

GRID-Geneva



UNIVERSITÉ
DE GENÈVE



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation



UNEP



GRID
Geneva

- Global Resource Information Database
- Institutional partnership between Swiss Confederation, University of Geneva and UNEP
- Role: to **facilitate** access to environmental data but also to **provide** environmental data and information for decision making
- GRID works with Open Data

GRID-Geneva's contributions to open data solutions, UNEP/GRID-Geneva 2014

- my name is Yaniss Guigoz
- I work at GRID-Geneva
- GRID-Geneva (Global Resource Information Database): is the result of an institutional partnership between CHE, UNIGE and UNEP
- GRID-Geneva: our main roles are to facilitate access to environmental data but also to provide such environmental data and information for decision making
- GRID works with Open Data

Open data: what is it?



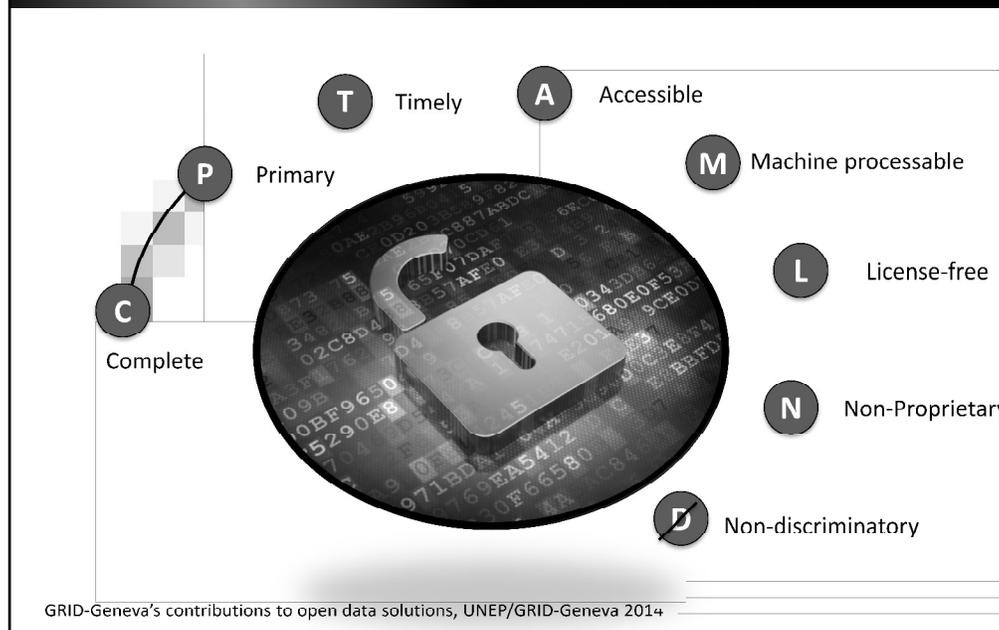
“A piece of data or content is open if anyone is free to use, reuse, and redistribute it — subject only, at most, to the requirement to attribute and/or share-alike.”

(<http://opendefinition.org/>)

GRID-Geneva's contributions to open data solutions, UNEP/GRID-Geneva 2014

-Formal definition from opendefinition.org (read)

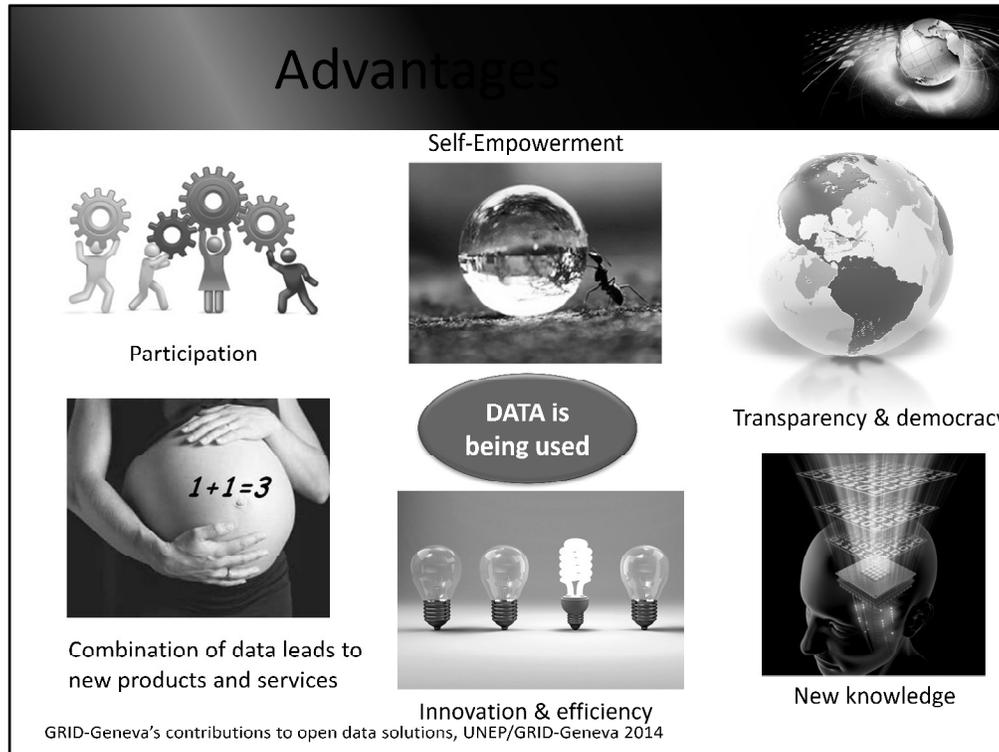
Open data: what is it?



GRID-Geneva's contributions to open data solutions, UNEP/GRID-Geneva 2014

- The Open data concept needs to answer certain criteria: data should be:

1. Complete: All public data is made available. Public data is data that is not subject to valid privacy, security or privilege limitations.
2. Primary: Data is as collected at the source, with the highest possible level of granularity, not in aggregate or modified forms.
3. Timely: Data is made available as quickly as necessary to preserve the value of the data.
4. Accessible: Data is made available to the widest range of users for the widest range of purposes.
5. Machine processable: Data is reasonably structured to allow automated processing. (opens the interoperability issue)
6. License-free: Data is not subject to any copyright, patent, trademark or trade secret regulation. Reasonable privacy, security and privilege restrictions may be allowed.
7. Non-proprietary: Data is available in a format over which no entity has exclusive control.
8. Non-discriminatory: Data is available to anyone, with no requirement of registration.



-Open data brings a lot of advantages:

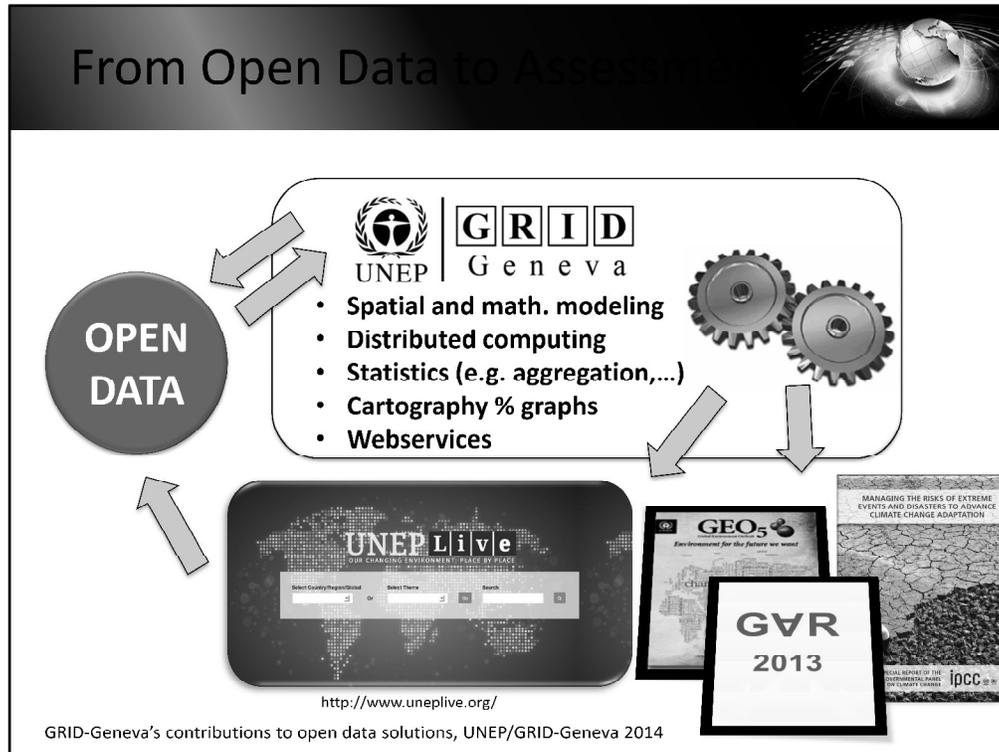
- Self-empowerment: data open → more data available to citizens → citizens have more knowledge and stimulation to participate in public affairs => more citizen power with more informed decisions
- Participation: idem
- Transparency & Democracy: = institutional aspect: public data completely available = transparency that allows to control government activities => DEMOCRACY
- New products and services: access to mines of data allows to create new products and services...
- Innovation and efficiency: ... that translate into increased **INNOVATION** capacities of a country and better **EFFICIENCY** in the government thanks to citizen control => ECONOMIC value of open data
- New knowledge: new products, innovation, participation lead to an improved global knowledge

⇒ DATA IS BEING USED!!!!

⇒ DATA POWER UNLOCKED!!!

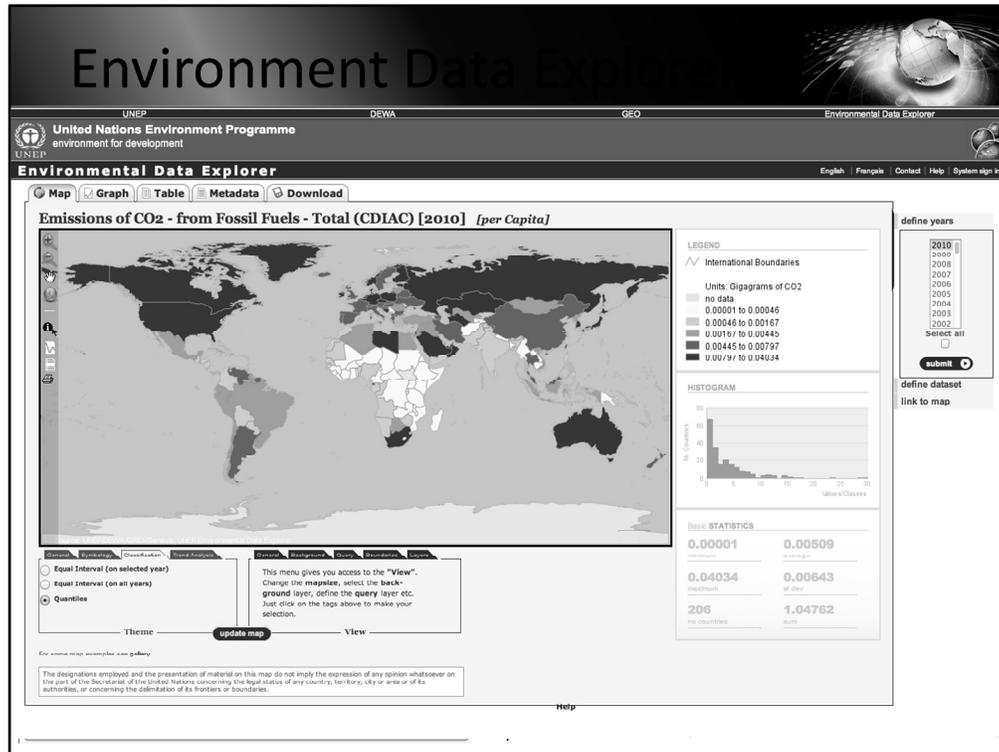


GRID-Geneva's contributions to open data solutions, UNEP/GRID-Geneva 2014



-The workflow in GRID-Geneva linked to open data is the following:

- 1) GRID-Geneva uses open data and uses various means to process and distribute it depending on projects. It can be through:
 - Spatial or mathematical modeling
 - Distributed computing
 - Statistics (ex: aggregation of data, ...)
 - Cartography and graphs
 - Web services
- 2) Then this processed data is used for reports, assessments, ...
- 3) And also feeds the new “UNEP-live” platform
- 4) This created information in turn feeds open data as it is distributed openly

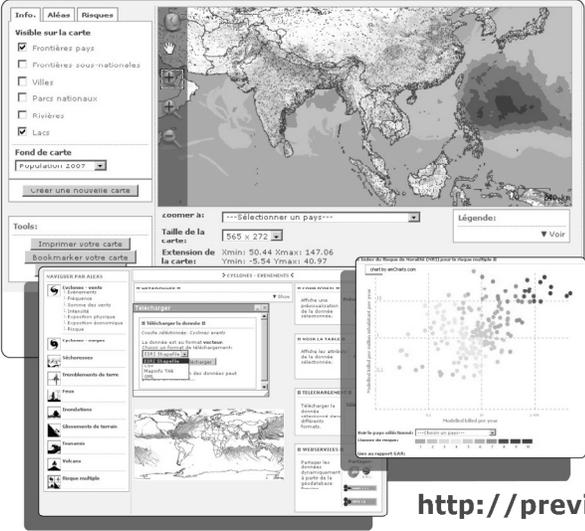


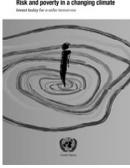
- GRID-Geneva has some flagship data portals, all using open data
- the oldest one is the "Environment Data Explorer" = UNEP authoritative source of data
- has a database with more than 500 variables, mostly environmental
- they can be displayed on-the-fly as:
 - maps,
 - data tables,
 - graphs,
 - or downloaded in different formats.
- It feeds the UNEP-live platform

PREVIEW Global Risk Data



The PREVIEW Global Risk Data Platform






IPCC SREX



GAR

2013

<http://preview.grid.unep.ch>

GRID-Geneva's contributions to open data solutions, UNEP/GRID-Geneva 2014

- Another flagship portal if the PREVIEW Global Risk Data Platform
- it allows to visualise, download or extract data on:
 - past hazardous events,
 - human & economical hazard exposure and
 - risk from natural hazards
- it was used to create several assessments

PREVIEW Global Risk Data Platform



Functionalities:

- Visualization of data (layers, Zoom in/out, pan, + on google Earth)
- Interrogation of data
- Data download (and extraction)
- OGC Webservices (WMS, WFS, WCS, KML, GeoRSS)
- MetaData
- Advanced tools: aggregation by region, graphs

Data included:

- Past hazardous events: flood (FI), cyclone (TC), drought (Dr), earthquakes (Eq), tsunamis (Ts), volcanoes (Vo), Vegetation fires (Fi)
- Hazards models: FI, TC, Eq, Landslides (Ls), Ts
- Exposure models (economic and human exposure to FI, TC, Eq, Ls and Ts)
- Mortality risk models (FI, TC, Ls + multi-risk)
- Economic risk models (FI, TC, Eq).

Partners: UNISDR, NGI, CIMA, CIMNE, DFO, WAPMER, ERN-AL, World Bank, GEM.

Users: UNISDR, UNEP, UNDP, World Bank, OCHA, WFP, UNHCR, UNU, JRC, MapleCroft,...

UNEP/GRID-Geneva: GIS modeling (TC, FI, exposure, mortality risk), data distribution

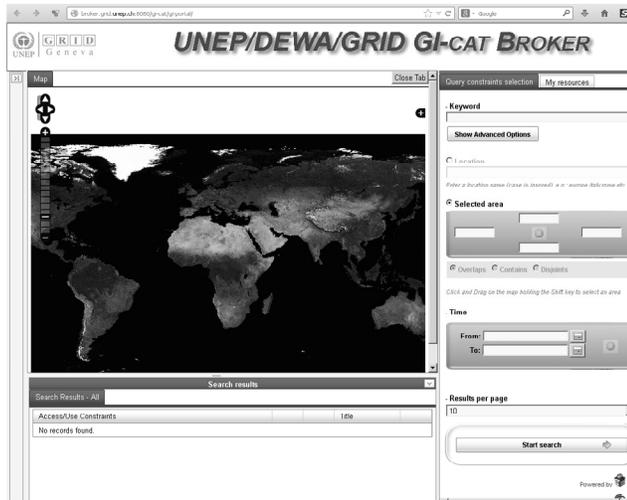
GRID-Geneva's contributions to open data solutions, UNEP/GRID-Geneva 2014

read

GRID-Geneva Open data platform



GRID-Geneva Broker



<http://broker.grid.unep.ch:8080/gi-cat/gi-portal>

GRID-Geneva's contributions to open data solutions, UNEP/GRID-Geneva 2014

- Currently being set up
- based on “brokering” technology
- “system of systems” concept
- homogeneous interface to search for heterogeneous standardized data and docs managed at GRID:
 - geospatial data
 - geospatial services
 - reports
 - posters
 - ...

- Not completely set up
- based on the brokering technology that relies on the concept of “system of systems”
- Users will be able to search in an homogeneous interface all geospatial data, all geospatial services, and all other documents (e.g., reports, posters, ...) managed at GRID-Geneva through various projects



GRID-Geneva's contributions to open data solutions, UNEP/GRID-Geneva 2014

- RAMSAR: the international wetlands convention
- GRID is designing the new information system to collect and share data about each RAMSAR Site (available in summer 2014)
- All the GIS data (around 2000 sites) available as open data
- Each site is accompanied by its RIS (Ramsar information sheet) = Identity Card of each site
- follows OGC standards (WMS, WFS, WCS)



GRID-Geneva's contributions to open data solutions, UNEP/GRID-Geneva 2014



GRID-Geneva's contributions to open data solutions, UNEP/GRID-Geneva 2014

ClimVar Mediterranean Integrated Coastal Zones Management



Partners: UNEP/MAP, Plan bleu, GWP-Med

Objective:

Integration of Climatic Variability and Change into National Strategies to Implement the ICZM Protocol in the Mediterranean (UNEP/MAP).

Roles of GRID-Geneva towards Open data:

- Generation of the Mediterranean Integrated Climate Information Platform (MediCIP) to receive and serve 11 countries.
- Capacity building workshops (3) to train dedicated staff from 11 countries on SDI technologies.

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read

ECOWREX 2

"Mapping Renewable Energy in West Africa"



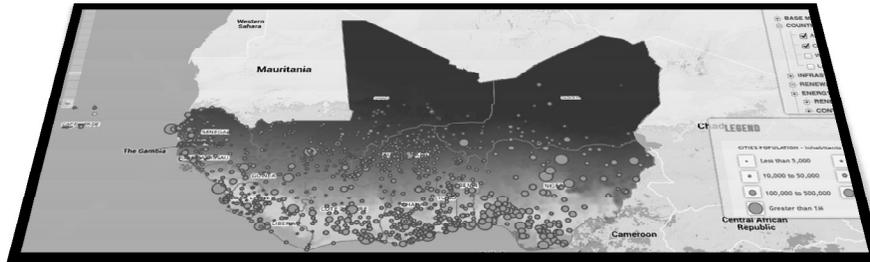
Partners: (ECREE, KNUST, Ministry of Cape Verde, Noveltis).

Objectives:

- Promoting sustainable energy access through Geospatial technologies
- Support policies and plans for improving access to sustainable energy.

Roles of GRID-Geneva towards Open data:

- GIS modelling on renewable energy (solar, wind, biomass, geothermia, waves, hydro) production vs energy demand in West Africa: 15 countries.
- Development of a new platform for data visualisation and sharing.
- Capacity building to staff from 15 countries and to ECREE (SDI + GIS)



GRID-Geneva's contributions to open data solutions, UNEP/GRID-Geneva 2014

- Energy domain
- Project just started
- Use and distribution of open data on energy in West Africa is crucial in this project

TWAP

Transboundary Water Assessment Project



Objectives:

Improve management of transboundary waters for addressing environmental issues

Role of GRID-Geneva towards Open data:

- GRID-Geneva responsible for SDI => need of existing core data + production of data
=> all data openly shared and redistributed in the SDI

Open data produced:

- Extended Large Marine Ecosystems
- Continental shelves
- Ocean governance regimes



GRID-Geneva's contributions to open data solutions, UNEP/GRID-Geneva 2014

-Water domain
-read

SIDS data on EbA for O



The SIDS portal in support to GEO SIDS



- Small Islands Development States

-

Capacity Building

Using Open Data



Project	Participants	Countries Supported
<p>Bringing GEOSS services into practice Gregory Giuliani and Others This book is available for download with iBooks on your Mac or iPad, and with iTunes on your computer. Multi-touch books can be read with iBooks on your Mac or iPad. Books with interactive features may work best on an iPad.</p> <p>Description The "Bringing GEOSS services into practice" workshop aims at teaching participants how to install, configure and deploy a set of open source software to publish and share data and metadata through GEOSS using OGC and ISO standards.</p> <p>Free Available on iPad and Mac.</p>	> 800	> 50
Total		

Gregory Giuliani, Pierre Lacroix, Yanick Guigoz, Lorenzo Bigagli, Nicolas Rey, Anthony Lehmann

Bringing GEOSS services into practice



«teaching how to configure, use and deploy a set of open source software to set up a spatial data infrastructure (SDI)»

+ workshop downloadable through internet

+ workshop available as e-book

=> Large Capacity Building outreach <http://www.unige.ch/sig/enseignements/GeossInPractice.html>

GRID-Geneva's contributions to open data solutions, UNEP/GRID-Geneva 2014

- Open Data is also useful in CB activities => allows to raise knowledge and capacity using real data => unlocks the power of d
- sGRID provides several trainings but the flagship one is "Bringing GEOSS Services into practice"
- has been taught to more than 800 people in support to more than 50 countries
- freely available for download
- also available as e-book

Capacity Building (RiVAMP)

On Ecosystems Based Adaptation Using Open Data

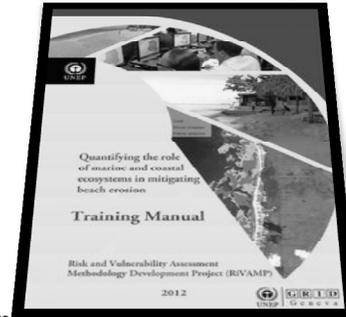


RiVAMP (using EbA for DRR and CCA)

- Open Data
- Training Manual
- OpenSource Software (GIS, Stats; + coastal erosion modelling software)

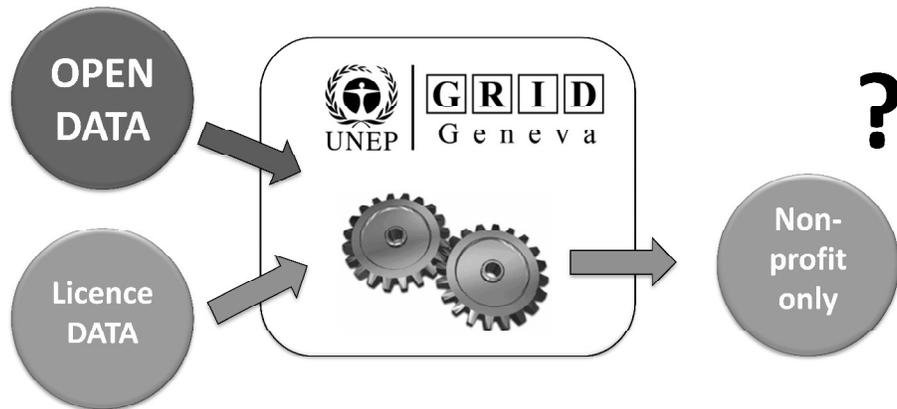
Trained: 21 people (Jamaica)

On-line trainings: > 7170 downloads (2 years)



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Limitations ?



**For non-commercial
use only**

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- For all our products we use open data BUT
- For some of them (PREVIEW) we put a licence creative commons saying that it is for non-commercial use only

Limitations



All datasets on PREVIEW can be available for free for non commercial purpose (governments, international organisations, universities, non-governmental organisations, civil society according to the terms of the following disclaimer...

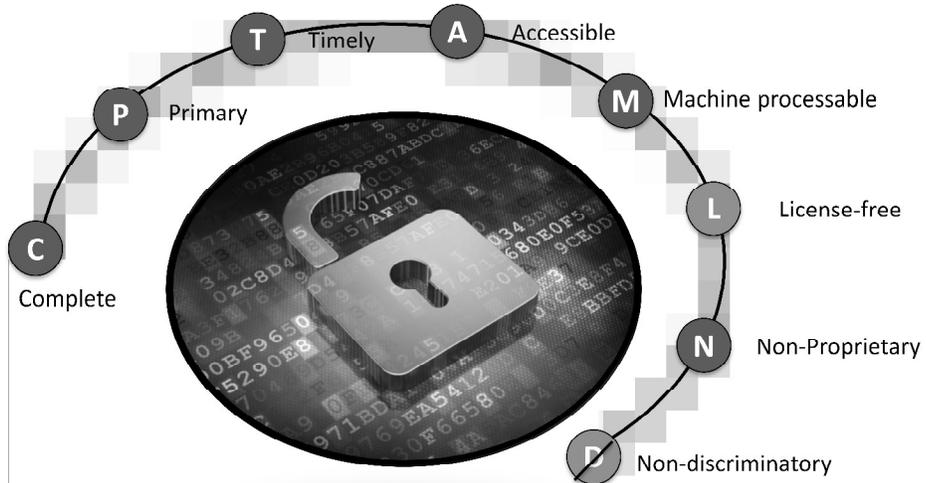
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- Here is the accompanying text

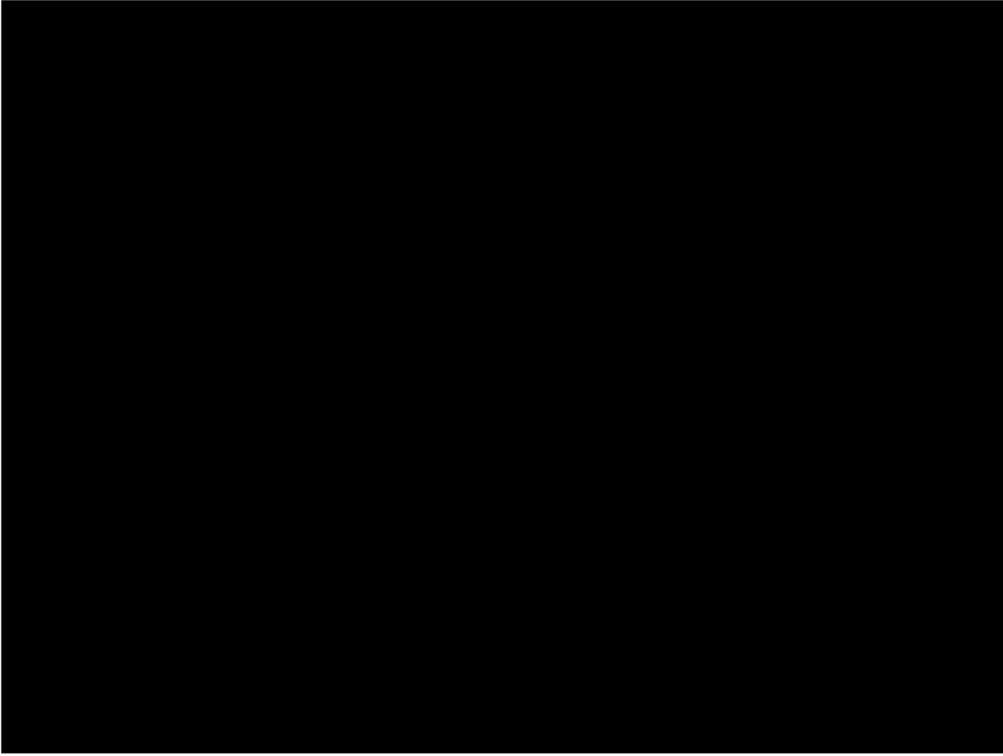
Toward Open Data



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-In conclusion, even though we want to be open source, we might not fulfill all criteria:

- we still put a licence, even though only for non commercial use
- we discriminate commercial companies





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Example of added value

Modeling mortality risk from Tropical Cyclones



From meteorological tabular data to risk index

IBTracks (best tropical cyclones tracks) NOAA

Season	Num	Basin	Sub_basin	Name	ISO_time	Nature	Latitude	Longitude	Wind(WMO)	Pres(WMO)
2006	3	NA	MM	BERYL	18.07.06 12:00	TS	32.3	-73.3	30	1010
2006	3	NA	MM	BERYL	18.07.06 18:00	TS	33	-73.3	35	1008
2006	3	NA	MM	BERYL	19.07.06 00:00	TS	33.8	-73.5	35	1006
2006	3	NA	MM	BERYL	19.07.06 06:00	TS	34.5	-73.7	35	1005
2006	3	NA	MM	BERYL	19.07.06 12:00	TS	35.2	-73.6	40	1004
2006	3	NA	MM	BERYL	19.07.06 18:00	TS	35.9	-73.5	50	1003
2006	3	NA	MM	BERYL	20.07.06 00:00	TS	36.6	-73.2	50	1002
2006	3	NA	MM	BERYL	20.07.06 06:00	TS	37.4	-73.2	50	1001
2006	3	NA	MM	BERYL	20.07.06 12:00	TS	38.3	-73	50	1002
2006	3	NA	MM	BERYL	20.07.06 18:00	TS	39.1	72.5	45	1002
2006	3	NA	MM	BERYL	21.07.06 00:00	TS	39.8	-71.8	45	1003
2006	3	NA	MM	BERYL	21.07.06 06:00	TS	41	-70.5	45	1000
2006	3	NA	MM	BERYL	21.07.06 06:45	TS	41.3	-70.1	45	1000
2006	3	NA	MM	BERYL	21.07.06 12:00	TS	42.4	-68.4	40	1002
2006	3	NA	MM	BERYL	21.07.06 18:00	ET	43.8	-66.3	35	1000
2006	3	NA	MM	BERYL	22.07.06 00:00	ET	45.5	-63.3	35	1002
2006	3	NA	MM	BERYL	22.07.06 06:00	ET	47.2	60	35	1003
2006	3	NA	MM	BERYL	22.07.06 12:00	ET	48.5	-56.5	30	1004

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Example 1: modelisation of mortality risk from tropical cyclones

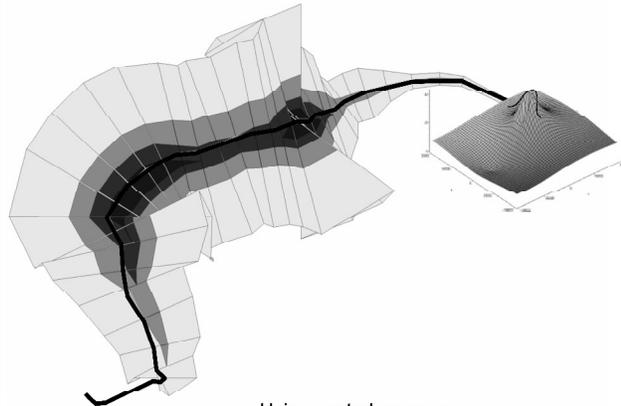
- 1st stage: tabular data of cyclones tracks as open data

Example of added value

Modeling mortality risk from Tropical Cyclones



>6000 tropical cyclones events were processed
Global coverage for the period 1970 to 2012.

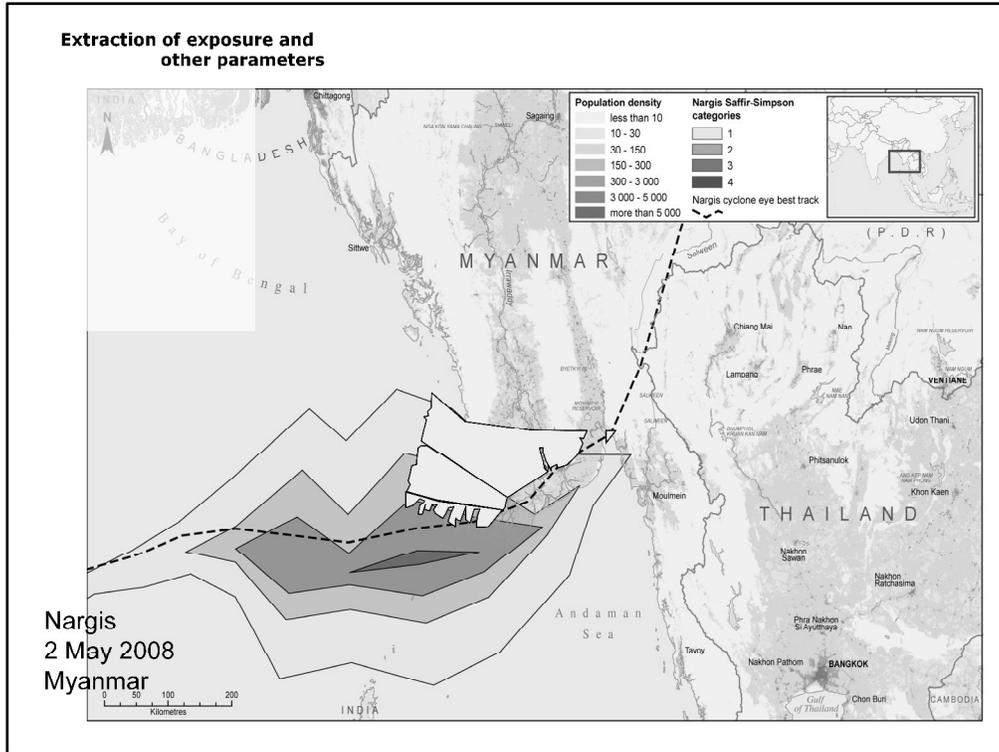


Using central pressure
Maximum windspeed
Latitude ...

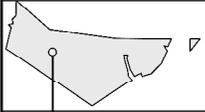
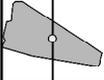
GRID-Geneva's contributic

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- 2nd stage: **modelisation** of the cyclones events based on the tabular data using several parameters



- 3rd stage: exposure and other parameters extracted

Footprints	Category	Pop. exp.	GDP exp.	Pop.Urb exp.	GDP Urb. exp	...
	1	10,500,000	43,000,000	4,800,000	32,500,000	
	2	1,500,000	3,500,000	1,400,000	525,000	
	3	400,000	800,000	375,000	150,000	

Country: Myanmar
 Iso3: MMR
 Date: 02 May 2008
 Killed: 138,366
 Damages: 4,000 US\$ millions
 GDPcap: 1,227 US\$
 Voice & acc.: -2.16
 Governance efficiency : -1.608
 Radio/inhabitant: 99.68%
 HDI: 0.592
 ...
 Urban growth: 2.55%

Preview Tropical Cyclones Database



Date
Iso3

EM-DAT RED Database 43 indicators



Date
Iso3
GDPcap
Voice & acc.
Governance efficiency
Radio/inhabitant
HDI
...
Urban growth

Example of added value

Modeling mortality risk from Tropical Cyclones



List of vulnerability parameters considered

43 indicators on:
Economy,
Demography,
Environment,
Development,
Early Warning,
Governance,
Health,
Education,
...

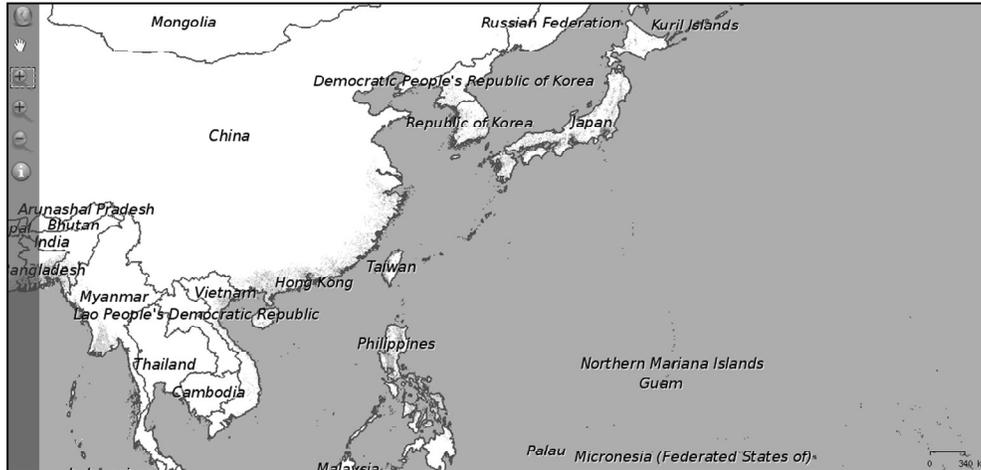
- 2 non GLC2000 bare land
- 3 Arable and Permanent Crops - % of non GLC2000 bare land
- 4 Motor vehicles in use - Passenger cars (thousand)
- 5 Motor vehicles in use - Commercial vehicles (thousand)
- 6 Physical exposure to conflicts
- 7 Corruption Perceptions Index (CPI)
- 8 Arable and Permanent Crops - Total
- 9 Arable and Permanent Crops - Percent of Land Area
- 10 Control of Corruption
- 11 Deforestation rate
- 12 % of population with access to electricity
- 13 Forests and Woodland (% of Land Area)
- 14 Gross Domestic Product - Purchasing Power Parity per Capita
- 15 Gross Domestic Product - Purchasing Power Parity
- 16 inequality (Gini coefficient)
- 17 Human Induced Soil Degradation (GLASOD)
- 18 Government Effectiveness
- 19 Human Development Index (HDI)
- 20 Per capita government expenditure on health (PPP int. \$)
- 21 # of hospital beds per 100,000 habitants # of doctors
- 22 infant mortality and malnutrition (though are also factored into HDI)

Example of added value

Modeling mortality risk from Tropical Cyclones



From hazardous events to frequency and exposure

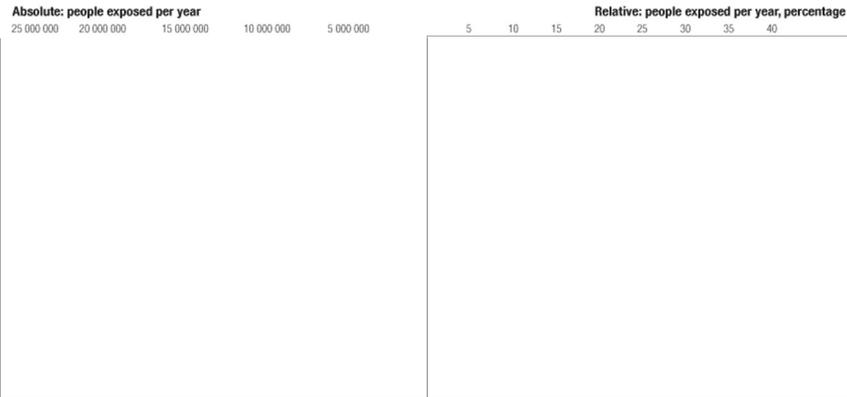


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Example of added value

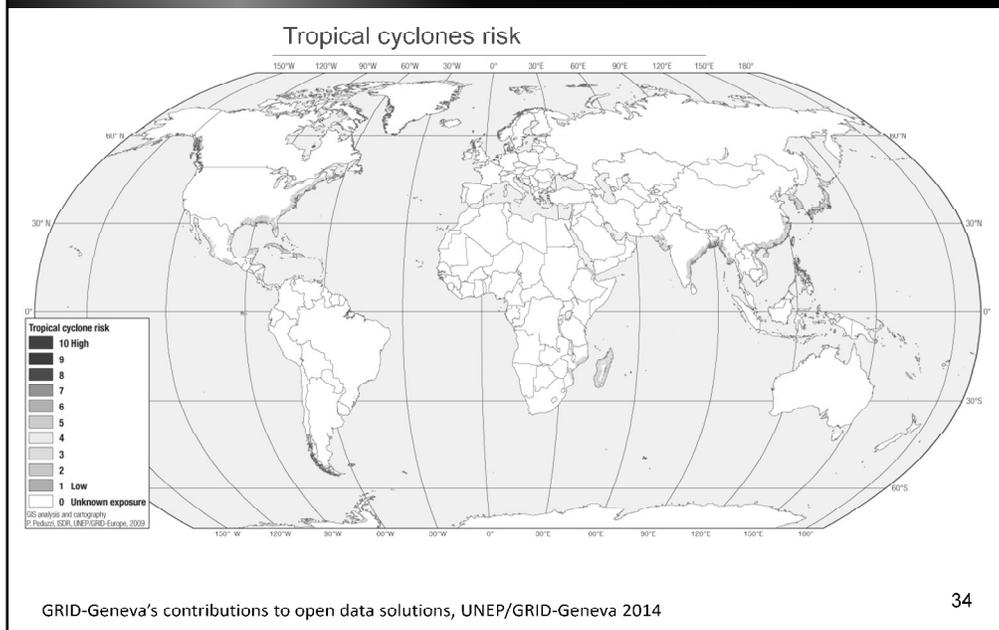


Aggregation of human exposure at country level



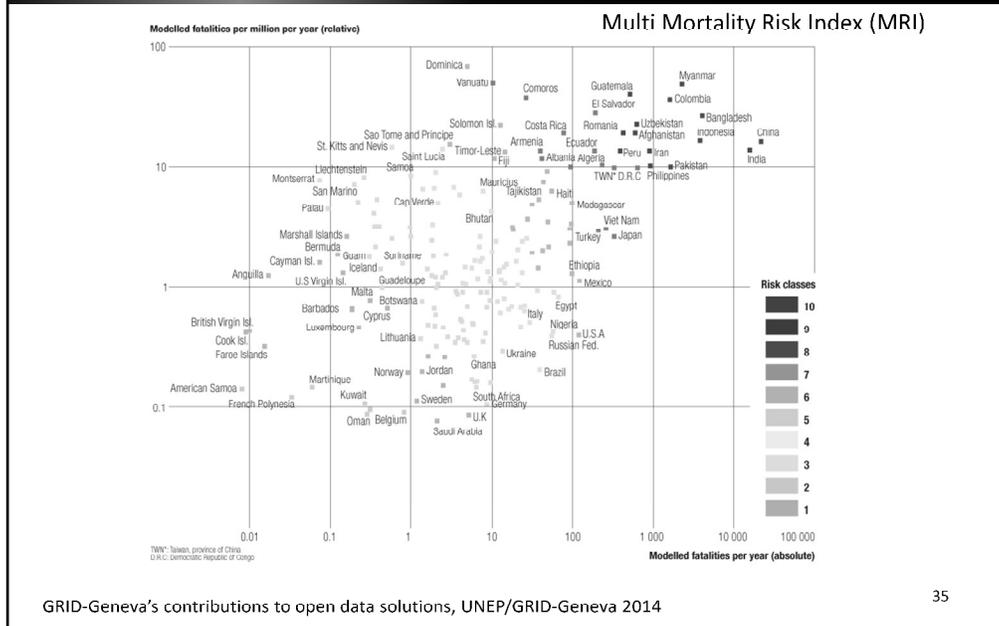
Example of added value

Modeling mortality risk from Tropical Cyclones



Example of added value

Modeling mortality risk from Tropical Cyclones



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