

PROCEEDINGS OF SPIE

Remote Sensing for Agriculture, Ecosystems, and Hydrology XVII

Christopher M. U. Neale
Antonino Malfese
Editors

22–24 September 2015
Toulouse, France

Sponsored by
SPIE

Cooperating Organisations
European Association of Remote Sensing Companies (Belgium)
European Optical Society
CENSIS—Innovation Centre for Sensor & Imaging Systems (United Kingdom)
EARSeL—European Association of Remote Sensing Laboratories
Optitec (France)
Route des Lasers (France)

Published by
SPIE

Volume 9637

Proceedings of SPIE 0277-786X, V. 9637

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

The papers 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. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers 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 these proceedings:

Author(s), "Title of Paper," in *Remote Sensing for Agriculture, Ecosystems, and Hydrology XVII*, edited by Christopher M. Neale, Antonino Maltese, Proceedings of SPIE Vol. 9637 (SPIE, Bellingham, WA, 2015) Six-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781628418477

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 © 2015, 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/15/\$18.00.

Df]bhX`]b`h\Y`l`b]hY`X`GhUH`g`c`Z5a`Y`f]WU`V`m7`i`ffUb`5`ggc`W]UH`g`z`b`Wz`i`b`XY`f`]W`bgY`Z`c`a`GD`9`

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

SPIE. DIGITAL LIBRARY
SPIEDigitalLibrary.org

Paper Numbering: *Proceedings of SPIE* follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article at the time of 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 and print versions of the publication. SPIE uses a six-digit CID article numbering system structured as follows:

- 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 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.

Contents

- vii *Authors*
- ix *Conference Committee*
- xi *Introduction*

NATURAL RESOURCES MONITORING

- 9637 02 **Estimation of crop parameters using multi-temporal optical and radar polarimetric satellite data** [9637-2]
- 9637 03 **Seasonal parameter extraction of paddy rice fields in West Java using multi-temporal MODIS imagery datasets** [9637-3]
- 9637 04 **Using remote sensing to calculate plant available nitrogen needed by crops on swine factory farm sprayfields in North Carolina** [9637-4]

HYPERSENSPECTRAL, SPECTROSCOPY AND FLUORESCENCE

- 9637 05 **A critique of field spectroscopy and the challenges and opportunities it presents for remote sensing for agriculture, ecosystems, and hydrology (Invited Paper)** [9637-5]
- 9637 06 **Determination of pasture quality using airborne hyperspectral imaging** [9637-6]
- 9637 07 **An advanced fluorescence LIDAR system for the acquisition of interleaved active (LIF) and passive (SIF) fluorescence measurements on vegetation** [9637-7]
- 9637 08 **Estimation of leaf chlorophyll content in winter wheat using variable importance for projection (VIP) with hyperspectral data** [9637-8]
- 9637 09 **Disease stress detection on citrus using a leaf optical model and field spectroscopy** [9637-9]

UAV AND HIGH SPATIAL RESOLUTION IMAGERY

- 9637 0A **Complementing airborne laser bathymetry with UAV-based lidar for capturing alluvial landscapes** [9637-10]
- 9637 0D **The inversion model of soil organic matter of cultivated land based on hyperspectral technology** [9637-13]

9637 0E **Mangrove species mapping in Kuala Sepetang Mangrove Forest, Perak using high resolution airborne data** [9637-14]

IMAGE CLASSIFICATION

9637 0J **RGB picture vegetation indexes for High-Throughput Phenotyping Platforms (HTPPs)** [9637-22]

EVAPOTRANSPIRATION AND ENERGY BALANCE I

9637 0O **Water balance indicators from MODIS images and agrometeorological data in Minas Gerais state, Brazil** [9637-30]

9637 0P **Evaluation of disaggregated thermal images for evapotranspiration estimation in Barrax test site** [9637-31]

EVAPOTRANSPIRATION AND ENERGY BALANCE II

9637 0S **Testing two temporal upscaling schemes for the estimation of the time variability of the actual evapotranspiration** [9637-34]

9637 0U **Modelling radiation and energy balances with Landsat 8 images under different thermohydrological conditions in the Brazilian semi-arid region** [9637-37]

HYDROLOGY AND IRRIGATION

9637 0W **Determination of water body structures for small rivers using remote sensing data** [9637-40]

9637 10 **Monitoring irrigation volumes using high-resolution NDVI image time series: calibration and validation in the Kairouan plain (Tunisia)** [9637-45]

VEGETATION AND CARBON MONITORING

9637 15 **GLORI: a new airborne GNSS reflectometry instrument for land surface monitoring** [9637-50]

VEGETATION MODELLING

9637 17 **Application of a regularized model inversion system (REGFLEC) to multi-temporal RapidEye imagery for retrieving vegetation characteristics (Invited Paper)** [9637-52]

9637 18 **Modelling canopy radiation budget through multiple scattering approximation: a case study of coniferous forest in Mexico City valley** [9637-53]

- 9637 1A **Algorithm developing of gross primary production from its capacity and a canopy conductance index using flux and global observing satellite data [9637-55]**

SNOW AND ICE HYDROLOGY

- 9637 1B **Interpreting snowpack radiometry using currently existing microwave radiative transfer models [9637-56]**
- 9637 1D **Extracting fields snow coverage information with HJ-1A/B satellites data [9637-58]**
- 9637 1F **Mapping of bare soil surface parameters from TerraSAR-X radar images over a semi-arid region [9637-60]**
- 9637 1G **A multi-scale soil moisture and temperature regularly automatic monitoring network aim at multi-satellite data validation in Tibet Plateau [9637-44]**

POSTER SESSION

- 9637 1J **Analysis of principal elements of land surface temperature retrieval from AVHRR over Tibetan Plateau [9637-62]**
- 9637 1L **Winter wheat GPC estimation with fluorescence-based sensor measurements of canopy [9637-64]**
- 9637 1M **Performance of fluorescence retrieval methods and fluorescence spectrum reconstruction under various sensor spectral configurations [9637-65]**
- 9637 1N **Monitoring the ratio of leaf carbon to nitrogen in winter wheat with hyperspectral measurements [9637-66]**
- 9637 1O **Endmember identification from EO-1 Hyperion L1_R hyperspectral data to build saltmarsh spectral library in Hunter Wetland, NSW, Australia [9637-67]**
- 9637 1P **The impact of different reference panels on spectral reflectance coefficients of some biological water pollutants [9637-68]**
- 9637 1S **The applicability of FORMOSAT-2 images to coastal waters/bodies classification [9637-74]**
- 9637 1Z **Derivation from the Landsat 7 NDVI and ground truth validation of LAI and interception storage capacity for wetland ecosystems in Biebrza Valley, Poland [9637-81]**
- 9637 20 **Processing of airborne laser scanning data to generate accurate DTM for floodplain wetland [9637-82]**
- 9637 21 **Fire detection from hyperspectral data using neural network approach [9637-83]**
- 9637 23 **Mapping areas invaded by Prosopis juliflora in Somaliland on Landsat 8 imagery [9637-87]**
- 9637 26 **Dielectric properties of marsh vegetation [9637-90]**

- 9637 27 **Altimetry backscattering signatures at Ku and S bands over land and ice sheets** [9637-92]
- 9637 29 **Forecasting of cereals yields in a semi-arid area using the agrometeorological model «SAFY» combined to optical SPOT/HRV images** [9637-94]
- 9637 2A **Winter wheat growth spatial variation monitoring through hyperspectral remote sensing image** [9637-95]
- 9637 2B **Application of agrometeorological spectral model in rice area in southern Brazil** [9637-96]
- 9637 2E **Delay-tolerant mobile network protocol for rice field monitoring using wireless sensor networks** [9637-100]
- 9637 2G **Mapping crop based on phenological characteristics using time-series NDVI of operational land imager data in Tadra irrigated perimeter, Morocco** [9637-102]
- 9637 2H **Identification and characterization of agro-ecological infrastructures by remote sensing** [9637-104]
- 9637 2I **Early pest detection in soy plantations from hyperspectral measurements: a case study for caterpillar detection** [9637-105]
- 9637 2O **Investigation variation of carbon dioxide based on GOSAT data in peninsular Malaysia** [9637-112]
- 9637 2P **An assessment of the impact of climate change effects on forest land cover based on satellite data** [9637-113]
- 9637 2R **Estimating canopy water content of wetland vegetation using hyperspectral and multispectral remote sensing data** [9637-115]