

# GEOBIA

## **GEOBIA 2008 - Pixels, Objects, Intelligence** **GEOgraphic Object-Based Image Analysis for the 21st Century**

University of Calgary, Calgary Alberta Canada, August 05-08, 2008

### **Program<sup>1</sup>**

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<sup>1</sup> Author: Geoffrey J. Hay, Department of Geography, University of Calgary, Alberta, Canada

Dear Colleagues,

On behalf of the Conference Planning Committee, welcome to the international conference and workshops entitled ***GEOBIA 2008 - Pixels, Objects, Intelligence: GEOgraphic Object-Based Image Analysis for the 21st Century***. GEOBIA 2008 will be held at the [University of Calgary](#), Alberta, Canada August, 6-7, 2008, with an icebreaker on the evening of August 5, and workshops scheduled for Aug 5 & 8. The conference program will be based on concurrent oral & poster sessions covering a range of [topics](#) from theory and methods to applications. A [special session](#) will also be presented on 'GEOBIA in Support of the Government of Canada Needs'. Invited [keynote](#) speakers will further highlight key issues and challenges. GEOBIA, 2008 is co-organized in partnership with the [Canadian Space Agency](#), the [ASPRS](#) and the [ISPRS](#). Conference proceedings will be linked with ISPRS Working Group IV/4 to provide literary/scientific standards and online access. A GEOBIA [special issue](#) of Photogrammetric Engineering and Remote Sensing ([PE&RS](#)) will be published in 2009.

GEOBIA (pronounced *ge-o-be-uh*) is a recent sub-discipline of [Geographic Information Science](#) devoted to developing automated methods to partition remote sensing (RS) images into meaningful image-objects, and assessing their characteristics through spatial, spectral and temporal scales. Its applications range from agriculture and natural resource management, to national defense and global climate change. Its economic impact spans from data collection, hardware and software vendors, developers and users, to recipients of sound sustainable environmental policy.

GEOBIA 2008 builds upon the success of the 1st International Conference on Object Based Image Analysis ([OBIA 2006](#)), held in Salzburg Austria, where over 120 participants from 24 different countries attended to discuss the latest advances in this developing field. An edited book<sup>2</sup> is currently being published from extended peer-reviewed conference papers. A [GEOBIA Wiki](#)<sup>3</sup> has also been established to facilitate community interaction related to this conference.

A key objective of this event is to facilitate a forum for this growing international community of practice from which we can better share in the latest developments of GEOBIA theory, methods, and applications so as to more intelligently exploit remote sensing imagery. Our theme - '***Pixels, Image-objects, Intelligence: GEOgraphic Object-Based Image Analysis for the 21st Century***' - is intended to highlight this objective, and the evolution of this discipline.

We invite you to help build this discipline by contributing your comments, expertise and experience at GEOBIA, 2008 and to the [GEOBIA Wiki](#).



Dr. Geoffrey J. Hay  
Conference Chair



Dr. Thomas Blaschke  
Conference Co-Chair



Dr. Danielle Marceau  
Conference Co-Chair

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<sup>2</sup> Object-Based Image Analysis - Spatial concepts for knowledge-driven remote sensing applications. Eds: Thomas Blaschke, Stefan Lang, Geoffrey J. Hay. Springer Lecture Notes in Geoinformation and Cartography, 2008

<sup>3</sup> <http://wiki.ucalgary.ca/page/GEOBIA>

# GEOBIA: Program at a Glance

(see pg 16 for map locations)

## Workshops & Registration – Day 1

August 05 (Tuesday)

REGISTRATION [9h00 – 14h00 Main Foyer Earth Sciences (ES)]		
Lab 1: Definiens (ES 407)	Lab 2: ITT VIS (ES 415)	Lab 3: Overwatch VLS (ES 307)
10:00 – 16:00 Large Landcover Dataset analysis with Definiens Developer and eCognition Server	10:00 – 12:00 ENVI Vegetation Analysis for Land Management	14:00-16:00 Feature Analyst: Object Based Feature Extraction from Imagery and Scanned Maps
	14:00 – 16:00 ENVI-FX: Feature Extraction and Classification	
17:00 – 19:00+ Ice Breaker + Registration (Black Lounge – MacEwan Hall)		

## Program – Day 2

August 06 (Wednesday)

REGISTRATION (8h00 – 17h00 Rozsa Centre - Main Foyer)			
8:00-9:45	OPENING SESSION – KEYNOTES (Plenary – Husky Oil, Great Hall)		
9:45-10:00	BREAK – POSTERS – Industry Booths (Plenary)		
<b>Time:</b>	<b>Room 1 (Scotia Milling Area)</b>	<b>Room 2 (CIBC Hub)</b>	<b>Room 3 (Evans Room)</b>
10:00-12:00	1. Comparison of object-based and pixel-based methods	3. Automated feature detection (a)	5. New classification and segmentation methods (a)
12:00-13:15	LUNCH – POSTERS – Industry Booths (Plenary)		
13:15-14:35	2. Comparison of segmentation methods and 3D applications (a)	4. Monitoring (a)	6. New classification and segmentation methods (b)
14:35-15:15	BREAK – POSTERS – Industry Booths (Plenary)		
15:15-17:00	No Session	No Session	7. Government session (Plenary)

## Program – Day 3

August 07 (Thursday)

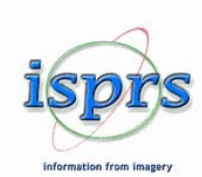
REGISTRATION (8h30 – 12:00 Rozsa Centre - Main Foyer)			
8:50 -9:45	OPENING SESSION – KEYNOTES (Plenary – Husky Oil, Great Hall)		
9:45-10:00	BREAK – POSTERS – Industry Booths (Plenary)		
<b>Time:</b>	<b>Room 1 (Scotia Milling Area)</b>	<b>Room 2 (CIBC Hub)</b>	<b>Room 3 (Evans Room)</b>
10:00-12:00	8. Monitoring (b)	9. Delineation of man-made features	11. New classification and segmentation methods (c)
12:00-13:15	LUNCH – POSTERS – Industry Booths (Plenary)		
13:15-14:55	No Session	10. Ontology	12. Map updating and tree crown delineation
14:55-15:15	BREAK – POSTERS – Industry Booths (Plenary)		
15:15-16:30	Discussion, Conclusion and Acknowledgements (Plenary)		
18:00+	DINNER-BANQUET (Barley Mill, meet for LRT tickets)		

## Workshops – Day 4

August 08 (Friday)

Location: Earth Sciences (ES)		
Lab 1: Definiens (ES 407)	Lab 2: ITT VIS (ES 415)	Lab 3: Overwatch VLS (ES 307)
10:00 – 16:00 Large Landcover Dataset analysis with Definiens Developer and eCognition Server	10:00 – 12:00 ENVI-FX: Feature Extraction and Classification	10:00-12:00 Feature Analyst: Object Based Feature Extraction from Imagery and Scanned Maps
	*** 13:00 – 14:00 <sup>4</sup> *** ENVI Vegetation Analysis for Land Management	

<sup>4</sup> ITTVis ENVI Vegetation workshop, time changed: Originally 14:00-16:00 (updated June 27, 2008)



### Committees and Organization:

The Organization committee is lead by Dr Geoffrey J. Hay ([Geography](#), University of Calgary) with Co-Chairs Dr Thomas Blaschke ([Z\\_GIS](#): Austria), and Dr Danielle Marceau ([Geomatics Engineering](#), University of Calgary). The scientific committee includes ten Remote Sensing and GIScience experts from academia, government and industry working throughout North-America and Europe.

### Conference Chair & Co-Chairs:

- [Geoffrey J. Hay](#) (U.Calgary, AB, Canada)
- [Thomas Blaschke](#) (Z\_GIS, Salzburg, Austria)
- [Danielle Marceau](#) (U.Calgary, AB, Canada)

### Scientific Committee (alphabetical order):

- [Thomas Blaschke](#) (Z\_GIS, Salzburg, Austria)
- [Guillermo Castilla](#) (U.Calgary, AB, Canada)
- [Manfred Ehlers](#) (U.Osnabrück, Germany)
- [Geoffrey Hay](#) (U.Calgary, AB, Canada)
- [Maggi Kelly](#) (U.C.Berkeley, USA)
- [Stefan Lang](#) (Z\_GIS, Salzburg, Austria)
- [Marguerite Madden](#) (U.Georgia, USA)
- [Danielle Marceau](#) (U.Calgary, AB, Canada)
- [Greg McDermid](#) (U.Calgary, AB, Canada)
- [Mike Wulder](#) (Canadian Forest Service, BC, Canada)

### Executive Committee (alphabetical order):

- [Yves Crevier](#) (GRIP, Canadian Space Agency)
- [Marcelle Grenier](#) (Environment Canada, QC, Canada)
- [Mryka Hall-Beyer](#) (U.Calgary, AB, Canada)
- [Erica Borgstrom](#) (Conference & Special Events, U.Calgary)
- [Tim Fukami](#) (Conference & Special Events, U.Calgary)

## Special Session:

*'GEOBIA in Support of Government of Canada Needs'.*

The Government of Canada (GoC) need for environmental information is growing in the context of new government priorities on climate changes, the North, sovereignty and security and the sustainable development of natural resources.

Within the framework of their respective mandates, federal government departments such as Natural Resource Canada (NRCan), Agriculture and Agri-Food Canada (AAFC), Environment Canada (EC) and Parks Canada (PC) are increasingly using data from space-based Earth observation (EO) systems as a source of information. The information extracted from EO data is currently used to monitor land use, land cover and other environmental variables that enable scientists and policy makers to address issues such as biodiversity at the national level, ecological integrity of National Parks, environmental changes in northern Canada and the Arctic, sustainable development of forest and agricultural resources and Canada's commitment to international treaties (Kyoto, RAMSAR, UNFCCC, etc).

This session will serve as a platform to initiate the dialog between government stakeholders and scientists involved in developing innovative techniques for information extraction from EO images in the following sectors:

- Ecological integrity for management, monitoring and enforcement
- Land cover for modeling, resource management and national reporting
- National land and water information services

Presentations will expose GoC issues and outcomes in order to stimulate discussions, exchange experiences, identify and highlight problems, gaps and solutions which may result in new opportunities for collaboration. In addition to five thematic presentations by GoC leaders in EO and national resources management, this session will include a presentation on the Canadian Space Agency programs in support of EO data applications and use.



[Canadian Space Agency/Agence Spatiale Canadienne](#)

## Keynote Abstracts:

### **GEOgraphic Object-Based Image Analysis (GEOBIA) in Context: Past, Present and Future.**

*Geoffrey J. Hay*, University of Calgary, Web: [www.ucalgary.ca/f3gisci/](http://www.ucalgary.ca/f3gisci/), Email: [gjhay@ucalgary.ca](mailto:gjhay@ucalgary.ca), (Wed Aug 6, 8h20 – 9h00 Plenary).

What is *GEOgraphic Object-Based Image Analysis (GEOBIA)*? To answer this we provide a historical, geographical and contextual overview leading up to this conference. We then propose a formal definition of GEOBIA along with a brief account of its coining and recommend a key objective for this new discipline. We then, propose GEOBIA's main tenets and discuss its plausible future. Much remains to be accomplished.

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### **10 Years of Object-oriented Image Analysis for Geospatial Applications: Evolution and**

**Outlook.** *Martin Baatz*, Gregor Willhauck, Christian Hoffmann. Definiens, Web: [www.definiens.com](http://www.definiens.com), Email: [ttaylor@definiens.com](mailto:ttaylor@definiens.com). (Wednesday Aug 6, 9h00 – 9h45 Plenary).

Automated feature extraction from earth observation data is a key requirement in numerous application fields. Increased availability of remote sensing data and increasing market request generate a demand for high-throughput information extraction. Spectral variation, level of detail and the multitude of forms of appearance of specific types of landcover features however are only some aspects that set significant challenges for fully automated analysis. Object-based and object-oriented image analyses have proven in recent years to be a new paradigm for automated feature extraction. At the same time, a shift in focus from desktop based interactive workflows to industrial production workflows can be observed. This contribution discusses requirements and challenges within this context. In order to support fully automated processing, semantic segmentation approaches are needed that are knowledge-based as well as context-driven and support modelling at the same time. Fast adaptation to new tasks, scalability and integratability are further key requirements. An overview about the evolution of Definiens object-oriented Cognition Network Technology is combined with an outlook on future trends and developments.

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**Automated Feature Extraction from Terrestrial and Airborne LIDAR.** *Stuart Blundell*, David W. Opitz, Raj Rao Visual Learning Systems, Inc., Web: [www.featureanalyst.com](http://www.featureanalyst.com), Email: [sblundell@vls-inc.com](mailto:sblundell@vls-inc.com). (Thursday Aug 7, 9h00 – 9h45 Plenary).

The U.S. Army and other Department of Defense (DoD) combat and combat support agencies requires automated feature extraction (AFE) software for collecting very high-resolution 3D urban features from terrestrial LIDAR data to support the ground-based Warfighter operating in the urban battlespace. Advanced vehicle-mounted and man-portable terrestrial Light Imaging and Range Detection (LIDAR) systems capture accurate 3D measurements of the urban environment with spatial resolutions on the order of 5 centimeters or less [Blais, 2004]. The 3D imaging capability of these systems is negated, however, by a lack of commercial software tools capable of exploiting terrestrial LIDAR datasets [Shiode 2001]. Current approaches for creating high-resolution 3D urban models are expensive requiring thousands of man-hours to digitize feature geometries, assign textures to features and attribute features. The lack of robust AFE software tools for collecting geospecific urban features from terrestrial LIDAR systems directly impacts applications for facility reconnaissance, special operations planning and urban warfare decision-making. Visual Learning Systems, Inc. (VLS) has developed a LIDAR AFE system capable of extracting over 1,000 buildings per minute as 3D Shapefiles from airborne LIDAR. In this presentation we provide an overview of the VLS solution for 3D AFE from advanced terrestrial LIDAR systems operating in urban environments.

## Free Industry Workshops: Days 1 & 4



### Definiens Operational Image Analysis:

- **Number of workshops: (2) Times and Dates:** Duration 5 hrs
  - Tuesday, August 5<sup>th</sup>, 2008 (10:00 -16:00). Price: **Free** - Must Register
  - Friday, August 8<sup>th</sup>, 2008 (10:00 -16:00). Price: **Free** - Must Register
- **Location:** Earth Sciences (ES) 407
- **Content:** Within this workshop Definiens shows how to create transferable high throughput Landcover Analysis on Large Data Sets using Definiens Developer and Definiens eCognition™ Server.



## ITT

### ITTVIS: Feature Extraction and Classification ENVI- FX

- **Number of workshops: (2) Times:** 2-hour, Intermediate Level,
  - Tuesday, August 5<sup>th</sup>, 2008 (14:00 -16:00). Price: **Free** - Must Register
  - Friday, August 8<sup>th</sup>, 2008 (10:00 -12:00). Price: **Free** - Must Register
- **Location:** Earth Sciences (ES) 415
- **Content:** This workshop will include a brief overview of the ENVI software for new users, along with an introduction to Feature Extraction with the supervised and rule-based classification functionality of ENVI FX. This new module uses object-based image analysis technology to allow for easy extraction of features from readily available panchromatic (black-and-white) and multispectral (color) data.



### ENVI: Vegetation Analysis for Land Management

- **Number of workshops: (2)**
- **Times:** 2-hour, Intermediate Level,
  - Tuesday, August 5<sup>th</sup>, 2008 (10:00 -12:00). Price: **Free** - Must Register
  - Friday, August 8<sup>th</sup>, 2008 (13:00 -14:00<sup>5</sup>). Price: **Free** - Must Register
- **Location:** Earth Sciences (ES) 415
- **Content:** This workshop will include a brief overview of the ENVI software for new users, along with an introduction to the use of Remote Sensing for exploitation of vegetation signatures, detecting stressed vegetation, burn severity mapping, and the location of areas of interest and man-made structures from a variety of multispectral, hyperspectral, and Radar data types.

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<sup>5</sup> ITTVIS ENVI Vegetation workshop, time changed: Originally 14:00-16:00 (updated June 27, 2008)

## Free Industry Workshops (continued) Days 1 & 4



### **Feature Analyst: Object Based Feature Extraction from Imagery and Scanned Maps**

- **Number of workshops: (2)**
- **Time:** 2 hours, Beginner and Intermediate
  - Tuesday, August 5<sup>th</sup>, 2008 (14:00 -16:00). Price: **Free** - Must Register
  - Friday, August 8<sup>th</sup>, 2008 (10:00 -12:00). Price: **Free** - Must Register
- **Location:** Earth Sciences (ES) 307
- **Content:** The workshop is designed to introduce participants to feature extraction workflows using the Feature Analyst software. Participants will extract a variety of features from different image and scanned map datasets with emphasis on the use of training set example for learning, use of spatial parameters for object detection (size, shape, texture, pattern shadow and spatial association). At the end of the workshop all participants will be capable of basic feature techniques for remotely sensed imagery and scanned map data.

## NEW PRESENTATION



### **Lunch-Time Demonstrations of IMAGINE Objective**

- **Time:** 10-20 mins
  - Wednesday and Thursday August 6 & 7, 2008 (12:00-13:00). Price: **Free**
- **Location:** ERDAS Exhibitors Booth – Great Hall, Rozsa Conference Center
- **Content:** Mr Paul Beaty (*ERDAS Remote Sensing Product Manager*) will provide lunch time demos of the newly released *ERDAS IMAGINE Objective* which offers a new approach to object oriented image classification.

## Oral Sessions: Day 2

August 6, 2008

Room 1 – Scotiabank Milling Area, Plenary – Husky Oil, Great Hall

Time	Title and authors	Room
8h00	<b>Opening session:</b>	<b>Plenary</b>
8h00 – 8h05	<b>Welcome and organization:</b> Introduce team	
8h05 – 8h10	<b>Dean - Social Sciences:</b> Kevin McQuillan	
8h10 – 8h15	<b>Dean - Geomatics Engineering:</b> Elizabeth Cannon	
8h15 – 8h20	<b>Business – Updates:</b> Danielle Marceau	
8h20 – 9h00	<b>Keynote:</b> Geographic Object-Based Image Analysis (GEOBIA) in Context: Past, Present and Future. <i>Geoffrey J. Hay</i> , University of Calgary, Department of Geography, Alberta Canada.	
9h00 – 9h45	<b>Keynote:</b> 10 Years of Object-oriented Image Analysis for Geospatial Applications: Evolution and Outlook, <i>Martin Baatz</i> , Definiens	
<b>9h45 – 10h00</b>	<b>Break (Posters &amp; Booths)</b>	<b>Plenary</b>
	<b>Session 1: Comparison of object-based vs. pixel-based methods</b> <i>(Chair - Roeland de Kok)</i>	<b>Room 1</b>
10h00 – 10h20	A comparison of the performance of pixel-based and object-based classifications over images with various spatial resolutions. <i>Yan Gao</i> , Centro de Investigaciones en Geografía Ambiental-Universidad Nacional Autónoma de México (UNAM)	
10h20 – 10h40	Correlation of object-based texture measures at multiple scales in sub-decimeter resolution aerial photography. <i>Andrea Laliberte</i> , Jornada Experimental Range, New Mexico State University	
10h40 – 11h00	A comparison of object-based and pixel-based approaches to estimate Lidar-derived forest canopy height using Quickbird imagery. <i>Gang Chen</i> , Department of Geography, University of Calgary	
11h00 – 11h20	Comparison of pixel- and object-based sampling strategies for thematic accuracy assessment. <i>Julien Radoux</i> , Université catholique de Louvain	
11h20 – 11h40	Class modelling of biotope complexes – success and remaining challenges. <i>Stefan Lang</i> , Centre for Geoinformatics, Salzburg University	
11h40 – 12h00	The role of edge objects in full autonomous image interpretation. <i>Roeland de Kok</i> , <a href="http://www.progea.pl">www.progea.pl</a>	
<b>12h00 – 13h15</b>	<b>Lunch Provided: (Posters &amp; Booths)</b>	<b>Plenary</b>
	<b>Session 2: Comparison of segmentation methods; 3D applications (a)</b> <i>(Chair – Marco Neubert)</i>	<b>Room 1</b>
13h15 – 13h35	Objective image segmentation evaluation framework. <i>James Peters</i> , University of Manitoba	
13h35 – 13h55	Quantitative segmentation evaluation for large scale mapping purposes. <i>Frieke Van Coillie</i> , Ghent University	
13h55 – 14h15	Library concept and design for Lidar data processing. <i>Nicolas David</i> , IGN (French National survey)	
14h15 – 14h35	Assessment of remote sensing image segmentation quality. <i>Marco Neubert</i> , Leibniz Institute of Ecological and Regional Development (IOER)	
<b>14h35 – 15h15</b>	<b>Break (Posters &amp; Booths)</b>	<b>Plenary</b>
<b>15h15 – 16h55</b>	<b>Government session:</b> <i>(Chair - Paul Briand)</i>	<b>Plenary</b>
<b>17h00+</b>	<b>End of Sessions for First Day</b>	<b>Free</b>

## Oral Sessions: Day 2

August 6, 2008

Room 2 – CIBC Hub Room, Plenary – Husky Oil, Great Hall

Time	Title and authors	Room
8h00 – 8h20	<b>Opening session:</b> Welcome and organization	<b>Plenary</b>
8h20 – 9h00	<b>Keynote:</b> Geographic Object-Based Image Analysis (GEOBIA) in Context. Past, Present and Future. <i>Geoffrey J. Hay</i> , University of Calgary, Department of Geography, Alberta Canada.	
9h00 – 9h45	<b>Keynote:</b> 10 Years of Object-oriented Image Analysis for Geospatial Applications: Evolution and Outlook, <i>Martin Baatz</i>	
<b>9h45 – 10h00</b>	<b>Break (Posters &amp; Booths)</b>	<b>Plenary</b>
	<b>Session 3: Automated feature detection (a)</b> (Chair – <i>Stefan Steiniger</i> )	<b>Room 2</b>
10h00 – 10h20	Development of an automated cloud detection for MSG using image segmentation. <i>Roger Huckle</i> , IMK, Forschungszentrum Karlsruhe, Germany	
10h20 – 10h40	Automated cloud detection using object-based image analysis for assessing image quality. <i>Dave Hulslander</i> , ITT Visual Information Solutions	
10h40 – 11h00	Mapping Road Traffic Conditions using High Resolutions Satellite Images. <i>Siri Øyen Larsen</i> , Norwegian Computing Center	
11h00 – 11h20	Recognizing meanders to reconstruct river dynamics of the Ganges. <i>Elisabeth Addink</i> , Faculty of Geosciences, Utrecht University	
11h20 – 11h40	Multi Image Matching of Straight Lines with Geometric Constraints. <i>Ahmed Elaksher</i> , Faculty of Engineering, Cairo University	
11h40 – 12h00	IMAGINE objective for residential rooftop extraction. <i>Paul Beaty</i> , Leica Geosystems	
<b>12h00 – 13h15</b>	<b>Lunch Provided (Posters &amp; Booths)</b>	<b>Plenary</b>
	<b>Session 4: Monitoring (a)</b> (Chair - <i>Marguerite Madden</i> )	<b>Room 2</b>
13h15 – 13h35	Methods for tracking landscape change in an object-based environment. <i>Julia Linke</i> , Department of Geography, University of Calgary	
13h35 – 13h55	Incorporation of texture, intensity, hue, and saturation for rangeland monitoring with unmanned aircraft imagery. <i>Andrea Laliberte</i> , Jornada Experimental Range, New Mexico State University	
13h55 – 14h15	Object-based change detection of historical aerial photographs reveals altitudinal forest expansion. <i>Maarit Middleton</i> , Geological Survey of Finland	
14h15 – 14h35	Object-based land-use and land-cover mapping using spectral, spatial and topographic information from Ikonos imagery. <i>Marguerite Madden</i> , University of Georgia	
<b>14h35 – 15h15</b>	<b>Break (Posters &amp; Booths)</b>	<b>Plenary</b>
<b>15h15 – 16h55</b>	<b>Government session:</b> (Chair - <i>Paul Briand</i> )	<b>Plenary</b>
<b>17h00</b>	<b>End of Sessions for First Day</b>	<b>Free</b>

## Oral Sessions: Day 2

August 6, 2008

Room 3 – Evans Room, Plenary – Husky Oil, Great Hall

Time	Title and authors	Room
8h00 – 8h20	<b>Opening session:</b> Welcome and organization	<b>Plenary</b>
8h20 – 9h00	<b>Keynote:</b> Geographic Object-Based Image Analysis (GEOBIA) in Context. Past, Present and Future. <i>Geoffrey J. Hay</i> , University of Calgary, Department of Geography, Alberta Canada.	
9h00 – 9h45	<b>Keynote:</b> 10 Years of Object-oriented Image Analysis for Geospatial Applications: Evolution and Outlook, <i>Martin Baatz</i>	
<b>9h45 – 10h00</b>	<b>Break (Posters &amp; Booths)</b>	<b>Plenary</b>
	<b>Session 5: New classification and segmentation methods (a)</b> <i>(Chair - Thomas Blaschke)</i>	<b>Room 3</b>
10h00 – 10h20	A Framework for the evaluation of multi-spectral image segmentation. <i>Andre R. S. Marcal</i> , Faculdade de Ciencias, Universidade do Porto	
10h20 – 10h40	The integration of graph based knowledge discovery with image segmentation hierarchies for data analysis, data mining and knowledge discovery. <i>James C. Tilton</i> , NASA GSFC	
10h40 – 11h00	Universal object segmentation in fused range-color data. <i>Chris Lewis</i> , Kansas State University	
11h00 – 11h20	Image segmentation using a graph theoretic approach. <i>Prashanth Reddy Marpu</i> , Freiberg University of Mining and Technology	
11h20 – 11h40	Crop mapping based on object-based classification and image fusion techniques. <i>G. Hong</i> , Canada Center for Remote Sensing	
11h40 – 12h00	A method for adapting global image segmentation methods to images of different resolutions. <i>Peter Hoffmann</i> , Leibniz University Hannover, Germany - <i>presented by Thomas Blaschke</i>	
<b>12h00 – 13h15</b>	<b>Lunch Provided (Posters &amp; Booths)</b>	<b>Plenary</b>
	<b>Session 6: New classification and segmentation methods (b)</b> <i>(Chair - Danielle Marceau)</i>	<b>Room 3</b>
13h15 – 13h35	Fuzzy image segmentation for urban land-cover classification. <i>Ivan Lizarazo</i> , Universidad Distrital Francisco Jose de Caldas	
13h35 – 13h55	Automatic adaptation of segmentation parameters applied to non-homogeneous objects detection. <i>Raul Feitosa</i> , Pontifícia Universidade Católica do Rio de Janeiro	
13h55 – 14h15	Image-to-map conflict detection using iterative trimming: application to forest change. <i>Julien Radoux</i> , Université catholique de Louvain	
14h15 – 14h35	An object-based land-use cellular automata model to overcome scale sensitivity. <i>Danielle Marceau</i> , University of Calgary, Geomatics Engineering	
<b>14h35 – 15h15</b>	<b>Break (Posters &amp; Booths)</b>	<b>Plenary</b>
	<b>Session 7: Government session:</b> <i>(Chair - Paul Briand)</i>	<b>Plenary</b>
15h15 – 15h35	Forest monitoring information needs in Canada. <i>Mike Wulder</i> , Natural Resources Canada, Canadian Forest Service – presented by <i>Joanne White</i>	
15h35 – 15h55	The use of Earth Observation to assess Groundwater Resources. <i>Stéphane Chalifoux</i> , NRC, Earth Sciences - Groundwater	
15h55 – 16h15	Wetland mapping using object based classification of Radarsat and Landsat-ETM images for protected areas. <i>Marcelle Grenier</i> , Environment Canada - Ecosystem Conservation	
16h15 – 16h35	Space-based Monitoring to Support Wildlife Research, Management and Enforcement to deliver on Environment Canada's Mandate. <i>Jason Duffe</i> , Environment Canada - Pesticides Evaluation	
16h35 – 16h55	Object-based Resource Information Extraction: Relevance to Ecological Inventory and Monitoring. <i>Rajeev Sharma</i> , National Parks Directorate EI Branch - Ecosystem Monitoring	
<b>17h00</b>	<b>End of Sessions for First Day</b>	<b>Free</b>

## Oral Sessions: Day 3

August 7, 2008

Room 1 – Scotiabank Milling Area, Plenary – Husky Oil, Great Hall

Time	Title and authors	Room
8h50 – 9h00	<b>Opening session: Business</b>	<b>Plenary</b>
9h00 – 9h45	<b>Keynote:</b> Automated Feature Extraction from Terrestrial and Airborne LIDAR. <i>Stuart Blundel, Overwatch - VLS</i>	
<b>9h45 – 10h00</b>	<b>Break (Posters &amp; Booths)</b>	<b>Plenary</b>
	<b>Session 8: Monitoring (b)</b> <i>(Chair - Joanne White)</i>	<b>Room 1</b>
10h00 – 10h20	Have forests really become denser? An object-oriented assessment of a key premise in wildfire policy. <i>Rutherford Iatt, Gettysburg College</i>	
10h20 – 10h40	Delineating climate relevant structures for the Beijing metropolitan area. <i>Matthias Moeller, Austrian Academy of Sciences, GIScience - presented by Thomas Blaschke</i>	
10h40 – 11h00	Development of process trees for object-oriented change detection in riparian environments from high spatial resolution multi-spectral images. <i>Kasper Johansen, The University of Queensland</i>	
11h00 – 11h20	Studying the earthquake effect on lineament density changes by remote sensing technology. <i>Alireza Sharifi, Department of Geomatics Engineering, University of Tehran, Tehran - presented by Negin Fouladi Moghaddam</i>	
11h20 – 11h40	Quantitative comparison of segmentation results from IKONOS images sharpened by different fusion and interpolation techniques, <i>Tessio Novack, Geógrafo – USP, Mestrando em Sensoriamento Remoto - INPE</i>	
11h40 – 12h00	Image objects for monitoring forest disturbance. <i>Joanne White, Canadian Forest Service</i>	
<b>12h00 – 13h15</b>	<b>Lunch Provided (Posters &amp; Booths)</b>	<b>Plenary</b>
	<i>Sessions continue in CIBC Hub (Room 2) and the Evans Room (Room 3)</i>	
<b>14h55 – 15h15</b>	<b>Break (Posters &amp; Booths)</b>	<b>Plenary</b>
15h15 – 16h30	<b>Discussion, Conclusion and Acknowledgements</b>	<b>Plenary</b>
<b>16h30 – 18h00</b>	<b>End of Sessions for Second day</b>	<b>Free</b>
18:00+	<b>BANQUET/DINNER – DOWNTOWN (LRT/metro tickets provided)</b> Barley Mill Eatery & Pub, 201 Barclay Parade SW, Calgary, AB T2P 4R3 Phone: 403.290.1500	<b>Barley Mill</b>
<b>21:00+</b>	<b>LRT back to Hotels</b>	<b>Free</b>

## Oral Sessions: Day 3

August 7, 2008

Room 2 – CIBC Hub Room, Plenary – Husky Oil, Great Hall

Time	Title and authors	Room
8h50 – 9h00	<b>Opening session: Business</b>	<b>Plenary</b>
9h00 – 9h45	<b>Keynote:</b> Automated Feature Extraction from Terrestrial and Airborne LIDAR. <i>Stuart Blundel, Overwatch - VLS</i>	
<b>9h45 – 10h00</b>	<b>Break (Posters &amp; Booths)</b>	<b>Plenary</b>
	<b>Session 9: Delineation of man-made features</b> <i>(Chair - Danielle Marceau)</i>	<b>Room 2</b>
10h00 – 10h20	Detection of ring shaped structures in agricultural land using high resolution satellite images. <i>Siri Øyen Larsen, Norwegian Computing Center</i>	
10h20 – 10h40	Building detection from high-resolution satellite imagery using adaptive fuzzy-genetic approach. <i>Emre Sumer, Baskent University, Ankara, TURKEY</i>	
10h40 – 11h00	Hidden Markov models applied in agricultural crops classification. <i>Paula Beatriz Leite, Catholic University of Rio de Janeiro - presented by Prof. Raul Feitosa</i>	
11h00 – 11h20	Delineation of neighbourhoods of Accra, Ghana based on segmentation of Quickbird imagery. <i>Douglas Stow, San Diego State University</i>	
11h20 – 11h40	Comparative analysis of automatic approaches to building detection from multi-source aerial images. <i>Kourosh Khoshelham, Delft University of Technology, Delft, The Netherlands</i>	
11h40 – 12h00	Extraction of railroad objects from very high resolution helicopter-borne Lidar and ortho-image data. <i>Marco Neubert, Leibniz Institute of Ecological and Regional Development (IOER)</i>	
<b>12h00 – 13h15</b>	<b>Lunch Provided (Posters &amp; Booths)</b>	<b>Plenary</b>
	<b>Session 10: Ontology</b> <i>(Chair - Guillermo Castilla)</i>	<b>Room 2</b>
13h15 – 13h35	GEOBIA: The Information Bridge between Remote Sensing and GIS. <i>Darryl Murdock, ESRI-DC.</i>	
13h35 – 13h55	From pixels to grixels: a unified functional model for geographic object-based image analysis. <i>Ivan Lizarazo, Universidad Distrital Francisco Jose de Caldas</i>	
13h55 – 14h15	From Image-Objects to Maps: An Assesment of Cartographic Requiriements for GEOBIA. <i>Stefan Steiniger, Department of Geography, University of Calgary</i>	
14h15 – 14h35	Geons – establishing manageable geo-objects for spatial planning and monitoring purposes. <i>Stefan Lang, Centre for Geoinformatics, University of Salzburg</i>	
14h35 – 14h55	Segmentation: The Achilles heel of object-based image analysis? <i>Geoff Smith, Centre for Ecology and Hydrology</i>	
<b>14h55 – 15h15</b>	<b>Break (Posters &amp; Booths)</b>	<b>Plenary</b>
15h15 – 16h30	<b>Discussion, Conclusion and Acknowledgements</b>	<b>Plenary</b>
<b>16h30 – 18h00</b>	<b>End of Sessions for Second day</b>	<b>Free</b>
18:00+	<b>BANQUET/DINNER – DOWNTOWN (LRT/metro tickets provided)</b> Barley Mill Eatery & Pub, 201 Barclay Parade SW, Calgary, AB T2P 4R3 Phone: 403.290.1500	<b>Barley Mill</b>
<b>21:00+</b>	<b>LRT back to Hotels</b>	<b>Free</b>

## Oral Sessions: Day 3

August 7, 2008

Room 3 – Evans Room, Plenary – Husky Oil, Great Hall

Time	Title and authors	Room
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9h00 – 9h45	<b>Keynote:</b> Automated Feature Extraction from Terrestrial and Airborne LIDAR. <i>Stuart Blundel, Overwatch - VLS</i>	
<b>9h45 – 10h00</b>	<b>Break (Posters &amp; Booths)</b>	<b>Plenary</b>
	<b>Session 11: New classification and segmentation methods (c)</b> <i>(Chair - Luis M.T De Carvalho )</i>	<b>Room 3</b>
10h00 – 10h20	IMALYS - an automated and database-integrated object-oriented classification system. <i>Evelin Matejka</i> , Department of Geoinformatics, Hydrology and Modelling. University of Jena	
10h20 – 10h40	An architecture based on class dependent neural networks for object-based classification. <i>Prashanth Reddy Marpu</i> , Freiberg University of Mining and Technology	
10h40 – 11h00	Multilevel object based image classification over urban area based hierarchical image segmentation and invariant moments. <i>Peijun Li</i> , Peking University	
11h00 – 11h20	Quantum-inspired evolutionary algorithm and differential evolution for the automatic adaptation of segmentation parameters. <i>Gilson Costa</i> , Catholic University of Rio de Janeiro	
11h20 – 11h40	Interimage: an open source knowledge based framework for automatic interpretation of remote sensing data. <i>Gilson Alexandre Ostwald Pedro da Costa</i> , Catholic University of Rio de Janeiro	
11h40 – 12h00	Developing an Agent Based System for Customizing distributed GIS Services. <i>Aliaa Youssif</i> , Faculty of computers and information, Helwan University, Cairo, Egypt	
<b>12h00 – 13h15</b>	<b>Lunch Provided (Posters &amp; Booths)</b>	<b>Plenary</b>
	<b>Session 12: Map updating and tree crown delineation</b> <i>(Chair – Maggi Kelly)</i>	<b>Room 3</b>
13h15 – 13h35	Individual tree detection based on densities of high points from high resolution airborne Lidar. <i>Muhammad Zulkarnain Abd Rahman</i> , Delft University of Technology	
13h35 – 13h55	Automatic delineation of forest stands from Lidar data. <i>Vesa Leppänen</i> , University of Joensuu	
13h55 – 14h15	Applied 3D texture features in ALS based tree species segmentation. <i>Timo Tokola</i> , University of Joensuu	
14h15 – 14h35	Estimating canopy cover from eucalypt dominant tropical savanna using the extraction of tree crowns from very high resolution imagery. <i>Tim Whiteside</i> , Batchelor Institute of Indigenous Tertiary Education	
14h35 – 14h55	Spectral and spatial settings for optimal object definition in aboveground biomass and leaf area index mapping. <i>Elisabeth Addink</i> , Faculty of Geosciences, Utrecht University	
<b>14h55 – 15h15</b>	<b>Break (Posters &amp; Booths)</b>	<b>Plenary</b>
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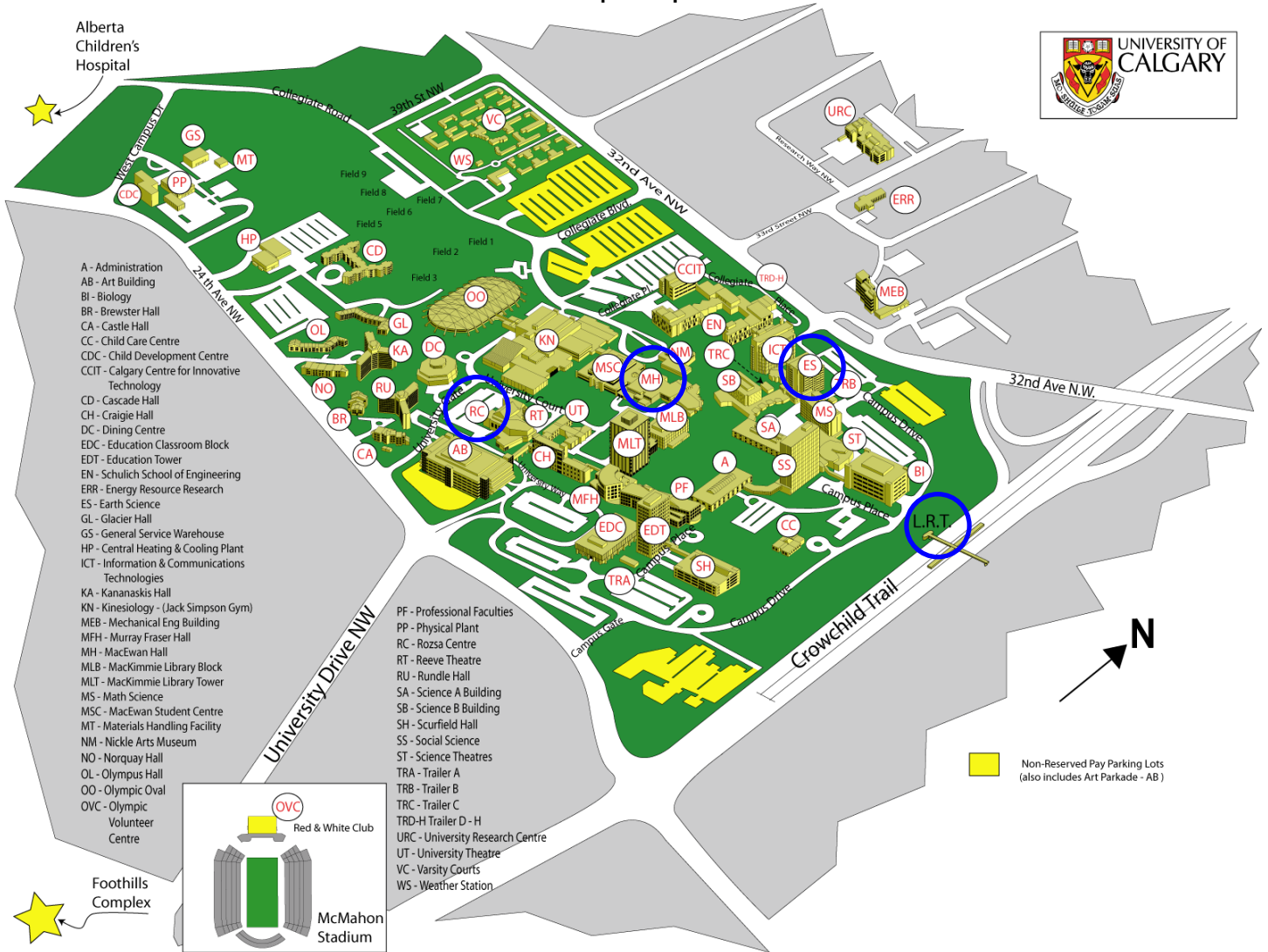
**Poster Presentations: Day 2 & 3**  
(Setup in the Plenary- Great Hall - for the entire conference)

Topics	Title and Author
3D	1. An object-based approach for level-of-detail building model reconstruction from airborne and lidar optical imagery. <i>Freeman Chikomo</i> , University of Newcastle
Automated feature detection for specific targets	2. Use of statistical distribution for segmentation of SAR images of oceanic areas. <i>Renato Feijo da Rocha</i> , Brazilian Navy 3. Multi scale object based detection and classification of roads and vehicles in high resolution optical satellite imagery. <i>Arjen Oostdijk</i> , National Aerospace Laboratory NLR, the Netherlands 4. An object-oriented approach for extraction and identification of individual tree crowns from winter high resolution aerial images. <i>Aaron Trowbridge</i> , Bulkley Valley Centre for Natural Resources Research and Management
Comparative studies of object-based and pixel-based methods	5. 3D facial recognition system based on photogrammetry and neural network. <i>Rami Al-Ruzouq</i> , Al-Balqa Applied University 6. Geo-object based VHR image classification supported by GIS layers and expert knowledge. <i>Jerzy Chimel</i> , Warsaw University of Technology, Faculty of Geodesy and Cartography, Division of Photogrammetry, Remote Sensing and Spatial Information Systems, PI. Politechniki Warsaw, Poland 7. Evaluation of ASTER spectral bands for agricultural land cover mapping using pixel-based and object-based classification approaches. <i>Mst. Farida Perveen</i> , Tottori University, Japan 8. A comparison of object-based and pixel-based approaches to estimate Lidar-derived forest canopy height using Quickbird imagery. <i>Gang Chen</i> , Department of Geography, University of Calgary
Disaster management	9. An inverse analysis of unobserved trigger factor, according to slope failure types. <i>Hirohito Kojima</i> . Dept. of Civil Engineering, Tokyo University of Science 10. Vegetation fire fuels mapping in the San Diego City canyons – A method comparison. <i>Marco Neubert</i> , Leibniz Institute of Ecological and Regional Development (IOER) 11. Classifying high resolution image data in Southeast Asian urban areas using MFC line scanner data. <i>Martin Oczipka</i> , German Aerospace Center (DLR)
Monitoring	12. Monitoring vegetation structure in floodplains to estimate flood risks. <i>Elisabeth Addink</i> , Faculty of Geosciences, Utrecht University 13. A monitoring system using object-based image analysis in the context of treaty monitoring applications. <i>Prashanth Reddy Marpu</i> , Freiberg University of Mining and Technology 14. Leveraging strengths: Linking pixel-based trajectories of forest disturbance with multi-scale object-oriented classification to identify forest disturbance agents during the past two decades in Southeastern U.S. forests. <i>Karen Schleeweis</i> , University of Maryland 15. Automatic classification of central Italy land cover: selection criteria of training set. <i>Primo Zingaretti</i> , Polytechnic University of Marche, Ancona 16. Automatic classification of central Italy land cover: comparative analysis of algorithms. <i>Primo Zingaretti</i> , Polytechnic University of Marche, Ancona 17. Identification of the piping plover nesting habitat using object-based classification of Landsat-ETM images. <i>Sandra Labrecque</i> , Environment Canada - Canadian Wildlife Service
Multi-scale/temporal representations	18. Object-oriented hierarchical image vectorization. <i>Alexei Skurikhin</i> , Los Alamos National Laboratory
New classification methods	19. Active SVDD for one-class object-based Classification. <i>Zhigang Liu</i> , State Key Laboratory of Remote Sensing Science, Beijing Normal University
New segmentation methods	20. Texture segmentation using invariant moments. <i>Prashanth Reddy Marpu</i> , Freiberg University of Mining and Technology
Other	21. The contribution of EVI data to an object based land cover classification with MODIS data. <i>Yan Gao</i> , Centro de Investigaciones en Geografía Ambiental-Universidad Nacional Autónoma de México
accuracy assessment	22. Accuracy Assessment Method for Wetland Object Based Classification. <i>Marcelle Grenier</i> , Environment Canada
Semi-automated map updating	23. Change detection for updates of vector database through region-based classification of VHR satellite data. <i>Alexandre Carleer</i> , Université Libre de Bruxelles 24. Evaluating surface fuel models using object-, rule-, and pixel-, based image classification techniques. <i>Muge Mutlu</i> , Texas A&M University - presented by <i>Jared Stukey</i>

**MAPS:**

<http://www.ucalgary.ca/map/index.html>

**UofC Campus Map**



**Conference Locations to Note:**

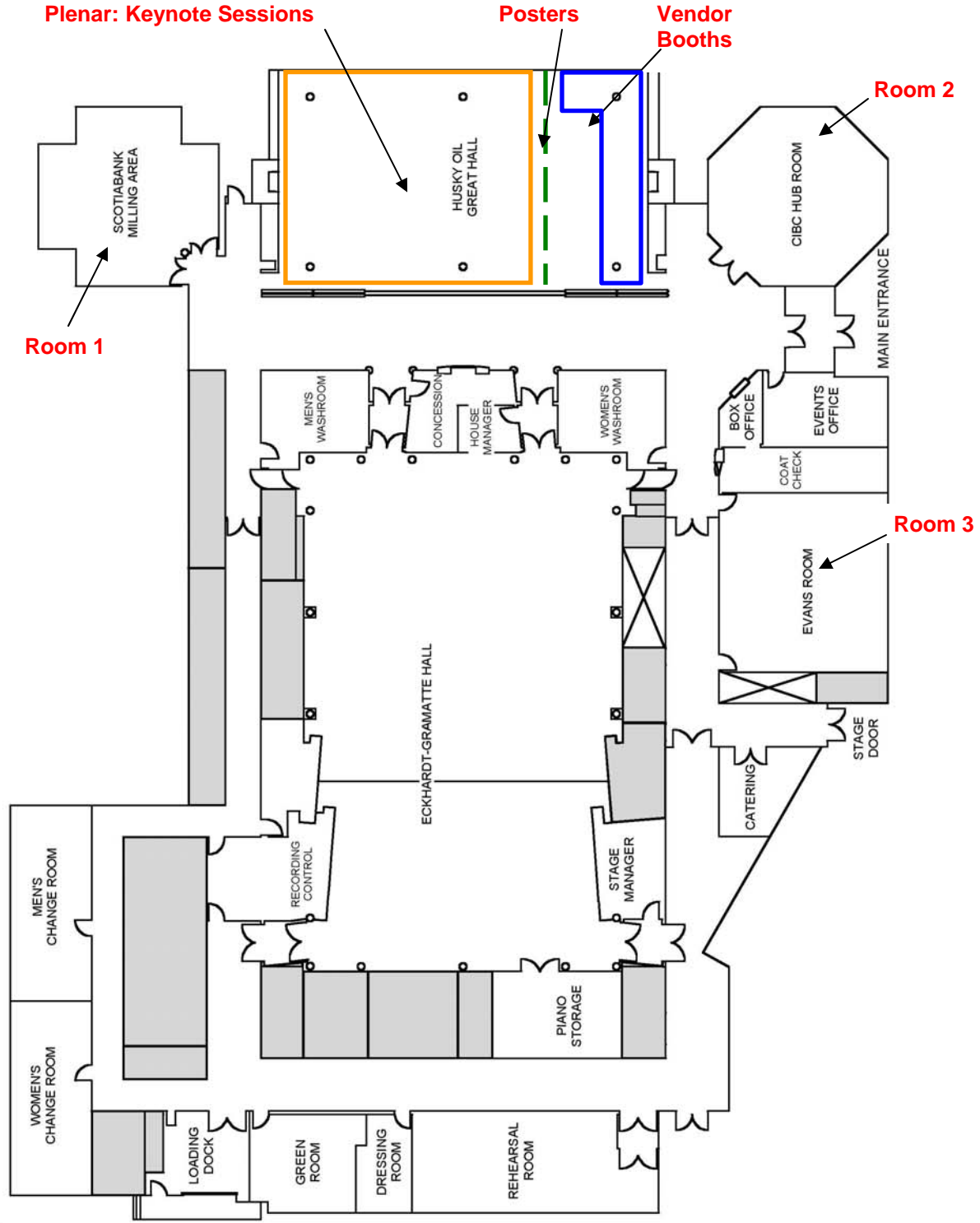
**ES** – Earth Sciences Building (Workshops) 3<sup>rd</sup> & 4<sup>th</sup> Floors [http://www.ucalgary.ca/map/detailed\\_map/earth000.htm](http://www.ucalgary.ca/map/detailed_map/earth000.htm)

**LRT** – Light Rail Transit (Transportation down town)

**MH** – MacEwan Hall (Black Lounge – Ice Breaker) [http://www.ucalgary.ca/map/detailed\\_map/macew001.htm](http://www.ucalgary.ca/map/detailed_map/macew001.htm)

**RC** – Rozsa Center (Conference sessions) [http://www.ucalgary.ca/map/detailed\\_map/rozsa000.htm](http://www.ucalgary.ca/map/detailed_map/rozsa000.htm)

# Conference Floorplan:



Rozsa Centre  
Floor Plan

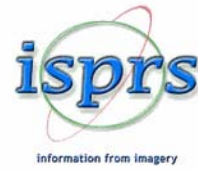
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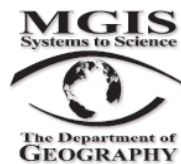
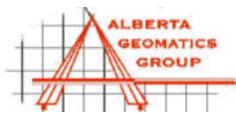
Silver Partners:



Bronze Partners:



In-Kind Partners:



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### NOTES:

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**See the big picture...**



**Natural Resource Management**

**Infrastructure Planning**

**Security and Emergency Response**

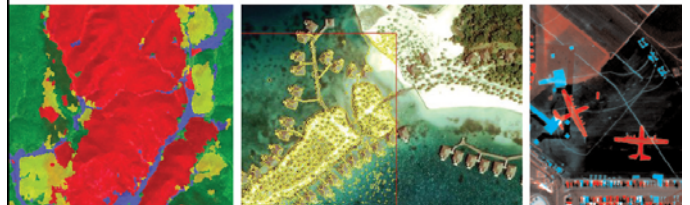
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