RECIPE

REINFORCING CIVIL PROTECTION CAPABILITIES INTO MULTI-HAZARD RISK ASSESSMENT UNDER CLIMATE CHANGE

Minutes of the RECIPE Project 1st Workshop

MILESTONE 3

March 31th 2020

Funded by European Union Humanitarian Aid and Civil Protection

Project name: Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change (RECIPE)

Financed by: DG ECHO 2019 Call for projects on prevention and preparedness in civil protection and marine pollution

Website: http://recipe.ctfc.cat/ **Twitter**: @NAThaz_recipe **Mail:** recipe@ctfc.cat

Partnership: Forest Science and Technology Centre of Catalonia - CTFC (Coord.), Pau Costa Foundation - PCF, Civil Protection General Directorate of Catalonia - DGPC-CAT, Forest Research Institute Baden-Wüttemberg - FVA, CIMA Research Foundation - CIMA, Austrian Research Centre for Forest Natural Hazards and Landscape - BFW, Institute of Cartography and Geology of Catalonia - ICGC, Higher Institute of Agronomy- ISA

Duration: 2020-2021

CONTENTS

1. Objective

The 1st Workshop is part of the **Work Package 2 – Framing civil protection requirements for integrated multi-hazard risk management**, which seeks to frame a common risk assessment approach, able to integrate multi-hazard risk interactions and the civil protection and emergency management requirements into the risk planning process.

The general objective of the workshop was to define a common baseline in terms of methodological components towards an **integrated prevention-preparedness-response risk management approach**, following the so-called **crisis management cycle**. This shared common understanding of risk components is necessary to undertake a multi-hazard risk assessment, and to evaluate how new situations posed by climate change can modify the level of risk. The results of this workshop will serve as a basis for the subsequent project actions.

In Session I, an introduction to general concepts of risk and crisis management was done. This was followed by Session II: presentations of external experts who presented selected best cases, methodologies and tools towards integrated prevention-preparedness-response approaches into Disaster risk reduction (DRR) strategies.

On the second day, Session III started with a participatory workshop to define **dimensions of risk** (hazard, exposure and vulnerability) per each single natural hazard process (forest fires, floods, storms, avalanches, rock-falls and land-slides), as well as **factors and components** that increase/reduce risk (e.g. topography [hazard] and infrastructures [exposure]). First, a quick hazard characterization exercise was done to describe each hazard process. Second, factors and system components within hazard groups were collected, building on what project partners have prepared, complemented with the contribution of external experts. Then a common methodology was discussed and agreed by all partners.

Session IV included the presentation of the operation tools (case-studies) to be developed at a pilot site level to reinforce civil protection capabilities with the participation of public agencies towards end-users oriented focus (task 4.3 in the project work plan).

The presentations are found in the Annex II of this document, and the electronic version can be found here.

2. Program and Venue

Thursday, February 20th 2020 1st RECIPE technical workshop	
10:30-11:00	Welcome Coffee break
11:00-11:15	**Welcome** – DGPC and CTFC
11:15-11:30	**Presentation of the 1st RECIPE technical workshop** – CTFC and FVA
11:30-13:00	**Session I: Introduction to risk and crisis management: terminology and common understanding of risk components and the crisis management cycle** – FVA
13:00-19:00	**Session II: Best cases, methodologies and tools towards integrated prevention-preparedness-response approaches into DRR strategies** – conducted by PCF
13:00-13:15	**Introducing the RISKPLAN, a risk evaluation tool of natural hazards.** Jakob Hörl - FVA
13:15-14:30	*Lunch*
14:30-14:50	**Dutch policies and programs for flood protection.** Dr. Ir. Michaël van Buuren. Landscape planner
14:50-15:10	**Avalanches: forest interactions and risk management.** Frank Krumm. Institute for Snow and Avalanche Research SLF - WSL
15:10-15:30	**Towards integrated wildfire risk management.** Laurent Alfonso – Civil Protection expert & Int. consultant
15:30-15:50	**Flood hazard and the risk maps tool MAPRI.** Eva Crego. Catalan Water Agency – ACA
15:50-16:10	*Coffee break*
16:10-16:30	**Fire & Rescue collaborative partnership merging knowledge transfer and operability. FIRE-IN project.** Marta Miralles, UT-GRAF, Fire Service of Catalonia
16:30-16:50	**EnhANcing emergencY management and response to extreme WeatHER and climate Events. ANYWHERE tool use real experiences**. Representatives of Home Affairs Department of Catalonia
16:50-18:00	**Visit to the GD of Civil Protection facilities– Risk management functioning.** Representatives of Home Affairs Department of Catalonia
18:00-19:00	**Round-table and open discussion:** Reinforcing civil protection capabilities and the integration of multi-risk interactions and climate change scenarios into risk assessment and planning
20:30	*Social dinner*

Friday, February 21th 2020 1st RECIPE technical workshop	
9:00-9:30	**Presentation of the methodology for the workshop: identifying factors and components influencing risk, including potential risks interactions** – FVA
9:00-13:00 *(Coffee break included)*	**Session III: Preliminary identification of factors and attributes influencing risk including potential risks interactions: i) RISKPLAN case-study ii) factors and system components within hazard groups iii) risk scenarios and agencies dialogues** – conducted by FVA
13:00-14:30	**Session IV: Presentation of RECIPE operational tools (task 4.3)** – conducted by PCF Short presentation made by each partner about the operational tool to be developed in task 4.3 will be expected.
	Guidelines for flood and fire civil protection planning with participatory approach with an operational tool for collecting citizens monitoring observations in emergency situations – CIMA
	Decision-support tool and accompanying handbook for dynamic risk planning procedures for rock-falls and landslides - BFW
	Guidelines for a participatory crisis management plan to manage wind throw along roads – FVA
	Visualizer tool for managing emergency situation in case of high avalanche risk - ICGC
	Support tool and guidelines for integrated risk assessment and planning for landscape and wild-land urban interface fires – CTFC, ISA, PCF
	Protocol for wildfire and avalanche risk management in mountain areas – CTFC, ICGC, BFW
14:30-15:00	Questions, comments and end of Workshop
15:30	*Lunch (optional)*

VENUE:

General Directorate of Civil Protection. Home Affairs Department of the Government of Catalonia.

Carrer Diputació, 355, Barcelona (Google maps: https://goo.gl/maps/XLN75pFjwW7JWSzh9)

3. List of participants

Eduard Plana Bach - Forest Science and Technology Centre of Catalonia (CTFC)

Marta Serra - Forest Science and Technology Centre of Catalonia (CTFC)

Jordi Vendrell - Pau Costa Foundation (PCF)

Guillem Canaleta - Pau Costa Foundation (PCF)

Sergio Delgado - General Directorate of Civil Protection, Gov. Catalonia (DGPC-CAT)

Francesca Baró - General Directorate of Civil Protection, Gov. Catalonia (DGPC-CAT)

David Pagès - General Directorate of Civil Protection, Gov. Catalonia (DGPC-CAT)

Rosa Mata - General Directorate of Civil Protection, Gov. Catalonia (DGPC-CAT)

Cristina Vicente - General Directorate of Civil Protection, Gov. Catalonia (DGPC-CAT)

Christoph Hartebrodt- Forest Research Institute of Baden-Wuerttemberg (FVA)

Jakob Hörl - Forest Research Institute of Baden-Wuerttemberg (FVA)

Yvonne Henghst- Ehrhart - Forest Research Institute of Baden-Wuerttemberg (FVA)

Marta Giambelli - CIMA Research Foundation (CIMA)

Chiara Franciosi - CIMA Research Foundation (CIMA)

Peter Andrecs - Austrian Research Centre for Forest, Natural Hazards and Landscape (BFW)

Glòria Martí - Institute of Cartography and Geology of Catalonia (ICGC)

Sara Figueras - Institute of Cartography and Geology of Catalonia (ICGC)

Santiago Manguán - Institute of Cartography and Geology of Catalonia (ICGC)

Carles Garcia - Institute of Cartography and Geology of Catalonia (ICGC)

Conceição Colaço - Instituto Superior de Agronomia (ISA)

Michaël van Buuren – Landscape planner, Wageningen University & Research (WUR)

Marta Miralles - UT-GRAF, Fire Service of Catalonia

Miquel Martí – Polytechnic University of Catalonia (UPC)

Laurent Alfonso – Civil Protection expert & Int. consultant

Frank Krumm – Institute for Snow and Avalanche Research SLF (WSL)

Eva Crego – Catalan Water Agency (ACA)

Eduard Angelats – Centre Tecnològic de Telecomunicacions de Catalunya (CTTC)

Inazio Martinez – European Forest Institute, Mediterranean Facility (EFIMED)

Mario Colonico – Sapienza – University of Rome

Daniel Sempere - Center of Applied Research in Hydrometeorology of Polytechnic University of Catalonia (CRAHI-UPC)

4. Summary and Outcomes of Workshop Sessions

4.1 Session I: Introduction to risk and crisis management: terminology and common understanding of risk components and the crisis management cycle

Conclusion of session I:

An introduction to general concepts of risk and crisis management opened the 1st workshop. The goal was to clarify the used terminology and concepts within the RECIPE project and to generate a common understanding of risk dimensions and introduce the crisis management cycle.

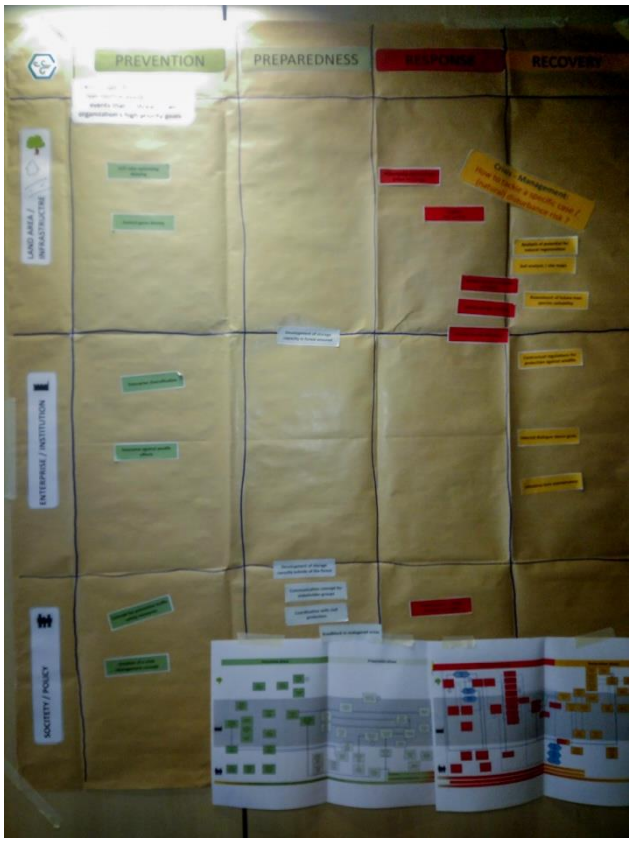
The key aspects of risk management were demonstrated in an entertaining presentation by Dr. Christoph Hartebrodt (FVA, Germany), using chicken eggs, a pan and protective equipment (Figure 1). The main outcomes were that risk is mostly related to underlying goals, which is also reflected in an international norm: According to ISO 31000:2018 – Risk management, risk is defined as the *"effect of uncertainty on objectives".*

Further, the difference and interrelation of risk management and crisis management were touched upon. Here it became clear that risk management is a continuous process of regular business procedures, where all sort of potential risks are assessed and evaluated, while crisis management is addresses one specific type of hazard scenario and tries to develop concrete actions to prevent, prepare and respond to a crisis. It was pointed out, that in the international context the term 'disaster risk' is used frequently interchangeably with the term 'crisis'. The different phases of the crisis management cycle were elaborated more in detail (Figure 2, 3 and 4).

It turned out to be very beneficial to discuss and agree upon a common language and clarify some key concept at the start of the project.

Figure 1. Session I: Introduction to risk and crisis management: terminology and common understanding of risk components and the crisis management cycle

Figure 2, 3 and 4. Work material and basic schemes of Session I of the workshop.



4.2 Session II: Best cases, methodologies and tools towards integrated prevention-preparedness-response approaches into DRR strategies

Conclusion of session II:

The first day focused on best cases, methodologies and tools towards integrated risk management approaches. Experts presented the practical application of state-of-the-art tools used in disaster risk prevention (Figure 5). The presentations can be found in Annex II.

A quick introduction of the **Swiss tool RiskPlan** was given by Jakob Hörl (FVA, Germany) and showed the wide ranging application in geographic and thematic terms, as well as general benefits to **stimulate a risk dialogue between stakeholder groups and involved agencies**. The potential application and usage within the RECIPE project were outlined and discussed.

The century-long history and culture of Dutch flood risk management was illustrated vividly by Michael van Buren (Wageningen University & Research, Netherlands). Current and new developments of flood risk prevention policies and integration of climate change impacts (i.e. sea level rise) were shown to combine important insights from social research, such as decreasing risk awareness in society due to successful hazard prevention, and the potential for nature-based solutions (e.g. Room for the River – Program). A recently much sought-after report ("A nature-based future for the Netherlands in 2120") that envisions the Netherlands in 2120 was presented and showed how scientific knowledge across different disciplines can be translated into compelling narratives to stimulate public discussions and dialogue.

A similarly long history of living with risk originating from natural hazard processes exists in Switzerland and was presented by Frank Krumm (Institute for Snow and Avalanche Research, Switzerland). There, almost any place is exposed to natural hazard processes due to the mountainous geomorphology of the country. A nation-wide comprehensive avalanche risk monitoring system has been constructed and allows authorities to take well informed decisions for risk planning. It was emphasized that such a system requires substantial financial and technological resources to be set up and maintained, which can only be long-lasting if it is accepted by the general public and policy. Regarding natural hazard processes, Switzerland is probably one of the leading countries in Europe.

Figure 5. Presentations of Session II.

The challenges of integrated wildfire management were highlighted by Laurent Alfonso (General Directorate of Civil Protection and Crisis Management, France), who coordinated a fire fighting assistance deployment in the tropical forests of Bolivia. The complex interactions with local authorities, as well as limited capacities and infrastructure showed common challenges that were aggravated by high air temperatures and limited visibility due to ferquent smoke cover.

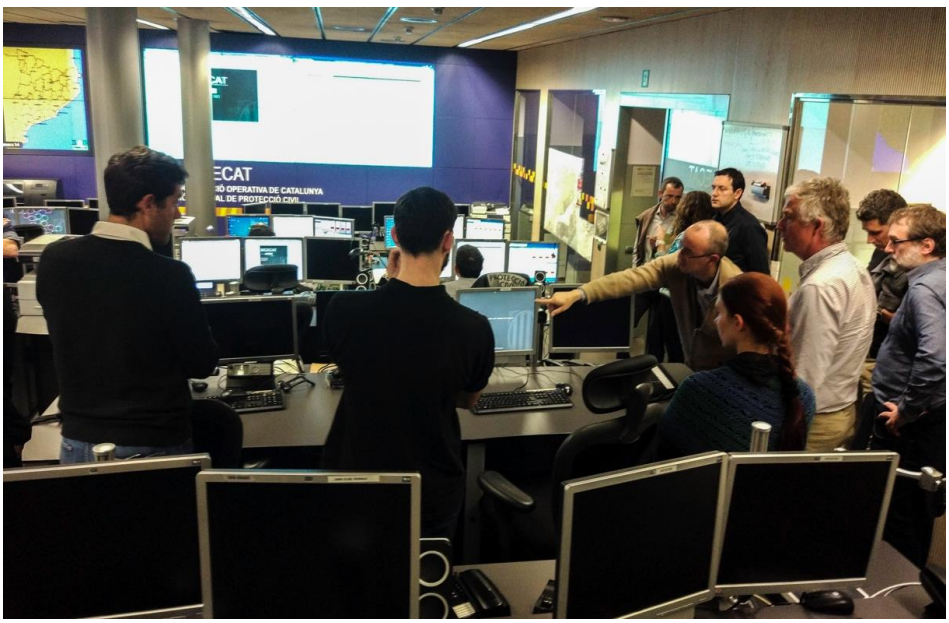
The innovative tool MAPRI connects flood risk mapping with actual and forecasted weather data and allows to identify critical infrastructure in affected areas. It was introduced by Eva Crego (Catalan Water Agency, Catalonia). Through the provision of unprecedented real-time information the tool has helped to evacuate areas and building at risk in several cases in Catalonia.

The FIRE-IN project strengthened cooperation and exchange of European fire and rescue services through the application of faster and cheaper access to state-of-the-art technology for the whole of Europe.

The ANYWHERE project was demonstrated by Cristina Vicente (General Directorate of Civil Protection, Catalonia) and Daniel Sempere (Center of Applied Research in Hydrometeorology, Catalonia). It empowers exposed institutions and citizens enhancing their preparedness and ability to respond to extreme and high impact weather events and climate change induced emergencies. Within the project 31 partner organisations across 12 countries integrate the main scientific and technological advancements of past decades into an operational platform. The main aim to translate meteorological forecasts into advanced impact-based multi-hazard forecasts before the events occurs and allow emergency managers and first responders to do a better job.

A visit of the Catalan Emergency Center (Figure 6) housed in the basement of Home Affairs Department of the Government of Catalonia rounded off the presentations and was conducted by Sergio Delgado (General Directorate of Civil Protection, Catalonia).

Figure 6. Visit of Civil Protection facilities



4.3 Session III: Preliminary identification of factors and attributes influencing risk including potential risks interactions

Conclusion of session III:

The hazard characterization exercise conducted for each hazard process revealed that despite the apparent simplicity of that task, it is actually not that easy to come up with a universal or common characterization for each hazard. Insights are that each hazard process is highly situative and is determined by a range of factors and components. It can be relevant to agree and indicate the characteristics of the hazards to be analysed and addressed within the project.

An empty form of this excercise can be found in Annex I.

During the second part of the workshop, factors and system components that increase/reduce risk for hazard groups were collected and discussed (Figure 7, 8 and 9). It became evident that it is important to agree on a common methodology to allow an overarching comparision of hazard processes and multi-hazard risk assessment in the course of the project. Key points from previous day's presentations were picked up by partners and reflected during the discussion. This helped to stimulate ideas to develop a common methodology in the follow-up of the workshop. Therefore a scheme will developed to identify factors and components influencing the different dimensions of risk (hazard, vulnerability and exposure). It was agreed to provide additional material that define key concepts and terms used within the project.

Figure 7, 8 and 9. Discussion of factors and attributes influencing risk

4.4 Session IV: Presentation of RECIPE operational tools (task 4.3)

Conclusion of session IV:

Each partner presented the outline of their planned operational tool to be developed within the project. Focussing on the hazard process of each partner's expertise, the range of topics was highly diverse. Common to all presented case-studies was the close collaboration with and involvement of respective end-users and emergency services from the beginning. This ensures that the final product is applicable and will be used by these institutions in future.

The presentations can be found in Annex II.

Annex I. Hazard characterization exercise Session III

Hazard characterization exercise

Author (s):

Name of hazard process:

Background

Frequency

Duration

Areal Extent

Speed of Onset

Spatial Dispersion

Temporal Spacing

Effects of land use on hazard process

Climate change impacts

Potential cascading effects / multi-hazard interactions / secondary hazard

Risk / Likeliness of occurrence

Previous Incidents (list remarkable events)

Response and Recovery Issues

Suggested Course of Action / Measures

Existing / missing capacities for risk mitigation

Annex II. Presentations of session II and IV

flood protection in the Netherlands

RECIPE workshop – barcelona march 20, 2020

michaël van buuren
Wageningen University & Research

WAGENINGEN UNIVERSITY & RESEARCH

flood protection

- past
- present
- future

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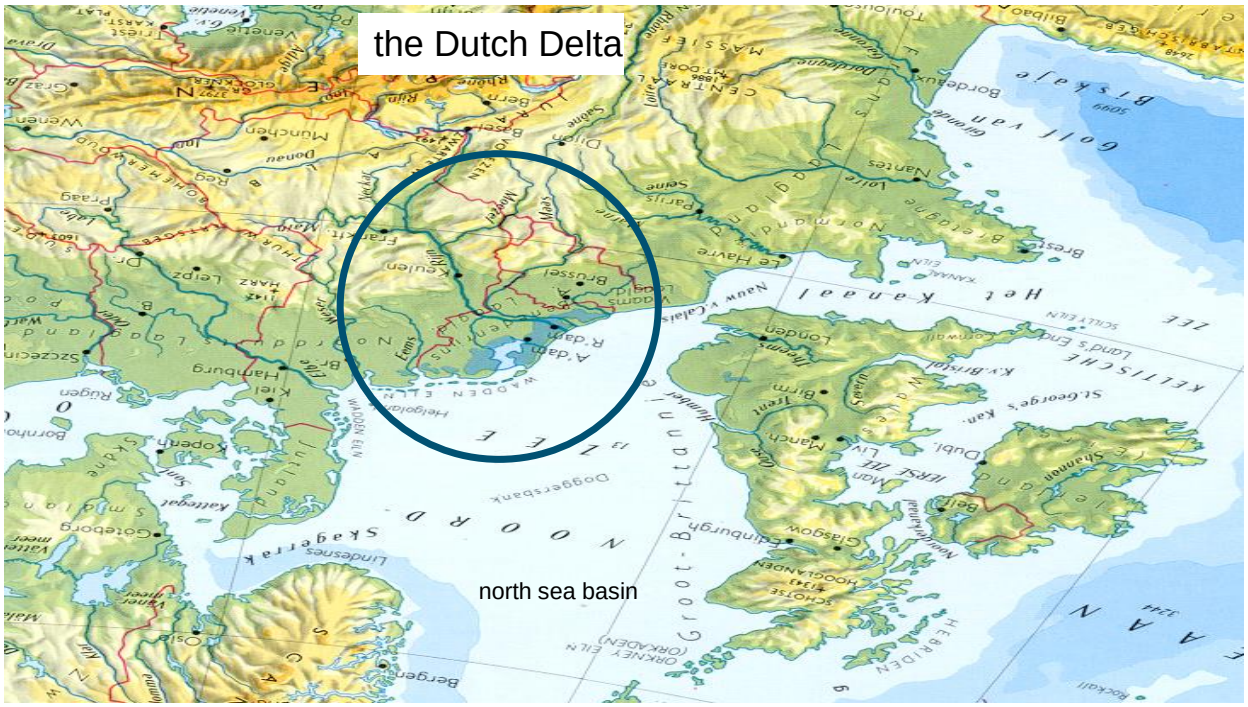
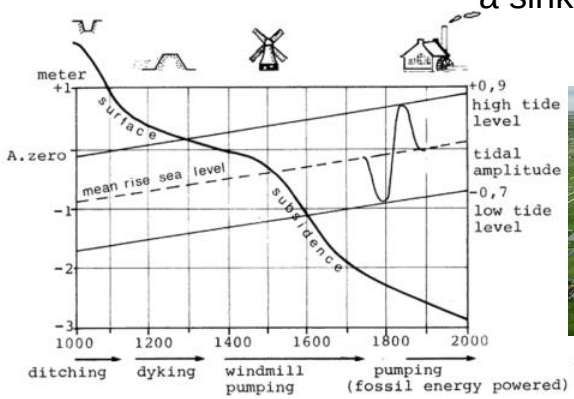


past

many floods, joining forces to dike the land: water boards

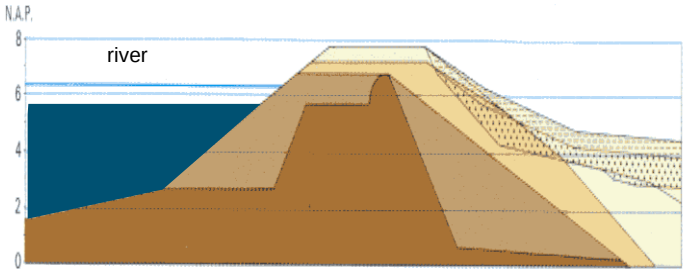
a sinking nation?



the delta project: a new approach

legal safety standards and statistics; higher, stronger and wider dikes

protesting against dike reinforcement



different stages of the dike

WAGENINGEN
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present

WAGENINGEN
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A Different Approach to Water, Water Management Policy in the 21st Century

room for the river program

- 34 projects
- 2.2 billion euro
- realised 2008-2017

participtive design

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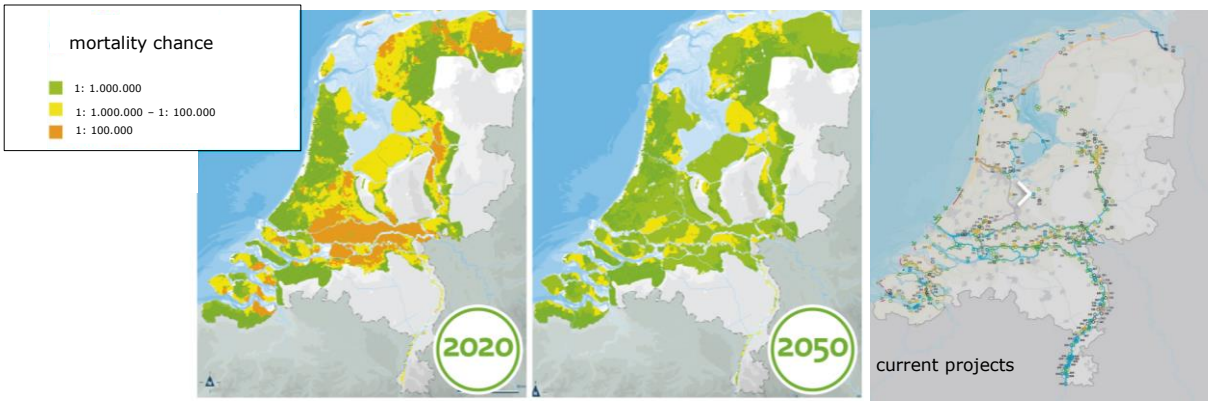
new legal safety standards : risk = chance x effect



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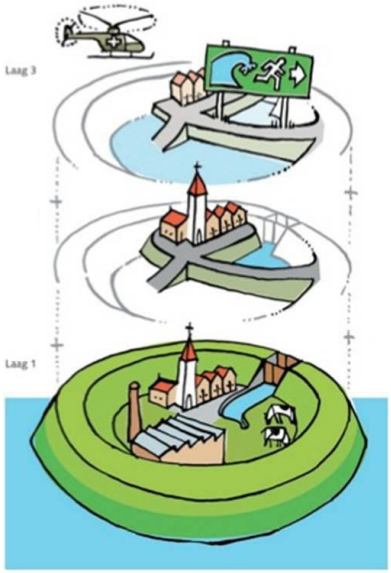
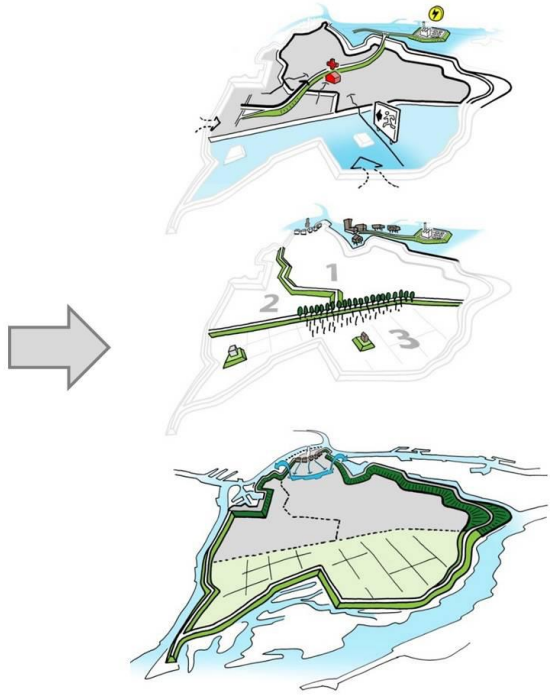
“multi-layered” safety

third layer:
evacuation

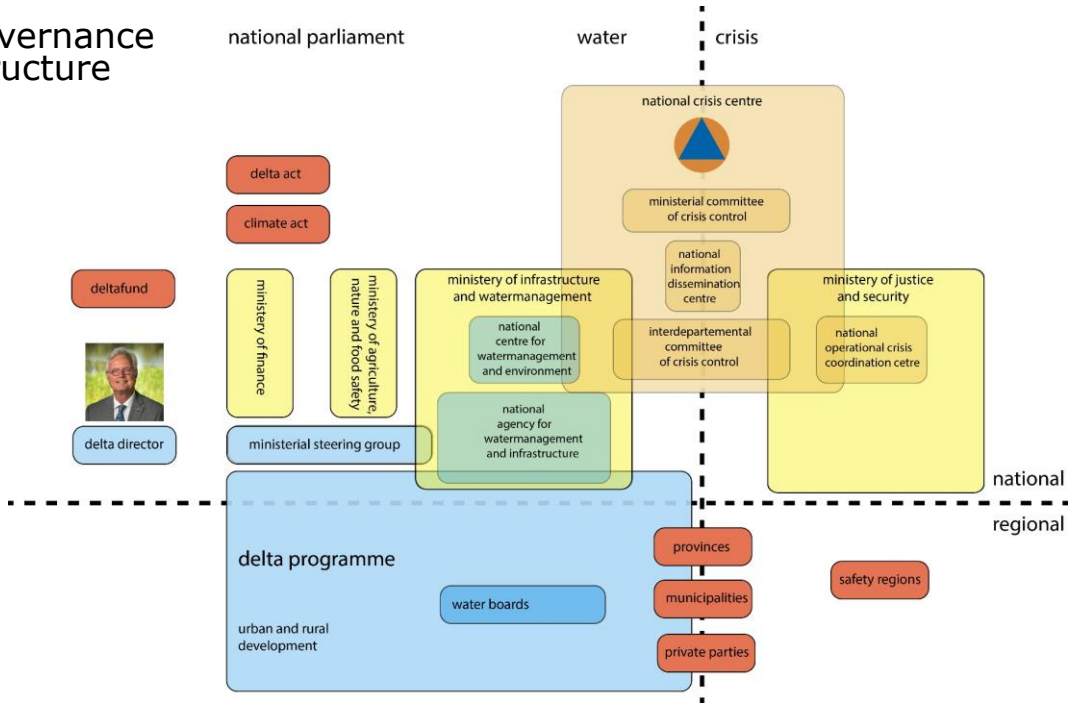
second layer:
adapt land use

first layer:
enforcing protection

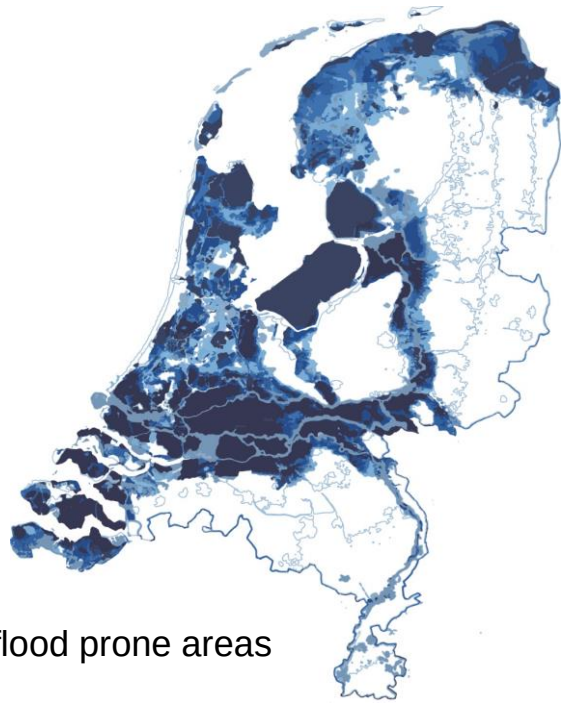




governance structure



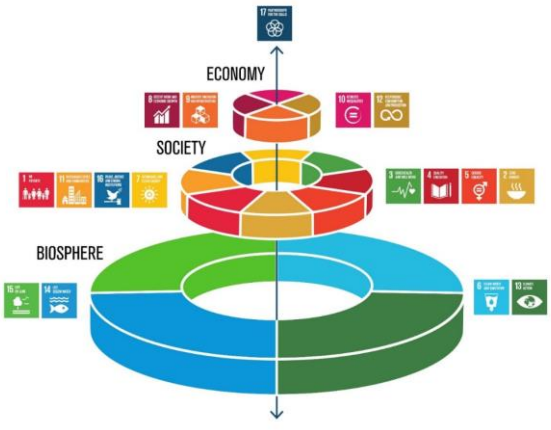
future ?



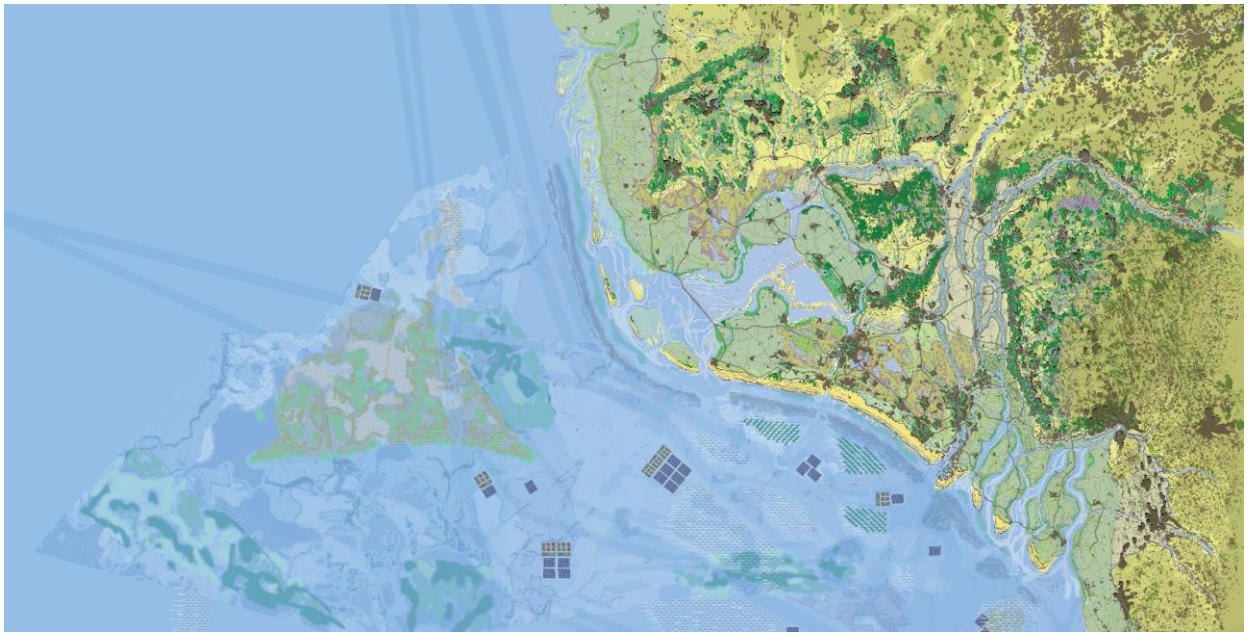
flood prone areas

sustainable development goals

nature-based solutions

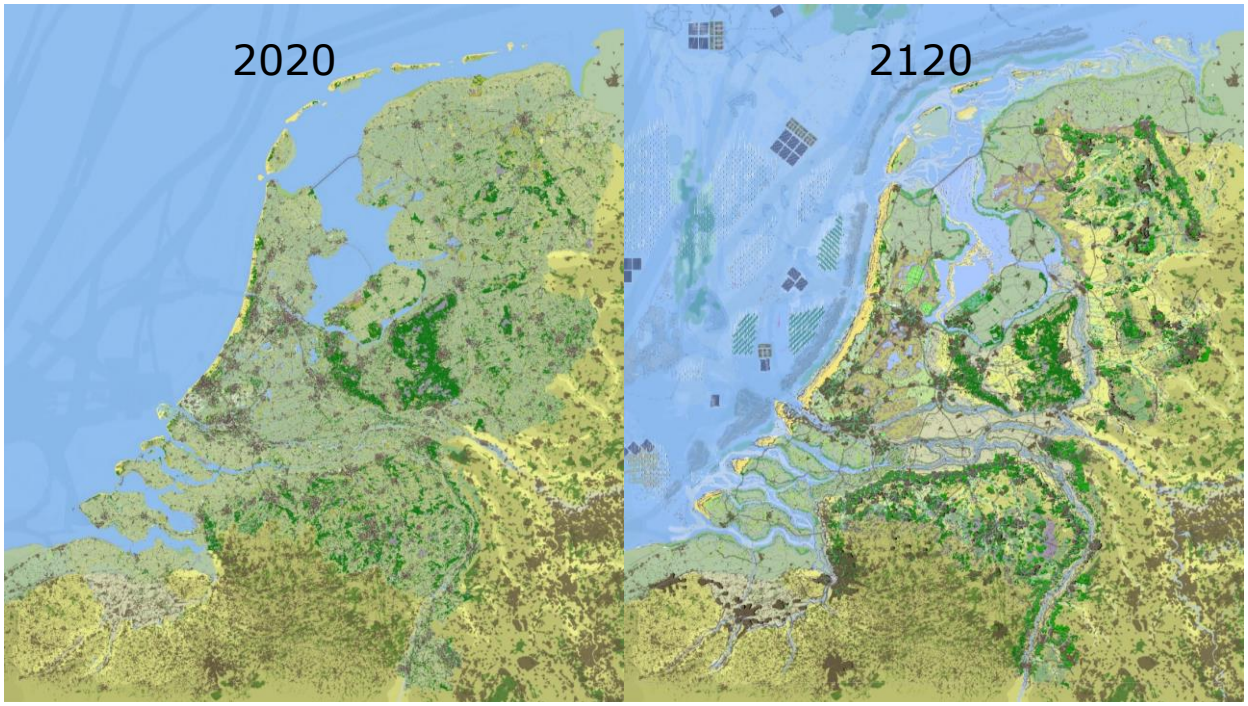


source: Rockström, Stockholm Resilience Institute, 2018



Disclaimer

blueprint



great attention in society – a positive perspective

coast

- ‘soft’ seaward defence
- sandsuppletion (‘sandmotor’)
- ecological differentiation
- nature and open-air recreation

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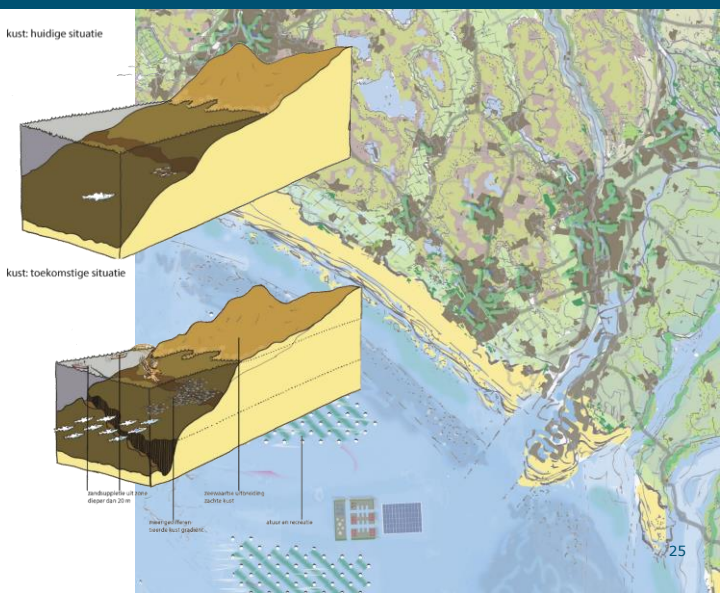

rivers

- more room for the river
- marshlands to prevent piping
- floating houses

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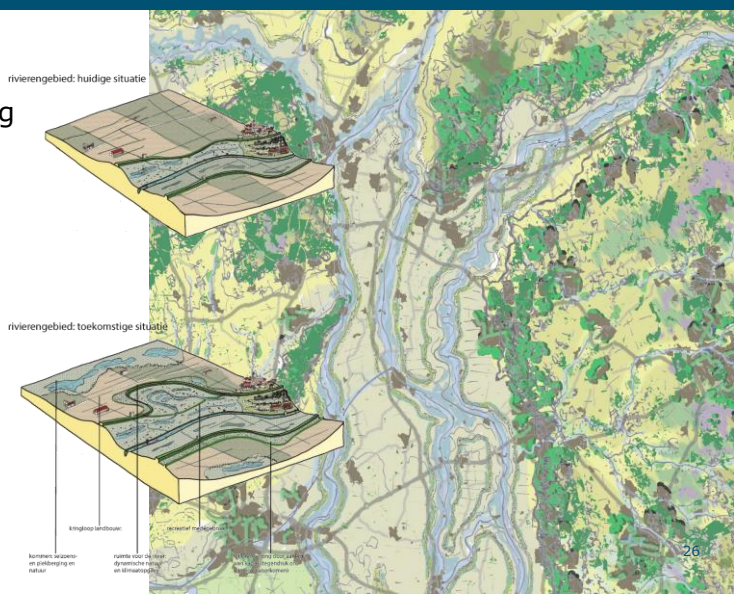
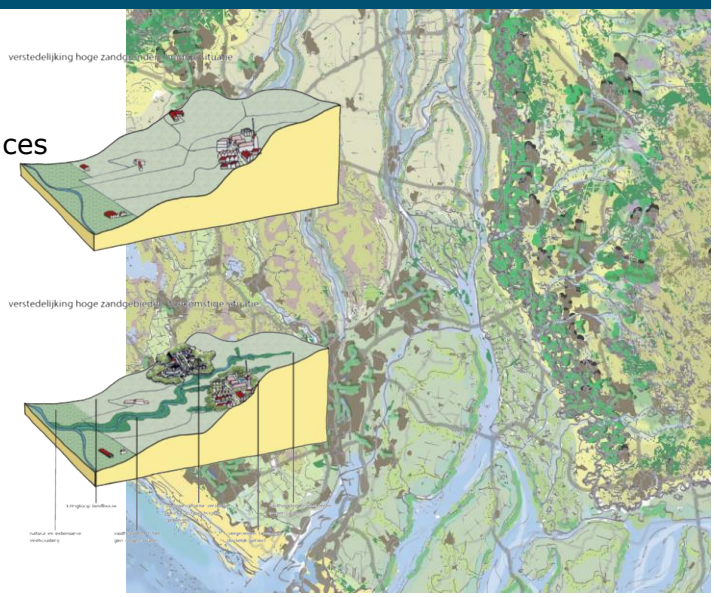


urban areas

- the Netherlands: a 'green metropolitan area'
- new urban areas at higher places
- greening up to prevent heat stress
- room for ecology and water



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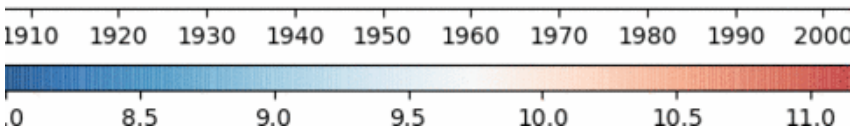
drought

'climate barcode' mean temperatures de bilt



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thanks for your attention

michael.vanbuuren@wur.nl

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Avalanches et al.

risk management in mountain areas

Frank Krumm, WSL

Specific situation in Switzerland (multiple risks on small scales)

- Climate is changing
- Sensitive areas and processes (early recognition)
- Sensitivity of species
- Consequences for managers

Risk of bark beetle attacks

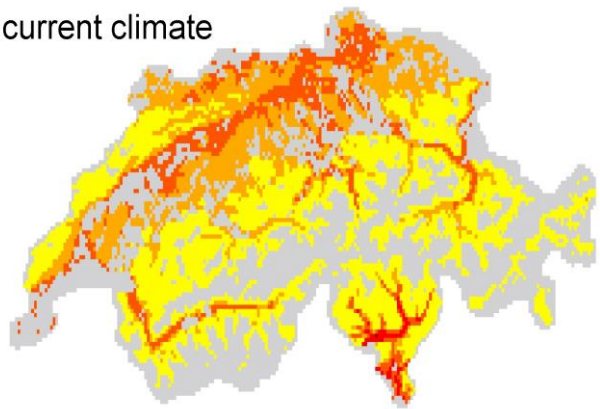
Swiss climate scenario CH2011

- modifications population dynamics bark beetle

→ increasing number of generations

→ earlier start of activity

current climate



Jacoby et al. 2016

average number of generations

- < 1.00
- 1.00 - 1.49
- 1.50 - 1.99
- 2.00 - 2.49
- 2.50 - 2.99
- >= 3.00

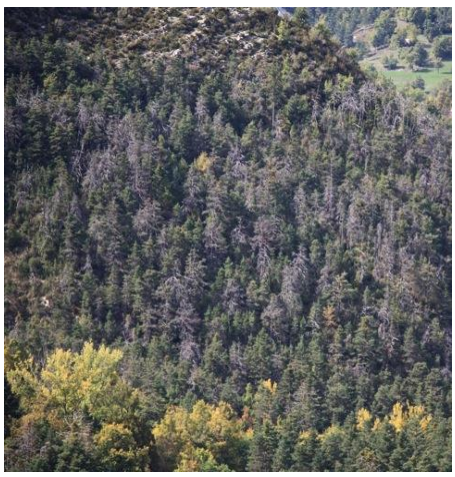
Mortality in Pine forests

Scots pine mortality near Visp, Swiss Alps (1996)

Switzerland – Chur/Domleschg (2004-2006)

Austria – Innsbruck (2003-2007)

France - Region Verdon (2009)



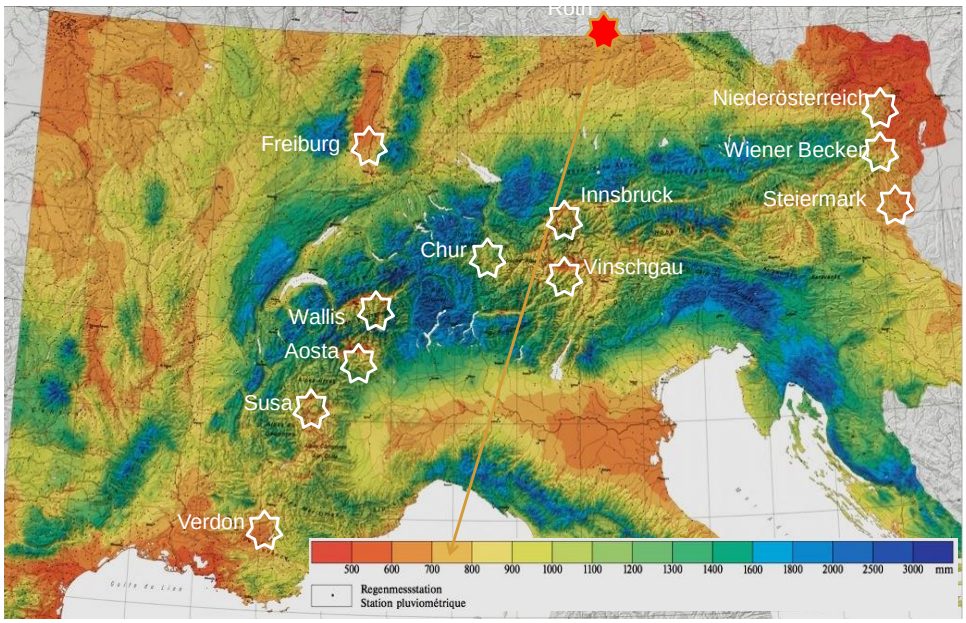
Italy – Aostavalley (2010)

Italy – Vinschgau (2010)

Austria – Kamptal (2015)

Germany – Roth (2016)

Yearly precipitaion for the Alps



Federal Agency for topography

Land use changes

~ 1900 ~ 2000

Basic principles of risk management in Switzerland

- There is no such thing as absolute security. However, damage resulting from natural events must be socially and economically acceptable. Risk-conscious thinking and action are needed to establish adequate Security and to maintain that security over the long term.
- Switzerland is resistant - Being resistant means reducing damage from hazardous natural events to a tolerable level.
- Switzerland is able to recover - Ability to recover means having capability to surmount the negative impacts of natural events in order for society and the economy to rapidly regain functional capacity.
- Risk-oriented management of natural hazards is the only way to ensure that various risks can be compared and comparably managed everywhere, and that the security thus established is preserved over the long term.

Basic principles of risk management in Switzerland

- Switzerland's risk culture is characterised by the recognition of risks, a willingness to improve and maintain security, and open, transparent dialogue on opportunities and risks.
- Integrated risk management encompasses the full range of natural hazards. It applies comparable standards for quantifying risks and comparably manages those risks, involving all stakeholders and affected parties. All aspects of sustainability are considered in the weighing of possible measures.
- Natural hazards can affect everyone in Switzerland so everybody must be involved in dealing with them.

Basic principles of risk management in Switzerland

- Sound scientific principles and their implementation as practical information form the basis for competent management of natural hazards.
- The goal is to achieve a level of security that is ecologically tenable, economically reasonable, and socially acceptable.
- Risk management is an ongoing endeavour that requires resources and prioritising.

Strategy

„Improving Security against natural hazards in Switzerland“

The look back…..

Motion Danioth/Inderkum (Fall 1999) demands for :

- Hierarchial and connected strategy to improve security in the alpine area
- Pilotproject «security in the alpine space“
- Establishment of a long term, interdisciplinary alpine research institute with seperate finances based on the support of national (Federal level) and subnational level (Cantons) and the economy (Foundation)

  ➢ This resulted in a Swiss – wide approach, including all types of risks (also outside of the Alps) -> SLF Institute took this task

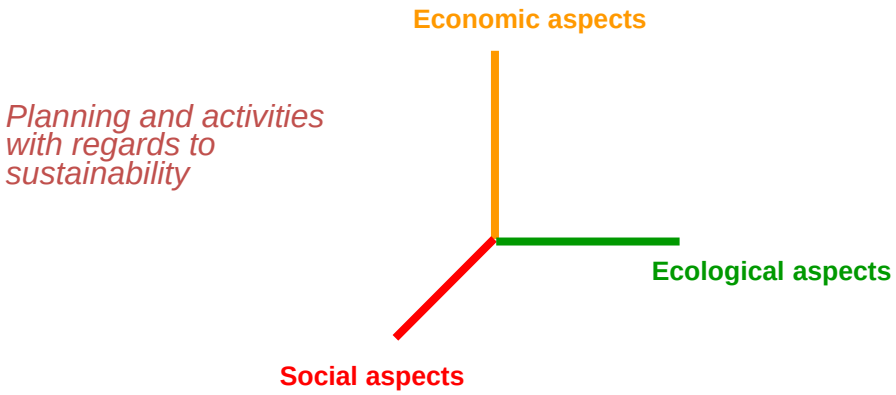
Vision

- Societal challenge (Increasing vulnerability, Sustainability, growing infrastructure, mobility, Sociocultural changes, communication…)
- Protection aims (Protecting lives!, defining limits – what may happen?)
- No absolute security (technically, ecologically and financially not feasible)
- Integrated risk management
- Joined action and optimized use of resources (common challenge, common consciousness of risks and the limits of management -> Dialogue, Science and international collaboration)

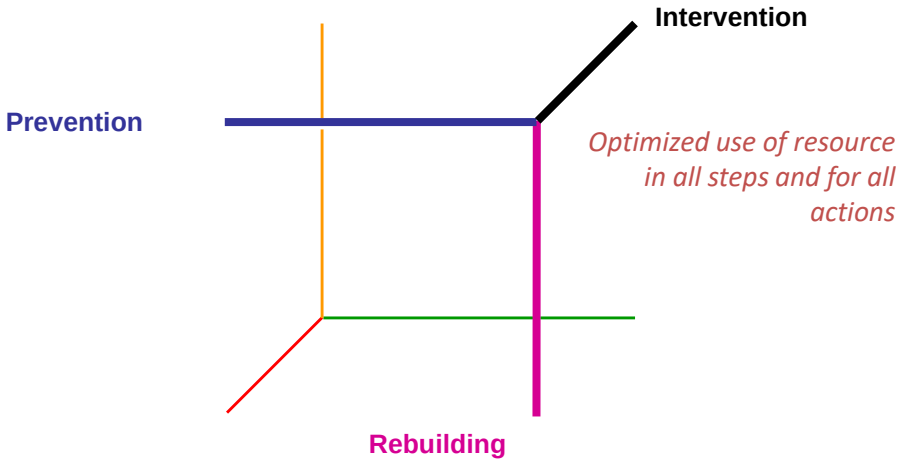
Vision – Integrated risk management

RiskPlan as an application tool

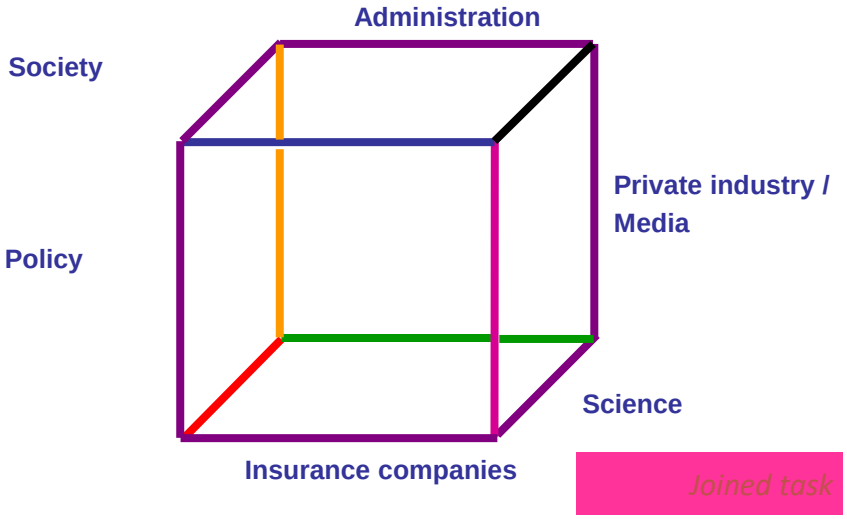
Vision and Strategy - Synthesis



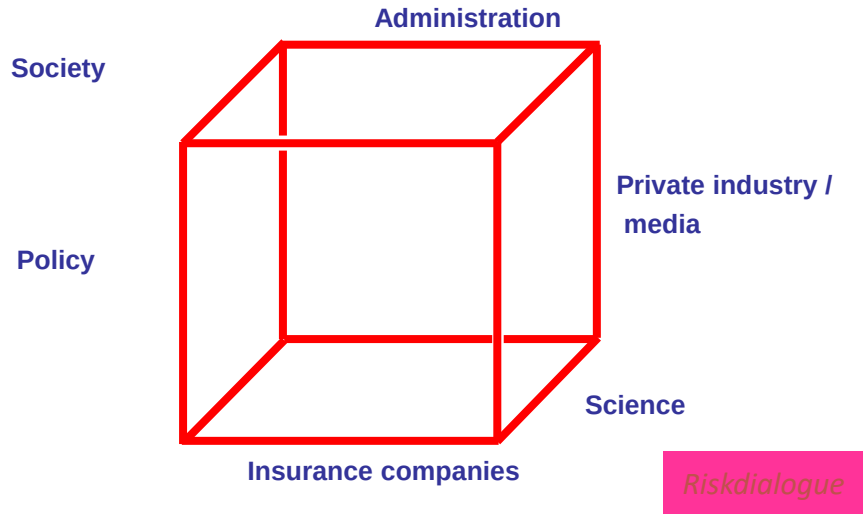
Vision and Strategy - Synthesis



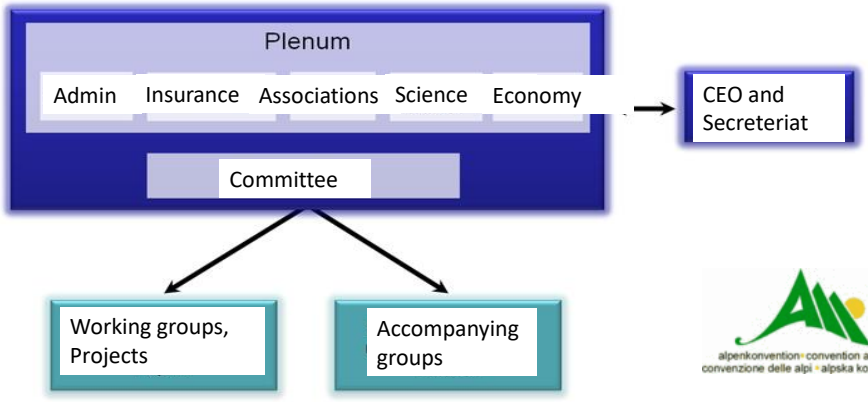
Vision and Strategy - Synthesis



Vision and Strategy - Synthesis



Structure Planat



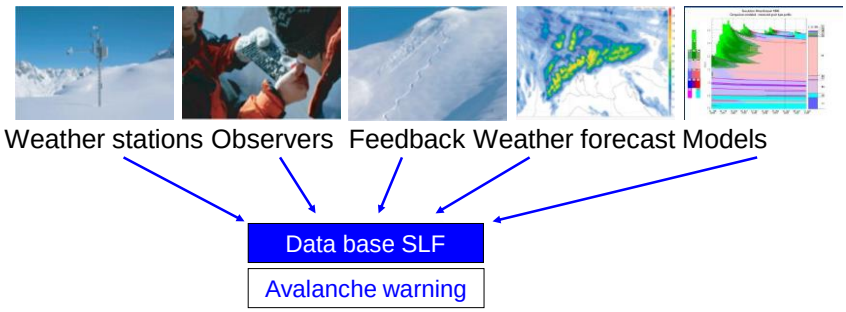
alpenkonvention · convention alpine
convenzione delle alpi · alpska konvencija

Schweizerischer Wasserwirtschaftsverband
Association suisse pour l'aménagement des eaux
Associazione svizzera di economia delle acque

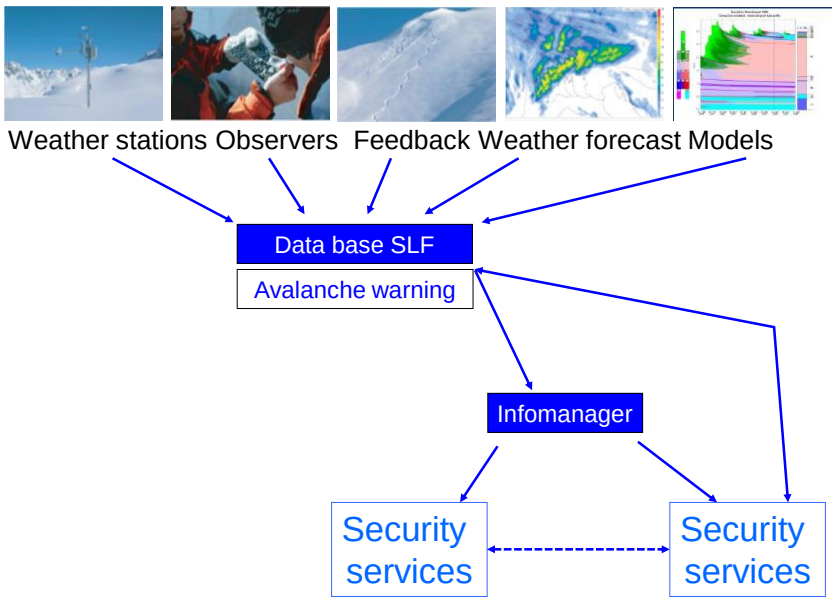
FAN
Fachleute Naturgefahren Schweiz

SFIG - SCHWEIZERISCHE FACHGRUPPE FÜR INGENIEURGEOLOGIE
GSGI - GROUPEMENT SUISSE DE LA GEOLOGIE DE L'INGENIEUR
Arbeitsgruppe Geologie und Naturgefahren
Groupe de travail Danger naturel et Géologie
AGN - DNG

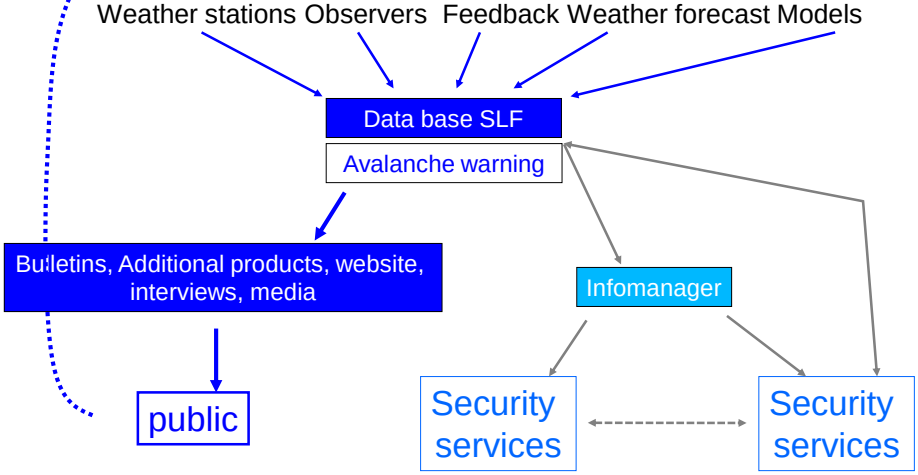
Example avalanche warning: Data and information flux



Example avalanche warning: Data and information flux



Example avalanche warning: Data and information flux



Automatic weather stations: measurements during nights and storms

80 IMIS Stations (SLF / Cantons)

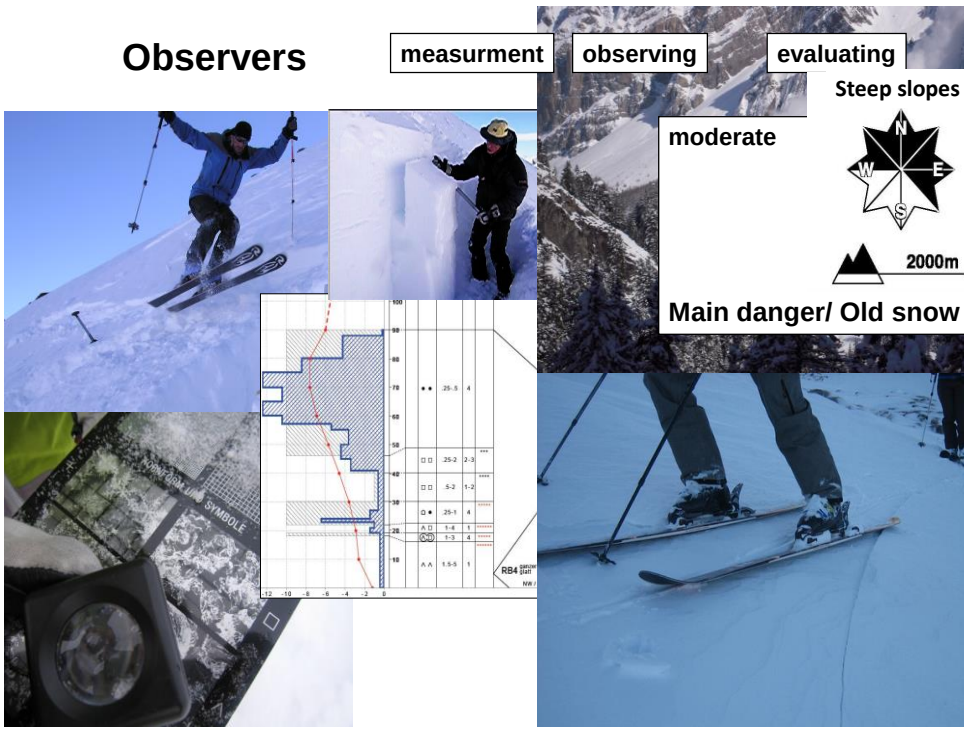
11 ENET Stations (SLF / MeteoCH)

ANETZ Stations (MeteoCH)

180 Observers: Multifunctional and reliable

- Inhabitants of high altitude settlements, Owners of alpine and mountain huts, …
- Managers of Ski resorts
- Security services
- mAvalanche

Observers

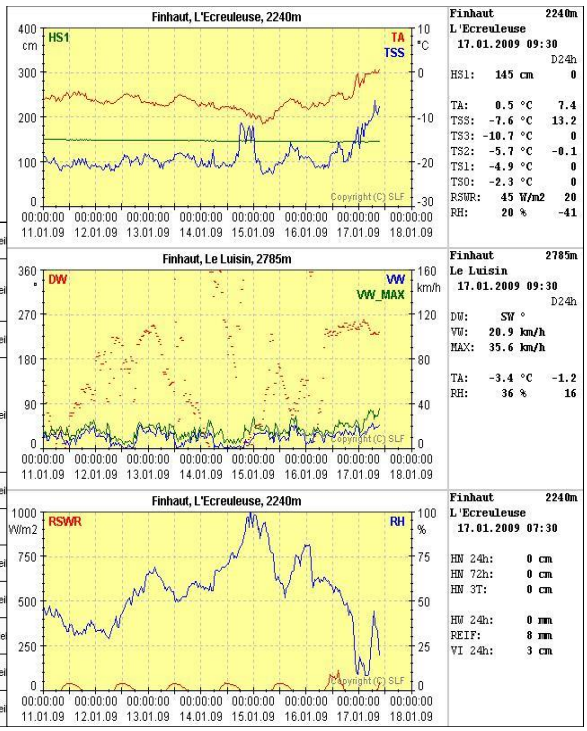


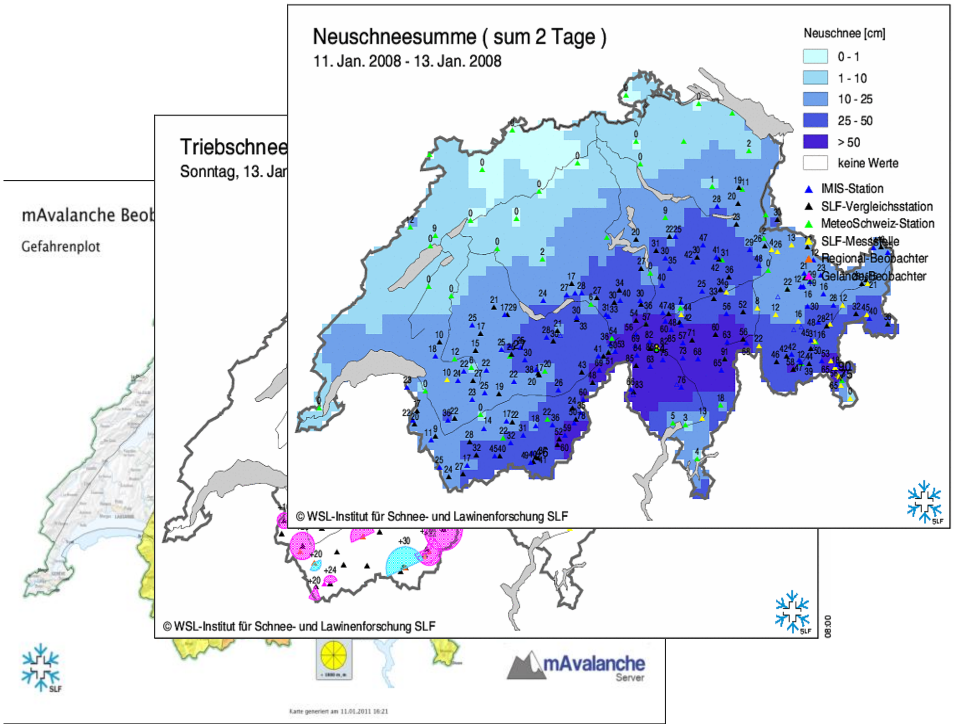
mAvalanche: mobile application

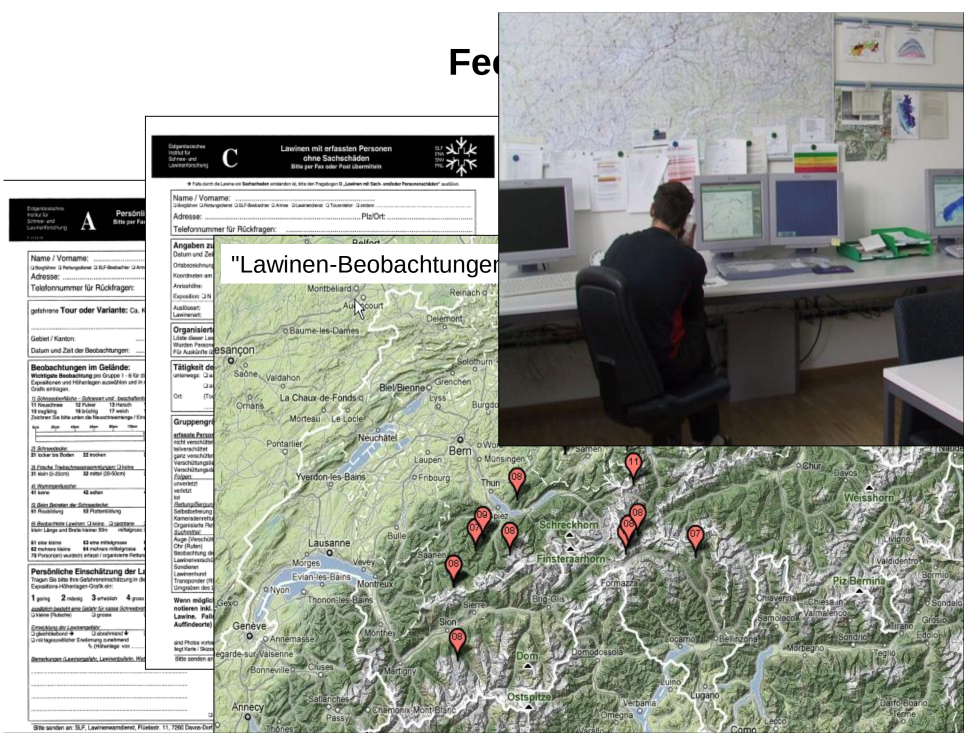
Information from the area

- Input from mountain guides
- mobile → Database
- Uses GPS and maps

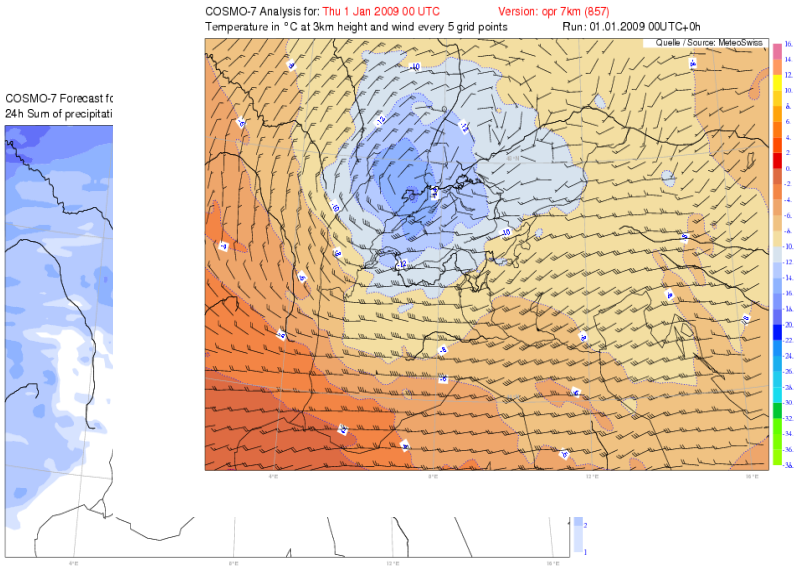
5213-nördliche Surselva	13.01.2008 06:28		4		Trocken	N	N	ober	1800	Steil
5214-südliche Surselva inkl. Lugnez, Valser- u. Safiental	13.01.2008 07:11	1820	3+		Trocken	N	N	ober	1400	Steil
5216-Zervreila	13.01.2008 05:32		4		Trocken	N	N	ober	1800	Steil
5221-Domleschg / Lenzerheide	13.01.2008 15:39		3-		Trocken	E	SE	ober	1800	Steil
5221-Domleschg / Lenzerheide	13.01.2008 06:45		3+		Trocken	N	N	ober	1800	Steil
5221-Domleschg / Lenzerheide	12.01.2008 17:14									
5223-Rheinwald	13.01.2008 07:39	1457	4		Trocken	N	N	ober	1800	Steil
5232-Oberhalbstein	13.01.2008 07:53	1770	3-		Trocken	N	N	ober	1600	Steil
5233-Avers	13.01.2008 04:53	2117	3+		Trocken	N	N	1600	3000	Triel
6111-Betrettotal	13.01.2008 05:53		4		Trocken	N	N	ober	1400	Steil
6112-obere Leventina	13.01.2008 07:48	1412	4		Trocken	N	N	ober	1600	Steil




Neuschneesumme (sum 2 Tage)
11. Jan. 2008 - 13. Jan. 2008
Neuschnee [cm]
0 - 1
1 - 10
10 - 25
25 - 50
> 50
keine Werte
IMIS-Station
SLF-Vergleichsstation
MeteoSchweiz-Station
SLF-Messstelle
Regional-Beobachter
Gelände-Beobachter
© WSL-Institut für Schnee- und Lawinenforschung SLF
Triebschnee
Sonntag, 13. Jan
mAvalanche Beob
Gefahrenplot
mAvalanche
Server

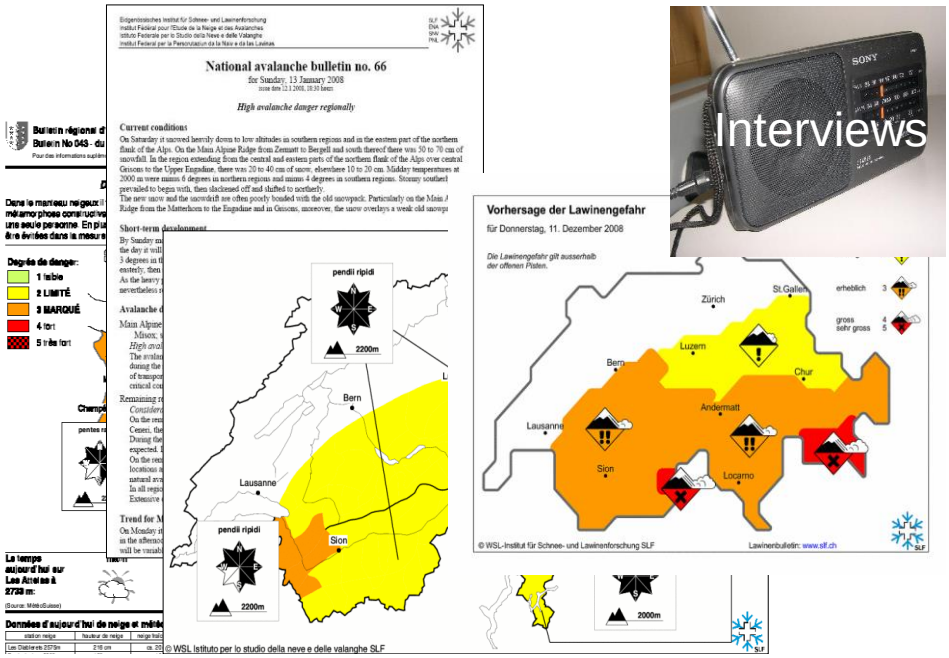

Fe
C
Lawinen mit erfassten Personen
ohne Sachschäden
A
"Lawinen-Beobachtunger

Weather forecast / prognosis

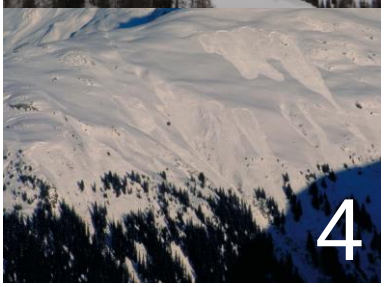


Evaluation based on combined informations

Products



Level of risk



Level of risk

Examples that illustrate “soft factors”

- in ski / fun “hotspots”, the will to take risks is very high
- Freeskiers drive everywhere!
- Avalanches are rare, but might be of medium size

2

Avalanche bulletin: Possibilities and limits

Description of the overall avalanche risk for a certain region

→ Planning should be based on this

No estimation for the certain situation / for the specific slope

→ „Is this slope now too dangerous for me?“

No evaluation of the risk

→ Risk = Avalanche danger + own behaviour!

Flood Hazard and Flood Risk Maps in the River Basin District of Catalonia

2nd Flood Risk Management Cycle

Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change - RECIPE

Barcelona, February 20th 2020

Agència Catalana de l'Aigua

Generalitat de Catalunya
Departament de Territori i Sostenibilitat

Summary

1. Floods Directive
2. Preliminary assessment of flood risk
3. Flood Hazard and Flood Risk Maps
4. Analysis of recent flooding events (DANA and Gloria) based on the Flood Hazard Maps
5. Climate Change and Flooding

DIRECTIVE 2007/60/EC

Assessment and Management of Flood Risks

(review and update every 6 years)

Preliminary assessment of flood risk (APRI) Identification of areas where potential significant flood risk exists or might be considered likely to occur (ARPSI)

Flood Hazard and Flood Risk Maps (MAPRI) for those areas identified as potentially at risk

Flood Risk Management Plan (PGRI) that includes different measures for the reduction of the potential adverse consequences of flooding

Multi-sectoral Plan

Developed in collaboration with different responsible authorities from the local, to the regional and national levels: Civil Protection Authorities, Municipalities, Directorate General for the Sustainability of the Coast al Areas and the Sea

2nd Planning Cycle – APRI 2018

Review and update – Preliminary assessment of flood risk

1st Cycle

15	ARPSI (river overflow)
72	river reaches with significant flood risk (TRI)
447	km TRI
80%	of potential damages in case of flooding

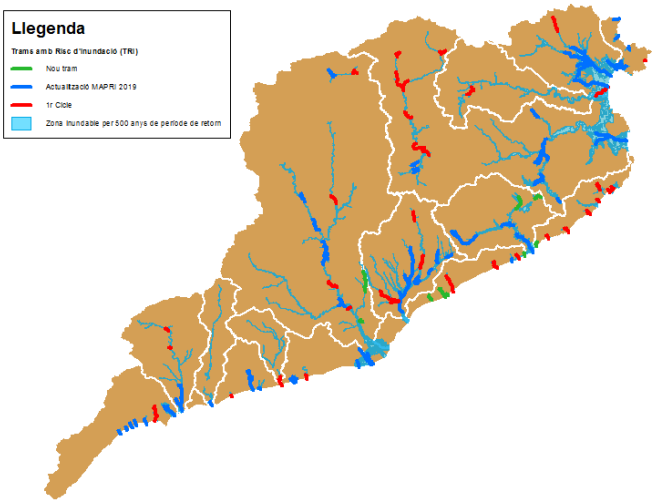
2nd Cycle

14	ARPSI (river overflow)
1	ARPSI (river/pluvial flooding)
1	ARPSI (pluvial flooding)
79	TRI
524	km TRI

2nd Planning Cycle – MAPRI 2019

Review and update – Flood Hazard and Flood Risk Maps

79 TRI



8 new TRI

Flood Risk assessed

524,2 km

Flood Risk updated 2nd Cycle

524,2 km

Municipalities in TRI

160

Flood Hazard assessed

1.962,3 km

Updated 2nd Cycle

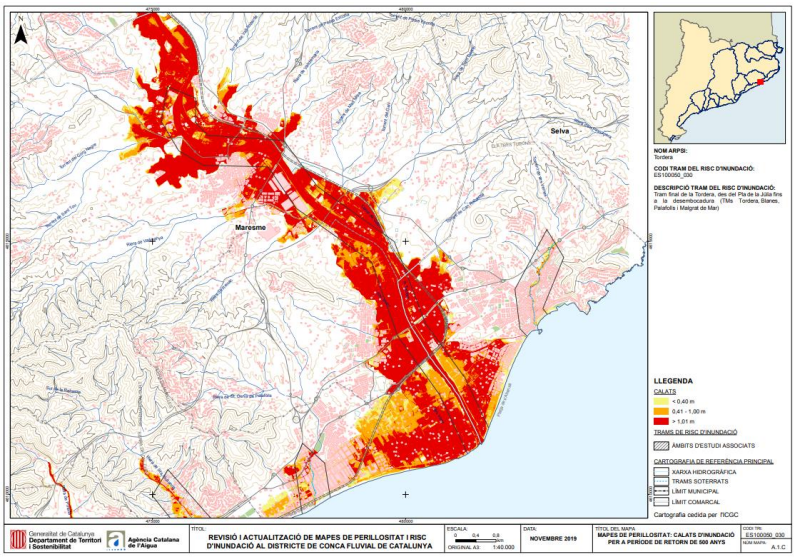
616,3 km

Municipalities in flood prone areas

416

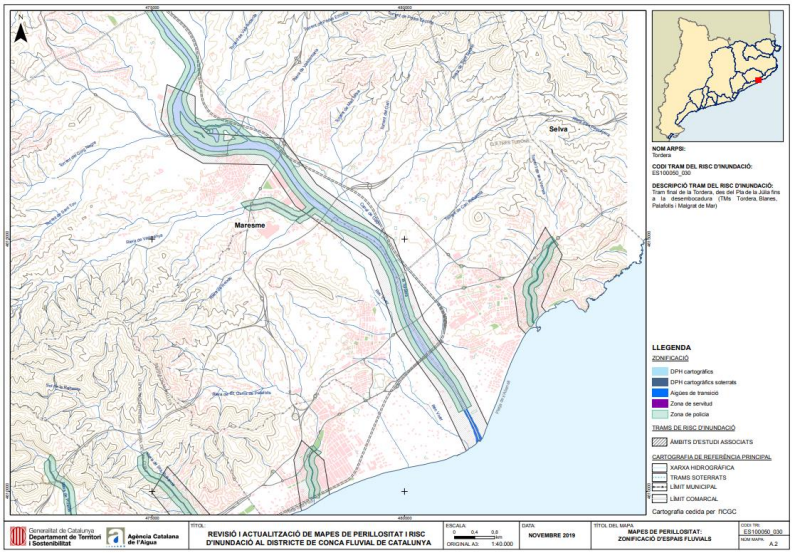
2nd Planning Cycle – HAZARD MAPS

Flood Hazard (10, 100 and 500 years return period)



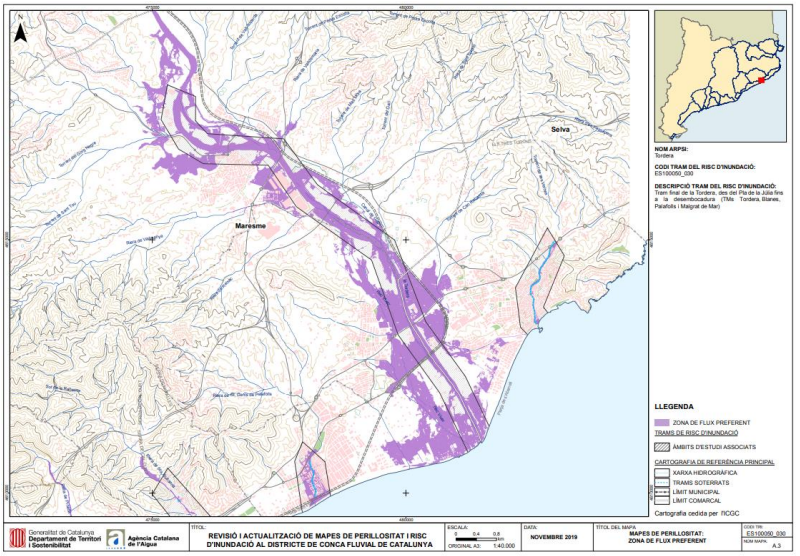
2nd Planning Cycle – HAZARD MAPS

River Area Zoning



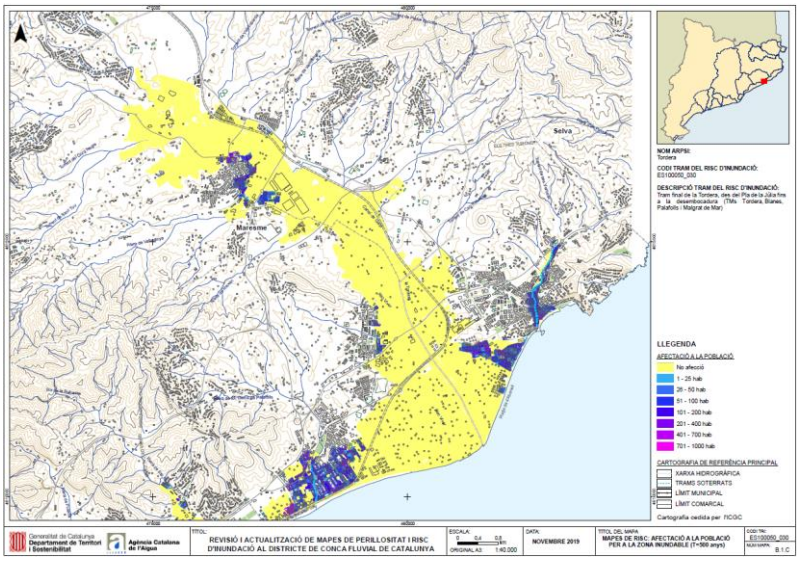
2nd Planning Cycle – HAZARD MAPS

Main Flow Conveyance Area



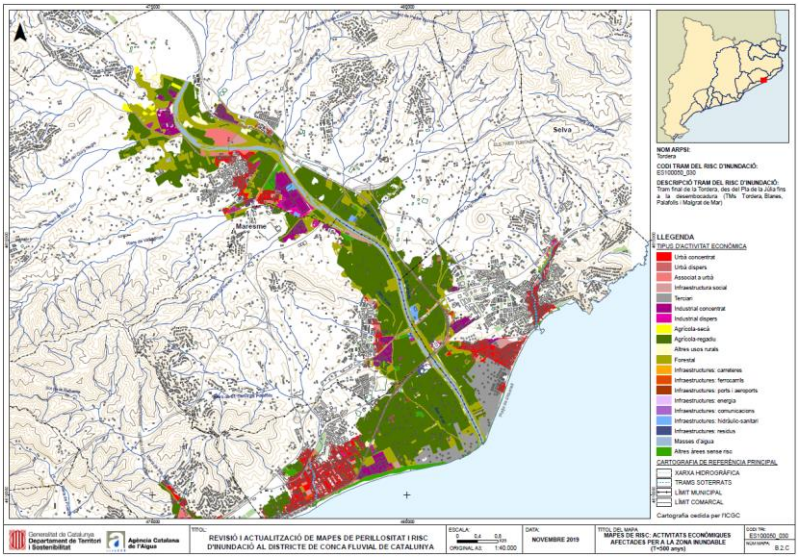
2nd Planning Cycle – RISK MAPS

Population affected by flooding (10, 100 and 500 years return period)



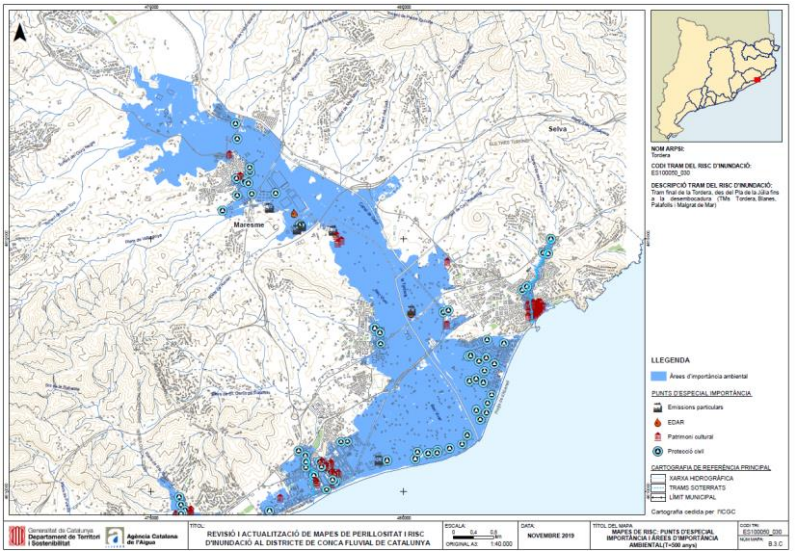
2nd Planning Cycle – RISK MAPS

Economic activities affected by flooding (10, 100 and 500 years return period)



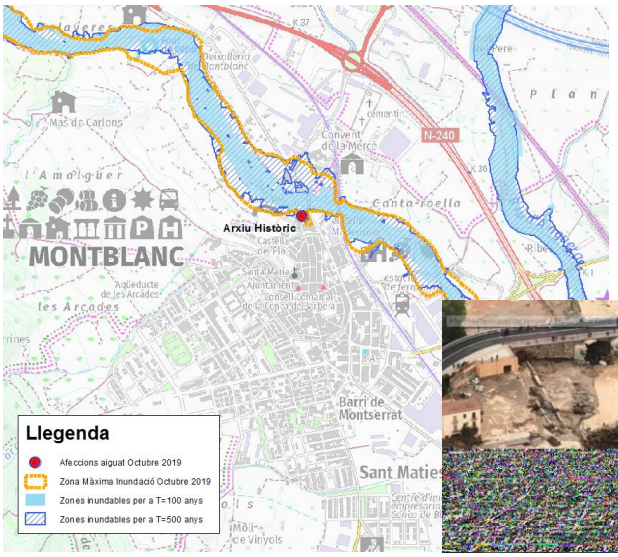
2nd Planning Cycle – RISK MAPS

Elements of particular interest (10, 100 and 500 years return period)



DANA – 22nd October 2019

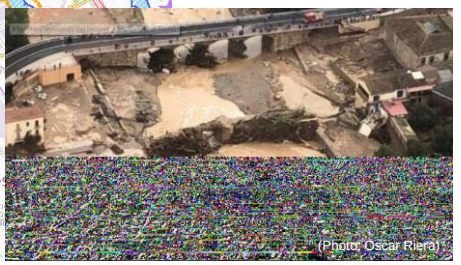
Francolí river in Montblanc



650 m³/s
gauged at Montblanc

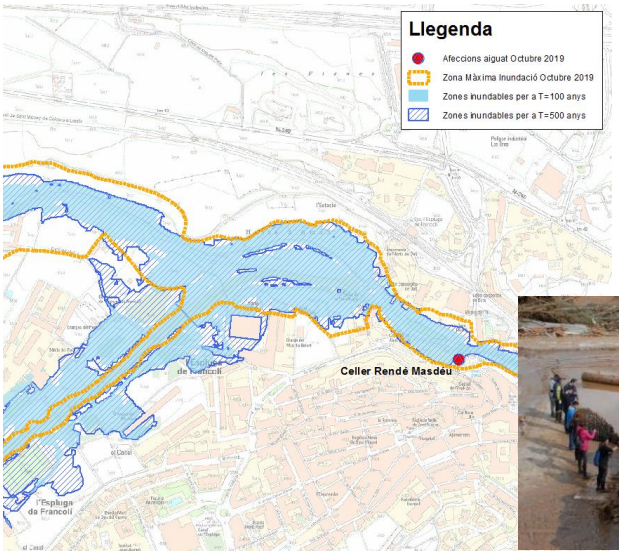
464 m³/s
T = 100 years

882 m³/s
T = 500 years



DANA – 22nd October 2019

Francolí river in l'Espluga de Francolí



650 m³/s
gauged at Montblanc

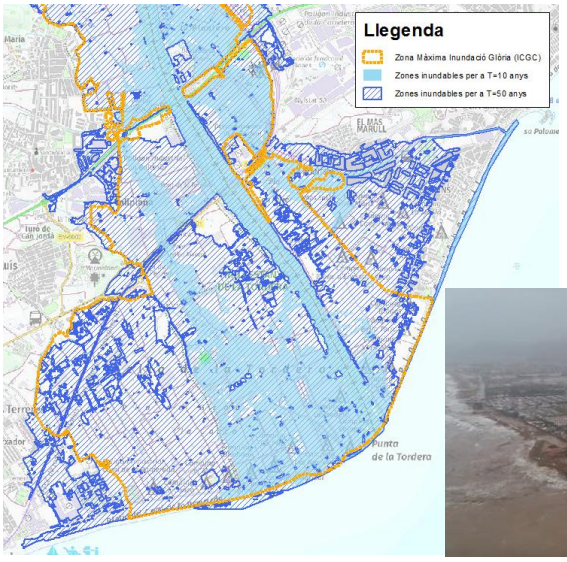
464 m³/s
T = 100 years

882 m³/s
T = 500 years


(Photo: Angel Juanpere)

Storm Gloria – 20th to 23rd January 2020

Tordera Delta



600 m³/s
gauged at Fogars de la Selva

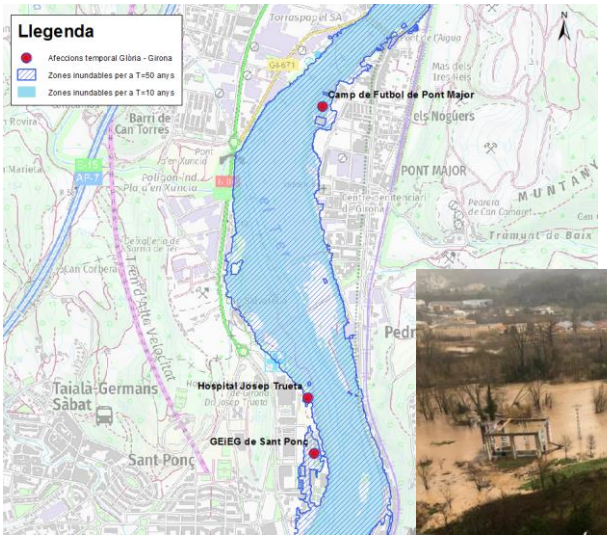
437 m³/s
T = 10 years

1225 m³/s
T = 50 years


(Photo: Cos d'Agents Rurals)

Storm Gloria – 20th to 23rd January 2020

Ter River in Girona

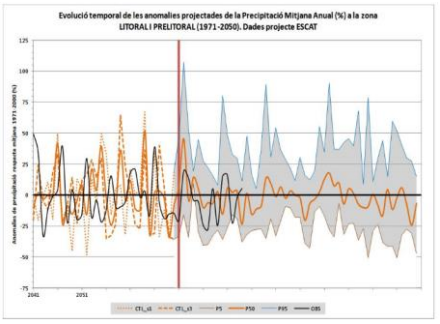


1200 m³/s
gauged at Girona

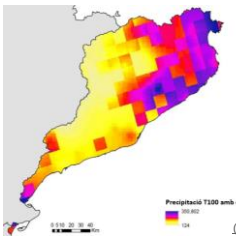
796,7 m³/s
T = 10 years

1473 m³/s
T = 50 years

Climate Change and Flooding



(Source: https://www.meteo.cat/wpweb/climatologia/el-clima-dema/projeccions-de-precipitacio-1971-2050/)



(Source: APRI 2018)

High uncertainty about the impact of climate change on **precipitation**, specially in the **Mediterranean areas**

Many **factors impacting flow discharge** that contribute to increase uncertainty (e.g. **land use**)

Climate change will certainly change the **probability of exceedance** of floods

To enhance forecasting tools to predict flow discharge and flood impact

Gràcies per la vostra atenció

Agència Catalana de l'Aigua
Web: aca.gencat.cat
Twitter: @aigua_cat
Instagram: @aigua_cat
Facebook: facebook.com/aiguacat
YouTube Canal ACA

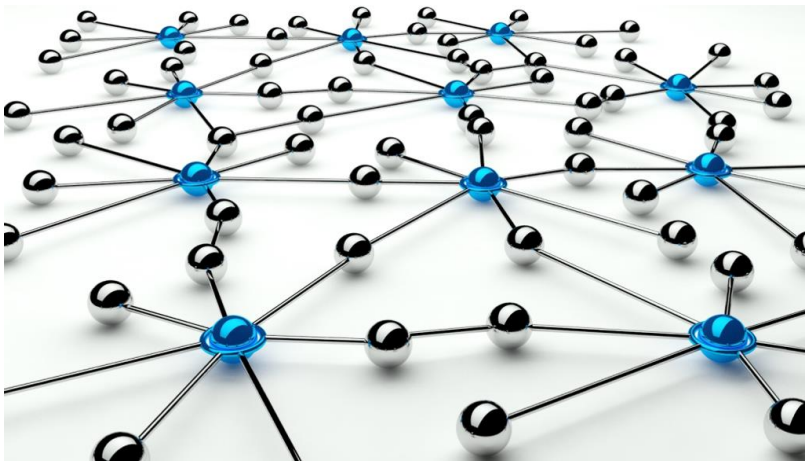
FIRE-IN

FIre and
REscue
Innovation
Network

WP1: STATE OF THE ART AND CHALLENGES

FIRE-IN has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement N°740 575

1



FIRE-IN has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement N°740 575

Partners brief presentation

1. **SAFE CLUSTER**, France (SAFE)
2. Ecole Nationale Supérieure des Officiers de Sapeurs-Pompiers, France (ENSOSP)
3. Italian Ministry of Interior, Department of Fire Corps, Public Rescue and Civil Defence, Italy (CNVVF)
4. Bundesanstalt Technisches Hilfswerk, Germany (THW)
5. Global Fire Monitoring Centre, Germany (GFMC)
6. INERIS DEVELOPMENT (INEDEV)
7. Fraunhofer INT, Germany (FhG-INT)
8. Fire Ecology and Management Foundation Pau Costa Alcubierre, Spain (PCF)
9. Catalonia Fire Service Rescue Agency, Spain (CFS)
10. Scientific and Research Centre for Fire Protection, Poland (CNBOP)
11. The Main School of Fire Services – Poland (SGSP)
12. Council of Baltic Sea States, Sweden (CBSS)
13. Civil Contingency Agency, Sweden (MSB)
14. KEMEA, Greece (KEMEA)
15. Czech Association of Fire Officer, Czech Republic (CAFO)
16. InnoTSD, France (INNO)

FIRE-IN has received funding from the European Union's Horizon 2020 Research and Innovation p

Project methodology

Practitioners' capability gaps

Common Capability Challenges

Screening of existing solutions

Request for ideas

Project duration:5 years.

Work is organized in 3 cycles, with 5 workshops each cycle

FIRE-IN has received funding from the European Union's Horizon 2020 Research ramme under grant agreement N°740 575

Capability gaps for crisis management

A. Search and Rescue (SAR) and emergency Medical Response

Cave Rescue

Air crash

Preplanning earthquake

B. Structures fires

High rise building

Road tunnel fires

Prevention larg commercial buildings

C. Landscape fires

LF crisis mitigation

LF vulnerabilit mitigation

WUI

D. Natural disasters

Flash Floods

Floods

Storms

E. CBRNE

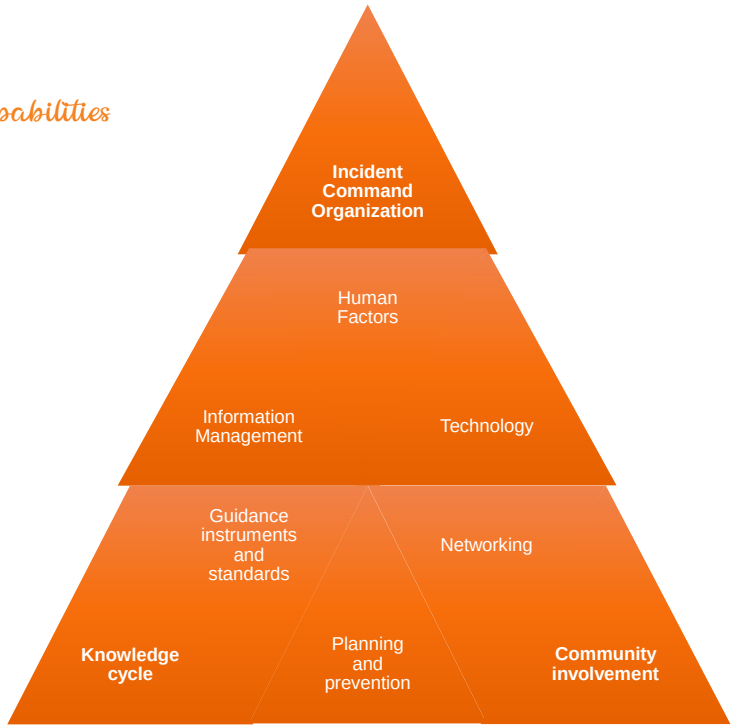
Accident in transport

Dirty bomb

Biological and Disease threats

5

Capabilities



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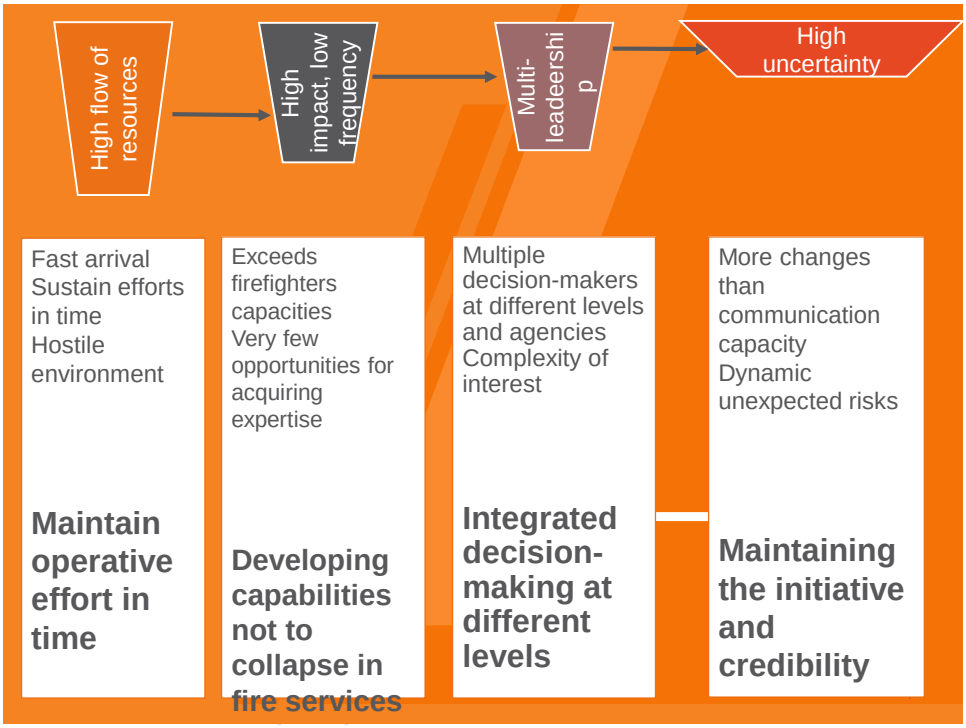

CCC	High flow of effort in hostile environment	Low frequency, high impact	Multiagency / Multileadership environment	High level of uncertainty
Incident Command Organization	Organize to susstain safe operations	Anticipate avoiding collapse of emergency system	Distributed decision-making	Strategies choosing safe, resilient scenarios.
Knowledge Cycle	Train specific roles and risks	Organizational learning on scenarios.	Shared understanding of emergency, and train interagency scenarios	Capacity building towards resilient societies
Community involvement	Self-protection to minimize responders' exposure	Actively involve citizens and communities	——	Cultural changes in risk tolernance and resilience
Planning and prevention	Preplan time-efficient and safe response	Negociate anticipated scenarios with stakeholders	Enhance synergies &Interoperability	Governance and integral risk management.
Guidance instruments & standards	Specific procedures and guides	Shared capabilities in front of pre-established scenarios	Harmonized and interagency framework	Build doctrine for Resilience in emergency services snd society
Information management	Information cycle	Focus information to decision-making	Interagency information process	Build a shared understanding
Technology	To assess risk and minimize responders' engagement	To forecast and simulate complex scenarios	To support data sharing	To get a clear picture of the risk evolution

High flow of effort in hostile environment

- Focus incident command on organizing to sustain safe operations
- Train specific roles and risks
- Community self-protection to minimize responders' exposure
- Preplan time-efficient and safe response
- Specific procedures and guides
- Build information cycle
- Technology to assess risk and minimize responders' engagemen

Low frequency, high impact

- Focus incident management on anticipating to avoid collapse of emergency system
- Organizational learning on anticipated scenarios.
- Actively involve citizens and communities
- Negociate solutions for anticipated scenarios with stakeholders
- Shared capabilities in front of pre-established scenarios
- Focus information to decision-making
- Technology forecast and simulate complex scenarios

Multiagency / Multileadership environment

- Distributed decision-making
- Shared understanding of emergency, and train interagency scenarios
- ____
- Enhance synergies & Interoperability in planning and prevention
- Harmonized and interagency framework
- Focus on interagency information sharing
- Technology to support data sharing

High level of uncertainty

- Strategies choosing safe, resilient scenarios.
- Capacity building towards resilient societies
- Cultural changes in risk tolernance and resilience
- Governance and integral risk management.
- Build doctrine for resilience in emergency services snd society
- Build a shared understanding
- Technology to get a clear picture of the risk evolution

Some results on 2nd cycle

Table 2. Conceptual compilation of the results collected from the first and second cycle of workshops about Pre-planning.

I. HIGH FLOW OF RESPONDERS IN HOSTILE ENVIRONMENT	II.HIGH IMPACT, LOW FREQUENCY EMERGENCIES	III.MULTI-AGENCY/MULTI-LEADERSHIP ENVIRONMENT	IV.HIGH LEVEL OF UNCERTAINTY
Pre-plan a time-efficient, safe response, minimizing responder's engagement	Negotiate solutions with stakeholders for anticipated scenarios	Pre-plan interoperability and enhance synergies	Focus on governance and integral risk management
1. Plan logistics & legal issues a. For specific scenarios. Consider help from outside the regionals System. b. Package and pre-positioning modules of resources. c. Available minimum of logistical resources and suplies.	1. Plan scenarios: a. Based on: a_1. Historical events, statistics (baseline), modelling actual conditions and the human factor. a_2. On a range of probable scenarios, from a local to a regional level b. Including scenarios probable at long term, investing in knowledge and skills and being prepared by a flexible and modular approach. c. Integrate the different disciplines based on the scenarios and strategies.	1. Create a transboundary framework a. Legal framework for cross-border help, emergency support, victim transportation, recognition of qualifications... b. Pre-plan should be known by all agencies and stakeholders	1. Create a flexible and fast framework a. Quick adaptation to changes through situation assessment and decision-making structures. b. Focus: small window of opportunities to change policies and governance processes.
2. Information – Awareness – Communication: Share information of local hostile scenarios, and its pre-planned response measures.	2. Information – Awareness – Communication: Regulate the expectations about the communications coming from the emergency systems.		2. Information – Awareness – Communication: a. Communication management for specific scenarios. Include post-accident procedures. b. Promote the growth of sustainable, risk-decreasing activities
3. Prevention & Preparedness: Passive prevention for safe access.	3. Prevention & Preparedness a. Change the focus towards active prevention, self-protection and risk mitigation. Facilitate firefighters' capacity. b. At a regional scale, harmonize P&P measures in cross-border/cross-regional areas.	2. Prevention & Preparedness: Emergency preparedness should be dealt with international / European perspectives.	
4. People: Roles & Experts a. Key specific roles. b. Networks of experts that exchange knowledge, experience and best practices. c. Coordination between cross-border crews.	4. People: Comunities a. Involve actors and agencies for their capacity to solve gaps. b. Exchange experts in large events in other places (countries?). c. Build communities of practice of experts.	3. People: Synergies a. Enhance synergies from regional, to national and international level. Share specialists and experts. b. Plan strategic ownership. c. Boost the exchange of aid-teams to train themselves.	3. People: Resilience a. Involve key stakeholders in action-based strategies, considering integral risk management opportunities. Identify strategic ownership. b. Encourage own skills and community skills fostering habits focused on the adaptation to risk

This project has received funding from the European Union's Horizon 2020 Coordination and

Some results on 2nd cycle

I. HIGH FLOW OF RESPONDERS IN HOSTILE ENVIRONMENT	II.HIGH IMPACT, LOW FREQUENCY EMERGENCIES	III.MULTI-AGENCY/MULTI-LEADERSHIP ENVIRONMENT	IV.HIGH LEVEL OF UNCERTAINTY
Pre-plan a time-efficient, safe response, minimizing responder's engagement	Negotiate solutions with stakeholders for anticipated scenarios	Pre-plan interoperability and enhance synergies	Focus on governance and integral risk management
	5. Negotiate/Agree: a. Responsibilities of organizations involved in the anticipated scenarios. b. Involve society in choosing between alternative strategical scenarios and negotiate solutions. c. Negotiate the accepted level of risk on a range of probable scenarios considered in the pre-planning (This phrase comes from II.1.b). 6. Best practices & Lessons Learnt: Context-specific guidelines on best practices in planning, preparedness and prevention at a national scale. 7. Pre-planning vs response: adapt the pre-plans to usable tools at the the emergency.	4. Negotiate/Agree a. Chain of command, specifying roles and capabilities. b. Establish agreements and structures for cross-collaboration between entities (private and public): ▪ with specific key intelligence, ▪ with those who have power of decisions ▪ with those who have influence on the management 5. Best practices & Lessons Learnt: European interagency round tables.	scenarios and on the robustness in front of the risk. c. Improve the resilience among responders to maintain their response capacity. 4. Pre-planning vs response: a. Reduce bureaucracy and other inhibitors. b. Pre-plans: Flexible, focused on indicators of key changes and providing tools for alternatives and contingency plans.

Thanks for your attention!!!

FIRE-IN has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement N°740 575

FIRE-IN

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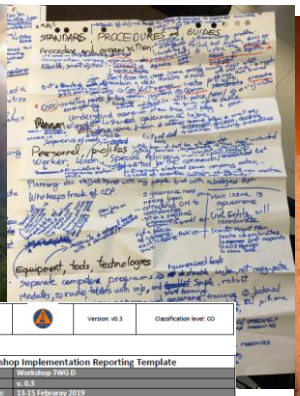

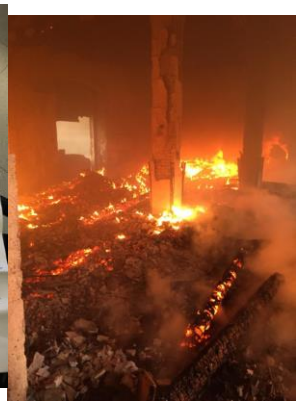

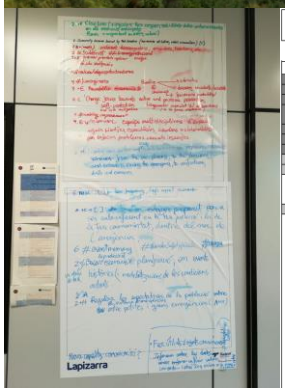

FIRE-IN	GA No. 740575		Version: v0.3	Classification level: CO

FIRE-IN WP 1 Workshop Implementation Reporting Template

Title:	Workshop TWG D
Document version:	v. 0.3
Workshop dates and location:	13-15 February 2019
Workshop participants and affiliation	See attached list
Submission date:	1rst April 2019
Submitted by:	Iris Schneider
Reviewed by:	Sébastien Lahaye

Identification of capability challenges

Background

WINTER STORM Scenario – Guidance instruments and standards- standardize capabilities in front of pre- established scenarios

Improvement opportunity / Capability Challenge:

Capability #3 – Guidance instruments and standards- standardize capabilities in front of pre-established scenarios

As we are talking about a major natural disaster it implies that there are not only fire and rescue agencies but many other key responders (public services and private operators) that are not used to Incident Command Systems and thuse need more EU directives on management and coordination rather than standards.

Why do you see the need to discuss this task with respect to capability needs?
It is a question of risk average time return. Countries and/ or regions are not all adquately prepared to face the risks and have thus no procedures in place.
Two key topics have to be looked into: Command and Control and logistics.
On logistics, standards and procedures should promote interoperability regarding plugs, maps, data sharing, telecommication to name only the most obvious ones.
On Command and Control a flexible approach that takes the local structures into account is required.

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CCC from second cycle and deliverable 1.3. (JJ)

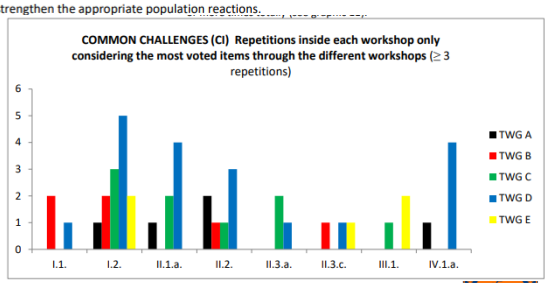
The process to find the CCC

3.7. Community involvement

Items collected from the first and second cycle of workshops concerning Community involvement:
I. HIGH FLOW OF RESPONDERS IN HOSTILE ENVIRONMENT: Develop public self-protection to minimize responders' exposure

I.1. [III] Focus on prevention, self-protection and risk awareness of population. Encourage self-protection measures (subsidy, exceptions in regulations…) Create a culture of emergency.
I.2. [IIIIIIIIIII] *Train/educate/inform* general population starting from scratch and in a basic and easy way, about knowledge of risk and appropriate behaviours, specially targeting those more exposed and vulnerable. Address all phases of emergency and the different levels of risk. Provide tools to facilitate adequate decision-making: checklists, emergency kits …
I.3. Agree with public and private stakeholders on accepted risk and self-protection measures reaching pacts and deals. Do mandatory exercises financed by the owners of high risk activities. Focus on crowd management and panic.
I.4. [II] Disseminate instructions to apply in case of risk, in order to strengthen the appropriate population reactions.

#voluntaryinvolvement #PressConferenceArea #floatingpopulation



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Challenges

· Which are the areas in which there are more difficulties of knowledge?

· Adjustment of the methodology and theme of the third cycle of workshops

· How can the E-FIRE-IN Platform help to provide knowledge in those areas in which gaps have been detected?

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THANKS!

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Introduction to RiskPlan
A pragmatic tool for risk assessment

- Jakob Hörl
- 20th February 2020, Barcelona

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Overview

- What it is
- Origin
- Target Users & available publications
- Case studies
- Methodology
- Advantages & Limits of Risk Plan

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RiskPlan

- is a calculation and management tool to assess the risks posed by hazard processes in defined areas and to evaluate the cost-effectiveness of protective measures.
- enables a pragmatic approach to risk management
- is a planning tool for integrated risk management
- is an excellent instrument for risk dialogue
- is an ideal tool for learners who are not familiar with the details of risk assessments

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Origin – reasons RiskPlan was developed (I)

Two major developments in Switzerland since the 90ties

- Introduction of risk-based hazard management for natural and technological risks
  - methodological background
  - understanding of benefits
  - guidelines for risk analyses
- Systematic hazard mapping for natural risks
  - necessary data for risk assessments
  - understanding of hazard
  - Opportunity to calculate risks and to practice risk-based hazard management
  - Costly
  - Time-consuming

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Origin – reasons RiskPlan was developed (II)

Alternative to the detailed risk assessment without giving up the methodology of risk-based hazard management

- Use local knowledge and experience where data are missing
- Estimate damage where simulations and calculations are not possible or too costly
- Provide the possibility to assess risks in communities or regions or even catchment areas
- Provide the possibility to assess the cost-effectiveness of measures
- Provide the possibility to use risk assessments for risk dialogue
- Provide a learning tool for risk management and risk dialogue

- Different versions of RiskPlan were developed and continuously tested in real-world case studies.

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Target Users

- Authorities responsible for (natural) risk management in communities or regions (prevention and/or response)
- Professionals in engineering and insurance companies
- Research organisations in (natural) risk management
- Teachers, students and interested persons

Publications

Case studies

- 2006 Case study Kam Phuan (tsunami and flooding risk in a region of Thailand) in cooperation with local authorities and ETHZ
- 2007 – 2008 Pragmatic Risik Management (RiskPlan online)
  - Case Study Climate Change, Taschinasbach (GR)
  - ChlimchAlp: Delegation Südtirol
  - Fallbeispiel Nidwalden
  - AdaptAlp: Various Case Studies in France, Germany, Austria, Slovenia, Italy
- 2009 Pragmatic Risik Management (RiskPlan offline - online 2.0)
  - ParaMount: Application to traffic routes in France, Germany, Austria, Slovenia, Italy

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Methodology (I)

- RiskPlan is a risk based methodology, which means:
  - Hazards are described by a set of distinct scenarios
  - Scenarios are described by its probability or frequency of occurrence and by its damages
  - Damages are described by damage indicators (fatalities and property damage, others are possible)
- Different damage indicators are aggregated to a total monetized damage through willingness-to-pay-values [WTP]

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Methodology (II)

- System definitions:
  - Spatial grouping: assessment area, divided into regions, subdivided into object areas
  - Hazards: scenarios S characterised by its intensity
  - Exposures E, e.g. 3 types: normal / unfavourable / disastrous
- Parameters to estimate societal risks:
  - Frequency of scenario Si: H(Si)
  - Probability of exposure Ej: p(Ej)
  - Damage for given indicators Ik (fatalities, material damage, ...): Dk(Si, Ej)
- Further parameters to estimate societal risk values:
  - willingness-to-pay values m to monetize non monetary damage values (e.g. CHF 5 Mio. to statistically avert 1 fatality)
  - "risk aversion" g (weighting function depending on damage) to account for "indirect damage" or indicators not used → can be used or disregarded

  RiskPlan contains recommended values for these parameters!
- Calculation of societal risk values for an object area q:

$$R_q = \sum H_q(S_i) * p_q(E_j) * D_{qk}(S_i, E_j) * m_k [* g(D_{qk}(S_i, E_j))]$$

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Methodology (III)

- Risk Matrix

Scenario	E1 Probability: 60%	E2 Probability: 35%	Ek Probability: 3%	Ep Probability: 2%
S1 Frequency: 0.0666667	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF
S2 Frequency: 0.0233333	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF
Si Frequency: 0.0666667	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF
Sq Frequency: 0.00333333	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF	Minimum value / Maximum value Number of fatalities per event 0 / 0 Material damage per event 0 CHF / 0 CHF

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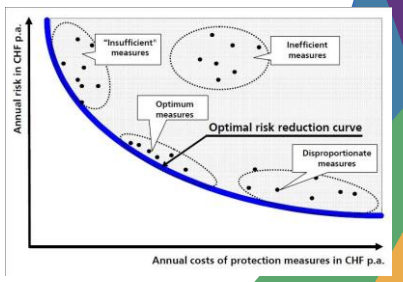
Methodology (IV)

- RiskPlan is a methodology for assessing safety measures on the basis of cost-effectiveness, which means:
  - The effectiveness of possible safety measures (incl. combinations thereof) is assessed in terms of the (yearly) risk reduction.
  - The costs of possible safety measures are assessed in terms of the (yearly) cost C_a derived from investment costs C_i, operating cost C_o and maintenance costs C_m using life span t [years] and interest rate p [e.g. 2% → p=0.02]:

    $C_a = C_o + C_m + C_i/t + (p \cdot C_i)/2$
  - The optimal safety measures is chosen on the basis of the risk-cost-diagram.



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Advantages of RiskPlan

- Quick estimate of risk situation in a region (strategic level)
- Use of experience and expert judgement for risk estimates (e.g. round table)
- Suitable to lead a risk dialogue involving all stakeholders
- Tool is flexible with respect to hazards, scenarios, risk parameters etc.
- Application not limited to natural hazards

Advantages for RECIPE

- Common methodology that can be applied to various hazard in projects => comparability
- Quantitative results
- Climate change can be included (different hazard processes; with / without CC)
- Make use of existing data and information
- Simple
- Encourage risk dialogue & reach out to other agencies

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Limits of RiskPlan

- Primary field of application is on the strategic level:
  - need for additional safetymeasures
  - rough prioritization of safety measures → assessment of need foraction
- RiskPlan is not normally used for detailed risk assessments

  → more is needed before investing heavily on additional measures
- Results between different applications of RiskPlan (by different groups) might not be comparable

Limits for RECIPE

- Technical issues (create account, figure out handling)
- Limited official support (RiskPlan online only till end 2020; RiskPlan offline available, but not updated runs on Windows 10)
- Preperatory work defines achievable outcomes

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RECIPE

Thanks for your attention

Contact

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TASK D4.2
Guidelines for flood and fire civil protection planning with participatory approach with an operational tool for collecting citizens monitoring observations in emergency situations

- Chiara Franciosi, Marta Giambelli- CIMA Foundation

- 21/02/2020, Barcellona

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What are we speaking of

- Guidelines for an operative protocol (in Italian, summary version in English) suited to local conditions to perform good participatory processes addressed to civil protection stakeholder and municipality staff.

- A mobile operational tool for collecting floods and fires monitoring observations from key citizens, to be integrated into pre-existing systems for the emergency management at local level

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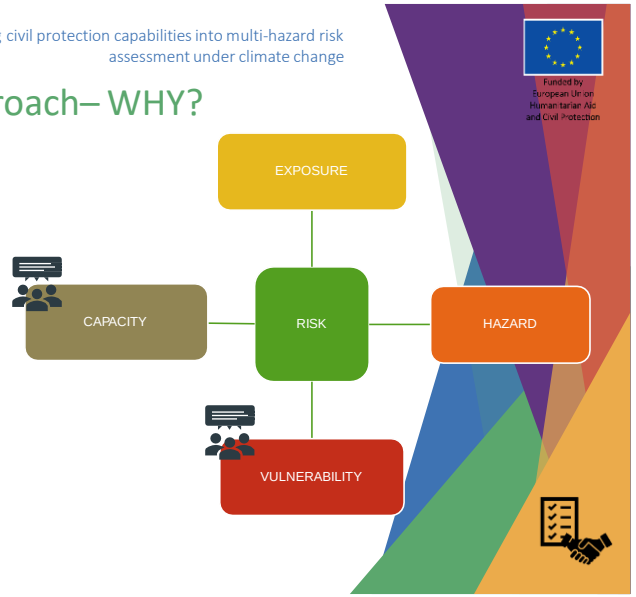
The participatory approach– WHY?

Active involvement of the population leads to

A better flood risk scenarios definition (Vulnerability)

A more robust awareness of the local risk , a general context of a shared responsibility and a strong credibility of the institutions, who are the first respondents to any disasters (Capacity)

and so decreasing the risk



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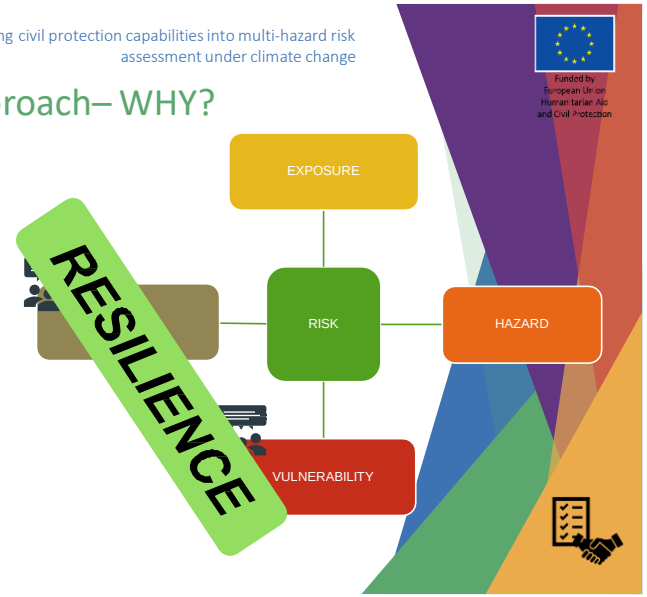

The participatory approach– WHY?

The participatory process for CP planning reinforces the capacity of the civil protection to cope with future natural hazards because

- It develops a "social" ground , able to produce an improvement in future risk governance, "making " the local community and technicians more aware of their territory, its needs and its vulnerability and its opportunity, and of their role for better managing the territory, and of the importance of interacting and collaborating for preventing the future risk

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The participatory approach– WHY?

PARTICIPATORY
Civil Protection Plan

Civil Protection Plan

the Cp planning could be seen as a tool of Preparedness but also of Prevention and mitigation, focusing on understanding and dealing with non foreseen impacts of disasters and emergencies

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The participatory approach– HOW?

Project writing

Stakeholders mapping

- *Project writing: what elements will be partecipated?*
- *Stakeholders mapping ➔ Mapping and activation of stakeholders through territorial meetings*

Process Implementation
Participated meetings

Arnstein (1969) Ladder of citizen participation

- *Participated meetings with stakeholders, Local Insititution and administrators*
- *Collecting informmation and data*

Final «return» of the process

Putting indications emerged during the process into the Plan

- *Final return to the stakeholders*
- *Putting the process results in the plan*

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The participatory approach– WHO?

ACTORS

MAYOR, MUNICIPAL TECHNICIANS AND POLITICIANS (WORKING GROUP)

CIVIL PROTECTION EXPERTS (engineers, territorial planners, jurists)

FACILITATORS

KEY STAKEHOLDERS

CIVIL PROTECTION VOLUNTEERS

SCHOOLS AND FAMILIES

MUNICIPALITY

OTHER ASSOCIATIONS AND USERS

In the past experiences

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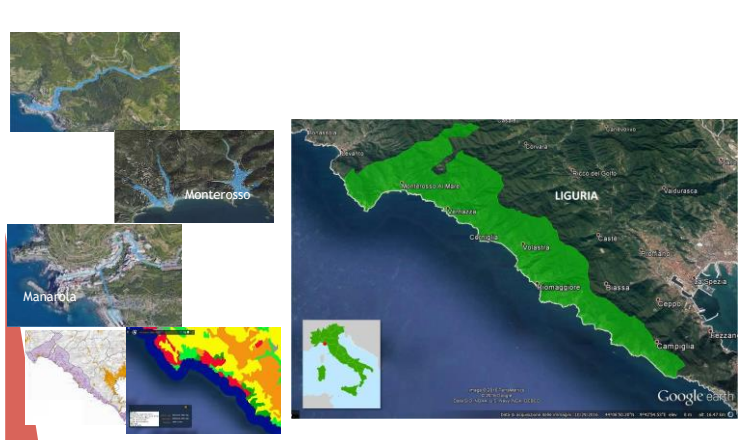
Pilot Site: 5 lands territory



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Pilot Site: 5 lands territory

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Pilot Site: 5 lands territory

Community Stakeholders

Institutional Stakeholders

MUNICIPAL ITIES

Civil Protection Volunteers

Practioners

Tour Operators

Schools

Local Associations

REGIONE LIGURIA

cima RESEARCH FOUNDATION

RFI RETE FERROVIARIA ITALIANA GRUPPO FERROVIE DELLO STATO ITALIANE

PARCO NAZIONALE DELLE CINQUE TERRE

RECIPE

Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

Pilot Site: 5 lands territory

The Participated process for a civil protection planning will

- Take into account the interaction of flood and fire risk in the context of climate change and improve emergency management, filling existing gaps
- Be able to collect and put together the needs of the local community, institutions and the other economic stakeholders towards a effective collaboration
- Be able to "appreciate" the link between different planning and so Provide indications relating to territorial planning for better risk mitigation governance, increasing territorial resilience

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RECIPE

Thanks for your attention

marta.giambelli@cimafoundation.org
chiara.franciosi@cimafoundation.org

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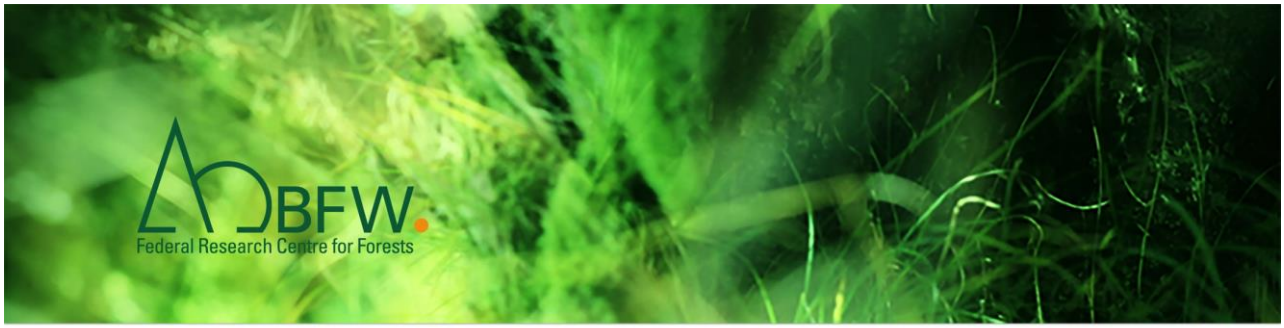


BFW - Austrian Federal Research Centre for Forests

Multi-Hazard Risks - Decision Support for Sustainable Risk Management

Peter Andrecs

BARCELONA, Feb. 2020

Content

- **Multi-Hazard Risks**
- **Protection Forests**
- **New Assessment Tools**
- **Knowledge Transfer**
- **Civil Protection in Austria**
- **Main Task in RECIPE**

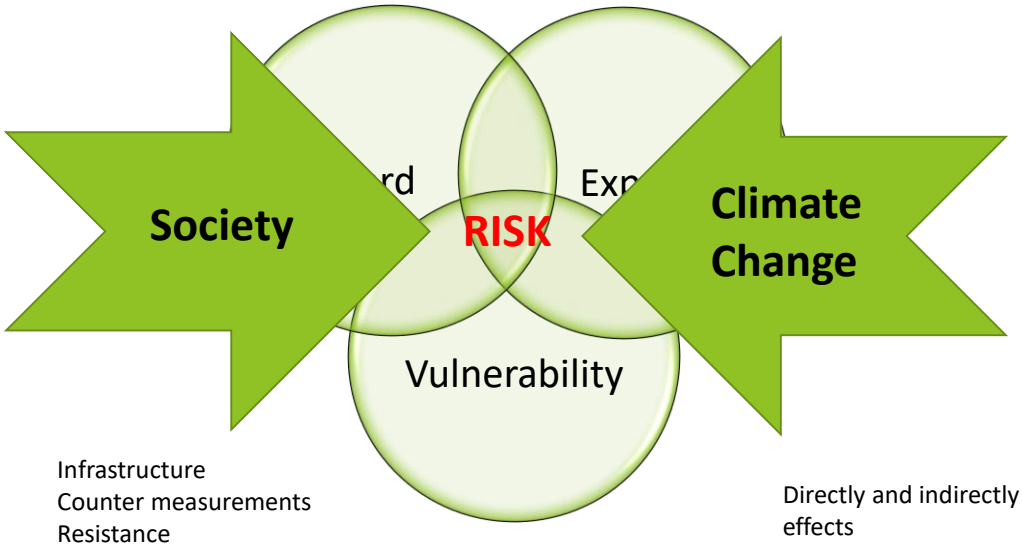
Multi-Hazard Risks

Gravitational Natural Hazard Processes

3

Multi-Hazard Risks

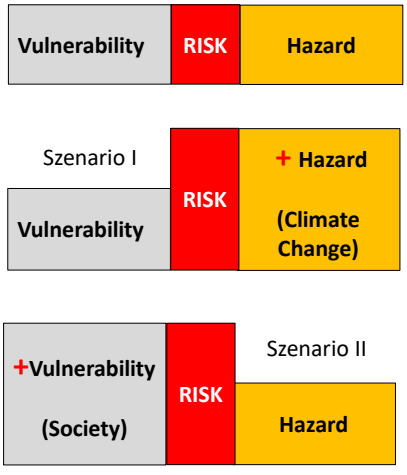
Multi-Hazard Risk

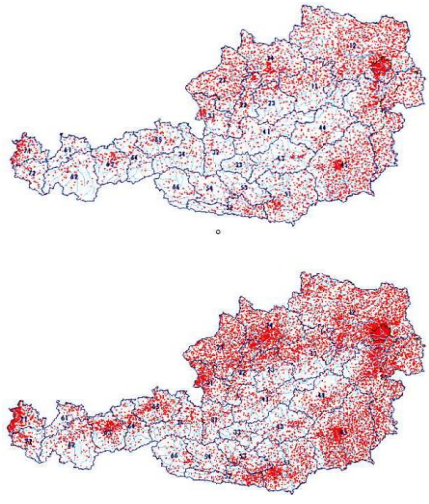


Infrastructure
Counter measurements
Resistance
Acceptance

Directly and indirectly effects

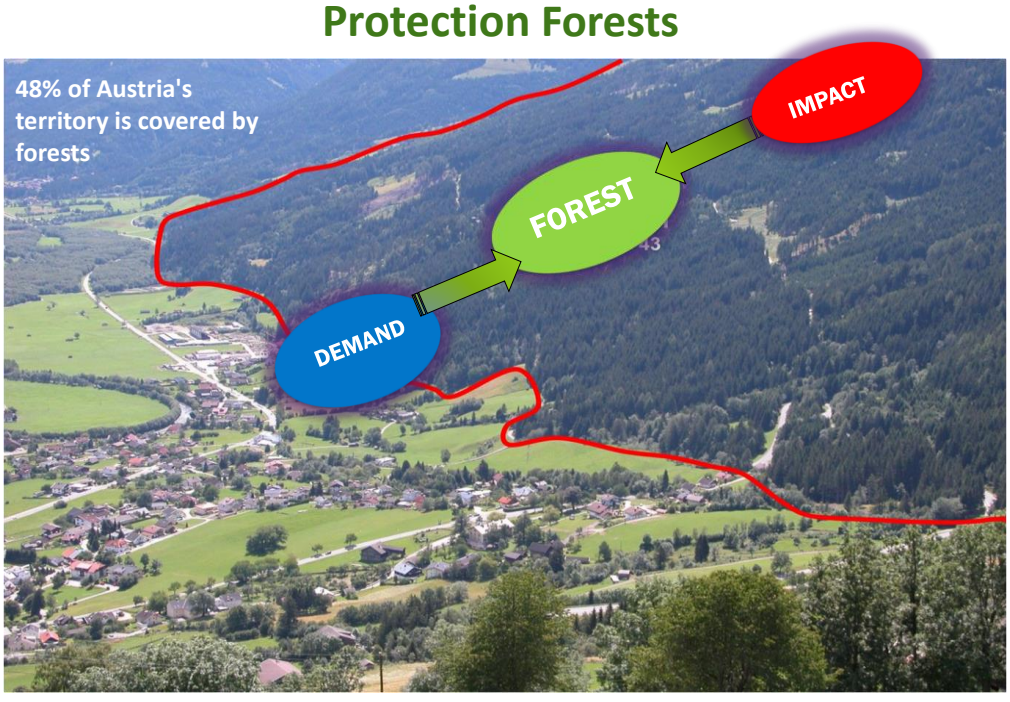
RISK - Increase Scenarios



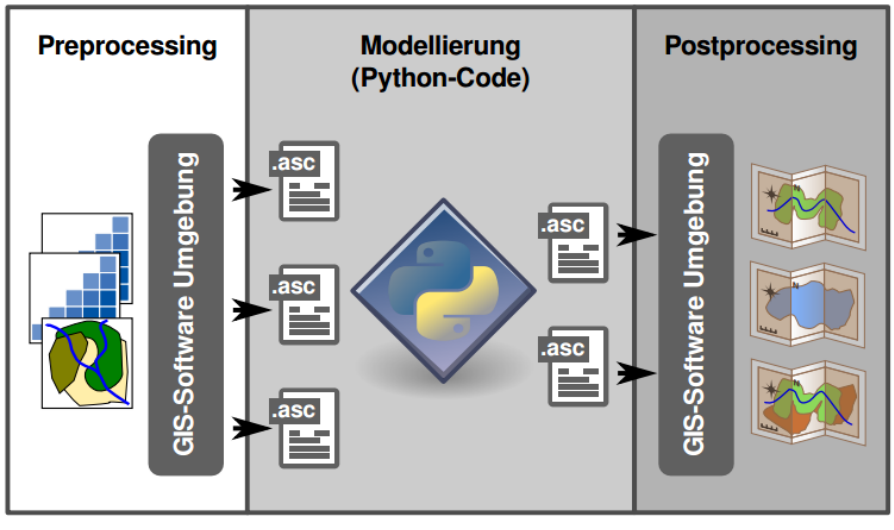


Building census, Austria 1951 – 2001
(each red point represents 100 buildings)
(Statistics Austria)

Protection Forests



Schematic Workflow – Roles of Forests



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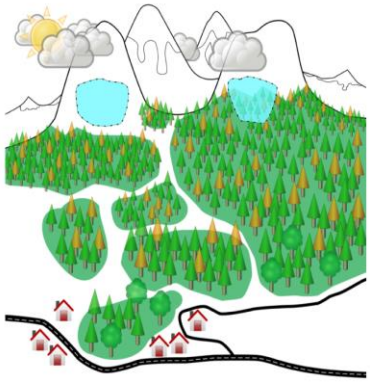
Schematic Work Flow – Pre-Processing

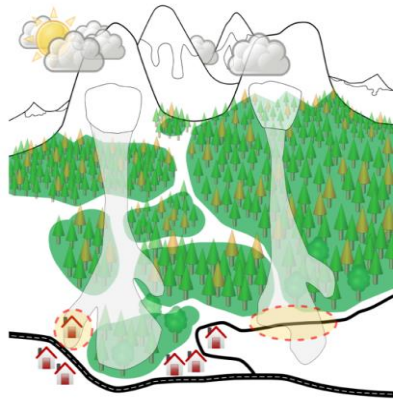


PRE-PROCESSING
(use of a digital terrain model, raster-resolution: 10 m x 10 m)

- estimation of Potential Release Areas (PAR)
- disposition-classification
- digitalisation of forests (forest-layer)
- digitalisation of infrastructure (infra-layer)

9

Schematic Work Flow – (Main-)Processing

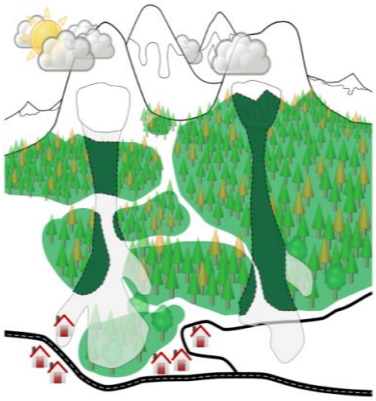


PROCESSING

- run-out – infrastructure overlap
- backcalculation – forest classification
- homogenization: buffering of narrow relevant runout areas

10

Schematic Work Flow – (Main-) and Post-Processing



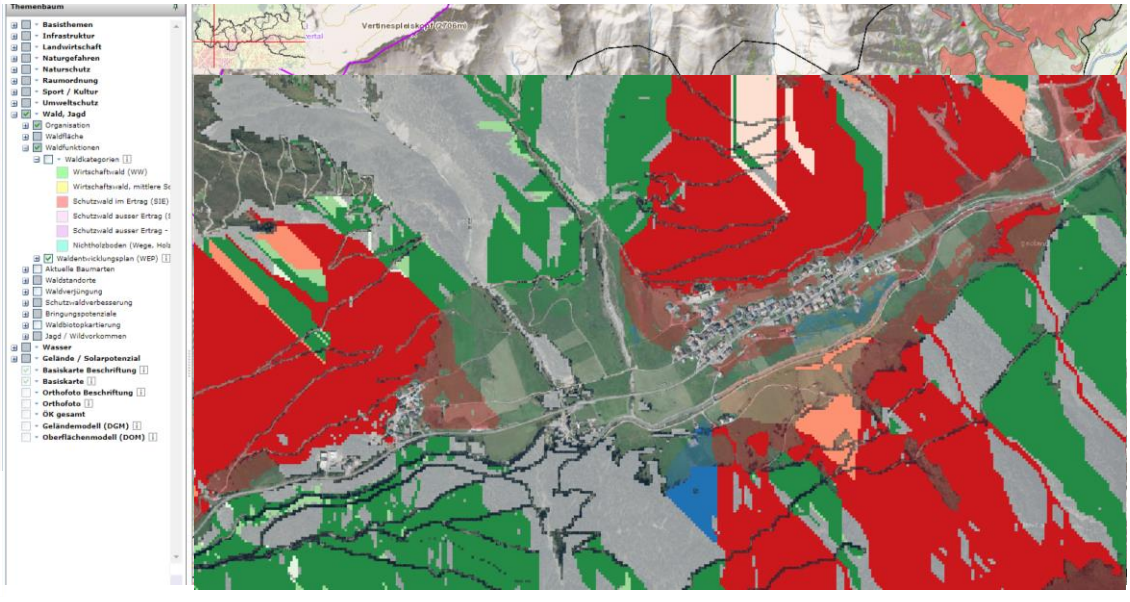
PROCESSING - Final Goal

- forest areas with direct protection function against gravitational natural hazards

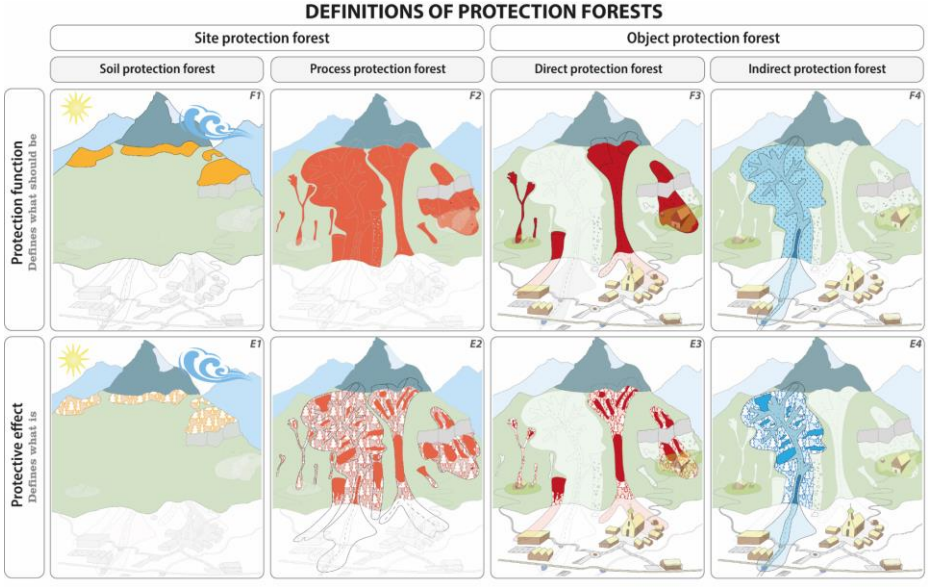
- + further **POST**PROCESSING – steps
  (e.g. layer overlapping, 3 m x 3 m matrix for risk classification, graphical operations,…)

11

Forest Protection Functions - Analysis



Protection Forests – Matrix



New Assessment Tools – FlowPy-Model

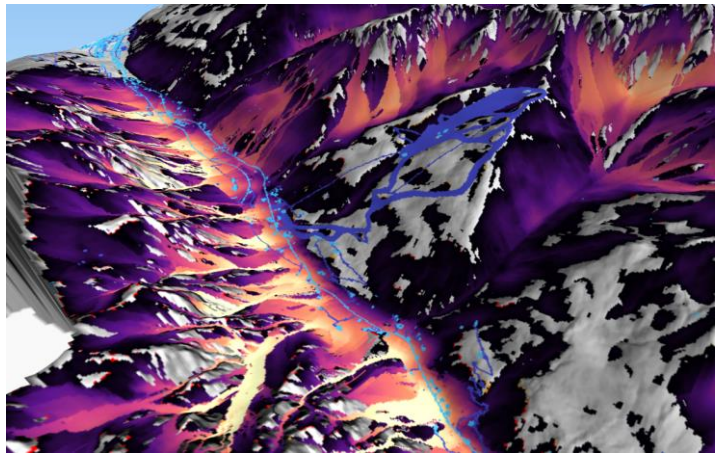
Regional modelling of protection functions and protective effects

Hazard situation based on:

- event inventory
- slope
- max. average snow depth

Calculated:

- height of avalanche power line
- process area

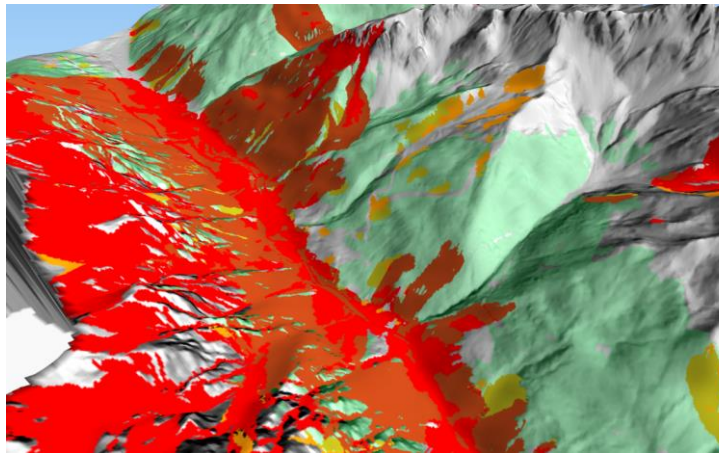


New Assessment Tools – FlowPy-Model

Regional modelling of protection functions and protective effects

Protection function based on:

- damage potential
- forest area



New Assessment Tools – FlowPy-Model

Regional modelling of protection functions and protective effects

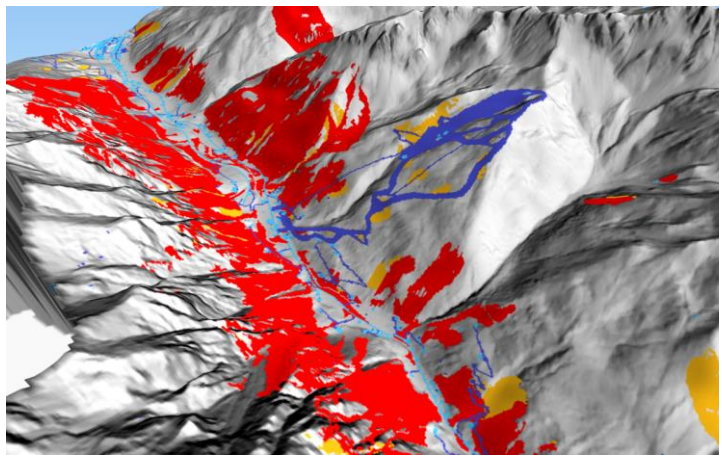
Protection function based on:

- damage potential
- forest areas

Calculated:

- two categories

  infrastructure of high public interest and of lower public interest



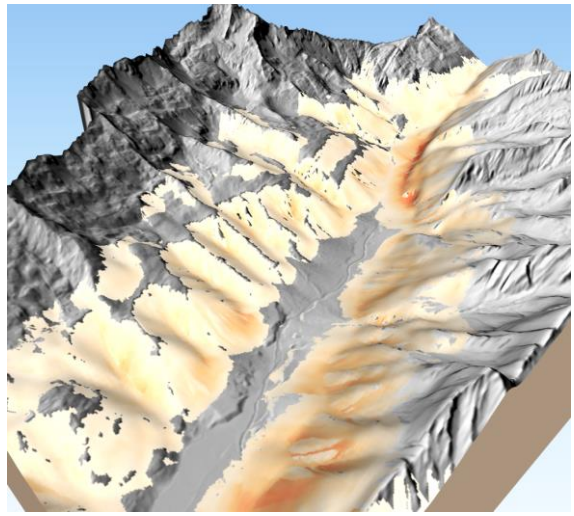
New Assessment Tools – FlowPy-Model

Regional modelling of protection functions and protective effects

Protective effect based on:

- 3 types of forests
- crown coverage

(Further development with remote sensing data and observations is planned)



New Assessment Tools – FlowPy-Model

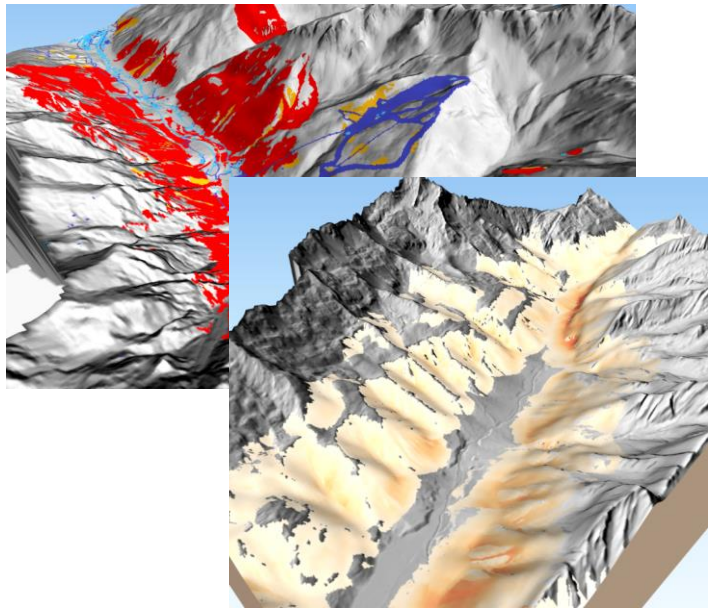
Prioritization in protection forest management

↓

Protection function

+

Protective effect



New Assessment Tools – FAT

FAT – Forest Assessment Tool

process model blended with an economic model

	Direct Costs	Benefits
Steel Snow Bridges	511 500 €	198 000 €
Catchment Dam	840 500 €	150 000 €
Catchment Dam + Afforestation	760 000 €	150 000 €
Afforestation	187 000 €	200 000 €

Decision Alternatives - TEGRAV

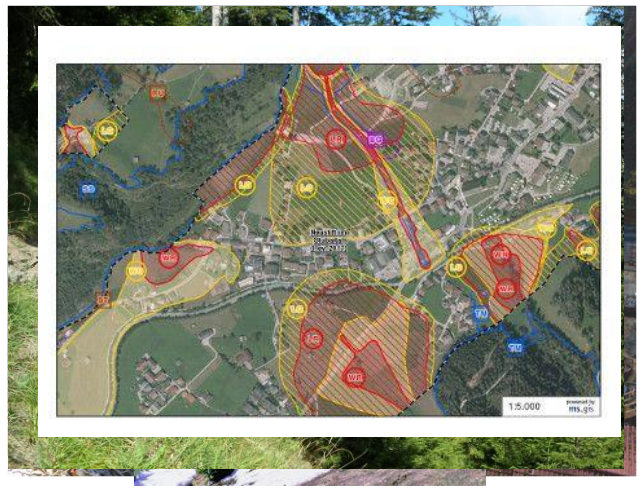
New risk assessment procedure,
integrating costs and protective effects of the main mitigation types

TE GR AV

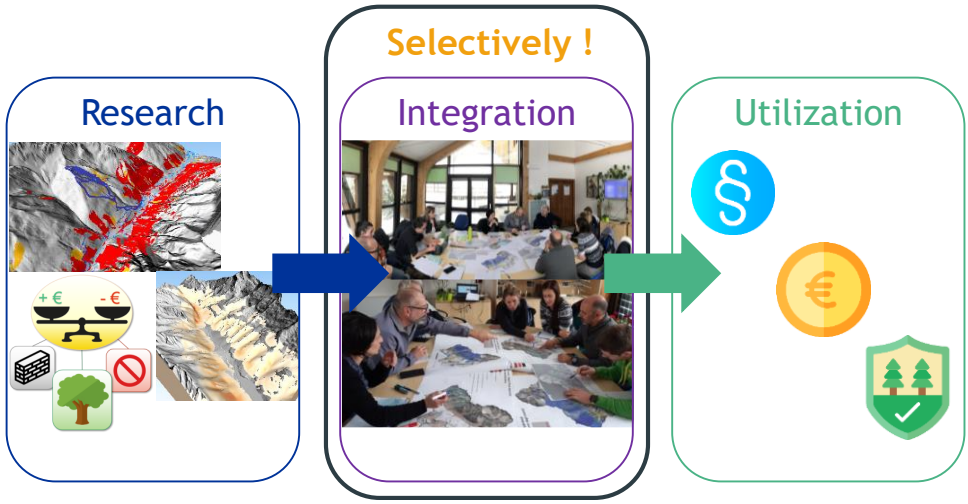
TEchnical

AVoidance

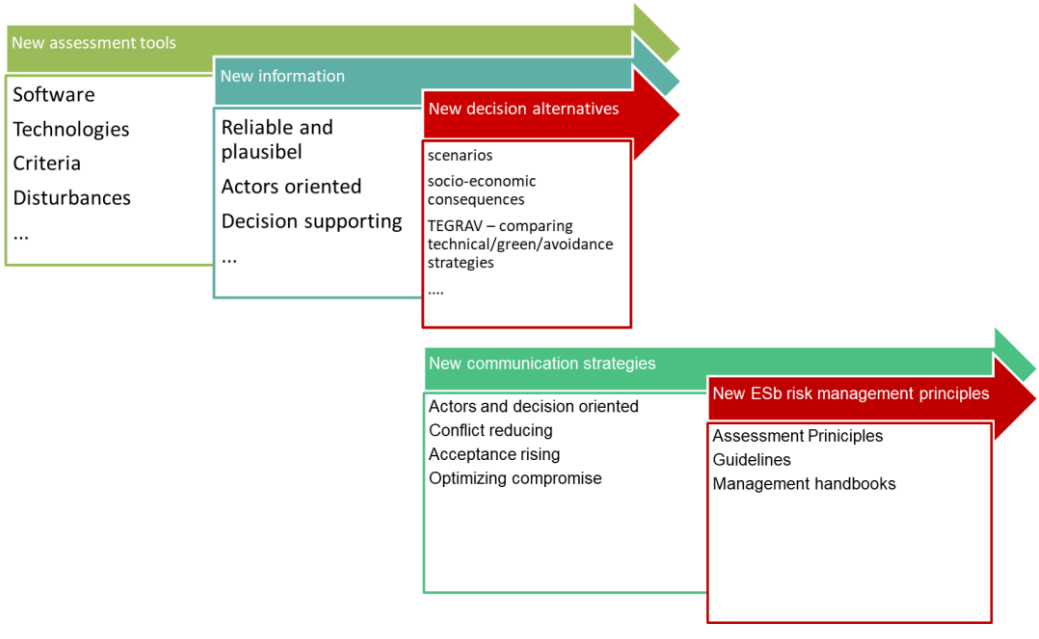
GReen



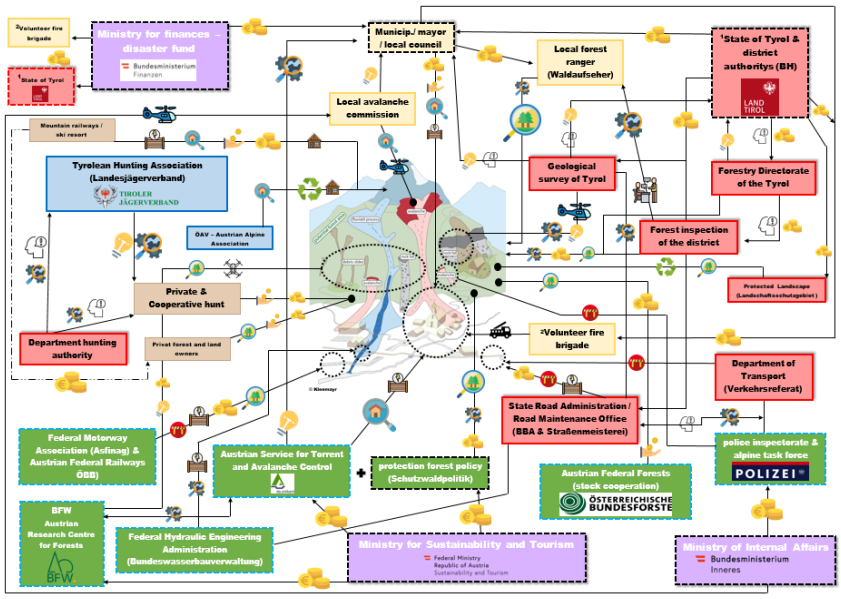
New Ways of Transferring Knowledge



New Ways of Transferring Knowledge



Need for New Communication Strategies



meaning	sign / icon
money flow, financial support, financing for the implementation of measures	
financial revenues, from the forest or the alpine catchment area as an economic area	
expertise, management and maintanence with focus on the (protection) forest / in some cases property of forest	
protection with focus on settlement areas and infrastructure	
expertise, consultation and supervision	
general cooperation and checkup or interest in functionality	
instructions	
construction / establishment of mitigation and protective measures	
road closure, bans, avoidance of danger	
observation and control with traffic and airborne operations	
core interest in landscape and environmental protection	
infrastructure in alpine space & catchment area, tourism	

level / kind of institution	frame
governmental, federal level: Ministry	
federal company / institution / operation	
governmental, state level	
authority or company on state level	
governmental, municipal level	
organization / establishment of the municipality	
private institution / operation	
(E)NGO	

Note: In principle, it is likely that the network of actors and network of cash flows is much more pronounced than illustrated (cooperation, exchange of knowledge, grants, rents, levies). However, the primary networks and cash flows shown are those that may be relevant in natural hazards and risk management. The graph is therefore not complete in this respect. Icon sources: flaticon.com, bundesforste.at, polizei.gv.at, bmnt.gv.at, bmi.gv.at, bfw.ac.at, tiv.at, tirol.gv.at, bmf.gv.at

Quelle M. Plörer, BFW

What we are doing now

Prevention:

- development of simulation models and assessment tools
- provide basics for hazard mapping
- modelling and expertise
- slope assessment through irrigation attempts
- slope monitoring - early warning system
- drone flights to spot hazards

After a damage event:

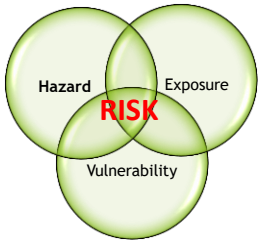
- damage documentation
- damage analysis

During/After a damage event:

- emergency measures
- rescue and protection measures
- immediate structural measures

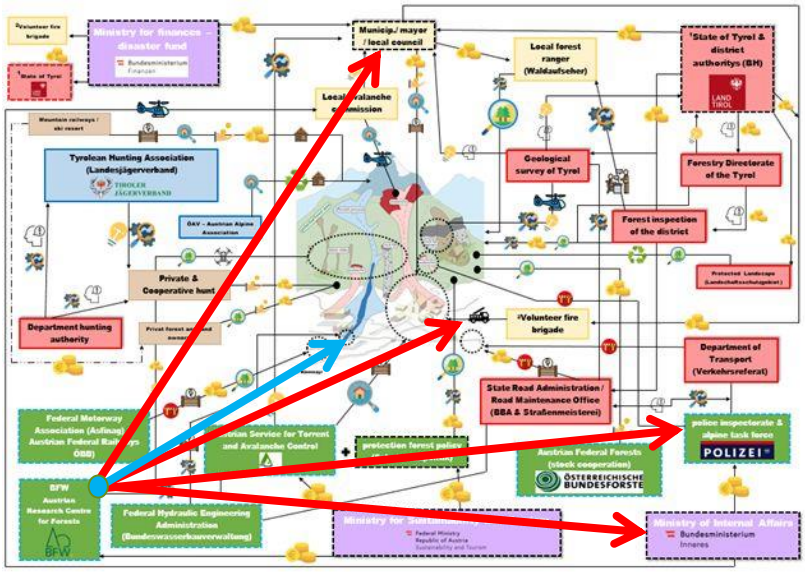
Conclusio:
We provide decision-making basics but no decision-making tools

RECIPE – Our goals



- Increased engagement with vulnerability
- Increased communication with civil protection and emergency management
- Try to integrate their demands in our tools

Main Tasks



RECIPE

Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

Guidelines for a participatory crisis management plan to manage wind throw along roads

- Jakob Hörl

- 21st February 2020, Barcelona

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RECIPE

Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

Outline

- Problem and future challenges
- Recent Example winterstorm “Sabine”
- Case-study development
- Risk dialogue

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Problem & challenges

- Storms unpredictable
- Climate change impact:
  - Frequency of storms unchanged
  - Increased intensity and severity
  - Change of storm tracks
- Increased complexity and connectedness of infrastructure and daily life
  - Higher economic damages when system fails

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Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

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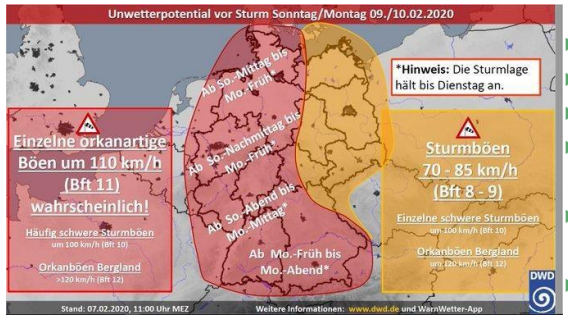
Winterstorm „Sabine“ 9th – 10th February 2020



- Wind speed > 120 km/h
- Thunderstorm & heavy rain
- Early warning system
- Broad media coverage
- Damages not as high as expected
- Forest damage remarkable in some areas (1/2 a.c.)

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Winterstorm „Sabine“ 9th – 10th February 2020

- Many road blockages
- Train & flight cancellations
- Power outages (France, Czech)
- Injured persons

- Local fire service:
  - 35 of 43 operations 2020

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Case-study development

“Guidelines for a participatory crisis management plan to manage wind throw along roads”

1. Prepare methodology
   - Literature search
   - Application of Swiss tool “RiskPlan”
2. Develop case
   - Define factors and identify data basis (available parameters, requirements)
   - Define case (develop scenarios, object areas)
   - Identify stakeholder groups / authorities to involve
3. Find partners
   - Contact districts / municipalities willing to conduct case study
   - Contact state forest administation and civil protection agency of Baden-Württemberg
4. Workshop “risk dialogue” / risk assessment
5. Develop participatory crisis management plan for case-study
6. Prepare guidelines at state level

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Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

Define case

Assessment area:
- Administrative district (Landkreis): XXX
- Regions within assessment area: 25 – 30 municipalities

Object areas:
- Roads (direct and indirect damages)
- Buildings
- Train track
- Protected areas

Hazard processes
- Windthrow of trees (with and without climate change impact)
- Scenarios
  - Return period/frequency
  - Intensity
  - Weather before and during hazard event
- Expositions
  - Normal
  - Unfortunate
  - Catastrophic

Measures
- Combinations
- Cost-effectiveness analysis

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Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

Identify stakeholder groups

- State administration (Forest service; civil protection agency)
- District administration
  - Resp. Departments (e.g. Fire and Civil Protection, Public Roads, Forestry)
- Fire service
- Federal Agency for Technical Relief (THW)
- Media
- Private forest owners
- Associations
- Insurances
- Appraisers (e.g. for tree control)
- Forest contractors

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Identify data basis (available parameter)

Factors:

- Critical wind speed
- Topografy
- Tree height
- Tree species
- Rooting depth
- Forest management
- Stand structure

- Storm damage probability maps

  Based on actual tree heights and species distribution

  Norway spruce (today; actual values)

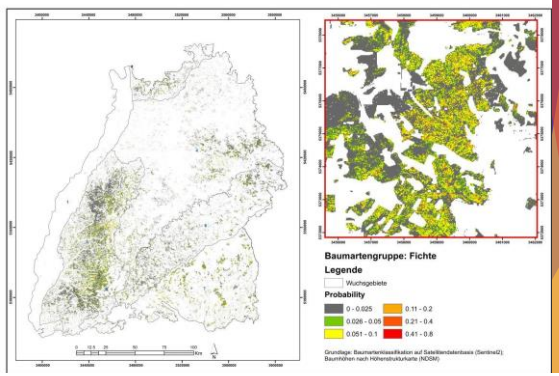

Abbildung 10: Kartenset I: Sturmgefährdung (Probability) für die Baumartengruppe Fichte (Picea abies) anhand deren realen heutigen Vorkommen und deren luftbildbasiert ermittelten Baumhöhen. Die Karte rechts ist eine beispielhafte Nahansicht.

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Identify data basis (available parameters)

- Storm damage probability maps

  Based on actual tree heights and species distribution

  Oak and beech (today; actual values)

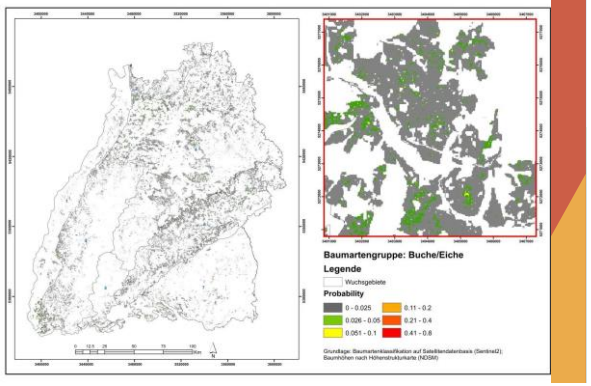

Abbildung 12: Kartenset I: Sturmgefährdung (Probability) für die Baumartengruppe Buche/Eiche (Fagus sylvatica Quercus robur, Q. petraea, Q. rubra,) anhand deren realen heutigen Vorkommen und deren luftbildbasiert ermittelten Baumhöhen. Die Karte rechts ist eine beispielhafte Nahansicht

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Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

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Identify data basis (available parameters)

- Storm damage probability maps
  - Based on actual tree heights and species distribution
  - Norway spruce (climate change)
  - Increase of wind gust speed by 1,58 %

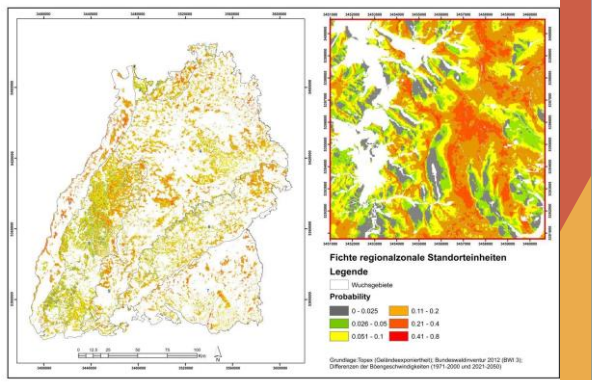

Abbildung 28: Kartenset III: Unter Klimawandel möglicherweise leicht erhöhte Sturmgefährdung (Probability) als Potentialkarte für einen Normbaum der Baumartengruppe Fichte. Beurteilungsgrundlage für die Staunässeinformation ist die regionalzonale Standorteinheit nach Standortskartierung. Nicht standortskartierte Waldflächen sind in dieser Karte nicht abgebildet. Die Karte rechts ist eine beispielhafte Nahansicht

RECIPE

Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

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Identify data basis (available parameters)

- Storm damage probability maps
  - Based on actual tree heights and species distribution
  - Oak and beech (climate change)
  - Increase of wind gust speed by 1,58 %

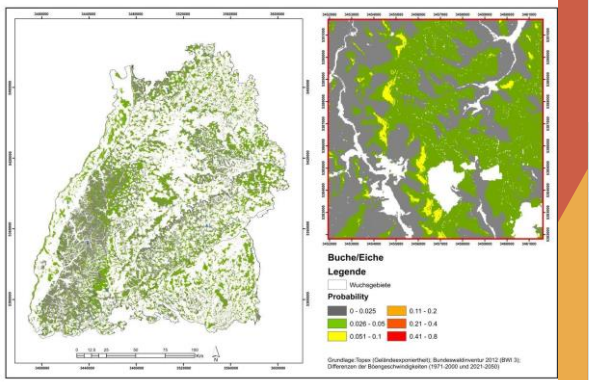


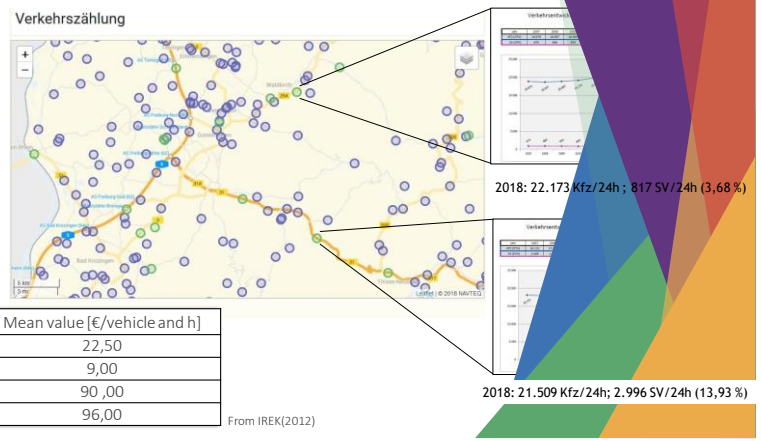
Abbildung 32: Kartenset III: Unter Klimawandel möglicherweise leicht erhöhte Sturmgefährdung (Probability) als Potentialkarte für einen Normbaum der Baumartengruppe Buche/Eiche. Abgebildet sind alle Waldflächen Baden-Württembergs. Die Karte rechts ist eine beispielhafte Nahansicht.

Identify data basis (available parameters)

- Traffic volume data

Calculate
- Exposure
- Damage potential

Indirect damages
- Economic losses due to road closure



Traffic type	Mean value [€/vehicle and h]
Commuter traffic	22,50
Leisure traffic	9,00
Business traffic	90 ,00
Freight traffic	96,00

From IREK(2012)

RECIPE

Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

Procedure for risk assessment with RiskPlan

Define Hazard scenarios

⇩

Define damage potential according to indicators

⇩

Calculate extent of damage

⇩

Calculate risk within RiskPlan

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Reinforcing civil protection capabilities into multi-hazardrisk assessment under climate change

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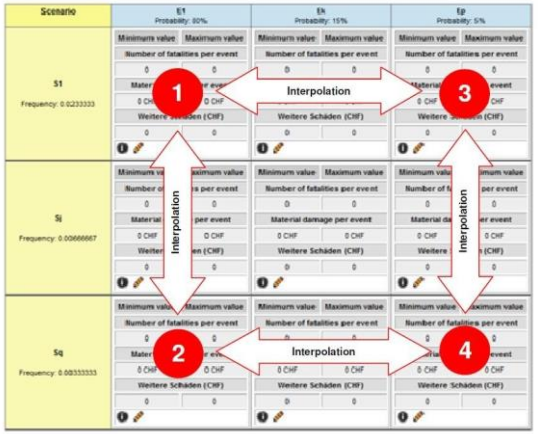
Risk dialogue

- Prepare scenarios
  - Frequencies
  - Exposures
  - Discuss
- Rough estimates of damage costs
- Identify needs and requirements of authorities / stakeholder



RECIPE

Thanks for your attention

Jakob Hörl
jakob.hoerl@forst.bwl.de

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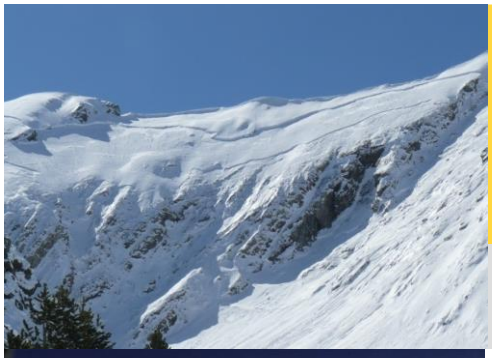
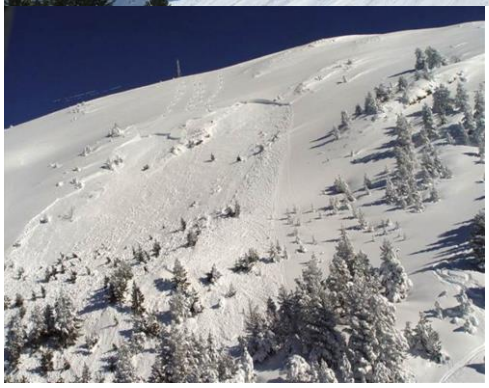




Visualizer tool for managing emergency situations in case of high avalanche risk

Avalanche Forecasting Unit
allaus@icgc.cat

ICGC
Institut
Cartogràfic i Geològic
de Catalunya

Generalitat
de Catalunya

CURRENT SITUATION

- Special warning to Civil Protection when avalange danger is:

VERY HIGH

HIGH

HIGH DANGER WARNING

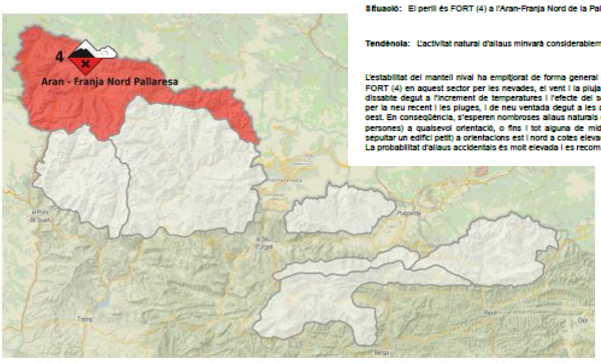
Avís de perill d'allaus

Avís emès el 13/12/2019 a les 13:00

Període: Vàlid fins el 15/12/2019 a les 00:00

Situació: El perill és FORT (4) a l'Aran-Franja Nord de la Pallaresa.

Tendència: L'activitat natural d'allaus minvarà considerablement diumenge.



ICGC Institut Cartogràfic i Geològic de Catalunya

meteo.cat Servei Meteorològic de Catalunya

Avís de perill d'allaus

Avís emès el 13/12/2019 a les 13:00

Període: Vàlid fins el 15/12/2019 a les 00:00

Situació: El perill és FORT (4) a l'Aran-Franja Nord de la Pallaresa.

Tendència: L'activitat natural d'allaus minvarà considerablement diumenge.

L'estabilitat del mantell nival ha empitjorat de forma general a l'Aran-Franja Nord de la Pallaresa. El perill és FORT (4) en aquest sector per les nevades, el vent i la pluja del present episodi, i continuarà en aquest grau diasable degut a l'increment de temperatures i l'efecte del sol. Els principals problemes són de neu humida, per la neu recent i les pluges, i de neu ventada degut a les acumulacions de neu formades pel vent de nord-oest. En conseqüència, s'esperen nombroses allaus naturals de mida 3 (amb capacitat per enterrar un grup de persones) a qualsevol orientació, o fins i tot alguna de mida 4 (amb capacitat per arribar a fons de vall o sepultar un edifici petit) a orientacions est i nord a cotes elevades.
La probabilitat d'allaus accidentals és molt elevada i es recomana no accedir a terreny allavós.

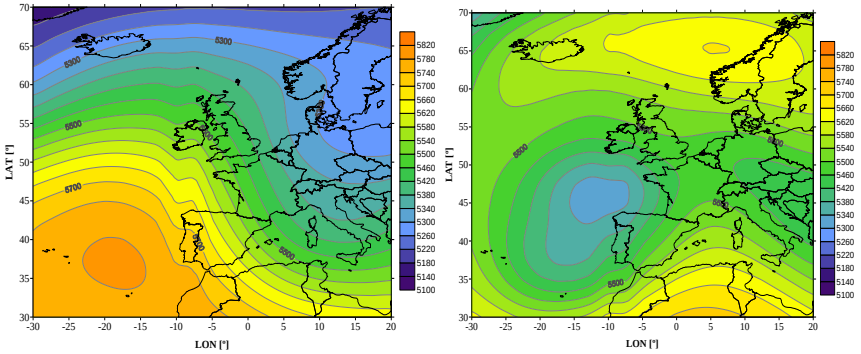
HOW TO IMPROVE THIS INFORMATION:

RELATIONSHIP: MAJOR AVALANCHES – ATMOSPHERIC CIRCULATION

6 SYNOPTIC PATTERNS LEADING MAJOR AVALANCHES

- Period: 1970 – 2009
- Changes in atmospheric circulation are observed till now
- Patterns must be updated

➢ PCA applied to 500 hPa: avalanche episodes days (DJFMA, 1971-2009)



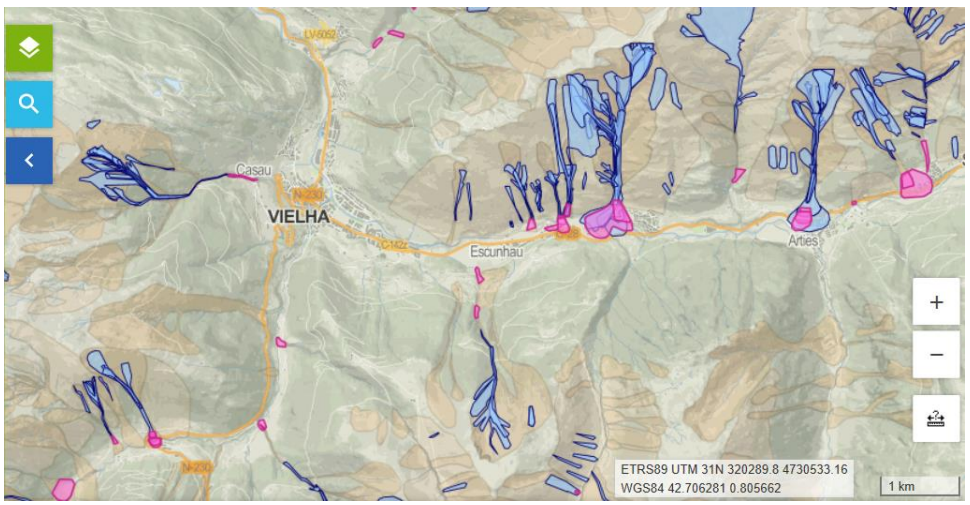
Atmospheric circulation pattern corresponding to the component 1 (500 hPa).

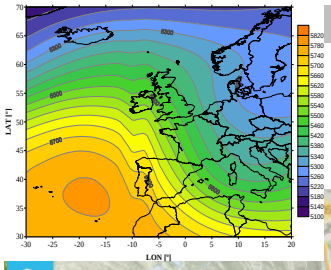
Atmospheric circulation pattern corresponding to the component 5 (500 hPa).

C1. NW advection	
500 hPa	SLP anomalies
39% of the total variance	NAOi 0.58

C5. SW advection	
500 hPa	SLP anomalies
8% of the total variance	NAOi -3.75

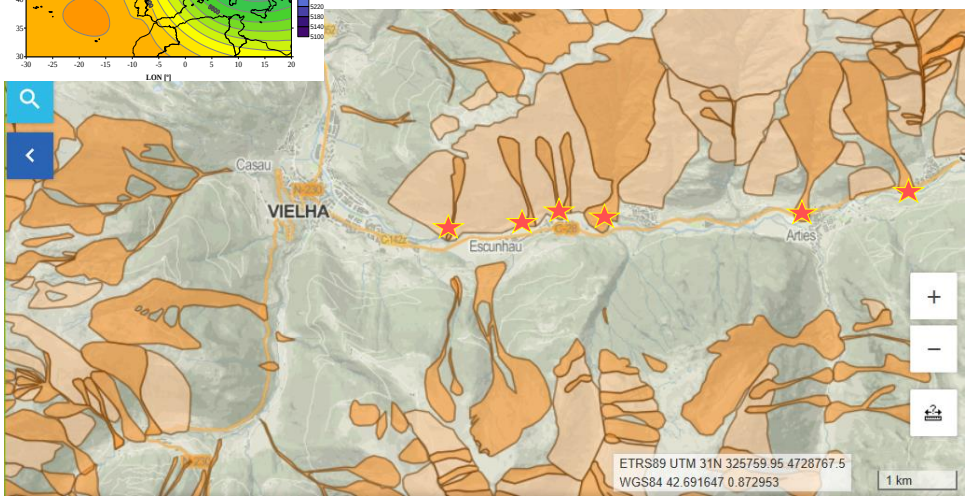
AVALANCHE EVENTS classified by each atmospheric pattern

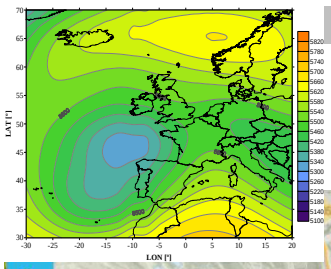




9

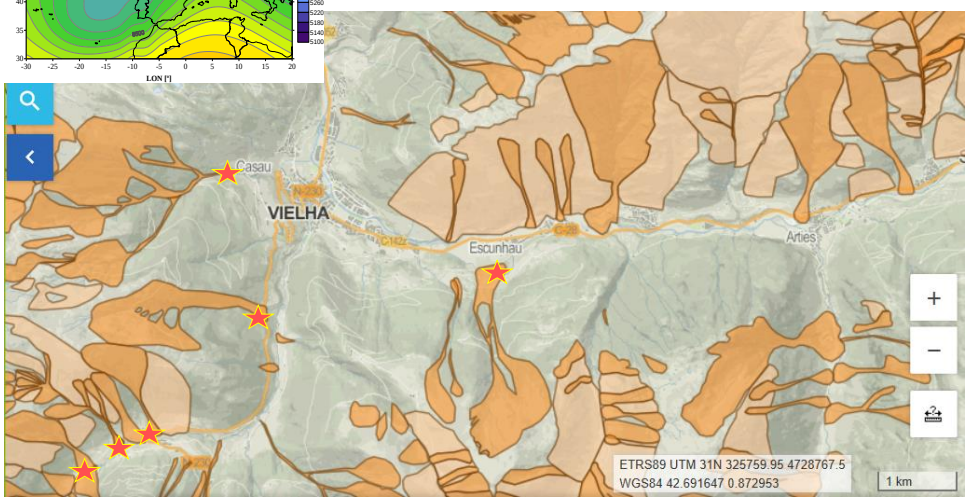
PATTERN 1: MOST PROBABLE ACTIVITY





10

PATTERN 5: MOST PROBABLE ACTIVITY



IMPROVE CURRENT INFORMATION TO CIVIL PROTECTION

- RISK MANAGEMENT ⟶ Risk identification (especific av., Levels 4-5)
- CRISIS MANAGEMENT ⟶ Response: Priorities (road cuts, evacuations)

1

Allau provocada per sobrecàrrega d'un esquiador. Foto i video: Albert Tudela.

2

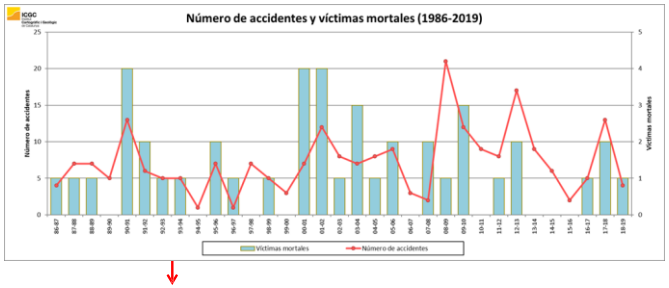
Do you know what level 3 considerable means?

Lets's understand del Avalanche Danger Scale

Unitat de Predicció d'allaus de l'ICGC

Fatalities in the Catalan Pyrenees

Average 1-2 killed people each winter season

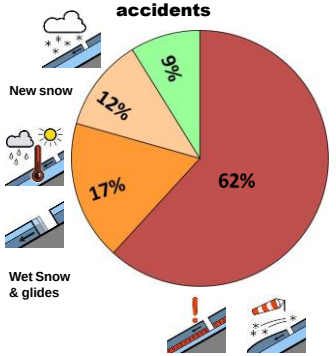


European Avalanche Danger Scale (1993)

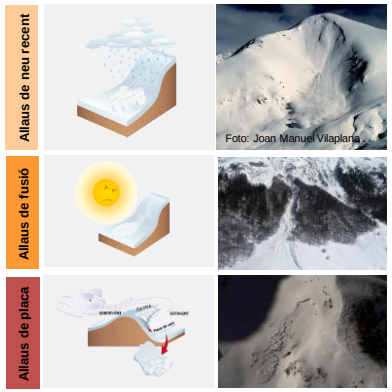
:www.icgc.cat/Administracio-i-empresa/Serveis/Allaus/Sobre-les-allaus/Accidents-per-allaus

Accidents (fatalities) & aval. problems

Avalanche problems in fatal accidents



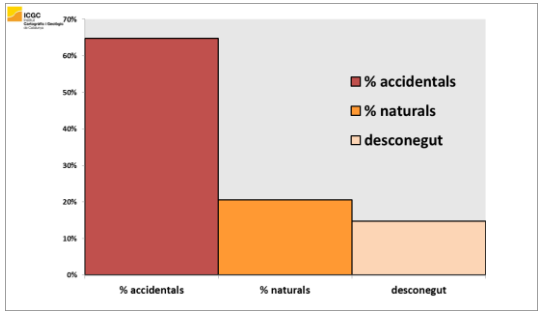
Slabs: persistent weak layer & windrifted snow



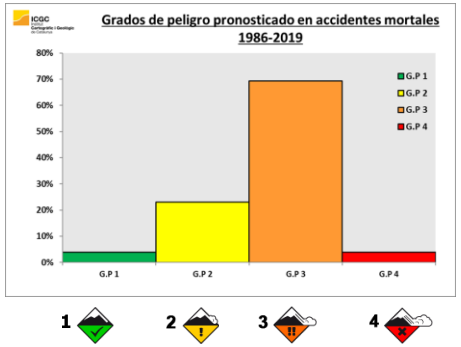
Unknown (data before avalanche forecasting públic service)

Fatalities in the Catalan Pyrenees

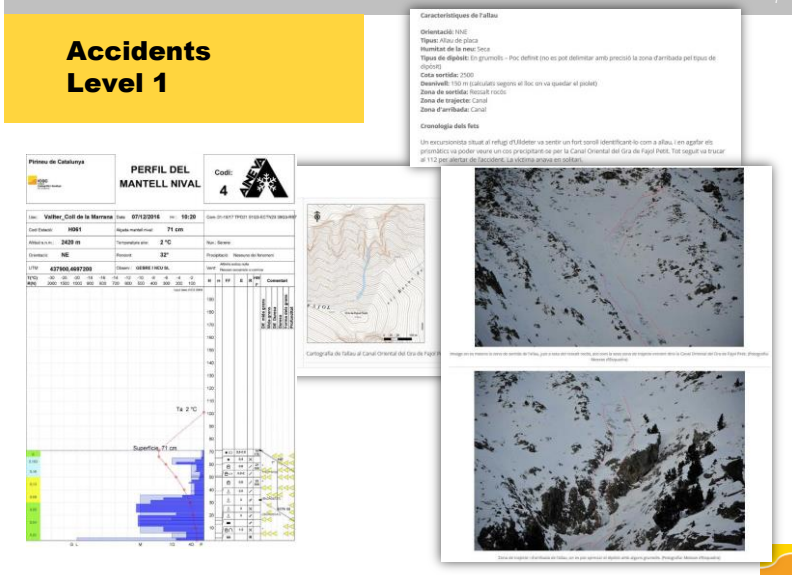
Spontaneus vs triggered



Danger level in fatal accidents in Catalan Pyrenees



Accidents Level 1



Avalanche danger matrix

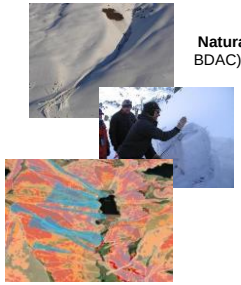
Danger level is a regional assessment

(100 km2 x 24 h)

Nor local neither slope assessment

Dir/Incl.	Mida de l'allau	Sensibilitat al desencadenament (allaus accidentals/provocades)														Allaus naturals					
		No reactiva (molt difícil de desencadenar)				Poc reactiva (difícil de desencadenar)				Reactiva (fàcil de desencadenar)				Molt reactiva (molt fàcil de desencadenar)				Nombre d'allaus esperat	Mida de l'allau				
		d1	d2	d3	d4/5	d1	d2	d3	d4/5	d1	d2	d3	d4/5	d1	d2	d3	d4/5		d1	d2	d3	d4	d5
Dir/Incl.	Aillat	1	1	1	2	1	1	2	3	1	1	2	3	1	2	2	3	Poques	1	1	2	3	4
	Específic	1	2	2	3	1	2	2	3	1	2	3	4	2	3	3	4	Diverses	1	2	3	4	5
	General	1	2	2	3	2	2	3	4	2	3	4	5	3	4	4	5	Nombroses	2	3	4	5	5

Elements of danger level: triggered or natural



Natural avalanches: 3 degrees: few/ several/ many (observation & data base - BDAC)

Sensibility to triggering: 4 degree from inactive to very easy. (Stability tests on the snowpack)

Distribution of the aval. problem: 3 degrees isolated/ specific/ widespread. Deals with terrain knowledge (avalanche mapping)

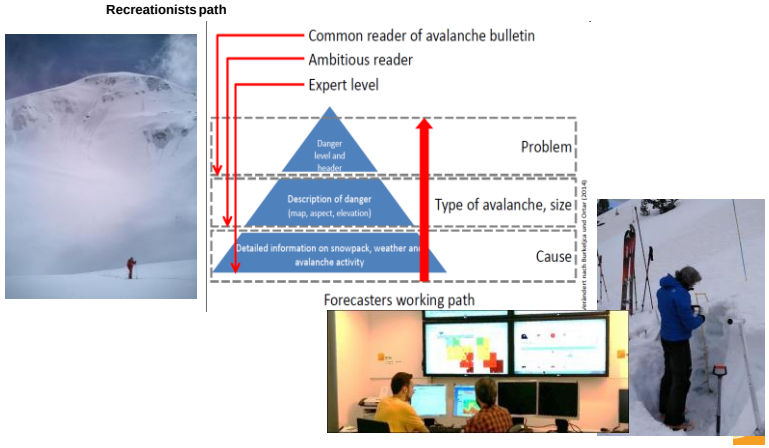
Aval a. size: 5 sizes in relation with potential damage and runout zone 5 extrem, 4 very large, 3 large, **2 medium,** 1 small

Why avalanche forecasting?

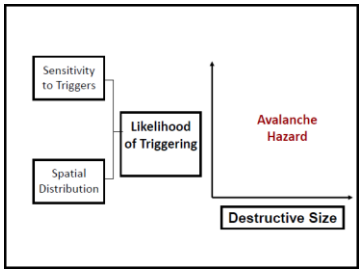
	**PROTECCIÓ CIVIL**	**situacions crítiques per allaus naturals amb destrosses i afeccions a infraestructures**	PLA ALLAUCAT Comunicats especials
	**USUARI DE MUNTANYA HIVERNAL**	**Allaus petites provocades Activitat professional i oci**	**Butlletí de perill d'allaus Resum nivològic setmanal Evolució del gruix de neu Accidents Butlletí nivològic (anual) Visor de nivologia i allaus BDAC**

Forecasting process

- Avalanche danger level is a simplified Picture of the reality



Avalanche conceptual model



Confidence degree: GOOD, FAIR, LOW

Anomalies

Unusual events

Unprecedented events or conditions

Amount of data

Quality of data

Spatial scale

Temporal scale

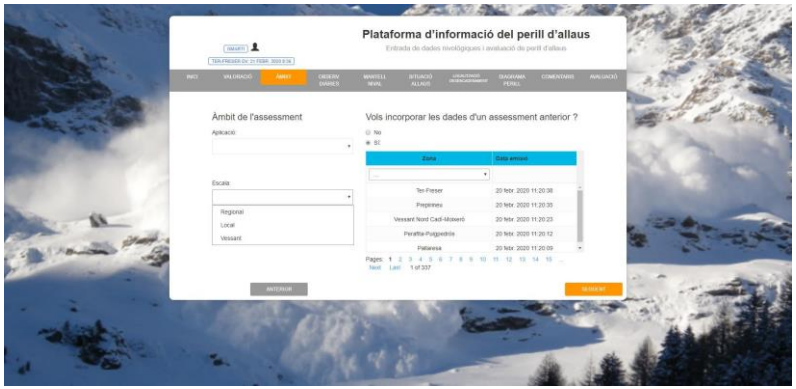
Spatial variability

Temporal variability

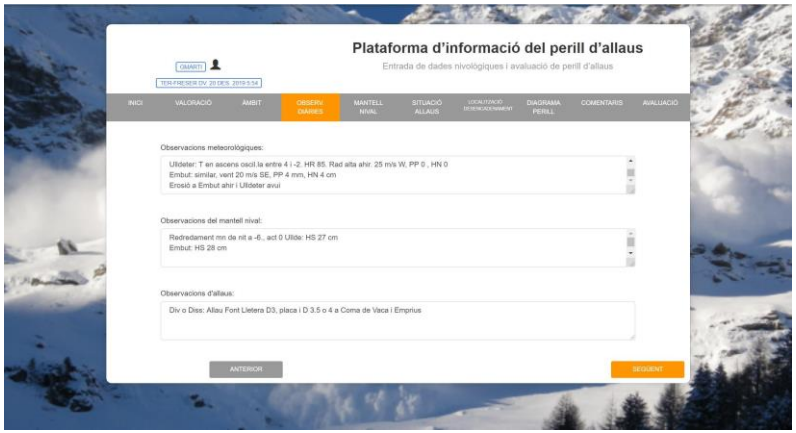
Lingering instability

State of knowledge

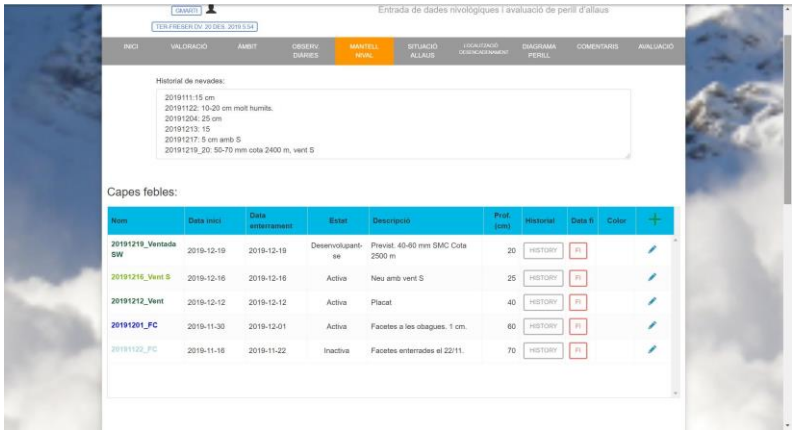
Forecaster's experience



13


Plataforma d'informació del perill d'allaus
Entrada de dades nivològiques i avaluació de perill d'allaus
INICI
VALORACIÓ
ÀMBIT
OBSERV. DARRES
MANTELL NIVAL
SITUACIÓ ALLAUS
DIAGRAMA PERILL
COMENTARIS
AVALUACIÓ
Observacions meteorològiques:
Ulldeter: T en ascens oscil.la entre 4 i -2. HR 85. Rad alta ahir. 25 m/s W, PP 0 , HN 0
Embut: similar, vent 20 m/s SE, PP 4 mm, HN 4 cm
Erosió a Embut ahir i Ulldeter avui
Observacions del mantell nival:
Redreçament mm de nit a -6., act 0 Ulld: HS 27 cm
Embut: HS 28 cm
Observacions d'allaus:
Div o Diss: Allau Font Lletera D3, placa i D 3.5 o 4 a Coma de Vaca i Emprius
ANTERIOR
SEGUENT

14


Entrada de dades nivològiques i avaluació de perill d'allaus
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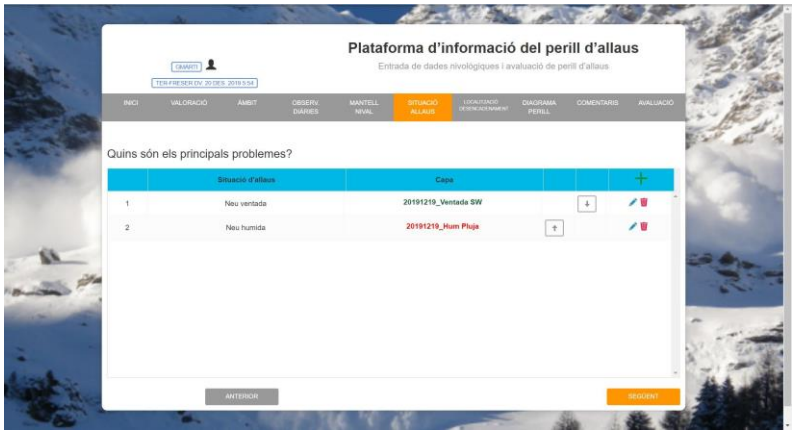
MANTELL NIVAL
SITUACIÓ ALLAUS
DIAGRAMA PERILL
COMENTARIS
AVALUACIÓ
Historial de nevades:
2019111:15 cm
20191122: 10-20 cm molt humits.
20191204: 25 cm
20191213: 15
20191217: 5 cm amb S
20191219_20: 50-70 mm cota 2400 m, vent S
Capes febles:
Nom
Data inici
Data enterrament
Estat
Descripció
Prof. (cm)
Historial
Data fi
Color
20191219_Ventada SW
2019-12-19
2019-12-19
Desenvolupant-se
Previst. 40-60 mm SMC Cota 2500 m
20
20191216_Vent S
2019-12-16
2019-12-16
Activa
Neu amb vent S
25
20191212_Vent
2019-12-12
2019-12-12
Activa
Placat
40
20191201_FC
2019-11-30
2019-12-01
Activa
Facetes a les obagues. 1 cm.
60
20191122_FC
2019-11-18
2019-11-22
Inactiva
Facetes enterrades el 22/11.
70
HISTORY

15


Plataforma d'informació del perill d'allaus
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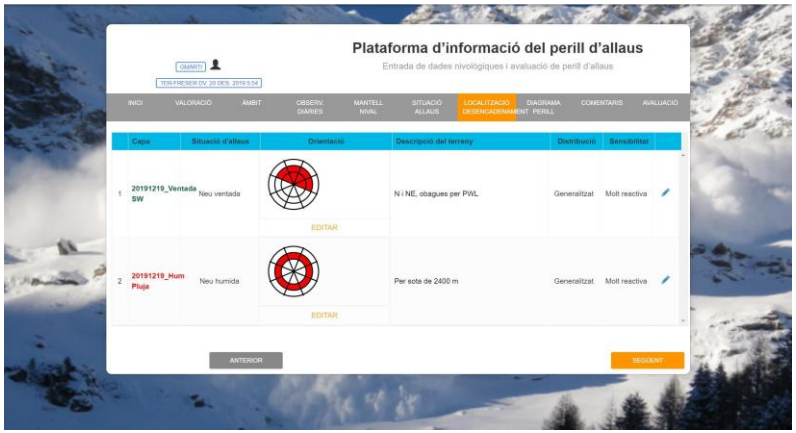
MANTELL NIVAL
SITUACIÓ ALLAUS
LOCALITZACIÓ DESENCADENAMENT
DIAGRAMA PERILL
COMENTARIS
AVALUACIÓ
Quins són els principals problemes?
Situació d'allaus
Capa
1
Neu ventada
20191219_Ventada SW
2
Neu humida
20191219_Hum Pluja
ANTERIOR
SEGÜENT

16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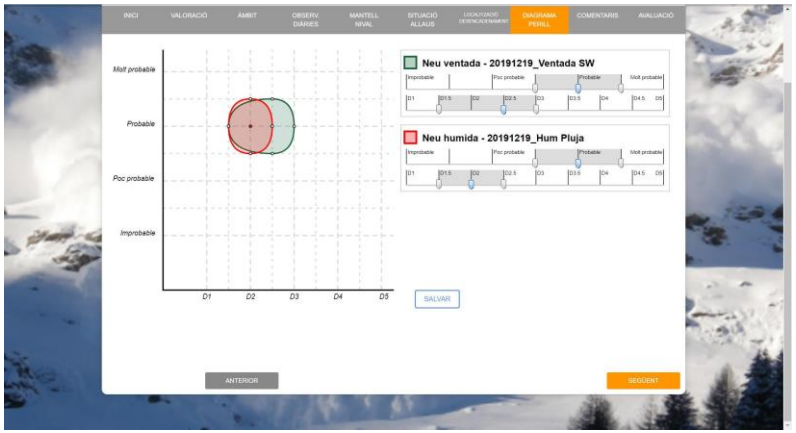
MANTELL NIVAL
SITUACIÓ ALLAUS
LOCALITZACIÓ DESENCADENAMENT
DIAGRAMA PERILL
COMENTARIS
AVALUACIÓ
Capa
Situació d'allaus
Orientació
Descripció del terreny
Distribució
Sensibilitat
1
20191219_Ventada SW
Neu ventada
N i NE, obagues per PWL
Generalitzat
Molt reactiva
EDITAR
2
20191219_Hum Pluja
Neu humida
Per sota de 2400 m
Generalitzat
Molt reactiva
EDITAR
ANTERIOR
SEGÜENT

17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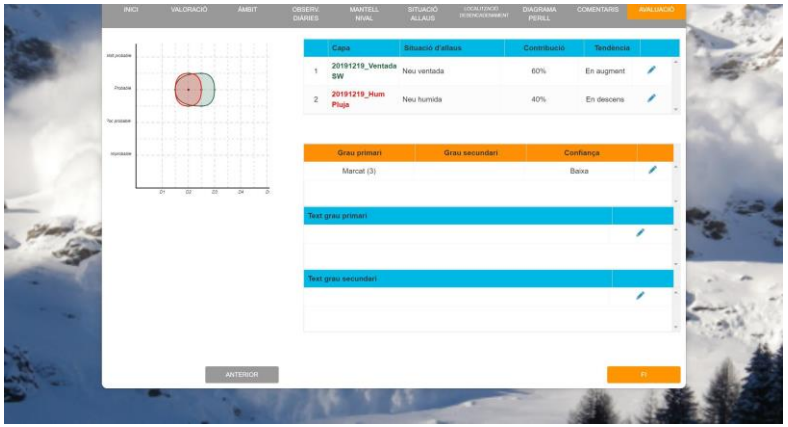
MANTELL NIVAL
SITUACIÓ ALLAUS
LOCALITZACIÓ DESENCADENAMENT
DIAGRAMA PERILL
COMENTARIS
AVALUACIÓ
Molt probable
Probable
Poc probable
Improbable
D1
D2
D3
D4
D5
Neu ventada - 20191219_Ventada SW
Neu humida - 20191219_Hum Pluja
SALVAR
ANTERIOR
SEGÜENT

18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MANTELL NIVAL
SITUACIÓ ALLAUS
LOCALITZACIÓ DESENCADENAMENT
DIAGRAMA PERILL
COMENTARIS
AVALUACIÓ
Capa
Situació d'allaus
Contribució
Tendència
1
20191219_Ventada SW
Neu ventada
60%
En augment
2
20191219_Hum Pluja
Neu humida
40%
En descens
Grau primari
Grau secundari
Confiança
Marcat (3)
Baixa
Text grau primari
Text grau secundari
ANTERIOR

RECIPE

Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

Funded by European Union Humanitarian Aid and Civil Protection

Support tools and guidelines for integrated risk assessment and planning for landscape and wild-land urban interface fires

Eduard Plana and Marta Serra

Barcelona, February 21th 2020

CTFC · PAU COSTA FOUNDATION · protecció civil · FVA Forest Research Institute Baden-Württemberg · cimo · BFW · Instituto Superior de Agronomia · ICGC Institut Cartogràfic i Geològic de Catalunya

RECIPE

Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

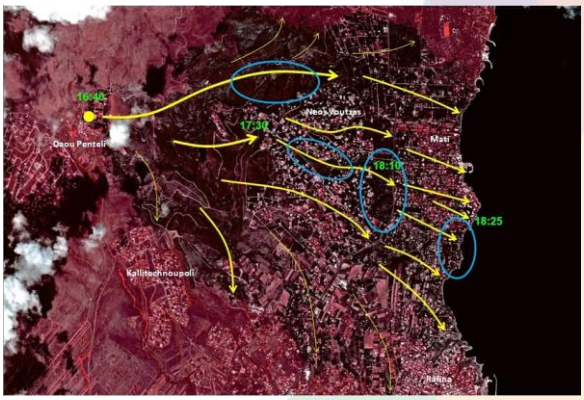
Funded by European Union Humanitarian Aid and Civil Protection

Short description

- Shared tool including a DSS able to simulate land uses, climate scenarios and fuel management scenarios (ISA)
- **Complemented with guidelines to integrate wildfire risk management into land planning at landscape and WUI levels** (CTFC)
- With participatory processes to involve the community into the decision-making process (PCF)

Components of risk

- **Risk formula**: Risk = Hazard x Exposition x Vulnerability (Response)
- **Risk cycle**: Prevention – Preparedness – Response - Recovery



RECIPE
Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change
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RECIPE

Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

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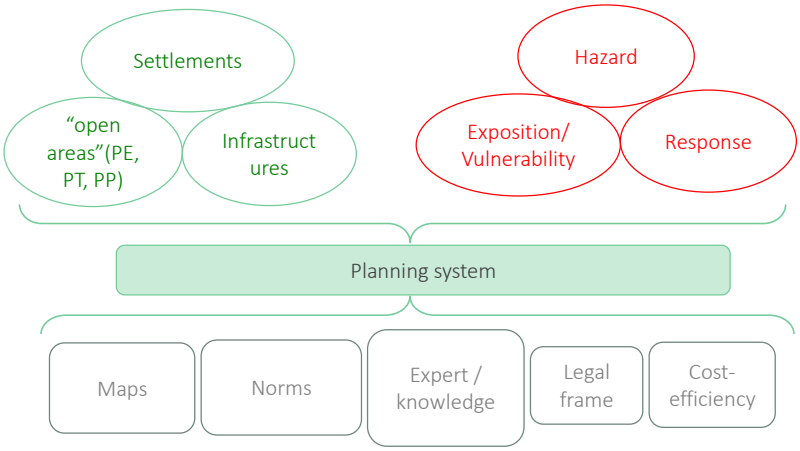
Conceptual scheme towards wildfire risk integration to urban and spatial planning



Participatory approach

Marta Serra. 2016. **La integració del risc d'incendis forestals en la planificació territorial i urbanística de Catalunya: anàlisi de la situació i propostes de millora.** Treball Final de Màster en Plans i Polítiques per a la Ciutat, l'Ambient i el Paisatge. Universitat Autònoma de Barcelona.

Plana, E. 2011. **Integració del risc d'incendis en la planificació forestal territorial i l'ordenació del territori**. Treballs de la Societat Catalana de Geografia, 71-72: 69-92

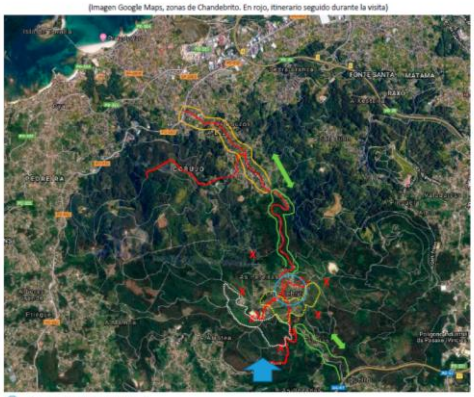
RECIPE

Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

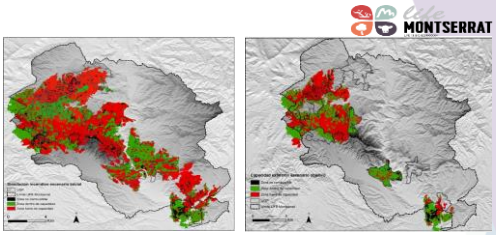
Funded by European Union Humanitarian Aid and Civil Protection

Figura 8. Ejemplo simplificado de planificación del riesgo en un macizo forestal con núcleos urbanos con a un patrón de incendio de S

(Imagen Google Maps, zonas de Chandebrito. En rojo, itinerario seguido durante la visita)

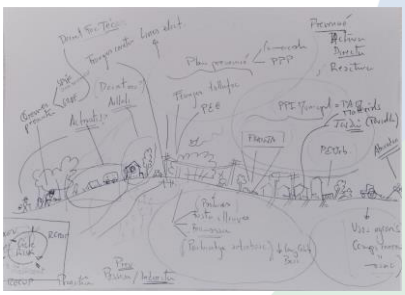


- Zona de confinamiento seguro.
- Ruta de evacuación predefinida y en caso de llegada del frente de llamas.
- Zona de tratamiento de la vegetación para habilitar la carretera como infraestructura de apoyo a la gestión de la emergencia (movilidad de medios, rutas de evacuación).
- Tramo de adecuación de la red viaria como infraestructura de apoyo a la gestión de la emergencia (ensanche, zonas de cambio de dirección para camiones, cartería, etc.).
- Rutas cerradas en caso de llegada del frente de llamas. Sin necesidad de ejecución de fajas.
- (Punteado amarillo) Zonas agrarias de protección especial para la prevención de incendios. Conservar el uso agrícola en el planeamiento urbano.
- (Punteado blanco) Zonas forestales de protección especial para la prevención de incendios. Incentivar el desbroce del sotobosque y el clareo del arbolado.



Plana, E. 2007. La gestió forestal com a eina per a la prevenció d'incendis: Anàlisis de cost eficiència i de gestió del risc de grans incendis forestals. Revista Silvicultura 53:6-7

Plana, E., Font, M. 2015. Cost effective assessment of wildfire risk mitigation strategies. En Plana, E., Font, M., Green, T. (Ed.). Operational tools and guidelines for improving efficiency in wildfire risk reduction in EU landscapes. FIREfficient Project. CTFC Editions. Pp: 26-30



RECIPE

REINFORCING CIVIL PROTECTION CAPABILITIES INTO MULTI-HAZARD RISK ASSESSMENT UNDER CLIMATE CHANGE

Funded by European Union Humanitarian Aid and Civil Protection

Thanks for your attention

eduard.plana@ctfc.cat

marta.serra@ctfc.cat

RECIPE

Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

Funded by European Union Humanitarian Aid and Civil Protection

Protocol for wildfire and avalanche risk management in mountain areas

Eduard Plana and Marta Serra

Barcelona, February 21th 2020

RECIPE

Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

Funded by European Union Humanitarian Aid and Civil Protection

Short description

- Protocol with operational recommendations to face **avalanche and wildfire risk interaction** assessment and planning in mountain areas.
- Addressed to **civil protection servers**.
- Joint **risk mapping** will be tested at **pilot site level** and embedded into visualizer for high avalanche risk (D4.5).
- Participation of CTFC, ICGC and BFW.

Funded by
European Union
Humanitarian Aid
and Civil Protection

Conceptual scheme

- Climate change and its effects on **forest disturbances** are becoming a reality and faster than expected.
- **Risk cascade effects**: avalanche after fire.

RECIPE
Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change
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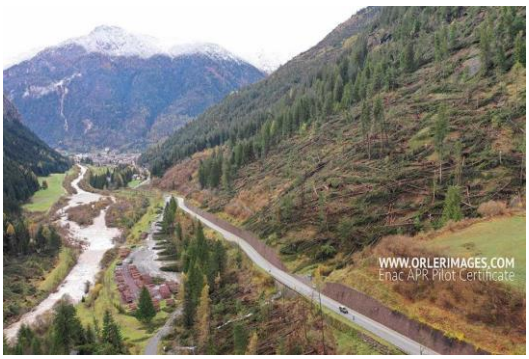

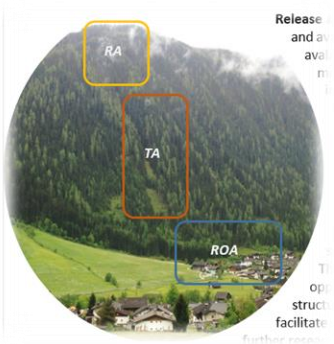

Font, M., Garcia, J., Plana, E., Pons, M., Garcia, C., Riba, S. 2018. **Assessing wildfires vulnerability of avalanche protection forest; a study case from Andorra**. In: International Snow Science Workshop (22: 07-12, October 2018 Innsbruck, Austria).

net risk work
http://netriskwork.ctfc.cat/

RECIPE

REINFORCING CIVIL PROTECTION CAPABILITIES INTO MULTI-HAZARD RISK ASSESSMENT UNDER CLIMATE CHANGE

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