Space

Alpine SPACE
EUROPEAN TERRITORIAL COOPERATION
THIS PROJECT IS CO-FUNDED BY THE EUROPEAN REGIONAL DEVELOPMENT FUND
investing in your future

Multilingual Glossary

http://www.adaptalp.org

Multilingual Glossary and final report

http://www.lfu.bayern.de/geologie/massenbewegungen/glossar/index.htm

Results of the collaboration of SlopeIn:

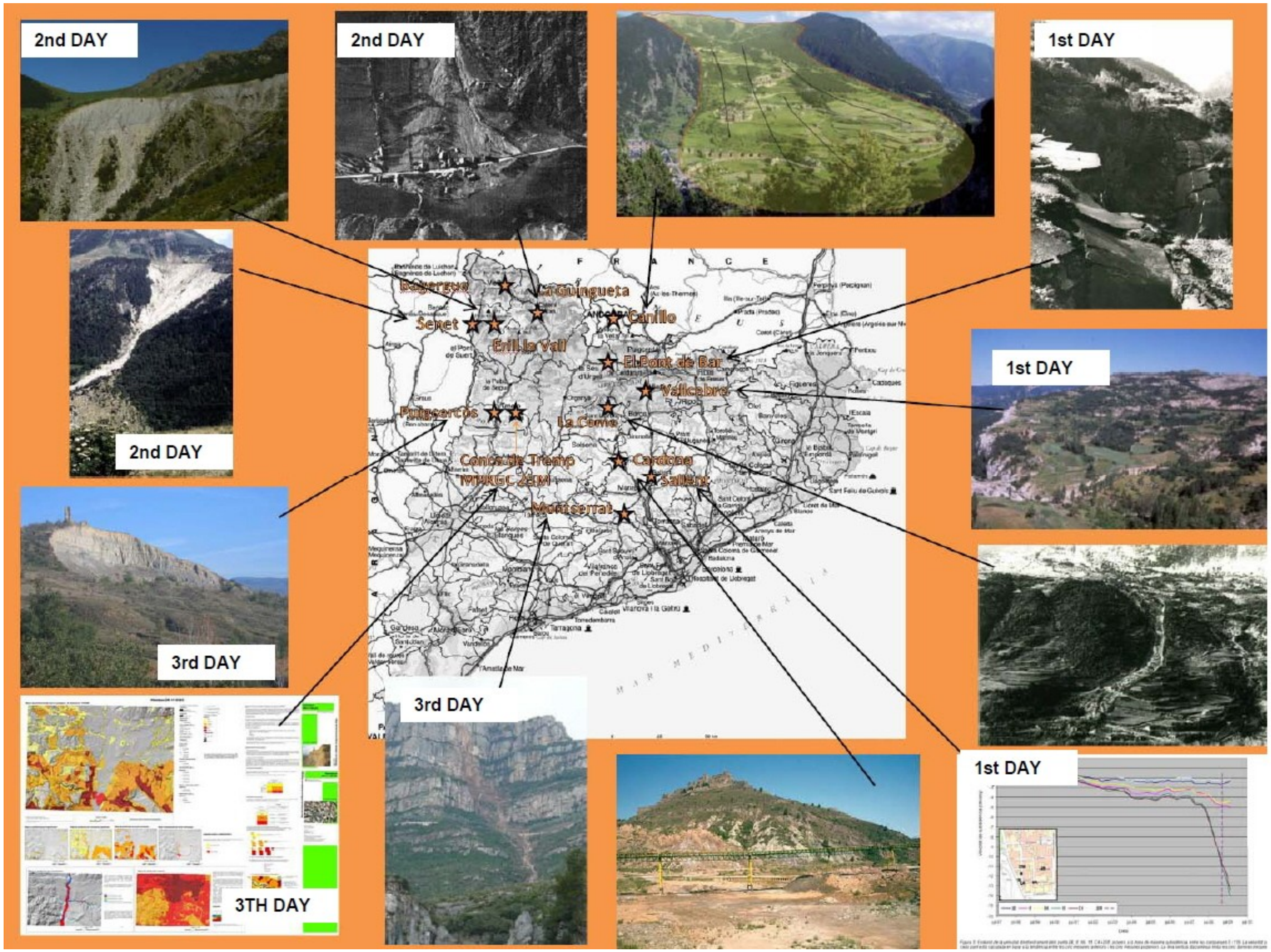
Organization of a technical excursion for specialists to landslides and debris flows in Catalonia.

28 excursion participants from Geological Surveys, Water Authorities, Road Authorities and Universities of

Catalonia, France, Austria and Germany

have been guided by the IGC collaborators to the most important subsidence, landslide and debris flow sites in Catalonia.

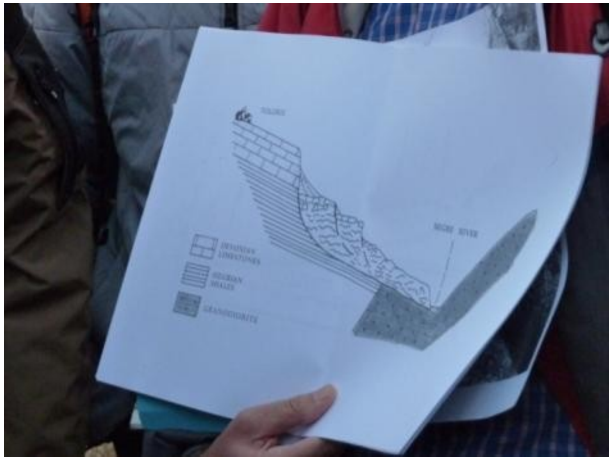
Technical Excursion to Catalonia:



Technical Excursion to Catalonia:





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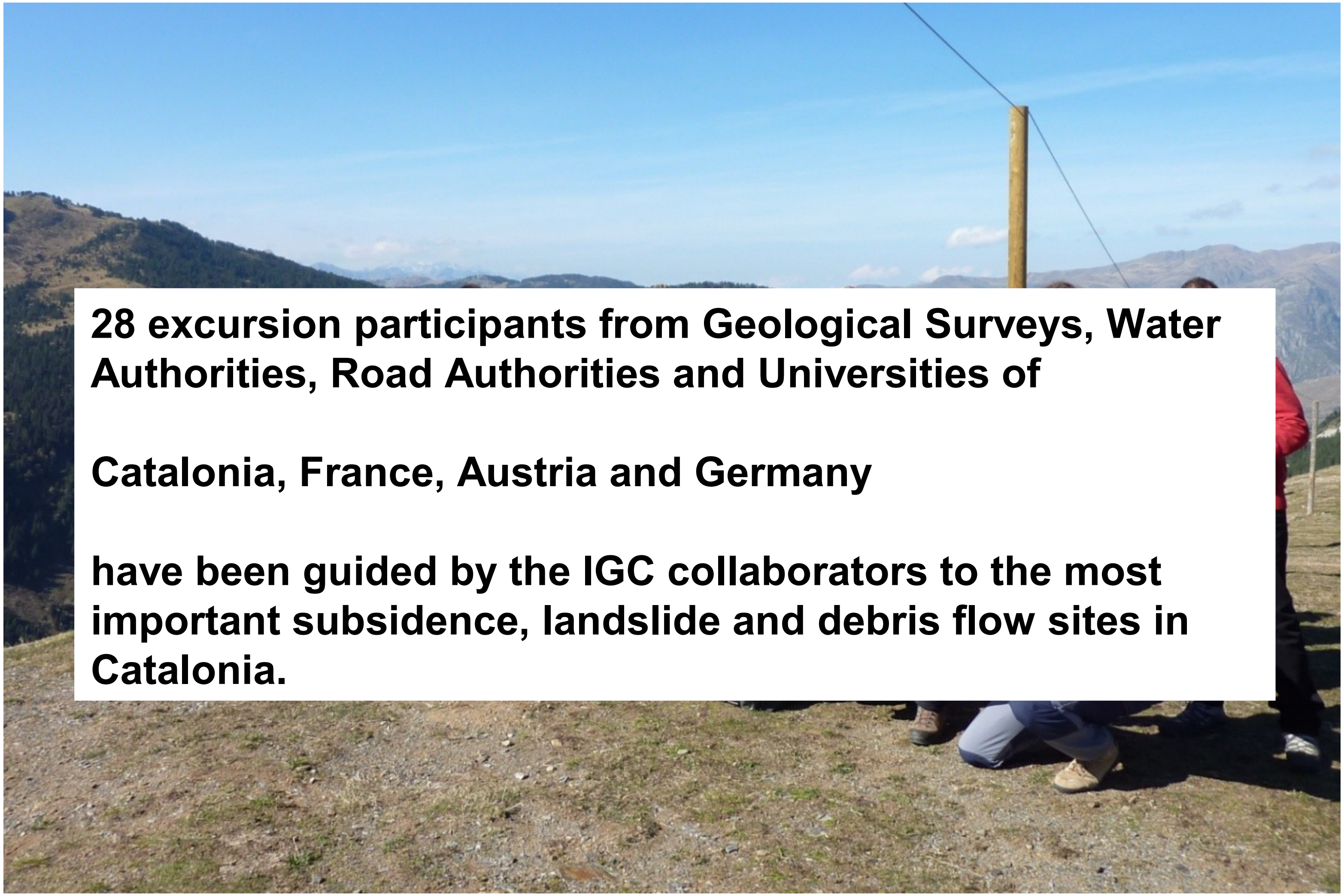

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Results of the collaboration of SlopeIn:

The 7th congress of Bologna 2012:

Organization and of the
Session 1 Slope Instabilities
in the congress of Bologna in 2012.

7th EUropean Congress
on REgional GEOscientific Cartography
and Information Systems
Sustainable Geo-Management
Bologna | Italy
june 12th - 15th 2012

Results of the collaboration of SlopeIn:

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Chairman

Professore Nicola Casagli - University of Firenze

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