IUSS Bulletin

Bulletin of the International Union of Soil Sciences (IUSS) | December 2017

2015-2024 International Decade of Soils

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International Union of Soil Sciences (IUSS)

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21st World Congress of Soil Science 2018

RIO18
21st World Congress of Soil Science
Rio de Janeiro August | 12 - 17

SOIL SCIENCE: beyond Feed and Fuel the World

The 21st World Congress of Soil Science (21WCSS) will take place in Rio de Janeiro, at the Windsor Conventions & Expo Center, August 12-17, 2018. Dedicated to the theme "Soil Science: Beyond food and fuel", it will review the key role of soil science in answering some of the topical key questions regarding future food and water security, environmental protection and climate change mitigation.

There will be 8-12 conferences, 16 interdivisional symposia, 72 symposia organized by the four Divisions of IUSS, 16 symposia organized by the IUSS Working groups, and numerous oral presentations and poster sessions. Around 7,000 participants are expected from more than 100 countries. The organizers are looking forward to receiving your abstracts and to your registration through the 21WCSS online registration system. A conference folder showing all the details is available at the IUSS website.

Important dates:

- Abstract submission ends by January 20, 2018
- Abstract acceptance after March 15, 2018
- Early registration ends March 31, 2018
- Regular registration until May 12, 2018

Rio de Janeiro

Rio de Janeiro by night

Please take note of these dates in order to submit your contribution and to register for the congress in time. We are looking forward to seeing as many of you as possible at the WCSS 2018.

Conference website: *https://www.21wcss.org/*

Download the congress information: *http://iuss.boku.ac.at/files/21wcss_-_meeting_information.pdf*

Windsor Conventions & Expo Center

Copacabana Beach, Rio de Janeiro

Report from the IUSS Secretariat

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, creating new content, eg for the International Decade of Soils and programming it backend, and finally, keeping information of IUSS members updated.

Worth mentioning are two new items regularly published in the Newsroom of our website, namely **viewpoints on soil issues** mainly addressed to soil science community, provided by Prof. Rattan Lal, President of the International Union of Soil Sciences, and **fact sheets** on soil in relation to issues of high importance for society. The fact sheets are written by well-known experts and are addressed not only to scientists, but also to decision makers and opinion leaders. Both of these publications are part of the activities launched under the International Decade of Soils. For further details, the reader is kindly referred to a separate section dedicated to the International Decade of Soils.

IUSS Stimulus Fund

The IUSS Stimulus Fund was created 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.
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.

IUSS has set aside a sum of $15,000 annually to help fund a number of 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. For more information about the stimulus fund, please go to: *http://www.iuss.org/index.php?article_id=594*

In 2017 there were 2 submission dates for applications: 15 March and 15 September. Results of the first round were published in the last Bulletin, which can be downloaded from the IUSS website: *http://www.iuss.org/index.php?article_id=76*

By 15 September, seven additional requests for funding were received, only one of which was considered eligible for funding, namely a project dedicated to 'Awareness creation on soil organic matter management to improve the performance of agriculture and forestry sectors on climate change adaptation and mitigation in Ghana'. Thus, a total of USD 9,490,00 was granted in 2017.

Please note that research projects, travel costs of individual people, and applications from countries with outstanding membership fees as well as applications lacking detailed budgets cannot be taken into consideration for funding.

Outlook

In 2018 there will again be $15,000 available, with 2 submission dates for applications: 15 March and 15 September2018. Applications are always welcome and should be sent to in due time to *iuss@umweltbundesamt.at*.

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.

Awards

Award of Best Paper in Pedometrics 2016

Thirty votes were received. Seven of the eight nominated papers received at least one first-place vote, and the voters had quite a range of rankings. For the first time we have a split victory; in DOI order:

Viscarra Rossel, R.A., T. Behrens et al. (2016). A global spectral library to characterize the world's soil. Earth-Science Reviews 155, 198-230.
https://doi.org/10.1016/j.earscirev.2016.01.012

Poggio, L., Gimona, A., Spezia, L., & Brewer, M. J. (2016). Bayesian spatial modelling of soil properties and their uncertainty: The example of soil organic matter in Scotland using R-INLA. Geoderma, 277, 69-82.
https://doi.org/10.1016/j.geoderma.2016.04.026

If you have not read these or the other nominated papers, it's never too late! We will repeat the process next year "Best Paper 2017" to be awarded at World Soil Congress 2018.

By David Rossiter, Chairman, Awards Commission
IUSS Pedometrics Commission 1.5

IUSS Distinguished Service Award for Prof. Klaus Töpfer

On 24 May 2017 the International Union of Soil Sciences awarded Prof. Dr. Dr. h.c. mult. Klaus Töpfer the Distinguished Service Medal in Berlin. The medal was presented during the Closing Plenary of the Global Soil Week 2017 addressing the theme 'Catalyzing SDG Implementation through a Land and Soil Review.' Attended by almost 300 participants, the meeting aimed to develop policy messages as input to the High-level Political Forum on Sustainable Development (HLPF).

Photo of award ceremony (from the left to the right): Dr. Stefan Schmitz (German Federal Ministry for Economic Cooperation and Development), Prof. Dr. Takashi Kosaki (IUSS President Elect), Prof. Dr. Klaus Töpfer (founding Director of the Institute for Advanced Sustainability Studies), Prof. Dr. Rainer Horn (IUSS Past President), Prof. Dr. Rattan Lal (IUSS President), Dr. Margaret Thalwitz (Chair of the Board of Trustees, ICARDA), Jochen Flasbarth (State Secretary at Ministry for Environment, Nature Conservation, Building and Nuclear Safety, Germany), Prof. Dr. Joachim von Braun (Center for Development Research, University of Bonn, Germany).

With this award IUSS recognizes that Prof. Dr. Dr. h.c. mult. Klaus Töpfer translated knowledge of soil science into policy and governance as German Federal Minister for the Environment, Nature Conservation and Nuclear Safety; Federal Minister for Regional Planning, Civil Engineering and Urban Development; Under-Secretary-General of the United Nations; Executive Director of the United Nations Environment Programme; founding and Executive Director of the Institute for Advanced Sustainability Studies. IUSS has been and shall continue to be pleased to work with Prof. Klaus Töpfer and the Institute for Advanced Sustainability Studies towards the implementation of the UN Sustainable Development Goals, in particular by providing knowledge and expertise on soil functions and their impacts on sustainable life on planet earth.

Thus far the International Union of Soil Sciences (IUSS) has presented the Distinguished Service Medal to two prominent world citizens and policy makers. In 2012 the first medal was awarded to HRH the late King of Thailand Bhumibol Adulyadej in order to recognize His outstanding achievements in soil care and sustainable soil and land management. The second medal was presented to HE Hon'ble Stéphan Le Foll for promoting soil science on the global agenda through COP21, and for pointing out that soil and agriculture present integral solutions to climate change and advancing food security by implementing the "4 per Thousand" programme.

Read more:
http://www.iuss.org/index.php?article_id=26

Dokuchaev Award, Von Liebig Award, and the IUSS Jeju Award

By Mary-Beth Kirkham, Chair of the IUSS Committee on awards and prizes

At each World Congress of Soil Science three awards are presented by the IUSS to recognize outstanding contributions in three areas:

- IUSS Dokuchaev Award for basic research in soil science
- IUSS Liebig Award for applied research in soil science
- The IUSS Jeju Award for a young or mid-career soil scientist

Ryan to receive the Liebig Award of the IUSS

John Ryan, Soil Science Consultant based in Ireland, will receive the Liebig Award of the IUSS at the World Congress of Soil Science in Rio de Janeiro, Brazil, in August 2018.

This will be the fourth presentation of the Liebig Award, established in 2006. The award recognizes

outstanding contributions in applied soil science research, contributing to new discoveries, techniques, inventions or materials that increase food security, improve environmental quality or conservation, land and water development, and other areas covered by the divisional structure of IUSS.

Each award includes an engraved medal, a certificate, a US$ 1000 honorarium, and financial support to attend the presentation at the World Congress of Soil Science.

Ryan's career has spanned over 50 years and has been dedicated to international agriculture. He has worked at the Aridoculture Center in Settat, Morocco; at the American University of Beirut in Lebanon; and, most recently, at the International Center for Agricultural Research in the Dry Areas in Aleppo, Syria, which he had to evacuate due to civil war. He has been instrumental in initiating programs that have been successful in addressing serious production limitations in the Middle East and North Africa. His work has focused on soil fertility and nutrient management. The results of his research have contributed to increases in crop production and alleviation of rural poverty. He is widely acknowledged as the foremost expert on crop nutrition in the Middle East. He exemplifies extreme service to soil science, because he has risked his life to carry out his research done in the war-torn Middle East, first in Lebanon during its civil war and then in Aleppo, Syria.

Ryan is a Fellow of the Soil Science Society of America, the Crop Science Society of America, the American Society of Agronomy, and the American Association for the Advancement of Science. He is the recipient of the International Plant Nutrition Institute Science Award, the International Service in Crop Science Award, and the International Service in Agronomy Award. He is an Honorary Member of the International Union of Soil Sciences. He has over 200 refereed papers and has written 10 books and edited 12 books. His academic background includes an M.S. degree from the University of Arizona and a Ph.D. from the University College of Dublin.

Bouma to receive the Dokuchaev Award of the IUSS

Johan Bouma, Emeritus Professor of Soil Science, Wageningen University, the Netherlands, will receive the Dokuchaev Award of the IUSS at the World Congress of Soil Science in Rio de Janeiro, Brazil, in August 2018.

This will be the fourth presentation of the Dokuchaev Award, established in 2006. The award is made for major research accomplishments, resulting from basic researches in any field of soil science.

Each award includes an engraved medal, a certificate, a US$ 1000 honorarium, and financial support to attend the presentation at the World Congress of Soil Science.

Bouma is known for the functional characterization of soils, emphasizing use of data from soil surveys to improve soil physical characterization of soils, now referred to as hydropedology. This work includes his development of the widely used term "pedotransfer functions," which relate pedogenic soil data to physical parameters. He has been involved in projects in non-European countries, including the Philippines, Costa Rica, Niger, Vietnam, Kenya, China, Ecuador, Peru, Panama, and South Africa. In his work, sustainable development has been a guiding principle. He has applied his soil science expertise in the policy arena. He has paid particular attention to policy aspects of environmental legislation where soil aspects are often not adequately represented.

He is Fellow of the Soil Science Society of America and also the recipient of its Presidential Award. In 2017, he received the Alexander von Humboldt Medal of the European Geosciences Union. He is an Honorary Member of the International Union of Soil Sciences. He was the first soil scientist to be elected as a member of the Royal Dutch Academy of Sciences, Arts, and Letters. He has published 332 referred papers, 59 book chapters, and edited 15 books. His academic background includes an M.S. degree and a Ph.D. obtained from the Agricultural University, Wageningen.

Bennett to receive the Jeju Award of the IUSS

John McLean Bennett, Senior Research Fellow at the University of Southern Queensland in Australia, will receive the Jeju Award of the IUSS at the World Congress of Soil Science in Rio de Janeiro, Brazil, in August 2018.

This will be the first presentation of the Jeju Award. The award has been co-established by the IUSS and the Korean Society of Soil Science and Fertilizer in commemoration of the successful 20th World Congress of Soil Science held in Jeju, Korea, in 2014. The award is given to a young or mid-career soil scientist who has had outstanding accomplishments in education, research, or extension and has made a substantial contribution to the IUSS objectives.

Each award includes an engraved medal, a certificate, a US$ 1000 honorarium, and financial support to attend the presentation at the World Congress of Soil Science.

Bennett is a soil physico-chemist with globally recognized expertise in soil structure. His research has focused on water quality interactions with soil physical and chemical mechanisms. His results have direct application for irrigated agriculture and in the coal-seam gas industries. He also is an inspirational educator who is making an important contribution to the next generation of soil scientists. He has revitalized soil science courses at his university, introducing innovative problem based learning approaches. He is a dynamic leader of soil science in Australia, and, in 2017, became the President of the Australian Soil Science Society.

Bennett received the University of Sydney, Faculty of Agriculture and Environment Alumni Award for Young Achievement. He was the recipient of the University Research Excellence Award (Early Career) of the University of Southern Queensland. He was recognized as the Queensland Science Rising Star from the Department of Science Information Technology and Innovation. He has 22 refereed papers. He has given seven invited lectures and many radio interviews. He has received awards for excellence in communications. His academic background includes a Bachelor of Science degree from the Australian National University in Canberra and a Ph.D. from the University of Sydney.

Read more on IUSS Awards and Prizes:
http://www.iuss.org/index.php?article_id=632

Election IUSS Division and Commission Officers 2018-2022

Every four years elections of the officers for Divisions and Commissions take place. 4 Division and 44 Commission chairs and vice chairs stand to be elected: a chance to become actively involved in the IUSS and shape its future in the years 2018 to 2022. Nominations were sought for all positions, and a description of the Divisions is given here: *http://www.iuss.org/index.php?article_id=40.*

The deadline for applications was once prolonged from 31 March to 30 April, with IUSS Full Members (national soil science societies who paid the membership fees) being encouraged to look for suitable candidates and propose them to the Divisional Nominating Committees. Nominees could not be nominated for more than one position. Applications were to include the position, a 100 words biography and homepage URL, if available. A number of interesting applications were received, and the list of candidates approved by the Electoral Committee is available at the IUSS website.

Read more:
http://iuss.boku.ac.at/index.php?article_id=649

The ballots (list of nominated persons and the corresponding biographies) provided by the Divisional Nominating Committees and the Electoral Committee are the basis for the election. All officers except the appointed First Vice-Chairs of the Divisions can be re-elected for one further term.

According to the IUSS statutes and bye-laws (both version Oct. 2014) voting by Members will be conducted electronically on a one vote per individual in each National Member Society basis, using a procedure developed by the National Society or adhering organization to the Union. Results of the election will be reported by the National Society or adhering organization to the Electoral Committee via the President. The number of votes cast within each country shall be based on a true and fair ballot of their national membership.

The Electoral Committee shall receive all the ballots from all the voting constituencies. There will be one vote for each member and not adjusted in any manner to reflect the number of members in a National Society. Elections will be decided by a simple majority of votes cast.
Those having the majority of votes cast will then be declared elected. The names of those elected shall be notified officially by the President and shall be published in the Bulletin and on the IUSS Website.

The Presidents of the National Member Society are kindly requested to send the results of their na-

tional elections to *iuss@umweltbundesamt.at* (Cc to *rhorn@soils.uni-kiel.de*).

Voting for all Divisional and Commission officers shall be completed 6 months before the Congress. Therefore the following dates have been stipulated:
Opening of the voting system for your society members: 1 September 2017
Closing of the voting system for your society members: 31 December 2017
Provision of votes to Electoral Committee: 28 January 2018

Summary of steps to be taken by national societies:

1. Build up an electronic voting system at national level
2. Distribute the ballots to the individual members
3. Collect the votes from each individual member
4. Provide the number of individual votes for each candidate (Excel list to be filled) to IUSS

Other IUSS news

Ivan Rodrigo Orjuela Osorio (†2017)

The Secretariat was sad to learn that Ivan Rodrigo Orjuela Osorio passed away on the evening of Friday 30th June, shortly after a tragic traffic accident in Wageningen. Ivan was a PhD student from the Universidad Nacional de Colombia and worked on soil carbon prediction by spectroscopy. He was an enthusiastic participant in Pedometrics 2017 and received excited feedback for his conference presentation. He was making plans with all the new scientific contacts he made at the conference. We are shocked with the news and extend our condolences to his family, friends and colleagues. Please see the Pedometrics 2017 website (*http://www.pedometrics2017.org*) for a condolence register.

Meeting on the progress of the preparation of the WCSS 2018 at the IUSS headquarters in Vienna

On the 23rd of June, 2017 the former President of the Brazilian Soil Science Society, Gonzalo Farias, and Prof. Floria Bertsch, President of the Soil Science Society of Costa Rica, visited IUSS Secretary Sigbert Huber at his office in Vienna. They were accompanied by Prof.Winfried Blum, honorary member of IUSS and Secretary General of IUSS 1990-2002. The main purpose was to discuss the preparation of the WCSS 2018. The congress programme was finalized and uploaded to the congress website.
Read more:
http://www.iuss.org/index.php?article_id=26

From left to right: Gonzalo Farias, former President of the Brazilian Soil Science Society, Prof. Floria Bertsch, President of the Soil Science Society of Costa Rica, IUSS Secretary Sigbert Huber, and Prof.Winfried Blum, honorary member of IUSS and Secretary General of IUSS 1990-2002

Pedometron 40 – celebrating 25th anniversary of Pedometrics

The July 2017 issue of the newsletter of the IUSS Commission 1.5 Pedometrics is dedicated to the 25th anniversary of Pedometrics. It contains articles about the history of Pedometrics, portraits about related IUSS Working Groups and Prof. Andrey Nikolaevich Kolmogorov as well as interviews with soil experts.
Read more: *http://iuss.org/index.php?article_id=421*

Newsletter of IUSS Division 4 'Soil Connects' published

Issue 6 of the biannual SOIL Connects Newsletter of IUSS Division 4 has just been released. It includes a number of interesting articles, starting with a report from the Division Chair, followed by a number of articles on soil and art, concluding with new publications and forthcoming meetings.
Read more:
http://iuss.boku.ac.at/index.php?article_id=423

New Newsletter of Commission 1.1. Soil Morphology and Micromorphology

The most recent issue of the Newsletter of Commission 1.1. Soil Morphology and Micromorphology contains plenty of information about new publications, new books, forthcoming congresses and courses. Note that abstract submission is already open for the 3 symposia dealing with micromorphology at the 21st World Congress of Soil Science next August in Rio de Janeiro.
The Rio Meeting will host the award ceremony of the 2018 Kubiëna Medal, which will be awarded to Maria Innokentievna Gerasimova, for her most continued and valuable contributions to soil micromorphology.
Read more:
http://www.iuss.org/index.php?article_id=419

New WRB homepage

The World Reference Base for Soil Resources (WRB) Working Group belongs to IUSS Division 1 (Soils in Space and Time), Commission 1.4. (Soil Classification). The WRB is an international soil classification system for naming soils and creating legends for soil maps. The task of the Working Group is to test and further develop the WRB. The WRB Working Group has a strong relationship to the Food and Agriculture Organization of the United Nations (FAO), where the WRB documents are published. The third edition, update 2015, is the currently valid WRB. At present, it is available in four languages (English, Georgian, Spanish and Polish) and can be downloaded from the new homepage. In addition, the new homepage has information about the WRB classification levels, features a picture gallery and a history section.
Read more: *http://www.soil-science.com/?id=wrb*

2017 edition of the Soil Science Society of Nigeria Newsletter published

The most recent newsletter of the Soil Science Society of Nigeria is now available: The Bill for an Act for the establishment of the Nigeria Institute of Soil Science was signed into law on 3 February 2017. There are various reports on the 2016 World Soil Day and International Year of Pulses, followed by information on the 41st Annual Conference of the Soil Science Society of Nigeria held at the Abubakar Tafawa Balewa University, Bauchi, 12-17 March 2017, with the theme "Land Degradation, Sustainable Soil Management, Food and Nutrition Security".
Read more:
http://www.iuss.org/index.php?article_id=673

News from European Confederation of the Soil Science Societies

The next Eurosoil will take place at Geneva in 2020. Switzerland was elected in Istanbul in November 2016, with the theme "Connecting people and soils". The commitment made is not only to organize a high level "Swiss made" scientific congress, but also to develop the scope of the congress towards stakeholders and to revive the European Confederation of the Soil Science Societies (ECSSS). As put forward by the theme, the ambition is to make ECSSS the soil voice for the soil causes at European level, and to involve stakeholders in the activities.
Therefore, new statutes, activities and a web site for the ECSSS are in preparation. During 2018, these changes will be submitted to the ECSSS council by Pr. Pascal Boivin, the elected ECSSS president, and a vote will be organized at Rio WCSS 2018. We are currently updating the contacts for the council members. Among the objectives of the future ECSSS is to support the countries that need help to maintain permanent activities of a soil science society, and foster the involvement of young scientists in the Eurosoil2020.
Contact: *EUROSOIL@hesge.ch* or *pascal.boivin@hesge.ch*.
Read more: *http://eurosoil2020.com/*

International Decade of Soils (2015-2024)

Background information on the declaration of the International Decade of Soils (IDS), its intentions and aspirations, the role of the IUSS Executive Committee and the Council and the tasks IUSS envisages to execute during its lifetime can be found at *http://www.iuss.org/index.php?article_id=588*.

The following paragraphs provide an overview of progress made and activities carried out during the last six months.

Recent achievements

The IDS **logo** can be downloaded from the IUSS website in different formats at *http://www.iuss.org/index.php?article_id=588*.

Soil book series

Following the very successful publication of *Soil Matters – solutions under foot* and *Soils within Cities – Global Approaches to their sustainable Management,* the next book in this series is ***The Nexus of Soils, Plants, Animals and Human Health*** and was published at the end of 2017 by Schweizerbart. It was edited by Bal Ram Singh, Michael J. McLaughlin and Eric Brevik on behalf of the International Union of Soil Sciences.

The 21 contributions in this book describe the role soils play for plant, animal and human health. They show that soil- and human health are intricately connected, because healthy soils produce healthy crops, which in turn nourish humans and animals, allowing for their health and productivity.
Climate change has been shown to affect animal and human health, and soils are intricately linked to the atmosphere by being both a source and sink of greenhouse gases. Soils are the largest active terrestrial reservoir of organic carbon and its sequestration in soils can be enhanced by improved management practices.

The Nexus of Soils, Plants, Animals and Human Health summarizes the current state of research of these important issues and provides a comprehensive treatise of the global importance of soils for humankind.

Copies can be ordered directly from the publisher or from the IUSS Secretariat for EUR 24.90 (paperback). IUSS members can order it from the Secretariat for a reduced price of EUR 20.00 (minimum 10 copies) – please note that shipping costs will be added to the sales price.

Read more: *www.schweizerbart.de/publications/detail/isbn/9783510654178*

IUSS would like to thank all authors for their dedication and work on this book.

IUSS participates in ICSU Grant Project "TROP-ICSU"

Another way of reaching out to a broader audience and to support education on soil is IUSS's participation as supporting partner in an ICSU Grant Project led by IUBS called "TROP-ICSU: Trans-disciplinary Research Oriented Pedagogy for Improving Climate Studies and Understanding".

The aim of TROP ICSU is to develop education and science communication modules in such a way that every future citizen would be better equipped to identify appropriate solutions for sustainable and equitable development.
The main target audience are senior school and undergraduate college/university teachers. TROP ICSU will train them to use new pedagogical tools that are based on the use of local data to teach the science of climate change. In year one of the project, the main activity was to test a suite of simulators (and also models/interactive videos/virtual reality platforms) of climate change as pedagogical tools. In 2018 the project will focus on pilot testing of new pedagogical tools, curriculum outreach and public engagement modules. The project partners are: IUBS – Lead partner, INQUA – co-lead partner, IUSS, IMU, IUGS, IUGG, IUHPST, IUFRO, AUC, IMAGINARYCODATA, ICSU-ROA, UNESCO and the National academies of Australia, India, Mongolia, South Africa, Ecuador & Egypt.

The TROP ICSU team would be glad to learn from your experience related to the topic. Please, contact experts you think may know about such tools. If you and/or your colleagues are aware of such tools, please submit web links to either projects or web tools that are related to climate change and soil to *barbara.birli@umweltbundesamt.at*

Read more: *https://tropicsu.org/*

NEWS FROM THE Latin American Soil Science Society: SLCS

"#ElSueloEsVida, #InTlalliTonemiliz, #LaTeraÉsVida, #TheSoilIsLife, #DerBodenistLeben"

With the hash tag #TheSoilIsLife and the support of the Argentinean Soil Science Association (AACS), the regional FAO South America and INTA; within the framework of the educational project carried out by the Latin American Soil Science Society (SLCS), Argentina is resuming its educational project this year and launches "So are the Soils of my Country" together with the agricultural enterprise CREA, and Federico Fritz in front of it.
The project is for young people from the last two years of secondary school in public and private schools, with the purpose of generating a space for reflection, awareness, study and research based on the multiple functions carried out by the SOIL resource.

"¡Thus are the Soils of my Nation®!"
In 2017, another school in Ecuador joined the SLCS Educational project "¡Thus are the Soils of My Nation!" and therefore the "Educar 2000" College is a new member of the "**Latin American Network for Soil Science teaching and learning"** (RELAEECS® for its acronym in Spanish), which also participates in social networks with the hash tag #TheSoilIsLife. Likewise, the Bolivian Society of Soil Science has begun its educational project by convening its first Bolivian "Symposium of Educational Innovations on Teaching Soil Science" held on November 14, 2017, from 9 a.m. to 2:00 p.m. at the Chané Hall of the International Convention Center FEXPOCRUZ, in the city of Santa Cruz de la Sierra, Bolivia, within the framework of its VIII Bolivian Congress of Soil Science.

Books:
The digital archive of the second edition of the **"White Book: Treatment of soil in compulsory secondary and high school textbooks in Spain"** is now online, edited by the Spanish Society of Soil Science, in which information on projects, actions, games, books and didactic material generated by teachers and researchers from the Latin American Educational Project "Thus are the Soils of my Nation!" and the "Latin American Network for Soil Science teaching and learning" was integrated.
http://www.secs.com.es/wp-content/uploads/2017/06/Llibro-de-los-suelos-digital-2-Edición.pdf

New CALL:
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** – would like to renew its invitation to the global soil community and the general public to participate in an awareness campaign about the value of the soil for life.
With the hash tag #TheSoilIsLife the goal is to create a "**Soil's Friends Virtual Network**", in which all people interested in soil collaborate globally on various levels to educate and generate public awareness of the need to preserve the soil as an essential part of the ecological balance.
The campaign will be kicked off on Twitter using the hash tag **#TheSoilIsLife**, translated into our different languages and dialects.

Why all of them with the same hash tag?
Because we are stronger together and it is the volume of traffic in Social Networks that generates interest in the mind of a citizen.

Why #TheSoilIsLife as hash tag?
Because our readers are citizens; we need the hash tag to be short and clear on what we are trying to say as well as about the soil's importance for citizens of all ages.
The volume of response will depend on our consistency over time and creativity of our messages; this will determine whether we achieve our goal of

reaching the eyes and ears of the citizens so that they learn and care about the soil.
Without any regard for Societies, countries and languages we invite you to participate in this education and public awareness initiative. Let's make science accessible to the public!

"Latin-American network for soil science teaching & learning"
lbrs@unam.mx
@LauraBReyesS

IUSS at EGU 2018

Following the Short Course *'International Decade of Soils: Ideas for outreach activities'* during EGU 2017, in which ongoing activities carried out by soil science societies were presented which were to give rise to further activities as well as creating new ideas for the future, IUSS is currently involved in the organisation of *session SSS1.3/EOS5 Soil science education, outreach and public engagement* (co-organized). This session welcomes all perspectives on teaching soil science from school level to continuing professional development in non-academic settings. Contributions are welcome that move away from concepts and methods for teaching soil science within traditional disciplines (chemistry, biology, physics) to those that use soil systems approaches. Innovative methods from the field, classroom and laboratory are welcome from anyone working with soil science education across varied settings. The conveners also welcome demonstrations of novel approaches for soil science outreach and public engagement that involve scientists and non-scientists. Examples that also measure the effectiveness of educational and outreach activities are especially welcome.

IUSS kindly invites you to submit abstracts until 10 January 2018, 13:00 CET.

Read more: *https://egu2018.eu/*

Message of the Executive Secretary of the Convention on Biological Diversity, Dr. Cristiana Paşca Palmer, on the occasion of the World Soil Day, 5 December 2017

"Caring for the planet starts from the ground"

Soil is a symbol of fertility. It is the origin of life. It is the basis for food production.
Soils are also home to a range of life forms, which are not, perhaps, as charismatic as bees or butterflies. However, soil biodiversity is fundamental to keeping Mother Earth fertile and for nurturing life on our planet.
Let's take a minute to think about how much biodiversity we have underground: small mammals, earthworms, insects and millions and millions of microorganisms. We estimate that soils host a quarter of our planet's biodiversity. The microorganisms themselves belong to another huge and fascinating world, a world we are still trying to discover. Understanding their role in maintaining soils and keeping plants and animals – including people – healthy is an ongoing challenge.
But what is well recognized is that thanks to the interaction of all this visible and invisible biodiversity, forests can keep their life cycles, water is purified, nutrients are absorbed and carbon can be sequestered. And, importantly, farmers can produce our food. In fact, the nutritional value of the food we consume is directly related to the health of the soil in which it grows.
Did you know that it takes thousands of years to form 1 cm of soil? Yet, it can be destroyed in almost no time at all. Unsustainable agriculture practices, urban infrastructures, pollution, erosion, climate change and other factors all contribute to the rapid degradation of our soils and to desertification. About 33 per cent of our lands are already degraded, and this increasing trend is putting in check the achievement of many global agreements.
Therefore, today on World Soil Day, I invite you to reflect on the importance of healthy soils for biodiversity, for our well-being, and to think about the ways that you can take action and contribute to keeping this underground world alive – for its own sake, and for the sake of humanity to be able to enjoy a sustainable life on the planet.
Happy World Soil Day!

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World Soil Day Celebrations at Kerala Agricultural University in Kerala, India

Chief Guest of The Event: Sri.Teekka Ram Meena, IAS, Vice Chancellor, Kerala Agricultural University

Name and No. of activities/events

1. Essay writing competition on the topic "Caring the soil for sustainable development" for U.G. & P.G. students
2. Poster & Collage competition on the theme "Caring for the planet starts from the ground"
3. Soil Exhibition
4. Visit to Mobile soil testing lab
5. Visit to Soil Museum
6. Flash mob to invite attention on importance of soil and its caring by U.G. students
7. Soil day celebrations with Vice Chancellor as chief guest
8. School children from HSS, Venganoor, farmers from Pallichal and Venganoor Panchayaths, students, teachers and office staff of College of Agriculture participated in the programme.

Soil Museum visit

9. Soil health card distribution to selected farmers
10. Seminar conducted for school students and farmers on topics "Caring the soil for sustainable agriculture" and "Healthy soil for healthy farming"

No. of Farmers Participated: 30
No. of Soil Health Cards Distributed: 10
No. of Students Participated: 100

Any Other Relevant information:

Soil day kit with seeds, manures, micronutrients and seedlings were distributed to farmers. Soil day oath taking was lead by Dean, College of Agriculture, Vellayani

Certificate for essay competition

Soil Day Oath

Soil Health card distribution

KERALA AGRICULTURAL UNIVERSITY
College of Agriculture, Vellayani 695 522
Department of Soil Science & Agricultural Chemistry Kerala, India

IUSS Fact Sheets

In late spring 2017 the International Union of Soil Sciences started to provide fact sheets on soil in relation to issues of high importance for society. The fact sheets can be downloaded for free from the IUSS website at *http://iuss.boku.ac.at/index.php?article_id=647*. Topics covered include soil and climate change, soil degradation and desertification, soil perception of society, soil and water quality, soil and biodiversity, soil governance, soil and arts, soil and health, soil and history as well as soil and food security. The fact sheets are written by well-known experts and are addressed not only to scientists, but also to decision makers and opinion leaders.
Comments are always welcome and should be addressed to *iuss@umweltbundesamt.at*.

For ease of reference, please find the fact sheets published so far below, in their order of appearance, with the most recent on top. >>>>

Religions and Soil

By Nikola Patzel (Germany), chair of IUSS working group "Cultural patterns of soil understanding", and Winfried Blum (Austria), Secretary General of ISSS/IUSS 1990-2002, Professor emeritus at the University of Natural Resources and Life Sciences (BOKU Vienna)

All religions are aware of soil. But different religious corpora and traditions address it differently, and consequently they carry diverse cultural patterns of soil understanding.
The main difference between religious perspectives on soil (matter, nature) is, whether it is considered having divine qualities, or seen as a dependent creation or even a transient illusion. Soil being alive and divine, is, e.g., the belief of Buryat shamanistic culture of Baikal region; other varieties of this belief are found in Hinduism, with the Dogon in Mali, or the Andean peoples. For Judaism, Christianity and Islam, soil is not acknowledged to be divine; nevertheless it is often addressed as a "mother".
Some flashlights on different views on soil moulded by religious beliefs:

1. Soil as the first matter (prima materia) of anthropogenesis: e.g., Greek religion, Judaism, Christianity, Islam, some African beliefs.
2. Soil as a healing and strengthening agent: almost generic in folk beliefs of various cultural areas; expressed for example in customs of geophagy, or body painting with earth colours, or rituals of putting new-borns on the ground.
3. Sacred soil being part of, or vesture to a divine body like "Mother Earth". This corresponds, e.g., to the Sanskrit-origin term bhumiputra "son(s) of the soil", used in some countries also for conceptualizing identity. Attention may be devoted to the Earth's 'skin' not to be violated: Buryat Shamanism and others. Or she is seen as a divine female entity which is fecundated by a heavenly sower e.g. in Hinduism and other Indo-European religions, or with the Dogon in Mali: earthly ploughmen may identify with this symbolism.
4. Soil seen as a feminine donor, attributed predominantly by chthonic properties e.g., Hindu Dhartī – or as well by cosmic elements: e.g., the Andean Pachamama; a divine Mother, who in many cultural areas has to be recompensed and conciliated by offerings and sacrifices, to prevent her from "taking revenge" for human withdrawal of plants by punishing humans with starvation and death.
5. Soils and the intestines of the earth being seen as a realm of chthonic or just local spirits are an official or off-the-record belief in all religions. In Christianity historically mingled with ideas of the earth being Satan's dwelling place, and the demonization of the 'pagan' worship of nature.
6. Soil being a symbol of "mere dust", an ephemeral world – nevertheless supporter of life – which hides the reality of the divine: e.g., in Buddhism, some Shinto schools, as well as in folksy Christianity.
7. Soil (living matter) as a place of ongoing creativity, the creative agent being identified in different religious areas with elemental beings, different divinities, or a cosmic spirit.

Religious patterns, mentioned only very fragmentarily here, also have so-called 'secularized' consequences, as on the opinions on tilling, e.g.; or if soil life is conceptualized, e.g., as cogwheels of a machinery, as a carrier of spirit, as a cradle of life. It is recommendable for soil scientists and for anybody concerned with soil to know about the varieties of religious understanding of soil nature, and its cultural and practical consequences.

Exemplary reference: "Sols et sociétés, regards pluriculturels" (soils and societies, cross-cultural perspectives), by R. Lahmar and J.-P. Ribaut, Paris 2001.

International Union of Soil Sciences

Soil and Land use change

By Ryusuke Hatano, Hokkaido University, Kita 9 Nishi 9, Kitaku, 060-8589 Sapporo, Japan
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Land use change has a huge influence on various ecosystem services. While improper land use leads to a reduction in ecosystem services and results in soil degradation (Hatano et al. 2015), optimal land use can maintain or increase ecosystem services. In this fact sheet, the focus is on ecosystem services related to soil functions.

The provisioning of goods is one of the prime ecosystem services. Agricultural land uses rely on the provisioning services of soil to produce food, feed, fibre and fuel. Agricultural land use alters these services by cultivating the soil, controlling the vegetation and adding various amendments. Forestry provides not only timber and biomass, but also various foods such as fungi and understory vegetation. The provision of clean water is getting more and more important under the climate change.

The regulating services of soil are found in the remediation of waste, toxics and other nuisances. Absorption and adsorption of cations and particles on the aggregate surfaces is especially important when it comes to providing clean water. These physicochemical soil functions are hardly influenced by artificial management, while some soil amendments have been found to be effective such as zeolite amendments to immobilize radioactive Cs in soil.

The mediation of flows is also an important regulating service of soil. Material and water flows are hugely influenced by land use. Changes in land use can release or sequestrate carbon till the equilibrium specific to the soil and environmental condition is reached. Soil microbes play a key role in the regulation of nitrogen flows. It is important to connect different spatial and temporal scale to capture the whole flow from regional to global scale (Kimura et al. 2009). Symbiotic nitrogen fixation by rhizobium as well as other plant growth promoting rhizobacteria can be used to enhance nutrient availability. The use of the microbial activities is still difficult to manage since spatial and temporal variability in the field often masks the effect.

Maintaining the physical, chemical and biological conditions of a given environment is also an important regulating service of soil. For example, land use type and soil management methods influence water storage and this function is crucial to prevent soil erosion or to provide water for drinking or succeeding crops.

Cultural services are of importance at landscape scale. Scenic landscape patterns formed by traditional land use attract tourists. Even if there is no economic benefit at field level, there are many areas that maintain special land use systems to boost tourism and, thus, benefit at regional level. Payment for ecosystem services is considered a governance tool to enhance ecosystem services of soil and land use systems (Uthes and Matzdorf 2016).

Hatano R. Suwardi, Bellingrath-Kimura S.D. 2015: Key processes and factors to mitigate land degradation. Catena 133. 453–454

Kimura S.D., Hatano R. and Okazaki M. 2009: Characteristics and issues related to regional-scale modeling of nitrogen flows Soil Sci. Plant Nutr. 55,1-12

Uthes, S., Matzdorf, B. (2016): Budgeting for government-financed PES: Does ecosystem service demand equal ecosystem service supply? Ecosystem Services 17, 255-264.

International Union of Soil Sciences

Soil degradation and desertification

By Prof. Dr. Rainer Horn, Past President of IUSS 2017 -2018
CAU Kiel, Hermann Rodewaldstr. 2, 24118 Kiel Germany

Based on the GLASOD map, which covers the earth's surface between 72°North and 57°South, a total land area of 13 bn ha is available, of which according to an evaluation of Blum and Eswaran (2004) only 13-18 % are very fertile soils, with more than 50 % being of the lowest fertility class. Since an area of 3-400 km² is irreversibly degraded per day we are not only faced with a shortage of productive soils; to make matters worse these productive soils are also more intensely used for food production. Overuse may result in a decline of soil properties and functions. At the same time the population increases and may reach approx. 9 bn people worldwide in the year 2050, which exacerbates the food production problems.

Soil degradation is defined as a change in the soil health status resulting in a diminished capacity of the ecosystem to provide goods and services for its beneficiaries. It is therefore one of the major threats to future life. Soil degradation comprises physical, chemical and biological processes. Rainfall, surface runoff, floods, wind erosion, tillage, mass movements and soil compaction/deformation, and prevented carbon sequestration are examples of physical processes, which lead to a loss of fertile soils and declining soil quality and functionality. The reduction of soil nutrients due to alkalinity and acidity, loss of organic matter or water logging can be regarded as chemical components of soil degradation. The loss of biodiversity due to non- site adjusted soil management results both in changes in microbial activity, which affects crop yield, and sustainability of soil productivity.

At present 15 % of the total area is degraded which equals 1.95 bn ha and affects 1.5 bn people or 74 % of the poor globally. Approx. 1.6 bn ha are affected by soil erosion, while the further physical degradation amounts to nearly 0.1 bn ha and the chemical degradation to 0.25 bn ha. It can be assumed that nearly half of the eroded land is caused by secondary effects of soil degradation due to compaction and deformation by non-site adjusted management. According to the European Soil Framework Directive (2006) soil compaction is besides water and wind erosion one of the main physical threats causing soil degradation. It is estimated that 32 % of the subsoils in Europe are highly degraded and 18 % moderately vulnerable to compaction. The problem is not limited to cropland or forest areas (especially because of non-site adjusted harvesting machines) but is also prevalent in rangelands and grassland, and even in so-called natural non-disturbed ecosystems. The main reasons for an intense increase in compacted agricultural or forested land are the still increasing weight of the machines as well the increased frequency of machine wheeling under non-favorable site conditions. The same holds true for animal trampling in combination with overgrazing of moist to wet pastures.

Desertification: Since the pressure is increasing on dryland ecosystems to provide services such as food, forage, fuel, building materials, and water needed for humans, livestock, irrigation and sanitation, soil loss due to desertification ranges worldwide at 6 to 12 million km². It defines (a) land degradation in dryland areas and/or (b) the irreversible change of the land to such a state that it can no longer be recovered for its original use. Desertification-related processes such as reduction of vegetation cover increase the formation of aerosols and dust. These, in turn, affect cloud formation and rainfall patterns, the global carbon cycle, and plant and animal biodiversity. Desertification occurs because of a long-term failure to balance human demand for ecosystem services and the amount the ecosystem can supply.

International Union of Soil Sciences

Soil and Health

By Ganga M. Hettiarachchi, Chair of Commission 4.2 Soils, Food Security, and Human Health
Kansas State University, Throckmorton Hall, Manhattan, KS 66506, U.S.A.

Soils' contribution to (1) food production (amount and quality), (2) cycling of carbon, nutrients, and water, and (3) overall environment health including plants, human and other organisms are the direct beneficial effects of soil on health. While human and other living organisms exposure to potentially toxic compounds and pathogens in soils are the direct adverse effects of soils on health.

We count on soils for enhancing food quality and safety, providing safe habitat for soil microorganisms, maintaining or enhancing our air quality by minimizing greenhouse or other potentially toxic gas release, protecting our groundwater by filtering potentially toxic substances and disease organisms from wastewater, and protecting our surface water by sequestering or degrading potentially problematic substances including nutrients and disease organisms moving with runoff water.

Soils can be a sink, interacting medium, or a source for many potential pollutants including agricultural inputs (nutrients, pesticides), waste, spills, leaks, aerial deposition, and greenhouse gases (CO_2, CH_4, N_2O). Thus healthy soils capable of functioning well are vital to our health and future well-being through their impact on food production, food safety, human and ecosystem health and climate change. Soil health is defined as the capacity of a living soil to function, within natural or managed ecosystems boundaries, to (1) sustain plant and animal productivity, (2) maintain or enhance water and air quality, and (3) promote plant and animal health. It is clear that the combination of an increasing population and decreasing area of per-capita cultivated land puts our soils under ever-increasing pressure to enhance food production. Thus protecting soil health should be a critical component in our effort to sustainable intensification of existing croplands.

Humans may assimilate beneficial or toxic compounds and pathogens in soil through direct (soil-human) or indirect pathways (for example, soil-food-human or soil-water-human, etc.). The environmental consequences of beneficial and toxic substances in soils are related to their bioavailability. The bioavailability of a substance is related to the possibility for that substance to cause an effect, either positive or negative, on an organism. Thus the bioavailability of a given substance in soils is controlled more by its chemical form than its total concentration in soil.

A major challenge for those examining effects of soil on health will be developing accurate and sensitive methods for the determination of the soil health as well as the bioavailability of beneficial and toxic substances in soil to various end points in order to better understand their direct or indirect effects on human and ecosystem health. Responsibility of soil scientists is to work together with expertise in other disciplines to design strategies that can optimize the benefits of soils to overall ecosystem health and to minimize any negative impacts.

Reference: Doran, J. W. 2002. Soil health and global sustainability: translating science into practice. Agriculture, Ecosystems Environ. 88, 119–127.

International Union of Soil Sciences

Soil Governance

By Winfried E.H. Blum, Secretary General of ISSS/IUSS 1990-2002
Professor em. at the University of Natural Resources and Life Sciences (BOKU), Vienna/Austria

Soil is a finite resource. Only 12% of the global soil and land resources can produce food and fibre, 24% sustain grasslands, 31% forests, and 33% are unfit for any kind of ecological use, because they are too cold, too dry, or without soils at all.

Soils are owned by individuals or groups of individuals, including states. As stakeholders, decision makers or politicians, they have the mandate and are responsible for soil governance. Science can only develop scenarios or concepts, based on acquired scientific knowledge and experience in the protection and the sustainable use of soil and land resources, which have to be focused on the locally prevailing conditions, in view of the extreme diversity of soil and site conditions at the global scale.

In this context, important competition exists between ecological and non-ecological uses of land and soils, for example between the protection and the use of natural, agricultural and forest ecosystems on the one hand, and the development of technical infrastructure for daily life, industrial production, transport or for other purposes on the other hand.

Through sealing and the excavation of soil material we lose, globally estimated, up to 400 km² of fertile land per day, which means that every second we lose large surfaces for food and fibre production, which can only be compensated by intensification of the production on the remaining surfaces without considering impacts on the renovation of groundwater resources or the maintenance of biodiversity.

Additionally, within the ecological soil uses there is a competition between intensive agriculture and the quantity and quality of groundwater resources or between intensive agriculture and soil biodiversity. To explain these and further complex problems in an understandable way to stakeholders, politicians and decision makers is a further important task of soil sciences besides their role in developing concepts and practices for the protection and the sustainable use of thousands of different soils and sites at a global scale.

For example, looking at the politically defined 17 Sustainable Development Goals (SDG's), the role of soil science is to develop concepts for a sustainable realisation of these goals, which can only be achieved on the local level, given the most diverse physio-geographical conditions world wide for food and fibre production, protection of human health, or the provision of clean water resources.

In this context, the protection of soils and the development of concepts for the harmonisation of land take for infrastructure development on the one hand and the sustainable production of food and fibre for an increasing world population on the other, is of paramount importance and will be decisive in the near to medium future.

International Union of Soil Sciences

Soil and Food Security

By Alex McBratney, IUSS Deputy Secretary General 2010-2014
The University of Sydney, Biomedical Building,1 Central Avenue, Australian Technology Park, Eveleigh, NSW 2015

The challenge of food security is one of the greatest threats to human society. From 2014 – 2016, hunger affected just over one in nine people in the world. Continuing population growth means that the global demand for food will increase for at least another 40 years.

Food security is central to the United Nations (UN) 2015 Sustainable Development Goals which broadly aim to "end poverty, protect the planet, and ensure prosperity for all". SDG 2 is 'Zero Hunger: end hunger, achieve food security and improve nutrition and promote sustainable agriculture'. Approximately 95% of the world's food comes from soils. Effectively managing our soils is essential to maintain and increase crop yields, necessary to meet this zero hunger objective.

Food security is a complex issue encompassing biophysical, socio-economic, and political challenges. Simply increasing food production will not address food security and many soils are already approaching their productive limit.

Food security must instead be addressed through the broader concept of soil security. Soil security aims to maintain and improve the world's soil resource. It recognizes that soil is not just a biophysical product. How we value and relate to the soil affects its ability to produce the resources we need.

The five dimensions of soil security – capability, condition, connectivity, capital, codification – distinguish between the current state of the soil, optimal state of the soil, and how the soil is used and valued.

Addressing food security on the global scale is a difficult problem, but understanding which dimension of soil security is the greatest threat for the situation is more achievable at the farm scale. For example, can the soil produce the required food (capability), and can it keep doing so (condition)? Does the land manager have the right knowledge and resources to manage the land according to its capability? (connectivity). Connection to the soil often comes through land tenure because soil is used less optimally where land tenure is unclear or absent (codification).

Is the soil valued more for its food production capabilities, ecosystem services, biodiversity, or ability to mitigate climate change (capital)? Places in the world that are most food insecure are also often regions with competing demands and existing soil degradation.

Soil security founded on sound evidence-based soil science is key to food security, and in itself is fundamental to continued human existence on Earth.

Further Reading:

Field DJ, Morgan CLS, McBratney AB (Eds.) (2017) Global Soil Security, Springer; Switzerland.

McBratney AB, Field DJ, Koch A (2014) 'The dimensions of soil security' Geoderma vol. 213, pp. 203-213.

International Union of Soil Sciences

Perception of soil by society

By Christian Feller (France), chair of IUSS Division 4, 2014-2018 and
Nikola Patzel (Germany), chair of working group "Cultural patterns of soil understanding"

More than 90% of humanity's food depends on fertile soils. Its importance for humankind is equal to air and water, but much less perceived and known by modern human societies. Soil-plant systems provide terrestrial ecosystems with water household and climate regulation, and with many remedies for the whole food chain.

The word "soil" is often perceived rather as a technical term, whereas people are more touched by words like earth, ground, land, dirt, etc.

If scientists want society to care more about the soils of the earth, ways of communication are needed which integrate scientific and cultural knowledge, outer facts and inner images, in an appealing and respectful way.

But what is the perception of soil by society? Some major societal framings of soil perception are:

- Ecological: The great pioneer of soil science (pedology) Vasilii Dokuchaev considered soil as a "natural body", that is, a natural entity (or system) at the interface of air (atmosphere), water (hydrosphere), rock (lithosphere), and life (biosphere), created by soil life and chemo-physical forces fueled by sun energy. This is the "soil" of most soil scientists, agro-ecologists etc. It is the role of scientists to try and share soil ecosystem science with society by using simple words. Teaching such soil knowledge from primary school to university is very important, and farmers, NGOs, politicians and other decision makers are most important partners and have to be addressed in ways which acknowledge their standpoints and knowledge, their languages and concerns.
- Economic: Soil as a production factor. Generally, from this functional perspective soil is mainly valued for its productive potential (agriculture and forestry) in terms of output and money, for its "surface" value with regard to urban development or transport (soil sealing!) etc. In this view, all benefits which don't show immediately on the economic balance, and that holds true for most "ecosystem services", are generally neglected. These factors have to be internalized into the economic balance, in order to prevent soil depletion and destruction.
- Cultural: Soil as a cultural entity. In all societies around the world, soil is perceived in a cultural context. This is a symbolic web of meaning given by religious and secular myths and beliefs, which also act as (positive or negative) orientational knowledge for human soil relation. "Mother Earth", "Holy Mary", Adam and Eve "created from soil", "soil as a vessel for plant nutrients" are examples for that. Cultural perceptions can be in line or in conflict with scientific views as well as with "development projects". The symbolism of "tilling" vs. "no till" is an example, the often strong connotations of soil with "dirt" or even "death" are others. If soil communication is to succeed, it has to outweigh "dirt" by the "wonder beneath our feet" Not only certain farmers, also artists can be allies in that perspective, and ambassadors for soil.

Soil scientists need to talk about soil with society also as a discourse on culture, and considering all mentioned factors. Their task is not only to produce specific types of knowledge, but also to deal with different sources and types of knowledge. The learning about soil, and extending soil awareness and care, can only work through dialogues.

International Union of Soil Sciences

Soil in Western paintings

By Christian FELLER, Chair of IUSS Division 4, 2014-2018

It is widely accepted that humans have always considered the natural environment a subject of great interest to art. This includes cave paintings from about 30-40,000 years ago, with representations of animals. Since early antiquity, there are beautiful pictorial examples of landscapes, plants, rocks, etc., but what about an artistic vision of soil? Could a soil scientist visiting paintings at a museum recognize a soil profile on ancient paintings? Was soil a central subject for artworks in past centuries?

One can answer the 2nd question in the negative until the 19th century.

When soil was depicted by chance in the landscape it is as a line or a surface, not a volume. In some upper-Palaeolithic cave paintings, soil is represented by a line. The same goes for the Assyrian civilization (11th to 7th BC), which depicts natural scenes in which the soil surface is represented by schematic rocks and hillocks, drawn as shaped curves. In wall paintings of the Roman civilization, soil is clearly represented and in a realistic style as a surface that would never be seen during the Middle Ages until the Early Renaissance, even if rocks were clearly represented.

It is in some Renaissance paintings (by Bosch, Memling, Van der Weyden, Giorgione, Brueghel…) that the eyes of the pedologist can sometimes discern a kind of soil profile with different colors from the surface to deep horizons and/or with large roots in the soil profile. Description and reasons of these soil profiles' presence were detailed in some of Feller's publications. Three reasons cited were: to explain the resurrection of the dead (the dead was depicted like a pedologist coming out of the pit), to show a root from a magic plant – the mandragora –, or to show ploughing. Ploughing, showing realistic soil (e.g. Rosa Bonheur, 1849), was in fashion in the 19th century with rural art, but it was until the 20th century for artists to be inspired by the soil itself for the creation of their artworks.

Among the forerunners of Soil Art (a phrase created by G. Wessolek) in paintings, one can mention the American ruralist artist Grant Wood and his Arbor day (1932) with a kind of catena depicted in a cultivated landscape and the French artist Jean Dubuffet with his paintings series of Texturologies and Matériologies (1950-60) made with earth from his garden. After 1950, many artists used soil and represented it in paintings, such as the French artist Paul Rebeyrolles with his Grands Paysages (1978) and the famous German artist Anselm Kiefer and his Aperiatur Terra et Germinet Salvatorem (2005-2006).

Since the end of the 20th century, besides paintings, artists have also used other forms of expression such as installations, performances, sculpture, videos, etc. Among them, the author of this article has a passion for soil installations by the Japanese artist Kôichi Kurita (*http://soillog2.exblog.jp/*), whose philosophy is to show that soil is not dirt but beautiful. The artist has worked with soil from all around the world for more than 20 years. For each exhibition, he collects soils from a specific region, works with soil samples as a soil scientist (he is not) and he has installed hundreds of multicolored soil samples in sacred buildings such as abbeys, cathedrals, temples etc. Visitors say "Are these our soils? How beautiful!"

International Union of Soil Sciences

Soils and History

By Verena Winiwarter, Alpen-Adria-Universität Klagenfurt, Schottenfeldgasse 29, A 1070 Wien
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Soils are indispensable for human life. Terrestrial plants and animals have provided the greatest part of human nourishment over the course of history and continue to do so. Soil-derived biomass has been the prime source of fuel. In recent years, using soils to grow new energy crops is of increasing importance for climate protection. Soil has been and is still used as building material and decoration, as protective cover for skin and as material for vessels and ovens. The practice of geophagy, consuming soil as medicine or nourishment, was once more widespread than it is now.

Not only has soil quality determined individual wealth, but also settlement patterns, food choices and livelihoods in general and can thus be called a defining factor of human history. Wars have been fought over fertile land, and the value of soils is the basis of legal systems based on territory.

Anthrosols, soils co-created by humans, are widespread, with Terra Preta do Indio, the dark, fertile soils of the Amazon, as one prominent example. The plaggen soils resulting from centuries of adding grass sod soaked with animal droppings from being used as bedding in stables to otherwise marginal soil, or the soils of paddy rice fields are other examples of long-term soil management. Erosion prevention measures included stone mulching and terracing. Irrigation added further complexity, making cycles of leaching excess salt after periods of irrigating fields necessary. The administrative needs of building and maintaining infrastructure (often built partially with soil as in earth dams) created the need to develop forms of long-term documentation. Some of the earliest of such documents were made of soil themselves, i.e. clay tablets with cuneiform script.

All agriculture-based civilizations tried to document and systematize knowledge about soils and soil fertility. Soils were distinguished in several dimensions already in ancient China and in the Roman Empire. Soil classifications as well as tests for its qualities and suitability for crops were developed. Roman polymath Pliny the Elder held – echoing agricultural treatises of his time – that wine would taste like the soil it grew on, an early recognition of what is marketed as 'terroir' at present. The European roots of ecological thought can be found in Theophrastus' of Eresos (c. 371 - c. 287 BC) botanical writings, where he discusses the influence of soil quality on plants. He maintains that different soils can completely change a plant, and mentions the pomegranate as an example.

Many cultures revered the soil, either personified as Mother Earth (e.g. Latin: Terra Mater or Tellus, Greek: Gaia) or as a numinous entity. The Chinese worshipped clods of soil at stone altars close to the fields, later on also personified them. Many goddesses and gods of fertility also include the aspect of soil fertility.

Soils are an important archive for cultural and natural history, preserving remains and artifacts. Under some circumstances, human interventions will leave a discernible imprint on aboveground biodiversity and plant cover over millennia, a testimony to the long-term entanglement of humans and soils.

International Union of Soil Sciences

Soil and Water Quality

By Bernd Lennartz, Chair of Commission 3.2 Soil and Water Conservation
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The term 'soil quality' indicates to what extent the soils of the world are able to provide ecosystem and societal services through several different functions. The production of food (and energy) is the most important function of soils from an anthropogenic perspective. Maintaining biodiversity is a likewise crucial soil function in the ecosystem context. Furthermore, the resilient reaction of landscapes upon weather extremes such as heavy rainfall is fundamentally linked to the water storage function of soils. Fully functional deep soils lower the flooding risk and provide water to plants during dry conditions because of the soils' water storage capacity. Closely related to water retention is the ability of soils to cleanup the percolating rainwater.

Water quality is characterized by means of physical, chemical and biological parameters, in general, with respect to a certain purpose such as drinking or maintaining biodiversity. Soil quality and water quality very much depend on each other since soils form an important stage in the water cycle by temporally retaining water. The filter and buffer function of soils

directly improve (ground)water quality as estimated on the basis of chemical indicators. Soils store nutrients and thereby protect water resources against eutrophication. Water purification through soils is achieved by mechanical filtration, adsorption of compounds and transformation of pollutants into non-toxic degradation products. Soil protection is, thus, a prime measure of water conservation because of the close interlinkages of soil and water processes. After decades of loading land surfaces with nutrients and pollutants, soils may also become a source of water contamination. Even after rethinking and reversing fertilization strategies and use of pesticides, nutrients and pollutants are leached from soils.

Soil quality and productivity of farmland as core elements of food and nutritional security can be rated based on how operational soil functions are. Soil physical properties including rooting depth or water holding capacity along with substrate composition and organic matter content are key parameters to be determined in soil quality assessments. Site specific conditions including drought/flooding and salinization risks have to be taken into account in order to fully understand soil quality at a given site.

Protection and maintenance of soil functions in landscapes under agriculture or forest use are the basis of a sustainable land management. Processes such as soil erosion, compaction, contamination, and loss of fertility compromise soil quality, eventually causing land degradation. Water quality is, likewise, at risk if soils are not carefully managed and protected. Historical and current examples of an unsustainable land management demonstrate the clear connection between loss of soil quality and hunger and/or poverty often at large scales.

International Union of Soil Sciences

Soil and Climate

By Rattan Lal, President of International Union of Soil Sciences 2017-2018
Carbon Management and Sequestration Center, The Ohio State University, Columbus, OH 43210

World soils play an important role in the global C cycle. The soil C stock comprises of two related but distinct components: soil organic C (SOC) and soil inorganic C (SIC). The global SOC stock (Pg = 1 billion ton = Gt) is estimated at 704 for 0.3-m, 1505 for 1-m and 3300 for 2-m depth. The SIC stock (Pg) is estimated at 234 for 0.3-m, 722 for 1-m, and 1700 for 2-m depth. Thus, total soil C stock to 2-m depth is 5000 Pg. In addition, soils of the permafrost contain 1400-1700Pg. Thus, total soil C stock of ~6500 Pg is 8.1 times the atmospheric C stock of 800 Pg and 10.5 times that of the biotic C stock (620 Pg).

Soil can be a source or sink of atmospheric CO2 depending upon land use and management. Conversion of natural into managed (agricultural, urban, etc.) ecosystems can deplete the SOC stock. The magnitude of depletion depends on the historic land use, management, and vulnerability to erosion and other forms of degradation.

Soils of managed ecosystems, and those prone to degradation and depletion, have a potential C sink capacity. The strategy to recarbonization of the soil is based on the concept of creating a positive soil C budget. This implies that input of biomass-C into the soil (e.g. crop residues return, cover cropping, manuring) exceeds the losses caused by erosion, decomposition and leaching. Managing soils for increasing C stock, called "soil C sequestration" refers to that of SOC or SIC. Within a landscape unit sequestration of SOC is a preferred option in humid, sub-humid, and semi-humid climates. However, sequestration of SIC, as secondary carbonates or leaching of bicarbonates, can be an option in arid and semi-arid regions and in irrigated soils.

Techniques of SOC sequestration include conservation agriculture, cover cropping, agroforestry, controlled grazing, improved pastures, integrated nutrient management, biochar etc. The rate of SOC sequestration may range from 0.1 to 1.0 MgC/ha.yr depending on climate, soil and land use. The rate of SIC sequestration as secondary carbonates may be 2-5 kg/ha.yr.

The global technical potential of SOC sequestration (PgC/yr) is estimated at 0.4-1.2 for cropland, 0.3-0.5 for grasslands/grazing lands, 0.3-0.7 for restoration of salt-affected soils and 0.2-0.7 for desertification control and avoiding soil erosion. Thus, the total technical potential of SOC sequestration is 1.2-3.1 PgC/yr or an average of 2.2 PgC/yr. In addition, there is a potential of SIC sequestration and in the vegetation biomass. The total potential of world soils to sequester C is about 80-100 Pg, equivalent to atmospheric CO2 drawdown of 40 to 50 ppm over 25 to 50 years.

In addition to mitigating the climate change, soil C sequestration has numerous co-benefits. Important among these are: improving food and nutritional security, increasing renewability and quality of water, enhancing biodiversity etc. Thus, soil C sequestration is a win-win-win option.

International Union of Soil Sciences

Conference and Meeting Reports

1st World Conference CONSOWA

Final report and conclusions

The 1st World Conference on Soil and Water Conservation under Global Change was held from 12-16 June 2017 in Lleida (Spain). For the first time, all the main World Scientific Organizations promoting wise and sustainable use, management and conservation of the mail natural resources, namely *soil and water*, responsible for the maintenance of life on Earth, have decided to have a joint conference, called CONSOWA.

The 1st World Conference on Soil and Water Conservation under Global Change (CONSOWA), was a joint Conference of the International Soil Conservation Organization (19th ISCO Conference), the World Association for Soil and Water Conservation (WASWAC International Conference), the European Society for Soil Conservation (8th ESSC Congress), the International Union of Soil Sciences (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).

The main objectives of the 1st World Conference on Soil and Water Conservation under Global Change (CONSOWA) were:

- To analyze the present and projected future situation, at world-wide level, of the conservation of the soil and water resources, as influenced by Global Changes, including population growth and development, changes in land use and management, and human induced climate changes. This situation would be analyzed and discussed taking into consideration the close and critical relation of the use and management of the limited soil and water resources with present and future climate changes, natural disasters, and with food and water supply for an increasing world population.
- To promote an increased collaboration, and even a full integration of their activities, to reach their goals more efficiently, of the main scientific international organizations promoting soil and water conservation research and activities at Worldwide level.

which were mainly fulfilled.

The Conference was carefully organized during the last two years, after having the approval of sponsorship from the different International Organizations and from the Spanish Soil Science Society (SECS), when they were approached by Prof. Ildefonso Pla, who took the responsibility for the organization. The following step was to get the approval of the Universitat de Lleida (UdL), and its Foundation, and from the Department of Soils and Environmental Sciences (DMACS) of the UdL. The Organization Committee was mainly composed by members of the DMACS-UdL, namely:

- PRESIDENT AND GENERAL COORDINATOR: Ildefons Pla Sentís
- INSTITUTIONAL COMMISSION COORDINATOR: Jaume Porta
- SCIENTIFIC COMMISSION COORDINATOR: Rosa Poch
- PROGRAMMING COMMISSION COORDINATOR: Angela Bosch
- FIELD TRIPS COMMISSION COORDINATOR: J. Carles Balasch
- PUBLICATIONS COMMISSION COORDINATOR: Rosa Poch
- EXHIBITIONS COMMISSION COORDINATOR: J. M. Villar
- ADMINISTRATIVE COMMISSION COORDINATOR: Ildefons Pla and Fundación UdL
- ORGANIZING COMMITTEE SECRETARY: Clara Llena
- CONFERENCE SECRETARIES: Mariona Puigdevall and Marta Iglesias

Thanks to all of them and their collaborators, we have been able to organize this very complex Conference, which has been very well qualified by most of the participants.

Afterwards, we obtained the support of the European Geosciences Union (EGU) Meeting Support Program, of the IUSS Stimulus Fund and of IUSS Division 3, of the ESSC Grants Program, which allowed us to give scholarships, including registration fees, to a group of bright young researchers, mainly from developing countries, and to cover registration fees of some keynote speakers from developing countries. Some of the young researchers from developing countries also got free lodging in the UdL dormitories.

Some support from local Organizations, and especially from the Diputació de Lleida, the Paería de Lleida, the Institut Geologic de Catalunya, the Consell Catalá de la Producció Integrada, AKIS International, and the Cabildos of Lanzarote and Fuerteventura Islands, also contributed to the success of the Conference.

Although initially we had expected 300-350 participants, based on the number of people who had manifested their interest and intention to participate, submitting on time short abstracts, finally the number of registered participants was close to 250. This reduction in number could be mainly attributed to cancellations for different reasons, among them difficulties to obtain entry visas (at least 60) and to get financing from their institutions. For future conferences, it would be necessary to take into consideration those increased restrictions, which will decrease the number and countries of origin of participants. In our case, those restrictions to get entry visa, apparently could not be sorted in many cases despite our invitation letters, certifying the reception and approval of the submitted paper, for oral or poster presentations. Still, with all those limitations, we were able to have participants from 34 countries of all continents, including: **Algeria, Argentina, Australia, Austria, Belgium, Brazil, Canada, Czech Republic, China, Chile, Colombia, Costa Rica, France, Germany, Hungary, Italy, Iran, Japan, Jordan, México, Mozambique, Paraguay, Peru, Portugal, Romania, Russia, Serbia, Spain, Switzerland, Taiwan, Turkey, UK, USA, and Venezuela.**

In any case, the number of participants and represented countries was much higher than in other conferences organized separately by the different Organizations sponsoring CONSOWA in the last two years, where the number of foreign participants and represented countries in most cases did not exceed 50 and 12, respectively.

It is worth mentioning that in CONSOWA we had a large participation of young researchers, including PhD students (30% of the total number of participants), thanks to the very reduced registration

fees for them, and thanks to the high number of scholarships, covering registration fees and in some case lodging, with funds provided by IUSS, EGU, ESSC and UdL.

The program of the Conference **included 19 invited keynote plenary lectures, 87 oral presentations in 13 sessions, and 104 poster presentations in three daily sessions**. Besides there were two discussion sessions, with the following objectives:

Discussion Session 1: 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.

Discussion Session 2 (Activity dedicated to the International Decade of Soils (2015-2024) proclaimed by IUSS): Analysis and setting the challenges and required achievements in the next decade, to prevent and counteract the predicted effects of global changes on soil and water degradation processes, and effects on food and water supply for a growing world population, on environmental degradation and on natural disasters

Additionally, there were 7 field trips, one pre-conference, one post-conference and five during the conference, to visit and observe different systems and practices of land use and management, and of soil and water degradation processes and effects, both under dry-land and irrigated conditions.

The keynote lectures were a very important part of the Conference, with lecturers carefully selected, based on their recognized experience, research and responsibilities, at world or regional levels, in the central topics of CONSOWA. They included:

- ***RATTAN LAL (USA)***
  "Soil and Water Conservation to Mitigate Climate Change and Advance Food and Nutritional Security".
- ***ZHAOYIN WANG (CHINA)***
  "Two thousand years debate and practices of sedimentation management of the Yellow River".
- ***WINFRIED BLUM (AUSTRIA)***
  "Threats to soil and water conservation – general developments and future scenarios, a worldwide perspective".
- ***WALTER PENGUE (ARGENTINA)***
  "Mining Soils in the Argentinian Pampas: Hidden costs derived of technological intensification in industrial agricultural models"
- ***JOSÉ LUIS RUBIO (SPAIN)***
  "New perspectives for soil conservation in today's global transition scenarios".
- ***FERNANDO DELGADO (VENEZUELA)***
  "Soil-water-climate management and conservation systems in ancient cultures of Tropical Latin America".
- ***GUSTAVO MERTEN (BRAZIL)***
  "Soybean expansion in Brazil: land use changes and soil management challenges".
- ***MIODRAG ZLATIC (SERBIA)***
  "Socio-economic issues of torrential flooding prevention".
- ***SAMIR A. EL SWAIFY (USA)***
  "Diagnostic Criteria for Soil Degradation – Necessary Distinctions for Tropical Environments".
- ***LI RUI (CHINA)***
  "Preliminary Functions of Soil and Water Conservation Practices for Climate Change Mitigation and Adaptation in China".
- ***MIQUEL ARAN (SPAIN)***
  "Role of inorganic and organic fertilizers on soil degradation. Case of the intensive arable land in Western Catalonia (Spain)".
- ***MARK NEARING (USA)***
  "The Rangeland Hydrology and Erosion Model".
- ***CARMELO DAZZI (ITALY)***
  "Anthropogenic soils and soil security: environmental and economic consideration".
- ***ARTEMI CERDÁ (SPAIN)***
  "Fire effects on soils and on erosion processes".
- ***FENLI ZHENG (CHINA)***
  "Soil erosion, soil quality and crop yield in the Chinese Mollisol region".
- ***ROY SIDLE (AUSTRALIA)***
  "Dynamic environmental controls on rainfall triggered landslides".
- ***ILDEFONSO PLA (SPAIN)***
  "New advances in the evaluation of salt-affected soils under dryland and irrigated conditions".
- ***WANG FEI (CHINA)***
  "Impacts of re-vegetation on surface soil moisture over the Chinese Loess Plateau and new challenges of soil and water conservation".
- ***BERND LENNARTZ (GERMANY)***
  "Nutrient export patterns from artificially drained lowland catchments".

Their presentations covered, and even surpassed our expectations, and from them, and the discussion generated, we may extract the following conclusions:

- Most of the present and future/medium term problems due to soil and water degradation and their effects worldwide, may be mainly attributed to pressures derived from population growth and development, and to social, economic and marketing factors.

- Nowadays, besides surface erosion processes, there are other soil degradation processes such as mass erosion, soil organic matter and nutrient depletion, soil and water contamination and salinization, soil compaction, etc, which in many cases have more direct influence on critical derived effects related to food and water supply for an increasing population, and on natural disasters like droughts, sedimentation, flooding, etc, causing increasing human and economic losses.

- The adoption of what usually are considered "standard", of universal application, land conservation systems and practices, like bench terracing, zero tillage, etc, without considering the specific conditions (soil, climate, drainage, crops, rotations, etc) may lead, and is leading instead to land, soil and water degradation processes, with onsite and offsite sometimes catastrophic consequences. Examples of those processes in China, Argentina and Brazil were presented, with different characteristics, but in all cases affecting very large stretches of agricultural lands.

- The benefits of soils, as regulator of greenhouses gas emissions to the atmosphere, through C sequestration in the soil, may be better reached in a sustainable way, with appropriate land, soil and water management leading to improved sustainable agricultural production, and to reduced deforestation. The approach has to be rather to apply land management practices to attenuate climate change progress and effects, than to adapt land management practices to mostly hypothetical predicted future climate changes.

- Although land and soil degradation processes and related effects are generally a consequence of inadequate land use and management, resulting from social and economic pressures, their effective control is in many cases limited due to deficiencies in the available local information on soils, climate, and on research related to the specific degradation processes. In those cases, the empirical application of "standard" or "universal" conservation practices, supposedly effective under any combination of soils, climate, hydrological conditions, cropping systems, etc, may lead and is leading to catastrophic consequences.

- The great number of factors, and their complex interactions, determining and affecting soil and water degradation processes, and conservation practices, require more interdisciplinary approaches and research, in order to be able to identify, to evaluate and to find adequate valid and sustainable alternatives to the different problems.

The main topics of the oral and poster presentations were related to **surface erosion (16%), soil quality (SOM and biological aspects) (13%), water management (12%, of which 10% dryland, 2 % irrigated), carbon sequestration (10%), climate changes (10%), soil tillage (8%), and soil contamination (6%).** Worth mentioning is the reduced number of papers on topics like **sedimentation effects (5%), socio-economic factors (4%), crop production effects (4%), mass erosion (2%), desertification (2%), salinization and sodification (2%), soil compaction (2%), wind erosion (1.5%), flooding effects (1.5%).**

About 60% of the papers were based on empirical approaches and empirical models, rather than on actual field or laboratory data and research. In any case, compared to previous conferences, there is a decrease in presentation of papers dedicated to surface soil erosion, and to soil tillage and desertification, and an increase in aspects more related to the hydrological, chemical and biological aspects and factors of soil degradation. In general, with some very valuable exceptions, empirical approaches, reduced field work, a focus on isolated aspects of soil and water conservation, and scarce interdisciplinary work, were the predominant characteristics of the research results presented at CONSOWA.

The discussion sessions started with a short presentation of the members of each panel, about the particular points of view in relation to the topic of each session, followed by open participation of the

attendants, with comments and questions based on them and on the main points contained in a basic draft paper. The content of the draft paper, previously distributed to all participants, was based on contributions of selected leading specialists on different aspects of soil and water conservation at global level. They were: J. Dumansky (Canada); S. El-Swaify (USA); J. L. Rubio (Spain); W. Blum (Austria); C. Dazzi (Italy); G. Farías (Brazil); A. Cerdá (Spain); Li Rui (China); I. Pla (Spain). The members of the panels were:

Discussion Session 1: **Carmelo Dazzi, Samir El-Swaify, José L. Rubio, Craig Benson**
Moderator: **Ildefonso Pla Sentís**

Discussion Session 2: **Winfried Blum, Mark Nearing, Li Rui, Gonçalo Farías**
Moderator: **Ildefonso Pla Sentís**

As the time allocated for those discussion sessions during the Conference was limited, it was decided to ask all participants to submit or to send by email their comments or ideas during or after (with a time limit) CONSOWA. All contributions will be taken into account by a selected editorial committee, as a basis, together with the draft paper and the talks of the panel members, to write a final document, which will be published and submitted to all potentially interested Institutions and Organizations at different levels.

The field trips, the pre-conference (surroundings of Barcelona), post-conference (Lanzarote and Fuerteventura Canary Islands), and the five ones during the Conference, were carefully organized, with a selection of places to be visited, which showed examples of different land use and management systems and practices related to soil and water conservation. The places visited included areas with semiarid to arid climate, but also with sub-humid climates, used for forestry, different cropping systems and for husbandry, both under dry-land and irrigated conditions. Among the main aspects that could be observed during the field trips, the following are particularly worth mentioning:

- *Agricultural use of lands in peri-urban areas*
- *Land and soil reclamation and use for organic and bio-dynamic agriculture, in areas previously used for mining and quarry extractions*
- *Rain water harvesting, and soil water conservation practices, for agricultural production in arid climates*
- *Effects of changing from dry-land to irrigated conditions, on soil and water management and on soil conservation practices and structures*
- *Changes in land use and management and on soil and water conservation practices, determined by economic and marketing pressures*
- *Effects of present and historical land use and management on surface erosion and on mass erosion, as a source of sediments affecting the storage capacity of dams. Practices and structures to control them*
- *Land, soil and water use and management, with high technological level, under very intensively irrigated highly productive agriculture (mainly fruit production), in soils of "inherent" very low quality*
- *"Terroirs", where the combination of soils, climate, variety and age of the vines, and management permits the production of very high quality wines.*

All field trips included visits to places with spectacular landscapes and of high historical and archeological value.
One of the most important events of the Conference was the ceremony of investiture as "Doctor Honoris Causa" at the University of Lleida (Spain) of Prof Dr Rattan Lal, President of IUSS (International Union of Soil Sciences) upon proposal of the Departments of Soils and Environmental Sciences and of Crop and Forest Science of the Agricultural and Forestry Schools of UdL. Prof. Dr. Rattan Lal, besides being at present the President of the IUSS, the main World Organization in Soil Science, is one of the main world renowned rechearchers in the area of Soil and Water Conservation and related effects on agricultural food production and on the environment. He has been a pioneer in studying the relations of C sequestration in soils and vegetation under climate change.
During the Conference board meetings of several of the organizations sponsoring CONSOWA were held. One of the main points discussed, both in the individual board meetings on Monday 12 June, and afterwards in the joint board meeting on Friday 16 June, was the feasibility of organizing similar joint conferences like CONSOWA in the future. In general, both the different members of the organizations participating in those meetings, and many other opinions of participants, either expressed directly at the Conference and in mails received afterwards, concur in that, based on the generally accepted success of this first experience of CONSOWA, it would be worth continuing in the future. Based on that general feeling, we made a proposal to the joint board meeting, which would be called "Lleida Declaration", as follows:

LLEIDA DECLARATION

The Joint Board Meeting of the International Organizations participating in the 1st CONSOWA Conference held in Lleida (Spain), 12-16 June 2017, based on the positive experience of this first Joint Conference, have decided:

1. To repeat in the future this kind of Joint Conferences, which will be called CONSOWA with consecutive numbers (2nd CONSOWA, 3rd CONSOWA, etc).

2. These Joint Conferences would be held every 2-4 years, in a country selected during the previous CONSOWA.

3. This would not prevent that the individual organizations have conferences, workshops, etc on specific topics, in between those CONSOWA Conferences, inviting to them all the other organizations.

4. To facilitate the organization of those Joint Conferences, the Organizations here represented decide to create a Confederation of them, with a Coordinating Committee formed by the Presidents of the different Organizations, chaired by one of them on a rotating basis.

5. The final objective, to be further analyzed by the Confederation, would be to become in the future a unified Organization on Soil and Water Conservation, with different units, corresponding to different aspects of the general topic, including the different objectives and activities of the – at present – separate organizations, if possible.

6. To this declaration and agreements, other organizations dealing with the general objective of soil and water conservation, not represented here, may request to be included at any time, if they wish to do so.

Lleida, 16 June 2017

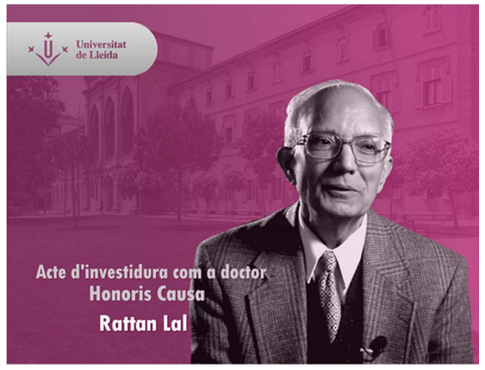
Although it was generally considered as desirable to have a unified strong organization in the future, it was also realized that due to the very different structures and rules of the present organizations, it would take some time to reach that final objective. This is why, in the meantime, it is proposed to create a kind of confederation of the organizations agreeing to be members of such confederation, chaired by the President of one of the organizations, on a rotating basis.
As not all the Organizations sponsoring CONSOWA 2017, were represented in the joint board meeting, and due to the small number of board members of the represented Organizations being present, it was decided to take some time to consider the different proposals in each board, before reaching a final decision. As President of ISCO and of the first CONSOWA I would be ready to act as a liaison between the different organizations to prepare the final proposal agreed by all of them. The next proposed joint meeting of WASWAC and ISCO in India in 2019, which could also be sponsored by the other organizations participating in the 1st CONSOWA, if the organizers asked for it, could be a good occasion to reach a final decision about the proposed joint Organization.

Lleida, 10 July 2017

Ildefonso Pla Sentís,
President of ISCO
President of CONSOWA 2017

Investiture as "Doctor Honoris Causa" at the University of Lleida (Spain) of Prof Dr Rattan Lal, President of IUSS (13 June 2017)

One of the most relevant programmed activity of the 1st World Conference on Soil and Water Conservation under Global Change (CONSOWA Lleida 2017), was the ceremony of investiture of Prof Dr Rattan Lal, President of IUSS, as "Doctor Honoris Causa" at the University of Lleida (UdL) (Spain), upon proposals of the Departments of Soils and Environmental Sciences and of Crop and Forest Science of the Agricultural and Forestry Schools of UdL and the support of the Sections of Control de la Degradación y Recuperación de Suelos and of Conservación de Suelos y Aguas of the Soil Science Spanish Society (SECS). For this investiture, Dr. Lal's long-time and pioneering research, reflected in numerous publications, directed to solve problems of soil and water management of agricultural soils, and their relations both with C sequestration in soils, control and mitigation of climate change and finally with food production and food security were taken into account.



The presentation of merits (laudatio) of Prof. Dr. Rattan Lal was in the hands of Prof. Dr. Ildefonso Pla Sentís. For the ceremony old traditions of the UdL, founded the year 1300, were followed.

Ceremony of Investiture of Prof Dr Rattan Lal as "Doctor Honoris Causa" at the University of Lleida

Pedometrics 25th Anniversary Conference, 26th June - 1st July 2017

Report on Pedometrics Conference by Grant Campbell

At the end of June, I attended my first ever international PhD conference in Wageningen, the Netherlands. This was an extra special conference for me because I was a part of the conference's 25th anniversary and it provided me with a great opportunity to meet fellow PhD students and experts in my research field of Digital Soil Mapping (DSM) in an international environment. It also provided me with an opportunity to present my latest work I've been doing on DSM of soil properties across Great Britain. During the week there were a lot of things on offer and I will explain my experiences in this post below. According to the book, there were 5 workshops, 6 keynote speakers, 130 oral talks and 120 poster presentations: a LOT of science! The conference was attended by 247 participants from 50 countries.

Day 1: After an initial welcome from Gerard Heuvelink to the conference, we were treated to two excellent keynote presentations from speakers Alfred Hartemink who discussed how the pedon is at the core of Digital Soil Morphometrics and Laura Poggio who looked into fusing data and expert knowledge for Digital Soil Assessment. I personally found both presentations thought provoking and very insightful.
The day then moved into some parallel sessions where attendees could go along to a range of oral presentation sessions on themes centred on soil monitoring, uncertainty in soil data and predictions & geostatistics, data fusion in soil mapping and modelling, proximal soil sensing and Digital Soil Morphometrics.

Day 2: The next day kick started with two keynote presentations from Tom Orton on sample support in connection to soils data and Jianghao Wang on what Pedometrics can learn from big data.
After lunch, we were then introduced to a few presentations at a very exciting and interesting 25th anniversary celebration session. The session began with the Alex McBratney and Jaap De Gruijter talking about the start of Pedometrics and the journey it has undertaken to date. After the duo completed their presentation, Murray Lark stepped up to discuss the past, present and future methods of mathematical models in Pedometrics – another very entertaining session.
The session was then suspended for a coffee break featuring excellent 25th anniversary cake and a quiz centred on soils!
Day 3: The penultimate day of the Pedometrics Conference began with a talk from Mike Kirkby from the University of Leeds who looked into implementing a conceptual model of physical and chemical soil profile evolution. This was another engaging talk and made us think about the soils more specifically that what we may not have thought about on a regular basis.
The Conference dinner was a rather interesting evening which took place in a Zoo…Yes, you may laugh, but the busses took us to the Burgers Zoo just outside Wageningen for the meal at night! A rather interesting and unusual choice of location but one that worked extremely well! After a great evening of food, drink and terrible dancing, the conference rolled onto the final day for me on the Friday.
Day 4: The final day, after an excellent night before, began with a keynote talk from Rob Beens and Peter van Erp talk who were discussing the marketability and business concept for fast and reliable soil sensing. This was very different from the other talks and I found it particularly interesting indeed.
The session was ended by an excellent final keynote from another one of the founders of DSM research Budiman Minasny who looked at unearthing soil change with what he called 'dirty' data! It was a very thought provoking talk which certainly got me thinking about how to deal with data that may be incomplete or not ideal to work with.

Winners
A short mention to congratulate the students who won awards at the Pedometrics Conference notably Wartini Ng from The University of Sydney

for Best Oral Presentation entitled: Rapid sensing of petroleum-contaminated soils with mid infrared spectrometers and Alexandre M.J-C. Wadoux from Wageningen University for Best Poster Presentation entitled: Modelling the soil information content of mid-infrared spectra at European scale.

Reflections

As the conference closed, I reflected on one of the best experiences I have ever had since I started my PhD. Being my first international conference made it extra special and I would encourage all students during the PhD's to try to attend a conference internationally. It is definitely a different experience from attending a conference at national level as you can mingle with different colleagues and networks from different countries and get a sense of the different philosophies that people are implementing in their own research. The Pedometrics Conference was an invaluable experience for me and I'll certainly take a lot of the feedback, connections and thoughts on board going forward for the rest of my own PhD.

For photos and further information see *www.pedometrics2017.org*

Grant Campbell is a PhD student based at The James Hutton institute and Cranfield University. Grant's PhD aims to improve the scale of Scotland and England and Wales soils data by using Digital Soil Mapping (DSM) and modelling algorithms for a range of stakeholders.

International WRB soil classification field workshop

July 22-27, 2017, Latvia and Estonia

By Raimonds Kasparinskis, President of the Soil Science Society of Latvia and
Peter Schad, Chair of the IUSS Working Group WRB

Organized by:
- Soil Science Society of Latvia
- University of Latvia, Faculty of Geography and Earth Sciences
- Soil Science Society of Estonia,
- Estonian University of Life Sciences

Financial support by:
- IUSS Stimulus Fund
- IUSS Division 1
- University of Latvia
- Estonian University of Life Sciences

Report

The development of the international soil classification system World Reference Base for Soil Resources (WRB) has progressively improved the characterization of the functioning of soil systems and the understanding of soil processes and soil functional qualities for agriculture, forestry and the environment.

The International WRB Soil Classification Field Workshop held in Latvia and Estonia (July 22-27, 2017) was a great opportunity for soil scientists to stimulate deep reflections on the strong links between soil classification, soil quality and sustainable soil management and conservation. We were able to test the WRB in the boreo-nemoral region, where soils are the result of very complex factors and processes at different scales.

The participants of the workshop came from 13 countries: Estonia, Latvia, Russia, Poland, Germany, Austria, Italy, Spain, Belgium, The Netherlands, Norway, Mexico, and South Africa, among them a significant number of young scientists.

The soil profiles were developed mainly from Late Weichselian glacial deposits (formed by loamy sand, sandy clay, loam, clay, gravel, and sand) that have been altered to some extent by postglacial aeolian, marine, lacustrine, alluvial and mire sediments, as well as formed on pre-Quaternary sedimentary rocks.

This workshop showed terrestrial, semihydromorphous and hydromorphous soils. We saw 22 soil profiles, which belong to the following Reference Soil Groups: Histosols, Gleysols, Planosols, Stagnosols, Phaeozems, Luvisols, Retisols, Podzols, Cambisols, Calcisols, Arenosols, Fluvisols, and Anthrosols. They were located in intensively and extensively used agricultural lands and in deciduous and coniferous forests. Some had thick organic surface layers, and the humus forms and related biological activities were discussed: mull, moder, mor, amphi etc. Many peatlands had been drained resulting in enhanced decomposition of organic matter. Some of them still are Histosols, in the WRB characterized by the Murshic qualifier, and some passed to other Reference Soil Groups. Soils characterized by groundwater (Gleysols) or stagnant water (Planosols, Stagnosols) are very common and led to an intensive discussion how to differentiate them.

Participants of the International WRB Soil Classification Field Workshop during discussions at a soil profile (photo: Raimonds Kasparinskis)

Profile 6: Hypereutric Endoluvic Planosol (Anoarenic, Aric, Ochric, Endoraptic, Bathyclayic) (photo: Peter Schad)

Such field workshops with discussions of specialists from different countries and different disciplines of soil science, like soil morphology, soil genesis, soil management, soil conservation, and soil classification, are important for the further development of our science.

The Guidebook of the International WRB Soil Classification Field Workshop in Latvia and Estonia (compiled before the workshop) is available here: *https://store.lu.lv/?vid=61815177-241c-6729-923f-00002e3f8d1f*

A series of soil profile pictures is available here: *http://iuss.org/index.php?article_id=73*

VII[th] International Conference on Cryopedology

By Dr. Megan Balks, Senior Lecturer at Waikato University, New Zealand

International Conference on Cryopedology "CRYOSOLS IN PERSPECTIVE: A VIEW FROM THE PERMAFROST HEARTLAND" was held on 21-28 August, 2017 in Yakutsk, Sakha (Yakutiya), Russia. It was organized by the Cryosol Working Group of the International Union of Soil Sciences, International Permafrost Association, Dokuchaev Soil Science Society and several institutes of the Russian Academy of Sciences with the Institute of Biological Problems in the Cryolithozone as the host institute of the conference.

The major goal of the conference was to summarize international knowledge in cryopedology and to outline prospects for future research.

114 scientists from more than 20 research centers of the Russian Federation and 11 colleagues from Germany, Japan, New Zealand, France, Sweden and Belarus took part in the conference. The program included the plenary session and seven working sessions with oral and poster presentations.

The opening session of the conference "Current challenges in cryosol research" featured an excellent introduction to the conference, with leading Russian and international researchers discussing the current range of issues, including the concept of "extreme pedology" that is represented in cryogenic environments. Cryosol dynamics and changes in permafrost were covered in relation to human induced changes such as fire, and forest clearance as well as climate change. There was presented new information that suggested that the greenhouse gas emissions from cryosols are strongly impacted by local land use impacts and that the magnitude of such emissions was similar to the emissions projected as a result of climate change effects.

The working sessions were as follows: 1) Genesis, geography, mapping, classification, and terminology of Cryosols, 2) Cryosol dynamics and regimes, 3) Carbon cycles in permafrost landscapes, 4) Pedobiology of the cryosphere, 5) Paleopedological issues in Cryosol research, 6) Application of different methods in Cryosol research, 7) Cryosol management and awareness building.

A public outreach effort that sets cryosols in the global context of the range of soils on the planet in a new book entitled "Celebrating Soil, discovering soils and landscapes" was presented by Dr. Megan Balks, New Zealand.

New co-chair of the Cryosol Working Group (CWG) was elected. Alexey Lupachev from Puschchino Scientific Center followed Dmitry Konyushkov (Dokuchaev Soil Science Institute) after 8 years of successful work as the chairman. John Tedrow Prize – a new award of the Cryosol Working Group "for influential contributions in the field of cryopedology promoting for our understanding of the genesis, geography, functioning, and management of permafrost-affected soil systems" was established at the conference.

The fieldtrips were excellent with the wide range of soils within the Lena River valley presented. The international standard of profile presentation

From the left to the right: Roman Desyakin, Yakutsk, Vice-chair of the Organizing committee, Mikhail Zheleznyak, Director of P.I. Melnikov Permafrost Institute, Yakutsk, Mikhail Lebedev, Chairman of Yakutsk Research Center, Chair of the Organizing Committee, Megan Balks, Waikato University, New Zealand, Vice-chair of the Organizing committee, Sergey Goryachkin, Vice-president, Dokuchaev Soil Science Society, Russia

At the mid-conference field tour

with pit excavation to 2 m depth was impressive and allowed the large group to readily see and understand the soils with good supporting analytical data available. The highlight was a catena of three soils across the Desyatkin alas with the soil changes across the topography readily evident. The combination of cryoturbation, peat accumulation, and soil pHs in the 8-9 range, was a source of interest to international visitors who are not so familiar with the extreme environment of Yakutia. There are 8 month winters with tempertatures as low as -60 degrees C, a closed system with no water outflow in the alas, about 200 mm mean annual precipitation, that is farmed for hay production. A number of researchers took advantage of the opportunity to take samples for further analytical investigations as well as profiles to contribute to the soil profile collection of the V.V. Dokuchev Central Museum of Soil in St Petersburg.

This conference left no doubt that Russian scientists are the current world leaders in cryopedology which was demonstrated by the range and depth of papers presented. There was however no clear consensus as to the effects of current or potential climate change in the Yakutia region. Data sets and information suggested that where forest was undisturbed there was no evidence for increasing depths of permafrost or other changes. However where human disturbance and removal of forest had occurred either by fire or removal for road or farm infrastructure the melt out of subsurface ice and subsequent surface subsidence are a major medium term disruption to the landscape.

There is an ongoing need to support further research into the dynamic changes that occur within permafrost environments in response to anthropogenic changes, be they local disturbances, or wider climate effects. The challenge is to effectively manage changes for the benefit of the local peoples of the region.

The organisers are to be congratulated on the excellent standard of papers, English language, availability of translators, and running fieldtrips to a high international standard in remote areas with a challenging climate! The conference was an enjoyable and educational event for all participants.

More details at *www.cryosols.org*

Short report about visit of Prof. Flavio A. O. Camargo to the Japanese Society of Soil Science and Plant Nutrition

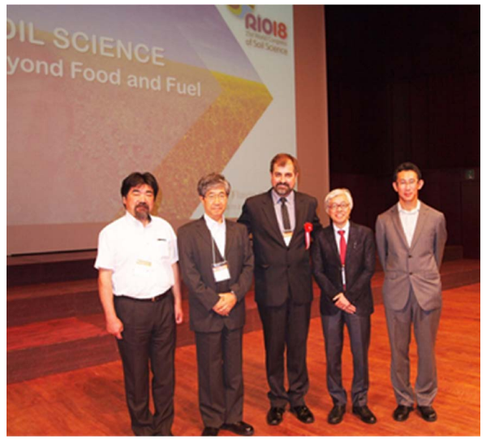
Report by Kazuyuki Inubushi

Prof. Flavio A. O. Camargo, vice President of IUSS, Federal University of Rio Grande do Sul, was invited by the Japanese Society of Soil Science and Plant Nutrition (JSSPN) to the Annual Meeting, 5-7 September 2017 in Sendai, Japan.

He delivered a special lecture on "Soil science: beyond food and fuel – Brazilian agriculture in perspective". It was impressive to the JSSSPN members to find history and dynamic scenes of agriculture in Brazil and important roles of soil science for local and global environment, social and cultural aspects and so on. Please see photos of the event below.

On 4 September he also joined the Japanese Paddy Soil Working Group to exchange knowledge, experience and current hot topics about paddy soil sci-

ence. Participants also expressed the wish to have the opportunity to attend WCSS 2018 Rio, not only in conference but also actual paddy soil and practices in the field after the congress. Prof. Camargo promised to organize a post-congress tour for Japanese paddy soil scientists and all participants of WCSS 2018.



Profs Hatano (Vice President of JSSSPN), Inubushi (President of JSSPN, Camargo, Kosaki (President-elect, IUSS) and Yanai (International correspondence, JSSSPN), after the special lecture.

2nd Global Soil Biodiversity Conference

By Elizabeth Bach, Executive Director, Global Soil Biodiversity Initiative, Colorado State University

The 2nd Global Soil Biodiversity Conference (GSBC2) was held 15-18 October, 2017 in Nanjing, China. More than 1000 scientists from 47 countries gathered at the Nanjing International Youth Culture Centre to hear about the latest soil biodiversity science, network with colleagues new and old, and share new ideas.

Applying soil biodiversity science to global policy, Dr. Ronald Vargas, the Soils and Land Management Officer at the UN Food and Agricultural Organization and Secretary of the Global Soil Partnership, and Dr. Luca Montanarella, European Commission Joint Research Centre and chair of the Intergovernmental Technical Panel on Soils, called for a formal international assessment on soil biodiversity. There was much excitement around this call and it will be exciting to see it develop.

Conference co-chairs Prof. Ren-fang Shen (Institute of Soil Science, Chinese Academy of Science) and Prof. Yong-guan Zhu (Institute of Urban Environment, Chinese Academy of Science) shared recent developments in soil biodiversity research in China. Soil biology research has accelerated tremendously in the past 5 years in China and support for future work is strong. The China Soil Microbiome Initiative is a more than USD$35 Million project to systematically survey and sequence soil microbial diversity across China and link this biodiversity with key ecosystem services including nutrient cycling, crop production, and carbon storage. Leaders in the Soil Science Institute of the Chinese Academy of Science are seeking additional funding to extend support to include soil animals as well. In addition, the hundreds of Chinses graduate students, postdocs, lectures, and professors in attendance demonstrated deep knowledge, enthusiasm, and curiosity driving soil biodiversity research in China on topics ranging from agricultural production, ecosystem functioning, and restoration. In addition, the 19th National Congress of the Communist Party of China happened in Beijing the same week as GSBC2, and President Xi Jinping specifically included soil and ecological concerns as priorities for the Chinese agenda.

Dr. Diana Wall, Scientific Chair for the Global Soil Biodiversity Initiative (Colorado State University), highlighted key Global Soil Biodiversity Initiative (GSBI) accomplishments since the 1st GSBC including publication of the Global Soil Biodiversity Atlas (including a new website), publication of many prominent papers, establishment and funding of working groups like sWORM, and incorporation of soil biodiversity into international policy documents including the Global Land Outlook (UNCCD), Global Assessment on Land Degradation and Restoration (Intergovernental Platform on Biodiversity & Ecosystem Services, IPBES, expected spring 2018), and Global Assessment on Soil Biodiversity (IPBES, expected spring 2018).

Read more: *http://blog.globalsoilbiodiversity.org/article/2017/10/25/2nd-global-soil-biodiversity-conference*

42nd Congress of Italian Soil Science Society (SISS)

By Kazuyuki Inubushi, chair of IUSS Division 2

The 42nd Congress of the Italian Soil Science Society (SISS) was held at CREA-AA (Centro di ricerca Agricolture e Ambiente), Firenze, Italy from 5-7 December 2017 (see photograph below).

There were about 130 participants from universities and institutes in all regions of Italy and invited speakers from Japan (Prof. Kazuyuki Inubushi, Chiba Univ., IUSS Division 2 Chair) and Spain (Dr. Cario Garcia Izquierdo, CSIC-CEBEAS, Murcia).

Before the congress on December 4, there was a soil education workshop at CREA-AA with about 30 school children who were to learn to what extent soil is important but that it is a limited resource; with some experimental demonstrations and discussion.

After opening on December 5 with a celebration of the International Year of Soil and perspectives for the International Decade of Soils, there was a key note lecture and panel discussion about transfer and utilization of pedological information, followed by a round table discussion with researchers, national and local government representatives and presidents of related societies and associations.

Invited lecture by Prof. Inubushi introduced research highlights of soil properties and processes in Division 2, IUSS and some introduction about Andosol and Paddy soil utilization in relation to global environment with some international activities.

Then a total of 5 scientific sessions with oral presentations and posters were presented covering soil quality, multi-functions, ecosystem services, soil erosion, contaminations, modeling, mapping, biodiversity and so on. There were also technical workshops in parallel on the application of new technologies such as soil quality analysis, greenhouse gas measurements and so on.

During the closing ceremony, some awards were given for research progress, and winners of poster and photo contest were announced. SISS will continue to keep up national activities and also towards the end of International Decade of Soil.

IUSS Alerts June - November 2017

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 2017.

Latin America loses one of its most famous soil scientists: Carlos C. Cerri (1946-2017)

The IUSS Secretariat was sad to learn that our distinguished colleague Carlos Clemente Cerri passed away on 22 April 2017 at the age of 71. He graduated as agronomist in 1971. He took his master degree in 1974 and his PhD in 1979 in soil science. He was a full professor at the "Centro de Energia Nuclear na Agricultura" (CENA) of the São Paulo University (USP, Brazil). After research on soil organic matter (composition, properties and dynamics), he performed research on soil carbon sequestration and greenhouse gas emissions and mitigations in tropical conditions, especially in the Brazilian Amazon. He established a close scientific cooperation with many countries in the world including South America. Dr Cerri received several awards and honorary positions including being associated – with IPCC – to the 2007 Nobel Peace Prize. He contributed to 260 scientific journal articles and authored more than 100 publications, 41 book chapters and 6 books. Dr C. Cerri will be very much missed for a long time to come by his family and by all who knew him or were touched by his work and friendship.
Read more:
http://iuss.boku.ac.at/index.php?article_id=651

In Memoriam Jan Frans De Coninck (1926-2017)

Dr. ir. Jan Frans De Coninck, Honorary Professor of Soil Science at the Faculty of Sciences of the Ghent University in Belgium died on June 10, 2017 at the age of 91.
Jan Frans De Coninck retired from the Ghent University on September 30, 1991, after 23 years of teaching in soil genesis and soil mineralogy at the International Training Centre for Post-graduate Soil Scientists, where he also served as Head of the Laboratory for Soil Analyses. In 1951 he joined the Belgian Centre for Soil Survey as chief cartographer and this was the beginning of a brilliant career in soil science. He established an international reputation for his research on the genesis and properties of Spodosols/Podzols. He was vice-President of Commission VII (Soil Mineralogy) of the International Society of Soil Science and European coordinator of the ICOMOD Commission (Spodosols) of the Soil Conservation Service of the USA.
Read more:
http://iuss.boku.ac.at/index.php?article_id=654

Presentations of a Soil Erosion modelling workshop

The workshop took place in Ispra, Italy (20-22 March 2017) and was organized by the Joint Research Centre (JRC). It hosted more than 110 participants and the 83 presentations are available for download. This workshop discussed mainly issues how the local/regional modeling results can be upscaled (or applied) at European scale. Emphasis was also given to management practices that can reduce soil erosion and small scale applications.
Read more: *http://esdac.jrc.ec.europa.eu/themes/erosion-modelling-workshop*

Future rainfall erosivity projections (2050) based on climate change scenarios

The challenge to develop trends in soil erosion changes can be responded developing modelling scenarios of the two most dynamic factors in soil erosion: rainfall erosivity and land cover change.
The mean rainfall erosivity for the European Union and Switzerland is projected to be 857 MJ mm ha-1 h-1yr-1 till 2050 showing a relative mean increase of 18% compared to baseline data (2010).The changes are heterogeneous in the European continent depending on the future projec¬tions of most erosive months (hot period: April–September). The output results (published in a recent paper in the Journal of Hydrology) report a pan-European projection of future rainfall ero¬sivity taking into account the uncertainties of the climatic models. The rainfall erosivity in 2050 was modelled based on a moderate climate change scenario (HadGEM RCP 4.5) and using as main data sources the REDES based European R-factors. Data on erosivity projections are available.
Read more: *http://esdac.jrc.ec.europa.eu/themes/future-rainfall-erosivity-projections-2050-based-climate-change*

European Digital Archive of Soil Maps (EuDASM)

A new interface of this important archive is presented in ESDAC. The 5500 maps are available for download (PDF, JPEG) and allow the user to browse by country or continent. The EuDASM archive is the result of a collaboration between JRC and ISRIC. The objective of this collaboration was to transfer paper-based soil maps into a digital format with the maximum possible resolution and to ensure their preservation and easy disclosure. Many of those documents are more than 50 years old and include information and data from developing countries in Africa, Asia and Latin America.
Read more: *http://esdac.jrc.ec.europa.eu/resource-type/national-soil-maps-eudasm*

Global assessment of pressures on soil biodiversity

The JRC's Soil Team is working on the first global assessment of the impacts on soil biodiversity by both anthropogenic and non-anthropogenic pressures. To reach this goal, JRC carries out a survey to incorporate expert judgments. The result of this survey will allow to rank the main pressures on soil life and to map their distribution at the global scale. Responses are essential for determining how to weight each pressure in the cumulative impact maps that will be produced. Therefore, participation in this process is highly appreciated.
Read more:
https://goo.gl/forms/F2MZb4hNUNGx4mCt1

New Project to Promote Sustainable Soil Management in the Alpine Space

Living soil performs multiple ecosystem services for humans. The Interreg Alpine Space project Links4Soils will raise the awareness of them to the surface and develop sustainable soil management practices in different sectors. The Links4Soils project officially started with a Kick-off Conference in Ljubljana. Main outputs of the project are the Alpine Soil Partnership linking experts and decision-makers and the Alpine soil information and decision web platform. The Alpine Soil Partnership will be embedded as a subgroup of the Global Soil Partnership of the FAO and work hand in hand with existing organisations dealing with soils in the Alpine region (e.g. ELSA, EUSALP and the Alpine Convention). In a bottom-up approach the project will develop sustainable management plans for different land uses and sectors in the Alpine space.
Project website: *www.alpine-space.eu/links4soils*
Alpine Soils Platform: *www.alpinesoils.eu*
Read more: *www.alpine-space.eu/project-news-details/en/1433*

Sprucing Up Your Springtime Soils

For many gardeners, spring is the time to tend that garden they might have been neglecting all winter. One of the first steps is getting the soil back into shape. David Lindbo, the director of the Soil Science Division at the U.S. Department of Agriculture, says soil is "an entire ecosystem unto itself." He discusses how different types of soils are formed and shares methods for examining soil's texture and color, which can clue you into its water and mineral content.
Read more:
http://www.sciencefriday.com/segments/sprucing-up-your-springtime-soils/?utm_source=Weekly+Newsletter+List&utm_campaign=47769b971a-EMAIL_CAMPAIGN_2017_05_22&utm_medium=email&utm_term=0_10d8eab927-47769b971a-54189233

The Economics of Soil Health

There are quantitative tests to determine soil health, there are qualitative tools to assess soil health, and there are predictive models to project changes in soil health. But after all the work, there is very little meaningful data to answer the most important question: does soil health improve farm economics? To find an answer to this, scientists compared multiple independent tests correlated to yield.
Read more: *http://www.agprofessional.com/news/key-issues-perspective/economics-soil-health*

Talking dirty: The conversation between plants and soil

Plants release chemicals into the soil, called exudates that tell microbes to turn on or turn off certain chemical processes. Scientists are beginning to understand these signals and are hoping to exploit them to improve the efficiency, sustainability and environmental impact of the trillion dollar agricultural industry.

Read more: *https://pursuit.unimelb.edu.au/articles/talking-dirty-the-conversation-between-plants-and-soil*

Readers recommend playlist: songs of earth, soil and dirt

My grandma used to say: "You have to eat a peck of dirt before you die." Charley Patton, who starts us off this week, sounds as if he's doing just that as he hollers and moans through Down the Dirt Road Blues. There are more songs that deal with earth, soil and dirt than you would imagine.

Read more: *https://www.theguardian.com/music/2017/may/25/readers-recommend-playlist-songs-earth-soil-dirt-blues-psych-rock*

Glinka World Soil Prize 2017

The Glinka World Soil Prize honours individuals and organizations whose leadership and activities have contributed or are still contributing to the promotion of sustainable soil management and the protection of soil resources. The Glinka Prize is an annual award for dynamic change-makers dedicated to addressing soil degradation. The first Glinka World Soil Prize was awarded on World Soil Day 2016. Nominations had to be submitted by 30 September 2017.

Read more: *http://www.fao.org/global-soil-partnership/pillars-action/2-awareness-raising/glinka-world-soil-prize/en/*

(From: Global Soil Partnership | Newsletter #12)

Global assessment of pressures on soil biodiversity

The JRC's Soil Team is working on the first global assessment of the impacts on soil biodiversity of both anthropogenic and non-anthropogenic pressures. To reach this goal, JRC carries out a survey to incorporate expert judgements. The result of this survey will allow to rank the main pressures on soil life and to map their distribution at the global scale. Responses to the survey are essential for determining how to weigh each pressure in the cumulative impact maps that will be produced. Therefore, your participation in this process is highly appreciated. Contact person: Alberto Orgiazzi (*alberto.orgiazzi@ec.europa.eu*).

Read more:

https://goo.gl/forms/F2MZb4hNUNGx4mCt1

(From European Soil Data Centre Newsletter No. 102, June 2017)

ISRIC entrusted as Global Soil Facility for the GSP

ISRIC – World Soil Information has been entrusted with the role of Global Soil Information Facility (GSF) by the Plenary Assembly of the Global Soil Partnership (GSP) on June 20, 2017.

Read more: *http://www.isric.org/news/isric-world-soil-information-elected-host-soil-data-facility-global-soil-partnership*

New post on Make Wealth History: Restoring soil in Bangladesh

Soil loss is the environmental crisis that gets the least attention from the media or from environmental campaigns. That's why I did a whole week on it last year, and wrote up a report as an introduction to the topic. Last week Practical Action released a short documentary on soil in Bangladesh. It makes a neat case study in how soil fertility is lost, and the risks that it poses to farmers. There are a number of culprits here – poor land management, generous subsidies on fertiliser that encourage overuse, and competing uses for organic matter. The solutions are holistic and creative – the country lacks a market for compost, and creating one could help solve problems with domestic waste and pollution at the same time.

I suspect you didn't plan on spending any time today thinking about soil in Bangladesh, but this is a great example of circular economy thinking in a developing world context. It shows the role that markets can play in solving environmental problems, and how government can enable and assist rather than direct. You'll also find appropriate technology, the case for a flexible 'mostly organic' approach to agriculture, and a documentary that lets Bangladeshis tell their own story [by Jeremy Williams].

Read more: *https://makewealthhistory.org/2017/06/27/restoring-soil-in-bangladesh/*

Study finds mercury levels in Arctic soils 5 times higher than temperate regions

Plants and soil in the Arctic tundra absorb and store mercury released into the atmosphere by industry and mining in the Earth's temperate regions, leading to soil mercury levels five times higher than in lower latitudes, according to a new study published this week in the journal Nature. The international team of researchers from the U.S. and France used a combination of methods to monitor the accumulation of mercury from the atmosphere, performing continuous sampling over a two-year period, including through the Arctic winter. They concluded that the Arctic tundra is a major "sink" for mercury, a toxin that affects the neurological and immune systems of Arctic wildlife and is passed along to indigenous peoples who rely on subsistence hunting for their food.

Read more: *https://www.nsf.gov/news/news_ summ.jsp?cntn_id=242476&WT.mc_id=USNSF_51&WT.mc_ev=click*

Carbon catch-22: the pollution in our soil

Bad behaviour doesn't usually have good consequences but our fossil fuel and fertiliser habits may have had some "good" environmental side-effects. New research suggests that the last 200 years of pollution have increased the carbon stored in soils across natural ecosystems in Britain. And this locking in of carbon in soils provides an offset for some of our carbon emissions. But the catch-22 is if we kick our polluting habits, this carbon is at risk of returning to our atmosphere, contributing to climate change.

Read more: *http://theconversation.com/carbon-catch-22-the-pollution-in-our-soil-78718*

Soil evolution par for the golf course

In 2008, Glen Obear was interning at a golf course in Hawaii when the superintendent asked him to help diagnose a mysterious problem. Some of the course's putting greens were developing bald patches, spots where the turfgrasses were dying and thinning out. The failures were troubling because the expensive, exquisitely crafted greens were just five years old. A new green is normally expected to last at least five times as long. Along the way of the investigation, the team discovered something else: The layers weren't so strange after all, but merely evidence of what all soils do – age and evolve. "The big difference is that in [turf] soils, it happens quickly because you irrigate them, and you apply lots of iron and fertilizer," says UW-Madison pedologist Alfred Hartemink, who chairs the UW-Madison Department of Soil Science. "But there is something happening that we can explain. It's soil formation."

Read more: *https://dl.sciencesocieties.org/story/2017/jun/wed/soil-evolution-par-for-the-golf-course*

Monitoring soil structure changes after compaction

Soil compaction is a global threat to soil ecosystem services, causing tremendous costs to society. The costs of soil compaction are borne by the cumulative loss of soil functionality (e.g. yield loss) following a compaction event until the soil has functionally recovered. Although soil compaction is relatively widely studied, there is a lack of reliable observations and metrics for soil structure recovery rates after compaction.

Read more: *https://www.sciencedaily.com/releases/2017/06/170619092213.htm*

Global Rainfall Erosivity

JRC has collected data on rainfall erosivity from 3,625 meteorological stations in 63 countries to establish the first ever Global Rainfall Erosivity Database (GloREDa). Quantifying rainfall erosivity is challenging as it requires high temporal resolution(1-60 minutes) and high fidelity rainfall recordings. In collaboration with 31 scientists and 100+ organizations, JRC has developed the global erosivity map which was published in Nature Group's Scientific Reports. The highest rainfall erosivity is found in South America (especially around the Amazon Basin) and the Caribbean countries, Central Africa and parts of Western Africa and South East Asia. The lowest values are in mid- and high-latitude regions such as Canada, the Russian Federation, northern Europe, northern Africa, the Middle East and southern Australia. The R-factor map at 30 arc-sec resolution is available for free download in the ESDAC:

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

(From European Soil Data Centre Newsletter No. 102, June 2017)

Launch of the International Network on Black Soils

The International Network of Black Soils (INBS) was established under the aegis of the GSP as a platform for knowledge-sharing by countries with black soils with the aim of stimulating discussion on common issues related to the conservation and

sustainable management of these soils and fostering technical exchange and cooperation.
The INBS was launched at the Global Symposium on Soil Organic Carbon in March 2017, with representatives from national soil institutions and the governments of Argentina, Brazil, China, the Russian Federation, and the United States of America. The Intergovernmental Technical Panel on Soils will provide scientific advice to the INBS, and the GSP Secretariat will facilitate the implementation of agreed activities as it receives contributions from resource partners.
The INBS concept note and terms of reference were submitted to the fifth GSP Plenary Assembly, where the INBS was officially endorsed. Mr Guiqing Han from China's Heilongjiang Academy of Agricultural Sciences was appointed as the INBS chair, and China proposed that it organizes the first meeting of the network.Read more: *http://www.fao.org/global-soil-partnership/pillars-action/1-soil-management/internationalnetworkblacksoils/en/*
(From: Global Soil Partnership | Newsletter #12)

Future Policy Award crowns the World's Best Land Restoration Policies

Ethiopia wins Gold Award; other winning policies from China, Brazil and Jordan. More people, less erosion – Ethiopia's Tigray region demonstrates that this can be a reality: They will take home the Gold Future Policy Award 2017, beating 26 other nominated policies to the prize. Also known as "Oscar for Best Policies", the Future Policy Award highlights the world's best policies that combat desertification and land degradation this year. With unique collective action, voluntary labour and the involvement of the youth, people of Tigray are restoring land on a massive scale. As a result, erosion has decreased significantly, groundwater levels are recharged, and the uptake of sustainable agricultural practices made a significant contribution to food self-sufficiency and economic growth.
Read more: *https://www.worldfuturecouncil.org/p/2017-desertification/*

Also worth mentioning is that the Vision Award from the World Future Council went to the international "4 per 1000" Initiative which communicates a new concept for mitigating climate change through the increase of soil organic carbon.
Read more: *https://www.worldfuturecouncil.org/press-release-fpa-2017/*

Agri-environment schemes: impacts on the agricultural environment

Environmental protection and human food security co-exist in a critical balance, one that is often difficult to get right. The pressures of population rise, farming intensification, and loss of habitats and species mean that protections afforded under the EU's Common Agricultural Policy are pivotal to the conservation of agri-ecology. In the EU, agri-environment schemes encourage farmers to undertake environmentally friendly practices and are thus vital to the objective of sustainable agriculture. This Thematic Issue looks at some of the impacts that AES have had on European farm ecosystems, biodiversity and farmers.
Read more: *http://ec.europa.eu/environment/integration/research/newsalert/pdf/AES_impacts_on_agricultural_environment_57si_en.pdf*

National Soil Health Measurements to accelerate agricultural transformation

For scientists, farmers and ag policy makers, one nagging question has yet to be completely "unearthed:" Just how healthy (or unhealthy) are the nation's soils? The concept of soil health is gaining widespread attention because it promotes agricultural practices that are not only good for the farmer, but also good for the environment. An abundance of research shows that improving soil health boosts crop yield, enhances water quality, increases drought resilience, reduces greenhouse gas emissions, increases carbon sequestration, provides pollinator habitat, and builds disease suppression. To help implement widely-applicable, consistent measures of soil health, the Soil Health Institute announces its endorsement of 19 national soil health measurements.
Read more: *http://soilhealthinstitute.org/national-soil-health-measurements-accelerate-agricultural-transformation/*

Measured soil moisture improves wildfire prediction

Despite the known connection between soil moisture and wildfire danger, measured soil moisture is conspicuously absent from the list of variables commonly used in wildfire danger assessments. Instead, assessments enlist the help of the decades-old Keetch-Byram Drought index (KBDI), a soil moisture surrogate calculated from precipitation and estimated evapotranspiration. In the absence of measured soil moisture data, the reliance upon KBDI as a surrogate to assess wildfire danger is understandable. But is the continued reliance on KBDI justified when high quality soil moisture data are available? According to recent work published in Soil Science Society of America Journal, the answer is no.
Read more: *https://dl.sciencesocieties.org/story/2017/jul/mon/measured-soil-moisture-improves-wildfire-prediction*

Friends of Phragmites

Friends of Phragmites is an organisation established by Prof D. Fanning to promote the use of swamp plants to remediate soils degraded by acid sulphate effects. The Australian Chapter, with new president Simon Smith, held its second plantout to remediate a degraded site near Balmoral, Victoria, Australia.
Read more:
https://drive.google.com/file/d/0B9Z3pi0ZMJ9iRTZ0REpCdEI5ZkU/view?usp=sharing

Glinka World Soil Prize 2017

The Glinka World Soil Prize honours individuals and organizations whose leadership and activities have contributed, or are still contributing to the promotion of sustainable soil management and the protection of soil resources. The Glinka Prize is a an annual award for dynamic change-makers dedicated to solving one of our world's most pressing environmental issue: Soil Degradation. Deadline for applications: 30 September 2017
Read more: *http://www.fao.org/global-soil-partnership/pillars-action/2-awareness-raising/glinka-world-soil-prize/en/*

A new way to test soil health

Experiment in soil biology has farmers burying jockey shorts in April and unearthing them in July.
Read more: *https://www.soils.org/science-policy/sspr/2017-09-06/#5229*
(From US Science Policy Report, 6 September 2017)

Are fertilizers punishing our soils?

USDA ARS researcher Rick Haney gives an interview with Yale Environment 360 on the benefits of healthy soils and the folly of pursuing ever-greater crop yields using fertilizers and other chemicals.
Read more: *http://e360.yale.edu/features/why-its-time-to-stop-punishing-our-soils-with-fertilizers-and-chemicals*
(From US Science Policy Report, 6 September 2017)

Can American soil be brought back to life?

A new idea: If we revive the tiny creatures that make dirt healthy, we can bring back the great American topsoil. But farming culture – and government – aren't making it easy.

Reed more: *http://www.politico.com/agenda/story/2017/09/13/soil-health-agriculture-trend-usda-000513*
(By Jenny Hopkinson, Politico, 13 September 2017)

Sharing soil knowledge in the 21st Century

By better sharing of soil knowledge between people over a sustained period, we can improve soil condition and function, and improve soil management. Soil scientists and practitioners often work independently of each other, with limited opportunity to learn from each other and share their soil knowledge. At the same time, there is a loss of people with a depth of experience, expertise and local knowledge of soil. Yet we have thought little about how we will capture their knowledge and experience and use it to inform and support the next generation. In a paper recently published in Soil Science Society of America Journal, soil educators and extension agents concluded we must value, capture and share the experience and expertise of scientists and practitioners equally, including: farmers, scientists, educators, extension staff, commercial sector and the public.
Read more: *https://dl.sciencesocieties.org/publications/sssaj/pdfs/81/3/427*
(From US Science Policy Report, 20 September 2017)

Organic farming traps carbon in soil to combat climate change

Organic farms were found to have 26 percent more long-term carbon storage potential than conventional farms. When it comes to mitigating the worst impacts of climate change, keeping excess carbon out of the atmosphere is the prime target for improving the health of our planet. One of the best ways to do that is thought to be locking more of that carbon into the soil that grows our food.
Read more: *http://civileats.com/2017/09/11/new-study-shows-organic-farming-traps-carbon-in-soil-to-combat-climate-change/?org=1364&lvl=100&ite=172&lea=143036&ctr=0&par=1&trk=*
(From US Science Policy Report, 20 September 2017)

First-ever global erosivity map shows areas most vulnerable to erosion

Understanding erosion is important in quantifying the loss of topsoil for agriculture, as well as the contamination of food and water by sediments. However, erosion is a very complex process. It depends on many factors, including climate, soil type, and vegetation cover. A new map, published in an open-access paper, tries to quantify how much energy is available to erode the land surface on a given spot globally.

Read more: *https://www.forbes.com/sites/davidbressan/2017/08/18/how-many-continents-are-there/#efe36866732f*

(From US Science Policy Report, 6 September 2017)

3D Soil Hydraulic Database of Europe at 1 km and 250 m resolution

A consistent spatial soil hydraulic database at 7 soil depths up to 2 m has been calculated for Europe based on SoilGrids250m and various 1 km datasets, and pedotransfer functions trained on the European Hydropedological Data Inventory. Saturated water content, water content at field capacity and wilting point, saturated hydraulic conductivity and Mualem-van Genuchten parameters for the description of the moisture retention, and unsaturated hydraulic conductivity curves have been predicted. The derived 3D soil hydraulic layers can be used for environmental modelling purposes at catchment or continental scale in Europe. It is the only EU provides information on the most frequently required soil hydraulic properties with full European coverage up to 2 m depth at 250 m resolution.

Read more: *https://esdac.jrc.ec.europa.eu/content/3d-soil-hydraulic-database-europe-1-km-and-250-m-resolution*

(From European Soil Data Centre Newsletter No. 103, July-August 2017)

ESDAC Map Viewer

The ESDAC Map Viewer allows the user to navigate key soil data for Europe. It provides access to the attributes of the European Soil Database and some additional data related to main soil threats as identified in the Soil Thematic Strategy. The ESDAC Map Viewer is developed according to standards (OGC WMS) so that they are interoperable with similar information allowing real-time integration of environmental data from around the world. The Viewer integrates the European Soil Database layers and some other soil layers in one single web-based application. You may navigate and select each of the 70 layers derived from the European Soil Database and other soil threats layers.

Read more: *https://esdac.jrc.ec.europa.eu/viewer*

(From European Soil Data Centre Newsletter No. 103, July-August 2017)

How human waste is helping Aussie farmers get the best out of their land

About 180,000 tonnes of biosolids are generated from Sydney's sewage each year, but authorities are having no troubles with getting rid of it. Biosolids, which is a by-product of the sewerage treatment process, is proving a hit with New South Wales farmers who want to improve soil health and boost yields. Harvested from 23 of Sydney's sewerage plants, the waste is processed through reactors which also create renewable energy that is fed back into the system.

Read more: *http://www.abc.net.au/news/2017-09-09/farmers-using-human-poo-to-improve-their-production/8887512?sf112663276=1*

How 12,000 tonnes of dumped orange peel grew into a landscape nobody expected to find

An experimental conservation project that was abandoned and almost forgotten about has ended up producing an amazing ecological win nearly two decades after it was dreamt up. The plan, which saw a juice company dump 1,000 truckloads of waste orange peel in a barren pasture in Costa Rica back in the mid 1990s, has eventually revitalised the desolate site into a thriving, lush forest.

Read more: *http://www.sciencealert.com/how-12-000-tonnes-of-dumped-orange-peel-produced-something-nobody-imagined*

The outsized role of soil microbes

Three scientists have proposed a new approach to better understand the role of soil organic matter in long-term carbon storage and its response to changes in global climate and atmospheric chemistry.

Read more: *https://www.sciencedaily.com/releases/2017/08/170829091049.htm*

Soil holds potential to slow global warming, Stanford researchers find

If you want to do something about global warming, look under your feet. Managed well, soil's ability to trap carbon dioxide is potentially much greater than previously estimated, according to Stanford researchers who claim the resource could "significantly" offset increasing global emissions. They call for a reversal of federal cutbacks to related research programs to learn more about this valuable resource. Stanford-led research finds that reduced tillage and other land management practices could increase soil's carbon storage enough to offset future carbon emissions. The work, published in two overlapping papers in Annual Review of Ecology, Evolution and Systematics and Global Change Biology, emphasizes the need for more research into how soil – if managed well – could mitigate a rapidly changing climate

Read more: *https://news.stanford.edu/2017/10/05/soil-holds-potential-slow-global-warming/*

[From: ASA-CSSA-SSSA Science Policy Report, Issue 19 October 2017)

Case studies show big economic benefits of soil health practices

Soil health practices such as cover crops and no-till can result in an economic return of over $100 per acre, according to a set of case studies jointly released by the National Association of Conservation Districts and Datu Research, LLC. Cover crops and no-till can limit soil loss, reduce run-off, enhance biodiversity, and more. Naturally, farmers who are considering adopting these practices are keen to know how they will affect their farm's bottom line. During the three-year study period, corn-soybean farmers experimented with cover crops and/or no-till, and quantified the year-by-year changes in income they attributed to these practices compared to a pre-adoption baseline. They found that while planting costs increased by up to $38 per acre.

Read more: *http://www.nacdnet.org/newsroom/case-studies-show-big-economic-benefits-soil-health-practices/*

[From: ASA-CSSA-SSSA Science Policy Report, Issue 19 October 2017)

Global Soil Biodiversity Atlas Website now available

A joint venture from the Global Soil Biodiversity Initiative and the European Commission Joint Research Commission, the Global Soil Biodiversity Atlas is the first synthesis of global soil biodiversity research and its importance to our living world. Download it for free or order the full Atlas at €25.

Read more: *https://atlas.globalsoilbiodiversity.org/*

Measure soil aggregates with new test

George Holsapple is seeing his soils improve as never before. The conventional tiller turned vertical tiller from Jewett, Ill., adopted cover crops about four years ago and has noted visual improvement in tilth and water infiltration in his fields of corn, soybeans and cover crops for seed that he farms with his wife Janice and son Thad….

Read more: *http://www.cornandsoybeandigest.com/soil-health/measure-soil-aggregates-new-test*

Cover Crops Gaining Use

OMAHA (DTN) -- The latest survey on cover crop use shows more farmers are using cover crops on a larger set of acreage, and those farmers using cover crops state they have a variety of benefits. The latest cover crop survey, done for the fifth consecutive year, was done by the Conservation Technology Information Center with help from Purdue University and funding from the American Seed Trade Association and USDA's Sustainable Agriculture Research & Education (SARE)…

Read more: *https://www.dtnpf.com/agriculture/web/ag/news/crops/article/2017/09/15/farmers-planting-acres-soil-health-2*

Rising temperatures, rice, and arsenic uptake

Arsenic is a widely distributed toxic element that naturally occurs in minerals. One of the most common pathways for exposure is when arsenic leaches into drinking water supplies. One crop known to take up arsenic when the element is available in soils or irrigation water is rice. Arsenic accumulates throughout the plant tissues including the grain that is consumed. Rice plants may be exposed to arsenic through soil or irrigation water. Specifically, rice plants release oxygen from their roots when flooded, and this oxygen reacts with iron forming "plaques" along root surfaces. The iron oxide plaques scavenge arsenic, and the plants take up arsenic released from the plaques or dissolved in the soil solution. One factor that can affect arsenic accumulation in the rice grain, is soil temperature.

Read more: *https://dl.sciencesocieties.org/story/2017/sep/thu/rising-temperatures-rice-and-arsenic-uptake*

How Mount Agung's eruption can create the world's most fertile soil

Mount Agung in Bali is currently on the verge of eruption, and more than 100,000 people have been evacuated. This eruption is likely to be cata-

strophic, spewing lava and ashes at temperatures up to 1,250°C, posing serious risk to humans and their livelihoods. Ash ejected from volcano not only affects aviation and tourism, but can also affect life and cause much nuisance to farmers, burying agricultural land and damaging crops. However, in the long term, the ash will create world's most productive soils.
Read more: *http://theconversation.com/how-mount-agungs-eruption-can-create-the-worlds-most-fertile-soil-85134?utm_source=facebook&utm_medium=facebookbutton*

National Comparison of the Total and Sequestered Organic Matter Contents of Conventional and Organic Farm Soils

By Gahhbour et al in Advances in Agronomy 146: 1-36 (2017), published Oct 1, 2017. Over the past nine years, Northeastern scientists Geoffrey Davies and Elham Ghabbour have been getting their hands dirty, analyzing soil samples from nearly every state in the country. All that sifting, sorting, labeling, and testing has culminated in new research showing that soil from organic farms is better at sequestering carbon than soil from conventional farms. In this article, the authors describe a novel method to extract humic acids from soil samples – a process that takes nine days to complete. They described the method in the paper with the hope that other labs around the world will replicate their findings. IUSS encourages its members to replicate this unique study and would welcome reports.
Read more: *https://news.northeastern.edu/2017/10/study-finds-organic-soil-captures-holds-more-carbon/?utm_source=Retiree+and+Emeriti*

ICSU and ISSC members vote to create a new merged 'International Science Council'

On 26 October 2017 at a historic joint meeting, members of two leading international science councils voted to merge, launching a process that will see the formation of a single global entity called the International Science Council that unites the scientific community, including all social and natural sciences. The new International Science Council brings together the current members of ISSC (International Social Science Council) and ICSU (International Council for Science), including 40 international scientific unions and associations including IUSS, and more than 140 national and regional organizations such as academies and research councils.
The organization will be launched at a founding General Assembly to be held in Paris, France in 2018. Its mission will be to serve as the global voice of science, providing leadership in coordinating international action on issues of major public concern.
[From: ICSU Newsletter, 26 October 2017]

2nd Global Soil Biodiversity Conference a big success

The 2nd Global Soil Biodiversity Conference held 15-18 October, 2017, in Nanjing, China, was a success attracting more than 1000 participants from 47 countries. Co-organized with the Chinese Academy of Science, the conference featured 20 keynote speeches from international leaders sharing ground breaking research from China, Europe, Australia, the United States, and Brazil. Concurrent sessions, poster presentations, workshops, and round-table events all contributed to sharing new ideas and building new collaborations.
Read more: *http://blog.globalsoilbiodiversity.org/article/2017/10/25/2nd-global-soil-biodiversity-conference*

Open digital mapping for assessing carbon storage in tropical peatlands

Researchers from Sydney, Australia, and Bogor, Indonesia demonstrate that tropical peatland can be mapped accurately and cost effectively using freely-available remote sensing data and open source software. At COP23 in Bonn, the Global Peatlands Initiative and various organisations held events aiming to bring peatlands on the agenda at COP23. Peatlands have an important role in the global carbon cycle as it stores a huge amount of carbon. A small loss of peat from land clearance and mismanagement can contribute a large amount of CO2 to the atmosphere. Indonesia has one of the largest peatlands in the tropics, with an estimate of 15 million hectares. Responding to the global issue of reducing CO2 emissions, Indonesia has legislation on the protection and management of the peat ecosystem. The legislation outlined conservation areas, which depends on the thickness of peat; however, the main challenge is the lack of fine-scale, accurate maps of peat distribution and its thickness. The current peatland map in Indonesia is at a coarse scale with much uncertainty that it cannot be used to implement conservation and management regulations.
Read more: *http://www.digitalsoilmapping.com/article/open-digital-mapping-for-assessing-carbon-storage-in-tropical-peatlands/*

Shallow soils promote savannas in South America

The boundary between South American tropical rainforests and savannas is influenced by the depth to which plants can root, research indicates. Shallow rooting depth promotes the establishment of savannas. Previous research has shown that precipitation and fire mediate tropical forest and savanna distributions. The study shows that below ground conditions need to be considered to understand the distribution of terrestrial vegetation both historically and in the face of future climate change. The study is based on computer vegetation models. Source: Senckenberg Research Institute and Natural History Museum.
Read more: *https://www.sciencedaily.com/releases/2017/10/171023180702.htm*

Massive Carbon Sink May Be More Resilient Than Scientists Thought

Carbon-rich peat bogs seem to adapt well to changes in temperature, precipitation and other climate-related factors. One of the world's most important carbon-storing ecosystems may be more resilient to environmental change than previously suspected, scientists have just reported. And that could be good news for addressing global warming.
A new study, released in the journal Nature Communications finds that plants in carbon-rich European peat bogs are able to adapt to changes in temperature, precipitation and other climate-related factors. As the environment changes, specific types of plants may die off and be replaced by new species – but the study suggests that the incoming species tend to be similar to the old ones, meaning the stability of the bog is preserved.
Read more: *https://www.scientificamerican.com/article/massive-carbon-sink-may-be-more-resilient-than-scientists-thought/?utm_source=facebook&utm_medium=social&utm_campaign=sa-editorial-social&utm_content&utm_term=sustainability_partner_text_free*

Upcoming Conferences and Meetings

2018

ICSSPN 2018 – 20th International Conference on Soil Science and Plant Nutrition

January 25 – 26, 2018, Paris, France. The ICSSPN 2018 aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results on all aspects of Soil Science and Plant Nutrition. It also provides a premier interdisciplinary platform for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions adopted in the fields of Soil Science and Plant Nutrition.
Read more: *https://www.waset.org/conference/2018/01/paris/ICSSPN*

TERRA ENVISION Conference

29 January - 1 February, 2018, Barcelona, Spain. This conference aims to focus on the scientific research towards finding solutions for the societal issues of our time. TERRAENVISION promotes interdisciplinary collaboration and networking. By bringing the people and their knowledge together, we may be able to take the steps towards solutions that can bring our society to a more sustainable situation. In this conference we want to link to International policies such as the sustainable Development Goals, the UN Climate conventions, CAP and COP. Issues proposed for the conference: Climate change, Water Resources, Land degradation and restoration, Erosion processes, Fire in the earth system, Ecosystem services and nature conservation, Science interface: with policy and public. Abstract submission is open.
Read more: *http://terra-envision.weebly.com/*

BonaRes2018 Conference: Soil as a sustainable resource

26-28 February, 2018, Berlin, Germany.
The conference brings together researchers from all disciplines of soil science to discuss the functionality of soil ecosystems and how to develop strategies towards sustainable soil management. A sustainable bioeconomy requires integration of soil productivity with a wide range of other soil functions including nutrient cycling, carbon storage, water retention and filtering as well as being the habitat of a myriad of organisms and their ac-

tivities. For sustainable soil management, we need to understand soils at a systemic level and to assess their value in a socio-economic framework. Abstract submission deadline: November 1st, 2017
Read more: *http://www.bonares2018.de/index.html*

42nd Annual Conference of Soil Science Society of Nigeria

"Sustainable Management of Soil and Water Resources for Food Security, Climate Change Adaptation and Mitigation"
March 12–16, 2018, Institute for Agricultural Training and Research, Moore Plantation, Ibadan – Oyo State, Nigeria. Abstract submission to *sssn.iart2018@gmail.com* until 31 December, 2017
Read more: *www.sssniart2018.com*

Intersol 2018 Polluted Sites & Soils – Call for papers

Intersol (International Conference-Exhibition on Soils, Sediments and Water) will take place in Paris, France, March 27-29, 2018, under the theme "Polluted Sites and soils: A challenge for major urban projects!" Deadline for the call for papers (spoken presentations and posters) was October 20, 2017.
Read more: *www.intersol.fr*

AWSPT'18 – 3rd International Conference on Air, Water, and Soil Pollution and Treatment

April 8-10, 2018, Budapest, Hungary
The AWSPT'18 aims to become the leading annual conference in fields related to air, water, and soil pollution and treatment. The goal of AWSPT'18 is to gather scholars from all over the world to present advances in the relevant fields and to foster an environment conducive to exchanging ideas and information. This conference will also provide an ideal environment to develop new collaborations and meet experts on the fundamentals, applications, and products of the mentioned fields. AWSPT'18 is part of the 3rd World Congress on Civil, Structural, and Environmental Engineering (CSEE'18). Paper Submission Deadline: October 20, 2017
Read more: *http://awspt.com/*

IUSS at EGU 2018

Abstract submission has started for the EGU General Assembly 2018 (EGU2018) that will take place 08–13 Apr 2018 in Vienna, Austria. You are kindly invited to find a session for your abstract at:
https://meetingorganizer.copernicus.org/EGU2018/sessionprogramme

In particular, the Secretariat would like to draw your attention to the fact that IUSS is involved in the organisation of the session SSS1.3/EOS5 Soil science education, outreach and public engagement (co-organized). This session welcomes all perspectives on teaching soil science from school level to continuing professional development in non-academic settings. Contributions are welcome that move away from concepts and methods for teaching soil science within traditional disciplines (chemistry, biology, physics) to those that use soil systems approaches. Innovative methods from the field, classroom and laboratory are welcome from anyone working with soil science education across varied settings. The conveners also welcome demonstrations of novel approaches for soil science outreach and public engagement that involve scientists and non-scientists. Examples that also measure the effectiveness of educational and outreach activities are especially welcome.
IUSS kindly invites you to submit abstracts until 10 January 2018, 13:00 CET.

If you would like to apply for a Roland Schlich travel support, please submit no later than 01 December 2017.
Details can be found at: *https://www.egu2018.eu/roland_schlich_travel_support.html*.
Read more: *https://egu2018.eu/*

Conference Soil Classification and Education

May 18-20, 2018, Toruń, Poland. Globalization and global environmental issues, as well as unification of scientific research and teaching on the EU and global levels require harmonization of technical languages, such as the terminology used in soil science. The aim of this conference is to present solutions for international education in soil science, elaborated within the Erasmus+ FACES project, to present new attempts to soil description and classification. Full papers submission deadline: 25 February 2018
Read more: *https://sites.google.com/site/facesconference/*

5th European Conference on Permafrost (EUCOP 2018)

23 June - 1 July, 2018, Chamonix-Mont Blanc, France. The conference aims at covering all relevant aspects of permafrost research, engineering and outreach on a global and regional level.
Key dates:

- Call for abstract submission: 28 August 2017 to 15 December 2017
- Decision on abstract (oral/poster): February 2018
- Early-bird registration: until April 1st 2018

Read more: *https://eucop2018.sciencesconf.org/*

10th International Symposium on Plant-Soil Interactions at Low pH 2018 (PSILPH2018)

25-29 June 2018, Putrajaya, Malaysia. The symposium's core objective is to address issues related to food production on low pH soil, and at the same time, achieving sustainability. 10th PSILPH2018 aims to gather researchers, scientists, experts and academicians in the field of soil sciences to share their latest research findings and thoughts on the current status of agriculture production; thus, ensuring food security and environmental sustainability. Abstract submission deadline: 30 November 2017.
Read more: *http://www.psilph2018.com/*

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*

21th ISTRO Conference 2018

September 24-27, 2018, Paris, France. The International Soil Tillage Research Organization (ISTRO) is an international association whose objective is to stimulate research on tillage and no till, compaction and, more broadly, to contribute to soil protection and to improve soil quality. The scientific topics during the conference will focus on advances in soil structure characterization, soil compaction, biogeochemical processes and carbon sequestration, with a special interest on soil ecology and ecosystem services. Equipment strategies will also be discussed with soil tillage strategies, smart farming, tires and tillage equipment design. Abstract submission until 1 March 2018.
Read more: *http://istro2018.webistem.com*

International Scientific Conference: "90 Years Forest Research Institute – for the Society and Nature" – First announcement

October 24-26, 2018, Sofia, Bulgaria. The objective of the event is to link traditions and innovations in international and local experience with forest ecosystems, their resources, services, functioning and management for social wellbeing.
More information will be available soon at *www.bas.bg/fribas* and *www.fri.bas.bg*.

The 13th International Conference of ESSS – first announcement

Management of Water and Soil Resources under Global Climate Changes.
December 4-5, 2018, Dokki, Giza, Egypt. Conference venue: the Egyptian International Center of Agriculture "EICA". Organized by the Egyptian Soil Science Society (ESSS), under the umbrella of the International Union of Soil Sciences (IUSS).
Read more: *http://www.esss.org.eg/*

2019

Euroclay meeting of the European Clay Groups Association (ECGA) – Call for sessions

Paris (France), 1-5 July 2019. The next quadrennial Euroclay meeting of the European Clay Groups Association (ECGA) will be held in Paris (France) 1-5 July 2019 (Jussieu Campus, Univ. Pierre & Marie Curie) jointly with the 56th annual meeting of The Clay Minerals Society (CMS), and the 6th Mediterranean Clay Meeting. Proposals should be submitted by e-mail (*euroclay2019@sciencesconf.org*) by January 31st, 2018.

Conference website: *http://euroclay2019.sciencesconf.org*
Download the 1st Circular: *http://iuss.boku.ac.at/files/flyer_euroclay.pdf*

New Publications

Soils: The Foundation of Life: Proceedings of a Workshop in Brief
Published in August 2017 by the National Academy of Sciences, the National Academies Press, 12 pages | 8.5 x 11 | DOI 10.17226/24866.

On World Soils Day, December 5, 2016, the U.S. National Committee for Soil Sciences convened a workshop on *Soils: The Foundation of Life* in Washington, DC. The purpose of the workshop was to increase awareness of the complexity of the roles and great importance of soils to national security, food and nutritional security, water quality and renewability, climate change mitigation and adaptation, human health, biological diversity, and more. In each of these areas, presenters spoke on the incorporation of scientific concepts in decisions made at different scales, from national and state policy to the choices that consumers make every day. A panel discussion followed on how soil science can meet the challenges of today and the future. In afternoon breakout sessions, participants discussed opportunities to bring soil-related issues to the forefront and engage policy makers, the public, and other stakeholders.
Read more: *https://www.nap.edu/catalog/24866/soils-the-foundation-of-life-proceedings-of-a-workshop-in*

Exploring Soils. A Hidden World Underground
By Samantha Grover and Camille Heisler. Published June 2017 by CSIRO Publishing, 32 pages, colour illustrations, ISBN: 9781486305001, price hardcover $ 24.95.
Have you ever wondered what happens in the earth underneath us? James has, and he wants to learn more about soil. In Exploring Soils: A Hidden World Underground, James discovers that soil is not just dirt for digging in. He explores how plants and animals live in soil, how soils are formed, how they differ, and the ways that soil is essential in our lives. Exploring Soils will take you to an underground world filled with activity and discoveries. Perfect for ages 6-9.
Read more: *http://www.publish.csiro.au/book/7464#sthash.LaHIJIDS.dpuf*

Research for AGRI Committee – Preserving agricultural soils in the EU
Berge, H.F.M. ten, Schroder, J.J., Olesen, J.E. and Giraldez Cervera, J.V. 2017, European Parliament, Policy Department for Structural and Cohesion Policies, Brussels. ISBN 978-92-846-0955-0.
This study explains how threats to soils and soil services are linked to agricultural soil management, how threats can be mitigated, and which barriers complicate this. It highlights trade-offs and synergies that exist between different interests affected by soil management, such as climate change mitigation, water and air quality, biodiversity, food security and farm income. Conservation of peatland and extensive agro-forestry systems, and protecting soils against sealing, erosion and compaction are ranked as highest priorities. Potential policy elements are suggested.
Read more: *http://www.europarl.europa.eu/RegData/etudes/STUD/2017/601973/IPOL_STU(2017)601973_EN.pdf*

China's Soil Pollution and Degradation Problems
By Claudio O. Delang, May 11, 2017, Routledge, 146 pages. ISBN 9781138684607, price hardback £ 45.00.
China's air pollution is infamous. The haze can make it impossible to see buildings across the street, and the pollution forces schools to close and creates health and morbidity problems, in addition to tremendous environmental degradation. However, China also faces another important environmental problem, which is less well-known to the public: that of soil degradation and pollution. This book provides an overview of the problems related to soil degradation and pollution throughout China, examining how and why current policy has fallen short of expectation. It also examines the challenges faced by policy makers as they attempt to adopt sustainable practices alongside a booming and ever-expanding economy.
China's Soil Pollution and Degradation Problems utilizes grey literature such as newspaper articles, NGO reports and Chinese government information alongside academic studies in order to provide an extensive review of the challenges faced by grassroots organizations as they tackle environmental policy failings throughout China.
This book will be of great interest to students of environmental pollution and contemporary Chinese studies looking for an introduction to the topics of soil pollution and soil degradation, and for researchers looking for an extensive list of sources and analysis of China's environmental problems more broadly.
Read more: *https://www.routledge.com/Chinas-Soil-Pollution-and-Degradation-Problems/Delang/p/book/9781138684607*

The Spirit of the Soil – Agriculture and Environmental Ethics, 2nd Edition
By Paul B. Thompson, May, 31, 2017, Routledge, 252 pages. ISBN 9781138676633, price softcover £ 29.99, hardback £ 110.00.
In this second edition of The Spirit of the Soil: Agriculture and Environmental Ethics, Paul B. Thompson reviews four worldviews that shape competing visions for agriculture. Productionists have sought increasing yields – to make two seeds grow where only one grew before – while traditional visions of good farming have stressed stewardship. These traditional visions have been challenged by two more worldviews: a call for a total cost accounting for farming and an advocacy for a holistic perspective. Thompson argues that an environmentally defensible systems approach must draw upon all four worldviews, recognizing their flaws and synthesizing their strengths in a new vision of sustainable agriculture. This classic 1995 study has been thoroughly revised and significantly expanded in its second edition with up-to-date examples of agriculture's impact on the environment. These include extensive discussions of new pesticides and the effects of animal agriculture on climate and other areas of the environment. In addition, a new final chapter discusses sustainability, which has become a dominant idea within environmental studies and agrarian political philosophy.
Read more: *https://www.routledge.com/The-Spirit-of-the-Soil-Agriculture-and-Environmental-Ethics/Thompson/p/book/9781138676633*

The Soils of Serbia
By Pavlović, P., Kostić, N., Karadžić, B., Mitrović, M., 1st ed. 2017 by Springer, XVI, 225 pages, 121 illus. World Soils Book Series, ISBN 978-94-017-8660-7, price hardcover € 164,99
The main objective of this book is to present the distribution and diversity of major soil types in Serbia. It focuses on giving a detailed description of the physical, chemical and biological properties of soil and their geomorphological forms, as well as the geological characteristics of parent material. An integrative approach is used to study the interaction between climate, vegetation and geology in soil formation. Special attention is paid to human-induced soil degradation due to the erosion and contamination of soils in Serbia. The book includes a harmonization of national soil classification systems, with the FAO, WBR and ESD systems.
Read more: *http://www.springer.com/de/book/9789401786591*

The Soils of Slovenia
By Vrščaj, Borut, Repe, Blaž, Simončič, Primož, 1st ed. 2017 by Springer, XXVI, 216 pages, 212 illus., 209 illus. in colour. World Soils Book Series, ISBN 978-94-017-8585-3, price hardcover € 126,49
This books gives a complete overview of the Soils of Slovenia, from soil research history, climate, geology, geomorphology, major soil types, soil maps, soil properties, classification, fertility, land use and vegetation, soil management, soils and humans, soils and industries and future soils issues.
Read more:
http://www.springer.com/de/book/9789401785846

Manual of Methods for Soil and Land Evaluation
Edited by Edoardo A.C. Costantini, June 30, 2017 by CRC Press, 564 pages. ISBN 9781138113985, price paperback £ 59.99, hardback £ 97.00.
The goal of the manual is to supply an operational tool for pedologists, agronomists, environmentalists, and all of the other specialists who carry out land evaluation for agriculture and forestry or, more generally, stakeholders and policy makers who make decisions at the local level based on the knowledge of the nature of soil. Discussion of the topics is not only technical and operational, but also in-depth and didactic; therefore, the text may also be used as a valid complement for students majoring in subjects that involve soil use, management and conservation. The literature offers a wide choice of possible soil and land evaluation methods, while knowledge of the relationships existing between the physical characteristics of lands, particularly those of soils, and the requirements of specific uses is limited.
Read more: *https://www.crcpress.com/Manual-of-Methods-for-Soil-and-Land-Evaluation/Costantini/p/book/9781138113985*

Soil Biochemistry
By K Haider, Andreas Schäffer, June 30, 2017 by CRC Press, 132 pages. ISBN 9781138116306, price paperback £ 59.99, hardback £ 47.99.
Soils play a central role in the conversion of organic matter and element fluxes because of the large number of microorganisms present in the soil. In this book the more important processes that are driven by microbiological activity are discussed. It will be of interest to students of chemistry, biology, ecology, soil science and related areas. Researchers from these fields will profit from extended literature surveys in each chapter comprising important findings from early as well as the most recent investigations.
Read more: *https://www.crcpress.com/Soil-Biochemistry/Haider-Schaffer/p/book/9781138116306*

Semi-Field Methods for the Environmental Risk Assessment of Pesticides in Soil
By Andreas Schaeffer, Paul J. van den Brink, Fred Heimbach, Simon P. Hoy, Frank M.W. de Jong, Jorg Rombke, Martina Roß-Nickoll, Jose P. Sousa, June 30, 2017 by CRC Press, 144 Pages, 36 B/W Illus. ISBN 9781138117969, price paperback £ 59.99, hardback £ 102.00.
The book includes a clear description of how to perform a higher-tier terrestrial risk assessment and provides a single reference on the subject. It examines various types of semi-field methods for soil assessment, including the use of terrestrial model ecosystems for pesticide risk assessment. In addition, the text also explores legislative and regulatory issues and offers technical recommendations. The book provides guidance on how to assess the soil risks of pesticides in the environment and explains how to use semi-field methods to access how pesticides may lead to spatial and temporal changes in soil biological communities and the larger agricultural landscape.
Read more: *https://www.crcpress.com/Semi-Field-Methods-for-the-Environmental-Risk-Assessment-of-Pesticides/Schaeffer-Brink-Heimbach-Hoy-Jong-Rombke-Ross-Nickoll-Sousa/p/book/9781138117969*

Growing a Revolution: Bringing Our Soil Back to Life
By David R. Montgomery, 1st Edition published in May 2017 by W. W. Norton & Company, 320 pages, ISBN: 9780393608328, price hardback $26.95.
The problem of agriculture is as old as civilization. Throughout history, great societies that abused their land withered into poverty or disappeared entirely. Now we risk repeating this ancient story on a global scale due to ongoing soil degradation, a changing climate, and a rising population. But there is reason for hope. David R. Montgomery introduces us to farmers around the world at the heart of a brewing soil health revolution that could bring humanity's ailing soil back to life remarkably fast. Growing a Revolution draws on visits to farms in the industrialized world and developing world to show that a new combination of farming practices can deliver innovative, cost-effective solutions to problems farmers face today.
Read more: *http://www.elliottbaybook.com/book/9780393608328*

Soils, Ecosystem Processes, and Agricultural Development
Edited by Shinya Funakawa, 1st ed. published by Springer in 2017, 392 pages, 126 illustrations, 55 illustrations in colour. Price hardcover: 149.99 € | £112.00 | $179.00.
The main objective of this book is to integrate environmental knowledge observed in local agriculture, based on the understanding of soils science and ecology, and to propose possible technical solutions and a more integrated approach to tropical agriculture. The chapters describe and analyse the ecological and technical countermeasures available for mitigating environmental degradation due to the increasing agricultural activities by humans, based on our scientific understanding of traditional agriculture in the tropics.
Read more: *http://www.springer.com/gp/book/9784431564829*

Managing Mississippi and Ohio River Landscapes
By Kenneth R. Olson and Lois Wright Morton. Published July 2017 by the Soil and Water Conservation Society, 240 full-colour pages, ISBN 978-0-9856923-1-5, price hardcover $49.00.
Two powerful rivers, the Ohio and Mississippi, and their tributaries drain more than 41% of the interior continental United States. *Managing Mississippi and Ohio River Landscapes* examines the complex and ever-changing Mississippi and Ohio Rivers' landscapes and their systems. Through a series of engaging case studies accompanied by illustrative maps and photographs, the book reviews the historical impacts of climate, economic and population growth, and efforts to manage the waterways with engineered structures. Topics include drainage of bottomlands for crop production and other land uses, flooding risks and responses, levee systems and breaches, river navigation, and river ecology. The book concludes with recommendations for future management of these major US waterways.
Read more: *http://news.aces.illinois.edu/news/new-book-explains-importance-great-river-management*

Pedometrics 25th Anniversary Virtual Issue
Free Open access articles until end of 2017, a selection of 75 best papers in Pedometrics.
The discipline of pedometrics is celebrating 25 years since it first conference in Wageningen, the Netherlands, in September 1992. This virtual special issue is part of that celebration. Pedometrics can be defined as the development and application of statistical and mathematical methods to data analysis problems in soil science. More broadly, Pedometrics applies mathematical, statistical and numerical methods to resolve the uncertainty and complexity inherent in the soil system. This virtual special issue brings together important contributions to pedometrics from the Elsevier suite of journals.
Read more: *https://www.journals.elsevier.com/geoderma/virtual-special-issues/pedometrics-25th-anniversary-virtual-issue*

Monitoring soil structure evolution after compaction
Soil compaction is a global threat to soil ecosystem services, causing tremendous costs to society. The costs of soil compaction are borne by the cumulative loss of soil functionality (e.g. yield loss) following a compaction event until the soil has functionally recovered. Although soil compaction is relatively widely studied, there is a lack of reliable observations and metrics for soil structure recovery rates after compaction. In the April issue of Vadose Zone Journal, researchers describe the objectives, the design, the implementation, and monitoring concept of a long-term field experiment for monitoring post-compaction evolution of soil structure, referred to as a soil structure observatory.
Read more: *https://dl.sciencesocieties.org/story/2017/may/fri/monitoring-soil-structure-evolution-after-compaction*

Soil Carbon and Nitrogen under a long-term fertilizer gradient
The connection between commercial N fertilizer and soil organic carbon is widely debated. In a recent article in the Soil Science Society of America Journal, researchers examined how long-term nitrogen use affected soil C and N in continuous corn production. The low rate of N application caused significant decreases in soil C and N content down to 100 cm, while no differences were determined between the recommended and high rates of N. In addition, plots receiving the low application of N were lower in elevation and had less depth of the A horizon.
Read more: *https://dl.sciencesocieties.org/story/2017/jun/tue/soil-carbon-and-nitrogen-under-a-long-term-fertilizer-gradient*

Unlocking the Potential of Soil Organic Carbon
By FAO, Rome, 2017, 36 pages, ISBN 978-92-5-109759-5. The Global Symposium on Soil Organic Carbon (GSOC17) outcome document "Unlocking the Potential of Soil Organic Carbon", was drafted and reviewed by the GSOC17 Scientific Committee. It highlights the role of soils and SOC management in achieving goals on climate change and sustainable development, and it makes recommendations on the key next steps for including SOC in the regular reports of the Intergovernmental Panel on Climate Change, starting with SR2, the refinement of guidelines on greenhouse gas inventories and the Sixth Assessment Report, as well as reporting to the UN Framework Convention on Climate Change and the UN Convention to Combat Desertification and on the Sustainable Development Goals.
Read more: *http://www.fao.org/3/b-i7268e.pdf*

Soil Organic Carbon Mapping Cookbook
Edited by Yusuf Yigini, Rainer Baritz, Ronald R. Vargas. FAO, Rome, 1st edition April 2017, 180 pages. Developing the Global Soil Organic Carbon Map will require intensive collaboration among soil information institutions globally. The Soil Organic Carbon Mapping Cookbook provides generic methodologies and the technical steps for producing national soil organic carbon (SOC) maps. It includes step-by-step guidance for developing 1 km grids for SOC stocks, the preparation of local soil data, the compilation and pre-processing of ancillary spatial datasets, upscaling methodologies, and uncertainty assessments. Guidance is mainly specific to soil carbon data, but it also includes generic sections on soil grid development due to its relevance to other soil properties. The cookbook provides technical guidelines for preparing and evaluating spatial soil datasets; determining SOC stocks from local samples to a target depth of 30 cm; preparing spatial covariates for upscaling; and selecting and applying the most suitable upscaling methodology.
Read more: *http://www.fao.org/3/a-bs901e.pdf*

Soils' potential to contribute to offset international aviation emissions

By FAO, 2017, 8 pages. This informative note presents soil carbon sequestration as an option for offsetting carbon dioxide emissions from international aviation as part of a market-based mechanism. Potentially, projects arising from such an approach could foster soil carbon sequestration to support the achievement of all FAO's strategic objectives (SOs), in particular eradicating hunger (SO1), making agriculture more productive and sustainable (SO2), and increasing resilience (SO3). Offsetting greenhouse gas emissions from international aviation through SOC sequestration can contribute to sustainable development by promoting economic development, mitigating and helping adapt to climate change, and food security.

Read more: *http://www.fao.org/documents/card/en/c/e4839d17-c6aa-44ca-85cc-b4a6de25c143/*

Phosphate in Soils: Interaction with Micronutrients, Radionuclides and Heavy Metals

Edited by H. Magdi Selim. Published August 1, 2017 by CRC Press in the Series: Advances in Trace Elements in the Environment; 381 pages, ISBN 9781138803183, Price paperback £50.00, hardback £102.00.

Recent studies reveal that Phosphorus (P) in the form of phosphate, a macronutrient essential for plant growth, and crop yields can influence the bioavailability, retention, and mobility of trace elements, metal(loid)s, and radio nuclides in soils. When this occurs, phosphates can affect the dynamics of heavy metals and influence soil characteristics, impacting soil mobility and toxicity.

Phosphate in Soils: Interaction with Micronutrients, Radionuclides and Heavy Metals utilizes the latest research to emphasize the role that phosphate plays in enhancing or reducing the mobility of heavy metals in soil, and the soil-water-plant environment. It provides an in-depth understanding of each heavy metal species, and expands on phosphate interactions in geological material.

Read more: *https://www.crcpress.com/Phosphate-in-Soils-Interaction-with-Micronutrients-Radionuclides-and-Heavy/Selim/p/book/9781138803183*

Soil Nematodes of Grasslands in Northern China

By Qi Li, Wenju Liang, Xiaoke Zhang, Mohammad Mahamood; 1st Edition published August 15, 2017 by Elsevier, imprint Academic Press, 254 pages, Paperback ISBN: 9780128132746, price paperback EUR 75.45.

Soil Nematodes of Grasslands in Northern China presents research on China's temperate grasslands, providing the findings and results of a large field survey along a transect across the northern temperate grassland. It examines nematode distribution patterns along the transect from trophic group and family, to genus level, also evaluating their relationship with climatic conditions, plant biomass and soil parameters. The book then presents detailed taxonomy information of nematodes to genus or species level, providing keen insights into nematode diversity along the grassland transect in north China.

Read more: *https://www.elsevier.com/books/soil-nematodes-of-grasslands-in-northern-china/li/978-0-12-813274-6?start_rank=21&producttype=books&publicationyear=2017&sortby=sortByDateDesc&q=soil*

Comparison of dung and soil fauna from pastures treated with and without ivermectin as an example of the effects of a veterinary pharmaceutical

By Dr. Jörg Römbke, Adam Scheffczyk, Jean-Pierre Lumaret, Thomas Tixier, Dr. Wolf Blanckenhorn, Dr. Joost Lahr, Dr. Kevin Floate, June 2017, Umweltbundesamt, Texte | 54/2017, 238 pages, download only, no costs.

Soil organisms in manure or organisms that colonize dung pats can be impacted by the application of veterinary medical products, especially parasiticides, to livestock. For this reason, the authorization process for veterinary medicinal products in the European Union and other countries includes a requirement for "higher-tier" tests when adverse effects on dung organisms can be detected in single-species toxicity tests. However, no guidance documents for the performance of higher-tier tests are available, so far. Therefore, an international research project was undertaken to develop and validate a proposed test method under varying field conditions of climate, soil, and endemic coprophilous fauna. The test took place at Lethbridge (Canada), Montpellier (France), Zurich (Switzerland), and Wageningen (The Netherlands). The aim of the project was to determine if fecal residues of a parasitide with known insecticidal activity (ivermectin) showed similar effects on insects breeding in dung of treated animals, coprophilous organisms in the soil beneath the dung, and rates of dung degradation.

Read more: *https://www.umweltbundesamt.de/en/publikationen/comparison-of-dung-soil-fauna-from-pastures-treated*

Remote Sensing of Soils

By Shankar R., 1st edition published August 2017 by Springer, 500 pages, 166 illustrations, ISBN 978-3-662-53740-4, price hardcover 149,99 € | £112.00 | $179.00, printed e-book € | $ 24.99.

This book is about applications of remote sensing techniques in the studies on soils. In pursuance of the objective, the book initially provides an introduction to various elements and concepts of remote sensing, and associated technologies, namely Geographic Information System (GIS), Global Positioning System (GPS) in chapter-1. An overview of the sensors used to collect remote sensing data and important Earth observation missions is provided in chapter-2. The processing of satellite digital data (geometric and radiometric corrections, feature reduction, digital data fusion, image enhancements and analysis) is dealt with in Chapter-3. In the chapter to follow the interpretation of remote sensing data, very important and crucial step in deriving information on natural resources including soils resources, is discussed. An introduction to soils as a natural body with respect to their formation, physical and chemical properties used during inventory of soils, and soil classification is given in Chapter-5.The spectral response patterns of soils including hyperspectral characteristics -fundamental to deriving information on soils from spectral measurements, and the techniques of soil resources mapping are discussed in chapter-6 and -7,respectively. Furthermore, the creation of digital soil resources database and the development of soil information systems, a very important aspect of storage and dissemination of digital soil data to the end users are discussed in chapter-8. Lastly, the applications of remote sensing techniques in soil moisture estimation and soil fertility evaluation are covered in chapter-9 and -10, respectively.

Read more:

http://www.springer.com/gp/book/9783662537381

Sustainable Management of Land Resources: An Indian Perspective

Edited by G.P. Obi Reddy, N.G. Patil, Arun Chaturvedi. Published August 29, 2017 by Apple Academic Press, 796 pages - 116 B/W illustrations, ISBN 9781771885171, price hardback £114.00.

The depletion of land resources is one of the greatest challenges for mankind in this millennium. Shrinking land resources, weather aberrations, deterioration of land quality, and the globalization and liberalization of market economies have become intertwined to influence the sustainable management of land resources and land use plans. This important volume addresses these challenges, looking at how scientists translate their knowledge and experience in sustainable land resources and management into implementable policy decisions, with a particular focus on India.

Read more: *https://www.crcpress.com/Sustainable-Management-of-Land-Resources-An-Indian-Perspective/Reddy-Patil-Chaturvedi/p/book/9781771885171*

Landscapes in transition

The EEA report 'Landscapes in transition: an account of 25 years of land cover change in Europe,' published on 7 September 2017, takes a closer look at the emerging trends over the last two and a half decades in land use and their environmental impacts. The dominant trend is the continued and accelerating shift from rural to urban use, influenced mostly by economic activities and urban lifestyle demands – such as high mobility and consumption patterns.

Read more:

https://www.eea.europa.eu/highlights/unsustainable-land-use-threatens-european-landscapes?utm_medium=email&utm_campaign=Landscapes%20in%20transition&utm_content=Landscapes%20in%20transition+CID_b6c7faec82d941e84a93a47944b0e9a1&utm_source=EEA%20Newsletter&utm_term=Read%20more

Spoil to Soil: Mine Site Rehabilitation and Revegetation

Edited by N.S. Bolan, M.B. Kirkham and Y.S. Ok. Published 7 September 2017 by Routledge, 371 pages, 50 B/W Illus., Hardback ISBN: 9781498767613, price £140.00.

The remediation of mine spoil is a global environmental issue affecting most nations. This book covers both the fundamental and practical aspects of remediation and revegetation of mine site spoils. It follows three major themes including characterisation of mine site spoils; remediation of chemical, physical, and biological constraints of mine site spoils; and revegetation of remediated mine site spoils. Each theme contains chapters featuring case studies involving mine sites around the world. The book provides a complete narrative of how inert spoil could be converted to live soil.

Read more: *https://www.routledge.com/Spoil-to-Soil-Mine-Site-Rehabilitation-and-Revegetation/Bolan-Kirkham-Ok/p/book/9781498767613*

Assessment, Restoration and Reclamation of Mining Influenced Soils

By Jaume Bech, Claudia Bini and Mariya Pashkevich (Editors). 1st edition published 12 September 2017 by Elsevier, imprint Academic Press, 520 pages, Paperback ISBN: 9780128095881, price paperback EUR 147.66.

This tome covers processes operating in the environment as a result of mining activity, including the whole spectra of negative effects of anthropopressure and the environment, from changes in soil chemistry, changes in soil physical properties, geomechanical disturbances, and mine water discharges. Mining activity and its waste are an environmental concern. Knowledge of the fate of potentially harmful elements and their effect on plants and the food chain, and ultimately on human health, is still being understood. Therefore, there is a need for better knowledge on the origin, distribution, and management of mine waste on a global level.

Read more: *https://www.elsevier.com/books/assessment-restoration-and-reclamation-of-mining-influenced-soils/bech/978-0-12-809588-1*

Soils of Malaysia

Edited by Muhammad Aqeel Ashraf, Radziah Othman, Che Fauziah Ishak. Published 20 September 2017 by Routledge, 214 pages, 53 colour illustrations, 14 B/W illustrations, Hardback ISBN: 9781138197695, price hardcover GBP 108.00.

There are approximately 500 different types of soils in Malaysia, most is residual soil and coastal alluvial soil. It covers topics including climate; flora and fauna; geology and hydrology; land use changes for agriculture; soil fertility; human-induced soil degradation; and soil contamination sources.

Read more: *https://www.routledge.com/Soils-of-Malaysia/Ashraf-Othman-Ishak/p/book/9781138197695*

Biofilms in Plant and Soil Health

Edited by Iqbal Ahmad and Fohad Mabood. Published in September 2017 by Wiley-Blackwell, 568 pages, ISBN: 978-1-119-24634-3, price hardcover: £160.00/€192.00.

Biofilms are predominant mode of life for microbes under natural conditions. The three-dimensional structure of the biofilm provides enhanced protection from physical, chemical and biological stress conditions to associated microbial communities. These complex and highly structured microbial communities play a vital role in maintaining the health of plants, soils and waters. Biofilm associated with plants may be pathogenic or beneficial based on the nature of their interactions. Pathogenic or undesirable biofilm requires control in many situations, including soil, plants, food and water.

Read more: *http://eu.wiley.com/WileyCDA/WileyTitle/productCd-1119246342.html*

Archaeological Soil and Sediment Micromorphology

Edited by Cristiano Nicosia, Georges Stoops. Published in October 2017 by Wiley-Blackwell, 496 pages, 400 illustrated full-colour plates, ISBN: 978-1-118-94105-8, price hardcover £100.00/€120.00, price e-book £90.99/€108.99.

Archaeological Soil and Sediment Micromorphology goes beyond a mere review of current literature and features the most up to date contributions from numerous scientists working in the field. The book represents a groundbreaking and comprehensive resource covering the plethora of applications of micromorphology in archaeology. Archaeological Soil and Sediment Micromorphology offers researchers, students and professionals a systematic tool for the interpretation of thin sections of archaeological contexts. It is also designed to help stimulate the use of micromorphology in archaeology outside Europe, where the technique is less frequently employed. Moreover, the authors hope to strengthen the proper application of soil micromorphology in archaeology, by illustrating its possibilities and referring in several cases to more specialized publications (for instance in the field of plant remains, pottery and phytoliths).

Read more: *http://eu.wiley.com/WileyCDA/WileyTitle/productCd-1118941055.html*

Soil Pollution: From Monitoring to Remediation

Edited by Armando Duarte, Anabela Cachada and Teresa Rocha-Santos. 1st Edition published by Elsevier on 6 October 2017, imprint: Academic Press, 312 pages, Paperback ISBN: 9780128498736, price paperback EUR 125.51.

Soil Pollution: From Monitoring to Remediation provides comprehensive information on soil pollution, including causes, distribution, transport, the transformation and fate of pollutants in soil, and metabolite accumulation. The book covers organic, inorganic and nanoparticle pollutants and methodologies for their monitoring. Features a critical discussion on ecotoxicological and human effects of soil pollution, and strategies for soil protection and remediation. Meticulously organized, this is an ideal resource for students, researchers and professionals, providing up-to-date foundational content for those already familiar with the field. Chapters are highly accessible, offering an authoritative introduction for non-specialists and undergraduate students alike.

Read more: *https://www.elsevier.com/books/soil-pollution/duarte/978-0-12-849873-6?start_rank=1&producttype=books&publicationyear=2017&sortby=sortByDateDesc&q=soil*

Soil Management and Climate Change: Effects on Organic Carbon, Nitrogen Dynamics, and Greenhouse Gas Emissions

Edited by Maria Munoz and Raúl Zornoza. 1st Edition by Elsevier in October 2017, imprint: Academic Press, 396 pages, Paperback ISBN: 9780128121283, price paperback EUR 168.26.

Soil Management and Climate Change: Effects on Organic Carbon, Nitrogen Dynamics, and Greenhouse Gas Emissions provides a state of the art overview of recent findings and future research challenges regarding physical, chemical and biological processes controlling soil carbon, nitrogen dynamic and greenhouse gas emissions from soils. This book is for students and academics in soil science and environmental science, land managers, public administrators and legislators, and will increase understanding of organic matter preservation in soil and mitigation of greenhouse gas emissions. Given the central role soil plays on the global carbon (C) and nitrogen (N) cycles and its impact on greenhouse gas emissions, there is an urgent need to increase our common understanding about sources, mechanisms and processes that regulate organic matter mineralization and stabilization, and to identify those management practices and processes which mitigate greenhouse gas emissions, helping increase organic matter stabilization with suitable supplies of available N.

Read more: *https://www.elsevier.com/books/soil-management-and-climate-change/munoz/978-0-12-812128-3?start_rank=1&producttype=books&publicationyear=2017&sortby=sortByDateDesc&q=soil*

The Indian Nitrogen Assessment. Sources of Reactive Nitrogen, Environmental and Climate Effects, Management Options, and Policies

Edited by Yash P. Abrol, Tapan K. Adhya, Viney P. Aneja, N. Raghuram, Himanshu Pathak, Umesh Kulshrestha, Chhemendra Sharma, and Bijay Singh. 1st edition published in September 2017 by Elsevier, 568 pages, ISBN: 978-0-12-811836-8, price paperback $185.00.

This book provides a reference for anyone interested in Reactive N, from researchers and students, to environmental managers. Although the main processes that affect the N cycle are well known, this book is focused on the causes and effects of disruption in the N cycle, specifically in India. The book helps readers gain a precise understanding of the scale of nitrogen use, misuse, and release through various agricultural, industrial, vehicular, and other activities, also including discussions on its contribution to the pollution of water and air. Drawing upon the collective work of the Indian Nitrogen Group, this reference book helps solve the challenges associated with providing reliable estimates of nitrogen transfers within different ecosystems, also presenting the next steps that should be taken in the development of balanced, cost-effective, and feasible strategies to reduce the amount of reactive nitrogen.

Read more: *https://www.elsevier.com/books/the-indian-nitrogen-assessment/abrol/978-0-12-811836-8*

Urban Soils

Edited by Rattan Lal, B. A. Stewart. Published in October 2017 by Routledge as part of the Advances in Soil Science Series, 406 pages, 55 B/W Illustrations, hardback ISBN 9781498770095, e-book ISBN 9781315154251, price hardback £114.00.

Urban soils are composed of geological material that has been drastically disturbed by anthropogenic activities and compromised their role in the production of food, aesthetics of residential areas, and pollutant dynamics. Properties of urban soils are normally not favorable to plant growth – the soils are contaminated by heavy metals and are compacted and sealed. Therefore, the quality of urban soils must be restored to make use of this valuable resource for delivery of essential ecosystem services (e.g., food, water and air quality, carbon sequestration, temperature moderation, biodiversity). Part of the *Advances in Soil Sciences Series, Urban Soils* explains properties of urban soils; assesses the effects of urbanization on the cycling of carbon, nitrogen, and water and the impacts of management of urban soils, soil restoration, urban agriculture, and food security; evaluates ecosystem services provisioned by urban soils, and describes synthetic and artificial soils.

Read more: *https://www.routledge.com/Urban-Soils/Lal-Stewart/p/book/9781498770095*

European achievements in soil remediation and brownfield redevelopment

Edited by Ana Payá Pérez and Sara Peláez Sánchez. A report of the European Information and Observation Network's National Reference Centres for Soil (Eionet NRC Soil), published by the Joint Research Centre, the European Commission's in-house science service in 2017, ISBN 978-92-79-71690-4 (PDF), ISBN 978-92-79-71691-1 (print).

This monograph presents examples of success stories of remediation of contaminated soils in various contexts and different European countries, aiming at sharing best practices of soil restoration and management of contaminated sites among European countries. Eight countries present a total of 17 cases which illustrate how soil and brownfields remediation along with sustainable land management have become essential for reversing the trend of soil degradation and ensuring the provision of ecosystem services by soil. The cases show progress in research and innovative technologies of soil remediation, new outstanding approaches to soil remediation management, beneficial integration of stakeholders in decision-making and fruitful progress in raising public awareness and citizen science.

Read more: *http://publications.jrc.ec.europa.eu/repository/bitstream/JRC102681/kj0217891enn.pdf*

Fundamentals of Soil Ecology

By David Coleman, Mac Callaham, D. Crossley, Jr.; 3rd Edition published by Elsevier 13 November 2017, imprint Academic Press, 376 pages, eBook ISBN: 9780128052525, paperback ISBN: 9780128052518, price paperback EUR 83.63.

Fundamentals of Soil Ecology, 3rd Edition, offers a holistic approach to soil biology and ecosystem function, providing students and ecosystem researchers with a greater understanding of the central roles that soils play in ecosystem development and function. The text emphasizes the increasing importance of soils as the organizing center for all terrestrial ecosystems and provides an overview of theory and practice in soil ecology, both from an ecosystem and evolutionary biology point of view. This new edition is fully updated, including an expanded treatment of microbial ecology and new sections on advances in molecular techniques and climate change research. These updates make this edition an essential resource for researchers and students in soil ecology and microbiology.

Read more: *https://www.elsevier.com/books/fundamentals-of-soil-ecology/coleman/978-0-12-805251-8?start_rank=1&producttype=books&publicationyear=2017&sortby=sortByDateDesc&q=soil*

The Soils of Turkey

Edited by Kapur Selim, Akça Erhan and Günal Hikmet. Published by Springer in the World Soils Book Series; 1st ed. 2018, XIII, 369 pages, 324 illustrations, 275 illustrations in color, ISBN 978-3-319-64390-8, price hardcover 149,99 € | £120.00 | $189.00, price e-book 118,99 € | £96.00 | $149.00.

This book compiles all available and relevant information concerning the soils of Turkey, including the soil survey studies conducted by universities and governmental institutes from the early 1950s until today. Recent findings and advances include the description and analyses of new profiles from some parts of the country by the chapter authors; reflecting the latest version of the World Reference Base (WRB) soil system, they produce a refined soil map. The book offers valuable guidance on soil management for planners of agricultural strategies, land management experts concerned with terrestrial carbon management (soil-sequestered and biomass carbon) and climate change mitigation, and educators concerned with raising awareness for the long-neglected significance of Turkey's soils.

Read more:
http://www.springer.com/de/book/9783319643908

Mires and peatlands of Europe. Status, distribution and conservation

Edited by Hans Joosten, Franziska Tanneberger and Asbjorn Moen, By Schweizerbart Science Publishers, Stuttgart; 2017, 780 pages, ISBN: 978-3-510-65383-6, price hard cover EUR 94.00.

This book provides the first comprehensive and up-to-date overview of mires and peatlands in biogeographic Europe. Authored by 134 mire specialists, the extensive volume describes mire and peatland types, terms, extent, distribution, use, conservation, and restoration, individually for each European country and in an integrated manner for the entire continent.

The descriptions are complemented by a multitude of maps and photographs, the book offers an impressive and colourful journey, full of surprising historical context and fascinating details, while appreciating the core principles and unifying concepts of mire science.

The European continent features an impressive variety of mires and peatlands. Polygon, palsa, and aapa mires, concentric and eccentric bogs, spring and percolation fens, coastal marshes, blanket bogs, saline fens, acid, alkaline, nutrient poor, nutrient rich: the peatlands of Europe represent unique ecosystem biodiversity and harbour a large treasure of flora and fauna typical of peat forming environments.

Europe is also the continent with the longest history, the highest intensity, and the largest variety of peatland use, and as a consequence it has the highest proportion of degraded peatlands worldwide. Peatland science and technology developed in parallel to exploitation and it is therefore not surprising that almost all modern peatland terms and concepts originated and matured in Europe.

Their massive degradation also kindled the desire to protect these beautiful landscapes, full of peculiar wildlife. In recent decades attention has widened to include additional vital ecosystem services that natural and restored peatlands provide. Already the first scientific book on peatlands (Schoockius 1658) contained a chapter on restoration. Yet, only now there is a rising awareness of the necessity to conserve and restore mires and peatlands in order to avoid adverse environmental and economic effects.

Read more: *www.schweizerbart.com/9783510653836*

Review by Kazuyuki Inubushi, Japan, Chair of IUSS Division 2 Soil properties and processes:

One of the important environmental functions of soil at a global scale is storage of carbon. Especially mires and peatlands store a huge amount of the world's soil carbon, more than 10 % of C in only less than 3 % of surface area. Especially mires and peatlands contain significant amounts of carbon in the world because of high water contents and anaerobic conditions, but it has been extensively utilized as fuel and other purposes and destroyed after drainage, losing biodiversity and soil C stocks. However, in many areas of the world mires have survived as the last wildernesses, due to limited accessibility. This book provides extensive information about natural and bio-geophysical formation of mires and peatlands in Europe. Part 1 covers mire diversity, terms and definitions, regionality, utilization and conservation in Europe. A lot of information is made available in boxes, with figures and tables, which helps understanding. Part 2 contains the geographic distribution of mires and peatlands across the 22 countries in Europe, explaining abiotic and biotic characters, distribution, utilization, conservation and list of international importance in each country.

Such a book is not available yet for the tropical peatlands in Asia, but it may be interesting to compare where peatlands are also under serious human impacts such as forest fires and land use change. Available book: Tropical Peatland Ecosystems, Springer Japan, 2016, M. Osaki, N. Tsuji (eds.), DOI 10.1007/978-4-431-55681

Review by Kazuyuki Inubushi, Japan

Miscellaneous

News from the Egyptian Soil Science Society (ESSS)

The Egyptian Soil Science Society (ESSS) is a non-governmental, non-profit organization mainly devoted to promoting the discipline of soil, water and environmental sciences. This society was established in 1950 and has published the Egyptian Journal of Soil Science (EJSS) since 1961. This Journal has been made available in electronic form since 2016 through its website (*http://ejss.journals.ekb.eg/*). More than 1000 of its actual members are from Egypt and other countries, whereas there are only about 400 active members. The election for the complete board of ESSS took place by April 27, 2017. Affairs of the Society are managed by an Executive Council, which is elected every four years. The Executive Council for 2017-2020 comprises Prof. Dr. Omar A. El-Hady (from National Research Center) as president, Prof. Dr. Abdelsamad Hegazy (from Ain Shams University) as General Secretary, Prof. Dr. Tolba Saleh as Treasurer (from Fayoum University), Manager of Membership Committee: Prof. Said Shaaban (from National Research Center), and Vice or Assistant General Secretary and Communication coordinator of ESSS, Dr. Hassan El-Ramady (from Kafrelsheikh University). Fifteen members for this board were selected from the Egyptian members. The board includes the following members beside previous members: Prof. Hassan Hamza and Prof. Raafat Abdelaal (Benha Uni.), Prof. Mohamed E. Shawky and Prof. Elsayed Gaber (Cairo Uni.), Prof. El-Hoseiny Abo Hussein (Menofyia Uni.), Prof. Saad El-Demardash (Desert Research Center), Prof. Mohsen Gamie (Assuit Uni.), Dr. Ahmed Ibrahim (Suez Canal Uni.), Prof. Khaled A. Shaban and Dr. Ahmed Khalil (Soil, Water and Environment Research Institute, ARC). Below you will find a photo of the event.

(Photo©Hassan El-Ramady)

Nigeria Institute of Soil Science founded

The Institute is the professional arm of the Soil Science Society of Nigeria and charged with the following responsibilities:

- Prescribe and regulate the standards of academic qualification and practical skills to be attained by the persons seeking to become registered as members, Associates or Fellows of the Institute
- Regulating the practice of the profession of Soil Scientists;
- Establish, update and maintain a register of Soil Science practitioners under this Act according to their various ranks and to regulate the prerogatives and privileges pertaining to those ranks;
- Ensure that the Soil Science Practitioners in Nigeria uphold the ethics of the profession and guarantee the sustainability of high quality soil;
- Advance the education, science, technology and art of soil science and crop production in collaboration with Zonal Coordinating Research Institutes;
- Promote soil quality management;
- Educate the public on soil science activities;
- Advise and encourage the enactment and the enforcement of laws that will guarantee efficient production and consistent supply of high quality food in Nigeria;
- Promote rapid sustainability of high quality soil through scientific methods, and regulate all issues pertaining to soil management in Nigeria;
- Corporate or affiliate with any relevant association and soil science body either locally or internationally, etc.

The Institute is temporarily located at the building of the National Programme for Food Security, Federal Ministry of Agriculture and Rural Development, 127 Adetokunbo Ademola Crescent, Wuse 2, Abuja.

By Prof. Victor O. Chude, Professor of Soil Science, President, Soil Science Society of Nigeria

In memoriam

Prof. Jules D'Hoore (1917-2017)

Jules D'Hoore was born in Sluis (the Netherlands) on 7th May 1917, while his family was on exile as Belgian refugees during WWI. After the war his family returned to Bruges where he followed the Greek-Latin option at St. Lodewijkscollege. During WWII Jules's university studies were disturbed by the war mobilization and he was war prisoner for a short period. Eventually he obtained his diploma of Engineering in Chemistry and Agricultural Industries from the State Higher Agronomic Institute in Ghent in 1943. He stayed on as assistant at the Faculty of Sciences of the State University of Ghent, in the Laboratory of Analytical Chemistry (Prof. J. Gillis).
In 1946, Jules undertook his first mission to Congo as assistant researcher in the Department of Agrology, INEAC, Yangambi. While serving as visiting Researcher of Wisconsin, USA in 1949 he made visits to soil laboratories of the Universities of Ames, Cornell, and Pennsylvania State and to the US Soil Conservation Service, Washington, DC. In 1951 Jules participated in an OECE mission (3 months) in western Africa in the company of L.T. Alexander (USA), R. Maignien and G. Aubert (France), and C. Bloomfield (UK): field study of laterisation phenomena.

In 1950 Jules D'Hoore started his doctoral project under supervision of L. De Leenheer at the then State Higher Agronomic Institute in Ghent (which later became the Faculty of Agricultural Sciences of the University of Ghent). On 10th September 1953 he defended summa cum laude his thesis entitled 'The Accumulation of free Sesquioxides in Tropical Soils'. He was the first to obtain his PhD at this Institute/Faculty, not his last pioneer achievement. With this thesis he became a world authority on the processes which led to laterite soils (present-day Plinthosols).
In 1953 he was detached to the Commission for Technical Cooperation in Africa (CCTA) as Director of the Service Pédologique Africain / Interafrican Pedological Service (SPI). In 1954 Jules was involved in the preparation of the "II° Conférence Interafricaine des Sols" (2nd Inter-African Soil Conference) and the International Soil Congress of Leopoldville, Congo. In this period he started assembling the soil map of Africa at 1/5,000,000 scale. For that purpose he made several visits to the major soil centers of Africa and Madagascar along with field work during numerous soil correlation meetings with regional soil scientists active in Africa.

During his fourth mission to Congo in 1956 he designed a first approximation of the Soil Resources Map of Africa and of its provisional legend. This map was verified during numerous regional workshops all over Africa. The third approximation of the Soil Resources Map of African was presented in 1960 during the 7th International Soil Congress at Madison, USA. At that time, the baseline documentation of that map, stored in Yangambi, becomes inaccessible, because of the evacuation of this research center. Jules had no other option than reconstituting this documentation by personal mailing to correspondents. He was temporarily hosted by the "Service Pédologique Interafricain" (Inter African Soil Service) in Ghent, thanks to the hospitality of Professor De Leenheer and Professor Tavernier. In

1962 he is assigned as member of the “Advisory Committee Project World Soil Map”, FAO-UNESCO.

In 1962 Jules joins the Centre for Tropical Soil Studies at Katholieke Universiteit Leuven. He drafts the Fifth Approximation of the Soil Resources Map of Africa which is eventually published in 1963 in French and in English along with its legend and an elaborate explanatory text.
In 1970 Jules makes a study visit to the Goddard Space Flight Center, Maryland, USA and studies remote sensing techniques and their usability for soil observation and broad scale soil mapping. As of then he is prominently present in international fora on remote sensing (ESRO) as delegate from Belgium, including the new department of Remote Sensing of the Joint Research Centre, EURATOM, Ispra, Italy. He also inspired a state funded programme on remote sensing studies in Belgium. In 1976 he becomes the permanent Belgian member at the Remote Sensing Advisory Group at ESA (European Space Agency), charged by the Science Policy Office, Brussels.

Also in that year he is elected President of the Soil Science Society of Belgium. As of 1977 Jules is member of the “Klasse voor Natuur- en Geneeskundige Wetenschappen van de Koninklijke Academie voor Overzeese Wetenschappen” (Class for Nature and Medical Sciences of the Royal Academy of Overseas Sciences). He also gets actively involved in the first versions of Belgium-supported Inter-University Development Cooperation with missions to Zambia, Malaysia, Thailand and Congo. In 1983 Jules is Entitled Member of the Class for Nature and Medical Sciences, Royal Academy of Overseas Sciences. During his professional career, Jules D’Hoore was honored several times with awards such as the price “Wetteren”, Royal Academy of Sciences, Belgium (together with J. Fripiat), the “Medal Order of the Lion” and “Great Officer in the Leopold Order”.

With his lectures at the forefront of scientific development, Jules D’Hoore was an excellent professor, giving his students a world view on soil genesis and soil geography, and a strong feel for interdisciplinarity, as he had worked with agronomists, geologists, ecologists and others during his career. With his Soil Resources Map of Africa he set a precedent internationally and to this day this valuable document is an important reference milestone from where new tropical natural resources work is starting. Jules D’Hoore’s soil map of Africa was recently the center-piece of the ‘Africa in Profile exhibition’ which was organized at KU Leuven to mark the International Year of the Soil in 2016. For the occasion, Jules kindly allowed recording an elaborate interview in which he reflects on his Soil Resources Map of Africa: *http://www.bbv-sbss.be/*.

Jules D’Hoore had a somewhat rigid appearance, but in fact he was a sensitive person, with discrete empathy for those in need. He was famous for his erudition, fluency in languages and his interest in art, culture and history, which he liked to share. Jules had a sarcastic sense of humor and a capacity for making verbal caricatures. His speech at the day of celebrating the end of his career will be remembered for two rather ‘Julian’ expressions: he compared the soil to a ‘palimpsest’ – a reused manuscript bearing traces of older writings, and he likened his career as a ‘time of great delight’. During his long retirement period, he kept delight in remembering his achievements and sharing it with visitors.

Jules D’Hoore passed away in his home on 19/09/2017, a few months after he celebrated his 100th anniversary with family and friends. He was a great man, a polymath whose stories will live on among the large community who had the chance of knowing him.
We end this in Memoriam with two quotes from Jules which we found in his Memoires (Family Archive, 2004): “…during our long travel through West-Africa for studying laterites in the Sahel, we often slept the night on a roof terrace. Safe of the odd cycads it was dead-silent, the stars hanging high in the sky like balls on a Christmas tree in the firmament. Sleeping in, I was thinking of the immemorial Chaldese astrologists, or better the proto-theologists, who could read God’s will from the run of the stars. They stood round me in a big group and I could recognize Copernicus, Galilei and Kepler. In that that excellent company I fell asleep till the morning chill woke us up to see the first stripe of yet another sunny day… “

“During my career I was able to travel a lot by sea, by land and though the sky… I could reflect and dream away above mountain chains, tropical rain forest, steppes and deserts, icy plains of Greenland, a snow-covered Canada, great water falls … Victoria, Niagara… safe dreaming is never to be taken for granted, also not when watching mother earth from the window of an air plane…”.

By Hubert Gulinck and Seppe Deckers

Chris Dirksen (1936-2017)

The well-known Dutch soil physicist Chris Dirksen passed away on September 17 2017. After completing his International relations degree at Wageningen University, in 1959 he and his wife Dicky Boeijenga moved to the USA. In 1964 Chris obtained his PhD degree at Cornell University, with a thesis on formation of ice lenses in unsaturated soil. Subsequently he was four years with Gulf Research and Development Company at Pittsburgh PA, working on natural convection during segregated burning. In the period 1968-1978, he was with the USDA-ARS, the first five years stationed at University of Wisconsin and next at the US Salinity Laboratory (USSL) in California. In 1978 Chris returned to Wageningen, first to Soil Science and Plant Nutrition and later on to Water Resources.

Throughout his career Chris developed novel laboratory and field methods to determine soil physical properties and monitor processes in unsaturated soils and response of plants to salinity and water stress. At Wageningen, he became much involved in teaching and organizing introductory and advanced soil physics courses. The book Soil Physics Measurements (Catena Verlag, 1999) reflects his promotion of sound methods. At Riverside Chris collected an impressive amount of data on the response of plants to salinity and water stress. At Wageningen he thoroughly analyzed those data, paying close attention to the hysteresis of the water retention curves. In the late 1990s, with colleagues he collected and analyzed more data on plant response to non-uniform, transient salinity and water stress.

By Peter Raats, Wageningen University

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
	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
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