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Frontiers of Earth Observations



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NEWSLETTER



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Editorial

Dear members,

This issue starts with a report on the EARSeL Bureau activities during the last two years followed by a report on 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.

The 'National Reports' section includes the Annual Report on the Remote Sensing Activities in Croatia, for the year 2015.

The EARSeL eProceedings feature two new remote sensing research publications, one in Volume 14, Special Issue 2, 2015: 9th EARSeL Imaging Spectroscopy Workshop, 2015 and one in New Publications in Vol. 15 (1), 2016.

Book releases include two highly respected books, dedicated to 'Spatial Data Mining' and 'Vegetation Dynamics: A Synthesis of Plant Ecophysiology, Remote Sensing and Modelling'.

A series of EARSeL SIG events is underway including 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!

Enjoy reading the 105th issue.

The Editors

News from EARSeL

Report on the Bureau activities during the last two years



Dear EARSeL members,

As you can see on this newsletter and on our website, the Council members shall elect the 4 members of the new EARSeL Bureau during the next Symposium held in Bonn next June.

We think it's the good moment to summarize the work done mainly by the 4 members of the Bureau in close collaboration with the EARSeL Secretariat, EARSeL editors and EARSeL Council members. Please find here a list of the achievements realized during the last two years since the establishment of the current Bureau:

- To better valorise the publications of EARSeL members, **EARSeL eProceedings is evaluated by the SCOPUS** and an agreement that established **the European Journal of Remote Sensing (EuJRS) as an official co-journal of EARSeL** was signed in Stockholm in June 2015. The main result (amongst others) is the fact that special (thematic) issues of the EuJRS on subjects proposed by EARSeL (or related to EARSeL major conferences) can be released. This agreement will give a better visibility and a better attractiveness to the EARSeL publications. It is the first time EARSeL offers free of charge possibility of publishing open-access papers in a Journal with IF (which is on the JCR list).
- EARSeL logo is present on the European Journal of Remote Sensing publications.
- **The next issue of the newsletter** will be available in a new digital format and on-line. This new design, with new functionalities, will soon be available on mobile devices.
- Bureau continues publishing and covering costs of the EARSeL Book Series (with the Springer).
- For more transparency, the Bureau set a new procedure which establishes that **the SIG chairpersons are now elected** by the EARSeL Council for a 4 years period (first election organized during the Council meeting of last January). These elections were also the opportunity to put in place a new SIG dedicated to UAVs. According to the procedure there are clear guidelines describing what is expected from the SIG chairs.
- The Bureau supervises also **the activities of the SIGs** and a document compiling the main tasks of the chairperson will be available online soon.
- EARSeL is more opened for young generation offering them attractive registration fees and (in parallel to main events) Young Scientist Days, as a set of highly specialised courses in a cooperation with ESA, European universities, ISPRS and private main players in the remote sensing market (Warsaw's, Bonn's and Kraków's Young Scientist Days).
- **New Conference management tool.** This new system is more modern and avoids complicated manipulations for registration and submission of contributions by the participants (scan of documents) and by the Symposium or workshop organizers. Participants have now a useful set of tools for registration, submission of contributions, checking program, order of extra services, etc. Organisers of EARSeL events have a good management system for the entire event organization: financial control, invoicing, reviewing of contributions according to pre-defined standards, which is fully under the organizer's control.

- **New website.** The idea is to have an integrated website of all EARSeL activities (main web page, SIGs, conference). It is more attractive, respecting the current standards and regularly updated. It will also contain a database with all information about previous events, publications... You will have the opportunity to visit this website from June.
- The current Bureau take also care that **each Country representative is well elected** by the EARSeL members of its country for a mandate of 4 years. This position is important because the Country representatives are voting members of the Council that have the mandate to approve the budget, to elect the members of the Bureau, and the SIG chairpersons.
- To make the annual Symposium more attractive it was decided **to incorporate the workshops (previously associated to this major event) under the shape of sessions dedicated to a specific topic.** This integration makes the registration and the administrative and financial management easier for organizers and participants.
- To facilitate the organization of an EARSeL event, each **organizer receives (in an early stage) guidelines and a MoU is also later signed with EARSeL.** The tasks and duties of both parties are therefore defined since the beginning to minimize the risk of budget problem and possible misunderstanding.
- The EARSeL Bureau and Secretary prepared an update of the database of all EARSeL members.
- The previous changes that are impacting the functioning of the association are also integrated in an updated version of the **EARSeL statutes** to be released after the next symposium.
- The number of active EARSeL members is increasing, and the financial situation of EARSeL is stable.
- The Bureau prepared new/or updated version of documents important for all EARSeL members:
 - EARSeL Statutes,
 - Statutes Appendix 1. Guidelines for the Organisation of EARSeL events,
 - Statutes Appendix 2. EARSeL SIG chairperson election process.

We hope you appreciate the measures listed here and we would like to ensure you we did our possible to make EARSeL more professional, more attractive and in line with the basics of the association.

All these efforts were done on a voluntary base by:

Lena Halounova	EARSeL Chairperson
Klaus Komp	EARSeL Vice-chairperson
Bogdan Zagajewski	EARSeL Treasurer
Jean-Christophe Schyns	EARSeL Secretary General
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Heide Bierbrauer	EARSeL Secretary

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



36th EARSeL Symposium 2016

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

June 20-24, 2016, Bonn, Germany

More info

<http://www.earsel.org/symposia/2016-symposium-Bonn>



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The 36th EARSel Symposium is organised by University of Bonn's Center for Remote Sensing of Land Surfaces (ZFL) and Department of Geography and will be in Bonn from 20 to 24 June 2016.

Preliminary Program

The Preliminary Program is now available at

<http://www.earsel.org/symposia/2016-symposium-Bonn/programme.php>

Contributions

- 127 submissions for oral presentations
- 32 poster contributions
- reviewed by 53 scientific committee members

SIG Sessions

- Agriculture
- COPERNICUS program (in cooperation with DLR)
- Developing Countries
- Earth Observation for Disaster Risk Management (in cooperation with UN-SPIDER)
- Earth Observation in Peace & Conflict Studies (in cooperation with BICC)
- Education & Training
- Forestry
- Geological Applications
- Imaging Spectroscopy
- Image Processing
- Land Degradation
- Land Use & Land Cover
- Land Ice & Snow
- SAR
- Temporal Analysis
- Thermal Remote Sensing
- UAV, UAS & RPAS
- Urban & 3D
- Wetland Monitoring

Keynotes

Prof. Dr. Stefan Dech	Director of the German Remote Sensing Data Center (DFD) Professor and Chair for Remote Sensing at the University of Würzburg	<i>'Challenges of Earth Observation for Global Change Monitoring'</i>
Prof. Dr. Reinhold Ewald	Association of Space Explorers (ASE) University of Stuttgart Institute of Space Systems	<i>'Citizens of Space - Stewards of Earth'</i>
Prof. Dr. Luis Guanter	Head of Section 1.4: Remote Sensing German Research Centre for Geosciences (GFZ) Scientific PI of the EnMAP hy-	<i>'Recent advances in global vegetation monitoring through the remote sensing of chlorophyll fluorescence'</i>

	perspectral mission	
Prof. Dr. Matthew Hansen	Department of Geographical Sciences University of Maryland	<i>'Advancing global land cover mapping and monitoring'</i>
Dr. Bianca Hoersch	Sentinel-2 Mission Manager ESA's European Space Research Institute (ESRIN)	<i>'The Copernicus Programme - a game changer in Earth Observation'</i>
Dr. Barbara J. Ryan	Secretariat Director Intergovernmental Group on Earth Observations (GEO), Geneva, Switzerland	<i>'International Collaboration for Integrated Earth Observations - Challenges and Opportunities'</i>
Prof. Dr. John Shi	Head of Department of Land Surveying and Geo-Informatics Hong Kong Polytechnic University	<i>'Towards reliable change detection based on satellite images'</i>
Dr. William L. Stefanov	Program Scientist for Earth Observation NASA Associate International Space Station (ISS) Program	<i>'The International Space Station: A Unique Platform for Earth Observations'</i>

Social Events

City Hall Reception

All conference participants are cordially invited by the City of Bonn for an Ice Breaker Reception on June 20 at the historical City Hall of Bonn taking place in the Gobelinsaal.



Symposium Dinner

The symposium dinner will be held on board the famous 'Moby Dick' cruising the River Rhine along the picturesque scene of the fairytale Siebengebirge (June 23, 55 Euro).

**Young Scientist Days**

All young PhD and MSc. students involved or interested in the field of the geoinformatics, remote sensing, and photogrammetry are warmly invited to participate. The meeting is focused on an international integration of young researches, getting to know new colleagues and to participate in interesting courses and training plus gain experience as oral and poster presenters.

Bogdan Zagajewski bzagajew@uw.edu.pl

Venue

The 36th EARSeL Symposium will be hosted at the Gustav-Stresemann-Institut (GSI) in Bonn (Bundesviertel):

Gustav-Stresemann-Institut e.V.
Europäische Tagungs- und Bildungsstätte
Langer Grabenweg 68
Bonn
Germany



Register here:

<http://www.earsel.org/symposia/2016-symposium-Bonn/registration.php>

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National Reports

Remote Sensing Activities in Croatia, 2015

The Executive Committee of the Council for Remote Sensing met twice to discuss current issues. European Commission had organized the European Space Expo in Zagreb in June 2015, with workshops where the Faculty of Geodesy took active part. Prof. Christopher B. Field and his co-worker, the oceanographer Catharine Mach, from the International Panel for Climate Change (IPCC) held the lecture on the global warming issues at the Department of Geophysics of the Faculty of Science in Zagreb. The remaining activity is presented in the section reports below.

Marijan Herak, president of the Council

Geodesy

Faculty of Geodesy, University of Zagreb, continued in teaching the courses related to remote sensing. The research in the field of remote sensing at the Faculty in 2015 was related to the complex needs of the FOP Project *Toolbox Implementation for Removal of Anti-personnel Mines and UXO Submunitions* (TIRAMISU) which ended on 31 December 2015, as well as to the terrestrial trial hyperspectral surveying of vines in the area of Jadrtovac near Šibenik. The report on the work done on the project in the past 4 years was submitted to the Commission. Hyperspectral surveying of vines in the area Jadrtovac was conducted upon invitation and in cooperation with the colleagues from the Faculty of Agriculture, University of Zagreb, in order to monitor the passage of moisture through the plant. It is planned to continue this cooperation in 2016.

Publications

- A. Krtalić, I. Racetin, (2015) Confidence of indicators of mine presence, The 12th International Symposium "HUMANITARIAN DEMINING 2015", Book of papers, Pavković, Nikola (ur.). Zagreb : HCR-CTRO d.o.o., 2015. 189-192.
- I. Racetin, A. Krtalić, (2015) Semi-Automated Detection and Extraction of Unexploded Ordnances using Object Base Image Analysis Approach, The 12th International Symposium "HUMANITARIAN DEMINING 2015", Book of papers, Pavković, Nikola (ur.). Zagreb: HCR-CTRO d.o.o., 2015. 209-2013.
- A. Krtalić (2015) Spatial Data Collected by Remote Sensing in Dangerous and Inaccessible Areas, Zbornik radova sa 1st International Interdisciplinary Scientific Conference, Global Environment, Stakeholders' Profile and Corporate Governance in Geodesy, in preparation.

Andrija Krtalić

Geology and Geophysics

Activities of this section which included usage of different types of methods of remote sensing were divided in several areas of interest. Some are described in the following document: (i) PhD thesis research was finished on the Faculty of Mining, Geology and Petroleum Engineering by L. Podolszki in the field of "Stereoscopic analysis of landslides and landslide susceptibility on the southern slopes of the Medvednica mt". (ii) expert lecture with field trip about "Landslides and landslide inventory development by usage of the methods of remote sensing" was held for the teachers from the field of Geology, Mining, Petroleum Engineering

and Chemical Technology and for the teachers from the field of Civil Engineering and Geodesy; (iii) project proposal "Landslide susceptibility in urbanized areas of Croatia" was prepared and applied for within a call from European Social Fund and although the project has passed the evaluation, it was not funded; similarly (iv) a project proposal "GeoTwin" was prepared and submitted within a Horizon 2020 programme call and although the project has passed the evaluation, funds were not granted. Within the project "Detailed engineering geological map of Podsljeme urbanized area in scale of M 1:5.000 - Phase II" which is going on, methods of remote sensing are used in landslide research for the purposes of urban planning in the area of the city of Zagreb.

Laszlo Podolszki

Hydrometeorology

Satellite meteorology

1. Participation of DHMZ representatives in EUMETSAT delegate body meetings.
 2. Participation in annual EUMETSAT conference in Toulouse, France, where DHMZ presented one oral presentation and one poster. Representatives of EUMETSAT NWC SAF consortium expressed interest in the presentation on validation of NWC SAF precipitation products which lead to the agreement on further research and the invitation for the visiting scientist engagement at AEMET in Madrid, Spain.
 3. EUMETSAT "Training Placement" activity successfully finished in November 2015. Satellite products for nowcasting were introduced in the operational activities and since the beginning of 2015 a new DVB-S2 satellite reception system with two receiving sites (Zagreb and Split) has been fully operational.
2. Project EUMeTrain continued with DHMZ as consortium member. All developed CAL modules, presentation recordings and case studies are available at the project homepage <http://eumetrain.org>.

Radar meteorology

1. Participation in EUMETNET OPERA project
2. Access to radar data from Žarkovica near Dubrovnik became operational, data used in operational activities.

Lightning measurements

1. Operational use of lightning data from LINET lightning detection network and global ATD network.
2. Preliminary climatology of lightning strikes for Central Europe for 2008-2012 5-years period published at the ECSS 2015 conference in Wiener Neustadt, Austria.

Nataša Strelec Mahović

Vegetation, agriculture and forestry

Research on forest health conditions based on satellite images interpretation from different time periods were continued in 2015 as planned. Possible application of remote sensing methods for estimating forest damage caused by natural disasters was tested in Gorski Kotar region. WorldView 2 satellite image was ordered for a part of Gorski Kotar, which was then used for visual and digital interpretation and analysis of damage (proportions/intensity),

spatial distribution and relief characteristics (altitude, inclination and exposure) influence on forest condition.

Landsat 8 satellite images, from two shooting periods (before and after the ice break), were also used for Gorski Kotar region. Normalized difference vegetation indices (NDVI) were calculated from these images. Relation between NDVI and damaged areas and vegetation index trends before and after the ice break were also determined. Conducted research resulted in an objective insight on forest damage state (database) and provided theme maps for spatial distribution of damage, digital terrain model (DTM), digital orthophoto of the research area and the results of environmental factors GIS analysis.

Renata Pernar & Ante Seletković

Oceanography

During 2015, the work on several multi-year monitoring projects has continued, and the work began on the project MARIPLAN of the Croatian Science Foundation. The collection of oceanographic data was conducted as a part of the monitoring in the frame of Croatian waters and long-term project of the Institute's so called "Small production". TIEMS-a (*The International Emergency Management Society*) workshop „Oil & Gas Harvesting: Benefits, Threats and Challenges” was held in Split, 27-28 May 2015, where Mira Morović gave invited lecture entitled „Monitoring of oil spills in the Adriatic Sea”.

In October 2015, Dr. Andrei Ivanov and Dr. Nadezda Terleeva, both from the Shirshov Institute of Oceanology of the Russian Academy of Sciences, visited the Institute of Oceanography and Fisheries, with whom we continued work on the project in cooperation with ESA (no. 19234, PI Prof. Dr. Marinko Oluić, GeoSat), and on joint publication for *Acta Adriatica*. Mira Morović participated in Macerata, Italy, 12 to 13 November 2015, at the International conference on "Governance of the Adriatic-Ionian marine region", where she held invited lecture entitled "Possible oil pollution in the Adriatic Sea".

We continued to collect new satellite data of chlorophyll (NASA), which will be used in future comparison with the in-situ data.

Publications

Ninčević-Gladan, Živana; Bužančić, Mia; Kušpilić, Grozdan; Grbec, Branka; Matijević, Slavica; Skejić, Sanda; Marasović, Ivona; Morović, Mira. The response of phytoplankton community to anthropogenic pressure gradient in the coastal waters of the eastern Adriatic Sea. *Ecological indicators*. 56 (2015); 106-115. doi:10.1016/j.ecolind.2015.03.018

Sanda Skejić, Ivica Vilibić, Slavica Matijević, Slaven Jozić, Živana Ninčević Gladan, Mira Morović, Ivona Marasović and Heliodor Prelesnik. Long-term regulating mechanisms of phytoplankton biomass in a traditional shell-fish aquaculture area. *Fresenius environmental bulletin*. 24 (2015), 9; 3001-3013.

Kovač, Žarko; Platt, Trevor; Sathyendranath, Shubha; Morović, Mira; Jackson, Thomas. 2015. Recovery of photosynthesis parameters from in situ profiles of phytoplankton production. *Ices journal of marine science*. doi = {10.1093/icesjms/fsv204}

Mira Morović, Andrei Ivanov, Marinko Oluić, Žarko Kovač and Nadezda Terleeva. 2015. Oil spills distribution in the Middle and Southern Adriatic Sea as a result of intensive ship traffic. *Acta Adriatica*. 56(2): 145 – 156.

Section for Archaeology and Historical Heritage

Aerial survey was conducted as part of the protection of the archaeological heritage of the Ministry of Culture "Aerial archaeology Osijek-Baranja County". Aerial archaeological surveys in two sessions on June and November captured a series of new sites in eastern Slavonia. Apart from the new sites, known sites were also captured. Sites were spotted either as soil marks, crop marks or shadow marks. Imagery from oblique aerial shots was completed with the analysis of vertical aerial imagery from cyclic survey by the State Geodetic Administration from ARKOD and Geoportal, as well as Google Earth, Bing maps. Preliminary view of the pottery has confirmed that the sites cover almost all archaeological periods, but mostly Neolithic and the Middle Ages.

The project entitled "Archaeological Topography of the Island of Rab" utilized both SGA shots and web browsers. The data about possible archaeologically interesting locations collected in this way were subsequently verified on site. These data, along with those gathered using other archaeological methods, were then used in the development of the GIS database in collaboration with the Conservation Department in Rijeka which will be available on the website of 15. 12. 2015. The survey using aerial photography was also carried out in the areas of Bjelovar- Bilogora and Koprivnica- Križevci County.

Publications

- B. Šiljeg, H. Kalafatić, Aerial archaeology in eastern Slavonia in 2014, *Annales Instituti Archaeologici XI/2015.*, 135-141.
- G. Lipovac Vrkljan, A. Konestra, Project Archaeological topography of the Island of Rab – results of field survey in the City of Rab area in 2014 and exhibition Archaeological topography: a journey through the history of Lopar, *Annales Instituti Archaeologici XI/2015.*, 128-132.
- I. Ožanić Roguljić, H. Kalafatić, B. Šiljeg, E. Zavodny, Decreasing significance – from Iapodian center to small Roman town, *EAA, 21st Annual Meeting in Glasgow (2-5 September 2015)*.
- B. Šiljeg, H. Kalafatić, T. Hršak, Circles in the Rye: Neolithic „Twin“ Enclosures on the South of Carpathian Basin, Croatia, *EAA, 21st Annual Meeting in Glasgow (2-5 September 2015)*.
- B. Šiljeg, H. Kalafatić, Not just circles, but „twin“ circles – combine usage of satellite imagery, different aerial photography to interpret landscape phenomena in the Neolithic in Eastern Croatia, *The Aerial Archaeology Research Group (AARG) 2015, Annual Conference in Santiago de Compostela*.

Bartul Šiljeg

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Croatian EARSeL Representative

EARSeL eProceedings



New Publications in Vol. 15 (1), 2016

Monitoring post-fire forest recovery using multi-temporal Digital Surface Models generated from different platforms

Irene Aicardi, Matteo Garbarino, Andrea Lingua, Emanuele Lingua, Raffaella Marzano, and Marco Piras

Abstract

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

Wildfires can greatly affect forest dynamics. Given the alteration of fire regimes foreseen globally due to climate and land use changes, greater attention should be devoted to prevention and restoration activities. Concerning in particular post-fire restoration actions, it is fundamental, together with a better understanding of ecological processes resulting from the disturbance, to define techniques and protocols for long-term monitoring of burned areas. This paper presents the results of a study conducted within an area affected by a stand-replacing crown fire (Verrayes, Aosta (AO), Italy) in 2005, which is part of a long-term monitoring research on post-fire restoration dynamics. We performed a change detection analysis through a time sequence (2008-2015) of DSMs (Digital Surface Models) obtained from LiDAR (ALS - Airborne Laser Scanner) and digital images (UAV - Unmanned Aerial Vehicle flight) to test the ability of the systems (platform + sensor) to identify the ongoing processes. New technologies providing high-resolution information and new devices (i.e. UAV) able to acquire geographic data "on demand" demonstrated great potential for monitoring post disturbance recovery dynamics of vegetation.

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

Feature-based tree species classification using hyperspectral and Lidar data in the Bavarian Forest National Park

Carolin Sommer, Stefanie Holzwarth, Uta Heiden, Marco Heurich, Jörg Müller, and Wolfram Mauser

Abstract

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

The Bavarian Forest National Park, established in 1970, is a unique area of forests with large non-intervention zones, which promote a large-scale rewilding process with low human interference. Thus, the National Park authority is particularly interested in investigating the structure and dynamics of the forest ecosystems within the park. However, conventional forest inventories are time-consuming and not able to fully record the heterogeneity of natural forests.

Our goal is to develop advanced techniques for tree species mapping based on hyperspectral remote sensing in combination with other remote sensing and in situ measurements that meet the demands of the National Park. This approach needs to be adapted to the heterogeneous appearance of the forest.

This work aims at building a model transferable to an area-wide mapping of tree species based on the needs of the Bavarian Forest National Park. It reveals the requirements for tree species mapping

and shows which spectral/spatial features and data combinations generate the best results within a Random Forest modelling approach.

The study is based on airborne hyperspectral data acquired with the HySpex VNIR-1600 sensor (160 spectral bands, 400-990 nm, 1.6 m spatial resolution). Additional full waveform LiDAR data, including a Digital Surface Model, Digital Terrain Model and a Digital Canopy Height Model, were available for the analysis. Individual tree crowns as well as clusters of tree crowns from 13 different tree species were located and identified during a field survey. The field-demarcated tree canopies were used as reference data for creating the feature database.

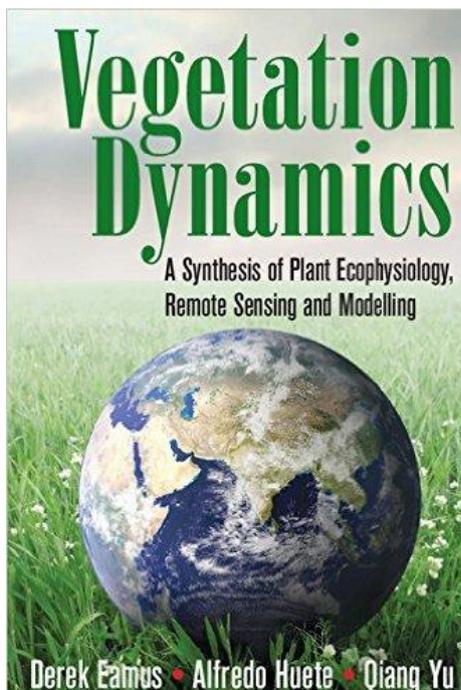
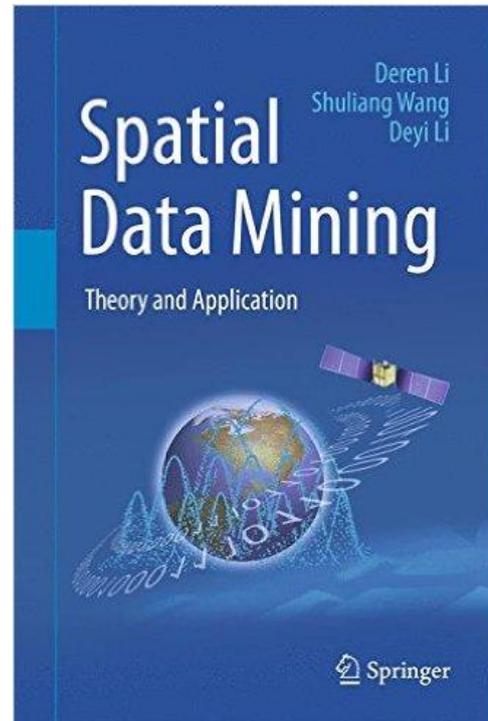
Several preprocessing steps including atmospheric correction, spectral and spatial polishing, bidirectional reflectance distribution function (BRDF) effect correction as well as ortho-rectification of the hyperspectral imagery were conducted before the analysis. A band selection procedure based on principal component analysis, band correlation, and band variance was performed to identify the most appropriate spectral bands for species discrimination, resulting in a set of 53 spectral bands. Seven different combinations of hyperspectral, structural and terrain-specific parameters contained in the feature database were investigated in a Random Forest Modelling approach to ascertain which variables enhance the overall classification accuracy. A classification model using all available parameters in the feature database yielded an overall accuracy that is 17 percentage points higher (94%) compared to using only the preselected spectral bands (77%). For most of the 13 tree species, the final classification model achieved individual class accuracies of more than 90%.

The study showed that a tree species feature database consisting of hyperspectral signatures and relatively simple LiDAR derived features has high potential for a forest inventory based on remote sensing. A model transferable to an area-wide mapping of tree species based on the needs of the Bavarian Forest National Park was established.

Book Releases

Spatial Data Mining by Deren Li, Shuliang Wang and Deyi Li is an updated version of a well-received book previously published in Chinese by Science Press of China (the first edition in 2006 and the second in 2013). It offers a systematic and practical overview of spatial data mining, which combines computer science and geo-spatial information science, allowing each field to profit from the knowledge and techniques of the other. To address the spatiotemporal specialties of spatial data, the authors introduce the key concepts and algorithms of the data field, cloud model, mining view, and Deren Li methods. The data field method captures the interactions between spatial objects by diffusing the data contribution from a universe of samples to a universe of population, thereby bridging the gap between the data model and the recognition model. The cloud model is a qualitative method that utilizes quantitative numerical characters to bridge the gap between pure data and linguistic concepts. The mining view method discriminates the different requirements by using scale, hierarchy, and granularity in order to uncover the anisotropy of spatial data mining.

The Deren Li method performs data preprocessing to prepare it for further knowledge discovery by selecting a weight for iteration in order to clean the observed spatial data as much as possible. In addition to the essential algorithms and techniques, the book provides application examples of spatial data mining in geographic information science and remote sensing. The practical projects include spatiotemporal video data mining for protecting public security, serial image mining on nighttime lights for assessing the severity of the Syrian Crisis, and the applications in the government project 'the Belt and Road Initiatives'.



Vegetation Dynamics: A Synthesis of Plant Ecophysiology, Remote Sensing and Modelling Understanding ecosystem structure and function requires familiarity with the techniques, knowledge and concepts of the three disciplines of plant physiology, remote sensing and modelling. This is the first textbook to provide the fundamentals of these three domains in a single volume. It then applies cross-disciplinary insights to multiple case studies in vegetation and landscape science. A key feature of these case studies is an examination of relationships among climate, vegetation structure and vegetation function, to address fundamental research questions. This book is for advanced students and researchers who need to understand and apply knowledge from the disciplines of plant physiology, remote sensing and modelling. It allows readers to integrate and synthesise knowledge to produce a holistic understanding of the structure, function and behaviour of forests, woodlands and grasslands. Published by Cambridge University Press.

Forthcoming EARSeL Conferences

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](#)

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 database, 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

-  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

-  12-13 April, 2016: NGDM 2016 New Geotechnologies for Disaster Management
Prague, Czech Republic

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

-  18-20 April, 2016: ISPRS WG IV-3: Advances in global DEMs and Tools for assessing their quality, useability and interoperability
Taipei, Taiwan

-  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
-  28-29 June, 2016: [Small Unmanned Aerial Systems for Environmental Research](#)
Worcester, United Kingdom
-  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
-  12-19 July, 2016: [XXIII ISPRS Congress and EARSeL: Imaging Spectroscopy in environmental analyses](#)
Prague, Czech Republic
-  12-22 July, 2016: [2nd Student Workshop on Ecology and Optics of Coastal Zones](#)
Kaliningrad, Russia
-  30 July - 7 August, 2016: [41st Scientific Assembly of the Committee on Space Research \(COSPAR 2016\)](#)
Istanbul, Turkey
-  21-24 August, 2016: [8th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing \(WHISPERS\)](#)
Los Angeles, United States



24-26 August, 2016: [FOSS4G conference 2016](#)
Bonn, Germany



14-16 August, 2016: [6th GEOBIA - Solutions & Synergies](#)
Enschede, The Netherlands



15-16 September, 2016: [3rd EARSel SIG Forestry Workshop](#).
Cracow, Poland



22-23 September, 2016 [2nd Virtual Geoscience Conference](#)
Bergen, Norway



22-23 September, 2016 [GeoTirol 2016](#)
Innsbruck, Austria



26-29 September, 2016: [SPIE Remote Sensing 2016 in Edinburgh](#)
Edinburgh, United Kingdom



29-30 September, 2016: [EUROGEO 2016: Geographic Information: for a better world.](#)
Malaga, Spain

Summer Schools and Advanced Courses



International Summer School on Mobile Mapping Technology 2016
4-8 May 2016, Hanoi, Vietnam

Registration deadline: **20 April 2016**



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**



ISPRS TC VI 2016 GeoInformatics Summer School
19-30 June 2016 Wuhan, China

Registration deadline: **25 April 2015**



Natural resource management: from data processing to web publishing
5 - 11 July 2016, Telč, Czech Republic

Registration deadline: **20 April 2016**



8th International Summer School on Radar / SAR
15-22 July 2016, Haus Humboldtstein, Remagen-Rolandseck near Bonn, Germany

Registration deadline: registration closed.



2nd Student Workshop on Ecology and Optics of Coastal Zones
19-23 July 2016, Museum of the World Ocean, Kaliningrad, Russia

Registration deadline: registration closed.



ESA Earth Observation Summer School: Earth System Monitor and Modeling
01-12 August, 2016, ESA ESRIIN, Frascati, Italy

Registration deadline: **6 May 2016**

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