



## PRESIDENT'S MESSAGE

Happy New Year to all CSSS members! Last year was a busy one for our soil science community, with a very successful 2016 CSSS annual meeting together with the Pacific Regional Society of Soil Science in Kamloops. It was great to see so many CSSS student members at the annual meeting, and we were able to give an additional 5 travel awards (17 in total) to support student attendance, thanks to a contribution from the Agricultural Institute of Canada.

I'm pleased to report that the Canadian Journal of Soil Science is thriving, with a significant increase in submissions and accepted, published papers in 2016. In addition to the high-quality research papers, I would encourage CSSS members to peruse the featured paper "Profiling undergraduate soil science education in Canada: Status and projected trends". Produced by members of the CSSS Soil Education Committee, this report illustrates the growing importance of soil science training in environmental science programs in Canadian universities.

I am always impressed at the many CSSS members who attend international soil science events as invited speakers, researchers, teachers and expert advisors. To encourage student members of CSSS to participate in international soil science meetings, we introduced two new travel awards in 2016 that provide financial support to CSSS student members wishing to present their research to an international audience. The first recipients of these awards, Carolyn Wilson and Lee-Ann Nelson, give their reports in this newsletter.

We recently marked World Soil Day (December 5, 2016) and this coincided with end-of-year celebrations for the International Year of Pulses. Appropriately, the IUSS President Prof. Dr. Rainer Horn titled his talk for the occasion "Soils and Pulses – a symbiosis for life". The symbiosis envisioned by Prof. Dr. Horn extends far beyond the plant-microbial-soil interaction, as sustainable soil management strategies are broadly connected to global issues of food security, water quality, biodiversity protection and carbon sequestration in an environment of climate change. The functionality of the soil ecosystem – its resilience and ability to withstand stresses – relies upon symbioses within the soil and among all of us who depend upon the soil for life. CSSS members are part of a global community of more than 60 000 soil scientists who are working to prevent soil degradation and support healthy soil systems. The CSSS will continue to promote soil science so it remains a priority for policy-makers and for the general public.

I would like to take this opportunity to thank those who have finished their terms on CSSS Council: Barbara Cade-Menun as Past-President, Nate Basiliko as Eastern Councillor, Carolyn Wilson as Graduate Student Representative and Xueming Yang as CJSS Editor. Their hard work and commitment in serving CSSS is most appreciated. I would also like to welcome the new members on Council: Noura Ziadi (President-Elect), Judith Nyiraneza (Eastern Councillor), Michael Carson (Graduate Student Representative) and Newton Luwayi (CJSS Editor).

This year, the CSSS will hold its annual meeting at Trent University in Peterborough, Ontario from June 10-14, 2017. Preparation for the upcoming meeting at Trent University is well underway and more information can be found in this newsletter. The annual meetings of CSSS are very important for our Society – a time to meet our colleagues from across Canada and build strong scientific friendships. Personally, I have participated in most of the CSSS annual meetings since I was a Master's student and found it a very rewarding experience. I encourage graduate students to take advantage of the travel awards available from their institutions and from the CSSS, to attend the annual meeting.

The organizers of the 2017 CSSS annual meeting have prepared an exciting and interesting program of activities, and I'm looking forward to see many CSSS members in attendance from June 10-14 in Peterborough!

*Joann Whalen*  
CSSS President



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The 2017 Canadian Society of Soil Science Annual Meeting will be held at **Trent University** from **June 10th to 14th, 2017**. The annual meeting theme is “Soil and the Environment” and includes sessions on nutrient cycling, soil health, water quality, soil modelling, soil mapping and forest soils. Online abstract submission and registration is now open. For more information on 2017 CSSS Annual Meeting please check the website (<http://csss-conference.ca/2017/>).

**Important Dates:**

Abstract submission starts on Feb 1, 2017

Abstract submission deadline: March 15, 2017

Notice of abstract acceptance: April 1, 2017

**Registration important dates:**

Registration opens on Feb 1, 2017

Early bird registration deadline: April 15, 2017

For more information on 2017 CSSS Annual Meeting please check the website (<http://csss-conference.ca/2017/>).

In order to take advantage of the reduced membership rate you must hold a current CSSS membership.

\*\*\*Note for students planning to compete for the CSSS student presentation Awards you MUST hold a current CSSS membership to be eligible.



## 2017 CALL FOR CSSS AWARD NOMINATIONS

### *FELLOW, HONORARY MEMBERSHIP, SOIL SCIENCE FOR SOCIETY AWARDS*

We all know someone who has made a significant contribution to Canadian soil science. The CSSS Fellow, Honorary Membership, and Soil Science for Society Awards represent your opportunity to make sure that their fine accomplishments are recognized. It is easy to do - the simple nomination process is described on the CSSS website at [www.csss.ca/index.php/awards](http://www.csss.ca/index.php/awards). Please take the time to submit an Award nomination for a deserving colleague before the deadline of **March 10, 2017**.

#### **CSSS Fellow Award**

This Fellow Award is bestowed upon CSSS members with a distinguished record of accomplishment in soil science and service to CSSS.

#### **CSSS Honorary Membership Award**

This Award honours non-members who have rendered valuable or special service to soil science.

#### **CSSS Soil Science for Society Award**

This Award is open to members or non-members who have made a significant commitment toward promoting soil science to the general public. The Award winner receives a plaque or certificate recognizing their contribution.

#### **CSSS Pedology Travel Award**

This award provides travel funds (up to \$4000) each year to allow for at least one soil scientist (regular member only) to attend a conference, workshop or meeting related to pedology. Please go to [www.csss.ca/index.php/awards](http://www.csss.ca/index.php/awards) for more details on the nomination process for CSSS Fellow, Honorary Membership, Soil Science for Society, or Pedology Travel Awards. All nominations must be submitted via e-mail (Word or pdf attachments) to Joann Whalen ([joann.whelen@mcgill.ca](mailto:joann.whelen@mcgill.ca)), Chair of the CSSS Awards Committee by **March 10, 2017**.

### *STUDENT AWARDS*

There are a number of Awards aimed at promoting student participation in CSSS.

#### **CSSS Student Travel Award**

This Award was established in 1991 to encourage student attendance at the CSSS Annual Meeting, which will be held in Peterborough, Ontario on June 10-14, 2017. Graduate students who are CSSS members are eligible to receive this award. The Student Travel Award is \$600 and a maximum of 12 awards are given each year. Details and the application form for the Student Travel Award can be downloaded from [www.csss.ca/index.php/awards](http://www.csss.ca/index.php/awards). Please send your complete application as an e-mail attachment to Noura Ziadi at [noura.ziadi@agr.gc.ca](mailto:noura.ziadi@agr.gc.ca), Chair of the CSSS Awards Committee by **March 10, 2017**.

#### **CSSS Student Presentation Awards**

The *C.F. Bentley Award* was initiated in 1983 to encourage and recognize excellence in oral presentations by students at the CSSS Annual Meetings. The Award honours [Dr. Fred Bentley](#) who was CSSS President in 1956-57 and inducted as a CSSS Fellow in 1973. The C.F. Bentley Award winner receives \$500, the first runner-up \$300, and the second runner-up \$200.

The *President's Award* was established in 1992 to foster excellence in student poster presentations as a means of disseminating research results at the CSSS Annual Meetings. The President's Award winner receives \$500, the first runner-up \$300, and the second runner-up \$200.

When submitting an abstract for the CSSS Annual Meetings, graduate students should indicate that they wish to be considered for a Student Presentation Award. Every CSSS student member attending the annual meeting is eligible to enter one (1) poster presentation OR one (1) oral presentation in the Student Presentation Award competition.

#### **CSSS Undergraduate Book Award**

This Award recognizes students at Canadian universities who demonstrate excellence in Soil Science at the undergraduate level. Award winners receive a copy of [Soil Sampling and Methods of Analysis](#) (2<sup>nd</sup> Edition), published jointly by CSSS and CRC Press in 2008. Candidates are nominated by their University department.

*Noura Ziadi, President-Elect*

## CSSS-CJSS Student Travel Awards for International Soil Science Meetings

The Canadian Society of Soil Science (CSSS) and the Canadian Journal of Soil Science (CJSS) are pleased to jointly sponsor two annual awards to provide travel funds for student members of CSSS to attend international soil science meetings.

The Travel Award for International Soil Science Meetings allows student members to broaden the scope of their work and expand their relationships with soil science researchers outside of Canada. This is expected to build capacity and increase the engagement of students studying soil science at Canadian universities in the international soil science milieu.

### **Regulation**

1. Award applicants must be registered as student members of CSSS in good standing at the time of application.
2. Eligible applications will be those that involve attendance of an international soil science meeting outside of Canada.
3. An international meeting is defined as an advanced workshop, a conference, a symposium or a congress where the applicant pays a registration fee to attend and has the opportunity to communicate their scientific findings.
4. Priority is given to applicants who will be the presenting author that attends and communicates their scientific results at the international soil science meeting, such as in the form of a poster, an oral presentation or in a peer-reviewed conference proceedings.
5. Students attending regular project meetings, participating in training courses, internships and work assignments outside of Canada are not eligible for support.
6. A student member of CSSS may only receive the award once.
7. A maximum of \$4000 will be awarded to two successful applicants in 2016 and a maximum of \$6800 will be awarded to two successful applicants in 2017, 2018, 2019 and 2020. The award amount is not fixed and depends on the total cost of the successful applications.
8. Due to the requirements for advanced registration for many meetings, funds may be allocated for an international scientific meeting in the year of application or the following year. If travel to the conference does not occur, the funds are forfeited.
9. Funds will be awarded to cover costs for registration, travel, accommodation and meals (at the per diem rate of the applicant's institution) and associated fees (e.g., visa, travel insurance). The application should include estimates for each of these categories, but the award will be based on the actual receipts for registration, accommodation and travel (per diem on actual days travelled), and should not exceed the estimation by more than 20%.

### **Application**

1. Eligible applicants must submit a one-page letter describing the international soil science meeting to be attended, the dates of the meeting, the deadlines for registration, how they will communicate their scientific findings at the meeting and why it is an appropriate venue to engage with the international soil science community. Applicants should also submit a budget estimate, including as much documentation as possible to show the basis for this estimate (e.g. registration fees, accommodation, airfare, etc.).
2. The applicant's primary supervisor must send a short (one-page) letter in support of the student's application.
3. Applications should be submitted to the Chair of the Awards Committee, Noura Ziadi (Noura.ziadi@agr.gc.ca) by March 10, 2017.
4. If no applications have been received by the deadline, awards will be evaluated in the order that they are received for the remainder of the calendar year.

Awards will be decided by the CSSS Awards Committee, with final approval by the CSSS Council.



## REPORTS OF INTERNATIONAL TRAVEL AWARD RECIPIENTS

### Lee- Ann Nelson

In September 2016, I had the privilege of attending the Organic Phosphorus Workshop in the Lakes District, England, with my co-supervisor Dr. Barbara Cade-Menun, thanks to the CSSS-CJSS International Travel Award. I am currently a master's student at the University of Northern British Columbia with my supervisor Dr. Paul Sanborn. I presented preliminary findings of my research in England via a short presentation and poster. My thesis examines soil development and phosphorus dynamics along a sandy, hypermaritime chronosequence spanning 11,000 years in British Columbia. Within 11,000 years, mature Humic Podzols have developed with ortstein and placic horizons. Total phosphorus (P) has declined dramatically with increasing age. We used Phosphorus-Nuclear Magnetic Resonance to examine the organic P forms within enriched organic and mineral horizons for each age. Phosphorus forms and quantities did not vary significantly with age in the organic horizons (forest floor); however, there was interesting results in the mineral horizons. With increasing age, P forms known to strongly sorb to mineral surfaces (ie. stereoisomers of inositol phosphate and DNA), steadily increased in concentration with age suggesting that when P leaks out of the forest floor it is subsequently sorbed to mineral surfaces in the horizon beneath. My preliminary findings currently follow the Walker and Syers' P transformation model and suggest a possible P limitation with increasing age on this chronosequence.



### Carolyn Wilson

Thanks to sponsorship from the CSSS-CJSS Student Travel Award for an International Meeting, I attended the ASA-CSSA-SSSA International Annual Meeting in Phoenix, Arizona in November. The weather was gorgeous and conference was excellent. In particular, I enjoyed the soil quality sessions, including a talk from Douglas Karlen from the USDA and many others. I also presented preliminary results from my thesis project: "Effects of Diverse Compost on Potato Productivity and Soil Quality" in the Soil Fertility and Plant Nutrient Division of the SSSA where I was awarded 1st prize for my talk in the M.Sc. category. I would like to extend my gratitude to the generous support from CSSS and CJSS for making this conference a reality!



## REPORT OF PEDOLOGY TRAVEL AWARD RECIPIENT

### Angela Bedard-Haughn

With the support of the 2016 CSSS Pedology Travel Award, I was able to travel to Wageningen in the Netherlands to participate in the ISRIC World Soil Information Spring School (<http://www.isric.org/springschool>). This annual workshop brings together soils enthusiasts from all over the world; I was registered in the Hands-on Global Soil Information Facilities (GSIF) course, which focused on data analysis and mapping tools. I was accompanied by one of my MSc students, Jeremy Kiss. Together we are using the skills we gained to work on digital soil mapping initiatives for the Prairies. I am also using the connections made at the Spring School to build new opportunities for collaboration between the Canadian soil science community and ISRIC, and am looking forward to expanding these connections in the coming years!



*Jeremy Kiss (right) and I visiting the World Soil Museum at ISRIC in the Netherlands.*

*Participants and lecturers of the ISRIC Spring School 2016 (photo from <http://www.isric.org/springschool>)*



## Visible Near Infrared Reflectance Spectroscopy in Soil Science

Accurate assessment of soil organic matter and other soil properties can help scientists manage the long-term sustainability of soils, particularly in the context of climate change. However, this often involves standard wet chemistry laboratory methods, which can be time-consuming and expensive. Hence, there is a growing demand for cost-effective and high-throughput methods for monitoring soil properties, especially in relation to soil organic carbon content, and overall soil health and quality. Visible near infrared reflectance spectroscopy (VNIRS) has shown to be a cost-effective, rapid, nondestructive and environmentally-friendly technique that can be extensively used for soil analyses. How does VNIRS work? Basically, VNIRS in soil science focuses on the interaction between visible to near infrared wavelengths (400 – 2500 nm) with soil properties (1). Soils contain covalent bonds that may vibrate (either by stretching or bending) in response to light that is directed towards the soil sample, resulting in light absorption to various degrees (2). Light absorption is due to vibrations of molecular bonds such as O-H, C-H, N-H, C=O, C-N, N-O or C=C (1). The frequencies at which light is absorbed appears as a reduced signal of reflected light and displayed in % reflectance (R), which can be transformed to apparent absorbance [ $A = \log(1/R)$ ] (2). Generally, reflectance decreases with soil organic matter and water content (1). A VNIRS spectrum is essentially a chemical signature of the sample. The soil spectra can be collected in the laboratory or in the field. Traditionally used to analyze plant and grain samples, scientists are now using VNIRS to rapidly measure key soil properties and quality in a cost-efficient manner.



Dr. Mervin St. Luce developed the expertise in VNIRS in soil science during his PhD studies at McGill University and Agriculture and Agri-Food Canada (AAFC), and subsequent postdoctoral research at AAFC and Laval University. Using diverse soil samples from across Canada, Dr. St. Luce, together with collaborators, developed VNIRS models to predict multiple soil properties. These included total nitrogen and soil organic carbon - some of the most widely recommended indicators of soil organic matter quality (3, 4). Moreover, Dr. St. Luce and collaborators were the first worldwide to develop a VNIRS model to predict light fraction organic matter nitrogen, a labile organic matter pool that is responsive to changes in soil management (4). Dr. St. Luce also developed VNIRS models to predict soil nitrogen supply in corn cropping systems (3) and soil heavy metal concentrations (5). Currently, Dr. St. Luce is using a global spectral library with samples from across Canada, France, Switzerland, Finland and China, to develop global VNIRS models to predict soil properties, mainly soil organic carbon, total nitrogen and soil pH at both local and global scales.

Although VNIRS estimation of soil properties may not be as accurate as standard methods, they can improve regional-to-continental soil resource assessments, since more samples can be analyzed for a given budget, and can provide greater consistencies across laboratories than standard chemical methods (6). The task now is to promote and develop regional, national and global spectral libraries for rapid and accurate monitoring of soil quality and health. Spectral acquisition from archived soil samples is the ideal starting point.

### References

- (1) Nocita, M. et al. 2015. Soil spectroscopy: An alternative to wet chemistry for soil monitoring. *Adv. Agron.*, 132:139-159.
- (2) Stenberg, B. et al. 2010. Visible and near infrared spectroscopy in soil science. *Adv. Agron.*, 107:163-215.
- (3) St. Luce et al. 2012. Near infrared reflectance spectroscopy prediction of soil nitrogen supply in humid temperate regions of Canada. *Soil Sci. Soc. Am. J.*, 76:1454-1461.
- (4) St. Luce et al. 2014. Rapid determination of soil organic matter quality indicators using visible near infrared reflectance spectroscopy. *Geoderma*, 232-234:449-458.
- (5) St. Luce et al. 2017. Visible near infrared reflectance spectroscopy prediction of soil heavy metal concentrations in paper mill bisolid- and liming by-product-amended agricultural soils. *Geoderma*, 288:23-36.
- (6) Nocita, M. et al. 2015. Soil spectroscopy: An opportunity to be seized. *Glob. Change Biol.*, 21:20-11.

*Mervin St. Luce, Ph.D.  
Agriculture and Agri-Food Canada*

## Structured Spontaneity for the Soil Science Classroom: Engaging Students with Improv

This year's Soil Education session at the 2017 CSSS annual meeting will also include a 50-min workshop by Dr. Andrea Buchholz (University of Guelph). This interactive workshop will explore how improv – a form of theatre in which actors spontaneously co-create the narrative with the audience, and for which there is neither script nor fourth wall – can inform university teaching. The traditional university lecture bears a striking resemblance to traditional scripted theatre. The instructor (i.e., actor) uses PowerPoint® (a script) to deliver content (the story). An invisible fourth wall separates instructors from students, just as it separates actors from the audience. Both students and audiences are typically passive.

The first part of the workshop will introduce the art form of improv, and its applications to university teaching. The remaining time will be spent doing improv-based activities adapted for the classroom, including Word Association, 3-Headed Expert, Invent-A-Gizmo, and Paper Chase. These activities are designed to promote structured spontaneity and student engagement with content. They can be adapted to classes of any size at any level.

### ***Learning Outcomes***

By the end of the workshop, you will be able to:

- Describe the relevance and applications of improv to teaching and learning.
- Implement a minimum of three improv-based learning activities in your own classroom.

### ***About the Workshop Facilitator***

Dr. Andrea Buchholz is an Associate Professor of Applied Human Nutrition at the University of Guelph, and a 3M National Teaching Fellow (2016). She has taught over 5,500 university and college students in disciplines from anthropology to zoology, and at all levels, in class sizes of 10 to 600. Known for her engaging lecturing style and learner-centredness, her teaching philosophy is to motivate and engage students to be partners in their learning. Andrea has also studied, taught and performed improv theatre for 12 years. She's a good improviser – just ask her Mom.

*Maja Krzic, CSSS Past President*

*Amanda Diochon, CSSS Secretary*

*Tom Yates (Univ. of Saskatchewan)*

## IUSS ANNOUNCEMENT

Dear representatives of national soil science societies,

First of all, let me wish you a good start into the year 2017.  
We are looking forward to another year of successful soil science activities.

In April the General Assembly of EGU will take place **in Vienna, 23-28 April 2017**.

Together with other organisations dealing with soil, IUSS is organising the session SSS1.8 'The contribution of the Soil Science Societies to scientific knowledge, education and sustainability' within the programme 'SSS1 – History, Education and Society of Soil Science, Taxonomy' of the Division SSS – Soil System Sciences. Contributions demonstrating good examples of capacity building, soil awareness and knowledge transfer to different target groups are welcome. In particular contributions that show new educational approaches, cooperation with other disciplines and efforts to improve sustainability are of interest. The call for abstracts is open **until 11 January 2017, 12:00 lunch time (GMT)**.

Read more: <http://meetingorganizer.copernicus.org/EGU2017/session/23790>

So I kindly invite you or other members of your society to submit a paper or poster to Session **SSS1.8 The contribution of the Soil Science Societies to scientific knowledge, education and sustainability**. Such a contribution gives you the chance to present recent achievements or plans of your society and its members and discuss them with other societies and many soil scientists from all over the world. This would bring forward the initiative of the International Decade of Soils 2015 – 2024. Furthermore the EGU provides a great programme ready for all scientists interested in the soil system in the broadest sense, from measuring approaches to policy related issues as well as outreach activities.

Together we can make it a big success!

Finally, let me announce that the IUSS December Alert and the IUSS Bulletin 129 have been published, see <http://www.iuss.org/>.

*Best wishes, Sigbert*



# Attention Graduate Students

*Do you enjoy writing?*

*Are you interested in Canadian  
Soil Science?*

*Do you want to PUBLISH?*

*(a FEATURE article in our newsletter)*

If so please submit your name and university  
to the CSSS graduate student representative:  
[mcarson@laurentian.ca](mailto:mcarson@laurentian.ca)

**DEADLINE: March 17<sup>th</sup>, 2017**

## UPCOMING CONFERENCES

2017 CSSS Conference, June 10-14, 2017, Peterborough, ON

<http://csss-conference.ca/2017/>

Global symposium on soil organic matter, 21-23 March, 2017, Rome, Italy <http://www.fao.org/about/meetings/soil-organic-carbon-symposium/en/>

European Geosciences Union (EGU), General Assembly, April 23-28, 2017, Vienna, Austria (<http://egu2017.eu/home.html>). EGU together with WASWC, ESSC and SSSA, IUSS will organise the session "*The contribution of the Soil Science Societies to scientific knowledge, education and sustainability*" in the programme 'SSS1 – History, Education and Society of Soil Science, Taxonomy' of the Division SSS – Soil System Sciences (<http://meetingorganizer.copernicus.org/EGU2017/session/23790>)

Water Environment Federation (WEF) Residuals and Biosolids Conference, April 8-11, 2017, Seattle, WA. Conference theme "The Future of Bio-solids and Bioenergy" (<http://www.wef.org/ResidualsBiosolids/>)

AQSSS, Association Québécoise des Spécialistes en Sciences du Sol, May 30th- June 1st, 2017, Trois-Rivières, Québec. <http://www.aqsss.com/spip.php?article210&lang=en>

Soil Ecology Society biennial meeting, June 5-9, 2017, Fort Collins, Colorado [http://soilhealthsummit.colostate.edu/?mc\\_cid=f09c752d7b&mc\\_eid=17bcf5d643](http://soilhealthsummit.colostate.edu/?mc_cid=f09c752d7b&mc_eid=17bcf5d643)

1st World Conference on Soil and Water Conservation under Global Change (CONSOWA), 12-16 June 2017, Lleida, Spain <http://www.consowalleida2017.com/>

1st World Conference on Soil and Water Conservation under Global Change (CONSOWA), June 12-16, 2017, Lleida, Spain. Conference theme "Sustainable Life on Earth through Soil and Water Conservation" (<http://www.consowalleida2017.com/>)

11th North American Forest Ecology Workshop, Edmonton, AB, June 19- 22, 2017, Conference theme "Sustaining forests: from restoration to conservation" (<http://nafew.org/>)

Soil and Water Conservation Society, 72th Annual Meeting, Madison, WI, July 30-August 2, 2017. Conference theme "Conservation Connections: Creating Pathways to Sustainability" ([http://www.swcs.org/en/conferences/2017\\_annual\\_conference/](http://www.swcs.org/en/conferences/2017_annual_conference/))

Wageningen Soil Conference: Soil Science in a changing world, 27-31 August 2017 <http://www.wur.nl/en/Research-Results/Projects-and-programmes/Wageningen-Soil-Conference-2017.htm>

2nd Global Soil Biodiversity Conference, 15-19 October 2017, Nanjing China <http://gsbc2.csp.escience.cn/dct/page/1>

ASA-CSSA, &SSSA annual meeting, 22-25 October, 2017 Tampa, FL <https://www.acsmeetings.org/>

American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America. Tampa, FL, October 22-25, 2017, Conference theme "Managing Global Resources for a Secure Future" (<https://www.acsmeetings.org/>)

2017 National Conference on Cover Crops and Soil Health, Indianapolis, IN, November 8-9, 2017.

Useful Link: International decades of Soils 2015-2024 [http://www.iuss.org/index.php?article\\_id=588](http://www.iuss.org/index.php?article_id=588)

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