

**Plenary Session 3 – Future of the SDI / Surveying Communities
Keynote presentation**

**Photogrammetry and Remote Sensing in SDIs and Preventing
Environmental Catastrophes**

**Prof. Dr. Ian DOWMAN,
President of the International Society of Photogrammetry and Remote Sensing (ISPRS)**



SUMMARY

Techniques for imaging the surface of the Earth have developed enormously over the past 20 years; not only have sensors on satellites become numerous, and the data become widely accessible, but other sensors such as LiDAR and Radar have developed to an extent that they are now used as additional tools alongside aerial imaging sensors: both photographic and digital. There have also been important political developments which have seen the importance of Earth Observation recognised and supported by government. The allied disciplines of GNSS and GIS have also grown in importance and political recognition, thus providing the infrastructure for the distribution and application of image data, and other data recorded from satellites.

This presentation will first outline the technical and social developments which have taken place and show how they have enabled the acquisition and distribution of data, and how this has been recognised by government to serve the needs of society, particularly in the areas of prediction, mitigation and response to hazards and disasters. A key point in this development was the World Summit on Sustainable Development (WSSD), held in Johannesburg in 2003. It was resolved to “Promote the development and wider use of earth observation technologies, including satellite remote sensing, global mapping and geographical information systems, to collect quality data on environmental impacts, land use and land-use changes,”. This has been followed up by the United Nations, The International Council of Science (ICSU), The Committee on Earth Observation Satellites (CEOS) and by government through the establishment of initiatives for the benefit of mankind, and particularly in Africa.

The establishment of the intergovernmental Group on Earth Observation (GEO) particularly emphasises the importance to society of Earth Observation. Recent disasters such as the SE Asian tsunami have also concentrated minds on preventing disasters.

The presentation will examine international structures to distribute data and will look at examples of how such data has been applied, and how IGOs and governments are developing the capability to monitor potentially disastrous natural and human activity, and to respond. It will also look at the technical developments which make it possible to implement such policies. The most important primary resource is data from satellite borne sensors; this is particularly the case in developing areas such as Africa because of the difficulties of mounting airborne surveys. High resolution optical sensors such as Ikonos and Quickbird can deliver high quality image data in quick time; digital elevation models are already available from the Shuttle Radar Topography Mission (SRTM) and optical missions such as SPOT HRS and ALOS Prism are and will collect data specifically for DEM generation with the help of navigation devices which reduce the need for ground control points. Other sensors, such as the Disaster Monitoring Constellation (DMC), sensors such as MODIS and MERIS with a lower resolution, can monitor events which affect the environment such as fire, flood, desertification and the spread of disease. In the future 'sensor webs' will be established which will allow the detection of events by such satellites to automatically trigger surveillance by higher resolution sensors. A key factor in using the data is its distribution in a timely manner and the ability of the user to handle and process data on the ground. The internet makes this possible, but a serious bottleneck is the speed of data transfer in many parts of the world and the availability of suitable hardware in developing countries. These developments will be illustrated by examples of recent activities.

Finally the presentation will ask how organisations such as FIG and ISPRS can play a part in these developments. Clearly helping with capacity building is a key role, but we should also look at how our scientific networks can be more efficiently deployed, and how such activity can be funded.

SHORT BIOGRAPHY

Ian Dowman is British and born 30th January 1942. He is currently the President of the International Society of Photogrammetry and Remote Sensing (ISPRS) and Professor of Photogrammetry and Remote Sensing at the University College of London (UCL).

Qualifications & membership – Professional & scientific bodies

- 1963 BSc in Geography, University College London
- 1964 Diploma in Photogrammetry, University College London
- 1970 Associate - Royal Institution of Chartered Surveyors (ARICS)
- 1981 PhD, University of London
- 1986 Fellow – Royal Institution of Chartered Surveyors (FRICS)

Awards & honorary positions

1992	Schermerhorn Award – International Society of Photogrammetry and Remote Sensing
1989	President's Medalist - Photogrammetric Society
1993-2001	Chair, CEOS Working Group Calibration/Validation sub group on Terrain Mapping
1995-1997	President, Photogrammetric Society
2000-2004	Secretary General, International Society for Photogrammetry and Remote Sensing (ISPRS)
2004-	President ISPRS

Career details

1964-1967	Photogrammetrist, Hydroelectric Commission of Tasmania, Australia
1967-1969	Technical Manager, Mapmakers, Sydney, Australia
1969-1970	Lecturer, Bedford College, University of London
1970-1983	Lecturer, University College London
1975-1976	Visiting Lecturer, University of New Brunswick, Canada
1983-1991	Reader in Photogrammetry and Remote Sensing, University College London
1991-present	Professor of Photogrammetry and Remote Sensing, University College London
1997-1999	Dean of Engineering, University College London

Relevant research and professional activities

Ian Dowman has worked as a photogrammetrist for 40 years in the field of applying photogrammetric techniques to a wide range of image sensors for surface and feature extraction. He has developed geometric models for accurate 3D modelling from SPOT data, and for a range of subsequent sensors, including RADAR and LIDAR systems. He has been a principal investigator for SPOT, ERS, JERS and RADASAT. In recent years the main thrust has been in the generation of digital elevation models and features from high resolution sensors and in using such techniques for the automation of registration of images to other images and to maps. He has been the project manager for the EU 4th Framework ARCHANGEL project for registration and change detection and has also carried out numerous research projects for Ordnance Survey, DERA and UK industry in the areas of feature extraction from imagery. He recently won a Joint Research Equipment Infrastructure grant from EPSRC worth £419K for equipment for 3D image measuring, processing and presentation, in collaboration with LH Systems and Laserscan. Current research focuses on use of LiDAR and IfSAR data, particularly with high resolution image data, and on the use of DEMs for geotectonic studies. Ian Dowman has been awarded the President's Medal of the Photogrammetric Society in recognition of his contributions to advancement of Photogrammetry. From 1996-2000 he was the President of ISPRS Technical Commission II, 2000-2004 he was Secretary General and is now President of ISPRS. From 1996 to 1998 he was Dean of Engineering at UCL.

CONTACTS

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