



LAUNCH OF THE GLOBAL MODEL FOR EARTHQUAKE
**SOCIAL VULNERABILITY AND
RESILIENCE (SVR)**

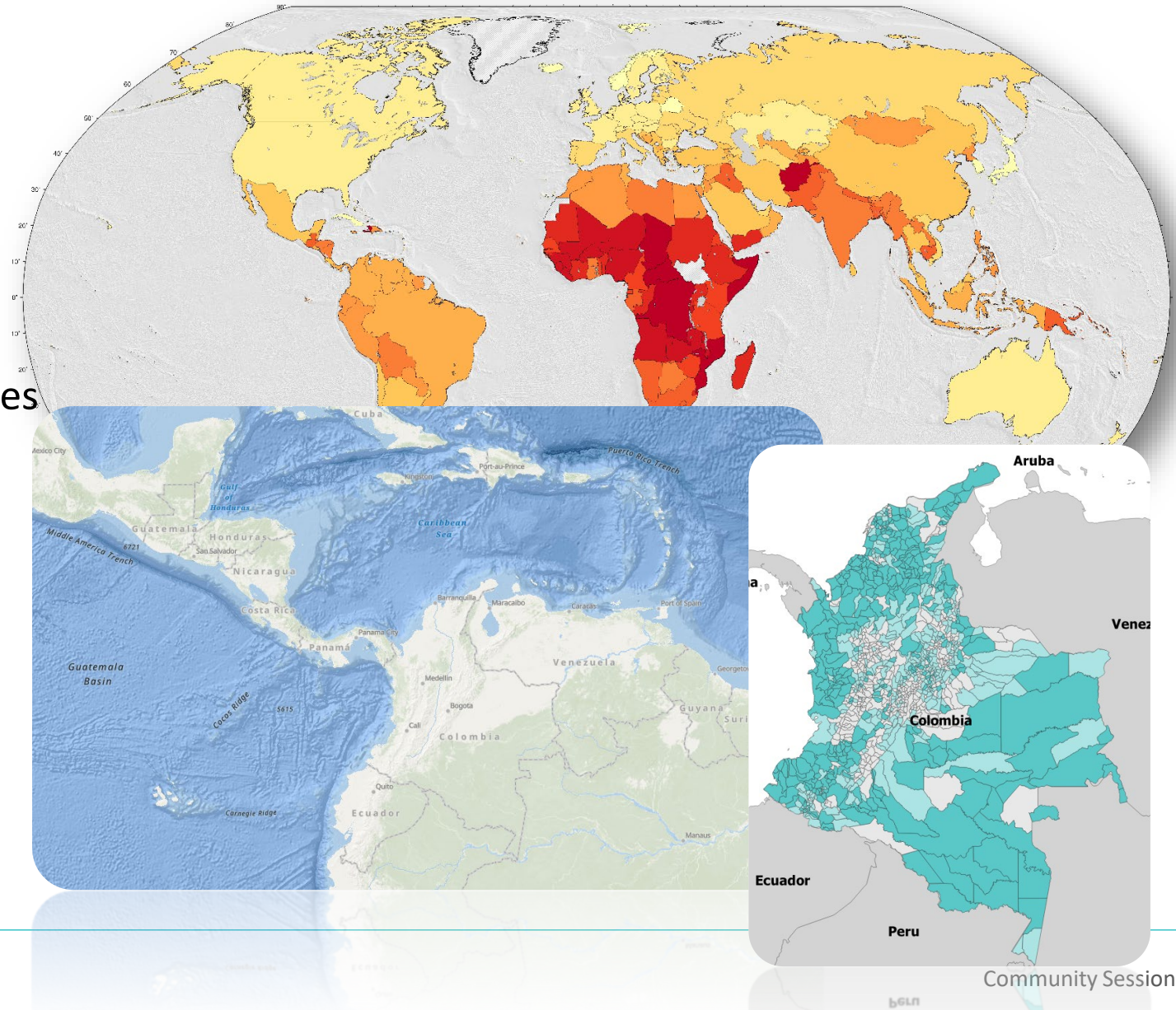


**Social Vulnerability and Resilience (SVR)
Colombia Downscale model
Miguel Toquica, GEM Foundation
Dr. Christopher G. Burton, University of Connecticut**



Social Vulnerability at Subnational level

- Define where the greatest need is and set priorities e.g. by deriving knowledge about
- Spatial distribution patterns at local level
- Local level policies and planning
- Monitor progress and analyze trends
- Measure effectiveness of mitigation approaches
- Inform policymakers, practitioners, and local DRR units
- Alert the public and raise awareness
- Gain funding e.g. for poverty reduction initiatives
- Represent social responsibility
- Look at the social roots of vulnerability

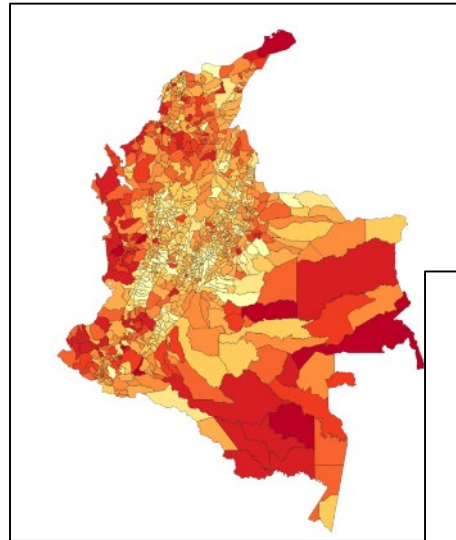


Workflow: Integrated Risk Modeling Toolkit

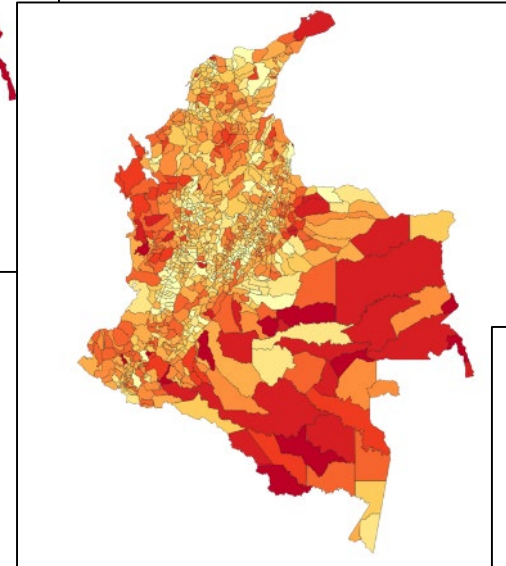


- Step 1.** Theoretical framework
- Step 2.** Select indicators
- Step 3.** Standardization/Normalization
- Step 4.** Multivariate analysis
- Step 5.** Weighting and aggregation
- Step 6.** Robustness and sensitivity
- Step 7.** Links to other variables
- Step 8.** Presentation and dissemination

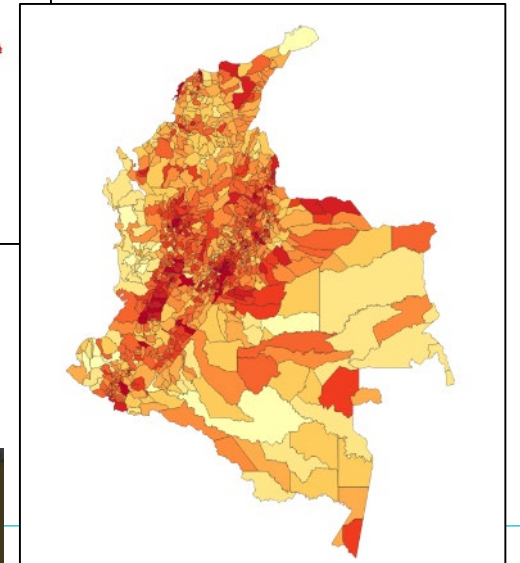
Social Vulnerability



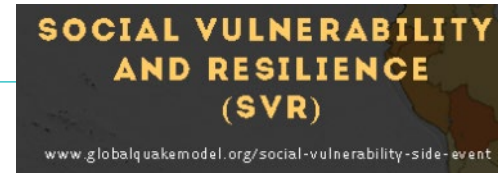
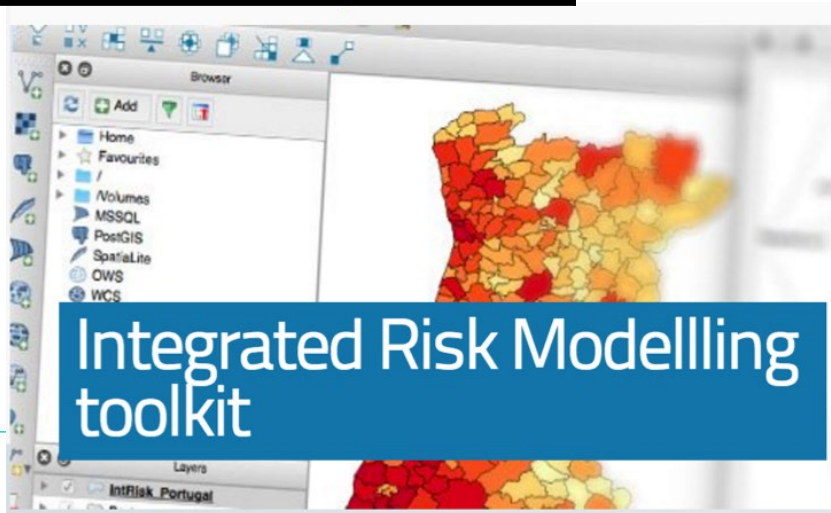
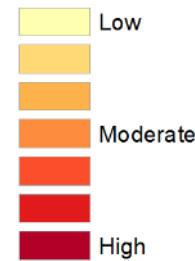
Economic Vulnerability



Recovery & Reconstruction



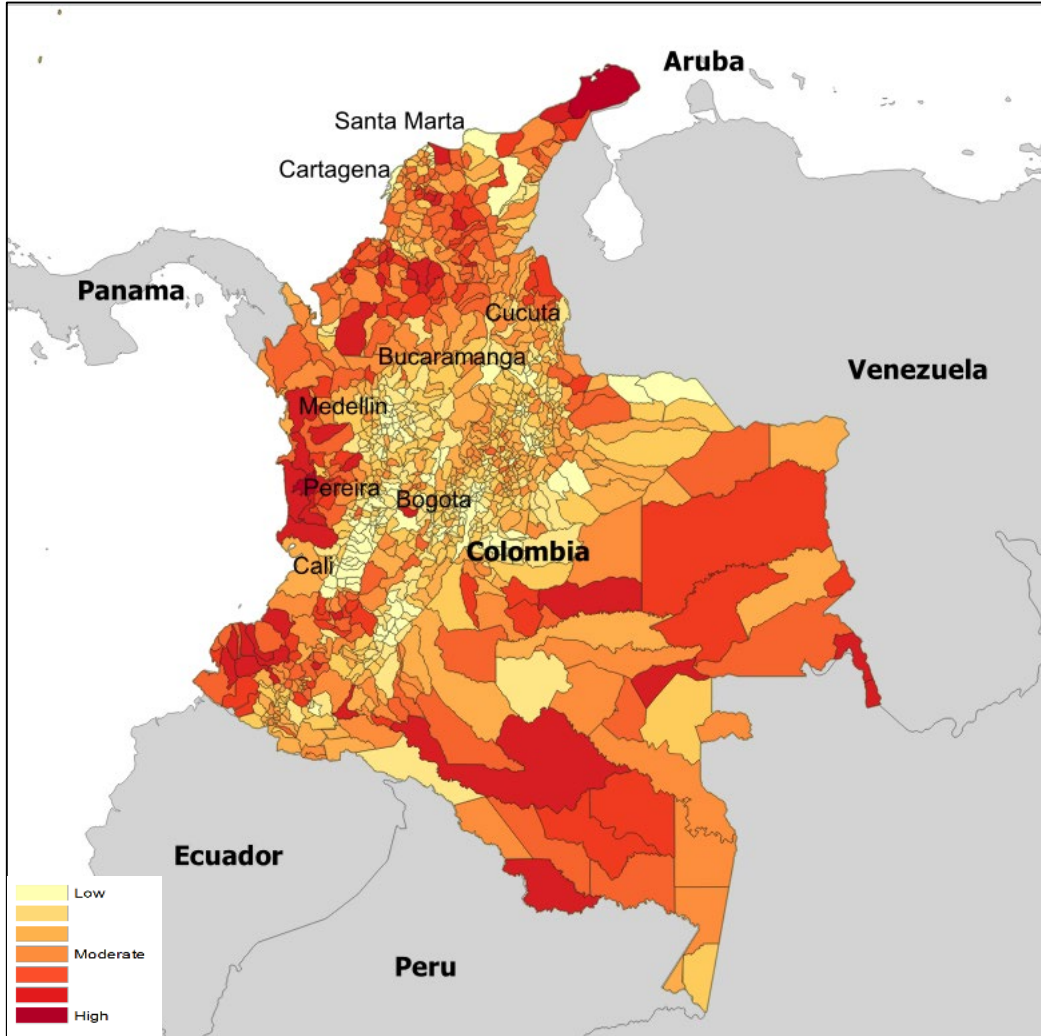
- 1000+ Subdivisions
- Census data 2005, 2018
- 100+ Socio-Economic and Housing indicators



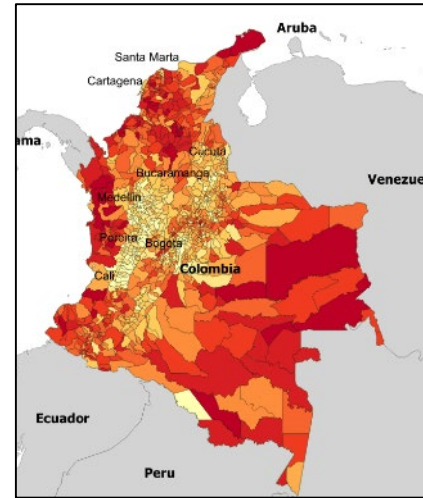
Dimensional Drivers of Social Vulnerability



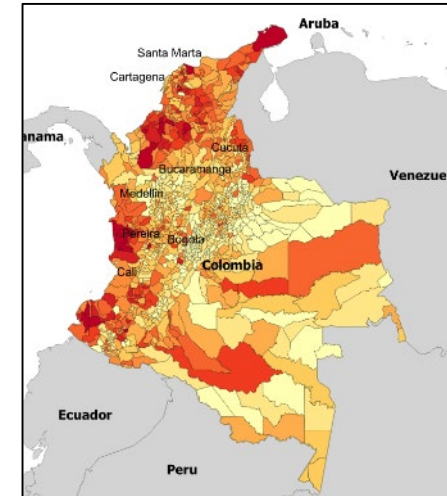
Social Vulnerability



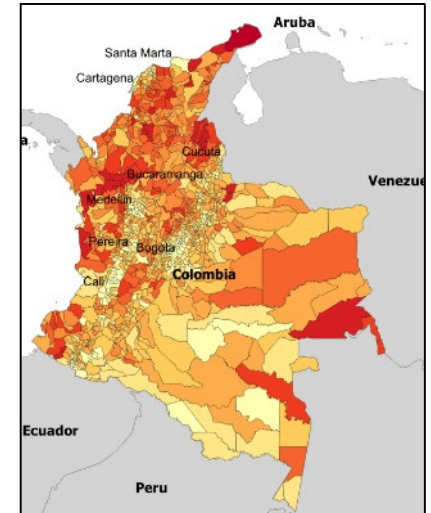
No access to Potable Water



No Healthcare coverage



No Elementary education



SOCIAL VULNERABILITY AND RESILIENCE (SVR)

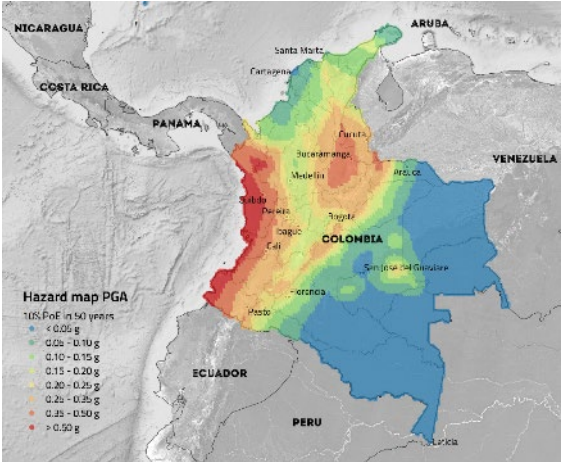
www.globalquakemodel.org/social-vulnerability-side-event

Low
Moderate
High

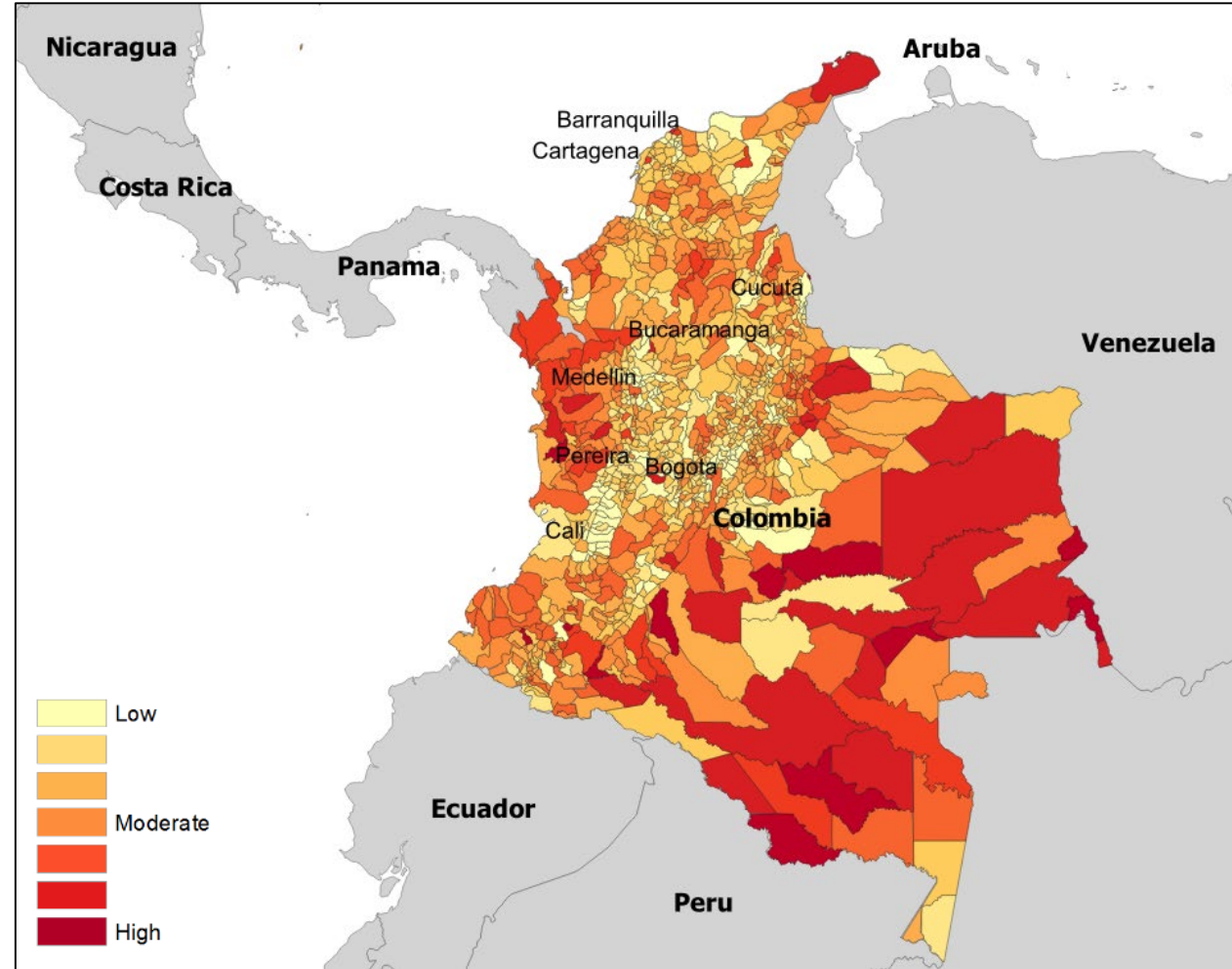
Colombia: Integrated Risk Modelling in OpenQuake



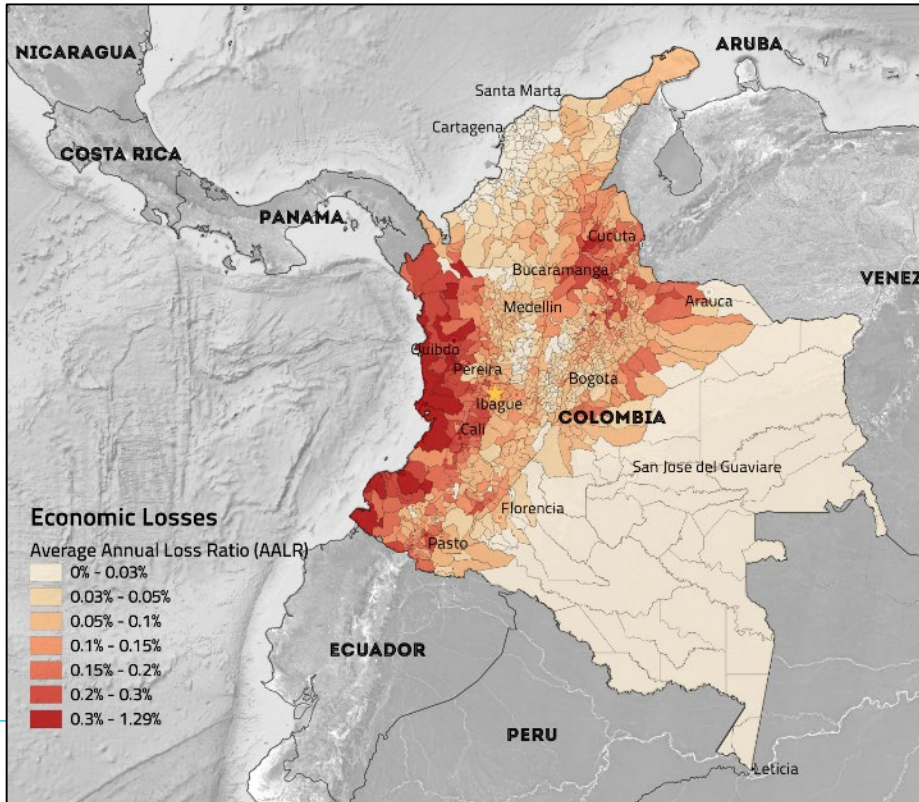
Hazard Map



SV - Economic Vulnerability

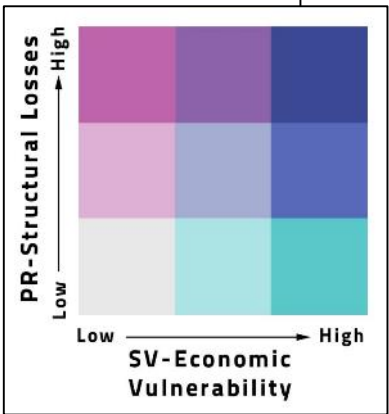
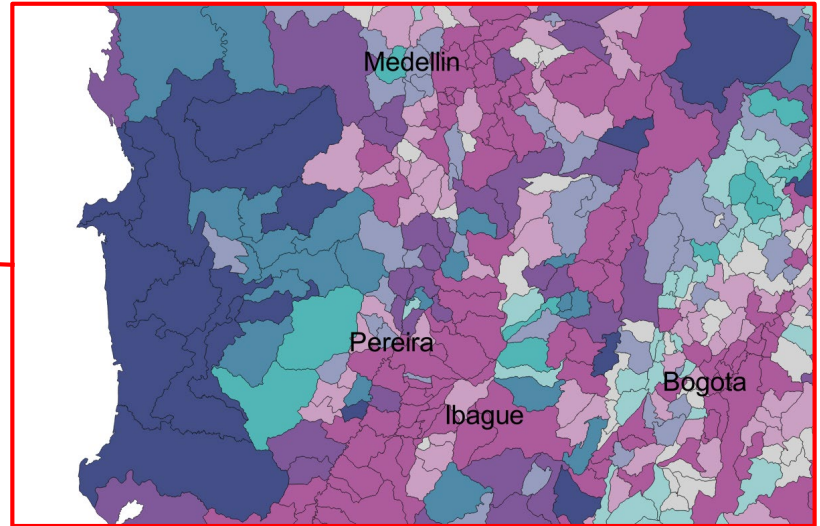
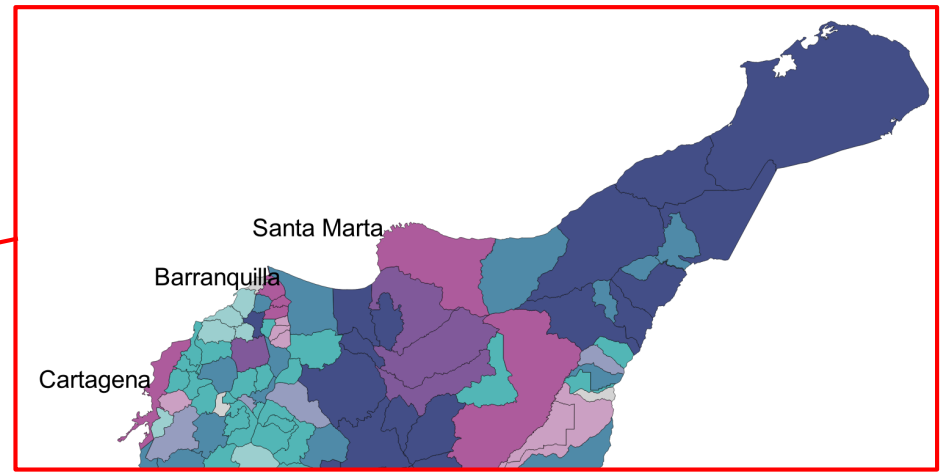
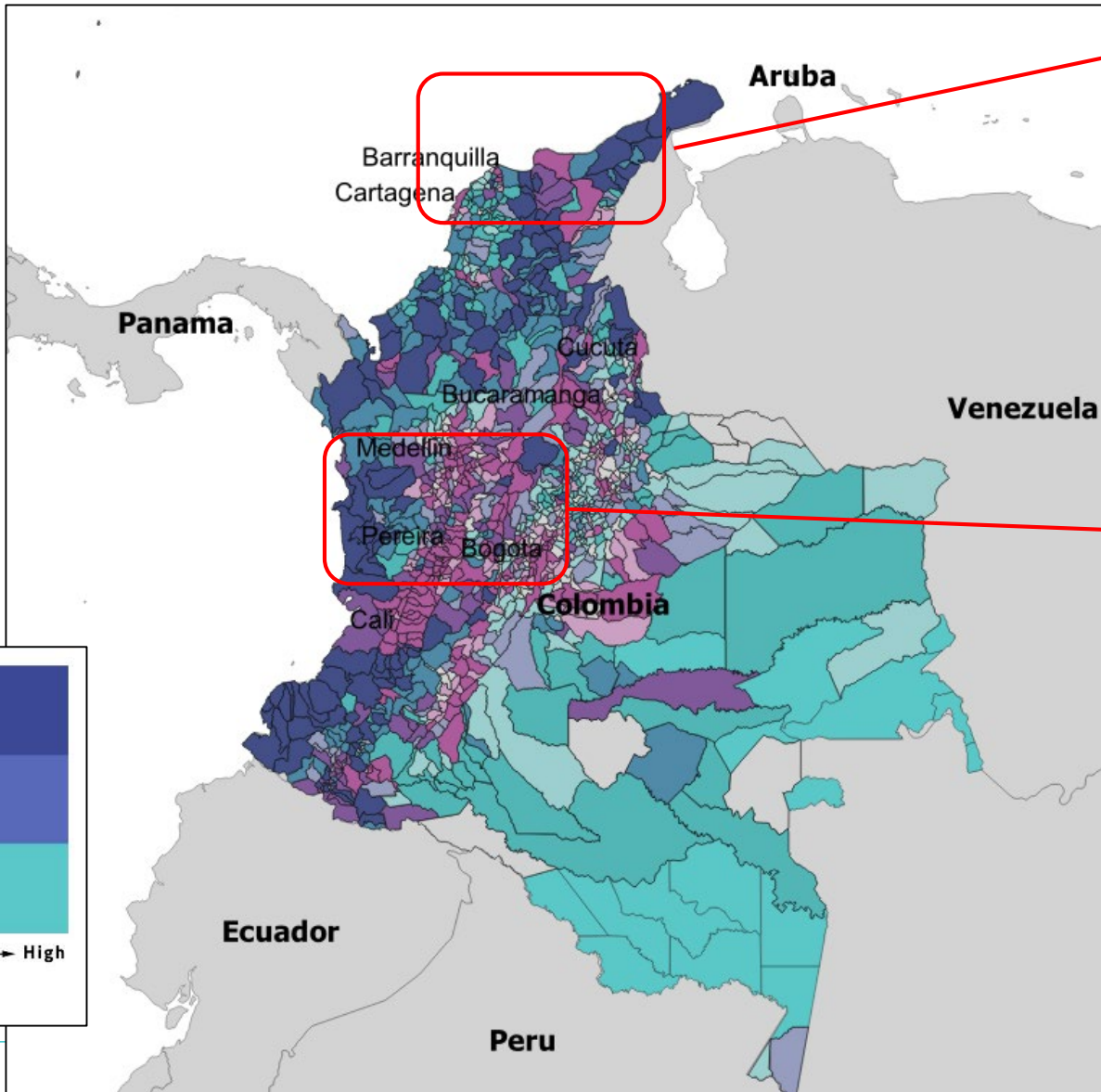


Physical Risk Map



Integrated Risk Map: Economic Impact

Case Study: Colombia



Top 5 Risk and Social Vulnerability

Risk	SV	Integrated
Bogota	Suarez	Cordoba
Cali	Guaranda	El Banco
Medellin	Maicao	Montenegro
Palmira	Novita	Yumbo
Pasto	Ricaurte	Quimbaya

GEM - Global Social Vulnerability Release

Global Social Vulnerability and Resilience Maps

1. Social Vulnerability
2. Economic Vulnerability
3. Recovery and Reconstruction

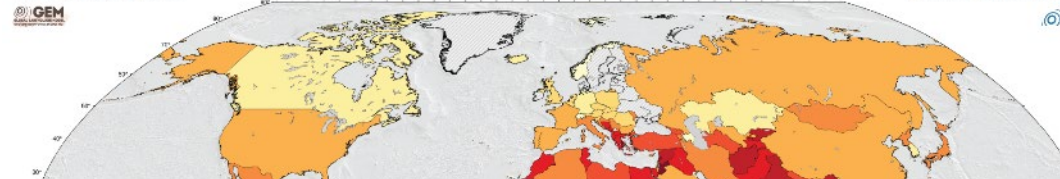


Developed using Open Source tools

Available on OpenQuake, GEM Geo-viewer, GEM Website

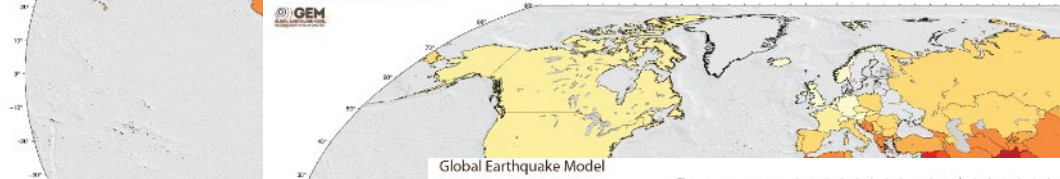
Global Earthquake Model

Economic Vulnerability Map



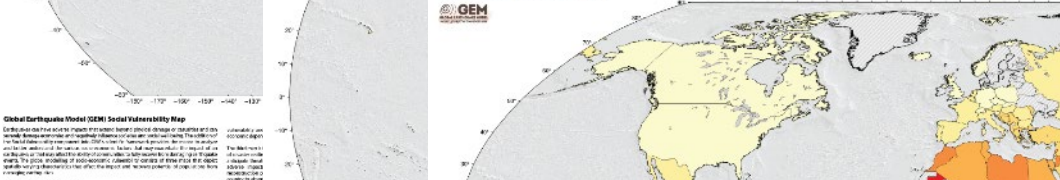
Global Earthquake Model

Reconstruction and Recovery Map

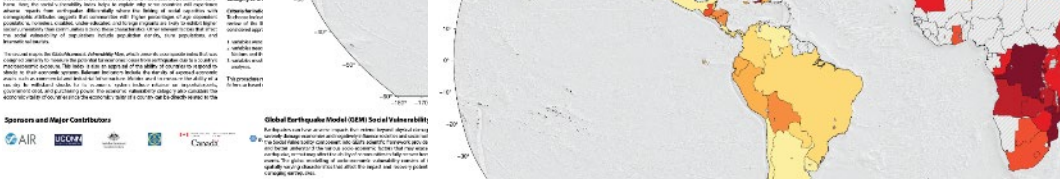


Global Earthquake Model

Social Vulnerability Map



Global Earthquake Model



Global Earthquake Model (GEM) Social Vulnerability Map

Global Earthquake Model (GEM) Economic Vulnerability Map

Global Earthquake Model (GEM) Reconstruction and Recovery Map

Global Earthquake Model (GEM) Social Vulnerability Map

Global Earthquake Model (GEM) Economic Vulnerability Map

Global Earthquake Model (GEM) Reconstruction and Recovery Map

Global Earthquake Model (GEM) Social Vulnerability Map

Global Earthquake Model (GEM) Economic Vulnerability Map

Global Earthquake Model (GEM) Reconstruction and Recovery Map

Global Earthquake Model (GEM) Social Vulnerability Map

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Global Earthquake Model (GEM) Economic Vulnerability Map

Global Earthquake Model (GEM) Reconstruction and Recovery Map

Global Earthquake Model (GEM) Social Vulnerability Map

Global Earthquake Model (GEM) Economic Vulnerability Map

Global Earthquake Model (GEM) Reconstruction and Recovery Map

Global Earthquake Model (GEM) Social Vulnerability Map

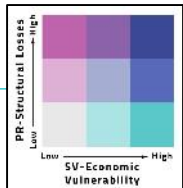
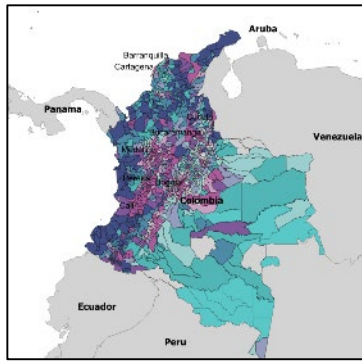
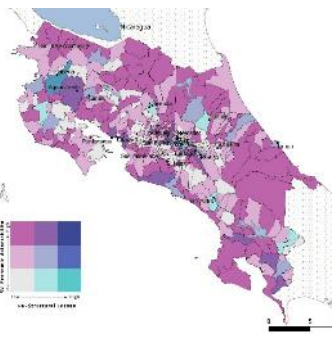
Global Earthquake Model (GEM) Economic Vulnerability Map

Global Earthquake Model (GEM) Reconstruction and Recovery Map

Global Earthquake Model (GEM) Social Vulnerability Map

Capable of producing Integrated Risk maps

1. Social Vulnerability & AA Casualties
2. Economic Vulnerability & AA Structural Losses



Aggravating/attenuating factors
 Hot-spots of compounded SV and PR
 Major structural losses + Adverse socio-eco effects
 Further localized risk assessments
 Structural, non structural, and soft investments
 Problem identification
 Further impact assessments

Thank You

www.globalquakemodel.org

