



April 1991

c/o Department of Soil Science
University of British Columbia
Vancouver, B.C. V6T 1Z4
(Tel: 822-2783; FAX: 822-8639)

EDITORIAL COMMENTS

Greetings! We've finally dug our way out of a barrage of submissions to the newsletter and here is the spring issue. The 14th B.C. Soil Science Workshop, sponsored by the PRSSS was a huge success, and the panel discussion on the Future of Soil Science inspired several of the articles in this edition of the newsletter. Some of the issues raised will be addressed in future editions of the newsletter as well.

At this time of year, many of us emerge from our winter "dens" and head for the field. As you pursue your individual investigations this summer, how about putting some thoughts together about the "big picture" and composing a few lines for the fall edition? Deadline is September 15th.

Thanks to all who contributed to this issue. Have a good summer!

Marcia Monreal
Chuck Bulmer
Bill Price

Hot Tips from the Latest Executive Meeting - March 18, 1991

Geoff Hughes-Games, President
Eveline Wolterson, Vice-President
Paul Sanborn, Secretary
Barbara Cade-Menun, Treasurer

The four members of your executive had a lonely meeting in the Ministry of Agriculture and Fisheries (Cloverdale Office) to discuss the PRSSS program for the coming year and to wrap up the 1990 year. So here's some hot tips from that meeting.

We were very pleased with the participation and the positive feedback of those who attended the 14th Annual Soil Science Workshop held during the reading break at the end of February. Thank you very much for attending and especially to those who contributed in presentations, the panel discussion and general support.

The consensus at the AGM was that the PRSSS would host the Soil Science Workshop again and so we have decided due to the underground recommendations that have been surfacing around us, to make "Soil Ecology" the theme of the 15th Workshop. There are lots of angles to this one: soil and plant fertility, plant pathology, bio-remediation of contaminated soils, nutrient cycling, etc., etc. There should be lots of interest in all areas of soil science. If you have any great ideas, would like to help organize, give a talk, make a poster presentation, or what-have-you, please contact Barbara Cade-Menun at the U.B.C. Soil Science Department, 2357 Main Mall, Vancouver, B.C. V6T 1Z4 (Tel. 822-2783; FAX 822-8639).

You will find attached two copies of the PRSSS registration form. If you have not paid your annual membership dues, please take the time to fill out one of these forms and bring your membership up to date. If there is anyone you know who would like to register or who has let their membership slide, why not fill one out for them as well? Membership is a paltry \$5 per year and to make things easier, you can pay for a four-year membership for \$20. What a deal! Unfortunately, we will have to drop your name from the membership list if you cannot keep your membership current, as it is this money that pays for your newsletter and postage and WE NEED IT!!

Mark November 6th, 1991 on your calendar. This is the proposed date of the fall evening lecture series. We're not sure about the place, however, we anticipate an after-dinner program beginning with a short happy hour with a no-host bar and coffee/tea/treats, followed by three or four guest speakers and a question period. We thought the panel discussion at the Workshop worked well so maybe we will have a similar format for this. The topic? Environmental Ethics! So set the date aside and watch this newsletter for more details.

We are planning a field day this summer, possibly late June or early July. The scope and subject of this event has not been finalized, but it has been suggested that we may piggy back with a Soil and Water Conservation field day. We could cover a specific topic such as forestry, agriculture, contaminated sites, mine reclamation, whatever; or, we could have a field day in a related science such as geology or geomorphology or bio-resource engineering. We could do some, all or a combination of these. There has been some discussion as to what the membership wants in field days, or even if they want to have them at all. Your feed back on this or any of the above topics is welcome. You can address your comments to myself, B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C. V6S 2L2 (Tel. 222-5505, local 416 or FAX 224-0540).

Eveline Wolterson
Vice-President

14TH B.C. SOIL SCIENCE WORKSHOP

Chuck Bulmer

The 14th B.C. Soil Science Workshop, hosted by the PRSSS, was attended by 67 people. The technical sessions held on February 21 included several papers on soil degradation in forestry and agriculture. The causes of site degradation on forest lands were discussed by Steve Chatwin, Marty Osberg, and Bob Mitchell. While ground skiddings is the major cause of forest soil degradation, site preparation with blade scarification may have an adverse effect on site quality if not done carefully. These papers focussed attention on a potentially serious problem affecting forest productivity.

Soil degradation associated with land use change in the lower mainland was discussed by Gary Runka and Geoff Hughes-Games who described the erosion problems associated with removing forest cover on upland areas.

Sandra Burton described her experience with the Peace River Soil Conservation Association, and provided a positive outlook for soil conservation efforts in northern B.C. It was clear that a lot of hard work and imagination is necessary to convince farmers that soil conservation can pay, but preliminary results indicated that alternative tillage systems can be cost effective.

These presentations highlighted the problems that occur when resource management proceeds in the absence of a clear and consistent policy, as well as the potential for improving the situation through local efforts.

All the speakers did a good job, and their efforts were rewarded by enthusiastic response in the form of questions and applause.

The technical sessions warmed everyone up for a rousing discussion on "A Vision for Soil Sciences" on Friday, February 22nd. After a most interesting historical perspective presented by Les Lavkulich, the panel was convened. The "discussion questions" are presented below, and although soil scientists can vigorously debate profile interpretations, this group really got excited about the future of soil science. Questions from the floor explored the issues of ethics, legislation for soil conservation, the role of the public in resource related decision making, and education. The meeting finally broke up just before 1:00, and the hungry participants went off for lunch, then back to the various corners of the province.

The following list of discussion questions was sent to the participants in the panel discussion:

- What is the role of government in soils related issues? (regulatory agencies, setting standards, providing direction, land use issue, pollution).
- How are funding sources and mandates changing? (for research, contract work, consulting; who handles the funding; what implication does this have on employment opportunities and directions).

- What is the changing role of women in soil science? (or demographics in general -- native Indians, small town politicians, big town politicians, multi-national corporations).
- What kinds of jobs are being offered now that are different than before? How is the market-place dictating soil science jobs? (Government, consulting, contractors, extension work, education).
- What influence is the market-place having on soil science in general? (GATT, free-trade, Canada/U.S. relations, overseas contracts, tropical soils, polar soils, mountain soils, desert soils).
- How are universal issues such as environment, world hunger, poverty, foreign aid, population explosion, desertification, the 'end' of the cold war or the 'beginning' of a Middle Eastern war affecting the role of soil science locally and on a world scale?
- Soil science training. Should university curriculums be changed to reflect some of these issues? What kind of training do soils professionals need? Do we need more undergraduates, graduates, technologists?
- How has more sophisticated soil testing and the ability to handle larger data bases changed the direction of soil science? What do all these numbers really mean?
- What is professionalism in soil science? Are we apathetic in terms of involvement as a group? Should we have a professional designation? Do we care? Should we care? Who cares?

GRADUATE STUDIES IN SOIL FAUNA

A stipend is available for a Master's or Ph.D. student to continue work on determining the impact of clearcutting and forest type on the communities of soil micro-, meso-, and macrofauna. A background in biology with emphasis on invertebrate zoology is preferred but not essential. Please contact either Dr. Shannon Berch or Dr. Valin Marshall if you are interested in the position.

Dr. Shannon M. Berch
 Department of Soil Science
 UBC
 Vancouver, B.C.
 V6T 1Z4
 604-822-3716

Dr. Valin Marshall
 Pacific Forestry Centre
 Forestry Canada
 Victoria, B.C.
 V8Z 1M4
 604-388-0663

Soil Ecology Society Meetings, Corvallis, Oregon

From April 1-6, I was in Corvallis, Oregon, attending the Soil Ecology Society's 1991 meeting. The title of the meeting was "Soil Biodiversity and Function: Resolving Global and Microscopic Scales". A grandiose objective for the 118 people registered.

The meeting was divided into four sections; Macroscale Manipulations, Microscale Manipulations, Biodiversity of Soil Organisms and Applied Megascale Problems. Three to four speakers presented a variety of papers each morning followed by field trips, posters and workshops each afternoon. The most interesting activity was a discussion period at the end of each day. From 4:00-5:00 p.m. we would gather in a conference room and talk about the problems, difficulties, examples, etc. of the day's topics.

It took me a day or so to overcome the initial shock of seeing and/or meeting those people I'd been reading about for the last year and a half. Once the stars had left my eyes, I began to listen to the discussions and talk with other people about the ideas and objectives raised by the group.

Difficulties begin with the conceptualizing, sampling, and analyzing microhabitats from a "macro-being" perspective. Microscale studies require intensive work on a single component of a community or ecosystem. This type of work is alive and well in the scientific community. However, macroscale studies require a large number of people for both functional and taxonomic biology as well as long-term financial support and commitment.

The question of biodiversity was not "What is it?" but "Do we need it?" There is redundancy of function in all organisms some said. Surely the system could make do with fewer specialized species. The loss of a species with a small, specialized niche could be covered over by the presence of a generalist species but loss of that generalist species could result in irreparable damage to that system. Our lack of knowledge as to what level of biodiversity is needed to maintain a system does not afford us the luxury to decide this at the present time. Diversity is of little importance when considering the individual, however it is of great importance when considering the whole system. This requires the identification of individuals to the species level which supplies a source of cumulative information. By limiting identification to higher levels such as order, class or family you lose valuable information about the system.

The time has come for us to decide what should be monitored now so that we can establish a baseline for the future and create a large data base. Canada missed out a valuable opportunity with the International Biological Program in the 1970's. We are twenty years behind. We are going to require long-term, integrated research projects which will allow for identification of species, habitats, species ecology, life histories, impacts and processes within systems. In such a large undertaking many people will be required to examine all the parts of the system. These researchers must be able to look at their favorite organisms and then be able to step back and fit it into the "big picture". The scientific infrastructure must change its views on co-operation and integration of research projects. This is the only way to develop extensive and valuable data bases for now and the future.

The greatest task in front of us is the education of the public. People must be made aware of the value of biodiversity and a stable ecosystem. To make this point we might have to place some type of economic value on the services provided by these systems such as cleaning air and water. Furthermore we must show that we are not above these systems but a part of the whole. By altering species populations and communities based on our sparse amount of information or allowing ecosystems to decay we may be creating conditions inappropriate for us to exist in!

Overall the meeting provided an excellent opportunity to see what is being done in soil ecological research. It also provided us with a chance to discuss where research should be heading in the future. A synergistic effort between ecologists and taxonomists is required to develop basic research questions which can have immediate application in outdoor systems and create a scientific community which prides itself in co-operation and integration of the parts to produce a global perspective.

Jeff Battigelli
Dept. of Soil Science
U.B.C.

CLEAR-CUT OLD GROWTH CEDAR AND LIFE UNDERGROUND

On the B.C. coast, old stands dominated by western red cedar build up thick layers of slowly decaying organic matter. After clear-cutting, young cedars grow slowly in this material and western hemlock ceases growth after a few years. Salal, which is well represented in the old growth stands, begins quickly to dominate the cutblocks. On adjacent sites which have been subjected to the soil mixing and accelerated decomposition resulting from periodic and widespread windthrow, growth of planted and naturally regenerating hemlock is very good.

A team of researchers from Forest Science and Soil Science at UBC are cooperating with Western Forest Products, MacMillan Bloedel and Fletcher Challenge Canada under an umbrella research consortium with the acronym SCHIRP (Salal/Cedar/Hemlock Integrated Research Program) to determine the causes of the seedling check and its remediation. The research is being jointly funded by NSERC (Natural Sciences and Engineering Research Council of Canada) and the forest companies.

Our subgroup, the soil biologists, is addressing how the soil fauna, fungi, and rhizosphere bacteria might contribute to the problems and the solutions. We are determining the extent of changes to the soil fauna communities: a) due to clearcutting, and b) in the two different forest systems, the one dominated by old cedar and hemlock and the other by hundred-year old hemlock and amabilis fir (Jeff Battigelli, M.Sc. candidate). We are assessing whether the nutritional capabilities of ericoid mycorrhizal fungi give salal the upper hand in accessing soil N and P over the ectomycorrhizal fungi of hemlock (Guoping Xiao, Ph.D. candidate). We will be looking for rhizosphere bacteria, N-

fixing or otherwise, that might improve the performance of hemlock or explain the dominance by salal (Silvia Gonzalez, Ph.D. candidate). We will explore innovative ways of determining the forms of P in these forest soils and their availability to salal, cedar, hemlock and their fungal associates (Barbara Cade-Menun, Ph.D. candidate). As the work progresses, we hope to explore the interactions between these soil organisms in regulating the growth of their plant associates.

Dr. Shannon M. Berch
Soil Science, UBC

GIS '91, "Applications in a Changing World"

GIS '91, the fifth annual International Symposium on Geographic Information Systems was held at the Vancouver Trade and Convention Centre from February 12 to 15. The symposium has been called "the world's premier GIS event of 1991 for forestry and natural resource management applications". Participants were mainly foresters and managers from industry, government and consulting companies with some people from academic institutions.

The Symposium objectives were to:

- review the present state of the art of GIS
- ensure the exchange of expert views, particularly of those currently using the technology in a forestry setting
- provide a forum for discussion between experts and decision makers
- present the latest developments in techniques for evaluating GIS options.

Pre-symposium workshops were held on Feb 12, including: introduction to GIS; GIS management and operations; knowledge-based systems in forestry; digital remote sensing; global positioning systems; and optimizing GIS conversion strategies. These were all-day sessions which gave the participants time to obtain a thorough coverage of the subjects.

The official symposium opening was held on Feb. 13 with a keynote address by Jack Dangermond (President of ESRI, ARC/INFO, and the "father of GIS") who addressed the question: "Where is the Technology Leading US?". Over the course of the symposium, 75 papers were presented during plenary and concurrent sessions. Session titles include: forest management - industrial experiences; forest management - wood supply and harvesting; international forestry applications; engineering and industrial applications; corporate GIS; and municipal applications of GIS. Symposium proceedings have been prepared and were made available to participants.

An Exhibition and Trade Show ran concurrently with the Technical program. Over 200 leading vendors of computer software and hardware, GIS systems and services participated in the trade show. This enormous show was very impressive and gave the participants an amazing opportunity to access the latest developments in the GIS field.

GIS '91 was sponsored by Forestry Canada with major participation by the Digital Mapping Group Ltd., Reid, Collins and Associates and the Province of British Columbia. Hans Schreier of the Department of Soil Science, UBC was in charge of the technical program. Many students from SFU, UBC, and UVic worked as volunteers and in exchange were able to attend the symposium.

GIS '91 was clearly a success. It was well attended, with over 700 registrants for the technical program and many more attending the Trade Show. One of the main messages of the symposium was: GIS is here, it is being developed at a very fast rate and its role in forestry and natural resource management will continue to become ever more important. It is essential that people in natural resource management keep up with this fast expanding GIS field. A vital question in all of this is: should we, as natural resource managers, not be leading the technology, rather than letting the technology lead us?

GIS '92 will be held in mid-March of 1992 at the Vancouver Trade and Convention Centre.

Margaret G. Schmidt
Department of Soil Science
University of British Columbia

A SOIL CHARTER FOR BRITISH COLUMBIA

The Future of Soil Science in British Columbia was discussed at the 14th BC Soil Science Workshop, held at UBC, February 1991. The issues, concerns and aims raised by the panel and the audience resulted in a spirited and wide ranging exchange of ideas. It is interesting to note that many of these points are also embodied in the Twelve Guiding Principles of the European Soil Charter signed in 1972. These simple statements reflect what we as dedicated soil scientists in an increasing complex world, try to achieve.

Excerpt from *Quality as Well as Quantity*, by H. Hacourt, *Naturopa*, No. 65, 1990.

The 12 guiding principles of the European Soil Charter, which all those in positions of responsibility, at whatever level, must endeavour to apply in the sphere of their activities, were adopted by the Committee of Ministers in 1972.

Described in a few strokes, the Charter can be said to cover the notion of soil as a limited resource, its appropriate use by farming, forestry, urban development and construction, methods for its protection (inventory, scientific research, interdisciplinary cooperation, teaching and information) and the responsibility of governments and those in authority.

The European Soil Charter, now 18 years old, is still, unfortunately, a topical issue. It is perhaps even more topical today than in 1972 since environmental problems, particularly those concerning natural resources are now, in 1990, even more acute on account of the dramatic growth of our industrial society.

1. Soil is one of humanity's most precious assets. It allows plants, animals and man to live on the earth's surface.
2. Soil is a limited resource which is easily destroyed.
3. Industrial society uses land for agricultural as well as for industrial and other purposes. A regional planning policy must be conceived in terms of the properties of the soil and the needs of today's and tomorrow's society.
4. Farmers and foresters must apply methods that preserve the quality of the soil.
5. Soil must be protected against erosion.
6. Soil must be protected against pollution.
7. Urban development must be planned so that it causes as little damage as possible to adjoining areas.
8. In civil engineering projects, the effects on adjacent land must be assessed during planning, so that adequate protective measures can be reckoned in the cost.
9. An inventory of soil resources is indispensable.
10. Further research and interdisciplinary collaboration are required to ensure wise use and conservation of the soil.
11. Soil conservation must be taught at all levels and be kept to an ever-increasing extent in the public eye.
12. Governments and those in authority must purposefully plan and administer soil resources.

Submitted by Bob Louie
Ministry of Environment

This article appeared in "COUNTRY ROADS", February/March 1991.

COLLEGE INSTRUCTOR NAMED DIRECTOR OF WASTE MANAGEMENT CORPORATION

Fraser Valley College soils instructor, Rose Morrison-Ives, has been named a founding director of the British Columbia Hazardous Waste Management Corporation.

The provincial crown corporation was established in June, 1990 with a five year mandate to develop, implement and maintain comprehensive hazardous waste management systems in co-operation with industry, business and local government.

Morrison-Ives, who is also president of the B.C. Chapter of the Soil and Water Conservation Society, believes she was appointed because "I was deeply interested in the environment, especially as it relates to soil and water conservation."

She hopes to ensure that BCHWMC develops good treatment methods and facilitates an overall reduction of waste products. "Waste is a sign of inefficiency in the system."

Another goal is to develop a training centre for waste management. "A lot of people want to do something, but no one is giving them good, cohesive information. We have to get good factual information to these people," Morrison-Ives said.

She believes Fraser Valley College could lead in this area. "Training could easily be provided through our continuing education department," she says, pointing to Fraser Valley College's excellent one-day air-quality seminar as an example of the type of programs she envisions.

She does not believe education should be restricted to the college level. Instead, "every school child in B.C. should receive an education in soil and water conservation and household waste reduction."

Morrison-Ives is especially interested in assisting the transfer of waste management technology to local agriculture. She says farmers are ready for it, noting they are becoming aware, becoming concerned and are willing to look at new solutions. She is particularly pleased with the upcoming generation. "I teach soil conservation to second-year students and they are very environmentally aware. I am impressed with their concern and understanding of the issues."

* * * * *

The following excerpt describes the structure and objectives of the B.C. Hazardous Waste Management Corporation.

A NEW APPROACH TO HAZAROUS WASTE MANAGEMENT

The British Columbia Hazardous Waste Management Corporation was established as a Crown corporation in June 1990 by the provincial legislature. Its assignment, over a five-year period: to develop a comprehensive system for the reduction and management of hazardous wastes in British Columbia.

The wastes for which the corporation has been given management responsibility are those categorized as toxic, corrosive, flammable and reactive. Radioactive wastes and explosives are the responsibility of the federal government; biomedical wastes are managed by the provincial Ministry of Environment.

The corporation's role is that of a catalyst, motivating and supporting initiatives by industry, business, governments and individual British Columbians. It will ensure that programs and technologies meet Ministry of Environment standards, and will establish and coordinate a continuing effective system for hazardous waste reduction and residue management throughout the province.

For more information, contact:

B.C. Hazardous Waste Management Corporation
500 - 3795 Carey Road
Victoria, B.C. V8Z 9Z9

and state which of the following areas you are interested in:

- | | | | |
|--------------------------|-----------------------|--------------------------|-----------------------------------|
| <input type="checkbox"/> | household waste | <input type="checkbox"/> | industrial wastes |
| <input type="checkbox"/> | small business wastes | <input type="checkbox"/> | hazardous waste management issues |

BOOK REVIEW

Where Terranes Collide, C.J. Yorath. Orca Book Publishers, 1990.
- 231 pp. \$14.95

This book begins with a 'bus tour' from Calgary to Tofino, discussing the history of the Cordillera along the way. From 1.7 billion years ago when the North American coast was located somewhere in the western Okanagan and Cariboo Mountains, through the time when the fossil rich Burgess shale

was deposited 500 million years ago to the collisions of numerous microcontinents with the coast beginning 180 million years ago, the author tells a fascinating story which relates the current ideas about how our province was formed.

The second chapter goes into detail about the mechanisms of plate tectonics, rock formation and mountain building, and provides a map showing the locations of the various terranes the province is made up of. If you want to know where Quesnellia ends and Stikinia begins, or when you are leaving Wrangellia, then this book is for you. Chapter Three is titled 'The Anatomy of Five Mountains' and includes detailed descriptions of Mt. Garibaldi and Mt. Logan. In the final chapter, the author introduces the reader to many of the geologists who have worked in the Cordillera, and who have uncovered the stories hidden in the rocks.

This book is written in a relaxed style and is fun to read, but there is also plenty of useful information. It's a bargain as a reference book.

Chuck Bulmer
Department of Soil Science

```

*****
**
**      Enrollment / Membership Renewal / Change of Address
**
**      Name: _____
**      Employment: _____
**      Position: _____
**      Address: _____
**
**      Postal Code: _____
**      Phone: _____
**
**      Area of Concentration _____
**
**      Comments and Suggestions: _____
**      _____
**      _____
**
**      Please find enclosed $5.00 membership for _____
**
**      ($20.00 for 4 years)
**
**      Return To: Pacific Regional Society of Soil Science
**                  c/o Department of Soil Science
**                  Room 139, MacMillan Building
**                  University of British Columbia
**                  Vancouver, British Columbia, V6T 2A2
**
*****

```

Ken Awmack 88 Box 2537, Vanderhoof, B.C.
 Ted Baker 88 R.R. #1, Furness Road, FULFORD HARBOUR, B.C.
 T.M. Ballard 90 Department of Soil Science, U.B.C.
 Gary Bank 90 Box 615, Watrous, Saskatchewan
 Mr. J.D. Beaton 89 Potash & Phosphate Inst., Saskatoon, Saskatchewan
 C.F. Bentley 91 13103-66 Avenue, Edmonton, Alberta
 S.M. Berch 90 Department of Soil Science, U.B.C.
 R.A. Bertrand 90 BCMAF, Abbotsford, B.C.
 Bruce Blackwell 91 806 Roche Point Dr., North Vancouver, B.C.
 Hugh Blair 90 1-975 Denman Street, Vancouver, B.C.
 Art Bomke 90 Department of Soil Science, U.B.C.
 Frank Brozensky 90 #702-1212 Howe Street, Vancouver, B.C.
 Chuck Bulmer 91 Department of Soil Science, U.B.C.
 Barbara J. Cade-Menun 91 Department of Soil Science, U.B.C.
 Dr. Bruce Cann 1693 Amblegreen Blvd., Surrey, B.C.
 Reid Carter 89 Faculty of Forestry, U.B.C.
 M. Christofferson 90 Department of Soil Science, U.B.C.
 Hong-hee Chuah 94 1875 Spall Road, Kelowna, B.C.
 Gerald Coen 90 Ag. Can., 653 Terrace Plaza Tower, Edmonton, Alberta.
 Kathryn Cook 91 Department of Soil Science, U.B.C.
 Dr. Christine Cross 90 Trinity Western College, 7600 Glover Road
 Crossfield Laboratories 89 P.O. Box 3607, Airdrie, Alberta
 M. Crowe 90 B.C. Research, 3650 Westbrook Mall, U.B.C. MAIL
 Michael Curran 88 Regional Pedologist, Ministry of Forests & Lands
 Gerry Davis 91 Soilcon Laboratories Ltd., #309, 2244 West 6th Ave, Vancouver, B.C.
 Elaine Dawson 89 B.C. Min. of Crown Lands, Surveys & Resource, Victoria, B.C.
 Elisabeth Deom 90 10806 St. Denis, Montreal, Quebec
 Dr. J. de Vries 91 Dept. of Soil Science, U.B.C.
 Dr. K.S. Dhillon 92 Dept. of Soil Science, Punjab Agric. Univ.
 Dale Donovan 90 7000 College Way, Vernon, B.C.
 Mary-Jane Douglas 90 Box 3547, Smithers, B.C.
 M.G. Driehuyzen 89 3120 Princess Ave., North Vancouver, B.C.
 David Dunkley 90 6-2295 West 1st Avenue, Vancouver, B.C.
 T. Duynstee 90 2965 West 12th Ave., Vancouver, B.C.
 Naomi Elliot 89 3937 West 30th Avenue, Vancouver, B.C.
 Philip Epp 90 3547 Skaha Lake Road, Penticton, B.C.
 Wayne Erickson 90 B.C. Ministry of Forests, Bag 5000, Smithers, B.C.
 Robert Faye 90 1220 Richland Rd. N.E., Calgary, Alta
 Mike Fenger 88 533 Harbinger Avenue, Victoria, B.C.
 Forest Tech. School 90 c/o A. James Friesen, 1176 Switzer Dr., Hinton, Alta.
 Helen Fyles 90 21111 Lakeshore Rd., Ste. Anne de Bellevue, P.Q.
 Sharmin Gamiet 91 Dept. of Soil Science, U.B.C.
 Dr. J.A. Gardner 5537 Wallace Street, VANCOUVER, B.C.
 René Giardini 91 #110 - 7500 Francis Road, Richmond, B.C.
 Michael Goldstein 91 #105-2931 Olafson Ave., Richmond, B.C.
 Silvia Gonzalez 90 Dept. of Soil Science, U.B.C.
 Alex Green 89 Agriculture Canada, 6660 N.W. Marine Drive, Vancouver, B.C.
 Coleen Hackinen 91 105 Elementary Road, Box 11
 Hugh Hamilton 91 195 Pemberton Avenue, North Vancouver, B.C.
 Martin Hilmer 91 Department of Soil Science, U.B.C.
 Geoff A. Hughes-Games 92 BCMAF, 101-33832 South Fraser Way, Abbotsford, B.C.
 Alex Inselberg 90 4473 Canterbury Crescent, NORTH VANCOUVER, B.C.
 Andy Jakoy 90 3838 West 33rd Avenue, Vancouver, B.C.
 Stephen Jenvey 89 5907 Brock Drive, PRINCE GEORGE, B.C.
 Carol E. Jones 90 C.E. Jones & Associates, 204 - 26 Bastion Square, Victoria, B.C.
 John Jungen 90 Ministry of Environment, 810 Blanshard Street, Victoria, B.C.
 Richard Kabzems 91 Box 999, Dawson Creek, B.C.
 Yash Pal Kalra 91 Canadian Forestry Service, 5320 - 122 Street, EDMONTON, AB T6H 3S5
 Michael Kelly 91 Unit 6, 2184 Cadboro Bay Rd., Victoria, B.C.
 Carol A. Kennedy 91 6908 Casabello Rd., SARDIS, B.C.
 Robert Kline 90 BCMAF, R.R. #8, RMD #7, Prince George, B.C.
 Dr. Karel Klinka 89 Faculty of Forestry, U.B.C.
 C. Grant Kowalenko 89 Agric. Canada Research Stn., Box 1000, AGASSIZ, B.C. VOM 1A0

R.C. Kowall 91 Ministry of Environment, 780 Blanshard Street, Victoria, B.C.
George Krumlik 90 1251 West Burnside Road, Victoria, B.C.
Ms. Roxanna Kuurne 90 R.R. #1, PEMBERTON, B.C. VON 2L0
C. Jim Lim 90 Chemical Engineering, U.B.C.
Scott Lindeburgh 90 Box 1979, Clearwater, B.C.
R.H. Louie 91 Ministry of Environment, 553 Superior St., Victoria, B.C.
Terence M. Lord 89 4742 Osler Street, Vancouver, B.C.
Lawrence E. Lowe 90 Department of Soil Science, U.B.C.
Herbert Luttmending 91 B.C. Ministry of Environment, 777 Broughton Street, Victoria.
Anne Macadam 93 c/o Min. of Forests, Box 5000, Smithers, B.C.
William McGill 88 10539-35 Ave., Edmonton, Alberta
Bob Maxwell 88 B.C. Min. of Environment, 765 Broughton St., Victoria, B.C.
Mr. Doug Maynard 90 788 Birch Avenue, SHERWOOD PARK, ALBERTA
Dave Moon 88 Agriculture Canada, 6660 N.W. Marine Drive, VANCOUVER, B.C.
Aline Mongrain 90 Dames & Moore, P.O. Box 991, Vancouver, B.C.
Marcia Monreal 91 Department of Soil Science, U.B.C.
Rose Morrison-Ives 91 8750 Lombardy Crescent, Chilliwack, B.C.
Kevin Murphy 91 BCMAF, 1201 - 103 Avenue, Dawson Creek, B.C.
Gerry Neilsen 91 482 Scott Avenue, Penticton, B.C.
Deborah Nikkel 91 6440 Silverthorne Rd., Sardis, B.C.
Lee Nikl 90 330 - 80 Sixth Street, New Westminster, B.C.
Susan Norman 90 1929 West 43rd Ave., Vancouver, B.C.
M.D. Novak 90 Department of Soil Science, U.B.C.
Michael Peterson 89 15, 20421 - 53rd Ave., Langley, B.C.
W. Price 90 1819A Dunbar Street, Vancouver, B.C.
E.L. Pottinger 90 NORECOL, #700-1090 W. Georgia St., Vancouver, B.C.
Harold J. Quesnel 91 2127 Panaview Hts., R.R.#3, Saanichton, BC.
Lawrence Redfern 90 Dept. of Soil Science, U.B.C.
Doug Robertson 89 1400-10655 Southport Road S.W., Calgary, Alberta
Patrice Rother 89 3935 Hoskins Road, North Vancouver, B.C.
Charles A. Rowles 1404 - 4660 W. 10th Ave., Vancouver, B.C.
Gary Runka 91 Box 80356, Burnaby, B.C.
G.K. Rutherford 90 Dept. of Geography, Queen's University, Kingston, Ont.
Andrea Ryan 90 1527 Edgewater Lane, North Vancouver, B.C.
Paul Sanborn 90 Dept. of Soil Science, U.B.C.
M. Schmidt 91 Dept. of Soil Science, U.B.C.
O. Schmidt 91 206 - 33400 Bourquin Pl., Abbotsford, B.C.
H. Schreier 89 Dept. of Soil Science, U.B.C.
O. Schwartzkopf 90 SPEC, 123 Main Street, Vancouver, B.C.
Corine Selby 88 Agriculture Canada, 6660 N.W. Marine Dr., Vancouver, B.C.
Mr. J.P. Senyk 92 Pacific Forestry Centre, 506 W. Burnside Road, Victoria, B.C.
Glen A. Singleton 89 18319 - 86th Avenue, EDMONTON, AB
H.C. Slavinski 90 1504, 9725 - 106th Street, Edmonton, AB
Scott Smith 91 Agriculture Canada, Yukon Soil Survey Unit
Richard B. Smith 90 Pacific Forestry Centre, 506 W. Burnside Road, Victoria, B.C.
S. Somerville 90 Ecowaste Industries, 14431 River Road, Richmond, B.C.
Dick Spillsbury (Hon.) Yellow Point Road, Nanaimo, B.C.
Dave Spittlehouse 90 B.C. Ministry of Forests, 35 Bastion Square, Victoria, B.C.
J.T. Standish 90 1343 Duncan Drive, Delta, B.C.
Dr. Mark D. Stauffer 89 Potash & Phosphate Institute of Canada, Saskatoon, Sask.
David S. Stevenson 90 198 Dafoe Place, Penticton, B.C.
Wayne Temple 91 Dept. of Soil Science, U.B.C.
Hubert Timmenga 91 B.C. Research, 3650 Wesbrook Mall
Rick Trowbridge 91 B.C. Ministry of Forests and Lands, Box 5000, Smithers, B.C.
Sherry Ulansky 90 Agriculture Canada, 6660 N.W. Marine Drive, Vancouver, B.C.
Inkeri Vaisanen 91 3160 Dunbar Street, Vancouver, B.C.
E. Ann Van Niekerk 89 Pacific Forestry Centre, 506 West Burnside Rd., Victoria, B.C.
A.L. Van Ryswyk 91 3015 Ord Road, Kamloops, B.C.
Laurens J.P. van Vliet 91 Agriculture Canada, 6660 N.W. Marine Drive, Vancouver, B.C.
B. von Spindler 91 Dept. of Soil Science, U.B.C.
Hu Wallis 90 c/o Dept. of Geography, U.B.C.
Gordon Weetman 89 Faculty of Forestry, U.B.C.
Ray Wehr 89 107 Parker Drive, Prince George, B.C.
J.H. Wiens 88 549 Riel Place, VICTORIA, B.C.
Harry B. Williams 90 c/o Stunned Ox Logging Co., Lasqueti Island, B.C.
Heather Williams 90 2405 Musgrave Street, VICTORIA, B.C.
U. Wittneben 90 B.C. Min. of Crown Lands, 553 Superior Street, Victoria, B.C.
E. Wolterson 91 B.C. Research, 3650 Wesbrook Mall
Gavin Young 88 R.R. 4, Kelowna, B.C.
B. Zebarth 91 #6-46689 First Avenue, Chilliwack, B.C.