Leveraging Geospatial Technology: Doing better, doing more... or doing differently?

Greg Scott

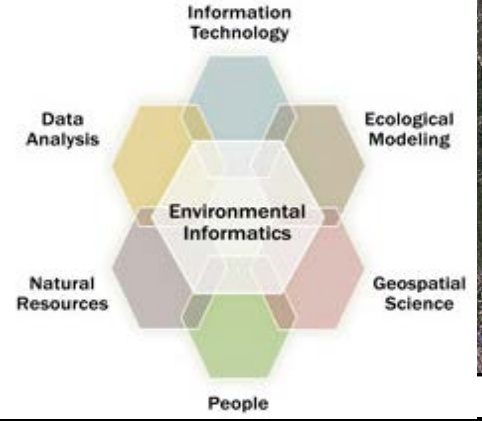
Inter-Regional Advisor, GGIM

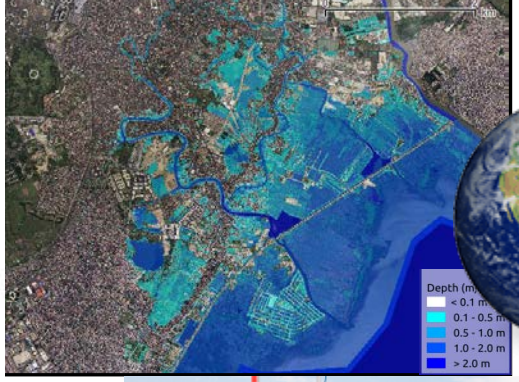
United Nations Statistics Division

UN-GGIM: A global initiative

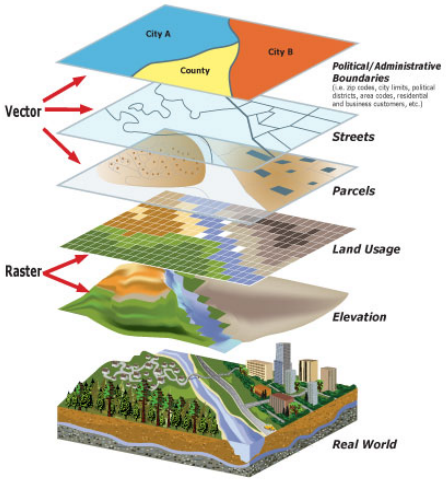
Formal inter-governmental UN Committee of Experts to:

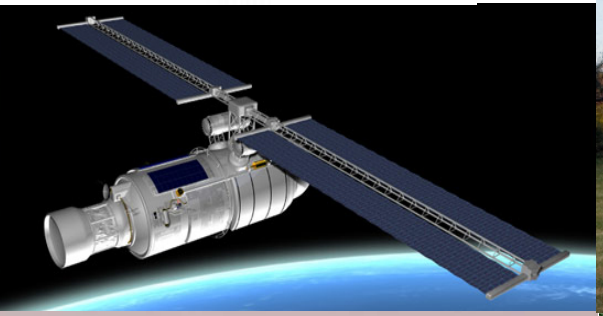
- Discuss, enhance and coordinate Global Geospatial Information Management activities by **involving Member States** at the highest level. Reports to ECOSOC
- Make joint decisions and set directions on the use of geospatial information within national and global policy frameworks
- Work with Governments to improve policy, institutional arrangements, and legal frameworks
- Address global issues and contribute collective knowledge as a community with shared interests and concerns
- Develop effective strategies to build geospatial capacity in developing countries

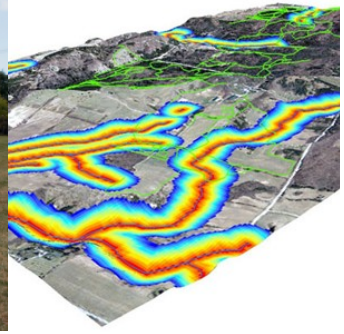

Information Technology
Data Analysis
Ecological Modeling
Environmental Informatics
Natural Resources
Geospatial Science
People

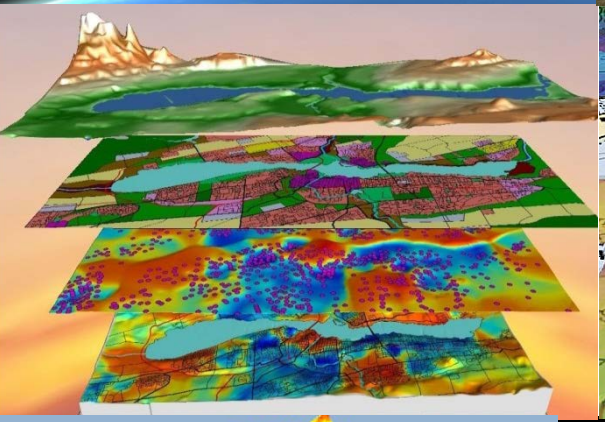

Depth (m)
< 0.1 m
0.1 - 0.5 m
0.5 - 1.0 m
1.0 - 2.0 m
> 2.0 m

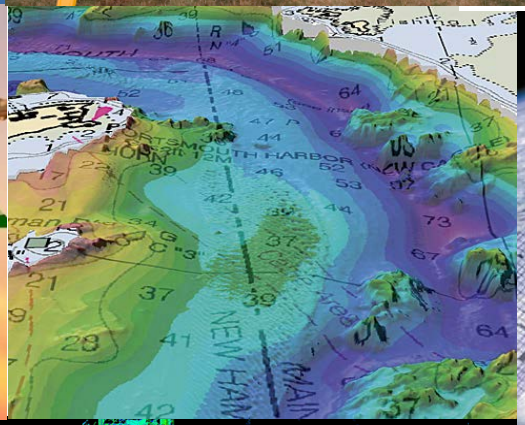

BUILDING EUROPEAN
Spatial Data Infrastructures
Second Edition
Ian Masser

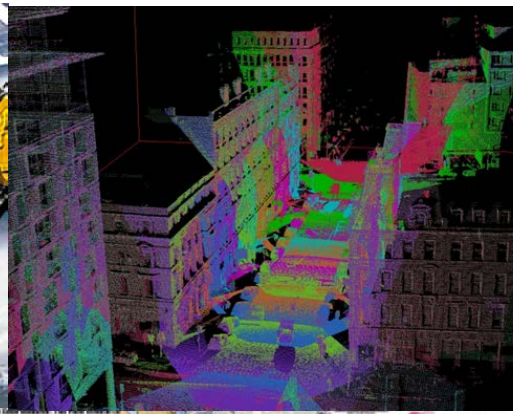

City A
City B
County
Political/Administrative Boundaries
Vector
Streets
Parcels
Land Usage
Raster
Elevation
Real World

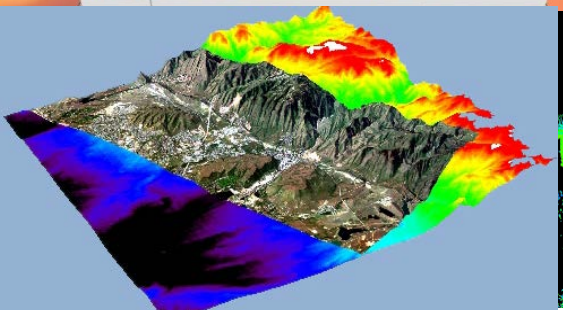


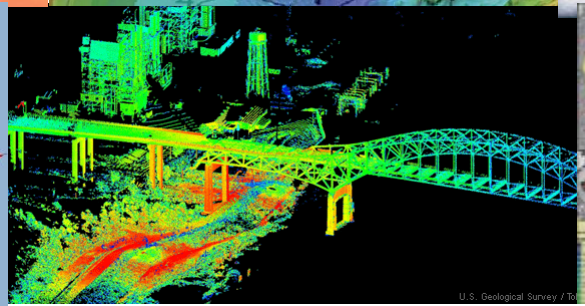


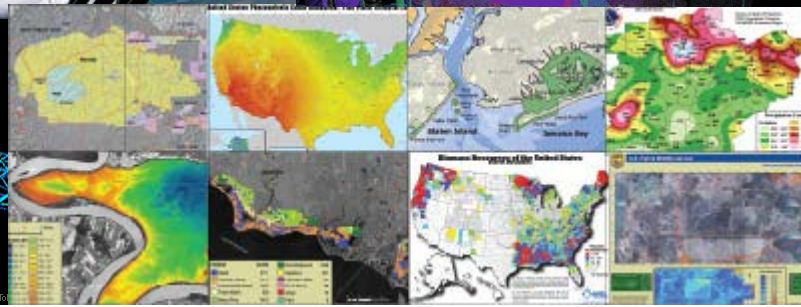









U.S. Geological Survey / To



“Everything happens somewhere…”

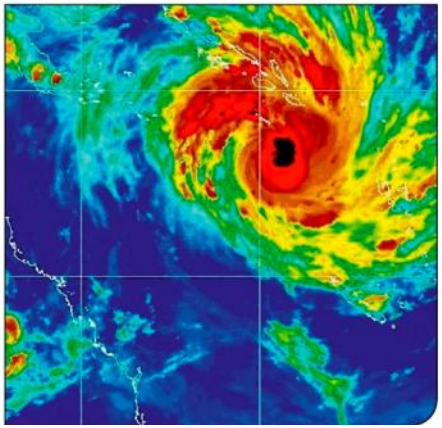
Nancy Tosta, June 2001

How can you measure and monitor sustainable development...

THE WORLD WE WANT





...without geography, place and location?

Geospatial in Sustainable Development

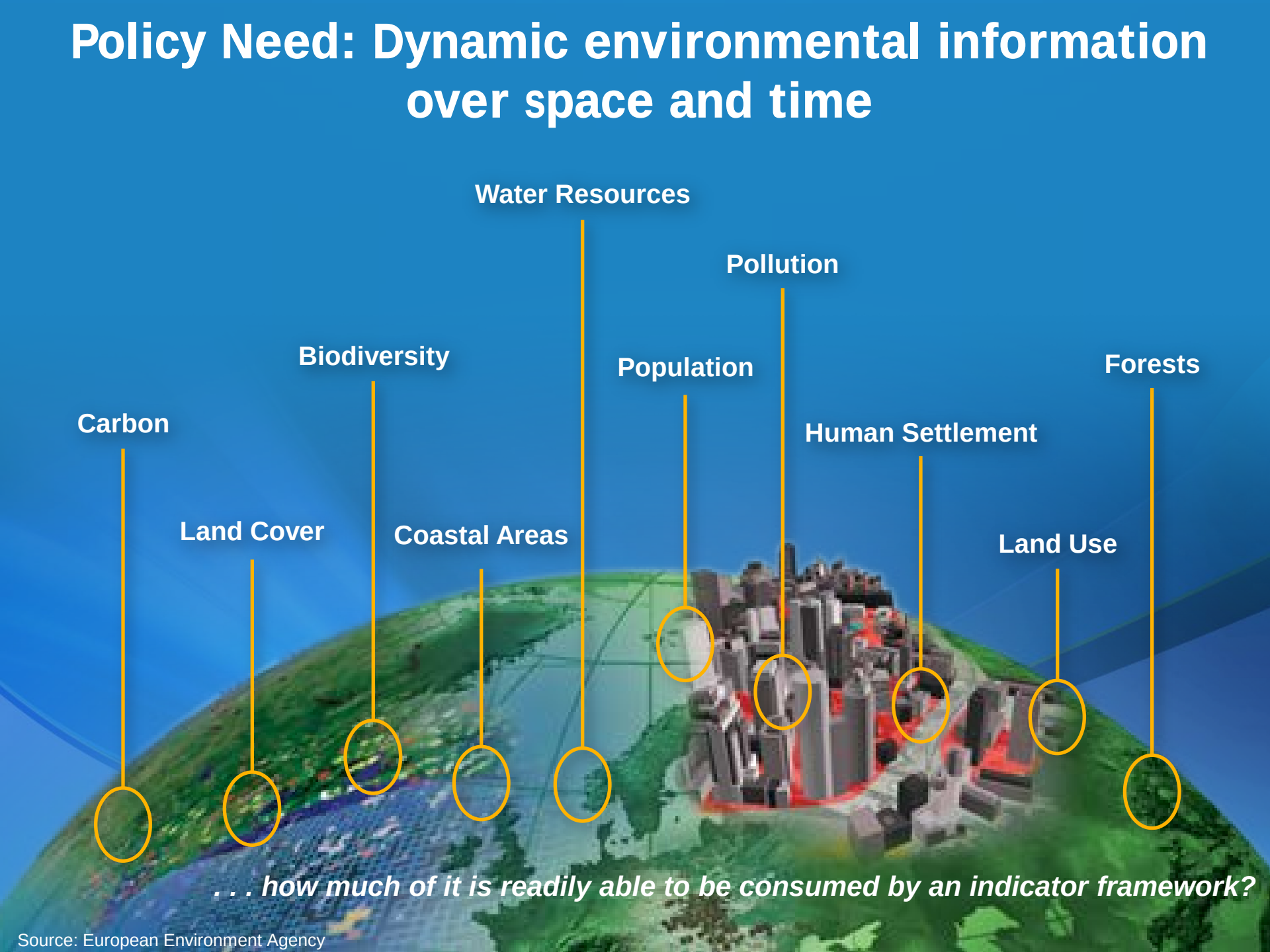
"The many environmental, developmental and humanitarian challenges we are facing today, make it increasingly apparent that location matters…

…thus, geospatial information is fundamental to decision making, policy formulation, measuring and monitoring development elements, all critical to the post-2015 development agenda"

Wu Hongbo
Under-Secretary-General for Economic and Social Affairs
August 2014

“Everything that happens… happens somewhere…”

Policy Need: Dynamic environmental information over space and time

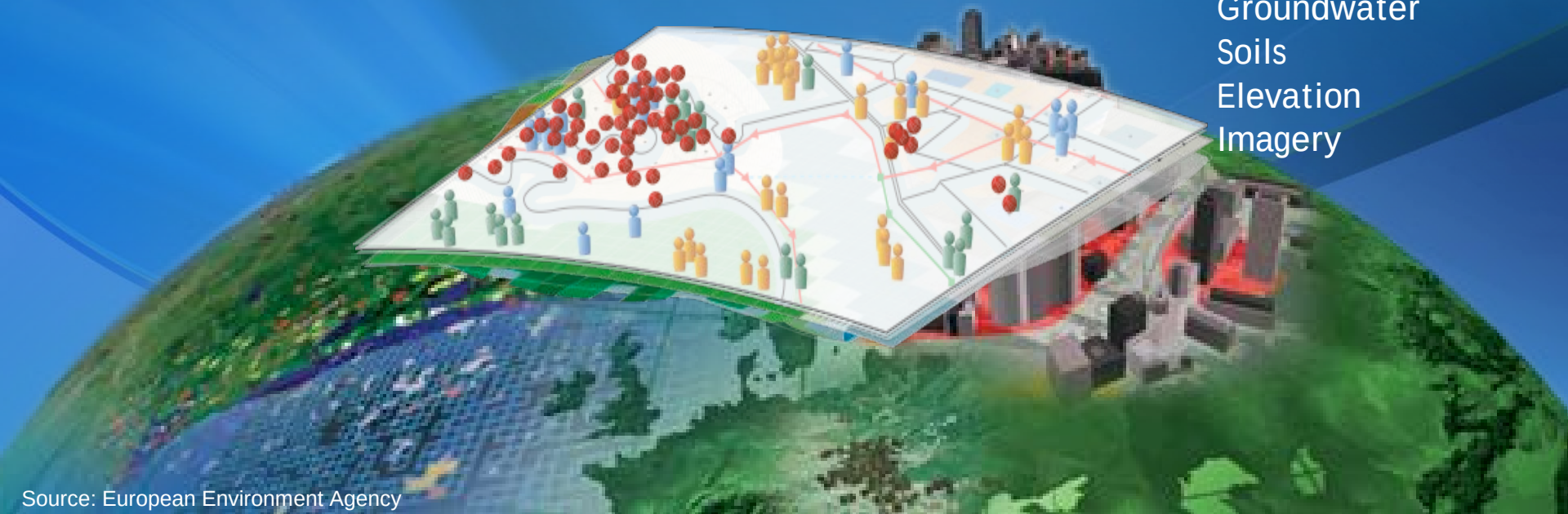


. . . how much of it is readily able to be consumed by an indicator framework?

Source: European Environment Agency

All of these variables can be integrated into consolidated indicators…. if the data is consistently available over space and time

Administrative bdys
Population
Human settlement
Infrastructure
Rainfall
Temperature
Land use
Land cover
Topography
Vegetation
Surface water
Groundwater
Soils
Elevation
Imagery



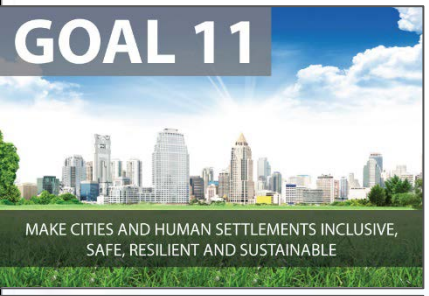
Source: European Environment Agency

Geospatial Data for Sustainable Development

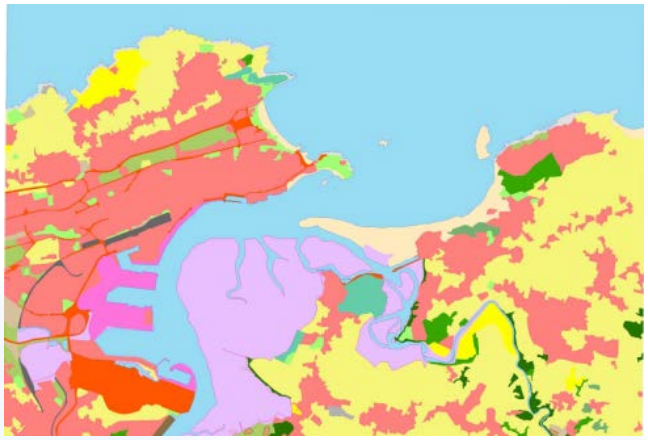
UN-GGIM | United Nations Committee of Experts on Global Geospatial Information Management

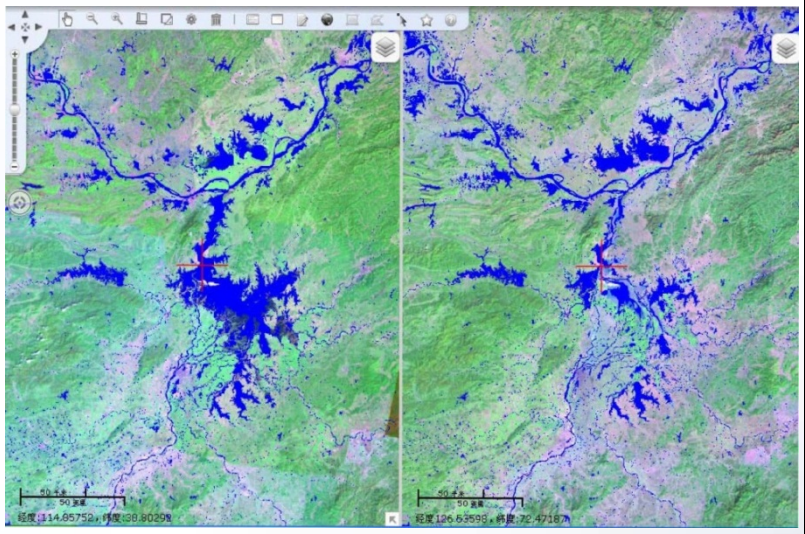
Positioning geospatial information to address global challenges

ggim.un.org



Land Use and Land Cover





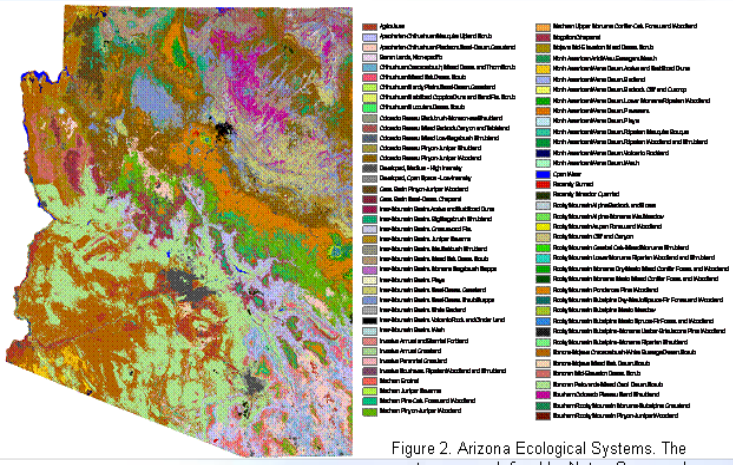
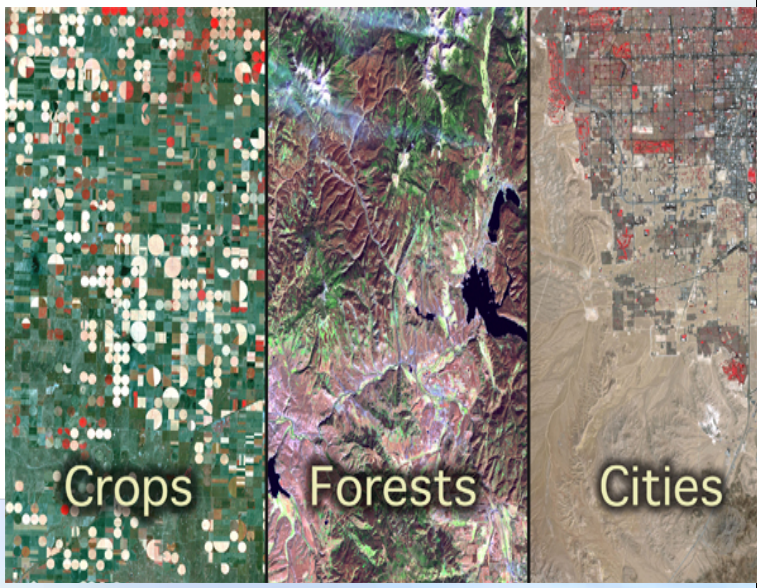


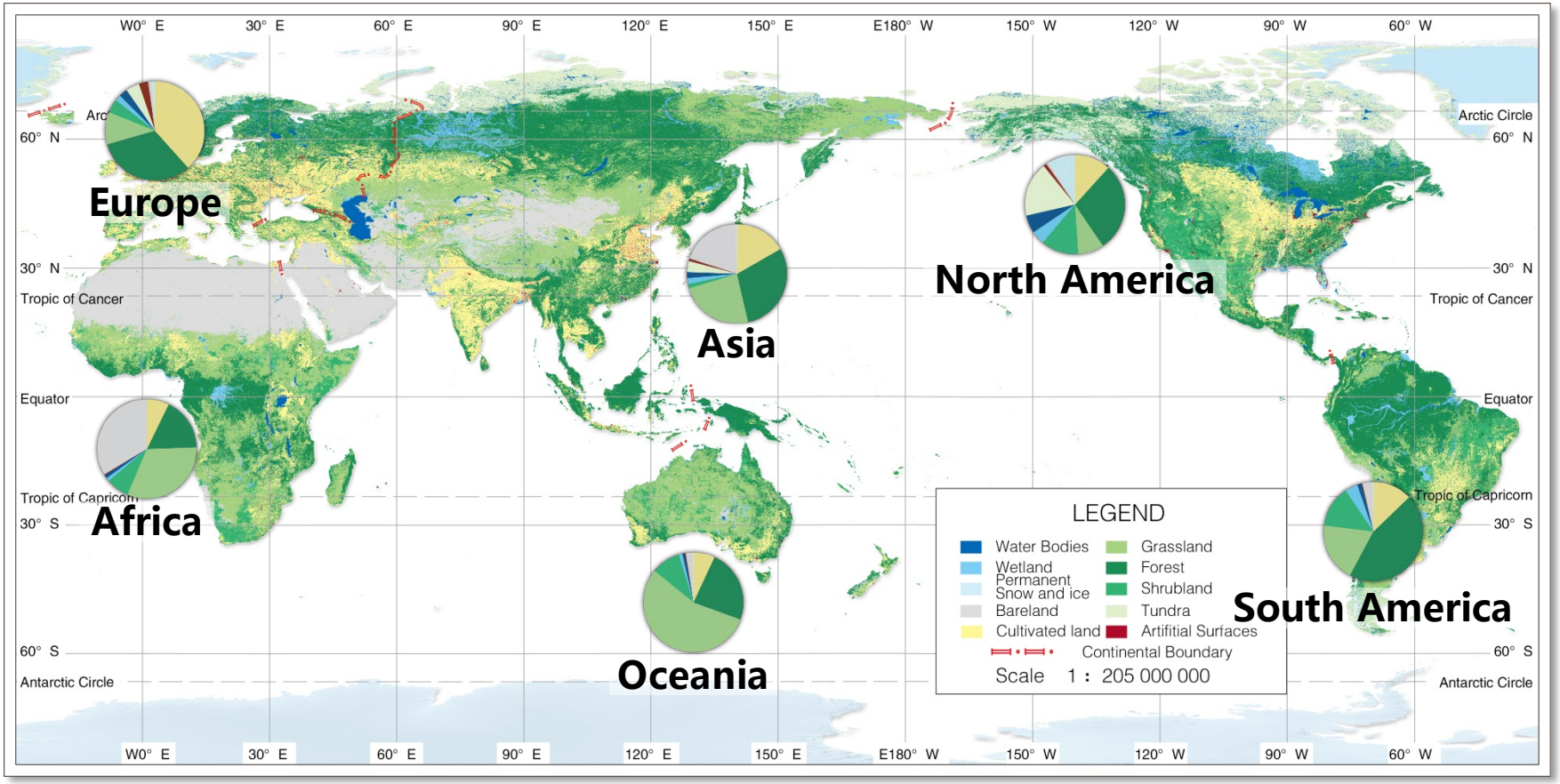
Figure 2. Arizona Ecological Systems. The systems were defined by NatureServe and mapped by the SWreGAP project



GlobeLand30 - Statistics

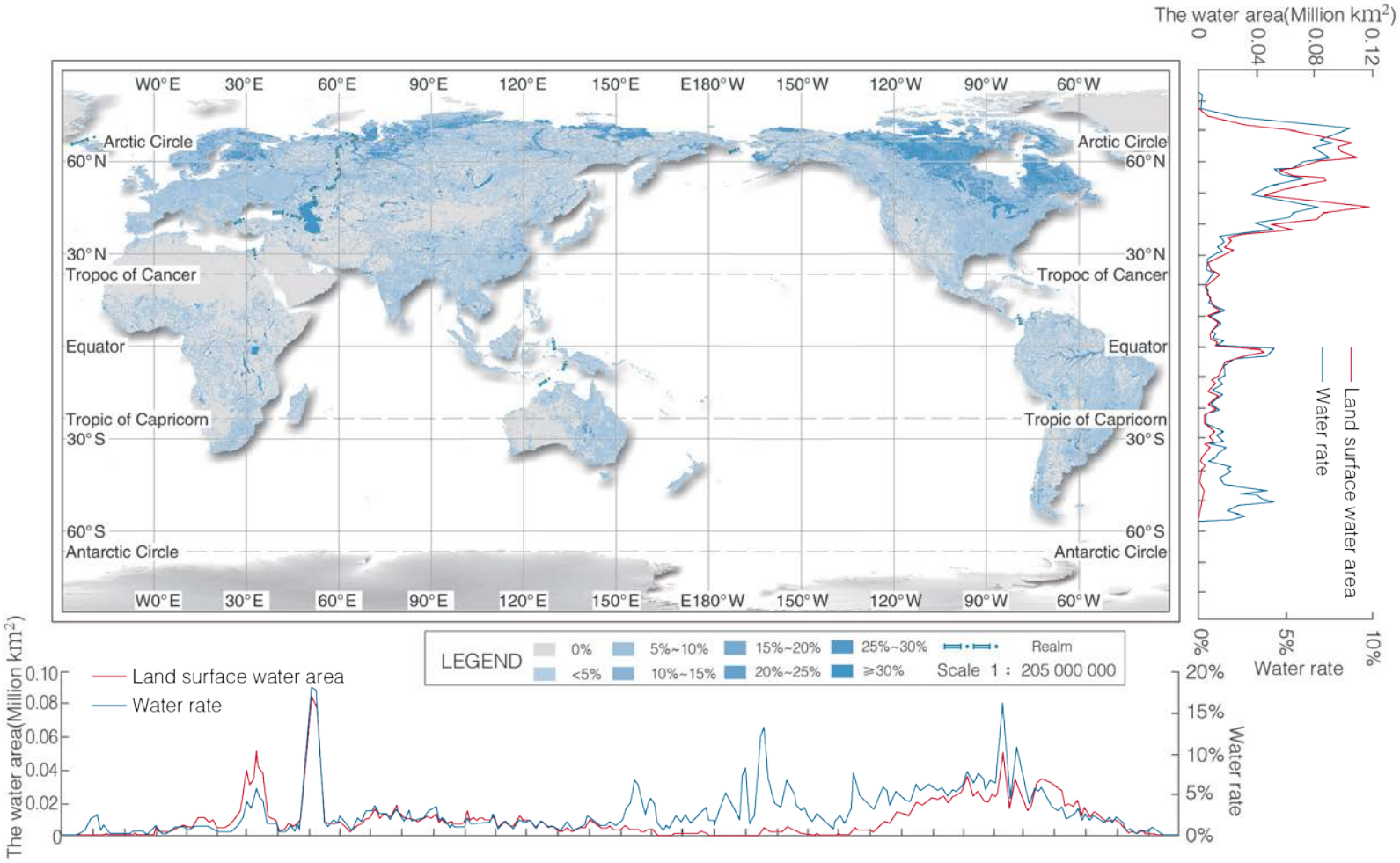
Statistics of 2010 Global land cover types

2010年全球地表覆盖类型统计



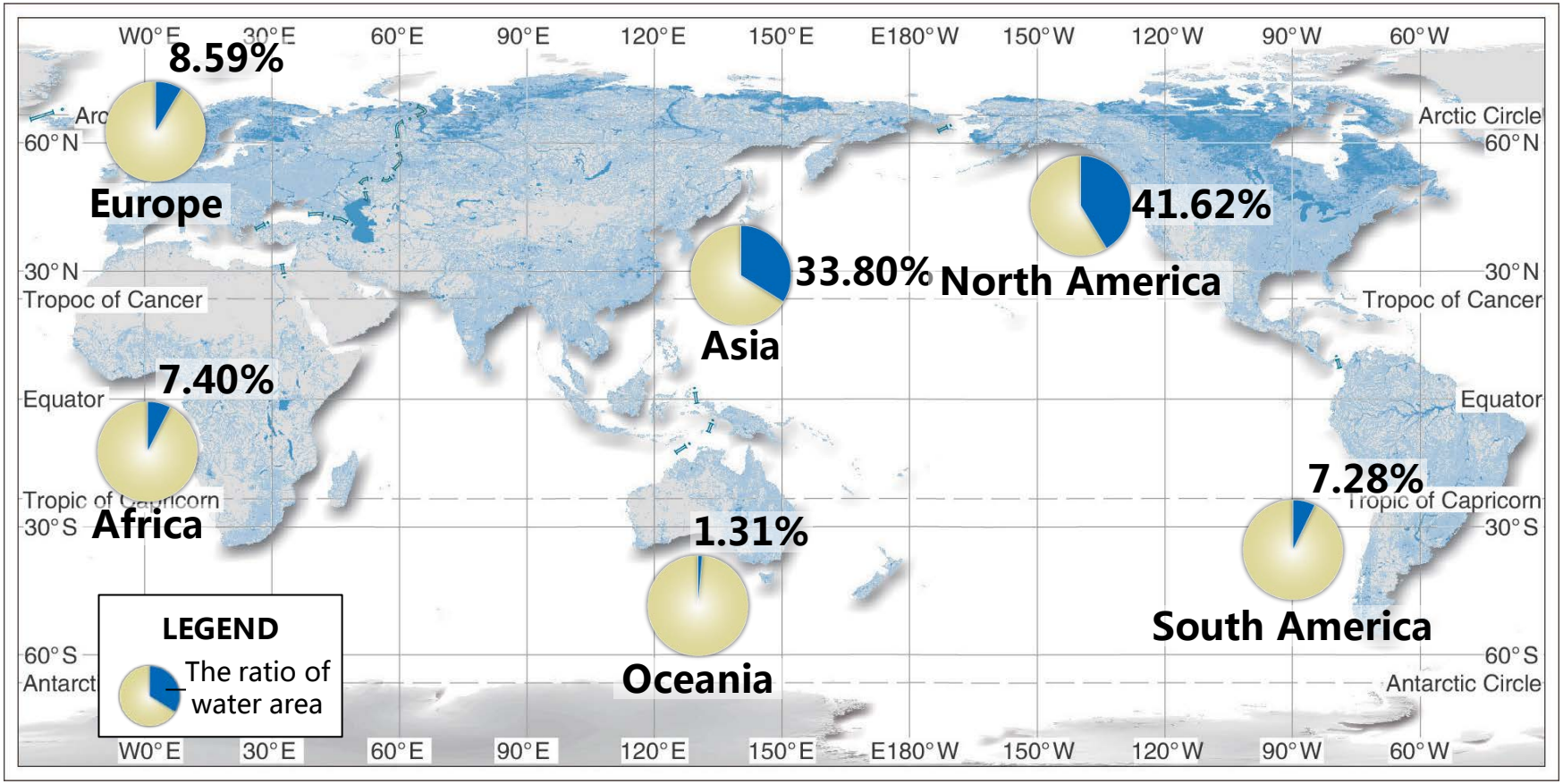
GlobeLand30 - Statistics

Global land water body distribution　全球陆表水体的空间格局



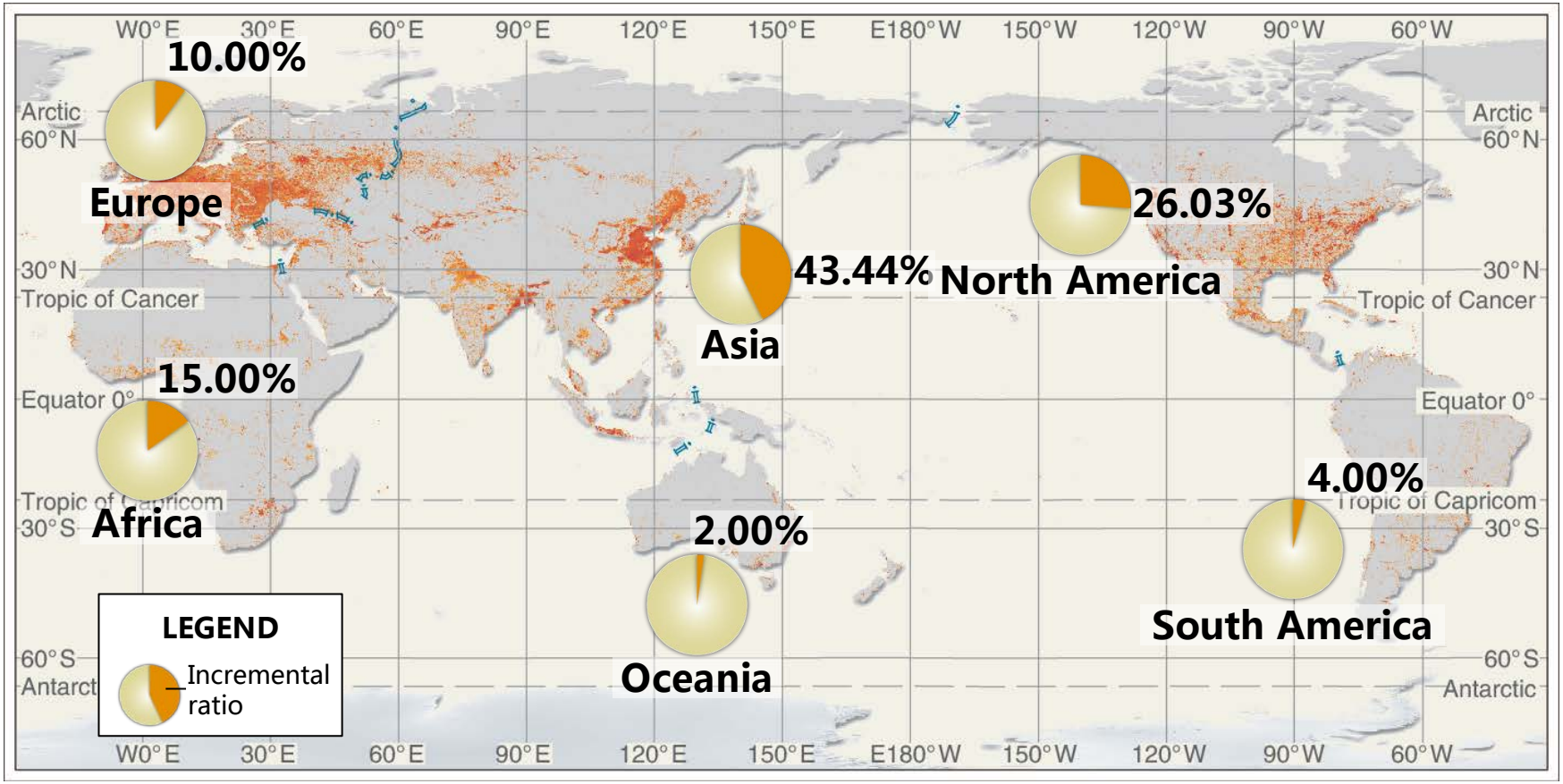
GlobeLand30 - Statistics

Global land water body distribution 全球陆表水体的空间格局



GlobeLand30 - Statistics

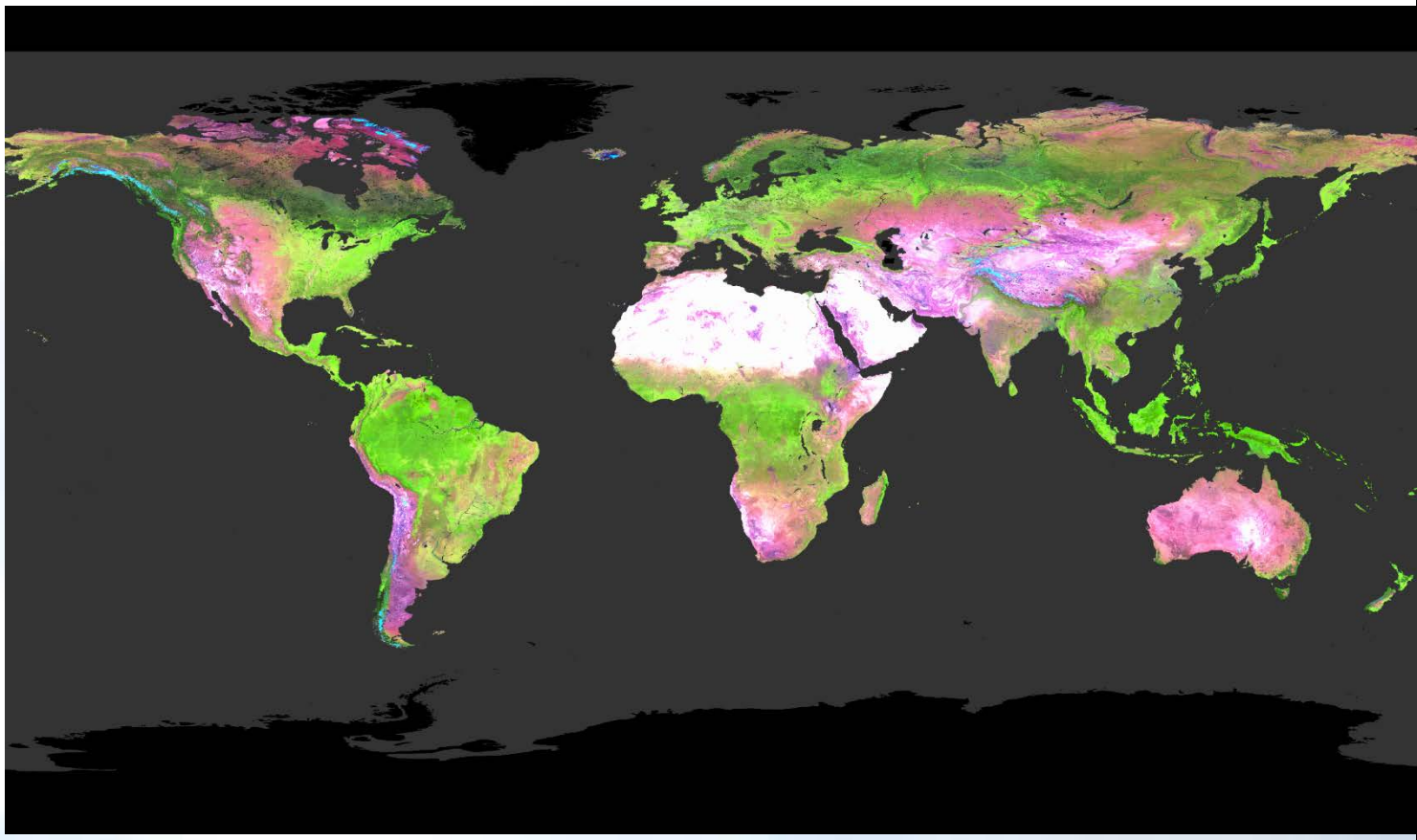
The incremental ratio of the global built-up areas from 2000 to 2010　2000年—2010年全球城乡建设用地面积增量占比



Earth-observing Environmental Satellites Map Forests Globally

Target 15.1:
By 2020 ensure conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands …

Target 15.2:
By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests, and increase afforestation and reforestation by x% globally.



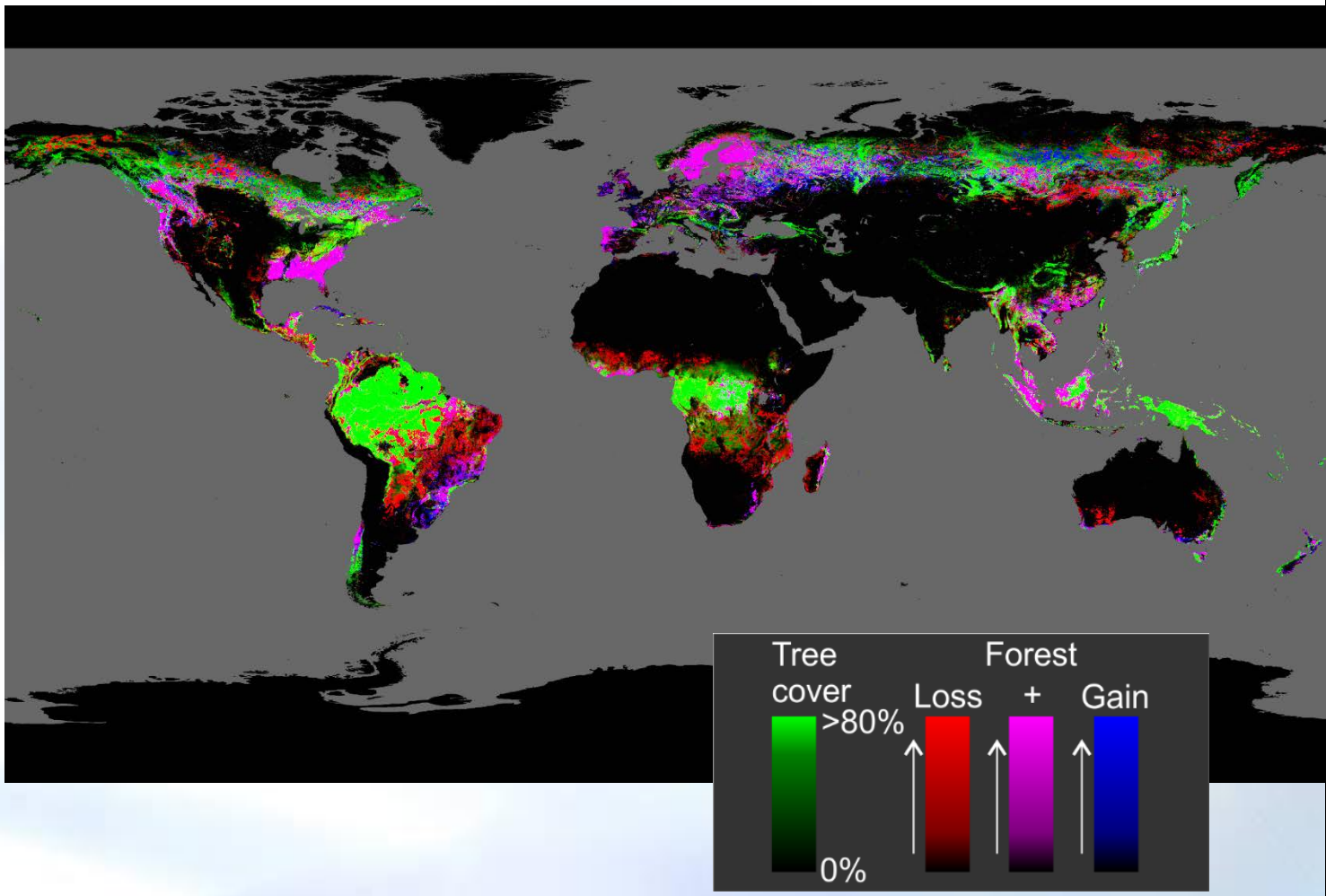
Vegetation in greens
Soils in mauves

Credit: Matthew C. Hansen, Univ. Maryland, et al. 2000 baseline

Tree cover extent and forest loss and gain 2000 to 2013

Target 15.1:
By 2020 ensure conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands …

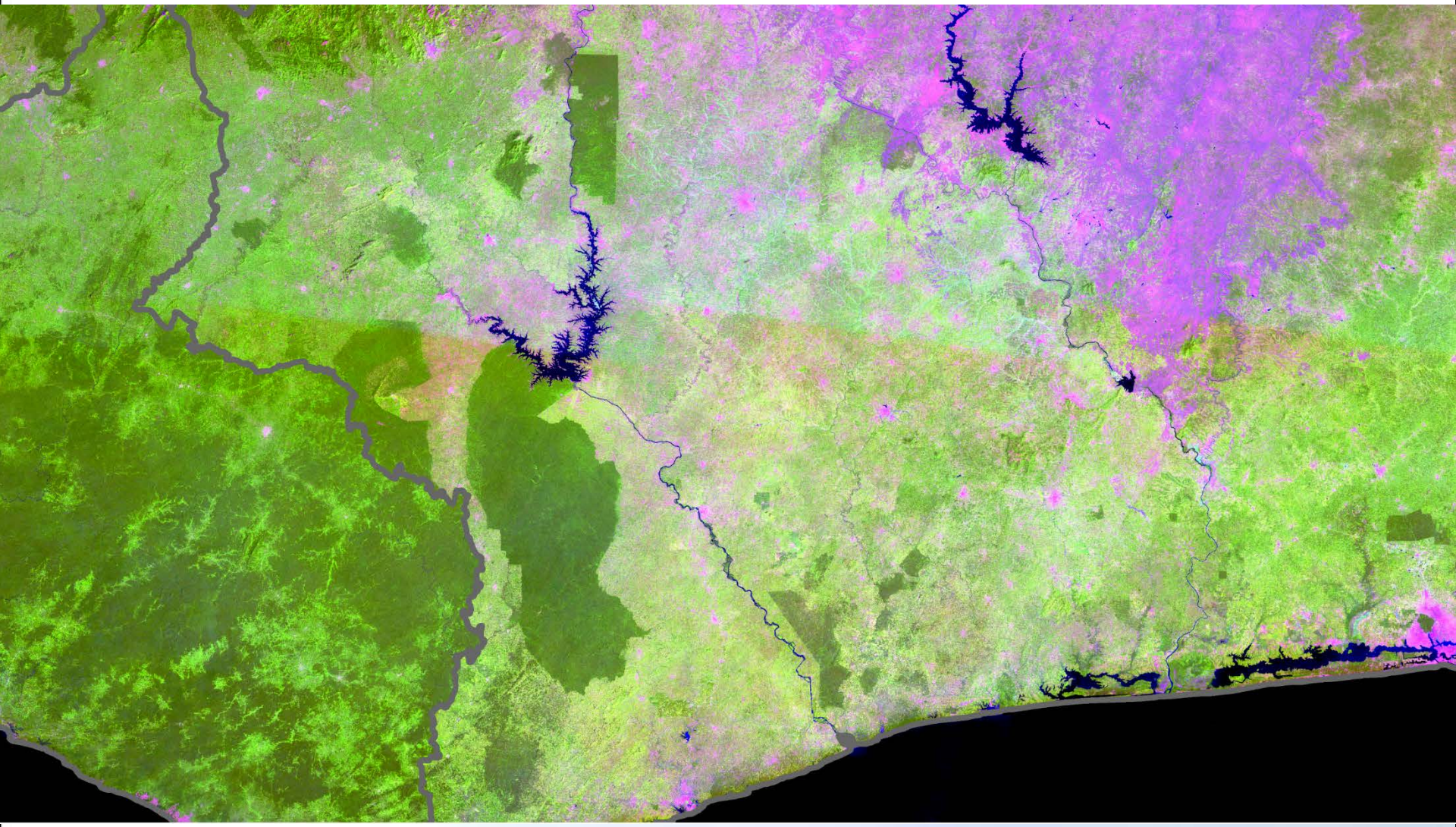
Target 15.2:
By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests, and increase afforestation and reforestation by x% globally.



Credit: Matthew C. Hansen, Univ. Maryland, et al.

Cote d'Ivoire/Liberia

Landsat 5-4-3
2000 best pixel composite

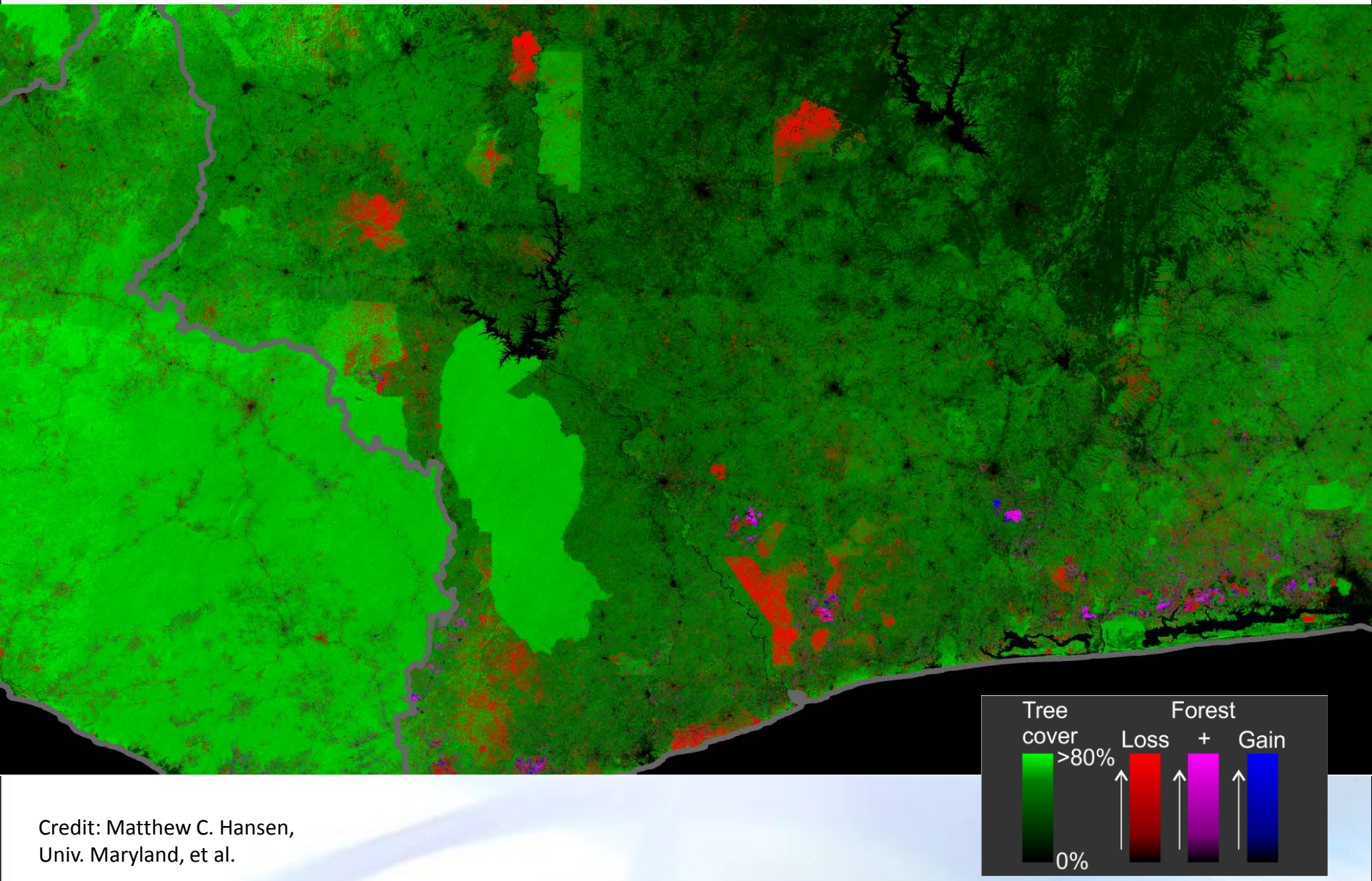


Credit: Matthew C. Hansen, Univ. Maryland, et al.

Vegetation in greens
Soils in mauves

Cote d'Ivoire/Liberia

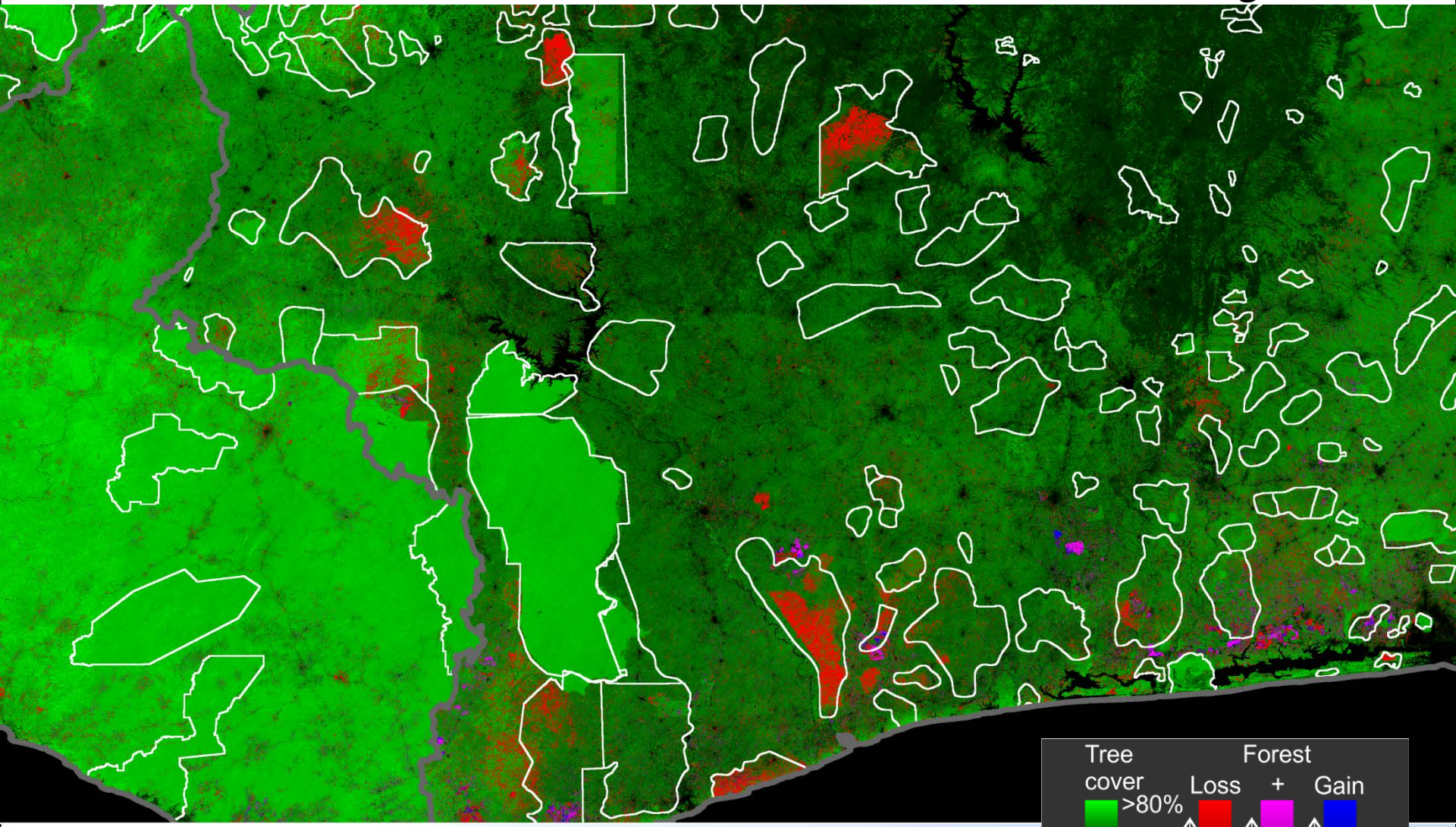
2000 to 2013 tree cover extent and forest loss and gain



Credit: Matthew C. Hansen, Univ. Maryland, et al.

Cote d'Ivoire/Liberia

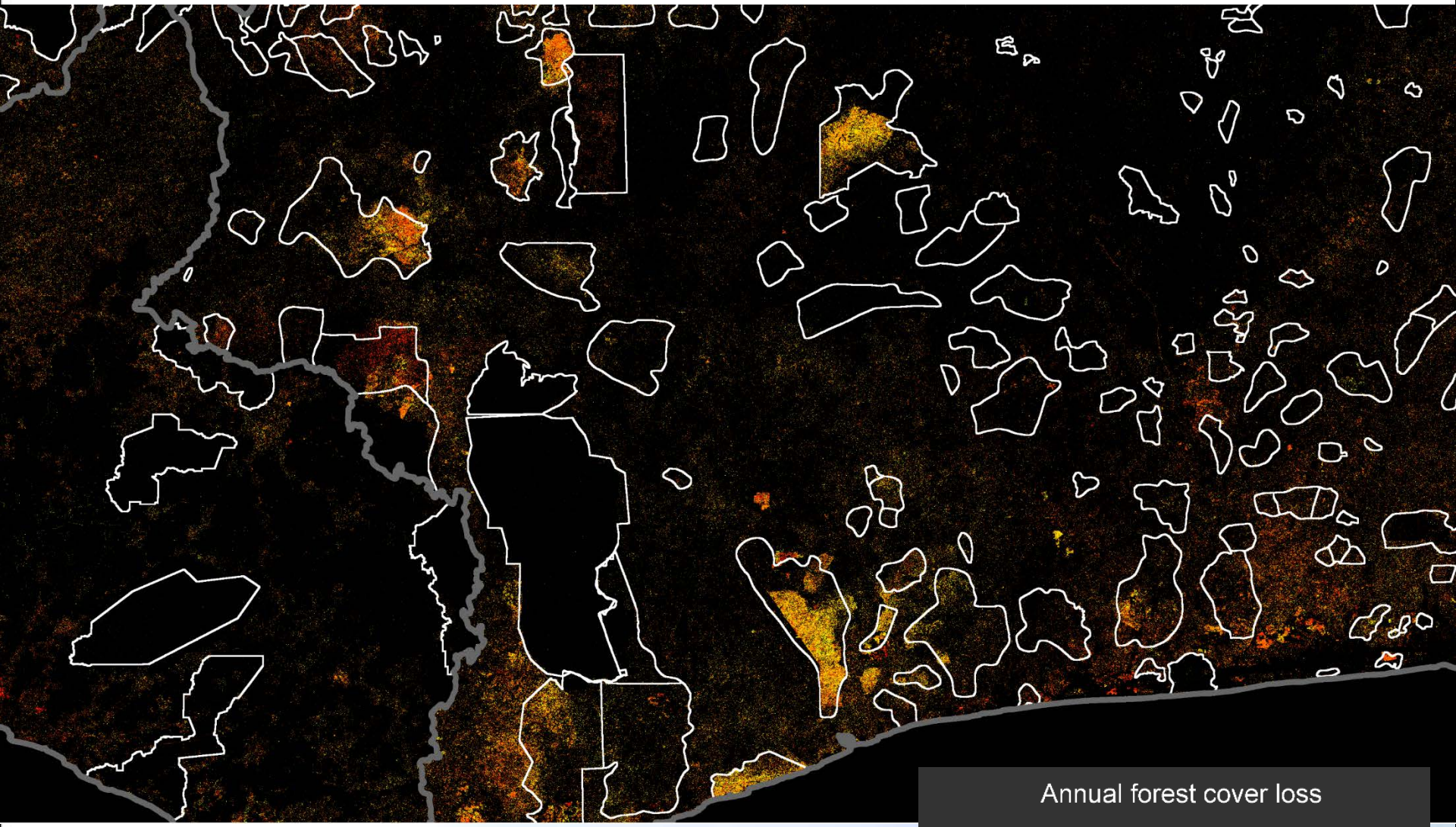
White = all protected areas.
2000 to 2013 tree cover extent and forest loss and gain



Credit: Matthew C. Hansen, Univ. Maryland, et al.

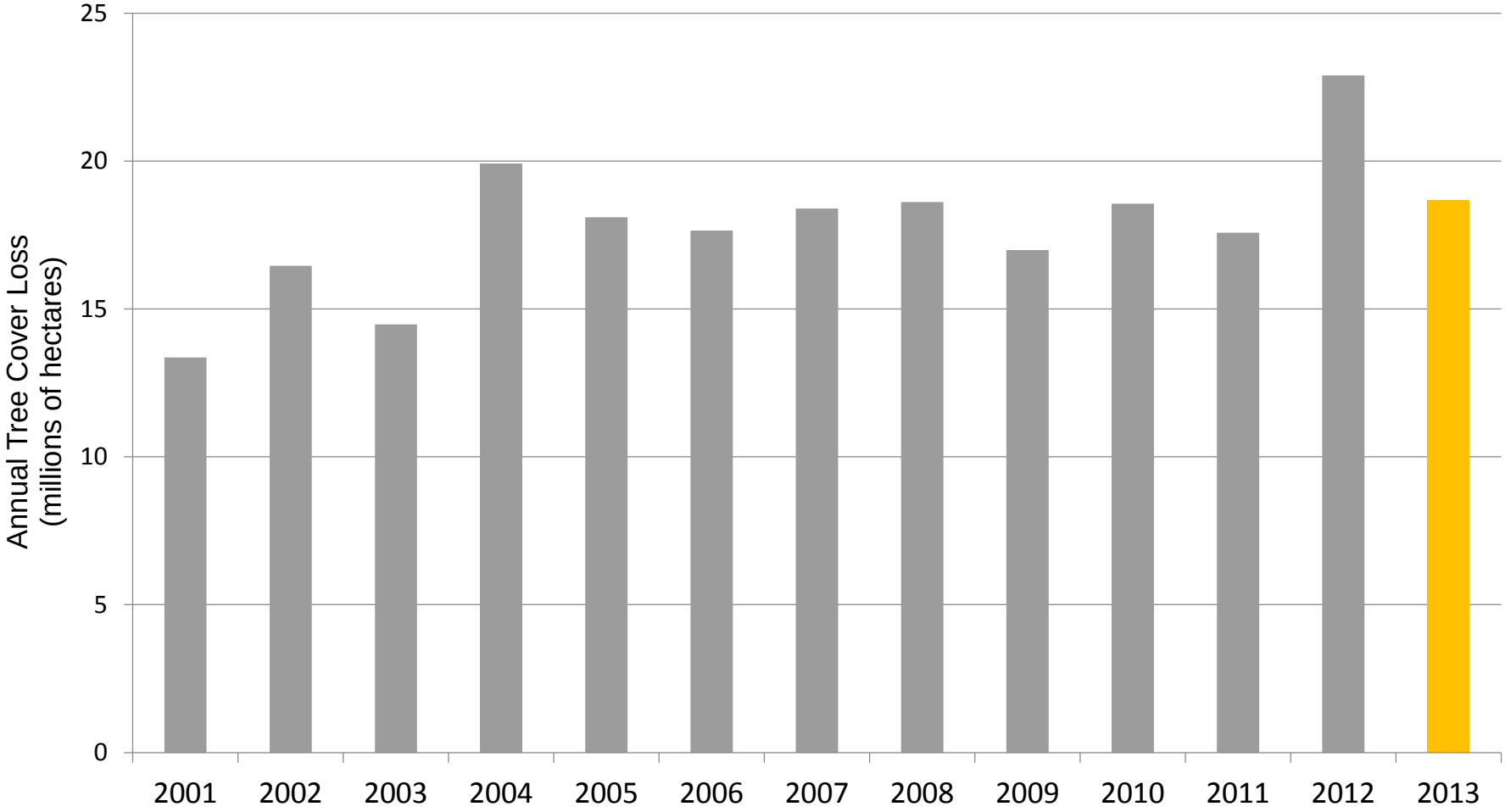
Cote d'Ivoire/Liberia

White = all protected areas.
Forest loss mapped by year.



Credit: Matthew C. Hansen,
Univ. Maryland, et al.

Global annual forest cover loss

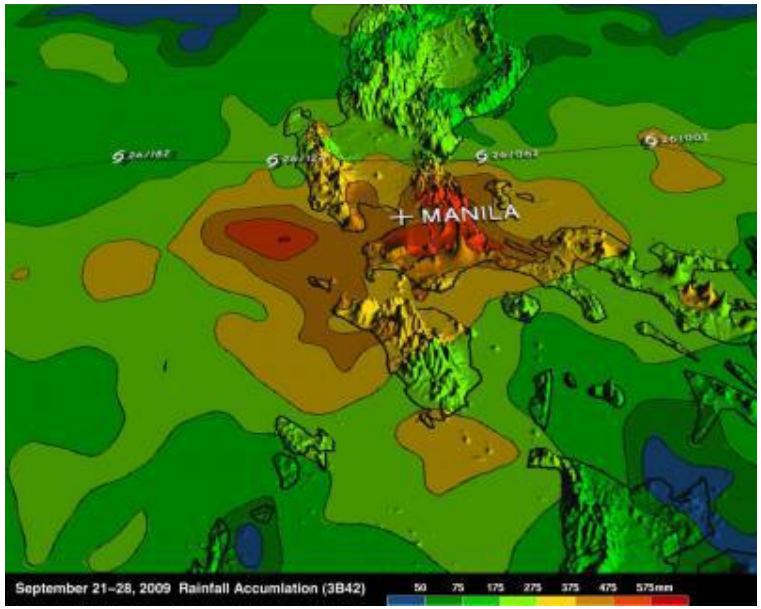


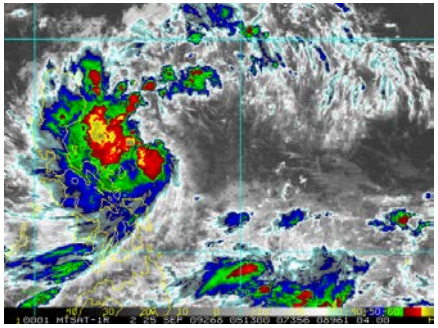
Credit: Matthew C. Hansen, Univ. Maryland, et al.

WORLD RESOURCES INSTITUTE

Target 11.5:
By 2030 significantly reduce the number of deaths and the number of affected people and decrease by [x] per cent the economic losses relative to GDP caused by disasters, including water-related disasters, with the focus on protecting the poor and people in vulnerable situations.

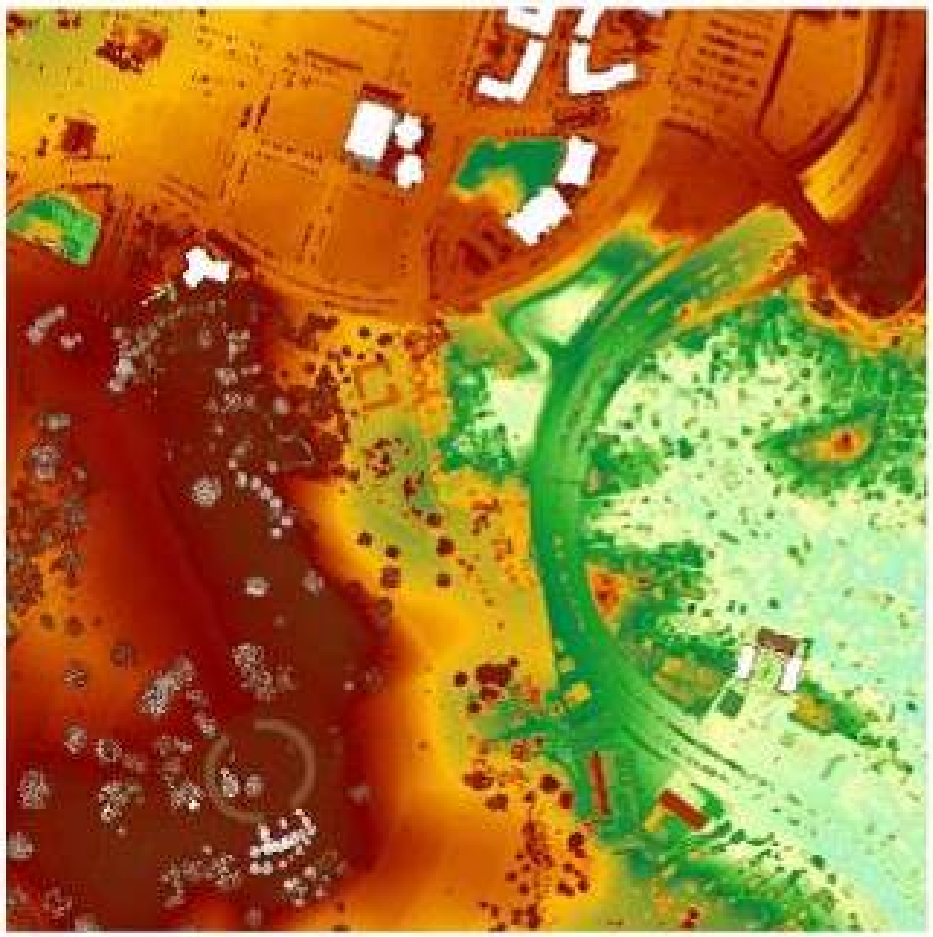
Proposed Indicator 2:
Number of housing units damaged and destroyed [by disasters]





TS *Ketsana*
Manila, Philippines
25 September 2009

High resolution Digital Elevation Model and imagery

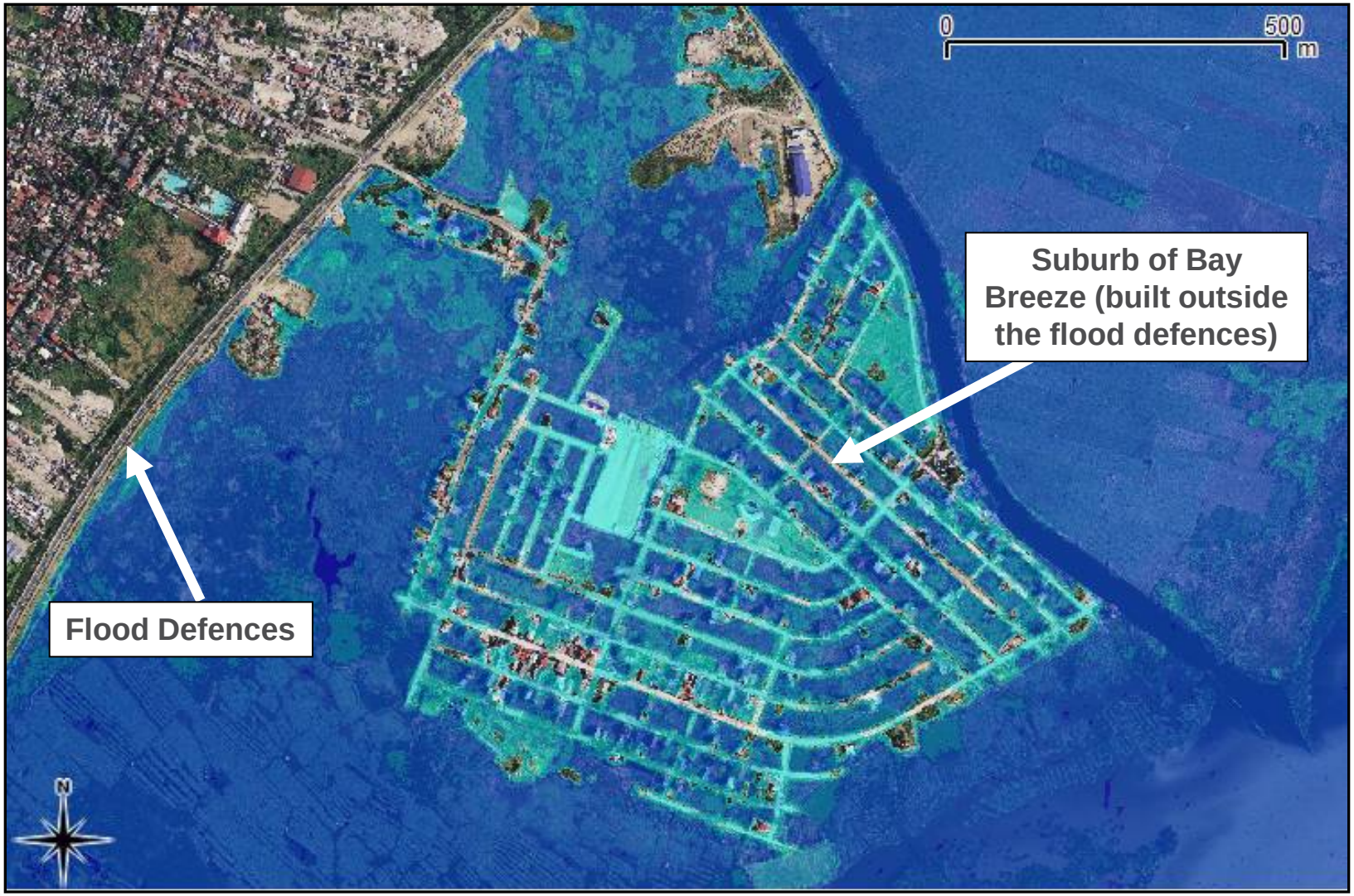


Digital Surface Model

New Imagery

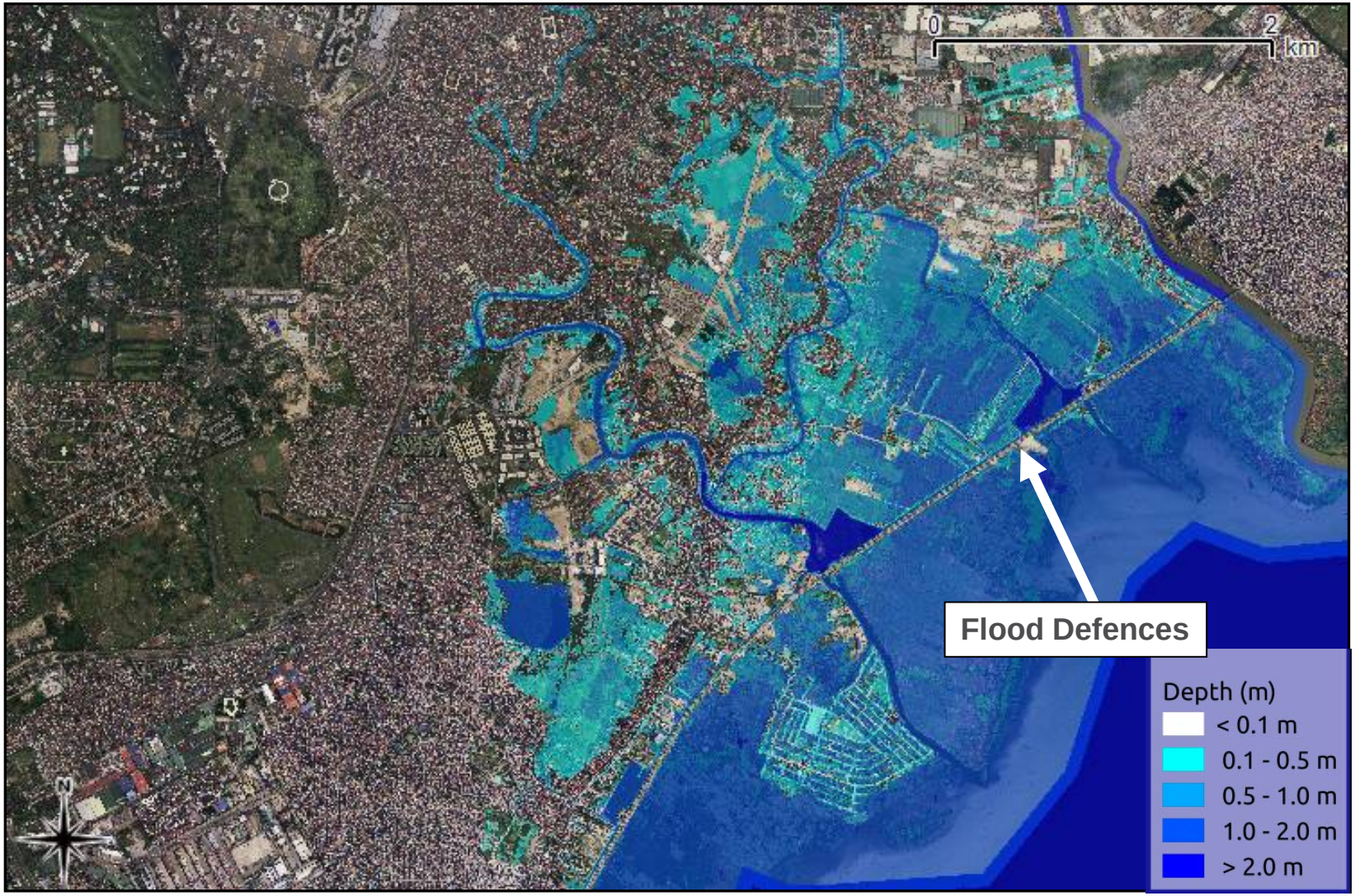
Taguig flood modelling

1 in 5 year Lake Laguna flood – assuming flood defences work



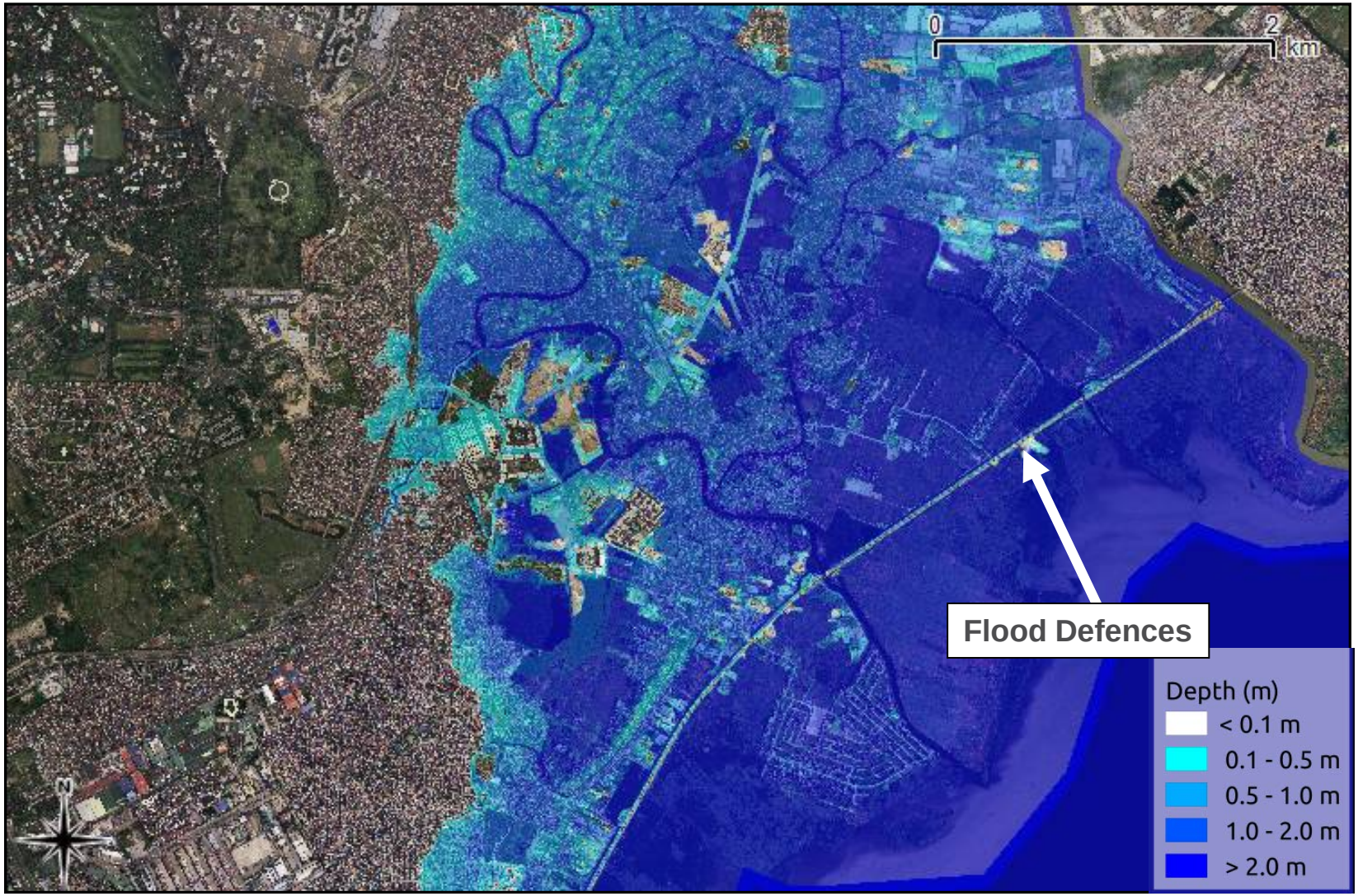
Taguig flood modelling

1 in 5 year Lake Laguna flood – assuming flood defences fail



Taguig flood modelling

1 in 100 year Lake Laguna flood – assuming flood defences



Exposure information

Taguig City – first LGU for exposure database development

Integration!!
Statistical, geospatial, standards, interoperability

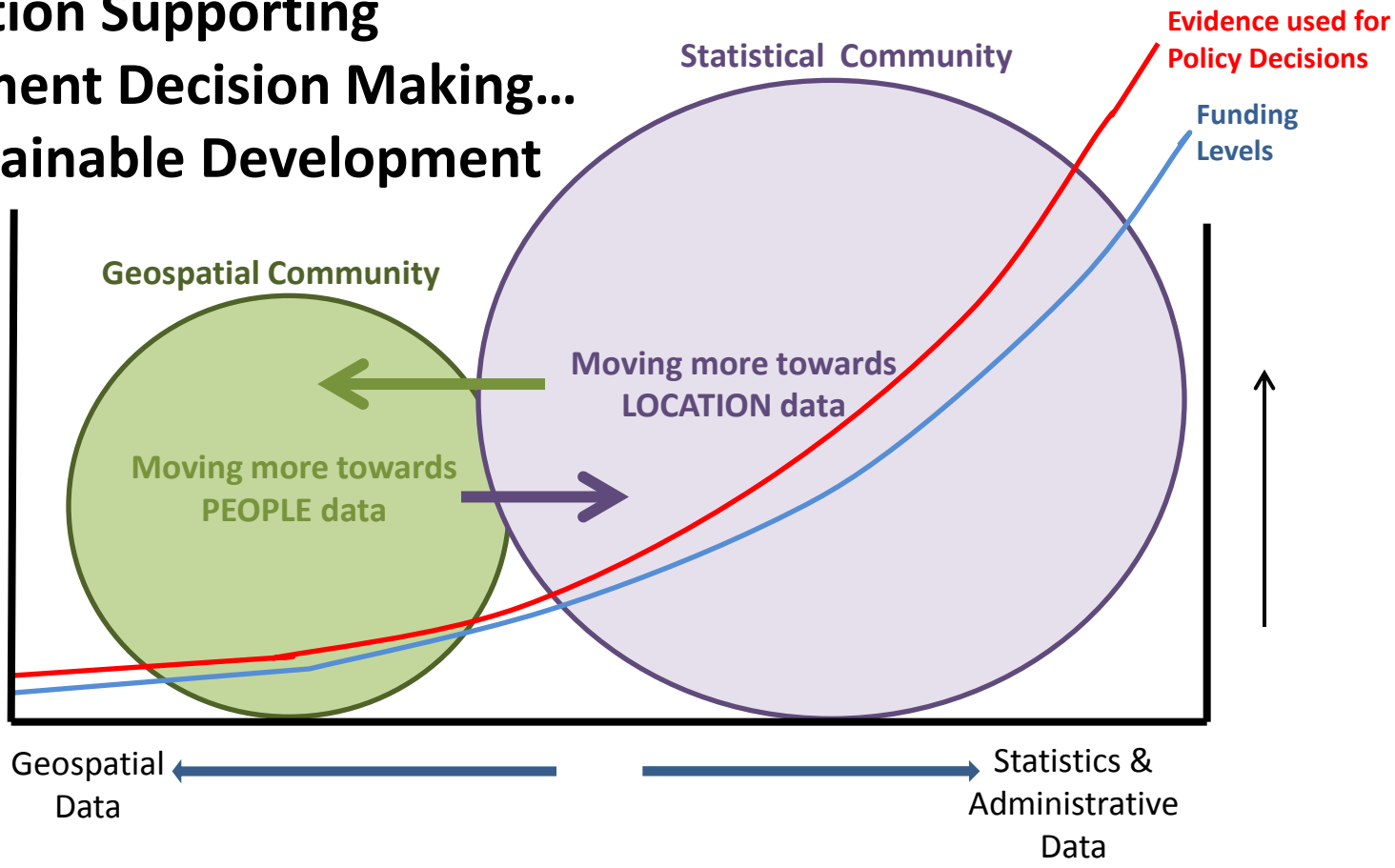
UN-GGIM | United Nations Committee of Experts on Global Geospatial Information Management

Positioning geospatial information to address global challenges

ggim.un.org

Integration - background and drivers

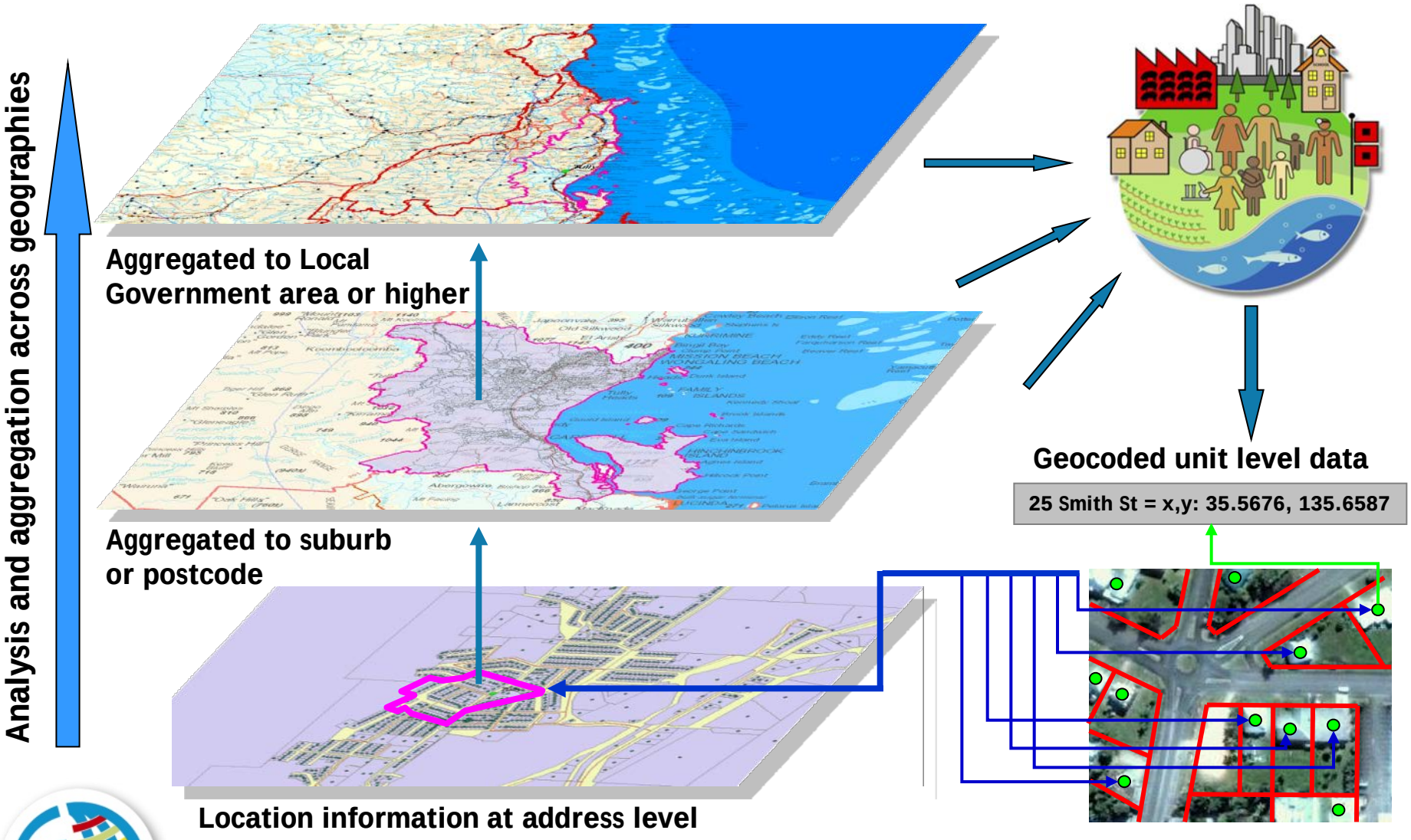
Information Supporting Government Decision Making… and Sustainable Development



Built & Natural Environment Focus
(primarily geospatial attributes)

People & Economic Focus
Health, Education, Welfare
(primarily non-geospatial attributes)

Statistical-Geospatial framework



International Workshop, Beijing, 9-12 June 2014

We are on a journey

Users want information, not data

Collaboration
Cooperation
Coordination
Commitment
Harmonisation

Population Census is an enabler and opportunity

So are the SDGs!

This is the start of an important journey to unite our professions and our business.

Users want information/knowledge. We need to transform data into information. Collection, processing, analysis and operations are a means to an end - not the end in themselves.

Collaboration is essential. Statistics and maps are part of an overall information management framework. They don't exist in isolation.

Cooperation is essential. Between communities, between organizations, between countries. Regionally and internationally. For capability building. To lower costs. To turn data into information.

Coordination between the statistical and geospatial offices within a country is an important step. Institutional integration provides the political will within a country to support statistical and geospatial integration.

All of this takes commitment!!

Population Censuses and the SDGs are KEY enablers for demonstrating statistical and geospatial integration - but its more than just input. Its all parts of the production chain: input – throughput – output, statistical cycle, and should be reusable for other collections and data sources. Build in a sustainable and repeatable way.

How do we influence and transform the agenda?

- The paradigm of data availability is changing – more real time. No longer just for mapping and delivery, but integration, analytics, modelling, aggregation and fusion.
- We need to see geospatial data for its 'information value', not where it has come from or who owns it. Treat location as the basic unit.
- Many of the challenges we face in the SDGs are crosscutting in nature and characterized by complex interlinkages – which can benefit from unleashing the power of location (the 'where') – as the thing they have in common.
- Data collection and sustainability comprises a big challenge. It is key that relevant data is collected worldwide for the chosen indicators.
- The need: "availability of reliable and timely statistical and geospatial information to openly serve sustainable development objectives"

Thank You

UN-GGIM | United Nations Committee of Experts on Global Geospatial Information Management

Positioning geospatial information to address global challenges

ggim.un.org