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

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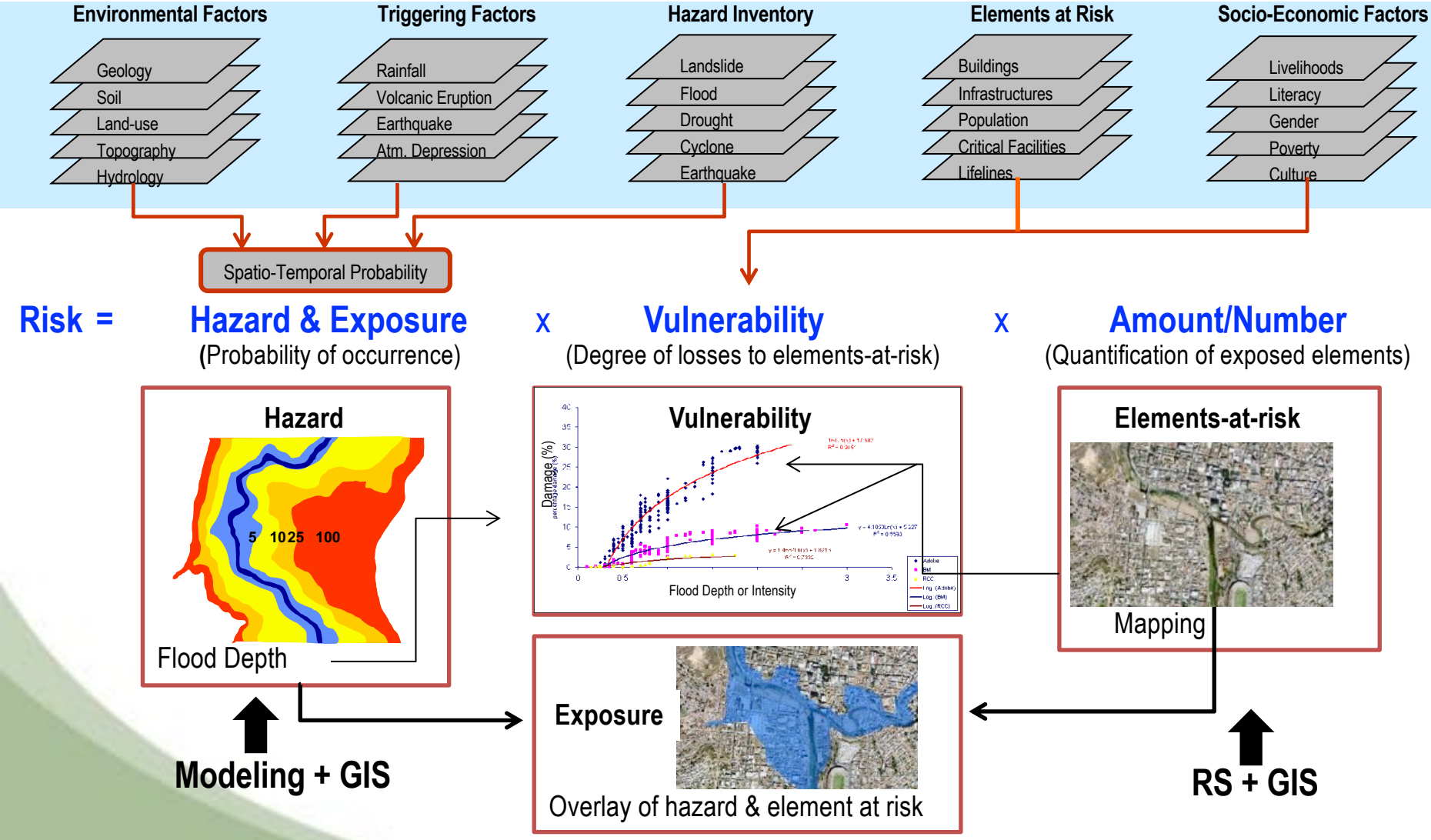
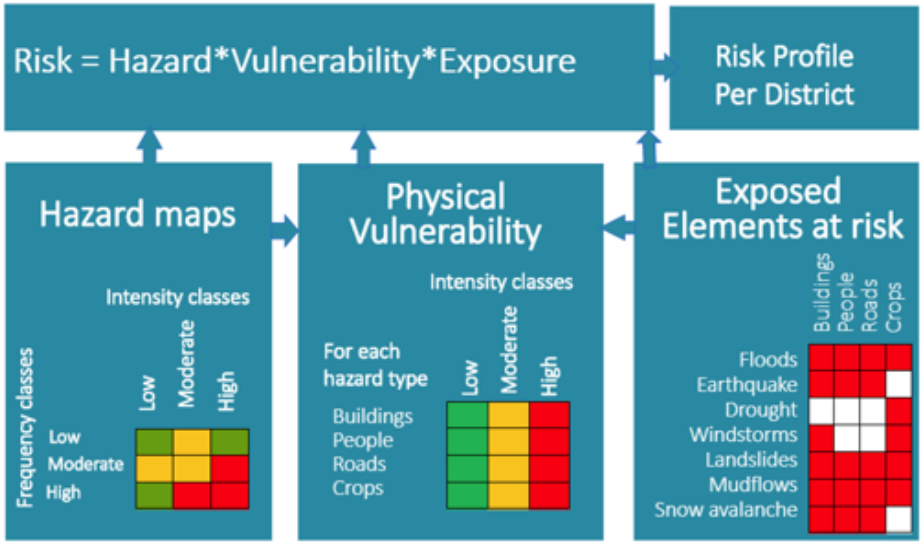
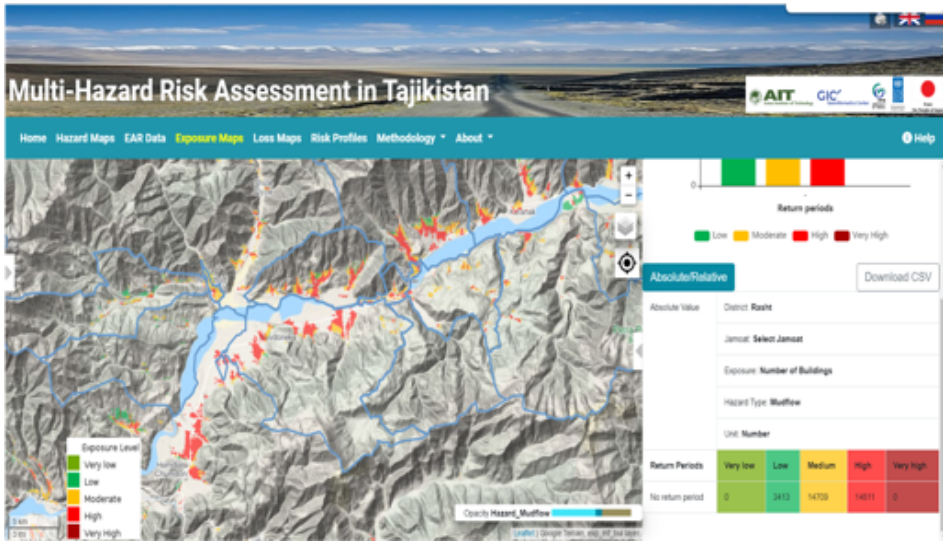
Spatial Representation of Multi-Hazard Risk



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:

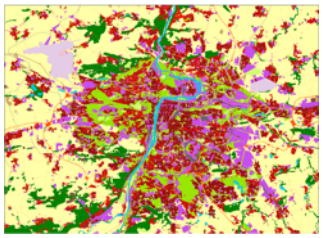
InaSAFE

RiskScape

OPENQUAKE
calculate share explore

CAPRA
Probabilistic Risk Assessment Platform

Workflow in RiskChanges



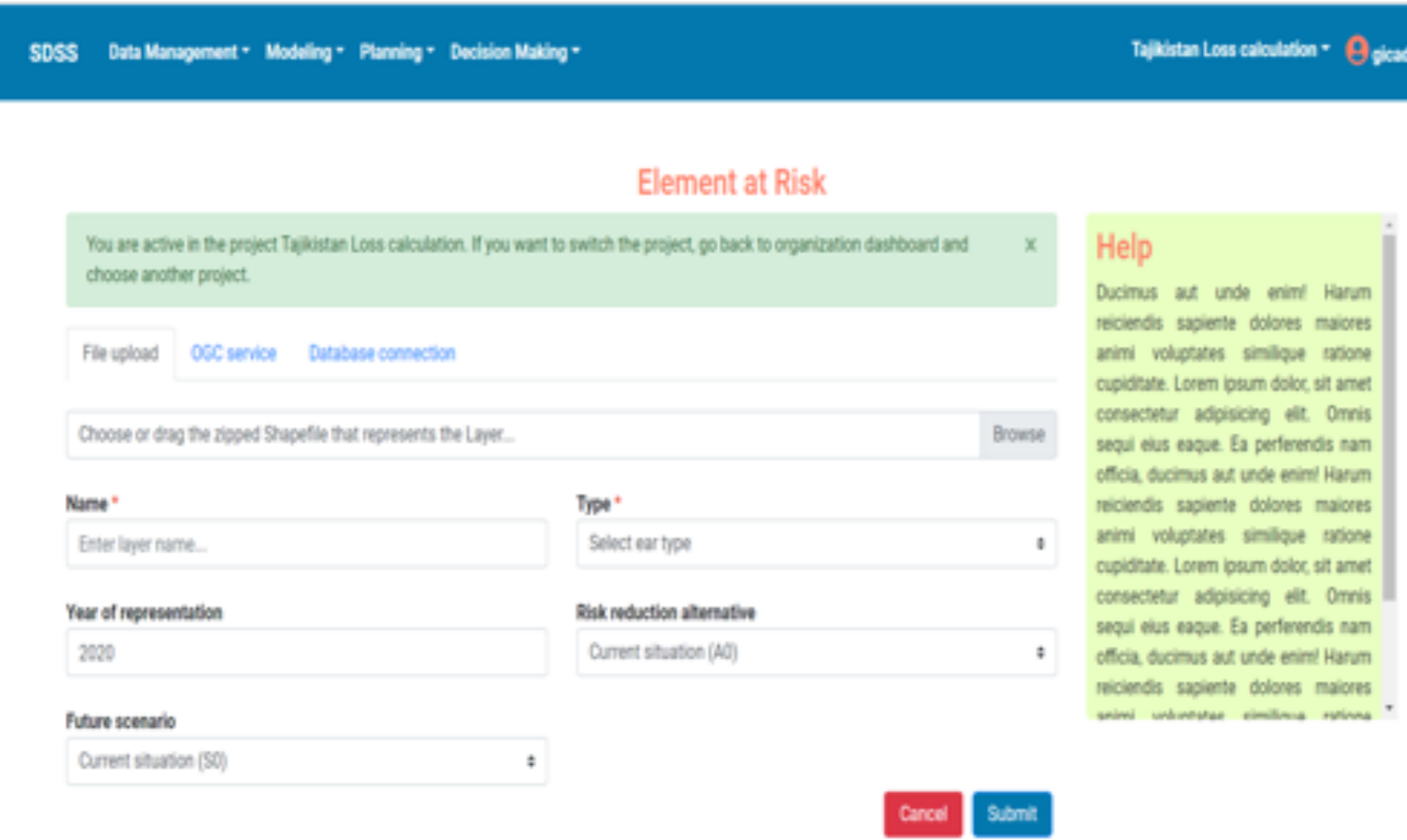
Data Input:
- Hazard Maps
- Elements at risk Maps
- Vulnerability Curves

Exposure Analysis

Loss Analysis

Risk Analysis
- Annual Average Loss (AAL)

Elements-at-Risk Module



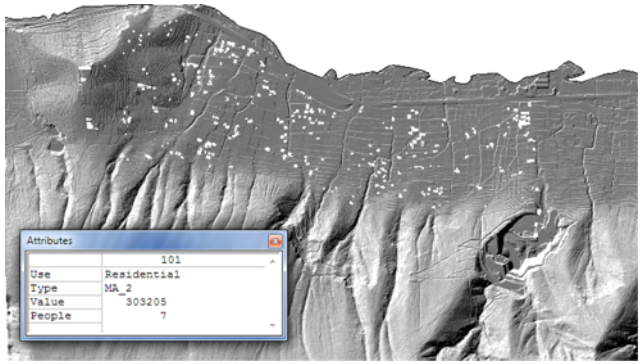
Elements-at-Risk Module

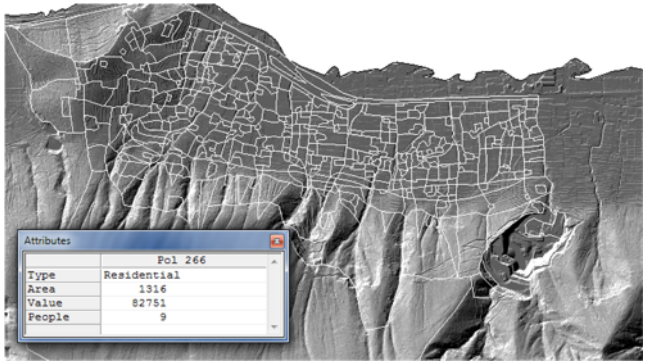
Points
- Critical facilities.

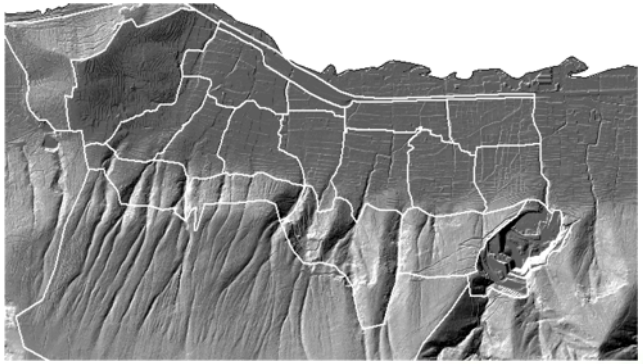
Lines
- Roads, utility lines (electricity, water etc.)

Building footprints
- Government, residential, commercial etc.

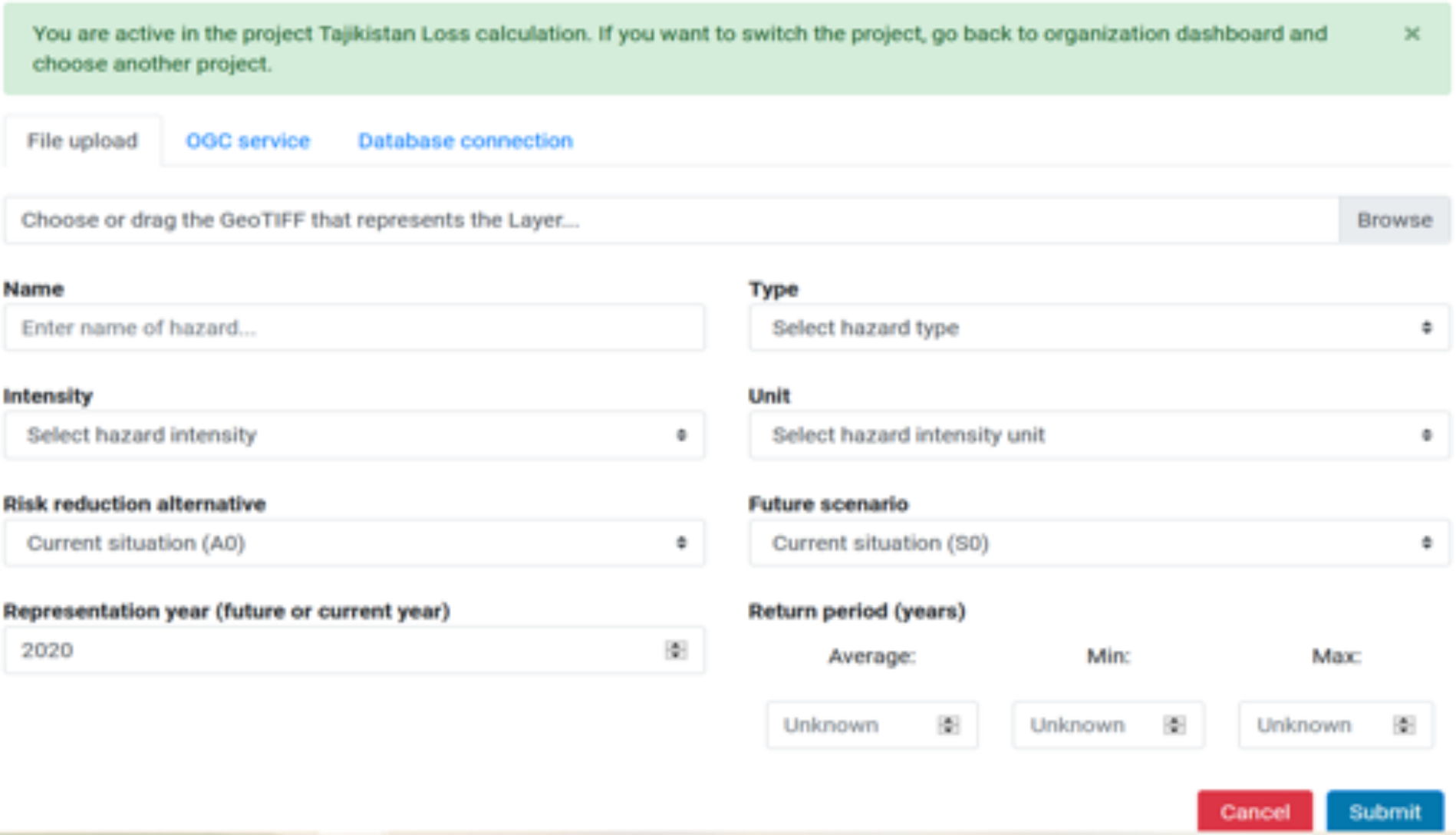
Land parcels
- Urban, agriculture, forest etc.



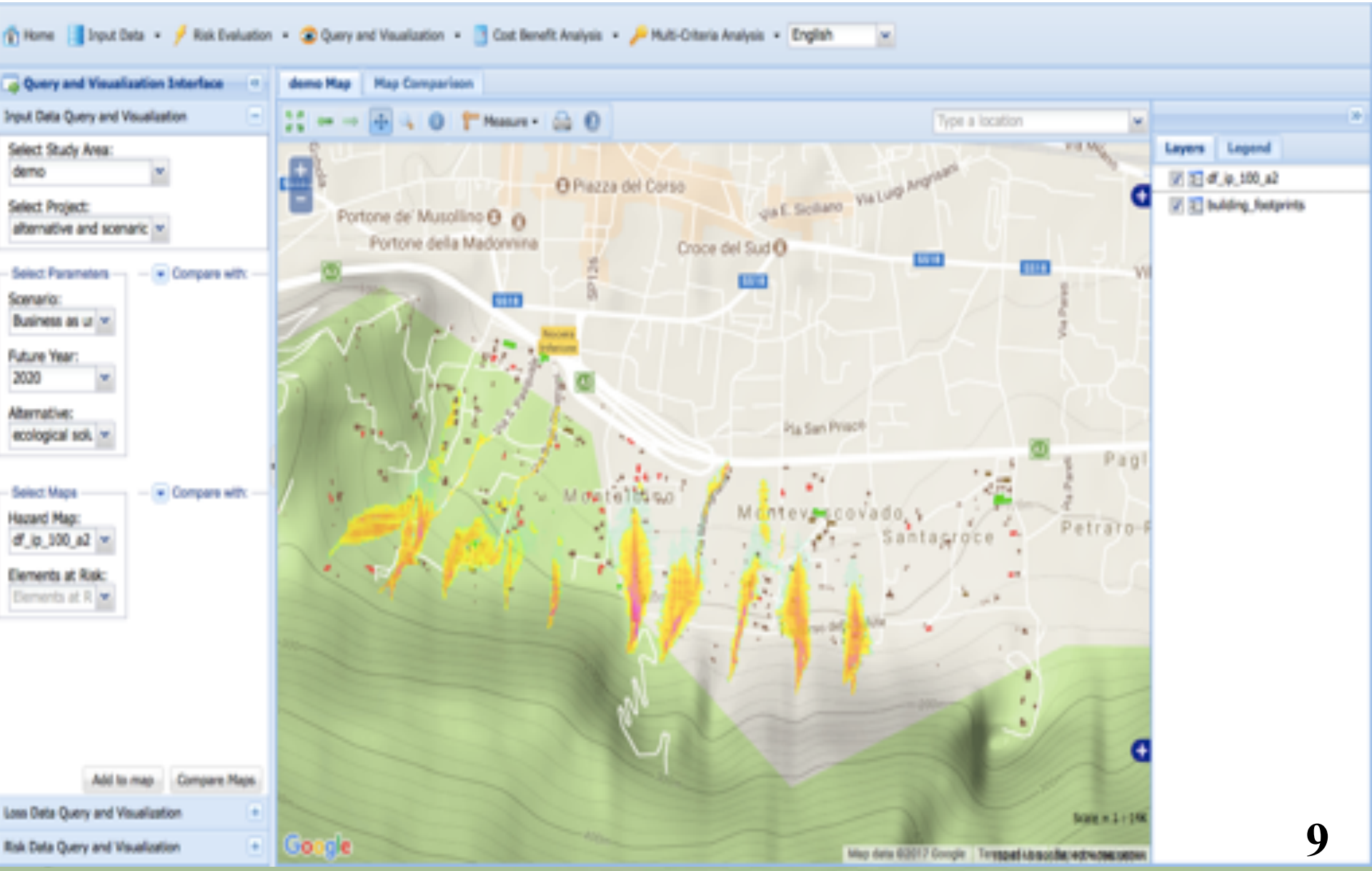




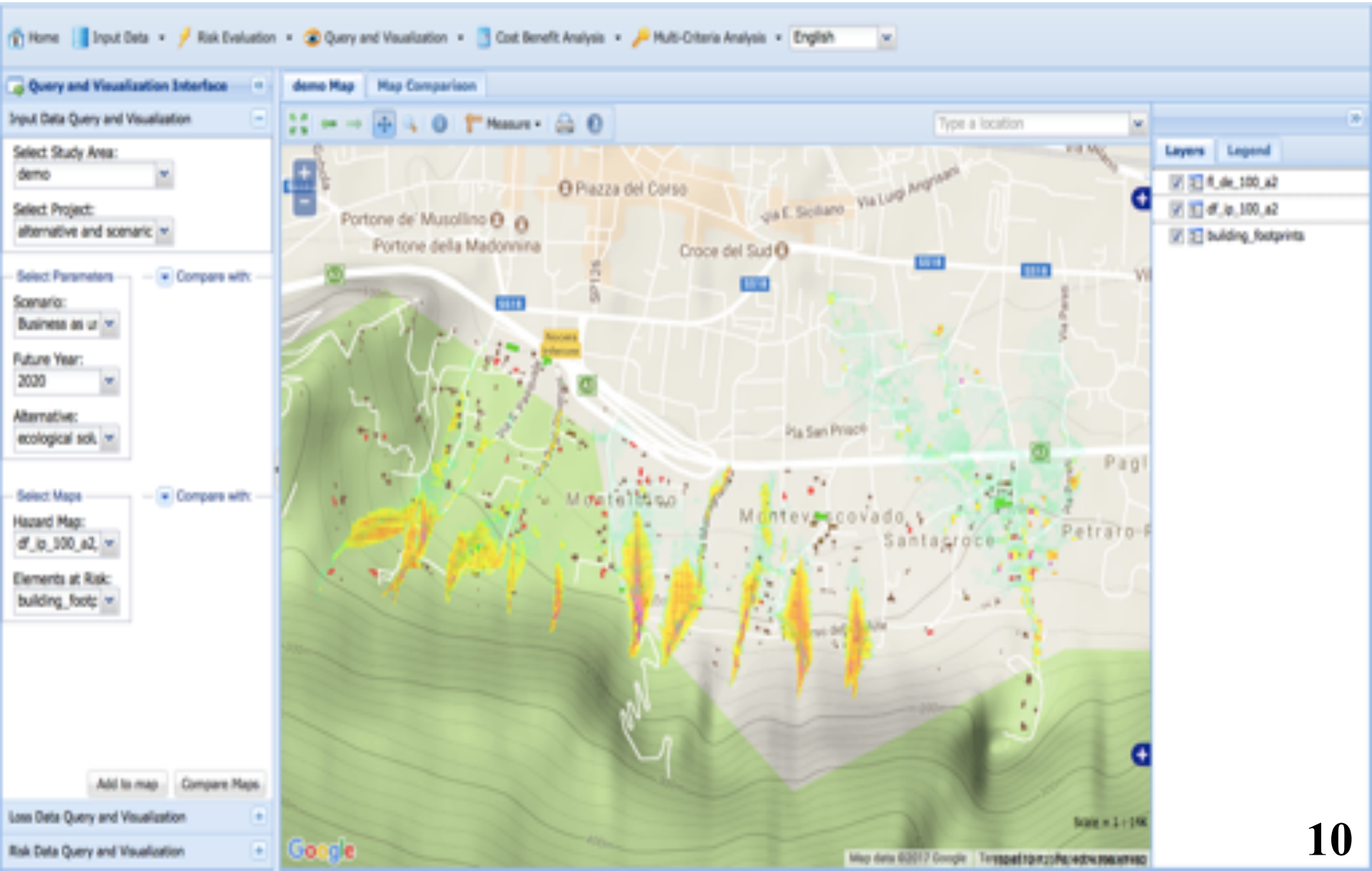
Hazard Module



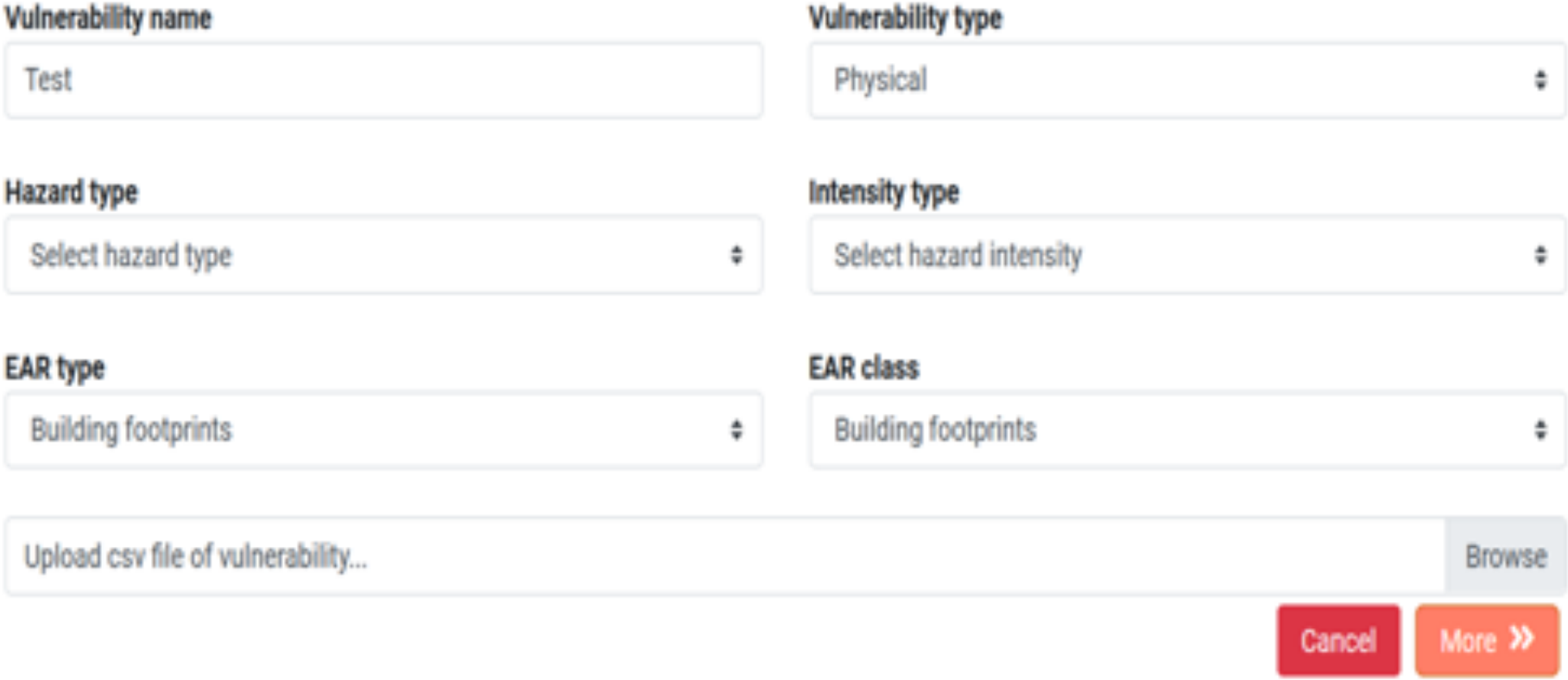
Hazard Module - Debris Flow



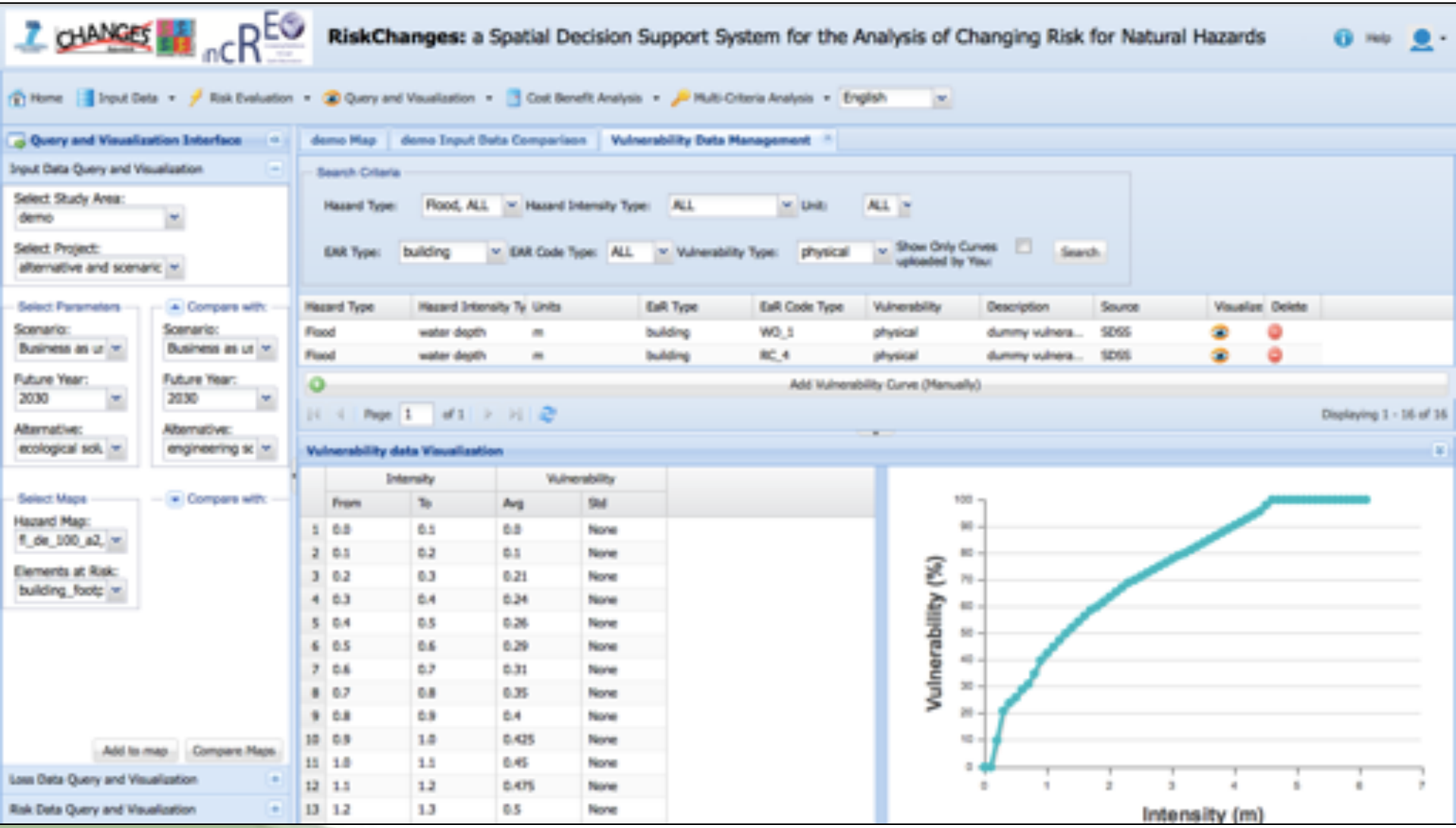
Hazard Module - Debris Flow and Flood



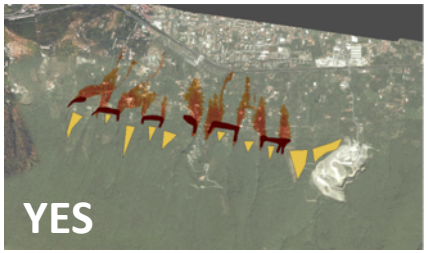
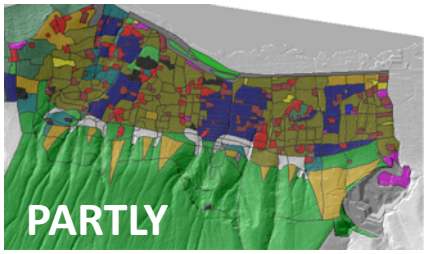
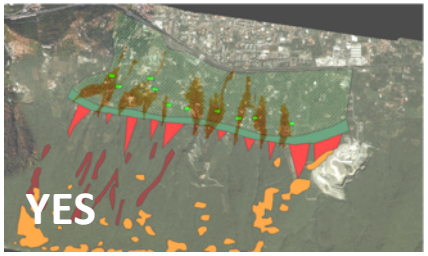
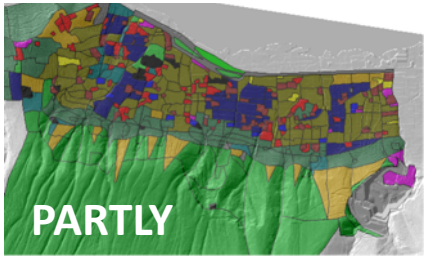
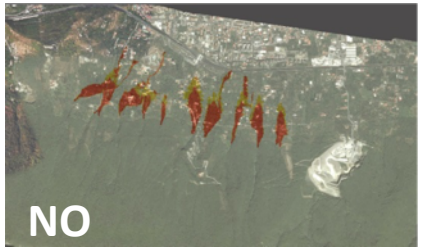
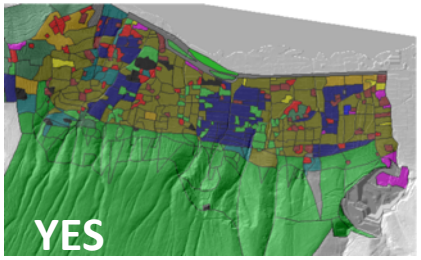
Vulnerability Module



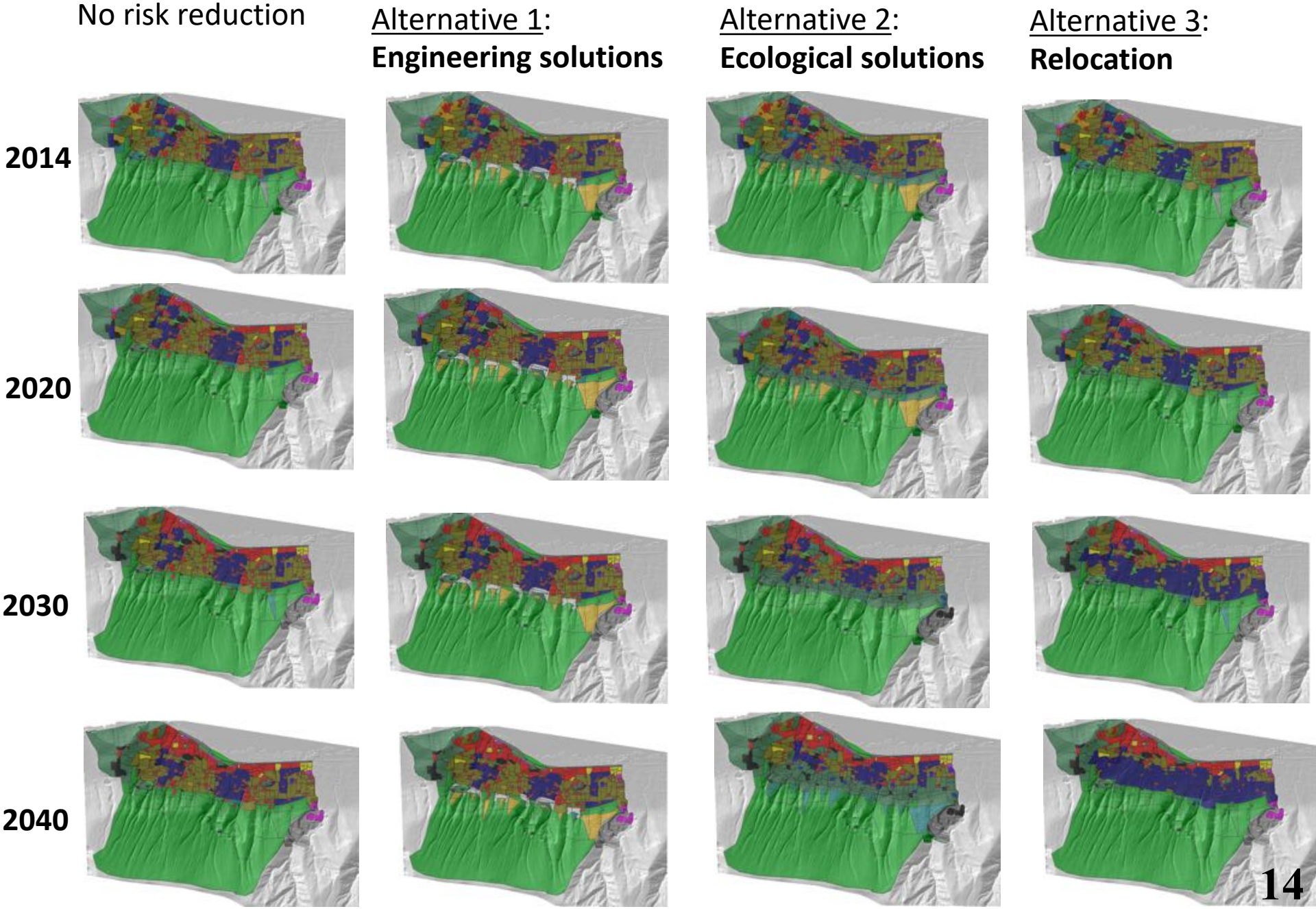
Vulnerability Module - Vulnerability Curves



Risk Assessment and Risk Reduction Alternatives

Alternatives	Measures	Hazard changes	Risk changes
Alternative 1: **Engineering solutions**	Engineering measures for: · Slope stabilization (Reinforcements) · Flood risk reduction (Embankments, storage tanks)		
Alternative 2: **Ecological solutions**	· Ecological measures for: · Slope stabilization (plantation) · Water harvesting structures		
Alternative 3: **Relocation**	· Compensation, environmental and social safeguards etc.		

Decision Making – Risk Informed Planning



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