THE 2013 BANGKOK CONFERENCE
GLOBAL DIALOGUE
ON SUSTAINABLE DEVELOPMENT

GROUP SESSION

Group 5:Measuring and Monitoring Sustainable Development

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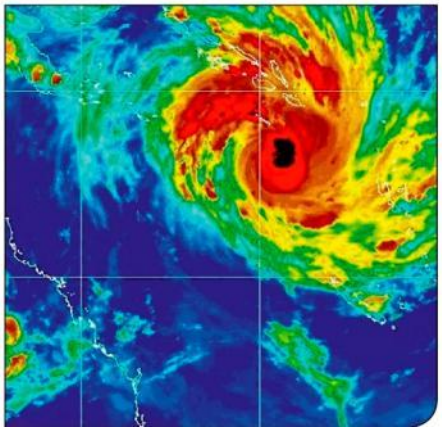
Sustainable development: location matters





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RIO+20 – SUSTAINABLE DEVELOPMENT STATISTICS

1. **The world today has 7 billion people, by 2050 there will be 9 billion:** *Where will they live? Moving to cities.*
2. **A billion and half people in the world don't have access to electricity:** *Where do they live? Innovation increasing.*
3. **Almost a billion people go hungry every day:** *Where can food be grown or sourced or transported from?*

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VOLUNTEER

RIO+20
United Nations Conference
on Sustainable Development

Accurate location information assisting better decision-making:

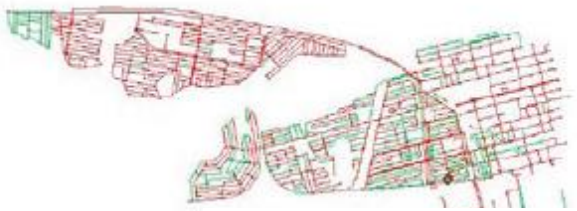
- Water management
- Food management
- Sustainable energy

Water management

To be able to manage water supply, we must be informed of its infrastructure, location and monitor its availability

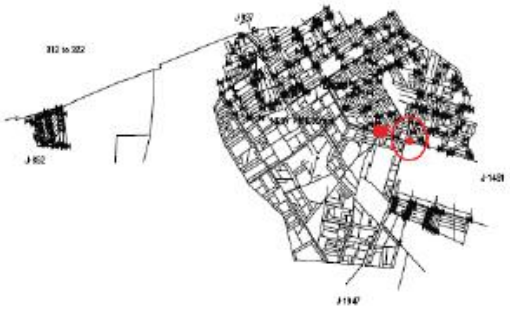
Monitoring local water use: assessing and improving water management

- The Water Plant in Ouagadougou, Burkina Faso uses a GIS-supported monitoring system to manage efficient water use through pressure control, automated valves and leak detection systems.
- By monitoring water flow and use, resources can be managed more effectively to identify areas and times of high use and potentially detect systemic problems such as leaks or illegal water tapping.
- The more consistent water supply has reduced water theft, raised local awareness of water management and freed up money to be spent on water quality and sanitation.



Area of distribution (top)

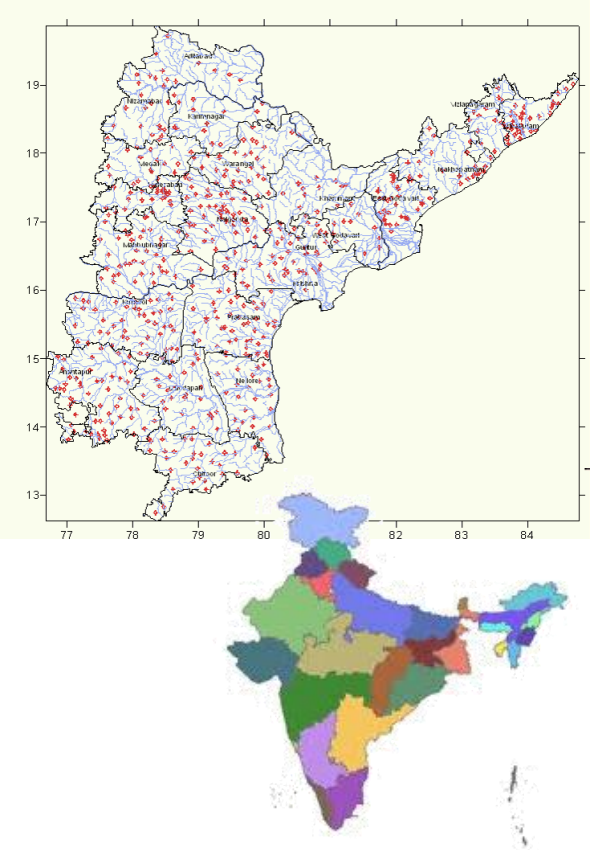
Identification of a leak point (bottom)



Source: The UN

Monitoring water issues: national and regional management

- The Hydrology Project in India is creating a hydrologic database and Hydrological Information System (HIS) to detail both natural and man-made water infrastructure.
- By monitoring infrastructure, more effective water resource planning and management can take place, improving the productivity and cost-effectiveness of water related investments, whilst aiding the future planning of infrastructure to meet increasing population needs.



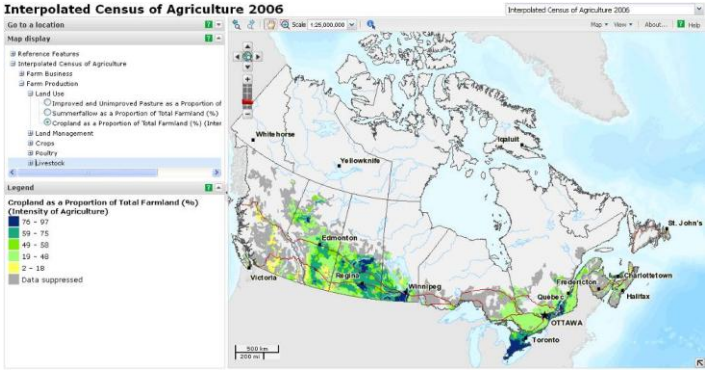
Source: The Hydrology Project, India

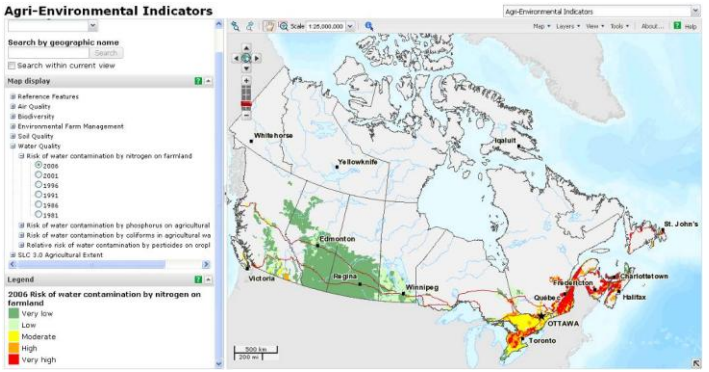
Food management: food supply and sustainable development

To be able to manage food supply, we must monitor current availability and access to food resources

Monitoring national food resources: managing food availability

- The Census of Agriculture in Canada provides a comprehensive picture of agricultural activity in Canada, supporting the development of agri-environmental indicators, policy analysis, land-use decision making and other analysis or applications and created ‘Agri Map’.
- By monitoring land use, future food security can be planned for by identifying areas of high production yields and the future potential of the crops in harvest.



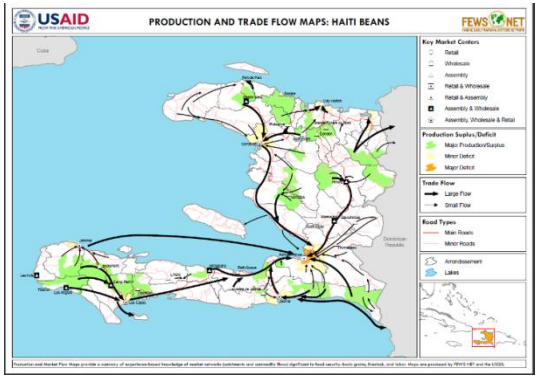


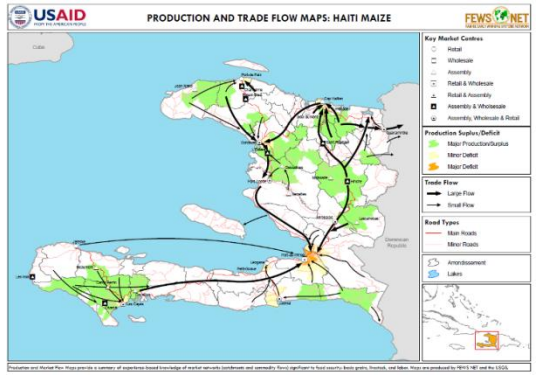
Source: Government of Canada (2012)

Monitoring national food resources: managing food access

- The Famine Early Warning System network monitors the flow and access to food within known national commodity trading.

- Monitoring food flows and understanding where food is and where food will flow to on local, national, regional and global scales is important to ensure every community has access to food helps planning for emergency food aid in the case of famine or disaster.





Source: USAID/FEWS/USGS

Food management and sustainable agriculture

To manage sustainable food production, we must monitor farming activities and plan for daily and seasonal changes

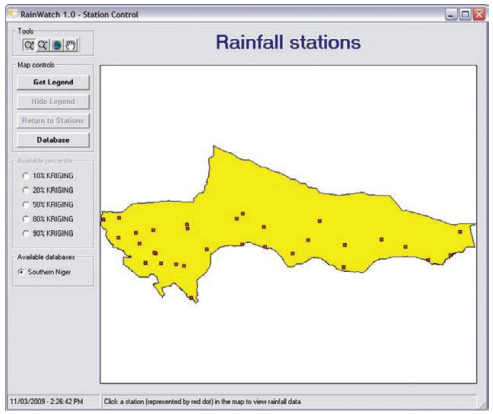
Monitoring sustainable agriculture: planning regional farming activities

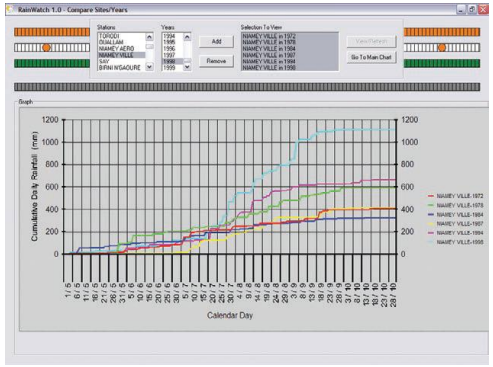
- Conservation International's Centre for Applied Biodiversity Science is researching into which crops will be the most productive and where within the Andes regions.
- Monitoring current crop productivity – and the environmental conditions in which they grow – is providing data to help decide future growing patterns and practices, particularly in response to the change climate.
- By integrating several separate pieces of information about changing environmental conditions against a land use map, future planning decisions are made simpler and more accurate.

Source: Conservation International

Monitoring sustainable agriculture: planning local farming activities

- Rainwatch, developed by NOAA, USA, is a prototype geographic information system that monitors monsoon rainfall and tracks season rainfall attributes and delivers the information directly to farmers in East Africa to monitor precipitation and assess the impact on their crops.
- By monitoring and delivering information about key environmental conditions that are location specific, farmers can pre-empt the impact on crops and therefore implement contingency measures, such as increased irrigation, earlier on.

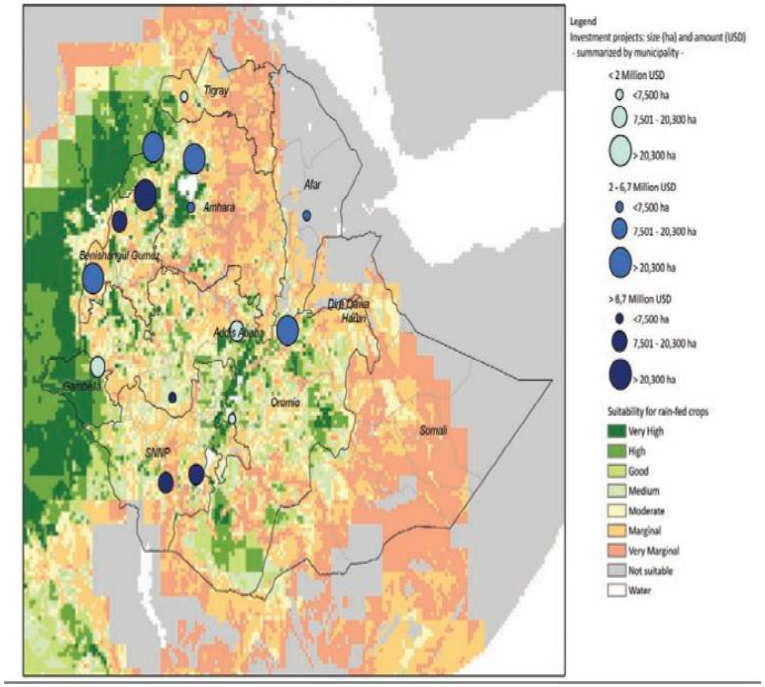




Source: NOAA

Monitoring sustainable agriculture: planning national land use

- As demand for food increases, the demand for usable agricultural land will increase and land ownership rights will become more important.
- Location information has provides a governance tool to prevent land grabbing and unsustainable agricultural development.



DOCUMENTED LAND ACQUISITIONS IN ETHIOPIA, 2004-2009

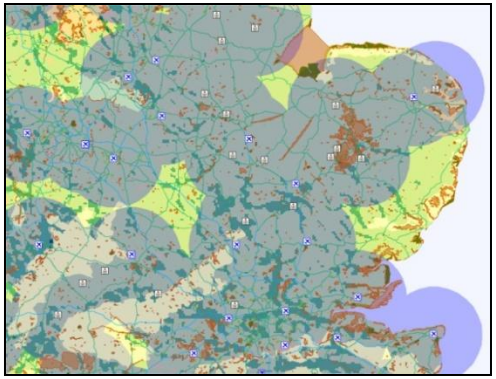
Source: International Fund for Agricultural Development (IFAD)

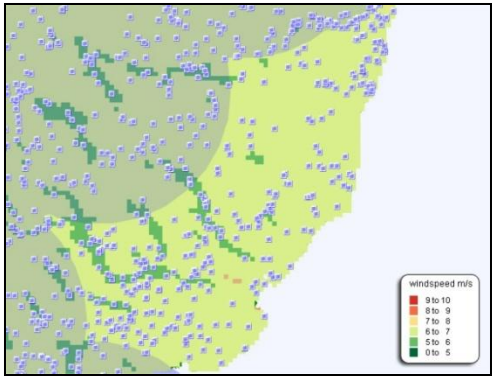
Sustainable energy

To manage energy and to provide sustainable energy we must understand where energy is needed and how it can best be provided

Monitoring energy: developing green energy

- Provide decision makers with crucial information required when identifying optimal sites for green energy generation.
- Site selection for a wind farm requires the analysis of different datasets at the regional, district and local levels.
- To avoid areas of natural beauty, airports and prioritise areas that have winds speeds 45 m above ground level, location information is essential.





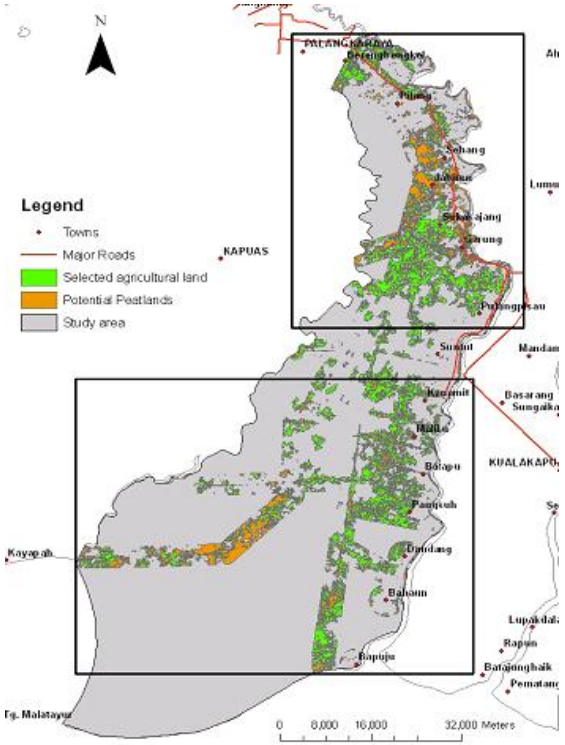
Monitoring energy: monitoring and managing energy use

- Initiative in West Oxford for community monitoring of household energy use and carbon footprint.
- Monitoring energy allows energy providers to plan to meet demand, reduce energy insecurity during and in areas of high use and plan for future infrastructure investment; this all depends on knowing where energy is being used.
- Monitoring energy also allows for authorities to target energy reduction campaigns; high energy use or patterns of peak use can be identified and more sustainable energy use can be explained to energy users.

Source: Oxford Brookes University

Resource management: Indonesia

- Major problem of how to balance conflicting ideals of economic growth and maintaining environmental quality and viability.
  Using location information:
  - provided a framework for the optimal use and cost benefit of drained peatlands in Indonesia in relation to generated revenue. By evaluating the results
  - helped to identity different crops that can be grown viably on the drained peatlands of Indonesia, for example, Sago palm, Melaleuca and Gharu wood
  - helped to identify suitable locations for the processing of the cash crops and likely local markets; such as Berengbengkel, Pilang, Senhang, Jabiren, Garung and the capital, Palangkaraya.



What can be achieved if we underpin decisions with accurate, authoritative and maintained location information?

Monitoring the city: creating a sustainable city

- Masdar City, Abu Dhabi: 'The First Carbon Neutral City' integrates the use of GIS in every aspect to plan the city: from ensuring the construction process is efficient and produces zero waste to planning the transport and energy network, to meet potential demand, and building in monitoring systems into the city infrastructure.

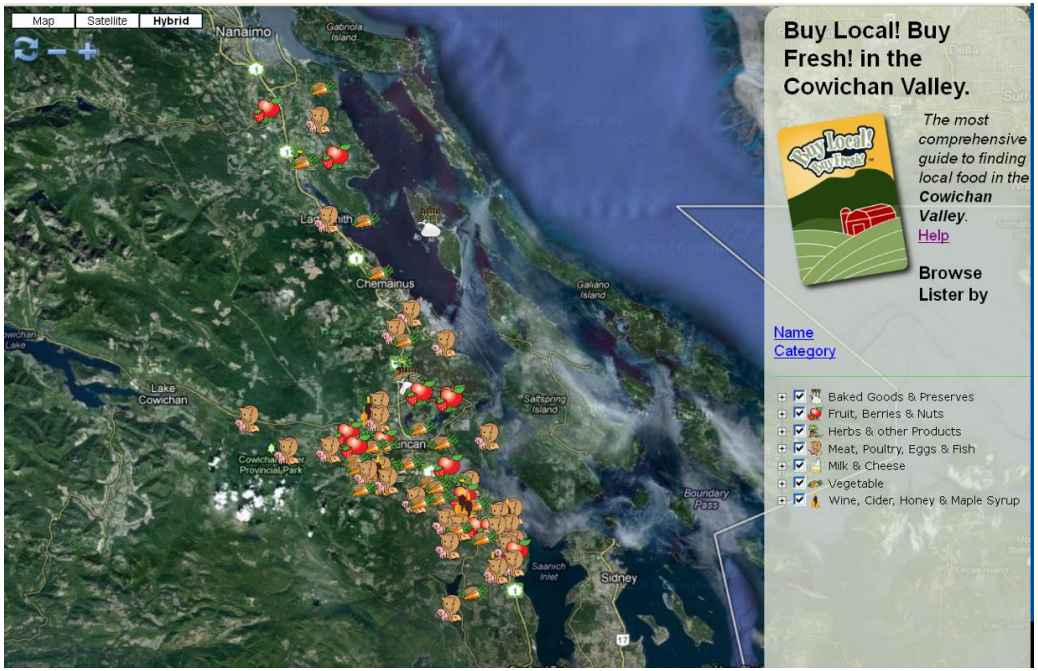
- Location is essential to help with urban planning on any scale: from creating a new city to expanding current infrastructure, location is needed to ensure infrastructure is optimal in terms of energy reduction, environmental conservation and social development.

Monitoring the city: managing daily life

- The Rio Operations Centre helps the City Authority watch and manage daily life.
- The Centre integrates information on weather forecasts, water information, traffic flows and any other anomalies in daily life of the city to predict and manage potential situations such as flooding or traffic accidents.
- By monitoring the city and communicating information to local services, including traffic officers, fire services, and flood protection officers, contingency plans can be put in place and the public put on alert to minimise impacts of potential situations.

Monitoring daily life: community food security management

- Community in Canada map their own food resources and access to food.
- Encourages residents to buy all produce locally.

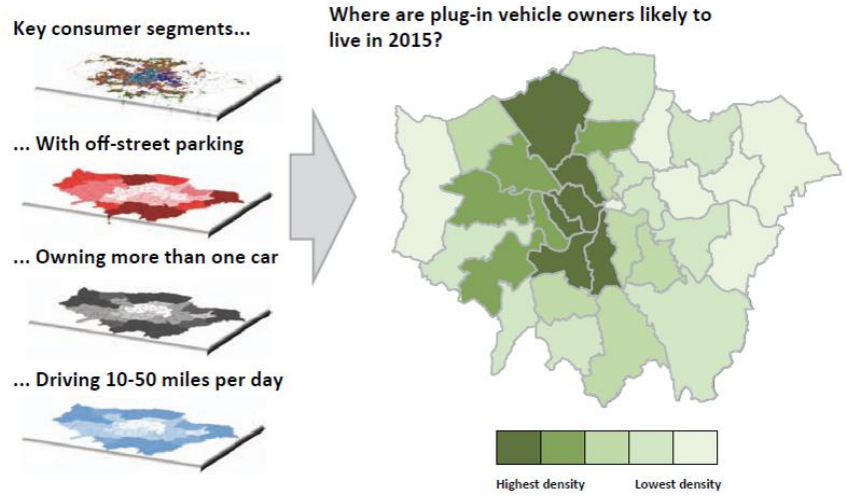


Source: RamanaTandale

Monitoring transport use: planning for electric cars

London's Smart City: part of the Plugged In Places Initiative.

Mapping car use to plan electrical charge points for most effective and sustainable use.



Source: DfT/TfL

Contextualising other information

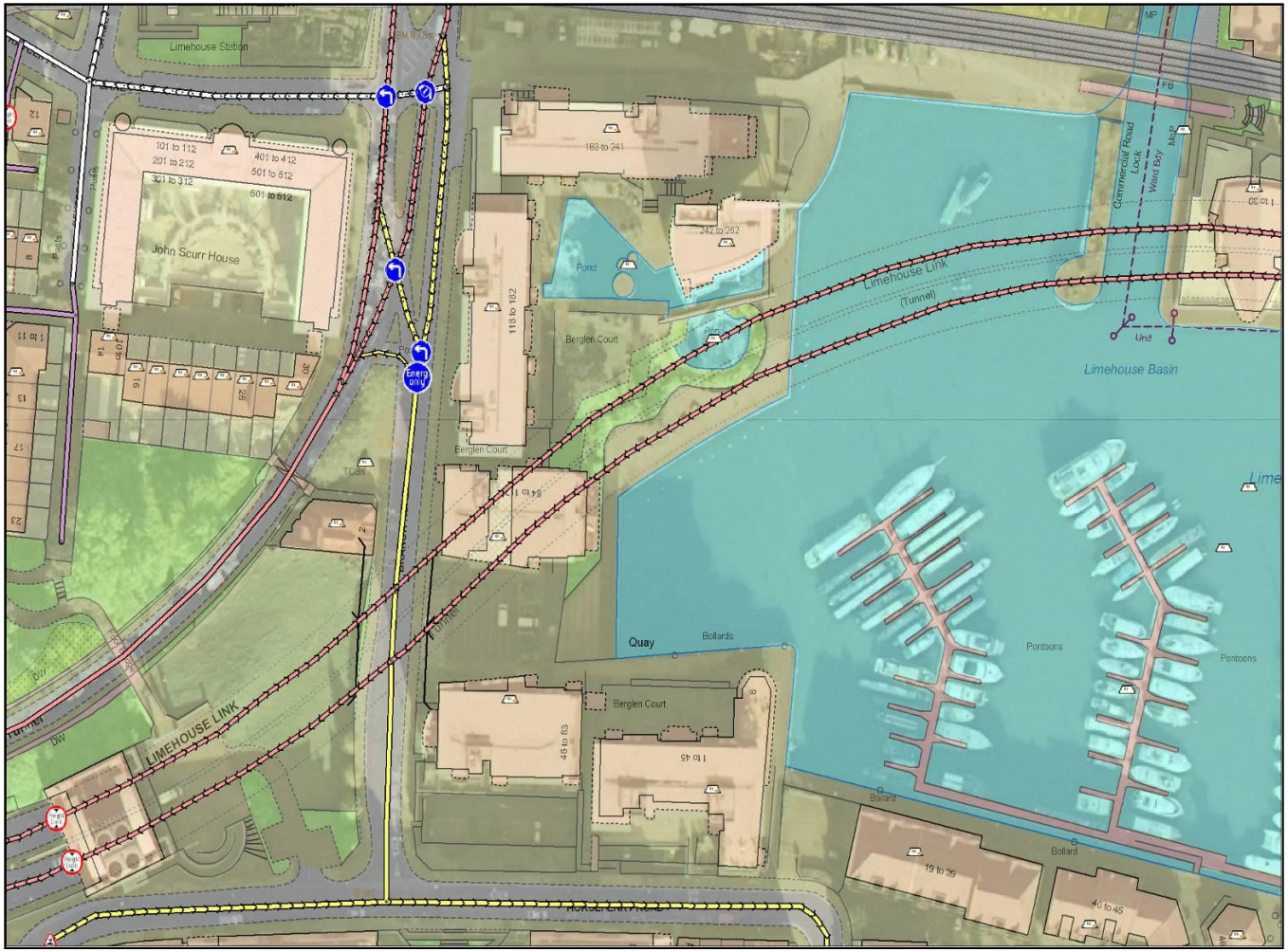
Geography as a mechanism for sustainable development

CITY FARMERS

Social enterprise facilitating new and existing growing schemes and local government engagement with local food.

A location-based web and mobile application that promotes locally-sourced food and farms.

Location information



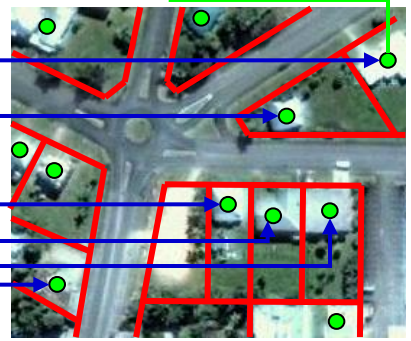
Location Information Framework

Aggregated to Local Government area or higher

Geocoded unit level data

25 Smith St = x,y: 35.5676, 135.6587

Aggregated to suburb or postcode



Location information at address level

Analysis and aggregation across geographies

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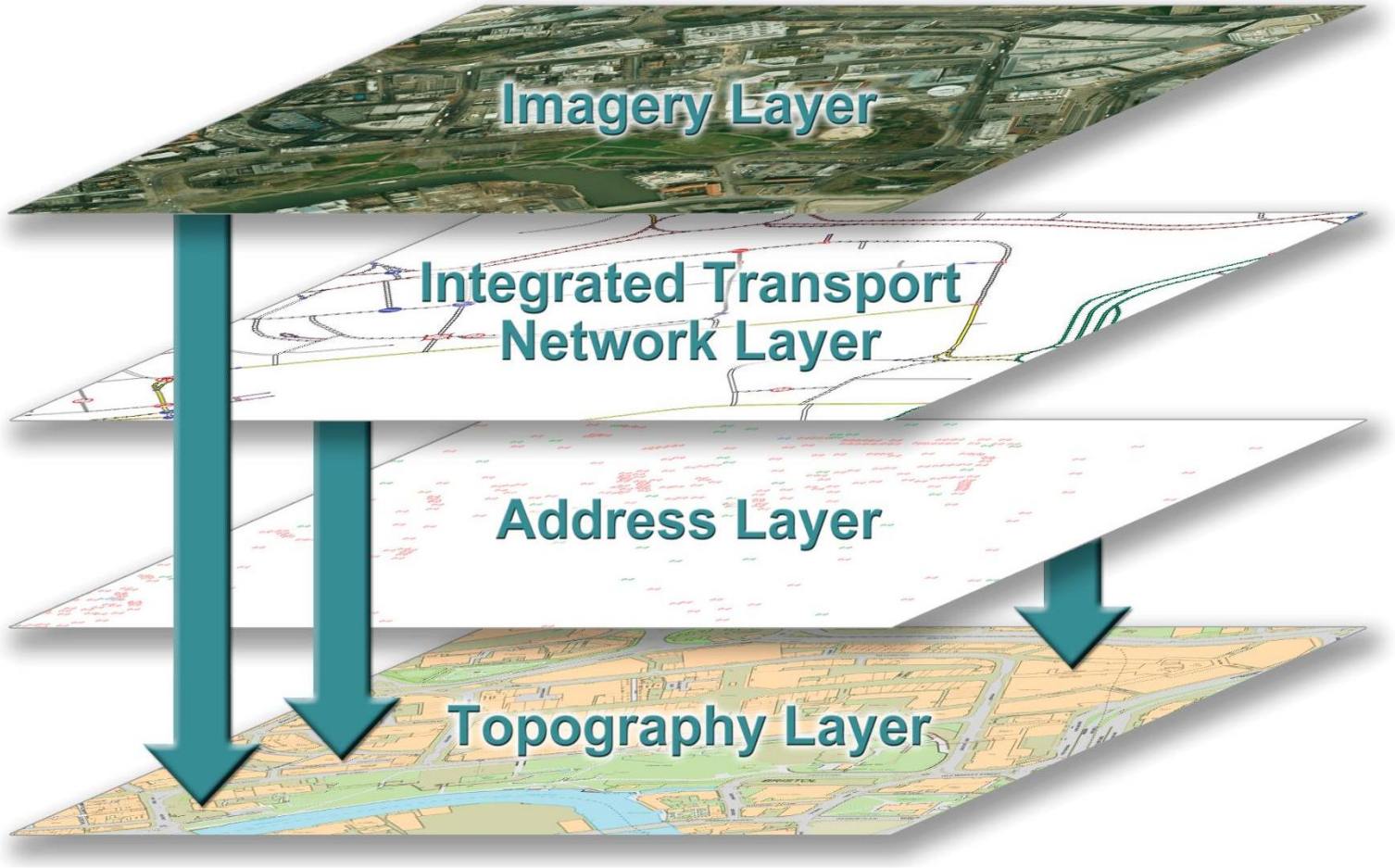
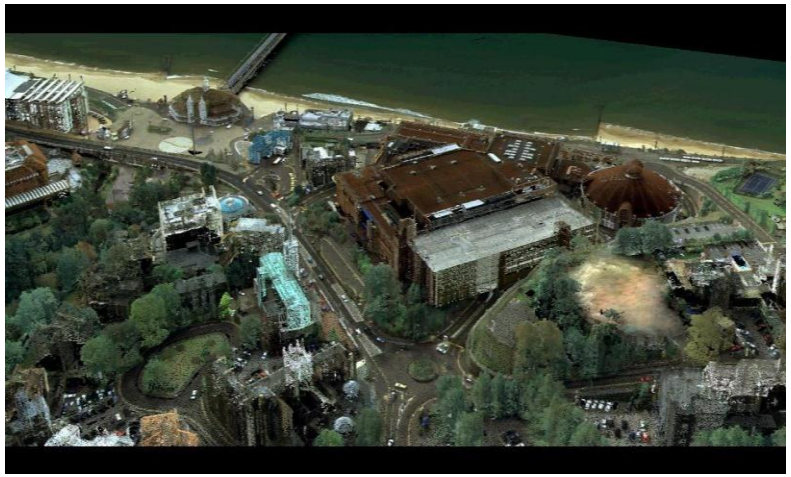
Mapping layers to which all other information can be connected



PARLIAMENT SQUARE
Queen Elizabeth II Conference Centre
Sanctuary Church (site of)
LITTLE SANCTUARY
Middlesex Guildhall
Belfry (site of)
LITTLE GEORGE STREET
STOREY'S GATE
Chorney Island
St Margaret's Church
ST MARGARET STREET
Westminster Hall
Houses of Parliament
St Stephen's Porch
The Crypt
Westminster Abbey
THE SANCTUARY
Memorial
Great Cloisters
The Cloister
Chapter House
Poets' Corner
Palace of Westminster (site of)
OLD PALACE YARD
Little Cloisters
Dean's Yard
Little Dean's Yard
Westminster School
Jewel Tower
Abingdon Street Gardens
Victoria Tower
Royal Court
Black Rod Garden
New Palace Yard
Speaker's Court
Star Chamber (site of)
Blackstole Tower (remains of)
The Elms (site of)
Statue


QUEEN'S GATE MEWS
QUEEN'S GATE TERRACE
GORE STREET
ELVASTON PLACE
ELVASTON MEWS
QUEEN'S GATE
WELLS WAY
CALLENDAR ROAD
Royal College of Science
Department of Physics
Cycle Hire Station
Imperial College
Huxley Building
Department of Aeronautics
Department of Chemical Engineering and Chemical Technology
Royal College
City and Gui
Sherfield Building
Science Museum Library
Alexandra Court
Bute Court Hotel
Royal Thai Embassy
Embassy House
Dower House
South Lodge
Surgery
Garage
PH
TCBs
El Sub Sta
Boro Const & LB Bdy
CR
Def
LB
10.5m
10.0m
9.8m
9.8m
180
171 to 175
170

Technological developments



Where have we come from?

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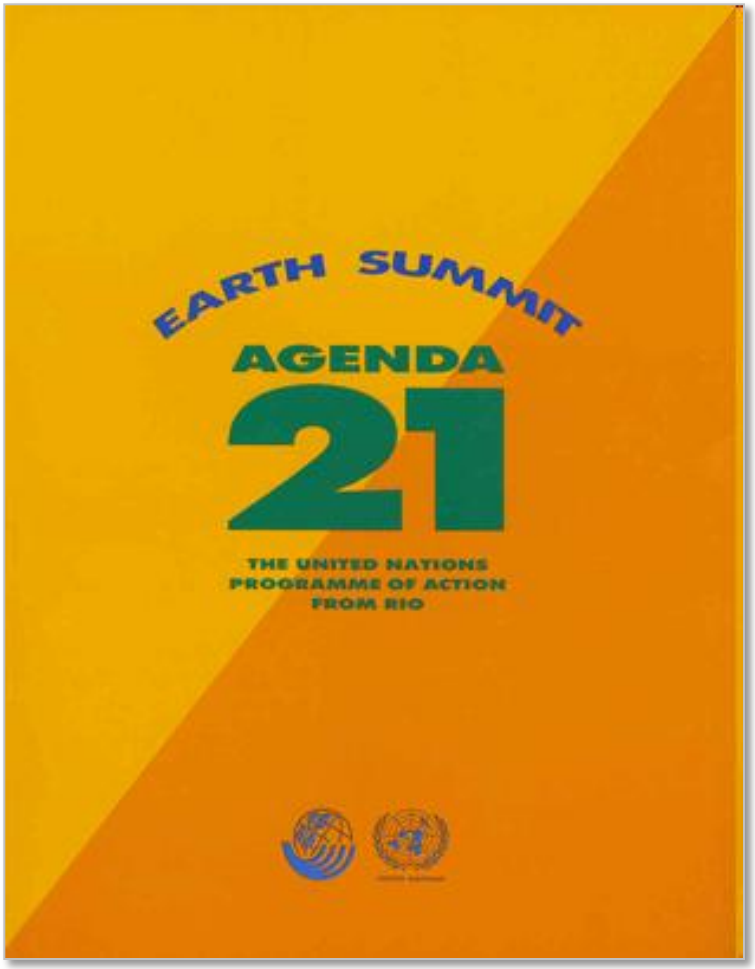
A solid information base



A solid information base

Plan of Implementation of the World Summit on Sustainable Development

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WORLD SUMMIT ON SUSTAINABLE DEVELOPMENT • JOHANNESBURG 2002 •

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A solid information base

132. Promote the development and wider use of earth observation technologies, including satellite remote sensing, global mapping and geographic information systems, to collect quality data on environmental impacts, land use and land-use changes, including through urgent actions at all levels to:

(a) Strengthen cooperation and coordination among global observing systems and research programmes for integrated global observations, taking into account the need for building capacity and sharing of data from ground-based observations, satellite remote sensing and other sources among all countries;

(b) Develop information systems that make the sharing of valuable data possible, including the active exchange of Earth observation data;

(c) Encourage initiatives and partnerships for global mapping.

133. Support countries, particularly developing countries, in their national efforts to:

(a) Collect data that are accurate, long-term, consistent and reliable;

(b) Use satellite and remote-sensing technologies for data collection and further improvement of ground-based observations;

(c) Access, explore and use geographic information by utilizing the technologies of satellite remote sensing, satellite global positioning, mapping and geographic information systems.

The Future We Want: 19 June 2012

187. We recognize the importance of early warning systems as part of effective disaster risk reduction at all levels in order to reduce economic and social damages including the loss of human life, and in this regard encourage States to integrate such systems into their national disaster risk reduction strategies and plans. We encourage donors and the international community to enhance international cooperation in support of disaster risk reduction in developing countries as appropriate through technical assistance, technology transfer as mutually agreed, capacity building and training programmes. We further recognize the importance of comprehensive hazard and risk assessments, and knowledge and information sharing, including reliable geospatial information. We commit to undertake and strengthen in a timely manner risk assessment and disaster risk reduction instruments.

274. We recognize the importance of space-technology-based data, in situ monitoring, and reliable geospatial information for sustainable development policy-making, programming and project operations. In this context, we note the relevance of global mapping and recognize the efforts in developing global environmental observing systems, including by the Eye on Earth network and through the Global Earth Observation System of Systems. We recognize the need to support developing countries in their efforts to collect environmental data.

Everything happens somewhere