

RiskChanges - An Open Source Tool for Multi-Hazard Risk Assessment and Decision Making

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With inputs from

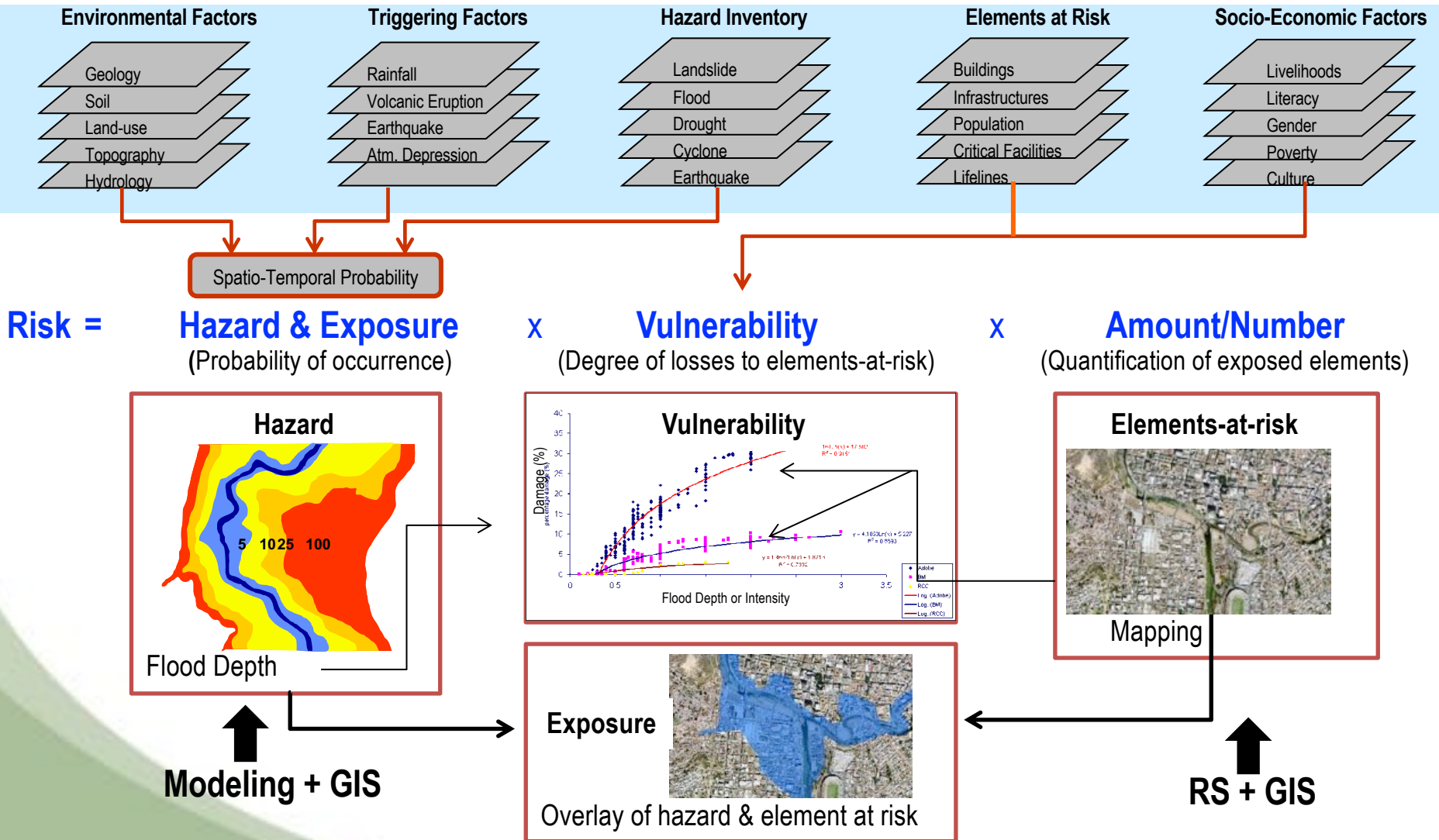
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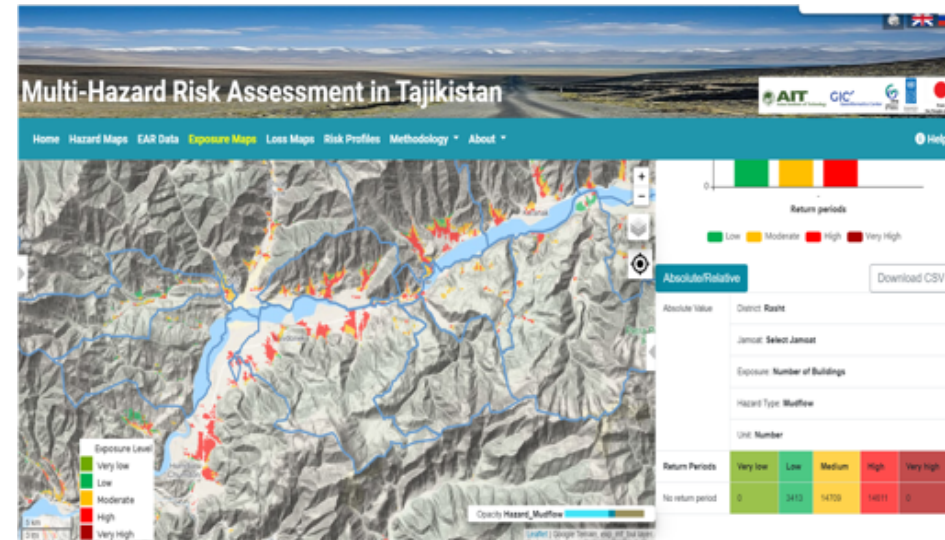
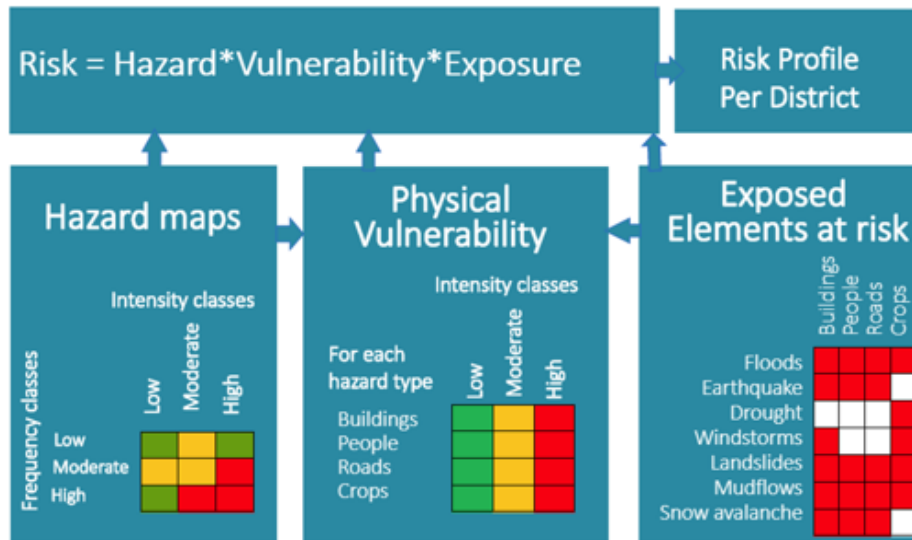


Spatial Representation of Multi-Hazard Risk



Multi-Hazard Risk Portal - Tajikistan

<http://tajirisk.ait.ac.th/>



Portal

- Risk profiles per administrative unit
- Querying hazard, exposure, loss and risk information

Further Requirements

- A risk assessment tool is required in-house;
- Data updating at local level;
- Future risk scenarios

Motivation for Developing RiskChanges

Short-comings in existing risk assessment tools:

- Non-availability of a true multi-hazard risk assessment software in opensource;
- Often too complex and data intensive;
- Many of them are country or region specific;
- Often lacking multi-hazard interactions;
- Often lacking future scenarios and risk reduction alternatives.

Examples:

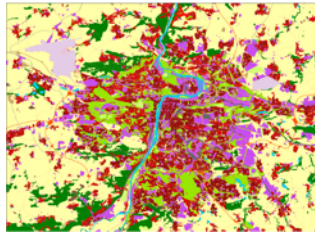


Workflow in RiskChanges



Data Input:

- Hazard Maps
- Elements at risk Maps
- Vulnerability Curves



Exposure Analysis



Loss Analysis



Risk Analysis

- Annual Average Loss (AAL)

Elements-at-Risk Module

Element at Risk

You are active in the project Tajikistan Loss calculation. If you want to switch the project, go back to organization dashboard and choose another project. x

File upload OGC service Database connection

Choose or drag the zipped Shapefile that represents the Layer...

Browse

Name *

Enter layer name...

Type *

Select ear type

Year of representation

2020

Risk reduction alternative

Current situation (A0)

Future scenario

Current situation (S0)

Cancel

Submit

Help

Ducimus aut unde enim Harum
reiciendis sapiente dolores maiores
animi voluptates similique ratione
cupiditate. Lorem ipsum dolor, sit amet
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Elements-at-Risk Module

Points

- Critical facilities.

Lines

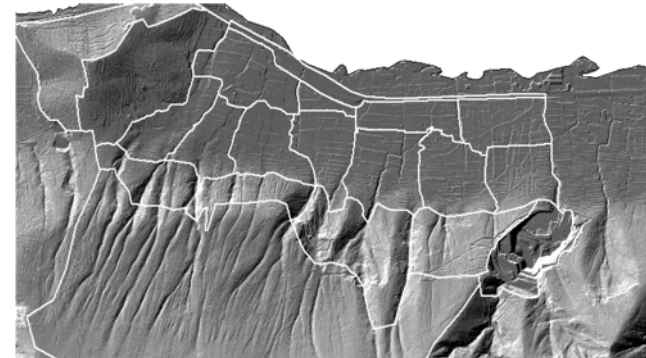
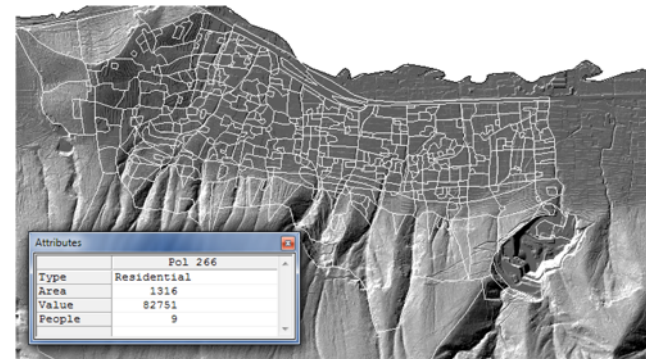
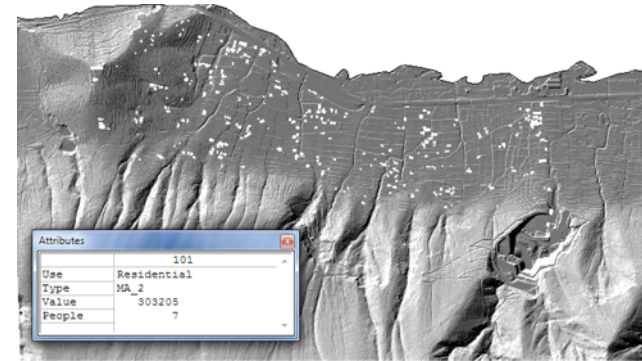
- Roads, utility lines (electricity, water etc.)

Building footprints

- Government, residential, commercial etc.

Land parcels

- Urban, agriculture, forest etc.



Hazard Module

You are active in the project Tajikistan Loss calculation. If you want to switch the project, go back to organization dashboard and choose another project. ×

File upload

OGC service

Database connection

Choose or drag the GeoTIFF that represents the Layer...

Browse

Name

Enter name of hazard...

Type

Select hazard type

Intensity

Select hazard intensity

Unit

Select hazard intensity unit

Risk reduction alternative

Current situation (A0)

Future scenario

Current situation (S0)

Representation year (future or current year)

2020

Return period (years)

Average:

Min:

Max:

Unknown

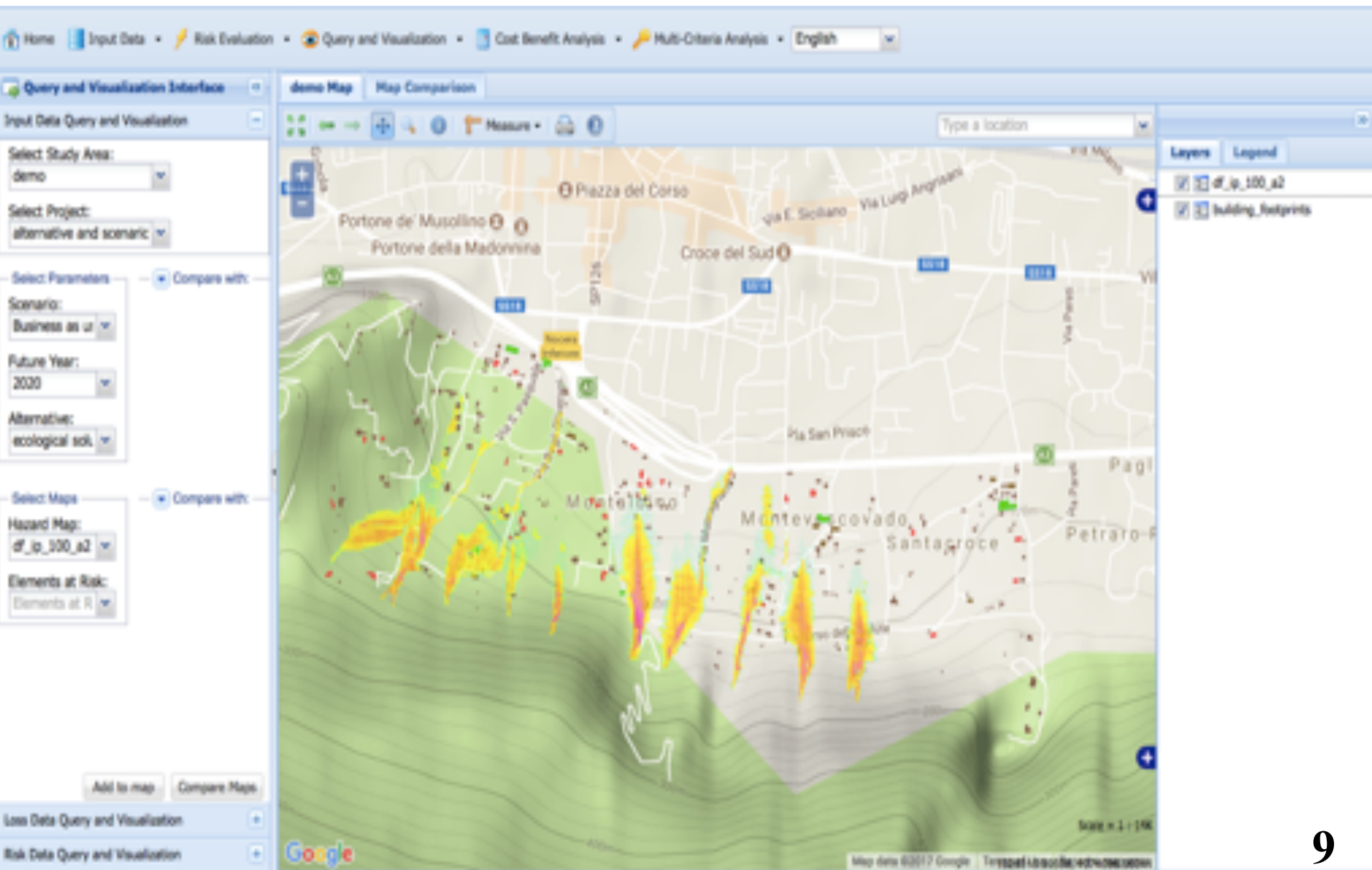
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Unknown

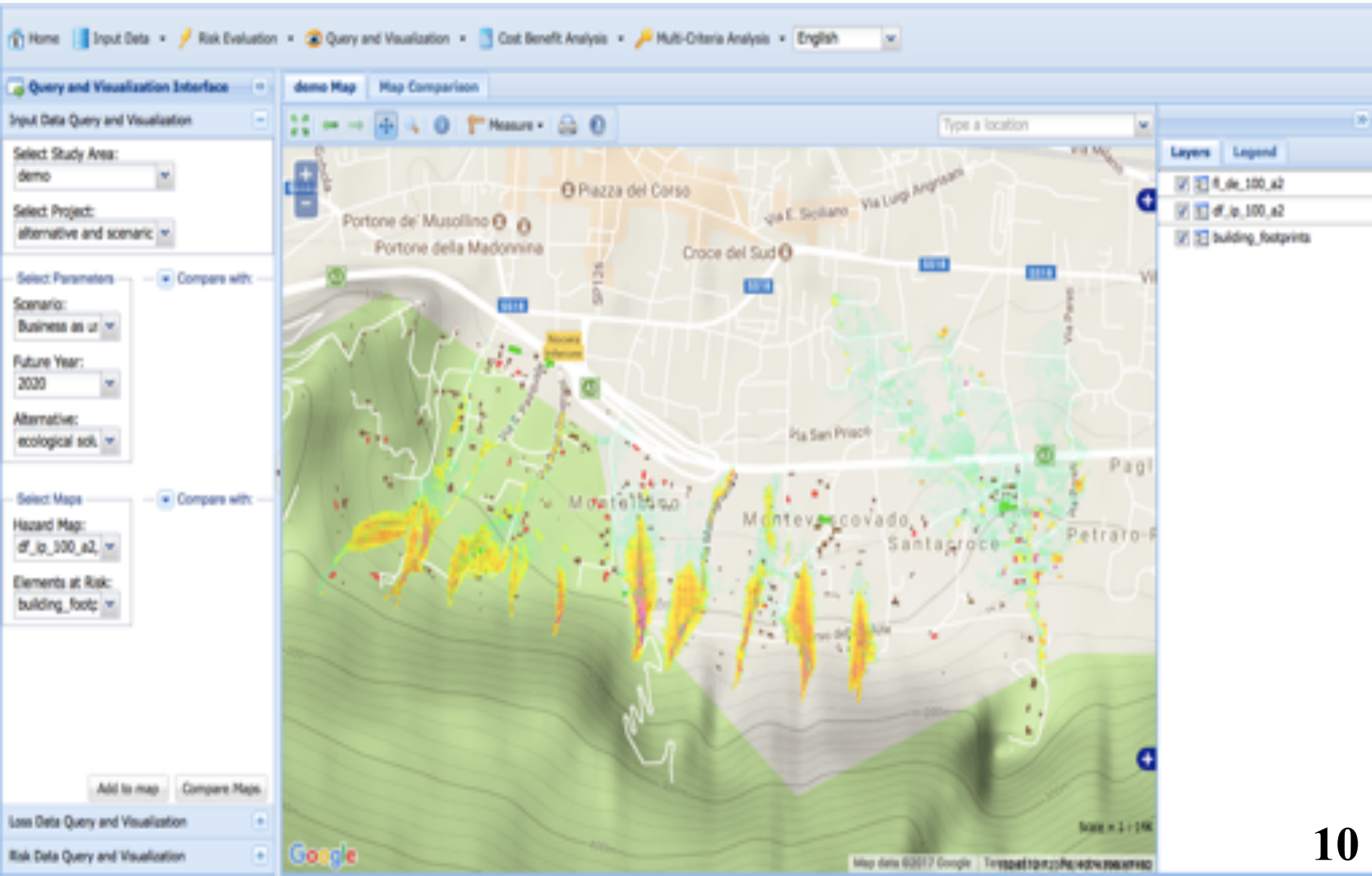
Cancel

Submit

Hazard Module - Debris Flow



Hazard Module - Debris Flow and Flood



Vulnerability Module

Vulnerability name

Test

Vulnerability type

Physical

Hazard type

Select hazard type

Intensity type

Select hazard intensity

EAR type

Building footprints

EAR class

Building footprints

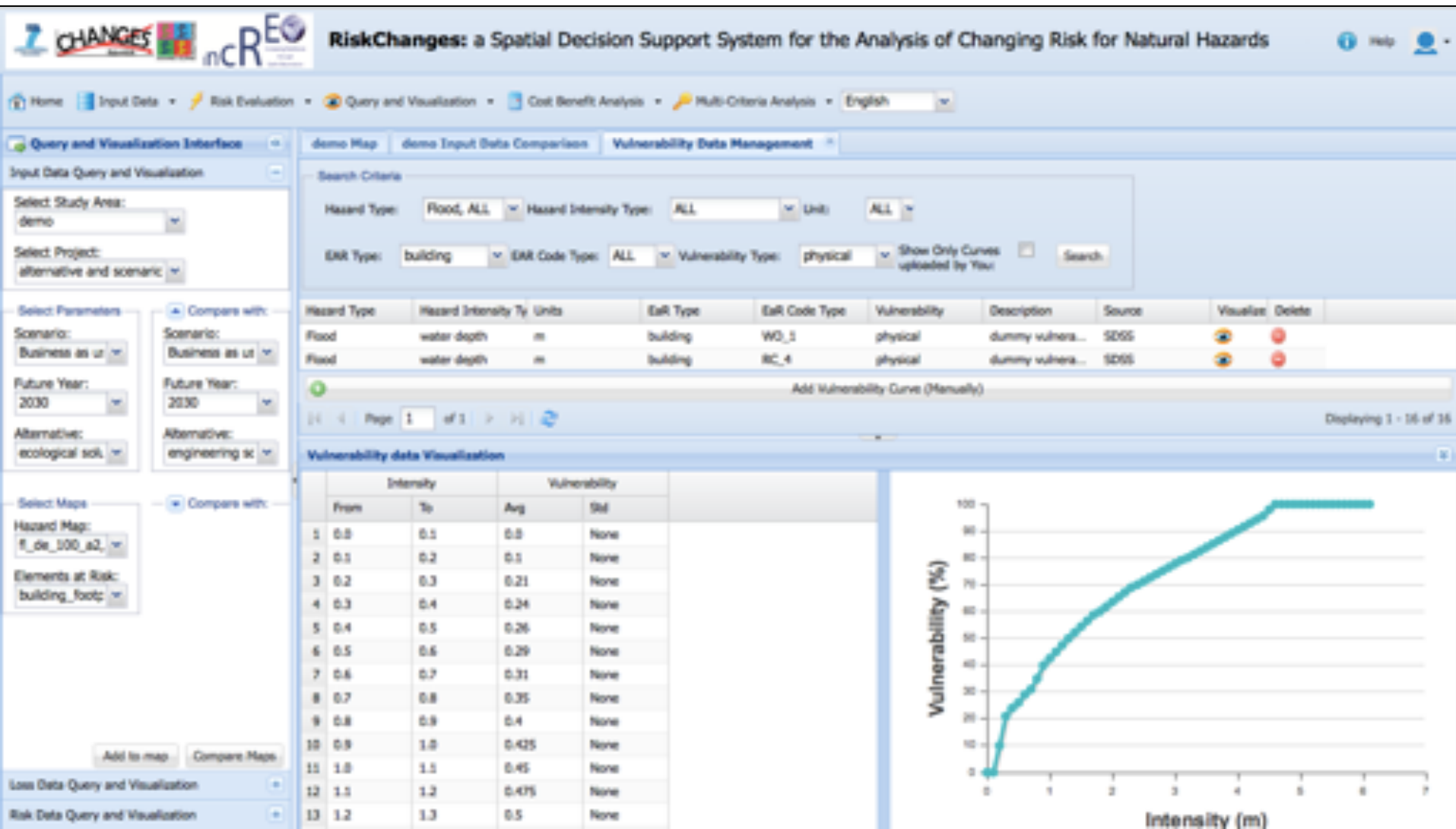
Upload csv file of vulnerability...

Browse

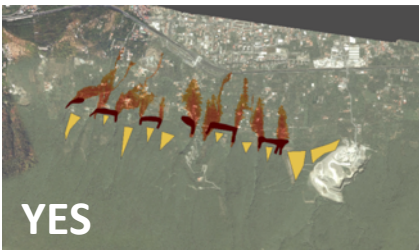
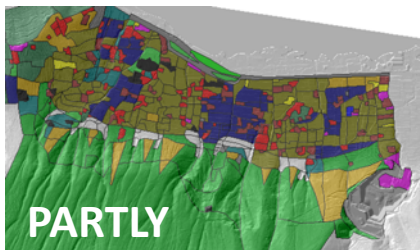
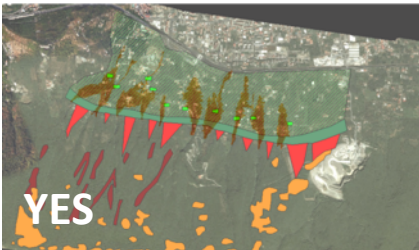
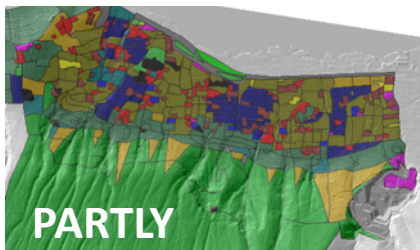

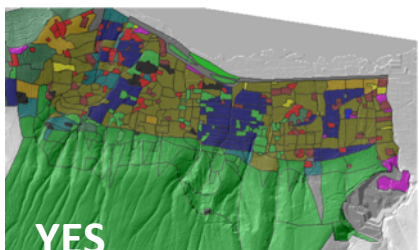
Cancel

More >>

Vulnerability Module - Vulnerability Curves



Risk Assessment and Risk Reduction Alternatives

Alternatives	Measures	Hazard changes	Risk changes
Alternative 1: Engineering solutions	<u>Engineering measures for:</u> <ul style="list-style-type: none"> · Slope stabilization (Reinforcements) · Flood risk reduction (Embankments, storage tanks) 	 <p>YES</p>	 <p>PARTLY</p>
Alternative 2: Ecological solutions	<u>Ecological measures for:</u> <ul style="list-style-type: none"> · Slope stabilization (plantation) · Water harvesting structures 	 <p>YES</p>	 <p>PARTLY</p>
Alternative 3: Relocation	<ul style="list-style-type: none"> · Compensation, environmental and social safeguards etc. 	 <p>NO</p>	 <p>YES</p>

Conclusions

- Multi-hazard risk assessment is the first and foremost requirement for identifying and prioritizing for risk reduction efforts;
- Existing risk assessment tools have limitations in terms of availability, useability, and complexity;
- RiskChanges is expected to address these issues and provide an opportunity for risk-informed planning and development.

Thank you for your kind attention