REMOTE SENSING IN CANADA

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A NATIONAL PROGRAMME IN REMOTE SENSING IS COORDINATED BY THE DEPARTMENT OF ENERGY, MINES AND RESOURCES IN CO-OPERATION WITH OTHER AGENCIES OF THE GOVERNMENT OF CANADA, PROVINCIAL GOVERNMENTS, INDUSTRY AND CANADIAN UNIVERSITIES

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Lee Godby named as Director-General

The appointment of E.A. "Lee" Godby as Director-General of CCRS was announced in late November, just as the previous issue of Remote Sensing in Canada was being printed. Mr. Godby began his professional career as an engineer with the Eldorado Mining and Refining Co. In 1951, he joined the Flight Research Division of the National Research Council where he remained until 1971, specializing in research on the detection of magnetic phenomena from the air, and the development of instrumentation for this purpose. During this period he was often called a "MAD" scientist, meaning Magnetic Airborne Detection, of course.

In 1971, at the time of the initial formation of the Centre, he joined the Department of Energy, Mines and Resources as Associate Director-General of C.C.R.S. and he has been associated ever since with the development of the national remote sensing program in Canada.

Mr. Godby is President of the Canadian Remote Sensing Society, which is affiliated to the Canadian Aeronautics and Space Institute, and he is Chairman of the Canadian Advisory Committee on Remote Sensing. He is a Canadian representative on the Committee on Space Research, which in 1980 awarded him the William Nordberg Memorial Award in recognition of his contributions to remote sensing, particularly his active participation in the establishment of remote sensing centres in developing countries.

REMOTE SENSING IN CANADA - APRIL 1981

Remote Sensing in Canada is the quarterly newsletter of the Canada Centre for Remote Sensing. It is principally intended to provide a vehicle for communication among the members of the Canadian remote sensing community.

"Quarterly" means that the newsletter is published four times a year, or whenever there is time left over from long and short term planning, budgeting, project management, and all the other ills that federal employee flesh is heir to.

Brief submissions for the newsletter are most welcome, but due to space limitations, they will be subject to editing where necessary.

Material and comments may be sent to:
The Editor, Applications Division, Canada Centre for Remote Sensing, 717 Belfast Road, Ottawa, Ontario, K1A 0Y7

One Potato, Two Potato.....

In 1980 the Canada Centre for Remote Sensing joined forces with Statistics Canada in a joint project to provide a timely potato acreage estimate for New Brunswick.

The boundaries of segments to be visited by field enumerators (in July 1980) were located by using 1978-79 geometrically corrected Landsat data. These segment boundaries were then overlaid on the 1980 Landsat data used in the analysis.

Three groups of fields within three separate segments were used for training. The potato areas collected by the enumerators for seventeen segments were then regressed against the Landsat derived potato area for the same segments. (Of sixty-one segments enumerated, half were retained as blind sites by Statistics Canada, while seventeen were directly used in the satellite analysis). The co-efficients from this analysis were used to modify the parallelpiped classification result to provide an estimate.

The area estimate was produced on the CCRS Image Analysis System on August 27, 1980, ten days after the Landsat pass, independently of the normal estimation process of Statistics Canada. Statistics Canada produced the more traditional estimate for its September 5 deadline using all sixty-one segments and ancilliary data, but without using the results of the satellite analysis. The satellite derived estimate of 51,400 acres was closer to the published statistic of 52,000 acres than any one of the three traditional estimates.

The project has demonstrated that satellite imagery combined with more traditional potato area estimation procedures can lower respondent burden, produce timely crop distribution maps and produce reliable estimates.

For additional information see:

Ryerson, R.A. and L.A. Murphy (1981) New Brunswick Potato Area Estimation: A CCRS-Statistics Canada Joint Project, to be presented at the 15th International Symposium on Remote Sensing of Environment, Ann Arbor, Michigan

Backscatter

If there is anyone out there who still hasn't heard, **ISIS** has melted away. It discontinued it's service operations at Prince Albert Satellite Station (Pass) last June. That's not news, but it is a reality. Unfortunately, requests sent to ISIS can no longer be processed and must be returned to the sender. Some business functions formerly handled by ISIS (i.e., marketing and order entry for products generated in Ottawa) have been transferred to our User Assistance and Marketing Unit, or U.A.M.U. (a perfect pixel award to anyone who can say it three times quickly). SED Systems and ADGA Limited now handle the order entry operations at Prince Albert and Shoe Cove respectively. Contact the ever-helpful Jean Heffernan for information (613) 995-1210.

Tom Alfoldi, popular veteran of almost eight years in the Applications Division, has taken a one year leave of absence to join Intera Environmental Services. He calls it his personal contribution to technology transfer.

Before leaving Tom completed a fine job of technical editing on the **Sixth Canadian Symposium on Remote Sensing.** The Proceedings are available from the Canadian Remote Sensing Society, #60-75 Sparks St., Ottawa K1P 5A5 ($46.00 Can; $47.00 U.S.)

On the subject of publications, **Gregory Geoscience Ltd.** (1750 Courtwood Cresc., Ottawa, Canada K2C 2B5) is offering a satellite image slide set at half price while quantities last ($25 or 2/$45). Each set of 22 coloured slides (35mm) illustrates a variety of environmental and cultural features such as seasonal changes, logging, geological structure, etc. Descriptive notes included.

The 30,000 agricultural producers of southern Manitoba will have the world's first commercial **Telidon** information service to help them run better businesses. In the offices of local agricultural representatives, at grain terminals, or community centres, wherever farm business is discussed, they will find Telidon, and Landsat data. Beginning in April 1981, the system will allow access to samples of Landsat data showing crop acreages and up-to-date information on market trends and prices, commodities or world weather conditions. The network will start with 25 Telidon TV terminals in the agent, elevator, crop insurance offices or other public areas where the farm producers of southern Manitoba come to do business.

A **COSPAR Symposium**, tentatively titled "Monitoring from Space of Anthropogenic Effects on the Environment - Needs Achievements, Limitations, Future Prospects", is being planned for the week following COSPAR's XXIV meeting in Ottawa in 1982. The Symposium will focus on analyses of land areas being transformed as a result of shifts in living patterns or changes in agricultural practices and the intensity of resource utilization. More information should be available in time for our next issue.

CCRS' User Assistance and Marketing Unit has produced a colorful brochure entitled Forest Fire Fuel Maps from Landsat Data which chronicles the use of modern technology to gain a tactical advantage in the war against forest fires in the Outaouais region of Quebec. The brochure highlights the work of the Forest Fire Research Institue in developing forest combustibility maps from Landsat data. Available free of charge from CCRS. Get them while they're, uh, hot.

CCRS' **Color Additive Viewer** is on the move again, this time all the way to Whitehorse for an extended one-year engagement. The CAV will be used by the Yukon Resource Planning Branch for geological and land covertype mapping. It has previously performed before avid audiences in Quebec, Manitoba and British Columbia, and more recently played locally for the entertainment of our Peruvian visitors. Grant Dixon tells me that the Mirror Stereoscope and the Density Slicer are also willing to travel for educational or training purposes. Call Grant at (613)995-1210.

Colour Landat mosaics of each of the provinces (the Maritimes on one sheet) are available from the National Air Photo Library, 615 Booth St., Ottawa. (613) 995-4597.

Brian McGurrin

MDA SEASAT IMAGERY PRODUCTION

Seasat Synthetic Aperture Radar (SAR) data can provide an additional channel of information for the traditional processing, registration, pattern recognition and classification of Landsat data. SAR imagery, being highly sensitive to texture and angular structures, can provide another dimension in decision space for agricultural, forestry, geological and oceanographic classification work.

Macdonald Dettwiler & Associates Ltd. (MDA) has been operating a digital Seasat imagery production facility since January 1979. In cooperation with the Canada Centre for Remote Sensing, MDA can provide imagery from high-density digital tapes (HDDT's) of raw Seasat SAR data. Input computer compatible tapes (CCT's) of the required raw data can be reproduced at the Shoe Cove, Nfld. receiving station, and imagery subsequently produced at MDA. MDA has a complete set of SEASAT orbital maps showing Canadian coverage for users who wish to order imagery products that have not already been processed.

The processor has been implemented on MDA'S in-house Interdata 8/32 computer/FPS array processor system, and produces imagery at a rate of one standard image per eight-hour shift. Some features of MDA's Seasat imagery include:

--Standard image size of 40 km azimuth x 36km ground range (nominal) or a modified orthographic projection.

--4 looks at 25 m resolution.

--Full one dimensional correction for slant range distortion.

--Azimuth scaling taking into account earth oblate spheroid model.

--Floating point processing throughout for preservation of full dynamic range - output CCT's of full 16-bit intensity dynamic range.

--Imagery interpolated to 12.5 sample spacing before intensity detection.

--Orbital, attitude, timing and signal processing parameters recorded on CCT for downstream precision registration and analysis.

--Demonstrated target location accuracy on a test scene of 250 m.

ORDERING SEASAT IMAGERY

Two products are available:

CCT's - Scene raw data merged with attitude data
- Available from CCRS at $200 per CCT

Processed Scenes - Imagery format
- Available from MDA

The cost of initial processing by MDA is $2400.00 per image. Processing requests should be addressed directly to MDA.

Previously processed Seasat scenes are available from CCRS at prices identical to Landsat scenes. For example, a 18.5cm x 18.5cm black and white photo currently costs $9.00.

Seasat images are available for the following sites: Halifax, N.S.; Grand Falls, N.B.; Trois-Rivières, Ungava Bay, Manicouagan, and Gatineau, Qué.; Ottawa, and Welland Canal, Ont; Vancouver, Vancouver Island, Anderson River and Georgia St. B.C.; Tuktoyaktuk, Wopmay Fault, Cambridge Bay, Peel Point, and Beaufort Sea, N.W.T.; Chesapeake Bay Bridge, Md.; Goldstone Reflector, Calif; Identified ship in St.Lawrence River, and waves off Duck Is., North Carolina.

For additional information on the Seasat scenes that are available now, contact: Jean Heffernan, CCRS, 717 Belfast Rd.
Ottawa, KIA OY7
tel:(613)995-1210

INTERPROVINCIAL/TERRITORIAL ADVISORY SUB-COMMITTEE TO THE CANADIAN ADVISORY COMMITTEE ON REMOTE SENSING

Cal D Bricker

To ensure that the needs of the provinces and territories would be reflected in the national remote sensing program an Interprovincial/Territorial Advisory Sub-Comittee (IPTASC, an acronym to end all acronyms) of the Canadian Advisory Committee on Remote Sensing (CACRS) was established in 1977.

Although there had been individual provincial representation in CACRS, cries from the wilderness had gone mostly unheeded. Most provinces felt that they had a lot to offer the national program and CACRS. This could best be done by a provincial committee, expanded later to include the Yukon and Northwest Territories.

At the request of the Chairman of CACRS, Dr. Victor Zsilinszky of the Ontario Centre for Remote Sensing organized a sub-committee comprising representatives from all provinces and territories. The committee's objectives are: 1) to ensure that remote sensing technology, data resources and developments in methodologies of application are readily available to all provinces and territories, and 2) to ensure that the needs of the provinces and territories are reflected in the national program.

The committee, meeting twice yearly, plays an essential advisory role as it truly represents the "national program".

Present members of the IPTASC

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11th floor, 9820 - 106 Street
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Phone: 403/427-2381

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Newfoundland
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Senior Development Officer
Newfoundland Dept. of Industrial Development
Confederation Building
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Centre québécois de coordination de la télédétection
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Phone: 403/667-5811

Members welcome suggestions, recommendations, and complaints, regarding the Canadian remote sensing program in their areas.

SUPPLEMENTARY AERIAL PHOTOGRAPHY: A REMOTE SENSING SUCCESS STORY

In 1968, Victor Zsilinszky (now director of the Ontario Centre for Remote Sensing) introduced a system of "do-it-yourself" aerial photography, using motorized 35 mm cameras, to the Ontario Ministry of Natural Resources. The Ministry's fleet of fire-control aircraft (mainly de Havilland Beavers and Turbo-Beavers) served as the airborne platform. The technique was enthusiastically received because it solved a major problem of field operations: it permitted reconnaissance coverage of local conditions to be obtained at any time during the ten-year interval between regular aerial photographic coverage, at a negligible cost. Because of the ability of 35mm photography to fill the gap, Zsilinszky dubbed it "supplementary" aerial photography, or "SAP".

Zsilinszky conducted yearly courses, which are still given by the Ontario Centre for Remote Sensing (OCRS) , to instruct field staff with little or no prior experience in photography, in practical SAP operation.

Now that more than a decade has passed since the introduction of SAP, 26 of the 48 districts of the Ministry, principally from the northern regions of the province, have SAP operators on staff and possess the basic SAP equipment package (motorized camera, lenses, battery pack and large film magazine, simple camera mount and basic darkroom equipment).

The majority of SAP assignments are carried out to obtain up-to-date imagery of forest cutovers and recent burns, and of the location of new roads. Photography is also obtained for the assessment of regeneration success and of site preparation for reforestation. Missions are occasionally flown for the mapping of floods, the review of pits and quarries, the assessment of forest disease and infestations, the mapping of wild rice beds and the study of cottage development. Miscellaneous tasks may include data on water pollution, the results of herbicide spraying, and various silvicultural projects.

Black and white panchromatic films are still the most popular, although there is a definite movement toward a greater variety of films and photo scales, as the objectives of SAP missions become more diverse.

Currently, the Ontario Centre for Remote Sensing is conducting an investigation into the possibility of standardizing SAP camera mounts across the province. Further, the OCRS is planning to organize workshops for SAP operators.

Supplementary aerial photography is an example of a simple remote sensing technique that has been successfully integrated into the resource management process.

REFERENCES

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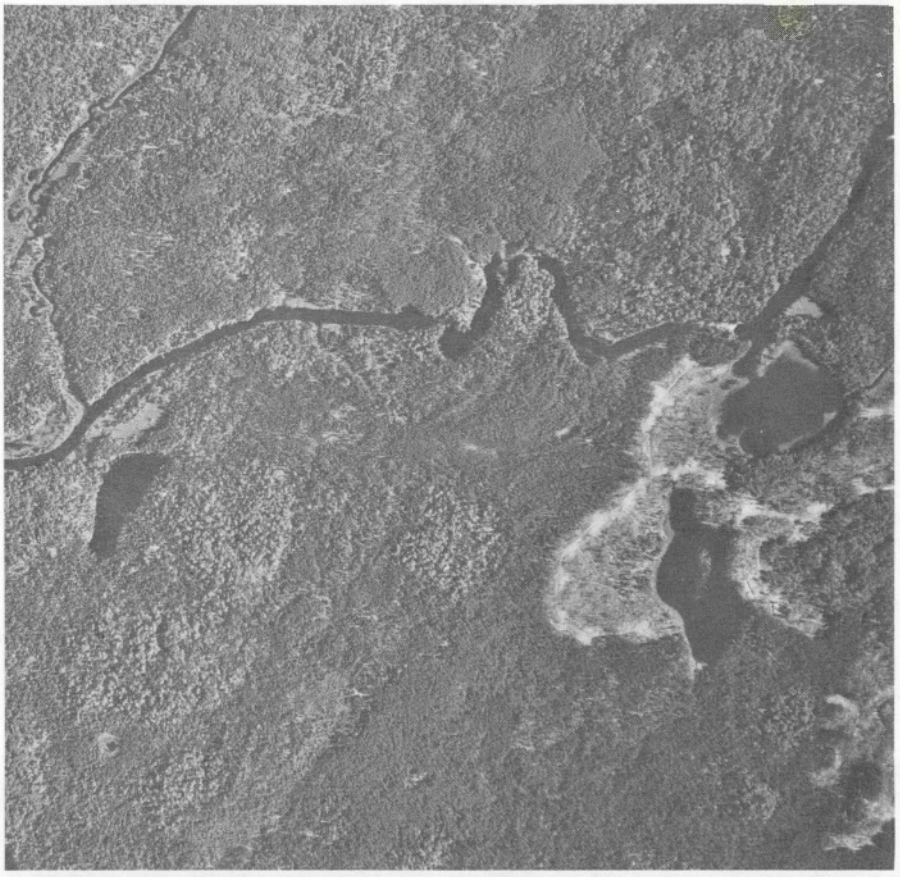
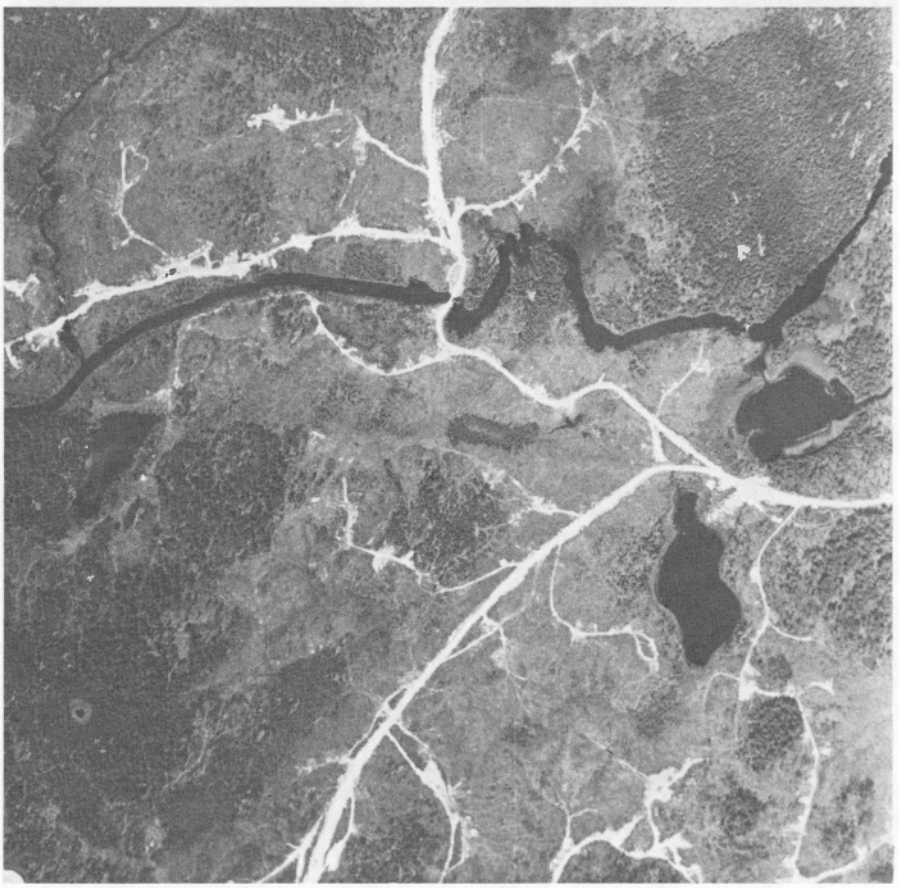


Photo A: Technical Data

Camera:	Wild RC8
Lens:	6 - inch Aviogan
Filter:	Wratten No. 12 (Minus Blue)
Paper:	Kodak 1594-contrast 3
Altitude:	7920 ft. AGL
Date:	1963
Overlap:	Forward 60%
Print Scale	1: 15, 840



Note the area of forest that has been cut between the time of the 1963 survey photography (Photo A) and the 1968 SAP flight (Photo B). Note the pattern of logging roads across the site recorded by the SAP photograph (Photo B).

Photo B: Technical Data

Camera:	Nikon F250 Motor Drive
Lens:	24mm Nikkor
Filter:	Wratten No. 12 (Minus Blue)
Film:	Kodak Tri-X, ASA 400
Developer:	Microdol-X
Paper:	Kodak 1594 - Contrast 3
Altitude:	8000 ft. AGL
Date:	August 15, 1968
Overlap:	Forward 60%
Scale of 6.25X Enlargement:	1:15,840
Camera Position:	Transverse

INVITATION & CALL FOR PAPERS
7th CANADIAN SYMPOSIUM ON REMOTE SENSING

THEME: DOWN TO EARTH MANAGEMENT

You are cordially invited to take part in this Symposium. The meeting is sponsored by the Canadian Remote Sensing Society of the Canadian Aeronautics and Space Institute.
The technical program will feature papers reflecting recent developments in:

* SENSORS
* DATA ACQUISITION
* PROCESSING AND ANALYSIS
  With special emphasis on
* THE APPLICATION ON THE MANAGEMENT OF NATURAL RESOURCES

Proposals should include:

* Title of Proposed Paper
* Authors name, address and affiliation
* Abstract of papers technical content, 200 words.

In order for papers (English or French) to be considered for inclusion in the program, proposals must be received no later than May 15, 1981.

Authors of papers accepted for presentation will be notified by June 30, 1981. Please submit proposal to Technical Program Chairman.

Mr. W.G. Best
General Chairman
7th Canadian Symposium on
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c/o Manitoba Remote
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R3H OW4

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Geocoded Landsat Imagery

In 1979 CCRS introduced a new Landsat MSS precision process which is informally known as DICS (Digital Image Correction System). DICS image products have many advantages: 50 metres by 50 metres pixels, east-west oriented scan lines, UTM projection, National Topographic System compatibility, and 50 metres RMS geometric accuracy. The product is available on computer compatible tapes in the universal format and in the international standard format. The precision processed imagery is also offered on film from a 250 mm colour master negative at 1:500,000 scale.

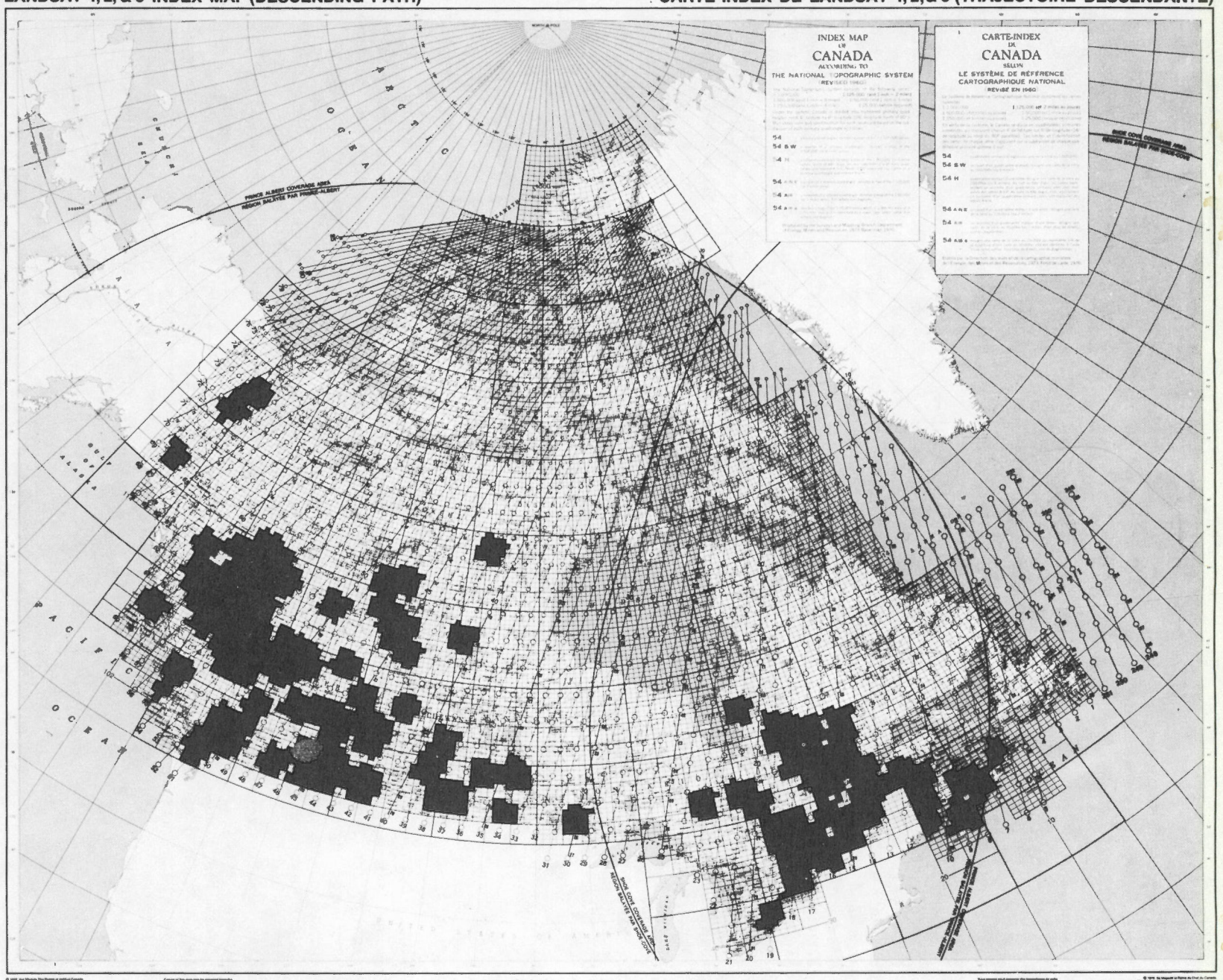
The following DICS Index Map shows (as shaded areas) the regions of Canada for which at least one Landsat MSS scene has been precision processed on DICS. For many areas the imagery corrected, so far, includes Landsat-1, -2 and - 3.

The DICS product has the marked advantage of being "geocoded". Multi-temporal imagery is already registered because each pixel is assigned a unique location independent of the particular orbit. The data can easily be integrated with other geocoded databases in the UTM projection or with similarly processed imagery from other remote sensing missions. The latter is particularly important because future remote sensing satellites, including Landsat-D, will present a worldwide orbital coverage different from the first three Landsat missions. Consequently, in the 80's, imagery which is platform and sensor independent, will present a distinct advantage.

The Landsat imagery is corrected on DICS on a request basis, and since its introduction the demand has been growing rapidly. In particular, Québec and British Columbia have placed orders for systematic coverage of large areas. In order to meet future demands, CCRS is adding a second image terminal to the DICS. This will allow for the processing, in parallel, of two Landsat images. This new capability is scheduled to be phased into operation late in 1981.

LANDSAT 1, 2, & 3 INDEX MAP (DESCENDING PATH)

CARTE-INDEX DE LANDSAT 1, 2, & 3 (TRAJECTOIRE DESCENDANTE)



SAR 580 TO TOUR EUROPE

In May of this year, the CCRS Convair 580 aircraft, or SAR-580, as it is commonly referred to, will be off to Europe for an intensive six weeks of airborne experiments. This project will be the first major exercise for the new C-Band capability being added to the CCRS Synthetic Aperture Radar.

In the planning stages since 1977, the project is being jointly sponsored by the European Space Agency (ESA) and the Joint Research Centre (JRC) at Ispra in support of mission studies for the proposed ESA Earth Resources Satellite (ERS) series.

The experiments will range over the many disciplines in which remote sensing has been identified as potentially beneficial for resource and environmental management. Close to forty experiment sites have been established over Western Europe and Greenland. Typical site-discipline combinations include, ice off Southern Greenland, coastal oceanography and oil pollution in the North Sea using a research platform as the ground truth base, and agriculture, geology, forestry, hydrology, and marine traffic management in a variety of sites over Germany, Great Britain, Italy, Switzerland, France, Spain, Austria, Belgium and the Netherlands. Some topical experiments will be conducted, such as coverage of the earthquake devastated areas in Southern Italy.

The proposed data acquisition activity is extremely ambitious with over 150 passes planned over sites, involving more than 130 hours of aircraft flying. The operations will be conducted from two main bases; RAE Bedford, just north of London and DFVLR Oberpfaffenhofen, just west of Munich.

The program has been organized along the lines of the Canadian SURSAT program with multiple experiments at each site, user workshops related to the various applications areas, and close co-ordination between the experimenters, project managers and data acquisition elements.

This project will provide an opportunity for CCRS scientists and applications development personnel to participate in selected experiments by becoming associated with their counterparts in Europe. To date only two or three such relationships have been set up, however this participation is expected to increase, as a result of a number of workshops scheduled during the next few months.

IMAGE ANALYSIS WORKSHOPS

An introductory level workshop on digital image analysis and its applications was held in Calgary from September 23 to 26, 1980. It was sponsored by the Alberta Remote Sensing Center and conducted by staff from the Canada Centre for Remote Sensing.

Digital remote sensing data and analysis techniques were described and illustrated with examples from different disciplines. Emphasis was on usage and capabilities of the CCRS Image Analysis System (CIAS), although some information on other digital image analysis facilities in Canada was available.

Similar workshops are in the planning stage for several other provinces. If you are interested in attending such a workshop, please ask for your name to be put on our workshop mailing list. Send your request either to your provincial remote sensing representative or to Paul Hession, User Assistance and Marketing Unit, CCRS.

A special workshop for Canadian companies or universities wishing to give such workshops and for people coordinating and contributing to provincial workshops will be given in Ottawa on May 4 and 5, 1981. Contact Paul Hession (613-993-0121) for details.

SANIOT LAUNCHED

No, not another satellite, but an image analysis service, SANIOT (Service d'analyse numérique des images obtenues par télédétection) provides Quebec users with state of the art technology in digital image processing.

SANIOT integrates elements of several existing systems:

- L.A.S.P. (a version of ARIES software furnished with the DIPIX LCT-11)
- MINI- VICAR (a modified version of software developed by U.S. Jet Propulsion Lab)
- C.I.A.S. (software developed at the Canada Centre for Remote Sensing)

The system was created by combining the expertise and resources of several organizations, including the Centre de recherches sur l'eau de l'Université Laval, the Centre de recherches forestières des Laurentides, and the ministère de l'Energie et des Ressources.

For further information:
Responsable administratif,
SANIOT/CENTREAU, Pavillon Pouliot -
Université Laval Sainte-Foy,
Québec G1K 7P4 Tél.: (418)656-5277

CONTINUING SURVEY OF CANADIAN
DIGITAL ANALYSIS SYSTEMS

System Name: Linear Measuring Set (LMS)
Bulk Store System

Contact: Mr. L. Hooton
Infrascan Inc.
Richmond, B.C.
V6X 1X5
Telephone: (604) 273-8655
Telex: 04-355635 "Camero"

Hardware: Processor - Electronic Devices Incorporated analogue image processor; 49,152 pixels spatial resolution; light pencil; 8 function keyboard; 20 key calculator; 20 - instruction digital interface option.

Camera - 128 step density resolution (maximum)

Video Cassette Recorder - JVC, 3/4 inch, U matic format

Display - Television set

System Capability: Area/distance measurement of remote sensing data
Image overlays
Planimetry using Light Pencil
Density slicing

ARIES moves to Petawawa

The Canadian Forestry Service's ARIES (Applied Resource Image Exploitation System) remote sensing computer system has been moved to new facilites at the Petawawa National Forestry Institute near Chalk River, Ontario. The system is now fully operational and research work is continuing. Don Leckie, recent graduate of the University of B.C. Graduate Program in Remote Sensing, has joined the research group headed by Peter Kourtz.

A prime objective of current research is to investigate the capabilities of satellite and airborne digital MSS data for forestry. Projects include: mapping of insect damage on Cape Breton Island (total damage) and in New Brunswick (partial defoliation), mapping of forest regrowth using Landsat and/or airborne data, and forest type mapping using airborne MSS (investigation of optimum bands and resolution). Landsat D simulations will also be evaluted. Long term projects are to apply terrain and atmospheric corrections to Landsat imagery and to develop change detection procedures.

Visitors welcome.

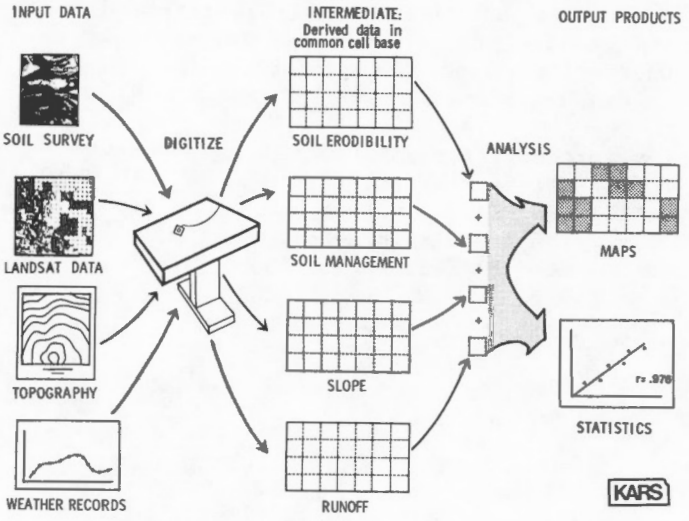
WHAT IS A GEOGRAPHIC INFORMATION SYSTEM ?

Information acquired through remote sensing is usually most valuable when employed in combination with ancillary data such as that contained in soils surveys, census records, topographic and thematic maps and similar resources. A very effective tool for combining and utilizing data from such disparate sources is the geographic information system (GIS). Usually computer based, such systems are constructed by coding and referencing all data to a location on the earth's surface. For example, in a GIS based on the U.S. Lands Survey, data might be coded by section, township and range. In such a case, land use, vegetation, soils, population, geology, relief, elevation, slopes, climatic characteristics, water quality, stream discharge, socio-economic condition, political / administrative jurisdictions or any of a multitude of other phenomena found in each section could be entered into the system. Some of these data could be acquired through remote sensing and some would come from other sources.

A digitizer is an instrument used to enter data into a GIS computer file. The digitizer converts data from its original format (e.g., map) to a numerical ("digital") format which can be used in computer processing. Digitizing may include procedures such as tracing, with the instrument's cursor, land use, soils, or political boundaries from an existing map. As the tracing is accomplished, the location and other attributes of the area are coded into the computer file.

(KARS Newsletter, University of Kansas, January 1981)

Once a GIS has been constructed, the data base can be utilized in many ways. If, for example, a resource manager wished to determine the potential for soil erosion in a large watershed, he could request that the system evaluate the relevant data coded for each section within the area of interest. The data evaluated for this application might include factors such as land cover, slopes, rainfall, soils characteristics, and conservation practices utilized. Very quickly the manager would be able to view a map and statistical report in which each section was classified according to its soil erosion hazard. Geographic information systems provide planner, resources managers and others with an ability to analyze complex spatial interrelationships in a cost effective manner.



CANASIP '81 SEEKING PARTICIPANTS

Following on the heels of the 1980 initial phase of the Canadian Agricultural Satellite Intelligence Program (CANASIP), the Sibbald Group of Deloitte, Haskins and Sells Associates will again offer similar services in 1981. This year, a new set of data will be added to the program, namely, the identification of summer fallow acreage in selected Prairie regions.

A training session will be offered by the Sibbald Group to participants to be held in Ottawa in the early summer of 1981. For further information, refer to Remote Sensing In Canada, 8 (1), Nov. 1980, or please contact:

Dr. P. Chagarlamudi,
Deloitte, Haskins & Sells Associates
99 Bank Street, Suite 630,
Ottawa, Ontario K1P 6B9
Telephone: (613) 563-0321

INTERNATIONAL LIAISON

Bill Bruce

The evolution and application of appropriate technologies to the development problems of third world countries is a topic of major international concern. There is growing evidence to indicate that the thoughtful application of remote sensing can be appropriate to the development needs of many nations. Knowledge of resource base is a prerequisite to sound development, but the provision of resource information is often an unrealistic goal in view of costs and time required for conventional data collection. Under such conditions, remote sensing technology is beginning to demonstrate considerable potential. This potential is now widely recognized both among aid giving agencies and recipient countries.

As a result of this recent growth, CCRS has, with increasing frequency, received requests for short-term advisory, demonstration or evaluation assistance. Whenever possible CCRS has attempted to accomodate these requests by making personnel and facilities available. In addition to such short-term assistance, CCRS participates in more formal bilateral programs. Two major international development projects are currently being carried out with CCRS coordination and technical support and under the funding of the Canadian International Development Agency (CIDA).

Project "PERCEP", involving Canada and Peru is nearing completion, and is providing a rewarding demonstration of the validity of several innovative design and management concepts in the field of technology transfer. The design of this project is based on the concept of shared responsibility through co-operative management. The keynotes to success have proven to be close, continuous communication at the management level and exposure of Peruvian experts to operational remote sensing through on the job integration with Canadian counter-parts at CCRS. These factors have helped to insure continuity of Peruvian involvement and support throughout the project.

Although modest in funding, the project has provided over 60 man-months of intensive research and training experience to members of the Peruvian remote sensing project team. The project is also outfitting a remote sensing interpretation laboratory based on a jointly developed design. The expected value of this laboratory is $250,000. In addition, a remote sensing library and an exhaustive English-Spanish glossary are being prepared under project sponsorship.

There is already ample evidence that many Peruvian specialists have benefited from participation in the project and are using remote sensing routinely in their work assignments. It is hoped that a mechanism will be found which will permit some form of continuing liaison between Peru and Canada's remote sensing program.

The second major international program undertaken by CCRS under CIDA sponsorship involves the countries of the Sahel region in West Africa. This two phase project sees Canadian efforts, through CCRS, concentrated initially in the areas of coordination, training and applications development. In the anticipated second phase, Canada will establish a regional satellite reception facility to complement the training centre established in Phase I.

This project is part of an international effort involving the United States, France and Canada. To date, Canada has assisted in the establishment of a regional training centre in Ouagaodugou, Upper Volta, and has provided the full time services of a Deputy Director to assist the counterpart African Director of the Centre. Phase I activities have included completion of engineering and benefit analysis of its proposed output. Several Applications Development projects have been sponsored by CIDA through CCRS, in the critical fields of hydrology, forestry and agrometeorology. It is anticipated that African counterparts will soon be in place to carry on and apply this work as data become available.

The experience of Canadians in international remote sensing technology transfer projects has been rewarding. The enthusiasm with which our efforts have been received and matched has encouraged CCRS to reconfirm its commitment to assist other nations to more fully appreciate and benefit from the rapidly expanding capabilities of the technology of remote sensing.

What's new on the CIAS

The CCRS Image Analysis System (CIAS) was designed to meet operational requirements for digital image analysis of Landsat, airborne and other remote sensing data, and to provide a flexible tool for research on methods of information extraction from an image. A description of the basic hardware and software structures appeared in an article by D.G. Goodenough in the Canadian Journal of Remote Sensing, May 1979, and will not be repeated here. However, the many users of the CIAS may be interested in a number of system enhancements which have been implemented recently.

Full frame Landsat file processing programs - These include sensor calibration, sensor correction, video filter, look-up-table processing, radiometric manipulations and combinations and a maximum likelihood classifier.

A program to allow the generation of a tape from an image file for later production of a Colour Image Recorder (CIR) photographic image - The image can contain video and/or classification data for both DICS and regular Landsat data.

A suite of programs to generate a scaled colour ink jet plot video and/or classified results - The colour plot is produced off-line from a computer tape which is generated from an image file on the CIAS.

In early April a Matrix Instruments Inc. colour camera system will produce a copy of the CIAS display screen on either 8X10 inch polaroid print film, 8X10 inch transparency film, 4X5 inch polaroid print film or 35 mm transparency film (for slide production). The inputs to this device are the electronic signals which are used to generate the CIAS display on the cathode ray tube. The users will be expected to supply their own film for this device. Details can be obtained when you book your CIAS session.

Landsat as Legitimate Fiction

Book review by Phil Howarth

CONGO, by Michael Crichton, Knopf,
348 pages, $13.95 (ISBN 0-394-51392-4)

"Ten thousand miles away, in the cold, windowless main data room of Earth Resources Technology Services, Inc., of Houston, Karen Ross sat hunched over a mug of coffee in front of a computer terminal, reviewing the latest Landsat images from Africa. Ross was the ERTS Congo Project Supervisor, and as she manipulated the satellite images in artificial contrast colours, blue and purple and green, she glanced at her watch impatiently. She was waiting for the next field transmission from Africa."

A dream of the Chairman of the CCRS Management Committee? No, it's the opening paragraph of Chapter 1 from a new thriller by Michael Crichton (author of The Andromeda Strain and Terminal Man). After all the articles in the scientific literature, Landsat has finally reached the pages of legitimate fiction!

Congo is the story of a race between ERTS and a Euro-Japanese consortium to find a valuable source of industrial diamonds. Image enhancement to find that lost city of Zinj, and the monitoring role of Landsat are important elements in this fast -moving tale. The purists will be disappointed with some of the inaccuracies regarding Landsat's capabilities; but with its satellite communications, killer hippos, a gorilla called Amy (capable of communicating in sign language), and much more, it makes for a good weekend's reading. In hardback, costing less than a Landsat colour composite, you can't go wrong!

(Dr. Howarth teaches at McMaster University, and has previously been regarded as a specialist only in remote sensing non-fiction. Ed.)

RBV PRODUCTION CHANGES

At present, Return Beam Vidicon (RBV) data from LANDSAT III is the only RBV data system being received and recorded by CCRS. It is panchromatic and double the resolution of the available MSS data. The LANDSAT III spacecraft and RBV system are functioning normally with no known or foreseeable problems. Since the launch of LANDSAT III, RBV data have been archived on film only and no attempt has been made to digitize the data. This procedure was based on cost and the low level of interest expressed by Canadian users who were surveyed by letter prior to the launch of LANDSAT III.

CCRS has been receiving and recording RBV data at the Prince Albert Satellite Station (PASS). It is planned to obtain a one-time summer and early fall coverage of Canada with five percent or less cloud cover and a master negative quality of "good" to "excellent". To date, only 59% of the available scenes south of 70° north have met these criteria. When one considers all of Canada (including the Arctic Islands), only 30% of Canada has coverage meeting the requirements. CCRS will continue to receive and record RBV data on film until the objective of one-time coverage is met. Specific requests for RBV coverage will be accepted by CCRS so that the data may be recorded and photographic products will be generated.

RBV data is archived at two locations. Data acquired prior to 1980 is archived at NAPL Ottawa on 70mm masters produced by the Electron Beam Image Recorder (EBIR) at CCRS. Data acquired since 1980 is archived at PASS on 70mm masters produced by the "quicklook" recorder (CRT type). Duplicate negatives of the NAPL archive have been supplied to PASS so that all orders for RBV may be accepted and processed at one location.

The use of Prince Albert's quicklook recorder to produce RBV archive masters was initiated in December 1980, after a comparison of RBV imagery from both the EBIR masters and quicklook masters. The RBV quicklook imagery was evaluated to be at least as good as the EBIR imagery. Concurrently, the EBIR production system developed problems which introduced artifacts into the imagery. The problems have been assessed as very difficult and costly to resolve. Therefore, the EBIR system has been abandoned in favor of the quickook.

Recording of RBV data has also undergone a change. Initially all RBV passes over Canada were received. Since June 1980 the RBV reception period has been reduced to six months, 1 April through 30 September of each year. This was done to reduce the reception and processing load at the stations and to better meet the requirements of one-time summer coverage of Canada.

CCRS REPORT PUBLICATIONS

Copies of the following reports are available, free-of-charge, from the CCRS Technical Information Service at 717 Belfast Road, Ottawa K1A 0Y7.

Application of LANDSAT Data to the Study of Land and Range Resources in the Narok Area, Kenya, RR 79-4
Victor Odenyo

This study provides an assessment of the use of Landsat digital and photographic data in the evaluation of land resources and detailed cover type mapping in the low rainfall areas of Kenya. Several maps were prepared from remote sensing data and assessed relative to existing sources and fieldwork. Detailed results of that assessment are given.

POTATO AREA ESTIMATION USING REMOTE SENSING METHODS
Users' Manual 80-2
R. Ryerson, P. Mosher, J. Harvie

This manual outlines a cost-effective procedure for determining and mapping potato acreage in New Brunswick's St. John river valley using Landsat digital MSS data from mid-summer, and a minimum of ground data. A back-up system based on small scale colour aerial photography is also described.

CONFERENCES

A list of meetings, conferences, courses, etc. in the areas of remote sensing, pattern recognition, computers and computer applications, space surveying and mapping and other related topics.

April - June, 1981

Environmetrics '81
April 6-8, 1981
SIAM
Washington, D.C.

Digital Image Processing of Earth Observation Sensor Data
April 6-10, 1981
George Washington University
Washington, D.C.

Perspectives in Landscape Ecology
April 6-11, 1981
NSLE
The Netherlands

2nd International Conference on Antennas and Propagation
April 13-16, 1981
IEE/IEEE
York, UK

Annual Meeting of the AAG: Rural Remote Sensing
April 19-22
Los Angeles, Calif.

Terrain Analysis: short course
April 27 - May 1, 1981
George Washington University
Washington, D.C.

Course on Air and Space Technology in the Planning Process
April 27 - May 1, 1981
Star, Inc.
Trinidad, California

International Remote Sensing Workshop on Applications in Geologic & Hydrologic Exploration & Planning
April 28 - May 29, 1981
Eros Data Center
Sioux Fall, SD

Symposium on Multidisciplinary Studies on Hudson/James Bay
April 28-30, 1981
Guelph, Ontario

Twelfth Annual Pittsburgh Conference on Modeling and Simulation
April 30 - May 1, 1981
University of Pittsburgh/IEEE
Pittsburgh, PA

Environmentally Compatible Hydro Development Conference
May 3-5, 1981
CWRA
Château Laurier Hotel
Ottawa, Ontario

Offshore Technology Conference, 13th
May 4-7, 1981
Houston, TX

Navigation Symposium
May 11-12, 1981
CASI
Montreal, Quebec

Geological Association of Canada & Mineralogical Association of Canada Joint Annual Meeting
May 11-13, 1981
Calgary, Al.

Technology of Scientific Space Experiments course
May 11-22, 1981
CNES
Toulouse, France

Fifteenth International Symposium on Remote Sensing of Environment
May 11-15, 1981
ERIM
Ann Arbor, Ml

8th International Symposium on Computer Architecture
May 12-14, 1981
ACM
Minneapolis, Minn.

Geological Association of Canada Annual Meeting
May 13-15, 1981
Banff Spring Hotel
Banff, Alberta

Wave Dynamics and Radio Probing
of the Ocean Surface
May 13-20, 1981
USRI/NOAA
Miami Beach, Fl.

Conference on Remote Sensing
Education
May 19-21, 1981
LARS/Purdue University
West Lafayette, Ind.

Symposium on the Application
of Remote Sensing on the
Continental Shelf
May 19-20, 1981
Voss, Bergen, Norway

5th General Assembly
EARSeL
May 19-20, 1981
Voss, Bergen, Norway

Canadian Institute of Surveying
Seventy-Fourth Annual Convention
May 19-22, 1981
St. John's, NFLD.

AGU Spring Meeting
May 25-29, 1981
Baltimore, MD

15th Annual Congress of the
Canadian Meteorological and
Oceanographic Society (CMOS)
May 27-29, 1981
Saskatoon, Sask.

Fundamentals of Applied Remote
Sensing Course
June 1-5, 1981
KARS/University of Kansas
Lawrence, Kansas

Advanced Training of Foreign Participants
in Remote Sensing: Geologic Interpretation
June 2 - July 3, 1981
U.S. Geological Survey
Flagstaff, Arizona

1981 International Geoscience
and Remote Sensing Symposium
(IGARSS'81)
June 8-10, 1981
IEEE
Washington, D.C.

Course on Remote Sensing
for Decision Makers
June 9-11, 1981
Cornell University
Ithaca, N.Y.

Conference on Lasers and
Electro-Optics (CLEO)
June 10-12, 1981
Washington, D.C.

Seventh Conference of the
Canadian Man-Computer
Communications Society
June 10-12, 1981
University of Waterloo,
Waterloo, Ontario

Canadian Water Resources Association
34th Annual Conference
June 10-12, 1981
Banff, Alberta

Second Scandinavian Conference
on Image Analysis
June 15-17, 1981
University of Technology
Helsinki, Finland

International Microwave
Symposium
June 15-17, 1981
IEEE
Los Angeles, CA

Forest Management Workshop
June 15-19, 1981
LARS/Purdue University
West Lafayette, In.

Fourth Conference on
Atmospheric Radiation
June 16-18, 1981
AMS
Toronto, Ontario

Ice Technology 1981
June 16-19, 1981
SNAME
Ottawa, Ontario

La cartographie thématique des
rèsultats de la télédétection:
4 ème Colloque International du G.D.T.A.
June 22-26, 1981
Toulouse, France

Symposium on Machine Processing of
Remotely Sensed Data
June 23-26, 1981
LARS/Purdue University
West Lafayette, Ind.

July - September, 1981

Synthetic Aperture Radar
Technology and Applications
Course
July 6-10, 1981
University of Michigan
Ann Arbor, Michigan

11th Intersociety Conference on
Environmental Systems
July 13-15, 1981
AIAA
San Francisco, CA

Fundamentals of Applied Remote
Sensing Course
July 13-17, 1981
KARS/University of Kansas
Lawrence, Kansas

Summer Computer Simulation Conference
July 15-17, 1981
AMS
Washington, D.C.

POAC '81
July 27-31, 1981
Université Laval
Quebec City, Quebec

International Symposium on Ice,
IAHR 1981
July 27-31, 1981
Château Frontenac
Québec City, Québec

ACM SIGGRAPH '81
August 3-7, 1981
Dallas, TX

AAS/AIAA Astrodynamics
Conference
August 3-5, 1981
Lake Tahoe, Nev.

Pattern Recognition and Image
Processing: IEEE Computer
Society Conference
August 3-5, 1981
Dallas, Texas

Land Use Workshop
August 3-7, 1981
LARS/Purdue University
West Lafayette, In.

Symposium Internacional
de Percepcion Remota
August 5-14, 1981
Universidad Tecnica Federico
Santa Maria
Valparaiso, Chile

Workshop on Inplace Inventories
August 9-14, 1981
University of Maine,
Orono, Maine

XX General Assembly of URSI Open
Symposium on Remote Sensing
August 11-12, 1981
Washington, D.C.

AIAA Aircraft Systems
and Technology
August 11-13, 1981
Dayton, Ohio

IAMAP Third Scientific
Assembly
August 17-28, 1981
Hamburg, W. Germany

Seventh International Joint
Conference on Artificial
Intelligence
August 24-28, 1981
University of British Columbia
Vancouver, B.C.

Symposium on North Sea
Dynamics
August 31 - September 4, 1981
Hamburg, W. Germany

International Remote Sensing Workshop
Applications in Vegetation Assessment
and Land Use Planning
August 31 - October 29
USGS
Sioux Falls, SD

Landsat '81: The Second Australian
Landsat Conference
August 31 - September 4, 1981
Australian Academy of Science
Canberra, Australia

Congress and Twelfth Assembly of
the International Commission for
Optics
August 31 - September 5, 1981
Graz, Austria

Thermosense IV
September 1-4, 1981
Government Conference Centre
Ottawa, Ontario

International Conference on Digital Signal Processing
September 2-5, 1981
Florence, Italy

32nd Congress of the International Astronautical Federation
September 6-12, 1981
Rome, Italy

XVII IUFRO World Congress
September 6-17, 1981
Kyoto, Japan

Colloque International: Signatures Spectrales d'Objets en Télédétection
September 8-10, 1981
CNES
Avignon, France

Annual Congress on Surveying and Mapping
September 8-11, 1981
ASP
San Francisco, Calif.

Seventh Canadian Symposium on Remote Sensing
September 9-11, 1981
CASI
Winnipeg, Manitoba

ASP-ACSM Fall Technical Meeting
September 9-12, 1981
San Francisco, CA

Remote Sensing for Land Use Inventories
September 14 - October 2, 1981
ISPRA/EARSeL
Ispra, Italy

Meeting on Handling of Soil Data
September 14-17, 1981
Paris, France

International Conference on Engineering in the Ocean Environment (OCEANS)
September 15-18, 1981
IEEE
Boston, MA.

October - December, 1981

Electronic and Aerospace Systems Convention (EASCON)
October 4-7, 1981
IEEE
Washington, D.C.

Land Use Planning and Environmental Applications
October 5 - Novermber 6, 1981
USGS
Flagstaff, Arizona

Fourth Conference on Hydrometeorology
October 7-9, 1981
AMS
Reno, Nev.

International Geological Correlation Programme (IGCP) Workshop on Remote Sensing and Mineral Exploration
October 13-24, 1981
Nairobi, Kenya

Pecora VII Symposium
October 18-21, 1981
AAG/USGS
Sioux Falls, SD

Optical Society of America National Meeting
October 26-30, 1981
Kissimmee, Fl.

Remote Sensing of Arid and Semi-arid Lands
November 3-9, 1981
ERIM
Cairo, Egypt

Geographical Information Systems and Remote Sensing
November 12, 1981
Remote Sensing Society
Swindon, U.K.

20th Conference on Radar Meteorology
November 30 - December 3, 1981
Boston, Mass.

Soils Workshop
December 7-11, 1981
LARS/Purdue University
West Lafayette, In.

AGU Fall Meeting
December 7-11, 1981
San Francisco, Calif.

Matching Remote Sensing Technologies & Their Applications: international conference
December 16-18 1981
Remote Sensing Society
London, Eng.

January - March, 1982

Digital Image Processing
February 8 - March 5, 1982
USGS
Flagstaff, Arizona

12th International Congress of
Soil Science: Managing Soil Resources
to Meet Challenge of Mankind
February 8-16, 1982
New Dehli, India

ACM Annual Computer
Science Conference
February 9-11, 1982
Indianapolis, Ind.

April 1982 -

Conference on Lasers and
Electro-Optics (CLEO)
April 14-16, 1982
Phoenix, Arizona

XXIV Plenary Meeting COSPAR,
including Symposium on Changes
in the Earth's Surface as
revealed by a Decade of
Observations from Space
May - June, 1982
Ottawa, Ontario

Symposium on Hydraulic Applications
of Remote Sensing and Remote Data
Transmission
July 19-30, 1982
Exeter, U.K.

Joint Oceanographic Assembly
August 2-13, 1982
IOC-UNESCO
Halifax, N.S.

If there are subject areas which you would like to see covered, conferences which have been missed or upcoming conferences which you are aware of or for further information contact:

Canada Centre for Remote Sensing,
TIS (Lidia Taylor),
717 Belfast Road,
Ottawa, Ontario. K1A 0Y7
tel. (613) 995-1210

THE BOOKSHELF

Canadian Symposium on Remote Sensing, 6th, Halifax, N.S., 1980
Available from: CASI,
Suite 60, 75 Sparks St., Ottawa, Ontario
K1P 5A5

International Symposium on Remote Sensing of Environment,
14th, San Jose, Costa Rica, 1980
Available from: ERIM, P.O. Box 48107,
An Arbor, Michigan
USA, 48107

The contribution of space observation to water resources management / edited by V.V. Salomonson and P.D. Bhavsar - Oxford: Pergamon Press, 1980

Coastal and marine applications of remote sensing: proceedings of the Sixth Annual Conference of the Remote Sensing Society, Dundee, December 18-19, 1979 / edited by A.P. Cracknell - Reading, England: the Remote Sensing Society, 1980
Available from: The Remote Sensing Unit, Dept. of Civil Engineering,
University of Aston, Gosta Birmingham B4 7ET, England

Remote sensing application in agriculture and hydrology/edited by Georges Fraysse - Rotterdam: A.A. Balkema, 1980

International Radar Conference, Arlington, Virginia, April 1980 Available from: IEEE Aerospace and Electronic Systems Society,
345 East 47th Street, New York, USA 10017

Remote sensing in geology / edited by Barry S. Siegal and Alan R. Gillespie - Toronto : Wiley, 1980

Remote sensing and mineral exploration / edited by W.D. Carter,
L.C. Rowan and J.F. Huntington - Oxford, England: Pergamon Press, 1980