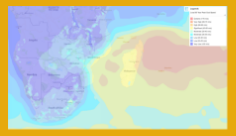
Motivation
Data vs actionable Knowledge
Added-value
EO and humanitarian Needs
Human Behavior
Next Steps
perigeo
Disaster risk management 2.0: why linking new data sources makes a difference

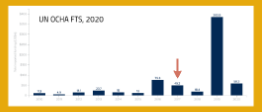
perigeo

Disaster risk management 2.0: why linking new data sources makes a difference

Motivation

Early February 2017





1) No central source for emergency info?
2) Who cares for 'my' emergency?
3) Satellite data vs. human behavior?

Luanda
Angola
V Benguela
CV Huambo
CV Lubango
CV Ondangwa
CV Tsumeb
Okavango Delta
Namibia
Windhoek
CV Windhoek
Kalahari Desert
Botswana
Ntwetwe Pan
Zambia
Lusaka
CV Lusaka
Central
CV Kitwe
CV Mzuzu
Lake Malawi
Malawi
CV Chipata
Lilongwe
CV Lilongwe
CV Blantyre
CV Tete
Zambezia
CV Ngabu
Southern Lake Kariba
CV Bindura
CV Waterfalls
CV Livingstone
Zimbabwe
Mozambique
CV Chimoio
CV Beira
CV Bulawayo
CV Francistown
CV Serowe
Gaborone
CV Tlokweng
CV Rustenburg
CV Mamelodi
CV Ennerdale
CV Nelspruit
CV Maputo
CV Siteki
CV Mbabane
CV Nhlangano
Maputo
CV Inhambane
Bassas da India
Europa Island
Juan de Nova Island
Mozambique Channel
Comoros
Grande Comore
Moroni
Mohéli
Anjouan
Mamoudzou
CV Pemba
Madagascar
Antananarivo
CV Antsirabe
CV Vontovorona
CV Mangarano
CV Fort Dauphin
Maseru
CV Maseru
CV Pietermaritzburg
Lesotho
South Africa
CV Quthing
CV Mthatha
CV Port Elizabeth
CV Cape Town
US Dept of State Geographer
© 2017 AfriGIS (Pty) Ltd.
Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Google

GDACS, 2017

Earthquake
25

Tornado
50

Volcano
0

Extratropical Cyclone
0

Hail
0

Tropical Cyclone
50

Lightning
25

Wildfire
50

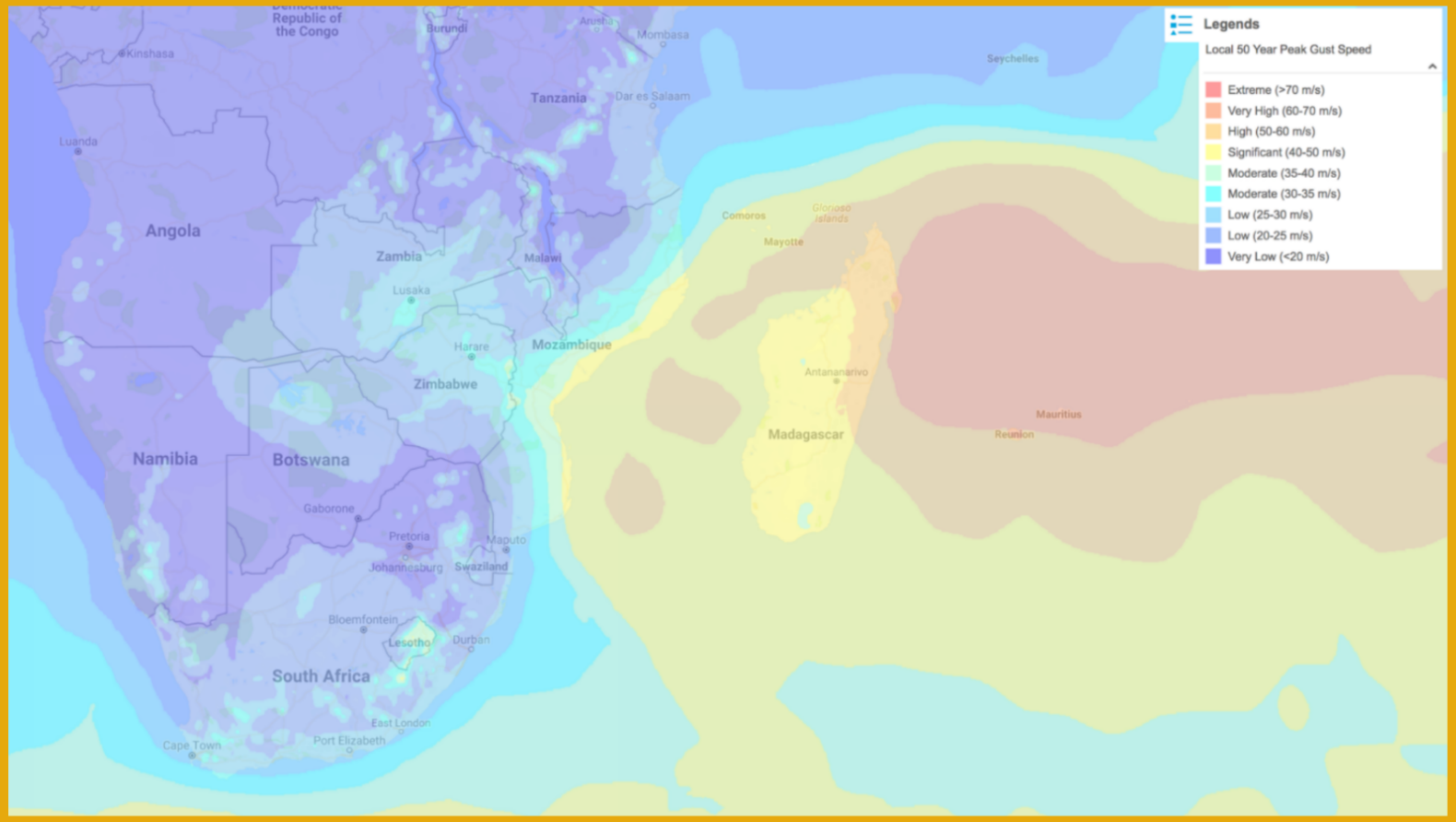
Tsunami
0

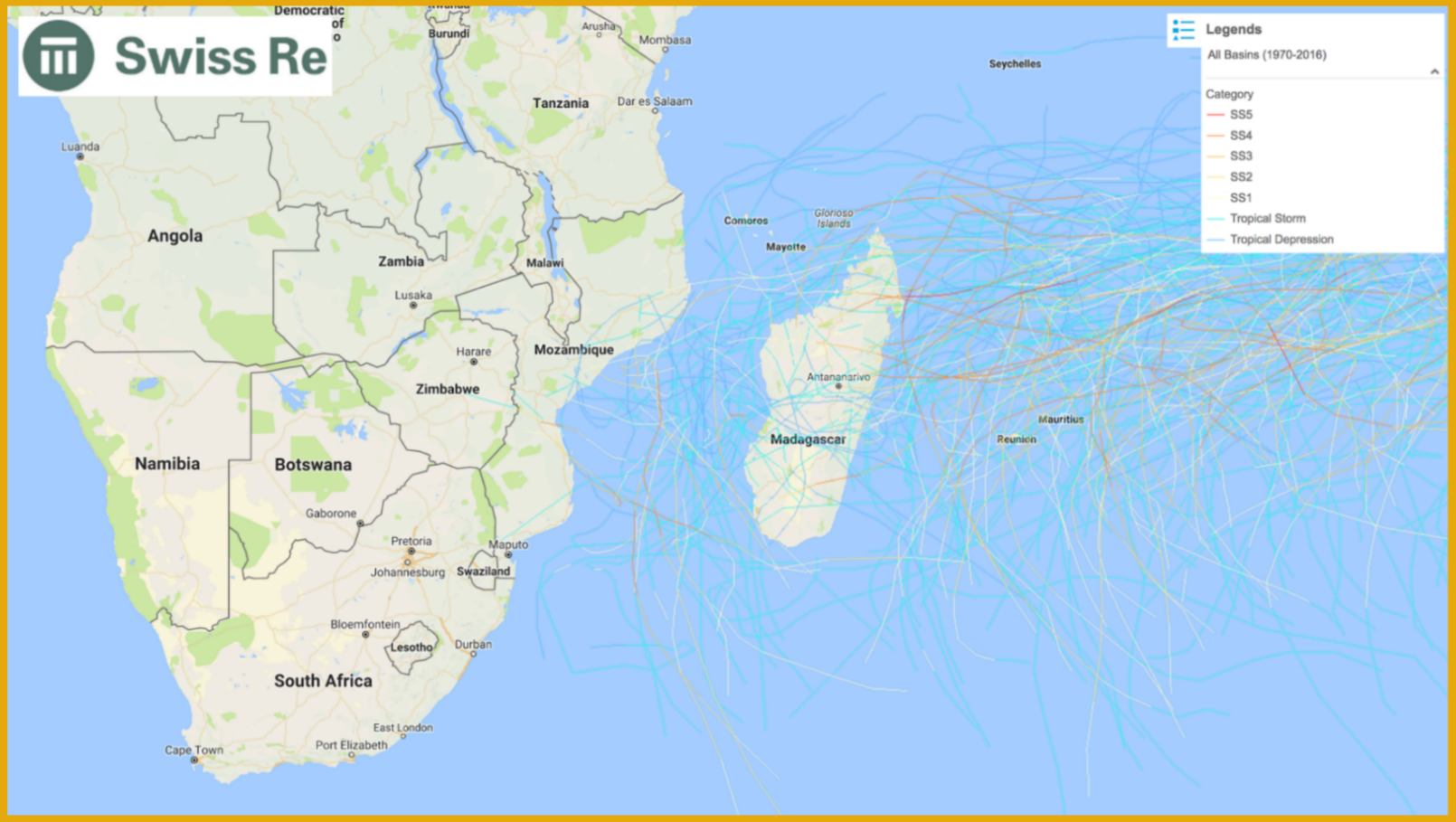
Storm Surge
0

Flood
0

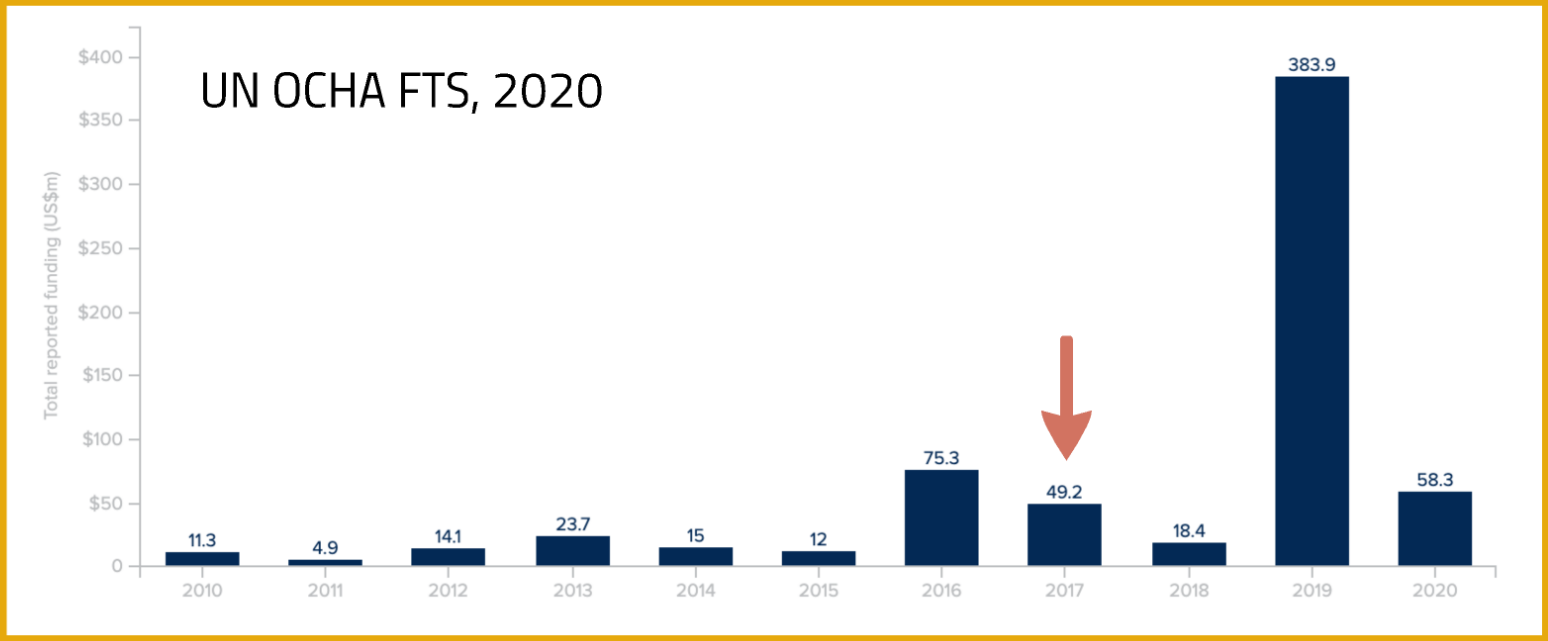
Flash Flood
100

▸ **Political Violence Index**
68


Legends
Local 50 Year Peak Gust Speed
Extreme (>70 m/s)
Very High (60-70 m/s)
High (50-60 m/s)
Significant (40-50 m/s)
Moderate (35-40 m/s)
Moderate (30-35 m/s)
Low (25-30 m/s)
Low (20-25 m/s)
Very Low (<20 m/s)
Republic of the Congo
Kinshasa
Burundi
Mombasa
Seychelles
Tanzania
Dar es Salaam
Luanda
Angola
Comoros
Mayotte
Zambia
Malawi
Lusaka
Harare
Mozambique
Zimbabwe
Antananarivo
Madagascar
Mauritius
Reunion
Namibia
Botswana
Gaborone
Pretoria
Maputo
Johannesburg
Swaziland
Bloemfontein
Lesotho
Durban
South Africa
East London
Cape Town
Port Elizabeth


Swiss Re
Legends
All Basins (1970-2016)
Category
SS5
SS4
SS3
SS2
SS1
Tropical Storm
Tropical Depression
Democratic
Burundi
Arusha
Mombasa
Seychelles
Tanzania
Dar es Salaam
Luanda
Angola
Zambia
Malawi
Comoros
Glorioso Islands
Mayotte
Lusaka
Harare
Mozambique
Zimbabwe
Antananarivo
Mauritius
Reunion
Madagascar
Namibia
Botswana
Gaborone
Pretoria
Maputo
Johannesburg
Swaziland
Bloemfontein
Lesotho
Durban
South Africa
East London
Cape Town
Port Elizabeth

SOS-CV-Inhambane
N242
100 m


UN OCHA FTS, 2020
Total reported funding (US$m)
$400
$350
$300
$250
$200
$150
$100
$50
0
11.3
4.9
14.1
23.7
15
12
75.3
49.2
18.4
383.9
58.3
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

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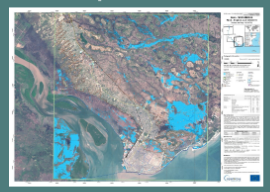
EO and humanitarian Needs

What is happening vs. what is happening to X

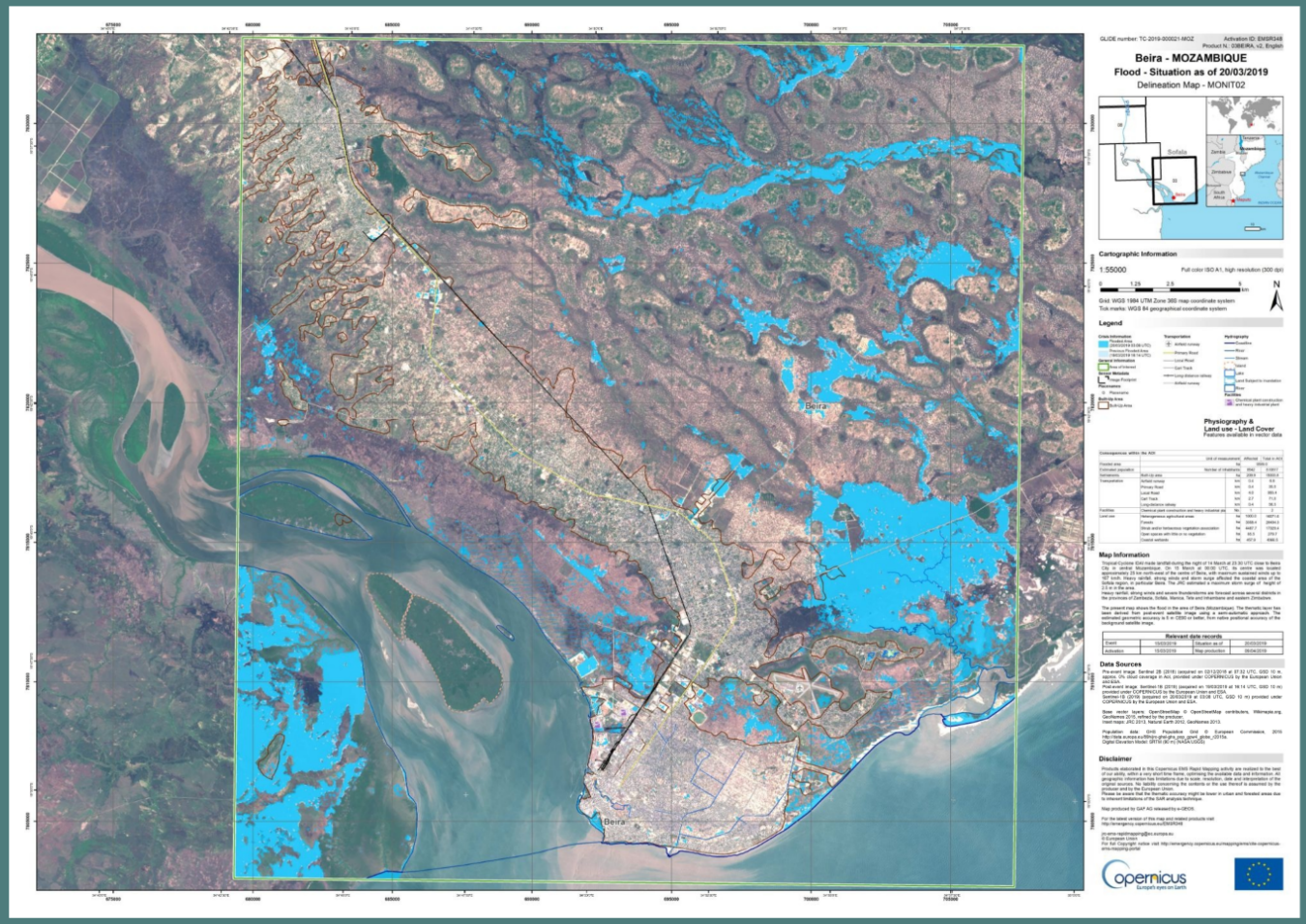
Satellite data require context and interpretation

Emergency data are shared via dozens of portals



Technical capacities are low (black boxes?)

Timely, visual evidence


Beira - MOZAMBIQUE
Flood - Situation as of 20/03/2019
Delineation Map - MONIT02
Cartographic Information
1:55000
Legend
Physiography &
Land use - Land Cover
Map Information
Data Sources
Disclaimer
Beira
Sofala
Copernicus

Data Sources

Pre-event image: Sentinel 2B (2018) (acquired on 02/12/2018 at 07:32 UTC, GSD 10 m, approx. 0% cloud coverage in AoI, provided under COPERNICUS by the European Union and ESA.
Post-event image: Sentinel-1B (2019) (acquired on 19/03/2019 at 16:14 UTC, GSD 10 m) provided under COPERNICUS by the European Union and ESA.
Sentinel-1B (2019) (acquired on 20/03/2019 at 03:08 UTC, GSD 10 m) provided under COPERNICUS by the European Union and ESA.

Base vector layers: OpenStreetMap © OpenStreetMap contributors, Wikimapia.org, GeoNames 2015, refined by the producer.
Inset maps: JRC 2013, Natural Earth 2012, GeoNames 2013.

Population data: GHS Population Grid © European Commission, 2015 http://data.europa.eu/89h/jrc-ghsl-ghs_pop_gpw4_globe_r2015a.
Digital Elevation Model: SRTM (90 m) (NASA/USGS)

Disclaimer

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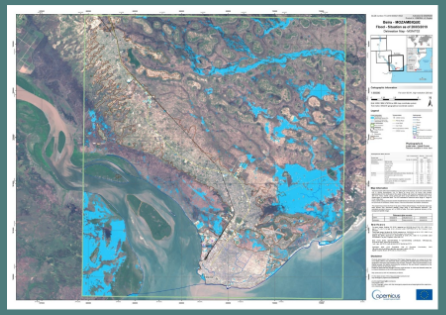

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perigeo
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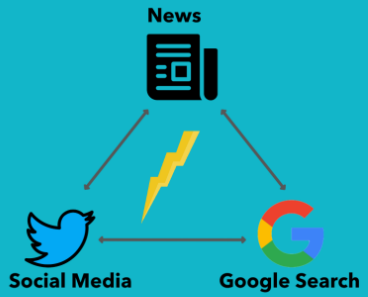
Human Behavior



People talk about their emotions, risk perception, ideas, behavior, etc. online

Mobile connectivity is rapidly increasing in low-income countries

(Social) media analysis must extend beyond the epicenter of disasters

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perigeo
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From Data to actionable Knowledge

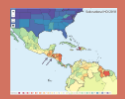
- TB of satellite data/day
- Model data/forecasts
- 6 Bn Google searches/day
- >500 Mio Tweets/day
- Hundreds of news reports
- Dozens of emergency reports

→

- Where do I find evidence for disaster impacts?
- Can I trust the data source?
- Is there public interest? Can I generate it?
- How does interest relate to behavior?
- Where and who are the new donors?

Use Case Hurricane Amanda

Early Warning


Human Development Index

El Salvador

Guatemala

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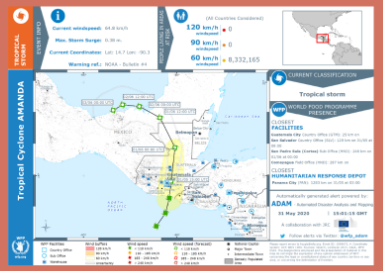
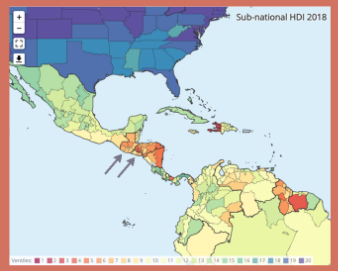
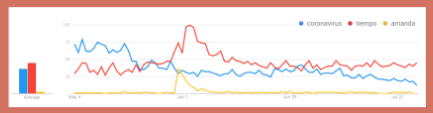


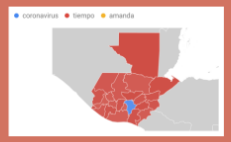
Early Warning



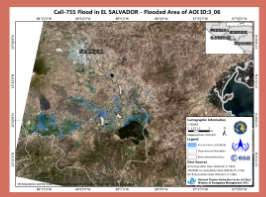
Human Development Index

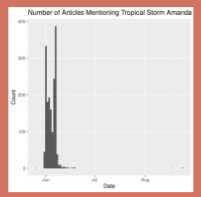


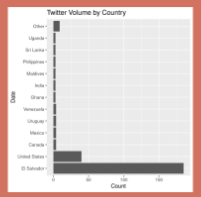
El Salvador

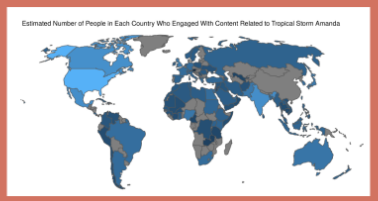


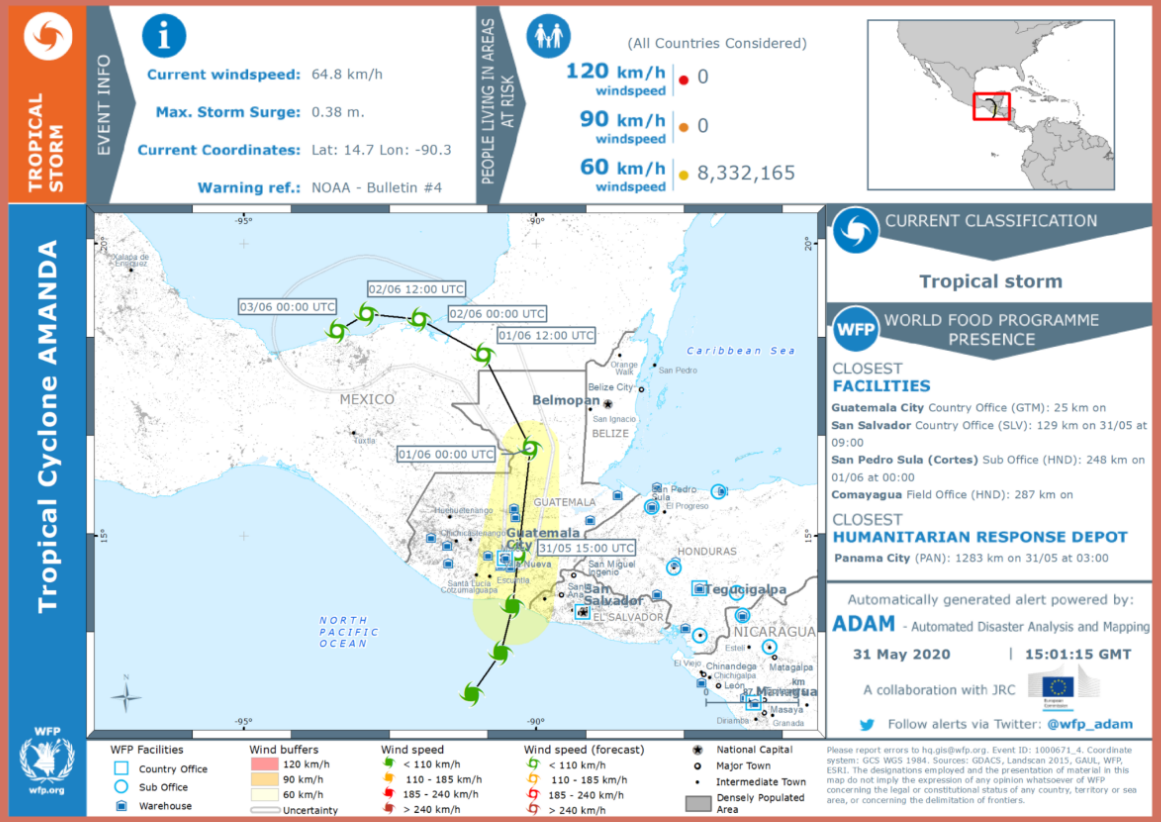
Guatemala



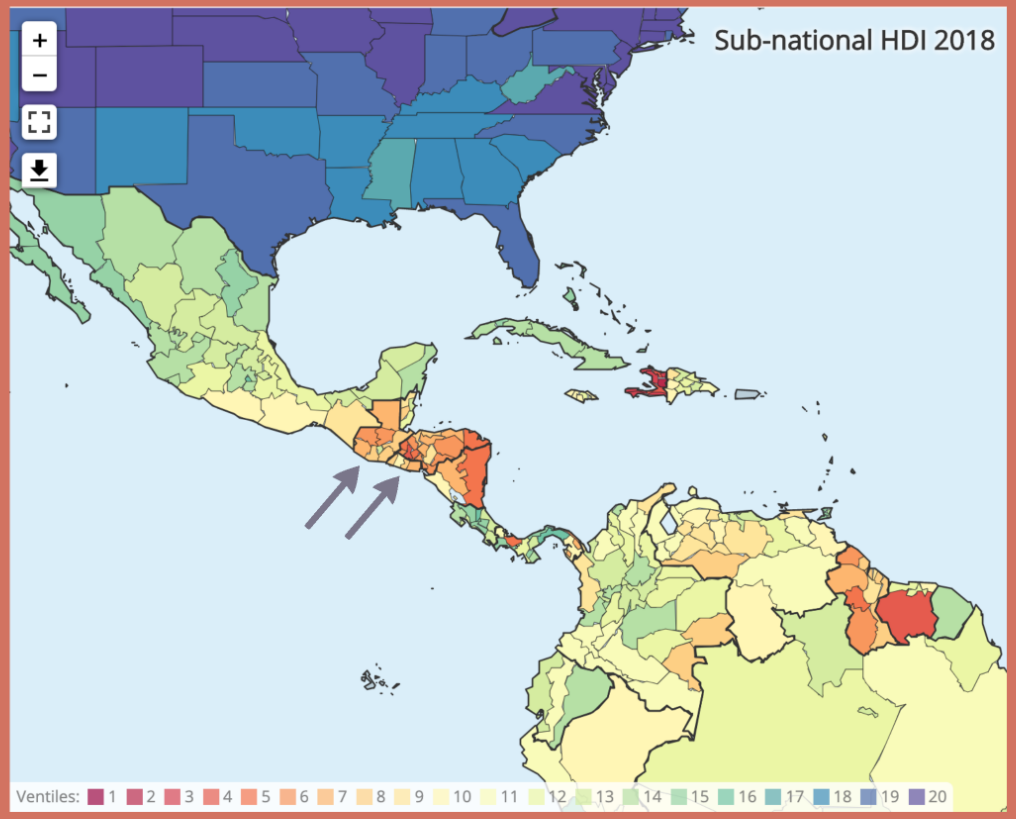




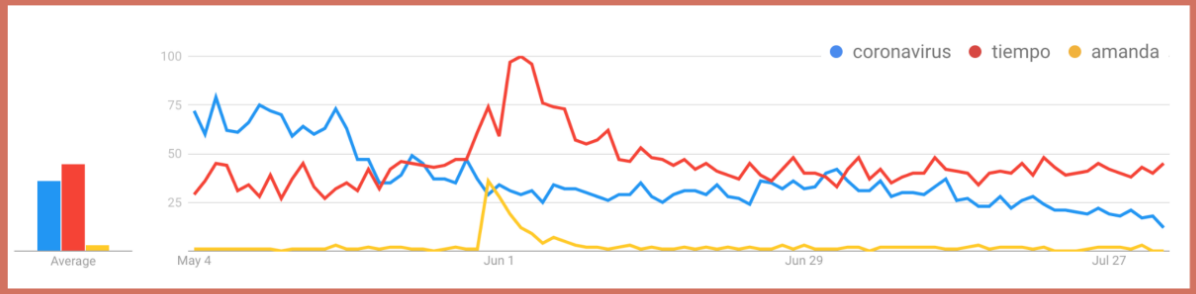




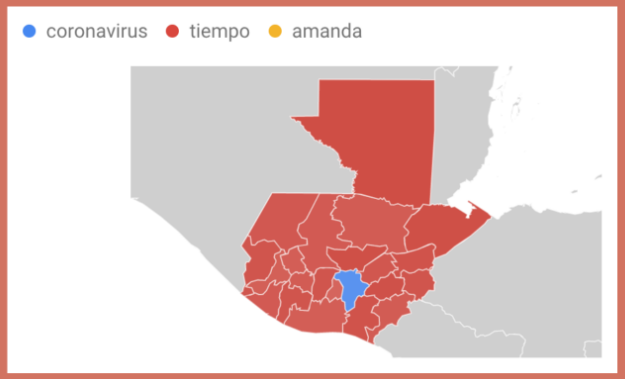
Early Warning



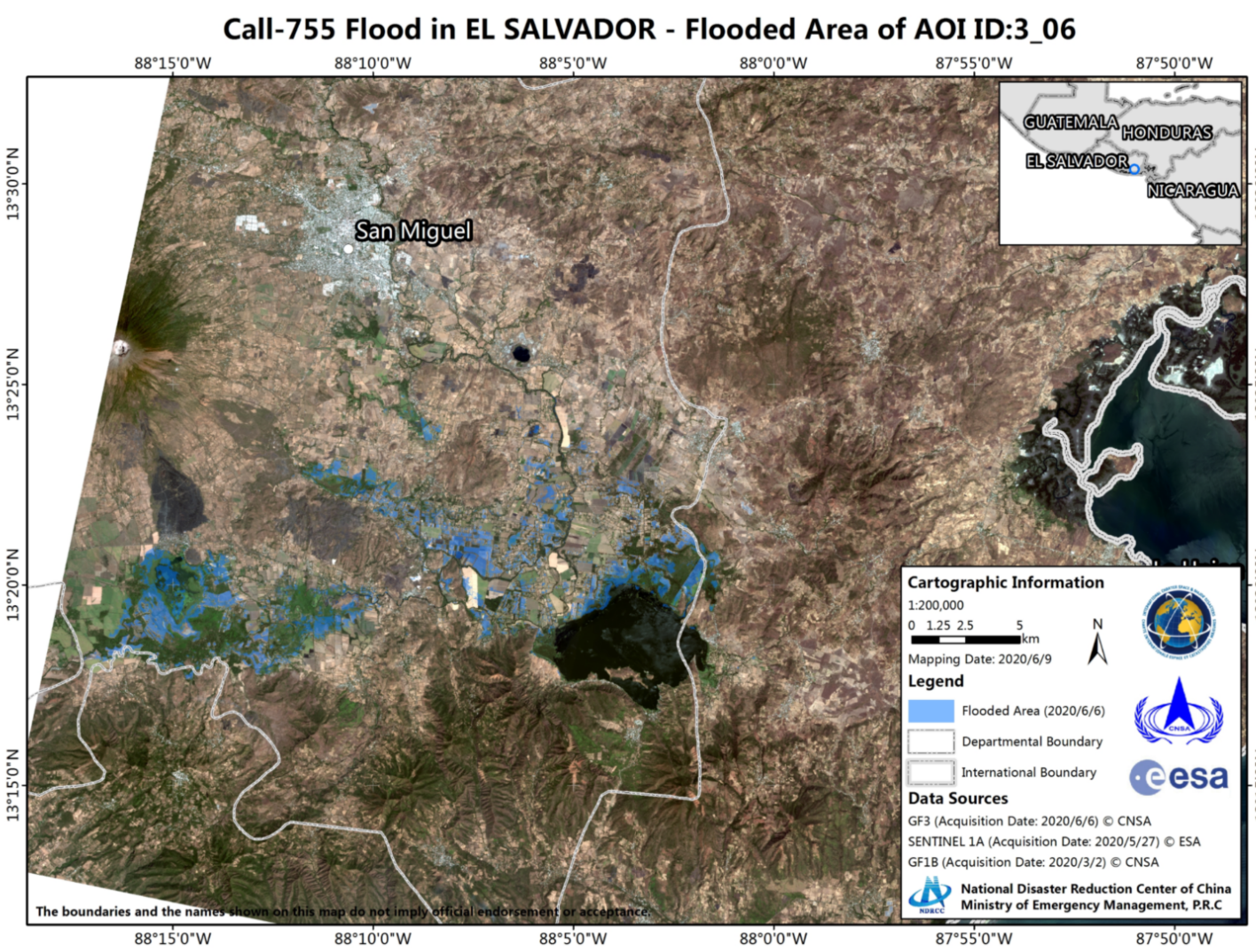
Human Development Index

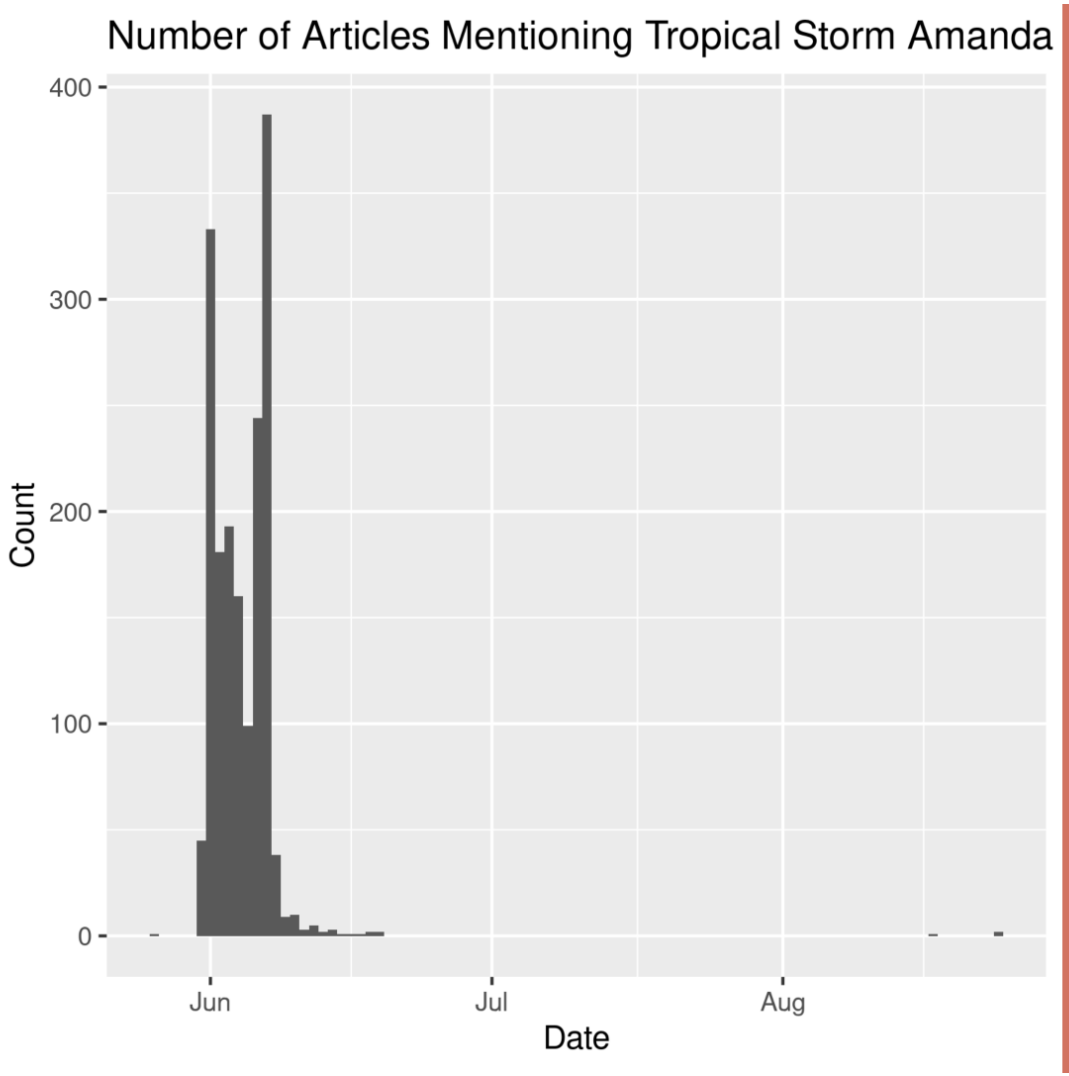


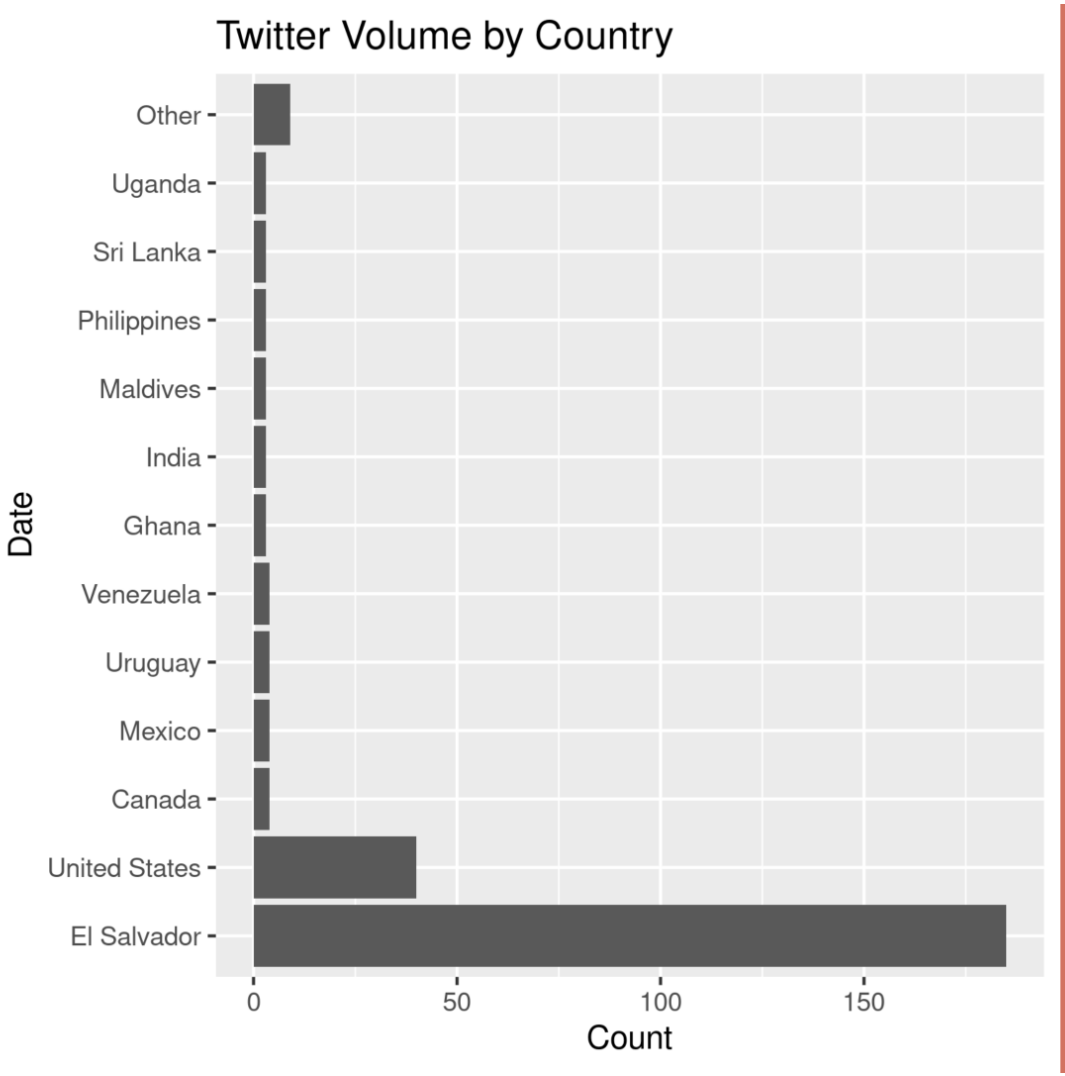
El Salvador



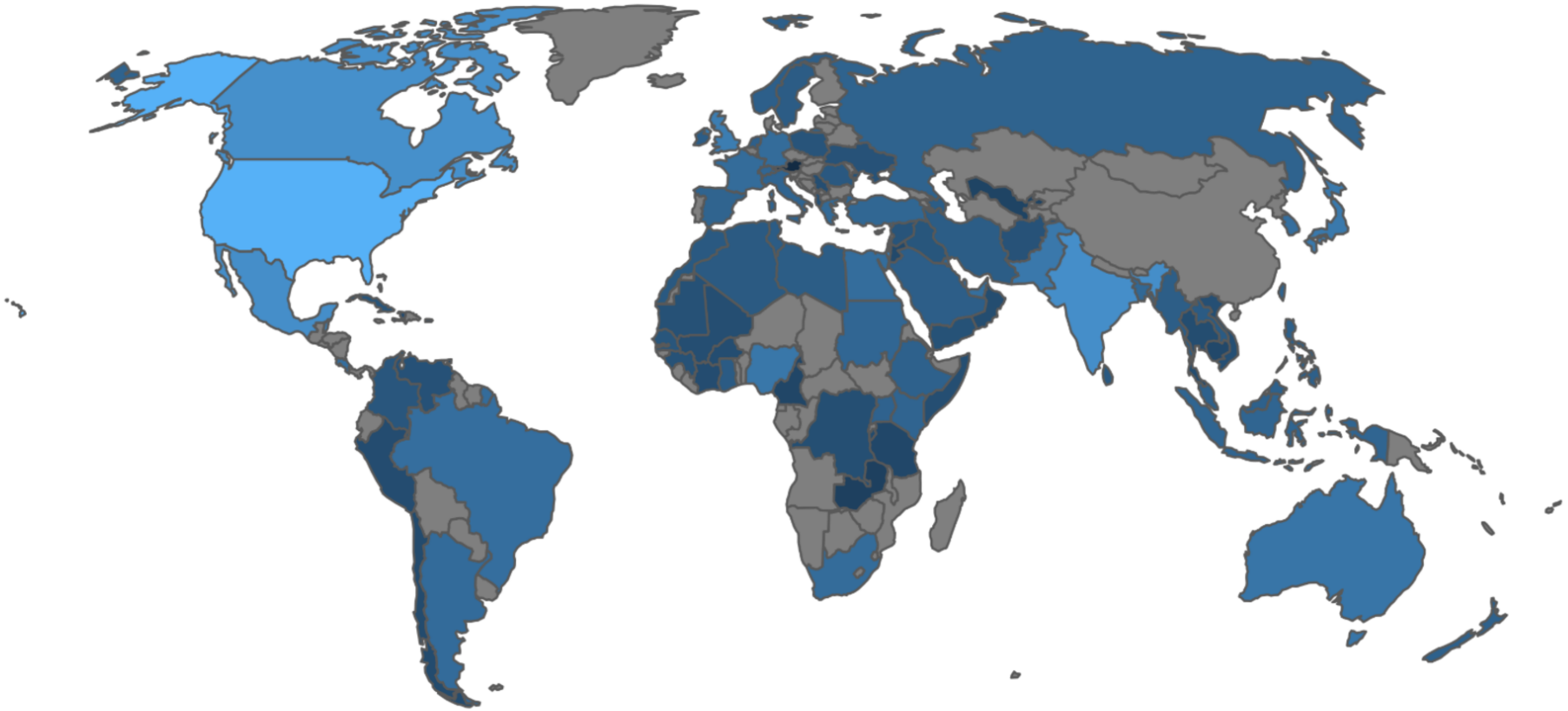
Guatemala


Call-755 Flood in EL SALVADOR - Flooded Area of AOI ID:3_06
88°15'0"W
88°10'0"W
88°5'0"W
88°0'0"W
87°55'0"W
87°50'0"W
13°30'0"N
13°25'0"N
13°20'0"N
13°15'0"N
San Miguel
GUATEMALA
HONDURAS
EL SALVADOR
NICARAGUA
Cartographic Information
1:200,000
0 1.25 2.5 5
km
N
Mapping Date: 2020/6/9
Legend
Flooded Area (2020/6/6)
Departmental Boundary
International Boundary
Data Sources
GF3 (Acquisition Date: 2020/6/6) © CNSA
SENTINEL 1A (Acquisition Date: 2020/5/27) © ESA
GF1B (Acquisition Date: 2020/3/2) © CNSA
National Disaster Reduction Center of China
Ministry of Emergency Management, P.R.C
The boundaries and the names shown on this map do not imply official endorsement or acceptance.


Number of Articles Mentioning Tropical Storm Amanda
Count
400
300
200
100
0
Jun
Jul
Aug
Date


Twitter Volume by Country
Other
Uganda
Sri Lanka
Philippines
Maldives
India
Ghana
Venezuela
Uruguay
Mexico
Canada
United States
El Salvador
Date
0
50
100
150
Count

Estimated Number of People in Each Country Who Engaged With Content Related to Tropical Storm Amanda



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perigeo
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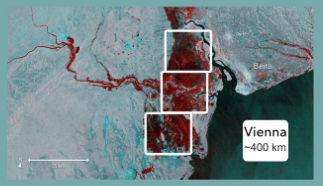
Added-Value

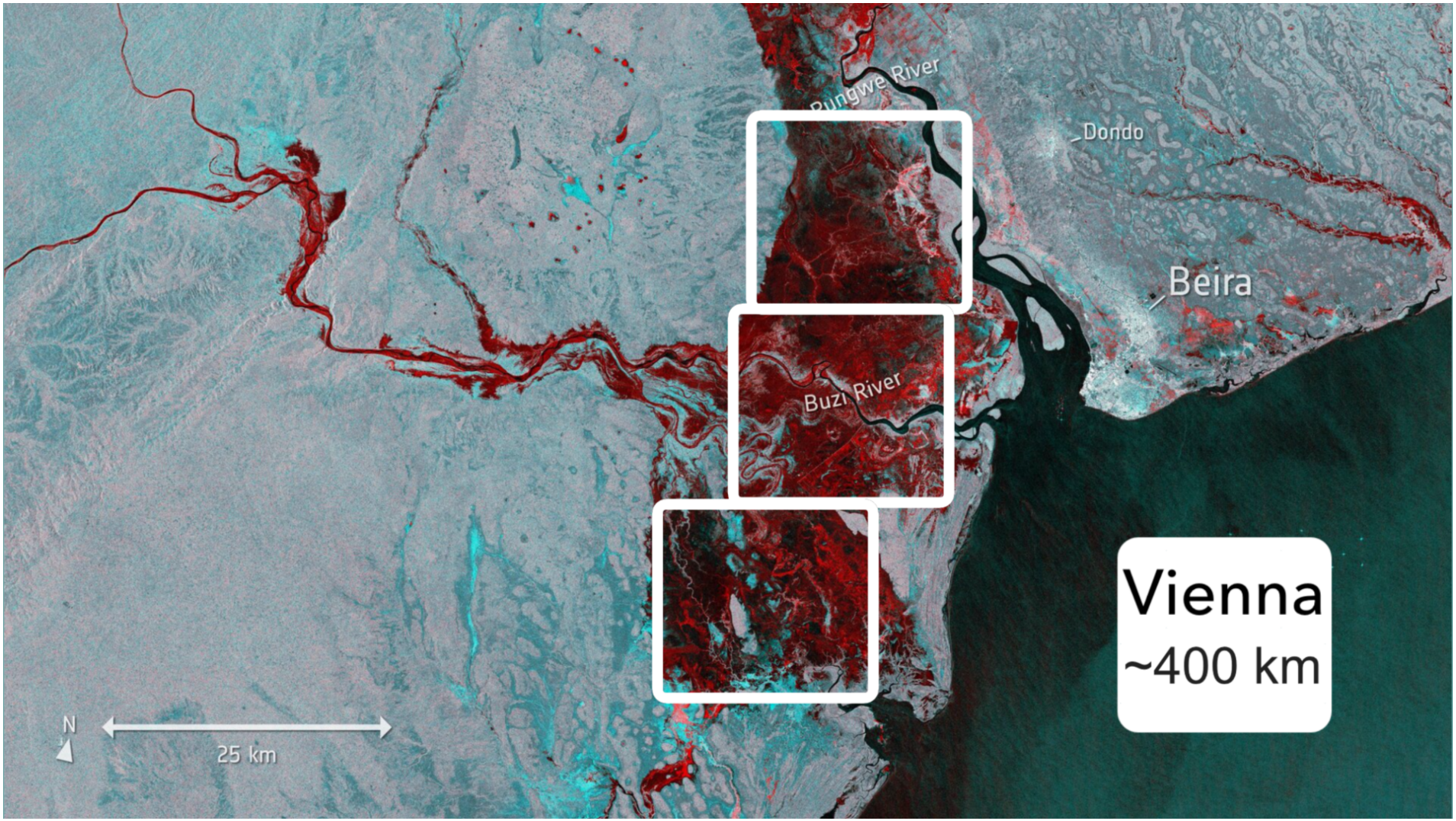
Centralize, harmonize, contextualize emergency information

Understand social interest

Emergency data vs human behavior



Satellite-based storytelling


Pungwe River
Dondo
Beira
Buzi River
Vienna
~400 km
N
25 km

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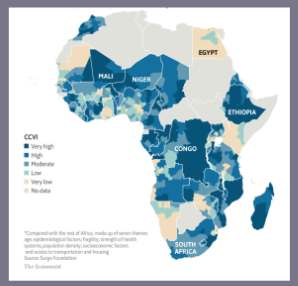
Conclusion and next Steps

Satellite data benefit from links to socioeconomic info AND social interest
--> disaster preparedness
--> disaster risk financing/fundraising
--> communications
...a 'new normal'?

We are moving towards predictive analytics

Actionable info: Data providers, analysts/researchers and end users need to collaborate



markus.enenkel@perigee.at

www.perigee.at

next Steps

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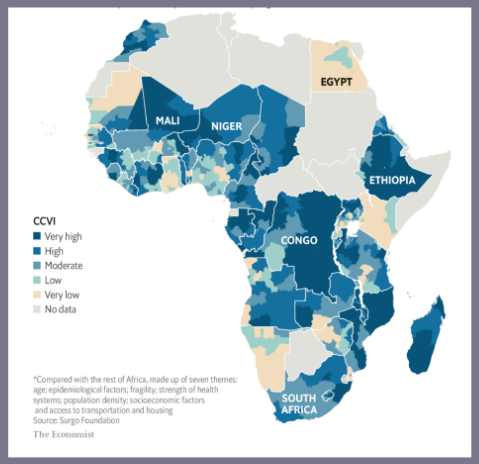

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