PROCEEDINGS OF SPIE

Remote Sensing and Modeling of Ecosystems for Sustainability X

Wei Gao Thomas J. Jackson Jinnian Wang Ni-Bin Chang Editors

26 and 29 August 2013 San Diego, California, United States

Sponsored and Published by SPIE

Volume 8869

Proceedings of SPIE 0277-786X, V. 8869

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

Remote Sensing and Modeling of Ecosystems for Sustainability X, edited by Wei Gao, Thomas J. Jackson, Jinnian Wang, Ni-Bin Chang, Proc. of SPIE Vol. 8869, 886901 © 2013 SPIE · CCC code: 0277-786X/13/\$18 · doi: 10.1117/12.2048398

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in *Remote Sensing and Modeling of Ecosystems for Sustainability X*, edited by Wei Gao, Thomas J. Jackson, Jinnian Wang, Ni-Bin Chang, Proceedings of SPIE Vol. 8869 (SPIE, Bellingham, WA, 2013) Article CID Number.

ISSN: 0277-786X ISBN: 9780819497192

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445 SPIE.org

Copyright © 2013, Society of Photo-Optical Instrumentation Engineers.

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/13/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.



Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc.

The CID Number appears on each page of the manuscript. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID Number.

Contents

ix Conference Committee

VEGETATION PARAMETERS

8869 03 Integrating remote sensing data from multiple optical sensors for ecological and crop condition monitoring [8869-2]

F. Gao, Agricultural Research Service (United States); P. Wang, Agricultural Research Service (United States) and Chinese Academy of Meteorological Sciences (China); J. Masek, NASA Goddard Space Flight Ctr. (United States)

LAND COVER

8869 OB Using mixture tuned match filtering to measure changes in subpixel vegetation area in Las Vegas, Nevada [8869-46]

C. Brelsford, Los Alamos National Lab. (United States) and Arizona State Univ. (United States); D. Shepherd, Los Alamos National Lab. (United States)

Inter-sensor relationship of two-band spectral vegetation index based on soil isoline equation: derivation and numerical validation [8869-11]

K. Taniguchi, Aichi Prefectural Univ. (Japan); K. Obata, Univ. of Hawaii (United States); M. Matsuoka, Kochi Univ. (Japan); H. Yoshioka, Aichi Prefectural Univ. (Japan)

POSTER SESSION

8869 0G Evapotranspiration analysis based on topography algorithm in the Yellow River Delta [8869-12]

J. Ning, Yantai Institute of Coastal Zone Research (China); Z. Gao, Yantai Institute of Coastal Zone Research (China) and Colorado State Univ. (United States); R. Shi, W. Gao, Colorado State Univ. (United States)

8869 0H Monitoring urbanization in Shanghai from 1990 to 2005 [8869-13]

C. You, R. Shi, East China Normal Univ. (China) and Ctr. for Earth Observation and Digital Earth (China)

Analysis trends of ultraviolet B fluxes in the continental US with USDA and TOMS data [8869-15]

Z. Gao, Yantai Institute of Coastal Zone Research (China) and Colorado State Univ. (United States); J. Ning, Yantai Institute of Coastal Zone Research (China); R. Shi, W. Gao, Colorado State Univ. (United States)

- 8869 0J Concomitant flow and space variations of evapotranspiration due to changes in LUCC under seawater intrusion in a coastal region [8869-16]
 - Z. Gao, Yantai Institute of Coastal Zone Research (China) and Colorado State Univ. (United States); J. Ning, Yantai Institute of Coastal Zone Research (China); X. Cao, Institute of Geographical Sciences and Natural Resources Research (China); R. Shi, W. Gao, Colorado State Univ. (United States)
- 8869 OK

 Evaluation of a regional assimilation system coupled with the WRF-chem model [8869-17]
 Y. Liu, East China Normal Univ. (China) and Univ. of Wisconsin-Madison (United States);
 W. Gao, East China Normal Univ. (China) and Colorado State Univ. (United States);
 H. Huang, K. Strabala, Univ. of Wisconsin-Madison (United States); C. Liu, R. Shi, East China Normal Univ. (China)
- 8869 OL Interpolation of XCO₂ retrieved from GOSAT in China using fixed rank kriging [8869-18] C. Zhou, R. Shi, East China Normal Univ. (China) and Ctr. for Earth Observation and Digital Earth (China); W. Gao, East China Normal Univ. (China), Ctr. for Earth Observation and Digital Earth (China), and Colorado State Univ. (United States)
- 8869 0N Comparison of aerosol optical depth (AOD) determined from UVMRP and AERONET [8869-20]

M. Wang, C. Liu, East China Normal Univ. (China) and Ctr. for Earth Observation and Digital Earth (China); R. Shi, W. Gao, East China Normal Univ. (China), Ctr. for Earth Observation and Digital Earth (China), and Colorado State Univ. (United States)

- Analyzing the non-stationary space relationship of a city's degree of vegetation and social economic conditions in Shanghai, China using OLS and GWR models [8869-21]

 K. Wang, Y. Zhang, Y. An, Z. Jing, C. Wang, East China Normal Univ. (China) and Ctr. for Earth Observation and Digital Earth (China)
- 8869 OP Application of genetic algorithm in atmospheric carbon dioxide concentration retrieval [8869-22]

J. Li, R. Shi, East China Normal Univ. (China), Ctr. for Earth Observation and Digital Earth (China); W. Gao, East China Normal Univ. (China), and Ctr. for Earth Observation and Digital Earth (China) and Colorado State Univ. (United States)

- 8869 0Q Differential analysis on urban heat island based on air temperature and LST [8869-23] K. Liu, Institute of Remote Sensing and Digital Earth (China) and Chongqing Normal Univ. (China); X. Gu, Institute of Remote Sensing and Digital Earth (China); W. Gao, East China Normal Univ. (China); Z. Gao, Institute of Geographical Sciences and Natural Resources Research (China)
- 8869 OR The relation between the urban heat island effect and the underlying surface LUCC of meteorological stations [8869-24]

K. Liu, Institute of Remote Sensing and Digital Earth (China) and Chongqing Normal Univ. (China); W. Gao, East China Normal Univ. (China); X. Gu, Institute of Remote Sensing and Digital Earth (China); Z. Gao, Institute of Geographical Sciences and Natural Resources Research (China)

8869 0S A simple estimation model of aerosol optical thickness based on meteorological station observed atmospheric visibility [8869-25]

Z. Li, J. Chen, The Second Institute of Oceanography, SOA (China); S. Gong, Nanjing Univ. of Information Science & Technology (China); Z. Mao, Z. Hao, The Second Institute of Oceanography, SOA (China)

8869 0U Absorption coefficient of CDOM in Zhejiang coastal waters [8869-27]

G. Fan, Z. Mao, P. Chen, H. Huang, The Second Institute of Oceanography, SOA (China)

8869 0V A new algorithm based on spectral differences for red tide monitoring in the East China Sea [8869-28]

X. Xu, South China Sea Institute of Oceanology (China), The Second Institute of Oceanography, SOA (China), and Univ. of Chinese Academy of Sciences (China); D. Pan, Z. Mao, B. Tao, The Second Institute of Oceanography, SOA (China)

8869 0W Inversion of suspended sediment concentration at the Hangzhou Bay based on the high-resolution satellite HJ-1A/B imagery [8869-29]

Q. Meng, Z. Mao, H. Huang, Y. Shen, The Second Institute of Oceanography, SOA (China)

Retrieving rice yield and biomass from Radarsat-2 SAR data with Artificial Neural Network (ANN) [8869-30]

Z. Jing, Y. Zhang, K. Wang, R. Shi, East China Normal Univ. (China) and Ctr. for Earth Observation and Digital Earth (China)

8869 OY Monitoring drought in the Monglian Plateau based on NDVI_Ts general space, 2000–2010 [8869-31]

X. Cao, J. Wang, Institute of Geographical Sciences and Natural Resources Research (China); Z. Gao, Yantai Institute of Coastal Zone Research (China) and Colorado State Univ. (United States); J. Ning, Yantai Institute of Coastal Zone Research (China); R. Shi, W. Gao, Colorado State Univ. (United States)

8869 0Z Study on spatio-temporal vegetation cover changes based on MODIS NDVI data in the Mongolian Plateau, 2000–2012 [8869-32]

X. Cao, J. Wang, Institute of Geographical Sciences and Natural Resources Research (China); Z. Gao, Yantai Institute of Coastal Zone Research (China) and Colorado State Univ. (United States); J. Ning, Yantai Institute of Coastal Zone Research (China); R. Shi, W. Gao, Colorado State Univ. (United States)

- 8869 10 The research on the fairness of carbon emissions for China's energy based on GIS [8869-33] Q. Wang, Yantai Institute of Coastal Zone Research (China), Univ. of Chinese Academy of Sciences (China), and Ludong Univ. (China); Z. Gao, Yantai Institute of Coastal Zone Research (China) and Colorado State Univ. (United States); J. Ning, Q. Lu, Yantai Institute of Coastal Zone Research (China); R. Shi, W. Gao, Colorado State Univ. (United States)
- 8869 11 The study on the changing characteristics and their countermeasures for China's carbon emissions in 2000–2010 [8869-34]

Q. Wang, Yantai Institute of Coastal Zone Research (China), Univ. of Chinese Academy of Sciences (China), and Ludong Univ. (China); Z. Gao, Yantai Institute of Coastal Zone Research (China) and Colorado State Univ. (United States); J. Ning, Q. Lu, Yantai Institute of Coastal Zone Research (China); R. Shi, W. Gao, Colorado State Univ. (United States)

- 8869 12 Preliminary study of a dust event over Beijing by using satellite data and ground-based measurements [8869-35]
 - X. Shen, C. Liu, R. Shi, K. Bai, C. Wang, East China Normal Univ. (China) and Ctr. for Earth Observation and Digital Earth (China); W. Gao, East China Normal Univ. (China), Ctr. for Earth Observation and Digital Earth (China), and Colorado State Univ. (United States)
- 8869 13 Assessment of desertification in the agro-pastoral transitional zone in Northern China (1982–2006) using GIMMS NDVI data [8869-36]

Y. An, East China Normal Univ. (China) and Ctr. for Earth Observation and Digital Earth (China); W. Gao, East China Normal Univ. (China), Ctr. for Earth Observation and Digital Earth (China), and Colorado State Univ. (United States); Z. Gao, Yantai Institute of Coastal Zone Research (China); C. Liu, R. Shi, East China Normal Univ. (China) and Ctr. for Earth Observation and Digital Earth (China)

8869 14 Spatial and seasonal variations of MODIS aerosol optical depth in East China during 2000–2012 [8869-37]

T. Zhai, Q. Zhao, R. Shi, East China Normal Univ. (China) and Ctr. for Earth Observation and Digital Earth (China); W. Gao, East China Normal Univ. (China), Ctr. for Earth Observation and Digital Earth (China), and Colorado State Univ. (United States)

8869 15 Estimation of surface heat fluxes and evapotranspiration using community land model [8869-38]

J. Du, C. Liu, R. Shi, S. Shu, East China Normal Univ. (China) and Ctr. for Earth Observation and Digital Earth (China); W. Gao, East China Normal Univ. (China), Ctr. for Earth Observation and Digital Earth (China), and Colorado State Univ. (United States)

- 8869 16 Long-term NO₂ monitoring by satellite in the Pearl River Delta [8869-39]
 L. Li, R. Shi, P. Liu, East China Normal Univ. (China) and Ctr. for Earth Observation and Digital Earth (China); J. Zhang, Foshan Bureau of Meteorology (China)
- Improved sensible and latent heat flux estimation of Community Land Model by using ensemble Kalman filter assimilation [8869-40]
 C. Liu, East China Normal Univ (China) and Colorado State Univ. (United States); S. Shu, East China Normal Univ. (China); W. Gao, East China Normal Univ. (China) and Colorado

State Univ. (United States)

Validation of aerosol optical depth and total ozone column in the ultraviolet retrieved from multifilter rotating shadowband radiometer [8869-41]

C. Liu, East China Normal Univ. (China), Ctr. for Earth Observation and Digital Earth (China), and Colorado State Univ. (United States); M. Chen, Colorado State Univ. (United States); W. Gao, East China Normal Univ. (China), Ctr. for Earth Observation and Digital Earth (China), and Colorado State Univ. (United States)

8869 19 **Soil erosion, policy and management in China coastal zone** [8869-42]
Q. Lu, Z. Gao, Yantai Institute of Coastal Zone Research (China); Q. Chen, Shandong Univ. of Science and Technology (China); J. Ning, Yantai Institute of Coastal Zone Research (China); R. Shi, W. Gao, Colorado State Univ. (United States)

8869 1A Automatic selection of optimal segmentation scales for high-resolution remote sensing images [8869-43]

R. Yin, R. Shi, East China Normal Univ. (China) and Ctr. for Earth Observation and Digital Earth (China); W. Gao, East China Normal Univ. (China), Ctr. for Earth Observation and Digital Earth (China), and Colorado State Univ. (United States)

8869 1B Analysis of non-point and point source pollution in China: case study in Shima Watershed in Guangdong Province [8869-44]

H. Fang, South China Institute of Environmental Sciences (China); Q. Lu, Z. Gao, Yantai Institute of Coastal Zone Research (China); R. Shi, W. Gao, Colorado State Univ. (United States)

Author Index

Proc. of SPIE Vol. 8869 886901-8

Conference Committee

Program Track Chair

Allen H.-L. Huang, University of Wisconsin-Madison (United States)

Conference Chairs

Wei Gao, Colorado State University (United States) **Thomas J. Jackson**, U.S. Department of Agriculture (United States)

Conference CoChairs

Jinnian Wang, Institute of Remote Sensing Applications (China) **Ni-Bin Chang**, University of Central Florida (United States)

Conference Program Committee

E. Raymond Hunt Jr., Agricultural Research Service (United States)
 Brian Robert Johnson, NEON, Inc. (United States)
 Thomas U. Kampe, NEON, Inc. (United States)
 Xin-Zhong Liang, University of Illinois at Urbana-Champaign (United States)

Dennis Ojima, Colorado State University (United States) **John J. Qu**, George Mason University (United States)

David Riaño, University of California, Davis (United States)

Jiong Shu, East China Normal University (China)

Qiao Wang, Ministry of Environmental Protection (China)

Hongjie Xie, The University of Texas at San Antonio (United States)

Denghua Yan, China Institute of Water Resources and Hydropower Research (China)

Xiaobing Zhou, Montana Tech (United States)

Session Chairs

Vegetation ParametersNi-Bin Chang, University of Central Florida (United States)

2 Water Resources

Thomas J. Jackson, U.S. Department of Agriculture (United States)

3 Land Cover

Ni-Bin Chang, University of Central Florida (United States)

Proc. of SPIE Vol. 8869 886901-10