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Flood Risk in Tours

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Collaborative modelling as a methodology for sustainable flood risk management

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Contents

1. The concept of collaborative modelling
2. The framework and examples
3. Conclusion & critical comments

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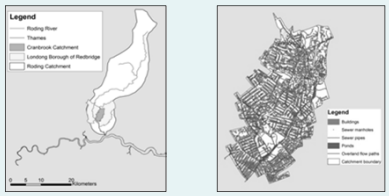
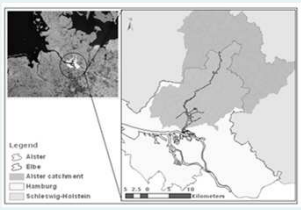
Background

- In order to reduce (urban) flood vulnerability an increased awareness of stakeholders and citizens about potential flood risk & capacity to handle flood risk is crucial
- For capacity building learning processes are essential
- Tangible information and target group specified and localised knowledge is needed

→ interaction
→ simulation and visualisation
→ social learning

DIANE-CM LEUPHANA UNIVERSITÄT LÜNEBURG Imperial College London UNESCO-IHE institute for Water Education

MAIN CHARACTERISTICS	Cranbrook Catchment (London Borough of Redbridge), UK	River Alster, Germany
		
Type of flood	Pluvial and fluvial	Fluvial Flooding
Area	9 km²	578 km²
Frequency of Floods	Most recent events in October 2000 and February 2009	Some during last decades, last flood event 6th February 2011
Stakeholder groups	- Flood management professionals - emergency managers - planners and governmantal organisation	- Administration and authorities - emergency managers - NGOs - affected people and public

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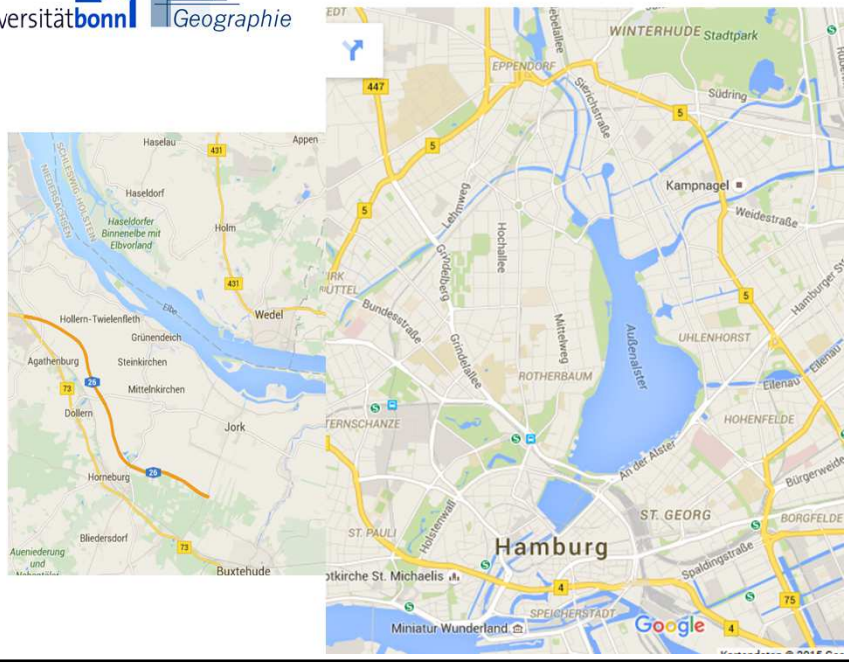

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The concept and goals of collaborative modelling

- CM* = interactive and iterative process in which stakeholder engagement and communication activities are constantly complemented by modelling and communication tools, such as a collaborative platform
- Objective of CM:
  - Create a constructive learning environment
  - Development of a shared understanding of current flood risk
  - Development and evaluation of alternatives for FRM
  - Flood risk alternative testing under different scenarios
  - Support for negotiation and selection of commonly agreed alternatives

*Decentralised Integrated ANalysis and Enhancement of Awareness through Collaborative Modelling and Management of Flood Risk

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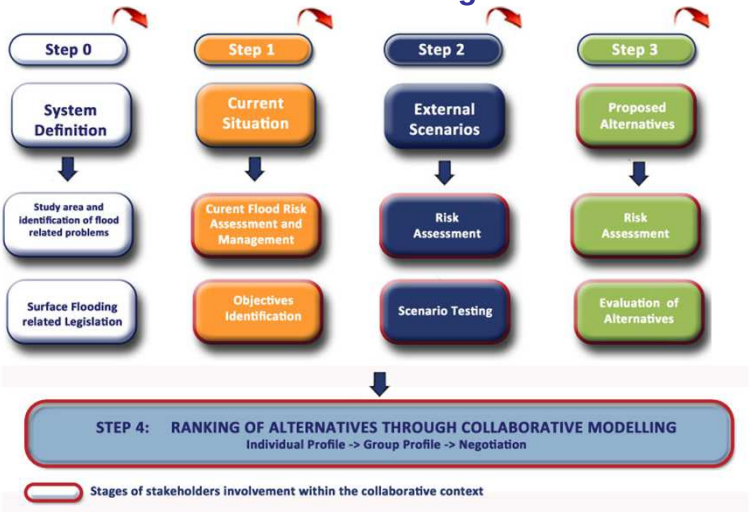
Collaborative modelling framework for flood risk management



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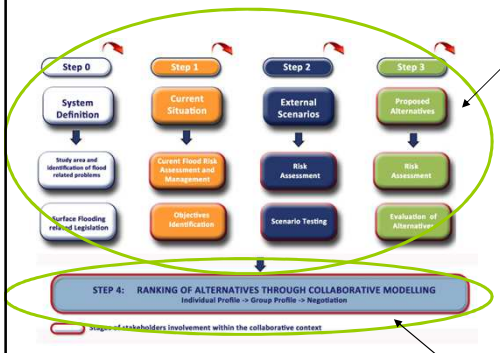

- Processes enabled by series of meetings and workshops with joint participation of stakeholders, flood management authorities, public and researchers
- Supported by web-based platform (Collaborative Platform-CP)
- Collaborative Modelling Exercise (CME) for individual and group ranking of proposed alternatives, with respect to identified objectives
- Supported by web-based tools embedded in the CP

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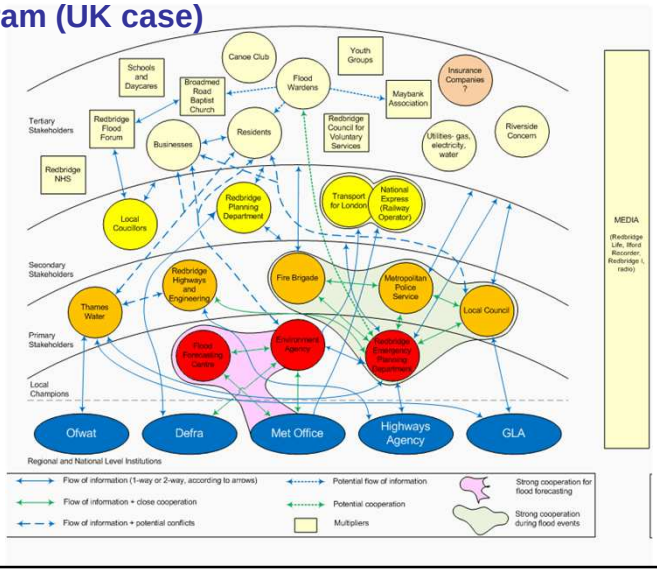
Sociogram (UK case)



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CRANBROOK CASE STUDY ALSTER CASE STUDY

INTRODUCTORY STAGE GOALS AND INTERESTS

June/2010 Brainstorming / Informative Session (13 people)

Kick-off meeting (45 people) Nov 18th /2010

1st Workshop Interests and needs of SHs (25 people) Dec 9th /2010

COLLABORATIVE PLATFORM

Jan 14th /2011 2nd Workshop Information/Discussion (13 people)

2nd Workshop Scenarios and objectives Definition of hotspots (19 people) Jan 19th /2011

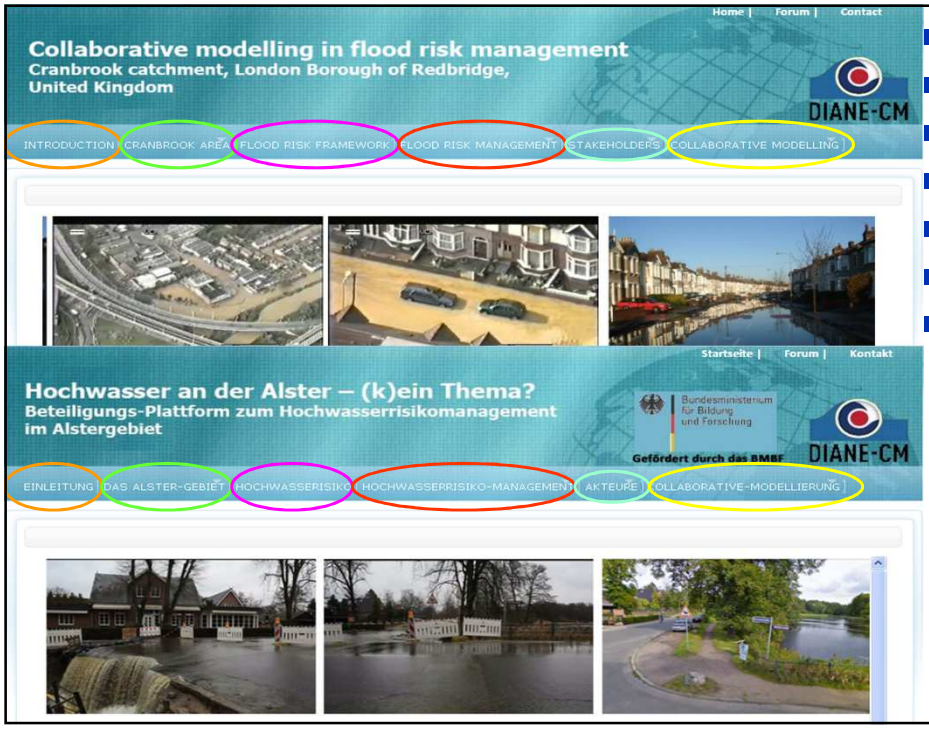
3rd Workshop Simulation results Alternatives and scenarios (17 people) Mar 1st /2011

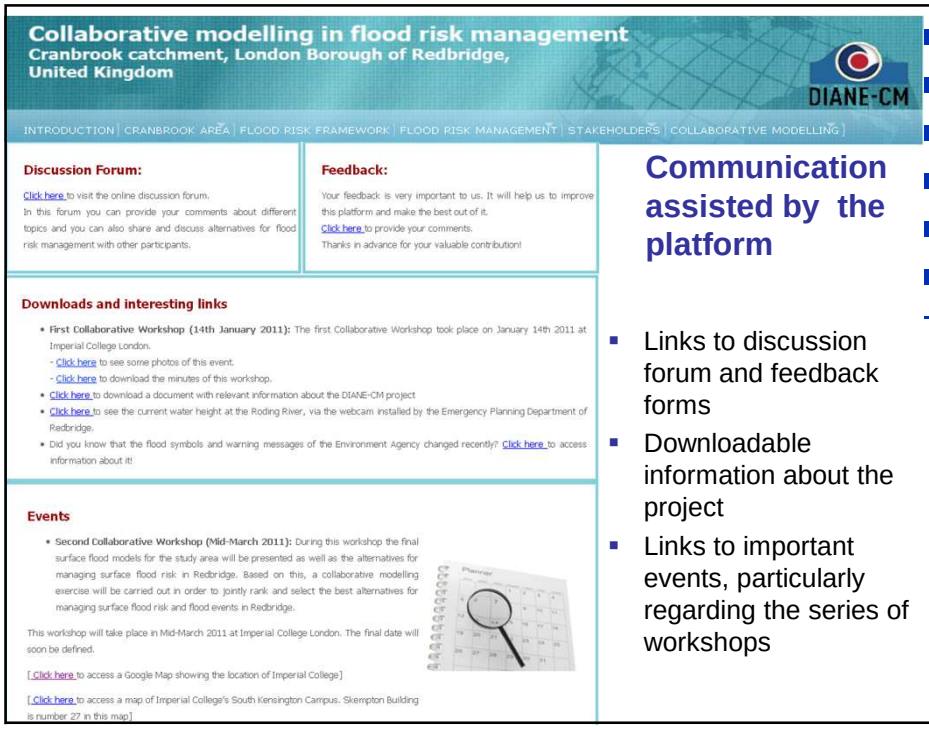
COLLABORATIVE PLATFORM + CME

Mar 18th /2011 3rd Workshop Collaborative modelling exercise (CME) (7 people)

4rd Workshop Collaborative modelling exercise (CME) (12 people) May 3rd /2011

COLLABORATIVE PLATFORM + CME





Communication assisted by the platform

- Links to discussion forum and feedback forms
- Downloadable information about the project
- Links to important events, particularly regarding the series of workshops

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Joint Data Base

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Alternatives

- Define various alternatives (which includes a set of measures)
- Risk assessment
- Evaluation of Alternatives

Alter-native	1	2	3	4	5
UK	Doing nothing	Rainwater harvesting	Improved and targeted maintenance regimes of the system	Improved resistance for preventing water from entering properties	Improved rainfall and flood forecasting and warning
D	Doing nothing	Technical measures	Management of the catchment	Prevention	

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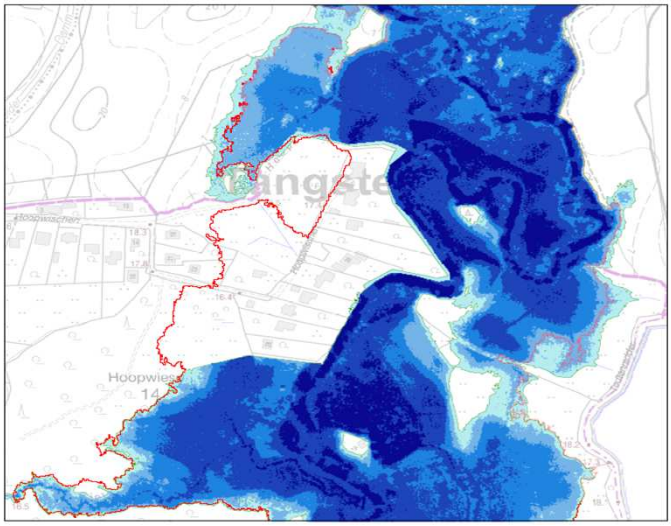

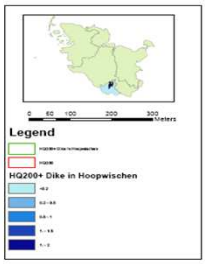

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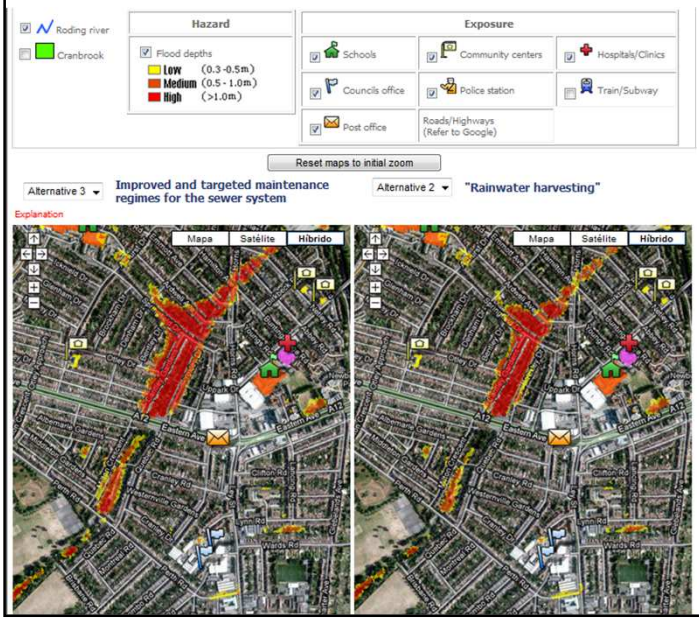

Alternatives (UK) Web-based mapping for evaluation

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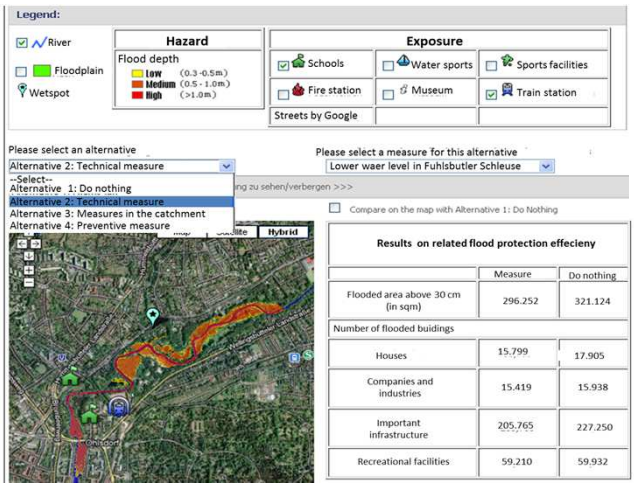

Alternatives (UK) Web-based mapping for evaluation

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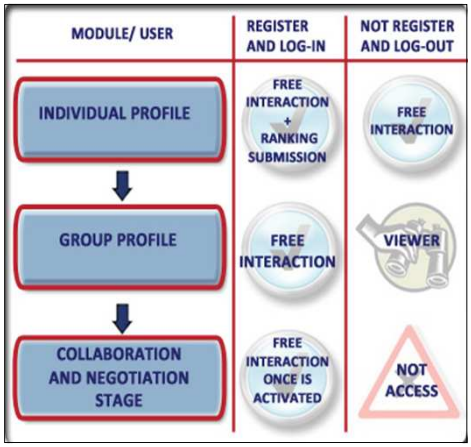
Collaborative Modelling Exercise (CME)

Ranking of alternatives

1. Individual ranking of alternatives by each stakeholder *(Individual profile)*
2. Group ranking of alternatives obtained by aggregated individual rankings *(Group profile)*
3. Negotiation and collaboration, by which individual stakeholders can adapt their individual ranking and consequently the group ranking



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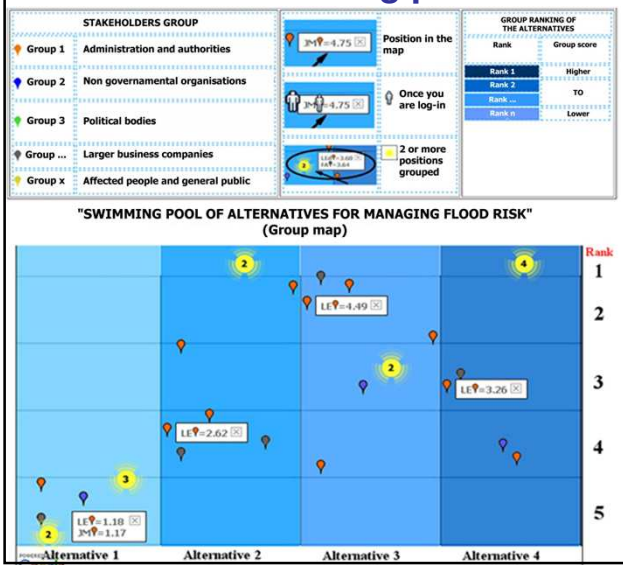
Swimming pool of alternatives



- Visualisation of the individual positions versus the group as a whole
- Darker blue colours represent more preferred alternatives by the whole group
- Individual ranking of the same alternative with markers
- Different markers (color) for different stakeholder group
- Similar individual rankings grouped in clusters

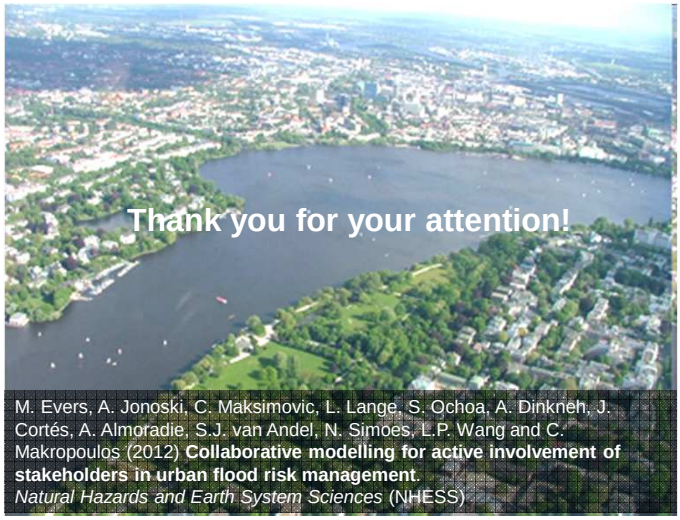
Conclusion

- The mixed approach of web-based tools and face to face workshops was appreciated and is promising
- Knowledge about values of other stakeholders → support for negotiation and selection of commonly agreed alternatives
- Group ranking indicates about preferences about different stakeholders (objectives, agencies should be responsible for implementation)
- Development of a shared understanding of current flood risk & increased knowledge about system and options

Critical comments

- Almost no technical problems (despite data)
- Motivate SH and PUBLIC – important: technical partner and local champion
- Not clear who and how many will participate
- Different roles (researcher, moderation, organiser, evaluator)
- Organisation, infrastructure

- Future research (i.a.):
  - How can be the “cherry on the top” (CME) used in real processes with high no. of people
  - Only online process without face-to-face meeting



M. Evers, A. Jonoski, C. Maksimovic, L. Lange, S. Ochoa, A. Dinkneh, J. Cortés, A. Almoradie, S.J. van Andel, N. Simoes, L.P. Wang and C. Makropoulos (2012) **Collaborative modelling for active involvement of stakeholders in urban flood risk management**. *Natural Hazards and Earth System Sciences* (NHESS)

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