



Intersociety Activities



Committee on Earth Observation Satellites (CEOS)

CEOS was created in 1984, in response to a recommendation from a Panel of Experts on Remote Sensing from Space, under the aegis of the Economic Summit of Industrialised Nations Working Group on Growth, Technology and Employment. This group recognised the multi-disciplinary nature of satellite Earth observation and the value of co-ordinating international mission plans. CEOS has since established a broad framework for co-ordination across all civil space-borne Earth observation missions. Its objectives are:

- to optimise benefits of space-borne Earth observations through the co-operation of its participants in mission planning and in the development of compatible data products, formats, services, applications and policies;
- to serve as a focal point for international co-ordination of space-related Earth observation activities;
- to exchange policy and technical information to encourage complementarity and compatibility of observation and data exchange systems.

CEOS Members are governmental organisations that have civil space-borne Earth observation programs which are currently operating. Associates, of which ISPRS is one, are governmental organisations that have either a civil space-segment activity under development or are international scientific non-governmental bodies having significant programmatic activities which support CEOS objectives.

The objectives of CEOS and ISPRS are quite compatible and their activities are synergistic. CEOS has two active Working Groups, both of which are very active, and receive significant funding from their sponsoring organisations to undertake their tasks.

The WG on Calibration and Validation (WGCV) addresses sensor specific calibration/validation and geophysical parameter/derived products validation. It is chaired by Dr. Alan Belward (JRC, Ispra) who is also ISPRS WGI/1 Co-Chairperson. Similarly, Prof. Ian Downman, ISPRS Commission II President is Chairperson of the WGCV Terrain Mapping Subgroup. This working group in its report recognised the importance of traceability and errors budgets in earth observation systems, and believes that members should demonstrate and confirm claimed accuracies of sensors and data analyses by independent or auditor review. This issue will be followed up by the WG in the

future and clearly should also an issue of concern for ISPRS WGs.

The WG on Information Systems and Services (WGISS) aims to facilitate data and information management and services for users and data providers by addressing Earth observation data capture, description, processing, access, retrieval, utilisation, maintenance, and interoperability. The WGISS Chairperson has been Dr. Takashi Moriyama (EORC/NASDA, Tokyo) who is also ISPRS WG I/5 Chairperson, but he has now been replaced by Peter Churchill from EC/JRC. The working group is very active and has recently developed GOIN (Global Observation Information Network), GLOBE (Global Land One-Kilometre Base Elevation) DEM, and CII (CEOS Information infrastructure) on CEOS information resources.

A major objective of CEOS is the development of an Integrated Global Observing Strategy (IGOS) to support the scientific, operational and research communities. Ultimately, an IGOS should be a joint product of all groups involved in the collection and analysis of both space-based and in-situ data. It is working to realise a comprehensive strategy for global observations through a partnership with the Global Climate, Global Ocean and Global Terrestrial Observing Systems, their inter-governmental sponsors; IGFA for Global Change Research, IGBP, WCRP and others.

A standing CEOS Secretariat is maintained by ESA, NASA/NOAA, and STA/NASDA and is chaired by the current CEOS host organisation. The host organisation changes annually and supports the annual CEOS Plenary which is held in November each year. During 1999 the CEOS host was the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) under the Chairmanship of Chairmanship of Dr. Tillmann Mohr, EUMETSAT Director. At the 13th Plenary, was held in Stockholm, Sweden in November 1999. A number of recommendations were passed by the Plenary which define the future activities of CEOS.

In 2000 will host CEOS under the Mr Marcio Barbosa from the Insitute of Space Research (INPE), Brazil. Readers are encouraged to visit the CEOS Home Page at: <http://www.ceos.org> for further information.

UN - Committee for the Peaceful Uses of Outer Space (COPUOS)

ISPRS has participated in the following activities:

Spin-off Benefits Conference in USA, April 1999

ISPRS organised the UN Spin-Off Benefits of Space Technology in Tampa, Florida, USA in association with the American Society for Photogrammetry and Remote Sensing (ASPRS). The UN expressed its appreciation for role ISPRS played in facilitating this meeting. Comments from participants stated that the deepness of subjects discussed in that conference showed an evident progress in relation with the first such conference. It provided developing countries with knowledge about the importance of investing in space applications programs, in order to take advantage of its benefits to improve peoples' living conditions. The support of ASPRS was also acknowledged.

UNISPACE III Conference in Vienna, July 1999

From 19-31 July 1999, The Office of Outer Space Affairs was held the 3rd major space applications conference, UNISPACE III in Vienna Austria. ISPRS participated in this conference by mounting an exhibition in the large space exhibit, and by its sponsorship or co-sponsorship of three of the 30 technical sessions in UNISPACE III Conference. They are as follows:

- A seminar "Environment and Remote Sensing for Sustainable Development" in co-operation with NASA
- A workshop on Remote Sensing for the Detection, Monitoring and Mitigation of Natural Disasters" in co-operation with EARSeL
- ISPRS workshop on "Resource Mapping from Space"

The proceedings of the conference will be available as a volume in the International Archives of Photogrammetry and Remote Sensing, through RICS Books at:

RICS Books Surveyor Court
Westwood Way
Coventry CV4 8JE
United Kingdom
Fax: +44-171-334-3800

"International Co-operation and Technology Transfer" Conference in Cotonou, Benin

The need to co-ordinate education in Remote Sensing, Photogrammetry and Geomatics in general has been recognised in a number of expert meetings in Africa. In response, a meeting was jointly organised by ISPRS working group VI/3, "International Co-operation and Technology Transfer", the Regional ISPRS member, AARSE (African Association for Remote Sensing of the Environment) and CENATEL, and the Benin Centre National de Teledetection et de Surveillance du Couvert

Forestier. The meeting was generously sponsored by the UN Office for Outer Space Affairs and by the Ministry of Rural Development, Benin. The theme and title of the meeting was "Promoting Space Technology Transfer and Geomatics Education in Africa" and was jointly chaired by Vincent Mama, Director of CENATEL and AARSE delegate for Benin and Profesor Heinz R  ther, ISPRS Treasurer, who is the ISPRS Council member responsible for ISPRS activities in Africa.

Some 120 delegates from 19, primarily African, countries, attended the opening session, a number which did not significantly change for all subsequent technical sessions. Besides the individual delegates, there were representatives from four International/regional organisations, four education centres, 10 application centres and nine Universities.

The symposium was officially opened by a senior representative of the Ministry of Rural Development. Keynote addresses were presented by Dr. Adigun Abiodun and Professor R  ther. Dr. Abiodun, recently retired from OOSA, is one of the most prominent experts in Africa and his very open and critical key note address reflected his deep insight into the African Remote Sensing scenario. Dr Abiodun reported on the numerous Remote Sensing initiatives in Africa, both in applications and in education, often associated with substantial funding. Although many of these have been successful, there are still many countries and sub-regions with a significant lack of Remote Sensing activities and a desperate need for training and education. Dr. Abiodun also drew attention to the fact that of the original six tracking stations in Africa only Hartebeesthoek near Johannesburg is fully active. The address was one of the highlights of the symposium.

The conference recommended that:

- A follow-up symposium on Space Technology Transfer and Geomatics Education in Africa is held in the year 2001 in an African country initiated by the organisers of the Cotonou symposium, involving a round table discussion of the four stakeholders: end-users, educators, decision makers and donors, regarding the technology transfer and education issues affecting the continent.
- The European Union (EU) through its Fifth Framework (INCO) should consider more active support of inter-African collaboration in research, education and consultancy in Geomatics and Geoinformation Technology with emphasis on South-South links in addition to and in conjunction with existing

CIPA (International Committee for Architectural Photogrammetry) – The ICOMOS & ISPRS Committee on the Documentation of the Cultural Heritage

By Peter Waldhäusl, Austria, President of CIPA

CIPA is no longer only an international group of experts discussing the application of photogrammetry in architecture and archaeology. It will in future be a more practical group, working for and with conservationists for a much wider area of interests. This is expressed by its new tagline title: “**The ICOMOS & ISPRS Committee for the Documentation of Cultural Heritage**”. Photogrammetry is just one of the means for Documentation, and Building Surveying; GPS and geophysical prospecting and GIS are examples of others. Databases, Heritage Information Systems, Image Archives have become central tasks. Photography, or – more general – imaging will be treated as a more central subjects. Rules, standards, guidelines will be developed according to the needs and in the language of the users. All possible technology, including terrestrial and aerial photogrammetry and remote sensing, will be applied for the monitoring of: the mobile and immobile cultural heritage; archaeological sites and finds, on land and under water; cultural landscapes, national parks and historical gardens; museum objects of art, as well as of natural objects; for change detection and change analysis in time; including planning for measures for protecting and developing the cultural heritage for millennia, rather than for only the next generation. The extension to immobile objects asks for close links to ICOM, the International Council of Museums, in order to avoid duplication of efforts. All of the above made an update of the statutes mandatory. The new Statutes were designed from 1997 to 1999 and discussed with and approved by the two parent societies, ICOMOS and ISPRS. CIPA thanks ICOMOS Vice-President Ann Webster Smith and the ISPRS Council Members President Larry Fritz, Secretary General Prof. John Trinder and Prof. Heinz Ruether for valuable contributions. The new statutes have been in force since 1.8.1999 and can be found in CIPA's internet web site at <http://cipa.uibk.ac.at>

CIPA consists now of 4 Boards:

- The **Executive Board** (the former “Committee”) with 12 Ordinary and up to 10 Associate Members from around the world;
- The **Expert Advisory Board** consisting of 3 Co-ordinators and 20 Chairpersons of the now 10 Expert Groups, 8 Working Groups and 2 Task Groups.
- The **Advisory Board of Delegates**, which are the *National Delegates* – two from each member country, one from ISPRS, one of ICOMOS – and the *ICOMOS Committee Delegates and ISPRS Commission Delegates*. This is a consulting Board directly linking

CIPA with the member organisations of the parent societies, whereas in the internet based Expert Advisory Board all interested experts of the world may converse freely co-operatively and competitively. By the end of 1998 CIPA had 10 National Delegates, by end of 1999 there were 30, and 15 more have been nominated.

All Member Societies of ISPRS and all National ICOMOS and ICOM Committees are kindly requested to nominate their Delegates! Please see the “Call for Delegates” in the internet! (<http://cipa.uibk.ac.at>)

- The fourth Board will be the **Board of Sustaining Members** assisting and furthering the aims of CIPA.

Summarising, CIPA is no longer a Committee of Europeans but a worldwide organisation open to hundreds who recognise Documentation of the Cultural Heritage of mankind with up-to-date technology as a basic task for its protection and development.

CIPA in the Internet

The activities of CIPA's Internet Communication Officer Klaus Hanke, Innsbruck, Austria, are most appreciated. The web pages of CIPA (<http://cipa.uibk.ac.at/>) are kept permanently up-to-date. Many new highly didactic examples are shown or linked to, providing a growing text and source of valuable and useful information. The web-page is one of the links for communication with CIPA. The reader is kindly requested to recommend its use.

Symposia and Workshops

Many CIPA members visited the **International Geodetic Week in Obergurgl**, Austria, 21-27 February 1999, and the **ISPRS Symposium in Thessaloniki**, Greece, July, 1999.

The most important event for CIPA was the **CIPA Symposium in Recife, Brazil, Oct 3-6, 1999**. A total of 107 abstracts were reviewed by CIPA's Expert Advisory Board, and 40 were finally received as oral and 25 as poster presentations. 108 specialists took part in spite of the long distance travel to Recife in the North/East of Brazil. CIPA thanks the Symposium Directors Prof. Camillo José Martins Gomes, President of the Brazilian Society of Cartography, Suzanna Sampaio, President of ICOMOS Brazil and Vice-President of the ICOMOS Advisory Committee, and Prof. José Jorge de Seixas, Technical University Recife, and all who helped in organising such an event.

The proceedings are available on CD-ROM and will soon be available in a printed version. A new CIPA series will be started. This is necessary for better distribution in the ICOMOS world. Nevertheless it will remain a part of the ISPRS Archives. The costs will be about \$US 25 for the CDROM and about twice as much for the printed version, plus mailing costs. Orders may be sent to icomos@cicrp.jussieu.fr (Ms. Gaia Jungeblodt), the ICOMOS Office in Paris.

The ten best posters of the Recife Symposium received "Best Poster Awards" and were shown in a well visited exhibition at the ICOMOS General Assembly in Mexico.

Annual Meeting of CIPA Oct 1-2 and 8 1999

Before and after the Symposium the CIPA Executive Board met for its Annual Meeting, the first one based on the new statutes. The main decisions are: six more months are required for the internal regulations and for setting up the infra structure. Thereafter, the substantial work will be within and for the Working Groups. The next Annual Meeting will be organised after the ISPRS Congress in Amsterdam.

Changes in the Executive Board of CIPA

- Secretary General *Edel Lundemo*, Norway, asked for replacement due to personal reasons. CIPA thanks her for her valuable and always constructive contributions. *Edel Lundemo* will continue as Norwegian National Delegate.
- Prof. Dr. *Jozef Jachimski*, Poland, was elected as new CIPA Secretary General. He is an experienced CIPA Ordinary Member since 1992, Member of ICOMOS Poland and President of the Polish Society of Photogrammetry and Remote Sensing. CIPA congratulates Prof. Jachimski for his election.
- *Antonio Almagro*, ICOMOS Spain, has completed his 3rd term and will be replaced by a new member
- ICCROM's Director -General will no longer be on the CIPA Committee as Society Delegate of ICOMOS,
- *Antonio Cheli*, ISPRS Argentina, is no longer a CIPA ordinary member after the maximum of 12 years service, but remains connected as CIPA Expert.
- *Antonio Almagro* will remain as Working Group chairperson, National Delegate of Spain and as Associate

Member responsible for Arab Architecture.

CIPA thanks its outgoing members for their long lasting good services.

New Ordinary Members have been proposed and approved by the parent societies:

- Prof. Dr. Pierre Grussenmeyer, Strasbourg, ISPRS and ICOMOS France,
- Prof. Dr. Heinz Ruether, ISPRS South Africa,
- Steve Nickerson, ICOMOS Canada.

CIPA cordially welcomes its new Ordinary Members.

Further proposals are due by spring 2000, when the Executive Committee of ICOMOS will nominate a new Society Delegate and when the three free ICOMOS seats shall be filled. It is the general policy of CIPA to select experts to its Executive Board who have previously shown interest and activity towards the mission of CIPA. CIPA is still looking for more participation by experts from Asia, Africa and South America.

CIPA Outreach Workshop in Porto de Galinhas, Brazil, 7-8 October 1999

CIPA has arranged a Workshop with International Participation and the Executive Board to discuss the future plans of CIPA's Working Groups in more detail. The result will be published in the internet. (<http://cipa.uibk.ac.at>)

General Assembly of ICOMOS, Mexico City and Guadalajara, 16-24 October 1999

The President of CIPA and the CIPA Associate Member Blaine Cliver, USA, took part at the General Assembly of ICOMOS.

Ing. Gen. *Maurice Carbonnell*, Honorary President of CIPA, St. Mandé, France, has been awarded the *Honorary Membership of ICOMOS* for his valuable contributions to ICOMOS, for the foundation of CIPA 30 years ago and for his 18 years of CIPA Presidency. CIPA congratulates cordially!

The General Assembly passed the following resolution 25 formulated by the ICOMOS Resolution Committee: "The General Assembly encourages the activities of CIPA on all levels of use of photogrammetric documentation and registration techniques". CIPA shall always feel free to contact all ICOMOS, ICOM and UNESCO sub-organisations

International Society of Biomechanics (ISB)

In 1999 there was no specific event of particular relevance to ISPRS to report on. However, it is of interest to note the upcoming Sixth International Symposium on the 3-D Analysis of Human Movement, Cape Town, South Africa, 1-4 May 2000. This is organised by the Technical Group "3-D Analysis of Human Movement" of the ISB and takes place every two years in a different place.

It might be also worthwhile to contact the Conference

Announcements of the ISB under <http://isb.ri.ccf.org/>. Among other facts of interest this home page gives details about the next upcoming ISB Congress 8-13 July 2001 in Zürich.

Armin Grün
Institut für Geodäsie und Photogrammetrie ETH-Zürich
ETH-Hönggerberg
CH-8093 Zürich
Switzerland

ISO/ TC 211 Geographic Information Standards

By Norman C. Andersen

The ISO (International Organisation for Standardisation) is a worldwide federation of national standards bodies, comprising of 118 members (85 Member Bodies, 24 Corresponding Members and, 9 Subscribing Members), one from each country.

The primary work product of TC 211 is the development of an International standard, ISO 191XX – Geographic Information. The purpose of ISO 191XX is to provide standardisation in the field of digital geographic information that is to establish a structured set of standards for information concerning objects or phenomena that are directly or indirectly associated with a location relative to the Earth. TC211 has 24 + identified work items, each expected to result in an international standard.

The Technical committee is managed by the Norwegian Technology Standards Institute, and is structured into five groups as follows:

- Framework and Reference Model - Reference Model, Overview, Conceptual Schema Language, Terminology, Conformance and Testing
- Geospatial Data Models and Operators - Spatial/Temporal subschema, Spatial operators, Rules for application schema
- Geospatial Data Administration - Cataloguing, Geodetic reference system, Indirect reference system, Quality, Quality evaluation procedures, Metadata
- Geospatial Services Positioning services, Portrayal of geographic information, Services, Encoding
- Profiles and Functional Standards – Profiles

Status of Standards

The current status of on-going work can be reviewed at the web site provided below under the Programme of work icon.

Proposals for New Work Items

The following proposals will be voted on at the March 2000 plenary in South Africa:

- Resolution 108 Simple feature access – SQL option
- ISO/TC 211 N834 Geographic information – Profile – FACC Data Dictionary
- ISO/TC 211 N835 Geographic information – Functional standards – Technical amendment
- ISO/TC 211 N386 Geographic information – Geodetic codes and parameters

ISO/TC211 and Liaison Organisations/committees

ISO/TC 211 currently has liaison relationships with the following organisations:

- CEO, Center for Earth Observation of the European Committee
- DWIWG, Digital Geographic Information Working Group
- EPSG, European Petroleum Survey Group

- FIG, International Federation of Surveyors
- IAG, International Association of Geodesy
- ICA, International Cartographic Association
- IHB, International Hydrographic Bureau (IHO – International Hydrographic Organisation)
- ISPRS, International Society for Photogrammetry and Remote Sensing
- OGC, Open GIS Consortium, Incorporated
- PCGIAP, The Permanent Committee on GIS Infrastructure for Asia and the Pacific
- UN ECE, Statistical Division
- ISCGM, International Steering Committee for Global Mapping
- ISO/IEC JTC 1/SC 2 Coded character sets
- ISO/IEC JTC 1/SC 24 Computer graphics and image processing
- ISO/IEC/JTC 1/SC 32 Data management and interchange
- ISO/TC 20/SC 13 Aircraft and space vehicles/Space data and information transfer systems
- ISO/TC 23/SC 19 Tractors and machinery for agriculture and forestry/Agriculture electronics
- ISO/TC 46/WG 2 Information and documentation/Coding of country names and related entities
- ISO/TC 82 Mining
- ISO/TC 184/SC 4 Industrial automation systems and integration/Industrial data
- ISO/TC 204 Transport Information and Control systems
- ISO/TC 204/WG 3 TICS Database Technology
- CEN/TC 287 Geographic Information

ISO/TC 211 is currently reviewing the following organisations for liaison status with the committee:

- CEOS/WGISS, The Committee on Earth Observation Satellites, Working Group on Information Systems and Services
- ISO/IEC JTC 1/SC35 User Interfaces
- WMO, World Meteorological Organisation

Web Site

For more information pertaining to ISO/TC 211 please visit our World Wide Web-server at the following URL address: <http://www.statkart.no/isotc211/>

Calendar of Upcoming Plenaries

Meeting	Time	Place
ISO/TC211	10th 2000-03-09/10	South Africa
ISO/TC211	11th 2000-09-28/29	USA
ISO/TC211	12th 2001-03/04	Portugal

Norman C. Andersen, Senior Staff Engineer in Lockheed Martin - Management and Data Systems (M&DS), Washington, USA, E-mail: norman.c.andersen@lmco.com

ICSU

The 26th General Assembly of the International Council of Science (ICSU) was held in Cairo, Egypt from 27 – 30 September 1999. The meeting was generously hosted by the Egyptian Academy of Scientific Research and Technology. ISPRS is an Associate of ICSU, and has applied for full membership. However, the assessment of the application for membership has been delayed and hence was not considered at this meeting. Its consideration will be delayed until the next plenary meeting in 2002.

The meeting commenced with a Symposium on 'Sciences and Food' on Monday 27 September, a Symposium on 'Science in Egypt' on Tuesday 28 September, followed by a number of fora on such topics as 'Issues Related to Scientific Data and Information', 'Food Security', 'Bioinformatics' and 'Natural Disasters Reduction'. ISPRS clearly has an interest in the last of these. The meeting was attended by the President, Lawrence Fritz and Secretary General John Trinder.

ICSU is the peak international scientific body, comprising National Scientific Members, International Scientific Unions and Associates. The Plenary meeting of ICSU is a large formal meeting comprising representatives of all Unions and Associate Members. It had an extensive agenda, which included amongst other matters, the following:

Reports

Amongst other matters, the 'Scientific Agenda – Framework for Action' adopted at the World Conference of Science in Budapest in June 1999, was adopted.

Progress of the ICSU Major Programs

- IGBP (International Geosphere Biosphere Program)
- START
- IHDP (International Human Developments Program)
- DIVERSITAS

Recommendations of Its Policy Committees

- Finance, including large grants to members
- Freedom in the Conduct of Science
- Responsibility and Ethics in Science
- Membership, Structure and Statutes

Reports and Proposals of Its Advisory Committees

- Science and technology in developing countries
- Environment

Common Concerns and Services

- Capacity building in science
- Data and information

Co-operation with Partner Organisations

Recommendations

IGBP research currently focuses on six key questions that are addressed by eight Core Projects:

- How is the chemistry of the global atmosphere regulated and what is the role of biological processes in producing and consuming trace gases?
- How will global changes affect terrestrial ecosystems? This project in particular features Land-Use and Land-Cover Change (LUCC) jointly with the International Human Dimensions Programme (IHDP) on Global Environmental Change.
- How does vegetation interact with physical processes of the hydrological cycle?
- How will changes in land-use, sea level and climate alter coastal ecosystems, and what are the wider consequences?
- How do ocean bio-geochemical processes influence and respond to climate change?
- What significant climate and environmental changes have occurred in the past and what were their causes?
- The integration of IGBP Core Projects is assisted by three cross-cutting Framework Activities:
 - IGBP Data and Information System (IGBP-DIS)
 - Global Analysis, Interpretation and Modelling (GAIM)
 - Global Change System for Analysis, Research and Training (START), addressing regional research initiatives and needs, jointly with the IHDP and WCRP.

ISPRS's primary interests in ICSU are in issues of the environment. It is the view of the Council that ISPRS can play a significant role in the provision of, and interpretation of remotely sensing data about the earth and its environment. Hence, a number of ISPRS working groups have in their terms of reference, a requirement to co-operate with such bodies as IGBP and its components. The development of inter-disciplinary research groups which include experts in remote sensing from ISPRS, as well as experts in the appropriate aspects of the environmental sciences, are essential for fulfilling the roles of relevant ICSU major programs. It is for this reason that ISPRS is fully committed to becoming a full member of ICSU, so that it can play a more active role in the application of its skills in environmental monitoring and assessment.



Open GIS Consortium

*By Lance McKee, Vice President, Corporate Communications
and Public Sector Programs, Open GIS Consortium, Inc.*

In this article we review progress made in 1999 by the Open GIS Consortium, Inc. (OGC), progress that is significant for everyone involved in the global geodata and geoprocessing industry and for billions of other people whose lives will be improved through integration of geospatial information with the global information infrastructure. 200 corporations, government agencies, non-governmental organisations, and universities now work in OGC, collaboratively developing open interfaces that integrate geographic information systems (GIS), Earth imaging, digital cartography, facilities management, navigation, surveying, and other spatial technologies so that users will have unimpeded network-based access to heterogeneous geodata and geoprocessing resources.

European SIG

More than half of OGC's member organisations are based outside the US, and about a third are based in Europe. Early in 1999, a European Special Interest Group (E-SIG) of the OGC Management Committee was formed to develop approaches relating to European member issues that have significance for the OpenGIS architecture, and to stimulate the further growth of the European GI market. Any member of OGC that has a European business address is eligible for SIG membership, as well as any Principal members of the OGC with an interest in European issues.

Grid Coverages and Catalogue Services Specifications

In August, OGC announced at the end of its meetings at the UK Ordnance Survey in Southampton, England, that its members had reached consensus on two new open interfaces: the OpenGIS Grid Coverages Specification and the OpenGIS Distributed Catalogue Services Specification. In OGC, 'Grid Coverages' refers to rectangular arrays of values such as satellite images and digital aerial photos, digital elevation data, and other kinds of data represented in a grid co-ordinate system in which individual cells in the grid can be addressed. 'Catalogue Services' refers to a common architecture for online automated directories of geodata and geoprocessing services (rather like 'spatial search engines').

Work done in OGC to develop the Grid Coverages specification, the Catalogue Services specification, the earlier 'Simple Features' specification (referring to 'vector' geodata, digital map information represented in polygons, points and lines), and a Co-ordinate Transformation Services document contributed significantly to the most important OGC activity of 1999, the Web Mapping Testbed.

Web Mapping Testbed

The Web Mapping Testbed (now called 'WMT Phase 1')

began April, 1999 and ended August, 1999. This work resulted in a draft OpenGIS Web Map Server Interface Specification which provides a set of open protocols that make it possible for users of ordinary web browsers to simultaneously obtain map layers from multiple distributed servers. What is remarkable is that each layer conforms to the same requested projection, so the layers automatically overlay, each providing a different 'view' into the same geographic region. This technology provides users with a powerful tool to integrate data held by different web servers. Moreover, map servers can be from different vendors, and they can vary widely in terms of processing capabilities and data type (including multiple vector and raster types).

The three protocols in the OpenGIS Web Map Server Interface Specification are relatively simple, and it is not difficult in most cases to add them to data servers. GetCapabilities provides information about what a server can do. GetMap fetches map images from data stores in specified projections (which might be georeferenced images such as JPEG and PNG), and GetFeatureInfo provides a mechanism that allows users to query map displays to get attributes of specific geographic features in a map layer. In Phase 2, the scope of the Web Mapping Interface will be extended to include simple display graphics (such as SVG or WebCGM), and the serving up of simple feature structures. A technology that may be used for the latter functionality is GML. GML is a method for encoding OpenGIS Simple Features (basic vector-based geographic data) in XML. XSLT 'stylesheets' can then be used to render this 'smart data' in application-specific ways. The GML draft document will be submitted to W3C as a Note. On December 13, 1999, OGC issued Requests for Comment on the pending OpenGIS Web Map Server Interface Specification and OpenGIS Geography Markup Language (GML) Specification. The OpenGIS Technical Document 99-077 titled, 'Web Map Server Interface Specification' was submitted by BBN Technologies (Cambridge MA), Cadcorp Ltd. (UK), CubeWerx Inc. (Canada), Ionic Software s.a. (Belgium), Laser-Scan Ltd. (UK), SICAD Geomatics GmbH & Co. oHG. (Germany), Social Change Online Pty Ltd. (Australia), and the US Army Engineer Research and Development Center (Alexandria, VA). The OpenGIS Technical Document 99-082r1 titled 'Geography Markup Language (GML)' was submitted by Galdos Systems, Inc. (Canada), Oracle Corp. (Redwood Shores, CA), MapInfo Corp. (Troy, NY), Compuconsult, Ltd (Canada), and CubeWerx (Canada). (The comment period has ended, but both documents can be seen at <http://www.opengis.org/techno/request.htm>.)

The OpenGIS Web Map Server Interface Specifications are likely to be formally adopted (as a single specification)

at the OGC Technical Committee and Management Committee meetings to be held in Vancouver, BC in February, 2000.

On September 10, 1999, members of OGC presented a live, on-line Web demonstration of this remarkable open interface to an executive government and industry audience near Washington, D.C. Mr. Thomas Kalil, Special Assistant to the President for Economic Policy, said to the high-level government and industry audience, 'Geospatial information is critical for disaster management, crime mapping, environmental monitoring, community decision-making, and a whole host of other public and private sector applications. The Web Mapping Testbed will greatly accelerate our ability to access and understand geospatial information from multiple sources'.

The Web Mapping Testbed is the first of OGC's planned Interoperability Initiatives, which involve sponsors and participants. Sponsors -- federal agencies, corporations, or other entities -- provide funding and a set of objectives related to geoprocessing interoperability. Participants -- mainly vendors and integrators -- are partially compensated for the contributions of time and technology they make during the fast-paced group effort to meet the sponsors' objectives. The Web Mapping Testbed will result in multiple pilot projects in which communities of people and organisations will use early implementations of interoperable geographic software.

Web Mapping Testbed sponsors included five US federal agencies and the Australian World Wide Web Mapping Consortium, a group of 24 Australian government and commercial organisations, led by the Australian Surveying and Land Information Group (AUSLIG).

Web Mapping Testbed participants included: Autodesk (US), BBN Technologies, a part of GTE (US), Blue Angel Technologies (US), Cadcorp (UK), Compusult (Canada), CubeWerx (Canada), ESRI (US), Galdos Systems (Canada), Geodan IT (Netherlands), Geomatics Canada (Canada), Hitachi (Japan), ILOG (France), Intergraph (US), Ionic Software (Belgium), Laser-Scan (UK), Litton/TASC (US), Lockheed-Martin (US), MapInfo (US), Microsoft (US), Massachusetts Institute of Technology (US), Mitsubishi Corporation (Japan), NTT Data (Japan), Object/FX (US), Oracle Corporation (US), Ordnance Survey (UK), PCI Geomatics (Canada), Penn State University (US), SICAD Geomatics (Germany), Social Change Online (Australia), Sun Microsystems (US), and Universal Systems (Canada).

The Web Mapping Testbed Phase 2 (WMT 2) will expand the range of interoperable web mapping services to meet a broader cross-section of community needs. In addition to creating new specifications, WMT 2 will result in more federal data coming on-line using WMT protocols, and it will lay a foundation for Pilot Projects that put local data on-line using WMT protocols in various US communities. One Web Mapping Pilot, targeting flood control and environmental management in the Upper Susquehanna and Lackawanna River region of Pennsylvania, is already underway.

WMT 2 objectives include:

- The finalisation and publishing of the first three OpenGIS Web Map Server Interface Protocols. WMT 2 provides an opportunity to test and agree upon minor improvements to GetFeatureInfo, GetMap, and GetCapabilities, approved by OGC in February, 2000.
- The provision of Legends and symbols. Every map needs a legend. Standard approaches to managing colors, symbols, and text in overlaid maps help make the overlays of data from distributed sources useful.
- The addition of authoring and publishing tools to empower everyone to place maps on the Web.
- The enhancement of GetMap so that it serves up simple features. WMT 1 focused mainly on raster (e.g. GIF) format transfers. WMT 2 will provide more support for transporting vector feature data (either in graphical or geographical form in XML-based packaging) to enable smart applications.
- The tight integration of Web Mapping with Catalogue Services. Especially, giving users tools to cope with very large libraries of imagery and spatial information.
- Increased emphasis to make federal agency servers available via WMT protocols - WMT protocol Tool Kits - 'How to' implement protocols on map servers.
- Coverage Data Access - Extend vector feature data access capability to imagery and raster data - Get information at a specific point in the image (e.g., average temperature at a specific location).

The WMT 2 initiative is expected to run from May until November, 2000.

One pending Interoperability Initiative is the SCOTS JMTK (Standards-based Commercial Off-The-Shelf Joint Mapping Toolkit) Testbed. This is a multi-phase testbed that will begin in April, 2000 and run through June, 2001. The sole sponsor is the US DoD National Imagery and Mapping Agency (NIMA). The SCOTS JMTK Testbed seeks to nominate commercial application programming interfaces (APIs) to replace most or all of NIMA's JMTK APIs.

This will make it possible for multiple vendors to compete to provide different but interoperable elements of the toolkit.

Another planned Interoperability Initiative, 'Web Mapping Infrastructure,' will produce a distributed and rigorously maintained set of reference servers (and supporting databases), reference clients, and reference documents that support both Web Mapping Testbed and pilot activity.

And finally, 'opengis.net' is a planned extension of the Web Mapping Infrastructure portion of the Web Mapping Initiative. It will provide 'Reference Implementations,' working prototypes that are robust enough to serve as models which provide detailed templates for similar implementations. Opengis.net will provide test tools and a test environment to meet OGC testing requirements, a set of resources that developers can use to test and demonstrate software being developed in other Interoperability Initiatives. It will help show, in fine detail, how spatial capabilities can be merged with mainstream IT technologies.

US Federal Agencies Embrace OpenGIS Specifications

On January 28, 2000, an OpenGIS Day event was held at

the headquarters of the US Geological Survey in Reston, Virginia, USA. Chip Groat, Director of USGS, introduced the session, stating USGS's firm commitment to using commercial, standards-based, off-the-shelf software in the Survey's current Gateway to the Earth program. Gateway to the Earth is a major effort to make much of USGS's vast store of geographic, geological, hydrological, and biological information available to the public in an integrated, easy-to-use way via the Web. At OpenGIS Day, WMT sponsors described WMT1, and software vendors had an opportunity to describe their Year 2000 plans for OpenGIS conformant products.

OGC is increasingly seen by US Federal agencies to be an important resource in helping them stimulate the private sector to develop and sell standards-based commercial products that serve the agencies' needs. Today's in-agency and inter-agency geodata programs need Web-based geoprocessing interoperability, and OGC is the only organisation in the world organised to solve this set of problems. Participation by users from all sectors, industries and nations is a necessary part of the process, because the spectrum of interoperability requirements is broad.

Conclusions

OGC members' six year effort to build consensus in this complex area is finally yielding demonstrable results. Immediately after the February, 2000 OGC meeting, vendors are expected to begin marketing products that will be conformant with the OpenGIS Web Map Server Interface Specification, and the range of additional interoperable capabilities is predicted by OGC members to grow steadily once this foundation is in place. OGC continues to grow and continues to become more global in its membership. This is a very positive development from the standpoint of global dissemination of geoprocessing technologies and global commerce in geodata and geoprocessing services.

Open GIS Consortium, Inc.
35 Main Street
Wayland, MA 01778, USA
Tel: +1-508-655-5858
Fax: +1-508-655-2237
Web site: <http://www.opengis.org>
E-mail: lmckee@opengis.org

Symposium Report – Modern Information and GPS Technology – Aspects and Implications of Their Application

By Prof. Dr. Eng. G. Milev, Prof. Dr. H. Pelzer, Chairmen of the Organising Committee of the Symposium

The international symposium "Modern Information and GPS Technology - Aspects and Implications of Their Application", with an exhibition was held in Sofia on 11 and 12 November 1999. It was held in pursuance of the resolution of the international symposium 'Law of immobilities, dynamics of the development of the systems and land management', Sofia, 12-13 November 1998. This year, the symposium was organised by the International Federation of Surveyors (FIG), the International Society for Photogrammetry and Remote Sensing (ISPRS), the International Cartographic Association (ICA), the Union of Surveyors and Land Managers in Bulgaria (USLMB), the Geodetic Institute (GI), the University of Hannover (UH). Co-organisers on the Bulgarian part were the government and other institutions.

This symposium is a succession of the tradition established by the Union of Surveyors and Land Managers in Bulgaria to organise annually in Sofia an international symposium on particularly topical issues, approved by a relevant resolution of the preceding symposium. This symposium is the main one in its turn among the annual international symposia with exhibition, organised by USLMB so far under the auspices of, and with the sponsorship of, the three international surveying organisations: FIG, ISPRS, ICA and our local institutions.

The exceptional potentialities of GPS and the information technologies, respectively GIS compared to the classical methods, instruments, systems and technologies open great and in many aspects unexpected applications. This calls for a permanent information about the up-to-date state of these problems and trends of their development as well as their spreading, and in many respects interdisciplinary use.

The basic issues considered by the symposium were:

- Information and GPS Technology
- Development, capacity, requirements, specificity
- GPS
- Geo-information systems
- Challenges and implications of technology applications
- Technology Applications in Geodesy, Photogrammetry, Cartography, Cadastre, etc.
- Geodesy
- Photogrammetry
- Cartography
- Cadastre
- Other applications (engineering surveys, national survey control networks, education)

The wide range of issues to be considered by the symposium predetermined, to a great extent, the large number of papers applied for, and the relatively wide representation. Representatives from 12 countries - Austria, Germany, Greece, Italy, Macedonia, Syria, Slovenia, Turkey, the

Netherlands, Yugoslavia, and of course, Bulgaria, delivered presentations or participated in the symposium.

The papers which were applied for, and submitted, cover, to a great extent, the major issues put down for consideration. All the papers that were submitted in due time were included and printed in a volume of symposium papers that was handed over to the participants before the start of the symposium.

The symposium programme comprised 43 papers. Interesting discussions took place on a good part of the issues treated in particular papers.

The symposium was coupled with an exhibition of modern equipment, software, technologies, etc.

At the end, the symposium accepted the following resolutions of the international symposium 'Modern Information and GPS Technologies – Aspects and Implications of Their Application', Sofia, November 11 – 12, 1999.

Considering the big opportunities for multipurpose application of the geodetic, photogrammetric, cartographic and information technologies presented at the present symposium, as well as the particular importance of physical plan-

ning of the territory – urban and rural areas, spatial planning and development of urban territories, cadastre and land registration, management and protection of territories etc., the unresolved issues in this sphere, their importance and actuality, the symposium recommends that the next international symposium 'Application of Geodetic and Information Technologies in the Physical Planning of Territories' should take place in Sofia on November 9 and 10, 2000.

Having in mind the process of integration of East European countries in the European Union and the discussion carried out at the symposium, it recommends that an initiative committee should be established by representatives of the East European associations for geoinformation and the specialised unions and non government associations dealing with these issues, to assist the process of integration. The Czech association for geoinformatics should undertake the preparation of the activity of the committee. The corresponding body of the Central European Initiative (CEI) and the European Association for geoinformatics shall be informed about this.
