Understanding Disaster Risk with Open Data

Saturday, March 6 14:00 – 14:45 GMT

An Open Data Day webinar

GFDRR
Global Facility for Disaster Reduction and Recovery

OPEN DRI Open Data for Resilience Initiative

Photo by Aziz Kountche

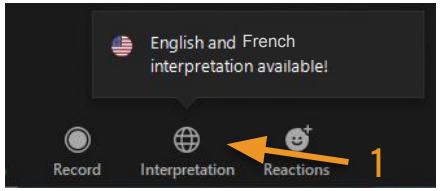
Interprétation en français

1. Cliquez sur le bouton d'interprétation

2. Cliquez sur "French"

3. Si cela vous intéresse : Coupez le son de la salle principale afin de n'entendre que l'interprétation en français. Si vous ne coupez pas le son, vous entendrez à la fois l'orateur et l'interprète.

Ordinateur



Mobile

Speakers

Grace Doherty

Disaster Risk Management
Consultant, GFDRR

@DohertyGrace

Pierre Chrzanowski

Disaster Risk Management
Specialist, GFDRR

@pzwsk

Mattia Amadio

Disaster Risk Management
Consultant, GFDRR

GFDRR
Global Facility for Disaster Reduction and Recovery

#opendataday

Arthur Guehi
English-French Interpreter

What is disaster risk?

The **potential** loss of life, injury, or destroyed or damaged assets (...) as a function of **hazard**, **exposure**, **vulnerability** and **capacity**.

Source: UNITED NATIONS OFFICE FOR DISASTER RISK REDUCTION (UNDRR)

Who works on disaster risk?

A collaborative effort of global and local communities

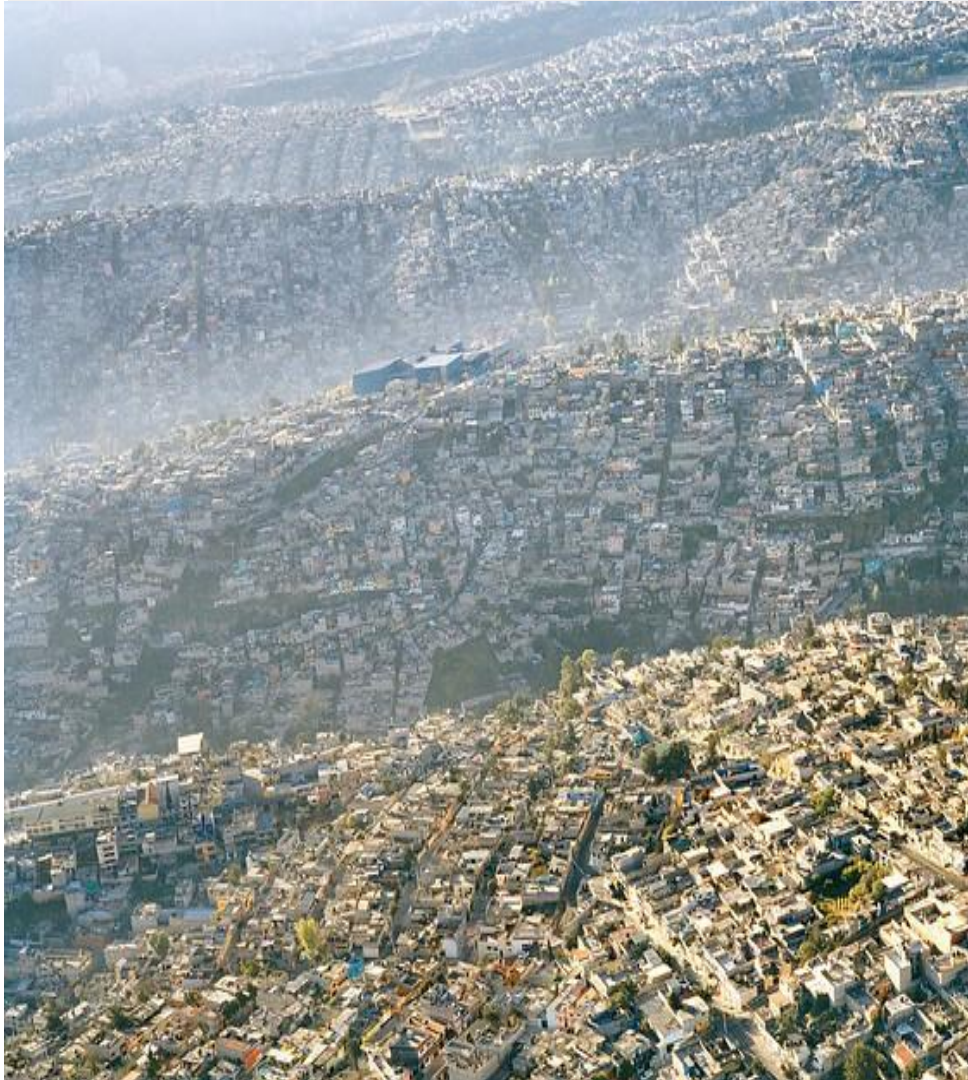
You?

Open disaster risk data?

Open data on **hazards** past and future

Open data on **exposure**

of population and infrastructures



Open data on vulnerability of population and infrastructure

Open data on capacity

to prepare, mitigate and respond

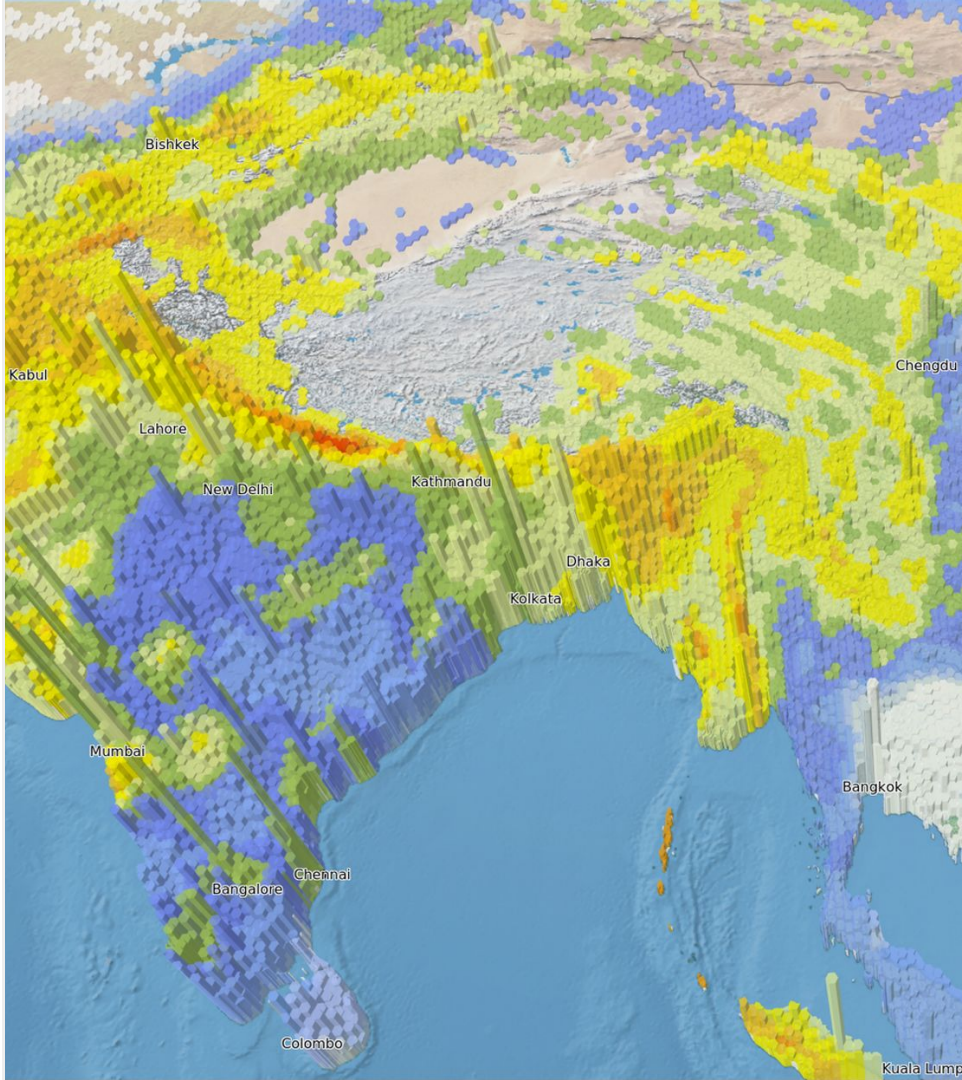
Open data on climate change

and its impact on disaster risk

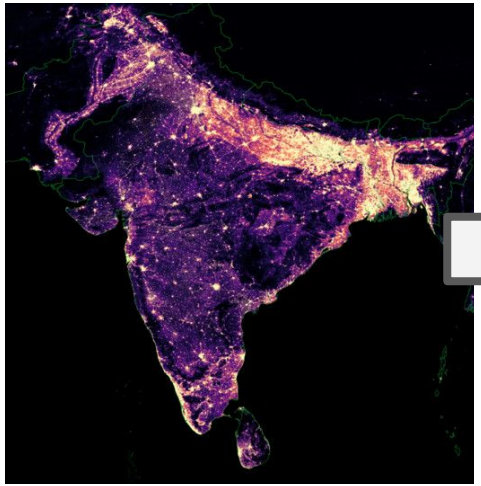
How to understand risk with data?

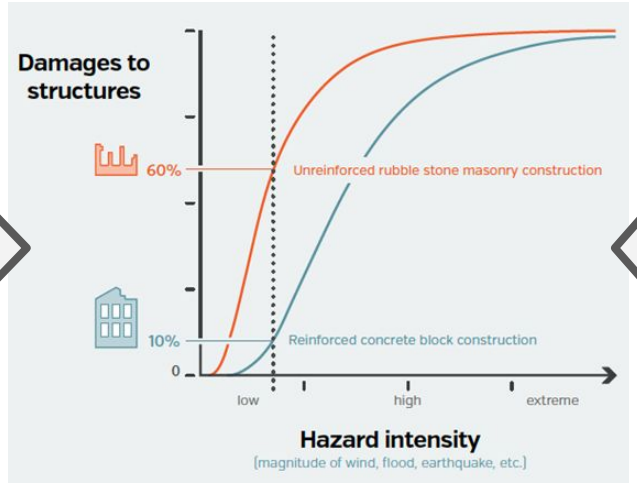
Open data into **Risk models**

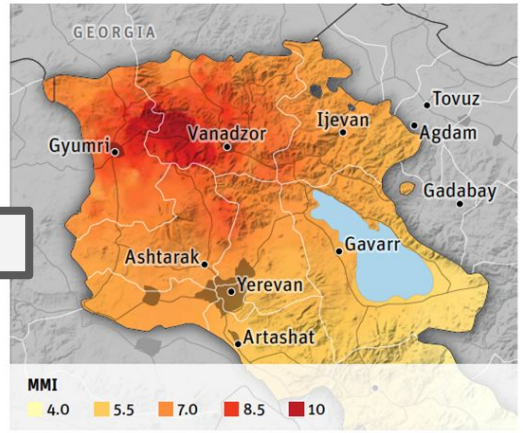
to obtain loss-probability estimates



Risk Assessment Framework







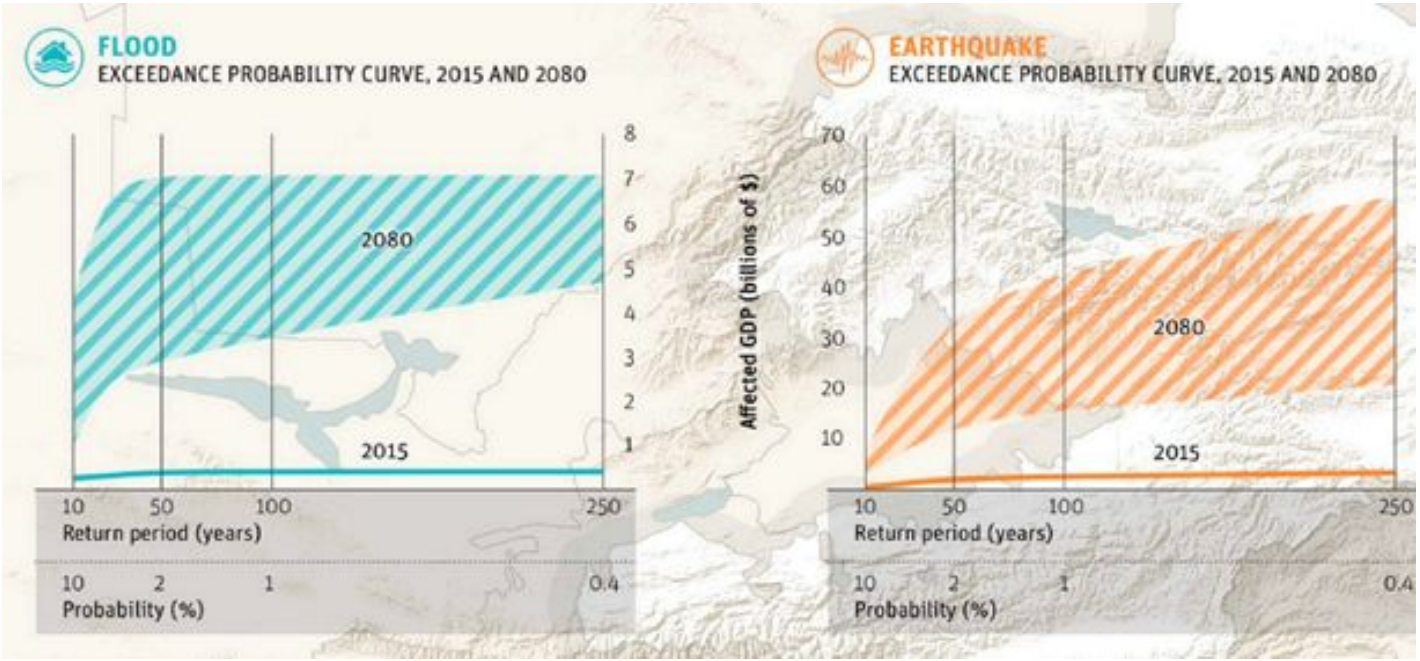
Hazard map showing Modified Mercalli Intensity.

Exposure

Vulnerability/ Capacity

Hazard

Risk Assessment Framework



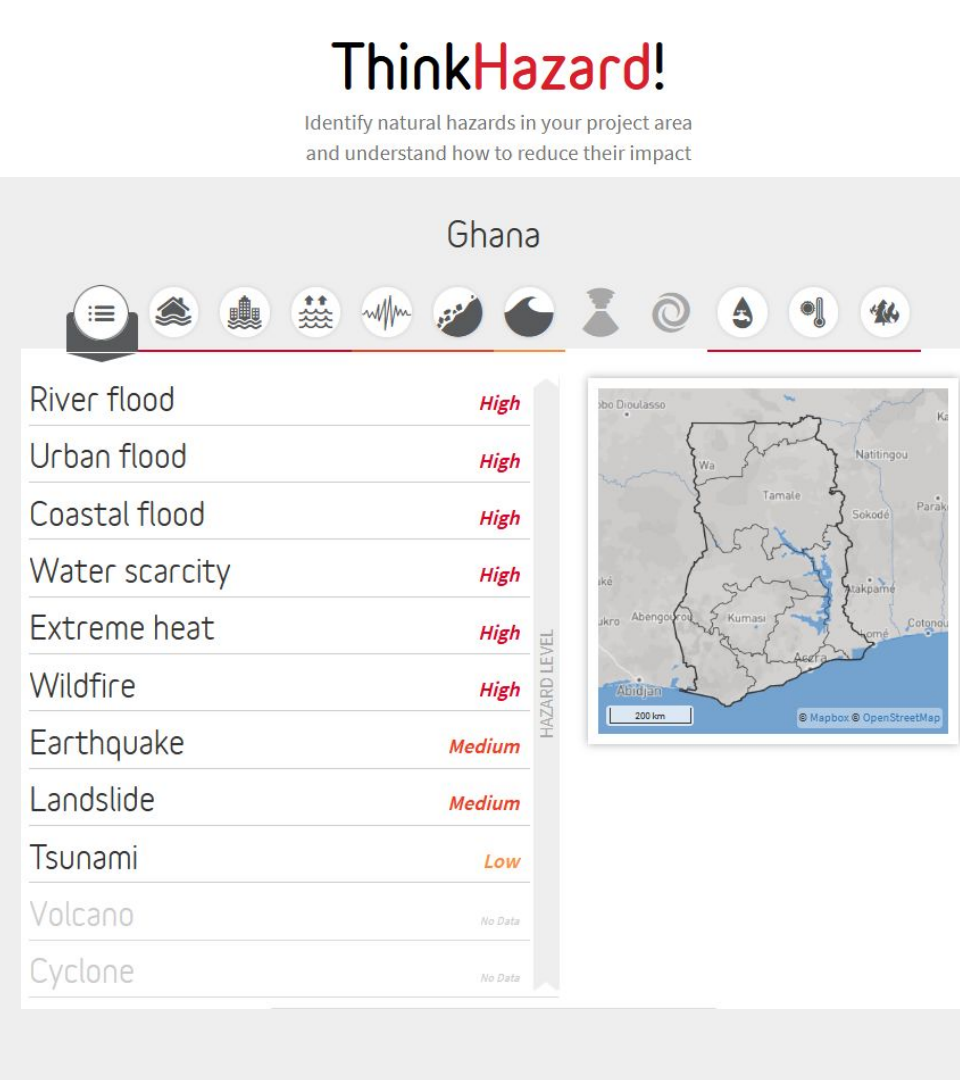
Risk = Loss x Probability

Tools, methodologies and risk data sources

ThinkHazard.org

ranking of natural hazards

Global coverage



GFDRR GeoNode

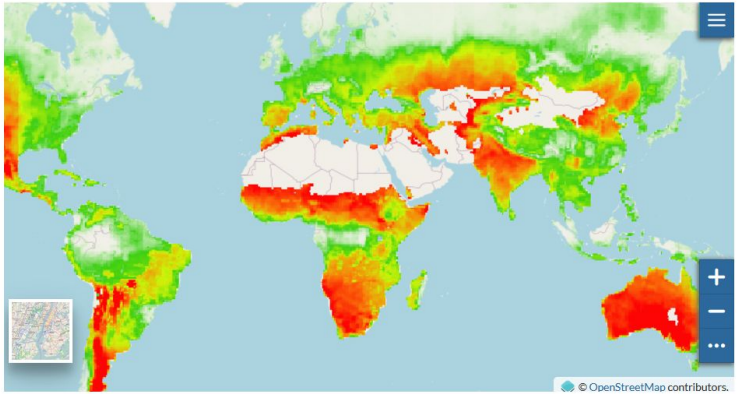
improving access to hazard data

Global coverage

GeoNode

GFDRR InnovationLab Dato Mappe A proposito

WF-GLOBAL-CSIRO-10



Informazioni | Attributi | Condividi | Valutazioni | Commenti | Preferito

Titolo	WF-GLOBAL-CSIRO-10
Licenza	Not Specified
Abstract	The approach to classify wildfire hazard levels used is based solely on fire weather index climatology. Fire weather indices are used in many countries to assess both the onset of conditions that will allow fires to spread, as well as the likelihood of fire at any point in the landscape. The method presented uses statistical modelling (extreme value analysis) of a 30 year fire weather climatology to assess the predicted fire weather intensity for specific return period intervals. These in...
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Tipo	Raster Data
Parole chiave	csiro_wf_max_fwi_rp10 , GeoTIFF , WCS
Categoria	Geoscientific Information
Regioni	Global

Index.OpenDRI.org

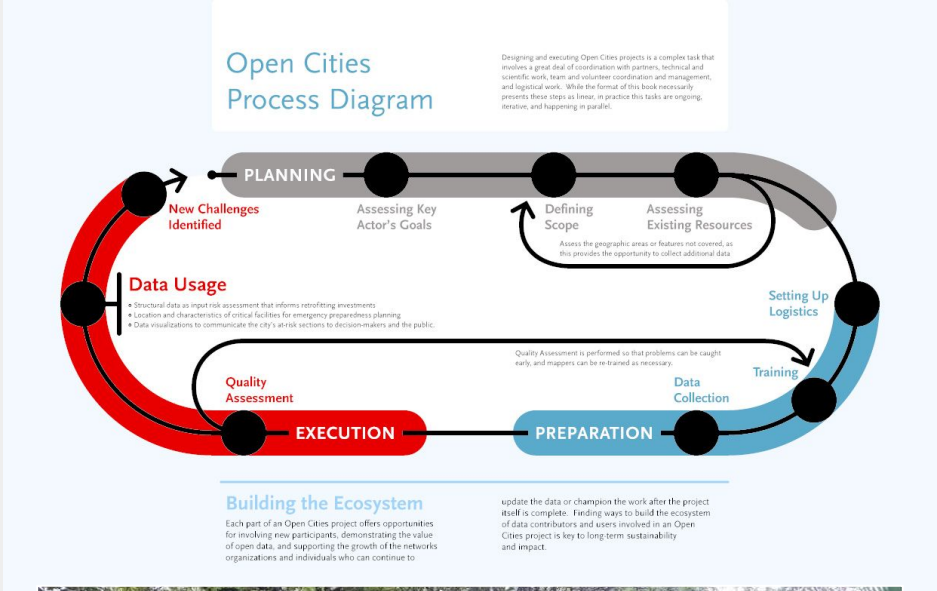
tracking open data for resilience

Global coverage

Open Cities

mapping to build skills and resilience of communities

Neighborhoods, cities, & islands



Machine Learning

advancing data for understanding risk

All scales

Pre-made interactive notebooks for

facilitated risk analysis

DEMO: http://bit.ly/gfdrr-pytools

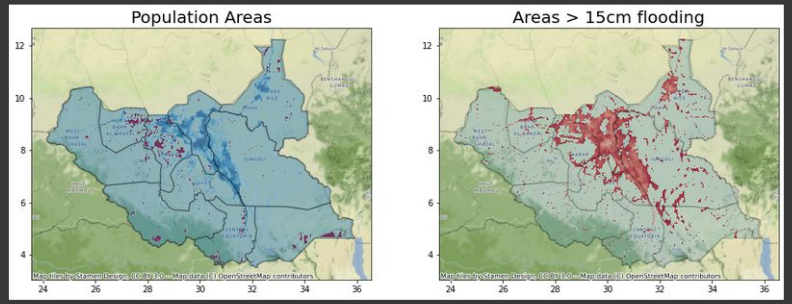
2. Flooded population

Set an hazard threshold and measure the number of population within hazard extent, then summarise at ADM level.

```
[ ] masked_pop = np.ma.masked_where(pop_data == 0, pop_data)
```

Show population distribution

```
fig, (ax1, ax2) = plt.subplots(1, 2, figsize=(16, 10))
ax1 = plot_affected_area(adm1, col=None, ax=ax1, title='Population Areas', cmap=None, alpha=0.4)
ax1 = show(flood_mask, ax=ax1, alpha=0.6, transform=flood_transform,
     cmap='Blues', vmin=0.1, vmax=2)
ax1 = show(masked_pop, ax=ax1, transform=pop_transform, cmap="coolwarm_r");

ax2 = plot_affected_area(adm1, col=None, ax=ax2, title='Areas > 15cm flooding', cmap=None, alpha=0.2)
ax2 = show(flood_mask, ax=ax2, transform=flood_transform,
          cmap='coolwarm_r')
```



Estimate population within hazard extent and plot as map

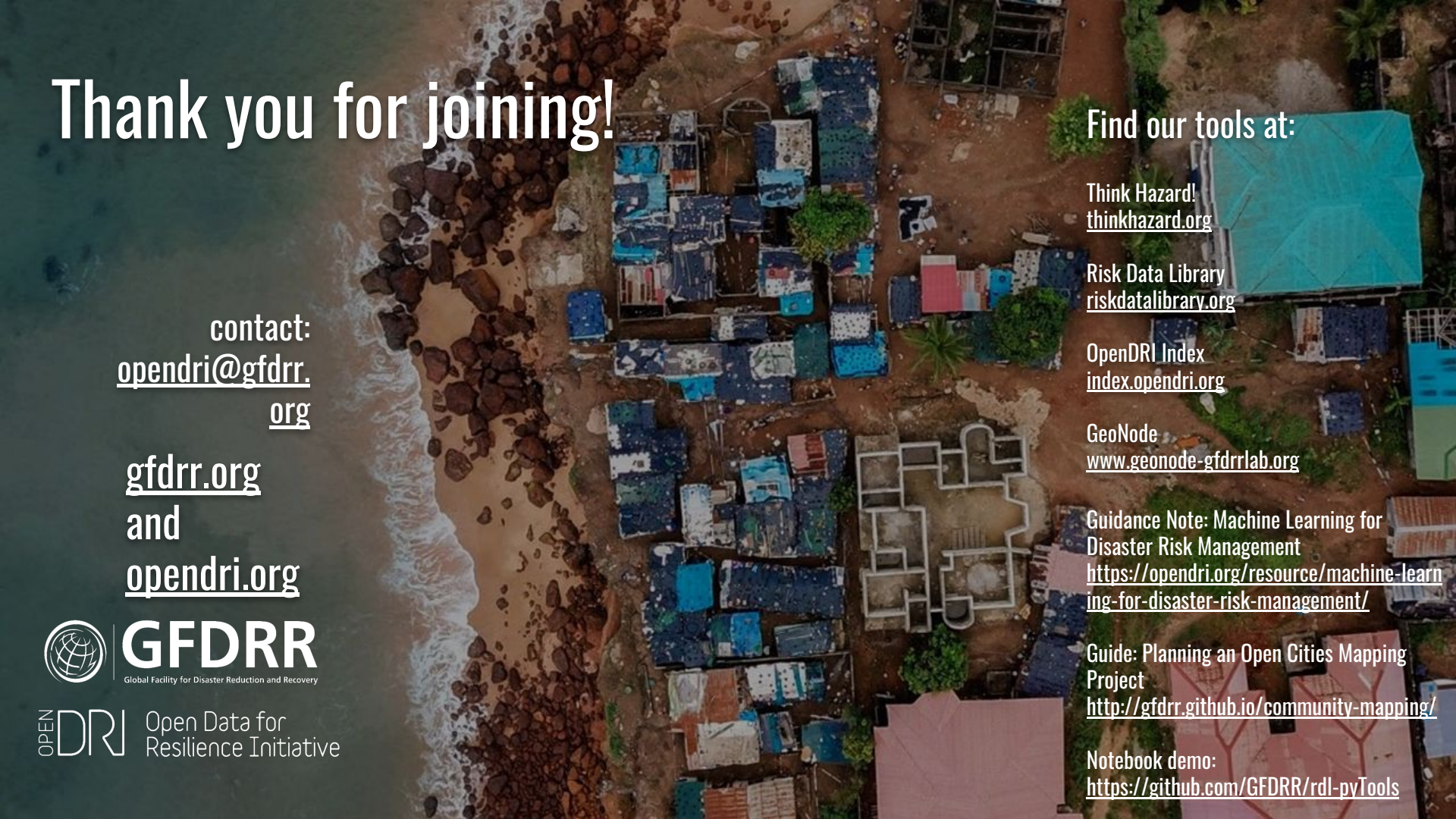
```
[ ] # Get populated areas that experienced > 15cm of flooding
    pop_fd = np.ma.masked_where(np.ma.getmask(flood_mask), masked_pop)
```

Summary for ADM1 level - zonal statistics

```
[ ] # Get total population in each administrative area
    stat = "sum"
    adm1_stats = collect_stats(pop_profile, adm1, pop_fd, stats=stat, colname='ADM1_PCODE')

[ ] res_df1 = convert_stats_to_df(adm1_stats, 'population_'+stat, stat)

[ ] # Relative normalization; 0 to 1 (i.e., 1 is populated area most affected by flood)
    res_df1 = (res_df1 / res_df1.max())

[ ] pop_flood_adm1 = adm1.join(res_df1, on='ADM1_PCODE')

[ ] ax = plot_affected_area(pop_flood_adm1, 'population_'+stat, title="Flood affected population (ADM1)", alpha=0.4);
```

What about disaster risk in your country or city?

Thank you for joining!



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Find our tools at:

Think Hazard!
thinkhazard.org

Risk Data Library
riskdatalibrary.org

OpenDRI Index
index.opendri.org

GeoNode
www.geonode-gfdrrlab.org

Guidance Note: Machine Learning for Disaster Risk Management
https://opendri.org/resource/machine-learning-for-disaster-risk-management/

Guide: Planning an Open Cities Mapping Project
http://gfdrr.github.io/community-mapping/

Notebook demo:
https://github.com/GFDRR/rdl-pyTools