Global Geospatial Information Management

Geospatial Information and the SEEA

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United Nations Initiative on Global Geospatial Information Management

Positioning geospatial information to address global challenges

UN-GGIM: A global initiative

Formal inter-governmental 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

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ggim.un.org

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UN-GGIM: Program of activities

- Future Trends and Inventory of Issues
- Develop baselines policy and legal, institutional arrangements, governance, methodologies
- Sustaining the global geodetic reference frame
- Implement and adopt international standards and interoperability
- Establishing a global geospatial information platform for sustainable development: Post-2015 agenda
- Information integration land, marine, environment, urban hazards, statistics
- Implement a global-regional architecture for UN-GGIM









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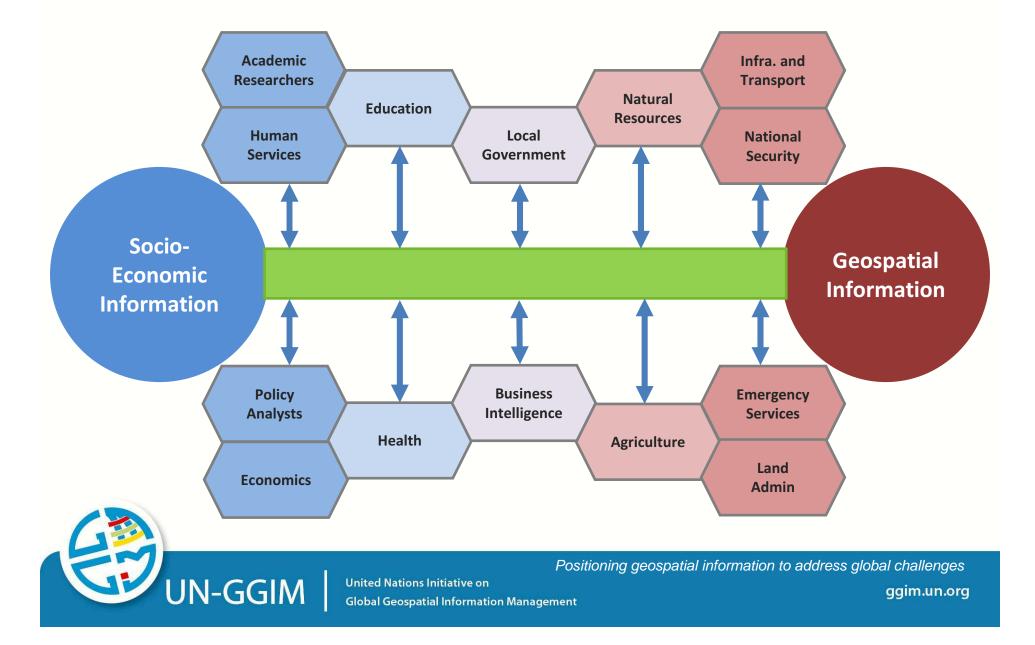
Linking geospatial information to statistics



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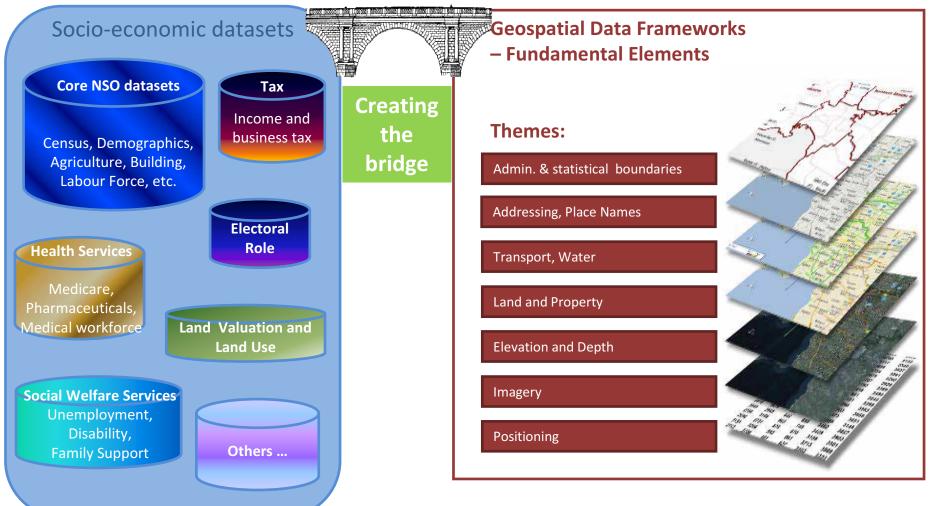
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A growing continuum of user needs



Statistical Community

Geospatial Community

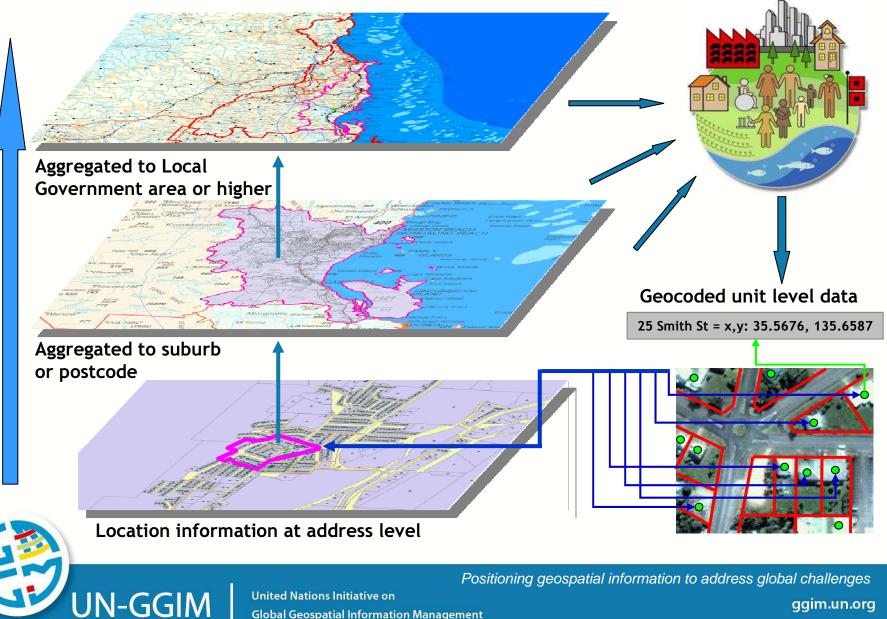




Geospatial framework

geographies

Analysis and aggregation across



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Statistical geospatial framework

Australian application of SSF

Policies, standards and guidelines, covering: confidentiality and privacy, data quality, Standards analysis, dissemination and visualisation. & Guidelines

Metadata interoperability Developing the interoperability of statistical and spatial metadata.

Statistical Spatial Framework **Common geographic boundaries**

ASGS – Australian Statistical **Geography Standard**

Data management: geocoded unit record data

Agreed and authoritative geocoding

Geocode is a NAMF compliant point coordinate and ASGS Mesh Block.

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NAMF – National Address Management Framework



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First meeting of United Nations Expert Group on the Integration of Statistical and Geospatial Information 30 October - 1 November 2013, UNHQ, New York

Decisions/conclusions:

"Agreed on the importance of influencing the 2020 Round of Population Censuses, but noted the importance of the integration of statistical and geospatial information to a broader agenda including agriculture and economic censuses, environmental-economic accounting, and the Post-2015 Development Agenda"



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Country user case studies



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Greece: Spatial data infrastructure for depicting habitats of "NATURA 2000" network

Background: Delimitation of terrestrial-type sites of "NATURA 2000" network

User's problem: Development of large scale spatial data infrastructure for terrestrial areas protected under "NATURA 2000" network, at national scale

Contribution of large scale color othophotomaps for:

- precise determination of the boundaries of terrestrial sites of "NATURA 200" network
- updating, description and delimitation of terrestrial type- habitats at 241 sites of "NATURA 2000"

Benefits: Protection of the high environmental importance sites of avifauna and other animal and floral species of the European Network of "NATURA 2000"











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Spain: National Mapping Agency (IGN)

Spanish Land Cover & Land Use Information System

• Users:

General public (using National Reference Map & databases at different scales)

- Key use:
 - Identify biophysical cover of the land (vegetation, bare soil, etc.) and its socio-economic purpose
- How?:

National Topographic Map shows LC & LU data, using synthetic symbology for cartographic purposes

• Benefits:

Increased **coherence** between specialized Land Cover database and topographic data sets and maps.

Production cost reduced by 20%.





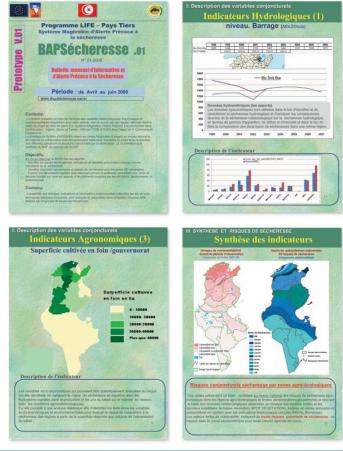


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TUNISIA: North African early warning system of drought (SMAS)

Drought Early warning is based on indicators of vulnerability to climatic and human pressure, as well as environmental monitoring instruments. Information generated by these tools has to be integrated into national development programmes. It should also serve as a basis for a collective strategy for the sub-region.

- There is a wide range of vulnerability indicators: some are derived from satellite data such as vegetation and biomass indexes and surface temperature, while others are based on agro-hydro-meteorological information including moisture deficit/excess, and attacks by harmful insects.
- The various vulnerability indicators allow experts to observe trends— in climatic changes for instance—and predict their impacts on natural resources and populations.





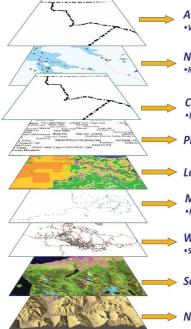
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Water information

Data Information Insight

Geospatial information and relationships

Management of water resources in the national interest



Administrative boundaries •Water planning areas, councils, supply schemes, g/w areas

National hydrofeatures •Rivers, lakes, wetlands, reservoirs, aquifers

Catchment reporting units Basins, catchments, sub-catchments

Place and feature names

Land cover, soils, hydrogeology

Monitoring points •Flow and rain gauges, water meters, climate stations, bores

Water infrastructure •Supply and drainage channels, pipes, plants, storages

Satellite and Airborne Orthoimagery

National Digital Elevation Data

Groundwater and

surface water modelling and reporting

Policy development

> **Evidence** based decision making

Service deliverv

Engaging the community



Australian Government **Bureau of Meteorology**



National Research Water for a Healthy Country





Geoscience Australia

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SEEA Experimental Ecosystem Accounting

Relies on a spatial units approach for Ecosystem Accounting

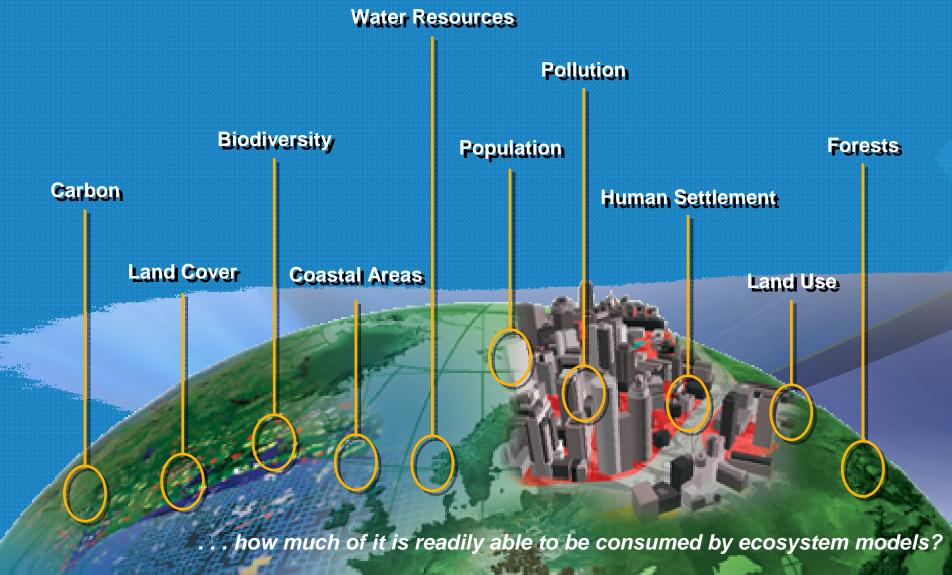
- Delineation of spatial units undertaken with the development of spatial and non-spatial databases (in a GIS)
- Databases could contain information such as soil type and status, water tables, rainfall amount and pattern, temperatures, vegetation, biodiversity, slopes, altitude, land management and use, population, and social and economic variables
- Information may be used to assess flows of ecosystem services from given spatial areas to relevant beneficiaries
- Proposes a units model based on spatial areas for measurement and compilation
- Relies on availability of persistent and appropriate spatial data. At what scales?
- Requires the spatial data to be analysed and/or input into specific models and tools to derive ecosystem baselines. What ecosystem assets? What units? What data? What conditioning of the data?



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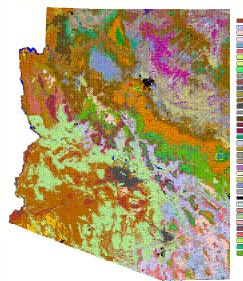
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Need: Dynamic environmental information over space and time



Source: European Environment Agency

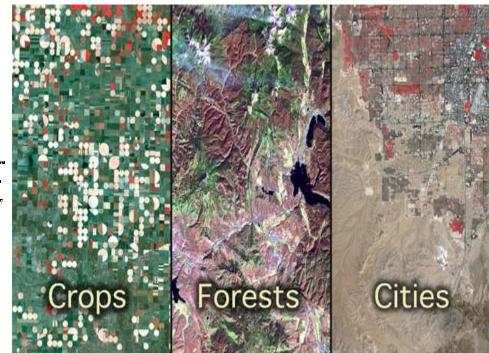




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Figure 2. Arizona Ecclogical Systems. The systems were defined by NatureServe and mapped by the SWreGAP project



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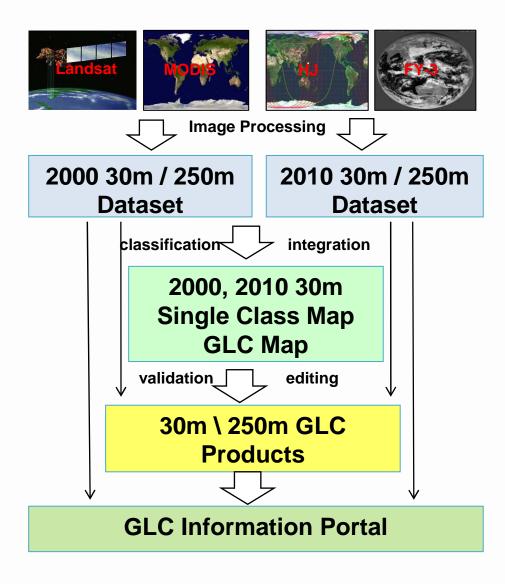
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Elevation of Australia 2011 30m resolution National DEM - enables modeling the stocks and flows of water at a national scale Land cover of Australia 2000-2008 250m resolution - enables reliable monitoring of changes in land cover at a national scale

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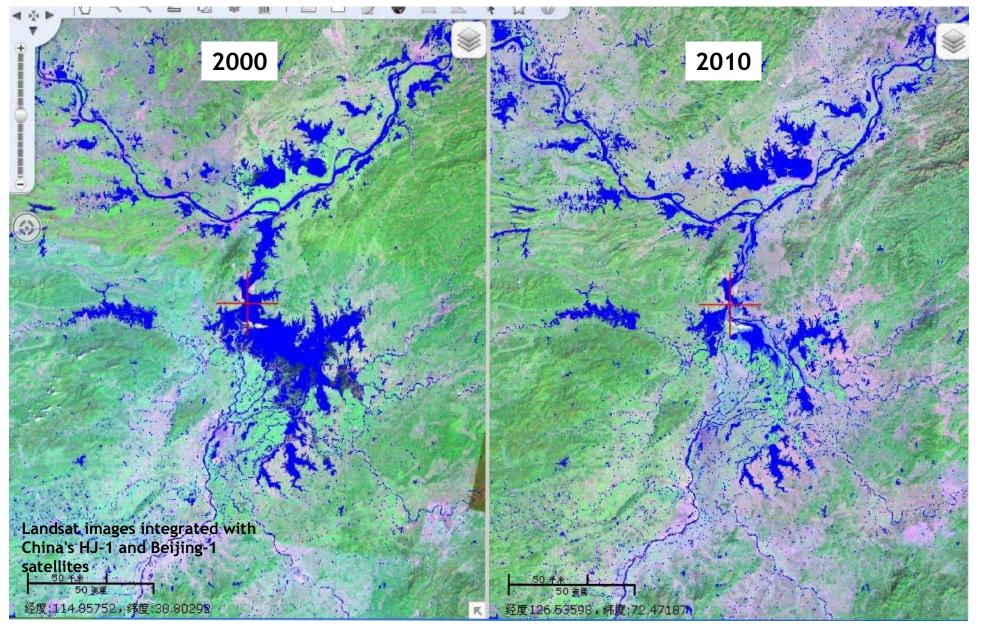
China Global Land Cover Mapping



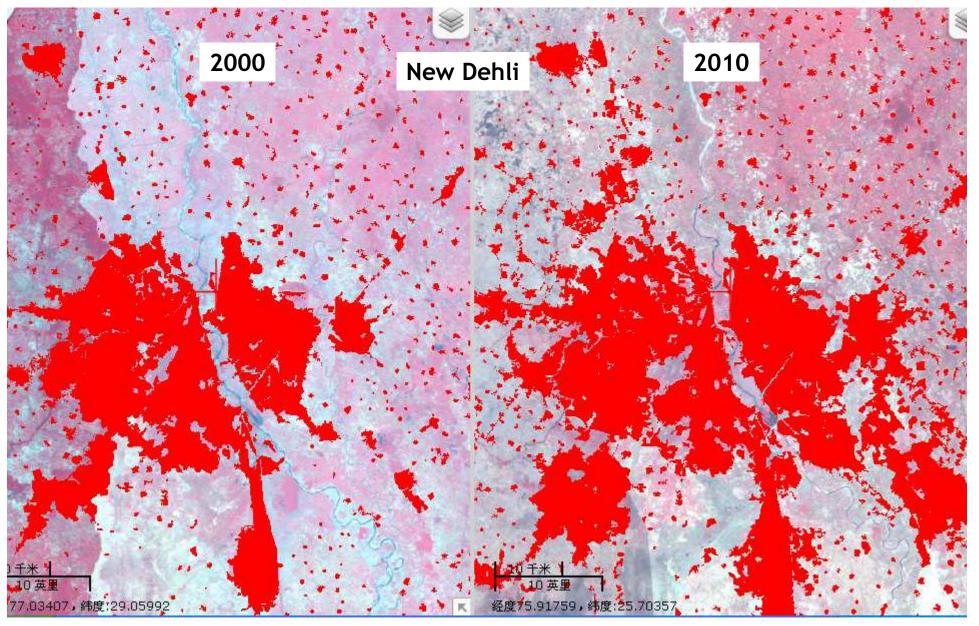
- Time: 2009~2013
- Financed by: Ministry of Science and Technology
- Led by: National Geomatics Center of China (NGCC)
- Overall Goals: Mapping land cover of the whole globe at 30 m for two baseline years (2000 and 2010)
- The first time in the world at 30m resolution



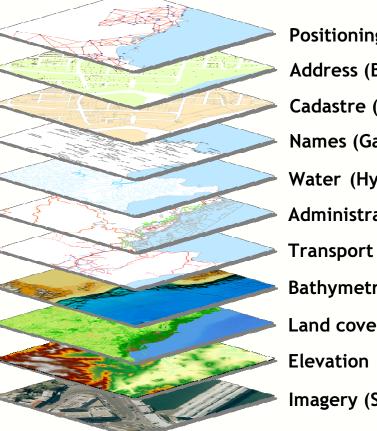
China Global Land Cover Mapping Water change analysis



China Global Land Cover Mapping Urban expansion



Local to global framework geospatial datasets exist, but are they suitable for Ecosystem Accounting?



- **Positioning (Geodetic)**
- Address (Buildings)
- Cadastre (Tenure)
- Names (Gazetteer)
- Water (Hydrology) Administrative Boundaries
- Bathymetry (Hydrography)
- Land cover (Vegetation)
- Imagery (Satellite & Photo)



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Geographical names

Cadastre, Topographic, **Natural Resources and Climate Data**

Land, Island and Submarine Relief

Coastal, International, **State and Municipal Limits**

Geodetic Reference Frame

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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

Source: European Environment Agency

SEEA Experimental Ecosystem Accounting

Some considerations regarding the geospatial aspects

- A new area and many data gaps, but requires a data-driven approach for the analysis
- What are countries and agencies doing? What are reliable sources of information/knowledge?
- Scale local to national, micro to macro?
- Within a geospatial-statistical paradigm, consider:
 - Tools and applications that may be needed and/or available
 - The data (and units of measure) needed to drive the analysis must be sustainable and persistent will be variable at first
 - The temporality of the data real-time, sensors, monitoring, etc.
 - Modelling and analysis to what level of detail, aggregation, disaggregation
 - Take a standards-based approach, be interoperable across systems
 - Being able to communicate outputs visualise and disseminate will be vital



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