

IUSS Bulletin

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90 years IUSS

1924-2014

125

International Union of Soil Sciences (IUSS)

The IUSS Bulletin is the official Newsletter of the International Union of Soil Sciences. It is freely distributed through the IUSS website. All contributions are welcome and should be send to the editor.

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2015
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Year of Soils



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Farewell from the Secretary General

This is the last IUSS Bulletin that I have edited, and in December 2014 my term as IUSS Secretary General ends. The positions of Secretary General (SG) and Deputy Secretary General (DSG) will no longer exist in the new IUSS administrative structure. In this editorial, I shall reflect on some of these changes, the things that we have done in the past years, and some ideas on the future. Since it is my last editorial, I take the liberty to reminisce a bit about the past 13 years in the IUSS. These are my personal reflections and they may reveal some internal compass directions that guided me through the wonderful wilderness of the world of soil science.

When Alex McBratney and I ran for the positions of Deputy SG and SG we had written a statement of interest with a vision for the IUSS. Central to that vision was that the IUSS should serve and reinforce the global soil science community, promote soil science and all its activities. This should be done by enhancing the management of the organization, stimulate all soil science initiatives inside and outside the IUSS, and improve communication with other scientific disciplines and the general public. Now a bit on what was achieved. Firstly, a strategic plan was written with goals, performance indicators, and external evaluations. This was adopted by the Executive Committee and the Council. It needs implementation. We speeded-up and improved transparency of decision making and used online voting for IUSS positions. The first global elections were held for the IUSS President in 2012, and for all Divisions and Commissions chairs in 2013.

We had the idea of developing a more permanent administrative unit for the IUSS that would take care of addresses, IUSS Alerts, Bulletin and all communication with national soil science societies, and our finances. Such secretariat would make the IUSS more professional with improved service to our members. With great efforts by many, that secretariat will become effective as of 1st January 2015. The scientific activities of SG and DSG are transferred to Presidential Committee, whereas the administrative duties are now taken care of by the secretariat. There is a considerable cost

to it but by reducing the number of leadership positions we strongly believe that this secretariat will be a boost for managing the IUSS service and activities. We can afford this thanks to support from several Austrian partners, and because in the past four years we have doubled the IUSS financial net worth as a result of reduced expenditure and higher income. We also invested k\$320 of our savings into bonds and equities in the USA that yields considerable income. In order to make the investments possible, the IUSS had to become incorporated into the USA (IUSS Inc.) which also allowed us to take insurance to protect IUSS officers against all possible liabilities.

Like many achievements they were a team effort, and we worked diligently with the Executive Committee and the ultimate group of stakeholders: the IUSS Council. As opposed to failures, achievements have many fathers and mothers. There is no exception for the IUSS. In that respect, we should not forget to mention that we have failed to rejuvenate the IUSS leadership, and weren't successful in bringing in more women in the IUSS. At least we have Erika Micheli as Division head and quite a few Commission chairs – and hopefully more to follow. As often the case, people do not necessarily volunteer for positions until someone steps down. Looking at the gender distribution in our soil science class rooms, we trust that time will take care of this all.

Enough self-evaluation, now something on the future. I sense that soil science is at the cross roads. It has matured in the past decades and we have a set of standardized tools and techniques that are routinely used in soil research, assessment and education. It has successfully reached out to policy and decision makers and has stressed the importance in many fora across the world. The soil science discipline has led new research fields and cooperated with many other disciplines. All of these remain important in the future but there are a couple of matters that may require attention – particular now soil science experiences such an upsurge.

Soil science activities have fragmented in the past decades. Now the time has come to firmly embrace



other groups that work on soils but not necessarily reside in soil science centres or departments or attend our meetings. These are, for example, biogeochemists, earth scientists, geologists, critical zone scientists, and a considerable part of the soil C and ecology research community. The IUSS would strengthen from the inclusion of such groups, and a strong union reflects a strong science. It may take some strategic thinking how can it be done but one way is to attend their meetings and invite them to IUSS meetings.

The role for the IUSS remains to keep promoting the soil science discipline but several other groups have been initiated with fairly similar objectives. As a principle, the IUSS should strive for enhanced participation and ownership of all soil scientists across the world. The IUSS is a large global organization of soils science and at the global level no other organization has such a great network of soil scientists and activities. Therefore, we should cooperate and embrace with other soil groups (provided they do science).

Thirdly, the IUSS should increase its support for all the activities of the Commissions and Working Groups. These groups are at the core of the IUSS and cover the entire gamut of soil science. They do much of the bottom-up work for our World Congress of Soil Science and in the period between the congresses. They should receive more financial

and management support that is based on performance. A good step in that direction is the "IUSS Commission and Working Group Forum" that has been approved by the council at the recent World Congress in Korea. Much can be expected from increased participation. The world of science is essentially bottom-up - the IUSS should reflect that.

Sofar, a few ideas about the future - now a bit of reminiscing. I have started working for the IUSS in 2001 when I suggested to Hans van Baren (DSG from 1990 to 2002) that the IUSS should have a website. "Go and do it" was his instantaneous reaction. I claimed the URL and learned how to ftp files, and by mid-2001 the first IUSS website was up containing the IUSS Bulletin. Later, a list of meetings, reports of meetings, a job vacancy page and many others html's were added. Over the years, most of the archive of the IUSS has been scanned and added as PDF to our website. This includes all ISSS/IUSS proceedings since 1927, IUSS Bulletins, the journal *Soil Research* and its predecessors, all historical documents and pictures. Usage steadily increased and in 2005, I started the IUSS monthly email Alerts focusing on IUSS matters, meetings, publications and anything interest to the global soil science community that further increased our website use. In 2011, Budiman Minasny from the University of Sydney took over the website,

revamped and improved its features. And from 2015 the website will be hosted by the IUSS permanent secretariat in Vienna further enhancing its global service and impact.

Another service that we have provided to our members since 1952 is the IUSS Bulletin. IUSS Bulletin 103 was the first that I have edited, and now this is my last: Bulletin 125 (coinciding, or not, with the 125th Anniversary of my Soil Science department here in Madison). The first bulletin in 1952 was produced by F.A. van Baren (Secretary-General from 1950 to 1975). From the foreword of the first Bulletin:

“..the bulletin aims to pass on official information about all important events concerning the life and activity of the Society to its members and to National Societies and Regional Groupings as well as to Research Institutes.....members had expressly shown their desire to be informed about these activities and about the development of Soil Science in the diverse countries of the world.”

Not much has changed, I guess, although we have tried to make the Bulletin more personal and owned by the members (e.g. 5 questions to a soil scientist, favourite soil science books, small articles) and the Bulletin has been professionally laid-out since 2008. For more than 20 years the Bulletin was produced by F.A. van Baren in Amsterdam, then it moved to Rome, to Wageningen, Vienna, Wageningen and since 2011 in Madison. It has helped to create a corporate soil science feeling in the diverse countries of the world.

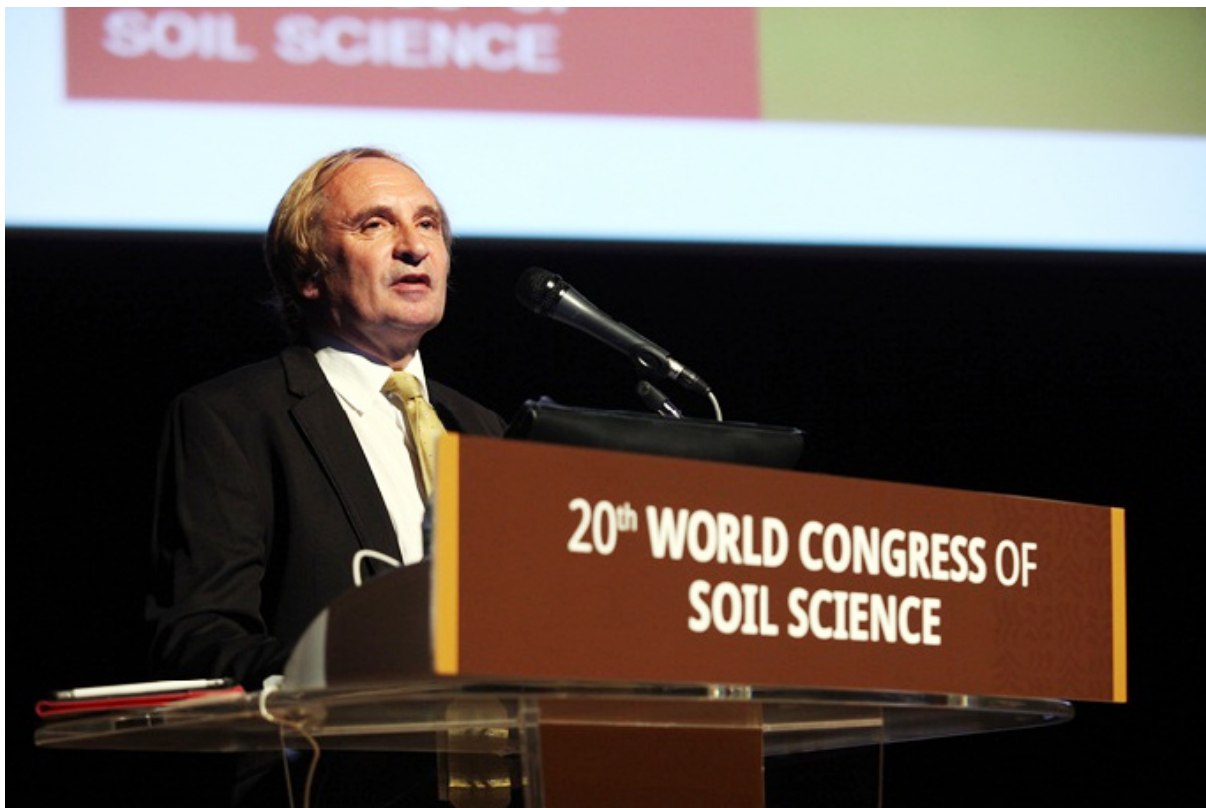
The first Secretary General was D.J. Hissink (1874-1956) who headed the international soil science society from 1924 to 1950 and he was succeeded by F.A. van Baren (1950-1975). He was followed up by R. Dudal (1975-1978), W.G. Sombroek (1978-1990), W. Blum (1990-2002), and S. Nortcliff (2002-2010) – and I had the great honour to serve in that role for the past four years. After 90 years the position of IUSS Secretary General ceases to exist. Although this breaks away from a long tradition, I am confident that our new leadership model will serve global soil science in a grander way. It shows that the IUSS is a dynamic body, prepared to change and thinking of the challenges that lay ahead.

At last, I wish to thank everybody whom I worked with so pleasantly and productively in the past 13 years, but realize that any list of names here would be incomplete. I thank you all for your trust, collegiality and friendship and our common goals:

move soil science forward. We have the most beautiful and electrifying discipline in the world (for once an objective reflection). Allow me to single out Hans van Baren whom has always been supportive and encouraging, but died too young in 2009. Thank you Hans for all your help, critical comments and discussions. Just like Hans had mentioned to me in 2001, I now say to all my IUSS friends and global soil scientists: *“Go and do it”*. Please, do it well.

Alfred E. Hartemink
Secretary General IUSS
(until 31 December 2014)
E-mail hartemink@wisc.edu

Farewell from the Deputy Secretary General



As most of you are aware IUSS has changed its governance structure and as a result the positions of Secretary General (SG) and Deputy Secretary General (DSG) in place since 1924 have come to an end. Therefore my DSG position ends on December 31. I am very much in favour of the change to a full-time professional secretariat like several of our national societies. I wish the new team in Vienna led by Sigbert Huber every success.

It has been a great honour and pleasure serving you the members of IUSS. IUSS is a vibrant organisation which every year through its Divisions, Commissions and Working Groups organises dozens of meetings for thousands of active participants. We are in great shape and we go from strength to strength. Finally, I should like to thank my colleague and SG, Alfred Hartemink, who has worked vigorously and tirelessly for IUSS for the last twelve years.

Have a wonderful and active International Year of Soils in 2015, and beyond that IUSS and its members will carry the message of soil secured by sound soil science into the future.

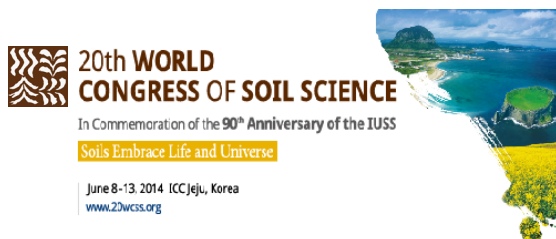
Alex McBratney

Deputy Secretary General IUSS

(until 31 December 2014)

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20th World Congress of Soil Science



The 20th World Congress of Soil Science (20WCSS) was held at the International Convention Center (ICC) in Jeju, Korea, from June 8 to 13, 2014, with the theme of 'Soils Embrace Life and Universe.' IUSS Council approved Korea as the venue of the 20th WCSS in 2006 during the 18th WCSS in Philadelphia, USA, in 8 years advance to 20WCSS according to the Statute. Thereafter, Organizing Committee (OC) of 20WCSS, 80 members and 75 volunteers, had a long journey with hard works to prepare the diverse programs of the 20WCSS.

There have been several justifications for 20WCSS to be held with such a meaningful theme. IUSS had the 90th anniversary since after its organization established on May 19th, 1924. UN designates 2015 as the International Year of Soil and Dec. 5th as the World Soil Day. The field of soil science is mushrooming by leaps and bounds due to the growing interest in food security and safety as well as ecosystem services. On the other hand, soil faces grand challenges such as population growth, shortage of food and soil degradation. In addition, many emerging state-of-the-art technologies being developed by other fields will be available for us to adapt to soil science. We are in the presence of an explosion of information and knowledge in the many fields of soil science.

The millennium WCSS will be held in Italy in 2024 to celebrate the IUSS 100th anniversary. Thus there was a need to focus the history of IUSS and prepare the relevant program in the 20WCSS. The 20WCSS was composed of pre-, main and post-congress events. Pre-congress event includes the first international soil judging contest and tour of the volcanic ash soils in Japan. Post-congress tour was to have the cultural tours in Seoul area. Main congress programs include the scientific symposia along with several accompanying events such as Soil Parade, Jeju Declaration, Soil Art and Film Festival, IUSS 90th anniversary exhibition, fortune drawing, etc. This report summarizes the main events and outcomes of the 20WCSS and provides few suggestions for the next WCSS.

Pre-Congress Event: The First International Soil Judging Contest

The International Soil Judging Contest was held during June 5–7, 2014 in Jeju as a pre-congress activity for the first time in the IUSS history. Total twelve teams from ten countries were participated: Korea-A, Korea-B, Australia, South Africa, USA-A, USA-B, Taiwan, Japan, China-A, China-B, Mexico and International team. Total participants were 95, of which competitors and coaches were 64 person and organizers and coordinators were 31 person. Cristine Morgan (Professor, Texas A&M University, USA) and Stephen Cattle (Professor, The University of Sydney, Australia) were served as the Chairs of the committee.



Soil profile pits of the contest were prepared separately for practice, individual and team competition. OC provided US\$1,000 scholarship to each team and exempt the registration fee for participants. OC secured the relatively reasonable accommodations for the participating students and coaches for their conveniences.

Awards were classified into the overall grand prize, team awards and individual awards. The Grand Prize, which considered overall individual and team achievements, went to USA-B team (Coach: Chris Baxter, University of Wisconsin, Platteville, USA). The first, second and third prizes for team competition were USA-B team (Coach: Chris Baxter, University of Wisconsin, Platteville, USA), USA-A team (Coach: John Galbraith, Virginia Tech University, USA), and Japan (Coach: Takashi Kosaki, Tokyo Metropolitan University, Tokyo, Japan), respectively. The first winner of the individual competition was Chien-Hui, Syu, Taiwan (Coach: Zueng-Sang Chen), followed by the 2nd prize for Tyler Witkowski (USA-B) and the 3rd prize for Fei Yang, China-B (Coach: Qiubing Wang). The Award of Excellence Certificate was given to the rest of the participating teams and individuals. Trophy was awarded to the grand prize and plaques were given to team and individual winners. All awards ceremony took place during the welcoming reception.

This exciting initiative gave students from around the world an opportunity to mix with fellow soil science students, to experience volcanic soils and landscapes in a beautiful part of Korea, and to test their soil description and interpretation skills on the world stage.

This challenging soil judging contest became one of the highlights of the 20WCSS and this legacy should be continued in the future WCSS or relevant meetings. For this, OC of the future WCSS should expect to prepare more of scholarships to encourage the students participation from the different and diverse countries.

Congress Participants

Total Participants were about 2,100 person, of which 1,973 person from 87 countries were registered and the rest were registration fee exempt such as invited speakers, conveners, exhibitors, special guests, volunteers and speakers at various functional meetings such as opening ceremony etc. OC provided free registration fee to 27 invited speakers, 82 conveners and 102 exhibitors.

Among registrants, 70% are from IUSS membership subscribing countries; 3.5% from non-member countries, 8.3% are retired scientists (over 65 years old; 64 person with 59 accompanying). OC reduced the registration fee about 50% for the soil scientists who are retired or age over 65. The countries that sent more than 50 soil scientists are Australia 139, China 264, Germany 76, Japan 160, Korea 479, Taiwan 51 and USA 157.

Ratio of regular/student registration was about 2.4 indicating relatively many students were participated in the 20WCSS. Ratio of registrants from oversea/domestic was 3.1 indicating more from abroad. About 93% of registration were early-bird and preregistered.





Scientific Symposia

Total of 2,886 abstracts from 112 countries were selected for presentation (Oral: 546, Poster: 2,340) after review by symposia conveners. Total of 88 symposia were organized for oral and poster presentations, as below table. Over 10 concurrent sessions for 4 days were held. As the supreme symposia, the Congress symposia include soils for peace, soil security, soil-plant welfare and IUSS for global soils: future nexus. The countries that

submitted more than 40 abstracts were Australia (222), Bangladesh (43), Brazil (102), Canada (41), China (363), France (51), Germany (100), India (142), Indonesia (42), Iran (116), Italy (42), Japan (158), Korea (324), Nigeria (88), Pakistan (44), Russia (77), Taiwan (56), Thailand (46), and USA (195). All information on programs and abstracts are in 20WCSS homepage (www.20wcscs.org). Abstracts are undergoing to be indexed in AGRIS system.

| Symposium Category | Sessions |
|---------------------------|-----------|
| Congress Symposia | 4 |
| Inter-Divisional Symposia | 17 |
| Divisional Symposia | 7 |
| Comm. Symposia of Div 1 | 11 |
| Comm. Symposia of Div 2 | 15 |
| Comm. Symposia of Div 3 | 13 |
| Comm. Symposia of Div 4 | 8 |
| Working Groups Symposia | 13 |
| Total | 88 |

IUSS Awards and Honorary Members

Awards



Dokuchaev Award: Alex McBratney, Professor, The University of Sydney, Australia

Liebig Award: Magdi Selim, Professor, Louisiana State University, USA

Honorary members

- Jai Joung Kim (Chungbuk National University, Korea)
- John M. Kimble (USDA, USA)
- Ahmet R. Mermut (University of Saskatchewan, Canada)
- Nicola Senesi (University of Bari, Italy)
- Donald L. Sparks (University of Delaware, USA)
- Robert E. White (University of Melbourne, Australia)

Jeju Declaration and Soil Parade

Jeju declaration (see below) was proposed by the organizer at the Soil Parade program and approved in the council meeting to be used for increasing soil awareness. Soil parade was held on June 9



after finishing the session. Students from across the world declare the Jeju Declaration. Several hundred participants had a chance to take a stroll along the pristine coast of the island. This event provided the platform for networking among participants. After the hiking the small mountain, a beer party was followed in the SEAES Hotel.

The 20WCSS Logo



The overall components of the 20th WCSS logo, giving out a scent of the orient, are rectangle to reflect soils and agricultural fields and four trigrams to depict the agricultural ecosystem and vital activities occurring inside. Each trigram being originated from the oriental philosophy symbolizes one of the four universal elements and key components of environment: upper left (☰: Sky, Spring, East, Tree), lower right (☷: Earth, Summer, West, Fire), lower left (☱: Sun, Autumn, South, Metal) and upper right (☽: Moon, Winter, North, Water). Four trigrams reflect the key components of agricultural ecosystem such as plants, river, rolling hills and contour, etc.; the live organisms in soil such as earthworms, grub and roots, etc.; and major practices such as strip-crops, plowing, windrows and erosion gullies, etc. There is a unity between them through form of shape and style and they sit in harmony. In addition, the four trigrams represent the four divisions of IUSS. The logo is a montage of soils embracing life and universe as becoming the theme of the 20th WCSS.

Technical Tours

The technical tour was an opportunity to find out more about Jeju Island, which is one of the most beautiful places in Korea and of great interest to soil scientists from around the world. There were four courses of technical tours. The first course was focused on the soil and rock around the southwest part of the island such as Yongmeori Beach, Suwolbong Peak, etc. The second course was focused on the natural environment, which consists of unique falls, Oreum and beautiful



coastline. The third course was socially focused and features visits to a green tea producer, citrus museum and folk village. The last course was Mt. Halla trekking. Total of 522 person were participated: Course 1 (Soil) 143, Course 2 (Nature) 138, Course 3 (Socio-culture) 135, and Course 4 (Mt. Halla Eco Trekking) 106.



Celebration of IUSS 90th Anniversary

The 20WCSS held in commemoration of the 90th anniversary of IUSS. To Celebrate the 90th IUSS anniversary, we were piecing together our past by collecting photos which are related to IUSS and previous WCSS congresses. What would be on display was a rare collection of photographs showing the history of the IUSS congresses dating back to



the early 1900s. The photos are sure to bring back fond memories and will be a perfect chance to see old friends and reminisce. And sand art performance (<http://www.youtube.com/watch?v=T71O3g8HEgo>) and traditional performance of Korea fork dance (<http://www.youtube.com/watch?v=SC5kLcxoZz0>) during the opening ceremony made the event more impressive.

Integrated Soil Art and Film Festival

Two artistic events were prepared for the 20WCSS as a commemoration of IUSS 90th anniversary: a soil film screening event and a soil art poster exhibition. The goal of this program was to bring together different areas of expertise, to inspire new opportunities for interdisciplinary collaboration, and to expand the practical horizons of soil protection, communication, and education. A range of soil topics in narrative, documentary, fiction, and experimental film genres were shown during the coffee breaks and lunch hours during the congress. The main featured film was 'Symphony of the Soil' which focuses on the beauty and mystery of the ecosystems beneath our feet as well as environmental risks from over-development, climate change, and poor land management. After the screening, there was a talk with a filmmaker.

Social Events

The beautiful island of Jeju has outstanding tourist attractions filled with breathtaking natural landscapes. There were a variety of social programs during the WCSS for participants and accompanying persons. The Welcome Reception and Gala Dinner were held onsite at the ICC Jeju. The Gala Dinner proved to be a particularly enjoyable night, with a captivating performance by a dance and traditional Korean percussion instrumental music and play. This was a great opportunity to relax with wonderful entertainment



while also giving us the time to get to know each other better. Social programs prepared were UNESCO site, trekking to Olleh trails, GEO park, City day and night tour, volcano site, botanical garden, Kimchi making experience, etc. About 300 persons attended at those social programs. Also post-congress tours in Seoul and vicinity were prepared for participants.

Scholarship

To help students from the developing countries attend at 20WCSS, substantial amount of budget set aside for scholarships. There were several hundred students who applied for scholarship but OC could not afford all the needs. Committee evaluated applicants based on student status, paper presentation and a country to where he/she is belonging. However, students who attended at 20WCSS with the scholarship expressed appreciation and delivered message saying this legend should continue.



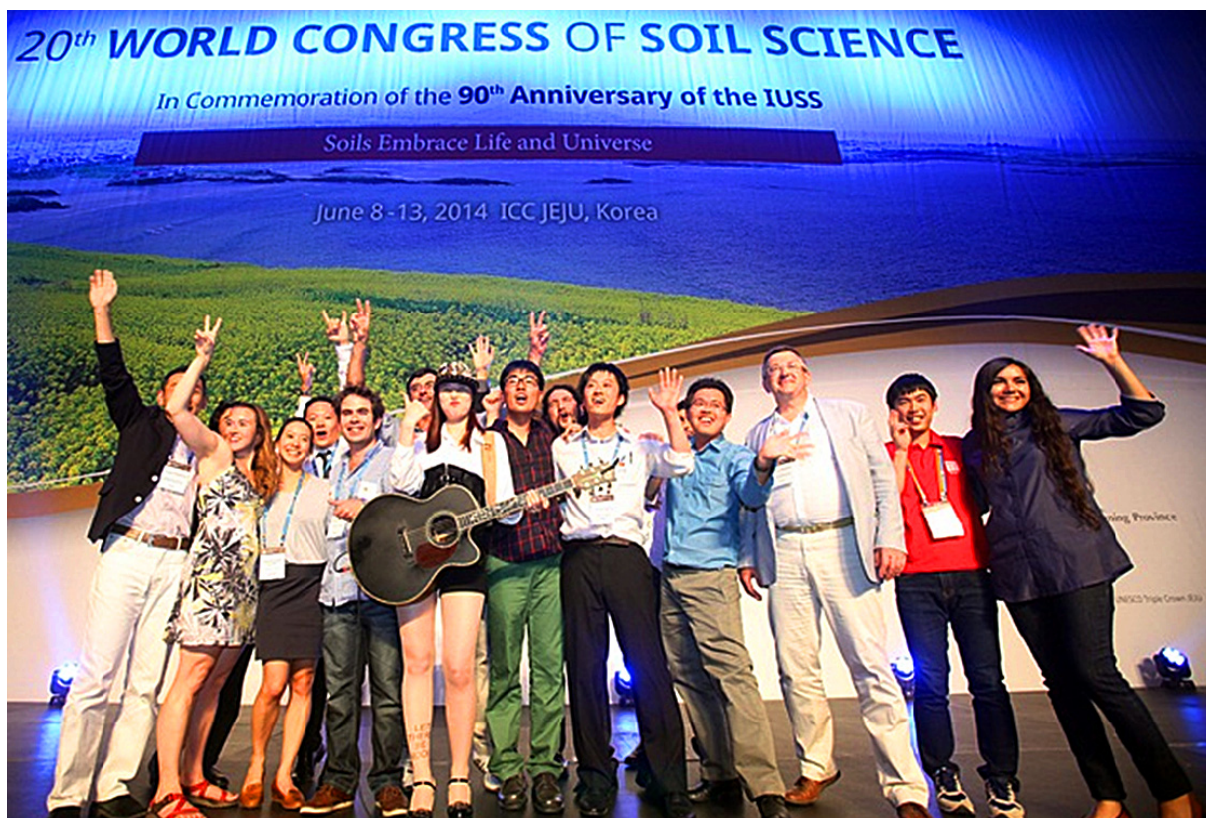
Exhibition

Total of 60 booth were used for exhibition. Twenty five booths were from foreign countries which are very appreciable for their efforts and budgets. Exhibitions were in general from categories of government, governmental agency, private company, research institutes, IUSS member countries such as USA, UK, Swiss, and few universities.

Presidential Luncheon

Purpose of the Presidential luncheon was to provide a platform to exchange idea and information among the presidents of member countries who participate in the 20WCSS. In general, they are eligible to attend at the IUSS council meeting but never had a special chance to meet together socially. This event was sponsored by Soil Environment Center, Ministry of Environment, Korea. About 50 Presidents and relevant guest participated in the event. Also this meeting provides a chance to confirm who is president of a member country.





Outcome and suggestions

The Korean Society of Soil Science and Fertilizer (KSSSF) appreciates IUSS for choosing Korea as the venue of 20WCSS which was held in June 8-13, 2014 in Jeju, Korea. OC is very proud of having the obligation to finish the 20WCSS successfully with diverse programs. About 21,000 were participated and 2,900 papers were presented through 88 symposia. OC tried to develop WCSS programs in order to serve member countries and other soil scientists with facilitating networking and communications among participants, other than the ordinary scientific meetings. In this regard, the first international soil judging contest, soil parade, Jeju declaration, President luncheon, soil art and film festival, fortune drawing and IUSS 90th anniversary exhibition were new faces of the 20WCSS as compared to the previous WCSS. Also we encourage student participation by developing programs for them such as scholarship, soil judging, soil parade and presentation awards. We hope that 20WCSS contributes to IUSS with some of the progressive development and basis for the IUSS millennium anniversary. Some suggestions for the future WCSS will be as follows.

- Need to develop a WCSS model that can serve members of IUSS

- Future WCSS should shed a light on the IUSS 100th anniversary and beyond
- Method to review papers and to reduce the loss of presentation
- More efforts to provide opportunity to students from developing countries
- More oral presentations necessary
- Encouraging the host of WCSS to share more of profit with IUSS
- Strategic planning to secure enough financial status

Soil in the modern era and future becomes more important in order to meet the societal needs and function the ecosystem services and welfare. We wish the 20WCSS provides the knowledge and perspectives on the soil's importance. We deeply appreciate all members of Korean Society of Soil Science and Fertilizer and Organizing Committee for their dedicated works to prepare the congress. Also very special appreciations should go to many sponsors, exhibitors, international partners, and international advisory groups. All of these have been essential components for 20WCSS and will guarantee the success of the future WCSS.

Jae Yang
IUSS Past-President



Jeju declaration

'Soils Embrace Life and the Universe'

***Proclaimed at the Soil Parade
of the 20th World Congress of Soil
Science (20WCSS)
Monday, June 9, 2014
Jeju, Korea***

Soils are important for life and the functioning of the world's ecosystems, and they face increasing challenges for their protection and sustainable use. We, the members of the International Union of Soil Sciences from more than 130 countries worldwide, are willing to contribute with information, knowledge, and resources to increase information about the worldwide importance of soils by raising soil awareness through new ideas and concepts about the value of soils on a global scale, as follows:

1. Soils are not dirt under our feet but the basis of our life;
2. Soils influence plant, animal, and human health. Therefore, we have to manage them carefully and sustainably;
3. Soils are an essential and finite natural resource and, therefore, need to be protected by all means;
4. Soils are complex in nature and heterogeneous in spatial distribution. Therefore, we all, irrespective of race, gender, culture, or location, must cooperate to increase the knowledge about our soils;
5. Soil loss and degradation are much quicker than soil formation. Therefore, we must protect our soils by developing a long-term strategy;
6. Besides food security, soils are closely related to water resources, biodiversity, energy generation, climate change, environmental health, and ecosystem services. Therefore, we must develop concepts for their sustainable use;
7. The value of soils is unknown to most politicians, decision makers, and the broader public. Therefore, we need to develop outreach programs for raising soil awareness.
8. Soils are used for urbanization, industrialization, waste disposal, and other forms of use, thus impacting long time food production. Therefore, we need to develop best management concepts for maintaining and restoring the ecological functions of our soils;
9. Because soils are our common basis, we should highlight their value and benefits by celebrating December 5 as the World Soil Day in all countries of the world.

IUSS President and Vice-President Report




Started as quite strangers to IUSS until the early 2000, I and John have participated various IUSS meetings including WCSS and tried to be acquainted with IUSS missions and functions during the last decade. Of our four years term, the first two years were to make linkages between IUSS and member countries as well as international organizations relating to soils. During the second two years, we focused more or less our activities on the 20WCSS. Briefly summarized are the major activities that we have pursued in last four years.

1. At the beginning of our term in 2011, we (with John, Alfred, and Alex) had steering meeting in Bogor, Indonesia to design the forthcoming four year projects and IUSS strategic plans. Herewith,

Alex prepared the IUSS strategic plan entitled 'Soil Science 2020 & beyond' which compose of two sections of (a) overarching strategies which have 11 components and (b) global noble challenges that have five components. The plan is designed to realize the value of soil and valuing who study soil and thus reflects a right direction that IUSS should pursue in the modern green growth era. Many projects seem to follow the right track based on the strategic plan, but we feel that more members should aware of this plan for more of IUSS activities.

2. I feel that IUSS should serve global soil science communities with more knowledge and information. IUSS soil C conference in 2013, organized by Alfred, is the typical example



to backup the objective. For the scientific leadership, I and John participated the IUSS divisional, commission and working group meetings to encourage their activities. For this purpose, we also took part in the regional meetings, such as EUROSIL and ESAFS, etc. other than Korean meetings.

3. IUSS should find a way to support more activity to hold the strongest leadership in soil science communities among global organizations. We have participated in not only soil science meetings but also other discipline meetings, e.g., agricultural engineering, crop science, information technology, agro-chemicals, governmental policy, energy, geology, etc. in order to boost soil science.
4. On behalf of IUSS, I and John have visited about 50 countries during the last four years to represent IUSS and interact with member countries and other national or international organizations. Examples are annual meetings of member countries, ICSU GA, Global Soil Partnership, Global Soil Week, IAEA/RCA, ISO/TC, etc. We promoted the IUSS activities and WCSS.
5. For our activities, we were very fortunate to have both financial and in kind supports from government, universities, KSSSF, and research grants without spending any IUSS fund, which might be equivalent in total to more than US\$ 150,000.
6. I tried hard to help IYS2015 and WSD be designated by UN GA in 2013 with writing supporting letters to many agencies including UN Secretary General Office, Korea Ambassador to UN, UNCCD, and other national ambassadors representing to UN, for example Thailand. In this regard, I appreciate IUSS members and other colleagues who helped me with valuable idea and advices.
7. With the full helps and advices from EC, PC and council members, overall operation of IUSS seems to be in right tracks, even some of the goals may fall short compared to the expectation. IUSS funds seem to increase a little compared to previous years, statutes and by-law improved better toward a more systematic and democratic way. As Alfred initiated, electronic voting was the first ever made in IUSS community.
8. In reward to IUSS decision to select Korea as the venue of the 20WCSS, we have worked very hard to organize the 20WCSS with diverse programs of soil science, awareness, interaction and socio-culture.

We are willing to share with next president the experiences and suggestions. During the last four years as President and Vice-president of IUSS, we have tried hard to fulfill our duties even we could not make IUSS quantum leap. We had an enormous experience that worth at least for the once-in-a-life. We deeply appreciate for great supports and advices from EC and council members to help us host 20WCSS and run Union smoothly. Thank you so much.

June 8-13, 2014

Jae Yang, IUSS President

*John Key-Hoon Kim, IUSS Vice-President
(now past President and Vice-President)*

IUSS Council meetings Jeju, June 2014

9 June 2014, 19:00-21:00 h
(Recorded by M.B. Kirkham)

The 2012 Council minutes were approved. The rest of the meeting focused on reports by members of the Executive Committee.

Jae Yang gave the presidential report. He told how he and John Kim had travelled widely over the past 10 years and had gotten support for the congress. He noted we need to emphasize international cooperation. He will share his experience with the president of the next congress.

Alfred Hartemink gave the Secretary General's report. He told how the biggest change had been the creation of a new Secretariat in Vienna. It will become effective on January 1, 2015. He reported on the elections. Division and commission chairs were elected electronically. At the presidential level, Rainer Horn was elected the new President and Rattan Lal is the President-Elect. The Soil Carbon Conference in Madison, Wisconsin, in 2013, was a success and sets an example to have such a conference in odd years between the inter-congress meetings and the congresses.

Alex McBratney gave the Deputy Secretary General's report. The strategic plan, which he distributed to all members in December 2012, had had no feedback. We need more ongoing support. He has travelled to several conferences, including

the Brazilian Soil Science Congress. Three thousand people were there, mainly students, which show that soil science is a thriving discipline. He noted that with the new Secretariat there are increased responsibilities for the presidential group. He ended by saying it had been an honor to serve in this position.

The reports from the Divisional Chairs were next. Karl Stahr gave the report for Division 1, Soil in Space and Time. The commissions in Division 1 have been active. Commission 1.4, Soil Classification, has given the Guy Smith Medal two times, once to Rudi Dudal and once to Hari Eswaran. He noted that both of these men have passed away. He wishes Erika Micheli, the new Chair of Division 1, success. Martin Gerzabek gave the report for Division 2, Properties and Processes. The division has had presentations at many conferences, and Commission 2.1, Soil Physics, organized a conference in Monte Verità. The division is proposing a new commission that will look at soils as a system. He ended by saying that the new Chair of Division 2, Kazuyuki Inubushi, will run the division well. Rainer Horn gave the report for Division 3, Soil Use and Management. The division has published a book on soil degradation. The division supported a meeting in Kenya, and it will participate in an international soil salinity meeting in Riverside, California. He ended by saying the division is working well, but there is still much work





to do, especially on land degradation. Chuck Rice gave the report for Division 4, The Role of Soils in Sustaining Society and the Environment. Early in his term, when he was President of the Soil Science Society of America, he organized a presidential symposium that included the presidents of several societies, including Jae Yang. The division has been involved in several conferences, workshops, and symposiums, including one at the annual meeting of the American Association for the Advancement of Science. Commission 4.4, Soil Education and Public Awareness, is important, and he noted that the first international soil judging contest was held in Jeju. It was well organized and exciting for the future of soil science. Commission 4.5, History, Philosophy and Sociology of Soil Science, has published a book, *The Soil Underfoot*.

The reports of the four standing committees then were given. The Standing Committee on Awards and Prizes selected Alex McBratney of Australia as the recipient of the Dokuchaev Award and Magdi Selim of the USA as the recipient of

the Liebig Award. The Standing Committee on Presidential Elections has successfully disconnected the presidency from the congress to a presidential group that consists of a President-Elect, President, and Past-President. Each office is for two years. The President-Elect becomes the President and then the Past-President. So someone who is elected President-Elect will serve six years. The Standing Committee on Budget and Finance reported that we have three groups of membership, depending upon the GDP of a country. The amount of money that a national society pays is determined by multiplying the number of members times the rate that each country pays (US\$7.75 per member for Group 1 countries; US\$4.65 for Group 2 countries; and US\$1.15 for Group 3 countries). There is under-reporting of members by some countries, which reduces the income. A special thanks was given to Jim Gauld for serving as Treasurer. He will be replaced by Andreas Baumgarten at the Secretariat in Vienna. The Standing Committee on Statutes and Bye-laws reported that the changes





associated with the new Secretariat have been incorporated into the statutes and bye-laws. The new presidential positions have been described in them, too. The new statutes and bye-laws will be circulated to Council and then it will vote to approve them.

12 June 2014, 12:00-14:30 h

Four countries bidding to host the 22nd World Congress of Soil Science in 2022 gave presentations. They were China, Italy, Switzerland, and the United Kingdom. The bid from Switzerland was a conglomerate of seven countries including Switzerland, Austria, Belgium, France, Germany, Slovakia, and Slovenia. The conferences would be held in Nanjing, Florence, Geneva, and Glasgow. After the presentations, a vote was taken, and the United Kingdom won the bid.

Linda Nol from The Netherlands presented the following motion to the Council:

“The council moves that the Executive Committee install and facilitate a **permanent forum** in which all Commission and Working Group Chairs be represented to exchange ideas and discuss matters pertaining to the work of the Commissions and Working Groups. The Division Chairs shall be members of the forum. The forum shall have the power to put items on the agenda of the meetings of the Council. The Executive Committee shall consult the forum on matters pertaining to the work of the Commissions and Working Groups. A first advice to seek shall be the creation of a **white book** describing the operation of the Commissions

and Working Groups, including a **description of the forum** to be created.”

The motion was approved unanimously.

Before adjournment, the President of the 20th World Congress of Soil Science, Jae Yang, was given thanks for his excellent work.

IUSS Alerts May - November 2014

International Union of Soil Sciences



Information for and from the global soil science community

IUSS Alerts are e-mailed to more than 12,000 people in over 100 countries. If you have information to share please send it Hartemink@wisc.edu Below are the still relevant contributions that appeared in the IUSS Alerts between May and December 2014.

Soil Micromorphology Newsletters

The April Soil Micromorphology Newsletter contains several informations and contributions, among them an extensive report on a Russian meeting devoted to the late Nicolas Fedoroff was sent by Marina Verba and Irina Kovda. Very sad news is that Dr Hari Eswaran (USDA) passed away on April the 14th. A "In Memoriam" written by Prof Georges Stoops is included. Also, the 2014 Young Micromorphology Publication Award is announced, the awardee is Dr. Amanda Williams (U. Las Vegas) for an excellent paper on desert crusts. The micromorphology session schedules for several forthcoming meetings is provided: the EGU meeting in Vienna; the World Congress of the IUSS in Jeju (Korea) and the International Workshop on Archaeological Micromorphology (Amersfoort). The preliminary scientific programme of the 2016 Mexico XV Micromorphology Congress, open for discussion, is provided as well. Information about three micromorphology courses (two in Spanish, one in English), meetings and publications is also available.

The October 2014 newsletter is online at www.iuss.org. It includes remembrances for three great soil scientists and micromorphologists that passed away recently: Prof. Gerhard Reuter, MSc Susana Pazos and Prof. Krystyna Konecka-Betley. You will also find a photographic report of the Kubiëna Medal, awarded to Prof. Rienk Miedema during the last IUSS meeting in Jeju, together with the reports on micromorphology and paleopedology courses that took place during 2014: Bogotá, Buenos Aires, Trep and Wurzburg; and announcements of forthcoming courses and meetings. Regarding future publications, a new edition of the book "Interpretation of Micromorphological Features of Soils and Regoliths" is foreseen, and the editors (Stoops et al.) are asking for suggestions to improve its second edition.

IUSS Working Groups

The scientific activities of the IUSS are organized through the Divisions and Commissions and Working Groups. We have recently updated the list of IUSS working groups (See the IUSS website), and the groups and their chair are:

Acid Sulphate Soils

Chair Peter Österholm, posterho@abo.fi

Cryosols

Chair Dimitry Konyushkov,
dkonyushkov@yandex.ru

Digital Soil Mapping

www.digitalsoilmapping.org

Chair Mogens Greve, mogensh.greve@agrsci.dk

Digital Soil Morphometrics

www.digitalsoilmorphometrics.org

Chair Alfred Hartemink, hartemink@wisc.edu

Forest soils

Chair Zhihong Xu, zhihong.xu@griffith.edu.au

Global Soil Change

Chair Dan Richter, drichter@duke.edu

Heritage Soils

Chair David Dent, dentsinengland@hotmail.com

Hydropedology

Chair Henry Lin, hul3@psu.edu

Land Degradation

Chair Bal Ram Singh, balram.singh@ipm.nlh.no

Modelling of Soil and Landscape Evolution

<http://soillandscape.org>

Chair Peter Finke, Peter.Finke@UGent.be

Paddy Soils

Chair Ho Ando,
handou@tds1.tr.yamagata-u.ac.jp

Proximal soil sensing

www.proximalsoilsensing.org

Chair Raphael Viscarra Rossel,

Raphael.Viscarra-Rossel@csiro.au

Soil monitoring

Chair Dominique Arrouays,
Dominique.Arrouays@orleans.inra.fr

Soil Information Standards

www.soilinformationstandards.org
Chair Peter Wilson, peter.wilson@csiro.au

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

http://ticri.inpl-nancy.fr/urban_soils.en
Chair Jean-Louis, Morel@ensaia.inpl-nancy.fr

Universal Soil Classification System

<http://clic.cses.vt.edu/IUSS1.4/>
Chair Jon Hempel, jon.hempel@lin.usda.gov

World Reference Base

<http://www.fao.org/nr/land/soils/soil/en/>
Chair Peter Schad, schad@wzw.tum.de

New Commission 1.4 Soil Classification Newsletter

The chair and vice-chair of Commission 1.4 Soil Classification released Newsletter http://clic.cses.vt.edu/IUSS1.4/Newsletters/IUSS_Soil_Classification_Newsletter_1.4.7.pdf. The 36 page newsletter contains a summary of the past four years activities of the Commission and alerts members of presentations scheduled for the 20th WCSS. The classical 1932 soil characterization paper on soil colloids in relation to classification of soil by H. Byers and M. Anderson is included for review.

New World Soil Museum

ISRIC has opened the new World Soil Museum. in Wageningen, The Netherlands. ISRIC, founded by a proposal of the ISSS (now IUSS) has hosted an international soil museum since 1966. In the new World Soil Museum, visitors can learn about the role of soils in life and ecosystems and get an impression of the variation in soils of the world, from the colourful volcanic ash soil from Indonesia to the Terra Preta soil from the Amazon. The museum displays soil monoliths with accompanying data including a full profile description, soil chemical and physical data, and information on the landscape and land-use.

Spring school on mapping and assessment of soils

From 18 to 22 May 2015, ISRIC - World Soil Information will organise a Spring School on digital soil mapping, soil assessment and classification

for soil and environmental scientists, students, soil experts and professionals in natural resources management. This spring school is a contribution to the Global Soil Partnership implementation. The Spring School will take place on the Wageningen Campus in the Netherlands and will consist of two five-day courses that are run in parallel. For more information and registration: <http://www.isric.org/content/isric-spring-school-2015>

International Field Course and Soil Judging Contest

September 1-5, 2015 Hungary. As part of the celebrations of the International Year of Soils (IYS), an International Field Course and Soil Judging Contest will be organized September 1-5, 2015 in Gödöllő, Hungary. Participants (in the form of teams and individuals) will contest their knowledge and practical skills to describe, understand and interpret soil characteristics in the field. To prepare for the event, a three day technical training course is offered to learn and practice the international standards and guidelines on local soils and landscapes. Read more: <http://soiljudging-iys2015.com/>

Bringing soil science to young people

Wondering how to introduce soil science to young people? Soil Farming and Science – free, multi-media teaching resources – is an introduction to nitrogen, phosphorus and soil properties. It also explores issues surrounding agricultural intensification and environmental impacts. Videos and short articles profile these topics along with the innovative ways science is helping farmers balance productivity, nutrient management and water quality. Novel, yet simple hands-on activities explore soil quality, nutrient leaching and some often-unseen aspects of the nitrogen cycle. The resources are also of value outside of the classroom with one farm consultant saying, “They provide a thorough understanding of nutrient cycles in an easily assimilated manner. Most importantly it is a non-threatening format for farmers who feel too shy to say they don’t fully understand nutrient cycling.” See <http://www.sciencelearn.org.nz/Contexts/Soil-Farming-and-Science>

ICSU General Assembly

The triennial GA of the International Council for Science hosted by the Royal Society of New Zealand was held in Auckland, New Zealand, August 30 – September 3, 2014. The discussions were wide ranging including the promotion of science and scientific understanding amongst the global population and the need for scientists to communicate with the people and policy makers, gender balance and the need to ensure freedom to participate in scientific exploration and to express science based views. There were sessions on a number of aspects of global science including the much heralded programme 'Future Earth'; this is developing into a major programme, but some Unions and National Academies expressed concern at the limited attention given in the programme to the solid earth component, such as soils, geological materials and earth surface processes. ICSU reiterated its commitment to open access of scientific material and also cautioned against the uncritical use of metrics when evaluating science and scientists. Professor Gordon Bean (IUGG) a meteorologist took over as President of ICSU at the end of the meeting.

Illustrated Guide to Soil Taxonomy

The Guide is a illustrated derivative product of the 12th Edition of the Keys to *Soil Taxonomy* (that was recently endorsed by the IUSS) presenting soil classification to the great group level. It is designed to help college students, especially those participating on collegiate soil judging teams, learn the fundamental concepts of pedogenic features and soil classification. The Guide supports soil scientists beginning their career in soil survey by presenting basic concepts of soil features and taxa that may be new to them. The Illustrated Guide is useful to natural resource management and engineering professionals who use soil survey information in their work. It presents the broad concepts and diagnostic features used in soil classification that impact use and management decisions. Definitions of the diagnostic horizons and features are accompanied by photos and background information, including examples of common horizon nomenclature. The Guide is available online at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/class/?cid=nrcs142p2_053580#illustrated

App for WRB

The recently released new edition of the World Reference Base for Soil Resources 2014 has now a support tool. It is an application for a smartphone that allows the user to browse step by step the key for reference soil groups and then to include the principal and supplementary qualifiers. The "help" button allows revising the definitions for each qualifier. The application has been developed by Denis Orlov under request of the Division 1 of the IUSS. The app works under Android, the versions for Windows-based smartphones and iPhones are coming soon. The app can be downloaded at <http://www.fao.org/soils-portal/soil-survey/soil-classification/world-reference-base/en/>

ICSU Grants Programme

The ICSU Grants Programme supports collaborative scientific initiatives of relevance to science and society. Its intent is to encourage cutting edge scientific development at the interface both of traditional scientific disciplines and at the interface of science and policy. The Grants Programme is competitive and peer-reviewed. Proposals must be led by the ICSU Scientific Unions. Proposals for 2015 grants must focus on ICSU's strategic priorities as detailed in the ICSU Strategic Plan II, 2012–2017 (www.icsu.org/about-icsu/strategic-priorities). ICSU particularly encourages the submission of proposals that (i) actively involve the ICSU Regional Offices, (ii) promote the involvement of young scientists, women scientists, and scientists from developing countries, and/or (iii) forge new partnerships between organisations that do not routinely collaborate. The total funding available for the Grants Programme in 2015 is €300000 and a ceiling of Euro 30,000 is imposed on all applications.

For further information on the Grants Programme please contact Rohini Rao at rohini@icsu.org. Deadline for receipt of applications: 1 December 2014.

Soil art

Soil will figure prominently in the minds of the people that live in and visit Washington, DC this autumn. The Mall will be the site of an art installation by Cuban-American artist Jorge Rodríguez-Gerada. This art project, "Out of Many,

One," will cover an area of 10-by-6-acres and use 800 tons of soil and 2,000 tons of sand to create a picture of a face only visible from above, such as from the top of the Washington monument, but that will allow people to walk through it. In keeping with the artist's environmental approach, the sand and soil will be tilled into the ground in November. For more information, please click [here](#)

Conferences and meetings

International Conference on Natural Resource Management for Food Security and Rural Livelihoods

International Conference on Natural Resource Management for Food Security and Rural Livelihoods to be organized by Soil Conservation Society of India, New Delhi, 10-13 February 2015, New Delhi, India. The conference aims to address the issues and challenges ahead for management of natural resources to meet the food demands and economic sustainability during the 21st century. The focus of the Conference will be to protect, conserve and develop the natural resources and use them on sustainable basis to alleviate hunger, enhance livelihood security and improve the quality of life. Scientists, scholars, students, academicians, extension workers, policy makers, farmers, farm organizations and other stakeholders from the field of natural resource management across the continents are invited to submit the abstract of their papers and attend the conference to deliberate on the issues. For details and updates visit website: www.soilcsi.in or contact icscsi2015@gmail.com

18th International Soil Conservation Organization (ISCO) conference

18th International Soil Conservation Organization (ISCO) conference will be held May 31 – June 5, 2015 in El Paso, Texas, USA. ISCO is an informal group of soil and water conservation professionals who gather biennially to share research results and new technologies. In addition to technical presentations in concurrent oral sessions and posters, the conference will feature a full-day technical tour of the Jornada Experimental Range and post-fire reforestation projects in the nearby Sacramento Mountains. An optional post-conference tour of many famous sites in Arizona will also be available. For more information, please visit www.Tucson.ars.ag.gov/isco or contact scott.vanpelt@ars.usda.gov

7th International Symposium of the Interactions of Soil Minerals with Organic Components and Microorganisms (ISMOM)

7th International Symposium of the Interactions of Soil Minerals with Organic Components and Microorganisms (ISMOM) will be held in Montreal, Canada from July 5th – 10th, 2015. This event is organized jointly by Commission 2.5 of the International Union of Soil Sciences, the Canadian Society of Soil Science and the Association québécoise de spécialistes en sciences du sol. Scientific areas include: Macro and micronutrients dynamics in soil; Dynamics of pollutants in soil; Soil microbiology; Organo-mineral interactions in soil; Analytical and methodological advances in soil; For detailed information, please visit <http://ismom2015.conference.mcgill.ca/index0f50.html?p=home>

5th International Symposium on SOIL ORGANIC MATTER

September 20-24, 2015, Göttingen, Germany. www.som2015.org Soil organic matter (SOM) is the most intriguing feature of soils and one of the most fascinating properties of terrestrial ecosystems. The key role of SOM in stability of global C cycle and greenhouse gas emissions raised studies connecting soils with atmosphere, hydrosphere and phytosphere – all of them with the focus on SOM. Despite static properties of SOM are well known, we just starting to understand processes: formation and functioning, interactions and fluxes, processes and rates. SOM 2015 will connect pools with fluxes, living and dead organic matter, organic and mineral compounds, topsoil and deep soil, experiments and modeling, terrestrial to aquatic ecosystems, dynamics and sequestration and surely the scientists investigating SOM from over the world. All this is necessary to elucidate Structure, Origin, Mechanisms of SOM formation and functioning. We are looking forward to welcome you in Göttingen for this exciting event of the International Year of Soils 2015.

Inaugural Global Workshop on Digital Soil Morphometrics

1-4 June 2015, Madison, USA. Digital soil morphometrics is defined as the application of tools and techniques for measuring and quantifying soil profile attributes and deriving continuous depth functions. In digital soil morphometrics, proximal soil sensing and other tools are used in soil profile descriptions where techniques and

toolkits have not changed in the past decades. This is a new IUSS Working Group and the inaugural workshop will be held in 2015. Conference topics include: 1. Soil profile attributes (horizons, texture, colour, structure, moisture, mottles, consistence, carbonates, rock fragments, pores, roots, and all physical, chemical or biological properties). 2. Soil profile imaging, 3. Soil depth functions, 4. Use and applications (environmental consultants, soil classification) The workshop format will be symposia with keynotes followed by 5-10 minutes presentations and ample time for discussions. For more information and expression of interest go to www.digitalsoilmorphometrics.org

39th Annual Conference of the Soil Science Society of Nigeria

9 – 13th March 2015 Kwara State, Nigeria. The Soil Science Society of Nigeria is pleased to announce that the 39th Annual Conference of the Society tagged “Landmark 2015” will be held at the Landmark University Omu-Aran, Kwara State, Nigeria from Monday 9 – Friday 13th March, 2015. The Capital of Kwara State is the City of Ilorin which is located 306km inland from the Coastal city of Lagos and 500km from the Federal Capital Territory, Abuja. There are daily flights from Lagos – Ilorin and Abuja – Ilorin. The Theme of the Conference is “Managing Nigerian Soils for Food Security and Climate Change Adaptation and Mitigation” The objective of the meeting is to share recent advances in scientific and technological developments, identify gaps in knowledge and discuss ways in which Nigerian soils can be better managed to meet the challenges of enhancing food and nutrition security through the dual approach of climate change adaptation and mitigation. The Conference is one of the activities to mark the 2015 International Year of Soils in Nigeria. For further Information, please contact: Prof. O. O. Agbede (Chairman LOC). Dept. Of Crops and Soil Science Website; soilsnigeria.net E-mail: agbeolu@yahoo.com

Soil Functions and Climate Change - do we underestimate the consequences of new disequilibria in soil properties? – SUSTAIN-2015

September 23-26, 2015; Kiel Germany. Soil properties and functions undergo changes also forced by environmental conditions. The key role of soil structure, its functions and its changes under various climatic conditions will be discussed to define boundary conditions for reliable predictions in a changing environment,

for a more precise definition of prediction model input parameters as basis for a reliable analysis of soil and environmental properties and functions. This 1st international congress will deal with such interactions and necessary topics in soil physics, chemistry, biology and coupled processes.

www.soils.uni-kiel.de/Sustain-2015

PSS-2015: Sensing soil condition and functions

The 4th Global Workshop on Proximal Soil Sensing (GWSS2015) will be held in Hangzhou, China on May 12-15, 2015. The workshop is sponsored by the IUSS working Group on Proximal Soil Sensing and several institutes in China. The theme is “Sensing soil condition and functions”. The workshop will provide a forum for researchers, professionals and engineers from all over the world to present their latest research and development results, and to exchange and share information and experiences in the fields of PSS, such as in situ measurement of soil properties, proximal sensing of soil carbon and biota, sensor data processing and fusion, sensor-based digital soil mapping, combining proximal and remote sensing, development of multi-sensor platforms, advances in soil electro-magnetic technologies, and new application of PSS.

More info: www.gwps2015.com

The Dan Yaalon Symposium

Vienna and Uherske Hradiste, 8-11 April 2015. We will honor Prof. Dan Yaalon’s memory and life’s work with a special IUSS Symposium that will be held in Vienna and Uherske Hradiste from 8-11 April 2015. Please inform us soon if you would like to contribute to this event: yaalonsymp2015@gmail.com or <https://danyaalonsymp.uni-hohenheim.de/>. Please provide the title of your abstract, and mention if you wish to contribute with a poster or an oral presentation. Please note that the 1 December 2014 will be the last date for abstract submission. The technical and schedule details will be sent in the second circular.



Report of the ICSU General Assembly

The assembly was held in Auckland, New Zealand August 31 to September 3, 2014. In addition to the business and operation of ICSU a major theme of the meeting was ICSU's relationships with the global science community (taking a very broad view of Science).

Some of ICSU's Key Partners

1. ISSC – International Social Science Council – there is increasingly strong collaboration with ICSU, particularly in the context of Future Earth. Whilst Future Earth is an important first step there are many other areas where collaboration would be very fruitful.
2. UNESCO – there is very close co-operation between ICSU and UNESCO. An example of developing co-operation is in the area of Disaster Risk Reduction. There are particularly strong links and similarities in policies in the broad area under the banner 'Universality of Science'.
3. IAC-IAP – IAMP IAP InterAcademy Partnership is a global network of science academies (107 members). IAMP InterAcademy Medical Panel – evidence based advice on health and science policy. IAC InterAcademy Council established in 2000 the aim is to provide advice to governments on science and technological matters.
4. WMO – Strong history of collaboration, particularly in relation to rapid changes in climate and weather and the economic and social impacts of climate change. Together with ICSU WMO jointly sponsors the World Climate Research Programme and endorses the involvement of WCRP in Future Earth.
5. TWAS – Third World Academies of Science – The focus is on the developing world by building capacity through PG support and facilitating exchange of scientists between the developing and developed world and within the developing world.

Secretary General's Report

David Black (the report was tabled)

1. Reorganisation of the Secretariat with an Executive Director and four Heads of Department (Administration & membership; Science Programmes; Communications; Human Resources)
2. Stephen Wilson the Executive Director resigns on October 3. A shortlist from 40 applicants for Executive Director was drawn up, with interviews planned for 27/28 October.
3. There will be an interim Executive Director for a period of a maximum of 6 months – Professor Peter Liss.

Poster Expresso

Poster Expresso - Unions and international projects had poster displays – the 'Poster Expresso' sessions allowed speakers a strictly timed 3 minutes to outline the key points of the poster.

Reports from Unions and Members

For the first part of the meeting the Unions and the National Academies met separately to discuss items on the Agenda. The GA received reports of these meetings:

Union Members

External Review of ICSU – generally well received.

1. Need to reach out to others not in the science community, e.g. engineers and economists.
2. Need to encourage early career scientists.
3. ICSU needs to take action on the report promptly.
4. ICSU needs to be more active in fund raising.

Open Science

1. There is a need to develop new metrics for evaluation of research.
2. The financial impact of moving to open access publication must to be considered.

3. Quality control in Open Access journals needs to be considered.

Future Earth

1. There was a perceived lack of clarity as to how National and Union Members will be involved in this major initiative.
2. For a programme entitled Future Earth there seemed very little attention to the physical nature of the Earth Surface and the processes operating there.

National Members' Forum

External Review

1. Need for clear mechanism for implementing the review.
2. More active promotion of ICSU by its Members.
3. Building stronger partnerships with UNESCO as well as IAP, IAC and TWAS.
4. Alignment of ICSU global-regional- local agendas.
5. Regional Offices need to be more strongly supported by ICSU Paris.
6. Need to continue the integration of social sciences into ICSU activities.
7. Need to improve science communication to various stakeholders.

Future Earth

1. Need to clearly define rules and responsibilities.
2. Need to ensure regional inclusivity, engaging regions not represented so far.
3. Ensure the involvement of all ICSU's disciplines.
4. Need to engage Governments.

Open Access

1. Who should pay for it?
2. Need to identify alternatives to impact factors.
3. Need to get funding agencies to support the initiatives.

Committee on Science Planning and Review (CSPR) Report

Malegapuru Makgoba

There is a Strategic Plan (2012-2017) which was approved in Rome 2011, this is supplemented by suggestions contained in the External Review of 2014.

There have only been 25 grants awarded over the last four years (the target was 30). There was a suggestion that there may be a need to review the operation of the grants programme.

In the discussions it was suggested that there is a lack of communication between CSPR and the Unions. There appears to be a focus on regional distribution, gender distribution, but less focus on the appropriate representation of the disciplines relevant to the particular science programme or activity.

30 years of Global Environmental Change Research

IGBP

1. Paul Creutzen introduced the notion of the Anthropocene
2. The Nitrogen Cascade
3. Land Cover Change – lack of a coherent land classification scheme until 1990s. This was developed by IGBP with others.
4. Inclusion of coupled land system models to model climates.

Diversitas

1. Produced a better understanding of biological diversity.
2. Biodiversity Observation Network including observations of ecosystem services.
3. Using models to predict changes in biodiversity.
4. Links to CBD and other policy related activities.

International Human Dimensions Programme and impact on Environmental Change

1. Why are cities growing so rapidly?
2. Development of measures beyond GDP (Inclusive Wealth Report).
3. Policy linkages and understand the policy linkages is key.

World Climate Research Programme

1. Considers earth systems and cycles.
2. The home of climate models!

Urban Health and Well-being

Indira Nath

A number of meetings have been organised both globally and with Regional Offices (particularly the Asia-Pacific Region). The aims and objectives are strongly linked to Sustainable Development Goals. There is less involvement with the African and Latin America and Caribbean Regional Offices. China is providing support to host the International Programme Office.

Science advice to Governments

Peter Gluckman – Science Advisor to NZ Government

The aim of the meeting held in the days before the ICSU GA focused on the role of science in forming policy. The key message was that the boundaries between science and policies are complex and nuanced. There are three forms of advice: Formal, Semi-Formal, Informal. Formal advice is long term and involves the establishment of Panels which may consider the matters over a long term review. The more direct and instant advice is short term involves direct contact and often some brainstorming.

There will be direct advice in the use of information and in response to emergencies (e.g. advice on response to earthquakes). The SAGE System in the UK is an excellent example. There is often a great deal of ‘fuzziness’ both in what is required and what might be the advice on outcomes. The fuzziness is important because the advice has to be presented in a political context. There is often overlap between science advice and how science is to be structured, there may be direction of the structure to meet advice requirement.

The ‘values’ incorporated in the science have to be ignored when the information are being interpreted. There is always a gap between what

we know and what we conclude! There is no place for science to include political values; that is the domain of the politicians! Politicians make the decisions, not scientists! The scientific community need to understand this and in giving their advice be aware of the political process – often scientists forget that their role is to advise!

Intergovernmental and Science Community assessments

IPCC and ICSU Global Environmental Change Programmes’ contributions and future challenges

Sybil Seitzinger

The Fifth Assessment Report (AR5) had a substantial input at all stages from the ICSU GEC programmes. Contributions include:

1. WRCP and IGBP were asked to develop new scenarios. Global CO₂ emissions are tracking the high CO₂ emissions scenarios. WRCP and IGBP coordinate the work towards these scenarios.
2. Outputs include predictions for the end of the century on temperature, precipitation and ocean pH.
3. What are the potential impacts of these changes on ecosystems and society and how capable are ecosystems in adapting to the projected changes.
4. One of the key tasks is to ensure there is good communication.

IPBES

Anne-Helene Prieur

1. Work started in 2013 and the programme is now actively working.
2. IPBES is required to identify gaps and find ways to fill them.
3. Generate knowledge that can be used in a policy context, strengthening the science-policy interface..
4. Must build capacity amongst the scientific community.
5. Link between scientific community and indigenous communities in evaluating the value of biodiversity.
6. Stakeholder (in the broadest sense) engagement is a key activity.
7. There are potentially strong linkages between Future earth and IPBES.

Disaster Risk Reduction and Assessment

Alik Ismail-Zadeh

1. International Programme on Integrated Research on Disaster Risk (IRDR)
2. Disasters due to natural hazard events continue to grow in number and intensity.
3. Early draft of WCDRR (World Conference on Disaster Risk reduction) presented in late August 2014.

Rio +20 and Sustainable Development Goals

Steve Wilson

1. ICSU provided the lead on Science and Technology.
2. Considerable effort to provide evidence for Rio+20, in particular through the ICSU Regional Offices.
3. GEC network produced 9 policy briefs for Rio+20.
4. Planet under Pressure March 2012 – Royal Society, London.
5. Owen Gatby video ‘Welcome to the Anthropocene’.
6. Forum on Science and Technology for sustainable development, June 2012 Rio de Janeiro.
7. Formal launch of Future Earth highlighting the two-way dialogue with scientists and stakeholders.
8. The outcomes of Rio+20 lacked ambition and were relatively weak.
9. A UN Science Advisory Board was established.
10. UN High-level Political Forum developed.
11. Beginnings of the coalitions of the willing e.g. ICSU is working with the insurance community.
12. 17 SDGs have been developed (see ICSU website), but there is a relatively weak scientific background. Unions need to review these draft SDGs.
13. ICSU needs to build closer partnerships with UN partners.
14. ICSU should support the UN Science Advisory Board.

Committee on Freedom and Responsibility in the Conduct of Science (CFRS)

Leiv Sydnes

Broad area of activity Freedom of expression, access to data, linked to the Charter on Human Rights. Responsibility of proper conduct and correct action in Society.

Actions:

Aspects of Freedom included: Human rights of scientists (23 cases); Movement – guidelines for Conference organisers, e.g. visa issues in the UK and elsewhere; Autonomy of academies – e.g. Montenegro, Russia, Turkey; Academic freedom: principal document, compilation of constitutional texts.

Aspects of Responsibility included: Integrity in research and publishing (World Conference on Research Integrity - 2013); Committee on Publication Ethics (COPE).

Balancing Freedoms and Responsibilities: Workshops, e.g. Science Assessment and Research Integrity (2014)

Outreach included: Online ‘Freedom and Responsibility Portal’; Brochure ‘Freedom and Responsibility in Science’ revised.

Open Access

John Ball

Includes access to literature, data and software. This links to ICSU Statute 5 – freedom of access to information. Metrics are widely used to evaluate scientists, who frequently seek to ‘maximise’ these metrics in their career developments. Does this lead to a ‘bias’ in where information is published? Does this lead to inaccessibility of data and information?

Concerns expressed included: Financial barriers to publish; Financial barriers to access; Must be peer reviewed. Must be available in perpetuity.

Some of the recommendations

1. Business models for scientific publishing should be based on the interest of science not publishers.
2. Urgent need to identify and signpost those journals which have the necessary assurances relating to archiving
3. The question of access is complicated by publishers, ‘bundling’ journals with restrictive clauses on access.

Metrics

Are metrics an appropriate way of evaluating the quality of an individual? Metrics should be regarded as an aid not the sole basis for evaluation of an individual. See for example the San Francisco Declaration. It is proposed that the International Council for Science endorse this Declaration.

<http://www.ascb.org/dora/>

ICSU endorses the OECD Principles on access to data and publications at no or low cost. Need to ensure that where data from other sources are used they are accurately and correctly cited. Revised text accepted as amended on a show of hands.

CODATA Review

(CODATA is 48 years old)

Kari Raivio and Huadong Guo

One of the key aims is to raise the awareness of the importance of data and their stewardship. Involvement in World Summit on Information Society.

How is CODATA responding to the ICSU Review?

1. Increasing visibility – part of GEO' improved Data Science Journal
2. Expanding membership – Africa and Latin America are poorly represented.
3. Taking a more strategic approach – linking with Future earth, etc.
4. Capacity Building and early career activities.
5. Working closely with WDS to support ICSU Strategy
6. In the future will work more closely with National and Union Members
7. Should CODATA combine with WDS?

External Review of ICSU

Andrew Holmes

Five pillars under pinned the Review: Vision and visibility; Relationships; Funding; Governance of ICSU; Regional Offices

Vision and Visibility

1. Prepare a consistent Mission Statement
2. Promote selected flagship projects – e.g. Future Earth
3. Develop a communication plan for each of its constituents
4. Generate and disseminate peer reviewed position papers and comments
5. Develop metrics to measure impact and success of ICSU's activities (how well is ICSU doing?)

Relationships

1. Develop a strategy to work with other global partners:
 - Global Network of Science Academies
 - Inter-Academy Council
 - Global research Council

- The World Academy of Science
2. Should develop a more active role with the Engineering Councils and the Social Sciences Councils.

Funding

Develop a campaign to fund flagship programmes (e.g. Future Earth):

- Engage with past Presidents
- Establish a not for profit Foundation
- Form dedicated teams for flagship projects (e.g. Future Earth)
- Engage business and industry
- Engage in high profile external scientific for a

Governance

1. 3 Policy Committee to provide ADVICE to the Executive Board (to be renamed Governing Board)
2. Proposals for reorganising the secretariat
3. Initiate a membership drive
4. Improve mechanisms for creating new Unions
5. Increase participation of early and mid-career researchers
6. Align ICSU research agendas with national research priorities
7. Promote gender and diversity agendas

Regional Offices

1. Secretariat to establish professional development strategy And performance reviews
2. Establish single point of contact in Secretariat for ROs
3. Promote formal links between ROs and local national science agencies
4. Train science officers in project management
5. Encourage staff secondments to Secretariat.

World Data Systems

Jean-Bernard Minster

First created in 2008 at the Maputo GA. An International Programme Office has been established in Japan since 2009.

Strategic Targets

1. Make trusted data services and integral part of scientific research – this involves support of Future Earth and expanding membership in social sciences. The IPO plays a key role in this target.
2. Nurture disciplinary and interdisciplinary scientific data communities – e.g. the International Polar Forum.

3. Improve the funding environment – Actively participating in the debates and workshops of the Belmont Forum – E-infrastructures and data management.
4. Improve the trust in and quality of open scientific data services – a certification framework for scientific data services. This includes data publication.
5. Position ICSU – WDS as the global interdisciplinary group for data. (there are now c. 90 members).

SciDataCon 2014, New Delhi, 2-5 November 2014.

ICSU Regional Offices

Africa - The office was launched in September 2005 with four priority areas; sustainable energy, hazards and wellbeing, health and human wellbeing, global environmental change.

- Priorities
- Implementation of science
- Consortia developing funding proposals.
- RO coordinates these activities
- RO engages with funders
- Africa Science Plan Committee
- Future Earth is a key component of planned activities
- Links with ICSU Unions and others including UN Agencies
- Developed Training workshops for capacity building
- Worked with Rio +20

Asia and Pacific - Established September 2006 and supported by Malaysia

- Priority areas
- Hazard and disaster
- Health and wellbeing
- Sustainable energy – collaborated with other Regional Offices
- Sustainable Ecosystems - Sustainability Initiative for the marginal seas of East Asia. (funded by ICSU).
- Has been actively involved in discussions concerned with Future Earth.

Latin America and the Caribbean - Moved from Rio to Mexico in 2011

- Priority Areas
- Sustainable Energy have undertaken some work together with ROA
- Biodiversity – closely linked with DIVERSITAS
- Math Education

- Disaster Risk Reduction meeting in Costa Rica – November 2014
- Future Earth is the main focus for the longer term strategy.

Election of Officers -Results

- President Elect Daya Reddy (South Africa)
- Vice-President for Scientific Planning and Review Jinghai Li (China)
- Vice President for external Relations Michael Clegg (USA)
- Secretary General David Black (Australia)
- Treasurer Barbara Erasmus (France)

Date and Place of the 32nd General Assembly
China, Taipei

Early Career Science Panel

Presentations from a panel of 6 early career scientists followed by questions, covering a wide range of procedures and media (in particular social media).

Reports of the Treasurer and Chair of the Committee on Finance

Hans Rudolf Ott and Dov Jaron.

The Treasurer reviewed the performance of the accounts over 2012, 2013 and to date in 2014, noting the need to consider requesting overheads when funds are obtained from external funders, the need to consider readjusting the investment portfolio, considered the impact of linking NM payments to GDP.

The management of finances is undertaken with a conservative attitude.

Annual core contribution to Regional Offices raised to €75k p.a.

Grant programme for Unions set at €300k p.a.

In 2013 the accounts ran at a deficit of €203,040 (this included accumulated arrears of Members' dues in excess of €150k)

Budgets for 2015 and 2016-18 and proposals for dues outlined (initial proposals for an annual 3% increase in Members' dues). The continuation of the generous subvention from France beyond 2016 has a major impact on future budgets.



Election of Ordinary Members of the Executive Board

National Members: John Ball (UK); Nicole Moreau (France); Raghavendra Gadagkar(India) ;Kazuyuki Tasumi (Japan)

Union Members: Manuel de Leon (IUM); Orhan Altan (ISPRS); John Buckeridge(IUBS); Cheryl de la Rey (IUPsyP)

*ICA (International Cartographic Association)
admitted as a Scientific Union Member*

Closing Ceremony - Yuan Tseh Lee stepped down as President of ICSU to be succeeded by Gordon McBean.

Stephen Nortcliff

IUSS Representative on ICSU

October 2014


World Reference Base for Soil Resources (WRB)

The third edition of the international soil classification system WRB was presented during the 20th World Congress of Soil Science in Jeju, Korea, in June 2014. It was compiled by the IUSS Working Group WRB and published by the Food and Agriculture Organization of the United Nations (FAO) as World Soil Resources Reports No. 106. It can be downloaded at the FAO homepage as pdf and as app for Android (the app was developed by Denis Orlov): <http://www.fao.org/soils-portal/soil-survey/soil-classification/world-reference-base/en/> WRB has two categorical levels. The upper level comprises 32 Reference Soil Groups (RSGs), identified using a key. For the lower level, a set of adjectives, called qualifiers, is added to the name of the RSG.

The major changes in the third edition compared to the second edition (2006) are:

- The qualifier sequences and the rules for qualifier usage are now suitable for both classifying soils and creating map legends. They
- are now subdivided into principal qualifiers (ranked for every RSG in order of relevance) and supplementary qualifiers (not ranked, but used in alphabetical order).
- The only change at the RSG level is to replace Albeluvisols by Retisols. Retisols have a broader definition and include the former Albeluvisols. The name is derived from Latin 'rete' (net), which refers to the intercalating of eluvial material into the illuvial horizon. 'Retic properties' are the newly introduced diagnostic property in order to characterize Retisols. The 'retic properties' have a broader definition than the former 'albeluvisol tonguing' that is now called 'albeluvisol glossae' and remains as a special case of 'retic properties'.
- Fluvisols have moved down in the key to be the second last RSG, changing some former Fluvisols especially into Solonchaks and Gleysols. The Umbrisols are now placed directly after Phaeozems. The following RSGs switched their positions: Solonetz and Vertisols, Durisols and





Gypsisols, Cambisols and Arenosols. The soils characterized by an argic horizon now have the following order: Acrisols – Lixisols – Alisols – Luvisols.

- The definition of Gleysols has been broadened.
- Base saturation – used to separate Acrisols from Lixisols, Alisols from Luvisols and the Dystric qualifier from the Eutric qualifier – is now based on the sum of exchangeable bases (by 1 M NH_4OAc , pH 7) plus exchangeable Al (by 1 M KCl, unbuffered). (Base saturation used to differentiate mollic and umbric horizons is still based on the CEC at pH 7.)
- The definition of the Chernozems has been made stronger. They require now a chernic horizon, which is a special type of the mollic horizon. The chernic horizon replaces the voronic horizon, although the criteria of the chernic are less strong compared to the former voronic horizon.
- The pretic horizon has been introduced for a better accommodation of ‘Terra preta de Indio’ within the Anthrosols.
- ‘Soil organic carbon’ has been introduced to separate pedogenetic organic carbon from organic carbon that satisfies the diagnostic criteria of artefacts.
- ‘Hypersulfidic material’ and ‘hyposulfidic material’ have been added as specific varieties of ‘sulfidic material’.
- Major improvements have been made in the definitions of the argic and natric horizons, in the depth criteria of the mollic and umbric horizons and in the separation between ‘organic material’ and ‘mineral material’.
- Several new qualifiers have been added to give more information about some important soil properties. Precise rules have also been introduced for the use of specifiers to define subqualifiers.
- Efforts have been made to improve the clarity of definitions and terminology.

In September 2014, a first international field workshop to test the new WRB was held in Ireland, organized by the Irish Agriculture and Food Development Agency (Teagasc). We saw interesting soils and landscapes and discovered that the third edition works well for Irish soils (see photo of the excursion group, taken by Johan van der Waals).

Peter Schad (Chair)
Cornie van Huyssteen (Vice-Chair)
IUSS Working Group WRB



A Petition from the Soil Science Societies of Europe

In these last decades, particular attention was deserved in Europe to environment and environmental policy. Such attention was strongly supported by the EU citizens who recognise that environmental problems go beyond national and regional borders (Eurobarometer, 2005). During 2005 and 2006, the EU Commission has proposed seven thematic strategies, addressing several environmental areas and forming part of a new approach to environmental policymaking. The seven strategies regarded: Urban environment; Marine environment; Pesticides; Waste prevention and recycling; Sustainable use of resources; Air quality; Soil quality.

Preliminarily, the Commission presented its approach to soil protection in a preparatory Communication in which it was clearly written: “*Soil is both essential to human existence and subject to human activities*” (COM(2002) 179 final). The Communication stressed the need to protect soil and enable it to perform its functions. It identified the following main threats to soil quality: erosion, decline in organic matter and biodiversity, local and diffuse contamination, sealing, compaction, salinization, landslides, and flooding. It was also underlined the importance of integrating soil aspects into other policies, and made clear from the outset that a legislation was required that exclusively focussed on soil.

In the years 2003 and 2004, working groups formed by experts and stakeholders took an active part in an intensive consultation process. In June 2004, the working groups finished their extensive reports. These reports included information on the state of soils in Europe, the pressures, the driving forces behind soil degradation, and a set of recommendations addressed to the Commission for the development of an EU soil policy (European Commission, 2006).

On 22 September 2006, with the aim of protecting and using soils in a sustainable way, the European Commission adopted the “Thematic Strategy on the protection of Soil” (COM(2006)231 final). In presenting the Thematic Strategy on soil protection,


the Commission gave to soil degradation the same importance that was given to water and air degradation. This was a big step forward in considering the soils and their importance in the environmental equilibria. In Europe, all the soil scientists started to call it, familiarly, “The Strategy”!

But

In October 2013 (COM(2013)685 final), the Commission identified areas where initiatives foreseen would not be taken forward, and listed a number of proposals to withdraw that had been long blocked in the legislature. The corresponding decision was taken in the context of the 2014 Work Programme of the Commission (COM(2014)368 final) and 53 legislative proposals were withdrawn. Among these, the Framework Directive on Soil, which had not received sufficient support in the Council.

The withdrawals of the Thematic Strategy on the protection of Soil took effect with the publication in the Official Journal C 153 of 21 May 2014 (European Commission, 2014). The Strategy has been withdrawn because: “*The Commission notes that the proposal has been pending for 8 years during which time no effective action has resulted. It will therefore examine carefully whether the objective of the proposal, to which the Commission remains committed, is best served by maintaining the proposal or by withdrawing it, thus opening the way for an alternative initiative in the next mandate. This will be judged on the feasibility of reaching adoption before the European Parliament elections*”.

During the works of the 1st European Soil Partnership Meeting that was held in Ispra (Italy) in May 21/23, 2014, emphasis was placed on the withdrawal of the proposal for a Soil Framework Directive. Moreover, the decision to withdraw “The Strategy” was commented negatively by about 100 scientists from 25 Countries attending the ASWEP-ESSC international Conference held in Imola, Italy, in June 23/26, 2014 (<http://aswep-essc.unibo.it/>).



The ESSC (European Society for Soil Conservation) Executive Committee convened in Imola, considering the opinion of the conference audience, proposed to charge the main responsible of the Organizing Committee of the ASWEP-ESSC International Conference (Edoardo Costantini, Carmelo Dazzi and Gilmo Vianello) to prepare a petition aiming at maintaining “The Strategy”. It was decided to ask to the Presidents of the European and National Scientific Societies involved in Soil Science, to approve and support the petition by subscribing it. Carmelo Dazzi (President of ESSC) was entrusted the task to contact all these Persons.

At the end of September 2014 the petition, with the signatures of 26 distinguished Colleagues representing over 10,000 Soil Scientists, was ready and sent to the most representing people of the Committee on Agriculture and Rural Development and of the Committee on the Environment, Public Health and Food Safety of EU.

The petition will be also sent to the Ministers of Agriculture and Environment of each Country listed in it.

The petition subscribers appreciate that the Seventh Environment Action Programme provides that by 2020 land would be managed sustainably in the European Union, soil adequately protected and the remediation of contaminated sites well underway. They also appreciate that such Programme commits the EU and its Member States to an increasing effort to reduce soil erosion, increase soil organic matter content, and to remediate contaminated sites. However, the petition subscribers stress that this is not enough! Such commitments cannot be empty words! These must be followed by effective and positive actions, to preserve the multi-functionality of soil and its vital role in the environmental equilibrium and human health and welfare.

Carmelo Dazzi

E-mail: carmelo.dazzi@unipa.it

5 Questions to a Soil Scientist

5 questions to Boris Jansen



Name: Dr. Boris Jansen

Age: 40

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Position: Assistant Professor, since 2008

1. When did you decide to study soil science?

My interest in the broader field of the Earth sciences was triggered when I did a one year minor in this field during my studies of Environmental Chemistry at the Vrije Universiteit in Amsterdam. I narrowed this interest down to soil science when I started my PhD research at the University of Amsterdam in 1999. During this, I unraveled the role of interactions of iron, aluminum and dissolved organic matter in soil formation in the Dutch Veluwe National Park. I have continued working at the interface of soil science and chemistry ever since.

2. Who has been your most influential teacher?

My PhD supervisor Prof. Koos Verstraten was my most influential teacher. He awed me through his impressive soil scientific expertise. But, equally important, he taught me to fend for myself. He gave me an exceptional amount of freedom in the design and performance of my PhD project. He allowed me, even encouraged me, to make mistakes, but at the same time taught me that with great freedom comes great responsibility. I would not be the confident, independent researcher I am now had it not been for him.

3. What do you find most exciting about soil science?

Soils are at the basis of our existence, and play a key role in the great challenges that we as a society face. Whether it is climate change, feeding a growing world population or sustaining the Earth's biodiversity. What can be more exciting than contributing to sustainable solutions for such issues?

4. How would you stimulate teenagers and young graduates to study soil science?

At first glance soils might seem boring or dull. That is why we must explain the relevance of soil science for the great challenges just mentioned to young scientists-to-be. Also we must realize that, in spite of its crucial role, soil science alone will not solve those challenges. Therefore, teenagers and young graduates must be shown how soil science ties in with other disciplines from the natural and social sciences. As Director of the successful interdisciplinary Bachelor program Future Planet Studies at the University of Amsterdam, I am explicitly addressing this issue. Our increasing enrollment over the last few years to ca. 200 freshmen in 2014 shows that such an approach is able to attract young people.

5. How do you see the future of soil science?

As said, soil science is crucial to address the great challenges of our world, but for this must connect with other relevant disciplines from the natural and social sciences. Also, within the broad field of soil science, increasing interdisciplinary connections are crucial. For instance to connect processes operating at different scale levels from the molecular to the landscape. In this sense I see soil science evolving from a classical discipline with strict subdivisions, into a broader, dynamic field with increasing connections with related research fields outside soil science, but also with non-scientific stakeholders such as policy makers and indeed the general public.

5 questions to Damien Field



Name: Damien Field
Age: 43
E-mail: Damien.field@sydney.edu.au
Position: Senior Lecturer, Soil Security & Soil Education, University of Sydney, since 2012

1. *When did you decide to study soil science?*

I decided to study soil science as part of a geology major in a Bachelor of Science degree in the early 1990's. First I was just fascinated by the diverse colours and feel of the soil, i.e. how soil looked. As my studies progressed this interest shifted to focus on 'what can soil do' and with this I began to study how soil is used for crop production. This was the transition from aspirations in geology to that for soil.

2. *Who has been your most influential teacher?*

A pedologist, Tony Koppi introduced me to soil and how it could be read and interpreted. His real inspiration though was taught me to look at soil as an integral part of a system and there is always the need to question how soil is engaged and how it influences other parts of the system. This idea of connections is fundamental to my research and teaching.

3. *What do you find most exciting about soil science?*

For me the fact that soil is fundamental to understanding many of the major challenges being discussed internationally. From its obvious role in the provision of food and a store of quality water through to its impact on biodiversity, provision of energy and climate change it is possible to demonstrate how soil mediates these. What is most exciting about its biophysical relationships is that it demonstrates the need for soil to be included in the economic and policy debates on these challenges, bring new dimensions in the way to study and discuss soil.

4. *How would you stimulate teenagers and young graduates to study soil science?*

Teaching in the field and talking about real world problems I believe is an extremely effective way to stimulate people to be engaged with soil science.

Why, this lets them identify the problems that they are interested in, after all people work on what they are interested in. Being in the field they can look above and below the ground describing what the issues are and what they see. Using their observations there we can then discuss soil science ideas and terms and what needs to be measured. Of course this is not the only way to stimulate but, self-discovery I think is a key skill that fits those interested in science and people who are problem solvers.

5. *How do you see the future of soil science?*

I think soil science has made huge advances in developing ideas and ways to measure its complex biophysical nature and this will continue. The immediate challenge for soil science is to be brave and be willing to develop the socio-economic dimensions of soil. This will involve developing ways to put a value on soil and to support we need to strengthen or influence in areas of relevant policy. Of course putting a value and influencing policy will depend on us increasing the broader communities connectedness with soil and although developing this connectedness is probably the most difficult challenge, this will surely benefit the future security of soil.

5 questions to Stephan Peth



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Position: Professor for Soil Science (since 2012)

1. *When did you decide to study soil science?*

My soil science career started with rocks. I studied geology beginning in 1995, which took me to various places in Germany and South-Africa and finally to the Baltic Sea in Kiel in 1998 where I specialized in applied geology (engineering and hydrogeology). While focusing on groundwater contamination first I thought that each drop of water moving into aquifers and potentially carrying contaminants has

to pass through soil layers on its way down and that a lot of things can happen on this journey. To learn more about those soils I took courses in soil science and eventually found it so fascinating that a PhD followed and finally a habilitation in soil physics. What was at first planned merely as a supplementary course turned out to become a dedicated exploration of one of the most complex and dynamic but also vulnerable materials on earth, which is the basis of all life on our planet.

2. Who has been your most influential teacher?

I think the most influential teacher maybe to all soil scientists (at least to me) is nature itself. By carefully observing all those interesting phenomena taking place on top and within soils we gain an insight into the underlying soil forming processes and functions. This observation is the starting point for developing a theoretical framework on how soils work and the basis for setting up suitable experimental approaches to assess soil quality and how management impacts it. Nevertheless, if I were to name a teacher besides nature who had a strong influence on my later career as a soil scientist I should mention Rainer Horn. He taught me soil physics in a very lively way. From him I learned that soil physics doesn't need *High Tech* and that we can learn a lot on soil physical behavior from simple experiments.

3. What do you find most exciting about soil science?

To me the most exiting thing about soil science is its complexity. Soils unify so many different disciplines - the most traditional ones being chemistry, biology and physics, but also geology, geography and engineering etc. – so that we are continuously encouraged to widen our personal “horizon”. Another thing, which I find fascinating on studying soils, is that they form a thin veneer of the earth crust but with ultimate importance to provide and protect live just like our skin protects our body. Following the GAIA hypothesis the earth could even be viewed as a self-organized system in which soils as the earth skin play a crucial role by regulating the interaction of chemical, physical and biological and human components.

4. How would you stimulate teenagers and young graduates to study soil science?

Take a hand full of “dirt” and watch it with a magnifying glass. Look into the landscape and think of how it was formed. Consciously observe nature. Watch the cycle of life. Ask yourself, for example, why trees are growing and where the

matter that they are made off comes from and how it gets there and where it goes. Think of your own connection to soils and how they support your wellbeing. And finally look at the beauty and variety of soils wherever you have the chance to observe their different layers.

5. How do you see the future of soil science?

I think it is an exciting time for soil scientists since soils are getting more into the public focus as a major component of ecosystems which is more and more under pressure due to climate and global change effects. Soil scientists are facing challenges in finding solutions for the future of our society with ever-increasing demands for food, fiber and fuels while at the same time resources are diminishing. We have to take responsibilities by providing the scientific basis for developing sustainable soil utilization plans and solve questions on how to increase soil productivity while preserving soil fertility for succeeding generations. This is not an easy task and requires a close cooperation of different environmental and social science disciplines but also politicians and stakeholders.

5 questions to Scott Chang



Name: Scott Chang

Age: 50

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Position: Professor of Forest Soils and Nutrient
Dynamics (since 2001)

1. When did you decide to study soil science?

I decided to study soil science when I was deciding which university to attend. At the time I was only 16 and even though I grew up in the countryside and had worked on the land during summer school breaks, I had no idea what I would be studying in an agricultural university and what is soil science. Because I liked chemistry and I performed well on the chemistry exam in the national university entrance exam, when it comes to deciding a degree program to pursue, I was attracted by the program called Soil Science and Agricultural Chemistry at Zhejiang

Agricultural University. Four years of university education in that program increased my interest in soil science, particularly in a new discipline called soil ecology, under the influence of one of my professors (see Question 2 below). In the last year of my degree program, I took another entrance exam (at the graduate level) and was accepted into a soil ecology M.Sc. degree program by the Institute of Soil Science in Nanjing, which is one of the research institutes under the Chinese Academy of Sciences.

2. Who has been your most influential teacher?

Professor Jinyan Yu was my most influential teacher at Zhejiang Agricultural University. Professor Yu was the supervisor for my graduate thesis research. At the time he was initiating a research program to understand the energy and material flow in farming communities even though his main area of research was soil physics. That project got me interested. That's an area of research he called soil ecology. The graduation thesis (an article length thesis; it was nowhere near a modern day thesis) got accepted by a university level thesis compilation, thesis selected from graduating classes throughout the university. That experience strongly influenced my choice on a graduate program as I mentioned earlier.

3. What do you find most exciting about soil science?

What I found most exciting about soil science is its broad application in many different disciplines. For example, we can find application of soil science in bioenergy research, environmental remediation, life on Mars, forensic science, and research on the Arctic and climate change, to name a few. The broader application of soil science will ensure that this discipline will remain a vibrant one. This is exciting as we work to find more applications of soil science in different areas. Land reclamation, an area I personally have a heavy involvement, for example, increasingly rely on soil scientists to address questions such as sustainability and functionality of reclaimed ecosystems.

4. How would you stimulate teenagers and young graduates to study soil science?

I consider it critical to expose teenagers and young graduates to soil science very early on in their education. My former colleague, Professor Emeritus Jim Robertson, used to run an annual soils show for a school district a couple of hours away from the University of Alberta. After I joined the University, I was one of those who helped to run that soils show a few times and from that experience I realized that

school students have a keen interest to learn new things and such learning is typically limited by the availability of resources and expertise within the school system. As soil scientists, we should take every opportunity to educate teenagers and young graduates about opportunities in soil science. After I took on the role as a curator for the soil science collection, part of the University of Alberta Museum, I have taken advantage of that position to annually offer students from some under-privileged families in Edmonton to gain hands-on experience in soil science. That work was done through the U-School program offered by the University of Alberta.

5. How do you see the future of soil science?

I see soil science as a young discipline that has a bright future. The future of soil science is rooted in both the development of soil science as a discipline and in the broadening of its application in existing and new areas of science and engineering. As such, multi-disciplinary approaches will be needed. For soil science to flourish, soil scientists will need to take a broad view of the discipline and will need to apply our expertise to solving the most pressing global problems such as global change and environmental degradation. If we only confine our work in the traditional soil science disciplines, soil science could become a discipline with no relevance. Our future also lies with developing strong collaborations with scientists in other disciplines.

5 questions to Ganga Hettiarachchi



Name: Ganga Hettiarachchi

Age: 48

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Position: Associate Professor of Soil &
Environmental Chemistry (since 2012)

1. When did you decide to study soil science?

I decided to specialize in soil science when I was a third year undergraduate in Faculty of Agriculture,

University of Peradeniya, Sri Lanka. I did my fourth year specialization and undergraduate honors project in soil science. At that time I chose soil science because that was the subject I found fascinating and stimulating, not because there was great potential for finding a job when I graduated.

2. Who has been your most influential teacher?

I have had many influential teachers, but I think the three that have had the most influence on shaping me as a scientist, researcher, and teacher are my undergraduate research advisor, Prof. Mervyn W. Thenabadu; my graduate advisor, Dr. Gary Pierzynski; and my postdoctoral research mentor, Dr. James Ryan. Prof. Thenabadu, my first research advisor, generated my endless interest in relating soil mineralogy to soil chemical processes. Even today I tend to look at mineralogy to understand underlying mechanisms of various soil chemical processes. Dr. Gary Pierzynski had so much faith in me as a researcher and helped me to grow as an independent researcher. He gave me opportunity to design my Ph.D. research, and always was there as a great advisor whenever I needed help and direction. Dr. Jim Ryan, a great mentor, taught me not to forget the big picture even when I am looking at soil processes at sub-micron scale. I must mention the great colleagues I met along the way at the U.S. EPA, Kansas State University and University of Peradeniya, and my mentor Dr. Mike McLaughlin and colleagues I worked or interacted with at CSIRO and the University of Adelaide, Australia. They all helped me grow further by creating a very intellectually stimulating yet friendly atmosphere.

3. What do you find most exciting about soil science?

It is extremely exciting to see how soil is influencing all other spheres (lithosphere, biosphere, hydrosphere, and atmosphere) by standing at the intersections of the all of these spheres. Various soil processes have a tremendous influence on the quality of other spheres. The result is that many other disciplines are now interested in gaining an understanding of and appreciation for the science of soil.

4. How would you stimulate teenagers and young graduates to study soil science?

I think it will be stimulating if we can clearly show them or help them to understand how various soil processes influence us through their effect on the food we eat, air we breathe, water we drink, and other living processes with which we interact.

5. How do you see the future of soil science?

It is exciting to be a soil scientist today. I strongly believe the future of soil science is extremely bright. Today, more than ever before, those in other disciplines are realizing that soil science is important to their areas of study. We see that soil scientists today are instrumental partners in many large interdisciplinary research groups. I see increasing demand for soil scientists as we face this grand challenge of feeding nine billion people by 2050 while protecting our environment and health.

5 questions to Rainer Horn



Name: Rainer Horn

Age: 63

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Position: Professor of Soil Science (since 1982)

1. When did you decide to study soil science?

I became interested in soil science long before I decided to study horticulture at the University in Hannover partly because of my interests in gardening but also because the high school teachers interested us in soils and their functions. During my 1 year internship in the nursery in Essen (necessary as a prerequisite for the study of horticulture in those days), a coworker presented me the book of E.A. Mitscherlich which furthermore made me more fascinated.

2. Who has been your most influential teacher?

During the second year in the university I participated in the soil science courses given by the well-known Prof. Dr. Dr.h.c. P. Schachtschabel- his way to interest students was outstanding. However, my final decision was supported by to extraordinary way Prof. Hartge motivated and explained the processes in soils and their relevance for ecosystem processes during his lectures, practical training courses and excursions. His approach to explain soil processes was fascinating and created for me as an undergraduate and later on also as a PHD student a complete new insight in soils and their functions. Later on, Prof. Dr. H.P.

Blume as my mentor during my postdoc time at the Technical University in Berlin added the impressive insight in the pedogenetic processes and the environmental aspects which resulted in a more complete soil science view. The way Prof. Hartge and Prof. Blume promoted young scientists and students to follow their own research topics and approaches supported my career also because of their positive discussions adding further aspects or additions open questions. Both colleagues acted literally as Doctor Fathers during my PHD and my habilitation period.

3. What do you find most exciting about soil science?

To see soils as three phase systems, to understand the dynamics of their physical, chemical and biological functions, to link their properties to external physical, chemical forces as well to quantify the boundary conditions to maintain these properties, to get an insight in the soil structure processes and functions on the various scales as well as the sensitivity create continuous new inspirations for further research.

4. How would you stimulate teenagers and young graduates to study soil science?

To stimulate teenagers is indeed often difficult because their views are mostly limited to soils as dirt under their shoes. We must start much earlier in the Kindergarten and continue during the whole school education in order to get the kid's view focused on the beauty and diversity of soils but also their sensitivity for irreversible degradation. The often mentioned facts of the nonrenewable soils, the processes of soil degradation and the wonder world within these soil systems must be communicated to students, the public, NGO's or politicians by our own enthusiasm supported by easily understood facts and hints for consequences. We must also show ways how to solve such problems and encourage them to step into soil science by interesting excursions etc. I try to convince the students with these various facts and insights in soils as often still unknown but most important links in ecosystems; furthermore the explanations about Soil Science as the discipline which really helps mankind to develop their future in a more sustainable way is hopefully also convincing for graduate students.

5. How do you see the future of soil science?

I am convinced that soil science will become more important in the near future and may actually obtain

the necessary standing and acceptance because the belief of the finite nature and instability of soils and their functions furthermore affected by the growing population and under the threat of the global change processes will create enough power of persuasion. The growing demand for food, the decreasing area per capita for food production etc in the world until 2050 will support the creativeness of people to optimize but at the same time to also support the necessary attention for a more site adjusted land use and reduced degradation. New experimental methods and research strategies will help us to get a more complete idea about e.g. scale dependent processes and the extrapolation to various scales. The UN declaration for the International Year of Soils helps us in a perfect manner to improve the understanding and the acceptance for soil science topics and to interest various groups for soil science. If we professionally link the knowledge about soils and the options for an even more precise insight into the details of soil processes under various land use management and parent material conditions worldwide at the various scales Soil Science will furthermore grow not only in the recognition but also will finally reach the status of one of the most important topics for the mankind globally.

5 questions to Takashi Kosaki

Name: Takashi Kosaki

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Position: Professor (since 1994)

1. When did you decide to study soil science?

It was in 1973 when I was a senior student in the Faculty of Agriculture, Kyoto University, Japan. I started studying soils in the Department of Agricultural Chemistry and I was not interested in soil science at all in the beginning since we have been informed of the difficulty and scarcity in finding job after the university. It was no wonder that most of the students were looking at the field of biochemistry, molecular biology, microbiology, organic chemistry, etc. The teachers in the soils lab, however, showed me a new field of study which attracted me a lot with stories of field work

in the developing countries, philosophy of soil classification, and fantastic pageant of colorimetric analyses of inorganic elements.

2. Who has been your most influential teacher?

There are many and thus difficult to mention who has been the most. Professors K. Kawaguchi and Y. Matsuo of Kyoto University talked soils stories of the world just like fairy tales in my childhood. Professor K. Kyuma of Kyoto University and Professor R.B. Corey of the University of Wisconsin-Madison gave me a wide, deep and comprehensive view of soils. I learnt how students should be educated in the class given by Professor M.L. Jackson in Madison and was always inspired scientifically by the papers of Professor R. Webster of Rothamsted Experimental Station, UK, when I was working for Ph.D. in Kyoto.

3. What do you find most exciting about soil science?

To experience the diversity of soils in the field and to seek the universal rule of a variety of reactions in them under the effects of environmental factors in the ecosystems. I collected all seeds of my research in the field wherever I was given chances to work. The seeds have been mostly automatically sown in the respective projects thus I was most excited when I found a research topic from seeds, even if it is small, very basic or too theoretical thus quite far from practical needs. I, however, find it now that such topics are all interrelated and form the major direction of my research, i.e. soil and land degradation.

4. How would you stimulate teenagers and young graduates to study soil science?

The most important thing for me to do is to take them in the fields, show and let them touch, feel, and think of soils together with the surrounding environment including climate, topography, parent material, fauna and flora as well as human intervention. I would like to let them understand that soil science is not simple but rather tough to learn because soil is a complex system and thus there is no need to learn it in a hurry and a student can study it with his/her own approach, e.g. chemistry, physics, biology, geology, geography, mathematics, history, archaeology, or even anthropology. It is apt to them.

5. How do you see the future of soil science?

Shall be more closely concerned and better understood by the people. The process would,

however, be slow. We should not be disappointed, since we have started learning soils since long time before Christ was born and we know them now a little. I am sure it is not a shame to go slowly. Soils are always changing and thus there may not be a goal in studying soils and we may not be able to know them all. But, it is OK. This would be the reason why it is fun to study soil science in future and forever. What we learn slowly will never disappear quickly.

5 questions to Bernd Lennartz



Name: Bernd Lennartz
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Position: Professor for Resources Conservation and Soil Physics (since 2000)

1. When did you decide to study soil science?

After studying Pharmacy for 2 semesters, I was more attracted to environmental sciences. That was the time when an awareness for environmental issues developed in society throughout many European countries and the US (first mass demonstrations against nuclear power in the late 1970s and early 1980s). I decided to study Agriculture, which – in many places – was the only option to get into contact with environmental sciences such as soil science. Early on during my studies I was inclined towards soil science and hydrology as these disciplines seemed to play a central role in the functioning of environmental systems (eco-systems).

2. Who has been your most influential teacher?

Several scientists and teachers affected my career. My first soil science professor at Kiel University (Germany) was Prof. H.-P. Blume. His enthusiasm for soil science was very contagious and surely awakened my interest in the subject in general. Prof. G. Brümmer was teaching physico-chemical soil properties and reactions at Kiel University and became my supervisor of my master thesis (diploma thesis at that time) on pesticide mobility in soils. The same subject became the topic of my PhD thesis, which I conducted under Prof. P. Widmoser

(Kiel University). From Peter Widmoser I learned that soil and water are two sides of the same coin as they are closely connected. Eventually, soil hydrology became important to me, which led me directly to Prof. H. Flüher (EZH Zürich, Switzerland) who was and still is very influential to many young scientists for his outstanding work and his heart geniality.

3. What do you find most exciting about soil science?

From a scientific point of view, soil science is still a hidden world with plenty of secrets waiting to be discovered regardless if you prefer physics, chemistry, biology or a mixture of it all. Although soil science conjours up an image of dirt at times, it is most relevant for food security issues worldwide. In this respect, I find it exciting that soil science combines practical aspects of agriculture with basic research.

4. How would you stimulate teenagers and young graduates to study soil science?

Students who have an interest in environmental sciences, can be motivated to study soil science by demonstrating the key role of soils in the functioning of ecosystems. It mainly depends on the soils how resilient the ecosystem can react upon various impacts such as loading by agrochemicals. There is also a sociological dimension to soil science which might be of interest to young people. In the 1970s people believed that we would have wars about the remaining oil reserves; in the 1990s water was identified as a scarce good; now we know that it is soil that is really limited and mankind would not survive without sufficient soil resources. We already see land grabbing around the world. Soils are at risk and we need more young enthusiastic soil scientists to protect soils and to raise the awareness about the significance of soils.

5. How do you see the future of soil science?

There are burning issues ahead: soil degradation through soil loss (erosion and sealing), contamination, compaction, etc.; competition for soil for food, fodder and energy. The inevitable decrease in soil resources will result in a high demand for smart and sustainable management strategies for soils. That is why soil science will become more important in future. We need more soil experts to solve the food security and energy issues of today and tomorrow.

5 questions to Ian Hollingsworth



Name: Ian Hollingsworth

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Position: Owner (since 2010)

1. When did you decide to study soil science?

I decided to study soil science when I was at Hawkesbury Agricultural College in 1981. We had a visiting speaker who related his career since leaving Hawkesbury. He had gone on to do a PhD in soil science and was involved in establishing large centre pivot irrigation schemes in Saudi Arabia. But of course I spent a lot of time in the sand pit as an infant and was fascinated by the effect of water on cohesion in sand.

After graduating with an agriculture diploma and specializing in soil conservation and farm mechanization I went to work in a remote region of Papua New Guinea as a food crops agronomist. My job was to develop food production from local subsistence agriculture for a cash market. Including the local population in the cash economy had large social benefits apart from valuing established agricultural activity that kept communities intact. The locals saw the universe like an egg with different layers. Their ancestors lived in the soil and interacted with the living through the food supply and particular trees where human remains were placed. Other spiritual influences were in the air and seemed to communicate using birds, particularly hornbills. It all seemed feasible. I spent time learning the geography enough to focus business development activity in productive parts of the landscape and realized that soil fertility was a critical factor for social cohesion and community health in subsistence societies.

2. Who has been your most influential teacher?

Alf Cass and Don McLeod supervised my Masters degree at the University of New England. Both were very capable people in their disciplines of soil physics and soil chemistry. Alf inculcated a thorough understanding of phase relations and factors affecting plant available water, particularly

soil strength. Don gave well-reasoned insights into soil chemical fertility and thesis writing and also recommended me for a contract soil survey that started my professional soil science career. After my Masters degree I took on aid work as a soil surveyor in Sabah, Malaysia. I was looking to get a job in Australia when this finished. Don recommended me to a former student of his who offered a contract position to survey landscapes and native vegetation health in a world heritage wetland on the River Murray. I did the work well and career opportunities followed. My inspiration came from the approach to multidisciplinary land resources mapping that CSIRO Land Resources undertook in northern Australia, PNG and Vanuatu up until the 1980's.

3. What do you find most exciting about soil science?

I think, influenced by exposure to a hot, seasonally wet tropical climate that the science of soil may be as close to investigating the miracle of life as we get. Reincarnation through the soil is a central theme of classical religions and my mates in PNG and the way seeds germinate and grow in soil is always an inspiration. Understanding the links between local and regional processes and global climate systems is exciting and we seem to have a way to go. Looking at NASA's global nitrous oxide emission maps and seeing no signal from Australia's northern savanna woodlands where early dry season burning is practiced as an approved nitrous oxide emissions reduction strategy makes me question the accuracy of the science and the value of land management based abatement. Being able to verify local and regional land management activities aimed at reducing greenhouse gas emissions with global remote sensing systems would be exciting.

4. How would you stimulate teenagers and young graduates to study soil science?

Supporting interdisciplinary research that increases our professional profile and broadens our relevance could increase the demand for work and attract people early in their career. I think that we tend to give emphasis to the arcane and the elaborate instead of the relevant in soil science. Also, there is a stamp collecting approach that can drive a lot of unproductive effort in areas like soil classification and land suitability assessment that can create the feeling of going in circles. Emphasising interdisciplinary research and linking local to regional and global scales of relevance would test the science, broaden intellectual horizons and prevent us from becoming comfortable in bureaucracies and fraternal society.

5. How do you see the future of soil science?

I think that the focus of soil science is shifting from site assessment to describing landscape scale processes that support ecosystems including agricultural ecosystems. This requires changing the way soils are described and classified; theoretical developments and institutional changes that build on international standards; reinforce commercial practice links with centers of higher education; and ensure that public service activity isn't isolated from professional practice. I think that extension, or profession led research is a model for continuous improvement that should largely replace public service led research and would increase recruitment.

Geotechnical engineers and landscape architects may be professional models relevant to soil scientists. Geotechnical engineers operate under international standards based on tested theories that support risk-based design. Geotechnical research seems to be readily applied in industry. Professional landscape architects appear to be usefully engaged with training accreditation and professional development in ways that we could adapt. Developing a common soil classification that accurately reflects soil genesis in landscapes, promoting soil investigations with reasonable support for risk-based decision making and design in agriculture and land use change from natural and agricultural ecosystems would brighten the future of soil science.


5 questions to Balwant Singh



Name: Balwant Singh
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Position: Associate Professor in Soil Chemistry
(since 2006)

1. When did you decide to study soil science?

I was enrolled in the BScAgr 5 year degree program at Haryana Agricultural University, Hisar in India. The choice for soil science was made in the final year of the degree program and by then I had done three units of soil science. I was tossing between soil science and agricultural economics, but



because of the influence of soil science lectures and my farming background, I decided to do major in soil science. This is perhaps one of the best decisions of my life, as my enthusiasm for the subject has become stronger with time.

2. Who has been your most influential teacher?

I am fortunate enough to have been taught by highly dedicated lecturers during my Bachelor and Master degree programs. However, the standout lecturer was Dr R.S. Chahal, who taught us the introductory soil chemistry unit in the third year of my bachelor degree at Haryana Agricultural University in India. Bob Gilkes from the University of Western Australia taught me the holistic approach to understanding soil properties and processes.

3. What do you find most exciting about soil science?

The most interesting aspect of soil science for me is that the more I learn about a certain aspect of soil science more questions arise. It is such a fascinating and complex science that your interest and curiosity cannot be eroded with time.

4. How would you stimulate teenagers and young graduates to study soil science?

I would start with some local soil type or a local soil problem that they are most familiar with and then use soil science principles to explain the system. Additionally, digging a soil pit is the best way to expose young people to the fascinating world of soil science. Hand on experience is perhaps the best way to introduce and teach young people. Making connections between production of food, fibre and fuel and different soil types should be a good way to get young graduates interested in the subject.

5. How do you see the future of soil science?

In my view the future of soil science is very bright. We will need increasing numbers of soil scientists to meet the demand for food for the growing population and to solve increasing environmental problems, such as climate change, soil and water contamination and waste management. We need to improve our communication with the general public and learn to effectively collaborate with scientists from other disciplines, particularly with our pure science colleagues.



Favourite Soil Books

Favourite soil science books of Scott Chang (Canada)

My three favourite soil science books are *Soils and Geomorphology*, 3rd Edition, by Peter W. Birkeland (1999 Oxford University Press, 430 pp.), *Ecology and Management of Forest Soils*, 3rd Edition, by Richard F. Fisher (1941-2012) and Dan Binkley (2000 John Wiley & Sons, 489 pp.), and *Understanding Soil Change: Soil Sustainability over Millennia, Centuries and Decades* by Daniel D. Richter, Jr. and Daniel Markewitz (2001 Cambridge University Press, 255 pp.). The first two books are textbooks I use in my classroom teaching. They are two of my three picks because those are very resourceful books and they helped me tremendously very early on in my career, when I started my teaching appointment. *Soils and Geomorphology*, as the title implies, emphasizes on soil formation and how that is affected by geomorphology, with a minor treatment on soil classification. Even though it was written with reference to the soil classification system in the United States (Soil Taxonomy), with its process-level focus, the book should equally be useful for a reader not familiar with Soil Taxonomy. Most texts on soil classification do not provide detailed process-level explanations on soil formation and this book provides a comprehensive treatment of soil forming processes, with a wealth of examples provided in it. I especially appreciated the emphasis on time as a soil forming factor in several chapters of the book.

The *Ecology and Management of Forest Soils* is the most authoritative textbook on forest soils. A new version of this book was published last year but unfortunately I have not had time to review the new version in detail and thus the old version is listed here. On the *ecology* side, the book covers soil-vegetation relationships, the biology (including roots) of forest soils, nutrient cycling, and effects of disturbance regimes such as forest fire on soil properties and processes. On the *management* side, the book heavily placed its emphasis on forest nutrient management, such as understanding nutrient limitations in forests and applying fertilizers to eliminate nutrient limitations for maintaining forest productivity. The newest edition

of this book went through an overhaul and while the main structure of the book has been retained, the chapters have been re-organized and the book is now divided into six parts. Several new chapters have been added; for example, "Influence of tree species" (on forest soils) and "Managing forest soils for carbon sequestration" have been added as new chapters. This would bring the book up-to-date and should increase its utility to classrooms.

The third book, *Understanding Soil Change*, provides an account of forest soils research that the authors were personally involved with for many years on a long-term experiment established by their former colleagues in the United States Forest Service. The two sides of the story about long-term change, changes in the land use and that of the soil in southern United States, told together made the reading interesting; that also help tell the reader about how and why managed soils change over time. This book is on my recommended reading list for an upper level undergraduate soil class. All three books are highly recommended whether for general reading or for use as textbooks.

Favourite soil science book of Thomas Scholten (Germany)

Asking me to write about my favorite books in soil science, I thought this would be an easy job. In fact it is not! When searching through my offices at Tübingen University and at home, I realized that there are many candidates and that almost every book has its personal relationship to me and is worth to be mentioned. Finally, I decided to list three benchmark books. First place without any doubt is the German bible of Soil Science, the so-called Scheffer/Schachtschabel. Since this book was already presented by Peter Schad in the IUSS Bulletin 122, I can just underline the importance of this book for Soil Scientists, at least in Germany, and hope that the English version will be released soon.

Almost 30 years ago in 1986, one of the first textbooks on theoretical and practical principles for spatial information systems and geostatistics was issued by Peter A. Burrough which is

presently available in a 2000 reprint (Principles of Geographical Information Systems, second edition, Peter A. Burrough and Rachael A. McDonnell, ISBN: 978-0-1982-3365-7, 1998, Oxford University Press). Based on the development of computer programs, satellite sensors and first GIS systems, this textbook marks the beginning of a new era in soil science introducing spatial analysis using geostatistical methodology and opens doors for the development of modern pedometrical approaches and data-based modelling. Machine learning and big data enter our research field and is now widely used for up to date spatial modeling and we are under way to solve Hans Jenny's revolutionary theoretical state factor equation from 1941 (see IUSS Bulletin 121, page 32) in a quantitative manner.

Another favorite and wonderful book in soil science is Roy P.C. Morgan's text book on soil erosion and conservation (Soil Erosion and Conservation, 3rd edition, R. P. C. Morgan, ISBN: 978-1-4051-1781-4, 316 pages, December 2004, Wiley-Blackwell). This internationally recognized textbook describes and explains all processes of soil erosion and methods of soil conservation in a holistic way. Its commendable structure and comprehensible style offers an easy access to the fundamentals of soil erosion, which is still one of the most scary soil threats on Earth, as well as basic knowledge on designing and implementing soil conservation programs.

In addition to the three classic benchmark books mentioned above, I draw your attention to 'Soils of the World' by Wolfgang Zech and Gerd Hintermaier-Erhard (original German edition published by Spektrum Akademischer Verlag GmbH Heidelberg, 2002, due 2015, ISBN 978-3-540-30460-9a, 180p, Springer). This book illustrates all earth soils structured not only in accordance with the WRB classification but along ecological zones and natural ecosystems. The soil forming factors as well as aspects of land suitability are comprehensively described and extensively illustrated by maps, photographs and catena graphs. This book can not only serve as reference about the earth's soils and their geography but is a valuable aid to attract people from other disciplines in soil science. It is a worthy follower of the famous lecture notes from Driessen & Dudal ('Lecture Notes on the Major Soils of the World', P.M. Driessen & R. Dudal (1989), Geography, Formation, Properties and Use, Agricultural University Wageningen) which is still available on the internet and to which I would like to express my great respect.

Favourite soil science book of Nikolay Khitrov (Russia)

Books reflect our ideas about things, phenomena and events around us. They are different due to the great diversity of nature and changes in our knowledge about the world. A reader's point of view about the particular book depends both on the content, design, illustration of the book and the reader himself, his emotion, interests, knowledge at the moment of reading. That is why it is difficult for me to answer the question about only three favourite books. We are in continuous development.

There are lots of books concerning different branches of soil science and allied sciences that could be mentioned. To give preference to any book is a thankless task because each of them contains something useful for the development of my perception of the world or for making decisions. I am supposed to choose only three favourite books ... So, I'll limit my search to the period when I was a student of Leningrad (now St.Petersburg) State University in the 1970s.

The first book is "*The System of Research Methods in Soil Science*" by A.A. Rode (1972). The methodological approach and basic principles for investigating composition, properties and functioning of soils are considered in this book.

The second one is "The Genetic Morphology of Soils" by B.G. Rozanov (1975). Now this book under a shorter title "Soil Morphology" is one of the "Classical textbooks for university" reissued by Moscow State University. B.G. Rozanov systematized information about soil morphological properties, soil horizons and possible hypothesis of their genesis.

The third book is "Podzol- and Gley- Formation" by F.R. Zaidelman (1974). It was the first book for me in which an important statement was decisively proved. The statement is the following: there are several different processes leading to the formation of bleached soil horizons. It was important, because only one version of the horizon genesis was in the ascendant in that time.

Since the 1970s I have read many other interesting and important books and papers. I am sure there will be new discoveries in the world of books about soils.

Examen a soil poem

Dr Paul Farres from the University of Portsmouth, UK, has taken students on fieldtrips to the Netherlands for the past 32 years. He has sent us the following exam question and answer from one of his undergraduate students.

*Five things influence soil landscapes;
Biota, climate, terrain shapes,
Initial stuff and human kind.
A blend of these may loose or bind
The land skin of hills and dales:
Here turns soil dark, and elsewhere pales;
Leaches it poor or makes it rich,
Defining each natural niche,
Erodes or catches soil debris,
Changing the landscape endlessly.*

F. Hole and J. Campbell, 1985

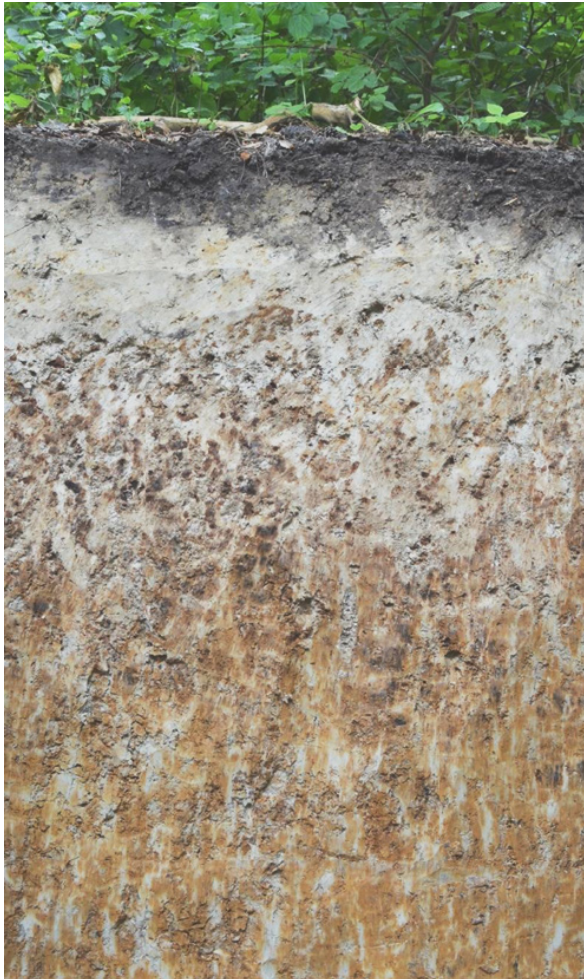
Exam question: Using field evidence, critically discuss how the sentiment of this poem informs our understanding of the soilscape of Southern Gelderland (Netherlands).

*Reset the clocks, the flood plain has gone,
Totally submerged as swollen rivers run;
Concealing the centuries of soil evolution;
Features and forms calved by erosion.
Underlying horizons shaped by biota and terrain
Hidden by the unrelenting rain,
Only the ancient terraces hold the solution,
To questions of soil evolution,
The parent material that gave birth to this soil
And man's impact, his farming, his toil;
Reset the clocks, once more eternal round,
As a new born soil forms in the ground.*

Mark Thewlis, Undergraduate 2014
University Portsmouth



German Soil of the Year 2015: Stagnosol



The profile shows a typical *Stagnosol*: Nearly white colored E horizon with Fe/Mn concretions above a strongly mottled B horizon from loess of the Kottenforest near Bonn. It was described by colleagues of the *Geological Survey of NRW*.

H.-P. Blume, Kiel

The German Society of Soil Science (DBG) and the Federal Association of Soil (BVB) de-fined **Stagnosols** as *Soils of the Year 2015*, following a suggestion of soil scientists of North Rhine-Westphalia (NRW) in Germany. The soil was presented in Berlin under the patronage of *Mr. Johannes Remmel, the Minister of Climate Protection, Nature and Agriculture of NRW* to the public at 5th of December 2014, the *International Day of Soil*.

Stagnosols are often formed of marl. Surface water stagnated upon the clay enriched subsoil under humid climate conditions, and formed wet - bleached topsoil with concretions below the humic A, above a mottled subsoil. Agricultural land use needs subsoil loosening and/or drainage.

Victor Targulian 80 years

10/08/2014 was the 80th birthday of Prof. Dr. Victor O. Targulian – the Honorary Member of the IUSS, and the Honorary Vice-President of Dokuchaev Soil Science Society, Russia. In 2006, Prof. Targulian was the first winner of the Dokuchaev Award of the IUSS. In 2011 he was also awarded by the Dokuchaev Gold Medal of the Russian Academy of Sciences. He participated in 9 World Congresses of soil science.

Victor O. Targulian was born in Moscow. After the high school, he became a student of Timiryazev Agricultural Academy. He got his first experience in soil science in the Dokuchaev Soil Institute. This was a wonderful school for a young specialist; moreover, he did extensive field work in very remote areas of the Arctic, East Siberia, Kamchatka, and Far East for the purposes of collecting data on unexplored soils there for the State Soil Map of Russia, scale 1:1M. He liked this kind of activities with overcoming many difficulties, wandering in uninhabited taiga or tundra lands, hunting for food, rafting on dangerous mountainous rivers.

Victor was lucky to have two outstanding teachers – Prof. E. Ivanova and Academician I.Gerasimov, who proposed him to work in the new department of soil geography and geochemistry that he organized in the Institute of Geography, Academy of Sciences. In 1967 he has got the degree of a full doctor (Doctor of Sciences, Geography), without the transitional Ph.D. stage, for his comprehensive monograph “Pedogenesis and weathering in cold humid areas” (published in Russian in 1971). This study made a revolution in understanding the soil genesis in cold climates of Russia; most popular was the new soil name he invented: “podboor” for well-drained soils with spodic but without albic horizons – these soils are in the Russian classification systems and on the national maps since that time.

His studies of northern soils were highly evaluated not only in Russia but also by many specialists in arctic soils of the North America (J.Tedrow, F.Ugolini). However, the worldwide recognition came to Prof. V.O.Targulian several years later, in 1974 during the X International Congress of Soil




Science in Moscow. He organized and carried out the most detailed study of soil genesis ever been in worldwide practice and prepared the brilliant field excursion. Two books ‘Arrangement, composition and genesis of sod-pale-podzolic soil derived from mantle loams’ (separately morphological and analytical studies) published in both English and Russian made him known as a deep and very skillful specialist in soil genesis.

In 1976 he took part in long-term expedition to the tropical islands of Pacific Ocean on board the scientific vessel. After this experience and following overseas trips Victor Targulian entered the club of “global pedologists”. He attended many international conferences and congresses, his fresh ideas, vivid lectures and discussions in good English attracted many well-known soil scientists, and in 1989-90 he managed to organize the team and to prepare together with R.Arnold, I.Szabolc, R.Dudal, D.Yaalon and many other prominent specialists the book “Global Soil Change” (1990), which reflected the response of world soil community to global challenges.

Victor Targulian is also widely known for his theoretical papers on the pedogenesis on global scale, soil behavior in time, soil memory, characteristic time in soils and many other basic points.

As an IUSS officer (1990-2006) he has been very active – permanently organizing international



meetings, expeditions and publications. In spite of his time-consuming international activity, Prof. Dr. Victor Targulian manages to carry on not only his scientific career but also pedagogical, editing activities and work in the national Soil Science Society. His last papers and books on development of soils in time and soil memory of biosphere interactions, and very detailed and deep investigations of soil matter of recent and very old soils together with his students make him one of the most readable pedologist.

V.O.Targulian is both one of the leaders among pedologists and at the same time an 'ambassador', enriching the world science by 'diamonds' of Dokuchaev soil science school and enriching national science by up-to-date world experience. The world community of soil scientists wishes many years of healthy and productive life to Prof. Victor Targulian.

Awards

Kubiëna Medal 2014: Rienk Miedema

Rienk Miedema was born in Stiens (The Netherlands) in 1945. He studied Soil Science and Soil Fertility at Wageningen University, where he obtained the degrees of MSc (With Honours, 1972) and PhD (1987) with his thesis "Soil formation, microstructure and physical behaviour of Late Weichselian and Holocene Rhine deposits in the Netherlands".

He was Assistant and Associate Professor at the Department of Soil Science and Geology of until 2000, when he received the Teacher of The Year Award of WU. Afterwards, he held different positions as Project Manager and Curricula Coordinator at the same university.

In the field of soil micromorphology, he has been very active as Secretary of the Micromorphology Commission of the IUSS (4 years). He participated in 9 micromorphology meetings and was member of the scientific committee of the 10th IWMSM in Moscow (1996), and co-editor of its proceedings. He organized the two first international intensive courses on soil micromorphology in Wageningen (1990, 1992), and was teaching in the following courses in Belgium, Spain, Italy, USA and Mexico. These courses formed most of the soil micromorphologists that are nowadays active in research and teaching.

As researcher, he made very relevant contributions

to the methodology and interpretation of micromorphological data for soil genetic and applied purposes. He developed the first widely used method of drying soil samples, prior to impregnation with resin, using acetone in the liquid solvent exchange technique. The use of this method has been generalized around the world, and is the only one that can be used in practice for porosity studies in shrinking-swelling soils. The importance of his basic and applied research is derived from his experience, not only on soils of the Netherlands, but also on soils he studied from Sierra Leone, Denmark, Uruguay, Niger, France, Thailand, Pakistan, Russia, Costa Rica. They deal mostly with dynamics of fluvial and hydromorphic soils, clay-related processes, effects of soil tillage and of biological activity and soil organic matter evolution. His first paper "Micromorphological quantification of clay illuviation" (1972) is a turning point in how to address soil genetic questions with a morphometric approach.

In 1990, at a time of no use of the web, he compiled, together with A. Mermut, the most complete and useful annotated bibliography on soil micromorphology, that represented a real advance in the field. Because of his deep insight and knowledge on soil micromorphology he was honoured to give a key speech in the WCSS in Acapulco (Mexico) in 1994, where he presented "Soil Micromorphology: towards an analytical and quantitative tool for assessing anthropogenic influences on soils".



The abovementioned merits are only a part of the many relevant activities of Rienk Miedema in different aspects of research, teaching and service in microscopy of soils. The Kubiëna Medal, awarded to him during the 20th WCSS in Korea by IUSS Commission 1.1. is therefore a recognition of his an outstanding and sustained contribution in the discipline of soil micromorphology.

Rosa M Poch

Chair IUSS Commission 1.1.

Soil Morphology and Micromorphology

Raimat, July 2014

Guy Smith Medal 2014: Otto Spaargaren



The Guy Smith Award Selection Committee has unanimously selected Dr. Otto Spaargaren as the winner of the 2014 Guy Smith Medal Award. Otto has been recognized for his major contributions to international soil classification and correlation with special reference to the World Reference Base for Soil Resources (WRB).

Otto Spaargaren (Born on 10th June, 1944) obtained his M.Sc. degree in Physical Geography and Soil Science at the University of Amsterdam in 1974. Five years later he graduated in Mathematics and Sciences at the University of Amsterdam specializing in soil genesis, soil chemistry, thermodynamics and soil mineralogy.

Otto started his professional career as Educational Officer at the International Soil Museum (now ISRIC – World Soil Information), Wageningen, The Netherlands. Next to lecturing soil resources and

contributing to the soil monolith collection and its reference materials he assisted the Secretariat of the International Society of Soil Science (ISSS) which was based in Wageningen. From his base at ISRIC Otto undertook numerous soils projects all over the world: soil survey for rice production in the Niger Delta in Nigeria; soil survey for the Mahaweli Development Project in Eastern Sri Lanka; feasibility for irrigation in Western Nepal.

From 1983 – 1987 Otto was Soil Correlator in the Soil Survey Unit of the Ministry of Agriculture and Water Development of Zambia. He was not only coordinating and supervising the soil survey work, but elaborated upon the Soil Classification System of Zambia.

From 1988 – 1991 Otto became the Coordinator of the African Acid Soils Network of the International Board for Soil Research and Management (IBSRAM). In this capacity Otto was putting to good use its soil classification to organize and streamline field experiments in Burundi, Cameroon, Congo, Cote d'Ivoire, Ghana, Madagascar, Nigeria, Rwanda, Senegal and Zambia.

In 1992, Otto prepared for FAO the first classification system for top soils in the world.

From 1993 onwards Otto landed back at ISRIC to work on numerous assignments such as establishing a meta-database on Land Quality Indicators (LQI) under the authority from the World Bank; and preparation of a joint ISSS-ISRIC-FAO World Soil Resources Report on the World Reference Base for Soil Resources.

This latter publication was so well received during the 1994 World Congress of Soil Sciences at Acapulco, Mexico, that Otto became the secretary of the IUSS Working Group World Reference base for Soil Resources, through to 2006. After his retirement in 2007, Otto returned to the field, this time in Ireland where he contributed to the field studies of the soil map of Ireland.

Although Otto acquired his personal research experience in tropical areas, he has a perfect, comprehensive understanding of the whole world of soils, which is of particular importance for soil classification. His unique feature as of a 'classifier' is the feeling of importance given to criteria or properties when constructing the whole system, and 'a sharp nose' for the consequences of possible defaults in the system when some changes are introduced. Otto

Spaargaren's contribution to international soil classification may be defined as designing and

checking its architecture (and controlling its rules). The other dimension in Otto's approach is harmony both within one system and among systems. In Otto's world of soil classification, WRB has its unique place which he iconized as "umbrella between equally worthy national soil classification systems". With his concern to come to harmonization with Soil Taxonomy, Otto made numerous moves with the definitions of the diagnostics in WRB, so as to bring WRB and Soil Taxonomy closer to each other.

His broad soil geographic experience contributed to the development of guidelines for small-scale soil mapping in WRB. These guidelines, rooted in the FAO Soil Resources Map of the World, have opened the scope for streamlining and harmonizing the system of qualifiers in WRB. Developing soil classification for field management applications is one more trend in Otto's research areas, as well as the related attempt of topsoils inventory for classification purposes.

Otto's enthusiasm for soils has inspired many young soil scientists. He really is a master in animating the discussions in the profile pits and then bringing the floating ideas towards a consensus by projecting them on his vast field experience. Not only that, during numerous field excursions in the margin of international soil congresses Otto would sneak out to collect numerous soil monoliths which are now on display in the soil museum at ISRIC and at the places of origin all over the world. Otto has been very active in spring- and summer schools of soil classification at ISRIC (Wageningen, The Netherlands) and at the JRC (Ispra, Italy).

*Seppie Deckers, Lucia Anjos and Maria Gerasimova
IUSS Guy Smith Medal Award Selection Committee*

Richard Webster Medal 2014: Gerard Heuvelink

The IUSS Richard Webster Medal corresponding period 2011-2014 was awarded at the 20th World Congress of Soil Science (June 2014) to Dr Gerard B. M. Heuvelink, Associate Professor in the Land Dynamics group at the Wageningen University (NL), as well as a Senior researcher at ISRIC - World Soil Information. He was nominated by two colleague pedometricians (Tomislav Hengl and Dick Brus), and evaluated by the five members of the Pedometrics Committee on Prizes and Awards. Gerard amply satisfied the criteria for the award, viz: (a) "a

distinction in the application of mathematics or statistics in soil science through their published works": Gerard has co-authored 40 ISI papers between consecutive World Soil Congresses. Among his most influential publications, based on Google Scholar, are:-- "A Propagation of Errors in Spatial Modelling with GIS" (Citation rate: 32/year)-- "A generic framework for spatial prediction of soil variables based on regression-kriging" (CR: 38/year)-- "Optimization of sample patterns for universal kriging of environmental variables" (CR: 20/year)-- "Modelling soil variation: past, present, and future" (CR: 17/year). The latter is a comprehensive review article from 2001, written with Richard Webster, that has served as guide for soil scientists trying to apply pedometric techniques to soil geography

(b) "innovative research in the field of pedometrics": He is so recognized by his peers in Pedometrics, e.g., by the 2006 Best paper award in Pedometrics: Heuvelink G.B.M., Schoorl J.M., Veldkamp A., Pennock D.J. 2006. Space-time Kalman filtering of soil redistribution. *Geoderma* 133:124-137. This followed the more theoretical and motivating paper: Webster, R., and G.B.M. Heuvelink. 2006. The Kalman filter for the pedologist's tool kit. *European Journal of Soil Science* 57(6): 758-773. (c) "leadership qualities in pedometrics research": Since 2012 Gerard has lead the largest research project at ISRIC: AfSIS (Africa Soil Information Services); chaired the Dutch Soil Science Society from 2004-2008; project leader or (co)-supervisor of 4 current and 13 completed research projects registered by the (Dutch) National Academic Research and Collaborations Information System (NARCIS); see list at [http://www.narcis.nl/person/RecordID/PRS1284143/\(d\)](http://www.narcis.nl/person/RecordID/PRS1284143/(d)) "contributions to various aspects of education in pedometrics": Gerard teaches geostatistics, spatial uncertainty analysis and pedometrics to students of



Gerard Heuvelink (left) and Dick Webster

Wageningen University. The teaching is embedded in the Landscape Properties and Variability course to undergraduate students of Soil, Water, Atmosphere. Gerard also contributes to the Spatial Modelling and Statistics course to MSc students of Geo-information Science of Wageningen University and the Inventory Techniques for Land Science and Frontiers in Land Science courses of the MSc Soil Science. Recent post-graduate courses taught by Gerard are the Space-Time Geostatistics course to employees of Wageningen IMARES, the Statistical Methods for Spatial Data Analysis and Modelling course to PhD-students of the Production Ecology and Resource Conservation graduate school, and the Spatial Uncertainty Propagation workshop organised prior to the Pedometrics 07 conference. He has been a member of 18 PhD committees since 1996. (e) "service to pedometrics": Gerard chaired the Pedometrics Commission in the period 2002-2006; during his mandate, the Digital Soil Mapping working group has been established; pedometrics got much more visibility within the IUSS (it was promoted to a commission in 2004; Pedometrics is now one of the most active research groups within IUSS). He chaired the Dutch Soil Science Society from 2004-2008, after being vice-president from 2001-2004). He is the co-editor of the Geoderma journal, and has edited several issues of the Pedometron newsletter and is still one of the main contributors to that newsletter (notably with the Pedomathemagia column). Gerard is originally from Kranenburg and he attended the University of Twente, majoring in applied mathematics, and found his way to Peter Burrough's group at the University of Utrecht, where he wrote an influential thesis (1993) "Error propagation in quantitative spatial modelling: applications in Geographical Information Systems", later (1998) published in book form by Taylor & Francis, with a glowing introduction by Michael Goodchild. He then spent about ten years at the University of Amsterdam, before joining Wageningen University, first with Alterra and then ISRIC as well as in the academic Soil Geography and Landscape group. On his Wageningen professional directory page he lists his expertise as "Statistics" with the keywords "uncertainty analysis, geostatistics, pedometrics". With the award of this medal we are pleased to confirm the last!

*David G Rossiter
Chair Pedometrics Committee on
Prizes and Awards for 2014-2017*

2014 World Agriculture Prize: Paul Vlek




The GCHERA World Agriculture Prize was awarded to Professor Paul Vlek, world-renowned soil scientist and leader in interdisciplinary research for development, education and capacity building. The award is in recognition of Paul Vlek's remarkable success in developing global collaborative partnerships and being an inspiration to generations of students and researchers in Germany and worldwide.

In his early career Paul Vlek researched the benefits in preventing nitrogen (N) losses by deep-placement of urea in flooded rice, a technology now applied on over 2 million ha of rice cultivation today. However having experienced the long delay between discovery and adoption of this technology, Paul Vlek drew attention "to the all too often delay between invention of new agricultural practice and adoption which can run into decades. New approaches in agricultural research are needed to avoid such time lapses by engaging and integrating all stakeholders in the innovation process from the onset of research".

This interdisciplinary research approach has been a hallmark of Paul Vlek's career working in Africa, Uzbekistan and elsewhere to ensure the research outcomes lead to innovation and adopted new practice. An example was the GLOWA Volta project in West Africa (2000-2010), an interdisciplinary program addressing the impact of global climate change and water management in the region.

Since 1998, Paul Vlek has been the Director of the Center for Development Research (ZEF), which he co-founded, at Bonn University, Germany. He has held a number of senior appointments over his 40-year career both in Germany and overseas including Director of the Agro-Economic Division of the International Fertiliser Development



Center (IFDC, USA), Director of the IFDC in Africa, Director of the Institute of Agronomy in the Tropics and Dean of the Faculty Agriculture at the Georg –August-University Göttingen, Germany, and founding Executive Director of West African Science Service Center on Climate Change and Adapted Land Use (WASCAL) in Ghana. In 2011, Paul Vlek was appointed to the UNESCO chair on Education for Sustainable Development at Urgench State University, Uzbekistan.

In memoriam John Letey

1933-2014



UC Riverside Distinguished Professor of Soil Physics and Soil Physicist Emeritus John Letey, Jr. passed away on September 14, 2014. He was 81 years old. Dr. Letey joined the faculty in the Department of Irrigation and Soil Science at UCLA in 1959. With the phasing out of Agriculture at UCLA, he elected to join the Department of Soil Science at UCR in 1961 and enjoyed a distinguished career in research, teaching, administration, and service at the university. During his tenure he served as chair of the Department of Soil and Environmental Science from 1975 to 1980, director of the Kearney Foundation of Soil Science from 1980 to 1985, and director of the University of California Center for Water Resources from 1999 to 2003. Dr. Letey was instrumental in the establishment of the Environmental Sciences undergraduate major at UCR, which was one of the first of its kind in the United States. He recognized and appreciated the critical link between science and policy and built teams and research to address it.

He received his B.S. degree at Colorado State University and Ph.D. degree at the University of Illinois. He was a fellow in the Soil Science Society of America, American Society of Agronomy, and the American Association for the Advancement of Science. His research focused on all aspects of water quantity and quality related to irrigated agriculture that provided both applied and basic

information critical to establishing sound water resource management. Topics of research included irrigation, drainage, salinity, pesticide transport, plant-water relations, nitrogen, soil aeration, and polymers. He was also recognized as one of the world authorities on water repellent soils and the utilization of surfactants.

He authored or co-authored more than 300 technical publications concerning chemical, water, and gas movement through soil. In 2005 he was awarded the *Soil Science Society of America's* Soil Science Distinguished Service Award and he received the society's Soil Science Research Award in 1970. He retired from UCR in 2002 and in 2007 published a fictional book titled, "The Folly of Fearing Death" (PublishAmerica, Baltimore). Dr. Letey was a friend and mentor to students, visiting scholars, and faculty across the world

Reports of meetings

Climate Changes and Sustainable Developments of Natural Resources – Egypt 2014

The meeting held on November 5 – 7, 2014 in Soil and Water Sciences Department, Faculty of Agriculture, Kafrelsheikh University, Kafr El-Sheikh, Egypt. The 11th International Conference of Egyptian Soil Science Society (ESSS) “*Climate Changes and Sustainable Developments of Natural Resources*” were held in conjunction with *Soils, Water and Environment, Institute (SWERI), Agricultural Research Center*. Nearly 400 people attended the ESSS Meeting from Italy, Germany, France, Hungary, USA, Gambia, Nigeria, Egypt, Saudi Arabia and Tunisia. More than 120 papers were presented. The presented papers were divided into the following sessions:

- Soil Physics, Water Relations, Climate Changes and Modeling
- Soil Chemistry, Pollution and Remediation
- Biotechnology and Soil Biology
- Pedology, Mineralogy, GIS and Remote Sensing
- Plant Nutrition, Soil Fertility and Fertilizers

The ESSS 2016 will be held in Ismailia, Faculty of Agriculture, Suez Canal Uni. about “Development of soil and water resources – challenges and solutions, Suez Canal region”.

Italy-China Meeting on Soil degradation Beijing

1-6 June 2014

Soil degradation is the main emergency in Italy and China, that damages soil structure leading to losses of soil nutrients, fertility and ecosystem functioning through wind and water erosion. Though degradation is largely anthropogenic, and hence its rate is governed by the intensification of land use, extreme natural events, such as droughts or rainfall events of high intensity, exacerbate the situation. In addition to the direct damages such events have on populations, long term environmental losses are always present. Understanding and reducing the main causes of soil degradation may help in limiting inappropriate land use, unsustainable agricultural practices, overgrazing, and deforestation. Soil degradation was the topic of a meeting held in Beijing on 1-6 June 2014 at the Chinese Academy of Sciences between Italian and Chinese researchers. This meeting gave the opportunity to participants to discuss the most important causes of soil degradation at different scales, from surface reactions to soil components, from rhizosphere to soil horizons, from soil profile to landscape. The first day the meeting was held at the Institute of Geology and



Some Hungarian and German participants (Pyramids, Giza)



Geophysics of the Chinese Academy of Sciences and emphasis was given to instrumental and modelling approaches that can help in the evaluation of soil contamination and remediation. The relationships between soil, microorganisms and vegetation were instead the main topic of the second day, at the Research Centre for Eco-Environmental Sciences of the Chinese Academy of Sciences. Presentations were about the effects of soil contamination on soil microorganisms, including Archaea, the insights that can be reached by the evaluation of rhizosphere processes, the problems of erosion estimates under different land use, the new frontiers of agricultural management. The meeting was organised by prof. Claudio Colombo, from the University of Molise and sponsored by the RTD office of the Italian Embassy in Beijing with the supervision of the Science and Technology Counsellor Prof. Plinio Innocenzi. Presentations were given by 5 Italian researchers: Fabio Terribile, Elenora Bonifacio, Giuseppe Corti and Giuseppe Lo Papa and by 5 Chinese researchers: Haibin Wu Qingzhen Hao ; Qinsong Liu; Jizheng He, Chuanyong Jing.



New Publications

GlobalSoilMap: Basis of the Global Spatial Soil Information System

Edited by D. Arrouays, N. McKenzie, J. Hempel, A.R. de Forges, A. McBratney. 2014. CRC Press. ISBN: 978-1-138-00119-0. Hardcover 494 pages. Price \$189.95. GlobalSoilMap: Basis of the global spatial soil information system contains contributions that were presented at the 1st GlobalSoilMap conference, held 7-9 October 2013 in Orléans, France. These contributions demonstrate the latest developments in the GlobalSoilMap project and digital soil mapping technology for which the ultimate aim is to produce a high-resolution digital spatial soil information system of selected soil properties and their uncertainties for the entire world. GlobalSoilMap: Basis of the global spatial soil information system aims to stimulate capacity building and new incentives to develop full GlobalSoilMap products in all parts of the world.

Soil Carbon

Edited by A. E. Hartemink, K. McSweeney. Springer Progress in Soil Science Series. 2014. ISBN: 978-3-319-04083-7. Hardcover 560 pp. Price \$179.00. Few topics cut across the soil science discipline wider than research on soil carbon. This book contains 48 chapters that focus on novel and exciting aspects of soil carbon research from all over the world. It includes review papers by global leaders in soil carbon research, and the book ends with a list and discussion of global soil carbon research priorities. Chapters are loosely grouped in four sections: Soil carbon in space and time, Soil carbon properties and processes, Soil use and carbon management, and Soil carbon and the environment. A wide variety of topics is included: soil carbon modeling, measurement, monitoring, microbial dynamics, soil carbon management, and 12 chapters focus on national or regional soil carbon stock assessments. The book provides up-to-date information for researchers interested in soil carbon in relation to climate change, and to researchers that are interested in soil carbon for the maintenance of soil quality and fertility. Papers in this book were presented at the IUSS Global Soil C Conference that was held at the University of Wisconsin-Madison, USA.

Soil Science

By H. Blume, G.W. Brümmer, R. Horn, E. Kandeler, I. Kögel-Knabner, R. Kretzchmar, P. Schad, K. Stahr, and B. Wilke. March 28th 2015. Springer. ISBN: 978-3-642-30941-0. Hardcover 550 pages. Price \$89.95. The soils are fundamental to our existence, delivering water and nutrients to plants that feed us. But they are in many ways in danger and their conservation is therefore a most important focus for science, governments and society as a whole. A team of world recognized researchers have prepared this first English edition based on the 16th European edition. Details on the precursors and the processes of soil development, the physical, biological and chemical properties of soils, Nutrients and Pollutants, the various soil classifications with the main focus on the World Reference Base for Soil Resources (WRB), the most important soils and soil landscapes of the world, Soil Evaluation Techniques, and Basic Principles of Soil Conservation.

The Soils of Bulgaria

By T. Shishkov, and N. Kolev. World Soils Book Series. 2014. Springer. ISBN: 978-94-007-7783-5. Hardcover 228 pages. Price \$129.00. The Soils of Bulgaria offers a comprehensive analysis of the characteristics of soils and concepts on their magnitude. The purpose of the book is to introduce readers to the soil problematic and ecology in Bulgaria. The volume is divided into 3 parts. The first includes historical facts on soil research in Bulgaria, as well as general conditions and factors of soil formation, while the second applies an original pedological approach. The book's third part focuses on essential information concerning land use/cover in Bulgaria. Each of the 13 chapters deals more specifically with fundamental chemical and physical soil properties, concepts of soil evolution, old and modern processes, geographic distribution, climatic conditions, topography, parent materials, plant associations, morphology, and the relationship with different classification systems. The interactions between soil status and management are also highlighted. The use of the latest, statistically significant data ensures precise conclusions. The book also includes a large number

of charts and new illustrations. The Soils of Bulgaria is crucial reading material for anyone interested in soil management and agriculture in Eastern Europe, from students to policy makers and is also of particular interest for researchers in the field.

Soil Colloids: Properties and Ion Binding

Series: Surfactant Science Series Volume 156. By Fernando V. Molina. 2013. CRC Press. ISBN: 978-1-43-985114-2. Hardcover 545 pages. Price \$179.95. Within the field of soil science, soil chemistry encompasses the different chemical processes that take place, including mineral weathering, humification of organic plant residues, and ionic reactions involving natural and foreign metal ions that play significant roles in soil. Chemical reactions occur both in the soil solution and at the soil particle–solution interface—the latter surface reactions being vitally important in soil properties and behavior. The binding of ions to soil particles is important in defining the fate of foreign species, such as pollutants, and has a direct impact on nutrient availability. The text examines soil colloidal components and their interactions with ionic species, integrating soil science and colloid chemistry and considering the latest advances in this active research area. Part I covers the fundamentals of colloid science for readers not familiar with these principles. It discusses all the important concepts, without excessive detail such as extensive mathematical derivations. Part II deals with soil and its components, especially clay and oxide minerals and humic substances. It covers their composition and characteristics, with an emphasis on colloidal properties and ion sorption on colloids. Part III provides in-depth coverage of ion binding to soil colloids, with a focus on modeling, including recent advances. Chapters in this section describe general concepts and the issues arising from the heterogeneous nature of most natural colloids, particularly organic ones. Reviewing the state of the art in dealing with the more complex interactions, the text covers ion binding to minerals and humics, presenting different theoretical approaches, as well as ion binding to multiple components, or whole natural soils.

The Soils of the Philippines.

Series: World Soils Book Series

By R.B. Carating, R.G. Galanta, and C.D. Bacatio. 2014, XXV. Springer. ISBN: 978-94-017-8681-2. Hardcover, 293 pages. Price \$179.00. The first soil survey in the Philippines was done in 1903. The Soils of the Philippines, is the first comprehensive

summary of more than a century of soil-survey work. It integrates the soil concepts of the reconnaissance soil-survey results, with the semi-detailed soil surveys that continue to this day. The result is the first-ever genetic key for classifying Philippine soils at soil series level; thus, making it possible for any newcomers to the soil survey field to confidently produce their own soil map, at a more detailed map scale, to suit the project requirements. This book brings together discussions on soils and soil mapping units and up-to-date international techniques and technologies. The Soils of the Philippines is a source of authoritative and updated data on soil resources for macro-level resource management planning. As the country leaps from an agricultural economy towards modernization and a more diversified economic base, some of the soil series in the Philippines, for example the Guadalupe series underlying the skyscrapers of Makati City, are becoming extinct as a result of urban development. Therefore, this book serves as the repository for the soils that we possess, the soils that have been lost through decades of urbanization while, at the same time, it creates a soil classification system for the soils we are yet to discover.

Chemistry of Europe's Agricultural Soils (2 parts)

By C. Reimann, M. Birke, A. Demetriades, P. Filzmoser and P. O'Connor (Eds.). Part A: Methodology and Interpretation of the GEMAS data set. Geologisches Jahrbuch B102. 2014. Schweizerbart. ISBN 978-3-510-96866-6. Hardcover 528 pages. Price 118 Euro. Part B: General Background Information and Further Analysis of the GEMAS Data set. Geologisches Jahrbuch B103. 2014. Schweizerbart. ISBN 978-3-510-96847-3. Hardcover 352 pages. Price 78 Euro (both volumes together: 150 Euro). The GEMAS project (Geochemical Mapping of Agricultural and Grazing Land Soil - <http://gemas.geolba.ac.at/>) collected during 2008 and until early 2009 a total of 2108 samples of agricultural (Ap-horizon, ploughed land, 0–20 cm) and 2023 samples of grazing land (0–10 cm) soil each from 33 European countries, covering an area of 5,600,000 km². The average sample density is 1 site/2500 km² per land cover class. All samples were analysed for 52 chemical elements after an aqua regia extraction, 41 elements by XRF (total), and soil properties, like CEC, TOC, pH (CaCl₂), following tight external quality control procedures. In addition, the agricultural soil samples (Ap) were analysed for 57 elements in a mobile metal ion (MMI[®]) extraction, Pb isotopes

and magnetic susceptibility. Part A provides a short introduction to the project, a description of the analytical methods used and gives an overview of the extensive quality control procedures carried out to guarantee the homogeneity of the project data set. The core of the book is the collection of geochemical maps and description of results, element by element in alphabetical order. It closes with a discussion of the results and the conclusions of the project. Part B of the GEMAS atlas provides a more detailed interpretation of the spatial distribution of selected elements (As, C, Cd, K, Th, U) at the European scale than it was possible to provide in Part A, the geochemical atlas. To highlight the importance of scale it also contains interpretations of the data set at a more local scale (Scandinavia and Ukraine). Possibilities for more-in-depth uses of the data set from assessing the impact of agriculture (carbon stock), through risk assessment to unravelling geological processes (loess distribution) are demonstrated. Several Chapters cover the background information needed for the interpretation of a geochemical atlas (geology, soil formation, distribution of mineral deposits). Finally, data on the regional distribution of some rarely analysed elements (B, Cl, F) at the European scale are presented.

Application of Soil Physics in Environmental Analyses: Measuring, Modelling and Data Integration

By W.G. Teixeira, M.B. Ceddia, M.V. Ottoni, G.K. Donnagema (Eds.). *Progress in Soil Science Series*. 2014. Springer, Dordrecht. ISBN 978-3-319-06012-5 Hardcover 476 pages. Price \$209.00. The importance to preserve soil and water is widely recognized. Soil physics has grown considerably in the last years, however, those advances are thoroughly dispersed. In this volume, the authors will bring together the effectiveness of new field and lab sensors and the state-of-the-art in modeling and data analysis. The topics have been divided as follows: Part 1 - Integrating data in soil physics proposes re-establishing the knowledge chain, linking tacit knowledge to cutting edge science. The use of field soil data or what has been called hydropedology, is discussed and exemplified. Part 2 - Data analysis in soil physics and pedotransfers functions presents the analysis of data in state-space and geostatistical approaches. Part 3 - Different approaches to characterize soil physical quality indicators is focused on new techniques used to characterize, map and interpret soil

physical parameters. The challenge of assessing soil physical quality is discussed from the simplest to the most complex indicators. Part 4 - Sensors and monitoring in soil physics centers the discussion on equipment and sampling techniques for monitoring soil physical parameters. Technological advances are addressed, such as X-ray tomography, which provides a means to evaluate pore topological properties in a noninvasive way. A comparison with in situ and remotely sensed data of soil moisture and limitations in using these data for hydrological modeling are also discussed. Part 5 - Creating data bases and models applied to soil physics discusses alternative approaches for modeling water flow and solute transport in the vadose zone. A review of multi-component solute transport models and examples of their use in agricultural and environmental applications are given. The phenomenon of dynamic non-equilibrium in soil water flow is discussed as the need of a paradigm change. Root water uptake is also covered with advanced approaches and the last two chapters address the challenges to develop soil data bases

Geotechnics of Organic Soils and Peat

By Huat, B.B.K., Prasad, A., Asadi, A., and Kazemian, S. 2014. CRC Press. 978-04-156-5941-3. Hardcover, 250 pages. Price \$139.95 Peat and organic soils commonly occur as extremely soft, wet, unconsolidated surficial deposits that are an integral part of wetland systems. These types of soils can give rise to geotechnical problems in the area of sampling, settlement, stability, in situ testing, stabilization and construction. There is therefore a tendency to either avoid building on these soils, or, when this is not possible, to simply remove or replace soils, which in some instances can lead to possibly uneconomical design and construction alternatives. However, in many countries of the world, these soils cover a substantial land area and pressure on land use is resulting in ever more frequent utilization of such marginal grounds. For the successful design, construction and performance of structures on such marginal soils, it is crucial to predict geotechnical behavior in terms of settlement, shear strength and stability, with respect to time. This means expanding our knowledge base and calls for a reliable characterization of their geotechnical properties and mechanical behavior and subsequently, the devising of suitable design parameters and construction techniques for dealing with these materials.

Böden der Welt (Soils of the world, in German)

By W Zech, P Schad, G Hintermaier-Erhard, 2014. SpringerSpektrum, ISBN 978-3-642-36574-4. 164 pages, 360 figures and photos. 55 Euros. The soils of the world are presented in eleven sections according to the World Reference Base for Soil Resources (WRB, 2006). Nine sections refer to the ecozones of the world (from the polar and subpolar zone to the tropics with year-round rain) and discuss 26 Reference Soil Groups (RSGs) of the WRB. Section ten explains three RSGs dominant in mountain regions and section eleven describes three RSGs with worldwide distribution. For every RSG, the physical, chemical and biological properties are presented, their distribution is explained and the potentials and problems of land use are discussed. Broad attention is given to the soil-forming processes. In addition, for every ecozone, information about location, climate and vegetation is added, a map informs about soil distribution and climate, and some examples for catenas are presented. 157 figures and 203 photos explain soil characteristics and processes in a comprehensive and didactic way.

Agro-Ecological Intensification of Agricultural Systems in the African Highlands

By B Vanlauwe, P Van Asten, G Blomme. 2014, Earthscan. ISBN: 978-0-415-53273-0. Hard Cover 314 pages. Price £85. With growing population and food security risks, there is an urgent need to increase sustainable agricultural productivity in sub-Saharan Africa. This book addresses the issue of agricultural intensification in the humid highland areas of Africa. In addition to introductory and synthesis chapters, the book focuses on four themes: system components required for agricultural intensification; the integration of components at the system level; drivers for adoption of technologies towards intensification; and the dissemination of complex knowledge. It provides case studies of improved crop and soil management for staple crops such as cassava and bananas, as well as examples of how the livelihoods of rural people can be improved.

Elements of Soil Mechanics

9th Edition. By I. Smith. July 2014. Wiley-Blackwell. ISBN: 978-04-706-7339-3. Paperback, 480 pages. Price \$49.95. The 9th edition maintains the content on all soil mechanics subject areas - groundwater flow, soil physical properties, stresses, shear strength, consolidation and settlement, slope

stability, retaining walls, shallow and deep foundations, highways, site investigation - but has been expanded to include a detailed explanation of how to use Eurocode 7 for geotechnical design. The key change in this new edition is the expansion of the content covering Geotechnical Design to Eurocode 7. Redundant material relating to the now defunct British Standards - no longer referred to in degree teaching - has been removed. Building on the success of the earlier editions, this 9th edition of Smith's Elements of Soil Mechanics brings additional material on Geotechnical Design to Eurocode 7 in an understandable format. Many worked examples are included to illustrate the processes for performing design to this European standard. Significant updates throughout the book have been made to reflect other developments in procedures and practices in the construction and site investigation industries. More worked examples and many new figures have been provided throughout. The illustrations have been improved and the new design and layout of the pages give a lift.

3rd edition of World Reference Base for Soil Resources (WRB)

3rd edition of World Reference Base for Soil Resources (WRB) was presented at the World Congress of Soil Science in Jeju. It is a follow-up of the first (1998) and second edition (2006). It is available as pdf and as app for Android at the WRB homepage on the FAO site: <http://www.fao.org/soils-portal/soil-survey/soil-classification/world-reference-base/en/>. This third edition provides a system for naming soils and creating legends for soil maps. The central concepts of most of the 32 Reference Soil Groups have been maintained

12th edition of the Keys to Soil Taxonomy

12th edition of the Keys to Soil Taxonomy created an opportunity to update Soil Survey Technical Note No. 10 – Buried Soils and Their Effect on Taxonomic Classification. The buried soil concept was originally proposed in soil taxonomy to cover soils subject to catastrophic events like flooding on flood plains and burial by volcanic eruptions, and though recent interest in human-transported materials and subaqueous soils has expanded the application of the buried soil concept. This and other Soil Survey Technical Notes are available online at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_053566. Soil Taxonomy was recognised as an international system of soil classification at the World Congress of Soil Science.

World soil distribution educational poster

IUSS Working Group WRB 2014, Published by European Commission Joint Research Centre, IUSS, UN FAO and NSW Office of Environment and Heritage. Prepared by J. Gray, J. Deckers, B. Murphy and S. Dondeyne. Free download (2 or 26 MB file) from the JRC website: <http://eusoils.jrc.ec.europa.eu/events/Conferences/20wcss.html>

This free educational poster aims to convey some fundamental principles of soil formation and to graphically illustrate how different environmental factors give rise to different soils. The main feature is two central charts that graphically present the distribution ranges of 23 of the 32 World Reference Base (WRB) soil groups according to the factors of climate, parent material and topography. It also includes supporting information on the five main factors of soil formation, a table on WRB soil attributes with correlation to Soil Taxonomy and a number of soil profile and landscape photos. The poster is primarily intended as an educational tool, particularly for students but also for many practicing soil and environmental scientists.

Antarctic Terrestrial Microbiology: Physical and Biological Properties of Antarctic Soil Habitats

Edited by D. Cowan. 2014. Springer. ISBN: 978-3-642-45212-3. Hardcover, 299 pages. Price \$189.00. This book brings together many of the world's leading experts in the fields of Antarctic terrestrial soil ecology, providing a comprehensive and completely up-to-date analysis of the status of Antarctic soil microbiology. Antarctic terrestrial soils represent one of the most extreme environments on Earth. Once thought to be largely sterile, it is now known that these diverse and often specialized extreme habitats harbor a very wide range of different microorganisms. Antarctic soil communities are relatively simple, but not unsophisticated. Recent phylogenetic and microscopic studies have demonstrated that these communities have well established trophic structuring, and play a significant role in nutrient cycling in these cold, and often dry desert ecosystems. They are surprisingly responsive to change, and potentially sensitive to climatic perturbation. Antarctic terrestrial soils also harbor specialized 'refuge' habitats, where microbial communities develop under (and within) translucent rocks. These cryptic habitats offer unique models for understanding the physical and biological 'drivers' of community development, function and evolution.

Biological Control of Plant-Parasitic Nematodes: Soil Ecosystem Management in Sustainable Agriculture

By G.R. Stirling. 2nd Edition. 2014. CABI. ISBN: 978-17-806-4415-9. Hardcover, 496 pages. Price \$240.00. Plant-parasitic nematodes are one of multiple causes of soil-related sub-optimal crop performance. This book integrates soil health and sustainable agriculture with nematode ecology and suppressive services provided by the soil food web to provide holistic solutions. Biological control is an important component of all nematode management programs, and with a particular focus on integrated soil biology management, this book describes tools available to farmers to enhance the activity of natural enemies, and utilize soil biological processes to reduce losses from nematodes.

Application of Soil Physics in Environmental Analyses. Series: Progress in Soil Science

By W.G. Teixeira, M.B. Ceddia, M.V. Ottoni, G.K. Donnagema (Eds.) June 22, 2014. Springer. ISBN: 978-3-319-06012-5. Hardcover, 400 pages. Price \$209.00. The green economy and the recognition of the importance to preserve soil and water have been discussed in many interdisciplinary forums in the world, which invokes the necessity to better characterize the soil and understand the behavior of water in this medium. Soil scientists are an integral part in interdisciplinary studies about the interactions in the continuum soil-plant-atmosphere, soil management practices and indicators of soil quality. The more frequency of natural disasters, as landslides and thunderstorms addresses the importance to integrate soil characteristics in predictive models. This book seeks to integrate the efforts of scientists to meet this demand. Soil physics research has grown considerably specially in the use of innovative sensors, software, soil database, algorithms and modeling techniques have been introduced into soil water relationship and environmental monitoring. Those advances are thoroughly dispersed in articles and conference proceedings. In this volume, the authors will bring together the effectiveness of many new field and lab sensors and examine the current state-of-the-art in modeling and data analysis. It also includes innovative approaches and case studies in tropical soils. Key researchers in this discipline give future directions in soil physics research. The topics tackled by the chapters were divided in five parts that include: Part 1- Integrating data in soil physics, Part 2- Data analysis in soil physics and pedotransfers functions, Part 3- Different approaches for the characterization

of soil physical quality indicators, Part 4- Sensors and monitoring in soil physics, Part 5- Creating databases and models applied to soil physics.

Interactions in Soil: Promoting Growth

By J. Dighton, J.A. Krumins (Eds.) May 31, 2014. X. Springer. ISBN: 978-94-017-8889-2. Hardcover, 272 pages. Price \$129.00. Soil is a heterogeneous medium, which supports more biodiversity per unit volume than any other system. This book explores how that biodiversity is translated into ecological functions supporting plant growth by providing both essential minerals for plant growth and other growth promoting factors like pathogen suppression. Interactions between plants and associated soil organisms evolve through trophic and non-trophic feedback mechanisms, which are moderated by plant-plant interactions (allelopathy), invasive plant species and land use change and pollution. These factors are discussed in natural, agricultural and urban soil systems to provide a framework for a holistic understanding of soil as a dynamic living entity.

Manual of Soil Laboratory Testing. Volume III: Effective Stress Tests, Third Edition

By K.H. Head, and R. Epps. March 31, 2014. CRC Press. ISBN: 978-14-822-2796-3. Hardcover, 416 pages. Price \$199.95. This volume provides a comprehensive working manual for the laboratory testing of soils for civil engineers. It is an essential practical handbook for all who are engaged in laboratory testing of soils as well as being of great value to professional engineers, consultants, academics and students in geotechnical engineering. Revised and updated, the contents reflect current practice in standard laboratory test procedures for determining some of the important engineering properties of soils.

Soil Liquefaction during Recent Large-Scale Earthquakes

By R.P. Orense, I. Towhata, and N. Chow. April 7, 2014. CRC Press. ISBN: 978-11-380-2643-8. Hardcover, 280 pages. Price \$139.00. Soil Liquefaction during Recent Large-Scale Earthquakes contains selected papers presented at the New Zealand – Japan Workshop on Soil Liquefaction during Recent Large-Scale Earthquakes (Auckland, New Zealand, 2-3 December 2013). This book will be of great interest to researchers, academics, industry practitioners and other professionals

involved in Earthquake Geotechnical Engineering, Foundation Engineering, Earthquake Engineering and Structural Dynamics.

Sulfate Reduction for Remediation of Gypsiferous Soils and Solid Wastes. UNESCO-IHE PhD Thesis

By P. Kijjanapanich. March 19, 2014. CRC Press. ISBN: 978-11-380-1535-7. Paperback, 160 pages. Price \$79.95. Construction and demolition debris (CDD) and gypsiferous soils contain elevated concentrations of sulfate, which can cause several environmental and agricultural problems. Reduction of the sulfate content of CDD and gypsiferous soils is an option to overcome these problems. This study aimed to develop sulfate removal systems either by biological or chemical processes to reduce the sulfate content of CDD and gypsiferous soils in order to decrease the amount of solid wastes and to improve the quality of CDD and soils for recycling purposes or agricultural applications. The treatment concept leaches the gypsum contained in the CDD by water. The sulfate containing leachate is further treated and reused in the leaching step. A mixture of cheap organic materials can be utilized as electron donor for the biological sulfate reduction step, especially in gypsiferous soils treatment. The sulfide containing effluent from the bioreactor can be removed by electrochemical sulfide oxidation system.

Contaminant Geochemistry: Interactions and Transport in the Subsurface Environment

By B. Berkowitz, I. Dror, B. Yaron, September 9, 2014. Springer. ISBN: 978-3-642-54776-8 (Hardcover) 978-3-642-54777-5 (Online), 2nd edition, 577 pages. Price \$24.99 (MyCopy Softcover edition). This book combines soil science, subsurface hydrology and environmental geochemistry, providing a comprehensive background for specialists interested in the protection and sustainable management of the subsurface environment in soils vadose zone, and ground water. Initially the reader is introduced to the characterization of subsurface environment, to selected geochemical processes, and the chemistry of selected contaminants in the soil and subsurface. The major focus of the book is on contaminant partitioning and reactions in porous media solid phases, soil solutions, and groundwater, accounting for their persistence and transformation in the subsurface, as they are transported from the land surface into groundwater. Case studies discussions are provided for each part of the book illustrating

many of the subjects presented. In this updated and expanded second edition, new literature has been added on contaminant fate in the soil-subsurface environment. In particular, more data on the behavior of inorganic contaminants and on engineered nanomaterials were included, the latter comprising a group of “emerging contaminants” that may reach the soil and subsurface zones. New chapters are devoted to a new perspective of contaminant geochemistry, namely irreversible changes in pristine land and subsurface systems following chemical contamination. Two chapters were added on this topic, focusing attention on the impact of chemical contaminants on the matrix and properties of both liquid and solid phases of soil and subsurface domains.

Soil Strength and Slope Stability, 2nd Edition

By J.M. Duncan, S. G. Wright, and T.L. Brandon. September 22, 2014. Wiley. ISBN: 978-1-118-65165-0. Hardcover 336 pages. Price \$150.00. Soil Strength and Slope Stability, Second Edition presents the latest thinking and techniques in the assessment of natural and man-made slopes, and the factors that cause them to survive or crumble. Using clear, concise language and practical examples, the book explains the practical aspects of geotechnical engineering as applied to slopes and embankments. The new second edition includes a thorough discussion on the use of analysis software, providing the background to understand what the software is doing, along with several methods of manual analysis that allow readers to verify software results. The book also includes a new case study about Hurricane Katrina failures at 17th Street and London Avenue Canal, plus additional case studies that frame the principles and techniques described. Slope stability is a critical element of geotechnical engineering, involved in virtually every civil engineering project, especially highway development. Soil Strength and Slope Stability fills the gap in industry literature by providing practical information on the subject without including extraneous theory that may distract from the application. This balanced approach provides clear guidance for professionals in the field, while remaining comprehensive enough for use as a graduate-level text. Topics include: (1) mechanics of soil and limit equilibrium procedures, (2) analyzing slope stability, rapid drawdown, and partial consolidation, (3) safety, reliability, and stability analyses, (4) and reinforced slopes,

stabilization, and repair. The book also describes examples and causes of slope failure and stability conditions for analysis, and includes an appendix of slope stability charts. Given how vital slope stability is to public safety, a comprehensive resource for analysis and practical action is a valuable tool. Soil Strength and Slope Stability is the definitive guide to the subject, proving useful both in the classroom and in the field.

Smith’s Elements of Soil Mechanics, 9th Edition

By I. Smith. 2014. Wiley-Blackwell. ISBN: 978-0-470-67339-3. Paperback 488 pages. Price \$49.95. The 9th edition maintains the content on all soil mechanics subject areas - groundwater flow, soil physical properties, stresses, shear strength, consolidation and settlement, slope stability, retaining walls, shallow and deep foundations, highways, site investigation - but has been expanded to include a detailed explanation of how to use Eurocode 7 for geotechnical design. The key change in this new edition is the expansion of the content covering Geotechnical Design to Eurocode 7. Redundant material relating to the now defunct British Standards - no longer referred to in degree teaching - has been removed. Building on the success of the earlier editions, this 9th edition of Smith’s Elements of Soil Mechanics brings additional material on geotechnical design to Eurocode 7 in an understandable format. Many worked examples are included to illustrate the processes for performing design to this European standard.

Transport and Fate of Chemicals in Soils: Principles and Applications

By H. M. Selim., 2014. CRC Press. ISBN: 978-1-466-55794-9. Hardcover 352 pages. Price \$139.95. This book provides the fundamentals for the understanding of reactive chemicals retention and their transport in soils and aquifers. The book offers the first comprehensive treatment with supporting examples of mathematical models that describe contaminants reactivity and transport in soils and aquifers. It is also a practical guide for designing experiments and collecting data that focuses on characterizing retention as well as release kinetic reactions in soils and contaminant transport experiments in the laboratory, greenhouse (column) and in the field.

Soil: Reflections on the Basis of our Existence

By H. Wallander. 2014. Springer. ISBN: 978-3-319-08457-2. Hardcover 141 pages. Price \$189.00. It is

well known that the soil beneath our feet is one of the most critical components for life on our planet. And yet it holds secrets that would surprise even the most avid gardener. Håkan Wallander, Professor of Soil Biology at Lund University, takes us on a journey through this hidden and multifaceted world, sharing his intimate knowledge of soil acquired during years of research and visits to the rainforests of South America, Africa's deserts and North America's glaciers, interwoven with observations from his homeland, Sweden. Through words and pictures, Wallander brings to life the biological and chemical processes that shape and form the soil. He explains the critical role of bacteria and fungi in soil fertility, interspersing personal reflections with scientific argument and illuminating his subject with fascinating insights. What, for instance, makes a fine wine explode on our taste buds like an Olympic fireworks display? This is a book like no other. One that makes the soil a little easier – and infinitely more exciting – to understand.

Impaired Wetlands in a Damaged Landscape: The Legacy of Bitumen Exploitation in Canada

By K.P. Timoney. 2014. Springer. ISBN: 978-3-319-10234-4. Paperback 125 pages. Price \$ 54.99. This work is a scientific monograph that examines the flora and vegetation of natural mineral wetlands in comparison to mineral wetlands affected by bitumen exploitation. The work is of broad relevance because (a) wetland loss and degradation is a global problem; (b) the continued global increase in fossil fuel exploitation is resulting in widespread damage; and (c) bitumen (tar sands, oil sands) exploitation is a rapidly growing and destructive set of activities. The core of the work is a meta-analysis of 417 vegetation plots. Analyses of change over time and chemical and physical attributes of water and soil are presented for the subset of plots with sufficient data. The purpose of the work is to demonstrate that: (1) There are marked differences between natural and industrially-affected wetlands. (2) Industrially-affected mineral wetlands differ from natural wetlands in their vegetation assemblages, their depressed vegetation and species diversity, and their abundance of exotic weeds. (3) Successful post-bitumen mining wetland reclamation has not been accomplished and may not be attainable within the foreseeable future given the ecological and physical conditions of the industrial wetlands, current reclamation practices, and lax regulatory standards. In regard to government policy and industrial practices, it finds that they are responsible for reclamation failure on a grand scale.

Humic Matter in Soil and the Environment. Principles and Controversies, Second Edition

By K.H. Tan. June 16, 2014. CRC Press. ISBN: 978-14-822-3445-9. Hardcover, 482 pages. Price \$139.95. The field of humic matter research has undergone drastic changes in concepts and principles, and a second edition is now warranted to communicate these advances. This revised and updated edition continues the tradition of providing comprehensive coverage of the genesis, extraction, properties, and impacts of humic matter on agriculture, industry, and the environment. Chapters examine organic matter; present concepts of humus versus humic matter; and explore the nature and distribution, chemical composition, characterization, electrochemical properties, agronomic and industrial applications, and medicinal and pharmaceutical applications of humic substances.

Soil Sequences Atlas

M. Świtoniak, P. Charzyński (Eds.). 2014. Nicolaus Copernicus University Press. ISBN 978-83-231-3282-0. Hardcover 212 pages. To understand the soil-landscape relation it is necessary to study the spatial diversity of soil cover. This book provides an extensive database of soil sequences from the following countries: Hungary, Latvia, Lithuania and Poland. The main objective is to present a great diversity of soil-landscape/climate/hydrology relations and its effect on patterns in soil cover. Most recent edition of the WRB system (2014) was used to classify soils. The collected data will be useful in soil-science teaching, helping to understand variability of soil cover and influence of various soil-forming factors on development of 'Earth skin'. Pdf can be downloaded for free from ResearchGate: https://www.researchgate.net/publication/266851450_Soil_Sequences_Atlas

Suelos con acumulaciones calcáreas y yesíferas de Argentina (Soils with calcareous and gypsiferous accumulations in Argentina)

Perla Amanda Imbellone (Editor). Asociación Argentina de la Ciencia del Suelo. Ediciones INTA. Buenos Aires, Argentina. 2014. ISBN 978-987-521-477-4. 219 p. (In Spanish with abstracts in English). The book includes an Introduction on general aspects of calcareous and gypsiferous soils of Argentina and eight chapters devoted to specific studies on these soils, mainly in the Pampean Region and Patagonia, formed under arid to humid climates (1: Calcretes of SW Córdoba province. 2:

Calcium carbonate accumulations in soils of Central-SE Buenos Aires province. 3: Calcareous soils of NE littoral Buenos Aires province. 4: Calcareous accumulations in the soil cover of southern Buenos Aires province. 5: Genesis of tosca in Pampean soils. 6: Soils with calcareous accumulations in the Upper Valley of Negro river, northern Patagonia. 7: Gypsiferous soils in the Colorado river basin. 8: Properties and genesis of carbonate accumulations in Aridisols from east central Chubut province). Website: www.agro.uba.ar/catalog/164?page=2

Determination of Metals in Water, Soil and Sediments

By T.R. Crompton. November 17, 2014. CRC Press. ISBN: 978-11-380-2106-8. Hardcover, 300 pages. Price \$159.95. The potential health hazards that might arise from the presence of metals in natural waters, soils and sediments are a matter of increasing concern to the water industry, environmentalists, and the general public alike. This comprehensive reference volume draws together and systematizes the vast body of information available in the global scientific literature on the determination of metals in waters, soils & sediments. Sediments in rivers have the property of adsorbing dissolved metals present in the overlying water so that the concentration in the sediment is appreciably greater than that in the water by factors between 100-60,000. The concentration of metals in sediments is a measure of its concentration in water over a period of time and is therefore a useful measure of water quality. *Determination of Metals in Natural Waters, Soils & Sediments* provides comprehensive information on this subject.

Acid Mine Drainage, Rock Drainage, and Acid Sulfate Soils: Causes, Assessment, Prediction, Prevention, and Remediation

By J.A. Jacobs, J.H. Lehr, and S.M. Testa. 2014. Wiley. ISBN: 978-04-704-8786-0. Hardcover, 520 pages. Price \$149.95. Written to help readers understand the formation of AMD, Acid Mine Drainage addresses the generation of acidic waters usually from both used and abandoned coal or metal mines. Offering the most up-to-date ideas on metals remediation, which makes finding control methods relatively easy, the text provides a section on legal and policy issues and details the causes, control, prediction, prevention, and remediation of AMD formation. Case studies from North America, Europe, Asia, and developing countries highlight various approaches to AMD problems.

Soil Strength and Slope Stability, 2nd Edition

By J.M. Duncan, S. G. Wright, and T.L. Brandon., 2014. Wiley. ISBN: 978-1-118-65165-0. Hardcover 336 pages. Price \$150.00. *Soil Strength and Slope Stability, Second Edition* presents the latest thinking and techniques in the assessment of natural and man-made slopes, and the factors that cause them to survive or crumble. Using clear, concise language and practical examples, the book explains the practical aspects of geotechnical engineering as applied to slopes and embankments. The new second edition includes a thorough discussion on the use of analysis software, providing the background to understand what the software is doing, along with several methods of manual analysis that allow readers to verify software results. The book also includes a new case study about Hurricane Katrina failures at 17th Street and London Avenue Canal, plus additional case studies that frame the principles and techniques described. Slope stability is a critical element of geotechnical engineering, involved in virtually every civil engineering project, especially highway development. *Soil Strength and Slope Stability* fills the gap in industry literature by providing practical information on the subject without including extraneous theory that may distract from the application.

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| | E.C.J. Mohr † | Netherlands | | D.H. Yaalon † | Israel |
| 1960 | F.A. Bear † | USA | | S.V. Zonn † | Russia |
| 1964 | J.A. Prescott † | Australia | 2002 | R.W. Arnold | USA |
| 1968 | F. Hardy † | UK | | G.V. Dobrovolsky † | Russia |
| | W.L. Kubiena † | Germany | W. Gardner † | USA | |
| | L.A. Richards † | USA | H.M. Hamdi † | Egypt | |
| | A.A. Rode † | USSR | L.A.L. Sarmiento | Colombia | |
| 1974 | R. Bradfield † | USA | | F. Mancini | Italy |
| | G.V. Jacks † | UK | | B.S. Nosko | Ukraine |
| | Ch.E. Kellogg † | USA | | R. Rosell | Argentina |
| | M.K. Kononova † | USSR | | A. Ruellan † | France |
| | A. Oudin † | France | | A. Tanaka | Japan |
| | F. Scheffer † | Germany | 2006 | P.B.H Tinker | UK |
| 1978 | G. Barbier † | France | | W.E.H. Blum | Austria |
| | V. Ignatieff † | Canada | | H-P. Blume | Germany |
| | Y. Ishizuka † | Japan | | J. Bouma | Netherlands |
| | L. Krolkowski † | Poland | S-J. Cho † | S Korea | |
| | L. Vettori † | Brazil | J. Glinski | Poland | |
| 1982 | Ph. Duchaufour † | France | | M.G.H. Jamagne | France |
| | W. Flaig † | Germany | | D.R. Nielsen | USA |
| | V. Kovda † | USSR | | J.H.V. van Baren † | Netherlands |
| | E. Mueckenhausen † | Germany | | L.P. Wilding | USA |

IUSS Honorary members (Continued)

| Year | Member | Country |
|------|----------------|---------|
| 2010 | C. Feller | France |
| | K. Kumazawa | Japan |
| | K. Kyuma | Japan |
| | J. Ryan | Syria |
| | B.A. Stewart | USA |
| | V. Targulian | Russia |
| | G. Varallyay | Hungary |
| | J.S.P. Yadav † | India |

| Year | Member | Country |
|------|-------------|-----------|
| 2014 | J.J. Kim | Korea |
| | J.M. Kimble | USA |
| | A.R. Mermut | Canada |
| | N. Senesi | Italy |
| | D.L. Sparks | USA |
| | R.E. White | Australia |

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 |

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