



START HACK 2022

UNEP Case

Shaping the future of landslide prevention and management



18 000 deaths worldwide due to landslides (1998-2017)

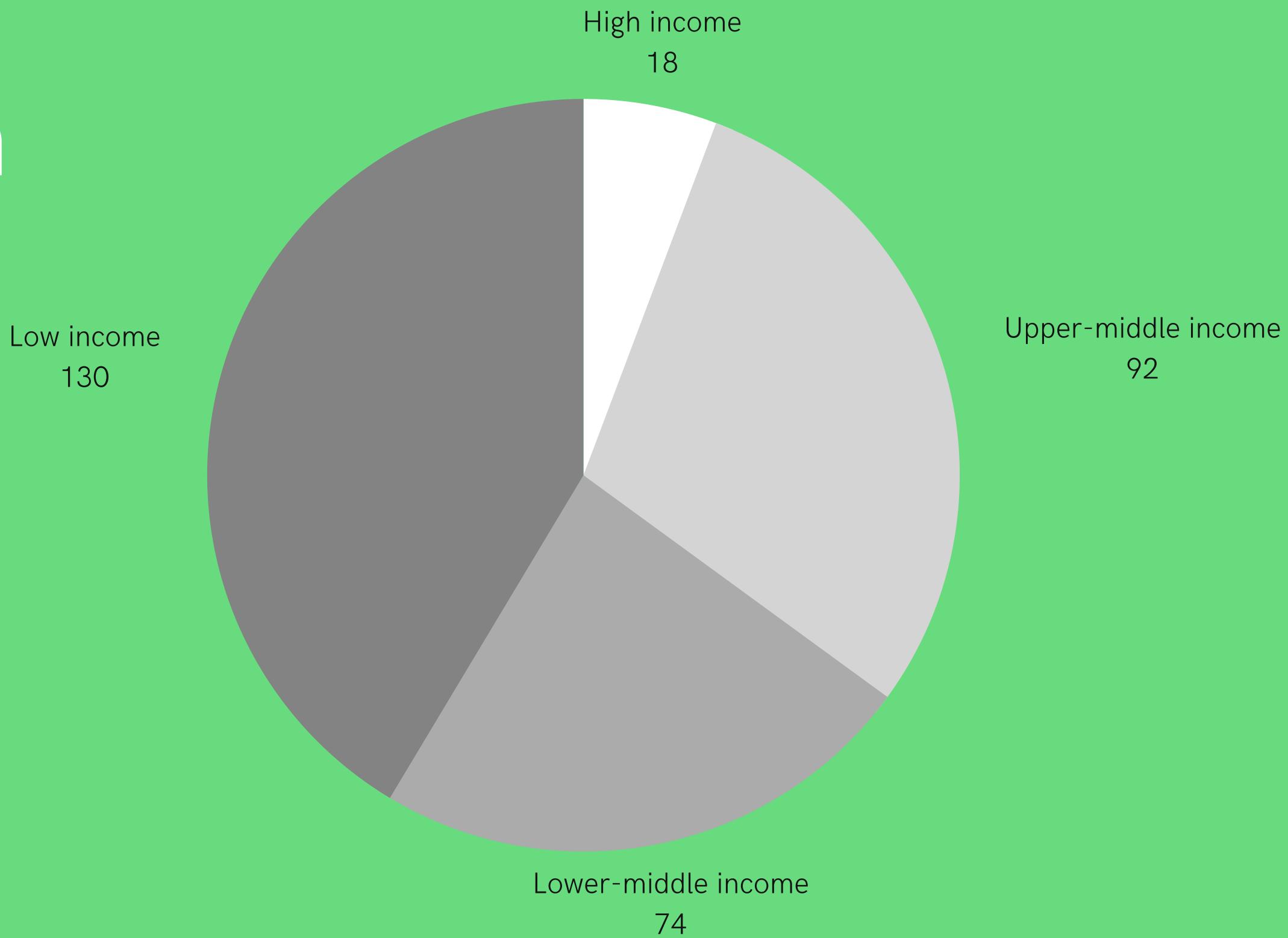
**CLIMATE CHANGE AND RISING TEMPERATURES
ARE EXPECTED TO TRIGGER MORE LANDSLIDES**

Landslides are more widespread than any other geological event, and can occur anywhere in the world

Human cost of disasters falls on mid/low income countries

DISASTER DEATHS

in numbers per millions population potentially exposed (PPE) 2000-2017



Source: UNISDR - Economic Losses, Poverty & Disasters 1998-2017

Our mission

We save lives by using data-driven environmental risk assessments that helps governments to improve urban planning



The Team

COLLABORATING SINCE 36 HOURS AGO



Martin Wessel



Aamir Shakir



Igor Alves



Johannes King

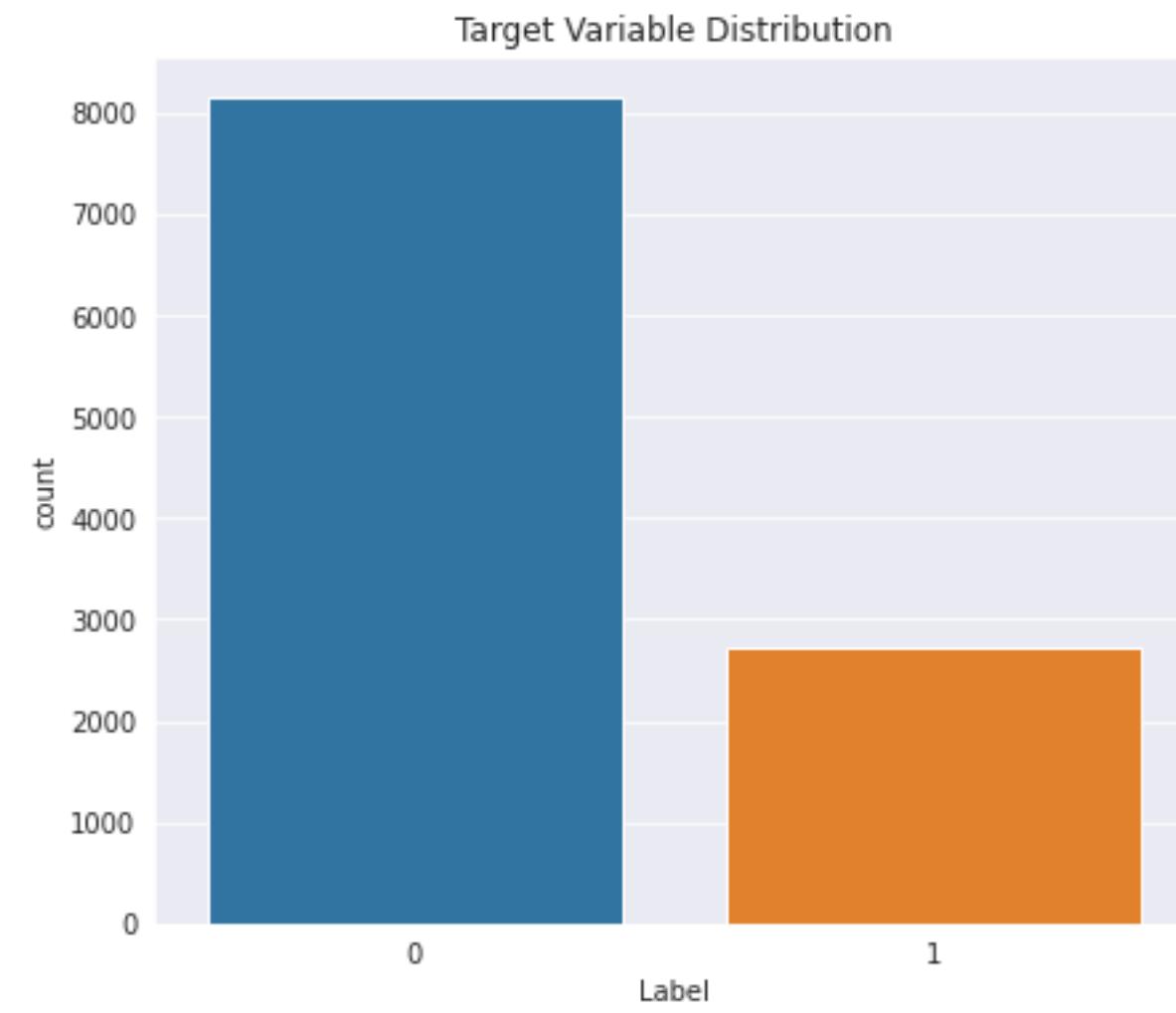
Case study



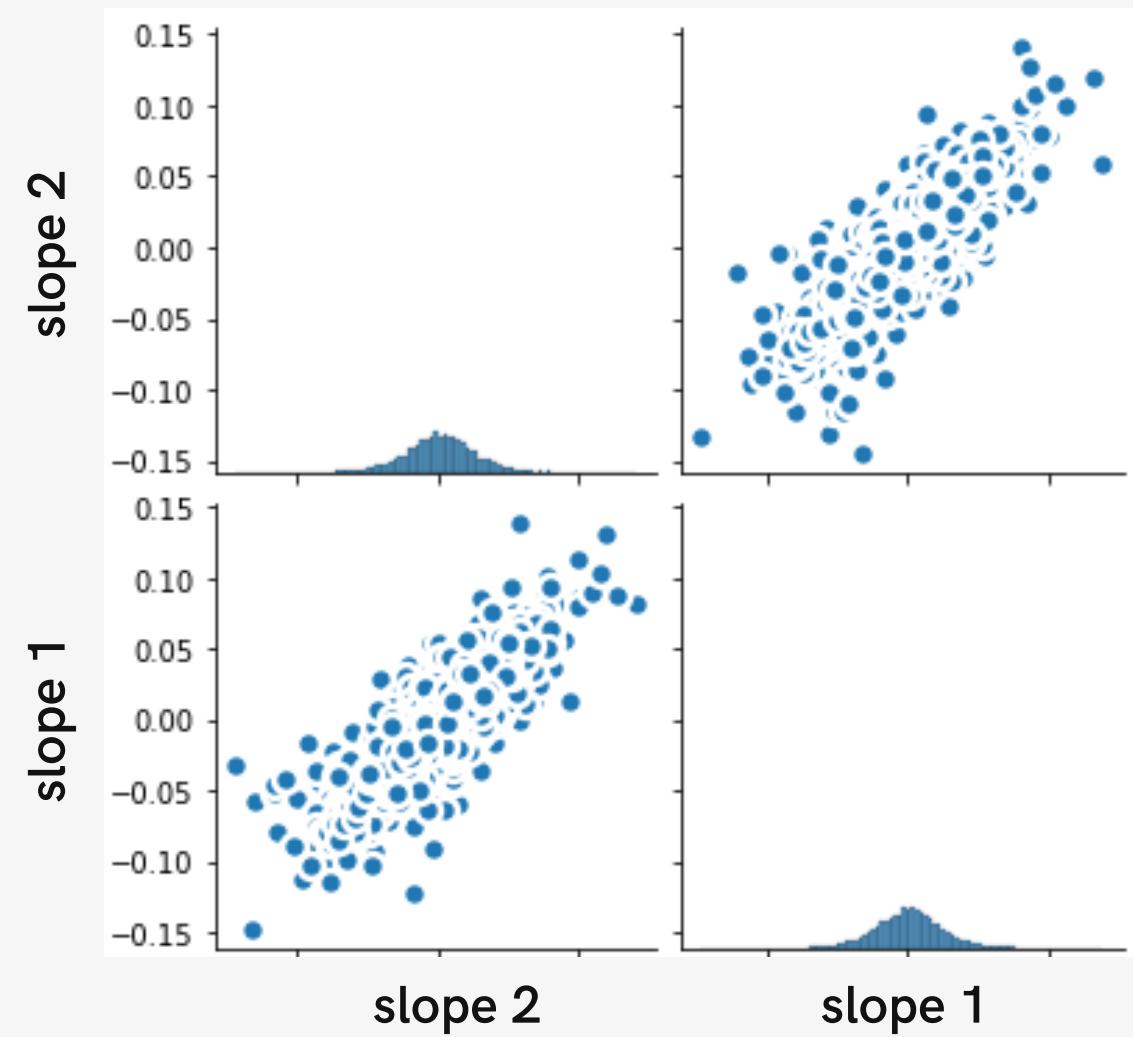
THE FUTURE OF LANDSLIDE PREVENTION AND MANAGEMENT IN HONG KONG.

In June 1972, 71 people were killed in a single landslide event, including many children.

Data Preprocessing



Feature Engineering

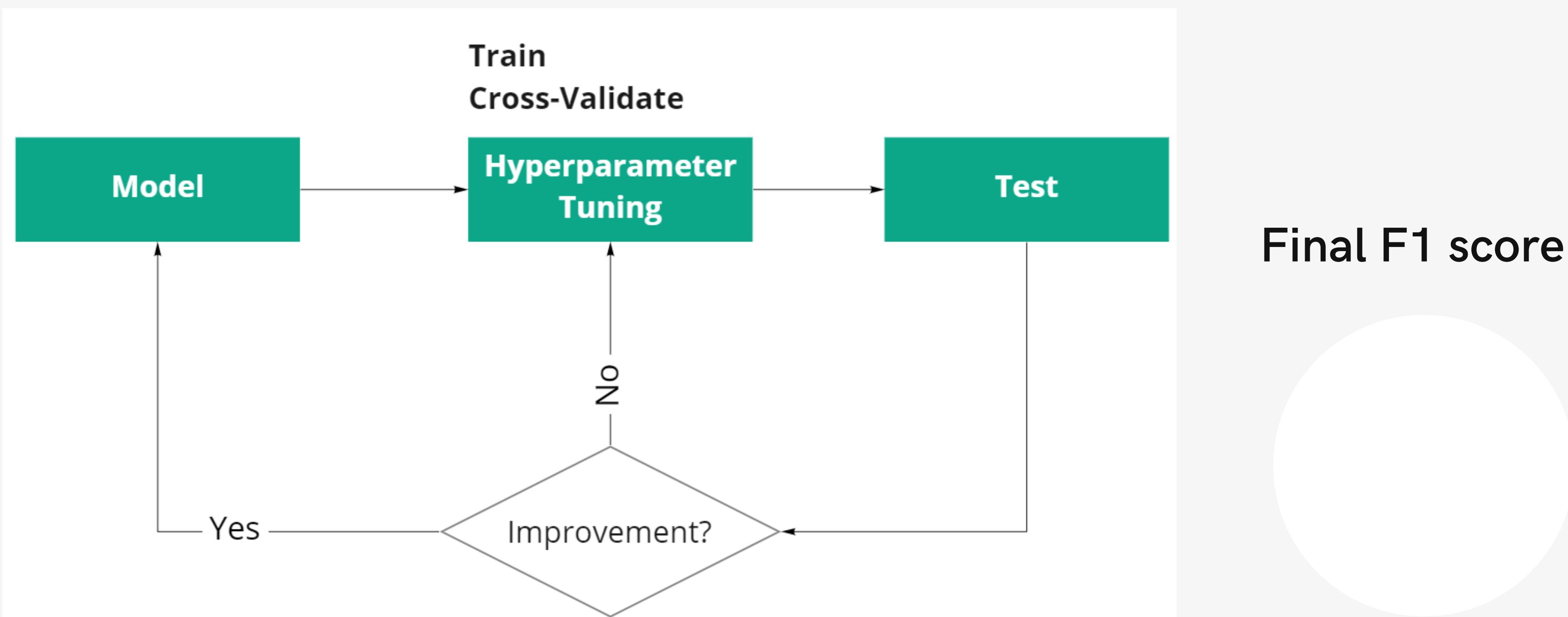


- Imbalanced classification task.
Undersample the majority class (no landslide)

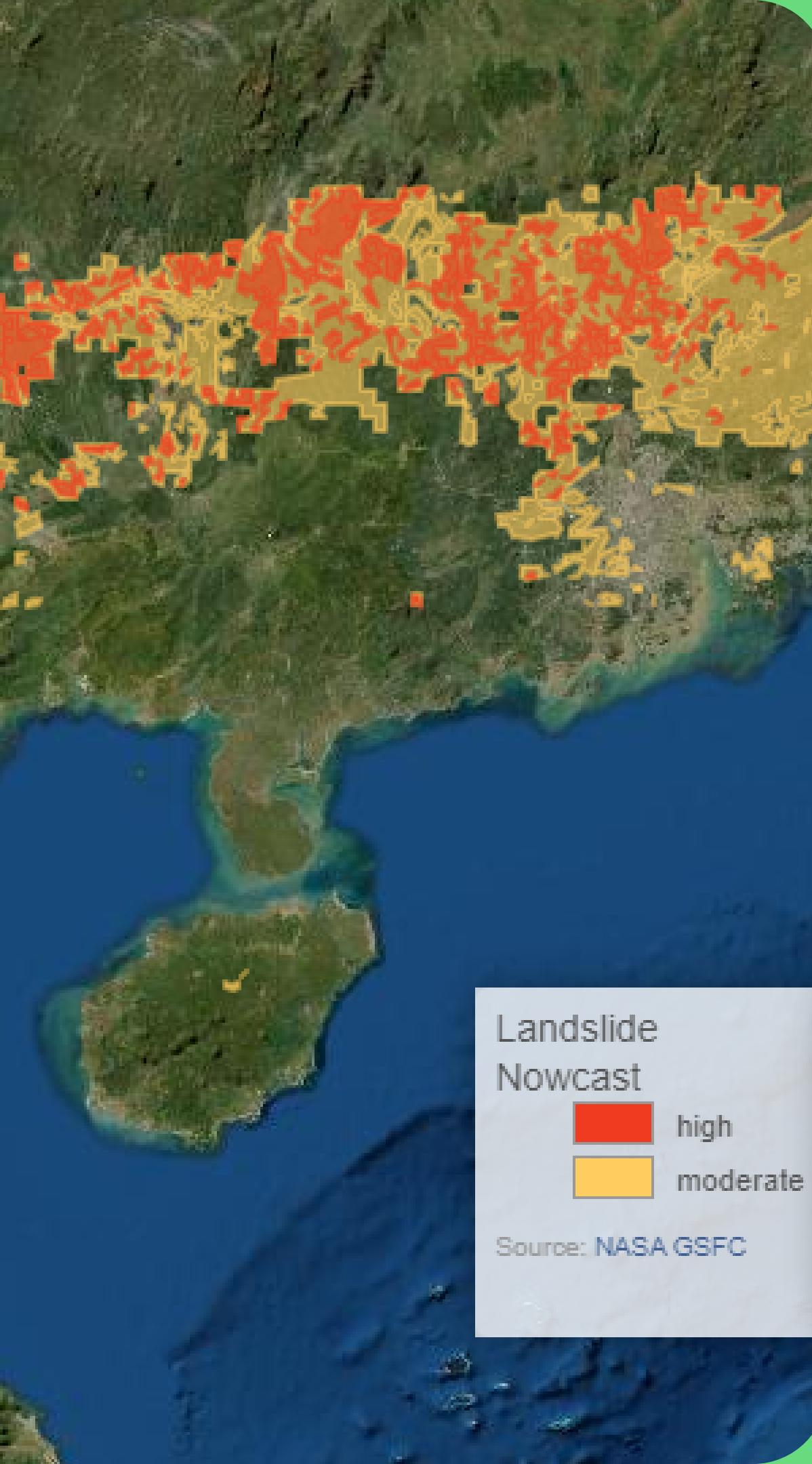
- Continuous variable slope is correlated. Sum neighbouring values to increase prediction power

Model selection

- First Baseline: Linear Regression
- Most successfull Model: CatBoost
- X-Validation (to prevent overfitting): StratifiedKFold's



What's next?



Towards a global landslide impact score

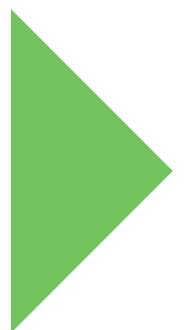
Take out the big guns

Build on satellite based, state-of-the-art models for landslide nowcast

Source: <https://gpm.nasa.gov/landslides/projects.html>

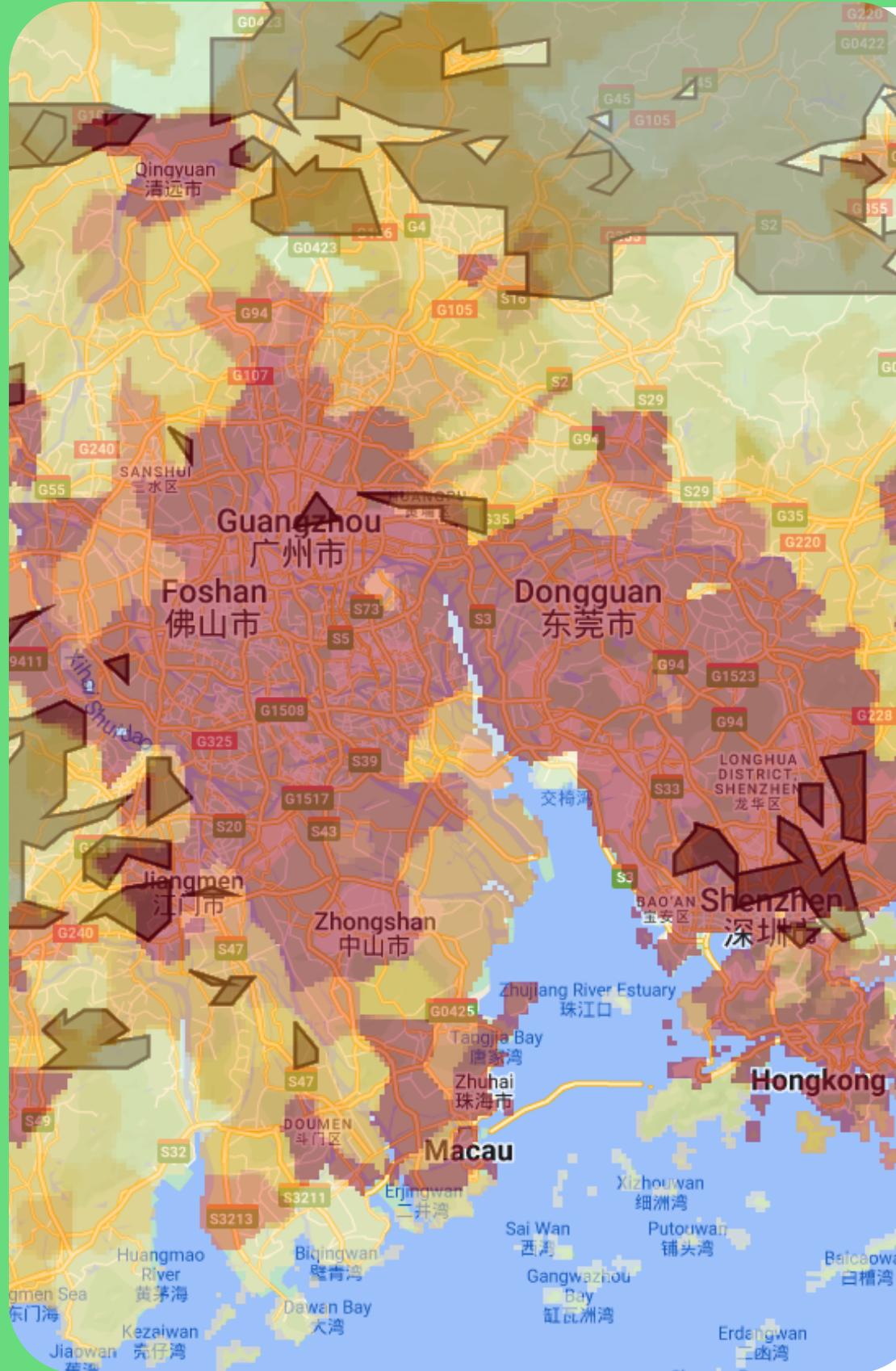
Factor in societal impact

Enable governments to make better policy decisions




descoberta
Impact Score

Impact Score - Prototype



POPULATION DATA (RED)

NASA Socioeconomic Data and Applications Center (SEDAC). Based on counts consistent with national censuses and population registers.

LANDSLIDE NOWCAST (BLACK)

Hazard Assessment model for Situational Awareness (LHASA). Uses surface susceptibility and satellite rainfall data from the Global Precipitation Measurement (GPM)

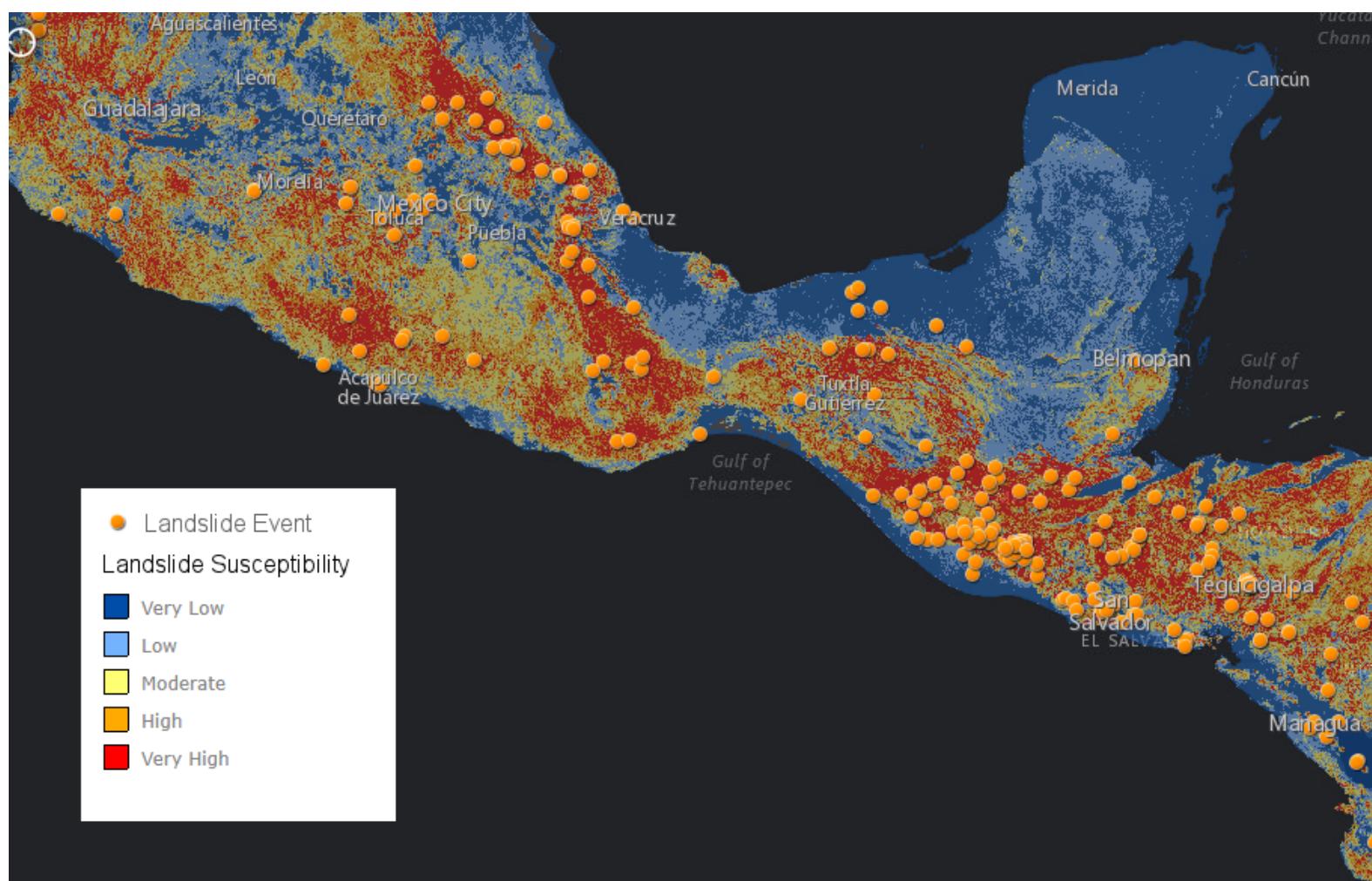
Questions?



BACKUP

Landslide Susceptibility Map

- quantitative information on if roads have been built, trees have been cut down etc.



GPM



- Next-generation global observations of rain and snow
- Relies on active and passive instruments to measure the properties of precipitation from space

Descoberta Score

Input data

Nowcast Model



Population
Density



Take *immediate* action

Take action

Stay alert

Monitor the situation

No risk