

# 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*

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# 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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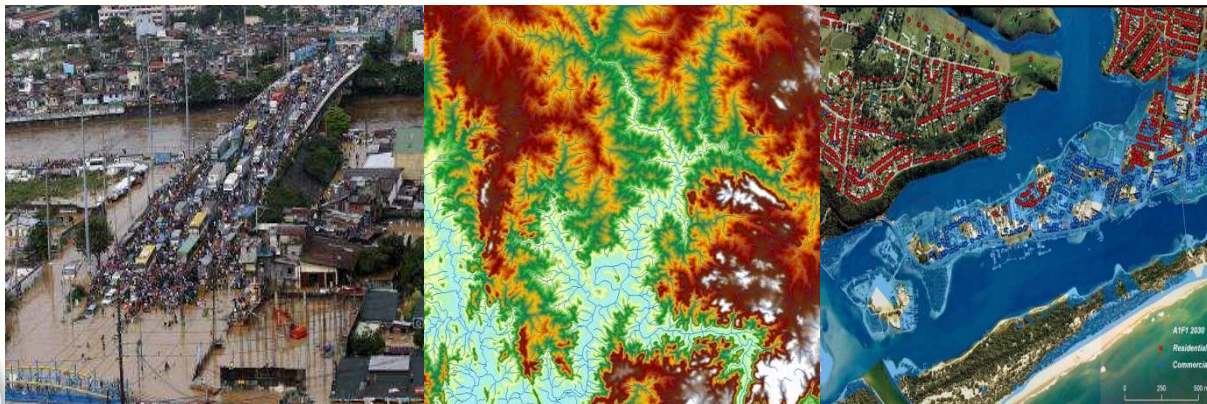
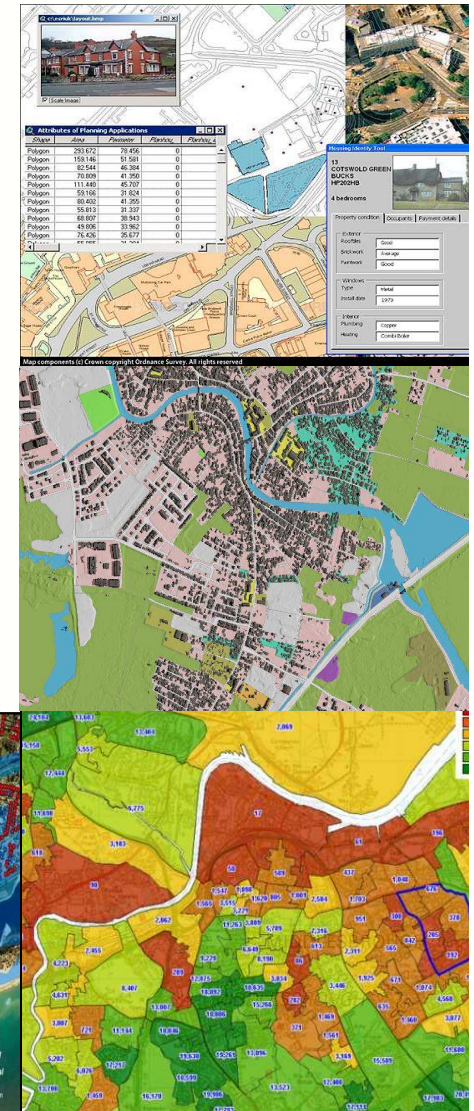
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# UN-GGIM: Program of activities

- 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



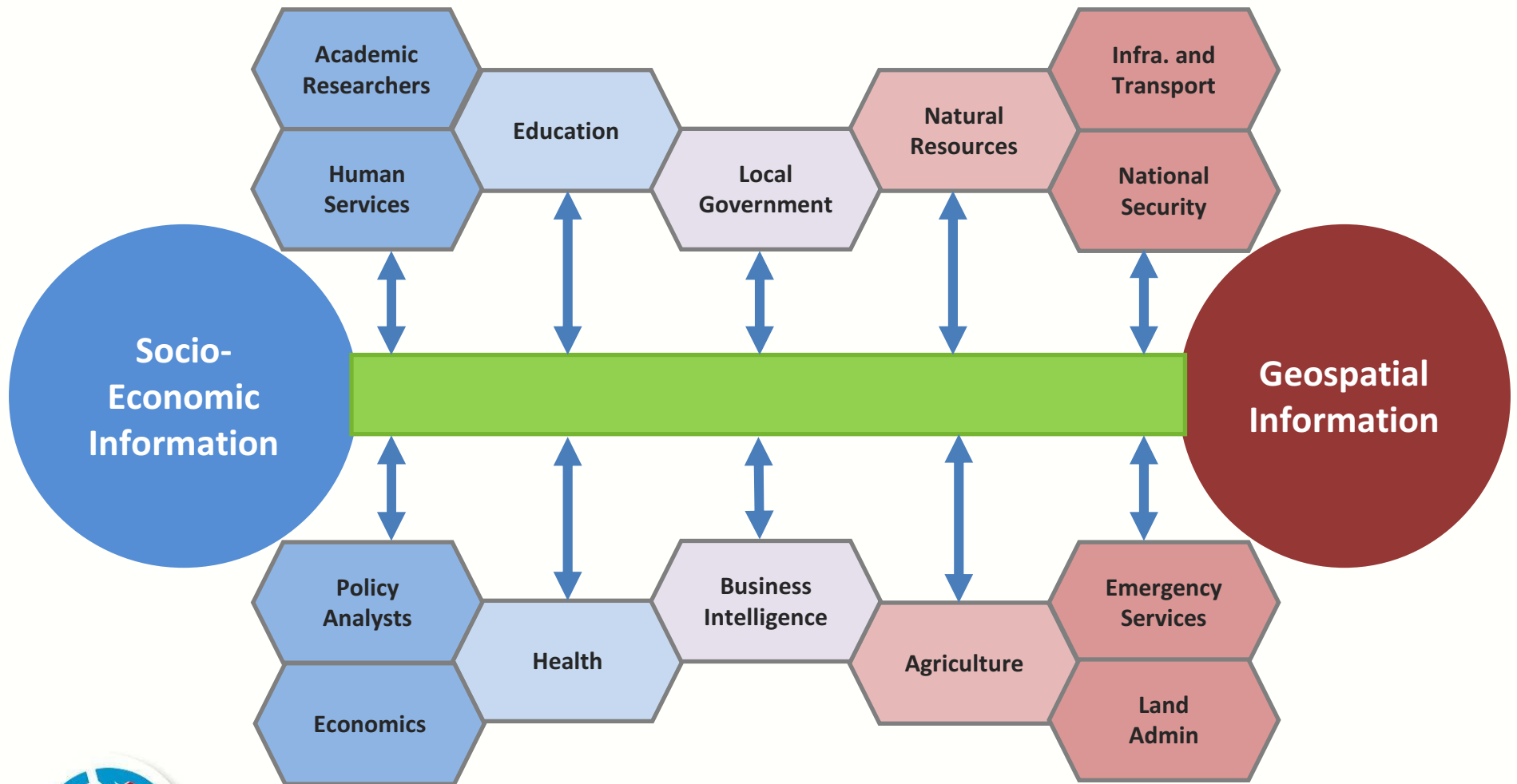
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# A growing continuum of user needs



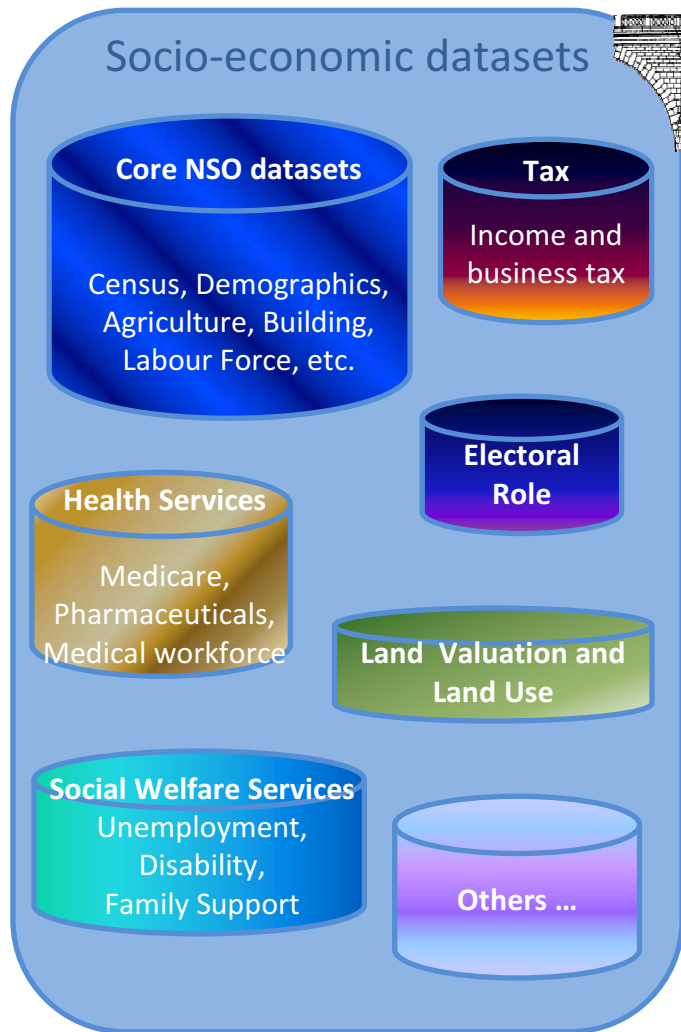
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## Statistical Community



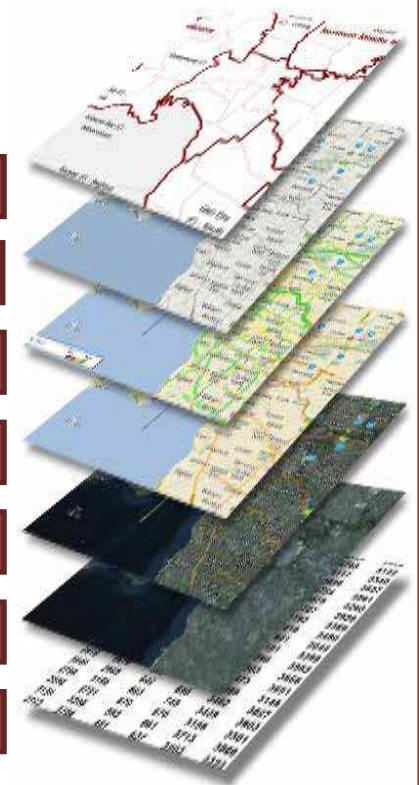
Creating the bridge

## Geospatial Community

### Geospatial Data Frameworks – Fundamental Elements

#### Themes:

- Admin. & statistical boundaries
- Addressing, Place Names
- Transport, Water
- Land and Property
- Elevation and Depth
- Imagery
- Positioning



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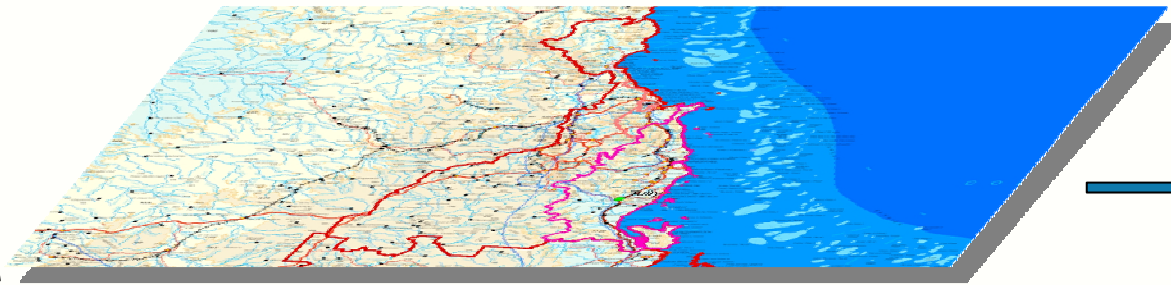
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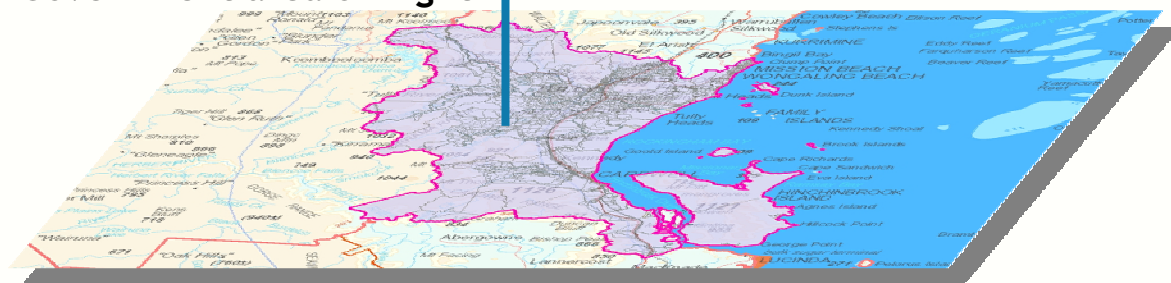
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# Geospatial framework

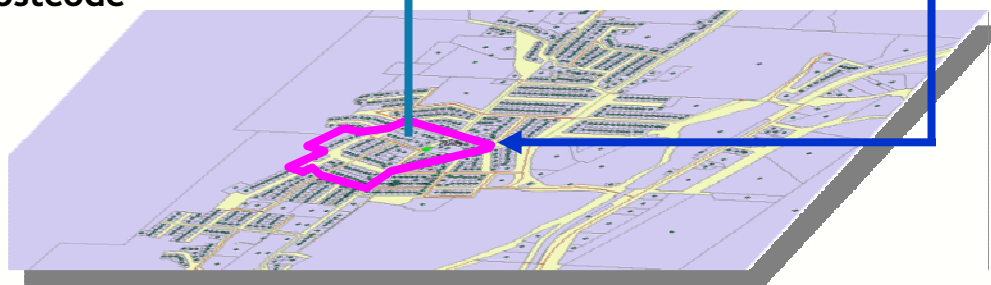
Analysis and aggregation across geographies



Aggregated to Local Government area or higher



Aggregated to suburb or postcode



Location information at address level



Geocoded unit level data

25 Smith St = x,y: 35.5676, 135.6587



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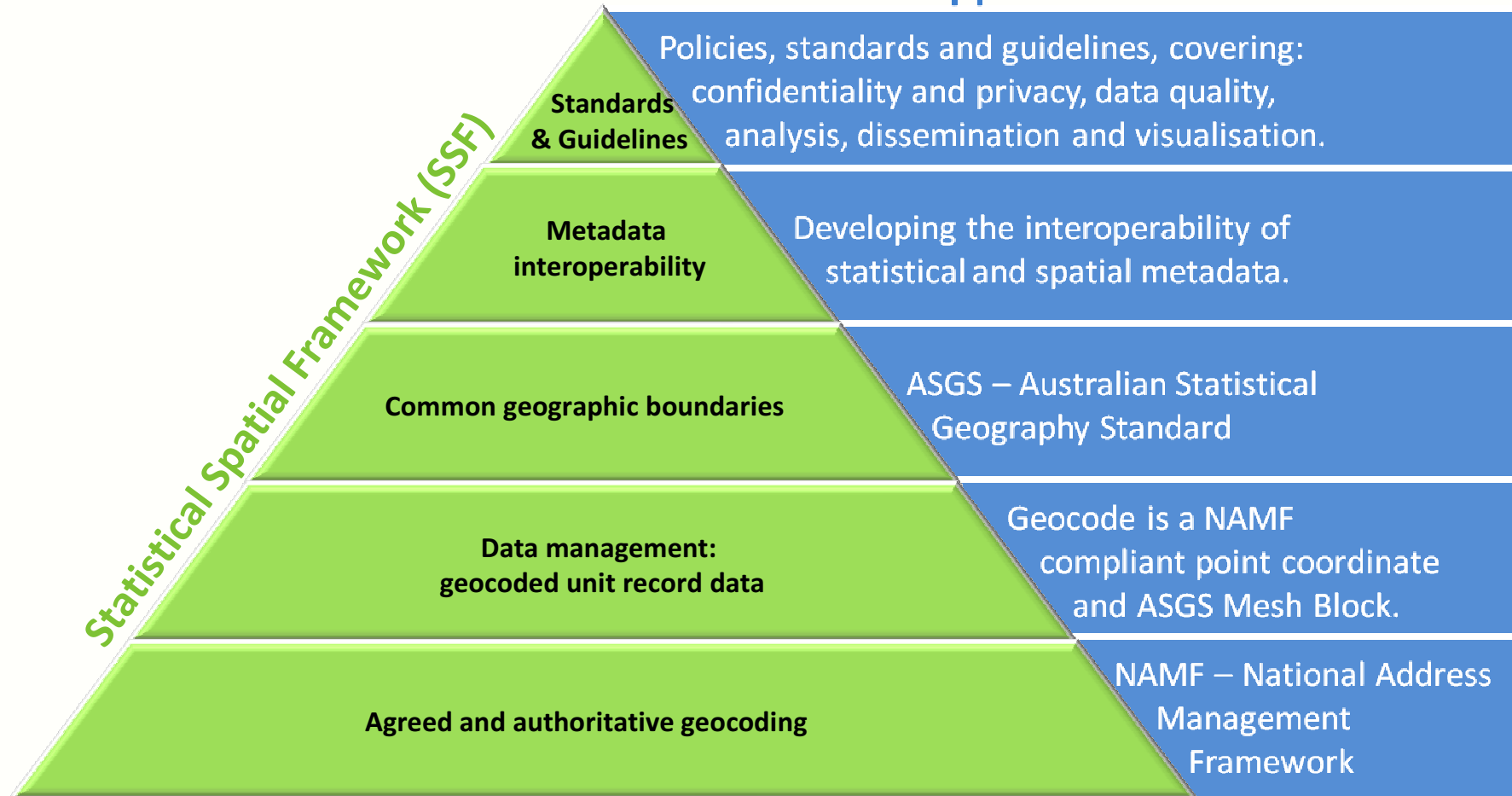
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# Statistical geospatial framework

## Australian application of SSF



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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 orthophotomaps 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”



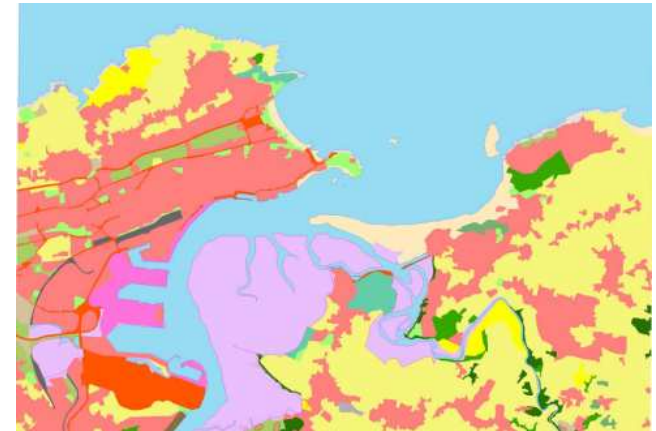
**Benefits:** Protection of the high environmental importance sites of avifauna and other animal and floral species of the European Network of “NATURA 2000”



# Spain: National Mapping Agency (IGN)



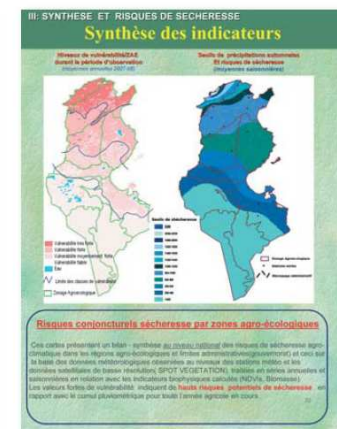
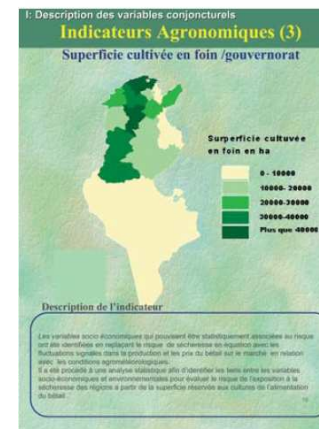
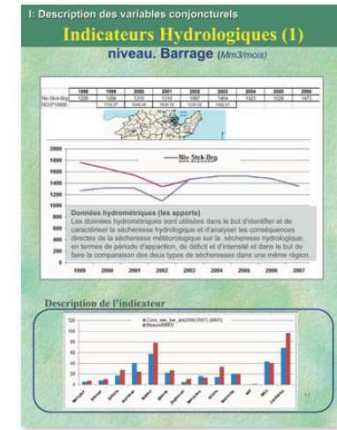
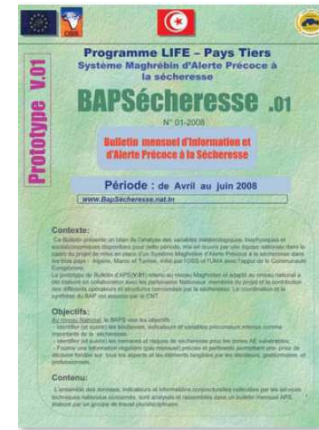
- **Users:**  
General public (using National Reference Map & databases at different scales)
- **Key use:**  
Identify biophysical cover of the land (vegetation, bare soil, etc.) and its socio-economic purpose
- **How?:**  
**National Topographic Map** shows LC & LU data, using synthetic symbology for cartographic purposes
- **Benefits:**  
Increased **coherence** between specialized Land Cover database and topographic data sets and maps.  
Production **cost reduced** by 20%.



# 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.

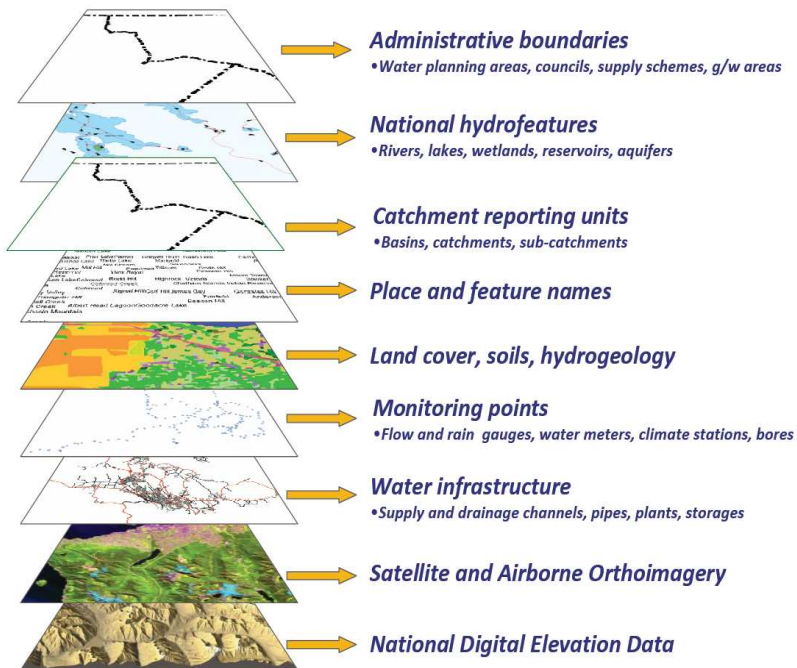
- There is a wide range of vulnerability indicators: some are derived from satellite data such as vegetation and biomass indexes and surface temperature, while others are based on agro-hydro-meteorological information including moisture deficit/excess, and attacks by harmful insects.
- The various vulnerability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



# water information

Data  $\curvearrowright$  Information  $\curvearrowright$  Insight

## Geospatial information and relationships



## Management of water resources in the national interest



Groundwater and surface water modelling and reporting

Policy development

Evidence based decision making

Service delivery

Engaging the community



Australian Government  
Bureau of Meteorology



ANU

THE AUSTRALIAN NATIONAL UNIVERSITY

National Research  
**FLAGSHIPS**  
Water for a Healthy Country



CSIRO



Australian Government  
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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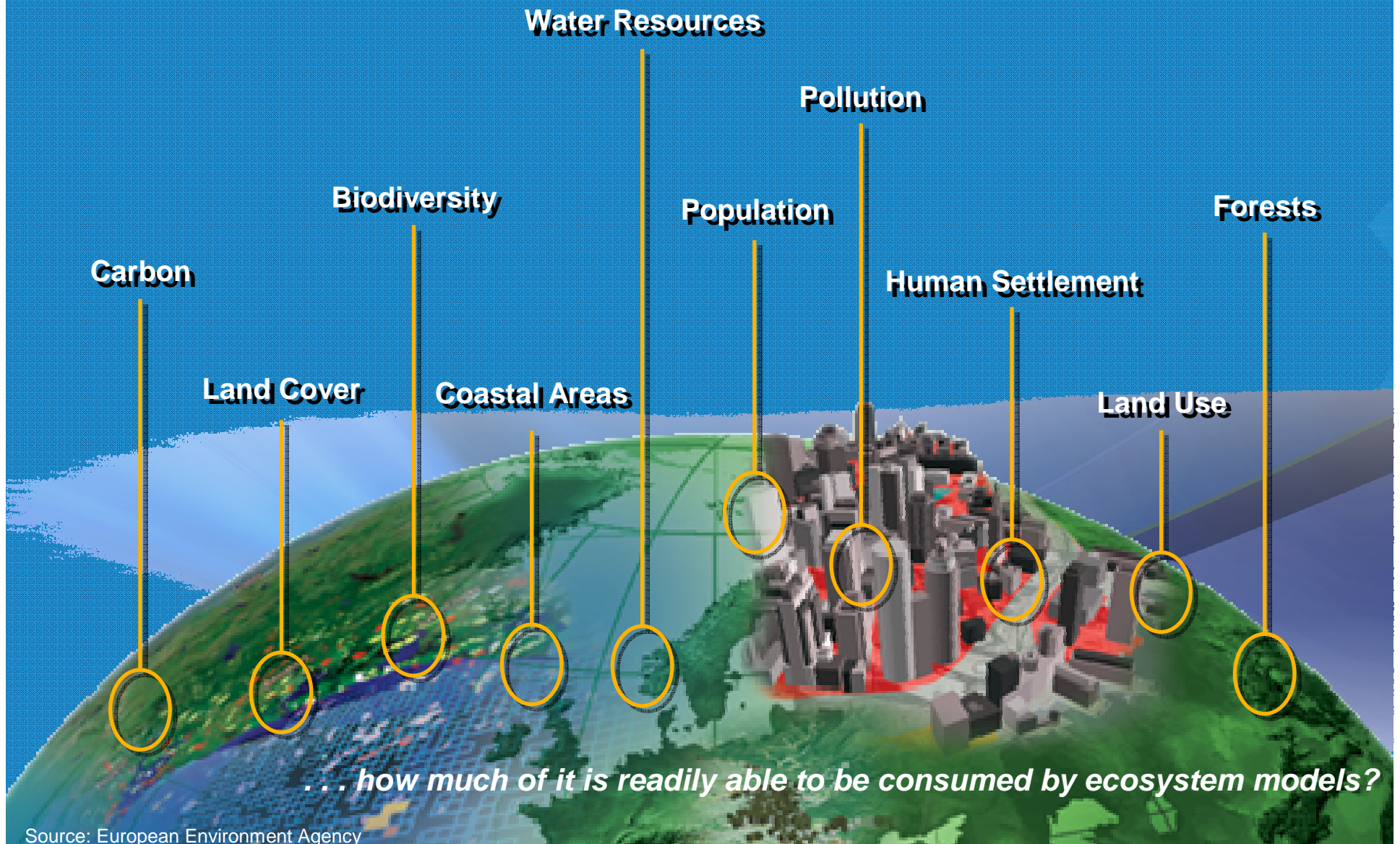
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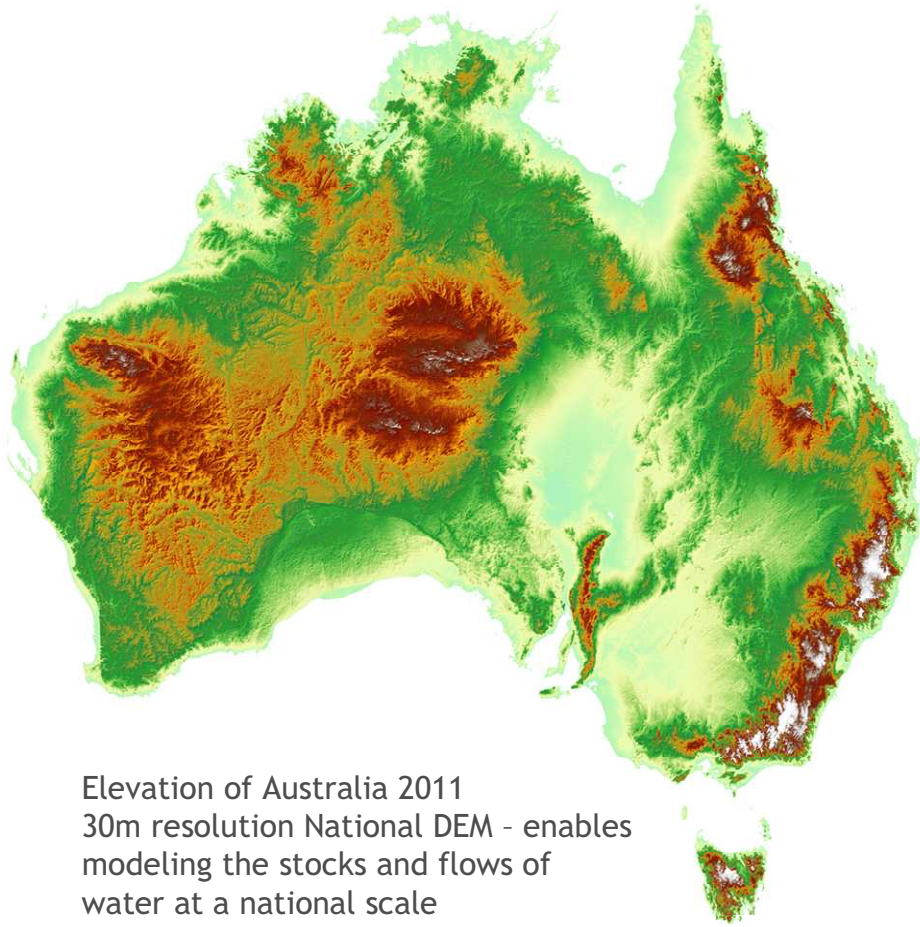
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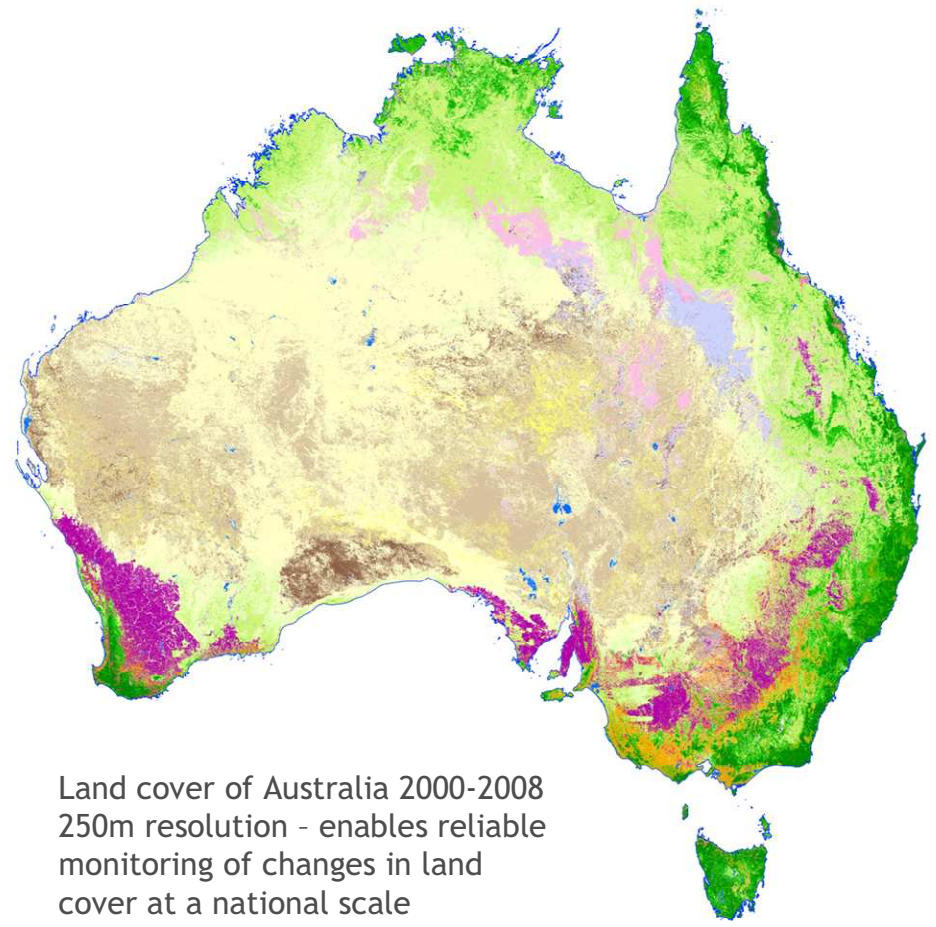
# Need: Dynamic environmental information over space and time





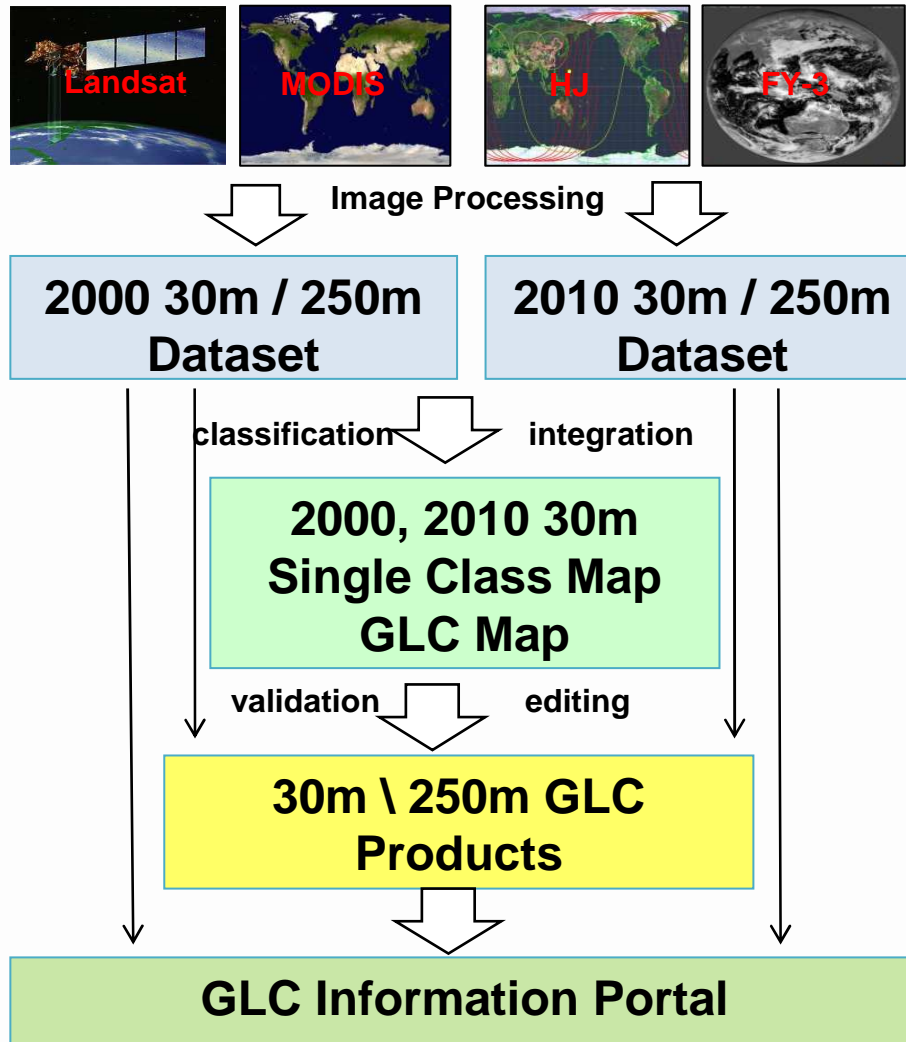


Elevation of Australia 2011  
30m resolution National DEM - enables modeling the stocks and flows of water at a national scale



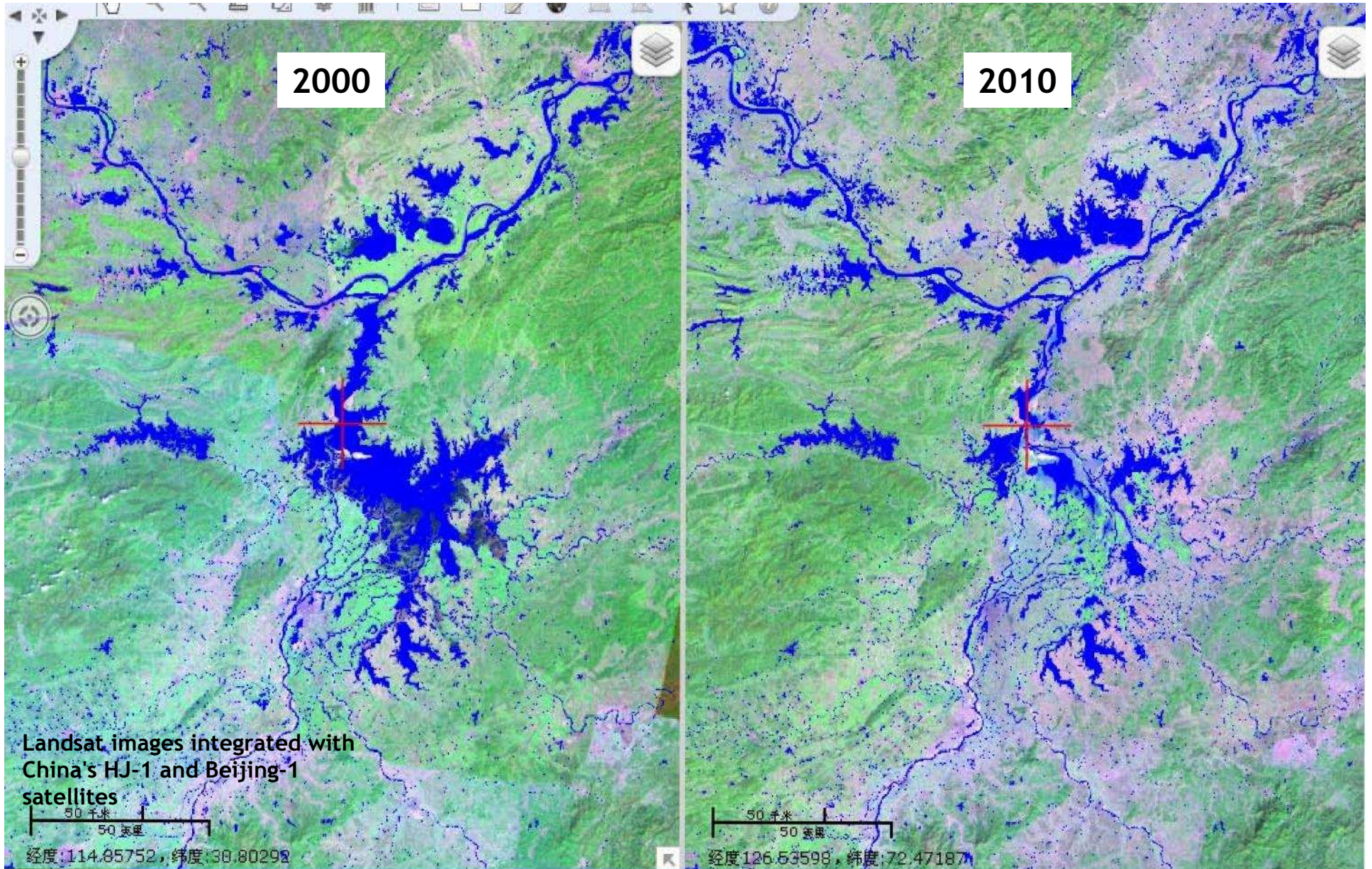
Land cover of Australia 2000-2008  
250m resolution - enables reliable monitoring of changes in land cover at a national scale

# China Global Land Cover Mapping



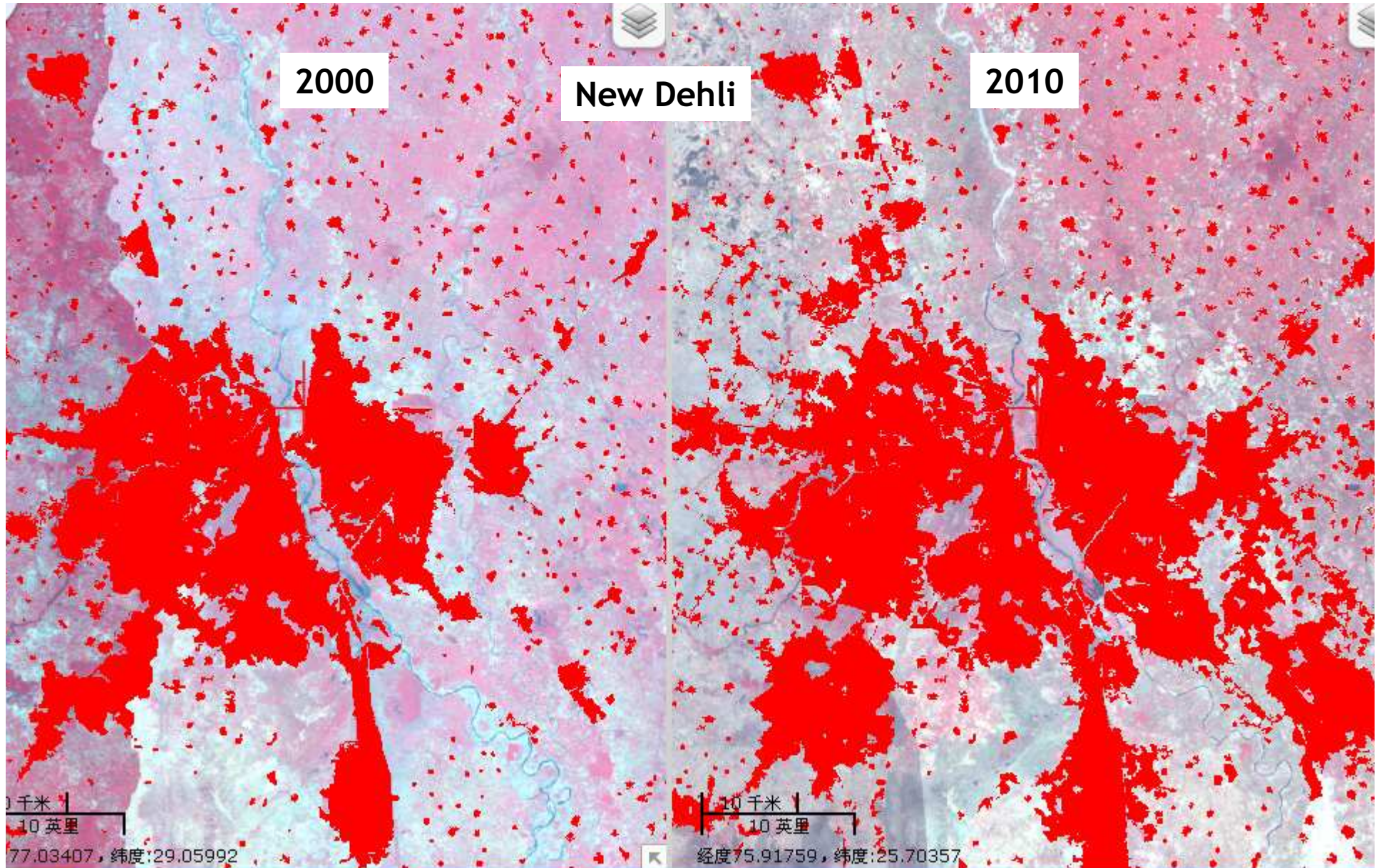
- Time: 2009~2013
- Financed by: Ministry of Science and Technology
- Led by: National Geomatics Center of China (NGCC)
- Overall Goals: Mapping land cover of the whole globe at 30 m for two baseline years (2000 and 2010)
- The first time in the world at 30m resolution

# China Global Land Cover Mapping Water change analysis

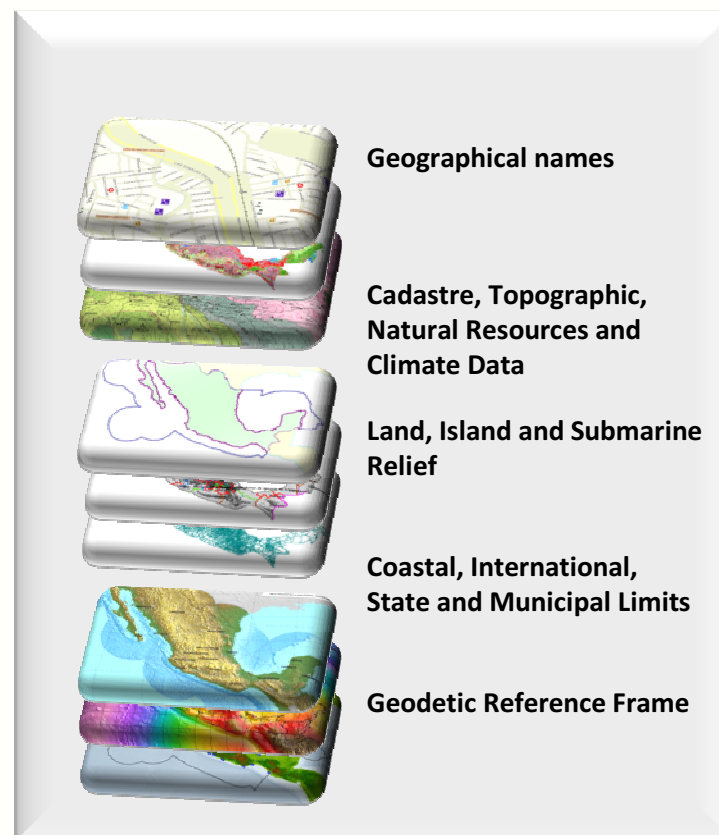
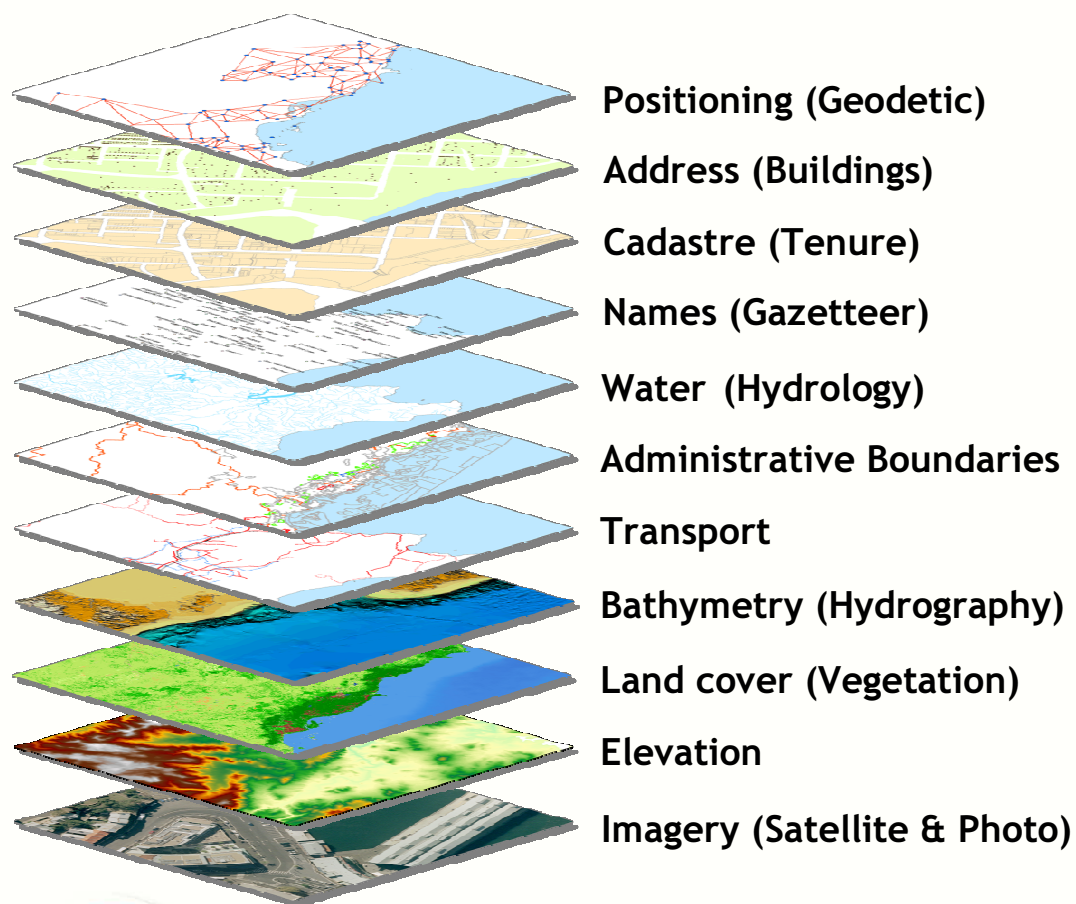


# China Global Land Cover Mapping

## Urban expansion



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



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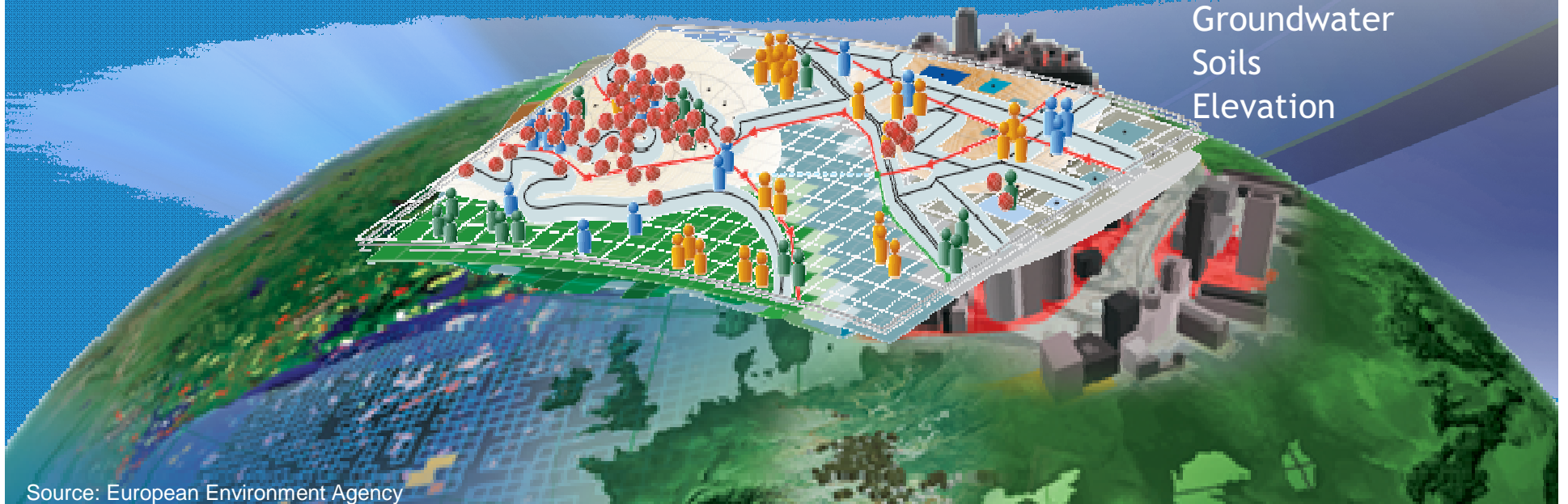
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All of these variables can be integrated into consolidated indicators....  
if the data is consistently available over space and time

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





# 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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Thank you



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