

EARSeL

36th EARSeL Symposium 2016

20-24 June 2016, Bonn



December 2015

No. 104

NEWSLETTER



The Newsletter is a forum for the exchange of news and views amongst the members of the Association. The opinions expressed in the Newsletter do not necessarily reflect the views of the editors, the EARSeL Bureau or other members of the Association.
Articles published in the Newsletter may be reproduced as long as the source of the article is acknowledged.

Front Cover – Landsat 7 RGB 532 composition of Bonn. University of Bonn building.

Credits: Earth Explorer, University of Bonn

Source: earthexplorer.usgs.gov, www.uni-bonn.de

EARSeL Newsletter

ISSN 0257-0521

Bulletin of the European Association of
Remote Sensing Laboratories<http://www.earsel.org>

December 2015 – Number 104

EARSeL Newsletter Editors**Konstantinos Perakis****Athanasios Moysiadis**Department of Planning and Regional Development,
University of Thessaly, Greeceperakis@uth.grmoysiadis@uth.gr

Phone: +30 24210 74465

Fax: +30 24210 74371

**Karolina Orłowska**Department of Geoinformatics and Remote Sensing
(WURSEL),

University of Warsaw, Poland

karolina.orłowska@student.uw.edu.pl**Editorial Assistance**

EARSeL Secretariat

Heide Bierbrauer

Wasserweg 147

48149 Münster (Westf.), Germany

Fax: +49 251 13307 33

secretariat@earsel.org**Newsletter Proofreading**

Dr. Samantha Lavender

slavender@pixalytics.com**Published by:**Department of Planning and Regional Development
University of Thessaly, 38334, Volos, Greece**EARSeL Annual Membership Fee**

Individual observer	330€
Laboratory/Company with fewer than 10 researchers	330€
Laboratory/Company with 10 or more members	500€

Contents

Editorial.....	5
News from EARSeL.....	6
36th EARSeL Symposium and 39th General Assembly_20 – 24 June 2016, Bonn, Germany	6
Report on the 10th International Workshop on ‘Sensors, Multi-sensor Integration, Large Volumes: New Opportunities And Challenges In Forest Fire Research’ 2-5 November 2015, Limassol, Cyprus	8
New EARSeL Members.....	13
EARSeL eProceedings	15
New Publications in Vol. 14 (1), 2015	15
Volume 14, Special Issue 1, 2015: 1st Student Workshop on Ecology and Optics of the White Sea, 2014	16
Volume 14, Special Issue 2, 2015: 9th EARSeL Imaging Spectroscopy Workshop, 2015	17
Book Releases.....	20
Forthcoming EARSeL Conferences	23
2nd Joint Workshop of the EARSeL Special Interest Group on Land Use & Land Cover and the NASA LCLUC Program	23
36th EARSeL Symposium and 39th General Assembly.....	23
European Remote Sensing - Frontiers in Earth Observation.....	23
EARSeL: Imaging Spectroscopy in environmental analyses.....	24
2nd Student Workshop on Ecology and Optics of Coastal Zones.....	24
3rd EARSeL SIG Forestry Workshop.....	25
10th EARSeL Workshop on Imaging Spectroscopy.....	25
Other Conferences.....	26
Summer Schools and Advanced Courses	28

EARSel Bureau

Chairman: Dr. Lena Halounova
Department of Mapping and Cartography
Czech Technical University in Prague
166 29 Prague 6, Czech Republic
Phone: +420 22435 4952
lena.halounova@earsel.org

Vice-Chairman: Dr. Klaus-Ulrich Komp
EFTAS Fernerkundung Technologietransfer
GmbH, Oststrasse 2 – 18, 48 145
Münster, Germany
Phone: +49 2 51 1 33 07 0
klaus.komp@eftas.com

Secretary General: Jean-Christophe Schyns
Belgian Science Policy Office (BELSPO),
Avenue Louise, 231, Louizalaan, 1050,
Brussels, Belgium
Phone: +32 2 23 83 591
schy@belspo.be

Treasurer: Dr. Bogdan Zagajewski
Remote Sensing of Environment Laboratory
Faculty of Geography and Regional Studies,
University of Warsaw
Krakowskie Przedmiescie, 30, 00-927
Warsaw, Poland
Phone: +48 22 826 83 58
bogdan@uw.edu.pl

Honorary Bureau Members

Prof. Preben Gudmandsen
Danish National Space Center
Technical University of Denmark
2800 Lyngby, Denmark
Phone: +45 45 25 37 88
prebeng@space.dtu.dk

Prof. Gottfried Konecny
Institut für Photogrammetrie und
Geoinformation
Leibniz Universität Hannover
30167 Hannover, Germany
Phone: +49 511 7622487
konecny@ipi.uni-hannover.de

EARSel Newsletter Editors

Prof. Konstantinos Perakis
Mr. Athanasios Moysiadis, MSc.
Department of Planning and Regional
Development, University of Thessaly,
38334, Volos, Greece
Phone: +30 24210 74465
perakis@uth.gr
moysiadis@uth.gr

Mrs. Karolina Orłowska
Department of Geoinformatics and Remote
Sensing (WURSEL), University of Warsaw,
00-927 Warsaw, Poland
karolina.orlowska@student.uw.edu.pl

Newsletter Proofreading

Dr. Samantha Lavender
slavender@pixalytics.com

**Springer Series on Remote Sensing
and Digital Image Processing Editor**

Dr. Anna Jarocińska
Faculty of Geography and Regional Studies,
Department of Geoinformatics, Cartography
and Remote Sensing, University of Warsaw
00-927 Warsaw, Poland
Phone: +48 22 55 21507
ajarocinska@uw.edu.pl

EARSel eProceedings Editor

Dr. Rainer Reuter
Institute of Physics
University of Oldenburg
26111 Oldenburg, Germany
Phone: +49 441 798 3522
rainer.reuter@earsel.org

EARSel Secretariat

Mrs Heide Bierbrauer
Wasserweg 147
48149 Münster (Westf.), Germany
Fax: +49 251 13307 33
secretariat@earsel.org

Editorial

Dear members,

This issue starts with the forthcoming 36th EARSeL Symposium and 39th General Assembly that will take place in Bonn, Germany, 20 – 24 June 2016. This year's Symposium is organised by the Center for Remote Sensing of Land Surfaces & Department of Geography of the University of Bonn. A report is included in this issue on the 10th International Workshop on 'Sensors, Multi-sensor Integration, Large Volumes: New Opportunities And Challenges In Forest Fire Research' that took place in Limassol, Cyprus from 2-5 November 2015.

We extend a warm welcome to the new member 'Integration- Plus Ltd. (IP)' from Ukraine and are looking forward to their active participation and contribution to EARSeL. A report on its research activities is also included.

The EARSeL eProceedings feature a wealth of new remote sensing research publications in Volume 14 (1), 2015, a Special Issue from the 1st Student Workshop on Ecology and Optics of the White Sea, and a second Special Issue from the 9th EARSeL Imaging Spectroscopy Workshop, 2015.

Book releases include three highly respected remote sensing books, among them one written by Prof. Marinko Oluić a council member of EARSeL.

A series of EARSeL SIG events is underway including the 2nd Joint Workshop of the EARSeL Special Interest Group on Land Use & Land Cover and the NASA LCLUC Program in Prague, the 36th EARSeL Symposium and 39th General Assembly in Bonn, the EARSeL: Imaging Spectroscopy in environmental analyses in Prague, the 2nd Student Workshop on Ecology and Optics of Coastal Zones in Kaliningrad, the 3rd EARSeL SIG Forestry Workshop in Krakow and the 10th EARSeL Workshop on Imaging Spectroscopy in Zurich.

A list of conferences, training courses and summer schools to attend in the near future appear towards the end of the Newsletter.

We look forward to receiving your feedback and contributions to the EARSeL Newsletter, and send our warmest wishes for a prosperous 2016.

Enjoy reading the 104th issue.

The Editors

News from EARSeL

36th EARSeL Symposium and 39th General Assembly 20 – 24 June 2016, Bonn, Germany



The 36th EARSeL Symposium 2016 is organized by the Center for Remote Sensing of Land Surfaces & Department of Geography of the University of Bonn. It will be held in 20 – 24 June 2016, Bonn, Germany.

Complementary to the regular sessions on various topics (see list below), there will be special sessions on: Cultural and Natural Heritage, Developing Countries, Education & Training, Geological Applications, Open Access / Data / Software, Earth Observation in Peace & Conflict Studies, Risk & Disaster Management, RPAS / UAV, Urban & 3D. In addition, we organize a coherent education program for Young Scientists.

The 36th EARSeL Symposium 2016 addresses the following cluster of topics:

Application Areas

- Agriculture
- Archaeology
- Biogeophysical/ Biogeochemical parameters
- Climate Change
- Land Degradation and desertification
- Developing countries
- Disaster management
- Forestry and forest fires
- Geology
- Heritage conservation
- Ice and snow
- Land use and land cover
- Oceans, coastal zones, and inland waters
- Peace & conflict studies
- SDSS and monitoring systems
- Urban areas
- Vegetation and chlorophyll fluorescence
- Water management
- Wetlands

Instruments and technology

- 3D
- Airborne
- Big data and data bases
- Hyperspectral
- LiDAR
- Multispectral
- Open Data
- Radar
- Thermal infrared
- UAV/RPAS

Methods and techniques

- Change detection
- Classification
- Data fusion

Education and Training

- School
- University
- Adult education

- Field information
- Image processing
- Mapping
- Monitoring
- Multi temporal analysis
- Modeling
- OBIA
- Validation and uncertainty analysis
- Capacity building
- Public life and Outreach
- GMES/Copernicus
- eLearning
- Webinars
- Multimedia

Important Dates:

- 1) Due date for abstract submission
15th February 2016
- 2) Notification of authors
1st March 2016
- 3) Due date for the Symposium fee payment of authors*
14th March 2016

* Early registration with reduced fees before March 14, 2016 is mandatory for authors of oral and poster contributions

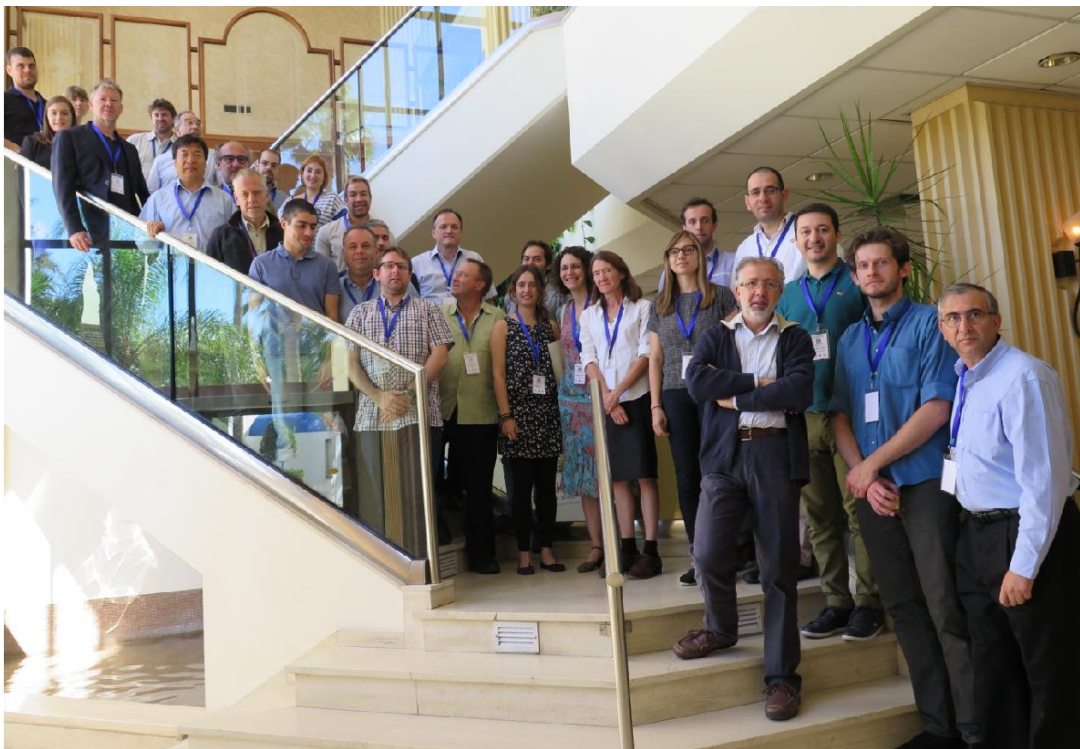
For more information, please, refer to the Symposium website at:
<http://www.earsel.org/symposia/2016-symposium-Bonn/index.php>

Report on the 10th International Workshop on 'Sensors, Multi-sensor Integration, Large Volumes: New Opportunities And Challenges In Forest Fire Research' 2-5 November 2015, Limassol, Cyprus

The 10th International Workshop on 'Sensors, Multi-Sensor Integration, Large Volumes: New Opportunities And Challenges In Forest Fire Research' was organised by the Cyprus Remote Sensing Society and the Cyprus University of Technology in collaboration with the Laboratory of Forest Management and Remote Sensing, Aristotle University of Thessaloniki.

The Limassol workshop is the most recent of a series of technical meetings that were organised by the EARSel SIG on Forest Fires after its foundation in 1995. The previous meetings were held in Alcalá de Henares (1995), Luso (1998), Paris (2001), Ghent (2003), Zaragoza (2005), Thessaloniki (2007), Matera (2009), Stresa (2011), and Coombe Abbey (2013).

The focus of the workshop was Sensors, Multi-Sensor Integration, Large Volumes: New opportunities and Challenges in Forest Fire Research. More specifically, the aim was on the use of multi-scale sensors, including UAV, drone, aircraft, helicopter, Landsat/Sentinel, MODIS/PROBA and systematic observations through Landsat WELD and Sentinel 1/2/3 to conduct research in forest fires. As a result, a good number of paper contributions were related to the pre-fire planning and management, fires in boreal forests, wildfires, burned areas, satellites and post-fire solutions.



The workshop was attended by 37 participants from 15 different countries. The majority of the participants originated from European Mediterranean countries, as well as from other European countries such as Austria, Poland, Sweden, Switzerland, and the U.K. and from non-European countries such as Lebanon, Australia, Mexico and the USA.

The main activities of the Workshop included 4 keynote lectures given by invited speakers, and 8 oral sessions. The different activities of the Workshop are presented, in more detail, below:

Keynote lectures

The invited lectures focused on the following topics:

- NASA Fire Science and Applications: Building Capacity and Understanding of Ecosystem Impacts by Vince Ambrosia (CA. State University, Monterey Bay and NASA- Ames Research Center, USA).
- Towards Prototyping a Global Landsat-8 Sentinel-2 Burned Area Product by David Roy (Geospatial Sciences Center of Excellence, Wecota Hall, South Dakota State University, USA).
- Wildfire Monitoring in the Context of the Copernicus EU Program -Status and Future Perspectives by Jesús San-Miguel-Ayán (European Commission Joint Research Centre, Italy).
- Generation and Analysis Of Global Burned Area by Emilio Chuvieco (Environmental Remote Sensing Research Group, Universidad de Alcalá, Spain).



Oral communication sessions

The oral communication sessions focused on seven topics, namely, 'Recent and ongoing Forest Fire Projects' (1st session), 'Pre-Fire Planning' (2nd session) 'Wildfires' (3rd session), 'Post Fire' (4th and 8th session), 'Pre-Fire Planning and Fire in Boreal Forests' (5th session), 'Burned Area mapping and monitoring' (6th session) and 'MODIS/MERIS Satellites' (7th session).

During the first oral communication session, three papers were presented focusing on:

- FIRESAT: Integration of dynamic and static factors for the operational monitoring of the fire risk in the Basilicata.
- PREFER project achievements.
- Earth observation measurements of selected Terrestrial Essential Climate Variables (ECVs): Design of an operational national fire risk assessment scheme – NFOFRAS.

During the second session, two papers were presented focusing on:

- Landsat, Sentinel-1 and CORINE LC data fusion for fuel model mapping in Mediterranean zone.
- Multi-level “Forest Firefighting – Management System” for an optimized operational guidance of ground and air forces in forest fire events.

During the third session, three papers were presented focusing on:

- Wildfire Video Observer network with physical and virtual sensors.
- Understanding Wildfire spatial and temporal patterns in Australia and associated hazard mapping.
- Modeling the complex interactions among wildfire, fuel treatment and hydrology.

During the fourth session, two papers were presented focusing on:

- Using remote sensing and GIS to assess carbon dioxide emissions post-fire.
- Modeling boreal forest fire return intervals with a statistical survival analysis approach.

During the fifth session, four papers were presented focusing on:

- Fuel type mapping on a national scale using object-based image analysis and Landsat 8 OLI imagery: The National Observatory of Forest Fires (NOFFi) case.
- Multispectral and ALS data combination for fuel types mapping to support forest fire prevention planning.
- Advancing Lebanon’s fire danger forecast.
- Boreal wetlands and wildfire: Conductors or barriers?

During the sixth session, four papers were presented focusing on:

- Comparison between global burned area products.
- Towards CEOS validation stage-3 for burned area validation.
- Automatic mapping of burnt areas in Mediterranean ecosystems using Landsat images.
- A stratified random sampling design in space and time for global burned area validation.

During the seventh session, three papers were presented focusing on:

- Mapping live fuel moisture content for Europe using MODIS imagery.
- MODIS-based NDVI derived index for Fire Susceptibility estimation in northern China.
- Retrieving time series of forest fires by combining MODIS and Landsat data: a case study in Chile.

Finally, during the eighth and last oral presentation session, three papers were presented focusing on:

- Photo plot interpretation of the impact of a major forest fire in Sweden.
- Investigating the effect of fire dynamics on above ground carbon storage in the Bateke landscape, Congo.

- Paleo-fires and remote sensing? – Towards an inter-satellite accuracy assessment of past and recent fires in Europe.

It should be noted that the oral communication sessions included presentations of the work as well as discussion with the authors.



Key points

At the end of the workshop the following key points were made:

- Each presentation focused on a specific topic, so the oral presentations were an opportunity to communicate the research work being conducted.
- The conclusions from the presentation were used to identify current trends and research needs; thereby, the synergy of isolated research is encouraged.
- The presentations focused on using multi-source satellite data for Burned Area (BA) mapping, fire danger forecast, and fuel mapping from global to local scales.
- The presentations also focused on the methodological challenges to validate large volume of fire data and BA products distributed through various biomes and regions.
- The workshop provided opportunities for advancing fire research with relatively new satellites, including the Sentinels, Landsat 8, and others.
- As well, the workshop provided information on how to take advantage of new programs of Copernicus.
- Finally, it is evident that community engagement in the validation of fire and BA products is a common theme throughout world.

Publications

Selected papers will be included in a special issue of MDPI Remote Sensing, which will be completed by July 2016, while abstracts of the presented lectures and papers were included in the following recently published volume:

Themistocleous K., Hadjimitsis D., Gitas I.Z, Boschetti L. (Editors) (2015) Sensors, Multi-Sensor Integration, Large Volumes: New Opportunities And Challenges In Forest Fire Research. Abstract Proceedings of the 10th International Workshop of the EARSeL Special Interest Group on Forest Fire. IBAN: 978-9963-697-15-1



New EARSeL Members

We extend a warm welcome to the new member registered with EARSeL. We are looking forward to their active participation and contribution to EARSeL, and in collaboration with other members, in this long-established network of scientific research laboratories.



Integration- Plus Ltd. (IP) is a small Ukrainian enterprise located in Kyiv that was established in 2003. IP Ltd. is specializing in the development of distributed information systems using modern information technologies based on remote sensing and geo-information systems, service-oriented architecture (SOA), Web services, and high performance computing (HPC). Experts of IP Ltd. have strong expertise in heterogeneous data processing (space-borne remote sensing data, ground measurements, modelling data), operational geoinformation products delivery, GIS, software development, training & consulting.

IP Ltd. has been involved in several research & development projects on the application of satellite data for agriculture and environmental monitoring. In particular, IP Ltd. is currently a subcontractor for two European Commission (EC) Seventh Framework Programme (FP7) projects “Stimulating Innovation for Global Monitoring of Agriculture and its Impact on the Environment in support of GEOGLAM (SIGMA)” (www.geoglam-sigma.info, (2014–2017)) and “Implementation of Multi-scale Agricultural Indicators Exploiting Sentinels (ImagineS)” (<http://fp7-imagines.eu>, (2015)). IP Ltd. is also involved into the ESA’s the Sentinel-2 for Agriculture project (2015) with providing ground data sets and developing agriculture products for Ukraine based on Copernicus services.

In the past, IP Ltd. was a subcontractor for the EC-JRC project on "Crop area estimation with satellite images in Ukraine" (2010–2011) to collect representative ground data and to provide their harmonization. IP Ltd. was involved in the development and creation of the remote environment monitoring and area control system for the nature preserve fund of Ukraine and for natural resources of Ukraine for the Ministry of Ecology and Natural Resources of Ukraine. IP Ltd. has experience in interacting with private agricultural enterprises and providing operational geoinformation services on crop state based on remote sensing images and ground observations.

Relevant publications:

1. Skakun, S., Kussul, N., Shelestov, A.Y., Lavreniuk, M., Kussul, O. (2015) “**Efficiency Assessment of Multitemporal C-Band Radarsat-2 Intensity and Landsat-8 Surface Reflectance Satellite Imagery for Crop Classification in Ukraine**”, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, DOI: 10.1109/JSTARS.2015.2454297.
2. Skakun S., Kussul N., Shelestov A., Kussul O. (2015) “**The use of satellite data for agriculture drought risk quantification in Ukraine**”, *Geomatics, Natural Hazards and Risk*, in press. (doi:10.1080/19475705.2015.1016555)

3. Skakun S., Kussul N., Shelestov A., Kussul O. (2014) **"Flood Hazard and Flood Risk Assessment Using a Time Series of Satellite Images: A Case Study in Namibia"**, *Risk Analysis*, Vol. 34, No. 8, pp. 1521–1537. (<http://dx.doi.org/10.1111/risa.12156>)
4. Gallego J., Kussul N., Skakun S., Kravchenko O., Shelestov A., and Kussul O. (2014) **"Efficiency assessment of using satellite data for crop area estimation in Ukraine"**, *International Journal of Applied Earth Observation and Geoinformation*, Vol. 29, pp. 22–30. <http://dx.doi.org/10.1016/j.jag.2013.12.013>
5. Kogan, F., Kussul, N., Adamenko, T., Skakun, S., Kravchenko O., Kryvobok O., Shelestov A., Kolotii A., Kussul O. & Lavrenyuk A. (2013) **"Winter wheat yield forecasting in Ukraine based on Earth observation, meteorological data and biophysical models"**, *International Journal of Applied Earth Observation and Geoinformation*, vol. 23, pp. 192-203. <http://dx.doi.org/10.1016/j.jag.2013.01.002>
6. Kussul N., Mandl D., Moe K., Mund J.-P., Post J., Shelestov A., Skakun S., Szarzynski J., Van Langenhove G., Handy M. (2012) **"Interoperable Infrastructure for Flood Monitoring: SensorWeb, Grid and Cloud"**, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 5, no. 6, pp. 1740-1745. (<http://dx.doi.org/10.1109/JSTARS.2012.2192417>).

Integration- Plus Ltd. (IP)

Director: Ruslan Basarab

EARSeL Representative: Andrii Shelestov

Email: andrii.shelestov@gmail.com

Zabolotnogo str. 150-A

Office 77

03680 Kyiv

Ukraine

Phone: +38 0676598479

New Publications in Vol. 14 (1), 2015

Monitoring municipal solid waste small magnitude landfill settlement with DInSAR

Pietro Milillo, Eric J. Fielding, Salvatore Masi, Paul Lundgren, and Carmine Serio

Abstract

Read full paper online: <http://www.eproceedings.org>

Municipal solid waste landfill has been suffering from well-documented, post-closure settlement over a long period of time. Settlement may lead to various undesirable phenomena such as cracks, failure of the cover system and surface ponding contamination surrounding areas and the aquifer. In this paper we highlight how differential synthetic aperture radar (SAR) Interferometry (DInSAR) is capable of monitoring landfill settlements on different spatial and temporal scales. We focus our attention on the Montegrosso-Pallareta landfill (Potenza, Italy) using COSMO-SkyMed interferometric data. Results are compared with a solid waste landfill settlement model, showing good agreement between measurements and expected deformation.

Monitoring cultural heritage environments in Svalbard: Smeerenburg, a whaling station on Amsterdam island

Alma Elizabeth Thuestad, Hans Tømmervik, Stian Andre Solbø, Stine Barlindhaug, Anne Cathrine Flyen, Elin Rose Myrvoll, and Bernt Johansen

Abstract

Read full paper online: <http://www.eproceedings.org>

Cultural environments are not static and unchanging, they are subject to a number of site transformation processes. Environmental hazards and human activity are among the primary degradation parameters for cultural heritage in Svalbard. The objective of this contribution is to demonstrate the potential advantages of utilising remote sensing for mapping and monitoring cultural heritage in a high arctic environment such as Svalbard. Our data illustrate how various factors associated to an underlying site transformation impact a cultural environment in Svalbard. Furthermore, our findings are a basis for some clues regarding the use of vegetation as a potentially suitable indicator for cultural heritage monitoring.

We utilised digital aerial photographs (NIR-R-G) and scanner data including the Vexcel Ultracam sensor (RGB-NIR), WorldView-2 satellite imagery, RGB data from an Unmanned Aerial System (UAS). Ground-based surveys included vegetation cover and species composition analysis. There were differences concerning the various sensor abilities to detect the full range of structures and objects within the cultural environment in Smeerenburg. This performance was highly dependent on image resolution, the character of the structures and objects, as well as the vegetation.

Our data provide strong indications that Smeerenburg as a cultural environment has been impacted by both environmental and anthropogenic processes linked to the site formation since 1990. Using vegetation indices NDVI and a greenness index, this study showed a decrease and damage on vegetation during the period 1990-2014. Indirectly a pressure on the cultural heritage could be detected, especially around and on the structures. The impact on the cultural environment in Smeerenburg was primarily attributed to coastal erosion, wind, sand drift, trampling and other

damage by tourists. The impact from natural hazards such as erosion and sand drift is readily apparent throughout Smeerenburg, but human activity has contributed to the cumulative impact on structures and objects. The wear and tear by tourists to the vulnerable Arctic vegetation and cultural heritage features are exacerbating an ongoing degradation of Smeerenburg as a cultural environment.

We focused on vegetation as a potential useful indicator for cultural heritage monitoring in Svalbard, and we found that data describing the state of the vegetation and the factors that impact the vegetation can provide valuable information for threat and vulnerability assessments and for assessing the state of the cultural environment as a whole.

Volume 14, Special Issue 1, 2015: 1st Student Workshop on Ecology and Optics of the White Sea, 2014

The applicability of remote sensing and geodetic methods for studying water bodies on the western White Sea coast

Natalia Frolova, Elena Krasnova, Mikhail Fatkhi, Timofey Samsonov, Alexey Sazonov, Anna Telegina, and Ekaterina Telegina

Abstract

Read full paper online: <http://www.eproceedings.org>

The article presents the results of field studies carried out by the Department of Land Hydrology, Faculty of Geography, Lomonosov Moscow State University, in the area near the White Sea Biological Station, Moscow State University (Kandalaksha Bay, White Sea) in January, June, and September 2014 and January 2015. The objects of studies were the unique lakes on the White Sea coast at different stages of their isolation and separation from the sea. Geodetic methods were applied to determine the surface elevation of modern lakes. The degree of isolation of the studied water bodies was estimated and used to identify the following types of lakes: those permanently disconnected from the sea, those having such connection periodically, and those having it permanently in the form of daily tidal influence. The decrease in seawater inflow caused by ice cover was estimated with the use of a conductivity data logger. In winter, the study area is difficult to access and to work in; therefore, remote sensing products such as GlobSnow were used to determine water storage in the snow cover yet another that affects water level and water chemistry in lakes after snow melting. It was shown that large-scale satellite data could be used for assessing the total snow water equivalent in a small area along coast zone. However snow surveys are still in need to determine the local characteristics and spatial variability of snow cover on the ice cover of lakes and lake watersheds. The ground-based observations of snow storage in winters 2010, 2014, and 2015 were compared with remote sensing data obtained by the Finnish Meteorological Institute (the GlobSnow project).

Volume 14, Special Issue 2, 2015: 9th EARSeL Imaging Spectroscopy Workshop, 2015

ARTMO's Global Sensitivity Analysis (GSA) toolbox to quantify driving variables of leaf and canopy radiative transfer models

Jochem Verrelst, Juan Pablo Rivera, and Jose Moreno

Abstract

Read full paper online: <http://www.eproceedings.org>

This contribution introduces ARTMO's new global sensitivity analysis (GSA) toolbox. With the GSA toolbox the majority of ARTMO's available radiative transfer models (RTMs) can be used for global sensitivity analysis with little user interaction. For a selected RTM output, the global sensitivity analysis identifies most influential and non-influential input variables according to Sobol' first-order and total-order indices. The toolbox can process RTM spectral outputs for any kind of optical sensor setting within the spectral range of 400-2400 nm. Multiple model outputs can be automatically analysed within the same execution, which is of interest for more advanced, multi-output RTMs such as SCOPE. To illustrate its functioning, total-order sensitivity indices results for spectral outputs of PROSPECT-4/5 (leaf) and PROSPECT+SAIL (canopy) RTMs were calculated. Wavelength-dependent key driving and non-influential input variables were identified. The toolbox can be beneficial to the broader remote sensing community to gain insight into vegetation-light interactions and RTM input-output functioning.

SYSIPHE System: A state of the art airborne hyperspectral imaging system. Initial results from the first airborne campaign

Laurent Rousset-Rouviere, Christophe Coudrain, Sophie Fabre, Yann Ferrec, Laurent Poutier, Trond Løke, Andrei Fridman, Søren Blaaberg, Ivar Baarstard, Torbjorn Skauli, and Isabelle Sisakoun

Abstract

Read full paper online: <http://www.eproceedings.org>

SYSIPHE is an airborne hyperspectral imaging system and the result of a cooperation between France (Onera and DGA – Délégation Générale de l'Armement) and Norway (NEO and FFI (Forsvarets forskningsinstitutt)). It is a unique system by its spatial sampling of 0.5 m with a 500 m swath at a ground height of 2000 m combined with its wide spectral coverage from 0.4 μm to 11.5 μm in the atmospheric transmission bands.

Its infrared component, named SIELETTERS, consists in two high étendue imaging static Fourier transform spectrometers, one for the midwave infrared and one for the longwave infrared. These two imaging spectrometers are closely similar in design, since both are made of a Michelson interferometer, a refractive imaging system, and a large infrared focal plane array (1016×440 pixels). Moreover, both are cryogenically cooled and mounted on their own stabilization platform which allows the line of sight to be controlled and recorded. These data are useful to reconstruct and to georeference the spectral image from the raw interferometric images. The visible and shortwave infrared component, named Hypspx ODIN-1024, consists of two spectrographs for VNIR (Visible and Near InfraRed) and SWIR (Short Wave InfraRed) based on transmissive gratings. The latter share a common fore-optics and a common slit to ensure perfect registration between the VNIR and the SWIR images. The spectral resolution varies from 5 nm in the visible to 6 nm in the shortwave infrared. In addition, the STAD, the postprocessing and archiving system, is developed to provide spectral reflectance and temperature products (SRT products) from calibrated georeferenced and

inter-band registered spectral images at the sensor level acquired and pre-processed by SIELETTERS and Hypsux ODIN-1024 systems.

SYSIPHE was flown for the first time in September 2013, over Cazaux, a French military airbase for experiments, and over Fauga-Mauzac in France where Onera has installed ground targets. A description of the experiment and some initial results are presented.

Multi-angle hyperspectral observations using fluorescence and PRI to detect plant stress and productivity in a cornfield

Laurent Rousset-Rouviere, Christophe Coudrain, Sophie Fabre, Yann Ferrec, Elizabeth M. Middleton, Yen-Ben Cheng, Petya E. Campbell, K. Fred Huemmerich, Lawrence A. Corp, Sergio Bernardes, Qingyuan Zhang, David R. Landis, William P. Kustas, Craig S. T. Daughtry, Joseph G. Alfieri, and Andrew L. Russ

Abstract

Read full paper online: <http://www.eproceedings.org>

The effects of seasonal water stress and nitrogen availability, which significantly impact plant productivity, can be monitored remotely using reflectance and fluorescence measurements which are commonly acquired under varying viewing and illumination geometries. During the growing seasons of 2012 and 2014, we collected canopy fluorescence, hyperspectral reflectance spectra, and biophysical measurements in corn plots established for nitrogen (N) and water augmentation within a USDA/Beltsville experimental cornfield also hosting an eddy covariance flux tower. There were four N application levels (0% N, 50% N, 100% N, 200% N) of the optimal level of 140 kg/ha, and two water availabilities (watered, not-watered) to produce eight treatment plots.

We examined the behaviour of the Solar Induced Fluorescence (SIF) and the Photochemical Reflectance Index (PRI) during morning and afternoon periods for nine days throughout the 2012 growing season, including early, vegetative, reproductive, and senescent phenological growth stages. The SIF was retrieved from high resolution spectra using the 3-wavelength Fraunhofer Line Depth method in both oxygen absorption bands associated with the two chlorophyll fluorescence peaks in the red at 687 nm and the far-red at 760 nm. PRI was calculated as a Normalized Difference Reflectance Index using two wavelengths at 531 and 570 nm.

At each collection, directional measurements were obtained for the SIFs and PRI at 15° view-zenith angle increments along the solar principal plane, in order to quantify the maximum anisotropy associated with the cornfield's bidirectional reflectance and fluorescence distribution functions. Along the solar principal plane, the maximum and minimum values at the hotspot and the coldspot, respectively, were determined and used to calculate an Anisotropy Difference Index (ANDI) as coldspot minus hotspot. We found that the various SIF values and PRI all exhibited significant anisotropy across the growing season, and these seasonal ANDI profiles differed significantly among these four observation types. Anisotropy for far-red SIF760 always exceeded that for red SIF687 ($<0.001 \text{ W}/(\text{m}^2\text{sr})$), at each phenologic stage, and was greatest in mid-season during early reproductive phases. Also at mid-season, ANDI was highest for the SIF Ratio (SIF687/SIF760) but lowest for the PRI. ANDI for SIFs was most variable for watered plots over the season. Nitrogen application rates did not significantly affect the observed anisotropy. We include examples of data acquired in 2014 for cornfield anisotropy obtained with our custom tower-mounted FUSION system, and the new FluoWat leaf clip.

Recent developments in ATCOR for atmospheric compensation and radiometric processing of imaging spectroscopy data

Daniel Schläpfer, and Rudolf Richter

AbstractRead full paper online: <http://www.eproceedings.org>

Recent developments in atmospheric compensation are summarized in this paper with emphasis on algorithms implemented in the ATCOR model. First, achievements and current limitations in haze and aerosol detection and correction as well as in BRDF correction are outlined. Secondly, correction approaches for high resolution spectral variations in the reflectance outputs are described. The inherent problem of high resolution imaging spectroscopy is that smallest spectral variations of the instrument response during data acquisition, radiative transfer model errors in atmospheric gas absorption, and errors in the employed solar irradiance spectrum lead to significant spectral variations after atmospheric compensation. Applying spectral recalibration and using air pressure dependent processing is shown to improve the comparability of the radiometrically corrected reflectance data to the ground measurements and to modelled spectra. Remaining open issues are the aerosol scattering compensation below 420 nm wavelength, the model-based BRDF correction in rugged terrain, and the correct consideration of spectral band width during processing.

Book Releases

POTRESI uzroci nastanka i posljedice s posebnim osvrtom na Hrvatsku i susjedna područja

-EARTHQUAKES Causes and Consequences with Regards to Croatia and Neighbouring Regions-

was written by **Marinko Oluić** (geo-sat@zg.t-com.hr) and published was by **Prosvjeta, Zagreb 2015**.

The book has 346 pages, numerous color illustrations and tables.

The book is a glossy full-colour monograph on this subject, which has only one disadvantage: its Croatian language, but it has very good extended summary in English. The book presents a variety of applications of remote sensing techniques for earthquake exploration: pre-earthquake exploration, immediately after the main shock and after earthquakes. That is multi disciplinary work which includes earth sciences: geology (tectonics), geophysics (seismology) and technical sciences - geodesy and civil engineering, as well as state administration for protection and rescue.

The book is divided into three parts:

- The Earth's structure and composition and its impact on seismicity.
- Earthquakes in Croatia and neighbouring countries.
- Earthquakes - after effects and how to safeguard against them.

Part one is generally devoted to tectonics and seismotectonics, particularly to plate tectonics as a major trigger of earthquakes. The Earth, as a planet, is in a state of constant changes ever since its birth; this is evidenced in natural processes such as earthquakes, tsunamis, volcanism, etc.

Approximately 5 million earthquakes of various intensities shake the Earth every year. Major earthquakes (circa 18 to 20 earthquakes) are of the magnitude $M > 7.0$, and about 100 to 200 are strong earthquakes with magnitudes of $M = 6.0 - 6.9$. Catastrophic or great earthquakes with $M > 7.9$ occur approximately once every few years. During the last decade, earthquakes and earthquake-generated tsunamis have caused more than 800,000 deaths and enormous property loss.

Most earthquakes are caused by tectonic movements in the Earth's interior which are most prominent at the plate boundaries. The majority of earthquakes in the world, over 90%, occur in one of three seismically active zones. The most active is the Circumpacific zone which has generated approximately 80% of all earthquakes in the world. The second, by intensity, is the Mediterranean-Transasian zone which has generated approximately 15% of all earthquakes, and the third is the African-Atlantic zone which has generated approximately 5 % of all earthquakes.

The Mediterranean region hosts a seismotectonically very active zone known as the Hellenic tectonic arc which stretches from Turkey, then south of Crete into the Ionian Sea. It is considered one of seismotectonically most active regions of Europe.

The eastern Adriatic Sea coast (the western Balkans) is an area of enhanced seismic activity, a subduction zone where the Adria microplate plunges beneath the Dinarides. The Adria microplate



is drifting towards the north and north-east at a rate of 4 - 5 mm per year causing the Italian coast to move closer to Croatian coast.

Part two describes the seismicity and earthquakes in Croatia and neighbouring countries which belongs to the Mediterranean-Transasiatic seismic zone. Several devastating earthquakes have occurred in this area in the past such as in Dubrovnik in 1667, Zagreb in 1880, Messina in 1908, Skopje in 1963, and Banja Luka in 1969, and on Montenegro's coast in 1979.

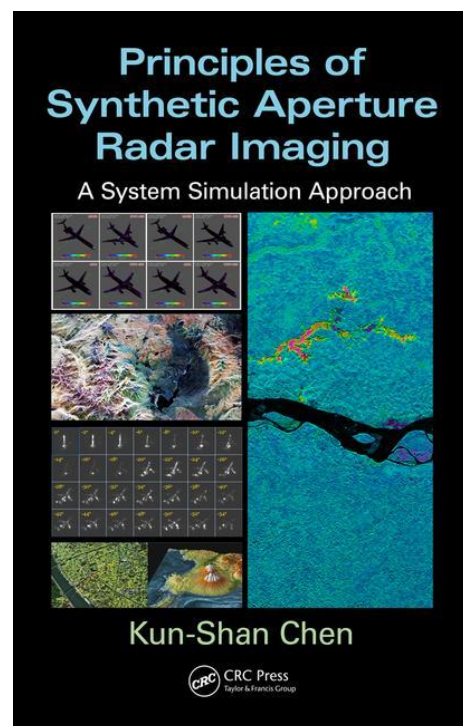
In Croatia and neighbouring countries it is possible to identify about 12 epicentral areas with increased seismic activity, which have been described in detail.

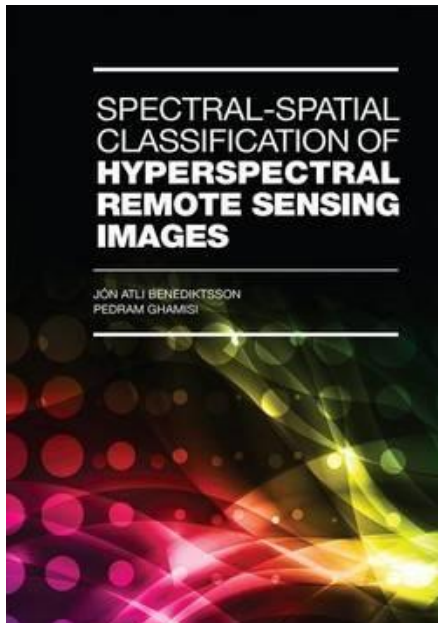
Part three describes earthquakes' after effects, but emphasized on the role of prevention work particularly of application of building codes, norms and regulations which are imposed for regulating construction works, particularly in seismically active areas (e.g. the Eurocode-8 - EC 8). An early warning system is a very important phase in disaster management. Space technologies and GIS are available for monitoring natural hazards (their spatial and temporal dynamics). These can be utilized at all stages of hazard management and mitigation and several United Nations institutions are particularly involved in the application of satellite images and GIS in early warning systems, e.g. UN-SPIDER and UNISDR.

Principles of Synthetic Aperture Radar Imaging: A System Simulation (CRC Press) by Kun-Shan Chen demonstrates the use of image simulation for SAR. It covers the various applications of SAR (including feature extraction, target classification, and change detection), provides a complete understanding of SAR principles, and illustrates the complete chain of a SAR operation.

The book places special emphasis on a ground-based SAR, but also explains space and air-borne systems. It contains chapters on signal speckle, radar-signal models, sensor-trajectory models, SAR-image focusing, platform-motion compensation, and microwave-scattering from random media.

While discussing SAR image focusing and motion compensation, it presents processing algorithms and applications that feature extraction, target classification, and change detection. It also provides samples of simulation on various scenarios, and includes simulation flowcharts and results that are detailed throughout the book.





Spectral-Spatial Classification of Hyperspectral Remote Sensing Images (ARTECH HOUSE INC) by Jon Atli Benediktsson and Pedram Ghamisi brings readers up to date on recent developments in the classification of hyperspectral images using both spectral and spatial information, including advanced statistical approaches and methods. The inclusion of spatial information to traditional approaches for hyperspectral classification has been one of the most active and relevant innovative lines of research in remote sensing during recent years.

This book gives you insight into several important challenges when performing hyperspectral image classification related to the imbalance between high dimensionality and limited availability of training samples, or the presence of mixed pixels in the data. This book also shows how to integrate spatial and spectral information in order to take advantage of the benefits that both sources of information provide.

Forthcoming EARSeL Conferences

2nd Joint Workshop of the EARSeL Special Interest Group on Land Use & Land Cover and the NASA LCLUC Program

6 – 7 May 2016, Prague, Czech Republic.

[More info](#)

Following the successful 1st EARSeL Special Interest Group on Land Use and Land Cover (SIG LU/LC) and NASA Land-Cover/Land-Use Change (LCLUC) Program joint Workshop with more than 150 participants from 4 continents, the 2nd EARSeL SIG LU/LC and NASA LCLUC joint Workshop “Advancing horizons for land cover services entering the big data era” sets the questions towards and beyond the 2020 emerging challenges.

The Workshop is organized around four representative sessions, covering the latest advances; trending activities and future challenges in land-cover services in the big data era. The four sessions are:

- Harmonization of Sentinel-2 and Landsat products
- Mapping Land Cover and Land Use with cross-scale and cross-sensors approaches
- Challenges of Land Cover and Land Use Monitoring with Dense Time Series of EO Data
- EO benefits for ecosystem services and human wellbeing

Further information can be found at: <http://web.natur.cuni.cz/gis/lucc>.

Contact: Premysl Stych, stych@natur.cuni.cz

36th EARSeL Symposium and 39th General Assembly

European Remote Sensing - Frontiers in Earth Observation

Organised by University of Bonn, Center for Remote Sensing of Land Surfaces (ZFL), Department of Geography

20 – 24 June 2016, Bonn, Germany

[More info](#)

- Due date for abstract submission is extended to 15th February 2016

Further information can be found at: <http://www.earsel.org/symposia/2016-symposium-Bonn/> and at the ‘News from EARSeL’ section.

EARSeL: Imaging Spectroscopy in environmental analyses

A Special Session within the ISPRS XXIII Congress

12 – 19 July 2016, Prague, Czech Republic.

[More info](#)

➤ Keywords:

Hyperspectral image, Imaging Spectroscopy, field spectroscopy, n-visualisation, subpixel analyses, hyperspectral mapping, feature extraction, SpS18 - GEO: Earth Observation from Global Land to Urban Systems
Keywords: global urban observation, global land cover, urban morphological data-base, sustainable cities, requirements for global mapping and validation.

Further information can be found at: <http://www.isprs2016-prague.com/program/scientific-program-sessions/special-sessions#sps17>

2nd Student Workshop on Ecology and Optics of Coastal Zones

Jointly organised by: EARSeL's Special Interest Group Education & Training, Faculty of Physics, Lomonosov Moscow State University, Russia, Institute of Physics, University of Oldenburg, Germany and the Museum of the World Ocean, Kaliningrad, Russia.

19 – 22 July 2016, Museum of the World Ocean, Kaliningrad, Russian Federation.

[More info](#)

The Workshop will be a 4-day training event for master and PhD students interested in environmental research. The programme includes:

- Plenary lectures presented by international researchers on the current use of optical methods, including in situ and remote sensing, for environmental research and monitoring.
- Individual study groups for an in-depth evaluation of selected methods of optical analysis and their relevance for an understanding of marine ecosystems, followed by presentations in plenary sessions.
- Demonstrations and practical exercises with optical instruments for environmental research in the rooms of the Museum of the World Ocean.
- Plenary presentation and discussion of results obtained in the practical programmes.
- Presentation of student projects, e.g. master and PhD theses, as oral presentations and with posters.

Further information can be found at: <http://www.earsel.org/SIG/ET/2nd-student-workshop/index.php>

3rd EARSeL SIG Forestry Workshop

Organised by the University of Agriculture in Krakow, Faculty of Forestry, Institute of Forest Resources Management

15 – 16 September 2016, Krakow, Poland

[More info](#)

Workshop topics:

- from 2D to 3D forest inventory and forest planning using digital Photogrammetry - image based stereomatching; LiDAR and Radar (ALS, TLS, MLS),
- forest change: 4D time detection of multi-temporal and multi-source information,
- forest mapping technologies using very high ground resolution and hyperspectral sensors,
- automation of data processing (e.g. GEOBIA, LiDAR point clouds classification),
- state-of-the-art remote sensing technologies: UAV-LiDAR and hyperspectral mapping, TLS, etc.,
- multi-source RS data integration,
- mapping of forest decline/degradation/disasters,
- modeling application on forest biomass,
- monitoring of protected forests, biodiversity, forest services.

Further information can be found at: <http://sigforestry2016.eu/>

10th EARSeL Workshop on Imaging Spectroscopy

2017, Zurich, Switzerland

Further information on the 10th EARSeL Workshop on Imaging Spectroscopy will be provided at the forthcoming issues of the EARSeL Newsletter.

Other Conferences



27-28 January, 2016: [SkyTech 2016](#)
London, United Kingdom



10-12 February, 2016: [EuroCOW 2016](#)
Lausanne, Switzerland



07-08 March, 2016: [EuroSDR Educational Service 2016](#)
Warsaw, Poland



15-17 March, 2016: [ESA Conference on Big Data from Space \(BiDS\)](#)
Santa Cruz de Tenerife, Spain



16-18 March, 2016: [GIS Ostrava 2016](#)
Ostrava, Czech Republic



29 March - 1 April, 2016: [Latin American Remote Sensing Week](#)
Santiago of Chile, Chile



4-7 April, 2016: [SPIE Photonics Europe 2016](#)
Brussels, Belgium



4-7 April, 2016: [SPIE Asia-Pacific Remote Sensing](#)
New Delhi, India



4-8 April, 2016: [RSCy2016 - Fourth International Conference on Remote Sensing and Geo-information of Environment](#)
Paphos, Cyprus



17-22 April, 2016: [European Geosciences Union - General Assembly 2016 and Mapping, Monitoring & Modelling of Vegetation Characteristics using Earth Observation](#)
Vienna, Austria



20-22 April, 2016: [Interexpo GEO-Siberia- 2016 with ISPRS Working Group IV/2 Workshop Global Geospatial Information and High Resolution Global Land Cover/Land Use Mapping](#)
Novosibirsk, Russia



28-29 April, 2016: [GISTAM 2016 2nd International Conference on Geographical Information Systems Theory, Applications and Management](#)
Rome, Italy



2–6 May, 2016: [IEEE Radar Conference](#)
Philadelphia, United States



6-7 May, 2016: [6th EARSel SIG LU/LC & 2nd EARSel LULC/NASA LCLUC Workshop](#)
Prague, Czech Republic



9-13 May, 2016: [European Space Agency Living Planet Symposium](#)
Prague, Czech Republic



10-12 May, 2016: [International Radar Symposium \(IRS\)](#)
Cracow, Poland



10-13 May, 2016: [Earth Observation and Cryosphere Science](#)
Prague, Czech Republic



24-25 May, 2016: [GEO Business 2016](#)
London, United Kingdom



13-17 June, 2016: [6th INTERNATIONAL CONFERENCE ON CARTOGRAPHY & GIS & Seminar with EU cooperation on Early Warning and Disaster / Crisis Management](#)
Albena Resort, Bulgaria



20-24 June, 2016: [36th EARSel Symposium](#)
Bonn, Germany



21-24 June, 2016: [9th NASA Direct Readout Conference](#)
Valladolid, Spain



28 June - 07 July, 2016: [16th International Multidisciplinary Scientific GeoConference & EXPO SGEM2016](#)
Albena Resort, Bulgaria



4-6 July, 2016: [EORSA 2016 - The Fourth International Workshop on Earth Observation and Remote Sensing Applications](#)
Guangzhou, China



July 12-19, 2016 [XXIII ISPRS Congress and EARSel: Imaging Spectroscopy in environmental analyses.](#)
Prague, Czech Republic

Summer Schools and Advanced Courses



Remote Sensing for Wind Energy

30 May - 3 June 2016, Varna, Bulgaria

Registration deadline: **2 May 2016**



SPLIT Remote Sensing Summer School 2016

6-10 June 2016, CIHEAM/Mediterranean Agronomic Institute of Chania, Chania, Greece

Registration deadline: **1 June 2016**



8th International Summer School on Radar / SAR

15-22 July 2016, Haus Humboldtstein, Remagen-Rolandseck near Bonn, Germany

Registration deadline: **22 March 2016**



2nd Student Workshop on Ecology and Optics of Coastal Zones

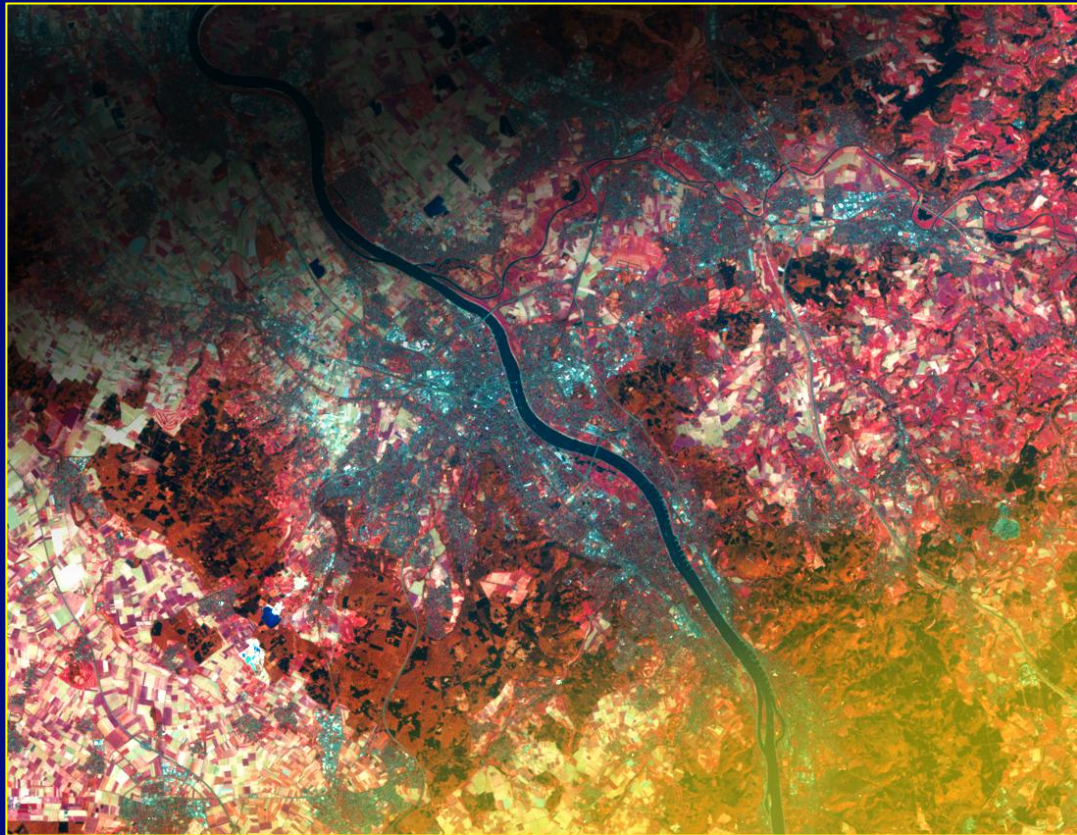
19-23 July 2016, Museum of the World Ocean, Kaliningrad, Russia

Registration deadline: **1 April 2016**

Back Cover – Landsat 7 RGB 532 composition of Bonn.

Credits: Earth Explorer

Source: earthexplorer.usgs.gov



EARSeL Sponsoring Agencies:



Council of Europe



European Space Agency

Information concerning EARSeL activities can be obtained from the

EARSeL Secretariat
Wasserweg 147 48149 Münster
(Westf.), Germany
Fax: +49 251 13307 33
E-mail: secretariat@earsel.org
[Http://www.earsel.org](http://www.earsel.org)