



Ground Penetrating Radar

by Harry Jol, University of Calgary

Ground Penetrating Radar (GPR) is a subsurface mapping technique which has been in use by University of Calgary geomorphologists for the past three years. Unlike seismic and sonar reflection profiling (which rely on sonic waves), GPR relies on electromagnetic radio waves in the 1 to 1000 MHz frequency range. The radar waves are emitted and received and processed into profiles by a proprietary radar system known as a pulseEKKO IV™.

GPR has a wide range of applications in archeology, civil engineering, and earth science. Ground profiles may be used to delineate the water table, frozen/unfrozen interfaces, subsurface depositional features in soil and bedrock, and geological topography and structure. The technique has been most effective (resolution and depth of penetration) in dry or wet (freshwater) clean (no silt or clay) silica sand and gravel deposits. Considering time and cost effectiveness, portability, and resolution in assessing the shallow sub-surface stratigraphy of sand, gravel, and organic deposits, GPR is unrivalled by any other ground sensing technology.

Harry Jol, a PhD student, and Professor Derald Smith (University of Calgary) have carried out over 200 field experiments on modern and pleistocene deltaic, fluvial and coastal deposits. Interpretation of radar facies from GPR profiles has allowed the recognition of distinct regimes of sedimentation which will aid in developing models of deposition.

Above: GPR profile of the wave influenced William R. Delta, Saskatchewan.

Below: Interpreted line drawing based on analysis of GPR profile above.

Modified from H.M. Jol and D.S. Smith (1992) "Ground Penetrating Radar of Northern Lacustrine Deltas" *Canadian Journal of Earth Science* 28:1939-1947.

Capilano College, North Vancouver, March 19-21

Canadian Regional Science Association

Third Annual Student Paper Competition

The deadline for student papers is March 31, 1993. Papers should be about 20 pages in length and will be judged by a panel of CRSA members. The panel will announce the winning paper during the annual meeting in Whistler, July 11-14. (For more information see page 7.) As well as garnering a \$100 prize, the winner will be encouraged to submit a version of the paper for publication in the *The Canadian Journal of Regional Science*. Entries should be submitted in five copies to:

Dr. Claude Marchand, I.C.U.R.R.,
150 Eglinton Avenue East, Suite 301,
Toronto, Ontario, M4P 1E8

Programs Merge to Create Waterloo-Laurier Graduate Program in Geography

Existing graduate programs at the University of Waterloo and Wilfrid Laurier University have been combined to create a joint faculty complement of 40 making it one of the largest in Canada. Students will register at one of the two universities but will then be able to take advantage of facilities, courses, and faculty at both institutions. Dr. Barry Boots at Wilfrid Laurier will be the director of the new program.

The Newsletter of the Western Division, Canadian Association of Geographers is currently edited and printed at the University of Lethbridge.

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Contributions are welcome. **The submission deadline for the Autumn issue is August 15, 1993.**

Acknowledgements

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The Editor's Mail Bag

Thank you for your letter dated September 8, 1992, in which you point out the importance of including Geography in the Social Studies curriculum. I appreciate the copy of the *Newsletter of the Western Division, Canadian Association of Geographers*. The article, "Ministry of Education's Curriculum Revision Threatens Geography" (September 1992 issue) outlines the author's perceived threats to the inclusion of geography in the curriculum.

Although the Curriculum/Assessment Frameworks are quite general, future curriculum development would certainly involve members of the social studies Curriculum/Framework Committee. This committee is the same as the "reviewing team" to which Ms. North refers. Although there is no professional geographer on the committee neither is there an historian, political-scientist, lawyer, economist, sociologist, anthropologist nor ethnographer. For a committee to be truly representative of the disciplines and of teachers it would be quite large. I am sure you are aware of the difficulties in conducting a writing committee on reflecting of many disparate view.

Ms. North states her concerns "are being neglected in developing the Social Studies Framework Document". This judgement may be premature since the Framework has not yet been finalized by the committee let alone made public.

The article will, I hope, encourage your members to review the Framework. There will be a response form in the published Framework and comments based on the included form or otherwise are appreciated.

Robin Syme, Director
Curriculum Development Branch
Ministry of Education
Province of British Columbia

Interesting Question...

A 1988 Gallup Poll found that only 32 percent of a national sample of U.S. adults could locate Vietnam on a world map. Considering the eight year war ended only fifteen years earlier, this seems incredible. Even more stunning is a *Washington Post* report that one third of the adults surveyed did not know whether the U.S. fought on the side of North Vietnam or South Vietnam ("From Geography in the News", by Neal Lineback, NCGE Newsletter). In view of Canada's greater reliance on international trade, one wonders whether Canadians would fare better in such surveys. And considering the provincial differences in the emphasis given to geography in secondary school curricula, are there regional differences in geographic

literacy?

Canadian Cartographic Association

The CCA provides for the exchange of ideas and information in all mapping related fields including GIS at regional to international scales via meetings and publications.

Regular membership is \$70; student membership is subsidized at \$35 per year. This includes 4 issues of *Cartographica* (worth about \$35 alone), 4 issues of the newsletter *Cartouche* and news of meetings including the annual meeting which will be held in Winnipeg June 3-6, 1993 close at hand for westerners.

Student Members might note the following extra advantages: Travel assistance to annual meeting if presenting a paper; Best student paper award at Winnipeg; Norman Nicholson Scholarship (awarded annually), worth \$500; President's Prize Map competition, with prizes valued up to US\$300.

For further information contact Roger Wheate, Geography Department, University of Calgary, Calgary, T2N 1N4.
Tel: (403) 220-4892 or see your local contact:
U. of Victoria: Peter Keller, Diana Hocking
UBC: Brian Klinkenberg
Simon Fraser: Tom Poiker, Martin Feuchtwanger
U. of Alberta: Ron Eyton
U. of Lethbridge: Rod McNaughton
Lethbridge Community College: Don Taylor

Statistics Canada Axes Urban Atlases

In December Statistics Canada announced that the entire Metropolitan Atlas Series will be cut from the 1991 Census Program. This decision came as a direct result of spending cuts announced in the last budget. None of the twelve volumes that had been planned by the Geography Division will be published. This is especially disappointing since the 1991 Atlas Series was to be the first that used contributions from professional geographers in each of the 12 metropolitan areas.

UNESCO Environmental Materials

The International Environmental Education program of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) has produced a series of publications for teachers of environmental issues. These include modules on urban environmental problems, resource conservation, pedagogical materials for developing an environmental education program, and their newsletter, *Connect* which is geared to environmental educators. To get on the mailing list and learn more about these materials contact: A. Ghafoor

Ghaznawi, Chief, Environmental Education Unit, UNESCO, 7, Place de Fontenoy, 75700 Paris, France.

Alberta Geomorphological Field Group Attracts Record Crowd

By John Shaw, University of Alberta

The Alberta Geomorphological Field Group (AGFG) gathered in Delia for its Third Annual Meeting in late September. Present in the convoy were vehicles crowded with faculty and students from U of A, U of C, U of L, and GSC staff from Calgary. Rob Young and Tim Schowalter led the first day in the Hand Hills and adjacent area. Rob showed a number of stratigraphic sections with burrows beneath till. The stratigraphy with only one till, and dates on prairie dog remains beneath the till of around 22,000 years BP, led to considerable debate. This is not surprising considering the implications for the glacial history of this area. Rob also showed us a variety of landforms and sediments including bewildering deformation structures, classical periglacial features in Tertiary gravels (the gravels are Tertiary not the periglacial features), hummocky moraine and eskers. Of course Global Change is a must these days so we speculated at Little Fish Lake on warming and lake levels.

Bruce Rains and Darren Sjogren led the second day in the Coronation-Spondin area. This area was as controversial as the first. Megaflood was the theme word and we stood, surrounded by a vast landscape, trying to appreciate the scale of channels and scour zones on Irene Shetsen's magnificent maps, Landsat images, and Darren Sjogren's Digital Elevation Model (DEM). To some this was sound evidence for subglacial floods and the boulder lags, pendant bars, and eroded sandstone blocks were icing on the cake. Others who were not so convinced, were certainly given plenty to think about.

Ian Campbell led the final day discussing the late Quaternary geomorphology of Onetree Creek basin and the Red Deer River badlands. Again a regional approach was taken and beautifully illustrated by a Landsat mosaic. Large drainage events were shown to have scoured channels across some giant flutings. These channels are related to lake drainage events; boulder lags at Onetree Creek give a clear indication that these events followed glacial deposition in "preglacial" valleys. Once again the scale of the late-glacial landforms was awesome.

The AGFG Annual General Meeting took place in the Patricia Hotel. The one item of business was quickly concluded and it was agreed that Derald Smith would lead the next trip will to the Anastomosing Rivers in the Rocky Mountain Trench. Gerry Osborne showed the wisdom of Solomon in thanking the leaders.

Editor's Note: Full details of the AGFG Fourth Annual AGFG Field Trip will be provided in the Fall issue of the *WCAG Newsletter*.

College and University News

University of British Columbia

A number of hard working faculty have had their achievements recognized and honoured in recent months. Trevor Barnes was awarded a U.B.C. Killam Research Prize, John Stager was elected a Fellow of the Arctic Institute of North America, and Alf Siemans was presented the Carl O. Sauer Distinguished Scholarship Award by Conference of Latin Americanist Geographers. Wang Yaolin, a Ph.D. student, was awarded an International Development Research Centre Young Canadian Researcher's Award which allowed him to conduct field work in China.

David Edgington's *Japanese Direct Investment in Canada: Recent Trends and Prospects* has been published in the BC Geographical Series. Alf Siemens will lead a new third year field course to Southern California between May 10 and May 23.

University of Alberta

Dr. Martin Sharp (Cambridge) will be joining the department in September 1993. Martin is a geomorphologist with research interests in glacial hydrology and ice sheet modelling and he is very keen on attracting new graduate students to work on two separate research projects.

Ed Lozowski has received an \$80,000 Strategic Equipment grant from NSERC to study and simulate the dynamics of ship icing. Trevor Bell (Ph.D., Fall 1992) was awarded a Post Doctoral Fellowship at McGill University for 1992-93 and Joseph Oppong (Ph.D., Fall 1992) is now an Assistant Professor in the Department of Geography, University of North Texas in Denton.

University of Calgary

In September, 1991, the Department welcomed a new faculty member, Miriam Grant (Ph.D. Queen's). Miriam is an Africanist whose research interests include low income rental housing in Zimbabwe, third world cities and under development. In other faculty news, Nigel Waters and Michael Coulson were promoted to Full Professor in 1990 and 1992, respectively. Steven Franklin is the new Graduate Coordinator and Dianne Draper is undertaking the Undergraduate Coordination while Peter Herrem is on sabbatical.

Art Limbird continued his CIDA-supported subcontract research in the West Indies. As part of the Forestry Management Plan for St. Vincent and the Grenadines, Art has recently published two papers on land use and soils in St.

Vincent.

The Department has recently acquired two new University Computer labs. One, housed in the Department, consists of 25 Macintosh IIVX computers, networked with a file server and laser printers. The other lab includes 12 IBM RISC 6000 Unix work stations.

From June 9 to 12, 1992 the Department held the 27th Annual Meeting of the Canadian Transportation Research Forum in Banff. Nigel Waters organized the conference program which attracted about 125 participants from academia, government and industry. Some 45 papers were presented and are available as the Conference Proceedings from Gail Sparks, CTRF Secretariat, 2220 Avenue C. North, Saskatoon, Sask., S7L 6C3, for \$50.00.

Currently there are about 34 graduate students in residence or in program. Many have received scholarships and fellowships, including Ivan Townshend who is the recipient of a Canada Mortgage and Housing Corporation Graduate Scholarship (1991-92), a Province of Alberta Graduate Scholarship, and a Social Sciences and Humanities Research Council. Doctoral students and their thesis topics include:

Barge, Judith - An environmental history of the Bow River at Calgary 1884-1994.

Fisher, Timothy G. - Glacial Lake Agassiz: The northwest outlet and paleoflood.

Giles, Philip - Change detection using satellite data.

Jol, Harry M. - Ground penetrating radar (GPR): A subsurface modelling concept.

Kane, Karen - Application of GIS to black bear management in Banff National park.

Mahoney, John M. - Geomorphic and hydrologic effects on regeneration of poplars on river floodplains in southern Alberta.

McNicol, Barbara - Visual quality assessment for tourism land use.

Rieger, Monika - The perception of cartographic screen images utilizing GIS.

Townshend, Ivan - Retirement housing: An environmental quality profile.

Weber, Lena - Drought during the 1930s and 1980s in the Canadian Prairies.

Yeboah, Ian E. A. - Urban systems economic structures in Ghana: 1960-84.

Young, Robert R. - Late Pleistocene gravel valley fills in the Edmonton area, central Alberta.

continued on p. 5

University College of the Fraser Valley

UCFV continues to attract many more students than it can accommodate, typical of most post-secondary institutions in B.C. It has now added and offered three new third year courses (Cultural, Historical, Urban) and hopes to offer more next September (Biogeography or Geomorphology).

One more full-time faculty member will be added this spring, a physical geographer with major interests in geomorphology and/or biogeography. This will bring UCFV up to four full-time faculty and three regular sessional instructors.

The Department has set up a small MacIntosh lab at the Abbotsford Campus and will continue to expand in this area as resources permit. Doug Nicol is adding a small GIS module to the cartography course and increased computerization of the physical geography labs at both campuses is planned.

The Department is sponsoring a four-session lecture series on issues in suburbanization (geographical colleagues Walter Hardwick and Len Evenden are among the speakers) for the spring at the Abbotsford Campus, a session arranged by our new faculty member, John Belec. David Gibson is the new department head of the Department of Geography and Economics. This combination is an administrative convenience but functions well. David is involved in the Latin American Studies program and is currently planning a study tour to Mexico for May. Some spaces may still be left.

University of Idaho

Piotr Jankowski and Curtis Thompson received a \$28,500 National Science Foundation Grant to develop a new computer laboratory for teaching GIS, digital cartography, and remote sensing. This will be augmented with \$30,000 from the College of Mines and Earth Resources.

The grants will help to fund the department's new B.S. Cartography Program. The new program consists of 50% geography and cartography courses, 30% computer science and math courses, 10% engineering, and 10% other disciplines.

The third issue of the brand new *Green Library Journal: Environmental Topics in the Information World* was recently published by the Green Library of Berkeley, California. Edited at the University of Idaho, it covers environmental topics of relevance to the information sciences including libraries and publishers. Among the articles in this issue is Frederick W. Stoss' description of the Carbon Dioxide Information Analysis Center at Oak Ridge National Laboratory, Andrea Hagan's bibliography on environmental management in the former Soviet Union, Christopher Dodge's list of alternative environmental periodicals, Paul Lindholdt's "Range Wars: An Essay on the Environmental Impacts of Livestock Grazing on Public Rangelands in the West" based on the North Cascades of Washington.

The Green Library is a non-profit organization founded in 1986

to establish a network of interdisciplinary information centers in environmentally-degraded and information-poor countries.

Kwantlen College

The winter and spring of 1993 should prove to be very busy around the department. We are still getting used to our new campus in Richmond and dealing with the teething in of heating systems and new computers. The new challenge for the next few months will be the coordination of timetabling and scheduling for not two but three campuses. Our Langley campus, offering a range of first year geography courses, is slated for opening in the spring of 1993. This will require the already mobile faculty to become even more mobile, as most of us will be required to teach on at least two if not three campuses. A potential full time physical geography position is being proposed as a solution to our ever increasing teaching needs. This would mean an expansion of the full time faculty to four geographers and one geologist.

University of Lethbridge

With the hiring of Yanni Xiao as its GIS specialist and the development of new methodology courses, the U of L is gradually developing its GIS and cartography laboratory facilities. Thanks to support from the Faculty of Arts and Science and the Geography Department, more computers and software have been purchased to meet the new teaching requirements and to keep our pace with the rapid development of new technologies.

Currently, three GIS programs (OSU-Map, SPANS, and PAMAP), one mapping package (SPANS MAPS), and one drawing package (CorelDraw) are up and running on seven PCs which are networked to the University's mainframe computer. These programs will be used by at least six courses (in GIS, cartography and soil science) offered in the department. The Lab is also being used by students working on their independent studies and by researchers from other Faculties such as management.

Students in GIS courses find it very helpful to be able to get their hands on different systems so that they can get a better understanding of various concepts such as different data models, user interfaces. Cartography students are now able to design and draw most of their maps by using computers in their lab work.

The lab also serves as a training site for non-credit GIS workshops which are operated by the software vendors. Our next step? More computers and more peripherals!

Malaspina College

Malaspina College Geography Department is currently in the second year of a three year plan to introduce the appropriate use of GIS throughout the instructional curriculum. In the first year the faculty started the immersion process by developing a

facility with TerraSoft. The second year has seen the "toe-in-the-water" introduction of occasional GIS activities into some courses. The Spring '93 semester will be the first to see all first year students experiencing at least one GIS lab.

By next year Malaspina will have a GIS component in all courses at all levels. We are quite encouraged by the establishment of a centre at the college for the computer-based support of those disciplines that use spatial representation. This initiative will benefit many departments from Aquaculture to Zoology. We are down-playing the explicit geography content and will let our colleagues discover the usefulness of the tool before we reveal that they are engaged in just regular old Geography with an electronic assist.

The acronym of the centre (ACCESS) is much more manageable than its formal name: Applications Centre for Computer-based Environmental Spatial Systems. The primary goal of the ACCESS Project is to support educators in the use of computer based spatial tools by: collecting and disseminating information about relevant software and courseware, developing courseware related to classroom exercises, and providing training support.

The ACCESS Project can already list three achievements:

1. The College formally designated the facility as a Centre to provide a focus for future activities.
2. We obtained funding for a GIS training workshop for 14 Malaspina instructors to be conducted Spring '93. The instructors represent a wide range of disciplines from Sociology, Criminology, and Anthropology, to Aquaculture, Resources Officer Training, Biology, Forestry and Geography. Additional provincial funding was obtained for a GIS training workshop for 14 BC college instructors (Geography/Forestry) to be held in May.
3. We obtained a commitment to retain a GIS consultant to support the start-up phase of the ACCESS activities.

Trinity Western University

The Department of Geography has two full time faculty, Lance Werner (Ph.D., Washington) and Carl Tracie (Ph.D., Alberta), assisted by two part-time instructors, Cherie Enns (Ph.D. Candidate, Simon Fraser) and Bruce Prior (Ph.D., Simon Fraser). Some 275 students per semester enroll in geography courses including about 75 with a major or minor in geography, many of the latter in the education program.

Lance Werner (Russia, Eastern Europe) and Bruce Prior (GIS) took a group of 30 students to the Pacific Coast Geographers meetings at Western Washington State University in September. Lance is preparing to lead a study tour to Russia in the spring of 1993.

Carl Tracie (ethnic settlement, historical) has returned from a semester's sabbatical leave devoted to research for a monograph on Doukhobor village settlement in Saskatchewan.

University of Washington

The University of Washington welcomes a new faculty member, Katharyne Mitchell, who is just finishing her doctoral dissertation at UC Berkeley. Mitchell specializes in international investment and its impact on urban forms as well as issues related to cultural symbolism, social theory, capitalism, and racism. Her dissertation deals with reactions to the influx of capital into Vancouver, B.C. from Hong Kong in the 1980s. She earned her BA in Art and Archeology at Princeton and received her MA from UC Berkeley in Geography. She has worked as a junior high school teacher, journalist, and quality control engineer at a caviar factory in northern Heilongjiang Province of the People's Republic of China.

In faculty research news, Bill Beyers has been awarded a three year \$225,000 grant from the National Science Foundation to study the development of producer service firms in the U.S. between 1975-1990. Nick Chrisman has been awarded a grant for "Vector Comparison Studies of Forest Land Mapping" by the California Department of Ecology through UC Santa Barbara. David Hodge received a \$130,000 grant from the Washington State Department of Transportation to study alternative performance measures for public transportation. Vicky Lawson is doing research through the Winter Quarter as a result of winning the University of Washington's prestigious faculty Scholar Award. Kam Wing Chan has had a manuscript on urbanization in China from 1949 - present accepted by Oxford University Press.

Quotables from *Edge Cities*

"Show me a man over 30 who regularly takes the bus and I will show you a life failure" - Mass Transit Official (p. 130).

"Confronted with the Blade Runner landscape of North Dallas...the Dean [of Harvard's Graduate School of Design] went into the intellectual equivalent of the fetal position" (p. 220)

"Everybody...[wants] trees and bunnies and birds, okay? And that's why we put two swans out there and feed the damn ducks so all the frigging geese and ducks come around and people say, "Gee I work out in a place where they have paths and running tracks, ponds, birds. Do you have a running track where you work?" - a developer (p. 376).

"Master planned community... it doesn't mean anything more than a marketing term" - developer of Irvine California (p. 301).

Extracted from Michael Poulton's review of *Edge City: Life on the New Frontier* by Joel Garreau (Doubleday, 1991). Extracted from *Plan Canada*, January, 1993, pp. 37-38).

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Forthcoming Meetings

Alberta Association, Canadian Institute of Planners 1993 Conference: The Land-Water Interface. May 13-16, 1993, Medicine Hat

The AACIP's annual conference: "Integrating Land Use and Water Resource Planning" will be held in Medicine Hat, Alberta from May 13 to 16, 1993. For further information contact: Steve Welling, Southeast Alberta Regional Planning Commission, 623-4th Street, Medicine Hat, Alberta, T1A 0L1. Tel: 527-3326, Fax: 528-2493.

Canadian Association of Geographers 1993 Annual Meeting, May 30-June 3, Carleton University, Ottawa

The Annual CAG Meeting will be held in conjunction with the Learned Societies Conference in Ottawa to mark the Fiftieth Anniversary of the founding of Carleton University. Along with the usual paper sessions and social events, field trips are planned to witness some local sites of historical interest in Perth and Ottawa, explore the Karst Geomorphology of Gatineau Park, and to visit either Statistics Canada or the Canadian Centre for Remote Sensing.

Early June is a spectacular time to visit Ottawa. Millions of tulips should be in bloom to mark the annual Tulip Festival and the weather is just about perfect. If you have not already received the Call for Papers, contact: Ken Torrance, Geography, Carleton University, Ottawa, Ontario, K1S 5B6. Tel: 788-2600, Fax: 788-4301.

Abstract Deadline: February 28, 1993

Innovative Housing '93

A World Conference on Advanced Housing for Energy Efficiency and Environmental Responsibility. June 21-25, 1993, Vancouver

For further information contact: Darinka Tolot, Conference Coordinator, Energy Mines and Resources Canada, 580 Booth Street, Ottawa, Ontario, K1A 0E6 Tel: 943-2259, Fax: 996-9416.

Canadian Regional Science Association 17th Annual Meeting, July 11-14, 1993, Whistler, B.C.

These meetings will be held in conjunction with the **Thirteenth Meetings of the Pacific Regional Science Conference Organization** and provide the opportunity of contact with a large group of regional scientists. The abstract deadline has passed but submission of complete papers may still be possible. Contact: John Munro, Economics, Simon Fraser, Tel: 291-3927, Fax: 291-5876.

