Geospatial Information for the Post-2015 Development Agenda

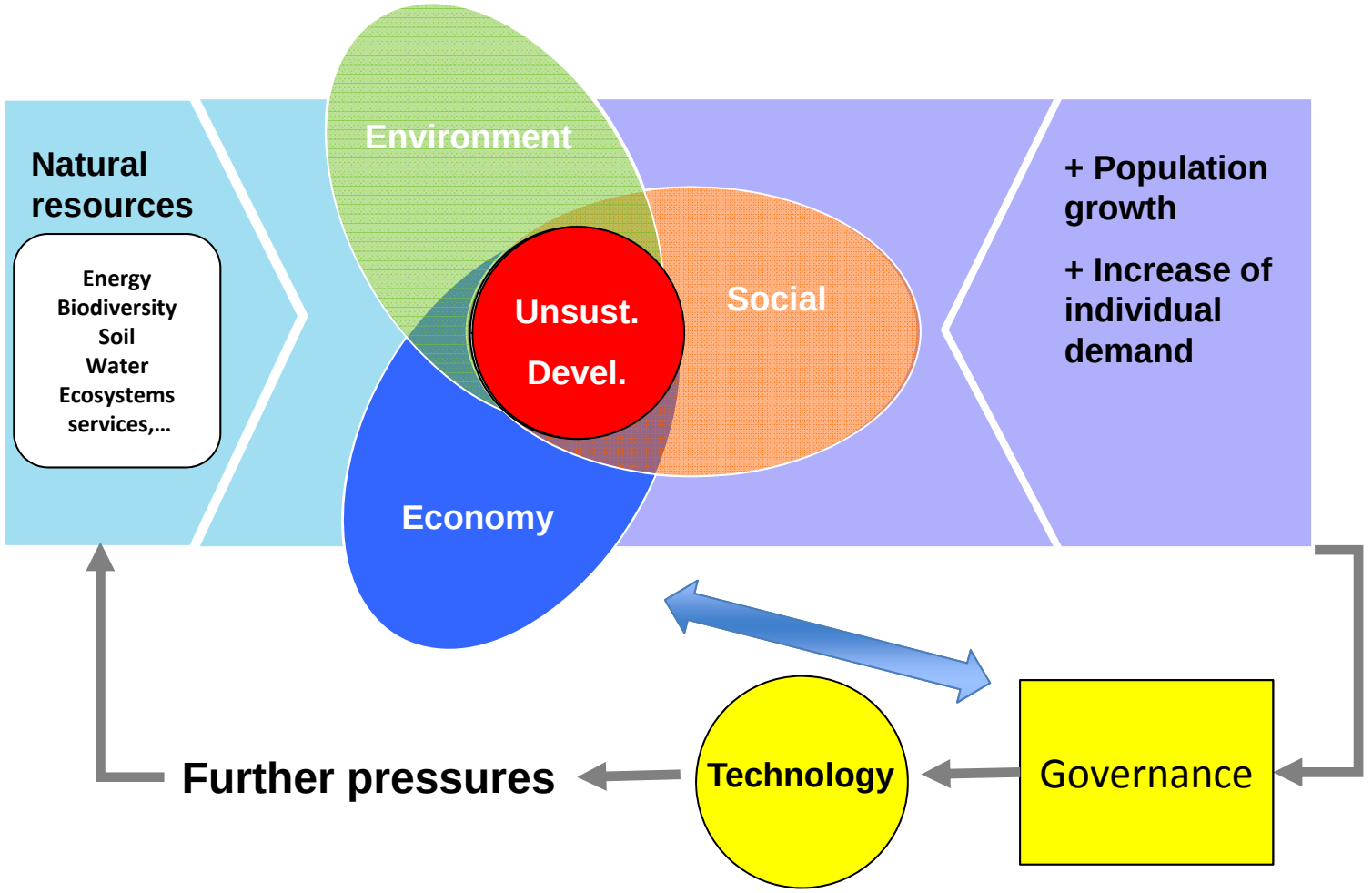
Global geospatial data Local to National perspectives

Pascal Peduzzi,

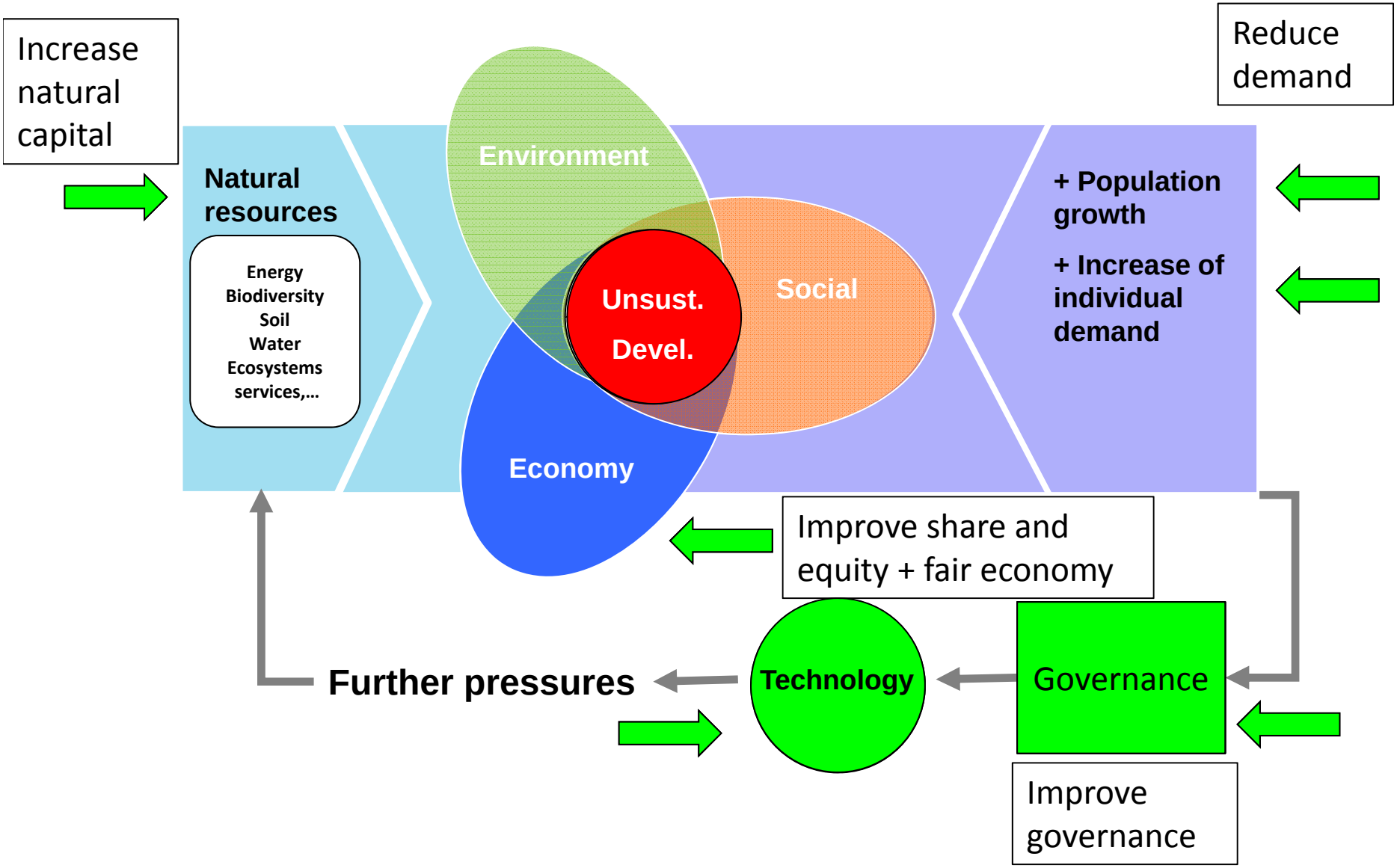
3rd High Level Forum on UN Global Geospatial Information Management

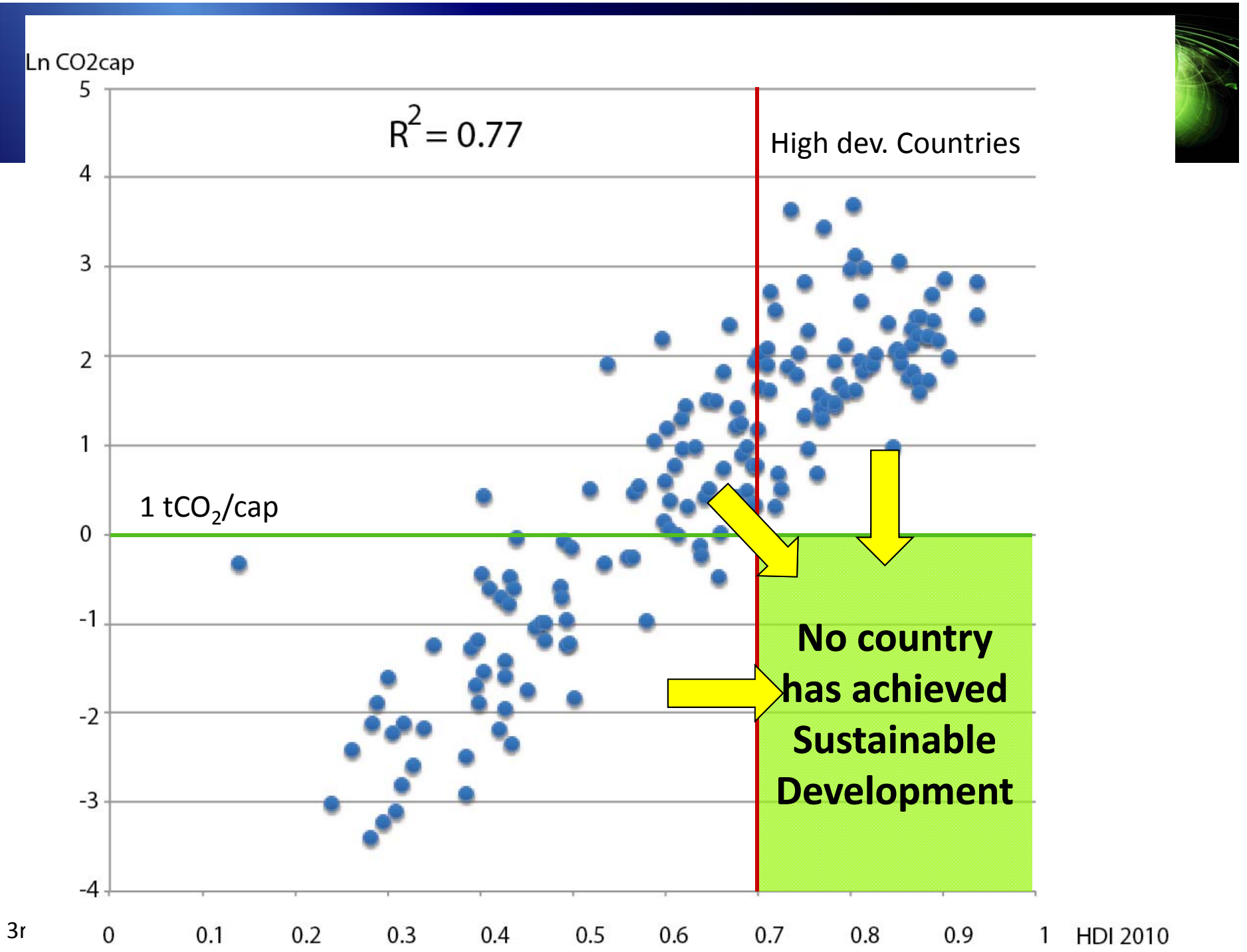
21 October 2014, Beijing, China

What is the framework ?



What is the framework ?




Ln CO2cap
$R^2 = 0.77$
High dev. Countries
1 tCO_2/cap
No country has achieved Sustainable Development
5
4
3
2
1
0
-1
-2
-3
-4
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
HDI 2010

Where can data help?

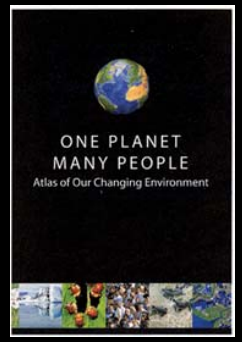
- Start understand processes
- Identify issues & hotspots
- Raise awareness

- Scenarios
- Planning
- Implementation

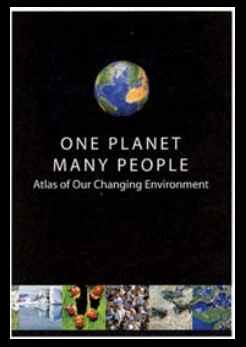
- Monitoring
- Assessments
- Enforcement

Identification of issues & hotspots + Awareness

Monitoring deforestation (Iguaçu)



Monitoring deforestation (Bolivia)

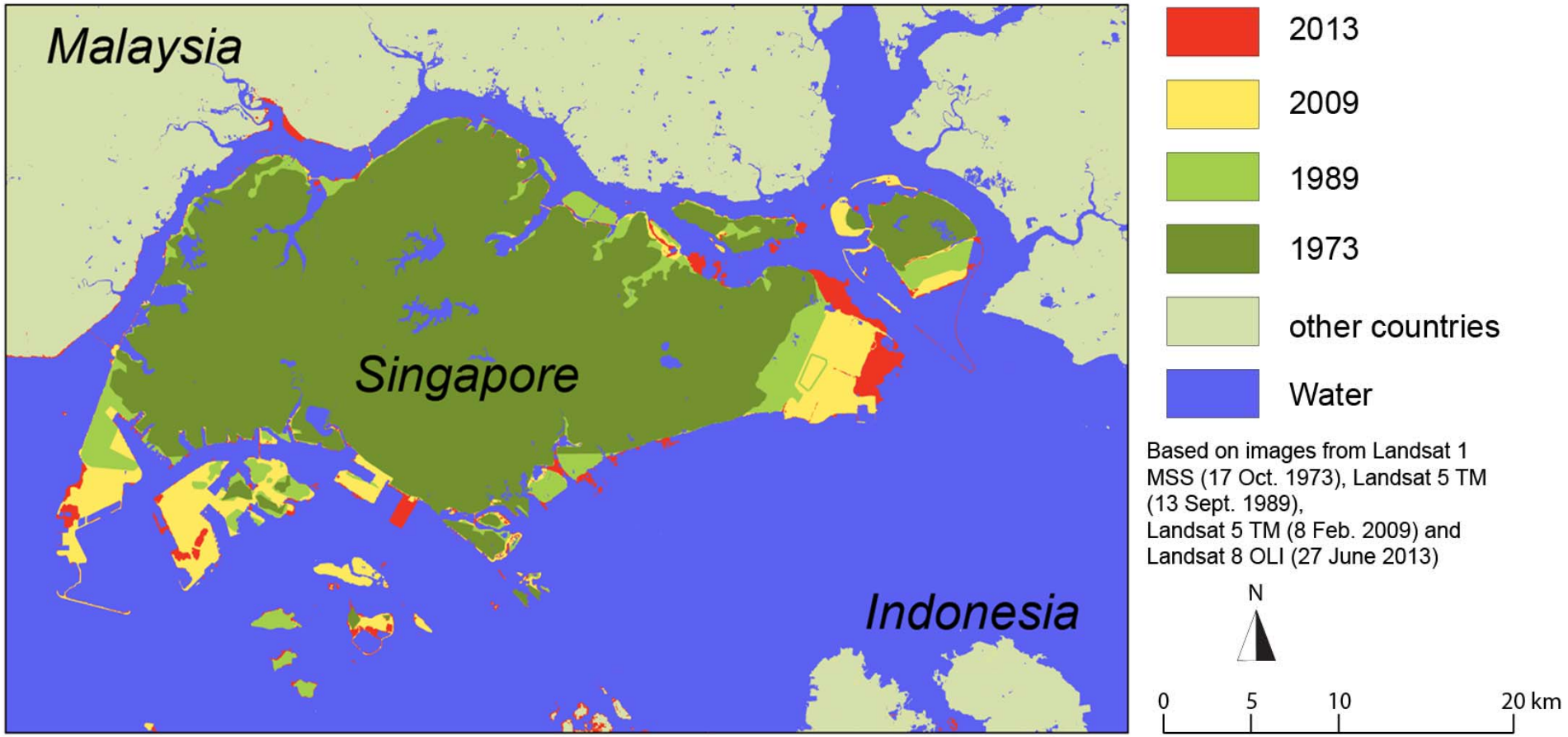


Sand

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

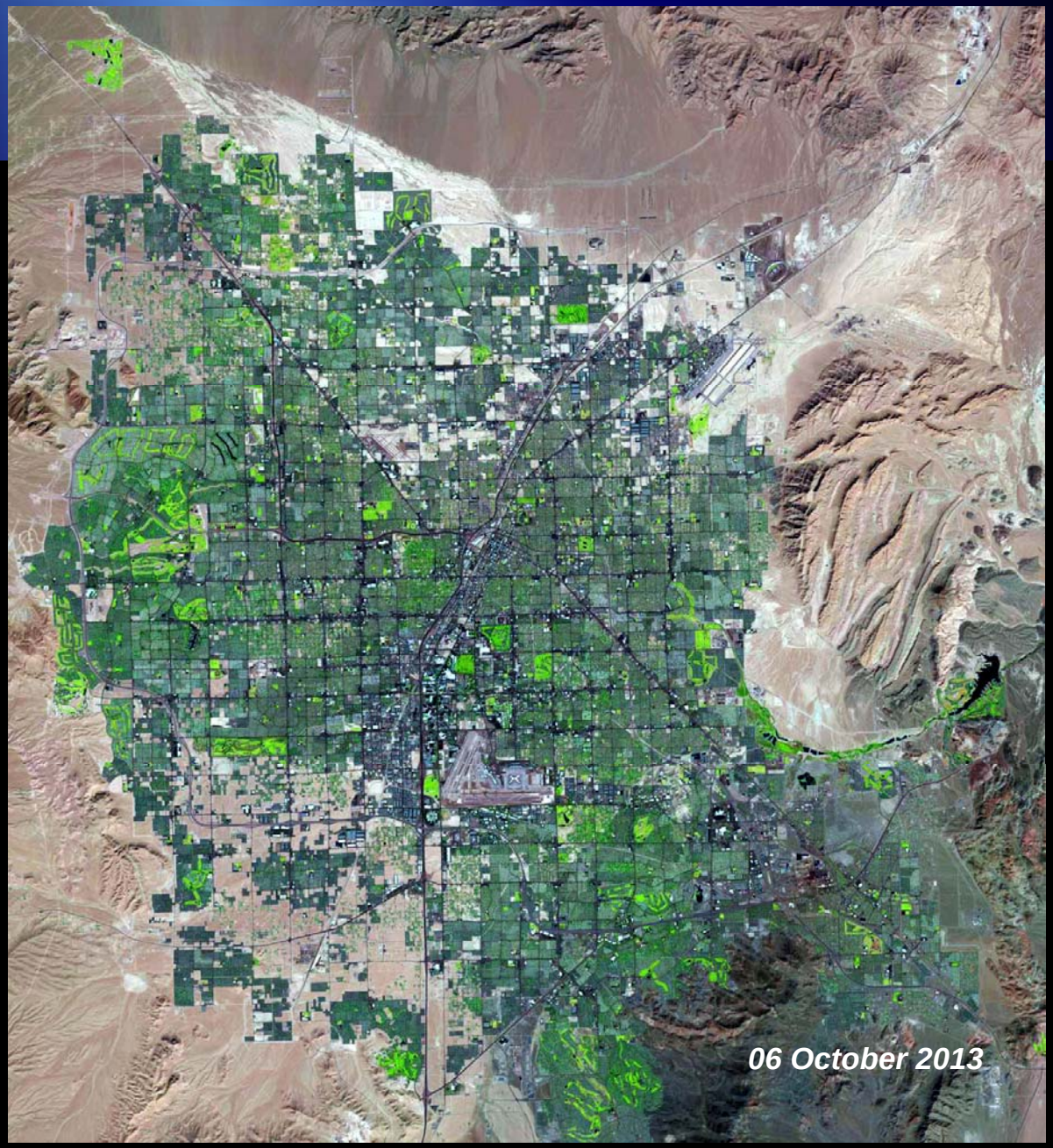
Dubai

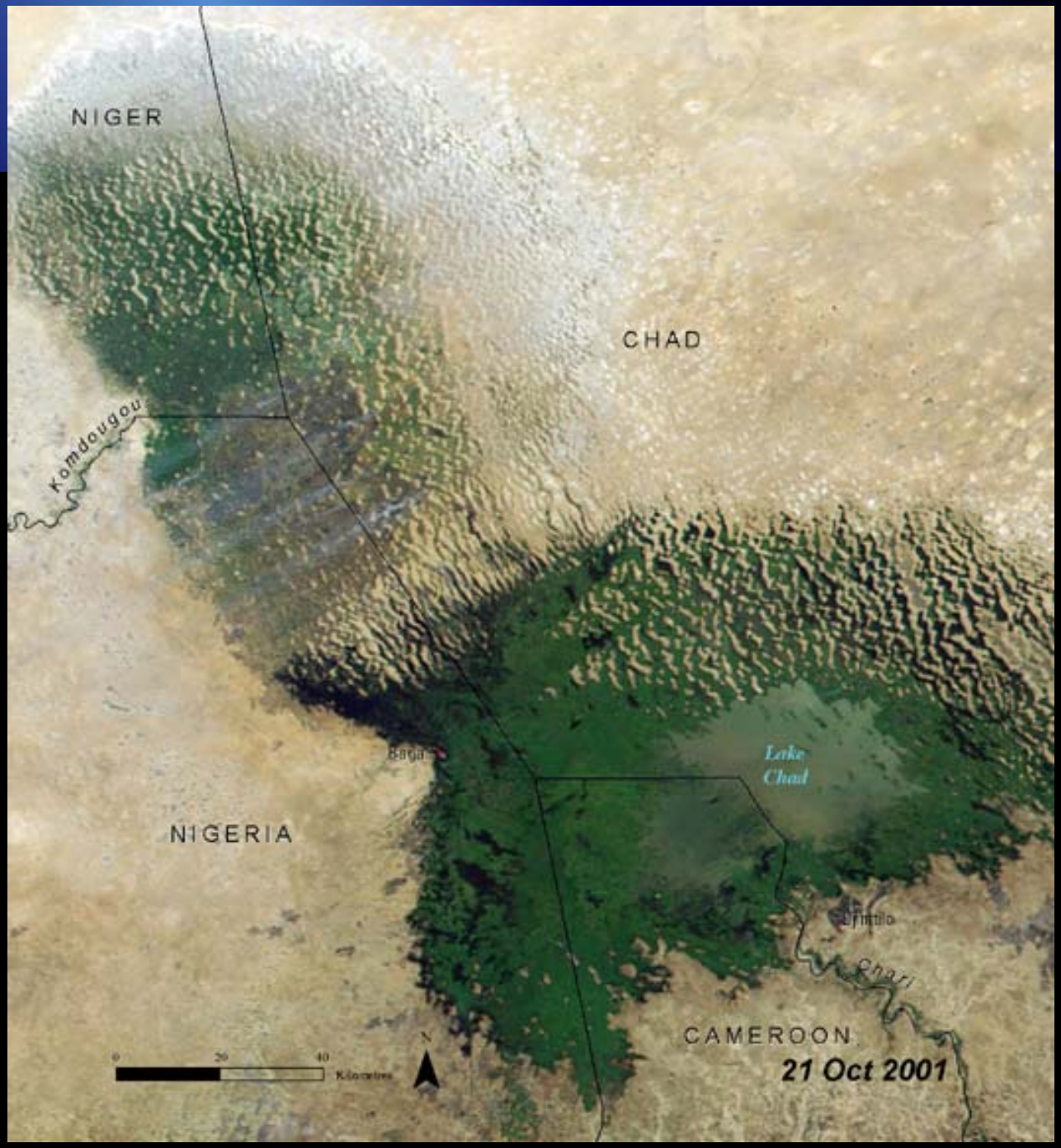
1.2 billion tons.

Sources :Jan De Nul group, 2013

Aral sea (when cotton absorbs a sea)

Las Vegas



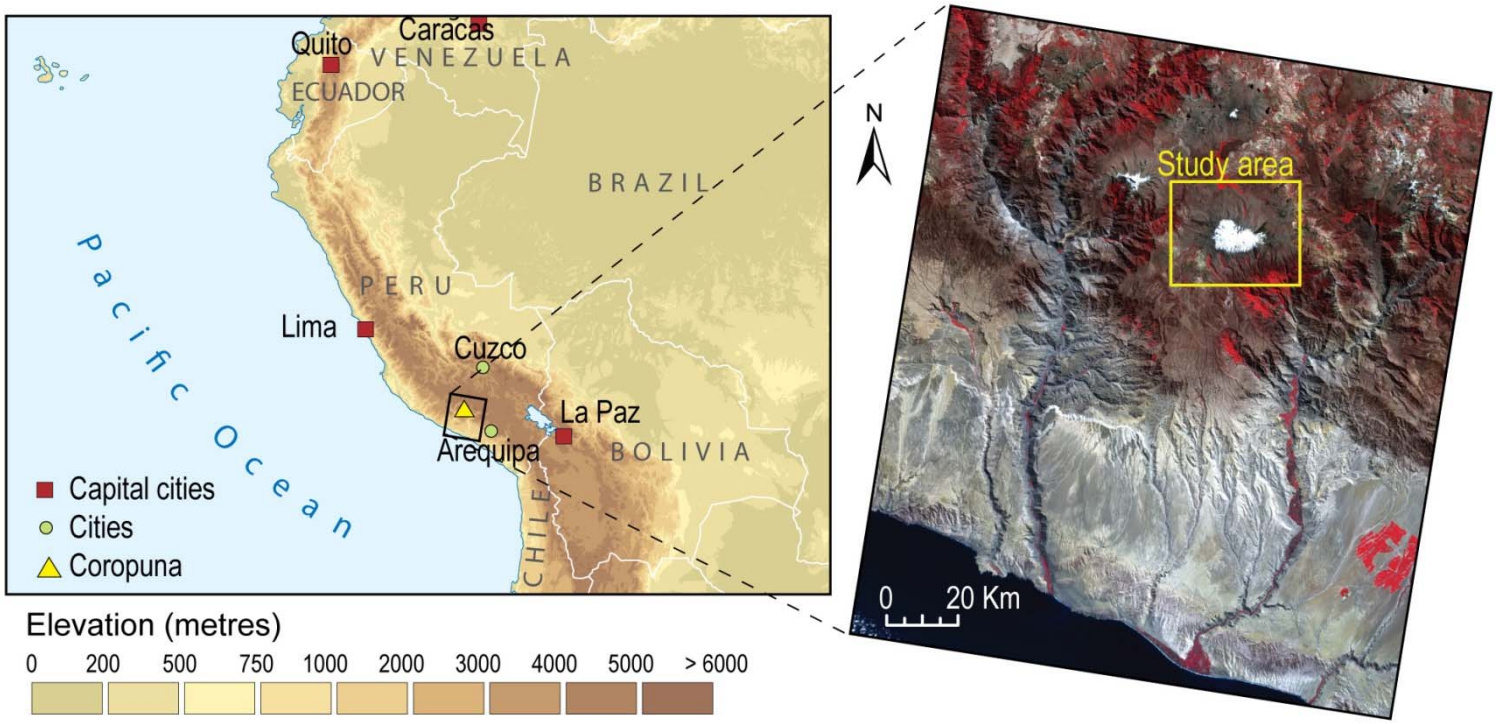


Monitoring the Decline of water ressources (Lake Chad)

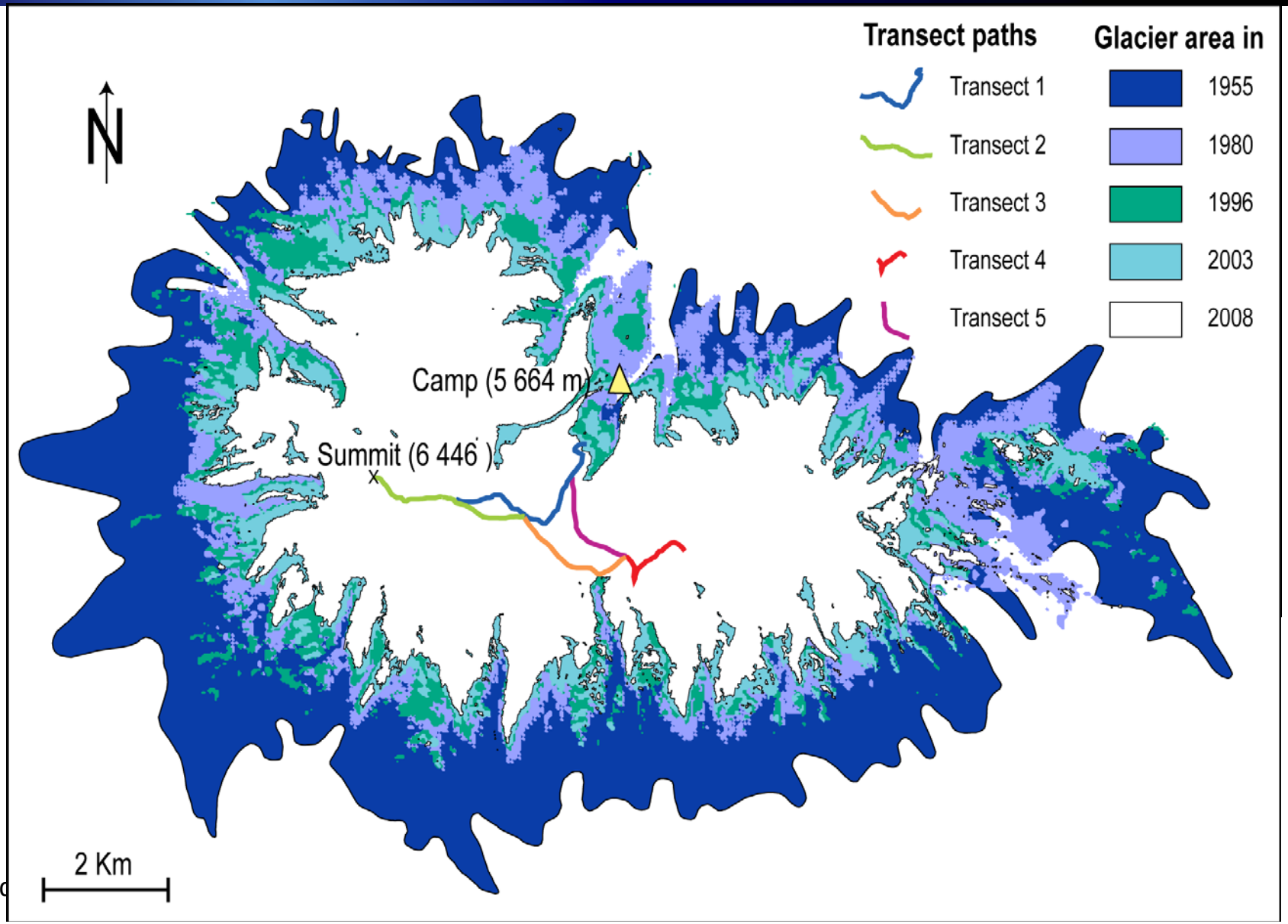
Scenarios, planning, implementation

Coropuna Glacier retreat

The Case of Coropuna (Peru)

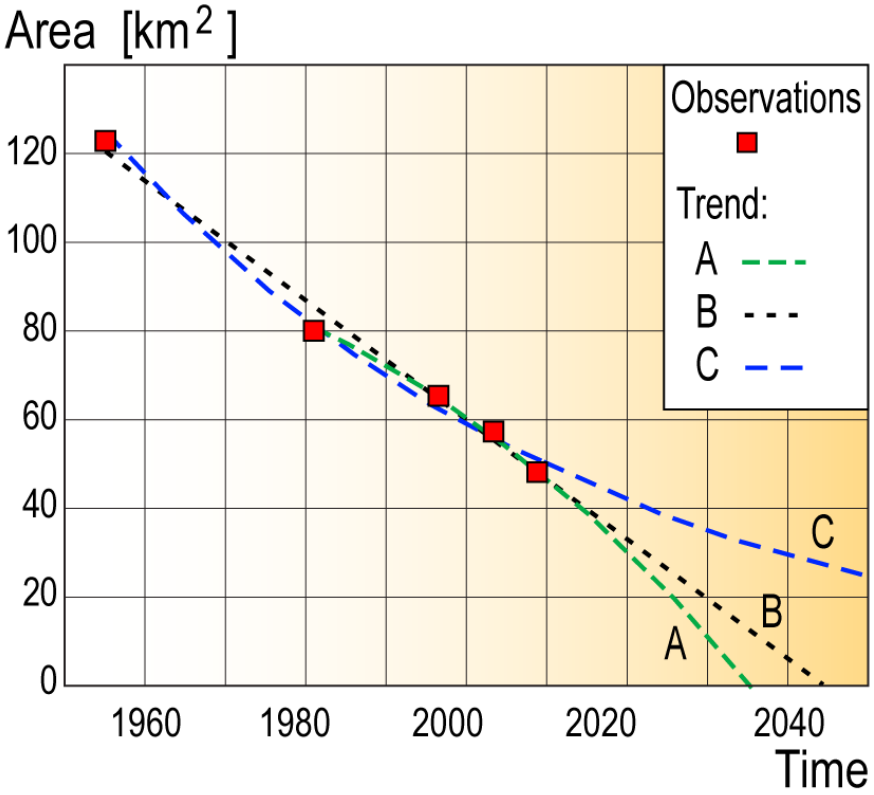


Peduzzi, P., Herold, C., Silverio, W., Assessing high altitude glacier thickness, volume and area changes using field, GIS and remote sensing techniques: the case of Nevado Coropuna (Peru), *The Cryosphere*, **4**, 313-323, 2010
http://www.the-cryosphere.net/4/313/2010/tc-4-313-2010.html


Transect paths
Transect 1
Transect 2
Transect 3
Transect 4
Transect 5
Glacier area in
1955
1980
1996
2003
2008
N
Camp (5 664 m)
Summit (6 446)
2 Km

3rd

Trend and potential future scenarios



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Negril

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)

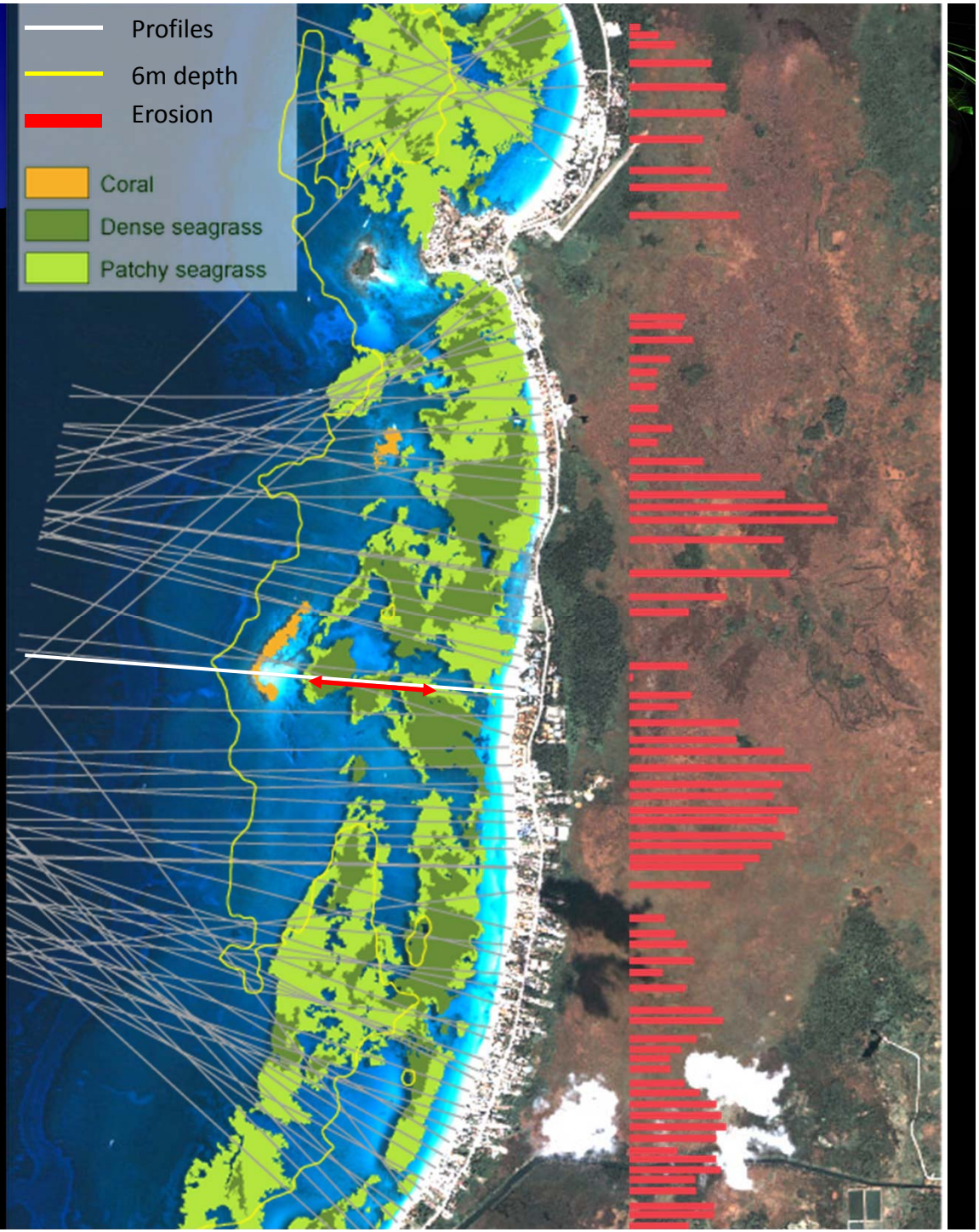
Data extraction

Satellite imagery

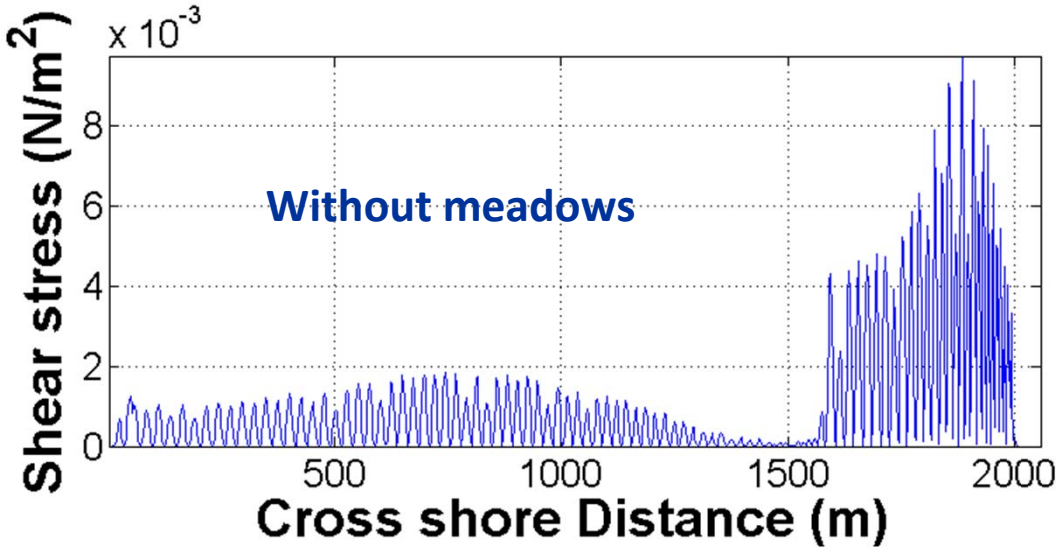
To classify marine ecosystems

GIS analysis

Data retrieval and remote sensing to identify erosion rate



Coastal ecosystem importance: beach protection by seagrass meadows



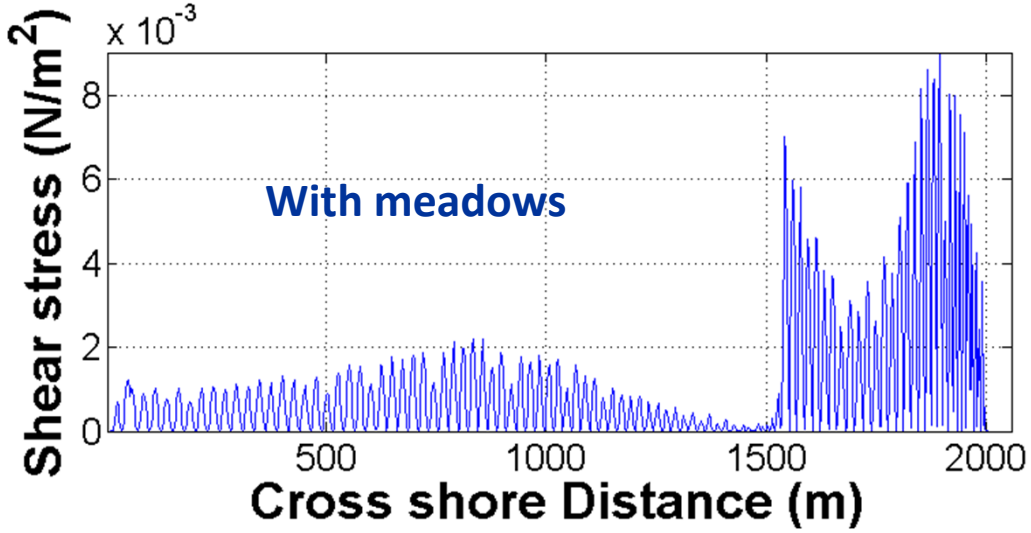
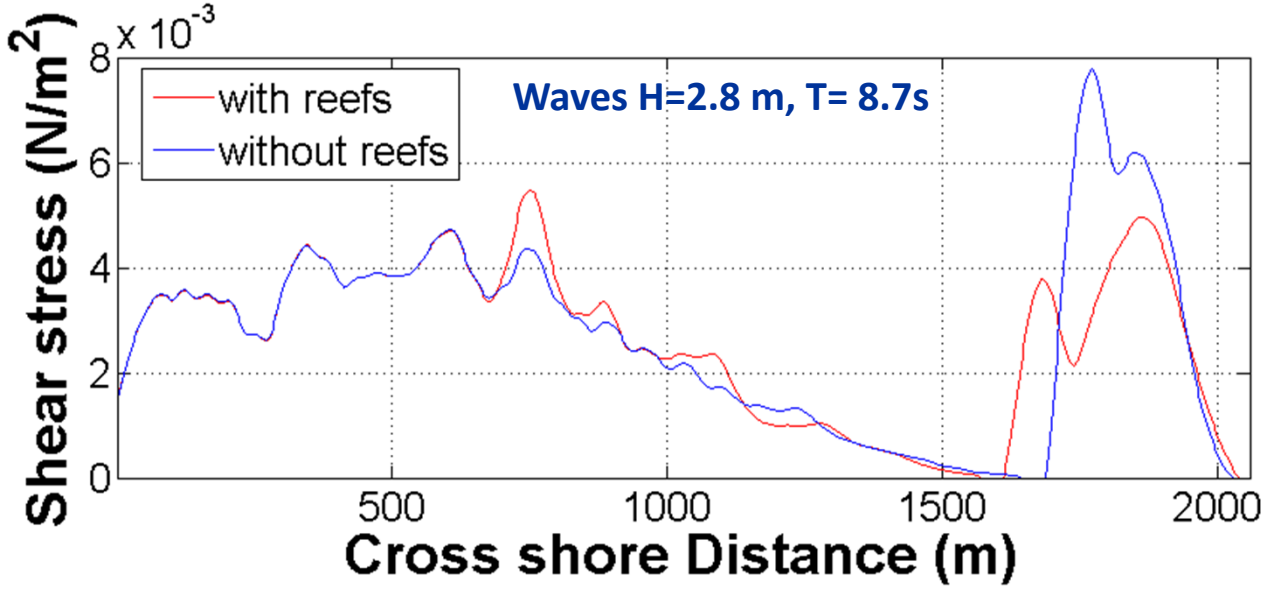


Fig. 11. Modelled bed shear stress (force per unit area) (SBEACH mode (wave height 1 m, period 6s) in the Negril coastal zone

The seagrass meadows spread the wave force on wider area and dissipate wave energy

Coastal ecosystem importance: beach protection by coral reefs



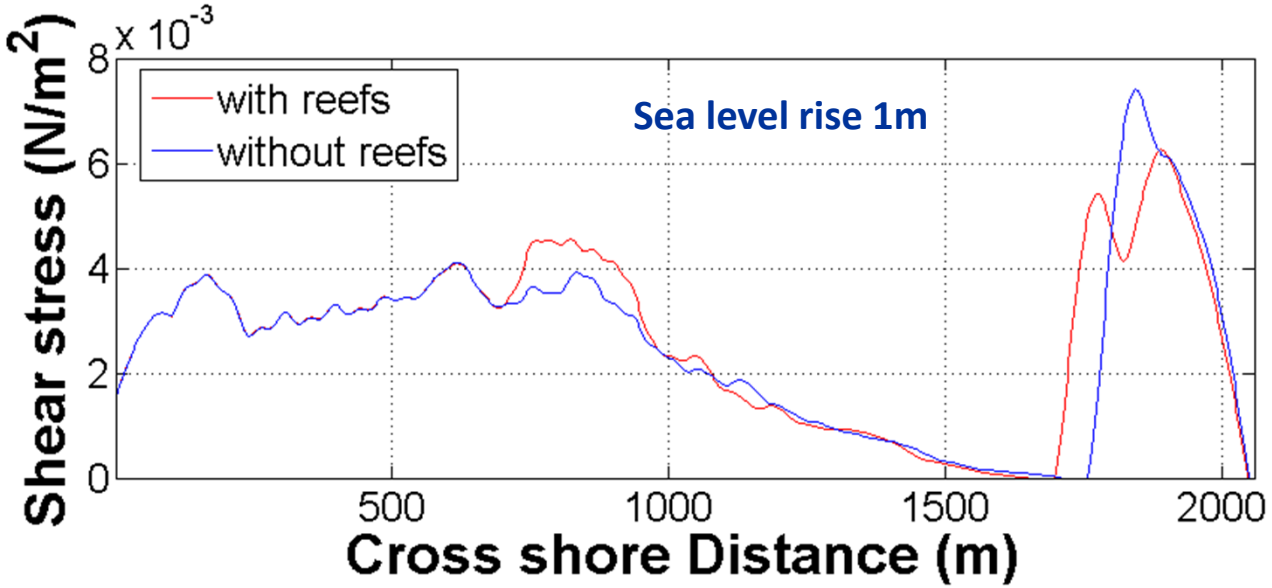
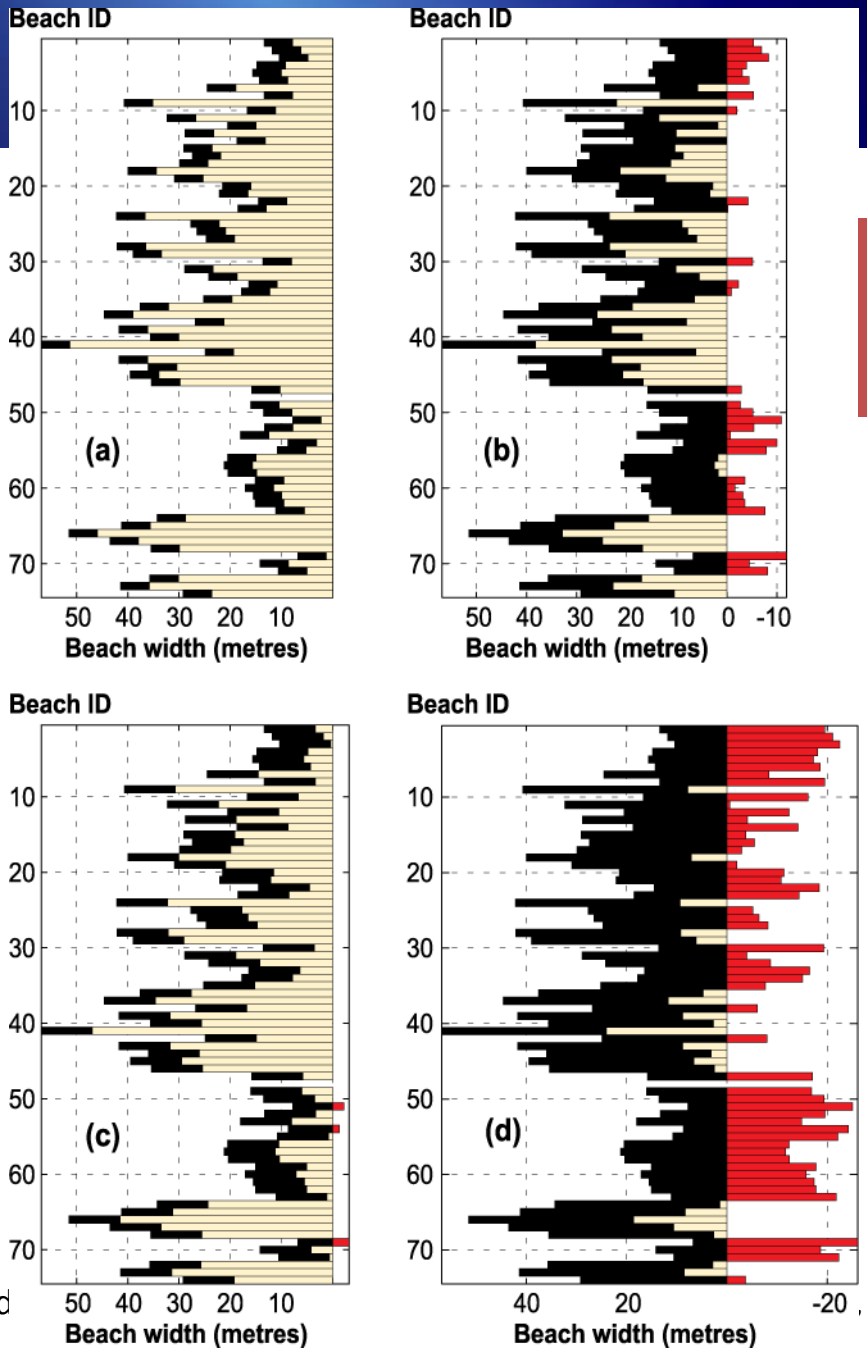


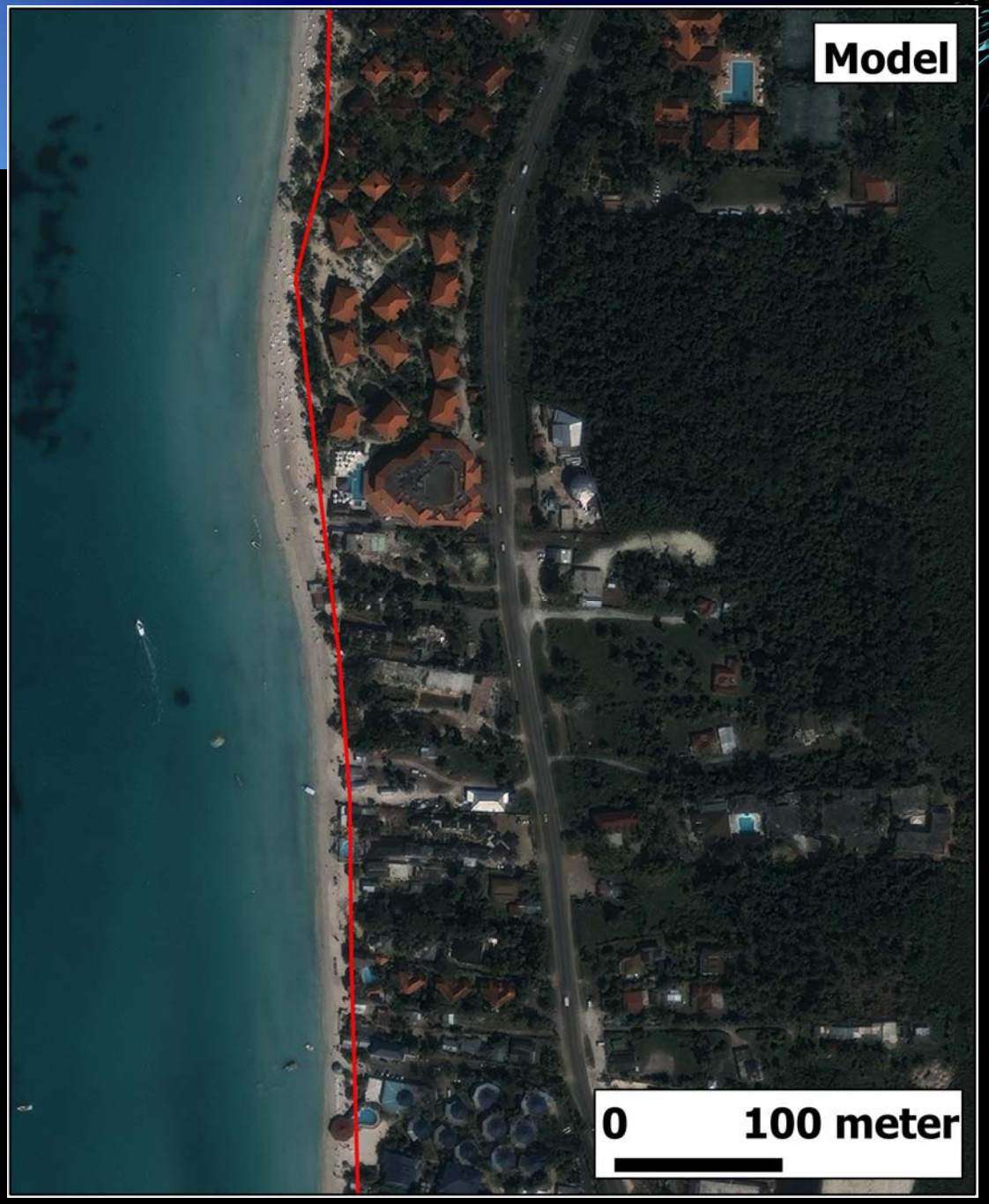
Fig. 9b. Modelled bed shear stress (force per unit area) (SBEACH model) induced by waves in the Negril coastal zone, showing the protection effects of inshore coral reefs



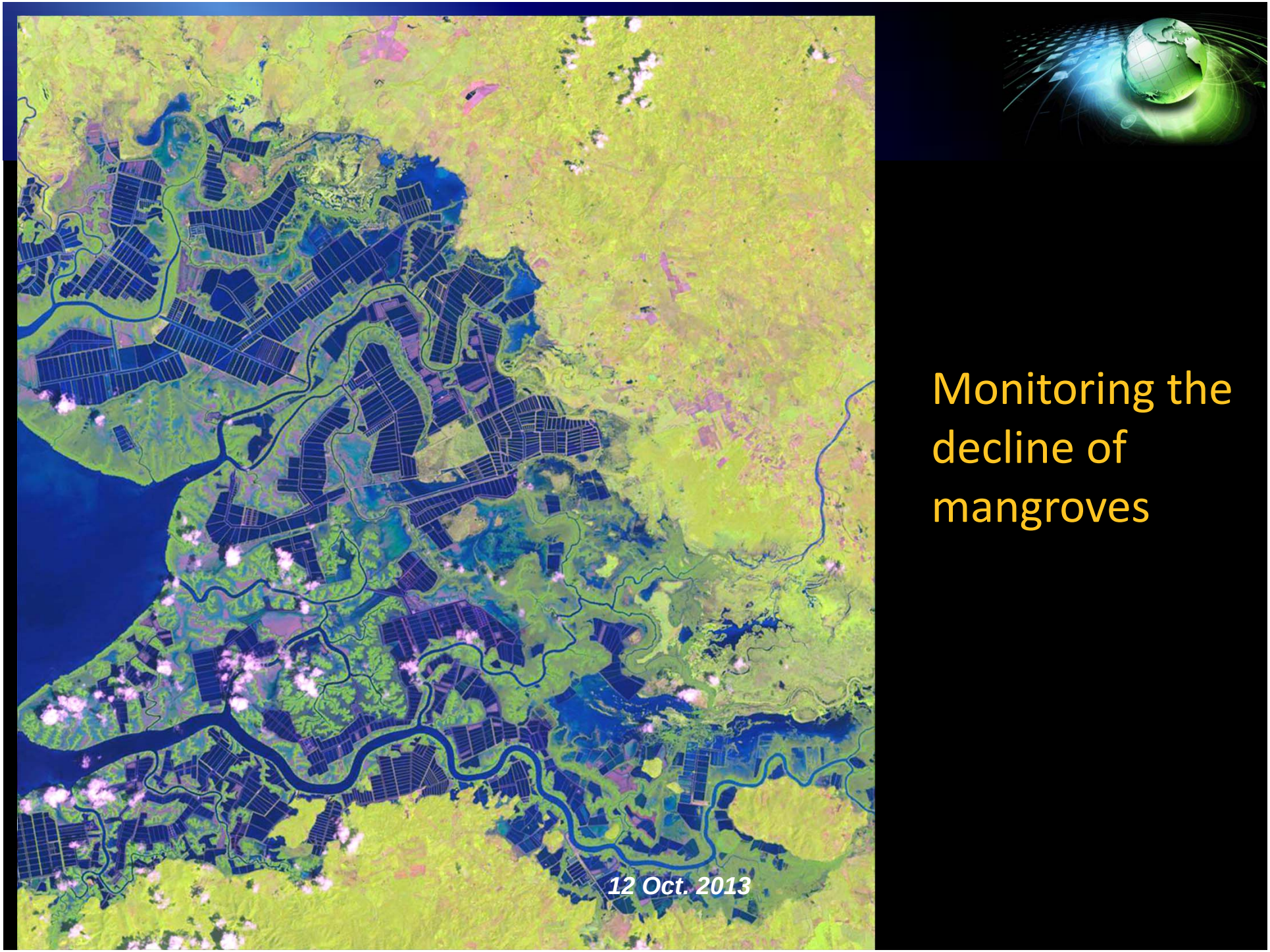
Beach erosion Scenarios

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


Model
0
100 meter

Monitoring & enforcement



Monitoring the decline of mangroves

Can we monitor poaching ?

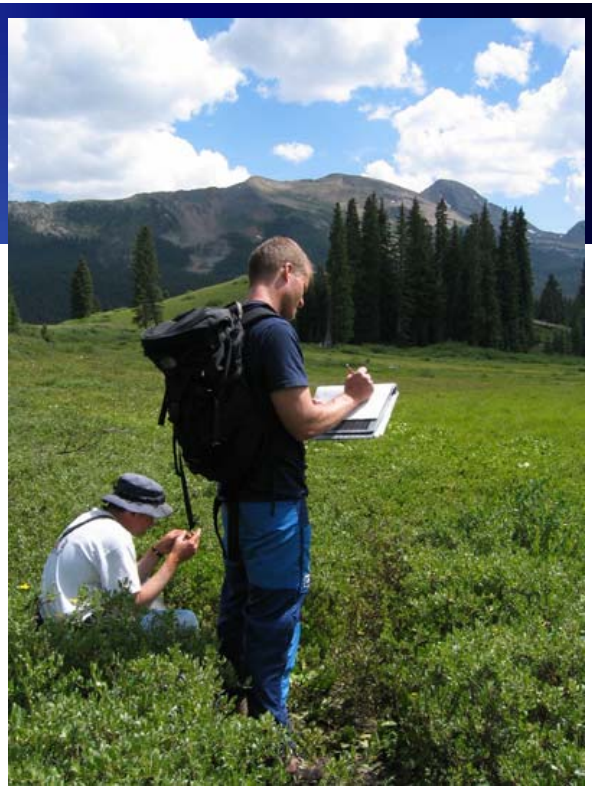
A need for a data revolution

Need a data revolution

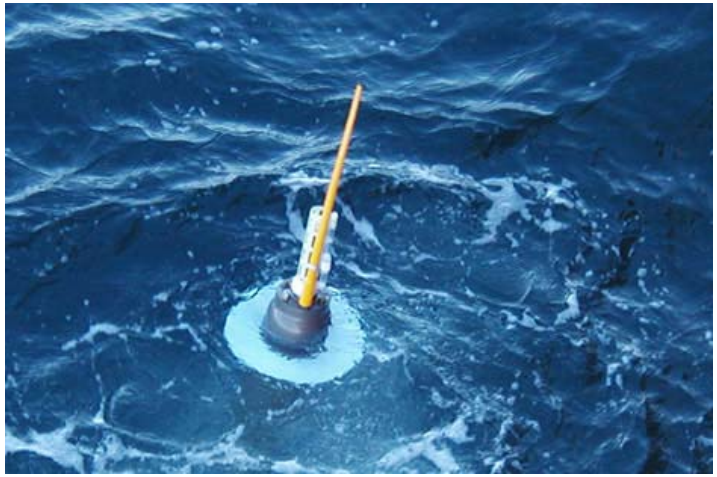
SDGs will request :

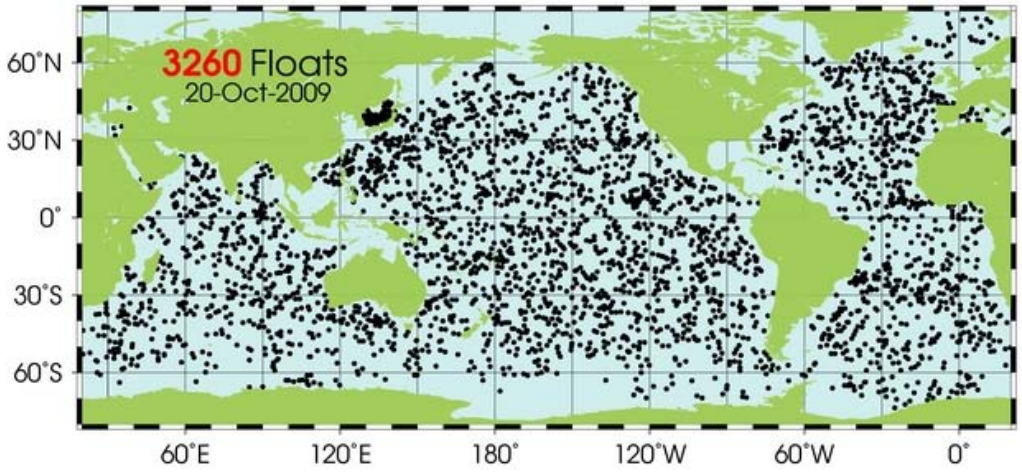
- more frequent updates
- Gender disaggregation
- Rural / Urban differentiation
- Sub-national data
- New indicators
- More holistic analysis

This will exceed the capacity of national statistical offices in many countries, so…




315° NW




3260 Floats
20-Oct-2009
60°N
30°N
0°
30°S
60°S
60°E
120°E
180°
120°W
60°W
0°

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
Responsability
Copyright
Privacy

Human

Cooperation, collaboration
Training

Solutions

Metadata

Standards

Shared best practices

Business models

Copyright

Networks

Authorization

Agreements

Semantic ontology

Brokering

Incentives to cooperate

Open data

Policy framework

Spatial Data Infrastructure (SDI)

Open data: what is it?

- **T** Timely
- **A** Accessible
- **M** Machine processable
- **L** License-free
- **N** Non-Proprietary
- **D** Non-discriminatory
- **P** Primary
- **C** Complete

Advantages

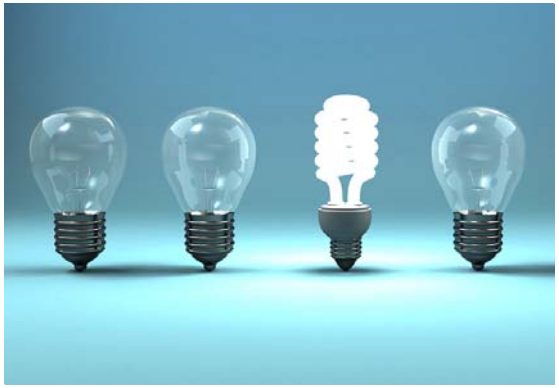
Self-Empowerment

Participation

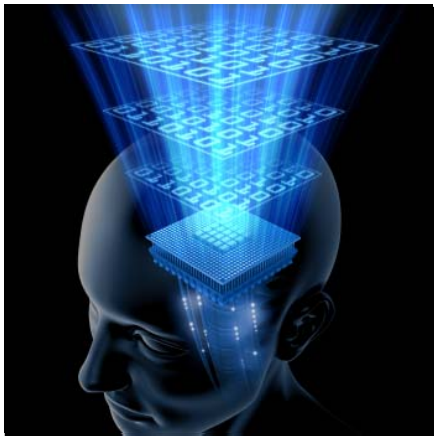
Transparency & democracy

DATA is being used

Combination of data leads to new products and services



Innovation & efficiency



New knowledge

UNEP is willing to support

OPEN DATA

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

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).... Show more >

explore by theme:


Air pollution and air quality


Biodiversity


Chemicals and waste


Climate change


Energy


Environmental governance


Forests


Freshwater


Land


Oceans and seas

supports | can be portrayed | supports

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 62-98 of 31 January 2008

Variables

found 82 variables

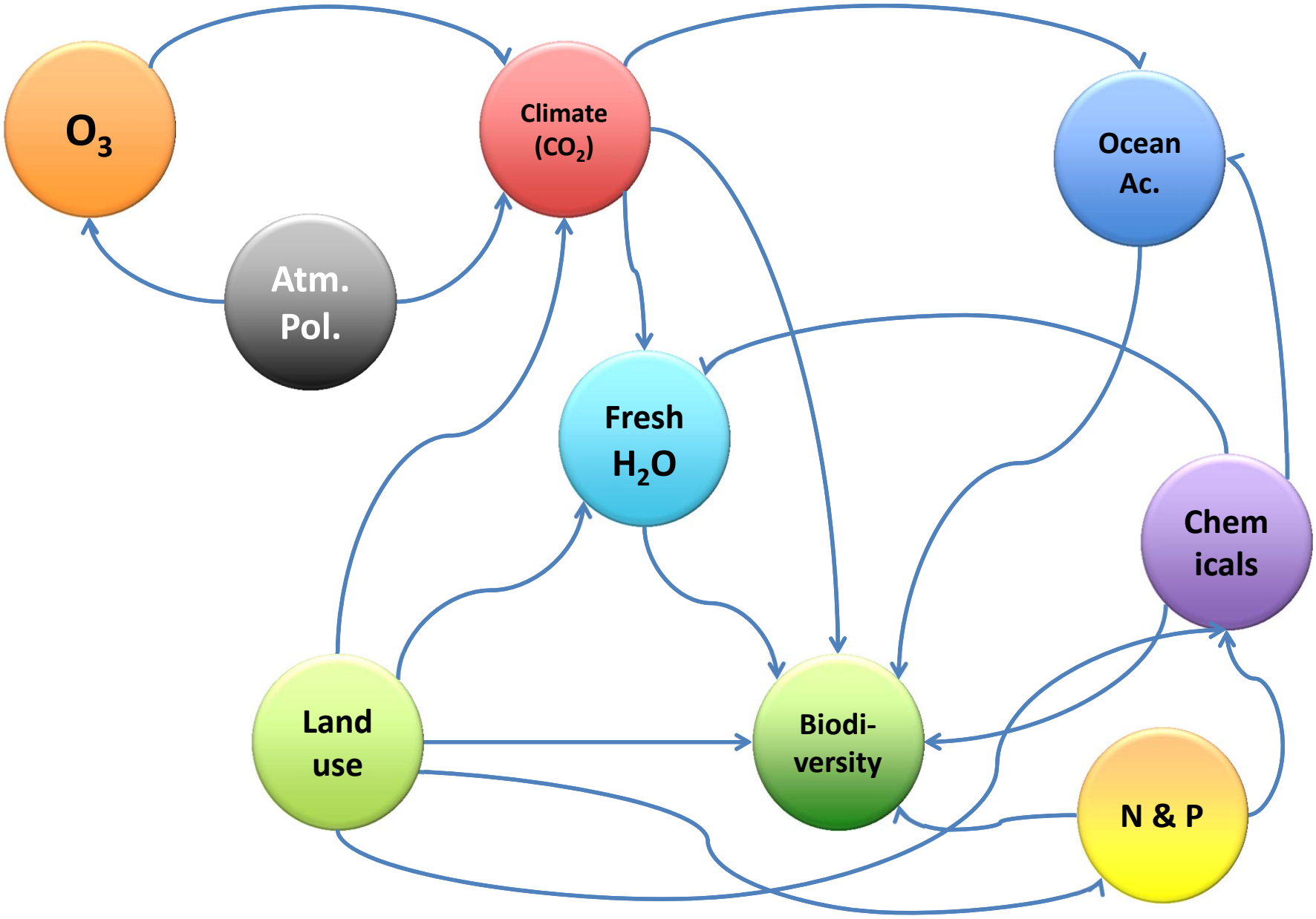
- Agricultural Area
- Agricultural Area Certified Organic
- Agricultural Production Index
- Aquaculture Production - Marine
- Birds - Number of Threatened Species
- Carbon Stock in Living Forest Biomass
- Cereals - Yield

Sustainable Development Goals

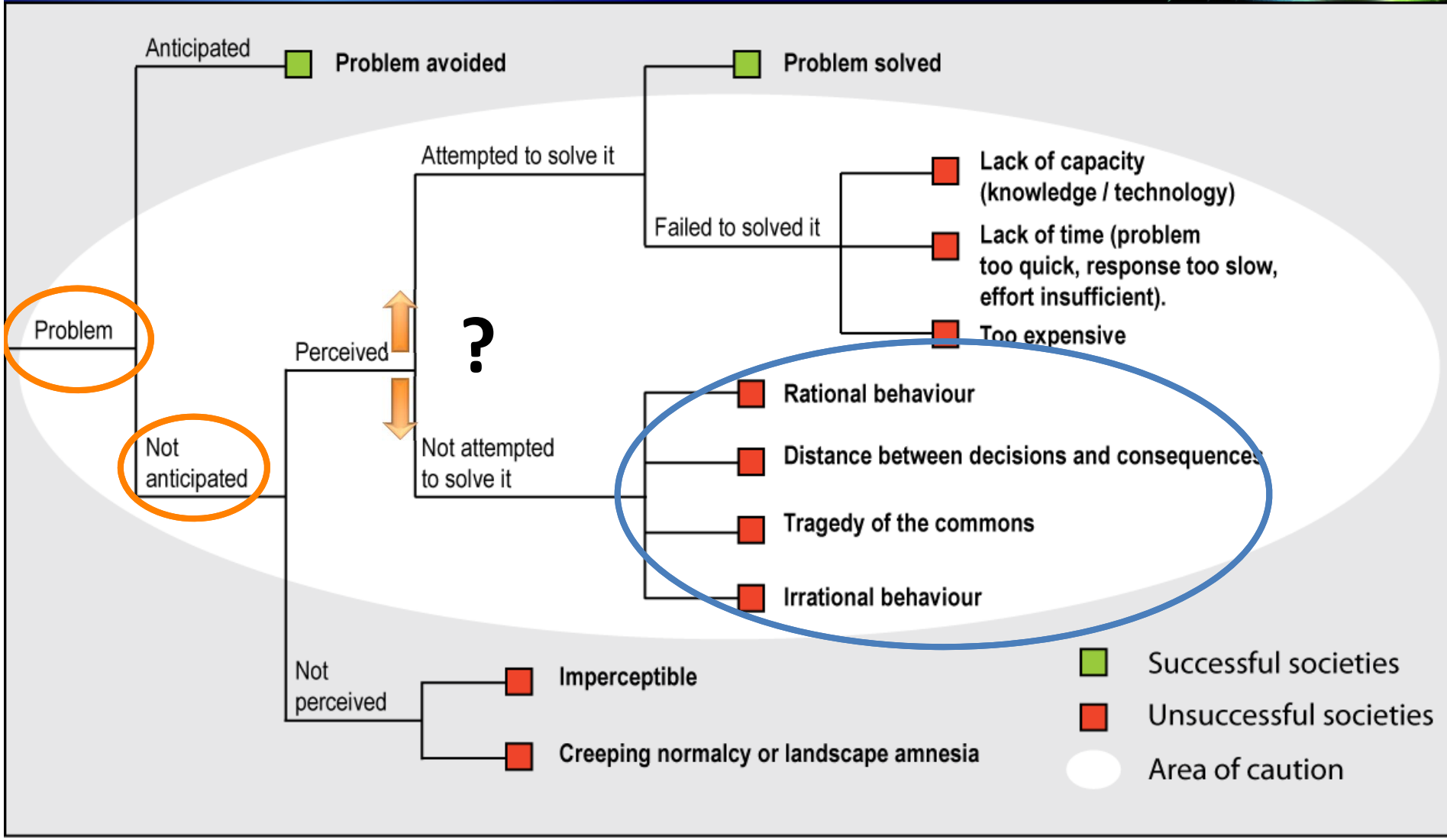
- Goal 1: End poverty in all its forms everywhere
- Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
- Goal 3: Ensure healthy lives and promote well-being for all at all ages
- Goal 4: Ensure inclusive and equitable quality education and promote life-long 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.

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?

More useful data is good,…

- New technologies carry many hopes an 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.

UNEP | GRID GENEVA

Thank you

Http://www.uneplive.org