

Situation overview of EM-DAT products and future directions

The georeferencing activity

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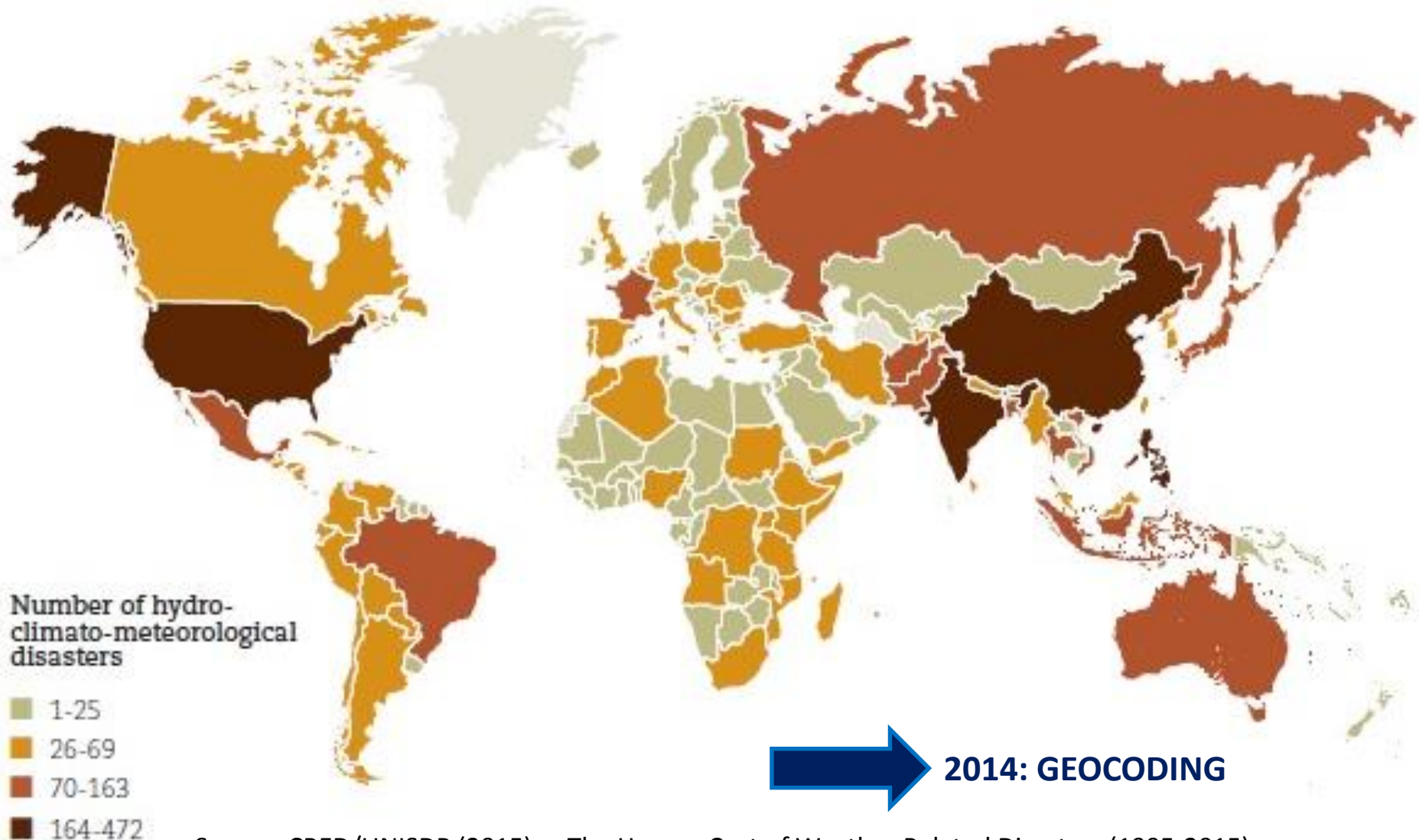
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EM-DAT: country level data

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Source: CRED/UNISDR (2015). « The Human Cost of Weather Related Disasters (1995-2015) »

Georeferencing activity

State of the activity

State of the activity:

- Earthquakes, volcanic activities, mass movements (dry), floods, landslides, storms, extreme temperatures, droughts and wildfires
- From 2000 to 2015
- Worldwide
- At ADM 2 AND/OR ADM1 level

Georeferencing activity

Methodology

Standardized methodology:

- Location of affected areas: text → GIS format (GAUL 2015 codes (FAO, 2015)), up to the 2nd administrative unit level.

Edit Country

Disaster No: 2014 - 9404
Disaster type: Drought
Glide:
Enter date: 10-15-2014 By: Regina Below
Modify date: 08-02-2016 By: Alizée Vanderve

Country:* Kenya
Region: Eastern Africa
Continent: Africa

Start date:* - January - 2014
End date:* - May - 2015

Origin:
Associated disaster: --
Associated disaster2: --
Dis. magnitude value: Km2
River basin:
Epicenter:
Latitude: ex: 66.77/-65.88 : positive for North, negative for South
Longitude: ex: 66.77/-65.88 : positive for East, negative for West
Local time: hh:mm (hh in [00-23], m
Aid contribution:

☐ OFDA Response
☐ Appeal for Int'l assistance
☐ Appeal date
☐ Declaration of disaster
☐ Declaration date

PPA: 4520358
APA: 233352.42

Location

Mandera, Wajir districts (North Eastern province) Turkana, Baringo, Samburu districts (Rift Valley province), Marsabit district (Eastern province)

Georeferencing

Locations
Shapefiles

Gaul version: 2015
Insert ADM1/2: ma

ADM1_CODE	ADM1_NAME	ADM2_CODE	ADM2_NAME	Delete
51327	Eastern	51352	Marsabit	<input type="button" value="X"/>
51329	North Eastern	51363	Mandera	<input type="button" value="X"/>
51329	North Eastern	51364	Wajir	<input type="button" value="X"/>
51331	Rift Valley	51377	Baringo	<input type="button" value="X"/>
51331	Rift Valley	51389	Samburu	<input type="button" value="X"/>
51331	Rift Valley	51392	Turkana	<input type="button" value="X"/>

☐ Partial Georef.
☐ .shp to update
☐ Details
☒ Srcs consulted

Comments:

Georeferencing activity

Outputs

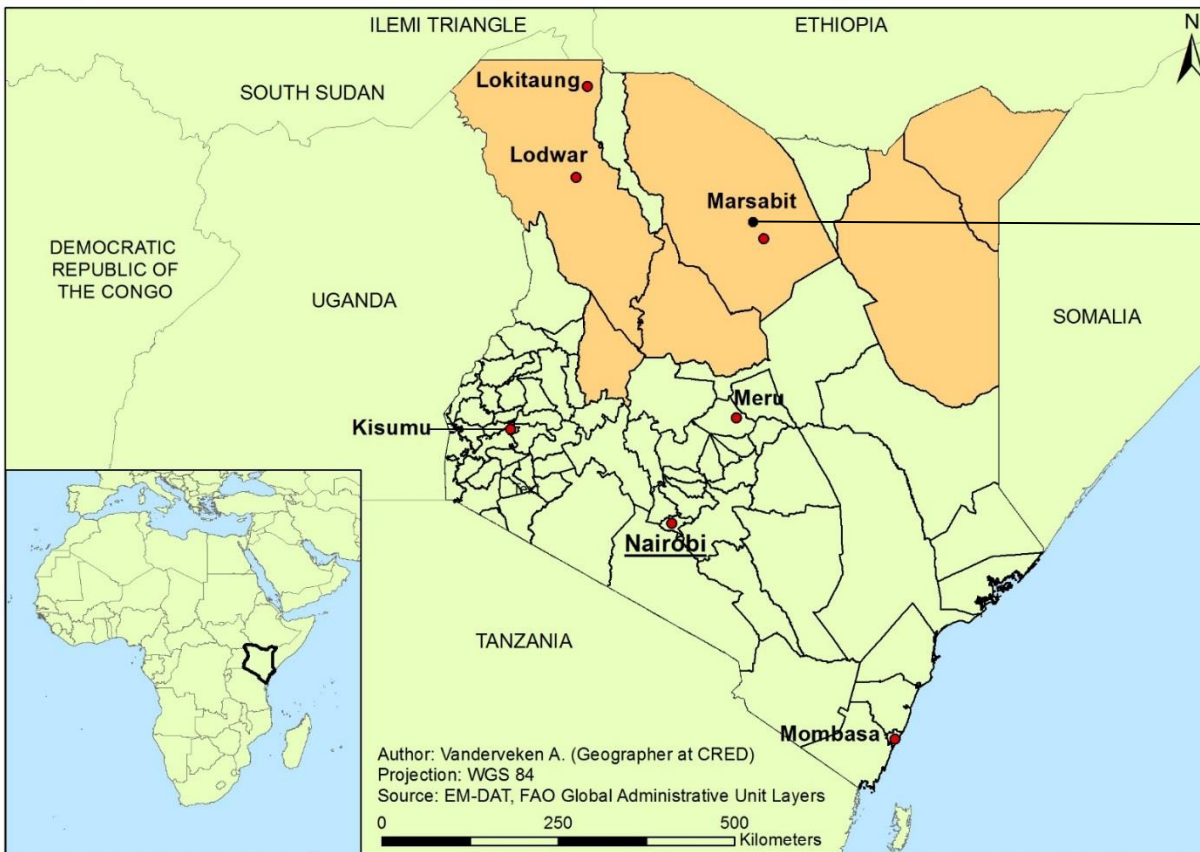
Standardized methodology:

- Creation of a shapefile and its centroid for each disaster based on the selected GAUL2015 codes, automatized procedure in R.

Kenyan drought, 2014

X	Y
2.5432	37.8681

Start Date: Jan 2014
End Date: May 2015
Total victims: 1,600,000





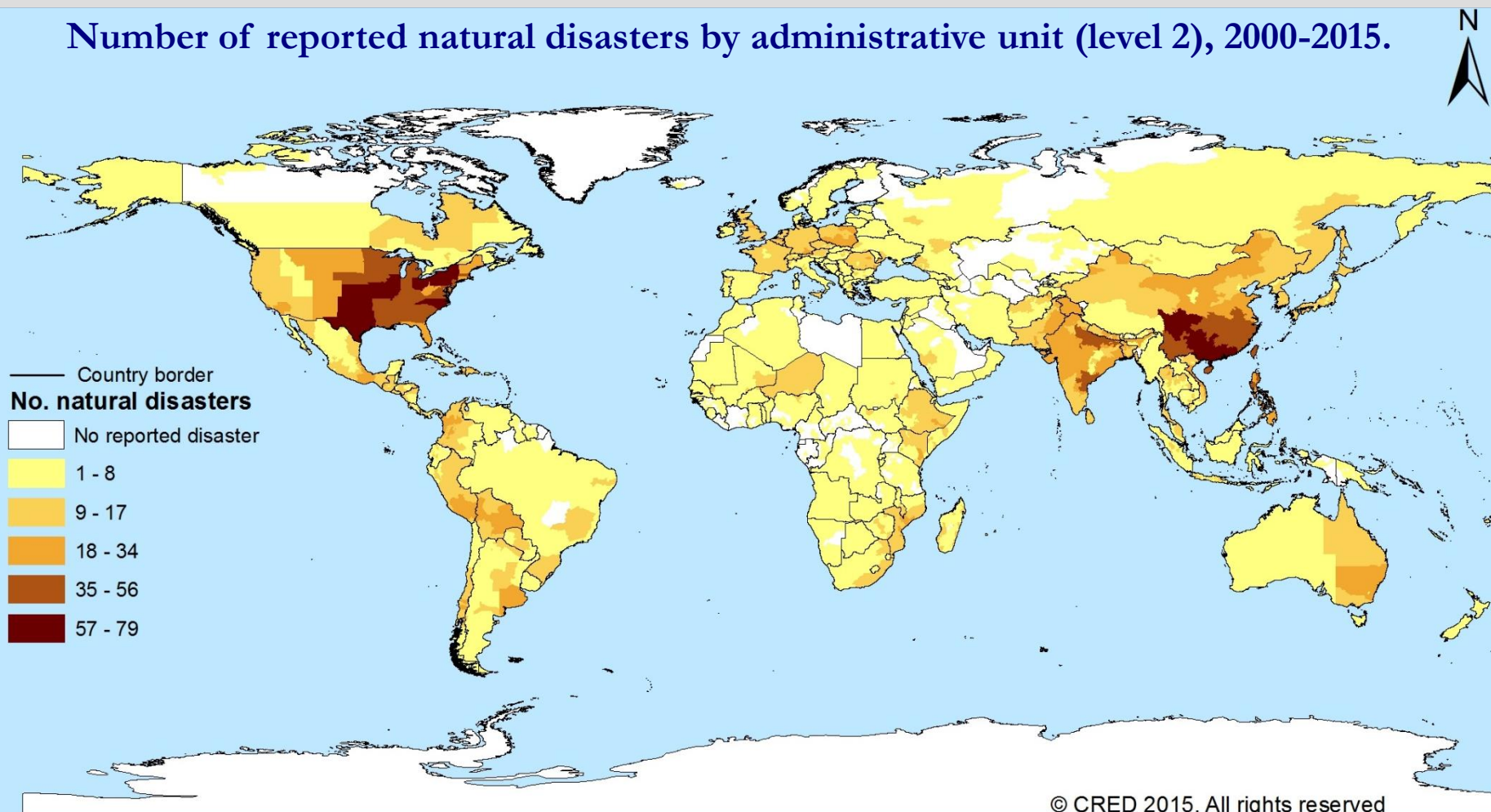
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First results

Sub-national Hazard Frequency

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Number of reported natural disasters by administrative unit (level 2), 2000-2015.



Author: Alizée Vanderveken
Source: EM-DAT, 2016
Projection: WGS84



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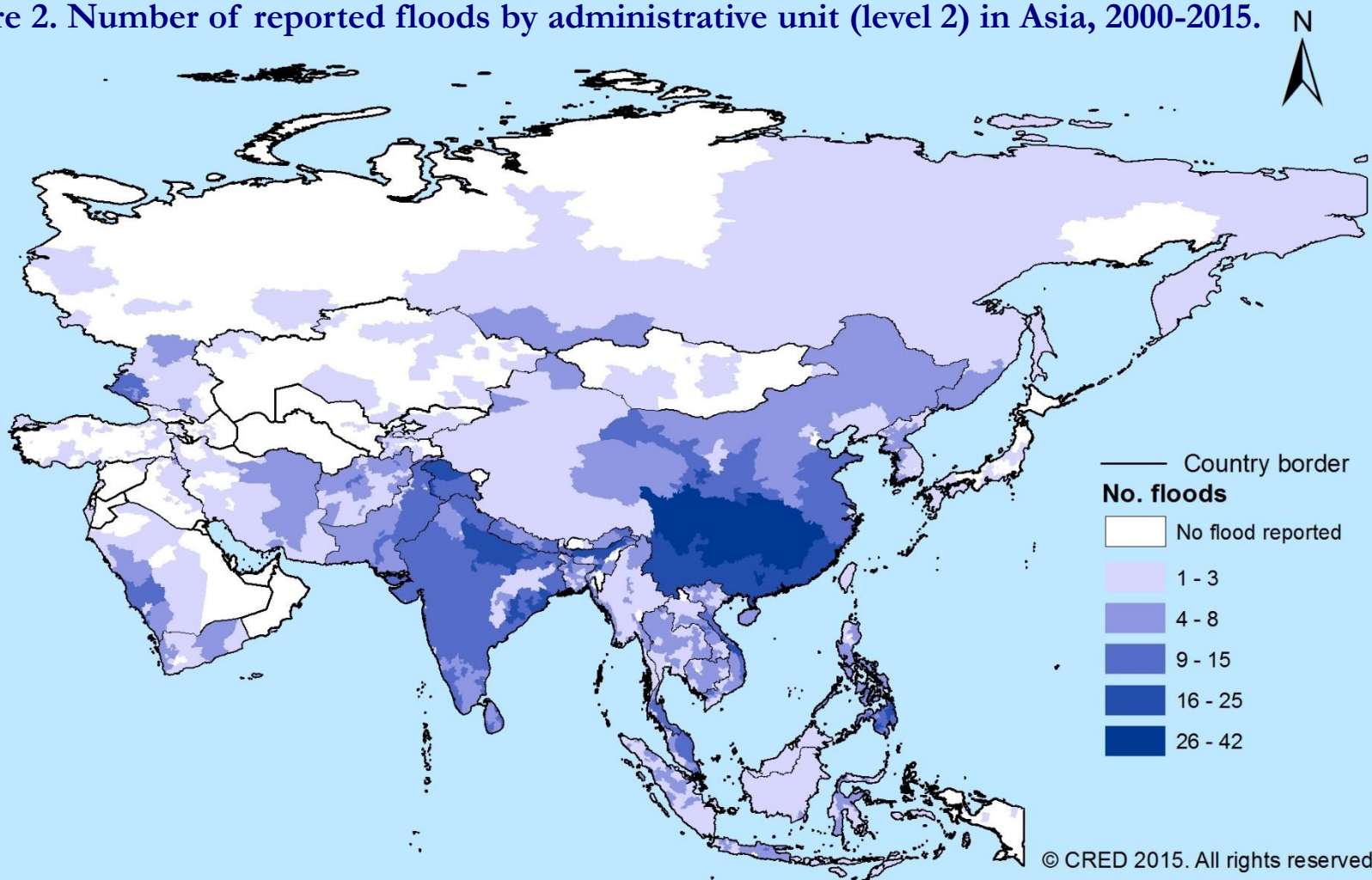
First results

Sub-national Hazard Frequency

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Figure 2. Number of reported floods by administrative unit (level 2) in Asia, 2000-2015.



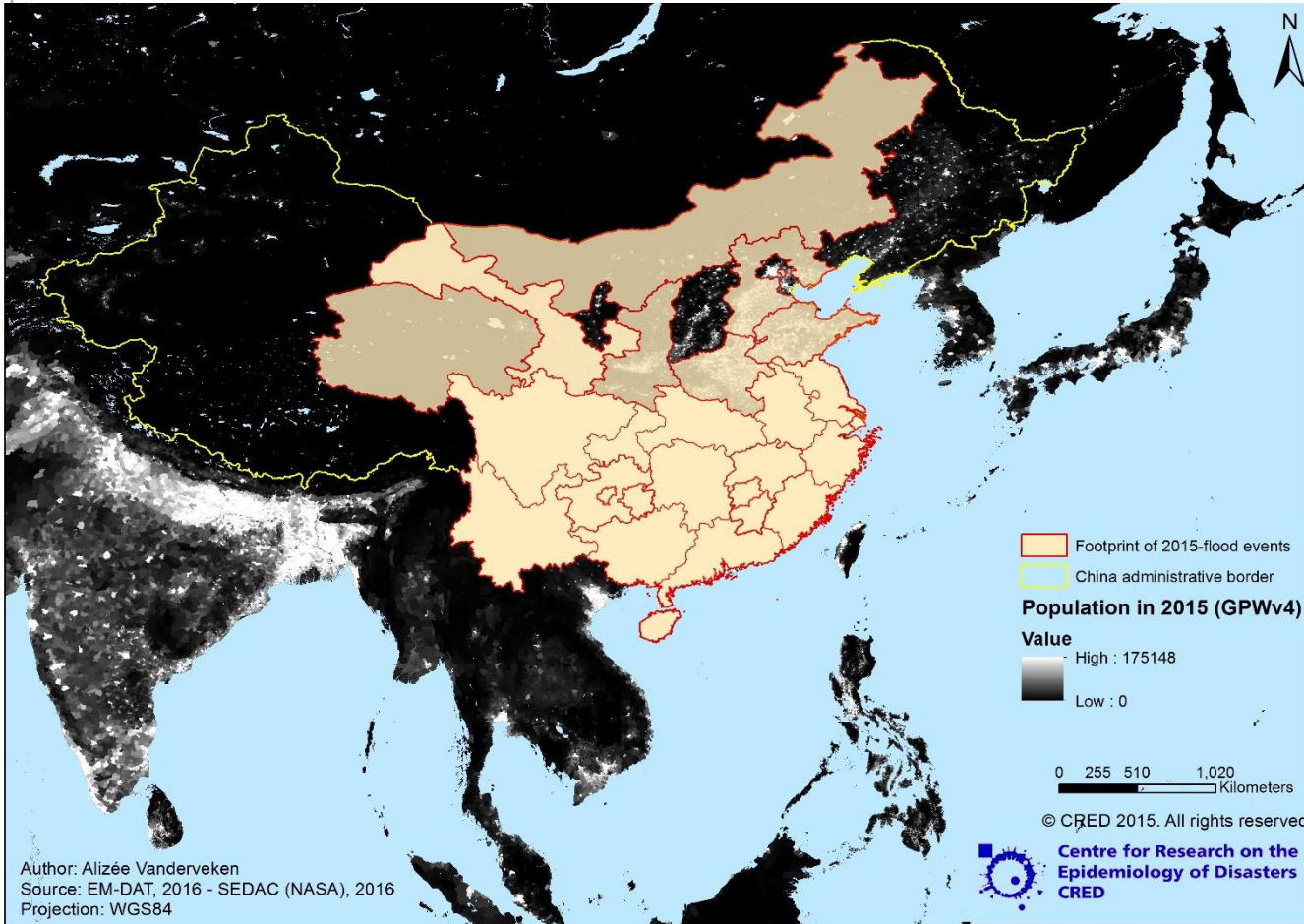
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First results

Combination EM-DAT with GPWv4 For calculation of population exposure

China, 2015-flood events



Author: Alizée Vanderveken
Source: EM-DAT, 2016 - SEDAC (NASA), 2016
Projection: WGS84

Start	No. deaths	PPA
13-May	58	690,511,744
13-May	20	622,318,386
28-May	17	178,825,764
16-Jun	15	506,988,922
01-Jun	9	380,271,317
07-Jun	16	490,224,019
26-Jun	35	218,651,269
20-Jul	28	263,901,591
02-Aug	19	686,886,001
16-Aug	41	189,273,640
15-Sep	14	525,918,424
10-Nov	38	66,418,965

$$\Rightarrow \frac{\text{No. deaths}}{\text{PPA}}$$

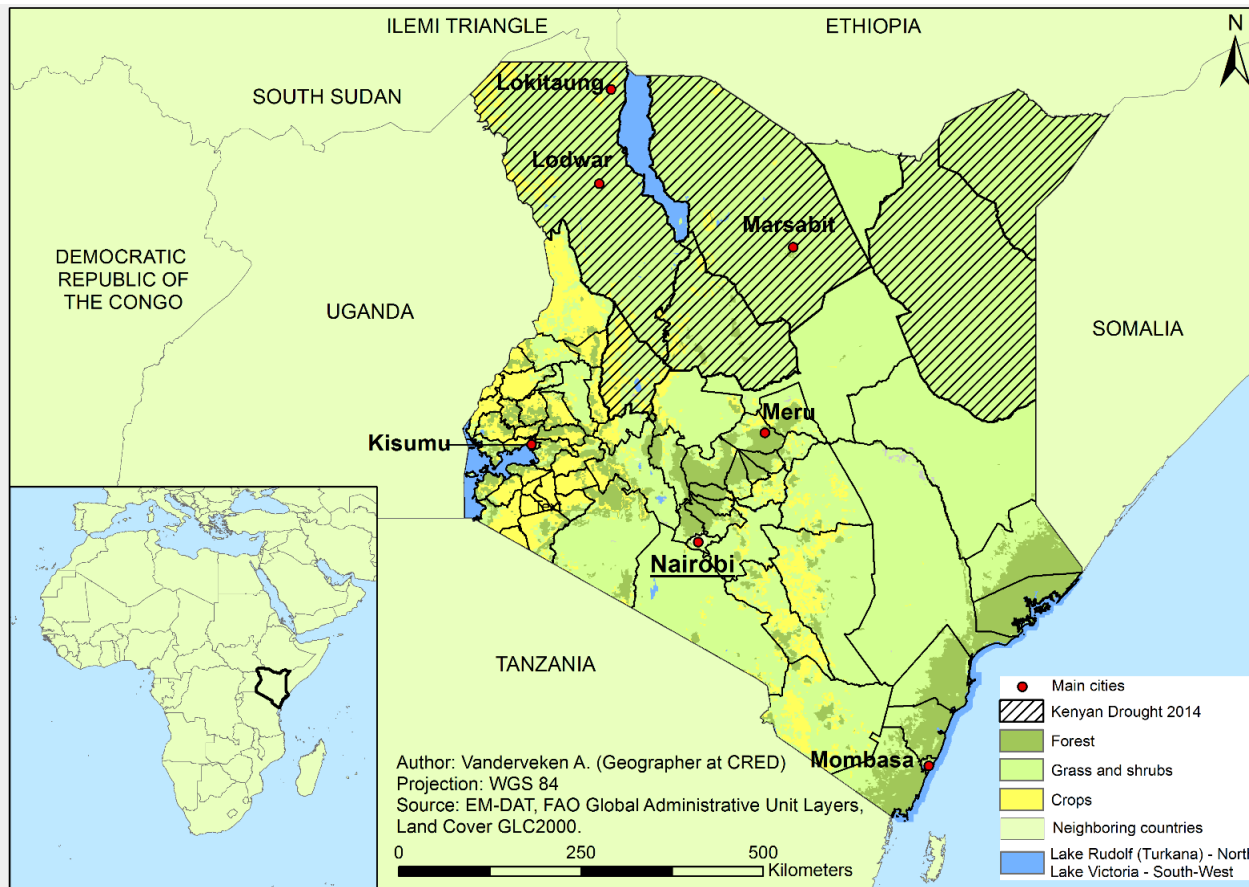
**Degree of importance of
a disaster:**

- At the time of the event
- Future: based on population forecast

First results

Importance of the right denominator

The case of Kenyan drought, 2014



Start Date: Jan 2014
Total victims: 1,600,000

Tot. Pop. Kenya
(AfriPop, 2016):
44,863,583

→ SIDI* (%): 3.6

Tot. Pop.

≠

Pop. Pot. Affected (PPA)

PPA Kenya
(Drought-2014) :
4,520,358

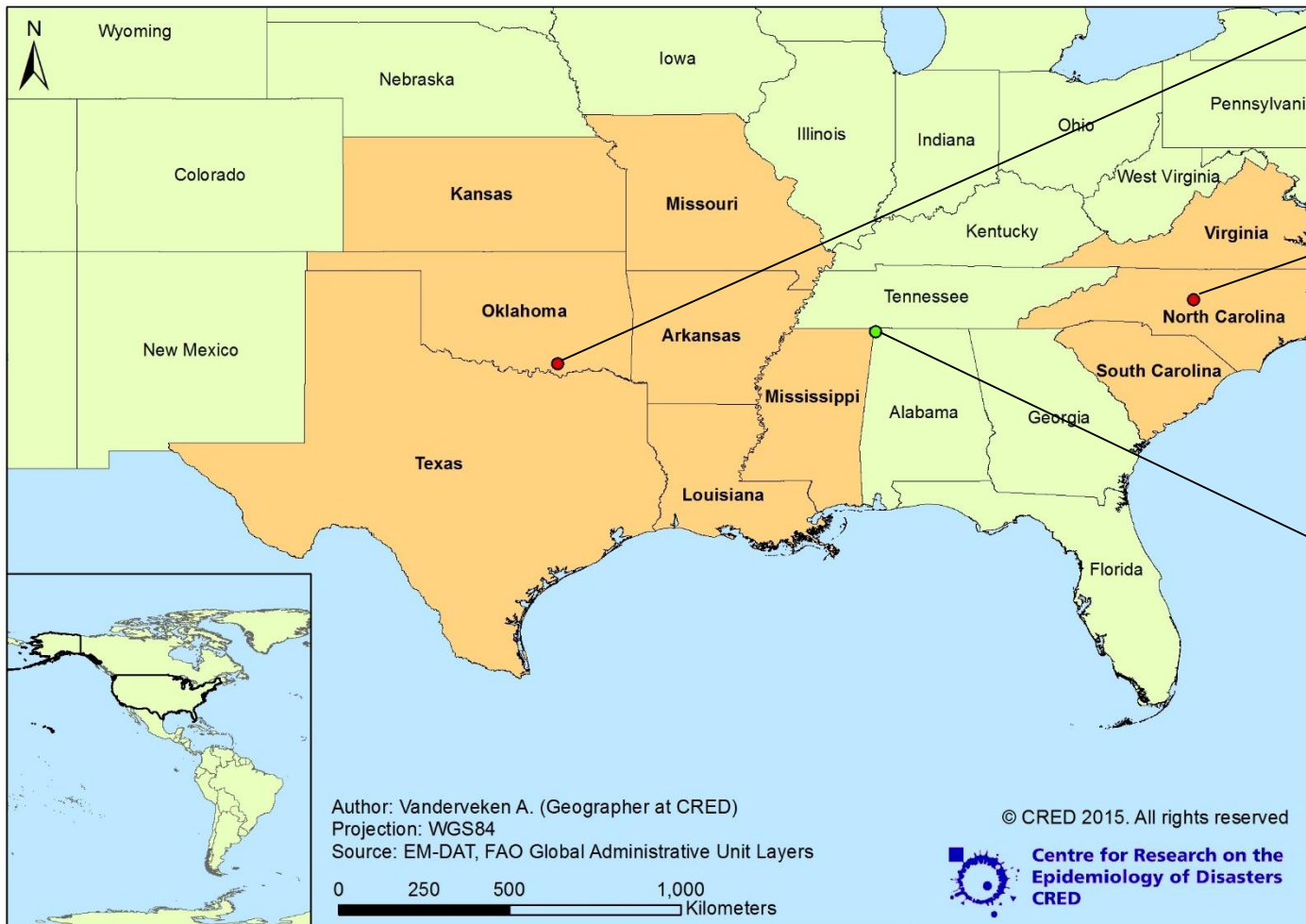
→ Adj. SIDI (%): 35.4

*SIDI = Proportion of victims (deaths, missing, affected) over the **total population** (%) of a country

Georeferencing activity

Challenges

➤ Centroids? USA storm, 2004 – 9 deaths, 1749 affected – \$300,000 USD losses



X	Y
34.0723	-96.4099
X	Y
35.7382	-79.6947
↓ ?	
X	Y
34.9053	-88.0523

Georeferencing activity

Challenges

➤ Challenges:

- Creation of centroids
- Impact data stays at the event-scale
 - Possibilities for modelling?
- Quality of georeferencing depends on:
 - Data reporting
 - Other data sources?
 - Standardization in data collection would be an added value
 - GAUL dataset
 - Reviewed each year
 - Available resources: possibility to automatize?

Georeferencing activity

Conclusion

- Georeferencing activity improves EM-DAT
- Useful material to serve as evidence-based
- Can be combined with a wide range of other data (population, landuse, ...)
- Future steps:
 - Assess the level of completeness and precision of georeferenced data
 - Improve the georeferenced data
 - Georeference 2016 events onwards
 - In-depths studies & analyses (e.g. joint paper with P. Rowhani, Z. Mehrabi, N. Ramkuty – What is the effect of disasters on crop yield and price?)
 - Integration of outputs on our website – online mapping tool

Future tasks: Development of an online mapping tool

EM-DAT

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1. Advanced mapping tool

1. Advanced mapping tool

Query options:

Reference Maps

- Lists in **Location** section: you can use only one list at a time; selecting from one will reset the others.
- **Display by Admin1/Admin2:** This option is currently available for earthquakes, landslides, volcanic activities, mass movements (dry), floods, storms, extreme temperatures, droughts, and wildfires.

Notes:

Search Criteria

Period
From: 1900 To: 2015

Location
☒ Continent ☐ Region ☐ Country

Available

- Africa
- Americas
- Asia
- Europe
- Oceania

Selected

Disasters classification

Group/Subgroup/Type/Subtype

- ☐ G Complex Disasters
- ☒ G Natural
 - ☐ SG Biological
 - ☐ SG Climatological
 - ☐ SG Extra-terrestrial
 - ☐ SG Geophysical
 - ☒ SG Hydrological
 - ☐ Flood
 - ☐ Landslide
 - ☐ Meteorological
- ☒ G Technological
 - ☒ SG Technological
 - ☐ Industrial accident
 - ☐ Miscellaneous accident
 - ☐ Transport accident

Search

Reset fields

Map Display options

Variable to display: Display by: Background layer: Symbology: Classification type: Classes:

Number of events
Total deaths
Total affected
Total damage

Country
Admin1
Admin2

Imagery
Imagery with labels
Topographic
Streets
OpenStreetMap

Graduated colors
Graduated symbols

Natural breaks (Jenks)
Quantile

3
5
7

Show results table Save map as PDF Save map as JPEG

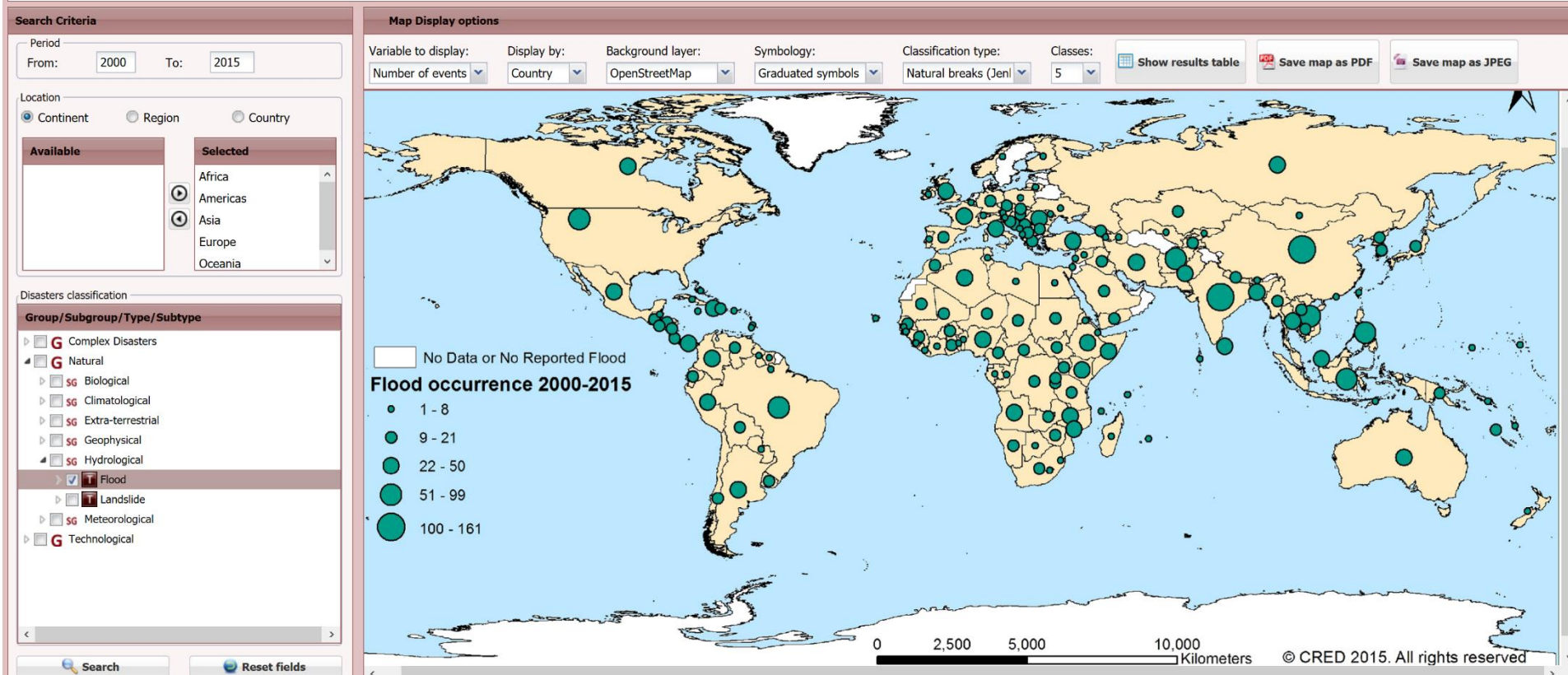
1. Advanced mapping tool

Output 1.1

+ Add transparency

Reference Maps

- Notes:**
- Lists in **Location** section: you can use only one list at a time; selecting from one will reset the others.
 - **Display by Admin1/Admin2:** This option is currently available for earthquakes, landslides, volcanic activities, mass movements (dry), floods, storms, extreme temperatures, droughts, and wildfires.

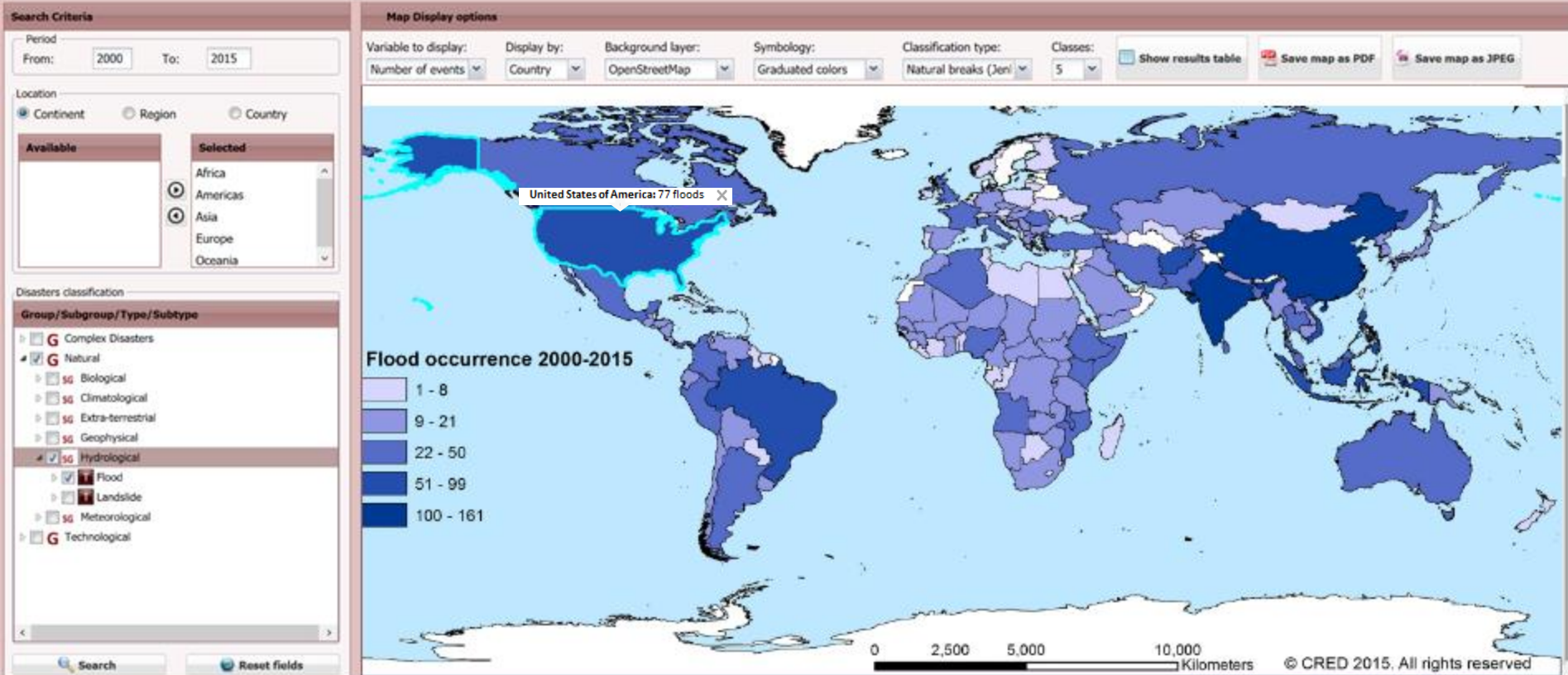


1. Advanced mapping tool

Output 1.2

Reference Maps

- Lists in **Location** section: you can use only one list at a time; selecting from one will reset the others.
- **Display by Admin1/Admin2:** This option is currently available for earthquakes, landslides, volcanic activities, mass movements (dry), floods, storms, extreme temperatures, droughts, and wildfires.

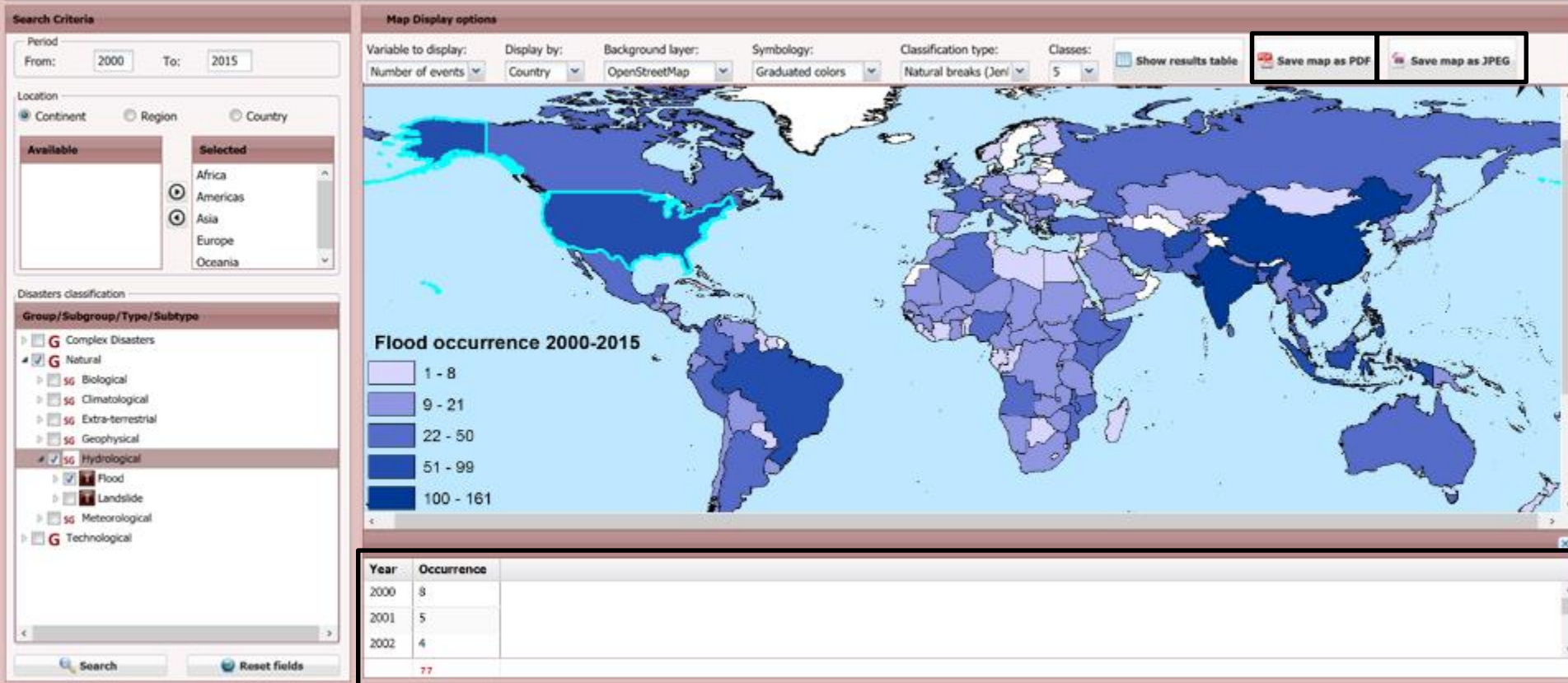


1. Advanced mapping tool

Output 1.2

Reference Maps

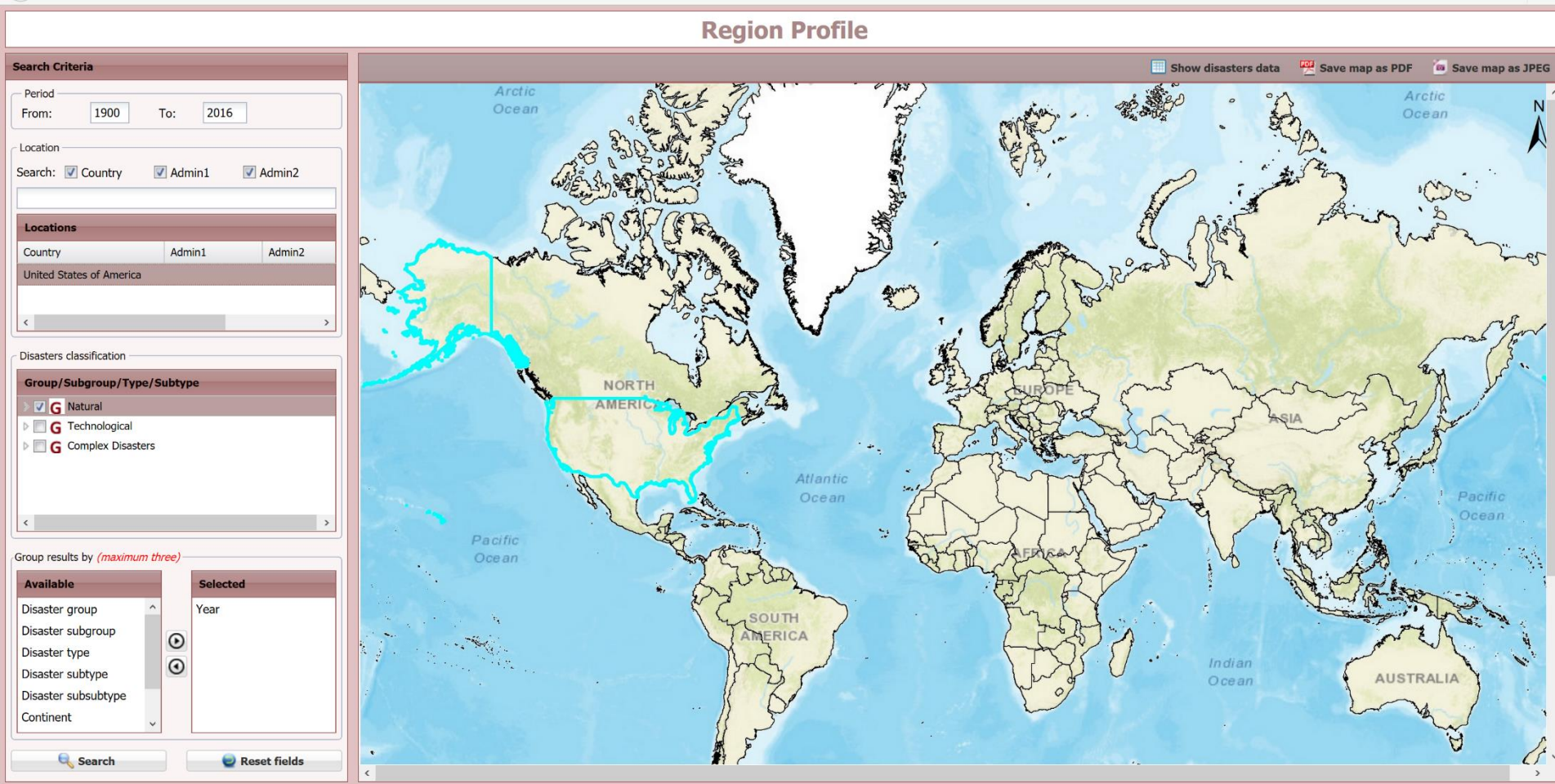
- Lists in **Location** section: you can use only one list at a time; selecting from one will reset the others.
- **Display by Admin1/Admin2:** This option is currently available for earthquakes, landslides, volcanic activities, mass movements (dry), floods, storms, extreme temperatures, droughts, and wildfires.



2. Region profile tool

2. Region profile tool

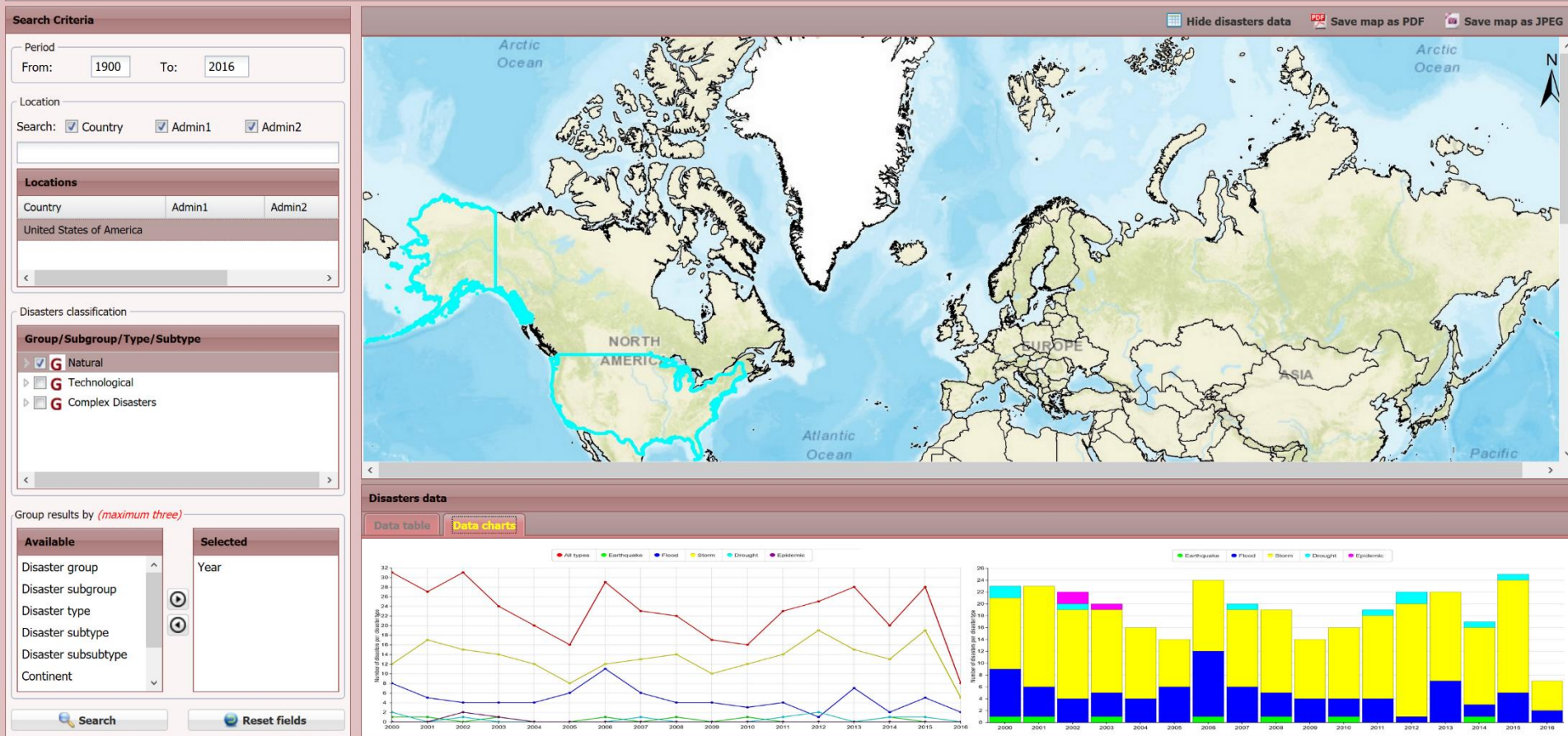
Output 2.1



2. Region profile tool

Output 2.1

Region Profile



2. Region profile tool

Output 2.2

Region Profile

Search Criteria

Period
From: To:

Location
Search: ☒ Country ☒ Admin1 ☒ Admin2

Locations

Country	Admin1	Admin2
United States of America		
United States of America	Florida	
United States of America	Florida	Miami-Dade

Disasters classification


Group/Subgroup/Type/Subtype

- ☒ Natural
- ☒ Technological
- ☒ Complex Disasters

Group results by (maximum three)

Available	Selected
Disaster group	Year
Disaster subgroup	
Disaster type	
Disaster subtype	
Disaster subsubtype	
Continent	

[Search](#) [Reset fields](#)

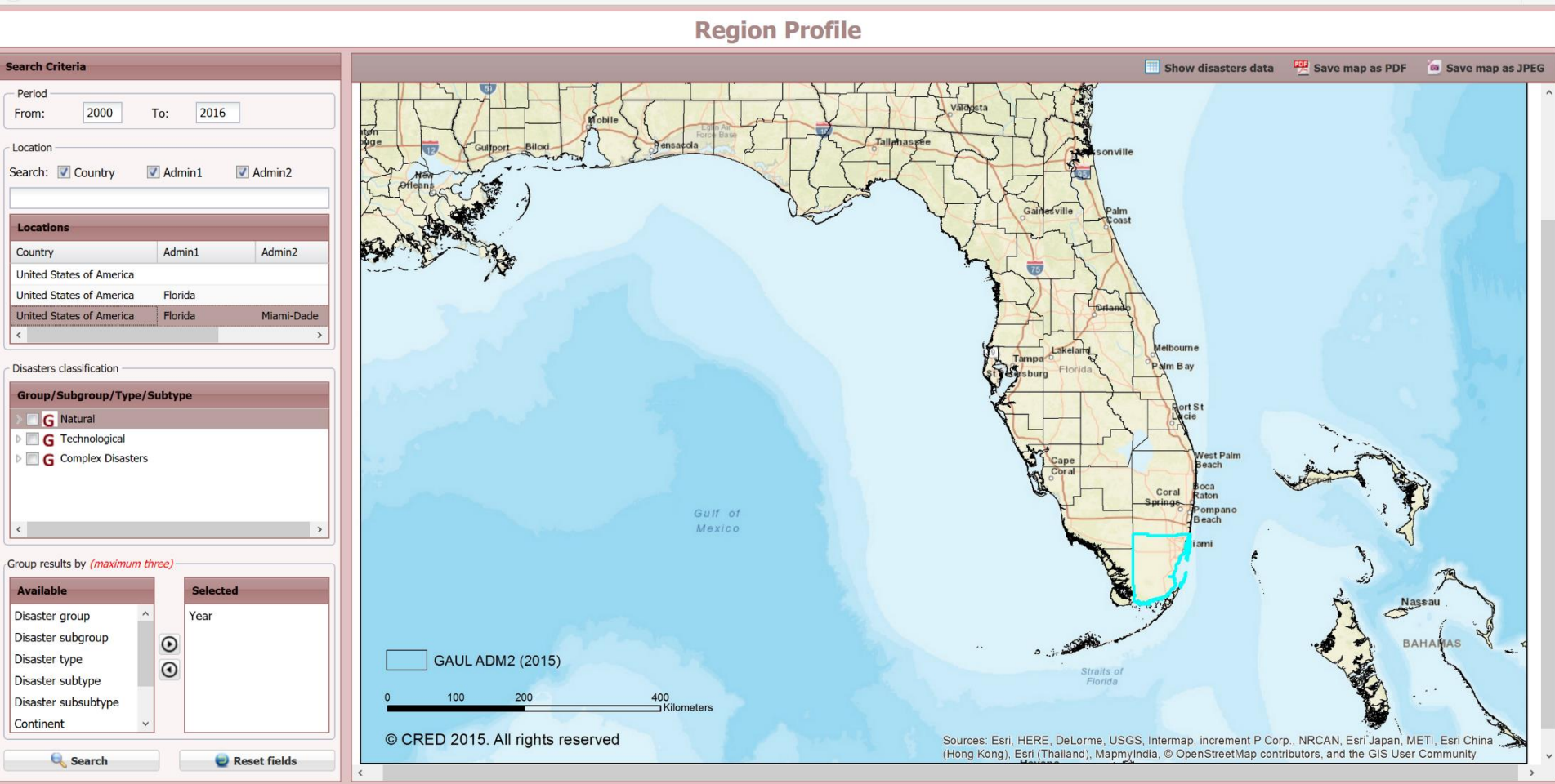


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Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), Mapbox India, © OpenStreetMap contributors and the GIS User Community

2. Region profile tool

Output 2.3



3. Disaster maps

3. Disaster maps tool

Linked with the disaster list tool

Disaster Map

Search criteria

Period
From: 2000 To: 2016

Location
☐ Continent ☐ Region ☒ Country

Available

- United Kingdom of Great Britain and Northern Ireland
- Uruguay
- Uzbekistan

Selected

- United States of America (the)

Natural/Technological Disasters: Subgroup/Type

- ☒ Biological
- ☒ Climatological
- ☒ Geophysical
- ☒ Hydrological
- ☒ Meteorological
- ☒ Storm
- ☐ Extreme temperature
- ☐ Technological

Include in search results

Available

- Associated disaster
- Associated disaster2

Selected

- Total deaths
- Total affected
- Total damage
- Insured losses

[Search](#) [Reset fields](#)

Search Results

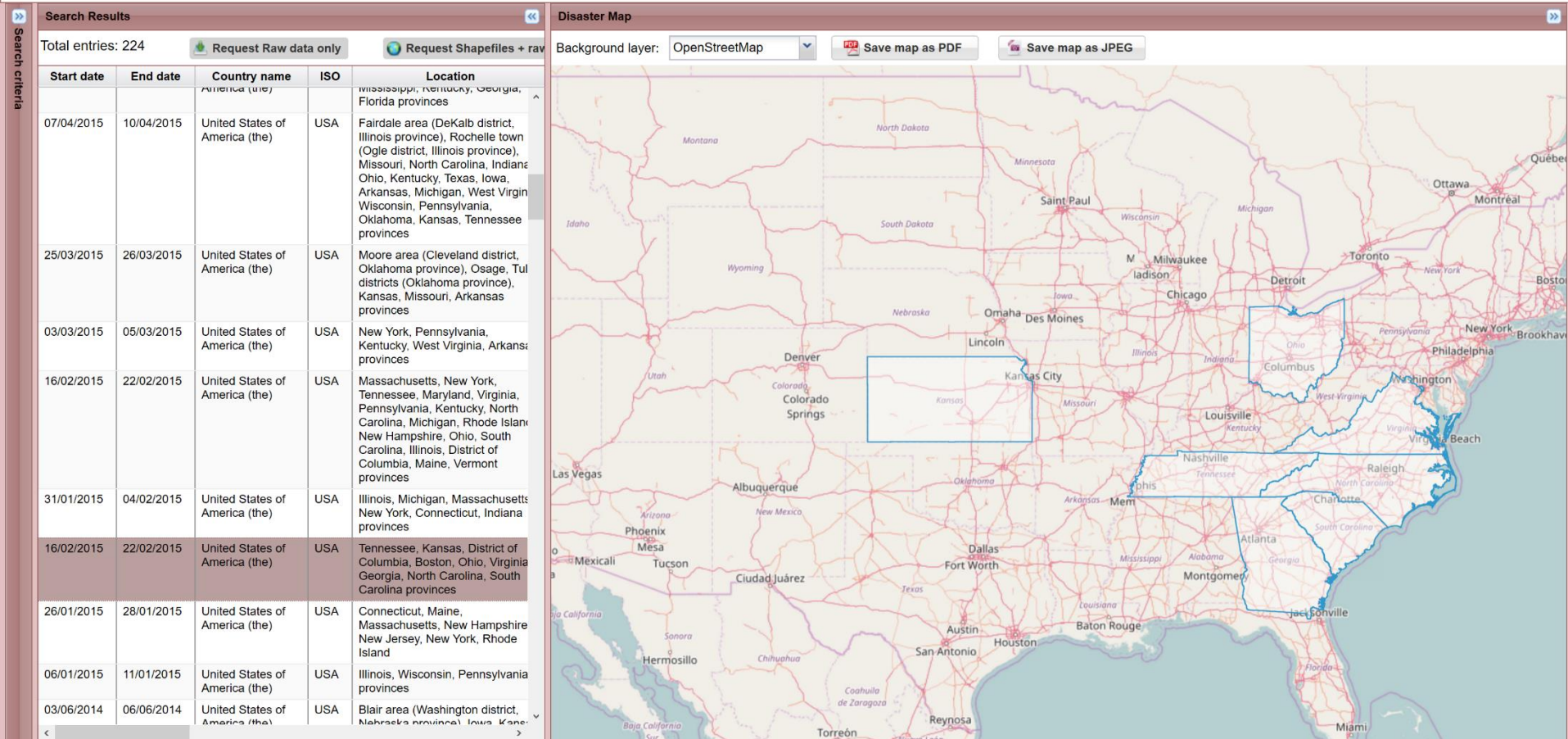
Total entries: 224 [Request Raw data only](#) [Request Shapefiles + raw data](#)

Start date	End date	Country name	ISO	Location	Disaster Type	Disaster subtype	Total deaths	Total affected	Total damage ('000 US\$)
07/04/2015	10/04/2015	United States of America (the)	USA	Mississippi, Kentucky, Georgia, Florida provinces	Storm	Convective storm	3	12	1400000
25/03/2015	26/03/2015	United States of America (the)	USA	Fairdale area (DeKalb district, Illinois province), Rochelle town (Ogle district, Illinois province), Missouri, North Carolina, Indiana, Ohio, Kentucky, Texas, Iowa, Arkansas, Michigan, West Virginia, Wisconsin, Pennsylvania, Oklahoma, Kansas, Tennessee provinces	Storm	Convective storm	1	3312	500000
03/03/2015	05/03/2015	United States of America (the)	USA	Moore area (Cleveland district, Oklahoma province), Osage, Tulsa districts (Oklahoma province), Kansas, Missouri, Arkansas provinces	Storm	Convective storm	13		170000
16/02/2015	22/02/2015	United States of America (the)	USA	New York, Pennsylvania, Kentucky, West Virginia, Arkansas provinces	Storm	Convective storm	30		3000000
31/01/2015	04/02/2015	United States of America (the)	USA	Massachusetts, New York, Tennessee, Maryland, Virginia, Pennsylvania, Kentucky, North Carolina, Michigan, Rhode Island, New Hampshire, Ohio, South Carolina, Illinois, District of Columbia, Maine, Vermont provinces	Storm	Convective storm	22		150000
16/02/2015	22/02/2015	United States of America (the)	USA	Illinois, Michigan, Massachusetts, New York, Connecticut, Indiana provinces	Storm	Convective storm	10		100000
26/01/2015	28/01/2015	United States of America (the)	USA	Tennessee, Kansas, District of Columbia, Boston, Ohio, Virginia, Georgia, North Carolina, South Carolina provinces	Storm	Convective storm	2		80000
06/01/2015	11/01/2015	United States of America (the)	USA	Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island	Storm	Convective storm	15		100000
03/06/2014	06/06/2014	United States of America (the)	USA	Illinois, Wisconsin, Pennsylvania provinces	Storm	Convective storm	2	36	1600000
				Blair area (Washington district, Nebraska province), Iowa, Kansas	Storm	Convective storm			

3. Disaster maps tool

Output 3.1

Disaster Map



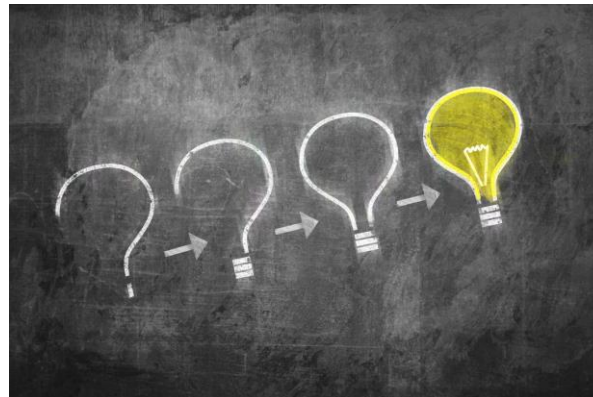
Online mapping tool

Conclusion

- Will be developed in the next 4 years
- Increase EM-DAT value
- Facilitate user visualization

THANK YOU!

Time for discussion



Contacts

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