Geospatial Information for the Post-2015 Development Agenda

Global geospatial data
Local to National perspectives

Pascal Peduzzi,
3rd High Level Forum on UN Global Geospatial Information Management

21 October 2014, Beijing, China
What is the framework?

- Natural resources
- Environment
- Economy
- Social

Further pressures

Technology

Governance

- Population growth
- Increase of individual demand
What is the framework?

Increase natural capital

Natural resources
- Energy
- Biodiversity
- Soil
- Water
- Ecosystems services

Environment

Unsust. Devel.

Social

Economy

Further pressures

Technology

Governance

Reduce demand

+ Population growth
+ Increase of individual demand

Improve share and equity + fair economy

Improve governance
No country has achieved Sustainable Development.

1 tCO₂/cap

R² = 0.77

High dev. Countries

No country has achieved Sustainable Development
Where can data help?

- Start understand processes
- Identify issues & hotspots
- Raise awareness

- Scenarios
- Planning
- Implementation

- Monitoring
- Assessments
- Enforcement

3rd High Level Forum on UN Global Geospatial Information, P. Peduzzi, UNEP/GRID-Geneva 2014
Identification of issues & hotspots + Awareness
Monitoring deforestation (Iguaçu)
Monitoring deforestation (Bolivia)
Sand

Global use of sand: 29.6 billion tons /year

Enough to build a wall 27 x 27 m around the globe
Singapore and sand: +25% territory

Remote sensing, GIS analysis and cartography, Pascal Peduzzi, UNEP/GRID-Geneva 2013

3rd High Level Forum on UN Global Geospatial Information, P. Peduzzi, UNEP/GRID-Geneva 2014
Dubai

1.2 billion tons.
Sources: Jan De Nul group, 2013
Aral sea (when cotton absorbs a sea)
Monitoring the Decline of water resources (Lake Chad)
Scenarios, planning, implementation
The Case of Coropuna (Peru)

http://www.the-cryosphere.net/4/313/2010/tc-4-313-2010.html

3rd High Level Forum on UN Global Geospatial Information, P. Peduzzi, UNEP/GRID-Geneva 2014
http://www.the-cryosphere.net/4/313/2010/tc-4-313-2010.html
Erosion rate between 1968-2006: 0.5 and 1 m/year
(large temporal and spatial variability; Smith Warner International, 2007)

Observation 2006-2008, shows that beach erosion continues (UNEP, 2010)
Data extraction
Satellite imagery

To classify marine ecosystems

GIS analysis

Data retrieval and remote sensing to identify erosion rate
Coastal ecosystem importance: beach protection by seagrass meadows

Fig. 11. Modelled bed shear stress (force per unit area) (SBEACH mode (wave height 1 m, period 6s) in the Negril coastal zone

The seagrass meadows spread the wave force on wider area and dissipate wave energy
Coastal ecosystem importance: beach protection by coral reefs

Fig. 9b. Modelled bed shear stress (force per unit area) (SBEACH model) induced by waves in the Negril coastal zone, showing the protection effects of inshore coral reefs
Beach erosion Scenarios
Results from RiVAMP

- Climate change “only” account for 9 %
- Destruction coral (lack of sewage, sediments,...)
- Daily removal of seagrass
- Conversion of the Morass to crop land
Monitoring & enforcement
Monitoring the decline of mangroves
Can we monitor poaching?

Recorded number of rhino poached in South Africa

Year


Number of rhino poached SA

6 7 25 22 13 10 10 13 83 122 333 448 668 790

3rd High Level Forum on UN Global Geospatial Information, P. Peduzzi, UNEP/GRID-Geneva 2014
A need for a data revolution
Need a data revolution

SDGs will request:
• more frequent updates
• Gender disaggregation
• Rural / Urban differentiation
• Sub-national data
• New indicators
• More holistic analysis

This will exceed the capacity of national statistical offices in many countries, so...
New technologies options?

- Big data
- Crowd sourcing / citizen sciences
- Anonymous mobile phone data (itineraries & Public Transports?)
- New satellite sensors
- On-line processing
- GRID computing
- Data cubes
**Challenges**

**Technical**
- Internet speed and coverage
- Machine to machine communication
- Software module interaction
- APIs
- Formats
- Schemas

**Semantic**
- Common understanding
- Common concepts, terms, ...
- Interdisciplinary special vocabularies

**Costs**
- Private-public Partnerships

**Legal**
- Digital rights
- Ownership
- Responsibility
- Copyright
- Privacy

**Human**
- Cooperation, collaboration
- Training
Open data: what is it?

- **T**: Timely
- **A**: Accessible
- **P**: Primary
- **C**: Complete
- **M**: Machine processable
- **L**: License-free
- **N**: Non-Proprietory
- **Ø**: Non-discriminatory

3rd High Level Forum on UN Global Geospatial Information, P. Peduzzi, UNEP/GRID-Geneva 2014
Advantages

Self-Empowerment

Combination of data leads to new products and services

Participation

DATA is being used

Transparency & democracy

Innovation & efficiency

New knowledge

1+1=3

3rd High Level Forum on UN Global Geospatial Information, P. Peduzzi, UNEP/GRID-Geneva 2014
UNEP is willing to support

- Spatial and math. modeling
- Distributed computing
- Statistics (e.g. aggregation)
- Cartography & graphs
- Webservices (OGC)

OPEN DATA

3rd High Level Forum on UN Global Geospatial Information, P. Peduzzi, UNEP/GRID-Geneva 2014
Welcome to the Global Environmental Goals (GEGs) Live Tracker

There is a multitude of internationally-agreed environmental goals and objectives, which are part of outcome documents of relevant United Nations summits and conferences, resolutions of the General Assembly, decisions of other global intergovernmental conferences, multilateral environmental agreements and decisions of their governing bodies. The compendium of those goals and objectives is called the Global Environmental Goals (GEGs)...

explore by theme:
- Air pollution and air quality
- Biodiversity
- Chemicals and waste
- Climate change
- Energy
- Environmental governance
- Forests
- Freshwater
- Land
- Oceans and seas

Global Environmental Goals
- Agenda 21
- Aichi Biodiversity Targets
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal
- Convention on Biological Diversity
- General Assembly resolution 52-98 of 31 January 2008

Variables
- found 82 variables
  - Agricultural Area
  - Agricultural Area Certified Organic
  - Agricultural Production Index
  - Aquaculture Production - Marine
  - Birds - Number of Threatened Species
  - Carbon Stock in Living Forest, Biomass Cereals - Yield

Sustainable Development Goals
- Goal 1: End poverty in all its forms everywhere
- Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
- Goal 3: Ensure healthy lives and promote well-being for all at all ages
- Goal 4: Ensure inclusive and equitable quality education and promote life-long learning opportunities for all
Conclusions
Need for a holistic approach
Pathway for successful societies?

Sources: Peduzzi, P. (2012) Risk and global change: developing scientific methods for advocacy and awareness raising, University of Lausanne, Switzerland.

3rd High Level Forum on UN Global Geospatial Information, P. Peduzzi, UNEP/GRID-Geneva 2014
Missing data on processes

- Knowledge about the physical environment is necessary but not sufficient.
- Geospatial data should be linked with socio-economical data and governance data.
- What are the social and economical processes leading to unsustainable development?
- What are the legislations and policies (or the lack of) which are leading to unsustainable development?

3rd High Level Forum on UN Global Geospatial Information, P. Peduzzi, UNEP/GRID-Geneva 2014
More useful data is good,…

- New technologies carry many hopes and expectations. We will have much more data, however…
- This is not to say that we need to wait for this new data. There is enough data and knowledge to take decisions and actions.
- We need to differentiate the lack of data and the lack of available data. Efforts are needed to access data.
..., but more used data is better!

IPCC conclusions on anthropogenic climate change

- TAR, 2001 → **Likely** (>66%)
- AR4, 2007 → **Very Likely** (>90%)
- AR5, 2013 → **Extremely likely** (>95%)

We do not need to wait for being **Virtually certain** (99%), to take actions.

3rd High Level Forum on UN Global Geospatial Information, P. Peduzzi, UNEP/GRID-Geneva 2014
Thank you

Http://www.uneplive.org