



Advancing Sustainability with Geospatial

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Geospatial Information and Spatial Data Infrastructure



Logistics & Transport



Education & Research



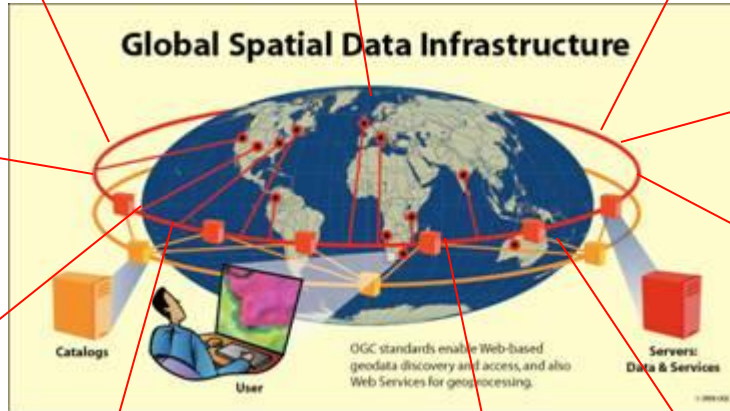
Sustainable Development



Utilities



Health



E -Government



Emergency Services



Consumer Services



Energy



Geosciences



Pandemic Disease Events



Marine: Red Tide



Extreme Weather / Climate Change



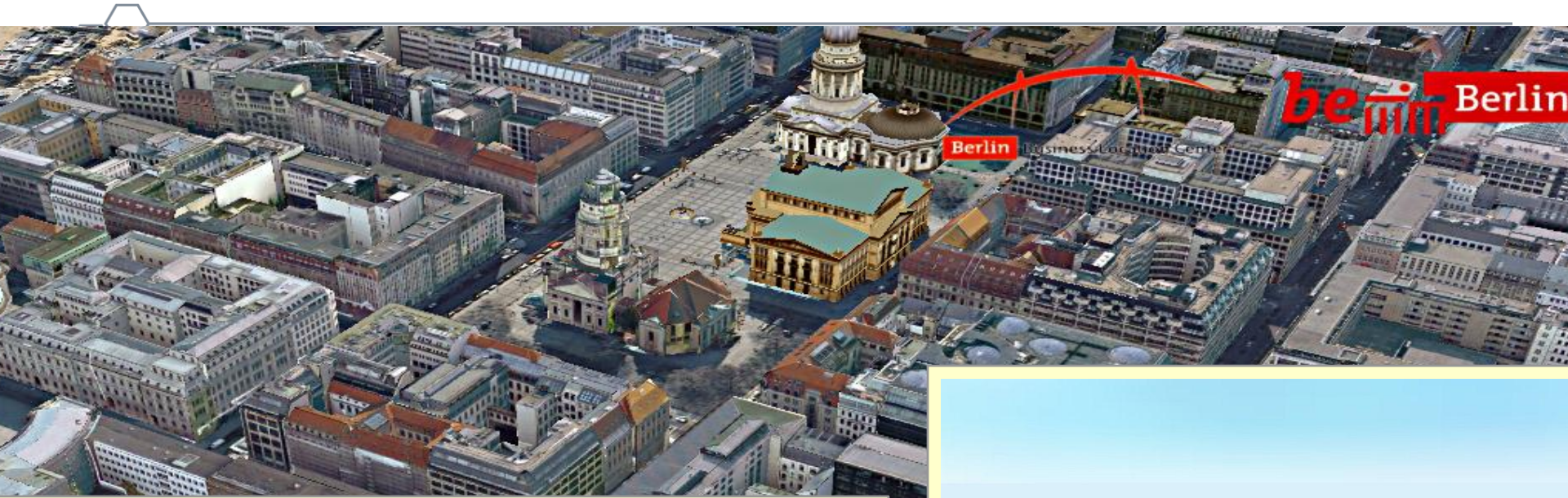
Oxfam East Africa at <https://www.flickr.com/photos/46434833@N05/5933226731>

OGC[®]

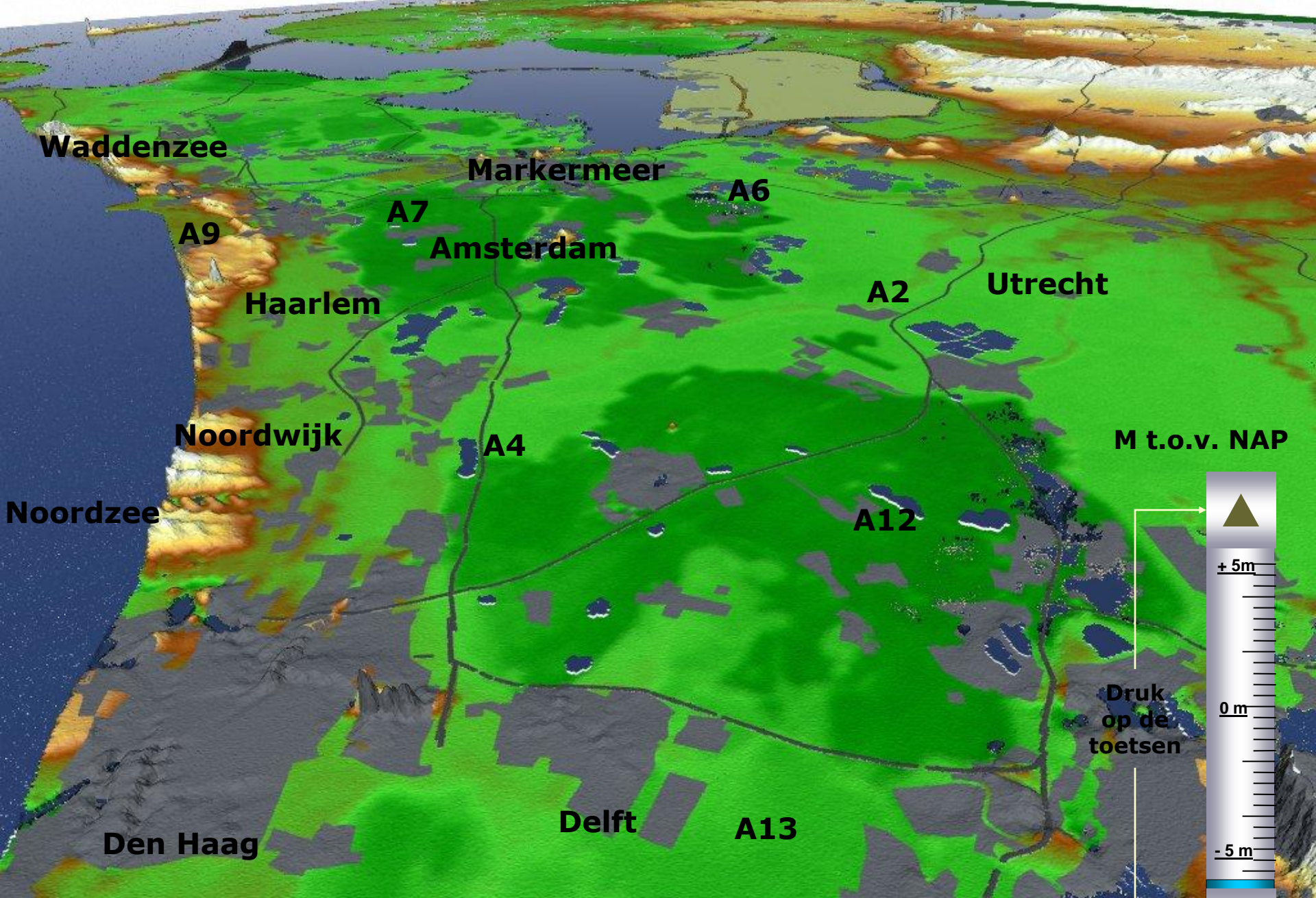


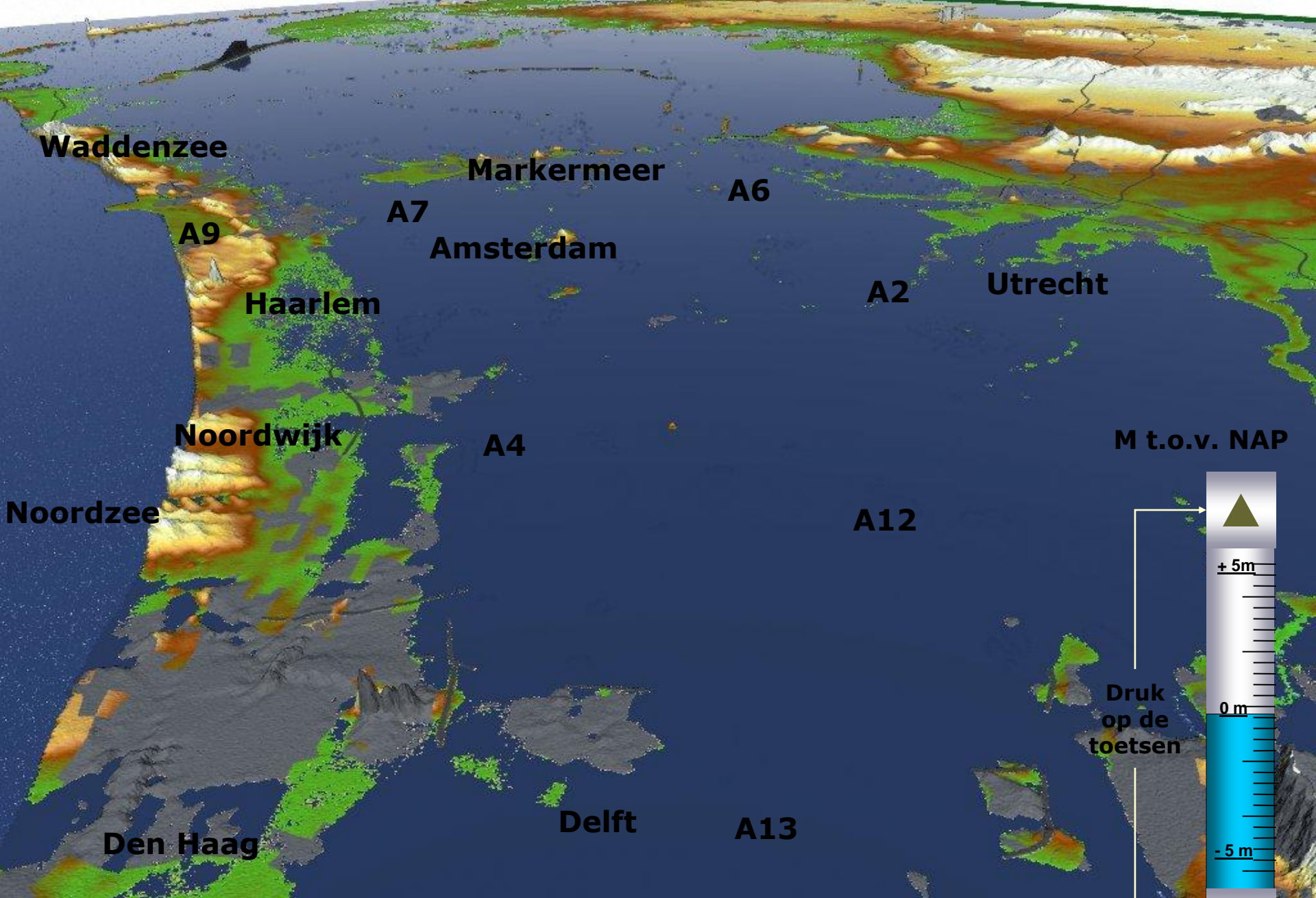
Source: VirtualSteve at the [English language Wikipedia](https://en.wikipedia.org/)

Urban Sustainability

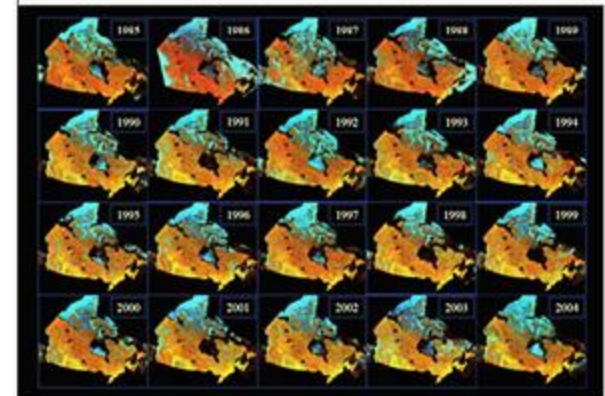
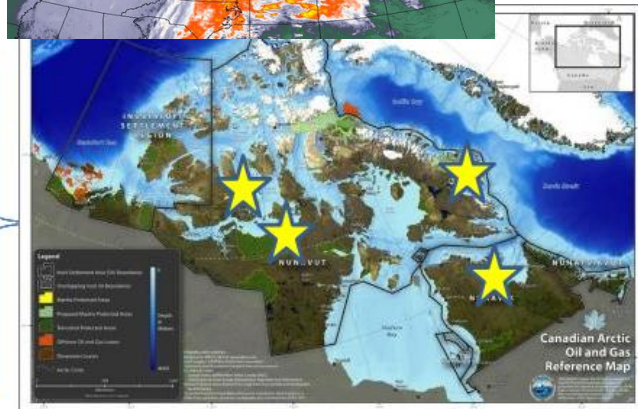
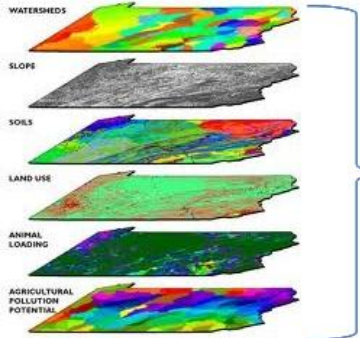
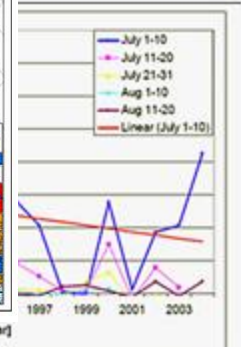
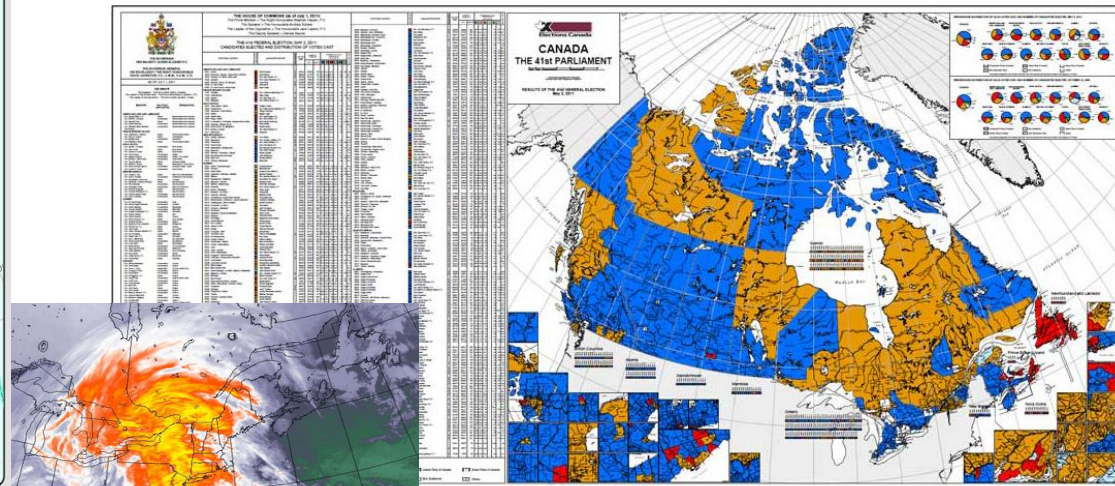
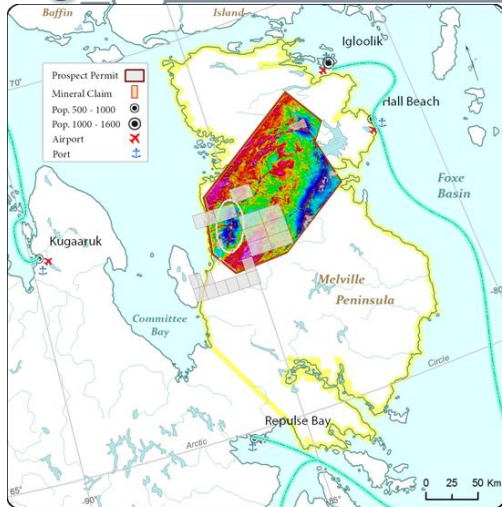


Source: GTA Geoinformatik GmbH, www.gta-geo.de





Geospatial information is widely utilized throughout government...



...to support broad national objectives such as economic growth, social cohesion and well-being, and environmental management

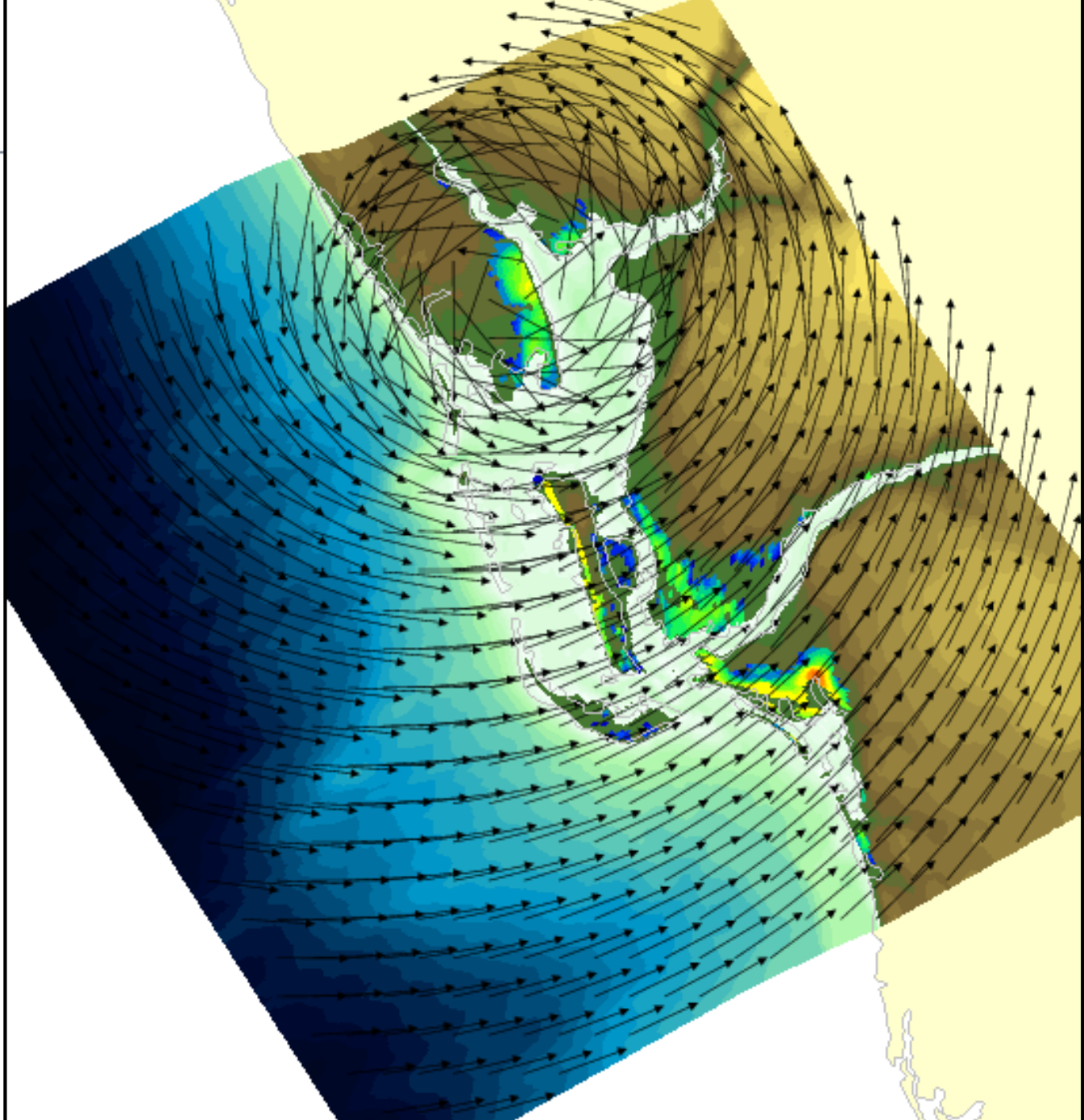
Complex Observing Systems





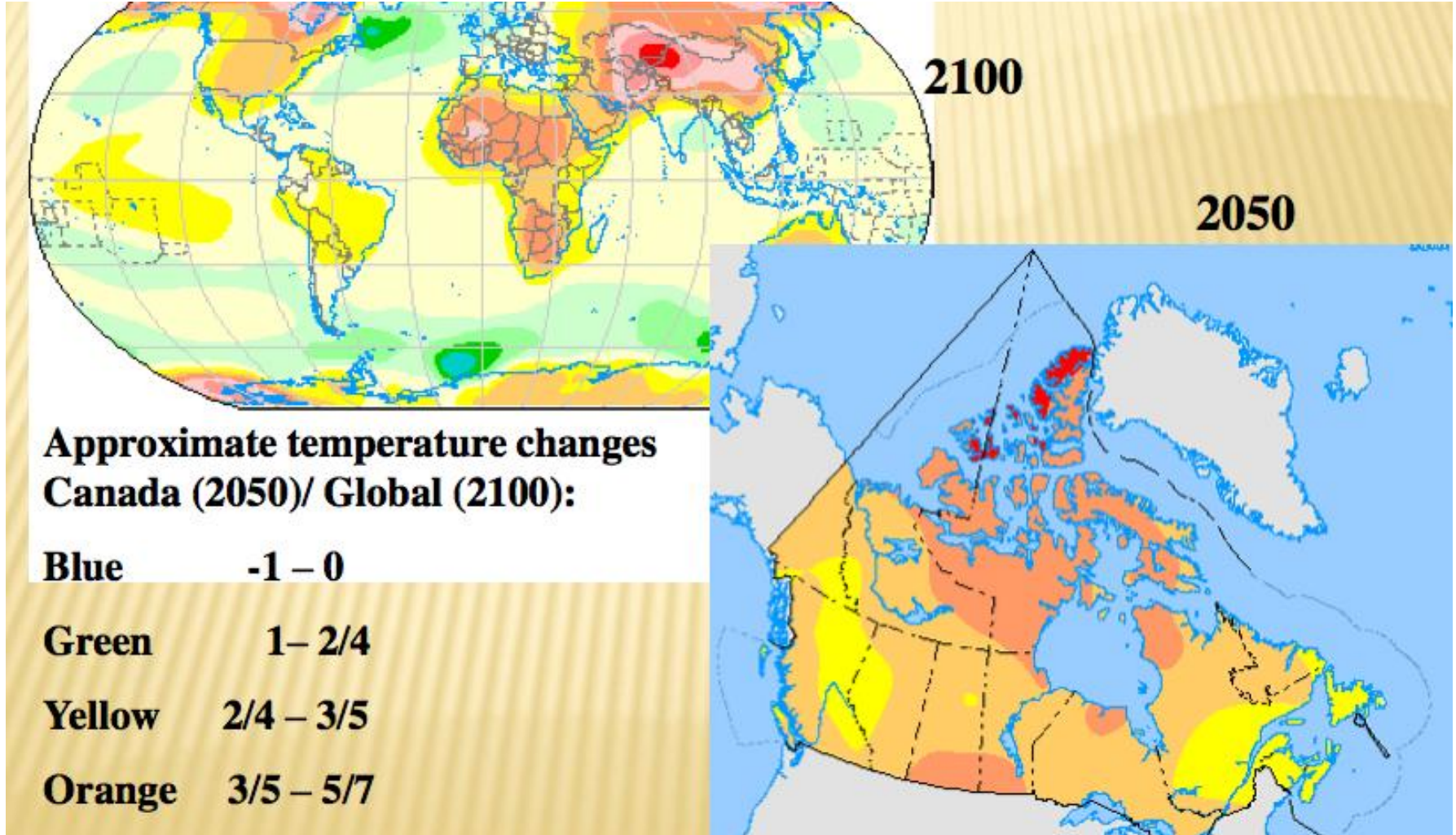
Numerical Models

Short Term Prediction



MODEL MISC | t=20040813T2100 | t0=19691231T1800 | WIND | sto= | run=

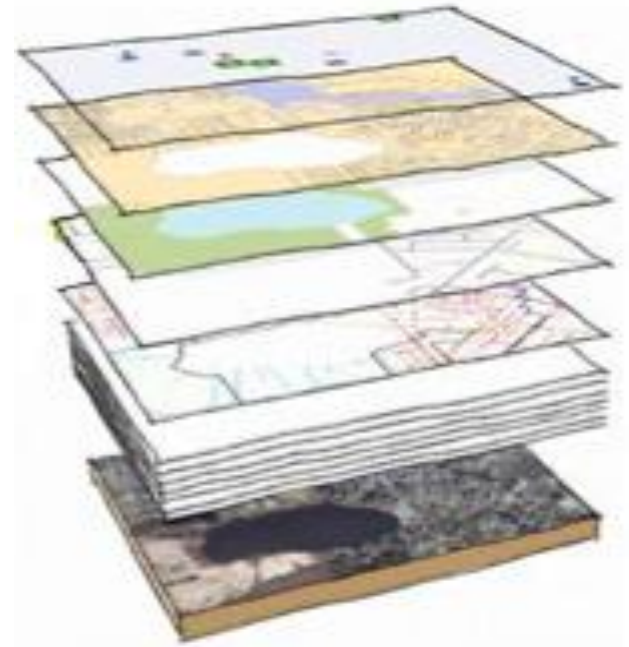
Long Term Prediction



Spatial Data Infrastructure



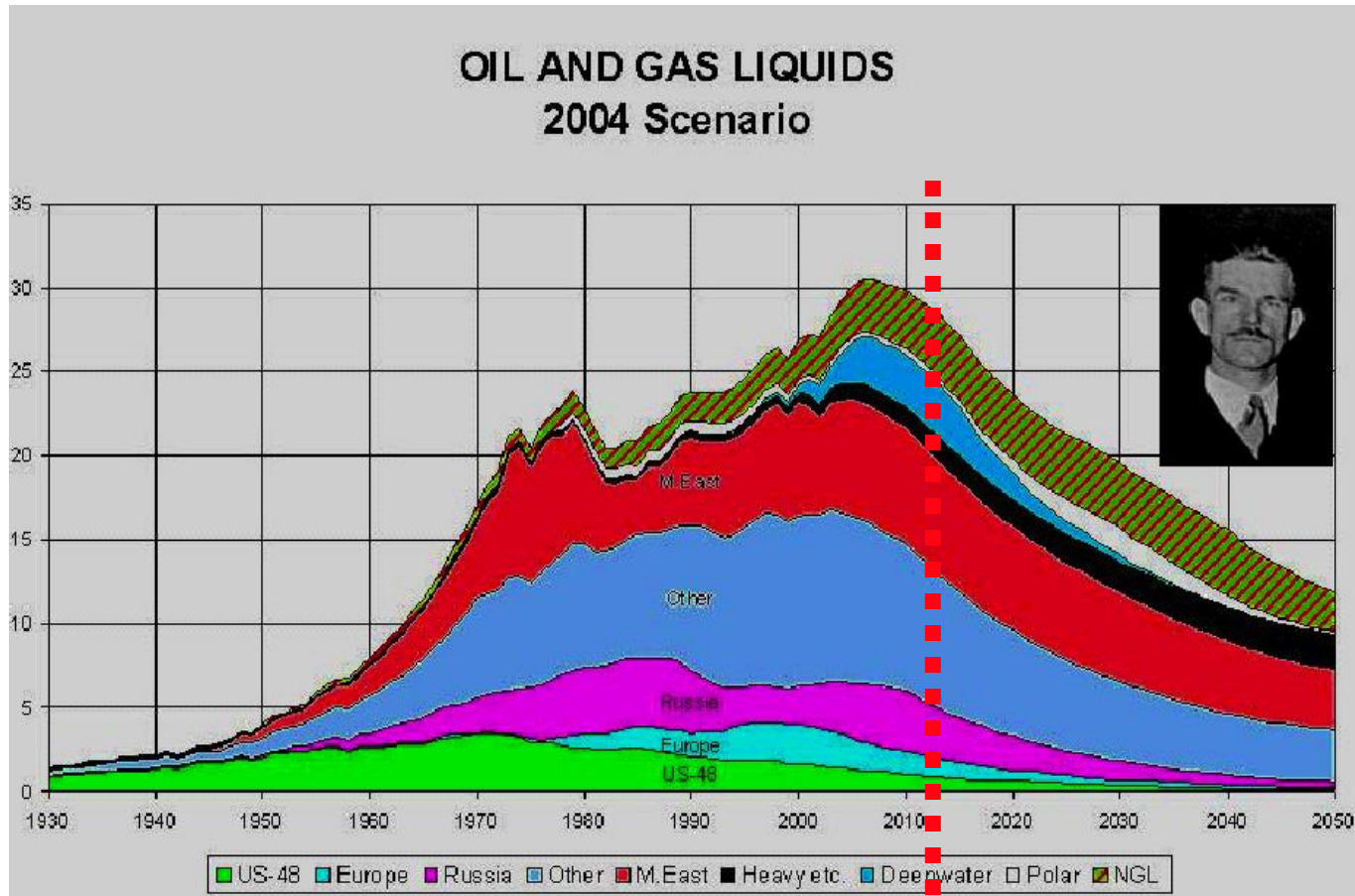
- Location is relevant to all of these issues
- Location is the common integrating link





Energy

M. K. Hubbert (& intellectual heirs) on World Oil Production



Increasing demand for oil!

2012!

Solar Potential Analysis / Solar Atlas Berlin




The energy production potentials for photovoltaics and solar thermal heating, the required investments and achievable CO₂ reductions have been computed for each of the 550,000 buildings on the level of roof surface segments and were added to the 3D city model



BLDG_0003000a000afa2d

Photovoltaic suitability **3**

Address:
Albertstr. 14
Berlin



Available area for photovoltaic installations: 139,20 m²
Average solar radiation in a year: 1126,30 kWh/m²
Solar electricity yield: 18,81 MWh/a
Maximal installable power: 19,90 kW/m²

CO₂ Savings: 11,74 t per year
Investment volume: 69.650 €

Stadtmodell © Der Senat von Berlin Image © 2011 AeroWest

Solar Energy Production Potential Analysis

Assessment of the suitability of roofs for the production of solar energy and the estimation of potential CO2 savings based on the 3D city model of Hamburg

- Prior year renewable rates

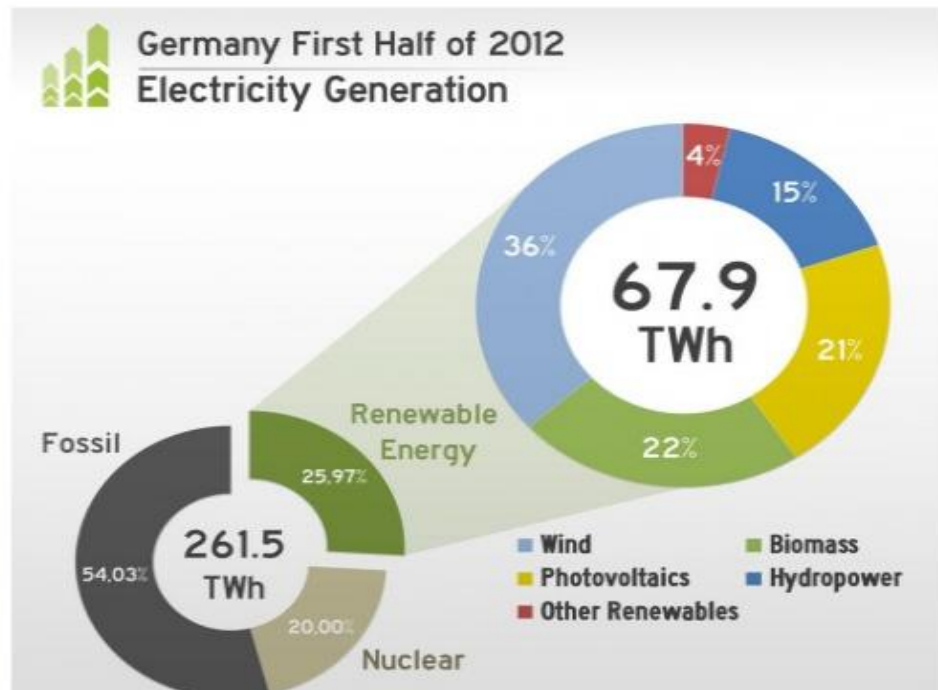
- 2011 20.56%
- 2010 18.3%

- Geospatial information and technologies are key

- Policy tools:
 - Feed-In Tariffs

Germany — 26% of Electricity from Renewable Energy in 1st Half of 2012

JULY 26, 2012 BY THOMAS 17 COMMENTS



<http://cleantechnica.com/2012/07/26/germany-26-of-electricity-from-renewable-energy-in-1st-half-of-2012/>



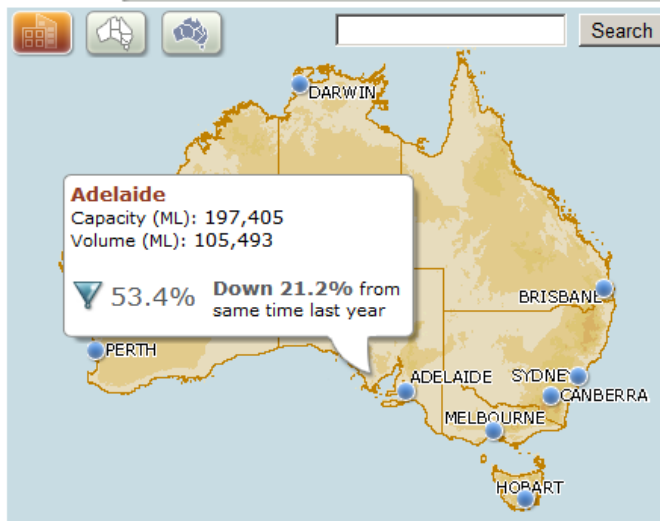
Water



Place: Australia
Date: 10 August 2012

Water Storage

Map

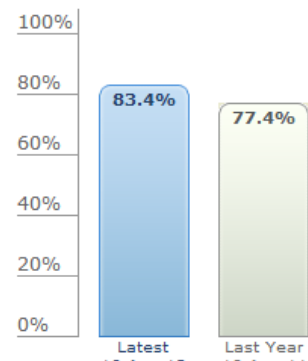


Snapshot

Summary

Changes

Australia



Latest Volume: 66,581,953ML
Accessible Capacity: 79,833,335ML

- [About](#)
- [Copyright](#)
- [Help](#)
- [FAQs](#)
- [Glossary](#)
- [Feedback](#)
- [iPhone App](#)

LINKS

- [Bureau of Meteorology - Water Information](#)
- [Water Regulations](#)
- [National Water Commission](#)

Funded by the National Water Commission under the Raising National Water Standards Program.



Graph

Details

Australia by Cities and Systems

change for same time: Previous Year Previous Month Previous Week

Cities and Systems (8 available)	Latest Observation				Previous Year		
	Capacity (ML)	Volume (ML)	% Full	Date Reported	Capacity (ML)	Volume (ML)	% Full
Adelaide	197,405	105,493	53.4	08 Aug 2012	197,405	147,399	74.7
Brisbane	2,220,150	2,200,446	99.1	09 Aug 2012	2,220,150	1,859,610	83.8
Canberra	205,490	203,174	98.9	08 Aug 2012	205,490	199,087	96.9
Darwin	285,450	249,500	87.4	08 Aug 2012	285,450	257,600	90.2
Hobart	3,600	3,590	99.7	04 Aug 2012	3,600	3,600	100.0



www.csiro.au

The South Esk Hydrological Sensor Web: Next- Generation Catchment Management

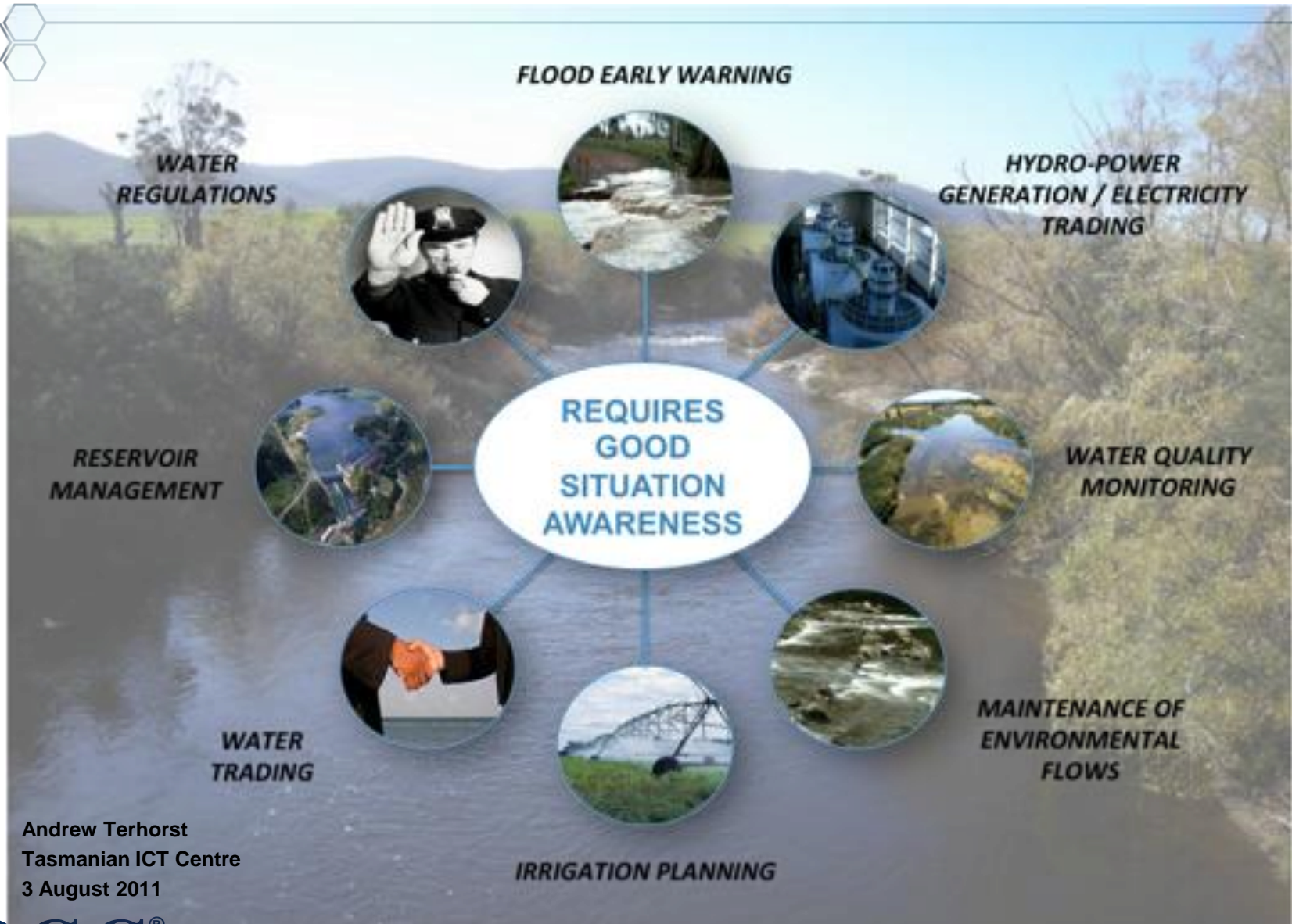
Tasmania 2011 iAward State Winner – Green IT and Sustainability

Water for a Healthy Country

GC[®]

National Research
FLAGSHIPS





- Andrew Terhorst
- Tasmanian ICT Centre
- 3 August 2011

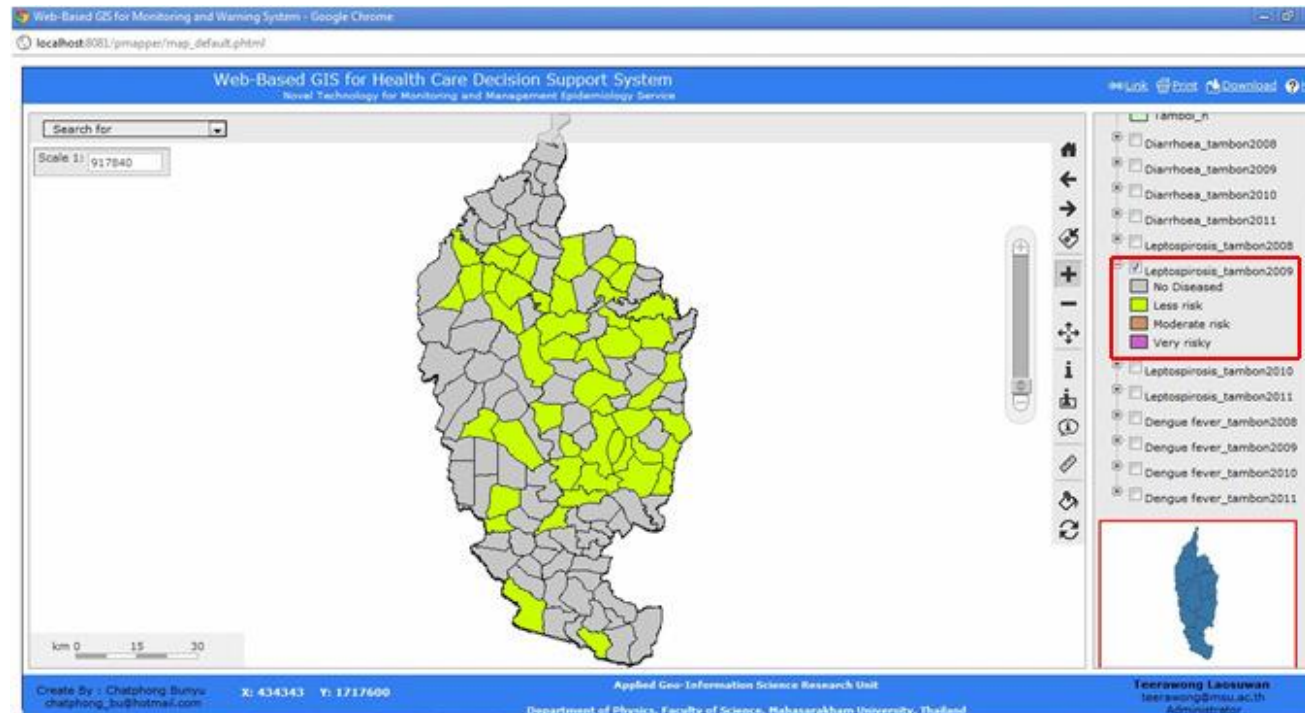


Health

Thailand Pilot – Health Care Decision Support Leptospirosis



- Mahasarakham Province, Thailand
- Piloting web-based geospatial capability for sharing of disease epidemiology



Adapting to Possible Increases in Ambient Air Pollution

Air Pollution

Personal actions (Efficiency measures, switching time for electricity use, lawn mowers, barbeques, reduce vehicle use)

Building air filtration technology

Technological and policy measures at government and industry levels

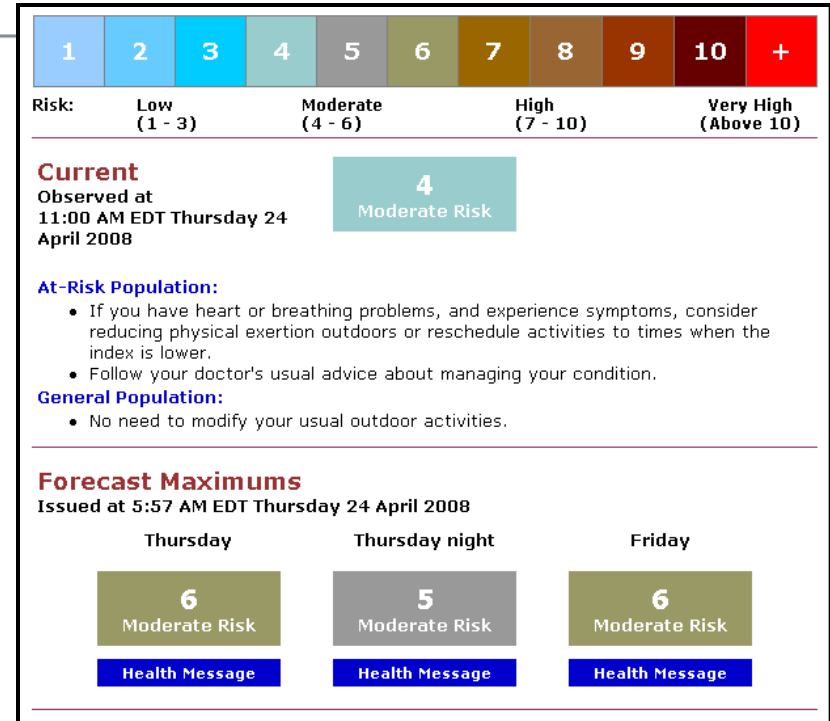
The new Air Quality Health Index

www.airhealth.ca

GIS real-time mapping. Britain uses air quality index and forecasts to plan hospital emergency room staff levels.



Source: Eddie Oldfield, New Brunswick Climate Change Hub

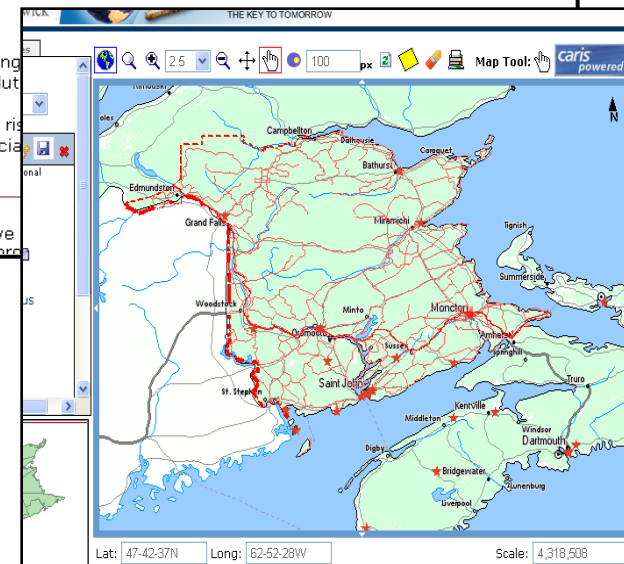


Who is at risk?

People with heart and lung most affected by air pollution

To find out if you are at risk, see the [health guide](#), your physician or [Public Health](#).

The AQHI is an initiative of the Environment Canada





Environmental

The Pika



- Native to cold climate areas in N. America, Asia and Europe
- American Pika at risk due to destruction of habitat / food sources suspected to be associated with climate change
- Research ongoing to measure and model potential habitat futures



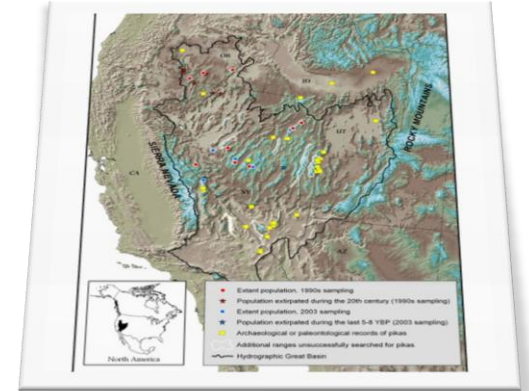
Source: sevenstar, [http://en.wikipedia.org/wiki/File:Ochotona princeps rockies.JPG](http://en.wikipedia.org/wiki/File:Ochotona_princeps_rockies.JPG)

Species Presence with Climate Change

Global Earth Observing System of Systems (GEOSS) Pilot - Phase 2

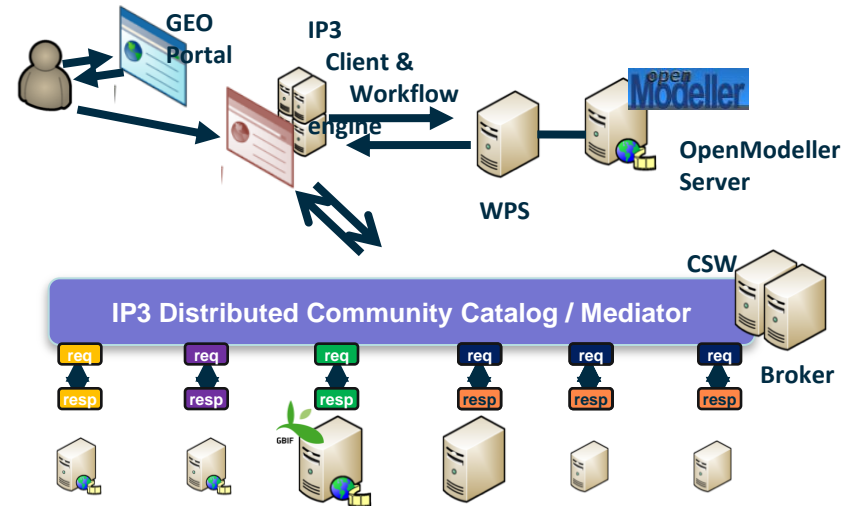


- Scientific research on distribution of pika
- Interoperability to determine valuable predictors for the impact of climate change on biodiversity
- Use observations of pika over the last 20 years, plus modeling systems, to model pika distributions and how they change with climate



Area of Interest

The US Great Basin region (1x1 km)



Biological Data Recording System

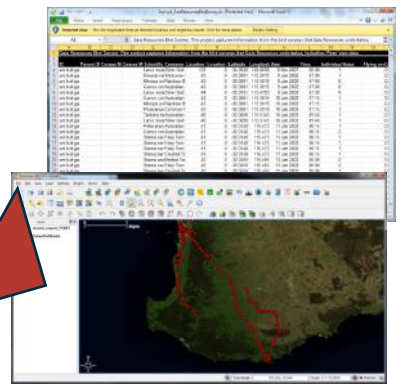
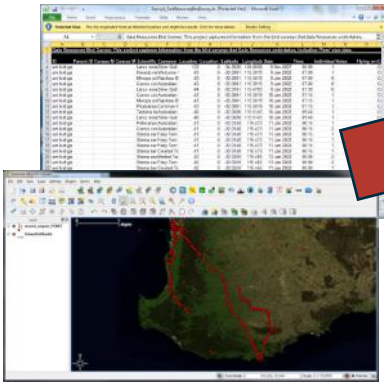
Mobile Apps



BDRS Server



Web Services



Bulk Data Loading

Exporting



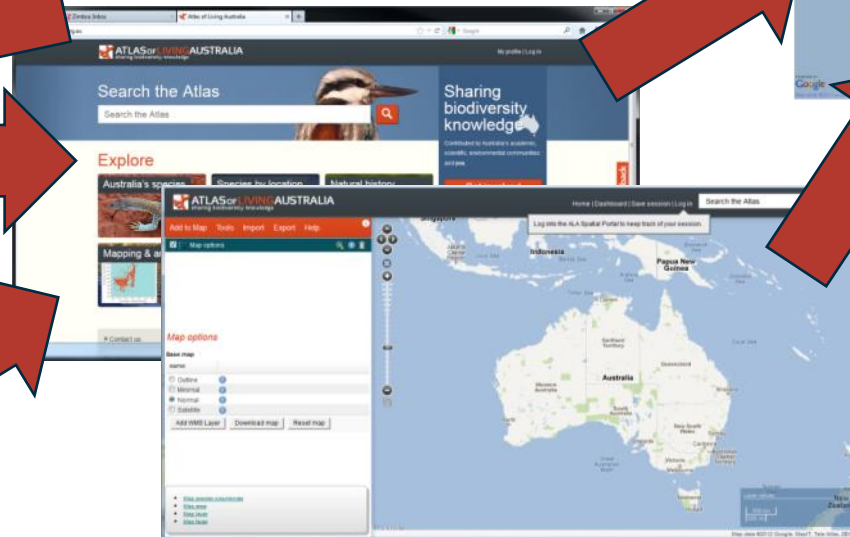
OGC SERVICES

Biological Data Recording System

Web Services

Atlas of Living Australia Aggregator

<http://www.ala.org.au/>



ALA Analysis

Spatial Data Infrastructure



- Underpins Sustainability:
 - Locational and temporal for reference / fusion
 - Based on foundational geospatial information, policies, standards
 - Authoritative providers (e.g. government agencies, commercial providers)
- The examples in this presentation leverage established SDIs, and use OGC standards to maximize geospatial sharing and integration for improved decision making



Sustainability and Spatial Data Infrastructure



- The pursuit of sustainability will benefit from continued expansion of SDIs to:
 - Assure integration of a growing and diverse universe of spatially relevant information
 - Include real time information from sensors and the growing Internet of Things
 - Further facilitate the processing, modeling and analysis of information
 - Embrace new technologies and practices – be agile!

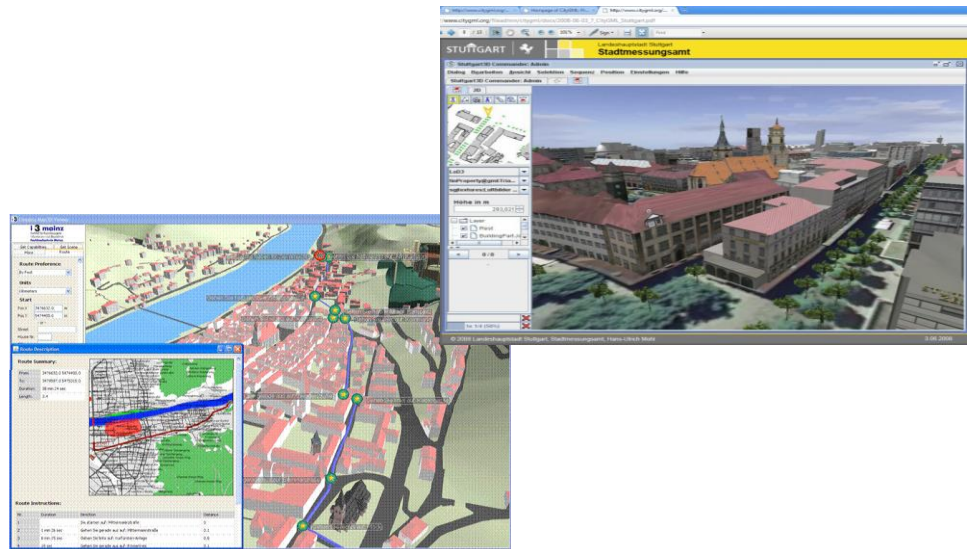


Source: Alison Dunlop, <http://www.alison-dunlop.com>

The OGC Mission

- To serve as a global forum for the **development, promotion and harmonization of open and freely available geospatial standards ...**
- **And best practices....**

- OGC CityGML, 3D Urban Models:
 - Urban Planning
 - Emergency Mgt / Response
 - Transportation / Routing / Logistics
 - Indoor navigation
 - Retail Site analysis
 - Sustainable / Green Communities
 - City Services Management
 - Noise abatement
 - Telecommunications placement
 - Many other uses...



www.geographie.uni-bonn.de/karto

For More Information



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