

Soil Science Education Ad Hoc Committee – Inaugural Meeting, May 6, 2014

At the Canadian Society of Soil Science Annual Meeting, Banff, AB

In Attendance: Angela Bedard-Haughn, Nathan Basiliko, Elyn Humphreys, Maja Krzic, Sue Grayston, Bobbi Helgason, Edith Olson, Paul Sanborn, Ghulam Murtaza Jamro, Gladys Oka, Bryanna Thiel, David Burton, Dan Pennock, Eryne Croquet, Melissa Iverson, Kent Watson, Tom Yates, Katie Neufeld, Meghan Laidlaw, Jacynthe Masse, Marney Isaac, Kari Dunfield, Darrell Hoffman, Preston Cumming, Catherine Fox, Les Lavkulich, Amanda Diochon, Brandon Heung, Katelyn Congreves, Mehdi Sharifi, Daryl Dagesse, Zhang Wang, Meng Wang, Brian Amiro, David Chanasyk, Anne Naeth, Genevieve Noyce, Emily Smenderovac, Michael Carson, Adam Gorgolewski, Autumn Watkinson, Julie Wilson

Executive Summary

From the discussion at the meeting, it became apparent that there is abundance of interest (and ideas) to enhance soil science education in Canada. The following 3 common themes emerged from the discussion:

1. **Graduate level:** Cross institution collaboration on graduate curriculum, either on a course-by-course basis (via existing initiatives such as the Western Deans agreement) or more formally via development of a cross Canadian graduate soil science training by applying for the NSERC CREATE funding in May 2015 (see http://www.nserc-crsng.gc.ca/professors-professeurs/grants-subs/create-foncer_eng.asp). Lead for this theme – Anne Naeth, e-mail: anne.naeth@ualberta.ca.
2. **Undergrad level:** Need to find out what soil science courses are offered in all Canadian provinces and what educational online resources are available. Nathan Basiliko compiled a list of courses in Ontario, while similar list for British Columbia was prepared by Maja Krzic (see www.soilweb.ca). Jacynthe Masse volunteered to compile a list of courses for Quebec. **Volunteers for other provinces are needed.** This information would provide a basis for a manuscript focused on the current state of the soil science education in Canada. Lead for this theme – Nathan Basiliko, e-mail: nbasiliko@laurentian.ca.
3. **High school level:** Follow up and build upon Soil4Youth program (<http://soilweb.landfood.ubc.ca/youth/>), including application for the PromoSicnece funding in September 2014 & addition of the French version of the website and activities. Lead for this theme – Maja Krzic, e-mail: maja.krzic@ubc.ca.

If you have interest to join any of the 3 themes, pls contact the lead person mentioned above.

Meeting Agenda

- 1) Opening remarks, outline of committee mandate – Maja Krzic
 - 2) Soil 4 Youth Program – Angela Bedard-Haughn & Nathan Basiliko
 - 3) Student involvement with the committee – Elyn Humphreys
 - 4) Ideas to move forward
-

DISCUSSION

1) Introductory Comments (Maja Krzic)

-Planning for the Soil Education (SoilEdu) Ad Hoc Committee has been under way since mid-2000s, and last year's establishment of the Soil Education Committee within the SSSA, precipitated this idea

-Proposed plan of action for the SoilEdu Committee:

- a) Gather information on what has been done to date on soil science education in Canada, maybe form two streams – postsecondary (university & college) and K-12
- b) Provide platform for exchange of ideas on how to improve upon existing initiatives and make sure to involve graduate and undergraduate students
- c) Choose one or two priority activities for the Committee to move forward, and build collaborations around those priority activities

-The Committee will meet once per year at annual CSSS conferences, while the on-going communication will be through e-mail (e-mail list has been initiated at this meeting) and/or a Wiki page (to be linked to the CSSS website). The Wiki page would allow a platform for communication and collaboration among the members of this Committee. Maja will look into getting this set up with a help of UBC's Center for Teaching, Learning and Technology.

2) Soil4Youth Program (Angela Bedard-Haughn & Nathan Basiliko)

-About 7-8 years ago, education emerged as one of the priorities that would help revitalize the CSSS. Initial ideas on teaching of soil science in innovative ways started to be exchanged at the CSSS conferences through sessions focused on education.

-In 2010, NSERC PromoScience funding helped to establish the Soil4Youth program, a new initiative to promote soil science to high school students and teachers. Exploring creative avenues in which soil science can be incorporated in the high school science curriculum as well as extracurricular programs such as Envirothon, Girls Guides, Scots Canada, various crowdsourcing initiatives on soil biodiversity, etc.

- Soil4Youth website was created as online hub of information: <http://soilweb.landfood.ubc.ca/youth/>
- Detailed description of the Soil 4 Youth program can be found in manuscript published in the Natural Sciences Education journal [see <https://www.agronomy.org/publications/nse/tocs/43/1>]
- Looking for feedback on the website from all members of the SoilEdu Committee (email maja.krzic@ubc.ca)

3) Opportunities for Graduate Students (Elyn Humphreys)

- Graduate (and undergraduate) students can create various educational activities for high school (or younger) students and these activities would be posted at the Soil4Youth website.
- The Committee is considering to launch a student competition at next year's CSSS annual meeting where students' teaching activities would be judged and top three activities would be awarded prizes
- As of 2013, Natural Science Education journal (published by the American Society of Agronomy) started publishing lesson plans / learning activities that are peer reviewed. This could be an incentive for some of us to do this type of work

David Burton: The CSSS Council would like a statement of the current status of soil science education in Canada. Nathan started this review for Ontario, will talk about in his presentation on May 7. Jasynthe Masse and Maja Krzic volunteered to compile similar lists of soil science courses in Quebec and BC, respectively. Volunteers for other provinces are needed.

Feedback on Soil4Youth Program – Next Steps and Future Opportunities

Jacynthe Masse: Translate into French for Quebecers (e.g., French school boards, northern Ontario) → This will be included in the proposal for renewal. It would be good to launch the French version of Soil4 Youth website in 2015, especially since The Food and Agriculture Organization of the United Nations has designated 2015 as the **International Year of Soils** (see <http://www.fao.org/globalsoilpartnership/highlights/detail/en/c/175190/>). Let's talk science initiative (<http://www.letstalkscience.ca/>) is another potential collaborator

Brian Amiro: Do learning outcomes and curricula translate between provinces? Only 3 opportunities in the Manitoba curriculum to shoe horn soil science in. **Maja:** Based on the Soil4Youth experience with high school curricula in BC, Saskatchewan and Ontario, there are some similarities among those 3 provinces, but learning outcomes are not identical.

Maja Krzic: Envirothon, competition for high school students in the US & Canada (<http://www.envirothon.org/>), is another initiative through which we could generate interest among

high school students, since soil is one of the 4 focus topics. Envirothon may not exist in every Canadian province (it is very popular in Ontario and Manitoba), but SoilEdu Committee could:

- (a) Help identify soil scientists who are already involved with Envirothon (e.g. Paul Hazlett & David Kroetsch in ON, Lindsay Andronak in MB, Eryn Crouquet in BC) and
- (b) Provide an avenue for those soil scientists who would like to get involved to connect with the high school teachers

David Burton: Identify provincial champion(s) for each province for Soil4Youth program, or SoilEdu Committee; connect to each community. Blended approach - ambassador for each province, with website (e.g., Wiki page for SoilEdu) resource as support

Post-Secondary Education Opportunities

-A page could be added for the SoilEdu Committee on CSSS website, where we could list existing courses (campus-based and online) and educational resources. This has been done in BC (see www.soilweb.ca) and this could be expanded to include other courses and educational resources.

Kent Watson: Suggests formal science degree program offered by different institutions; rebuild a degree program delivered by different institutions with different foci; pull whole country together, would be a lot of work; plus a big field trip to pull it together, each year to explore different provinces

Dan Pennock: We need to be aware of what courses are available at what institutions, to better coordinate the initiative of cross-university offerings. This initiative should not be the solution for decreasing number of soil science positions in academia.

Brain Amiro: All Agricultural Faculty deans (except UBC) signed an agreement to have undergrads take courses for credit at different institutions; signed 3-4 years ago. Hasn't been advertised, no one knows about it.

Summer Field Courses

-University of Guelph has a 2-week long field camp

-PRSSS has a 3-day long field trip on soil identification and classification. Offered in summer

-Paul Sanborn has changed format of the UNBC Soil genesis and classification course, which is now offered mostly online, plus 3 day field trip on Labour Day weekend, to accommodate students from other institutions. Grad students can obtain credits for this course via Western Deans Agreement

-We should advertise these field trips at SoilEdu web page

Brian Amiro: Develop a week-long soil classification field course for grad (and undergrad) students. At some universities, travel funding for courses is relatively easy to access. Multiple instructors could contribute to this. NSERC - CREATE Fund could be a potential source of funding for this initiative. **Anne Naeth** will move forward with the NSERC CREATE idea (note CREATE is focused on graduate training and development of innovative curriculum) to develop inter-institutional, soil science graduate program. This would provide a platform through which we could build from each institution's strengths and to fill particular gaps in each participating institution. Multi university graduate seminar could be done to connect students.

Outreach Opportunities

Mehdi Sharifi: Soil scientists to connect to high schools; quite often they are opportunities for outreach. Example from Ontario - through an enrichment program, university professors propose a course first week of May. Advertise in schools in region, students sign up, spend one day at university; introduction to sustainable agriculture example, 8 registered; engaged grad students to participate, really enjoyed it; forensic was more popular; food was an appealing feature; less lecture format, hands on activities and experiments; Tim Horton's cups as pots, different crops growing under different treatments; featured pollinators; grade 7 and 8; university has set up program. Grad students and post docs pitch a course, university decides.

Dan Pennock: CSSS could be public home for soils data base, will inherit from Agricultural Institute of Canada, could use as educational tool - Another avenue to add to justification

Kathy Fox: Jill Clapperton website Wormwatch (<https://www.naturewatch.ca/english/wormwatch/>), includes Canadian earthworm species, how to do backyard sampling, etc. In addition, Agriculture and Agri-Food Canada has an office that focuses on science communication, hence, that could be linked to SoilEdu committee's web page (once we have it). Also, maps soil textures exist and could be useful educational resource.

Brian Amiro: Cornell University has agricultural bridge program, which includes video collection (e.g., go to field and do 30 minute video).