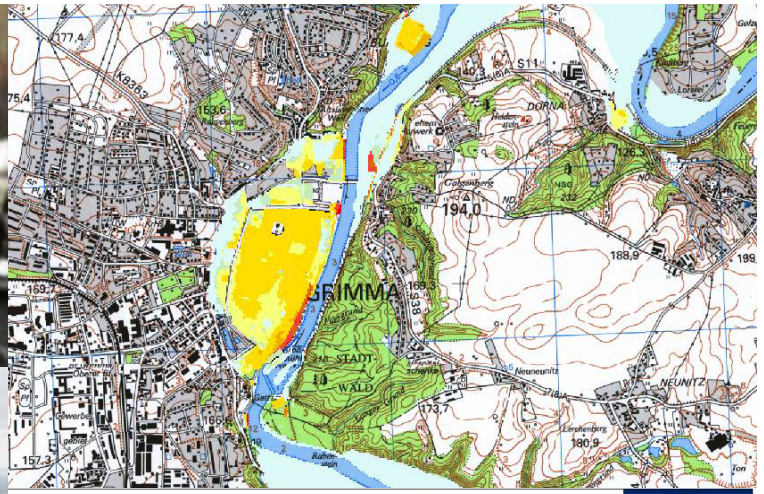
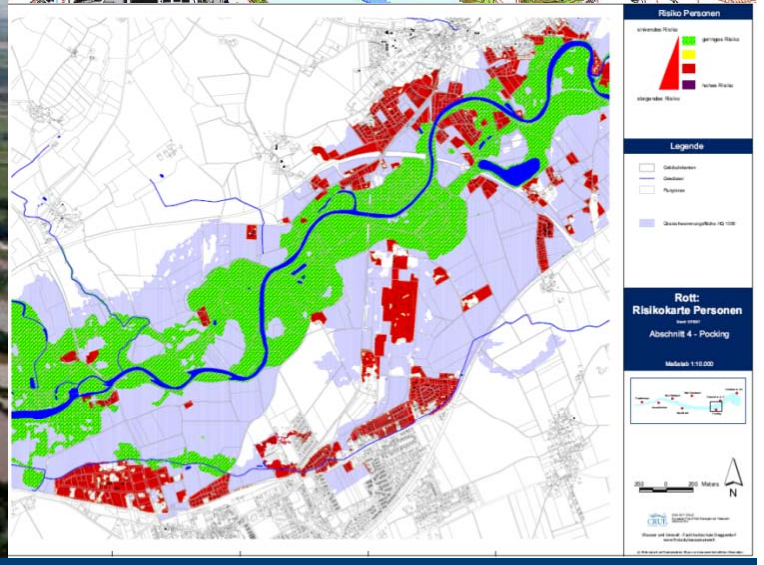




RISK MAP

Improving Flood Risk Maps as a Means to Foster Public Participation and Raising Flood Risk Awareness: Toward Flood Resilient Communities

V. Meyer, C. Kuhlicke, S. Fuchs, S. Tapsell, S. Priest, W. Dorner, K. Serrhini, H. Unnerstall, S. Scheuer

HELMHOLTZ ZENTRUM FÜR UMWELTFORSCHUNG UFZ

Roma, 21.10.2009

Outline

- Introduction
- Objectives
- Project structure:
  - partners
  - tasks
  - case studies
- Expected outcomes
- Dissemination

Introduction

“How can flood **hazard and risk maps** be improved as an instrument of risk communication?
How can data from hazard and vulnerability analyses be used to initiate a public dialogue?“

(ERA-Net CRUE 2nd Common Call)

European Flood Risk Directive

Article 6:

- “Member States shall ensure that the flood hazard maps and flood risk maps are completed by 22 December 2013”
- “Flood risk maps shall show the potential adverse consequences…”: economic, social and environmental risk criteria shall be included

Article 10 (communication & participation issues):

- “…make [risk maps] available to the public…“
- “…active involvement of interested parties in the production, review and updating of the flood risk management plans…”

Shortcomings in practice of risk mapping

1. Top-down risk communication:
   - The public is only seen as a *receiver* of information
   - no involvement in the risk mapping process

2. Risk maps (if existing at all) focus on economic damages:
   - social and environmental effects are often neglected

3. Complex visualisation:
   - risk maps often cannot be easily understood by laypersons
   - not suitable for the respective needs of public authorities in risk and event management

Objectives of RISK MAP

Improving risk communication by means of risk maps:

1. Developing of appropriate stakeholder **participation** processes
   - incorporation of local knowledge and preferences
   - foster communication and risk awareness

2. Improving the **content** of risk maps by considering social, economic and environmental risks
   - participative multicriteria risk mapping tool

3. Improving the **visualisation** of risk maps in order to produce user-friendly risk maps
   - experimental graphic semiology: eye-tracking approach
   - recommendations on visualisation

RISK MAP Team

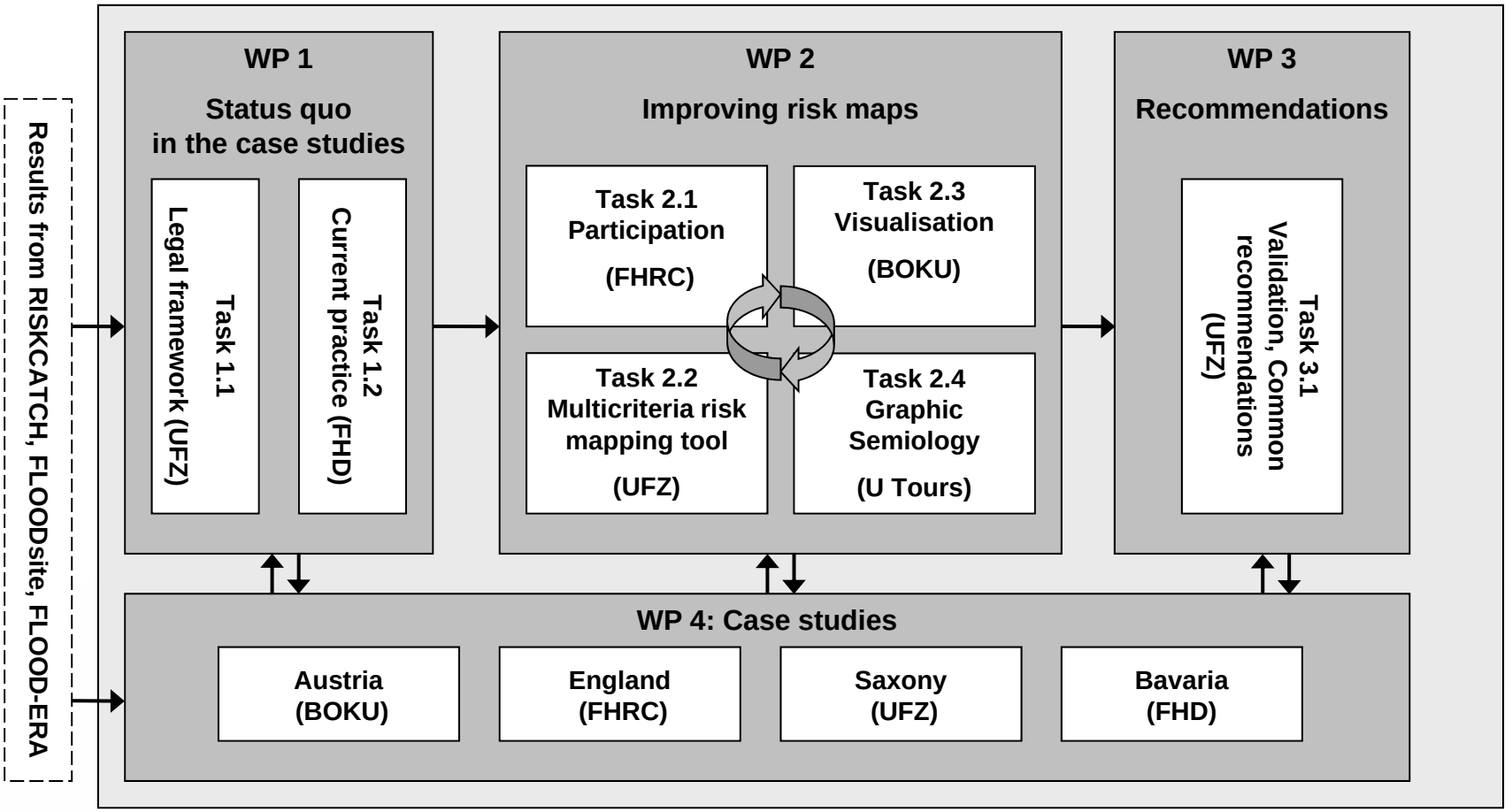
- BOKU – University of Natural Resources and Applied Life Sciences (Wien, Austria)
  Sven Fuchs
- FHD - University of Applied Science Deggendorf (Germany)
  Wolfgang Dorner
- Université François-Rabelais Tours, EPU'DA, UMR CNRS 6173 CITERES (France)
  Kamal Serrhini
- Flood Hazard Research Center, Middlesex University (UK)
  Sue Tapsell, Sally Priest
- UFZ – Helmholtz Centre for Environmental Research (Leipzig, Germany):
  C. Kuhlicke, H. Unnerstall, J. Luther, S. Scheuer, V. Meyer (Coordination)

RISKCATCH

FLOODsite
FLOOD-ERA

Structure of RISK MAP

TEAM:
- UFZ (Leipzig, Germany)
- FHRC - Flood Hazard Research Centre (UK)
- BOKU Wien (Austria)
- FH Deggendorf (Germany)
- Univ. Francois-Rabelais Tours, CNRS (France)



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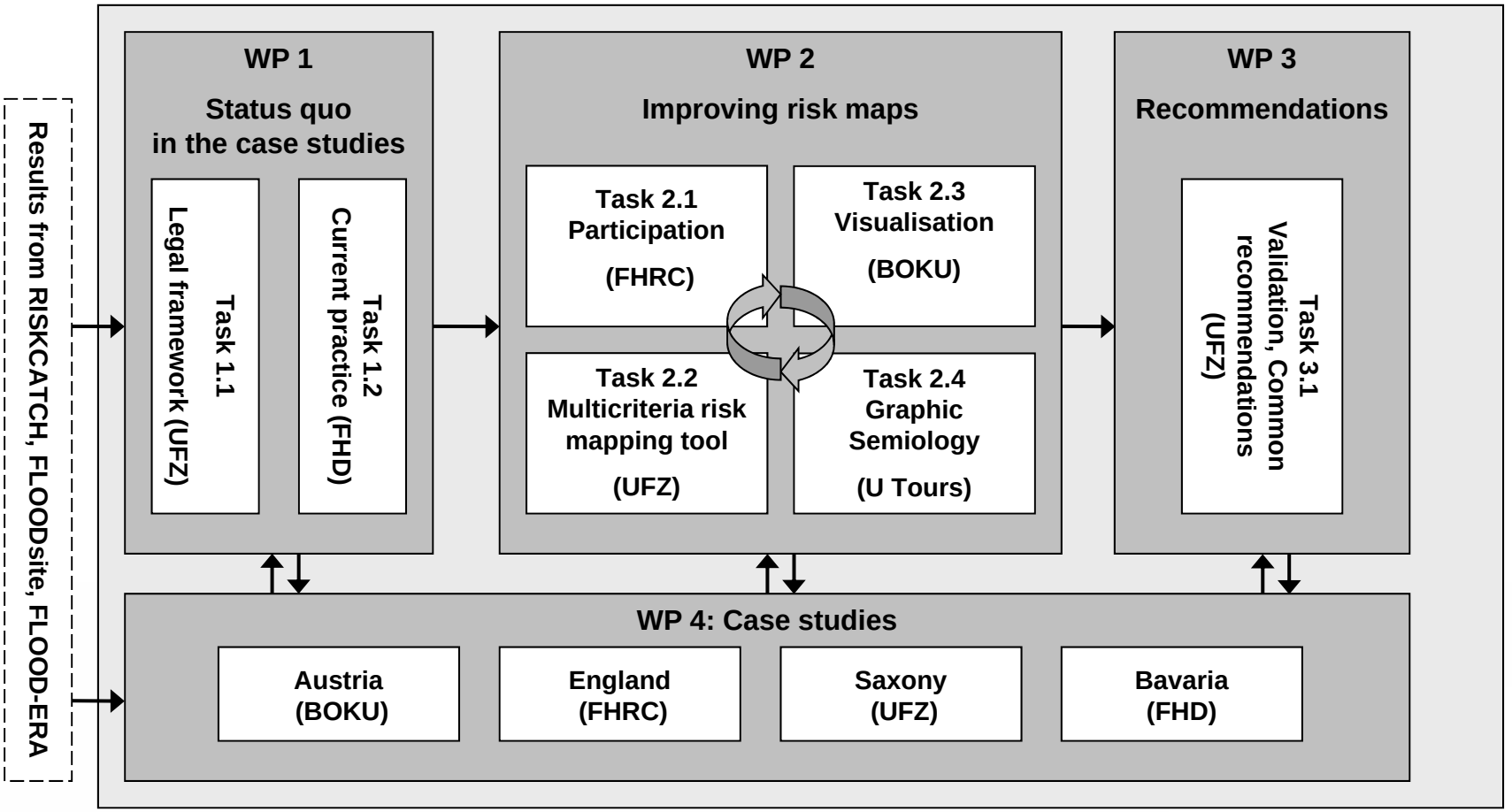


Task 2.2: Multicriteria risk mapping tool

Objective

- Improving the content of risk maps
- Enhancing a multicriteria risk mapping tool
- ➢ Stakeholder participation

Approach

- Multicriteria risk mapping approach…

Multicriteria risk mapping: aggregation of different risk criteria maps

Economic:

annual average damage

Environmental:

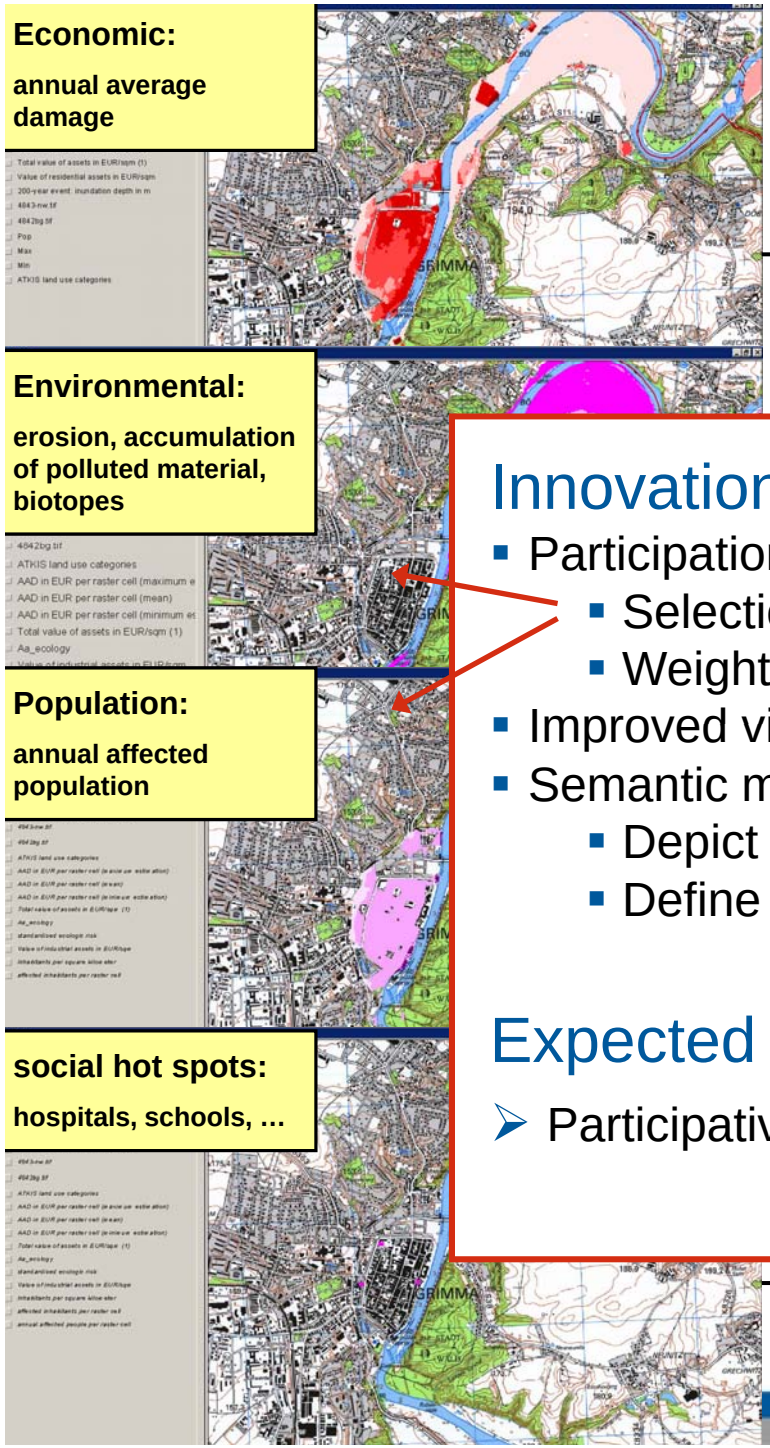
erosion, accumulation of polluted material, biotopes

Population:

annual affected population

social hot spots:

hospitals, schools, ...

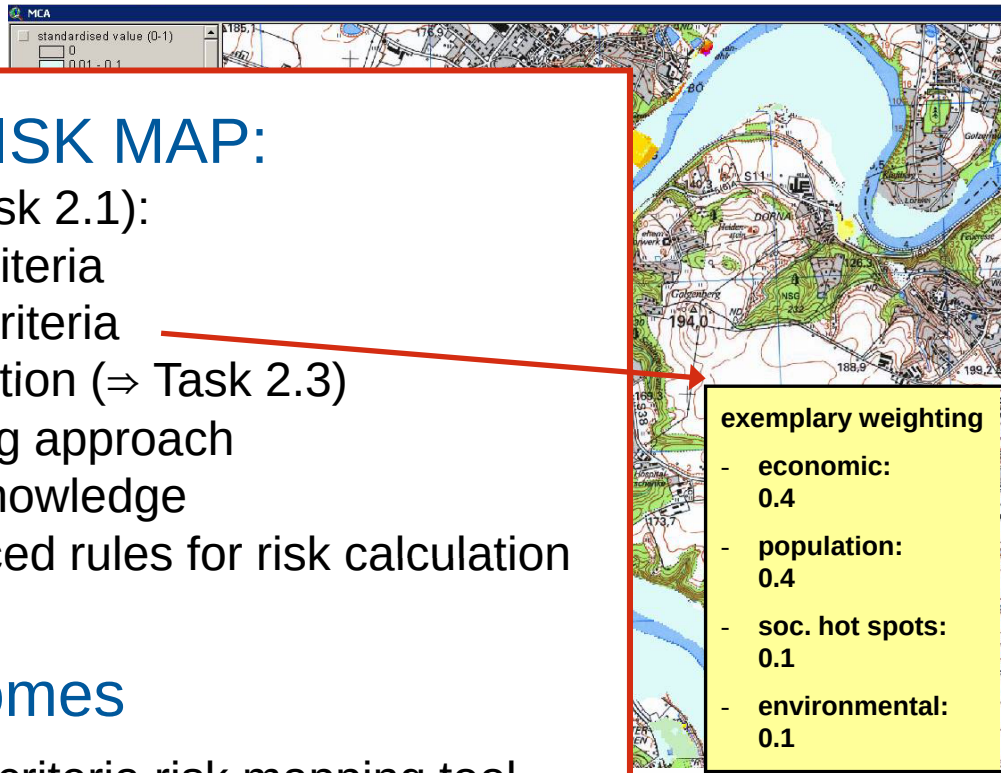


Innovation in RISK MAP:

- Participation (⇒ Task 2.1):
  - Selection of criteria
  - Weighting of criteria
- Improved visualisation (⇒ Task 2.3)
- Semantic modelling approach
  - Depict local knowledge
  - Define advanced rules for risk calculation

Expected outcomes

➢ Participative multicriteria risk mapping tool



exemplary weighting

- **economic: 0.4**
- **population: 0.4**
- **soc. hot spots: 0.1**
- **environmental: 0.1**

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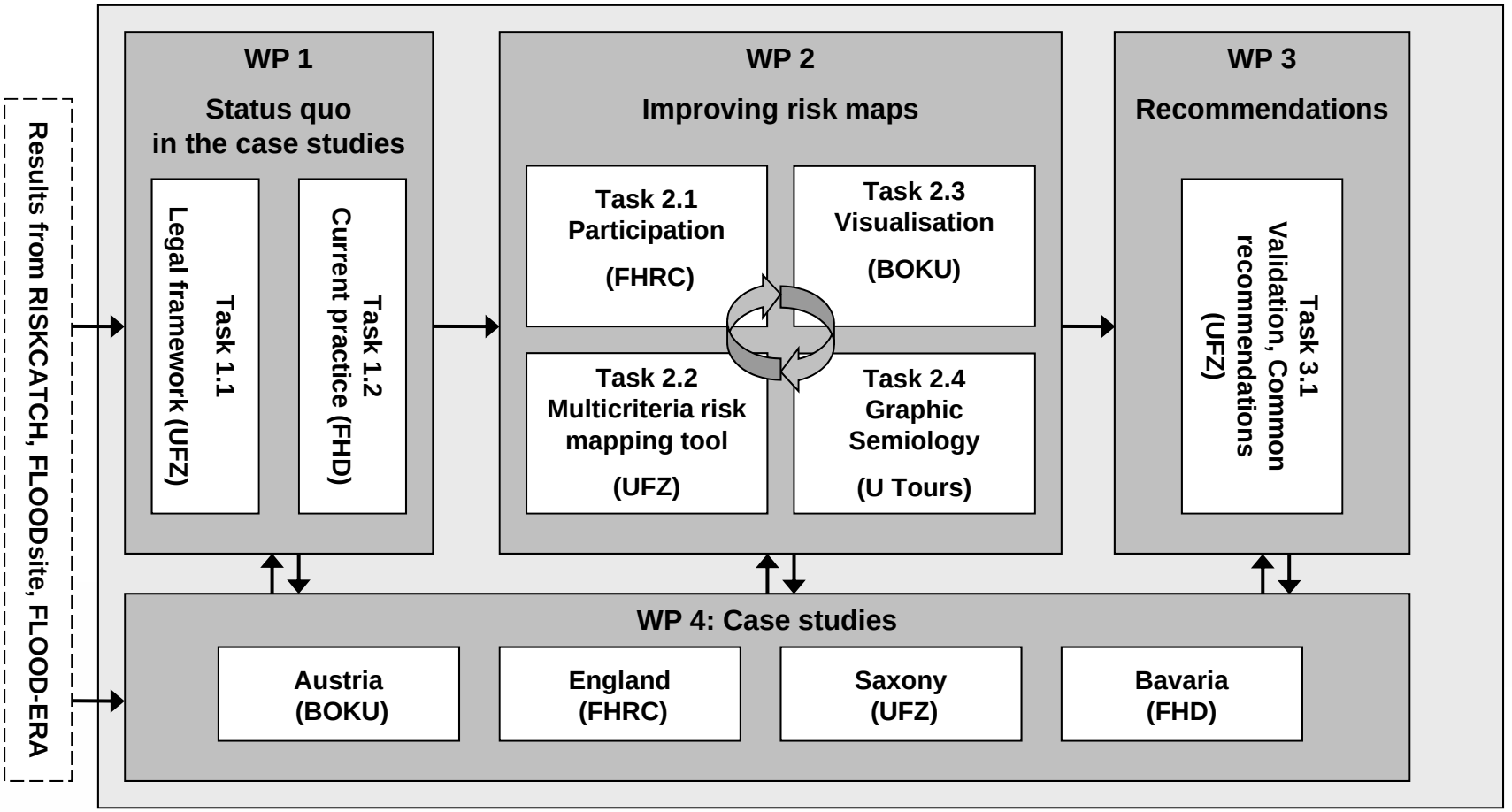

Task 2.1: Participation

- Objective
  - to create a participatory framework that allows integration of selected stakeholders in the risk mapping process: their information requirements and local expertise
- Approach/Methods
  - Differentiation of stakeholder groups (decision-makers, experts, civil society and local population),
  - Literature review on participation
  - Interviews & series of workshops
- Expected outcomes
  - Recommendation for stakeholder participation in the risk mapping process

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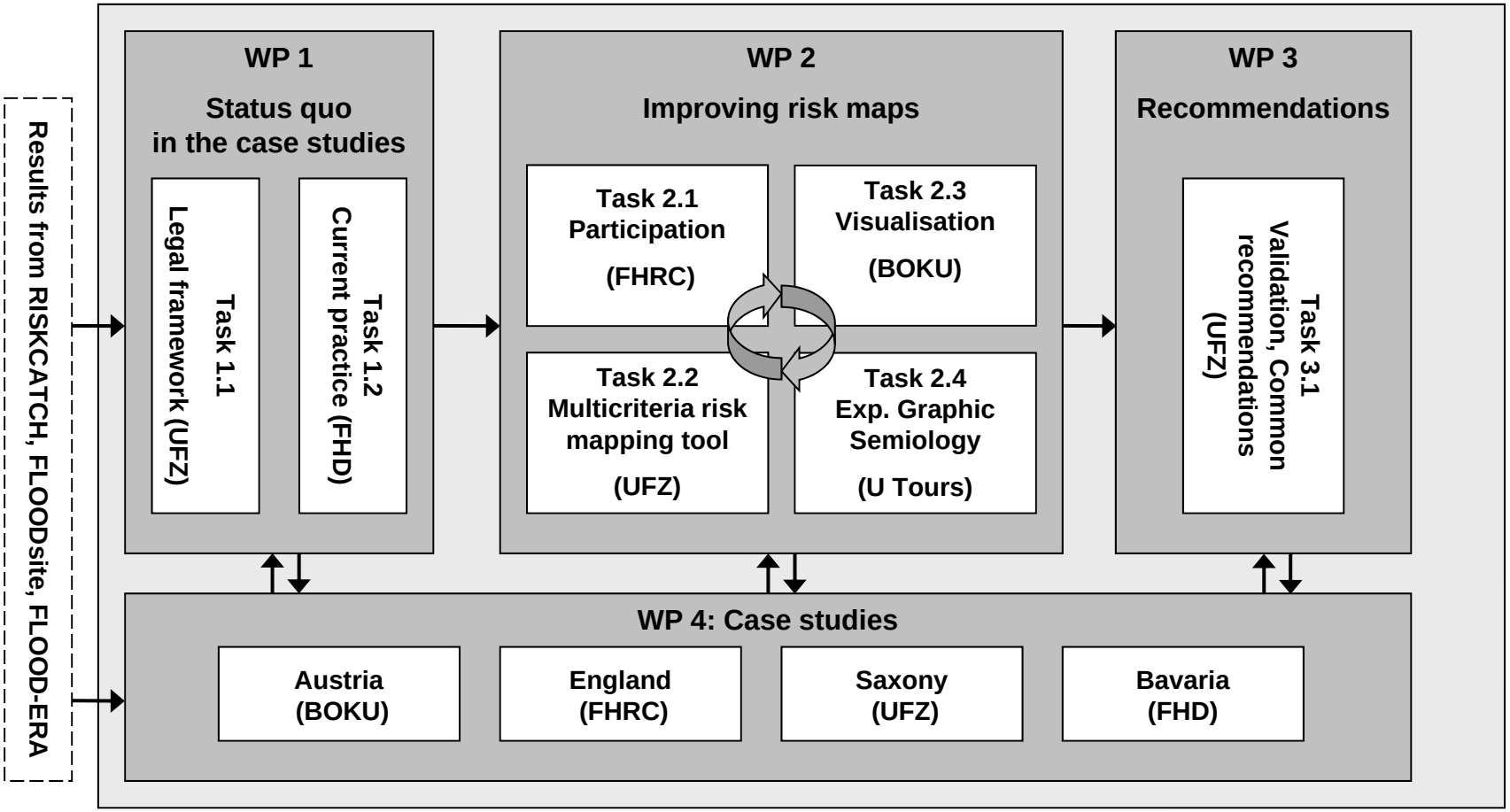
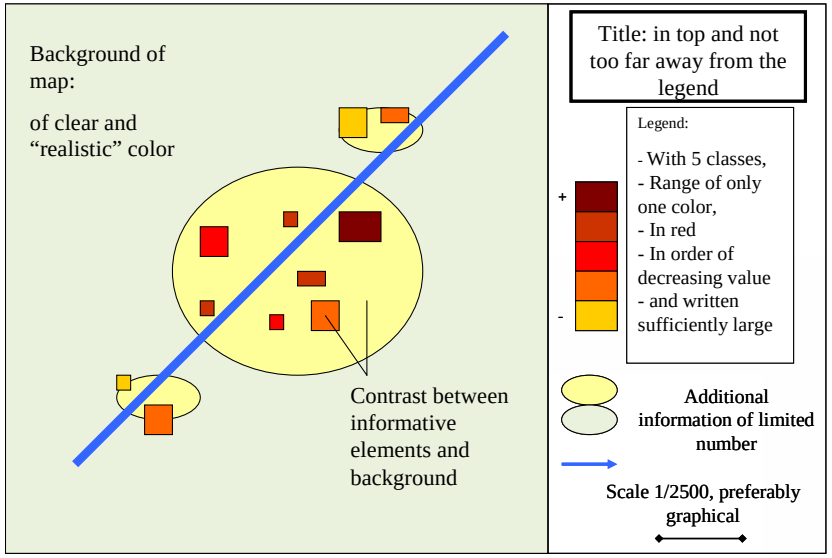


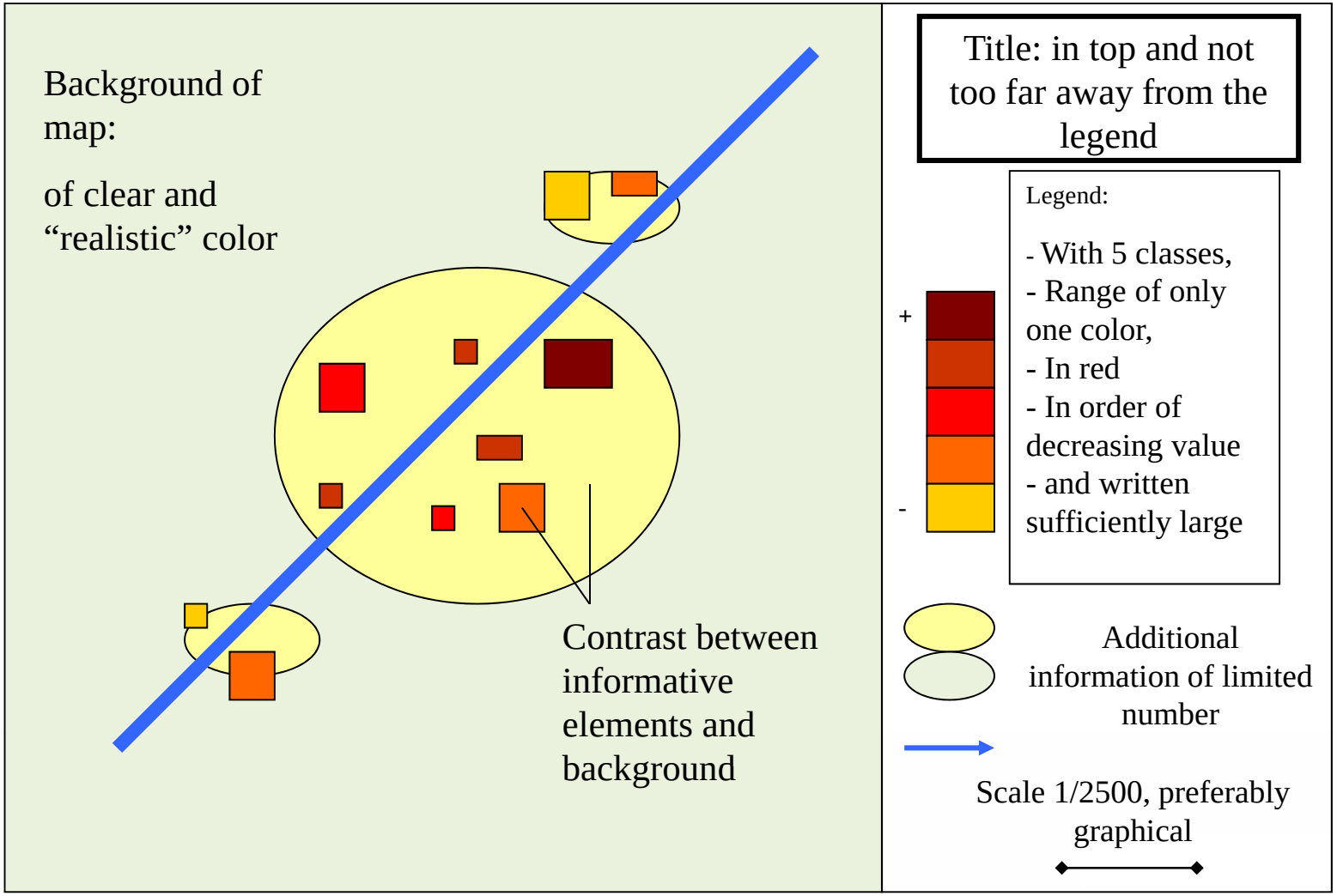
Task 2.3 & 2.4: Visualisation & Experimental Graphic Semiology

- Objective
  - To develop improved recommendations for risk visualisation in risk maps

- Approach/Methods
  - Based on participative approach (Task 2.1)
  - Interviews with different stakeholders
  - GIS-based compilation of a set of different maps:
    ⇒ Scale, size, content, colours used,…
    ⇒ based on results of RISKCATCH…
  - Test of maps by using the method of experimental graphic semiology…



Visualisation: RISKCATCH results



- Test of maps by using the method of experimental graphic semiology
  ⇒ Task 2.4

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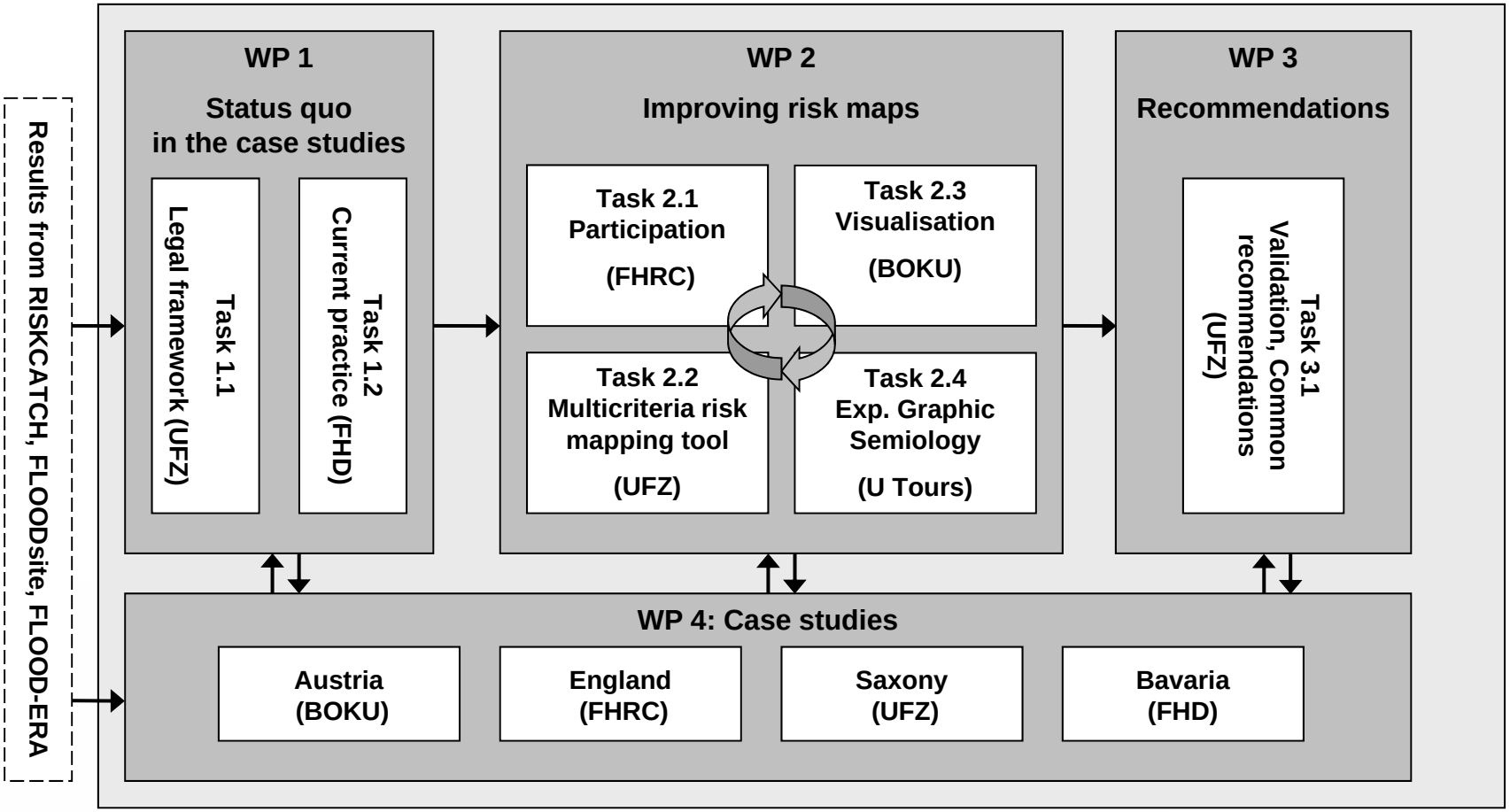
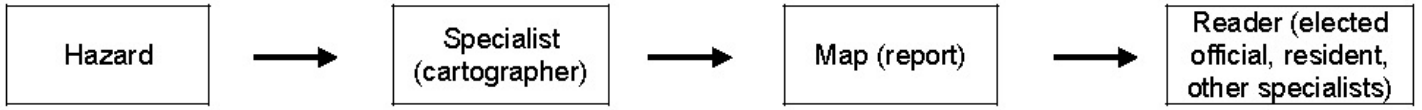


Task 2.4: Experimental Graphic Semiology

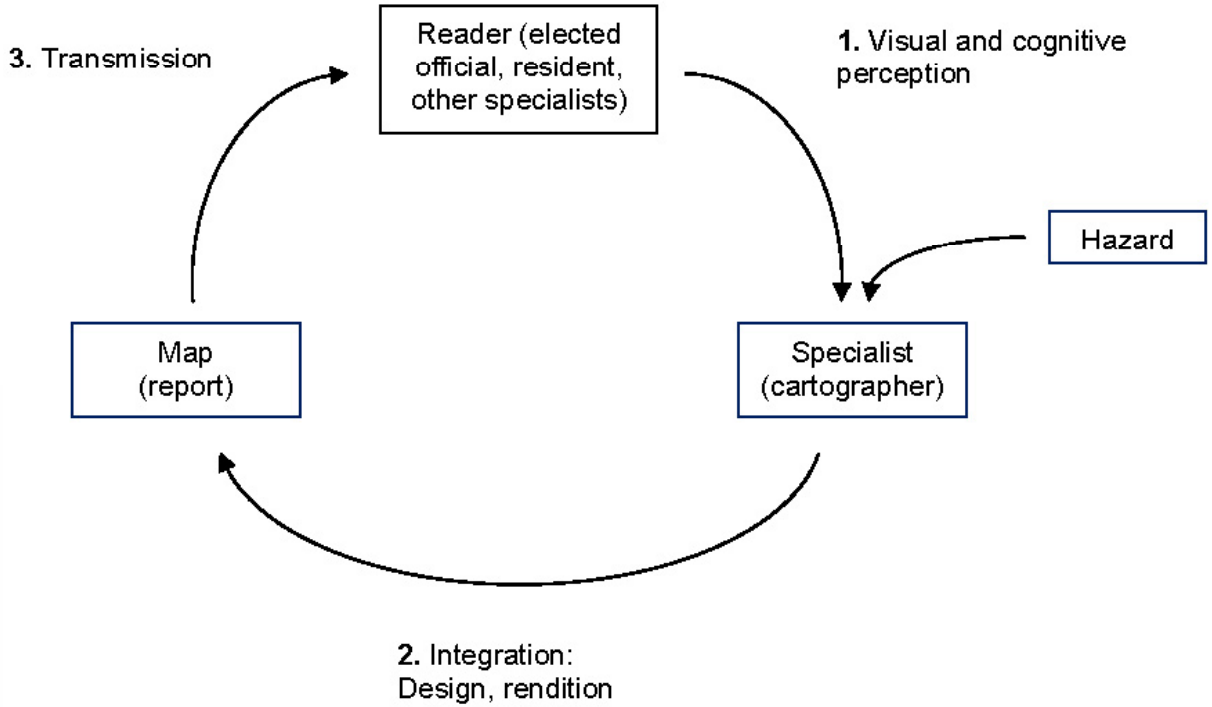
- Objective
  - Identify preferences concerning graphic representation and arrangement
- Approach/Methods
  - Experimental Graphic Semiology….

Experimental Graphic Semiology

Traditional mapping scheme



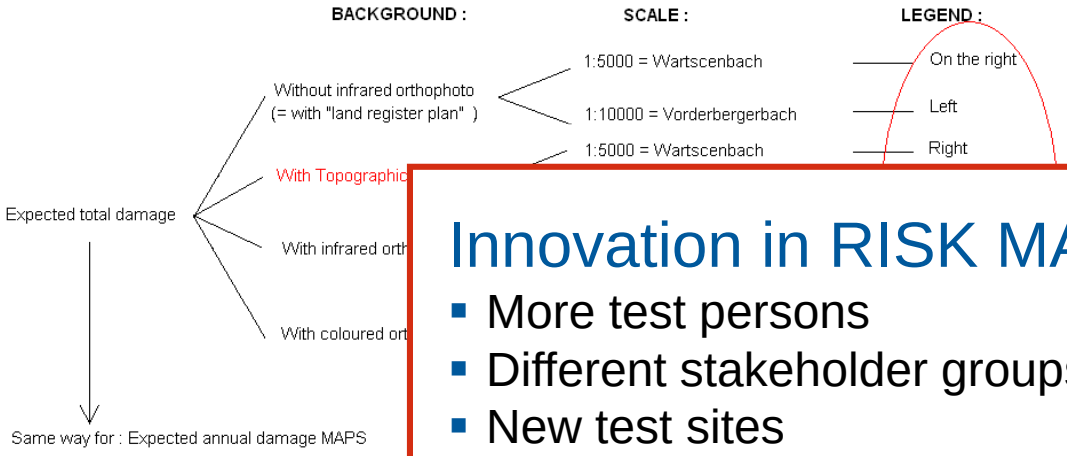
Experimental graphic semiology: feedback between receiver and expert



Fuchs, Dorner, Sprachinger & Serrhini 2007

Experimental Graphic Semiology

1) Different maps… (⇒ Task 2.3)



2) Presentation (15 s) of maps to stakeholders

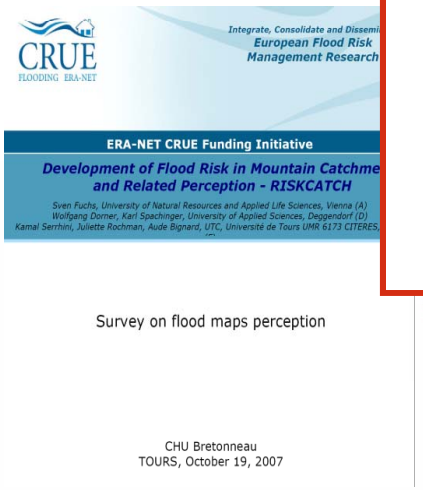
Innovation in RISK MAP:

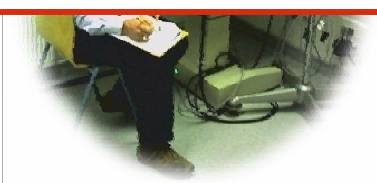
- More test persons
- Different stakeholder groups
- New test sites
- *pre*- and *post*-questionnaire
- Multicriteria Maps (⇒Task 2.2)

Expected outcomes (Task 2.3 & 2.4)

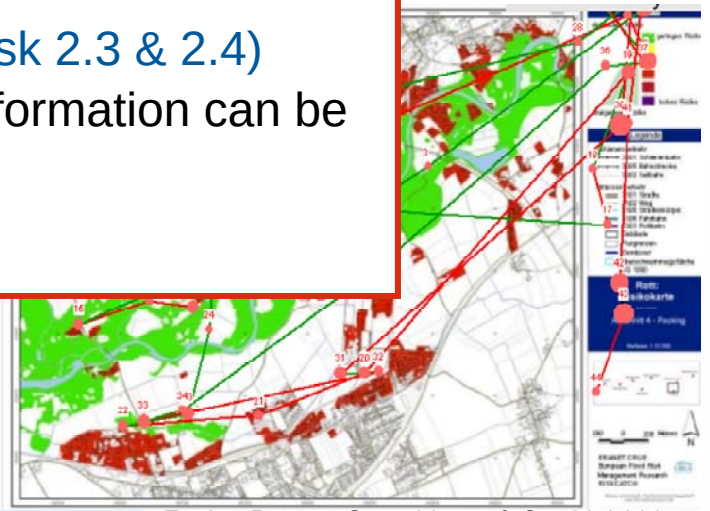
- Recommendations of how information can be delivered target-oriented…

3) Cognitive surv





s:
spatial analysis)



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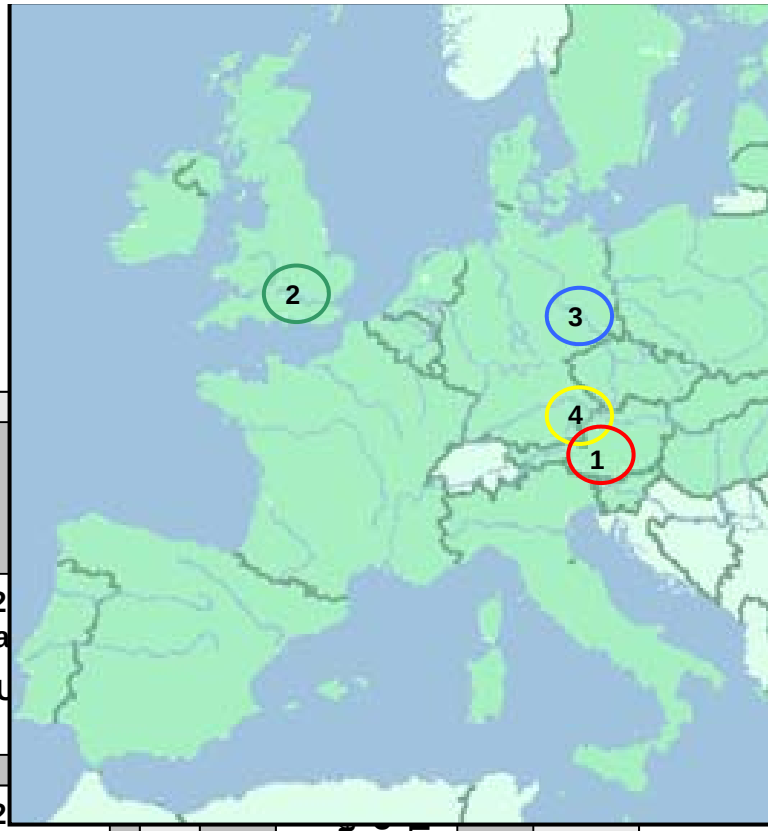
Structure of RISK MAP



Results from RISKCATCH, FLOODsite, FLOOD-ERA

WP 1

Status quo in the case studies

Task 1.1 Legal framework (UFZ)

Task 1.2 Current practice (FHD)

WP 2

Improving risk maps

Task 2.1 Participation (FHRC)

Task 2 Visualisa (BOKU

Task 2.2 Multicriteria risk mapping tool (UFZ)

Task 2 Graphic Semiology (U Tours)

ations

WP 4: Case studies

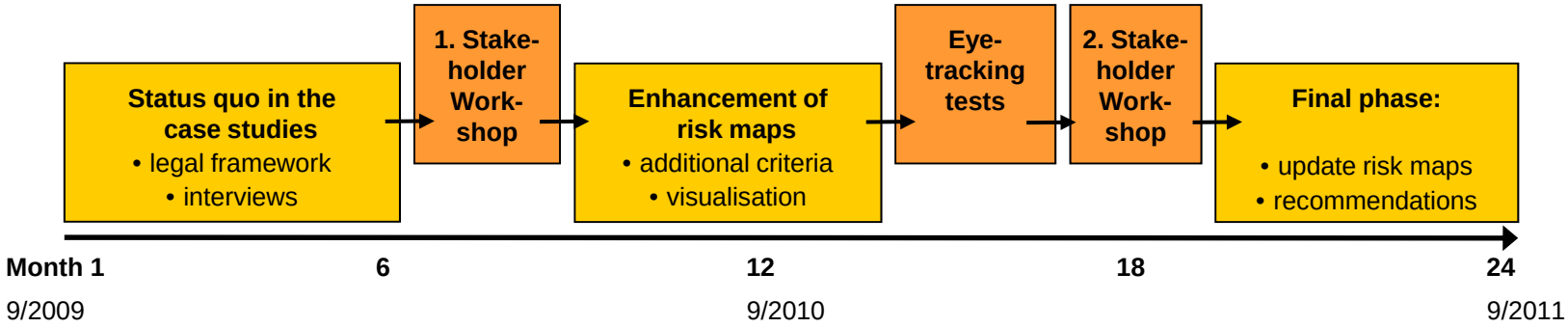
1 Austria (BOKU) Wartschenbach & Vorderbergerbach

2 England (FHRC) Lower Thames

3 Saxony (UFZ) Vereinigte Mulde

4 Bavaria (FHD) Vills & Rott

Time schedule in the case studies



Stakeholder involvement

- interviews
- 2 workshops
- eye-tracking tests

Expected results of RISK MAP

- Improved risk maps…
  - exemplary risk maps in the case studies
- Recommendations on how to…
  - organize participation in risk mapping
  - improve the content of risk maps
  - improve the visualisation of risk maps
- Limitations of risk maps

Dissemination

Local & regional stakeholders:

- Direct involvement during & after the project

Science & policy audience

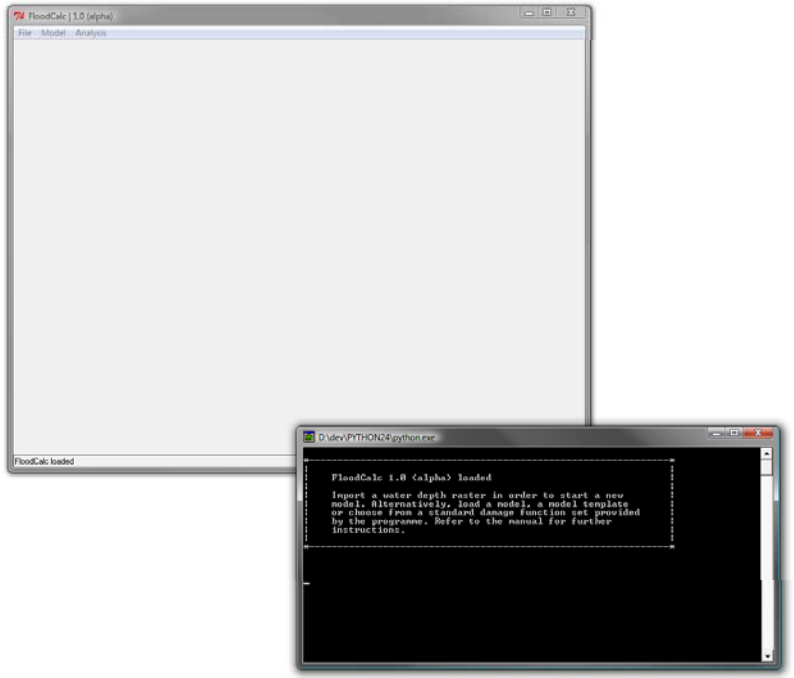
- Conference presentations
- Journal articles (national and international)
- Stakeholder & scientific Network
  (EU-projects CapHaz-Net & ConHaz)

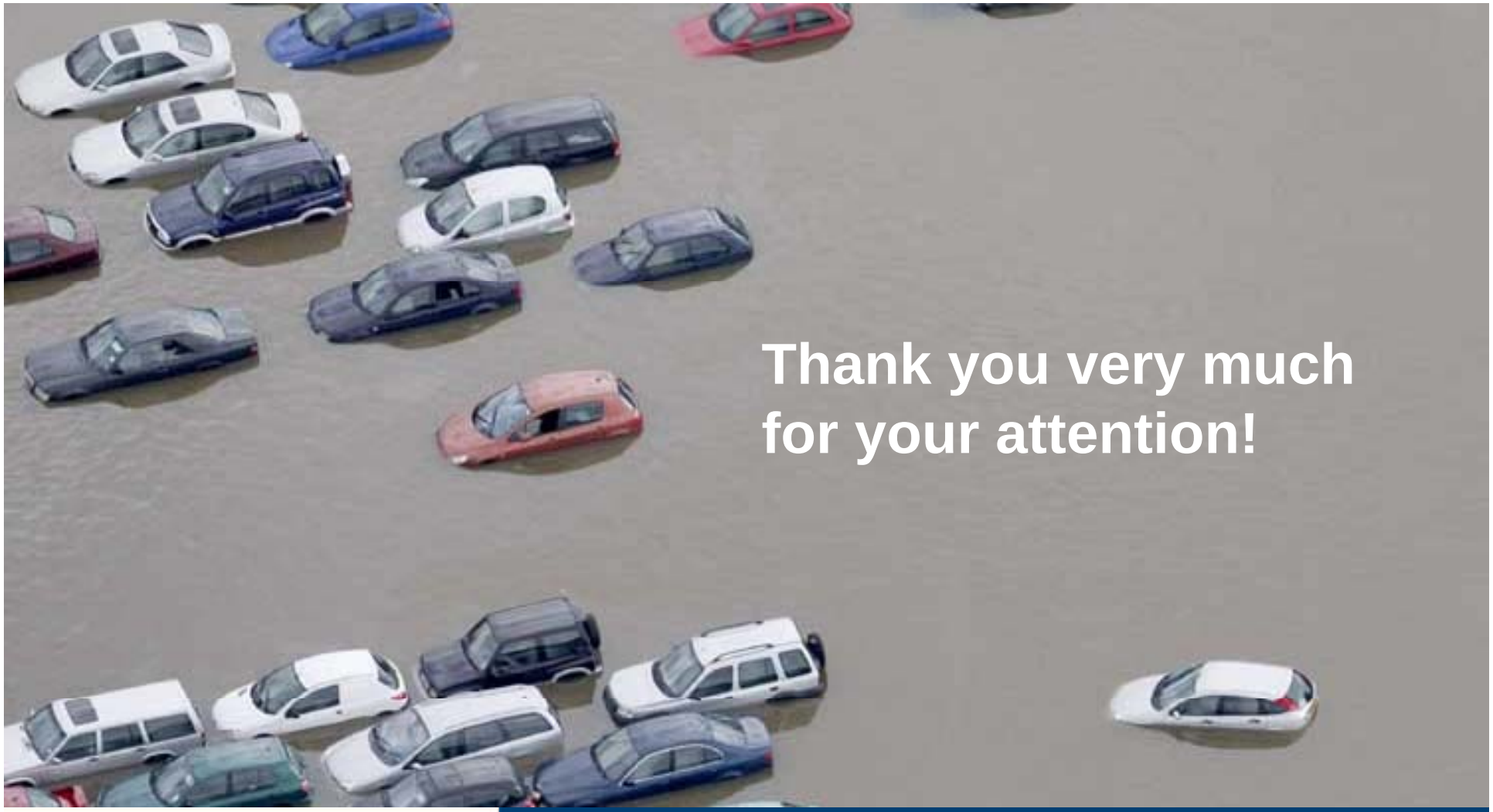
Wider audience

- Project reports
- web-page (www.risk-map.org)

Status of the project

- Status quo in the case studies: explorative phase
- First interviews in the case studies (?)
- Study on legal framework
- New version of the multicriteria risk mapping tool (FloodCalc II)
- …





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