



Federal Geomatics Bulletin

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Digital Chart of the World

The United States Defense Mapping Agency (DMA), in cooperation with Australia, the United Kingdom and Canada, through the Department of National Defence, Directorate of Geographical Operations, has initiated a research project to establish a new Digital Chart of the World (DCW). Employing a topologically-based vector structure, the DCW will provide users with a digital representation of land surface information on CD-ROM disks for use with PCs. Coverage will be worldwide at the 1:1M scale, being derived largely from DMA's Operational Navigation Chart (ONC) series. Attribute information will reflect the levels of detail shown on the ONC. Software will both display the contents and allow users to use basic algorithms to build their own display and query capabilities.

Scheduled for completion in 1991, the DCW will be the forerunner of other digital data bases from DMA. A \$10M (US) contract has been let to ESRI of Redlands, California to produce DCW prototypes, the first of which is now being evaluated. For further information, please contact: Directorate of Geographical Operations (DGEO OPS), National Defence Headquarters, 101 Colonel By Drive, Ottawa, ON, K1A 0K2.

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Surveys, Mapping and
Remote Sensing Sector

National Digital Map Data Available



René Gareau, right, explains the use of a scanner for map digitization to EMR's Deputy Minister, Bruce Howe. Looking on are: J.H. O'Donnell, Assistant Deputy Minister, Surveys, Mapping and Remote Sensing Sector, EMR, François Faucher and Claude Marcoux.

The Topographical Mapping Division of the Canada Centre for Mapping (CCM) recently completed the digital recording of all 1:250 000 reconnaissance scale maps for all of Canada. The five year digitization project involved electronic scanning and interactive editing of information from the 917 maps in CCM's inventory. The digital map data, which is now available for limited purchase from EMR, may be used as the base for many GIS applications.

Work is currently underway on the digitization of the 1:50 000 scale maps, which provide greater detail in the more developed regions of Canada. In this regard, the Canada Centre for Geomatics (CCG), a division of CCM, recently produced its first data set from scanned 1:50 000 map sheets. This data set was presented to Mr. Bruce Howe, Deputy

Minister of EMR during his visit to the Centre in January, 1990. Mr. Howe was accompanied by Mr. Hugh O'Donnell, Assistant Deputy Minister of the Surveys, Mapping and Remote Sensing Sector.

John MacDougall, parliamentary secretary to Energy, Mines and Resources Minister Jake Epp stated: "Canadians are recognized as world leaders in digital mapping techniques. This accomplishment sets the stage for many new commercial opportunities and it has the ability to streamline planning by urban and environmental resource managers." For further information, please contact: Director General, Canada Centre for Mapping, Surveys, Mapping and Remote Sensing Sector, EMR, 615 Booth Street, Ottawa, ON, K1A 0E9.

IACG Activities

The IACG had several successful meetings since the summer break. The IACG steering committee met to approve funding for next fiscal year's activities. The tasks of the IACG Technical Sub-committees are progressing well. Reports outlining the Sub-committees' achievements during fiscal year 1989-90 are being prepared for March 1990 and summaries of these reports will be presented as technical papers at the Second National GIS Conference by the sub-committee chairpersons.

Technical Sub-Committee #1 on Data Models has a new acting chairman, from Statistics Canada. A new direction for the Committee was formulated during a meeting on November 7, 1989 and the Committee will focus on identifying and documenting the various data models used by selected IACG member agencies.

Technical Sub-Committee #2 on Data Communication is about to launch a study on the feasibility of a federal network.

Technical Sub-Committee #3 on Data Dissemination and Government Databases published three issues of the *Federal Geomatics Bulletin* in March, August and December, 1989 and the next bulletin should be available for distribution at the GIS conference in March, 1990.

Federal Geomatics Bulletin

This newsletter is intended as a vehicle for the communication of information on geomatics activities within the Canadian federal government. It is published several times a year under the auspices of the Inter-Agency Committee on Geomatics and is available without charge. Articles pertain to the methods, procedures and technology associated with systems for the collection, manipulation, display and dissemination of geographically-referenced digital data.

Submissions for Volume 2 No. 2, which should be submitted before **May 1, 1990**, are most welcome. Subscription requests, queries, comments or submissions may be sent to:

Federal Geomatics Bulletin
GIS Division, EMR
615 Booth Street
Ottawa, Ontario
K1A 0E9

In addition, this Committee has selected Roger Tomlinson Associates, of Ottawa as the winning bidder for a contract to identify, report and catalogue the existing geomatics data holdings in federal government agencies.

Technical Sub-Committee #4 on GIS Standards succeeded in initiating the major task of developing national standards under the auspices of the Canadian General Standards Board (CGSB). A National Committee was formed under the chairmanship of René Gareau, Director of the Canada Centre for Geomatics of EMR. The CGSB National Committee formed four working groups for the development of data exchange standards, a standard data model, feature classification standards and data cataloguing standards.

In addition, this Committee reviewed its mandate and has included two new tasks, namely:

- to act as the scientific authority for the IACG with the CGSB Committee on Geomatics;
- to promulgate national standards as they become available and to assist IACG member agencies in understanding, installing and using the new standards.

Technical Sub-Committee #5 is organizing the workshops' program for the Second National GIS Conference (a total of 7 workshops will be conducted) and the Committee will increasingly focus on dealing with questions relating to GIS education and training.

Technical Sub-Committee #6 is identifying the various projects involving data exchange between the various IACG member agencies, and is providing a forum for IACG members to discuss their GIS projects.

For further information on the IACG, please contact: IACG Technical Secretariat, GIS Division, EMR, 615 Booth Street, Ottawa, ON, K1A 0E9

GIS for the 1990s

The Canadian Institute of Surveying and Mapping (CISM) in cooperation with the Inter-Agency Committee on Geomatics and the Surveys, Mapping and Remote Sensing Sector, EMR, is presenting a wide and varied program for the second National Conference on Geographic Information Systems at the Ottawa Congress Centre, March 5-8, 1990.

As Jean Gauthier, Conference Chairman, stated, "With its vast

landmass and richness of natural resources, Canada is the logical gathering place for a discussion of state-of-the-art GIS technology At GIS for the 90s, the best minds in the industry will address topics ranging from GIS data sharing, technologies and current research, to the role of GIS in such important issues as sustainable development."

The program includes seven workshops on the first day of the conference. The workshop topics are as follows: GIS planning, GIS data structures, PC-based GIS, remote sensing in GIS, data exchange standards, GIS case studies and applications to agriculture. An industrial forum will allow exhibitors to present their latest products and services to the audience. The conference will be opened by The Honourable Jake Epp, Minister of Energy, Mines and Resources.

Numerous plenary sessions and concurrent sessions will address issues ranging from technology through applications to management issues. Technical tours of various organizations in the Ottawa area will be offered on the day following the conference.

For further information, please contact: CISM, PO Box 5378, Station F, Ottawa, ON, K2C 3J1.

Postal Code Conversion Files

Since 1978, Statistics Canada has been responsible for linking Canadian postal codes to Census geography, in the creation of the Postal Code Conversion File (PCCF). This file gained instant acceptance as a geo-referencing tool for area designation and analysis. Within a GIS environment, spatial and attribute data can easily be analyzed because the postal code is linked to representative point coordinates (in UTM and latitude-longitude), giving it spatial reference for computerized mapping applications. In addition, the PCCF has been used for routing and scheduling of trucks and buses, for site location analysis, survey sampling and direct database marketing.

The latest version of the PCCF links over 670 000 postal code records, valid as of January, 1989, for a total of 250 megabytes of data, to the standard geostatistical areas of the 1986 Census. In urban areas with a population over 50 000, covered by the Area Master File (AMF), each postal code is linked to the nearest centroid of a street block-face. In areas with less than 50 000 population, the linkage is to the enumeration area centroid.

Approximately 1500 new postal codes are created each month by Canada Post Corporation.

For further information on the PCCF, the AMF or other geomatics products available from Statistics Canada, please contact: Geography Information Services, Geography Division, Statistics Canada, Ottawa, ON, K1A 0T6.

New Videos Available

Three short videos related to developments in geomatics are now available. These include a GIS marketing video, a video on the Inland Waters, Coastal and Ocean Information Network (ICOIN), as well as one on the National Atlas Information Service.

The marketing video, called "Modern Mapping", was produced by the Surveys, Mapping and Remote Sensing Sector of EMR to encourage the use of GIS. The seven-minute video is available in both official languages. For further information, please contact Communications EMR, 580 Booth Street, Ottawa, ON, K1A 0E4.

The Canadian Hydrographic Service of the Department of Fisheries and Oceans has prepared a twelve-minute video on the ICOIN concept, which will consist of a national network of integrated digital and geographically-referenced data bases dealing with Canada's inland, coastal and oceanic waters. For further information, contact: Director, Planning and Development, Canadian Hydrographic Service, 615 Booth Street, Ottawa, ON, K1A 0E6.

The Geographical Services Division of the Canada Centre for Mapping has produced a video outlining the new National Atlas Information Service. For further information, contact: Director, Geographical Services Division, Canada Centre for Mapping, 615 Booth Street, Ottawa, ON, K1A 0E9.

Forestry GIS Conference

The fourth in an annual series of symposia on GIS in forestry and natural resources management is once again being held in Vancouver, British Columbia from March 13-16, 1990. GIS '90 is co-sponsored by Forestry Canada and Reid, Collins and Associates, a division of H.A. Simons Ltd., with funding provided under the Canada-British Columbia Forest

Resource Development Agreement.

The technical program comprises 24 concurrent sessions, five special interest group meetings, three hands-on tutorials, poster sessions, a trade exhibition and six pre-symposium workshops. The plenary sessions include "Forestry in the Age of Sustainable Development" and "Meeting the Challenges of Environmental Stewardship."

For further information, please contact: GIS '90 Symposium Office, 303 - 134 Abbott Street, Vancouver, BC, V6B 2K4.

Developments in Geomatics

- Tydac Technologies Inc. of Ottawa received the Silver Award for Innovation in the 1989 Canada Awards for Business Excellence. At the sixth annual awards ceremony, The Honourable Harvie André, Minister of Industry, Science and Technology, stated that "once again this year's winners demonstrate that Canadian businesses can outperform international competition in meeting the needs of the marketplace." Tydac won the award for its SPANS GIS, which performs the integration, analysis and modelling of spatial data.

- The Canadian Institute of Surveying and Mapping (CISM) recently published a special issue of the *CISM Journal ACSGC* on GIS. Ed Kennedy, President, Geomatics Industry Association of Canada and Guest Editor of the issue, stated that "the purpose of the GIS special issue is to communicate Canadian successes in the development and utilization of Geographic Information Systems (GIS) technology to current and potential users of the technology in Canada and abroad. A number of important Canadian success stories are featured, and highlights of activities in the public, private and academic sectors of the Canadian GIS industry are summarized." The issue contains over 300 pages on the state of GIS in Canada. For further information, please contact: CISM, Box 5378, Station F., Ottawa, ON, K2C 3J1.

- The Canadian Council on Surveying and Mapping, which held its 17th Annual Meeting in Halifax in September, 1989, has changed its

name to the Canadian Council on Geomatics.

The Council consists of representatives from federal, provincial and territorial surveying and mapping agencies. It provides a forum for the consideration of common issues and concerns, proposed legislation, current and future programs, achievements, organizational changes, new ideas and technology procedures, and the development of national geomatic standards. For further information, contact: The Secretary, Canadian Council on Geomatics, 615 Booth Street, Ottawa, ON, K1A 0E9.

- Energy, Mines and Resources (EMR) and the Natural Sciences and Engineering Research Council (NSERC) of Canada have entered into an agreement to fund additional university research in the fields of geological sciences, surveys, mapping and remote sensing, and mineral and energy technology.

This was one of a series of agreements between NSERC and federal government departments, and the additional NSERC funding will bring the total for this EMR/NSERC initiative to \$1.8 million in 1990. For further information, contact: The Director, Research Partnerships Program, NSERC, 200 Kent Street, Ottawa, ON, K1A 1H5.

- QUERY is a bilingual facility of the Canada Centre for Remote Sensing, which allows users to obtain information about satellite imagery held in the CCRS archives. QUERY maintains information on imagery from the following sensors: Landsat MSS and TM; SPOT MLA and PLA; as well as MOS MESSR.

The user can search for the desired imagery according to a variety of search criteria including geographic position, satellite path and row, acquisition time, sensor type, and orbit number. QUERY can be accessed through a dial-in connection to the central VAX system in Ottawa. For further information, please contact: User Liaison, CCRS, 2464 Sheffield Road, Ottawa, ON, K1A 0Y7.

Statistics Canada Collaborates with Other Federal Agencies on Environmental Activities

Efforts to report on the state of the environment have provided the major impetus to the development of a program on the environment and natural resources at Statistics Canada. The Federal State of Environment Reporting Program was formally initiated with the signing of a Memorandum of Understanding between Environment Canada and Statistics Canada in December 1986. Under this agreement, Environment Canada has taken the lead in coordinating a National State of the Environment Report due to be released in 1991, while Statistics Canada has been active in a number of statistical development and integration activities. Other departments have also joined the Federal Program.

A major element of the Statistics Canada Program has been the development of an Environmental Information System. This System facilitates access to Statistics Canada data for environmental purposes, and allows the integration of other environmental data series with Statistics Canada data for analysis. Geographically-detailed information from the Census of Population and Housing, the Census of Agriculture and manufacturers' surveys are available from the system. The system also contains a selection of

environmental information from other sources, as well as a number of geographic files including drainage basins and ecological units.

The Environment and Natural Resources Unit has also recently completed an inventory of federal government environmental data bases. This project focused on identifying statistical data sets useful for State of Environment Reporting. Collected in conjunction with Environment Canada, this information will serve as a valuable means of identifying data available for the preparation of national and regional reports. Plans are underway to make the information available to a broader group of environmental researchers.

There are a number of other elements in the Statistics Canada Program, including the preparation of a third edition of the environmental statistics handbook, **Human Activity and the Environment**, for 1991. Major research initiatives will examine the development of indicators of environmental state and change and the use of Statistics Canada instruments for the collection of new environmental data. For more information, contact the: Environment and Natural Resources Unit, Analytical Studies Branch, Statistics Canada, 24th Floor, R.H. Coats Building, Ottawa, Ontario K1A 0T6.

Geomatics Industry Association

The Geomatics Industry Association of Canada (GIAC) has just completed a very successful second year in its expansion plan. At a meeting of the GIAC Board of Directors in Montreal on November 8, 1989, applications from another 15 new member firms were approved, bringing the total membership to 62 companies. The Association experienced an unprecedented growth rate of over 50 percent in 1989. At the same Directors' meeting, the Board approved a motion to open membership in the Association to suppliers of geomatics hardware and software. In this way, GIAC will be able to represent all sectors of the geomatics industry in Canada.

The Association undertook a number of new initiatives in 1989, aimed at improving business opportunities for its member firms, and raising the profile of the geomatics industry. A Directory of Member Firms was published and widely distributed to major client groups, such as governments, the resource industry and utility groups. GIAC commissioned a study of market opportunities for Canadian industry in the United States, and will be sponsoring workshops to disseminate the results of this study in early 1990.

For further information, please contact: Geomatics Industry Association of Canada, 66 Queen Street, Suite 400, Ottawa, ON, K1P 5C6

National Atlas of Canada

Since 1906, the federal government has provided authoritative geographic information about the country through five editions of the The National Atlas of Canada. Now, the conventional Atlas program is evolving into a more responsive National Atlas Information Service (NAIS). Having been converted from a bound atlas format to a loose-leaf series, the 60 maps published in the 5th Edition were updated as required and were then reprinted. A common scale of 1:7.5M, along with consistent base components and designs, makes comparison of individual map themes possible.

In addition to the Atlas, the Service publishes maps in the International Map of the World (IMW) 1:1M scale series (74 sheets), at 1:2M (being updated currently in 7 provincial or regional sheets), and at scales as small as 1:30M. NAIS manages the National Toponymic Data Base, containing

some 485 000 Canadian place and feature names. For other federal departments without cartographic or geographic resources, NAIS also provides consultation, mapping and contract mapping services.

NAIS has digitized some of the maps in the 1:7M series and is currently digitizing the 1:2M series. The data is clean and topologically consistent, but does not yet carry any attribute information. Elements are separated into individual files and registered together.

Both cartographic and toponymic digital data are available. Prices, which are currently under review, will be quoted at the time of ordering. Enquiries and requests should be directed to: National Atlas Information Service, Canada Centre for Mapping, EMR, 615 Booth Street, Room 650, Ottawa, ON, K1A 0E9, Tel. (613) 992-7680.

Radarsat, Canada's First Earth Observation Satellite

The federal government recently announced a series of agreements with nine provinces and industry on participation in the Canadian-led international RADARSAT earth observation satellite project. In making the announcement, The Honourable Harvie Andre, Minister of Industry, Science and Technology Canada, called the agreement "a major investment in Canada's scientific, technical and industrial future. RADARSAT is a ground-breaking enterprise, one of the largest ever federal-provincial technical projects." (the project budget exceeds \$380 million).

"With this project, Canada will join a select group of nations who benefit from the ability to view earth from space. Indeed, when RADARSAT is launched (in 1994), Canada's remote

sensing satellite will be the envy of the world" stated The Honourable William Winegard, Minister of State (Science and Technology). The RADARSAT announcement will allow the further development of Canada's world class industrial capabilities including radar systems, ground receiving stations, image analysis systems and geographic information systems.

Spar Aerospace Systems Division of Montreal will be the primary contractor for the spacecraft. Major sub-contracts include Canadian Astronautics Ltd. and Telesat Canada of Ottawa, SED Systems of Saskatchewan and Comdev of Cambridge Ontario. MacDonald Dettwiler and Associates of Vancouver will develop the advanced ground-processing equipment. A newly-formed Canadian company called Radarsat International (RSI) will be responsible for marketing and distributing RADARSAT images

globally. Intera Technologies Ltd. of Calgary will take the lead in developing applications and marketing for the satellite images.

RADARSAT's data will be received at Canadian ground stations near Gatineau, Quebec and at Prince Albert, Saskatchewan, as well as at other stations around the world.

RADARSAT will be launched into a circular, sun-synchronous polar orbit on a medium-class NASA rocket, provided by NASA in exchange for data. It will circle the earth at an altitude of 800 kilometres, completing approximately 15 orbits during a 24-hour period. Radarsat will cross the same point at the equator every 16 days and cover the Arctic daily. Radarsat is planned to operate in space for a minimum of five years.

The synthetic aperture radar (SAR) will use a 15 by 1.5 metre antenna. The antenna will be able to point its beam anywhere within a swath

of 500 kilometres between 20 and 50 degrees off the side of the satellite. In addition, the SAR will have the ability to zoom both in and out for greater or lesser detail.

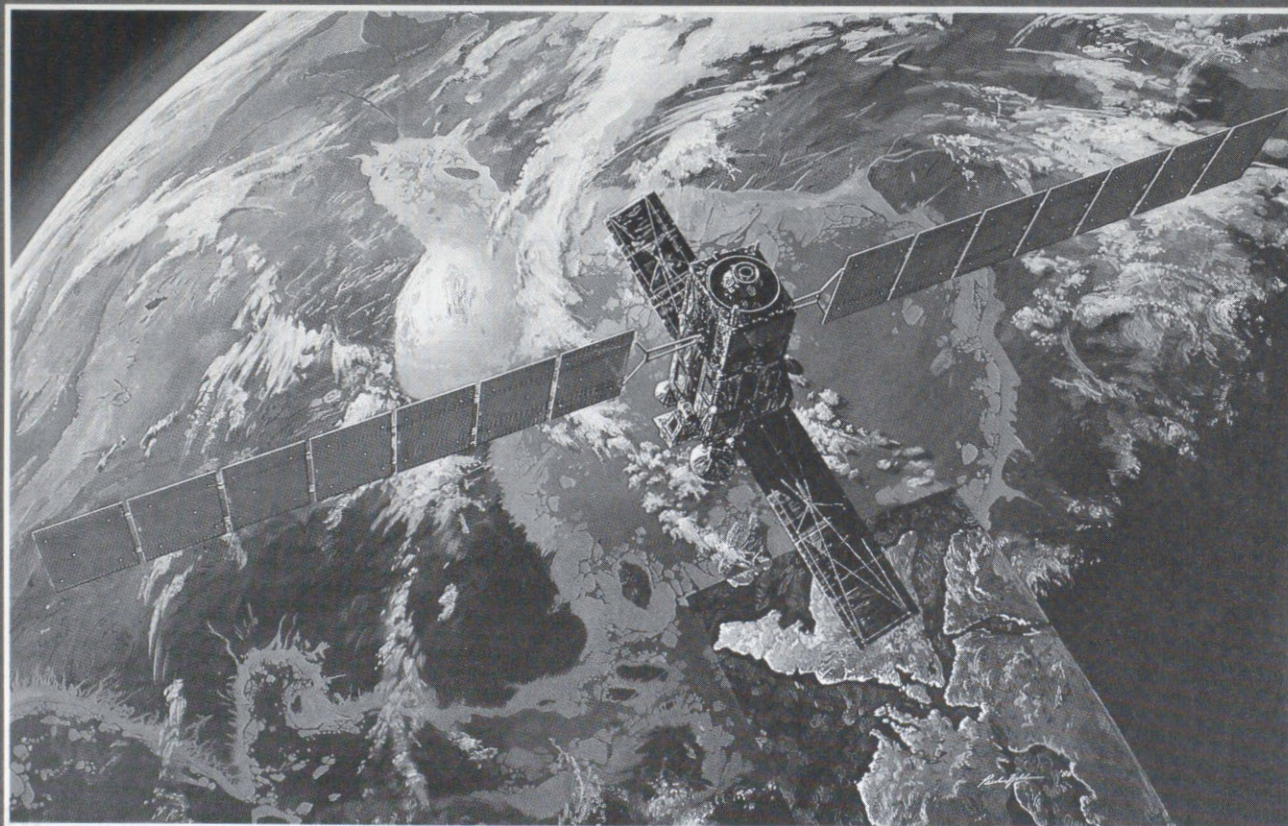
Images from RADARSAT will be an important addition to the services provided by the remote sensing industry. These images will be used for many applications, including the inventory of major crops such as canola and wheat and for monitoring and managing our forests. Stereo images will be used for topographical analysis and geological studies, as well as for environmental and natural disaster monitoring and Arctic surveillance.

For further information, please contact: Canadian Space Agency, RADARSAT Project Office, 110 O'Connor St., Ottawa, ON, K1A 0Y7.

Canadian
Space
Program

Le programme
spatial
canadien

RADARSAT



Artist's view of RADARSAT tracking over Canada

RADARSAT culminant au-dessus du territoire canadien
(conception d'artiste)

Illustration : Paul Fjeld

Artist's view of RADARSAT tracking over Canada.

GIS Calendar of Events 1990



March-May

GIS '90 — Making it work, Forestry
Canada, Vancouver, BC;
March 13-19.

ACSM / ASPRS Annual Convention,
Denver, Colorado;
March 18-24.

Mid-America GIS Symposium,
Overland Park, Kansas;
April 30-May 3.

Vision Interface 90, Bedford Institute
of Oceanography, Halifax, NS;
May 14-18.

Joint CISM/CGU Annual Meeting
"To Know the Earth", Ottawa, ON;
May 22-25.

June-August

Canadian Cartographic Association,
Victoria, BC;
June 10-13.

13th Canadian Symposium on Remote
Sensing: Tools to Manage Land and
Ocean, Fredericton, NB;
July 16-19.

4th International Symposium on
Spatial Data Handling, Zurich,
Switzerland;
July 23-27.

IUFRO World Congress: Sciences In
Forestry, Montreal, QC;
August 1-18

URISA Annual Conference,
"Information: The Currency of the
Future", Edmonton, AB;
August 12-16