



Confluence by the Bay — A Gathering of Geospatial Insights

ASPRS 2013 Annual Conference

March 24-28, 2013

Baltimore Marriott Waterfront Hotel

Baltimore, Maryland USA

Final Program



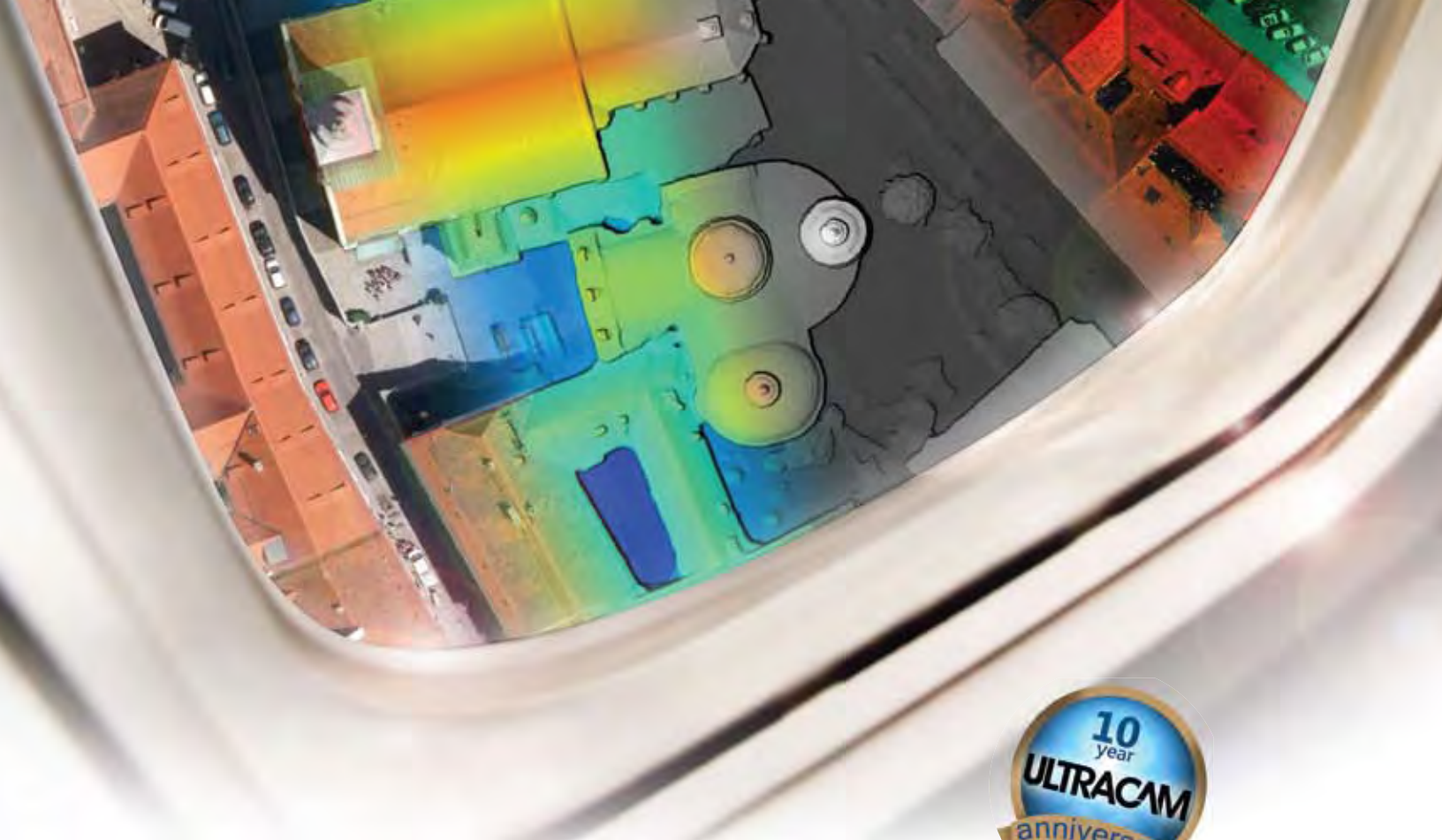
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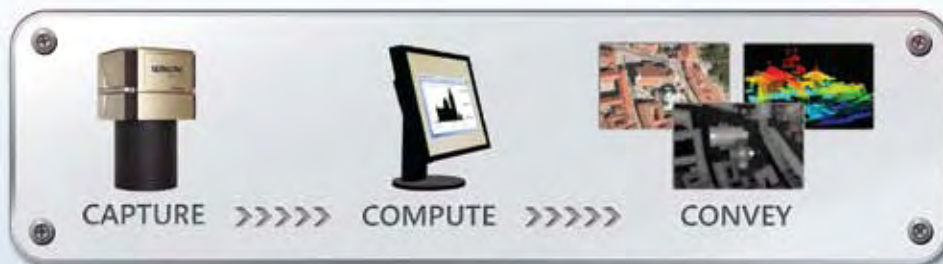


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A MESSAGE FROM GOVERNOR MARTIN O'MALLEY

Dear Friends:

Welcome to the American Society for Photogrammetry and Remote Sensing Conference.

Since 1934, ASPRS has been fostering innovation in photogrammetry, remote sensing, and other geospatial technologies. Maryland is home to an estimated 2,000 or more geospatial professionals and has been named #1 in entrepreneurship and innovation by the U.S. Chamber of Commerce.

Your conference's theme, "Confluence by the Bay – A Gathering of Geospatial Insights" is especially appropriate given the partnership of Photogrammetry and Remote Sensing and our own ongoing efforts to protect the Chesapeake Bay. Here in Maryland, we rely on GIS to track our progress on meeting strategic goals, like reducing nutrient levels in our watersheds leading to the Bay. By using a data-based management approach we can ensure that our government remains transparent and accountable.

Best wishes for a successful event and enjoy your stay in Baltimore.

Sincerely,

A handwritten signature in black ink, appearing to read "Martin O'Malley".

Governor

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Sponsors

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ULTRACAM



Don't Forget to Take a Break

Take a break and visit with the fantastic Exhibitors in the exhibit hall this week! Daily refreshment breaks will be held in the hall along with other fun and engaging events and games. Don't Miss Out!

See the schedule below for daily refreshment breaks:

Tuesday, March 26th

10:45 AM – 11:00 AM

3:00 PM – 3:30 PM

5:30 PM – Exhibitors' Reception

Wednesday, March 27th

9:00 AM – 9:15 AM

10:45 AM – 11:00 AM

3:00 PM – 3:30 PM

Thursday, March 28th

8:00 AM - Breakfast with Exhibitors & the Exhibit Hall

Passport Contest Prize Drawing

10:30 AM – 11:00 AM

The ASPRS Potomac Region and the 2013 Conference Planning Committee want to welcome you to the Annual Conference of the American Society for Photogrammetry and Remote Sensing (ASPRS) in Baltimore, Maryland. Our conference theme: "Confluence by the Bay – A Gathering of Geospatial Insights" was chosen to highlight the most recent advances in imaging and geospatial analysis through the synergy (i.e. "confluence" or "coming together") of researchers and practitioners to exchange ideas within the geospatial community. Our technical program, developed by David Johnson (USDA) and Claire Boryan (USDA), promises to address the imaging and geospatial confluence of the hydrologic, atmospheric, and terrestrial systems and their assessment via remotely sensed means. ASPRS members are encouraged to participate in ASPRS program development by attending the Division and Committee meetings, whose activities help shape the direction of the Society. The technical program contains over 400 technical presentations and Hot Topics that will address a myriad of topics including cutting edge applications such as cloud computing, object-based image analysis and accuracy assessment, and smartphone/mobile applications. The conference planning and execution is a big effort and we want to thank the entire organizing committee, the ASPRS Potomac Region, student volunteers, sponsors, exhibitors and presenters for their efforts in making this event outstanding.



John Iames

Our Tuesday morning keynote address by Dr. Hans W. Paerl, a renowned professor from the University of North Carolina's Institute of Marine Sciences, will detail the current conditions of global estuarine systems with respect to excessive nutrient loadings. Dr. Paerl will comment on the combined system analysis of ground-based measurements and airborne/spaceborne remote sensing data collection to assess nutrient enrichment and hydrologic alterations on water quality and sustainability of inland, estuarine, and coastal waters. On Wednesday morning our keynote speaker for the second Opening General Session is Jim Irons, NASA Project Scientist for the LDCM. Jim will update our geospatial community on the successful launch of the Landsat Data Continuity Mission (LDCM) and also the future direction for the National Land Imaging Program. In addition to these two quality keynote presentations, we also look forward to Wednesday's address by incoming ASPRS President Dr. Stephen D. DeGloria.



David Szymanski

In response to member suggestions, we have adjusted the conference schedule to allow an open night March 27 (Wednesday) for attendees to meet with colleagues/clients/friends. ASPRS National and the ASPRS Potomac Region have collaborated to provide a first night March 25 (Monday) welcoming social in Baltimore's charming Little Italy neighborhood at the award winning Da Mimmo's Italian Restaurant. Exquisite food, great music, and bocce competition will highlight this event in this historic district. The exhibitor's reception on Tuesday night March 26 also allows for an opportunity to reconnect and network.

Please fully participate in everything the conference has to offer, strengthen professional relationships with colleagues, and leave with a memorable, enriched experience. Best wishes and enjoy!

A handwritten signature in black ink, appearing to read "John Iames".

John Iames
Conference Co-Director

A handwritten signature in black ink, appearing to read "David C. Szymanski".


Dave Szymanski
Conference Co-Director

Media Sponsors

ASPRS would like to Thank our Media Sponsors for continually supporting our organization, the conferences and our exhibitors. These partnerships are a valuable key to our success.

American Surveyor

www.amerisurv.com

 A Spatial Media publication. Dr. Gene Roe leads an expert editorial team, bringing insights and commentary to readers via websites, blogs, eNewsletters & the print editions. Spatial Media (Frederick, Maryland) is an advanced internet media provider, operating websites, eNewsletters and interactive magazines. Publications include The American Surveyor (www.amerisurv.com), GISuser.com, LBSzone.com, Machine Control Magazine (www.machinecontrolonline.com) and others.


COORDINATES

www.mycoordinates.org

 COORDINATES is an international monthly magazine on positioning, navigation and geospatial technologies and applications. In its 9th year, it is widely circulated in Asia, Australia, New Zealand, Europe, N. America. Download the complete magazine including the AD's free from www.mycoordinates.org.


Directions Magazine

www.directionsmag.com

 Directions Magazine is the worldwide leader in delivering timely news and technology trends to professionals using geospatial technology and location intelligent software solutions. We bring awareness to the news that shapes the geospatially-enabled IT marketplace and the expansion of mobile location-based applications. Read Directionsmag.com, everyday for the most complete coverage of all things location.


Earth Imaging Journal (EIJ)

www.eijournal.com

 Earth Imaging Journal is devoted to exploring the world of remote sensing. The bimonthly publication focuses on the dominant business applications that support the international remote sensing industry, emphasizing the inherent beauty and informational value of Earth imagery from numerous sources. The magazine also delivers insightful perspectives on remote sensing policy initiatives and covers niche markets as they develop. Earth Imaging Journal is complemented by its Web site, www.eijournal.com, and its weekly electronic newsletter, Earth Imaging Express. Subscribe online at www.eijournal.com.


EARTH Magazine

www.earthmagazine.org

 Each monthly issue of EARTH gives readers definitive coverage on topics from natural resources, energy, natural disasters and the environment to space exploration and paleontology and much, much more. EARTH explores the science behind the headlines with timely, relevant editorial content, numerous photos, illustrations, and great maps, with an increasingly diverse mix of topics in each issue. EARTH's readers are spread across the earth science disciplines in academia, government, research and the private sector, people who are involved directly in the issues affecting everyone daily. Awareness of our planet has never been as critical as it is today. EARTH is available digitally at Zinio.com for just \$19.99.


Geoinformatics

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 Geoinformatics Magazine is the leading publication for Surveying, Mapping, GIS, Photogrammetry and Remote Sensing Professionals. The magazine is available in print and digital (fluid book). Please visit the daily updated website www.geoinformatics.com and start your free subscription to Geoinformatics.

GIM International

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 GIM International – Your Source for Geomatics
GIM International, the global magazine for geomatics (also available in digital), its related e-newsletter and the website www.gim-international.com focus on reporting the latest news and communicating new developments and applications in geomatics. GIM International addresses both technological and managerial aspects of the industry and profession.

GISCafe.com

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 GIS Cafe is a portal offering GIS and geospatial professionals complete GIS product catalog listings, technical papers, GIS news, CEO interviews, multimedia presentations, priority press releases, event postings, job placement and more. Each GISWeekly Review delivers to its readers news concerning the latest developments in the GIS industry, in a readable newsletter format with feature stories and news bytes. GIS Cafe receives more than 100,000 unique visitors and its daily newsletter has more than 40,000 subscribers. Subscribe to the daily newsletter at GISCafe.Com.


GISuser.com

www.gisuser.com

A Spatial Media publication. Dr. Gene Roe leads an expert editorial team, bringing insights and commentary to readers via websites, blogs, eNewsletters & the print editions. Spatial Media (Frederick, Maryland) is an advanced internet media provider, operating websites, eNewsletters and interactive magazines. Publications include The American Surveyor (www.amerisurv.com), GISuser.com, LBSzone.com, Machine Control Magazine (www.machinecontrolonline.com) and others.

Imaging Notes


www.imagingnotes.com

 Imaging Notes is a quarterly print publication and monthly eNews covering Earth remote sensing for security, energy and the environment. Reporting is in-depth and exclusive, about the uses of imagery and geospatial solutions worldwide. On www.imagingnotes.com, you can subscribe quickly, read eNews and the current issue, search the archive of in-depth articles, and obtain advertising information.

Imaging Notes is a proud partner of The Location Media Alliance, which also includes Sensors & Systems, Informed Infrastructure, LBx Journal and Asian Surveying & Mapping.


LiDARnews.com

www.lidarnews.com

 LiDAR News (www.lidarnews.com), a Spatial Media publication, that promotes the adoption of LiDAR and 3D imaging technology. Dr. Gene Roe leads an expert editorial team, bringing insights and commentary to readers via websites, blogs, eNewsletters & the print edition of LiDAR Magazine. Spatial Media (Frederick, Maryland) is an advanced internet media provider, operating websites, eNewsletters and interactive magazines. Publications include The American Surveyor (www.amerisurv.com), GISuser.com, LBSzone.com, Machine Control Magazine (www.machinecontrolonline.com) and others.


POB

www.pobonline.com

 Founded in 1975, Point of Beginning, also known as POB, serves the surveying and mapping profession through an informative national print publication, bimonthly eNewsletters, a comprehensive website, digital magazines and a professional online community, www.pobonline.com.


Professional Surveyor Magazine

www.profsurv.com

 Professional Surveyor Magazine: Business and technology information for land and hydrographic surveyors, photogrammetrists, and lidar/GIS professionals. Published with it are annual Aerial Mapping and Red Pages supplements, and e-newsletters Pangaea and Field Notes, the latest in geospatial technologies.

Sensors & Systems

www.sensorsandsystems.com

 Sensors & Systems (www.sensorsandsystems.com), covers the integrated technologies of GIS, remote sensing, modeling, spatial analysis, surveying and sensor technologies for the stewardship of our planet. We focus on some of the key challenges that these tools help us address, including energy, water, food, biodiversity, environment and security.

PROCLAMATION

BY

MAYOR STEPHANIE RAWLINGS-BLAKE

DESIGNATING MARCH 24-28, 2013

AS

“AMERICAN SOCIETY OF PHOTOGRAMMETRY AND REMOTE

SENSING DAYS”

IN RECOGNITION OF THEIR ANNUAL CONFERENCE

IN BALTIMORE

WHEREAS, founded in 1934, the American Society for Photogrammetry and Remote Sensing (ASPRS) is a scientific association serving more than 7,000 professionals worldwide; and

WHEREAS, their mission is to promote the ethical application of active and passive sensors, the disciplines of photogrammetry, remote sensing, geographic information systems, and other supporting technologies; to advance the understanding of the geospatial and related sciences; to expand public awareness of the profession; and to promote a balanced representation of the interests of government, academia, and private enterprise; and

WHEREAS, this year’s conference theme: *Confluence by the Bay – A Gathering of Geospatial Insights*, refers to the coming together of researchers and practitioners for the purpose of open dialogue with respect to the most recent advances in geospatial analysis; and

WHEREAS, the citizens of Baltimore encourage the attendees of ASPRS’s Annual Conference to take advantage of all the wonderful things our city has to offer while learning the most up to date information on geospatial analysis. Welcome to our city!

THEREFORE, I, STEPHANIE RAWLINGS-BLAKE, MAYOR OF THE CITY OF BALTIMORE, do hereby proclaim March 24-28, 2013, as “AMERICAN SOCIETY OF PHOTOGRAMMETRY AND REMOTE SENSING DAYS” IN BALTIMORE, and do urge all citizens to join in this celebration.

IN WITNESS WHEREOF, I have hereunto set the Great Seal of the City of Baltimore to be affixed this twenty-fourth day of March, two thousand thirteen.



Stephanie Rawlings-Blake

Mayor

Frequently Asked Questions

How do I get help in an Emergency?

Contact an ASPRS staff person or pick up any house phone in the Baltimore Marriott Waterfront Hotel and ask for Security. Give all details of the emergency including the location. DO NOT CALL 911.

Where is the Conference Registration Desk?

The Conference Registration Desk is located in the Baltimore Marriott Waterfront Hotel on the third floor at Convention Registration.

What are the Conference Registration Desk Hours?

Saturday, March 23 rd	4:00 PM to 7:00 PM
Sunday, March 24 th	6:30 AM to 5:00 PM
Monday, March 25 th	6:30 AM to 5:00 PM
Tuesday, March 26 th	7:00 AM to 5:45 PM
Wednesday, March 27 th	7:00 AM to 5:00 PM
Thursday, March 28 th	7:00 AM to 11:00 AM

Conference Registration materials are available only during the above hours. Once the Conference Registration Desk is closed, materials will not be available until the following morning.

What are the Exhibit Hall Hours?

The exhibit hall is located in the Grand Ballroom on the third floor of the Baltimore Marriott Waterfront Hotel.

Tuesday, March 26 th	10:30 AM to 7:00 PM
<i>Exhibitors' Reception</i>	<i>5:30 PM to 7:00 PM</i>
Wednesday, March 27 th	9:00 AM to 5:00 PM
Thursday, March 28 th	8:00 AM to 11:00 AM

Are Workshops included with the registration fees?

No. Workshops require individual registration and a separate fee in addition to the general conference registration fees. Conference registration is not required to attend a workshop but early registration is advisable. Availability is based on space.

Is there a charge for the User Group Meetings?

No, the User Group Meetings are free of charge; however, some may require advanced registration.

Are Daily Registrations permitted for all categories?

Yes. Daily registrations are available on-site. If registering for only one day, you may purchase social tickets for that day only.

What does the Daily Registration include?

Daily Registrations include that day's general and technical sessions, exhibits and proceedings. Daily Registration for Tuesday, March 26th includes the Exhibitors' Reception from 5:30 pm until 7:00 pm. Tickets for the Conference & Region combined social on Monday, March 25th may be purchased separately.

Is there an ASPRS staff office on-site?

Yes, the ASPRS staff office is located in the Baltimore Marriott Waterfront Hotel on the fourth floor in the James room.

What should presenters do after they register?

ALL PRESENTERS ARE REQUIRED TO CHECK IN AT THE CONFERENCE REGISTRATION DESK BY INITIALING THE MASTER FINAL PROGRAM NEXT TO THEIR NAME AND INCLUDING EITHER A CELL PHONE NUMBER OR A HOTEL ROOM NUMBER. A Master Program will be posted at the Conference Registration Desk. This information is essential for the moderators to determine that all presenters have arrived and are prepared to make their presentations.

Do presenters bring their own laptops?

ASPRS does **NOT provide laptops or desktop computers**, laser pointers, internet or flip charts for speakers. Projectors will be provided in all meeting rooms.

What does ASPRS provided in each Technical Session room?

Each technical session room will be equipped with a LCD projector and screen. A microphone will be provided when necessary. ASPRS does **NOT provide internet access, laser pointers, or laptop computers for the technical sessions.**

Do Presenters have a Preparation Room?

Yes, the Falkland room on the fourth floor has been reserved for Presenters. The room will be available on a first come basis and should be used for rehearsal only.

Monday, March 25 th	8:00 AM to 5:00 PM
Tuesday, March 26 th	8:00 AM to 5:00 PM
Wednesday, March 27 th	8:00 AM to 5:00 PM
Thursday, March 28 th	8:00 AM to 12:00 NOON

This room will be equipped with an LCD projector and screen. **All presenters must bring their own laptops for all presentations.** We encourage all presenters to review their materials prior to their presentation.

Do Moderators need to check-in?

Yes, as soon as you arrive, at the Conference Registration Desk a Master Final Program will be posted. Please put your initials and cell phone number or hotel room number beside your name on this Master Program. We are asking the presenters to do the same thing. This will be our way of knowing that moderators and presenters have arrived.

Prior to your session, check back at the Conference Registration Desk Master Final Program to confirm that all of your presenters have arrived at the conference.

What are Poster Presenters expected to do?

ASPRS provides to each poster presenter one side of a poster board and push pins. Poster boards will be located in Exhibit Hall A, first floor of the convention center. All poster presenters should plan to arrive no earlier than 7:30 am on Tuesday, March 26th to display their work and affix it to any available board. Poster presenters **MUST ALSO CHECK IN AT THE CONFERENCE REGISTRATION DESK BY INITIALING THE MASTER FINAL PROGRAM NEXT TO THEIR NAME AND INCLUDING EITHER A CELL PHONE NUMBER OR A HOTEL ROOM NUMBER.** A Master Program will be posted at the Conference Registration Desk. This information is essential for the moderators to determine that all poster presenters have arrived and are prepared to make their presentations.

All posters must be removed by 11 am Thursday, March 28th.

ASPRS is not responsible for posters that are not removed. All poster packaging must be removed from the poster area once posters are installed.

Where should Student Assistants and Volunteers report?

All Student Assistants and Volunteers should check in with the Volunteer Coordinator in the Chasseur room on the third floor of the Baltimore Marriott Waterfront Hotel when they arrive to coordinator their work assignments. All volunteers should plan to arrive at least 30 minutes before their scheduled start time.

Frequently Asked Questions

Why do I need a badge?

Your badge is proof that you paid your registration fee. For entrance to the General Sessions, plenary and technical sessions, and Exhibit Hall, 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.

Is there an additional charge for the Conference & Region Social Event?

All daily registrants, unregistered guests, and children must purchase tickets if they wish to attend the Conference & Region Social event. The ticket cost for children under 13 is \$35 each. Children 13 years of age and over must have an adult ticket. All tickets must be purchased in advance no later than 10 am on Sunday, March 24, 2013. The cost of an adult ticket is \$85. See page 42 of this program for complete details.

How can I visit the Exhibit Hall if I am not registered for the conference?

Daily Exhibit Hall badges may be purchased at the Conference 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, posting boards are provided near the Exhibit Hall for all resumes and job openings. 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 Proceedings?

All registrants, except for those registered as Spouse/Guest, will receive access to the online proceedings on the conference website. Access for additional people can be ordered on-site for \$20. *ASPRS has requested proceedings from all speakers and is not responsible for the number of proceedings submitted.*

How can someone from outside the hotel contact me?

Messages cannot be personally delivered to Conference attendees due to the varied schedules of everyone in attendance. Cell phone numbers should be made available to anyone needing to contact a conference attendee.

Is there a Lost and Found?

Please contact either the Hyatt Regency Sacramento Hotel Security or the Baltimore Marriott Waterfront Hotel Security for all lost and found items.

Where can I store my bags/luggage?

Please contact the Hotel Bellman Desk for storage of your personal items. There may be a fee for this service. **ASPRS is NOT** responsible for your bags or luggage during the Conference and will not hold personal items.

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**UltraCam User Group Meeting
ASPRS 2013 Annual Conference**

Monday, March 25th | 8:00am – 12:00 noon
Harborside Ballroom C, 4th Floor | Baltimore Marriott Waterfront Hotel

Visit Microsoft at Booth #207 for details.

**Come see a new
breed of UltraCam.**



Awards for Outstanding Papers, Professional Achievement, Service and Region activities are determined by committee selection; scholarships and academic awards are also determined by committee selection but are chosen from among current applications. For details on the application process, see: <http://www.asprs.org/ASPRS-Awards-and-Scholarships.html>

Keynote Address

Honorary Member Award

Outstanding Technical Achievement Award

Photogrammetric (Fairchild) Award

ASPRS Honorary Member

2013 Recipients: Clifford W. Greve and Vincent V. Salomonson

Clifford W. Greve has over 25 years of work experience in project management, systems development, and corporate management. Since 2006 he has served as Senior Vice President, Science Applications International Corporation (SAIC) where, as an unscheduled professional, he provides part time technical and management services to help in the conduct of the National Geospatial-Intelligence Agency (NGA) GGI contract. He also helps in proposal preparation, and business development. From 1995-2006 Greve was SAIC Senior Vice President/Director of Imagery and Remote Sensing Systems where he was manager of the NGA Omnibus and GGI contracts, and was capture manager on both of those efforts. He also served as manager of the NOAA Coastal Mapping and USGS CSC-II contracts, and was capture manager on those efforts as well.

Before moving to SAIC, Greve worked for the U.S. Geological Survey for three years as Special Assistant for Technology to the Chief, National Mapping Division, and was responsible for advising the Chief on technology matters. In the performance of these duties, Greve was intimately involved in legislative and technical issues surrounding the Landsat program, and has been a liaison to many interagency committees involved in the definition of Landsat and other earth observing systems. He managed a research project in Temporal Geographic Information Systems, among other duties. He defined and guided the procurement of the National Advanced Remote Sensing Applications Program, a suite of workstations designed to combine civilian and intelligence remote sensing for land management and environmental applications. He chaired the "proponency" panel of the Classification Review Task Force, and was instrumental in generating the policy that released the early intelligence satellite imagery into the public domain and decompartmented much of the remainder of the information. He was the Civilian Applications Committee delegate to the Imagery Policy Subcommittee and the Imagery Research and Development Committee. He served on the National Imagery Agency Task Force and Steering Committee, representing the Civilian Applications Committee.

Greve worked for Autometric, Incorporated from 1972-1992. There he served in many capacities, beginning at Senior Scientist, culminating in the CEO position, which he held from 1979 until 1991. During his tenure as CEO, Autometric grew from an annual sales volume of \$1.1 million to an annual volume of \$23 million. He was program manager on numerous technical efforts, including the development of on line photogrammetric mensuration systems, the development of the target scene generation system for the conventional cruise missile, and the development of the Wetlands Analytical Mapping System for the Fish and Wildlife Service.

In addition, he holds a patent on the APPS-IV Analytical Stereoplotter. He has participated heavily in many studies and development efforts for the military and intelligence communities and served as a member of the Mapping Sciences Committee of the National Research Council.

Greve's early career included work in the Topographic Division at the USGS, then four years in the U.S. Army, where he was assigned to the U.S. Army Engineer Topographic Laboratories. While there he performed investigations into error modelling for ambiguous range positioning systems, and developed software to drive an automated stellar comparator. He also performed research into the optimization of geodetic network observations using non-linear programming methods. He received a BSE and MSE in Civil Engineering (1966, 1967) from the University of Michigan and a PhD in Geodesy and Photogrammetry from Cornell University (1969).

A Past President and Fellow of ASPRS and Vice President of the ASPRS Foundation, Greve is a Certified Photogrammetrist. He is a member of American Congress on Surveying and Mapping and several honorary societies. In 1980 he received the ASPRS Photogrammetric Award and in 1994 received the Intelligence Community Seal Medallion-Presented by the DCI, for efforts on the Classification Review Task Force. He has published more than 25 professional papers, and authored or been a primary contributor to well over 100 technical reports.

Vincent V. Salomonson is a Research Professor at the University of Utah where he has served since 2005. He has substantial depth and breadth of experience spanning nearly 40 years working at NASA and the Goddard Space Flight Center relative to developing and applying space technology for basic and applied research studies of Earth system processes and applications enabling Earth resources surveys and management. He was a Senior Scientist in the Earth Sciences Directorate at the Goddard Space Flight Center of NASA from 2001-2005. He has also been serving as the Science Team Leader for the NASA Earth Observing System (EOS) facility instrument, called the Moderate Resolution Imaging Spectrometer (MODIS), that is flying on the EOS Terra and Aqua missions since 1988 to the present and as Principal Investigator and Co-Investigator for the development and refinement of the MODIS snow and ice products. In the Science Team Leader position he is leading a Science Team of over 90 Principal Investigators providing some 40 data products from MODIS to the Earth science and applications communities and performing scientific studies of global and regional land, ocean, and atmospheric processes and trends using MODIS observations.

Prior to being Senior Scientist Salomonson served with distinction as the Director of the Earth Sciences Directorate at the Goddard Space Flight Center, NASA from 1990-2000. In that capacity he was responsible for overseeing and coordinating the activities of approximately 300 civil service scientists and engineers in the Directorate who were actively involved in research of the Earth-Atmosphere system using advanced technology along with over 700 supporting contractors, students and visiting faculty. He served at Goddard as the Deputy Director for Earth Sciences in the Space and Earth Sciences Directorate (1988-1990), Chief of the Laboratory for Terrestrial Physics (1980-1988), Project Scientist for Landsat 4 and 5 (1977-1989), the Head of the Hydrospheric Sciences Branch (1973-1980), and as a research meteorologist (1968-1973).

Prior to his employment at Goddard, Salomonson spent three years as Weather Officer in the United States Air Force (1959-1962). His academic training includes a BS degree in Agricultural Engineering from Colorado State University (1959), a BS degree in Meteorology from the University of Utah (1960), an MS degree in Agricultural Engineering from Cornell University (1964), and a PhD in Atmospheric Science from Colorado State University (1968). His publication record shows more than 130 publications in scientific journals, conference proceedings, and NASA reports.

Salomonson has received numerous recognitions for his work and leadership. These include the Goddard Exceptional Performance Award (1975) for his work as Chairman of the NASA Sub-discipline Panel for

Water Resources, the NASA Exceptional Scientific Achievement Medal (1976) for outstanding contributions in the practical applications of remote sensing data in the water resources field, the NASA Exceptional Scientific Achievement Medal (1983) in recognition of his extensive contributions to land remote sensing as Landsat 4 and 5 Project Scientist, the NASA/U.S. Geological Survey William T. Pecora Award (1993) for his overall contributions to satellite remote sensing, and the NASA Outstanding Leadership Medal (1996) for his leadership of the Goddard Earth Sciences Directorate. In 1993 he received the rank of Meritorious Executive and in 1998 the rank of Distinguished Executive in the Senior Executive Service. In 2002 he was named a Goddard Senior Fellow and received the William Nordberg Memorial Award from the Goddard Space Flight Center.

Salomonson has served the IEEE Geoscience and Remote Sensing Society (GRS-S) in several leadership capacities including being a member of the Executive Administrative Committee ("Ad-Com") for several years. He has also served in leadership capacities for the American Society for Photogrammetry and Remote Sensing (ASPRS) including being ASPRS President in 1991/1992. He was made a Fellow of ASPRS in 1994. In 1999 he was made a Fellow of the IEEE. He is also a member of the American Meteorological Society and the American Geophysical Union and serves as an Associate Editor for the *Remote Sensing of Environment Journal*.

ASPRS Outstanding Technical Achievement Award

2013 Recipient: Clive Fraser

This year's recipient of the Outstanding Technical Achievement Award is Dr. Clive Fraser for his development and production of the digital camera calibration program "*Australis*."

Fraser serves as Honorary Professor of Infrastructure Engineering, Program Science Director, Cooperative Research Center for Spatial Information, and Professional Fellow, Department of Infrastructure Engineering, University of Melbourne, Australia. Fraser's areas of research include digital close-range photogrammetry, industrial measurement systems and the metric exploitation of high-resolution satellite imagery. He is a Fellow of the American Society for Photogrammetry and Remote Sensing (ASPRS), Australian Academy of Technological Sciences and Engineering, and Engineers Australia as well as an Honorary Member of the Remote Sensing and Photogrammetry Society of the UK. He has earned numerous international awards including the Fairchild Photogrammetric Award, the Talbert Abrams Award, Wild Heerbrugg and Bausch & Lomb Awards, all from ASPRS; and the President's Medal, President's Prize, and the E.H. Thompson Award from the Remote Sensing & Photogrammetry Society. He has authored more than 280 publications and serves on the editorial boards of four leading international journals that focus on photogrammetry and remote sensing. He received his PhD degree from the University of Washington, MSurvSc from the University of New South Wales, and BAppSc from Curtin University of Technology, Australia.

The *Australis* automatic camera calibration system was developed to accommodate contemporary calibration requirements. The significant features of *Australis* are efficiency, flexibility, automation, and calibration

to the highest metric standards. *Australis* is a software system for digital camera self-calibration that incorporates an innovative workflow for improved efficiency and effectiveness. The system incorporates the use of coded targets for automated exterior orientation. Once a network of target field images is established, recorded, and uploaded to *Australis*, the calibration process is completed as a push-button operation.

The *Australis* system represents the industry standard calibration system for digital cameras. The mathematical model rigorously represents camera parameters to be calibrated. The model uses the projective equations to represent interior orientation parameters and odd powered polynomial for radial distortion. The model also includes a decentering distortion equation originally developed by Duane Brown. Advantages of *Australis* include (1) cost savings from not having to survey X,Y,Z coordinates of targets, (2) ease of operation, (3) performance of simultaneous bundle block adjustment using a least squares solution with relevant output of graphics and results of the calibration, (4) practicality due to laboratory rather than *in situ* target acquisition resulting in significant cost savings, (5) significant scientific impact being rigorous, less expensive, and less time consuming than other camera calibration systems, (6) originality, and (7) broad-scale international use by photogrammetrist and non-photogrammetrists in industry and government.

The ASPRS Outstanding Technical Achievement Award was introduced for the first time in 2012. This Award consists of a silver presentation plaque mounted on a walnut wood panel plus a check for \$5,000.

Purpose: This generous grant is designed to reward the developer[s] of a specific breakthrough technology which causes quantum advances in the practice of photogrammetry, remote sensing or geographic information systems in the United States.

Donor: In 2011, ASPRS and the ASPRS Foundation received a very generous individual donation of \$90,000 to endow a new Outstanding Technical Achievement Award.

In accordance with the wishes of the donor, a long time ASPRS member, this donation was made anonymously. ASPRS has agreed to match \$35,000 of the donation in accordance with its current matching policy, for a total of approximately \$125,000. The result of the match ensures that this annual Award will be fully endowed at the \$5000 level.

Past Award Recipient:

2012: Franz Leberl

The Photogrammetric (Fairchild) Award

2013 Recipient: Christian Heipke

The 2013 Photogrammetric Award (Fairchild) is awarded to Prof. Dr. Christian Heipke in recognition of his major contributions to the science and art of photogrammetry. His contributions include advancing the transition from analytical to digital photogrammetry, significant achievements in object extraction from digital imagery and image matching, progressing the introduction of softcopy systems, and, more recently, helping to reinforce the essential connection between photogrammetry and computer vision.

Heipke received his MSc and PhD from the Technical University of Munich in 1986 and 1990, respectively. He has been a visiting researcher and professor at several universities, including the University of North South Wales, Australia; Technical University of Munich, Germany; The Ohio State University, Columbus, OH; and *École Polytechnique Fédérale de Lausanne*, Switzerland. He obtained his *Habilitation* (the highest academic qualification given overseas) in 1994, and has been a Full Professor and the head of the Institute of Photogrammetry and GeoInformation at the Leibniz University Hannover since 1998.

As a professor, Heipke has supervised more than 100 graduate students, including 24 PhD dissertations. He has published over 400 papers (including 75 peer-reviewed) in a wide range of technical journals in the field of photogrammetry. He has been on the editorial boards of several technical journals, and has served as Chair or Co-chair on the program committee of numerous conferences, including the world renowned biannual Hannover Workshop. He has received several awards, including Otto von Gruber Award (International Society of Photogrammetry and Remote Sensing [ISPRS], 1992), Duane C. Brown Award (The Ohio

State University, 1995), ESRI Award (ASPRS, 2005), and Frederick J. Doyle Award (ISPRS, 2012).

During the XXII World Congress, recently held in Melbourne, Australia, Heipke was elected as Secretary General of ISPRS and will serve in that role from 2012 through 2016. He has chaired several ISPRS Working Groups on “Digital systems for image analysis”, “Systems for automated geo-spatial data production and updating from imagery”, “Automated geo-spatial data acquisition and mapping”, and “Automatic geospatial data acquisition and image-based databases” from 1996 to 2012 and has assumed several leadership roles in EuroSDR since 1996.

Purpose: The Photogrammetric (Fairchild) Award is designed to stimulate the development of the art of aerial photogrammetry in the United States. Practicability is the essence of the Award and is the basis for the review of all candidates.

Donor: The ASPRS Foundation and Lockheed Martin

The award consists of a silver presentation plaque mounted on a walnut wood panel and an engraved plaque.

Past Award Recipients:

2008: Donald L. Light

2009: Charles K. Toth

2010: Qassim Abdullah

2011: Ayman F. Habib

2012: Dean Merchant

79th Business Meeting and 24th Awards Luncheon

Welcome	Roberta Lenczowski	Teller's Report	Larry Hothem
Lunch			
Introduction of Guests	Roberta Lenczowski	Installation of New and Re-elected Directors	Roberta Lenczowski
Presentation of ASPRS Awards	Alan R. Stevens Roberta Lenczowski	Nicholas William Hazelton, Alaska Region Thomas J. Young, Florida Region Lucinda A. Clark, Intermountain Region Haluk Cetin, Mid-South Region John J. Trunkwalter, North Atlantic Region Douglas Fuller, Western Great Lakes Allen E. Cook, Primary Data Acquisition Division Brian Murphy, Sustaining Members Council	
Outstanding Papers Awards		Installation of New Assistant Directors	Roberta Lenczowski
Boeing Award for Best Paper in Image Analysis and Interpretation John I. Davidson President's Award for Practical Papers ERDAS Award for Best Scientific Paper in Remote Sensing ESRI Award for Best Scientific Paper in GIS Talbert Abrams Award		Pierre LeRoux, Primary Data Acquisition Division TBA, Sustaining Members Council	
Scholarships and Academic Awards		Installation of President-Elect & Vice President	Roberta Lenczowski
Robert E. Altenhofen Memorial Scholarship Abraham Anson Memorial Scholarship John O. Behrens ILI Memorial Scholarship Robert N. Colwell Memorial Fellowship ERDAS Internship William A. Fischer Memorial Scholarship GeoEye Foundation Award Francis H. Moffitt Memorial Scholarship Kenneth J. Osborn Memorial Scholarship Ta Liang Memorial Award Z/I Imaging Award International Educational Literature Award		A. Stewart Walker, President-Elect E. Lynn Usery, Vice-President	
Service Awards		Installation of Incoming President	Roberta Lenczowski
Outstanding Service Award Ford Bartlett Membership Award SAIC/Estes Memorial Teaching Award Outstanding Workshop Instructor Award George E. Brown, Jr. Congressional Honor Award		Stephen D. DeGloria	
President's Report	Roberta Lenczowski	Presentation of Birdseye Citation & President's Key to Retiring President	Stephen D. DeGloria
		Roberta Lenczowski	
Executive Director's Report	James R. Plasker	Adjournment	
Recognition of Retiring Members of Board of Directors and Executive Committee	Roberta Lenczowski		
Nicholas William Hazelton, Alaska Region Thomas J. Young, Florida Region Haluk Cetin, Mid-South Region David Stolarz, North Atlantic Region Douglas Fuller, Western Great Lakes Region Lucinda A. Clark, Intermountain Region Robert E. Ryan, Primary Data Acquisition Division Jim Green, Sustaining Members Council			

Boeing Award for Best Paper in Image Analysis and Interpretation

2013 Recipients: Jan Svejksky, W. Lehr, Judd Muskat, George Graettinger and Joseph Mullin for “Operational Utilization of Aerial Multispectral Remote Sensing during Oil Spill Response: Lessons Learned During the Deepwater Horizon (MC-252) Spill,” *PE&RS*, 78 (10), 1089-1102.

Purpose: Established in 1965 as the Autometric Award, this grant recognizes development and achievement in the field of photographic interpretation through special acknowledgment of superior publications on the various aspects of image analysis and interpretation.

Donor: Boeing S&IS Mission Systems through the ASPRS Foundation
The Award includes an inscribed certificate and a cash award of \$1,000.

Past Award Recipients:

2008: Xiaoliang Lu, Ronggao Liu, Jiyan Liu, and Shunlin Liang
2009: Robert A. Chastain, Jr., Matthew A. Struckhoff, Hong S. He, and David R. Larsen
2010: Xin Huang, Liangpei Zhang, and Pingxiang Li
2011: Thomas B. Pollard, Ibrahim Eden, Joseph L. Mundy, and David B. Cooper
2012: Joe Fortier, John Rogan, Curtis E. Woodcock, and Daniel Miller Runfola

The John I. Davidson President's Award for Practical Papers

2013 Recipients:

First Place: Mark R. Shortis and G. Burgess for “Photogrammetric Monitoring of the Construction of a Solar Energy Dish Concentrator,” *PE&RS*, 78 (5) 519-527.

Second Place: Rongfu Tang, Dieter Fritsch, Michael Cramer, and Werner Schneider, “A Flexible Mathematical Method for Camera Calibration in Digital Aerial Photogrammetry,” *PE&RS*, 78(10): 1069-1077.

Third Place: Jan Svejksky, W. Lehr, Judd Muskat, George Graettinger and Joseph Mullin, “Operational Utilization of Aerial Multispectral Remote Sensing during Oil Spill Response: Lessons Learned During the Deepwater Horizon (MC-252) Spill,” *PE&RS*, 78(10): 1089-1102.

Purpose: The John I. Davidson Award was established in 1979 to encourage and commend individuals who publish papers of practical or applied value in *Photogrammetric Engineering & Remote Sensing (PE&RS)*.

Donor: The ASPRS Foundation

The First Place award includes an engraved pewter tankard, a cash award of \$500 and a hand-engrossed certificate; Second Place is a cash award of \$300 and a hand-engrossed certificate; Third Place is a cash award of \$200 and a hand-engrossed certificate.

Past Award Recipients:

2008:

1st Place: A. Baccini, M.A. Friedl, C.E. Woodcock, and Z. Zhu
2nd Place: P.S. Thenkabil, P. GangadharaRao, T.W. Biggs, M. Krishna, and H. Tural.
3rd Place: Ayman F. Habib, Eui-Myoung Kim, and Chang-Jae Kim

2009:

1st Place: Zhen Xiong and Yun Zhang
2nd Place: Hongxing Liu, Jaehyung Yu, Zhiyuan Zhao, and Kenneth C. Jezek
3rd Place: Caixia Wang, Anthony Stefanidis, Arie Croitoru, and Peggy Agouris

2010:

1st Place: John R. Jensen, Michael E. Hodgson, Maria Garcia-Quijano, Jung-ho Im, and Jason A. Tullis
2nd Place: Benjamin E. Wilkinson, Bon A. Dewitt, Adam C. Watts, Ahmed H. Mohamed, and Matthew A. Burgess
3rd Place: Xuelian Meng, Le Wang, and Nate Currit

2011:

1st Place: Francis P. Padula and John R. Schott
2nd Place: Tristan Goulden and Chris Hopkinson
3rd Place: Francisco Javier Ariza López, Alan D.J. Atkinson, José Luis García Balboa, and José Rodríguez Avi

2012:

1st Place: Kass Green, Mark Tukman, and Mark Finkbeiner
2nd Place: David Streutker, Nancy Glenn, and Rupesh Shrestha
3rd Place: Jill Bruning, John Gierke, and Ann MacLean

ERDAS Award for Best Scientific Paper in Remote Sensing

2013 Recipients:

First Place: Caiyun Zhang and Fang Qiu for “Mapping Individual Tree Species in an Urban Forest Using Airborne Lidar Data and Hyperspectral Imagery,” *PE&RS*, 78 (10), 1079-1087.

Second Place: Huifang Li, Liangpei Zhang, Huanfeng Shen, Pingxiang Li for “A Variational Gradient-based Fusion Method for Visible and SWIR Imagery,” *PE&RS*, 78 (9), 947-958.

Third Place: Elizabeth Heller, Jeanine Rhemtulla, Sharachchandra Lele, Margaret Kalacska, Shrinivas Badiger, Raja Sengupta and Navin Ramankutty for “Mapping Crop Types, Irrigated Areas, and Cropping Intensities in Heterogeneous Landscapes of Southern India Using Multi-Temporal Medium Resolution Imagery: Implications for Assessing Water Use in Agriculture,” *PE&RS*, 78 (8), 815-827

Purpose: Established in 1991 as the ERDAS Award for Best Scientific Paper in Remote Sensing, it became the Leica Geosystems Award for Best Scientific Paper in Remote Sensing in 2002 and returned to ERDAS sponsorship in 2009. This award encourages and commends individuals who publish papers of scientific merit that advance our knowledge of remote sensing technology.

Donor: ERDAS through the ASPRS Foundation

The ERDAS Award first prize is \$500 and a hand-engrossed certificate; second prize is \$300 and a hand-engrossed certificate; third prize is \$200 and a hand-engrossed certificate.

Past Award Recipients:

2008:

1st Place: Frank Crosby

2nd Place: Zhong Lu

3rd Place: A. Baccini, M.A. Friedl, C.E. Woodcock, and Z. Zhu

2009:

1st Place: Jan A.N.van Aardt, Randolph H. Wynne, and John A. Scrivani

2nd Place: Eva Ivits, Alistair Lamb, Filip Langar, Scott Hemphill, and Barbara Koch

3rd Place: Nikolaos Galiatsatos, Daniel N.M. Donoghue, and Graham Philip

2010:

1st Place: Hua Liu and Qihao Weng

2nd Place: Stephen V. Stehman, James D. Wickham, Timothy G. Wade, and Jonathan H. Smith

3rd Place: J. Linke, G.J. McDerimid, D.N. Laskin, A.J. McLane, A. Pape, J. Cranston, M. Hall-Beyer, and S.E. Franklin

2011:

1st Place: Francis P. Padula and John R. Schott

2nd Place: Yinghai Ke, Wenhua Zhang, and Lindi J. Quackenbush

3rd Place: Ben Somers, Stephanie Delalieux, Willem W. Verstraeten, Annelies Vanden Eynde, Graham H. Barry, and Pol Coppin

2012:

1st Place: Jungho Im, Zhenyu Lu, and John R. Jensen

2nd Place: Minh Kim, James B. Holt, and Marguerite Madden

3rd Place: Christopher E. Parrish, Inseong Jeong, Robert D. Nowak, and R. Brent Smith

The Esri Award for Best Scientific Paper in GIS

2013 Recipients:

1st Place: Yurai Nunez-Rodriguez, Michael A. Johnson, Igor Raskin, and Jesse L. Thé for “Computing Non-Crossing Smooth Contours on Triangulated Meshes,” *PE&RS*, 78 (7), 703-714.

2nd Place: Sinan A. Abood, Ann L. Maclean, and Lacey A. Mason for “Modeling Riparian Zones Utilizing DEMS and Flood Height Data,” *PE&RS*, 78 (3), 259-269.

3rd Place: Zachary J. Christman and John Rogan for “Error Propagation in Raster Data Integration: Impacts on Landscape Composition and Configuration,” *PE&RS*, 78 (6), 617-624.

Purpose: Established in 1991, the fully-endowed ESRI Award honors individuals who publish papers of scientific merit that advance our knowledge about GIS technology.

Donor: Esri, Inc. through the ASPRS Foundation

The Esri Award first prize is \$1,000 and a hand-engrossed certificate;

second prize is \$600 and a hand-engrossed certificate; third prize is \$400 and a hand-engrossed certificate.

Past Award Recipients:

2008:

1st Place: Rongxing Li, Kaichang Di, Jue Wang, Xutong Niu, Sanchit Agarwal, Evgenia Brodyagina, Erik Oberg and Ju Won Hwangbo

2nd Place: Rifaat Abdalla, C. Vincent Tao, Qiuming Cheng, and Jonathan Li

3rd Place: Pravara Thanapura, Dennis L. Helder, Suzette Burckhard, Eric Warmath, Mary O’Neill, and Dwight Galster

2009:

1st Place: Jie Shan, Sharaf Alkheder, and Jun Wang

2nd Place: Carlos F. Mena

3rd Place: David Potere, Neal Feierabend, Alanb H. Strahler, and Eddie E. Bright

2010:

- 1st Place: John R. Jensen, Michael E. Hodgson, Maria Garcia-Quijano, Jungho Im, and Jason A. Tullis
- 2nd Place: Hubo Cai and William Rasdorf
- 3rd Place: Peng Hu, Xiaohang Liu, and Hai Hu

2011:

- 1st Place: Lee De Cola
- 2nd Place: M. Mokhtarzade, M.J. Valadan Zoej, H. Ebadi, and M.R. Sahebi

- 3rd Place: Geoffrey M. Smith and R. Daniel Morton

2012:

- 1st Place: Fayek A. Farag, Christopher M.U. Neale, Roger K. Kjelgren, and Joanna Endter-Wade
- 2nd Place (tie): Minh Kim, James B. Holt, Rebecca J. Eisen, Kerry Padgett, William K. Reisen and Janet B. Croft And Issabella Mariotto, Vincent P. Gutschick, and Dennis L. Clason

The Talbert Abrams Award

2013 Recipients:

Grand Award: Craig Glennie for “Calibration and Kinematic Analysis of the Velodyne HDL-64E S2 LiDAR Sensor,” *PE&RS*, 78 (4), 339-347.

First Honorable Mention: Keith F. Blonquist and Robert T. Pack for “Network Orientation Using the Scaled Orthographic Projection for Parameter Initialization,” *PE&RS*, 78 (5), 505-517.

Second Honorable Mention: Wenkai Li, Qinghua Guo, Marek K. Jakubowski, and Maggi Kelly for “A New Method for Segmenting Individual Trees from the LiDAR Point Cloud,” *PE&RS*, 78 (1), 75-84.

Purpose: The Talbert Abrams Award was established in 1945 to encourage the authorship and recording of current, historical, engineering, and scientific developments in photogrammetry. The Award is determined from papers published in *Photogrammetric Engineering & Remote Sensing (PE&RS)*.

Donor: The ASPRS Foundation

The award consists of a check for \$3,000 and an engraved plaque for the Grand Award, and an award certificate for the First and Second Honorable Mentions.

Past Award Recipients:

2008:

- Grand Award: Michel Morgan, Kyung-Ok Kim, Soo Jeong, and Ayman Habib
- First Honorable Mention: Ayman F. Habib, Eui-Myoung Kim, and Chang-Jae Kim
- Second Honorable Mention: Simon Clode, Franz Rottensteiner, Peter Kootsookos, and Emanuel Zelniker 2009 recipients:

2009:

- Grand Award: Junhee Youn, James S. Bethel, Edward M. Mikhail, and Changno Lee
- First Honorable Mention: Elja Honkavaara, Jouni Peltoniemi, Eero Ahokas, Risto Kuittinen, Juha Hyypya, Juha Jaakkola, Harri Kaartinen, Lauri Markelin, Kimmo Nurminen, and Juha Suomalainen
- Second Honorable Mention: Nikolaos Galiatsatos, Danuel N.M. Donoghue, and Graham Philip

2010:

- Grand Award: Karsten Raguse and Christian Heipke
- First Honorable Mention: K. Gwinner, F. Scholten, M. Spiegel, R. Schmidt, B. Giese, J. Oberst, C. Helpe, R. Jaumann and G. Neukum
- Second Honorable Mention: N. Akel, S. Filin and Y. Doytsher

2011:

- Grand Award: Shahaf Levin and Sagi Filin
- First Honorable Mention: Huayi Wu, Yong Lu, Jonathan Li, Jianya Gong

2012:

- Grand Award: Christopher E. Parrish, Inseong Jeong, Robert D. Nowak, and R. Brent Smith
- First Honorable Mention: C.S. Fraser and M. Ravanbakhsh
- Second Honorable Mention: Jaehong Oh, Won Hee Lee, Charles K. Toth, Dorota A. Grejner-Brzezinska, and Changno Lee

Robert E. Altenhofen Memorial Scholarship

2013 Recipient: Hui Ju

Hui Ju is a doctoral candidate at the Ohio State University, Department of Civil and Environmental Engineering and Geodetic Science, with a specialization in photogrammetry. He has an extremely strong background in photogrammetry, geomatics and computer vision. He has three refereed publications and numerous other papers. He proposes to

apply lidar geo-referencing for earth-imaging applications. He has two excellent academic letters of recommendation, has served as a graduate research associate, and has been very active professionally. His faculty advisor is Professor Dorota Grejner-Brzezinska.

Purpose: First given in 1986, the Robert E. Altenhofen Memorial Scholarship is intended to encourage and commend college students who display exceptional interest and ability in the theoretical aspects of photogrammetry.

Donor: The ASPRS Foundation. This award was originally established by Mrs. Helen Altenhofen as a memorial to her husband, Robert E. Altenhofen, past president of ASPRS. He was an outstanding practitioner of photogrammetry and made notable contributions to the mathematical aspects of the science.

The Altenhofen Scholarship consists of a check for \$2,000 and a hand-engrossed certificate.

Past Award Recipients:

2008: In-seong Jeong
2009: Changjae Kim
2010: Caixia Wang
2011: Jaehong Oh
2012: Ivan D. Detchev

Abraham Anson Memorial Scholarship

2013 Recipient: Colin Axel

Colin Axel is selected as the fifth recipient of Abraham Anson Memorial Scholarship.

Axel is studying for his Bachelor of Science degree in Imaging Science at the Rochester Institute of Technology (RIT), Rochester, New York. Axel has been the recipient of several academic honors, awards and scholastic achievements. He is an excellent student, as evidenced by his high 3.95 GPA earned in his undergraduate studies. Axel has been on the RIT Dean's List and recipient of the RIT Computing Medal and Carlson Imaging Award. He is the recipient of several scholarships namely, the Goldwater Scholarship, the RIT Presidential Scholarship, the RIT Honors Program Scholarship, the Nathaniel Rochester Society Scholarship, the Omnova Scholarship and the Jerry G. Hughes Memorial Scholarship. Axel has gained excellent experience as an undergraduate research and teacher's assistant in digital image processing.

He expects to graduate in 2013 and plans to continue his studies at the Imaging Science PhD program at RIT.

Purpose: To encourage students who have an exceptional interest in pursuing scientific research or education in geospatial science or

technology related to photogrammetry, remote sensing, surveying and mapping to enter a professional field where they can use the knowledge of their discipline to excel in their profession.

Donor: This award is presented by the ASPRS Foundation from funds donated by the Anson bequest and contributions from the Society and the Potomac Region as a tribute to Abe Anson's many contributions to the field of photogrammetry, remote sensing, and long, dedicated service to the Society.

The award consists of a certificate, a check in the amount of \$2,000 and a one-year student membership (new or renewal) in the Society.

Past Award Recipients:

2009: Nicole Wayant
2010: Tyler Rigazio
2011: Philip S. Salvaggio
2012: Bradley Scott Henning

John O. Behrens Institute for Land Information (ILI) Memorial Scholarship

2013 Recipient: Benjamin Adams

Adams is selected as the fifth annual recipient of the John O. Behrens ILI Memorial Scholarship. Adams is a person who exemplifies the pursuit of learning and spirit of excellence which were hallmarks of John Behrens. Adams demonstrates the commitment, dependability and motivation of Mr. Behrens and his own passion in preparing himself for a career in surveying and engineering. Adams is an excellent student with an outstanding grade point average. His goals include completing his academic studies with a top-ranking and pursuing a professional career in surveying and engineering. Adams has been active in local student professional organizations and has received recognition for leadership and outstanding achievement. It is with pleasure that the 2013 John O Behrens ILI Memorial Scholarship is awarded to Benjamin Adams of Ferris State University.

The John O. Behrens ILI Memorial Scholarship was established by the

Institute for Land Information (since officially dissolved) as a tribute to the many contributions of Mr. Behrens to the field of geographic and land related information and technology. John O. Behrens was a founder of the ILI and the author of many articles about the value of spatial information, land assessment and taxation, and land information policy. In recognition of Mr. Behrens outstanding contributions over his distinguished career, funds from the ILI have been donated to the ASPRS Foundation to be administered for the John O. Behrens ILI Memorial Scholarship.

Purpose: To encourage students/persons who have an exceptional interest in pursuing scientific research or education in geospatial science or technology or land information systems/records to enter a professional field where they can use the knowledge of this discipline to excel in their profession.

Donor: The ASPRS Foundation from funds donated by the ILI.

The Award consists of a certificate and a check in the amount of \$2,000 and a one-year student or associate membership (new or renewal) in ASPRS.

Past Award Recipients:

2009: Christopher Griffith
2010: Elizabeth Young
2011: Thomas Davis
2012: Tiffany Tatum

Robert N. Colwell Memorial Fellowship

2013 Recipient: Xiaolin Zhu

Xiaolin Zhu is a PhD candidate in the Department of Geography at The Ohio State University. He holds a BS degree in Resource Science and Engineering and a Master's in Civil Engineering from Beijing Normal University. His early research included use of NDVI time-series data to develop a knowledge-based approach to mapping farming intensity and also to detect changes in vegetation phenology in China.

Zhu's dissertation research focuses on developing new methods for mapping forest composition and modeling forest function in the Appalachian Ohio region using satellite remote sensing and ecosystem modeling. A primary goal of his research is to improve or develop algorithms for producing high-quality remotely sensed images with both high spatial and temporal resolution for natural resource applications. Toward this end, he has already published a paper on the development of a data fusion model to combine high spatial resolution data such as Landsat with high temporal resolution data such as MODIS (*Remote Sensing of Environment*, 2010). The algorithm he developed was shown to be an improvement over the existing algorithm, especially for heterogeneous landscapes. As a result, it is anticipated to be widely used.

Two of Zhu's other accomplishments are also highly original and important. The Scan Line Corrector on the Landsat ETM+ sensor failed in 2003, resulting in significant data gaps that limit use of post-2003 Landsat-7 data. Zhu developed an innovative geostatistical approach to fill the pixel gaps that occur in the data. His technique, published in *Remote Sensing of Environment* (2011), works to improve upon existing techniques, especially in heterogeneous environments. He also developed a simple but very accurate and robust algorithm to remove thick cloud contamination on Landsat images, which is a common and serious problem with optical imagery. This work was published in the *IEEE Geoscience and Remote Sensing Letters* (2012). Given the importance of satellite remote sensing in global change studies, these two accomplishments have great potential to advance a wide range of studies based on high-quality satellite imagery, particularly for land change science. His faculty advisor commented that these works are among more than 10 peer-reviewed papers that Zhu has published in

well-known international journals, a record which is comparable to some junior faculty members. This places him in the very top tier of his peers. Upon graduation in 2014, Zhu will seek a tenure-track faculty position focusing on research with opportunities to teach remote sensing.

Over the course of more than a half century, Dr. Robert N. Colwell developed a reputation as one of the world's most respected leaders in remote sensing, a field that he stewarded from the interpretation of aerial photographs during World War II, to the advanced acquisition and analysis of many types of geospatial data from military and civilian satellite platforms. His career included nearly 40 years of teaching and research at the University of California, Berkeley, a distinguished record of military service reaching the rank of Rear Admiral, and prominent roles in private industry and as a consultant for many U.S. and international agencies. Among the many awards bestowed upon Dr. Colwell, he had the distinction of being one of the 25 Honorary Members of ASPRS, chosen from the Society's 6000 members

Purpose: Established in 2006 to encourage and commend college/university graduate students or post-doctoral researchers who display exceptional interest, desire, ability, and aptitude in the field of remote sensing or other related geospatial information technologies, and who have a special interest in developing practical uses of these technologies.

Donor: The ASPRS Foundation, from funds donated by students, associates, colleagues and friends of Robert N. Colwell.

The Award now consists of a grant of \$5,500 and a one-year student or associate membership (new or renewal) in ASPRS.

Past Award Recipients:

2008: Jonathan Thayn
2009: Sergio Bernardes
2010: Frank D.W. Witmer
2011: Christopher D. Lippitt
2012: Meghan Graham MacLean

ERDAS Internship

The award will not be made this year.

Purpose: The ERDAS Internship is an eight-week internship for graduate students in photogrammetry. The selected intern works with ERDAS personnel at a selected ERDAS facility. The internship consists of a

stipend of \$2500 plus an allowance for travel and living expenses for the period of the internship.

Donor: ERDAS, Inc. through the ASPRS Foundation. The internship

provides the award winner with an opportunity to carry out a small research project of his/her own choice, or to work on an existing ERDAS project as part of a team.

Past Award Recipients:

2007: Kaiguang Zhao
2008: David Milledge
2009, 2010: No award
2011: Harini Sridharan

William A. Fischer Memorial Scholarship

2013 Recipient: Mathew D. Cross

Matthew D. Cross, currently a PhD student in an interdisciplinary PhD program in the College of Engineering and Applied Science at the University of Denver, has been selected to receive the 2013 William A. Fischer Memorial Scholarship. Cross is being presented with this award in recognition of his significant academic accomplishments and very impressive record of research and teaching in the application of remote sensing to environmental problems. Cross's research is highly interdisciplinary; calling up fundamental and applied climatology, meteorology and remote sensing to map and monitor the vegetation cover in industrial forests across North and South America. Cross's approach will incorporate multi-temporal and multi-scale remote sensing datasets to allow us to better understand the environmental implications of these activities.

The award selection committee congratulates Mr. Cross on his accomplishments and we are confident that his current and future research and teaching efforts will continue to make important contributions to the global community.

Purpose: The William A. Fischer Scholarship facilitates graduate studies and career goals of a worthy student adjudged to address new and innovative uses of remote sensing data and techniques that relate to the natural, cultural, or agricultural resources of the Earth. It was established in 1984.

Donor: the ASPRS Foundation through individual and corporate contributions in memory of William A. Fischer.

The William A. Fischer Memorial Scholarship consists of a \$2,000 check and a hand-engrossed certificate.

Past Award Recipients:

2008: Yuyu Zhou
2009: Suzanne Walther
2010: Benjamin W. Heumann
2011: Sergio Bernardes
2012: Baojun Zheng

The GeoEye Foundation Award

2013 Recipient: Sergey Reid

Sergey Reid is an undergraduate student in the Geographic Information Science program at Texas A&M, Corpus-Christi. Reid has been selected to receive a GeoEye Foundation data grant for his work on hydrodynamic model calibration through the application of satellite imagery and GIS. His research will take advantage of available high-resolution satellite imagery to verify coastal inundation predictions computed by a hydrodynamic model. The Coastal Modeling System (CMS) hydrodynamic model was implemented and optimized for the Texas Coastal Bend area to predict water levels and currents. CMS generates predictions in XYZ format, which can be subsequently mapped to show the predicted extent of flooding. The significance of coupling the model with satellite imagery is that it provides a new and efficient approach to verifying the model against the observed water/land conditions. Not only does satellite imagery provide a broad view of the inundation area, it also provides an accurate time stamp, which can be matched with the time stamp of the model's prediction output. With the model output fitted to the satellite imagery for the same prediction/observation time, statistical analysis will be conducted to determine the model's prediction accuracy. The requested satellite imagery will allow the method to be extended to other selected areas along the Texas coast, particularly those regions that

are prone to significant inundation (due to storm surge as well as regular tides).

The Award was established in 1991. In 2001 it became known as the Space Imaging Award for the Application of High Resolution Digital Satellite Imagery and in 2006 it became The GeoEye Foundation Award.

Purpose: To support remote sensing education and stimulate the development of applications of high-resolution digital satellite remote sensing data through the granting of GeoEye imagery for applied research by undergraduate or graduate students.

Donor: The GeoEye Foundation through the ASPRS Foundation

The ASPRS GeoEye Foundation Award consists of a grant of data valued up to \$4,000 and a hand-engrossed certificate.

Past Award Recipients:

2008: Sergio Bernardes, Sheika Aragundi, and Hunter Allen
2009: Yinghai Ke and Erica Capuana
2010: David Meek and Chandhi Witharana
2011: Nicholas Roberts
2012: Katie Ann Corcoran

Francis H. Moffitt Memorial Scholarship

2013 Recipient: Andreas Torsvik

Torsvik is an undergraduate student at California State (Fresno) pursuing a degree in Geomatics Engineering. He is an active student member in both the ASPRS and ACSM student chapters and a member of numerous academic honor societies while maintaining a 4.0 grade point average. He attended the ASPRS annual conference in 2012 and plans to apply for the ASPRS Geospatial Intern Certification in both the Photogrammetrist and Remote Sensing Scientist tracks in the spring of 2013. His professors have been quoted as saying that, "He is keen, honest, hardworking, and has also shown great interest in serving the program and field of Geomatics in general," and also "One of the strongest points in Andreas is his ability to understand and solve mathematically-oriented engineering problems very easily. He is one of the brightest students I have in the class. I expect a bright future for him in Geomatics Engineering."

In recognition of Professor Moffitt's many contributions to the surveying and photogrammetry profession and his devotion to the related professional societies, this Award is presented by the American Society for Photogrammetry and Remote Sensing (ASPRS), the Management Association for Private Photogrammetric Surveyors (MAPPS), and the American Congress on Surveying and Mapping (ACSM) through the ASPRS Foundation from funds donated by students, associates,

colleagues and friends of Frank Moffitt as a memorial to his lifetime contributions to the photogrammetric surveying profession and the goals of these professional societies.

Purpose: The award was first presented in 2008 with the purpose of encouraging upper-division, undergraduate-level and graduate-level college students to pursue a course of study in surveying and photogrammetry leading to a career in the geospatial mapping profession.

Donor: The ASPRS Foundation from funds donated to the Foundation from former students, associates, colleagues and friends.

The award consists of a certificate and a check in the amount of \$4,000 and a new or renewal membership in ASPRS.

Past Award Recipients:

2008: Chad M. Schaeding

2009: Nathaniel Ovans

2010: Ivan D. Detchev

2011: Scott J. Roberts

2012: Ana Paula Baungarten Kersting

The Kenneth J. Osborn Memorial Scholarship

2013 Recipient: Kerri J. Crowder

Kerri J. Crowder is pursuing a Bachelor of Arts degree in Geography (geographic information systems emphasis) from the University of Alaska at Fairbanks (UAF) and plans to graduate in December of 2013. Following her BA, she intends to continue her education at UAF applying her outstanding scholarship towards the pursuit of contributing further to the geospatial science field. Crowder exemplified the Osborn qualities of communication and collaboration through leadership of activities within the UAF campus and Alaska Satellite Facility (ASF) communities by serving as a science consultant to the public, and through her participation in the Alaska Chapter of ASPRS. She has represented both ASF and ASPRS at external gatherings. Her faculty advisor is Dr. Cary de Wit.

Purpose: to encourage and commend college students who display exceptional interest, desire, ability, and aptitude to enter the profession of surveying, mapping, photogrammetry, or geospatial information and technology. In addition, the Award recognizes students who excel at an aspect of the profession that Ken demonstrated so very well, that of communications and collaboration.

Donor: The ASPRS Foundation from funds donated by the friends and colleagues of Kenneth J. Osborn. Recognized nationally and internationally, Ken was an outstanding practitioner of surveying, mapping, photogrammetry, and geospatial information and technology, and a great friend of the Society. As a professional cartographer with the U.S. Geological Survey, Ken made significant contributions to these fields. The award was first offered in 2005.

The Award consists of a one-year membership in the Society (new or renewal), an engrossed certificate and a check in the amount of \$2,000.

Past Award Recipients:

2008: Nathaniel Ovans

2009: Jason B. Jones

2010: Eric S. Wilder

2011: Erielle Lamb

2012: Andreas Torsvik

Ta Liang Memorial Award

2013 Recipient: Nishan Bhattarai

The Ta Liang Memorial Award for 2013 is presented to Nishan Bhattarai. The selection was based on his academic achievements, planned program of research-related travel, and extracurricular activities. Bhattarai is a PhD student in geospatial information science and engineering at the State University of New York College of Environmental Science and Forestry. He earned an MS in forestry, focused on remote sensing, hydrology and GIS, from Auburn University (2010), and a BS in forestry from Tribhuvan University, Nepal (2006). His current research uses remotely sensed data to estimate evapotranspiration (ET) and map invasive species, with a particular focus on exploring the influence that such species have on the hydrology of natural ecosystems. Bhattarai's doctoral research builds from his master's studies at Auburn, which used a modified surface energy balanced algorithm to estimate evapotranspiration in the southeastern U.S. Bhattarai aims to create an improved algorithm for estimating ET that integrates historic Landsat 5 Thematic Mapper and Moderate Resolution Imaging Spectroradiometer (MODIS) data using multiple linear regression models. His current project is focused on analyzing remotely sensed ET rates from invasive and native vegetation in the southeastern U.S., comparing ET from invasive *Melaleuca* and native plants in the Florida Everglades to analyze potential hydrological impacts of such invasion in the southeastern swamps. The Ta Liang travel grant will support field visits to Florida to collect data for model calibration and validation, and to engage with local research partners.

Bhattarai has excelled as a student at both the undergraduate and graduate levels. His research uses remote sensing tools to do rigorous science that has direct applications to solving environmental problems. He has also been involved in a range of extracurricular efforts related to science outreach and environmental restoration. Bhattarai is a truly deserving recipient of the Ta Liang Memorial Award.

Purpose: To facilitate research-related travel by outstanding graduate students in remote sensing, including field investigations, agency visits, participation in conferences, or other travel which enhances or facilitates graduate research.

Donor: Individual and corporate contributions to the ASPRS Foundation in memory of Ta Liang.

Established in memory of Ta Liang, a skilled civil engineer, an excellent teacher, and one of the world's foremost airphoto interpreters, the award consists of a \$2,000 grant and a hand-engrossed certificate.

Past Award Recipients:

2008: Akira Kato
2009: Lucy Kammer
2010: Jason Parent
2011: Nicholas Roberts
2012: Matthew Fagan

Z/I Imaging Award

2013 Recipient: Sergio Bernardes

Sergio Bernardes is being presented with this award in recognition of his academic achievements, the outstanding nature of his current research and his future career goals pertaining to the practical application of photogrammetry and related technologies. Bernardes, who is pursuing his PhD in Geography with a Certification in Geographic Information Systems from the University of Georgia, has demonstrated sustained academic excellence in his area of primary research including innovative analysis and visualization of time-series remote sensing images, ground-based climate data and indices of vegetation productivity to assess biotic responses to changes in temperature and precipitation. Practical applications of his results include assessments of vegetation affected by natural and anthropogenic changes, food security, agricultural production and ecosystem adaptation in dynamic environments. In addition to his focus on academics, Bernardes has continued to serve in key leadership roles within both the ASPRS and IEEE community.

Purpose: The Z/I Imaging Award, is designed to facilitate graduate-level studies and career goals adjudged to address new and innovative uses of signal processing, image processing techniques, and the application of photogrammetry to real-world techniques within the earth imaging industry.

Donor: Z/I Imaging through the ASPRS Foundation

The Z/I Imaging Award consists of a \$2,000 cash prize and a hand-engrossed certificate.

Past Award Recipients:

2008: Eva Paska
2009: Ju Won Hwangbo
2010: Jaehong Oh
2011: Shadrock Roberts
2012: Jacky Chow

International Educational Literature Award

2013 Recipient: Kyrgyz State University of Construction, Transport and Architecture (KSUCTA), Department of Geodesy and Geoinformatics, Kyrgyzstan

Dr. Akylbek Chymyrov, Department Head

The Department of Geodesy and Geoinformatics offers curricula in Geomatics at the graduate and undergraduate levels. With limited internet capabilities, a lack of geospatial text materials, and a focus on instruction in English, the materials of the IELA award will be beneficial to the geoinformatics program. Kyrgyzstan is a developing area with limited resources available to provide current content, technological developments, and fundamental teaching materials for University students and professors. The award materials will provide students with the opportunity to include current journal articles and books into course work and the materials will allow professors access to current technology advances for inclusion into class programs. The IELA will provide a unique opportunity for a much needed infusion of knowledge and literature to the Department of Geodesy and Geoinformatics at Kyrgyz State University of Construction, Transport and Architecture.

Purpose: The International Educational Literature Award (IELA) was first bestowed in 1990. Its goal is to improve the quantity and quality of literature in the recipient's library, particularly in the mapping sciences (i.e. photogrammetry, remote sensing, GIS, and related disciplines) by providing ASPRS educational materials and publications.

Donor: the ASPRS Foundation from funds donated by ASPRS members and participating sponsors through contributions to the ASPRS Foundation.

The IELA includes \$350 worth of books, manuals, or other literature published by ASPRS; a five-year subscription to *PE&RS*, proceedings of the Annual Conference and Fall technical meetings for five years; one free registration to the Society's Annual Conference at the time of receiving the award for a member of the institution to whom the award is being given; and a hand-engrossed certificate.

This award has been augmented by

- a generous grant from the Environmental Systems Research Institute (ESRI) of the complete ESRI Press Library collection
- Selected titles from the John Wiley and Sons, Publishers, catalog.
- The conference proceedings from The Association of American Geographers (AAG)

Past Award Recipients:

2008: Egerton University, Njoro, Kenya

2009: Universidad Autónoma de Ciudad Juárez, Mexico

2010: The Waiariki Institute of Technology, Rotorua, New Zealand

2011: Budapest University of Technology and Economics, Budapest, Hungary

2012: Mzuzu University, Department of Land Management, Mzuzu, Malawi

ASPRS Outstanding Service Award

2013 Recipients:

Mike Renslow, for his service as Editor-in-Chief of the *Lidar Manual*, his efforts to achieve accreditation for the ASPRS Certification Program, and his service as ISPRS Treasurer, 2009 – 2012.

The Guidelines for Procurement of Commercial Geospatial Mapping Products Committee, Charles Mondello, Chair; and committee members Mark Baker, Becky Morton, Marvin Miller, Brant Howard, Kari Craun, George Southard, Jeff Lovin, Mike Ritchie and Paul Harwig for their efforts to develop the draft guidelines.

Chris McGlone for his service as Editor-in-Chief of the *Manual of Photogrammetry, 6th Edition*.

George Y. G. Lee for his service as Technical Editor of the *Manual of Photogrammetry, 6th Edition* and his dedicated efforts to fully endow the Francis H. Moffitt Memorial Scholarship.

Purpose: Established in 1991, The Outstanding Service Award is given to Society members in recognition of outstanding and unusual efforts in helping ASPRS develop and carry out its program over a sustained period. Recipients have performed outstanding service at the chapter, regional, or national level. Awardees' service includes any activities,

including professional, that have helped the Society achieve its goals and objectives.

Donor: The ASPRS Foundation

The Outstanding Service Award consists of a bronze plaque

Past Award Recipients:

2008: James W. Merchant, Bernard "Barney" Schur, James V. Taranik, George Y. G. Lee

2009: The Procurement Guidelines Committee, R. Douglas Ramsey, Russell G. Congalton, Roberta E. "Bobbi" Lenczowski, John Moeller

2010: Marguerite Madden, Lockheed Martin, Major contributors to the Geospatial Revolution Film Project.

2011: Thomas Lillesand, Alan Voss, and Karen Schuckman

2012: no award given

ASPRS Ford Bartlett Award

2013 Recipients: Dr. James B. Campbell – Potomac Region, Katarina Doctor – Potomac Region, Dr. Michael Krimmer – Potomac Region, and Prof. Jonathan Li – At Large

Purpose: First awarded in 1968, the ASPRS Ford Bartlett Membership Award honors members for actively promoting membership in ASPRS.

Donor: the ASPRS Foundation. (This award was originally sponsored by the firm of Lockwood, Kessler, and Bartlett, Inc.)

A member is eligible to receive the Award after sponsoring ten or more members in one year. Each recipient receives a hand-engrossed certificate and a one-year membership in the Society.

Past Award Recipients:

2008: Brian Miyake, Michelle R. Kinzel, Xiaojun Yang

2009: Daniel L. Civco, Brian Miyake, L. Monika Moskal, Brian Murphy

2010: James B. Campbell, Bon A. Dewitt, Brian Miyake, Karen L. Schuckman, Steven J. Steinberg, Xiaojun Yang

2011: Michaela Buenemann, Thomas R. Mueller, Steven P. Lennartz, Jonathan Li, Karen L. Schuckman, Steven J. Steinberg, Tim Warner

2012: Steven P. Lennartz, Nathan P. Jennings

SAIC Estes Memorial Teaching Award

2013 Recipient: Douglas A. Stow

Douglas A. Stow is a Professor of Geography at San Diego State University (SDSU) and received his BA, MA and PhD degrees in Geography from the University of California, Santa Barbara (UCSB). While at UCSB he served as a teaching assistant and lecturer in the Department of Geography and staff research assistant for the Geography Remote Sensing Unit. Stow has a distinguished record of funded research that has emphasized the application of multi-temporal remote sensing image analysis for analyzing land surface changes and dynamics. This has included research on ecosystem processes and habitat monitoring in the Arctic tundra, Mediterranean shrub land, coastal salt marsh landscapes, urban land use dynamics, coastal circulation and sediment transport, as well as technical studies on image registration, change detection and object-based image segmentation and classification. He is the author or co-author of 120 refereed publications. Many of these articles are co-authored with his graduate students, who he guides through the peer-review publication process and who normally serve as first author. Stow has twice received the ASPRS Leica Geosystems Award for Best Scientific Paper in Remote Sensing. He has been instrumental in helping to create a student chapter of ASPRS at SDSU and has led successful student recruitment drives. He has also assisted in the establishment of the Volunteer Hazard Mapping Corps, a group of student volunteers who

are certified to provide remote sensing and GIS support during natural hazard events in San Diego County.

The SAIC Estes Memorial Teaching Award was inaugurated in 2003 and is named in honor of Professor John E. (“Jack”) Estes, teacher, mentor, scientist, and friend of the American Society for Photogrammetry and Remote Sensing.

Purpose: This award is designed to recognize individual achievement in the promotion of remote sensing and GIS technology, and applications through educational efforts. Award recipients are chosen based on documented excellence in education, teaching, mentoring and, training.

Donor: Science Applications International Corporation (SAIC) through the ASPRS Foundation

The award consists of a presentation plaque and a cash award of \$2,000.

Past Award Recipients:

2008: Sam Goward

2009: Alan H. Strahler

2010: Daniel L. Civco

2011: Marguerite Madden

2012: Russell G. Congalton

ASPRS Outstanding Workshop Instructor Award

2013 Recipient: William H. Farrand, PhD

William H. Farrand has been active in the ASPRS workshop/webinar program since the annual meeting in 1999. He has developed, either individually or with a collaborator, three different hyperspectral workshops: Processing and Feature Extraction, Data Processing, and Phenology and Data Processing. Additionally, Farrand has been one of the early participants in the ASPRS webinar program and he has given this program a number of times in the last couple of years. His workshops

are well attended and the participants give very positive feedback on his courses and comment on his knowledge and background. With over 20 years of experience in hyperspectral remote sensing, Farrand has been proven to be an expert in the field. Like other workshop authors, Farrand works hard to share his vast knowledge and experience. For his activities in the workshop and webinar programs, Farrand is a fitting recipient of this award.

Purpose: The Outstanding Workshop Instructor Award is conferred by ASPRS in recognition of special, personal, and meritorious contributions to continued organization, promotion, and/or delivery of workshops at the ASPRS Annual and Fall Conferences.

Donor: The award is administered by the ASPRS Foundation from funds donated by ASPRS members and participating sponsors through contributions to the ASPRS Foundation.

The award consists of a certificate and an inscribed laser pointer.

Past Award Recipients:

- 2008: Kass Green and Robert Burtch
- 2009: David Fuhr and Brian Huberty
- 2010: Russell G. Congalton
- 2011: Charles E. Olson, Jr.
- 2012: Qassim A. Abdullah

George E. Brown, Jr. Congressional Honor Award

2013 Recipient: Senator Jack Reed (D-RI)

In the 110th Congress, Senator Jack Reed introduced S. 1938, a FEMA flood mapping reform bill. It included provisions such as acquiring current and accurate elevation data using state-of-the-art mapping technologies (lidar) and services, mapping by watershed instead of political boundary, and re-establishing the Technical Mapping Advisory Council (TMAC). Reed’s reforms were included in the FEMA bill enacted into law in 2012. P.L. 112-141 included reauthorizing the Highway and FEMA Flood programs into the “MAP-21 Act.” The bill also included provisions led by Reed to require National Flood Insurance Program rate maps to use “the most accurate topography and elevation data available.”

The elevation provisions effectively provide a specific Congressional authorization for the 3DEP program USGS is launching. This is significant because neither the NSDI, The National Map, nor IFTN were ever specifically authorized by Congress. As a result, they either floundered or never got adequate funding. Most importantly, Section 100220 Develops a funding strategy to leverage and coordinate budgets and expenditures, and to maintain or establish joint funding and other agreement mechanisms with other Federal agencies and units of State and local government to share in the collection and utilization of geospatial data among all governmental users, and specifically mentions OMB, FEMA, USGS, NOAA & USACE. Section 100121 includes a NAPA study on how FEMA can improve interagency and intergovernmental coordination on flood mapping, including a funding strategy to leverage and coordinate budgets and expenditures and establish joint funding mechanisms with other Federal agencies and units of State and local government to share the collection and utilization of data among all governmental users.

This bill is unprecedented and is a model for geospatial coordination, as well as an innovative way of funding inter-agency and intergovernmental geospatial requirements.

Purpose: ASPRS created the award in honor of the late Congressman George E. Brown, Jr. and the contributions he made to advance the benefits of imagery and geospatial information to Society. Representative Brown was very supportive of the geospatial industry. He authored key legislation affecting the industry, supported geospatial information research, and promoted the development of the commercial remote sensing industry for the greater good of Society.

Donor: The ASPRS Foundation

This award is presented periodically to recognize members of the U.S. Congress whose leadership and personal efforts have advanced the science, engineering, application, education, and commerce of imaging and geospatial information. In addition to a plaque, the award consists of an opportunity for ASPRS to sponsor a geospatial sciences presentation to an elementary school, secondary school, or university of the recipient’s choice in his or her District or State.

Past Award Recipients:

- 2000: Congressman George E. Brown, Jr. (D-Cal.) posthumously
- 2001: No award given
- 2002: Senator Trent Lott (R-Miss.)
- 2003-2004: No award given
- 2005: Senator Wayne Allard (R-CO)
- 2006-2012 – No award given

Col. Claude H. Birdseye President’s Citation

2013 Recipient: Roberta E. “Bobbi” Lenczowski

Purpose: The Col. Claude H. Birdseye President’s Citation was established in 1965 as a tribute to one of the founders and the first president of the Society. Each year at the Annual Convention it is conferred on the outgoing president in recognition of her/his contributions to the Society.

Donor: ASPRS Foundation

The Birdseye Citation carries with it a gold Past President’s Key, and a hand-engrossed certificate.

Past Award Recipients:

- 2008: Marguerite Madden
- 2009: Kass Green
- 2010: Bradley D. Doorn
- 2011: Carolyn J. Merry
- 2012: Gary Florence

General Session

Fellow Award

Paul R. Wolf Memorial Scholarship

BAE Systems Award

Conference Management Awards

ASPRS Fellow Award

2013 Recipients: George Y. G. Lee and Charles Mondello

George Y. G. Lee, ASPRS Certified Photogrammetrist and Emeritus Member, is most deserving of the ASPRS Fellow Award due to his constant outstanding service to ASPRS, the USGS, and the imaging and photogrammetric community around the world through contributions of considerable personal time and professional expertise.

Lee was awarded a PhD in Engineering from the University of California Berkeley (Photogrammetry) in 1994. He received a MS in Engineering in 1974 and a BS in Engineering Mathematics and Statistics in 1973 from U.C. Berkeley as well.

In his professional life, Lee has worked for the U.S. Geological Survey (USGS) for 38 years. He is currently the National Product and Service Lead for Orthoimagery within the USGS National Geospatial Program from his office in Menlo Park, California. He is responsible for providing policy and strategic guidance for all aspects of the USGS Orthoimagery Program including planning, production, distribution, archiving, and outreach. While he has had many varied accomplishments throughout his USGS career, one of the most significant for the country and the entire geospatial and imaging industry, was his leadership in developing and implementing the USGS (and partners) program to complete first time coverage of the United States with Digital Orthophoto Quarter Quadrangles (DOQs) in the early 1990s. Lee not only provided considerable leadership and technical expertise to make this significant accomplishment possible, he also broke new ground in implementing DOQ contracts that established an innovative kind of public-private partnership in getting the work done. In addition, he became part of a network of Federal, state, and local government; academic; and, private sector partners and DOQ “evangelists” who are still pushing digital orthoimagery forward around the world today. In addition, he served as the USGS technical lead on a research project with Microsoft Corporation’s Research Group that resulted in the TerraServer technology to serve imagery data over the Internet. While this may not seem significant today, in the early 2000s this was a ground-breaking precedent in freely distributing a large orthoimagery dataset to the public.

Lee’s ASPRS contributions and accomplishments are equally varied and significant. He has served on committees too numerous to individually mention, but, some of his more recent involvement includes membership on the Camera Calibration and Revised National Mapping Accuracy Standard Committees within the Primary Data Acquisition Division. He was also a member of the Professional Practice Division Professional Services Procurement Committee and the ASPRS Films Committee. He led the effort to establish and raise funding to fully endow the Francis H. Moffitt Memorial Scholarship and is still very actively involved in

supporting this scholarship. The award has become one of the fastest growing awards in the suite of awards that ASPRS Foundation gives annually. He was a critical link to the USGS in ASPRS’ development of recommendations to that organization for camera calibration activities. Last, but, certainly not least, Lee is currently spending his weekends as Technical Editor of the 6th edition of the *Manual of Photogrammetry*.

In 2007, Lee was recognized by ASPRS with the prestigious Photogrammetric (Fairchild) Award and in 2008 the Society awarded him the Outstanding Service Award for his work on the Moffitt Scholarship. Lee has also been recognized for exceptional service to the Department of the Interior by being awarded both the Superior and Meritorious Service Awards.

Charles Mondello exemplifies what is best in our Society. He has been a noted contributor to the scientific and commercial foundation of ASPRS and the industry. His tireless support to ASPRS and our industry not only covers many years, but also many roles. His work has been instrumental in the extension of geospatial technology to new markets and to our homeland security. His peers have shown their approval and recognized him through his nominations and election to multiple levels of ASPRS governance. Mondello continues his support to the Society and the industry through multiple works. These have given the community at large a better understanding of ASPRS, as well as how remote sensing and mapping can be used for the betterment of society as a whole.

Currently Deputy Chief Technical Officer at Pictometry International, Mondello helps provide corporate management direction for the overall development and of Pictometry. As such, he is involved in many facets of Pictometry’s engineering, production, marketing and sales efforts. Throughout his career, he has developed and directed various remote sensing programs that included film, digital sensing and output systems. Pictometry’s Real Time Airborne Management System (RAMS) provides immediate, geo-referenced images for use in disaster responses.

Mondello received his BS and MS degrees in Imaging Sciences from the Rochester Institute of Technology (RIT). He has served as Executive Vice President Corporate Development, Earth Data Technologies; Director of Technology at Litton Emerge; Director of Marketing and Sales at Eastman Kodak; as well as, Aerial Systems Product Line Manager at Kodak. He also served in multiple Federal Government and commercial positions prior to that.

Mondello’s accomplishments have been recognized by his peers through his election as the Director of the ASPRS Primary Data Acquisition Division (PDAD) and as the Director of the ASPRS/NASA 10-Year

Remote Sensing Strategic Forecast. Also, Mondello developed the Digital Aerial Guideline for ASPRS. He currently chairs the development of the Digital Product Guideline for the ASPRS Professional Practice Division (PPD) and the Oblique Industry Standard for PDAD. The Digital Product Guideline will become the definitive guide for procurement of geospatial products in our profession.

As Director of PDAD, he served on the ASPRS Board of Directors for two years. He has been the Chair of the Aerial Film Guidelines, a specification to provide guidance on film based data acquisition; Chair of the Digital Aerial Guideline, a tutorial on digital remote sensing; and, chaired the 10-Year Industry Forecast for 13 years since its inception. The Forecast has grown under his leadership to become the definitive guide to the direction and growth within the geospatial industry.

As a lead writer for the ASPRS 10-Year Forecast, Mondello has been published in Photogrammetric Engineering & Remote Sensing on six occasions and as a separate publication, in print and on the ASPRS web site. He is also a co-author of the ASPRS *Manual of Photogrammetry, 5th Edition*. He is the Primary Author & Investigator in four Small Business Innovative Research (SBIR) grants defining Littoral Remote Sensing for NGA and Real Time airborne imaging in active and passive based airborne sensing for DHS. In addition, he served a two-year term as one of 28 members on the inaugural National Geospatial Advisory Committee (NGAC) for the Secretary of the Interior.

Mondello holds multiple patents as a co-inventor in oblique remote sensing and was a principle investigator and designer of the Digital Aerial Camera In-Lab Calibration System now in use at EROS data center. Mondello is a four-time ASPRS Presidential Citation Recipient and he is a certified Geographic Information Systems Professional (GISP).

Purpose: Started in 1992, the designation of Fellow is conferred on Society members who have been active for a total of at least ten years and who have performed exceptional service in advancing the science and use of the mapping sciences and related disciplines. It is awarded for professional excellence and for service to the Society.

Donor: the ASPRS Foundation

The ASPRS Fellow Award includes a hand-engrossed certificate.

Past Award Recipients:

- 2008: Allan Falconer, Peggy J. Harwood, Frank Scarpace, Bernard “Barney” Schur
- 2009: Ray Helmering, Thomas R. Loveland
- 2010: George Hepner, Marguerite Madden, J. Chris McGlone, Clifford J. Mugnier
- 2011: Paul D. Brooks and Kass Green
- 2012: Kari J. Craun and Herbert W. Stoughton

Paul R. Wolf Memorial Scholarship

2013 Recipient: Ryan Sheridan

Ryan Sheridan is being presented with this award in recognition of his outstanding academic credentials and his plans and enthusiasm to become an education professional in Surveying, Mapping, and Photogrammetry and related fields. Sheridan is currently a PhD candidate (planned graduation: Spring, 2014) in Agriculture and Life Sciences, Department of Renewable Natural Resources at the Texas A&M University in College Station, Texas. Sheridan has demonstrated his continued interest, dedication, enthusiasm, and aptitude to become an education professional and has been recognized at all levels for this. The committee wishes Sheridan much success and is confident that his current and future education efforts will continue to make important contributions to the Surveying, Mapping and Photogrammetry community.

Purpose: To encourage and commend college students who display exceptional interest, desire, ability, and aptitude to enter the profession of teaching surveying, mapping, or photogrammetry.

Donor: the ASPRS Foundation from funds donated by the friends and colleagues of Paul R. Wolf. Recognized nationally and internationally, Paul was an outstanding educator and practitioner of surveying, mapping, and photogrammetry and a great friend of the Society. As author, teacher, and mentor, Paul made significant educational and academic contributions to these fields. The award was inaugurated in 2003.

The award includes a grant of \$3,000 and a hand-engrossed certificate.

Past Award Recipients:

- 2008: Akira Kato
- 2009: Anthony Richard Vannozzi
- 2010: Benjamin E. Wilkinson
- 2011: Adam Benjamin
- 2012: Allan Ng

BAE Systems Award

2013 award results were not available at press time. Please check the Final Program Errata Sheet for details.

Purpose: To reward top quality research and publication by young students (under age 35 as of the application deadline) at master's or doctoral level and to encourage researchers to use the ASPRS annual conference as a vehicle to publish and present their findings. The recipient's paper will be published in *Photogrammetric Engineering & Remote Sensing* (PE&RS), the official journal of ASPRS.

Donor: BAE Systems Foundation through the ASPRS Foundation

The award was first offered in 2005 and consists of a certificate and a grant of \$2,000.

Past Award Recipients:

2008: Xuerian Meng
2009: Ju Won Hwangbo
2010: Jaehong Oh
2011: Y.A. Mustapha
2012: Nima Pahlevan

ASPRS Conference Management Awards

2013 Recipients: Conference Co-Chairs John S. Iiames, Jr. and David L. Szymanski

Conference Technical Program Co-Chairs David M. Johnson and Claire G. Boryan

Purpose: The intent of this award is to recognize the great effort put forth by the individuals who volunteer their time to assist in the planning and execution of a successful annual conference.

Donor: The ASPRS Foundation

The award is an engraved plaque with the conference program cover.

Past Award Recipients:

2008: Roger Crystal, Nancy Tubbs, and Geoffrey Duh
2009: James D. Hipple, Karen L. Schuckman, John S. Iiames, Jr., Douglas A. Miller, and Larry D. Hothem
2010: Steve Yool, Doug Stow, Cynthia Wallace, Soe Myint
2011: Brian Huberty, Miles Strain, and Frank Scarpace
2012: Alan Mikuni, George Hepner, Maggi Kelly and Ryan Jensen

Memorial Address

Presidential Citations

Region Awards

- Region of the Year
- Region Newsletter of the Year
- Region Website of the Year
- GeoLeague Awards

Presidential Citations

2013 Recipients:

Gary Florence of ASPRS for serving as technical program co-chair for the Fall 2012 ASPRS/MAPPS meeting and successfully executing that responsibility in the face of government budget restrictions and unexpected travel-impacting weather and for his service as the ASPRS Delegate to the Coalition of Geospatial Organizations.

Eric Andelin of MAPPS for serving as technical program co-chair for the Fall 2012 ASPRS/MAPPS meeting and successfully executing that responsibility in the face of government budget restrictions and unexpected travel-impacting weather.

Adam R. Benjamin for his motivating enthusiasm and outstanding leadership of the Student Advisory Council.

Steve DeGloria for his service building a workable agenda for the Ad Hoc Restructuring Committee, for enabling constructive discussion with ASPRS Region representatives, and for conducting teleconferences with his committee drawn from across membership.

Don Lauer for his unsurpassed volunteer service as National Treasurer of ASPRS

Carolyn Merry for her sustained volunteer representation of ASPRS on the National Academy of Sciences Mapping Science Committee and at the University Consortium for Geographic Information Science meetings.

Kim Tilley and Billie Plasker for support with the ISPRS Congress exhibit in Melbourne, Australia.

Purpose: First awarded in 1992, Presidential Citations are presented by the ASPRS President to members of ASPRS and other societies, family members, and friends in recognition of special, personal, and meritorious contributions to the operation or advancement of the Society and its interests during the presidential year.

Donor: The ASPRS Foundation

The Presidential Citation is a hand-engrossed certificate.

Past Award Recipients:

2008:

- Sandra Hunkele
- Kim Tilley
- Gene Dial
- Ed Freeborn

- Tina Cary
- Matthew Austin
- Rae Kelley

2009:

- Michael S. Renslow
- Charles Mondello and George F. Hepner
- Katie Mayo, Vaughn Rogers, and Jack Mayo
- Richard A. Pearsall, Rebecca A. Morton, and Louis N. Graham
- Gene Forsburg
- George Y. G. Lee
- Kimberly A. Tilley and Marguerite Madden
- Michael R. Thomas and A. Stewart Walker
- Mary Potter and Terrence J. Keating
- The 75th anniversary committee, Russell G. Congalton, Stewart Walker, Karen Schuckman, Bill Hemple, and Brian Kloer

2010:

- Paul Brooks
- Larry Handley
- Don Lauer
- Al Stevens
- Becky Morton
- John Iames.
- Doug Smith
- Al Karlin
- Bradley Rundquist
- Rose Kearney
- Mark Jackson

2011:

- William Philpot
- Don Vance
- Marguerite Madden
- Lynn Usery
- Christopher Aldridge
- Daniel Civco
- Bob Redfield
- Cindy Sopher
- Rick Pearsall
- Jesse Winch

2012:

Lewis Graham
Bobbi Lenczowski
Ekaterina Fitos
Devin Bourland

Thomas Holm
Brian Murphy
Kim Tilley
Carolyn Merry

ASPRS Region of the Year Award

2013 award results were not available at press time. Please check the Final Program Errata Sheet for details.

Purpose: The Region of the Year Award was established in 1968 to recognize excellence at the regional level in providing service to the members and to the profession at large.

Donor: The ASPRS Foundation

The Region of the Year Award includes a hand engrossed certificate and possession of the Region of the Year banner for one year for the winner and certificates for first and second honorable mention.

Past Award Recipients:

2008: The Columbia River Region
2009: The Columbia River Region
2010: The Potomac Region
2011: St. Louis Region
2012: Western Great Lakes

ASPRS Region Newsletter of the Year

2013 award results were not available at press time. Please check the Final Program Errata Sheet for details.

Purpose: The Society first bestowed this award in 1980 to recognize excellence of the Region in providing service to the members and to the profession at large through publications of a newsletter.

Donor: The ASPRS Foundation

The Newsletter of the Year Award includes a hand engrossed certificate.

Past Award Recipients:

2008 *Wavelengths* (Columbia River)
2009 *Wavelengths* (Columbia River)
2010: *Rocky Mountain Compiler*
2011: *Wavelengths*, (Columbia River)
2012: *Wavelengths*, (Columbia River)

Region Website of the Year

2013 award results were not available at press time. Please check the Final Program Errata Sheet for details.

A scoring and weighting system applied by a third party neutral judge is used to decide the winners of the Region Website of the Year Award.

The winning websites demonstrate high quality look and feel in the site design and effectively convey accurate, informative and timely content. Each site is easy to navigate with few or no broken links and page file sizes are minimized to reduce page loading times. The sites display content of unique regional flavor.

Purpose: The Region Website of the Year Award serves to recognize excellence among the regions in providing service to members and to the profession at large through web site publication.

Donor: The ASPRS Foundation

The Region Website of the Year Award, inaugurated in 2003, includes hand-engrossed certificates for all winners.

Past Award Recipients:

2008: Northern California Region
2009: St. Louis Region
2010: Florida Region
2011: Florida Region
2012: Rocky Mountain Region

Session Categories

Sensor and Satellite Design and Development

- 21 Special Session – Airborne Digital Mapping Camera Systems; Manufacturers Perspective
- 32 Special Session – UAS Sensors and Analysis Tools Overview
- 45 Special Session – Digital Image Quality Assurance Panel
- 62 Unmanned Aerial Vehicles (UAV)
- 76 Special Session – Satellite Image Acquisition Strategies
- 77 Special Session – UAS Capabilities Overview
- 86 Special Session – Operational Space Imaging Systems, Advances, Calibration, and Standards

Remote Sensing of Land Applications

- 6 Land Surface Temperature
- 12 Agriculture II – Orchards
- 13 Vegetation I – Monitoring
- 23 Hyperspectral
- 24 Vegetation II – Dynamics
- 34 Agriculture III – Cropland
- 35 Forestry I – Monitoring
- 46 Agriculture IV – Cropland Classification
- 47 Forestry II – Mapping
- 48 Soils
- 50 Infrastructure I – Buildings
- 58 Forestry III – Disturbances
- 61 Infrastructure II – Transportation
- 63 Human Geography
- 67 Special Session – Urban Mapping

Remote Sensing of Water Applications

- 1 Agriculture I – Irrigation
- 8 Special Session – Maritime Applications of Remote Sensing
- 37 Bathymetry
- 39 Cryosphere
- 51 Coasts
- 59 Hydrology
- 74 Wetlands – Coastal
- 81 Water Monitoring
- 83 Wetlands II – Inland

Oral Poster Presentations

- 7 Oral Poster Session #1 – Vegetation Mapping
- 17 Oral Poster Session #2 – Data and Methods
- 28 Oral Poster Session #3 – Environmental Applications

Photogrammetric and Lidar Applications

- 4 Aerotriangulation
- 31 Special Session – Fundamental Topics in Kinematic Laser Scanning
- 49 Lidar I – Accuracy Assessment
- 60 Lidar II – Methods
- 71 Lidar III – Forestry
- 80 Lidar IV – Applications
- 82 Terrain Modeling
- 88 Special Session – Dense 3D Point Cloud Reconstruction from Imagery

Algorithm and Methods Development

- 5 Machine Learning
- 11 NGA Session #1
- 15 Imagery Enhancement
- 16 Automation
- 22 NGA Session #2
- 26 Data Compression
- 27 Feature Extraction
- 33 NGA Session #3
- 36 Multi-Sensor Analysis
- 38 Positional Accuracy
- 52 Theoretical Concepts

- 68 Geoinformatics
- 70 GEOBIA I – Methods
- 72 Precision Mapping
- 73 Surface Modeling
- 79 GEOBIA II – Applications
- 84 Geostatistics

Data Capture, Storage and Dissemination

- 3 Big Data
- 10 Special Session – Real Time Geospatial Data Capture through Implementation
- 14 Open Source Software
- 25 Data Dissemination
- 40 Project Planning
- 43 Special Session – Big Data #1
- 55 Special Session – Big Data #2
- 56 Special Session – Mobile Mapping and Geospatially Enabled Smart Devices
- 66 Special Session – Big Data #3
- 85 Special Session – Best Practices and Preservation of Imagery and Geospatial Data

Disaster Management and Rapid Response

- 9 Special Session – Time Sensitive Remote Sensing #1
- 18 Special Session – Disaster Monitoring Constellation
- 20 Special Session – Time Sensitive Remote Sensing #2
- 69 Hazards – Mapping
- 78 Disasters – Mapping

Education/Professional Development

- 29 Special Session – GeoLeague Challenge
- 54 Special Session – SAC #2 – Strategies and Application Processes for Winning an ASPRS Award or Scholarship
- 64 Special Session – Education/Outreach in Remote Sensing
- 65 Special Session – SAC #3 – Advice on How to Successfully Write a NSF Grant (Graduate Fellowship/Doctoral Dissertation Improvement Grant)
- 89 Special Session – K-12 Geospatial Education and Citizen Science

Environmental Assessment

- 2 Change Detection
- 19 Special Session – Climate Change and the Coastal Environment
- 30 Special Session – Extreme Weather Monitoring with Remote Sensing
- 41 Special Session – Environmental Remote Sensing – Applications for the Oil and Gas Industry
- 42 Special Session – New Trends in Remote Sensing Research
- 53 Special Session – Applied Remote Sensing
- 57 Land Cover/Land Use Change
- 75 Special Session – Alaska – Mapping America's Last Frontier

National Geospatial-Intelligence Agency (NGA)

- 11a Session 1 - Advancements in GEOINT Analytics I
- 11b Session 2 - Geospatial Intelligence in Academia
- 22 Session 3 - Advancements in GEOINT Analytics II
- 33 Session 4 - NGA Academic Research Program

Students & Young Professionals



Please join the Student Advisory Council (SAC) for some activities designed just for YOU!

Student Advisory Council Meeting (SAC)

Monday, March 25th, 5:30 PM to 6:30 PM
Room: Dover B & C, 3rd Floor

Get together with the other Students and Associate members of ASPRS and learn what the SAC has been working on and what is planned for the coming week. They would love to meet you and hear any ideas you may have to make your conference experience enjoyable. All are welcome to attend.

Exhibit Hall Guided Tour for Students

Tuesday, March 26th, 11:00 AM to 12:00 NOON
Location: Exhibit Hall, Grand Ballroom, 3rd Floor

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. Exhibit halls can be intimidating, but not after this personal tour. Meet at the main exhibit hall entrance doors to participate in this fun tour. See you there!

GeoLeague Competition

Tuesday, March, 26th, 3:30 PM to 5:00 PM, Room: Atlantic, 3rd Floor

The teams competing in the GeoLeague Challenge will be presenting their projects during this technical session. Students should attend and support the teams. Judging will take place following the session and prizes will be awarded during the Memorial Address on Wednesday, March 26th.

Student & Employer “Meet and Greet”

Wednesday, March 27th, 11:00 AM to 12:00 NOON,
Room: Dover C, 3rd Floor

This great event is designed to connect students looking to apply for jobs in the digital mapping industry and employers looking to hire! Bring your resume, a business card, or just a smile and a handshake, and expand your job network at the conference. It's also an opportunity to meet other students and young professionals from all over the world who are attending the conference. Don't miss out on this great event!

Social Activities:

Your SAC Networking Coordinator will arrange relaxed social gatherings after each of the day's conference activities. These events will allow you to get to know more of the students and young professional members of ASPRS. Attendees are welcome to join in on the fun. To find out about all the activities, visit the conference web page at www.asprs.org/Conferences/Baltimore2013 and click on the Presenters & Students tab. Or stop by the Message Board onsite – activities will be posted.

Young Professionals Council Meeting

Wednesday, March 27th, 11:00 AM to 12:00 NOON
Room: Essex A, 4th Floor

The ASPRS Young Professionals Council (YPC) requests your participation as we focus to enhance membership benefits for non-students below the age of 35. This demographic is critical to ASPRS's future. As an organization we can do more to make the Society attractive to this demographic. YPC's mission is to utilize ASPRS to support young professional's development through:

- Certification
- Mentoring
- Networking

YPC is holding an open meeting with the objective of getting input and having an open discussion on ways to develop these initiatives. We're requesting participation and volunteers from:

- Region board members — to support implementation at the local level
- Sustaining Member firms — promoting ASPRS to young employees and mentorship by experienced managers are important elements
- Student members — can provide insights on the reasons for membership drop-off with students leaving the university and entering the workplace who allow their memberships to lapse and how to engage with these members at that point in time
- Seasoned professionals — with the belief in giving back to the profession through mentoring
- Young professionals and Associate Members — who can tell us directly what needs ASPRS should be meeting

Operation Sock Drop

Support the local Baltimore community and donate a pair of new socks for Operation Sock Drop. The SAC will be helping to support this service project by selling socks to donate. Stop by the SAC booth (#616) in the exhibit hall and purchase a pair of socks! Net sales of the socks will be used by the SAC to underwrite a future SAC-sponsored Summer School.

Student Advisory Council Booth #616

The SAC will have a booth in the exhibit hall at the Conference this year! Be sure to drop by to get information about the SAC, how to participate in next year's GeoLeague Challenge, Student Activities going on throughout the conference, and more. Also, don't forget to buy socks to donate for Operation Sock Drop. Stop by the SAC booth #616.

We guarantee that your participation in these activities will make your conference experience more enjoyable!

Sunday, March 24th

My Day-at-a-Glance

Time	Event	Room	
6:30 AM to 5:00 PM	Conference Registration Desk Open	3 rd Floor Convention Registration	
7:45 AM - 5:15 PM	Workshop #1 — Georeferencing: State of the Art and New Trends	Laurel C & D, 4 th Floor	
7:45 AM - 5:15 PM	Workshop #2 — Object-Based Image Analysis	Kent B & C, 4 th Floor	
7:45 AM - 5:15 PM	Workshop #3 — Lidar for Terrain and Vegetation Mapping	Laurel A & B, 4 th Floor	
8:00 AM - 10:00 AM	ASPRS Committee Meeting — Division Directors & Committee Chairs	Room: Harborside C, 4 th Floor	
10:00 AM to 12 NOON	ASPRS Committee Meeting — Journal Policy & Publications Committee	Harborside C, 4 th Floor	
10:00 AM to 11:00 AM	ASPRS Committee Meeting — Bylaws Committee	Harborside D, 4 th Floor	
10:00 AM to 12 NOON	ASPRS Committee Meeting — Awards Committee	Harborside E, 4 th Floor	
1:00 PM to 2:00 PM	ASPRS Committee Meeting — Region Officers	Harborside D, 4 th Floor	
2:00 PM to 3:00 PM	ASPRS Committee Meeting — Remote Sensing Applications Division (RSAD)	Harborside C, 4 th Floor	
2:00 PM to 3:00 PM	ASPRS Committee Meeting — Photogrammetric Applications Division (PAD)	Harborside D, 4 th Floor	
3:00 PM to 4:00 PM	ASPRS Committee Meeting — Photogrammetric Applications Division (PAD) Defense & Intelligence Subcommittee	Harborside C, 4 th Floor	
3:00 PM to 5:00 PM	ASPRS Committee Meeting — ASPRS Education & Professional Development Committee	Harborside D, 4 th Floor	
4:00 PM to 5:00 PM	ASPRS Committee Meeting — Remote Sensing Applications Division (RSAD) Climate Change Subcommittee	Harborside C, 4 th Floor	
5:00 PM to 6:00 PM	ASPRS Committee Meeting — Films Committee	Harborside C, 4 th Floor	
1:00 PM to 5:00 PM	User Group Meeting — RapidEye	Harborside B, 4 th Floor	

Notes:

Sunday, March 24th

Conference Registration Desk Open

6:30 AM to 5:00 PM

Location: 3rd Floor Convention Registration



Workshops

Workshop #1

Georeferencing: State of the Art and New Trends

Joe Hutton, Director of Airborne Business, *Applanix Corporation*

Mohamed MR Mostafa, Chief Technical Authority, *Applanix*

Corporation

7:45 AM to 5:15 PM, Room: Laurel C & D, 4th Floor, CEU .8*

Workshop #2

Object-Based Image Analysis

Jarlath O'Neil-Dunne, *University of Vermont*

Keith Pelletier, *University of Minnesota*

7:45 AM to 5:15 PM, Room: Kent B & C, 4th Floor, CEU .8*

Workshop #3

Lidar for Terrain and Vegetation Mapping

Qi Chen, *University of Hawaii at Manoa*

7:45 AM to 5:15 PM, Room: Laurel A & B, 4th Floor, CEU .8*

* For more information on CEUs, please see page 35.

ASPRS Committee Meetings

Anyone interested in the work of an ASPRS Division or Committee is welcome to attend these meetings. There is no registration required for attendance at the Division and Committee meetings. Your participation is encouraged and welcome.

Division Directors & Committee Chairs

(Joint Meeting - will focus upon the activities of each entity as they relate to the Strategic Plan of ASPRS.)

8:00 AM to 10:00 AM, Room: Harborside C, 4th Floor

Journal Policy & Publications Committee (Joint Meeting)

10:00 AM to 12 NOON, Room: Harborside C, 4th Floor

Bylaws Committee

10:00 AM to 11:00 AM, Room: Harborside D, 4th Floor

Awards Committee

10:00 AM to 12 NOON, Room: Harborside E, 4th Floor

Region Officers

1:00 PM to 2:00 PM, Room: Harborside D, 4th Floor

Remote Sensing Applications Division (RSAD)

2:00 PM to 3:00 PM, Room: Harborside C, 4th Floor

Photogrammetric Applications Division (PAD)

2:00 PM to 3:00 PM, Room: Harborside D, 4th Floor

Photogrammetric Applications Division (PAD)

Defense & Intelligence Subcommittee

3:00 PM to 4:00 PM, Room: Harborside C, 4th Floor

ASPRS Education & Professional Development Committee

3:00 PM to 5:00 PM, Room: Harborside D, 4th Floor

Remote Sensing Applications Division (RSAD)

Climate Change Subcommittee

4:00 PM to 5:00 PM, Room: Harborside C, 4th Floor

Films Committee

5:00 PM to 6:00 PM, Room: Harborside C, 4th Floor

User Group Meetings

User Group Meetings are a wonderful chance for YOU to meet with exhibitors one-on-one.

The meetings are four hour sessions which include a discussion or presentation from the exhibiting company about their new products, software or innovations. These sessions are designed for personal attention from the exhibitor and are complimentary for all conference attendees. You don't want to miss this opportunity!

RapidEye

1:00 PM to 5:00 PM, Room: Harborside B, 4th Floor

RapidEye Mosaic Product. We're proud to debut our newest product at the ASPRS User Group Meetings: RapidEye mosaic products consist of multiple RapidEye image takes that have been orthorectified and

radiometrically color balanced to a uniform appearance. These image takes are then assembled to create a single, seamless area image. Product specifications for the RapidEye Mosaic will be discussed as well as which specific countries are available 'off-the-shelf'.

Session Level: Suitable for all levels.

Continuing Education Credits (CEU's)

ASPRS is pleased to announce that Continuing Education Units (CEUs) are awarded for the ASPRS workshops. This program is being offered in conjunction with George Mason University.

The Continuing Education Unit (CEU) is a nationally recognized unit of measurement for participation in non-credit continuing education programs. Adults who successfully complete George Mason University's approved programs will be awarded continuing education units. A permanent record of CEUs awarded will be maintained in the university database and will be easily accessible for certification and verification purposes.

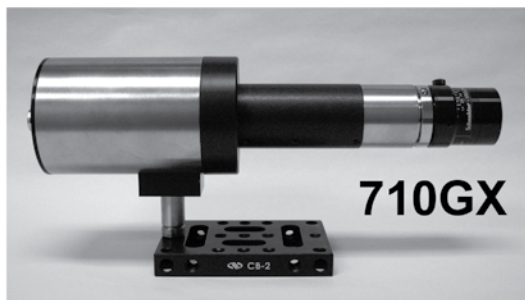
The objective of the CEU is to:

- Provide a nationally established record of professional development learning activity
- Encourage adult students to utilize educational resources to meet their personal and educational needs
- Recognize individuals who continue their education and keep themselves current in their chosen professions
- Enable individuals to have an accurate source of their current CEU activity
- Provide a system to document continuing education experiences in meeting certification requirements.

George Mason University, Office of Continuing Professional Education is registered with the National Association of State Boards of Accountancy (NASBA), as a sponsor of continuing professional education on the National Registry of CPE Sponsors. State boards of accountancy have final authority on the acceptance of individual courses for CPE credit.

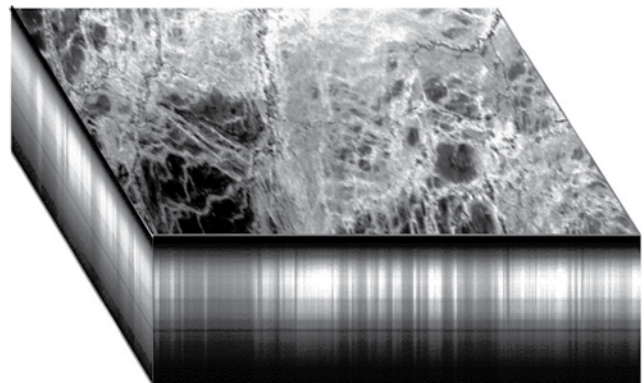


AIRBORNE HYPERSPECTRAL CAMERA



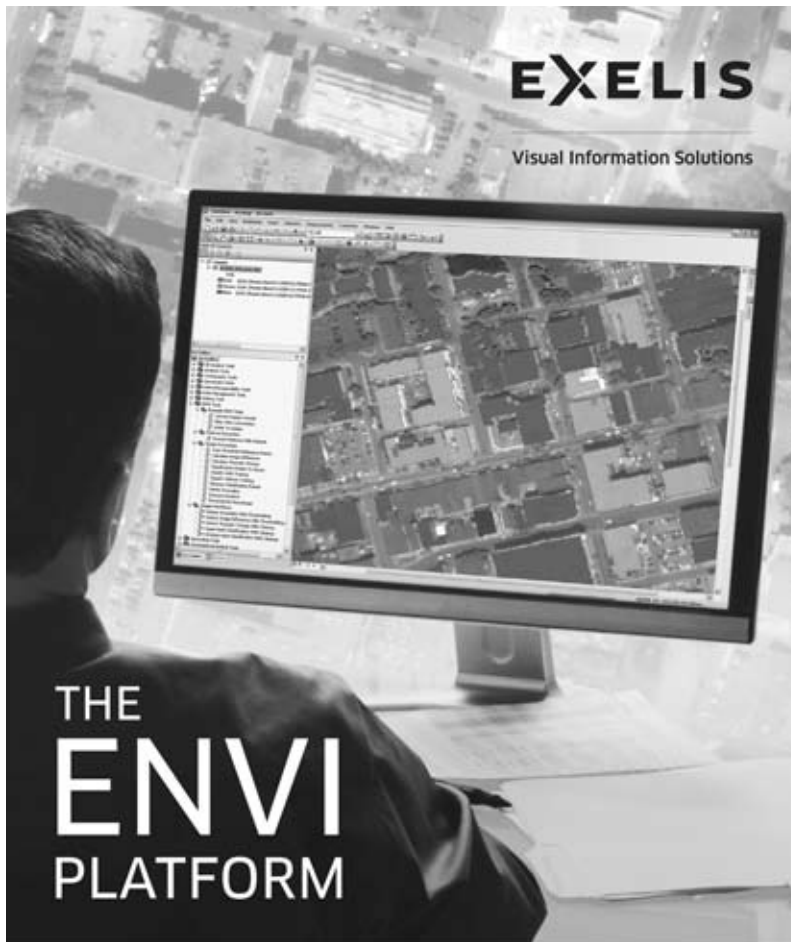
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Giving Back

“OPERATION Sock Drop” –

A Sock Drive for the Homeless Supporting St. Vincent de Paul of Baltimore

At this year's annual conference, we are excited to help support a local Baltimore homeless shelter, **St. Vincent de Paul of Baltimore**, through **OPERATION SOCK DROP**.

We are asking for your help. All that is needed is a small donation of at least one brand-new pair of men's, women's or children's socks (wool or cotton tube socks work best). Place your



donation in the Drop Box for your ASPRS Region and participate in the Region competition! Drop Boxes will be located near the Conference Registration Desk on the 3rd Floor of the Baltimore Marriott Waterfront Hotel. Help your Region receive recognition for collecting the most donated individual pairs of socks!

Forgot Your Socks?

Purchase a pair to donate at the SAC booth #616

It's an easy and inexpensive way to have a big impact on the comfort, health and safety of the homeless men, women and children in the Baltimore community. And to make giving back even easier, the **ASPRS Student Advisory Council** will be assisting with this project by **selling socks at their booth #616** in the Exhibit Hall for you to donate. If you forgot to bring a donation, don't worry, stop by the SAC booth and purchase a pair!

Warm Feet, Warm Hearts.

Time	Event	Room	Attending
6:30 AM to 5:00 PM	Conference Registration Desk Open	3 rd Floor Convention Registration	
7:45 AM to 5:15 PM	Workshop #6 — Unmanned Aerial System (UAS) Fundamentals	Essex B & C, 4 th Floor	
7:45 AM to 5:15 PM	Workshop #7 — Photogrammetric Processing: Surface Model and Orthophotograph Workshop	Laurel C & D, 4 th Floor	
7:45 AM to 12:15 PM	Workshop #9 — Calibrating Film and Digital Sensors for Today's Geo-Spatial Business	Laurel A & B, 4 th Floor	
12:45 PM to 5:15 PM	Workshop #11 — Lidar Waveform: The Potential and Benefits for Topographic Mapping	Laurel A & B, 4 th Floor	
8:00 AM to 5:00 PM	Classified Session — Advancements in GEOINT Analytics	Offsite	
8:00 AM to 9:00 AM	ASPRS Committee Meetings — Evaluation for Certification	Dover A, 3 rd Floor	
9:00 AM to 10:00 AM	ASPRS Committee Meetings — ASPRS Membership Committee	Dover A, 3 rd Floor	
10:00 AM to 12:00 NOON	ASPRS Committee Meetings — Geographic Information Systems Division (GISD)	Dover A, 3 rd Floor	
11:00 AM to 1:00 PM	ASPRS Committee Meetings — New Board Orientation	Atlantic, 3 rd Floor	
1:00 PM to 2:00 PM	ASPRS Committee Meetings — Electronic Communications Committee	Dover B & C, 3 rd Floor	
1:00 PM to 2:00 PM	ASPRS Committee Meetings — Lidar Airborne Lidar Subcommittee	Dover A, 3 rd Floor	
2:00 PM to 3:00 PM	ASPRS Committee Meetings — Data Preservation & Archives Committee	Dover A, 3 rd Floor	
2:00 PM to 4:00 PM	ASPRS Committee Meetings — Convention Policy & Planning Committee (CPPC)	Essex A, 4 th Floor	
3:00 PM to 4:00 PM	ASPRS Committee Meetings — Professional Practice Division (PPD)	Dover A, 3 rd Floor	
4:00 PM to 5:00 PM	ASPRS Committee Meetings — ASPRS Standards Committee	Dover A, 3 rd Floor	
4:15 PM to 5:15 PM	ASPRS Committee Meetings — ASPRS Sustaining Members Council	Dover B & C, 3 rd Floor	
5:00 PM to 6:00 PM	ASPRS Committee Meetings — ASPRS Division Directors	Dover A, 3 rd Floor	
5:30 PM to 6:30 PM	ASPRS Committee Meetings — Student Advisory Council (SAC)	Dover B & C, 3 rd Floor	
8:00 AM to 12 NOON	User Group Meeting — BAE Systems	Harborside B, 4 th Floor	
8:00 AM to 12 NOON	User Group Meeting — GeoCue Corporation	Harborside E, 4 th Floor	
8:00 AM to 12 NOON	User Group Meeting — Microsoft / Vexcel Imaging GmbH	Harborside C, 4 th Floor	
8:00 AM to 12 NOON	User Group Meeting — Topcon Positioning Systems	Harborside A, 4 th Floor	
8:00 AM to 12 NOON	User Group Meeting — TopoFlight Mission Planner	Harborside D, 4 th Floor	
8:00 AM to 12 NOON	User Group Meeting — Esri	Dover B & C, 3 rd Floor	
1:00 PM to 5:00 PM	User Group Meeting — Certainty 3D	Harborside E, 4 th Floor	
1:00 PM to 5:00 PM	User Group Meeting — Exelis Visual Information Solutions	Harborside D, 4 th Floor	
1:00 PM to 5:00 PM	User Group Meeting — Intergraph® and Leica Geosystems	Harborside B, 4 th Floor	
1:00 PM to 5:00 PM	User Group Meeting — Optech	Harborside A, 4 th Floor	
1:00 PM to 5:00 PM	User Group Meeting — Trimble	Harborside C, 4 th Floor	
5:30 PM to 6:30 PM	Students & Young Professionals — Student Advisory Council Meeting (SAC)	Essex A, 4 th Floor	
6:00 PM to 9:00 PM	Conference & Region Welcome Reception	Da Mimmo's Restaurant in Baltimore's Little Italy	

Notes:

Technical Program

Monday, March 25th, 6:30 AM to 5:15 PM

Conference Registration Desk Open

6:30 AM to 5:00 PM, Location: 3rd Floor Convention Registration



Presenter Prep Room Open

8:00 AM to 5:00 PM, Room: Falkland, 4th Floor

ASPRS has arranged a room for presenters to practice their presentations. This room will be open daily and is available on a first come, first served basis. Please be respectful of fellow presenters when using the practice room. Just like a regular session room, a LCD projector and screen are provided for practice use.

Workshops

Workshop #6

Unmanned Aerial System (UAS) Fundamentals

Lt. Col. Morgan Andrews, USAFR

Ed Freeborn, *Unmanned Experts LLC*

7:45 AM to 5:15 PM, Room: Essex B & C, 4th Floor, CEU .8

Workshop #7

Photogrammetric Processing: Surface Model and Orthophotograph Workshop

Jennifer Nix, *DigitalGlobe Inc.*

Jon Proctor, *DigitalGlobe Inc.*

7:45 AM to 5:15 PM, Room: Laurel C & D, 4th Floor, CEU .8

Workshop #9

Calibrating Film and Digital Sensors for Today's Geo-Spatial Business

Dr. Qassim Abdullah, *Woolpert*

Don Light, CP, *Rochester Institute of Technology*

7:45 AM to 12:15 PM, Room: Laurel A & B, 4th Floor, CEU .4

Workshop #11

Lidar Waveform: The Potential and Benefits for Topographic Mapping

Charles K. Toth, PhD, *Center for Mapping, The Ohio State University*

Nora Csanyi May, PhD, *Fugro EarthData, Inc.*

12:45 PM to 5:15 PM, Room: Laurel A & B, 4th Floor, CEU .4

* For more information on CEU's, please see page 35.

RIEGL LIDAR 2013

INTERNATIONAL USER CONFERENCE

Vienna, Austria
June 25 - 27



HIGHLIGHTS:

- Segment Tracks
- NEW Hardware & Software
- NEW Applications
- User, Partner & Scientific Presentations
- Networking, Reception & Gala Event
- Headquarter & Technical Tours



The conference will be held at the Vienna Marriott Hotel, which is situated on the famous Ringstrasse in the Historic city center of Vienna, Austria. For more information, please visit the official user conference website: <http://www.riegllidar.com>



(855) GO-RIEGL USA
info@rieglusa.com
<http://www.rieglusa.com>

RIEGL Laser Measurement Systems GmbH, Austria

RIEGL USA Inc.

RIEGL Japan Ltd.

Classified Session

Advancements in GEOINT Analytics

8:00 AM to 5:00 PM, Location: Offsite

The National Geospatial-Intelligence Agency (NGA) will be hosting an all-day classified session in conjunction with the 2013 ASPRS Annual Conference. The purpose of the classified session is to engage the attendees in exploring views, ideas, approaches, and research results for *Advancements in GEOINT Analytics*.

Morning Session: Keynote presentation and cutting edge research presentations on Advancements in GEOINT Analytics.

Afternoon Session: Additional research presentations and in-depth round table discussions on Advancements in GEOINT Analytics.

Location: Northrop Grumman Electronic Systems, 1550 West Nursery Road, Linthicum Heights, MD 21090

Transportation: A shuttle will be provided for all pre-registered attendees. The shuttle will depart from the Baltimore Marriott Waterfront Hotel at 7:00 AM. There is plenty of free parking at the Northrop Grumman building for those wishing to drive. A special parking area will be designated.

Breaks/Lunch: A light continental breakfast and coffee will be provided at the facility upon arrival. A complimentary lunch for all attendees will be held at the facility as well as an afternoon break.

Important Details: All registered attendees must have a conference name badge and personal government identification for access to the facility. All personal electronic equipment (ex. cell phone, ipad, laptop, etc.) is discouraged – lockers for such items will be provided.

ALL participants for the classified session must be pre-registered with ASPRS.

For questions regarding this session, please contact Dennis Walker at dennis.t.walker@nga.mil or dennis.t.walker@nga.ic.gov.

ASPRS Committee Meetings

Evaluation for Certification

8:00 AM to 9:00 AM, Room: Dover A, 3rd Floor

ASPRS Membership Committee

9:00 AM to 10:00 AM, Room: Dover A, 3rd Floor

Geographic Information Systems Division (GISD)

10:00 AM to 12:00 NOON, Room: Dover A, 3rd Floor

New Board Orientation

11:00 AM to 1:00 PM, Room: Atlantic, 3rd Floor

Electronic Communications Committee

1:00 PM to 2:00 PM, Room: Dover B & C, 3rd Floor

Lidar

Airborne Lidar Subcommittee

1:00 PM to 2:00 PM, Room: Dover A, 3rd Floor

Data Preservation & Archives Committee

2:00 PM to 3:00 PM, Room: Dover A, 3rd Floor

Convention Policy & Planning Committee (CPPC)

2:00 PM to 4:00 PM, Room: Essex A, 4th Floor

Professional Practice Division (PPD)

3:00 PM to 4:00 PM, Room: Dover A, 3rd Floor

ASPRS Standards Committee

4:00 PM to 5:00 PM, Room: Dover A, 3rd Floor

ASPRS Sustaining Members Council

4:15 PM to 5:15 PM, Room: Dover B & C, 3rd Floor

ASPRS Division Directors

5:00 PM to 6:00 PM, Room: Dover A, 3rd Floor

Student Advisory Council (SAC)

5:30 PM to 6:30 PM, Room: Essex A, 4th Floor

User Group Meetings

User Group Meetings are a wonderful chance for YOU to meet with exhibitors one-on-one.

The meetings are four hour sessions which include a discussion or presentation from the exhibiting company about their new products, software or innovations. These sessions are designed for personal attention from the exhibitor and are **complimentary for all conference attendees**. You don't want to miss this opportunity!

BAE Systems

8:00 AM to 12 NOON, Room: Harborside B, 4th Floor

SOCET GXP software delivers end-to-end photogrammetric strengths with the added benefits of an intuitive and customizable user interface, advanced image processing, and improved workflow automation for ease-of-use and maximized productivity. Preview SOCET GXP v4.1 enhancements including the integration of ClearFlite, the SOCET GXP Explorer connector, and the new Visual Coverage Tool (VCT), which replaces the existing VCT. And, get a sneak peek of GXP Web, which enables the viewing and analyzing of geospatially referenced imagery all within a Web browser.

GeoCue Corporation

8:00 AM to 12 NOON, Room: Harborside E, 4th Floor

GeoCue Corporation is a software development and consulting services company specializing in geospatial production management solutions. We will be demonstrating our GeoCue product family of integrated solutions in booth #515 as well as during our annual user's group meeting on Monday, March 25th, 8:00 am to 12 noon. These products provide an integrated end-to-end processing framework that, when combined with industry leading production tools, significantly reduces production time from data acquisition to finished product.

Microsoft / Vexcel Imaging GmbH

8:00 AM to 12 NOON, Room: Harborside C, 4th Floor

Join the technical experts and business leaders from Microsoft's UltraCam product group in this half day presentation for an opportunity to learn firsthand about the company's latest aerial mapping sensor and software product advancements: UltraCam Eagle, UltraCam Falcon and UltraMap 3.0. Prizes will be raffled, refreshments will be served, and seating will be limited so be sure to arrive early.

Topcon Positioning Systems

8:00 AM to 12 NOON, Room: Harborside A, 4th Floor

Join Topcon for this informational workshop, as we present Map, Extract and Deliver; an understanding of mobile mapping systems technology and workflows. Technical aspects of the IP-S2HD will be presented including functionality of core components and available sensors.

An overview of data collection, processing, and calibration methods is explained. Software workflows for viewing and extracting data using point clouds and digital images as well as geospatial data management for a variety of applications will be presented.

TopoFlight Mission Planner

8:00 AM to 12 NOON, Room: Harborside D, 4th Floor

TopoFlight/New Tech Services, Inc. sells a Flight Planning Program. Please download a demo. Current Version is 8. The "Navigator" is a Flight Management System to navigate the Aircraft and trigger the Camera at pre-defined positions. New Tech Services markets Pre-Owned Mapping Equipment and modified Planes. TopoFlight Products are marketed in over 20 countries. Contact nts@nts-info.com. More information at www.nts-info.com, www.TopoFlight.com or call: 1-281-573-8029. Habla español. Llámenos. "TopoFlight - The Standard in 3d Flight Planning".

Esri

8:00 AM to 12 NOON, Room: Dover B & C, 3rd Floor

ArcGIS – A Comprehensive Imagery System

Join ESRI for an interactive session about imagery. We'll be covering topics that will help you manage massive collections of imagery, learn the latest techniques for processing and analyzing imagery and how to jumpstart your projects with imagery from ArcGIS.

Certainty 3D

1:00 PM to 5:00 PM, Room: Harborside E, 4th Floor

This course will review the integration of LiDAR technology across survey, design, engineering and construction operations. The material covers topics of LiDAR technology, assessment of data, and extraction of features and 3D models. A case study is presented demonstrating the practical application and economic benefits of LiDAR technology within design and engineering processes.

Exelis Visual Information Solutions

1:00 PM to 5:00 PM, Room: Harborside D, 4th Floor

Join us at the ENVI User Group Meeting to learn how advances in the ENVI product family can help you turn imagery, LiDAR, and SAR data into the knowledge you need to make more informed decisions. This event will feature presentations by remote sensing and GIS professionals who will demonstrate how they use ENVI to solve real-world problems. And, get a sneak peak at what's coming soon in ENVI for desktop, cloud, and mobile environments.

Intergraph® and Leica Geosystems

1:00 PM to 5:00 PM, Room: Harborside B, 4th Floor

As a global leader in its industry, Hexagon invites you to discover the most advanced and comprehensive geospatial solutions from Intergraph and Leica Geosystems. Learn how you can exploit the wealth of information contained in data from any source, share it rapidly (and securely), and deliver it on demand. Also, learn more about Intergraph Geospatial 2013, an integrated solution that streamlines photogrammetry, remote sensing, and GIS from the desktop, server, web, and the cloud.

Monday, March 25th, 1:00 PM to 6:30 PM

Technical Program

Optech

1:00 PM to 5:00 PM, Room: Harborside A, 4th Floor

Optech Workflow Tools User Group Meeting. Optech presents its latest workflow tools to maximize production efficiency and collection confidence for lidar/camera surveys. The session discusses our innovative real-time point display capability, which moves data validation and decision-making into the air during the survey flight itself—immensely valuable for emergency and rapid response applications. Also included is an active demonstration of the Optech FMS Flight Management Suite, and a discussion of the differences between the Optech LMS Standard and Professional post-processing capabilities.

Trimble

1:00 PM to 5:00 PM, Room: Harborside C, 4th Floor

Trimble's Inpho & eCognition user group is your opportunity to explore the most recent versions of the popular software packages for aerial photogrammetry, laser scanning data production and object based image analysis (OBIA). Demonstrations include UAV/UAS photogrammetry and terrain modeling, dense matching for quality point clouds, and OBIA analysis of images and point clouds from land mobile sensors. Time has also been allocated to discuss the topics of interest to you: the members of the Inpho & eCognition community.

Students & Young Professionals

Student Advisory Council Meeting (SAC)

5:30 PM to 6:30 PM, Room: Dover B & C, 3rd Floor

Get together with the other Student members of ASPRS and learn what the SAC has been working on and what is planned for the coming week. They would love to meet you and hear any ideas you may have to make your conference experience enjoyable. All are welcome to attend.



Anywhere. Anytime. Anyone.

Terrorism, crime, natural disaster and accidents threaten the UK's transport, banking, telecommunications, utilities, health and food distribution – anywhere, at anytime, affecting anyone.

Contingency Today covers all significant threats to the critical national infrastructure, including electronic attack and the sophisticated misuse of computer systems; physical attacks by terrorist organisations and other criminals; the effects of climate change; and other natural disasters, including pandemics, fire and flood.

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Latest issue out now:

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Benvenuti! Welcome!

Conference & Region Welcome Reception

Monday, March 25th, 2013

6:00 PM until 9:00 PM

Da Mimmo's Restaurant in Baltimore's Little Italy

NEW for 2013!

The ASPRS Potomac Region and the Conference social events are joining together to start the conference week off with a party!

Stop by and join your fellow conference attendees on **Monday, March 25th**, to eat, drink, and get to know each other in Baltimore's Little Italy at De Mimmo's Italian Restaurant! There is no better way to start your conference week than with friends, food, fun and laughter.



Little Italy is located in the heart of downtown renaissance Baltimore.

Nestled between the Inner Harbor and historic Fells Point, you will find a cozy neighborhood of mostly Italian residents and Trattorias. De Mimmo's is a neighborhood mainstay serving award winning Italian cuisine with the hospitality of home cooking.



A tented and heated area will be arranged for the Conference & Region Welcome Reception featuring live music and refreshments.

Transportation: Little Italy and De Mimmo's is within walking distance of the Conference Host Hotel, less than a half-mile away. Continuous complimentary bus transportation will also be available between Little Italy and the Baltimore Marriott Waterfront Hotel from **6:00 PM to 9:30 PM on Monday, March 25th, 2013**. The bus will pick-up in the Hotel main lobby.



Food & Beverage: This is a roaming reception with heavy hors d'oeuvres and one complimentary beverage per guest. A cash bar will be available throughout the evening.

Buon Divertimento!

(Have a Good Time)



The evening reception is included in the registration fee for those paying the Full Registration rate. All others, including children, wishing to attend this event must purchase tickets in advance at the ASPRS Registration Desk in the Baltimore Marriott Waterfront Hotel no later than 10:00 am on Sunday, March 24th. Tickets will not be sold at the door. Adult tickets for this event are \$85 and tickets for children 13 years of age and under are \$35. All children attending the event must be accompanied by an adult.



Tuesday, March 26th

My Day-at-a-Glance

Time	Event	Room	Attending
7:00 AM TO 5:45 PM	Conference Registration Desk Open	3 rd Floor Convention Registration	
8:00 AM TO 9:00 AM	General Session 1/Keynote Address	Harborside C, D & E, 4 th Floor	
9:15 AM TO 10:45 AM	Technical Sessions 1-6	Various, see description	
10:30 AM TO 7:00 PM	Technical Poster Presentation #1	Kent A, 4 th Floor	
9:15 AM TO 10:45 AM	Technical Sessions 8-11A	Various, see description	
10:30 AM TO 7:00 PM	Exhibit Hall Open	Grand Ballroom, 3 rd Floor	
10:30 AM TO 7:00 PM	Poster Sessions	Grand Ballroom Foyer, 3 rd Floor	
10:45 AM TO 11:00 AM	Beverage Break in Exhibit Hall	Exhibit Hall, Grand Ballroom, 3 rd Floor	
11:00 AM TO 12 NOON	Students & Young Professionals — Exhibit Hall Guided Tour for Students	Exhibit Hall, Grand Ballroom, 3 rd Floor	
11:00 AM TO 12 NOON	Hot Topics	Various, see description	
11:00 AM TO 12 NOON	Technical Sessions 11B	Dover B & C, 3 rd Floor	
12:15 PM TO 1:30 PM	24 th Annual Awards Luncheon & 79 th Installation of ASPRS Officers	Harborside Ballroom C, D & E, 4 th Floor	
1:30 PM TO 3:00 PM	Technical Sessions 12-16	Various, see description	
1:30 PM TO 3:00 PM	Technical Poster Presentation #2	Kent A, 4 th Floor	
1:30 PM TO 3:00 PM	Technical Sessions 18-22	Various, see description	
3:00 PM TO 3:30 PM	Beverage Break in Exhibit Hall	Exhibit Hall, Grand Ballroom, 3 rd Floor	
3:30 PM TO 5:00 PM	Students & Young Professionals — GeoLeague Competition Presentations	Atlantic, 3 rd Floor	
3:30 PM TO 5:00 PM	Technical Sessions 23-27	Various, see description	
3:30 PM TO 5:00 PM	Technical Poster Presentation #3	Kent A, 4 th Floor	
3:30 PM TO 5:00 PM	Technical Sessions 29-32	Various, see description	
5:30 PM TO 7:00 PM	Exhibitors' Reception	Exhibit Hall, Grand Ballroom, 3 rd Floor	

Notes:

Technical Program

Tuesday, March 26th, 7:00 AM to 5:45 PM

Conference Registration Desk Open

7:00 AM to 5:45 PM, Location: 3rd Floor Convention Registration



Poster Set-up

7:30 AM to 9:00 AM, Location: Grand Ballroom Foyer, 3rd Floor

All poster presenters should plan to arrive no earlier than 7:30 AM to display their work and affix it to any available board. Board space is available on a first-come, first-served basis – NO holding board space. All poster packaging must be removed from the poster area once posters are installed.

Presenter Prep Room Open

8:00 AM to 5:00 PM, Room: Falkland, 4th Floor

ASPRS has arranged a room for presenters to practice their presentations. This room will be open daily and is available on a first come, first served basis. Please be respectful of fellow presenters when using the practice room. Just like a regular session room, a LCD projector and screen are provided for practice use.

EXHIBIT HALL PASSPORT CONTEST

Play the Exhibit Hall Passport Contest and YOU could win one of many great prizes, just for talking with exhibitors!

All registered attendees will receive a game card with your registration packet. Each game card lists the participating booths with company logos and booth numbers. All you need to do is visit each booth listed on the game card, answer a fun trivia question and receive their specific stamp! Fill your entire game card and enter for a chance to WIN!

It's that Easy and Fun.

This is a great opportunity to speak with exhibitors, learn about some of their great new products, technology and services, while participating in a fun and interactive game!

Play today for a chance to win! Prize drawing will take place on Thursday, March 28th at 8:30 a.m. in the Exhibit Hall. *Must be present to win. Only one entry per registered attendee will be accepted.*

Blue Marble Geographics
Booth #707

NovAtel Inc
Booth #212

VisionMap
Booth #100

DAT/EM Systems International
Booth #307

DMC International Imaging LLC
Booth #111

Cardinal Systems, LLC
Booth #201

RIEGL USA
Booth #115

MosaicMill
Booth #709

Lead Air Inc.
Booth #600

Microsoft/Vexcel Imaging GmbH
Booth #207

Exelis Visual Information Solutions
Booth #401

Optech
Booth #312

Phase One Industrial
Booth #605

Certainty 3D
Booth #412

New Tech Services, Inc.
Booth #703

Keynote Address

8:00 AM to 9:00 AM, Room: Harborside C, D & E, 4th Floor



Hans W. Paerl is Kenan Professor of Marine and Environmental Sciences at the University of North Carolina's Institute of Marine Sciences, located in Morehead City, NC. His research includes; microbially-mediated nutrient cycling and primary production dynamics of aquatic ecosystems, environmental controls and management of harmful algal blooms, and assessing the effects of man-made and climatic (storms, floods) nutrient enrichment and hydrologic alterations on water quality and sustainability of inland, estuarine, and coastal waters. His studies have identified the importance and ecological impacts of atmospheric nitrogen deposition as a new nitrogen source supporting estuarine and coastal eutrophication. He is involved in the development and application of microbial and biogeochemical indicators of aquatic ecosystem condition and change in response to human and climatic perturbations. He directs the Neuse River Estuary Modeling & Monitoring Program, ModMon (www.unc.edu/ims/neuse/modmon) and ferry-based water quality monitoring program, FerryMon (www.ferrymon.org), which employs environmental sensors and microbial indicators to assess near real-time ecological condition of the Albemarle-Pamlico Sound System, the USA's second largest estuary.

In 2003 he was awarded the G. Evelyn Hutchinson Award by the American Society of Limnology and Oceanography for his work in these fields and its application to interdisciplinary research, teaching and management of aquatic ecosystems. In 2011 he received the Odum Lifetime Achievement Award from the Estuarine and Coastal Research Federation for his work on the cause and consequences of eutrophication and harmful algal blooms in estuarine and coastal waters.

“Scaling Up”: Assessing Aquatic Ecosystem Responses to Human- and Climatically-Induced Change By Coupling Ecological Indicators To Remote Sensing

Hans W. Paerl, University of North Carolina at Chapel Hill, Institute of Marine Sciences

Nutrient and other contaminant pollution of freshwater, estuarine and coastal ecosystems is expanding in time and space. These ecosystems are simultaneously impacted by climatic perturbations and change, including warming, increasing frequencies and intensities of tropical cyclones and record droughts, sea-level rise; causing additional stresses, biogeochemical and ecological changes. There is a need to develop rapidly detectable, quantitative, and from a management-perspective, useful indicators of these changes over a range of scales (e.g., habitat, ecosystem, regional to global) that will facilitate taking appropriate steps to mitigate adverse effects of excessive nutrient and pollution and ensure sustainability of affected waters. A suite of environmental indicators that can be detected by autonomous optical and electrochemical sensors on ships, ferries, moorings and buoys can be coupled to aircraft and satellite-based remote sensing (SeaWiFS, MERIS, MODIS, LANDSAT, AVIRIS) in order to “scale up” to ecosystem and regional responses to these stresses. Relevant indicators include; water temperature, chromophoric dissolved organic matter (CDOM), diagnostic algal and higher plant photopigments, and turbidity. Using space-time intensive ship- and mooring-based data for calibration, remote sensing can be used as an early warning tool for delineating storm-water and other nutrient pollution plumes, harmful algal blooms on the ecosystem-scale and beyond. Examples from large lakes, estuaries and coastal waters will be used to demonstrate applicability of this approach. These combined technologies provide management with cost-effective and comprehensive means to rapidly assess the condition, safety and sustainability of affected waters that are not amenable to routine monitoring.

ISPRS Remarks

Chen Jun, *ISPRS President*

Awards Presentations

Honorary Members

Outstanding Technical Achievement Award

Photogrammetric (Fairchild) Award

Technical Program Tuesday, March 26th, 9:15 AM to 10:45 AM

Technical Sessions — 9:15 AM to 10:45 AM

The Conference Planning Committee does its best to assure all speakers attend the conference; however, occasionally there are situations that arise where a listed speaker does not attend. Session Moderators should not skip ahead if a scheduled speaker is not present. Please use this open time for a question and answer period in your session.

1 — Agriculture I — Irrigation

Moderator: Forrest Melton, *NASA*
Room: Laurel C & D, 4th Floor

Satellite Mapping of Agricultural Water Requirements in California

Forrest Melton, *CSU Monterey Bay*, United States

Lee Johnson, Chris Lund, Andrew Michaelis, Lars Pierce, Alberto Guzman, Sam Hiatt, Adam Purdy, Carolyn Rosevelt, Ty Brandt, Petr Votava, and Rama Nemani

Remote Sensing-assisted Land Surface Phenology in the Northern Fertile Crescent: A Comparative Analysis of Agriculture

Brian Bunker, *University of Arkansas*, United States

Jason Tullis

Sensitivity of Canopy Temperature in Response to Transpiration Under Fully Irrigated and Water Deficit Conditions using Thermal Imaging

Jamshid Farifteh, *Katholieke Universiteit Leuven*, Belgium

Raymond Struthers, Jonathan Van Beek, Rony Swennen, and Pol Coppin

2 — Change Detection

Moderator: Lisa Erickson, *Photo Science*
Room: Essex A, 4th Floor

Spatio-temporal Assessment of Climate Change Vulnerability in Georgia

Binita KC, *University of Georgia*, United States

Marshall Shepherd, Marguerite Madden, and Cassandra Johnson

Forest Disturbance Detection using Harmonic Regression and Quality Control Charts on Landsat Data

Evan Brooks, *Virginia Tech Department of Forest Resources and Environmental Conservation*, United States

Randolph Wynne, Valerie Thomas, Christine Blinn, John Coulston, Phillip Radtke, and Curtis Woodcock

Implementation of a Custom Outlier Detection Tool for Object-based, High-resolution Land Cover Change Mapping

Lisa Erickson, *Photo Science Inc.*, United States

Andrew Brenner and Chad Evelyn

Geomorphological Change Detection using Multi-resolution Terrestrial Laser Scans

Reuma Arav, *Technion Israel Institute of Technology*, Israel

Sagi Filin

3 — Big Data

Moderator: Gerald Kinn, *Esri*
Room: Essex B & C, 4th Floor

An Automated HPC Implementation of the Metric Information Network (MIN)

Carolyn Johnston, *DigitalGlobe*, United States

C. Bleiler, O. Sjahputera, B. Bader, R. Ravi, and M. Karspeck

The Paradigm for Modern Imagery Access for Remote Sensing

Gerald Kinn, *ESRI*, United States

Kurt Schwoppe

Harnessing Big Data and Models to Solve User Geospatial Problems and Challenges using IDEAS (Intelligent Data and Model Discovery and Access)

Charles Samuels, *The SI Organization, Inc.*, United States

Shawana Johnson

Street Factory: Photogrammetric 3D Urban Models

Frank Bignone, *Astrium GEO Information Services*, United States

4 — Aerotriangulation

Moderator: Ruijin Ma, *University of Redlands – Spatial Program*
Room: Dover A, 3rd Floor

An Automated Approach for a Pluggable Multi-sensor Aerial Triangulation

Stephan Gehrke, *North West Geomatics*, Canada

Belai Beshah

Measuring Underground Tunnel Deformation using Photogrammetry

Ruijin Ma, *University of Redlands*, United States

Framework for Line Feature Matching Across Images

Mohammed Al-Shahri, *The Ohio State University*, United States

Alper Yilmaz

Realtime Georeferencing of Image Sequences using Fast Sequential Bundle Adjustment

Kyoungah Choi, *The University of Seoul*, South Korea

Impyeong Lee

5 — Machine Learning

Moderator: Peter Doucette, *Integrity Applications Incorporated*
Room: Kent B & C, 4th Floor

Feature Data Simulation for Evaluating Conflation Methods

Peter Doucette, *NGA (Contractor)*, United States

John Dolloff, Rob Zuzelski, Michael Lenihan, and Dennis Motsko

GPU-based Manifold Learning Methods for Hyperspectral Image Processing

Xutong Niu, *Troy University*, United States

Lin Yan

Change Detection Between Existing Feature Data and New Imagery

Chris McGlone, *SAIC*, United States

Automatic Classification of ALS Data by Fusing Co-registered Image with Semi-supervised Learning

Jianwei Wu, *Wuhan University*, China

Information Content Capabilities of Very High Resolution Optical Space Imagery for Updating GIS Database

Mehmet Alkan, *Zonguldak Karaelmas University*, Turkey

G. Büyüksalih and K. Jacobsen

6 — Land Surface Temperature

Moderator: Hua Liu, *Old Dominion University*
Room: Atlantic, 3rd Floor

Downscaling Thermal Images for Assessing the Impact of Urbanization on Land Surface Temperature and Moisture

Yitong Jiang, *Indiana State University*, United States

Qihao Weng

Relationship Between Electrical Energy Consumption and Urban Heat Island using Multi-sensor Data

Zhu Gu, *State University of New York College of Environmental Science and Forestry*, United States

Jungho Im

Modeling the Spatial-temporal Patterns of Urban Land Surface Temperature with Combined Datasets of MODIS and GOES Imagery

Peng Fu, *Indiana State University*, United States

Qihao Weng

Land Surface Temperature Simulation in an Urban Environment

Hua Liu, *Old Dominion University*, United States

Qihao Weng


Understanding our world.

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Poster Session #1

7 — Vegetation Mapping

Moderator: Karen Owen, *George Mason University*

Room: Kent A, 4th Floor

Identifying Spatial and Temporal Patterns in NDVI to Better Characterize the Geographic Risk of Spotted Fever Group Rickettsial Disease in Kilimanjaro Region, Tanzania

R. Ryan Lash, *Department of Geography, University of Georgia*, United States

Sergio Bernardes, Marguerite Madden, John Crump, Venance Maro, Holly Biggs, and William Nicholson

The Role of Lidar in Volumetric Estimation of Invading Eastern Redcedar (*Juniperus virginiana* L.)

Johnny Bryant, *Kansas State University*, United States

David Burchfield, Kevin Price, Larry Biles, Ross Hauck, Sabina Dhungana, and Deon van der Merwe

Improving Urban Vegetation Classification Accuracy through Multi-sensor Data Fusion

Guinevere McDaid, *Texas State Geography Department*, United States

Jennifer Jensen

Estimating Green Leaf Area Index using MODIS Data: The use of Close Range Radiometers for Product Calibration

Anthony Nguy-Robertson, *University of Nebraska-Lincoln*, United States

Anatoly Gitelson, Donald Rundquist, and Timothy Arkebauer

Fusion of Satellite and Aerial Images for Identification and Modeling of Mountain Vegetation

Arnt Salberg, *Norwegian Computing Center, Section for Earth Observation*, Norway

Lars Erikstad and Maciel Zortea

Fine Scale Land Cover Classification of Urban Vegetation in Metropolitan Areas of Texas

Justin McCreight, *Texas State University-San Marcos*, United States

Jennifer Jensen

An Analysis of the Effects of Land Ownership Change on Forest Land Cover Dynamics: An Alachua County Case Study

Adam Benjamin, *University of Florida*, United States

Automated Detection of Pine Plantation Prone to Wood Wasp Infection in Central Chile

Maria Paz Herrera, *Universidad de Concepción*, Chile

Guido Staub and Rafael Gonzalez

Lidar-derived Metrics for Distinguishing Urban Natural Forests from Treescapes and Quantifying the Functional Integrity

Kunwar Singh, *University of North Carolina-Charlotte*, United States

Ross Meentemeyer

Investigating the Ethanol Industry Driven Land Cover Changes in Agriculture-based Farms using Multi-temporal LANDSAT Data Analysis

Thais Rosan, *USP*, Brasil

Rodrigo Affonso, Tadeu Tommaselli, and Luiz Augusto Manfré


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Special Sessions

8 — Special Session: Maritime Applications of Remote Sensing

Sponsored by the Remote Sensing Applications Division

Moderator: Thomas Morelli, *Sea Land & Air Technologies & Systems, Inc.*, United States
Room: Laurel A & B, 4th Floor

Geography of Maritime Regions: A Systematic Approach to Delineation and Understanding

Thomas Morelli, *Thomas D Morelli LLC*, United States

UAS Remote Sensing Detection and Monitoring of Maritime Illicit Trafficking in Gulf of Guinea West Africa Implemented through Comprehensive Engagement Strategy

Thomas Morelli, *Sea Land & Air Technologies & Systems, Inc.*, United States

Bradley Niesen

Spatial Interpolation of Satellite-derived Salinity and Temperature Observations in the Chesapeake Bay: An Ecological Forecasting Application

Erin Urquhart, *Johns Hopkins University*, United States

Matthew Hoffman, Rebecca Murphy, and Benjamin Zaitchik

Remote Sensing of Cyanobacteria and Green Algae in the Baltic Sea

Stefan Riha, *German Aerospace Center (DLR)*, Germany

Harald Krawczyk

9 — Special Session: Time Sensitive Remote Sensing #1

Moderator: Christopher D. Lippitt, *University of New Mexico*, United States

Room: Harborside A, 4th Floor

USDA Forest Service Rapid Response Remote Sensing Programs Providing Spatial Information on Forest Disturbances and Degradation

Robert Chastain, *U.S. Department of Agriculture, Forest Service Remote Sensing Applications Center*, United States

Brad Quayle, Haans Fisk, Mark Finco, Everett Hinkley, Frank Sapio, Jim Ellenwood, Tony Guay, Jess Clark, Jan Johnson, and Vernon Thomas

Detection of Moving Objects through Rapid Succession Airborne Imaging

Douglas Stow, *San Diego State University*, United States

Lloyd Coulter, Yu Hsin Tsai, Christopher Lippitt, and Grant Fraley

Large Area, Slow Frame Rate Video using Nadir Viewing Frame Images Collected on a Single Moving Aircraft

Douglas Stow, *San Diego State University*, United States

Lloyd Coulter, Christopher Lippitt, and Grant Fraley

10 — Special Session: Real Time Geospatial Data Capture through Implementation

Sponsored by the ASPRS Primary Data Acquisition Division

Moderator: Charles Mondello

Room: Harborside B, 4th Floor

Panelists:

Bruce Davis, *Department of Homeland Security*

Jim Green, *Optech*

Mike Hodgson, *University of South Carolina*

11A — NGA Session #1: Advancements in GEOINT Analytics I

Moderator: Dennis Walker, NGA

Room: Dover B & C, 3rd Floor

Exhibit Hall Open

10:30 AM to 7:00 PM, Location: Grand Ballroom, 3rd Floor



Posters Open

10:30 AM to 7:00 PM, Location: Grand Ballroom Foyer, 3rd Floor

All Conference Beverage Break

10:45 AM to 11:00 AM,

Location: Exhibit Hall, Grand Ballroom, 3rd Floor



Take a break! Come to the Exhibit Hall for a beverage and visit with our great Exhibitors! All attendees are welcome, complimentary beverages provided. Beverage service will be provided inside the exhibit hall.

Technical Program Tuesday, March 26th, 11:00 AM to 12 NOON

Students & Young Professionals

Exhibit Hall Guided Tour for Students

11:00 AM to 12 NOON, Location: Exhibit Hall, Grand Ballroom, 3rd Floor

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. Exhibit halls can be overwhelming, but not after this personal tour. Meet at the main exhibit hall entrance doors to participate in this fun tour. See you there!



HOT TOPICS

Interactive Networking

11:00 AM TO 12:00 NOON

These one-hour HOT TOPIC discussion groups, hosted by ASPRS Divisions and Committees, are a high point of every conference. This is an opportunity for all attendees to weigh in with their thoughts on the issues being discussed and network with your peers.

“Crowd Sourcing Data and Mapping”

Sponsored by the ASPRS Education and Professional Development Committee and the Primary Data Acquisition Division

Moderator: Larry Handley, *U.S. Geological Survey/MCGSC*

Room: Essex B & C, 4th Floor

“Who are we?... Where are we going?”

Moderator: Steve DeGloria, *Cornell University*, ASPRS President-Elect

Room: Kent B & C, 4th Floor

Join a spirited discussion to help chart a sustainable future for our community of practice. Discussion topics will focus on recommendations of the ASPRS Restructuring Task Force.

State Licensing, Professional Services, and the new Guidelines for Procurement of Commercial Geospatial Mapping Products

Sponsored by the Professional Practice Division

Moderator: Becky Morton, *Towill, Inc.*

Room: Essex A, 4th Floor

Please come and ask questions, get insight into the recently published Guidelines.

Laser Safety Regulations and Impact on Lidar Operations

Sponsored by the Lidar Division

Moderator: Chris Parrish

Room: Laurel A & B, 4th Floor

Guideline Development for Appropriate Use of Remote Sensing Data for Climate Change

Sponsored by the Remote Sensing Applications Division Climate Change Subcommittee

Moderator: David Szymanski

Room: Laurel C & D, 4th Floor

ASPRS Aerial Camera Calibration Guidelines

Sponsored by the ASPRS Primary Data Acquisition Division

Moderator: Dean Merchant, Professor Emeritus

Room: Kent A, 4th Floor

We are looking for suggestions/questions about the proposed guidelines.

Special Sessions

NGA Session #2 — 11B — Geospatial Intelligence in Academia

11:00 AM to 12:00 NOON

Moderator: Dennis Walker, *NGA*

Room: Dover B & C, 3rd Floor

24th Annual Awards Luncheon & 79th Installation of ASPRS Officers

12:15 PM to 1:30 PM, Location: Harborside Ballroom C, D & E, 4th Floor

Join your colleagues at this year's luncheon on Tuesday, March 26th, to honor current award recipients and participate in the installation of the 79th slate of ASPRS Officers.

The award winners will be given special honor and the annual business meeting of the Society will include installation of the new ASPRS Officers and a report from ASPRS Executive Director James Plasker. To conclude the year, Bobbi Lenczowski, outgoing ASPRS President, will give a summation of the past year's events.

Tickets for this Luncheon are required and are separate from the conference registration. Tickets may be purchased from the Conference Registration Desk, no later than 2:00 PM, Monday, March 25th. Cost is \$65 per person.

On site ticket purchases are limited to availability. Limited seating in the rear of the room is available at no cost for conference registrants wishing to attend the ceremonies only.

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Technical Program Tuesday, March 26th, 1:30 PM to 3:00 PM

Technical Sessions — 1:30 PM to 3:00 PM

The Conference Planning Committee does its best to assure all speakers attend the conference; however, occasionally there are situations that arise where a listed speaker does not attend. Session Moderators should not skip ahead if a scheduled speaker is not present. Please use this open time for a question and answer period in your session.

12 — Agriculture II — Orchards

Moderator: Mathew Voss, *U.S. Army Core of Engineers*
Room: Laurel C & D, 4th Floor

On the Contribution of Background Effects in High Spatial Resolution Images for Detecting Stress in Pear Orchards

Jonathan Van Beek, *Katholieke Universiteit Leuven, Biosystems Department, Geomatics Lab, Belgium*

Laurent Tits, Pieter Janssens, Hilde Vandendriessche, Tom Deckers, Jamshid Farifteh, and Pol Coppin

Early Detection of Water Stress in Fruit Orchards using Hyperspectral Remote Sensing

Raymond Struthers, *Katholieke Universiteit Leuven, Belgium*

Jamshid Farifteh, Pieter Janssens, Rony Swennen, and Pol Coppin

Dynamic Light Distribution in Fruit Orchards and its Potential Impact on Fruit Production and Quality

Dimitry Van der Zande, *Biosystems Department, Katholieke Universiteit Leuven, Belgium*

Jamshid Farifteh, Anouck Delaere, Laurent Tits, and Pol Coppin

13 — Vegetation I – Monitoring

Moderator: Yuan Zhang
Room: Dover A, 3rd Floor

Estimating Canopy Fuel Properties in Sagebrush-steppe using Three-dimensional Vegetation Structure and Spectral Data

Nancy Glenn, *Idaho State University, United States*

Jessica Mitchell, Rupesh Shrestha, and Lucas Spaete

Biomass Estimation from Waveform Lidar using Gaussian Area Index Metrics

Wei Zhuang, *SUNY, College of Environmental Science and Forestry, United States*

Giorgos Mountrakis, Colin Beier, and John Wiley

Assessing Vegetation Change from MODIS Data using Volcanoes as Climate Change Proxies

Harrison Bloom, *SUNY, College of Environmental Science & Forestry, United States*

Giorgos Mountrakis

A Study into the Influence of Topographic Variation on Vegetation Structure in Two Woody Plant Communities: A Remote Sensing Approach

Sisira Ediriweera, *School of Environment, Science and Engineering, Southern Cross University, Australia*

Sumith Pathirana, Tim Danaher, and Doland Nichols

14 — Open Source Software

Moderator: Vinay Viswambharan, *Esri*
Room: Atlantic, 3rd Floor

Building Image Caches for OGC Web Services with GDAL

Christopher Morabito, *Woolpert, United States*

Prototyping the Open-source Collaborative Photogrammetric Sensor Modeling Didactic and Research Framework

Ioakeim Tellidis, *Michigan Technological University, United States*

Eugene Levin

Remote Sensing Image Processing using Java Advanced Imaging (JAI)

Rakesh Kumar Mishra, *University of New Brunswick, Canada*

Yun Zhang

Using Open Source Datasets to Perform IMU Lever Arm Calculations

David Day, *Keystone Aerial Surveys, United States*

15 — Imagery Enhancement

Moderator: Peter Guth, *U.S. Naval Academy*
Room: Essex A, 4th Floor

An Algorithm for Realistically Colorizing Historic Panchromatic Aerial Photographs

Zachary Bortolot, *James Madison University, United States*

The Plateau Hill Algorithm to Convert 16bps Images to 8bps Images

Rahul Rajkuma Dhamecha, *Stony Brook University, United States*

Parvatham Venkatachalam

Enhancing Spatial Resolution of MODIS FPAR using Downscaling Cokriging Method

Haixia Liu, *The Ohio State University, United States*

Desheng Liu

Scalability of LAI Metrics

Keith Krause, *Rochester Institute of Technology, United States*

Jan van Aardt, David Kelbe, Paul Romanczyk, Thomas Kampe, and Kerry Cawse-Nicholson

16 — Automation

Moderator: Tao Liu, *SUNY, College of Environmental Science & Forestry*, United States
Room: Kent B & C, 4th Floor

Lidar QA/QC: An Automated Approach

Merinda Lobato, *Merrick & Company*, United States

An Implementation of Fully-automated, Real-time Georegistration of Video

Reuben Settergren, *BAE Systems Inc.*, United States
Stewart Walker

Automatic Geometric Correction of Kompsat-2 Stereo Scenes using Dem

Kwan-Young Oh, *University of Seoul*, South Korea
Hyung-Sup Jung

Direct Volumetric Computations from Point Clouds

Lewis Graham, *GeoCue Corporation*, United States

Practical and Efficient Applications Utilizing Automated Range Ambiguity Resolution in High Repetition Rate Airborne Lidar Systems

Peter Rieger, *RIEGL Laser Measurement Systems GmbH.*, Austria
Andreas Ullrich

Poster Session #2

17 — Data and Methods

Moderator: Karen Owen, *George Mason University*
Room: Kent A, 4th Floor

Registration of Lidar with Imagery using Fourier and Fourier-Mellin Transforms

Donald Rudy, *The Aerospace Corporation*, United States
Patrick Johnson

Implementation of a Stereo Camera App Based on Smartphone with Bluetooth

Seongkyu Lee, *Pukyong National University*, South Korea
Chuluong Choi, Jisun Choi, Student, Jinsoo Kim, Manager

The Lidar Index File: A Quick Way to Your Data

Patrick Johnson, *The Aerospace Corporation*, United States
Donald J. Rudy

Metrics and Tracking of Movements

Zoltán Koppányi, *Budapest University of Technology and Economics*, Hungary
Tamás Lovas

ESA ExoMars Rover PanCam: Pre-Launch Geometric Modeling and Accuracy Assessment

Rongxing Li, *The Ohio State University*, United States
Ding Li, Gerhard Paar, Andrew Coates, Jan-Peter Muller, Andrew Griffiths, and Jürgen Oberst

A New Approach for the Testing, Understanding, and Demonstrating of New Algorithms

Gregg Petrie, *IEEE*, United States

P-CurB: Pixel Curve Based Hyperspectral Image Compression

Vipul Raheja, *IIT Hyderabad*, India
Ankush Khandelwal and KS Rajan

Spatial Pattern Identification for Different Accuracy Land Cover Maps

Luiz Manfré, *University of Sao Paulo*, Brazil
Rodrigo Nobrega, Charles O'Hara, and José Quintanilha

Impact Crater Modeling using Stereoscopic Depth Inpainting

Raghavendra Bhalerao, *IIT Bombay*, Mumbai
SS Gedam and A Almansa

Feasibility of Smartphone On Multi-copter In Photogrammetric Field

ByungWoo Kim, *Pukyong National University*, South Korea
So Young Park, Ho Young Ahn, and Chuluong Choi

Spatial Distribution and Rating of Hotels Around Murtala Mohammed International Airport, Ikeja, Lagos State

Festus Olusola Olugbenga, *Geocard Data Solutions*, Nigeria
Doctor Olayiwola

Vertical Accuracy Assessment of X-band and P-Band Derived DTMs in Alaska

Lorraine Tighe, *Intermap Technologies*, United States
Marc Champlain and Michael Wollersheim

Modeling Lossy Compression of Ultraspectral Images

Rolando Herrero, *Northeastern University*, United States
Martin Cadirola

Probabilistic Terrain Models from Waveform Airborne Lidar

André Jalobeanu, *University of Texas- Austin*, United States
Gil Rito Gonçalves

Special Sessions

18 — Special Session: Disaster Monitoring Constellation

Moderator: Drew Hopwood, *Astrium GEO-Information Services*
Room: Laurel A & B, 4th Floor

Evaluating the Coverage of the Disaster Monitoring Constellation for the NASS Cropland Data Layer

Robert Seffrin, *U.S. Department of Agriculture*, United States

Making Available Multitemporal Coverages at Continental Scale: DEIMOS-1 Imaging Campaigns Over Sub-Saharan Africa

Francisco J. Lozano, *Elecnor Deimos Imaging*, Spain

M. Diez, J. Gil, C. Moclan, P. Pisabarro, A. Romo, and F. Pirondini

Selected Farming Services with Satellite Assistance: Optimizing Water-fertilizer Resources and Assessing Crop Status and Potential Stress

Alfonso J. Calera, *IDR*, Spain

F.J. Lozano

Evaluating the Classification Accuracy of Specialty Crops in California using 22m Disaster Monitoring Constellation Imagery Compared to 30m Imagery

Audra Zakzeski, *U.S. Department of Agriculture*, United States

19 — Special Session: Climate Change and the Coastal Environment

Sponsored by the ASPRS Remote Sensing applications Division

Moderator: John McCombs, *NOAA*, United States

Room: Essex B & C, 4th Floor

Variation in Coastline and Thermokarst Lake Conditions on the Arctic Coastal Plain from 1948 to 2012

Scott Arko, *University of Alaska Fairbanks*, United States

Kerri Crowder, Jennifer Jenkins, and Philip Martin

Geoinformatics and Coastal Vulnerability Modeling in North-Eastern NSW Australia

Clement Akumu, *Ontario Ministry of Natural Resources*, Canada

Pathirana Sumith

A Multi-sensor Approach to Mapping the Inland Expansion of Mangrove Forests in the Florida Everglades National Park: Utilizing UAVSAR, ALOS/PALSAR, MODIS, and Landsat TM for Improved Climate Change Oriented Mangrove Management Practices

Kristofer Lasko, *NASA Applied Sciences DEVELOP National Program*, United States

Brock Blevins, Melissa Oguamanam, Katrina Laygo

Shoreline and Shoreline Changes of Zhejiang Province, China with the Multi-temporal Satellite Datasets

Yang Shen, *University of Electronic Science and Technology of China*, China

Yong Wang

20 — Special Session: Time Sensitive Remote Sensing #2

Moderator: Christopher Lippitt, *University of New Mexico*, United States

Room: Harborside A, 4th Floor

Following on from the special session of the same name last year, this session is intended to bring together researchers, administrators, and practitioners that are working to enable the effective use of remote sensing to address time-sensitive information requirements. Emphasis is placed on methods for improving the timeliness of remote sensing derived information, the tradeoffs implied by those methods, and lessons learned.

A Workflow for Automated Change Detection with High Spatial Resolution Imagery for Post-disaster Damage Assessment

Douglas Stow, *San Diego State University*, United States

Lloyd Coulter, Grant Fraley, Christopher Lippitt, and Richard McCreight

Tracking Satellite and Airborne Remote Sensing Assets for Emergency Response

Michael Hodgson, *University of South Carolina*, United States

Sarah Battersby, Bruce Davis, and Shufan Liu

A Preliminary Review of Time-sensitive Remote Sensing Methods

Christopher Lippitt, *University of New Mexico*, United States

The Influence of the Homeland Security Geospatial Concept-of-Operations on Remote Sensing at DHS

Robert (Chris) Barnard, *Department of Homeland Security*, United States

Tuesday, March 26th, 1:30 PM to 3:00 PM

Technical Program

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

Sponsored by the ASPRS Primary Data Acquisition Division

Moderator: TBD

Room: Harborside B, 4th Floor

This is the 10th annual panel session hosting the leading digital mapping camera manufacturers in the world. Over the last decade significant advances in digital mapping cameras have continued to occur. Each manufacturer's representative will give a short overview presentation of their firm and system(s). Following the manufacturer's presentations there will be 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 digital mapping images.

Panel Participants:

Representatives from major aerial imaging systems, including Leica, Z/I, Microsoft (Vexcel) and others.

22 — NGA Session #3: Advancements in GEOINT Analytics II

Moderator: Joan Vallancewhitacre, NGA

Room: Dover B & C, 3rd Floor

All Conference Beverage Break

3:00 PM to 3:30 PM,

Location: Exhibit Hall, Grand Ballroom, 3rd Floor



Take a break! Come to the Exhibit Hall for a beverage and visit with our great Exhibitors! All attendees are welcome, complimentary beverages provided. Beverage service will be provided inside the exhibit hall.

Students & Young Professionals

GeoLeague Competition Presentations

3:30 PM to 5:00 PM, Room: Atlantic, 3rd Floor

The teams competing in the GeoLeague Challenge will be presenting their projects during this technical session. Students should attend and support the teams. Judging will take place following the session and prizes will be awarded during the Memorial Address on Wednesday, March 26th.



Technical Sessions — 3:30 PM to 5:00 PM

The Conference Planning Committee does its best to assure all speakers attend the conference; however, occasionally there are situations that arise where a listed speaker does not attend. Session Moderators should not skip ahead if a scheduled speaker is not present. Please use this open time for a question and answer period in your session.

23 — Hyperspectral

Moderator: Raymond Struthers, *KU Leuven*, Belgium
Room: Essex B & C, 4th Floor

Spectral Characterization of Licit and Illicit Agricultural Crops

Mathew Voss, *U.S. Army Corps of Engineers*, United States

Stephen Newman, Michael Campbell, Bruce Blundell, Kathryn Kash,
Rich Curran, Nick Kruskamp, and Shan Rammah, Kyle Smith

NEON Airborne Observation Platform Test Flights: Validation of Airborne Lidar and Hyperspectral Data

Keith Krause, *National Ecological Observatory Network*, United States

24 — Vegetation II — Dynamics

Moderator: Jessica Mitchell, *Idaho State University*
Room: Dover A, 3rd Floor

Interpretation of Phenological Responses of Vegetation in the Geographically Diverse Upper Colorado River Basin and a Phenological Decision Support System

Yuan Zhang, *University of Utah*, United States

George Hepner and Philip Dennison

The Relationship Between Biodiversity and Drought Resistance of Dune Ecosystems in the Netherlands: A Remote Sensing Approach

Wanda De Keersmaecker, *Katholieke Universiteit Leuven*, Belgium

Nils Van Rooijen, Ben Somers, Olivier Honnay, Jamshid Farifteh, Joop
Schaminée, and Pol Coppin

Mapping and Monitoring Planned Development of Vegetation Cover in Desert Area using Temporal Remote Sensing Data

Jie Shan, *Purdue University*, United States

Ejaz Hussain, Serkan Ural, and Muhammad Usman

25 — Data Dissemination

Moderator: David Day, *Keystone Aerial Surveys*
Room: Essex A, 4th Floor

Statewide Publishing of Image Services

Vinay Viswambharan, *ESRI*, United States

Gerald Kinn

Digital Camera Radiometric Characterization and Color Balancing

Robert Ryan, *Innovative Imaging and Research*, United States

Mary Pagnutti and Kara Holekamp

Geospatial Adventures at Google Scale

Sean Maday, *Google*, United States

26 — Data Compression

Moderator: Zachary Bortolot, *James Madison University*
Room: Kent B & C, 4th Floor

Efficient Lossless Compression for Hyperspectral Data Based on Integer Wavelets and 3D Binary EZW Algorithm

Kai-jen Cheng, *Ohio University*, United States

Jeffrey Dill

JPEG 2000 Standard – Compliant Lossy-to-Lossless Schema for Lidar Full Waveform Compression

Michelle Quirk, *NGA*, United States

Lossy Compression of Lidar Point Clouds

Peter Guth, *U.S. Naval Academy*, United States

Statistical and Visual Analysis of the ECW Compression Effects on Feature Extraction of Aster Data

Chuyen Nguyen, *Marshall University*, United States

James Brumfield, Ralph Oberly, and Randall Jones

Tuesday, March 26th, 3:30 PM to 5:00 PM

Technical Program

27 — Feature Extraction

Moderator: Stewart Walker, *BAE Systems*
Room: Laurel A & B, 4th Floor

Automatic Planar Matching through Octree-based Planar Segmentation

Arpan Kusari, *University of Houston*, United States

Craig Glennie

Spectral-angle Based Nonlinear Dimensionality Reduction of Hyperspectral Imagery: Applications on Mineral Mapping

Lin Yan, *Troy University*, United States

Xutong Niu

Tree Crown Delineation by Combination of Improved Watershed Segmentation and Random Forest Classification with Lidar Data

Tao Liu, *SUNY, College of Environmental Science & Forestry*, United States

Jungho Im

Robust Affine-invariant Lines Matching for High-resolution Remote Sensing Image

Min Chen, *Wuhan University*, China

Zhenfeng Shao

Spherical Target Based Trajectory Recovery from Kinect Depth Imagery

Bence Molnar, *Budapest University of Technology and Economics*, Hungary

Charles Toth



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Poster Session #3

28 — Environmental Applications

Moderator: Karen Owen, *George Mason University*
Room: Kent A, 4th Floor

Elevation Change Detection in the Southern WV Coalfields

Jessica DeWitt, *West Virginia University*, United States

Tracking Watershed Drainage Network Changes During Watershed Development with Sequential Lidar DEMs

Daniel Jones, *University of Maryland, Baltimore County*, United States

Matthew Baker and Andrew Miller

The Heat Island New Orleans: Determining the Impacts of Hurricanes Katrina and Isaac on an Urban Phenomenon

Aram Lief, *University of New Orleans*, United States

Landscape Ecology and Land use Dynamics Across A Vulnerable Freshwater System

Firoozha Pavri, *University of Southern Maine*, United States

Abraham Dailey and Paul Bourget

Using WorldView-2 Multispectral Bands for Bathymetric Survey Near Golovin, Alaska

Jacquelyn R. Smith, *University of Alaska Fairbanks*, United States

Nicole E.M. Kinsman and Debasmita Misra

Mapping of Lunar Aluminum and Magnesium Distributions Based on Chang'E-1 Data and SELENE Data

Mingshu Wang, *University of Georgia*, United States

Yunzhao Wu

Analysis of Urban Expansion of Chengdu, China since the Economic Boom of late 1980s Using Multi-temporal Satellite Datasets

Yong Wang, *University of Electronic Science and Technology of China*, China

Yuanyuan Yang

Lake Volume Monitoring for Water Resources: Combining Water Level and Surface Area Measurements

Charon Birkett, *ESSIC/University of Maryland*, United States

Robert Brakenridge

Use of Google Earth Historical Imagery on Dynamics of Aquatic Invasive Plants Along Ohio River

Ming-Chih Hung, *Northwest Missouri State University*, United States

Yi-Hwa Wu and Jamie Patton

LR Measurement of Cirrus Cloud based on Rotational Raman-Mie Scattering Lidar

Binglong Chen, *Beijing Institute of Technology*, China

Chen He, Zhang Yin-chao, Chen Si-ying, and Guo Pan

Investigating the Spatio-temporal Patterns for the Dynamics of Environmentally-sensitive Areas in Sao Paulo-Brazil

Luiz Manfré, *University of Sao Paulo*, Brazil

Rodrigo Nobrega and José Quintanilha

Mapping Seagrass Meadows in Texas Coast with High Spatial Resolution Satellite Imagery

Lihong Su, *Texas A&M University-Corpus Christi*, United States

James Gibeaut

A Landsat-Based Approach to Assess Erosion Potential for Rangeland Resource Management

Chandra Holifield Collins, *U.S. Department of Agriculture*, United States

M. Kautz, S. Lohani

Special Sessions

29 — Special Session: GeoLeague Challenge

Moderator: Patrick Adda, *UNB Fredericton*, Canada
Room: Atlantic, 3rd Floor

Currently there are five teams competing in this year's GeoLeague Challenge. They will present their projects during this technical session.

30 — Special Session: Extreme Weather Monitoring with Remote Sensing

Sponsored by the ASPRS Remote Sensing Applications Division
Moderator: Sergio Bernardes, *Center for Remote Sensing and Mapping Science-UGA*, United States
Room: Laurel C & D, 4th Floor

Assessing Vegetation Disturbance Resulting from an Extreme Windthrow Event in the Great Smoky Mountains National Park

Sergio Bernardes, *Center for Remote Sensing and Mapping Science-UGA*, United States

Christopher Strother, Thomas Jordan, and Marguerite Madden

Support to Environmental Emergencies with DEIMOS-1: Examples of 2012 Floods in Australia and Forest Fires in Spain

Alfredo Romo, *Elecnor DEIMOS Imaging*, Spain

FJ Lozano and R Lees

Environmental Disaster Damage Assessment: Hurricane Katrina Case Study

Reza Khatami, *SUNY, College of Environmental Science & Forestry*

Giorgos Mountrakis

Landslide Hazard Detection from Lidar Data

Charles Toth, *The Ohio State University*, United States

Omar More and Dorota Brzezinska

31 — Special Session: Fundamental Topics in Kinematic Laser Scanning

Moderator: Ty Naus, *Fugro* United States
Room: Harborside B, 4th Floor

Lidar Waveform: A Practical Perspective

Christopher Parrish, *NOAA*, United States

The Language of Lidar

Lewis Graham, *GeoCue*, United States

Segregating Lidar Calibration from Project Geometric Correction

Nora May, *Fugro*, United States

32 — Special Session: UAS Sensors and Analysis Tools Overview

Sponsored by the ASPRS Primary Data Acquisition Division
Moderator: Robert E. Ryan, *Innovative Imaging & Research*
Room: Harborside A, 4th Floor

The U.S. Geological Survey (USGS) Unmanned Aircraft Systems (UAS) Project Office is working with several partners on the transformation of UAS sensor and analysis tool development to support civil applications. The USGS is dedicated to expanding the use of sUAS technology in support of scientific, resource and land management missions. UAS technology is currently being used to monitor environmental conditions, analyze the impacts of climate change, respond to natural hazards, understand landscape change rates and consequences, conduct wildlife inventories and support related land management and law enforcement missions. The data being collected by UAS can be routinely shared in near real time at several locations leading to increased tactical awareness among a cross section of stakeholders. Analysis tools are becoming available that can produce a robust set of products including a georeferenced base for value added investigations. This session will include developers of UAS sensors and analysis systems. Topics will address platform developments, emerging sensor capabilities such as full motion video (including photogrammetric point cloud), Synthetic Aperture Radar (SAR), magnetometers, Infrared, radio telemetry, chemical and biological plume detection, and gimbal mounted "photogrammetric" cameras.

33 — NGA Session #4: NGA Academic Research Program

Moderator: Joan Vallancewhitacre, *NGA*
Room: Dover B & C, 3rd Floor

Exhibitors' Reception

5:30 PM to 7:00 PM, Location: Exhibit Hall, Grand Ballroom, 3rd Floor

A highlight of the ASPRS Annual Conferences is this gathering of exhibitors the night the Show officially opens, as ASPRS says "Thank You" to its exhibitors for bringing all the innovative new products and creative displays that are the main attraction.

All the extraordinary displays of the latest innovations in imaging and geospatial technology remain the star attraction of the ASPRS Annual Conference Exhibit Hall year after year.



Join us for this fun way to say "Thank You" to all of our supporting exhibitors! The Exhibitors' Reception is also a terrific way for exhibitors to connect with each other, "shop" the Show floor themselves and do business with other exhibitors, as many do.

"The strength of the ASPRS Exhibit Hall, and its ability to draw professional business people in our industry from around the world comes from the ingenuity in the imaging and geospatial technology these companies will bring to Baltimore," said Jim Plasker, ASPRS Executive Director. "At

ASPRS, we work hard and smart to produce a fantastic exhibit hall, but it's the exhibitors and their fine displays that put our industry buyers in the exhibit aisles every year, and we thank them for all their efforts and support."

Light hors d'oeuvres will be served and each attendee will be given one complimentary drink ticket. Admission to this event is included with most registrations. A cash bar will be open until 7:00 PM.



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Time	Event	Room	Attending
7:00 AM TO 5:00 PM	Conference Registration Desk Open	3 rd Floor Convention Registration	
8:00 AM TO 9:00 AM	General Session 2	Harborside C, D & E, 4 th Floor	
9:00 AM TO 5:00 PM	Exhibit Hall Opens	Grand Ballroom, 3 rd Floor	
9:00 AM TO 9:15 AM	Beverage Break in Exhibit Hall	Exhibit Hall, Grand Ballroom, 3 rd Floor	
9:00 AM TO 5:00 PM	Poster Sessions	Grand Ballroom Foyer, 3 rd Floor	
9:15 AM TO 10:45 AM	Technical Sessions 34-43	Various, see description	
10:45 AM TO 11:00 AM	Beverage Break in Exhibit Hall	Exhibit Hall, Grand Ballroom, 3 rd Floor	
11:00 AM TO 12 NOON	Technical Session 45	Harborside B, 4 th Floor	
11:00 AM TO 12 NOON	Students & Young Professionals — Student & Employer "Meet and Greet"	Dover C, 3 rd Floor	
11:00 AM TO 12 NOON	ASPRS Committee Meeting Public Forum — Lidar Public Forum	Dover A, 3 rd Floor	
11:00 AM TO 12 NOON	ASPRS Committee Meeting Public Forum — Primary Data Acquisition Division (PDAD) Public Forum	Dover B, 3 rd Floor	
11:00 AM TO 12 NOON	Commercial Sessions	Various, see description	
12 NOON TO 1:15 PM	Memorial Address	Harborside Ballroom C, D & E, 4 th Floor	
1:30 PM TO 3:00 PM	Technical Sessions 46-56	Various, see description	
3:00 PM TO 3:30 PM	Beverage Break in Exhibit Hall	Exhibit Hall, Grand Ballroom, 3 rd Floor	
3:30 PM TO 5:00 PM	Technical Sessions 57-67	Various, see description	

Notes:

Technical Program Wednesday, March 27th, 7:00 AM to 5:00 PM

Conference Registration Desk Open
7:00 AM to 5:00 PM, Location: 3rd Floor Convention Registration



Presenter Prep Room Open
8:00 AM to 5:00 PM, Room: Falkland, 4th Floor

ASPRS has arranged a room for presenters to practice their presentations. This room will be open daily and is available on a first come, first served basis. Please be respectful of fellow presenters when using the practice room. Just like a regular session room, a LCD projector and screen are provided for practice use.

PASSPORT CONTEST

EXHIBIT HALL PASSPORT CONTEST PRIZES

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DMC International Imaging Ltd — Booth 111
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Exelis Visual Information Solutions — Booth 401
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Cisco Flip UltraHD 4GB

MosaicMill — Booth 709
Fine glass ware from Iittala, Finland

New Tech Services, Inc. — Booth 703
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NovAtel Inc. — Booth 212
Camera

Optech — Booth 312
Jacket

Phase One Industrial — Booth 605
Box of Capture One Pro 7 SW

RIEGL USA — Booth 115
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VisionMap — Booth 100
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General Session 2

8:00 AM TO 9:00 AM, Room: Harborside C, D & E, 4th Floor

USGS, NASA and Landsat: Building a Future on 40 Years of Success

James R. Irons, PhD, *Landsat Data Continuity Mission Project Scientist, NASA Goddard Space Flight Center*

The U.S. Geological Survey (USGS) and NASA celebrated the 40-year anniversary of the Landsat program last year. As the world's longest-running Earth-observing satellite program, the 40-year Landsat record provides global coverage at a scale that shows large-scale human activities. This presentation will discuss the next 40 years, beginning with the Landsat Data Continuity Mission (LDCM) launch in 2013, the role of USGS Earth Resources Observation and Science Center, and availability of enhanced data information products. Building on these accomplishments, the work now begins on the path for the next 40 years — not only for Landsat, but for the future of land imaging.

Presidential Address: “Relevancy of ASPRS in a Geospatial World”

Stephen D. DeGloria, PhD, *Cornell University*

The purpose of ASPRS is to advance the principles of our profession, address the interests of individuals and organizations engaged in a wide spectrum of geospatial technologies, and serve the public interest in matters of imaging and geospatial information. To be relevant to our members and our profession, we provide opportunities to learn, mentor, and network with our fellow professionals and students. The relevancy of ASPRS is based on our ability to provide practical solutions to a range of problems from routine to complex, to offer useful connections that can be limited or extensive that enhance professional development and satisfaction, and to generate an awareness and understanding of geospatial data and information for addressing a range of environmental and societal issues. The degree to which we are successful in this endeavor will dictate the growth and sustainability of our organization.

Awards Presentations

ASPRS Fellows

Paul R. Wolf Memorial Scholarship

BAE Systems Award

ASPRS Conference Management Award



James R. Irons is the Associate Deputy Director for Atmospheres, Earth Sciences Division, NASA Goddard Space Flight Center (GSFC), a position he has held since 2007. He is also the NASA Landsat Data Continuity Mission (LDCM) Project Scientist and in that capacity ensures that the specification, design, and implementation of the mission meet science requirements.

Prior to 2007, Dr. Irons conducted research for 28 years as a physical scientist in the Biospheric Sciences Branch, NASA GSFC where he served as the Landsat 7 Deputy Project Scientist beginning in 1992. During those years Dr. Irons studied land cover change using Landsat data, investigated the bidirectional reflectance of bare soils and vegetation canopies, and acted as the instrument scientist for an airborne sensor that collected hyperspectral, multi-angle images for multiple field campaigns. He is the author or co-author of four book chapters and over 35 refereed journal articles.

Dr. Irons received his B.Sc. degree in environmental resources management in 1976 and the M.Sc. degree in agronomy in 1979 from the Pennsylvania State University. He received his Ph.D. degree in agronomy in 1993 from the University of Maryland College Park. He has received several honor awards including the NASA Exceptional Service Medal in 2009.



Stephen D. DeGloria is Professor of Resource Inventory and Analysis, and Director, Institute for Resource Information Sciences, Department of Crop and Soil Sciences, at Cornell University in Ithaca, New York. He teaches undergraduate and graduate courses in

geographic information systems, environmental information science, GPS, and spatial modeling and analysis. His research focuses on improving the resource inventory process through the application of aerospace imagery, mapping land cover conditions and trends using digital imagery and geospatial databases, and integrating resource inventory data for use in spatially-explicit predictive models of agro-environmental processes in temperate and tropical landscapes.

He joined ASPRS in 1979. He became actively involved in the Society as a member of the Central New York Region

Technical Program Wednesday, March 27th, 9:00 AM to 10:45 AM

Exhibit Hall Open

9:00 AM to 5:00 PM, Location: Grand Ballroom, 3rd Floor



Posters Open

9:00 AM to 5:00 PM, Location: Grand Ballroom Foyer, 3rd Floor

Posters are on display throughout the conference to view at your leisure.

All Conference Beverage Break

9:00 AM to 9:15 AM

Location: Exhibit Hall, Grand Ballroom, 3rd Floor



Take a break! Come to the Exhibit Hall for a beverage and visit with our great Exhibitors! All attendees are welcome, complimentary beverages provided. Beverage service will be provided inside the exhibit hall.

Technical Sessions — 9:15 AM to 10:45 AM

The Conference Planning Committee does its best to assure all speakers attend the conference; however, occasionally there are situations that arise where a listed speaker does not attend. Session Moderators should not skip ahead if a scheduled speaker is not present. Please use this open time for a question and answer period in your session.

34 — Agriculture III — Cropland

Moderator: Ruedi Wagner, *Leica-Geosystems*

Room: Laurel C & D, 4th Floor

Environmental Assessment of Bioenergy Crops in the Midwest with Remote Sensing Data and SWAT Model

Susan Wang, *University of Missouri*, United States

Characterizing Agricultural Landscape Patterns in the Mid-Western USA During 2000-2010

Yang Shao, *Virginia Tech*, United States

MODIS-based Modeling of Corn and Soybean Yields in the US

David Johnson, *U.S. Department of Agriculture*, United States

Mapping Tillage Practices using Multi-temporal Landsat Imagery in the United States

Baojuan Zheng, *Virginia Tech*, United States

Guy Serbin, James B. Campbell, and Craig S.T. Daughtry

35 — Forestry I — Monitoring

Moderator: Dr. Michael Gruber, *Microsoft*

Room: Dover A, 3rd Floor

Estimating Age of Even-aged Loblolly Pine Plots from GeoSAR and Landsat ETM+ data

Valquiria Ferraz Quirino, *Virginia Polytechnic Institute and State University*, United States

Randolph H. Wynne, Harold E. Burkhart, and Valerie A. Thomas

Hyperspectral Prediction of Foliar Isotopic Nitrogen

Laura Lorentz, *Virginia Tech*, United States

Valerie Thomas and Brian Strahm

Remotely Detecting Forest Damage in Yosemite National Park

Karla King, *Towson University*, United States

John Morgan III

Spectral Signatures of Bhutan National Forest Inventory

Maung Moe Myint, *Mapping & Natural Resources Integration*, Switzerland

36 — Multi-sensor Analysis

Moderator: Darrel Williams, *Global Science & Technology*

Room: Dover B, 3rd Floor

3D Urban Reconstruction using Lidar and EO Sensors

Qian Xiao, *Woolpert, Inc.*, United States

Mapping Impervious Surfaces in Guangzhou, China using a Hyperion Image by Integrating the WorldView-2 Dataset

Bingqing Liang, *University of Northern Iowa*, United States

Optimal Airborne Lidar and Hyperspectral Combination Methods for Improved Quantification of Sparse, Low Height Vegetation Cover

Jessica Mitchell, *Idaho State University*, United States

Lucas Spaete, Peter Olsoy, Rupesh Shrestha, and Nancy Glenn

Data Fusion Method Based on Kinect Depth Images

Tao Hu, *Remote Sensing Information Engineering Surveying And Mapping State Key Laboratory*, Wuhan University, China

Xinyan Zhu and Wei Guo

37 — Bathymetry

Moderator: Joong Yong Park, *Optech*

Room: Dover C, 3rd Floor

Improving the Ability of Airborne Bathymetric Lidar to Detect the Seafloor in Shallow and Turbid Waters

Joong Yong Park, *Optech*, United States

Viktor Feygels, Vinod Ramnath, Jennifer Aitken, and Brant Smith

Performance Assessment of an Underwater Topographic Reconstruction Method

Amin Sarafraz, *University of Miami*, United States

Brian K. Haus

Analyzing Multi-year Hyperspectral Imageries for Detecting Submerged Aquatic Vegetation in Shallow Black Water

Roshan Pande-Chhetri, *University of Florida*, United States

Amr Abd-Elrahman and Charles Jacoby

38 — Positional Accuracy

Moderator: Clive Frasier, *University of Melbourne*, Australia
Room: Kent B & C, 4th Floor

Pleiades Positional Accuracy

David Nale, *eMap International*, United States

Comparative Analysis of Different Approaches for Automated Image Coordinates Measurement for Camera Calibration

Zahra Lari, *University of Calgary*, Canada

Hussein T. Attya and Ayman Habib

Assessing the Positional Accuracy of OpenStreetMap Roads Using Vectorgrammetry

Roberto Canavosio-Zuzelski, *George Mason University*, United States

Peggy Agouris and Peter Doucette

Long-Strip Georeferencing of Quickbird Imagery with Minimal Ground Control

Clive Frasier, *CRC for Spatial Information*, Australia

Mehdi Ravanbakhsh

39 — Cryosphere

Moderator: Daniel Sousa, *NASA DEVELOP Program*, United States
Room: Kent A, 4th Floor

Arctic Region Environmental Orthomosaics and 3D Models from Airborne Imagery

Jessica Cherry, *University of Alaska Fairbanks and Northern Science Services*, United States

Continuity of VIIRS/MODIS Radiometric Measurements: Simultaneous Nadir Overpass and Pseudo-Invariant Site Comparisons for Reflective Solar Bands

Slawomir Blonski, *University of Maryland*, United States

Changyong Cao, Sirish Uprety, and Xi Shao

About the Correlation Between Ice Shelf Front Variations and Temperature Anomalies — Case Study At George VI Ice Shelf

Guido Staub, *Universidad de Concepción*, Chile

Andreaw Rifo

SAR-based Estimation of Glacial Extent and Velocity Fields on Isanotski Volcano, Aleutian Islands, Alaska

Daniel Sousa, *NASA DEVELOP Program*, United States

Audrey Lee, Owen Parker, Yamina Pressler, Sung-Yee Guo, Cindy Schmidt and Batuhan Osmanoglu

MODIS Snow Cover Validation for River Basin in NW Himalaya

Chelamallu Hari Parasad, *IITB*, India

40 — Project Planning

Moderator: Chris Guy, *AeroMetric*, United States
Room: Essex A, 4th Floor

Applying PMI Project Management Principles to Geospatial Projects

Robert Crawford, *Intermap Technologies, Inc.*, United States

Planning a Successful Lidar Project

Chris Guy, *AeroMetric*, United States

Opportunities for Growth within the Guidelines for Procurement of Geospatial Professional Services, Technical Services, and Products

Paul Pope, *Global Geomatics Inc.*, United States

Dave McBride

Special Sessions

41 — Special Session: Environmental Remote Sensing — Applications for the Oil and Gas Industry

Moderator: Andrea Steffke and Marty Evans, *Chevron Energy Technology Company*, United States
Room: Harborside A, 4th Floor

Detection of Methane, Carbon Dioxide, and Water Vapor Plumes using Airborne Imaging Spectrometry: Potential for Oil and Gas Industry

A. K. Thorpe, *University of California- Santa Barbara*, United States
P.E. Dennison, D.A. Roberts, E.S. Bradley, and C.C. Funk

Use of Hyperspectral Remote Sensing to Detect Plant Stress and Monitor Recovery from the Macondo Oil Spill in the Gulf of Mexico

Shruti Khanna, *University of California - Davis*, United States
Alexander Koltunov, Maria J. Santos, Paul J. Haverkamp, Mui C. Lay, Susan L. Ustin

42 — Special Session: SAC #1 -- New Trends in Remote Sensing Research

Sponsored by the ASPRS Student Advisory Council
Moderator: Kunwar Singh, *University of North Carolina-Charlotte*, United States
Room: Essex B & C, 4th Floor

Data Processing and Analytics

Charles Samuels, *The SI Organization, Inc*

Lidar

Charles Olson, *Michigan Tech Research Institute*

Lidar

Sonja Ellefson, *Aerometric*

Visualization and Animation

Matt Bethel, *Merrick & Company*

Cloud Computing

Gerald Kinn, *ESRI*

Disasters

Michael Hodgson, *University of South Carolina*

43 — Special Session: Big Data #1

Sponsored by the ASPRS GIS Division
Moderator: Edward H. Bosch, *NGA*
Room: Laurel A & B

Spatial Network Activity Summarization

Renee B Laubscher, *NGA*, United States

Uncued Analytics for Non-Traditional Geospatial Datasets

Matt Schmidt, *MIT Lincoln Lab*, United States

Large Scale Machine Learning for Massive Remote Sensing Data — A Case Study in Biomass Monitoring

Varun Chandola, *Oak Ridge National Lab*, United States

All Conference Beverage Break

10:45 AM to 11:00 AM

Location: Exhibit Hall, Grand Ballroom, 3rd Floor



Take a break! Come to the Exhibit Hall for a beverage and visit with our great Exhibitors! All attendees are welcome, complimentary beverages provided. Beverage service will be provided inside the exhibit hall.

Special Session 11:00 AM to 12 NOON

45 — Special Session: Digital Image Quality Assurance Panel

Sponsored by the ASPRS Primary Data Acquisition Division

Moderator: TBD

Room: Harborside A, 4th Floor

Satellite and aerial imaging are in a period of rapid growth and change with new technologies, new customers, and new missions requirements. Digital airborne sensors have matured over the last few years and have been gaining acceptance by the mapping community. This is evidenced by: 1) the enhancement of current remote sensing systems by the manufacturers; 2) the manufacturers introducing new sensors into the marketplace that address the needs of a particular sector of the user market not previously addressed; 3) and the amount of data being collected. In many cases, the collection system may have methods that are designed to help the data collectors and current owners of the data may be able to obtain enough information to use the data. However, the quality and long term usefulness of the acquired data in comparison to other data types may be an issue. This session will have four panelists with short presentations and discussions. All information will be made available on the PDAD web site.

The Importance of Data Quality and Need for Standards

Qassim Abdullah, *Woolpert*

Imagery QA Processes and Tools

Chuck O'Hara, *Spatial Information Solutions, Inc.*

User QA Needs and QC Processes

David Davis, *USDA*

George Lee, *U.S. Geological Survey*

Data Fusion and Integration Requirements

Ayman Habib, *University of Calgary*

Students & Young Professionals Events

Student & Employer "Meet and Greet"

11:00 AM to 12:00 NOON, Room: Dover C, 3rd Floor

This great event is designed to connect students looking to apply for jobs in the digital mapping industry and employers looking to hire! Bring your resume, a business card, or just a smile and a handshake, and expand your job network at the conference. It's also an opportunity to meet other students and young professionals from all over the world who are attending the conference. Don't miss out on this great event!



Young Professionals Council Open Meeting

11:00 AM to 12:00 NOON, Room: Essex A, 4th Floor

All attendees at the conference who are 35 years of age and younger and no longer students are invited to the first open meeting of the Young Professionals Council (YPC). This is your opportunity to meet the YPC Council Chairs and give them your feedback on how the new Council can best serve the needs of ASPRS Young Professionals.

ASPRS Committee Meetings – Public Forums

Public Forums are meetings held to specifically engage conference attendees in the work of the ASPRS Divisions and are held at a time to be most advantageous for attendee participation. Everyone is welcome to attend.

Lidar Public Forum

11:00 AM to 12 NOON, Room: Dover A, 3rd Floor

Primary Data Acquisition Division (PDAD) Public Forum

11:00 AM to 12 NOON, Room: Dover B, 3rd Floor

Technical Program Wednesday, March 27th, 11:00 AM to 12 NOON

Commercial Sessions — 11:00 AM to 12 NOON

Commercial Session: Airborne Imagery

Moderator: David Johnson, *U.S. Department of Agriculture*
Room: Laurel A & B, 4th Floor

The iOne STKA - Foundation for the Iris One Sensor Family

Armando Guevara, *Visual Intelligence, LP*, United States
Wei Wang

News from the UltraCam Camera Line-Up

Alexander Wiechert, *Microsoft*, Australia

Pushing the Boundaries on Sensor Performance

Ruedi Wagner, *Hexagon Geosystems*, Switzerland
Patrick Steinmann, Tauno Saks, and Klaus Neumann

The Leica RCD30 Medium Format Camera - One Camera, Many Applications

Ruedi Wagner, *Leica Geosystems*, Switzerland
Klaus Neumann

Commercial Session: Software

Moderator: Karla King, *Towson University*, United States
Room: Laurel C & D, 4th Floor

A Disruptive Innovation for Managing Massive Lidar Datasets

Matt Bethel, *Merrick & Company*, United States

In-database Image Processing in Oracle Spatial Georaster

Qingyun (Jeffrey) Xie, *Oracle Corporation*, United States
Chen Fengting, Zhang Zhihai, and Lucena Ivan

How Express Server Software Improves Geospatial Image Delivery

Jon Skiffington, *LizardTech*, United States

UltraMap — Details and Results from the Digital Photogrammetric Workflow

Michael Gruber, *Microsoft*, Australia

Commercial Session: Future Spaceborne Sensors

Moderator: Jessica Mitchell, *Idaho State University*
Room: Kent B & C, 4th Floor

The DMC Constellation, Sensors and Next Generation Satellites

Gary Holmes, *DMC International Imaging Ltd*, United Kingdom
Paul Stephens

The WorldView-3 Multi-spectral Commercial Imaging Satellite

Milan Karspeck, *DigitalGlobe*, United States

Smallsat Solutions Can Yield BIG Results

Darrel Williams, *Global Science & Technology, Inc.*, United States
Samuel Goward and Bryant Cramer

The COSMO-SkyMed X-band SAR Constellation

Cesarano Lucio, *e-GEOS SpA*, Italy

Commercial Session: Making Imagery Accessible

Moderator: Peter Becker, *Esri*, United States
Room: Essex B & C, 4th Floor

Using ArcGIS as a Platform for Managing and Making Imagery Accessible so the Full Value can be Exploited

Peter Becker, *Esri*, United States

Commercial Session: Strategies for Conducting Remote Sensing in the Cloud

Sponsored by the ASPRS Remote Sensing Applications Division
Moderator: Kurt Schwoppe, *Imagery Solutions*, United States
Room: Harborside B, 4th Floor

This panel of leading experts will discuss how the cloud has the potential to fundamentally change the field of remote sensing. Traditionally, image processing has been a file based linear workflow conducted by an image processing expert. By combining Content-as-a-Service (CaaS) and Software-as-a-Service (SaaS), in the cloud, the potential now exists for end-users to directly access remote sensing services that provide answers for a specific need. These services appear to the end-users as easy to operate, low cost Apps. Types of users that could benefit from this mobile approach include those involved with precision agriculture, forestry management, and emergency response just to name a few. Panelists will present their vision as to how this future can be realized and how the remote sensing community must evolve to take full advantage of these emerging technologies.

Panelists:

Lawrie Jordan, *ESRI*
Greg Keoln, *MDA Information Systems*
Mladen Stojic, *Intergraph*
Jaye Lampe, *Exelis Visual Information Solutions Visual Information Systems*

Memorial Address

12 NOON to 1:15 PM, Location: Harborside Ballroom C, D & E, 4th Floor



Donald Belcher

A special presentation will be given by Raymond Kreig honoring Donald Belcher as the 2013 Memorial Addressee. Belcher will be honored for his lifetime of accomplishments and service to the geospatial industry. Join us for this spectacular presentation followed by a luncheon.

Professor Donald Belcher had a career that spanned time at Purdue University and Cornell University. Don's lifelong exploration of the practical engineering applications of aerial photography – a discipline that became known as aerial photographic interpretation and, more recently, remote sensing – placed him as the foremost pioneer in this field. Among his distinguished colleagues were Professors Ta Liang and Arthur J. McNair. Don Belcher distinguished himself as an educator, scholar, innovator, and consultant.

Presenter

Raymond A. Kreig is the President of RA Kreig & Associates of Anchorage, Alaska. Ray was closely associated with Don Belcher as a teaching assistant.

Awards Presentations

Presidential Citations
Region of the Year Award
Region Newsletter Award
Region Website Award
GeoLeague Awards

Technical Sessions — 1:30 PM to 3:00 PM

46 — Agriculture IV — Cropland Classification

Moderator: Cyril Wilson, *University of Wisconsin – Eau Claire*
Room: Laurel C & D, 4th Floor

Crop Specific Covariate Data Based on the NASS Cropland Data Layer for Area Frame Stratification

Claire Boryan, *U.S. Department of Agriculture/NASS*, United States

Zhengwei Yang

Decadal Land Use Change Detection for Palo Verde Irrigation District using Landsat Imageries

Xiaofang Wei, *Central State University*, United States

47 — Forestry II — Mapping

Moderator: Meghan MacLean, *Babson College*
Room: Dover A, 3rd Floor

Delineating Ground and Forest Canopy in Simulated ICESat-2 Data Exhibiting Diverse Terrain, Vegetation Conditions, and Noise Levels

Ryan Sheridan, *Texas A&M University*, United States

Sorin Popescu

Application of Landsat-derived Landcover Maps in Assisting U.S. Nationwide Forest Management

Sheng Yang, *SUNY, College of Environmental Science & Forestry*, United States

Giorgos Mountrakis

Investigation of Spatiotemporal Patterns of Forest Carbon Stock According to Urban Land Use Changes using Remote Sensing

Jungho Im, *Ulsan National Institute of Science & Technology*, South Korea

Evaluation of a Geometric Optics and Radiative Transfer Lidar Waveform Model for Forest Canopies

Wenze Ni-Meister, *Hunter College of The City University of New York*, United States

Wenze Yang, Shihyan Lee, and Alan H. Strahler

Technical Program Wednesday, March 27th, 1:30 PM to 3:00 PM

Technical Sessions — 1:30 PM to 3:00 PM

48 — Soils

Moderator: Henrique Momm, *Middle Tennessee State University*
Room: Essex B & C, 4th Floor

Extracting Sub-pixel Information from Agricultural Areas through Alternating Least-Squares Unmixing

Wanda De Keersmaecker, *Biosystems Department, Geomatics Lab, Katholieke Universiteit Leuven*, Belgium

Ben Somers, Wouter Saeyns, Jamshid Farifteh, Pol Coppin, Laurent Tits

Using Worldview-2 Data and Hyperspectral Processing Approaches to Map Ferric Iron-Bearing Minerals and Materials

William Farrand, *Space Science Institute*, United States

Rachana Ravi

Prospects of Biophysical Remote Sensing for Studying Soil Microbial Community Biogeography

Yuki Hamada, *Argonne National Laboratory*, United States

Jack Gilbert

A Multispectral Index to Estimate Bare Soil Wetness

Michael Campbell, *Topographic Engineering Center*, United States

Kevin Caillouet and Mark Rider

49 — Lidar I — Accuracy Assessment

Moderator: Joshua Gluckman, *Woolpert*
Room: Kent B & C, 4th Floor

FOCUS — Lidar QA and Data Exploitation Tool

Mark E. Meade, *Photo Science*, United States

Ortho & Lidar Accuracy

Mike Tully, *Aerial Services, Inc.*, United States

Chuck O'Hara

QC Methods for Delivering a Quality Lidar Project

Sonja Ellefson, *Aerometric*, United States

Accuracy Analysis of a Low Cost, Kinematic Lidar Scanner

Darren Hauser, *The University of Houston*, United States

Craig Glennie, Benjamin Brooks, and Todd Erickson

50 — Infrastructure I — Buildings

Moderator: Colin Brooks, *Michigan Technological University*
Room: Dover C, 3rd Floor

Options for Medium-accuracy Architectural Facades Mapping from Terrestrial Photogrammetry

Hussein Attya, *University of Calgary*, Canada

Ayman Habib

Creation and Use of Benchmark Imagery for Validating Facility

Paul Pope, *Los Alamos National Laboratory*, United States

Travis White, John Goforth, Lucinda Gaines, Randy Roberts, and Ian Burns

Automatic Detection and Reconstruction of Complex Buildings with Right-angled Corners

Ayman Habib, *University of Calgary*, Canada

Eunju Kwak

Extracting Building Features from Lidar and Optical Data

Cherie Muleh, *Exelis Visual Information Solutions Visual Information Solutions*, United States

51 — Coasts

Moderator: George Southard, *Trimble*
Room: Kent A, 4th Floor

Where's the Reef? An Inexpensive Method for Mapping Nearshore Marine Habitats

Kelly Kingon, *Florida State University*, United States

Overview of NOAA's Continually Updated Shoreline Product

Douglas Graham, *National Oceanic and Atmospheric Administration*, United States

Airborne Remote Sensing of Coastal Features and Processes

Victor Klemas, *University of Delaware*, United States

52 — Theoretical Concepts

Moderator: TBD
Room: Essex A, 4th Floor

Is Accuracy Necessary?

Charles Olson, *Michigan Tech Research Institute*, United States

Implications of Provenance-aware Remote Sensing Process

Jason Tullis, *University of Arkansas*, United States

Xuan Shi and Jackson Cothren

Array Algebra Expansion of 4-D Photogrammetry to Unified Relativity and String Theory

Urho Rauhala, United States

A Novel Approach of Building Specific Ontology for Remote Sensing Image

Xiran Zhou, *Wuhan University*, China

Zhenfeng Shao

Special Sessions

53 — Special Session: Applied Remote Sensing



Sponsored by America View

Moderator: Russell Congalton, *University of New Hampshire*, United States
Room: Harborside A, 4th Floor

Hyperspectral Remote Sensing as a Monitoring Tool for Geologic Carbon Sequestration

Gabriel Bellante, *Montana State University*, United States

Scott Powell, Rick Lawrence, Kevin Repasky, and Tracy Dougher

Mapping and Analyzing Conservation Reserve Program Enrollment Patterns from 1991 to 2011 in Nelson County, North Dakota, Using Remote Sensing and GIS Techniques

Nicholas Roehrdanz, *University of North Dakota*, United States

Bradley Rundquist

Using Spatial Models with Remote Sensing to Map Invasive Species Distributions: A Case Study of Tamarix Along the Arkansas River, Colorado

Amanda West, *Colorado State University*, United States

Paul Evangelista, Nicholas Young, Lane Carter, Nicholas Young and Catherine Jarnevič

Evaluating Worldview-2 Imagery for Forest Cover Type Mapping in Complex New England Forests

Jenna Kovacs, *University of New Hampshire*, United States

Russell Congalton

54 — Special Session: SAC #2 — Strategies and Application Processes for Winning an ASPRS Award or Scholarship

Sponsored by the ASPRS Student Advisory Council

Moderator: Hui Ju, *Ohio State University*, United States

Room: Atlantic, 3rd Floor

Panelists:

Jesse Winch, ASPRS Program Administrator

Stephen D. DeGloria, ASPRS President

A. Stewart Walker, BAE Award Representative

Adam Benjamin, Past Award Recipient

55 — Special Session: Big Data #2

Sponsored by the ASPRS GIS Division

Moderator: Matthew Dunbar, *University of Washington*, United States

Room: Laurel A & B, 4th Floor

In general the size is the primary definition of Big Data. Alternatively, the “big” in Big Data can refer to the number of useful permutations of sources that makes useful querying difficult (like the sensors in an aircraft) and the complex interrelationships between sources that makes purging difficult. In this case, “Big” refers to data complexity rather than volume.

The purpose of this session is to increase awareness of Big Data usages in the geospatial community; specifically, developments and evaluations of technologies and tools for data collection, management, visualization, and data analytics. Understanding how to interact with Big Data will lay the foundations for U.S. competitiveness for many decades to come.

High-resolution National Elevation Dataset: Opportunities and Challenges for High-performance Spatial Analytics

Lynn Usery, *U.S. Geological Survey*, United States

Yan Liu, Michael Finn, Babak Behzad, and Eric Shook

Big Data from the Long-tail of Biological and Ecological Sciences Perspective

Mike Frame, *U.S. Geological Survey*, United States

Towards Rapid Validation of Climate Models Through Integrated Testbeds and Data Fusion

Galen Shipman, *Oak Ridge National Laboratory*, United States

56 — Special Session: Mobile Mapping and Geospatially-Enabled Smart Devices

Sponsored by the ASPRS Photogrammetric Applications Division, Defense and Intelligence Committee

Moderator: Peter Doucette, *Integrity Applications Incorporated*, United States

Room: Harborside B, 4th Floor

Starting in the 1990s, direct georeferencing techniques and multi-sensor integration developed into what is now commonly referred to as mobile mapping technology (MMT). The conditions that made this possible--the integration of digital imaging devices and robust navigation solutions such as GPS and IMUs, are now readily found in our day-to-day “smart” devices, representing the next iteration of MMT. Your phones and tablets started off with providing basic geolocation services, i.e., map-based services, but are becoming increasingly sophisticated in the functions they can support. Today, we see these expanded functions in a variety of areas that include shopping, GIS field collects and 3D scene reconstruction.

This session will explore the concepts of MMT and how they apply to smart devices and the human as a platform. Submitted and invited briefings will focus on applications developed to support first responders (i.e., police, fire and rescue), consumer activities, military, and 3D scene reconstruction. Of particular interest are those applications that deliver timely, accurate and reliable geospatial information, based on the intended use of the collected data.

Close Range Photogrammetry Using A Smart Phone

Ron Benziger, *Purdue University*, United States

GxP Xplorer Mobile 1.0

Tin Yen Dennison, *BAE Systems*

Other Panelists:

Isaac Zaworski, *Urban Robotics*, United States

Christopher Ashabanner, *National Geospatial-Intelligence Agency*, United States

David W. Lilley, *Army Geospatial Center*, United States

Technical Program Wednesday, March 27th, 3:30 PM to 5:00 PM

All Conference Beverage Break

3:00 PM to 3:30 PM

Location: Exhibit Hall, Grand Ballroom, 3rd Floor



Take a break! Come to the Exhibit Hall for a beverage and visit with our great Exhibitors! All attendees are welcome, complimentary beverages provided. Beverage service will be provided inside the exhibit hall.

Technical Sessions — 3:30 pm to 5:00 pm

57 — Land Cover/Land Use Change

Moderator: Claire Boryan, *U.S. Department of Agriculture*
Room: Essex B & C, 4th Floor

Spectral Analysis of Civil Conflict Induced Forced Migration On Land Use/Land Cover Change: The Case of a Primate and Lower Order Cities in Sierra Leone

Cyril Wilson, *University of Wisconsin-Eau Claire*, United States

Land Cover Assessment in Mongolia by Principal Component Analysis of Phonological Parameters using MODIS Imagery

Narumasa Tsutsumida, *Graduate School of Global Environmental Studies, Kyoto University*, Japan

Izuru Saizen

Analysis of Modeled and Observed Surface Areas of Three Gorges Reservoir at Different Water Levels

Ao Du, *School of Resources and Environment, University of Electronic Science and Technology of China*, China

Yong Wang

58 — Forestry III — Disturbances

Moderator: Ryan Sheridan, *Texas A&M University*
Room: Dover A, 3rd Floor

Hyperspectral Assessment of Fire Hazard within the Wildland Urban Interface

James Lein, *Ohio University*, United States

Predicting Woody Invasive Species Presence Using a New Fragmentation Program: PolyFrag

Meghan MacLean, *Babson College*, United States

Russ Congalton

Analyzing Ash (*Fraxinus* spp.) Tree Response to Emerald Ash Borer (*Agrilus planipennis* Fairmaire) Infestations using Multispectral Imagery

Laura Calandra, *SUNY, College of Environmental Science & Forestry*, United States

Estimating Canopy Bulk Density from Lidar for Fire simulation: a Semi-direct Approach

Qi Chen, *University of Hawaii - Manoa*, United States

Travis Freed and David Saah

59 — Hydrology

Moderator: William Farrand, *Space Science Institute*
Room: Essex A, 4th Floor

Watershed-scale Characterization of Riparian Vegetation as Potential Filter Strips using Multi-source Remote Sensing

Henrique Momm, *Middle Tennessee State University*, United States

Ronald Bingner

Application of Remote Sensing and Surface Energy Based Algorithms in Estimating Evapotranspiration in the Southeastern US

Nishan Bhattarai, *SUNY, College of Environmental Science and Forestry*, United States

Lindi J. Quackenbush and Stephen B. Shaw

Continuous Detecting of Growing of Middle River Islands and the Negative Effects to the River by using Remote Sensing Techniques

Omar al-Jarrah, *Anbar University*, Iraq

Mico Watershed Characterization and Analysis of a Rainfed Watershed Using Geo Spatial Technologies

A Siva Sena Reddy, *Indian Institute of Technology- Bombay*, India

M. Janga Reddy

60 — Lidar II — Methods

Moderator: Mike Tully *Aerial Services Inc.*
Room: Kent B & C, 4th Floor

Automatic Selection of Overlapping Strip Pairs/Regions for Optimized Lidar System Calibration

Essam Hamza, *University of Calgary*, Canada

Ayman Habib

Background Noise Removal of Single Photon Counting Lidar Data

Joshua Gluckman, *Woolpert*, United States

Multispectral Full-Waveform Lidar Analysis for Target Identification

Preston Hartzell, *University of Houston*, United States

Craig Glennie and David C. Finnegan

High Spatial Resolution Automated Three Dimensional Vegetation Structure Mapping using Computer Vision

Jonathan Dandois, *University of Maryland - Baltimore County*, United States

Erle Ellis

An Accurate Airborne Lidar Data Strip Adjustment Method with Semi-parametric Model

Jianwei Wu, *Wuhan University*, China

61 — Infrastructure II — Transportation

Moderator: David Gonzalez, *Exelis*
Room: Dover C, 3rd Floor

Identification of Unpaved Roads in a Regional Road Network using Remote Sensing

Colin Brooks, *Michigan Tech Research Institute*, United States

Andrea VanderWoude, David Dean, Richard Dobson, Justin Carter, Christopher Roussi, Tim Colling, and Caesar Singh

Using Close Range Photogrammetry to Develop a 3D Optical Bridge Evaluation System (3DOBS)

Richard Dobson, *Michigan Tech Research Institute*, United States

Colin Brooks, Chris Roussi, Robert Shuchman, Theresa Ahlborn, and David Dean

On the Use of Off-the-shelf Digital Cameras for Civil Engineering Fatigue Testing

Ivan Detchev, *University of Calgary*, Canada

Ayman Habib and Mamdouh El-Badry

Monitoring of Cracks in Asphalt Pavement using Laser Scanners and Cameras of Mobile Mapping System

Yoshiyuki Yamamoto, *Aichi Institute of Technology*, Japan

Eiji Nakamura, Masayuki Okugawa, Tomohito Asaka, and Keishi Iwashita

62 — Unmanned Aerial Vehicles (UAV)

Moderator: Doug Graham, *NOAA*
Room: Dover B, 3rd Floor

Characterization of Unpaved Road Conditions Through the Use of a UAV Helicopter

Colin Brooks, *Michigan Tech Research Institute*, United States

Chris Roussi, Tim Colling, Richard Dobson, Brian White, Joe Garbarino, Jack Kelly, Colleen Sain, and Caesar Singh

A Little UAV Grows Up

George Southard, *Trimble Navigation Limited*, United States

Creation of a Remote Sensing Unmanned Aerial System (UAS) for Precision Agriculture and Related Mapping Applications

Dimitrios Stefanakis, *University of the Aegean*, Greece

John Hatzopoulos, Margaris Nikolaos, and Danalatos Nikolaos

High-resolution Ecosystem Monitoring in Both Time and Space by Unmanned Aerial Vehicle (UAV) Based Sensing System

Kaiyu Guan, *Princeton University*, United States

Lyndon Estes, Adam Wolf, Kelly K. Caylor, Ming Pan, Peter Oudemans, and Rick Lathrop

63 — Human Geography

Moderator: Jason Tullis, *University of Arkansas*
Room: Kent A, 4th Floor

Characterization of Villages in Rural Afghanistan

John Irvine, *Draper Laboratory*, United States

Janet Lepanto, Natasha Markuzon, John Regan, Edward Vaisman, Mon Young, Fotini Christia, and Roger Petersen

Looking Beneath: Geophysical Remote Sensing at the Colonial Town of Martinville, North Carolina

Roy Stine, *University of North Carolina- Greensboro*, United States

Jacob Turner and Stacy Curry

Developing A Land Information System for Poverty Alleviate Through Geographical Information System and Community Remote Sensing

Matthew Adepoju, *National Space Research and Development Agency*, Nigeria

Taslim Alade

A Subjective Assessment of the Suitability of SCIAMACHY Total Column CO Measurements to Interpolate Reliable Concentration Estimates Over a Low-latitude Region

Mofoluso Fagbeja, *National Space Research and Development Agency*, Nigeria

Jennifer Hill, Tim Chatterton, James Longhurst, and Joseph Akinyede

Special Sessions

64 — Special Session: Education/ Outreach in Remote Sensing

Sponsored by America View

Moderator: Rebecca Dodge, *Midwestern State University*, United States
Room: Laurel A & B, 4th Floor



Helping Educators to Educate with Geospatial Technologies

John McGee, *Virginia Tech*, United States

Tammy Parece and James Campbell

Place-based and Event-based Learning using Geospatial Technologies; The TexasView Earth Observation Day Program

Rebecca Dodge, *Midwestern State University*, United States

Paul R. Blackwell

Satellites: A K-12 STEM Education Project for the 21st Century

Kevin Czajkowski, *America View*, United States

Rick Landenberger, Todd Ensign, and Rick Sharpe

Earth Observation Day: An Outreach Event to Increase the Use of Geospatial Science and Technology in K-12 and Higher Education

Tom Mueller, *America View*, United States

Rick Landenberger

Introducing Land Cover Classification in Middle and High School Classrooms

Allison Howard, *University of Georgia*, United States

Sergio Bernardes, Chris Strother, Taylor Johnson, Patrick Lines, Larry Biehl, Rick Landenberger, and Marguerite Madden

65 — Special Session: SAC #3 — Advice on How to Successfully Write an NSF Grant (Graduate Fellowship/Doctoral Dissertation Improvement Grant)

Sponsored by the ASPRS Student Advisory Council

Moderator: Raechel A. Bianchetti, *Penn State University*, United States
Room: Atlantic, 3rd Floor

Panelists:

Charlotte E. Smith, *Appalachian State University*

Dr. Marguerite Madden, *University of Georgia*

Raechel A. Bianchetti, *Penn State University*

66 — Special Session: Big Data #3

Sponsored by the ASPRS GIS Division & Defense and Intelligence Committee

Moderator: Edward H. Bosch, *NGA*

Room: Harborside B, 4th Floor

Round Table Discussion

Panelists:

Renee B Laubscher, *NGA*, United States

Matt Schmidt, *MIT Lincoln Lab*, United States

Varun Chandola, *Oak Ridge National Lab*, United States

Yan Liu, *University of Illinois*, United States

Galen Shipman, *Oak Ridge National Laboratory*, United States

67 — Special Session: Urban Mapping

Moderator: Donald Atwood, *University of Alaska*

Room: Laurel C & D, 4th Floor

Overcoming Challenges of Urban Classification using PoISAR

Donald Atwood, *University of Alaska Fairbanks/Geophysical Institute*, United States

Integration of Urban Growth Prediction Models to Image-based Urban Change Classification

Huiran Jin, *State University of New York College of Environmental Science and Forestry*, United States

Giorgos Mountrakis

Remotely Sensed Analysis of the Urban Sprawl of Istanbul for Supporting Decision Making for a Sustainable Future

Orhan Altan, *Istanbul Technical University*, Turkey

Gerhard Kemper

Thursday, March 28th

My Day-at-a-Glance

Time	Event	Room	Attending
7:00 AM TO 11:00 AM	Conference Registration Desk Open	3 rd Floor Convention Registration	
8:00 AM TO 11:00 AM	Exhibit Hall Opens	Grand Ballroom, 3 rd Floor	
8:00 AM TO 11:00 AM	Poster Sessions	Grand Ballroom Foyer, 3 rd Floor	
8:00 AM TO 8:45 AM	Breakfast with the Exhibitors & Prize Drawing	Exhibit Hall, Grand Ballroom, 3 rd Floor	
8:00 AM TO 5:00 AM	ASPRS Committee Meeting — ASPRS Board of Directors	Various, see description	
9:00 AM TO 10:30 AM	Beverage Break in Exhibit Hall	Exhibit Hall, Grand Ballroom, 3 rd Floor	
11:00 AM TO 12 NOON	Technical Sessions 68-77	Various, see description	
10:30 AM TO 11:00 AM	Beverage Break in Exhibit Hall	Exhibit Hall, Grand Ballroom, 3 rd Floor	
11:00 AM TO 12:30 PM	Technical Sessions 78-89	Various, see description	

Notes:

Technical Program

Thursday, March 28th, 7:00 AM to 5:00 PM

Conference Registration Desk Open

7:00 AM to 11:00 PM

Location: 3rd Floor Convention Registration



Exhibit Hall Open

8:00 AM to 11:00 AM, Location: Grand Ballroom, 3rd Floor



Posters Open

8:00 AM to 11:00 AM, Location: Grand Ballroom Foyer, 3rd Floor

Please Note: All posters must be removed by 12 noon on Thursday, March 29th.

Presenter Prep Room Open

8:00 AM to 12:00 Noon, Room: Falkland, 4th Floor

ASPRS has arranged a room for presenters to practice their presentations. This room will be open daily and is available on a first come, first served basis. Please be respectful of fellow presenters when using the practice room. Just like a regular session room, a LCD projector and screen are provided for practice use.

Breakfast with Exhibitors & Prize Drawing

8:00 AM to 8:45 AM, Location: Exhibit Hall, Grand Ballroom, 3rd Floor

A light continental breakfast will be held in the Exhibit Hall before the Technical Sessions begin on Thursday, March 28th. Take some time to leisurely view the exhibit hall and continue discussions with the exhibitors.

Also taking place in the Exhibit Hall during the breakfast is the **Prize Drawing** for the winners of the **Exhibit Hall Passport Contest!** Don't miss this opportunity to win some great prizes. *Winners must have completed the Exhibit Hall Passport Contest game card and be present to win. Admission to these events is included with most registrations.*

ASPRS Committee Meeting

ASPRS Board of Directors

8:00 AM to 5:00 PM, Room: Harborside C, 4th Floor

Technical Sessions — 9:00 am to 10:30 am

68 — Geoinformatics

Moderator: Melissa Rura, *UMNC*, United States
Room: Laurel A & B, 4th Floor

Web Mapping Metro Rail Services in Los Angeles County
Bin (Owen) Mo, *LACMTA*, United States

WMS-T Service: Disseminating the Content of Mobility Datasets. Case Study of the Fredericton Transit System
Adegoke Lawal, *University of New Brunswick*, Canada

Emmanuel Stephanakis and Monica Wachowicz

Urban Situated Simulation Interface: Design & Development of a Tablet-based Solution
Benoit Duinat, *Université Laval*, Canada

Sylvie Daniel

Web Service-based Vegetation Condition Monitoring System - VegScape
Zhengwei Yang, *U.S. Department of Agriculture*, United States

Genong Yu, Liping Di, Bei Zhang, and Rick Mueller

69 — Hazards — Mapping

Moderator: Nichlas Roberts, *Simon Fraser University*
Room: Essex B & C, 4th Floor

Destruction and Reconstruction of the Village of Birek: Tsunami 2004
Paul Baumann, *SUNY*, United States

Continuous Assessing for the Recovery and Reconstruction of Post-tsunami Disaster of Rikuzentakata City in Ria Coast by using Time Series High-resolution Satellite Images

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

Landscape Epidemiology: West Nile Virus in the US
Sean Young, *Center for Advanced Spatial Technologies*, United States
Jason Tullis

Assessing the Probability of High Floods in Potential Mangrove Plantation Sites along the Saudi Arabian Red Sea Coast
Ayman S. Aguib, *King Saud University*, Saudi Arabia
Scot E. Smith and Hesham El Monsef

70 — GEOBIA I — Methods

Moderator: Richard Curran, *U.S. Army Engineer Research and Development Center*, United States
Room: Laurel C & D, 4th Floor

Integrating GEOBIA and Multisensor Fusion in the Undergraduate Remote Sensing Curricula — Opportunities and Challenges
Jitendra Sharma, *Gainesville State College*, United States

Object Based Image Analysis: A New Paradigm in Remote Sensing?
Thomas Blaschke, *University of Salzburg*, Australia

Comparative Analysis of Object-domain and Parameter-domain Lidar Segmentation Results
Zahra Lari, *University of Calgary*, Canada
Mohannad Al-Durgham and Ayman Habib

Investigating the Effectiveness of Data Fusion on Image Segmentation in Rapid Mapping Workflows
Chandi Witharana, *University of Connecticut Storrs*, United States
Thomas Blaschke and Asela Bandara

71 — Lidar III — Forestry

Moderator: Lindsay Weitz, *Esri*
Room: Kent B & C, 4th Floor

Retrieving Forest Structural Parameters and Studying Forest Growth at Individual Tree Level using Multi-Temporal Terrestrial Lidar Datasets
Shruthi Srinivasan, *Texas A&M University*, United States
Sorin C. Popescu, Ryan D. Sheridan, and Nian-Wei Ku

Classification of Tree Species in Indianapolis using Lidar and High-resolution IKONOS Data
Yuanfan Zheng, *Indiana State University*, United States
Qihao Weng

Elements Contributing to Accuracy of Forest Leaf Area Density and Leaf Area Index Calculations using Terrestrial Lidar Data
Jonathan Van Beck, *Biosystems Department, Katholieke Universiteit Leuven*, Belgium

Dimitry Van der Zande, Christian Salas Eljatib, Jamshid Farifteh, Pol Coppin and Renato Cifuentes La Mura

Analyzing Vertical Canopy Structure using A Multi-layered Voxel Approach From Discrete Return Lidar Data
Nicholas Kruskamp, *U.S. Army Corps of Engineers*, United States
Bruce Blundell, Michael Campbell, Richard Curran, Kathryn Kash, Matthew Voss, Harry Puffenberger, and Christopher Gard

Technical Program Thursday, March 28th, 9:00 AM to 10:30 AM

Technical Sessions — 9:00 AM to 10:30 AM

72 — Precision Mapping

Moderator: Kevin Chen-ChunKai, *Sinotech Engineering Consultants, Inc.*, China
Room: Dover A, 3rd Floor

Utilizing Geospatial Technologies to Detect and Monitor Foreign Objects and Debris on Airport Runways and Vicinities

Frederick Wilson, *Morgan State University*, United States

Judy Jackson-Pringle

High-resolution Geospatial Data Conflation for Efficient 3D Visualization and Decision Support

Kevin Takala, *Michigan Technological University*, United States

Riccardo Tortini and Eugene Levin

Moving Target Detection using Single Pass WorldView-2 Satellite

Rakesh Kumar Mishra, *University of New Brunswick*, Canada

Yun Zhang

Target-free Automated Image Orientation and Camera Calibration in Close-Range Photogrammetry

Christos Stamatopoulos, *CRC for Spatial Information*, Australia

Clive Fraser

73 — Surface Modeling

Moderator: Yunjae Choung, *The Ohio State University*
Room: Dover B, 3rd Floor

Comparing Lunar Surface Roughness at 5m and 500m Scales

Prasun Mahanti, *LROC Science Operations Center, Arizona State University*, United States

Mark Robinson and Aaron Boyd

Point Cloud Creation and Exploitation with Geospatial Applications

Joe Mostowy, *Intergraph*, United States

Steve DuPlessis

Geospatial Semantics from Raster Data

E. Lynn Usery, *U.S. Geological Survey*, United States

DTM Vertical Accuracy for Conterminous United States

M. Lorraine Tighe, *Intermap*, United States

Doug King, Heiko Balzter, Abderrazak Bannari, Heather McNairn

74 — Wetlands I – Coastal

Moderator: Mary Latiolais, *MDA Information Systems, Inc.*
Room: Dover C, 3rd Floor

Fusion of Lidar and Multi-spectral Data to Quantify Carbon Stocks in Galveston Saltmarshes

Ranjani Wasantha Kulawardhana, *Texas A&M University*, United States

Sorin C. Popescu and Rusty A. Feagin

Coastal Change Detection in the Lower Mississippi River Delta Region using NDWI and MNDWI Comparatively

Matthew Ramspott, *Frostburg State University*, United States

Michael Keating

Mapping South Atlantic Coastal Wetlands with Multisensor Object-oriented Image Classification

Yong Wang, *East Carolina University*, United States

Thomas Allen

Continuous-time Modeling of Streamwater Nutrient Loading from Forested Watersheds in the Chesapeake Bay using MODIS and Meteorological Data

Aditya Singh, *University of Wisconsin-Madison*, United States

Philip A. Townsend and Keith Eshleman

Special Sessions

75 — Special Session: Alaska — Mapping America's Last Frontier

Moderator: Dr. David Maune, *Dewberry*, United States
Room: Harborside D, 4th Floor

Alaska Statewide Digital Mapping Initiative (SDMI)

Tom Heinrichs, United States

Alaska Geospatial Strategic Plan

Nick Mastrodicasa, United States

Alaska Mapping Roundtable and Alaska Federal Mapping Executive Committee

Kevin Gallageher, United States

Status of Alaska Statewide Digital Orthophotos

Tony Follett, United States

Status of Alaska IFSAR DTMs, DSMs and ORIs

David Maune, *Dewberry*, United States

76 — Special Session: Satellite Image Acquisition Strategies

Moderator: Owen Mo, *LACMTA*, United States
Room: Harborside A, 4th Floor

Optimization of Satellite Image Acquisition Planning for Disaster Response

Shufan Liu, *University of South Carolina*, United States

Michael E. Hodgson

Exploiting the DMC Satellite Constellation for Applications in Agriculture, Forest Monitoring and Disaster Response

Gary Holmes, *DMC International Imaging Ltd*, United Kingdom

Paul Stephens

A Satellite System Designed for Mapping the Globe at 1:50,000- Scale, Part I

Don Light, *Rochester Institute of Technology*, United States

A Satellite System designed for Mapping the Globe at 1:50,000- Scale, Part II

Don Light, *Rochester Institute of Technology*, United States

77 — Special Session: UAS Capabilities Overview

Sponsored by the ASPRS Primary Data Acquisition Division

Moderator: Pierre le Roux, *Aerometric*, United States
Room: Harborside B, 4th Floor

Panelists:

Tom Zambrano, *Aerovironment*, United States

George Southard, *Trimble-Gatewing*, United States

Michael Piasecki, *Dragonfly Pictures*, United States

All Conference Beverage Break

10:30 AM to 11:00 AM

Location: Exhibit Hall, Grand Ballroom, 3rd Floor



Take a break and wrap-up your conversations with exhibitors. All attendees are welcome, complimentary beverages provided. Please see the exhibit hall map for location of beverage service.

Technical Program Thursday, March 28th, 11:00 AM to 12:30 PM

Technical Sessions — 11:00 AM to 12:30 PM

78 — Disasters — Mapping

Moderator: Sean Young, *University of Arkansas*
Room: Essex A, 4th Floor

Terrestrial Laser Scanning and Discontinuity Plane Characterization for Landslide Hazard Assessment

Abdullah Al-Rawabdeh, *University of Calgary*, Canada

Ayman Habib and Hussein Attya

Urban Landslide Activity at La Paz, Bolivia from Traditional and Advanced Remote Sensing Methods

Nicholas Roberts, *Simon Fraser University*, Canada

Reginald L. Hermanns, Bernhard Rabus, John J. Clague, and Marco Antonio Guzmán

79 — GEOBIA II — Applications

Moderator: Aaron Smith, *Equinox Analytics*
Room: Laurel C & D, 4th Floor

A Comparison of Five Segmentation Methods for Forest Mapping with Historical Aerial Photographs

Zhouxin Xi, *The Ohio State University*, United States

Xiaolin Zhu and Desheng Liu

Acquisition and Update of Road Data Based on Multiple Models

Christian Heipke, *Leibniz Universitaet Hannover*, Germany

Marcel Ziems, Uwe Breitkopf, and Franz Rottensteiner

Object-based Feature Extraction of Poppy Fields in Afghanistan

Richard Curran, *U.S. Army Engineer Research and Development Center*, United States

Bruce Blundell, Michael Campbell, Kathryn Kash, Nicholas Kruskamp, Stephen Newman, Matthew Voss, Shan Rammah, and Kyle Smith

A New Way of Extracting Building Information from the Aerial Urban Image

Lv Fenghua, China

80 — Lidar IV — Applications

Moderator: Nicholas Kruskamp, *U.S. Army Corps of Engineers*, United States

Room: Kent B & C, 4th Floor

3D Analysis using Lidar in a GIS Environment

Lindsay Weitz, *ESRI*, United States

Vegetation Reflectance and Lidar Returns

Charles Olson, *Michigan Tech Research Institute*, United States

A Study of Signal Attenuation Due to Canopy in Small-footprint Waveform Lidar

Keith Krause, *Rochester Institute of Technology*, United States

Jan van Aardt, Paul Romanczyk, David Kelbe, Kerry Cawse-Nicholson, and Thomas, Kampe

Comparison of the Measurements of Woody Plant on Rangelands Between Airborne Lidar Remote Sensing and A Global Canopy Height Map

Nian-Wei Ku, *Texas A&M University*, United States

Sorin C. Popescu

81 — Water Monitoring

Moderator: Frederick Wilson, *Morgan State University*
Room: Dover A, 3rd Floor

Trophic State Determination by Multispectral Satellite Images: Chapala Lake, Mexico

Alejandra-Selene Membrillo-Abad, *Posgrado en Ciencias de la Tierra. UNAM*, Mexico

Marco-Antonio Torres-Vera and Rosa-Maria Prol-Ledesma

Satellite Remote Sensing and GIS to Assess Water Storage in the Duhok Dam

Yaseen Mustafa, *University of Zakho, Duhok*, Kurdistan Region-Iraq

Noori Mohammed Jalal

Combination with Multi-scale Remote Sensing and Spatial Data Warehouse Technology for Immediately Evaluating Sediment Disaster of the Typhoons Event in the Reservoir Watershed

Chun-Kai Chen, *Disaster Prevention Technology Research Center, Sinotech Engineering Consultants, Inc.*, Taiwan

Cheng-Yang Hsiao and Bor-Shiun Lin

82 — Terrain Modeling

Moderator: Prasun Mahanti, *LROC Science Operations Center, Arizona State University*, United States
Room: Dover B, 3rd Floor

A Study on Accuracy and Fidelity of Terrain Reconstruction after Filtering DSMs produced from Digital Aerial Images and Airborne Lidar Surveys

Ricardo Passini, *BAE SYSTEMS GP&S*, United States

David Day and Karsten Jacobsen

Extraction of Levee Components for Riparian Zone Management using Lidar Data and Multispectral Orthoimages

Yunjae Choung, *The Ohio State University*, United States

Fusing Terrain Elevations into Sensor Imagery

Roger Brown, *U.S. Army Topographic Engineering Center*, United States

An Automated, Scalable, Open-source Pipeline for Mass Production of Meter-Scale DEM and Velocity Maps from Commercial Satellite Imagery of the Antarctic and Greenland Ice Sheets

David Shean, *University of Washington*, United States

Zachary Moratto, Ian Joughin, Ben Smith, Paul Morin, and Claire Porter

83 — Wetlands II — Inland

Moderator: Yong Wang, *East Carolina University*
Room: Dover C, 3rd Floor

Multitemporal Landsat Change, Harrison County, MS: Monitoring Wetland Changes from the Ground to the Crowd

Mary Latiolais, *MDA Information Systems, Inc.*, United States

Jon Dykstra, Adam Estrada, David Cunningham, Greg Koeln, and Bill Wilen

Wetland Mapping in Three Different Ecological Regions in Minnesota: An Object-oriented Approach to Integrate Lidar Data and Multispectral High-resolution Imagery

Lian Rampi, *University of Minnesota*, United States
Joseph Knight

Utility of Lidar Derived Terrain Variables for Wetland Detection

Nilam Kayastha, *Virginia Tech*, United States

Valerie Thomas and John Galbraith

Mapping Wetlands and Determining Shallow-lake Depths using Topographic and Bathymetric Lidar and High-resolution Imagery on the Alaskan North Slope

Kutalmis Saylam, *University of Texas at Austin*, United States

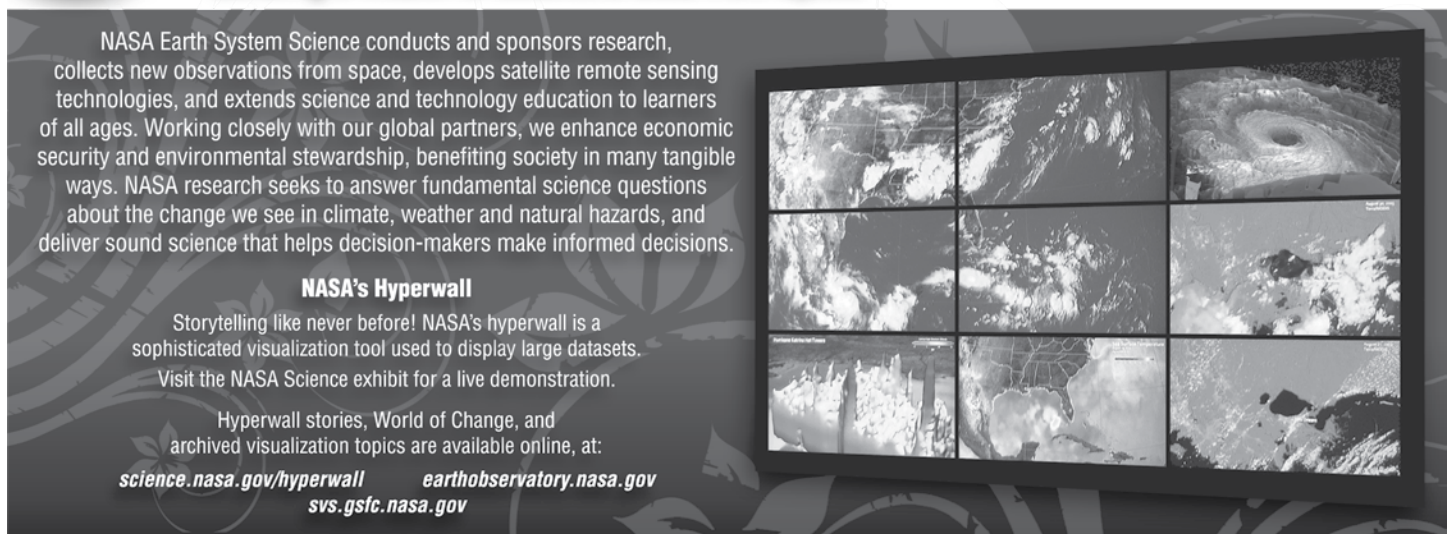
John Andrews, Aaron Averett, Tiffany Caudle, Jeffrey Paine, Thomas Tremblay, Michael Young, Petter Kullenberg, and Daniel Andersson



NASA Earth Science
From Data to Images
Sensing a Wealth of Scientific Data from Space




National Aeronautics and Space Administration
NASA



NASA Earth System Science conducts and sponsors research, collects new observations from space, develops satellite remote sensing technologies, and extends science and technology education to learners of all ages. Working closely with our global partners, we enhance economic security and environmental stewardship, benefiting society in many tangible ways. NASA research seeks to answer fundamental science questions about the change we see in climate, weather and natural hazards, and deliver sound science that helps decision-makers make informed decisions.

NASA's Hyperwall
Storytelling like never before! NASA's hyperwall is a sophisticated visualization tool used to display large datasets. Visit the NASA Science exhibit for a live demonstration.

Hyperwall stories, World of Change, and archived visualization topics are available online, at:
science.nasa.gov/hyperwall earthobservatory.nasa.gov
svs.gsfc.nasa.gov



Special Session — 11:00 AM to 12:30 PM

84 — Special Session: Geostatistics

Moderator: Owen Mo, *LACMTA*, United States

Room: Laurel A & B, 4th Floor

Exploring Spatial Relationship Between Coastal Population Density and Inland Distance

Bandana Kar, *University of Southern Mississippi*, United States

Shahdad Naghsour

Applications of the USDA NASS CDL Based Automated Stratification Method for the NASS Area Sampling Frames

Kevin Hunt, *U.S. Department of Agriculture*, United States

K-color Join Count for Categorical Map Comparison

Melissa Rura, *UMNC*, United States

SpatialSTEM: A Mathematical/Statistical Framework for Understanding and Communicating Grid-based Map Analysis and Modeling

Joseph Berry, *Berry & Associates/Spatial Information Systems*, United States

86 — Special Session: Operational Space Imaging Systems, Advances, Calibration, and Standards

Moderator: TBDs

Room: Harborside B, 4th Floor

Converting space imagery into meaningful datasets is a process that varies from one imaging system to the other. This requires the development of complete “camera model” and related set of software tools that are compatible for downstream analyses and cartographic production. The lack of consistent information about space imaging systems presents a major bottleneck, on both developing analysis tools as well as cartographic production, with measureable cost consequences. The panel will address the most advanced space imaging systems, including the Landsat Data Continuity Mission (LDCM), data quality, and imaging system calibration requirements, and standards. The panel would also discuss standardized reporting of pre-launch camera calibration procedures, technical specifications, and geometric properties. Such standards would potentially facilitate development of complete “camera models” required for image analysis, developments of processing tools, software compatibility, and cartographic production.

Panelists will include satellite operating companies, such as GeoEye and DigitalGlobe; government, such as EROS and NASA; as well academia and the user community.

88 — Special Session: Dense 3D Point Cloud Reconstruction from Imagery

Sponsored by the ASPRS Photogrammetric Applications Division and the Defense and Intelligence Committee

Moderator: John Marshall, *Integrity Applications Incorporated*, United States

Room: Essex B & C, 4th Floor

Readily accessible digital cameras, coupled with advances in computing power that allow a high level of automation in feature extraction and pixel matching, have resulted in exciting new developments in the application of photogrammetry. Through various automated operations on imagery (e.g., feature extraction, pixel matching, etc.), imagery from both metric and non-metric digital cameras can be used to generate highly detailed descriptions of the 3D object scene (e.g., 3D point clouds, surface models, voxel models) similar to what might be achieved with high density lidar systems. These capabilities are largely platform agnostic; potential platforms may include satellites, manned or unmanned aircraft, vehicle mounted, tripod mounted or handheld mobile mapping devices. As this technology continues to evolve, an increasing number of applications will be developed, ranging from survey accuracy feature extraction to general 3D visualization. This session will provide an overview of the applications, accuracies and potential implementations of this technology from the perspective of a cross section of developers, researchers and commercial providers.

89 — Special Session: K-12 Geospatial Education and Citizen Science

Sponsored by the Education and Professional Development Committee

Moderator: TBD

Room: Kent A, 4th Floor

This session includes papers that focus on the ASPRS response to K-12 education, the development of citizen scientist programs for place-based learning, GIS program development for K-12 curriculum, and geospatial pre-service education.

The Emergence of Geospatial Technology in K12

Stan Hovey, *Retired*, United States

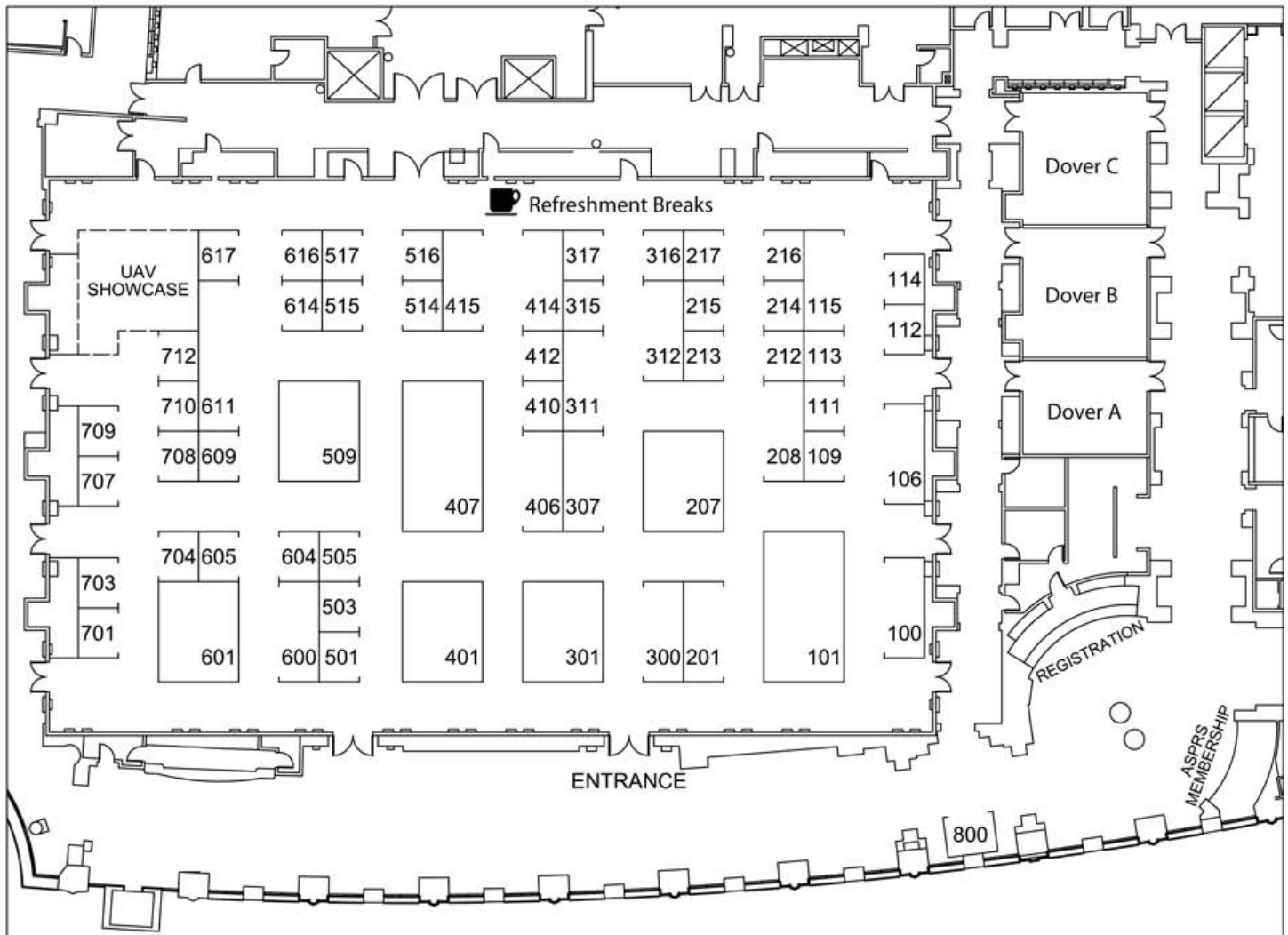
Driving Big Results in Geospatial Learning through Pre-service Education

Vivek Ratna, *Digital Learning Solutions*, United States

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Exhibitor Descriptions

American Aerospace Airborne Systems Group **UAV**

Villanova, Pennsylvania
610-225-2604, www.american-aerospace.net

American Aerospace Advisors Inc. (AAAI) is leading the way in the civilian uses of long endurance Unmanned Aircraft Systems (UAS), offering commercial UAS flight services, RS-16™ UAS Mission Systems, interoperable Mobile Operations Centers (iMOCs™) and our state-of-the-art Real-Time Multispectral HD Video Mapping Payloads. From wildfire monitoring to mapping utility corridors, from precision agriculture to oil spill remote sensing, from emergency management to airborne science, AAAI's Airborne Systems Group delivers high performance mission systems, support equipment and payloads as well as safe and effective flight services every time at disruptively low costs.

American Surveyor and LiDAR Magazine **617**

www.amerisurv.com

A Spatial Media publication. Dr. Gene Roe leads an expert editorial team, bringing insights and commentary to readers via websites, blogs, eNewsletters & the print editions. Spatial Media (Frederick, Maryland) is an advanced internet media provider, operating websites, eNewsletters and interactive magazines. Publications include The American Surveyor (www.amerisurv.com), GISuser.com, LBSzone.com, Machine Control Magazine (www.machinecontrolonline.com) and others.

ASPRS **611**

Bethesda, Maryland 301-493-0290, www.asprs.org

Come visit the ASPRS Bookstore to preview ASPRS' new technical manuals, the *Manual of Photogrammetry, 6th Edition*, and see Lidar Manual. These two Manuals, as well as many more, will be available for purchase; so take advantage of the show discount and save on shipping.

ASPRS staff will be on hand to answer questions about membership, certification, and the awards and scholarship program. Ask about our upcoming conference with CaGIS in the Fall of this year. Don't forget to pick-up your complimentary copy of *PE&RS* and enter our drawing for free copy of our two newest books.

ASPRS — Student Advisory Council **616**

All students are encouraged to stop and meet members of the Student Advisory Council. If you are in a Student Chapter, come tell us the kinds of activities your chapter holds during the year so we can add them to our Student Chapter handbook. Interested in applying for a SAC position? Come ask questions. We also are looking for people interested in working on the various activities that SAC plans throughout the year. Don't forget we are selling socks for the Sock Drop. Proceeds from the sale will go to funding SAC activities.

Applied Imagery **800**

Silver Spring, Maryland 301-589 4446, www.appliedimagery.com

Applied Imagery's Quick Terrain Modeler LiDAR exploitation software enables powerful, intuitive, interactive analysis of enormous 3D terrain models and point clouds. It is simple to use, can fuse 3D data and 2D imagery from different sources, and is widely used in both the DoD and civilian communities.

ASD Inc. **410**

Boulder, Colorado 303-444-6522, www.asdi.com

ASD Inc., a PANalytical company, is the global leader in remote sensing and hyperspectral measurement solutions, providing unparalleled ground truthing results. Our rugged, portable FieldSpec® 4 line of spectroradiometers provides the freedom to rapidly collect high-quality spectra in the field. Trusted by top research experts at thousands of universities and research institutions, ASD's full-range spectrometers are used in more than 70 countries. For more information, please visit www.asdi.com.

Asian Surveying & Mapping **617**

Astrium GEO-Information Services **215**

Chantilly, Virginia 703-715-3100, www.astrium-geo.com

With exclusive access to Pléiades, SPOT and TerraSAR-X satellite data, and a broad range of other space and airborne resources, Astrium GEO-Information Services offers an extensive product and services portfolio covering the entire geographic information value chain: from optical and radar satellite imagery to value-services and turnkey geo-information solutions.

BAE Systems **300**

San Diego, California 800-316-9643, www.baesystems.com/gxp

BAE Systems, well known for its precision photogrammetry and geospatial production tools, develops software to address the need for multi-sensor image exploitation, and higher productivity. SOCET GXP v4.0 includes tools for terrain registration, comparison and volumetrics, such as: automated 3-D site and city modeling, planimetric feature extraction, 3-D line of sight analysis and visualization, and LiDAR terrain visualization. In addition, our newest product offering, GXP Xplorer, introduces a revolutionary way to access, catalog, and share data.

BEIJING GEOWAY SOFTWARE CO, LTD **514**

Beijing, China 86-10-68638580, www.geoway.cn

Beijing GEOWAY Software Co., Ltd. is the leading provider of geomatic solutions in China, and is competitive in imagery processing and database-based mapping worldwide. GEOWAY is engaged in research and development of geoinformation processing system, image processing system and digital photogrammetric system, while carrying out stereo mapping, image processing, electronic map production, 3D modeling and other spatial data processing business. GEOWAY is now looking for partners worldwide.

Exhibitor Descriptions

Blue Marble Geographics 707
Hallowell, Maine 207-622-4622, www.bluemarblegeo.com

Blue Marble Geographics of Hallowell, ME is a leading developer and provider of software products and services for highly accurate geospatial data conversion solutions. Blue Marble is known for their coordinate conversion and file format expertise and is the developer of The Geographic Calculator, GeoCalc SDK, Global Mapper and Global Mapper SDK. Blue Marble has been creating GIS software tools and solutions for 20 years and currently serves hundreds of thousands of users worldwide.

Cannon IV, Inc. 505
Indianapolis, Indiana 317-951-0500, www.cannon4.com

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Cardinal Systems, LLC 201
Flagler Beach, Florida 386-439-2525, www.cardinalsystems.net

Cardinal Systems, LLC provides mapping software solutions for the handling of digital spatial data and is the developer and provider of the Vr Mapping software suite. Offering the modules VrOne, VrTwo, VrLiDAR, VrOrtho, VrAirTrig, VrMosaic, VrBalance, VrAdjust, VrVolumes and VrLite we are continually developing fresh new programs for the geospatial community in which Vr is fast becoming the standard. To learn how to revolutionize your data collection and editing methods please visit us at Booth 201.

Certainty 3D 412
Orlando, Florida 407-248-0160, www.certainty3d.com

Certainty 3D offers LiDAR data processing solutions for Riegl, Leica, Optech, Z&F, Faro and other systems. Certainty 3D's primary focus is the extraction of high quality CAD deliverables from point cloud and calibrated image data. Certainty 3D also offers freeware applications for LiDAR project planning, scheduling and cost estimation. Certainty 3D's primary product is TopoDOT, a CAD application used to deliver value from LiDAR system data.

Clark Labs 213
Worcester, Massachusetts 508-793-7526, www.clarklabs.org

Since 1987, Clark Labs has been dedicated to the development of geospatial software as well as customization, consulting and training. Clark Labs is best known for the IDRISI GIS and Image Processing software. The latest version, IDRISI Selva, is feature-rich, comprised of an unsurpassed range of geospatial tools, including image segmentation and classification. IDRISI also provides innovative applications such as the Land Change Modeler and the Earth Trends Modeler. Visit Clark Labs at Booth 213 in the exhibitor hall for a demonstration. Website: www.clarklabs.org.

ContingencyToday 617
Cambridge, United Kingdom
+ 44 (0)1223 279151, www.contingencytoday.com

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Coordinates Magazine 217
<http://mycoordinates.org/>

DAT/EM Systems International 307
Anchorage, Alaska 907-522-3681, www.datem.com

DAT/EM Systems International has been a leader in the development of world-class software for digital mapping and photogrammetry applications since 1987. Currently, DAT/EM serves over 500 photogrammetric and engineering firms as well as government agencies in more than 70 countries worldwide. DAT/EM employs highly technical personnel and integrates cutting-edge technology. We take pride in a reputation for delivering quality systems and superior customer service, and in our commitment to developing -of-the-art software and hardware solutions.

Diamond Airborne Sensing 115
Wiener Neustadt, Austria 22 692 6 6604, www.diamond-sensing.com

Diamond Airborne Sensing is a subsidiary of Diamond Aircraft Industries Group and offers the most economical special mission aircraft for remote sensing technologies, the DA42MPP. This twin-engine aircraft is available as a turn-key solution with the sensors of your choice already integrated and certified. With its unique fuel flow of only 7 USGal/h of JetA/Diesel in total and its incredible stability, it is found ideal for any mapping, laserscanning, or other GIS remote sensing applications.

Directions 617
www.directionsmag.com

Directions Magazine is the worldwide leader in delivering timely news and technology trends to professionals using geospatial technology and location intelligent software solutions. We bring awareness to the news that shapes the geospatially-enabled IT marketplace and the expansion of mobile location-based applications. Read Directionsmag.com, everyday for the most complete coverage of all things location.

Exhibitor Descriptions

DMC International Imaging Ltd 111
Guildford, Surrey +44 1483 804235, www.dmcii.com

DMC International Imaging Ltd (DMCii) is one of the world's fastest growing satellite imagery products and services providers. Based in the UK, we have customers in 100 countries around the globe, supplying both programmed and archived optical satellite imagery from the multi-satellite, multi-temporal, multi-resolution (2.5m, 5m, 22m, and 32m) Disaster Monitoring Constellation (DMC). We supply imagery for a wide variety of applications, including agriculture, forestry, infrastructure planning, land cover and environmental mapping.

Dynamic Aviation 609
Bridgewater, Virginia 540-828-6070, www.dynamicaviation.com

Dynamic Aviation specializes in providing turbine powered aircraft and aviation infrastructure to organizations with exacting data needs, but lacking aviation resources. We offer versatile, superior aerial platforms into which existing and emerging technologies can be installed to acquire data of all types. Our aerial platforms can be deployed to obtain LiDAR and multi/hyperspectral data. They may be used for aerial photography, geophysical survey, and air sampling; as well as for aerial and maritime surveillance.

Earth Imaging Journal 617
Greeley, Colorado 970-223-6295, www.eijournal.com

Earth Imaging Journal is devoted to exploring the world of remote sensing. The bimonthly publication focuses on the dominant business applications that support the international remote sensing industry, emphasizing the inherent beauty and informational value of Earth imagery from numerous sources. The magazine also delivers insightful perspectives on remote sensing policy initiatives and covers niche markets as they develop. Earth Imaging Journal is complemented by its Web site, www.eijournal.com, and its weekly electronic newsletter, Earth Imaging Express. Subscribe online at www.eijournal.com.

EARTH Magazine 617
www.earthmagazine.org

Each monthly issue of EARTH gives readers definitive coverage on topics from natural resources, energy, natural disasters and the environment to space exploration and paleontology and much, much more. EARTH explores the science behind the headlines with timely, relevant editorial content, numerous photos, illustrations, and great maps, with an increasingly diverse mix of topics in each issue. EARTH's readers are spread across the earth science disciplines in academia, government, research and the private sector, people who are involved directly in the issues affecting everyone daily. Awareness of our planet has never been as critical as it is today. EARTH is available digitally at Zinio.com for just \$19.99.

e-GEOS 315
Rome, Italy 3.90641E+11, www.e-geos.it

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Ecopia Tech 317
Waterloo, Ontario, Canada 289-681-0918

Ecopia Tech provides world-class software solutions for remotely sensed image processing through easy-to-use tools that empower the common user.

Providing vast labor-cost savings to customers and partners, Ecopia has automated the previously labor-intensive process of object recognition and extraction within remotely sensed imagery.

Elecnor Deimos Imaging 216
Boecillo, Valladolid - Spain
+34-983548923, www.deimos-imaging.com

ELECNOR DEIMOS IMAGING is a private company owning, operating and marketing DEIMOS-1, a 22 meter multispectral Earth Observation Mission. Based on DEIMOS-1, DEIMOS markets imaging capacity, satellite imagery and value added products, as well as tailored data supply services. Core expertise and strength refer to frequent coverages of large areas (countries, continents) and tailored imaging services. In the last quarter of 2013 the company will launch DEIMOS-2, a very high resolution multispectral mission.

Esri 301
Redlands, California 909-793-2853, www.esri.com

Esri® creates GIS software tools and methodologies that enable organizations to effectively analyze and manage their geographic information and make better decisions. On any given day, more than a million people around the world use Esri's GIS to improve the way their organizations conduct business. Every year, Esri reinvests more than 20 percent of its revenues in research and development to ensure users have the best tools possible to accomplish their missions.

Exelis Visual Information Solutions 401
Boulder, Colorado 303-786-9900, www.exelisvis.com

Exelis Visual Information Solutions provides software solutions to help scientists, geographers, and GIS specialists solve problems using remotely sensed data. Our advanced ENVI Platform gives you the foundation you need to build a better geospatial image analysis workflow, regardless of the data formats and types you use. Visit Exelis booth #401 to see how the ENVI Platform enables you to get more information about the world around you and make more informed decisions.

Exhibitor Descriptions

- GeoCue** 515
Madson, Alabama 256-461-8289, www.geocue.com
GeoCue Corporation is a software development and consulting services company specializing in geospatial production management solutions. We will be demonstrating our GeoCue product family of integrated solutions in booth #515 as well as during our annual user group meeting on Monday, March 25th from 8:00am-12:00noon. These products provide an integrated end-to-end processing framework that, when combined with industry leading production tools, significantly reduces production time from data acquisition to finished product.
- GeoConnexion** 617
Cambridge, United Kingdom
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- GeoInformatics** 617
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- GISCafe.Com** 712
Campbell, California 408-221-0982, GISCafe.Com
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- IGI** 214
Kreuztal, NRW, Germany +49 2732 5525 0, www.igi-systems.com
IGI was founded in 1978. The primary goal of the company was to manage airborne sensor systems for flight guidance, sensor control using GNSS (Global Navigation Satellite Systems) and INS (Inertial Navigation Systems). Today the portfolio includes additional sensor systems using LiDAR, hyperspectral, digital camera systems and thermal camera systems. With over 30 years of experience, IGI offers not only integration of various sensors but also complete sensor systems for airborne and terrestrial survey missions.
- Imaging Notes** 617
Denver, Colorado 303-477-5272, www.imagingnotes.com
Imaging Notes is a quarterly print publication and monthly eNews covering Earth remote sensing for security, energy and the environment. Reporting is in-depth and exclusive, about the uses of imagery and geospatial solutions worldwide. On www.imagingnotes.com, you can subscribe quickly, read eNews and the current issue, search the archive of in-depth articles, and obtain advertising information.
Imaging Notes is a proud partner of The Location Media Alliance, which also includes Sensors & Systems, Informed Infrastructure, LBx Journal and Asian Surveying & Mapping.
- Intergraph & Leica Geosystems** 101
Norcross, Georgia 770-326-9536, www.leica-geosystems.us
Intergraph SG&I provides geospatially powered solutions to a wide range of industries. Hexagon Geosystems newly formed Geospatial Solutions Division is bringing together Leica Geosystems' Airborne Sensors and Intergraph's Z/I Imaging Solutions.
- ITRES Research Limited** 614
Calgary, Alberta, Canada 403-250-9944, www.itres.com
ITRES imagers feature unmatched precision, focus, and resolution for hyperspectral and thermal imaging of infrastructure and environmental applications. Our Lidar-ready systems cover all major spectral regions: hyperspectral VNIR CASI, SWIR SASi, MWIR MASI, hyperspectral thermal TASI and broadband thermal TABI. Supporting products include multiple sensor operation, remote operation capability, and (soon) in-flight geocorrection.
New development: Wide-array thermal TABI-1800. Halve survey costs with a mapping swath twice as wide as the closest competing imager.

Exhibitor Descriptions

KLT Associates, Inc.
Peabody, Massachusetts

106/108
978-536-9100, kltassoc.com

ATLAS was written specifically to handle solutions for all aspects of mapping 3D geographic data. ATLAS provides a fully integrated system for collecting, editing, and retrieving geographic information, SOFTCOPY STEREO data collection, Terrain tools handling LIDAR, TINs, DEMs. ORTHO rectification and MOSAIC of frame cameras, digital imagery, including cameras, airborne line sensors and spaceborne imagery. AERIAL TRIANGULATION provides solutions for even the most difficult mapping project, in an interactive environment. Visit us to discuss ALL your mapping needs.

Lead Air Inc.
Kissimmee, Florida

600
407-343-7571, <http://trackair.com>

Lead'Air Inc., located on the Kissimmee airport, FL, is an affiliate of Track'Air in the Netherlands. Lead'Air manufactures and installs aerial navigation and surveying equipment for use in airplanes and helicopters.

Lead Air has developed an exceptional ability to provide their customers with dedicated resources to research and design completely custom solutions with unsurpassed speed and cost.

LizardTech
Seattle, Washington

701
206-652-5211, www.lizardtech.com

Since 1992, LizardTech® has delivered state-of-the-art software products for managing and distributing massive, high-resolution geospatial data such as aerial and satellite imagery and LiDAR data. LizardTech pioneered the MrSID® technology, a powerful wavelet-based image encoder, viewer, and file format and now has offices in Seattle, Denver, London and Tokyo. For more information about LizardTech, visit www.lizardtech.com.

Microsoft / Vexcel Imaging GmbH
Graz, Austria

207
+43 316 849 066 0, www.iFlyUltraCam.com

Microsoft's UltraCam business unit brings more than two decades of photogrammetry expertise to Microsoft's Bing Maps business unit. Its family of award-winning UltraCam sensor systems includes the UltraCamLp, the UltraCam Falcon and the UltraCam Eagle. Rounding out the company's UltraCam offerings, is the UltraMap photogrammetric workflow software that provides UltraCam customers with an end-to-end image processing system, including automated point cloud and DSM generation as well as an automated ortho pipeline.

MosaicMill
Helsinki, Finland

709
358-40-5965322, www.mosaicmill.com

MosaicMill is a Finnish company established in 2009. Company specializes on remote sensing and photogrammetry, and develops and distributes EnsoMOSAIC medium format digital aerial imaging system and EnsoMOSAIC image processing software for frame cameras. MosaicMill also distributes EnsoMOSAIC 3D software for advanced 3D processing and editing. In ASPRS MosaicMill will show full software package for UAV image post processing as well as hyperspectral 2D (frame) camera for agriculture and forestry.

National Geospatial-Intelligence Agency (NGA)
www.nga.mil

311

NASA

www.nasa.gov

509

New Tech Serives, Inc.

Sugar Land, Texas

703
281-573-8029, nts@nts-info.com

New Tech Services, Inc. specializes in the Sales of pre-owned Mapping equipment and Aircrafts with Camera ports. NTS also markets a Mission Planning Tool to calculate the amount of images needed anywhere, accurately and cost efficient. All data can be exported to most FMS. Download Maps directly from Google into TopoFlight with selectable resolution. TopoFlight Navigator is the Flight Management System. Visit: www.nts-info.com and www.TopoFlight.com for more info.

Please contact: Tony at nts@nts-info.com 1-281-573-8029.

NOAA/NOS/NGS/RSD

Silver Spring, Maryland

301-713-2663, www.ngs.noaa.gov/RSD/rsd_home.shtml

704

The Remote Sensing Division of NOAA's National Geodetic Survey uses a variety of photogrammetry and remote sensing technologies to support the Aeronautical Survey Program (ASP), Coastal Mapping Program (CMP), and Emergency Response. The ASP collects data using field survey and photogrammetric methods to create runway approach procedures and airport obstruction charts. The CMP works to provide a regularly-updated National Shoreline for supporting marine navigation, defining territorial limits, and managing coastal resources. Emergency response efforts are carried out to provide timely, high-resolution remotely-sensed data following hurricanes, tornadoes, and other disasters.

NovAtel Inc.

Calgary, Alberta, Canada

212
403-295-4562, <http://www.novatel.com>

Long-time supplier of high precision GNSS positioning and attitude determination technology for mobile mapping applications. NovAtel GNSS receivers, antennas and SPAN™ GNSS/INS products offer a wide range of performances and are designed to integrate easily with existing camera and flight management systems. Our Waypoint Products Group's GrafNav is the industry's preferred GNSS data post-processing software. Inertial Explorer® extends this functionality with tightly coupled GNSS/INS processing. Visit Booth 212 to learn more.

NovaSol

Honolulu, Hawaii

109
808-441-3600, www.nova-sol.com

NovaSol is an electro-optic engineering small business specializing in state-of-the-art hyperspectral imaging (HSI) sensors and systems and tactical free space optical communication systems. NovaSol's HSI sensor products feature its patented solid block spectrograph design, resulting in the lowest size weight and power high performance sensors in the industry. Combined with similarly compact NovaSol real time data processors, complete systems are flexibly configured for deployment on light aircraft and small UAVs.

Exhibitor Descriptions

Optech 312
West Henrietta, New York 585-427-8310, www.optech.com

Optech is the world leader in lidar and camera survey instruments. Optech's CS-series aerial digital cameras—standalone or lidar-integrated—are rugged, high-precision, metric imaging systems with camera control, INS integration and image processing.

Optech ALTMs deliver complete airborne data collection solutions, from high-altitude wide-area to low-altitude corridor surveys. Optech CZMIL, integrated lidar/imagery bathymetry system, automatically generates information products for the coastal zone.

Optech Lynx Mobile Mapper™ collects engineering/survey-grade lidar data at highway speeds.

Panvion Technology Corp. 604
Edmonton, Alberta, Canada 780-989-5409, www.panvion.com

Panvion is a geomatics and airborne sensor company that has in the past ten years focused exclusively on designing and manufacturing one-of-a-kind sensors that provide wide-area coverage while maintaining high resolution and geo-location accuracies. Panvion will introduce the G7, a revolutionary Ultra-large format multispectral, stereo and photogrammetric camera in the multi-Gigapixel range. The G7 was created to be affordable for small and large aerial survey companies achieving greater productivity and cost savings in operation.

PCI Geomatics 406
www.pcigeomatics.com/

Phase One Industrial 605
Copenhagen, Denmark +45 36 46 0111, aerial.phaseone.com

Phase One Industrial has engineered the iXA aerial camera system to meet the exacting needs of aerial photography and to create a streamlined capture and processing workflow. Its rugged, lightweight aluminum alloy construction enables quick and flexible installation and deployment in a variety of configurations, and makes it particularly suited to single and multiple camera configurations. The iXA is available in 80 MP or 60 MP configurations and in NIR, Achromatic or RGB versions.

Pix4D UAV
<http://pix4d.com/>

POB 617
Troy, Michigan 248-362-3700, www.pobonline.com/

Founded in 1975, Point of Beginning, also known as POB, serves the surveying and mapping profession through an informative national print publication, bimonthly eNewsletters, a comprehensive website, digital magazines and a professional online community, www.RPLS.com. As our mission states, we are dedicated to helping the geomatics industry succeed through our coverage of new applications and evolving technologies, practical solutions to surveying and mapping problems, and business, legal and educational issues.

Professional Surveyor Magazine 114
Frederick, Maryland 301-682-6101, www.profsurv.com

Professional Surveyor Magazine: business and technology information for land and hydrographic surveyors, photogrammetrists, and lidar/GIS professionals. Published with it are annual Aerial Mapping and Red Pages supplements, and e-newsletters Pangaea and Field Notes, the latest in geospatial technologies.

QCoherent - A GeoCue Company 515
Madison, Alabama 256-461-8289, www.LP360.com

QCoherent Software is an innovative provider of high-capacity LIDAR software for ArcGIS(2) and standalone desktop environments. Our extensive knowledge of LIDAR and geospatial software has been applied to LP360 and LIDAR Server for point cloud visualization and distribution. With unparalleled performance in point cloud processing, classification, extraction, and operating environment options QCoherent is the provider of choice for LIDAR software. Free evaluation is available at www.LP360.com. Please visit our booth #515 and annual user group meeting on Monday, March 25th from 8:00am-12:00noon.

RapidEye 501
Arlington, Virginia 571-384-7922, www.rapideye.com

RapidEye is a leading provider of quality high-resolution satellite imagery and derived geo-information products. With a constellation of five EO satellites, RapidEye images up to 5 million square kilometers of earth every day and its archive of imagery grows by over one billion square kilometers every year. With an unprecedented combination of wide area repetitive coverage and five meter pixel size multi spectral imagery, RapidEye is a natural choice for many industries and government agencies.

RIEGL USA 115
Orlando, Florida 407-248-9927, www.rieglusa.com

With over nineteen years' experience, RIEGL USA delivers cutting-edge technology in quality airborne, mobile and stationary terrestrial laser scanning solutions. RIEGL USA is recognized as the performance leader in airborne scanning, hydrographic, mobile mapping, mining, and terrestrial based industries. From your initial purchase, to integration of the systems, as well as training and support, RIEGL USA stands out as an industry leader. The key factor to RIEGL USA's success is complete reliability and customer support.

Sense Fly UAV
<http://www.sensefly.com/>

Exhibitor Descriptions

SimActive Inc. 503

Montreal, Quebec, Canada 514-288-2666, www.simactive.com

SimActive is the developer of Correlator3D™ software, a patented end-to-end photogrammetry solution for the generation of high-quality geospatial data from satellite and aerial imagery, including UAVs. Correlator3D™ performs aerial triangulation (AT) and produces dense digital surface models (DSM), digital terrain models (DTM), orthomosaics and vectorized 3D features. Powered by GPU technology and multi-core CPUs, Correlator3D™ ensures matchless processing speed to support rapid production of large datasets.

Spatial Media 617

Frederick, Maryland 301-620-0784, www.spatialmedia.us

LiDAR News (www.lidarnews.com), a Spatial Media publication, promotes the adoption of LiDAR and 3D imaging technology. Dr. Gene Roe leads an expert editorial team, bringing insights and commentary to readers via websites, blogs, eNewsletters & the print edition of LiDAR Magazine. Spatial Media (Frederick, Maryland) is an advanced internet media provider, operating websites, eNewsletters and interactive magazines. Publications include The American Surveyor (www.amerisurv.com), GISuser.com, LBSzone.com, Machine Control Magazine (www.machinecontrolonline.com) and others.

Spectral Evolution 708

Lawrence, Massachusetts 978-687-1833, www.spectralevolution.com

SPECTRAL EVOLUTION is a leading manufacturer of field portable and laboratory spectroradiometers, spectrometers, and spectrophotometers for applications including geological remote sensing, ground truthing, spectral remote sensing, environmental and climate research, crop and soil research, vegetative studies, water body research including water quality and pollution studies, forestry and canopy studies, calibration transfer, upwelling and downwelling measurement, and more. With the PSR-Series, the company offers the standard in portable spectroradiometers with a 350-2500nm spectral range. www.spectralevolution.com.

Surface Optics 710

<http://surfaceoptics.com/>

Topcon Positioning Systems, Inc. 407

Livermore, California 925-245-8300, www.topconpositioning.com

Topcon Positioning Systems is a leading developer and manufacturer of precision positioning solutions for the GIS, surveying, and civil engineering markets. Topcon's innovative 3D mobile mapping solutions increase production by quickly collecting and integrating 360° images and high density point clouds for easy feature recognition and data extraction.

Trimble 601

Westminster, Colorado

720-587-4905, <http://www.trimble.com/geospatial/>

Trimble provides solutions for the collection, processing and analysis of geo-referenced images and point clouds including mobile sensor systems, digital photogrammetry, terrain modeling, image analysis, change detection and feature extraction software. Trimble's Imaging solutions are complemented by precision measurement tools, mobile data collection, wireless technologies, and software from Trimble's Survey and GIS data collection portfolios to provide geospatial professionals with comprehensive field and office solutions to plan, build, manage and maintain both natural and man-made assets.

UTC Aerospace Systems UAV

<http://utcaerospacesystems.com/>

Vector1 Media 617

Denver, Colorado 720-255-8127, www.sensorsandsystems.com

Vector1 Media publishes Sensors & Systems (www.sensorsandsystems.com), Informed Infrastructure (www.informedinfrastructure.com) and Asian Surveying & Mapping (www.asmmag.com). Each of these publications deal with the combination of sensors and systems for different scales of geography. Sensors & Systems covers global change, Informed Infrastructure examines smart city applications and technology, and Asian Surveying & Mapping is focused on geospatial technology application in Asia-Pacific. Surveying, positioning, GIS, and remote sensing are key areas of coverage with the goal of better stewardship for our planet.

VisionMap 100

Berryville, Virginia

540-955-1029, www.visionmap.com

VisionMap LTD. is a leading provider of state-of-the-art digital automatic aerial survey and mapping systems.

VisionMap's unique technology creates innovative data acquisition and data processing systems which optimize mapping work and set a new standard for productivity in the geospatial data industry.

Visual Intelligence 112

Houston, Texas

713-917-8300, visualintell.com

Visual Intelligence delivers to the geospatial market place the most economical, best performing, reliable family of oblique corridor-area (iOne IMS) and stereo-3D large area (iOne Stereo) digital airborne sensors for infrastructure engineering surveying & mapping and precision geospatial web content (oil & gas, railroads, highways, energy networks, telecoms, land records, real estate, agro & forestry management and many more).

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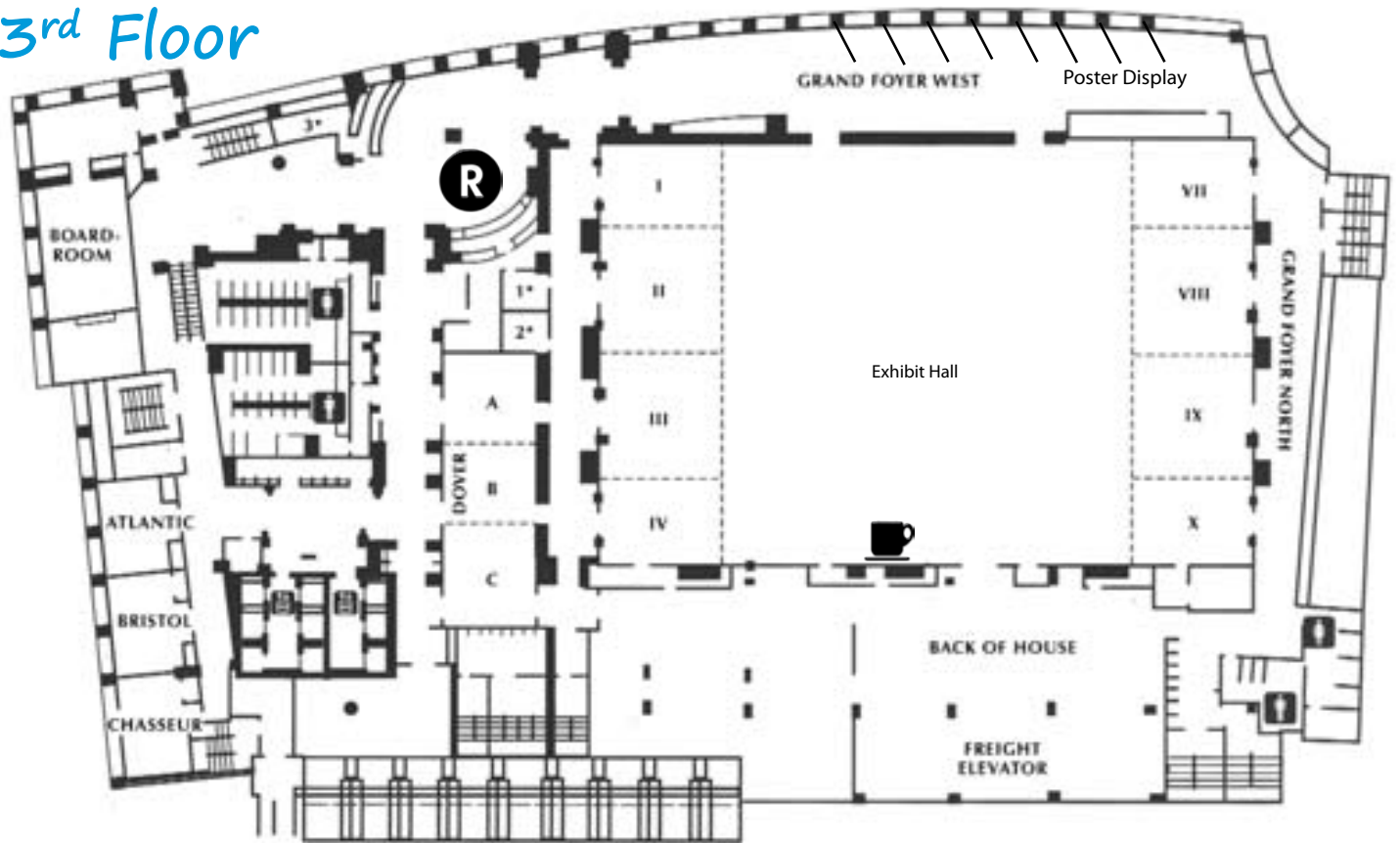
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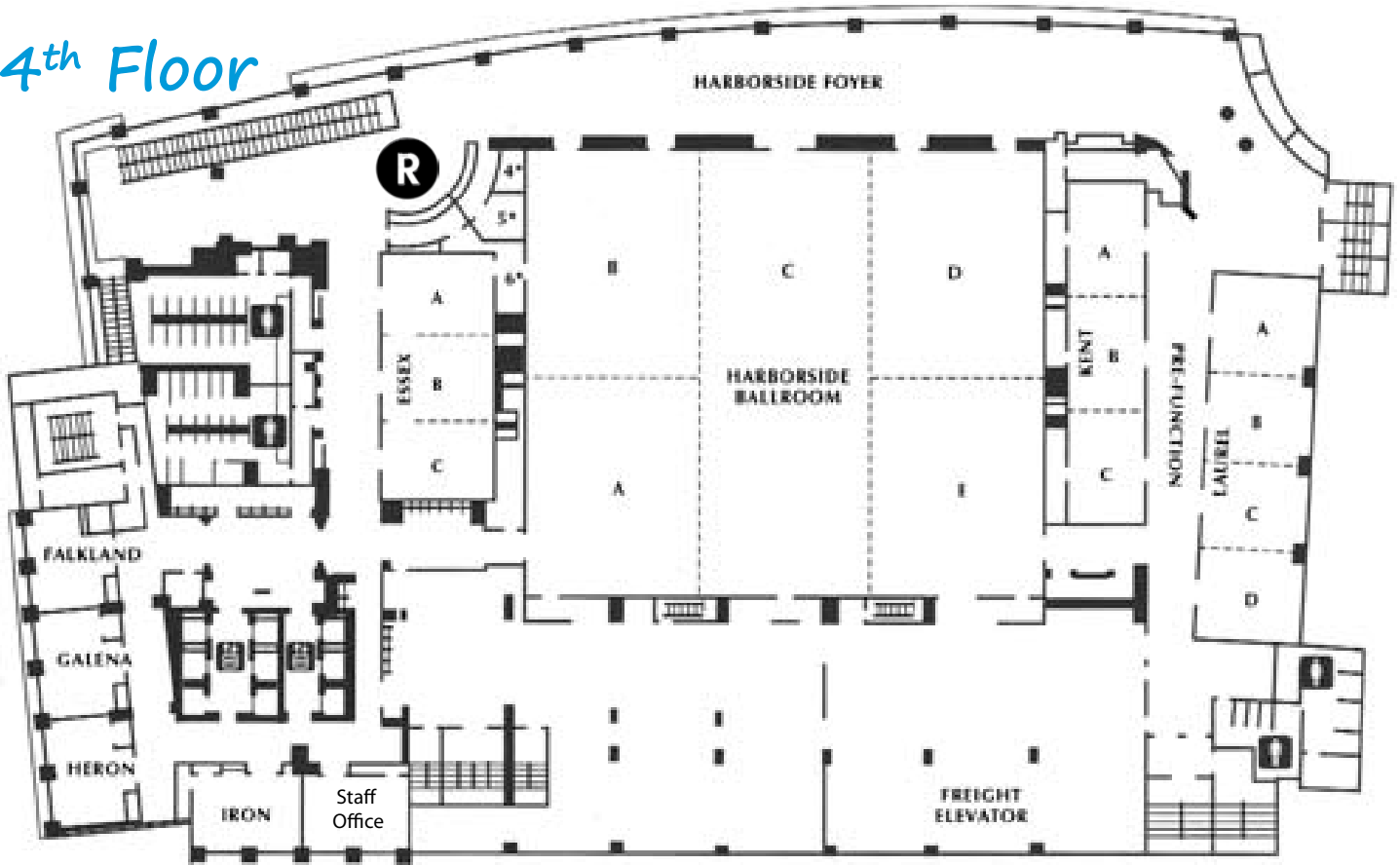
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COMING SOON

MANUAL OF PHOTOGRAMMETRY

Sixth Edition

Editor: J. Chris McGlone, PhD, CP

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Photogrammetry is a broad field which incorporates a wide range of technologies. This Manual covers photogrammetry in depth, as well as its constituent technologies, providing the student, practitioner, or researcher with a single valuable reference resource.

The topics addressed include:

- **Mathematics:** the perspective geometry which underlies the imaging process and its current usage in computer vision, the statistical modeling of measurement error, and the basic photogrammetric operations of resection, intersection, and triangulation, coordinate transformation;
- **Image acquisition:** the physics of optical systems and imaging chips, digital airborne and satellite sensors;
- **Digital photogrammetry:** image processing, computer vision, and their applications in photogrammetry;
- **Photogrammetric operations:** flight planning and GPS/INS utilization;
- **Photogrammetric products:** standard product types and formats and their associated accuracy standards;
- **Current applications:** mobile mapping vans, close-range industrial photogrammetry, space measurements, and forensic photogrammetry;
- **Bibliography:** each chapter has an extensive bibliography to guide further study.

These topics are covered by contributing authors who combine long experience with many aspects of photogrammetry and familiarity with the state-of-the-art; many of the authors have been pivotal in defining the current state of the art of digital photogrammetry.

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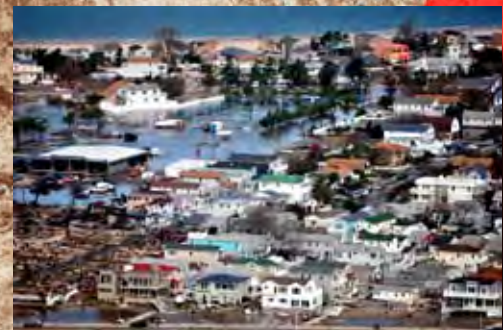
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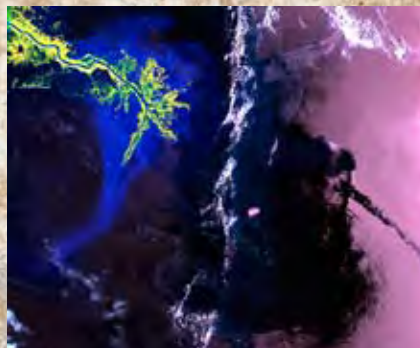
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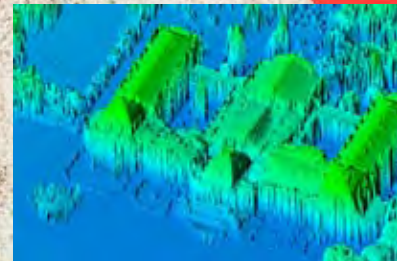
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