

30<sup>th</sup> Canadian Symposium on Remote Sensing /  
30<sup>e</sup> Symposium canadien sur la télédétection

June 22-25 juin 2009  
Lethbridge Alberta Canada

# FINAL PROGRAM PROGRAMME FINAL

*Bridging Excellence / Un pont vers l'excellence*



<http://www.uleth.ca/~remotesensing/csrs-sct2009/>

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National Chair/Président: CRSS,  
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Queen's Univ.

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DRDC-Ottawa

Dr. Lee Vierling  
Univ. Idaho, USA

Dr. Mike Wulder  
Cdn. Forest Service (PFC-BC)



Dear Delegates,

Greetings, and a warm welcome to Lethbridge and the 30<sup>th</sup> Canadian Symposium on Remote Sensing ! Our Conference Theme is **Bridging Excellence**, and it has significance in various ways. We will be honouring excellence as we salute all of our Gold Medalists – many of the founding developers of our field in Canada and internationally – who have received the highest award in remote sensing in Canada, being brought together for the first time here. We have a full technical program consisting of four parallel oral sessions and four poster sessions throughout the week where the latest scientific excellence in our field will be presented and discussed. Our delegates range in age from 90 to 19, with the latter representing the next generation of excellence in our field. Our Conference Theme also has local significance - the opening day of our Conference is the 100<sup>th</sup> Anniversary of the opening of the historic High Level Bridge in Lethbridge on 22 June 1909, designated a National Historic Event. The Bridge symbolizes excellence that has stood the test of time - an engineering marvel that is the longest and highest viaduct of its type in the world. Today, it is still in heavy use for rail transport and is a prominent landmark spanning the beautiful river valley of the Oldman River that flows from the nearby Rocky Mountains west of Lethbridge.

With **Bridging Excellence**, our vision has been to create new events, opportunities and perhaps even some new traditions – to make this a Conference with a Difference. We have a number of high profile national and international speakers and organised several Plenary Forums, or “Firesides” that will encourage discussion and exchange. These include the Multi-sector Partnerships Forum with panelists from government, industry and universities; an International Publications Forum with 6 Editors-in-Chief from leading international remote sensing journals; a Gold Medal Forum; and a Career Mix-and-Match to help foster connections. Special Sessions, Workshops, Meetings and a variety of social events round out the program.

On behalf of the Executive of the Canadian Remote Sensing Society, the 2009 Conference Organising Committees, and the University of Lethbridge Remote Sensing Faculty Members, I invite you to enjoy our week together in Lethbridge, where we can all reacquaint ourselves and make new friends and colleagues too. Building this Conference with the help of valued colleagues has been a privilege and an honour, and I am indebted to many.

Thank you and best wishes to all, meilleurs voeux et bon Symposium !

---

Derek R. Peddle, Ph.D.  
2009 Conference Chair, 30<sup>th</sup> CSRS  
National Chair, Canadian Remote Sensing Society  
Professor of Geography, University of Lethbridge

University of  
Lethbridge





Chers délégués,

Bonjour et bienvenue à Lethbridge et au 30<sup>e</sup> Symposium canadien sur la télédétection ! Le thème de la Conférence **Un pont vers l'excellence** comporte plusieurs significations. Nous célébrerons l'excellence en saluant tous nos Médailleurs d'or de la SCT - dont plusieurs sont les développeurs fondateurs de notre domaine au Canada et au plan international - qui ont reçu la plus haute distinction en télédétection au Canada et qui sont tous réunis ici ensemble pour la première fois. Nous avons un programme technique très complet réparti sur quatre sessions orales parallèles et sessions d'affichage au cours de la semaine où l'excellence scientifique actuelle dans notre domaine sera présentée et discutée. L'âge de nos délégués varie de 90 à 19 ans, ces derniers représentant la prochaine génération d'excellence dans notre domaine. Le thème de la Conférence a aussi une signification locale - la journée d'ouverture de notre Conférence correspond aussi au 100<sup>e</sup> anniversaire de l'ouverture du *High Level Bridge* de Lethbridge, le 22 juin 1909, un fait reconnu comme événement historique national. Le pont est également un symbole d'excellence qui a survécu au test du temps et ce dernier est toujours soumis à une utilisation intensive encore aujourd'hui - une merveille d'ingénierie qui demeure le viaduc le plus long et le plus haut de ce type dans le monde, et qui constitue une attraction majeure surplombant la pittoresque vallée de la rivière Oldman qui prend sa source dans les montagnes Rocheuses à proximité, à l'ouest de Lethbridge.

Avec **Un pont vers l'excellence**, notre vision a été de créer de nouveaux événements, de nouvelles opportunités et qui sait, peut-être de nouvelles traditions - de faire de cette Conférence une conférence qui fait une différence. Nous accueillons un bon nombre de conférenciers de haut calibre aux plans national et international et nous avons planifié plusieurs ateliers ou "*Firesides*" qui devraient favoriser la discussion et les échanges. Ces ateliers incluent un forum sur les partenariats multi-secteurs avec des panélistes du gouvernement, de l'industrie et des universités, un forum international sur les publications avec la participation de six rédacteurs en chef des revues internationales de télédétection les plus prestigieuses, un forum avec les Médailleurs d'or et une session de choix de carrière pour aider à établir des contacts. Il y aura également des sessions spéciales, des ateliers de travail, des rencontres et diverses activités sociales pour compléter le programme.

Au nom de l'exécutif de la Société canadienne de télédétection, des membres des comités d'organisation de la Conférence 2009 ainsi que de la Faculté de télédétection de l'Université de Lethbridge, je vous invite à profiter de notre semaine ensemble à Lethbridge, où nous pourrons reprendre contact et faire de nouveaux amis et collègues également. L'élaboration de cette Conférence avec l'aide de collègues appréciés a été un privilège et un honneur pour moi et je suis reconnaissant envers plusieurs d'entre eux.

Merci, meilleurs vœux et bon Symposium!

Derek R. Peddle, Ph.D.  
Président de la Conférence 2009, 30<sup>e</sup> Symposium canadien sur la télédétection  
Président national, Société canadienne de télédétection  
Professeur de géographie, University of Lethbridge



University of  
Lethbridge





ALBERTA

MINISTER OF ADVANCED EDUCATION AND TECHNOLOGY

### Message to the Delegates of the 30<sup>th</sup> Canadian Symposium on Remote Sensing

On behalf of the Government of Alberta, I am pleased to welcome the delegates to the 30<sup>th</sup> Canadian Symposium on Remote Sensing in Lethbridge. We are proud to host this gathering of leaders in a technology that is playing an ever more important role in Alberta.

Our government's vision for Alberta is one where our economy is diverse, value-added, and grounded in knowledge-based industries; we call it the next-generation economy. It provides a sustainable vision because knowledge is a resource that can never be depleted.

Over the past year, Alberta has introduced important programs that support technology learning, research and development, and commercialization. This includes our multi-million dollar action plan for Bringing Technology to Market and its components, such as technical and business advisory services and innovation vouchers.

This spring Alberta introduced its new legislation that supports land stewardship, an area where remote sensing technologies could play a vital role. This is part of our government's effort to provide effective management of the many and sometimes overlapping uses of lands and resources in our province.

As you may already know, Alberta is home to impressive remote sensing capabilities and talent in a growing research and commercialization community. Just as a satellite has a global perspective, so too does our province look globally for opportunities for collaboration and partnership. I encourage all the visiting delegates to look at how you can work with your Alberta colleagues.

To the organizers of this conference, thank you again for selecting Alberta as the meeting place for your members. To all delegates, please enjoy this opportunity to learn about the latest in research and applications and Alberta's growing leadership role in Canada's remote sensing industry.

Yours truly,

  
Doug Horner  
Minister





Dear Delegates,

On behalf of the University of Lethbridge I would like to welcome delegates of the 30<sup>th</sup> Canadian Symposium on Remote Sensing "*Bridging Excellence*" to our campus.

Remote sensing is an institutional strength at the University of Lethbridge and we are delighted to be hosting this event. The emphasis placed on remote sensing applications for agriculture, agri-food, water, forestry, and energy are reflective of important industries in Alberta. By building on these applications, the University is committed to continuing to support these initiatives and their broader roles as significant contributions to remote sensing and society on a global level.

Building this broader focus certainly can be achieved through initiatives like this year's symposium. I am very impressed by the quality of the speakers and participants at this year's event. I have no doubt the collaboration that takes place over the next few days will be of tremendous benefit to all participants.

Once again, I would like to welcome you to our Lethbridge campus and I wish a successful and productive symposium to all involved.

A handwritten signature in black ink, appearing to be "Richard Davidson", written over a horizontal line.

Richard Davidson, Q.C.  
Chancellor  
University of Lethbridge



# CONFERENCE AT A GLANCE

	June 22 Monday	June 23 Tuesday	June 24 Wednesday	June 25 Thursday
	8:00 Registration Opens			
Morning-I	* CRSS Workshops 9am start (Hazards: 10:00 start) * Industry meetings/IGC (Closed)	8:15-10:00 Opening+Keynotes-I PE250: Plenary	8:30 - 10:20 Oral session-III	8:30 - 10:20 Oral session-VI
Morning Health Break	10:30-10:45 AH-100 SpecNET: WESB 2nd level lounge			
Morning-II	* CRSS Workshops 10:45-12:15 * Industry meetings/IGC (Closed)	10:20-11:00 Keynotes-II	10:40-12:10 Oral session-IV Poster Session-III	10:40-12:10 Fireside 3: Gold Medal Forum PE-250 Plenary
		11:00-12:20 Fireside 1: Multisector Partnerships Forum PE-250 Plenary		
Lunch	12:15-1:30 CRSS Workshops Lunch AH-100 Patio	12:30-1:50pm Solar Noon BBQ / Multisector Reception Atrium + Patios	12:15 - 1:25 <b>SUB PUB GRUB</b> - Int. RS Pub. Reception - <b>SUB ballroom + Patio</b>	12:15 - 1:25 Gold Medal Reception & BBQ SUB ballroom + Patio
Afternoon-I	* CRSS Workshops: 1:30-3:00 (Hazards: end) * Industry meetings/IGC (Closed)	2:00-3:30 Oral session-I Poster Session-I	1:30-3:15 Fireside 2: International RS Publication Forum PE-250 Plenary	1:30-3:20 Oral sessions-VII Poster Session-IV
Afternoon Health Break	3:00-3:15			
		3:30-3:50	3:15-3:30	3:20-3:30
			3:30 - 4:30 Career Mix & Match Exhibitor Foyer	3:30-4:30 CRSS AGM: <a href="#">PE-261</a>
Afternoon-II	* CRSS Workshops (3:15-4:30) * Industry meetings/IGC (Closed)	3:50 - 5:20 Oral session-II Poster Session-II	3:30-5:20 Oral session-V	4:30 Symposium Closing. PE-250 Plenary
		5:20-6:30 free time	5:20-6:30 free time	
Evening	CRSS Summer Solstice Sizzler (Icebreaker): All Delegates. <b>Lethbridge Lodge</b> Registration Available. 4:30pm - close  lunctus Dinner Closed: By Invitation only Cocktails 5:30 / Seating: 6:15pm Galt Museum - Viewing Gallery	6:30. Industry Sponsored Dinner lunctus Geomatics Corp. All Delegates. Student's Union Ballroom (SUB) <b>University of Lethbridge</b>	6:30 CRSS Gold Medal Banquet All Delegates Atrium - University Hall	

## OPENING SPEAKERS

Tues. June 23: 8:15-8:45a.m. Room PE-250 [Plenary]

**Dr. Derek R. Peddle** - National Chair/Président, Canadian Remote Sensing Society and 2009 Conference Chair.

**Dr. William H. Cade** - President and Vice-Chancellor, University of Lethbridge.

**Dr. Dennis Fitzpatrick** - Vice-President Research, University of Lethbridge.

**Mayor Robert D. Tarleck** - Mayor of Lethbridge.

**The Honourable Rick Casson** - Member of Parliament, Lethbridge Constituency

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## KEYNOTE SPEAKERS

Tues. June 23: 8:45 - 11:00a.m. Room PE-250 [Plenary]

**Robert Lai** - Executive Director, Department of Advanced Education and Technology, ICT Institute, Alberta

**Morris Seiferling** - Assistant Deputy Minister, Land-use Secretariat, Government of Alberta

**Tom Gillon** - Head of Remote Sensing Space Systems Policy and Licensing, Department of Foreign Affairs and International Trade, Ottawa, Canada

**Anthony Milne** - Visiting Professor of Geography and Remote Sensing, School of Biological, Earth and Environmental Sciences, University of New South Wales, Sydney, Australia

**Diane Wickland** - Manager, Terrestrial Ecology Program; NASA HQ, Washington, DC, USA



Robert Lai

Robert Lai has over 25 years experience in the Information and Communications Technology sector. He is currently the Executive Director of the ICT Institute with the Department of Advanced Education and Technology. Robert was a former executive with Bell West, and was instrumental in the development of the SuperNet initiative in Alberta. During his extensive professional career, Robert has held senior positions with TELUS, EDS and Enabil Solutions.



Morris Seiferling

Morris Seiferling is the Assistant Deputy Minister of the Land-use Secretariat and is responsible for supporting the Government of Alberta in the development and implementation of the Land-use Framework. Morris has been working in the Alberta public service for 26 years in the land and natural resources area. He has worked with Public Lands in various roles including the regional manager for Community Pastures and as branch head for public lands in central Alberta. Morris has also worked with Alberta Agriculture as the regional director in the Peace Region, and as the Director of Technical Services dealing with environmental, engineering, livestock and water issues.



Tom Gillon

Dr. Tom Gillon is currently the Head of Remote Sensing Space Systems Policy and Licensing with the Department of Foreign Affairs and International Trade in Ottawa, Canada. Prior to becoming Head of Remote Sensing, Tom worked as Senior Remote Sensing Policy and Licensing Officer with DFAIT since 2007. Before 2007, Dr. Gillon was Senior Policy Officer with the Directorate of Arms and Proliferation Control Policy at the Department of National Defence in Ottawa, Canada and was, for five years, Senior Policy Analyst/Head of Policy and Cooperation with the Directorate of Space Development at National Defence Headquarters. Over the past several years Dr. Gillon has overseen numerous international space cooperation activities. His experience includes work in a wide range of space security/military space activities involving issues such as remote sensing space systems regulation, non-weaponization and militarization of space, and allied defence space cooperation. Dr. Gillon lectures regularly on space policy, strategy and law including recent presentations at the NATO School in Oberammergau, Germany and at the McGill University Institute of Air and Space Law in Montreal, Quebec. Dr. Gillon holds a PhD in Political Studies from Queen's University at Kingston, Ontario and an MA in Military and Strategic Studies from the University of Manitoba.



Tony Milne

Anthony Milne received his B.A degree in Geography from the University of New England, Armidale in 1967; Honours Masters in Geomorphology, University of Sydney in 1974 and a PhD from the University of Colorado, Boulder, in 1977. He is currently a Visiting Professor of Geography and Remote Sensing in the School of Biological, Earth and Environmental Sciences at the University of New South Wales, Sydney, Australia and Remote Sensing Science Manager in the Australian Government sponsored Cooperative Research Centre for Spatial Information. He is also a Co-Director of Horizon Geoscience Consulting Pty. Ltd founded in 1992. Professor Milne has been a Principal Investigator in international research programs including: the SIR-B and SIR-C radar missions, AIRSAR, ERS-1 and ERS-2, ENVISAT, JERS-1, ALOS PALSAR and MOMS and was Co-Chairman of the three NASA-sponsored AIRSAR PACRIM missions to Australia, South East Asia and the Pacific between 1994 and 2000 involving 18 countries. He is currently a member of the Science Team for the Japanese Space Agency's ALOS Kyoto and Carbon Initiative research program. His research interests lie in radar remote sensing, vegetation assessment and the mapping of wetlands. He is the President of the IEEE Geoscience and Remote Sensing Society.



Diane Wickland

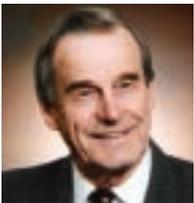
Diane Wickland manages the Terrestrial Ecology Program and leads the Carbon Cycle and Ecosystems Focus Area at NASA Headquarters in Washington, DC. She received a B.A. degree from the University of Wisconsin - Madison (Botany) and M.S. (Botany) and Ph.D. (Biology/Botany) degrees from the University of North Carolina - Chapel Hill. Her scientific interests and expertise include plant ecology, biogeochemistry, stress and disturbance effects, remote sensing, and global ecosystem dynamics. Diane's work for NASA involves planning future research directions, drafting program plans, soliciting and reviewing research proposals, managing funded research, and reporting on performance and accomplishments. She has sponsored numerous scientific field campaigns and airborne deployments that have been conducted around the world. The Large-Scale Biosphere-Atmosphere Experiment in Amazonia (LBA) in South America and the Boreal Ecosystem-Atmosphere Study (BOREAS) in Canada are two of these major campaigns. Diane is responsible for the scientific outcomes of several NASA missions, and is currently involved in mission concept studies for new Decadal Survey missions. She chairs the North American Carbon Program (NACP) Subcommittee on behalf of the U.S. Carbon Cycle Interagency Working Group. In all of these roles she regularly seeks inputs from the ecological and remote sensing communities and builds partnerships with national and international programs.

## CRSS GOLD MEDAL AWARD

The CRSS Gold Medal Award was introduced in 1986 to recognize either a significant new advance in remote sensing research, development, technology or applications, or a significant long-term contribution to the field of remote sensing in Canada. The Gold Medal is the highest award granted by the Canadian Remote Sensing Society for excellence in remote sensing.

### *Recipients:*

- 1986 - Dr. Lawrence W. Morley, Institute for Space and Terrestrial Science
- 1987 - Mr. Lee Godby, Canada Centre for Remote Sensing / Centre canadien de télédétection
- 1989 - Dr. John S. MacDonald, MacDonald Dettwiler and Associates Ltd
- 1991 - Dr. Frank J. Ahern, Canada Centre for Remote Sensing / Centre canadien de télédétection
- 1993 - Dr. Philip J. Howarth, University of Waterloo
- 1996 - Dr. John R. Miller, York University
- 1997 - Dr. Edryd Shaw, Canada Centre for Remote Sensing / Centre canadien de télédétection
- 1999 - Dr. R. Keith Raney, Johns Hopkins University, Applied Physics Laboratory
- 2000 - Dr. James F.R. Gower, Institute for Ocean Sciences
- 2001 - Dr. Ferdinand Bonn, Université de Sherbrooke [deceased]
- 2002 - Dr. Josef Cihlar, Canada Centre for Remote Sensing / Centre canadien de télédétection
- 2004 - Dr. David Goodenough, Pacific Forestry Centre
- 2005 - Dr. Ellsworth F. LeDrew, University of Waterloo
- 2006 - Dr. Philippe M. Teillet, Canada Centre for Remote Sensing / Centre canadien de télédétection
- 2007 - Dr. Steven E. Franklin, University of Saskatchewan
- 2008 - Dr. A. Laurence Gray, Canada Centre for Remote Sensing / Centre canadien de télédétection  
[affiliations at time of award]



Larry Morley  
1986

Lawrence W. Morley was born in Toronto in 1920 and married Beverly Anne Beckworth. He retired from Energy Mines and Resources (EMR) in 1982 after having been the first geophysicist at the Geological Survey of Canada (GSC) from 1952-1970. He was the Founding Director General of the Canada Centre for Remote Sensing (CCRS) and the National Program from 1970-1980. He then served as Science Counsellor to the Canadian High Commission in London (1980-82), was President of Teledetection International (1982-90), Adjunct Professor at York University (1985-86), Executive Director of the Institute for Space and Terrestrial Science (1986-89) and consultant for PCI (1989-91). He received the Hon.D.Sc. from York University (1974), the McKurdy Medal from CASI (1974), the Tuzo Wilson Medal (CGU, 1980), the CRSS Gold Medal (1986), and the Hon.Dr.Envir.Studies from University of Waterloo (2001).

Prior to 1952, he served in the RN&RCN as a radar officer (1941-45) and is a Retired Lt. Cdr.R.C.N.V.R. He received his B.A. degree (1946) in Physics and Geology, and M.A (1949) and Ph.D. (1952) degrees in palaeomagnetism from the University of Toronto. He was Party Chief with Fairchild Aerial Surveys (Los Angeles) pioneering the first commercial aeromagnetic survey (Venezuela and Columbia) during 1946-48, and was Chief Geophysicist of Dominion Gulf Co. in Toronto in 1948-49.

He instigated the Federal/Provincial Aeromagnetic Survey of the Canadian Shield by the Canadian Air Survey Industry, resulting in the publication by the GSC of more than 3000 aeromagnetic maps at a scale of 1:50,000 and which assisted industry in discovering several billion dollars of worth of minerals. He was the first to propose the hypothesis of the magnetic imprinting of the ocean basins, known as the Morley-Vine-Matthews hypothesis. This added experimental proof to the hypotheses of 'Continental Drift', 'Ocean Floor Spreading' and that of a 'Reversing Earth's magnetic field. These laid the foundation for the Theory of Plate Tectonics.



Lee Godby  
1987

Ensley A. (Lee) Godby was born in Mountain Park Alberta, a town in the Canadian Rockies, and moved to Edmonton to attend the University of Alberta where he received BSc and MSc degrees in Electrical Engineering. During all of his student years he spent the summer with Eldorado Mining and Refining prospecting for radioactive materials both on the ground and from aircraft. This was his first encounter with remote sensing. Upon graduation he joined the Flight Research Section of the National Research Council, where he led a group working on Military and Geological applications of magnetometry. In association with Larry Morley's group at the Geological Survey, we did a magnetic survey of the Scotia Shelf. Gradually we added more Remote Sensing capability to our research aircraft, including an Infra Red Scanner and multispectral cameras. When the USA announced its intention to launch the first Earth Observation satellite, Dr. Morley set up a Program Planning Office to develop a plan for a Remote Sensing Program for Canada that included a satellite ground receiving station in Prince Albert Saskatchewan. When the Canada Center for Remote Sensing was established with Dr. Morley as its first Director General (DG), I became the Associate DG. When Dr. Morley left CCRS to be the Science Officer at the Canadian Embassy in London, I became DG, a position I retained until my retirement in 1978.



John MacDonald  
1989

Dr. John S. MacDonald is currently Chairman and CEO of Day4 Energy Inc., a solar energy company of which he is a co-founder. He was also a co-founder of MacDonald Dettwiler and Associates (MDA) and was President and CEO for 13 years and Chairman for a subsequent 16 years until his retirement from MDA in 1998. Dr. MacDonald was a faculty member in engineering at UBC and MIT for 12 years prior to founding MDA. He has served on the Boards of numerous technology companies and continues to do so. He led the industrial team that successfully stimulated the formation of the Canadian Space Agency in 1989. Dr. MacDonald has been awarded eight Honorary Degrees, and is an Officer of the Order of Canada. In 1999 he was named one of the "50 most influential British Columbia business leaders of the 20<sup>th</sup> Century" and "Technology Entrepreneur of the Year" in 1995. He is a registered Professional Engineer (BC), Fellow of IEEE and CASI, and Founding Fellow of the Canadian Academy of Engineering. He was awarded the IEEE Centennial Medal in 1984 and the CRSS Gold Medal in 1989. In 2000 he was awarded The John H. Chapman Excellence Award of the Canadian Space Agency, the Agency's highest award. In 2006 he was inducted as a Laureate of the British Columbia Business Hall of Fame and received the Ernst and Young Entrepreneur of the year Lifetime Achievement Award. In 2009 he was inducted into the Canadian Manufacturers Hall of Fame. Dr. MacDonald earned his Ph.D. (1964) and M.Sc. (1961) from the Massachusetts Institute of Technology (MIT) and a B.A.Sc. (honours, 1959) from UBC, all in Electrical Engineering.



Frank Ahern  
1991

Frank Ahern has been an enthusiastic observer of Earth and space since his boyhood days roaming the hills in upstate New York. After receiving a PhD in astrophysics from the University of Maryland in 1972 and two years under Sydney van den Bergh at the David Dunlap Observatory (U of T), he turned his telescope upside down and observed the earth from space as a research scientist at the Canada Centre for Remote Sensing. During his 25-year career there he developed radiometric corrections for Landsat data that are still used around the world. With Ron Brown he developed the CCRS mobile spectroscopy lab and used it to help unravel some complex applications issues, particularly in rangeland. He then migrated to forestland applications, working with provincial partners and developing applications for emerging Landsat (TM), airborne (MEIS), and SAR (CV-580 and RADARSAT-1) sensors. In the RADARSAT-1 era he led the development of forestland and wetland applications in Latin America, particularly Brazil. He ended his time at CCRS as the founding Executive Director of an international initiative, Global Observations of Forest Cover. After leaving CCRS, Frank Ahern has worked part-time as TerreVista Earth Imaging and has written a popular book "Algonquin Park through Time and Space." He is the recipient of the Gold Medal and the Val Shaw Memorial Award of the Canadian Remote Sensing Society.



Philip Howarth  
1993

Dr. Philip Howarth is a professor emeritus in the Department of Geography and Environmental Management at the University of Waterloo. He retired in January 2006 after a career spanning more than 37 years. In his remote sensing research, Dr. Howarth focused on methods for extracting information from a variety of sensors and the use of that information in environmental applications – particularly in studies of agriculture, forestry, wetlands, mine tailings and urban areas. During his career, he supervised the studies of a total of 18 doctoral students and 40 Master's students. He is the author or co-author of 14 chapters in books and 60 refereed journal publications. In 1993, he received the Gold Medal from the CRSS. Dr. Howarth's academic contributions have also been recognized by the Canadian Association of Geographers. He was presented with the Award for Scholarly Distinction in Geography in 2001 and the Award for Service to the Profession of Geography in 2006. He is a member of the Board of Governors of the Royal Canadian Geographical Society. Although he is retired, Dr. Howarth still reviews research proposals and referees papers for journals. Most of his time, however, is spent in leisure pursuits; particularly sailing, skiing and keeping fit.



**John Miller**  
1996

John R. Miller received a B.E. degree (Engineering Physics) from the University of Saskatchewan, Saskatoon, in 1963, and the M.S.c. (1966) and Ph.D. (1969) degrees in space physics from the same university, studying the aurora borealis using rocket-borne radiometers. He joined York University as a faculty member in 1972, where he has served as a Professor in the Department of Physics and Astronomy and from 2003-07, Chair of the Department of Earth and Space Science and Engineering. His early remote sensing interests included atmospheric correction and extraction of biophysical *in-situ* constituent properties from water colour reflectance through radiative transfer models. From 1993-97, John was a Principal Investigator in the Boreal Ecosystem-Atmosphere Study (BOREAS), responsible for the deployment of the Canadian Compact Airborne Spectrographic Imager (*cas*) for images of forested and fen test sites. This began a new focus of his research over the next 15 years: the development and evaluation of algorithms and radiative transfer models to retrieve canopy biophysical variables for forestry and agriculture applications.



**Ed Shaw**  
1997

Edryd Shaw has a Ph.D in Radar Signal Processing and a B.Sc in Electrical Engineering. He worked on radar multi-beam antennas in the U.K. before emigrating to Canada in 1966. Ed spent 5 years at Computing Devices of Canada where he introduced FFT's to process sonar signals for detecting submarines. He joined the Canada Centre for Remote Sensing to lead the ground processing system for LANDSAT-1, launched in 1972. He was the director for the RADARSAT-1 satellite program during the design and program approval stages. He then served in successively more senior positions at CCRS, retiring in 2001 as the Director General. Since then he has provided consultation services to clients from industry, university and government. He was awarded the Canadian Remote Sensing Society Gold Medal in 1997 for his significant contributions to Remote Sensing. In 2002 he was awarded the Alouette award for his leadership in developing the first Canadian Earth Observation satellite, RADARSAT. In 2004 he was awarded a Gold Medal from the Royal Canadian Geographic Society for his contribution to Canada's role as a world leader in remote sensing technology. He was President of the Canadian Aeronautics and Space Institute for 2007-08.



**Keith Raney**  
1999

Dr. R. Keith Raney (Harvard, BS 1960; Purdue, MS 1962; Michigan, PhD 1968) contributed to the design of NASA's Venus radars Pioneer and Magellan, the ERS-1 microwave AMI instrument of the European Space Agency (ESA), and the Shuttle Imaging Radar SIR-C. While with the Canada Centre for Remote Sensing (1976-1994) Dr. Raney was scientific authority for the world's first digital processor for the SeaSat SAR, and responsible for the conceptual design of the RADARSAT SAR. ESA's CryoSat radar altimeter design is based on his original concept, and he is the design architect for the Mini-RF hybrid-polarity radars on India's Chandrayaan-1 and NASA's Lunar Reconnaissance Orbiter. Dr. Raney holds US and international patents on various aspects of radar. Review and advisory committee service includes the Office of Naval Research, the National Academy of Sciences, the European Space Agency, Germany's Helmholtz Society, the Danish Technical Research Council, and ONERA (France). He is a Life Fellow of the IEEE, a Fellow of the Electromagnetics Academy, and an Associate Fellow of CASI. Awards include the IEEE GRSS 1993 Distinguished Achievement Award, the 1999 CRSS Gold Medal, the IEEE Millennium Medal 2000, and the IEEE 2007 Dennis J. Picard Medal for radar technologies and applications.



**Jim Gower**  
2000

Dr. James Gower began research as a radio-astronomer at Cambridge University in England where he helped map radio sources using synthetic aperture passive radiometry at VHF frequencies. He started work in 1971 as the "Satellite Oceanographer" at the Institute of Ocean Sciences in Sidney at a time when the first environmental satellites were being launched. He has been a member of US, Canadian and European (NASA, CSA, ESA) space agency teams for altimeters, imaging radars and colour sensors. A recent interest has been in satellite observations of the Sumatra tsunami. A long-term specialty is the colour of ocean and coastal waters, for which the new European sensor, MERIS, provides new and interesting data. He received the Gold Medal of the Canadian Remote Sensing Society in 2000 and the PORSEC Distinguished Science Award in 2006. He is presently working on satellite techniques for monitoring intense surface plankton blooms in seas and lakes, and on collecting surface plankton data from buoys, ships and underwater gliders.



Ferdinand Bonn  
2001

#### Ferdinand Bonn (1943-2006)

Professeur à l'Université de Sherbrooke depuis 1970, titulaire d'une Chaire de recherche du Canada en Observation de la Terre en 2002, Dr. F. Bonn a été un pionnier en télédétection. En 1975, il fonde l'Association québécoise de télédétection avec son ami Guy Rochon. Depuis ses débuts, il acquiert rapidement la reconnaissance scientifique par ses pairs grâce à la réussite de ses travaux de recherche sur le développement de méthodes d'analyse et d'interprétation d'images (Landsat, HCMM, SPOT, RADARSAT). Ses travaux innovateurs lui vaudront la médaille du CRSNG pour vingt-cinq ans continus de subventions de recherches, le prix de l'environnement de l'ACFAS-Québec en 1992, et la médaille d'or de la Société canadienne de télédétection (SCT) en 2001. Sa contribution dans le domaine de la coopération internationale a été très importante à travers le monde (Europe, Afrique, Asie et Amérique latine). Son exceptionnelle implication au Viêt-Nam lui a valu d'être le premier Canadien à recevoir, en 1997, la Médaille de l'Amitié, la plus haute distinction accordée par le Viêt-Nam à un étranger. Il a publié plus de soixante articles, près de cent quarante actes de conférences et chapitres de livres. Il est l'auteur, avec Guy Rochon, du *Précis de télédétection*, vendu à plus de 6 000 copies dans les pays de la francophonie. Il a diplômé plus de 40 étudiants à la maîtrise et au doctorat à l'Université de Sherbrooke. Son exceptionnelle carrière, sa notoriété nationale et internationale et ses très grandes qualités humaines étaient reconnues et appréciées par tous.

#### Ferdinand Bonn (1943-2006)

Professor at the Université de Sherbrooke since 1970, senior Canada Research Chair in Earth Observation in 2002, Dr. Ferdinand Bonn was a pioneer in remote sensing. In 1975, he founded the Association Québécoise de Télédétection (AQT) with his friend Guy Rochon. Since his beginning, he rapidly acquired a distinct scientific reputation thanks to his leading edge research in the development of analysis and interpretation of satellite images (Landsat, HCMM, SPOT, RADARSAT). His success in innovative science initiatives was recognized with the awarding of the NSERC medal for twenty-five years of continuous research grants, of the environment prize from ACFAS-Québec and of the Gold Medal from the Canadian Remote Sensing Society (CRSS) in 2001. He was an exceptional leader in the field of international cooperation in more than a dozen countries in Europe, Africa, Asia and South America. His exceptional contributions in Vietnam were recognized and led to his being the first Canadian to be ever awarded the Friendship Medal, the highest distinction offered by the country of Vietnam to a foreigner. Dr. Bonn has published more than sixty articles, over one hundred thirty conference proceedings articles and a number of book chapters. He is the author, along with Guy Rochon, of *Précis de télédétection*, a standard remote sensing book with 6000 copies sold in the Francophonie. He has successfully supervised over forty Ph.D. and M.Sc. students at the Université de Sherbrooke. His exceptional career, his national as well as international renown, and his warm human nature were recognized and valued by friends and colleagues alike.

Ferdinand Bonn en tenue d'ambassadeur de la télédétection dans les réunions scientifiques. *Ferdinand Bonn as a remote sensing ambassador in scientific meetings.*



Josef Cihlar  
2002

Josef Cihlar is currently President and principal scientist of ZEMKON Inc., an environmental consulting company that he established in 2005. Between 1975 and 2004, he was a scientist and manager serving in various capacities at the Canada Centre for Remote Sensing, most recently as Manager of the Climate Change Program of NRCan's Earth Sciences Sector. Dr. Cihlar's scientific interests deal with earth science, environmental monitoring, and the application of satellite systems and other geomatic tools for knowledge-based environmental management. Between 1990 and 2001, Dr. Cihlar was actively involved in numerous international programs dealing with global observation, including the Global Terrestrial Observing System and the Global Climate Observing System. He co-led the development of global terrestrial carbon observation initiatives on behalf of the space agencies and several UN organizations. Dr. Cihlar has received numerous awards for his achievements in Canada and from international agencies in recognition of his contributions to the development of global observing concepts and systems. He was the first remote sensing scientist to be elected as Fellow of the Royal Society of Canada (2000), was elected Fellow of the Canadian Aeronautics and Space Institute in 2002, and received the 2002 CRSS Remote Sensing Gold Medal.



David Goodenough  
2004

David G. Goodenough is a senior Research Scientist at Pacific Forestry Centre in Victoria, BC, of the Canadian Forest Service, Natural Resources Canada. He is also an Adjunct Professor of Computer Science at the University of Victoria where he has graduate students and is a NSERC recipient. He is a recipient of the IEEE Third Millennium Medal (2000). He was President of the IEEE Geoscience and Remote Sensing Society (1992-1993) and served as Past-President (1994-1996). Dr. Goodenough holds the following degrees: Ph.D. and M.Sc. (University of Toronto), M.Sc. and B.Sc. (University of British Columbia). Dr. Goodenough worked at the Canada Centre for Remote Sensing (1973-1991), where he was a Chief Research Scientist and Head of the Methodology and Knowledge-Based Methods and Systems Sections. He has published extensively (>200 papers). He has received several awards, including the Government of Canada's Award of Excellence; the IEEE GRS-S Distinguished Achievement Award; the Canadian Remote Sensing Society's Gold Medal Award; and IEEE Fellow. He was a PI of several projects with NASA and CSA. Dr. Goodenough's current research interests focus on methods and algorithms for forest information from hyperspectral and polarimetric radar systems.



Ellsworth LeDrew  
2005

Ellsworth Frank LeDrew is Professor in the Department of Geography and Environmental Management of the Faculty of Environment at the University of Waterloo, Ontario, Canada. He received his PhD in 1976 and MA in 1974 from the University of Colorado and BA in 1972 from the University of Toronto. He was appointed University Research Chair in 2002 and University Professor in 2009. Dr. LeDrew is a Fellow of the Canadian Aeronautics and Space Institute and a Fellow of the IEEE. In 2005 he was awarded the Gold Medal by the Canadian Remote Sensing Society. He has supervised 18 PhD students and 30 Masters students. He is the author or co-author of 87 refereed papers, 8 refereed chapters in books, and has co-edited 9 books or monographs. He is the founding Editor-in-Chief of the IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (J-STARS). Research interests include climate-cryosphere interactions using Passive Microwave imagery and numerical climate models, the exploration of high spectral and spatial resolution imagery for analysis of environmental stress on tropical coral reefs, the use of earth observations in international energy management, and data management and archiving for Polar Environmental Science.



Phil Teillet  
2006

Dr. Philippe M. Teillet is a Professor in the Department of Physics and Astronomy at the University of Lethbridge, in Lethbridge, Alberta, Canada. His research concerns terrestrial remote sensing scene physics and analysis, spectroradiometric imaging, satellite sensor and image radiometry, and vegetation canopy spectral reflectance. Prior to his academic appointment in 2006, he was a Senior Research Scientist at the Canada Centre for Remote Sensing (CCRS), Natural Resources Canada, in Ottawa, Canada. He joined CCRS following his PhD in astrophysics from the University of Toronto in 1977 and remained at CCRS until 2006 with the exceptions of a year as Visiting Scientist at the Optical Sciences Center of the University of Arizona and a year as Visiting Scientist at the Biospheric Sciences Branch of the NASA Goddard Space Flight Center. He is also an Adjunct Professor at two Canadian universities and has served as a Member of various national and international committees and working groups. While preferring to work behind the scenes, he has demonstrated exceptional national and international leadership in several research fields, has maintained a solid scientific publication record, has received a variety of awards, and is widely consulted for his expertise.



Steven Franklin  
2007

Steven E. Franklin specializes in the application of satellite and aerial remote sensing in environmental science and management. He studied in the School of Forestry at Lakehead University and the Faculty of Environment at University of Waterloo, where he received his B.E.S. (Honours), M.A. (Physical Geography), and Ph.D. (Remote Sensing) degrees. He has held academic appointments at University of Waterloo (1984-1985), Memorial University of Newfoundland (1985-1988), University of Calgary (1988-2003) and University of Saskatchewan (2003-2009), where he served as Vice-President Research. Dr. Franklin was appointed President and Vice-Chancellor of Trent University in Peterborough, Ontario, Canada in 2009, where he also holds a joint appointment in the Department of Geography and the Environmental and Resource Science/Studies program. Dr. Franklin has been a visiting professor in the College of Forestry at Oregon State University (1994), the Department of Geography at University of California (Santa Barbara) (2000) and the Department of Spatial Sciences at Curtin University of Technology (2008). His research and consultancy work have taken him to Argentina, India, Norway, Colombia, France, China and numerous field sites in Australia, Canada and the United States. His research team has been recognized by the Canadian Forest Service (2006 Merit Award) and the Alberta Emerald Foundation (2005 Excellence Award). Dr. Franklin has authored more than 125 peer-reviewed articles and several books, and has supervised more than 50 senior undergraduate and graduate students and six postdoctoral fellows. In October 2007, he received the Canadian Remote Sensing Society Gold Medal Award.



Laurence Gray  
2008

Beginning in 1975, Laurence Gray worked at CCRS on the development of both the technology and application of microwave remote sensing. His early contributions include the demonstration of imaging radar for operational sea ice reconnaissance, but mostly Gray has been recognized for his pioneering work in the field of SAR interferometry. In 1990 he proved that relative movement within a SAR scene could be recovered with interferometric techniques to a fraction of a wavelength. Subsequently, he developed both airborne cross-track and along-track interferometric SAR (InSAR) systems at CCRS for mapping topography and moving targets. Gray has also worked on the application of satellite data for monitoring change in the cryosphere, e.g. using RADARSAT data from the 1997 Antarctic Mapping Mission to map previously unknown ice streams and tributaries in Antarctica. He has worked on a number of advisory and review groups for the European Space Agency, NASA and NSF, and is currently an Emeritus Scientist at CCRS and an Adjunct Professor at the U. Ottawa working on polar applications of remote sensing.

# WORKSHOPS

## Polarimetry Workshop

Monday June 22: 9:00a.m. - 4:30p.m.  
Room: TH-201 (Turcotte Hall)

Meet at 9:00a.m. at University Tim Horton's in 1st Choice Savings Building (PE)

### Practical Radar Polarimetry: Theory and Applications

#### Workshop instructors:

Gordon Staples  
MDA  
Richmond, B.C., CANADA  
gstaples@mdacorporation.com

Daniel DeLisle  
Canadian Space Agency  
St. Hubert, Quebec  
daniel.delisle@asc-csa.gc.ca

#### Summary:

The objective of the workshop is to provide a point-of-entry for the user who is familiar with radar data and radar applications, but is interested in polarimetric radar theory, analysis, and applications. The workshop, which presents radar polarimetry from a practical perspective, relates polarimetric parameters to physical interpretation. The workshop will provide a discussion of scattering polarimetry, polarimetric visualization, and target decomposition techniques. In addition, the advanced features of RADARSAT-2, with a focus on radar polarimetry are discussed.

The workshop integrates theory with hands-on computer-based demonstrations. The objective of the demonstrations is to provide experience with the manipulation of quad-polarized data, and to augment the topics presented in the theory. The demonstrations also provide exposure to the various quad-polarized data analysis and visualization algorithms that are available.

To compliment the theory section, an overview of polarimetry applications will be presented. The applications will cover many areas including agriculture, defence, forestry, resource management, flooding, ice mapping, and marine surveillance.

The workshop is designed to be interactive, so attendees are encouraged to openly discuss issues related to radar polarimetry.

#### Duration:

The workshop is proposed for a duration of one day.

## Lidar Workshop

Monday June 22: 9:00a.m. - 4:30p.m.  
Room: PE-264

Meet at 9:00a.m. at University Tim Horton's in 1st Choice Savings Building (PE)

A workshop on airborne laser scanning (ALS) and the development of environmental research project partnerships:

#### Workshop instructors:

- Dr. Chris Hopkinson, Research Scientist, Applied Geomatics Research Group, Centre of Geographic Sciences, Lawrencetown, Nova Scotia.
- Ms. Allyson Fox, Research Associate, Applied Geomatics Research Group
- Mr. Tristan Goulden M. Eng. Department of Biological Engineering, Dalhousie University.
- Guest presentations from the lidar industry.

#### Summary:

This full day workshop will provide a comprehensive overview of airborne laser scanning (ALS) technology, operations and environmental research project applications. It is divided into two parts with frequent opportunities for interactive discussion. In the morning, we will focus on gaining a better understanding of what an ALS system is and how it works. The learning objective for the first half of the workshop is that attendees become familiar enough with ALS technology and applications that they know: a) when ALS would or would not be useful in answering particular environmental research problems; and b) what type of ALS technology would best suit a particular project. Examples of 'off the shelf' terrestrial, bathymetric and fluorescent ALS instruments and their uses will be presented. Some common data processing procedures, options and the tools available will be illustrated and discussed. The applications focus for the workshop will be environmental monitoring and natural resources assessment.

The afternoon will focus on real world ALS research project issues with a learning objective that an attendee is better prepared to define the scope of their own ALS projects while avoiding some of the problems commonly encountered. Topics covered will range from definition of scope of work and requests for proposals; mission planning; airborne data acquisition logistics; ground validation planning and logistics; data processing and output options; error assessment and reporting; and more. These topics will be introduced both explicitly and within the scope of real world case studies. Project and partnership examples from the last seven years of Canadian Consortium for Lidar Environmental Applications Research (C-CLEAR) activities will be outlined. The afternoon will end with a case study detailing an example of the consortium approach to research project partnership data collections across Canada.

Attendees can elect to take the full day or either half day of the workshop. Those attendees registering for the full day will receive a free copy of the book "Hydroscan: Airborne laser mapping of hydrological features and resources", edited by Chris Hopkinson and Alain Pietroniro, and published in 2007 by the CWRA, CSHS and C-CLEAR. Half day attendees can elect to purchase a copy at the workshop.

## SpecNET Workshop

Monday June 22: 9:00a.m. - 4:30p.m.

Room: WE-2034 (Water and Environmental Science Building - North end of campus)

Meet in front lobby at 9:00a.m.

SpecNet – where have we been, and where are we going?

### Workshop instructors:

- Dr. John Gamon, Professor  
Departments of Earth & Atmospheric Sciences and Biological Sciences  
University of Alberta

### Summary:

SpecNet (Spectral Network) is an international collaboration of sites and investigators exploring the links between remote sensing and ecosystem processes, with a particular focus on ecosystem fluxes. Begun in 2003 as a "Working Group" at the National Center for Ecological Analysis and Synthesis (NCEAS) in Santa Barbara, California, early SpecNet meetings reviewed methods for multi-scale optical sampling with the purpose of defining standards and facilitating cross-ecosystem analyses of flux models driven by remote sensing. SpecNet has provided a forum for developing novel field optical sampling approaches, including the use of automated field sampling and multi-scale analytical approaches. An additional goal has been to define methods for validating satellite data. SpecNet is evolving into a virtual community taking advantage of web-based dissemination tools and web 2.0 technologies to facilitate exchange of data and methods. Current activities include development of vegetation spectral libraries and open source processing and analytical tools for spectra, in part through the GeoChronos portal. SpecNet remains a community-driven collaboration, with the goal of advancing our understanding of ecosystem states and processes through integrated, multi-scale optical sampling.

This workshop will review some of the methods used and science goals addressed by the SpecNet community, with an emphasis on physiological applications, including carbon and water vapour fluxes. The workshop will include a field trip to a local grassland site equipped with eddy covariance, a tram system, and field radiometry. The workshop will review field methods and evolving methods for data processing and integration over the web, including the development of spectral libraries and modeling applications.

### Topics for workshops:

Informatics requirements for effective vegetation spectral libraries.  
Field spectroscopy sampling methods for vegetation.

Scaling in time and space – linking multi-scale sampling approaches.

Finding needles in haystacks – methods for separating physiological and structural signals in vegetation spectral reflectance.

What's your angle? – angular sampling considerations and what we can learn from them.

Linking empirical methods to models.

## Hazards Workshop

Monday June 22: 10:00a.m. - 3:00p.m.

Room: TH-204 (Turcotte Hall)

Meet at 10:00a.m. at University Tim Horton's in 1st Choice Savings Building (PE)

Recent Developments in Disaster Management, Mitigation and Planning:

### Workshop instructors:

- Dr. Hamid Assilzadeh
- Dr. Zhinong Zhong
- Mr. Ala Kassab
- Maya Nand Jha

### Description of the Workshop:

This workshop is designed to give participants information about current issues in disaster management, mitigation and planning. The workshop introduces the latest development in Geomatics and web-based applications for integrating disaster management components and facilitating operational multi-agency system framework for disaster management. We discuss how to generate a single umbrella of control and administration for centralizing efficient disaster management. We introduce a scalable infrastructure for disaster monitoring and real time management based on a GIS event-driven system.

## SOCIAL EVENTS

### Summer Solstice Sizzler

Like an Icebreaker, but its Summer now.

Monday June 22: - 4:30pm - close

Lethbridge Lodge

Registration Available.

All Delegates

### Solar Noon BBQ and Multisector Reception

Tuesday June 23: 12:30-1:50pm

Atrium + **Patios**

Check out the albedo of some juicy Alberta Beef on a Bun.

Black and White Non-Lambertian Reference Panels [Cowboy Hats] optional.

Vegetation targets available for non-meat eaters.

All Delegates

### Industry Sponsored Dinner

**lunctus Geomatics Corp.**

Tuesday June 23: 6:30 p.m.

Student's Union Building (**SUB**) Ballroom

**University of Lethbridge**

All Delegates.

### SUB PUB GRUB

Wednesday June 24: 12:15 - 1:25

- Int. RS Pub. Reception -

SUB Ballroom + Patio

All Delegates

### CRSS Gold Medal Banquet. "Bridging Excellence"

Wednesday June 24: 6:30 p.m.

Atrium - University Hall

All Delegates

The 2009 CRSS-SCT Gold Medalist will be announced at this Banquet, as well as other CRSS Awards

### Gold Medal Reception & BBQ

Thursday June 25: 12:15 - 1:25

SUB ballroom + Patio

All Delegates

### Reception / Symposium Closing Ceremonies.

Thursday June 25: 4:30pm.

PE-250 Plenary

All Delegates



## CANADIAN REMOTE SENSING SOCIETY

### NOTICE

## ANNUAL GENERAL MEETING 2009

Thursday, June 25<sup>th</sup> 2009 3:30pm

30<sup>th</sup> Canadian Symposium on Remote Sensing  
Lethbridge, Alberta (June 22-25, 2009)

Room: PE-261

### AGENDA

1. Introduction / Approval of Agenda / Welcome
2. Report of the CRSS Chair and Executive Committee
3. Treasurer's Report
4. Report of the Editor, *Canadian Journal of Remote Sensing*
5. Plans for Future Symposia
  - Regina 2010 (with CAG)
  - Sherbrooke 2011 (avec AQT)
  - Québec 2014 (IGARSS)
  - 2012, 2013 : Available.
6. Nomination and Election of Officers for 2009-2010  
*(see next page)*
7. Other Business
8. Adjournment

## CANADIAN REMOTE SENSING SOCIETY - EXECUTIVE

The 2009-2010 Executive of the Canadian Remote Sensing Society (CRSS) will be formed at the CRSS Annual General Meeting (AGM) to be held June 25, 2009 at 3:30p.m. Mountain Time at the 30<sup>th</sup> Canadian Symposium on Remote Sensing in Lethbridge, Alberta.

Most Executive positions have a two-year term. Regional Chair positions can be renewed for a further two-year term. The Student position is a one-year term and can be renewed for one additional year. Nominations are open at the end of a given term. The CRSS Past-Chair and the *Canadian Journal of Remote Sensing* (CJRS) Editor-in-Chief are *ex officio* members of the CRSS Executive. All members of the Executive have equal voting privileges.

A CRSS member may nominate another CRSS member for any of the positions indicated below that are open for new or additional nominations. Both must be members in good standing, and nominee consent must be obtained. Nominations should be sent by e-mail to the CRSS Secretary/Treasurer Dr. Anne Smith <SmithA@AGR.GC.CA> or can be accepted from the floor at the AGM. If there is more than one nomination for a given position, an election will be held at the AGM, with all CRSS members in good-standing eligible to vote.

### CANADIAN REMOTE SENSING SOCIETY LIST OF NOMINEES FOR EXECUTIVE POSITIONS: 2009-2010

Position	Current	Nominated (or continuing) for 2009-2010	Open for New or Additional Nominations
Chair	Derek Peddle	Monique Bernier	YES
Vice-Chair	Monique Bernier	Anne Smith	YES
Secretary/Treasurer	Anne Smith	Richard Fournier	YES
Past-Chair	Olaf Niemann	Derek Peddle	NO
CJRS Editor-in-Chief	Nicholas Coops	Nicholas Coops	NO
Student	Philippe Vachon	Philippe Vachon	YES
Regional Chair - Northern Canada	Steve Schwarz	Steve Schwarz	NO
Regional Chair - Atlantic	Chris Hopkinson	Chris Hopkinson	YES
Regional Chair – Québec	Richard Fournier	<i>Vacant</i>	YES
Regional Chair - Ontario	Andrew Davidson	Andrew Davidson	NO
Regional Chair – Prairie Provinces	Joe Piwowar	Joe Piwowar	YES
Regional Chair – British Columbia	Gordon Staples	Gordon Staples	YES



## SOCIÉTÉ CANADIENNE DE TÉLÉDÉTECTION

*Avis*

### ASSEMBLÉE ANNUELLE 2009

**Jeudi 25 juin 2009 15:30**

**30e Symposium canadien sur la télédétection,  
Lethbridge, Alberta (22-25 juin 2009)**

**Salle: PE-261**

#### *AGENDA*

1. Mot de bienvenue et introduction
2. Rapport du Président et du comité exécutif de la SCT
3. Rapport de Trésorier
4. Rapport de l'Éditeur du *Journal Canadien de télédétection*
5. Plans et suggestions pour les futurs colloques et ateliers
  - Régina 2010 (avec CAG)
  - Sherbrooke 2011 (avec AQT)
  - Québec 2014 (IGARSS)
  - 2012, 2013 ; disponible
6. Nomination et élection des membres du Comité Exécutif : 2009-10  
*(prochaine page)*
7. Divers
8. Ajournement

## SOCIÉTÉ CANADIENNE DE TÉLÉDÉTECTION – BUREAU DE DIRECTION

Le bureau de direction 2009-2010 de la Société canadienne de télédétection (SCT) sera élu lors de l'Assemblée annuelle des membres de la SCT laquelle se tiendra le 25 juin 2009 à 15:30 lors du 30<sup>ième</sup> Symposium Canadien de télédétection à Lethbridge, Alberta.

La majorité des membres du Bureau ont un mandat de deux ans. Les mandats des représentants régionaux peuvent être renouvelés pour un second terme. Le mandat du représentant étudiant est d'un an et peut être renouvelé pour une seconde année. Les candidatures sont ouvertes à la fin d'un terme donné. Les positions de Président sortant et d'Éditeur-en-chef (*Journal canadien de télédétection: JCT*) sont des membres *ex officio* du Bureau de direction. Tous les votes des membres du Bureau ont le même poids.

Un membre de la SCT peut proposer un autre membre pour toutes les positions identifiées ci-dessous ouvertes aux candidatures. Tous les deux doivent être des membres en règle et la personne proposée doit accepter d'être candidate. Les candidatures doivent être envoyées par courriel à la secrétaire /trésorière de la SCT, Dr. Anne Smith <SmithA@AGR.GC.CA> mais pourront être acceptées durant la tenue de l'Assemblée annuelle des membres. S'il y a plus d'un candidat pour une position donnée, une élection aura lieu lors de l'Assemblée et tous les membres en règles pourront voter.

### LISTE DES CANDIDATURES POUR LE BUREAU DE DIRECTION : 2009-2010

Position	En poste 2008-2009	Candidat (ou en poste) pour 2009-2010	Ouverte aux candidatures
Président	Derek Peddle	Monique Bernier	OUI
Vice-Président	Monique Bernier	Anne Smith	OUI
Secrétaire/Trésorier	Anne Smith	Richard Fournier	OUI
Président sortant	Olaf Niemann	Derek Peddle	NON
Editeur-en-Chef, JCT	Nicholas Coops	Nicholas Coops	NON
Étudiant	Philippe Vachon	Philippe Vachon	OUI
Représentant du Nord canadien	Steve Schwarz	Steve Schwarz	NON
Représentant de la région - Atlantique	Chris Hopkinson	Chris Hopkinson	OUI
Représentant de la région – Québec	Richard Fournier	<i>Vacant</i>	OUI
Représentant de la région - Ontario	Andrew Davidson	Andrew Davidson	NON
Représentant de la région des Prairies	Joe Piwowar	Joe Piwowar	OUI
Représentant de la région– Colombie-Britannique	Gordon Staples	Gordon Staples	OUI

## CRSS CHAIR AND VICE-CHAIR



Dr. Derek R. Peddle

Derek R. Peddle is a Professor of Geography at The University of Lethbridge. He has graduate degrees in Geography (Ph.D. Waterloo; M.Sc. Calgary) and B.Sc. degrees in Computer Science and Geography (Memorial University of Newfoundland). He has worked at C-CORE, NORDCO, ISTS, WLU and NASA. In 2000 he was International Fulbright Scholar at the NASA Goddard Space Flight Centre and University of Maryland. He received the NASA Visiting Scientist Award (USRA 1994), National Best Ph.D. Thesis Award (CRSS 1997), Alberta Centennial Medal (2005) and was awarded the 2006 Canada-U.S. Fulbright Distinguished Visiting Research Chair for the University of California Santa Barbara. His NSERC-funded research program involves remote sensing image analysis and software development for environmental change, forestry, agriculture, water and mountain terrain applications. He is an Associate Editor of the *Canadian Journal of Remote Sensing*, National Chair of the Canadian Remote Sensing Society and 2009 Conference Chair of the 30<sup>th</sup> CSRS in Lethbridge. Further information is at: <http://people.uleth.ca/~derek.peddle/>

Derek R. Peddle est professeur de géographie à l'Université de Lethbridge. Il détient deux diplômes d'études supérieures en géographie (Ph.D., Waterloo; M.Sc., Calgary) ainsi que deux diplômes de M.Sc. en informatique et en géographie (Memorial University of Newfoundland). Il a travaillé chez C-CORE, NORDCO, ISTS, à l'Université Wilfrid Laurier ainsi qu'à la NASA. En 2000, il a obtenu une bourse internationale Fulbright à la NASA GSFC et à l'U. of Maryland. Il a reçu le *Visiting Scientist Award* de la NASA (USRA 1994), le Prix de la meilleure thèse de doctorat (SCT, 1997), la Médaille du Centenaire de l'Alberta (2005) et il s'est mérité une bourse dans le cadre du Programme de chaires de recherche invitées Fulbright Canada-É.U. -2006 pour l'University of California Santa Barbara. Son programme de recherche financé par le CRSNG concerne l'analyse d'images de télédétection et le développement de logiciels dans le contexte des changements environnementaux, la foresterie, l'agriculture, l'eau et les applications en terrain montagneux. Il est rédacteur associé au *Journal canadien de télédétection*, président national de la Société canadienne de télédétection et président du 30<sup>e</sup> Symposium canadien de télédétection de 2009 à Lethbridge. <http://people.uleth.ca/~derek.peddle/>



Dr. Monique Bernier

Je détiens une maîtrise en géographie de l'Université de Sherbrooke et j'ai débuté ma carrière comme scientifique au Centre canadien de télédétection (Ressources naturelles Canada) à Ottawa. Après avoir complété un doctorat en sciences de l'eau à l'INRS, j'y ai été engagée en tant que professeure et me suis spécialisée dans le développement des applications de la télédétection radar pour le suivi des ressources en eau et de la cryosphère (neige, glace, tourbières boréales, humidité et gel du sol). Je suis impliquée dans les réseaux GEOIDE et ArcticNet et suis membre du Centre d'études nordiques (CEN) depuis 7 ans. C'est avec beaucoup d'enthousiasme que j'ai accepté de rejoindre l'équipe de direction du CEN en juin dernier. Comme chercheurs et citoyens nous avons de beaux défis nordiques devant nous! Elle est présentement vice-présidente de la SCT et elle est membre de la SCT depuis 1984. Elle est aussi membre du comité exécutif depuis 2001.

Monique Bernier has a Master's degree in Geography from the University of Sherbrooke and a Ph.D. in water sciences from INRS. Her scientific career began at the Canada Centre for Remote Sensing (NRCan). After completing her PhD, she obtained a position as professor at INRS and specializes in developing remote sensing applications to monitor water resources and the cryosphere (snow, ice, boreal bogs, humidity and frost). She is part of GEOIDE, ArcticNet and the Centre d'études nordiques (CEN). In June 2008 she joined the CEN directorate with much enthusiasm to face the exciting challenges of the North as a researcher and as a citizen. She has been a member of CRSS since 1984 and served on the CRSS Executive since 2001 for which she is currently the Vice-Chair.

# REMOTE SENSING FIRESIDE 1:

## "Multi-Sector Partnerships Forum"

Tues. June 23: 11:00a.m. - 12:20p.m. Room PE-250 [Plenary]

**Panelists:** Representatives from Canadian and International Government, Industry and University will discuss multi-sector partnerships, funding initiatives, programming, and future perspectives and opportunities. All panelists have worked in different sectors, with several currently holding appointments or affiliations across sectors.

**Elizabeth Cannon** - Dean, Schulich School of Engineering, University of Calgary, Canada  
**Dennis Fitzpatrick** - Vice-President Research, University of Lethbridge, Canada  
**Forrest Hall** - NASA Goddard Space Flight Center / University of Maryland Baltimore County, USA  
**Ryan Johnson** - President and CEO, Iunctus Geomatics Corp. Lethbridge, Canada  
**Richard Kolacz** - General Manager, Missions Development Group, COM DEV, Canada  
**Lee Kruszewski** - Director of ICT Industries, Government of Alberta, Canada  
**Karl Magnusson** - Global Business Development Manager, SSC Satellite Operations, Sweden  
**Keith Raney** - Johns Hopkins University, USA



Elizabeth Cannon

Elizabeth Cannon, PEng, is Dean of the Schulich School of Engineering at the University of Calgary and Professor in the Department of Geomatics Engineering. As the Dean, Elizabeth is leading a strategic expansion of the School and the development of new academic and research programs. Elizabeth has been involved with GPS since 1984 in both industrial and academic environments and her research has encompassed the development of new satellite navigation methods and integrated systems that have been applied to such areas as vehicular navigation, precision farming, and aircraft flight inspection. The results of her research have been patented and commercialized through the licensing of software to over 200 agencies world-wide. Prior to this appointment, Elizabeth was the Head of Geomatics Engineering and from 1997-2002 she held the NSERC/Petro-Canada Chair for Women in Science and Engineering (Prairie Region). Elizabeth is a Fellow of the Canadian Academy of Engineering, the Royal Society of Canada, was named one of Canada's Top 40 Under 40 and was an NSERC Steacie Fellow during 2002-2004. She is a Past President of the US-based Institute of Navigation (ION) and received the Kepler Award from the ION Satellite Division in 2001.



Dennis Fitzpatrick

Dennis Fitzpatrick is Professor of Biochemistry and Vice-President for Research at the University of Lethbridge. He previously held positions at the University of Manitoba where he was head of the Department of Foods and Nutrition and at Agriculture Canada where he worked as a research scientist in the Animal Feed Safety and Nutrition Program, Central Experimental Farm research complex, Ottawa. Dr. Fitzpatrick is a biological scientist by training, holding degrees in biological sciences, nutrition and biochemistry. His research program focused on the environment, nutrition and human health. He maintained an active research program for over twenty years working in two major areas, nutritional toxicology sponsored by NSERC and Andean Foods Systems, a multi-centred agriculture, environmental science network sponsored by the International Development Research Centre of Canada. As part of The University of Lethbridge's commitment to meeting the education and research needs of Albertans, Dr. Fitzpatrick serves on a number of key associations such as Alberta Value Added Corporation, the Agriculture and Foods Council, and the Western Watersheds Institute. He founded the Water Institute for Semi-Arid Ecosystems, served as Board Chair for the Alberta Institute for Advanced Water Research and serves as a founding Board Member for the Alberta Water Research Institute. Dr. Fitzpatrick was the founding President and CEO of Genome Prairie. He currently serves on the Board of Genome Alberta.



Forrest Hall

Forrest G. Hall, a physicist, currently with the University of Maryland, Baltimore County, is located at the Goddard Space Flight Center, in the GSFC/UMBC Joint Center for Earth Systems Technology. Dr. Hall has been active since 1980 in global change research using earth-observing satellites to monitor human-induced and natural changes to the earth's land ecosystems and the effects those changes have had on the earth's climate. He has authored more than 45 scientific papers on satellite monitoring, the global carbon cycle and climate change. Dr. Hall has a BS in Mechanical Engineering from the University of Texas, and an MS and PhD in Physics from the University of Houston.



Ryan Johnson

Ryan Johnson is President and CEO of Iunctus Geomatics Corporation, Lethbridge Alberta, a company he co-founded in 2000. Iunctus is a high-tech remote sensing and imaging geomatics firm with international business in multiple sectors. As the Canadian Channel Partner with SPOT Image (France), Iunctus operates the SPOT Satellite Ground Receiving Station on the University of Lethbridge campus. He was the Chief Technology Officer of the joint-venture company Terra Image USA, responsible for the world-wide commercialization of GeoExplorer that was sold in 2008. In 2005, Iunctus and the University of Lethbridge (UL) established the Alberta Terrestrial Imaging Centre (ATIC) as a research joint-venture. He received his B.Sc. (1997) and M.Sc. (2000) degrees from the University of Lethbridge and received the 2000 National Best Masters Thesis Award from the Canadian Remote Sensing Society. He was President of the UL Graduate Student Association and has been inducted into the UL Alumni Association Honour Society. He is a member of CRSS, CAG, AGG and GIAC. Further information is available at: <http://www.terraengine.com/>



Richard Kolacz

Richard Kolacz completed his Undergraduate Degree in Engineering at the University of Alberta. Upon Graduation he joined the Canadian Navy as a Combat Systems Engineer. Richard served in a number of positions at sea with the Atlantic and Pacific Fleets. He served ashore in the former Yugoslavia during the Balkan Conflict where his unique contribution was recognized by the Government of Canada. Upon completion of an MSc in Guided Weapon Systems at the Royal Military College of Science in the UK, he was appointed as the Above Water Warfare Systems Fleet Technical Authority in Halifax. In 1998 he joined COM DEV. He participated in a number of programs related to military communications, surveillance and navigation systems. Richard led the establishment of a new division in the company which is responsible for the design, build, launch and operations of micro-satellites. He was appointed as General Manager of the newly formed Missions Development Group in 2008. MDG was awarded a contract for the build of Canada's first dedicated Maritime Monitoring and Messaging Micro satellite and remains engaged in several other mission opportunities related to surveillance, intelligence and reconnaissance missions as well as environmental monitoring, earth observation, space science and low data rate applications.



Lee Kruszewski

Lee Kruszewski has over 20 years experience in the Information & Communications industry. He is currently the Director of ICT Industries with the Department of Alberta Advanced Education and Technology. In this role he is responsible for public/private research and development partnerships, investment attraction, industry development, and provincial technology strategy development. He is also responsible for the adoption of technology in the energy and environmental sectors. In previous roles he has managed software architecture, IT infrastructure, and intellectual property with a local wireless technology company and held various senior management and product/systems/strategic planning positions with Telus Corporation, a national Canadian telecommunications company.



Karl Magnusson

Karl Magnusson is the Global Business Development Manager at SSC Satellite Operations in Sweden, since 2008. Previously, he was the Business Area Manager for SSC's Teleport Services since 2002. Prior to entering the Space Business, Karl was VP Infocom at the dot.com company Razorfish, where he oversaw their global engagements to the Infocom industry. Before that, Karl spent 5 years with Swedish Telecom, where he was responsible for introducing the first Internet products in the Swedish market place, using satellite communications and other technologies. Karl holds a degree in International Business Administration and Information Technology from the European Business School. He is married with two small children and lives in Stockholm, Sweden.



Keith Raney

R. Keith Raney (Harvard, BS 1960; Purdue, MS 1962; Michigan, PhD 1968) contributed to the design of NASA's Venus radars Pioneer and Magellan, the ERS-1 microwave AMI instrument of the European Space Agency (ESA), and the Shuttle Imaging Radar SIR-C. While with the Canada Centre for Remote Sensing (1976-1994) Dr. Raney was scientific authority for the world's first digital processor for the SeaSat SAR, and responsible for the conceptual design of the RADARSAT SAR. ESA's CryoSat radar altimeter design is based on his original concept, and he is the design architect for the Mini-RF hybrid-polarity radars on India's Chandrayaan-1 and NASA's Lunar Reconnaissance Orbiter. Dr. Raney holds US and international patents on various aspects of radar. Review and advisory committee service includes the Office of Naval Research, the National Academy of Sciences, the European Space Agency, Germany's Helmholtz Society, the Danish Technical Research Council, and ONERA (France). He is a Life Fellow of the IEEE, a Fellow of the Electromagnetics Academy, and an Associate Fellow of CASI. Awards include the IEEE GRSS 1993 Distinguished Achievement Award, the 1999 CRSS Gold Medal, the IEEE Millennium Medal 2000, and the IEEE 2007 Dennis J. Picard Medal for radar technologies and applications.

# REMOTE SENSING FIRESIDE 2: "International Remote Sensing Publications Forum"

Wed. June 24: 1:30-3:10p.m. Room PE-250 [Plenary]

**Panelists:** Editors-in-Chief (EICs) of 6 major international remote sensing journals

**Dr. Marvin Bauer - Minnesota USA:** *Remote Sensing of Environment (RSE)*

**Dr. Giles Foody - Nottingham UK:** *International Journal of Remote Sensing (IJRS)*

**Dr. Christopher Ruf - Michigan USA:** *IEEE Transactions on Geoscience and Remote Sensing (IEEE TGRS)*

**Dr. Nicholas Coops - Vancouver Canada:** *Canadian Journal of Remote Sensing (CJRS)*

**Dr. Russ Congalton - New Hampshire USA:** *Photogrammetric Engineering & Remote Sensing (PE&RS)*

**Dr. Ellsworth LeDrew - Waterloo Canada:** *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (IEEE J-STARS)*



Dr. Marvin Bauer

Marvin Bauer is professor of Remote Sensing at the University of Minnesota. His research and teaching focuses on applications of remote sensing to monitor land, vegetation, and water resources. Recent research projects have concentrated on monitoring lake water quality, impervious surface mapping, and land cover classification and change detection and analysis. He is a fellow of the American Society of Photogrammetry and Remote Sensing; he has received the NASA Distinguished Public Service Medal and the ASPRS SAIC Estes Memorial Teaching Award. He also serves as editor-in-chief of *Remote Sensing of Environment*.



Dr. Giles Foody

Giles Foody completed B.Sc. and Ph.D. degrees at the University of Sheffield in 1983 and 1986 respectively and is currently Professor of Geographical Information Science at the University of Nottingham, England. His main research interests lie at the interface between remote sensing, biogeography and informatics. Topics of particular interest relate to image classification for land cover mapping and monitoring applications, addressing issues at scales ranging from the sub-pixel to global. His publication list includes 7 books and >135 refereed journal articles; a major recent publication is *The Sage Handbook of Remote Sensing (2009)* that provides in a single edited volume an account of recent developments in remote sensing. He has been fortunate to receive several awards, notably the Leica Geosystems Award for best scientific paper from the American Society for Photogrammetry and Remote Sensing and is to receive the Remote Sensing and Photogrammetry Society Award this year. He currently serves as editor-in-chief of the *International Journal of Remote Sensing* and holds associate editor roles with *Ecological Informatics* and *Landscape Ecology* as well as serving on the editorial boards of *Remote Sensing of Environment*, *Geocarto International* and the *International Journal of Applied Earth Observation and Geoinformation*. He has refereed for over 90 journals and served on numerous committees and panels.



Dr. Christopher Ruf

Chris Ruf is Professor of Atmospheric Science and Electrical Engineering and Director of the Space Physics Research Laboratory (SPRL) at the University of Michigan. He has worked previously at Intel Corporation, Hughes Space and Communications, the NASA Jet Propulsion Laboratory, Penn State University, and the Technical University of Denmark. He has been involved in microwave remote sensing for 26 years, with an emphasis on spaceborne microwave radiometer design, calibration and system engineering, and the development and validation of ocean and atmosphere geophysical inversion algorithms, and with related technology development efforts. His involvement with spaceborne microwave radiometer missions includes: instrument scientist for TOPEX and GeoSat Follow, science or cal/val team member for five missions (Jason, WindSat, Aquarius, Global Precipitation Measurement and Juno), and advisory team member for MIS on NPOESS. Prof. Ruf is a Fellow of the IEEE and a member of the AGU, AMS and URSI Commission F. SPRL is a research unit specializing in the fabrication of spaceborne scientific instruments. It has developed and flown over 33 successful spaceflight sensors since its founding in the 1950s.



Dr. Nicholas Coops

Nicholas Coops received his B.App. Sc. Cartography degree and then his Ph.D. from the Royal Melbourne Institute of Technology (RMIT) in Melbourne Australia. Dr. Coops then joined the Australian federal research agency CSIRO in 1994, originally in the Division of Wildlife and Ecology in Canberra, and then the Division of Forestry in Melbourne. After 10 years at CSIRO Dr. Coops took a position as a faculty member at the University of British Columbia in Vancouver Canada in 2004 and is a Canadian Research Chair in Remote Sensing. Dr. Coops has written more than 130 refereed papers and is the editor in chief of the *Canadian Journal of Remote Sensing*.



Dr. Russ Congalton

Russell G. Congalton is a Professor of Remote Sensing and GIS in the Department of Natural Resources & the Environment at the University of New Hampshire. He is responsible for teaching courses in Photogrammetry and Photo Interpretation, Digital Image Processing, and Geographic Information Systems. Dr. Congalton has authored or coauthored more than 130 papers and conference proceedings. He is the author of eight book chapters, is co-editor of a book on spatial uncertainty in natural resource databases entitled, [Quantifying Spatial Uncertainty in Natural Resources: Theory and Applications for GIS and Remote Sensing](#), and is the co-author of the book entitled, [Assessing the Accuracy of Remotely Sensed Data: Principles and Practices](#). Dr. Congalton served as President of the American Society for Photogrammetry and Remote Sensing (ASPRS) in 2004-2005 and was the National Workshop Director for ASPRS from 1997 - 2008. In January 2008 he was appointed Editor-in-Chief of *Photogrammetric Engineering and Remote Sensing*.



Dr. Ellsworth LeDrew

Ellsworth Frank LeDrew is Professor in the Department of Geography and Environmental Management of the Faculty of Environment at the University of Waterloo, Ontario, Canada. He received his PhD in 1976 and MA in 1974 from the University of Colorado and BA in 1972 from the University of Toronto. He was appointed University Research Chair in 2002 and University Professor in 2009. Dr. LeDrew is a Fellow of the Canadian Aeronautics and Space Institute and a Fellow of the IEEE. In 2005 he was awarded the Gold Medal by the Canadian Remote Sensing Society. He has supervised 18 PhD students and 30 Masters students. He is the author or co-author of 87 refereed papers, 8 refereed chapters in books, and has co-edited 9 books or monographs. He is the founding Editor-in-Chief of the IEEE *Journal of Selected Topics in Applied Earth Observations and Remote Sensing* (J-STARS). Research interests include climate-cryosphere interactions using Passive Microwave imagery and numerical climate models, the exploration of high spectral and spatial resolution imagery for analysis of environmental stress on tropical coral reefs, the use of earth observations in international energy management, and data management and archiving for Polar Environmental Science.

## REMOTE SENSING FIRESIDE 3: "Gold Medal Forum"

Thurs. June 25: 10:40a.m. - 12:10p.m. Room PE-250 [Plenary]

### *Panelists:*

**Gold Medalists.** Join our Distinguished Gold Medalists for a lively discussion of past, current and future perspectives on remote sensing. Don't miss this one !!



# CALL FOR PAPERS

## *Canadian Journal of Remote Sensing* CJRS Special Issue from the 30<sup>th</sup> Canadian Symposium on Remote Sensing *"Bridging Excellence / Un pont vers l'excellence"*

The Canadian Remote Sensing Society is hosting its 30<sup>th</sup> conference at the University of Lethbridge campus in Lethbridge, Alberta, Canada June 22 – 25<sup>th</sup> 2009.

The conference offers an opportunity for Canadian and international researchers to discuss and present their research related to remote sensing and geospatial science. Conference delegates with accepted abstracts who submitted a Conference Proceedings paper and presented their work at the Conference (oral or poster) are eligible to submit their full-length manuscript(s) to this CJRS Conference Special Issue.

Although based on the Conference Proceedings Paper, your submission to the CJRS Conference Special Issue must be a sufficiently different from the Proceedings paper. The Proceedings Paper is typically shorter, is unrefereed, and there are no page charges. The CJRS paper will be a full-length manuscript, possibly with additional or further developed results, will be reviewed, and has page charges. Further information regarding the distinction between the Proceedings Paper and the CJRS manuscript submission is available at:

<http://www.uleth.ca/~remotesensing/csrs-sct2009/paper.htm>

All submissions to the CJRS Special Conference Issue will be subjected to peer-review. The manuscript review process will be coordinated by the Guest Editor(s), from which a recommendation will be made to the CJRS Editor-in-Chief for final decision. Manuscripts for the CJRS Conference Special Issue must be submitted using the CJRS online submission web-site:

<http://mc.manuscriptcentral.com/cjrs-jct>

Deadline for submission to the CJRS Conference Special Issue: **30 September 2009.**

**NOTE:** Papers will be reviewed as they are received. Depending on the timing and number of accepted papers, more than one Special Issue Volume or Section is possible. For example, papers received shortly after the Conference that receive positive reviews and are accepted rapidly can be published in 2009 as part of a CJRS Special Conference Section in a Regular CJRS Issue. The target date for the main Special Conference Issue is mid-2010.

CJRS Special Issue – 30th CSRS

**Guest Editors:**

Dr. Derek R. Peddle, Dr. Craig A. Coburn  
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**CJRS Editor-in-Chief:**

Dr. Nicholas C. Coops  
University of British Columbia  
Canada



# APPEL D'ARTICLES

*Journal canadien de télédétection*

## Numéro spécial du JCT pour le 30<sup>e</sup> Symposium canadien sur la télédétection "Bridging Excellence / Un pont vers l'excellence"

La Société canadienne de télédétection organise sa 30<sup>e</sup> Conférence sur le campus de l'Université de Lethbridge, à Lethbridge, Alberta, Canada, du 22 au 25 juin 2009.

La conférence offre une occasion unique aux chercheurs canadiens et internationaux pour discuter et présenter leur recherche dans les domaines de la télédétection et des sciences géospatiales. Les délégués à la conférence dont les résumés ont été acceptés, qui ont soumis un article pour inclusion dans les Comptes rendus et qui ont présenté leur travail lors de la Conférence (session orale ou par affichage) peuvent soumettre leur(s) manuscrit(s) complet(s) pour publication dans un numéro spécial du JCT consacré à la Conférence.

Bien que l'article doive être basé sur votre article tel que publié dans les Comptes rendus de la Conférence, l'article soumis pour ce numéro spécial du JCT doit être suffisamment différent de l'article publié dans les Comptes rendus. L'article des Comptes rendus est généralement plus court, n'est pas soumis à une évaluation par les pairs et il n'y a pas de frais de page. L'article pour le JCT devra être un manuscrit exhaustif comportant possiblement des résultats additionnels ou développés davantage, il sera évalué par des pairs et comporte des frais de page. Plus d'informations concernant les différences entre les articles pour les Comptes rendus et les soumissions de manuscrits pour le JCT sont disponibles à l'adresse :

<http://www.uleth.ca/~remotesensing/csrs-sct2009/paper.htm>

Toutes les soumissions d'articles pour le numéro spécial du JCT de la Conférence seront soumises à une évaluation par les pairs. Le processus d'évaluation des manuscrits par les pairs sera coordonné par les rédacteurs invités, lesquels soumettront leurs recommandations au rédacteur en chef du JCT pour décision finale. Les manuscrits pour le numéro spécial du JCT de la Conférence doivent être soumis en ligne via le site Web du JCT prévu pour la soumission d'articles à l'adresse:

<http://mc.manuscriptcentral.com/cjrs-jct>

La date limite pour la soumission d'articles pour ce numéro spécial du JCT est le : **30 septembre 2009**.

**NOTE:** Les articles seront évalués au moment de leur réception. Selon la période et le nombre d'articles acceptés, il est possible qu'il y ait plus d'un volume ou d'une section du numéro spécial. Par exemple, les articles reçus peu de temps après la Conférence dont les évaluations seront positives et qui seront acceptés rapidement pourront être publiés en 2009 dans une section spéciale du JCT consacrée à la Conférence dans un numéro régulier du JCT. La date prévue pour la publication du numéro spécial de la Conférence en tant que tel est la mi-2010.

Numéro spécial du JCT – 30<sup>e</sup> Symposium canadien sur la télédétection

**Rédacteurs invités:**

Dr. Derek R. Peddle, Dr. Craig A. Coburn  
University of Lethbridge  
Canada  
derek.peddle@uleth.ca  
craig.coburn@uleth.ca

**Rédacteur en chef du JCT:**

Dr. Nicholas C. Coops  
University of British Columbia  
Canada

### Technical Sessions at a Glance

SESSION	DAY	TIME	Session A	Session B	Session C	Session D
			Room: PE-261	PE-250	PE-275	PE-264
ORAL-I	Tues. June 23	2:00 - 3:30 PM	AGRICULTURE	RADAR 1	METHODS 1	LIDAR 1
ORAL-II	Tues. June 23	3:50 - 5:20 PM	ATMOSPHERE	RADAR 2	HAZARDS 1	CENTRES / EDUCATION
ORAL-III	Wed. June 24	8:30 - 10:20 AM	HAZARDS 2	RADAR 3	WATER	HYPERSPECTRAL 1
ORAL-IV	Wed. June 24	10:40AM - 12:10PM	MODELING	CRYOSPHERE	VEGETATION	LIDAR 2
ORAL-V	Wed. June 24	3:30 - 5:20 PM	FORESTRY 1	RADAR 4	METHODS 2	HYPERSPECTRAL 2
ORAL-VI	Thurs. June 25	8:30 - 10:20 AM	GLOBAL CHANGE	ECOLOGY 1	METHODS 3	LIDAR 3
ORAL-VII	Thurs. June 25	1:30 - 3:20 PM	FORESTRY 2	ECOLOGY 2	METHODS 4	GEOLOGY / OCEANS
SESSION	DAY	TIME	Room			
POSTER-I	Tues. June 23	2:00 - 3:30 PM	Foyer			
POSTER-II	Tues. June 23	3:50 - 5:20 PM	Foyer			
POSTER-III	Wed. June 24	10:40AM - 12:10PM	Foyer			
POSTER-IV	Thurs. June 25	1:30 - 3:20 PM	Foyer			

## **TECHNICAL PROGRAM: ORAL SESSIONS**

**Tuesday June 23: 2:00 – 3:30 pm. Room PE-261**

**Oral Session I-A: AGRICULTURE**

**Chair: Dr. Anne Smith**

- 2:00 – 2:20 **Quantifying Crop Biomass Accumulation Using Multi-temporal Optical Remote Sensing Observations. (#598)**  
Jiangui Liu (1), Elizabeth Pattey (1), Jiali Shang (1), Stuart Admiral (1), Guillaume Jégo (1), Heather McNairn (1), Anne Smith (1), Baoxin Hu (2), Frank Zhang(2) and Jim Freementle (2)  
1 - Agriculture and Agri-Food Canada  
2 - York University, Department of Earth and Space Science and Engineering
- 2:20 – 2:40 **Neural Network Classification of Hyperspectral Image Data for Improved Site-Specific Herbicide Management. (#601)**  
P.R. Eddy (1,2), A.M. Smith (3,2), B.D. Hill (3), D.R. Peddle (2), C.A. Coburn (2), R.E. Blackshaw (3).  
1 - Alberta Terrestrial Imaging Center  
2 - Department of Geography, University of Lethbridge  
3 - Agriculture and Agri-Food Canada
- 2:40 – 3:00 **Mapping native grassland change using single-date multispectral satellite imagery. (#564)**  
Anne M. Smith (1), G.L. Larson (1), C. Kloppenburg (1), B. D. Hill (1), R. Carreau (1) and P.M. Teillet (2)  
1 - Agriculture and Agri-Food Canada 2 - University of Lethbridge
- 3:00 – 3:20 **Estimation of gross ecosystem production by hyperspectral measurements in a rice field. (#595)**  
Micol Rossini (1), Michele Meroni (1), Giovanni Manca (2), Lorenzo Busetto (2), Guenther Seufert (2)  
1 - Remote Sensing of Environmental Dynamics Lab. University of Milano-Bicocca (UNIMIB) Italy  
2 - Institute for Environment and Sustainability JRC Ispra Italy, Sergio Cogliati, UNIMIB
- 3:20 – 3:30 **Panel Discussion**

**Tuesday June 23: 2:00 – 3:30 pm. Room PE-250**

**Oral Session I-B: RADAR 1 (Compact Polarimetry)**

**Chair: Dr. Brian Brisco**

- 2:00 – 2:20 **An Overview of Compact Polarimetry. (#503)**  
R. Keith Raney  
Johns Hopkins University, Applied Physics Laboratory
- 2:20 – 2:40 **Compact Polarimetry Assessment: Wetlands and Soil Moisture. (#499)**  
Brian Brisco, François Charbonneau and Mélanie Trudel  
Canada Centre for Remote Sensing
- 2:40 – 3:00 **Ship Detection using RADARSAT-2 Polarimetric and Simulated Compact Polarimetric Data. (#502)**  
Chen Liu, Paris W. Vachon  
Defence R&D Canada – Ottawa
- 3:00 – 3:20 **An Assessment of Compact Polarimetry for Crop Classification. (#501)**  
Heather McNairn, Jiali Shang, Catherine Champagne, Francois Charbonneau and Amine Merzouki  
Agriculture and Agri-Food Canada
- 3:20 – 3:30 **Panel Discussion**

**Tuesday June 23: 2:00 – 3:30 pm. Room PE-275**

**Oral Session I-C: METHODS 1**

**Chair: Dr. J.R. Gibson**

- 2:00 – 2:20 Automation of Geospatial Image Processing for Creating Northern Resource SPOT Mosaics. (#584)  
J. R. Gibson and M. Buchheit  
Canada Centre for Remote Sensing
- 2:20 – 2:40 The use of Stereo Satellite Imagery: Applicability and Accuracy Assessment (#486)  
Ahmed SHAKER and Wai Yeung YAN: Ryerson University
- 2:40 – 3:00 Adaptation of Toutin's 3D Physical Math Model for Wide FOV MERIS Full Resolution Data. (#655)  
C.V. Schmitt, Th. Toutin  
Natural Resources Canada, Canada Centre for Remote Sensing, Ottawa, Canada.
- 3:00 – 3:20 Image and Terrain-based Estimation of Snow Distribution in the Canadian Rocky Mountains: A Comparison of Spatial Interpolation Methods (#614)  
Shiyong Xu and Derek Peddle: Department of Geography, University of Lethbridge
- 3:20 – 3:30 Panel Discussion

**Tuesday June 23: 2:00 – 3:30 pm. Room PE-264**

**Oral Session I-D: LiDAR 1 (Forest Resources)**

**Chair: Dr. Chris Hopkinson**

- 2:00 – 2:20 The use of LiDAR and High-Resolution Aerial Photography to Assess the Influence of Forest Structure on Snow Accumulation and Ablation in Extensively Disturbed Forests. (#663)  
Andres Varhola (1), Nicholas Coops (1), Pat Teti (2), Sarah Boon (3), Markus Weiler (4), Christopher Bater (1)  
1 - University of British Columbia  
2 - BC Ministry of Forests and Range  
3 - University of Lethbridge  
4 - Universität Freiburg
- 2:20 – 2:40 A Structural Analysis for Single Tree Classification Using Airborne Lidar Data. (#505)  
Jili Li, Baoxin Hu, and Gunho Sohn: Department of Earth and Space Science and Engineering, York University.
- 2:40 – 3:00 The Application Of ALS LIDAR Data to Differentiate Among Three Classes of Increasing Structural Complexity in Boreal Spruce and Mixedwood Forest Types. (#520)  
Ben Kuttner and Jay Malcolm: University of Toronto
- 3:00 – 3:20 Using a Markov Network For Individual Tree Detection From Airborne Laser Scanning Data (#495)  
Junjie Zhang and Gunho Sohn: GeolCT Lab, Department of Earth and Space Science and Engineering, York University
- 3:20 – 3:30 Panel Discussion

**Tuesday June 23: 3:50-5:20 pm. Room PE-261**

**Oral Session II-A: ATMOSPHERE**

**Chair: Dr. Adriana Predoi-Cross**

- 3:50 – 4:10 Determination of telluric water vapour using absorption measurements of lunar irradiance. (#516)  
Richard R. Querel and David A. Naylor, Department of Physics and Astronomy, University of Lethbridge
- 4:10 – 4:30 Lineshape Study of Carbon Dioxide Transitions for Tropospheric Remote Sensing Applications. (#536)  
A. Predoi-Cross (1), A.R.W. McKellar (2), A. Liu (1), C. Povey (1), D. Hurtmans (3),  
1 - Department of Physics and Astronomy, University of Lethbridge,  
2 - Steacie Institute for Molecular Sciences, National Research Council of Canada  
3 - Service de Chimie Quantique et Photophysique, Université Libre de Bruxelles,
- 4:30 – 4:50 Spectroscopic Study Of Deuterated Fluoroform In The Context Of Atmospheric Greenhouse Gas Monitoring. (#534)  
Petr Pracna (1), Adina Ceausu-Velcescu (2), Adriana Predoi-Cross (3), and Brant Billingham (4),  
1 - J. Heyrovsky Institute of Physical Chemistry, v.v.i., Academy of Sciences of the Czech Republic  
2 - Université de Perpignan, Laboratoire de Mathématiques, Physique et Systèmes, 3 - Canadian Light Source,  
3 - University of Lethbridge, Department of Physics and Astronomy,  
4 - Canadian Light Source Inc.,
- 4:50 – 5:10 Spatial Heterodyne Observations of Water in Middle Atmosphere. (#631)  
Dr. Yunlong Lin: York University
- 5:10 – 5:20 Panel Discussion

**Tuesday June 23: 3:50-5:20 pm. Room PE-250**

**Oral Session II-B: RADAR 2**

**Chair: Dr. Joseph Buckley**

- 3:50 – 4:10 The Annual Cycle of Vegetation at CFB Shilo as Monitored with Radarsat 2 Polarimetry. (#636)  
Joseph R. Buckley, Department of Physics, Royal Military College of Canada
- 4:10 – 4:30 Classification of Polarimetric SAR Images Using Support Vector Machines. (#573)  
Reza Shah Hosseini (1), Iman Entezari (1), Saeid Homayouni (1), Babak Mansouri (2)  
1 - University of Tehran  
2 - International Institute of Earthquake Engineering and Seismology
- 4:30 – 4:50 CCRS-China RADARSAT-2 Applications Research Program Overview. (#498)  
Brian Brisco (1), Ridha Touzi (1), Joost van der Sanden (1), Bert Guindon (1), Ying Zhang (1), Guo Huadong (2), Li Zhen (2), Liao Jinjuan (2) and Liu Guang (2)  
1 - Canada Centre for Remote Sensing  
2 - Centre for Earth Observation and Digital Earth Chinese Academy of Sciences, Beijing, China
- 4:50 – 5:10 Compact Polarimetry Assessment: Sea Ice. (#500)  
Roger DeAbreu (1), Matt Arkett (1), Brian Brisco (2), and François Charbonneau (2)  
1 - Canadian Ice Service/Environment Canada  
2 - Canada Centre for Remote Sensing
- 5:10 – 5:20 Panel Discussion

**Tuesday June 23: 3:50-5:20 pm. Room PE-275**

**Oral Session II-C: HAZARDS 1**

**Chair: Dr. Hamid Assilzadeh**

3:50 – 4:10. Enhanced Methodology for Oil Spill Contingency Systems (#527)

Hamid Assilzadeh (1), Yang Gao (1) and Jason K. Levy (2)

1 - University of Calgary

2 - Virginia Commonwealth University, USA

4:10 – 4:30 Katrina's Oil Spill Hazard Evaluation and Analysis Using SAR Image Processing (#525)

Hamid Assilzadeh (1), Jason K. Levy (2), Yang Gao (1)

1 - University of Calgary

2 - Virginia Commonwealth University, USA

4:30 – 4:50 Strategic Decision Making for Terrorism and Disasters in the Oil and Gas Industry: Integrating Geomatics and Conflict Resolution (#)

Jason K. Levy, Sayedur R. Chowdhury and C. Emdad Haque

Virginia Commonwealth University, USA

4:50 – 5:10 Enhancing Emergency Response to Oil and Gas Pipelines Incidents Using a Fuzzy JESS Method (#)

A. Asgary, A. Ghaffari and A. Kong

York University

5:10 – 5:20 Panel Discussion

**Tuesday June 23: 3:50-5:20 pm. Room PE-264**

**Oral Session II-D: CENTRES / EDUCATION**

**Chair: Dr. Dirk Werle**

3:50 – 4:10 ATIC (Alberta Terrestrial Imaging Center) - an Introduction. (#612)

Erik Kokko - ATIC, Lethbridge Canada.

4:10 – 4:30 The Canadian Centre for Unmanned Vehicle Systems (CCUVS) (#668)

Sterling Cripps, CCUVS, Medicine Hat, AB., Canada.

4:30 – 4:50 An Inventory of Canadian Universities Active in Radar Remote Sensing. (#615)

Dirk Werle, Aerde Environmental Research, Halifax, NS

Guy Aube, Canadian Space Agency, St. Hubert, QC

4:50 – 5:10 Teaching RADARSAT across disciplines (#541)

Elizabeth L. Simms, Memorial University

5:10 – 5:20 Panel Discussion

**Wednesday June 24: 8:30-10:20 am. Room PE-261**

**Oral Session III-A: HAZARDS 2**

**Chair: Dr. Hamid Assilzadeh**

- 8:30 – 8:50 **Decision Support for Real-time Oil Spill Emergency Management. (#617)**  
Jason Levy (1), Hamid Assilzadeh (2), and Yang Gao (2)  
1 - Virginia Commonwealth University  
2 - University of Calgary
- 8:50 – 9:10 **Performance Evaluation of Multi-Spectral and Panchromatic Image Fusion Techniques. (#509)**  
Qing Guo (1, 2), Siyue Chen (1), Henry Leung (1), Shutian Liu (2)  
1 - University of Calgary  
2 - Harbin Institute of Technology
- 9:10 – 9:30 **An Architecture of Integrating GIS/RS/GPS in Urban Fire Response System. (#544)**  
Zhinong Zhong and Yang Gao: University of Calgary
- 9:30 – 9:50 **Emergency Management Systems with Event-Driven GIS. (#557)**  
Shui Liu (1), Yang Gao (1) and Songnian Li (2)  
1 - University of Calgary  
2 - Ryerson University
- 9:50 – 10:10 **Use of Web-services for Emergency Response to Oil and Gas Pipeline Incidents (#)**  
Ali Asgary, Albert Kong and Alireza Ghaffari: York University
- 10:10 – 10:20 **Panel Discussion**

**Wednesday June 24: 8:30-10:20 am. Room PE-250**

**Oral Session III-B: RADAR 3**

**Chair: Dr. Daniel De Lisle**

- 8:30 – 8:50 **Traitements de données Radarsat-2 pour la cartographie topographique Radarsat-2 data processing for topographic mapping. (#644)**  
Saïd Kharbouche, Frédéric Happi Mangoua, Daniel Clavet
- 8:50 – 9:10 **RADARSAT-2: Serving Canadians. (#476)**  
Daniel De Lisle, Denis Auger, Luc Brûlé  
Canadian Space Agency
- 9:10 – 9:30 **Analysis of the Department of National Defence/Canadian Forces Space-Based Surveillance Objectives for the RADARSAT Constellation Mission. (#473)**  
Mark Ball and Ian Chapman, Defence Research and Development Canada Centre for Operational Research and Analysis (DRDC CORA)
- 9:30 – 9:50 **Soil Moisture Inversion from RADARSAT-2 Images Acquired Over an Agricultural Area. (#475)**  
Imen Gherboudj (1), Ramata Magagi (1), Aaron Berg (2), and Brenda Toth (3)  
1 - Université de Sherbrooke, Centre d'applications et de recherches en télédétection (CARTEL)  
2 - University of Guelph  
3 - Environment Canada, MSC Hydrometeorology and Arctic Lab, Saskatoon
- 9:50 – 10:10 **On Incidence Angle Dependence in Polarimetric SAR Imagery. (#635)**  
Joseph R. Buckley, Department of Physics, Royal Military College of Canada
- 10:10 – 10:20 **Panel Discussion**

**Wednesday June 24: 8:30-10:20 am. Room PE-275**

**Oral Session III-C: WATER**

**Chair: Dr. Xulin Guo**

- 8:30 – 8:50 **La classification de l'occupation du sol à partir des images SPOT et RADARSAT-2 au Vietnam du Nord. (#660)**  
Kim-Huong Hoang(1), Monique Bernier(1), Sophie Duchesne(1), Minh-Y Tran(2)  
(1) Institut National de la Recherche Scientifique (INRS),  
Centre Eau, Terre et Environnement (ETE)  
(2) Académie des sciences et des technologies du Vietnam  
Institut des sciences spatiales
- 8:50 – 9:10 **Effects of Classification Approaches on CRHM Model Performance. (#526)**  
Xulin Guo (1), Xing Fang (1), Lyle Boychuk (2), Adam Minke (1), Cherie Westbrook (1), and John Pomeroy (1)  
1 - University of Saskatchewan  
2 - Ducks Unlimited Canada
- 9:10 – 9:30 **Spectral Interpretation of Plankton Blooms and Floating Vegetation in Global Waters. (#533)**  
Stephanie King and Jim Gower, Institute of Ocean Sciences
- 9:30 – 9:50 **Mapping Wetlands Variation Using High Resolution Image in the Pandeiros Wildlife Sanctuary, Brazil. (#511)**  
Ivan Seixas Barbosa, Philippe Maillard, Thiago Alencar Silva. Universidade Federal de Minas Gerais
- 9:50 – 10:10 **Hydrologic modeling of protected area boundary in Sundance Provincial Park using SAR data. (#558)**  
David Aldred (1), Jinfei Wang (1), Harold Zwick (2),  
1 - University of Western Ontario  
2 - Macdonald Dettwiler & Associates
- 10:10 – 10:20 **Panel Discussion**

**Wednesday June 24: 8:30-10:20 am. Room PE-264**

**Oral Session III-D: HYPERSPECTRAL 1**

**Chair: Dr. Karl Staenz**

- 8:30 – 8:50 **Terrestrial Imaging Spectroscopy – Some Future Perspectives. (#652)**  
Karl Staenz  
Alberta Terrestrial Imaging Centre and Department of Geography, University of Lethbridge, Canada.
- 8:50 – 9:10 **Hyperspectral Remote Sensing Algorithms for Retrieving Forest Chlorophyll Content. (#552)**  
Yongqin Lisa Zhang, University of Toronto
- 9:10 – 9:30 **Inferring Spatial Distribution of Vegetation Nitrogen Content from Airborne Hyperspectral Remote Sensing Imagery. (#605)**  
Yongqin Zhang (1), John R Miller (1), Jing M Chen (2).  
1 - York University  
2 - University of Toronto
- 9:30 – 9:50 **Improving the Canopy Model Inversion using a Weighting Function. (#549)**  
K. Frank Zhang (1), Baoxin Hu (1), Jian-guo Wang (1) and Anne Smith (2)  
1 - York University  
2 - Agriculture and Agri-Food Canada – Lethbridge Research Station
- 9:50 – 10:10 **Monitoring Rangeland Community/Health Using Multispectral and Hyperspectral Data. (#568)**  
Nadia Rochdi (1), Peter Eddy (1), Jinkai Zhang (1), Karl Staenz (1,2), Livio Fent (3), Barry Adams (3), Anne Smith (4).  
1 - Alberta Terrestrial Imaging Center  
2 - Department of Geography, University of Lethbridge  
3 - Alberta Sustainable Resources Development  
4 - Agriculture and Agri-Food Canada – Lethbridge Research Station
- 10:10 – 10:20 **Panel Discussion**

**Wednesday June 24: 10:40 a.m. -12:10 p.m. Room PE-261**

**Oral Session IV-A: MODELING**

**Chair: Dr. Derek Peddle**

10:40 – 11:00 **BIOPHYS: A Physically-Based Continuous Fields Algorithm for Ecosystem, Climate and Carbon Models. (#608)**

Forrest G. Hall (1), Derek R. Peddle (2), and Fred Huemmrich (1)  
1 - NASA GSFC  
2 - Department of Geography, University of Lethbridge

11:00 – 11:20 **Adaptive Full-Blind Multiple Forward-Mode Canopy Reflectance Model Inversion of Forest Structure in Mountain Pine Beetle Damaged Stands, Central British Columbia. (#610)**

Derek R. Peddle (1), Sarah Boon (1), Aaron P. Glover (1), and Forrest G. Hall (2)  
1 - Department of Geography, University of Lethbridge  
2 - NASA GSFC

11:20 – 11:40 **Characterization of Olive (*Olea europaea* L.) Tree Crowns Using Terrestrial Laser Scanning and 3D Radiative Transfer Modeling. (#630)**

Inian Moorthy (1), John R., Miller (1), Jose A. Jimenez-Berni (2), Pablo J. Zarco-Tejada (2), Baoxin Hu (1)  
1 - Center for Research in Earth and Space Science, York University,  
2 - Instituto de Agricultura Sostenible (IAS), Consejo Superior de Investigaciones Científicas (CSIC), Córdoba, Spain

11:40 – 12:00 **Modelling and Mapping Forest Structural Complexity using High Resolution Airborne Imagery and Topographic Information. (#659)**

Jon Pasher and Doug King  
Department of Geography and Environmental Studies, Carleton University, Ottawa, Canada

12:00 – 12:10 **Panel Discussion**

**Wednesday June 24: 10:40 a.m. -12:10 p.m. Room PE-250**

**Oral Session IV-B: CRYOSPHERE**

**Chair: Dr. Laurence Gray**

10:40 – 11:00 **Remote Sensing of Glacial Ice in the Canadian Arctic. (#651)**

Laurence Gray (1) and Dave Burgess (2)  
1 - Natural Resources Canada, Canada Centre for Remote Sensing, Ottawa, Canada.  
2 - Natural Resources Canada, Geological Survey of Canada, Ottawa, Canada.

11:00 – 11:20 **Utilisation conjointe de données de micro-ondes passives et actives pour le suivi du gel saisonnier du sol de la toundra dans le Nord du Québec. (#654)**

Parvin Kalantari, Maxime Rousseau et Monique Bernier  
INRS, Centre Eau Terre Environnement, Québec, Canada.

11:20 – 11:40 **Lake Ice Monitoring using Multi-Polarized SAR Imagery. (#465)**

Torsten Geldsetzer, Joost van der Sanden and Brian Brisco  
Canada Centre for Remote Sensing, Ottawa, Ontario

11:40 – 12:00 **Monitoring Glacial Change with ALOS PALSAR. (#604)**

Don Atwood, Franz Meyer  
Geophysical Institute, University of Alaska Fairbanks

12:00 – 12:10 **Panel Discussion**

**Wednesday June 24: 10:40 a.m. -12:10 p.m. Room PE-275**

**Oral Session IV -C: VEGETATION**

**Chair: Dr. Nicholas Coops**

10:40 – 11:00 Mapping Leaf Area Index (LAI) through SPOT Images in a Managed Forest in Central Mexico. (#574)

J. René Valdez-Lazalde (1), Carlos Arturo Aguirre-Salado (2), Gregorio Ángeles-Pérez (1), Hector M. De los Santos-Posadas (1).  
1 - Colegio de Postgraduados  
2 - Universidad Autonoma de San Luis Potosi

11:00 – 11:20 Predicting Tree Species Distribution in the Southern Gulf Islands, Canada, using ASD FieldSpec3, AISA and Mark II Data Fusion. (#662)

Trevor Jones (1), Nicholas Coops (1), and Tara Sharma (2),  
1 - University of British Columbia  
2 - Parks Canada

11:20 – 11:40 Global Monitoring of Green House Gases using A Constellation of three Micro-Satellites. (#632)

Dr. Yunlong Lin  
York University

11:40 – 12:00 Design And Qualification Of The Sac-D NIRST Flight Model Radiometer. (#650)

François Châteauneuf (1), Linh Ngo Phong (2), Mélanie Leclerc, (1), Linda Marchese(1), Patrice Côté (1), Claude Chevalier (1), and Hugo Marraco (3),  
1 - INO, Québec City, Québec, Canada  
2 - Canadian Space Agency  
3 - Comisión Nacional de Actividades Espaciales

12:00 – 12:10 Panel Discussion

**Wednesday June 24: 10:40 a.m. -12:10 p.m. Room PE-264**

**Oral Session IV -D: LiDAR 2 (Water Resources)**

**Chair: Dr. Chris Hopkinson**

10:40 – 11:00 Topographic LiDAR – Providing a New Perspective in the Mackenzie Delta. (#649)

Dustin Whalen (1), Don Forbes (1), Chris Hopkinson (2), JC Lavergne (3), Gavin Manson (1), Phillip Marsh (4), Steve Solomon (1).  
1 – Natural Resources Canada, Geological Survey of Canada, Ottawa, Canada.  
2 - Applied Geomatics Research Group, Centre of Geographic Sciences, Lawrencetown, Canada.  
3 - Natural Resources Canada, Geodetic Survey Division, Ottawa, Canada.  
4 - National Water Research Institute, Saskatoon, Canada.

11:00 – 11:20 Combining Interannual Airborne Lidar and Diurnal Oblique Thermal Imagery to Investigate Glacial Moraine Dynamics. (#488)

Chris Hopkinson (1), John Barlow (2), Mike Demuth (3) and John Pomeroy (2)  
1 – Applied Geomatics Research Group, NSCC Annapolis Valley Campus, Nova Scotia  
2 – Department of Geography, University of Saskatchewan, Saskatoon  
3 – National Glaciology Program, Geological Survey of Canada, Ottawa

11:20 – 11:40 An Investigation into the Impact of Surface Saturation on Laser Pulse Intensity Data. (#637)

Kevin Garroway (1), Chris Hopkinson (2), and Rob Jamieson (1).  
1 - Dalhousie University.  
2 - AGRG.

11:40 – 12:00 Estimating Snow Volume in the Elbow River Watershed Using Airborne LiDAR. (#491)

Tim Collins (1,3), Chris Hopkinson (1), Axel Anderson (2), Ian Spooner (3)  
1 – Applied Geomatics Research Group, NSCC Annapolis Valley Campus, Nova Scotia  
2 – Sustainable Resources Development, Government of Alberta, Calgary, Alberta  
3 – Department of Geology, Acadia University, Wolfville, Nova Scotia

12:00 – 12:10 Panel Discussion

**Wednesday June 24: 3:30-5:20 pm. Room PE-261**

**Oral Session V-A: FORESTRY 1**

**Chair: Dr. Laura Chasmer**

- 3:30 – 3:50 **Spatial Modeling of Foliar Nutrients Using Hyperspectral and LIDAR Remote Sensing at a Boreal Mixedwood Forest in Northern Ontario, Canada. (#597)**  
Kemal Gökkaya (1), Valerie Thomas (1), Tom Noland (2), Harry McCaughey (3), Ian Morrison (4), and Paul Treitz (3)  
1 - Virginia Tech / 2 - Ontario Ministry of Natural Resources  
3 - Queen's University / 4 - Canadian Forest Service
- 3:50 – 4:10 **Spatial Partitioning of CO<sub>2</sub> Fluxes Based on Canopy Structure Within a Heterogeneous Managed Boreal Wetland Ecosystem (#666)**  
Laura Chasmer (1), Richard Petrone (1), Scott Brown (1), Chris Hopkinson (2), Natascha Kljun (3), and Kevin Devito (4)  
1- Cold Regions Research Centre, Dept. of Geography, Wilfrid Laurier University  
2 - Applied Geomatics Research Group, Centre of Geographic Sciences, Nova Scotia Community College,  
3 - Department of Geography, Swansea University, Swansea, UK,  
4 - Department of Biological Sciences, University of Alberta.
- 4:10 – 4:30 **Spatial Modeling of Carbon Stocks Using Discrete Multi-Return Lidar Data in a Sub Boreal Forest: a Comparison To Optical Remote Sensing. (#646)**  
Darren Janzen, Claudette Bois, Roger Wheate, and Arthur Fredeen: University of Northern British Columbia
- 4:30 – 4:50 **Development of an Annual Forest Change Product for Canada from 250m MODIS Data. (#479)**  
Darren Pouliot, Rasim Latifovic, Richard Fernandes and Ian Olthof: Canada Centre for Remote Sensing
- 4:50 – 5:10 **Spatiotemporal Dynamics of MODIS-based Leaf Area Index in the Boreal Forest in Northern Alberta. (#513)**  
Quazi K. Hassan (1) and Charles P.-A. Bourque (2)  
1 - University of Calgary / 2 - University of New Brunswick
- 5:10 – 5:20 **Panel Discussion**

**Wednesday June 24: 3:30-5:20 pm. Room PE-250**

**Oral Session V-B: RADAR 4**

**Chair: Dr. Bryan Mercer**

- 3:30 – 3:50 **Comparing C- And L-Band Radar for Mapping Riparian Wetlands in the Brazilian Savannah Context: An Approach Using Unsupervised Image Segmentation. (#496)**  
Thiago de Alencar-Silva and Philippe Maillard, Universidade Federal de Minas Gerais
- 3:50 – 4:10 **Measurement of Snow Water Equivalent and Depth using Differential Interferometric Synthetic Aperture Radar. (#553)**  
Ali Esmaeily G.(1) Hardy B. Granberg (1), Q. Hugh J. Gwyn (2),  
1 - Université de Sherbrooke  
2 - Infoterra CO.
- 4:10 – 4:30 **Recent Results on Forest Height and DTM Extraction using a Single-Pass Fully Polarimetric L-Band InSAR System. (#611)**  
Bryan Mercer (1), Qiaoping Zhang (1), Marcus Schwaebisch, Michael Denbina  
1- Intermap Technologies Corp.
- 4:30 – 4:50 **Creation and Evaluation of DEMs from TerraSAR-X Stereo Images. (#480)**  
Chen Xu[1], Stephen Griffiths[1], Parivash Lumsdon[2], Bryan Mercer[1], and Qiaoping Zhang[1]  
Intermap Technologies Corp.
- 4:50 – 5:10 **Demonstration of RADARSAT-2 and Space-based Automatic Identification System (AIS) for Ship Detection. (#616)**  
Paris W. Vachon (1), Nicholas Sandirasegaram(1), Ryan English(1), Jeff Secker(1), and Ian D'Souza (2)  
1 - Defence R&D Canada – Ottawa  
2 - COM DEV Canada
- 5:10 – 5:20 **Panel Discussion**

**Wednesday June 24: 3:30-5:20 pm. Room PE-275**

**Oral Session V-C: METHODS 2**

**Chair: Dr. Geoffrey J. Hay**

3:30 – 3:50 Object-Oriented Classification of Multi-Resolution Images For the Extraction of Narrow Linear Forest Disturbance. (#521)

Yuhong He (1), Steven E. Franklin (1), Xulin Guo (1), Greg J. McDermid (2), Gordon Stenhouse (3)  
1 - Department of Geography and Planning, University of Saskatchewan,  
2 - Department of Geography, University of Calgary,  
3 - Foothills Model Forest.

3:50 – 4:10 Comparing Remote-Sensing and Climate-Based Methods for Modeling Pine Species. (#627)

Adam McLane (1), Greg McDermid (1), Nicholas Coops (2)  
1 - University of Calgary  
2 - University of British Columbia

4:10 – 4:30 Object-Oriented Urban Tree Cover Extraction from High-Resolution Colour-Infrared Aerial Imagery. (#550)

Brad Lehrbass (1), Jinfei Wang (1), Ian Smyth (2), John Bontje (3),  
1 - Department of Geography, University of Western Ontario  
2 - Ontario Ministry of Natural Resources  
3 - GIS and Information Systems, City of London, London, Ontario, Canada

4:30 – 4:50 HEAT - Home Energy Assessment Technologies: High Resolution Airborne Thermal Imagery Based Residential Waste Heat Monitoring. (#485)

Geoffrey J. Hay and Christopher D. Kyle, University of Calgary

4:50 – 5:10 A Geographic Object-Based Image Analysis (GEOBIA) Approach to Estimate Forest Vertical Structure Using Optimal Lidar Transects and Quickbird Data. (#467)

Gang Chen, Geoffrey J. Hay: Department of Geography, University of Calgary

5:10 – 5:20 Panel Discussion

**Wednesday June 24: 3:30-5:20 pm. Room PE-264**

**Oral Session V-D: HYPERSPECTRAL 2**

**Chair: Dr. H. Peter White**

3:30 – 3:50 Far-Infrared Imaging Fourier Transform Spectroscopy. (#546)

Locke D. Spencer and David A. Naylor, University of Lethbridge, Department of Physics and Astronomy.

3:50 – 4:10 First Field Tests of realSens; for Detection of Leaks of Natural Gas. (#607)

Boyd T. Tolton (1), Doug Miller, and Adrian Banica  
1 - Synodon Inc., Edmonton, AB

4:10 – 4:30 Spectral Reflectance Retrieval for Mineralogical and Remote Sensing Analysis of Historical Gold Mine Tailings Sites in Nova Scotia, Comparisons and Comments. (#575)

H.P.White (1) and J.B. Percival (2)  
1 - Canada Centre for Remote Sensing, Natural Resources Canada  
2 - Geological Survey of Canada, Natural Resources Canada

4:30 – 4:50 Spectrophotometric Detection Of *Phellinus sulphurascens* Colonization In Douglas-Fir (*Pseudotsuga menziesii*) Foliage. (#494)

Geoff Quinn (1), K. Olaf Niemann (1) and David G. Goodenough (2)  
1 - University of Victoria  
2 - Natural Resources Canada

4:50 – 5:10 Towards developing an appropriate means of characterizing Arctic vegetation in the Canadian North using hyperspectral image data. (#576)

R.P. Gauthier, H.P. White, R.J. Soffer, and B. Brisco: Canada Centre for Remote Sensing, Natural Resources Canada

5:10 – 5:20 Panel Discussion

**Thursday June 25: 8:30-10:20 am. Room PE-261**

**Oral Session VI-A: GLOBAL CHANGE**

**Chair: Dr. Joseph M. Piwowar**

- 8:30 – 8:50 **Integration of Earth Observation and Ancillary Data in the Production of an Historical National Land Use Map of Canada. (#647)**  
Ted Huffman (1), Mark McGovern (2), Don Leckie (3), David Hill (3), Robby Bemrose (1), Flavius Rogrovan (2), Dominique Blain (2), Nancy Hoffmann (4) and Morgan Cranny (3)  
1 - Agriculture and Agri-Food Canada, Ottawa ON / 2 - Environment Canada, Greenhouse Gas Division Gatineau, QC  
3 - Natural Resources Canada, Canadian Forest Service, Victoria, BC / 4 - Statistics Canada, Ottawa, ON
- 8:50 – 9:10 **AMSR-E Passive Microwave Brightness Temperatures for Snow Properties Retrieval Compared with In-Situ Measurements Across a Boreal Forest to Taiga Transect in Québec. (#639)**  
Alain Royer, Alexandre Langlois and Kalifa Goïta: Université de Sherbrooke
- 9:10 – 9:30 **North American Land Change Monitoring System Present and Future. (#481)**  
Rasim Latifovic (1), Darren Pouliot (1), Collin Homer (2), Chandra Giri (2), Francisco Takaki (3), Rainer Ressler (4),  
1 - Canada Centre for Remote Sensing  
2 - U.S. Geological Survey  
3 - National Institute of Geographic Statistics and Information of Mexico  
4 - Mexico National Commission for the Knowledge and Use of Biodiversity
- 9:30 – 9:50 **Spectral and Spatial Variability within the Northern Mixed-Grass Prairie. (#571)**  
Joseph M. Piwowar. University of Regina
- 9:50 – 10:10 **Quantifying Change in Peat Plateau and Wetland Areas within the Discontinuous Permafrost Zone: 1947 To Present. (#667)**  
Laura Chasmer (1), Chris Hopkinson (2), William Quinton, and Masaki Hayashi (3)  
1 - Wilfrid Laurier University  
2 - Centre of Geographic Sciences  
3 - University of Calgary
- 10:10 – 10:20 **Panel Discussion**

**Thursday June 25: 8:30-10:20 am. Room PE-250**

**Oral Session VI-B: ECOLOGY 1**

**Chair: Dr. Fred Huemrich**

- 8:30 – 8:50 **A Model-Based Approach To Examining The Reduction Of Noise In NDVI Time Series. (#522)**  
Jennifer Hird and Greg McDermid: Foothills Facility for Remote Sensing and GIScience, Dept of Geography, University of Calgary
- 8:50 – 9:10 **Land Use Land Cover Change Detection Through Fragmentation Analysis. (#554)**  
Kristi Fedec and Xulin Guo: University of Saskatchewan.
- 9:10 – 9:30 **The Impact of Sampling Intensity and Failed GPS Acquisition on Animal Home Range Estimation. (#645)**  
Aleksandra Sobol (1), Julia Linke(1), Gregory J. McDermid (1), John Boulanger (2), and Gordon Stenhouse (3),  
1 - Foothills Facility for Remote Sensing and GIScience, Department of Geography, University of Calgary  
2 - Integrated Ecological Research, Nelson, Canada.  
3 - Foothills Research Institute and Alberta Fish and Wildlife Division, Hinton, Canada.
- 9:30 – 9:50 **Suitable Vegetation Indices on Monitoring Temporal Variation of Leaf Area Index in Mixed Grassland. (#529)**  
Zhaoqin Li and Xulin Guo, University of Saskatchewan
- 9:50 – 10:10 **Remote Sensing of Ecosystem Light Use Efficiency. (#602)**  
Karl F. Huemrich (1), Elizabeth Middleton (2), David Landis (3),  
Andy Black (4), Alan Barr (5), J. Harry McCaughey (6), Forrest G. Hall (1).  
1 - University of Maryland / 2 - NASA Goddard Space Flight Center / 3 – SSAI / 4 - University of British Columbia  
5 - Climate Research Branch, Meteorological Service of Canada / 6 - Queens University.
- 10:10 – 10:20 **Panel Discussion**

**Thursday June 25: 8:30-10:20 am. Room PE-275**

**Oral Session VI-C: METHODS 3**

**Chair: Dr. Philippe Teillet**

- 8:30 – 8:50 Remote Sensing at the Flight Research Laboratory: Applying the Tools and Techniques to Diverse Disciplines. (#468)  
George Leblanc (1), Ramesh Srinivasan (1), Mengistu Wolde (1), Dave Marcotte (1), Sion Jennings (1), Greg Craig (1), Brad Nelson (2), Elizabeth Pattey (3)  
1 - Flight Research Laboratory  
2 - Defence Research and Development Canada  
3 - Agriculture and Agri-Food Canada
- 8:50 – 9:10 High-Performance Field and Laboratory Goniometer for Measuring Hyperspectral Bi-directional Reflectance Characteristics of Various Agricultural Canopies. (#581)  
Craig A. Coburn (1), Scott D. Noble (2)  
1 - University of Lethbridge  
2 - University of Saskatchewan
- 9:10 – 9:30 Image-Based Measurements of Vegetation BRDF Characteristics. (#483)  
Philippe M. Teillet (1), Xiaomeng Ren (1), Refah Seyed-Mahmoud (1), Craig Coburn (2), Anne M. Smith (3,2), and Scott Noble (4)  
1 - Department of Physics and Astronomy, University of Lethbridge / 2 - Department of Geography, University of Lethbridge  
3 - Agriculture and Agri-Food Canada / 4 - Department of Agricultural and Bioresource Engineering, University of Saskatchewan
- 9:30 – 9:50 Anisotropic Reflectance Effects on the Sensitivity of Spectral Indices for Estimating Ecophysiological Parameters. (#613)  
Craig Coburn, Eric Van Gaalen, Derek Peddle, Lawrence Flanagan: University of Lethbridge.
- 9:50 – 10:10 Post-Launch Monitoring of Satellite Sensor Calibration Using Rangeland Terrain as a Reference Site. (#482)  
Philippe M. Teillet (1), Xiaomeng Ren (1), and Anne M. Smith (2),  
1 - Department of Physics and Astronomy, University of Lethbridge  
2 - Agriculture and Agri-Food Canada
- 10:10 – 10:20 Panel Discussion

**Thursday June 25: 8:30-10:20 am. Room PE-264**

**Oral Session VI-D: LiDAR 3**

**Chair: Dr. Richard Fournier**

- 8:30 – 8:50 A Framework for Better Surface Description through the Integration of Photogrammetric and LiDAR Data. (#469)  
Changjae Kim (1), Ayman Habib (1), Chang-Rak Yoon (2), Sung-Woong Shin (2), and Kyung-Ok Kim (2),  
1 - University of Calgary  
2 - Department Electronics and Telecommunications Research Institute
- 8:50 – 9:10 Floating Models for 3D Building Modeling from Topographic Maps and LiDAR Data. (#466)  
Sendo Wang (1), Yi-Hsing Tseng (2), and Ayman F. Habib (1)  
1 - University of Calgary  
2 - National Cheng Kung University
- 9:10 – 9:30 Measurement of Tree-Level Attributes in Heterogeneous Stands Using Terrestrial Laser Scanners. (#585)  
Caroline Rivest (1), Richard A. Fournier (1), Chhun-Huor Ung (2), Enda Keane (3), Garret Mullooly (3), Hans Pretzsch (4), Hans-Joachim Klemmt (4).  
1 - Université de Sherbrooke / 2 - Sciences Canadian Service Forest  
3 - TreeMetrics Ltd. / 4 - Technische Universität München
- 9:30 – 9:50 New Approach for LiDAR System Calibration Based on the Discrepancies Between Overlapping Strips. (#490)  
Ayman F. Habib, Ki In Bang, and Ana Kersting, University of Calgary
- 9:50 – 10:00+ Panel Discussion

**Thursday June 25: 1:30-3:20 pm. Room PE-261**

**Oral Session VII-A: FORESTRY 2**

**Chair: Dr. Ron Hall**

1:30 – 1:50 Comparing Change Detection Methods based on a Vegetation Index and Canopy Reflectance Model for the Detection of Aspen Dieback from Multi-temporal Landsat Thematic Mapper Data. (#515)

Eric J. Arsenault, Ron J. Hall, E.H. (Ted) Hogg, and Michael Michaelian  
Natural Resources Canada, Canadian Forest Service

1:50 – 2:10 Characterizing the Spectral Trajectory of Cerrado Regeneration to Estimate Its Age. (#497)  
Priscilla de Souza da Costa-Pereira and Philippe Maillard: Universidade Federal de Minas Gerais

2:10 – 2:30 Mapping Eastern Spruce Budworm Cumulative Defoliation Severity from Landsat and SPOT. (#658)

R.J. Hall (1), M. Filiatrault (1), A. Deschamps (2), E. Arsenault (1). Natural Resources Canada:  
1 - Canadian Forest Service  
2 - Canada Centre for Remote Sensing.

2:30 – 2:50 Mapping the Health of Forests. (#493)

David G. Goodenough (1), K. Olaf Niemann (2), Geoff Quinn (1), and Jessie Liu (1)  
1 - Natural Resources Canada  
2 - University of Victoria

2:50 – 3:10 The Synthetic Crown Recognition Model for Automatic Image Interpretation on UltraCamD Imagery. (#653)

Chengqian Zhang (1), Michael Collins (1), Don Leckie (2) and François Gougeon (2)  
1 - Department of Geomatics Engineering, University of Calgary  
2 - Natural Resources Canada, Canadian Forest Service, Pacific Forest Centre

3:10 – 3:20 Panel Discussion

**Thursday June 25: 1:30-3:20 pm. Room PE-250**

**Oral Session VII-B: ECOLOGY 2**

**Chair: Dr. Greg McDermid**

1:30 – 1:50 An Object-Oriented Approach to Identifying Eelgrass along the Gulf of St. Lawrence Using High-Resolution Optical Imagery. (#472)

Matthew Mahoney (1), Herb Vandermeulen (2), Al Hanson (1), Venitia Joseph (2), Guy Robichaud (2).  
1 - Environment Canada  
2 - Department of Fisheries and Oceans

1:50 – 2:10 Using new earth observation products for a nationwide assessment of ecosystem status and trends. (#532)

Frank Ahern (1) and Risa Smith (2)  
1 - TerreVista Earth Imaging / 2 - Environment Canada

2:10 – 2:30 Remote Sensing and Forest Inventory for Wildlife Habitat Assessment. (#624)

G.J. McDermid (1), R.J. Hall (2), G.A. Sanchez-Azofeifa (3), S.E. Franklin (4), G.B. Stenhouse (5), T. Kobliuk (6), E.F. LeDrew (7)  
1 - Foothills Facility for Remote Sensing and GIScience, Department of Geography, University of Calgary,  
2 - Canadian Forest Service, Northern Forestry Centre / 3 - Department of Earth and Atmospheric Science, University of Alberta,  
4 - Department of Geography, University of Saskatchewan / 5 - Foothills Research Institute and Alberta Fish and Wildlife Division,  
6 - Forest Management Branch, Public Lands and Forest Division, Sustainable Resource Development, Edmonton, AB

2:30 – 2:50 Research on Relationships between Landscape Spatial Pattern and Grizzly Bear Appearance in Agricultural Areas in Alberta. (#579)

Kai Wang, Adam Collingwood, Steven Franklin and Xulin Guo. University of Saskatchewan.

2:50 – 3:10 Tracking Annual Landscape Change in the Rocky Mountain Foothills of Alberta: An Application of the Disturbance-Inventory Monitoring Framework. (#621)

J. Linke, G. McDermid Department of Geography, University of Calgary, Calgary, Alberta

3:10 – 3:20 Panel Discussion

**Thursday June 25: 1:30-3:20 pm. Room PE-275**

**Oral Session VII-C: METHODS 4**

**Chair: Dr. Karl Staenz**

- 1:30 – 1:50 Thermal Remote Sensing of the Greater Toronto Area Urban Heat Island. (#578)  
Matt Maloley, CCRS, Natural Resources Canada
- 1:50 – 2:10 Architecture of an Intelligent System for Remote Sensing Image Processing and Classification. (#547)  
Mohammad Mostafa Kamal, Department of Geography, University of Saskatchewan,
- 2:10 – 2:30 The National Land Cover Project for Geobase. (#643)  
Alexandre Beaulieu, Natural Resources Canada, Centre for Topographic Information, Ottawa, Canada.
- 2:30 – 2:50 Automatic Surface Reflectance Retrieval from SPOT Data using MODTRAN-based Look-up-table. (#569)  
Jinkai Zhang (1), Karl Staenz (1,2), Nadia Rochdi (1), Philippe M. Teillet (2)  
1 - Alberta Terrestrial Imaging Center  
2 - University of Lethbridge
- 2:50 – 3:00+ Panel Discussion

**Thursday June 25: 1:30-3:20 pm. Room PE-264**

**Oral Session VII-D: GEOLOGY / OCEANS**

**Chair: Dr. Jim Gower**

- 1:30 – 1:50 Use of the fluorescence line height (FLH) signal from MERIS for mapping chlorophyll in coastal waters (#669)  
Jim Gower, Institute of Ocean Sciences, Sidney, BC. Stephanie King, Institute of Ocean Sciences, Sidney, BC.
- 1:50 – 2:10 Observing ground deformation in the city of Auckland, New Zealand by C- and L-band Synthetic Aperture Radar. (#477)  
Sergey Samsonov. University of Western Ontario and GNS Science
- 2:10 – 2:30 Erosion Estimation Using Remote Sensing Data - An Approach for Northern Pakistan and Adjoining Regions. (#656)  
Syed Amer Mahmood, Arief Wijaya, Mathias Leidig, Faisal Shahzad, and Richard Gloaguen  
Remote Sensing Group, Institute of Geology, TU-Bergakademie Freiberg, Germany
- 2:30 – 2:40+ Panel Discussion

## **TECHNICAL PROGRAM: POSTER SESSIONS**

### **Tuesday June 23: 2:00 – 3:30 pm. Room: Foyer. Poster Session I**

#### **Evaluating Land Cover Classification Accuracy for the Rare Hairy Prairie Clover. (#524)**

Sarah Lowe, University of Saskatchewan

#### **Evaluation of alternative remote sensing land cover products for modeling and monitoring forest bird habitat in the Western Boreal Plains. (#588)**

Evan Seed (1), Steven Cumming (2), Erin Bayne (3), Jason Duffe (1), Ken Baldwin (4)

1 - Environment Canada, National Wildlife Research Centre, Carleton University

2 - Sciences du Bois et de la Forêt, Université Laval, Québec

3 - Department of Biological Sciences, University of Alberta, Edmonton

4 - Natural Resources Canada, Canadian Forest Service, Great Lakes Forestry Centre

#### **Twenty-five year monitoring of the Mealy Mountains, Labrador, tree line. (#593)**

Élizabeth L. Simms, Alvin Simms and Heather Morrison, Memorial University

#### **Mapping and Update of Vegetation and Land Cover for Grizzly Bear Research and Conservation in Alberta. (#628)**

G.J. McDermid (1), S.E. Nielsen (2), J.N. Hird (1), D.N. Laskin (1), S.E. Franklin (3), and G.B. Stenhouse (4)

1 - Foothills Facility for Remote Sensing and GIScience, Department of Geography, University of Calgary,

2 - Department of Renewable Resources, University of Alberta,

3 - Department of Geography and Planning, University of Saskatchewan,

4 - Foothills Research Institute and Alberta Fish and Wildlife Division,

#### **Blanding's Turtle (*Emydoidea blandingii*) Potential Habitat Mapping in Gatineau Park, Québec, Using Aerial Orthophotographic Imagery. (#555)**

Rebecca Barker and Doug King, Carleton University

#### **Mapping the cumulative footprint of anthropogenic and natural disturbances in the boreal forests of Canada with the Landcover Change Mapper (LCM). (#625)**

A.Fraser, G. Castilla, J.Linke, and G. McDermid

Foothills Facility for Remote Sensing and GIScience, Department of Geography, University of Calgary,

**Tuesday June 23: 2:00 – 3:30 pm. Room: Foyer.  
Poster Session I (continued)**

Monitoring grassland biophysical parameters and carbon fluxes of montane grasslands using remote sensing measurements. (#590)

Loris Vescovo (1), Damiano Gianelle (1), Georg Wohlfahrt (2) and Manuela Balzarolo (3)  
1 - CRI, Fondazione Mach, Trento, Italy  
2- University of Innsbruck, Austria  
3 - Università della Tuscia, Viterbo, Italy

Influence of the extent of sample landscapes on the accuracy of human footprint statistics in the context of biodiversity monitoring. (#626)

Adam McLane, Jennifer Hird, Julia Linke, Guillermo Castilla, and Greg McDermid  
Foothills Facility for Remote Sensing and GIScience, Department of Geography, University of Calgary.

Monitoring Wetland Area along the St. Lawrence River: A Multi-Sensor Approach. (#471)

Guy Letourneau, Martin Jean and Caroline Savage: Environment Canada

Land Use Monitoring In the Mixed Wood Plains Ecozone: Current State. (#470)

Guy Letourneau: Environment Canada

Remote Sensing of Vegetation Phenology and Relations to Grizzly Bear Health. (#618)

David Laskin (1), Scott Nielsen (2), Jennifer Hird (1), Greg McDermid (1), Gord Stenhouse (3)  
1. Foothills Facility for Remote Sensing and GIScience, Department of Geography, University of Calgary,  
2. Department of Renewable Resources, University of Alberta  
3. Foothills Research Institute and Alberta Fish and Wildlife Division.

Quantifying the effects of litter on the performance of spectral indices in mixed grassland. (#528)

Xiaohui Yang and Xulin Guo: University of Saskatchewan

Effect of Photo Plot Displacement on Landscape Pattern Analysis: Implications for Biodiversity Monitoring in Alberta. (#622)

J. Linke, G. Castilla, A. McLane, G. McDermid Department of Geography, University of Calgary, Calgary, Alberta

**Tuesday June 23: 3:50 - 5:20 pm. Room: Foyer.  
Poster Session II**

Using Bi-Directional Reflectance to Identify and differentiate crop types using the University of Lethbridge  
Lightweight Field Goniometer 2 (ULGS2). (#606)

Steve Myshak (1), Craig Coburn (1), Philippe Teillet (1), Anne M. Smith (2,1)  
1 - University of Lethbridge  
2 - Agriculture and Agri-Food Canada

A 2006 Land Cover Classification for Agricultural Land in Saskatchewan, Alberta and the British Columbia  
Peace River Region. (#633)

David V. Hildebrand (1), Carmen Finnigan (2), Weidong Zhou (2), and Chun Chen (2)  
1 - Agriculture Financial Services Corporation  
2 - Digital Environmental

Quantifying Biomass Production on Rangeland in Southern Alberta Using SPOT Satellite Imagery. (#580)

Kristin Grant (1, 2), Dan Johnson (2), David V. Hildebrand (3), and Derek Peddle (2)  
1 - Iunctus Geomatics Corp., Lethbridge  
2 - University of Lethbridge  
3 - Agriculture Financial Services Corporation

Agricultural Land Use Classification Accuracy: Comparing Maximum Likelihood Classification to Neural Net  
Tree Models using Single and Multi-Date SPOT Imagery. (#591)

Gary L. Larson, Anne M. Smith, Bernard D. Hill and Travis Hulstein  
Lethbridge Research Station, Agriculture and Agri-Food Canada

Analysis of northern ET trends and associated regional water balance changes using satellite inputs and  
meteorology reanalysis from 1983 to 2005. (#586)

Ke Zhang, John Kimball, Lucas Jones, Qiaozhen Mu and Steven Running: University of Montana, USA

Assessment of Temporal Dynamics and Vegetation Stress Using a Series of Seven-day NOAA AVHRR  
NDVI Thematic Images. (#587)

Eugenia Roumenina, Lachezar Filchev, Vanya Naydenova, Georgi Jelevev, Petar Dimitrov, and Vassil Vassilev.  
Space Research Institute.

**Tuesday June 23: 3:50 - 5:20 pm. Room: Foyer.  
Poster Session II (continued)**

**A Multi-Scale Approach To Extract Savanna Tree Structure Parameters. (#559)**

Martin Béland and Richard Fournier  
Centre for Research and Applications in Remote Sensing (CARTEL), University of Sherbrooke.

**Spectral Separability of Selected Rangeland Plant Species Common to Southern Alberta. (#565)**

David Rolfson (1,2), Karl Staenz (1,2), Craig Coburn (2), Philippe Teillet (1,2), Anne Smith (3, 2)  
1 - Alberta Terrestrial Imaging Center  
2 - University of Lethbridge  
3 - Lethbridge Research Station, Agriculture and Agri-Food Canada

**Hyperspectral land covers classification using an SVM-based algorithm. (#582)**

Reza Shah Hosseini and Saeid Homayouni. University of Tehran

**Individual Tree Crown Delineation using Combined LiDAR Data and Optical Imagery. (#596)**

Baoxin Hu (1), Wen Zhang (1), Kun Qian (1), and Murray E. Woods (2),  
1 - York University, Department of Earth and Space Science and Engineering  
2 - Ontario Ministry of Natural Resources

**Hyperspectral Discrimination of Cottonwood Clones in Southern Alberta. (#603)**

Aaron Mullin, Craig Coburn: University of Lethbridge

**Wednesday June 24: 10:40 a.m. -12:10 p.m. Room: Foyer.  
Poster Session III**

**Spectroscopic Study of the 11102-10002 Band of Pure Carbon Dioxide for Atmospheric Remote Sensing.  
(#535)**

A. Predoi-Cross (1), Amr Ibrahim (1), V. Malathy Devi (2), D. Chris Benner (2), Brant Billingham (3), Phil Teillet (1)  
1 - Department of Physics and Astronomy, University of Lethbridge,  
2 - Department of Physics, The College of William and Mary, USA  
3 - Canadian Light Source.

**Spectral Line Parameters For Ethane Fundamental Band At 12 Micron. (#592)**

V. Malathy Devi (1), D. Chris Benner (1), C.P. Rinsland (2), R.L. Sams (3), T.A. Blake (3).  
1 - Department of Physics, The College of William and Mary, USA  
2 - Science Directorate, NASA Langley Research Center, USA  
3 - William R. Wiley Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory

**Remote Sensing of Water Vapour above the Las Campanas Observatory. (#517)**

Richard R. Quereh (1), David A. Naylor (1), Joanna Thomas-Osip (2), Gabriel Prieto (2)  
1 - Department of Physics and Astronomy, University of Lethbridge  
2 - Las Campanas Observatory, Chile

**Spectroscopy of Methane at 7.6 Microns in Support of NASA's Upper Atmosphere Research Program.  
(#537)**

M. A. H. Smith (1), V. Malathy Devi (2), D. Chris Benner (2), and A. Predoi-Cross (3),  
1 - Science Directorate, NASA Langley Research Center, USA  
2 - Department of Physics, The College of William and Mary, USA  
3 - Department of Physics and Astronomy, University of Lethbridge.

**Spectral Line Fitting of an Astronomical Source. (#556)**

Scott Jones (1), David Naylor (1) and Rene Plume (2)  
1 - University of Lethbridge  
2 - University of Calgary

**Towards Validation of RADARSAT-2 Data and Snow on First-Year Sea Ice Parameterization. (#640)**

M. Christopher Fuller and Melissa Peters: University of Calgary

**Wednesday June 24: 10:40 a.m. -12:10 p.m. Room: Foyer.  
Poster Session III (continued)**

**An Interactive Atmospheric Radiative Transfer Model Application. (#542)**

Ian Chapman (1), Peter Davis-Imhof (2), David Naylor (3), Brad Gom (3)  
1 - Defence Research and Development Canada, Centre for Operational Research and Analysis (DRDC CORA)  
2 - Blue Sky Spectroscopy Inc  
3 - Department of Physics and Astronomy, University of Lethbridge

**La classification de l'occupation du sol à partir des images SPOT et RADARSAT-2 au Vietnam du Nord.  
(#660)**

Kim-Huong Hoang (1), Monique Bernier (1), Sophie Duchesne (1), Minh-Y Tran (2)  
(1) Institut National de la Recherche Scientifique (INRS), Centre Eau, Terre et Environnement (ETE)  
(2) Académie des sciences et des technologies du Vietnam, Institut des sciences spatiales

**Effets des changements climatiques en zone tropicale : cas de la disparition des cours d'eau de la région  
de Katiola en Côte d'Ivoire. (#634)**

Talnan Jean Honoré COULIBALY (1), Jean Paul DEROIN (1) et Issiaka SAVANE (2)  
1 - Université Paris Est, France  
2 - Université d'Abobo-Adjamé, Côte d'Ivoire

**Implementation of a New Adaptive Image Representation Approach (AIPR-BPNN) For Compression of  
IKONOS Images. (#641)**

V. Cherkashyn (1), D.-C. He (1), R. Kountchev (2)  
1 CARTEL- Centre d'Application et de Recherche en Télédétection, Département de Géomatique Appliquée, Sherbrooke, Canada.  
2 Department of Radio Communication and Video Technology, Technical University-Sofia, Sofia, Bulgaria

**Image Registration of Optical and SAR Images Using Control Point and Area-Based Matching. (#508)**

Siyue Chen (1), Chen Xu (2), Henry Leung (1), Anne Smith (3)  
1 - University of Calgary  
2 - Intermap Technologies Corp.  
3 - Agriculture and Agri-Food Canada

**Classification of Polarimetric SAR Data in Toronto Suburban Areas Using Model-Based Decomposition and  
Morphology Analysis. (#599)**

Niu, Xin and Yifang Ban  
Division of Geoinformatics. Dept. of Urban Planning and Environment, Royal Institute of Technology KTH, Stockholm, Sweden

**Thursday June 25: 1:30 - 3:20 p.m. Room: Foyer.  
Poster Session IV**

**Intensity Image Integration from RADARSAT-2 Full Polarimetric Data. (#474)**

Igor Zakharov (1) and Thierry Toutin (2)

1- Canadian Government Laboratory Visiting Fellow at Canada Centre of Remote Sensing;

2 - Canada Centre of Remote Sensing, Natural Resources Canada

**Estimating Forest Structural Attributes From Airborne Remote Sensing Datasets for Use in Mountain Pine Beetle Susceptibility Mapping. (#518)**

A.M. Faraguna and G.J. McDermid

Foothills Facility for Remote Sensing and GIScience, Department of Geography, University of Calgary, Calgary

**Land Use Mapping at Micro-level: Application of IKONOS Images in South-west Bangladesh. (#512)**

Quazi K. Hassan, University of Calgary; Mir A. Matin, International Water Management Institute

**The remote sensing of vegetation phenology: questioning the benefits of noise reduction. (#523)**

Jennifer Hird and Greg McDermid

Foothills Facility for Remote Sensing and GIScience, Department of Geography, University of Calgary

**Assessing the Effect Of Point Density And Terrain Complexity On The Quality Of Lidar-Derived Dems In Multiple Resolutions. (#629)**

S. Sanii and G.J. McDermid

Foothills Facility for Remote Sensing and GIScience, Department of Geography, University of Calgary, Calgary, Canada.

**Developing Future Carbon Algorithms for SMAP. (#583)**

Lucas Jones (1), John Kimball (1), Ke Zhang (1), and Kyle McDonald (2),

1 - University of Montana, USA

2 - Jet Propulsion Laboratory/California Institute of Technology, Pasadena, California USA

**Thursday June 25: 1:30 - 3:20 p.m. Room: Foyer.  
Poster Session IV (continued)**

**ALOS PALSAR interferometry of Taupo Volcanic Zone, New Zealand. (#478)**

Sergey Samsonov (1, 2), Kristy Tiampo (1), John Beavan (2), Chris Bromley (2), Bradley Scott (2), and Gill Jolly (2)  
1 - University of Western Ontario  
2 - GNS Science

**Advanced research initiatives using the Mackenzie Delta Air Photo Project spatial data. (#543)**

Marcella Snijders: Indian & Northern Affairs Canada.

**Evaluation of Radar Backscatter Models over Agricultural Fields: Validation Using Polarimetric C-band RADARSAT-2 SAR Image Data. (#514)**

Amine Merzouki, Heather McNairn, and Eric Gauthier: Research Branch, Agriculture and Agri-Food Canada

**Estimating Prairie Wetland Water Storage Using a LIDAR DEM. (#538)**

Adam Minke (1), Cherie Westbrook (1), Xulin Guo (2),  
1 - Centre for Hydrology, University of Saskatchewan  
2 - Department of Geography and Planning, University of Saskatchewan

**Monitoring Freeze/Thaw Conditions over Agricultural Fields from Radarsat-2 Polarimetric Data. (#638)**

Louis-Philippe Rousseau (1), Ramata Magagi (1), Robert Leconte (1), Aaron Berg (3), Brenda Toth (4),  
1 - Université de Sherbrooke. / 2 - École de technologie supérieure.  
3 - University of Guelph / 4 - Environment Canada

**Lower Souris River Watershed Biophysical Inventory. (#657)**

Lyle Boychuk (1), Bill Tedford (2), and Eric Mayer (1)  
1 - Ducks Unlimited Canada. Western Region. South Saskatchewan Operations. Regina, Saskatchewan, Canada.  
2 - Ducks Unlimited Canada. National Headquarters. Oak Hammock Interpretive Centre. Stonewall, Manitoba, Canada.

**Prairie Shelterbelt Inventory: Using High Resolution Imagery and Object-based Classification. (#589)**

Joey Pankiw (1), John Kort (2) Joseph M. Piwowar (1)  
1 - Dept. of Geography, University of Regina  
2 - PFRA Shelterbelt Centre, Agriculture and Agri-Food Canada

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