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CatchRisk

Alpine Space
Interreg III B

ti Repubblica e Cantone Ticino

Assessment and mitigation of natural hazards induced by heavy rainfall

The experience of the European Union Interreg III-B Project CatchRisk

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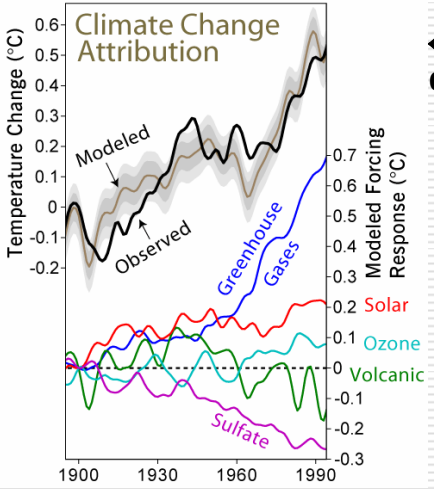
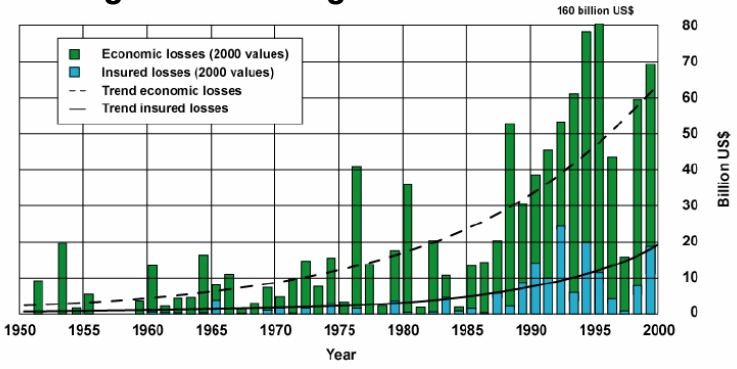
Heavy rainfall causes natural hazards

- Climate change
- Higher Temp. » More energy in the atmosphere » More rainfall
- More focalized, more radical weather phenomena
- Drought-flood succession
- Increased damage potential due to more intense use of territory/insured values



← Temperature increase due to greenhouse gases.



↑ Development of total/insured losses.

↑↑ Rockfall at Gotthard highway (2 lives, modest direct damage).
↑ Central Switzerland, 2005- 6 lives, 1.25 billion € damages.

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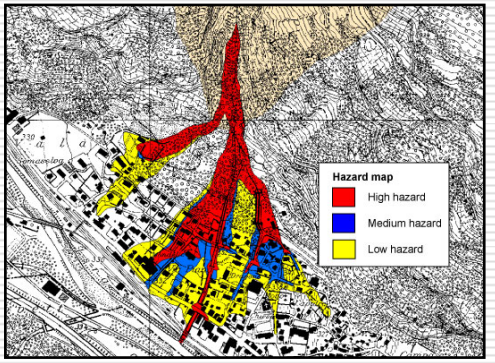
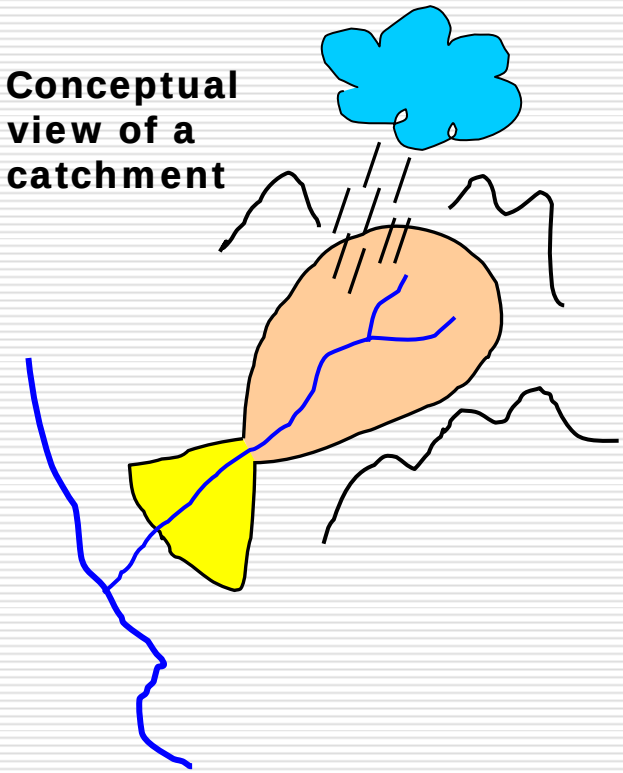
Project CatchRisk

- Hazard and risk assessment: Different realities in the Alpine space
- EU initiative Interreg III-B
- Hydrological **Catch**ment
  - Natural hazards **Risk**
- Protection - approaches
  - Do emergency planning
  - Protect objects at risk
  - Plan land use

Project CatchRisk



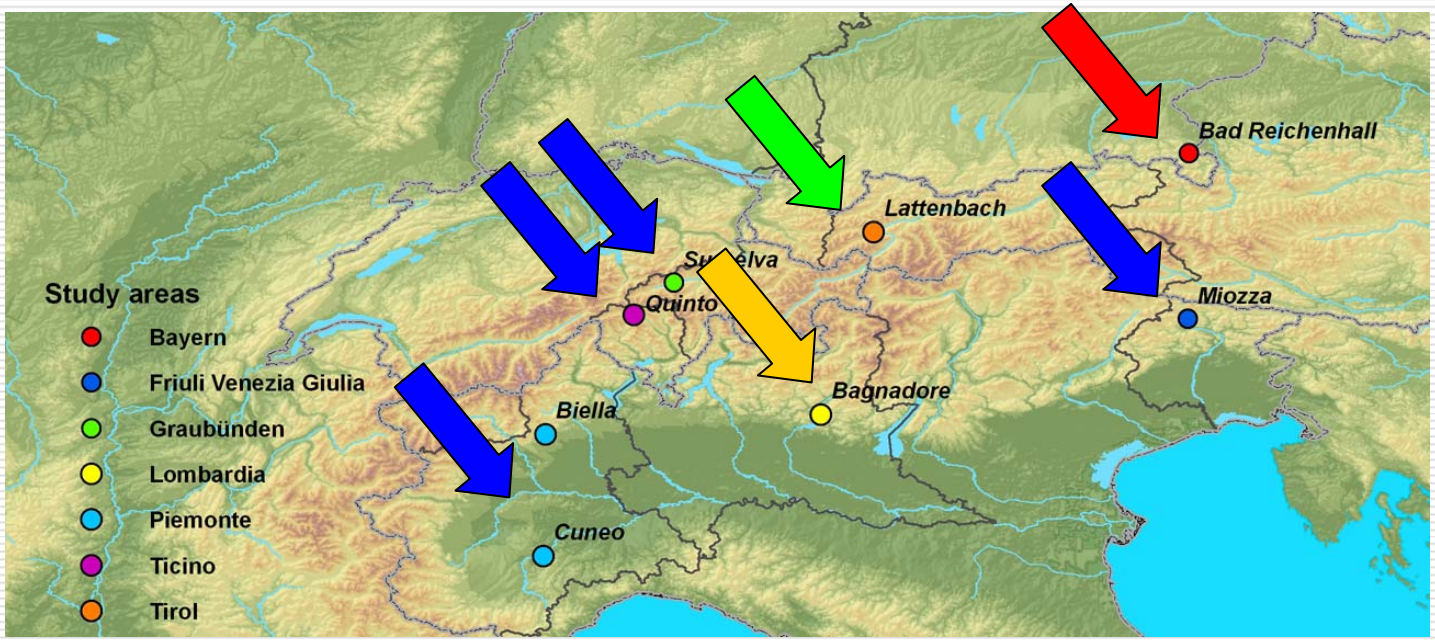
CatchRisk in short



Conceptual view of a catchment

- CatchRisk: Heavy rainfall causes natural hazards in alpine valleys
- Rockfalls, superficial landslides, debris flows, flooding
- Exchange/develop tools for hazard/risk assessment
- 2.6 milion €uro, 2002-2005
- 11 European regions from Germany, Austria, Switzerland, Italy
- Different workpackages
  - WP1: Data organisation
  - WP2: Processes within catchment
  - WP3: Debris flows on the alluvial fan
  - WP4: Flooding
  - WP5: Reporting

CatchRisk – WP2: Processes within catchment



Rockfall modeling

Superficial landslide modeling

Study erosion potential

Debris flow alert system

► **7 partners - 4 nations - 4 topics - 2 languages**

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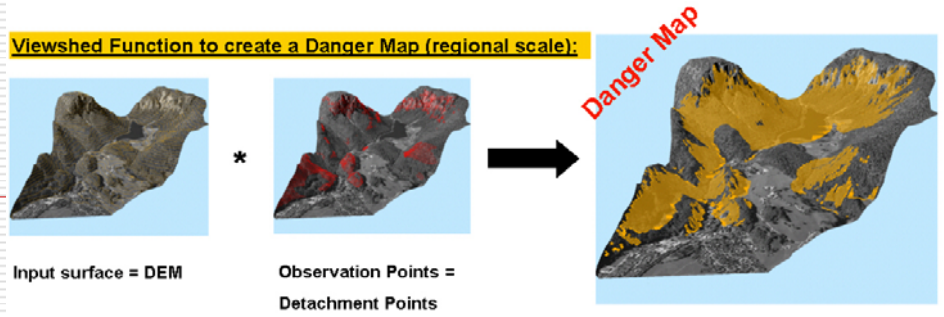
CatchRisk - Rockfalls

Get areas prone to rockfall

- Empirical analysis: maximum reach of rockfalls
- Database: starting points
- Modelled in GIS (cone)
- Areas prone to rockfall hazard
- Compared to physically based 3D model:

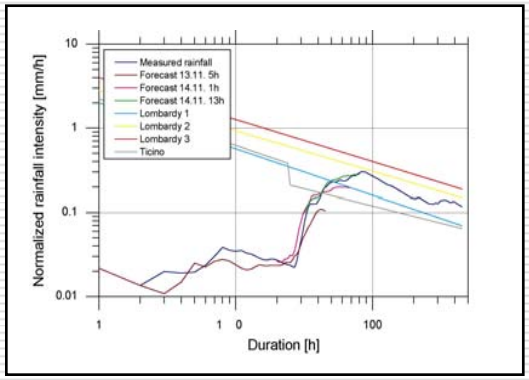
  Match in 80 %

Rockfall deposit

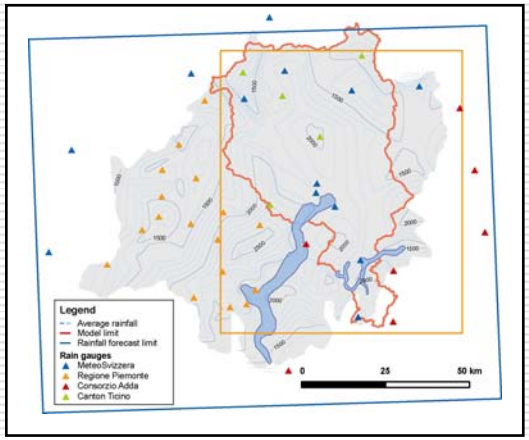


CatchRisk – Rainfall induced soil slips

When is the situation getting critical?



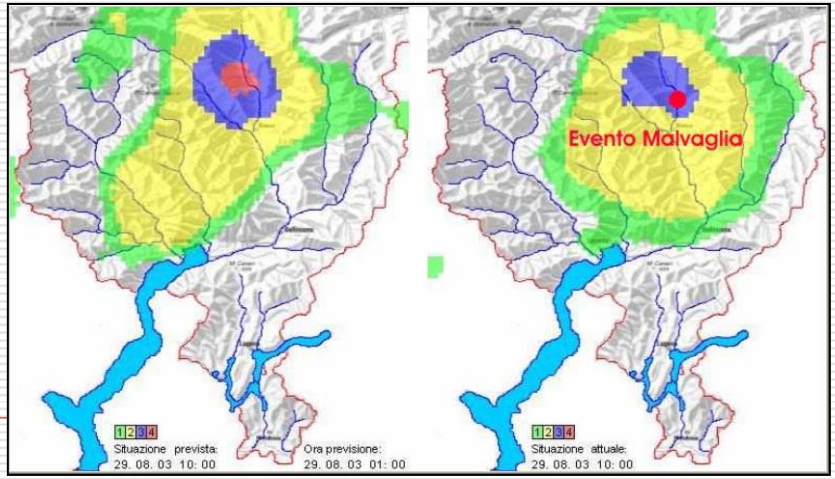
Triggering levels (magnitude)



Model spans the catchment of Ticino river

Empirical model, input

- Triggering levels
- Rain gauges
  - ➔ Current situation
- Weather forecast
  - ➔ Forecasting tool



Snapshot of model output: forecast and reality

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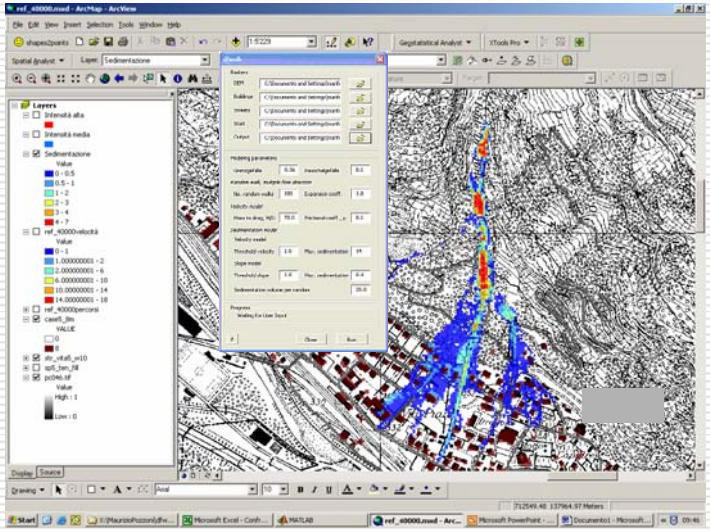
CatchRisk – Debris flows

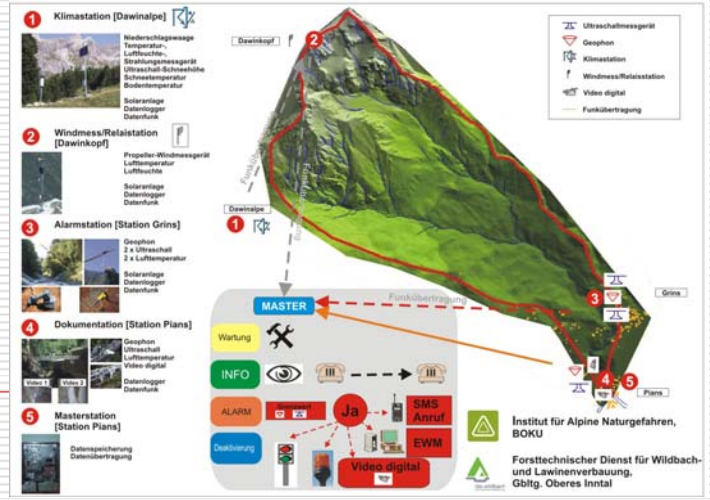
Reduce debris flow risk

- Hazard and risk assessment at the municipality level
- Which area is at risk at what magnitude?
  - Assessment by modeling
- Debris flow monitoring/alert system installed

Debris flow modeling for hazard zoning



Debris flow monitoring/ alert system



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CatchRisk

Outputs

- Experiences, methods exchanged among participants
- Scientific report
- Guidelines for users

Conclusions

- Project needs defined by the basis
- Exchange know-how and experience
- Learn from each other
- Scientists are consultants to decision makers
- Get the right tools and procedures!
- Be prepared – the next natural hazard event is around the corner!
- International projects are not occupational therapies for scientists – they must deliver usable results!

Two volumes: scientific report and guidelines