irasmos

WSL Institute for Snow and Avalanche Research SLF

IRASMOS

(*Integral Risk Management of Extremely Rapid Mass Movements*)

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SLF Davos, Switzerland

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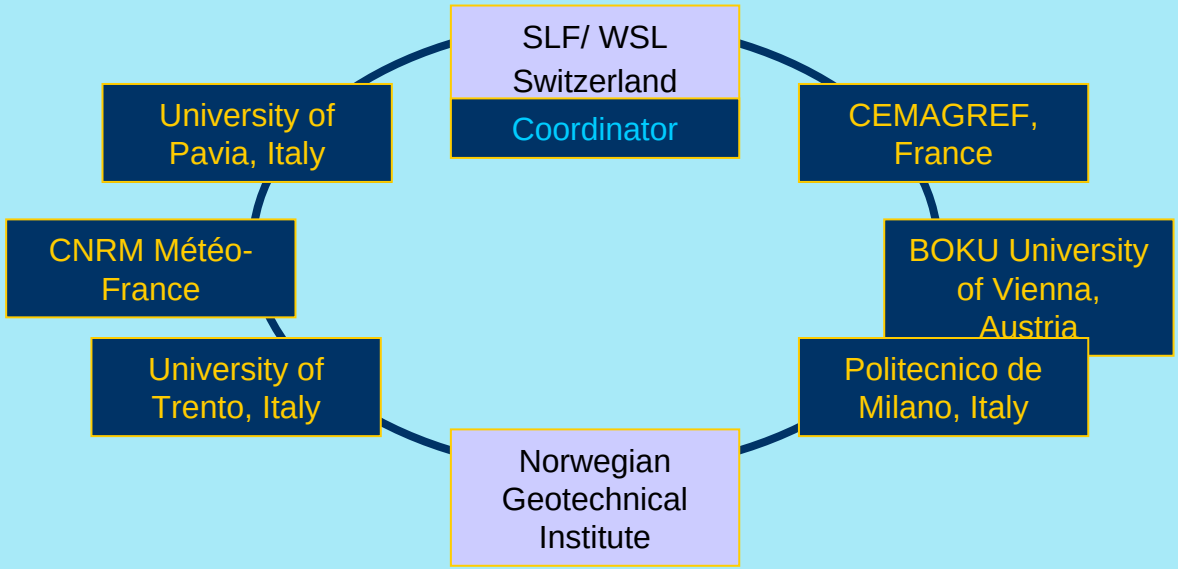
The IRASMOS partners

Integral Risk Management of
Extremely Rapid Mass Movements

Duration: 1 Sept 2005 – 30 June 2008



(Non-)Objectives of IRASMOS

Integral Risk Management of Extremely Rapid Mass Movements

- Snow avalanches
- Debris flow
- Rock avalanches

- Widespread efforts for natural hazard management
- Risk based solutions are still unsystematic and diverse…
  - …between different countries
  - …between different hazard processes
- Project IRASMOS attempts to…
  - …evaluate, review and compare methods and procedures
  - …bring scientists and practitioners into contact
  - …compile and develop best practices
  - …take first steps towards an international harmonization in risk management
  - …identify open questions and research priorities
- Not attempting to…
  - …develop / harmonize common data bases

Three very different hazard processes…

Snow avalanches

Debris Flow

Rock avalanches

Very different state of

- experience / data base / terminology
- physical process understanding
- predictability
- international harmonization

Tool Kit for Integral Risk Management

Recovery
- Reconstruction
- Insurance
- Mitigation of indirect consequences

Prevention
- Land use planning
- Technical measures
- Biological measures

Intervention
- Forecast and Warning
- Evacuation
- Closure

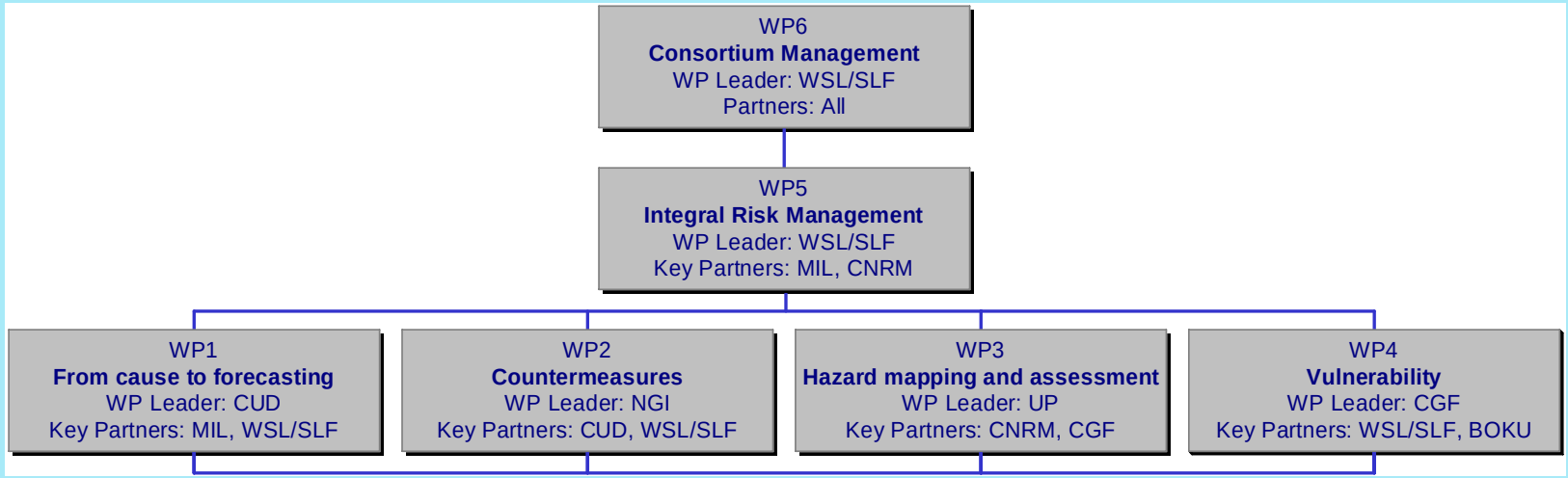
Risk

$$R_{i,j} = p_j \cdot P_{i,j} \cdot A_i \cdot V_{i,j} \cdot \varphi_{i,j}$$

i : object
j : scenario

- p_j : Probability of scenario
- $P_{i,j}$: Exposition
- A_i : Value
- $V_{i,j}$: Vulnerability
- $\varphi_{i,j}$: Risk Aversion

Organisation of IRASMOS



Forecast & Warning

Depends critically on process understanding and predictability

Snow avalanches:

- Well developed scientific understanding of release mechanisms
- Relatively good data bases
- Daily forecasts in alpine countries (tourism!)
- International coordination / harmonization highly developed (Group of European Avalanche Warning Services (EAWS)

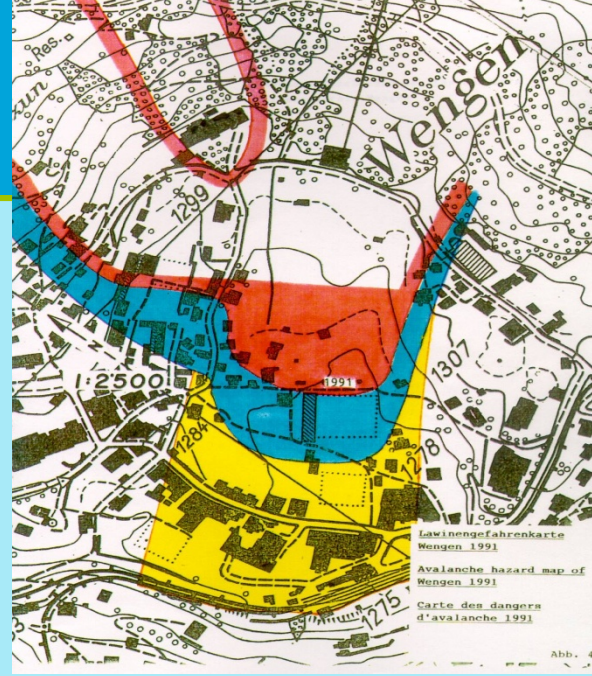
Debris flows:

- Increasing scientific understanding of release mechanisms
- Poor data base
- Individual local warning systems (*best developed in Eastern Asia*)
- Poor international coordination / harmonization

Rock avalanches:

- Poor scientific understanding of release mechanisms and multi-risk aspects
- Very poor data base
- Poor international coordination / harmonization

Hazard mapping & zoning



Basis: long term statistical averages are relevant

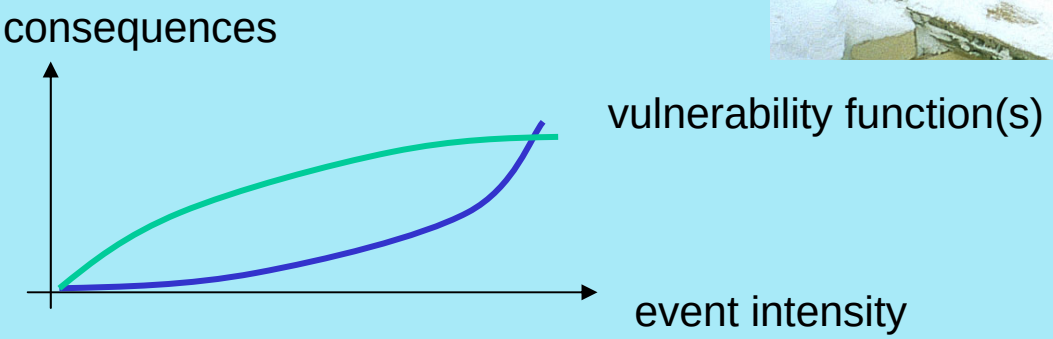
→ *Critical dependence on long term data bases!*

Basic concepts are similar between countries and hazard processes, but…

- …details and quantitative thresholds have developed differently in different countries (*and show in some cases differences that can not be justified scientifically*)
- …international harmonization may be arduous, due to economical implications (in contrast to forecast and warning)
- ...transfer into stringent spatial planning is an import

Vulnerability

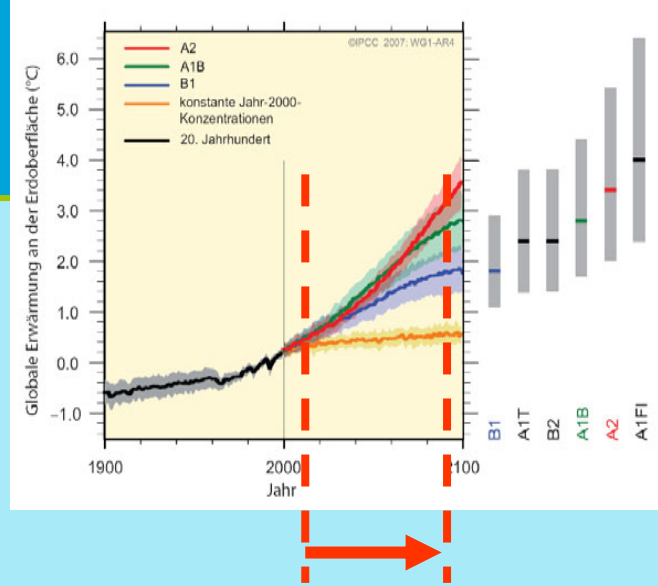
Vulnerability is the most proble-matic aspect w.r.t. data base



- Very diverse types of consequences
  (local / system, direct / indirect, material / immaterial, …)
- Difficulties with respect to conceptual formulation as well as with respect to data base
- *→ needs w.r.t. basic research as well as improvement of data base*

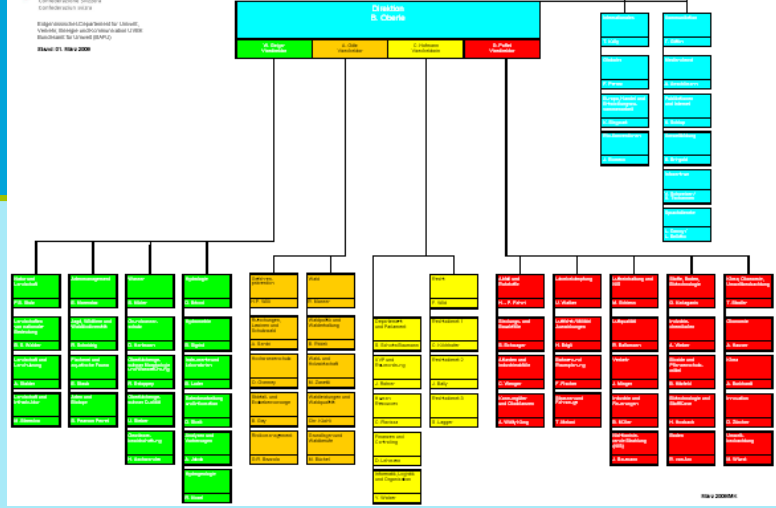
Risk management and climate change

Many risk mitigation measures (particularly technical measures) cover a life span of 50 – 100 years.



- This is the time scale of climate change!
- Thus climate change has implications for sustainable natural hazards risk management, but they are still poorly known quantitatively.
- → *Challenge*: Development of robust risk management strategies under uncertain climate change scenarios

Institutional aspects



Integral risk management approach often involves many (often separated) administrative domains.

- Unclear responsibilities are often a considerable source of uncertainty for planners.
- Much room for improvement, but progress can be slowed down by complex political configuration

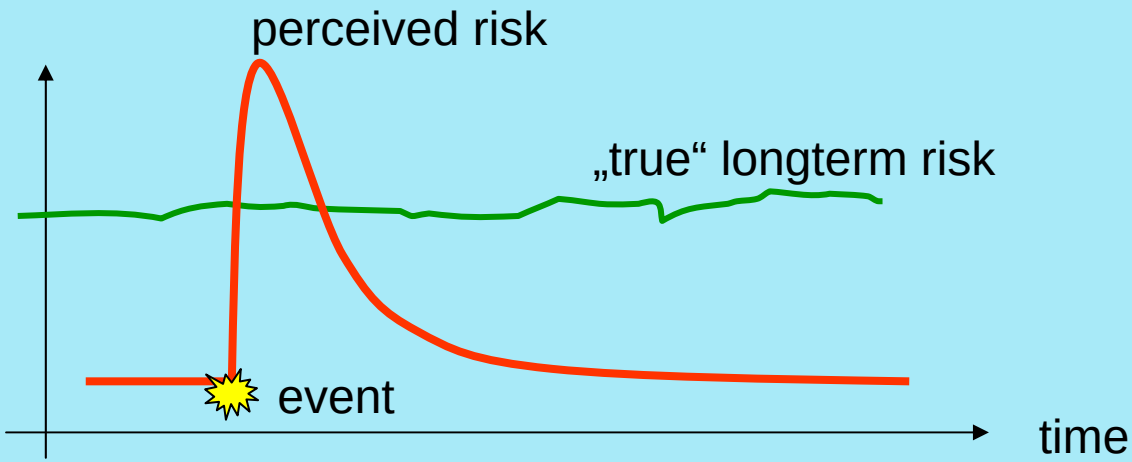
Example Switzerland:

Responsibilities for Meteo, Floods, Earthquakes, Snow Avalanches is distributed among 3 federal departments

→Project *Common Information Platform Natural Hazards (GIN)*
(2 years technical development instead of 7 years reorganisation…)

Risk communication

"Thinking in terms of risk" is not yet well established in the public, often even among hazard experts.



- Risk communication and will be an important future issue

Some consequences

Data bases:

- Large diversity of existing national and regional data bases
- International coordination is highly desirable in view of improvement data base
- Selection of events and data: Common international agreement on the basis of scientific and risk management aspects
- Development should be driven by civil service rather than science (but strongly supported by the latter)
- Incentives for data owners and providers should be developed

Hazard and risk mapping / zoning:

- Due to various national and regional approaches, a detailed harmonization hazard and risk mapping is perhaps a formidable task…
- …but an attempt to formulate basic guidelines on a European level would be very desirable and helpful

Research synergies:

- Desirable in practically the fields addressed in the talk. FP7 provides excellent opportunities!


Thank you for your attention!
More information on http://irasmos.slf.ch