2012 Asia-Pacific Remote Sensing

29 October – 1 November 2012

Technical Program

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Conference
29 October –
1 November 2012

Location
The Kyoto International Conference Center
(Kyoto ICC)
Kyoto, Japan

Organizing Committee

SYMPOSIUM TECHNICAL PROGRAM COMMITTEE

Kohei Mizutani
National Institute of Information and Communications Technology (Japan)

Jiancheng Shi
Institute of Remote Sensing Applications (China)

SYMPOSIUM INTERNATIONAL ORGANIZING COMMITTEE

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Toru Fukuda, Japan Aerospace Exploration Agency (Japan)
George Komar, NASA Headquarters (United States)
Shailesh R. Nayak, Ministry of Earth Sciences Government of India (India)

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Co-Chair: **George J. Komar,** NASA Goddard Space Flight Ctr. (United States)
Kazuhiro Asai, Tohoku Institute of Technology (Japan)
A. S. Kiran Kumar, Space Applications Ctr. (India)
Takashi Moriyama, Japan Aerospace Exploration Agency (Japan)

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Haruhisa Shimoda, Tokai Univ. (Japan)

Welcome

Welcome to the 8th SPIE Asia-Pacific Remote Sensing in Kyoto, Japan, with a focus on "Remote sensing for the environment and the prevention and mitigation of disaster."

Rapid growth and development in Asian countries has increased their economic and social importance in the world; their effects on the global environment have become serious as well. Examples include increasing releases of greenhouse gases, environmental contamination, exhaustion of water resources, and vulnerability to severe natural disasters. Under such circumstances it is imperative to monitor the global environment by remote sensing and to understand environmental changes in order to preserve the environment for our lives and the future.

The individual conferences focus on active and passive remote sensing techniques, applications of atmosphere, land and marine sensing technologies, and development of new remote sensing sensors. The symposium brings together policy makers, scientists and engineers from the Asia-Pacific region and other parts of the world to discuss the issues and the development of the remote sensing technologies, data processing techniques, applications of remote sensing data, modeling aspects that make use of remotely sensed data sets and societal benefits of remote sensing products.

We look forward to meeting you and to having a productive week in beautiful Kyoto.

Symposium Chairs:

Upendra Singh
NASA Langley Research Ctr. (United States)

Toshio Iguchi
National Institute of Information and Communications Technology (Japan)

Symposium Co-Chair:

A. S. Kiran Kumar
Space Applications Ctr. (India)

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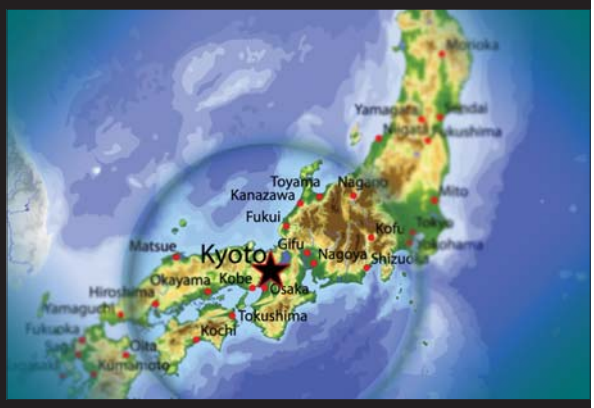

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Welcome and Plenary Session

Monday 29 October · 08.50 to 12.00
Room A

Symposium Chairs:

Upendra N. Singh
NASA Langley Research Ctr.
(United States)

Toshio Iguchi
National Institute of Information and Communications Technology (Japan)

Join your colleagues for updates from our sponsoring organization for these special plenary presentations.

08:50 to 09:20

Welcome Address

Symposium Chairs and:

Masanori Homma
Japan Aerospace Exploration Agency (Japan)

09:20 to 09:40

Space technology for sustainable development

Yasushi Horikawa
Japan Aerospace Exploration Agency (Japan)

Abstract: Space science and technology and their applications can contribute more efficiently to the efforts of humankind to promote sustainable development in all countries and regions of the world.

Information obtained from space-derived geospatial data is providing essential inputs for decision-making in areas such as disaster management and emergency response. The Earth observation satellites can be well applied through observations of the Earth's surface from space to help in the preservation of forests by grasping the seriousness of deforestation or with mitigation of devastating disasters by capturing images and studying geographical changes in affected areas. Having "No Sustainable Development without Space" in mind? I would like to speak the significance of the utilization of the Earth observation data. Space technology provides a wide range of essential tools for making informed decisions in support of development at local, national, regional and global levels in both public and private domains.

A continuous monitoring and observation system that feeds into decision support systems and ensures an informed decision-making is crucial. I would also like to touch upon the related activities conducted in the United Nations Committee on the Peaceful Use of outer Space.

Biography: He is a technical counselor of Japan Aerospace Exploration Agency (JAXA), Tokyo Japan. He graduated at Tokyo University and he received PhD from Tokyo University on Electrical Engineering. He worked for many years in the field of spacecraft design. He contributed

to the successful implementation of Japanese meteorological satellite programs and the Earth observation programs as well as the laying down of the space station program. During this time, he stationed at Hughes Aircraft Company in Los Angeles for two years. He contributed to the implementation of the Japanese space station program as the Program Manager. After that, he was responsible for all application satellite programs as an executive director of JAXA, including Earth observations, communications and broadcasting, and global positioning satellites and those operation and utilization as well. At the present time, he is advising to the activities of the Japanese application satellite development and utilization programs.

09:40 to 10:00

Remote sensing of Earth and environment for global sustainability

Ghassem Asrar
World Meteorological Organization (Switzerland)

Biography: Dr Ghassem R. Asrar is currently the Director of the World Climate Research Program (WCRP) in Geneva, Switzerland. He served as chief scientist for the Earth Observing System in the Office of Earth Science at NASA prior to being named as the Associate Administrator for Earth Science in 1998. While in his position of chief scientist, he led an international team developing the scientific priorities and measurements to be obtained from a series of advanced Earth-orbiting satellites that provided fundamental new insights into the connections between Earth's land, oceans, atmosphere, ice and life. He also established the NASA Earth System Science graduate fellowship and New Investigators Programs to support training of the next generation of Earth scientists and engineers that have graduated more than 1000 recipients to date.

Dr Asrar earned his education in civil engineering and environmental physics from Michigan State University, East Lansing, Michigan. He conducted research and trained undergraduate and post-graduate students for nine years in academia prior to joining NASA as a senior scientist in 1987. He has authored more than 90 peer-reviewed scientific and technical papers, primarily in the fields of biosphere and atmosphere studies, and has edited several remote-sensing reference books. Dr Asrar has been invited speaker at several hundred scientific, technical and education conferences and meetings. He has also served as the chair and member of numerous national and international scientific and technical committees for evaluating academic and national environmental research and education programs and proposals in Europe, Asia and America.

Dr Asrar is the recipient of U.S. Presidential Distinguished Executive Award (2002), an elected Fellow of American Meteorological Society (2001), and IEEE (2000). He has received numerous awards and honors, including the NASA Exceptional Performance Award in 1997, the AIAA Goddard Memorial Lecture Medal in 1998, NASA Exceptional Service Medal, 1999, NASA Distinguished Leadership Medal, 2000, the Space System Award from the American Institute of Aeronautics and Astronautics, 2006, and Distinguished Alumni Award from the Michigan State University, 2008.

10:00 to 10:20

NASA's future Earth science missions: opportunities and challenges

George J. Komar
NASA Goddard Space Flight Ctr. (United States)

Abstract: The overarching goal of the Earth Science Division at NASA is to advance Earth System science through spaceborne data acquisition, research and analysis, and predictive modeling. This plenary address summarizes recent mission developments and future directions within the NASA Earth Science community.

A central part of this strategy is a robust technology investment program, to improve Earth observation capabilities. After a brief overview of technologies addressing each of these key challenges, the remainder of the talk focuses upon active remote sensing technology developments, including both lidar and radar advancements. The majority of future Earth-science missions will require active remote sensing capabilities. This presentation provides an overview of the technology investments NASA is making in Earth Science.

Biography: George J. Komar has over 38 years experience in engineering, program, project and operational management. Presently he serves as the Associate Director in the Earth Science Division and Program Manager for the Earth Science Technology Office (ESTO) for NASA. In this capacity he is responsible for developing, integrating and managing all the advanced technology developments that will enable future Earth Science capabilities.

He recently he served as the Deputy Associate Administrator for Technology for the NASA Science Mission Directorate (SMD), where he was responsible for planning, advocating, and optimizing an integrated advanced technology program. He was the Program Manager for the Landsat 7 Program and the TOPEX/Poseidon Program. George also managed the integration of the NASA Space Station Ground System Program for Space Station Freedom.

Coffee Break · 10:20 to 11:00

1100 to 11:20

Introduction of satellite earth observation in China

Xiaohan Liao
The Ministry of Science and Technology (China)

Abstract: After decades of explorations and technology accumulations, a framework of earth observations has been established in China and among them satellite observation has been playing an important role. This presentation briefly summarizes 1) the current status of the satellite earth observation systems, data and applications in China, and 2) China's policy in international earth observation collaborations, including those in Asia-Pacific regions.

There are several satellite earth observation systems in China, including the series of the resource (ZY), the oceanic (HY), the meteorology (FY), and the environmental disaster mitigation (HJ). In addition, the Chang-E (CE-1) and (CE-2) lunar orbiters expanded the satellite remote sensing into deep space. In addition, the second-generation polar orbit meteorological satellite, FY-3, can be used in the fields of global numerical weather prediction, global change, monitoring of large-scale natural disasters and the surface environment. The overall efforts made for satellites data sharing will be described. The application examples in the fields of meteorology, agriculture, environment protection, oceanography, seismology and urban planning, based on China's satellite data will be presented in this talk.

China is also active in GEOSS progress and plays a significant role. The CMACast is one of three GEOSS earth observation data distribution platforms (GEONETCast). It provides the observations over the Asia-Pacific regions from the weather and environmental satellites, such as FY-1D, FY-2C/2D, NOAA-16/17/18, MTSAT-1R, and EOS/MODIS with roughly 22GB data volume per day. China's activities and policy in international earth observation collaborations, especially in Asia-Pacific regions will be demonstrated. The role of NRSCC in the yearly coordinating of government R & D funds for remote sensing is also introduced.

Biography: Dr. Liao obtained his bachelor (1984) and master (1987) degrees from Peking Univ, and Chinese Academy of Sciences, respectively. During 1988-1992 He did his doctoral research in school of Geography, Oxford University with research interest in General Circulation Model (GCM) sensitivity experiments using different cloud parameterizations of UK Met Office GCM. Since 1992 he worked for NASA Goddard Institute for Space Studies as a scientist for seven years and focused in the field of global monitoring of upper atmospheric aerosol extinction using remote sensing data from NASA Stratospheric Aerosol and Gas Experiment (SAGE) II. He also studied the data with high-level clouds detection and global statistics by concurrently using nadir-looking (ISCCP) and occultation (SAGE II) data. Many of his research results in modeling and remote sensing data applications were published as the first author and cited. He also is the co-author of earlier version of SAGE II gridded data products officially distributed by NASA.

Dr. Liao became the DDG responsible for IT and remote sensing R & D in the High-Tech Department (2004-2008) of the Ministry of Science and Technology (MOST). Later he moved to take the DDG position responsible for national laboratories, state key programs and big R & D infrastructures in the Basic Research Department (2008-2011). He is now the Director General of National Remote Sensing Center of China (NRSCC), which is an executive agency of MOST, responsible for organizing and implementing government programs and coordinating various agencies in various application areas.

11:20 to 11:50

Greenhouse gas measurement from space: status of GOSAT Project and recent outcomes

Tatsuya Yokota
National Institute for Environmental Studies (Japan)

Abstract: Augmenting the surface-based measurements of greenhouse gases such as carbon dioxide (CO_2) and methane (CH_4) is an important task in better understanding the global carbon cycle. To this end, the Greenhouse gases Observing SATellite (GOSAT) was launched in early 2009. The main sensors onboard GOSAT are the Thermal And Near-infrared Sensor for carbon Observation (TANSO) - Fourier Transform Spectrometer (FTS) and the TANSO - Cloud and Aerosol Imager (CAI). These sensors have been collecting data since June 2009. The column concentrations of CO_2 and CH4 are retrieved from the spectral data by TANSO-FTS. The TANSO-CAI data are used to remove scans that are contaminated with clouds. The column concentrations of CO_2 and CH_4 (TANSO-FTS Level 2 products) have been disseminated to the general public. The quality of the retrieved concentrations was validated by comparing with reference data collected by ground-based FTSs and airborne in-situ instruments. The GOSAT-based CO_2 data and ground-based observations were used together to estimate monthly surface CO_2 fluxes for 64 sub-continental regions and obtain three-dimensional CO_2 distributions. Here, I will present the status and progress of the GOSAT Project and touch on recent major outcomes.

Biography: Dr. Tatsuya Yokota received Ph.D. degree in Measurement and Information Systems Engineering from the University of Tokyo in 1987. He is the project leader of the Greenhouse Gases Observing Satellite (GOSAT) in the National Institute for Environmental Studies (NIES), and the head of the Remote Sensing Research Section of Center for Global Environmental Research (CGER), NIES. Currently, he is in charge of data retrieval algorithm development, data validation, higher level processing of the GOSAT data, and distributing the GOSAT products to the researchers and general users. He was engaged in several atmospheric satellite remote sensing projects in Japan, ILAS, ILAS-II, SOFIS, for polar ozone layer monitoring.

Monday - Thursday 29 October – 1 November 2012 • Proceedings of SPIE Vol. 8524

Land Surface Remote Sensing

Conference Chairs: **Dara Entekhabi,** Massachusetts Institute of Technology (United States); **Yoshiaki Honda,** Chiba Univ. (Japan); **Haruo Sawada,** The Univ. of Tokyo (Japan); **Jiancheng Shi,** Institute of Remote Sensing Applications (China); **Taikan Oki,** The Univ. of Tokyo (Japan)

Program Committee: **Christopher D. Elvidge,** National Oceanic and Atmospheric Administration (United States); **Peng Gong,** Univ. of California, Berkeley (United States); **Alfredo R. Huete,** Univ. of Technology Sydney (Australia); **Koji Kajiwara,** Chiba Univ. (Japan); **Joon Kim,** Seoul National Univ. (Korea, Republic of); **Masao Moriyama,** Nagasaki Univ. (Japan); **Dawen Yang,** Tsinghua Univ. (China)

Monday 29 October

WELCOME AND PLENARY PRESENTATIONS

Room: A . . . . . Mon 8:50 to 11:50

Symposium Chairs: **Upendra N. Singh,** NASA Langley Research Ctr. (United States); **Toshio Iguchi,** National Institute of Information and Communications Technology (Japan)

08:50 to 09:20 **Welcome Address**
Symposium Chairs and **Masanori Homma**, Japan Aerospace Exploration Agency (Japan)

09:20 to 09:40 **Space technology for sustainable development**
Yasushi Horikawa, Japan Aerospace Exploration Agency (Japan)

09:40 to 10:00 **Remote sensing of Earth and environment for global sustainability**
Ghassem Asrar, World Meteorological Organization (Switzerland)

10:00 to 10:20 **NASA's future Earth science missions: opportunities and challenges**
George J. Komar, NASA Goddard Space Flight Ctr. (United States)

10:20 to 11:00 Coffee Break

11:00 to 11:20 **Introduction of satellite earth observation in China** (Paper 8523-504)
Xiaohan Liao, The Ministry of Science and Technology (China)

11:20 to 11:50 **Greenhouse gas measurement from space: status of GOSAT Project and recent outcomes** (Paper 8523-502)
Tatsuya Yokota, National Institute for Environmental Studies (Japan)

See details pages 3-5

Lunch Break . . . . . Mon 11:50 to 13:30

SESSION 1

Room: J . . . . . Mon 13:30 to 17:20

Land Use and Land Cover Change

Session Chairs: **Koji Kajiwara,** The Univ. of Tokyo (Japan); **Peng Gong,** Univ. of California, Berkeley (United States)

13:30: **Impacts of land-use/land-cover (LULC) changes on land surface temperature (LST) in Addis Ababa, Ethiopia, based on satellite images of December 1986 and 2010 respectively**, Daniel M. Mbithi, Kenya Meteorological Services (Kenya) . . . . . [8524-1]

13:50: **Application of MERIS in retrieval of chlorophyll-a concentration in the highly turbid Taihu Lake**, Ronghua Ma, Nanjing Institute of Geography and Limnology (China); Zhongping Lee, Univ. of Massachusetts Boston (United States) . . . . . [8524-2]

14:10: **Mapping fifty global cities' growth using time-series Landsat data**, Hasi Bagan, Yoshiki Yamagata, National Institute for Environmental Studies (Japan). . . . . [8524-3]

14:30: **China's 30m global land cover map**, Peng Gong, Tsinghua Univ. (China). . . . . [8524-4]

14:50: **Polarimetric analysis of coastal region using time series of Radarsat-2 images**, Hsiu-Wen Wang, Kun-Shan Chen, National Central Univ. (Taiwan); Horn-Ru Liao, National Science Council (Taiwan). . . . . [8524-5]

Coffee Break. . . . . Mon 15:10 to 15:40

15:40: **Validation of the wetland map derived from MODIS imagery in North America**, Gegen Tana, Chiba Univ. (Japan); Husi Letu, Tokai Univ. (Japan); Ryutaro Tateishi, Chiba Univ. (Japan) . . . . . [8524-6]

16:00: **Land cover classification comparisons between dual polarimetric, pseudo-fully polarimetric and fully polarimetric SAR imagery,** Bhogendra Mishra, Junichi Susaki, Kyoto Univ. (Japan) . . . . . [8524-7]

16:20: **A compound method for automatically extracting plateau wetlands from satellite imagery**, Jay Gao, The Univ. of Auckland (New Zealand) . . . . . [8524-8]

16:40: **Monitoring land and water use in Nha Trang, Vietnam by remote sensing technique**, Phan Minh-Thu, Wageningen Univ. (Netherlands); Michael E. Schaepman-Strub, Zurich Univ. of Applied Sciences (Netherlands); Rik Leemans, Wageningen Univ. (Netherlands); Nguyen Tac-An, Tong Phuoc Hoang-Son, Insitute of Oceanography (Viet Nam) . . . . . [8524-9]

17:00: **PolSAR change detection applied to specific land cover type**, Meng Liu, Hong Zhang, Bo Zhang, Fan Wu, Bo Chen, Ctr. for Earth Observation and Digital Earth (China) . . . . . [8524-11]

Tuesday 30 October

SESSION 2

Room: J . . . . . Tue 8:50 to 11:40

Water Cycle

Session Chairs: **Taikan Oki,** The Univ. of Tokyo (Japan); **Dawen Yang,** Tsinghua Univ. (China)

8:50: **Estimation of soil moisture with the combined L-band radar and radiometer measurements**, Jiancheng Shi, Institute of Remote Sensing Applications (China) . . . . . [8524-13]

9:10: **Calibration of a land surface model using microwave remote sensing observations**, Hui Lu, Tsinghua Univ. (China) . . . . . [8524-14]

9:30: **Assimilation of surface soil moisture into catchment hydrologic model via ensemble Kalman smoother**, Fangni Lei M.D., Wuhan Univ. (China); Chunlin Huang, Cold and Arid Regions Environmental and Engineering Research Institute (China); Huanfeng Shen, Wuhan Univ. (China) . . . . [8524-15]

9:50: **Analyzing the inundation patterns in Asia floodplains by passive microwave data**, Haolu Shang, Institute of Remote Sensing Applications (China) and Technische Univ. Delft (Netherlands); Jia Li, Institute of Remote Sensing Applications (China) and Wageningen Univ. (Netherlands); Massimo Menenti, Technische Univ. Delft (Netherlands) . . . . . [8524-37]

Coffee Break. . . . . Tue 10:10 to 10:40

10:40: **A simple method for estimating irrigation area using HJ-1A/1B CCD data**, Zhongli Zhu, Fan Du, Beijing Normal Univ. (China) . . . . . [8524-18]

11:00: **Airborne active and passive L-band measurements using PALS instrument in SMAPVEX12 soil moisture field campaign**, Andreas Colliander, Seth L. Chazanoff, Steven J. Dinardo, Simon H. Yueh, Jet Propulsion Lab. (United States); Thomas J. Jackson, U.S. Dept. of Agriculture (United States); Heather McNairn, Agriculture and Agri-Food Canada (Canada); Eni G. Njoku, Jet Propulsion Lab. (United States). . . . . [8524-20]

11:20: **A nested global-local hydrological model for large scale flood forecasting using remote sensing satellite data: a contribution to monitoring global environmental change**, Amir AghaKouchak, Ali Mehran, Navid Nakhjiri, Univ. of California, Irvine (United States) . . . . . [8524-21]

Lunch Break . . . . . Tue 11:40 to 13:50

SESSION 3

Room: J . . . . . Tue 13:50 to 17:20

Thermal Remote Sensing and Evaportransportation

Session Chairs: **Jiancheng Shi,** Institute of Remote Sensing Applications (China); **Masao Moriyama,** Nagasaki Univ. (Japan)

13:50: **Monitoring surface climate with its emissivity derived from satellite measurements**, Daniel K. Zhou, Allen M. Larar, Xu Liu, NASA Langley Research Ctr. (United States). . . . . [8524-22]

14:10: **Estimation and monitoring heat discharge rates using Landsat ETM+ thermal infrared data: a case study in Unzen geothermal field, Kyushu, Japan**, Md. B. Mia, Yasuhiro Fujimitsu, Kyushu Univ. (Japan); Chris Bromely, GNS Science (New Zealand) . . . . . [8524-23]

14:30: **Estimation of global ET-Index from satellite imagery for water resources management**, Masahiro Tasumi, Univ. of Miyazaki (Japan); Reiji Kimura, Tottori Univ. (Japan); Masao Moriyama, Nagasaki Univ. (Japan); Richard G. Allen, Univ. of Idaho (United States); Aiko Fujii, Univ. of Miyazaki (Japan). . . . . [8524-24]

14:50: **Semi-analytical land surface temperature estimation algorithm for GCOM-C/SGLI**, Masao Moriyama, Nagasaki Univ. (Japan) . . . . . [8524-25]

Coffee Break. . . . . Tue 15:10 to 15:40

15:40: **Remote-sensing-based continuous estimation of regional evapotranspiration by improved SEBS model**, Dawen Yang, He Chen, Tsinghua Univ. (China) . . . . . [8524-26]

16:00: **Operational retrieval results of land surface temperature from the first Korean geostationary satellite: COMS data**, Ara Cho, Myoung-Seok Suh, Ki-Hong Park, Kongju National Univ. (Korea, Republic of); Jung-Lim Lee, National Meteorological Satellite Ctr. (Korea, Republic of) . . . . . [8524-28]

16:20: **Regression imputation with ground air temperature for the satellite-based lake and reservoir temperature database in Japan**, Hideyuki Tonooka, Ibaraki Univ. (Japan) . . . . . [8524-29]

16:40: **Evaluation of single-source, dual-source algorithms for the remote sensing of evapotranspiration**, Li Jia, Institute of Remote Sensing Applications (China) and Wageningen Univ. (Netherlands); Massimo Menenti, Technische Univ. Delft (Netherlands); Guangcheng Hu, Zhangsheng Li, Institute of Remote Sensing Applications (China). . . . . [8524-30]

17:00: **Analysis of microwave backscatter measured by radar altimeter on land to study surface aerodynamic roughness**, Le Yang, Qinhuo Liu, Institute of Remote Sensing Applications (China). . . . . [8524-31]

Wednesday 31 October

SESSION 4

Room: J . . . . . Wed 8:30 to 11:40

Forest and Vegetation I

Session Chairs: **Haruo Sawada,** The Univ. of Tokyo (Japan); **Yoshiaki Honda,** Chiba Univ. (Japan)

8:30: **The development of microwave vegetation index for SMOS applications**, Jiancheng Shi, Institute of Remote Sensing Applications (China); Qiang Liu, Yunqing Li, Institute of Remote Sensing Applications (China) and Graduate Univ. of Chinese Academy of Sciences (China) . . . . . [8524-32]

8:50: **Calibration and validation of Landsat-based time-series of persistent green-vegetation fraction for Australia**, Kasper Johansen, The Univ. of Queensland (Australia); Tony Gill, NSW Office of Environment and Heritage (Australia); Peter Scarth, Dept. of Environment and Resource Management (Australia); Stuart Phinn, The Univ. of Queensland (Australia); Rebecca Trevithick, Dept. of Environment and Resource Management (Australia) . . . . . [8524-33]

9:10: **A decadal observation of vegetation dynamics using multi-resolution satellite images**, Yang-Sheng Chiang, Kun-Shan Chen, Chang-Jen Chu, National Central Univ. (Taiwan) . . . . . [8524-34]

9:30: **Characterizing vegetation dynamics in forestland of Java using MODIS time-series imagery: a monitoring approach of ecological resources in regional scale**, Yudi Setiawan, Kunihiko Yoshino, Univ. of Tsukuba (Japan) . . . . . [8524-35]

9:50: **SAR-based monitoring of plantation area in peatland forests of Sarawak, Malaysia**, Ram Avtar, Hideki Kobayashi, Hadi Fadaei, Rikie Suzuki, Japan Agency for Marine-Earth Science and Technology (Japan) . . . [8524-36]

Coffee Break. . . . . Wed 10:10 to 10:40

10:40: **On the high-fidelity monitoring of C3 and C4 crops under nutrient and water stress**, Gladimir V. G. Baranoski, Tenn F. Chen, Bradley Kimmel, Erik Miranda, Univ. of Waterloo (Canada) . . . . . [8524-38]

11:00: **Isolated tree 3D modeling: based on photographing leaf area density(LAD) calculation and L-system method**, Shengye Jin, Masayuki Tamura, Kyoto Univ. (Japan). . . . . [8524-39]

11:20: **Pastureland use planning in Bayan, Mongolia using remote sensing and GIS**, Khishigsuren Nyamsambuu, Kunihiko Yoshino, Univ. of Tsukuba (Japan) . . . . . [8524-40]

Lunch Break . . . . . Wed 11:40 to 13:30

SESSION 5

Room: J . . . . . Wed 13:30 to 16:30

Disasters and Hazards

Session Chairs: **Joon Kim,** Seoul National Univ. (Korea, Republic of); **Yoshiaki Honda,** Chiba Univ. (Japan)

13:30: **Detection of three-dimensional crustal movements due to the 2011 Tohoku, Japan earthquake from TerraSAR-X intensity images**, Wen Liu, Chiba Univ. (Japan) and Japan Society for the Promotion of Science (Japan); Fumio Yamazaki, Chiba Univ. (Japan) . . . . . [8524-41]

13:50: **Monitoring southwest drought of China using HJ-1A/B and Landsat remote sensing data**, He Huang, Siquan Yang, Haixia He, National Disaster Reduction Ctr. of China (China). . . . . [8524-42]

14:10: **Detecting damage to coastal forests caused by the Tohoku Earthquake 2011 in Japan using time-series remote sensing images**, Eiji Kodani, Katsunori Nakamura, Tomoki Sakamoto, Tohoku Research Ctr. (Japan); Koki Kimura, Aomori Prefectural Industrial Technology Research Ctr. (Japan). . . . . [8524-43]

14:30: **Detection of damaged buildings using GeoEye-1 imagery and airborne lidar data: a case study on the 2011 Tohoku earthquake**, Yoshiyuki Yamamoto, Aichi Institute of Technology (Japan); Tomohito Asaka, Sadayoshi Aoyama, Keishi Iwashita, Katsuteru Kudou, Nihon Univ. (Japan). . . . . [8524-44]

14:50: **Disaster monitoring by using the Pi-SAR2**, Seiho Uratsuka, Toshihiko Umehara, Tatsuharu Kobayashi, Makoto Satake, Jyunpei Uemoto, Shoichiro Kojima, National Institute of Information and Communications Technology (Japan). . . . . [8524-45]

Coffee Break. . . . . Wed 15:10 to 15:30

15:30: **A framework for diagnosis of environmental health based on remote sensing**, Chunxiang Cao, Min Xu, Institute of Remote Sensing Applications (China) . . . . . [8524-46]

15:50: **Semi-automatic recognition and mapping of event-induced landslides by exploiting HR MS satellite images and VHR DEMs in a Bayesian framework**, Alessandro C. Mondini, Consiglio Nazionale delle Ricerche (Italy); Kang-tsung Chang, Kainan Univ. (Taiwan); Mauro Rossi, Ivan Marchesini, Fausto Guzzetti, Consiglio Nazionale delle Ricerche (Italy) . . . . . [8524-47]

16:10: **Damage estimation of the great east Japan earthquake by NICT airborne SAR (PI-SAR2)**, Makoto Satake, Tatsuharu Kobayashi, Jyunpei Uemoto, Toshihiko Umehara, Uratsuka Seiho, National Institute of Information and Communications Technology (Japan) . . . . . [8524-48]

POSTERS-WEDNESDAY

Room: B-1 . . . . . Wed 16:30 to 18:00

The interactive poster session with authors in attendance will be Wednesday 16:30 to 18:00. Poster authors are asked to display their posters beginning at 10:00 for extended viewing. Authors should remove their posters at the end of the interactive poster session. Posters left displayed will be considered unwanted and will be discarded.

Land Use and Land Cover Change

Urban waterbody extraction using medium-resolution, multispectral remote sensing image based on knowledge-based decision tree, Jingbo Chen, Chengyi Wang, Dongxu He, Institute of Remote Sensing Applications (China). . . . . [8524-68]

Influence of intensified human activities on coastal environment over Yellow River delta from multiscale remote sensing, Yonghong Hu, Ctr. for Earth Observation and Digital Earth (China); Gensuo Jia, Yuting He, Institute of Atmospheric Physics (China) . . . . . [8524-69]

Accuracy assessment of land use classification using hybrid methods, Kuan-Tsung Chang, F. G. Yiu, Minghsin Univ. of Science and Technology (Taiwan); J. T. Hwang, National Taipei Univ. (Taiwan); Y. X. Lin, Minghsin Univ. of Science and Technology (Taiwan) . . . . . [8524-70]

Global land cover classification using annual statistical values, Noriko Soyama, Tenri Univ. (Japan); Kanako Muramatsu, Nara Women's Univ. (Japan); Motomasa Daigo, Doshisha Univ. (Japan). . . . . [8524-71]

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Forest and Vegetation

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Landslide detection using very high-resolution satellite imageries, Yuzo Suga, Hiroshima Institute of Technology (Japan); Tomohisa Konishi, Nihon CADIC Co., Ltd. (Japan). . . . . [8524-90]

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GIS-based data assimilation of a numerical model for hazard assessment, Tuba Zahra, The Univ. of Tokyo (Japan); Prasun K. Gupta, Indian Institute of Remote Sensing (India) . . . . . [8524-94]

Remote Sensing Analysis and Modeling

Basic study of BRDF over Tokyo for the spaceborne measurements of atmospheric trace gases, Katsuyuki Noguchi, Nara Women's Univ. (Japan); Andreas Richter, John P. Burrows, Univ. Bremen (Germany); Hitoshi Irie, Chiba Univ. (Japan); Kazuyuki Kita, Ibaraki Univ. (Japan) . . . . . [8524-95]

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Extraction of road traffic information using satellite images and a three-dimensional digital map, Fumito Shinmura, Hitoshi Saji, Shizuoka Univ. (Japan) . . . . . [8524-97]

Relationship between DMSP/OLS nighttime light and CO_2 emission from electric power plant, Husi Letu, Tokai Univ. (Japan); Yuhai Bao, Inner Mongolia Normal Univ. (China); Masanao Hara, VisionTech Inc. (Japan); Gegen Tana, Fumihiko Nishio, Chiba Univ. (Japan). . . . . [8524-98]

Landsat-imagery-based water turbidity monitoring in lake Paldang, Korea, Sang Il Na, Jong-Hwa Park, Jin-Ki Park, Shin Chul Baek, Si-Young Oh, Chungbuk National Univ. (Korea, Republic of) . . . . . [8524-99]

Methane analysis using SCIAMACHY data in permafrost area of China, Cen Yi, Taixia Wu, Hengqian Zhao, Lifu Zhang, Institute of Remote Sensing Applications (China) . . . . . [8524-100]

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Hyperspectral land surface remote sensing using a VNIR airborne imaging spectrometer, Yegor V. Dmitriev, Institute of Numerical Mathematics (Russian Federation); Timophey V. Kondranin, Moscow Institute of Physics and Technology (Russian Federation); Vladimir V. Kozoderov, Lomonosov Moscow State Univ. (Russian Federation); Tamara A. Sushkevich, M. V. Keldysh Institute of Applied Mathematics (Russian Federation) . . . . . [8524-103]

Forest biomass estimation algorithms for the earth observation satellite optical sensor using multi-angle observation data, Koji Kajiwara, Chiba Univ. (Japan); Yusaku Ono, Japan Aerospace Exploration Agency (Japan); Yosiaki Honda, Chiba Univ. (Japan). . . . . [8524-104]

Thursday 1 November

SESSION 6

Room: J . . . . . Thu 8:30 to 12:00

Forest and Vegetation II

Session Chairs: **Yoshiaki Honda,** Chiba Univ. (Japan); **Koji Kajiwara,** Chiba Univ. (Japan)

8:30: **The relationship between GPP and spectral reflectance for monitoring grassland status and carbon uptake in an alpine grassland in the Qinghai-Tibetan Plateau**, Hideki Kobayashi, Japan Agency for Marine-Earth Science and Technology (Japan); Tomomichi Kato, Univ. de Versailles Saint-Quentin-en Yvelines (France); Shin Nagai, Japan Agency for Marine-Earth Science and Technology (Japan); Yanhong Tang, National Institute for Environmental Studies (Japan); Mingyuan Du, National Institute for Agro-Environmental Sciences (Japan) . . . . . [8524-49]

8:50: **Accuracy evaluation of satellite remote-sensing-based phenological observations in East Asia by performing long-term continuous ground-truthing and ecological examinations**, Shin Nagai, Japan Agency for Marine-Earth Science and Technology (Japan); Takeshi Motohka, Japan Aerospace Exploration Agency (Japan); Hideki Kobayashi, Rikie Suzuki, Japan Agency for Marine-Earth Science and Technology (Japan); Hiroyuki Muraoka, Gifu Univ. (Japan); Kenlo N. Nasahara, Univ. of Tsukuba (Japan); Taku M. Saitoh, Gifu Univ. (Japan). . . . . [8524-50]

9:10: **Retrieval of leaf area index using wireless sensor network**, Yonghua Qu, Beijing Normal Univ. (China) . . . . . [8524-51]

9:30: **Assessing the sensitivity of two new indicators of vegetation response to water availability for drought monitoring**, Li Jia, Alterra B.V. (Netherlands) and Institute of Remote Sensing Applications (China); Massimo Menenti, Technische Univ. Delft (Netherlands); Jie Zhou, Guangcheng Hu, Institute of Remote Sensing Applications (China). . . . . [8524-52]

9:50: **A novel method of scales transformation for quantitative remote sensing retrievals: fractal and its analysis, improvement**, Haijun Luan, Nanjing Univ. (China); Xingfa Gu, Tao Yu, Institute of Remote Sensing Applications (China); Qingjiu Tian, Nanjing Univ. (China); Qingyan Meng, Xinli Hu, Chunzhu Wei, Institute of Remote Sensing Applications (China) . [8524-54]

Coffee Break. . . . . Thu 10:10 to 10:40

10:40: **Quantification of human activity on NPP change during 2000-2010 in China**, Juan Gu, Xin Li, Chunlin Huang, Lanzhou Univ. (China). . . . [8524-55]

11:00: **Study on forest above ground biomass synergy inversion from GLAS and HJ-1 data**, Zhou Fang, Chunxiang Cao, Min Xu, Huicong Jia, Wei Ji, Jian Zhao, Haibing Xiang, Institute of Remote Sensing Applications (China). . . . . [8524-56]

11:20: **Satellite remote sensing of photosynthetic potential of boreal forest in Alaska**, Rikie Suzuki, Shin Nagai, Hideki Kobayashi, Japan Agency for Marine-Earth Science and Technology (Japan); Taro Nakai, Yongwon Kim, International Arctic Research Ctr. (United States) . . . . . [8524-57]

11:40: **Mapping Sargassum beds off, ChonBuri Province, Thailand, using ALOS AVNI2 image**, Thidarat Noiraksar, Burapha Univ. (Thailand); Teruhisa Komatsu, Shuhei Sawayama, The Univ. of Tokyo (Japan); Sophany Phauk, Royal Univ. of Phnom Penh (Cambodia); Ken-ichi Hayashizaki, Kitasato Univ. (Japan). . . . . [8524-58]

Lunch Break . . . . . .Thu 12:00 to 13:30

SESSION 7

Room: J . . . . . Thu 13:30 to 16:40

Remote Sensing Analysis and Modeling

Session Chairs: **Dara Entekhabi,** Massachusetts Institute of Technology (United States); **Masao Moriyama,** Nagasaki Univ. (Japan)

13:30: **Possibility of mutual verification between satellite products and climate model simulation results**, Kazuo Mabuchi, Meteorological Research Institute (Japan); Yoshiaki Honda, Chiba Univ. (Japan); Kenlo N. Nasahara, Univ. of Tsukuba (Japan); Hiroshi Murakami, Masahiro Hori, Japan Aerospace Exploration Agency (Japan); Masao Moriyama, Nagasaki Univ. (Japan); Akiko Ono, Nara Women's Univ. (Japan) . . . . . [8524-59]

13:50: **Multiple view angle effects on classification of forward-modelled MODIS reflectance**, Ziti Jiao, Beijing Normal Univ. (China) . . . . . [8524-60]

14:10: **Monte Carlo modeling in problems of land surface aerospace sensing**, Boris A. Kargin, Arseny B. Kargin, Institute of Computational Mathematics and Mathematical Geophysics (Russian Federation). . . [8524-62]

14:30: **Parametric representation of soil isoline equation and its accuracy estimation in red-NIR reflectance space**, Kenta Taniguchi, Yasuhiro Ikuta, Aichi Prefectural Univ. (Japan); Kenta Obata, Univ. of Hawai'i (United States); Masayuki Matsuoka, Kochi Univ. (Japan); Hiroki Yoshioka, Aichi Prefectural Univ. (Japan) . . . . . [8524-63]

14:50: **Influences of band-correlated noise on FVC by VI-isoline based LMM: characteristic behavior of propagated error**, Yasuhiro Ikuta, Kenta Taniguchi, Aichi Prefectural Univ. (Japan); Kenta Obata, Univ. of Hawai'i (Japan); Masayuki Matsuoka, Kochi Univ. (Japan); Hiroki Yoshioka, Aichi Prefectural Univ. (Japan) . . . . . [8524-64]

Coffee Break. . . . . .Thu 15:10 to 15:40

15:40: **Mapping spatial and temporal continuous daily land surface shortwave albedo with MODIS and AMSR-E data**, Ying Qu, Lizhao Wang, Youbin Feng, Gongqi Zhou, Qiang Liu, Suhong Liu, Beijing Normal Univ. (China). . . . . [8524-65]

16:00: **Comparison between the research result of mathematical morphology method applied to satellite SAR data and the other reported results for the detection of the 2011 off the Pacific coast of Tohoku Japan earthquake and tsunami-affected farmlands**, Yasuharu Yamada, National Agriculture and Food Research Organization (Japan) . . . . . [8524-66]

16:20: **Supporting elephant conservation in Sri Lanka through MODIS imagery**, Kithsiri Perera, Univ. of Southern Queensland (Australia); Ryutaro Tateishi, Chiba Univ. (Japan) . . . . . [8524-67]

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