IUSS Bulletin

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2015-2024 International Decade of Soils

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International Union of Soil Sciences (IUSS)

The IUSS Bulletin is the official Newsletter of the International Union of Soil Sciences.
It is freely distributed through the IUSS website.
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Report from the IUSS Secretariat

IUSS Secretariat

In addition to running the Secretariat on a day-to-day basis including regular updating of the website and compiling the monthly Alerts, in the second half of 2016, the Secretariat was busy organizing the Presidential Elections and the election of new Honorary Members, which took place during the IUSS Inter-Congress Meeting in Rio de Janeiro, which the Secretariat helped prepare, organize and document.

Following the International Year of Soils 2015, the International Decade of Soils (2015-2024) was proclaimed by Rainer Horn, IUSS President. The end of the International Decade of Soils will coincide with the centennial anniversary of the International Union of Soil Sciences.
The Secretariat has lent its support to related activities and will continue to report on activities and achievements through its various communication channels. For details please see the relevant section of this Bulletin.

IUSS Presidential elections 2016

The election of the next President of the IUSS was due this year. The appointment of the President represents a total of six years commitment to the Union by serving two years each as President-Elect (2017/18), President (2019/20) and Past-President (2021/22). The call for nominations was published in a separate Alert on 16 March 2016. Full documentation is available on the IUSS website.
Read more:
http://www.iuss.org/index.php?article_id=582

The nomination period for the Presidential elections closed May 31. The two nominated candidates, Professor Alex McBratney (Australia) and Professor Takashi Kosaki (Japan), were accepted by the Presidential Election Committee. The Council (National Soil Science Societies in good financial standing with IUSS, Executive Committee members and 3 Honorary Members) cast their vote by the closing date 15 September 2016. The result of the election was presented to the President and Executive Committee and subsequently announced to members by email and on the IUSS website: Takashi Kosaki received the majority of the votes. He will take up the position of President-Elect on 1st January, 2017. IUSS was very pleased to have two very good candidates and to have a contested election.
With the turn of the year, current IUSS President Prof. Rainer Horn will become past president. He will be succeeded by Prof. Rattan Lal, who will take over as IUSS President.

Election of IUSS Honorary Members 2016

This year saw the election of 13 new IUSS Honorary Members: I. P. Abrol (India), Jaume Bech (Spain), Maria Gerasimova (Russia), Martin H. Gerzabek (Austria), Mary Beth Kirkham (USA), Josef Kozak (Czech Republic), Stephen Nortcliff (United Kingdom), Marcello Pagliai (Italy), Piotr Sklodowski (Poland), Karl Stahr (Germany), Roger Swift (Australia), Tengiz F. Urushadze (Georgia) and Jae Yang (Korea). The Secretariat extends its congratulations.

National Soil Science Societies were requested to submit their country's nomination for Honorary Members to the IUSS. In line with the IUSS Bye-laws, nominations had to be submitted to the IUSS Secretariat *iuss@umweltbundesamt.at* by 19 May 2016. Later submissions were not considered.
According to the IUSS Statutes Honorary Members are elected by Council, and shall be living at the time of election. They must be scientists of great distinction in Soil Science and have made substantial contributions to ISSS/IUSS. The number of Honorary Members that can be elected every four years at the Intercongress meeting will be determined by the merit of the candidates but shall not exceed 15. Voting takes place at the InterCongress Meeting as defined in Bye-Laws 5.1h. The nominations for Honorary Membership are made with supporting documentation as defined in the Bye-Laws 5.1 h (for details please see below).
According to the IUSS By-laws, item 5.1 h) Honorary Members as defined in Statute B7 are nominated by any Full Member and supporting documentation was sent to the Secretary 6 months before the Inter-Congress meeting of the Council. The material was not to

exceed 2 pages and to show the background of the individual and his or her service to the IUSS and the impact that this person has had internationally on soil science. A total of 20 nominations were distributed to the Council members three months before the Inter-Congress meeting. Elections took place by secret ballot among Council members present for the Inter-Congress meeting in Rio de Janeiro on 24 November 2016. Council members were allowed to vote only for candidates they considered to have the requirements of a Honorary Member of the Union. Successful candidates had to receive more votes than a number equivalent to half of the number of eligible voting members attending the Council Meeting. The results are announced in the present Bulletin (see above). The IUSS President sent a letter to the nominators of the elected Honorary Members. The new honorary members will be recognized with a certificate at the next World Congress of Soil Science, which will take place in Rio de Janeiro, 12-18 August 2018.

IUSS Inter-Congress Meeting

The 2016 Inter-Congress Meeting took place in Rio de Janeiro, Brazil, Sunday 20 - Friday 25 November 2016. This meeting comprised a Council meeting, Division meetings, a One-Day symposium related to the theme of the WCSS 2018 'Soil science: beyond food and fuel' and a meeting of the Executive Committee. The Secretariat provided support to the general organization of this event and the development of the detailed programme as well as the detailed documents for the event.

In the course of this meeting, the Executive Council took the decision to allocate the IUSS Working Groups to Divisions in order to give them an organizational home.

In addition to the existing working groups, proposals for 4 new working groups were discussed and accepted by the IUSS Council: the **Working Group Critical Zone System**, which evolved from the Hydropedology Working Group to better reflect its activities, the **Working Group Cultural Patterns of Soil Understanding,** the **Working Group Global Soil Map** and the **Working Group Soil Modeling Consortium**.

According to the IUSS Statutes, Point E7, the Division Chairs will report to the Executive Committee biannually on the performance of Working Groups. Based on these evaluations, a recommendation will be made to the Council concerning the status and activities of each Working Group and whether it should be maintained or terminated.

The Working Group Global Soil Change was closed down, since there was no obvious activity and no activity reports provided.

The table below presents an overview of the IUSS Working Groups following the InterCongress Meeting 2016 (new working groups *in italics*):

IUSS WG	Division 1	Division 2	Division 3	Division 4
Acid Sulfate Soils			x	
Cryosols	x			
Digital Soil Mapping	x			
Digital Soil Morphometrics	x			
Forest Soils			x	
Global Soil Change			closed down	
Heritage Soils				x
Critical Zone System		x		
Land Degradation			x	
Modelling of Soil and Landscape Evolution			x	
Paddy Soils			x	
Proximal Soil Sensing	x			
Soil Information Standards	x			
Soil Monitoring	x			
Soils of Urban, Industrial, Traffic, Mining and Military Areas (SUITMA)			x	
Universal Soil Classification	x			
World Reference Base	x			
Cultural Patterns of Soil Understanding				x
Global Soil Map	x			
Soil Modeling Consortium		x		

The minutes of the Council meeting and the Executive Committee meeting during the Inter-Congress meeting will follow in the next Bulletin.

IUSS website

The main tasks of the webmaster during the last six months were adding new information to the website (e.g. new events, news), implementing alert news into the content management system and sending out the alerts, further creating new contents eg for the International Decade of Soils and programming it backend, and finally, keeping information of IUSS members updated.

Following a request from Jai-Joung Kim, Honorary Member of IUSS and Professor Emeritus of Chungbuk National University, South Korea, first names of Honorary Members were fully spelled out from 2002 onwards to avoid any possibility of a mix up of names.

IUSS Notice of Non-discrimination

Based on the ICSU (International Council for Science) Statement on Freedom in the Conduct of Science, the International Union of Soil Sciences (IUSS) supports the Principle of Universality (freedom and responsibility) of Science: the free and responsible practice of science is fundamental to scientific advancement and human and environmental well-being. Such practice, in all its aspects, requires freedom of movement, association, expression and communication for scientists, as well as equitable access to data, information, and other resources for research. It requires responsibility at all levels to carry out and communicate scientific work with integrity, respect, fairness, trustworthiness, and transparency, recognising its benefits and possible harms.

In advocating the free and responsible practice of science, IUSS promotes equitable opportunities for access to science and its benefits, and opposes discrimination on the basis of race, color, ethnicity, national origin, sex (including sexual harassment and sexual violence), sexual orientation, gender identity, religion, age, ancestry, disability, genetic information, military status, or veteran status, in its programs and activities as required by applicable laws and regulations.

Should any acts of discrimination come to your attention, do not hesitate to contact the IUSS Secretariat at *iuss@umweltbundesamt.at*.

IUSS Stimulus Fund, Revised June 2016

IUSS has established an annual Stimulus Fund to support suitable activities within the Commissions and Working Groups. Where appropriate, the Fund will also support other activities to assist the development of Soil Science generally but particularly in regions of the world where lack of resources limit opportunities.

IUSS has set aside a sum of $12,500 annually to help fund these activities, but this funding may be increased if the quality of applications is particularly high. The normal maximum award will be $2,500, but larger awards may be considered.

The initial application process requires a short written proposal of no more than 500 words plus a budget indicating how the funds awarded are to be spent. There are two submission dates for applications each year: 15 March and 15 September. Applications should be sent to:
iuss@umweltbundesamt.at

The funds can be used for a wide range of activities; the principal aims are the promotion and development of Soil Science. Activities might include the support of meetings, assistance with travel, website development, travel matching funds and any other soil science-related undertaking that stimulates work of a Commission or Working Group. Where funds for meetings or travel are requested, monies from the IUSS Stimulus Fund will normally be used to match funds raised locally. The relation between IUSS money and local funds will depend on the local economic circumstances.

In addition to the activities outlined above, some funds will be allocated to undertake specific projects identified by the Executive Committee, particularly projects which contribute to fulfilling the objectives of the International Decade of Soils. In these instances a project description will be provided and interested parties will be required to submit a proposal to carry out the project. The financial arrangements for these projects will be negotiated as part of the selection process.

The IUSS Executive Committee shall evaluate all proposals and make recommendations to the President. Final approval will be given by the IUSS President or delegate within one month after the submission dates given above. Because of the

strict auditing regime that IUSS operates under, full accounting of all expenditure must be provided to the Treasurer. All expenditure must be accompanied by appropriate receipts. Under normal circumstances approximately 50 % of the allocated funds will be paid in advance, with the balance paid on receipt of a summary of expenditure with accompanying receipts. These conditions may be varied at the discretion of the President.

On completion of the activity a full financial statement with invoices/receipts for all expenses must be submitted to the Executive Committee within 2 months of the completion of the project. Simultaneously, a short (minimum 500 words) report of the activity must be presented for inclusion in the IUSS Bulletin.

In 2016 USD 9,000 of the available funds (USD 12,500) has been allocated, and used for a wide range of activities. Financial support has been granted to support 3 fellowships to attend the 15th International Conference on Soil Micromorphology (Mexico city, Nov 27-Dec 5 2016); the 5th International Soil Classification Congress and Field Workshop (South Africa, 1-7 December 2016); an updated application for mobile phones for classifying soils in World Reference Base for Soil Resources and the 1st World Conference on Soil and Water Conservation (CONSOWA), 12-16 June 2017 in Lleida (Spain).
A short (500-1000 words) report of the activity for which the funds were received, must be presented for inclusion in the IUSS Bulletin within 2 months of completion.

Outlook
In 2017, there will again be 2 submission dates for applications: 15 March and 15 September. Applications should be sent to *iuss@umweltbundesamt.at*.

Participation in ICSU calls

The Secretariat elaborated proposals for IUSS to participate as supporting partner in three ICSU grants. IUSS has declared its readiness to participate in the following proposed projects: iMAGe: MApping Geoscience Unions to the 2030 Agenda and the Sustainable Development Goals (lead applicant 1: ISPRS); TROP-ICSU-: Trans-disciplinary Research Oriented Pedagogy for Improving Climate Studies and Understanding (lead applicant: IUBS); Global Understanding for Sustainability (GUS), lead applicant: IGU. The decision about the Grant proposals is expected for the first quarter of the year 2017.

IUSS booth at EGU 2017 General Assembly in Vienna

At the EGU General Assembly in Vienna from April 23-28, 2017, the IUSS will again have a booth at the venue. A medium-sized booth at the main level was reserved which will be shared with the Brazilian, British and Italian Soil Science Society. This offers the opportunity to present the IUSS to approx. 12,000 geoscientists from all over the world. The Secretariat will support the presentation of the IUSS at the venue. Furthermore, together with other organisations dealing with soil, IUSS is organising the session 'The contribution of the Soil Science Societies to scientific knowledge, education and sustainability' in the programme 'SSS1 – History, Education and Society of Soil Science, Taxonomy' of the Division SSS – Soil System Sciences. Contributions demonstrating good examples of capacity building, soil awareness and knowledge transfer to different target groups are welcome. In particular contributions that show new educational approaches, cooperation with other disciplines and efforts to improve sustainability are of interest. The call for abstracts is open until 11 January 2017.
Read more: *http://egu2017.eu/home.html*

Report of Division 1: 'Soils in Space and Time'

By Erika Micheli, Division Chair

Division 1 focuses on soils as part of a changing environment. It coordinates and harmonizes research activities on observation, genesis, classification and mapping of the soils and landscapes, as well as communicating results to the soil science community, soil users and to the general public.

IUSS Division 1 Soils in Space and Time consists of 6 Commissions and several working groups:

- Commission 1.1 – Soil Morphology and Micromorphology
- Commission 1.2 – Soil Geography
- Commission 1.3 – Soil Genesis
- Commission 1.4 – Soil Classification
- Commission 1.5 – Pedometrics
- Commission 1.6 – Paleopedology

Working Groups: Cryosols, Digital Soil Mapping, Digital Soil Morphometrics, Proximal Soil Sensing, Soil Information Standards, Soil Monitoring, Universal Soil Classification, World Reference Base for Soil Resources.

Structure and officers:
Chair: Erika Michéli / Hungary
1st Vice Chairperson: Lucia dos Anjos / Brazil
2nd Vice Chairperson: Ademir Fontana / Brazil

IUSS Division 1 2015-2016 report

During 2015, the International Year of Soil, the priority of the division was to organize visible celebration events, perform educational activities for young people and awareness raising events for the general public, and get the "key soil messages" out from the soil science community.

Divisional activities:
International Field Course and Soil Judging Contest, 1-5 September in Hungary
(120 participant, 28 countries, 16 teams; detailed report sent, and attached)
Homepage still running: *http://soiljudging-iys2015.com/*

The African meeting of the International Year of Soil – organized with in Soil Science Society of East Africa. Subtitle: Soils and land use for climate smart agriculture,, 23-27 November 2015, Morogoro, Tanzania
(100 participants, 9 countries; report will be prepared)

Expedition to the Olduvai Gorge – the cradle of mankind (pay respect and celebrate the IYS, taking soil monolith) 27 November-2 December 2015 (**IUSS ,** Kenyatta University, Kenya, Sokoine University, Tanzania, Szent István Univesity, Hungary) (detailed report will be prepared)

Division supports:
Contribution to Commission 1 newsletters
Contribution to Young scientists participation in Commission 6 event, 2015.
Contribution of 2 officers (Commission 6 and WG WRB) in IYS event, Vienna
Contribution to the Webster Medal
Contribution the International Field Course and Soil Judging Contest, 2015
Contribution to the Expedition to the Olduvai Gorge – the cradle of mankind, 2015
Contribution to the WRB classification key application development, 2016

Commission 1.1: Soil Morphology and Micromorphology

Chair: Rosa Poch / Spain
Vice Chair: Richard J. Heck / Canada

The commission is circulating regular Newsletters: *http://loess.umcs.lublin.pl/micro_pliki/Page421.htm*

Events organized:
INTENSIVE TRAINING COURSE ON SOIL MICROMORPHOLOGY
Zagreb, 17 August-28 August, 2015
Archaeological Soil Micromorphology Workshop
Dalrymple WASM: Department of Chemical and Geological Sciences of Cagliari University. 5-8 June, 2015
Developing International Geoarchaeology, DIG2015: Sassari University, Department of Architecture and Design in Alghero, 9-12 June, 2015
Micromorfología de suelos: herramientas teórico-prácticas y aplicaciones a problemas geoarqueológicos (3-day intensive course) 16 - 18 March, 2016 , Centro Universitario de la Región Este, Sede Rocha, Uruguay

Course on soil mineralogy and micromorphology. 1st-12th August, 2016. Post Graduate School ¨Alberto Soriano¨, Faculty of Agronomy, University of Buenos Aires (Argentina).
Micromorphology course with special attention to tropical, arid and volcanic soils and paleosols (lectures in Spanish-III Curso Latinoamericano de Micromorfología de Suelos). November 21-25, 2016
15th International Conference on Soil Micromorphology. Universidad Nacional Autónoma de México (UNAM). Colegio de Postgraduados. With mid-and post-conference field trips Mexico city, November 27-December 5 2016

Award of the Commission:
Young Micromorphologist Publication Award 2016 recipients: Vincent Felde and Mareike Stahlschmidt

Publications
G. Stoops, J.C. Loaiza, R.M. Poch, M. Casamitjana (Eds) 2016. Micromorfología de suelos y técnicas complementarias. Fondo Editorial Pascual Bravo, Colombia. ISBN 978-958-58510-3-0
The Sociedad Latinoamericana de la Ciencia del Suelo has awarded the "Premio Andrés Aguilar Santelices In Memoriam" (2016) to this book, presented by the Sociedad Colombiana de Ciencia del Suelo. This award has been presented during the XXI Congreso Latinoamericano de Ciencia del Suelo in Quito, Ecuador (24-28 Oct 2016).
The Comission submitted proposals for the 18th WCSS

Commission 1.2: Soil Geography

Chair: Thomas Scholten / Germany
Vice Chair: Angel Faz Cano / Spain

The Commission 1.2 Soil Geography participated in several events such as SUSTAIN, SOM, WRB, RAISIN, DBG, presented research results on soil geographic topics and supported the organisation of congresses. In particular, a jont session on soil quality and soil conservation was held during the European Geosciences Union General Assembly (EGU) 2016 organized by the European Society for Soil Conservation (ESSC).
The commission further started to prepare an own session for the EGU 2017 in Vienna and the session on the World Congress of Soil Science (WCSS) 2018 in Brazil entitled 'The geography of soils in a changing world'. With this very broad title, we aim to bring together scientists both from the different regions of the world and all kinds of disciplines in soil science involved in research on the dynamics of spatial changes in the geography of soils at large and to exchange research findings and discuss future concepts of soil geography in general. The specific topic 'scaling of soil information' has been discussed widely on several occasions and seems of high interest to many soil scientists, so being more a cross-cutting topic than a specific topic of the Commission 1.2 Soil Geography.
The group of Prof. Scholten and Dr. Peter Kühn (University of Tübingen, Germany) started soil research on Antartica together with soil scientists from the Technical University of Munich (TUM) and the German Research Centre for Geosciences (GFZ Potsdam). During a 41 day expedition to James Ross Island a large number of soil samples were collected. The project asks about the interaction between biotic and abiotic processes in polar environments and integrates microbial and pedogenic research. Another initiative of the Commission 1.2 Soil Geography aims on 4D Soil Geography (Soils under Climate Change). In Germany, a first meeting on that topic was held at the Environmental Research Centre (UFZ) in Leipzig/Halle initiated by Dr. Horst Gerke under the auspices of the German Soil Science Society (DBG).
Other small business concentrated on a new mailing list and, preparation of EGU 2017, WCSS 2018 and the participation of the chair in conferences and meetings. Cooperation with the GlobalSoilMap.net, ISRIC.

Commission 1.3: Soil Genesis

Chair: Teruo Higashi / Japan
Vice Chair: Nikolay Khitrov / Russia

No report received
The Commission submitted proposals for the 18th WCSS.

Commission 1.4: Soil Classification

Chair: John Galbraith / USA
Vice Chair: Augusto Zanella / Italy
The Comission has a home page:
https://sites.google.com/a/vt.edu/iuss1-4_soil_classification/
Major event: **5th Conference for Soil Classification** - South Africa Dec.1-7, 2016

Award of the Commission:
Guy Smith Award (handed in every year)

Activities mostly under the WG WRB and the WG Universal Soil Classification.

Commission 1.5: Pedometrics

Chair: Budiman Minasny / Australia
Vice Chair: Lin Yang / China

The commission is circulating regular Newsletters *http://pedometrics.org/*
The Commission is organizing biennial conference (Pedometrics Conference) which showcases innovative research on the mathematical spatial and temporal modelling of soil. Meetings are also organized in the form of symposia in larger conferences such as EGU, AGU, and Eurosoil.

Major events 2015-16:
Pedometrics Conference 2015 (Cordoba, Spain, 14-18/9/2015) (next in 2017)
WG Digital Soil Mapping has its conference in Aarhus, 27 June - 1 July 2016 in Aarhus, Denmark.

Awards of the Commission:
The Richard Webster medal
The Margaret Oliver Award for Early-Career Pedometricians (new!)
Best paper in pedometrics

Publications:
Geoderma Special Issue on Advances in DSM

The Commission submitted proposals for the 18th WCSS

Commission 1.6: Palaeopedology

Chair: Daniela Sauer / Germany
Vice Chair: Sergey Sedov / Mexico

Major events organized
Dan Yaalon Symposium in Vienna, Austria, 8–11 April 2015
EGU in Vienna, Austria, 12–17 April 2015, Session: Soil as a Record of the Past: Landscape evolution by natural and cultural processes
INQUA Congress in Nagoya, Japan, 26 July-2 August, 2015, 3 Sessions organized by the commission
Workshop "Soils and Paleosols of Brazil", Campinas, São Paulo State, Brazil, 23-29 Aug 2015
5th International School on Paleopedology in in Ust-Kamenka village, 70 km from Novosibirsk, Siberia, 23–28 Aug 2015 (Organizers: Maria Dergacheva, Alexander Makeev)
International conference "SOILS OF COLD AREAS: GENESIS, GEOGRAPHY, ECOLOGY", dedicated to the 100th anniversary of Oleg V. Makeev, Ulan-Ude, Russia, August 31-September 9, 2015 (Organizers: Nimazhap B. Badmaev and team)
6th International Geochronology Summer School "Dating Anthropogenic and Natural Changes in a Fragile Alpine Environment" 30 August-04 September 2015 in Bergün, Switzerland (Organizers: M. Egli, H. Gärtner, P. Cherubini, S. Ivy-Ochs, D. Dahms)
„Soils as a Record of the Past"17-22 April: EGU in Vienna: Organisation of six sessions in the program group SSS3
7th International Geochronology Summer School in Switzerland 4-9 Sep, 2016: **International Conference on Soil Micromorphology** in Mexico City, one full-day session „Micro-paleopedology" Nov - 5 Dec 2016
"Paleosols and polygenetic soils" Session at Eurosoil in Istanbul16-21 October: **Workshop and fieldtrip: „THE ROUTE OF HUMBOLDT** 6-13 December 2016"

Newly proposed award of the Commission: Dan Yaalon Young Scientist Medal

The Commission submitted proposals for the 18th WCSS

Working Groups of the Division

Cryosols
Chair: Megan Balks / New Zealand
Vice Chairs: Dimitry Konyushkov/ Russia and Sebastian Zubrzycki/ Germany

Digital Soil Mapping
Chair: Laura Poggio/ UK
Vice Chair: Luboš Borůvka/ **/** Czech Republic

Digital Soil Morphometrics
Chair: Alfred Hartemink / USA

Proximal Soil Sensing
Chair: Professor Zhou SHI / China
Vice-Chair: Dr Craig LOBSEY / Australia

Soil Information Standards
Chair: Peter Wilson / Australia
Vice Chair: Rainer Baritz / Germany

Soil Monitoring
Chair: Dominique Arrouays/ France
Vice Chair: Ben Marchant / UK

Universal Soil Classification System
Chair: Jon Hempel / USA, Australia
Vice Chair: Luca Montanarella / EU-JRC, Italy

World Reference Base
Chair: Peter Schad / Germany
Vice Chair: Cornie Van Huyssteen

New: Global Soil Map

Symposia for WCSS 2018 proposed by the Division 1, Commissions and WGs:

Div 1. Level, Comm., WG	Title of Symposium	Organisers/Proposed Conveners
Inter-Divisional	Pedodiversity and biodiversity	Alex McBratney, Budiman Minasny (University of Sydney) Ellen Kandeler, University of Hohenheim)
Inter-Divisional	Functional Land Management - managing soils from ped to planet	Rachel Creamer (Wageningen Univ) Maria Victoria Ramos Ballester (USP, Brasil)
Joint C.1.1, C1.6	How to use (micro-) morphology for deciphering under which environments palaeosols and polygenetic soils formed?	Dr. Daniela Sauer, Institute of Geography, University of Göttingen, Germany Dr. Michele Francis, Dr. Sergey Sedov, UNAM, Mexico City, Mexico
C1.1.	Using soil morphology and micromorphology indicators of soil health	Iñigo Virto (Universidad Pública de Navarra, Spain)
C1.1.	Structural Indicators of Soil Quality using X-ray Computed Tomography	Richard J Heck, University of Guelph
C.1.2	The geography of soils in a changing world	Thomas Scholten, University of Tübingen Angel Faz Cano, Universidad Politécnica de Cartagena
C.1.3.	Soil pedogenesis and diversity in extreme environments	N. Khitrov, Vice-chair (Dokuchaev Soil Science Institute) Prof. Dr. Sergey V. Goryachkin Prof. Dr. Carlos Schaefer, Brazil (Provisional)
C.1.3.	Soil-forming processes and their transformation under human impact	N. Khitrov, Vice-chair (Dokuchaev Soil Science Institute) Prof. Dr. Lucia Anjos, Brazil, (provisional)
C.1.4	2 WG proposals	
C1.5.	Global soil carbon modeling	Lin Yang, Institute of Geographical Sciences and Resources Research, Chinese Academy of Sciences Leigh Winowiecki, International Center for Tropical Agriculture, (CIAT), Kenya
C.1.5.	Reconciling pedometrics and pedology	Budiman Minasny, The University of Sydney Erika Micheli, Szent Istvan University, Hungary, Lin Yang, Institute of Geographical Sciences and Resources Research, China
C.1.5. + WGs	Crucial techniques for the critical zone: Soil Morphometrics, Monitoring & Modelling	Peter Finke, Ghent University, Belgium. Alfred Hartemink, UW-Madison, Madison, WI, USA
C.1.6.	Human-environment interactions recorded in soils and palaeosols	Dr. Elizabeth Solleiro, UNAM, Mexico Dr. Alexander Makeev, MSU-RAS Moscow, Russia Dr. Daniela Sauer, University of Göttingen, Germany
C1.6.	Soil memory: Proxies for deciphering records of past environmental conditions in soils and palaeosols	Dr. Michal Jankowski, Nicolaus Copernicus University, Toruń, Poland, Maria Bronnikova, Russian Academy of Sciences, Moscow
WG Cryosols	Cryosols: progress in understanding the dynamic soils of colder regions	Dr Megan Balks, New Zealand Dr Dimitry Konyushkov, Russia

Div 1. Level, Comm., WG	Title of Symposium	Organisers/Proposed Conveners
WG WRB	Soil Classification – a tool for detecting soil genesis, creating soil maps and deriving soil functions. Experiences with the third edition of WRB and other soil classification systems	Peter Schad (TUM, Germany), Cornie van Huyssteen (UFS, ZA)
WG Digital Soil Mapping	Progress in Digital Soil Mapping	Mogens Humlekrog Greve Section (Aarhus University, Denmark)
WG Digital Soil Morphometrics	Soil imaging and image analysis at multiple scales	Matt Aitkenhead, James Hutton Institute, UK., Alfred Hartemink, University of Wisconsin, USA, Markus Steffens, Technical University of Munich, Germany
WG Acid Sulfate Soils	Acid sulfate soils: processes, assessment and management	Leigh Sullivan, University Drive
WG Universal Soil Class	Progress for the Development of a Universal Soil Classification System	Jon Hempel USDA Natural Resources Conservation Service, Retired

Proposal for new Dan Yaalon medal (accepted during Division meeting on 22 November 2016)

The Dan Yaalon Young Scientist Medal

An award by the International Union Of Soil Sciences
Division 1: Soils in Space and Time
and
Commission 4.5: History, philosophy and sociology of soil science

Background

The award honours Dan Hardy Yaalon (1924-2014), a professor of soil science at the Hebrew University of Jerusalem. Dan H. Yaalon had 57 years of an exceptional research career. He contributed to some of the most fundamental issues of soils in space and time as well as theory and history of soil science. In particular, he made some of the most significant contributions in pedology and palaeopedology, especially regarding arid and Mediterranean landscapes. Highlights of his scientific impact were his research on the effect of dust on soil formation as well as his work in the fields of anthropo-pedology and environmental reconstruction. Yet Dan H. Yaalon was also an intellectual who contributed greatly to the history of soil science, its philosophy and sociology. He was also engaged in archaeology, as he attributed much importance to the interface between human beings and their natural environment. His unequalled contributions to the disciplines of basic soil research and the history of soil science have earned him the honour of being the only scientist who was recognized both by the Dokuchaev Medal from the IUSS (2010), and the Sarton Medal from the University of Ghent (2000). Dan H. Yaalon was a modest and open-minded person, straightforward and full of creative ideas. His inspiring personality and works have influenced many and will surely continue doing so for generations to come.

Criteria for the selection of nominees for the Dan Yaalon Young Scientist Medal

A nominee should have the following qualifications:

- be a researcher in his/hers early scientific career, i.e., PhD student or postdoc researcher within the first 5 years after PhD graduation and,
- be an active member of a national soil science society and/or the International Union of Soil Science and,
- have published in at least one of the following fields: Soil morphology and micromorphology, soil geography, soil genesis, soil classification, pedometrics, palaeopedology, history of soil science, philosophy of soil science, sociology of soil science, and
- either have made a significant contribution that advanced the fields of soil science as presented above, or compiled a body of work that has advanced the science, success, methodology, or use of the above fields.

The medal is not awarded posthumously.

Current officers of IUSS Divisions, Commissions and Working Groups cannot be nominated.

Periodicity of nomination

The Dan Yaalon Young Scientist Medal is awarded once every four years at the World Soil Congress.

Nomination procedure

The call for nominations is distributed by the Commission officers not later than **twelve months** before the suggested date of award of the Medal via IUSS Alerts and all involved Commissions' and Working Groups' Newsletters and e-mail lists. The nominees may be proposed by institutions, societies, commissions and working groups of the IUSS, and by individuals. Self-nomination is not encouraged.

The proposal for nomination should include a short justification, including the main steps of the scientific career of the nominee, his/her main scientific publications and the major contribution to the development of one or more of the following fields: Soil morphology and micromorphology, soil geography, soil genesis, soil classification, pedometrics, palaeopedology, history of soil science, philosophy of soil science, sociology of soil science.

The deadline for nominations ends at least **nine months** before the date of award of the medal.

The decision will be made at least **six months** before the date of award of the medal.

Dan Yaalon Young Scientist Medal Award Committee

The Dan Yaalon Young Scientist Medal Award Committee is a standing committee invited by the current officers of IUSS Division 1 'Soils in Space and Time', and Commission 4.5 'History, Philosophy, and Sociology of Soil Science'. Its task is to select outstanding individuals among the candidates for being awarded the Dan Yaalon Young Scientist Medal.

The Committee includes three members representing Division 1 and one member representing commission 4.5. The committee is headed by a chair person. The service of the Award Committee Members has no strict time limitation. If a member of the Committee is planning to resign his/her service, he/she should inform the officers of Division 1 and Commission 4.5 in due time, to allow for his/her timely replacement.

The responsibility of the Committee Chair is to receive nominations and, after discussion and voting on the candidatures, to announce the decision to the Division 1 and Commission 4.5 officers. The Chair of Division 1 has priority to hand over the Medal to the nominee. If he/she cannot do it personally, the responsibility may be passed to a member of the Award Committee.

The following scientists (in alphabetic order) are proposed as members of the Award Committee:

- Eric Brevik
- Danny Itkin
- Rosa Poch
- Daniela Sauer
- Karl Stahr

Working Group Cryosols

Prepared by Sebastian Zubrzycki, Dimitry Knoyushkov and Megan Balks.

The Cryosol Working Group of the IUSS serves to promote communication among members of the Cryosol research community.

Current Officers:

Co-chairs:

- Dimitry Konyushkov, Dokuchaev Soil Science Institute, Russian Academy of Agricultural Sciences, Moscow, Russia (*dkonyushkov@yandex.ru*) and
- Sebastian Zubrzycki, Institute of Soil Science, Universität Hamburg, Germany (*sebastian.zubrzycki@uni-hamburg.de*)

A steering committee:

- Megan Balks, New Zealand (immediate past co-chair) (*megan.balks@waikato.ac.nz*)
- Alexey Lupachev, Russia (*a.lupachev@gmail.com*),
- Dimitry Kaverin, Russia (*dkav@mail.ru*),
- Alevtina Evgrafova, Germany (*alevtina.evgrafova@gmail.com*) and
- Marcus Phillips, Canada (*marcusphillips@cmail.carlton.ca*)

We currently have 133 members on our mail list.

Activities over 2014-16

Business meetings held:

2014: Jeju, Korea, in association with the IUSS conference.

2016: Potsdam, Germany in association with the Eleventh International Conference on Permafrost

International Year of Soils 2015 Cryosol Calendar:

- Megan Balks thanked everyone for their contributions to the success of the International Year of Soils 2015 Cryosol Calendar.

Simple guide to description of cryosols:

- A number of people working on cryosols (and soils in general) who come from biology, chemistry or other backgrounds fail to include any

soil description or classification in their reports which makes data extrapolation difficult. There is a plan to cooperate with ANTPAS (the Antarctic soils and permafrost group) to widen their existing simple guide to description of (Antarctic) cryosols and to promote it to a wider audience.

Cryopedology award: The John Tedrow Medal/Award: an award by the Cryosols Working Group of the International Union of Soil Sciences:

- The Cryosols Working Group of the International Union of Soil Sciences (CWG IUSS) has decided to establish an award – The John Tedrow Medal/Award – for influential contributions in the field of cryopedology for promoting our understanding of the genesis, geography, functioning, and management of permafrost-affected soil systems. This award is also intended to commemorate John Charles Fremont Tedrow (1917-2014), a Professor Emeritus of Rutgers University, New Brunswick, an outstanding soil scientist and explorer of Arctic and Antarctic soils, and a great teacher, whose dedication to science inspired many research careers extending far beyond the soil science disciplines. The John Tedrow Medal/Award is to be awarded at the IUSS World Congresses (once in four years) by decision of the Cryosol Working Group (CWG) Award Committee consisting of four members headed by one of the the co-chairs of the CWG.. The Award Committee members are invited by the officers of the CWG IUSS and presented for approval to the CWG members during mid-congress International Conferences on Cryopedology (the next 7th conference is scheduled to August 2017 in Yakutsk, Russia). The members of the CWG Award Committee are to evaluate all submissions on a scale from 0 to 10 for the criteria listed in the nomination procedure. The winner of the medal shall be the nominee who receives the most points. In the event of a tie, the chairman of the Committee shall cast the deciding vote.

Important books with CWG contributions:

Cryopedology, Bockheim, James G.: This is the first book solely devoted to Cryopedology, the study of soils of cold regions. The analysis treats Cryosols as a three-part system (active layer, transition layer, permafrost). The book considers soil-forming factors, cryogenic processes, and classification and distribution of Cryosols. Cryosols of the Arctic, Antarctica, and the high mountains are considered in detail. The chapters address cryosols and earth-system science, cryosols in a changing climate, cryosols databases and their use, and management of cryosols. The book is rich in color photographs and highlights the author's 43 field trips to Antarctica, the Arctic, and alpine areas.

The Soils of Antarctica, Bockheim, James G. (Ed.): This book divides Antarctica into eight ice-free regions and provides information on the soils of each region. Soils have been studied in Antarctica for nearly 100 years. Although only 0.35% (45,000 km2) of Antarctica is ice-free, its weathered, unconsolidated material qualify as "soils". Soils of Antarctica is richly illustrated with nearly 150 images and provisional maps are provided for several key ice-free areas.

Celebrating Soil, Discovering Soils and Landscapes, Balks, M.R., Zabowski, D.: This richly illustrated book celebrates the diversity, importance, and intrinsic beauty of soils around the world and helps the reader to understand the ways that soils are related to the landscapes in which they form. The book unravels the complex bond between humans and soils and the importance of soils in our cultures and everyday lives. Soil is critical to terrestrial life on earth. It underpins human food supply and provides materials on which we build our lives. Soil is out of sight and often out of mind, thus easy to overlook. Yet soil has tremendous variety and intrinsic beauty for those who care to look. Soil contains a memory of the events that have shaped the landscape and the environment. With help you can look at a soil and understand the stories that it has to tell. Written in a reader-friendly way, Celebrating Soil is a wonderful resource for farmers, horticulturalists, naturalists, students and others who are concerned about how soils are formed, work and are used.

Facebook and websites:

To increase the communication and interaction within the community, especially to attract younger researchers to actively get involved into the group, we have launched a facebook site (*https://www.facebook.com/cryosols/*). Additionally, there will be a relaunch of the Cryosol working group's website in the end of 2016.

Other Meetings in which CWG members participated/ organised own sessions:

- 2015, April 12-17, Vienna, Austria: European Geosciences Union General Assembly 2015
- 2015, August 31-September 9, Ulan-Ude, Buryatia, Russia: International conference «SOILS OF COLD AREAS: GENESIS, GEOGRAPHY, ECOLOGY». The Conference was devoted to the 100th anniversary of the birth of Oleg V. Makeev.
- 2015, December 14-18, San Francisco, USA: American Geophysical Union – Fall Meeting AGU
- 2016, April 17-22, Vienna, Austria: European Geosciences Union General Assembly 2016

Next planned meetings of Cryosol working group:

- 2017, August 21-28, Yakutsk, Russia during the 7th Cryosol Conference
- 2018, Brazil: 21st World Congress of Soil Science, International Union of Soil Science
- **Other upcoming meetings with some cryosol group presence/participation**
- 2017, April 23-28, Vienna, Austria: European Geosciences Union General Assembly 2017
- 2017, June 4-8, Pushchino, Russia: International conference "Earth's Cryosphere: Past, Present and Future"
- 2017, July 2-6, Sapporo, Japan, 2nd Asian Conference on Permafrost, ACOP2017
- 2017, August 21-28, Yakutsk, Russia: 7th Cryosol Conference
- 2018, June 24-July 1, Mont Blanc, Chamonix, France: 5th European Conference on Permafrost, EUCOP 2018
- 2020, China: 12th International Conference on Permafrost

Working Group Digital Soil Mapping

Activities since 20 WCSS, Jeju, Korea, 2014

2014

6th Global Workshop on Digital Soil Mapping, Nanjing, China, 10-14 November 2014

- election of chair: Mogens Humlekrog Greve, University of Aarhus, Denmark (vice-chair: Luboš Borůvka, Czech University of Life Sciences Prague, Czech Republic)

2015

- Restoration and running of the WG **website** on *http://digitalsoilmapping.org*
- Participation on the conference **Pedometrics 2015, Cordoba, Spain**, 14-18 September 2015
- Sessions on the general assembly of the **European Geosciences Union, Vienna, Austria**, 12-17 April 2015

2016

- **7th Global Workshop on Digital Soil Mapping, Aarhus, Denmark**, 27 June - 1 July 2016
  - election of chair: Laura Poggio, James Hutton Institute, Scotland, U.K. (vice-chair: Luboš Borůvka, Czech University of Life Sciences Prague, Czech Republic)
- Sessions on the general assembly of the **European Geosciences Union, Vienna, Austria**, 17-22 April 2016
- Publication of book: Zhang, G.L., Brus, D., Liu, F., Song, X.D., Lagacherie, P. (eds.): Digital Soil Mapping Across Paradigms, Scales and Boundaries. Springer, 2016.

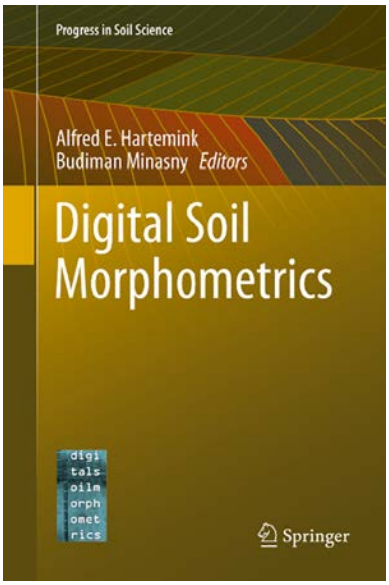
Outlook

- Participation in preparation of the joint **conference Pedometrics 2017, Wageningen, the Netherlands**, 26 June - 1 July 2017
  - preparation of a special workshop on DSM
- Preparation of sessions for the general assembly of the **European Geosciences Union, Austria, Vienna**
- Participation on the **Global Soil Map 2017 Conference, Moscow, Russia**, 4-6 July 2017
- Preparation of 2 sessions for the **21 WCSS, Rio de Janeiro, Brazil**, 2018
- Preparation of **8th Global Workshop on Digital Soil Mapping, Peru**, 2018
- Preparation of a special issue from the contribution at the **7th Global Workshop on Digital Soil Mapping, Aarhus, Denmark 2016**

Working Group Digital Soil Morphometrics

By Alfred Hartemink, Chair, WG Digital Soil Morphometrics

The working group was founded and approved by the IUSS council in 2014. It organised the inaugural global workshop in Madison in June 2015 that was held as part of the International Year of Soil celebration. The workshop was attended by 70 people from 15 countries and included a one-day fieldtrip during which instruments were shown and tested. These included pXRF and vis-NIR as well as cone penetrometer and conventional morphometrics tools for soil profile descriptions. The meeting focused on four aspects: soil profile properties and its measurement and assessment, soil depth func-



Erika Micheli (Division 1 chair) and Budiman Minasny (co-organizer of the Inaugural Global Workshop) and the book that came from it.

tions of properties, soil imaging and soil profile mapping, and lastly on the role of digital soil morphometrics in digital soil mapping. A report of this inaugural workshop was written by Pierre Roudier and published in IUSS Bulletin 127. The workshop yielded the book that contains a selected number of presentation centered around the four research themes.

A half-day symposium was organised at the annual Soil Science Society of America (SSSA) meeting in Minneapolis in October 2015 that included presentations from work in the USA. It was organized by Daniel Hirmas from the University of Kansas. In November 2016, a symposium on quantitative pedon descriptions and digital soil morphometrics was held at the SSSA meeting Phoenix. The second global workshop of the working group will be held at the Pedometrics meeting in June 2017 in Wageningen that will include four other IUSS working groups under the umbrella of the Pedometrics Commission.

Since its inception in 2014 the working group has held three meetings, published a book and maintains a website (*www.digitalsoilmorphometrics.org*). It should be emphasized that digital soil morphometrics focuses on the pedon and not on instruments or sensors *per se*. The pedon is at the core of many soil investigations whether that is for digital soil mapping purposes, site characterization, or pedological research. The overall purpose of digital soil morphometrics is enhanced understanding including more objective ways of identifying and delineating soil horizons and treating the soil as a continuum with depth. The workshop and meetings have shown that there is considerable progress in the *in-situ* measurement of soil properties and soil functions linking instruments with soil inference systems, as well more objective ways of soil horizon delineation and purity assessment.

Working Group Proximal Soil Sensing

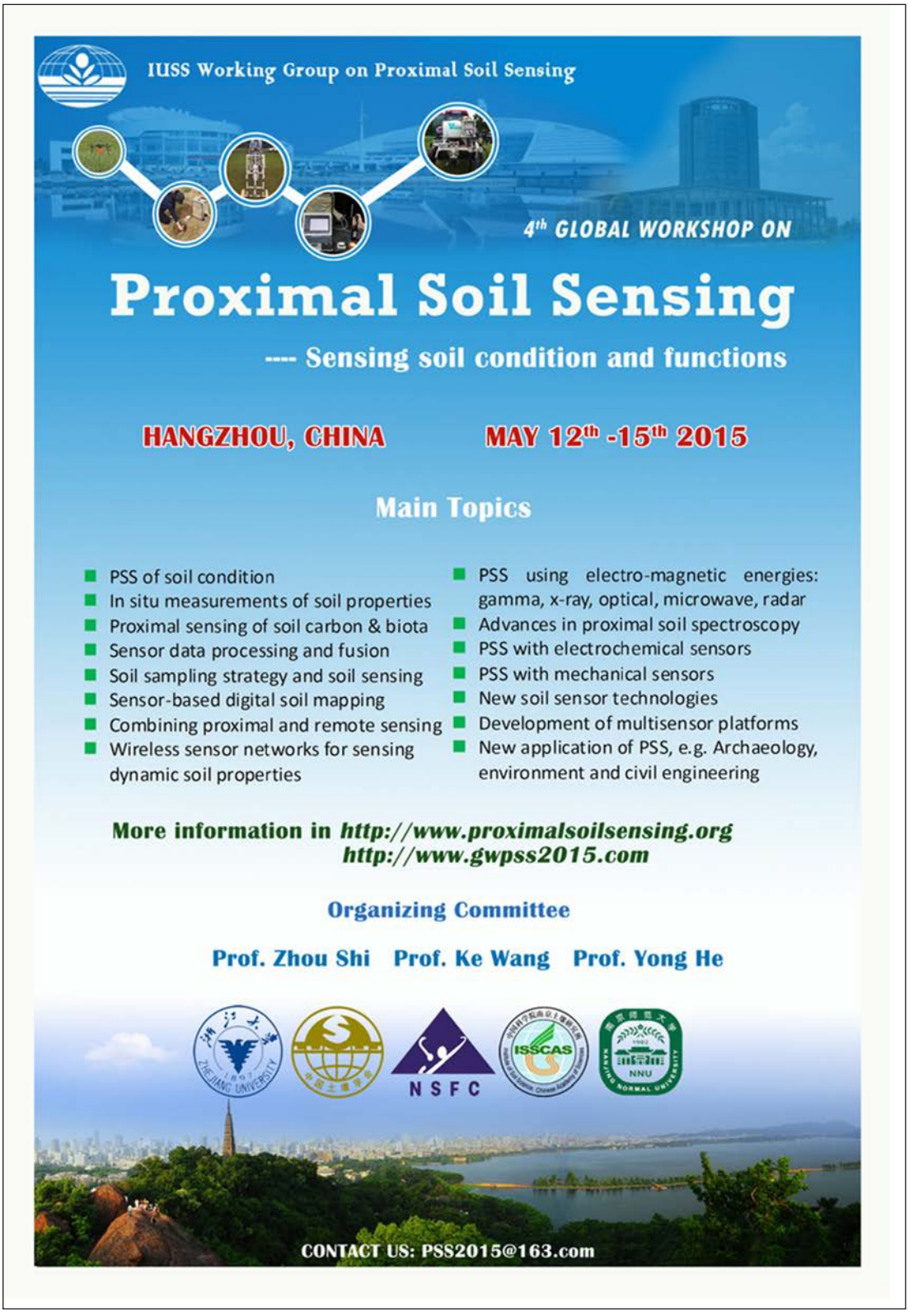
By Marc Van Meirvenne, chair of Proximal Soil Sensing (PSS) Working Group

The Working Group Proximal Soil Sensing organized an international conference at Hangzhou, China, 12-15 May 2015. For a detailed report on the conference the reader is kindly referred to the Section Conference and Meeting Reports.

The WG-PSS also co-organised the Pedometrics 2015 conference in Cordoba, Spain, between 13 and 18 September 2015.

Marc Van Meirvenne stepped down as chairman of the WG Proximal Soil Sensing by the end of November 2016 and was replaced by Professor Zhou SHI and the Vice-Chair is Dr Craig Lobsey

In 2017 the WG-PSS will co-organise the Pedometrics 2017 conference in Wageningen, The Netherlands, 26 June-1 July 2017.



Flyer for the 4th global Workshop on Proximal Soil Sensing at Hangzhou, China

Working Group on Soil Information Standards (WGSIS)

Activity and Recommendations Sept 2016

Meetings and Member Activity

The WGSIS formally met during the 2014 WGSS in Korea and following that as a joint working group with ISO in Wageningen, The Netherlands in 2015

The Wageningen meeting resolved to support the revision of the ISO 28258 standard for exchange of digital soil data. A member of the WGSIS was recommended as ISO project leader to progress the data exchange standard following the ISO TC190 meeting in Berlin, Germany in late 2015. However, to date there has been no further formal progress on the ISO revision.

The WGSIS resolved to progress a demonstration of global soil interoperability through the Open Geospatial Consortium interoperability program. A Soil Interoperability Experiment (SoilIE) was initiated in 2016 by CSIRO Australia and Landcare Research New Zealand. Members of the WGSIS actively participated in the SoilIE, including through development of an implementable core data exchange model, delivery of standardised data services (WFS), creation of a web processing service (WPS) for pedo-transfer function analysis and deployment of a number of web portals for demonstration of the project. An OGC Interoperability Experiment technical report is available at *https://portal.opengeospatial.org/files/?artifact_id=69891*. The report recommends further development of a fully attributed, implementable global soil data exchange standard through an OGC Standards Working Group. Resourcing and capacity to initiate a SWG is problematic and will be further discussed at future OGC Agriculture Domain Working Group meetings.

The WGSIS co-Chair, Rainer Baritz has been seconded to the secretariat of the FAO Global Soil Partnership in Rome to progress development of implementation plans for GSP Pillar 4, global soil information system and Pillar 5 Harmonization.

WGSIS members from Australia and New Zealand participated and presented at the ICSU CODATA SciDataCon conference in Denver, USA in September 2016. Presentations related to the progress in developing global soil information standards and delivery of the OGC SoilIE. The development and delivery of controlled vocabularies was also discussed during the CODATA sessions. The IUSS WGSIS should give consideration to developing and maintaining an online vocabulary service for soil as an addition to the information modelling work it has focussed on to date. Discussions were also had regarding the possible involvement in the WGSIS in future activity of CODATA including a recommendation that ICSU seek information on standards from the individual science unions, and that a CODATA working group be established to show interoperability and integration of data across the science disciplines. WGSIS members suggested that the soil community is well placed to participate and lead as an exemplar following the activities undertaken to date. IUSS support and engagement in future ICSU/CODATA activity should be discussed during the IUSS inter-congress meeting in Rio in November 2016.

WGSIS members also participated in the Research Data Alliance 8th Plenary in Denver, USA in September 2016. Rainer Baritz presented to the RDA Agricultural Working Group regarding the activities of the Global Soil Partnership and a proposal to form a Soil Working Group within GODAN to further facilitate development of global soil data exchange standards and implementation.

Recommendations

The WGSIS recommends that:

- This report is presented to the Division of Pedometrics (and Soil Geography) at the Rio IUSS inter-congress meeting for discussion and further advice to the WGSIS
- The WGSIS should continue and expand activity beyond soil data exchange standards development to include delivery of an IUSS authoritative controlled vocabulary service and support to the implementation of standardised data services from all countries
- The WGSIS should meet more regularly (monthly/quarterly?) via GoToMeeting or other web collaboration to keep members up to date with activities and opportunities, and also reinvigorate and update the WGSIS website soilinformationstandards.org

Working Group Soil Monitoring

By Ben P. Marchant & Dominique Arrouays, 12 November 2016

End 2013-2016 actions

The IUSS Working Group (WG) on Soil Monitoring aims to highlight the importance and issues of soil monitoring and facilitate research which addresses these issues. To these ends, the WG has organized a symposium in Ulm in October, 2013, called "Interdisciplinary challenges of soil monitoring", special sessions at the 2014 World Congress and the 2015 Pedometrics Conference, co-edited a special issue of the European Journal of Soil Science (Marchant & Arrouays, 2015) which highlighted challenges in soil monitoring such as the statistical design of monitoring networks, and developed space-time statistical methods and software required to analyse soil monitoring networks. The WG will organise another special session at the 2017 Pedometrics Conference and a proposal has been submitted to present the space-time statistics software in a pre-conference workshop.

A business meeting of the WG will also be held at the Pedometrics Conference. This will discuss the future of the WG and its evolving role. A primary motivation for the creation of the WG was the proposal of a European Union Soil Framework Directive which required member states to implement national-scale soil monitoring networks. The WG was to facilitate research into the tools required to implement, analyse, interpret and communicate the findings of these soil monitoring networks. However, the directive was withdrawn in 2014 and is therefore no longer a driving force behind the activities of the WG.

Of course, the need for soil monitoring remains and this has been stressed by the Global Soil Partnership, by the Status of the World's Soils Resource report (ITPS-FAO, 2015) and the Revised World Soil Charter (FAO, 2015a). Much recent focus has been on how soil carbon sequestration rates can be monitored to establish whether targets such as the COP21 '4 pour mille' initiative are being satisfied. The carbon monitoring issue has already been addressed during the 2014-2016 period (Arrouays et al., 2014) but needs to be pursued considering recent advances and specific targets. Soil monitoring is also vital across the globe to confirm whether land management, and specifically agricultural, practices are sustainable.

To some extent, there has been a shift away from purpose-built soil monitoring networks towards the use of remotely sensed data or data obtained from citizen-science activities. These different data sources have required different statistical methodologies. The business meeting will discuss how the WG should react to these changes in the focus of soil monitoring and better integrate with other relevant activities such as the GlobalSoilMap (GlobalSoilMap Science Committee, 2015) and the Pillar 4 action plan of the Global Soil Partnership (FAO, 2015b). The business meeting discussions will lead to a proposal for a new structure of the WG in time for the 2018 World Congress.

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Working Group Universal Soil Classification System

The report has been delivered in the form of an article 'Universal Soil Classification', which can be found in a separate chapter at the end of the IUSS Division Reports.

Working Group World Reference Base for Soil Resources (WRB)

Report for 2014-2016

By Peter Schad (Chair) and Cornie van Huyssteen (Vice-Chair)

The third edition of the WRB was presented in 2014 during the 20th World Congress of Soil Science in Jeju, Korea. In 2015, an update of the third edition was finalized. This update 2015 is the current official document of the WRB. It is published as World Soil Resources Reports No. 106 of the Food and Agriculture Organization of the United Nations (FAO) and can be downloaded at the WRB homepage at the FAO site: *http://www.fao.org/soils-portal/soil-survey/soil-classification/world-reference-base/en/.*

Currently, the Polish and the Spanish translations are ready. The Spanish translation can also be downloaded at the FAO site. The Polish translation has been printed in Poland. The French and the Georgian translations are almost ready and will be available soon.

After the publication of the new edition, two new tasks come to the fore:

- testing the system, including field tests and revisions of the profiles in the databases,
- WRB courses and summer schools to train interested people on the new system.

In September 2014, an international field workshop to test the new WRB was held in Ireland, organized by the Irish Agriculture and Food Development Agency (Teagasc). Interesting soils and landscapes were presented, and it was discovered that the third edition works well for Irish soils. For July 2017, a WRB excursion to Latvia and Estonia is planned.

A summer school that was held in Borjomi, Georgia, during October 2014 explained the new edition to Georgian scientists and students. After the Spanish translation came out, WRB courses were held in Mexico and Ecuador. The latter one was associated with the Latin American Soil Science Congress in Quito, October 2016.

The IUSS Commission Soil Classification will have its 5th congress and field workshop from 1 to 7 December, 2016, in South Africa, organized by Cornie

The participants of the WRB course in Quito, October 2016

Quito Soil Profile: Dystric Umbric Silandic Andosol (Hyperhumic, Pantoloamic, Melanic, Bathygleyic)

van Huyssteen. The field workshop will be a good opportunity to test the new WRB in the South African environment. At the congress, the majority of the presentations will discuss topics relevant to the WRB.

The third edition of the 'Encyclopedia of Soil Science', published in 2016, contains an updated chapter about the WRB, written by Peter Schad and Stefaan Dondeyne.

Report of Division 2: 'Soil properties and processes'

by Kazuyuki Inubushi, Division Chair

Division 2 is concerned with the integration of physics, chemistry, biology, mineralogy and pedogenesis to understand fundamental soil properties and processes that control transport, cycling, speciation and bioavailability of elements or molecules. These phenomena are studied at multiple scales ranging from global to atomic.

Division 2 is organized in five commissions:

- Commission 2.1 - Soil physics
- Commission 2.2 - Soil chemistry
- Commission 2.3 - Soil biology
- Commission 2.4 - Soil mineralogy
- Commission 2.5 - Soil chemical, physical and biological interfacial reactions

IUSS Division 2 2015-2016 report

Main activities of Division 2 in 2014-2015 was to organize one Inter-Divisional Symposium

- *Critical issue of radionuclide behaviours in soils and remediation*

and 2 Divisional Symposia

- *Soil development and soil properties and functions*
- *Modelling of soil properties and processes – challenges and opportunities*

during the 20th World Congress of IUSS in Jeju, Korea, which received a large number of oral and poster presentations.

Divisional meeting was also held in Jeju to discuss further activity plan especially in the IYS, 2015 (Photo below).
The division chair contributed to presenting a paper in the IUSS Global Soil C Conference in Madison and the proceedings book published by Springer.

A detailed account of the activities of IUSS Division 2 for the International Year of Soil (IYS) can be found in chapter "Activities of IUSS Divisions and Commissions for IYS", Bulletin 127. Some of their highlights are summarized here:

- Commission 2.1 organized conference on Soil Functions and Climate Change - do we underestimate the consequences of new disequilibria in soil properties? - SUSTAIN hosted in Kiel, Germany on 23-26 Sept. 2015; and

Chairs and Vice-Chairs of Division 2 -Soil properties and processes		
Division	Chair	Kazuyuki Inubushi / Japan
	1st vice-chair	Dalvan José Reinert / Brazil
	2nd vice-chair	Valdomiro Severino de Souza Junior / Brazil
Commissions		
1: Soil Physics	Chair	Stephan Peth / Germany
	Vice Chair	Tsuyoshi Miyazaki / Japan
2: Soil Chemistry	Chair	Boris Jansen / Netherlands
	Vice Chair	
3: Soil Biology	Chair	Ellen Kandeler / Germany
	Vice Chair	Susumu Asakawa / Japan
4: Soil Mineralogy	Chair	Balwant Singh / Australia
	Vice Chair	Stephen Hillier / Scotland
5: Interfacial Relations	Chair	Siobhan Staunton / France
	Vice Chair	Qiaoyun Huang / China

Division Meeting during the 20th World Congress of IUSS in Jeju, Korea, June 2014

- Third Brazilian Soil Physics Meeting (3rd BSPM) on 4-8 May, 2015, Curitiba, Paraná State, Brazil with Commission 2.1. Further information is provided under *http://www.soils.uni-kiel.de/de/sustain-2015 and http://www.agrarias.ufpr.br/portal/bspm2015/*.

- As part of the endeavour to strengthen ties with other fora such as the European Geosciences Un ion (EGU), coordinated by Boris Jansen, Commission Chair with Dr. Saskia Keesstra, Chair of the EGU Soil System Science Division. During the EGU General Assembly in Vienna, Austria 12 -17 April 2015, the Soil Chemistry Commission explicitly endorsed session SSS6.3 “Biogeochemical processes in terrestrial ecosystems: New methodological perspectives to trace organic matter cycling and transformation in soils, sediments and the liquid phase”.

- In addition, ties were further strengthened by participation in the Wageningen Soil Conference, Wageningen, The Netherlands, 23-27 August 2015 as well as the 5th International Symposium on Soil Organic Matter in Göttingen, Germany, 20-24 September 2015.

- Second International Conference “Ecology of Soil Microorganisms”, 29 November - 3 December 2015, Prague, Czech Republic, organized by Petr Baldrian, Institute of Microbiology, ASCR, Prague, Czech Republic with Commission 2.3 Chair, Ellen Kandeler.

- Stephen Hillier, the current vice-chair of commission 2.4, was the Conference Chair for Euroclay 2015 and a symposium “Clays in the Critical Zone: soils, weathering and elemental cycling” is being at the conference. The symposium organisers are Paul A. Schroeder (University of Georgia), Jason Austin (University of Georgia), Bruno Lanson (University of Grenoble) and Steve A Banwart (University of Sheffield)

- International Symposium named ISMOM was held in Montreal, 7-10 July 2015, with the theme Soil Interfaces for Sustainable Development, coordinated by Siobhan Staunton, commission 2.5 Chair. Keynote talks will be given by John Duxbury (Integrative Plant Science, Cornell, USA), Stephan Kraemer (Environmental Geosciences, Vienna, Austria), Beverly Hale (Environmental Sciences, Guelph, Canada), Kornelia Smalla (Epidemiology and Pathogen Diagnostics, Julius Kuhn Institut, Germany), Claire Chenu (Ecology & Environmental Sciences, Paris, France) and Peter Leinweber (Soil Science, Rostock, Germany).

Then, the main activities of Division 2 during 2015-2016 were to summarize divisional activities for IYS and to start preparations for the forthcoming 21th IUSS World Congress, Rio de Janeiro, Brazil.

Also several international conferences/symposiums/colloquiums were coordinated in this period, such as

- 5th International Conference Enzymes in the Environment: Activity, Ecology and Applications, from 24th-28th July 2016 in Bangor, Wales, UK, coordinated with Commission 2.3;
- 15th International Peat Congress, from 15th-19th August 2016 in Kuching, Sarawak, Malaysia, organized by the Malaysian Peat Society in partnership with the International Peat Society, XVII International Colloquium on Soil Zoology (ICSZ) and VIX International Colloquium on Apterygota (ICA) 2016, from 22nd-26th August 2016 in Nara, Japan, coordinated with Commission 2.3;

- Joint meeting on „Biological Control on Soil Mechanical and Hydraulic Properties“, from 1st -2nd September 2016 in Braunschweig, Germany, by the Soil Physics & Hydrology commission of German Soil Science Society (DBG Com. 1) and Commission 2.1 of IUSS,
- 18th International Conference of the International Humic Substances Society (IHSS 18), from 11th-16th September 2016, in Kanazawa, Japan, organized by the Japanese Humic Substances Society in partnership with the IHSS International Society,
- 6th International Conference on Sustainable Energy and Environment (SEE 2016), from 28th-30th November 2016 in Bangkok, Thailand.
- Global Soil Security Conference, from 5th-6th December 2016 in Paris, France, coordinated with Commission 2.5,

Furthermore preparations were made for a session titled “Soil organic matter turnover: from molecules to ecosystems and back again” (SSS6.2/BG9.11), coordinated with Commission 2.2, to be held during the European Geosciences Union (EGU) 2017 in Vienna from 23-28 April 2017. See below report of Commission 2.2.

Potential proposals from Division 2 of Symposia for 21st WCSS (Rio, 2018)

Division 2 organized a large internet forum of discussions during April and May 2016 to facilitate emergence of symposium proposals for the the 21st World Congress 2018.

The results are summarized below.

Div 2 level and Comm.	*Temporary Title (Symposium)*	Potential Conveners
Div 2	Role of K on the regulation of Cs behavior in soil and Cs uptake by plant	Kazuyuki Inubushi, Takuro Shinano, Ciro Antonio Rosolem
Div 2 C2.1/2.2/2.3	Interactions between physical, biological and chemical processes in soil	Paul Hallett, Boris Jansen, Ellen Kandeler, Stephan Peth
Div 2 C2.3/2.1/2.5	Spatial distribution of soil microorganisms within their habitat	Ellen Kandeler, Naoise Nunan, Stephan Peth, Staunton Siobhan
C2.1	Soil structure dynamics	Thomas Keller, Stephan Peth, Mathieu Lamandé
C2.1	Soil compaction and tillage effects on soil processes and functions	Dalvan José Reinert
C2.1	The role of soil physics in water conservation and food security	Stephan Peth, Quirijn de Jong van Lier
C2.2	Soil organic matter dynamics from molecules to landscapes	Boris Jansen, Karen Vancampenhout
C2.2	Life on the interphase: interactions between soil geochemical and biological traits	Karen Vancampenhout, Beat Frey
C2.2	Soil and water pollution: dynamics and evaluation	To be determined
C2.3	Soil microbiological processes and nutrient cycling under crop rotation	Susumu Asakawa, Ralf Conrad
C2.3	Pedodiversity and biodiversity	Alex McBratney, David Wardle
C2.3	Rhizosphere mineral dynamics: Soil-Plant-Microorganism	Susumu Asakawa (tentative), Maria Catarina, Megumi Kasuya, Keitaro Tawaraya
C2.4	Dynamic Minerals: Shifts in soil mineral composition as a result of soil use and management over the human time scale	Aaron Thompson
C2.4	International Workshop on Alternative Potash	Antoine Allanore, Davide Ciceri, David Manning
C2.5	Soil interfacial reactions and their control of biogeochemical cycles	Siobhán Staunton, Deborah Dick
C2.5	Advances in techniques to investigate soil interfaces to understand interfacial reactions	Siobhán Staunton, Deborah Dick
WG Hydropedology (Div 1)	Hydropedology and Critical Zone Science: Toward Systems Soil Science	Quirijn de Jong van Lier, Brent Clothier

Report of Commission 2.1 Soil physics

By Stephan Peth, Commission Chair

As a joint meeting of IUSS commission 2.1 and the commission of soil physics and hydrology (Com. 1, Chair Prof. Durner) of the German soil science society (DBG) we organized an international workshop held from 1-2 Sept. at the University of Braunschweig/Germany with a focus topic on the Influence of biological, chemical and physical factors on mechanical and hydraulic properties of soils. The aim was to exchange ideas on the interacting processes in soils to be understood as a habitat of organisms and medium for plant growth. The workshop was opened with a keynote talk given by Prof. Sacha Mooney from University of Nottingham (UK) on Seeing is Believing – Multi-scale imaging of root-soil interactions. Sacha gave a fascinating insight into the in-situ relationships between plant roots and soil and showed new ways of quantifying pore scale interactions of roots with its physical environment. The workshop was with 60 participants very well attended and contributions covered topics on modelling and measuring in-situ root architectures and growth as well as root and earthworm induced biopore networks, the physicochemical environment of the rhizosphere and its effect on micro-scale water, nutrient and gas flux. Very interesting were also the contributions on biological soil crusts and their role for ecohydrological processes and the physical stabilisation of soils on the landscape scale.

Report of Commission 2.2: Soil chemistry

By Boris Jansen, Commission Chair

During the European Geosciences Union (EGU) 2017 that will take place in Vienna from 23-28 April 2017, a session titled "Soil organic matter turnover: from molecules to ecosystems and back again" (SSS6.2/BG9.11) will be organized by Boris Jansen and Karen Vancampenhout.

This session aims to discuss the important and fascinating topic of soil organic matter turnover together with a wide range of scientists from various fields. From scientists looking at the ecosystem scale in various ecosystems and environments, to the colleagues looking at the details of interactions at the molecular scale. From those focusing on field observations, through those using advanced characterization techniques in the laboratory, to those using modeling approaches. Thus we hope to fuel a discussion about linking the various scales and processes of soil organic matter turnover from molecules to ecosystems and back again.

The session is endorsed by the IUSS Division 2. To stimulate the participation of young scientists, in addition to the grant possibilities offered by the EGU itself, the IUSS offers some possibilities for financial support to young scientists participating in this session. Specifically three grants of 500 euro's each have been generously made available to this end. More details about the session and possibilities to apply for a grant will be placed on the following website:
http://meetingorganizer.copernicus.org/EGU2017/session/23288

Report of Commission 2.3: Soil biology

By Ellen Kandeler, Commission Chair

Commission 2.3 Soil Biology contributed to the 5th conference "Enzymes in the Environment" which was held in Bangor, Wales, from 24th to 27th July 2016. The conference gave an excellent overview about the current developments in enzyme research: Imaging technologies are enabling nano-scale visualisation of enzyme locations and their reactivity with substrates. Modern techniques using meta-transcriptomics of mRNA and cDNA combined with direct detection of proteins and enzymes provide information on metabolic controls of enzyme production. IUSS played an important role during this conference by supporting the Lifetime Achievement Award in Terrestrial Enzymology. It was a pleasure and an honour to acknowledge Professors Carol Arnosti and Paolo Nannipieri as the recipients of the Life Achievement Awards in Aquatic and Terrestrial Enzymology, respectively. They have both made fundamental contributions towards understanding the ecology of extracellular enzymes. In addition, we want to thank our IUSS members Richard Dick and Chris Freeman for organizing this conference and for making this conference a great success.

The chair of commission 2.3 Soil Biology, Ellen Kandeler, plans the following activities for the near future: Commission 2.3 will support the 2nd Global Soil Biodiversity Conference (GSBC2) and Science Chair of the Global Soil Biodiversity Initiative which will be held from the 15th to the 19th October 2017 in Nanjing, China (*http://gsbicon-*

ference.csp.escience.cn/dct/page/1). In addition, the planning phase for the conference on "Ecology of Soil Microorganisms" (17-21 June 2018, Helsinki, Finland) has already started. Further information can be obtained by the following web page: *https://www.luke.fi/projektit/esm2018/*

Report of Commission 2.4: Soil Mineralogy

By Balwant Singh, Commission Chair and Stephen Hillier

- Commission chair is involved in the preparation of a symposium – 'Environmental applications of clay minerals' for the 16th International Clay Conference that will be held from 17th-21st July 2017 in Granda, Spain.
- Commission 2.4 proposed two possible sessions within the domain of the Commission to be organized at the 21st World Congress of Soil Science in Brazil in 2018. These sessions will be discussed at the Interconference Meeting that takes place in November 2016. More details will follow in due course.

Report of Commission 2.5: Soil interfacial relations

By Siobhan Staunton, Commission Chair

- Commission chair is involved in the preparation for the Global Soil Security Conference, from 5-6 December 2016 in Paris, France, coordinated with Commission 2.5.
- Commission 2.5 proposed two possible sessions within the domain of the Commission to be organized at the 21st World Congress of Soil Science in Brazil in 2018. These sessions will be discussed at the Interconference Meeting that takes place in November 2016. More details will follow in due course.

Working Group Critical Zone System

By Henry Lin, Chair, Hydropedology Working Group of the IUSS

A very detailed report of the Hydropedology Working Group of the IUSS was published in IUSS Bulletin 128. The reader is kindly referred to the IUSS website:
http://www.iuss.org/index.php?article_id=76.

In the course of the recent 2016 Inter-Congress Meeting, which took place in Rio de Janeiro, Brazil, Sunday 20-Friday 25 November 2016, the Working Group was renamed 'WG Critical Zone System'.

Report of Division 3: 'Soil Use and Management'

Division 3 focuses on how we use the soil and how it links to the knowledge base of Divisions 1 and 2 in order to ensure that soils are used and managed in a sustainable manner. The Division is concerned with both soil use and management in terms of agricultural production, forestry, grazing lands, and the broader environmental context. Activities to remediate degraded soil, arising from the agricultural misuse of soil or contaminations resulting from non-agricultural activities are part of the scientific area of this Division. The aim of this Division is to ensure that through our knowledge and understanding of soil properties and processes and the distribution of soils within the landscape soils and soil quality are maintained and improved.

Division 3 is organized in six commissions

- Commission 3.1 - Soil evaluation and land use planning
- Commission 3.2 - Soil and water conservation
- Commission 3.3 - Soil fertility and plant Nutrition
- Commission 3.4 - Soil engineering and Technology
- Commission 3.5 - Soil degradation control, remediation and reclamation
- Commission 3.6 - Salt-affected Soils

Chairs and Vice-Chairs of Division 3 – Soil use and management

Division

Chair: Takashi Kosaki / Japan
1st Vice Chair: Ildegardis Bertol / Brazil
2nd Vice Chair: Heitor Cantarella / Brazil

Commissions

1: Soil Evaluation and Land Use Planning
Chair: Ivan Vasenev / Russia

2: Soil and Water Conservation
Chair: Bernd Lennartz / Germany
Vice Chair: Li Zhanbin / China

3: Soil Fertility and Plant Nutrition
Chair: Scott Chang / Canada
Vice Chair: Toru Fujiwara / Japan

4: Soil Engineering and Technology
Chair: Bin Zhang / China
Vice Chair: Ţărău Dorin / Romania

5: Soil Degradation, Control, Remediation and Reclamation
Chair: Jaume Bech / Spain
Vice Chair: Xudong Zhang / China

6: Salt Affected Soils
Chair: Donald Suarez / USA
Vice Chair: Jingsong Yang / China

IUSS Division 3 2015-2016 report

Joint activities of the division and commissions

Division 3 is always working with Commission 3.1 through 3.6 and very closely collaborating with Working Groups such as "Land Degradation", "Soils of Urban, Industrial, Traffic, Mining and Military Areas (SUITMA)" and "Paddy Soils". In 2015, International Year of Soils, the division has worked not only within the soils community but also tried to collaborate with those who are mainly involved in related disciplines, e.g. Quaternary Research, Biogeochemistry, Biotechnology, Geotechnics, Civil Engineering and others to exchange the ideas, share the new methodologies and findings and discuss towards the goal of constructing a sustainable society. The followings were the major activities organized by the division together with relevant commissions, working groups and colleagues from related disciplines.

1. The 13th International Conference on the Biogeochemistry of Trace Elements (ICOBTE), July 12-16, 2015, in Fukuoka, Japan. The division organized the symposium on "Remediation of heavy metals-contaminated soils: Novel practical approach based on state-of-the-art science" together with Commission 3.3 as well as the one on "Application of synchrotron radiation (SR)-based methods to biogeochemistry and environmental geochemistry of trace elements". Both symposiums were supported by the National Institute for Agro-Environmental Sciences, Japan.
2. The 19th International Union for Quaternary Research (INQUA) Congress, July 26-August 2, 2015, in Nagoya, Japan. The division held the session "Biosphere contaminated with artificial and natural radionuclides" together with Japanese Society of Soil Science and Plant Nutrition and convened a joint session "Urban soil development" with WG SUITMA and Tokyo Metropolitan University, Japan.
3. The 12th East and Southeast Asia Federation of Soil Science Societies (ESAFS) Conference, September 18-21, 2015, Nanjing, China. The divi-

sion held the symposiums on “High yield of rice and sustainable soil utilization” with WG Paddy Soils.

4. The International Congress on the Occasion of the International Year of Soils 2015 (Soil Functions and Climate Change – do we underestimate the consequences of new disequilibria in soil properties_ - SUSTAIN), September 23-16, 2015, in Kiel, Germany. The division co-convened “Special Symposium: Plant nutrition research for future sustainable agriculture” with Commission 3.3 and “Special Symposium: Soil degradation – impact on soil quality, productivity and climate change” with Working Group Land Degradation.
5. The 28th Bi-Annual Conference of the Soil Science Society of East Africa (SSSEA) and African Celebration Meeting of the International Year of Soil, November 23-27, 2015, in Morogoro, Tanzania. The division held the symposium on “Sustainable soil productivity in tropical Africa ~ nutrient stock and flow~”.
6. The division jointly published “Soils of Anthropized Environment” as a supplementary issue of Soil Science and Plant Nutrition (Vol. 61(S1), 2015) including the selected papers related to the 7th International Conference of SUITMA held on September 16-20, 2013, in Toruń, Poland. Additionally, those selected from The Conference on Desertification and Land Degradation held on June 17-18, 2013, in Gent, Belgium, were published as a special section of the above journal (Vol. 61(3), 2015). Publication of both volumes was financially supported by Tokyo Metropolitan University, Japan.
7. The division collaborated with national societies for convening a series of international conferences in 2016. The examples include 1) International Scientific Conference “Long-term agroecosystems sustainability: Links between carbon sequestration in soils, food security and climate change” on October 4-6 at Kaunas, Lithuania, together with Lithuanian Society of Soil Science and 2) International Conference on “Integrated land use planning for smart agriculture: An agenda for sustainable land management” on November 10-13 at Nagpur, India, together with Indian Society of Soil Survey and Land Use Planning.

Activities of the commissions (in addition to the above):

Commission 3.1 Soil Evaluation and Land Use Planning

by Ivan Vasenev, Commission Chair

In General Assembly of European Geosciences Union (EGU-2015, Vienna, April 13-17) the commission organized the sessions SSS10.2 “Soil environmental functions and land quality evaluation for land-use optimization”. During May 18-22 there was in Moscow the 7th Congress of European Society of Soil Conservation (ESSC), where the commission organized under umbrella of ESSC, Dokuchaev Soil Science Society and the commission convened the symposium on “Soil Evaluation and Land Use Planning”, which included 2 plenary and 12 scientific sessions and 1 field trip in the representative area of Central Russia agro-landscapes with different types of Podzoluvisols and land-use practices.

Commission 3.3 Soil Fertility and Plant Nutrition

by Scot Chang, Commission Chair

The commission was involved in the 2nd International Symposium on Forest Soils held in Fuzhou, China and delivered an invited talk on some aspects of soil fertility/plant nutrition in reclaimed/reconstructed soils/ecosystems. The papers are expected to be published on Soils and Plant in the near future.

Commission 3.4 Soil Engineering and Technology

by Bin Zhang, Commission Chair, and Ţărău Dorin, Commission Vice-Chair

The commission was involved in the “High Level Forum on Sustainable Use and Protection of Mollisols in China” held during Sept 7-9, 2015, in Harbin and the “Sino-German Symposium on Soil Science and Soil Protection” held in Beijing during September 17-19, 2015, in celebration of the 2015 International Year of Soils.
At the 10th International Symposium “Young People and Agriculture Research” on November 21, 2014, Timisoara, the University of Agricultural Sciences and Veterinary Medicine of Banat “King Michael I of Romania”, Timişoara in which debate was organized “Soil Science and challenges of millennium” moderated by Dorin Tarau and othres, event held under

the sign of 2015 international year of soil. During the discussions concerning the existence of risks arising from the various manifestations of natural phenomena or due to interventions irrational human rights, sustainable management of natural resources and the anthropogenically induced may represent a modern land management, with the purpose of maintaining and increasing the fertility soil and enable long-term achievement of high-quality food production.

The 11th International Symposium "Young People and Agriculture Research" was organized by the above university on November 23, 2015, when Prof. Rainer Horn, President of IUSS, was awarded the highest Doctor Honoris Causa. The events that marked by the founding of the International Year of ground 2015 constituted an appropriate framework for discussion of high professionalism arguing consensus on the need of popularizing consistent problems investigated by soil science, not only among professionals but also politicians, whose awareness, knowingly, could contribute decisively to creating optimal institutional framework for the enhancement of land.

Commission 3.5 Soil Degradation Control, Remediation and Reclamation

by Jaume Bech, Commission Chair

In General Assembly of European Geosciences Union (EGU-2015, Vienna, April 13-17), the commission organized the session SSS8.3. "Remediation of polluted soils" in which 17 oral and 30 poster papers were presented. The commission additionally organized the symposium on "Reclamation and management of polluted soils: options and case studies" and for EUROSOIL 2016 with a symposium on "Detection, Risk Assessment and Remediation of Polluted Soils from Mining and Smelting Areas". The commission has also worked for the publication of "Soil Pollution and Remediation" as a special issue of the Journal of Soils and Sediments and of "Reclamation of Mining Site Soil" as the one of CATENA. In Eurosoil 2016, the commission convened the symposium "Detection, Risk Assessment and Remediation of Polluted Soils from Mining and Smelting Areas" on July 19 in Istanbul.

Potential proposals from Division 3 of Symposia for 21st WCSS (Rio, 2018)

Division 3 organized a large internet forum of discussions during April and July 2016 to facilitate emergence of symposium proposals for the 21st World Congress 2018.

Results are summarized in the table below.

Div 3 level and Comm.	Temporary Title (Symposium)	Potential Convener(s)
Int. Div. with Div.2	Role of K on the regulation of Cs behavior in soil and Cs uptake by plant	Kazuyuki Inubushi
		Takuro Shinano
		Ciro Antonio
Div.3	Soil and soil fertility management and the African Green Revolution: status, challenges, and future prospects	N Sanginga
		Takashi Kosaki
Div.3 (with Div.2?)	Biogeochemical fate of radiocesium in terrestrial environment: Advances after the Fukushima accident	Atsushi Nakao
		Takashi Kosaki
Div.3	Agricultural Management to Protect Soil Resource to support a growing population	Jane M.F. Johnson
		Takashi Kosaki
Div.3	Managing and remediating floodplain and wetland soils	Vanessa Wong
		Takashi Kosaki
		Dr Claudio Zaccone
Div.3	Wetlands soils as ecological hotspots - identification, form, and function	Jacob F Berkowitz
		Patrick Inglett
		Takashi Kosaki
Div.3	Recent advances in terroir zoning, functioning and sustainability	Edoardo Costantini
		Emmanuelle Vaudour
		Maria Concepción Ramos

Div 3 level and Comm.	Temporary Title (Symposium)	Potential Convener(s)
Comm.3.1	Multi-scale and multi-domain approaches to develop smart farming	Ivan Vasenev
Comm.3.2	Artificial Drainage Systems: Maintaining soil functions and protecting water resources	Bernd Lennartz
		Youssef, Mohamed A.
Comm.3.2	Nutrient and contaminant transport in drained and rewetted peat soils	Bernd Lennartz
		Fereidoun Rezanezhad
Comm.3.3	Beneficial Management Practices for Sustaining Soil Fertility	Scott Chang
Comm.3.3	Biochar for Soil Fertility Management	Scott Chang
Comm.3.3	Advancement of plant nutrition studies for sustainable agriculture.	Toru Fujiwara
Comm.3.5	Native metallophytes from mine spoils as a potential source for phytoremediation	Jaume Bech
		Maria Manuela Abreu
		Carmen Perez-Sirvent
Comm.3.5	Frontier of soil quality evaluation after remediation of contaminated field	Zeng-Yei Hseu
Comm.3.5	Antibiotics and Antibiotic Resistance in Agricultural Food Production	Hui, Li
Comm.3.6	Salinity Mapping and Modeling Salinization Processes	Donald Suarez
		John Triantafilis
Comm.3.6	Salinity management for agricultural production and ecological restoration	Jingsong Yang
Comm.3.6	Prognosis of soil salinization and remediation of salt-affected soils	Jingsong Yang
Comm.3.6/ Comm.3.2	Impact of land use change on soil and environment in dry regions	Tibor Toth
WG. Land Degradation	Restoring degraded lands through soil carbon management	Bal Ram Singh
WG Paddy Soils	Uniting mitigation of GHG emission and enhancement of crop productivity in paddy rice fields	Mizuhiko Nishida
WG SUITMA	Urban soils: soil science for sustainable cities	Jean Louis Morel
WG SUITMA	(Under consideration)	Maxine J. Levin
		Susan D. Day
		Bryant Scharebroch
		John Kim

Working Group Acid Sulfate Soils

By Professor Leigh Sullivan, Chair, 12 December 2016

IUSS Working Group Acid Sulfate Soils has continued to be active since the Jeju World Soils Congress in 2014. The major activity during this period for the Working Group was the 8th International Acid Sulfate Soil Conference held in College Park, Maryland, USA, during July 17-23 2016.

8th International Acid Sulfate Soil Conference

This conference 'entitled 'Acid Sulfate Soils: Pathways to Exposure and Remediation' and was well attended. There were 74 registrants, with 66 papers, 66 authors, and fifteen countries being represented. The presentations were held over three days, preceded by a day-long Pre-Conference Tour, interspersed by a day-long field trip, and followed by a two day-long Post Conference Field Tour. Figure 1 shows some of the participants of this Conference.

Conference themes

The Conference presentations were organised under the following themes:

- Understanding sulfidization - Environments for the formation of sulfide minerals and potential acid sulfate soils
- Understanding sulfuricization - Natural and anthropogenic processes leading to acid sulfate soil problems

Figure 1. Some participants at the 8th International Acid Sulfate Soil Conference held in College Park, Maryland, July 17-23 2016.

- Understanding issues and remediation strategies for inland acid sulfate soils and landscapes, AMD (acid mine drainage), ARD (acid rock drainage)
- Understanding issues and remediation strategies for coastal and agricultural acid soils and landscapes
- Policy, Regulation and Education - Best practices in avoidance and remediation
- Monitoring and mitigating impacts of acid sulfate soil and water during reclamation and development (assessment techniques, laboratory analysis and soil classification and mapping issues)

Keynote Presentations

The Keynote Presenters at the Conference were:

- Prof. David Rickard (Cardiff University, UK) on 'Sedimentary iron sulfides revisited,
- Prof. D. Kirk Nordstrom (US Geological Survey) on 'Sulfide mineral oxidation, secondary minerals, and acid sulfate waters',
- Dr Jeff Skousen (West Virginia University, USA) on 'Geologic Testing for Land Disturbance: Acid-Base Accounting for Predicting Acid Mine Drainage on Surface Mines,
- Prof. Peter Österholm (Åbo Akademi University, Finland) on 'Management of Boreal agricultural acid sulfate soils',
- Prof. Leigh Sullivan (Federation University Australia) on 'Acid Sulfate Soil Regulation, Policy and Guidance in Australia: Status and Trajectory', and
- Prof. Markku Yli-Halla (University of Helsinki, Finland) on 'Abundant stocks and mobilization of elements in boreal acid sulfate soils'.

Conference tours

The conference tours were accompanied by a field manual authored by Profs. Marty Rabenhorst, Delvin Fanning and Lee Daniels. The Pre-Conference field tour was to Hart-Miller Island on the 17th July. Hart-Miller Island is a 1,100 ha dredge material containment facility in Baltimore Harbour that began development in 1981. Part of this island is now operating as a State Park, but the rest of the island is under going management is closed to the public. This field trip was highlighted by a number of soil exposures accompanied by extensive field and laboratory information on eth properties and behaviour of these dredge materials post deposition.

The mid-conference tour on July 20th visited the University of Maryland Agricultural Experiment Station Farm in Upper Marlboro and a road-ide cutting to examine soils (including post-active acid sulfate soils) formed in glauconitic parent materials. This was followed by a visit to a site on Rhode River examining the important work of Wessel and Rabenhorst on occurrence, development and behaviour of subaqueous acid sulfate soil materials. The final stop was to the Smithsonian Environmental Research Center (SERC) of considerable renown to view sulfide-forming processes in subaqueous soils and tidal marshes of Chesapeake Bay and also to being incredibly impressive by the scale of the extensive and intensive monitoring of a multitude of wetland processes that that occurs at SERC. This tour was concluded by a cookout at the scenic Sandy Point State Park (near Annapolis) overlooking Chesapeake Bay.

The post-conference tour was a two-day excursion on July 22 and 23 examining sulfidic materials exposed in the Nanjemoy formation along the Potomac river and native American shell middens en route to the Richmond, Virginia area where acid sulfate soils problems associated with both mining activities and highway construction were examined. On the second day of this field excursion, Active acid sulfate soils exposures associated with both the Stafford regional airport and Residential housing development were examined. The Shirley Plantation site examining the utilisation of dredge spoil material by liming methods was also visited to cap off a valuable experience for all participants.

Figure 2: Emeritus Professor Delvin Fanning (rhs) is presented with the Pons Medal by the Acid Sulfate Soil Working Group Chair Professor Leigh Sullivan.

Pons medal

This medal commemorates Prof. Leen Pons who is widely regarded as the Father of the International Acid Sulfate Soils Symposia/Conferences. As well as publishing landmark studies on the acid sulfate soils of the Dutch polders, Leen Pons also published on soil ripening and soil classification, as well as on acid sulfate soils in the Guiana's, Thailand, and Vietnam. In 1972 he played a key role in organizng the first International conference on acid sulfate soils in Wageningen, marking the beginning of international attention on these soils and was active in all of the succeeding international acid sulfate soil conferences held during his lifetime.

Selection criteria

The selection criteria for the award of the Pons Medal are as follows:

Soil scientists eligible for the award will have shown:

1. distinction in the application of acid sulfate soil science through their published works,
2. innovative research in the field of acid sulfate soil science,
3. leadership qualities in acid sulfate soil research, for example, by leading a strong research team,
4. contributions to various aspects of education in acid sulfate soil science (e.g. supervision of doctoral students, teaching of acid sulfate soil science courses in higher education, the development of courses for broader professional needs), and
5. service to acid sulfate soil science and practice e.g. by serving on a committee of the Acid Sulfate Soil International Working Group or by promoting acid sulfate soil science and practice by active engagement with the broader community affected by acid sulfate soils including stakeholders such as legislators, regulators and land managers.

During the Conference the inaugural Pons Medal was awarded to Emeritus Professor Delvin Fanning of the University of Maryland (see Figure 2).

The Conference was concluded with a meeting of the Acid Sulfate Soil Working Group.

Working Group Forest Soils

The Forest Soils Working Group had assisted in organizing a major International Symposium on Forest Soils: Linking Soil Processes to Forest Productivity and Water Protection under Global Change (ISFS 2015), 24-28 October 2015, Fuzhou, China to celebrate the International Year of Soils, with more than 200 participants from many countries including China, USA, Germany, Australia, Canada, Finland, Korea, Japan, New Zealand etc.

The topics of this symposium included: (1) Tracking and monitoring: advancing innovative techniques and novel approaches to simulate and monitor the effects of local management and climate change; (2) Assessing the pressures and threats: impacts of global environmental changes (especially soil warming) on carbon, water and nutrient cycling, ecosystem functioning and ecosystem services; (3) Untangling the linkages: elucidating relationships between soil processes and ecosystem functioning and ecosystem services; and (4) Strategies for management and conservation: practices to maintain and enhance forest productivity and ecosystem services provided by forest soils in particular for water cycling and purification.

Working Group Global Soil Change

No report available. Since there was no obvious activity and no activity reports provided the Working Group Global Soil Change was closed down follow-

International Symposium on Forest Soils: Group-Photo-Shanming-Research-Station, 2015

ing a decision of the Executive Council during the 2016 Inter-Congress Meeting which took place in Rio de Janeiro, Brazil, Sunday 20-Friday 25 November 2016.

Working Group Land Degradation

Activity Report 2014-2016

By Bal Ram Singh, Leader WGLD, IUSS; Professor, Norwegian University of Life Sciences (NMBU); 1432 Ås, Norway

20th World Congress of Soil Science 2014

Participation in 20th World Congress of Soil Science in Jeju, Korea, where the author presented several oral and poster presentations. As a president of the Norwegian Society of Soil Science (NJF), he also attended the council meetings during the congress including the election for the "22 end IUSS Congress in 2022.

International Conference 2015

A conference held in 2013 was very successful and resulted in a book entitled "**Sustainable Intensification to Advance Food Security and Enhance Climate Resilience in Africa"**, edited by Rattan Lal, Bal Ram Singh, Dismas L. Mwaseba, Dave Kraybill, Dave Hansen and Lars Olav Eik (2015) and published by Springer New York, USA. In this conference, one full session was devoted to land degradation entitled "Rehabilitation of Degraded Lands through Forestry and Agro-forestry". SSA is one of the global hot spots for adverse effects of climate change on agricultural production and the environment. These included severe problem of soil degradation, nutrient and organic matter depletion, water contamination and eutrophication, and loss of biodiversity, especially the below ground.

The success of this conference encouraged us to organize the second conference on "**Climate Change and Multidimensional Sustainability in African Agriculture"** at Morogoro, Tanzania June 2015. A significant part of the work for this conference was done in 2014 by organizing monthly Skype meeting of the Steering Committee. The Sokoine University of Agriculture, Norwegian University of Life Science (support from NORAD) and the Ohio State University, USA (Support from USAID) and FAO, Rome, organized the conference. The conference broadly covered environmental, economic, social and institutional sustainability in the face of climate change, adaptation and mitigation in Sub-Saharan Africa. In addition, a session was devoted to the International Year of Soils (IYS) and climate change. More than 100 participants from nearly 15 countries from Africa, Europe and USA attended the conference and presented their recent results on the above-mentioned topics of the conference. The outcome of this conference resulted in a new book entitled **"Climate Change and Multidimensional Sustainability in African Agriculture,** Edited by Lal R., D. Krybill, D. Hansen, B.R. Singh, T. Mosogova and L.O. Eik (2016), Springer, Dordrecht. The book was published in October 2016.

International Conference 2017

A new international conference in connection with our ongoing project entitled "Regional Capacity Building for Sustainable Natural Resource Management and Agricultural Productivity under Changing Climate" in Africa (Uganda, Ethiopia and South Sudan) is being planned for November 2017, with a working title of **Ecosystem Resilience and Agricultural Productivity**. The conference is being planned in cooperation with Mekerere University, Addis Ababa University, University of Juba, Norwegian University of Life Sciences, Ohio State University but will be sponsored by several national organizations in these countries. Sustainable natural resource management including land degradation and restoration of degraded lands will be one of the topics for this conference. The conference will be held in Kampala, Uganda in November 2017. It is likely to be announced before the end of this year.

21st World Congress of Soil Science 2018

As a contribution from Working Group on Land Degradation, a symposium entitled **"Restoring degraded lands through soil carbon management"** is proposed to the executive board of IUSS, which will be discussed during the meeting in Brazil in November 2016. The symposium aims to bring together leading experts in the fields of soil degradation and control measures, SOC management and environmental sustainability of soil resources. This will provide a forum to discuss physical, chemical and ecological issues on the subject and the possible solutions using currently available technologies for the restoration of degraded lands.

Working Group on Modelling of Soil and Landscape Evolution

This WG aims to progress quantitative soil and landscape evolution modelling by bringing together people modelling at (2D- or 3D-)landscape scales and people modelling (1D-) pedons. According to a survey, landscape modellers need more detailed and mechanistic process descriptions while pedon-scale modellers need the incorporation of matter fluxes (3-D) at the landscape scale in their models. We perceive that the cooperation of scientists active in landscape- and pedon scale modelling, paleopedology and pedometrics will be needed to bridge this gap.

The Working Group aims at establishing a platform where soil and landscape modellers can meet physically and virtually. Physical meetings are organized in the form of symposia in larger conferences such as EGU, AGU, Eurosoil, Pedometrics, etc. and in the form of workshops containing model demonstrations. A website (*http://soillandscape.org*) and an annual newsletter are established to stimulate interactions. To identify main development issues in soilscape modelling a review paper has been written and discussion sessions are planned in workshops.
The ambition is to have, at the end of the 4-year period of the working group, a community interacting on the topic of soilscape modelling that is producing, testing and evaluating models.

Activities in 2015:

- Launch of *http://soillandscape.org*
- A first edition of the annual newsletter (early march 2015)
- Co-organisation of a workshop at EGU (12-17/4/2015: Linking evolution of landscapes, soils and biogeochemical cycles through models, novel approaches and soil records
- Organization of a 1-day workshop (14/9/2015) during Pedometrics 2015 (Cordoba, Spain, 14-18/9/2015)

Activities in 2016

- Second newsletter (early March 2016)
- We organized a workshop of 1 week on soilscape modelling, but had to cancel it because of insufficient subscriptions
- We submitted a proposal for a joint workshop with WG Digital Soil Morphometrics and WG Soil monitoring during WCSS 2018 Rio
- We have started the organization of a 1-day workshop on soilscape modelling during EGU2017
- Similarly, we started the organisation of a 1-day workshop on soilscape modelling during Pedometrics 2017

Working Group Paddy Soils

By Mizuhiko Nishida, chair of PSWG

Paddy Soils Working Group (PSWG) organized two symposia "High yield of rice under sustainable production" and "Research frontiers on microbiological and biochemical processes in paddy soil" in 12th International Conference of the East and Southeast Asia Federation of Soil Science Societies (ESAFS) held in Nanjing, China, 18-21 September, 2015. The latter was joint symposium with Soil Biology Commission, Division 2, IUSS. Both were financially supported by Division 3 and 2, IUSS, respectively. In the session of "High yield of rice under sustainable production", 6 oral presentations and 13 poster presentations were made. In the session of "Research frontiers on microbiological and biochemical processes in paddy soil", 8 oral presentations and 8 poster presentations were made.

In 2016, PSWG will give scientific support to one symposium "Direction of technological innovation to cope with structural changes in paddy field farming" held in Tokyo, 06 Dec, organized by National Agriculture and Food Research Organization, Japan.

Working Group Soils of Urban, Industrial, Traffic, Mining and Military Areas (SUITMA)

Chair: Kye-Hoon John Kim (University of Seoul, Korea)

1. The 8th SUITMA conference
2. Election of new chair person
3. Publication of IUSS book, Urban Soils

1. The 8th SUITMA conference

The eighth SUITMA conference was held in Mexico City from September 20th till 25th, 2015 at the National Autonomous University of Mexico (UNAM). It was organized by soil scientists from the Institutes of Geology and Geography, the chairpersons being Christina Siebe, Silke Cram and Eleonora Ramírez. There were 112 registered participants attending the meeting, coming from 18 different nations (Fig. 4).

Along 3 conference days 10 sessions with a total of 49 oral and 74 poster presentations took place, covering the topics: (i) soil ecological functions in urban planning and management, (ii) urban soils and human health, (iii) restoration and reclamation of environmental liabilities, (iv) soil forming processes in Technosols, (v) soil and city biodiversity, (vi) soils as archives of settlement history, (vii) food production in urban and peri-urban areas, (viii) soil conservation to improve water management in urban areas, and (ix) geological hazards in urban and peri-urban areas (*www.geologia.unam.mx:8080/~cisu/suitma8/*).

One and a half days of the conference were further dedicated to field trips in the metropolitan area of Mexico-city. Problems such as accelerated surface sealing, land subsidence due to groundwater overexploitation, flood hazards and surface runoff regulation, groundwater pollution and overexploitation, wind erosion in peri-urban areas affecting air quality, waste production and disposal, rehabilitation of industrial liabilities were discussed at the different excursion stops. Soils developed out of rubble debris, saline-alkaline lake deposits, or in prehispanic floating gardens were shown, as well as soils which function as archives of more than 2000 years of settlement history within the basin of Mexico. Also examples of reforestation of environmentally strategic ravines, clean-up strategies of former industrial sites, green roofs installed by different institutions and the conservation program of ecological soil functions at the university campus were demonstrated.
Half day of the meeting was dedicated to a soil education fair, in which conference participants showed outreach activities to promote social awareness on soil ecological functions to conference participants and to children from a nearby primary school. The outreach program of the Institute of Geology named “Terramóvil” can be seen here *www.geologia.unam.mx:8080/igl/index.php/terramovil*.

One post conference tour showed archaeo-urban soils at the Teotihuacan archaeological site, soils of the largest wastewater irrigated area worldwide in the Mezquital valley and soils on mine waste deposits of the Guanajuato mining district in Central Mexico. Another three days tour went to the city of Xalapa, state Veracruz, east of Mexico City. Deep weathered soils formed on volcaniclastic materials were shown as well as their degradation by accelerated urban growth and deforestation, which leads to increasing landslide hazards and liquefaction processes. Preventive and remediation solutions that have been taken by the government such as contention walls or vegetation covers were demonstrated and their effectiveness discussed.

2. Election of new chair
Prof. Kye-Hoon John Kim of Republic of Korea was elected as the 3rd chair of SUITMA in a business meeting during 8th SUITMA conference after prof. Wolfgang Burghardt of Germany (1st) and prof. Jean-Louis Morel (2nd).

3. Publication of IUSS book, Urban Soils
The IUSS book, Urban Soils, was prepared jointly by WG SUITMA and Division 3. Based on the frame prepared by prof. Jean-Louis Morel of France, the book is composed of 10 chapters covering wide range of topics in urban soils area. Over 50 authors were contributed to publication of the book. This book was published through the hard work of a team of editors (Maxine Levin, Wolfgang Burghardt, Jean-Louis Morel, Przemyslaw Charzynski, Richard Shaw, Kye-Hoon John Kim) led by Maxine Levin.

Report of Division 4: 'The Role of Soils in Sustaining Society and the Environment'

Division 4 is generalized and entails the transfer and outreach of our knowledge base to segments of our society where soils and soil science are frequently misunderstood or sometimes under appreciated. It takes the soils information generated in the other three divisions along with developing new scientific information and addresses public literacy in soil science, education, international conventions, consequences of human activities on soil ecosystems, policy issues, food security, history of the discipline, etc. This division might be considered the "capstone" division because it must integrate our scientific body of knowledge so scientists, policy makers, and those specialists remote to soil science may become more informed about the utility of this most essential natural resource at the Earth's surface. It is the scientific entity that interacts well beyond traditional bounds.

Division 4 is organized in five commissions:

- Commission 4.1 - Soils and the Environment
- Commission 4.2 - Soils, Food Security and Human Health
- Commission 4.3 - Soils and Land Use Change
- Commission 4.4 - Soil Education and Public Awareness
- Commission 4.5 - History, Philosophy, and Sociology of Soil Science

IUSS Division 4 2015-2016 report

During this "2015, International Years of Soils (IYS)" Division 4 developed different activities for large audiences such as:

- publication of the Division 4 newsletter: "Soil Connects",
- short articles (10) to be put each week on the IUSS website from October to December 2015,
- participation in local, national and international seminars, symposia and conferences targeted to large public audiences,
- exhibitions on soils and workshops to improve soil awareness.

The Division 4 newsletter *"Soil Connects"*

This newsletter (c.a. 20 pages) was created and is managed by Damien Field.

The first issue was published on December 2014, the second on July 2015, the third one on Decem-

Chairs and Vice-Chairs of Division 4 -The Role of Soils in Sustaining Society & the Environment		
Division	Chair	Christian Feller, France
	1st vice-chair	Cristine Carole Muggler / Brazil
	2nd vice-chair	Cassio Hamilton Abreu Junior / Brazil
Commissions		
1: Soils and the Environment	Chair	Masamichi Takahashi, Japan
	Vice Chair	Ian Hollingsworth, Australia
2: Soils, Food Security, and Human Health	Chair	Ganga Hettiarachchi, USA
	Vice Chair	Adelheid (Heide) Spiegel, Austria
3: Soils and Land Use Change	Chair	Ryusuke Hatano, Japan
	Vice Chair	Jay Jabro, USA
4: Soil Education and Public Awareness	Chair	Damien Joseph Field, Australia
	Vice Chair	Cristine Carole Muggler, Brazil
5: History, Philosophy, and Sociology of Soil Science	Chair	Thomas J. Sauer, USA
	Vice Chair	Richard Doyle, Australia

Week	Commission	Author	Titles
(1) Oct 5-11	Div. 4 Chair	Feller C.	*The IUSS Division 4*
	Div. 4 Vice Chair	Muggler C.	*Towards the IYS: the challenge of bring people to care about the soil*
	Div. 4 Chair	Feller C.	*Soil connects Nature and Culture*
(2) Oct 12-18	Comm. 4.1	Hollingsworth I.	*Connecting people with soil*
(3) Oct 19-25	Comm. 4.2	Hettiarachchi G.	*Growing food crops on urban brown-fields. Best management practices to reduce potential human health risk*
(4) Oct 26 - Nov 1	Comm. 4.3	Hatano R.	*Key processes and factors to mitigate land degradation*
(5) Nov 2-08	Comm. 4.3	Jabro J.	*Soil compaction*
(6) Nov 9-15	Comm. 4.4	McBratney A. & Field D.	*Making connections through Global Soil Security*
(7) Nov 16-22	Comm. 4.5 (History)	Demas S.Y. (and Sauer T.)	*A soil treasure unearthed*
(8) Nov 23-29	Comm. 4.5 (History)	Churchman J.	*Books from Commission 4.5*
(9) Nov 30-Dec 6	Comm. 4.5 (History)	Feller C., Blanchart E. & Brown G.	*Popularity of earthworms before and after Darwin*
(10) Dec 7-15	Comm. 4.5 (Sociology)	Doyle R.	*Links between soil science, indigenous landscape knowledge and society – examples from NZ and Australia*

Table 1. Articles from Division 4 published on the IUSS website.

ber 2015 and the 4th one will be on December 2016.
Soil Connects is largely illustrated and provides short articles from Division 4 members, announces scientific events and new books published.

Short articles on IUSS website
From October to December 2016, Division 4 commissions proposed one or more articles to be download from the IUSS website, especially for the International Year of Soils (IYS).
See Table 1.

Participations to local, national and international seminars, symposium conferences and exhibitions
The information below was received from: Christian Feller (chair Division 4), Damien Field (chair Commission 4.4), Ian Hollingsworth (vice-chair Commission 4.1) and Cristine Muggler (vice-chair Division 4), Masamichi Takahashi (chair commission 4.1), Ganga Hettiarachchi (chair commission 4.2) and Ryusuke Hatano (chair commission 4.3)

Australia and New Zealand: International Year of Soil. Achievements of IYS 2015.

Soil Science Australia, New Zealand Soil Science and Oceania
By Ian Hollingsworth

The IYS core goal was to raise public awareness of the importance of soils through a range of activities beyond the usual technical symposia in Australia, New Zealand and the South Pacific. Most of the activities fit into IUSS Division 4 Soils & Environment.
Awareness and understanding of the importance of soil for food security and essential ecosystem functions varies across the region between highly urbanized market economies like Australia and New Zealand and Nations where subsistence agriculture is a major part of the economy in Melanesia, Polynesia and East Timor.

Activities organized under the following specific objectives of the IYS 2015:

1. **Raise full awareness among civil society and decision makers** about the profound importance of soil for human life;
   - Department of Agriculture and Water sponsored publication of Soil Science in Australia – an IYS small book to celebrate and promote wise management of the Australian soil resource.
   - Steward of the soil photographic competition (Richard MacEwen)
   - Tasmanian soil photographic competition - Tasmanian Branch of Soil Science Australia invited photographers of all ages to enter its Tasmanian Soil Photo Competition. The judges are looking for striking images of soil in Tasmania that highlight the beauty, values, roles and importance soils have within the human and natural environments.
   - Celebration of food and drink and the soil that produces it from the landscapes of Victoria (Richard MacEwen)
   - Film, art, music, soil - 'Celebrate Soil', in Federation Square Melbourne on World Soil Day (Richard MacEwen).

2. **Educate the public** about the crucial role soil plays in food security, climate change adaptation and mitigation, essential ecosystem services, poverty alleviation and sustainable development.
   - NZ Soil Science Society developed an informative and interactive Soil website: *www.ilovesoil.kiwi* targeting the general public and suitable for primary school teachers and children, with fun activities related to soil and a legacy beyond IYS
   - NZ Soil Science Society World Soils Day activities including public talks and seminars in regional centres throughout NZ were promoted in the media featuring soil scientists on national radio in newspapers and the farming press.
   - FIJI Department of Agriculture International Year of Soils promotion to commemorate the Golden Anniversary of Soil Science in Fiji by a publication and in the Fijian media.
   - Soil Science Australia Special Publication for the Year of Soils (Linda Bennison)
   - There were active soil education programs in schools. The Queensland Branch of Soil Science Australia (SSA) adopted a three-pronged approach for soil science communication running stalls at Community events, school workshops and teacher professional development sessions.
   - The QLD branch developed four teacher guides to teach soil science that fit within the National high school science curriculum. These guides incorporated advice and final review from science teachers.
   - Professor Rob Fitzpatrick gave the inaugural Boodja lecture in soil science, Western Australia "Boodja" is a Noongar word for 'land' and this lecture series acknowledges the important role of Aboriginal understanding in the responsible management of the soil and land. For thousands of years Noongar people have resided on and had cultural connection to this land. Everything in our vast landscape has meaning and purpose – and the connection to Boodja (the land) is passed on through stories and expressive forms of art.
   - In the Northern Territory we supported schools programs describing soils in school or community gardens, seeking to inculcate an understanding that food comes from soil and how to produce it by looking after soil and water.
   - Promotional of IYS goals and media interviews at the Darwin annual Garden Spectacular, an exposition of horticulture for urban dwellers, which receives strong media attention.

3. **Support effective policies** and actions for the sustainable management and protection of soil resources;
   - Indigenous knowledge project – linking soil science, indigenous landscape knowledge and society in New Zealand and Australia (Richard Doyle)
   - Australian E(ART)H project which was supported by Soil Science Australia continues to progress with the team recently meeting with Tasmanian Aboriginal landscape and cultural expert Greg Lehman. Greg was supportive of the project which aims to tell landscape genesis stories through indigenous art using soils and ochre's see *http://www.theearthproject.com.au/* (Richard Doyle)
   - Soil information was the subject of international regional collaboration between University of Sydney researchers Budiman Minasny & Damien Field and Baba Barus from Institute Pertanian Bogor. The workshop, titled Soil Information to secure Agriculture & Food Security in Indonesia was held on the 18th October 2015 at Institute Pertanian Bogor. Soil information is used at the ministerial level to allocate land for crop production, set fertilizer subsi-

dies, and to reclaim and manage agricultural land. The Australia Indonesia Centre funded this event, which discussed how the soil information system be used to manage sustainable expansion and intensification of agriculture in Indonesia.

4. **Promote investment in sustainable soil management activities** to develop and maintain healthy soils for different land users and population groups;
   - Promoting awareness of the value of soil to grow food in urban community gardens using social media Growing from the ground up interviews (Ian Hollingsworth)
   - The Remote indigenous garden network and ACIAR Project Making links between subsistence agriculture in Northern Australia, Melanesia and the urban community garden network to improve food production in urban areas and food security in remote communities by sharing soil knowledge and crop plants. (Anthea Fawcett, Tania Paul, Ian Hollingsworth)

5. **Strengthen initiatives in connection with the Sustainable Development Goals** process and Post-2015 agenda.

6. **Advocate for rapid capacity enhancement for soil information** collection and monitoring at all levels (global, regional and national);
   - To this end the Faculty of Agriculture and Environment at The University of Sydney hosted the 2015 Research Symposium titled "Soil to save our planet" on 14 of July 2015. The Symposium brought together International and Australian experts to present their latest research and ideas on innovations to drive the future, focusing on how soil contributes to our planet's continued functioning and human wellbeing.
   - Patron of Soil Science Australia, the Hon. Dr. Penelope Wensley AC presented the trophy for the National student soil judging competition, Mundijong, Western Australia to the winning team from LaTrobe University (Tim Overheu)

Soil received heightened attention in the media during 2015. There were 4,654 hits for international year of soils as a topic on the ABC (Australian Broadcasting Corporation) web site. The issues covered were soil and gardening, sustainability, land use, locally grown produce…

Australia : specific activities from Div4 members

Related to soil security, soil education and soil awareness, besides the formally advised activities of the Australian Society of Soil Science, other public events were organized or communications given in Australia and other countries (USA, Malaysia) by **Damien Field** (Commission 4.4 chair) on behalf of IUSS Div4.

Organization

2015, May 19-21. "Global Soil Security Symposium", Texas A&M University (USA).

Organizing Committee and moderator of the session 2 "Condition".

2016, Dec 5-6, 2nd Symposium Soil Security, More Science-Society Interfaces for a Global Soil Security, Paris, France.

https://gssparisen.wordpress.com/

Global Soil Security (D. J. Field, C. L.S. Morgan, & A.B. McBratney. EDs.) Springer NY

See: *http://www.springer.com/gp/book/9783319433936#bibliographic*

The IUSS is one of the recognised sponsors for the symposium and this book, along with Commission 4.4, through me as senior editor.

I would like to acknowledge the support of the IUSS & its Division 4.

The official release is on 5th Dec 2016 but electronic copies available online now.

The 2nd symposium will be in Paris, *https://gssparisen.wordpress.com/* 5-6Dec 2016

***Communications** (D. Field, Commission Chair 4.4)*

- 2015, May 19. (with A. McBratney). *Aspects of Soil Security.* "Global Soil Security Symposium", Texas A&M University (USA).
- 2015, April 5-7. *Soil Security: Addressing the Challenges of Food Security*. Malaysian Soil Science Society Conference, KL, Malaysia, (Plenary) *http://www.msss.com.my/soils2015.php*
- 2015, August 19. *Soil security, food production and nutrition-sensitive policy.* "Resetting the Australian Table: adding value and adding health". Charles Perkins Centre & Marie Bashir Institute, The University of Sydney.
- 2015 October 8, Securing Soil to Strengthen Food Security, *Soil Information to Support Sustainable Agriculture& Food Security in Indonesia,* The Australian-Indonesia Centre, Bogor, Indonesia.
- 2015 Making Connections through Soil Security, *Surface Soil, the Key for Human and Ecosystem Conference,* Seoul Korea.

- 2015. Soil health warning not all doom and gloom. ABC Rural. *http://www.abc.net.au/news/2015-09-01/soil-health-warning-not-all-doom-and-gloom/6740630*
- 2016. Soil Education: for the 21st Century. Soil Productivity – Growing Agriculture' – Symposium. Crawford Fund and the NSW DPI, 9th May, MLC Centre, Sydney Australia. *http://www.dpi.nsw.gov.au/about-us/media-centre/releases/2016/soil-master-class*
- 2016, Dec 5-6, 2nd Symposium Soil Security, More Science-Society Interfaces for a Global Soil Security, Paris, France. https://gssparisen.wordpress.com/

Austria

by Adelheid Spiegel

- 2015, October 5-9. Conference ISO TC 190: „Soil Quality"and CEN TC 345: „Characterization of Soils", including a soil awareness workshop.
- 2015, Dec. 3. Austrian Soil Film day („Symphony of the Soil") including a panel discussion organized by the Austrian Soil Science Society (ASSS) in cooperation with several institutions interested in the topic.
- Austrian UNESCO Prize for Education for Sustainable Development (ESD) for Soil awareness activities in schools.
- 2015, Dec. 7. A Div4 working group on the "Future challenges for soils" was held in Vienna during the "Celebration of the International Year of Soils 2015: Achievements and Future Challenges" meeting.

Brazil

by Cristine C. Muggler

In 2008 the Soil Education commission of Division 4 of the Brazilian Soil Science Society (SBCS) started an inventory of existing soil education groups in Brazil. By now, there are more than 30 groups, most linked to university departments of Soil Science and Geography, but not only. Those groups developed or inspired a wide set of activities during the year as well as for the World Soil Day, as listed below:

Education and outreach

- *Trilha do Solo*. Soil trail at the State Park Serra Verde, Belo Horizonte, Minas Gerais. April, 11th.
- *Year 2015 tematic project "O solo é vivo!* Investigando a vida no solo" (Soil is alive: investigating life in the soil). February – December 2015. Project developed with basic education schools of Viçosa and region. The concept was offered to schools to work with and educational material was developed to support the school communities. In total, 25 schools joined the project, directly involving 53 teachers and 1150 pupils. A celebration of the project, including presentations and prizes, will happen on the 5th of December in the central square of the city, Viçosa, in a main event called "Viva o Solo!"
- *Exhibition "O Solo é Vivo".* Developed by the Earth Sciences Museum of the Federal University of Viçosa (UFV). It was opened at the Annual meeting of the Brazilian Society for the Advancement of Science (SBPC)", in São Carlos, state of Sao Paulo, July 12-18th. It was visited by 11 thousand people. After that it has been traveling and passed by Natal, Rio Grande do Norte (at the XXXV Brazilian Soil Science Congress), Rio de Janeiro (two months at the Science Centre UFF Ciência Viva), Simonésia, Minas Gerais (3000 visitors) and many schools in the region.
- *Exhibition "Solos de Minas".* Developed by the State Foundation for the Environment (FEAM) and the Soils Department of the Federal University of Viçosa (DPS/UFV), the set assembles 20 soil monoliths that represent the soil diversity of Minas Gerais State. Presented at the Natural Sciences Museum of the Catholic University of Minas Gerais in Belo Horizonte from May, 19th to July, 30th and Contagem from August 31st to November 15th. It was exposed in Natal, Rio Grande do Norte, at the XXXV Brazilian Soil Science Congress in August.
- *Exhibition "Sem solo, sem vida".* Developed by the Luiz de Queiroz Museum and the Soil in School Programme (Programa Solo na Escola ESALQ) of the State University of São Paulo, Piracicaba. It presents demonstrations and experiments of the hands-on area of the Programme as well as soil monoliths of the region. September 14th to October 30th.
- *Expedição Solo na Escola.* Two agronomists are travelling 32.000 km on bike crossing 18 countries in Americas, from Ushuaia to Alaska, in an Environmental Education Project focused on soils with the support of the "Programa Solo na Escola" from the Federal University of Paraná. They left Curitiba, Paraná on September 18th, to start from Ushuaia on September, 22nd. (*https://www.facebook.com/expedicaosolonaescola/timeline*)

- *Feira do Conhecimento O solo é vivo*. Knowledge Fair organized at the state school of Araponga, Minas Gerais, November, 19th.
- *"Você conhece o chão onde pisa?"* (Do you know the ground you step on?). Exhibition and workshops about soils for children of all ages organized by the Massapê Soil education group. Parque de Dois Irmãos, Recife, Pernambuco, December, 2-5.
- *Feira do Solo (Soil Fair):* exhibitions, lectures, radio interviews and agroecological open market organized by the Federal University of Campina Grande (UFCG) *Solo na Escola* project in Sumé, Paraíba, November, 26th to December, 4th.
- *Comemoração do Dia do Solo* no Projeto Solo na Escola Geografia USP. Soil Day comemoration at the Soil in School Project of State University of São Paulo. Field classes for the public and activities for children. December, 3-4th.
- *Exhibition "Solos da Paraiba"* and short course on soils. Organized by the Soil Science Department of the Federal University of Paraíba, November, 25-27th.
- *Public open space presentations on soils* by the Soil Study Group (GESOLO) of the Federal University of Rio Grande do Norte, campus Macaíba, October 21st to December, 5th. (*https://www.facebook.com/grupogesolo/timeline*)
- *Commemorative exhibition on the World Soil Day* at the Barigui Park, Curitiba, Paraná. At the event the film produced by the Paulo Freire TV "Vamos Conservar o Solo?" will be launched.

Scientific meetings, seminars and field days

- Public perception and social representation of soils: barriers or tools for soil conservation? Symposium held by Division 4 at the Brazilian Conference Governance of Soils, Brasília promoted by the Brazilian Federal Court of Accounts, with the support of the Brazilian Soil Science Society and Embrapa Soils, March 25-27th.
- Mês do Solo na UFRGS (Soil Month at Federal University of Rio Grande do Sul). Commemoration of the International Year of Soils by the post graduation programme in Soil Science that includes Field day, Seminars and lectures as well launching of publications. November, 20 to 27th and December, 4 to 17th.
- Encontro Regional do Ano Internacional dos Solos: Alimentos e Vida. Organized by the State University of the West of Paraná (UNIOESTE), Campus Francisco Beltrão. October 27th.
- Functionalities and responsible use of soil resources. Symposium organized by the Study Group on Soil Science (NECS) of the Federal University of Lavras (UFLA), November 30th to December 4th.
- Field celebration day on soils. Organized by the Soil Department of the Federal University of Santa Maria (UFSM) and the State Foundation on Agricultural and Livestock Research (FEPAGRO). Júlio de Castilhos, Rio Grande do Sul, December 2nd.
- I Simpósio de Ciência do Solo / I Expo Solos. Organized by the Soil in School Project and Soil Science Post Graduation Programme of the Federal University of the Recôncavo da Bahia to celebrate the International Year of Soils. It will be held in Cruz das Almas, Bahia, December, 3-5th
- Workshop World Soil Day. Organized by the Extension Programme Soil in School of the State University of Santa Catarina, Florianopolis, Santa Catarina, December, 4th.

Awareness raising among civil society and decision makers

- Public audience on Healthy Soils at the State Council of Paraná to celebrate the IYS, in Curitiba, Paraná, November 24th.
- Round tables, debates, press meetings and TV programmes at:
  - Curitiba City Council, November 9th (Soil Conservation) and December, 3rd (IYS).
  - Lages, Santa Catarina, December 2nd;
  - Viçosa, Minas Gerais, December 2nd.

Other activities and communications were given by Cristine Muggler (Division 4 vice-chair) on behalf of IUSS Div4 in Italy and Mexico:

- 2015, September 20-25 (Mexico City): Education strategies to promote awareness on urban soil ecological functioning: painting with soil materials. 8th International Conference of the Working Group on Soils in Urban, Industrial, Traffic and Mining Areas (SUITMA), of the International Union of Soil Sciences (IUSS).
- 2015, October 21-23 (Milan and Ispra). *The catwalk to soil awareness: achievements and challenges*. "ENSA Meeting 2015 - *Giving soils a voice"*
- 2016, September 7-10.
  - Round Table: *Relatos de experiências extensionistas na Educação em Solos.* 8th Brazilian Symposium on Education in Soils (*VIII Simpósio Brasileiro de Educação em Solos*).
  - Working group: *Percepção pública do solo, avanços e perspectivas.*

France and Belgium

Besides the formal activities of the French or Belgium Society of Soil Science, different events for the general public were organized and papers given by **Christian Feller** (Division 4 chair) on behalf of IUSS Div4.

Organization of events

- 2015 Nov. 21 A «IUSS soil day» in Montpellier (Herault, France) entitled:
  «Le sol, un patrimoine de l›humanité» ("Soils, a mankind patrimony").
  There were 7 communications by soil scientists from Univ. Montpellier 2, IRD, Cirad and Inra.
  Audience: 70 people
- 2016 Dec. 8. "Journée Mondiale des Sols" (World Soil Day) (co-organizer). Numerous communications for parliamentarians (senators and deputies)
- Two IUSS conferences for local learned societies given by Dominique Arrouays, the presently president of the French soil science society:
  - 2015, nov. 19 at «Académie de Lascours» (France, Bagnols sur Cèze):
    «Les sols de la planète sont-ils en danger ?» ("Are the planet Earth soils in danger?").
    Audience: 50 people.
  - 2015, Nov. 20 at «Les Conférences du Temple» (France, Uzès):
    «Les sols au centre des grands enjeux planétaires» ("Soils at the hearth of large planetary challenges?").
    Audience: 110 people.

Papers (C. Feller):

- 2015, 12 nov., at Academy of Nîmes (France):
  «Les sols, un nouvel enjeu pour l›humanité» ("Soils, a new challenge for the humanity").
  Audience: 60 people.
- 2015, 21 nov., at Montpellier (France, see above), 2 communications:
  «Vous avez dit Sol?» ("You said soil ?")
  «Le Sol et l'Art» ("Soil and Art")
  Audience: 70 people
- 2015, 24 and 25 Nov., at Gembloux (Belgium), 2 invited key notes to an "International Agricultural Seminar" organized by the CSA NGO and entitled «Fertilité des sols: échanges autour de pratiques innovantes…» ("Soil fertility: discussions about innovating practices"):
  - *«Gestion organique des sols: quelques réflexions»* ("Organic management of soils: some reflections"),
  - *«Humus et fertilité: une approche historique»* ("Humus and fertility: a historical approach").
    Audience: 70 people.

Japan

by Masamichi Takahashi and Ryusuke Hatano

Specific activities from members of the Japanese Society of Soil Science and Plant Nutrition and other public events.

- Publication of Special Section on Key Processes and Factors to Mitigate Land Degradation (from Commission 4.3 symposium in 20th WCSS); Edited by Ryusuke Hatano, Suwardi, Sonoko Dorothea Bellingrath-Kimura. Catena, Volume 133, Pages 1-13 and 453-502 (October 2015)
- Open a portal site for cheering IYS. *http://pedologyjp.sakura.ne.jp/iys2015/*
- 2015. February 15. National competition of digging soil. by Family enjoy land 'Narita Yume Farm', Chiba, Japan.
- 2015. March 25-April 7. Wander Sand Land. 'What wonderful and interesting soil!' by Kids Plaza Osaka. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1328*
- 2015. May 8. Symposium 'Healthy foods and soil for children' by Japan Organic Agriculture Association. Kokugakuin University. Tokyo, Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1274*
- 2015. May 17. Earth day at Toyama 'Investigation of soil animals' Toyama University. Toyama, Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1345*
- 2015 May 26. Academic seminar 'Calibrating Pedogenic Thresholds in Hawaii: Global Implications' by Professor Oliver Chadwick. NIAES, Tsukuba, Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1387*
- 2015. May 27. International session of JpGU 'Exploring the role of soil in earth science: ecological/biogeochemical linkage and beyond' Makuhari Messe, Chiba. Japan.
- 2015. May 30-2016. January 24. Touring exhibition of soil monoliths 'What is soil?-Cerebration of IYS' Saitama, Koganei, Sumida, Kyoto, Osaka, Hyogo, Koto and Ibaraki. Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1369*

- 2015, May 31 Photographic contest of soil. by Japanese Society of Soil Science and Plant Nutrition and Japanese Society of Pedology. *http://jssspn.jp/soils2015/notice/photo_contest/photo_contest.html*
- 2015. June 27-July 5. Touring exhibition of soil monoliths. Tokyo University of Agriculture and Technology. Koganei, Tokyo.
- 2015. July 5. Symposium 'Utilization of familiar soil' Tokyo University of Agriculture and Technology. Koganei, Tokyo. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1419*
- 2015. July 7. Symposium 'Protect soil and succeed soil – message from Akita, Tohoku area' by Tohoku branch of Japanese Society of Soil Science and Plant Nutrition. Akita, Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1403*
- 2015. August 15-September 6. Open science museum EXEDRA, 'Understanding soil by five senses' Kashiwanoha Science Education Lab. Kashiwa, Chiba, Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1661*
- 2015. August 22. The earth cafe. Special event 'Soil, Grass and Cow' by Hokkaido branch of Japanese Society of Soil Science and Plant Nutrition. Obihiro Univ. of Agriculture and Veterinary Medicine. Obihiro, Hokkaido, Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1650*
- 2015. February 18. A lesson of Satoyama in a primary school. 'Cerebration of IYS' Professor Hideaki Hirai, Utsunomiya University. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1281*
- 2015. November 15. Workshop 'Occupation on dry land soil' Tokyo Metropolitan University. Tokyo, Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1737*
- 2015. November 27. Student seminar 'Environment, Agriculture and Culture related to Soil' Nagoya University, Nagoya, Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1750*
- 2015. December 5. IYS Symposium 'Soil, Land and Life. Let's talk about soil' Science council of Japan. Tokyo, Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1730*
- 2015. December 5. Commemoration event of IYS. (Japanese Society of Pedology) National Science Museum. Tokyo, Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1773*
- 2015, December 5. Symposium 'The earth is made of soil' Okinawa, Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1765*
- 2015. Decmber 12. IYS Citizen symposium 'Familiar soil: from its roll to kitchen garden' Matsuyama, Ehime, Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1778*
- 2015. December 12. Regular workshop 'Learn from the practice: theory of preparation of healthy soil' Yamazaki agriculture institute, Ibaraki, Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1783*
- 2015, December 18. Forum 'Water, Soil, Culture and Civilization' Tokyo University of Agriculture. Tokyo, Japan. *http://pedologyjp.sakura.ne.jp/iys2015/archives/1757*

USA

By Ganga Hettiarachchi

In addition to the various activities organized by Soil Science Society of America, commission members involved in organizing multiple activites under the general theme of soils, food security and human health.

International Year of Soils Celebration

- Kansas State University hosted an event, with a program, displays and reception on Sunday, Sept. 27, at the Hilton Garden Inn, Manhattan, Kansas, recognizing the 2015 International Year of Soils. The event kicked off the 12th International Phytotechnologies Conference that took place through Sept. 30.
- Twelve videos celebrating IYS were prepared by Kansas State University Research and Extension (KSRE). Each monthly theme for the International Year of Soils were adopted from the Soil Science Society of America.
  - January 2015 Soils Sustain Life *https://www.youtube.com/watch?v=CmADUO6FeoU&feature=youtu.be*
  - February 2015 Soils Support Urban Life *https://www.youtube.com/watch?v=lvDs8LyEm8w*
  - March 2015 Soils Support Agriculture *https://www.youtube.com/watch?v=nW1ozgrmyMo*
  - April 2015 Soils Clean and Capture Water *https://www.youtube.com/watch?v=ExB0W85Zo1w&feature=youtu.be&list=PLAD45744D5128C8EB*

- May 2015 Soils Support Buildings and Infrastructure *https://www.youtube.com/watch?v=MwW6W_UA3Ks&feature=youtu.be*
- June 2015 Soils Support Recreation *https://www.youtube.com/watch?v=ApDJGV0R5Is&feature=youtu.be*
- July 2015
- August 2015 Soils Support Health *https://www.youtube.com/watch?v=eJc0knmNhi4&feature=youtu.be*
- September 2015 Soils Protect the Natural Environment *https://www.youtube.com/watch?v=G7V4JKTR6eU&feature=youtu.be*
- October 2015 Soils and the Products We Use *https://www.youtube.com/watch?v=6lq2YGgRM-0&feature=youtu.be*
- November 2015 Soils and Climate *https://www.youtube.com/watch?v=2Xv_j7S8IPE&feature=youtu.be*
- December 2015 Soils, Culture and People *https://www.youtube.com/watch?v=evWAdrZMbx4&feature=youtu.be*

Workshops

2015 September. Workshop titled *Cross Pollination: Community Garden Topics for Everyone*. Round table discussion at the 2015 National Brownfields Conference in Chicago, USA.

Topical sessions

2015. November, Tropical session titled "Chemical Processes Responsible for Carbon Fluxes" in Soil Chemistry division at the ASA/CSSA/SSSA Annual Meetings in Minneapolis, MN, USA.

Webinars

2015. December. *Gardening on Brownfields - Research Results and Best Management Practices.* One-hour Webinar organized as a part of EPAs Brownfields National Training Webinar Series.
2015. April. *Urban Vegetable Gardening*. One-hour Webinar organized by the Agency for Toxic Substances and Disease Registry (ATSDR), as part of monthly webinar series

Communication

Various presentations were made by commission members at multiple international and national scientific meetings. Main focus was soils, food security and human health. Some examples are given below.

- "Embedding soils in the general education undergraduate curriculum" at the ASA/SSSA/CSA Annual Meetings, Nov. 2015, Minneapolis, MN.
- "Growing safely to produce healthy crops- community gardens on previously used sites." At the American Community Gardening Association, August 15, Denver, CO.
- "Managing urban garden soils: Minimize potential for soil contaminant transfer." The 100th Annual Meeting of Ecological Society of America, Aug. 2015. Baltimore, MD.
- "Gardening on contaminated urban soils: Mechanisms to reduce risk potential." The 12th International Phytotechnologies Conference, Sep. 2015, Manhattan, KS.
- "Long-term effects of compost additions to chemical and biological properties of metal-contaminated soils." The 13th International Conference on Biogeochemistry of Trace Elements. July 2015, Fukushima, Japan.
- "Promising opportunities to use biosolids in revitalizing urban brownfields." International Water Association/Water Environment Federation/ Residuals and Biosolids Conference. June 2015. Washington, DC.

News Releases

- CSA News. May 2015
- *https://www.soils.org/story/gardening-polluted-paradise*
- Science Daily, May 2015. American Society of Agronomy (ASA), Crop Science Society of America (CSSA). "Gardening in a polluted paradise: Is it safe?" *www.sciencedaily.com/releases/2015/05/150515111628.htm*.
- Kansas State University. "With proper care, contaminated urban soils are safe for gardening, study finds." Science Daily, 11 June 2015. *www.sciencedaily.com/releases/2015/06/150611114050.htm*.

Potential proposals from Division 4 of Symposia for 21st WCSS (Rio, 2018)

(to be discussed at InterCongress meeting 2016)

Division 4 organized a large internet forum of discussions during April and May 2016 to facilitate emergence of symposium proposals for the the 21st World Congress 2018.
Results are summarized in table 2.

Div4 level and Comm.	*Temporary Title (Symposium or **Exhibit**)*	Potential Convener
Div 4	*A panorama of soil governance around the world* (and the Brazilian situation as a main agricultural producer country).=	Cristine Muggler or (?)
Div 4	*Soil as natural capital: Economic and legal dimensions of the delivery of ecosystem services*	Brent Clothier
Div 4	*Intangible roots of soil perception and representation*	Nikola Patzel
Div 4	*Perceptions of soils by different audiences. How to build up soil care and conservation from these?*	Cristine Muggler
Div 4	***Integrated soil arts poster exhibition and film program***	Alexandra Toland
Div 4	*Dialogues between traditional and scientific knowledge*	Cristine Muggler or ?
Div 4	*Foreseeable breakthroughs in soil science* and	Alfred Hartemink
Div 4	*Foreseeable contributions of soil science to humanity.*	Alfred Hartemink
C4.1	*Climate changes and adaptation of soil functions*	Masamichi Takahashi
C4.1	*Synthesis of marine and terrestrial biogeography: How much does sea level rise enhance carbon sequestration in coastal environments and does it account for missing mass in the global carbon balance?*	Ian Holling-sworth
C4.2	*Soil and Human Health*	Eric Brevik
C4.2	*Optimizing nutrient management for improving soil, human, and ecosystem health*	Ganga Hettiarachchi
C4.3	*Soil compaction: evaluations, problems and solutions*	Jay Jabro
C4.3	*Learn from the nature: Development of soil management system*	Masamichi Takahashi
C4.3	*Rehabilitation of ecosystem services on degraded and damaged land*	Masamichi Takahashi
C4.4	*A 21st Century Soil Science Education*	Damien Field
C4.4	*Critical needs: Strategies for recruitment, education and placement of the future workforce in soil science and natural resources,*	Damien Field
C4.4	*Field to Palette:* *Artistic Perspectives on Soil Functionality*	Alexandra Toland
C4.4	***Soil Science Fair exhibit***	Cristine Muggler
C4.5	*Soil in the Anthropocene*	Alexandra Toland or (?)
C4.5	*Historic development of relations between soil science and society in various countries and an outlook for future SDG-relative activities*	Johan Bouma
C4.5	Synthesis of historical, philosophical and sociological worldviews to secure and sustain soils in the future	Sabine Grunwald

Table 2. Symposia proposals from Division 4.
(Highlighted grey proposals are not yet documented, others are well documented).

Working Group Heritage Soils

The Working Group has been supporting the Government of Moldova in a proposal that the Typical chernozem of the Balti Steppe be listed as a UNESCO World Heritage Site. This is the first time that a soil has been submitted for such recognition.

The Balti chernozem was critical in the foundation of the soil science by VV Dokuchaev in the late 19th century. In his seminal *Russian chernozem* (1883), Dokuchaev reported examining the site during an expedition to Bessarabia, concluding: 'The chernozem seemed to me, in 1877, so typical in its great thickness, structure and stock of humus that I called it "first class". The analysis showed the content of humus was 5.718%.' Soil monoliths from this locality have been exhibited in Paris and Chicago.

Chernozem is generally recognized as the best arable soil in the world. However, during more than a century of increasingly industrial farming, steppe chernozem have lost more than half of their humus and profound but largely un-noticed changes threaten the stability of the whole agro-ecosystem. NDVI satellite imagery over the last 35 years reveals the trend of soil degradation across the whole chernozem belt from Moldova through Ukraine, Russia and Central Asia. Another 25 years of business-as-usual will see the chernozem disappear from the Eurasian steppes. There will still be soil but it will not be chernozem.

The World Heritage proposal seeks to draw the attention of the world to the fate of its best soil and, also, to long-term field experiments on Typical chernozem at the Selectia Research Institute for Field Crops at Balti. Half a century of painstaking experimentation on different agricultural practices (crop rotations, monoculture, different systems of soil tillage, fertilization and irrigation) and a poly-factorial experiment on ecological farming established in 1994 provide hard evidence of the changes in chernozem under cultivation and demonstrate how the functionality and fertility of the soil can be rebuilt under a productive, economically viable faming system. The results obtained in these experiments have been published in *Soil as World Heritage,* edited by David Dent (Springer 2014).

Given World Heritage status, our plan is to develop the site as an international focus for public information, education and research and extend this work across a network of cooperating sites in Romania, Ukraine, Russia and Kazakhstan.

This proposal was submitted to UNESCO World Heritage Centre and the Balti Chernozem was included in the Tentative List in 2011(whc.unesco.org/en/tentativelists/5647/). At this point, the Working Group stalled because the Government of Moldova, in the hands of a succession of fragile coalitions and facing an array of daunting geopolitical and economic circumstances, was unwilling to pursue the project. However, the proposal was kept alive by patient lobbying and, in 2015, the Government of Moldova sent Professor Boris Boincean as its representative to the 39th Session of the World Heritage Committee held in Bonn, Germany, July 1-4, 2015. This brought an encouraging response and subsequent discussions on which organization in the frame of UNESCO (ICOMOS or IUCN) should be responsible for promoting the Site. At the end 2015, National Commission of the Republic of Moldova for UNESCO, represented by Prof. Constantin Rusnac, went ahead with an official request for World Heritage status and requested an IUCN Advisory Mission.

The Director of the UNESCO World Heritage Centre is now suggesting joining the GEOPARKS network rather than the World Heritage List. We have responded with argument for the original concept. In our view, and following Dokuchaev, a soil is fundamentally different from a geological feature: a soil is an independent living organism and a cultivated soil like the chernozem is inseparable from the culture of the human society that lives on it, with it and by it. Recognition as a World Heritage Site – embracing education, science and culture - can facilitate the redirection of policy, ecologic and agronomic knowledge. We need to restructure the dominant model of agricultural intensification by adopting agro-ecological principles – which requires a groundswell of political and societal support as well as rational argument.

We are especially glad to have received, in the last month, a letter of support on behalf of the IUSS, signed by distinguished Professors Rainer Horn, Rattan Lal and Jae Jang. And the Working Group stands ready to support the establishment and development of the World Heritage Site with the purpose of promoting the understanding and proper management of these unique soils. All we need is the green light from UNESCO.

Universal Soil Classification

By Jon Hempel (USDA NRCS 100 Centennial Dr., Lincoln, NE), Erika Micheli (Szent Istvan Univ., Godollo, Hungary), Vincent Lang (Szent Istvan Univ., Godollo, Hungary), Alex McBratney (Univ. of Sydney, Sydney, Australia)

Introduction

Professional soil scientists have been working internationally for many decades to develop systems for soil classification and great progress has been made from before 1900 to the present time. Soil classification is the naming of different types of soils based on a set of common or expected properties. Classification is an aid to talk about the soil in a consistent, comparable way, and is applied at local, national and international levels, as well as various levels of complexity and scientific consideration. Classification and consistent terminology allows land management lessons and soil interpretive information to be shared consistently from one location to another and in similar regions.

The system for global soil classification is based on many different national systems, of which there are over 50 throughout the world. Many of these are no longer being updated or have been abandoned, it is often cumbersome to correlate these systems because of definitional differences in concepts, in physical and chemical measurements and in organizational formats (Krasilnikov *et al.*, 2009). There are several classification systems that have been designed for wider application. Examples of these systems are the US Soil Taxonomy, the World Reference base and the French Référentiel Pédologique. These overarching systems have been in development for many decades and have matured to the point where they are used in many parts of the world. There is now a renewed interest within the soil science community for the further development of a system of soil classification that can be applied across the world.

The International Union of Soil Sciences Working Group for Universal Soil Classification was officially established by an IUSS Council decision in August of 2010 at the World Congress of Soil Science in Brisbane, AU and was renewed by the IUSS Council in June of 2014 at the World Congress of Soil Science in Jeju, South Korea. The charge for the Working Group remains the same and includes the development of common standards for methods and terminology in soil observations and investigations and the continued development of a Universal Soil Classification System.

In this vein, the Working Group has spent the last three years developing an overarching conceptual Universal Soil Classification System that is based on numerical classification concepts (e.g. *Micheli et al.*, 2015). This global system for allocating soil information will be at an overarching, aggregated level and allow its extension below as required for national, regional and local applications.

The concept of this Universal Soil Classification system is based on a soil property data centroid approach. This concept involves analyzing databases from across the world, using a set of accepted soil properties, to make allocations into logical clouds or clusters of points that recognize “Great Soil Groups” or “Mesotaxa.” This level will be equivalent to the great group level from U.S. Soil Taxonomy, along with similar levels in the World Reference Base, Australian Soil Classification, and other defined soil classification systems. Correlation between different soil taxonomic systems can be accomplished using soil taxonomic distance calculations of the soil property centroids. (*Lang and Fuchs, 2013).*

More or less detail can be developed from the Mesotaxon. Lower taxa in the system will potentially recognize anthropogenic features, family criteria, and other important use and management characteristics. Higher taxa in the system will be developed for meso and macroscale applications. As more data are added to the system, taxonomic distance calculations can be used to determine if new categories are needed based on set tolerances. This system can then be more scalable based on the objective analyses of the data that are collected and entered into the system.

Data Preparation

Point data has been assembled from available databases across the world including 42,000 profiles from the US National Cooperative Soil Survey data-

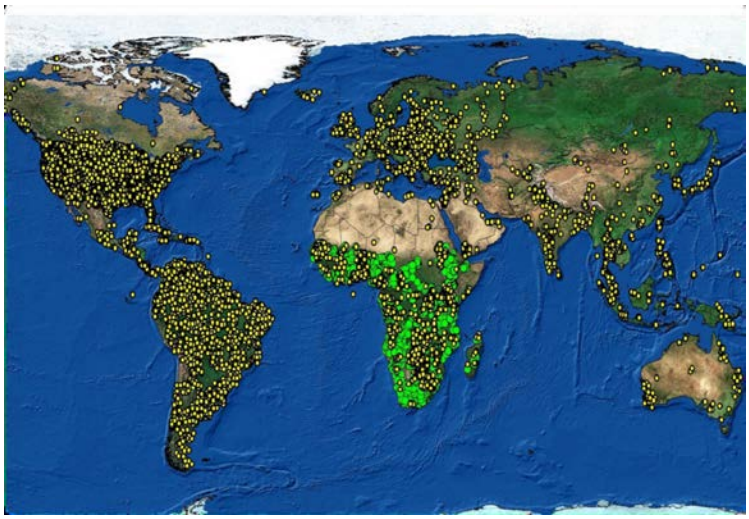


Figure 1. Data points currently available for centroid calculations

base, 3000 profiles from the ISRIC-WISE 3.1 dataset, 11,000 profiles from the AFSIS legacy database and an additional 1200 profiles were assembled from the Hungarian database and 680 profiles from the Russian database. The spatial distribution of these data points can be seen in Figure 1.

As a starting point in developing develop the "Centroid" concept, only pedons from the US National Cooperative Soil Survey were analyzed. Based on the analysis of a set of predetermined soil properties, and using weighted means calculations, a central concept based on data was produced. A data "centroid" was assembled for each Great Group within the Soil Taxonomy system. The data were quality checked and the issues which were addressed and solved are as follows:

1. Non continuous layer/horizon sampling/lab analysis

Profiles with non-continuous horizon data were excluded from the calculations unless the gap in the sampling/description occurred below 200 cm. Profiles not sampled from the surface (in some cases the first horizon or several horizons from the surface) have been also excluded from the calculations.

2. Changes in the definition of the organic horizon description

Due to the definition change of the organic horizon depth recording in 1993 (US system), both depth designations can be found in the database. To solve the problem, carbon content and horizon designation were checked and both the pre 1993 and the post 1993 depth descriptions were included in the new dataset to provide the opportunity to study soils including and excluding the organic horizons.

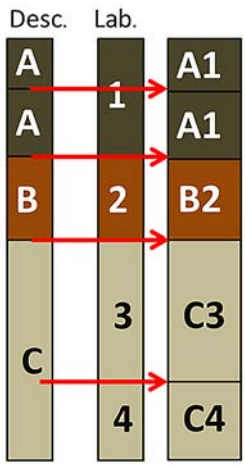
3. Linking the description database to the laboratory database (US database)

Linking the datasets is based on an interconnecting table, which joins sampled layers to described horizons. This linkage caused several problems:

3.1 The described (genetic) horizons have been sampled in two or more layers or

3.2 A sampled layer refers to two or more described (genetic) horizons

If one of the above statements fulfilled, the result of the query is duplication in either the description values or the laboratory values.



All such profiles have been studied and the depth of either the laboratory or the description layer/horizon was used, whichever was more detailed (figure on the right) in a new interconnecting table.

4. Records on classification (US database)

The correct classification of a profile is fundamental to calculate centroids for the surveyed taxons. If this data is not perfectly appropriate, the result of the whole study can be misleading and inaccurate.

The classification table of the NASIS database contains several records for a profile.

- Sampled taxon name
- Correlated taxon name
- Sampled class name
- Correlated class name
- SSL class name

Only profiles, with correlated class name, and soil survey lab (SSL) class name were used in the calculations (these are the records that have been supervised by classification experts). SSL classification have priority to the correlated class name.
Problem of older classification categories, and missing categories:

On the great group level, several, "old" (not existing in the 11th edition) classification units have occurred in the database, these were excluded from the calculations.

5. Other quality checks
Several other basic quality check methods were used to find the errors in the database, like limits, inconsistency and relationship checks.

Calculation of centroids

As previously stated, centroids were calculated for the selected soil units from the US National Cooperative Soil Survey database and is based on the classification at the Great Group level from the 11th edition of Soil Taxonomy (*Soil Survey Staff, 2010*).

Centroid data was generated from the profiles in layer increments. In the first 50 cm property values were generated at 5 cm intervals. From a depth of 50 cm to 110 cm property values were generated at 10 cm intervals and from 110 cm to 150 cm, property values were generated in 20 cm intervals. (See figure 2.)

Values were calculated on a weighted mean bases with the R package. The following properties were included in the calculations and were used to develop the central concept for the property values:
1-coarse fragments,
2-clay content,
3-Silt content,
4-Sand content,
5-r (color),
6-g, (color)
7-b, (color)
8- Presence of redox features (evidence of water)
9- Presence of permafrost (evidence of ice)
10-Bulk Density,
11-Organic Carbon,
12-CaCO3,
13-pH in water
14-Cation Exchange Capacity,
15- Ca,
16- Mg,
17- Na,
18- K,
19- Acidity,
20-Base saturation,
21-Electrical Conductivity,
22-Gypsum

Calculation of distances

In the initial study involving the US Cooperative Soil Survey Database, 299 US soil units (soil orders, suborders and great groups) were included in the distance calculations. Mahalanobis distance metrics was performed on three different input matrices.
a) soil unit centroids were specified by the total number of attributes (variables x depth)
b) soil unit centroids were transformed to a set to depth functions (curve fitting).
c) soil unit is specified by calculated layers (or by depth function)

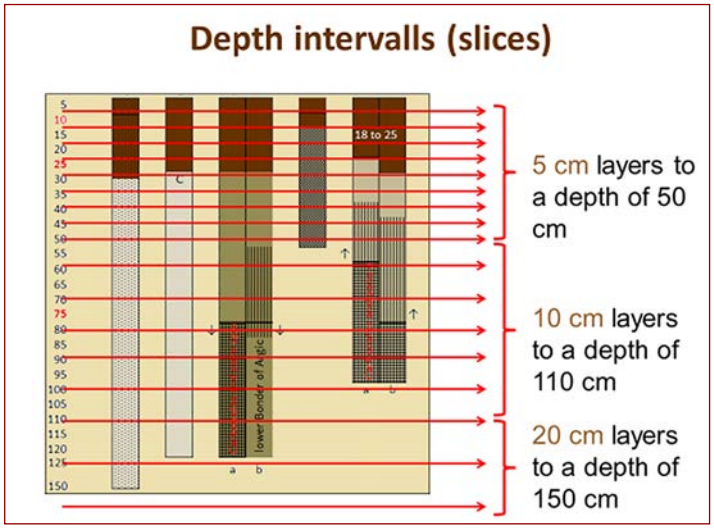


Figure 2. Depth intervals for Centroid Soil Property increments.

0-5	5-10	10-15	15-20	20-25	25-30	
38.55	42.94	50.62	56.55	58.62	60.27	
30-35	35-40	40-45	45-50	50-60	60-70	70-80
61.56	61.32	60.95	61.31	62.13	62.68	62.61
80-90	90-100	100-110	110-130	130-150		
63.75	64.77	64.47	60.57	57.36		

Example of calculated centroid values and depth ranges of clay for the Dystruderts, Great Group (US National Co-operative Soil Survey database)

Each Great Group has centroid data developed for the 18 layers for all 22 properties. This data can be transformed into depth functions as displayed for the clay data (Dystruderts). (See figure 3.)

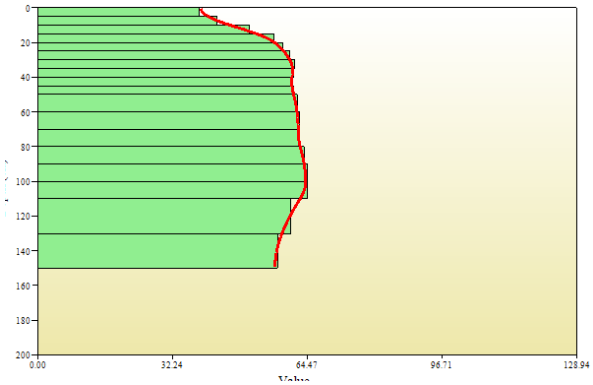


Figure 3. Depth function for calculated centroid values and depth ranges of clay for the Dystruderts Great Group data.

The depth functions generated for each property define the centroid and are the comparison values used for classifying data for new pedons that are brought into the system. As new pedons are analyzed, taxonomic distances will be generated for all existing centroids. The closest distance would be the classification of the new pedon. If taxonomic distance calculations of new pedons do not meet set tolerances (to be determined) a new category or centroid could be developed.

As we look to making the system truly "universal" the next step would be to analyze data in the same manner the Soil Taxonomy centroids were developed from other parts of the world and classified under different systems than Soil Taxonomy. This step is currently underway in Australia. These new centroids could be compared to the Soil Taxonomy centroid information and if the centroids meet tolerances this information could then be linked to the existing centroid information, thereby combining classification information into one "universal" system.

There is work underway to develop a nomenclature for the centroid system. The system for naming centroids will be a one word nomenclature and is based on a dendrogram cut at three levels. A consonant is given to each branch at each level. Letters are turned into syllables that can be pronounced as follows '3a2e1ozem' – the numbers representing levels in the dendrogram, level 1 being the highest level – and consequently more general. An example of the proposed nomenclature follows in Figure 4.

Conclusion

Soil classification using a data "Centroid" concept is a potential for development of a Universal Soil Classification System. This kind of classification concept is very objective and relies on measured analytical data that is used to produce central concepts that other pedons and characterization data can be measured and classified against.

At this point in time, morphological or diagnostic features (i.e. mollic, argillic, cambic, vertic, etc) are not part of the system. One of the fundamental objectives at the onset of the working group was a need to simplify the structure of a soil classification system (reference the complexity for the classification scheme of the mollic epipedon in the US Soil Taxonomy). The data centroid concept greatly simplifies the complexity and subjectivity of current classification schemes. This data driven process also takes advantage of advancements in statistical knowledge and computing power along

level 3	level 2	level 1	USCS mesotaxon	ST level	ST great group
D	D	C	dadecozem	3	RHODOXERALFS
H	D	C	hadecozem	3	RHODUSTALFS
B	F	C	bafecozem	3	PLINTHUSTALFS
C	F	C	cafecozem	3	KANDIUDALFS
D	F	C	dafecozem	3	KANDIUDULTS
F	F	C	fafecozem	3	KANDIUSTULTS
N	D	G	nadegozem	3	CALCIARGIDS
C	B	G	cabegozem	3	AGRIDURIDS
C	G	M	cagemozem	3	HAPLOSALIDS

Figure 4. Examples of proposed flexible Universal Soil Classification Nomenclature based on soil property centroid information of the Soil Taxonomy Great Group.

with our ability to share information. Morphological information i.e. slickensides, will still be noted in the pedon descriptions and could be added into the system at a later time, especially as digital technology advances to recognize and distinguish, important soil classification features.

This kind of system is scalable, meaning that "qualifiers" can be added to document more or less information. For example, family criteria could be added as a qualifier to the classification and could be easily documented from laboratory data. Other important qualifiers that relate to use and management or important diagnostic features can also be developed.

References:

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International Decade of Soils (2015-2024)

In the course of the highly successful conference *Celebration of International Year of Soils 2015 – Achievements and Future Challenges*, which attracted more than 120 participants from all over the world, a draft version of the Vienna Soil Declaration 'Soil matters for humans and ecosystems' was adopted and the International Decade of Soils (2015-2024) proclaimed by Rainer Horn, IUSS President.

In the 'Vienna Soil Declaration[1]' of Dec. 7, 2015, the IUSS has identified the key roles played by soils in addressing the major resource, environmental, health and social problems which humanity is currently facing. Given this situation, the IUSS believes that it is incumbent on IUSS members to not only maintain the level of activity generated in IYS 2015 but to increase the momentum and the extent of our contributions on these issues as we move towards the Centenary of the IUSS formation in 2024.

The Executive Committee and the Council of the IUSS will play a pivotal role in setting overall objectives and directions during this period. However, it is essential that all Divisions, Commissions, Working Groups, National, Regional and individual Members accept the challenge to undertake activities to ensure that the significance of soils in maintaining healthy life and environment remain continually at the forefront of political and scientific planning and decision making.
The International Decade of Soils shall thus be a continuation of the efforts made during the International Year of the Soils 2015. It will be marked by a number of activities on the national and international levels.

IUSS plans to play a key role in education, dissemination of information, issuing informative press statement on key issues, co-ordinating activities across the world through our National Members (e.g. World Soils Day) and maintaining a historical record and collecting personal biographies.

[1] The full text of the Vienna Soil Declaration can be found on the IUSS website: *http://www.iuss.org/files/draft_vienna_soil_declaration_december_6.pdf*

Recent achievements

International Decade of Soils 2015-2024

The IDS **logo** was used in all correspondence. Partners and supporting organizations were invited to do the same. In order to do so, the logo is available on the IUSS website in different formats at *http://www.iuss.org/index.php?article_id=588.*

Secondly, the **Vienna Soil Declaration** was translated into Japanese. Its key messages are used for dissemination purposes.

Public outreach
Since it is important to show the emotional and cultural relevance of soils to reach the general public and other target groups, alliances and partnerships with other organizations working in soil science or related fields at national and international level need to be forged. Official letters of support were received from the International Council for Sciene (ICSU), European Society for Soil Conservation (ESSC), the Italian Society of Soil Science (SISS), the Latin American Society of Soil Science (SLCS), the German Soil Science Society (DBG), the Japanese Society of Soil Science and Plant Nutrition (JSSSPN) and the Ukrainian Society of Soil Scientists and Agrochemists (USSSA). Furthermore support to activities was expressed by FAO, Embrapa (Brazil) and the Soil Science Society (SSSA)

Soil book series
Following the very successful publication of *Soil Matters - solutions under foot* , the next book in this series is on urban soils and will be published by the end of 2016 by Schweizerbart. Edited by M.J. Levin et al., on behalf of the International Union of Soil Sciences, *Soils within Cities - Global*

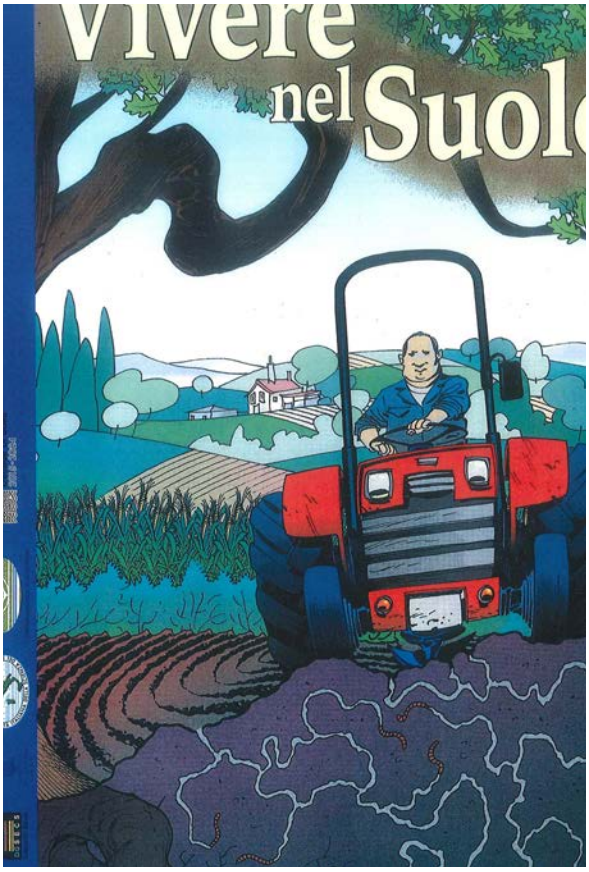
Approaches to their sustainable Management, is a joint effort of the IUSS Working Group Soils of Urban, Industrial, Traffic, Mining and Military Areas (SUITMA). 34 short contributions comprehensively highlight key aspects and characteristics of soils of the urban ecosystem and the problems and challenges associated with them. The authors lay out the fundamentals of soil science appied to anthropized environments (environments degraded by human activity), including composition, properties, and functions of soils of the urban environment, their pedogenic evolution, classification and mapping.
Soils within Cities is aimed at expanding our view of soils of our planet, and having them taken into consideration for human well-being. It provides city planners and managers with a special reference that can serve to offer citizens a better life in the long run.

Education
Upon the initiative of the Latin American Society for Soil Science (SLCS) the first outreach campaign via social media was launched in which the global soil science community is invited to participate. Based on the FAO Global Soil Partnership and the International Decade of Soils, the program "¡Thus are Soils of my Nation®!" - an educational project of the Latin-American Soil Science Society and the Latin-American network for soil science teaching & learning –invited the global soil community and the general public to participate in an awareness campaign about the value of the soil for life. The goal is to create a "**Soil's Friends Virtual Network**", in which all people who are interested globally collaborate on diverse levels to educate and generate public awareness of the need to preserve the soil as an essential part of the environmental balance. The campaign was kicked off on Twitter using the hashtag #ElSueloEsVida; so far the hashtag has been translated into 25 different languages.

The 'Living in the Soil' Comic by Mª Pilar Jiménez Aleixandre, Estudio Tangaraño, María Teresa Barral Silva and Francisco Díaz-Fierros V. was translated into Italian. A snail, a worm and a group of young people are some of the characters who star in 'Living in the Soil,' a comic produced to raise awareness about the most significant environmental and social issues related to soil and its need for protection. Through some 60 sketches, the authors report various aspects of the characteristics, functions and implications related to the use of this non-renewable resource. It reflects both the view of humans and the living organisms that inhabit soil. The comic, which is conceived as an educational resource, is aimed both at children and the general public and for students at all educational levels.

Read more: *http://www.suelos2015.es/sites/default/files/pdfmateriales/living_in_the_soil.pdf*

This is what it looks like in Italian. Copies can be ordered from the Italian Soil Science Society.



Planned future activities

Public outreach: IUSS will continue to seek and forge partnerships with other international organisations (e.g. IAEA, CGIAR, UNEP, Worldbank, WWF, Friends of the Earth, …) who could help propagate IDS messages and support us in our endeavours. Furthermore, interested media (National Geographic, Discover, …) will be approached to help us to reach the general public and companies who share the same values, as well as others who wish to propagate IUSS IDS messages through

their own channels by becoming “soil ambassadors”; all working together with potential sponsors, who would benefit from publicly showing their interest in protecting soil etc.

Education

The main focus of our activities should be on school age children (who will be teenagers and young adults in 10 years’ time). Some young children’s books already exist; we could assist with their translation into other languages. Web-based material needs to be developed (together with teachers notes) that would target several age groups (including adults). When this material has been developed it could again be translated into other languages. Another idea put forward was to create a soil jigsaw which would allow every person doing the jigsaw to make their own world of soils.

Dissemination of information

The IUSS will act as an independent, reliable source of information about soils and their role in key areas affecting humanity, such as: food production, food security, climate change, carbon sequestration, nuclear contamination, etc. It is important that we communicate regularly and directly with the general public on these and many other issues.

Personal biographies

IUSS has prepared documents to guide the collection of personal biographies through a series of interviews or personal statements and plans to run trials over the next few months using an initial template. Following this initial period the process will be refined based on the feedback from interviewers and the project will be disseminated more widely through international contacts and National Member Societies. Based on these interviews it will be possible to publish a collection of Personal Biographies for the Centenary celebrations.

If you plan any related activities or have aideas for any other activities, please contact the IUSS Secretariat at *iuss@umweltbundesamt.at.*

Conference and Meeting Reports

The 4th global workshop on Proximal Soil Sensing

Hangzhou, China, 12-15 May 2015
By Marc Van Meirvenne, Chairman of the WG-Proximal Soil Sensing

Since its establishment in June 2008, the Working Group on Proximal Soil Sensing organises biannually a global workshop, and this year the event took place at the Zhejiang University in the city of Hangzhou, relatively close to Shanghai, China. The overall theme was "Sensing soil conditions and functions". The organisation was in the hands of Professor Zhou Shi of the Institute of Agricultural Remote Sensing and Information System of the College of Environmental and Resource Sciences of the Zhejiang University.

The workshop was a success. There were 112 registered participants from 16 countries and all inhabitable continents, and as usual the majority of participants (87) came from the organising country. The workshop covered three days, two days of plenary and poster sessions and one day with a field trip to experimental fields and the surrounding areas of Hangzhou. The two days of plenary sessions were subdivided according to different themes, each with a keynote speaker. These were (in chronological order):

- Raphael Viscarra Rossel "Baseline estimates of organic carbon and uncertainty by proximal soil sensing and soil spectroscopy"(CSIRO, Australia),
- Minzan Li "Development of soil nutrient sensors with spectroscopy" (China Agricultural University, China),
- Immo Trinks "State-of-the-art geophysical archaeological prospection and virtual archaeology" (Ludwig Boltzmann Institute for Archaeological Prospection, Austria),
- Richard Webster "Field sampling for proximal soil sensing), Advances in Field Spectroscopy for Soil Analyses" (Rothamsted Research, UK),
- Abdul Mouazen "Advances in Field Spectroscopy for Soil Analyses" (Cranfield University, UK).

The major attention of the workshop went to soil spectroscopy, reflecting the intensively conducted research on this promising technology. The major focus of application was agricultural, but other functions of soil, such as environmental health and protection of the buried cultural heritage, were also covered. There is a clear trend towards multi-signal and multi-sensor systems and a widening of soil sensor applications.
One session was devoted to a plenary discussion on the future planning and strategy of our working group. During this session it was agreed to join the Pedometrics-2017 initiative for a joint conference of the commission and all its working groups in

Participants of the 4th Global Workshop on Proximal Soil Sensing

Wageningen in the Netherlands, between 26 June and 2 July 2017. Given how frequently conferences and workshop are organised by the commission on Pedometrics and its four working groups, often with overlapping themes, it might be good to further explore such initiatives for jointly organised activities. It was also decided to expand the focus of our working group by seeking joint activities with other organisations dealing with soil sensing applications such as archaeology, civil engineering, environmental sanitation and protection, natural capital assessment, image processing…

Finally, it was discussed how the outcome of the workshop should be published. The choice fell on a special issue of a scientific journal and it was decided to contact "Biosystems Engineering". Dr. A. Mouazen agreed to act as the main supervisor of this special issue.

The workshop was followed by an extra day with two hands-on courses: "Sensors as data source and data acquisition methods" and "Data processing using R software".

This 4th workshop of our working group was excellently and efficiently organised by the team of Prof. Shi. We are very grateful to Prof Shi and his collaborators!

The International Conference of the European Society for Soil Conservation

The annual scientific meeting of the European Society for Soil Conservation (ESSC) was organized in Cluj Napoca (Romania), 15-18 June 2016. In collaboration with the Executive Board of the ESSC, and co-ordinated by ESSC President Professor Dr Carmelo Dazzi, three important institutions from Cluj Napoca jointly organised the Conference. These were Babeş-Bolyai University, the University of Agriculture Sciences and Veterinary Medicine and the Office for Pedological and Agrochemical Studies. All three institutions are engaged in fundamental and applied soil research. Together with the ESSC they organized the 2016 ESSC International Conference on 'Soil – Our common future.' The Conference was dedicated to the 'UN Day of Combatting Desertification,' which was celebrated on 17 June. Thus, scientists from around the world came together to Cluj Napoca to prove the vital interconnection between soil and life, as well as its importance for the future of human society.

The Opening Ceremony took place on 15 June in Aula Magna of Babeş-Bolyai University (Plate 1). Five plenary lectures were presented by invited speakers. These provided the introduction to the main Conference themes and clearly identified some of the most important challenges for soil scientists.

The key-note plenary lectures were:

1. **I. Pla Sentís** (University of Lleida, Lleida, Spain): 'Hydrological approaches to land management under global change.'
2. **I. Calciu**, C. Simota, M. Dumitru (National Institute of Research-Development for Pedology, Agrochemistry and Environment Protection, Bucharest, Romania): 'Indicators for evaluation of agricultural land degradation risk.'
3. **G. Corti**, St. Cocco (Università Politecnica delle Marche, Ancona, Italy): 'Climate change and soil threats: Salinization and vertisolization.'
4. **R.E. Creamer**[1], F. Bampa[1], S. Sturel[2], B.B. Ghaley[3], T. Lehtinen[4], K. Madena[5], J. Staes[6], T. Rusu[7], R.P.O. Schulte[1,8] ([1]Teagasc, Wexford, Ireland ; [2]Chambres d'agriculture (APCA), Paris, France ; [3]Department of Plant and Environmental Sciences, Faculty of Science, University of Copenhagen, Denmark; [4]Department for Soil Health and Plant Nutrition, Institute for Sustainable Plant Production, Austrian Agency for Health and Food Safety, Austria; [5]Chamber of Agriculture, Lower Saxony, Germany; [6]Department of Biology, University of Antwerp, Belgium; [7]University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania, [8]Latvia University of Agriculture, Latvia): 'The multitasking soil: How do we manage multiple soil functions?'
5. **M. Sellitto** (Microspore S.p.A, Italy): 'Using products based on soil micro-organisms in sustainable agriculture.'

Figure 1: The Opening Ceremony of the 2016 ESSC International Conference in Aula Magna of Babeş-Bolyai University, Cluj Napoca, 15 June 2016.

Scientific session	Oral presentations	Posters	Total
Desertification and food security	6	2	8
02. Organic soils, protection and conservation	3	2	5
03. Management of soil functions: monitoring and remediation	11	12	23
04. Post-fire soil management in natural and anthropogenic fire	4	2	6
05. Urban soil: technical evaluation and engineering	1	-	1
06. Soil conservation issues in organic farming and conservation agriculture	5	12	17
07. Forest soil: conservation policies	4	2	6
08. Land management in a changing environment	28	5	33
09. Soil quality improvement using natural materials	6	11	17
10. Climate-smart agriculture: modelling and prediction	2	-	2
11. Pedotechniques in large-scale farming	2	1	3
12. Remediation of mine, quarry and oil field soils	2	4	6
Total	74	53	127

Table 1: Summary of Scientific Sessions at the ESSC Conference in Cluj Napoca.

Figure 2: Conference delegates studying land remediation issues at the tailing pond of the former Iara Mine during the Conference field trip on 18 June 2016.

The presentations of 16 and 17 June were dedicated to scientific presentations. These were organized into oral and poster presentations within 12 sessions. These sessions covered important and complex topics in soil research, including desertification, food security, monitoring of soil functions, improving soil quality, organic farming and land management in changing environments. The 2016 ESSC International Conference gathered together 127 contributions as oral and poster presentations, representing the scientific results of over 200 scientists from all over the world (Table 1). It was a wonderful celebration of science on behalf of our Earth Planet!

The programme of scientific presentations was complimented by a field trip on 18 June. The field trip focused on several important environmental topics. These included:

1. Several prepared soil profiles.
2. A former mining area (Iara-Băişoara; Figure 2).
3. The Arieş River, which drains gold and copper mining sites from the Apuseni Mountains (e.g. Roşia Montană, Baia de Arieş and Roşia Poieni).
4. The spectacular land morphology developed around the limestone cliffs from northern Trascău Mountains (Colţii Trascăului Jurasic limestone).
5. The Agricultural Research-Development Station at Turda.

The field trip also included interesting touristic sites: Rimetea village, with its remarkable architectural heritage of houses built in the 18th and 19th centuries, as well as the old Salt Mine in Turda-Dârgău (Salina Turda). Wonderful moments were also spent by the participants at the Romanian cultural evening, which took place in the open-air authentic environment of the Romanian Village Museum of Cluj Napoca.

Report by:
Nicolae Har, President of the Conference Organizing Committee
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E-mail: nicolae.har@ubbcluj.ro

Report of the Conference Enzymes in the Environment: Activity, Ecology, and Applications

Enzymes in the Environment: Activity, Ecology, and Applications

Bangor, Wales, UK
24-27, July, 2016

By Richard Dick, Executive Director

The conference focused on ecological and industrial applications and basic research of extracellular enzymes. There were 86 participants from 21 countries representing a wide range of disciplines of terrestrial and aquatic microbial ecologists and biochemists. Chris Freeman and his team did an excellent job of managing the local organization, facilities, entertainment, and logistical arrangements for the conference in Bangor.

The conference had a range of topics on recent advances in aquatic and terrestrial extracellular enzyme research and methodology. The venue was arranged into 9 symposia with one invited key note speaker per symposium. The remainder of the presentations in each symposium consisted of volunteered papers, competitively selected.

One symposia was devoted to "-omics" as emerging approaches to study environmental enzymology and was entirely presented by invited speakers, with notable internationally recognized expertise on various aspects of this topic. The emphasis was to go beyond genomics; and take advantage of meta-transcriptomics of mRNA and cDNA combined with direct detection of proteins and enzymes to provide information on metabolic controls of enzyme production. This session also had a roundtable discussion.

Other highlights were presentations on new developments in imaging technologies that enable nano-scale visualization of enzyme locations and their reactivity with substrates. Use of classical enzyme activity assays is still an important research tool as evidenced in the vast majority of presentations. The merits, modifications and standardization of enzyme activity for micro-titre plate, high throughput methods were presented and discussed in a roundtable session; not without some amiable controversy. Since the 2011 meetings in Germany, where there was a major emphasis on climate change, much progress has been made. Elegant experimental approaches were presented which will enable environmental enzymology to make contributions towards building robust C cycling and climate change models. New emphases for this conference were industrial and practical applications. The purposeful manipulation of extracellular enzymes to address food security, bioremediation, waste water remediation, and other applications is an exciting development that ultimately can serve the greater societal good.

The IUSS sponsorship supported the soil scientist, Professor Paolo Nannipieri who was a keynote speaker and the recipient of the Lifetime Achievement Awards in Terrestrial Enzymology. Professor Nannipieri delivered an outstanding keynote presentation that reflected on the historical milestones of soil enzymology and future directions with the emerging molecular methods as a means towards fundamental breakthroughs on the ecology of extracellular enzymes. He also presented a volunteered paper, and participated in the "-omics" roundtable discussion.

IUSS was advertized on the conference website and the Proceedings and on all printed materials for the conference.

The Organizing Committee extends its deep appreciation for the sponsorship by the IUSS. This made a significant contribution towards the success of the conference.

Some selected photos from the conference:

Professor Paolo Nannipieri (right) receiving Terrestrial Enzymology Award from Professor Richard Dick (Photo Credit Alexander Rose).

Professor Ellen Kandeler as Plenary Speaker (Photo Credit Alexander Rose)

Professor Kazuyuki Inubushi as Symposium Chair (Photo Credit Alexander Rose)

XVII International Colloquium on Soil Zoology, XIV International Colloquium on Apterygota

ICSZ NARA, JAPAN, 2016

Soil Biodiversity for Our Future Earth

ICA NARA, JAPAN, 2016

August 2016, in Japan

URL: http://soilzoology.jp/icsz_ica2016/
Email: 2016nara@soilzoology.jp

Dear Pr. Kazuyuki Inubushi
Chair Division-2, International Union of Soil Sciences

We are pleased to tell you that XVII International Colloquium on Soil Zoology (22 to 26 August) and XIV International Colloquium on Apterygota (24 to 25 August) were successfully ended. We had 167 attendants from 31 countries and 185 presentations during the conference. We also, as a first time in this conference, organized an outreach program to acknowledge the importance of soil and soil organisms for sustainable agriculture and land use to the public.

A few pictures from the above mentioned events:

Gabriel Costa Queiroz (left) from Brazil, winner IUSS Early Career Grant

Sopark Jantarit from Thailand, winner IUSS Early Career Grant

We also appreciate your support for young scientists. We have selected two attendants after discussion among the organizing committee members.

IUSS Early Career Grant

Gabriel Costa Queiroz (UEPB/MUSEU NACIONAL-UFRJ, Brazil)
Sopark Jantarit (Prince of Songkla University, Thailand)

We believe that these two conferences successfully promoted soil science and enforced the linkages between the scientists.

Sincerely yours,
Prof. Nobuhiro Kaneko, Chair XVII International Colloquium on Soil Zoology
Prof. Hiroshi Takeda, XIV International Colloquium on Apterygota

Group photo during the excursion

Report from the VI Latin-American Symposia of Educative Innovations on Teaching Soil Science

By Laura Bertha Reyes Sanchez

As part of the XXI Latin American Congress on Soil Science, held in Quito, Ecuador, 24-28 October 2016, the 'VI Latin-American Symposia of Educative Innovations on Teaching Soil Science', was held with the attendance of 217 children from Spain, Peru and Ecuador.

The "Symposia of Educative Innovations on Teaching Soil Science" is a core part of the Educational Project of the Latin American Soil Science Society (SLCS), called ¡®Thus are the Soils of my Nation!, and try, through the Latin American Network of Education and Teaching Soil Science: **RELAEECS**, both educate on natural sciences using the resource as a transversal axis, as creating a clear awareness of its value and about the need to preserve all the natural resources of our countries, through activities and projects that are developed in conjunction with Societies of the 19 countries that make up the SLCS: *http://slcs.org.mx/index.php/en/educacion*.

During the event, the children presented five oral presentations in which they presented four field investigations and one documentary research, two awareness-raising scenarios (performances) about the value of the soil, a Monumental Map of the Soils of Ecuador carried out by children with ecological materials, as well as twenty-one Works in poster and five models.

Below a few pictures of the event (copyright by the author).

Development of National Soil Science Societies in the BRICS group of countries: An overview

By Julierme Zimmer Barbosa (Doctoral student of Federal University of Paraná, Brazil; barbosajz@yahoo.com.br) and Giovana Clarice Poggere (Doctoral student of Federal University of Lavras, Brazil; gi.poggere@gmail.com).

Background

Soil science spread around the world through the individual actions of soil scientists and joint activities of universities, research institutes and scientific societies, established on a national and international scale (Churchman, 2010; Hartemink, 2015). Currently, there are at least 74 national soil science societies in the world (ESDAC, 2016; IUSS, 2016), indicating that soil science followed the trend of organizing societies in various scientific fields. In this paper we draw a parallel with respect to the development of national soil science societies from countries of the BRICS group (Brazil, Russia, India, China and South Africa), in order to impart a portion of the soil science history of these countries.

Russia

In 1888 in St. Petersburg, the Soil Commission, affiliated to the Free Economic Society of Russia was founded. The commission was founded and headed by Vasily Vasiliyevich Dokuchaev and had Gavriil Ivanovich Tanfilyev as first secretary (Teplyakov et al., 1998). In 1912, the Russian imperial government approved the establishment of the Dokuchaev Society of Soil Science (DSSS), which was endowed with legal and financial rights. From the formation of Union of Soviet Socialist Republics (USSR) in 1922 and the founding of the International Society of Soil Science (ISSS; now IUSS) in 1924, the former DSSS became known as the Soviet Section of ISSS. In 1938, the Soviet Section of the ISSS was transformed into the All-Union Society of Soil Science, attached to the USSR Academy of Sciences. The institution was maintained until the collapse of the USSR in 1991, being that in December a conference was held where it was decided that the All-Union Society of Soil Science would be reorganized in the Russian Society of Soil Science, attached to the Russia Academy of Sciences. The founding congress of the new SCS was held in 1992, in Moscow, although it was officially registered with the Russian Academy of Sciences in 1993. However, at the Second Congress of the Society held in St. Petersburg in 1996, on the occasion of the 150th anniversary of Dokuchaev, it was decided to rename the institution with its first name, DSSS, which was formalized in 1997. In 2004, the DSSS was no longer affiliated with the Academy of Sciences of Russia and became independent as a non-governmental organization (DSSS, 2016).

Currently, the DSSS has 1557 members, which corresponds to 10.9 soil scientists per million inhabitants of Russia (DSSS, 2016; US Census Bureau, 2015) (Figure 1). The administrative structure is divided into Congress (73 members), Central Council (president, six vice presidents, executive secretary, scientific secretary and 27 councilors) and Financial Audit Commission (three members). In addition, the DSSS has 43 regional chapters in the Russian Federation and three international chapters (Azerbaijan, Belarus and Uzbekistan) (DSSS, 2016).

On the other hand, regarding the scientific structure, DSSS contains 11 committees, 12 subcommittees and 7 working groups (DSSS, 2016) (Figure 2). The subcommittee of the Red Data Book of Soils draws attention for its history and contribution. Between 1979 and 1989, still in the All-Union Society of Soil Science (USSR), there was the formulation of the theoretical and methodological aspects of creating a book on soils, with emphasis on soils that require special protection (e.g., rare, virgin, with archaeological value, high fertility models for agriculture, historical or scientific significance). Even in 1989, a working group was created to develop the book, and in 1996, in the DSSS, the group was transformed into a subcommittee. Between

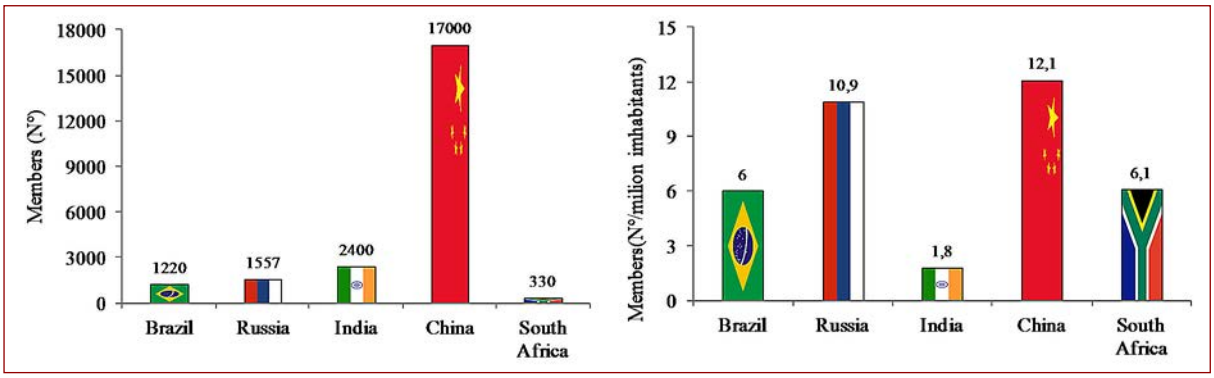

Figure 1. Members and members per million inhabitants in soil science society of Brazil, Russia, India, China and South Africa.

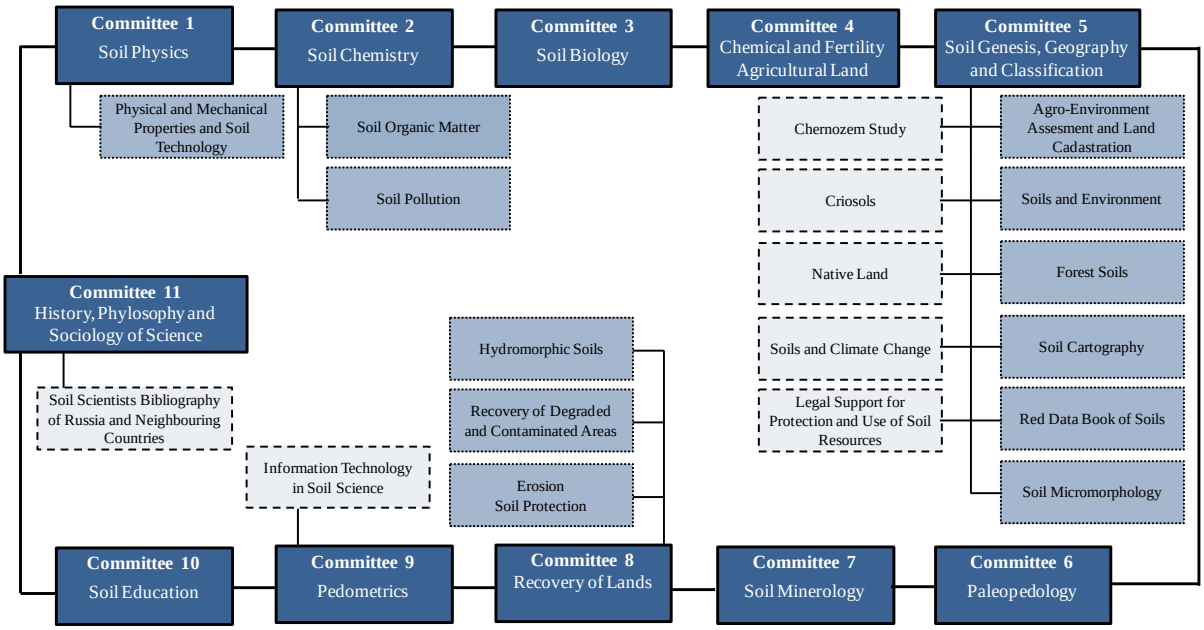

Figure 2. Schematic representation of the scientific structure of the Dokuchaev Society of Soil Science. Rectangles: solid, dotted and dashed lines represent, respectively, committees, subcommittees and working groups.

2000 and 2012 books were published on a regional scale and the first edition (2009) on a national scale, and also an article on the special soil protection was included in the National Environmental Protection Act. Currently, the DSSS and other research groups are preparing a book covering the Russian soil and neighboring countries (Nikitin et al., 2014).

The DSSS conducts international, national and regional events, and, largely in partnership with other institutions (scientific societies, research institutes and universities). Regarding the main events, the DSSS Congress is the most traditional national event. Held since 1992, every four years, the event covers the various areas relating to soil science (DSSS, 2016). Two events that include the participation of the society may be highlighted: the Dokuchaev Conference for Young Scientists, which has taken place since 1998 and which has as its main participants scientists up to 35 years of age, post-graduate students, undergraduates and high school students from Russia and other countries (IUSS, 2015a); the International Forest Soil Science Soil Conference, an event organized since 2005 covering various aspects related to soils in forest ecosystems (Fedorets and Bakhmet, 2006). The DSSS also organizes or participates in organization of scientific conferences to cover certain topics and/or celebrations of milestones in the history of Soil Science in Russia and, international periodic events (DSSS, 2016; FESSS, 2016). In time, the main and most traditional event held by national societies in partnership with IUSS is the

World Soil Science Congress. Of the twenty previous editions of the World Soil Science Congress, two were in Russia/USSR (2nd edition, Leningrad, 1930; 10th edition, Moscow, 1974) (van Baren et al., 2000).

The DSSS has re-edited classic works of Soil Science, published a seminal monograph of famous Russian scientists, manuals, literature about the history of Soil Science, as well as documents and event summaries (DSSS, 2016). Through the Federation of Eurasian Soil Science Societies, DSSS participates in the edition of the magazine entitled "Eurasian Journal of Soil Science." Furthermore, general information about the DSSS is published in the newsletter of the Federation of Eurasian Soil Science Societies (FESSS, 2016). Also, there is information published about DSSS and texts published on specific dates, mainly related to the Russian soil scientists, in a special section of the Eurasian Soil Science, published by the Russian Academy of Sciences. Regarding the Eurasian Soil Science, it is interesting to note that this magazine is also published in Russian under the name Pochvovedenie (meaning Pedology). It turns out that Pochvovedenie was the first magazine dedicated to Soil Science worldwide, created in 1889 by the Soil Commission, affiliated of Free Economic Society of Russia (Editorial Board, 2009).

Scientists with important contributions to the DSSS and Soil Science receive the title of honorary members, or receive honorary medals on certain dates, such as the 5th DSSS Congress (18 to 22 August 2008), where members of the organizing committee received a medal to honor the 100th anniversary of the book "Russian Chenozem", from Dokuchaev (Lyubimova and Pogodina, 2009).

India

The Indian Society of Soil Science (ISSS) was founded on December 22, 1934 in Calcutta, with 28 members. The first president was Bryce C. Burt, who was the Agriculture Commissioner in the Imperial Council of Agricultural Research, as the first secretary was Professor Jnanendra Nath Mukherjee (ISSS, 2016). Tamhane and Mukherjee (1964) emphasize that the design and foundation of ISSS arose from the effort, organizational capacity and imposing personality of the teacher J. N. Mukherjee, who managed the initial support of the Congress of the Indian Association of Science and later, Bryce C. Burt. In the period in which ISSS was founded, India was a British colony. Thus, from the country's independence in 1947, the scientific institution reduced its operating area and there was probably a loss of some members due to the territorial division of British India into India and Pakistan (later East Pakistan became Bangladesh) (Huq and Shoaib, 2013).

Currently, ISSS has 2400 members, which corresponds to 1.8 soil scientists for every million inhabitants of India (ISSS, 2016; US Census Bureau, 2015) (Figure 1). The administrative structure of ISSS contains: President; two vice-presidents; three secretaries (general, deputy and assistant); treasurer; Chief editor of the journal and 34 other members). In addition, ISSS has 45 chapters throughout the territory of India (ISSS, 2016).

The ISSS conducts international and national events and support events held by its chapters. On an annual basis and without interruption since 1935, the most traditional national event is the Annual Convention (ISSS, 2016). In short, the event addresses the various areas of interest to Soil Science, has the presentation of scientific papers and lectures, in addition to making decisions about the institution. A point that can be highlighted is that during the event, memorial lectures are held titled with names of prominent Indian soil scientists, for example, teacher Jnanendra Nath Mukherjee (ISSS, 2014/2015). International events are often international conferences on specific topics. However, ISSS has its history marked by the organization of XII World Congress of Soil Science, in 1982, in New Delhi (ISSS, 2016).

The ISSS is responsible for editing the journal, newsletters, and special publications. The newsletters, the first (established in 1938) is used to display the state of the art in various topics related to Soil Science, while the second (created in 1996), is used for reporting the main activities of the institution. As for the scientific journal, since 1953 the ISSS has edited the journal entitled "Journal of the Indian Society of Soil Science". In parallel, special publications include five books, three editions containing international work and event information, and abstracts of the Annual Convention (ISSS, 2016).

To leading scientists the ISSS grants: Honorary Members title; ISSS Fellow; Award in celebration of the XII World Congress of Soil Science; Young Scientist Award to commemorate the Golden Jubilee; Award for Best Presentation Doctoral Research; Zonal Award; Award for Best Poster Presentation; Doctor S. P. Raychaudhuri Gold Medal (ISSS, 2016).

China

The Soil Science Society of China (SSSC) was founded on December 25, 1945 in Chongqing, with 58 members. The first president of SSSC was Li Lian Jie and the first secretary was Zhu Lian Qing (SSSC, 2016a). Prior to the institution's foundation, both Jie and Qing worked with renowned soil scientist James Thorp and studied soil science in US universities (Gong et al., 2010).

Currently, the SSSC has 17000 members, which corresponds to 12.1 soil scientists for every million inhabitants of China (SSSC, 2016b; US Census Bureau, 2015) (Figure 1). The administrative structure of the SSSC has its Management Board composed of: president; honorary president; nine vice-presidents; secretary; six deputy secretaries; Executive Board (57 members); General Board (177 members). In addition, in 1950 the SSSC started the formation of chapters, and has 31 such chapters around China (SSSC, 2016a).

As to the scientific structure, the SSSC has 14 special committees and 5 working committees (SSSC, 2016a) (Figure 3). The main activities of the SSSC involve the delivery of prizes, organizing events, publishing of publications and dissemination of general information via the Internet. Scientists who excel in their fields of study receive awards, the Science and Technology Award of SSSC, and awards to authors of highly relevant papers presented at events (SSSC, 2016b).

The SSSC conducts international and national events, individually or in partnership with other institutions. Among these, there is the SSSC congress, in which issues are discussed regarding the SSSC and there are presentations of papers and lectures. Another important event is the National Conference of Young Soil Scientists. This event has themes related to science and the development of the country, aiming to inspire young people to scientific and innovative thinking, as well as promote contact among them. In addition, the SSSC holds commemorative events, international conferences and eventually participates in the organization of periodic international events, such as the International Conference of the East and Southeast Asia Federation of Soil Science Societies (SSSC, 2016b).

Regarding publications, the SSSC is responsible for editing (or co-publishing) several scientific journals and a newsletter. The first journal was established in 1947 with the name of Soil Communications, which aimed to introduce the activities of soil scientists around China. However, in 1957, it became a formal journal and was renamed Soil Bulletin. Then came the magazine Bulletin of the Soil Science Society of China (established in 1948 and renamed in 1952 to Acta Pedologic Sinica). While this is an official journal of the SSSC, it also has the support of the Chinese Academy of Sciences and the Soil Science Institute. From 1955 until 1963 Soil Science Translation was published, which aimed to incorporate the advances of Soil Science obtained in the USSR. Decades later, there were other scientific journals, Arid Zone Research (1984 - co-edited by the Institute of Ecology and Geography of Xinjiang and, the Chinese

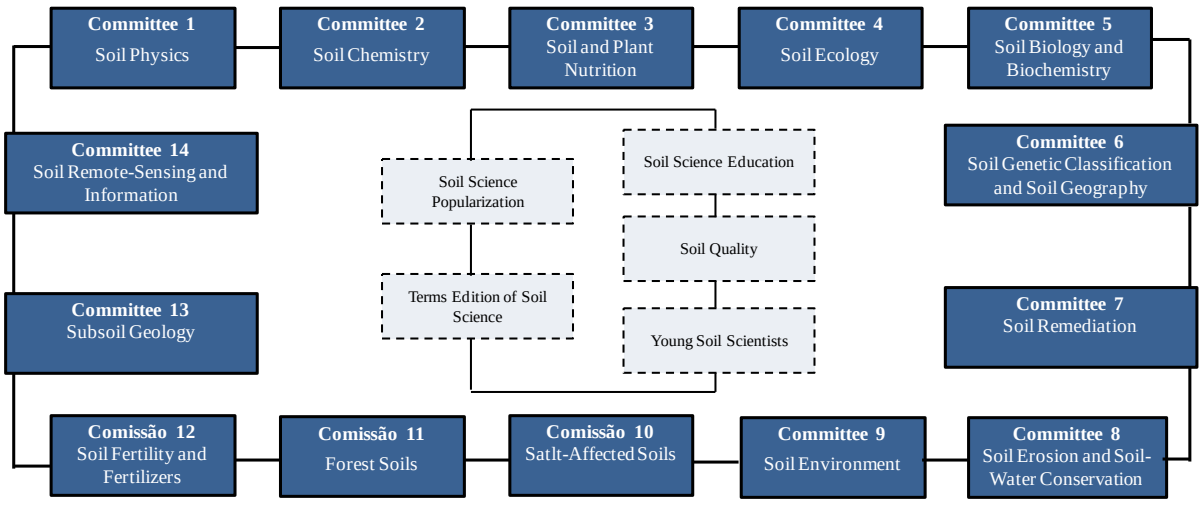

Figure 3. Schematic representation of scientific structure of the Soil Science Society of China. Rectangles: solid and dotted lines represent, respectively, specialty committees and working committees.

Academy of Sciences), Journal of Soil and Water Conservation (1987, co-edited by the Chinese Academy of Sciences and Soil Conservation Institute and Water) and Pedosphere (1991). Among these journals, it is worth mentioning that only Pedosphere is fully published in English. The Bulletin of the SSSC is an internal publication that provides general information about the institution and its activities, and any other matters that are raised by its members (SSSC, 2016b).

Brazil

The founding of the Brazilian Society of Soil Science (SBCS) was due to a series of discussions initiated in 1945, at the Fourth Inter-American Conference on Agriculture, held in Caracas, Venezuela. The event recognized the need to create an Inter-American Society of Soil Science, which would be consolidated through the creation of National Societies of Soil Science. After one year, in the II Pan American Congress of Mining and Geology (held in Petrópolis, Rio de Janeiro), some professionals defended the need to group soil area researchers in specific scientific meetings. The idea won fans and was widely discussed in the V Brazilian Chemical Congress, held in February, 1947 in Porto Alegre, where the date was established for a meeting for the creation of SBCS (SBCS, 1950). With 31 members, the SBCS was founded in the I Brazilian Meeting of Soil Science, held between 6 and October 20, 1947, in Rio de Janeiro. The meeting was held at the Institute of Agricultural Chemistry and organized by the National Center for Education and Research Agronomic with the support of the Ministry of Agriculture, Federal University of Rio de Janeiro and other institutions. Álvaro Barcelos Fagundes was the first president of the SBCS, while the first secretary was Raul Edgard Kalckman (Oliveira et al., 2015). Moreover, it is noteworthy that the SBCS was the first national soil science society founded in Latin America, coinciding with the date of the founding of the Spanish Society of Soil Science, founded on October 10, 1947 (SLCS, 2016).

Currently, SBCS has 1220 members, which corresponds to 6.0 soil scientists for every million inhabitants of Brazil (SBCS, 2016; US Census Bureau, 2015) (Figure 1). The administrative management of SBCS is carried out by the board, involving: President; vice president; executive secretary (general secretary, assistant secretary and treasurer); two former presidents; editor in chief of the journal of the society; president of the congress at the beginning of the period of the current administration; directors of specialized divisions (four) and chapter directors (nine members). Furthermore, throughout the national territory the SBCS has nine chapters comprising regions or states. Regarding the scientific structure, SBCS has four divisions and 15 specialized committees (Oliveira et al., 2015) (Figure 4).

The current model of scientific organization began in 2009 when, after a thorough statutory reform, the SBCS started to adopt a structure similar to the International Union of Soil Science (IUSS). This model was implemented in 2011, when there were also changes in the administrative structure, espe-

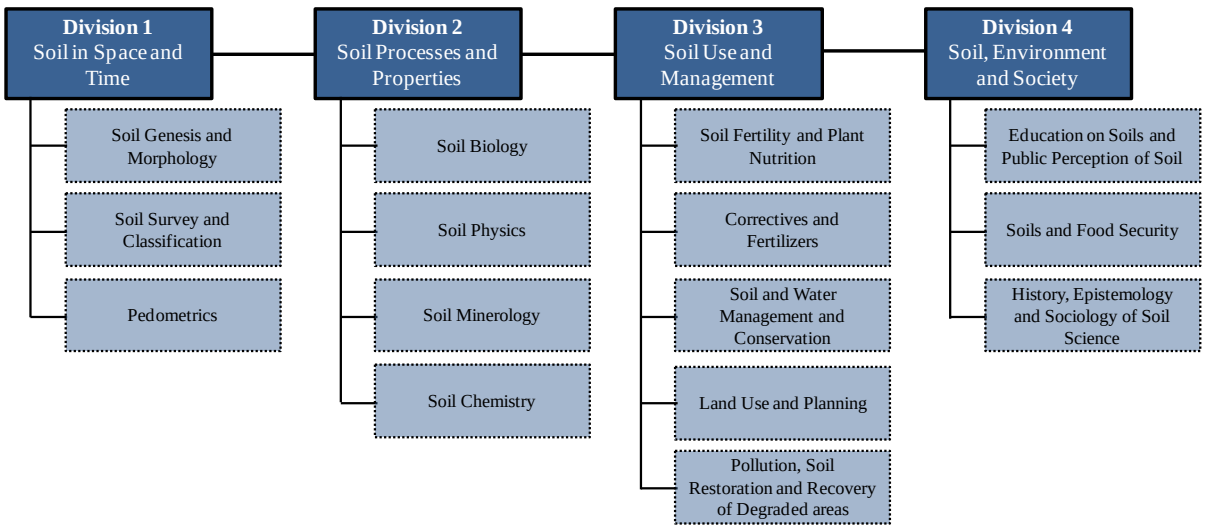

Figure 4. Schematic representation of the scientific structure of the Brazilian Society of Soil Science. Rectangles: solid and dotted lines represent, respectively, divisions and commissions.

cially with the creation of chapters throughout the national territory (although there were already a few) and the incorporation of the chapter directors and divisions coordinator to the Board of SBCS (Oliveira et al., 2015).

The SBCS hold national events and support a number of other events held by the chapters. Among these, the Brazilian Soil Science Congress is the most traditional event and one that has a greater number of participants. Two facts call attention regarding the event: (I) from the first congress in 1947 (called 'Meeting', until 1953) until today, there never occurred interruption or alteration in the conduction standard (every two years); (II) in the VIII edition of the congress (15 to 30 of July, 1961, Belém, Pará) the headquarters of the event was a ship. Other national events are FertBio, Brazilian Meeting of Management and Soil-Water Conservationr, Brazilian Meeting of Classification and Soil Correlation and Brazilian Symposium on Education in Soils. On two occasions (1965 and 1996), the SBCS also organized the Latin American Congress of Soil Science (Oliveira et al., 2015). Still, although the SBCS has not organized any of the twenty previous editions of the World Soil Science Congress, the twenty-first edition will be held in 2018 in Rio de Janeiro, Brazil, organized by the SBCS in partnership with the Latin American Society of Soil Science (IUSS, 2015b).

Regarding publications, the SBCS is responsible for issue of the Brazilian Journal of Soil Science (BJSS), the bulletin of the SBCS and two book collections, among others. The first periodical published by the SBCS was the Newsletter, whose first number is the January/April 1976 issue. The bulletin, which is still published today, aims to disseminate news, articles (informative and opinionated) and activities of the SBCS (Oliveira et al., 2015). The society Journal, published without interruption since 1977, is intended for publication of scientific papers totaling 3743 works published up to volume 39 in 2015 (Cantarutti and Reichert, 2015). Regarding the two collections of books, the first entitled "Topics in Soil Science", began in 2000 and so far has nine volumes, while the second, titled "Textbooks in Soil Science", started in 2007 and contains six books to date (Soil Fertility, Soil Physics, Chemistry and Soil Mineralogy - Parts I and II, Mineral Nutrition of Plants; Pedology - Fundamentals; Handbook of Description and Soil Collection in Field). Additionally, the SBCS published 30 different publications such as "Soil Science Vocabulary" and "Brazilian Society of Soil Science: A look at its history" (Oliveira et al, 2015).

The awards, honors and titles are intended for researchers with important contributions to Soil Science, namely: Soil Science Commendation (currently no longer granted); Honorary Members; Benefactor Members; Tributes; Posthumous honors and of Antonio Carlos Moniz Soil Science Medal (Oliveira et al., 2015).

On the internet, the SBCS has maintained a website since 1999, containing relevant information about their activities, general news and acting as an interactive channel of communication among the partners. In the website there is also a virtual shop where publications, accessories (shirts, jackets, key chains, mugs and buttons with reference to Soil Science) and CD's with event proceedings can be purchased. In addition, the SBCS have two pages on social media, one on Facebook (since 2012) and the other on Twitter (since 2015) (Oliveira et al, 2015; SBCS, 2016), indicating that the information disclosure trends and promotions are up to date.

South Africa

Finally, the Soil Science Society of South Africa (SSSSA) was the last scientific society dedicated to Soil Science established among the countries of the BRICS group. The SSSSA was founded on April 27, 1953 in Pretoria, with 16 members. The first president was Christiaan Rudolph van der Merwe (SSSSA, 2016).

Currently, the SSSSA has 330 members, which corresponds to 6.1 soil scientists for every million inhabitants of South Africa (SSSSA, 2016; US Census Bureau, 2015) (Figure 1). The Board of SSSSA involves 12 members, namely: president; vice president; secretary; assistant secretary; newsletter editor, and five other members. The SSSSA has one working group (System Update Soil Classification of South Africa) (SSSSA, 2016).

The most traditional SSSSA event is its Congress, held since 1965. In the event themes interesting to the country's soil scientists are presented and it also serves to settle issues related to its activities and management. Although the timing of the event has been variable since its first edition, from 2005 it has been held annually. However, in the 31th edition, in 2011, the event had to be held in a Combined Congress format, involving three other scientific societies of the same country (South African Crop Production Society, South African Weed

Science Society and South African Horticulture Sciences Society). The SSSSA also organizes regional and international events. Moreover, SSSSA organizes a photo competition on South African soils, and the twelve best photographs are used for the establishment of a calendar, which is marketed by SSSSA (SSSSA, 2016).

The South African Journal of Plant and Soil, established in 1984, is jointly edited by the SSSSA and other scientific societies (South African Crop Production Society, South African Weed Science Society and South African Society Horticulture Sciences). The scope of the journal covers all aspects of soil science and plant science, therefore, among the scientific societies dedicated to Soil Science in the countries of the BRICS group, SSSSA is that which does not have a journal exclusively about soil science. Nevertheless, aiming at sharing information, the SCSAS publishes a newsletter (SSSSA, 2016).

The awards and honors are intended for leading researchers, as follows: Honorary Members; Gold Medal; Silver Medal for contributions to SSSSA; Silver Medal for contributions to Soil Science; Silver Medal for Best Annual Soil Science Student; Best Paper; Best Junior Paper; Best Paper in Innovative New Technology; Omnia Student Award; Best Poster; Best Contribution to the Development of Research in Soil Science; Best Soil Science article published in the South African Journal of Plant and Soil; Eskom Expo Award for Young Soil Scientist (SSSSA, 2016).

On the internet, the SCSAS has a website that provides information on its activities, organization and other relevant information on Soil Science. In addition, SSSSA has a page on Facebook social media (SSSSA, 2016).

Highlights from the International Union of Soil Sciences (IUSS)

In 1998, due to statutory changes, the International Soil Science Society changed to IUSS. However, in general, objectives, activities, administrative structures and science have remained more or less the same since 1924, with its foundation in Rome (Hartemink, 2015). Thus, henceforth only the abbreviation "IUSS" will be used. It is also worth noting that in eight years IUSS will complete its centenary, constituting one of the great traditional and scientific societies of the world.

The Russian soil science society exerted a strong influence on the IUSS formation. In the period between 1909 and 1922 there occurred international meetings (Budapest, Hungary; Stockholm, Sweden; Prague, Czech Republic) used to envision the need for a global scientific society dedicated to Soil Science. Russia would have hosted one of these meetings in 1914, but due to World War I, it was not possible to hold the meeting. Nevertheless, they always had active participation in other meetings (van Baren et al., 2000).

Country	IUSS	
	Presidents	Honorary members
Brazil	-	L. Vettori (1978)
Russia/ USSR	K. K. Gedroiz (2º; USSR; 1927-1930) V. A. Kovda (10º; USSR; 1968-1974)	K. D. Glinka (USSR; 1924) S. Winogradsky (USSR; 1924) A. A. Rode (USSR; 1968) M. K. Kononova (USSR; 1974) V. A. Kovda (USSR; 1982) S. V. Zonn (Russia, 1998) G. V. Dobrovolsky (Russia, 2002) V. Targulian (Russia, 2010)
India	J. S. Kanwar (12º; 1978-1982)	S. K. Mukherjee (1986) J. S. Kanwar (1990) J. S. P. Yadav (2010)
China	-	-
South Africa	-	-

Table 1. Members of national soil science societies from countries of the BRICS group that were IUSS presidents or honorary members. Source: Hartemink (2015).

Regarding the development of IUSS, it was no different, which can be perceived because of the number of IUSS presidents and honorary members from Russia or the USSR (Table 1). To avoid confusion, it is worth noting that although some of these presidents and honorary members are under the USSR regime, the majority were Russian, direct disciples or followers of Dokuchaev (Kovda and Dobrovolsky, 1974). Still, the only honorary member of IUSS from Brazil, Leandro Vettori, was also one of the founders of SBCS (Oliveira et al., 2015).

Final Considerations

In general, scientific societies dedicated to Soil Science in the countries of the BRICS group have very different historical and organizational profiles, but have similar activities. Loosely speaking, a factor which is common in soils (Targulian and Goryachkin, 2004) and humans is that, unlike rocks, both accumulate information as they age, that is "memorized". The preservation of memories is undoubtedly an important link between generations of soil scientists and the advancement of their knowledge, which, in varying intensity, has been valued by soil science societies from countries of the BRICS group. Thus, in addition to diffusing a portion of soil science history of the five countries, it is hoped that this paper will contribute to highlight the value of belonging to a scientific society and "be more soil and less rock"

Acknowledgments

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Book Reviews

Precision in Crop Farming – Site specific concepts and sensing methods: Applications and results

By Hermann J. Heege (editor). 2013 by Springer, 356 pages, ISBN 978-94-007-6759-1; DOI 10.1007/978-94-007-6760-7.

Sustainable but also economicfarming requires precise adaptation to the natural site management and economic conditions. Thus, interactions between external and internal i.e. soil processes and properties need to be considered in order to optimize site specific and adapted farming systems and to minimize environmental impacts and economic consequences. This very interesting book aims at explaining the rationales between agronomical sciences, sensing principles in addition to elucidating its physical, chemical and biological background as well as finally describing possibilities in agricultural engineering and farming management. Therefore the book's focus is to be located between several fields of agricultural sciences and related disciplines.

The book is well written containing agricultural engineering details. I, personally, would have like to see more information on actual soil properties and functions, because it is not capacity but intensity parameters of soils which define the consequences of soil and environmental management approaches. However, since the aim of this book is to build bridges between scientific disciplines, it can´t go too much into these certainly necessary details.
It can be recommended for agricultural engineers, environmental scientists and all those who are interested in modern agricultural topics and technological approaches.

Read more: *http://www.springer.com/de/book/9789400767591*

Book review written by Rainer Horn, IUSS president

Le sol. Une merveille sous nos pieds. (The Soil. This Wonder Beneath Our Feet)

By Feller, C., De Marsily, G., Mougin, C., Peres, G., Poss, R., Winiarski, T., 2016. Belin, Pour la science, Paris, 256 pp. ISBN 978-2-7011-8349-7.

This book is a particularly welcome attempt at presenting the soil in its for human being most relevant facets avoiding any scientific jargon and using a wording that every francophone reader is likely to understand. Such an initiative is very much of a risk, first because it is a real challenge to try for all the complex characteristics and potential uses of the topic to be adequately covered in nine chapters each of a few pages only, and second because the earth is generally looked at by most people as being just "dirt".

The authors have devoted the first chapter to a short, yet comprehensive description of the object soil, its various origins, compositions, aspects, properties, as well as the farmers' perceptions of this poorly known but fundamental basis of all the ecosystems of the world. In the following three parts of the book, they deal successively with widely different functions of the soil in terms of resource for mankind starting with its key role as the substrate on which all plants are growing. A clear comparison of the benefits from, and a discussion of the problems posed by different cropping strategies of current practice (conventional vs. organic, biodynamic and/or agroecological approach) are also proposed. A separate section considers specifically the circulation of water and its relevance at both the microsite and the landscape scales, while another one concentrates on all the organisms living in and from the earth. A substantial portion of the latter is rightly dedicated to the extraordinary and usually neglected role played by the many earthworms that ingest huge fractions of soil and thereby contribute to its fertility. It is a bit unfortunate, however, and difficult to justify why leaf aphids and ladybirds are being evoked here and not the devastating phylloxera of grapevine roots for instance, whereas the Bacillus thuringiensis preparations also extracted from the soil, mass-produced and nowadays commercial-

ized worldwide as biological control agents of a number of pest insects are not even mentioned.

Some even more unexpected side aspects of the soil are being dealt with in a second part of the book, starting with the alarming threat posed to the environment by the accumulation of all sorts of possibly quite polluting mineral and chemical residues disposed of on, or in a whole range of soils. The readers are made aware of the fact that the capacity of the ground to stock or degrade contaminants of that kind has narrow limits. Next we discover that on top of determining the quality of our nutrition and water to a large extent, the earth may have a number of human applications as medicament e.g. for fango, etc., or may be directly consumed by several domesticated and wild animal species! A further chapter examines how diverse soils have been incorporated in the construction of human shelters including roads and dams as well as the problems the weight of these buildings may create on the soil structure. Over many centuries finally, the soil has been a source of inspiration for many visual artists, or else has been extensively used as material for their sculptures and paintings.

It ought to be emphasized that the authors did not elude a discussion of the recently introduced scientific concepts of ecosystem services (the terminology of which is, admittedly, sometimes a bit confusing for non-specialists) - by providing simple explanations of the way they operate and several clear examples. As a consequence, the whole book always remains very pleasant reading. In addition, a serious effort has been made at gathering first class, large-sized colour pictures, drawing easily apprehended diagrams, and retaining convincing, straightforward information only for the tables to illustrate the major developments. In summary the team of French research workers led by FELLER offers herewith a beautiful opus that can only be recommended to anyone interested in environmental sciences.

Jean-Paul AESCHLIMANN
Specialist in integrated control of pest organisms
AGROPOLIS, Montpellier (FRANCE)
October 27, 2016

IUSS Alerts June-November 2016

International Union of Soil Sciences

Information for and from the global soil science community

IUSS Alerts are e-mailed to nearly 10,000 people in over 100 countries. Please forward the IUSS Alerts to your friends and colleagues. Send information for IUSS Alerts to *iuss@umweltbundesamt.at*. Below are still relevant contributions that appeared in the IUSS Alerts between June and November 2016.

Sustainable Soil Management: Soil for life

A brand new MOOC (Massive Open Online Course) on sustainable soil management has just been launched at Wageningen University, the Netherlands.

Soil is the earth's fragile skin that anchors all life. We depend on soil to build our homes and cities, to grow crops for food and raise livestock, to support transportation and enable recreation. Yet we disregard this crucial and precious resource that lies right under our feet. This introductory environmental studies course will explore the importance of soil to life on earth, the issues, processes and societal challenges underlying soil degradation – and what can be done to ensure sustainable soil management for the future. The threats to our soil span deforestation, erosion, overgrazing, use of agrochemicals, pollution and climate change. Learn what you can do to make a difference in protecting this vital natural resource.

Read more: *https://www.edx.org/course/sustainable-soil-management-soil-life-wageningenx-soilx*

Global Soil Partnership endorses guidelines on sustainable soil management

The Global Soil Partnership (GSP) endorsed a set of voluntary guidelines for sustainable soil management at its plenary conference at FAO this week, marking a step towards coordinated action to assure that the earth under our feet - a keystone of global food security - remains fertile. The GSP has been set up as a coalition tasked with promoting efforts to improve the parlous state of the world's soils, a third of which are defined as degraded. For prescriptions for improving soil health to succeed, much diagnostic work must be done, according to the GSP.

Read more: *http://www.fao.org/news/story/en/item/416121/icode/*

Global Rainfall Erosivity

In the context of developing the Rainfall Erosivity dataset at Global scale (REDaG), the Joint Research Centre in collaboration with scientists and institutions all over the World collects high temporal resolution (5-min, 10-min, 15-min, 30-min, 60-min) rainfall data. The same participatory approach as in Rainfall Erosivity at European Scale (REDES) is also applied for the development of the Global Erosivity Dataset. We invite scientists (or institutes) outside the European Union to contribute to this data collection. In case you have high temporal resolution rainfall data for long-time periods, you can be part of this project and co-author of sub-sequent publications. Please contact Panos Panagos for more information.

Read more: *http://esdac.jrc.ec.europa.eu/themes/global-rainfall-erosivity*

Contact: *panos.panagos@jrc.ec.europa.eu*

Effective sampling for digital soil mapping

Field soil samples are key inputs to digital soil mapping for provision of soil spatial information. Collecting field soil samples is not only labor intensive, but also costly. It is important to incorporate the vast amount of geospatial data currently available to increase the efficiency of soil sampling, but existing sampling methods can hardly achieve that. In a recent article in the Soil Science Society of America Journal, researchers developed a new sampling method that integrates the geospatial data derived from GIS and remote-sensing techniques to improve the efficiency of field sampling.

Read more: *https://dl.sciencesocieties.org/story/2016/jun/fri/effective-sampling-for-digital-soil-mapping*

Field to Market releases report on opportunities to advance soil health

Over the past decade, Field to Market: The Alliance for Sustainable Agriculture has developed a set of sustainability metrics that focus on environmental outcomes of agricultural management practices, specific to commodity crop production systems in the United States. Responding to a charge from membership to conduct an assessment on how the Alliance can work to further overall maintenance of and improvement to soil health, we have prepared a new report as a resource for Field to Market members. Exploring Opportunities to Advance Soil Health assesses the current situation of the science of soil health, efforts of the conservation community, related research and the relationship to Field to Market's ongoing efforts.

Read more: *https://www.fieldtomarket.org/news/2016/exploring-opportunities-to-advance-soil-health/*

How to Eat Your Lawn: Transform Your Wasteful Grassy Space into a Food Forest Garden

There are several organizations now that help people transform their lawns into edible food forests, and one of those is Edible Estates. This company is the brainchild of Fritz Haeg, who has made it his mission to replace the water-guzzling, pesticide-drenched grasslands of American front yards with functional, fruitful plots filled with all things edible.

Read more: *http://regenerationinternational.org/how-to-eat-your-lawn*

The disappearing West

Every two and a half minutes, a football field's worth of open, natural area in the western United States disappears to human development. An interactive map helps to explore how and why open lands in the West are disappearing so quickly and to estimate the amount of natural land loss across the 11 western United States, to map the degree of human modification at a high spatial resolution (30 m) and to estimate the amount of natural land loss between two time periods: 2001-06 and 2006-11.

Read more: *https://www.disappearingwest.org/map/*

The case of urban sprawl in Spain as an active and irreversible driving force for desertification

The United Nations Convention to Combat Desertification (UNCCD) does not distinguish between natural and human drivers, and between active and inherited desertification. Partly as a result of these ambiguities the UNCCD has attracted a low level of international attention. As the Spanish case study shows, this vagueness hinders the implementation of effective strategies to combat this global challenge. Unsustainable agricultural land management is the most blamed desertification agent in Spain but as land use changes trends demonstrate, desertification phenomena are fueled by a push–pull dynamics. Our data indicate that agriculture, rather than being a desertification agent, is a victim of a set of social and economic conditions leading to its abandonment and/or transformation in urban land, becoming irreversibly degraded by soil sealing. From 1975 to 2008, half a million ha of former agricultural land has been made available for development. Urban sprawl has become the most active desertification agent in Spain.

Read more: *http://www.sciencedirect.com/science/article/pii/S0140196312002820*

MPs sound alarm on neglected soils

By Roger Harrabin, BBC

According to an article published on the BBC website on 2 June 2016, MPs say that ministers are failing to protect Britain's soils on farmland and in cities. The Commons Environmental Audit Committee warns that tracts of polluted soil are a potential health hazard in many towns because the government has stopped grants to decontaminate them.

Read more: *http://www.bbc.com/news/science-environment-36428361*

Study unlocks surprising behaviour of soil bacteria

Newly sequenced genomes of soil bacteria have raised questions about how differing land management affects the organisms' behaviour. UK scientists found one strain locked nitrogen in the soil, while another released a potent greenhouse gas. The findings came to light after the researchers sequenced Bradyrhizobium, one of the most active and abundant groups of soil bacteria.

Read more: *http://www.bbc.com/news/science-environment-36547632*

A troubled future for industrial farming

Less humus means lower fertility – something that no amount of fertilizer can solve. And new cultivation methods bring new problems.

Read more: *http://globalsoilweek.org/wp-content/uploads/2016/04/INTENSIVE-CROPPING.pdf*

A Boon for Soil, and for the Environment

At a farm in Peru, charcoal from bamboo burned in special ovens is used to fertilize the soil. Carbon farming is seen as a way of replenishing depleted farmland and helping reduce damage to the environment.
Read more: *http://www.nytimes.com/2016/05/18/business/energy-environment/a-boon-for-soil-and-for-the-environment.html?rref=collection%2Ftimestopic%2FSoil&action=click&contentCollection=science&region=stream&module=stream_unit&version=latest&contentPlacement=1&pgtype=collection&_r=3*

How does water move through soil?

Soil texture, soil structure, and gravity influence water movement. Each of these factors is critical in how we understand soil hydrology concepts. Once we understand them, we can then use them for agriculture, construction, and environmental sustainability purposes.
Read more: *https://soilsmatter.wordpress.com/2016/05/15/how-does-water-move-through-soil/*

WRB now available in Spanish

The third edition of the international soil classification system World Reference Base for Soil Resources (WRB) is now available in Spanish. After the Polish version, this is the second translation of the current WRB. Many thanks to Silvia Chávez and Francisco Manríquez (INEGI, Mexico) for the draft, to Roque Ortiz (University of Murcia, Spain) for the final editing and to the FAO team for making the publication possible. Translations into some other languages are currently in progress.
Read more: *http://www.fao.org/3/a-i3794s.pdf*

Global Soil Biodiversity Maps

ESDAC distributes 2 datasets of the recently published Global Soil Biodiversity Atlas. The Soil Biodiversity map is presented on pages 90-91 of the Atlas and shows a simple index describing the potential level of diversity living in soils on our planet. This dataset is based on distribution of microbial soil carbon and distribution of main groups of soil macrofauna. The second dataset is presented on pages 134-135 of the Atlas. The map shows the potential rather than the actual level of threat to soil organisms. Many proxy datasets have been used to develop this map: loss of aboveground biodiversity, pollution and nutrient overloading, agriculture use, overgrazing, fire risk, land degradation, climate change, etc.
Read more: *http://esdac.jrc.ec.europa.eu/content/global-soil-biodiversity-maps-0*

Better soil data key for future food security

To project how much food can be produced in the future, researchers use agricultural models that estimate crop yield, or how much of a crop can be produced in a certain amount of space. These models take into account factors like climate and weather variability, irrigation, fertilizer, and soil type. A new study published in the journal Nature Communications shows that the type of soil used in such a model can often outweigh the effects of weather variability - such as year to year changes in rainfall and temperature. The study is the first global assessment of the importance of soils in global crop models.
Read more: *http://www.eurekalert.org/pub_releases/2016-06/iifa-bsd062016.php*

High-resolution digital soil map identifies intricate corn-yield environments

Integrating spatial information into decision processes for precision agriculture is a key approach to site-specific management. Soil maps, such as the NRCS Soil Survey Geographic (SSURGO) dataset, are often used to partition fields into separate zones but still lack the resolution needed for implementing precision agriculture. Digital soil models (DSMs) are used to help improve traditional soil maps by integrating high-resolution environmental data with statistical processes to define complex soil-landscape associations; however, methods for validating their success in precision agriculture are needed.
Read more: *https://dl.sciencesocieties.org/story/2016/jun/mon/high-resolution-digital-soil-map-identifies-intricate-corn-yield-environments*

Increase claying to decrease soil erosion

Increasing the clay content of sandy soils in the Great Southern could reduce soil erosion risk by improving crop establishment, according to a project by North Stirlings Pallinup Natural Resources (NSPNR). Funded through the Federal Government's national Landcare program, the soil erosion management project conducted in 2015 and 2016 at five sites south of Borden demonstrated the effect of applying clay subsoil to sandy duplex soils.
Read more: *http://www.farmweekly.com.au/news/agriculture/general/events/increase-claying-to-decrease-soil-erosion/2753056.aspx*

Soil increasingly at risk from household products

Changing Australian soil conditions are exposing crops to silver nanoparticles, which are widely used in household products, a study led by The University of Queensland has found. Study author and senior lecturer in soil science Dr Peter Kopittke from the School of Agriculture and Food Sciences said silver nanoparticles generally pose a low risk to agricultural food production, however testing in certain soil conditions led to an "unexpected" finding.

Read more: *https://www.uq.edu.au/news/article/2016/07/soil-increasingly-risk-household-products*

Soil 'booster shots' could turn barren lands green

A new study reveals that the addition of foreign soil – and more importantly, the organisms it contains – can shape which plants will grow in the future. Such "inoculations" could even help bring back fallow farmlands and turn deserts green. "This is a really cool and remarkable study," says Harsh Bais, a root biologist at the University of Delaware, Newark, who was not involved in the work. "Dirt matters".

Read more: *http://www.sciencemag.org/news/2016/07/soil-booster-shots-could-turn-barren-lands-green*

Hubus - Erde schenken

(from German: to give earth as a present)

Hubus inspires city dwellers to transform their daily bio-waste into fertile soil. It offers elaborate vermicompost furniture, tools for comfortable waste handling, and a network to exchange soil in order to establish a tightly closed loop of matter. Benefits are created for people and for nature.

Read more: *http://socialimpactstart.eu/EN/start-ups/hubus-erde-schenken-2724*

Take a tour through the world soil museum at Wageningen

Learn more: *https://www.youtube.com/watch?v=KFUroOQmefU*

Call for Nominations: Dokuchaev and Liebig Awards

Two awards are presented by the IUSS at each World Congress of Soil Science to recognize outstanding contributions in two areas: the IUSS Dokuchaev Award for basic research in soil science and the IUSS Liebig Award for applied research in soil science.

Eligible nominees and nominators are members of the IUSS. Each award consists of an engraved medal, a certificate, a US$ 1000 honorarium, and financial support to attend the presentation at the World Congress of Soil Science. Nomination procedures are on the IUSS Website. Go to *www.iuss.org* and then click on "About the IUSS" and then click on "Awards & Prizes" and then click on "Dokuchaev award" or "Von Liebig award" and then click on "Criteria & Guidelines." Submissions are due one year before the beginning of the WCSS. The next WCSS begins in Rio de Janeiro, Brazil, on 18 August 2018. Therefore, nominations are due 18 August 2017. Nominators who have submitted previous nominations are encouraged to submit the nomination again. For further information, please contact M.B. Kirkham (*mbk@ksu.edu*).

Margaret Oliver Award for Early-career Pedometricians Call for Nominations, 2017 award

The Pedometrics Commission of the International Union of Soil Sciences (IUSS) is pleased to introduce a new award, which is intended to recognize up-and-coming talent in pedometrics. The award is named for Margaret Oliver, in recognition of her outstanding commitment to the promotion and encouragement of pedometricians in the early stages of their careers as well as her overall service to pedometrics. The award will be given at each biennial meeting of the Pedometrics Commission starting with the Pedometrics 2017 , 26 June - 01 July 2017 in Wageningen (*http://www.pedometrics2017.org*). Nominations should be sent before December 1, 2016.

Read more: *http://iuss.boku.ac.at/files/oliver_medal_call_for_nominations_2016.pdf*

Newsletter of IUSS Division 4 'Soil Connects' published

Issue 4 of the SOIL Connects Newsletter of IUSS Division 4 was published. It has a number of interesting articles including one on how to keep soils sexy after the IYS, asks whether microbes can survive the drying of the world's soils and gives an example of soil 's role in preserving archaeological heritage, to name just a few.

Read more: *http://iuss.boku.ac.at/files/division_4_newsletter_issue_4_13072016.pdf*

Donald L. Sparks receives Clay Science Award

Donald L. Sparks, Unidel S. Hallock du Pont Chair in Environmental Soil Chemistry at the University of Delaware and director of the Delaware Environmental Institute, has received the 2016 Pioneer in Clay Science Award from the Clay Minerals Society (CMS) for his pioneering work. The award recognizes research contributions that have led to important new directions in clay mineral science and technology.

Read more: *http://www.udel.edu/udaily/2016/june/pioneer-clay-science-award/?utm_source=UDaily+Subscribers&utm_campaign=203c31a886-UDaily_News_Email&utm_medium=email&utm_term=0_0b5034716d-203c31a886-177571321#.V2TEFCyawDU.mailto*

Pál Stefanovits (1920-2016)

The Hungarian Soil Science Society and the IUSS Secretariat were sad to learn that our distinguished soil scientist Pál Stefanovits died on August 4th, 2016 at the age of 95. The major scientific fields of professor Stefanovits span from soil minerals to soil classification and mapping. The development of the Hungarian soil classification system and his classic soil text books were the foundation of a strong soil science school in Hungary. His publications, participation in international meetings and soil mapping projects brought him international recognition. The death of Pál Stefanovits, honorary president of the Hungarian Soil Science Society, member of the Hungarian, the Ukrainian, the German and the Austrian Academy of Sciences, is a great loss for the international soil science community. His legacy will be summarised in the next IUSS Bulletin.

Soil Biodiversity featured in PNAS

The Global Soil Biodiversity Atlas and GSBI Associates Tandra Fraser and Thomas Crowther were featured in the Proceedings of the National Academy of Sciences news feature: Crucial role of belowground biodiversity.

Read more: *http://www.pnas.org/content/113/28/7682*

GSBI seeks to unify soil indicator research

Much work has and is being done linking soil biodiversity indicators with ecosystem functions. GSBI seeks to connect knowledge of past policy decisions based on indicators with emerging global interest. Contact us to share your knowledge with the global scientific community.

Contact: *info@globalsoilbiodiversity.org*

ISRIC World Soil Museum can now be visited virtually

The World Soil Museum of ISRIC – World Soil Information in Wageningen can now be visited online. The museum has a collection of reference soil profiles from around the world. These 3D profiles, or monoliths, are used to explain main soil forming factors and to show the importance of the soil for ensuring food security, mitigating climate change, or in terms of their cultural value. The museum, the collection, including the objects in the collection storage – normally off limits to visitors – can now be visited online. You can explore the museum as part of an online tour and search for specific data and information on each soil profile. Further, you can also view profiles from the storeroom which houses the majority of the collection, and obtain a complete overview of the soil profiles by country or soil type. This means you can put together your own exhibition for your studies or as a work project. The virtual tour is available in English. The scope of the virtual tour will be gradually extended.

Online tour: *http://wsm.isric.org/#tourGoogle*

ISRIC releases upgraded SoilGrids system: up to two times improved accuracy of predictions

ISRIC – World Soil Information has just released a major update of its global predictions of soil properties and classes, now available at a spatial resolution of 250 m. The previous SoilGrids system at 1 km resolution has been systematically upgraded and the accuracy of the predictions has been improved (up to two times) compared to the previous predictions. The new version of SoilGrids predictions comes with an open data licence.

SoilGrids data are available for viewing and download via the data portal at *www.soilgrids.org* and via the SoilInfo App (available for Android and Apple devices).

Read more: *http://www.isric.org/content/isric-releases-upgraded-soilgrids-system-two-times-improved-accuracy-predictions*

White House call to save U.S. soil natural resources

Soil plays critical roles in food security, climate mitigation, ecosystem function, and buffering against extreme weather events. Although it is essential

for the stability of the planet, soil is disappearing at an alarming rate. In issuing a call to action for soil, the White House Office of Science and Technology Policy seeks innovative actions from Federal agencies, academic scientists and engineers, farmers, entrepreneurs, businesses, advocates, and members of the public in a nationwide effort to impede soil loss, enhance soil genesis, and restore degraded soils.
Read more: *https://www.whitehouse.gov/blog/2016/08/01/call-action-save-one-americas-most-important-natural-resources*

Spatial and temporal variability of soil water content

The topsoil water content plays a key role in partitioning energy and water fluxes at the land surface. Knowledge about its spatial and temporal variability is crucial for improving climate and hydrology modelling. In the June 2016 issue of Vadose Zone Journal, researchers studied the spatial heterogeneity of topsoil water content, which is expressed as the relationship of the spatial standard deviation of the topsoil soil moisture to the spatial mean soil moisture. Past studies have shown that sq first increases during drying out, reaches maximum value at some critical spatial mean soil moisture and then decreases thereafter. However, the drying out and rewetting processes sequentially alternate each other in time, and this relationship demonstrates hysteresis.
Read more: *https://dl.sciencesocieties.org/story/2016/jul/wed/spatial-and-temporal-variability-of-soil-water-content*

The 7 biggest problems facing science, according to 270 scientists

Science is in big trouble. Or so we're told. In the past several years, many scientists have become afflicted with a serious case of doubt – doubt in the very institution of science. As reporters covering medicine, psychology, climate change, and other areas of research, we wanted to understand this epidemic of doubt. So we sent scientists a survey asking this simple question: If you could change one thing about how science works today, what would it be and why?
Read more: *http://www.vox.com/2016/7/14/12016710/science-challeges-research-funding-peer-review-process*

Soil microbes burp carbon dioxide after drought-breaking rain

An unpredictable source of carbon emissions in areas of sporadic rainfall is the carbon dioxide released from soil when rain falls after drought. The emissions come from soil microbes, and as Catherine Osborne explains, these critters are very difficult to study. But recent advances in DNA sequencing technology have made things easier. In her work at the University of California Berkeley, Catherine investigated soil microbes.
Read more: *http://www.abc.net.au/radionational/programs/scienceshow/soil-microbes-burp-co2-after-drought-breaking-rain/7652800*

The definition of soil since the early 1800s

Soil scientists and the definition of soil have changed over time. This paper reviews how the definition of the soil has changed since the early 1800s by selecting and listing 81 definitions given in a wide range of soil science books, handbooks, glossaries and dictionaries. Initial definitions of the soil were based on developments in agricultural chemistry or geology. The soil was seen as a production factor (medium) for agriculture that needed to be understood before it could be improved, or the soil was defined as disintegrated rocks mixed with organic matter. Definitions were rudimentary reflecting the overall level of understanding. This review ends with a proposal for a scientific definition of soil, and a definition for lay persons and the general public.
Read more: *https://www.researchgate.net/publication/293649319_The_definition_of_soil_since_the_early_1800s*

Sustainable soil management key to Africa's food security

The Status of the World's Soil Resources report has established that 40 per cent of Africa's soils are severely degraded. A recent report published in *Down To Earth* points out that desertification has turned out to be a big challenge for Africa, seriously undermining its efforts in sustainable soil management. The continent suffers from soil erosion and low soil fertility which pose a threat to food production. By 2050, Africa will witness an enormous growth in population. According to the Food and Agriculture Organization (FAO) of the United Nations, more than a quarter of sub-Saharan Africa's people are undernourished. Crop production will need to increase by 260 per cent by 2050 to feed the continent's population. Bet-

ter land management practice is one of the ways to fight climate change and increase resilience of farming systems in the continent.
Read more: *http://www.downtoearth.org.in/news/sustainable-soil-management-key-to-africa-s-food-security-54817?platform=hootsuite*

'Soil and Air' – Where Crops Meet the Environment

You probably know that climate change affects how we grow food, but you might not know that how food is grown also affects our climate. This interplay is at the heart of an Agricultural Research Service (ARS) project called "Soil and Air," a concerted effort to feed the Earth's 7.5 billion people while protecting the planet.
Read more: *http://blogs.usda.gov/2016/05/31/soil-and-air-where-crops-meet-the-environment/*

Soilcam captures living underground

This time-lapse captures how things decompose underground.
Video: *https://www.facebook.com/TechInsiderScience/videos/927452267363450/*

New version of Chem_Transport software released

Chem_Transport is a software package of several models that describe the transport and sorption of chemicals in soils and other porous media. There are two new features in version 2. The user now has the option of providing input data in a template which is to be populated by the user. The second feature is that two new models are now included in this package. The first model deals with stir flow and the second model deals with solute transport through a thin disk system.
Read more: *www.spess.lsu.edu/Chem_Transport*

Awards granted to soil scientists

In the light of recent suggestions it has been decided that awards given to soil experts will only be included in the IUSS alerts upon suggestion from the Council representatives of the national soil science societies.

Soil hydraulic properties for Europe

Soil water information is an essential input for environmental, hydrological or land surface models. A reliable soil water map can serve multiple purposes, including scientific research and application of models on different geographical scales. It is also essential for the development of a comprehensive soil quality (SQ) indicator. New soil hydraulic pedotransfer functions (PTFs) were recently developed and could support the computational basis of the new series of maps of soil hydraulic properties. The purpose of the study that JRC undertook is to assist with the implementation of the research programme on soil quality indicators, namely to facilitate the completion of a new soil quality indicator by supplying reliable spatial data on soil hydraulic properties. For this, the following map layers were developed: Water retention of topsoil (saturated water content, water content at field capacity, water content at wilting point; hydraulic conductivity of topsoil (saturated hydraulic conductivity).
Read more: *http://esdac.jrc.ec.europa.eu/content/maps-indicators-soil-hydraulic-properties-europe*

Soil Organic Carbon (SOC) saturation capacity in Europe

This dataset (map) shows the Soil Organic Carbon (SOC) saturation capacity, expressed as the ratio between the actual and the potential SOC stock in each pixel. Values close to 0 indicate a great potential of soil to store more carbon. The actual SOC stock was derived from the Pan-European simulation using the biogeochemical CENTURY model. The associated data can be found in ESDAC: "Pan-European SOC stock of agricultural soils". The potential SOC stock was obtained simulating a grassland land use without nitrogen limitation, since it was considered a good scenario for SOC accumulation. The scenario set-up was analogous to that described in Lugato et al (2014b) for the grassland land use, namely 'AR_GR_LUC'. However to obtain a potential SOC stock, the model was run for 2000 years with repeated actual climate, in order to reach an equilibrium condition. The simulation involved only the agricultural soils, according to the Corine Land Cover.
Read more: *http://esdac.jrc.ec.europa.eu/content/soil-organic-carbon-saturation-capacity*

Launch of Global Soil Biodiversity Atlas in Australia

The EU Joint Research Centre and the Global Soil Biodiversity Initiative (GSBI) are releasing the first-ever Global Soil Biodiversity Atlas in Australia. The Global Soil Biodiversity Atlas will be launched by the Government Authorities in Canberra on Monday 10 October 2016. This unique Atlas maps the soil biodiversity of the entire planet providing a

detailed analysis of soil organisms and of threats to soil biodiversity as a fundamental component of the Earth's biodiversity. Global food security is dependent on life found beneath our feet: 98% of all global daily calories derive from soil biodiversity. The Atlas provides current solutions for sustainable management of soils for food security, climate regulation and improved human health.
Read more: *http://esdac.jrc.ec.europa.eu/event/launch-global-soil-biodiversity-atlas-australia*

Land use and forest trees affect soil nutrients

Urbanization, agriculture, and clear-cutting of forests can have major negative impacts on carbon (C) and nitrogen (N) cycles but reforestation can replenish these nutrients over time. This relationship has been well documented for tropical habitats, but effects on C and N pools remains relatively understudied in deciduous forests. In a recent article in the Soil Science Society of America Journal, researchers selected forested sites in southern Ohio to investigate whether soil organic carbon (SOC) and N pools were affected by land-use history and forest community structure. Aerial images dating back to 1932 were used to reconstruct the history of reforestation with land-use determined from a geographic information system, and tree community structure and soil nutrient levels at different depths were measured in the field.
Read more: *https://dl.sciencesocieties.org/story/2016/aug/fri/land-use-and-forest-trees-affect-soil-nutrients*

Our very existence depends on soil, so why is it not protected?

In the minds of many, soil is simply dirt, but without it we would all cease to exist. Unlike the water we drink and the air we breathe, soil is not protected in the EU and its quality is getting worse. This has to change, writes Balázs Horváth.
Read more: *https://www.euractiv.com/section/agriculture-food/opinion/our-very-existence-depends-on-soil-so-why-is-it-not-protected/*

Our best shot at cooling the planet might be right under our feet

It's getting hot out there. Every one of the past 14 months has broken the global temperature record. Ice cover in the Arctic sea just hit a new low, at 525,000 square miles less than normal. And apparently we're not doing much to stop it: according to Professor Kevin Anderson, one of Britain's leading climate scientists, we've already blown our chances of keeping global warming below the "safe" threshold of 1.5 degrees.
Read more: *https://www.theguardian.com/global-development-professionals-network/2016/sep/10/soil-our-best-shot-at-cooling-the-planet-might-be-right-under-our-feet*

In general, what relationship does soil colour bear to climate?

What is the first colour that comes to mind when you envision soil? Is it brown, black, yellow, or red? How about white, grey, green, or blue? Any of these answers are correct depending on where you are from! It is true; soils come in an incredible range of colours.
Read more: *https://soilsmatter.wordpress.com/2016/09/01/in-general-what-relationship-does-soil-color-bear-to-climate/*

Bhumibol Adulyadej, King of Thailand (1927-2016)

It is with enormous sadness that we hear of the death of King Bhumibol Adulyadej. In addition to his outstanding leadership of Thailand, he was globally recognised as a leader in the promotion of sustainable soil management. Following the World Congress of Soil Science held in Bangkok in 2002, the International Union of Soil Sciences proposed, in recognition of the outstanding leadership provided by King Bhumibol in promoting practices of sustainable soil management to ensure Food Security, the international celebration of World Soil Day on December 5th, His Majesty's birthday. It was through King Bhumibol's enthusiastic encouragement that the United Nations formally adopted December 5th as World Soil Day and furthermore pronounced 2015 to be The International Year of Soils. Through his leadership soil scientists globally and in particular in South East Asia were provided with encouragement in the development of soil management strategies which are both sustainable and relevant to the farmers who use them. The passing of King Bhumibol Adulyadej is a great loss for Thailand, but also to Soil Science. The IUSS Secretariat has dispatched a letter of condolences to the Royal Family, the Land Development Department of Thailand and the Soil and Fertilizer Society of Thailand.
The IUSS letter of condolences can be found on our website: *http://www.iuss.org/index.php?article_id=618*

Survey on Global Soil Biodiversity Data

A survey on global soil biodiversity data to assess what data currently exist is conducted, as an initial step towards developing a global soil biodiversity database. The results will allow to identify key gaps in knowledge and issues for database development. Please participate by filling out the survey. Your contribution is much appreciated. This project is led by sDiv's sWORM working group, the JRC and the Global Soil Biodiversity Initiative.
Survey: *https://globalsoilbiodiversity.typeform.com/to/GM9ETm*
Contacts: *erin.cameron@helsinki.fi* and *alberto.orgiazzi@jrc.ec.europa.eu*

Visual assessment of sulfate reduction to identify hydric soils

Wetlands are recognized as an important source of biodiversity, recreation, and ecosystem services. The protection and delineation of wetlands which encompass hydric soils, wetland hydrology, and hydrophytic vegetation, is not only ecologically important, but also mandated by federal law. Requirements for the identification of hydric soils mainly involve observable features generated as result of oxidation-reduction reactions. In a recent issue of the Soil Science Society of America Journal, researchers demonstrated the observation of SO_4^{2-} reduction as black staining of FeS on Indicator of Reduction in Soil (IRIS) panels is a viable method for determining hydric soil status and ultimately performing wetland identification and delineations.
Read more: *https://dl.sciencesocieties.org/story/2016/sep/mon/visual-assessment-of-sulfate-reduction-to-identify-hydric-soils*

The Soil Colors of the National Parks - 100 Years of Conservation & Soil Science

August 25th, 2016 marked the 100 year anniversary of the National Park Service in the United States. In celebration of this historic event, we continue the efforts of others to drawn attention to the importance soil plays in the vitality of these parks. By showcasing the beautiful soil colors of the parks, we can better understand and appreciate the soils surrounding us. Soil color is not just an indicator of the makeup of the soil in a certain region, it can also help to indicate what the soil can be used for, whether it be for food production, maintaining, restoring or rebuilding ecosystems, conserving and promoting biodiversity, viability for water systems, classification of artefacts and more. Soil is the often overlooked "skin of the earth," so let us "dig" deep and discover.
Read more: *http://munsell.com/color-blog/soil-colors-national-parks-anniversary/*

Noted astronomer urges viewers to unlock the secrets in the soil

Dr. Laura Danly of California's Griffith Observatory is helping USDA's Natural Resources Conservation Service promote its "healthy soils" campaign. But why is an astronomer talking about soil, rather than the stars? "Studying Earth is just like studying the planets. Earth is a planet, and it's the most amazing planet we know. It's the only one we know that has life on it, so it's a natural for me to want to talk about Earth and share some important messages with people about how we can make Earth healthier," Danly says.
Watch the video: *https://www.youtube.com/watch?v=6tJIkAjDjjo&index=6&list=PL4J8PxoprpGZ-uMTxScBBn9nYT6CMX8aD*

Ethiopia soil map arms farmers with new fertilizers in climate fight

A comprehensive digital map charting soil fertility in Ethiopia is proving an important tool in tackling the country's low farm productivity, a challenge made more acute by climate change. The nationwide mapping effort was launched by the Ethiopian Soil Information System (EthioSIS) in 2012, and is due to be finished this year. The project in the Horn of Africa nation is already achieving results, with new fertilizer combinations boosting wheat yields from around 1 tonne to 3 tonnes per hectare on more than 40 percent of its agricultural land last year.
Read more: *http://www.reuters.com/article/us-ethiopia-climatechange-agriculture-idUSKCN11Z197*

Storing and filtering capacity in EU for cations, anions, solids …

ESDAC has published 2 new datasets. One dataset contains 4 maps related to predicting the preservation of cultural artefacts and buried materials in soils in the EU: Preservation capacity for 'bones, teeth and shells', 'organic materials', 'metals (Cu, bronze and Fe)' and 'stratigraphic evidence'. The maps produced demonstrate how soil provides an extensive but variable preservation of buried objects. Another dataset contains 10 maps that show the soil's storing and filtering capacity in EU for cations, anions, solids and pathogenic microorgan-

isms, non-polar organic chemicals and non-aqueous Phase Liquids (NAPL). Both datasets are available after registration.
Read more: *http://esdac.jrc.ec.europa.eu/content/maps-related-predicting-preservation-cultural-artefacts-and-buried-materials-soils-eu-0*
Read More: *http://esdac.jrc.ec.europa.eu/content/maps-storing-and-filtering-capacity-soils-europe*

IUSS publication *Task Force: Soil Matters - Solutions Under Foot* henceforth available from Schweizerbart Science Publishers

Since Catena has been taken over by Schweizerbart, Task Force: Soil Matters - Solutions Under Foot is now available from Schweizerbart Science Publishers. Also the next IUSS book which will deal with urban soils will be published by Schweizerbart, probably by the end of the year.
Read more: *http://www.schweizerbart.de/publications/detail/isbn/9783510653928*

New Newsletter of IUSS Commission 1.1. Soil Morphology and Micromorphology

The most recent Newsletter of Commission 1.1. contains a number of interesting articles, from the 2016 Young Micromorphologist Publication Award, information on forthcoming meetings and congresses, research notes and publications to past and future courses and, last but not least, the lyrics to a song dedicated to Calcrete.
Read more: *http://www.iuss.org/index.php?article_id=419*

Latest issue of Pedometron #39, the Newsletter of Commission 1.5 now available

This newsletter contains interesting articles including Digital Soil Mapping meeting report, GlobalSoilMap, Citizen Science, Soil Science Journals' Impact factor, Mapping soil carbon in Madagascar, Shannon's index, and le Clavier sphérique.
Download the newsletter**:** *http://www.pedometrics.org/Pedometron/Pedometron39.pdf*

CONSOWA 2017 – Request for contributions to Session 2, dedicated to the International Decade of Soils (2015-2024)

During CONSOWA 2017, Discussion Session 2, dedicated to and sponsored by the International Decade of Soils (2015-2024) proclaimed by IUSS, will focus on analysis and setting the challenges and required achievements in the next decade, to prevent and counteract the previewed effects of global changes on soil and water degradation processes, and effects on food and water supply for the increasing World population, on the environmental degradation and on natural disasters.
Potential authors are kindly requested to submit their contributions, namely about two pages each (present situation, and recommendations for the future) with their ideas before 31 January 2017 to Ildefons Pla Sentis at *ipla@macs.udl.cat* A draft document, including the different proposals, will be sent for further corrections to all contributors and reproduced to be distributed before the Conference, as a document for discussion. Contributions will be included in the final document to be published as part of the conclusions and recommendations of CONSOWA2017.

ICSU and ISSC to merge into a new international science council

"The world faces great challenges and society increasingly looks towards science to address them. This places demands on all fields of science in all parts of the world. It compels a global response, involving strengthened collaboration within the international scientific community and between it and the world of policy and business, civil society, and the public at large", the Presidents of the ICSU and the International Social Science Council (ISSC) stated in a joint letter. The ICSU Executive Board and the ISSC Executive Committee therefore decided to consult their members on the possibility of merging the two Councils. Thus, an extraordinary ICSU General Assembly was held in Oslo, Norway, on 24 October 2016 jointly with the ISSC. IUSS was represented by Takashi Kosaki. The decision of the joint Assembly was to approve the merger in principle and to allow the two Councils to develop a strategic and transition plans for setting up a new international science council. Despite a reportedly significant number of ICSU unions being against the merger, 76% of ICSU Members and 87% of ISSC Members voted in favour of a future merger of the two organizations. The final decision on the merger will be taken by the membership of ICSU and ISSC at the ordinary General Assembly of ICSU in October 2017.
Read more: *http://www.icsu.org/news-centre/news/top-news/world2019s-top-bodies-representing-the-social-and-natural-sciences-vote-to-pursue-a-merger-forming-a-single-organization-representing-all-social-and-natural-sciences-by-2018*

Wind Erosion Quantitative Assessment

A GIS version of the Revised Wind Erosion Equation (RWEQ) was developed in JRC to model wind erosion at large scale. The RWEQ was developed to i) move a step forward into the large-scale wind erosion modelling, ii) evaluate the soil loss potential due to wind erosion in the arable land of the EU, and iii) provide a tool useful to support field-based observations of wind erosion. The model was designed to predict the daily soil loss potential at a ca. 1 km2 spatial resolution. The average annual soil loss predicted by GIS-RWEQ in the EU arable land totalled 0.53 Mg ha-1 yr-1. Cross-validation shows a high consistency with local measurements reported in literature. The Revised Wind Erosion Equation (RWEQ) quantitative assessment (2001-2010) is available for download (together with the relevant datasets on Wind-erodible fraction) and Index of Land Susceptibility to wind erosion).
Read more: *http://esdac.jrc.ec.europa.eu/content/Soil_erosion_by_wind*

Sampling depth confounds soil acidification outcomes

Low soil pH can affect herbicide persistence, decrease nutrient availability, and contribute to metal toxicity, all of which can compromise crop production. In the Northern Great Plains (NGP) of North America, surface sampling depths of 0 to 15 or 0 to 20 cm are suggested for testing soil pH. Soil acidification, however, is often most pronounced nearer to the soil surface. In a new article published in the Soil Science Society of America Journal, researchers at the USDA-ARS Northern Great Plains Research Laboratory quantified soil pH change in two long-term dryland cropping studies near Mandan, ND. Soils were sampled at multiple depths in both studies, allowing for soil pH evaluation at surface (0–7.6 cm) as well as deeper (0–15.2 and 0–30.5 cm) depths.
Read more: *https://dl.sciencesocieties.org/publications/sssaj/abstracts/80/5/1424*

Plant based remediation of acid sulphate soils

On Friday Nov 4, a small group of landholders in Western Victoria, Australia got together to plant a selection of plant species which have shown promise in remediating acid sulphate soils. The original concept was developed by Prof Del Fanning, (Emeritus Professor, Maryland University, awarded the Pons medal, 8th International Acid Sulfate Soils Conference, 2016) who formed the " Phriends of Phragmites" group to assist implementation of the ideas. The concept aligned with conclusions of the group in Australia, and an Australian Chapter has been formed, and the landholder plantout resulted.
More information: *https://drive.google.com/file/d/0B9Z3pi0ZMJ9iTlg4cjRUWGdlQ3c/view?usp=sharing*
This activity is an example of how somewhat esoteric soil research can result in on ground participation by landholders to address soil degradation issues.

What Would It Take to Mainstream 'Alternative' Agriculture?

The industrialized food system, studies have shown, is linked to greenhouse gas emissions, algal blooms, pesticide pollution, soil erosion and biodiversity loss, to name a few ecological troubles. Add to this a long list of social ills, from escalating rates of obesity to the demise of the family farmer and deadening of rural landscapes and rural economies across much of the U.S.
In 2010, the National Academies of Science updated its seminal 1989 publication "Alternative Agriculture" with a fresh look at the state of food and farming in America. Its expert panel concluded, "Growing awareness of unintended impacts associated with some agricultural production practices has led to heightened societal expectations for improved environmental, community, labor, and animal welfare standards in agriculture."
Read more: *http://regenerationinternational.org/what-would-it-take-to-mainstream-alternative-agriculture*

Meet NASA's robot destined to mine Martian soil

It looks like the Curiosity rover won't be the only craft exploring Mars. NASA recently released a video of its latest Regolith Advanced Surface Systems Operations Robot prototype going through its paces in a test facility. "RASSOR uses counterrotating bucket drums on opposing arms to provide near-zero horizontal and minimal vertical net reaction force so that excavation is not reliant on the traction or weight of the mobility system to provide a reaction force to counteract the excavation force in low-gravity environments," NASA writes.
Read more: *https://www.engadget.com/2016/10/03/meet-nasas-robot-destined-to-mine-martian-soil/*

The woman who digs the dirt to catch serial killers

Forensic soil scientist Prof Lorna Dawson is helping detectives solve decades-old murder cases.
Read more: *http://www.bbc.com/news/uk-scotland-37561722*

'Thinking soil' made of bacteria could keep buildings from collapsing

It can be quite costly, even catastrophic, when the land under a building subsides. But genetically engineered microbes may one day keep that from happening if researchers in the United Kingdom are successful. Inspired by undergraduates who made a concrete-repairing bacterium – dubbed BacillaFilla – for a synthetic biology competition, a biodesigner and his colleagues have been pushing hard to develop biocement, a material that custom-built soil microbes would produce in response to the changing pressures in soil to help shore up the ground under foundations. Toward that end, the team grew a common gut bacterium in surrogate soil – a "hydrogel" shaped into a cylinder. They subjected the bacteria-laden hydrogel to pressures up to 10 times that experienced at sea level. They identified 122 bacterial genes that increased their activity by at least threefold by the pressure change. The team then modified the bacterial genome so that the regulatory DNA responsible for activating one of these genes was attached to a gene for a protein that glows when produced. The more pressure exerted on the microbe, the more intensely it glows. Eventually the researchers plan to replace the glowing protein gene with genes that make biocement, creating a "thinking soil" that will keep buildings safe and be a self-constructing foundation. The effort is part of a growing movement to incorporate biology into architecture.
Read more: *http://www.sciencemag.org/news/2016/10/thinking-soil-made-bacteria-could-keep-buildings-collapsing*

Prince Charles joins clean soil project to combat climate change

Prince Charles urged governments, individuals and businesses to take greater care of the world's soils as part of an initiative aimed at keeping carbon locked in soil, rather than escaping into the atmosphere and causing global warming. The "4 per 1000" project is a pledge to reduce the amount of carbon leaked from soils by 0.4% a year, which would be enough to halt the rise of carbon dioxide levels in the air. Nearly 180 countries have signed up to the initiative that was set up by the French government as part of its efforts to make the Paris agreement on climate change, signed last year, a success.
At a ceremony this week to celebrate the initiative, the prince said that the preservation of farmland, forests and soils were of "absolutely critical importance - for, in my experience, the fertility and health of the soil is at the heart of everything". Drawing on his own work as an organic farmer, he contrasted organic methods with the "previously conventional" farming systems which he called "toxic". The 4 per 1000 initiative does not require farmers to adopt organic methods, but does encourage more attention to farming techniques, which are currently contributing to the erosion of soils around the world. The prince said this project could "make a remarkable contribution to the wellbeing, livelihoods, food security and resilience of farmers, to the health of the planet and to addressing climate change".
Read more: *https://www.theguardian.com/environment/2016/oct/28/prince-charles-joins-clean-soil-project-to-combat-climate-change*

Quest to map Africa's soil microbiome begins

One thousand ziplocked bags of soil from ten countries will form the basis of the first large-scale survey of the microbial life hidden underground in sub-Saharan Africa. The leaders of the African soil microbiology project hope that the data will one day help to drive better agricultural practices and to protect ecosystems and crops in the face of climate change. "Soils are critical and soil health is vital for human and animal livelihoods," says Don Cowan, director of the Centre for Microbial Ecology and Genomics at the University of Pretoria in South Africa. He launched the project on 8 October at the consortium's first meeting in Pretoria. Researchers increasingly recognize the importance of soil microbes to ecology and agriculture. Some bacteria and fungi colonize plant roots, promoting the plant's growth. A diverse population of soil microbes helps to regulate an ecosystem's climate, and maintains the fertility of the soil and its ability to support crops. And biotechnology companies including Monsanto are testing additives that contain soil microbes for their ability to improve agricultural productivity.
Read more: *http://www.nature.com/news/quest-to-map-africa-s-soil-microbiome-begins-1.20956*

Comprehensive new coverage on the soils of the USA

The Soils of the USA is the first comprehensive coverage of the soils in the U.S. since 1936. Written by 46 soil scientists from across the country and richly illustrated, the book provides an overview of the distribution, properties and function of soils in the USA, including Alaska, Hawaii and its Caribbean territories.

Co-edited by L.T. West, M.J. Singer and A.E. Hartemink, The Soils of the USA discusses the history of soil surveys and pedological research in the U.S., and offers general descriptions of the country's climate, geology and geomorphology. For each Land Resource Region (LRR) – a geographic/ecological region of the country characterized by its own climate, geology, landscapes, soils, and agricultural practices – there is a chapter with details of the climate, geology, geomorphology, pre-settlement and current vegetation and land use, as well as the distribution and properties of major soils including their genesis, classification and management challenges. The final chapters address topics such as soils and humans, and the future challenges for soil science and soil surveys in the United States. Maps of soil distribution, pedon descriptions, profile images and tables of properties are included throughout the text.

Read more: *http://scienmag.com/comprehensive-new-coverage-on-the-soils-of-the-usa/*

Innsbruck Nature Film Festival - Best Film on the topic of soil: Lands for Freedom

After having started to do so in the International Year of Soils in 2015, the renowned Innsbruck Nature Film Festival also in 2016 announced an award for the 'Best Film on the Topic of Soil'. This year, the documentary Lands for Freedom by Jean-Christophe Lamy (Belgium) was selected. A movie that is showing alternatives to industrial agriculture and gives insight into the motivation and success of family-led farming businesses. The movie demonstrates the important role of soils for a sustainable use of lands. It also emphasises that a thoughtful agricultural management in good terms with nature ascertains the production of valuable food. Small is considered beautiful and also economically sustainable.

Lands for Freedom paints a vivid portrait of a rebellion following 4 farmers who have decisively turned their backs on conventional farming methods. Thanks to archive material we will also go back to a time in black and white when it was commonly believed that Science could save the world from hunger and malnutrition. Pictures of European and African landscapes during the four seasons, 4 moving and provocative characters with their life stories becoming linked to each other while speaking the same language: the one of the Earth.

View the trailer: *https://www.lesliberterres.com/EN/*

Upcoming Conferences and Meetings

2017

Frontiers of Potassium

January 25-27, 2017, Rome, Italy. The International Plant Nutrition Institute is pleased to invite you to participate in the upcoming international conference designed to exchange information on how to improve potassium plant nutrition and soil management to better the health of soils, plants, animals, and humans. The 4R Nutrient Stewardship framework is integrated into the conference structure to keep the discussions anchored to the information needs of farmers and those who provide nutrient management guidance.

Read more: *http://kfrontiers.org*

Soil Science Society of Nigeria, 41st Annual Conference on "Land Degradation, Sustainable Soil Management and Food and Nutrition Security"

March 13-17, 2017, Abubakar Tafawa Balewa University, Bauchi, Nigeria. The Conference subthemes are; (a) Soil related aspects of Sustainable Development Goals (b) Management of degraded soils in Nigeria: Strategies and Challenges (c) Soil information services in Nigeria: A necessary tool for sustainable land management (d) Climate change: A challenge to sustainable land resource management and soil productivity (e) Soil fertility management in Nigeria (f) Indigenous technical knowledge, training and capacity building in Soil Science. The meeting aims to bring together academic scientists, researchers and research scholars to exchange and share their experiences and research results on all aspects of Land Degradation and Sustainable Soil Management in relation to Food Security and Nutrition. It also provides an interdisciplinary platform for researchers, practitioners and educators in soils, food science, hu-

man nutrition and health to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions adopted in the fields of Land Degradation, Sustainable Soil Management, Food Sufficiency, Quality and Human Health. Abstract submission closes on 31st December, 2016.
Contact: *sssn.atbu2017@gmail.com*

Intersol 2017: The Europe of Polluted Sites and Soils: Blockages and Successes

March 14-16, 2017, Lyon, France. International Conference-Exhibition on Soils, Sediments and Water; Deadline for call for papers: November 4, 2016.
Read more: *http://www.intersol.fr/*

Soil Erosion modelling workshop

March 20-22, 2017, Ispra, Italy. This workshop will discuss mainly issues how the local/regional modeling results can be upscaled (or applied) at European scale. The workshop serves also as a follow-up of recent JRC modelling developments and published maps for soil erosion by water and wind. The workshop will try to focus on how various project or local/regional modelling applications can improve the "know-how" at European scale. Emphasis will also be given to management practices that can reduce soil erosion. Young scientists and Post-Docs in soil erosion modelling can apply for travel support. In case you are interested in this workshop, please contact Panos Panagos.
Contact: *panos.panagos@jrc.ec.europa.eu*

Freshwater Mollusk Conservation Society, 10th Biennial Symposium

March 26 – 30, 2017, Cleveland Downtown Marriott at Key Center, Cleveland, Ohio. Theme: Ecosystems, Engineering, Valuation, and Practice – The Roles of Freshwater Mollusks in a Changing Environment. We anticipate four plenary sessions on the following themes: 1 - Mollusks in Ecosystems – Implications for a Changing Environment; 2 - Mollusks as Ecosystem Engineers - Species to Landscape Level Review; 3 - Value of Mollusks (monetary, human, and ecosystems); and 4 - A Review in Mollusk Research – Lessons Learned from Research to Regulation to Practice.
We promise a thought-provoking Symposium that introduces new research, discusses challenging topics imposed by an uncertain future in the face of climate and land use changes, and one that nurtures FMCS's commitment to conservation of America's most imperiled group of animals.
Read more: *http://molluskconservation.org/EVENTS/2017Symposium/2017_FMCSSymposium_INTRO.html*

European Geosciences Union General Assembly 2017 (EGU 2017)

23–28 April 2017, Vienna, Austria. Abstract submission: 20 Oct 2016–11 Jan 2017
Conference website: *http://www.egu2017.eu/*

European Geosciences Union General Assembly 2017 (EGU 2017), Session SSS2.8/BG9.44 on Soil Quality Assessment in Degraded Ecosystems: Global Advances and Challenges

23–28 April 2017, Vienna, Austria. On this session studies on soil quality assessment by using of traditional physical, chemical, biochemical and biological indicators in degraded, restored, reclaimed or rehabilitated soils, and also in agricultural-livestock and urban soils are very welcome. Studies also focused on: i) new SQ assessment frameworks and indexing approaches, ii) on-farm SQ assessment strategies and its practical application challenges, iii) studies that exploring the relationship between SQ and ecosystem outputs (i.e., air quality, primary productivity, biodiversity, human wellbeing and health) and, iv) soil quality and public policies, are welcome. In addition, we are looking forward to seeing studies using new methodologies as stable isotopes, spectroscopy and molecular indicators based on proteomic and metagenomics techniques that aim to link the phylogeny and functional relationships to the concept of soil quality. Around 14,000 scientists from 109 countries participated in the last EGU General Assembly. Early career researchers and PhD students are strongly encouraged to participate. Abstract submission deadline: 11 January 2017. Deadline for applying for travel and attendance support was 1 December 2016.
Read more: *http://meetingorganizer.copernicus.org/EGU2017/session/24181*

ISSPA 2017 - 15th International Symposium Soil and Plant Analysis

May 14-18, 2017, Nanjing, China. The symposium theme is 'The roles of soil, plant, water and waste analyses in food security and environmental quality'. Deadline for Submission of Abstracts: January 16, 2017. Deadline

for Early Bird Registration: March 15, 2017. Read more: *http://isspa2017.csp.escience.cn/dct/page/1*

9th International Congress of the Working Group on Soils of Urban, Industrial, Traffic, Mining and Military Areas, SUITMA 9

May 22-27, 2017. Moscow, Russia. This year's theme for the congress will be «Urbanization: a challenge and an opportunity for soil functions and ecosystem services». The SUITMA 9 congress will summarize the experiences and existing methodologies in analyses, assessments, and modelling of anthropogenic effects on soils and the related ecological risks to the sustainability of soils of urban, industrial, traffic, mining and military areas (SUITMAs) and explore the potential of SUITMAs to provide key functions and ecosystem services. The scientific program will include a plenary session, 14 thematic sessions and 6 round tables, 4 one-day field tours and two post-congress tours. On-line registration and abstract submission until January 15, 2017.
Read more: *http://www.suitma-russia.com/index.php/en/*

LuWQ2017 - 3rd International Interdisciplinary Conference on LAND USE AND WATER QUALITY: Effect of Agriculture on the Environment

May 29 - June 1, 2017 The Hague, the Netherlands. Abstract submission deadline was October 17, 2016. Read more: *http://www.luwq2017.nl/*
Download flyer: *http://www.luwq2017.nl/upload/LuWQ2017_Flyer_A4page_4pages_03-06-2016_web.pdf*

Humic Substances in Ecosystems (HSE11)

May 29 - June 1, 2017, Wrocław/Kudowa-Zdrój, Poland. HSE11 is a cyclic international conference organized in 2017 by the Polish Chapter of the International Humic Substances Society. Topics: 1. Structure and properties of humic substances; 2. Humic substances in soil genesis and soil protection; 3. Transformation of NOM in terrestrial and water ecosystems; 4. Industrial and agricultural applications of organic matter; 5. Organic wastes and their utilization. Deadline for Early Bird Registration: January 31, 2017. Deadline for Submission of Abstracts: March 1, 2017.
Read more: *http://www.org.up.wroc.pl/ptsh/HSE11.htm*

1st World Conference on Soil and Water Conservation under Global Change (CONSOWA)

June 12-16, 2017, Lleida (Spain). A joint Conference of the "International Soil Conservation Organization" (19th ISCO Conference), the "World Association for Soil and Water Conservation" (Conference on Soil and Water Conservation of WASWAC), the "European Society for Soil Conservation" (8th ESSC Congress), the "International Union of Soil Science (IUSS-Commissions 3.2, 3.6), the Soil and Water Conservation Society (SWCS), the "International Erosion Control Association" (IECA) and the "World Association for Sedimentation and Erosion Research" (WASER), in parallel with the VIII Simposio Nacional sobre Control de la Degradación y Restauración de Suelos (SECS).

There will be two special sessions to discuss the present situation and future requirements of research and actions on Soil and Water Conservation at global level: Session 1 will deal with Analysis and recommendations to change present limitations for the study and research of soil and water degradation processes and in the application of prevention and remediation practices. Session 2, dedicated to the International Decade of Soils (2015-2024)and sponsored by IUSS, will focus on analysis and setting the challenges and required achievements in the next decade, to prevent and counteract the previewed effects of global changes on soil and water degradation processes, and effects on food and water supply for the increasing World population, on the environmental degradation and on natural disasters.
New deadline for short abstract submission: 15 January 2017. New deadline for early registration at reduced rates: 30 January 2017. New deadline for CONSOWA scholarships: 31 January 2017.
Read more: *http://www.consowalleida2017.com/*

IUSS Conferences of Commission 3.2: Soil and Water Conservation and Commission 3.6: Salt Affected Soils will be held in the framework of CONSOWA (see above).

14th International Conference on Sustainable Use and Management of Soil, Sediment and Water Resources – AquaConSoil 2017

June 26–30, 2017 Lyon, France. Topics covered range from Assessment and monitoring of soil, water and sediment quality to Risk assessment; Advances in remediation technologies; Strategies and

policies for pollution management and remediation; Reuse and upgrading of land, water and sediment in the circular economy and Sustainable use & spatial planning of the subsurface. Deadline for abstract submission: Tuesday, 15 November 2016.
Read more: *http://www.aquaconsoil.org/*

Pedometrics 2017 Conference

June 26 -July 1,2017 the 25th anniversary of Pedometrics will be celebrated in Wageningen, the Netherlands. Pedometrics is a branch of soil science dedicated to the application of mathematical and statistical methods for the study of the distribution and genesis of soils.
Abstract submissions are now open for conference topics ranging from 'big data, data mining and machine learning for soil science' to 'proximal soil sensing'. We are also calling for submission of proposals for pre-conference workshops. Pedometrics 2017 is organised by the Pedometrics Commission of the International Union of Soil Science and its Working Groups: Digital Soil Mapping, Digital Soil Morphometrics, Modelling of Soil and Landscape Evolution, Proximal Soil Sensing and Soil Monitoring. It will be an excellent opportunity to present and discuss your work and learn about recent developments in quantitative soil science.
Read more: *http://www.pedometrics2017.org/*

GlobalSoilMap 2017 International Conference

July 4-6, 2017, Moscow, Russia. The Conference theme is "Trends in Digital Soil Mapping development, and last achievements of DigitalSoilMap Project". Deadline for Submission of Abstracts: December 31, 2016. Deadline for Early Bird Registration: April 15, 2017.
Read more: *http://globalsoilmap2017.ru/en/Home/*

Soil-ecological summer school in Siberia 2017: Land use opportunities across climatic zones on the edge of human influence

Mid July until beginning of August, Siberia. Since 1995 annual excursions across climatic zones in Siberia were offered for students (Siewert et al. (2014): Teaching soil science and ecology in West Siberia: 17 years of field courses. Environmental Education Research. Volume 20, Issue 6, pp. 858-876). On demands of colleagues and former participants this excursion will be enhanced in 2017 in order to support collaboration with Russia for scientists from different fields of knowledge related to land use. The aim of the summer school is to show the resource wealth of natural ecosystems covering climatic zones from tundra to semi-deserts. With the content of the excursion we try to extend knowledge about natural soil formation and soil functions in order to facilitate the understanding of interrelations between land use, local culture, social structure, live style trends and economic needs as a prerequisite for sustainable society development.
Read more: *http://www.apollo-online.de/index.php?s=Sibirien2017*
Download folder: *http://iuss.boku.ac.at/files/siberia_2017.pdf*

Wageningen Soil Conference: Soil Science in a Changing World

August 27-31,2017, Wageningen, the Netherlands. Humankind is currently facing unprecedented challenges regarding food security, water resources, climate change and biodiversity. The participants of the 2015 edition of the Wageningen Soil Conference agreed that soils play a key role in confronting these challenges. In their resolution, they emphasized the important role of soil organic carbon for several soil functions, and that a professional communication strategy is needed to ensure that society benefits from soil-based solutions. In 2017, Wageningen University & Research would like to invite you to the third edition of the Wageningen Soil Conference, to continue work on identifying actions for soil-based solutions that help achieving the UN Sustainable Development Goals, to initiate programs that aim at a lasting increase in soil organic carbon, and to develop narratives on soil-based solutions that are convincing to policy makers and other stakeholders.

125 Years of IUFRO - Anniversary Congress 2017

September 19 to 22, 2017, Freiburg, Baden-Württemberg, Germany. The 125th Anniversary Congress in Freiburg will not only celebrate the accomplishments of the past. It will also establish a dialogue on the future of forestry and forest research. These discussions will focus on globally pressing topics such as how to enhance the contribution forest research will need to make towards mitigating climate change, conserving biodiversity, providing water, creating income and employment, and improving the quality of life. Issues such as how changes and disruptions in society and technologies are likely to impact on forests and peo-

ple in the future will also be discussed. This will be a meeting that brings together not only forest scientists from around the globe but also leading decision makers from the forestry, environment, development and other key sectors. In doing so, the IUFRO 125th Anniversary Congress aims to provide a platform for the exchange of scientific knowledge and a dialogue across the full range of forest-related topics and scientific disciplines.
Deadline for Call for Abstracts: September 1, 2016
Read more: *http://iufro2017.com/*

2nd Global Soil Biodiversity Conference

October 15-21, 2017, Nanjing, China. GSBI is collaborating with the Institute of Soil Science, Chinese Academy of Sciences to host the Second Global Soil Biodiversity Conference.
Read more: *https://globalsoilbiodiversity.org/*

2018

21st World Congress of Soil Science (WCSS)

21st World Congress of Soil Science (WCSS), Rio de Janeiro, Brazil, August 12-17, 2018. The theme will be "Soils to feed and fuel the world". The (WCSS) is the main event of the IUSS. It takes place every 4 years and is open to all Members of the IUSS and other participants. For further information go to *www.21wcss.org* or contact Flavio Camargo, Vice President Congress, at *fcamargo@ufrgs.br*

New Publications

New Land Evaluation report from UNEP's International Resources Panel (IRP) - "Unlocking the Sustainable Potential of Land Resources: evaluation systems, strategies and tools" is a new guide for land managers, policymakers, natural resource scientists and students. It provides a review of land evaluation principles and concepts, a review of currently new and existing systems, and recommendations for future development. The report was produced by the International Resources Panel (UNEP-IRP) and jointly released with the United Nations Convention to Combat Desertification (UNCCD).
Read more: *http://www.unep.org/resourcepanel/KnowledgeResources/AssessmentAreasReports/LandSoils/tabid/133334/Default.aspx*
Additional resources: *http://landpotential.org/*

Push Button Agriculture - Robotics, Drones, Satellite-Guided Soil and Crop Management
By K. R. Krishna. June 8, 2016, Apple Academic Press, 470 pages, 68 B/W illus., ISBN 9781771883047, Price £108.00.
This book covers three main types of agricultural systems: the use of robotics, drones (unmanned aerial vehicles), and satellite-guided precision farming methods. Some of these are well refined and are currently in use, while others are in need of refinement and are yet to become popular. The book provides a valuable source of information on this developing field for those involved with agriculture and farming and agricultural engineering. The book is also applicable as a textbook for students and a reference for faculty.

Hydrostructural Pedology
By Erik Braudeau, Amjad T. Assi, Rabi H. Mohtar, June 2016, Wiley-ISTE, 186 pages, ISBN: 978-1-84821-994-6. Price (hardcover) £80.00.
It first defines the scientific problems of soil science to show that it cannot progress without a physical and systemic approach to the internal organization of the soil and its functionality with water. It shows how the systems approach presented and described by Le Moigne (1994) should be reversed and modified in its application to soil science, descriptive science of the organization of the soil, to allow the development of a physical interaction between water and soil structure. This led to particularly the exact formulation of thermodynamic state equations of the pedostructure. Thus, is opened the possibility of physical coupling, interdisciplinary, between biological models of the living and the organized soil medium represented by the pedon, its horizons and its pedostructures.

Trace Elements in Waterlogged Soils and Sediments
By Jörg Rinklebe, Anna Sophia Knox, Michael Paller (editors). July 15, 2016 – CRC Press, 386 pages | 19 Color Illus. | 156 B/W Illus. ISBN: 978-1-48-224051-1. Price hardback GBP 121.00.
Many wetlands around the world act as sinks for pollutants, in particular for trace elements. In comparison to terrestrial environments, wetlands are still far less studied. A collaborative effort among world experts, this book brings the current knowledge concerning trace elements in temporary waterlogged soils and sediments together. It discusses factors controlling the dynamics and release kinetics of trace elements and their underlying biogeochemical processes. It also discusses current technologies for remediating sites contaminated with trace metals, and the role of bioavailability in risk assessment and regulatory decision making. This book is intended for professionals around the world in disciplines related to contaminant bioavailability in aquatic organisms, contaminant fate and transport, remediation technologies, and risk assessment of aquatic and wetland ecosystems.

Soils and Sediments as Archive of Landscape Change. Geoarcheology and Landscape Change in the Subtropics and Tropics
By Bernhard Lucke, Rupert Bäumler and Michael Schmidt (editors). 2016 by Franconian Geographical Society and Palm & Enke, ISBN 978-3-941665-04-0. Price EUR 29, shipping inside Germany EUR 4,90 , international EUR 16. For ordering please send an email to *geographie-fgg@fau.de*, and copy it to *boris.michel@fau.de* in case of international shipping.
The book was compiled in order to support interdisciplinary collaboration of archeology with soil science in the subtropics and tropics. The focus

is therefore on methods of investigating soils and sediments in the context of geoarchaeological questions. The idea to produce the book was born out of the challenges of interdisciplinary collaboration in the subtropics and tropics, since not much literature for these regions is available that illustrates the potentials and limitations of the methods of soil and sediment analysis.

Paludiculture - productive use of wet peatlands. Climate protection - biodiversity - regional economic benefits

By Wendelin Wichtmann; Christian Schröder; Hans Joosten (editors) with contributions by 73 authors. July 2016 by Schweizerbart Science Publishers. 272 pages, 109 tables, 49 infoboxes, 21x28cm, ISBN 978-3-510-65283-9; price hardcover: EUR 79.90.

The volume introduces paludiculture as a novel land use practice for the production of biomass, which is further able to reactivate or sustain a wide variety of ecosystem services impaired by peatland drainage. Biomass from wet peatlands is useful for various applications: as fuel and raw material, food, fodder and medicine.

Read more: *http://www.schweizerbart.de/publications/detail/isbn/9783510652839*

Digital Terrain Analysis in Soil Science and Geology, 2nd Edition

By Igor V. Florinsky. Expected release: August 4, 2016, Academic Press, ISBN : 978-0-12-385036-2, 506 pages. Price hardcover: EUR 106.25.

The updated second edition of this comprehensive reference presents an integrated overview of the principles, methods, and applications of digital terrain analysis and modeling in the context of soil science and geology, featuring the latest advances in techniques for recognition, analysis, and interpretation of topographically manifested geological features.

Read more: *http://store.elsevier.com/Digital-Terrain-Analysis-in-Soil-Science-and-Geology/Igor-Florinsky/isbn-9780128046326/*

Essential Soil Physics. An introduction to soil processes, functions, structure and mechanics

1st edition, based on the fourth, completely revised and extended German edition; By Robert Horton; Rainer Horn; Jörg Bachmann; Stephan Peth (editors). 2016 by Schweizerbart Science Publishers, 389 pages, 186 figures, 24 tables, ISBN 978-3-510-65288-4, price hardcover: 72.00 €.

This textbook introduces the reader gently but comprehensively to soil physical processes. The authors discuss both the origin and dynamics of soil physical properties and functions - volume-mass relations of the solid, water and gas phases, grain and pore size distributions, permeability and storage capacity for water, gases and heat - and finally soil deformation and strength in relation to mechanical and hydraulic stresses resulting in structural changes through compaction, kneading, slaking and soil crusting. This book is valuable for researchers, upper-level undergraduate students, and graduate students of agronomy, soil science, horticulture, geo-sciences, environmental science, landscape architects and everybody interested in understanding the intricate physical processes which control and modify soil functions.

Read more: *https://www.schweizerbart.de/publications/detail/isbn/9783510652884/Hartge_Horn_Essential_Soil_Physics_g*

Soil Phosphorus

Edited by Rattan Lal, B. A. Stewart; August 2016 by CRC Press. 339 pages, 15 colour illus., 47 B/W illustrations, ISBN 9781482257847, price hardback: £89.00.

Phosphorus is an essential plant nutrient, but global population growth has dramatically reduced the availability of phosphorus fertilizer resources. Despite this scarcity, there remain numerous problems associated with the excessive and inappropriate use of phosphorus leading to non-point source pollution and eutrophication of natural waters. Identifying appropriate systems for managing soil phosphorus and reducing the risks of eutrophication are needed to minimize the environmental risks. This book focuses on the availability and recycling of phosphorus; regulatory and policy issues of sustainable phosphorus use; and water quality management in agroecosystems pertaining to phosphorus.

Read more: *https://www.routledge.com/Soil-Phosphorus/Lal-Stewart/p/book/9781482257847*

Soil: The Life Supporting Skin of Earth

Kristín Vala Ragnarsdóttir and Steven A. Banwart (eds.); January 2015, published as an eBook by the University of Sheffield, Sheffield (UK) and the University of Iceland, Reykjavík (Iceland). 50 pages, ISBN 978-0-9576890-2-2.

This book was written as an output from the research project: SoilTrEC (Soil transformations in European catchments). Framework 7 Env.2009.2.1.2.1

Soil Processes and Modelling, Large-Scale Integrating Project, grant agreement number 244118. Target audience are school children from 11-18.
Weblink: *http://www.iuss.org/index.php?article_id=179*

Trace Materials in Air, Soil, and Water
By Kendra R. Evans, Elizabeth S. Roberts-Kirchhoff, Mark A. Benvenuto, Katherine C. Lanigan, and Alexa Rihana-Abdallah (eds.), September 1, 2016 by Oxford University Press, 240 Pages, 62 line art; 16 halftones, 227x152mm, ISBN: 9780841231108, price hardcover: £97.00.
The field of techniques for preparing, preconcentrating, quantitating, tracking, and remediating trace pollutants is vast. This volume is intended to be a diverse 'sampling' of such methods, each chapter representing one specific field of environmental chemistry analyses. The book is divided into three sections: air, soil and minerals, and water. The air section includes studies on airborne particulate matter and other pollutants present in trace levels. The soil and mineral section includes chapters on X-ray fluorescence spectroscopy, mercury-thiourea complex ion chromatography, and mercury speciation analyses. The water section of the book focuses on specific contaminants in water and addresses the existing and future remediation methods for metals in water.

Crisis Management of Chronic Pollution: Contaminated Soil and Human Health
By Magalie Lesueur Jannoyer, Philippe Cattan, Thierry Woignier, Florence Clostre (editors), September 28, 2016 by CRC Press, - 290 Pages - 66 B/W Illustrations, ISBN 9781498737838, price hardback £ 121.00.
This book deals with a long term pollution problem, generated by the former use of organochlorine pesticides. Through a case study of the chlordecone pollution in the French West Indies, the authors illustrate a global and systemic mobilization of research institutions and public services. This book gathers all the works that have been carried out over the last ten years or more and links them to decision makers' actions and stakeholders' expectations. This reference fills a gap in the literature on chronic pollution.

New Scientific Journal: Plant Production Science
Plant Production Science is an Open Access journal that publishes original research reports on field crops and resource plants, their production and related subjects. It covers a wide range of sciences such as soil science, physiology, biotechnology, morphology, ecology, cropping system, production technology and post harvest management and more.
The journal is the official English journal of the Crop Science Society of Japan and has an impact factor of 0.612, ©2016 Thomson Reuters, 2016 Journal Citation Reports®.
You can view all the research published in Plant Production Science for free and also find out how you can submit a paper to the journal via the journal's homepage on Taylor & Francis Online.
Read more: *http://bit.ly/tandfonline-PPS*

The soil organic matter: organic residues, humus, compost, & carbon sequestration ("La materia orgánica del suelo: Residuos orgánicos, humus, compostaje, captura de carbono").
By Gallardo J.F. 2016. Prologue by G. Almendros. S.i.F.yQ.A., Salamanca (Spain). ISBN: 978-84-937437-7-2, 392 pages.
This book is an attempt to approach the study of soil organic matter (SOM) using an easy-to-read language; it is addressed to people with some technical training in agricultural or environmental issues. Starting out with an introduction, the 12 chapters of the book describe different aspects of SOM from different perspectives; the final chapter (Epilogue) summarizes all chapters and establishes the final conclusions.
Read more: *http://www.sifyqa.org.es/publicaciones.php*

Soil Fertility Management in Agroecosystems
By Dick, W. A., S. W. Culman, A. Chatterjee, and D. Clay. 2016. ASA, CSSA, and SSSA, Madison, WI. doi:10.2134/soilfertility.2014.0007.
In Soil Fertility Management in Agroecosystems, Editors Amitava Chatterjee and David Clay provide a thoughtful survey of important concepts in soil fertility management and relevant recommendations. Topics covered include crop-specific nutrient management, program assessment, crop models for decision making, optimization of fertilizer use, cover crops, reducing nitrous oxide emissions, natural abundance techniques, tile-drained conditions, and soil biological fertility.

Le sol. Une merveille sous nos pieds (The soil. A wonder beneath our feet)
Christian Feller, Ghislain de Marsily, Christian Mougin, Guénola Pérès, Roland Poss and Thierry

Winiarski (eds.) October 2016 by Editions Belin, Paris, France. 256 pages / € 24.90 / ISBN : 978-2-7011-8349-7.
What do Roquefort cheese and tuberculosis have in common: the soil! The very specific taste of Roquefort cheese is due to Penicillium roqueforti, a fungus found in the soil and streptomycin, the drug used very efficiently against tuberculosis, was extracted in 1943 from Streptomyces griseus, another soil fungus. The soil is crucial for our everyday life. We use the soil, walk, drive and build on it. In a word, we live from the soil. In the present book, the authors describe this often poorly known wonder. What in essence is the soil and how is it generated? Which organisms inhabit it? How does water circulate within it? How can the soil help reduce the impact of climate change? All these aspects and many more are clearly dealt with in this remarkably illustrated volume.
Read more (in French): *http://www.editions-belin.com/ewb_pages/f/fiche-article-le-sol-une-merveille-sous-nos-pieds-23005.php*

Encyclopedia of Soil Science, Third Edition
By Rattan Lal, November 1, 2016 by CRC Press. 2804 pages, ISBN 9781498738903. Price hardback £ 507.00.
A ready reference addressing a multitude of soil and soil management concerns, the highly anticipated and widely expanded third edition of Encyclopedia of Soil Science now spans three volumes and covers ground on a global scale. A definitive guide designed for both coursework and self-study, this latest version describes every branch of soil science and delves into trans-disciplinary issues that focus on inter-connectivity or the nexus approach.
Read more: *https://www.crcpress.com/Encyclopedia-of-Soil-Science-Third-Edition-Three-Volume-Set/Lal/p/book/9781498738903*

Soil Salinity Management in Agriculture: Technological Advances and Applications
By S. K. Gupta, Megh R. Goyal (eds.). November 30, 2016 forthcoming by Apple Academic Press. 410 Pages - 20 Color & 42 B/W Illustrations; ISBN 9781771884433 - CAT# N11731. Price hardback £99.00.
This important volume, Soil Salinity Management in Agriculture, addresses the crucial issue of soil salinity of potential farmland and provides a comprehensive picture of the saline environment and plant interactions, along with management and reclamation methods and policies. With contributions from researchers from the fields of agricultural chemistry, soil science, biotechnology, agronomy, environmental sciences, and plant breeding and genetics, the volume emphasizes a multidisciplinary approach.
Read more: *https://www.crcpress.com/Soil-Salinity-Management-in-Agriculture-Technological-Advances-and-Applications/Gupta-Goyal/p/book/9781771884433*

Miscellaneous

The significance of soils and soil science towards realization of the UN sustainable development goals

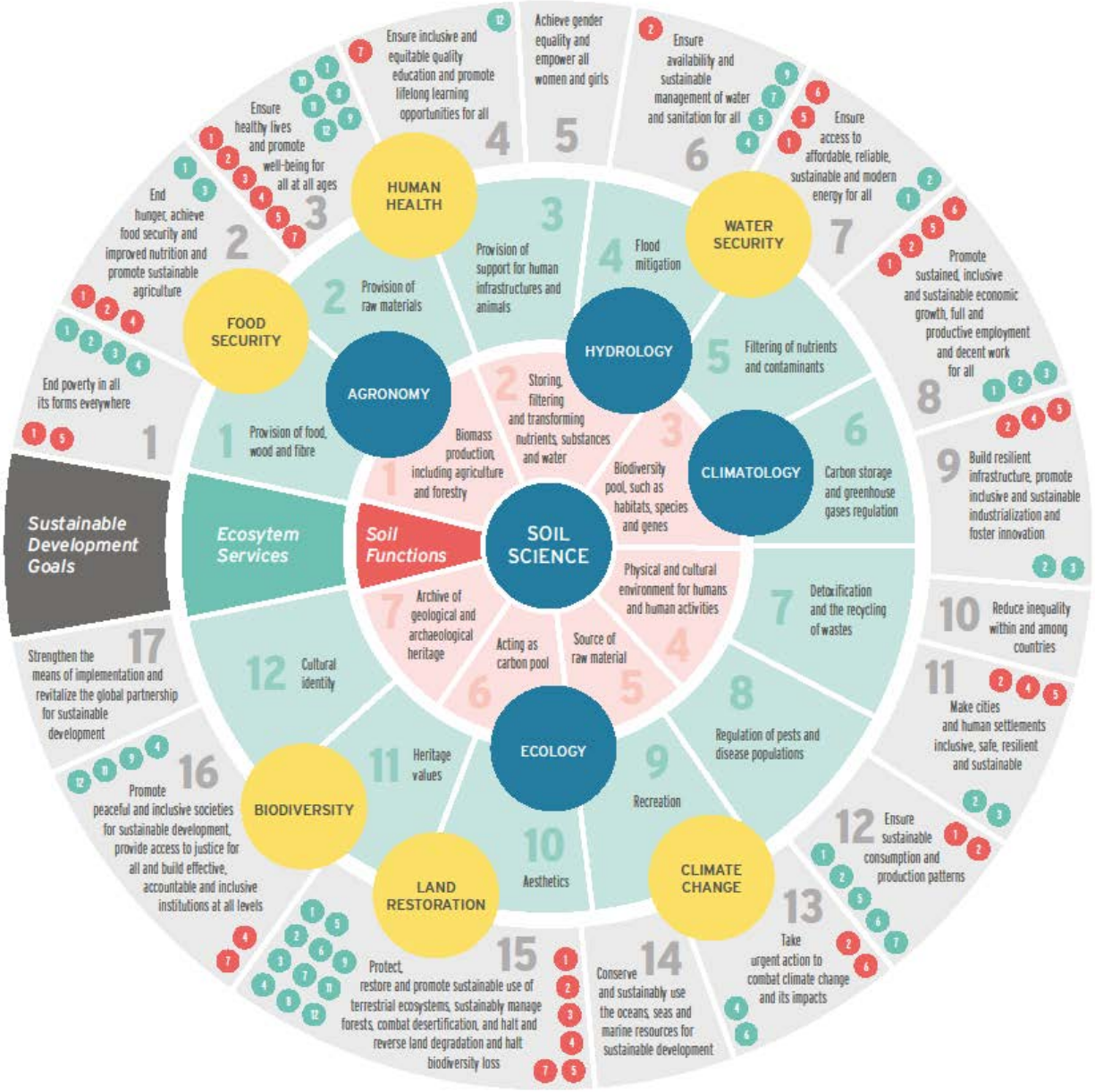
In a forum paper, written by Saskia D. Keesstra et al., and published by Copernicus on behalf of the European Geosciences Union (EGU), the authors discuss how soil scientists can help to reach the recently adopted UN Sustainable Development Goals (SDGs) in the most effective manner. Soil science, as a land-related discipline, has important links to several of the SDGs, which are demonstrated through the functions of soils and the ecosystem services that are linked to those functions (see graphical abstract below).

The authors explore and discuss how soil scientists can rise to this challenge both internally, in terms of their procedures and practices, and externally, in terms of their relations with colleague scientists in other disciplines, diverse groups of stakeholders and the policy arena. To meet these goals the autors recommend the following steps to be taken by the soil science community as a whole: (i) embrace the UN SDGs, as they provide a platform that allows soil science to demonstrate its relevance for realizing a sustainable society by 2030; (ii) show the specific value of soil science: research should explicitly show how using modern soil information can improve the results of inter- and transdisciplinary studies on SDGs related to food security, water scarcity, climate change, biodiversity loss and health threats; (iii) take leadership in overarching system analysis of ecosystems, as soils and soil scientists have an integrated nature and this places soil scientists in a unique position; (iii) raise awareness of soil organic matter as a key attribute of soils to illustrate its importance for soil functions and ecosystem services; (iv) improve the transfer of knowledge through knowledge brokers with a soil background; (v) start at the basis: educational programmes are needed at all levels, starting in primary schools, and emphasizing practical, down-to-earth examples; (vi) facilitate communication with the policy arena by framing research in terms that resonate with politicians in terms of the policy cycle or by considering drivers, pressures and responses affecting impacts of land use change; and finally (vii) all this is only possible if researchers, with soil scientists in the front lines, look over the hedge towards other disciplines, to the world at large and to the policy arena, reaching over to listen first, as a basis for genuine collaboration.

[Quoted entirely from the paper]

The significance of soils and soil science towards realization of the UN sustainable development goals

A GRAPHICAL ABSTRACT



FORUM paper: The significance of soils and soil science towards realization of the UN sustainable development goals (SDGs)
Keesstra, S.D., Bouma, J., Wallinga, J., Tittonell, P., Smith, P., Cerdà A., Montanarella, L., Quinton, J., Pachepsky, Y., van der Putten, W.H, Bardgett, R.D, Moolenaar, S., Mol, G., Fresco, L.O.

The IUSS and Sustainable Development Goals (SDGs) of the United Nations

Of the 17 SDGs of the U.N. activities of IUSS are extremely relevant to several of those related to hunger, water quality and climate change etc. For example, through research, education and outreach of its member societies and affiliated soil scientists, IUSS is advancing SDG#2 (zero hunger), #3 (good health and wellbeing), #6 (clean water and sanitation), #8 (decent work and economic growth), #11 (sustainable cities and communities), 13 (climate action), and #15 (life on land). Several of these SDGs are also being addressed by the activities of IUSS under the auspices of its initiative "International Decade of the Soil 2015-2024" inaugurated at the Celebration event of the International Year of Soils 2015 "Achievements and Future Challenges" in Vienna on 7th December 2015. For example, a book "Soils within Cities" was inaugurated on the World Soil Day celebrations of FAO in Rome on 5th December 2016 as a contribution to the IDS 2015-2024. Similarly, among several targets of SDGs, IUSS is specifically advancing the following two targets:

- SDG Target 2.4: "By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality."
- SDG Target 15.3: "By 2020, combat desertification, restore degraded land and soil, including land by desertification, drought and floods, and strive to achieve a land degradation neutral world."

Sukuma Award for short films on soil

By announcing the Sukuma Award on the topic of soil, a high number of people could be sensitised for the topic of soil. In the participating German cities of Dresden, Leipzig and Chemnitz a series of radio and TV shows were broadcast and a number of articles printed. Thus, about 2.5 million people could be reached and their awareness of soil issues raised.

The following spots won the award. They were first shown in July/August 2016. Sadly, they are available in German only..

Leipzig: *http://bit.ly/2bFSIvp*
Dresden: *http://bit.ly/2ce75Mb*
Chemnitz: *http://bit.ly/2bRHoQu*

In memoriam

Maria Alfredovna Glazovskaya (1912-2016)

By M.I.Gerasimova and S.V.Goryachkin (Vice-President, Dokuchaev SSS)

The outstanding and oldest Russian soil scientist, Prof. Dr. Maria A. Glazovskaya passed away on the 20th of November, 2016. She was 104 years old.
She was a great pedologist widely known for her two-volume monograph "SOILS of the WORLD" (1983, 1984), the very popular manual (co-author I.P.Gerasimov) "Fundamentals of Soil Science and Soil Geography" (1965) and many other books and papers. Together with her teacher Boris Polynov and her colleague Alexander Perelman she gave birth to the new discipline – Geochemistry of landscapes. Now the conceptual background of this science became the basis for research on contaminants migration in the environment. M. Glazovskaya is famous for her studies on weathering and soil formation in Antarctic and Alpine landscapes, Scotland, and Norway, for her contribution to the development of catena concept, geochemistry of natural and human-modified landscapes, cycles of carbon in deep subsoil and beneath-soil horizons (concept of pedolithogenesis); she was involved in compiling soil maps of continents in World atlases of 1964 and 1998.
During her long career Maria Glazovskaya has been a Vice-president of the All-Union (Soviet) Society of Soil Science, a member of the International Commission on land use, a member of the advisory committee of the FAO-UNESCO, National Committee of SCOPE, for many years she was active in national and international projects.

Maria Glazovskaya was born in Saint-Petersburg, graduated from the Leningrad University. Then she was a post-graduate student in this university and after getting her PhD degree moved to Kazakhstan (1939-1952), where she was working at the Institute of Soil Science, Kazakh Academy of Sciences. In 1952, she was invited to the Moscow State University. In the years 1959-1987 Maria Glazovskaya was the Head, and from 1987 until the present time she was a consulting professor of the Department of Geochemistry of Landscapes and Soil Geography, Faculty of Geography, Lomonosov Moscow State University. She was the Distinguished Professor of this University, Honorary Member of the Russian Geographical Society and the Dokuchaev Soil Science Society.

Glazovskaya belonged to a generation of geographers who had practically no opportunity to perform scientific research in the world outside the Soviet Union because of political circumstances, but her brilliant geographical education and thorough study of foreign publications have largely compensated for these restrictions. The broad geographic background allowed her to write a short book about an exotic continent that was totally unknown in our country in the postwar years: it was entitled" Soil-Geochemical Essay on Australia" (1952). The fathers of Australian soil science (J.A. Prescott and C.G. Stephens) adhering to V.V. Dokuchaev's ideas, and Prof. J.A.Prescott

were sincerely surprised to learn that the author of this book had never seen the object described. Her Australian colleagues expressed affection and deep respect for Glazovskaya, who took part in the IX International Congress of Soil Science in Adelaide in 1968 and in congress excursion across the continent. Prof. Glazovskaya said then with her inherent self-irony that her field terrain observations proved that she had described everything correctly in her small book.

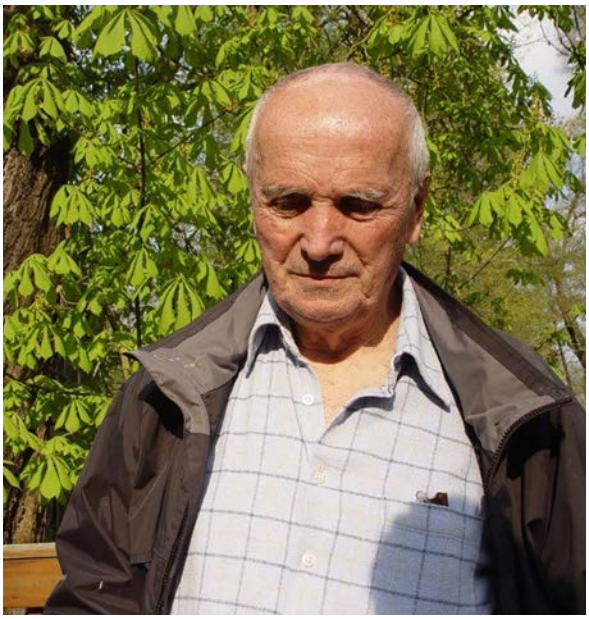
Australia was one of few lucky exceptions in Glazovskaya's acquaintance with foreign soils; nevertheless, problems of global soil geography attracted her attention. This was the time of the triumphant progress of zonal ideas in soil geography and soil classification; however, few attempts were made from time to time to revise them and to produce alternative hypotheses. In 1966, Glazovskaya published a paper on general regularities of global soil geography with a strong criticism of the zonal concept. Glazovskaya outlined her ideas concerning the regularities of the distribution of soils on the earth based on the assessment of soil properties and soil processes, as well as on the types of soil-geochemistry interactions. These ideas, as well as the grouping of world soils proposed by her, were realized in her two-volume work Soils of the World (1972-73 in Russian, 1983-84 in English). A clearly unique place in soil geography belongs to the Soil Map of the World (1:15 M Scale) compiled by Glazovskaya and supplemented by V.M. Fridland's insert map of genetic–geometric forms of the soil cover patterns (1982). Unlike its predecessors, this map has no zonal concept, and it is the implementation of Glazovskaya's idea of the objective cartographic expression of regularities governing the distribution of soils in the world.

Along with the global soil geography and cartography M.A.Glazovskaya got distinguished scientific results in many branches of pedology and biogeochemistry – initial stages of weathering, pedolithogenesis and continental carbon cycles, technopedogenesis, regional studies in soil geography and geochemistry of landscapes.

Professor Glazovskaya was a brilliant lecturer and a supervisor of many PhD theses and several habilitations. With her energy, bright talent and very kind attitude to people, she inspired many students for a soil science and biogeochemistry.

Soil scientists, geographers and biogeochemists in Russia and all over the world will remember Maria Glazovskaya as an outstanding scientist, patriot of Russian soil science, kind and modest person, open to people's problems and ready to support their scientific, educational and cultural initiatives.

Prof. Emil Klimo (1930-2016)



Professor Klimo headed the Department of Soil Science and Geology at the Faculty of Forestry Mendel University in Brno (former Agicultural University), Czech Republic for many years and since 1970, he has participated in the development of the newly arising Department for International Biological Programme, predecessor of the current Institute of Forest Ecology, a workplace where he was active as a deputy head and later as its head.

As to his teaching activities at the Faculty of Forestry, Professor Klimo lectured on the subject of Forest Soil Science and participated in the teaching as part of postgraduate studies. He was also external lecturer at the Faculty of Science, Masaryk University in Brno, and visiting professor at the University of Natural Resources and Life Sciences Vienna (BOKU).

He was involved in the development and implementation of the flagship research projects at the Institute of Forest Ecology that were focused on biogeochemical cycling and soil processes in spruce ecosystems of lower vegetation zones and floodplain forest. In addition, his activities were important in the international arena with regard to IUFRO, the European Forest Institute in Joensuu, and in the bilateral cooperation with the universities of Zagreb, Freiburg, Munich, Vienna, Tharandt, Uppsala, Aas, Moscow and many other places in the world.

During his work in the academic sphere, Prof Klimo published more than 100 research papers in journals and conference proceedings nationally and abroad, defended over 30 final research projects and developed a wide range of expertise and recommendations for forestry practice. His most important contributions to science include the involvement in the compilation of a two-part book monograph on floodplain forests published in cooperation of the publishing houses of Academia, Prague, and Elsevier, the Netherlands, in 1985 and 1991, the monograph entitled Floodplain Forests of the Temperate Zone of Europe, and a number of other internationally acclaimed books on the studies of spruce culture ecosystems in Europe (Norway Spruce-Conversion Options and Spruce Monocultures in Central Europe).

In addition to his extensive scientific work, Prof. Klimo was active in the editorial boards of several international journals, in IUBS, IUSS and will forever remain in our memories as honorary member of the Czech Soil Science Society.

Prof. Pál Stefanovits (1920-2016)

By Erika Michéli, past president, Hungarian Soil Science Society

The Hungarian Soil Science Society was sad to learn that the honorary president of the society, Pál Stefanovits, passed away on 4th August, 2016.

Pál Stefanovits was a professor emeritus of Szent István Univetsity, Gödöllő, Hungary, he was a member of the Hungarian, the Ukrainian, the German and the Austrian Academy of Sciences, and mentor of many active Hungarian soil scientists and an internationally highly respected pedologist, who took part in several international mapping projects.
Pál Stefanovits was born on 24th November 1920 in Kassa. After graduating as chemist from the Budapest József Nádor Technical University in 1942 he started his soil survey work in the Hungarian Geological Institute and later in 1949 the Research Institute of Soil Science and Agricultural Chemistry of the Hungarian Academy of Sciences. His teaching career started in 1965 in Gödöllő. The current generation of soil scientists in Hungary grew up with his concepts and text books. Pál Stefanovits coordinated the development of the genetic soil classification system of Hungary, which served as basis for most mapping activities in the past 5 decades.

His major international contribution was to the development the FAO-UNESCO World Soil Map (1975) and the Soil Map of the Danube Countries (Bodenkarte der Donauländer, 1985).
His participation in correlation meeting and field activities exposed him to the diagnostic approach in soil classification that he shared with and introduced to his students. His scientific lectures on soil genesis and classification he delivered in several languages (English, French, German, Russian, Slovak and Hungarian) which brought a broad scientific network and respect to the Hungarian soil science community.

Pál Stefanovits lived 95 years. With the death of Pál Stefanovits we lost one of the giants of soil science, but his concepts and memory will stay with us.

Prof. Akira Tanaka (1924-2016)

The IUSS Secretariat was sad to learn that prominent scientist Akira Tanaka passed away on August 22, 2016 at the age of 91. He was President of the IUSS (ISSS) and of the Japanese Society of Soil Science and Plant Nutrition (JSSSPN) in 1986-1990 and 1980-1981, respectively. Emeritus Professor Tanaka, Hokkaido University, devoted a large part of his life to research in soil science and plant physiology. One of his distinguished achievements was his great contribution to the boost of rice production in Asia - people call it 'green revolution'. During his stay at the International Rice Research Institute (IRRI) in 1962-1966, Prof. Tanaka proposed an ideal plant type concept of tropical rice plants based on theoretical and practical experiments. His proposal was eventually realized as modern, high-yielding cultivars through the close collaboration with breeders. At the same time, Prof. Tanaka surveyed the fertility status of various soils, especially in Asian countries, and contributed to establishing appropriate fertilizer use.

Prof. Tanaka published nearly 200 research papers, many reviews and several monographs, and gave academic speeches in various international meetings and symposia. He actively joined various international and national organizations such as the Food and Agriculture Organization (FAO), Consultative Group on International Agricultural Research, World Vegetable Center, Chinese Academy of Sciences, etc. For his achievements he received the Japan Academy Prize and Japan Prize of Agricultural Science in 1975, in addition to receiving awards from the American Society of Plant Biologists in 1984 and the Committee of International Year of Rice in 2004.

IUSS Honorary members

Year	Member	Country
1924	L. Cayeux †	France
	K. Glinka †	USSR
	Jos. Kopecky †	Czechoslovakia
	G. Murgoci †	Romania
	E. Ramann †	Germany
	Sir John Russell †	UK
	S. Winogradski †	USSR
1927	P. Treitz †	Hungary
1935	E.A. Mitscherlich †	Germany
	A. d'Sigmond †	Hungary
	J. Stoklasa †	Czechoslovakia
	G. Wiegner †	Switzerland
1950	A. Demolon †	France
	D.J. Hissink †	Netherlands
	W.P. Kelley †	USA
1954	S. Mattson †	Sweden
	E. Truog †	USA
1956	G. Bertrand †	France
	E.C.J. Mohr †	Netherlands
1960	F.A. Bear †	USA
1964	J.A. Prescott †	Australia
1968	F. Hardy †	UK
	W.L. Kubiena †	Germany
	L.A. Richards †	USA
	A.A. Rode †	USSR
1974	R. Bradfield †	USA
	G.V. Jacks †	UK
	Ch.E. Kellogg †	USA
	M.K. Kononova †	USSR
	A. Oudin †	France
	F. Scheffer †	Germany
1978	G. Barbier †	France
	V. Ignatieff †	Canada
	Y. Ishizuka †	Japan
	L. Krolikowski †	Poland
	L. Vettori †	Brazil
1982	Ph. Duchaufour †	France
	W. Flaig †	Germany
	V. Kovda †	USSR
	E. Mueckenhausen †	Germany

Year	Member	Country
	E.W. Russell †	UK
1986	H. Jenny †	USA
	D. Kirkham †	USA
	S.K. Mukherjee †	India
	R. Tavernier †	Belgium
1990	G. Aubert †	France
	E.G. Hallsworth †	Australia
	J.S. Kanwar	India
	P. Schachtschabel †	Germany
	R.W. Simonson †	USA
	I. Szabolcs †	Hungary
1998	G.H. Bolt †	Netherlands
	R. Dudal †	Belgium
	K.H. Hartge †	Germany
	M. Kutilek	Czech Rep.
	J. Quirk	Australia
	W.G. Sombroek †	Netherlands
	K. Wada	Japan
	D.H. Yaalon †	Israel
	S.V. Zonn †	Russia
2002	Richard W. Arnold	USA
	Gleb V. Dobrovolsky †	Russia
	Wilford Gardner †	USA
	Hassan M. Hamdi †	Egypt
	Luis A.L. Sarmiento	Colombia
	Fiorenzo Mancini †	Italy
	Boris S. Nosko	Ukraine
	Ramon Rosell †	Argentina
	Alain Ruellan †	France
	Akira Tanaka †	Japan
	Bernard H. Tinker	UK
2004	Winfried E.H. Blum	Austria
	Hans-Peter Blume	Germany
	Johan Bouma	Netherlands
	Seong-Jin Cho †	S Korea
	Jan Glinski	Poland
	Marcel G.H. Jamagne †	France
	Donald R. Nielsen	USA
	Hans V. van Baren †	Netherlands
	Larry P. Wilding	USA

IUSS Honorary members (Continued)

Year	Member	Country
2008	Christian Feller	France
	Kikuo Kumazawa	Japan
	Kazutake Kyuma	Japan
	John Ryan	Syria
	Bob A. Stewart	USA
	Victor Targulian	Russia
	György Varallyay	Hungary
	Jai Singh Pal Yadav †	India
2012	Jai-Joung Kim	Korea
	John M. Kimble	USA
	Ahmet Ruhi Mermut	Canada
	Nicola Senesi	Italy
	Donald L. Sparks	USA
	Robert E. White	Australia

Year	Member	Country
2016	I. P. Abrol	India
	Jaume Bech	Spain
	Maria Gerasimova	Russia
	Martin H. Gerzabek	Austria
	Mary Beth Kirkham	USA
	Josef Kozak	Czech Republic
	Stephen Nortcliff	United Kingdom
	Marcello Pagliai	Italy
	Piotr Sklodowski	Poland
	Karl Stahr	Germany
	Roger Swift	Australia
	Tengiz F. Urushadze	Georgia
	Jae Yang	Korea

IUSS Award Winners

Year	Dokuchaev Award	Country
2006	Victor Targulian	Russia
2010	Dan Yaalon	Israel
2014	Alex McBratney	Australia

Year	Von Liebig Award	Country
2006	Rattan Lal	USA
2010	Don Sparks	USA
2014	Magdi Selim	USA