REFLECTION OF THE PAST
VISION FOR THE FUTURE

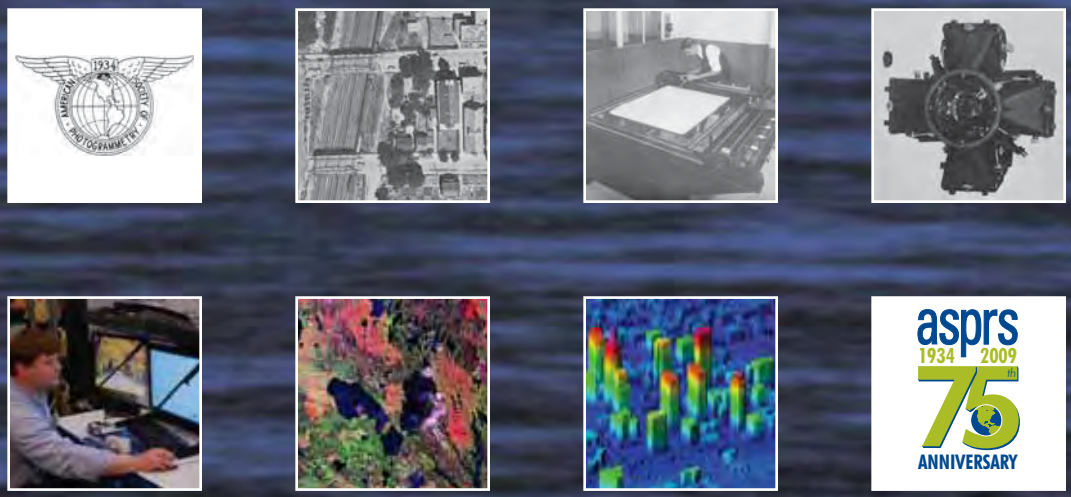
ASPRS 2009 Annual Conference

March 9 - 13, 2009

Baltimore Marriott Waterfront Hotel

Baltimore, Maryland

Preliminary Program



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Pennsylvania DCNR . Penn State . Photo Science . Rolta

Sanborn . Southern Nevada Water Authority . Surdex . Survey

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INTEGRATING THE GEOSPATIAL WORKPLACE

GeoCue

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Thirteen million visitors are drawn to Baltimore's world-famous Inner Harbor every year and you can be one of them by attending the 2009 ASPRS Annual Conference – March 9 – 13, 2009, the 75th Anniversary of ASPRS.

- Experience the many museums including the Baltimore Maritime Museum, Museum of Industry, the USS Constellation Museum and the Civil War Museum.
- World-class theaters – the Peabody Conservatory of Music, the Morris A. Mechanic Theatre/Baltimore Center for the Performing Arts, the recently restored Hippodrome Performing Arts Center featuring headline Broadway shows, are just a few of the many to be found in the city.

- Historic sites and homes are located throughout Baltimore. No visit would be complete without seeing Fort McHenry National Monument, the inspiration for Frances Scott Key's composition of the *Star Spangled Banner* – Baltimore is so full of interesting and artful expressions.
- Sports fans will want to visit the Baltimore Orioles Home at Camden Yards with year-round tours available. The Baltimore Ravens Stadium is next door to Camden Yards.
- The National Aquarium, the Maryland Science Center, Power Plant Live, shopping and nightlife are all within walking distance of the Marriott Waterfront Hotel.
- Tempt your taste buds with world renowned Chesapeake Bay Cuisine. Baltimore boasts of having over 1,000 restaurants with something to satisfy every appetite.

- Baltimore's Little Italy and Greektown are just two of the well-known ethnic experiences waiting to welcome you.
- Getting to Baltimore is so easy. Baltimore/Washington International Airport (BWI) is just 15 minutes from the Marriott Waterfront Hotel – ASPRS Conference Hotel, and has direct service to over 60 U.S. and eight international cities. Numerous means of ground transportation are available from the airport. PLUS, Amtrak's ACELA train service makes Baltimore easily accessible to one-third of the U.S. population.
- Baltimore is only 35 miles from our Nation's Capital with sites too numerous to list – a great extension to your time at the ASPRS Annual Conference. Why not plan to bring your friends and family?

The ASPRS Potomac Region welcomes you to the 2009 Annual Conference in Baltimore. We host the conference every 4th year and are thrilled to do so during the 75th anniversary of ASPRS. The Potomac Region Conference Planning Committee has worked hard to prepare an eclectic program befitting of our theme, "Reflection of the Past, Vision for the Future."

To celebrate this milestone for ASPRS and to meet and greet conference attendees, the Potomac Region is hosting an after-dinner coffee and dessert reception, with live entertainment and cash bar, on Tuesday evening, March 10, at the Marriott Waterfront Hotel. Please make a note on your calendar of this free event intended for socializing and catching up with friends.

We are very much looking forward to seeing you in Baltimore.

Barbara Eckstein, President Potomac Region
Dave Szymanski, Past-President Potomac Region

Table of Contents

Sponsors

Dear Colleagues,


Jim Hipple


Karen Schuckman

We, the ASPRS Potomac Region and the 2009 Conference Planning Committee, invite you to the ASPRS 2009 Conference and to the great city of Baltimore!

The theme for this year's conference is "Reflection of the Past, Vision for the Future," celebrating ASPRS's 75 years as the PREMIER geospatial imaging and information society. We're also looking forward to 75 more!

Throughout its history, ASPRS, and you its members, have played a critical role in pioneering and enhancing the technologies you will see highlighted during this conference.

We have a superb program planned for you, with well over 300 technical and special session presentations. World renowned experts, seasoned practitioners, and the young, bright, up and coming in our field demonstrate geospatial technologies at work in applications to manage our environment, regulate development, prepare for disasters, improve data sharing, build enterprise assets, strengthen national security, and advance quality of life in neighborhoods around the globe. The Poster Sessions include over 30 presentations and demonstrations that will be available throughout the week.

Preceding our technical presentations, we are offering 14 outstanding workshops that address current topics. These workshops are an important source of continuing education for academic, government and private sector users alike.

Our Keynote address will be given by the Governor of Maryland, Martin O'Malley (invited), who has provided the vision and leadership needed to promote a healthy physical and economic environment across the Potomac region and Chesapeake Bay Watershed.

The Thursday plenary session will feature incoming ASPRS President, Brad Doorn, who will deliver his Presidential Address. Following Doorn, industry expert Anne Miglarese, chair of the National Geospatial Advisory Committee, will give her vision for the future. Several prestigious ASPRS awards will be given during this session.

An exceptional range of products and services, many of them just released, will be on display by over 100 vendors in the Exhibit Hall located in the Marriot Waterfront Hotel, the conference headquarters. The Exhibit Hall is open Wednesday through Friday.

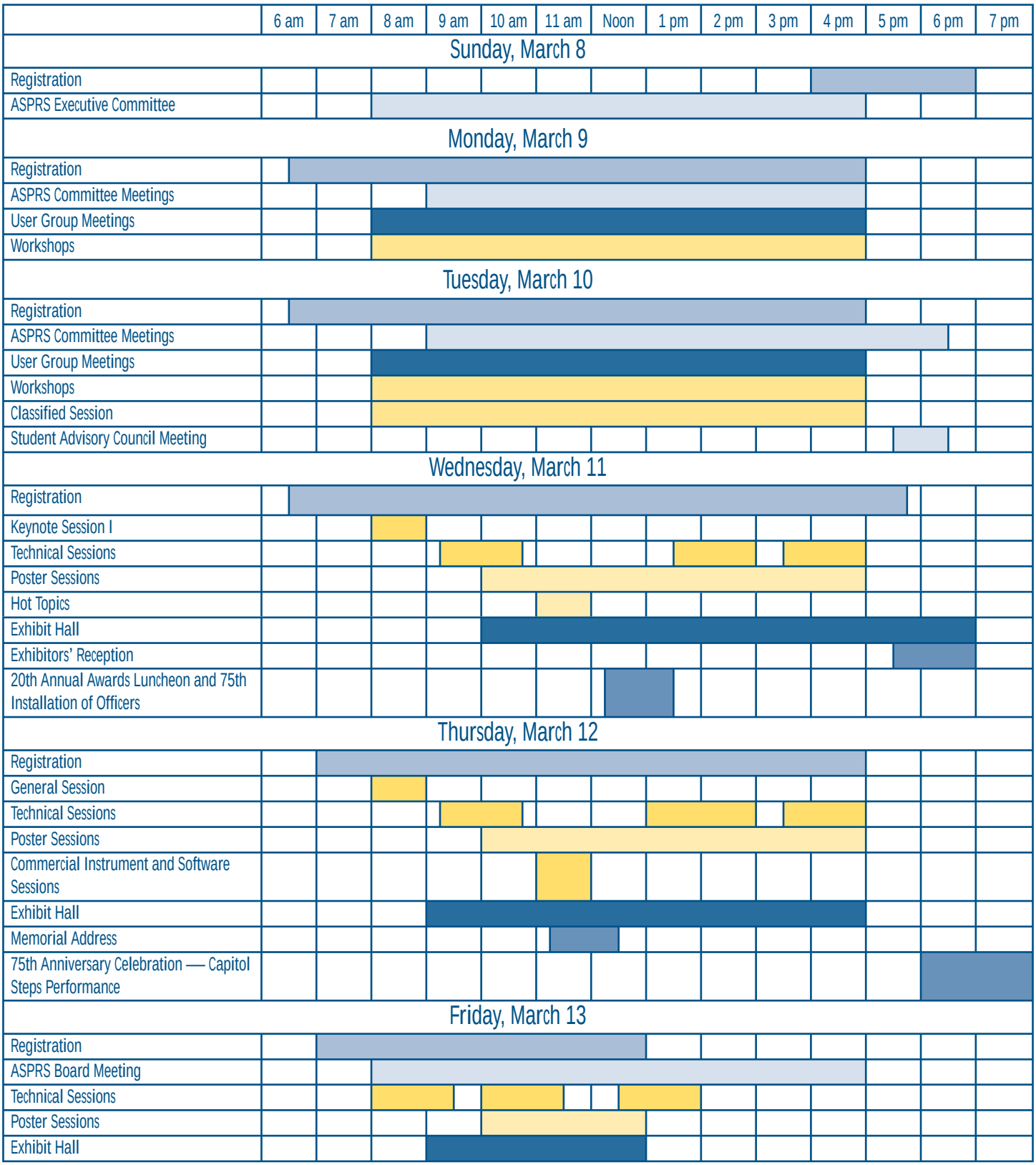
We are excited about our three noteworthy social events. The first is the Welcome Reception hosted by the Potomac Region and its immediate Past President David Szymanski and President Barbara Eckstein on Tuesday evening. The second, is the ever-popular Exhibitors' Reception on Wednesday evening. And, in CELEBRATION of ASPRS's 75th Anniversary, a dinner and entertainment featuring the Capitol Steps performing music and political satire will take place at the Marriott Baltimore Waterfront Hotel on Thursday evening.

You won't want to miss this momentous occasion to celebrate with colleagues and friends.

Jim Hipple
Conference Co-Chair

Karen Schuckman
Conference Co-Chair

Conference-at-a-Glance



Exhibitors*

AGFA Corporation
Airborne 1 Corporation
Alaska Satellite Facility
Applanix Corporation
ASD Inc.
BAE Systems
Cardinal Systems
Clark Labs
CRC Press/Taylor & Francis Group
DAT/EM Systems International
Definiens
DIMAC Systems
DMC International Imaging Ltd.
Dudley Thompson Mapping (DTM)
Dynamic Aviation
E. Coyote Enterprises, Inc.
ERDAS, Inc.
ESRI
Federal Geographic Data Cmte
GeoCue Corporation
GeoEye
Geographic Resource Solutions
Global Marketing
HAS Images, Inc.
INPHO
Intergraph
ITRES Reserach Limited
ITT Visual Information Solutions
KLT Associates Inc.
Leica Geosystems Inc.
LizardTech
MDA Federal Inc.
Merrick & Company
Microsoft Corporation
National Geospatial Intelligence Agency (NGA)
New Tech Services, Inc.
NOAA
NovAtel Inc.
Optech
Overwatch Geospatial - VLS
Penn State
PCI Geomatics
QCoherent Software, LLC
Riegl USA Inc.
Rollei Metric GmbH
SimActive
SPADAC, Inc.
Spectral Instruments
TerraSim Inc
TopoSys Topographische Systemdaten GmbH
TRACK'AIR
Wehrli & Associates
Wilson & Company

**as of November 25, 2008*

ASPRS Committee & Board of Directors' Meetings

Sunday, March 8

Executive Committee
8:00 am to 5:00 pm

Monday, March 9

Division Directors
9:00 am to 10:00 am

Committee Chairs
9:00 am to 10:00 am

Photogrammetric Applications Division (PAD)
10:00 am to 11:00 am

Electronic Communications Committee
10:00 am to 11:00 am

Awards Committee
10:00 am to 12 noon

Data Preservation and Archiving Committee
10:00 am to 12 noon

Region Officers
11:00 am to 12 noon

Photogrammetry Applications Division (PAD) Defense and Intelligence Subcommittee
1:00 pm to 3:00 pm

Education & Professional Development Committee
1:00 pm to 3:00 pm

New Board Orientation
2:00 pm to 3:00 pm

Convention Policy and Planning Committee
3:00 pm to 5:00 pm

Tuesday, March 10

Standards Committee
9:00 am to 12 noon

Membership Committee
10:00 am to 12 noon

Sustaining Members Council
11:00 am to 12 noon

Professional Practice Division (PPD)
1:00 pm to 2:00 pm

Primary Data Acquisition Division (PDAD)
1:00 pm to 3:00 pm

Photogrammetric Applications Division (PAD) Lidar Subcommittee
1:00 pm to 3:00 pm

Photogrammetric Applications Division (PAD) Transportation Surveys Subcommittee
1:00 pm to 5:00 pm

Geographic Information Systems Division (GIS)
2:00 pm to 3:00 pm

Remote Sensing Application Division (RSAD)
3:00 pm to 4:00 pm

Journal Policy Committee & Publications Committee (Joint Meeting)
3:00 pm to 5:00 pm

Evaluation for Certification Committee
3:00 pm to 5:00 pm

Photogrammetric Applications Division (PAD) Softcopy Photogrammetry Subcommittee
4:00 pm to 5:00 pm

By-Laws Committee
5:00 pm to 6:00 pm

Division Directors
5:00 pm to 6:00 pm

Student Advisory Council
5:30 pm to 6:30 pm

Friday, March 13

Board of Directors
8:00 am to 5:00 pm

User Groups — Monday, March 9

User Groups are open to all ASPRS Conference attendees. There is no additional fee to participate.

ASD Inc.

Monday, March 9, 8:00 am to 12 noon

For new and existing users of ASD's rugged field spectrometers, this session will include an introduction to ASD Inc. and field spectroscopy, followed by a demonstration of the benchmark FieldSpec® 3 spectroradiometer. We will cover basic set-up, operation of the instrument, the RS3 control software with the latest upgraded features, and the use of foreoptics and the Contact Probe. The session will conclude with an open Q/A discussion and attendees are encouraged to bring application specific questions.

DIMAC

Monday, March 9, 8:00 am to 12 noon

DIMAC SYSTEMS invites you to its annual User Group Meeting focused on our innovative yet affordable large and medium format digital aerial cameras. Technological features as well as use of the system will be highlighted during this highly regarded session. The workshop will introduce the new generation of CCD sensor the DiMAC cameras will be equipped with. Do not miss this free opportunity to learn more about DiMAC's impressive capabilities. For more information, please call 00-352-2651-2166 in Europe or 303-651-2018 in the US. Email info@dimacsystems.com.

E Coyote Enterprises

Monday, March 9, 8:00 am to 12 noon

The reliable Jena Airborne Scanner (JAS 150s) provides very high resolution, accuracy and radiometric digital data based on the pushbroom principle. Developed for airborne photogrammetry, mapping and remote sensing the JAS 150s represents an affordable solution of the highest quality. All nine bands capture data with the same high resolution. A new and small storage and control rack with hot swappable solid states memory provides best data handling.

Merrick & Company

Monday, March 9, 8:00 am to 12 noon

Merrick & Company is pleased to host the third annual MARS® User Group Meeting at the 2009 ASPRS conference – please join us! The purpose of this meeting is to assist current and prospective MARS® users with technical issues and to provide basic LiDAR training in a relaxed instructional setting. MARS® Explorer is a stand-alone Windows application used to visualize, process and analyze LiDAR, orthophotography and hyperspectral imagery. Open to the public – no pre-registration required Bill Emison, MARS® Product Manager E-mail: bill.emison@merrick.com Office: (303) 353-3634.

ESRI

Monday, March 9, 1:00 pm to 5:00 pm

ESRI's ArcGIS software is a complete geographic information system that provides powerful data management, analysis, and visualization capabilities. ArcGIS includes an Enterprise Image Management System allowing organizations to collect, manage, produce and exploit large collections of imagery and rasters from various sources. By integrating imagery with other types of geospatial data, ArcGIS enables users to make better informed decisions and maximize the value of imagery. Learn more about ESRI's Enterprise Image Management System at www.esri.com/imagery.

GeoEye

Monday, March 9, 1:00 pm to 5:00 pm

GeoEye's earth imaging satellites and worldwide network of ground stations offer a unique ability to accurately map, measure, and monitor the world. See product samples of the most advanced commercial imagery available, and watch demos of GeoEye's intuitive online search and discovery tools. Observe new imagery from GeoEye-1, the world's highest resolution and most accurate commercial imaging satellite with a ground resolution of 0.41-meters. Examine new tools to search GeoEye's online catalog through many endpoints such as ESRI® ArcGIS, Google® Maps, and Google® Earth.

Optech

Monday, March 9, 1:00 pm to 5:00 pm

Optech is the world leader in the development, manufacture, and support of advanced laser-based survey instruments. We offer client-driven lidar solutions for airborne terrestrial and marine survey applications, ground-based static and mobile survey instrumentation, as well as space-qualified sensors for orbital operations and planetary exploration. All are welcome to participate in the annual Optech open user group meeting at ASPRS for a special look into the future advancements of airborne and ground-based mobile lidar technology.

PCI Geomatics

Monday, March 9, 1:00 pm to 5:00 pm

With the abundance of satellite imagery and digital mapping currently available, our customers are discovering a need to process geospatial information in near real-time to help with critical decision making regarding the sustainability and security of our world. PCI Geomatics is changing the way the world prepares their image date, by automating tedious manual processes and improving operating efficiencies. We'd like to learn our users pain points and discuss our solutions including our "Maps on Demand" systems and "ProLines".

User Groups — Tuesday, March 10

BAE Systems
Tuesday, March 10, 8:00 am to 12 noon

BAE Systems demonstrates new features in SOCET SET® v5.5 as well as functionality in SOCET GXP® v3.1, which highlights the use of the Microsoft® Ribbon user interface as well as many new photogrammetric applications, and establishes the union of image analysis, geospatial analysis, photogrammetry and mapping within a single product. Terrain extraction continues to be an area focus with enhancements to the Next-Generation Automatic Terrain Extraction (NGATE) module and the addition of numerous new terrain editing tools.

ENVI
Tuesday, March 10, 8:00 am to 12 noon

ITT Visual Information Solutions invites you to the ENVI User Group Meeting. If you're an ENVI user or would like to learn about ENVI's image processing capabilities, this meeting is for you. See ENVI users from a variety of disciplines showcase their ENVI applications. Talk to the ENVI experts and learn more about some of the latest advances in ENVI including our new ENVI Feature Extraction Module, SPEAR tools for automated workflows,and ESRI ArcGIS integration. Website: www.ittvis.com. Registration not required.

GeoCue Corporation
Tuesday, March 10, 8:00 am to 12 noon

GeoCue Corporation invites you to their User Group Meeting for an informative session that could have a dramatic positive impact on your productivity. GeoCue is a geospatial process framework that has been widely adopted for production tasks such as LIDAR, Digital Camera, SAR and other map production flows. We will demonstrate the new features we have added to our products to enable easy end-user workflow configurations. We will also discuss the advanced products we have released for distributed processing and distributed project management.

Intergraph
Tuesday, March 10, 8:00 am to 12 noon

Join Intergraph to learn about the latest updates in our solutions for Image Acquisition and Geospatial Data Production systems for producing maps, digital terrain models (DTMs), and other geographic data that government, military, and commercial organizations need to preserve accuracy and precision of data. Intergraph experts will highlight our industry-leading digital camera technology as well as flight and sensor management systems and automated production systems.

DAT/EM
Tuesday, March 10, 1:00 pm to 5:00 pm

DAT/EM Systems International is a leading supplier of photogrammetry and terrain modeling software. We will present our flagship product, SUMMIT EVOLUTION, at our 2009 User Group Meeting. We shall discuss the latest features, future development plans, strategic partners, and hardware news. A key event will be open Q&A with lead staff from DAT/EM. All past, present and future users of DAT/EM products, including Summit Evolution, CAPTURE, Map/Editor, and DAT/EM hardware products, are welcome to attend.

ERDAS
Tuesday, March 10, 1:00 pm to 5:00 pm

ERDAS invites you to join us for our User Group Meeting at the ASPRS Annual Conference in Baltimore, March 10th, 2009 from 1 to 5 pm. A Geospatial Business System transforms geospatial data into information useful for decision-making processes. During this meeting, ERDAS' Product Managers, Support Engineers and Sales staff will present the components of a Geospatial Business System, highlighting the individual and combined solutions for authoring, managing, connecting and delivering your information.

INPHO
Tuesday, March 10, 1:00 pm to 5:00 pm

INPHO, leading supplier of solutions for photogrammetry and terrain modeling, will present new features of their photogrammetric system. All processing steps of a photogrammetric project are covered, from aerial triangulation to orthophoto production and mosaicking. INPHO's experts will show how to achieve superior productivity and best quality when using MATCH-AT, inBLOCK, MATCH-T DSM, Summit Evolution, DTMaster, SCOP++, OrthoMaster, OrthoVista or PictoVera. For more information and to register, please contact David Snyder at +1 (225) 6124873 or david_snyder@trimble.com.

Microsoft
Tuesday, March 10, 1:00 pm to 5:00 pm

Join Microsoft's Photogrammetry division, Vexcel Imaging GmbH, for an opportunity to learn about our latest business updates and product developments including the UltraCamXp large format digital aerial camera, the UltraCamL medium format photogrammetric camera, and the UltraMap integrated photogrammetric workflow software system. Presentations will focus on the technology behind these offerings and how these products are being used to implement the world's largest photogrammetry project: "Microsoft Virtual Earth."

Workshops — Monday, March 9

NOW AVAILABLE — Student Pricing for ASPRS Workshops

Students will be allowed to attend workshops at a reduced price on a space available basis.

Send in your registrations by February 9, 2009. We will hold your workshop registration until that date. If there are still spaces available in the workshop of your choice on that date, you will be notified that your workshop registration has been accepted.

If there is no space available, your workshop registration will not be accepted, but your workshop fee will be refunded in full.

Of course, if you want to ensure your spot in a specific workshop, you will have to register at the regular registration rate.

Workshop 1

Remote Sensing of Vegetation

Charles E. Olson, Jr., PhD, *Professor Emeritus of Natural Resources, University of Michigan and Senior Image Analyst, Michigan Tech Research Institute*

Monday, March 9, 8:00 am to 12 noon

Registration Fee: $85 Student, $165 Member, $265 Non-Member

INTRODUCTORY Workshop

This workshop will be an examination of factors affecting signals upwelling from vegetated terrain features; including, effects of these factors on applications in agriculture, forestry, geology, water/wetland management, and wildlife management.

I. The Energy Flow Profile for Remote Sensors
   - A. Energy sources
     1. Wien's Law
     2. Stefan-Boltzmann Law
   - B. Vegetation reflectance
     1. vegetation signatures
     2. seasonal change
     3. bi-directional variation (lack of normality)
   - C. Atmospheric transmission effects
   - D. Sensor response (spectral bands)
     1. detectors and spectral bands
     2. Instantaneous-Field-of-View (pixel effects)
        - a. spatial resolution and detectivity
        - b. mixed-pixel responses

II. Applications
   - A. Agriculture
   - B. Forestry
   - C. Geology
   - D. Wildlife management
   - E. Urban analyses

III. Considerations in Data Acquisition
   - A. Spectral band(s)
   - B. Season of year
   - C. Time of day

Workshop 2

Now That You have Land Use/Land Cover, What are You Going to Use it for?

Andrew Brenner, *Sanborn, Solutions Division*

Monday, March 9, 1:00 pm to 5:00 pm

Registration Fee: $85 Student, $165 Member, $265 Non-Member

INTRODUCTORY Workshop

We all know that the production of land cover information is useful but do we really know how it is being used or can be used outside the academic environment. This workshop is designed for producers and consumers of land cover datasets to understand what users need from a land cover product, how to match needs to specifications, including cost, and specification to technologies. Unlike most workshops this will not start with the technology but start with the demonstrated need and show how land cover products from federal and state programs, university researchers and the private sector are matched or not matched to specific real world applications.

The workshop will be presented as a series of case studies where applications are presented showing examples from real world clients. Based on its requirements the definition of the product is developed and then the technology is selected that can best meet those requirements. The workshop will focus on operational not research projects and will bring in real financial constraints and how those constraints dictated the technology and approach taken.

The workshop will be divided into two sections

Section 1: Use of Generalized Land Cover Products

This section will cover the use of land cover and land use products that are created by agencies for their application over multiple domains. It will cover uses of standard products produced at federal, state and local levels.

I. Applications of Impervious and Canopy Products
II. Applications of Standard Land Cover Products
III. Application of Land use Products

Section 2: Use of Specific Land Cover Products

The section will cover domain or subject specific products, examples will be taken from fields of

I. Forestry
II. Ecological Systems
III. Fire
IV. Agricultural
V. Aquatic Systems

Workshops — Monday, March 9

Workshop 3

Topics in Orthophoto Production

Frank L. Scarpace, Emeritus Professor, *Department of Civil and Environmental Engineering, University of Wisconsin-Madison*
Peggy Bostwick, MS, Vice President, *Image Processing Software, Inc*
Monday, March 9, 8:00 am to 12 noon
Registration Fee: $85 Student, $165 Member, $265 Non-Member

INTERMEDIATE Workshop

This course will discuss the tasks and principles necessary to produce orthophotos from both film and digital aerial images. The topics that will be covered include: a review of aerotriangulation, automated aerotriangulation methods, producing simple orthophoto mosaics, methods of automatic and manual generation of the seam lines, methods of automatic and manual color balance including correcting for uneven scene illumination and reflection from water, creating orthorectified overlays and creating true orthophotos within cities. Methods of creating orthophotos from the recent high resolution satellites will be covered. Methods of creating orthophotos from direct georeferencing will be discussed.

I. Introduction
II. Interior Orientation
  A. Film cameras
  B. Digital cameras
III. Exterior Orientation
  A. Review of AT
  B. Using GPS data
  C. Using IMU data
IV. Matching Fundamentals
V. Automated Point Selection
  A. Using ground control
  B. Using GPS/IMU data
  C. Using only GPS data
VI. Production an Orthophoto
  A. Resampling
  B. Single orthophotos
VII. Automatic and Manual Mosaic Routines
VIII. Updating Mosaics
IX. Color Balance
X. Correcting Individual Tiles
XI. Creating True Orthophotos
XII. Quality Control
XII. Visual Orientation
XIII. Creatign Orthorectified Overlays
XIV. RPC Camera Model

Workshop 4

Marketing Your Business

Tina Cary, *Cary and Associates*
Monday, March 9, 1:00 pm to 5:00 pm
Registration Fee: $85 Student, $165 Member, $265 Non-Member

INTRODUCTORY Workshop

This course is designed to help people who are new to marketing and those who want to review marketing principles and techniques in the context of the geotechnology industry. Material will cover marketing of both products and services. Primary emphasis will be placed on marketing to organizations more than to individuals. Course participants will receive an annotated bibliography of marketing resources.

I. Introduction
II. Marketing Process
  A. Analyze the situation
  B. Develop strategy and tactics
  C. Implement the plan
  D. Evaluate results
III. Situation Analysis
  A. Internal
    1. business goals
    2. resources
  B. External
    1. context and trends
    2. target market
    3. competition
IV. Strategy and Tactics
  A. Value proposition
  B. Magnify differences
V. Implementation
  A. Allocate resources
  B. Communicate to the marketplace
  C. Record results
VI. Evaluation
  A. Compare results to plan
  B. Identify discrepancies and reasons
VII. Summary

Workshop registration fees are NOT included in the full Conference registration fee. Workshops require separate registration and payment for each workshop. Please see the registration form on page 53. Availability is based on space.

ASPRS reserves the right to cancel any workshop if the minimum number of registrations is not received by February 9, 2009. Popular workshops sell out early, so register early to ensure your place in a selected workshop. Workshops are limited to a maximum of 40 attendees.

Workshops — Monday, March 9

Workshop 5

Airborne GPS and Inertia in Support of Triangulation and Orientation of Airborne Framing and Push Broom Sensors

Qassim A. Abdullah, Chief Scientist, *Fugro EarthData International, Inc.*
Riadh Munjy, Professor of Geomatics and Civil Engineering, *California State University*

Monday, March 9, 8:00 am to 5:00 pm
Registration Fee: $120 Student, $215 Member, $315 Non-Member

INTERMEDIATE Workshop

I. Introduction to GPS- and IMU-controlled AT
   A. Objective
   B. Benefits
II. Fundamentals of an Airborne GPS and IMU Integrated System
   A. Operational principles and requirements of a GPS system
   B. Operational principles and requirements of an IMU system
III. Functional System Design and Requirements for an Airborne GPS/IMU Integrated Photogrammetric System
   A. Geometric integration of airborne sensors
   B. Electronic integration of airborne sensors
   C. System calibration
IV. Flight Design and Control Criteria for Successful Airborne GPS-controlled Missions for Framing Cameras (Analog or Digital)
   A. Flight configuration
   B. Ground control configuration
V. Incorporating Airborne GPS and IMU Data in the Mathematical Model for Bundle Adjustment of AT Blocks
   A. Incorporating airborne GPS data
   B. Incorporating airborne IMU data
VI. Fundamental of the Push Broom Digital Photography, the ADS40 case
   A. Image formation with ADS40 push broom digital aerial camera
   B. Image characteristics at various processing levels
VII. Flight Design and Control Criteria for Successful Airborne GPS-controlled Missions for Push Broom Digital Camera (ADS40)
   A. Flight configuration
   B. Ground control configuration
VIII. Processing Flow for Bundle Adjustment of Imagery from Frame and Push Broom Cameras
   A. Input data requirements
   B. Systematic error corrections
   C. Data analysis
IX. Practical Results and the Status of Airborne GPS and IMU-controlled Aerial-triangulation in Production Today.

Workshop 6/6A

A Do-It-Yourself Approach to Lidar and Imagery Processing and Analysis Using Open-Source Tools

Christopher E. Parrish, *NOAA's National Geodetic Survey, Remote Sensing Division*
Jon Sellars, *NOAA's National Geodetic Survey, Remote Sensing Division*
Jason Woolard, *NOAA's National Geodetic Survey, Remote Sensing Division*

Workshop 6 — Monday, March 9, 8:00 am to 5:00 pm
Registration Fee: $120 Student, $215 Member, $315 Non-Member
Workshop 6a — Monday, March 9, 8:00 am to 12 noon
Registration Fee: $85 Student, $165 Member, $265 Non-Member

INTERMEDIATE Workshop

Over the past few years, there has been a rapid increase in the amount of publicly-available imagery and lidar data. As an example, NOAA recently began public dissemination of imagery and lidar data collected as part of the Integrated Ocean and Coastal Mapping (IOCM) initiative, through the "DigitalCoast" Web portal. Likewise, there has also been an increase in the number of commercial-off-the-shelf (COTS) lidar processing and analysis software packages. Most of the COTS software packages are very robust, offering considerable built-in functionality; however, most cost thousands of dollars and typically function as a "black box" (i.e., the processing algorithms are treated as proprietary information and are not released to users). While the COTS software packages are well suited for many organizations engaged in production surveying and mapping operations using lidar, some individuals and organizations may require other software alternatives. Researchers in NOAA's National Geodetic Survey (NGS) have discovered several open source tools and techniques that may be appropriate for the community of scientists, engineers, and other professionals, including:

- Researchers who require the ability to add or modify processing and analysis algorithms.
- Small organizations or individuals who would like to utilize lidar data, but cannot afford and/or do not need large, commercial software packages.
- "Nontraditional" lidar data users (e.g., those with unique processing/analysis needs or who work in other fields with vastly different requirements).

This workshop is designed to provide contemporary technical information well suited to these users' needs. Participants will learn about open-source, customizable software and tools for processing and analyzing lidar data and imagery, as well as simple strategies for developing their own software. The morning session will consist of presentations and demos by the instructors, and the afternoon session will be devoted to projects conducted in groups of two to three. Participants will have the option of taking the course as either a half-day (morning session only) or full-day (morning and afternoon sessions). In the afternoon session, participants will be able to choose from a set

of pre-selected projects ranging in level of difficulty (beginning through advanced) and the topic/application area.

Prerequisites: Some basic ("101-level") familiarity with computer programming and scripting will be helpful for this course, but is not required. To participate in the afternoon session, attendees must have a Windows laptop, as well as administrator rights (i.e., the ability to install software). It is permissible for participants to share the same computer, if they intend to work together as a team.

Specific topics to be covered:

- What's out there: examination of publicly-available data and tools, as well as open-source software
- Scripts for visualizing lidar data and imagery in Google Earth
- MATLAB/Octave code for lidar processing and analysis
- Quantum GIS (QGIS) and Geographic Resources Analysis Support System (GRASS) for lidar and imagery processing and analysis

Note: Mention of a particular vendor, product, process, or technique in this abstract or in the workshop does not constitute an endorsement by the National Geodetic Survey.

Workshop 7

Introducing Active Hyperspectral Remote Sensing

Andre Samberg, *AVAPROedu/Training & Consulting*

Monday, March 9, 8:00 am to 5:00 pm

Registration Fee: $120 Student, $215 Member, $315 Non-Member

INTRODUCTORY Workshop

This workshop has been designed at the introductory level for those people, who are interested in understanding what the term "active hyperspectral remote sensing" stands for. There are no pre-requisites. However, a familiarity with optical remote sensing techniques and possibly previous experience would form a good background for a more efficient acquisition of new knowledge.

In general, active hyperspectral remote sensing system is a complex system. Its operating principle is based on multi-discipline achievements in both the fundamental sciences and the various technologies. This workshop will provide an overview of a history of active hyperspectral technology. The students will learn how a laser rangefinder migrated into a multi-spectral lidar, and later into a hyperspectral lidar. A necessary physical background and the key scientific disciplines will be outlined and briefly described. A project manager will find an interesting discussion about a concept of novel active hyperspectral remote sensing vs. traditional passive hyperspectral remote sensing. Aerial mapping service providers and mission planning officers may find useful information about the state-of-the-art as well as a 3-tier surveillance principle with regard to the SFS technology. The advantages and limitations of a hyperspectral lidar system will be discussed too. Training material is based on a new textbook "Active Hyperspectral Remote Sensing: Theory, Principles, and Applications" by Andre Samberg. This textbook is included in the price.

I. Introduction
   A. Workshop overview
   B. Active RS systems: basic overview
   C. Active hyperspectral RS technique as a part of optical RS
   D. History of active hyperspectral technology
II. Theoretical Background
   A. Overview of multi-discipline approach
      1. quantum mechanics
      2. molecular chemistry
      3. geometrical optics
      4. physical optics
      5. molecular spectroscopy
   B. Light-matter interaction
   C. LIF-based lidar operation
   D. Raman effect
III. Operating Principles
   A. Simplified block diagram
   B. How hyperspectral lidar works
   C. Outputs
IV. Active Hyperspectral RS vs. Passive Hyperspectral RS
   A. Hardware concept
      1. main elements and their main characteristics
      2. single wavelength
      3. multi-wavelength
   B. Carrying platform and power consumption requirements
   C. Advantages and disadvantages
V. Data Processing Workflow
VI. State-of-the-Art
   A. Existing airborne systems and their main performances
   B. Software tools for active hyperspectral data processing
   C. Market overview
VII. Existing and Feasible Applications
VIII. Examples
IX. Summary and Discussions

Workshops — Tuesday, March 10

Workshop 8

Assessing the Accuracy of GIS Information Created from Remotely Sensed Data: Principles and Practices

Russell G. Congalton, Professor, *University of New Hampshire*
Kass Green, President, *Kass Green and Associates*

Tuesday, March 10, 8:00 am to 12 noon
Registration Fee: $85 Student, $165 Member, $265 Non-Member

INTRODUCTORY Workshop

This course focuses on the principles, techniques, and practical aspects of assessing the accuracy of GIS information derived from remotely sensed data and is based on the new 2nd edition of the book written by the instructors. Participants will receive instruction in how to design accuracy assessment procedures, allocate accuracy assessment samples, collect both field and photo reference data, and analyze accuracy assessment results. Examples of accuracy assessment case studies based on actual project data will be presented and discussed. Each participant in this course will come away with a solid understanding of accuracy assessment procedures for spatial data, and the knowledge to properly interpret the results of such procedures. In order to maximize the benefits of completing this course, participants should have previous experience with GIS and remotely sensed data. In addition, a good understanding of statistical principles is also strongly suggested.

I. Introduction
II. A Historical Review
III. Positional Accuracy
  A. Standards
  B. Design of the assessment
  C. How analyzed
IV. Thematic Accuracy
  A. Non-site specific assessments
  B. Site specific assessments
    1. The Error Matrix
V. Sample Design Considerations
  A. Classification scheme
  B. Sample unit
  C. Sample size
  D. Sampling scheme
VI. Reference Data Collection
VII. Basic Analysis Techniques
  A. Kappa
  B. Margfit
VIII. Analysis of Differences in the Error Matrix
IX. Fuzzy Accuracy Assessment
X. Case Study
XI. Conclusions

Workshop 9

Looking Above the Terrain Model: Lidar for Vegetation Assessment

Sorin C. Popescu, *Texas A&M University*

Tuesday, March 10, 1:00 pm to 5:00 pm
Registration Fee: $85 Student, $165 Member, $265 Non-Member

INTERMEDIATE Workshop

The participants are expected to have a basic understanding of remote sensing techniques and image processing. The overall goal of this workshop is to introduce participants to lidar concepts, processing techniques, and applications for deriving information on forest vegetation resources and canopy parameters. More specific objectives are to: (1) familiarize participants with basic lidar and laser ranging concepts; (2) introduce types of lidar sensors for forest resources assessment and the LAS lidar data format – ground-based, airborne, and satellite sensors; (3) review algorithms for deriving information on terrain elevation and forest resources; (4) review processing techniques for generating canopy height models and "multi-band" lidar height bins, (5) review methods for deriving vegetation information at individual tree, plot, and stand level; (6) introduce participants to TreeVaW, a lidar processing software for identifying and measuring individual trees on lidar-derived canopy height models, and (7) discuss an array of processing techniques derived from multi- and hyper-spectral image processing for using lidar-derived data products for assessing vegetation parameters. This workshop is intended to be a half-day workshop at intermediate level, as the participants are expected to have a basic understanding of remote sensing techniques and image processing.

I. Why Use Lasers for Range Finding?
II. Types of Lidar Sensors and the LAS Lidar Data Exchange Format
III. Full Waveform vs. Discrete-returns, Small Footprint vs. Large Footprint Lidar; Comparison of ICESat Waveforms and Airborne Lidar Metrics
IV. Approaches to Lidar Processing for Deriving Terrain Elevation and Assessing Forest Vegetation: Lidar Discrete Points and Interpolated Surfaces
V. Seeing the Trees in the Forest: Direct Lidar Measurements at Individual Tree Level – Tree Height, Crown Diameter, Crown Base Height, and Stand Density
VI. TreeVaW: An Automated Software Application using Adaptive Filtering to Locate and Measure Individual Trees in Complex Canopy Structures
VII. Derived Biophysical Parameters: Volume, Biomass, Percent Canopy Cover, Leaf Area Index, and Forest Fuel Models, by using Lidar Data and Lidar-multispectral Fused Imagery
VIII. When Every Lidar Point Counts: Making use of all Lidar Points above the Terrain Model to Generate Lidar Pseudo-tomography of Forest Vegetation; The Height-bins Approach and Applications for Characterizing and Mapping Forest Vegetation
IX. Online Workshop Resources: LAS Lidar Files, Canopy Height Models, Conferences, and Publications

Workshops — Tuesday, March 10

Workshop 10

Visual Interpretation, Photogrammetric Processing, and Feature Extraction of High-Resolution Satellite Imagery

Gene Dial, Product Engineering Director, *GeoEye*
Kurt deVenecia, Product Manager, *BAE Systems*
Tuesday, March 10, 8:00 am to 12 noon
Registration Fee: $85 Student, $165 Member, $265 Non-Member

INTERMEDIATE Workshop

Though basic principles will be covered, we assume the attendees are familiar with basics of image adjustment, photogrammetry and feature extraction. The workshop is intended to help users of aerial photography transition to high resolution satellite imagery and to help current users of satellite imagery to learn more advanced photogrammetric and cartographic processing techniques.

Workshop attendees will be provided with sample satellite imagery and collateral data so they can practice the workshop techniques on their own systems. Imagery samples will be provided from the IKONOS and GeoEye-1 satellites operated by GeoEye and processing will be demonstrated with SOCET GXP® software by BAE Systems. The techniques shown are broadly applicable to any high-resolution satellite imagery processed by any quality image processing, photogrammetry, and feature extraction software.

The following topics will be presented and demonstrated.

I. Introduction
II. IKONOS and GeoEye-1 Satellite Performance Characteristics
  A. Spatial and spectral resolution
  B. Collection capacity
  C. Geometric accuracy
  D. Image quality
III. GeoEye Image Product Characteristics
  A. Processing levels
  B. Geometry of Basic, Geo, Ortho, & Stereo image products
  C. Metadata
  D. GIS data
  E. Licensing
IV. Camera Models
  A. Rigorous
  B. Replacement
  C. RPC
  D. NCDRD
V. Image Enhancement
  A. Dynamic Range Adjustment for brightness, contrast, and color balance.
  B. Sharpness
  C. Pan-sharpening
  D. Enhancement of shadow and highlight areas
VI. Photogrammetric Processing
  A. Triangulation to improve accuracy using multi-image block adjust, surveyed control, image control, and vertical control.
  B. Orthorectification with an external Digital Elevation Model (DEM)
  C. Automatic & manual DEM generation from stereo imagery
  D. Orthomosaic generation
VII. Feature Extraction
  A. Horizontal feature extraction from orthorectified imagery
  B. 3-D feature extraction from stereo imagery
  C. Compatibility with GIS applications
VIII. Sample Data
  A. Imagery
  B. Ground control
  C. DEM

Workshop 11

GIS Updating from Imagery and Collateral Data Sources

Christian Heipke, IPI, *Leibniz Universität Hannover*, Germany
Tuesday, March 10, 1:00 pm to 5:00 pm
Registration Fee: $85 Student, $165 Member, $265 Non-Member

INTERMEDIATE Workshop

It is well known that geospatial data are the most valuable source of data in any GIS. In particular with regard to new applications such as car navigation it is of prime importance to keep the GIS database up-to-date in very short intervals, sometimes on a daily basis. In different countries this goal is reached in different ways. Whereas some countries are in the process of establishing a ground based service, sometimes even incorporating taxi drivers and the local postman, other countries take a more centralized approach and rely on image information as the prime data source. Once the data are acquired, they have to be included in the data set and possibly also in derived data sets. This can be achieved using incremental update functionalities in a so called MRDB (multi resolution database).

This half-day workshop deals with the different possibilities to update a topographic GIS database and describes in some detail what is necessary to keep the database up-to-date. It is shown that updating can be viewed as a two-stage approach involving two questions: (a) are the data in the database correct? (b) are the data in the database complete? Whereas the first question potentially leads to correction and deletion of existing data, the second adds new data to the database.

Data sources taken into account comprise aerial and satellite images, ground survey, and larger scale data, which are propagated through scale making use of MRDB. The different theoretical concepts are explained in detail and are discussed using real-world applications from various countries. Short presentations from an industry and an user point of view complement the material covered in the workshop.

The workshop is aimed at scientists involved in designing new updating processes for a large topographic database, to practitioners in National Mapping and cadastral agencies facing the task of keeping the databases up-to-date, and software developers who need to implement and efficient workflow for GIS database updating.

Workshops — Tuesday, March 10

Workshop 12

Preparing for ASPRS Certification

Robert Burtch, Professor, *Ferris State University*
Rakesh Malhotra, *North Carolina Central University*
Tuesday, March 10, 8:00 am to 5:00 pm
Registration Fee: $120 Student, $215 Member, $315 Non-Member

INTERMEDIATE Workshop

Assumes participants have subject knowledge and are serious about taking the Certification Exam. The purpose of this workshop is to prepare individuals who are planning to sit for the ASPRS Certification exams as a Certified Photogrammetrist or Certified Mapping Scientist in either Remote Sensing or GIS. The workshop will begin by explaining the purpose and form of the exam. It will then identify key topical areas that an applicant should be aware of prior to taking the exam. Topics will start with a review of the basic concepts and sample questions to show how they will be tested for on the exam. Finally, the workshop will try to identify resources in which exam takers should be aware of and study from in their preparation for the examination.

I. Purpose of the Exam
   A. Role of the exam in the certification process
   B. Format of the exam
   C. Topical areas covered on each of the three different exams
II. Geodesy/Surveying
   A. Principles of state plane coordinates
   B. Surveying Technologies
   C. Resources for further study
III. Photogrammetry
   A. Important principles
   B. Review questions
   C. Resources for further study
IV. Remote Sensing
   A. Important principles
   B. Review questions
   C. Resources for further study
V. Geographic Information Systems
   A. Important principles
   B. Review questions
   C. Resources for further study
VI. Other Topical Areas of Importance in Preparation for the Exam

Workshop 13

Hyperspectral Image Processing and Feature Extraction: Maximizing Geospatial Information Retrieval

William Farrand, *Space Science Institute*
Stuart Blundell, *Overwatch Geospatial*
Tuesday, March 10, 8:00 am to 5:00 pm
Registration Fee: $120 Student, $215 Member, $315 Non-Member

INTERMEDIATE Workshop

Imaging spectrometry, commonly referred to as hyperspectral remote sensing, provides high-resolution spectral information for environmental, natural resources, and urban characterization projects. Hyperspectral image processing approaches can also be applied to broadband multispectral imagery and results from these analyses can be used to enhance automated feature extraction techniques. In this workshop, we will provide students with an introduction to the phenomenology of imaging spectrometry, hyperspectral image processing techniques, and feature extraction approaches to demonstrate how to add value to the maintenance of geospatial databases. We will emphasize that the added value in imaging spectrometry is on the *spectrometry*, the ability to identify materials based on their reflectance signatures. We will briefly discuss the phenomenology of reflectance spectrometry and explain why some materials are more amenable to mapping than others. We will describe commercially available processing systems that are available for processing hyperspectral and multispectral data and discuss the processing techniques within those packages. Certain processing techniques are better suited to certain applications. We will explain why this is so. We will also discuss some of the advantages and shortcomings of current airborne and orbital hyperspectral systems as well as planned systems.

Hyperspectral imagery provides users with discrete spectral, and consequently compositional, information about Earth surface materials. The ability to integrate other types of geologic, geochemical, biologic, or hydrologic data with information from hyperspectral data improves the interpretation and mapping process. The student will be introduced to the concepts of developing feature extraction models for assisted and automated feature extraction approaches using hyperspectral, Lidar, DEMs and multispectral data within a GIS. We will provide real-world examples of how end products, derived from hyperspectral and multispectral data processing, including resultant mineral and vegetation species maps, can be extracted using the Hyperspectral Toolkit for Feature Analyst software.

We will provide a package of materials to the students that will include hard copies of the material presented and an extensive list of references on the topics addressed. We will engage the class with an in-class exercise and several “take-home” hands-on exercises.

Topics to be addressed

I. Define Imaging Spectrometry (Hyperspectral Remote Sensing)

Workshops

II. The Phenomenology of Reflectance Spectrometry
III. Object Recognition and Feature Extraction using Spatial and Spectral Attributes
IV. Commercially Available Hyperspectral Imaging (HSI) Software Packages
V. Processing Techniques for Applications of HSI and MSI (demonstration)
VI. Feature Extraction Strategies using HSI, Lidar and MSI Datasets
VII. Descriptions of Available and Soon-to-be Available Hyper Spectral Systems
VIII. Exercises
IX. Case Studies
X. Summary and Final Discussion

Workshop 14

Professional Airborne Digital Mapping Systems - An Overview

Dave Fuhr, Airborne *Data Systems*
Brian Huberty, *U.S. Fish & Wildlife Service*
Tuesday, March 10, 8:00 am to 5:00 pm
Registration Fee: $120 Student, $215 Member, $315 Non-Member

INTRODUCTORY Workshop

The primary objective of this tutorial is to review professional airborne digital mapping camera systems. We will discuss all advantages and disadvantages of these new, dynamic systems - technical, costs, feasibility, calibration and applications. Participants will leave with a better understanding of what it takes to map their projects by either contracting or acquiring airborne digital mapping camera systems.

I. Introduction
II. Geospatial Information - What and Where is the information You Need?
  A. Physical resolution
  B. Spectral resolution
  C. Positional accuracy
III. History
IV. Mapping and Multi-spectral Airborne Cameras
V. Platforms UAV's to U2's
VI. Camera Basics
  A. Array sensors-CCD,CMOS
  B. Linear/pushbroom sensors
  C. Scanning mirror
  D. Lenses
  E. Filters/bandwidth
  F. Electronic shutters
VII. Camera Systems Design
  A. Processing and storage systems
  B. Aircraft power supply
  C. Navigation GPS/IMU
  D. Real-time data links
VIII. Applications
IX. References
X. Future

Student Events

Students and Young Professionals — These events are just for you!

Speed Networking

Whether this is your first ASPRS Conference or if you have had an opportunity to attend previously, you are invited to join other students and young professionals from all over the world at this special event designed just for you.

You've heard of Speed Dating. We're offering Speed Networking where you will get to meet at least seven new people who may become good friends for the conference or the rest of your life.

Student Advisory Council Meeting

Tuesday, March 10, 5:30 pm to 6:30 pm

All students are welcome to join the Student Advisory Council meeting and learn the many ways you can become more involved in ASPRS and further your professional life.

Exhibit Hall Guided Tour

The ASPRS Sustaining Members Council is hosting a guided tour of the exhibit hall for students. This is your opportunity to meet the exhibitors, up close and personal.

Keynote Session — Wednesday, March 11

Keynote Session

Martin O'Malley, *Governor of Maryland,* (invited)
8:00 am to 9:00 am

Governor Martin O'Malley is currently serving as the 61st Governor of Maryland. Previously, he served as the mayor of Baltimore City from 1999 to 2007.

During his six years as mayor of Baltimore City, O'Malley worked tirelessly with the citizens and public servants to make Baltimore a more beautiful, cleaner city where people want to live and businesses want to invest. As Governor, O'Malley is applying that knowledge, experience and energy to the state of Maryland to make it stronger and more prepared for any challenges that lie ahead.

As part of that effort, Governor O'Malley spearheaded the performance measurement and management accountability programs implemented in the state of Maryland that utilize geospatial information. One performance measurement and management accountability tool, BayStat, evaluates state initiatives directed at improving the health of the Chesapeake Bay. This tool includes data from the state's departments of Agriculture, Environment, Natural Resources, and Planning with the goal of providing timely, accurate information that is shared by all; rapidly deploying resources for real-time responses; creating effective tactics and strategies; and encouraging relentless follow-up and assessment.

O'Malley graduated from Catholic University and the University of Maryland Law School. He was raised in Montgomery County, Maryland. He served as a prosecutor from 1988 to 1990 and was elected to the City Council in 1991.

He and his wife, Katie O'Malley, live in northeast Baltimore with their daughters, Grace and Tara, and sons William and Jack.

ASPRS Awards

Several prestigious ASPRS awards will be given.

Technical Sessions — Wednesday, March 11

Technical Sessions
9:15 am to 10:45 am

Data Fusion/Agriculture Forestry
Moderator: Todd Erdody, *University of Washington*

Data Fusion/Integration of High and Medium Resolution Imagery for Crop Analysis
Joseph E. Kunz, *ASRC Management Services*
Sean Patrick Griffin

Fusion of Lidar and Imagery for Estimating Canopy Fuel Metrics in Eastern Washington Forests
Todd Erdody, *University of Washington*
L. Monika Moskal

Combining Aerial Photographs and Lidar Imagery for Automated Individual Tree Top Detection and Registration
Jun Hak Lee, *University of California-Berkeley*
Joshua B. Fisher and Gregory S. Biging

MODIS and AWIFS Multi-sensor Imagery Data Fusion for Crop Classification Using Decision Tree Method
Zhengwei Yang, *U.S. Department of Agriculture/NASS*
Patrick Willis and Rick Mueller

Feature Extraction I
Moderator: Peter Doucette, *National Geospatial-Intelligence Agency*

An Edge-centered Correlator for Automatic Building Extraction in Urban Scenes
Fengliang Xu, *ERDAS Inc*.
Younian Wang and Neil Woodhouse

Independent Component Analysis: Applications in Feature Extraction from Multispectral and Hyperspectral Images
Xiaoying Jin, *ITT Visual Information Solutions*

Stereo Matching using Recognized Objects as Controls
Hongwei Zhu, *University of Wisconsin-Madison*
Frank Scarpace

Image Processing and Analysis using ASTER Imagery for Lithological Mapping at Fawakhir, Central Eastern Desert of Egypt
Reda Amer, *Saint Louis University*
Timothy Kusky and Abdulwasit Ghulam

Vegetation Mapping/Forestry
Moderator: Cuizhen Wang, *University of Missouri*

Retrieval of Canopy Structural Variables from ICESAT Waveform Data for Forests over Sloped Terrain
Kaiguang Zhao, *Spatial Sciences Lab., Texas A&M University*
Sorin Popescu

Individual Tree Crown Detection and Delineation from High Spatial Resolution Imagery using Active Contour and Hill-climbing Algorithms
Yinghai Ke, *SUNY College of Environmental Science and Forestry*
Lindi J. Quackenbush

Above Ground Forest Biomass Estimation using Linear Mixture Model for the State of Mississippi, USA.
Tiruveedhula Mohan, *Mississippi State University*
Fan Zhaofei, Sadasivuni Ravi, and Durbha Surya

Extracting Forest Structural Attributes in South Africa using Image Texture Analysis, and Artificial Neural Networks from IKONOS Imagery
Michael Gebreslasie, *University of KwaZulu-Natal,* South Africa
Jan A.N. van Aardt

Special Session — GEO Progress and Prospects (I) – Progress in Building the Global Earth Observation System of Systems (GEOSS) Through International Partnerships and Cooperation
Moderator: Lawrence R. Pettinger, *U.S. Geological Survey*

This session highlights accomplishments of the intergovernmental Group on Earth Observations (GEO) that is developing the Global Earth Observation System of Systems (GEOSS). The purpose of GEOSS is to achieve comprehensive, coordinated and sustained observations of the Earth system, in order to improve monitoring of the state of the Earth, increase understanding of Earth processes, and enhance prediction of the behavior of the Earth system.

The Group on Earth Observations (GEO) – Moving Successfully From Early Vision to Reality
U.S. Principal Representative to GEO (invited)

Developing and Implementing the GEOSS Common Infrastructure
Ivan B. DeLoatch, *U.S. Geological Survey*
Douglas D. Nebert,*U.S. Geological Survey*

Leveraging the United States Group on Earth Observations (USGEO) to Achieve Coordinated and Sustained Observations of the Earth System
Teresa Fryberger, *National Aeronautics and Space Administration*

GIS Modeling and Analysis/Urban and Environmental

Moderator: Tilottama Ghosh, *University of Denver*

What is the Modeled Potential Residential Loss?
Bandana Kar, *University of Southern Mississippi*
M.E. Hodgson

Using 3D GIS Data to Model Building Height Restriction Surfaces around Airports
Christopher Rado, *New York City Department of City Planning*
Christopher Holme and Parul Agarwala

Modeling and Analysis of Mosquito and Environmental Data to Predict the Risk of Japanese Encephalitis
Penny Masuoka, *Uniformed Services University of the Health Sciences*

Design of an Informal Settlement Upgrading and Growth Model Using Remote Sensing and Spatial Technologies in South Africa
Karishma Busgeeth, *CSIR,* South Africa

Homeland Security Emergency Management

Moderator: Michael K. McInerney, *U.S. Army Engineer Research Development Center*

Emergency Management Applications for Harsh Economic Times
Mary L. Johnson, *Remington & Vernick Engineers*

Night-time Orthophotography for Public Safety Mapping and Lighting Applications
Peter Sforza, *Virginia Tech*
Mintai Kim and Katherine Smith

Object-based Image Classification and Web-mapping Techniques for Flood Damage Assessment
Jie Shan, *Purdue University*
KyoHyouk Kim

Monitoring of Land Degradation for the Selection of A/R CDM Candidate Sites by using Multi-temporal Image Classification of North Korea
Do-Hyung Kim, *Department of Geography, University of Maryland-College Park*
Chong-Hwa Park and Jae-Shim Yu

Natural Hazards Fire Flood

Moderator: Appollonia A. Okhimamhe, *Centre for Climate Change and Freshwater Resources (CCCFR), Federal University of Technology,* Nigeria

Volunteer Hazard Mapping Corps: A Student-based Hazard GIS Support Group
Caitlin L. Chason, *San Diego State University*
Christopher D. Lippitt and Grant Fraley

Florida's Canopy Fuels Inventory Project: Developing an Approach to Statewide Canopy Fuels Mapping
Matt Vernier, *Sanborn*
Andrew Brenner, Jim Brenner, Don Carlton, and Janet Hoyt

Burn Severity Assessment in the Okanogan-Wenatchee Forest using NASA Satellite Missions
Michelle Newcomer, *San Francisco State University*
Diana Delgado, Collette Gantenbein, Thomas Wang, Susan Prichard, Cindy Schmidt, and Joseph Skiles

Developing a Natural Hazard Vulnerability Map of Sariwon, North Korea: Focused on Flood Hazard
Soojeong Myeong, *Korea Environment Institute,* South Korea
Hyun Jung Hong

Marine/SAR

Moderator: D. Marius Necsoiu, *Southwest Research Institute*

Marine Oil Pollution Detection from Radarsat-2 Dual Polarization ScanSAR Imagery
Wenxia Tan, *Department of Geography & Environmental Management, University of Waterloo*, Canada
Jonathan Li and Ziqiang Ou

Marine Oil Spill Detection from Radarsat-1 Images using Marked Point Processes
Yu Li, *Department of Geography & Environmental Management, University of Waterloo*, Canada
Jonathan Li and Michael A. Chapman

MarineSAR: Integrated RADARSAT Monitoring of Marine Pollution
Jonathan Li, *Department of Geography & Environmental Management, University of Waterloo*, Canada
Yu Li, Wenxia Tan and Yuanming Shu

Wetland Aquatic

Moderator: David Lusch, *RS & GIS, Michigan State University*

Modeling Seagrass Community Change using Remote Sensing and Real-Time Instrument Packages
Justin Janaskie, *The University of Mississippi*
Greg Easson, Deborah Gochfeld, Cole Easson, and Anne Boettcher

Salt Marsh Migration: Using High Resolution Imagery and Lidar Data to Model the Effects of Sea Level Rise on Connecticut's Salt Marshes
Mark Hoover, *University of Connecticut*
Daniel Civco

How Many Wetlands are Missing? A Multiscale Geographic Object-based Image Analysis (GEOBIA) of Wetlands in the Boreal Plains of Alberta
Ryan Powers, *Department of Geography, University of Calgary*, Canada
Geoffrey Hay

Close Range Imaging for Mapping a Ship Grounding on a Coral Reef
Nuno Gracias, *EIA Department, University of Girona*, Spain
Arthur Gleason, Diego Lirman, Brooke Gintert, Eduardo Martinez, Greg DeAngelo, and R. Pamela Reid

Technical Sessions — Wednesday, March 11

Special Session — Promoting Geospatial Workforce Development by Building Bridges among Stakeholders

(Sponsored by the ASPRS Education and Professional Development Committee)

Moderator: Jeannette Allen, *SSAI, NASA Goddard Space Flight Center*

Progress in workforce development for geospatial careers has been made, yet much remains to be achieved. Industries and government employers still lack educated, skilled job candidates, and work is regularly going overseas that might be done in the United States. Stakeholders in the development and strengthening of an educated, skilled geospatial workforce include a multitude of industries and governments employing geospatial specialists; professional associations; students; and K-12 teachers and higher education faculty and administration. These groups have different perspectives, needs, and interests. How can bridges be built among them to foster successful collaboration for geospatial workforce development?

This panel will include representatives from industry, professional associations, faculty, and students, who have been personally engaged in promoting geospatial education and training at national and regional levels. The panel will explore the current status and needs of geospatial workforce development; stakeholder groups' views of their responsibilities for it; specific shared goals that might be pursued collaboratively; examples of successful workforce development collaborations, both past and current; best practices and lessons learned; and other considerations for future programs.

Presenters

Harold Cline, Director of Outreach & Education, *ITT Visual Information Solutions*

Michael E. Flynn, Jr., Operations Manager, *M. J. Harden, GeoEye*

Ann Johnson, Higher Education Solutions Manager, *ESRI*

Michelle Kinzel, Chair, ASPRS Student Advisory Council, and GIS TA, *Department of Geosciences, Oregon State University*

Marguerite Madden, President, ASPRS and Associate Professor and Director, *Center for Remote Sensing and Mapping Science (CRMS), Department of Geography, The University of Georgia*

David Webb, Assistant Professor, *Mechanical Engineering Technology, Virginia Western Community College*

Poster Session

10:00 am to 5:00 pm

HOT TOPICS

Interactive Networking

11:00 am to 12:00 noon

The one-hour HOT TOPIC discussion groups, hosted by ASPRS Divisions and Committees, continue to be a crowd pleaser. This is an opportunity for all attendees to weigh in with their thoughts on such issues as certification, the future of land imaging, state licensing of professionals, and commercial use of UAVs, and more. What HOT TOPIC would YOU like to discuss in Baltimore?

ASPRS will send an electronic questionnaire to members and registrants so you can rank the proposed HOT TOPICS and recommend others for discussion.

20th Annual Awards Luncheon and 75th Installation of Officers

12:15 pm to 1:30 pm

Join in recognition of your colleagues and participate in the occasion marking the installation of the Society's 75th slate of officers.

The recipients of this year's prestigious awards will be given special honor and the business meeting will include installation of ASPRS Officers and Directors. Kass Green, retiring President, will give a summation of the past year's events.

Tickets for the Luncheon are required and may be purchased by completing the information on the conference registration form found on page 50 of this program. Cost is $50 per person for the luncheon. Limited seating in the rear of the room is available at no cost for conference registrants wishing to attend the ceremonies only. On site luncheon ticket sales are limited to availability.

Technical Sessions
1:30 pm to 3:00 pm

Accuracy Error Assessment I
Moderator: Kristian Morin, *Leica Geosystems*

Assessment of Forest Disturbance Change Products Derived from Landsat Time Series Stacks (LTSS)
Nancy Thomas, *Department of Geography, University of Maryland*

Chengquan Huang, Samuel Goward, Scott Powell, Karen Schleeweis, Khaldoun Rishmawi, and Adrienne Hinds

Early Season Winter Wheat Identification using Limited Ground Truth
Patrick Willis, *U.S. Department of Agriculture, National Agricultural Statistics Service*

Rick Muller and Zhengwei Yang

To Spatially Smooth or Not, Developing Rules to Clean a Thematic Layer
Robert Seffrin, *U.S. Department of Agriculture, National Agricultural Statistics Service*

Spatial Accuracy Assessment of Digital Elevation Models: A Probabilistic Approach
Andre Jalobeanu, *Centro de Geofisica de Evora,* Portugal

Special Session — Remote Sensing of LAI at the Scale of Forest Management: New Approaches
(Sponsored by the Remote Sensing Applications Division)
Moderator: Randolph Wynne, *Virginia Tech*

This session will focus on the remote sensing of leaf area index with both passive and active sensors including Landsat and lidar. Talks will cover the current and future applications of these technologies for forest management at both the stand and sub-stand level.

Lidar-hyperspectral Analysis to Examine Leaf Area Index, Clumping, and Canopy Biochemistry in a Boreal Mixed-wood Environment
V. Thomas, *Virginia Tech*

T. Noland, J.H. McCaughey and P. Treitz

Improving Pine Plantation Silviculture using Lidar-derived Estimates of Leaf-area
Alicia Peduzzi, *Virginia Tech*

Randolph H. Wynne, Valerie A. Thoma,s and Thomas R. Fox

Mapping Temperate Forest Leaf-area using BioSAR
Randolph H. Wynne, *Virginia Tech*

Steven B. Shaffer, Thomas Carson, Alicia Peduzzi, Asim Banskota, and Valerie A. Thomas

Feature Extraction/Urban
Moderator: Hongwei Zhu, *University of Wisconsin-Madison*

Multi-temporal, Semi-automated Impervious Surface Mapping Utilizing IKONOS High-resolution Satellite Image Data
Chad Cerar, *GeoEye*

Robert Black

Object Detection from HS/MS and Multi-Platform Remote Sensing Images by Integrating Biologically and Geometrically Inspired Approaches
Bo Wu, *Mapping and GIS Laboratory, CEEGS, The Ohio State University*

Lin Yan, Jiangye Yuan, Yuan Zhou, Ron Li, and Deliang Wang

An Object-based Approach for Classification of Impervious Surfaces from High Spatial Resolution Imagery
Hu Xuefei, *Indiana State University*

Weng Qihao

Development of Quality Assessment Methods of Features Extracted from Quickbird Imagery for Urban Planning Purposes
José Tenedório, *e-GEO, Centre of Geographical and Regional Planning Studies, Universidade Nova de Lisboa*, Portugal

Teresa Santos and Inês Boavida-Portugal

Higher Education K12 Workforce Development
Moderator: Brian D. Lee, *Kentucky Division of Geographic Information*

Small Unmanned Aerial Vehicles in Teaching Geospatial Disciplines
Eugene Levin, *Michigan Technological University*

Robert Liimakka

Remote Sensing Education for the Future
Christopher Cruz, *West Valley College*

National Geospatial-Intelligence College Overview
Major Jayson Putnam, *NGA College*

Building a 4-H Geospatial Program in New York
Susan Hoskins, *Cornell University*

Stephen Smith

Technical Sessions — Wednesday, March 11

High-Resolution

Moderator: Younian Wang, *ERDAS, Inc.*

Studies of Imaging Geometry for Optimal IKONOS Stereo Image Acquisition
Xutong Niu, *Geomatics Program, Department of Math, Physics, CS, and Geomatics, Troy University*
Ron Li

Study on Corner and Center for Image Registration
Xiong Zhen, *University of New Brunswick*, Canada
Zhang Yun

Control Network Based Interest Point Matching in Highly Woody Images
Xiong Zhen, *University of New Brunswick*, Canada
Zhang Yun

A Direct Approach for Finding Conjugate Points in Multi Resolution Satellite Images using Geometric and Radiometric Properties
Ahmed Elaksher, *Cairo University,* Egypt
Abdellatif Alharthy

ASPRS History I

Moderator: Ray Byrnes, *U.S. Geological Survey*

Computer-Aided Classification of the First Frame of Landsat-1 Data
Roger Hoffer, *Colorado State University*

Calibrating Film Cameras Then; and Digital Cameras Now
Don Light, *Rochester Institute of Technology and M7VI*
Fei Ma

Multispectral Image Classification using Neuro-Fuzzy Method in PCA Domain: 25 Years of Landsat 5
Sakreya Chitwong, *Faculty of Engineering King Mongkut's Institute of Technology Ladkrabang*
Nilas Pongchai and Cheevasuvit Fusak

Lidar I

Moderator: T. Edwin Chow, *University of Michigan - Flint*

PAMAP Quality Assurance Testing Lessons Learned
Chris Markel, *PAMAP Program*
Brian Bills

Automated Accuracy Assessment and Boresight Adjustment of Lidar using Generalized 3D Surfaces
Craig Glennie, *Terrapoint*
Jerry Dueitt and Kresimir Kusevic

Lidar System Calibration Based on Laser Footprint Coordinates from Overlapping Strips
Ayman F. Habib, *University of Calgary*, Canada
Ana Paula Kersting and Sung Woong Shin

Benefits of a Millimeter Vertical Precision to Improve the Positional Accuracy of Topographic Contours
Gary Merrill, *U. S. Geological Survey*

Special Session — Requirements for a National Lidar Dataset

(Sponsored by the ASPRS Remote Sensing Applications Division)
Moderator: Jason M. Stoker, *U.S. Geological Survey EROS Center*

The USGS is taking the lead in cooperation with many partners to design and implement a future high-resolution National Lidar Dataset. Initial work is focused on determining viability, developing requirements and specifications, establishing what types of information contained in a lidar signal are most important, and identifying key stakeholders and their respective roles.

Summary of the 2nd National Lidar Strategy Meeting
Jason Stoker, *U.S. Geological Survey*

USGS Lidar Working Group Developments
Gregory Snyder, *U.S. Geological Survey*

NASA High-altitude Developments
David Harding, *NASA*

National Lidar and Imagery for the Nation
Jay Parrish, *AASG, NSGIC*

LULC - Vegetation Mapping

Moderator: Ryan Jensen, *Brigham Young University*

Assessment of MLC and SVM Techniques for Land Cover Mapping in the Fort Cobb Reservoir Watershed, Oklahoma
Mahesh Rao, *Oklahoma State University*

A Quantitative Evaluation of Image Segmentation Quality
Honglei Zhu, *Clark Labs, Clark University*
Hao Chen

Ecological Systems Mapping for the California ReGAP project
Steven Lennartz, *The Sanborn Map Co.*

GIS Improved Object Based Classification For Land Use/cover Change Detection In A Human Altered Deciduous Forest Environment
Erick Sánchez-Flores, *Universidad Autónoma de Ciudad Juárez,* Mexico
Rolando Diaz-Caravantes and Alfredo Granados-Olivas

SAR

Moderator: Alexa McKerrow, *North Carolina State University*

Application of Interferometric SAR for Crop Identification and Mapping
Steven Shaffer, *Fugro EarthData Incorporated*
Chad Lopez

The Exploitation of P-band Interferometric Synthetic Aperture Radar (IFSAR) for the Production of Bare Earth Digital Terrain Models and Elevation Contours
Thomas Carson, *Fugro EarthData Incorporated*

Analysis of Land Cover Types using a Modified Scattering-model-based Speckle Filter and ALOS PALSAR Data
Yong Wang, *East Carolina University*
Mingsheng Liao, Changcheng Wang, and Lin Liu

Combining Mutual Information and Scale Invariant Feature Transform for Fast and Robust Multisensor SAR Image Registration
Sahil Suri, *German Aerospace Center (DLR), Remote Sensing Technology Institute (IMF)*, Germany
Peter Schwind and Peter Reinartz

Special Session — Remote Sensing Satellite Platform Characterization: Panel Discussion

(Sponsored by the ASPRS Primary data Acquisition Committee)
Moderator: Robert Eadie, *IntrSearch, Inc.*

This session will focus on the current and future US government requirements for commercial panchromatic and multispectral satellite remote sensing data. The platform characterization of a variety of commercial U.S. satellite platforms, such as QuickBird, WorldView, Ikonos, GeoEye, as well as the Landsat "Data Gap" platforms will be discussed.

Panelists:
Mike Lawless, *Digital Globe*
Erol Morey, *GeoEye*
Jennifer Sabers Willems, *U.S. Geological Survey/EROS*

Technical Sessions

3:30 pm to 5:00 pm

Special Session — Monitoring, Mapping, and Estimating the Bioenergy Domain

(Sponsored by the ASPRS Remote Sensing Applications Division)
Moderator: Rick Mueller, *U.S. Department of Agriculture/NASS*

This session will discuss ongoing agricultural monitoring, mapping and estimating efforts relating to the growing bioenergy industry using GIS and satellite techniques.

Estimating Cropland Management and Biomass Feedstock Availability: Integrating Satellite Remote Sensing with Socio-economic Modeling
Tris West, *Oak Ridge National Lab*

Characterizing Cropland Change using MODIS-NDVI Data in the Great Lakes Basin, USA
Yang Shao, *U.S. Environmental Protection Agency*

Biofuel Feedstock Mapping: Integrating MODIS and AWIFS Data for Operational Crop Type Monitoring
Matt Hansen, *SDSU*

Monitoring the Spatial Extent of Bioenergy Crops and Estimating Acreage with AWIFS Imagery
Rick Mueller, *U.S. Department of Agriculture/NASS*

Feature Extraction II

Moderator: Zachary Bortolot, *James Madison University*

A Methodology for Evaluating Automated Registration Algorithms
Peter Doucette, *Contractor for National Geospatial-Intelligence Agency*
Christopher Kavanagh, Stephen Barton, and Derek Lewis

Automatic Generation of Seamlines in Orthophoto Production
Yandong Wang, *Pictometry International Corp.*

Hierarchical Image Feature Extraction by an Irregular Pyramid of Polygonal Partitions
Alexei N. Skurikhin, *Los Alamos National Laboratory*

Automatic Quality Control of Topographic GIS Data from Images
Christian Heipke, *Institute for Photogrammetry and GeoInformation, Leibniz University Hannover*, Germany

ASPRS History II

Moderator: Roger Hoffer, *Colorado State University*

Development of Computer-aided Analysis Techniques — The Early Years
Roger Hoffer, *Colorado State University*

The Birth of Production Photogrammetry at TVA
Alan Voss, *Tennessee Valley Authority* – Retired
Major McCollough and Roy Teal

Comparison of Analog vs. Digital Mapping Camera Products
Acharya Bishwa, *Earth Mapping International*
Jeffrey Fagerman, Tilak Shrestha, and Arvind Chaturvedi

Geospatial Archiving: Missouri River Historical Digital Image Archive 1860-1999
N. Scott Bowman, *Wilson & Company*
Scott Perkins

Technical Sessions — Wednesday, March 11

Lidar II

Moderator: Jared Stukey, *Texas A&M University*

An Analysis of Lidar-derived Versus Photogrammetrically-derived Contours

Qassim Abdullah, *Fugro EarthData, Inc.*

Tian Wang, Dave Chavez, Radha Kandukuri, and Nora Csanyi May

Mitigating the Impact of the Laser Footprint Size on Airborne Lidar Data Accuracy

R. Valerie Ussyshkin, *Optech Incorporated*

Michael Ilniki, Rachana Ravi, and Martin Pokorny

High Density Lidar Data Collection with a Fixed-Wing Aircraft: Challenges and Solutions

Nora Csanyi May, *Fugro EarthData, Inc.*

Tian Wang, Lawrence Scott and Deborah Simerlink

Object-oriented Feature Extraction based on Lidar Point Segmentation

Jie Chang, *University of Texas at Dallas*

Fang Qui

Marine

Moderator: Wenxia Tan, *University of Waterloo*, Canada

Integrating Data from NASA Missions into NOAA"s Pacific Region Integrated Climatology Information Products (PRICIP)

Lisa Benham, *San Jose State University*

W.Kyle Chester, Art Eisberg, Supriya Iyer, Krista Lee, John Marra, Cindy Schmidt, and Joseph Skiles

Extraction of Tidal Creek Networks from Landsat TM Images

Yuanming Shu, D*epartment of Geography & Environmental Management, University of Waterloo,* Canada

Jonathan Li and Yongxue Liu

Comparative Evaluation of Airborne Laser Altimetry Versus Ship-based Multibeam SoNAR for Mapping Coral Reef Ecosystems

Bryan Costa, *National Oceanic & Atmospheric Administration*

Timothy Battista and Simon Pittman

High Performance Computing Support for Chesapeake Bay Model

Jibo Xie, *Joint Center for Intelligent Spatial Computing (CISC), College of Science, George Mason University*

Chaowei Yang

Special Session — Digital Camera Technologies and Applications: Panel Discussion

(Sponsored by the ASPRS Primary Data Acquisition Committee)

Moderator: George Lee, *U.S. Geological Survey*

Aerial Imaging is in a period of rapid growth and change with new technologies, new customers, and new missions. This is a select panel of digital camera owners and operators from across North America who will talk about the highlights and some pitfalls of new airborne digital mapping cameras. Digital airborne sensors have matured over the last few years and have gaining acceptance by the mapping community. This is evidenced by the increase in sales of new sensors, the purchase of multiple sensors by data providers, the introduction of enhanced models by the initial manufacturers of sensors, and the new manufacturers introducing new sensors into the marketplace. However, the use of these new sensors has been for traditional photogrammetric work and the traditional photogrammetric products produced from imagery. Just as there have been many applications that use analog aerial photography, there are as many applications for digital imagery. There are clearly advantages to digital imagery captured directly with today's digital technology, but all the advantages of digital imagery have not been fully exploited.

The panel includes representatives from sensor manufacturers, data providers, academia, and end-users who offer their insight in this aspect of digital sensors applications today and in the future.

Panelists:

John Welter, *NWG*
Layton Hobbs, *Woolpert, Inc*
Michael Ritchie, *Photo Science, Inc.*
Anne Miglarese, *Fugro EarthData, Inc.*
Craig Molander, *Surdex Corporation*

Special Session — Career Planning Panel Discussion

(Organized by the ASPRS Student Advisory Council)

Moderator: Lisa Wedding, *University of Hawaii*

This session addresses career planning and professional development for graduate students from the perspective of a representative cross section of the ASPRS professional community. A panel of professionals from industry, consulting, as well as academic research and teaching positions will be represented. Students will be exposed to a wide range of views on professional development and the steps involved in preparing for both academic and non-academic positions. This session will provide students with a foundation to guide their career planning to focus on what particular job they hope to secure in the future.

Panelists:

Consulting: Kass Green, *Kass Green & Associates*
Academic: Marguerite Madden, *University of Georgia*
Industry: Mike Flynn, *M.J. Harden Associates*
Industry: Stewart Walker, *BAE Systems*

Operational Moderate Resolution Satellites/Data Processing

Moderator: Yu Li, *University of Waterloo*, Canada

A Comparison Between AVHRR, MODIS, and VIIRS
Paula Smit, *Raytheon IIS*
Kerry Grant and Mike Mussetto

Error Assessment of Atmospheric Correction
Todd Ansty, *Cornell University*
William Philpot

CORONA Atlas of the Near East
Jackson Cothren, *Center for Advanced Spatial Technologies*
Jesse Casana, Adam Barnes and Tuna Kalacyi

Utility of the IRS-AWIFS Data to Map the Potential Italian Locust (Calliptamus Italicus L.) Habitats in Northeast Kazakhstan
Ramesh Sivanpillai, *University of Wyoming, WyGISC*
Alexandre Latchininsky, Ralf Peveling and Vladimir Pankov

Transportation - GIS Modeling and Analysis

Moderator: Rodrigo Nobrega, *GeoResources Institute - Mississippi State University*

A Transportation Corridor Case Study for Multi-Criteria Decision Analysis
Charles O'Hara, *GeoResearch Institute, Mississippi State University*
Rodrigo Nobrega and Jeremiah Dumas

Integration RTK-GPS and Video Flow for Travel Time Measurement
Guoqing Zhou, *Old Dominion University*
M. Abbas

Evaluation of Environmental Impacted Features from Traditional Approaches Versus Remote Sensing and GIS Based Approaches for EIA Study on Transportation Planning
Rodrigo Nobrega, *GeoResources Institute - Mississippi State University*
Charles O'Hara, Raviraj Sadasivuni and Jeremiah Dumas

Optimal Haulage Routing of Waste Dump Trucks in Large Open Pit Mines using GIS
Yosoon Choi, *Department of Energy Systems Engineering,* South Korea
Hyeong-Dong Park

Unmanned Aerial Vehicles I

Moderator: Babak Ameri, *GEOSYS Technology Solutions Ltd.*

Photogrammetric Processing of Low-altitude UAV Imagery
Chunsun Zhang, *South Dakota State University*

An Alternative Cost Function to Bundle Adjustment used for Aerial Photography from UAVs
Dale Schinstock, *Kansas State University*
Craig Buckley and Chris Lewis

Development of an Autonomous Unmanned Helicopter Based Road Condition Assessment System
Chunsun Zhang, *South Dakota State University*

Rangeland Remote Sensing Applications with Unmanned Aerial Systems (UAS) in the National Airspace: Challenges and Experiences
Andrea Laliberte, *U.S. Department of Agriculture, Agricultural Research Service, Jornada Experimental Range, New Mexico State University*
Albert Rango, Craig Winters, Connie Maxwell, and Amalia Slaughter

Vegetation Mapping I

Moderator: Yong Wang, *East Carolina University*

The Importance of Bi-directional Variations in Spectral Reflectance Values
Colin Brooks, *Michigan Tech Research Institute*
Richard Powell, Charles Olson, Jr. and Colin Brooks

The Kansas Next-generation Land Use/Land Cover Mapping Initiative
Dana Peterson, *Kansas Applied Remote Sensing Program of the Kansas Biological Survey*
J. Whistler, E. Martinko, S. Egbert, J. Lomas, K. Dobbs, and M. Jakubauskas

Geographic Characterization of Black Cohosh Habitat in Western Maryland
Matthew Ramspott, *Department of Geography, Frostburg State University*
Francis Precht

Influence of Input Variables on Predictions of Vegetation Pattern from Decision Tree Models
Alexa McKerrow, *North Carolina State University*
Thomas Wentworth and Heather Cheshire

Exhibitors Reception

5:30 pm to 7:00 pm

Always a highlight of the Annual ASPRS Conferences is the Exhibitors' Reception and the 2009 Conference will continue this tradition. This is a great opportunity to view the latest products and services offered by both national and international suppliers who are your hosts for the evening. Light hors d'oeuvers and beverages will be served for your enjoyment while you mingle with old and new friends.

General Session — Thursday, March 12

General Session
8:00 am to 9:00 am

ASPRS: Mapping, Monitoring, and Preparing for Change
Bradley Doorn, PhD, *U.S. Department of Agriculture Foreign Agricultural Service*

The world is rife with change that is impacting the land that sustains us. While the causes of change to our land are many and much debated, it is clear that the need to measure land changes must be met by leading edge science and a pragmatic and experienced professional community. ASPRS members embody the expertise and professionalism to measure change with integrity. ASPRS sustaining members drive the innovation and efficiencies to integrate this expertise into business and government needs that require the knowledge of change. Dr. Doorn's message will discuss how ASPRS can and should lead the mapping, measuring, and preparation efforts to meet the challenges the change for the future ahead.

Bradley D. Doorn directs the Remote Sensing Program applied to global agriculture monitoring and leads the U.S. Department of Agriculture (USDA) Satellite Imagery Archive (SIA) at the Foreign Agricultural Service (FAS). The FAS is the focal point within the U.S. Government for assessing the global crop production and crop conditions that affect world food security and trade. The USDA SIA exploits USDA's extensive use of satellite information by providing centralized contracting and distribution for multiple USDA agencies to reduce cost and expand use. As a result, Dr. Doorn is the manager of the nation's largest, commercial Fed-Civ satellite imagery contract and budget for operational programs.

Besides establishing the USDA SIA, Doorn has worked extensively with universities, NASA, USGS, NOAA, USAID, and other government agencies to improve operational access to existing satellite information. One example of such collaborations, the Global Agriculture Monitoring (GLAM) partnership program, was established to facilitate technology transfer of satellite data into an operational information flow for decision-makers. Access to satellite imagery and other related information was standardized through web and GIS interfaces for better internal and public use.

Doorn served over nine years on active duty as a U.S. Army Corps of Engineers Topographic Officer, including Company Commander of the 175th Topographic Company in direct support of the XVIII Airborne Corps and Fort Bragg, NC facilities. He also spent five years in private industry as a manager and specialist in remote sensing, GIS, and mapping for numerous engineering and environmental projects.

Doorn has been a member of ASPRS since 1986, served as President and Board member for the Potomac Region from 2001-2005, Steering committee member of Pecora 16 and Baltimore 2005 conferences, technical committee member of PECORA 15/Land Satellite Information IV, and presented on numerous occasions at ASPRS conferences.

The National Geospatial Advisory Committee the First Year and "Unofficial" Observations from the Chair
Anne Miglarese, *Booze Allen Hamilton*

Anne Miglarese is a Principal with Booz Allen Hamilton, a technology and consulting firm in Mclean, Virginia. Miglarese is focused on growing Booz Allen's geospatial solutions and services business in the Defense, Security and Federal Civil markets. She is also delivering services to Federal customers in the geospatial data, strategy and policy arena. Prior to joining Booz Allen, Miglarese was president and CEO of EarthData International (now known as Fugro EarthData) an airborne mapping, remote sensing, and geographic information system (GIS) services Company that operates throughout the United States as well as internationally.

Prior to joining Fugro EarthData, Miglarese served as chief of the Coastal Information Services branch of the National Oceanic and Atmospheric Administration's Coastal Services Center, where she directed the remote sensing and GIS programs of the organization for 10 years. She began her career in the private sector as an environmental consultant specializing in regulatory compliance for the Clean Water and National Environmental Policy Acts. Throughout her career, Miglarese has worked for numerous state agencies including the South Carolina Department of Health and Environmental Control, the Water Resources Commission, and the Department of Natural Resources.

Active in national policy governing spatial data, Miglarese is chairman of the National Geospatial Advisory Committee and presently on the Board of Directors of the Management Association of Private Photogrammetrist and Surveyors (MAPPS) and TerraGo Technologies. Further, she is on the Editorial Board of Imaging Notes, GeoSpatial Solutions and GIS World. She was a past Chairwoman of the Federal Geographic Data Committee's Marine and Coastal Spatial Data Subcommittee. She was a founding member of the National States Geographic Information Council, a past chairwoman of the South Carolina State Mapping Advisory Committee, and a previous board member of the Urban and Regional Information Systems Association.

Miglarese has a BS and MS in geography from the University of South Carolina.

ASPRS Awards

Several prestigious ASPRS awards will be given.

Technical Sessions — Thursday, March 12

Technical Sessions
9:15 am to 10:45 am

Feature Extraction III
Moderator: Robert Black, *GeoEye*

Image Feature Extraction with Curve Evolution and Filtering-based Methods
Jie Shan, *Purdue University*
Yonghak Song

Spatial Principle Components Analysis: An Efficient Algorithm for Choosing Eigenvectors Based on Spatial Connectivity for Constructing Spatial Filters
Melissa Rura, *UT Dallas*

A Comparison of the Normalized Distance Based Similarity Measures for Optimal Histogram Matching Based
Meihua Xu, *U.S. Department of Agriculture/NASS/RDD*
Feng Ran and Xuemei Zou

Contrast Enhancement for Minimum Mean Brightness Error from Histogram Partitioning
Nattapong Phanthuna, *Digital Image Processing,Faculty of Engineering, King Mongkut's Institute of Technology Ladkrabang,* Thailand
Fusak Cheevasuvit and Sakreya Chitwong

GIS Modeling and Analysis
Moderator: Karishma Busgeeth, *CSIR*

Using Upward Openness for Viewshed Prediction
Peter Guth, Department of Oceanography, *U.S. Naval Academy*
Adrien Nantet and Aymeric Schaeffer

Crop Rotational Analysis in Illinois, Iowa and Nebraska Derived using TM and AWIFS Satellite Data
Claire Boryan, *U.S. Department of Agriculture/NASS*

iCampus: 3D modeling of York University Campus
Costas Armenakis, *GeoICT Lab, York University,* Canada
Gunho Sohn

Flood Early Warning with Integration of Rain Rate Estimation, Hydrological Simulation Models and GIS - Case Study: Madarsoo Basin, Iran
Hamid Azari, Iran
Aliakbar Matkan and Alireza Shakiba

High-Resolution/Hyperspectral – Space - Forestry
Moderator: Qassim Abdullah, *Fugro EarthData, Inc.*

Object-Based Urban Environment Mapping with High Spatial Resolution IKONOS Imagery
Ruiliang Pu, *University of South Florida*
Shawn Landry and Qian Yu

Considerations on Spectral Band Reduction for Hyperspectral Imagery Classification
Stefan Robila, *Montclair State University*

Automation of Rover Localization Process with Integrated Orbital and Ground Bundle-adjustment Network
Ju Won Hwangbo, *Mapping and GIS Laboratory, CEEGS, The Ohio State University*
Kaichang Di and Rongxing Li

Individual Tree Crown Segmentation in High-resolution Satellite Imagery
Sora Kim, *Department of Environmental Science and Ecological Engineering,* South Korea
Woo-Kyun Lee

Special Session — Airborne Lidar Mapping Technology: Panel Discussion
(Sponsored by the ASPRS Primary Data Acquisition Division)
Moderator: Robert Eadie, *IntraSearch, Inc*

The purpose of this panel discussion is to have industry experts present ASPRS mapping professionals with the latest information on lidar sensor technology and Digital Elevation Model (DEM) data production work flow. By attending this session, an ASPRS mapping professional will learn about this state-of-the-art elevation mapping technology and be able to better understand the critical factors in digital elevation data acquisition and production for various mapping applications.

Panelists:
Don Carswell, *Optech, Inc.*
Roman Kathofer, *TopoSys GmbH*
Ron Roth, *Leica GeoSystems GIS & Mapping*
Mike Watry, *QCohrent Software, LLC*
Rebecca Holman, *Overwatch Geospatial*

Technical Sessions — Thursday, March 12

Special Session — Entering A New Landsat Era? The Future is Now

(Sponsored by the ASPRS Remote Sensing Application Division)

Moderators: Bruce Quirk, *U.S. Geological Survey*
Tom Holm, *U.S. Geological Survey*

Landsat data have been acquired continuously over the global land surface since July 1972 creating an unprecedented comprehensive record of landscape dynamics. NASA and the U.S. Geological Survey are now developing the Landsat Data Continuity Mission, which will further extend the global land record. In addition, the USGS will soon be making the entire 36-year long Landsat archive available to anyone via the Internet at no cost. The opening of the Landsat archive and the continuation of the Landsat record is a revolution that will affect the future of moderate resolution Earth observations. The session will explore the scientific advances possible in understanding global land changes, the opportunities for significant new innovations associated with free access to millions of Landsat images, and the scientific and technical challenges ahead for operational uses of Landsat data.

Presenters:
James Irons, *NASA*
Thomas Loveland, *U.S. Geological Survey*
Randolph Wynne, *Virginia Polytechnic Institute*
Sam Goward, *University of Maryland*

Close Range Photogrammetry

Moderator: Chris Markel, *PAMAP Program*

A New Approach for Vanishing Line Estimation
Po-Lun Lai, *Ohio State University*
Alper Yilmaz

A Photogrammetric System for 3D Reconstruction of a Scoliotic Torso
Ivan Detchev, *University of Calgary*, Canada
Ayman Habib

3D Modeling of Faculty Building in Google Earth
Dursun Zafer Seker, *Istanbul Technical University*, Turkey

A Novel Parametric Retro-Reflective Target Detector
Gustavo Olague, Mexico
Eddie Clemente

Standards

Moderator: Bishwa Acharya, *Earth Mapping International*

Discovery, Integration, 3D Visualization and Analysis of Geospatial Data using NASA World Wind
Nadine Alameh, *MobiLaps LLC/NASA Ames Research Center*
Patrick Hogan

Rigorous Calculation of HRE Accuracy Estimates
Henry Theiss, *Integrity Applications Incorporated*
Craig Rodarmel, Mark Lee, and John Gilbert

Universal LIDAR Error Model
Henry Theiss, *Integrity Applications Incorporated*
John Gilbert and Craig Rodarmel

Records Management Best Practices: Archiving Done Right
John Faundeen, *U.S. Geological Survey*

Unmanned Aerial Vehicles II

Moderator: Ken Fugate, *Federal Aviation Administration*

Multiple-image Matching of Low-altitude UAV Acquired Imagery
Chunsun Zhang, *South Dakota State University*

Unmanned Aircraft Operations in the National Airspace System
Ken Fugate, *Federal Aviation Administration*

UAV Applications: Disaster & Emergency Management
Babak Ameri, *GEOSYS Technology Solutions Ltd.,* Canada

Detecting and Counting Vehicles from Small Low-Cost UAV Images
Penggen Cheng, *East China Institute of Technology,* China
Guoqing Zhou

Special Session — The National Park Service Vegetation Inventory (NPSVI): Overview and Lessons Learned from a National Perspective I

Moderator: Karl Brown, *National Park Service*

The National Park Service Vegetation Inventory (NPSVI) (formerly the NPS Vegetation Mapping Program) classifies, describes, maps vegetation communities of over 270 national park units throughout the United States. The purpose of this Inventory is to provide park managers with critical information on resources that is needed to conserve biodiversity, respond to disturbances such as exotic species invasions and understand processes such as wildlife habitat relationships and wildland fires (NPS 2008). The NPSVI follows well-established procedures for the production of high-quality and standardized maps and associated data sets of vegetation and land cover within parks. The inventory is somewhat unique in that it uses extensive field sampling and ecological analysis to create a priori vegetation classifications. These are the basis for remotely sensed image analysis that map vegetation communities using the framework of the National Vegetation Classification Standard (NVC), a system that integrates major scientific efforts in the taxonomic classification of vegetation communities and is a Federal Geographic Data Committee (FGDC) standard. Currently, approximately 40 NPS park units have completed vegetation mapping inventories, another 35 parks are scheduled for completion in 2008 and 167 park inventories are in progress. At this point in the NPSVI, is a body of knowledge and expertise has been gained by program and park managers, field botanists, researchers and mapping teams alike. Presentations will provide an overview of the NPSVI from a national perspective, differences in the NVC in the eastern and western United States and ramifications for the

transition of vegetation classification in North America from an academic to an applied science, accuracy assessment of completed NPSVI products, and challenges and opportunities created by the 2008 revisions to the NVC structure and process.

Overview of the NPSVI from the Vegetation Mapping Program Manager's National Perspective
Karl Brown, *National Park Service*

Lessons Learned about Ecology and Mapping using the National Vegetation Classification System (NVC): Differences in East and West
Chris Lea, *National Park Service*

Old Problems and New Directions for Accuracy Assessments in the NPSVI
Chris Lea, *National Park Service*

Implementing the Revised U.S. National Vegetation Classification Standard – New Arections for Classification and Mapping
Don Faber-Langendoen, *NatureServe*
Pat Comer, Marion Reid, Shannon Menard, and Kathy Goodin

Wetland Aquatic

Moderator: Jonathan Li, *University of Waterloo*, Canada

Aquatic Remote Sensing Applications for the Lakes in the North Slope of Alaska
Liza Jenkins, *Michigan Tech Research Institute*
Guy Meadows, Chuck Hatt, and John Payne

Extracting Ecologically Relevant Geomorphic Metrics from Bathymetric Lidar Data
Lisa Wedding, *University of Hawaii*
Alan Friedlander and Qi Chen

An Enhanced Wetlands Classification using Object-oriented Classification Methodology: An Example from the Northwest Territories, Canada
Chad Delany, *Ducks Unlimited, Inc.*
Kevin Smith, Alain Richard, and Dan Fehringer

An Integrated Field and Geospatial Approach to Assess the Relationships between Geomorphic and Human Impact Parameters at Multiple Spatial Scales and Biotic Integrity of Connecticut Streams
Krystal Kliger, *University of Connecticut, AMEC Earth and Environmental*
Dan Civco

Special Session — Education and Workforce Development Session

(Sponsored by the ASPRS Education and Workforce Development Committee)
Moderator: Catherine M. Lockwood, *Chadron State College*

This session includes papers that focus on STEM initiatives and pedagogies in remote sensing curriculum, efforts and opportunities for collaboration and networking to help two-year college programs develop a highly skilled geospatial workforce, and iGETT, a national geospatial integrated technology program. Together these presentations integrate and emphasize science literary, curriculum, and transiting to a professional workforce.

The GeoTech Center: Helping Support Two Year College Geospatial Programs.
Ann Johnson, *ESRI*

Integrating Research Based Pedagogies of Engagement in Remote Sensing Curricula
J.B. Sharma, *Institute of Environmental Spatial Analysis, Gainesville State College*

Integrated Geospatial Education and Technology Training (iGETT)
Jeannette E. Allen, *NASA Goddard Space Flight Center*

Remote Sensing Education for the Future
Christopher Cruz

Poster Session

10:00 am to 5:00 pm

Poster presenters will be available at their posters for discussion from 11:00 am to 12 noon.

Technical Sessions — Thursday, March 12

Commercial Instrument and Software Sessions
11:00 am to 12 noon

Feature Extraction IV
Moderator: Brian Kloer, *ERDAS Inc.*

Automatic Road Extraction with ERDAS IMAGINE Objective
Brian Kloer, *ERDAS Inc.*
Xiangyun Hu

SFP - A New Pixel Classifier
Brian Kloer, *ERDAS Inc.*

Automated Road Tracker
Peter Doucette, Contractor for *National Geospatial-Intelligence Agency*
Jacek Grodecki, Richard Clelland, Seth Malitz, Josh Nolting, and Matthew Tang

Classification Based Recursive Object Merging and Splitting
Brian Kloer, *ERDAS Inc.*
John Woehler

Airborne/Spaceborne Sensors and Applications
Moderator: R. Valerie Ussyshkin, *Optech Incorporated*, Canada

UltraCamXp, the New Digital Aerial Camera System by Vexcel Imaging / Microsoft
Michael Gruber, *Vexcel Imaging GmbH* and *Microsoft*
Alexander Wiechert

Developments in Integrated Airborne GPS and INS Post-Processing
Thomas Loecherbach, *HJW GeoSpatial*
Sara Reed, Michael Uges, and Andy Wisner

Airborne Lidar: Improving Geo-Positioning Data Quality
R. Valerie Ussyshkin, *Optech Incorporated*
Mariusz Boba and Michael Sitar

Airborne Infrared Hyperspectral Mapping using Fourier-transform Spectrometer Technology
Vincent Farley, *Telops*
Martin Chamberland, J-P Gagnon, Philippe Lagueux, Yan Montembeault, Simon Savary, and André Villemaire

High Resolution Sensors and Applications I
Moderator: Qassim Abdullah, *Fugro EarthData, Inc.*

High Resolution, High Fidelity Digital Imagery with a Pushbroom Sensor: Is it Possible?
Qassim Abdullah, *Fugro EarthData, Inc.*
Deborah Simerlink, Suzee Parsons, and Jim Bergan

Automatic DEM Extraction of High-resolution Data with and without Ground Controls
Philip Cheng, *PCI Geomatics*

Orthorectification of High-resolution Data with and without Ground Controls
Philip Cheng, *PCI Geomatics*

High Resolution Sensors and Applications II
Moderator: Philip Cheng, *PCI Geomatics*, Canada

Analyzing Effects of JPEG2000 Compression on Land Feature Identification Applications using High-resolution Satellite Imagery
Glenn Reese, *DigitalGlobe, Inc*

On-Orbit Geolocation Accuracy and Image Quality Performance of the GeoEye-1 High-resolution Imaging Satellite
Kevin Kohm and David Mulawa, *GeoEye*

The ARCA of Iris A New Modular & Scalable Aerial Imaging Sensor Architecture
J. Armando Guevara, *M7 Visual Intelligence*

Feature Extraction V
Moderator: Byron Smiley, *DigitalGlobe*

Edge Matching for Automatic 3D Urban Surface Reconstruction from High-resolution Images
Younian Wang, *ERDAS, Inc.*
Neil Woodhouse and Fengliang Xu

A Sustainable Constellation: New Satellites Enhance the Disaster Monitoring Constellation (DMC) Global Daily Imaging Service
Paul Stephens, *DMC International Imaging Ltd,* England

The Absolute and Relative Geolocation Accuracies of QB02 and WV01
Byron Smiley, *DigitalGlobe*

Optimizing QC-QA Process of a County Wide Orthophoto Production
BIshwa Acharya, *Earth Mapping International/Pickens County, SC*
James Threatt

Memorial Address — Thursday, March 12

Memorial Address

12:15 pm to 1:30 pm

This year's Memorial Address will feature the life and achievements of Rupert Barron Southard, presented by Roy Mullen.

The Memorial Address Series affords attendees an opportunity to hear about the great accomplishments of industry pioneers and learn how they continue to impact our profession.

Honoree

Rupert Barron Southard, known by everyone as 'Rupe', was a native of Vermont, born in 1923 in St. Johnsbury. He completed his education, through high school, in St. Johnsbury where he attended the St. Johnsbury Academy. He then attended the University of Rochester in New York and was enrolled in the R.O.T.C. program there. He joined the U.S. Marine Corps to fulfill his R.O.T.C. requirement and after boot camp at Parris Island, South Carolina he went to Officer Training School and was commissioned a Second Lieutenant in the Marines. He was part of the Occupational Police Force in Japan after hostilities ceased in 1945.

Rupe returned to the pursuit of education, from1946 to 1948, attending Syracuse University from which he was graduated with a degree in Civil Engineering. He was then employed by the U.S. Department of the Interiors' Geological Survey, where he began his career in surveying and mapping. He spent several years in the field, performing plane table surveys as well as transit traverse and leveling. From there he was assigned to the Survey's headquarters, where he held various positions of increasing responsibility, culminating in his being selected as the Chief of the then Topographic Division, later the National Mapping Division. His first position at Headquarters was as Assistant Branch Chief for Research and Design where he served with Russell K. Bean. Southard then held various positions in the Office of Plans and Production, was the Chief of the Branch of International Activities where he was very effective in managing the programs that the U.S. Government supported in Antarctica. His efforts there were recognized by having Mount Southard, in Antarctica, named in his honor. Also, the British Antarctica Survey, in an unprecedented action, also named a geographic feature for him, the Southard Promontory. As the Chief of the National Mapping Division, he was responsible for the nation's civilian mapping activities from 1980 until his retirement in 1985.

Southard's many accomplishments have been recognized by numerous awards. He received the Department of the Interior Meritorious and Distinguished Service Awards. He served on several national and international committees and commissions, notably the Pan American Institute of Geography and History, where he chaired the Committee on Cartography. He was the U.S. representative on the United Nations Committee on Cartography for Africa, for the Americas, and for Southeast Asia.

Southard was married to Jean Scott, also of St. Johnsbury, Vermont and they had six children – John, Kathleen, Timothy, Matthew, Ann and Joseph. Southard died on September 23, 1999 in Fairfax, Virginia where the family resided.

Presenter

Roy Mullen is a native of New Jersey. After four years of service in the U.S. Marine Corps from 1942 to 1946 he returned to college and graduated from the American University in 1951. Upon graduation he joined the U.S. Geological Survey, beginning 43 years working for the federal government. He served in the Atlantic Region office, working in all phases of map production, both in photogrammetry and field operations. He worked for six years in the Branch of Research and Design, Office of Research and Technical and served as Chief, Branch of Photogrammetry and the headquarters staff from 1969 to 1972. He then joined the executive level management team of the Topographic Division when he was selected as Pacific Region Engineer in Menlo Park, California. He was responsible for all mapping operations in the western U.S. and the Trust Territories of the Pacific. Mullen returned to Reston headquarters in 1976 to the position of Assistant Chief Topographic Engineer for Research and Technical Standards, where he led that activity during the transition from graphic map production to the digital map domain. In 1980 he was selected as Associate Chief of the National Mapping Division, sharing with the Division Chief full responsibility for the technical, scientific and administrative activities of the nation's civilian mapping operations.

Mullen received the Department of the Interior's Meritorious and Distinguished Service Awards. Mount Mullen, in Antarctica, was named in his honor, for his support to the United States programs there. Mullen is an Emeritus, Fellow, and Honorary Member of the ASPRS and has served the Society in many different capacities, the most recent as Technical Editor of the 5th Edition of the *Manual of Photogrammetry*.

Technical Sessions — Thursday, March 12

Technical Sessions
1:30 pm to 3:00 pm

Lidar III
Moderator: Michael Hodgson, *University of South Carolina*

Selection of Optimal Lidar Transects to Estimate Large Area Forest Vertical Structure using Quickbird and Geographic Object-based Image Analysis (GEOBIA)
Gang Chen, *Department of Geography, University of Calgary*, Canada
Geoffrey Hay

Lidar Data Segmentation for Building Extraction
Jie Shan, *Purdue University*
Jun Wang

An Object Oriented Algorithm for Obtaining Information About Fixed Areas
Zachary Bortolot, *James Madison University*

Complex Digital Building Model Generation Through the Integration of Photogrammetric and Lidar Data
Changjae Kim, *Department of Geomatics Engineering, University of Calgary*, Canada
Ayman Habib, Ruifang Zhai, Sung Woong Shin, Chang Rak Yoon, and Kyungok Kim

Accuracy-Error Assessment II
Moderator: Craig Glennie, *Terrapoint*

Rapid Field Verification: A New Method for Assessing the Accuracy of Land Cover Data in the Field
Marshall Worthey, *PBSJ*

The Fallacy of Normality in Remotely Sensed Data
Charles Olson, *Michigan Tech Research Institute*

Accuracy Assessment of Fuzzy Bases Land use Mapping of Singrauli Coalfield, Madhya Pradesh , India
Parmita Bose, *Jiwaji University*, India
S.N. Mohapatra

Statistical Methods to Determine the Applicable Size and Location of the Classification Reference Area
Lu Kang-Ming, Taiwan
Lin Hsien-Te and Sun Chen-Yi

Change Detection - Environmental/Forestry
Moderator: Christian Heipke, *Leibniz University, Hannover*, Germany

A Moving Threshold Window-based Calibration Model to Improve Binary Change Detection Performance
Jungho Im, *SUNY ESF*
Jinyoung Rhee and John Jensen

Linear Forest Disturbance Recognition and Mapping from High Spatial Resolution Multispectral Imagery
Yuhong He, *University of Saskatchewan*, Canada
Steven E. Franklin and Xulin Guo

Identification of Vegetation Changes by using Bi-Temporal SPOT5 Imageries
Jose A. Malpica, *Alcala University,* Spain
Maria C. Alonso

Deforestation Dynamics in Mato Grosso, Central-west Brazil using GIS and NOAA/ AVHRR data
Yoshikawa Sayaka, *Ritsumeikan Asia Pacific University,* Japan

Data Fusion
Moderator: Steven Lennartz, *The Sanborn Map Co.*

Comparison of Linear Regression, Brovey Transform and Cokriging for Restoration of Clouded Pixels in Remotely Sensed Imagery
Chuanrong Zhang, *University of Connecticut*
Weidong Li

Creating an Image Dataset to Meet Your Classification Needs: A Proof-of-Concept Study
James Hurd, *University of Connecticut*
Daniel Civco

Land Cover/Use Classification using Optical and Quad Polarization Radar Imagery
Arjun Sheoran, *George Mason University*
Barry Haack, Terry Idol, and Salim Sawaya

Fusion of Remote Sensing Images using Geostatistical Techniques
Youfang Liu, *University of Arizona*
Moe Momayez and Daoqin Tong

Feature Extraction VI
Moderator: James Lein, *Ohio University*

Optimized Feature Extraction and Correspondence for Orbiter Image Pairs
Vinayak Reddy Jakkula, *Kansas State University*
Chris Lewis

Design Considerations of Automated Linear Feature Extraction Engine for Production Environment
Raad Saleh, *Global Sensing Group*

Object Recognition using Angles in the Projective Plane
Gabor Barsai, *Gotmaps?, LLC*
Alper Yilmaz

A Multifractal Approach for Sun Glint in Medium Resolution Satellite Imagery
Bouali Marouan, *INRIA / CNES,* France
Hussein Yahia, Antonio Turiel, and Patrice Henry

High-Resolution/Urban

Moderator: Glenn Reese, *DigitalGlobe, Inc.*

Photogrammetric Processing of High-resolution Planetary Orbital Imagery for Topographic Mapping
Yunhang Chen, *The Ohio State University*
Kaichang Di and Ron Li

U.S. Army TEC"s BuckEye GeoPDF Mapbooks
Ray Caputo, *U.S. Army Topographic Engineering Center*

Rectification of High-resolution Satellite Images
Ahmed Elaksher, *Cairo University,* Egypt

Survey and Analysis of Land Satellite Remote Sensing Applied in Highway Transportations Infrastructure and System Engineering
Jingyu Wei, *Nanchang University,* China
Guoqing Zhou

Special Session — Appropriate Use of Academic Resources for Emergency Response

(Sponsored by the ASPRS Geographic Information Systems Division)
Moderator: Bruce A. Davis, *Department of Homeland Security*

State universities and colleges generally enjoy a close working relationship with the local governmental agencies near their campus. Many have working relationships with cities and counties across their state for the purposes of research or community outreach. Particularly in the area of geographic information academic institutions have made significant partnerships with state and local government agencies. This access to geographic information can be very useful to emergency response teams seeking to provide resources and services during response periods. During several recent catastrophic incidents, universities have stepped forward to assist city, state, and federal officials in the area of remote sensing, spatial analysis, database construction, and map production. The assistance provided was generally recruited on an ad hoc basis or volunteered at the moment to overcome challenges presented by the incident. While some states have developed formal policies to govern the participation of a particular academic institution, to date there is no standard policy for the use of academic resources for emergency response. This session will begin a discussion of the appropriate use of academic resources, colleges and universities, for emergency response support to local, state, and federal response agencies.

Panelists:
Michael Hodgson, Professor of Geography, *University of South Carolina*
Paul Hardwick, Project Manager, *Regional GIS and Homeland Security, San Diego, California*
Ron Langhelm, GIS Project Manager, *Booze Allen Hamilton*

Hyperspectral

Moderator: Ruiliang Pu, *University of South Florida*

Hyperspectral Remote Sensing of Soil Organic Matter Content and Quantitative Predictions by Multivariate Statistical Techniques
Penggeng Cheng, *Department of Geography & Environmental Management, University of Waterloo*, Canada
Jonathan Li and Jian Wu

Towards Integrated System Modelling using Remote Sensing and in Situ Inputs: Extraction of Robust Operational Spectral Parameters from Hyperspectral Data for Forest Macro - and Micro-nutrient Assessment
Jan van Aardt, *Rochester Institute of Technology*
Russell Main, Moses Cho, Mark Norris-Rogers, and Abel Ramoelo

Using Hyperspectral Imagery to Map the Distribution of Fraxinus Species and Emerald Ash Borer Host Trees in Michigan and Ohio, USA
Benoit Parmentier, *Clark University*
John Rogan and Michael Lindgren

A Classification-Based Assessment of Optimal Hyperspectral Bands for Mapping Great Lakes Coastal Wetlands
David Lusch, *RS & GIS, Michigan State University*
Brian Becker

Special Session — Mobile Lidar Mapping

(Sponsored by the ASPRS Photogrammetric Applications Division)
Moderator: Becky Morton, PAD Division ASPRS

The demand for high-resolution, accurate, 3D geospatial information is driving the growth of mobile lidar mapping. Moving vehicles equipped with lidar sensors, digital imaging sensors, and precision GPS equipment are able to produce detailed measurements for visualization, digital terrain models, GIS objects, etc. The technology is undergoing rapid advancement and users are putting the systems to the test on exciting applications. This session brings together experts in mobile lidar mapping from the varied perspectives of manufacturers, users, and researchers.

Technical Specifications of the Optech Lynx System
Brian D. Bailey, *Optech International, Inc.*

StreetMapper Mobile Mapping System and Applications in Urban Environments
Graham Hunter, *3D Laser Mapping Ltd,* UK

RealTime 3D Fusion of Imagery and Mobile Lidar in an Urban Environment — A Case Study of Mobile Lidar in Challenging Environments
Paul Mrstik, *Terrapoint Canada*, Canada

User Tests of the Optech Lynx with QC to Ground Survey
Clay Wygant, *WHPacific, Inc.*

Future Trends in Mobile Lidar Mapping
Charles K. Toth, *Center for Mapping, The Ohio State University*

Technical Sessions — Thursday, March 12

Special Session — Airborne Digital Mapping Camera Systems: Manufacturer's Perspective: Panel Discussion

(Sponsored by the ASPRS Primary Data Acquisition Division)

Moderator: Brian Huberty, *USFWS*

This is the 6th annual panel session hosting a selection of digital mapping camera manufacturers from around the world. Each representative will give a short presentation followed by a question and answer session with the audience. The goal is to provide a dynamic forum to address current systems and future developments in this important and rapidly evolving mapping technology. System vendors will highlight their specific technologies in order to meet the demand for aerial digital mapping images for specific markets.

Panelists:

Ruediger ("Ruedi") Wagner, *Leica Geosystems*
Gerald Albe, *Jenoptik*
Klaus Neumann, *Intergraph*
Eric Liberty, *Applanix*
Dave Fuhr, *Airborne Data Systems*
Julien Losseau, DiMAC

Special Session — The National Park Service Vegetation Inventory (NPSVI): Overview and Lessons Leaned from a National Perspective II

Moderator: Marguerite Madden, *Center for Remote Sensing and Mapping Science (CRMS), University of Georgia*

This Session will include presentations from mapping teams who have created vegetation databases for a number of national park units, assessed human impacts on park resources and linked cultural and natural resources. Attention will be given to methods used as well as new approaches that show promise for increasing the efficiency, utility and accuracy of creating and maintaining NPSVI data sets.

Vegetation Databases and Human Impacts in 21 National Parks of the Southeast: Tried and True Combined with New Approaches
Marguerite Madden, *Center for Remote Sensing and Mapping Science (CRMS), University of Georgia*
Thomas Jordan, *University of Georgia*

Integration of New Remote Sensing Technologies for the National Resources Inventory (NRI) of Grazing Lands : Sub-decimeter Resolution Aerial Photos and Unmanned Aircraft
Andrea Laliberte, *U.S. Department of Agriculture ARS Jornada Experimental Range*
Jeff Herrick and Margaret Gronemeyer

Linking Cultural Resource Databases through GIS
Cheryl Sams, *North Carolina State University*
William Slocumb and Hugh Devine

NPS Vegetation Inventory: Experience in the Waterton-Glacier International Peace Park
Jennifer Dieck, *U.S. Geological Survey*

Technical Sessions
3:30 pm to 5:00 pm

Change Detection

Moderator: Matthew Ramspott

Identifying Surface Coal Mined Lands in Virginia Using a Landsat Chronosequence from 1984 to 2008
Susmita Sen, *Virginia Tech*
C.E Zipper, R.H. Wynne, and P.E. Donovan

Linking Recent Environmental Issues and Their Driving Factors with Regional Climate Change in Arid and Semi-arid Environments: A Case Study in North-Western China
Abduwasit Ghulam, *Saint Louis University*
Timothy Kusky and Tashpolat Teyip

A Synthesized Approach to Urban Growth Analysis
Douglas Olcott, *Santa Clara County, CA*

Land Use Change Analysis in Uvurkhnagai Province, Mongolia
Tsolmon Renchin, *National University of Mongolia*, Mongolia
Tungalag Amar and Douglas Miller

Special Session — Yesterday, Today, and the Future for Data Management

(Sponsored by the ASPRS Standards Committee)

Moderator: Alan Stevens, *Federal Geographic Data Committee*

Our industry is centered on the collection, archive, distribution, and application of geospatial data and information. However, both efficiency and effectiveness are hampered unless we step up to common standards, practices, and interoperable solutions in our day to day work. This session will look into some experiences in the industry.

Records Management Best Practices: Archiving Done Right
Donald Fundeen, *EROS Data Center*

A look to the past for the future- The North American Profile
Sharon Shin, *FGDC*

Maps or Not? A New Insight to the Map Interface in the Open and Distributed Geospatial Web Service Environment
Jung-Hong Hong, *NCKU*, Taiwan

Feature Extraction VII

Moderator: Yinghai Ke, *SUNY College of Environmental Science and Forestry*

Automated Extraction of Drumlins from Digital Elevation Models Through Object-Oriented Classification
Kakoli Saha, *Kent Sate University*
Mandy Munro-Stasiuk

Terrestrial Laser Scanning to Support Precision Navigation
Charles Toth, *The Ohio State University*
Xiankun Wang, Hongxing Sun, and Dorota Grejner-Brzezinska

Toward the Refinement of the Urban Terrain Zone Classification System Based on Hyperspectral Phenomenology
James Lein, *Ohio University*

Improving the Automation of Extracting Road Networks from Lidar and Panchromatic/Multi-spectral Imagery
Wilson Harvey, *TerraSim, Inc.*
David McKeown

Wildlife, Fire

Moderator: Stephanie Hulina, *GDA Corp.*

Managing Loggerhead Shrike Habitat Using Remote Sensing
Xulin Guo, *University of Saskatchewan*, Canada
He Yuhong and John Wilmshurst

Deriving Forest Canopy Fuel Parameters from Airborne Lidar and Multispectral Data for Fire Dispersion Modeling
Muge Mutlu, *Texas A&M University*
Sorin Popescu

Study of Impacts of Urbanization Process on Phenology using Multisource Satellite Data
Qingxu Huang, *Department of Geography & Environmental Management, University of Waterloo*, Canada
Hong Xu Xi Yang and Peijun Shi

Effects of Scale on Fire Behavior Simulation using FARSITE
Kaiguang Zhao, *Texas A&M University*
Sorin Popescu and Muge Mutlu

Special Session — KML Applications in Remote Sensing and GIS

(Sponsored by the ASPRS Remote Sensing Applications Division)
Moderator: Rakesh Malhotra

From text to images to movies, it was only a matter of time before spatial information became mainline content on the internet. GIS technology has become commonplace in a myriad of research and application fields. From daily planning and analysis of short-term, dynamic phenomena such as wildfires to long-term visualization and data delivery for state agencies, geospatial technology is all around us. Unfortunately, the complexities of a GIS that make it so ideal for research and analysis can make its use in data delivery and visualization applications too cumbersome for the general public. Furthermore, the proliferation of spatial data on websites such as Yahoo Maps and Google Earth has given a strong impetus to application development. Sketchup and Keyhole Markup Language (KML) are just such tools that users can use to create applications for Earth browsers such as Google Earth and deliver a wide variety of data (geographic, static maps, tabular, etc) in an easily updated, data-rich, and easy to use system. This special session focuses on how these tools are being used to develop applications that blend remote sensing and GIS.

Using Sketup to Develop a 3-model for North Carolina Central University
Albert P. Barnett, *North Carolina Central University*

Data Visualization and Dissemination using Keyhole Markup Language (KML)
Justin Shedd, *North Carolina State University*
Damian Maddalena

Supplying MODIS Hotspot Data via KML Feeds
Shriram Ilavajhala, *University of Maryland*

Special Session — The Road to Launching the Landsat Data Continuity Mission

(Sponsored by the Remote Sensing Applications Division)
Moderator: Thomas M. Holm, *U.S. Geological Survey*

The Landsat Data Continuity Mission (LDCM) is a partnership between the National Aeronautics and Space Administration (NASA) and the U.S. Geological Survey (USGS). NASA is responsible for the development of the space segment, launch segment, and mission operations systems and is accountable for overall mission success. The USGS is responsible for the LDCM ground system including the data acquisition network, image processing and archive systems, and capabilities to distribute data products to users. The USGS has made significant progress on the development of the data acquisition network, image processing and archive systems, and the data distribution system.

The Road to Launching the Landsat Data Continuity Mission
James R. Irons, *NASA Goddard Space Flight Center*
William R. Ochs and Del T. Jenstrom

LDCM Space Segment Overview
Jeanine Murphy-Morris, *NASA Goddard Space Flight Center*
William Anselm

Landsat Data Continuity Mission Calibration and Validation
Brian Markham, *NASA Goddard Space Flight Center*
James Storey and Ron Morfitt

Operating the Landsat Data Continuity Mission: Data Collection, Archiving, and Distribution
Tom Loveland, *U.S. Geological Survey*

Generation of Standard Products from LDCM OLI Data
John Dwyer, *U.S. Geological Survey*
Tom Loveland

Technical Sessions — Thursday, March 12

Hydrology - Marine/Ocean

Moderator: Hongliang Fang, *NASA Goddard Earth Sciences Data and Information Services Center*

Modelling Current and Future Water use in Utah with NASA's Terrestrial Observation and Prediction System

Gong Zhang, *Utah State University*

Kate Lowry, Ramakrishna Nemani, Cindy Schmidt, and Joseph Skiles

Spatio-temporal Consistency Analysis of AMSR-E Soil Moisture Data using Wavelet-based Feature Extraction and One-class SVM

Turlapaty Anish, *Mississippi State University*

Valentine Anantharaj and Nicholas Younan

Fuzzy Logic Analysis of Flood Disaster Monitoring and Assessment of Damage in SE Anatolia Turkey

Huseyin Bayraktar, *Yildiz Technical University*, Turkey

Bulent Bayram

Lidar V

Moderator: Andre Jalobeanu, *Centro de Geofisica de Evora*, Portugal

Lidar-derived Digital Elevation Models (DEMs) and Uncertainty Analysis

Cha-chi Fan, *University of Illinois*

Guangxing Wang, George Gertner, Heidi Howard, and Alan B. Anderson

Quality Assurance of Lidar Systems - Mission Planning

Kutalmis Saylam, *GeoBC, British Columbia*, Canada

New Approach to Determine Absolute, 3D Lidar Data Accuracy using Spatially Oriented Lidar Targets

Harald Steiner, *Ministry of Agriculture and Lands, Geographic BC*, Canada

Precise Quality Control of Lidar Strips

Matthias Rentsch, *University of Applied Sciences – München*, Germany

Peter Krzystek

MODIS I

Moderator: Todd Ansty, *Cornell University*

eMODIS ALASKA

Calli B. Jenkerson, *ADNET Systems, Inc*

Gail L. Schmidt

Comparison of MODIS and Proxy-VIIRS Derived Evapotranspiration Estimates for Improved Agricultural Best Practices Assessment

Henrique Momm, *The University of Mississippi*

Greg Easson and Ron Binger

Comparability of MODIS Gross Primary Production Estimates and Plot-Level Forest Growth Rate using FIA Database Across the Eastern U.S.A.

Youngsang Kwon, *State University of New York, Buffalo*

Modelling Perennial and Annual Vegetation in the Mojave Desert using MODIS-EVI Data

Cynthia Wallace, *U.S. Geological Survey*

Kathryn Thomas and Robert Webb

Special Session — Panel Discussion - Academic Publishing

(Organized by the Student Advisory Council)

Moderator: Lisa Wedding, *University of Hawaii*

This session will provide graduate students and young professionals with an introduction to the peer review publication process. Details will be presented on the proper organization, preparation and submission of a manuscript. This session will also provide insight on how to choose an appropriate journal, draft a letter to the editor, and address reviewer comments. Students will learn what to expect during all steps of the publication process.

Panelists:

Russell Congalton – Editor in Chief, *PE&RS, University of New Hampshire*

Jie Shan, *Purdue University*

Transportation

Moderator: Melissa Rura, *University of Texas at Dallas*

Integrating Multi-agent System and GIS for Modelling Urban Traffic System

Xiangyu Si, *Department of Geography, University of Waterloo*, Canada

A Real-time Image Mosaicking Approach for UAV Acquired Imagery

Chunsun Zhang, *South Dakota State University*

75th Anniversary Celebration — Capitol Steps Performance following Anniversary Dinner

For more information, see page 48.

Technical Sessions — Friday, March 13

Technical Sessions
8:00 am to 9:30 am

Special Session — Data Management Standards and Procedures for Archiving Spatial Data at the State and Federal Levels

(Sponsored by the ASPRS Data Preservation and Archiving Committee)
Moderators: John Faundeen, *U.S. Geological Survey*
Tom Holm, *U.S. Geological Survey*

There has always been a strong requirement to insure that digital data can be understood and used for land change monitoring. In order to do this properly, the imagery must be protected physically and electronically and must include metadata describing all pertinent collection parameters. There are many digital data quality aspects that must be defined, standardized, and implemented in order to insure long term use of digital data. Some of these include detailed image and metadata standards, archive standards, and image traceability and change techniques.

Library of Congress' Preserving State Government Information
William Lazorchat, *Library of Congress*

Archiving of Geospatial Data in the State of Utah
Cindy Clark, *State of Utah*

Archiving Spatial Data - USGS EROS Federal Standards and Procedures
John Faundeen, *U.S. Geological Survey, Library of Congress' Preserving State Government Information*
William Lazorchat, *Library of Congress*

Forestry

Moderator: Clio Andris, *Massachusetts Institute of Technology*

Lidar-based Mapping of Leaf Area Index and its use for Validating Moderate Resolution Satellite LAI Product
Kaiguang Zhao, *Spatial Sciences Lab, Texas A&M University*
Sorin Popescu and Alicia Griffin

Automated Mid-level Vegetation Classification and Mapping for National Forests in Southwest Idaho using 4-band DMC Stereo Imagery and Forest Inventory Data
Brad Weigle, *Photo Science Inc.*
Susan Miller, Nathaniel Morton, Randall Hayman, and Sanford Moss

Evaluation of Single vs. Integrated Sensor Algorithms to Estimate Leaf Area Index in Complex Forest Environments
Jennifer Jensen, *University of Idaho*
Raechel Bianchetti and Karen Humes

Mapping Burn Severity using Object-based Image Analysis and Classification and Decision Trees
Richard B. Powell, *Michigan Tech Research Institute*
Nancy H.F. French and Laura Bourgeau-Chavez

GIS Modelling

Moderator: Ramesh Sivanpillai, *University of Wyoming*

Impacts of Biofuel Development on Carbon Management and Agricultural Conservation Practices
Paul Doraiswamy, *U.S. Department of Agriculture, Agriculture Research Center*

Mapping Tidal Flushing with Multitemporal ASTER Thermal Data and a Tidal Repletion Model
Thomas Allen, *East Carolina University*
George Oertel

A Simplified Geometric and Topological Modelling of 3D Buildings: Combination of Surface-Based and Solid-Based Representations
Chokri Koussa, *Instituts Nationaux des Sciences Appliquées (INSA),* France
Mathieu Koehl

Modelling of Spatial and Temporal Expansion of Built-up and Residential Dwellings of the Lower Hunter Region of NSW, Australia
Ramita Manandhar, *University of Sydney*, Australia
Inakwu Odeh

Hydrology

Moderator: Umamaheshwaran Rajasekar, *Indiana State University*

Multisensor Spaceborne Monitoring of Large Lakes Worldwide
Jonathan Chipman, *Dartmouth College*

Predicting Surface Water Quality and its Relation with Urban Land Cover Changes in the Lake Calumet Area, Greater Chicago
Cyril Wilson, *Indiana State University*
Qihao Weng

Rain Rate Estimation using Object Orient Classification of Clouds in AVHRR Data
Hamid Azari, Iran
Ali Akbar Matkan, Alireza Shakiba, and Seyed Hossein Pourali

Technical Sessions — Friday, March 13

Lidar VI

Moderator: Lindi Quackenbush, S*tate University of New York College of Environmental Science and Forestry*

Effects of Lidar Point Density on Bare Earth Extraction and DEM Creation
R. Chris Olsen, *Naval Postgraduate School*
Angela M. Puetz and Brian Anderson

Deriving Segmentation Parameters for Object-oriented Classification Intelligently Through Landscape Metrics and Data Mining
Jared Stukey, *Texas A&M University*
Sorin Popescu, Muge Mutlu, Zach Vernon, and De'Etra Young

Meeting Lidar Industry and End-User Needs: Best Practice Guidelines, Skills Training and Efficient Project Design
Chris Hopkinson, *Applied Geomatics Research Group, NSCC*, Canada

Development of a Real-time 3D Reconstruction Technique for Supporting Power-Line Risk Management
G. Sohn, *GeoICT Laboratory at York University*, Canada

Photogrammetry

Moderator: Sheoran Arjun, *George Mason University*

Comparison of Bundle Adjustment Formulations
Zach Moore, *Kansas State University*
Dan Wright, Chris Lewis, and Dale Schinstock

Stereo Processing a Pushbroom Images with Correlated Path Measurements
Michal Jama, *Kansas State University*
Chris Lewis and Dale Schinstock

APFO's Database of Photo Identifiable Control Points: Creation, Maintenance, and Use in Image Inspection
Brian Vanderbilt, *U.S. Department of Agriculture, Farm Service Agency*
Sandra Hinkley

Radiometric Calibration of Digital Photogrammetric Camera Image Data
Birgen Haest, *Flemish Institute for Technological Research and Flemish Geographical Information Agency*, Belgium
Jan Biesemans, Walter Horsten, Nancy Van Camp, Jurgen Everaerts, and Jo Van Valckenborgh

Professional Development – Higher Education

Moderator: Sahil Suri, *German Aerospace Center, Remote Sensing Technology Institute*, Germany

How to Become a More Educated Buyer of Remote Sensing Services and Increase Your Programs Chance for Success
Larry Schaner, Consultant
Michael Hut

Mapping and Monitoring Land Resource Change: Bridging the Geospatial Divide for Decision Making — A First Conference in Kentucky and the Region
Demetrio Zourarakis, *Kentucky Division of Geographic Information*
Brian D. Lee and Carol D. Hanley

GIS Professional Training in Egypt: The Impact of New Technologies and Trends
Ahmed Darwish, *Computer and IT Studies Division, School of Continuing Education, AUC*, Egypt

OpenDragon Programmer's Toolkit: A Framework for Learning Geoinformatics Software Development
Sally E. Goldin, *King Mongkut's University of Technology, Thonburi*, Thailand
Kurt T. Rudahl

Special Session — Quality Assurance of Remote Sensing Data

(Sponsored by the ASPRS Primary Data Acquisition Division)
Moderator: Greg Stensaas, *U.S. Geological Survey*

The synergistic use of remote sensing data will provide the baseline for addressing change and how the changes impact our society. Data may be derived from a variety of sources (satellite, airborne and in situ) at all scales – global, regional and local – through the coordinated resources and efforts of many systems. In order to use data to addresses earth observation change parametric, users and processors of data and derived products must be able to assess the data's suitability for their particular application and the "fitness for purpose" of the data. This session discusses some of the current programs and processes being implemented to address data quality.

CEOS WGCV QA4EO "Operational Guidelines, A Quality Assurance Framework for Earth Observation
Greg Stensaas, *U.S. Geological Survey EROS*

Catalog of Worldwide Test Sites
Gyanesh Chander, *SGT/U.S. Geological Survey EROS*

USGS QA Plan for Digital Aerial Imagery
Jon Christopherson, *SGT/U.S. Geological Survey EROS*

JACIE
Mike Benson, *U.S. Geological Survey EROS*

Special Session — Overview of Remote Sensing Systems Technology

(Sponsored by the ASPRS Primary Data Acquisition Division)

Moderator: Jon Christopherson, *U.S. Geological Survey, Resources Observation and Science (EROS) Center*

This session is designed to provide an overview of the technology capabilities being used in support of remote sensing applications. It features key remote sensing technologists who will provide a status of current and future systems and programs.

Lidar – Jason Stoker, *U.S. Geological Survey EROS*
Infrared/Visible – Jon Christopherson, *SGT U.S. Geological Survey*
SAR – Zhong Lu, *U.S. Geological Survey Cascades Volcano Observatory*
Hyperspectral – Steve Ungar, N*ASA/UMB*

Vegetation Mapping II

Moderator: Raad Saleh, *University of Wisconsin - Madison*

Inventorying Existing Riparian Buffer Cover in L'Anguille River Watershed using Geospatial Technologies
Dharmendra Saraswat, *University of Arkansas Division of Agriculture Cooperative Extension Service*
Naresh Pai

A Comparative Analysis of CBERS and LANDSAT Data
Shrinidhi Ambinakudige, *Mississippi State University*
Jinmu Choi and Sami Khanal

Detection Limitations of 1930s Aerial Photography: How Much Woody Biomass are we missing in Arid Rangelands?
Dawn Browning, *School of Natural Resources, University of Arizona*
Andrew T. Byrne and Steven R. Archer

Estimation of Urban Vegetation Fraction by Linear Spectral Mixture Analysis
Matkan-Ali Akbar, Iran
Alimohammadi Abbas, Ashourloo Davood and Azadbakht Mohsen

Web Services, Image Browsing, Visualization and Archive

Moderator: Nadine Alameh, *MobiLaps LLC/NASA Ames Research Center*

Operational Assessment and Forecast of Global Crop Status and Market Opportunities
Julian Winter, *State College, Pennsylvania*
Dmitry Varlyguin, Stephanie Hulina and Luke Roth

HEAT - Home Energy Assessment Technologies: A Web Service for Evaluating and Monitoring Residential Home Energy Efficiency Using High Resolution Airborne Thermal Imagery
Christopher Kyle, *Foothills Facility for Remote Sensing and GIScience, Department of Geography, University of Calgary*, Canada
Geofffrey J. Hay

Spatial Ranking Mechanism for an Internet-based Remote Sensing Image Browsing
Zeal Su, *Tainan*, Taiwan
Jung-Hong Hong

Progressive Transmission and Visualization of Vector Data over Web
Tinghua Ai, *Wuhan University,* China

Technical Sessions

10:00 am to 11:30 am

Accuracy Assessment

Moderator: Thomas Allen, *East Carolina University*

Enhanced Automated Image Matching for Improved Accuracy and Optimized Tie Point Generation in Airborne Digital Line Scanners
Kristian Morin, *Leica Geosystems*

Quantifying the Spatiotemporal Structure of Error in Classified Multi-date Imagery
Amy Burnicki, *University of Wisconsin - Madison*

Evaluating Issues in Map Accuracy: A Study of Mapping Benthic Habitats on the Texas Gulf Coast
Meghan Graham, *University of New Hampshire*
Russell Congalton

Mapping the Drivers of the Rapid Land Use/Cover Change in Metropolitan Lagos, Nigeria with GIS/RS.
Matthew Adepoju, *National Space Research and Development Agency*, Nigeria
Andrew Millington and Kevin Tansey

Technical Sessions — Friday, March 13

Agriculture

Moderator: Jackson Cothren, *Center for Advanced Spatial Technologies*

Regional Visualization and Analysis of Agriculture with Multi-resolution Imagery
Stephanie Hulina, *GDA Corp*.
Dmitry Varlyguin, Julian Winter and Luke Roth

A Phenological Atlas of Major Crops from the United States Heartland
David Johnson, *U.S. Department of Agriculture/National Agricultural Statistics Service*

Estimating Crop Net Primary Production in Iowa from Advanced Wide Field Sensor (AWIFS) Data
E. Raymond Hunt Jr., *U.S. Department of Agriculture-ARS Hydrology and Remote Sensing Laboratory*
Guy Serbin, Craig S.T. Daughtry, Paul C. Doraiswamy, John H. Prueger, and Jerry C. Hatfield

Accounting for Green Vegetation and Soil Spectral Properties Improves Remote Sensing of Crop Residue Cover
Guy Serbin, *U.S. Department of Agriculture-ARS Hydrology and Remote Sensing Laboratory*
Craig S.T. Daughtry, E. Raymond Hunt Jr, Gregory W. McCarty, and Paul C. Doraiswamy

Archeology

Moderator: Douglas Comer, *Cultural Site Research and Management, Baltimore, MD*

Developing More Effective Archaeological Site Detection Protocols for use with NASA Imagery
Douglas Comer, *Cultural Site Research and Management*
Ronald Blom and James Tilton

Improved Understanding of Historical Sites with Geospatial Tools and Web-based Media: Wormsloe State Historic Site, Georgia
Thomas R. Jordan, *University of Georgia and Wormsloe Institute for Environmental History*
Marguerite Madden and Sarah V. Ross

A Surface Based Photogrammetric Model for Documentation of Archeological Sites
Filin Sagi, *Israel Institute of Technology*, Israel
Levin Shahaf

3D Reconstruction of the Historic Baalbek/Libanon Based on Historical Aerial, Oblique and Terrestrial Photos
Ahmed Al Amouri, *Technical University of Berlin, Institute for Geodesy and GeoInformation,* Germany
Lothar Gruendig

Feature Extraction VIII

Moderator: Joseph Edward Kunz, *ASRC Management Services*

A New Method of Jet Contrail Identification and Extraction on AVHRR Satellite Imagery using a Geostatistical Approach
Chuanrong Zhang, *University of Connecticut*
David Travis and Andrew Carleton

A Digital Processing and Data Compilation Approach for using Remotely Sensed Imagery to Identify Geological Lineaments in Hard-rock Terrains: An Application for Groundwater Exploration in Nicaragua
Jill Bruning, *Michigan Technological University*
Ann Maclean and John Gierke

Determining Urban Land Use Through Element Attributes Associated with Buildings from Lidar and Fine-resolution Imagery
Xuelian Meng, *San Marcos, Texas State University*
Nate Currit and Le Wang

Homeland Security Emergency Management & ISPRS

Moderator: Jun Wang, *Purdue University*

Exploratory Visualization for Disaster and Emergency Management
Rifaat Abdalla, *Defence Research and Development Canada – Toronto*, Canada
Keith K. Niall and Vincent C. Tao

Detection of Fresh Water Crude Oil Contamination using ARCHER HSI during July 2007 Kansas Flooding
Carol Mladinich, *U.S. Geological Survey - Rocky Mountain Geographic Science Center*

Object Oriented Change Detection of Buildings after the Indian Ocean Tsunami Disaster
Kurt Rudahl, *King Mongkut's University of Technology,* Thailand
Sally Goldin

The Future Role of Geo-Information Technologies in Environmental Monitoring and the Role of ISPRS in Contributing to Solve the Global Problems
Orhan Altan, *Technical University of Istanbul*, Turkey

Special Session — International Charter Space and Major Disasters - 2008 Hurricane Season Response

(Sponsored by the ASPRS Remote Sensing Applications Division)

Moderator: Brenda K. Jones, *U.S. Geological Survey EROS Center*

The International Charter aims at providing a unified system of space data acquisition and delivery to those affected by natural or man-made disasters through Authorized Users. Each member agency has committed resources to support the provisions of the Charter and thus is helping to mitigate the effects of disasters on human life and property.

Team Charter Overview and History
Brenda Jones, *U.S. Geological Survey*

Hurricanes Gustav, Hanna, and Ike in Haiti
Nate Smith, *Office of Foreign Disaster Assistance*

Hurricanes Dolly and Ike in Texas
Teresa Howard, *Center for Space Research, Univ. of Texas-Austin*

Hurricane Gustav and Ike in Louisiana
Brent Yantis, *University of Louisiana, Lafayette, Louisiana Response Team*

Invasive Species

Moderator: Kaiguang Zhao, *Texas A&M University*

Network Spatial Methods to Assess Clustering of Invasive Species
Karen Owen, *George Mason University*

Exploring the Spectral Characteristics of Sirex Woodwasp Infestation in Scotch Pines
Lindi Quackenbush, *State University of New York College of Environmental Science and Forestry*
Yinghai Ke, Stephen Teale, and Jungho Im

Utilizing Remote Sensing to Supplement Ground Monitoring of Diorhabda Elongata as a Control Agent for Tamarix Ramosissima in Dinosaur National Monument
Vanessa Archambault, *University of California, Berkeley*
Jared Auch, Jack Landy, Gabriel Rudy, Christopher Seifert, Cindy Schmidt, and Joseph Skiles

Using Forest Service Forest Inventory Data and Satellite Imagery to Model Honeysuckle (Lonicera spp.), and Privet (Ligustrum spp.) Spatial Distribution in the Southeast
Dumitru Salajanu, *U.S. Department of Agriculture Forest Service, SRS, Forest Inventory and Analysis*
Dennis Jacobs

Lidar – Hydrology, Coastal, Flood Plane Modeling

Moderator: Paul Pope, *Los Alamos National Laboratory*

Assessment of Hydrologic Enforcement in Lidar-derived DEM
T. Edwin Chow, *University of Michigan - Flint*

Full-waveform Analysis of the Shoals 3000 for Automated Seabed Classification
R. Narayanan, *York University*, Canada
G. Sohn

A Flooding-model Filter for Bare-earth Extraction from Lidar Data
Fengliang Xu

Lidar Data Post Spacing and Scaling Relationships with Hydrologic Parameters
Michael Hodgson, *University of South Carolina*

MODIS II

Moderator: Peter Sforza, *Virginia Tech*

eMODIS Overview
Calli B. Jenkerson, *ADNET Systems, Inc.*
Gail L. Schmidt

Water Quality Monitoring using Landsat TM and MODIS Images: A Case Study in Lake Simcoe, Ontario
Xian Guan, *University of Waterloo*, Canada
Jonathan Li and William Booty

Investigating Correlations Between Satellite-derived Aerosol Optical Depth and Ground PM 2.5 Measurements in California's San Joaquin Valley with MODIS Deep Blue
Erin Justice, *California State University, Monterey Bay*
Laura Huston, David Krauth, Jimmy Mack, Siddhartha Oza, Anthony Strawa, Marion Legg, Cindy Schmidt, and Joseph Skiles

Using MODIS Aqua 250 m to Derive Superficial Circulation Patterns in the Gulf of California
Guillermo Martinez-Flores, *CICIMAR-IPN*, Mexico
Enrique H. Nava-Sanchez

Thermal/Transportation Remote Sensing

Moderator: Abduwasit Ghulam, *Saint Louis University*

Diachronous Analysis of Urban Surface Temperatures: An Urban Heat Island Perspective
Umamaheshwaran Rajasekar, *Indiana State University*
Qihao Weng

As Different as Night and Day: A Diurnal Comparison of the Normalized Difference Thermal Index (NTDI) From ATLAS Imagery
Michael K. McInerney, *U.S. Army Engineer Research Development Center, Construction Engineering Research Laboratory*
Robert Lozar

Lynx Mobile Mapper: The New Survey Technology
Ablert Lavarone, *Optech Incorporated*, Canada
Federica Zampa

Spatial Analysis and Reporting Services for the Transportation Enterprise's Engineering Asset Infrastructure
Kevin Compher, *Harvard Mathematics and Amtrak Engineering Systems*
Greg Steele

Technical Sessions — Friday, March 13

Vegetation Mapping III

Moderator: Chunsun Zhang, *South Dakota University*

Trajectory-based Warm-season Grass Mapping in Missouri Prairies with Multi-temporal ASTER Imagery
Cuizhen Wang, *University of Missouri*

Spring Coast Seagrass Mapping Project - First use of Digital Imagery
Keith Kolasa, *Southwest Florida Water Management District*

A Novel Methodology to Devise Vegetation Indices for Estimation of the Cover Factor for Modelling Soil Erosion
Cesar Puente, *CICESE Research Center*, Mexico
Gustavo Olague, S.V. Smith, S.H. Bullock, and M.A. González-Botello

Earth Observations for FEWS NET: A Professional Review of Precipitation and Vegetation Requirements
L.W. Underwood, *Science Systems and Applications, Inc*
K.W. Ross, M.E. Brown, and J. Verdin

Poster Session

10:00 am to 1:00 pm

Technical Sessions

12:30 pm to 2:00 pm

Data Management

Moderator: Tobias Heuchel, *INPHO GmbH*, Germany

Towards Cooperative SDI in Small Island Nations: The Experience in Bermuda
Bob Ryerson, *Kim Geomatics Corporation*, Canada
Kevin Mayall and Bob Ryerson

Preservation of Geospatial Data
William Lazorchak, *Library of Congress*
Cindy Clark

Archiving of Geospatial Data in the State of Utah
Cindy Clark, *State of Utah's Automated Geographic Reference Center*

Management and Web Distribution of a Large Volume of Digital Image Data
Rostam Yazdani, *British Columbia Ministry of Agriculture and Lands - Integrated Land Management Bureau – GeoBC*, Canada
Andrew Calarco

Data Partnerships

Moderator: Julian Winter, *State College, Pennsylvania*

Successful Web Based Public/Private Data Partnerships
Shawana Johnson, *Global Marketing Insights, Inc.*
Robert Tetrault

2008-2018 African Remote Sensing Research and Western Comparisons
Sherry Loy, *Global Marketing Insights, Inc.*
Minye Pan and Shawana Johnson

An Addition to the National Atlas: 100 US Wetlands of Importance
Catherine Lockwood, *Chadron State College*
Lawrence Handley, Nathan Handley and Jay Donnelly

Data Partnership at the USDA
Robert Tetrault, *U.S. Department of Agriculture Foreign Agricultural Service*

Data Visualization

Moderator: Xuelian Meng, *San Marcos, Texas State University*

Visualization Approaches for Analyzing Relationships Between Satellite Launch Characteristics, Ephemeris, and Sensors
Clio Andris, *MIT*
Michael E. Hodgson

Geovisualization of Forest Dynamics: Hemlock Wooly Adelgid Damage in Great Smoky Mountains National Park
Hunter Allen, *Center for Remote Sensing and Mapping Science (CRMS)*
Marguerite Madden

SHRINKWRAP: 3D Model Abstraction for Remote Sensing Simulation Studies
Paul Pope, *Los Alamos National Laboratory*

A Neural Network Based Approach Toward Automated Real-time Cartographic Generalization
Jacqueleen Abu Daoud Joubran, *Mapping and Geo-Information Engineering, Technion - Israel Institute of Technology*, Israel
Yerach Doytsher

GIS Modelling and Analysis

Moderator: Muge Mutlu, *Texas A&M University*

Landscape-scale Assessment: Variability Analysis using Geospatial Information for Modelling and Mapping Applications
Mohammed A. Kalkahn, *Colorado State University*

Flood Early Warning with Integration of Hydrologic and Hydraulic Models, RS and GIS — Case Study: Madarsoo Basin, Iran
Aliakbar Matkan, Iran
Alireza Shakiba and Hossei Pouali

Detection on Seasonal Changes in the Haeundae Marine Topography using GIS
Ji-Yong Kim, *Pukyong Nat's University*, South Korea
Chul-Uong Choi and Cheong-Gil Jin

Application of Fuzzy Methodology in Modeling Atmospheric Pollution
Anshu Gupta, *Centre for Remote Sensing & GIS, NIT*, India
Alok Choudhary, Vivek Dey

Lidar - Forestry

Moderator: Hideki Hashiba, *College of Science and Technology, Nihon University*, Japan

Sensitivity Examination of LIDAR-Derived Plot-Level Tree Height to Inaccurate Field Plot Location Through Simulation Study
Yuzhen Li, *University of Washington*

Inventorying Trees in an Urban Landscape using Small-Footprint Lidar Data and Digital Orthoimagery
Rupesh Shrestha, *Virginia Tech*
Randolph H. Wynne

Defining a Southern Pine Beetle Movement Corridor with Lidar
Jared Stukey, *Texas A&M University*
Sorin Popescu, Robert Coulson, Andrew Birt, and Kaiguang Zhao

Stem Characterization using ALS Full-waveform for Single Tree Detection
Junjie Zhang, *York University*, Canada
Gunho Sohn

Lidar VII

Moderator: Stefan Robila, *Montclair State University*

Lidar fusion using image space transformations and focal planes
Kyle Holland, *University of California, Berkeley*
Carl Legleiter

Shoreline Extraction from Integration of Lidar Point Cloud Data and Aerial Orthophotos using Mean Shift Segmentation
I-Chieh Lee, *The Ohio State University*
Bo Wu and Ron Li

An Incremental Reconstruction of 3D Building Rooftop Based on the Level of Detail using Airborne Lidar Data
Y. Jwa, *York University*, Canada
G. Sohn

Benefit of Airborne Full Waveform Lidar for 3D Segmentation and Classification of Single Trees
Josef Reitberger, *University of Applied Sciences-München*, Germany
Peter Krzystek and Uwe Stilla

Natural Hazards

Moderator: Larry Schaner, Consultant

Comparative Study on Permanent Scatterer Synthetic Aperture Radar Interferometry and Coherent Target Analysis Methods for Urban Land Subsidence Detection
Xin Tian, *University of Waterloo*, Canada
Mingsheng Liao ans Jonathan Li

Effects of West Nile Virus Infection in Birds and Environmental and Socioeconomic Variables in Human Disease Incidence of West Nile Virus in Northern Virginia, USA
Hua Liu, *Old Dominion University*
Qihao Weng and David Gaines

A Survey of Drought Estimation Methods and Comparative Analysis of their Performance for Improving Operational Capabilities
Abduwasit Ghulam, *Saint Louis University*
Timothy Kusky

On Extending the Application of Remote Sensing and GIS to Climate Change and Water Resources Management in West Africa: The Case of Kainji Lake Pilot Project
Appollonia A. Okhimamhe, *Centre for Climate Change and Freshwater Resources (CCCFR), Federal University of Technology*, Nigeria
Y.M. Suleiman, M.D. Haruna, and M.O. Olowojoba

Special Session — Special Panel Discussion - Preparing Competitive Scholarship and Grant Proposals

(Sponsored by the ASPRS Student Advisory Council)

Moderator: Lisa Wedding, *University of Hawaii*

This session will provide graduate students with relevant information on organizing and preparing a successful grant or scholarship proposal. Topics covered will include finding prospective grants, developing a general proposal, securing letters of reference and the formal application process. A panel of experts will provide advice and insight from their professional grant writing experiences.

Panelists:
Dr. Curt Niebur, Program Scientist, *NASA*
Dr. Marguerite Madden, *University of Georgia*
Jesse Winch, Scholarship Administrator, *ASPRS*

Satellite Sensors and Applications

Moderator: Dumitru Salajanu, *U.S. Department of Agriculture Forestry Service*

DMC Constellation: Technical Performance Evaluation and Development
Owen Hawkins, *DMC International Imaging Ltd*, UK
Z. De Groot and K. Graham

Monitoring Leafy Spurge using a Low Cost Hyperspectral Spectrometer
Steven Jay, *Montana State University*
Rick Lawrence, Kevin Repasky, and Charlie Keith

Hyperspectral Remote Sensing System and its Applications
Rajamanickam Manoharan, *Annamali University, Chidambaram*, India
Sankaran Rajendran

Technical Sessions — Friday, March 13

Special Session — GEO Progress and Prospects (II) – Early Successes in Building GEOSS

Moderator: Lawrence R. Pettinger, *U.S. Geological Survey*

This session highlights accomplishments of the intergovernmental Group on Earth Observations (GEO) that is developing the Global Earth Observation System of Systems (GEOSS). The purpose of GEOSS is to achieve comprehensive, coordinated and sustained observations of the Earth system, in order to improve monitoring of the state of the Earth, increase understanding of Earth processes, and enhance prediction of the behavior of the Earth system.

The CEOS Constellations – a Framework for Building the Space Component of GEOSS
Mary Kicza, *National Oceanic and Atmospheric Administration* (invited)

Establishing a Biodiversity Observation Network That Integrates *in situ* and Satellite Observations
Douglas Muchoney, *U.S. Geological Survey* (invited)

Disaster Prediction and Management
James F. Devine, *U.S. Geological Survey*

Special Session — K12 Geospatial Technology Success & Lessons Learned In Virginia: Panel Discussion

(Sponsored by the ASPRS Education and Professional Development Committee)
Moderator: Stan Hovey, VTIN Board member

This session will include members from the Virginia Department of Education, technology teachers and administrators who have been involved over the past three years teaching geospatial technologies in K12. These offerings have been made available at middle and high schools with about a 300% increase in teacher and student participation in the second and third years. Papers will cover real-life successes and lessons learned from these initial years.

Poster Sessions

All posters available for viewing on the following dates and times: Wednesday, March 11 and Thursday, March 12, from 10:00 am to 5:00 pm and Friday, March 13, from 10:00 am to 1:00 pm.

Potentials and Impediments for Operational Remote Sensing of Small Recreational Vessels
Ernest G. Marshburn, *East Carolina University*
Thomas R. Allen and Yong Wang

Natural and Cultural Resource Inventory Maps, Somerset County Planning, New Jersey
Kevin Zelinsky, *Remington & Vernick Engineers*
Steve Volpe

GIS Spatial Analysis Model for Estimation of Tornado Damage Potential
N. Scott Bowman, *Wilson & Company*

The Kentucky Landscape Census Project: A Look Back and a Look Forward
Demetrio Zourarakis, *Kentucky Division of Geographic Information*
Andrew Brenner, Sudha Maheshwari, Sam Bacharach, and Raj Singh

Identifying Dicymbe Corymbosa Tropical Monodominant Forests in Guyana Using Landsat Satellite Imagery
Steven J. Steinberg, *Humboldt State University*
Rebecca Degagne and Terry W. Henkel

Modeling Urban LAI with AISA+ data
Perry Hardin, *Brigham Young University*
Ryan Jensen

Human-environment Interaction: A Spatial Analysis of Deer-Vehicle Accidents
Ryan Jensen, *Brigham Young University*
Rusty Gonser and Samuel Wolf

Mountain Pine Beetle Range Expansion and Climate Teleconnections
Michael Lindgren, *Clark University*

Hyperspectral Analysis of Vegetation Cover for Hazardous Waste Sites
Jungho Im, *SUNY ESF*
John Jensen, Ryan Jensen and Jinyoung Rhee

Semi-automated Delineation of Forest Stands from Lidar Canopy Height Models
Gang Chen, *University of Calgary*, Canada
G.L. Hay, G. Chen, B. St-Onge, and W. Wulder

A Signal Restoration Method to the Infrared Spectral Reflectance of ASD Fieldspec Pro Spectroradiometer
Lin Chinsu, Taiwan
Tsogt Khongor

Estimation of Soil Organic Matter, Total Nitrogen and Total Phosphorus from Hyperion Reflectance Data
Baojuan Zheng, *Virginia Tech*
Lin Li

ALOS PALSAR Data for Tropical Forest Biomass Estimation and Mapping
Md. Mahmudur Rahman, *Chiba University,* Japan
Josaphat Tetuko Sri Sumantyo

Application of an LUE Model to Estimate GPP 8-D using the FPAR MODIS Product in an Agricultural Ecosystem in the Upper Spanish Plateau
Maria Luisa Sanchez, *University of Valladolid,* Spain
Isidro Perez, Angeles Garcia and Beatriz Torre

Small Scale Underwater Change Detection
Delaunay Olivier, *Universitat de Girona*, Spain
Gracias Nuno and Garcia Rafael

Detecting Agricultural Land Classification Change due to River Channel Changes Caused by Flooding
Jeffrey Van Looy, *Radford University*

Unpaved Road Detection and Identification from Quickbird Imagery
Karen Owen, *George Mason University*

Application of Mathematical Morphology to Calculate of Reservoir and Flooded Area in Digital Images
Erivaldo Silva, *São Paulo University (UNESP)*, Brazil
Fabrício Leonardi, Raquel Stroppa, and Erivaldo Silva

Urban Road Extraction from High Resolution Satellite Image Combined with Lidar Data using an Object-oriented Method
Minjuan Cheng, *Indiana State University*
Qihao Weng

(High-Resolution) Application of Morphologic Routine for Detection of Tracks of Airports in Images of High-resolution
Erivaldo Silva, *São Paulo University (UNESP), National Institute for Space Research (INPE)*, Brazil
Fernando Leonardi and Thiago Gonçalves Rodrigues

Application of Digital Camera with Fisheye Lens in Close Range Photogrammetry
Anna Fryskowska, *Military University of Technology,* Poland
Michael Kedzierski

Application of Fisheye Lens and Terrestrial Laser Scanning in Architectonic Documentation of Hard-to-Reach of Cultural Heritage Objects
Anna Fryskowska, *Military University of Technology,* Poland
Michael Kedzierski and Piotr Walczykowski

Application of Terrestrial Laser Scanning in Assessment of Hydrotechnic Objects Condition
Anna Fryskowska, *Military University of Technology,* Poland
Michael Kedzierski and Piotr Walczykowski

Poster Sessions

Impact of Land Cover Change on the Summer Climate of the Marmara Region, Turkey
E. Sertel, *Istanbul Technical University*, Turkey
C. Ormeci

Study on Key Techniques for Regional Public Image Information Platform via Internet
Liu Qiang, *University of Electronic Science and Technology of China,* China
Cheng Boyan and Zhang Chang

Determination of areas left under risk in the limits of forescene and backscene zone of Bosphorus by dangerous load carrying vessels
Musaoglu Nebiye, *Istanbul Technical University*, Turkey
Buhur Sancar

Revision of a property topographic map by close range photogrammetry using an amateur digital camera
John Hatzopoulos, *University of Aegean*, Greece

Integration of Lidar Point Cloud data with High-Resolution Orthoimagery for Updating Large-Scale Landbase Data
Greg Mauldin, *Tallahassee-Leon County GIS*
David Forsyth

Coastal Wetlands Planning, Protection and Restoration Act Analysis for Louisiana's Disappearing Wetlands
William R. Jones, *U.S. Geological Survey*

Development of a Service Oriented Architecture Based GIS for Earth Sciences
Asli Dogru, Turkey
Gonul Toz

Real-time and Forecast Flood Extent Mapping in Eastern Kansas
Dana Peterson, *Kansas Biological Survey, University of Kansas*
Kevin Dobbs, Jude Kastens, Stephen Egbert, and Jonathan Thayn

Impact of Global Change in Coastal Water Quality
Sima Bagheri, *NJ Institute of Technology*

Global Land Data Assimilation System (GLDAS) Products, Services and Application from NASA Hydrology Data and Information Services Center (HDISC)
Hongliang Fang, *Goddard Earth Sciences Data and Information Services Center, NASA*
Hiroko Kato, Matthew Rodell, William Teng, and Bruce Vollmer

Classification of Turtlegrass (Thalassia Testudinum) Occurrence Near Caye Chapel, Belize using High-resolution Multispectral Imagery
Justin Janaskie, *The University of Mississippi*
Greg Easson, Justin Janaskie, and Cole Easson

Exploitation of Lidar Range Measurements for Indirect Geo-Referencing
Jaehong Oh, *The Ohio State University*
Youngjin Lee, Charles Toth, and Dorota Brzezinska

Using Ground Based and Airborne Lidar Remote Sensing to Assess Biomass Availability of Rangeland Woody Plants for Bioenergy Uses
Nian-Wei Ku, *Texas A&M University*
Sorin Popescu and James Ansley

Estimating Stand Volume Based on Integration of Individual Trees from Lidar Data
Doo-Ahn Kwak, *Environmental Science and Ecological Engineering, Korea University*, South Korea
Hyun-Kook Cho, Woo-Kyun Lee, and Seung-Ho Lee

Analysis of Lidar Leaf Penetration Indices for Selected Plant Species in a Coastal Marsh and Correlation with Terrain Elevation Accuracy
Nishanthi Wijekoon, *NOAA/National Geodetic Survey*
Christopher Parrish and Galen Scott

Research for a Long-term Topographic Changes of the Kwoangan-bridge Construction
Che-Young Oh, *Pukyong National University*, South Korea
Chul-Uong Choi and Ji-Yong Kim

An Aanalysis of Haeundae Beach Coastal Topography Change by Sea Level Rise
Ji-Yong Kim, *Pukyong National University*, South Korea
Chul-Uong Choi and Young Seop Kim

Analysis of Deforestation in Macarena National Park, Colombia
Michael Starbuck, *U.S. Geological Survey*

Forest Fire Hazard. Study of Aerial Photographs and Satellite Images
Maria Lazaridou, *Aristotle University*, Greece
Evangelos Patmios

InSAR Derived Displacement Gradiometry Applied to the 2003 Bam Earthquake (Iran)
D. Marius Necsoiu, *Southwest Research Institute*
David A. Ferrill and Jessica Quintanilla

Assessing the Impact of Data Resolution for Remote Sensing Based Models of Planetary Lava Flow Rheology
Robert Peckyno, Geosciences, *Oregon State University*
Shan de Silva

Accuracy Estimation of Declassified Hexagon Kh-9 Mapping Camera Imagery
Arzhan Surazakov, *University of Idaho*
Aizen Vladimir

The First Large Scale Maps of the Tennessee Valley
Roy Teal, *Tennessee Valley Authority*
Major McCollough, Ray Mitchell, and Alan Voss

(Video) 1940"s Mapping Process at TVA
Alan Voss, *Tennessee Valley Authority* - Retired
Major McCollough and Roy Teal

ASPRS Classified Session — Tuesday, March 10

Motion Imagery/Full Motion Imagery Issues and Concerns

March 10, 2008 • Roberdeau Hall, NGA-Bethesda

Motion imagery and full motion video sensors, such as the real-time video capability available with unmanned aerial vehicle (UAV) systems has shown its value in both military operations and civil applications. UAVs carry visible, IR, and/or radar (Moving Target Indicator) sensors to record events. These collections are a valuable tool in an arsenal of GEOINT applications used for ongoing operations and persistent surveillance. This capability allows analysts to monitor high-interest activities in the mission space, to include tracking moving, fleeting, and emerging targets. It also allows observation of rapidly developing events.

However, there are numerous challenges such as processing and exploitation issues, dissemination of motion/full motion imagery data, and development of effective tools and applications that need to be addressed and resolved. The full-day session intends to review the challenges influencing and shaping Motion/Full Motion imagery needs and requirements.

Classification Level:

This session is offered at the SECRET//REL VEY level.

Location:

National Geospatial-Intelligence Agency, Bethesda, Maryland, Roberdeau Hall.

Registration Fee: $85

In addition to the Conference Registration fee for those interested in also attending the 2009 ASPRS Annual Conference, participants will be charged $85 to attend the Classified Symposium. The registration fee includes transportation between the Marriott Waterfront Hotel and NGA, a continental breakfast, lunch, and morning and afternoon beverage breaks. Lunch will be served at the facility. Please send the completed registration form in this program or on-line at www.asprs.org/baltimore09/index.html and appropriate payment to the address on the form no later than March 6, 2009. Classified Session Speakers must register for this session and pay the $85 registration fee. Registration instructions are listed below.

REGISTRATIONS CAN NOT BE ACCEPTED AFTER March 6, 2009.

Points of Contact:

Phil Hwang, Open phone: 703-735-2639, Secure phone: 576-3617

John Findley. Open phone: 703735-2592, Secure phone: 576-3595

Steven Payton, Open phone: 703-735-2582, Secure phone: 576-3607

Important Deadlines

- All attendees and speakers must be pre-registered with ASPRS by March 6, 2009.
- In addition, attendees and speakers must have their security office submit clearances by March 4, 2009. Please FAX certifications – even if you have a government reciprocal badge - to the NGA Security Office: 301-227-3170. Information must include the event: ASPRS 2009 Classified Session; Location: Roberdeau Hall; and, POC: John Findley (703-735-2592)

ASPRS 75th Anniversary Dinner and Show

ASPRS invites you to celebrate our 75th Anniversary on Thursday night, March 12th with dinner and a performance from the renowned Capitol Steps.

OVER TWENTY-FIVE YEARS AGO, the Capitol Steps began as a group of Senate staffers who set out to satirize the very people and places that employed them. In the years that followed, many of the Steps ignored the conventional wisdom ("Don't quit your day job!"), and although not all of the current members of the Steps are former Capitol Hill staffers, taken together the performers have worked in a total of eighteen Congressional offices and represent 62 years of collective House and Senate staff experience.

"I like it better when they make fun of Clinton."
Newt Gingrich

The Capitol Steps were born in December, 1981 when some staffers for Senator Charles Percy were planning entertainment for a Christmas party. Ronald Reagan was President when the Steps began, so co-founders Elaina Newport, Bill Strauss and Jim Aidala figured that if entertainers could become politicians, then politicians could become entertainers! Their first idea was to stage a nativity play, but in the whole Congress they couldn't find three wise men or a virgin! So, they decided to dig into the headlines of the day, and created song parodies & skits which conveyed a special brand of satirical humor that was as popular in Peoria as it was on Pennsylvania Avenue.

"These people are very funny. They do comedy, they do satire, and they do it extremely well."
Bernard Shaw, CNN

Most cast members have worked on Capitol Hill; some for Democrats, some for Republicans, and others for politicians who firmly straddle the fence. No matter who holds office, there's never a shortage of material. Says Elaina Newport, "Typically the Republicans goof up, and the Democrats party. Then the Democrats goof up and the Republicans party. That's what we call the two-party system."

"The troupe has become a favorite on the Washington social circuit. Its political satire brings chuckles...rave reviews...guffaws... and bipartisan grins all around. The satire hits the mark."
The Wall Street Journal

Photos by Richard Termine

ASPRS Volunteer Opportunities

Attention All Students
If you are a student at an accredited college or university and would like to attend the 2009 Annual ASPRS Conference without paying the required Conference Registration fee, consider assisting with the conference. By helping the Conference Committee for only eight (8) hours during the week of March 8-13, 2009, depending on your assignments, you will be able to attend the General Sessions, and Technical Sessions, visit the Exhibit Hall, and enjoy the Exhibitors' Reception. This is a great opportunity to learn more about the geospatial field, meet some of the top names in the industry and explore job possibilities.

To serve as a volunteer, complete this application, and e-mail:

Kim Tilley
kimt@asprs.org

Please include ASPRS Volunteer Program in the Subject Line of all e-mail messages and send all applications via e-mail to the attention of the Kim Tilley.

Assignments will be made on a first come basis and cannot be guaranteed. For more information, visit www.asprs.org/baltimore09 or contact Kim Tilley.

Name (FML): _____

First Name for Badge: _____

Mailing Address: _____

Daytime Phone: _____

E-mail Address: _____

College/University: _____

Emergency Contact w/ Phone Number: _____

Travel dates (please attach an itinerary as well: _____

Please make three choices in order of task preference for each day you are attending:
Tasks include: Registration, General and Technical Sessions, Staff Office, and Floater

Sunday, March 8th

Availability - 1:00 pm to 7:00 pm _____
First Choice _____
Second Choice _____
Third Choice _____

Monday, March 9th

Availability - 6:30 am to 5:00 pm _____
First Choice _____
Second Choice _____
Third Choice _____

Tuesday, March 10th

Availability - 6:30 am to 5:00 pm _____
First Choice _____
Second Choice _____
Third Choice _____

Wednesday, March 11th

Availability - 6:30 am to 7:00 pm _____
First Choice _____
Second Choice _____
Third Choice _____

Thursday, March 12th

Availability - 7:00 am to 8:00 pm _____
First Choice _____
Second Choice _____
Third Choice _____

Friday, March 13th

Availability - 7:00 am to 3:00 pm _____
First Choice _____
Second Choice _____
Third Choice _____

Hotel & Travel Information

Baltimore Marriott Waterfront Hotel

700 Aliceanna Street
Baltimore, Maryland 21202
(410) 385-3000; (800) 468-3571 (Toll Free); (410) 895-1900 (fax)

ASPRS has selected the Baltimore Marriott Waterfront Hotel as the location for the 2009 Annual Conference. **All Conference presentations, the Exhibit Hall and Social Events will be held in the hotel.**

Among the many offerings at this AAA four-diamond hotel located in Baltimore's famous Inner Harbor are spectacular harbor views from all guest rooms, Marriott's Revive bedding package, the Plug In Panel to connect laptops, MP3 players, digital cameras and more to 32" HDTVs , in-room coffee makers, irons and ironing boards, hair dryers, two-line phones, guest laundry, full service business center, fitness center including cardiovascular equipment, free weights, treadmills, weights and cycles, and The Waterfront Spa. This is a smoke-free property.

Both valet and self-parking are available to guests.

Grille 700, located in the hotel, features Maryland Eastern Shore seafood specialties and Kozmo's Lounge, an upscale martini bar, is just off the lobby. Rigano's Bakery and Deli, also on the lobby level, is open for breakfast, lunch, dinner and take out snacks including Starbucks coffees.

All of this, plus a location within walking distance of major sites, numerous top restaurants and abundant shopping. Complete visitor information is available at the Baltimore Area Convention and Visitors Association web site www.baltimore.org or by calling 877-Baltimore.

Baltimore is only 35 miles from Washington, D.C. Why not bring your family to this special ASPRS 75th Anniversary Conference and plan a few extra days for a visit to our nation's capital?

We have arranged a special ASPRS Conference rate at the Baltimore Marriott Waterfront Hotel of only
$175 single/double occupancy.

A limited number of government rate rooms have been reserved and are available at the prevailing government rate. Appropriate identification may be required at check-in.

Reservations may be made through the link on the ASPRS web page asprs.org/baltimore2009 or by calling 800 468-3571. If making phone reservations, be sure to identify yourself as attending the American Society for Photogrammetry and Remote Sensing Conference.

Early reservations are strongly advised since we have a limited number of rooms available at this rate.

Reservations must be made no later than **February 4, 2009** to take advantage of this specially negotiated ASPRS rate.

ASPRS is obligated to fill a certain number of hotel rooms at all of our conference hotels. If we fail to fill these rooms, we pay a hefty penalty at the end of the conference, which means we will have to raise our conference registration fees in the future. If you make a hotel reservation, please be certain that you plan to occupy the room. The reason that the hotel is often sold out in advance is because reservations are made and then cancelled at the last minute. Please help us avoid this problem. Thank you for choosing to stay at the Baltimore Marriott Waterfront.

Baltimore/Washington International Airport (BWI)

BWI is located approximately eight miles from the Baltimore Marriott Waterfront Hotel and has direct service to over 60 U.S. and eight international cities. Ground transportation to the hotel is available by shuttle (approximately $18 one way) or taxi (approximately $25 one way). The ground transportation desk is located on the Baggage Claim Level. For further airport information consult the BWI web site at www.bwiairport.com.

AMTRAK

Amtrak trains traveling nationwide provide easy in-town access by calling at Penn Station located approximately 20 minutes drive time from the Baltimore Marriott Waterfront Hotel. A full description of service, location and fares is available at www.amtrak.com.

In the unlikely event of cancellation of this entire conference by ASPRS, ASPRS will refund 100% of registrations fees paid. ASPRS assumes no liability for any penalty fees on transportation tickets, deposits for hotel accommodations or any other fees, charges, penalties or other incidental costs that a registrant might incur as a consequence of a conference cancellation.

ASPRS regrets that for safety and insurance reasons, children under the age of 13 years will not be allowed in the Exhibit Hall or any sessions at any time.

Frequently Asked Questions

How do I register for the conference?

Please register on-line or by using the registration form in this Program on page **53**. The form may be duplicated as needed. Complete the form (type, print clearly, or attach a business card). Your name badge will reflect this information. Payment will be accepted by Visa, MasterCard, American Express, checks made payable to ASPRS 2009 Annual Conference, and signed government purchase orders or training orders. Registrations received without payment will not be processed. Please do not mail your registration form after you have registered by fax or online.

Online:
www.asprs.org/baltimore09
(Visa, MasterCard, or American Express only)

Mail To:
ASPRS 2009 Annual Conference Registration
IMI International Meetings, Inc.
9901 Business Parkway, Suite J
Lanham, Maryland 20706
(all forms of payment)

Fax To:
ASPRS 2009 Annual Conference Registration
301-306-7603 (fax)
301-306 - 7606 (phone)
Toll-free 888-233-2864
(Visa, MasterCard, American Express/purchase orders only)

Will I receive confirmation of my registration?

Your registration will be confirmed by e-mail, mail or fax. A registration is not considered complete until all registration fees are received by the Meeting Registrar. Please notify the Meeting Registrar at 301-306-7606 or 888-233-2864 if you have not received your confirmation within two weeks of submitting your registration, or if you have any questions. Your registration packet will be available at the ASPRS Registration Desk, in the Baltimore Marriott Waterfront Hotel, during the registration hours noted in the Conference-at-a-Glance on page 5 of this program.

What is the cancellation/refund policy?

To qualify for a full refund, a written cancellation must be received by the ASPRS 2009 Annual Conference Meeting Registrar by February 9, 2009. For cancellations received by February 23, 2009, a 50 percent refund will apply. No refunds will be made after February 23, 2009. This policy applies to all fees paid for the conference. All refunds are subject to a $50.00 processing fee and will be issued one month after the conference concludes.
Cancellations for medical emergencies after the above deadline require a signed note from your physician.

What is the location of the Conference?

All ASPRS sponsored Conference activities will be held in the
Baltimore Marriott Waterfront Hotel
700 Aliceanna Street
Baltimore, Maryland 21202
410 385-3000
410 385-0330 (Fax)

What is the Moderator's Registration Policy?

All Moderators are REQUIRED TO PRE-REGISTER at the appropriate Full Registration Rate if they are attending the entire conference. Moderators who register for Daily Registration must register at the appropriate Daily Registration Rate. Moderators registered at the Full Registration Rate who attend the conference and fulfill all requirements as directed by the Conference Coordinator including submitting the required Moderator Report Form immediately after their session(s) will be eligible for the appropriate rebate. This rebate will be issued within 30 business days after the conference. There are no rebates for Presenter/Moderator Daily or Student registrants. Moderators must fulfill all requirements as supplied by their Conference Coordinator including submitting the required forms immediately after their session(s) to be eligible for the appropriate rebate.

What is the Technical Paper and Poster Presenter's Registration Policy?

All Technical Paper and Poster Presenters are REQUIRED TO PRE-REGISTER at the appropriate Full Registration Rate if they are attending the entire conference. Presenters who register for Daily Registration must register at the appropriate Daily Registration Rate. Presenters registered at the Full Registration Rate who attend the conference and present a technical paper(s) or poster(s) at this conference and submit the Presenter Rebate Request Form by the deadline, will receive a rebate reflecting the difference of the Full Registration Rate and the appropriate Presenter Registration Rate. This rebate will be issued within 30 business days after the conference. **There are no rebates for Presenter/Moderator Daily or Student registrants**. Moderators must fulfill all requirements as supplied by their Conference Coordinator including submitting the required Moderator Report Form immediately after their session(s) to be eligible for the appropriate rebate.

As a technical paper presenter or poster presenter, whose presentation has been accepted, when do I submit my work to be included in the proceedings?

You will need to register for the conference using the methods described above and submit your complete paper or poster as directed in the e-mail instructions you received previously – **no later than December 19, 2008**.

Do presenters bring their own laptops?

Yes, ASPRS does not provide laptops or desktop computers for presenters.

Do Presenters have a Preparation Room?

Yes. A room will be available on a first come basis from 8 am to 5 pm Monday March 9 through Thursday, March 12 and from 8 am to noon on Friday, March 13 and will be equipped with an LCD projector and screen. **ALL PRESENTERS ARE REQUIRED TO CHECK INTO THE PRESENTERS ROOM, INITIAL THE FINAL PROGRAM NEXT TO THEIR NAME AND INCLUDE EITHER A CELL PHONE NUMBER OR A HOTEL ROOM NUMBER.** This information is essential for the moderators to be certain that all presenters have arrived and are prepared to make their presentations. **All presenters must bring their own laptops for all presentations**. The location of this room will be announced in the Final Program that will be included with the on-site registration materials you receive when you check in at the ASPRS Registration Desk in the Baltimore Marriott Waterfront Hotel. We encourage all presenters to review their materials prior to their presentation.

What are Poster Presenters expected to do?

ASPRS provides to each poster presenter one side of a poster board, measuring eight feet wide by four feet high, and push pins. All poster presenters should plan to arrive between 7 am and 8 am on the date they are scheduled to display their work and affix it to any available board. All posters must be removed by 1 pm Friday, March 13. ASPRS is not responsible for posters that are not removed. All poster packaging must be removed from the poster area once posters are installed.

I am a part-time student at an accredited institution, do I qualify for student registration fee?

Anyone who is currently enrolled as a full or part-time student at an accredited college or university may register at the student registration rates if they have not previously held ASPRS membership in another category, e.g. someone who previously held full membership then returned to college cannot now register as a student. You must submit your registration by fax to the number on the form, with a copy of your student identification to qualify for the student registration fee.

Frequently Asked Questions

Are Workshops included with the registration fees?
No. Workshops require a separate registration and fee in addition to the general conference registration fees. Availability is based on space. We do not reserve spaces without full payment in advance and there is no waiting list. Workshop registrations must be postmarked by February 9, 2009. ASPRS reserves the right to cancel any workshop if the minimum number of registrations is not received by February 9, 2009. On-site registration will be available for confirmed workshops with available space.

Must I pre-register for the conference?
No. On-site Registration will be located in the Baltimore Marriott Waterfront Hotel. However, a deep discount is available to everyone registering at least 30 days prior to the conference start date. **All presenters applying for a rebate must pre-register (see details above.)**

Is there a charge for the User Group Meetings?
No, the User Group Meetings are free of charge, however some require advanced reservations. See page 7 of this program for details.

Are Daily Registrations permitted for all categories?
Yes. Daily registrations may be done in advance or on-site. However, a deep discount is available to those who register at least 30 days prior to the conference start date. If paying for a daily registration, you may purchase social tickets for that day only.

May I bring a Guest to the conference?
Yes, we welcome adult guests. This is a professional conference and children under age 13 are not permitted to attend any of the sessions or visit the Exhibit Hall. A separate registration fee has been set for all adult guests. (Please see Registration Form on page 53 of this program). This fee includes the admission to the Exhibit Hall, Exhibit Hall beverage breaks, the Exhibitors' Reception, and the 75th Anniversary Dinner and Show at the Baltimore Marriott Waterfront Hotel. (Please note, the Show may not be appropriate for children under 13 years of age.) Admission to the keynote, plenary and technical sessions is not included with this registration. If guests wish to attend any of these sessions, they must register at the appropriate rate.

Is there an additional charge for the Social Events?
If you are registered as Full, Presenter Full, or Spouse/Guest, the Exhibitors' Reception, and the 75th Anniversary Dinner and Show at the Baltimore Marriott Waterfront Hotel are included in the registration (see chart on page 53 of this program). All student and daily registrants, unregistered guests, and children (Please note, the show may not be appropriate for children under 13 years of age) must purchase tickets if they wish to attend the 75th Anniversary Dinner and Show. The ticket cost for children under 13 is $75 each. Children over 13 years of age must have an adult ticket. All tickets must be purchased in advance no later than 12 noon on Wednesday, March 11.

How do I become an ASPRS Member?
We are offering a special New Member Promotion to non-member attendees at the ASPRS 2009 Annual Conference. Your Annual Conference registration at the Non-Member rate entitles you to a complimentary 1-year ASPRS membership. We are also offering a New Student Member Promotion to student non-members. Your ASPRS 2009 Annual Conference registration at the Student Non-Member rate entitles you to a complimentary 1-year ASPRS Student membership. Once your paid conference registration has been confirmed, we will provide you with a membership application and instructions for completing and returning it, if you choose to accept the complimentary membership. Students must provide proof of current status with their application.

Is Disability Assistance Available?
If you have special needs addressed by the Americans with Disabilities Act, please contact ASPRS Headquarters at 301-493-0290 ext. 106. A written statement will be required outlining your particular needs. **Please submit all requests for assistance by February 9, 2009 so that appropriate arrangements can be made.**

Will there be a Press Room?
Yes, a room will be provided for use by members of the press who are registered for the conference. All attendees are encouraged to place applicable press releases in this room for distribution to the press. The location will be announced in the Final Program. Press conferences and interviews with ASPRS officers and Keynote speakers should be arranged in advance of the conference. Please contact Anna Marie Kinerney at akinerney@asprs.org to make these arrangements.

Why do I need a badge?
Your badge is proof that you paid your registration fee. For entrance to the keynote, plenary and technical sessions, Exhibit Hall and social events, you need to wear your name badge.

What if I forget or lose my badge?
A charge of $5 will be made for replacement of lost badges.

Why do I need tickets for certain events?
Your tickets are proof of payment for certain events and must be presented at the collection point. Lost tickets will not be replaced.

How do I get into the Exhibit Hall if I am not registered for the conference?
Daily Exhibit Hall badges may be purchased at the ASPRS Registration Desk in the Baltimore Marriott Waterfront Hotel. Everyone entering the Exhibit Hall must have a name badge, including children over 13 years of age. Children under 13 years of age are not permitted in the Exhibit Hall at any time due to insurance and safety regulations.

Will it be possible to post resumes and job openings?
Yes, a separate area will be located in the Exhibit Hall for all resumes and job postings. Please bring multiple copies of all postings to allow interested parties to take one and check the board frequently for new materials.

How do I get a copy of the CD-ROM Proceedings?
All registrants, except for Spouse/Guest, will receive a copy on-site with the registration materials. Additional copies can be ordered with the Conference Registration Form or purchased on-site for $20 at the ASPRS Booth in the Exhibit area.

I am not a US citizen and am coming from outside the United States, how do I get a Letter of Invitation to obtain a visa?
You must first register for the conference following the procedures outlined above, and then if you need a formal letter of invitation in obtain a visa, you will need to submit a request to:

Sokhan Hing, Membership Manager
ASPRS
5410 Grosvenor Lane, Bethesda, Maryland 20814
sokhanh@asprs.org

We strongly suggest that you register and apply for your visa as soon as possible since lengthy delays sometimes occur in obtaining visas. Letters of invitation will not be issued until your registration is finalized and all fees are paid.

Where is the ASPRS 2009 Annual Conference Registration Desk?
The ASPRS Conference Registration Desk is located in the Baltimore Marriott Waterfront Hotel.

What are the Conference Registration Desk Hours?

Sunday, March 8	4:00 pm to 7:00 pm
Monday, March 9	6:30 am to 5:00 pm
Tuesday, March 10	6:30 am to 5:00 pm
Wednesday, March 11	6:30 am to 5:45 pm
Thursday, March 12	7:00 am to 5:00 pm
Friday, March 13	7:00 am to 1:00 pm

Please Note: Registration materials will be available only during the above hours. Please schedule your arrival accordingly.

What are the Exhibit Hall Hours?

Wednesday, March 11	10:00 am to 7:00 pm
Exhibitors' Reception	5:30 pm to 7:00 pm
Thursday, March 12	9:00 am to 5:00 pm
Friday, March 13	9:00 am to 1:00 pm

Reflection of the Past, Vision for the Future

Baltimore, Maryland • March 9 to 13, 2009

Register on-line at www.asprs.org/baltimore09 or complete this form (type, print clearly, or attach a business card) and return to ASPRS 2009 Annual Conference Registration, 9901 Business Parkway, Suite J, Lanham, Maryland 20706. Phone: 301-306-7606 or toll-free: 888-233-2864 (all forms of payment accepted by mail) or fax to 301-306-7603 (Visa, MasterCard, and American Express or purchase orders only).

Personal Information

Preferred first name on badge: _____

Name (please print): _____
First Name *M.I.* *Last Name/Family Name* *Suffix*

Organization Name (if applicable): _____

Street Address: _____

City: _____ State/Province: _____

Zip Code/Postal Code: _____ Country: _____

Business Phone: _____ Home Phone: _____

Business Fax: _____ Email: _____

Emergency Contact Name: _____ Emergency Contact Phone: _____
Optional

Spouse/Guest Name: _____
If attending

❑ ASPRS Member (# _____)
Current membership status will be verified.

❑ Non-member

Are you Currently certified by ASPRS?

❑ Photogrammetrist (# _____)

❑ Mapping Scientist — Remote Sensing (# _____)

❑ Mapping Scientist — GIS/LIS (# _____)

❑ Technologist (# _____)

please check the appropriate boxes

Member Registration Fees

	Through February 9, 2009	After February 9, 2009
❑ **Full**	$450	$600
❑ Daily		
❑ Wednesday 03/11*	$245	$305
❑ Thursday 03/12	$190	$250
❑ Friday 03/13	$190	$250
❑ **Technical Paper/Poster Presenter/Moderator, Full**	$450	$600
❑ Technical Paper/Poster Presenter/Moderator, Daily		
❑ Wednesday 03/11*	$215	$265
❑ Thursday 03/12	$165	$210
❑ Friday 03/13	$165	$210
❑ **Student, Full**	$110	$125
❑ Student, Daily		
❑ Wednesday 03/11*	$60	$65
❑ Thursday 03/12	$40	$45
❑ Friday 03/13	$40	$45
❑ **Student Technical Paper/ Poster Presenter, Full**	$110	$125
❑ Student Technical Paper/Poster Presenter, Daily		
❑ Wednesday 03/11*	$60	$65
❑ Thursday 03/12	$40	$45
❑ Friday 03/13	$40	$45
❑ **Spouse/Guest**	$140	$140
❑ Exhibit Hall Only		
❑ Wednesday 03/11*	$75	$75
❑ Thursday 03/12	$40	$40
❑ Friday 03/13	$40	$40

**includes exhibitor reception*

Non-Member Registration Fees

	Through February 9, 2009	After February 9, 2009
❑ **Full**	$585	$715
❑ Daily		
❑ Wednesday 03/11*	$330	$375
❑ Thursday 03/12	$275	$320
❑ Friday 03/13	$275	$320
❑ **Technical Paper/Poster Presenter/Moderator, Full**	$585	$715
❑ Technical Paper/Poster Presenter/Moderator, Daily		
❑ Wednesday 03/11*	$315	$360
❑ Thursday 03/12	$260	$305
❑ Friday 03/13	$260	$305
❑ **Student, Full**	$165	$175
❑ Student, Daily		
❑ Wednesday 03/11*	$85	$95
❑ Thursday 03/12	$50	$60
❑ Friday 03/13	$50	$60
❑ **Student Technical Paper/ Poster Presenter, Full**	$165	$175
❑ Student Technical Paper/Poster Presenter, Daily		
❑ Wednesday 03/11*	$85	$95
❑ Thursday 03/12	$50	$60
❑ Friday 03/13	$50	$60
❑ **Spouse/Guest**	$140	$140
❑ Exhibit Hall Only		
❑ Wednesday 03/11*	$75	$75
❑ Thursday 03/12	$40	$40
❑ Friday 03/13	$40	$40

**includes exhibitor reception*

	Full Member-Non-member	Presenter Full Member-Non-member	Student Member-Non-member	Spouse/Guest	Daily, all registration categories
General & Technical Sessions	*	*	*		*
Exhibit Hall	*	*	*	*	*
Exhibitors' Reception	*	*	*	*	*
Thursday Dinner/Capitol Steps	*	*		*	
Conference Proceedings	*	*	*		*

$ _____
Subtotal

Workshops (not included in registration fee)

		Student**	Member	Non-Member
❑	Workshop 1 — Remote Sensing of Vegetation*, Monday 3/9 (AM)	$85	$165	$265
❑	Workshop 2 — Now That You have Land Use/Land Cover, What are You Going to Use it for?*, Monday 3/9 (PM)	$85	$165	$265
❑	Workshop 3 — Topics in Orthophoto Production*, Monday 3/9 (AM)	$85	$165	$265
❑	Workshop 4 — Marketing Your Business*, Monday 3/9 (PM)	$85	$165	$265
❑	Workshop 5 — Airborne GPS and Inertia in Support of Triangulation and Orientation of Airborne Framing and Push Broom Sensors, Monday 3/9	$120	$215	$315
❑	Workshop 6 — A Do-It-Yourself Approach to Lidar and Imagery Processing and Analysis Using Open-Source Tools, Monday 3/9	$120	$215	$315
❑	Workshop 6a — A Do-It-Yourself Approach to Lidar and Imagery Processing and Analysis Using Open-Source Tools*, Monday 3/9 (AM)	$85	$165	$265
❑	Workshop 7 — Introducing Active Hyperspectral Remote Sensing, Monday 3/9	$120	$215	$315
❑	Workshop 8 — Assessing the Accuracy of GIS Information Created from Remotely Sensed Data: Principles and Practices*, Tuesday 3/10 (AM)	$85	$165	$265
❑	Workshop 9 — Looking Above the Terrain Model: Lidar for Vegetation Assessment*, Tuesday 3/10 (PM)	$85	$165	$265
❑	Workshop 10 — Visual Interpretation, Photogrammetric Processing, and Feature Extraction of High-Resolution Satellite Imagery*, Tuesday 3/10 (morning)	$85	$165	$265
❑	Workshop 11 — GIS Updating from Imagery and Collateral Data Sources*, Tuesday 3/10 (PM)	$85	$165	$265
❑	Workshop 12 — Preparing for ASPRS Certification, Tuesday 3/10	$120	$215	$315
❑	Workshop 13 — Hyperspectral Image Processing and Feature Extraction: Maximizing Geospatial Information Retrieval, Tuesday 3/10	$120	$215	$315
❑	Workshop 14 — Professional Airborne Digital Mapping Systems - An Overview, Tuesday 3/10	$120	$215	$315

*denotes a half-day workshop.

**Students must provide a valid student ID when they register. Students will be allowed to attend workshops at the reduced price on a space available basis.
All student registrations for workshops that are received before February 9, will be held until that date. If there are spaces available at that time the student will be notified that their registration has been accepted. If a student workshop registration is not accepted, their workshop fee will be refunded in full.

NOTE: Individual workshops are subject to cancellation if the minimum number of required registrations are not received by February 9, 2009.
Workshops are limited to a maximum of 40 attendees per workshop. Popular workshops sell out early and we do NOT keep a waiting list.

Classified Session (not included in registration fee)

See page 47 for more details on the Classified Session

❑ Classified Session $85

This session will be held on **Tuesday, March 10, 2009** at **National Geospatial-Intelligence Agency (NGA) facility, 4600 Sangamore Road, Bethesda, Maryland**. Bus transportation for attendees will be provided from the ASPRS Conference Hotel. **Attendees must be U.S. citizens and have a SECRET/REL VEY clearance.**

Those wishing to register for this session must do so no later than February 9, 2009.

Social Events

❑ 75th Anniversary Dinner w/Capitol Steps Adult
Adult (ages 16+) # tickets _____ @ $**125** each
Child (to age 15) # tickets _____ @ $**75** each

The Capitol Steps production may not be appropriate for children under 13 years of age.

❑ Award Luncheon # tickets _____ @ $**50** each

Additional Proceedings

❑ CD-ROM Proceedings quantity _____ @ $**20** each

Each Full, Student, and Daily registrant will receive one copy of the conference proceedings as part of their registration. Extra copies of the proceedings may be purchased on site.

Method of Payment (Full payment must accompany this form.)

❑ Check (make payable to ASPRS 2009 Annual Conference, print attendee name on check)
❑ Visa ❑ MasterCard ❑ American Express

Name on Credit Card

Billing address of Credit Card Holder

Contact phone and email address for Credit Card Holder if other than registrant.

Credit Card Account Number Expires (Month/Year)

Cardholder Signature Date

❑ Purchase Order #_____ (government and university only)
Payments must be made in US dollars drawn on a U.S. bank or appropriate credit card. Make checks payable to ASPRS 2009 Annual Conference and print attendee name on check.

$_____ $_____
Subtotal from front of form Total amount enclosed

Presenters registered at the Full Registration Rate who actually present a technical paper(s) or poster(s) at the conference are eligible for a rebate reflecting the difference of the Full Registration Rate and the appropriate Presenter Full Registration Rate. Presenters must fill out and return the Rebate Request form to receive the rebate. This rebate will be issued within 30 business days after the conference. **There are no rebates for any other registration categories.**

To qualify for a full conference registration refund, a written cancellation must be received by the ASPRS 2009 Annual conference Meeting Registrar by close of business on February 9, 2009. For cancellations received by close of business February 23, 2009, a 50 percent refund will apply. No refunds will be made after February 23, 2009. This policy applies to all fees paid for the conference. All refunds are subject to a $50.00 processing fee and will be issued one month after the conference concludes.

Cancellations for medical emergencies after the above deadline will be considered on an individual basis and will require a physician's signed letter.

In the unlikely event ASPRS finds it necessary to cancel this entire conference, 100 percent of the registration fees paid will be refunded. ASPRS assumes no liability for any penalty fees on transportation tickets, deposits for hotel accommodations or any other fees, charges, penalties, or other incidental costs that a registrant might incur as a consequence of this conference being canceled.

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Preliminary Program

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Baltimore, Maryland

March 9-13, 2009