16th International Surveyors' Congress, RISM, 19-20 June 2014

100+ years of serving society with relevant and reliable information from imagery

Jon Mills MRICS FCInstCES FHEA
ISPRS Treasurer, 2012-16

Professor of Geomatic Engineering
Head of School of Civil Engineering & Geosciences
Centre for Earth Systems Engineering Research
Newcastle University
United Kingdom

Greetings from ISPRS Council…

…and the entire ISPRS Community

Overview

- ISPRS
  - Mission and relevance
  - Challenges
  - Meeting the challenges
  - Collaboration
  - Remaining relevant

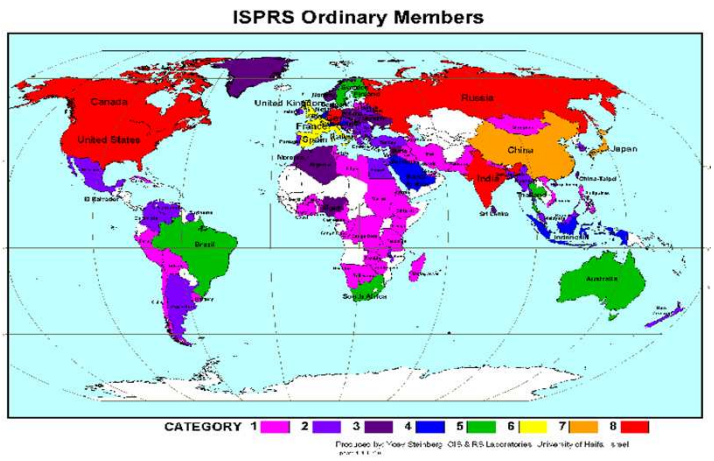
ISPRS

Mission and relevance

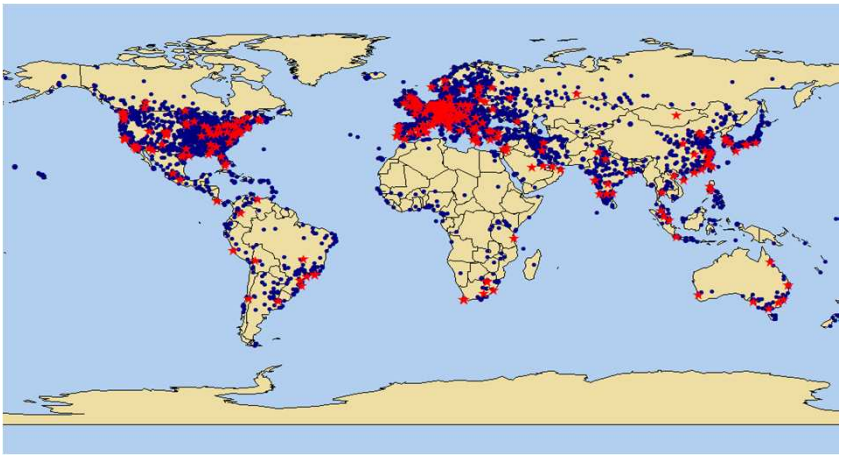
ISPRS is…

- …an international NGO with a focus on
  - **science and development** in
    - photogrammetry, remote sensing, spatial information
  - cooperation between **different stake holders**
    - academia, private industry, government, end users
  - truly **global** cooperation
    - **education**, technology transfer, capacity building

ISPRS
A global society of organisations



Visitors to ISPRS webpage



www.isprs.org

ISPRS mission: why we exist

- *… to advance the photogrammetry, remote sensing and spatial information sciences through international cooperation in research, development and education for the benefit of society and for environmental sustainability.*

(from ISPRS Strategic Plan 2010)

ISPRS: beyond photogrammetry

- Today, ISPRS activities include acquisition, modelling, analysis, database management and visualisation of geospatial data in different applications with a focus on imagery: **Information from Imagery**

Relevance of information from imagery

- **Sustainable development**
  - Urban and rural, mega cities, energy, …
- **Environmental monitoring**
  - Global warming, sea level rise, …
- **Disaster mapping and monitoring**
  - Wenchun Earthquake, China 2008, …
- **Autonomous driving and navigation**
  - Mobility, safety, …
- **Homeland security, …**

ISPRS activities

- Stimulate formation of national or regional Societies of Photogrammetry, Remote Sensing and Spatial Information Science
- Initiate and coordinate research in these areas
- Hold international Symposia and Congresses at regular intervals
- Ensure worldwide circulation of records of discussion and results of research by publication
- Promote cooperation and coordination with related international scientific organizations

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Challenges

Challenges: society, policy, industry

- **ICT development, internet time**
  - I want it **NOW**, 24/7
  - open source, open data, open standards
- **Need for global geospatial information**
  - rapid response to key global challenges
    - climate change, disaster management, peace and security, environmental quality, demographic change, migration, …
- **Changing roles of governments**
  - lean state: from producer to clearing house
  - relaxed resolution restrictions
  - consequences of financial crisis in many countries

Challenges: society, policy, industry

- **Changes in the commercial sector**
  - new big players: Google, Microsoft, Oracle, …
  - fusion of formerly independent companies
  - growing capability in GIS development and LBS
  - production in countries with low wages
- **Need for coordination** of GI management
  - among countries and commercial companies
  - between **countries and internat. organizations**
  - “spatial is not special any more”

Challenges: society, policy, industry

- **standardization**, **interoperability and sharing**
  - of data and services
  - by overcoming legal and institutional barriers
- **best practices** of geospatial information management
  - compilation and dissemination
- effective strategies for **capacity building**
  - for management of geospatial information
  - especially in developing countries

Challenges: research & development

- **better** sensors, **new** sensors, sens
  - nadir and oblique aerial im
  - ever improving re
  - image se
  - eye, ...)
  - exture projectors, ...
  - (in part for crowd sourcing)
  - ations, e. g. mobile mapping
  - iple cooperative sensors, geosensor networks
- **non-conventional** platforms: UAV, mobile mapping, ...

.. not to be forgotten:

terra or **petabytes of dump data** (pixels) per day

Challenges: research & development

- **full 3D**, needing data fusion, e.g. airborne + terrestrial
- **change** monitoring, database **update**, **prediction**
- **real-time processing** (navigation, driver assistance, traffic monitoring, safety and security applications, …)
- **distributed** processing (speed, integrity, scalability)
- crowd sourcing: new mechanisms for **trust and reliability**
- increased **automation** (a shear necessity)
- towards **consumer market** products (another necessity)
  - embedded photogrammetry
  - connection to CV, CG and game engines

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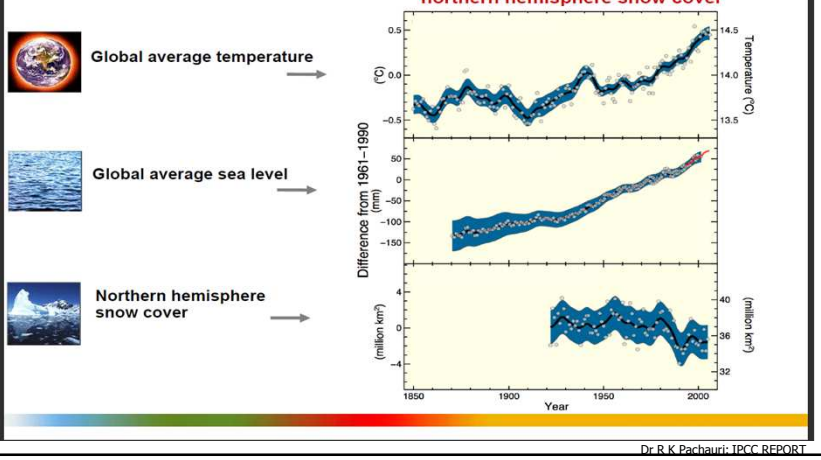
Meeting the challenges

Climate change

Direct observations of recent climate change

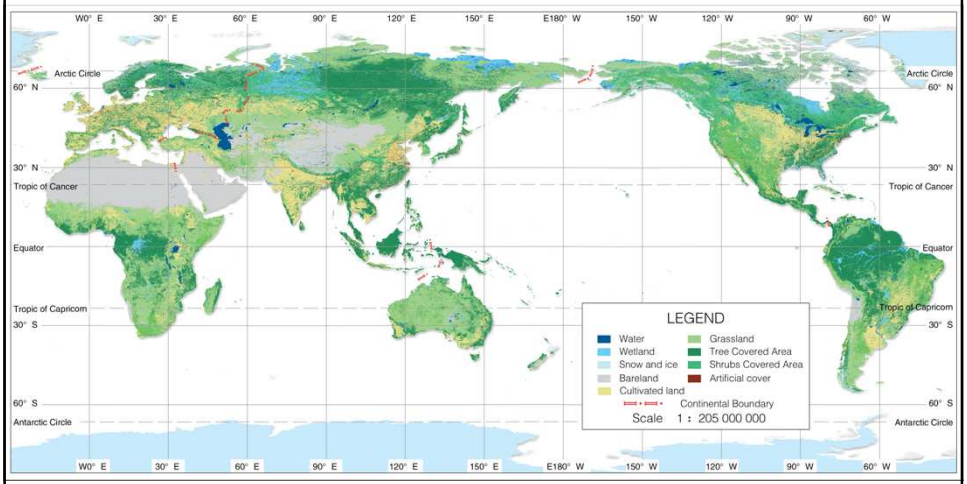
Changes in temperature, sea level and northern hemisphere snow cover



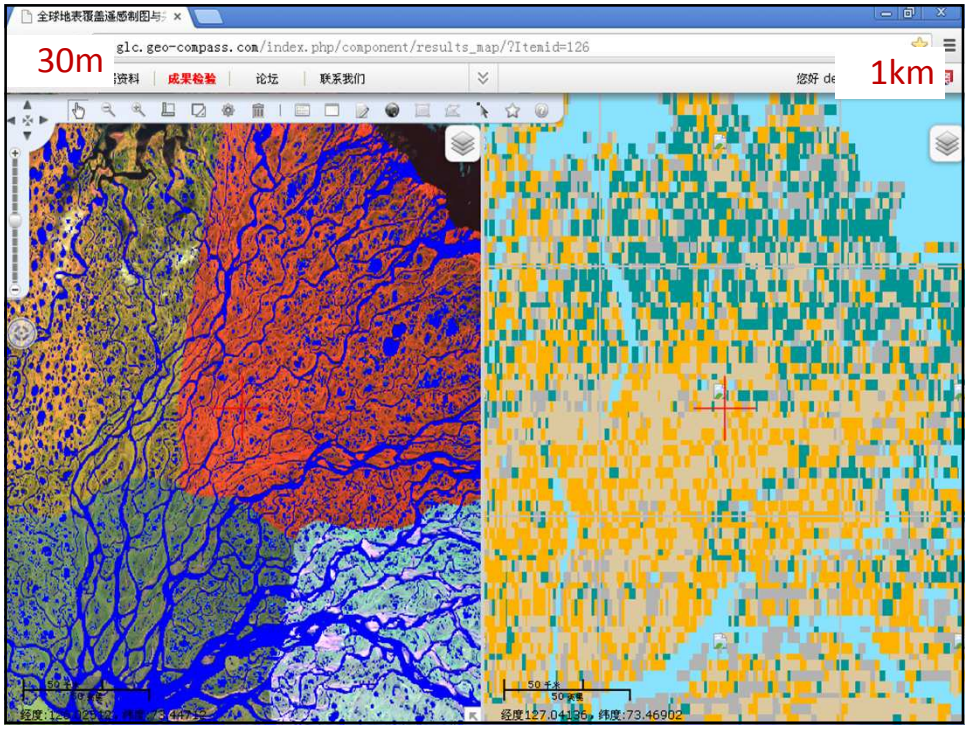
Dr R K Pachauri: IPCC REPORT

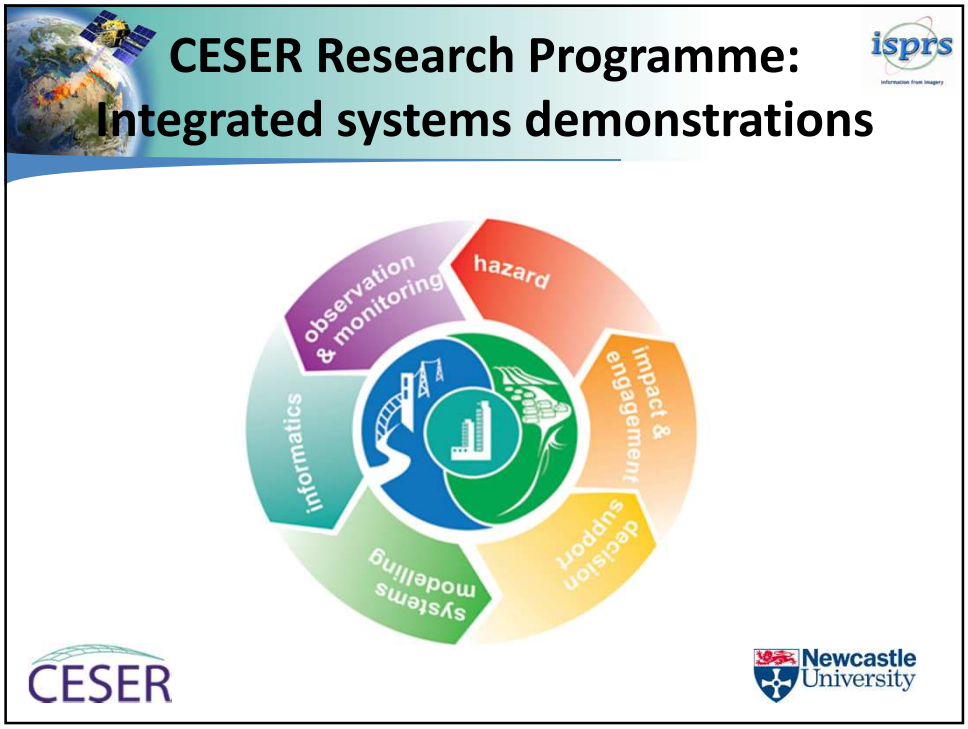
Global change

GlobalLand 30: 2010



National Geomatics Center of China


30m
glc.geo-compass.com/index.php/component/results_map/?Itemid=126
1km


CESER Research Programme:
Integrated systems demonstrations
isprs
observation & monitoring
hazard
impact & engagement
decision support
systems modelling
informatics
CESER
Newcastle University

Urban resilience

- Cities focal points of consumption and emissions:
  - 50% global population, ~80% global GHG emissions
- Cities concentrations of vulnerability to chronic climate stress and extremes:
  - Flooding, heat, air quality etc.
- Improved tools for urban design and adaption, both today and in the future

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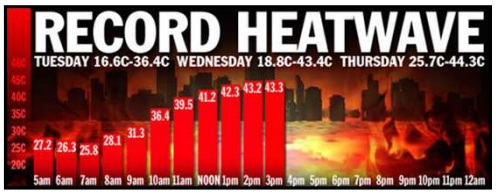
Urban resilience: heat



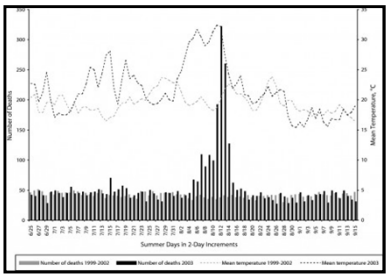
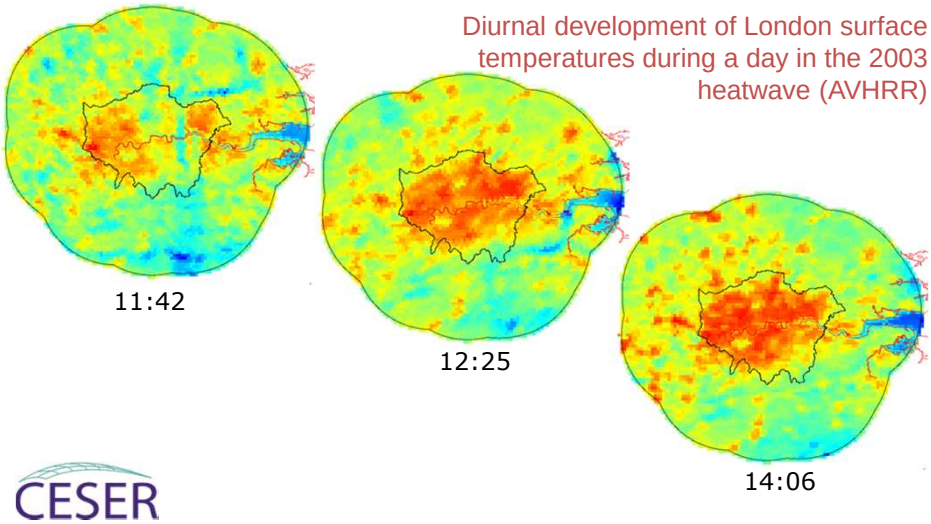


Table 1. Health costs in climate change-related case study areas, with costs per health effect, 2002 through 2009.

Climate Change-Related Case Study	Premature Death	Illness	Total Health Cost by Case Study
Ozone smog pollution	$6.3 Billion	$254 Million	$6.5 Billion
Heat wave	$5.2 Billion	$179 Million	$5.3 Billion
Hurricane	$1.1 Billion	$255 Million	$1.4 Billion
Wildfire	$545 Million	$34 Million	$578 Million
Mosquito-borne infectious disease	$190 Million	$18 Million	$207 Million
River flooding	$16 Million	$5 Million	$20 Million
Total costs (in U.S. dollars, 2008)	$13.3 Billion	$744 Million	$14.1 Billion

Daily urban temperature dynamics

Diurnal development of London surface temperatures during a day in the 2003 heatwave (AVHRR)



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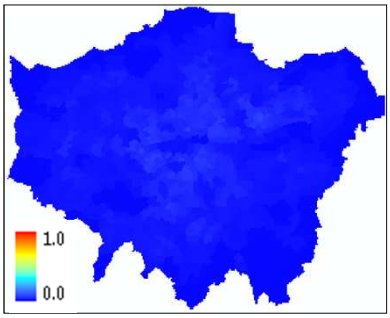
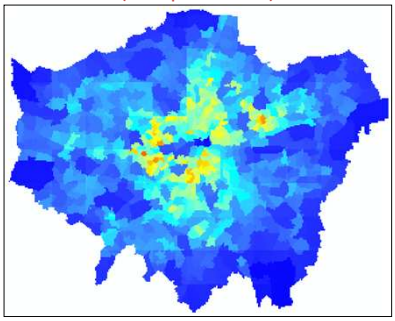
London future spatial heat risk

Heatwave Risk Control (1961-1990)



Heatwave Risk 2050s (90^{th} percentile)



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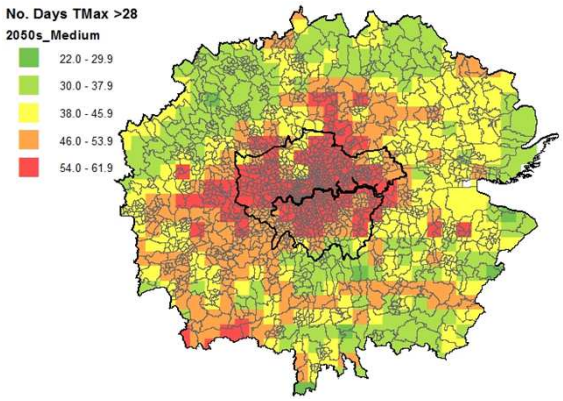
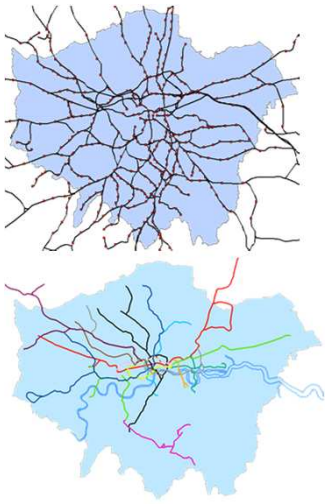
Transport disruption and economic risk





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Urban resilience: flooding

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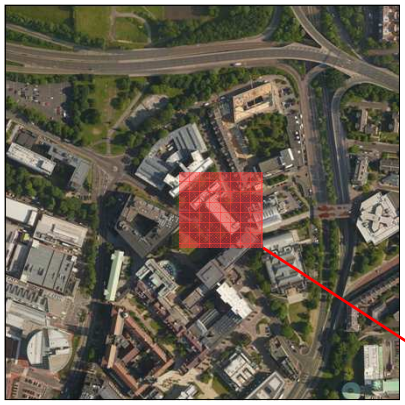
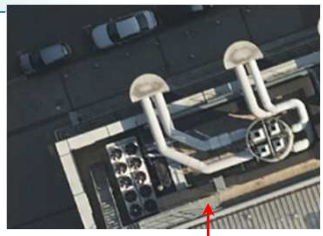
Airborne laser scanning data

Orthoimagery





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Mobile laser scanning

Panoramic imagery

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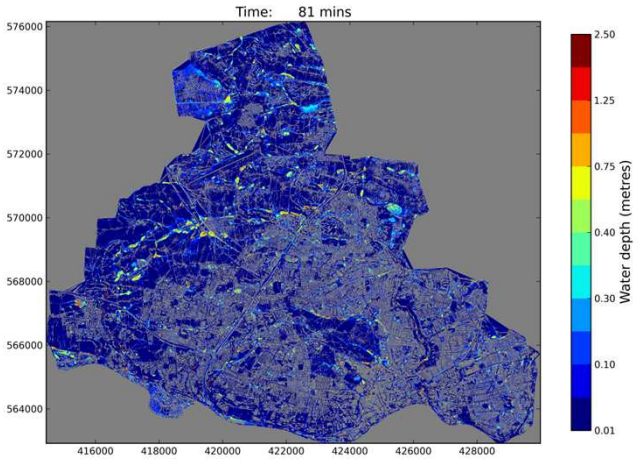
Combined mobile & airborne laser scanning

Flood modelling



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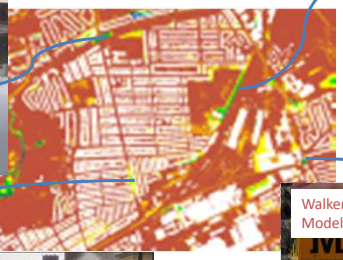
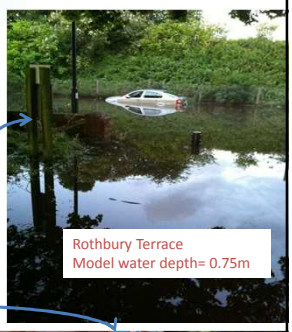
"Citizen science"

Crossing of Coast Road with Benton Road and Chillingham Road. Modelwater depth=1.45m



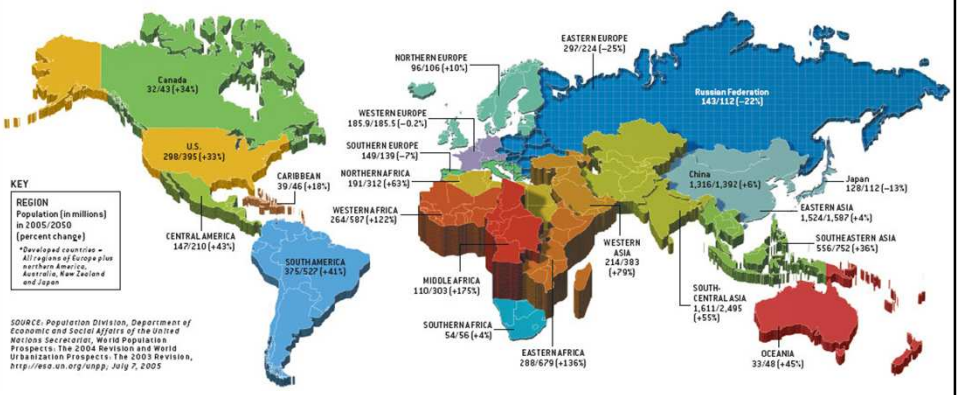


Rothbury Terrace
Model water depth= 0.75m

Walkergate
Model depth=1.36m

Chillingham Road
Model depth=0.45m

Future challenges: developing nations



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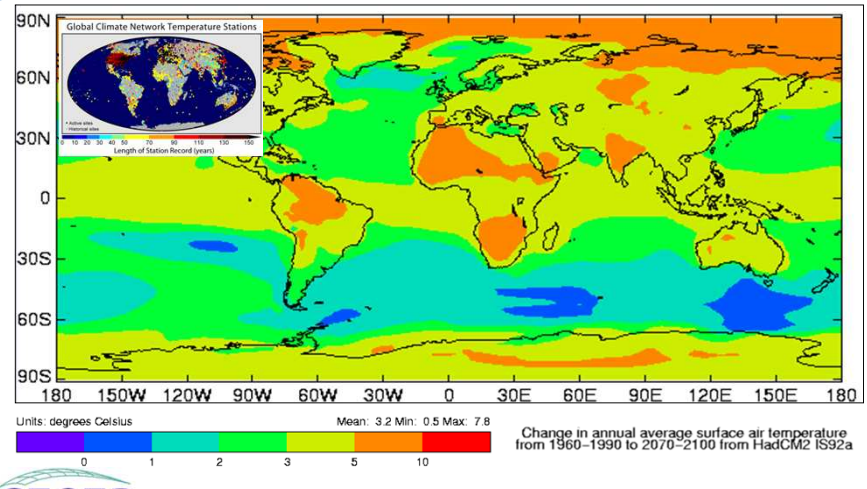
Future challenges: developing nations



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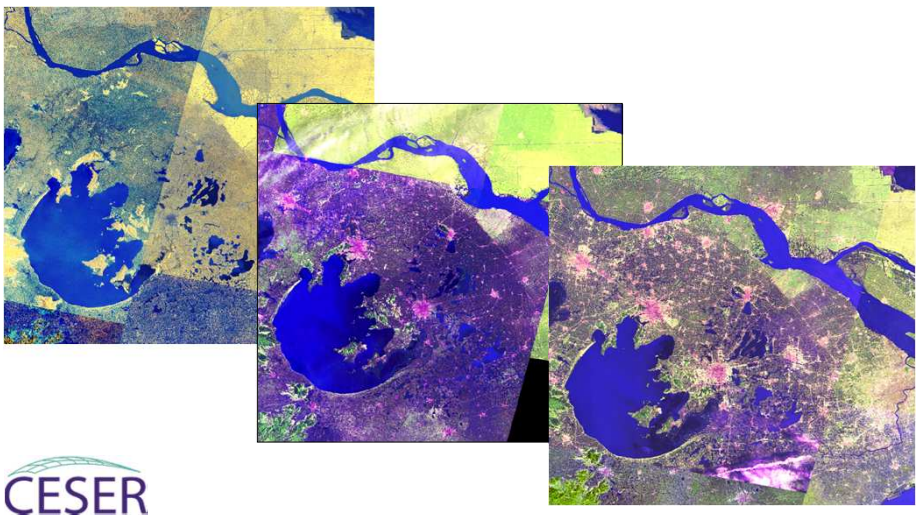
Future challenges: developing nations



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Collaboration

Collaboration is critical

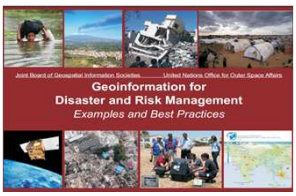
- JBGIS – The Joint Board of Geospatial Information Societies
  - GSDI, IEEE-GRSS, IAG, ICA, FIG, IGU, IHO, IMTA, ISPRS, ISCGM
  - … a coalition of leading international geospatial societies
  - … to represent GI societies at international level, in particular within United Nations

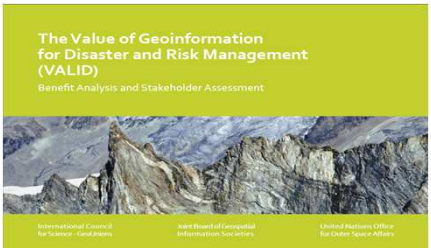
JBGIS
Joint Board of Geospatial Information Societies

Links to scientific umbrella organisations, UN bodies and other groups

- Memoranda of Understanding or close relations to
  - ICSU: International Council for Science
    - ICSU – GeoUNIONS
  - GEO: Group on Earth Observations
  - OGC: Open Geospatial Consortium
  - UN GGIM: Committee on Global Geospatial Information Management
  - UN OOSA: Office of Outer Space Affairs
  - COPUOS: Committee for Peaceful Uses of Outer Space
  - CEOS: Committee on Earth Observation Satellites
  - IAA: International Academy of Astronautics

Outreach and dissemination





UNITED NATIONS Office for Outer Space Affairs / UN-SPIDER

JBGIS Joint Board of Geospatial Information Societies

ISPRS

Remaining relevant

ISPRS vision: where we want to go

- *… to be the foremost scientific society in its field and for the Society at large,*
- *to speak for all people working in the field,*
- *to provide the necessary resources to develop the field.*

(from ISPRS Strategic Plan 2010)

Priorities for 2012 - 2016

- Strengthen scientific excellence on international level incl. facilitation of publication in high-ranked journals
- Enhance public recognition of photogrammetry, remote sensing and spatial information science for benefit of humankind and sustainability of environment
- Increase relevance to members
- Expand membership of ISPRS in areas where the society is underrepresented
- Increase cooperation with sister societies in overlapping areas
- Increase role in education and capacity building in collaboration with international partners

Individual membership

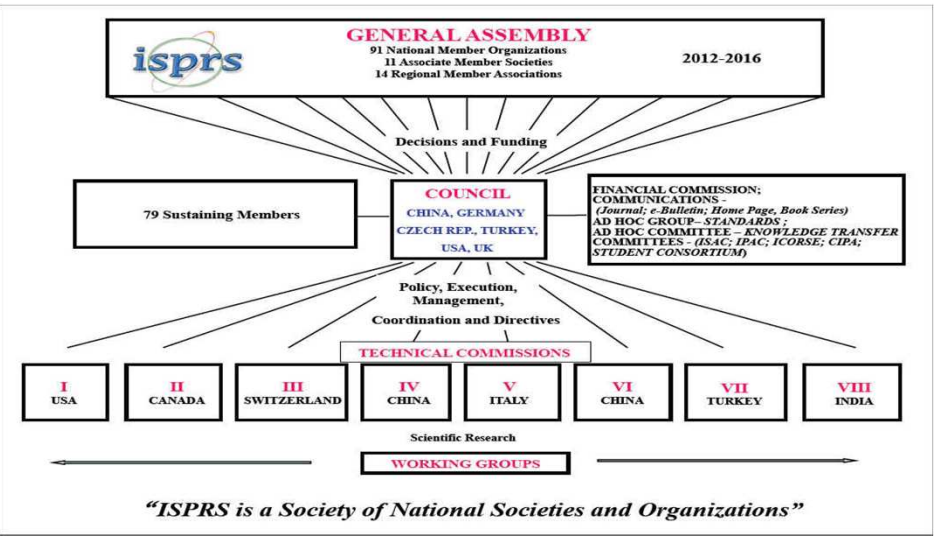
Application for ISPRS Individual Membership

Titel:	
First Name:	
Last (Familiy) Name:	
Gender	male
	preferably the employer's one
Address:	
Country:	Argentina
Phone:	
Employer:	
Type of Employer:	education

www.isprs.org/members/individuals/RegisterIndividuals.aspx

ISPRS publications: professional publishing of proceedings

ISPRS structure



8 Technical Commissions (2012 – 16)

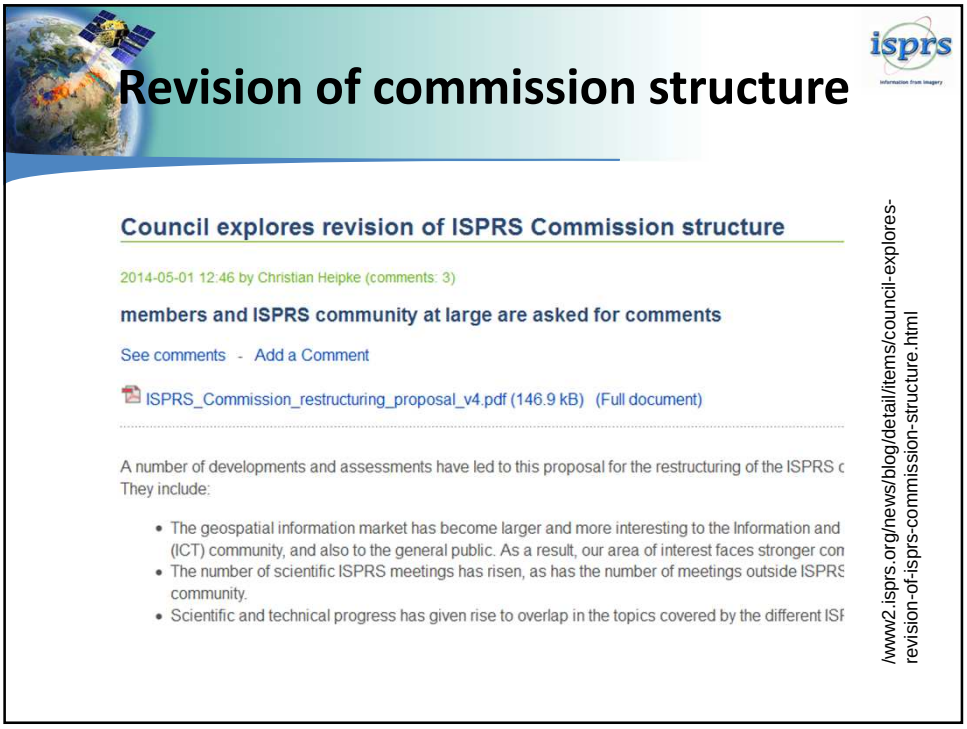
No.	Commission title	President
I	Sensors and platforms for remote sensing	Charles Toth (USA)
II	Theory and concepts of spatial information science	Songnian Li (CAN)
III	Photogrammetric computer vision and image analysis	Konrad Schindler (CH)
IV	Geospatial databases and location based services	Jie Jiang (China)
V	Close-range imaging, analysis and applications	Fabio Remondino (Italy)
VI	Education, technology transfer and capacity building	Jianya Gong (China)
VII	Thematic processing, modeling and analysis of remotely sensed data	Filiz Sunar (Turkey)
VIII	Remote sensing applications and policies	Vinay K. Dadhwal (India)

Ample cooperation within and across commissions

Recent developments

- Geoinformation market more interesting to ICT community and general public at large
  - stronger competition from other disciplines
- Number of relevant scientific meetings in ISPRS and beyond has risen
- Increasing overlap between TCs
  - in particular TC II+IV, TC III+V, TC VII+VIII
  - fragmentation, duplication of effort
- Interest in becoming WG officer, but less in TC

Revision of commission structure



Council explores revision of ISPRS Commission structure

2014-05-01 12:46 by Christian Heipke (comments: 3)

members and ISPRS community at large are asked for comments

See comments - Add a Comment

ISPRS_Commission_restructuring_proposal_v4.pdf (146.9 kB) (Full document)

A number of developments and assessments have led to this proposal for the restructuring of the ISPRS c
They include:

- The geospatial information market has become larger and more interesting to the Information and (ICT) community, and also to the general public. As a result, our area of interest faces stronger con
- The number of scientific ISPRS meetings has risen, as has the number of meetings outside ISPRS community.
- Scientific and technical progress has given rise to overlap in the topics covered by the different ISF

/www2.isprs.org/news/blog/detail/items/council-explores-revision-of-isprs-commission-structure.html

Aims of restructuring

- To **increase relevance** of ISPRS
- To **concentrate the efforts** on the most important issues and reduce existing lack of focus in some of our activities
- To **enhance the attractiveness** of hosting a TC for Ordinary Members and individuals acting as Technical Commission Presidents

To better position **ISPRS as a relevant, vibrant, forward-looking** organisation for 21st Century

A possible new structure

- 4 (larger) commissions
  - Earth Observation
  - Photogrammetry
  - Spatial Information Science
  - Policies, Education and Outreach
- A vice president for each commission
  - Preferably from a country different to the TCP
- ISPRS Geospatial Week, a combination of WS

ISPRS Geospatial Week 2015

Bundle of International Conferences

Montpellier (La Grande Motte) – France
28 September - 2 October 2015

ISPRS Midterm Symposia 2014

No.	Theme	Date	Location
I	Sensors and platforms for remote sensing	Nov. 17-20	Denver, US
II	Theory and concepts of spatial info. Science	Oct. 6-8	Toronto, CAN
III	Photogram. comp. vision a. image analysis	Sept. 5-7	Zürich, CH
IV	Geospatial DB and location based services	May 14-16	Suzhou, China
V	Close-range imaging, analysis and applications	Jun. 23-25	Riva del Garda,ITA
VI	Education, technology transfer and capacity building	May 19-21	Wuhan, China
VII	Thematic processing, modeling and analysis of remotely sensed data	Sept. 30-Oct. 2	Istanbul, TUR
VIII	Remote sensing applications and policies	Dec. 9-12	Hyderabad, IND

XXIII ISPRS Congress, Prague 2016

From human history to the future with spatial information

July 12-19, 2016

Due date for abstract submission **Autumn 2015**

http://www.isprs2016-prague.com



ISPRS…

…104 years of serving society with information from imagery…

…and still going strong

isprs information from imagery

Acknowledgements

- Contributions kindly received from:
  - ISPRS Council
    - Orhan Altan, Chen Jun, Lena Halounova, Christian Heipke, Marguerite Madden
  - Colleagues at Newcastle University
    - Stuart Barr, Richard Dawson, Pauline Miller
    - Centre for Earth Systems Engineering (CESER)
    - www.ncl.ac.uk/ceser
  - Funding bodies

NERC SCIENCE OF THE ENVIRONMENT

EPSRC Engineering and Physical Sciences Research Council