

Uncertainty on flood damage assessment

The challenges of assessing and combining hydraulic and vulnerability data

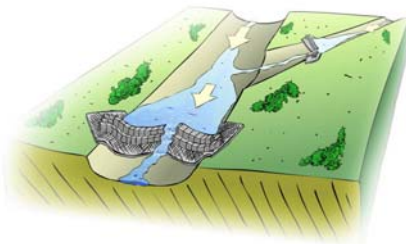
Julian ELEUTÉRIO

Flooding problems



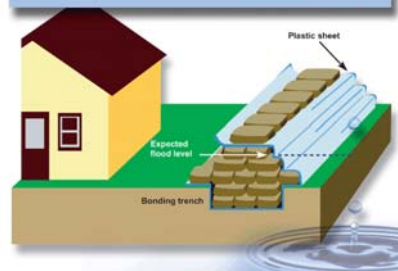
Source: <http://presentepravoce.wordpress.com/2008/07/06/salve-se-quem-puder/> (30 May 2009)

Solutions

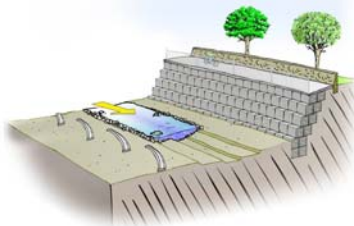


Source: www.alawaicana1project.net/ (01 June 2009)

Floodproofing – cross-section of a sandbag dyke



Source: <http://www.ec.gc.ca/water/> (30 May 2009)



Source: www.alawaicana1project.net/ (01 June 2009)

Basic approaches to floodproofing

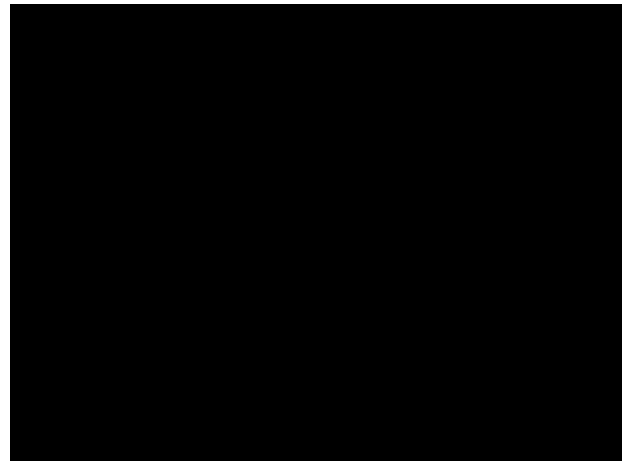


Source: <http://www.ec.gc.ca/water/> (30 May 2009)



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Introduction

- To evaluate flood damage potential is an essential step toward flood management.
- Cost-benefit analysis.
- Decision making process.
- Choice between different management alternatives.

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Plan

- Flood damage evaluation principals
- Uncertainty on the evaluation process:
Study case
- Results and perspectives

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FLOOD DAMAGE EVALUATION PRINCIPALS

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Flood risk

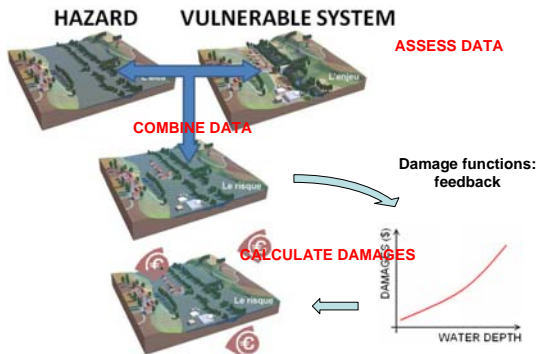
- Hazard
 - Hydrologic
 - Hydraulic
- Vulnerable system
 - Humans
 - Goods
 - Activities



Source: <http://www.prim.net> (01 June 2009)

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Flood damages evaluation



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STUDY CASE

UNCERTAINTY ON THE EVALUATION PROCESS

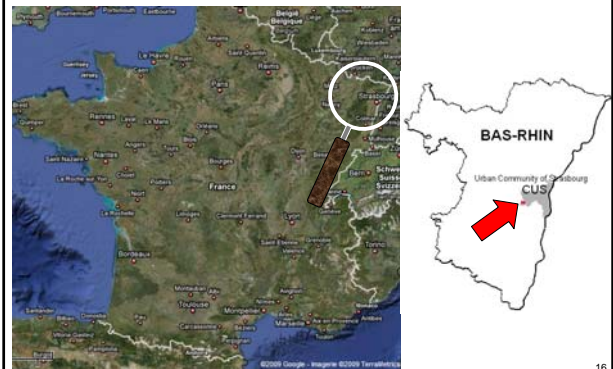
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Uncertainty sources

- Hazard modeling
 - Hydrologic (flood return period)
 - Hydraulic (topography, modeling hypothesis)
- Vulnerability assessment
 - Identification of assets vulnerability
 - Socio-economic aspects (like resilience)
- Data combination
- Damages calculation

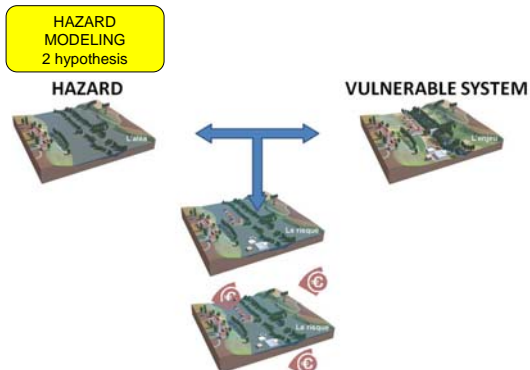
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Study area

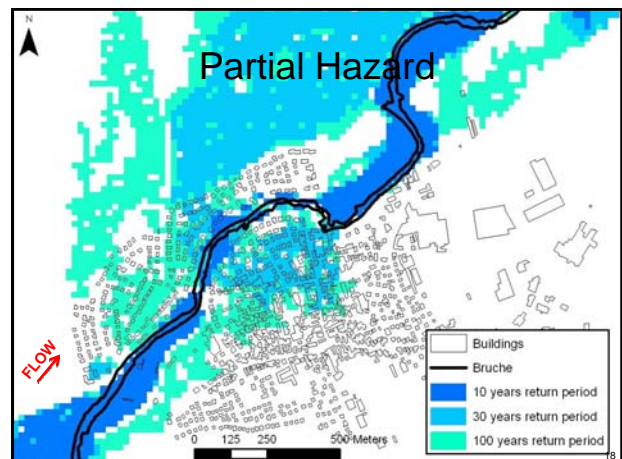


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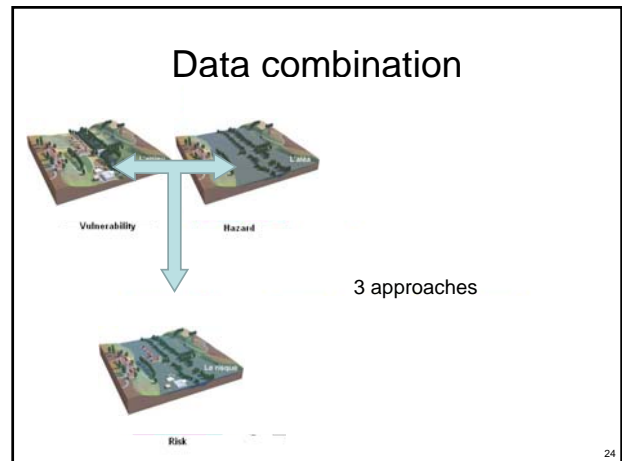
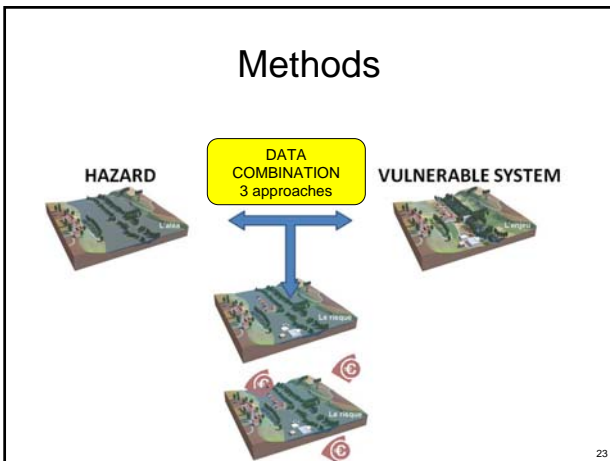
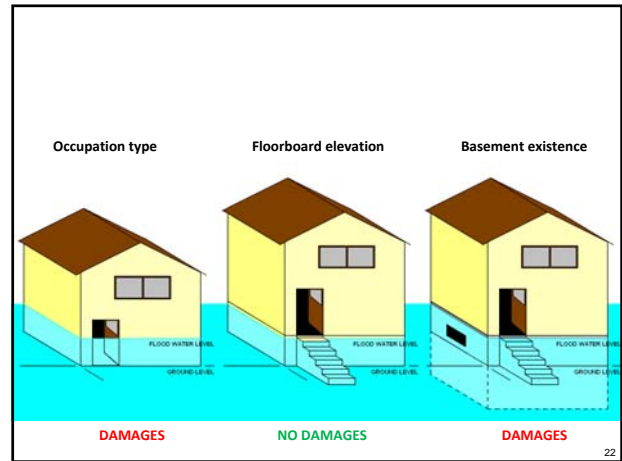
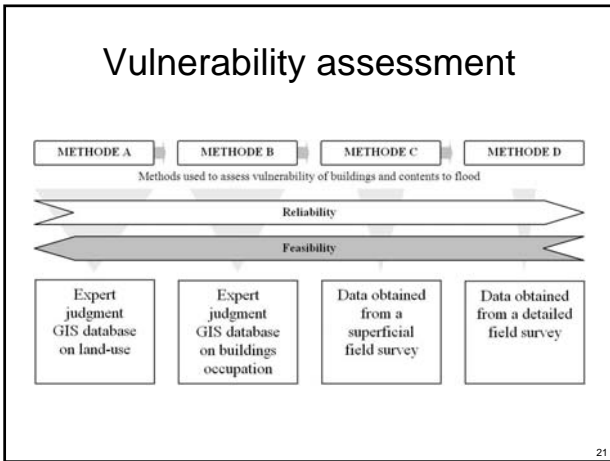
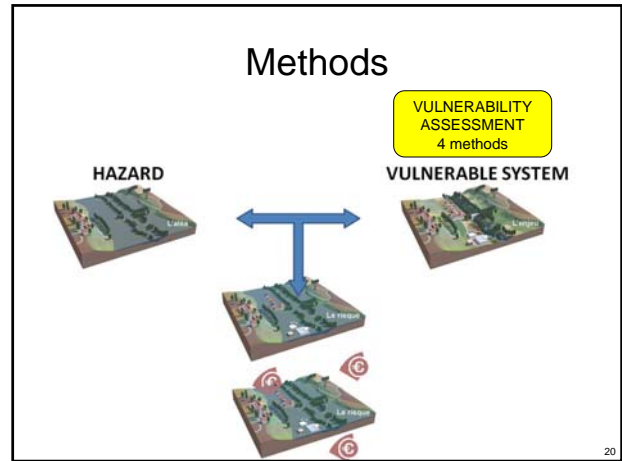
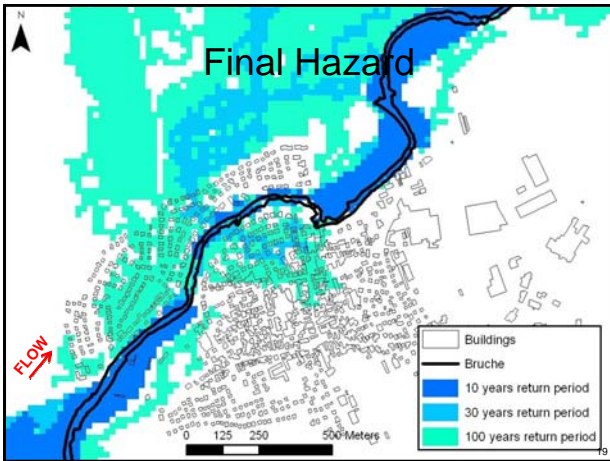
Methods

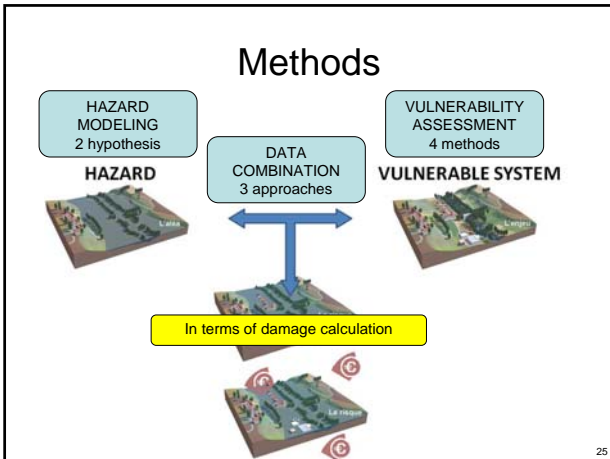


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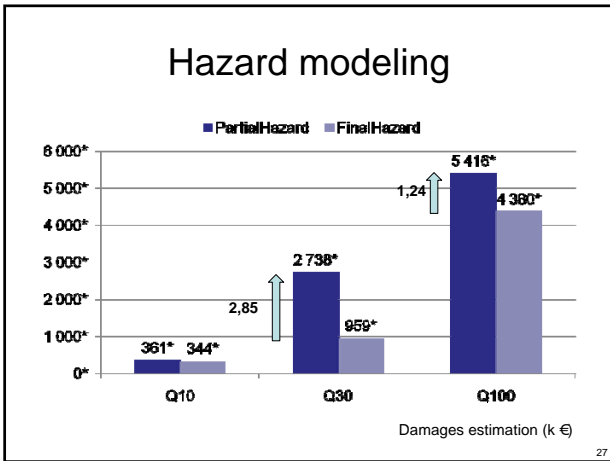




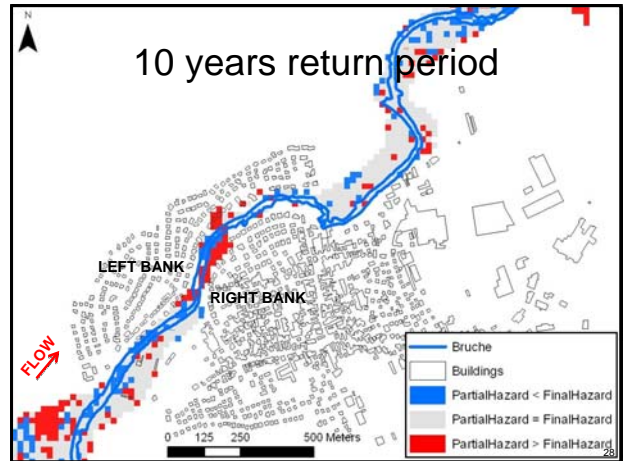
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RESULTS AND PERSPECTIVES

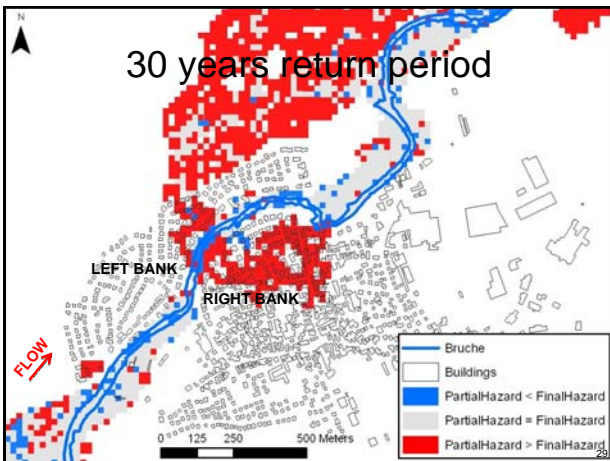
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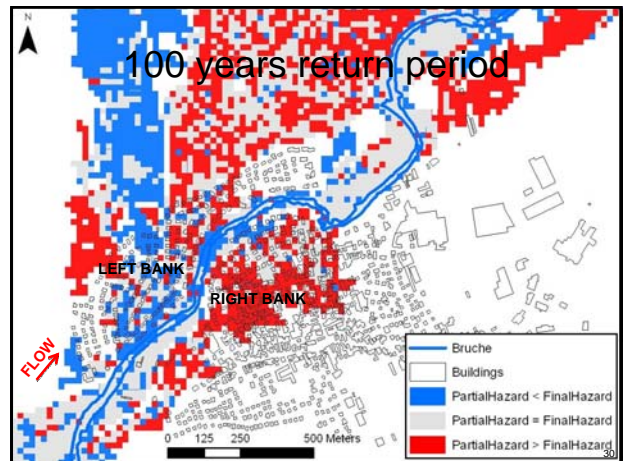
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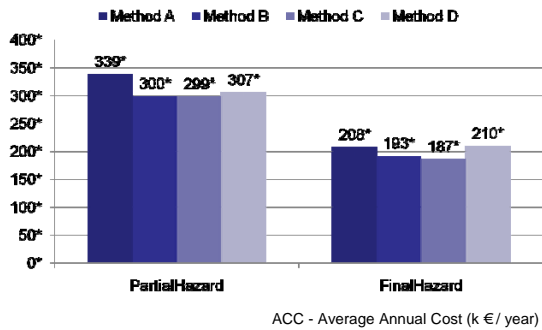


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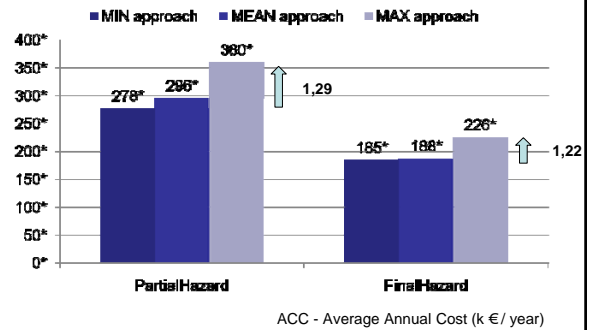
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Vulnerability assessment



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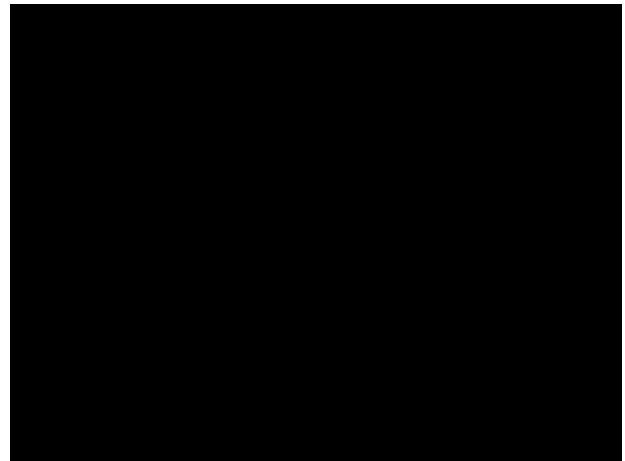
Data combination



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Perspectives

- To better study the relation between the evaluation reliability and feasibility.
- Specially concerning the hazard modeling step, which demands great investments.



**THAT'S ALL...
THANK YOU!**

Colmar (FR)?
Venice (IT)?
Vienna (AU)?
Blumenau (BR)?
Amsterdam (NL)?



Source: <http://www.prim.net> (01 June 2009)

Hazard determination

- 2 hydraulic modeling results are used:
 - PartialHazard modeling
 - Intermediary study results (2 years)
 - FinalHazard modeling
 - Final study results (3 years)

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Vulnerability assessment

- 4 methods are used to assess:
- Occupation characteristics
 - Type of occupation, activity, surface, location in the building...
- Constructive characteristics
 - Basement existence, ground floor elevation...