AWARDS PROGRAM

ASPRS 2016 Annual Conference

IGTF 2016

Imaging & Geospatial Technology Forum (IGTF)
& co-located JACIE Workshop

Joint Agency Commercial Imagery Evaluation (JACIE) Workshop

Fort Worth, Texas USA
April 11–15
Fort Worth Convention Center

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, Wednesday, April 13, 2016

- Honorary Lifetime Achievement Award
- Photogrammetric (Fairchild) Award
- Outstanding Technical Achievement Award

Awards Dessert Reception, Wednesday, April 13, 2016, 7:00 pm – 8:30 pm

- Fellow Awards
- Outstanding Service Awards
- Presidential Citations
- Scholarships
- Outstanding Paper Awards

ASPRS Honorary Lifetime Achievement Award

Roy A. Welch

Dr. Roy A. Welch was born in Waukesha, Wisconsin. In 1961, Welch received his B.S. degree in Geography and Biology from Carroll College, Waukesha, Wisconsin. In 1962, he conducted glacial geomorphological and ecological studies in southeast Alaska for The Ohio State University Institute of Polar Studies From 1962 to 1964, he was a photo-analyst with the U.S. Government. In 1965, he received his M.A. degree in Physical Geography from the University of Oklahoma and in 1968, his Ph.D. in photogrammetry, remote sensing and physical geography from the University of Glasgow. His doctoral research involved the development and application of aerial photographic methods for studying glacial areas in southeast Iceland and Britain. This work resulted in several publications in *The Photogrammetric Record* and *Photogrammetric Engineering*.

Following his graduation, 1968 to 1969, Welch worked as a manager in the Earth Science Department and Senior Photogrammetric Engineer for the Iteck Corporation and in 1969-1971, as a National Academy of Sciences Postdoctoral Research Associate for the National Research Council evaluating factors influencing image quality of air and space photographs. He also taught photogrammetry at the U.S. Department of Agriculture Graduate School. In 1971, he joined the faculty of The University of Georgia (UGA) Department of Geography where he was responsible for undergraduate and graduate courses in field methods, photo-interpretation, photogrammetry, remote sensing and geographic information systems. He reached the highest faculty rank of Distinguished Research Professor in the UGA Franklin College of Arts and Science and retired in 2003 as Emeritus Distinguished Research Professor.

Welch's early professional activities include service as a Remote Sensing Specialist for the U.S. Geological Survey (USGS). He participated in USGS and the Agency for International Development (AID) Landsat remote sensing projects and conducted research on the cartographic potential of SIR-B, SPOT, Landsat and Skylab image data In the 1970s, he also worked as a consultant or advisor to several groups, including the National Aeronautics and Space Administration (NASA), SPOT Image Corporation, and the California Institute of Technology's Jet Propulsion Laboratory In 1980, he received a four-month appointment from Japan's Ministry of Education to study the space program and remote sensing activities of Japan. In 1981, Welch was appointed to the Space Program Advisory Panel of the Office of Technology Assessment, U.S. Congress.

In 1984, Welch founded the Laboratory for Remote Sensing and Mapping Science (LRMS), a research laboratory, and served as its Director until his retirement in 2003 His externally-funded contracts and grants focused on research involving cartographic evaluation of remote sensing imagery, soil erosion processes, hydrologic modeling and assessment of invasive aquatic vegetation using photogrammetry, surveying, remote sensing and GIS. In 1989, LRMS was elevated to the status of a Center and renamed the Center for Remote Sensing and Mapping Science (CRMS) In 1998, CRMS was named a National Aeronautic and Space Administration (NASA) Center of Excellence and his leadership resulted in over $5M of externally funded grants from agencies including NASA, USGS, National Science Foundation, National Park Service, U.S. Environmental Protection Agency, National

Oceanic and Atmospheric Administration, U.S. National Geospatial Intelligence Agency, and the US Army Corps of Engineers, along with numerous state agencies, non-profit organizations and private companies.

Welch founded and was President of R-WEL, Inc., a company that developed and marketed mapping software for small computers. Dr. Welch was President of ASPRS in 1984 and between 1992-1996 he served as President of Commission IV, Mapping and Geographic Information Systems, International Society for Photogrammetry and Remote Sensing (ISPRS).

Welch is the author of more than 170 refereed publications on sensor performance, image quality, mapping from satellite image data, remote sensing and geographic information system (GIS) applications He is a member of ASPRS, the American Congress on Surveying and Mapping, Association of American Geographers, British Photogrammetric Society, and Society of Sigma Xi He has the distinction of being a Fellow of both ASPRS (1995) and ISPRS (2010) and he received many awards throughout his career including the ASPRS 2006 SAIC/Estes Memorial Teaching Award, The University of Georgia Research Foundation 1996 Inventor of the Year Award, ASPRS Alan Gordon Memorial Award (1993) for contributions to desktop mapping with personal computers including digital photogrammetry, radargrammetry and three-dimensional terrain visualization, Sigma Xi Active Member Research Award for significant research on the cartographic applications of satellite imagery (1982), ASPRS Fairchild Photogrammetric Award for research leading to significant contributions in remote sensing, image quality assessment and digital image processing (1981) and the University of Georgia Research Foundation Creative Research Medal (1981) for remote sensing studies of land use changes in China.

Welch has mentored nearly 40 doctoral and masters graduate advisees and invited many international scholars to conduct research at CRMS. His former students and associates hold positions of leadership in several government agencies, private companies, universities and professional societies, owing much to his influence and high standards.

The Honorary Lifetime Achievement Award is the highest award an ASPRS member can receive, and there are only 25 living Honorary Members of the Society at any given time Candidates are chosen by a Nominating Committee made up of the past five recipients of the award and chaired by the most recent recipient Initiated in 1937, this life-time award is given in recognition of individuals who have rendered distinguished service to ASPRS and/or who have attained distinction in advancing the science and use of the geospatial information sciences It is awarded for professional excellence and for at least 20 years of service to ASPRS.

Purpose: *To recognize an individual who has rendered distinguished service to ASPRS and/or who has attained distinction in advancing the science and use of the mapping sciences. It is awarded for professional excellence and for service to ASPRS and consists of a plaque and a certificate.*

Donor: *The ASPRS Foundation.*

ASPRS Honorary Lifetime Achievement Award

Kass Green

Kass Green's experience spans thirty years of managing and supervising GIS and remote sensing professionals, as well as leadership in GIS and remote sensing research and policy.

In 1974, Green received a B.S. degree in Forestry and Resource Management from the University of California, Berkeley (UC Berkeley); an M.S. degree in Resource Policy and Management from the University of Michigan, Ann Arbor in1981 and advanced to Ph.D. candidacy in Environmental Science, Policy, and Management at UC Berkeley that same year.

Green switched her career from natural resource economics to GIS and remote sensing in 1985 when an early employer requested that she perform a benefit cost analysis of alternative GIS software packages for the firm to purchase In1988, Green and her husband co-founded Pacific Meridian Resources a GIS/remote sensing firm that they grew to 75 employees in seven offices nationwide and sold to Space Imaging in 2000

After running half of Space Imaging for three years, Green decided to focus her career on challenging remote sensing mapping and policy projects As a non-tiring advocate of Landsat, Green testified before Congress and worked on numerous initiatives to support the Landsat Program Her research includes innovations in automated change detection and object oriented image classification

Over the last six years, Green has had the pleasure of using object oriented techniques to create detailed vegetation maps of the Grand Canyon National Park, the national parks of Hawaii, and Sonoma County, California, from high resolution optical and lidar imagery. Green chairs NASA's Earth Science Applications Committee, co-founded and chaired the Department of the Interior's Landsat Advisory Group and has served on a variety of Federal Advisory Committees for NASA, NOAA and DOI. She has taught numerous workshops for the American Society of Photogrammetry and Remote Sensing (ASPRS) and federal agencies

She is a fellow in ASPRS, and a past president of both ASPRS (2008-2009) and MAPPS She is currently the lead author on a remote sensing guide being developed for Esri, and will soon begin work on the third edition of *Assessing the Accuracy of Remotely Sensed Data, Principles and Practices* with Dr. Russell Congalton Deemed a "rock star of remote sensing" by *Directions* Magazine, her research and accomplishments in mapping and GIS are world renowned.

An ASPRS member since 1988, Green has served the Society on the ASPRS Board of Directors, as co-founder of the GIS Division, Program Chair for the 2000 Pecora Conference, and has presented workshops at almost every ASPRS conference for the last decade She has received numerous awards from the Society including:

- First Place, ASPRS John I. Davidson Award for Practical Papers, 2011
- ASPRS Fellow Award, 2011
- ASPRS Birdseye Presidential Award, 2009
- ASPRS Outstanding Workshop Instructor Award, 2008.
- ASPRS Presidential Citation, 2000.
- Meritorious Service Award, 1993.
- Second Place, ASPRS John I. Davidson Award for Practical Papers, 1994.

The Honorary Lifetime Achievement Award is the highest award an ASPRS member can receive, and there are only 25 living Honorary Members of the Society at any given time Candidates are chosen by a Nominating Committee made up of the past five recipients of the award and chaired by the most recent recipient Initiated in 1937, this life-time award is given in

recognition of individuals who have rendered distinguished service to ASPRS and/or who have attained distinction in advancing the science and use of the geospatial information sciences It is awarded for professional excellence and for at least 20 years of service to ASPRS.

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Donor: *The ASPRS Foundation.*

The Photogrammetric (Fairchild) Award

David F. Maune

The 2016 Photogrammetric Award (Fairchild) is awarded to David F. Maune in recognition of his lifelong contributions to the science and art of photogrammetry Maune earned his M.S. and Ph.D. degrees in geodetic science and photogrammetry from The Ohio State University in 1970 and 1973 respectively and won the ASPRS' Talbert Abrams Grand Award in 1977 for his pioneering research in digital photogrammetry. Maune also received the ASPRS Outstanding Service Award in 2002 and again in 2007 and an ASPRS Presidential Citation in 2015.

He served for 30 years on Army active duty in the U.S. Army Corps of Engineers (USACE) and was the Army's leading Topographic Engineer for over a decade He commanded topographic engineer units at platoon, company, and battalion levels. He was wounded in combat in 1966 while serving as the Mapping Officer, U.S. Army Vietnam He served as Topographic Plans Officer at Headquarters, Department of the Army, where he rewrote Army topographic engineering doctrine to focus on terrain analysis, created the Terrain Analysis Warrant Officer specialty, and created Division Terrain Teams equipped with modern technology He served as Inspector General of the Defense Mapping Agency, and Director of the Defense Mapping School where he transitioned Army topographic engineers from analog to digital technology. He last served as Director, U.S. Army Topographic Engineering Center (TEC), winning the Army's R&D Organization of the Year for 26 innovative technologies that modernized U.S. Army topographic engineers. He retired from the Army in 1991 at the rank of Colonel.

Maune joined Dewberry Consultants in 1992 as Senior Remote Sensing Project Manager. He has managed five major Dewberry geospatial contracts with USGS, four with NOAA, one with DHS, plus miscellaneous contracts with state and local governments and private industry His signature accomplishments at Dewberry include the following:

- 1998, author of the *National Height Modernization Study*, published by the National Geodetic Survey, on how to modernize the National Height System in the U.S. based on CORS stations and differential GPS.
- 2001, editor and principal author of *Digital Elevation Model Technologies and Applications: The DEM Users Manual*, published by ASPRS.
- 2003, author of Appendix A: "Guidance for Aerial Mapping and Surveying," to FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*.
- 2003, received the ASPRS Fellow Award for lifetime achievements.
- 2004, principal author of *Guidelines for Digital Elevation Data*, published by the National Digital Elevation Program (NDEP).
- 2004, principal author of the ASPRS Guidelines: *Vertical Accuracy Reporting for Lidar Data*.
- 2007, appointed as charter member of the National Geospatial Advisory Committee (NGAC).
- 2007, editor and principal author of *Digital Elevation Model Technologies and Applications: The DEM Users Manual*, 2nd edition, published by ASPRS.
- 2008, author of the Alaska DEM Whitepaper that led to statewide IFSAR mapping of Alaska.
- 2010, principal author of FEMA Procedure Memorandum No. 61, ***S**tandards for Lidar and Other High Quality Digital Topography*.
- 2012, author of the *National Enhanced Elevation Assessment (NEEA)* which documented benefits of elevation data

and led directly to USGS' ongoing 3D Elevation Program (3DEP) based on nationwide QL2 lidar.
- 2014, a principal author of the ASPRS *Positional Accuracy Standards for Digital Geospatial Data*.
- 2015, author of USACE Engineer Manual 1110-1-1000, *Photogrammetric and LiDAR Mapping*.
- 2015, appointed as member of NOAA's Hydrographic Services Review Panel (HSRP).

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

ASPRS Outstanding Technical Achievement Award (OTAA)

Charles C. Counselman III

for making accurate position information available to all

The ASPRS awards its 2016 OTAA to Professor and Dr. Charles (Chuck) Counselman of MIT for making it possible for everyone to determine position coordinates accurately from radio signals received from earth-satellites such as those of the Global Positioning System, or "GPS."

The path to accurate positioning for all became visible during World War II, with the development of radio- or radar-based methods of positioning and navigation, especially Loran. GPS is basically a Loran system with radio transmitters orbiting the Earth instead of fixed on shorelines. GPS is more accurate because its radio signals can travel along clear lines-of-sight; whereas Loran signals must follow the earth's curved surface *via* ground- and/or ionosphere-guided modes of propagation.

In 1981, GPS was being developed by the U.S. Air Force as a weapon system, a "force enhancer." To keep an enemy from using GPS against us, all GPS signals were encoded and the code keys would be military secrets, not available to anyone outside the Department of Defense (the "DoD"), a few other U.S. government agencies, and allied military forces.

Independently, in 1981, Professor Counselman invented a method and system for determining position from GPS signals without knowledge of the GPS codes. Recognizing the potential for hostile use of his inventions, he disclosed them to the Air Force. He was told to limit further disclosure and to register with the Office of Munitions Control, but he was encouraged to develop his inventions because they promised to reduce the uncertainty of GPS-based position determination by a factor of one thousand.

In 1982, the Air Force found another reason to like Counselman's inventions. The U.S. Congress had begun to press the DoD to make GPS available to the general public. Counselman gave the DoD a way to do this while continuing to defend against hostile use.

Counselman's GPS technology was derived from radio-astronomical techniques he had developed and applied ten years earlier to determine the positions of quasars (natural, extragalactic, radio sources) [*Ref. 1*]; to test Einstein's General Theory of Relativity [*2*]; to establish selenodetic control for photogrammetry of the Moon [*3*]; to track the Apollo Lunar Roving Vehicles [*4*]; and, in 1980, to determine wind speeds and directions in the atmosphere of Venus [*5*]. His method was to determine position from "doubly differenced" phase observations. The phases of radio signals emitted simultaneously by different sources and received simultaneously (except for propagation-delay differences) by different receivers were differenced between the sources and between the receivers. Thus, unknown phase shifts associated with individual sources, and with individual receivers, were canceled; so the relative positions of the sources and/or receivers could be determined with exquisite accuracy.

When he learned of the Air Force's NAVSTAR system (later renamed "GPS"), Professor Counselman knew that his doubly-differenced-phase technique, applied to GPS, would determine relative-position vectors with millimeter- to centimeter-level accuracy. [*6*] He would need receivers that were adapted to the GPS signal structure and that measured the phases of the carrier and subcarrier

waves implicit in GPS signals received simultaneously from multiple satellites.

To keep the phases of signals received from different satellites from being shifted differently by a receiver, he invented a receiver architecture in which a composite of signals coming from multiple satellites was digitized before different satellites' signals were separated. Then, by synchronous, parallel, digital processing, the different satellites' carrier and subcarrier phases could be determined, free of error due to inter-satellite differences.

Counselman and a former MIT colleague themselves funded the development of a practical hardware-software system for accurate positioning, using GPS satellite signals, without knowledge of the GPS codes. Position was determined from doubly-differenced phase observations. This system, the Macrometer® Interferometric Surveyor, was announced in Feb. 1982 [*7*] and was tested by the multi-agency Federal Geodetic Control Committee in Jan. 1983 [*8*]. Macrometer systems were bought by the U.S. National Geodetic Survey and by geodetic surveying firms in the USA and Germany; and they were used on five continents. Macrometer systems have been in the Scientific Instruments collection of the Smithsonian National Museum of American History in Washington, DC, since 1997 [*9*] and in the Geodesy and Mapping Department of the Deutsches Museum in Munich since 1998.

Until Professor Counselman's patents [*12*] expired, virtually all GPS receivers made in this country were made under licenses from Western Atlas International Inc., which had acquired the patents in 1984.

Professor Counselman continued to collaborate with the Air Force through the Air Force Geophysics Laboratory and Lincoln Laboratory; and, from 1994 to 1998, he consulted for the U.S. Secretary of Defense as a member of Defense Science Board Task Forces I & II on GPS.

References and Notes

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Counselman III, C. C., System for Simultaneously Deriving Position Information from a Plurality of Satellite Transmissions, U. S. Patent No. 5,014,066 (19 pp. incl. 9 figs. and 12 claims), May 7, 1991.
and others.

The ASPRS Outstanding Technical Achievement Award was first introduced in 2012 This Award consists of a silver presentation plaque mounted on a wood panel plus a monetary award of $5,500.

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 from Honorary Member and ASPRS Fellow Clifford W. Greve to endow a new Outstanding Technical Achievement Award. This award is now fully endowed at the $5,500 level..*

ASPRS Fellow Award

Ross Lunetta

Ross Lunetta is a Senior Research Physical Scientist at the United States Environmental Protection Agency in Research Triangle Park, NC. He obtained his B.A. (1977) and M.A. (1979) in Biology from Northern Michigan University. Also, he completed Post M.A. research in aquatic ecology (1979-81) from Wayne State University and in remote sensing (1981-83) from Eastern Michigan University.

For nearly three decades, Lunetta has made significant contributions to characterize landscape condition and monitor watershed changes at regional scales using remote sensing. He has developed methods for monitoring vegetation phenology related to landscape dynamics, and to land cover condition and changes in near real-time using automated approaches An important thrust of this work has been collaboration with ASPRS in a number of venues to both communicate the value of the technology and to reach out to a wide body of users to illustrate that utility.

Lunetta has been an active member since 1984 He has provided untiring support of ASPRS activities through a variety of venues including publications in *Photogrammetric Engineering and Remote Sensing* (*PE&RS*) and numerous *PE&RS* journal reviews. He has sponsored/participated in workshops on Remote Sensing of Wetlands in almost all ASPRS Annual Conferences since 1984 including the GIS/LIS conference and at PECORA 18 in Sterling, VA He has presented numerous talks and chaired sessions, as well as funding and staffing numerous exhibitor booths at ASPRS Annual, Fall, and Regional meetings and PECORA Symposia 17 and 16, while also chairing technical sessions, and presenting research, of which most were invited

Time and time again, Lunetta has sought out opportunities to bring his and his colleague's work into ASPRS venues He co-lead the ground-breaking Landsat Pathfinder North American Landscape Characterization (NALC) Program of the 1990's; he hosted peer reviews at ASPRS national meetings in New Orleans and in Reno, where the famous Multi-Resolution Land Characterization (MRLC) or NLCD land cover mapping and database consortium was initiated as a follow-on to NALC He brought his leadership to bare on the GIS/LIS series of meetings that were so successful for ASPRS leadership in the mapping sciences Whenever he and his colleagues have had seminal ideas to help the world, he has brought their involvement into the ASPRS "tent", helping demonstrate the Society's leadership worldwide.

The latest leadership opportunity was his co-organization and co-sponsorship of the MultiTemp 2009 Symposium in Connecticut for ASPRS He has successfully brought this program to the United States twice in the last decade, and his leadership was lauded at the Mississippi MultiTemp meeting a few years back by Under Secretary of Commerce Admiral Lautenbacher of NOAA. Interesting to note was his quiet nurturing of holding an ASPRS meeting with CASA in Ottawa; he advocated it for a MultiTemp meeting and later the Society saw the value and held their annual meeting in Ottawa.

All of this work has earned him recognitions from ASPRS including: the 2004 ESRI Award for Best Scientific Paper in Geographic Information Systems; in 1997 both the John I. Davidson President's Award for Practical Papers and the ERDAS Award for Best Scientific Paper in Remote Sensing and in 1992 and 1995, Certificates of Appreciation for Meritorious Service He was elected to the 2008-2009 International Society for Photogrammetry and Remote Sensing Co-Chair for Wetlands in the Working Group VIII/6 on Agriculture, Ecosystems and Biodiversity.

ASPRS Fellow Award

Mostafa S. Madani

Mostafa S. Madani was, until recently, the Chief Technology Officer (CTO) for Sanborn's Mapping Division. He was responsible for establishing the company's technical vision and leading all aspects of the company's technology development. He used a blend of technologies to assist Sanborn in building relationships with vendors, contractors, and external companies for all of its technology related initiatives.

Prior to joining Sanborn, he served as chief photogrammetrist and product/industry manager for Z/I Imaging, a division of Intergraph Corporation. He was responsible for directing and driving the overall operational concept and the feature requirements for the ImageStation line of analytical and digital photogrammetry applications (VAX, Unix, and Windows Operating Systems). In addition, he managed all aspects of photogrammetry product planning including ROI and market analysis and evaluation of customers' requirements.

He did intensive work on the Digital Mapping Camera (DMC) and RMK D (medium format digital camera) calibrations and provided a concept for QC/QA of the GPS/INS data in aerial triangulation. He has published over 55 technical papers.

He worked as a Surveyor and taught Surveying at the College of Civil Engineering for several years. While teaching at the Civil Engineering Department, University of Science and Technology, Tehran, Iran, he published a book on Surveying, in Persian.

He is affiliated with a number of national and international professional societies such as ASPRS and ISPRS. He is the co-chair of ISPRS WG I/3 and a member of the ISPRS Science Advisory and Scholarship Committees.

Madani earned a B.S. in Physics from the University of Tehran, Iran M. Eng. From the College of Surveying, Tehran, Iran, and an M.S. and Ph.D. from the Department of Geodetic Science and Surveying, The Ohio State University and has been an active member of ASPRS since 1978. He edited *PE&RS* papers for several years as Associate Technical Editor and contributed to *PE&RS* as well. Madani served on the PDAD Camera Calibration Committee and he is one of the authors and editors of the *Manual of Photogrammetry*, Fifth and Sixth Editions.

Purpose: *Started in 1992, the designation of Fellow is conferred on Society members who have been active for 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.

Presidential Citations

Stewart Walker
for his continued leadership of the Streamlining Task Force that now is working on implementation of our new bylaws and operating procedures.

Al Stevens
for his exceptional service to the Awards Program and acceptance and testing of the changes to the awards this year.

Jesse Winch
for his exceptional service to the Awards Program and acceptance and testing of the changes to the awards this year.

Jessica Fayne
for her work on the Awards Program including developing and stewarding a new application and review process.

Jerry Lencowski
for his leadership of the IGTF 2016 Planning and Organizing Committee.

Raad Saleh and Demetrio Zourourakis
for their diligent work on the IGTF 2016 Planning and Organizing Committee.

Becky Morton
for her leadership of the Value Proposition Task Force.

Bandana Karr and David Perkins
organizing and producing Frontier Day

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

ASPRS Outstanding Service Award

Russ Congalton

for his excellent editorship and dedication to *PE&RS* and his continued service during our search for a replacement.

Cliff Mugnier

for his column Grids and Datums in *PE&RS* and his dedication to ASPRS.

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

Robert E. Altenhofen Memorial Scholarship

Chisaphat Supunyachotsakul

Ms. Chisaphat Supunyachotsakul is a doctoral candidate at Purdue University, Civil Engineering/Geomatics, with a focus on lidar feature extraction She has an extremely strong background in photogrammetry and geomatics Last year, she was the recipient of a prestigious internship at NASA Goddard Space Flight Center to study lidar for NASA applications.

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 monetary award of $2,000 and a hand-engrossed certificate.

Abraham Anson Memorial Scholarship

Jory Fleming

Jory Fleming is an undergraduate at the University of South Carolina, majoring in both geography and marine science with a minor in geophysics. Fleming's core interest is GIS, a discipline with the ability to integrate multiple data sources and perform analyses and visualizations that enable deductive leaps and inferences. His academic program and internships in geography have given him extensive technical experience with GIS, while his studies and research in marine science and geophysics have given him a solid research background in the geosciences. Fleming plans to pursue graduate school in GIS and oceanography to further his understanding of both the marine environment and utilization

of geospatial technologies and sensor networks. He believes that the integration of big data analysis, regional or global scale sensor networks, and GIS will enable new breakthroughs in oceanography, facilitating his career goal of utilizing a robust set of technological methodologies in interdisciplinary oceanographic research..

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 and a monetary award of $2,000.

John 0. Behrens Institute for Land Information Memorial Scholarship

Scott Nesbit

Scott Nesbit is an undergraduate at the University of Wisconsin Eau-Claire, majoring in Geography and Environmental Science His passion and interest are both fed by remote sensing and the capabilities it has to monitor the Earth's water resources and to improve proper environmental policies. He believes that the avenues to be explored among runoff, agriculture, and human impacts to water resources are endless. Nesbit is interested in learning more about the environmental impacts of conventional farming on water quality and identifying a more sustainable way to provide food for the world. He hopes to use his remote sensing and GIS training, along with his landscape process knowledge, to complete additional research focused on runoff of all types as it relates to water pollution He hopes to bring new and additional attention to the causes of hypoxic zone development and, more importantly, develop mitigation strategies to reduce the expansion of the hypoxic zone and to learn more about the increased algae concentrations and impacts to aquatic life.

The John 0. 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 in the field of geographic and land related information and technology John 0. 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 0. 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 monetary award of $2,000.*

Robert N. Colwell Memorial Fellowship

Tammy Parece

Biographical data not available at press time.

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 him, Dr. Colwell had the distinction of being one of the 25 Honorary Members of ASPRS.

***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 $6,500.

The DigitalGlobe Foundation Award

Rachel Hackett

Rachel Hackett is a Ph.D. student at Central Michigan University in the Earth and Ecosystem Science Program, with focused interests in UAV Remote sensing, botany, and field research. Hackett has been selected to receive a Digital Globe Foundation data grant for her proposal related to her graduate research work, titled " Relationships Between Overall Prairie Fen Biodiversity and Vegetation Patch Dynamics: A Comparison of Remote Sensing Technologies." Hackett is an outstanding, published student scientist who has already written and received numerous grants and awards, and who received the highest accolades from her sponsoring academic committee members. Her promising research will investigate the use of high spatial-resolution imagery, acquired through different remote sensing platforms, for studying prairie fen diversity. This research has both scientific merit, as it will benefit ecological theories, and practical applicability, as it will also guide wetland managers on their future use of applied remote sensing data sources.

TThe Award was established in 1991 In 2001 it became known as the Space Imaging Award for the Application of High Resolution Digital Satellite Imagery, in 2006 it became The GeoEye Award and in 2013 became the DigitalGlobe 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 DigitalGlobe imagery for applied research by undergraduate or graduate students.*

***Donor:** The DigitalGlobe Foundation through the ASPRS Foundation*

William A. Fischer Memorial Scholarship

Lyndsay Rankin

Lyndsay Rankin, currently a Ph.D. student in Ecology at Northern Illinois University has been selected to receive the 2016 William A. Fischer Memorial Scholarship. Rankin is being presented this award in recognition of her innovative academic accomplishments, significant analytical skills, and impressive record of research. Rankin has clearly demonstrated the ability to combine her significant field and laboratory skills to answer important ecological questions. Her current research will be one of the first to connect terrestrial nutrient dynamics unique to seabird islands to nearshore environments utilizing advanced remote sensing technologies. Her work exhibits the kind of innovation William Fischer would have wanted recognized and the results of her dissertation research clearly holds significant promise to better understand land-water interaction and the impacts of these interactions on both land and marine species

The committee congratulations Rankin on her accomplishments and we are confident that her current and future research efforts will continue to make important contributions to the global community

.The committee congratulations Ms. Rankin on her accomplishments and we are confident that her current and future research 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 hand-engrossed certificate and a monetary award of $2,000.

Leica Scholarship (formerly the Z/I Imaging Scholarship)

Caren Remillard

Caren Remillard is a University of Georgia doctoral student in geography, GIS, and remote sensing. Her graduate research applies photogrammetry and remote sensing data in novel ways to explore complex environmental questions. One of her main research goals is to identify areas that possess high potential for restoring forest connectivity between fragmented regions of critical forest habitats. She is interested in integrating new image processing techniques for improved land cover classifications to extract the most accurate and valuable information from remotely sensed data. By incorporating multiple datasets and environmental variables into an innovative geospatial model, she hopes to improve upon previous management strategies. In the future, she would like to expand this research into a career as a professor and scientist using remote sensing for environmental conservation. Her research incorporates NASA satellite imagery and geospatial technologies to produce maps and quantitative information regarding historical and current conditions of the

habitat of the Cotton-top tamarin, one of the most endangered primates in the world. One of her ongoing research objectives is developing and refining a multi-input and weighted GIS model designed to identify suitable forest habitat for conservation using freely available remote sensing data.

Purpose: *The Leica Scholarship 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: *Leica Geosystems though the ASPRS Foundation.*

The Leica Scholarship consists of a $2,000 cash prize and a hand-engrossed certificate.

Francis H. Moffitt Memorial Scholarship

Tara Mullen

Tara Mullen is a junior at the University of Maine, Orono, majoring in Surveying Engineering Technology. She is the past winner of the Warner M. Plummer Scholarship and the E.N. Roberts Scholarship both offered by the New Hampshire Land Surveyors Association. She earned an Associate's degree from the University of New Hampshire's Thompson School of Applied Science in Applied Science in Civil Technology with a concentration in Surveying and Mapping and graduated Summa Cum Laude. This level of academic excellence is continuing with her current degree work. She has completed two research projects, one involving the intersection of geospatial data and sustainability and the other including the design of a full plan set and subdivision design presented to the local planning board. Mullen has been an active volunteer and mentor to other students. She is a member of the "Engineers Without Borders" student chapter, has served as a teaching assistant, a math tutor and tutored surveying for civil technology and forestry programs. She has also been an active member of the New Hampshire Outing Club, organizing and leading hikes and first aid training, as well as serving as a summer coordinator. She has worked as a surveying intern where, as one of her references noted, "she tenaciously battled through hot days on insect-infested, briar-thick sites with no complaint" and her office work has been exemplary.

She is a current Surveyor-in-Training in New Hampshire and plans to become a fully licensed Land Surveyor and Certified Photogrammetrist and plans to pursue a career in aerial mapping.

Purpose: *The Moffitt Scholarship 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 monetary award of $6,500.

The Kenneth J. Osborn Memorial Scholarship

Aryn Cowley

Cowley is pursuing a Bachelor of Science degree in Surveying Engineering from Ferris State University (FSU), and plans to graduate in May of 2016 Following her B.S., she intends to apply her outstanding scholarship towards pursuit of a Master's Degree at Purdue University Cowley exemplified the Osborn qualities of communication and collaboration through leadership of activities within the Ferris State campus community by serving at a student member of the Michigan Society of Professional Surveyors, West Central Chapter of the National Society of Professional Surveyors, and as President of Burt & Mullett, the student chapter of the National Society of Professional Surveyors at FSU.

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 an engrossed certificate and a monetary award of $2,000.

Ta Liang Memorial Award

April Frake

The Ta Liang Memorial Award for 2016 is being presented to April Frake for her academic achievements, planned program of research-related travel, and extracurricular activities. Frake is a Ph.D. student in Geography at the Michigan State University (MSU) specializing in medical geography She earned her M.A. (2014) and B.A. (2012) degrees from the University of North Carolina at Greensboro in applied geography and geography, respectively Frake's current research focuses on the intersection of food insecurity and malaria infection in Malawi Her research aims to develop a high-resolution hydrological model to characterize the potential increase in breeding sites for malaria vectors caused by irrigation for agriculture. The Ta Liang travel grant will support field visits to the Bwanje Valley Irrigation Scheme in central Malawi to gather raw elevation data in an effort to ensure greater reliability of modeling outputs and inform later vector sampling surveys across the study area. In addition to excelling as a student, Frake is co-organizer of the MSU Geography Department Colloquium Series and serves as an outreach committee member for Supporting Women in Geography.

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 hand-engrossed certificate and a $2,000 grant.

Paul R. Wolf Memorial Scholarship

Howard Lassiter

Howard Lassiter is being presented this award in recognition of his outstanding academic credentials and his plans and enthusiasm to become an education professional in Surveying, Mapping, Photogrammetry and related fields Lassiter is currently a Ph.D. candidate (planned graduation May 2018) in Geomatics at the University of Florida He has demonstrated his continued interest, dedication, enthusiasm, passion, and aptitude to become an education professional and has been recognized at all levels Of note is his interest in teaching across a wide spectrum of classes at all levels The committee wishes him 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 hand-engrossed certificate and a $4,000 grant.

International Educational Literature Award

Surveying Engineering Department, Salahaddin University-Erbil, Iraq

Established in 2009, the Surveying Engineering Department, Salahaddin University-Erbil, Iraq is in the process of building a remote sensing program with a focus on photogrammetry, map projections, geodesy, GPS, and Land Law Salahaddin University-Erbil has a strong need for materials to assemble library holdings and resources for the Department's Geoscience Program The award materials will provide students with current technology and advancements in remote sensing The Surveying Engineering Department will place the materials in the University Library to share the resources with other universities in Iraq, especially in Kurdistan.

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*

Boeing Award for Best Paper in Image Analysis and Interpretation

Xiaodong Li, Yun Du, and Feng Ling

"Sub-pixel-scale Land Cover Map Updating by Integrating Change Detection and Sub-Pixel Mapping" *PE&RS*, 81 (1), 59-67.

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 monetary award of $1,000.

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

First Place

Omar E. Mora, Jung-kuan Liu, M. Gabriela Lenzano, Charles K. Toth, and Dorota A. Grejner-Brzezinska

Small Landslide Susceptibility and Hazard Assessment Based on Airborne Lidar Data," *PE&RS*, 81 (3), 239-247.

Second Place (tie)

Craig Rodarmel, Mark Lee, John Gilbert, Ben Wilkinson, Henry Theiss, John Dolloff, and Christopher O'Neill

"The Universal Lidar Error Model," *PE&RS*, 81 (7), 543-563.

John Loomis, Steve Koontz, Holly Miller, and Leslie Richardson

Valuing Geospatial Information: Using the Contingent Valuation Method to Estimate the Economic Benefits of Landsat satellite Imagery," *PE&RS*, 81 (8), 647-668.

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, monetary award of $500, and a hand-engrossed certificate; Second Place receives a monetary award of $300 and a hand-engrossed certificate; Third Place receives a monetary award of $200 and a hand-engrossed certificate.

ERDAS Award for Best Scientific Paper in Remote Sensing

First Place
Michael Campbell,
Russell G. Congalton,
Joel Hartter, and Mark Ducey
"Optimal Land Cover Mapping and Change Analysis in Northeastern Oregon Using Landsat Imagery." *PE&RS*, 81 (1), 37-47.

Second Place
Maryam Imani and
Hassan Ghassemian
"Two Dimensional Linear Discriminant Analyses for Hyperspectral Data" *PE&RS*, 81 (10), 777-786.

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 a monetary award of $500 and a hand-engrossed certificate; second prize is a monetary award of $300 and a hand-engrossed certificate; third prize is a monetary award of $200 and a hand-engrossed certificate.

The Esri Award for Best Scientific Paper in GIS

First Place
Tammy E. Parece and
James B. Campbell
"Identifying Urban Watershed Boundaries and Area, Fairfax County, Virginia." *PE&RS*, 81 (5), 365-372.

Second Place
Muditha K. Heenkenda,
Karen E. Joyce, Stefan W. Maier
"Mangrove Tree Crown Delineation from High-Resolution Imagery," *PE&RS*, 81 (6), 471-479.

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 a monetary award of $1,000 and a hand-engrossed certificate; second prize is a monetary award of $600 and a hand-engrossed certificate; third prize is a monetary award of $400 and a hand-engrossed certificate.

The Talbert Abrams Award

Grand Award

Mehdi Mezaheri and Ayman Habib

"Quaternion-Based Solutions for the Single Photo Resection Problem," *PE&RS*, 81 (3), 209-217.

First Honorable Mention

Bo Wu, Lei Ye, and Yuansheng Yang

"Accuracy Analysis of a Dual Camera System with an Asymmetric Photogrammetric Configuration," *PE&RS*, 81 (3), 219-228.

Second Honorable Mention

Han Hu, Qing Zhu, Zhiqiang Du, Yeting Zhang, and Yulin Ding

"Reliable Spatial Relationship Constrained Feature Point Matching of Oblique Aerial Images," *PE&RS* 81 (1), 49-58.

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 monetary award of $3,000 and an engraved plaque for the Grand Award, and an award certificate for the First and Second Honorable Mentions.

ASPRS Service Award – Ford Bartlett Award

Erik Brewster

Ekaterina Fitos

Jonathan Li

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.


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