



Active vulnerability reduction by public participation - the RISK MAP project

Sven Fuchs and the RISK MAP team*

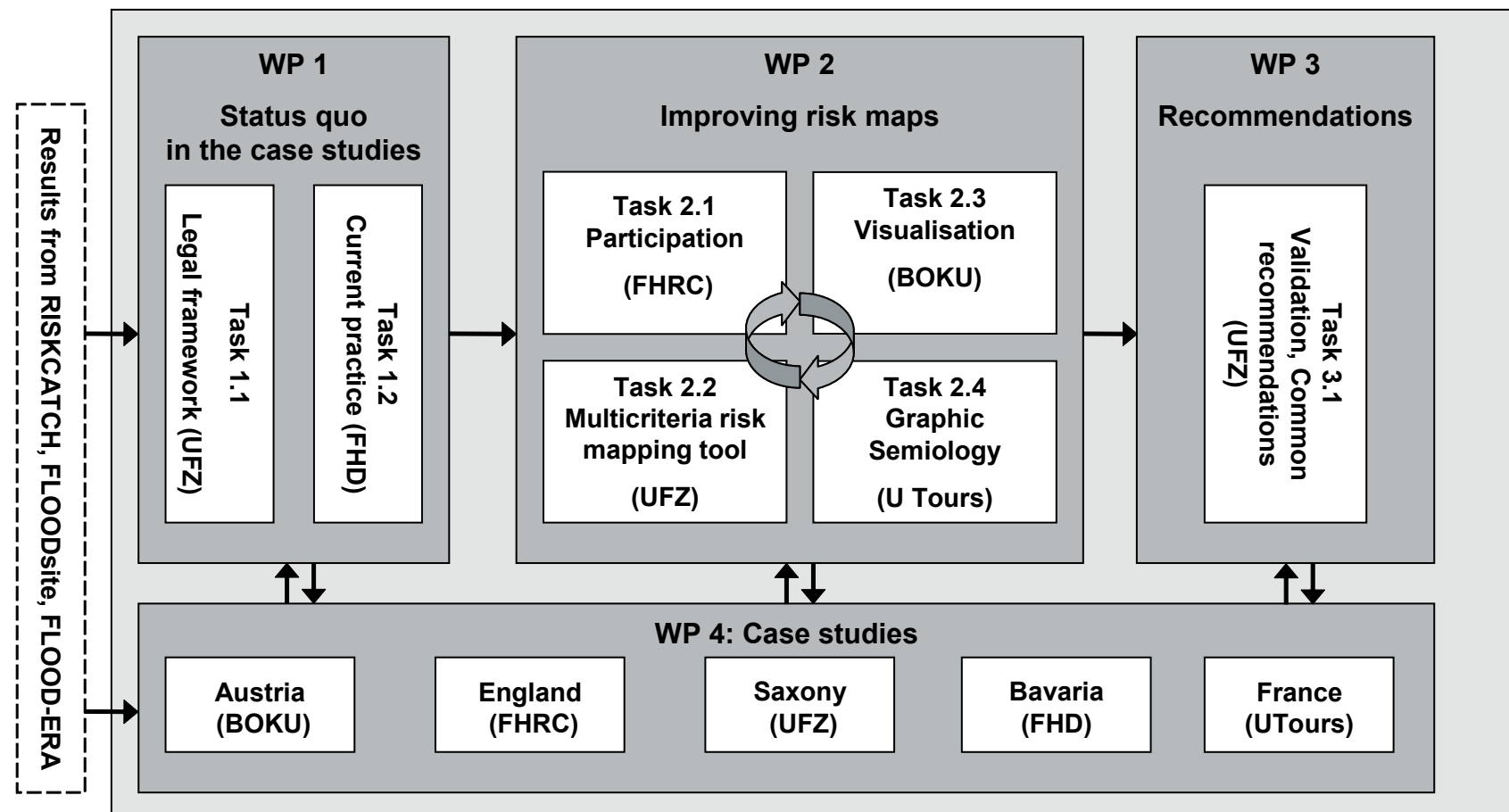


1. Introduction

RISK MAP aims at reducing vulnerability by improving flood risk maps as a means to foster public participation and raising flood risk awareness. For achieving this aim RISK MAP

- (1) develops rules for appropriate stakeholder participation enabling the incorporation of local knowledge and preferences into risk maps;
- (2) improves the content of risk maps by considering social, economic and environmental risks. Therefore an existing multicriteria risk mapping tool is enhanced towards a participative dialogue tool;
- (3) improves the visualisation of risk maps in order to produce user-friendly and understandable risk maps and
- (4) provides quantitative information related to the content of risk maps by the application of eye-tracking methods and by experimental graphic semiology.

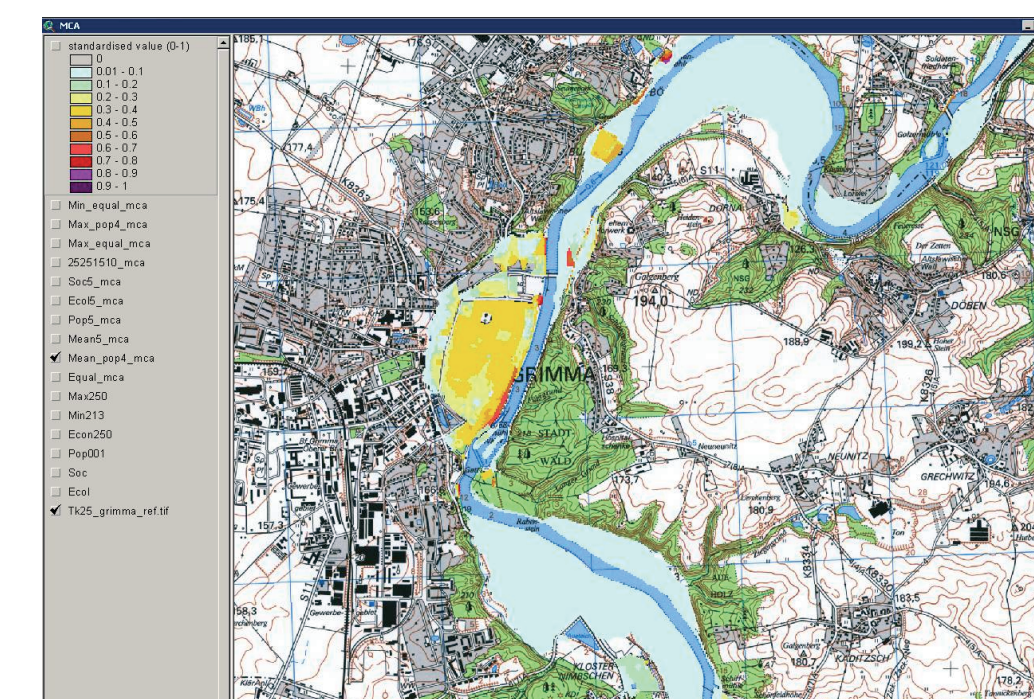
Structure of the project



2. Participation

The objective is to create a participatory framework that allows integration of selected stakeholders in the risk mapping process with respect to their information requirements and local expertise.

The following typology of stakeholders was included in the study: decision-makers, experts, civil society and local population. Based on interviews and a workshop series, recommendations for stakeholder participation in the risk mapping process result. Additionally, a multicriteria tool was developed to obtain information on the desirable map content.

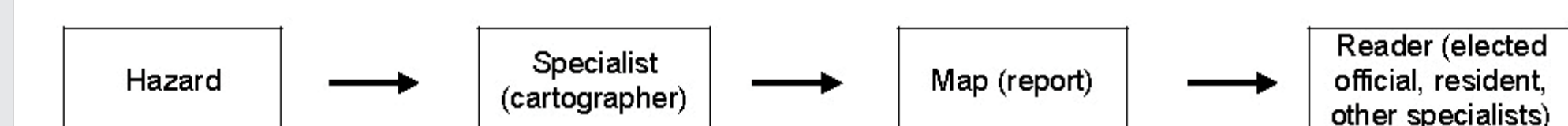


3. Risk visualisation

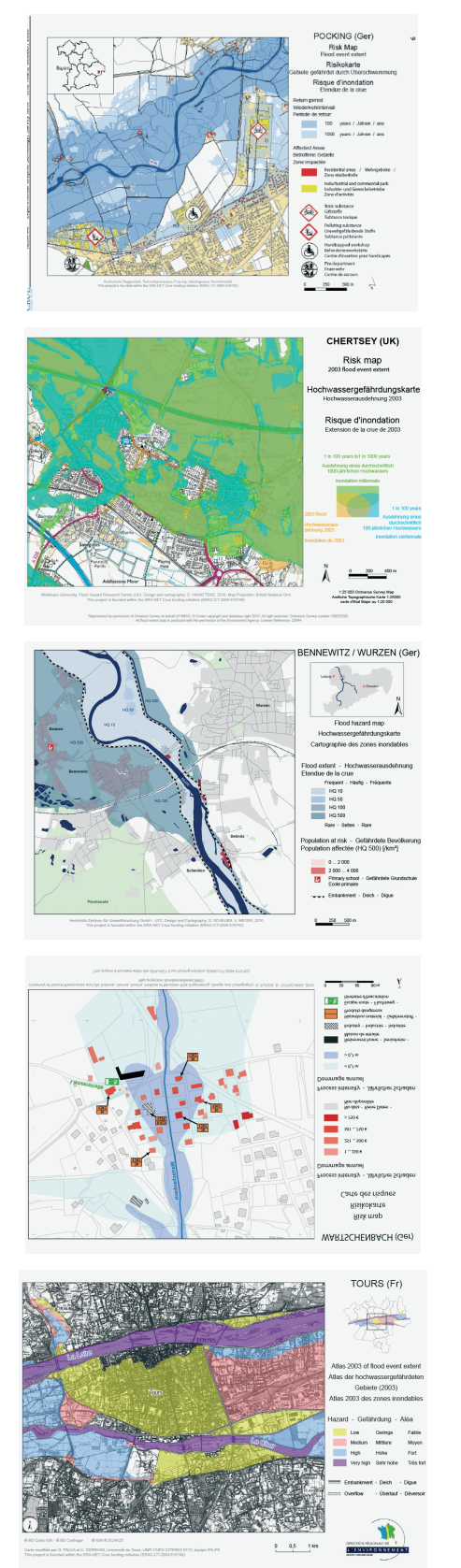
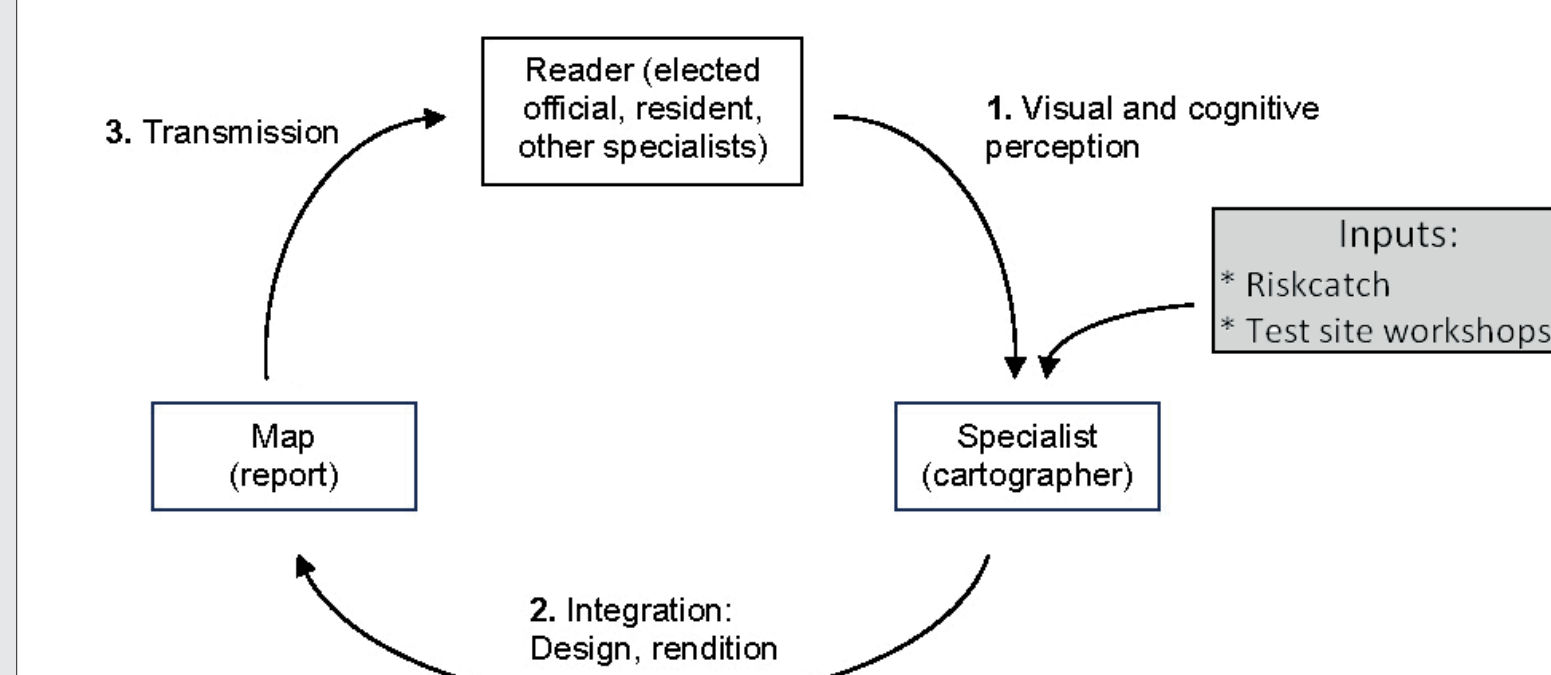
Based on the results of (2), a set of risk maps was created.

The maps were modified visually in order to test different symbols and information content in terms of accessibility through different stakeholder groups.

From the traditional linear model of graphic semiology...



...towards the cyclic model of graphic semiology:



4. Eye tracking

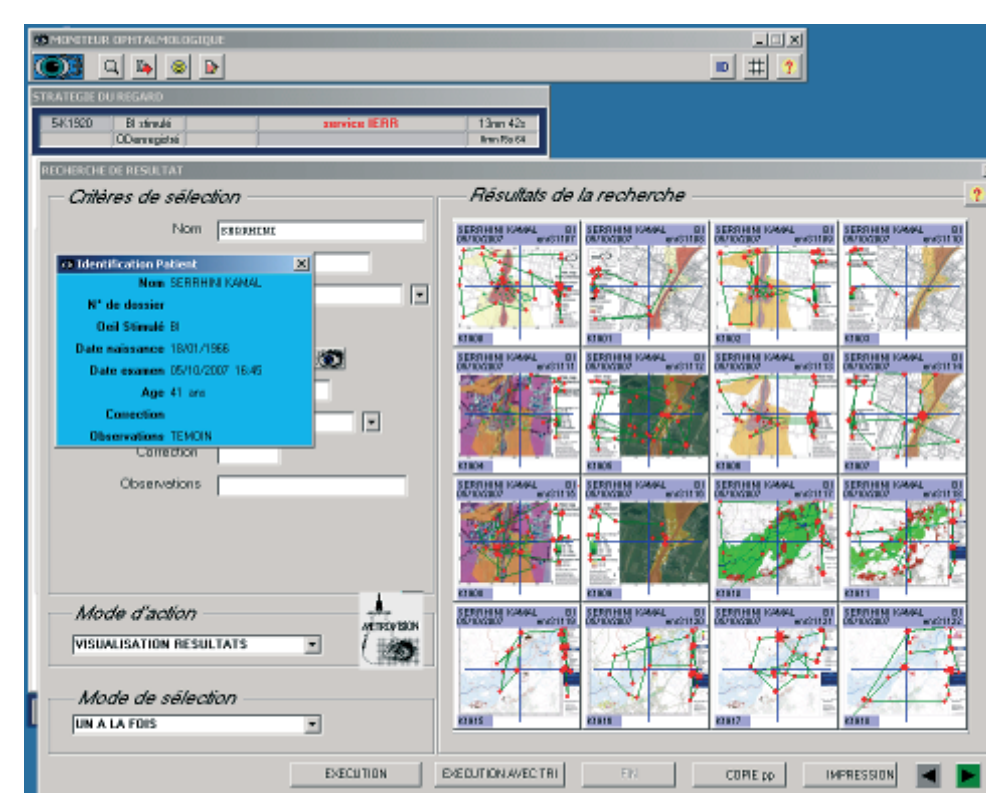
The set of risk maps was presented to 50 individuals (of different stakeholder categories) in order to study reading behaviour and to deduct visual preferences related to individual maps.

The results of the eye tracking were further processed and analysed

- statistically (descriptive),
- spatially (spatial analysis of eye movements), and
- dynamically (dynamic analysis of eye movements)

and preferred visual patterns were gathered.

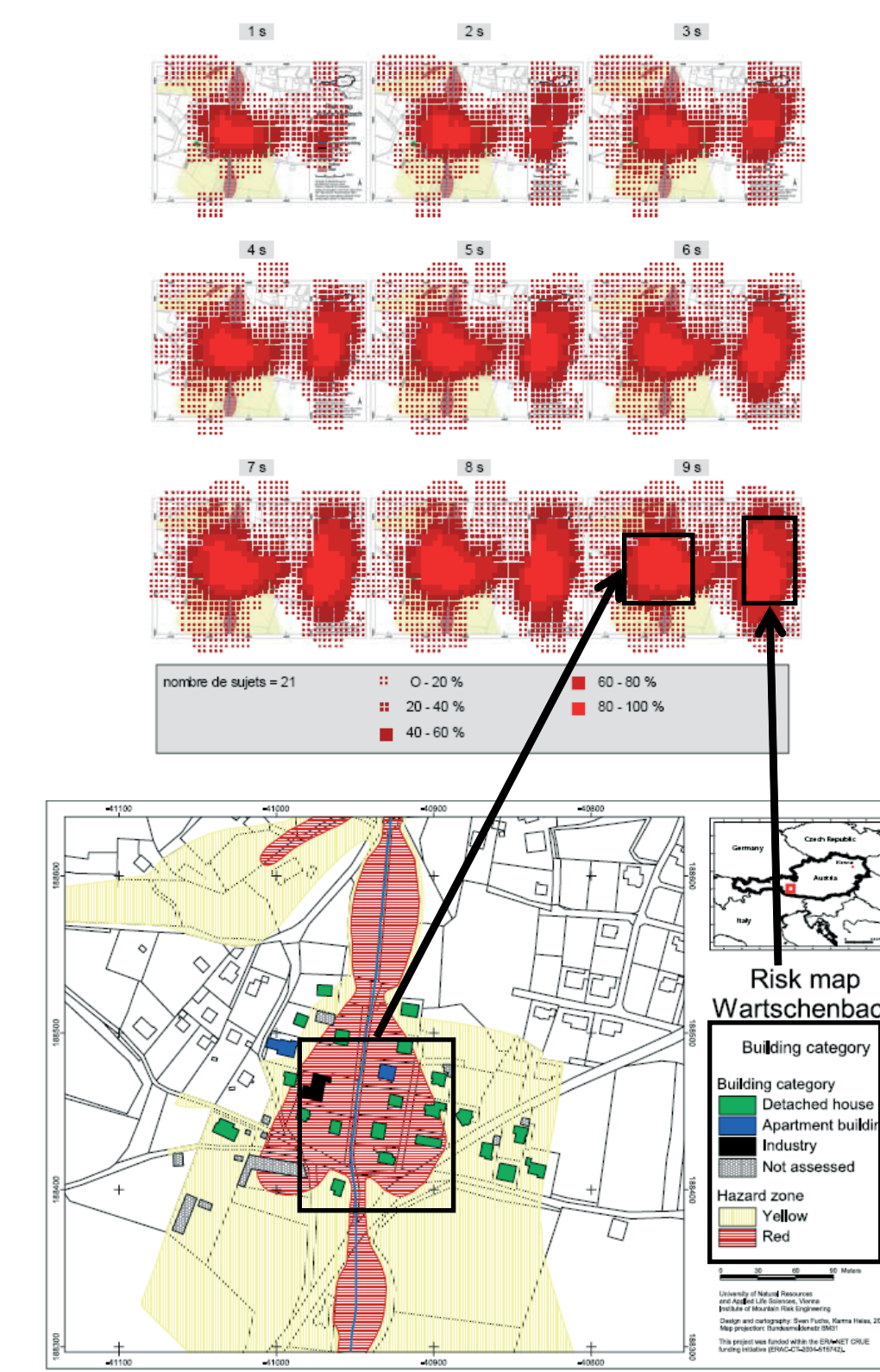
Systematic and regular patterns in map exploration were identified according to different visual behaviour between the groups of individuals.



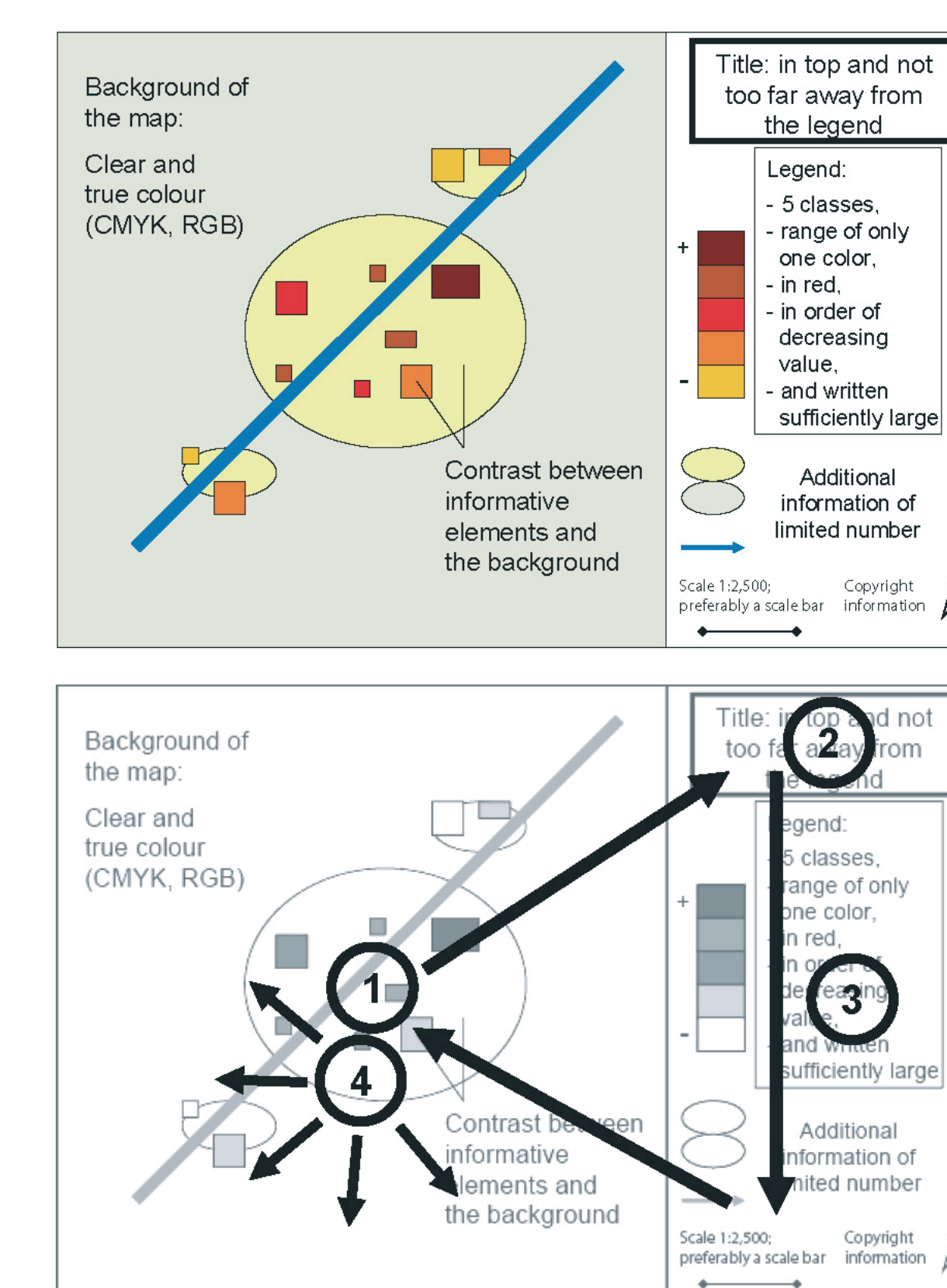
5. (Selected) Results

- The less complex a map is, the less number of fixings is detectable
- 90 % of the fixings is related to coloured and written information
- Almost 100 % of the duration of fixings is detectable in these areas of the map
- A simple legend (2 themes and 4-5 classes) generates one series of ocular movements
- Effect of contrast: The position and concentration of the eye movements varies according to the amount of information
- The visual strategy and thus perception is anthropic:

Professionals: Very precise and efficient reading behaviour
Persons concerned: Less precise and efficient reading behaviour
Laypeople: Learning phenomenon is observable



6. Conclusions



Specific elements of semiology that have to be taken into account when designing risk maps include the contrast, the level of discretisation and the colour range and hue:

A map background in bright colour in order to increase the contrast to informative elements and to avoid an overload of information;

A sufficiently large legend, preferably on the right side of the central element of the map, with a conservative amount of information (five classes of discretisation) comprised from one range in colour and arranged in decreasing values;

A sufficiently large scale such that the elements of the map are easily recognisable.

Consequently, if risk maps are adjusted to these findings, risk communication will be enhanced, vulnerability will be decreased, and awareness-building of the public will be increased.

Further Information:



PD Dr. Sven Fuchs

Institute of Mountain Risk Engineering
University of Natural Resources
and Applied Life Sciences

Peter Jordan Str. 82
A-1190 Wien

sven.fuchs@boku.ac.at

Acknowledgement

This work is funded by the ERA-Net CRUE Initiative (Contract ERACCT-2004-515742).

Authors in attendance: 3:30-5:00 p.m.

See also: www.risk-map.org

Reference

Fuchs, S.; Spachinger, K.; Dorner, W.; Rochman, J. & K. Serrhini (2009): Evaluating cartographic design in flood risk mapping. Environmental Hazards 8 (1). p. 52-70

* The RISK MAP team

V. Meyer, C. Kuhlicke, S. Fuchs, S. Tapsell, S. Priest, W. Dorner, K. Serrhini, H. Unnerstall, S. Scheuer, J. Luther, J. Pardoe, J. Seidel, R. Totschnig, G. Palka, C. Viavattenne, S. McCarthy
University of Natural Resources and Life Sciences (Vienna, A), University of Applied Sciences (Deggendorf, D), Université François-Rabelais (Tours, F), Flood Hazard Research Center, Middlesex University (London, UK), UFZ – Helmholtz Centre for Environmental Research (Leipzig, D)

