

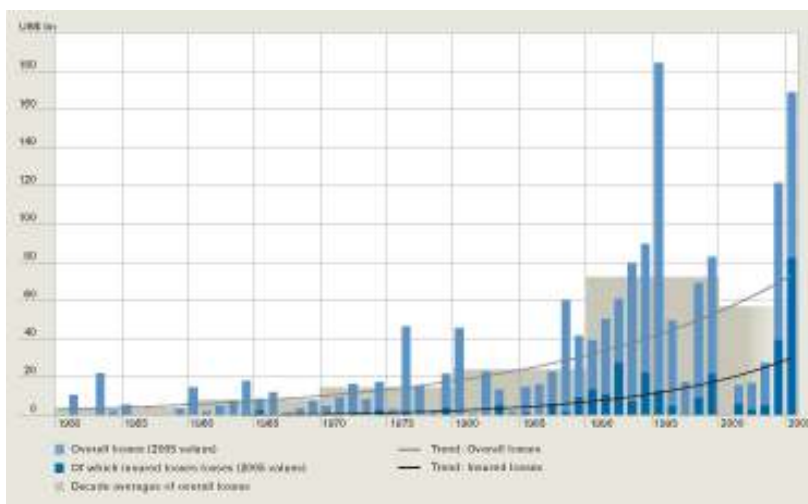
Development of flood risk in mountain catchments and related perception – RISKATCH

Sven Fuchs
Wolfgang Dörner, Rudolf Metzka
Kamal Serrhini

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World-wide increase in losses due to natural hazards



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MunichRe, 2006

Natural hazards in European Alps and related forelands



- Development of risk?
- Uncertainties?
- Perception?



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Introduction: Risk

- Risk dependent on
 - the probability of occurrence of a specific process and
 - the height of the damage potential exposed

$$R_{i,j} = f(p_{Si}, A_{Oj}, v_{Oj, Si}, p_{Oj, Si})$$

$R_{i,j}$ = risk

p_{Si} = probability of scenario i

A_{Oj} = value at risk of object j

$v_{Oj, Si}$ = vulnerability of object j , dependent on scenario i

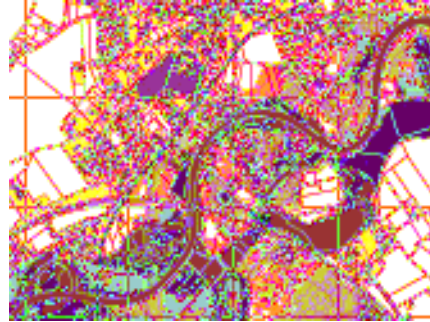
$p_{Oj, Si}$ = probability of exposure of object j to scenario i



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Development of flood risk in mountain catchments – hazard assessment

- A process has been recognised as dangerous.
- The hazard is assessed, and...



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Development of flood risk in mountain catchments – hazard assessment

- ...mitigation measures are implemented:
technical



land-use planning



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Development of flood risk in mountain catchments – needs for risk assessment

- Risk dependent on
 - the **probability of occurrence** of a specific process and
 - the height of the **damage potential exposed**

$$R_{i,j} = f(p_{Si}, A_{Oj}, v_{Oj}, s_i, p_{Oj}, s_i)$$

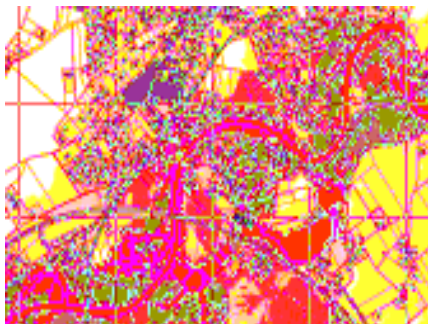
- Emphasis on determining the **hazard** potential (p_{Si})
- So far: little attention on determining the **values at risk**
- **Methods** to determine and assess values at risk and related vulnerabilities **are missing**
- Due to the high dynamic of nature and culture in mountain regions: need for a (multi-)temporal approach

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Development of flood risk in mountain catchments – needs for perception

- **Impact of information** on hazard and risk is not satisfyingly known.
- Laymen vs. experts?



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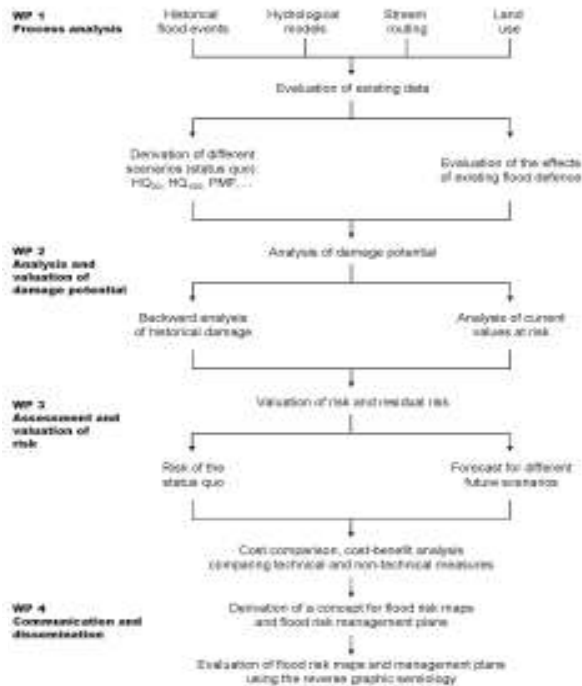
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RISKCATCH – Work packages

- **WP 1**
Process analysis
- **WP 2**
Analysis and valuation of damage potential
- **WP 3**
Assessment and valuation of risk
- **WP 4**
Communication and dissemination



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WP 1: Process analysis

- **Hazard assessment**
based on
 - historical events
 - modelling techniques
(hydrological,
routing,...)
- **Development of defined scenarios**
- **Multi-temporal analysis**



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WP 2: Analysis of damage potential

- **Current values at risk**
based on
 - a spatial analysis of
hazard scenarios
 - a spatial as well as an
object-based method
- **Development of values at risk over time**
- **Vulnerability analysis**

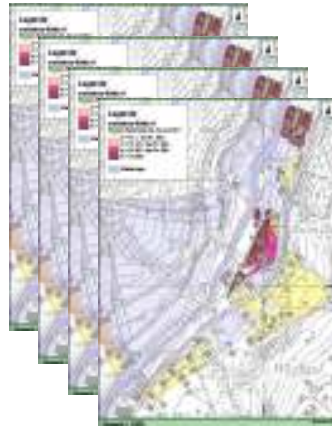


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WP 3: Risk analysis

- Compilation of **risk maps**, based on
 - the results of hazard assessment,
 - the results of the assessment of values at risk and vulnerability
- ...for defined periods of time.
- ...deduction of the temporal development of risk.
- ...economic valuation of risk maps as non-technical measure.



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Borler, 1999

WP 4: Communication and dissemination – Analysis of perception

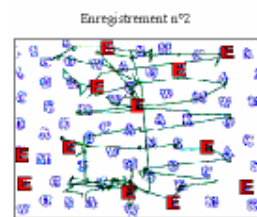
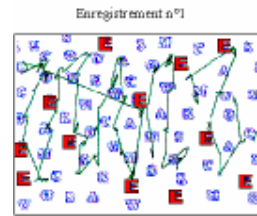
- A set of maps will be presented to different stakeholders
 - to assess the **perception** of the maps
 - to deduce possible improvements for an enhanced **risk communication**
- Method: evaluation of cartographic perception by **graphic semiology**
- Three samples of test persons:
 - Decision makers from the test sites [10]
 - Specialists in cartography [10]
 - Laymen [10]

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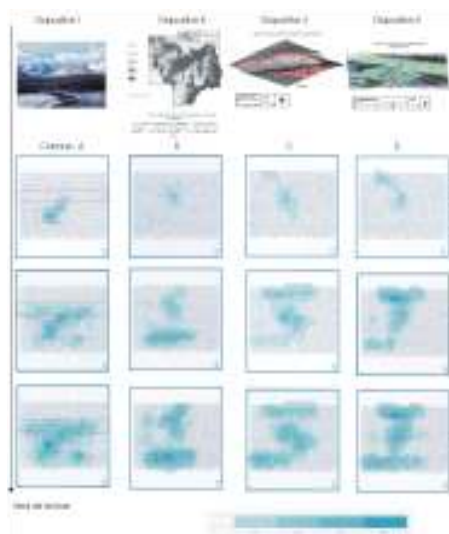
WP 4: Communication and dissemination – Analysis of perception

- **Experimental graphic semiology**
 - Different visual strategies in analysing information exist (e.g., vertical and horizontal).



WP 4: Communication and dissemination – Analysis of perception

- **Experimental graphic semiology**
 - Analysing the most attractive components in the maps,
 - Analysing the temporal order of perception
 - Studying the reading behaviour of text components



Summary

- **Four main questions** to be answered by RISKCATCH:
 1. How did risk develop during past decades (hazard, vulnerability, values at risk)?
 2. What particular benefits were created by non-technical mitigation in the test sites? Are the results comparable?
 3. How can hazard and risk maps contribute to non-technical mitigation?
 4. Which information should be included in those maps to serve as a communication tool for different stakeholders?

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RISKCATCH

- **Partner 1**
University of Natural Resources and Applied Life Sciences, Vienna (A)
- **Partner 2**
University of Applied Sciences, Deggendorf (D)
- **Partner 3**
Université de Technologie, Compiègne, UMR Citeres (F)



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Thank you for your attention!

sven.fuchs@boku.ac.at