- 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/)

-Formal definition from opendefinition.org (read)
- 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!!!
- In GRID-Geneva, we use a lot of open data in our daily work to produce new data that will in turn serve for assessment:

- example of Singapore:
  - population increased a lot → necessary to get more space → extension of land taken on the sea by importing sand
  - use of Landsat archive images to analyze the data
  - leads to assessment report “Global Environment Alert Service” (GEAS)
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 (e.g., aggregation, …)
   - 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
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
**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 (Fl), cyclone (TC), drought (Dr), earthquakes (Eq), tsunamis (Ts), volcanoes (Vo), Vegetation fires (Fi)
- Hazards models: Fl, TC, Eq, Landslides (Ls), Ts
- Exposure models (economic and human exposure to Fl, TC, Eq, Ls and Ts)
- Mortality risk models (Fl, TC, Ls + multi-risk)
- Economic risk models (Fl, 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, Fl, exposure, mortality risk), data distribution

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read
- 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
- 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)
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.
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)

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

-Water domain
-read
The SIDS portal in support to GEO SIDS

- Small Islands Development States

-
Open Data is also useful in CB activities => allows to raise knowledge and capacity using real data => unlocks the power of data

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

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### Project | Participants | Countries Supported
--- | --- | ---
| Training | 800+ | >50 |

+ 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
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)

GRID-Geneva's contributions to open data solutions, UNEP/GRID-Geneva 2021
- 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
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
Example 1: modelisation of mortality risk from tropical cyclones

- 1st stage: tabular data of cyclons tracks as open data
- 2nd stage: modelisation of the cyclones events based on the tabular data using several parameters
- 3rd stage: exposure and other parameters extracted
<table>
<thead>
<tr>
<th>Footprints</th>
<th>Category</th>
<th>Pop. exp.</th>
<th>GDP exp.</th>
<th>Pop. Urb. exp.</th>
<th>GDP Urb. exp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10,500,000</td>
<td>43,000,000</td>
<td>4,800,000</td>
<td>32,500,000</td>
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<tr>
<td>2</td>
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<td>3,500,000</td>
<td>1,400,000</td>
<td>525,000</td>
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</tr>
<tr>
<td>3</td>
<td>400,000</td>
<td>600,000</td>
<td>375,000</td>
<td>150,000</td>
<td></td>
</tr>
</tbody>
</table>

Country: Myanmar
Iso3: MMR
Date: 02 May 2008
Killed: 130,300
Damages: 4,000 US$ millions
GDP/cap: 1,227 US$
Voice & acc.: -2.16
Governance efficiency: -1.608
Radio/inhabitant: 99.68%
HDI: 0.592
Urban growth: 2.55%
<table>
<thead>
<tr>
<th>List of vulnerability parameters considered</th>
</tr>
</thead>
<tbody>
<tr>
<td>43 indicators on:</td>
</tr>
<tr>
<td>Economy, Demography, Environment, Development, Early Warning, Governance, Health, Education, ...</td>
</tr>
</tbody>
</table>

- Non GLC2000 bare land
- Arable and Permanent Crops - % of non GLC2000 base land
- Motor vehicles in use - Passenger cars (thousand)
- Motor vehicles in use - Commercial vehicles (thousand)
- Physical exposure to conflicts
- Corruption Perceptions Index (CPI)
- Arable and Permanent Crops - Total
- Arable and Permanent Crops - Percent of Land Area
- Control of Corruption
- Deinstitutionalization rate
- % of population with access to electricity
- Forests and Woodland (% of land area)
- Gross Domestic Product - Purchasing Power Product
- Human Development Index (HDI)
- Government Effectiveness
- Human Induced Soil Degradation (GLASOD)
- Infant Mortality and Malnutrition (Staffed into HDI)
Example of added value
Modeling mortality risk from Tropical Cyclones

From hazardous events to frequency and exposure
### Aggregation of human exposure at country level

<table>
<thead>
<tr>
<th>Absolute: people exposed per year</th>
<th>Relative: people exposed per year, percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>25,000,000</td>
<td>5</td>
</tr>
<tr>
<td>20,000,000</td>
<td>10</td>
</tr>
<tr>
<td>15,000,000</td>
<td>15</td>
</tr>
<tr>
<td>10,000,000</td>
<td>20</td>
</tr>
<tr>
<td>5,000,000</td>
<td>25</td>
</tr>
</tbody>
</table>

GRID-Geneva contributions to open data solutions, UNEP/GEOGRID-Geneva 2014
Example of added value
Modeling mortality risk from Tropical Cyclones

Tropical cyclones risk

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Example of added value
Modeling mortality risk from Tropical Cyclones

Multi Mortality Risk Index (MRI)

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